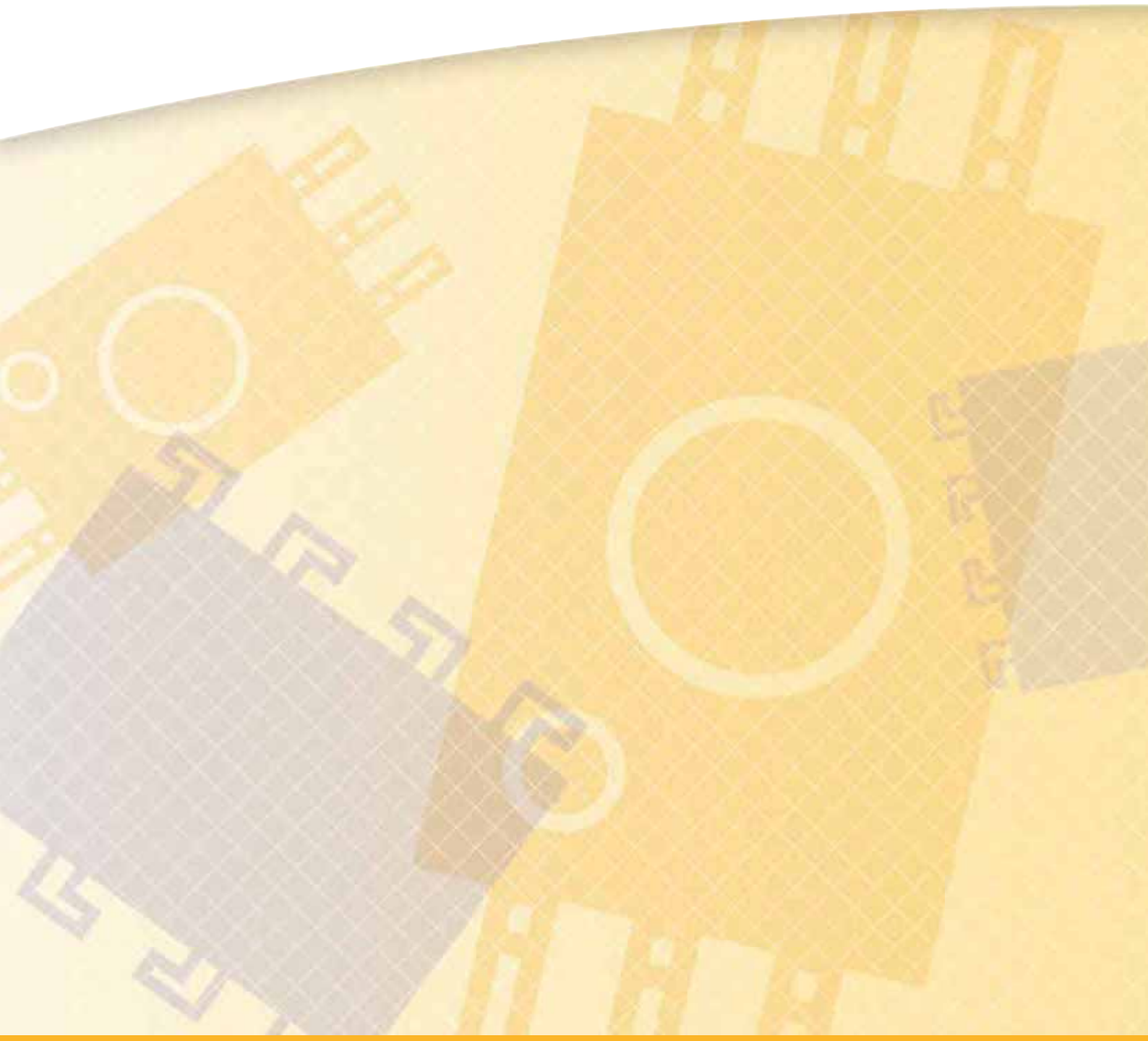
TOSHIBA
Leading Innovation

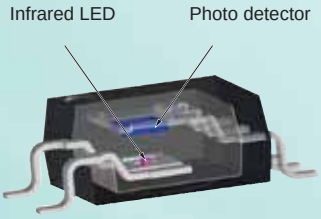
Semiconductor Catalog May 2015

Photocouplers and Photorelays

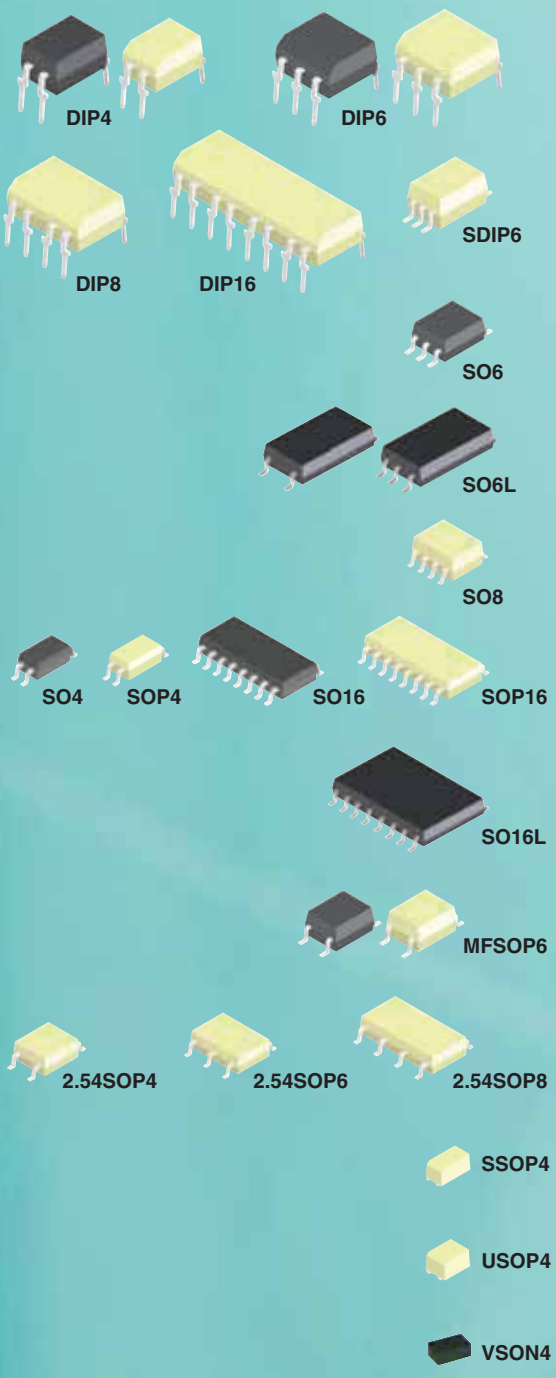


SEMICONDUCTOR & STORAGE PRODUCTS
http://toshiba.semicon-storage.com/

Photocouplers are widely used in various electronic devices to isolate high-speed signals from noise-sensitive circuits. Toshiba's photocouplers consist of a high-intensity infrared light-emitting diode (LED) optically coupled to a photodetector fabricated using the latest process. The LED-photodetector couple is encapsulated in an electrically insulating resin with high transparency. Features of Toshiba's photocouplers include certification to many international safety standards, high isolation and low power consumption. They are suitable for applications requiring a high level of safety.



Photocoupler Package



DIP4, DIP6, DIP8, DIP16		• General-purpose packages • Lead-forming options for surface mounting
SDIP6		• ≥ 7 mm clearance / creepage; ≥ 0.4mm isolation thickness • 6 pin thin SMD package (1.27 mm lead pitch)
SO6		• ≥ 5 mm clearance/creepage; ≥ 0.4 mm isolation thickness • 5 pin thin SMD package (1.27 mm lead pitch)
SO6L		• ≥ 8 mm clearance/creepage; ≥ 0.4 mm isolation thickness
SO8		• 8 pin SMD package (1.27 mm lead pitch)
SOP4, SO4, SOP16, SO16		• 4 pin SMD package (1.27 mm lead pitch) • 16 pin SMD package (1.27 mm lead pitch)
SO16L		• ≥ 8 mm clearance/creepage; ≥ 0.4 mm isolation thickness • 16 pin SMD package (1.27 mm lead pitch)
MFSOP6		• SMD package (1.27 mm lead pitch)
2.54SOP4, 2.54SOP6, 2.54SOP8		• SMD package (2.54 mm lead pitch)
SSOP4		• Ultra-small SMD package (1.27 mm lead pitch)
USOP4		• Ultra-small SMD package (1.27 mm lead pitch)
VSON4		• SMD package (Very Small Outline Non-leaded)

Product Lineup

Both photocouplers and photorelays consist of a light-emitting element and a light-receiving element in the same package. Their input and output signals are optically coupled with each other to provide electrical isolation. Photocouplers and photorelays are available with many output types to meet various interface needs.

Photocoupler Product Lineup

Isolation Amplifier

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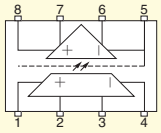
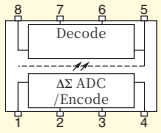


Analog Output Type



Digital Output Type

IC Output

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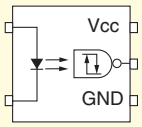
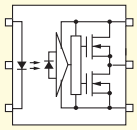
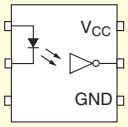


High Speed Communications



IGBT/MOSFET Gate Drive



IPM Drive

Transistor Output

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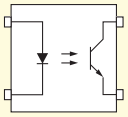
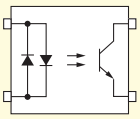
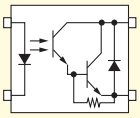


DC Input Type



AC Input Type



Darlington Transistor Output Type

Triac Output

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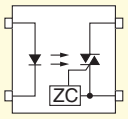
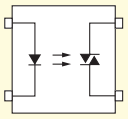


Zero Cross Type



Non Zero Cross Type

Thyristor Output

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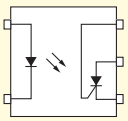

Photovoltaic Output

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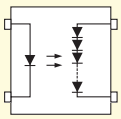
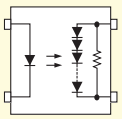


General-purpose



With discharge resistor

Photorelays

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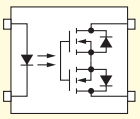
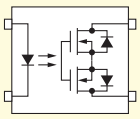


Form-A contact



Form-B contact

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Board Assembly — Page 56
Device Degradation — Page 58
Safety Standard Approvals — Page 64
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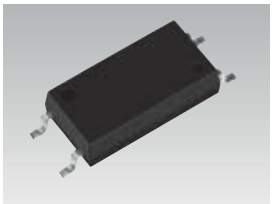
Toshiba Launches Low Power Consumption 15 Mbps High-speed Photocoupler with Creepage and Clearance Distance of 8 mm: TLP2761

The new photocoupler has a low height of 2.3 mm (max), an approximately 45 % reduction from conventional SDIP package products, and contribute to the development of thinner and smaller sets. Despite the low height, the new product guarantees a creepage and clearance distance of 8 mm (min), and isolation voltage of 5000 Vrms (min), making it suitable for applications requiring higher isolation specs.

"TLP2761" incorporate Toshiba's original high output infrared LEDs in the input side and reduces the threshold input current by approximately 54 % compared with Toshiba conventional products[1]. In the output side, it contains a photo detector IC die fabricated with a Bi-CMOS process, and reduces the supply current by approximately 66 % compared with conventional products[1]. Furthermore, it can contribute to lowering the operation voltage of sets with guaranteed supply voltage of 2.7 V to 5.5 V, at temperatures up to 125 degrees Celsius, the industry's highest class[2] of operation.

Toshiba Launches Low-height Package Low-input Current Drive Transistor Output Photocoupler: TLP383



The new product incorporate Toshiba's original high output infrared LEDs and guarantee the same CTR (Current Transfer Ratio) at 0.5 mA input current and at 5.0 mA input current.

The new photocoupler has a low height of 2.3 mm (max), an approximately 45 % reduction from Toshiba conventional DIP4 package products. At the same time, the new product has an isolation specification equivalent to DIP4 wide lead type package products and guarantees a creepage and clearance distance of 8 mm (min), and isolation voltage of 5000 Vrms (min). With its low height, the "TLP383" can be used in situations where there are strict height restrictions, such as on motherboards, and contribute to the development of smaller sets. It can be used for applications including inverter interfaces and general-purpose power supplies.

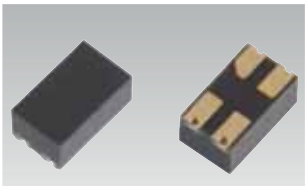
Ultra-small and thin VSON photorelay series: TLP3417, TLP3420, TLP3440, TLP3475

The TLP3440 and TLP3475 are suited to high-frequency applications. The TLP3475 provides improved on-state conduction characteristics, thus eliminating or reducing potential problems in high-frequency signal transmission. The TLP3440 has lower off-state leakage due to a high-frequency signal. While the TLP3417 and TLP3420 provide electrical characteristics equivalent to their predecessors in the USOP4 package, they have a 50% less mounting area. The TLP3417 and TLP3420 are suited to high-voltage applications such as semiconductor test equipment in which a device under test must tolerate high voltage. The TLP3417 has a V_{OFF} of 80 V while the TLP3420 has a V_{OFF} of 100 V.

Features

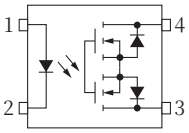
- Ultra-small VSON4 package (50% footprint area reduction compared to the USOP4 package)
- Chip-on-chip structure*
- Photorelays for high-frequency applications: TLP3440, TLP3475
- Photorelays for high-voltage applications: TLP3417, TLP3420

*: Chip-on-chip structure: An LED chip is stacked on top of a photodetector chip, with an insulation material in between.



VSON4

Pin configuration



1. Anode
2. Cathode
3. Drain
4. Drain

Applications

- Semiconductor test equipment
- Measuring instruments
- Medical devices
- Probe cards

Rail-to-rail-output gate drive photocouplers: TLP5751, TLP5752, TLP5754

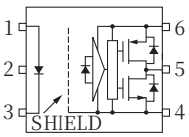
The TLP5751, TLP5752 and TLP5754 provide rail-to-rail outputs for full voltage swing almost equivalent to the supply voltage range, reducing losses in the photocoupler and the power device it drives. These photocouplers differ in the peak output current (1 A / 2.5 A / 4 A); so you can select one that best suits your need. Since these photocouplers incorporate an LED with outstanding lifetime characteristics, they are suitable for applications that are exposed to harsh heat conditions, including industry equipment, photovoltaic power generation systems and uninterruptible power supplies (UPS).

Features

- Housed in a 2.3-mm-thick SO6L package, which is approximately 54% thinner than SDIP
- Lower loss due to rail-to-rail output
- Available with different peak output currents (1 A / 2.5 A / 4 A)
- LED with excellent lifetime characteristics
- High operating temperature: T_{opr} = 110°C (max)

SO6L

Pin configuration



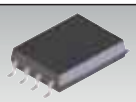
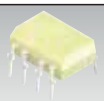
1. Anode
2. N.C.
3. Cathode
4. GND
5. Vo (Output)
6. Vcc

Applications

- IGBT and MOSFET gate drivers
- General-purpose inverters
- Air-conditioner inverters
- Servo amplifiers

Isolation Amplifier

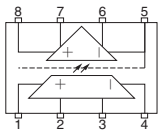
Selection Table

		
Output Configuration	SO8L	DIP8
Analog Output Type	TLP7820 **	TLP7920 **
Digital Output type	TLP7830 **	TLP7930 **

**: Under development

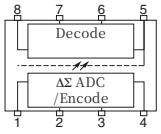
Selection Guide

Analog Output Type

Part Number	Pin Configuration	Features	Gain Error Rank (Ta=25°C) (%) max	Non Linearity INL_{200} (Ta=25°C) (%) typ.	Input Offset Voltage (mV) typ.	Supply Current Input I_{DD1} (mA) max	Supply Current Output I_{DD2} (mA) max	BVs @1min. (Vrms)	Safety Standards (1) UL	c-UL	VDE	BSI	CQC
TLP7820 **		**SO8L** •Gain = 8.2 (typ.) •Topr = 105°C (max)	±0.5 ±1.0 ±3.0	0.02	0.9	12	10	5000	△	△	△		△
TLP7920 **		**DIP8** •Gain = 8.2 (typ.) •Topr = 105°C (max)							△	△	△		△

**: Under development

Digital Output Type

Part Number	Pin Configuration	Features	SNDR (Ta=25°C) (dB) typ.	SNR (Ta=25°C) (dB) typ.	Output Clock Frequency (MHz) typ.	Supply Current Input I_{DD1} (mA) max	Supply Current Output I_{DD2} (mA) max	BVs @1min. (Vrms)	Safety Standards (1) UL	c-UL	VDE	BSI	CQC
TLP7830 **		**SO8L** •1bit digital & CLK output •Topr = 105°C (max)	75	80	10	15	8.0	5000	△	△	△		△
TLP7930 **		**DIP8** •1bit digital & CLK output •Topr = 105°C (max)							△	△	△		△

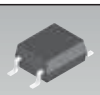
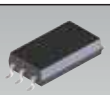
Note (1): Please refer to page 43.

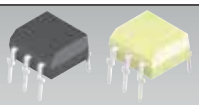
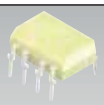
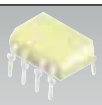
**: Under development

SNDR: Signal to Noise and Distortion Ratio
SNR: Signal to Noise Ratio

IC Output <High Speed Communications>

Selection Table

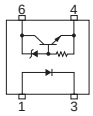
Data Rate (Typ.)	Output								
			5 pin MFSOP6	4 pin SO6	5 pin SO6	SO8 1ch	SO8 2ch	SO6L	SDIP6 (F type)
20 kbit/s	Open-collector			TLP2301					
100 to 300 kbit/s	Open-collector				TLP2303	TLP2403		TLP2703 *	
1 Mbit/s	Open-collector				TLP109 TLP2309	TLP2409			
		IPM drive			TLP104 TLP109 (IGM)	TLP2404		TLP2704 **	TLP714 TLP719 / TLP714F TLP719F
5 Mbit/s	Totem-pole		TLP2095 TLP2098		TLP2310 *		TLP2110 ** TLP2105 TLP2108	TLP2710 *	
		AC input			TLP2395 * TLP2398 *				
		IPM drive			TLP2355 TLP2358	TLP2405 TLP2408			TLP715 TLP718 / TLP715F TLP718F
10 Mbit/s	Open-collector				TLP2362				
	Totem-pole				TLP2391 *				
		IPM drive			TLP2345 * TLP2348 *			TLP2745 ** TLP2748 **	
15 Mbit/s	Open-collector						TLP2118E		TLP708 / TLP708F
	Totem-pole				TLP2361 *		TLP2116 TLP2161 * TLP2166A	TLP2761 *	TLP716 / TLP716F
20 Mbit/s	Open-collector				TLP118 TLP2368	TLP2418 TLP2468	TLP2168	TLP2768A *	TLP2768 / TLP2768F
	Totem-pole		TLP2066		TLP116A TLP2366	TLP2466	TLP2160		TLP2766 / TLP2766F
40 Mbit/s	Totem-pole				TLP2367 **	TLP2167 **			TLP2767 ** / TLP2767F **
50 Mbit/s	Totem-pole		TLP117						

Data Rate (Typ.)	Output					
			DIP6	DIP8 1ch	DIP8 (F type)	DIP8 2ch / (F type) / JEDEC Type
100 to 300 kbit/s	Open-collector			TLP553		6N138 6N139
1 Mbit/s	Open-collector		TLP512	TLP550 TLP551 TLP559 TLP651 TLP750 TLP751 TLP759	TLP750F TLP751F TLP759F	TLP2530 TLP2531 / 6N135 6N136
		IPM drive		TLP559 (IGM) TLP754 TLP759 (IGM)	TLP754F TLP759F (IGM)	
2.5 Mbit/s	3-state			TLP2200		
5 Mbit/s				TLP555 TLP558		
	Totem-pole					
		IPM drive		TLP2955 TLP2958	TLP2955F TLP2958F	
10 Mbit/s	Open-collector		TLP513	TLP552 TLP554 TLP2601 TLP2962 TLPN137	TLP2962F	TLP2630 TLP2631 TLP2662 / TLP2662F / 6N137

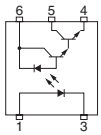
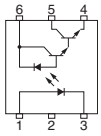
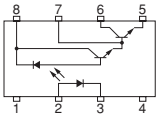
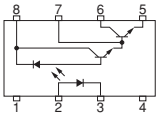
: Photocouplers with a maximum operating temperature (Topr.) of 125°C
: Photocouplers with low input current.
*: New product **: Under development

Selection Guide

Data Rate: 20 k bps (Typ.)

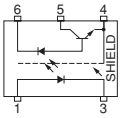
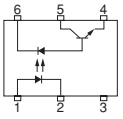
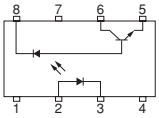
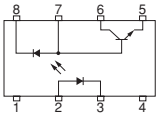
Part Number	Pin Configuration	Features	Propagation Delay Time (max) t_{pHL} (μs)	Propagation Delay Time (max) t_{pLH} (μs)	CTR min (%)	CTR @ I_F (mA)	BVs @1min. (Vrms)	Safety Standards (1) UL	c-UL	VDE	BSI	CQC
TLP2301		**4 pin SO6** •Reinforced insulation •Low input drive current •Data Rate (Typ. @NRZ) 20 k bps	30	30	50	1	3750	○	○	□		△

Data Rate: 100 k / 300 k bps (Typ.)

Part Number	Pin Configuration	Features	Propagation Delay Time (max) t_{pHL} (μs)	Propagation Delay Time (max) t_{pLH} (μs)	CTR min (%)	CTR @ I_F (mA)	BVs @1min. (Vrms)	Safety Standards (1) UL	c-UL	VDE	BSI	CQC
TLP2303		**5 pin SO6** •Reinforced insulation •Low input drive current •Data Rate (Typ. @NRZ) 100 k bps	15	50	900	0.5	3750	○	○	□		○
TLP2703 *		**SO6L** •Reinforced insulation •Low input drive current •Data Rate (Typ. @NRZ) 100 k bps					5000	△	△	△		△
TLP553		**DIP8** •Low input drive current •Data Rate (Typ. @NRZ) 300 k bps	25	60	400		2500	○				
TLP2403		**SO8** •SO8 version of the TLP553 •Data Rate (Typ. @NRZ) 300 k bps					3750	○	○	○		

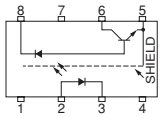
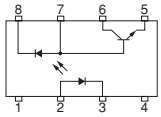
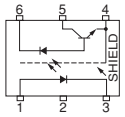
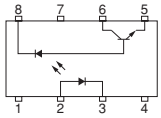
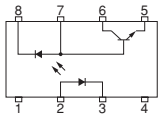
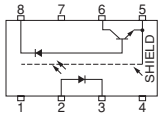
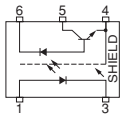
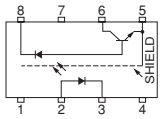
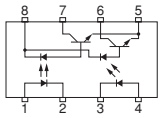
*: New product

Data Rate: 1 M bps (Typ.)

Part Number	Pin Configuration	Features	Propagation Delay Time (max) t_{pHL} (μs)	Propagation Delay Time (max) t_{pLH} (μs)	CTR min (%)	CTR @ I_F (mA)	BVs @1min. (Vrms)	Safety Standards (1) UL	c-UL	VDE	BSI	CQC
TLP109		**5 pin SO6** •Reinforced insulation •Data Rate (Typ. @NRZ) 1 M bps	0.8	0.8	20	16	3750	○	○	□		○
TLP512		**DIP6** •DIP6 package version of the TLP550 •Data Rate (Typ. @NRZ) 1 M bps					2500	○				
TLP550		**DIP8** •High CMR •Data Rate (Typ. @NRZ) 1 M bps	0.8	2	10 (19% min for rank O)			○	○			
TLP551		**DIP8** •Internal base connection •Data Rate (Typ. @NRZ) 1 M bps						○	○			

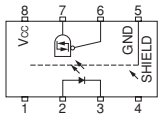
Note (1): Please refer to page 43.

Data Rate: 1 M bps (Typ.)

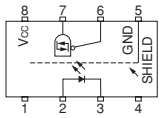
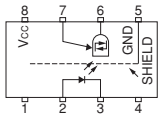
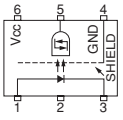
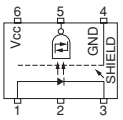
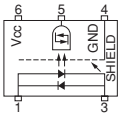
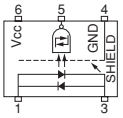
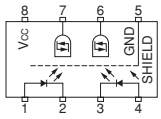
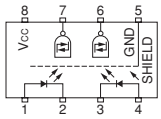
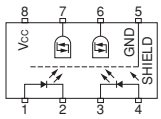
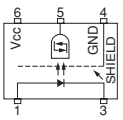
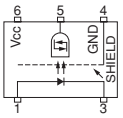
Part Number	Pin Configuration	Features	Propagation Delay Time (max)		CTR		BVs @1min.	Safety Standards (1)				
			t_{pHL} (μs)	t_{pLH} (μs)	min (%)	@ I_F (mA)	(Vrms)	UL	c-UL	VDE	BSI	CQC
TLP559		**DIP8** •High CMR version of the TLP550 •Data Rate (Typ. @NRZ) 1 M bps	0.8	0.8	20	16	2500	○	○			
TLP651		**DIP8** •High isolation voltage •Internal base connection •Data Rate (Typ. @NRZ) 1 M bps	0.8	2.0	10 (19% min for rank O)		5000	○	○			
TLP719 TLP719F		**SDIP6** •Direct drive of an IPM •Data Rate (Typ. @NRZ) 1 M bps	0.8	0.8	20			○	○	○		
TLP750 TLP750F		**DIP8** •High isolation voltage •SEMKO-approved •Data Rate (Typ. @NRZ) 1 M bps	0.8	2	10 (19% min for rank O)			○	○	○	○	
TLP751 TLP751F		**DIP8** •Internal base connection •SEMKO-approved •Data Rate (Typ. @NRZ) 1 M bps	0.2 (Typ.)	1.0 (Typ.)	10			○	○	○	○	
TLP759 TLP759F		**DIP8** •IEC60950 design standard version of the TLP559 •SEMKO-approved •Data Rate (Typ. @NRZ) 1 M bps	0.8	0.8	20			○	○	○	○	
TLP2309		**5 pin SO6** •Reinforced insulation •3.3-V/5.0-V power supplies •Data Rate (Typ. @NRZ) 1 M bps	1.0	1.0	15	10	3750	○	○	□		○
TLP2409		**SO8** •Topr = 125°C (max) •SO8 version of the TLP109 •Data Rate (Typ. @NRZ) 1 M bps	0.8	0.8	20	16		○	○	○		
TLP2530		**DIP8** •Dual channel version of the 6N135 and the TLP550 •Data Rate (Typ. @NRZ) 1 M bps	1.5	1.5	7		2500	○	○			
TLP2531		**DIP8** •Dual channel version of the 6N135 and the TLP550 •Data Rate (Typ. @NRZ) 1 M bps	0.8	0.8	19			○	○			

Note (1): Please refer to page 43.

Data Rate: 2.5 M bps (Typ.)

Part Number	Pin Configuration	Features	Propagation Delay Time (max)		Output Form		BVs @1min.	Safety Standards (1)				
			t_{pHL} (μs)	t_{pLH} (μs)		@ I_F (mA)	(Vrms)	UL	c-UL	VDE	BSI	CQC
TLP2200		**DIP8** •Low input current •Data Rate (Typ. @NRZ) 2.5 M bps	0.4	0.4	3-state output (Buffer logic)	I_{FLH} = 1.6 (max)	2500	○	○			

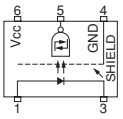
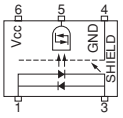
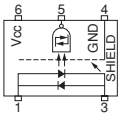
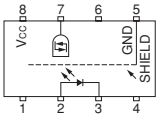
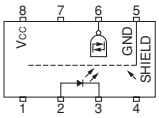
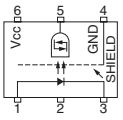
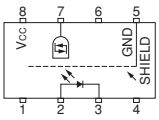
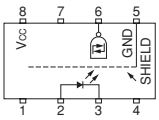
Data Rate: 5 M bps (Typ.)

Part Number	Pin Configuration	Features	Propagation Delay Time (max)		Output Form		BVs @1min.	Safety Standards (1)				
			t_{pHL} (μs)	t_{pLH} (μs)		@ I_F (mA)	(Vrms)	UL	c-UL	VDE	BSI	CQC
TLP555		**DIP8** •Low input current •Vcc = 4.5 to 20 V •With enable pin •Data Rate (Typ. @NRZ) 5 M bps	0.4	0.4	3-state output (Buffer logic)	I_{FLH} = 1.6 (max)	2500	○	○			
TLP558					3-state output (Inverter logic)	I_{FHL} = 1.6 (max)		○	○			
TLP715 TLP715F		**SDIP6** •Direct drive of an IPM •Data Rate (Typ. @NRZ) 5 M bps	0.25	0.25	Totempole output (Buffer logic)	I_{FLH} = 3 (max)	5000	○	○	○		
TLP718 TLP718F					Totempole output (Inverter logic)	I_{FHL} = 3 (max)		○	○	○		
TLP2095		**5 pin MFSOP6** •AC input •Vcc = 3.0 to 20 V •Data Rate (Typ. @NRZ) 5 M bps			Totempole output (Buffer logic)	I_{FLH} = ±3.0	3750	○	○	○		
TLP2098					Totempole output (Inverter logic)	I_{FHL} = ±3.0		○	○	○		
TLP2105		**SO8** •Dual channel •Data Rate (Typ. @NRZ) 5 M bps			Totempole output (Buffer logic)	I_{FLH} = 1.6 (max)	2500	○	○	○		
TLP2108					Totempole output (Inverter logic)	I_{FHL} = 1.6 (max)		○	○	○		
TLP2110 **		**SO8** •Dual channel version of the TLP2310 •Data Rate (Typ. @NRZ) 5 M bps	0.2	0.2	Totempole output (Buffer logic)	I_{FLH} = 1.0 (max)		△	△	△		△
TLP2310 *		**5 pin SO6** •Reinforced insulation •Ultra low consumption •Data Rate (Typ. @NRZ) 5 M bps	0.25	0.25	Totempole output (Buffer logic)	I_{FLH} = 1.0 (max)	3750	○	○	□		○
TLP2355		**5 pin SO6** •Reinforced insulation •Direct drive of an IPM •Data Rate (Typ. @NRZ) 5 M bps	0.25	0.25	Totempole output (Buffer logic)	I_{FLH} = 1.6 (max)		○	○	□		○

Note (1): Please refer to page 43.

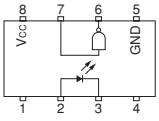
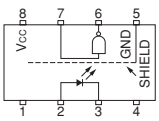
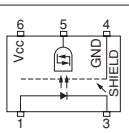
*: New product **: Under development

Data Rate: 5 M bps (Typ.)

Part Number	Pin Configuration	Features	Propagation Delay Time (max) t_{pHL} (μs)	Propagation Delay Time (max) t_{pLH} (μs)	Output Form	Output Form @ I_F (mA)	BVs @1min. (Vrms)	Safety Standards (1) UL	c-UL	VDE	BSI	CQC
TLP2358		**5 pin SO6** •Reinforced insulation •Direct drive of an IPM •Data Rate (Typ. @NRZ) 5 M bps	0.25	0.25	Totempole output (Inverter logic)	I_{FHL} = 1.6 (max)	3750	○	○	□		○
TLP2395 *		**5 pin SO6** •AC input version of the TLP2355 •Data Rate (Typ. @NRZ) 5 M bps	0.25	0.25	Totempole output (Buffer logic)	I_{FLH} = ±2.3 (max)	3750	○	○	□		○
TLP2398 *		**5 pin SO6** •AC input version of the TLP2355 •Data Rate (Typ. @NRZ) 5 M bps	0.25	0.25	Totempole output (Inverter logic)	I_{FHL} = ±2.3 (max)	3750	○	○	□		○
TLP2405		**SO8** •Low input current •Direct drive of an IPM •Data Rate (Typ. @NRZ) 5 M bps	0.25	0.25	Totempole output (Buffer logic)	I_{FLH} = 1.6 (max)	3750	○	○	○		
TLP2408			0.25	0.25	Totempole output (Inverter logic)	I_{FHL} = 1.6 (max)	3750	○	○	○		
TLP2710 *		**SO6L** •SO6L version of the TLP2310 •Data Rate (Typ. @NRZ) 5 M bps	0.25	0.25	Totempole output (Buffer logic)	I_{FLH} = 1.0 (max)	5000	○	○	□		△
TLP2955 TLP2955F		**DIP8** •Topr = 125°C (max) •Low input current •Vcc = 3.0~20-V •Direct drive of an IPM •Data Rate (Typ. @NRZ) 5 M bps	0.25	0.25	Totempole output (Buffer logic)	I_{FLH} = 1.6 (max)	5000	○	○	□		
TLP2958 TLP2958F			0.25	0.25	Totempole output (Inverter logic)	I_{FHL} = 1.6 (max)	5000	○	○	□		

*: New product

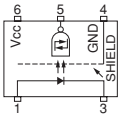
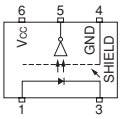
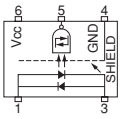
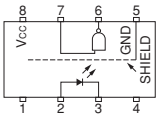
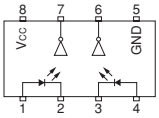
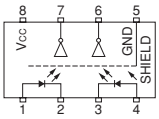
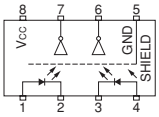
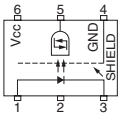
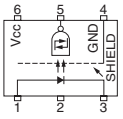
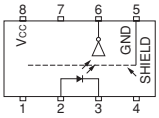
Data Rate: 10 M bps (Typ.)

Part Number	Pin Configuration	Features	Propagation Delay Time (max) t_{pHL} (μs)	Propagation Delay Time (max) t_{pLH} (μs)	Output Form	Output Form @ I_F (mA)	BVs @1min. (Vrms)	Safety Standards (1) UL	c-UL	VDE	BSI	CQC
TLP552		**DIP8** •High-speed •Data Rate (Typ. @NRZ) 10 M bps	0.12	0.12	Open-collector output (Inverter logic)	I_{FHL} = 5.0 (max)	2500	○				
TLP554		**DIP8** •High-speed •High CMR version of the TLP552 •Data Rate (Typ. @NRZ) 10 M bps	0.12	0.12	Open-collector output (Inverter logic)	I_{FHL} = 5.0 (max)	2500	○	○			
TLP2345 *		**5 pin SO6** •Reinforced insulation •High-speed •Direct drive of an IPM •Data Rate (Typ. @NRZ) 10 M bps	0.12	0.12	Totempole output (Buffer logic)	I_{FLH} = 1.6 (max)	3750	○	○	□		△

Note (1): Please refer to page 43.

*: New product

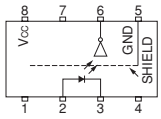
Data Rate: 10 M bps (Typ.)

Part Number	Pin Configuration	Features	Propagation Delay Time (max)		Output Form		BVs @1min.	Safety Standards (1)				
			t_{pHL} (μs)	t_{pLH} (μs)		@ I_F (mA)	(Vrms)	UL	c-UL	VDE	BSI	CQC
TLP2348 *		**5 pin SO6** •Reinforced insulation •High-speed •Direct drive of an IPM •Data Rate (Typ. @NRZ) 10 M bps	0.12	0.12	Totempole output (Inverter logic)	I_{FHL} = 1.6 (max)	3750	○	○	□		△
TLP2362		**5 pin SO6** •Reinforced insulation •Vcc = 2.7-V/5.5-V •Topr (max)125°C •Data Rate (Typ. @NRZ) 10 M bps	0.1	0.1	Open-collector output (Inverter logic)	I_{FHL} = 5.0 (max)		○	○	□		○
TLP2391 *		**5 pin SO6** •Reinforced insulation •Vcc = 3.3-V/5-V •Topr (max)125°C •Data Rate (Typ. @NRZ) 10 M bps			Totempole output (Inverter logic)	I_{FHL} = ±2.5 (max)		○	○	□		
TLP2601		**DIP8** •High-speed •High CMR •Data Rate (Typ. @NRZ) 10 M bps	0.075	0.075	Open-collector output (Inverter logic)	I_{FHL} = 5.0 (max)	2500	○	○			
TLP2630		**DIP8** •Dual channel version of the 6N137 and the TLP552 •Data Rate (Typ. @NRZ) 10 M bps						○	○			
TLP2631		**DIP8** •$CM_{H/L}$±1 kV/μs (min) •Dual channel version of the TLP554 •Data Rate (Typ. @NRZ) 10 M bps						○	○			
TLP2662 TLP2662F		**DIP8** •Vcc = 3.3-V/5-V •Topr (max)125°C •Dual channel version of the TLP2962 •Data Rate (Typ. @NRZ) 10 M bps					5000	○	○	□		
TLP2745 *		**SO6L** •Reinforced insulation •High-speed •Direct drive of an IPM •SO6L version of the TLP2345 •Data Rate (Typ. @NRZ) 10 M bps	0.12	0.12	Totempole output (Buffer logic)	I_{FLH} = 1.6 (max)		○	○	□		△
TLP2748 *		**SO6L** •Reinforced insulation •High-speed •Direct drive of an IPM •SO6L version of the TLP2348 •Data Rate (Typ. @NRZ) 10 M bps			Totempole output (Inverter logic)	I_{FHL} = 1.6 (max)		△	△	△		△
TLP2962 TLP2962F		**DIP8** •Vcc = 3.3-V/5-V •Topr (max)125°C •Data Rate (Typ. @NRZ) 10 M bps	0.075	0.075	Open-collector output (Inverter logic)	I_{FHL} = 5.0 (max)		○	○	□		

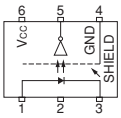
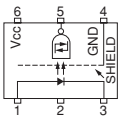
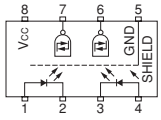
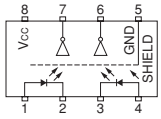
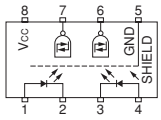
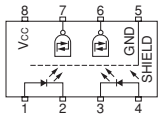
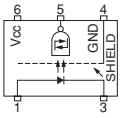
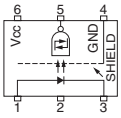
Note (1): Please refer to page 43.

*: New product

Data Rate: 10 M bps (Typ.)

Part Number	Pin Configuration	Features	Propagation Delay Time (max)		Output Form		BVs @1min.	Safety Standards (1)				
			t_{pHL} (μs)	t_{pLH} (μs)		@ I_F (mA)	(Vrms)	UL	c-UL	VDE	BSI	CQC
TLPN137		**DIP8** •High-speed •Data Rate (Typ. @NRZ) 10 M bps	0.1	0.1	Open-collector output (Inverter logic)	I_{FHL} = 5.0 (max)	5000	○	○	□	△	

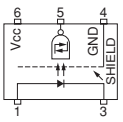
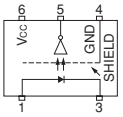
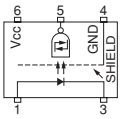
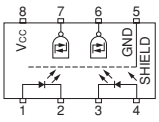
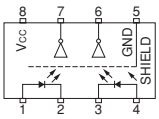
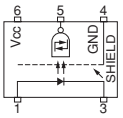
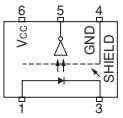
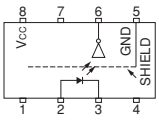
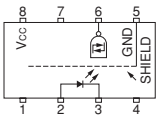
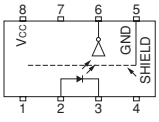
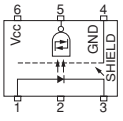
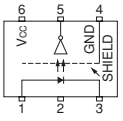
Data Rate: 15 M bps (Typ.)

Part Number	Pin Configuration	Features	Propagation Delay Time (max)		Output Form		BVs @1min.	Safety Standards (1)				
			t_{pHL} (μs)	t_{pLH} (μs)		@ I_F (mA)	(Vrms)	UL	c-UL	VDE	BSI	CQC
TLP708 TLP708F		**SDIP6** •Topr (max)125°C •High-speed •SDIP version of the TLP118 •Data Rate (Typ. @NRZ) 15 M bps	0.075	0.075	Open-collector output (Inverter logic)	I_{FHL} = 5.0 (max)	5000	○	○	○		
TLP716 TLP716F		**SDIP6** •High-speed •SDIP version of the TLP116A •Data Rate (Typ. @NRZ) 15 M bps			Totempole output (Inverter logic)	I_{FHL} = 6.5 (max)		○	○	○		
TLP2116		**SO8** •Dual channel version equivalent of the TLP116A •Data Rate (Typ. @NRZ) 15 M bps				I_{FHL} = 5.0 (max)		○	○	○		
TLP2118E		**SO8** •Dual channel version equivalent of the TLP118 •Data Rate (Typ. @NRZ) 15 M bps			Open-collector output (Inverter logic)			○	○	○		
TLP2161 *		**SO8** •Vcc = 3.3-V/5-V power supplies •Topr (max)125°C •Data Rate (Typ. @NRZ) 15 M bps	0.08	0.08	Totempole output (Inverter logic)	I_{FHL} = 1.6 (max)	2500	○	○	○		
TLP2166A		**SO8** •Vcc = 3.0-V/3.6-V •Dual channel version equivalent of the TLP2366 •Data Rate (Typ. @NRZ) 15 M bps	0.075	0.075		I_{FHL} = 3.0 (max)		○	○	○		
TLP2361 *		**5 pin SO6** •Reinforced insulation •Vcc = 2.7-V/5.5-V •Topr (max)125°C •Data Rate (Typ. @NRZ) 15 M bps	0.08	0.08	Totempole output (Inverter logic)	I_{FHL} = 1.6 (max)	3750	○	○	□		○
TLP2761 *		**SO6L** •Reinforced insulation •Vcc = 2.7-V/5.5-V •Topr (max)125°C •SO6L version of the TLP2361 •Data Rate (Typ. @NRZ) 15 M bps				I_{FLH} = 1.6 (max)	5000	○	○	△		△

Note (1): Please refer to page 43.

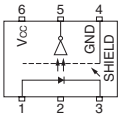
*: New product

Data Rate: 20 M bps (Typ.)

Part Number	Pin Configuration	Features	Propagation Delay Time (max)		Output Form		BVs @1min.	Safety Standards (1)				
			t_{pHL} (ns)	t_{pLH} (ns)		@ I_F (mA)	(Vrms)	UL	c-UL	VDE	BSI	CQC
TLP116A		**5 pin SO6** •Reinforced insulation •Data Rate (Typ. @NRZ) 20 M bps	60	60	Totempole output (Inverter logic)	I_{FHL} = 5.0 (max)	3750	○	○	○		○
TLP118		**5 pin SO6** •Reinforced insulation •Topr (max)125°C •Data Rate (Typ. @NRZ) 20 M bps			Open-collector output (Inverter logic)			○	○	□		○
TLP2066		**5 pin MFSOP6** •3.3-V power supply •Data Rate (Typ. @NRZ) 20 M bps			Totempole output (Inverter logic)			○		○		○
TLP2160		**SO8** •Dual channel •3.3-V/5-V power supplies •Topr (max)125°C •Data Rate (Typ. @NRZ) 20 M bps	40	40		I_{FHL} = 3.5 (max)	2500	○	○	○		
TLP2168		**SO8** •3.3-V/5-V power supplies •Topr (max)125°C •Data Rate (Typ. @NRZ) 20 M bps	60	60	Open-collector output (Inverter logic)	I_{FHL} = 5.0 (max)		○	○	○		
TLP2366		**5 pin SO6** •Reinforced insulation •3.3-V/5-V power supplies •Topr (max)125°C •Data Rate (Typ. @NRZ) 20 M bps	40	40	Totempole output (Inverter logic)	I_{FHL} = 3.5 (max)	3750	○	○	□		○
TLP2368		**5 pin SO6** •Reinforced insulation •Topr (max)125°C •Data Rate (Typ. @NRZ) 20 M bps	60	60	Open-collector output (Inverter logic)	I_{FHL} = 5.0 (max)		○	○	□		○
TLP2418		**SO8** •Topr (max)125°C •SO8 version of the TLP118 •Data Rate (Typ. @NRZ) 20 M bps	75	75				○	○	○		
TLP2466		**SO8** •3.3-V/5-V power supplies •Topr (max)125°C •Data Rate (Typ. @NRZ) 20 M bps	40	40	Totempole output (Inverter logic)	I_{FHL} = 3.5 (max)		○	○	○		
TLP2468		**SO8** •3.3-V/5-V power supplies •Topr (max)125°C •Data Rate (Typ. @NRZ) 20 M bps	60	60	Open-collector output (Inverter logic)	I_{FHL} = 5.0 (max)		○	○	○		
TLP2766 TLP2766F		**SDIP6** •3.3-V/5-V power supplies •Topr (max)125°C •Data Rate (Typ. @NRZ) 20 M bps	40	40	Totempole output (Inverter logic)	I_{FHL} = 3.5 (max)	5000	○	○	○		
TLP2768 TLP2768F		**SDIP6** •3.3-V/5-V power supplies •Topr (max)125°C •Data Rate (Typ. @NRZ) 20 M bps	60	60	Open-collector output (Inverter logic)	I_{FHL} = 5.0 (max)		○	○	○		

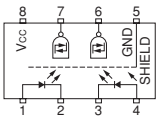
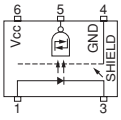
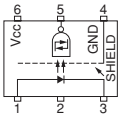
Note (1): Please refer to page 43.

Data Rate: 20 M bps (Typ.)

Part Number	Pin Configuration	Features	Propagation Delay Time (max)		Output Form		BVs @1min.	Safety Standards (1)				
			t_{pHL} (ns)	t_{pLH} (ns)		@ I_F (mA)	(Vrms)	UL	c-UL	VDE	BSI	CQC
TLP2768A *		**SO6L** •Reinforced insulation •Topr (max)125°C •SO6L version of the TLP2368 •Data Rate (Typ. @NRZ) 20 M bps	60	60	Open-collector output (Inverter logic)	I_{FHL} = 5.0 (max)	5000	△	△	△		△

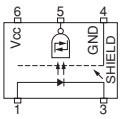
*: New product

Data Rate: 40 M bps (Typ.)

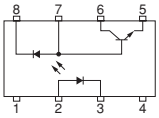
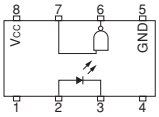
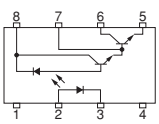
Part Number	Pin Configuration	Features	Propagation Delay Time (max)		Output Form		BVs @1min.	Safety Standards (1)				
			t_{pHL} (ns)	t_{pLH} (ns)		@ I_F (mA)	(Vrms)	UL	c-UL	VDE	BSI	CQC
TLP2167 **		**SO8** •3.3-V/5-V power supplies •Topr (max)125°C •Data Rate (Typ. @NRZ) 40 M bps	**	**	Totempole output (Inverter logic)	I_{FHL} = 5.0 (max)	2500	△	△	△		
TLP2367 **		**5 pin SO6** •Reinforced insulation •3.3-V/5-V power supplies •Topr (max)125°C •Data Rate (Typ. @NRZ) 40 M bps	**	**			3750	△	△	△		
TLP2767 ** TLP2767F **		**SDIP6** •3.3-V/5-V power supplies •Topr (max)125°C •Data Rate (Typ. @NRZ) 40 M bps	**	**			5000	△	△	△		

**: Under development

Data Rate: 50 M bps (Typ.)

Part Number	Pin Configuration	Features	Propagation Delay Time (max)		Output Form		BVs @1min.	Safety Standards (1)				
			t_{pHL} (ns)	t_{pLH} (ns)		@ I_F (mA)	(Vrms)	UL	c-UL	VDE	BSI	CQC
TLP117		**5 pin MFSOP6** •Ultra-high-speed •Data Rate (Typ. @NRZ) 50 M bps	30	30	Totempole output (Inverter logic)	I_{FHL} = 5.0 (max)	3750	○	○	○		

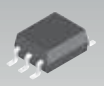
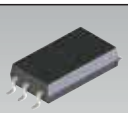
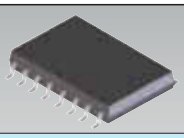
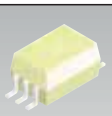
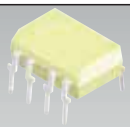
JEDEC Type

Part Number	Pin Configuration	Features	Propagation Delay Time (max)		CTR		BVs @1min.	Safety Standards (1)				
			t_{pHL} (μs)	t_{pLH} (μs)	min (%)	@ I_F (mA)	(Vrms)	UL	c-UL	VDE	BSI	CQC
6N135		**DIP8** •JEDEC-compliant •Data Rate (Typ. @NRZ) 1 M bps	1.5	1.5	7	16	2500	○				
6N136			0.8	0.8	19			○				○
6N137		**DIP8** •JEDEC-compliant •High-speed •Data Rate (Typ. @NRZ) 10 M bps	0.075	0.075	1000 (Typ.)	5		○				
6N138		**DIP8** •JEDEC-compliant •High-CTR •Data Rate (Typ. @NRZ) 300 K bps	10	35	300	1.6		○				
6N139			25	60	400	0.5		○				

Note (1): Please refer to page 43.

IC Output <IGBT / MOSFET Gate Drive>

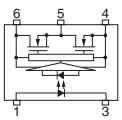
Selection Table

								
Output Peak Current (max) (A)	5 pin SO6	SO8	SO6L	SO16L	SDIP6	(F type)	DIP8	(F type)
±0.3							TLP557	
±0.6	TLP151A TLP155 TLP155E	TLP2451A H	TLP5701		TLP701 TLP701A TLP701H H TLP705A	TLP701F TLP701AF TLP701HF H TLP705AF	TLP351 TLP351A TLP351H H	TLP351F TLP351AF TLP351HF H
±1.0			TLP5751 *					
±2.0					TLP700	TLP700F		
±2.5	TLP152		TLP5702 TLP5752 *		TLP700A TLP700H H	TLP700AF TLP700HF H	TLP250H H TLP350H TLP352 H	TLP250HF H TLP350HF TLP352F H
±4.0			TLP5754 *	TLP5214 *				
±6.0							TLP358 TLP358H H	TLP358F TLP358H H

H: Photocouplers with a maximum operating temperature (Topr.) of 125°C
*: New product

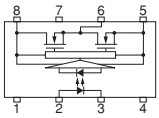
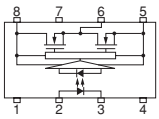
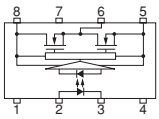
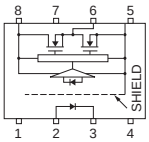
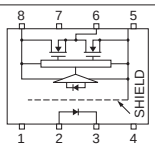
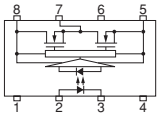
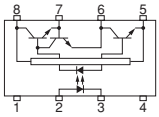
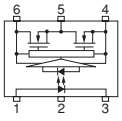
Selection Guide

IGBT/MOSFET Gate Drive

Part Number	Pin Configuration	Features	Propagation Delay Time (max) t_{pHL} (μs)	Propagation Delay Time (max) t_{pLH} (μs)	Peak Output Current (max) I_{OP} (A)	Threshold input current (max) I_{FLH} (mA)	BVs @1min. (Vrms)	Safety Standards (1) UL	c-UL	VDE	BSI	CQC
TLP151A		**5 pin SO6** •Reinforced insulation •Topr (max) 110°C •Direct drive of a small-power IGBT/MOSFET	0.45	0.45	±0.6	5	3750	○	○	□		
TLP152		**5 pin SO6** •Reinforced insulation •Topr (max) 100°C •Direct drive of a medium-power IGBT/MOSFET	0.19	0.17	±2.5	7.5		○	○	□		○
TLP155		**5 pin SO6** •Reinforced insulation •Topr (max) 100°C •Direct drive of a small-power IGBT/MOSFET	0.2	0.2	±0.6			○	○	□		
TLP155E								○	○	□		○

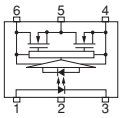
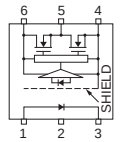
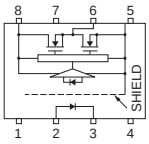
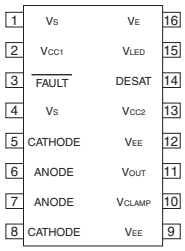
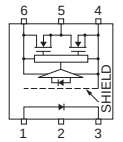
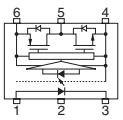
Note (1): Please refer to page 43.

IGBT/MOSFET Gate Drive

Part Number	Pin Configuration	Features	Propagation Delay Time (max)		Peak Output Current (max)	Threshold input current (max)	BVs @1min.	Safety Standards (1)				
			t_{pHL} (μs)	t_{pLH} (μs)	I_{OP} (A)	I_{FLH} (mA)	(Vrms)	UL	c-UL	VDE	BSI	CQC
TLP250H TLP250HF		**DIP8** •Topr (max) 125°C •Direct drive of a medium-power IGBT/MOSFET	0.5	0.5	±2.5	5	3750	○	○	□		
TLP350H TLP350HF		**DIP8** •Topr (max) 125°C •Direct drive of a medium-power IGBT/MOSFET						○	○	□		○
TLP351 TLP351F		**DIP8** •Direct drive of a small-power IGBT/MOSFET	0.7	0.7	±0.6			○	○	○		
TLP351A TLP351AF			0.5	0.5				○	○	○		
TLP351H TLP351HF		**DIP8** •Topr (max) 125°C •Direct drive of a small-power IGBT/MOSFET	0.7	0.7				○	○	□		○
TLP352 TLP352F		**DIP8** •Topr (max) 125°C •Direct drive of a medium-power IGBT/MOSFET	0.2	0.2	±2.5			○	○	□		○
TLP358 TLP358F		**DIP8** •Direct drive of a medium-power IGBT/MOSFET	0.5	0.5	±6.0			○	○	□		
TLP358H TLP358HF		**DIP8** •Topr (max) 125°C •Direct drive of a medium-power IGBT/MOSFET						○	○	□		○
TLP557		**DIP8** •Direct drive of a power transistor	5	5	±0.3		2500	○	○			
TLP700 TLP700F		**SDIP6** •Direct drive of a medium-power IGBT/MOSFET •SDIP6 version of the TLP350	0.5	0.5	±2.0		5000	○	○	○		
TLP700A TLP700AF		**SDIP6** •Direct drive of a medium-power IGBT/MOSFET •SDIP6 version of the TLP352	0.2	0.2	±2.5			○	○	○		○
TLP700H TLP700HF		**SDIP6** •Topr (max) 125°C •Direct drive of a medium-power IGBT/MOSFET •SDIP6 version of the TLP350H	0.5	0.5				○	○	○		

Note (1): Please refer to page 43.

IGBT/MOSFET Gate Drive

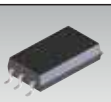
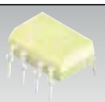
Part Number	Pin Configuration	Features	Propagation Delay Time (max) t_{pHL} (μs)	Propagation Delay Time (max) t_{pLH} (μs)	Peak Output Current (max) I_{OP} (A)	Threshold input current (max) I_{FLH} (mA)	BVs @1min. (Vrms)	Safety Standards (1) UL	c-UL	VDE	BSI	CQC
TLP701 TLP701F		**SDIP6** • Direct drive of a small-power IGBT/MOSFET • SDIP6 version of the TLP351	0.7	0.7	±0.6	5	5000	○	○	○		
TLP701A TLP701AF		**SDIP6** • Direct drive of a small-power IGBT/MOSFET • SDIP6 version of the TLP351A	0.5	0.5				○	○	○		
TLP701H TLP701HF		**SDIP6** • Topr (max) 125°C • Direct drive of a small-power IGBT/MOSFET • SDIP6 version of the TLP351H	0.7	0.7				○	○	○		
TLP705A TLP705AF		**SDIP6** • High-speed • Direct drive of a small-power IGBT/MOSFET	0.2	0.2		7.5		○	○	○		
TLP2451A		**SO8** • Topr (max) 125°C • Direct drive of a small-power IGBT/MOSFET • SO8 version of the TLP351A	0.5	0.5		5	3750	○	○	○		
TLP5214 *		**SO16L** • Topr (max) 110°C • Smart gate drive photocoupler • Overcurrent protection • Soft shutdown Active miller clamp • Direct drive of a medium-power IGBT/MOSFET • Rail to Rail output	0.15	0.15	±4.0	6		△	△	△		○
TLP5701		**SO6L** • Topr (max) 110°C • Direct drive of a medium-power IGBT/MOSFET • SO6L version of the TLP351A	0.5	0.5	±0.6	5	5000	○	○	△		○
TLP5702		**SO6L** • Topr (max) 110°C • Direct drive of a medium-power IGBT/MOSFET • SO6L version of the TLP352	0.2	0.2	±2.5			○	○	□		○
TLP5751 *		**SO6L** • Topr (max) 110°C • Direct drive of a medium-power IGBT/MOSFET • Rail to Rail output	0.15	0.15	±1.0	4		○	○	□		○
TLP5752 *					±2.5			○	○	□		○
TLP5754 *					±4.0			○	○	□		○

Note (1): Please refer to page 43.

*: New product

IC Output <IPM-Drive>

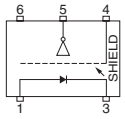
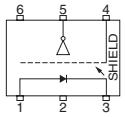
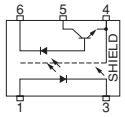
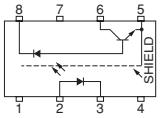
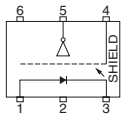
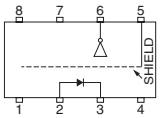
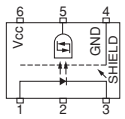
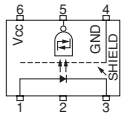
Selection Table

Data Rate (Typ.)	Output	5 pin SO6	SO8	 SO6L	SDIP6	SDIP6 (F type)	 DIP8	DIP8 (F type)
1 Mbit/s	Open-collector	TLP104 [M] TLP109 (IGM)	TLP2404 [M]	TLP2704 *	TLP714 TLP719	TLP714F TLP719F	TLP559 (IGM) TLP754 TLP759 (IGM)	TLP754F TLP759F (IGM)
5 Mbit/s	Totem-pole	TLP2355 [L] TLP2358 [L]	TLP2405 TLP2408		TLP715 TLP718	TLP715F TLP718F	TLP2955 [M][L] TLP2958 [M][L]	TLP2955F [M][L] TLP2958F [M][L]
10 Mbit/s	Open-collector	TLP2345 TLP2348		TLP2745 ** [M][L] TLP2748 **				

[M]: Photocouplers with a maximum operating temperature (Topr.) of 125°C
[L]: Photocouplers with low input current.
*: New product **: Under development

Selection Guide

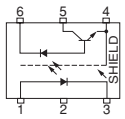
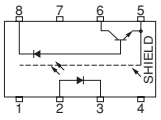
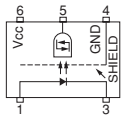
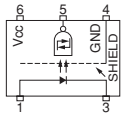
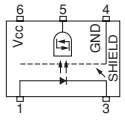
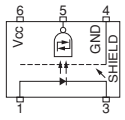
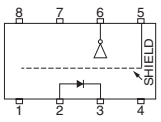
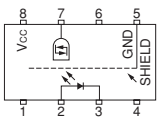
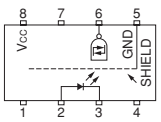
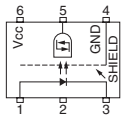
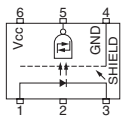
IPM Drive

Part Number	Pin Configuration	Features	Propagation Delay Time (max) t_{pHL} (µs)	Propagation Delay Time (max) t_{pLH} (µs)	CTR / Output form min	CTR / Output form @ I_F (mA)	BVs @1min. (Vrms)	Safety Standards (1) UL	c-UL	VDE	BSI	CQC
TLP104		**5 pin SO6** • Reinforced insulation • Topr (max) 125°C • Data Rate (Typ. @NRZ) 1 M bps	0.4	0.55	Open-collector output (Inverter logic)	I_{FHL} = 5.0 (max)	3750	○	○	□		○
TLP2704 *		**SO6L** • Reinforced insulation • Topr (max) 125°C • SO6L version of the TLP104					5000	○	○	△		△
TLP109(IGM)		**5 pin SO6** • Reinforced insulation • Data Rate (Typ. @NRZ) 1 M bps	0.8	0.8	25%	10	3750	○	○	□		○
TLP559(IGM)		**DIP8** • High CMR version of the TLP550					2500	○	○			
TLP714 TLP714F		**SDIP6** • SDIP6 version of the TLP104 • Data Rate (Typ. @NRZ) 1 M bps	0.4	0.55	Open-collector output (Inverter logic)	I_{FHL} = 5.0 (max)	5000	○	○	○		
TLP754 TLP754F		**DIP8** • DIP8 version of the TLP104 • Data Rate (Typ. @NRZ) 1 M bps						○	○	□		
TLP715 TLP715F		**SDIP6** • High CMR • Direct drive of an IPM • Data Rate (Typ. @NRZ) 5 M bps	0.25	0.25	Totempole output (Buffer logic)	I_{FLH} = 3 (max)		○	○	○		
TLP718 TLP718F					Totempole output (Inverter logic)	I_{FHL} = 3 (max)		○	○	○		

Note (1): Please refer to page 43.

*: New product

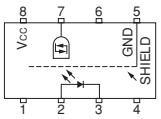
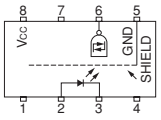
IPM Drive

Part Number	Pin Configuration	Features	Propagation Delay Time (max)		CTR / Output form		BVs @1min.	Safety Standards (1)				
			t_{pHL} (μs)	t_{pLH} (μs)	min	@ I_F (mA)	(Vrms)	UL	c-UL	VDE	BSI	CQC
TLP719 TLP719F		**SDIP6** • Direct drive of an IPM • Data Rate (Typ. @NRZ)1 M bps	0.8	0.8	20	16	5000	○	○	○		
TLP759(IGM) TLP759F(IGM)		**DIP8** • Data Rate (Typ. @NRZ) 1 M bps	0.8	0.8	25%	10	5000	○	○	○	○	
TLP2345		**5 pin SO6** • Reinforced insulation • High-speed • Direct drive of an IPM • Data Rate (Typ. @NRZ) 10 M bps	0.12	0.12	Totempole output (Buffer logic)	I_{FLH} = 1.6 (max)		○	○	□		△
TLP2348					Totempole output (Inverter logic)	I_{FHL} = 1.6 (max)		○	○	□		△
TLP2355		**5 pin SO6** • Reinforced insulation • Vcc = 3.0~20-V • Direct drive of an IPM • Data Rate (Typ. @NRZ) 5 M bps	0.25	0.25	Totempole output (Buffer logic)	I_{FLH} = 1.6 (max)		○	○	□		○
TLP2358					Totempole output (Inverter logic)	I_{FHL} = 1.6 (max)	3750	○	○	□		○
TLP2404		**SO8** • Topr (max) 125°C • SO8 version of the TLP104 • Data Rate (Typ. @NRZ) 1 M bps	0.4	0.55	Open-collector output (Inverter logic)	I_{FHL} = 5.0 (max)		○	○	○		
TLP2405		**SO8** • Low input current • Direct drive of an IPM • Data Rate (Typ. @NRZ) 5 M bps	0.25	0.25	Totempole output (Buffer logic)	I_{FLH} = 1.6 (max)		○	○	○		
TLP2408					Totempole output (Inverter logic)	I_{FHL} = 1.6 (max)		○	○	○		
TLP2745 *		**SO6L** • Reinforced insulation • High-speed • Direct drive of an IPM • SO6L version of the TLP2345 • Data Rate (Typ. @NRZ) 10 M bps	0.12	0.12	Totempole output (Buffer logic)	I_{FLH} = 1.6 (max)	5000	○	○	□		△
TLP2748 *		**SO6L** • Reinforced insulation • High-speed • Direct drive of an IPM • SO6L version of the TLP2348 • Data Rate (Typ. @NRZ) 10 M bps			Totempole output (Inverter logic)	I_{FHL} = 1.6 (max)		△	△	△		△

Note (1): Please refer to page 43.

*: New product

IPM Drive

Part Number	Pin Configuration	Features	Propagation Delay Time (max) t_{pHL} (μs)	Propagation Delay Time (max) t_{pLH} (μs)	CTR / Output form min	CTR / Output form @ I_F (mA)	BVs @1min. (Vrms)	Safety Standards (1) UL	c-UL	VDE	BSI	CQC
TLP2955 TLP2955F		**DIP8** • Topr (max) 125°C • Low input current • Direct drive of an IPM • Data Rate (Typ. @NRZ) 5 M bps	0.25	0.25	Totempole output (Buffer logic)	I_{FLH} = 1.6 (max)	5000	○	○	□		
TLP2958 TLP2958F					Totempole output (Inverter logic)	I_{FHL} = 1.6 (max)		○	○	□		

Transistor Output

Selection Table

DC Input Type

	Isolation Voltage	SO4	4pin SO6	4pin SO6L	SO16 (4channel)	DIP4	DIP4 F type	DIP6
General-Purpose	2500 Vrms				TLP291-4			
	3750 Vrms	TLP291 (SE *■	TLP185 (SE *■					
	4000 Vrms							TLP731 TLP732
	5000 Vrms			TLP385 *●		TLP785	TLP785F	
Low I_F	3750 Vrms	TLP293 *■	TLP183 *■ TLP2301 ■		TLP293-4 *■			
	5000 Vrms			TLP383 *●				
High V_{CEO}	3750 Vrms		TLP188 *■					
Darlington / High V_{CEO}	3750 Vrms		TLP187 ■					
	5000 Vrms					TLP627		

*: New product

AC Input Type

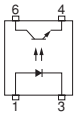
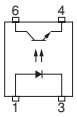
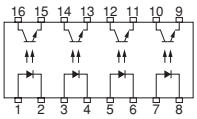
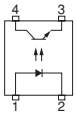
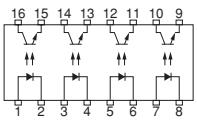
	Isolation Voltage	SO4	4pin SO6	SO16 (4channel)
General-Purpose	2500 Vrms			TLP290-4
	3750 Vrms	TLP290(SE *■	TLP184(SE *■	TLP292-4 *■
Low I_F	3750 Vrms	TLP292 *■	TLP182 *■	

*: New product

●: Reinforced insulation.
(Creepage distances and Clearance 8 mm)
■: Reinforced insulation.
(Creepage distances and Clearance 5 mm)
: Photocouplers with a maximum operating temperature of 125°C
: Built-in R_{BE}

Selection Guide

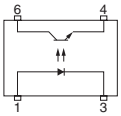
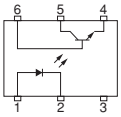
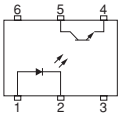
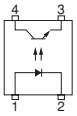
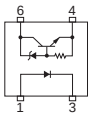
DC Input Type

Part Number	Pin Configuration	Features	CTR					V_{CEO} (V)	BVs @1min. (Vrms)	Safety Standards (1)				
			Rank	min (%)	max (%)	@ I_F (mA)	@ V_{CE} (V)			UL	c-UL	VDE	BSI	CQC
TLP183 *		**4 pin SO6** •Reinforced insulation •Low input drive current •Topr = 125°C (max)	—	50	600	0.5	5	80	3750	○	○	□		○
			Y	50	150									
			YH	75	150									
			GR	100	300									
			GRL	100	200									
			GRH	150	300									
			GB	100	600									
			BL	200	600									
			BLL	200	400									
TLP185(SE *		**4 pin SO6** •Reinforced insulation •General-purpose	—	50	600	5	5	80	3750	○	○	□	○	○
			Y	50	150									
			YH	75	150									
			GR	100	300									
			GRL	100	200									
			GRH	150	300									
			GB	100	600									
			BL	200	600									
			BLL	200	400									
TLP188 *		**4 pin SO6** •Reinforced insulation •High V_{CEO}	—	50	600			350		○	○	□	△	○
			GB	100										
TLP291-4		**SO16** •4-channel version equivalent of the TLP291 •Lead pitch: 1.27 mm	—	50	400	5	5	80	2500	○	○	○		○
			GB	100										
TLP291(SE *		**SO4** •Reinforced insulation •Lead pitch: 1.27 mm	—	50	600	5	5	80	3750	○	○	□	○	○
			Y	50	150									
			YH	75	150									
			GR	100	300									
			GRL	100	200									
			GRH	150	300									
			GB	100	600									
			BL	200	600									
			BLL	200	400									
TLP293 *		**SO4** •Reinforced insulation •Low input drive current •Topr = 125°C (max)	—	50	600	0.5				○	○	□		○
			Y	50	150									
			YH	75	150									
			GR	100	300									
			GRL	100	200									
			GRH	150	300									
			GB	100	600									
			BL	200	600									
			BLL	200	400									
TLP293-4 *		**SO16** •Reinforced insulation •4-channel version equivalent of the TLP293 •Lead pitch: 1.27 mm •Low input drive current •Topr = 125°C (max)	LA	50	600	0.5	5	80	3750	○	○	□		○
			LGB	100										

Note (1): Please refer to page 43.

*: New product

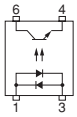
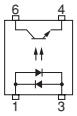
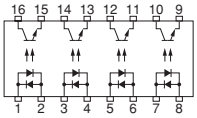
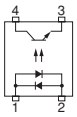
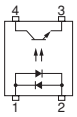
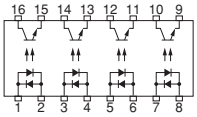
DC Input Type

Part Number	Pin Configuration	Features	CTR					V_{CEO} (V)	BVs @1min. (Vrms)	Safety Standards (1)				
			Rank	min (%)	max (%)	@ I_F (mA)	@ V_{CE} (V)			UL	c-UL	VDE	BSI	CQC
TLP383 *		**4 pin SO6L** • Guarantees a creepage and clearance distance of 8 mm (min) • Low input drive current • Topr = 125°C (max)	—	50	600	0.5	5	80	5000	○	○	□		△
			Y	50	150									
			YH	75	150									
			GR	100	300									
			GRL	100	200									
			GRH	150	300									
			GB	100	600									
			BL	200	600									
			BLL	200	400									
TLP385 *		**4 pin SO6L** • Guarantees a creepage and clearance distance of 8 mm (min)	—	50	600	5				○	○	□		○
			Y	50	150									
			YH	75	150									
			GR	100	300									
			GRL	100	200									
			GRH	150	300									
			GB	100	600									
			BL	200	600									
			BLL	200	400									
TLP731		**DIP6** • Internal base connection	—	50	600	5	5	55	4000	○	○	○	○	
			GR	100	300									
			GB	100	600									
TLP732		**DIP6** • No internal base connection	—	50	600					○	○	○	○	
			GR	100	300									
			GB	100	600									
TLP785 (3) TLP785F (3)		**DIP4** • High isolation voltage	—	50	600	5	5	80	5000	○	○	□	○	○
			Y	50	150									
			YH	75	150									
			GR	100	300									
			GRL	100	200									
			GRH	150	300									
			GB	100	600									
			BL	200	600									
			BLL	200	400									
TLP2301		**4 pin SO6** • Reinforced insulation • Low input drive current • Built-in R_{BE} • Topr = 125°C (max) • Equivalent to the TLP2301 with the IC output.	—	50	600	1	5	40	3750	○	○	□	○	△
			GB	100	600									

Note (1)(3): Please refer to page 43.

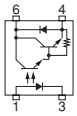
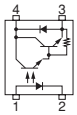
*: New product

AC Input Type

Part Number	Pin Configuration	Features	CTR					V_{CEO} (V)	BVs @1min. (Vrms)	Safety Standards (1)				
			Rank	min (%)	max (%)	@ I_F (mA)	@ V_{CE} (V)			UL	c-UL	VDE	BSI	CQC
TLP182 *		**4 pin SO6** • Reinforced insulation • Low input drive current • Topr = 125°C (max)	—	50	600	±0.5	5	80	3750	○	○	□		○
			Y	50	150									
			GR	100	300									
			GB	100	600									
			BL	200	600									
TLP184(SE *		**4 pin SO6** • Reinforced insulation	—	50	600	±5				○	○	□	○	○
			Y	50	150									
			GR	100	300									
			GB	100	600									
			BL	200	600									
TLP290-4		**SO16** • 4-channel version equivalent of the TLP290 • Lead pitch: 1.27 mm	—	50	400	±5	5	80	2500	○	○	○		○
			GB	100	400									
TLP290(SE *		**SO4** • Reinforced insulation • Lead pitch: 1.27 mm	—	50	600	±5				○	○	□	○	○
			Y	50	150									
			GR	100	300									
			GB	100	600									
			BL	200	600									
TLP292 *		**SO4** • Reinforced insulation • Low input drive current • Topr = 125°C (max)	—	50	600	±0.5	5	80	3750	○	○	□		○
			Y	50	150									
			GR	100	300									
			GB	100	600									
			BL	200	600									
TLP292-4 *		**SO16** • Reinforced insulation • 4-channel version equivalent of the TLP292 • Low input drive current • Lead pitch: 1.27 mm • Topr = 125°C (max)	LA	50	600	±0.5	5	80	3750	○	○	□		○
			LGB	100										

*: New product

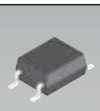
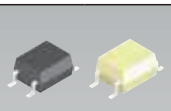
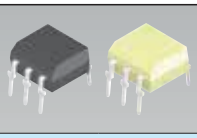
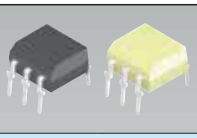
Darlington Transistor Output Type

Part Number	Pin Configuration	Features	CTR			$V_{CE\ (sat)}$			V_{CEO} (V)	BVs @1min (Vrms)	Safety Standards (1)				
			min (%)	@ I_F (mA)	@ V_{CE} (V)	max (V)	@I_C (mA)	@I_F (mA)			UL	c-UL	VDE	BSI	CQC
TLP187		**4 pin SO6** • Reinforced insulation • High V_{CEO}	1000	1	1	1.2	100	10	300	3750	○	○	□	△	○
TLP627		**DIP4** • High V_{CEO}	1000	1	1	1.2	100	10	300	5000	○	○	○	○	

Note (1): Please refer to page 43.

Triac Output

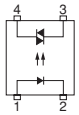
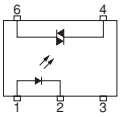
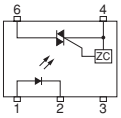
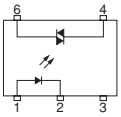
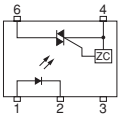
Selection Table

							
VDRM	**Isolation Voltage**	NZC / ZC	4 pin SO6	4 pin MFSOP6 (No5 cut)	DIP4	5 pin DIP6	5 pin DIP6 (cut)
					F type	F type	F type
400 V	2500 Vrms	NZC			TLP525G				TLP560G	
		ZC							TLP561G	
	5000 Vrms	NZC							TLP3022(S) TLP3023(S) TLP665G(S)	TLP3022F(S) TLP3023F(S) TLP665GF(S)
		ZC							TLP3042(S) TLP3043(S) TLP666G(S)	TLP3042F(S) TLP3043F(S) TLP666GF(S)
600 V	2500 Vrms	NZC							TLP560J	
		ZC		TLP163J					TLP561J	
	3750 Vrms	NZC	TLP265J *■ TLP267J *■							
		ZC	TLP266J *■ TLP268J *■							
	4000 Vrms	NZC					TLP762J	TLP762JF		
		ZC					TLP763J	TLP763JF		
	5000 Vrms	NZC			TLP360J	TLP360JF	TLP3052A **		TLP665J(S)	TLP665JF(S)
		ZC			TLP361J TLP363J	TLP361JF TLP363JF	TLP3062A **		TLP3062(S) TLP3063(S) TLP3064(S) TLP663J(S) TLP666J(S) TLP668J(S)	TLP3062F(S) TLP3063F(S) TLP3064F(S) TLP663JF(S) TLP666JF(S) TLP668JF(S)
800 V	5000 Vrms	NZC					TLP3073 **		TLP665L	
		ZC					TLP3782(S) TLP3783(S) TLP3083 **	TLP3782F(S) TLP3783F(S)	TLP669L(S) TLP3082(S) TLP666L(S)	TLP669LF(S) TLP3082F(S) TLP666LF(S)

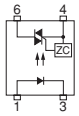
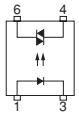
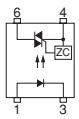
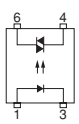
■: Reinforced Insulation
*: New product **: Under development

Selection Guide

V_{DRM} = 400 V

Part Number	Pin Configuration	Features	Trigger LED Current I_{FT}		Peak On-state Voltage V_{TM}		Off-state Output Terminal Voltage	BVs @1min.	Safety Standards (1)				
			Rank	max (mA)	max (V)	@ I_{TM} (mA)	V_{DRM} (V)	(Vrms)	UL	c-UL	VDE	BSI	CQC
TLP525G		**DIP4** • Non-zero cross	—	10	3.0	100	400	2500	○	○			
TLP560G		**5 pin DIP6 (cut)** • General-purpose • Non-zero cross	—	10	3.0	100	400	2500	○	○	○		
			IFT7	7									
			IFT5	5									
TLP561G		**5 pin DIP6 (cut)** • General-purpose • Zero cross	—	10					○	○	○		
			IFT7	7									
			IFT5	5									
TLP3022(S) TLP3022F(S)		**5 pin DIP6 (cut)** • Non-zero cross	—	10	3.0	100	400	5000	○	○	○	○	
TLP3023(S) TLP3023F(S)		**5 pin DIP6 (cut)** • Non-zero cross	—	5					○	○	○	○	
TLP3042(S) TLP3042F(S)		**5 pin DIP6 (cut)** • Zero cross	—	10					○	○	○	○	
TLP3043(S) TLP3043F(S)		**5 pin DIP6 (cut)** • Zero cross	—	5					○	○	○	○	

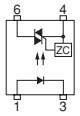
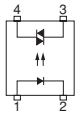
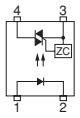
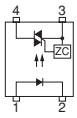
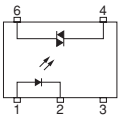
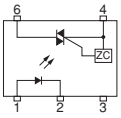
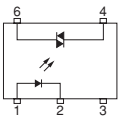
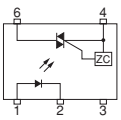
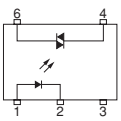
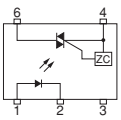
V_{DRM} = 600 V

Part Number	Pin Configuration	Features	Trigger LED Current I_{FT}		Peak On-state Voltage V_{TM}		Off-state Output Terminal Voltage	BVs @1min.	Safety Standards (1)				
			Rank	max (mA)	max (V)	@ I_{TM} (mA)	V_{DRM} (V)	(Vrms)	UL	c-UL	VDE	BSI	CQC
TLP163J		**4 pin MFSOP6 (cut)** • Zero cross • High impulse noise immunity • V_N = 2000 V (typ.)	—	10	2.8	70	600	2500	○	○	△		
TLP265J *		**4 pin SO6** • Reinforced insulation • Non-zero cross	—	10	2.8	70	600	3750	○	○	□		○
			IFT7	7									
TLP266J *		**4 pin SO6** • Reinforced insulation • Zero cross	—	10					○	○	□		○
			IFT7	7									
TLP267J *		**4 pin SO6** • Reinforced insulation • Non-zero cross • Low trigger LED current	—	3	2.8	70	600	3750	○	○	□		○
			IFT2	2									

Note (1): Please refer to page 43.

*: New product

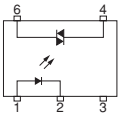
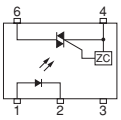
V_{DRM} = 600 V

Part Number	Pin Configuration	Features	Trigger LED Current I_{FT}		Peak On-state Voltage V_{TM}		Off-state Output Terminal Voltage	BVs @1min.	Safety Standards (1)				
			Rank	max (mA)	max (V)	@ I_{TM} (mA)	V_{DRM} (V)	(Vrms)	UL	c-UL	VDE	BSI	CQC
TLP268J *		**4 pin SO6** • Reinforced insulation • Zero cross • Low trigger LED current	—	3	2.8	70	600	3750	○	○	□		○
			IFT2	2									
TLP360J TLP360JF		**DIP4** • Non-zero cross	—	10	3.0	100	600	5000	○	○	○		○
			IFT7	7									
TLP361J TLP361JF		**DIP4** • Zero cross	—	10					○	○	○		○
			IFT7	7									
TLP363J TLP363JF		**DIP4** • Zero cross • High impulse noise immunity • V_N = 2000 V (typ.)	—	10									
TLP560J		**5 pin DIP6 (cut)** • General-purpose • Non-zero cross	—	10	3.0	100	600	2500	○	○	○		
			IFT7	7									
TLP561J		**5 pin DIP6 (cut)** • General-purpose • Zero cross	—	10					○	○	○		
			IFT7	7									
TLP762J TLP762JF		**5 pin DIP6** • Non-zero cross	—	10	3.0	100	600	4000	○	○	○	○	
TLP763J TLP763JF		**5 pin DIP6** • Zero cross	—	10					○	○	○	○	
TLP3052A **		**5 pin DIP6** • Non-zero cross	—	10	3.0	100	600	5000	△	△	△		△
TLP3062(S) TLP3062F(S)		**5 pin DIP6 (cut)** • High V_{DRM} • Zero cross	—	10					○	○	○	○	○
TLP3062A **		**5 pin DIP6** • Zero cross	—	10					△	△	△		△
TLP3063(S) TLP3063F(S)		**5 pin DIP6 (cut)** • High V_{DRM} • Zero cross	—	5					○	○	○	○	○
TLP3064(S) TLP3064F(S)		**5 pin DIP6 (cut)** • Zero cross	—	3					○	○	○	○	

Note (1): Please refer to page 43.

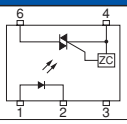
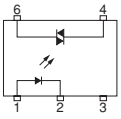
*: New product **: Under development

V_{DRM} = 800 V

Part Number	Pin Configuration	Features	Trigger LED Current I_{FT}		Peak On-state Voltage V_{TM}		Off-state Output Terminal Voltage	BVs @1min.	Safety Standards [1]				
			Rank	max (mA)	max (V)	@ I_{TM} (mA)	V_{DRM} (V)	(Vrms)	UL	c-UL	VDE	BSI	CQC
TLP3073 **		**5 pin DIP6** • Non-zero cross	—	5	3.0	100	800	5000	△	△	△		△
TLP3082(S) TLP3082F(S)		**5 pin DIP6 (cut)** • Zero cross	—	10					○	○	○	○	
TLP3083 **		**5 pin DIP6** • Zero cross	—	5					△	△	△		△
TLP3782(S) TLP3787F(S)		**5 pin DIP6** • Zero cross • High impulse noise immunity • V_N = 1500 V (typ.)	—	10					○	○	○		
TLP3783(S) TLP3783F(S)			—	5					○	○	○		

**: Under development

Product for Japan

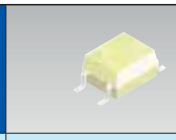
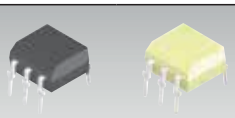
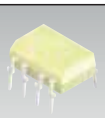
Part Number	Pin Configuration	Features	Trigger LED Current I_{FT}		Peak On-state Voltage V_{TM}		Off-state Output Terminal Voltage	BVs @1min.	Safety Standards [1]				
			Rank	max (mA)	max (V)	@ I_{TM} (mA)	V_{DRM} (V)	(Vrms)	UL	c-UL	VDE	BSI	CQC
TLP663J(S) TLP663JF(S)		**5 pin DIP6 (cut)** • Zero cross • High impulse noise immunity • V_N = 2000 V (typ.)	—	10	3.0	100	600	5000	○	○	○	△	
TLP665G(S) TLP665GF(S)		**5 pin DIP6 (cut)** • Non-zero cross	— IFT7	10 7			400						
TLP665J(S) TLP665JF(S)		**5 pin DIP6 (cut)** • High V_{DRM} • Non-zero cross	— IFT7	10 7			600		○	○	○	○	○
TLP665L * [4]		**5 pin DIP6 (cut)** • Non-zero cross	— IFT7	10 7			800		○	○	○		○
TLP666G(S) TLP666GF(S)		**5 pin DIP6 (cut)** • Zero cross	— IFT7	10 7			400						
TLP666J(S) TLP666JF(S)		**5 pin DIP6 (cut)** • High V_{DRM} • Zero cross	— IFT7	10 7			600		○	○	○	○	
TLP666L(S) TLP666LF(S)		**5 pin DIP6 (cut)** • Zero cross	—	10			800		○	○	○	△	○
TLP668J(S) TLP668JF(S)		**5 pin DIP6 (cut)** • Zero cross	—	3			600		○	○	○	○	
TLP669L(S) TLP669LF(S)		**5 pin DIP6 (cut)** • Zero cross • High impulse noise immunity • V_N = 1500 V (typ.)	— IFT5	10 5			800		○	○	○		

Note (1)(4): Please refer to page 43.

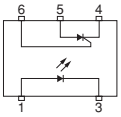
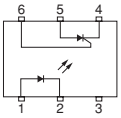
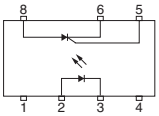
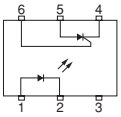
*: New product

Thyristor Output

Selection Table

					
V_{DRM}	Isolation Voltage	5 pin MFSOP6	DIP6	F type	7 pin DIP8
400 V	2500 Vrms	TLP148G			
600 V	2500 Vrms		TLP548J		TLP549J
	4000 Vrms		TLP748J	TLP748JF	

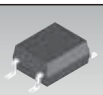
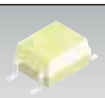
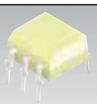
Selection Guide

Part Number	Pin Configuration	Features	Trigger LED Current I_{FT} max (mA)	Peak On-state Voltage V_{TM} max (V)	Peak On-state Voltage V_{TM} @ I_{TM} (mA)	Off-state Output Terminal Voltage V_{DRM} (V)	BVs @1min. (Vrms)	Safety Standards (1) UL	c-UL	VDE	BSI	CQC
TLP148G		**5 pin MFSOP6** • General-purpose	10	1.45	100	400	2500	○	○			
TLP548J		**DIP6** • General-Purpose • Low trigger current	7	1.45	100	600	2500	○	△			
TLP549J		**7 pin DIP8** • Long anode-cathode distance (SCR)	7	1.45	100	600	2500	○	△			
TLP748J TLP748JF		**DIP6**	10	1.45	100	600	4000	○	○	○	○	

Note (1): Please refer to page 43.

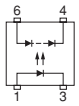
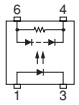
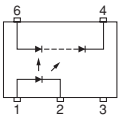
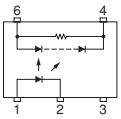
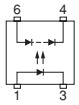
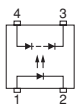
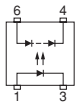
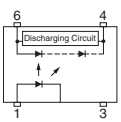
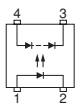
Photovoltaic Output

Selection Table

						
Open Voltage (Min)	**Isolation Voltage**	**Short-Circuit current (Min)**	SSOP4	4 pin SO6	4 pin MFSOP6	5 pin DIP6 (cut)
7 V	1500 Vrms	5 μA	TLP3904			
		20 μA	TLP3914			
	2500 Vrms	5 μA			TLP3902	
		12 μA			TLP190B	TLP590B
		24 μA			TLP191B	TLP591B
	3750 Vrms	12 μA		TLP3905 [H] TLP3906 [H]		
30 V	1500 Vrms	4 μA	TLP3924			

[H]: Photocouplers with a maximum operating temperature (Topr.) of 125°C

Selection Guide

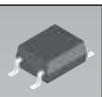
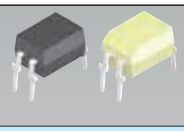
Part Number	Pin Configuration	Features	Short-Circuit Current I_{SC}			Open Voltage V_{OC}		BVs @1min.	Safety Standards (1)				
			Rank	min (μA)	@ I_F (mA)	min (V)	@ I_F (mA)	(Vrms)	UL	c-UL	VDE	BSI	CQC
TLP190B		**4 pin MFSOP6**	—	12	10	7	10	2500	○	○			
			C20	20									
TLP191B		**4 pin MFSOP6** • Built-in shunt resistor	—	24	20		20		○	○			
TLP590B		**5 pin DIP6 (cut)** • General-purpose	—	12	10		10		○				
			C20	20									
TLP591B		**5 pin DIP6 (cut)** • Built-in shunt resistor	—	24	20		20		○				
TLP3902		**4 pin MFSOP6** • General-purpose	—	5	10	7	10	2500	○	○			
TLP3904		**SSOP4** • General-purpose	—	5	10	7	10	1500	○				
TLP3905		**4 pin SO6** • General-purpose • Topr = 125°C (max)	—	12	10	7	10	3750	○	○	□		
			C20	20									
TLP3906		**4 pin SO6** • Built-in discharging circuit • Topr = 125°C (max)	—	12					○	○	□		
			C20	20									
TLP3914		**SSOP4** • High output	—	20	10	7	10	1500	○				
TLP3924		**SSOP4** • High open-circuit voltage		4		30			○				

Note (1): Please refer to page 43.

Photorelays

Selection Table

1-Form-A

													
V_{OFF} (max)V	R_{ON} (max) Ω	I_{ON} (max)A	VSON4	USOP4	SSOP4	4 pin SO6	2.54SOP4	2.54SOP6	2.54SOP8	DIP4	F type	DIP6	F type
	8	±0.16		TLP3330	TLP3230		TLP3130						
	5	±0.2	TLP3450 *	TLP3350	TLP3250								
	1.2	±0.3					TLP3131						
	1.2	±0.45	TLP3431 **	TLP3331 **	TLP3231								
20	0.22	±0.9		TLP3303	TLP3203								
	0.22	±1	TLP3403 *										
	0.08	±3.0								TLP3553			
	0.05	±2.5						TLP3100					
	0.05	±4.0										TLP3543	
30	0.04	±4.0						TLP3106 *					
	20	±0.1	TLP3442 *	TLP3342									
	15	±0.12			TLP3216		TLP3116						
	14	±0.12	TLP3440 *	TLP3340	TLP3240								
	10	±0.14	TLP3441 *	TLP3341	TLP3241								
	5	±0.2											
	3	±0.25			TLP3214		TLP3114						
40	1.5	±0.3		TLP3315	TLP3215		TLP3115						
	0.2	±2.0								TLP241A **■	TLP241AF **■		
	0.15	±2.0								TLP221A ■	TLP221AF ■		
	0.15	±2.5								TLP3554			
	0.13	±1.0					TLP3123						
	0.06	±2.5						TLP3102					
	0.06	±3.5										TLP3544	
50	1.5	±0.3	TLP3475 *	TLP3375	TLP3275								
	50	±0.1				TLP175A							
	15	±0.12	TLP3451 *	TLP3351									
	2	±0.4					TLP170A TLP171A TLP172A TLP176A	TLP192A TLP197A	TLP202A TLP206A				
	2	±0.5								TLP222A TLP227A TLP240A *■	TLP240AF *■	TLP592A TLP597A TLP598AA	
	1.5	±0.4	TLP3412 *	TLP3312	TLP3212								
60	1.1	0.5								TLP225A			
	0.7	±1.0					TLP3122						
	0.2	±2.0								TLP3555			
	0.13	±1.7					TLP3127 *						
	0.1	±2.5										TLP3542	
	0.07	±2.3						TLP3103					
	0.07	±3.0										TLP3545	
	0.06	±3.3						TLP3107					
75	2	±0.4		TLP3306									
	25	±0.04					TLP3118						
	20	±0.1					TLP3111						
	12	±0.12	TLP3417 *	TLP3317	TLP3217								
80	8	±0.2	TLP3419 *	TLP3319			TLP3119						
	1.2	±0.35					TLP3121						
	0.15	±1.25						TLP3120					

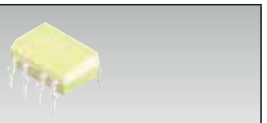
■: Reinforced Insulation
*: New product **: Under development

1-Form-A (Continued)

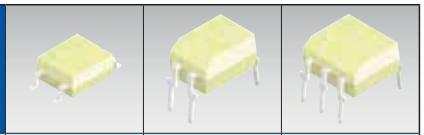
										DIP4		DIP6	
V_{OFF} (max)V	R_{ON} (max) Ω	I_{ON} (max)A	VSON4	USOP4	SSOP4	4 pin SO6	2.54SOP4	2.54SOP6	2.54SOP8		F type		F type
100	14	±0.08			TLP3220								
	14	±0.1	TLP3420 *	TLP3320									
	0.7	±1.0								TLP3556			
	0.2	±1.4						TLP3105					
	0.2	±2.0										TLP3546	
	0.07	±2.0						TLP3109 *					
200	50	±0.05					TLP179D	TLP199D	TLP209D				
	8	±0.2					TLP170D TLP171D TLP176D	TLP197D	TLP200D				
	8	±0.25								TLP240D *■	TLP240D *■		
	8	±0.3								TLP222D			
350	50	±0.1					TLP170G			TLP240G *■	TLP240GF *■		
	50	±0.11					TLP172G	TLP192G	TLP202G				
	50	±0.12								TLP222G TLP228G		TLP592G	
	35	±0.12					TLP174G TLP176G	TLP197G	TLP206G	TLP224G TLP227G		TLP597G	
400	35	±0.1					TLP171GA						
	35	±0.12					TLP174GA TLP176GA	TLP197GA	TLP206GA	TLP224GA TLP227GA TLP240GA *■	TLP240GAF *■	TLP597GA TLP797GA	TLP797GAF
	12	±0.15										TLP598GA TLP798GA	
	4	±0.2							TLP3125				
600	60	±0.07					TLP171J						
	60	±0.09					TLP170J			TLP240J *■	TLP240JF *■		
	45	±0.1										TLP797J	TLP797JF

■: Reinforced Insulation
*: New product

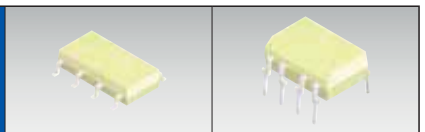
2-Form-A

			
V_{OFF} (max)V	R_{ON} (max) Ω	I_{ON} (max)A	DIP8
60	2	±0.5	TLP222A-2 TLP227A-2
350	50	±0.12	TLP222G-2 TLP228G-2
	35	±0.12	TLP224G-2 TLP227G-2
400	35	±0.12	TLP224GA-2 TLP227GA-2

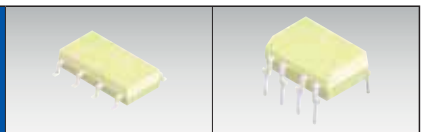
1-Form-B

					
V_{OFF} (max)V	R_{ON} (max) Ω	I_{ON} (max)A	2.54SOP4	DIP4	DIP6
350	25	±0.12	TLP4176G TLP4197G		
		±0.15		TLP4227G	TLP4597G

2-Form-B

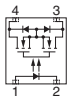
				
V_{OFF} (max)V	R_{ON} (max) Ω	I_{ON} (max)A	2.54SOP8	DIP8
350	25	±0.12	TLP4206G	
		±0.15		TLP4227G-2

1-Form-A , 1-Form-B

				
V_{OFF} (max)V	R_{ON} (max) Ω	I_{ON} (max)A	2.54SOP8	DIP8
350	25	±0.12	TLP4006G	TLP4026G

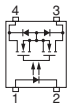
Selection Guide

1-Form-A: VSON4 package

Part Number	Pin Configuration	Features	Trigger LED Current I_{FT} max (mA)	On-State Resistance R_{ON} max (Ω)	On-State Resistance R_{ON} @ I_F (mA)	On-state Current I_{ON} max (A)	Off-state Voltage V_{OFF} (V)	BVs @1min. (Vrms)	Safety Standards (1) UL	c-UL	VDE	BSI	CQC
TLP3403 *		**VSON4** • Low R_{ON} • High I_{ON}	3	0.22	5	±1	20	300					
TLP3412 *		**VSON4** • Low R_{ON} • 60-V V_{OFF}		1.5		±0.4	60						
TLP3417 *		**VSON4** • Low CR • C_{OFF}: 5 pF (Typ.)		12		±0.12	80						
TLP3419 *		**VSON4**		8		±0.2							
TLP3420 *		**VSON4** • 100-V V_{OFF}		14	10	±0.1	100						
TLP3431 **		**VSON4**		1.2	5	±0.45	20						
TLP3440 *		**VSON4** • Ultra-low CR: 5 pFΩ • C_{OFF}: 0.45 pF (Typ.)		14		±0.12	40						
TLP3441 *		**VSON4**		10		±0.14							
TLP3442 *		**VSON4**		20		±0.1							
TLP3450 *		**VSON4**		5		±0.2	20						
TLP3451 *		**VSON4**		15		±0.12	60						
TLP3475 *		**VSON4** • C_{OFF}: 12 pF (Typ.)		1.5		±0.3	50						

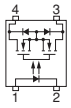
*: New product **: Under development

1-Form-A: USOP4 package

Part Number	Pin Configuration	Features	Trigger LED Current I_{FT} max (mA)	On-State Resistance R_{ON} max (Ω)	On-State Resistance R_{ON} @ I_F (mA)	On-state Current I_{ON} max (A)	Off-state Voltage V_{OFF} (V)	BVs @1min. (Vrms)	Safety Standards (1) UL	c-UL	VDE	BSI	CQC
TLP3303		**USOP4** • Ultra-low On-resistance R: 0.18Ω (Typ.) • High output current I_{ON}: 0.9 A (max)	3	0.22	5	±0.9	20	500	○				
TLP3306		**USOP4** • 75-V V_{OFF}		2		±0.4	75		○				
TLP3312		**USOP4** • C_{OFF}: 20 pF (Typ.)		1.5		±0.4	60		○				

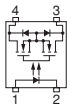
Note (1): Please refer to page 43.

1-Form-A: USOP4 package

Part Number	Pin Configuration	Features	Trigger LED Current I_{FT} max (mA)	On-State Resistance R_{ON} max (Ω)	On-State Resistance R_{ON} @ I_F (mA)	On-state Current I_{ON} max (A)	Off-state Voltage V_{OFF} (V)	BVs @1min. (Vrms)	Safety Standards (1) UL	c-UL	VDE	BSI	CQC
TLP3315		**USOP4** • Ultra-low CR: 10 pFΩ • C_{OFF}: 10 pF (Typ.)	3	1.5	5	±0.3	40	500	○				
TLP3317		**USOP4** • Low CR: 35 pFΩ • C_{OFF}: 5 pF (Typ.)		12		±0.12	80		○				
TLP3319		**USOP4** • Low CR: 30 pFΩ • C_{OFF}: 6.5 pF (Typ.)		8		±0.2			○				
TLP3320		**USOP4** • 100-V V_{OFF}		14	10	±0.1	100		○				
TLP3330		**USOP4** • Ultra-low CR: 5 pFΩ • C_{OFF}: 1 pF (Typ.)		8	5	±0.16	20		○				
TLP3331 **		**USOP4** • Ultra-low CR: 5 pFΩ • C_{OFF}: 5 pF (Typ.)		1.2		±0.45			○				
TLP3340		**USOP4** • Ultra-low CR: 5 pFΩ • C_{OFF}: 0.45 pF (Typ.)		14		±0.12	40		○				
TLP3341		**USOP4** • Ultra-low CR: 5 pFΩ • C_{OFF}: 0.7 pF (Typ.)		10		±0.14			○				
TLP3342		**USOP4** • Ultra-low C_{OFF}: 0.3 pF (Typ.)		20		±0.1			○				
TLP3350		**USOP4** • Ultra-low CR: 2.5 pFΩ • C_{OFF}: 0.8 pF (Typ.)		5		±0.2	20		○				
TLP3351		**USOP4** • Ultra-low C_{OFF}: 0.7 pF (Typ.)		15		±0.12	60		○				
TLP3375		**USOP4** • C_{OFF}: 12 pF (Typ.)		1.5		±0.3	50		○				

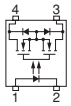
**: Under development

1-Form-A: SSOP4 package

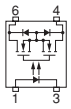
Part Number	Pin Configuration	Features	Trigger LED Current I_{FT} max (mA)	On-State Resistance R_{ON} max (Ω)	On-State Resistance R_{ON} @ I_F (mA)	On-state Current I_{ON} max (A)	Off-state Voltage V_{OFF} (V)	BVs @1min. (Vrms)	Safety Standards (1) UL	c-UL	VDE	BSI	CQC
TLP3203		**SSOP4** • Ultra-low On-resistance R: 0.18Ω (Typ.) • High output current I_{ON}: 0.9 A (max)	3	0.22	5	±0.9	20	1500	○				
TLP3212		**SSOP4** • Low CR: 20 pFΩ • C_{OFF}: 20 pF (Typ.)	5	1.5		±0.4	60		○				
TLP3214		**SSOP4** • Ultra-low CR: 10 pFΩ • C_{OFF}: 5 pF (Typ.)	4	3		±0.25	40		○				

Note (1): Please refer to page 43.

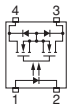
1-Form-A: SSOP4 package

Part Number	Pin Configuration	Features	Trigger LED Current I_{FT} max (mA)	On-State Resistance R_{ON} max (Ω)	On-State Resistance R_{ON} @ I_F (mA)	On-state Current I_{ON} max (A)	Off-state Voltage V_{OFF} (V)	BVs @1min. (Vrms)	Safety Standards (1) UL	c-UL	VDE	BSI	CQC
TLP3215		**SSOP4** • Ultra-low CR: 10 pFΩ • C_{OFF}: 10 pF (Typ.)	4	1.5	5	±0.3	40	1500	○				
TLP3216		**SSOP4** • Ultra-low CR: 10 pFΩ • C_{OFF}: 1 pF (Typ.)		15		±0.12			○				
TLP3217		**SSOP4** • Low CR • C_{OFF}: 50 pF (Typ.)	5	12		±0.12	80		○				
TLP3220		**SSOP4** • 100-V V_{OFF}		14	10	±0.08	100		○				
TLP3230		**SSOP4** • Ultra-low CR: 5 pFΩ • C_{OFF}: 1 pF (Typ.)	4	8	5	±0.16	20		○				
TLP3231		**SSOP4** • Ultra-low CR: 5 pFΩ • C_{OFF}: 5 pF (Typ.)		1.2		±0.45			○				
TLP3240		**SSOP4** • Ultra-low CR: 5 pFΩ • C_{OFF}: 0.45 pF (Typ.)	3	14		±0.12	40		○				
TLP3241		**SSOP4** • Ultra-low CR: 5 pFΩ • C_{OFF}: 0.7 pF (Typ.)		10		±0.14			○				
TLP3250		**SSOP4** • Ultra-low CR: 2.5 pFΩ • C_{OFF}: 0.8 pF (Typ.)		5		±0.2	20		○				
TLP3275		**SSOP4** • C_{OFF}: 12 pF (Typ.)		1.5		±0.3	50		○				

1-Form-A: 4 pin SO6 package

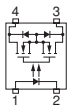
Part Number	Pin Configuration	Features	Trigger LED Current I_{FT} max (mA)	On-State Resistance R_{ON} max (Ω)	On-State Resistance R_{ON} @ I_F (mA)	On-state Current I_{ON} max (A)	Off-state Voltage V_{OFF} (V)	BVs @1min. (Vrms)	Safety Standards (1) UL	c-UL	VDE	BSI	CQC
TLP175A		**4 pin SO6** • General-purpose • Low trigger current	1	50	2	±0.1	60	3750	○	○	□		○

1-Form-A: 2.54SOP4 package

Part Number	Pin Configuration	Features	Trigger LED Current I_{FT} max (mA)	On-State Resistance R_{ON} max (Ω)	On-State Resistance R_{ON} @ I_F (mA)	On-state Current I_{ON} max (A)	Off-state Voltage V_{OFF} (V)	BVs @1min. (Vrms)	Safety Standards (1) UL	c-UL	VDE	BSI	CQC
TLP170A		**2.54SOP4** • Low trigger current • General-purpose	1	2	2	±0.4	60	1500	○	○	○		
TLP170D				8		±0.2	200		○	○	○		
TLP170G				50		±0.1	350		○	○	○		
TLP170J				60		±0.09	600		○	○	○		

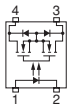
Note (1): Please refer to page 43.

1-Form-A: 2.54SOP4 package

Part Number	Pin Configuration	Features	Trigger LED Current I_{FT} max (mA)	On-State Resistance R_{ON} max (Ω)	On-State Resistance R_{ON} @ I_F (mA)	On-state Current I_{ON} max (A)	Off-state Voltage V_{OFF} (V)	BVs @1min. (Vrms)	Safety Standards (1) UL	c-UL	VDE	BSI	CQC
TLP171A		**2.54SOP4** • Ultra-low trigger current	0.2	2	0.5	±0.4	60	1500	○	○	○		
TLP171D				8		±0.2	200		○	○	○		
TLP171GA				35		±0.1	400		△	△	○		
TLP171J				60		±0.07	600		○	○	○		
TLP172A		**2.54SOP4** • High output current • General-purpose	3	2	5	±0.4	60		○	○	○		
TLP172G		**2.54SOP4** • General-purpose		50		±0.11	350		○	○	○		
TLP174G		**2.54SOP4** • Current-limiting function • Limit current 150 to 300 mA		35		±0.12	350		○	○			
TLP174GA				35		±0.12	400		○				
TLP176A		**2.54SOP4** • High output current		2		±0.4	60		○	○	○		
TLP176D		**2.54SOP4** • Low On-resistance		8		±0.2	200		○	○	○		
TLP176G		**2.54SOP4** • General-purpose		35		±0.12	350		○	○	○	○	
TLP176GA				35		±0.12	400		○		○	○	
TLP179D		**2.54SOP4** • C_{OFF} 15 pF (Typ.)		50		±0.05	200		○	○			
TLP3111		**2.54SOP4** • Low CR • C_{OFF} 11 pF (Typ.)	4	20		±0.1	80		○				
TLP3114		**2.54SOP4** • Ultra-low CR: 10 pFΩ • C_{OFF} 5 pF (Typ.)		3		±0.25	40		○	○	○		
TLP3115		**2.54SOP4** • Ultra-low CR: 10 pFΩ • C_{OFF} 10 pF (Typ.)		1.5		±0.3	40		○	○	○		
TLP3116		**2.54SOP4** • Ultra-low CR: 10 pFΩ • C_{OFF} 1 pF (Typ.)		15		±0.12	40		○	○	○		
TLP3118		**2.54SOP4** • Low CR: 40 pFΩ • C_{OFF} 2.5 pF (Typ.), 3.5 pF (max)	3	25		±0.04	80		○	○	○		
TLP3119		**2.54SOP4** • Low CR: 30 pFΩ • C_{OFF} 6.5 pF (Typ.), 11 pF (max)		8		±0.2	80		○	○	○		

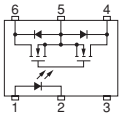
Note (1): Please refer to page 43.

1-Form-A: 2.54SOP4 package

Part Number	Pin Configuration	Features	Trigger LED Current I_{FT} max (mA)	On-State Resistance R_{ON} max (Ω)	On-State Resistance R_{ON} @ I_F (mA)	On-state Current I_{ON} max (A)	Off-state Voltage V_{OFF} (V)	BVs @1min. (Vrms)	Safety Standards (1) UL	c-UL	VDE	BSI	CQC
TLP3121		**2.54SOP4** • Low CR: 30 pFΩ	4	1.2	5	±0.35	80	1500	○	○	○		
TLP3122		**2.54SOP4** • High output current • I_{ON}: 1 A (max) @Ta: up to 50°C	3	0.7		±1	60		○	○	○		
TLP3123				0.13		±1	40		○	○	○		
TLP3127 *		**2.54SOP4** • High output current • I_{ON}: 1.7 A (max) @Ta: up to 50°C		0.13		±1.7	60		○	○			
TLP3130		**2.54SOP4** • Ultra-low CR: 5 pFΩ • C_{OFF} 1 pF (Typ.)	4	8		±0.16	20		○	○			
TLP3131		**2.54SOP4** • Ultra-low CR: 4 pFΩ • C_{OFF} 5 pF (Typ.)		1.2		±0.3	20		○	○			

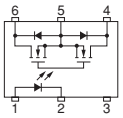
*: New product

1-Form-A: 2.54SOP6 package

Part Number	Pin Configuration	Features	Trigger LED Current I_{FT} max (mA)	On-State Resistance R_{ON} max (Ω)	On-State Resistance R_{ON} @ I_F (mA)	On-state Current I_{ON} max (A)	Off-state Voltage V_{OFF} (V)	BVs @1min. (Vrms)	Safety Standards (1) UL	c-UL	VDE	BSI	CQC
TLP192A		**2.54SOP6** • High output current	3	2	5	±0.4	60	1500	○	○			
TLP192G		**2.54SOP6**		50		±0.11	350		○	○			
TLP197A		**2.54SOP6** • High output current		2		±0.4	60		○	○			
TLP197D		**2.54SOP6** • Low On-resistance		8		±0.2	200		○	○			
TLP197G		**2.54SOP6**		35		±0.12	350		○	○	○	○	
TLP197GA		**2.54SOP6**		35		±0.12	400		○			○	
TLP199D		**2.54SOP6** • C_{OFF} 15 pF (Typ.)		50		±0.05	200		○	○			
TLP3100		**2.54SOP6** • Low On-resistance • High output current • I_{ON}: 2.5 A (max) @Ta: up to 50°C		0.05		±2.5	20		○	○			
TLP3102		**2.54SOP6** • High output current • I_{ON}: 2.5 A (max) @Ta: up to 50°C • C-connection: I_{ON} (DC) = 5.0 A (max)		0.06		±2.5	40		○	○			

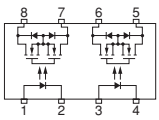
Note (1): Please refer to page 43.

1-Form-A: 2.54SOP6 package

Part Number	Pin Configuration	Features	Trigger LED Current I_{FT} max (mA)	On-State Resistance R_{ON} max (Ω)	On-State Resistance R_{ON} @ I_F (mA)	On-state Current I_{ON} max (A)	Off-state Voltage V_{OFF} (V)	BVs @1min. (Vrms)	Safety Standards (1) UL	c-UL	VDE	BSI	CQC
TLP3103		**2.54SOP6** • High output current • I_{ON}: 2.3 A (max) @Ta: up to 50°C • C-connection: I_{ON} (DC) = 4.6 A (max)	3	0.07	5	±2.3	60	1500	○	○			
TLP3105		**2.54SOP6** • High output current • I_{ON}: 1.4 A (max) @Ta: up to 50°C • C-connection: I_{ON} (DC) = 2.8 A (max)		0.2		±1.4	100		○	○			
TLP3106 *		**2.54SOP6** • General-purpose • High output current • I_{ON} = 4.0 A (max) • C-connection: I_{ON} (DC) = 8.0 A (max)		0.04		±4.0	30		△	△			
TLP3107		**2.54SOP6** • High output current • I_{ON}: 3.3 A (max) @Ta: up to 50°C • C-connection: I_{ON} (DC) = 6.6 A (max)		0.06		±3.3	60		○	○			
TLP3109 *		**2.54SOP6** • General-purpose • High output current • I_{ON} = 2.0 A (max) • C-connection: I_{ON} (DC) = 4.0 A (max)		0.07		±2.0	100		△	△			
TLP3120		**2.54SOP6** • High output current • I_{ON}: 1.25 A (max)	5	0.15		±1.25	80		○	○			

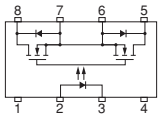
*: New product

1-Form-A: 2.54SOP8 package

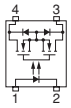
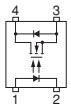
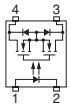
Part Number	Pin Configuration	Features	Trigger LED Current I_{FT} max (mA)	On-State Resistance R_{ON} max (Ω)	On-State Resistance R_{ON} @ I_F (mA)	On-state Current I_{ON} max (A)	Off-state Voltage V_{OFF} (V)	BVs @1min. (Vrms)	Safety Standards (1) UL	c-UL	VDE	BSI	CQC
TLP200D		**2.54SOP8** • Dual channel version of the TLP176D	3	8	5	±0.2	200	1500	○				
TLP202A		**2.54SOP8** • Dual channel version of the TLP172A		2		±0.4	60		○				
TLP202G		**2.54SOP8** • Dual channel version of the TLP172G		50		±0.11	350		○		○		
TLP206A		**2.54SOP8** • Dual channel version of the TLP176A		2		±0.4	60		○				
TLP206G		**2.54SOP8** • Dual channel version of the TLP176G		35		±0.12	350		○		○	○	
TLP206GA		**2.54SOP8** • Dual channel version of the TLP176GA		35		±0.12	400		○		○	○	
TLP209D		**2.54SOP8** • Dual channel version of the TLP179D		50		±0.05	200		○				

Note (1): Please refer to page 43

1-Form-A: 2.54SOP8 package

Part Number	Pin Configuration	Features	Trigger LED Current I_{FT} max (mA)	On-State Resistance R_{ON} max (Ω)	On-State Resistance R_{ON} @ I_F (mA)	On-state Current I_{ON} max (A)	Off-state Voltage V_{OFF} (V)	BVs @1min. (Vrms)	Safety Standards (1) UL	c-UL	VDE	BSI	CQC
TLP3125		**2.54SOP8** • Low On-resistance	3	4	5	±0.2	400	1500	○	○			

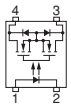
1-Form-A: DIP4 package

Part Number	Pin Configuration	Features	Trigger LED Current I_{FT} max (mA)	On-State Resistance R_{ON} max (Ω)	On-State Resistance R_{ON} @ I_F (mA)	On-state Current I_{ON} max (A)	Off-state Voltage V_{OFF} (V)	BVs @1min. (Vrms)	Safety Standards (1) UL	c-UL	VDE	BSI	CQC
TLP221A TLP221AF		**DIP4** • Reinforced insulation • General-purpose	2	0.15		±2.0	40	5000	○	○	○	○	○
TLP222A		**DIP4** • High output current • General-purpose		2		±0.5	60		○	○			
TLP222D		**DIP4** • High output current • General-purpose		8		±0.3	200		○	○			
TLP222G		**DIP4** • General-purpose		50		±0.12	350		○	○		○	
TLP224G		**DIP4** • Current-limiting function • Limit current 150 to 300 mA		35		±0.12	350		○	○		○	
TLP224GA		**DIP4** • Current-limiting function • Limit current 150 to 300 mA		35		±0.12	400	2500					
TLP225A		**DIP4** • For DC use only		1.1		0.5	60		○	○			
TLP227A		**DIP4** • General-purpose	3	2	5	±0.5	60		○	○			
TLP227G		**DIP4** • General-purpose		35		±0.12	350		○	○	○	○	
TLP227GA		**DIP4** • General-purpose		35		±0.12	400		○				
TLP228G		**DIP4** • High EMI immunity • General-purpose		50		±0.12	350		○	○		○	
TLP240A * TLP240AF *		**DIP4** • Reinforced insulation • General-purpose		2		±0.5	60	5000	○	○	○	△	○
TLP240D * TLP240DF *				8		±0.25	200		○	○	○	△	○
TLP240G * TLP240GF *				50		±0.1	350		○	○	○	△	○
TLP240GA * TLP240GAF *				35		±0.12	400		○	○	○	△	○
TLP240J * TLP240JF *				60		±0.09	600		○	○	○	△	○
TLP241A ** TLP241AF **				0.2		±2.0	40		○	○	○	△	

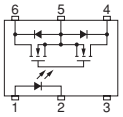
Note (1): Please refer to page 43.

*: New product **: Under development

1-Form-A: DIP4 package

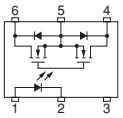
Part Number	Pin Configuration	Features	Trigger LED Current I_{FT} max (mA)	On-State Resistance R_{ON} max (Ω)	On-State Resistance R_{ON} @ I_F (mA)	On-state Current I_{ON} max (A)	Off-state Voltage V_{OFF} (V)	BVs @1min. (Vrms)	Safety Standards (1) UL	c-UL	VDE	BSI	CQC
TLP3553		**DIP4** • High output current • I_{ON}: 3.0 A (max) @Ta = 25°C	3	0.08	5	±3	20	2500	○	○			
TLP3554		**DIP4** • High output current • I_{ON}: 2.5 A (max) @Ta = 25°C		0.15		±2.5	40		○	○			
TLP3555		**DIP4** • High output current • I_{ON}: 2.0 A (max) @Ta = 25°C		0.2		±2	60		○	○			
TLP3556		**DIP4** • High output current • I_{ON}: 1.0 A (max) @Ta = 25°C		0.7		±1	100		○	○			

1-Form-A: DIP6 package

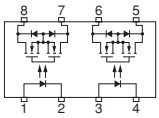
Part Number	Pin Configuration	Features	Trigger LED Current I_{FT} max (mA)	On-State Resistance R_{ON} max (Ω)	On-State Resistance R_{ON} @ I_F (mA)	On-state Current I_{ON} max (A)	Off-state Voltage V_{OFF} (V)	BVs @1min. (Vrms)	Safety Standards (1) UL	c-UL	VDE	BSI	CQC
TLP592A		**DIP6** • High output current	3	2	5	±0.5	60	2500	○				
TLP592G		**DIP6** • General-purpose		50		±0.12	350		○				
TLP597A		**DIP6** • High output current		2		±0.5	60		○				
TLP597G		**DIP6** • General-purpose		35		±0.12	350		○		○	○	
TLP597GA		**DIP6** • General-purpose		35		±0.12	400		○				
TLP598AA		**DIP6** • High output current		2		±0.5	60		○				
TLP598GA		**DIP6** • Low On-resistance		12		±0.15	400		○				
TLP797GA TLP797GAF		**DIP6** • High isolation voltage		35	5	±0.12	400	5000	○	○	○	△	
TLP797J TLP797JF		**DIP6** • High isolation voltage	5	45	10	±0.1	600		○	○	○	△	
TLP798GA		**DIP6** • High isolation voltage • Low On-resistance	3	12	5	±0.15	400		○	○	△	△	
TLP3542		**5 pin DIP6 (cut)** • Low On-resistance • High output current • I_{ON}: 2.5 A (max) @Ta = 25°C		0.1	10	±2.5	60	2500	○	○			
TLP3543		**DIP6** • High output current • I_{ON}: 4.0 A (max) @Ta = 25°C		0.05	5	±4	20		○	○			
TLP3544		**DIP6** • High output current • I_{ON}: 3.5 A (max) @Ta = 25°C		0.06		±3.5	40		○	○			
TLP3545		**DIP6** • High output current • I_{ON}: 3.0 A (max) @Ta = 25°C		0.07		±3	60		○	○			

Note (1): Please refer to page 43.

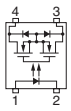
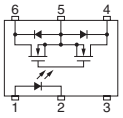
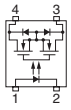
1-Form-A: DIP6 package

Part Number	Pin Configuration	Features	Trigger LED Current I_{FT} max (mA)	On-State Resistance R_{ON} max (Ω)	On-State Resistance R_{ON} @ I_F (mA)	On-state Current I_{ON} max (A)	Off-state Voltage V_{OFF} (V)	BVs @1min. (Vrms)	Safety Standards (1) UL	c-UL	VDE	BSI	CQC
TLP3546		**DIP6** • High output current • I_{ON}: 2.0 A (max) @Ta = 25°C	3	0.2	5	±2	100	2500	○	○			

2-Form-A

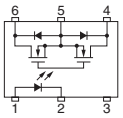
Part Number	Pin Configuration	Features	Trigger LED Current I_{FT} max (mA)	On-State Resistance R_{ON} max (Ω)	On-State Resistance R_{ON} @ I_F (mA)	On-state Current I_{ON} max (A)	Off-state Voltage V_{OFF} (V)	BVs @1min. (Vrms)	Safety Standards (1) UL	c-UL	VDE	BSI	CQC
TLP222A-2		**DIP8** • Dual channel version of the TLP222A		2		±0.5	60		○	○			
TLP222G-2		**DIP8** • Dual channel version of the TLP222G		50			350		○	○		○	
TLP224G-2		**DIP8** • Dual channel version of the TLP224G		35		±0.12	350		○	○		○	
TLP224GA-2		**DIP8** • Dual channel version of the TLP224GA • Current-limiting function • Limit current: 150 to 300 mA	3	35	5		400	2500					
TLP227A-2		**DIP8** • Dual channel version of the TLP227A		2		±0.5	60		○	○			
TLP227G-2		**DIP8** • Dual channel version of the TLP227G		35			350		○	○	○	○	
TLP227GA-2		**DIP8** • Dual channel version of the TLP227GA		35		±0.12	400		○				
TLP228G-2		**DIP8** • Dual channel version of the TLP228G		50			350		○	○		○	

1-Form-B

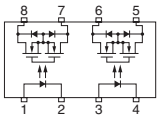
Part Number	Pin Configuration	Features	Trigger LED Current I_{FT} max (mA)	On-State Resistance R_{ON} max (Ω)	On-State Resistance R_{ON} @ I_F (mA)	On-state Current I_{ON} max (A)	Off-state Voltage V_{OFF} (V)	BVs @1min. (Vrms)	Safety Standards (1) UL	c-UL	VDE	BSI	CQC
TLP4176G		**2.54SOP4** • General-purpose	3	25	0	±0.12	350	1500	○				
TLP4197G		**2.54SOP4** • General-purpose							○				
TLP4227G		**DIP4** • General-purpose				±0.15		2500	○				

Note (1): Please refer to page 43.

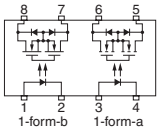
1-Form-B

Part Number	Pin Configuration	Features	Trigger LED Current I_{FT} max (mA)	On-State Resistance R_{ON} max (Ω)	On-State Resistance R_{ON} @ I_F (mA)	On-state Current I_{ON} max (A)	Off-state Voltage V_{OFF} (V)	BVs @1min. (Vrms)	Safety Standards (1) UL	c-UL	VDE	BSI	CQC
TLP4597G		**DIP6** • General-purpose	3	25	0	±0.15	350	2500	○				

2-Form-B

Part Number	Pin Configuration	Features	Trigger LED Current I_{FT} max (mA)	On-State Resistance R_{ON} max (Ω)	On-State Resistance R_{ON} @ I_F (mA)	On-state Current I_{ON} max (A)	Off-state Voltage V_{OFF} (V)	BVs @1min. (Vrms)	Safety Standards (1) UL	c-UL	VDE	BSI	CQC
TLP4206G		**2.54SOP8** • Dual channel version of the TLP4176G	3	25	0	±0.12	350	1500	○				
TLP4227G-2		**DIP8** • Dual channel version of the TLP4227G				±0.15		2500	○				

1-FormA, 1-Form-B

Part Number	Pin Configuration	Features	Trigger LED Current I_{FT} max (mA)	On-State Resistance R_{ON} max (Ω)	On-State Resistance R_{ON} @ I_F (mA)	On-state Current I_{ON} max (A)	Off-state Voltage V_{OFF} (V)	BVs @1min. (Vrms)	Safety Standards (1) UL	c-UL	VDE	BSI	CQC
TLP4006G		**DIP8** • General-purpose	3	25	0	1-Form-A: 5 1-Form-B: 0	350	2500					
TLP4026G		**2.54SOP4** • General-purpose						1500	○				

Note (1): Please refer to page 43.

Reference

Note (1): Certified to safety standards. For details on certification status, contact your Toshiba sales representative.

UL/c-UL/CQC: ○: Approved △: Approval pending as of April 2015

BSI: ○: Approved (supplementary, basic insulation or reinforced insulation) △: Approval pending as of April 2015

BSI: EN 60065 / EN 60950-1-certified

VDE: ○: Approved (EN 60747-5-certified) □: Approved (EN 60747-5-5 / EN 60065 / EN 60950-1-certified)

△: Approval pending as of April 2015

Specify VDE-certified devices with option V4 or D4

UL: Underwriters Laboratories (UL) is a safety consulting and certification company.

c-UL: c-UL Mark is the UL Mark for Canada.

VDE: Verband der Elektrotechnik Elektronik Informationstechnik e.V.

BSI: British Standards Institution

CQC: China Quality Certification center

(2): The products with the ranks Y and BL are limited in production. For details, please contact your local Toshiba sales representative.

(3): For details of the devices, please contact your local Toshiba sales representative.

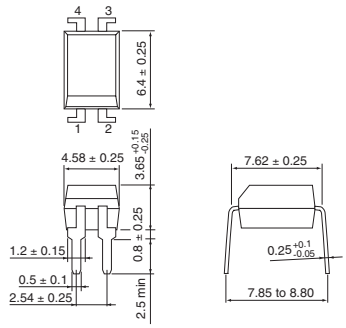
(4): This product is for Japan.

Package Dimensions

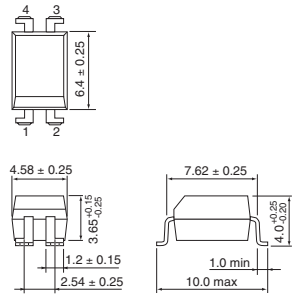
Unit: mm

▶4 pin DIP type

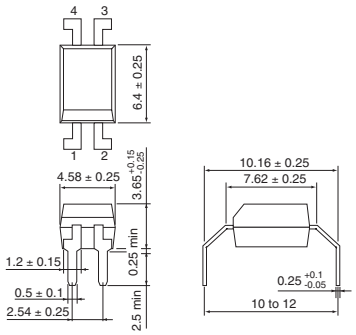
DIP4 (standard)



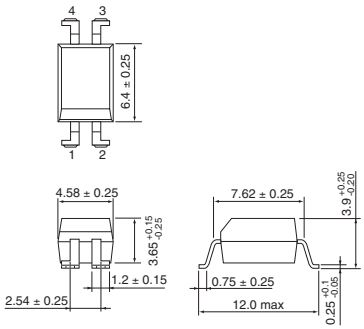
DIP4 (LF1)



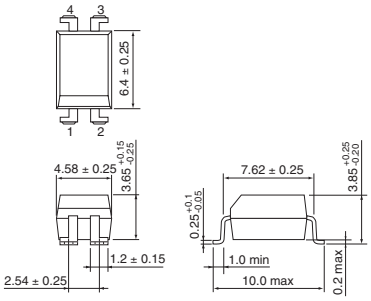
DIP4 (LF2) / DIP4 (F type)



DIP4 (LF4) / (LF7)

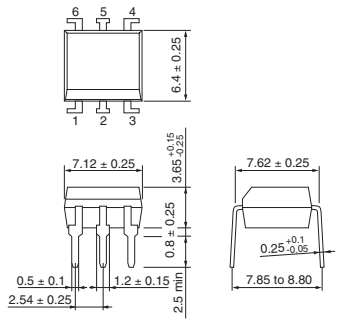


DIP4 (LF5) / (LF6)

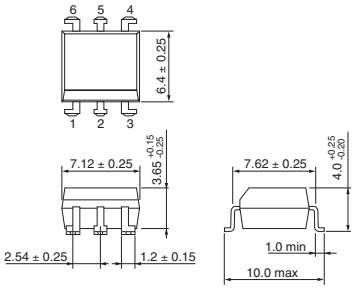


▶6 pin DIP type

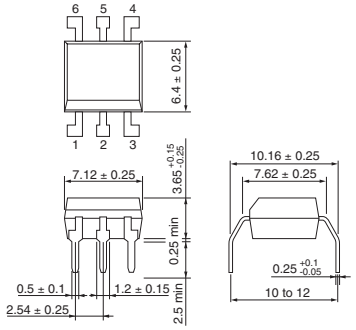
DIP6 (standard)



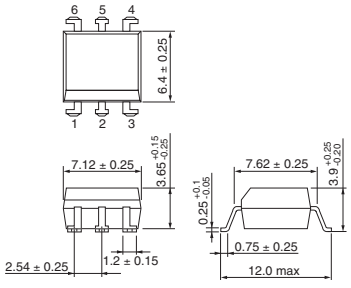
DIP6 (LF1)



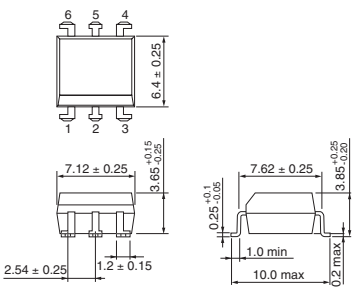
DIP6 (LF2) / DIP6 (F type)



DIP6 (LF4) / (LF7)



DIP6 (LF5) / (LF6)

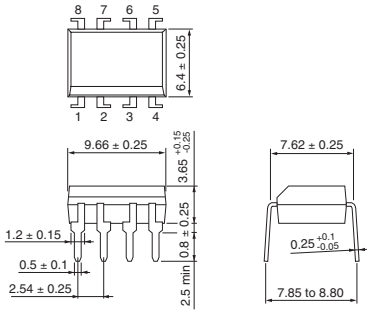


* All dimensions are for reference only unless tolerance is given.

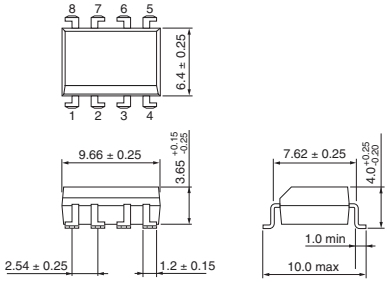
Unit: mm

▶8 pin DIP type

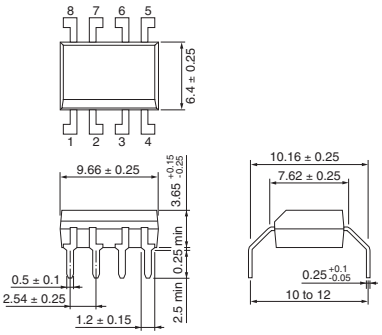
DIP8 (standard)



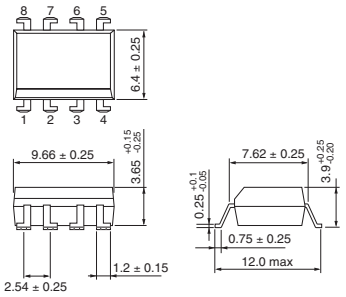
DIP8 (LF1)



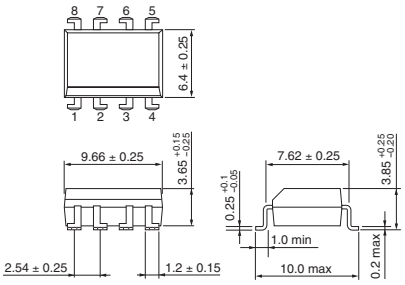
DIP8 (LF2) / DIP8 (F type)



DIP8 (LF4) / (LF7)

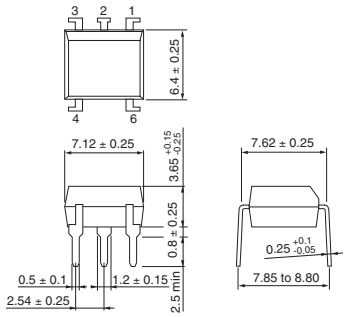


DIP8 (LF5) / (LF6)

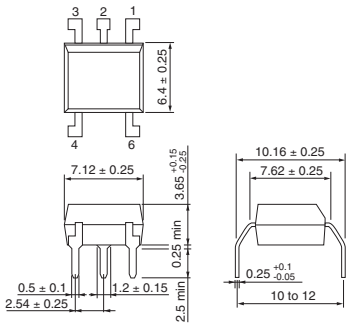


▶Other DIP type / SDIP type

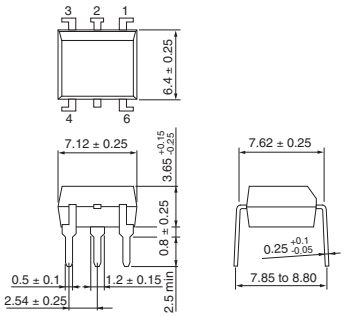
5 pin DIP6



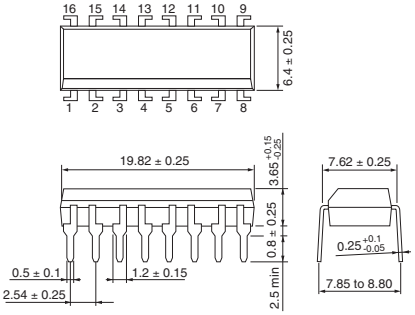
5 pin DIP6 (LF2)



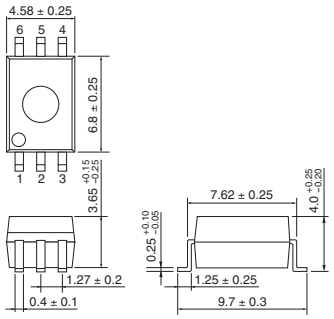
5 pin DIP6 (cut)



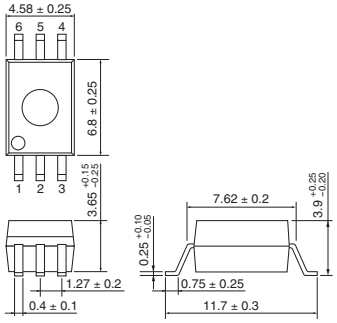
DIP16



SDIP6



SDIP6 (F type)

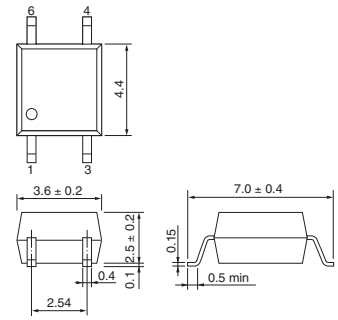


* All dimensions are for reference only unless tolerance is given.

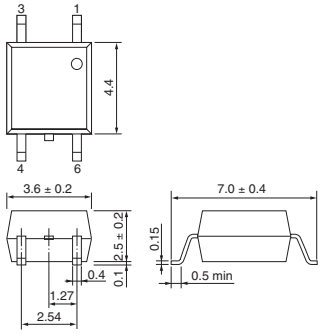
Unit: mm

▶MFC (Mini Flat Coupler) type

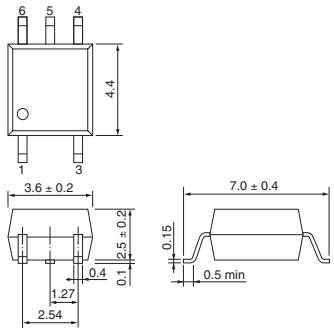
4 pin MFSOP6



4 pin MFSOP6 (No.5cut)

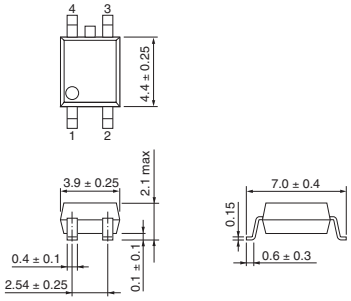


5 pin MFSOP6

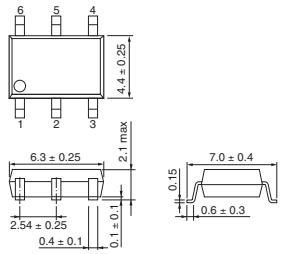


▶2.54 SOP type

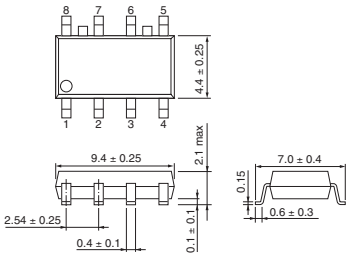
2.54 SOP4



2.54 SOP6

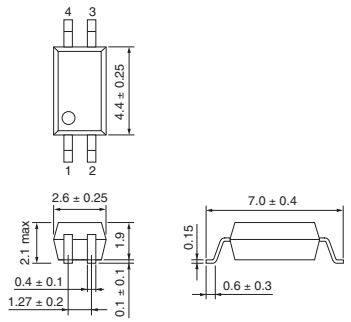


2.54 SOP8

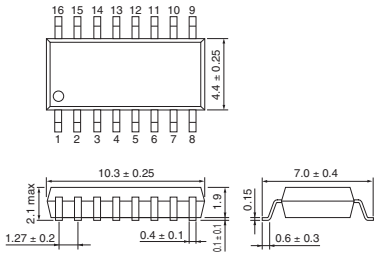


▶SOP/SSOP/USOP/VSON type

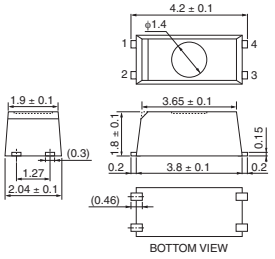
SOP4



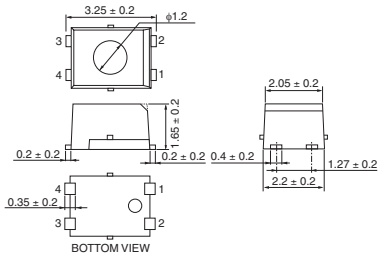
SOP16



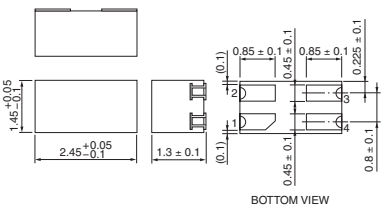
SSOP4



USOP4



VSON4

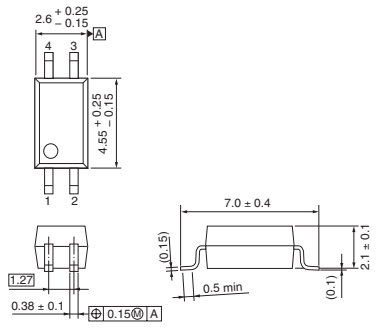


* All dimensions are for reference only unless tolerance is given.

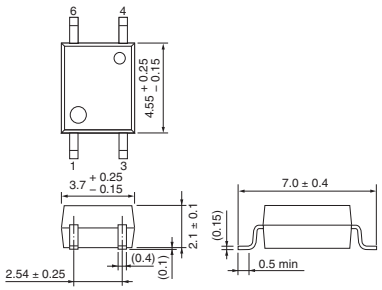
Unit: mm

▶SO type

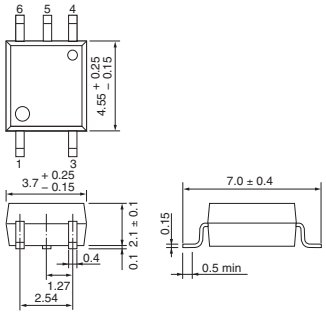
SO4



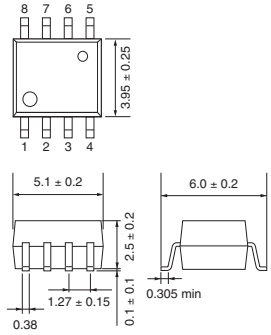
4 pin SO6



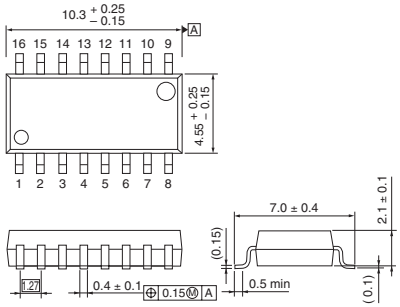
5 pin SO6



SO8

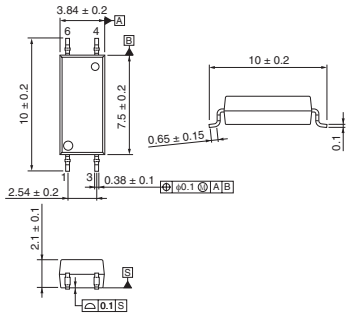


SO16

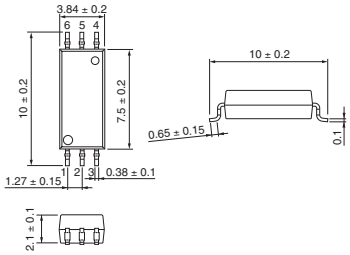


▶SOL type

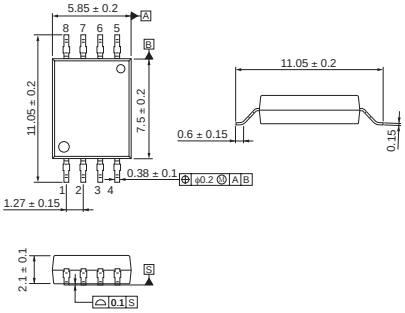
4 pin SO6L



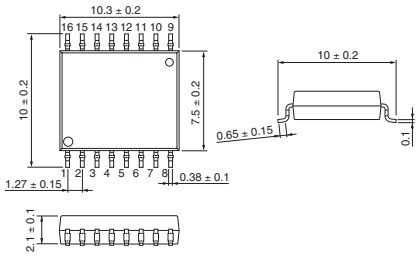
SO6L



SO8L



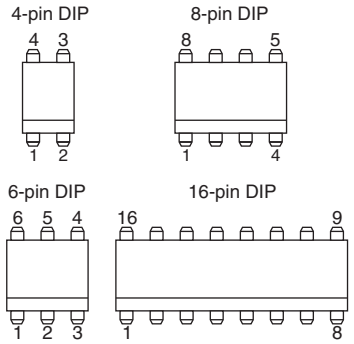
SO16L

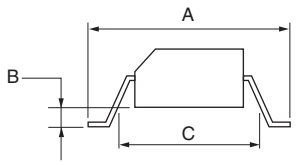
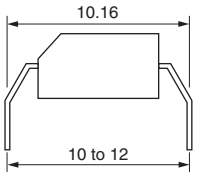


* All dimensions are for reference only unless tolerance is given.

Lead Form Options for DIP Packages

The DIP4, DIP6, DIP8 and DIP16 packages offer three surface-mount lead form options and a wide-spaced lead form option. The electrical characteristics are identical, regardless of these options.



Lead Form	Surface-Mount			Wide-Spaced
Appearance				
Lead Form Code	(LF1)	(LF4), (LF7)(2)	(LF5), (LF6)(2)	(LF2), (F type)
Carrier Tape Code	(TP1)	(TP4), (TP7)(2)	(TP5), (TP6)(2)	Not available(1)
Package Outline				

Dimensions **(mm)**

Dimension \ Version	(LF1)		(LF4)		(LF5)	
	min	max	min	max	min	max
A	—	10.0	—	12.0	—	10.0
B	(0.35 typ.)		(0.25 typ.)		—	0.2
C	6.4	—	8.0	—	6.4	—

All other package dimensions are the same as for each standard package specification.

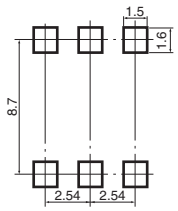
(1) Tape-and-reel packing is not available with (LF2).
(2) The package dimensions and lead form options of the TLP785 differ from those shown above. See the TLP785 datasheet.
(3) Standard part names should be used when applying for safety standard approval.

Example Land Patterns

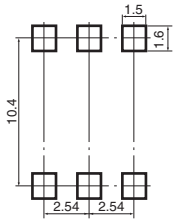
Unit: mm

DIP (surface-mount lead form)(1)

DIP (LF1) / (LF5)

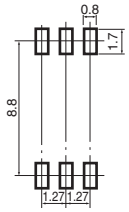


DIP (LF4) / (F type)

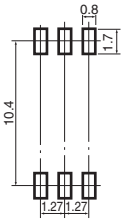


SDIP

SDIP6

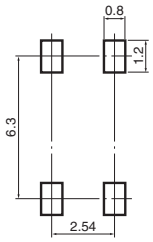


SDIP6 (F type)

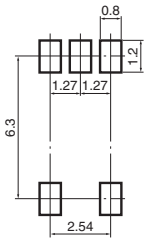


MFC

4pin MFSOP6

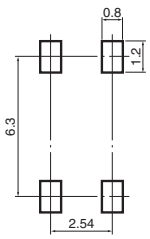


5pin MFSOP6

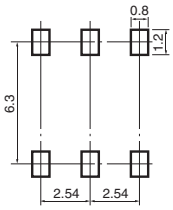


2.54 SOP

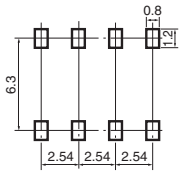
2.54SOP4



2.54SOP6

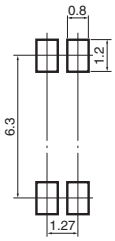


2.54SOP8

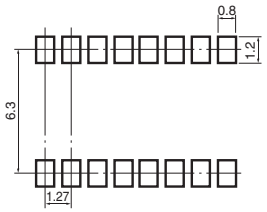


SOP/SSOP/USOP/VSON

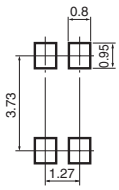
SOP4



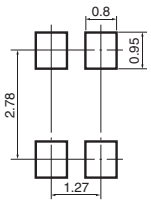
SOP16



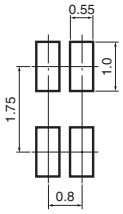
SSOP4



USOP4

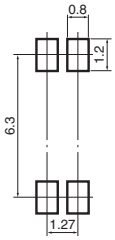


VSON4

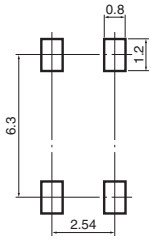


SO

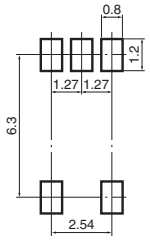
SO4



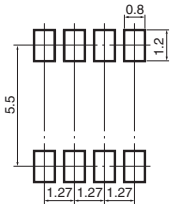
4pin SO6



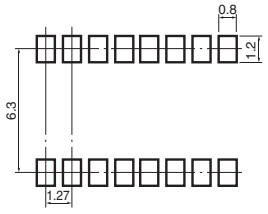
5pin SO6



SO8

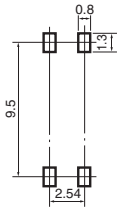


SO16

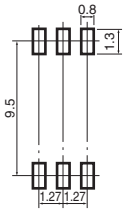


SOL

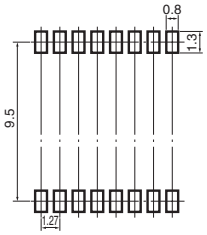
4pin SO6L



SO6L



SO16L



* The PCB land Pattern dimensions shown above are for reference only and should be determined empirically.

(1) For the example land patterns for the TLP785, see their respective datasheets.

Rank Marking

Transistor-output photocouplers are ranked according to their CTR (Current Transfer Ratio) ranges, whereas thyristor-output and triac-output photocouplers are ranked according to their maximum I_{FT} value. The following gives the rank classifications and rank marks printed on packages. Note that the rank classifications differ from product to product. For details, please refer to the relevant technical datasheets.

CTR Rank Name and Rank Marking (for Transistor-output)

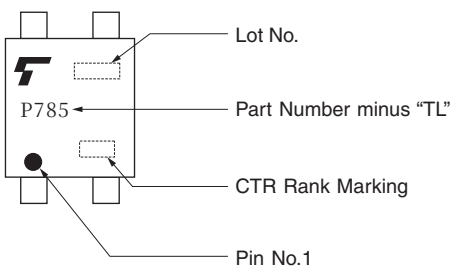
Available CTR Rank Selection (○ Available, △ Contact your nearest Toshiba sales representative)

Input Type	Rank Name	None		Y	YH	GR	GRL	GRH	GB		BL	BLL	LA	LGB
	CTR Rank Marking	Blank		YE	Y+	GR	G	G+	GB		BL	B	LA (*)	LB (*)
	CTR max	50	50	50	75	100	100	150	100	100	200	200	50	100
	CTR min	400	600	150	150	300	200	300	400	600	600	400	600	600
DC Input	TLP183		○	○	○	○	○	○		○	○	○		
	TLP185(SE		○	○	○	○	○	○		○	○	○		
	TLP188		○							○				
	TLP291-4	○							○					
	TLP291(SE		○	○	○	○	○	○		○	○	○		
	TLP293		○	○	○	○	○	○		○	○	○		
	TLP293-4		○							○			○	○
	TLP383		○	○	○	○	○	○		○	○	○		
	TLP385		○	○	○	○	○	○		○	○	○		
	TLP731		○	△		○				○	△			
	TLP732		○	△		○				○	△			
	TLP785/785F		○	○	○	○	○	○		○	○	○		
	TLP2301		○							○				
AC Input	TLP182		○	○		○				○	○			
	TLP184(SE		○	○		○				○	○			
	TLP290-4	○							○					
	TLP290(SE		○	○		○				○	○			
	TLP292		○	○		○				○	○			
	TLP292-4												○	○

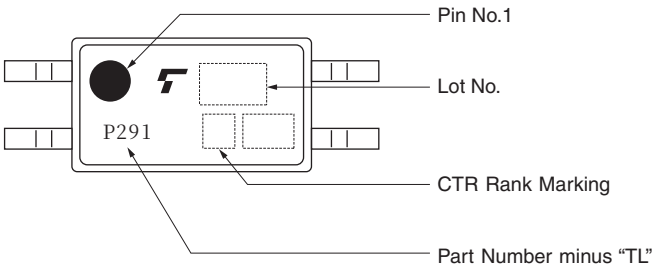
(*): The LA and LB rank are made CTR rank of the low input current condition.

Marking Examples

(a) DIP4 Package (TLP785)



(b) SO4 Package (TLP291)

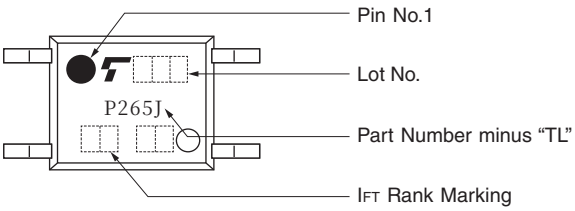


LED Trigger Current (I_{FT}) Rank Name and Rank Marking (for Triac-output)

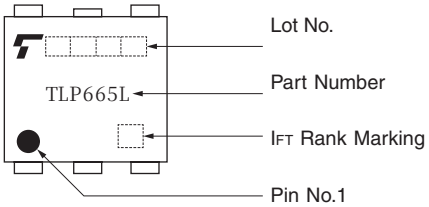
Off-state Output Terminal Voltage V_{DRM}	Part Number	Trigger LED Current I_{FT} (mA) max			
	Rank Name	None	IFT7	IFT5	IFT2
	I_{FT} Rank Marking	Blank	T7	T5	T2
400 V	TLP560G	10	7	5	—
	TLP561G	10	7	5	—
	TLP665G(S) / TLP665GF(S)	10	7	—	—
	TLP666G(S) / TLP666GF(S)	10	7	—	—
600 V	TLP265J	10	7	—	—
	TLP266J	10	7	—	—
	TLP267J	3	—	—	2
	TLP268J	3	—	—	2
	TLP360J / TLP360JF	10	7	—	—
	TLP361J / TLP361JF	10	7	—	—
	TLP560	10	7	—	—
	TLP561	10	7	—	—
	TLP665J(S) / TLP665JF(S)	10	7	—	—
	TLP665L	10	7	—	—
	TLP666J(S) / TLP666JF(S)	10	7	—	—
800 V	TLP669L(S) / TLP669LF(S)	10	—	5	—

Marking Examples

(a) 4 pin SO6 Package (TLP265J)



(b) 5 pin DIP6 Package (TLP665L)

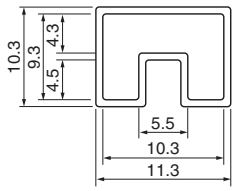
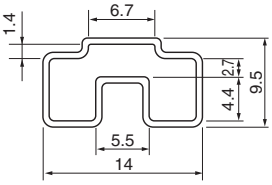


Note: 1. Specify both the part number and a rank in this format when ordering.
Examples: TLP183 (GB), TLP560G (T7)

2. For safety standard certification, however, specify the part number alone.
Examples: Part number: TLP183 (GB) → Use this part number: TLP183

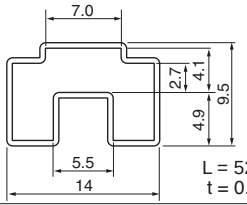
Magazine Packing Specification

Unit: mm

DIP type		Standard				Lead Forming LF1, LF2 / F type, LF4 / LF7, LF5 / LF6			
Magazine	Dimensions	 L = 525 t = 0.5				 L = 525 t = 0.5			
	Pin Count	4 pin	6 pin	8 pin	16 pin	4 pin	6 pin	8 pin	16 pin
	Quantities per Magazine	100 pcs	50 pcs	50 pcs	25 pcs	100 pcs	50 pcs	50 pcs	25 pcs

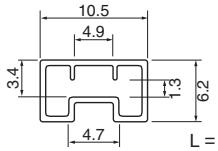
Carton							
	Number of Magazines		4	20	60	4	40
	Carton Dimensions	A	50 mm	67 mm	123 mm	60 mm	135 mm
		B	12 mm	51 mm	76 mm	13 mm	58 mm
		C	531 mm	559 mm	568 mm	531 mm	568 mm
	Label Position		Y	Y	X	Y	X

Unit: mm

SDIP type		SDIP6
Magazine	Dimensions	 L = 525 t = 0.5
	Quantities per Magazine	100 pcs

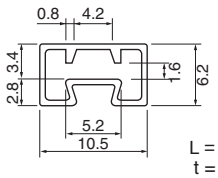
Carton			
	Number of Magazines		40
	Carton Dimensions	A	135 mm
		B	58 mm
		C	568 mm
	Label Position		X

Unit: mm

MFC type		MFSOP6
Magazine	Dimensions	 L = 555 t = 0.5
	Quantities per Magazine	150 pcs

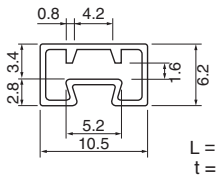
Carton					
	Number of Magazines		4	24	40
	Carton Dimensions	A	29 mm	77 mm	67 mm
		B	13 mm	31 mm	55 mm
		C	563 mm	586 mm	586 mm
	Label Position		Y	Y	X

Unit: mm

2.54 SOP type		2.54 SOP		
Magazine	Dimensions	 L = 555 t = 0.5		
	Pin Count	4 (2.54 SOP4)	6 (2.54SOP6)	8 (2.54SOP8)
	Quantities per Magazine	100 pcs	75 pcs	50 pcs

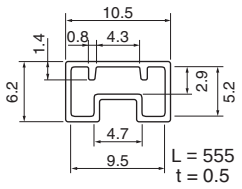
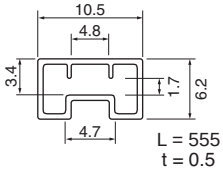
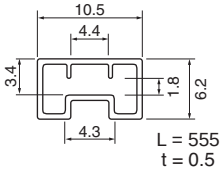
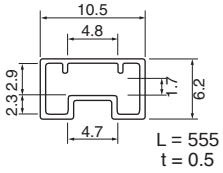
Carton					
	Number of Magazines		4	24	40
	Carton Dimensions	A	29 mm	77 mm	67 mm
		B	13 mm	31 mm	55 mm
		C	563 mm	586 mm	586 mm
	Label Position		Y	Y	X

Unit: mm

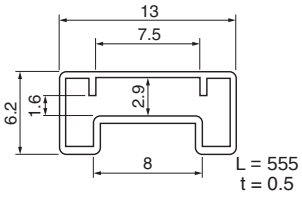
SOP type		SOP	
Magazine	Dimensions	 L = 555 t = 0.5	
	Pin Count	4 (SOP4)	16 (SOP16)
	Quantities per Magazine	150 pcs	50 pcs

Carton					
	Number of Magazines		4	24	40
	Carton Dimensions	A	29 mm	77 mm	67 mm
		B	13 mm	31 mm	55 mm
		C	563 mm	586 mm	586 mm
	Label Position		Y	Y	X

Unit: mm

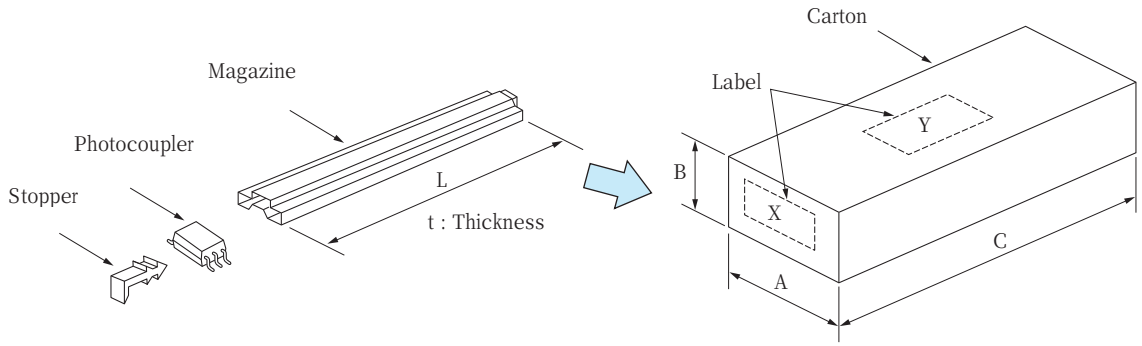
SO type			SO4	SO6	SO8	SO16
Magazine	Dimensions					
	Quantities per Magazine		175 pcs	125 pcs	100 pcs	50 pcs
Carton	Number of Magazines		40	40	24	40
	Carton Dimensions	A	71 mm	70 mm	75 mm	61 mm
		B	32 mm	55 mm	29 mm	56 mm
		C	584 mm	585 mm	579 mm	586 mm
	Label Position		X	X	X	X

Unit: mm

SOL type			SOL	
Magazine	Dimensions			
	Pin Count		6 (SO6L)	16 (SO16L)
	Quantities per Magazine		125 pcs	50 pcs
Carton	Number of Magazines		20	
	Carton Dimensions	A	70 mm	
		B	55 mm	
		C	585 mm	
	Label Position		X	

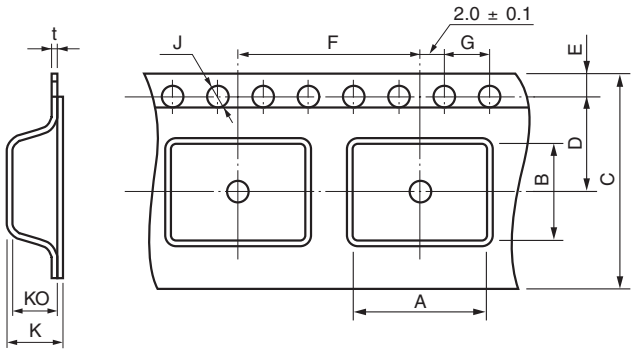
* All dimensions are typical values.

Photocouplers are stored in magazines, and packed into cartons. An overview of how devices are packed is shown below.



Tape-and-Reel Specification

Tape Dimensions



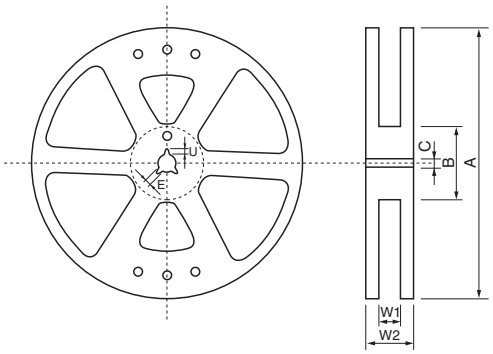
Unit: mm

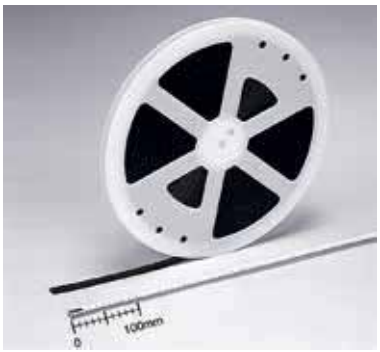
Package		DIP (LF1) (LF5)	DIP (LF4)	SDIP6	SDIP6 F type	MFSOP6	2.54SOP4	2.54SOP6	2.54SOP8	SOP4	SOP16	SSOP4	USOP4	VSON4	SO4	SO6	SO8	SO16	SO6L	SO16L
Taping		(TP1) (TP5)	(TP4)	(TP)	(TP)	(TPL) (TPR)	(TP)	(TP)	(TP)	(TP)	(TP)	(TP)	(TP15)	(TP)	(TP)	(TPL) (TPR)	(TP)	(TP)	(TP)	(TP)
Symbol	A	10.4±0.1	12.3±0.1	10.4±0.1	12.3±0.1	4.2±0.1	4.3±0.1	7.5±0.1		3.1±0.1	7.5±0.1	2.35±0.2	2.6±0.1	1.6±0.1	3.1±0.1	4.0±0.1	6.5±0.1	7.5±0.1	10.4±0.1	
	B	(*1)	(*1)	5.1±0.1		7.6±0.1	7.5±0.1	6.7±0.1	10.5±0.1	7.5±0.1	10.5±0.1	4.5±0.1	3.55±0.1	3.0±0.1	7.5±0.1	7.6±0.1	5.6±0.1	10.5±0.1	4.24±0.1	10.7±0.1
	C	16.3±0.3				12.0±0.3	12.0±0.3	16.0±0.3		12.0±0.3	16.0±0.3	12.0±0.3	12.0±0.3	8.0±0.3	12.0±0.3			16.0±0.3	16.0±0.3	
	D	7.5±0.1				5.5±0.1	5.5±0.1	7.5±0.1		5.5±0.1	7.5±0.1	5.5±0.1	5.5±0.1	3.5±0.1	5.5±0.1			7.5±0.1	7.5±0.1	
	E	1.75±0.1				1.75±0.1	1.75±0.1			1.75±0.1					1.75±0.1				1.75±0.1	
	F	12.0±0.1	16.0±0.1	12.0±0.1	16.0±0.1	8.0±0.1	8.0±0.1	12.0±0.1		8.0±0.1	12.0±0.1	4.0±0.1	4.0±0.1	4.0±0.1	8.0±0.1			12.0±0.1	12.0±0.1	
	G	4.0±0.1				4.0±0.1	4.0±0.1			4.0±0.1					4.0±0.1				4.0±0.1	
	J	$1.5^{+0.1}_{-0}$				$1.5^{+0.1}_{-0}$	$1.5^{+0.1}_{-0}$			$1.5^{+0.1}_{-0}$					$1.5^{+0.1}_{-0}$				$1.5^{+0.1}_{-0}$	
	K	4.55±0.2				3.15±0.2	2.6±0.2	2.5±0.2	2.4±0.2	2.5±0.2	2.4±0.2	2.4±0.2	(2.0±0.1)	(1.8±0.1)	3.15±0.2	2.9±0.2	3.4±0.2	2.6±0.2	(2.7±0.1)	
	K0	4.1±0.1				2.7±0.1	2.4±0.1	2.3±0.1	2.2±0.1	2.3±0.1	2.2±0.1	2.1±0.1	1.95±0.1	1.5±0.1	2.3±0.1	2.6±0.1	3.1±0.1	2.2±0.1	2.4±0.1	
	t	0.4±0.05				0.3±0.05				0.3±0.05			0.3±0.1	0.2±0.05	0.3±0.05				0.3±0.05	

(*1): Typical devices

DIP4	5.1±0.1
DIP6 (short package)	7.6±0.1
DIP8	10.1±0.1 (TP4) is not available.

Reel Dimensions



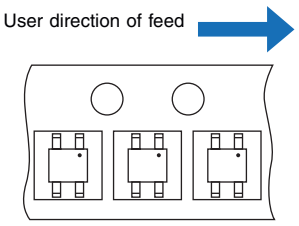
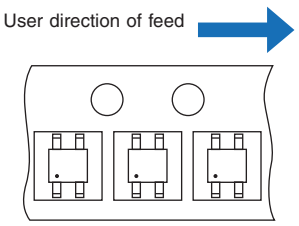
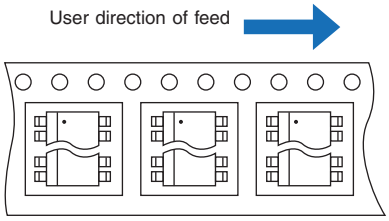


Unit: mm

Package		DIP (LF1) (LF5)	DIP (LF4)	SDIP6	SDIP6 F type	MFSOP6	2.54SOP4	2.54SOP6	2.54SOP8	SOP4	SOP16	SSOP4	USOP4	VSON4	SO4	SO6	SO8	SO16	SO6L	SO16L
Taping		(TP1) (TP5)	(TP4)	(TP)	(TP)	(TPL) (TPR)	(TP)	(TP)	(TP)	(TP)	(TP)	(TP15)	(TP15)	(TP)	(TP)	(TPL) (TPR)	(TP)	(TP)	(TP)	(TP)
Symbol	A	ø380±2				ø380±2	ø330±2			ø330±2		180^{+0}_{-4}	180^{+0}_{-4}	ø180±3	ø330±2	ø380±2	ø330±2		ø330±2	
	B	ø80±1				ø80±1	ø80±1			ø80±1		ø60	ø60	ø60±1	ø80±1	ø80±1	ø80±1		ø100±1	
	C	ø13±0.5				ø13±0.5	ø13±0.5			ø13±0.5		ø13	ø13±0.5		ø13±0.5				ø13±0.5	
	E	2.0±0.5				2.0±0.5	2.0±0.5			2.0±0.5					2.0±0.5				2.0±0.5	
	U	4.0±0.5				4.0±0.5	4.0±0.5			4.0±0.5					4.0±0.5				4.0±0.5	
	W1	17.5±0.5				13.5±0.5	13.5±0.5	17.5±0.5		13.5±0.5	17.5±0.5	13.0±0.3	13.0±0.3	9.0±0.3	13.5±0.5			17.5±0.5	17.4±1.0	
	W2	21.5±1.0				17.5±1.0	17.5±1.0	21.5±1.0		17.5±1.0	21.5±1.0	15.4±1.0	15.4±1.0	11.4±1.0	17.5±1.0			21.5±1.0	21.4±1.0	

Device Orientation on Tape

Photocouplers are oriented in cavity, as shown below.

Package Type	Tape Option	Packing Quantity (pcs/reel)	Device Orientation on Tape
MFSO6	TPR	3,000	
SO6		3,000	
MFSO6	TPL	3,000	
SO6		3,000	
2.54SOP4	TP	2,500	
SOP4		2,500	
VSON4		3,000	
SO4		2,500	
SSOP4	TP15	1,500	
USOP4			
SDIP6	TP	1,500	
SDIP6 (F type)		1,000	
2.54SOP6		2,500	
2.54SOP8		2,500	
SOP16		2,500	
SO8		2,500	
SO16		2,000	
SO6L		1,500	
SO16L		1,500	
DIP (LF1)	TP1	1,500	
DIP (LF4)	TP4	1,000	
DIP (LF5)	TP5	1,500	

Empty Device Recesses

Item	Specification	Note
Consecutive empty cavities	Zero	Any 40-mm portion of tape except leader and trailer
Non-consecutive empty cavities	0.2% max/reel (*2)	Except leader and trailer

(*2): 6pcs max/reel for DIP and SDIP packages

Packing Boxes

Either one reel or ten reels of photocoupler are packed in a shipping carton.

Label Indication

The carton bears a label indicating the part number, the symbol representing classification of standard, the quantity, the lot number and Toshiba company name.

Board Assembly Considerations

1. Soldering

The profile below shows only the typical temperature profile and conditions, which might not apply to all Toshiba photocouplers.
Temperature profiles and conditions may differ from product to product. Refer to the relevant technical datasheets when mounting a device.
When using a soldering iron or medium infrared ray / hot air reflow, avoid a rise in device temperature as much as possible by observing the following conditions.

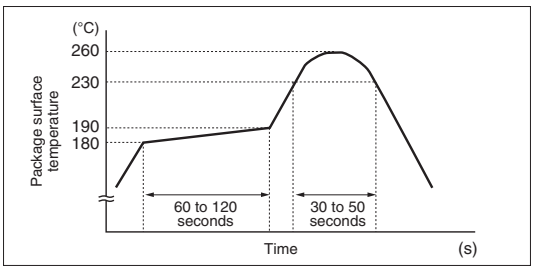
1.1) Using a soldering iron

a. Solder once within 10 seconds for a lead temperature of up to 260°C.
b. Solder once within 3 seconds for a lead temperature of up to 350°C.

1.2) Using medium infrared ray/hot air reflow

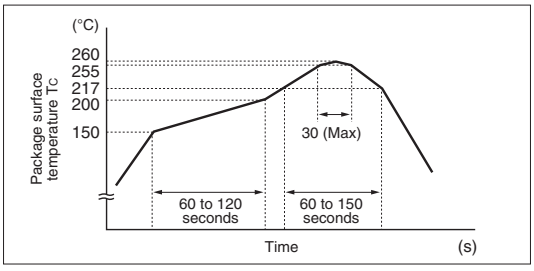
a. Complete the infrared ray/hot air reflow process at once within 30 seconds at a package surface temperature between 210°C and 240°C.

b. Example of temperature profile of lead (Pb)-free solder



Example of temperature profile of lead (Pb)-free solder

c. Temperature Profile of JEDEC Pb-Free Solder
(For Reference Only)



Temperature profile of JEDEC Pb-free solder (for reference only)

d. Precautions for heating
Keeping packages at high temperature for a long period of time can degrade the quality and reliability of devices.
Soldering time has to be kept as short as possible to avoid a rise in package temperature.
When using a halogen lamp or infrared heater, avoid direct irradiation of packages, since this may cause a rise in package temperature.

1.3) Dip soldering (flow soldering)

The thermal shock of dip soldering increases thermal stress on devices. To avoid stress, the use of a soldering iron or medium infrared ray/hot air reflow is recommended. If you want to use dip soldering, contact your nearest Toshiba sales representative.

2. Flux Cleaning

- When cleaning circuit boards to remove flux, make sure that no residual reactive ions such as sodium (Na+) or chloride (Cl–) ions remain. Note that organic solvents react with water to generate hydrogen chloride and other corrosive gases, which can degrade device performance.
- Washing devices with water will not cause any problems. However, make sure that no reactive ions such as sodium (Na+) or chloride (Cl–) ions are left as residue. Also, be sure to dry devices sufficiently after washing.
- Do not rub device markings with a brush or with your hand during cleaning or while the devices are still wet from the cleaning agent. Doing so can rub off the markings.
- Dip cleaning, shower cleaning and steam cleaning processes all involve the chemical action of a solvent. Use only recommended solvents for these cleaning methods. When immersing devices in a solvent or steam bath, make sure that the temperature of the liquid is 50°C or below and that the circuit board is removed from the bath within one minute.
- If a device package allows ultrasonic cleaning, keep the duration of ultrasonic cleaning as short as possible, since long hours of ultrasonic cleaning degrade the adhesion between the mold resin and the frame material.

■ **The following ultrasonic cleaning conditions are recommended.**

Frequency: 27 kHz to 29 kHz
Ultrasonic output power: 300 W or less (0.25 W/cm^2 or less)
Cleaning time: 30 seconds or less

Suspend the circuit board in the solvent bath during ultrasonic cleaning in such a way that the ultrasonic vibrator does not come into direct contact with the circuit board or the device.
Conventional cleaning solvents that contain freon are not recommended due to its adverse effects on the earth's ozone layer. Alternative freon-free products are available on the market.
Contact Toshiba or a Toshiba distributor regarding cleaning conditions and other relevant information for each product type.

Projected Operating Life Based on LED Light Output Degradation

Toshiba photocouplers use one of four types of LEDs and a projection of the operating life has been made for each LED. The table on page 52 shows the types of LED used in photocouplers and the figures on pages 58 to 60 show projections of long-term light output performance and operating life. Note that these operating life data are estimates extrapolated from long-term light output degradation over a single wafer lot and are shown as reference only.

	Projected Operating Life (1)		Photocouplers
	F50% operating life (2)	F0.1% operating life (3)	
① GaAs LED	1,300,000 h	260,000 h	Mainly for phototransistor output devices and phototriac output devices
② GaAlAs (SH) LED	540,000 h	100,000 h	Mainly for photo-IC couplers
③ GaAlAs (DH) LED	1,000,000 h	200,000 h	Mainly for photorelays (MOSFET output), photovoltaic couplers and photo-IC couplers
④ GaAlAs (MQW) LED	Ask your local Toshiba sales representative.		Mainly for photo-IC couplers

(1) Ta = 40°C, I_F = 20 mA, failure criteria: degradation rate $\Delta Po < -50\%$
(2) Cumulative failure rate 50%: Time period until the projected long-term light output degradation curve of the average light output change ($\bar{X}$) shown on pages 58 to 60 reaches the failure criteria.
(3) Cumulative failure rate 0.1%: Time period until the projected long-term light output degradation curve of $\bar{X} - 3$ shown on pages 58 to 60 reaches the failure criteria.

The relationship between LED light output degradation and optical coupling characteristics is shown below.

- The relationship between LED light output degradation and current transfer ratio (CTR)/short circuit current (I_{SC}) is 1:1.

$$\frac{CTR\ (t)}{CTR\ (o)} = \frac{Po\ (t)}{Po\ (o)}$$

- The relationship between a reciprocal value of LED light output degradation and $I_{FT}/I_{FLH}/I_{FHL}/I_{FH}$ change is 1:1.

$$\frac{IFT\ (t)}{IFT\ (o)} = \left(\frac{Po\ (t)}{Po\ (o)}\right)^{-1}$$

LEDs Used in Photocouplers

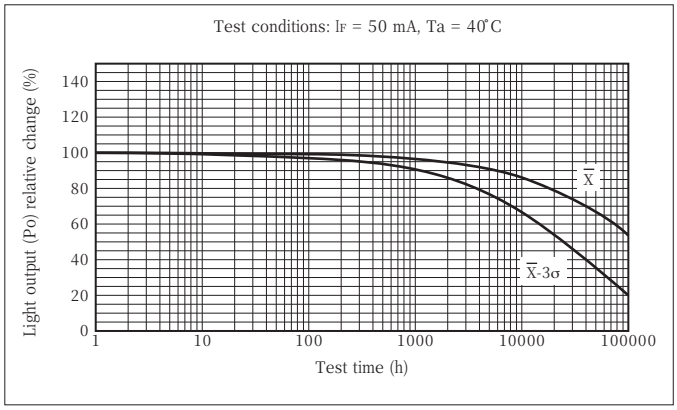
LED: ① GaAs ② GaAlAs (SH) ③ GaAlAs (DH) ④ GaAlAs (MQW)

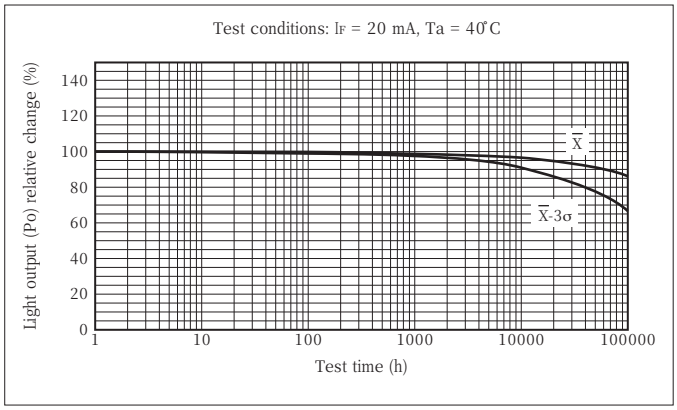
Photocouplers	LED	Photocouplers	LED	Photocouplers	LED	Photocouplers	LED	Photorelays	LED
TLP104	④	TLP358	④	TLP708	④	TLP2530	②	TLP170 Series	①
TLP105	④	TLP358H	④	TLP714	④	TLP2531	②	TLP171 Series	④
TLP108	④	TLP360J	①	TLP715	②	TLP2601	②	TLP172 Series	①
TLP109 Series	④	TLP361J	①	TLP716	②	TLP2630	②	TLP174G Series	①
TLP116A	④	TLP363J	①	TLP718	②	TLP2631	②	TLP175A	④
TLP117	④	TLP371	①	TLP719	②	TLP2662	④	TLP176 Series	①
TLP118	④	TLP372	①	TLP731	①	TLP2703	④	TLP179D	①
TLP124	①	TLP373	①	TLP732	①	TLP2766	④	TLP192 Series	①
TLP126	①	TLP385	**	TLP733	①	TLP2767	**	TLP197 Series	①
TLP127	①	TLP512	②	TLP734	①	TLP2768	④	TLP199D	①
TLP130	①	TLP513	②	TLP748J	①	TLP2955	④	TLP200D	①
TLP131	①	TLP523 Series	①	TLP750	②	TLP2958	④	TLP202 Series	①
TLP137	①	TLP525G Series	①	TLP751	②	TLP2962	④	TLP206 Series	①
TLP148G	①	TLP531	①	TLP754	④	TLP3022(S)	①	TLP209D	①
TLP151A	④	TLP532	①	TLP759 Series	②	TLP3023(S)	①	TLP221A	④
TLP152	④	TLP548J	①	TLP762J	①	TLP3042(S)	①	TLP222 Series	①
TLP155 Series	④	TLP549J	①	TLP763J	①	TLP3043	①	TLP224G Series	①
TLP160 Series	①	TLP550	②	TLP785	①	TLP3052	①	TLP225A	①
TLP161 Series	①	TLP551	②	TLP2066	③	TLP3062	①	TLP227 Series	①
TLP163J	①	TLP552	②	TLP2095	④	TLP3063(S)	①	TLP228 Series	①
TLP165J	①	TLP553	②	TLP2098	④	TLP3064	③	TLP240 Series	④
TLP166J	①	TLP554	②	TLP2105	②	TLP3082	①	TLP241A	④
TLP168J	③	TLP555	②	TLP2108	②	TLP3762(S)	①	TLP592 Series	①
TLP173A	①	TLP557	②	TLP2116	②	TLP3782	④	TLP597 Series	①
TLP182	④	TLP558	②	TLP2118E	④	TLP3783	④	TLP598 Series	③
TLP183	④	TLP559 Series	②	TLP2160	④	TLP3902	①	TLP797 Series	①
TLP184(SE	①	TLP560 Series	①	TLP2161	④	TLP3904	①	TLP798GA	③
TLP185(SE	①	TLP561 Series	①	TLP2166A	②	TLP3905	④	TLP31xx Series	①
TLP187	④	TLP570	①	TLP2167	**	TLP3906	④	TLP3203	①
TLP188	④	TLP571	①	TLP2168	④	TLP3914	③	TLP321x Series	①
TLP190B	③	TLP572	①	TLP2200	②	TLP3924	③	TLP3220	①
TLP191B	③	TLP590B	③	TLP2301	④	TLP5701	④	TLP3230	①
TLP220 Series	④	TLP591B	③	TLP2309	④	TLP5702	④	TLP3231	①
TLP250H	④	TLP620 Series	①	TLP2310	**	TLP5751	④	TLP3240	③
TLP265J	④	TLP624 Series	①	TLP2345	**	TLP5752	④	TLP3241	③
TLP266J	④	TLP626 Series	①	TLP2348	**	TLP5754	④	TLP3250	③
TLP267J	④	TLP627 Series	①	TLP2355	④	TLPN137	④	TLP3275	①
TLP268J	④	TLP628 Series	①	TLP2358	④	6N135	②	TLP33xx Series	①
TLP280-4	①	TLP630	①	TLP2361	④	6N136	②	TLP34xx Series	④
TLP281-4	①	TLP631	①	TLP2362	④	6N137	②	TLP35xx Series	③
TLP290-4	①	TLP632	①	TLP2366	④	6N138	②	TLP4xxx Series	①
TLP290(SE	①	TLP651	②	TLP2367	**	6N139	②		
TLP291-4	①	TLP663J	①	TLP2368	④				
TLP291(SE	①	TLP665 Series	①	TLP2395	④				
TLP292 Series	④	TLP666 Series	①	TLP2398	④				
TLP293 Series	④	TLP668J	③	TLP2403	④				
TLP331	①	TLP669L	④	TLP2404	④				
TLP332	①	TLP700	④	TLP2405	④				
TLP350	②	TLP700A	④	TLP2408	④				
TLP350H	④	TLP700H	④	TLP2409	④				
TLP351	②	TLP701	②	TLP2418	④				
TLP351A	④	TLP701A	④	TLP2451A	④				
TLP351H	④	TLP701H	④	TLP2466	④				
TLP352	④	TLP705A	④	TLP2468	④				

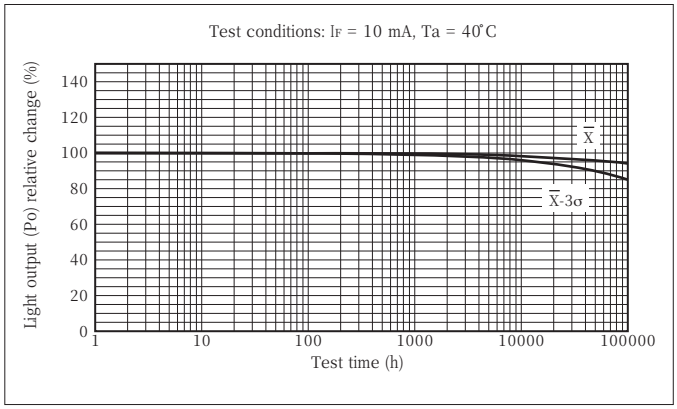
**: Under development

■ ① GaAs LED

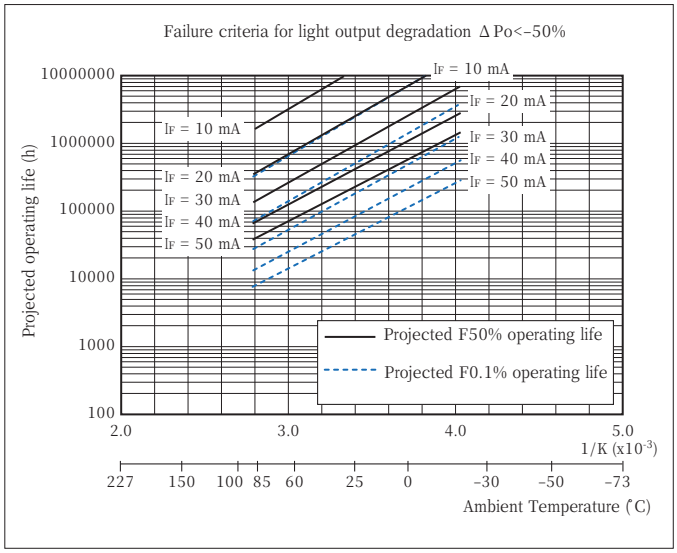
Projected Light Output Degradation Data

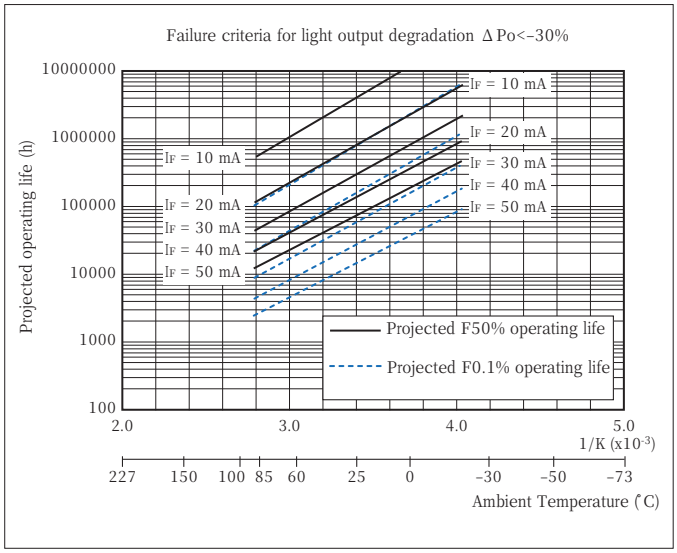






Projected Operating Life Data

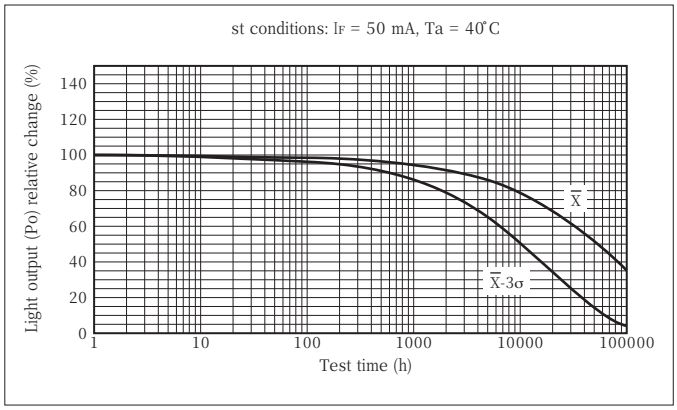


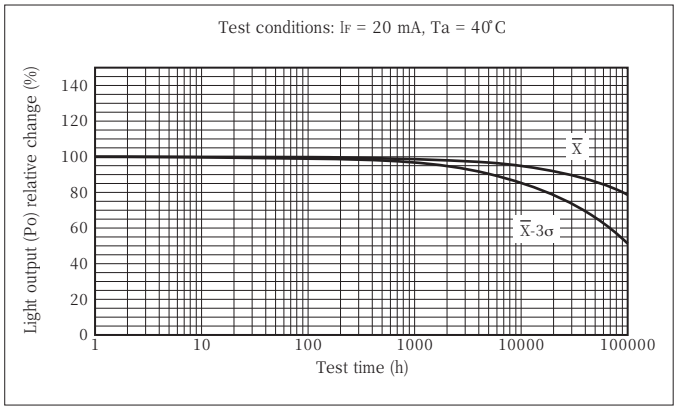


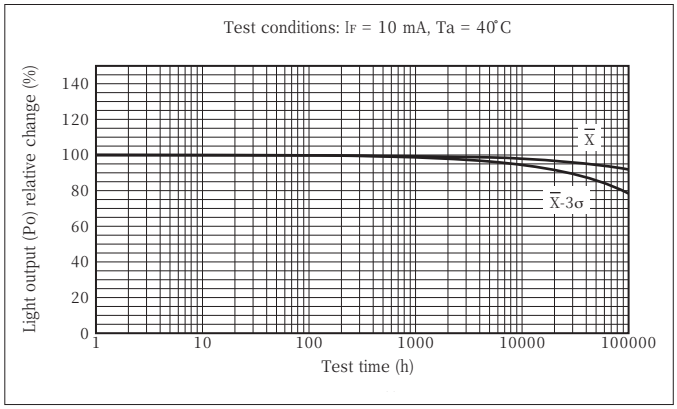
The above operating life data are estimates extrapolated from long-term light output degradation over a single wafer lot and are shown as reference only. Operating conditions exceeding the maximum ratings are not guaranteed.

■ ② GaAlAs (SH) LED

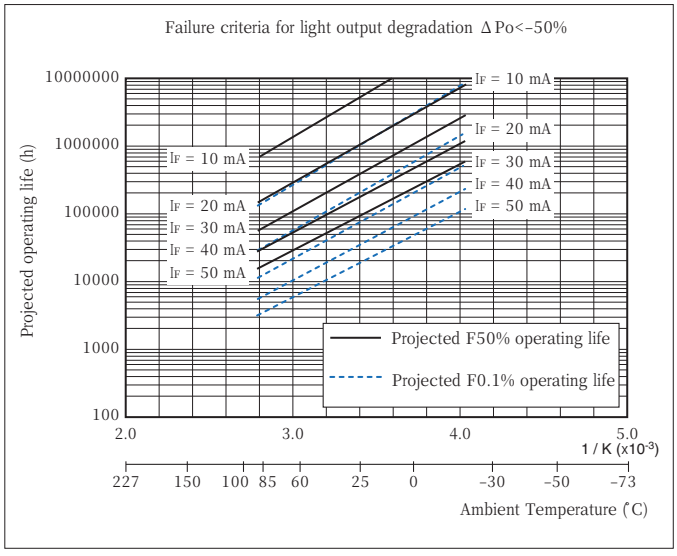
Projected Light Output Degradation Data

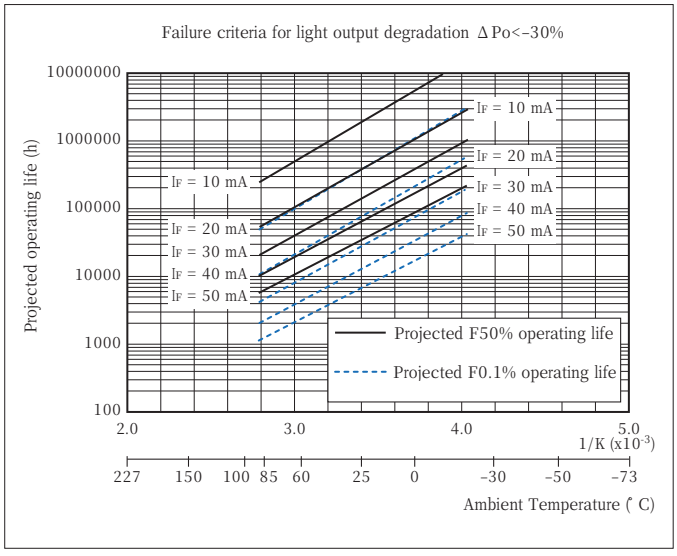






Projected Operating Life Data

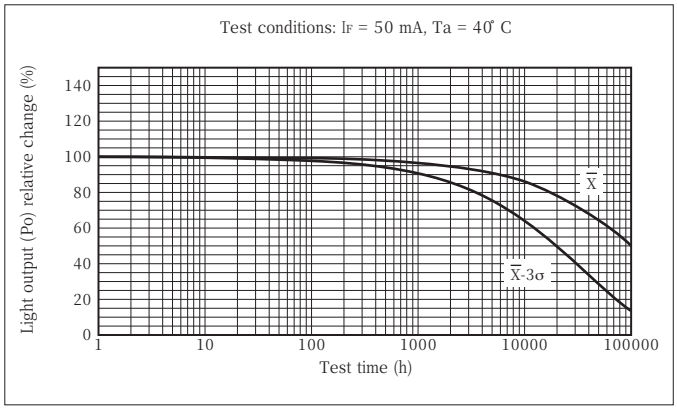


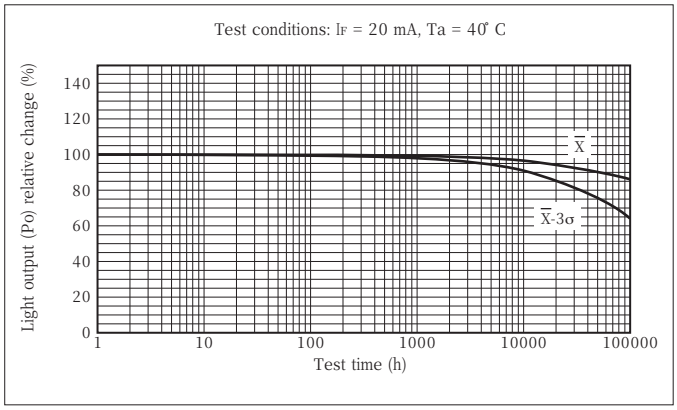


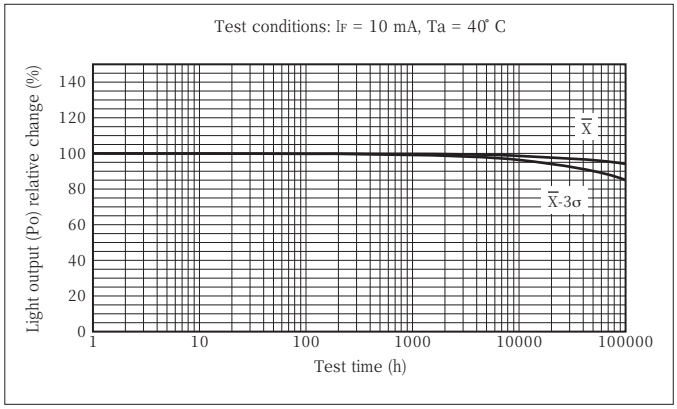
The above operating life data are estimates extrapolated from long-term light output degradation over a single wafer lot and are shown as reference only. Operating conditions exceeding the maximum ratings are not guaranteed.

■ ③ GaAlAs (DH) LED

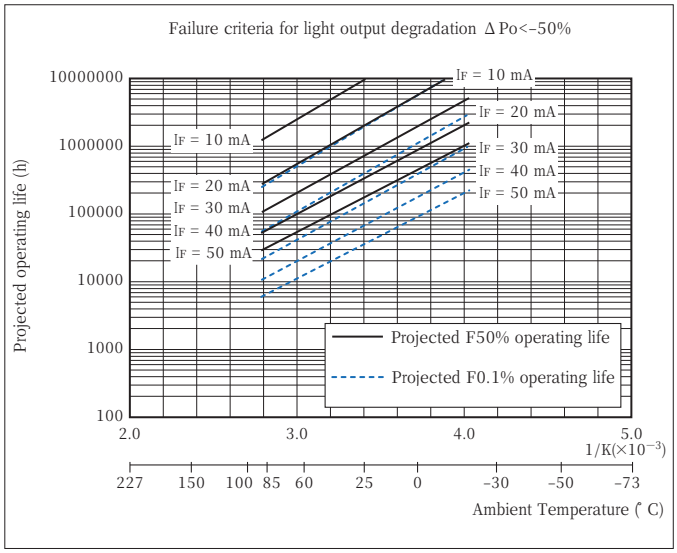
Projected Light Output Degradation Data

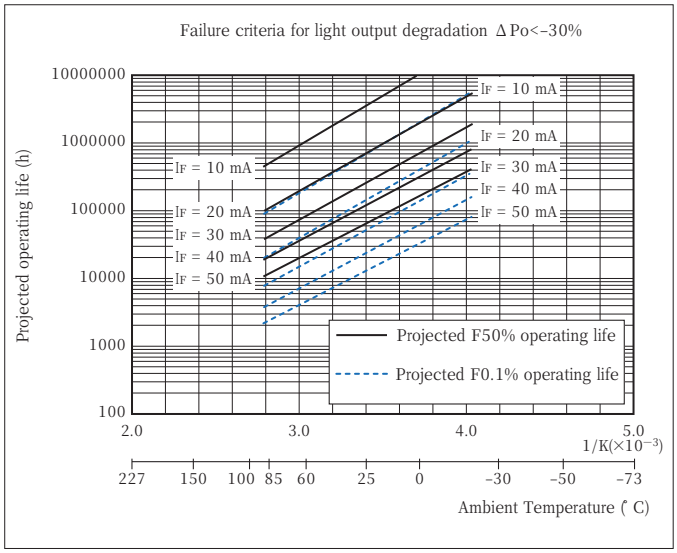






Projected Operating Life Data





The above operating life data are estimates extrapolated from long-term light output degradation over a single wafer lot and are shown as reference only. Operating conditions exceeding the maximum ratings are not guaranteed.

■ ④ GaAlAs (MQW) LED

Projected Light Output Degradation and Operating Life Data

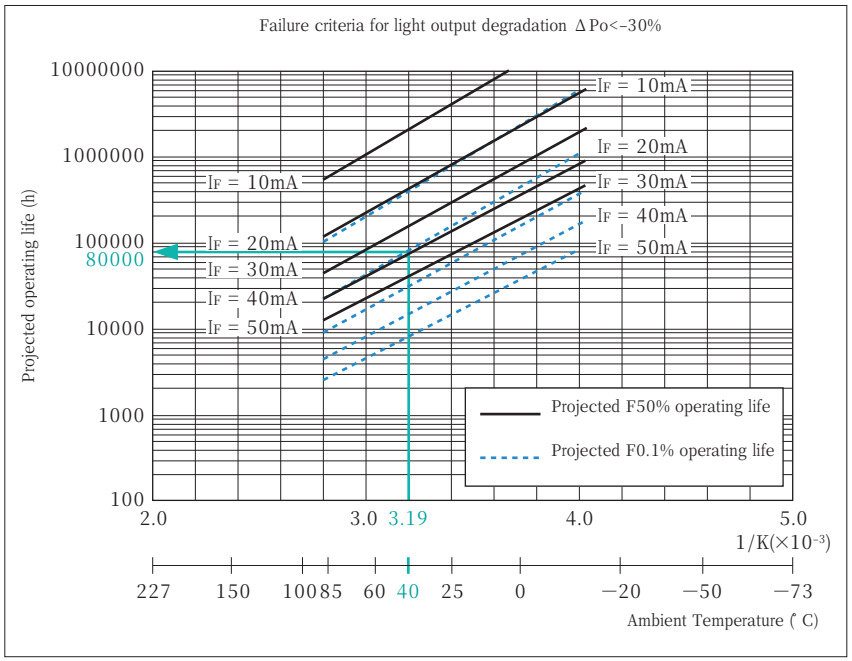
Toshiba is now preparing the light output degradation and operating life data for GaAlAs (MQW) LEDs.
These data are available for individual LEDs. Ask your local Toshiba sales representative.

Reading the Projected LED Operating Life Graph

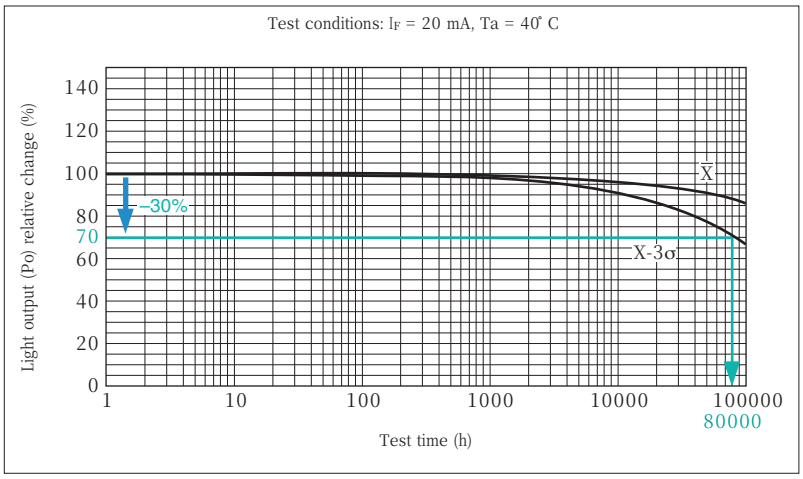
For example, let's calculate the operating life of the GaAs LED, based on the data shown on page 58.
Here is an example of how to read an operating life, assuming that the ambient temperature (Ta) is 40°C and that the failure criterion is a 30% decrease in light output.
Suppose that the initial LED current, I_F, is 20 mA. Since the horizontal axis of the failure criteria graph is the reciprocal of absolute temperature, it is necessary to convert the ambient temperature (Ta) to the reciprocal of absolute temperature (T):

$$T = \frac{1}{Ta + 273.15} = \frac{1}{40 + 273.15} \fallingdotseq 3.19 \times 10{-}3$$

The graph shows the projected lifetimes for F50% and F0.1% cumulative failure probabilities in solid and dashed lines respectively. Normally, it is recommended to use F0.1% lines. As X = 3.19, its intersection with the I_F = 20 mA line for F0.1% is approximately 80,000 hours. (This figure is for reference only.)

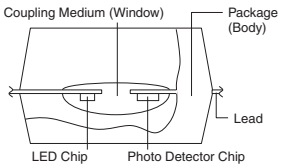
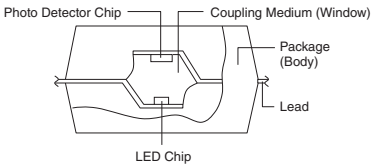


You can also estimate the projected operating life from the projected light output degradation data.



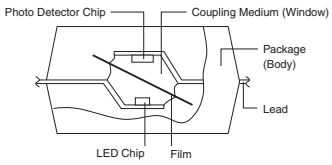
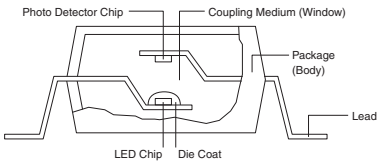
Safety Standard Approvals

Safety Standard Approvals for Photocouplers (DIN EN60747-5)

Mechanical Construction		Reflective Photocouplers in Single-Molded Packages			Transmissive Photocouplers in Single-Molded Packages				
Internal Construction									
Package		SOP4/SOP16		MFSO6	MFSOP6	SO8 (2ch)	2.54SOP 4/6/8	DIP	DIP (F type)
Construction Mechanical Ratings (min)	Isolation Creepage Path (mm)	4.0	5.0	4.0	4.0	4.2	4.0	6.4/7.0	8.0
	Isolation Clearance (mm)	4.0	5.0	4.0	4.0	4.2	4.0	6.4/7.0	8.0
	Isolation Thickness (mm)	0.4	0.4	0.4	—	—	—	(0.4)	(0.4)
	Internal Creepage Path (mm)	—	—	—	—	—	—	—	—
VDE/TÜV DIN EN 60747-5-5	Max Working Insulation Voltage (Viorm)	565 Vpk	707 Vpk	565 Vpk	565 Vpk	565 Vpk	565 Vpk	630 Vpk /890 Vpk	1140 Vpk
	Highest Allowable Overvoltage (Viotm)	4000 Vpk	6000 Vpk	6000 Vpk	4000 Vpk	4000 Vpk	2500 Vpk	4000 Vpk	6000 Vpk
Certified Devices	IC Output					**TLP2105** **TLP2108** **TLP2166A** **TLP2116** **TLP2118E** **TLP2168** **TLP2160**		**TLP350** **TLP351** **TLP559**	**TLP350F** **TLP351F**
	Transistor Output	**TLP280-4** **TLP281-4**			**TLP127**				
	Triac/Thyristor Output				**TLP160G** **TLP160J** **TLP161G** **TLP161J** **TLP168J**			**TLP560G** **TLP560J** **TLP561G** **TLP561J**	
	Photorelay/ Photovoltaic						**TLP176A** **TLP176D** **TLP176G** **TLP197G** **TLP206G**	**TLP227G** **TLP227G-2** **TLP597G**	

Toshiba offers a wide selection of photocouplers with a transistor output, IC output, thyristor output and triac output, as well as photorelays certified to UL (USA), c-UL (Canada), VDE (Germany), BSI (Britain), SEMKO (Sweden) and CQC (China).

The table above lists photocouplers and photorelays that have already been approved as of April 2015.
The information herein is subject to change. For the latest information, please contact your nearest Toshiba sales representative.

	Transmissive Photocouplers with an Insulating Film in Single-Molded packages					Transmissive Photocouplers in Double-Molded Packages						
												
	SO8 (1 ch)	**SDIP6**	**SDIP6** (F type)	**DIP**	**DIP** (F type)	**MFSOP6**	**SO4**	**SO6**	**SO6L**	**SO16**	**DIP**	**DIP** (F type)
	4.0	7.0	8.0	6.4/7.0	8.0	4.0	5.0	5.0	8.0	5.0	6.5/7.0	8.0
	4.0	7.0	8.0	6.4/7.0	8.0	4.0	5.0	5.0	8.0	5.0	6.5/7.0	8.0
	—	0.4	0.4	0.4/0.5	0.4/0.5	—	0.4	0.4	0.4	—	0.4/0.5	0.4/0.5
	—	—	—	—	—	—	—	—	—	—	0.4/0.5	4.0
	565 Vpk	890 Vpk	1140 Vpk	890 Vpk	1140 Vpk	565 Vpk	707 Vpk	707 Vpk	1140 Vpk /1230 Vpk	565 Vpk	890 Vpk /1130 Vpk	890 Vpk /1130 Vpk
	6000 Vpk	8000 Vpk	8000 Vpk	6000 Vpk /8000 Vpk	6000 Vpk /8000 Vpk	4000 Vpk /6000 Vpk	6000 Vpk	6000 Vpk	8000 Vpk	4000 Vpk	6000 Vpk /8000 Vpk	6000 Vpk /8000 Vpk
	TLP2403 **TLP2404** **TLP2405** **TLP2408** **TLP2409** **TLP2418** **TLP2451A** **TLP2466** **TLP2468**	**TLP700** **TLP700A** **TLP700H** **TLP701** **TLP701A** **TLP701H** **TLP705A** **TLP708** **TLP714** **TLP715** **TLP716** **TLP718** **TLP719** **TLP2766** **TLP2768**	**TLP700F** **TLP700AF** **TLP700HF** **TLP701F** **TLP701AF** **TLP701HF** **TLP705AF** **TLP708F** **TLP714F** **TLP715F** **TLP716F** **TLP718F** **TLP719F** **TLP2766F** **TLP2768F**	**TLP750** **TLP751** **TLP759** **TLP350H** **TLP351H** **TLP352** **TLP358** **TLP358H** **TLPN137** **TLP250H** **TLP351A** **TLP754** **TLP2662** **TLP2955** **TLP2958** **TLP2962**	**TLP750F** **TLP751F** **TLP759F** **TLP350HF** **TLP351HF** **TLP352F** **TLP358F** **TLP358HF** **TLP250HF** **TLP351AF** **TLP754F** **TLP2662F** **TLP2955F** **TLP2958F** **TLP2962F**	**TLP117** **TLP2066** **TLP2095** **TLP2098**		**TLP109** **TLP116A** **TLP104** **TLP118** **TLP151A** **TLP155** **TLP155E** **TLP2309** **TLP2345** **TLP2348** **TLP2355** **TLP2358** **TLP2362** **TLP2366** **TLP2368** **TLP152** **TLP2301** **TLP2303** **TLP2361** **TLP2391** **TLP2395** **TLP2398**	**TLP2703** **TLP2768A** **TLP5701** **TLP5702** **TLP5751** **TLP5752** **TLP5754**			
				TLP620 **TLP624** **TLP626** **TLP627** **TLP628** **TLP731** **TLP732**	**TLP620F**		**TLP290(SE** **TLP291(SE** **TLP292** **TLP293**	**TLP184(SE** **TLP185(SE** **TLP182** **TLP183** **TLP187** **TLP188**	**TLP385**	**TLP290-4** **TLP291-4** **TLP292-4** **TLP293-4**	**TLP733** **TLP734** **TLP785**	**TLP733F** **TLP734F** **TLP785F**
				TLP360J **TLP361J** **TLP363J** **TLP3022(S)** **TLP3023(S)** **TLP3042(S)** **TLP3043(S)** **TLP3052(S)** **TLP3062(S)** **TLP3063(S)** **TLP3064(S)** **TLP3082(S)** **TLP3762(S)** **TLP3782(S)** **TLP3783(S)** **TLP663J(S)** **TLP665G(S)** **TLP665J(S)** **TLP666G(S)** **TLP666L(S)** **TLP668J(S)** **TLP669L(S)**	**TLP360JF** **TLP361JF** **TLP363JF** **TLP3022F(S)** **TLP3023F(S)** **TLP3042F(S)** **TLP3043F(S)** **TLP3052F(S)** **TLP3062F(S)** **TLP3063F(S)** **TLP3064F(S)** **TLP3082F(S)** **TLP3762F(S)** **TLP3782F(S)** **TLP3783F(S)** **TLP663JF(S)** **TLP665GF(S)** **TLP665JF(S)** **TLP666GF(S)** **TLP666LF(S)** **TLP668JF(S)** **TLP669LF(S)**	**TLP165J** **TLP166J**		**TLP265J** **TLP266J** **TLP267J** **TLP268J**			**TLP762J** **TLP763J** **TLP748J**	**TLP762JF** **TLP763JF** **TLP748JF**
				TLP797GA **TLP797J**	**TLP797GAF** **TLP797JF**			**TLP175A** **TLP3905** **TLP3906**			**TLP220A** **TLP220D** **TLP220G** **TLP220GA** **TLP220J** **TLP221A** **TLP240A** **TLP240D** **TLP240G** **TLP240GA** **TLP240J** **TLP241A**	**TLP220AF** **TLP220DF** **TLP220GF** **TLP220GAF** **TLP220JF** **TLP221AF** **TLP240AF** **TLP240DF** **TLP240GF** **TLP240GAF** **TLP240JF** **TLP241AF**

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Photocouplers

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TLP2958	DIP8	IC	20
TLP2958F	DIP8	IC	11
TLP2958F	DIP8	IC	20
TLP2962	DIP8	IC	12
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TLP3022 (S)	5 pin DIP6 (cut)	Triac	26
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TLP3064F (S)	5 pin DIP6 (cut)	Triac	27
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TLP361J	DIP4	Triac	27
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TLP3782 (S)	5 pin DIP6	Triac	28
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TLP591B	5 pin DIP6 (cut)	Photovoltaic	30
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TLP665G (S)	5 pin DIP6 (cut)	Triac	28
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TLP665JF (S)	5 pin DIP6 (cut)	Triac	28
TLP665L	5 pin DIP6 (cut)	Triac	28
TLP666G (S)	5 pin DIP6 (cut)	Triac	28
TLP666GF (S)	5 pin DIP6 (cut)	Triac	28
TLP666J (S)	5 pin DIP6 (cut)	Triac	28
TLP666JF (S)	5 pin DIP6 (cut)	Triac	28
TLP666L (S)	5 pin DIP6 (cut)	Triac	28
TLP666LF (S)	5 pin DIP6 (cut)	Triac	28
TLP668J (S)	5 pin DIP6 (cut)	Triac	28
TLP668JF (S)	5 pin DIP6 (cut)	Triac	28
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TLP701AF	SDIP6	IC	18
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TLP715F	SDIP6	IC	10
TLP715F	SDIP6	IC	19
TLP716	SDIP6	IC	13
TLP716F	SDIP6	IC	13
TLP718	SDIP6	IC	10
TLP718	SDIP6	IC	19
TLP718F	SDIP6	IC	10
TLP718F	SDIP6	IC	19
TLP719	SDIP6	IC	9
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TLP751	DIP8	IC	9
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TLP754F	DIP8	IC	19
TLP759	DIP8	IC	9
TLP759 (IGM)	DIP8	IC	20
TLP759F	DIP8	IC	9
TLP759F (IGM)	DIP8	IC	20
TLP762J	5 pin DIP6	Triac	27
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TLP7830	SO8L		6
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Photorelays

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