

PRODUCT GUIDE

Photocouplers and Photorelays

s e m i c o n d u c t o r

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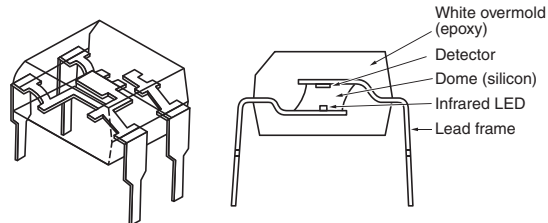
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Preface

As a type of isolator favored by manufacturers, photocouplers now serve as noise protectors in many electronic devices. TOSHIBA's photocouplers incorporate into a white mold package, a combination of either GaAs infrared LEDs or GaAlAs infrared LEDs and silicon photodetectors. GaAlAs LEDs are adopted in high-speed photo-IC types for their high speed and high light output. TOSHIBA's innovative white mold packaging also greatly contributes to high sensitivity, high CTR, and superb reliability.



Perspective view of the TLP521-1

Cross section of the TLP521-1

Extensive Line of Products

To meet the customers' various needs, we offer an extensive product portfolio shown below as well as general-purpose photocouplers.

1. Photo-IC couplers: High speed and advanced functions (highly-integrated detectors)
2. Zero-crossing phototriac couplers: Phototriac output devices with zero-crossing function
3. Photovoltaic couplers: MOSFET gate drive (high voltage output achieved using a photodiode array)
4. Photorelays (MOSFET output devices): AC-DC switches (MOSFET output)
Mechanical relay replacement

Safety Standard Approvals

UL approval under File No. E67349 has been obtained for most of our photocouplers. EN60747-5-2 approved photocouplers are also supplied along with a wide selection of output (transistor, thyristor, triac, IC output and photorelay). The designs of these devices meet other standards including IEC380/VDE0806, IEC60950/EN60950 and IEC60065/EN60065.

Small-Package Products

TOSHIBA offers a wide variety of small packaged photocouplers to meet requirements for size reduction and space savings in smaller and thinner end products. The devices include mini-flat packaged (MFSOP) products and half-pitch (1.27 mm) mini-flat SOP packaged products.

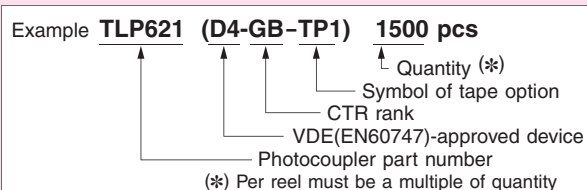
Overseas Manufactured Photocouplers

Part of the general-purpose photocouplers with transistor and triac outputs are manufactured by Toshiba Semiconductor Thailand Co., Ltd. This will help customers procure components locally for overseas assembly of end products.

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● Purchase order

Specify the part number, rank, tape, quantity and etc. as follows.



* For details, please refer to each page as follows.

Required Specification	page
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(2) ● Type of Leadforming for DIP ● Taping for SMD	P.42 P.46
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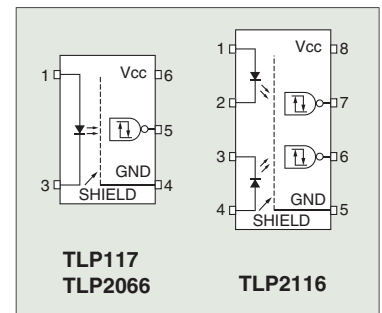
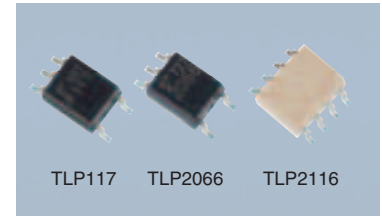
2 New Products

High-Speed Photo-IC Couplers

TLP117: 5 V, 50 Mbps/TLP2066: 3.3 V, 20 Mbps/TLP2116: 5 V, 20 Mbps (2-in-1)

Toshiba now offers three new photo-IC couplers: high-speed **TLP117**, low-voltage **TLP2066** and 2-in-1 **TLP2116**.

All these photo-IC couplers have a totem-pole output which makes bidirectional drive possible for both the sink and source currents. The maximum operating temperature (T_{opr}) is 100°C (except for the TLP117 which permits a T_{opr} of 105°C); this makes these photo-IC couplers suitable for a wide range of applications, including plasma displays, measuring instruments, control equipments, factory automation equipments and so on.



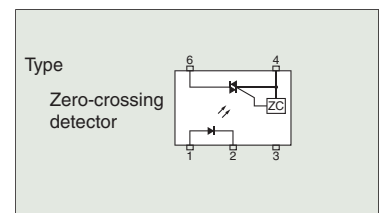
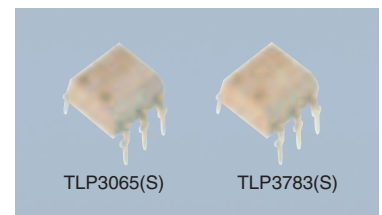
Characteristic	TLP117 (New)	TLP2066 (New)	TLP2116 (Under development)
Package	MFSOP6	MFSOP6	SO8
Propagation delay time (max), t_{PHL}/t_{PLH}	30 ns	60 ns	60 ns
Supply current (max), I_{CCL}/I_{CCH}	5 mA/5 mA	5 mA/5 mA	10 mA/10 mA
Supply voltage, V_{CC}	4.5 to 5.5 V	3.0 to 3.6 V	4.5 to 5.5 V
Operating temperature, T_{opr}	-40 to 105°C	-40 to 100°C	-40 to 100°C
Threshold input current high to low (max), I_{FHL}	5 mA	5 mA	5 mA
Common mode transient immunity (min) C_{ML}/C_{MH} ($T_a = 25^\circ\text{C}$)	± 10 kV/ms	± 15 kV/ms	± 10 kV/ms
Isolation voltage (min), BVs ($T_a = 25^\circ\text{C}$)	3.75 kVrms	3.75 kVrms	2.5 kVrms

High- V_{DRM} Phototriac Couplers TLP3082(S)/TLP3083(S)/TLP3782(S)/TLP3783(S) Low Trigger Current Phototriac Coupler TLP3065(S)

The new **TLP3082(S)/TLP3083(S)/TLP3782(S)/TLP3783(S)** feature a forward peak off-state voltage (V_{DRM}) of 800 V and a zero-crossing triac detector. The **TLP3782(S)/TLP3783(S)** offer an impulse withstand voltage (V_N) of 1500 V typical.

The new **TLP3065(S)** features very low trigger current (I_{FT}) of 2mA (Max).

In addition to the existing phototriacs in 4-pin and 6-pin DIPs, those new phototriac couplers are suitable for a wide range of applications such as office equipment, home appliances, triac drivers, solid-state relays and so on.



Parameter	TLP3065(S) (NEW)	TLP3762(S) (NEW)	TLP3763(S) (NEW)	TLP3082(S) (NEW)	TLP3083(S) (NEW)	TLP3782(S) (NEW)	TLP3783(S) (NEW)
Min. forward peak off-state voltage, V_{DRM} (V)	600			800			
Max. effective on-state current, Arms (IT)	0.1						
Min. isolation voltage, BVs (Vrms)	5000						
Typical impulse withstand voltage, V_N (V)	-	2000		-	-	1500	
Max. LED trigger current, I_{FT} (mA)	2	10	5	10	5	10	5

2 New Products

Low CR Photorelays for Testers and Measurement Instruments TLP32xx Series

The new **TLP32xx** Series photorelays exhibit lower output pin capacitance (C_{OFF}) and On-resistance (R_{ON}) than previous devices.

In addition, they feature CR values of 2.5 pF Ω , 5 pF Ω and 10 pF Ω , which are approximately equivalent to those of reed relays. These photorelays have been developed in response to requirements for high-speed operation, high reliability and smaller component size. Such characteristics are required for testers and measuring instruments used for testing semiconductor products (which by their nature are evolving at a rapid pace). Besides, the **TLP32xx** Series is housed in the industry's smallest package, the 4-pin SSOP, and can achieve high-density mounting, 50 devices/inch².

The new **TLP3217** and **TLP3220** feature high off-state voltages (V_{OFF}) of 80 V (min) and 100 V (min), respectively.



Part Number	Package	Off-State Voltage V_{OFF} (min)	On-State Current I_{ON} (max)	On-State Resistance R_{ON} (typ.)	Off-State Capacitance C_{OFF} (typ.)	Trigger Current I_{FT} (max)		
(New)TLP3220	SSOP4	100 V	80 mA	8 Ω	6 pF	5 mA		
(New)TLP3217		80 V	120 mA	7.5 Ω	5 pF			
TLP3212		60 V	400 mA	1 Ω	20 pF			
TLP3213		40 V		80 mA	25 Ω	0.6 pF	4 mA	
TLP3214				250 mA	2 Ω	5 pF		
TLP3215				300 mA	1 Ω	10 pF		
TLP3216				120 mA	10 Ω	1 pF		
TLP3240				120 mA	12 Ω	0.45 pF		
TLP3241		20 V		140 mA	7 Ω	0.7 pF	3 mA	
TLP3230				160 mA	5 Ω	1 pF		4 mA
TLP3231				450 mA	0.8 Ω	5 pF		
TLP3250				200 mA	3 Ω	0.8 pF	3 mA	

Photorelays for Testers, Measuring Instruments and Power Line Controls TLP3122/TLP3123

The new **TLP3122** and **TLP3123** can control high-load current with maximum On-state resistances of 0.70 Ω and 0.13 Ω respectively.

The **TLP3122** and **TLP3123** are a bi-directional switch, which can replace mechanical relays in many applications. And its high on-state current maximum rating is suitable to control a power line.



Part Number	Package	Operating Temperature Range	Off-State Voltage V_{OFF} (min)	On-State Current I_{ON} (max)	On-State Resistance R_{ON} (typ.)	Off-State Capacitance C_{OFF} (typ.)
(New)TLP3122	2.54SOP4	-20 to 85°C	60 V	1.0 A	250 m Ω	90 pF
(New)TLP3123		-40 to 85°C	40 V	1.0 A	100 m Ω	300 pF

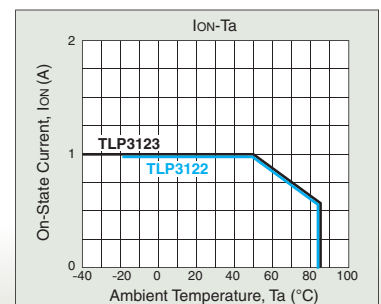
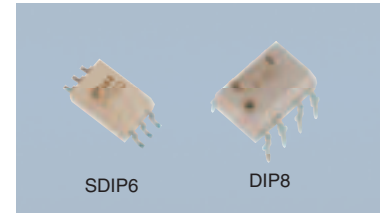


Photo-IC Couplers for IGBT/MOSFET Gate Drive TLP700, TLP701 and TLP705

Fabricated with the Bi-CMOS process, the **TLP700**, **TLP701**, **TLP705** achieve the best-in-class small power consumption and can directly drive a small- to mid-power IGBT or MOSFET. With greatly reduced supply current, these photocouplers generate less heat, allowing them to operate at up to 100°C (max).

Housed in a 6-pin SDIP, the **TLP700**, **TLP701** and **TLP705** provide reinforced isolation required by international safety standards and save board space by an approximately 50%, compared to the 8-pin DIP.



Characteristic		(New)TLP700	TLP701	TLP705
Output peak current (max)	I_{OPH}/I_{OPL} ($T_a = 25^\circ\text{C}$)	± 2.0 A	± 0.6 A	± 0.45 A
Supply voltage	V_{CC}	15 to 30 V	10 to 30 V	10 to 20 V
Supply current (max)	I_{CCH}/I_{CCL} ($T_a = -40$ to 100°C)	2 mA	2 mA	3 mA
Propagation delay time (max)	t_{PHL}/t_{PLH} ($T_a = -40$ to 100°C)	0.5 μs	0.7 μs	0.2 μs
Operating temperature	T_{opr} ($^\circ\text{C}$)	-40 to 100°C	-40 to 100°C	-40 to 100°C
Threshold input current	I_{FLH} (max) ($T_a = -40$ to 100°C)	5 mA	5 mA	8 mA
Common mode transient immunity (min)	CMH/CM_L ($T_a = 25^\circ\text{C}$)	± 10 kV/ μs	± 10 kV/ μs	± 10 kV/ μs
Isolation voltage (min)	BVs ($T_a = 25^\circ\text{C}$)	5000 Vrms		
Package		SDIP 6pin		
Pin Configuration				

Photo-IC Couplers for IPM Gate Drive TLP102, TLP106, TLP702 and TLP706

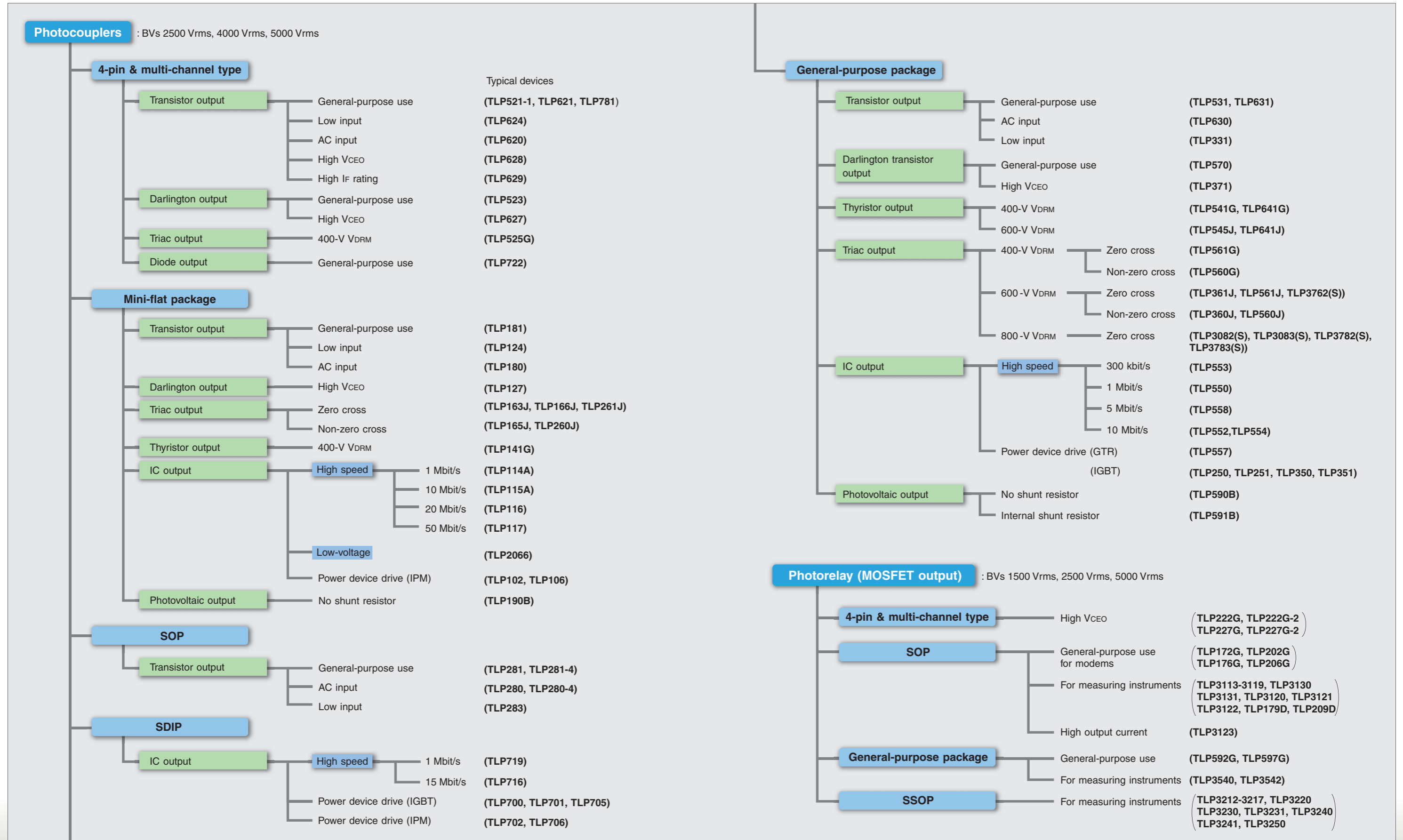
The new photo-IC couplers **TLP102**, **TLP106**, **TLP702** and **TLP706** are optimized for use in IPM drivers. The totem-pole output configuration makes bidirectional drive possible for the sink and source. Open-collector output type photo-IC couplers often require a pull-up resistor; however, employing the totem-pole configuration for the **TLP102**, **TLP106**, **TLP702** and **TLP706** eliminates the need for this resistor. Toshiba provides two logic output types: an inverter logic, the **TLP102** and **TLP702**, and a buffer logic, the **TLP106** and **TLP706**. You can select the photo-IC couplers best suited to your intelligent power modules. In addition, the shielded detectors enable high common-mode transient immunity, and excellent input and output noise characteristics.

Truth Table













Part Number	Logic	Input	Output
TLP102 TLP702	Inverter Logic	H	L
		L	H
TLP106 TLP706	Buffer Logic	H	H
		L	L

Part Number	TLP102/TLP106	TLP702/TLP706
Package	MFSOP6 	SDIP6
Threshold input current	3 mA (max)	5 mA (max)
Output current ($T_a \leq 25^\circ\text{C}$)	± 15 mA (max)	± 15 mA (max)
Propagation delay time	400 ns (max)	600 ns (max)
Operating temperature	-40 to 85°C	-40 to 100°C
Supply voltage	4.5 V to 20 V	4.5 V to 20 V
Isolation voltage	3750 Vrms (min)	5000 Vrms (min)

3 Photocoupler Product Tree



4 Recommended Products

Package		SSOP4	SOP4	SOP16	2.54SOP4	2.54SOP6	2.54SOP8	MFSOP6	SDIP6	DIP4	DIP6	DIP8	DIP16	Page for product features
Appearance														
Page for package dimensions		p. 40	p. 40	p. 40	p. 40	p. 40	p. 40	p. 39	p. 39	p. 36	p. 36, 37	p. 38	p. 39	
Output type	Transistor		TLP280 TLP281 TLP283	TLP280-4 TLP281-4				TLP180 TLP181 TLP124 TLP126 TLP130 TLP131 TLP137		TLP320 TLP421 TLP521-1 TLP620 TLP621 TLP624 TLP626 TLP628 TLP629 TLP781	TLP330 TLP331 TLP332 TLP531 TLP532 TLP630 TLP631 TLP632 TLP731 TLP732 TLP733 TLP734	TLP320-2 TLP521-2 TLP620-2 TLP621-2 TLP624-2 TLP626-2 TLP628-2 TLP629-2	TLP320-4 TLP521-4 TLP620-4 TLP621-4 TLP624-4 TLP626-4 TLP628-4 TLP629-4	p. 12 – 18
	Darlington transistor							TLP127		TLP523 TLP627	TLP371 TLP372 TLP373 TLP570 TLP571 TLP572	TLP523-2 TLP627-2	TLP523-4 TLP627-4	p. 18, 19
	Diode									TLP722				p. 19
	Thyristor							TLP141G			TLP541G TLP545J TLP641G TLP641J TLP741G TLP741J TLP747G TLP747J	TLP511GA TLP542G TLP543J TLP611J		p. 20
	Triac							TLP160G TLP160J TLP161G TLP161J TLP165J TLP166J TLP168J TLP163J TLP260J TLP261J		TLP525G TLP360J TLP361J TLP363J	TLP560G TLP560J TLP561G TLP561J TLP3022(S) TLP3023(S) TLP3042(S) TLP3043(S) TLP3052(S) TLP3062(S) TLP3063(S) TLP3064(S) TLP3082(S) TLP3083(S) TLP3782(S) TLP3783(S) TLP762J TLP763J	TLP525G-2	TLP525G-4	p. 21 – 23
	IC							TLP112 TLP112A TLP113 TLP114A TLP115 TLP115A TLP116 TLP117 TLP102 TLP106 TLP2066	TLP700 TLP701 TLP702 TLP705 TLP706 TLP716 TLP719		TLP512 TLP513	TLP250 TLP251 TLP351 TLP350 TLP550 TLP551 TLP552 TLP553 TLP554 TLP555 TLP557 TLP558 TLP559 TLP651 TLP750 TLP751 TLP759 TLP2200 TLP2530 TLP2531 TLP2601 TLP2630 TLP2631 6N136 6N137 6N139		p. 24 – 28
	Photorelay	TLP3212 TLP3213 TLP3214 TLP3215 TLP3216 TLP3217 TLP3230 TLP3231 TLP3240 TLP3241 TLP3250 TLP3220			TLP176A TLP172A TLP176D TLP172G TLP176G TLP179D TLP3113 TLP3114 TLP3115 TLP3116 TLP3118 TLP3119 TLP3130 TLP3122 TLP3131 TLP3123	TLP197A TLP197G TLP192A TLP192G TLP199D TLP3120	TLP200D TLP206A TLP206G TLP202A TLP202G TLP209D TLP3125	TLP3110 TLP3111		TLP224G TLP224GA TLP225A TLP227A TLP227G TLP227GA TLP222A TLP222G	TLP594G TLP594GA TLP592A TLP592G TLP597A TLP597G TLP597GA TLP598AA TLP598GA TLP797GA TLP797J TLP798GA TLP3542	TLP224G-2 TLP224GA-2 TLP227A-2 TLP227G-2 TLP227GA-2 TLP3540 TLP222A-2 TLP222G-2		p. 29 – 34
Photovoltaic	TLP3904 TLP3914 TLP3924							TLP190B TLP191B TLP3902			TLP590B TLP591B			p. 28

5 Selection Guide

1 Transistor Output

For Switching Supplies and DC-DC Converters

Part Number	Pin Configuration	Features	CTR (%)				V _{CEO}	BV _s	Safety Standards ⁽²⁾				
			Rank	Min	Max	@I _F , V _{CE}			UL	TÜV	VDE	BSI	IEC
TLP781 ⁽⁴⁾ TLP781F ⁽⁴⁾		4-pin DIP High isolation voltage UL-approved (double protection)	–	50	600	5 mA, 5 V	80 V	5000 Vrms	○	△ EN 60747	○ EN 60747	○ EN 60065 EN 60950	△ 60065 60950
			Y	50	150								
			GR	100	300								
			BL	200	600								
			GB	100	600								
			YH	75	150								
			GRL	100	200								
			GRH	150	300								
			BLL	200	400								
TLP181		Mini-flat 6-pin MFSOP General-purpose High CTR SEMKO-approved	–	50	600	5 mA, 5 V	80 V	3750 Vrms	○	△ ⁽¹⁾	○ ⁽¹⁾	○ EN 60065 EN 60950	△ 60065 60950
			Y	50	150								
			GR	100	300								
			BL	200	600								
			GB	100	600								
			YH	75	150								
			GRL	100	200								
			GRH	150	300								
			BLL	200	400								
TLP281		4-pin SOP Lead pitch = 1.27 mm General-purpose SEMKO-approved	–	50	600	5 mA, 5 V	80 V	2500 Vrms	○	○ ⁽¹⁾	○ ⁽¹⁾	○ EN 60065 EN 60950	△ 60065 60950
			Y	50	150								
			GR	100	300								
			BL	200	600								
			GB	100	600								
			YH	75	150								
			GRL	100	200								
			GRH	150	300								
			BLL	200	400								
TLP283		4-pin SOP Lead pitch = 1.27 mm Low input drive current High-speed switching	–	100	400	1 mA, 5 V	100 V	2500 Vrms	○				

For Home Appliances (HAs)

Part Number	Pin Configuration	Features	CTR (%)				V _{CEO}	BV _s	Safety Standards ⁽²⁾				
			Rank	Min	Max	@I _F , V _{CE}			UL	TÜV	VDE	BSI	IEC
TLP620 ⁽³⁾ TLP620F ⁽³⁾		4-pin DIP AC input SEMKO-approved	–	50	600	±5 mA, 5 V	55 V	5000 Vrms	○	△ EN 60747	○ EN 60747	○ EN 60065 EN 60950	△ 60065 60950
			Y	50	150								
			GR	100	300								
			BL	200	600								
			GB	100	600								
TLP180 ⁽³⁾		Mini-flat 6-pin MFSOP AC input SEMKO-approved	–	50	600	±5 mA, 5 V	80 V	3750 Vrms	○	○ ⁽¹⁾	△ ⁽¹⁾	○ EN 60065 EN 60950	△ 60065 60950
			Y	50	150								
			GR	100	300								
			BL	200	600								
			GB	100	600								
TLP280 ⁽³⁾		4-pin SOP Lead pitch = 1.27 mm AC input SEMKO-approved	–	50	600	±5 mA, 5 V	80 V	2500 Vrms	○	○ ⁽¹⁾	○ ⁽¹⁾	○ EN 60065 EN 60950	△ 60065 60950
			Y	50	150								
			GR	100	300								
			BL	200	600								
			GB	100	600								

Note 1: The EN60747-5-2 safety standards for compact package is different from that for standard DIP packages.

Since mini-flat package is a compact package, please contact your nearest Toshiba sales representative for more details.

Note 2: Legend in the Safety Standard column:

○: Approved ⊙: SELV-approved △: Design which meets safety standard; approval pending (as of December 2007)

TÜV and VDE: EN60747-5-2 approved with option V4 or D4.

Note 3: The products with the ranks Y and BL are limited in production. For details, please contact your nearest Toshiba sales representative.

Note 4: For details of the TLP781 and TLP781F, please contact your nearest Toshiba sales representative.

For Programmable Logic Controllers (PLCs)

Part Number	Pin Configuration	Features	CTR (%)				V _{CEO}	BV _s	Safety Standards ⁽²⁾				
			Rank	Min	Max	@ I _F , V _{CE}			UL	TÜV	VDE	BSI	IEC
TLP280-4		16-pin SOP 4-channel version of the TLP280 Lead pitch = 1.27 mm AC input SEMKO-approved	-	50	600	±5 mA, 5 V	80 V	2500 V _{rms}	○	△ ⁽¹⁾	○ ⁽¹⁾	◎ EN 60065 EN 60950	△ 60065 60950
			GB	100									
TLP281-4		16-pin SOP 4-channel version of the TLP281 Lead pitch = 1.27 mm SEMKO-approved	-	50	600	5 mA, 5 V	80 V	2500 V _{rms}	○	△ ⁽¹⁾	○ ⁽¹⁾	◎ EN 60065 EN 60950	△ 60065 60950
			GB	100									

For Telecommunications

Part Number	Pin Configuration	Features	CTR (%)				V _{CEO}	BV _s	Safety Standards ⁽²⁾				
			Rank	Min	Max	@ I _F , V _{CE}			UL	TÜV	VDE	BSI	IEC
TLP629		4-pin DIP High input current I _F = 150 mA DC input	-	20	80	100 mA, 1 V	55 V	5000 V _{rms}	○	△ EN 60747	△ EN 60747	△ EN 60065 EN 60950	△ 60065 60950
TLP320		4-pin DIP High input current AC input I _F = 150 mA	-	20	80	±100 mA, 1 V	55 V	5000 V _{rms}	○			◎ EN 60065 EN 60950	△ 60065 60950
TLP330		6-pin DIP High input current AC input I _F = 150 mA	-	20	80	±100 mA, 1 V	55 V	5000 V _{rms}	○				
TLP628		4-pin DIP High V _{CEO} V _{CEO} = 350 V	-	50	600	5 mA, 5 V	350 V	5000 V _{rms}	○	△ EN 60747	△ EN 60747	△ EN 60065 EN 60950	△ 60065 60950
			GB	100									

Note 1: The EN60747-5-2 safety standards for compact package is different from that for standard DIP packages.

Since mini-flat package is a compact package, please contact your nearest Toshiba sales representative for more details.

Note 2: Legend in the Safety Standard column:

○: Approved ◎: SELV-approved △: Design which meets safety standard; approval pending (as of December 2007)

TÜV and VDE: EN60747-5-2 approved with option V4 or D4.

5 Selection Guide

Low Input Type

Part Number	Pin Configuration	Features	CTR (%)				V _{CEO}	BV _s	Safety Standards ⁽²⁾				
			Rank	Min	Max	@ I _F , V _{CE}			UL	TÜV	VDE	BSI	IEC
TLP124		Mini-flat 6-pin MFSOP Low input drive current	-	100	1200	1 mA, 0.5 V	80 V	3750 Vrms	○				
			BV	200									
TLP126		Mini-flat 6-pin MFSOP AC input Low input drive current	-	100	1200	± 1 mA, 0.5 V							
TLP624		4-pin DIP Low input drive current BSI-approved	-	100	1200	1 mA, 0.5 V	55 V	5000 Vrms	○	△ EN 60747	△ EN 60747	◎ EN 60065 EN 60950	△ 60065 60950
			BV	200									
TLP626		4-pin DIP Low input drive current AC input BSI-approved	-	100	1200	± 1 mA, 0.5 V							
			BV	200									
TLP137		Mini-flat 6-pin MFSOP Low input drive current Internal base connection	-	100	1200	1 mA, 0.5 V	80 V	3750 Vrms	○				
			BV	200									
TLP331		6-pin DIP Low input drive current Internal base connection	-	100	1200	1 mA, 0.5 V	55 V	5000 Vrms	○				
			BV	200									
TLP332		6-pin DIP Low input drive current No internal base connection	-	100	1200	1 mA, 0.5 V							
			BV	200									

Note 2: Legend in the Safety Standard column:

○: Approved ◎: SELV-approved △: Design which meets safety standard; approval pending (as of December 2007)

TÜV and VDE: EN60747-5-2 approved with option V4 or D4.

1-Channel Type (other than those above)

Part Number	Pin Configuration	Features	CTR (%)				V _{CEO}	BV _s	Safety Standards ⁽²⁾				
			Rank	Min	Max	@ I _F , V _{CE}			UL	TÜV	VDE	BSI	IEC
TLP521-1		4-pin DIP General-purpose	—	50	600	5 mA, 5 V	55 V	2500 Vrms	○				
			Y	50	150								
			GR	100	300								
			BL	200	600								
			GB	100	600								
			YH	75	150								
			GRL	100	200								
			GRH	150	300								
BLL	200	400											
TLP621 TLP621F		4-pin DIP High isolation voltage UL-approved (double protection) SEMKO-approved	—	50	600	5 mA, 5 V	55 V	5000 Vrms	○	△ EN 60747	○ EN 60747	○ EN 60065 EN 60950	△ 60065 60950
			Y	50	150								
			GR	100	300								
			BL	200	600								
			GB	100	600								
			YH	75	150								
			GRL	100	200								
			GRH	150	300								
BLL	200	400											
TLP130 ⁽³⁾		Mini-flat 6-pin MFSOP AC input Internal base connection	—	50	600	±5 mA, 5 V	80 V	3750 Vrms	○				
			Y	50	150								
			GR	100	300								
			BL	200	600								
TLP131 ⁽³⁾		Mini-flat 6-pin MFSOP General-purpose Internal base connection	—	50	600	5 mA, 5 V	80 V	3750 Vrms	○				
			Y	50	150								
			GR	100	300								
			BL	200	600								
TLP531 ⁽³⁾		6-pin DIP General-purpose Internal base connection	—	50	600	5 mA, 5 V	55 V	2500 Vrms	○				
			Y	50	150								
			GR	100	300								
			BL	200	600								
TLP532 ⁽³⁾		6-pin DIP General-purpose High EMI immunity No internal base connection	—	50	600	5 mA, 5 V	55 V	2500 Vrms	○				
			Y	50	150								
			GR	100	300								
			BL	200	600								
TLP630 ⁽³⁾		6-pin DIP AC input High isolation voltage Internal base connection	—	50	600	±5 mA, 5 V	55 V	5000 Vrms	○				
			Y	50	150								
			GR	100	300								
			BL	200	600								
TLP631 ⁽³⁾		6-pin DIP General-purpose Internal base connection	—	50	600	5 mA, 5 V	55 V	5000 Vrms	○				
			Y	50	150								
			GR	100	300								
			BL	200	600								
TLP632 ⁽³⁾		6-pin DIP General-purpose High EMI immunity No internal base connection	—	50	600	5 mA, 5 V	55 V	5000 Vrms	○				
			Y	50	150								
			GR	100	300								
			BL	200	600								

Note 2: Legend in the Safety Standard column:

○: Approved ◎: SELV-approved △: Design which meets safety standard; approval pending (as of December 2007)

TÜV and VDE: EN60747-5-2 approved with option V4 or D4.

Note 3: The products with the ranks Y and BL are limited in production. For details, please contact your nearest Toshiba sales representative.

5 Selection Guide

1-Channel Type (other than those above) (continued)

Part Number	Pin Configuration	Features	CTR (%)				V _{CEO}	BV _s	Safety Standards ⁽²⁾				
			Rank	Min	Max	@ I _F , V _{CE}			UL	TÜV	VDE	BSI	IEC
TLP731 ⁽³⁾		6-pin DIP SEMKO-approved Internal base connection	–	50	600	5 mA, 5 V	55 V	4000 V _{rms}	○	△ EN 60747	○ EN 60747	○ EN 60065 EN 60950	△ 60065 60950
			Y	50	150								
			GR	100	300								
			BL	200	600								
TLP732 ⁽³⁾		6-pin DIP SEMKO-approved No internal base connection	–	50	600	5 mA, 5 V	55 V	4000 V _{rms}	○	△ EN 60747	○ EN 60747	○ EN 60065 EN 60950	△ 60065 60950
			Y	50	150								
			GR	100	300								
			BL	200	600								
TLP733 ⁽³⁾ TLP733F ⁽³⁾		6-pin DIP SEMKO-approved Internal base connection	–	50	600	5 mA, 5 V	55 V	4000 V _{rms}	○	△ EN 60747	○ EN 60747	○ EN 60065 EN 60950	△ 60065 60950
			Y	50	150								
			GR	100	300								
			BL	200	600								
TLP734 ⁽³⁾ TLP734F ⁽³⁾		6-pin DIP SEMKO-approved No internal base connection	–	50	600	5 mA, 5 V	55 V	4000 V _{rms}	○	△ EN 60747	○ EN 60747	○ EN 60065 EN 60950	△ 60065 60950
			Y	50	150								
			GR	100	300								
			BL	200	600								
CNY17-2		Direct replacement for CNY17 Series	–	63	125	10 mA, 5 V	70 V	2500 V _{rms}	△				
CNY17-3			–	100	200								
CNY17-4			–	160	320								

2-Channel Type

Part Number	Pin Configuration	Features	CTR (%)				V _{CEO}	BV _s	Safety Standards ⁽²⁾				
			Rank	Min	Max	@ I _F , V _{CE}			UL	TÜV	VDE	BSI	IEC
TLP504A		8-pin DIP General-purpose	–	50	600	5 mA, 5 V	55 V	2500 V _{rms}	○				
TLP521-2 ⁽³⁾		8-pin DIP Dual-channel version of the TLP521-1	–	50	600	5 mA, 5 V	55 V	2500 V _{rms}	○				
			Y	50	150								
			GR	100	300								
			BL	200	600								
TLP621-2 ⁽³⁾		8-pin DIP Dual-channel version of the TLP621 SEMKO-approved	–	50	600	5 mA, 5 V	55 V	5000 V _{rms}	○	△ EN 60747	○ EN 60747	○ EN 60065 EN 60950	△ 60065 60950
			Y	50	150								
			GR	100	300								
			BL	200	600								
TLP624-2		8-pin DIP Dual-channel version of the TLP624	–	100	1200	1 mA, 5 V	55 V	5000 V _{rms}	○	△ EN 60747	△ EN 60747	○ EN 60065 EN 60950	△ 60065 60950
			BV	200									
TLP628-2		8-pin DIP Dual-channel version of the TLP628	–	50	600	5 mA, 5 V	350 V	5000 V _{rms}	○	△ EN 60747	△ EN 60747	△ EN 60065 EN 60950	△ 60065 60950
			GB	100									
TLP629-2		8-pin DIP Dual-channel version of the TLP629	–	20	80	100 mA, 1 V	55 V	5000 V _{rms}	○	△ EN 60747	△ EN 60747	△ EN 60065 EN 60950	△ 60065 60950

Note 2: Legend in the Safety Standard column:

○: Approved ◎: SELV-approved △: Design which meets safety standard; approval pending (as of December 2007)

TÜV and VDE: EN60747-5-2 approved with option V4 or D4.

Note 3: The products with the ranks Y and BL are limited in production. For details, please contact your nearest Toshiba sales representative.

2-Channel Type with AC Input

Part Number	Pin Configuration	Features	CTR (%)				V _{CEO}	BV _s	Safety Standards ⁽²⁾				
			Rank	Min	Max	@ I _F , V _{CE}			UL	TÜV	VDE	BSI	IEC
TLP620-2		8-pin DIP Dual-channel version of the TLP620 SEMKO-approved	-	50	600	±5 mA, 5 V	55 V	5000 Vrms	○	△ EN 60747	⊙ EN 60747	⊙ EN 60065 EN 60950	△ 60065 60950
			GB	100									
TLP626-2		8-pin DIP Dual-channel version of the TLP626	-	100	1200	±1 mA, 5 V	55 V	5000 Vrms	○	△ EN 60747	△ EN 60747	⊙ EN 60065 EN 60950	△ 60065 60950
			BV	200									
TLP320-2		8-pin DIP Dual-channel version of the TLP320	-	20	80	±100 mA, 1 V	55 V	5000 Vrms	○			⊙ EN 60065 EN 60950	△ 60065 60950

4-Channel Type

Part Number	Pin Configuration	Features	CTR (%)				V _{CEO}	BV _s	Safety Standards ⁽²⁾				
			Rank	Rank	Rank	@ I _F , V _{CE}			UL	TÜV	VDE	BSI	IEC
TLP521-4		16-pin DIP 4-channel version of the TLP521-1	-	50	600	5 mA, 5 V	55 V	2500 Vrms	○				
			GB	100									
TLP621-4		16-pin DIP 4-channel version of the TLP621	-	50	600	5 mA, 5 V	55 V	5000 Vrms	○	△ EN 60747	⊙ EN 60747	⊙ EN 60065 EN 60950	△ 60065 60950
			GB	100									
TLP624-4		16-pin DIP 4-channel version of the TLP624	-	100	1200	1 mA, 5 V	55 V	5000 Vrms	○	△ EN 60747	△ EN 60747	⊙ EN 60065 EN 60950	△ 60065 60950
			BV	200									
TLP628-4		16-pin DIP 4-channel version of the TLP628	-	50	600	5 mA, 5 V	350 V	5000 Vrms	○	△ EN 60747	△ EN 60747	△ EN 60065 EN 60950	△ 60065 60950
			GB	100									
TLP629-4		16-pin DIP 4-channel version of the TLP629	-	20	80	100 mA, 1 V	55 V	5000 Vrms	○	△ EN 60747	△ EN 60747	△ EN 60065 EN 60950	△ 60065 60950

Note 2: Legend in the Safety Standard column:

○: Approved ⊙: SELV-approved △: Design which meets safety standard; approval pending (as of December 2007)

TÜV and VDE: EN60747-5-2 approved with option V4 or D4.

5 Selection Guide

4-Channel Type with AC Input

Part Number	Pin Configuration	Features	CTR (%)				V _{CEO}	BV _s	Safety Standards ⁽²⁾				
			Rank	Min	Max	@I _F , V _{CE}			UL	TÜV	VDE	BSI	IEC
TLP620-4		16-pin DIP 4-channel version of the TLP620	-	50	600	±5 mA, 5 V	55 V	5000 Vrms	○	△ EN 60747	○ EN 60747	○ EN 60065 EN 60950	△ 60065 60950
			GB	100									
TLP626-4		16-pin DIP 4-channel version of the TLP626	-	100	1200	±1 mA, 5 V	55 V	5000 Vrms	○	△ EN 60747	△ EN 60747	○ EN 60065 EN 60950	△ 60065 60950
			BV	200									
TLP320-4		16-pin DIP 4-channel version of the TLP320	-	20	80	±100 mA, 1 V	55 V	5000 Vrms	○			○ EN 60065 EN 60950	△ 60065 60950

2 Darlington Transistor Output

4-Pin Package Type

Part Number	Pin Configuration	Features	CTR (%)		V _{CE} (sat) (V)		V _{CEO}	BV _s	Safety Standards ⁽²⁾				
			Min	@I _F , V _{CE}	Max	@I _C , I _F			UL	TÜV	VDE	BSI	IEC
TLP127		Mini-flat 6-pin MFSOP High V _{CEO}	1000	1 mA, 1 V	1.2	100 mA, 10 mA	300 V	2500 Vrms	○	△ ⁽¹⁾	△ ⁽¹⁾	○ EN 60065 EN 60950	△ 60065 60950
TLP627		4-pin DIP High V _{CEO} SEMKO-approved	1000	1 mA, 1 V	1.2	100 mA, 10 mA	300 V	5000 Vrms	○	△ EN 60747	○ EN 60747	○ EN 60065 EN 60950	△ 60065 60950
TLP523		4-pin DIP General-purpose	500	1 mA, 1 V	1	50 mA, 10 mA	55 V	2500 Vrms	○				

6-Pin Package Type

Part Number	Pin Configuration	Features	CTR (%)		V _{CE} (sat) (V)		V _{CEO}	BV _s	Safety Standards ⁽²⁾				
			Min	@I _F , V _{CE}	Max	@I _C , I _F			UL	TÜV	VDE	BSI	IEC
TLP371		6-pin DIP High V _{CEO} SEMKO-approved Internal base connection	1000	1 mA, 1 V	1.2	100 mA, 10 mA	300 V	5000 Vrms	○				△ 60065 60950
TLP372		6-pin DIP High V _{CEO} No internal base connection SEMKO-approved											
TLP373		6-pin DIP High V _{CEO} Large emitter-collector distance SEMKO-approved											

Note 1: The EN60747-5-2 safety standards for compact package is different from that for standard DIP packages.

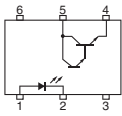
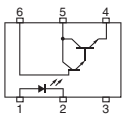
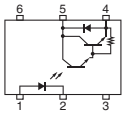
Since mini-flat package is a compact package, please contact your nearest Toshiba sales representative for more details.

Note 2: Legend in the Safety Standard column:

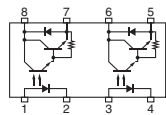
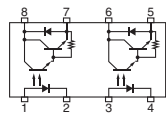
○: Approved ◎: SELV-approved △: Design which meets safety standard; approval pending (as of December 2007)

TÜV and VDE: EN60747-5-2 approved with option V4 or D4.

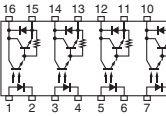
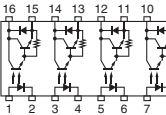
6-Pin Package Type (Continued)

Part Number	Pin Configuration	Features	CTR (%)		VCE (sat) (V)		V _{CEO}	BV _s	Safety Standards ⁽²⁾				
			Min	@I _F , V _{CE}	Max	@I _c , I _F			UL	TÜV	VDE	BSI	IEC
TLP570		6-pin DIP General-purpose High EMI immunity	1000	1 mA, 1 V	1.2	100 mA, 10 mA	35 V	2500 Vrms	○				
TLP571		6-pin DIP General-purpose Internal base connection											
TLP572		6-pin DIP General-purpose Built-in RBE	1000	1 mA, 1.2 V	1.2	100 mA, 10 mA	55V	2500 Vrms	○				

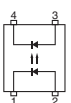
2-Channel Type

Part Number	Pin Configuration	Features	CTR (%)		VCE (sat) (V)		V _{CEO}	BV _s	Safety Standards ⁽²⁾				
			Min	@I _F , V _{CE}	Max	@I _c , I _F			UL	TÜV	VDE	BSI	IEC
TLP523-2		8-pin DIP Dual-channel version of the TLP523	500	1 mA, 1 V	1	50 mA, 10 mA	55 V	2500 Vrms	○				
TLP627-2		8-pin DIP Dual-channel version of the TLP627 SEMKO-approved	1000	1 mA, 1 V	1.2	100 mA, 10 mA	300 V	5000 Vrms	○	△ EN 60747	○ EN 60747	○ EN 60065 EN 60950	△ 60065 60950

4-Channel Type

Part Number	Pin Configuration	Features	CTR (%)		VCE (sat) (V)		V _{CEO}	BV _s	Safety Standards ⁽²⁾				
			Min	@I _F , V _{CE}	Max	@I _c , I _F			UL	TÜV	VDE	BSI	IEC
TLP523-4		16-pin DIP 4-channel version of the TLP523	500	1 mA, 1 V	1.0	50 mA, 10 mA	55 V	2500 Vrms	○				
TLP627-4		16-pin DIP 4-channel version of the TLP627	1000	1 mA, 1 V	1.2	100 mA, 10 mA	300 V	5000 Vrms	○	△ EN 60747	○ EN 60747	○ EN 60065 EN 60950	△ 60065 60950

3 Diode Output

Part Number	Pin Configuration	Pin Configuration	CTR (%)		I _{LEAK} (nA)		V _{KAO}	BV _s	Safety Standards ⁽²⁾				
			Min	@I _F	Max	@V _{KA}			UL	TÜV	VDE	BSI	IEC
TLP722		4-pin DIP General-purpose High-speed response SEMKO-approved	0.1	10 mA	50	10 V	30 V	4000 Vrms	○	○ EN 60747	△ EN 60747	△ EN 60065 EN 60950	△ 60065 60950

Note 2: Legend in the Safety Standard column:

○: Approved ◎: SELV-approved △: Design which meets safety standard; approval pending (as of December 2007)

TÜV and VDE: EN60747-5-2 approved with option V4 or D4.

5 Selection Guide

4 Thyristor Output

AC 100 to 120 V Line Type

Part Number	Pin Configuration	Features	I _{FT}		V _{TM}		V _{DRM}	BV _s	Safety Standards ⁽²⁾				
			Max	Max	@ I _{TM}	UL			TÜV	VDE	BSI	IEC	
TLP141G		Mini-flat 6-pin MFSOP General-purpose	10 mA	1.3 V	100 mA	400 V	2500 V _{rms}	○					
TLP541G		6-pin DIP General-purpose Low I _{FT}	7 mA	1.3 V	100 mA	400 V	2500 V _{rms}	○					
TLP641G		6-pin DIP General-purpose High isolation voltage	7 mA	1.3 V	100 mA	400 V	5000 V _{rms}	○					
TLP741G		6-pin DIP SEMKO-approved	10 mA	1.3 V	100 mA	400 V	4000 V _{rms}	○	△ EN 60747	⊙ EN 60747	⊙ EN 60065 EN 60950	△ 60065 60950	
TLP747G TLP747GF		6-pin DIP SEMKO-approved	15 mA	1.3 V	100 mA	400 V	4000 V _{rms}	○	△ EN 60747	⊙ EN 60747	⊙ EN 60065 EN 60950	△ 60065 60950	
TLP542G		8-pin DIP Large anode-cathode distance (SCR)	7 mA	1.3 V	100 mA	400 V	2500 V _{rms}	○					
TLP511GA		8-pin DIP Bidirectional thyristor pair Low trigger current	7 mA	1.3 V	100 mA	400 V		○					

AC 200 to 240 V Line Type

Part Number	Pin Configuration	Features	I _{FT}		V _{TM}		V _{DRM}	BV _s	Safety Standards ⁽²⁾				
			Max	Max	@ I _{TM}	UL			TÜV	VDE	BSI	IEC	
TLP545J		6-pin DIP High V _{DRM}	10 mA	1.3 V	100 mA	600 V	2500 V _{rms}	○					
TLP641J		6-pin DIP High V _{DRM} High isolation voltage	10 mA	1.3 V	100 mA	600 V	5000 V _{rms}	○					
TLP741J		6-pin DIP SEMKO-approved	10 mA	1.3 V	100 mA	600 V	4000 V _{rms}	○	△ EN 60747	⊙ EN 60747	⊙ EN 60065 EN 60950	△ 60065 60950	
TLP747J TLP747JF		6-pin DIP SEMKO-approved	15 mA	1.3 V	100 mA	600 V	4000 V _{rms}	○	△ EN 60747	⊙ EN 60747	⊙ EN 60065 EN 60950	△ 60065 60950	
TLP543J		8-pin DIP Large anode-cathode distance (SCR)	10 mA	1.3 V	100 mA	600 V	2500 V _{rms}	○					
TLP611J		8-pin DIP Bidirectional thyristor pair High isolation voltage	10 mA	1.3 V	100 mA	600 V	5000 V _{rms}	○					

Note 2: Legend in the Safety Standard column:

○: Approved ⊙: SELV-approved △: Design which meets safety standard; approval pending (as of December 2007)

TÜV and VDE: EN60747-5-2 approved with option V4 or D4.

5 Triac Output

For Solid State Relays (SSRs)

Part Number	Pin Configuration	Features	I _{FT}		V _{TM}		V _{DRM}	BV _s	Safety Standards ⁽²⁾													
			Rank	Max	Max	@I _{TM}			UL	TÜV	VDE	BSI	IEC									
TLP160G		Mini-flat 6-pin MFSOP Non-zero cross	—	10 mA	2.8 V	70 mA	400 V	2500 Vrms	○	△ ⁽¹⁾	○ ⁽¹⁾											
			IFT7	7 mA																		
			IFT5	5 mA																		
TLP161G		Mini-flat 6-pin MFSOP Zero cross	—	10 mA	2.8 V	70 mA	400 V	2500 Vrms	○	△ ⁽¹⁾	○ ⁽¹⁾											
			IFT7	7 mA																		
			IFT5	5 mA																		
TLP160J TLP165J		Mini-flat 6-pin MFSOP Non-zero cross	—	10 mA	2.8 V	70 mA	600 V	2500 Vrms	○	△ ⁽¹⁾	○ ⁽¹⁾											
			IFT7	7 mA																		
TLP161J TLP166J		Mini-flat 6-pin MFSOP Zero cross	—	10 mA										2.8 V	70 mA	600 V	2500 Vrms	○	△ ⁽¹⁾	○ ⁽¹⁾		
			IFT7	7 mA																		
TLP168J		Mini-flat 6-pin MFSOP Zero cross Low IFT	—	3 mA	2.8 V	70 mA	600 V	2500 Vrms	○	△ ⁽¹⁾	○ ⁽¹⁾											
TLP163J		Mini-flat 6-pin MFSOP Zero cross High impulse noise immunity V _N =2000 V (typ.)	—	10 mA										2.8 V	100 mA	600 V	2500 Vrms	○	△ ⁽¹⁾	△ ⁽¹⁾		
			IFT7	7 mA																		
TLP260J		Mini-flat 6-pin MFSOP Non-zero cross	—	10 mA	2.8 V	70 mA	600 V	3000 Vrms	○	△ ⁽¹⁾	○ ⁽¹⁾											
TLP261J		Mini-flat 6-pin MFSOP Zero cross	—	10 mA																		

For Office Automation (OA) Equipment

Part Number	Pin Configuration	Features	I _{FT}		V _{TM}		V _{DRM}	BV _s	Safety Standards ⁽²⁾				
			Rank	Max	Max	@I _{TM}			UL	TÜV	VDE	BSI	IEC
TLP360J TLP360JF		4-pin DIP Non-zero cross	—	10 mA	2.8 V	70 mA	600 V	5000 Vrms	○	◎ EN 60747	△ EN 60747		
			IFT7	7 mA									
TLP361J TLP361JF		4-pin DIP Zero cross	—	10 mA	2.8 V	70 mA	600 V	5000 Vrms	○	◎ EN 60747	△ EN 60747		
			IFT7	7 mA									
TLP363J TLP363JF		4-pin DIP Zero cross High impulse noise immunity V _N = 2000 V (typ.)	—	10 mA	2.8 V	70 mA	600 V	5000 Vrms	○	◎ EN 60747	△ EN 60747		
			IFT7	7 mA									
TLP368J		4-pin DIP Zero cross Low trigger current	—	2 mA	3 V	100 mA	600 V	5000 Vrms	△	△ EN 60747	△ EN 60747		

Note 1: The EN60747-5-2 safety standards for compact package is different from that for standard DIP packages.

Since mini-flat package is a compact package, please contact your nearest Toshiba sales representative for more details.

Note 2: Legend in the Safety Standard column:

○: Approved ◎: SELV-approved △: Design which meets safety standard; approval pending (as of December 2007)

TÜV and VDE: EN60747-5-2 approved with option V4 or D4.

5 Selection Guide

AC 100 to 120 V Line Type

Part Number	Pin Configuration	Features	I _{FT}		V _{TM}		V _{DRM}	BV _s	Safety Standards ⁽²⁾						
			Rank	Max	Max	@ I _{TM}			UL	TÜV	VDE	BSI	IEC		
TLP525G		4-pin DIP	—	10 mA	3 V	100 mA	400 V	2500 Vrms	○						
TLP560G		6-pin DIP General-purpose Non-zero cross	—	10 mA	3 V	100 mA	400 V	2500 Vrms	○						
			IFT7	7 mA											
			IFT5	5 mA											
TLP561G		6-pin DIP General-purpose Zero cross	—	10 mA	3 V	100 mA	400 V	2500 Vrms	○						
			IFT7	7 mA											
			IFT5	5 mA											
TLP3022(S) TLP3022F(S)		6-pin DIP Direct replacement for XXX3020/3021/3022 SEMKO-approved	—	10 mA	3 V	100 mA	400 V	5000 Vrms	○	△ EN 60747	◎ EN 60747	◎ EN 60065 EN 60950	△ 60065 60950		
TLP3023(S) TLP3023F(S)		6-pin DIP Direct replacement for XXX3023 SEMKO-approved	—	5 mA											
TLP3042(S) TLP3042F(S)		6-pin DIP Direct replacement for XXX3040/3041/3042 SEMKO-approved	—	10 mA	3 V	100 mA	400 V	5000 Vrms	○	△ EN 60747	◎ EN 60747	◎ EN 60065 EN 60950	△ 60065 60950		
TLP3043(S) TLP3043F(S)		6-pin DIP Direct replacement for XXX3043 SEMKO-approved Includes a Z.C. circuit.	—	5 mA											

AC 200 to 240 V Line Type

Part Number	Pin Configuration	Features	I _{FT}		V _{TM}		V _{DRM}	BV _s	Safety Standards ⁽²⁾					
			Rank	Max	Max	@ I _{TM}			UL	TÜV	VDE	BSI	IEC	
TLP560J		6-pin DIP General-purpose Non-zero cross	—	10 mA	3 V	100 mA	600 V	2500 Vrms	○					
			IFT7	7 mA										
TLP561J		6-pin DIP General-purpose Zero cross	—	10 mA	3 V	100 mA	600 V	2500 Vrms	○					

Note 2: Legend in the Safety Standard column:

○: Approved ◎: SELV-approved △: Design which meets safety standard; approval pending (as of December 2007)

TÜV and VDE: EN60747-5-2 approved with option V4 or D4.

AC 200 to 240 V Line Type (Continued)

Part Number	Pin Configuration	Features	IFT		V _{TM}		V _{DRM}	BV _s	Safety Standards ⁽²⁾				
			Rank	Max	Max	@ I _{TM}			UL	TÜV	VDE	BSI	IEC
TLP762J TLP762JF		6-pin DIP Internal creepage: 4 mm (min) SEMKO-approved Non-zero cross-on	—	10 mA	3 V	100 mA	600 V	4000 V _{rms}	○	△ EN 60747	◎ EN 60747	◎ EN 60065 EN 60950	△ 60065 60950
TLP763J TLP763JF		6-pin DIP Internal creepage: 4 mm (min) SEMKO-approved Zero cross	—	10 mA	3 V	100 mA	600 V	4000 V _{rms}	○	△ EN 60747	◎ EN 60747	◎ EN 60065 EN 60950	△ 60065 60950
TLP3052(S) TLP3052F(S)		6-pin DIP SEMKO-approved Non-zero cross-on	—	10 mA	3 V	100 mA	600 V	5000 V _{rms}	○	△ EN 60747	◎ EN 60747	◎ EN 60065 EN 60950	△ 60065 60950
TLP3062(S) TLP3062F(S)		6-pin DIP SEMKO-approved Zero cross	—	10 mA	3 V	100 mA	600 V	5000 V _{rms}	△	△ EN 60747	◎ EN 60747	◎ EN 60065 EN 60950	△ 60065 60950
TLP3063(S) TLP3063F(S)		6-pin DIP SEMKO-approved Zero cross	—	5 mA									
TLP3064(S) TLP3064F(S)		6-pin DIP SEMKO-approved Zero cross	—	3 mA									
TLP3065(S)		6-pin DIP Low trigger current Zero cross	—	2 mA									
TLP3762(S) TLP3762F(S)		6-pin DIP Zero cross	—	10 mA									
TLP3763(S) TLP3763F(S)		6-pin DIP High impulse noise immunity V _N = 2000 V (typ.)	—	5 mA									
TLP3082(S) TLP3082F(S)		6-pin DIP Zero cross	—	10 mA									
TLP3083(S) TLP3083F(S)		6-pin DIP Zero cross	—	5 mA									
TLP3782(S) TLP3782F(S)		6-pin DIP High impulse noise immunity	—	10 mA									
TLP3783(S) TLP3783F(S)		6-pin DIP High impulse noise immunity V _N = 1500 V (typ.)	—	5 mA									

Multi-channel Type

Part Number	Pin Configuration	Features	IFT		V _{TM}		V _{DRM}	BV _s	Safety Standards ⁽²⁾				
			Rank	Max	Max	@ I _{TM}			UL	TÜV	VDE	BSI	IEC
TLP525G-2		8-pin DIP Dual-channel version of the TLP525G	—	10 mA	3 V	100 mA	400 V	2500 V _{rms}	○				
TLP525G-4		16-pin DIP 4-channel version of the TLP525G	—	10 mA									

Note 2: Legend in the Safety Standard column:

○: Approved ◎: SELV-approved △: Design which meets safety standard; approval pending (as of December 2007)

TÜV and VDE: EN60747-5-2 approved with option V4 or D4.

5 Selection Guide

7 IC Output

For Plasma Display Panels and Factory Automations (FAs)

Part Number	Pin Configuration	Features	Propagation Delay Time (Max)	Output Form	I _{FHL} (Max)	BV _s	Safety Standards ⁽²⁾				
							UL	TÜV	VDE	BSI	IEC
TLP2066		Mini-flat 6-pin MFSOP 3.3-V power supply High speed: 20 MBd	60 ns	Totem pole output (Inverter logic)	5 mA	3750 Vrms	△ (Pending)	△ ⁽¹⁾	△ ⁽¹⁾ (Pending)		
TLP117		Mini-flat 6-pin MFSOP High speed: 50 MBd Low power dissipation	30 ns	Totem pole output (Inverter logic)	5 mA	3750 Vrms	○	△ ⁽¹⁾	△ ⁽¹⁾ (Pending)		
TLP116		Mini-flat 6-pin MFSOP High speed: 20 MBd High CMR Low power dissipation	60 ns	Totem pole output (Inverter logic)	5 mA	3750 Vrms	○	○ ⁽¹⁾	△ ⁽¹⁾		
TLP716		6-pin SDIP High isolation voltage 5000 Vrms (min)	75 ns	Totem pole output (Inverter logic)	6.5 mA	5000 Vrms	○	◎ EN 60747	△ EN 60747		

For IPM Drivers

Part Number	Pin Configuration	Features	Propagation Delay Time (Max)	Output Form/ CTR	@I _F	BV _s	Safety Standards ⁽²⁾				
							UL	TÜV	VDE	BSI	IEC
TLP102		Mini-flat 6-pin MFSOP IPM drive High CMR	400 ns	Totem pole output (Inverter logic)	I _{FHL} = 3 mA (max)	3750 Vrms	○	○ ⁽¹⁾	△ ⁽¹⁾		
TLP106		Mini-flat 6-pin MFSOP IPM drive High CMR	400 ns	Totem pole output (Buffer logic)	I _{FLH} = 3 mA (max)	3750 Vrms	○	○ ⁽¹⁾	△ ⁽¹⁾		
TLP702 TLP702F		6-pin SDIP IPM drive High CMR	600 ns	Totem pole output (Inverter logic)	I _{FHL} = 5 mA (max)	5000 Vrms	○	◎ EN 60747	△ EN 60747		
TLP706 TLP706F		6-pin SDIP IPM drive High CMR	600 ns	Totem pole output (Buffer logic)	I _{FLH} = 5 mA (max)	5000 Vrms	○	◎ EN 60747	△ EN 60747		
TLP114A(IGM)		Mini-flat 6-pin MFSOP High CMR	0.8 μs	25% (min)	10 mA	3750 Vrms	○	○ ⁽¹⁾	△ ⁽¹⁾		
TLP559(IGM)		8-pin DIP High CMR	0.8 μs	25% (min)	10 mA	2500 Vrms	○				
TLP759(IGM) TLP759F(IGM)		8-pin DIP High CMR SEMKO-approved	0.8 μs	25% (min)	10 mA	5000 Vrms	○	△ EN 60747	◎ EN 60747	◎ EN 60065 EN 60950	△ 60065 60950

Note 1: The EN60747-5-2 safety standards for compact package is different from that for standard DIP packages.

Since mini-flat package is a compact package, please contact your nearest Toshiba sales representative for more details.

Note 2: Legend in the Safety Standard column:

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TÜV and VDE: EN60747-5-2 approved with option V4 or D4.

For IGBT/MOSFET/Giant Transistor Gate Drive

Part Number	Pin Configuration	Features	Propagation Delay Time (Max)	Output Form	I _{FHL} (Max)	BVs	Safety Standards ⁽²⁾				
							UL	TÜV	VDE	BSI	IEC
TLP557		8-pin DIP Direct drive of a power transistor	5 µs	Constant current output: 0.25 A	5 mA	2500 Vrms	○				
TLP251 TLP251F		8-pin DIP Direct drive of a small-power IGBT/MOSFET	1.0 µs	Peak output current (max): ±0.4 A	5 mA	2500 Vrms	○	△ EN 60747	⊙ EN 60747		
TLP705 TLP705F		6-pin SDIP Direct drive of a small-power IGBT/MOSFET Low power dissipation	0.2 µs	Peak output current (max): ±0.45 A	8 mA	5000 Vrms	○	⊙ EN 60747	△ EN 60747		
TLP351 TLP351F		8-pin DIP Direct drive of a medium-power IGBT/MOSFET Low power dissipation	0.7 µs	Peak output current (max): ±0.6 A	5 mA	3750 Vrms	○	⊙ EN 60747	⊙ EN 60747		
TLP351A		8-pin DIP Direct drive of a medium-power IGBT/MOSFET Low power dissipation UL double protection	0.7 µs	Peak output current (max): ±0.6 A	7 mA	5000 Vrms	△ (Pending)	△	△ (Pending)		
TLP701 TLP701F		6-pin SDIP Direct drive of a medium-power IGBT/MOSFET Low power dissipation	0.7 µs	Peak output current (max): ±0.6 A	5 mA	5000 Vrms	○	⊙ EN 60747	△ EN 60747		
TLP250 TLP250F		8-pin DIP Direct drive of a medium-power IGBT/MOSFET	0.5 µs	Peak output current (max): ±1.5 A	5 mA	2500 Vrms	○	△ EN 60747	⊙ EN 60747		
TLP250(INV) TLP250F(INV)		8-pin DIP Direct drive of a medium-power IGBT/MOSFET For inverters	0.5 µs	Peak output current (max): ±2.0 A	5 mA		○	△ EN 60747	⊙ EN 60747		
TLP700		6-pin SDIP Direct drive of a medium-power IGBT/MOSFET Low power dissipation	0.5 µs	Peak output current (max): ±2.0 A	5 mA	5000 Vrms	○	△	△ (Pending)		
TLP350 TLP350F		8-pin DIP Direct drive of a medium-power IGBT/MOSFET High CMR Low power dissipation	0.5 µs	Peak output current (max): ±2.5 A	5 mA	3750 Vrms	○	○ EN 60747	⊙ EN 60747		

Note 2: Legend in the Safety Standard column:

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TÜV and VDE: EN60747-5-2 approved with option V4 or D4.

5 Selection Guide

1-Channel Type (other than those above)

Part Number	Pin Configuration	Features	Data Rate (NRZ) (Typ.)	CTR	@IF	BVs	Safety Standards ⁽²⁾					
							UL	TÜV	VDE	BSI	IEC	
TLP553		8-pin DIP Low input drive current	300 kbit/s	400% (min)	0.5 mA	2500 Vrms	○					
TLP112		Mini-flat 6-pin MFSOP High CMR	1 Mbit/s	10% (min)	16 mA	2500 Vrms	○					
TLP112A		High CTR version of the TLP112		20% (min)								
TLP114A		Mini-flat 6-pin MFSOP High CMR version of the TLP112A	1 Mbit/s	20% (min)	16 mA	3750 Vrms	○	○ ⁽¹⁾	△ ⁽¹⁾			
TLP512		6-pin DIP version of the TLP550	1 Mbit/s	20% (min)	16 mA	2500 Vrms	○					
TLP550		8-pin DIP No internal base connection High CMR	1 Mbit/s	10% (min) (19% min for rank O)	16 mA	2500 Vrms	○					
TLP559		8-pin DIP High CMR version of the TLP550	1 Mbit/s	20% (min)	16 mA	2500 Vrms	○					
TLP551		8-pin DIP Internal base connection High-speed	1 Mbit/s	10% (min) (19% min for rank O)	16 mA	2500 Vrms	○					
TLP651		8-pin DIP High isolation voltage Internal base connection	1 Mbit/s	10% (min) (19% min for rank O)	16 mA	5000 Vrms	○					
TLP750 TLP750F		8-pin DIP High isolation voltage High CMR SEMKO-approved	1 Mbit/s	10% (min) (19% min for rank O)	16 mA		○	△ EN 60747	◎ EN 60747	◎ EN 60065 EN 60950	△ 60065 60950	
TLP751 TLP751F		8-pin DIP High isolation voltage Internal base connection SEMKO-approved	1 Mbit/s	10% (min)	16 mA							
TLP759 TLP759F		8-pin DIP IEC60950 design standard version of the TLP559 SEMKO-approved	1 Mbit/s	20% (min)	16 mA	○	△ EN 60747	◎ EN 60747	◎ EN 60065 EN 60950	△ 60065 60950		
TLP719 TLP719F		6-pin SDIP High CMR	1 Mbit/s	20% (min)	16 mA	5000 Vrms	○	◎ EN 60747	△ EN 60747			

Note 1: The EN60747-5-2 safety standards for compact package is different from that for standard DIP packages.

Since mini-flat package is a compact package, please contact your nearest Toshiba sales representative for more details.

Note 2: Legend in the Safety Standard column:

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TÜV and VDE: EN60747-5-2 approved with option V4 or D4.

1-Channel Type (other than those above) (continued)

Part Number	Pin Configuration	Features	Data Rate (NRZ) (Typ.)	Output Form	I _{FH} , I _{FL} (Max)	BVs	Safety Standards ⁽²⁾				
							UL	TÜV	VDE	BSI	IEC
TLP555		8-pin DIP Low input current High Vcc operation	5 Mbit/s	3-state output (Buffer logic)	1.6 mA	2500 Vrms	○				
TLP558		8-pin DIP Inverted logic version of the TLP555	5 Mbit/s	3-state output (Inverter logic)	1.6 mA						
TLP2200		8-pin DIP Low input current High-speed High Vcc operation	5 Mbit/s	3-state output	1.6 mA						
TLP113		Mini-flat 6-pin MFSOP High-speed Logic output	10 Mbit/s	Open-collector	10 mA	2500 Vrms	○				
TLP115		Mini-flat 6-pin MFSOP High CMR version of the TLP113	10 Mbit/s	Open-collector	10 mA						
TLP115A		Highly Sensitive version of the TLP115			5 mA						
TLP513		6-pin DIP 6-pin package version of the TLP552	10 Mbit/s	Open-collector	5 mA	2500 Vrms	○				
TLP552		8-pin DIP High-speed Logic output	10 Mbit/s	Open-collector	5 mA						
TLP554		8-pin DIP High-speed High CMR version of the TLP552	10 Mbit/s	Open-collector	5 mA						
TLP2601		8-pin DIP High CMR High-speed	10 Mbit/s	Open-collector	5 mA						

2-Channel Type

Part Number	Pin Configuration	Features	Data Rate (NRZ) (Typ.)	Output Form /CTR	@I _F	BVs	Safety Standards ⁽²⁾				
							UL	TÜV	VDE	BSI	IEC
TLP2530		Dual-channel version of the 6N135 and the TLP550	1 Mbit/s	7% (min)	16 mA	2500 Vrms	○				
TLP2531		Dual-channel version of the 6N136 and the TLP550	1 Mbit/s	19% (min)							
TLP2630		Dual-channel version of the 6N137 and the TLP550	10 Mbit/s	Open-collector	I _{FHL} = 5 mA (max)						
TLP2631		High CMR Dual-channel version of the TLP2601	10 Mbit/s	Open-collector	I _{FHL} = 5 mA (max)						

Note 2: Legend in the Safety Standard column:

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TÜV and VDE: EN60747-5-2 approved with option V4 or D4.

5 Selection Guide

JEDEC Type

Part Number	Pin Configuration	Features	Data Rate (NRZ) (Typ.)	CTR		BVs	Safety Standards ⁽²⁾				
					@I _F		UL	TÜV	VDE	BSI	IEC
6N135		JEDEC-compliant	1 Mbit/s	7% (min)	16 mA	2500 Vrms	○				
6N136				19% (min)							
6N137	JEDEC-compliant High-speed	10 Mbit/s	700% (typ.)	5 mA	○						
6N138	JEDEC-compliant High CTR	300 kbit/s	300% (min)	1.6 mA	○						
6N139			400% (min)	0.5 mA							

7 Photovoltaic Output

Part Number	Pin Configuration	Features	Short-Circuit Current (μA)			Open Voltage (V)		BVs	Safety Standards ⁽²⁾				
			Rank	Min	@I _F (mA)	Min	@I _F (mA)		UL	TÜV	VDE	BSI	IEC
TLP190B		Mini-flat 6-pin MFSOP	—	12	10 mA	7	10 mA	2500 Vrms	○				
TLP191B		Mini-flat 6-pin MFSOP Built-in shunt regulator	—	24	20 mA	7	20 mA		○				
TLP590B		6-pin DIP General-purpose	—	12	10 mA	7	10 mA		○				
			C20	20									
TLP591B		6-pin DIP Built-in shunt regulator	—	24	20 mA	7	20 mA		○				
			C40	40									
TLP3902		Mini-flat 6-pin MFSOP Low cost	—	5	10 mA	7	10 mA	△					
TLP3904		4-pin SSOP General-purpose	—	5	10 mA	7	10 mA	1500 Vrms	△				
TLP3914		4-pin SSOP High short-circuit current	—	20	10 mA	7	10 mA		△				
TLP3924		4-pin SSOP High open voltage	—	4	10 mA	30	10 mA		△				

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TÜV and VDE: EN60747-5-2 approved with option V4 or D4.

8 Photorelays

MOSFET Output, 1-Form-A

Part Number	Pin Configuration	Features	I _{FT} Max	R _{ON}			V _{OFF}	BV _s	Safety Standards ⁽²⁾							
				Max	@I _F	@I _{ON}			UL	TÜV	VDE	BSI	IEC			
TLP3130		4-pin SOP Lead pitch: 2.54 mm COFF: 1 pF (typ.) Ultra low CR: 5 pF × Ω For measuring instruments	4 mA	8 Ω	5 mA	0.16 A	20 V	1500 Vrms	○							
TLP3230		4-pin SSOP COFF: 1 pF (typ.) Ultra low CR: 5 pF × Ω For measuring instruments	4 mA	8 Ω	5 mA	0.16 A			△							
TLP3250		4-pin SSOP COFF: 0.8 pF (typ.) Ultra low CR: 2.5 pF × Ω For measuring instruments	3 mA	5 Ω	5 mA	0.2 A			△							
TLP3131		4-pin SOP Lead pitch: 2.54 mm COFF: 5 pF (typ.) Ultra low CR: 5 pF × Ω For measuring instruments	4 mA	1.2 Ω	5 mA	0.3 A			○							
TLP3231		4-pin SSOP COFF: 5 pF (typ.) Ultra low CR: 5 pF × Ω For measuring instruments	4 mA	1.2 Ω	5 mA	0.45 A			△							
TLP3113		4-pin SOP Lead pitch: 2.54 mm COFF: 0.6 pF (typ.) Ultra low CR: 15 pF × Ω For measuring instruments	4 mA	35 Ω	5 mA	0.08 A	40 V	1500 Vrms	○							
TLP3213		4-pin SSOP COFF: 0.6 pF (typ.) Ultra low CR: 15 pF × Ω For measuring instruments	4 mA	35 Ω	5 mA	0.08 A			△							
TLP3116		4-pin SOP Lead pitch: 2.54 mm COFF: 1 pF (typ.) Ultra low CR: 10 pF × Ω For measuring instruments	4 mA	15 Ω	5 mA	0.12 A			○							
TLP3216		4-pin SSOP COFF: 1 pF (typ.) Ultra low CR: 10 pF × Ω For measuring instruments	4 mA	15 Ω	5 mA	0.12 A			△							
TLP3240		4-pin SSOP COFF: 0.45 pF (typ.) Ultra low CR: 5 pF × Ω For measuring instruments	3 mA	14 Ω	5 mA	0.12 A			△							
TLP3241		4-pin SSOP COFF: 0.7 pF (typ.) Ultra low CR: 5 pF × Ω For measuring instruments	3 mA	10 Ω	5 mA	0.14 A			△							
TLP3114		4-pin SOP Lead pitch: 2.54 mm COFF: 5 pF (typ.) Ultra low CR: 10 pF × Ω For measuring instruments	4 mA	3 Ω	5 mA	0.25 A			○							
TLP3214		4-pin SSOP COFF: 5 pF (typ.) Ultra low CR: 10 pF × Ω For measuring instruments	4 mA	3 Ω	5 mA	0.25 A			△							
TLP3115		4-pin SOP Lead pitch: 2.54 mm COFF: 10 pF (typ.) Ultra low CR: 10 pF × Ω For measuring instruments	4 mA	1.5 Ω	5 mA	0.3 A			○							
TLP3215		4-pin SSOP COFF: 10 pF (typ.) Ultra low CR: 10 pF × Ω For measuring instruments	4 mA	1.5 Ω	5 mA	0.3 A			△							
TLP3123		4-pin SOP Lead pitch: 2.54 mm COFF: 300 pF (typ.) High output current For measuring instruments and power lines	3 mA	0.13 Ω	5 mA	1 A			○							
TLP225A			4-pin DIP Designed for DC output modules	5 mA	1.1 Ω	10 mA			0.5 A	60 V	2500 Vrms	○				
TLP3110			4-pin SOP Lead pitch: 2.54 mm COFF: 100 pF (typ.) Low CR For measuring instruments	4 mA	1.2 Ω	5 mA			0.35 A			1500 Vrms	○			
TLP172A		4-pin SOP Lead pitch: 2.54 mm High output current	3 mA	2 Ω	5 mA	0.4 A	○									
TLP176A	4-pin SOP Lead pitch: 2.54 mm High output current	3 mA	2 Ω	5 mA	0.4 A	1500 Vrms	○	△ ⁽¹⁾	○ ⁽¹⁾							
TLP3122	4-pin SOP Lead pitch: 2.54 mm High output current: I _{ON} = 1.0 A (max) For measuring instruments and power lines	3 mA	0.7 Ω	5 mA	1.0 A		○									

Note 1: The EN60747-5-2 safety standards for compact package is different from that for standard DIP packages.

Since mini-flat package is a compact package, please contact your nearest Toshiba sales representative for more details.

Note 2: Legend in the Safety Standard column:

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TÜV and VDE: EN60747-5-2 approved with option V4 or D4.

5 Selection Guide

MOSFET Output, 1-Form-A (continued)

Part Number	Pin Configuration	Features	IFT Max	RON			V _{OFF}	BV _s	Safety Standards ⁽²⁾				
				Max	@I _F	@I _{ON}			UL	TÜV	VDE	BSI	IEC
TLP192A		6-pin SOP Lead pitch: 2.54 mm High output current	3 mA	2 Ω	5 mA	0.4 A	60 V	1500 Vrms	○				
TLP197A		6-pin SOP Lead pitch: 2.54 mm High output current	3 mA	2 Ω	5 mA	0.4 A			○				
TLP3212		4-pin SSOP COFF: 20 pF (typ.) Low CR: 20 pF × Ω For measuring instruments	5 mA	1.5 Ω	5 mA	0.4 A			○				
TLP222A		4-pin DIP General-purpose High output current	3 mA	2 Ω	5 mA	0.5 A		2500 Vrms	○				
TLP227A		4-pin DIP General-purpose SEMKO-approved	3 mA	2 Ω	5 mA	0.5 A			○				△
TLP592A		6-pin DIP High output current	3 mA	2 Ω	5 mA	0.5 A			○				
TLP597A		6-pin DIP High output current SEMKO-approved	3 mA	2 Ω	5 mA	0.5 A		2500 Vrms	○				△
TLP598AA		6-pin DIP High output current	3 mA	2 Ω	5 mA	0.5 A	○						
TLP3542		6-pin DIP Low On-resistance High output current: I _{ON} = 2.5 A (max) For measuring instruments and power lines	3 mA	0.1 Ω	10 mA	2.5 A	2500 Vrms	△					
TLP3118		4-pin SOP Lead pitch: 2.54 mm COFF: 3.5 pF (typ.) Low CR: 40 pF × Ω For measuring instruments	5 mA	25 Ω	5 mA	0.04 A	80 V	○					
TLP3111		4-pin SOP Lead pitch: 2.54 mm COFF: 11 pF (typ.) Low CR For measuring instruments	4 mA	20 Ω	5 mA	0.1 A		○					
TLP3217		4-pin SSOP COFF: 5 pF (typ.) Low CR: 40 pF × Ω For measuring instruments	5 mA	12 Ω	10 mA	0.12 A		△					
TLP3119		4-pin SOP Lead pitch: 2.54 mm COFF: 11 pF (typ.) Low CR: 30 pF × Ω For measuring instruments	3 mA	8 Ω	5 mA	0.2 A		○					
TLP3121		4-pin SOP Lead pitch: 2.54 mm COFF: 30 pF (typ.) Low CR: 30 pF × Ω For measuring instruments	4 mA	1.2 Ω	5 mA	0.35 A		○					
TLP3120		6-pin SOP Lead pitch: 2.54 mm High output current: I _{ON} = 2.0 A (max) For measuring instruments and power lines	5 mA	0.15 Ω	5 mA	1.25 A	1500 Vrms	○					
TLP3220		4-pin SSOP V _{OFF} : 100 V For measuring instruments	5 mA	15 Ω	10 mA	0.08 A	100 V	△					
TLP179D		4-pin SOP Lead pitch: 2.54 mm V _{OFF} : 200 V Low COFF: 15 pF (typ.) For measuring instruments	3 mA	50 Ω	5 mA	0.05 A	200 V	○					
TLP199D		6-pin SOP Lead pitch: 2.54 mm V _{OFF} : 200 V Low COFF: 15 pF (typ.) For measuring instruments	3 mA	50 Ω	5 mA	0.05 A		○					
TLP176D		4-pin SOP Lead pitch: 2.54 mm Low On-resistance	3 mA	8 Ω	5 mA	0.2 A		○	△ ⁽¹⁾	○ ⁽¹⁾			

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TÜV and VDE: EN60747-5-2 approved with option V4 or D4.

MOSFET Output, 1-Form-A (continued)

Part Number	Pin Configuration	Features	I _{FT} Max	R _{ON}			V _{OFF}	BV _s	Safety Standards ⁽²⁾					
				Max	@I _F	@I _{ON}			UL	TÜV	VDE	BSI	IEC	
TLP197D		6-pin SOP Lead pitch: 2.54 mm Low On-resistance	3 mA	8 Ω	5 mA	0.2 A	200 V	1500 Vrms	○					
TLP172G		4-pin SOP Lead pitch: 2.54 mm General-purpose	3 mA	35 Ω	5 mA	0.11 A	350 V		○					
TLP192G		6-pin SOP Lead pitch: 2.54 mm General-purpose	3 mA	35 Ω	5 mA	0.11 A			○					
TLP176G		4-pin SOP Lead pitch: 2.54 mm General-purpose SEMKO-approved	3 mA	35 Ω	5 mA	0.12 A			○	△(1)	○(1)	○	△	
TLP197G		6-pin SOP Lead pitch: 2.54 mm General-purpose SEMKO-approved	3 mA	35 Ω	5 mA	0.12 A			○	△(1)	○(1)	○	△	
TLP174G		4-pin SOP Lead pitch: 2.54 mm SEMKO-approved Current-limiting function Limit current: 150 to 300 mA	3 mA	35 Ω	5 mA	0.12 A			○				△	
TLP222G		4-pin DIP General-purpose SEMKO-approved	3 mA	50 Ω	5 mA	0.12 A			2500 Vrms	○			○	△
TLP227G		4-pin DIP General-purpose SEMKO-approved	3 mA	35 Ω	5 mA	0.12 A				○	△ EN 60747	○ EN 60747	○	△
TLP592G		6-pin DIP General-purpose	3 mA	50 Ω	5 mA	0.12 A				○				
TLP597G		6-pin DIP General-purpose SEMKO-approved	3 mA	35 Ω	5 mA	0.12 A				○	△ EN 60747	○ EN 60747	○	△
TLP224G		4-pin DIP SEMKO-approved Current-limiting function Limit current: 150 to 300 mA General-purpose	3 mA	35 Ω	5 mA	0.12 A		○					△	
TLP176GA		4-pin SOP Lead pitch: 2.54 mm General-purpose	3 mA	35 Ω	5 mA	0.12 A	1500 Vrms	○				○	△	
TLP174GA		4-pin SOP Lead pitch: 2.54 mm Current-limiting function Limit current: 150 to 300 mA	3 mA	35 Ω	5 mA	0.12 A		○						
TLP197GA		6-pin SOP Lead pitch: 2.54 mm General-purpose	3 mA	35 Ω	5 mA	0.12 A		○			○	△		
TLP3125		8-pin SOP Lead pitch: 2.54 mm V _{OFF} : 400V Low On-resistance For measuring instruments	3 mA	4 Ω	5 mA	0.2 A		400 V	○					
TLP227GA		4-pin DIP General-purpose SEMKO-approved	3 mA	35 Ω	5 mA	0.12 A			2500 Vrms	○				△
TLP224GA		4-pin DIP For modems Current-limiting function Limit current: 150 to 300 mA	3 mA	35 Ω	5 mA	0.12 A				○				△

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TÜV and VDE: EN60747-5-2 approved with option V4 or D4.

5 Selection Guide

MOSFET Output, 1-Form-A (continued)

Part Number	Pin Configuration	Features	I _{FT} Max	RON			V _{OFF}	BV _s	Safety Standards ⁽²⁾					
				Max	@ I _F	@ I _{ON}			UL	TÜV	VDE	BSI	IEC	
TLP597GA		6-pin DIP General-purpose SEMKO-approved	3 mA	35 Ω	5 mA	0.12 A	400 V	5000 Vrms	○				△ 60065 60950	
TLP598GA		6-pin DIP Low On-resistance	3 mA	12 Ω	5 mA	0.15 A			○					
TLP797GA		6-pin DIP Low On-resistance High isolation voltage IEC60950-compliant	3 mA	35 Ω	5 mA	0.12 A			○	△ EN 60747	△ EN 60747	△ EN 60065 EN 60950	△ EN 60065 EN 60950	
TLP797GAF				12 Ω	5 mA	0.15 A								
TLP798GA														
TLP797J		6-pin DIP High isolation voltage	3 mA	35 Ω	5 mA	0.1 A	600 V	○	△ EN 60747	△ EN 60747	△ EN 60065 EN 60950	△ EN 60065 EN 60950		
TLP797JF														

MOSFET Output, 2-Form-A

Part Number	Pin Configuration	Features	I _{FT} Max	RON			V _{OFF}	BV _s	Safety Standards ⁽²⁾				
				Max	@ I _F	@ I _{ON}			UL	TÜV	VDE	BSI	IEC
TLP202A		8-pin SOP Lead pitch: 2.54 mm Dual-channel version of the TLP172A	3 mA	2 Ω	5 mA	0.4 A	60 V	1500 Vrms	○				
TLP206A		8-pin SOP Lead pitch: 2.54 mm Dual-channel version of the TLP176A	3 mA	2 Ω	5 mA	0.4 A			○				
TLP222A-2		8-pin DIP Dual-channel version of the TLP222A	3 mA	2 Ω	5 mA	0.5 A		2500 Vrms	○				
TLP227A-2		8-pin DIP Dual-channel version of the TLP227A SEMKO-approved	3 mA	2 Ω	5 mA	0.5 A			○				△ 60065 60950
TLP209D		8-pin SOP Lead pitch: 2.54 mm Dual-channel version of the TLP179D	3 mA	50 Ω	5 mA	0.05 A	200 V	1500 Vrms	○				
TLP200D		8-pin SOP Lead pitch: 2.54 mm Dual-channel version of the TLP176D	3 mA	8 Ω	5 mA	0.2 A			○				
TLP202G		8-pin SOP Lead pitch: 2.54 mm Dual-channel version of the TLP172G	3 mA	50 Ω	5 mA	0.11 A			○				
TLP206G		8-pin SOP Lead pitch: 2.54 mm Dual-channel version of the TLP176G	3 mA	35 Ω	5 mA	0.12 A			○	△ ⁽¹⁾	○ ⁽¹⁾	○ EN 60065 EN 60950	△ 60065 60950
TLP222G-2		8-pin DIP Dual-channel version of the TLP222G SEMKO-approved	3 mA	50 Ω	5 mA	0.12 A	350 V	2500 Vrms	○			○ EN 60065 EN 60950	△ 60065 60950
TLP227G-2		8-pin DIP Dual-channel version of the TLP227G SEMKO-approved	3 mA	35 Ω	5 mA	0.12 A			○	△ EN 60747	○ EN 60747	○ EN 60065 EN 60950	△ 60065 60950
TLP224G-2		8-pin DIP Dual-channel version of the TLP224G SEMKO-approved	3 mA	35 Ω	5 mA	0.12 A			○			○ EN 60065 EN 60950	△ 60065 60950
TLP206GA		8-pin SOP Lead pitch: 2.54 mm Dual-channel version of the TLP176GA	3 mA	35 Ω	5 mA	0.12 A	400 V	1500 Vrms	○			○ EN 60065 EN 60950	△ 60065 60950
TLP227GA-2		8-pin DIP Dual-channel version of the TLP227GA SEMKO-approved	3 mA	35 Ω	5 mA	0.12 A			○				△ 60065 60950
TLP224GA-2		8-pin DIP Dual-channel version of the TLP224GA Current-limiting function Limit current: 150 to 300 mA	3 mA	35 Ω	5 mA	0.12 A		○					

Note 1: The EN60747-5-2 safety standards for compact package is different from that for standard DIP packages.









Since mini-flat package is a compact package, please contact your nearest Toshiba sales representative for more details.

Note 2: Legend in the Safety Standard column:

○: Approved ◎: SELV-approved △: Design which meets safety standard; approval pending (as of December 2007)

TÜV and VDE: EN60747-5-2 approved with option V4 or D4.

MOSFET Output, 1-Form-B

Part Number	Pin Configuration	Features	I _{FT} Max	R _{ON}			V _{OFF}	BV _s	Safety Standards ⁽²⁾				
				Max	@ I _F	@ I _{ON}			UL	TÜV	VDE	BSI	IEC
TLP4172G		4-pin SOP Lead pitch: 2.54 mm General-purpose 1-Form-B	3 mA	50 Ω	0 mA	0.09 A	350V	1500 Vrms	○				
TLP4192G		6-pin SOP Lead pitch: 2.54 mm General-purpose 1-Form-B	3 mA	50 Ω	0 mA	0.09 A			○				
TLP4222G		4-pin DIP General-purpose 1-Form-B	3 mA	50 Ω	0 mA	0.1 A		2500 Vrms	○				
TLP4592G		6-pin DIP General-purpose 1-Form-B	3 mA	50 Ω	0 mA	0.1 A			○				
TLP4176G		4-pin SOP Lead pitch: 2.54 mm General-purpose 1-Form-B	3 mA	25 Ω	0 mA	0.12 A		1500 Vrms	○				
TLP4197G		6-pin SOP Lead pitch: 2.54 mm General-purpose 1-Form-B	3 mA	25 Ω	0 mA	0.12 A			○				
TLP4227G		4-pin DIP General-purpose SEMKO-approved 1-Form-B	3 mA	25 Ω	0 mA	0.15 A		2500 Vrms	○				△ 60065 60950
TLP4597G		6-pin DIP General-purpose SEMKO-approved 1-Form-B	3 mA	25 Ω	0 mA	0.15 A			○				△ 60065 60950

Note 2: Legend in the Safety Standard column:

○: Approved ⊙: SELV-approved △: Design which meets safety standard; approval pending (as of December 2007)
TÜV and VDE: EN60747-5-2 approved with option V4 or D4.

5 Selection Guide

MOSFET Output, 2-Form-B

Part Number	Pin Configuration	Features	I _{FT} Max	R _{ON}			V _{OFF}	BV _s	Safety Standards ⁽²⁾				
				Max	@ I _F	@ I _{ON}			UL	TÜV	VDE	BSI	IEC
TLP4202G		8-pin SOP Lead pitch: 2.54 mm Dual-channel version of the TLP4172G 2-Form-B	3 mA	50 Ω	0 mA	0.09 A	350 V	1500 Vrms	○				
TLP4222G-2		8-pin DIP Dual-channel version of the TLP4222G 2-Form-B	3 mA	50 Ω	0 mA	0.1 A		2500 Vrms	○				
TLP4206G		8-pin SOP Lead pitch: 2.54 mm Dual-channel version of the TLP4176G 2-Form-B	3 mA	25 Ω	0 mA	0.12 A		1500 Vrms	○				
TLP4227G-2		8-pin DIP Dual-channel version of the TLP4227G 2-Form-B	3 mA	25 Ω	0 mA	0.15 A		2500 Vrms	○				△ 60065 60950

MOSFET Output, 1-Form-B + 1-Form-A

Part Number	Pin Configuration	Features	I _{FT} Max	R _{ON}			V _{OFF}	BV _s	Safety Standards ⁽²⁾				
				Max	@ I _F	@ I _{ON}			UL	TÜV	VDE	BSI	IEC
TLP4027G		8-pin SOP Lead pitch: 2.54 General-purpose 1a1b (N.C. + N.O.)	3 mA	50 Ω	(Form-A) 5 mA (Form-B) 0 mA	0.09 A	350 V	1500 Vrms	○				
TLP4007G		8-pin DIP General-purpose 1a1b (N.C. + N.O.)	3 mA	50 Ω	(Form-A) 5 mA (Form-B) 0 mA	0.1 A		2500 Vrms	○				
TLP4026G		8-pin SOP Lead pitch: 2.54 General-purpose 1a1b (N.C. + N.O.)	3 mA	25 Ω	(Form-A) 5 mA (Form-B) 0 mA	0.12 A		1500 Vrms	○				
TLP4006G		8-pin DIP General-purpose 1a1b (N.C. + N.O.)	3 mA	25 Ω	(Form-A) 5 mA (Form-B) 0 mA	0.12 A		2500 Vrms	○				

Note 2: Legend in the Safety Standard column:

○: Approved ◎: SELV-approved △: Design which meets safety standard; approval pending (as of December 2007)
TÜV and VDE: EN60747-5-2 approved with option V4 or D4.

9 Products Manufactured by Toshiba Semiconductor (Thailand) Co., Ltd.

Part Number	Pin Configuration	Pin Configuration	V _{CEO}	BV _s	Safety Standards ⁽²⁾					
					UL	TÜV	VDE	BSI	IEC	
TLP180 (T)		Mini-flat 6-pin MFSOP AC input SEMKO-approved	80 V	3750 Vrms	○	○ ⁽¹⁾	△ ⁽¹⁾	◎ EN 60065 EN 60950	△ 60065 60950	
TLP181 (T)		Mini-flat 6-pin MFSOP Transistor output General-purpose	80 V	3750 Vrms	○	△ ⁽¹⁾	○ ⁽¹⁾	◎ EN 60065 EN 60950	△ 60065 60950	
TLP521-1 (T)		4-pin DIP Transistor output General-purpose	55 V	2500 Vrms	○					
TLP521-2 (T)		8-pin DIP Dual-channel version of the TLP521-1 (T)								
TLP620 (T)		4-pin DIP Transistor output AC input SEMKO-approved	55 V	5000 Vrms	○		△ EN 60747	◎ EN 60747	◎ EN 60065 EN 60950	△ 60065 60950
TLP620-2 (T)		8-pin DIP Dual-channel version of the TLP620 (T) SEMKO-approved								
TLP621 (T)		4-pin DIP Transistor output High isolation voltage SEMKO-approved	55 V	5000 Vrms	○		△ EN 60747	◎ EN 60747	◎ EN 60065 EN 60950	△ 60065 60950
TLP621-2 (T)		8-pin DIP Dual-channel version of the TLP621 (T) SEMKO-approved								
TLP627 (T)		4-pin DIP Darlington transistor output High V _{CEO} SEMKO-approved	300 V	5000 Vrms	○		△ EN 60747	◎ EN 60747	◎ EN 60065 EN 60950	△ 60065 60950
TLP627-2 (T)		8-pin DIP Dual-channel version of the TLP627 (T) SEMKO-approved								

Note 1: The EN60747-5-2 safety standards for compact package is different from that for standard DIP packages.

Since mini-flat package is a compact package, please contact your nearest Toshiba sales representative for more details.

Note 2: Legend in the Safety Standard column:

○: Approved ◎: SELV-approved △: Design which meets safety standard; approval pending (as of December 2007)

TÜV and VDE: EN60747-5-2 approved with option V4 or D4.

Note that the products manufactured by Toshiba Semiconductor Thailand Co., Ltd. are not available in Japan.

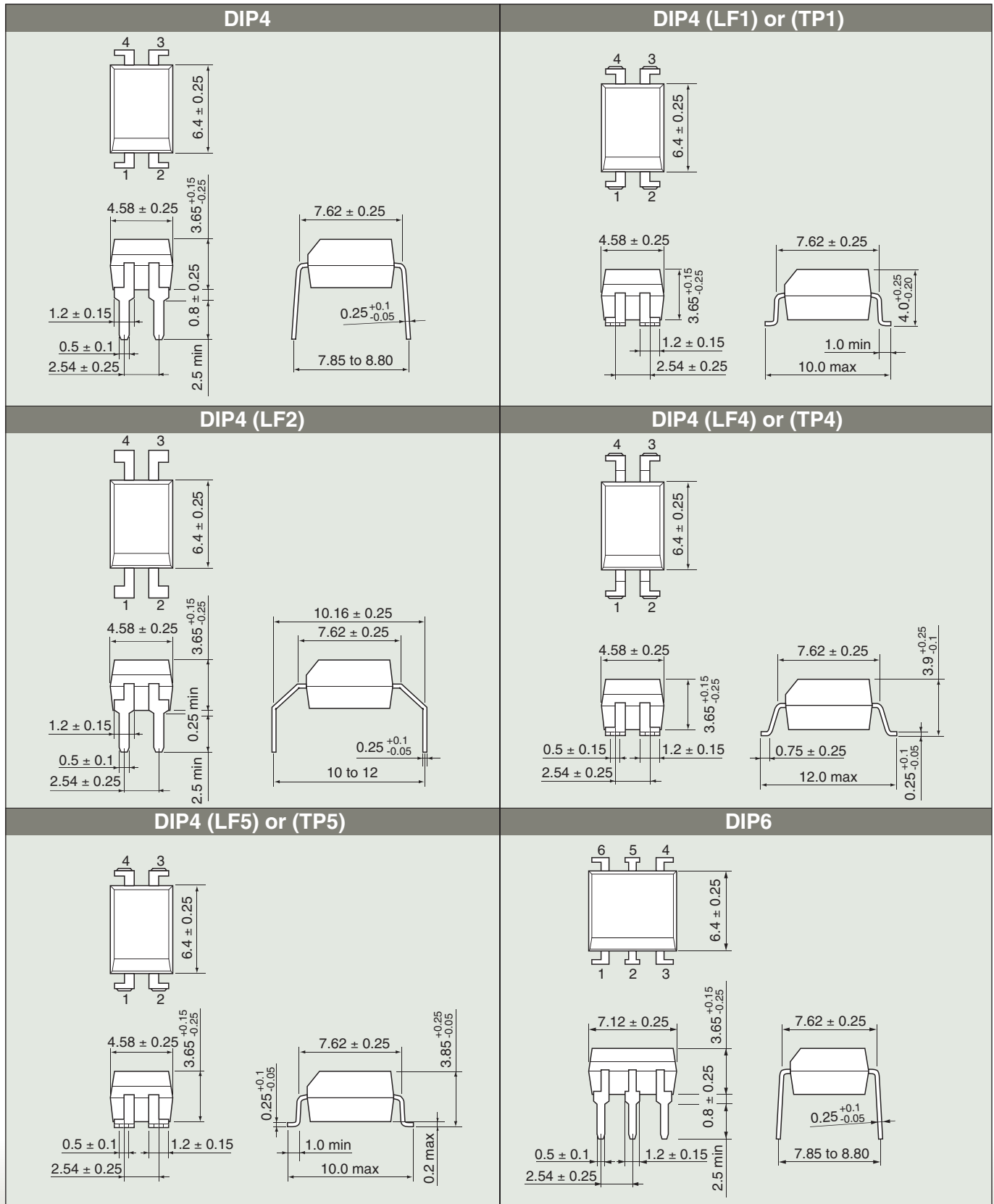
Some of the photocouplers with triac output are also manufactured by Toshiba Semiconductor Thailand Co., Ltd.. For detailed information, please contact your nearest Toshiba sales representative.

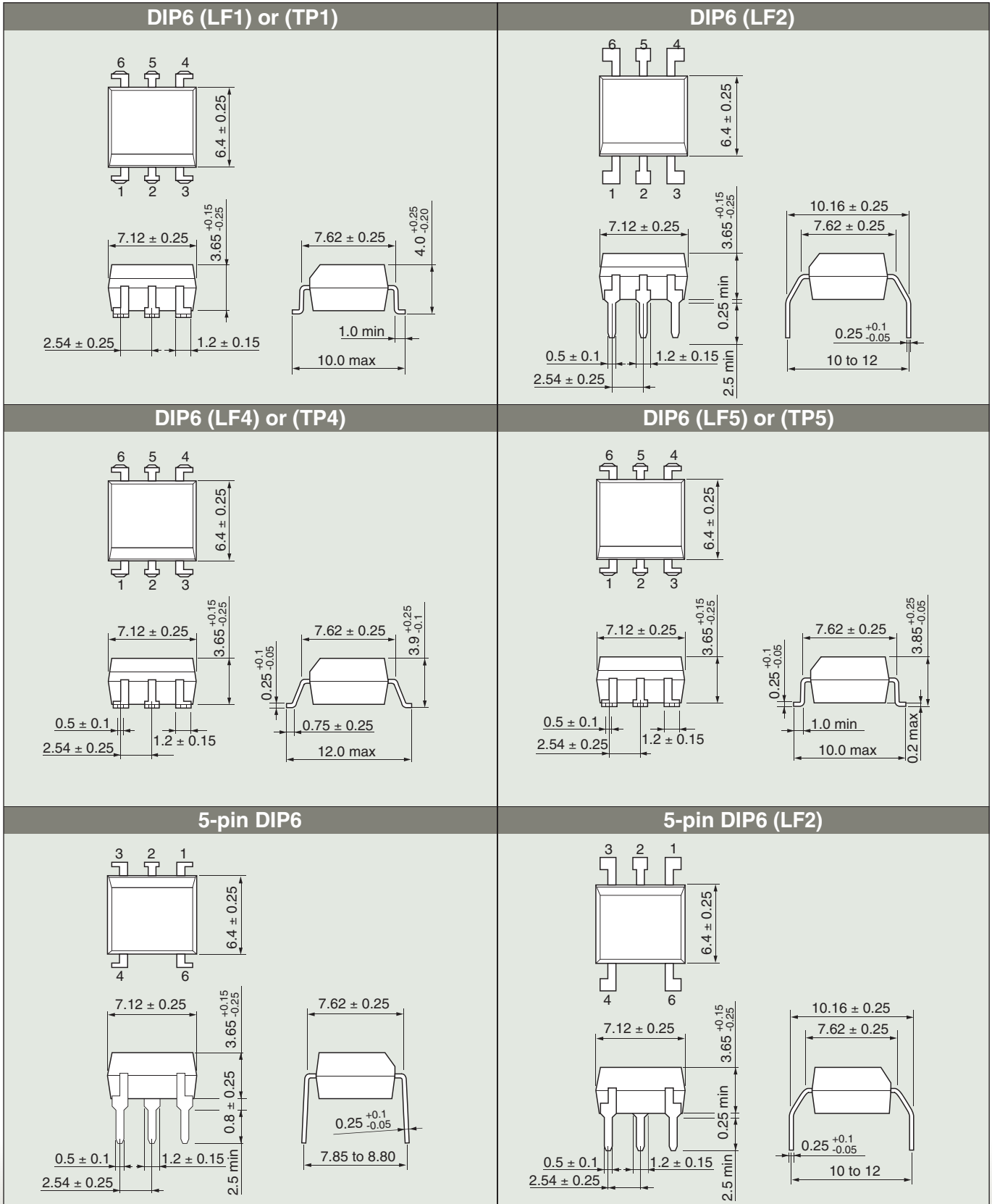
6 Package Information

1 Package Dimensions

* For TLP781 and TLP781F, please refer individual data sheet.

Unit: mm

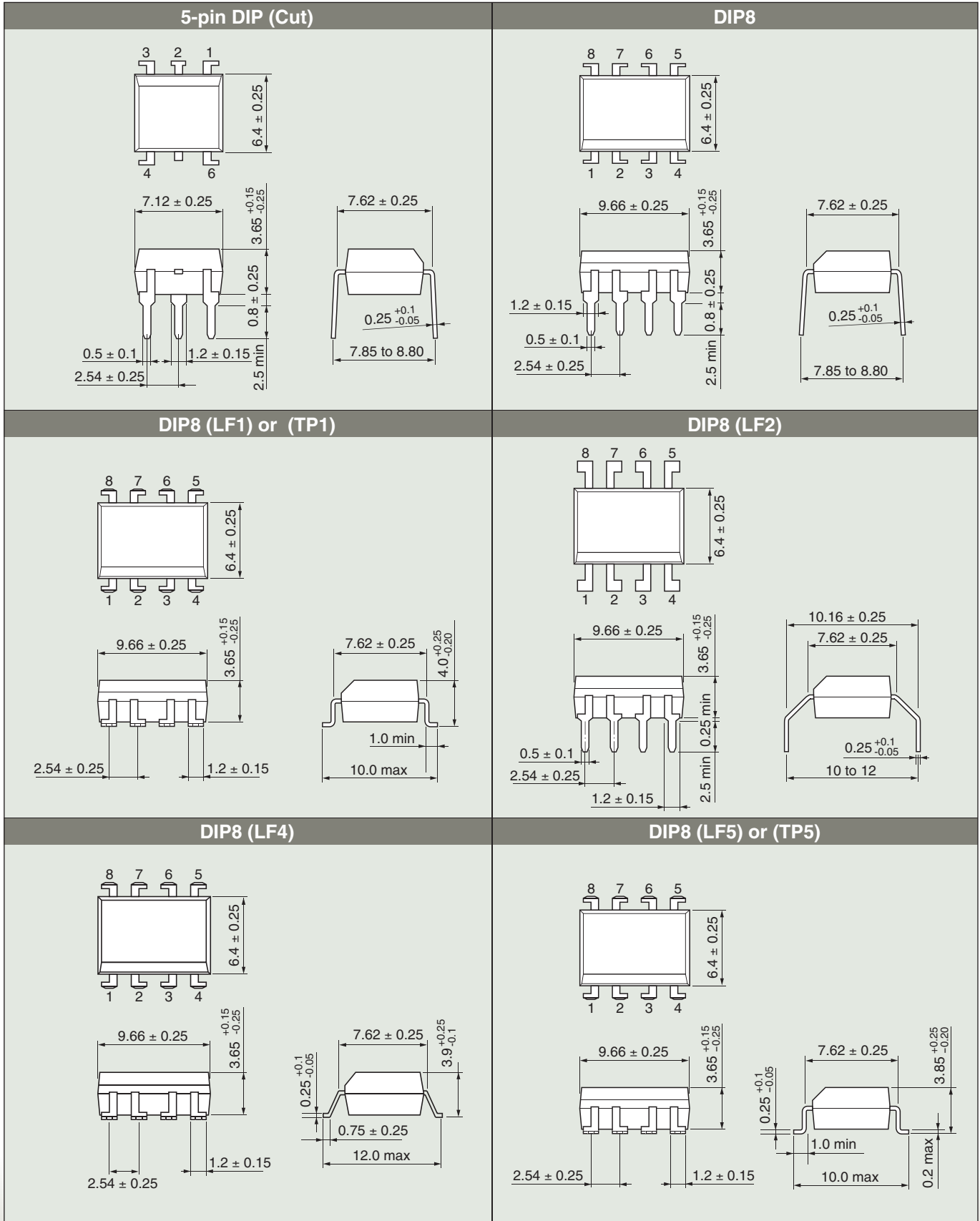




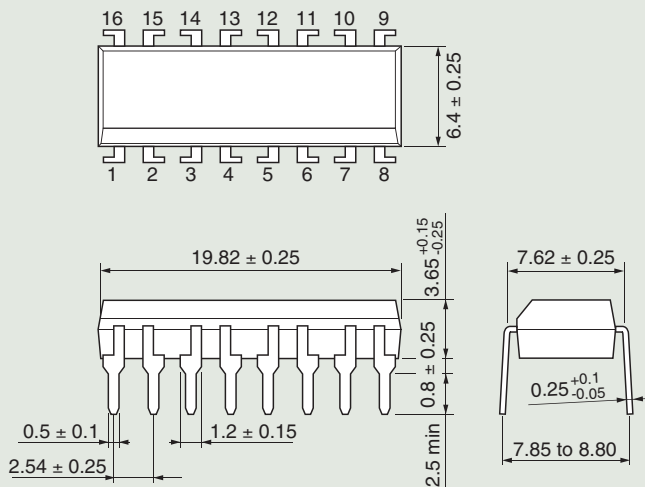
6 Package Information

1 Package Dimensions (continued)

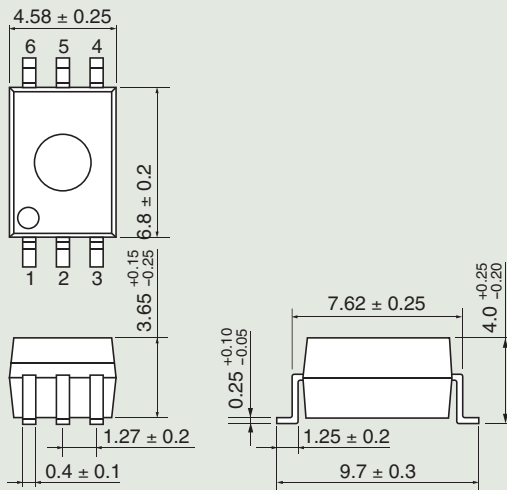
Unit: mm



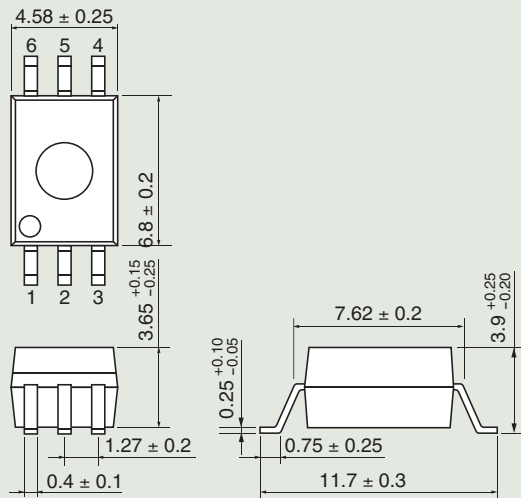
DIP16



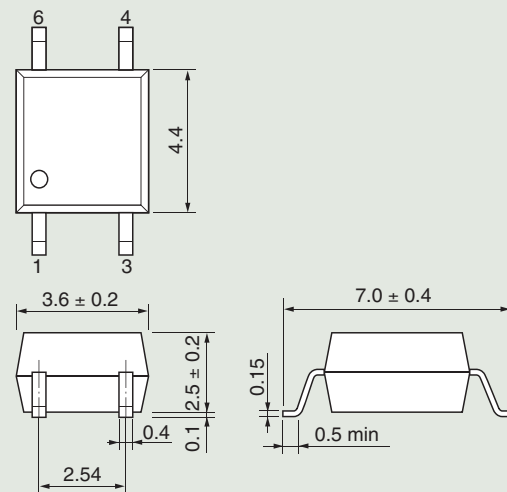
SDIP6



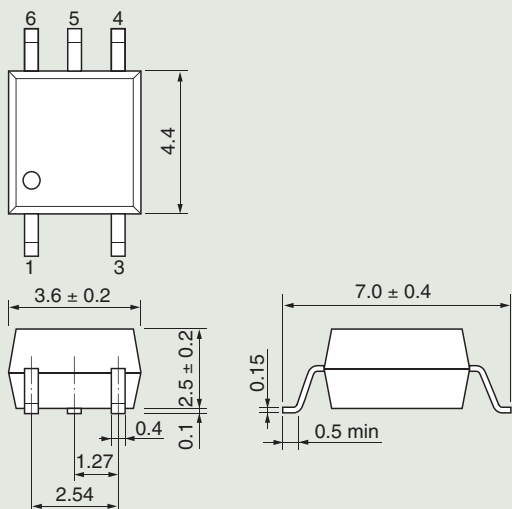
SDIP6 (F type)



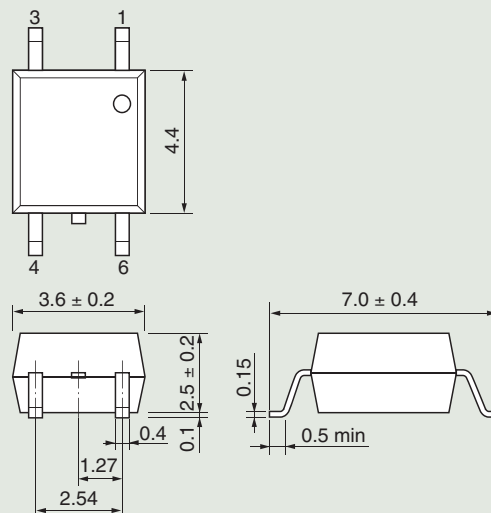
4-pin MFSOP6



5-pin MFSOP6



4-pin MFSOP6 (No.5Cut)

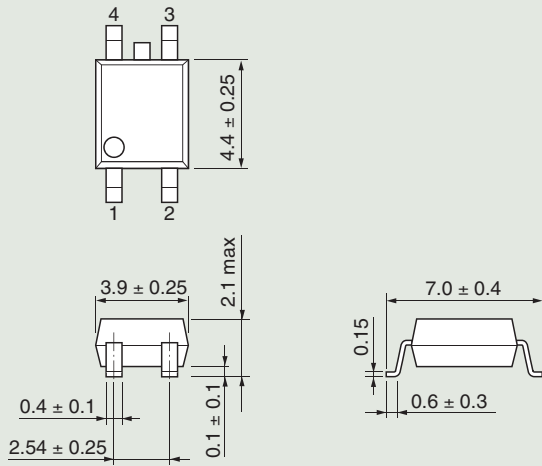


6 Package Information

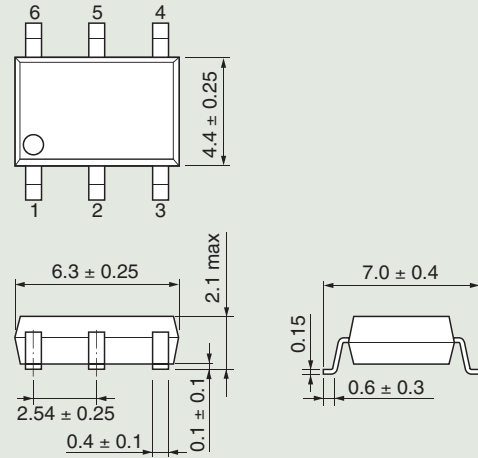
1 Package Dimensions (continued)

Unit: mm

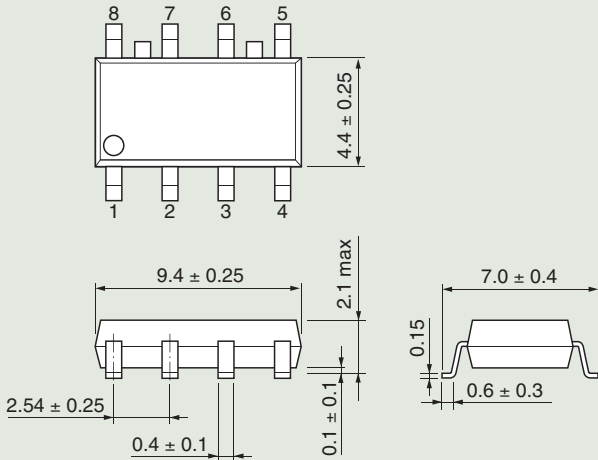
2.54SOP4



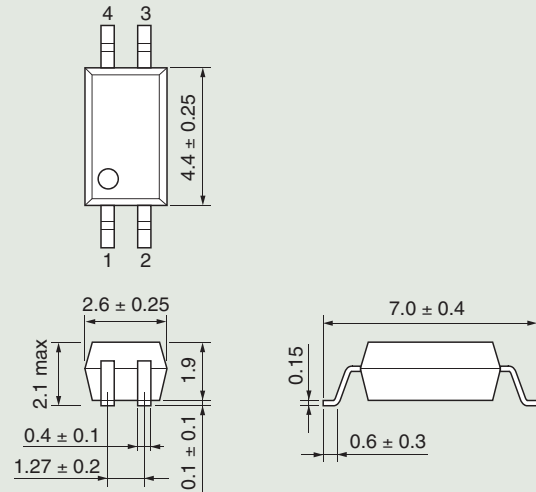
2.54SOP6



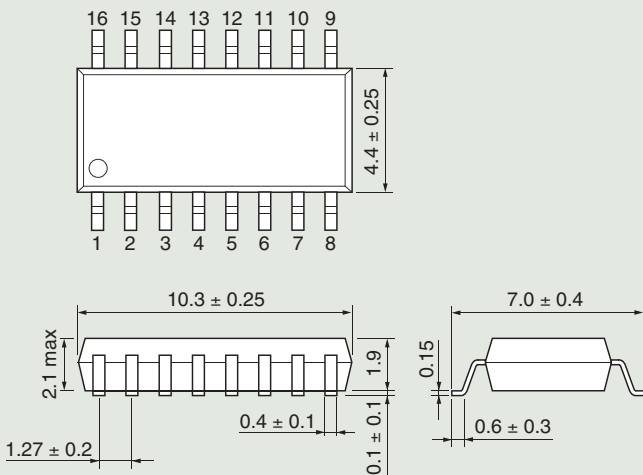
2.54SOP8



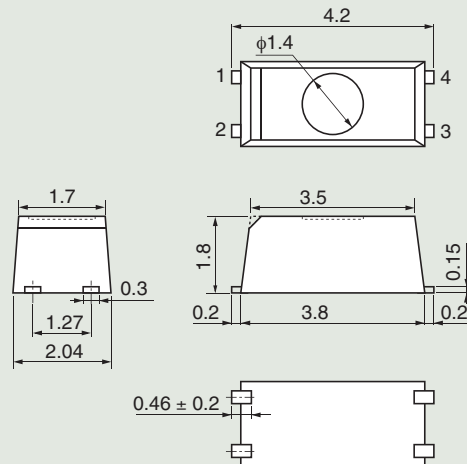
SOP4



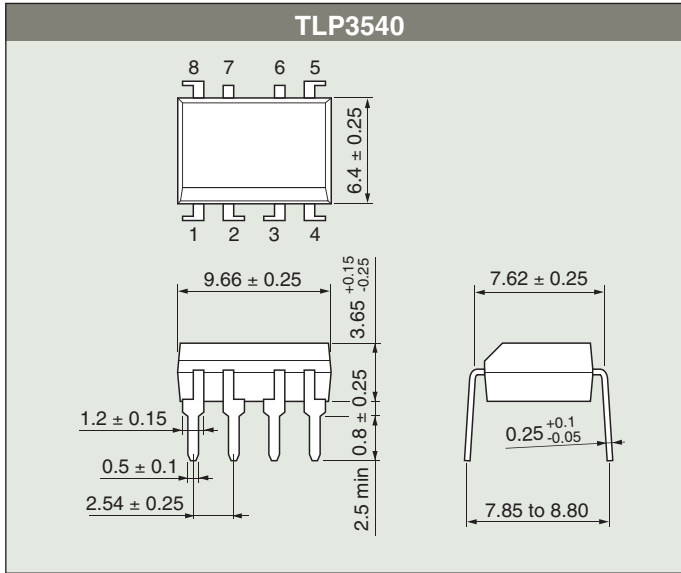
SOP16



SSOP4



Unit: mm



6 Package Information

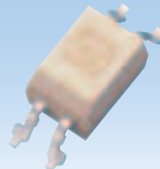
2 Optional Lead Formed Products

* For TLP781 and TLP781F, please refer individual data sheet.

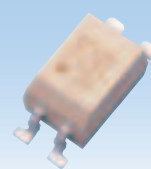
1. Surface-Mount Lead Form Options (LF1), (LF4), (LF5)



LF1



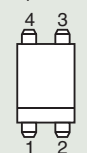
LF4



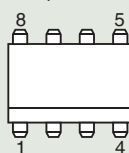
LF5

Package Outline

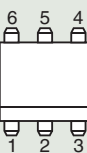
4-pin DIP



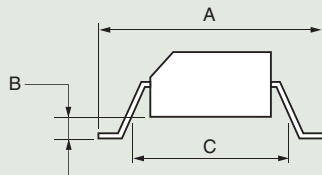
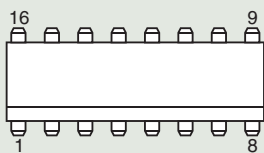
8-pin DIP



6-pin DIP



16-pin DIP



Dimensions

Unit: mm

Version	(LF1)		(LF4)		(LF5)	
	Min	Max	Min	Max	Min	Max
Dimension A	–	10.0	–	12.0	–	10.0
Dimension B	(0.35 typ.)		(0.25 typ.)		–	0.2
Dimension C	6.4	–	8.0	–	6.4	–

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

Note: For more details about package dimensions, refer to 6.1 Package Dimensions.

Features

Surface-mountable: Photocoupler leads with (LF1), (LF4) or (LF5) part number suffixes are available for all DIP packages except SDIP packages. These devices are suitable for hybrid circuits.

Applications: HIC modules, telephone exchanges, solid state relays, switching power supplies, inverter base amplifiers

This lead form option is available for all 4-, 6-, 8-, 12- and 16-pin DIP packages.

Ordering information

To order any standard photocoupler with a surface-mount lead form, add (LF1), (LF4) or (LF5) to the standard part number, depending on the lead form desired.

When tape and reel packaging is desired, add (TP1), (TP4) or (TP5) instead of (LF1), (LF4) or (LF5). Refer to 6.4 Tape and Reel Specifications for more details.

Example

Standard part number	TLP731 (GR)		
Surface-mount type part numbers	TLP731 (GR-LF1)	TLP731 (GR-LF4)	TLP731 (GR-LF5)
Part number when tape and reel packaging is desired	TLP731 (GR-TP1)	TLP731 (GR-TP4)	TLP731 (GR-TP5)

Safety Standards Approval

Use Toshiba standard part numbers for safety standards approved applications.

Example $\frac{\text{Part number}}{\text{TLP731 (GR-LF1)}} \longrightarrow \frac{\text{Approved part number}}{\text{TLP731}}$

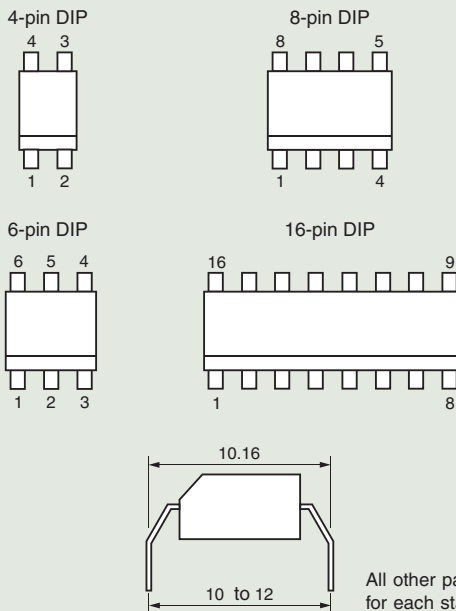
2. Wide-Spaced Lead Form Option (LF2)



LF2

■ Package Dimensions

Unit: mm



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

Note: For more details about package dimensions, refer to 6.1 Package Dimensions.

■ Features

Wide-spaced surface-mountable: Leads of the DIP packaged photocouplers with (LF2) part number suffixes are bend to satisfy 8-mm PC board spacing requirements.

Applications: Office equipment, home appliances, solid state relays, switching power supplies

The lead form option is available for all 4-, 6-, 8-, 12- and 16-pin DIP packages with electrical characteristics unchanged.

■ Ordering information

To order any standard photocoupler with a wide-spaced lead form, add (LF2) to the standard part number.

Example: Standard part number: TLP731 (GR)

Wide-spaced part number: TLP731 (GR-LF2)

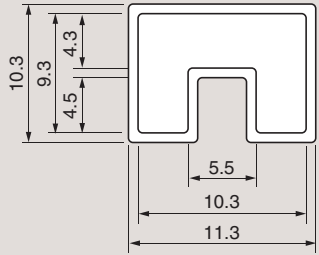
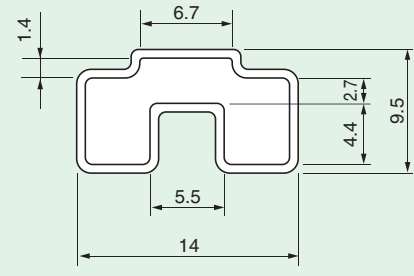
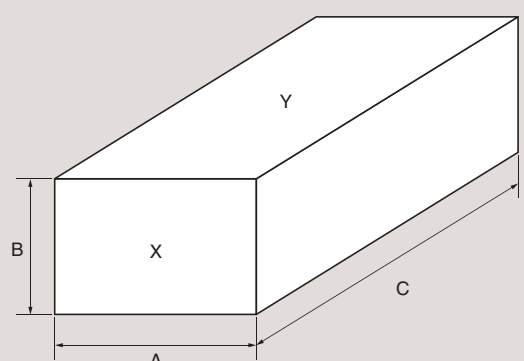
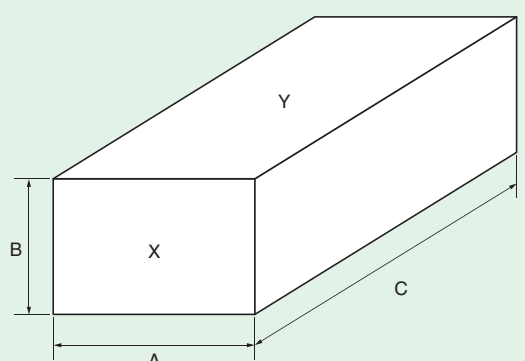
■ Safety Standards Approval

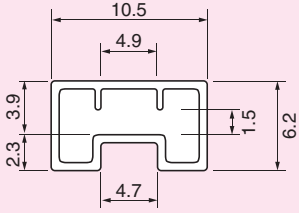
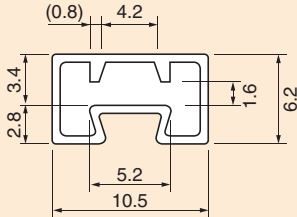
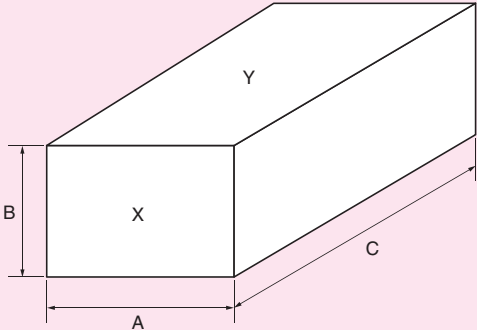
Use Toshiba standard part numbers for safety standards approved applications.

Example $\frac{\text{Part number}}{\text{TLP731 (GR-LF2)}} \longrightarrow \frac{\text{Approved part number}}{\text{TLP731}}$

6 Package Information

3 Photocoupler Magazine Packing Specifications

	Standard DIP	DIP LF1, LF2, LF4 and LF5 Lead Forming																					
Dimensions of Magazine	<p style="text-align: right;">Unit: mm</p>  <p style="text-align: center;">Length = 525 Thickness = 0.5</p>	<p style="text-align: right;">Unit: mm</p>  <p style="text-align: center;">Length = 525 Thickness = 0.5</p>																					
Quantities of Devices per Magazine	<table border="1" style="width: 100%; text-align: center;"> <tr> <td style="background-color: #d3d3d3;">Number of Pins</td> <td style="background-color: #d3d3d3;">4</td> <td style="background-color: #d3d3d3;">6</td> <td style="background-color: #d3d3d3;">8</td> <td style="background-color: #d3d3d3;">12</td> <td style="background-color: #d3d3d3;">16</td> </tr> <tr> <td style="background-color: #d3d3d3;">Quantity (pcs)</td> <td style="background-color: #d3d3d3;">100</td> <td style="background-color: #d3d3d3;">50</td> <td style="background-color: #d3d3d3;">50</td> <td style="background-color: #d3d3d3;">25</td> <td style="background-color: #d3d3d3;">25</td> </tr> </table>		Number of Pins	4	6	8	12	16	Quantity (pcs)	100	50	50	25	25									
Number of Pins	4	6	8	12	16																		
Quantity (pcs)	100	50	50	25	25																		
Packing Dimensions	<p style="text-align: right;">Unit: mm</p>  <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th style="background-color: #d3d3d3;">Quantity of Magazines</th> <th style="background-color: #d3d3d3;">Dimensions (A x B x C)</th> <th style="background-color: #d3d3d3;">Label Position</th> </tr> </thead> <tbody> <tr> <td style="background-color: #d3d3d3;">4</td> <td style="background-color: #d3d3d3;">50 x 12 x 531</td> <td style="background-color: #d3d3d3;">Y</td> </tr> <tr> <td style="background-color: #d3d3d3;">20</td> <td style="background-color: #d3d3d3;">67 x 51 x 559</td> <td style="background-color: #d3d3d3;">Y</td> </tr> <tr> <td style="background-color: #d3d3d3;">60</td> <td style="background-color: #d3d3d3;">123 x 76 x 568</td> <td style="background-color: #d3d3d3;">X</td> </tr> </tbody> </table>	Quantity of Magazines	Dimensions (A x B x C)	Label Position	4	50 x 12 x 531	Y	20	67 x 51 x 559	Y	60	123 x 76 x 568	X	<p style="text-align: right;">Unit: mm</p>  <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th style="background-color: #d3d3d3;">Quantity of Magazines</th> <th style="background-color: #d3d3d3;">Dimensions (A x B x C)</th> <th style="background-color: #d3d3d3;">Label Position</th> </tr> </thead> <tbody> <tr> <td style="background-color: #d3d3d3;">4</td> <td style="background-color: #d3d3d3;">60 x 13 x 531</td> <td style="background-color: #d3d3d3;">Y</td> </tr> <tr> <td style="background-color: #d3d3d3;">40</td> <td style="background-color: #d3d3d3;">135 x 58 x 568</td> <td style="background-color: #d3d3d3;">X</td> </tr> </tbody> </table>	Quantity of Magazines	Dimensions (A x B x C)	Label Position	4	60 x 13 x 531	Y	40	135 x 58 x 568	X
Quantity of Magazines	Dimensions (A x B x C)	Label Position																					
4	50 x 12 x 531	Y																					
20	67 x 51 x 559	Y																					
60	123 x 76 x 568	X																					
Quantity of Magazines	Dimensions (A x B x C)	Label Position																					
4	60 x 13 x 531	Y																					
40	135 x 58 x 568	X																					

	Mini-Flat Coupler (MFP)	SOP Photocoupler																		
Dimensions of Magazine	<p>Unit: mm</p>  <p>Length = 555 Thickness = 0.5</p>	<p>Unit: mm</p>  <p>Length = 555 Thickness = 0.5</p>																		
Quantities of Devices per Magazine	<table border="1"> <tr> <td>Number of Pins</td> <td>4 (MFSOP4)</td> </tr> <tr> <td>Quantity (pcs)</td> <td>150</td> </tr> </table>	Number of Pins	4 (MFSOP4)	Quantity (pcs)	150	<table border="1"> <tr> <td>Number of Pins</td> <td>4 (SOP4)</td> <td>16 (SOP16)</td> </tr> <tr> <td>Quantity (pcs)</td> <td>150</td> <td>50</td> </tr> </table> <table border="1"> <tr> <td>Number of Pins</td> <td>4 (2.54SOP4)</td> <td>6 (2.54SOP6)</td> <td>8 (2.54SOP8)</td> </tr> <tr> <td>Quantity (pcs)</td> <td>100</td> <td>75</td> <td>50</td> </tr> </table>	Number of Pins	4 (SOP4)	16 (SOP16)	Quantity (pcs)	150	50	Number of Pins	4 (2.54SOP4)	6 (2.54SOP6)	8 (2.54SOP8)	Quantity (pcs)	100	75	50
Number of Pins	4 (MFSOP4)																			
Quantity (pcs)	150																			
Number of Pins	4 (SOP4)	16 (SOP16)																		
Quantity (pcs)	150	50																		
Number of Pins	4 (2.54SOP4)	6 (2.54SOP6)	8 (2.54SOP8)																	
Quantity (pcs)	100	75	50																	
Packing Dimensions		<p>Unit: mm</p> <table border="1"> <thead> <tr> <th>Quantity of Magazines</th> <th>Dimensions (A x B x C)</th> <th>Label Position</th> </tr> </thead> <tbody> <tr> <td>4</td> <td>29 x 13 x 563</td> <td>Y</td> </tr> <tr> <td>24</td> <td>77 x 31 x 586</td> <td>Y</td> </tr> <tr> <td>60</td> <td>67 x 55 x 586</td> <td>X</td> </tr> </tbody> </table>	Quantity of Magazines	Dimensions (A x B x C)	Label Position	4	29 x 13 x 563	Y	24	77 x 31 x 586	Y	60	67 x 55 x 586	X						
Quantity of Magazines	Dimensions (A x B x C)	Label Position																		
4	29 x 13 x 563	Y																		
24	77 x 31 x 586	Y																		
60	67 x 55 x 586	X																		

Photocoupler Package Type		Typical Devices
MFC	A	TLP114A, TLP160J, TLP180, TLP190B
SOP	B	TLP280, TLP281
	C	TLP280-4, TLP281-4, TLP270D, TLP270G
	D	TLP176G, TLP176A
	E	TLP197G
	F	TLP206G, TLP206A

A: MFSOP6
B: SOP4
C: SOP16
D: 2.54SOP4
E: 2.54SOP6
F: 2.54SOP8

6 Package Information

4 Tape and Reel Specifications

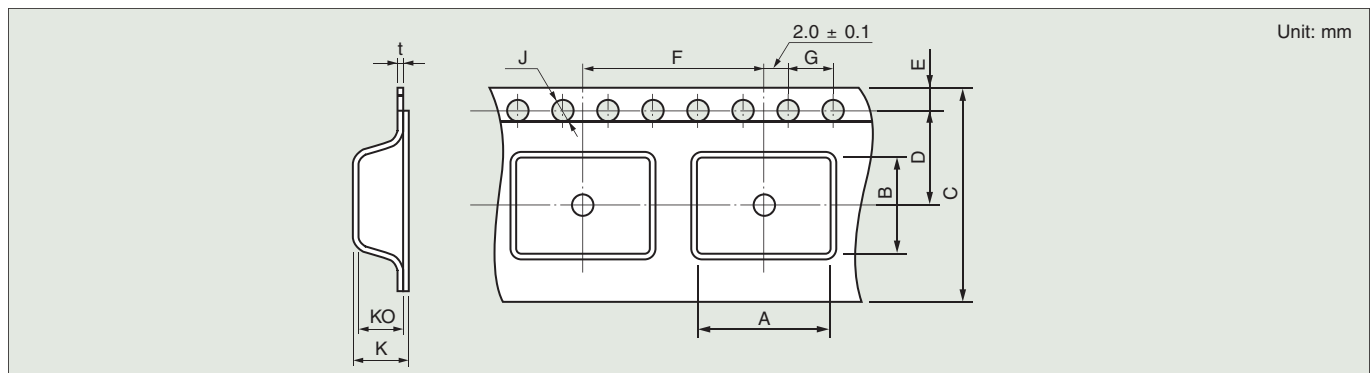
* The tape specifications differ for photocouplers manufactured in Thailand.

** For TLP781 and TLP781F, please refer individual data sheet.

1. Embossed Tape Packaging Specifications for Surface-Mount Lead Form Options

Photocoupler Package Types	Tape Option Symbol	Typical Devices
MFSOP6	(TPL) or (TPR)	TLP114A, TLP165J, TLP181, TLP190B
SOP4	(TP)	TLP280, TLP281
SOP16	(TP)	TLP280-4, TLP281-4
2.54SOP4	(TP)	TLP176G, TLP176A, TLP176D
2.54SOP6	(TP)	TLP197G
2.54SOP8	(TP)	TLP200D, TLP206A, TLP206G
SSOP4	(TP15)	TLP3212 to 3217, TLP3230 to TLP3250
SDIP6	(TP)	TLP701, TLP705, TLP719
DIP (LF1, LF5)	(TP1) or (TP5)	TLP550, TLP560G, TLP421
DIP (LF4)	(TP4)	TLP251, TLP560G, TLP421

2. Tape Dimensions



Unit: mm

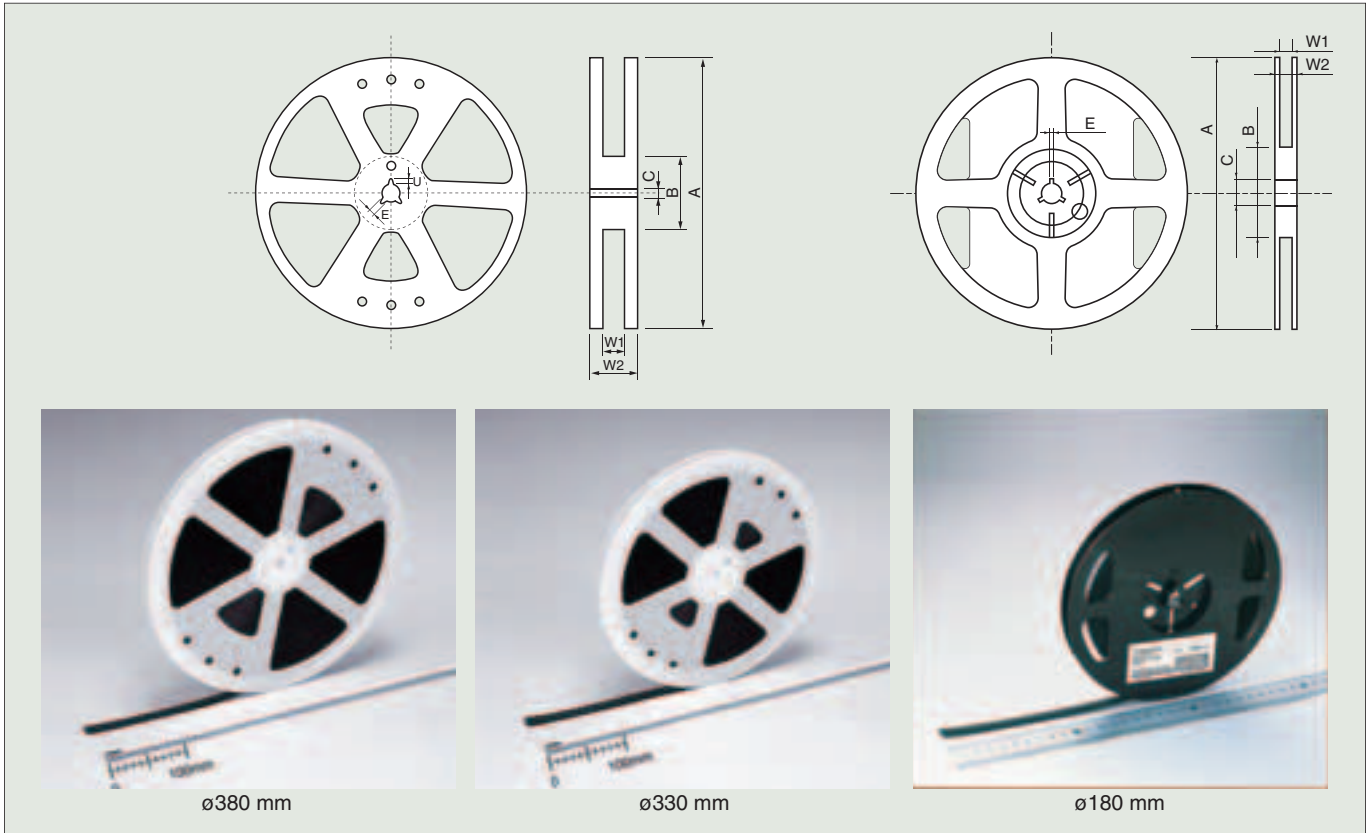
Unit: mm

Photocoupler Package Type	MFSOP6	SOP4	SOP16	2.54SOP4	2.54SOP6	2.54SOP8	SSOP4	SDIP6	SDIP6 F type	DIP (LF1, LF5)	DIP (LF4)	
Tape Option	(TPL), (TPR)	(TP)	(TP)	(TP)	(TP)	(TP)	(TP15)	(TP)	(TP)	(TP1), (TP5)	(TP4)	
Symbol (See Figure above)	A	4.2 ± 0.1	3.1 ± 0.1	7.5 ± 0.1	4.3 ± 0.1	7.5 ± 0.1	2.35 ± 0.2	10.4 ± 0.1	12.3 ± 0.1	10.4 ± 0.1	12.3 ± 0.1	
	B	7.6 ± 0.1	7.5 ± 0.1	10.5 ± 0.1	7.5 ± 0.1	6.7 ± 0.1	10.5 ± 0.1	4.5 ± 0.1	5.1 ± 0.1	*1	*1	
	C	12.0 ± 0.3		16.0 ± 0.3	12.0 ± 0.3	16.0 ± 0.3		12.0 ± 0.3	16.0 ± 0.3			
	D	5.5 ± 0.1	7.5 ± 0.1	5.5 ± 0.1	7.5 ± 0.1	5.5 ± 0.1	7.5 ± 0.1					
	E	1.75 ± 0.1										
	F	8.0 ± 0.1		12.0 ± 0.1	8.0 ± 0.1	12.0 ± 0.1		4.0 ± 0.1	12.0 ± 0.1	16.0 ± 0.1	12.0 ± 0.1	16.0 ± 0.1
	G	4.0 ± 0.1										
	J	1.5 $\begin{smallmatrix} +0.1 \\ -0 \end{smallmatrix}$										
	K	3.15 ± 0.2	2.5 ± 0.2	2.4 ± 0.2	2.6 ± 0.2	2.5 ± 0.2	2.4 ± 0.2	2.4 ± 0.2	4.55 ± 0.2			
	K0	2.8 ± 0.1	2.3 ± 0.1	2.2 ± 0.1	2.4 ± 0.1	2.3 ± 0.1	2.2 ± 0.1	2.1 ± 0.1	4.1 ± 0.1			
t	0.3 ± 0.05								0.4 ± 0.05			

*1: Typical devices

DIP4	TLP620, TLP421, TLP721	5.1 ± 0.1
DIP6 (short package)	TLP631, TLP734, TLP747G	7.6 ± 0.1
DIP8	TLP250, TLP555, TLP2601	10.1 ± 0.1 (TP4) is not available.

3. Reel Dimensions



Unit: mm

Photocopier Package Type		MFSOP	SOP4	SOP16	2.54SOP4	2.54SOP6	2.54SOP8	SSOP4	SDIP6	SDIP6 F type	DIP (LF1, LF5)	DIP (LF4)
Tape Option		(TPL), (TPR)	(TP)	(TP)	(TP)			(TP15)	(TP)	(TP)	(TP1), (TP5)	(TP4)
Symbol (See Figure above)	A	ø380 ± 2		ø330 ± 2				180 ⁺⁰ / ₋₄	ø380 ± 2			
	B	ø80 ± 1						ø60	ø80 ± 1			
	C	ø13 ± 0.5						ø13	ø13 ± 0.5			
	E	2.0 ± 0.5						2 ± 0.5	2.0 ± 0.5			
	U	4.0 ± 0.5						4.0 ± 0.5	4.0 ± 0.5			
	W1	13.5 ± 0.5		17.5 ± 0.5	13.5 ± 0.5	17.5 ± 0.5		13 ± 0.3	17.5 ± 0.5			
	W2	17.5 ± 1.0		21.5 ± 1.0	17.5 ± 1.0	21.5 ± 1.0		15.4 ± 1.0	21.5 ± 1.0			

Photocopiers Manufactured in Thailand

Photocopier Package Type		MFSOP	DIP6 (LF1,LF5,LF4)	DIP4 (LF1,LF5,LF4)	DIP8 (LF1,LF5)	
Tape Option		(TPL), (TPR)	(TP1), (TP5), (TP4)	(TP1), (TP5), (TP4)	(TP1), (TP5)	
Symbol (See Figure above)	A	ø380 ± 2		ø330 ± 2		
	B	ø80 ± 1				
	C	ø13 ± 0.5				
	E	2.0 ± 0.5				
	U	4.0 ± 0.5				
	W1	13.5 ± 0.5		17.5 ± 0.5		
	W2	17.5 ± 1.0		21.5 ± 1.0		

6 Package Information

4. Other Packing Information

(a) Device orientation on tape

The orientations of photocouplers in cavity are shown below.

A)	Photocoupler Package Type	Tape Option
	MFSOP6	TPR

B)	Photocoupler Package Type	Tape Option
	MFSOP6	TPL
	SOP4, 2.54SOP4	TP
	SSOP4	TP15

C)	Photocoupler Package Type	Tape Option
	SOP16	TP
	2.54SOP6/8	TP
	SDIP6	TP
	DIP(LF1, LF5)	TP1, TP5
	DIP(LF4)	TP4

User direction of feed

(b) Tape Specifications

■ Quantities per Reel

Photocoupler Package Type	MFSOP6	SOP4	SOP16	2.54SOP4/6/8	SSOP4	SDIP6	DIP(LF1, LF5)	DIP(LF4)
Quantities (pcs)	3000	2500	2500	2500	1500	1500	1500	1000

Photocouplers Manufactured in Thailand

Photocoupler Package Type	MFSOP	DIP6(LF1,LF5,LF4)	DIP4(LF1,LF5,LF4)	DIP8(LF1,LF5)
Quantities (pcs)	3000	1500	1000	1000

■ Empty Cavities

Item	Specification	Note
Consecutive empty cavities	Zero	Any 40 mm portion of tape except leader and trailer.
Nonconsecutive empty cavities	0.2% max/reel *2	Except leader and trailer.

*2: 6 pcs max/reel for DIP and SDIP types

(c) Packing boxes

One or five reels per box
 2 or 5 reels per box for photocouplers manufactured in Thailand

(d) Label

The reel label includes the following information.
 1. Part number 2. Tape type 3. Quantity 4. Lot number

(e) Purchase order

Specify the part number, tape and quantity as follows.

Example **TLP181 (GB-TPR) 3000 pcs**

Quantity (*)
 Symbol of tape option
 CTR rank
 Photocoupler part number

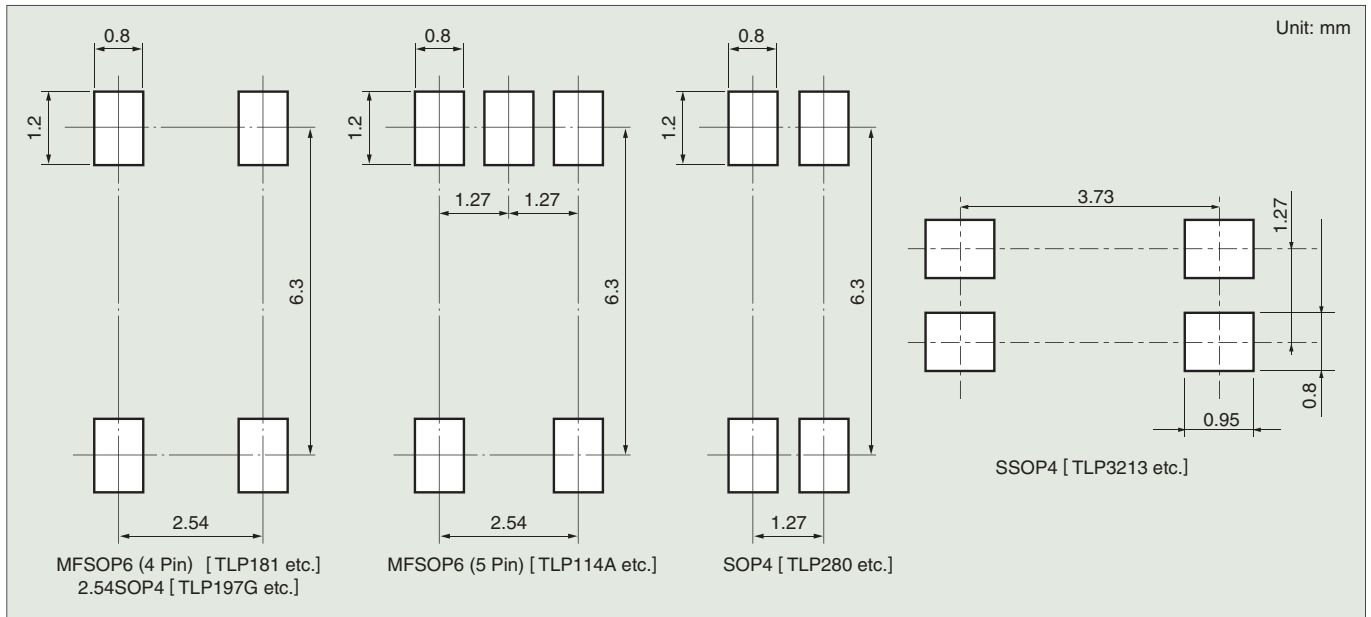
(*) Per reel must be a multiple of quantity

5 PC Board Mounting for Mini-Flat Coupler, SOP Coupler and Lead Formed Coupler

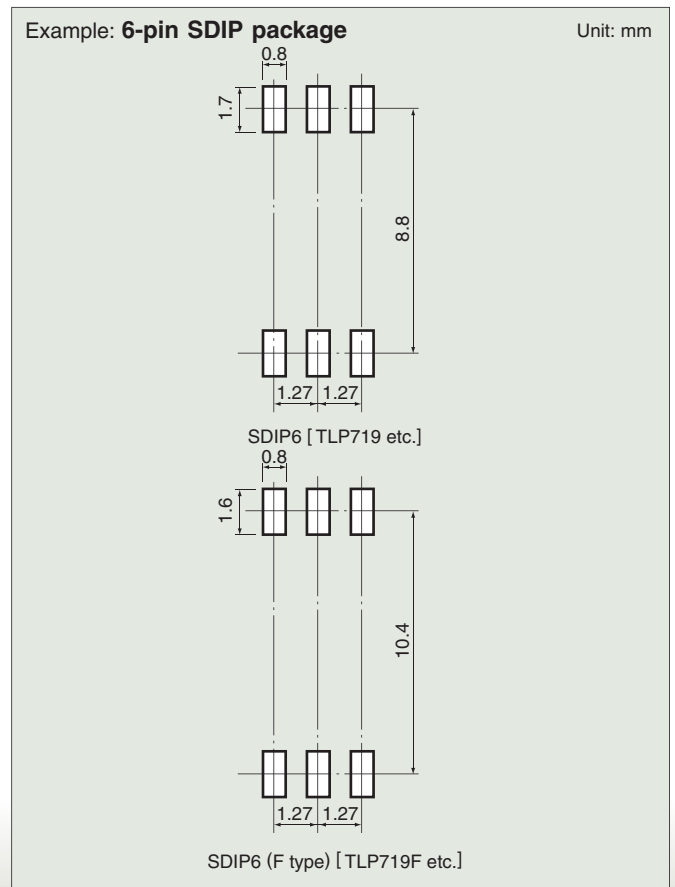
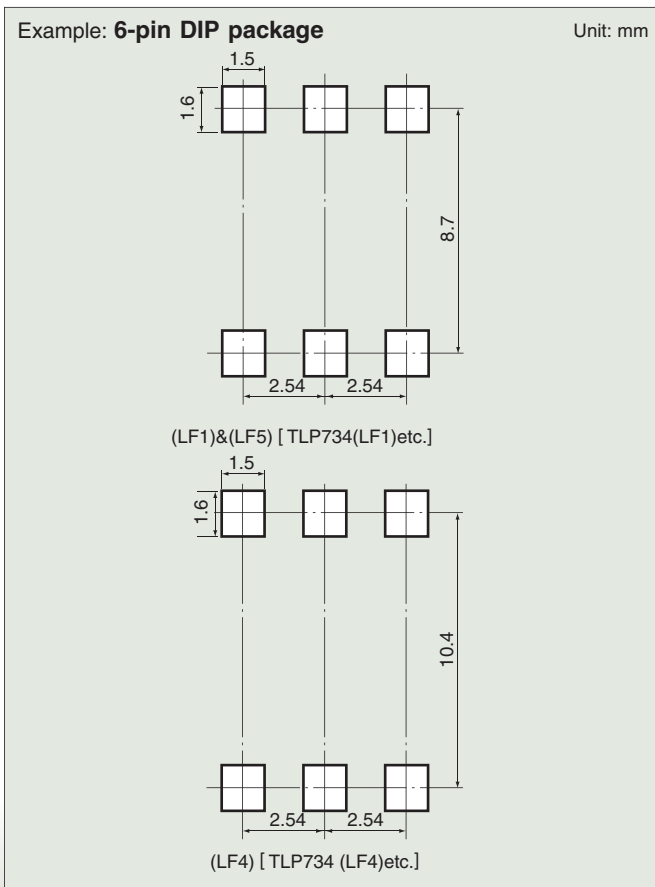
1. Recommended Footprint Dimensions

Below are the recommended footprint (mount pad) dimensions for surface-mount packages.

Mini-flat coupler and SOP couplers



Surface-Mount Lead-Formed Photocouplers



6 Package Information

2. Soldering

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.

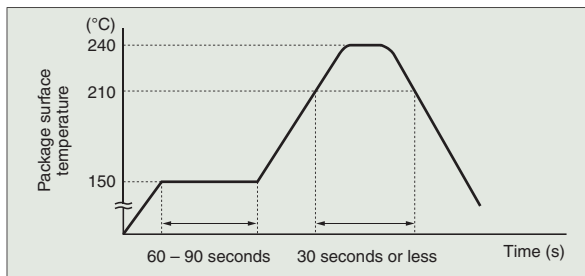
2.1) Using a soldering iron

Complete soldering within ten seconds for a lead temperature of up to 260°C.

2.2) Using medium infrared ray/hot air reflow

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

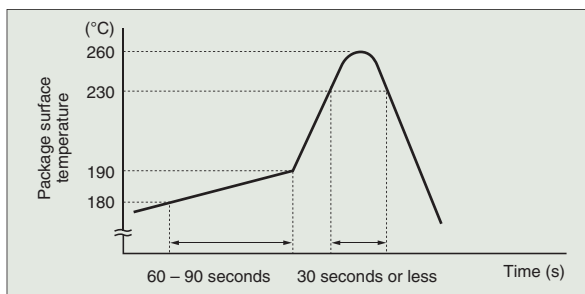
b. Example of temperature profile of lead (Pb) solder



Example of temperature profile of lead (Pb) solder

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

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 and databooks when mounting a device.



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

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 rise in package temperature.

When using a halogen lamp or infrared heater, avoid direct irradiation of packages, as this may cause a rise in package temperature.

2.3) 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 intended to use dip soldering, contact your nearest Toshiba sales representative.

3. Flux Cleaning

- When cleaning circuit boards to remove flux, make sure that no residual reactive ions such as Na or Cl 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 and chlorine 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 the danger that they pose to the earth's ozone layer. Alternative products not containing freon are available on the market. Some of these alternative cleaning agents are listed in the Table below.

Contact Toshiba or a Toshiba distributor regarding cleaning conditions and other relevant information for each product type.

Example of Alternative Cleaning Agents

Technocare	FRW-1, FRW-17, FRV-100	GE Toshiba Silicon
Asahi Clean	AK-225AES	Asahi Glass Co., Ltd
Clean Through	750H	Kao Co., Ltd.
Pine Alpha	ST-100S, ST-100SX	Arakawa Chemical Co., Ltd.

7 Supplementary Information

1 Current Transfer Ratio (CTR), LED Trigger Current (IFT) Ranking and Marking

Standard rank classifications are applied for the CTR of transistor output devices and for the I_{FT} of MOSFET, SCR and triac outputs. Indicative product markings corresponding to rank names are as shown below.

Note also that the applied rank classifications depend on product types. For details, refer to relevant technical datasheets.

1. CTR Rank Name and Rank Marking

Available CTR Rank Selection (○: Available, △: Call Toshiba)

Part Number	Rank Name									Rank Marking Group
	None	GB	Y	GR	BL	YH	GRL	GRH	BLL	
TLP180	○	○	△	○	△					①
TLP181	○	○	○	○	○	△	△	△	△	②
TLP280	○	○	△	○	△					①
TLP280-4	○	○								③
TLP281	○	○	○	○	○	△	△	△	△	①
TLP281-4	○	○								③
TLP321	○	○	○	○	○					②
TLP321-2	○	○		○	△					①
TLP321-4	○	○								③
TLP421/421F	○	○	○	○	○	△	△	△	△	TLP421
TLP521-1	○	○	○	○	○	△	△	△	△	②
TLP521-2	○	○	△	○	△					①
TLP521-4	○	○								③
TLP531/532	○	○	△	○	△					①
TLP620	○	○	△	○	△					①
TLP620-2	○	○								③
TLP620-4	○	○								③
TLP621	○	○	○	○	○	△	△	△	△	②
TLP621-2	○	○	△	○	△					①
TLP621-4	○	○								③
TLP630	○	○	△	○	△					①
TLP631/632	○	○	△	○	△					②
TLP721	○	○	△	○	△	△	△	△	△	②
TLP731/732	○	○	△	○	△					②
TLP733F/734F	○	○	△	○	△					②

* Blank list by part number

Rank Name	CTR	CTR Rank	
		Other than TLP421	TLP421
None	50 to 600%	* Refer to Blank list by part number.	Blank, Y, Y+, YE, G, G+, GR, B, B+, BL, GB
Y	50 to 150%	YE	YE
GR	100 to 300%	GR	GR
GB	100 to 600%	GB	GB
BL	200 to 600%	BL	BL
GRL	100 to 200%	G	G
GRH	150 to 300%	G■	G+

Part Number	Blank	Rank Marking Group
TLP180	Blank, YE, GR, BL, GB	①
TLP280		
TLP321-2		
TLP521-2		
TLP531/532		
TLP620		
TLP621-2		
TLP630		
TLP181	Blank, Y, Y■, YE, G, G■, GR, B, B■, BL, GB	②
TLP281		
TLP321		
TLP521-1		
TLP531		
TLP621		
TLP631		
TLP632		
TLP721		
TLP731		
TLP732		
TLP733F		
TLP734F		

Part Number	Blank	Rank Marking Group
TLP280-4	Blank, GB	③
TLP281-4		
TLP321-4		
TLP521-4		
TLP620-2		
TLP620-4		
TLP621-4		

7 Supplementary Information

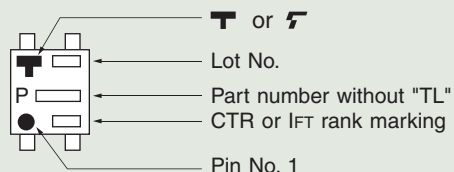
1 LED Trigger Current (IFT) Ranking and Marking

2. IFT Rank Name and Rank Marking

Rank Name	IFT	IFT Rank Marking
None	IFT max	Blank, T7, T5
IFT7	7 mA max	T7, T5
IFT5	5 mA max	T5
IFT2	2 mA max	T2 (only for photorelays)

3. Marking Example

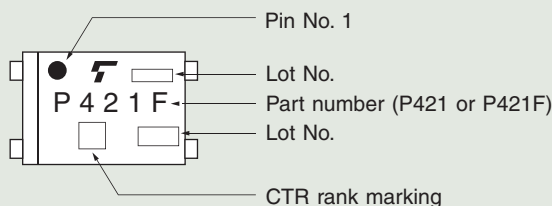
(a) 4-pin mini-flat 1-channel type



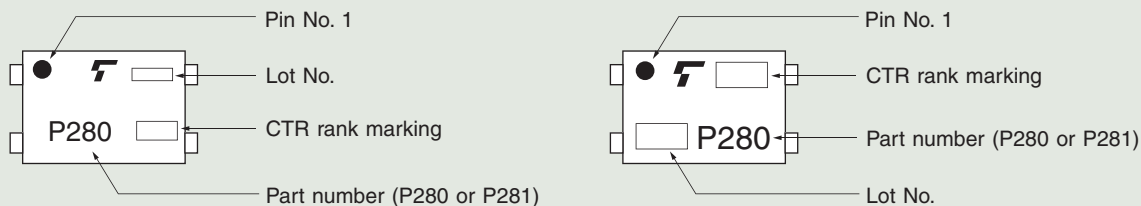
(Example: **TLP626** : P626
TLP521-1 : P521
TLP181 : P181



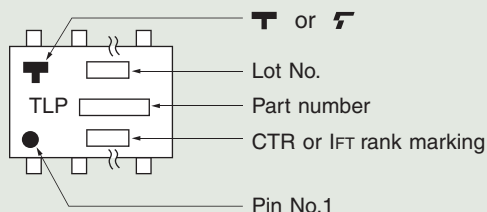
(b) TLP421, TLP421F



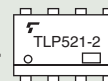
(c) TLP280, TLP281



(d) Others



(Example: **TLP521-2** : TLP521-2
TLP666GF : TLP666GF



Note: To order any standard photocoupler, add rank marking in parenthesis to the standard part number.

Example **TLP521-1 (GR)**, **TLP532 (GR)**

Use Toshiba standard part number for safety standards approved application.

Example $\frac{\text{Part number}}{\text{TLP621 (GR)}} \longrightarrow \frac{\text{Approved part number}}{\text{TLP621}}$

2 Projected Operating Life Based on LED Light Output Degradation

Toshiba photocouplers use one of three types of LEDs and a projection of the operating life is expected for each LED. The table on page 54 shows types of LED used in photocouplers and the figures on pages 55 to 57 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 ($T_a = 40^\circ\text{C}$, $I_F = 20\text{ mA}$, failure criteria: degradation rate $\Delta P_o < -50\%$)		Photocouplers
	F50% operating life	F0.1% operating life	
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

F50% (cumulative failure rate 50%) operating life: Time period until the projected long-term light output degradation curve of the average light output change (\bar{X}) shown on pages 55 to 57 reaches the failure criteria.

F0.1% (cumulative failure rate 0.1%) operating life: Time period until the projected long-term light output degradation curve of $\bar{X} - 3\sigma$ shown on pages 55 to 57 reaches the failure criteria.

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

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

$$\frac{\text{CTR}(t)}{\text{CTR}(o)} = \frac{P_o(t)}{P_o(o)}$$

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

$$\frac{I_{FT}(t)}{I_{FT}(o)} = \left(\frac{P_o(t)}{P_o(o)} \right)^{-1}$$

● How to estimate an operating life from the graph

Example: Estimate an operating life from GaAs LED projected operating life data (failure criteria $\Delta P_o < -50\%$) on page 55.

At ambient temperature of 25°C

1. Calculate absolute temperature. $25^\circ\text{C} + 273 = 298\text{ (K)}$
2. Calculate the reciprocal value of the calculated value. $1/298 = 3.36 \times 10^{-3}$
3. Read data from the graph.

Projected operating life at $T_a = 25^\circ\text{C}$, $I_F = 50\text{ mA}$ (failure criteria: light output degradation $\Delta P_o < -50\%$)

F50% (cumulative failure rate 50%) operating life: Approximately 200,000 h (reference value)

F0.1% (cumulative failure rate 0.1%) operating life: Approximately 40,000 h (reference value)

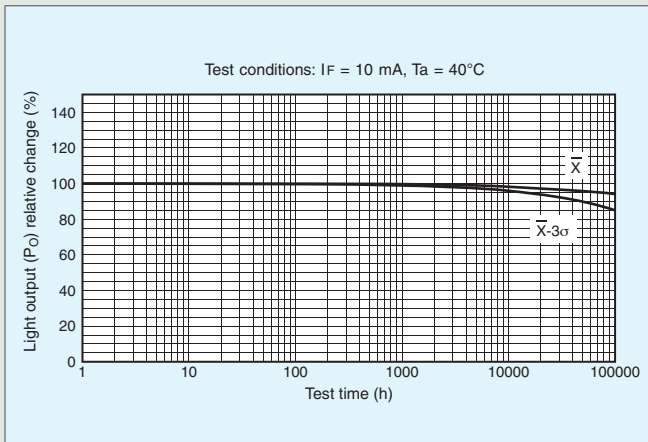
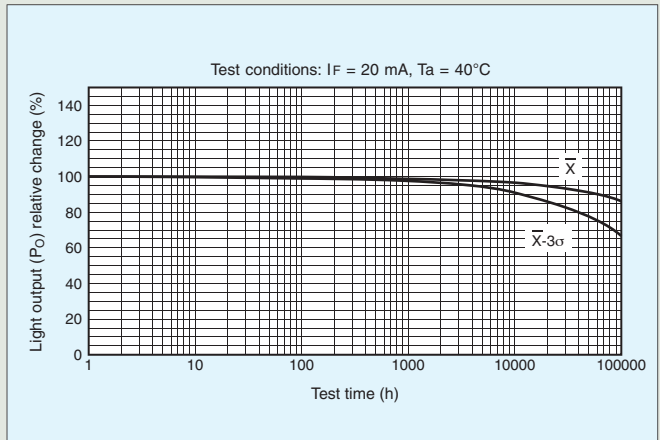
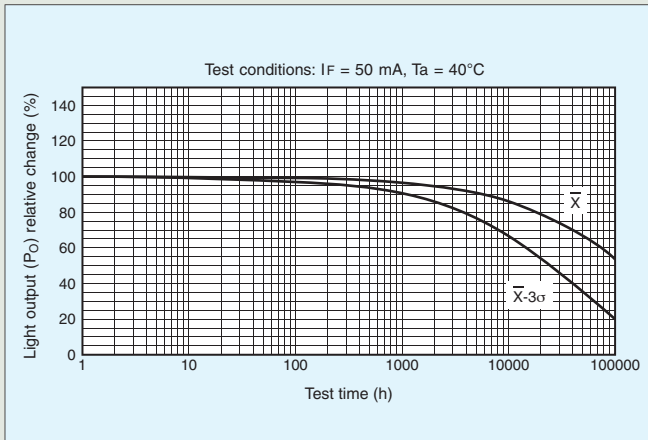
7 Supplementary Information

LED used in Photocouplers

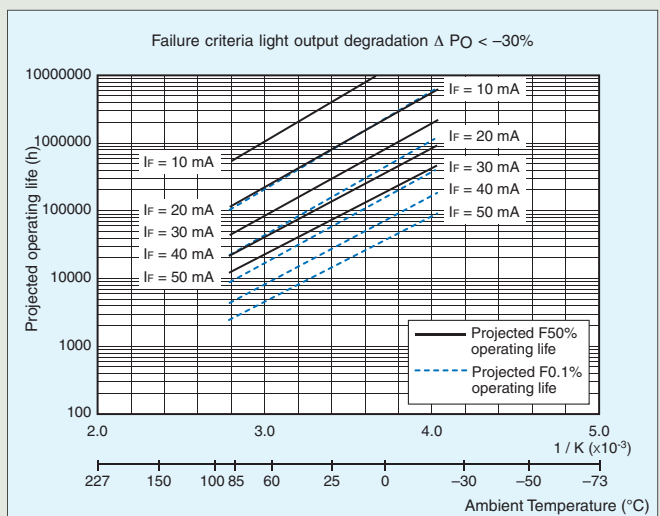
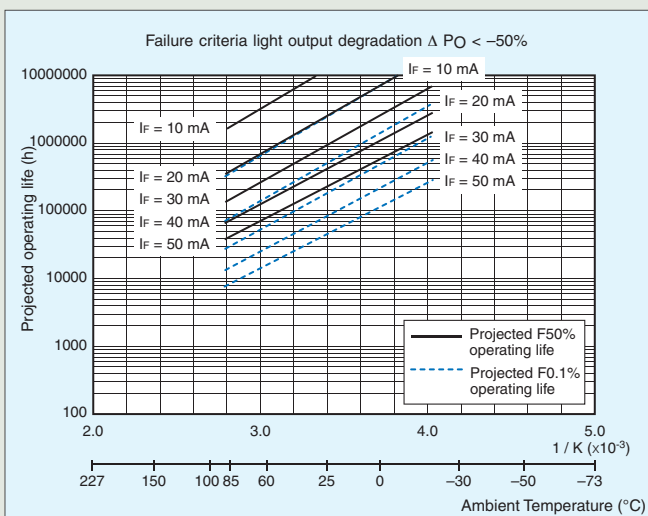
LED: ① GaAs LED ② GaAlAs (SH) LED ③ GaAlAs (DH) LED

Photocouplers	LED	Photocouplers	LED	Photocouplers	LED	Photocouplers	LED	Photocouplers	LED
4N25 (SHORT)	①	TLP141G	①	TLP360 Series	①	TLP592 Series	①	TLP798GA	③
4N25A (SHORT)	①	TLP160 Series	①	TLP361 Series	①	TLP594 Series	①	TLP2066	③
4N26 (SHORT)	①	TLP161 Series	①	TLP363 Series	①	TLP597 Series	①	TLP2200	②
4N27 (SHORT)	①	TLP163	①	TLP371	①	TLP598 Series	③	TLP2530	②
4N28 (SHORT)	①	TLP165J	①	TLP372	①	TLP599 Series	①	TLP2531	②
4N29 (SHORT)	①	TLP166J	①	TLP373	①	TLP611J	①	TLP2601	②
4N29A (SHORT)	①	TLP168J	③	TLP421 Series	①	TLP620 Series	①	TLP260J	①
4N30 (SHORT)	①	TLP172 Series	①	TLP504A	①	TLP621 Series	①	TLP2630	②
4N31 (SHORT)	①	TLP174G	①	TLP511GA	①	TLP624 Series	①	TLP2631	②
4N32 (SHORT)	①	TLP176 Series	①	TLP512	②	TLP626 Series	①	TLP3022(S) Series	①
4N32A (SHORT)	①	TLP180	①	TLP513	②	TLP627 Series	①	TLP3042(S) Series	①
4N33 (SHORT)	①	TLP181	①	TLP521-1	①	TLP628 Series	①	TLP3063(S) Series	③
4N35 (SHORT)	①	TLP190B	③	TLP521-2	①	TLP629 Series	①	TLP31xx Series	①
4N36 (SHORT)	①	TLP191B	③	TLP521-4	①	TLP630	①	TLP32xx Series	①
4N37 (SHORT)	①	TLP192 Series	①	TLP523 Series	①	TLP631	①	TLP3230	①
4N38 (SHORT)	①	TLP197 Series	①	TLP525G Series	①	TLP632	①	TLP3231	①
4N38A (SHORT)	①	TLP200D	①	TLP531	①	TLP641 Series	①	TLP3240	③
6N135	②	TLP202 Series	①	TLP532	①	TLP651	②	TLP3241	③
6N136	②	TLP206 Series	①	TLP541G	①	TLP700	③	TLP3250	③
6N137	②	TLP222 Series	①	TLP542G	①	TLP701	②	TLP3540	①
6N138	②	TLP224G Series	①	TLP543J	①	TLP702	②	TLP3762(S) Series	①
6N139	②	TLP225A	①	TLP545J	①	TLP705	②	TLP3904	①
TLP102	②	TLP227 Series	①	TLP550	②	TLP706	②	TLP3914	③
TLP106	②	TLP250 Series	②	TLP551	②	TLP716	②	TLP3924	③
TLP112	②	TLP251 Series	②	TLP552	②	TLP719	②	TLP4xxx Series	①
TLP112A	③	TLP260J	①	TLP553	②	TLP722	②		
TLP113	②	TLP270 Series	①	TLP554	②	TLP731	①		
TLP114A	③	TLP280 Series	①	TLP555	②	TLP732	①		
TLP115	②	TLP281 Series	①	TLP557	②	TLP733 Series	①		
TLP115A	③	TLP283 Series	①	TLP558	②	TLP734 Series	①		
TLP116	③	TLP296G	①	TLP559	②	TLP741 Series	①		
TLP117	③	TLP320 Series	①	TLP560 Series	①	TLP747 Series	①		
TLP124	①	TLP330	①	TLP561 Series	①	TLP750 Series	②		
TLP126	①	TLP331	①	TLP570	①	TLP751 Series	②		
TLP127	①	TLP332	①	TLP571	①	TLP759 Series	②		
TLP130	①	TLP350	②	TLP572	①	TLP762J Series	①		
TLP131	①	TLP351	②	TLP590B	③	TLP763J Series	①		
TLP137	①	TLP351A	②	TLP591B	③	TLP797 Series	①		

① GaAs LED Projected Light Output Degradation Data



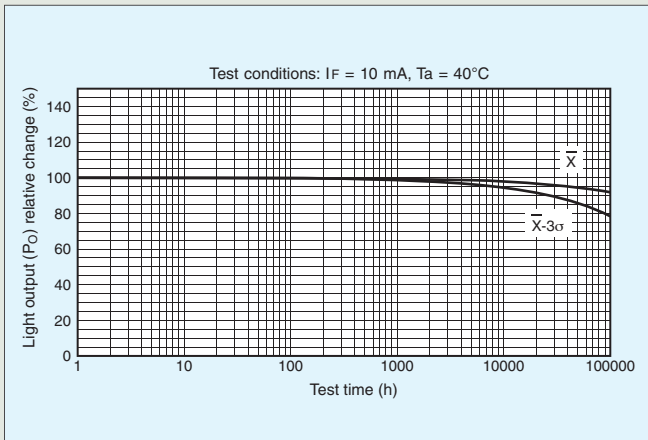
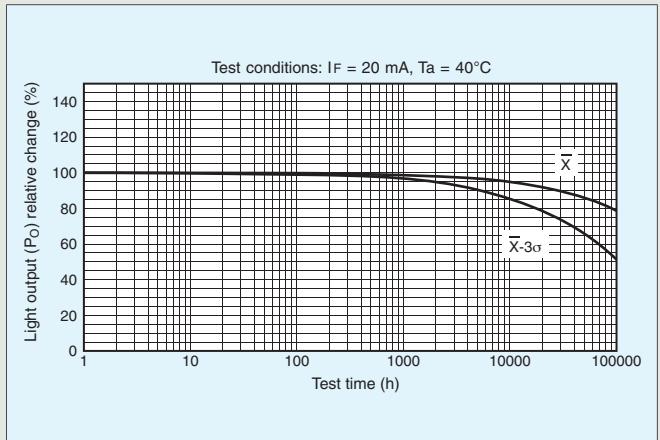
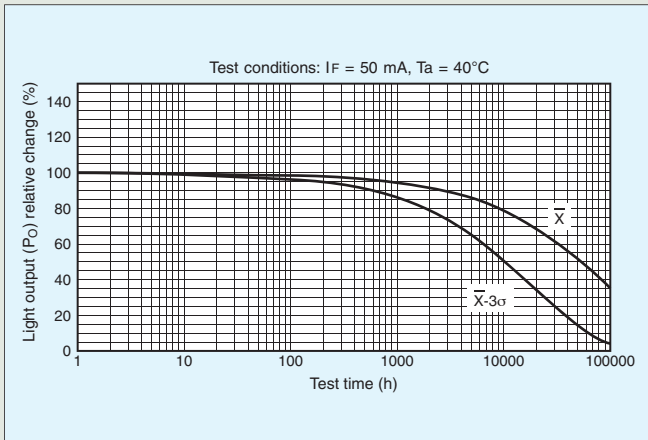
① GaAs LED Projected Operating Life Data



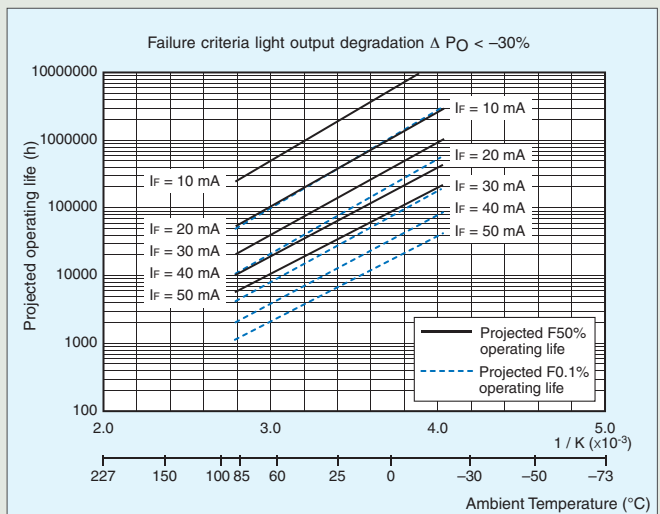
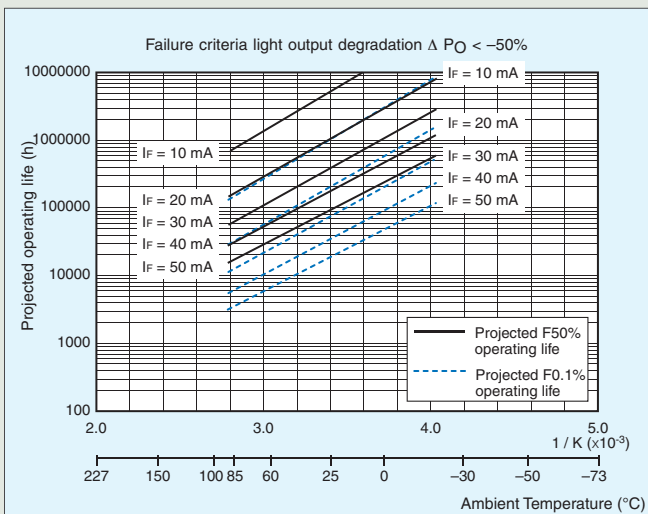
The above operating life data are estimates extrapolated from long-term light output degradation over a single wafer lot and are shown as reference only. Operating conditions exceeding the maximum ratings are not guaranteed.

7 Supplementary Information

② GaAlAs (SH) LED Projected Light Output Degradation Data

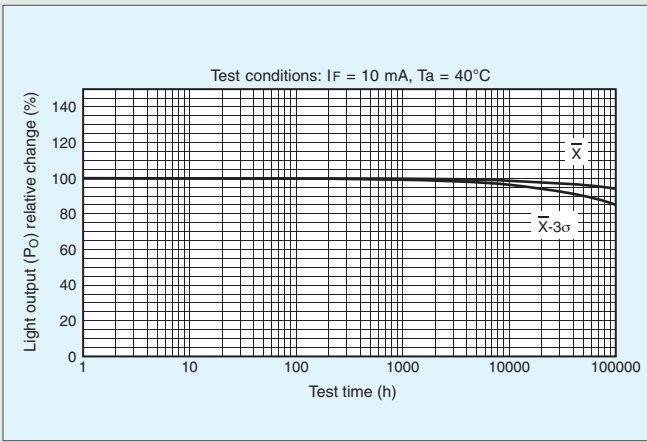
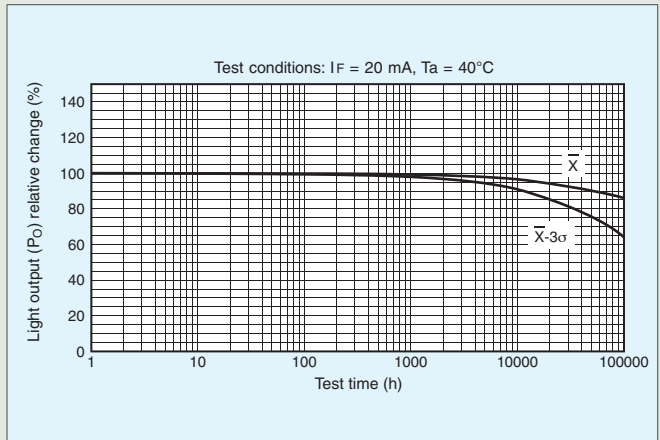
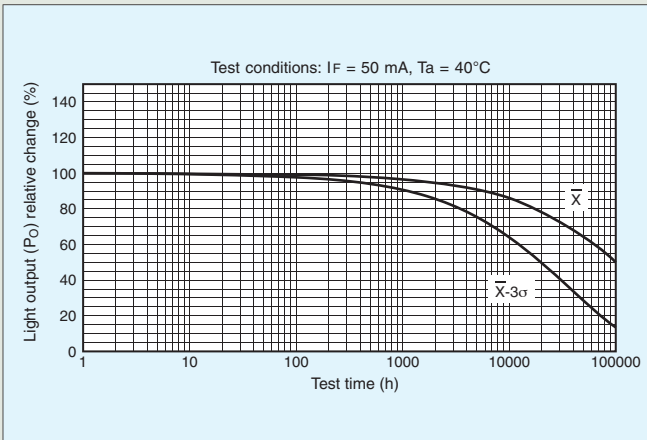


② GaAlAs (SH) LED Projected Operating Life Data

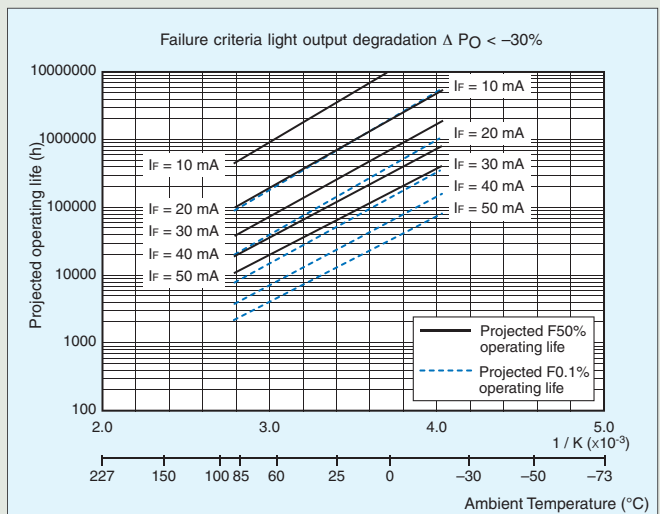
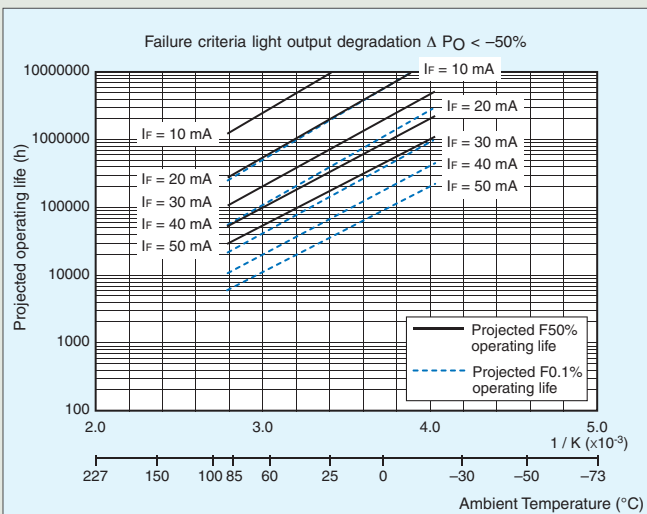


The above operating life data are estimates extrapolated from long-term light output degradation over a single wafer lot and are shown as reference only. Operating conditions exceeding the maximum ratings are not guaranteed.

③ GaAlAs (DH) LED Projected Light Output Degradation Data



③ GaAlAs (DH) LED 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.

8 Safety Standard Approved Photocouplers

Toshiba's extensive line of photocouplers is approved under UL (USA), VDE (Germany), BSI (England), SEMKO (Sweden). These devices offer a wide selection of output (transistor, thyristor and triac) and are suited to a range of applications including switching power supplies and solid state relays. When requiring VDE(EN60747)-approved devices, be sure to specify option D4.

Example: Standard part number: TLP731(GR)

Part number when an EN60747-5-2 approved type is needed : TLP731(D4-GR)

■ Safety Standards Approval





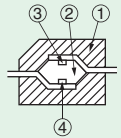
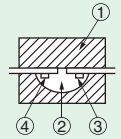
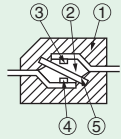
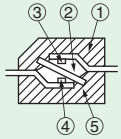
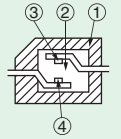
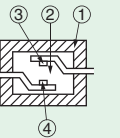
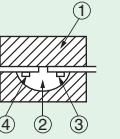
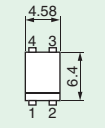
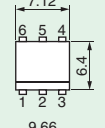
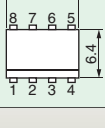
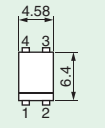
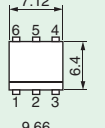
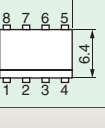
Use Toshiba standard part numbers for safety standards approved applications.

Example

Part number	Approved part number
TLP731(D4-GR)	TLP731

1 Safety Standard Approvals for Photocouplers

(As of December 2007)

Safety Standard	Part number	Approved part number	
   	TLP421 TLP521-1 TLP531 / 532 TLP541G / 545J TLP550 / 551 TLP560G / 561G	TLP620 / -2 / -4 TLP621 / -2 / -4 TLP750 / 751 TLP631 / 632 TLP641G / 641J TLP651 TLP360J TLP361J	
	TLP227G TLP227G-2 TLP350 TLP351 TLP597G	TLP620 / -2 / -4 TLP621 / -2 / -4 TLP627 / -2 / -4 TLP701 TLP705 TLP719	TLP3022(S) TLP3042(S) TLP3052(S) TLP3062(S)
	TLP227G TLP227G-2 TLP421 TLP597G	TLP620 / -2 / -4 TLP621 / -2 / -4 TLP624 / -2 / -4 TLP626 / -2 / -4 TLP627 / -2 / -4 TLP750 / 751	TLP798GA
	TLP222G TLP222G-2 TLP227G TLP227G-2 TLP421 TLP597G	TLP620 / -2 TLP621 / -2 TLP627 / -2	TLP798GA
Internal Construction (Cross-Section)	① Body ② Window ③ Detector ④ LED ⑤ Film	 TLP421 	    TLP180/181/280/281 
	Package Dimensions (Unit: mm)	  	  

2 Device Type, Construction Mechanical Ratings and Safety Standard Approvals

Device Type	4-pin multi-channel photocoupler	TLP181**/ TLP180	-	-	TLP280/TLP281	-	-		
	Transistor Output	-	TLP131	-	-	-	-		
	Thyristor Output	-	-	-	-	TLP141G	-		
	Triac Output	-	-	TLP165J/ TLP166J	-	TLP160J/ TLP161J	-		
	IC Output	-	TLP114A	-	-	-	-		
	Photorelay	-	-	-	-	-	TLP176G TLP206G		
Construction Mechanical Ratings (min)	Package	MFSOP		SOP		MFSOP	2.54SOP		
	Isolation Creepage Path (mm)	4.0		4.0		4.0			
	Isolation Clearance (mm)	4.0		4.0		4.0			
	Isolation Thickness (mm)	0.4	-	0.4	-	-	-		
	Internal Creepage Path (mm)	-		-		-			
	Isolation Voltage (kVrms)	3.75		2.5		2.5		1.5	
	Internal Construction (Cross Section)	① Body ② Window ③ Detector ④ LED ⑤ Film							
<ul style="list-style-type: none"> ● Safety Standard Approved ◎ Reinforced insulation (SELV) ○ Basic insulation (ELV) 		UL1577 (File No. E67349)	Parts Specifications	●	●	●			
		Double Protection	-	-	-				
		DIN EN60747-5-2 (Note 1)	Parts Specifications	●**	○	●	●*	○	○
		DIN IEC65/ VDE 0860/08.81	Home Appliances	○	○	○	○		
		DIN IEC380/ VDE 0806/08.81	Office Equipment	○	○	○	○		
		DIN IEC435/ VDE 0805/08.79	Data processing Equipment	○	○	○	○		
		DIN57 804 VDE 0804/01.83	Data processing Equipment	○	○	○	○		
		DIN57 700T1/ VDE 0700T1/2.81	Home Appliances	○	○	○	○		
		DIN IEC601T1/ VDE 0750T1/05.82	Medical Equipment	○	○	○	○		
		BS EN60065: 2002	Home Appliances	●	○	●	○	●	
		BS EN60950-1: 2002	Office Equipment	●	○	●	○	●	
		SEMKO SS-EN60950	Office Equipment	●	-	●	-	●	

Note 1: EN60747-5-2 standards for MFSOP and SOP photocouplers are different from those of standard DIP photocouplers because MFSOP and SOP are compact and small packages. When EN60747-5-2 approved type is needed, please designate "option(D4)" or "option(V4)".

* : Only applied to the TLP281

** : Only applied to the TLP181

8 Safety Standard Approved Photocouplers

2 Device Type, Construction Mechanical Ratings and Safety Standard Approvals

Device Type		TLP624/ TLP626	TLP621*/ TLP620/ TLP627	-	-	-	-	TLP521-1	TLP421	
Transistor Output		-	-	-	TLP733/ TLP734	-	-	-	-	
Thyristor Output		-	-	-	TLP747G/ TLP747J	-	-	-	-	
Triac Output		-	-	-	-	TLP762J/ TLP763J	TLP3022(S) TLP3032(S) TLP3042(S) TLP3062(S)	-	-	
IC Output		TLP750/ TLP751	-	TLP701/ TLP719	-	-	-	-	-	
Photorelay		-	-	-	-	-	-	-	-	
Construction Mechanical Ratings (min)		DIP		SDIP	DIP		DIP	DIP	DIP	
Isolation Creepage Path (mm)		6.4	7.0	7.0	7.0	7.0	7.0	6.4	7.0	
Isolation Clearance (mm)		6.4	8.0 (Note 2)	8.0 (Note 2)	8.0 (Note 2)	8.0 (Note 2)	8.0 (Note 2)	6.4	8.0 (Note 2)	
Isolation Thickness (mm)		0.4	0.4	0.4	0.5	0.5	0.5	-	0.4	
Internal Creepage Path (mm)		-	-	-	4.0	-	-	-	-	
Isolation Voltage (kVRms)		5.0	5.0	5.0	4.0	5.0	5.0	2.5	5.0	
Internal Construction (Cross Section)										
<ul style="list-style-type: none"> ● Safety Standard Approved ○ Reinforced insulation (SELV) ○ Basic insulation (ELV) 		UL1577 (File No. E67349)	Parts Specifications	●	●	●	●	●	●	●
		Double Protection	-	●*	-	-	-	-	-	-
		DIN EN60747-5-2 (Note 1)	Parts Specifications	○	●	●	●	●	-	-
		DIN IEC65/ VDE 0860/08.81	Home Appliances	○	○	○	○	○	○	○
		DIN IEC380/ VDE 0806/08.81	Office Equipment	○	○	○	○ (Note 2)	○	○	○
		DIN IEC435/ VDE 0805/08.79	Data processing Equipment	○	○	○	○ (Note 2)	○	○	○
		DIN57 804 VDE 0804/01.83	Data processing Equipment	○	○	○	○	○	○	○
		DIN57 700T1/ VDE 0700T1/2.81	Home Appliances	○	○	○	○	○	○	○
		DIN IEC601T1/ VDE 0750T1/05.82	Medical Equipment	○	○	○	○ (Note 2)	○	○	○
		BS EN60065: 2002	Home Appliances	●	○	●	●	●	○	●
BS EN60950-1: 2002		Office Equipment	●	○	●	●	●	○	●	
	SEMKO SS-EN60950	Office Equipment	● (Note 3)	-	●	●	●	-	●	

Note 1: EN60747-5-2 standards for MFSOP and SOP photocouplers are different from those of standard DIP photocouplers because MFSOP and SOP are compact and small packages. When EN60747-5-2 approved type is needed, please designate "option(D4)" or "option(V4)".

Note 2: Applied to (LF2) or F type.

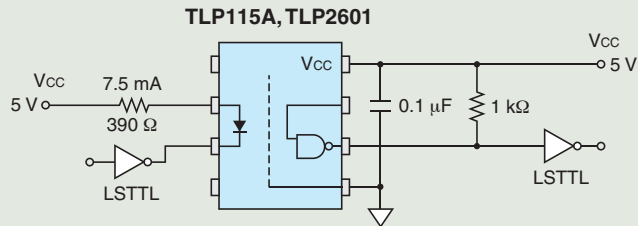
Note 3: The TLP621, TLP620 and TLP627 are approved.

*: Only applied to the TLP621

9 Photocoupler Application Circuit Example

1 Digital Interface Applications

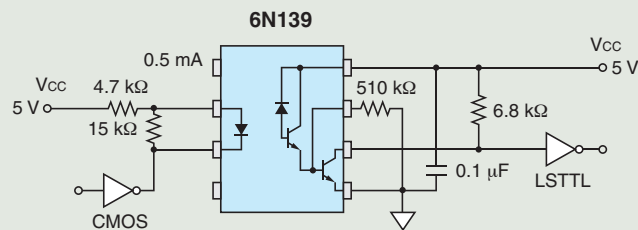
High Speed



By using the high-speed **TLP2061** (the equivalent MFC⁽¹⁾ version is the **TLP115A**), high-speed data transmission is possible up to approximately 5 MHz.

f (typ.): 5 Mbit/s (duty cycle \approx 1/2)

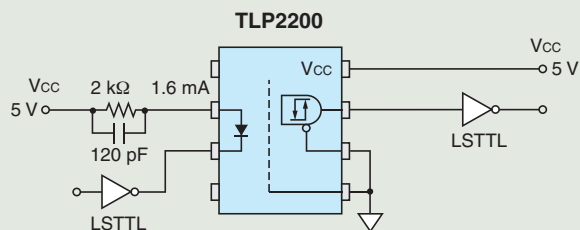
Low Input Current Drive



Use of the high-CTR (current transfer ratio) **6N139** enables operation by low input current (0.5 mA), and direct driving with a CMOS.

f (typ.): 50 kbit/s (duty cycle \approx 1/2)

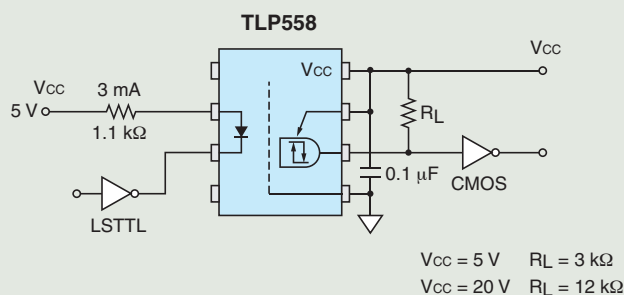
No Pull-up Resistor Required



When the 3-state-output **TLP2200** is used, the next-step logic gate can be actuated without using a pull-up resistor.

f (typ.): 1 Mbit/s (duty cycle \approx 1/2)

High Vcc Tolerance



By using the **TLP558** which accepts a wide range of V_{cc} (up to 20 V), the CMOS logic gates and other components can be operated with high V_{cc} .

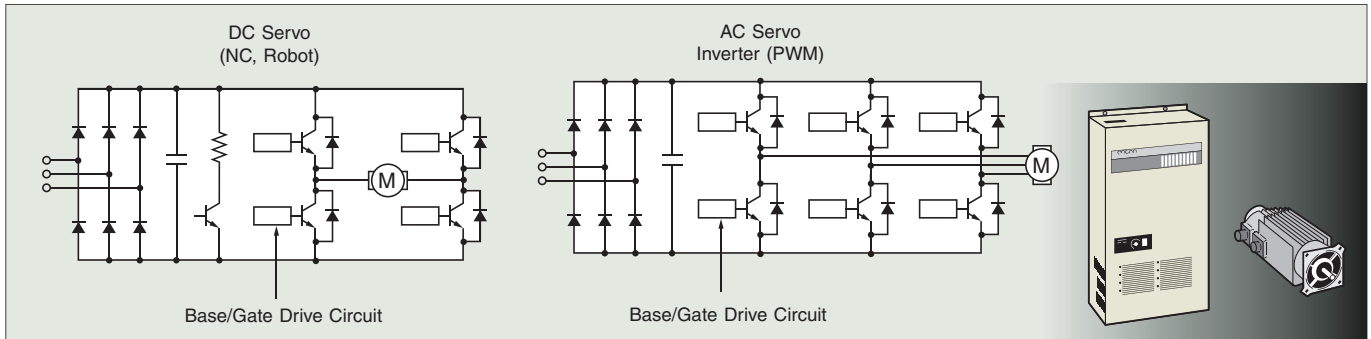
f (typ.): 1 Mbit/s (duty cycle \approx 1/2)

9 Photocoupler Application Circuit Example

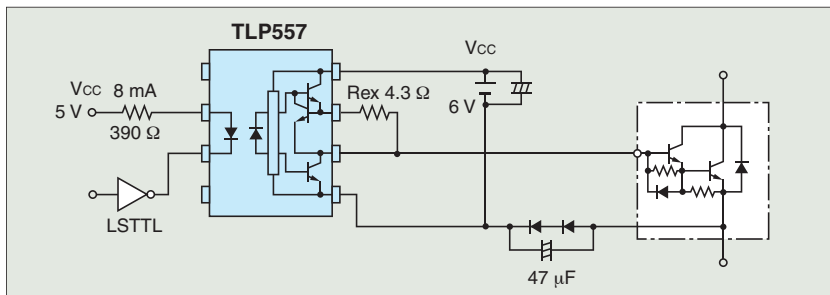
2 Inverter and AC-DC Servo Applications

[Photo-IC coupler, high-speed base/gate drive circuit application]

- | | |
|---|--|
| TLP112A/TLP550
TLP114A/TLP559
TLP759 | GTR Direct Drive ————— TLP557 |
| | IGBT / Power MOS Direct Drive ————— (for medium-power IGBTs): TLP250/TLP350/TLP700
(for small-power IGBTs): TLP251/TLP351/TLP701/TLP705 |
| | High-Speed ————— TLP115A/TLP554 |

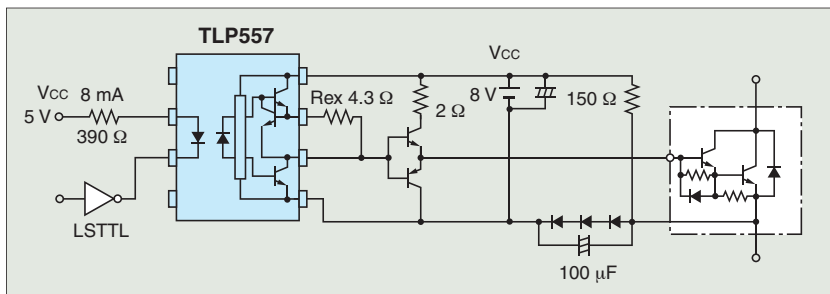


15-A Class GTR (Giant Transistor) Module Base Drive



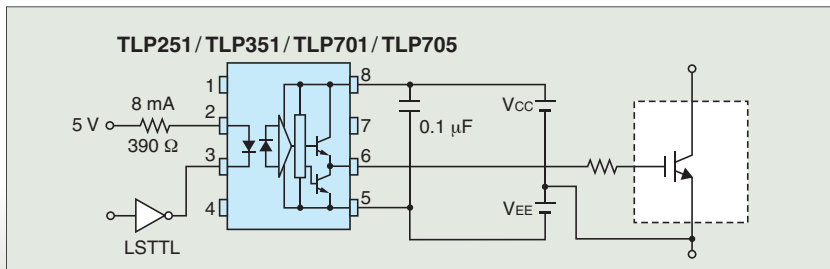
The **TLP557** drives a GTR base directly. An external resistor R_{ex} is connected between pins 6 and 7. This resistor causes the drive base current to become constant and stabilizes the GTR drive.

100-A Class GTR Module Base Drive



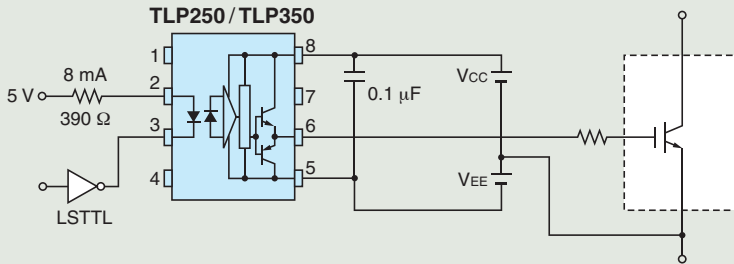
The **TLP557** photo-IC coupler and two booster transistors can drive a high-power GTR.

15-A Class IGBT (Insulated Gate Bipolar Transistor) Module Gate Drive



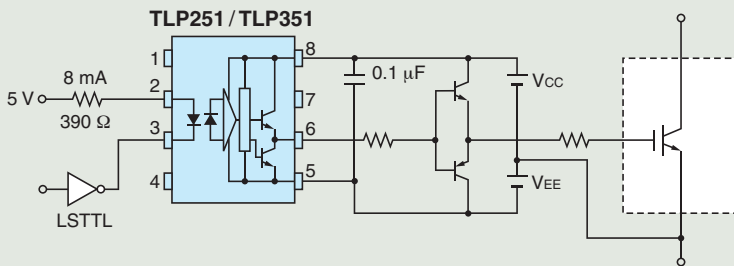
The **TLP251/TLP351/TLP701/TLP705** high-speed photo-IC photocoupler can drive a low power IGBT directly.

50-A Class IGBT Module Gate Drive



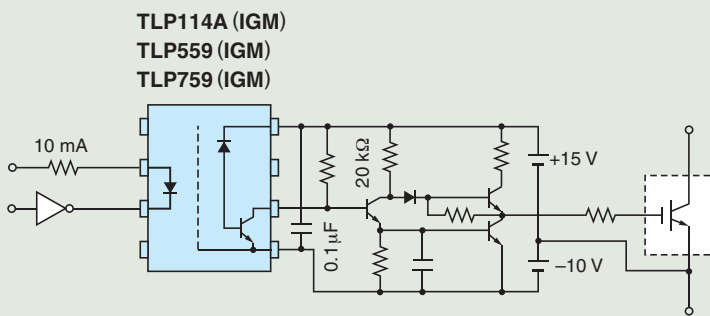
The **TLP250 / TLP350 / TLP700** can drive a medium power IGBT directly.

400-A Class IGBT Module Gate Drive



The **TLP251 / TLP351 / TLP701 / TLP705** high-speed photo-IC photocoupler and two booster transistors can drive a high power IGBT.

IGBT Module Gate Drive Using IGM Selection



IGM selection is suitable for driving an intelligent power module (IPM). The device has a guaranteed propagation delay difference $|t_{PLH} - t_{PHL}|$ and provides a high common transient immunity.

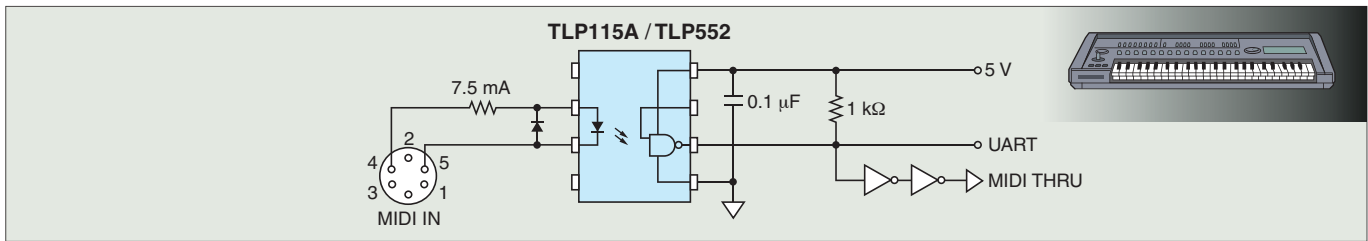
IGM Selection

Part Number	Package	BVs	V_o/V_{cc}	CTR	$ t_{PLH} - t_{PHL} $	CMH	CML
TLP114A (IGM)	MFSOP6	3750 Vrms	20 V / 30 V max	25% min 75% max @ $I_F = 10$ mA $V_{CC} = 4.5$ V $V_o = 0.4$ V	0.7 μ s max @ $I_F = 10$ mA $R_L = 20$ k Ω	10000 V / μ s min @ $I_F = 0$ mA $R_L = 20$ k Ω $V_{CM} = 1500$ Vp-p	- 10000 V / μ s min @ $I_F = 10$ mA $R_L = 20$ k Ω $V_{CM} = 1500$ Vp-p
TLP559 (IGM)	DIP8	2500 Vrms					
TLP759 (IGM)	DIP8	5000 Vrms					

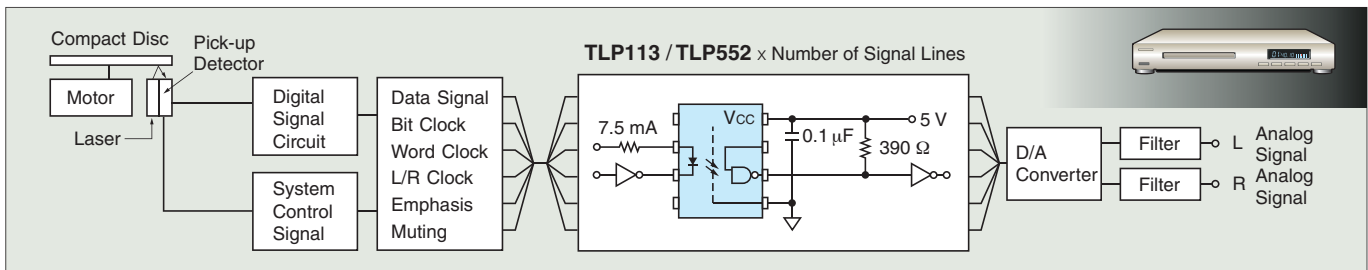
9 Photocoupler Application Circuit Example

3 TV and Audio Applications

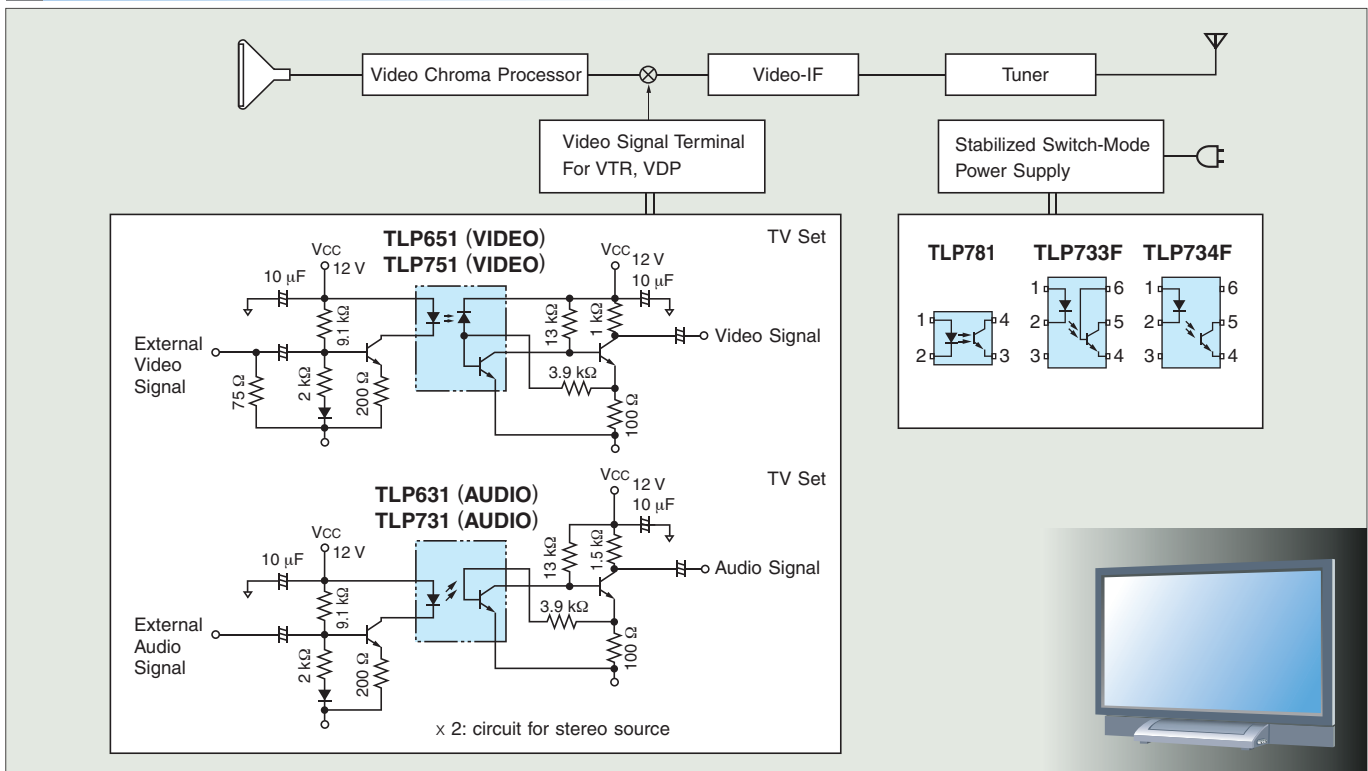
"MIDI" Interfaces for Electronic Musical Instruments



Compact Disc Players



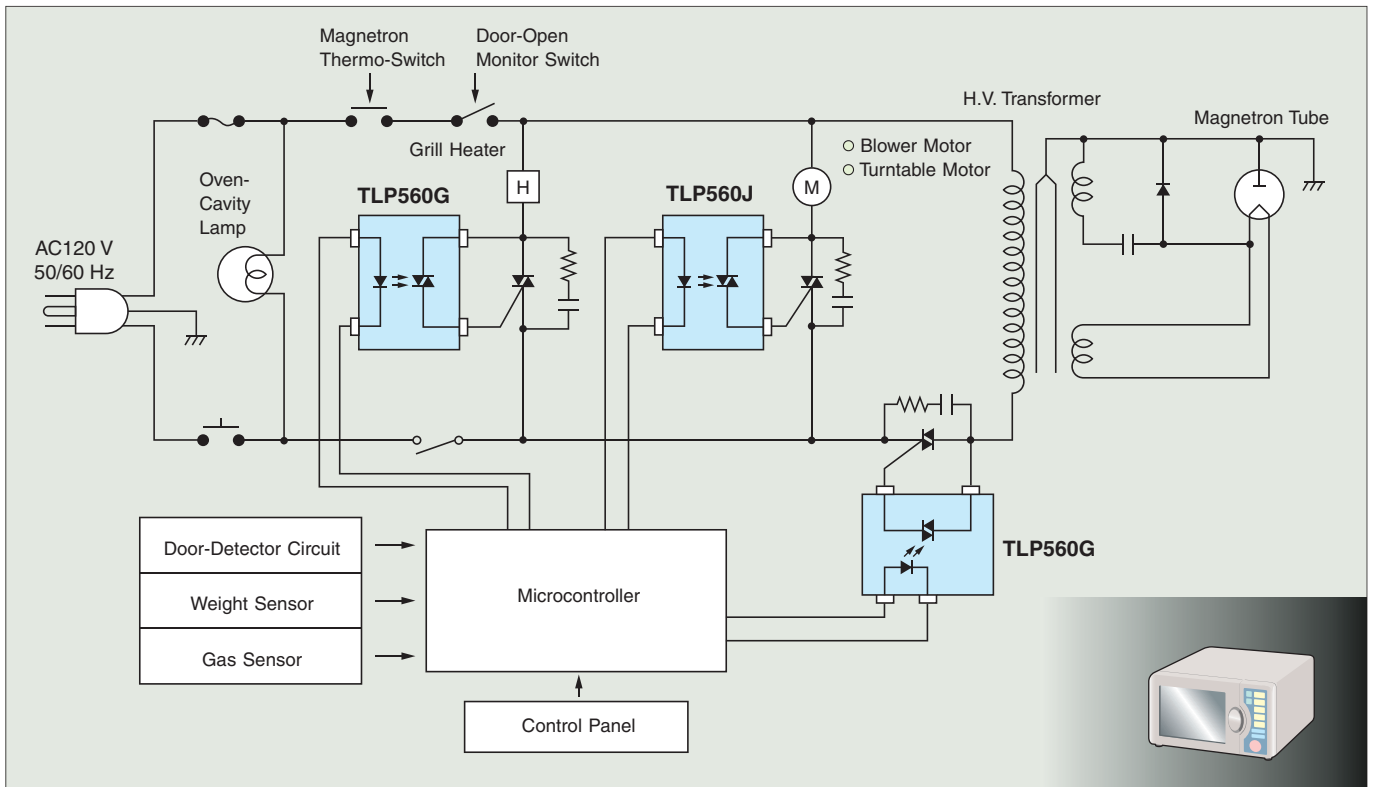
TV/AV Terminal Isolations



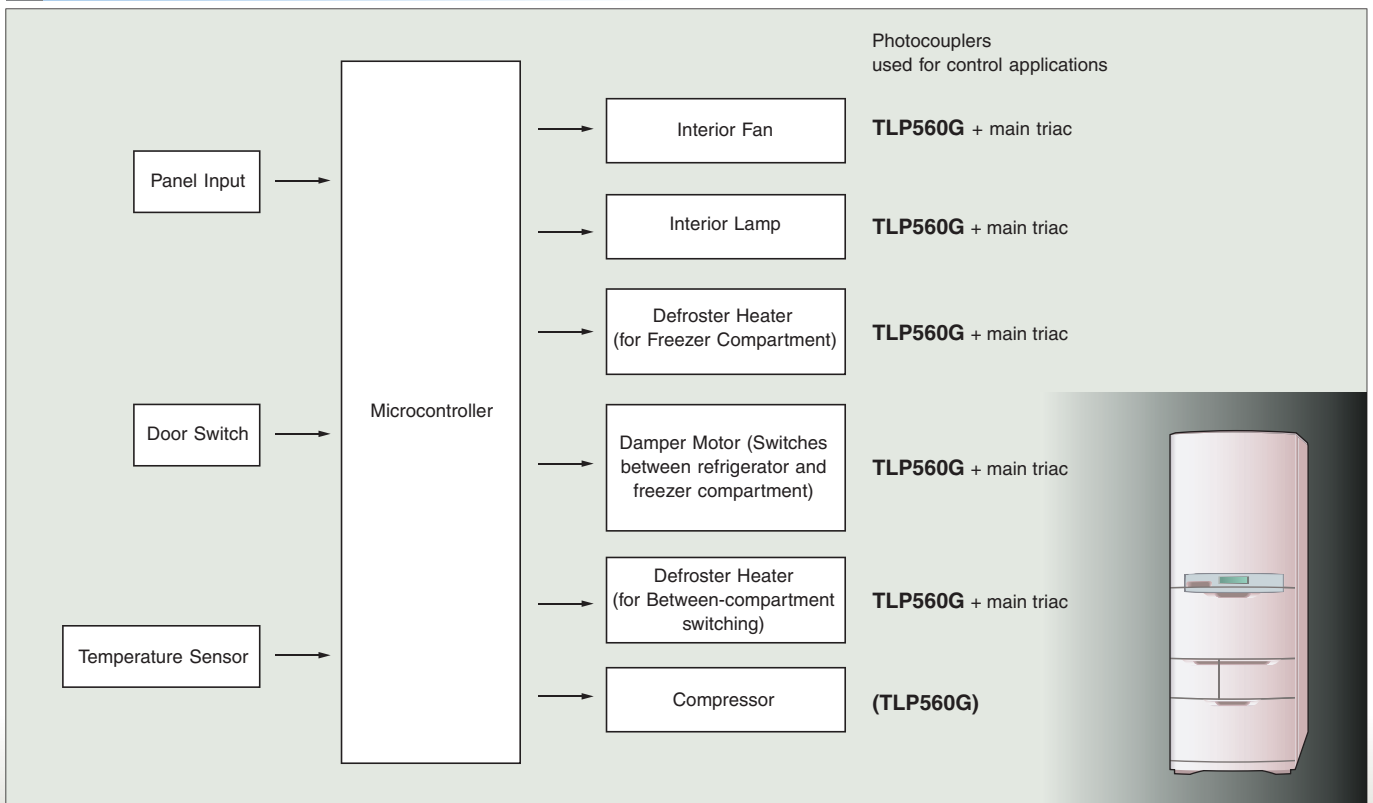
Part Number	Isolation Voltage	Band Width	Voltage Gain
TLP651 (VIDEO)	5000 Vrms	> 4.5 MHz	0.5 to 2
TLP751 (VIDEO)	5000 Vrms		0.4 to 1.8
TLP631 (AUDIO)	5000 Vrms	> 100 kHz	0.7 to 2
TLP731 (AUDIO)	4000 Vrms		

4 Home Appliance Applications

Oven/Grill Sets



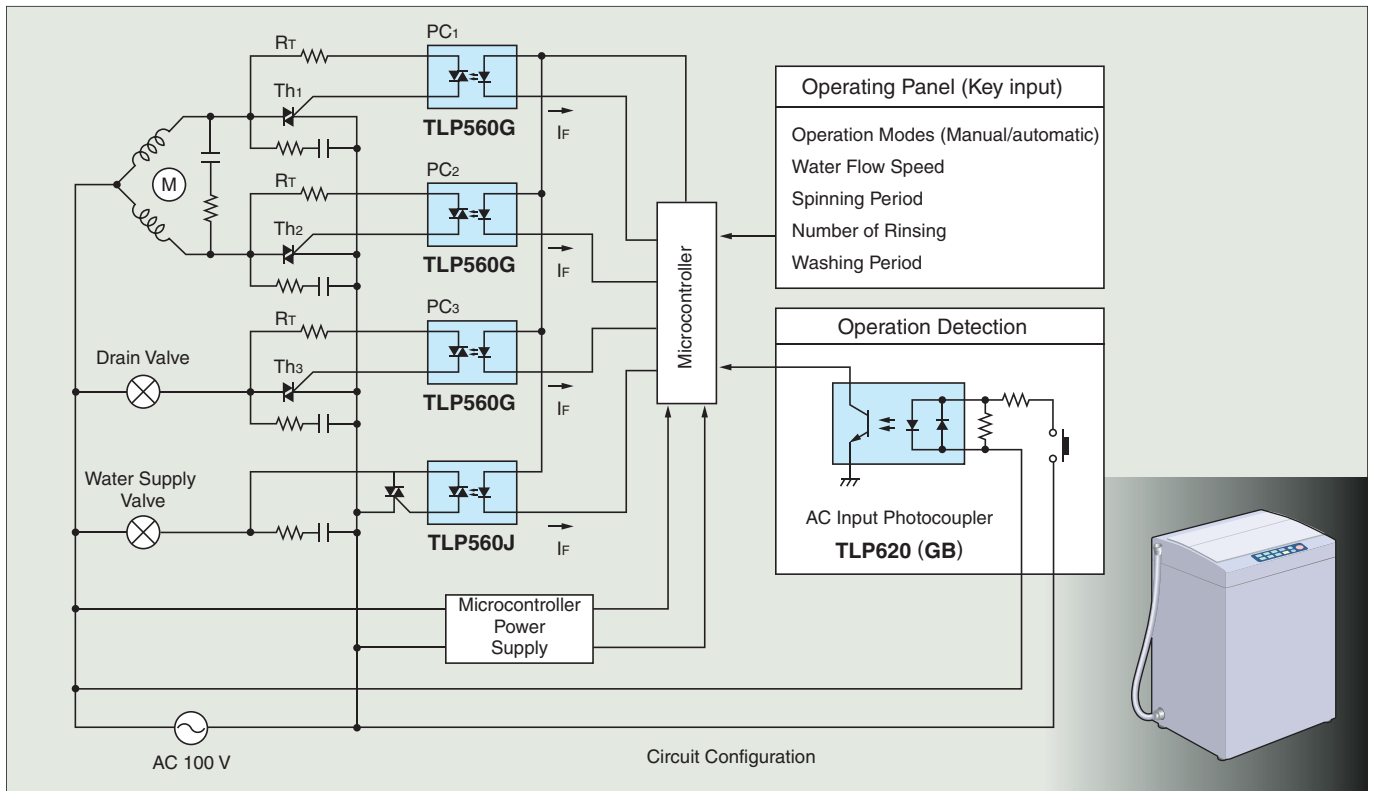
Block Diagram for Refrigerators



9 Photocoupler Application Circuit Example

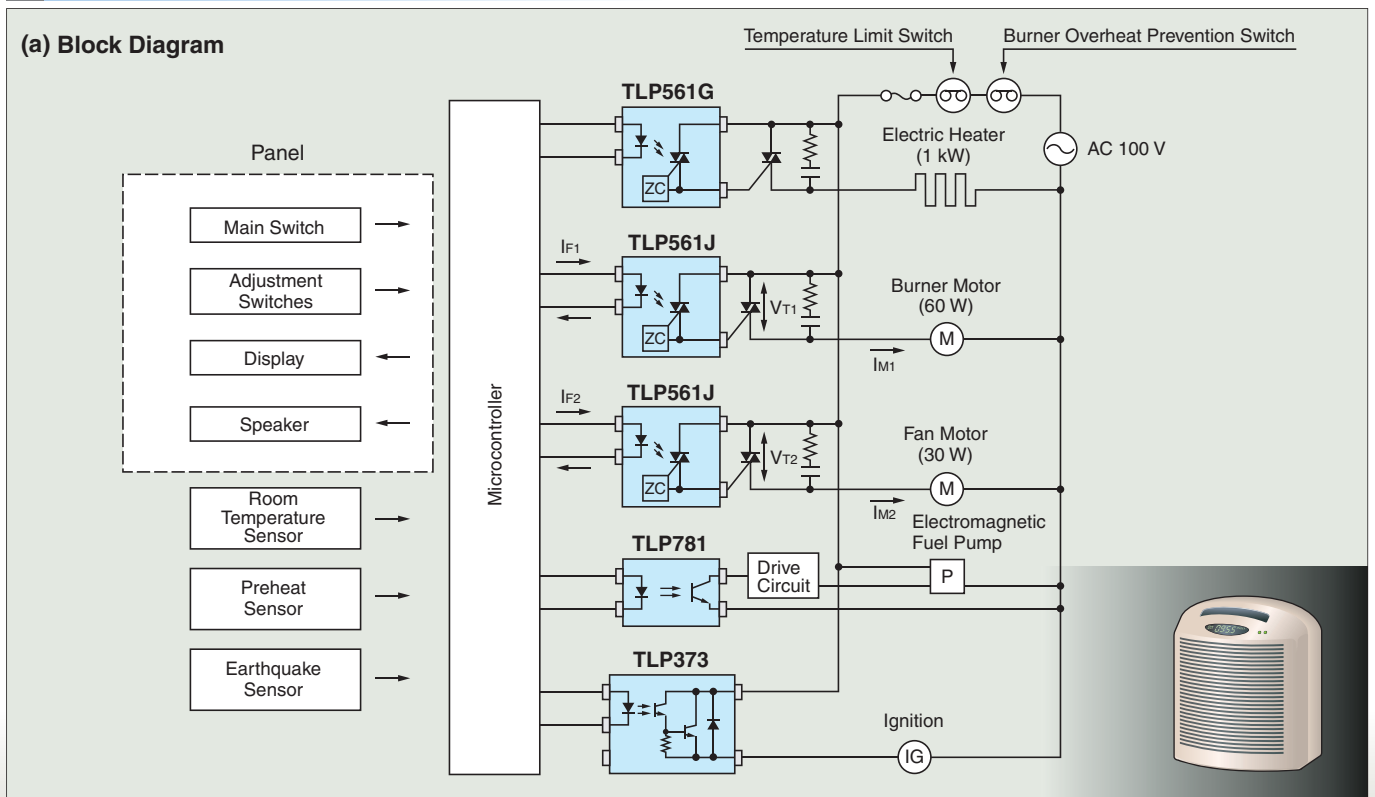
Home Appliance Applications (continued)

Automatic Washing Machines



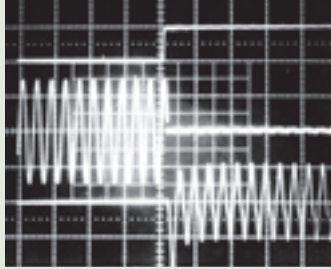
Fan Heaters

(a) Block Diagram



(b) Waveform Examples

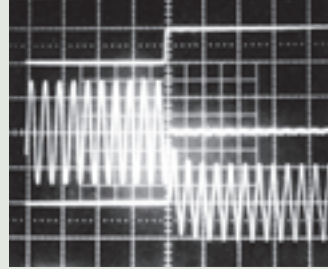
1. Example of Operating Waveform for Burner Motor



Trigger Point

Top: I_{F1} 20 mA/div
 Medium: V_{T1} 100 V/div
 Bottom: I_{M1} 1 A/div
 Horizontal: time 50 ms/div

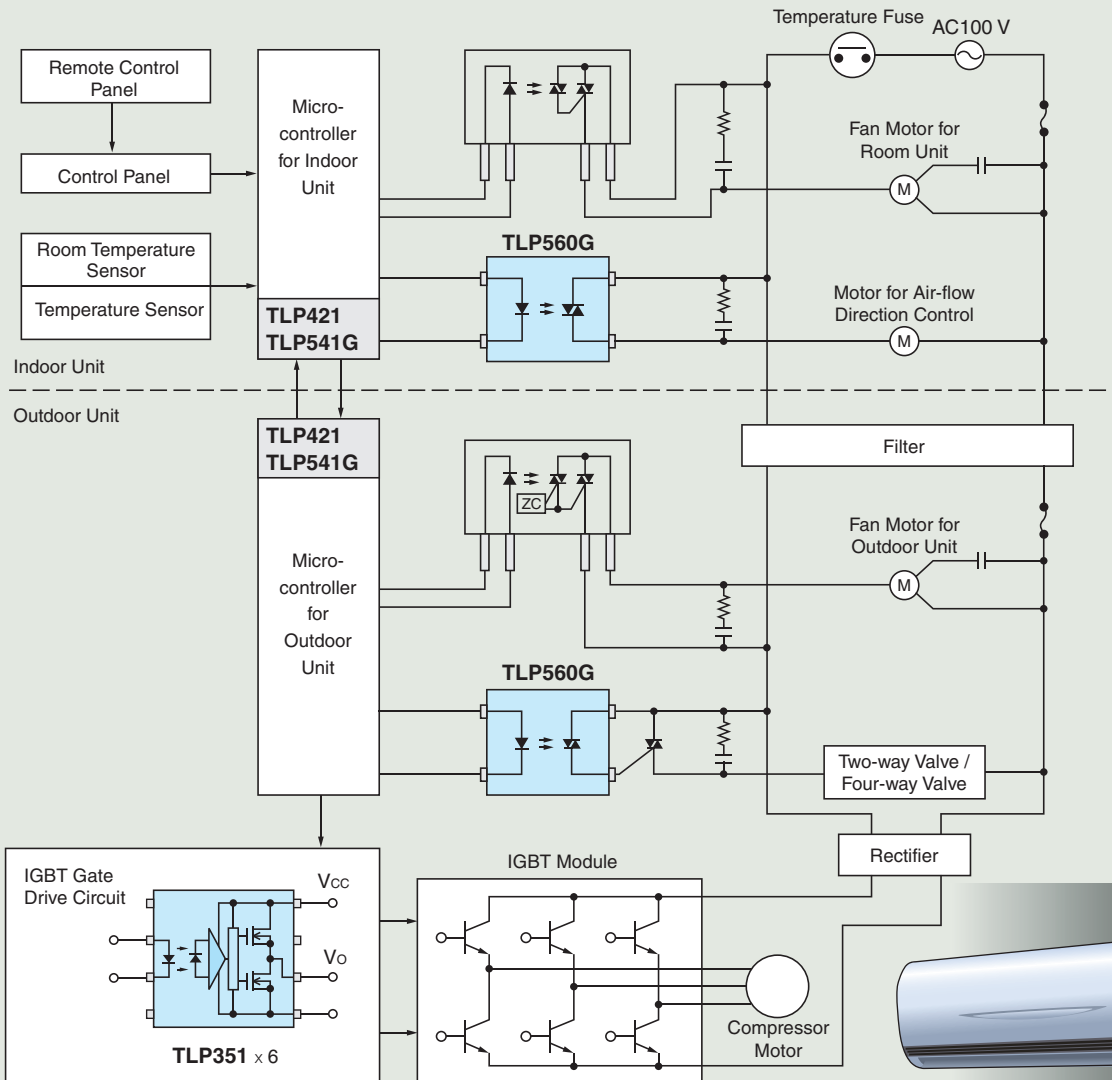
2. Example of Operating Waveform for Fan Motor



Trigger Point

Top: I_{F2} 20 mA/div
 Medium: V_{T2} 100 V/div
 Bottom: I_{M2} 0.5 A/div
 Horizontal: time 50 ms/div

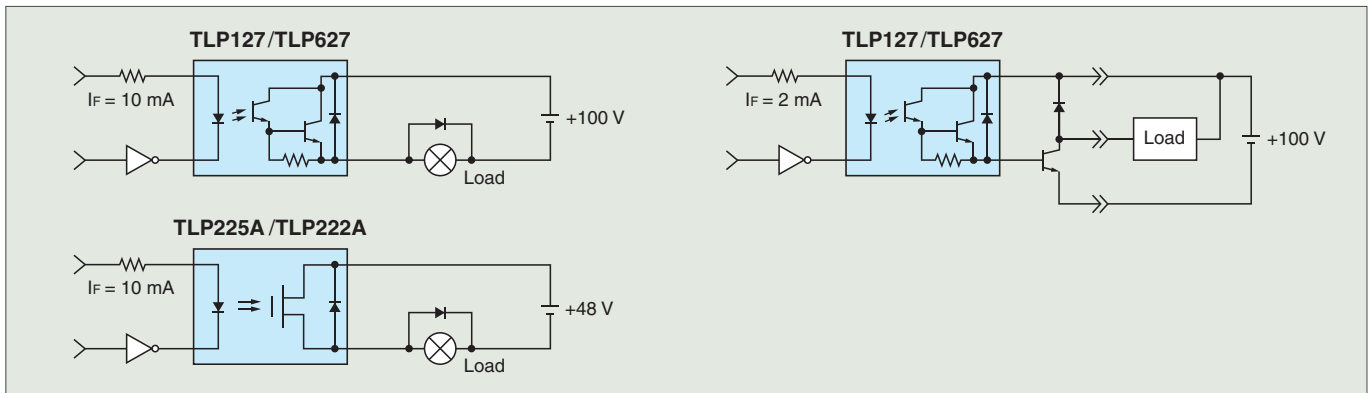
Inverter Air Conditioners



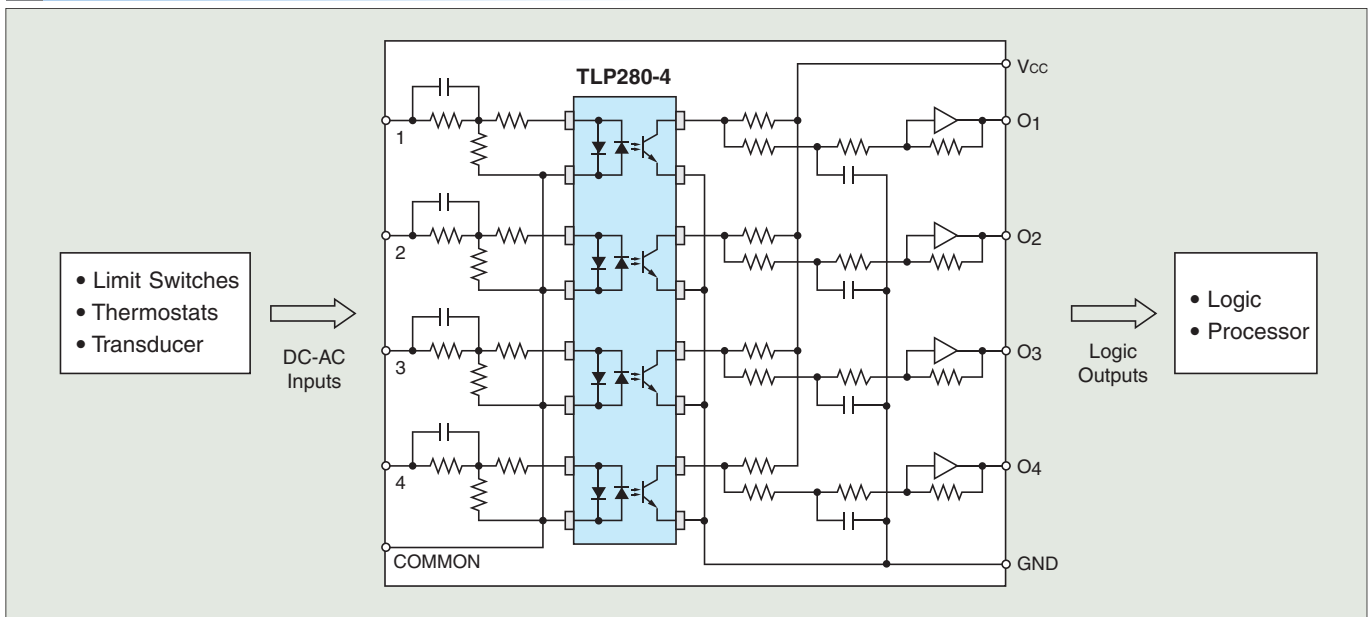
9 Photocoupler Application Circuit Example

5 Programmable Controller Applications

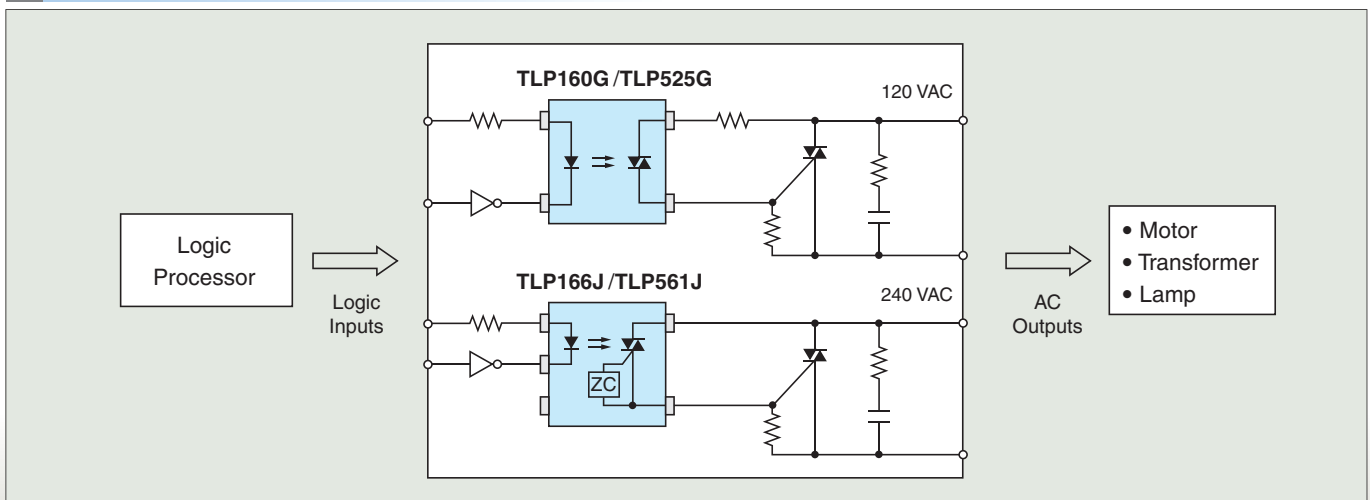
DC Output for Sequencers



AC Input for Sequencers

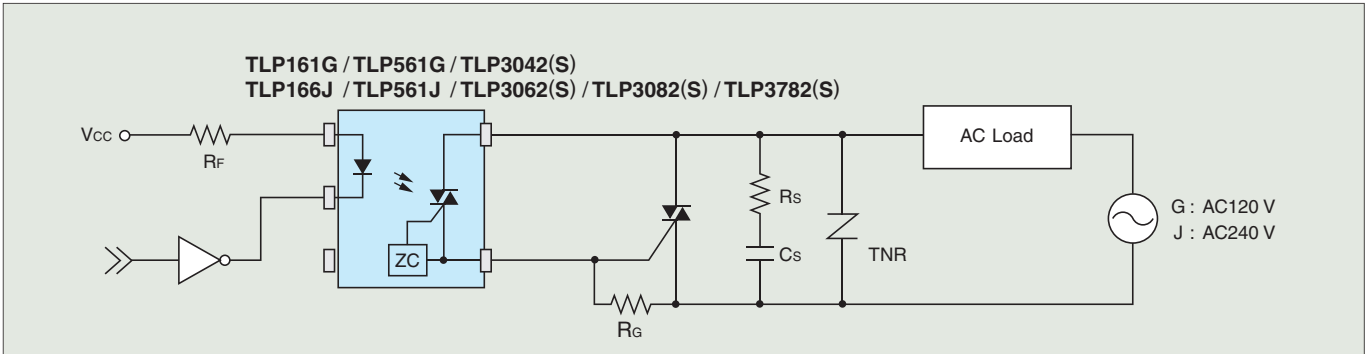


120-/240-V AC Output for Sequencers and SSRs

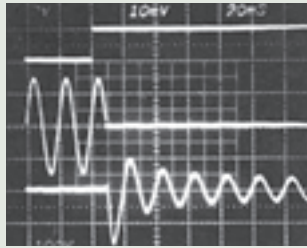


6 SSR and Power Control Circuit Applications

Zero-Crossing Phototriac Output: TLP561G/TLP561J and Mini-flat TLP161G/TLP166J



Lamp Load (1-A tungsten lamp)



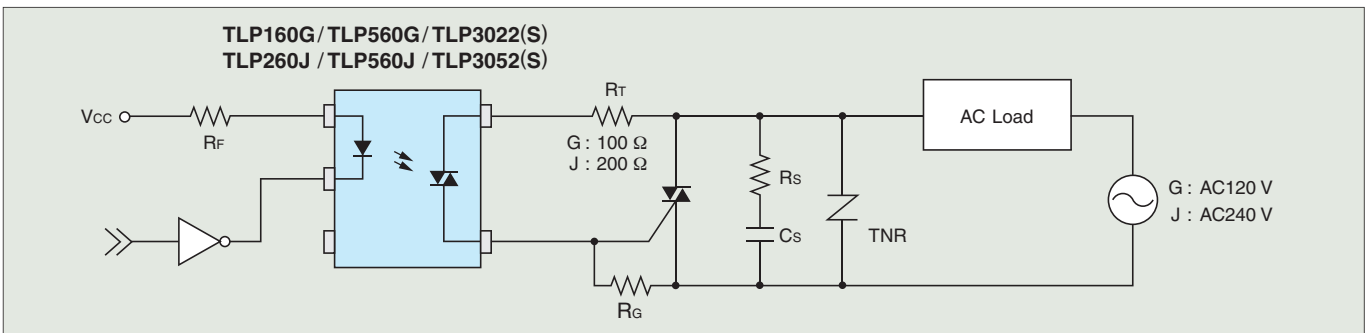
Waveforms { Top: I_F 20 mA/div
Medium: V_T 100 V/div
Bottom: I_T 5 A/div

L load (2.5-A pure inductive load)

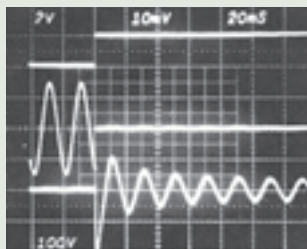


Recommended conditions { I_F = 20 mA
 R_G = 47 Ω
 R_S = 47 Ω , C_S = 0.033 μ F

Non-Zero Crossing Phototriac Output: TLP560G/TLP560J and Mini-flat TLP160G/TLP260J

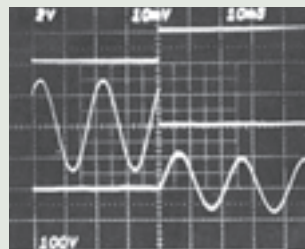


Lamp Load (1-A tungsten lamp)



Waveforms { Top: I_F 20 mA/div
Medium: V_T 100 V/div
Bottom: I_T 5 A/div

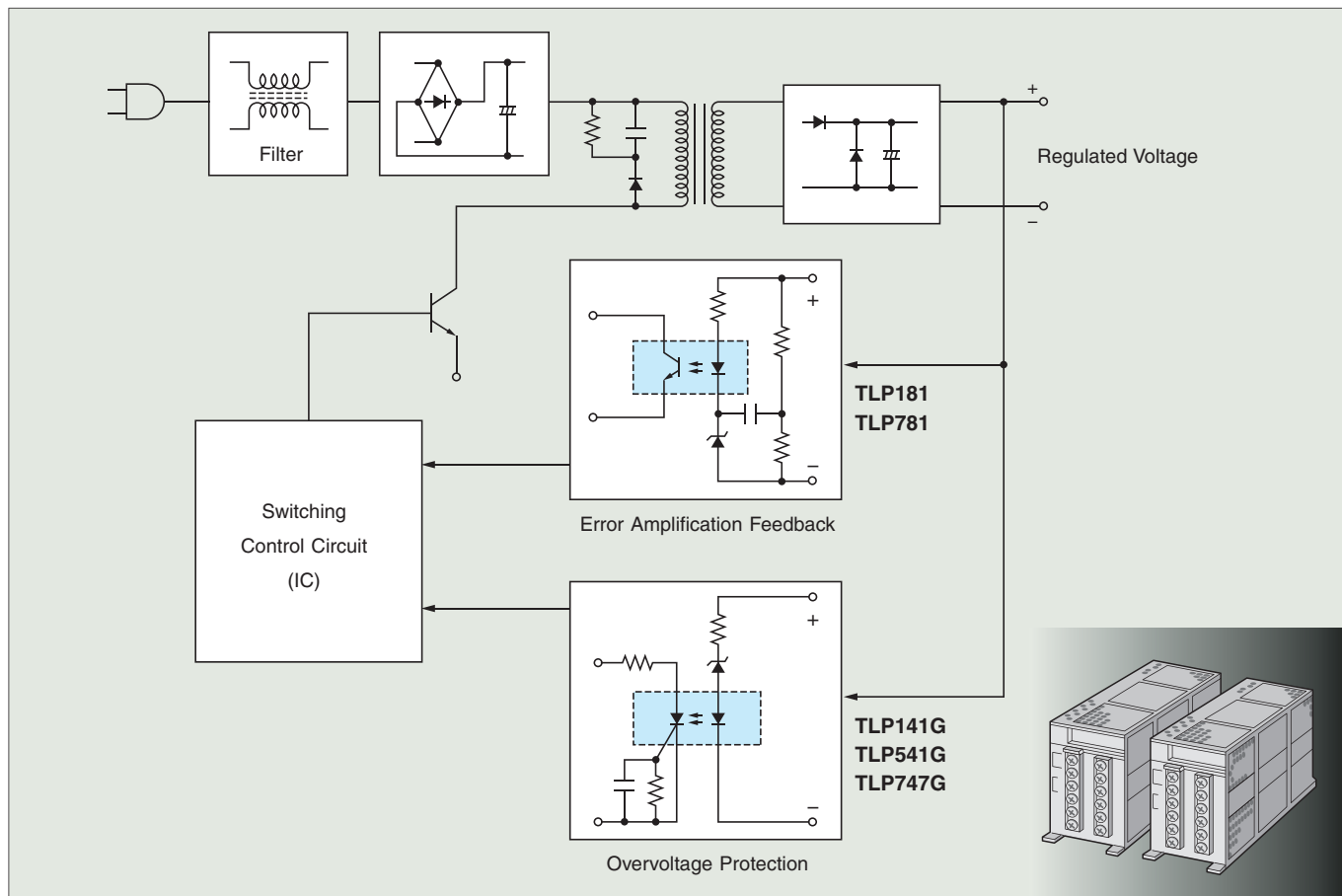
L load (2.5-A pure inductive load)



Recommended conditions { I_F = 20 mA
 R_T = 100 Ω /200 Ω
 R_G = 47 Ω
 R_S = 47 Ω , C_S = 0.033 μ F

9 Photocoupler Application Circuit Example

7 Switching Power Supply Circuit Application



■ Transistor Output (○: Approved, △: Design which meets safety standards, as of September 2007)

Part Number	Package Type	Isolation Voltage	Safety Standard Approvals				CTR (I _c / I _f) Rank (%)				
			UL 1577	BSI 7002 (EN60950)	EN60747 (Note 1)	Nordic SEMKO		Min	Max		
TLP181	Min flat	3750 Vrms	○	○	△(Note 2)	○	} No Rank	50	600		
TLP781	DIP4	5000 Vrms	○*	○	○	-		(Pending)	(GB) Rank	100	600
									(Y) Rank	50	150
							(GR) Rank		100	300	
							(BL) Rank		200	600	
TLP750 (high-speed)	DIP8	5000 Vrms	○	○	○	○	(GRL) Rank	100	200		
							(GRH) Rank	150	300		
							(O) Rank	19	-		
							(O) Rank	10	-		

■ Thyristor Output

Part Number	Package Type	Isolation Voltage	Safety Standard Approvals				I _{FT} (mA)	V _{DRM} (V)
			UL 1577	BSI 7002 (EN60950)	EN60747 (Note 1)	Nordic SEMKO		
TLP141G	Min flat	2500 Vrms	○			10	400	
TLP541G	DIP6		○			7		
TLP747G		4000 Vrms	○	○	○	○		15

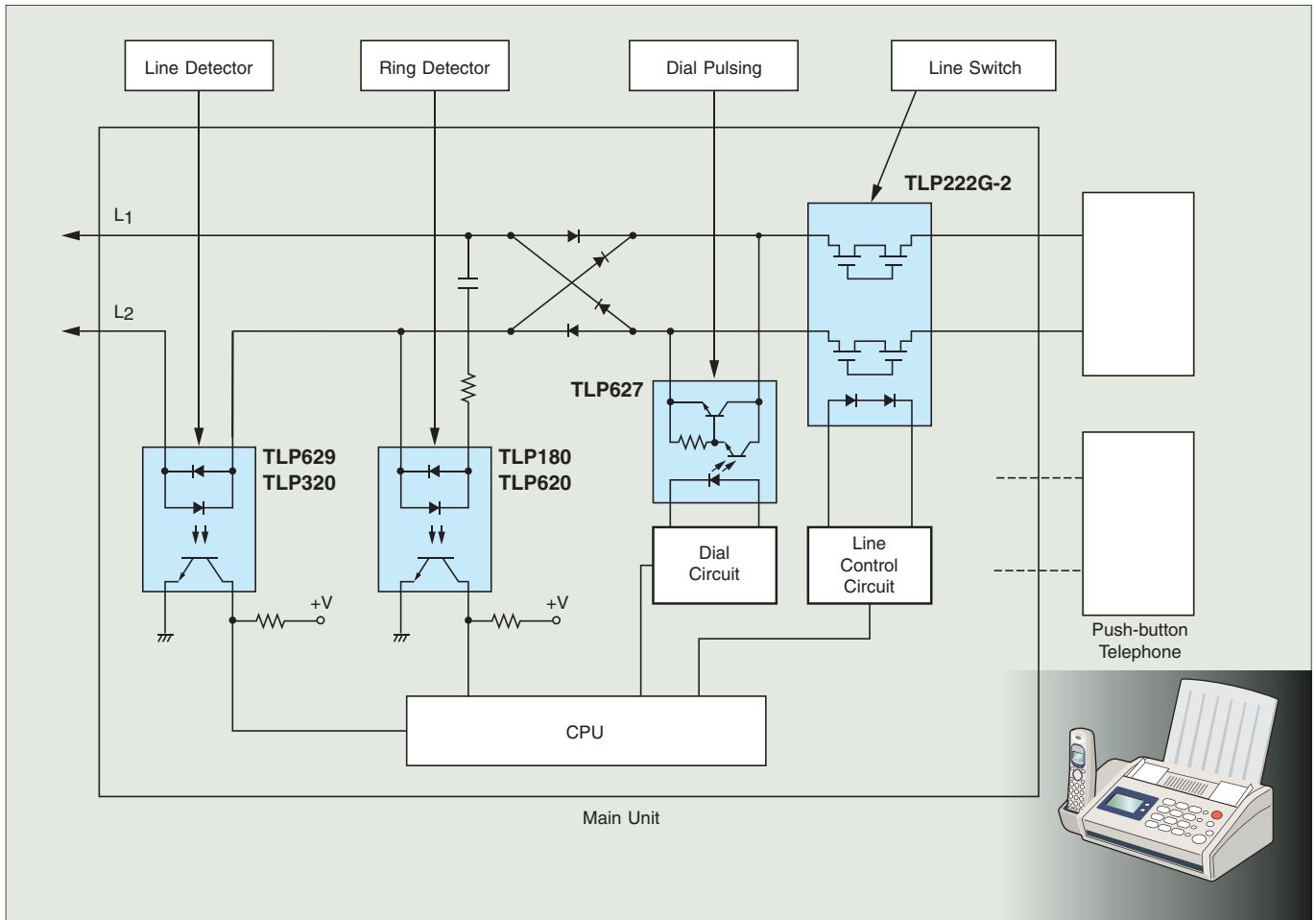
Note 1: EN60747-approved with option (D4)

Note 2: The EN60747-5-2 Safety Standard for compact package is different from those for standard DIP package. Since the mini-flat package is a compact package. Please contact your nearest Toshiba sales representative for more details.

*: Double-protection

8 Push-Button Telephone Application

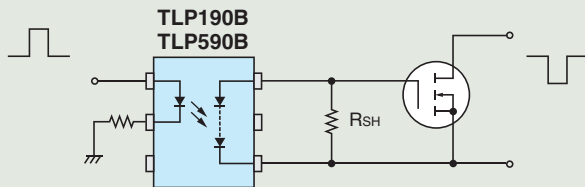
A variety of photocouplers are used to isolate between telephone lines (L1 and L2) and CPU.



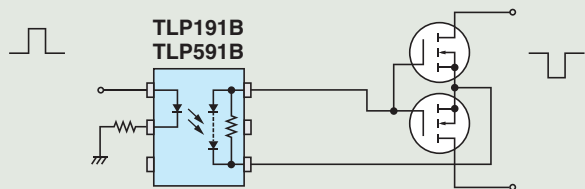
Application	Package Type	Part Number			Features
		DC Input		AC Input	
Ring Detector	DIP4	TLP781		TLP620	General single transistor output in compact packages Good cost performance
	Min flat	TLP181	TLP281	TLP180 TLP280	
Dial Pulsing	DIP4	TLP627			High $V_{CE0} = 300$ V darlington transistor output in compact packages Suitable to generate pulse dial signal
	Min flat	TLP127			
	DIP4	TLP628			High $V_{CE0} = 350$ V single transistor output
Line Detector	DIP4	TLP629		TLP320	High LED current rating 150 mA Directly connectable to telephone lines
Line Switch	DIP4	TLP222G*	TLP227G*		$V_{OFF} = 400$ V MOSFET output photorelay Crosspoint relay replacement (*: $V_{OFF} = 350$ V, **: $V_{OFF} = 200$ V)
	DIP6	TLP592G*	TLP597G*		
	DIP8 (Dual)	TLP222G-2*	TLP227G-2*		
	2.54SOP4	TLP172G*	TLP176D**	TLP176G*	
	2.54SOP6	TLP192G*	TLP197G*		
	2.54SOP8 (Dual)	TLP200D**	TLP202G*	TLP206G*	

9 Photocoupler Application Circuit Example

9 Photovoltaic Coupler Applications

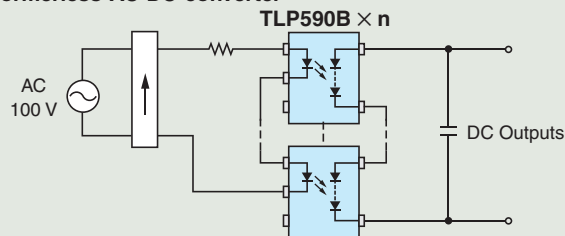


This is the simplest power MOSFET drive circuit. Resistor R_{SH} for discharging the gate capacitor reduces turn-OFF time. This R_{SH} is not required on the TLP591B, which has a built-in resistor. (T_{ON} , T_{OFF} \approx several ms)



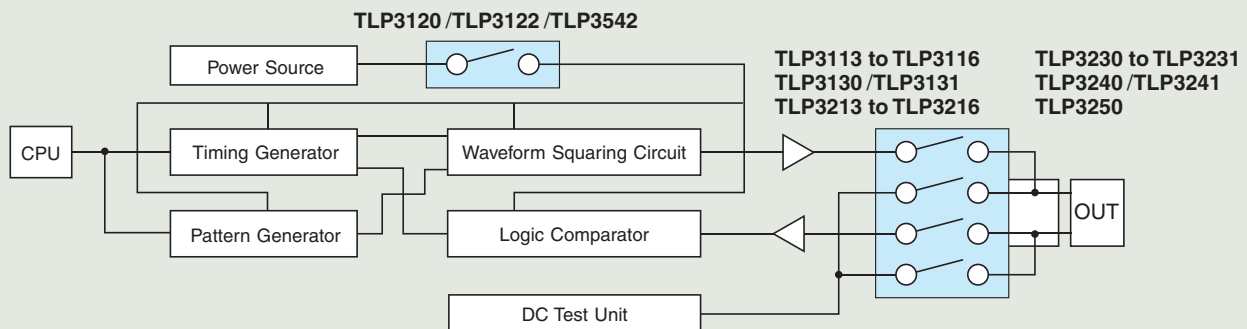
Drives for both AC and DC become possible by connecting power MOSFETs in a source common configuration.

Transformerless AC-DC converter

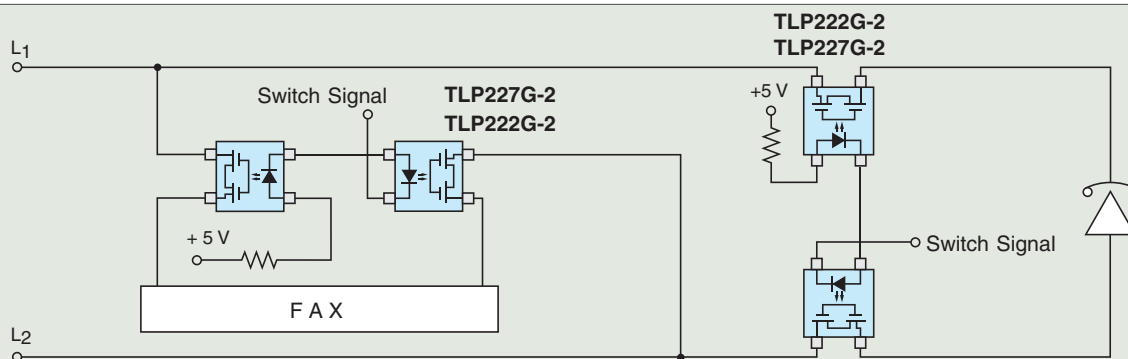


Photovoltaic couplers in parallel and serial configuration convert AC power to DC without a transformer. This type of configuration requires scores to hundreds of photovoltaic couplers.

10 Photorelay for Tester Application

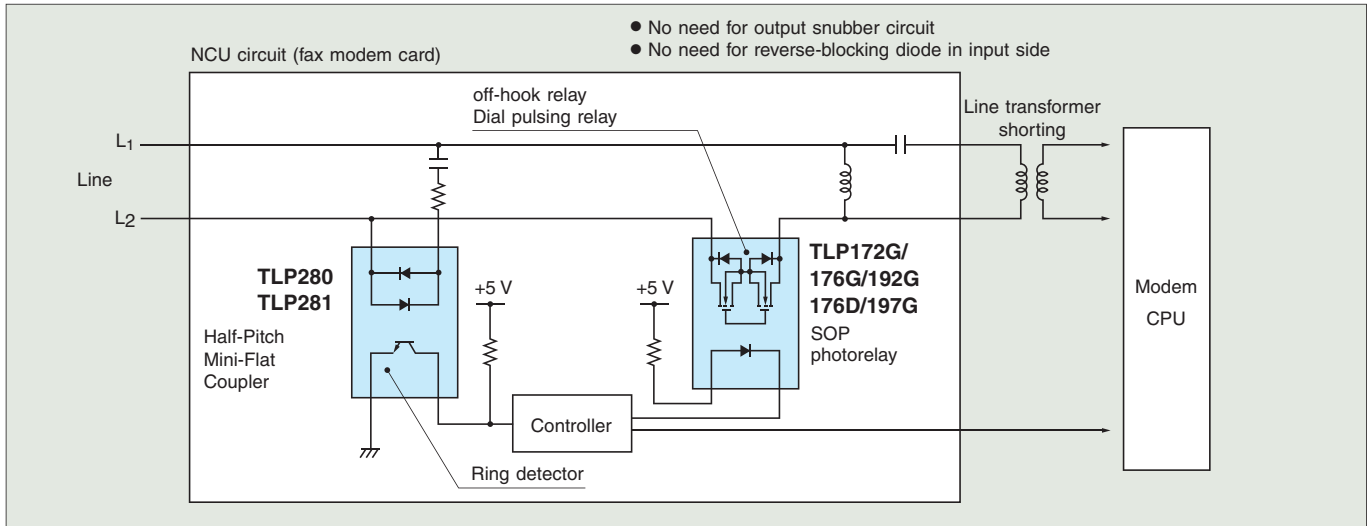


11 Photorelay (MOSFET Output) Application



Example of Terminal Switching Application

12 NCU Circuit (FAX Modem Card) Application



13 High-Speed Photo-IC Coupler Applications

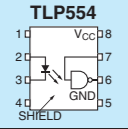
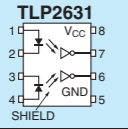
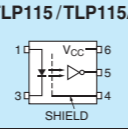
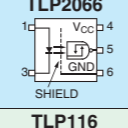
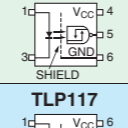
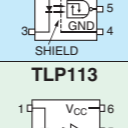
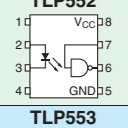
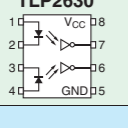
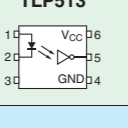
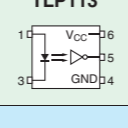
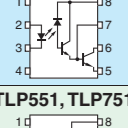
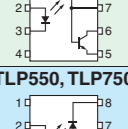
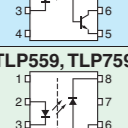
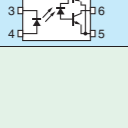
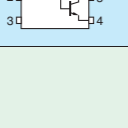
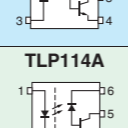
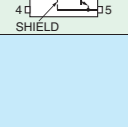
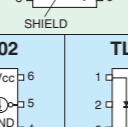
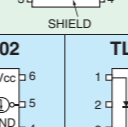
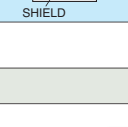
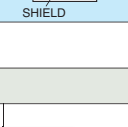
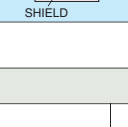
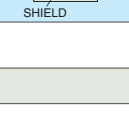
Listed below are typical values.

	SDIP	Output	Speed	Input Current I _F	Supply Voltage V _{CC}	Supply Current I _{CC}	CMR	Features	Applications	
		±0.5 A	0.2 μs	5 mA	10 to 35 V	10 mA	⊙	<ul style="list-style-type: none"> • IGBT/Power MOSFET direct gate drive 	<ul style="list-style-type: none"> • General-purpose inverters • Inverter air conditioners • AC servo motor control • IGBT/MOSFET drive 	
		±0.1 A	0.3 μs							
		TLP350 ±2.0 A TLP700 ±1.5 A	0.2 μs	5 mA	10 to 35 V	2 mA	⊙	<ul style="list-style-type: none"> • Constant-current base drive • 15-A GTR direct drive 	<ul style="list-style-type: none"> • General-purpose inverters • Inverter air conditioners • AC servo motor control • GTR base drive 	
		±0.2 A								
		-0.25/ 0.5 A	1 μs	5 mA	16V or less	10 mA	⊙	<ul style="list-style-type: none"> • Constant-current base drive • 15-A GTR direct drive 	<ul style="list-style-type: none"> • General-purpose inverters • Inverter air conditioners • AC servo motor control • GTR base drive 	
		3-state output	5 Mbit/s	1.6 mA	4.5 to 20 V		○	Inverter logic Input 1 0 ↓ ↓ 0 1 Output	3-state output	<ul style="list-style-type: none"> • Computer data bus drivers • High-speed digital signal interfaces • High-speed gate drive for power MOSFETs • Various industrial control equipment

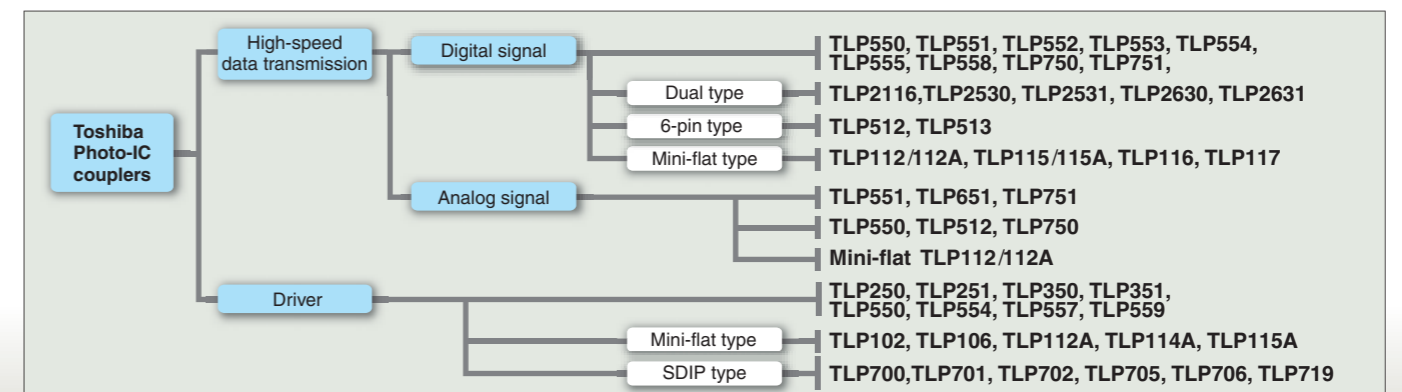
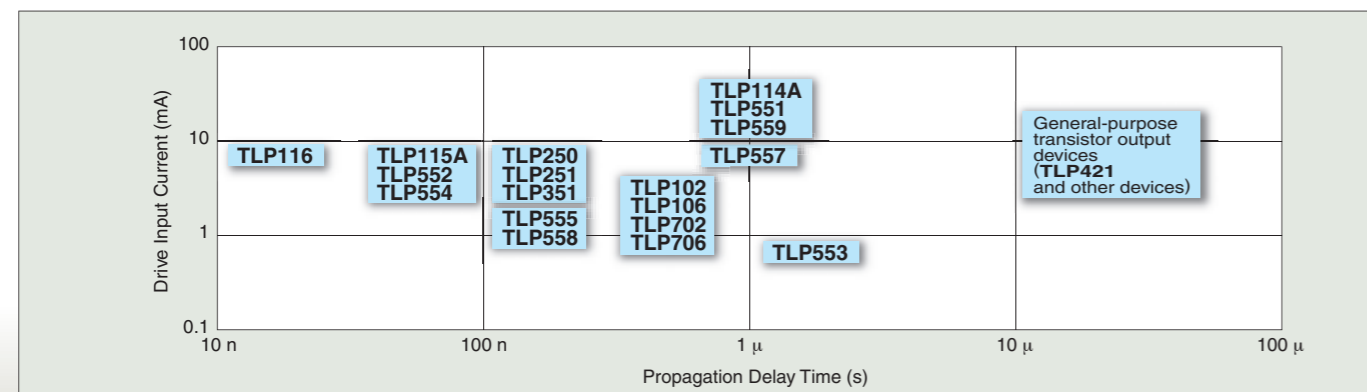
9 Photocoupler Application Circuit Example

13 High-Speed Photo-IC Coupler Applications (continued)

Listed below are typical values.

	Dual Type	6-Pin Type	SDIP	Mini-Flat Type	Output	Speed	Input Current I _F	Supply Voltage V _{CC}	Supply Current I _{CC}	CMR	Features	Applications	
					Open collector	10 Mbit/s	5 mA	5 V	12 mA (24 mA for dual type)	○	● Internal noise shield, high CMR version of the TLP552 and the TLP2630	● NC machines ● Industrial robots ● General-purpose inverters ● AC servo motor control ● Computer terminal devices ● Various industrial control equipment ● Electrostatic printers control	
					Totem pole	20 Mbit/s	5 mA	3.3 V	5 mA	○	● Low voltage	● PDPs ● Measuring instruments ● FA ● Control equipment ● OA equipment	
					Totem pole	20 Mbit/s	5 mA	5 V	2 mA	○	● Ultra-low power consumption ● high-speed operation	● PDPs ● Measuring instruments ● FA ● Control equipment ● OA equipment	
					Totem pole	50 Mbit/s	5 mA	5 V	5 mA	○	● Ultra-low power consumption ● high-speed operation	● PDPs ● Measuring instruments ● FA ● Control equipment ● OA equipment	
					Open collector	10 Mbit/s	5 mA	5 V	12 mA (24 mA for dual type)	—	● High-speed logic output	● Electronic devices ● CD players ● High-speed digital signal interfaces ● Computer terminal devices	
					Open collector	0.3 Mbit/s	0.5 mA	18 V or less	0.1 mA	—	● Low current drive	● CMOS direct drive ● Current loop receiver/drivers ● Telephone ring detectors ● Computer terminal devices	
					Open collector	1 Mbit/s	16 mA	15 V or less	0.1 mA (0.2 mA for dual type)	—	● Photodiode/phototransistor separated,	Internal base connection ● CTV video signal isolation ● Analog signal transmission ● Digital signal interfaces	
					Open collector	1 Mbit/s	16 mA	15 V or less	0.1 mA (0.2 mA for dual type)	○	general-purpose transistor output device		
					Open collector	1 Mbit/s	16 mA	30 V or less	0.1 mA (0.2 mA for dual type)	○	● Internal noise shield, high CMR version of the TLP550	No base connection ● General-purpose inverters ● Inverter air conditioners ● AC servo motor control ● NC machines ● Switching power supply units	
							Totem pole	5 Mbit/s	5 mA	20 V or less	○		

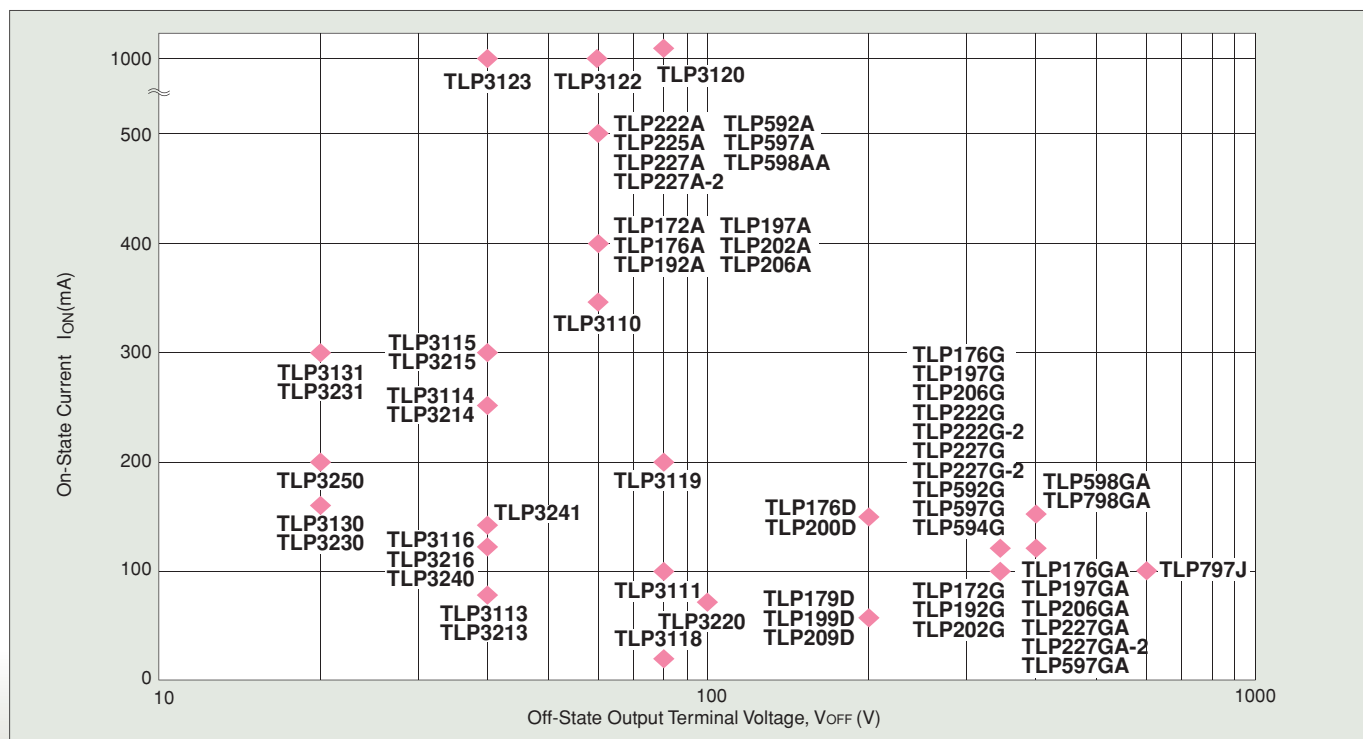
*: SDIP version of the TLP559/TLP759



9 Photocoupler Application Circuit Example

14 Photorelay Applications

Package (number of channels, contact type)								Off voltage V _{OFF} Max	On current I _{ON} Max	Trigger current I _{FT} Typ.	Features	Applications
SSOP4 (1ch, a)	SOP4 (1ch, a)	MFSOP6	SOP6 (1ch, a)	SOP8 (2ch, a)	DIP4 (1ch, a)	DIP6 (1ch, a)	DIP8 (2ch, a)					
	TLP176A TLP172A		TLP197A TLP192A	TLP206A TLP202A	TLP225A TLP227A TLP222A	TLP597A TLP592A	TLP227A-2 TLP222A-2	60 V	0.3 to 0.5 A	1 to 2 mA	Low on-resistance High-current output	<ul style="list-style-type: none"> Programmable controllers Relay output I/O boards Industrial robots Measuring instruments Gate drive for thyristor
	TLP176D		TLP197D	TLP200D				200 V	0.15 A	1 to 2 mA	FA switching	<ul style="list-style-type: none"> Digital line cards Industrial robots Relay output I/O boards
	TLP176G TLP172G		TLP197G TLP192G	TLP206G TLP202G	TLP227G TLP222G	TLP597G TLP592G	TLP222G-2 TLP227G-2	350 V	0.12 A	1 to 2 mA	High breakdown voltage Communication line switching UL1950-compliant	<ul style="list-style-type: none"> Public phone line cards Analog modems STBs Various actuator drivers
	TLP176GA		TLP197GA	TLP206GA	TLP227GA	TLP597GA TLP798GA TLP797GA	TLP227GA-2	400 V	0.12 A/ 0.15 A	1 to 2 mA	High breakdown voltage Communication line switching UL1950-compliant	<ul style="list-style-type: none"> Public phone line cards Analog modems STBs Various actuator drivers
						TLP797J		600 V	0.1 A	1 to 2 mA	High breakdown voltage Communication line switching UL1950-compliant	<ul style="list-style-type: none"> Public phone line cards Analog modems STBs Various actuator drivers
TLP3214 TLP3215 TLP3231	TLP3121 TLP3114 TLP3115 TLP3131	TLP3110						20 to 60 V	0.25 to 0.45 A	2 to 3 mA	Low on-resistance for IC testers/measuring instruments Low CR products/high current	<ul style="list-style-type: none"> Memory testers Logic testers Measuring instruments
TLP3213 TLP3216 TLP3217 TLP3230 TLP3240 TLP3241 TLP3250	TLP3113 TLP3116 TLP3118 TLP3119 TLP3130	TLP3111						20 to 80 V	0.08 to 0.2 A	2 to 3 mA	Low on-resistance for IC testers/measuring instruments C _{OFF} ≤ 15 pF Low CR product	<ul style="list-style-type: none"> Memory testers Logic testers Measuring instruments
TLP3220								100 V	0.08 A			
	TLP3122 TLP3123		TLP3120					40 to 80 V	1 to 1.25 A		Low on-resistance High On-current	<ul style="list-style-type: none"> Measuring instruments Factory equipment Power supplies



10 Competitor Cross Reference

1 Overseas Competitors

Fairchild

Part Number	TOSHIBA Part Number	Lv
FOD617	TLP421	B
FOD814	TLP620	B
FOD815	TLP627	B
FOD817	TLP421	A
FOD852	TLP627	A
FODM3021	TLP160G	A
FODM3022	TLP160G	A
FODM3051	TLP160J	A
FODM3052	TLP160J	A
H11A617	TLP421	B
H11A817	TLP421	A
H11AA814	TLP620	B
H11B815	TLP627	A
HMA121	TLP181	A
HMA124	TLP124	A
HMA2701	TLP181	A
HMHA2801	TLP281	A
HMHA281	TLP281	A
HMAA2705	TLP180	A
HMHAA280	TLP280	A
H11A1	TLP631	A
H11AA1	TLP630	A
H11AG1	TLP331	A
H11B1	TLP571	A
H11C1	TLP541G	A
H11D1	TLP371	C
H11G1	TLP371	A
MOC3021-M	TLP3021 (S)	A
MOC3022-M	TLP3022 (S)	A
MOC3023-M	TLP3023 (S)	A
MOC3041-M	TLP3041 (S)	A
MOC3042-M	TLP3042 (S)	A
MOC3043-M	TLP3043 (S)	A
MOC3051-M	TLP3051 (S)	A
MOC3052-M	TLP3052 (S)	A
MOC3061-M	TLP3061 (S)	A
MOC3062-M	TLP3062 (S)	A
MOC3063-M	TLP3063 (S)	A

COSMO

Part Number	TOSHIBA Part Number	Lv
K1010	TLP421	A
K1020	TLP621-2	A
K2010	TLP631	B
K3010	TLP620	B
KP3020	TLP620-2	B
KP4010	TLP627	A
KP4020	TLP627-2	A
K5010	TLP371	A
K6010	TLP630	A
KPS2801	TLP281	A
KPC354NT	TLP180	B
KPC355NT	TLP127	A
KPC357NT	TLP181	A
KPC452	TLP127	A

LITEON

Part Number	TOSHIBA Part Number	Lv
LTV-123	TLP421	A
LTV-816	TLP421	A
LTV-817	TLP421	A
LTV-851	TLP628	A
LTV-356T	TLP181	A
LTV-357T	TLP181	A
LTV-814	TLP620	B
LTV-814H	TLP320	A
LTV-354T	TLP180	B
LTV-815	TLP627	A
LTV-852	TLP627	A
LTV-352T	TLP127	A
LTV-355T	TLP127	B
MOC3020	TLP3020 (S)	A
MOC3021	TLP3021 (S)	A
MOC3022	TLP3022 (S)	A
MOC3023	TLP3023 (S)	A
MOC3051	TLP3051 (S)	A
MOC3052	TLP3052 (S)	A
MOC3061	TLP3061 (S)	A
MOC3062	TLP3062 (S)	A
MOC3063	TLP3063 (S)	A

Avago

Part Number	TOSHIBA Part Number	Lv
HCPL-M600	TLP115A	A
HCPL-M601	TLP115A	A
HCPL-M611	TLP115A	A
HCPL-M452	TLP114A	A
HCPL-M453	TLP114A	A
HCPL-M456	TLP114A	A
HCPL-2601	TLP2601	A
HCPL-2611	TLP2601	A
HCPL-2201	TLP555	B
HCPL-2530	TLP2530	A
HCPL-2531	TLP2531	A
HCPL-2630	TLP2631	A
HCPL-2631	TLP2631	A
HCPL-3120	TLP350	A
HCPL-3140	TLP351	A
HCPL-3150	TLP351	A
HCPL-3180	TLP350	B
HCPL-314J	TLP701 × 2	C
HCPL-4504	TLP559	A
HCPL-0708	TLP116	B
HCPL-181	TLP181	A
HCPL-354	TLP180	B
HCPL-814	TLP620	B
HCPL-817	TLP421	A

Vishay

Part Number	TOSHIBA Part Number	Lv
K817P	TLP421	A
SFH610A	TLP421	A
SFH614A	TLP628	A
SFH615A	TLP421	A
SFH617A	TLP421	A
SFH618A	TLP624	B
TCET1100	TLP421	A
SFH690xT	TLP181	A
TCMT1100	TLP281	A
TCMT4100	TLP281-4	A
SFH628A	TLP620	B
K815P	TLP627	A
SFH612A	TLP627	A
SFH619A	TLP627	A
SFH655A	TLP627	A
SFH692AT	TLP127	A
TCED1100	TLP627	A
IL66	TLP371	A
IL66B	TLP372	A
IL255	TLP330	A

Code

A: Direct replacement

B: Electrical improvement

C: Electrical improvement (pin layout changed)

*: Refer to the relevant technical datasheets for more details.

10 Competitor Cross Reference

2 Domestic Competitors

NEC

Part Number	TOSHIBA Part Number	Lv
PS2501-1	TLP421	A
PS2561-1	TLP421	A
PS2571-1	TLP421	A
PS2581L1	TLP421F	A
PS2505-1	TLP620	B
PS2565-1	TLP620	B
PS2502-1	TLP627	A
PS2562-1	TLP627	A
PS2532-1	TLP627	A
PS2533-1	TLP627	A
PS2521-1	TLP629	B
PS2525-1	TLP320	B
PS2701-1	TLP181	A
PS2761-1	TLP181	A
PS2705-1	TLP180	A
PS2765-1	TLP180	A
PS2702-1	TLP127	A
PS2801-1	TLP281	A
PS2801-4	TLP281-4	A
PS2861-1	TLP281	A
PS2805-1	TLP280	A
PS2805-4	TLP280-4	A
PS2865-1	TLP280	A
PS2811-1	TLP283	B
PS2811-4	TLP283-4	B
PS8601	TLP759	B
PS8602	TLP759	A
PS9613	TLP759 (IGM)	A
PS8701	TLP114A	B
PS8101	TLP114A	B
PS9713	TLP114A (IGM)	B
PS9113	TLP114A (IGM)	B
PS9601	TLP554	A
PS9614	TLP554	B
PS9714	TLP115A	B
PS9114	TLP115A	B
PS9715	TLP115A	B
PS9115	TLP115A	B
PS9701	TLP115A	A
PS7141-1A	TLP597GA	A
PS7141-2A	TLP227GA-2	A
PS7141-1B	TLP4597G	B
PS7141-2B	TLP4227G-2	B
PS7141-1C	TLP4006G	B
PS7341C-1A	TLP594G	B
PS7141C-2A	TLP224G-2	B
PS7241-1A	TLP176GA	A
PS7241-2A	TLP206GA	A
PS7241-1B	TLP4176G	B
PS7241-2B	TLP4206G	B
PS7241-1C	TLP4026G	B

SHARP

Part Number	TOSHIBA Part Number	Lv
PC123	TLP421	A
PC817	TLP421	A
PC813	TLP620	A
PC815	TLP627	A
PC357NT	TLP181	A
PC354NT	TLP180	A
PC355NT	TLP127	A
PC3H7	TLP281	A
PC3H3	TLP280	A
PC3H21	TLP525G	A
PC410	TLP115A	A
PC942	TLP351	C
PC923	TLP351	C
S2S3	TLP260J	B
S2S4	TLP161J	B
PR36MF11NSZ	TLP3506	B
PR36MF12NSZ	TLP3506	B
S21MD3V	TLP3051 (S)	A
S201D01	TLP3526	B
S201D02	TLP3527	B

AROMAT (NAIS)

Part Number	TOSHIBA Part Number	Lv
AQV210	TLP592G	A
AQV210E	TLP597G	A
AQV210EH	TLP797GA	A
AQV210S	TLP192G	A
AQV212	TLP592A	A
AQV212S	TLP197A	A
AQV214	TLP597GA	A
AQV214E	TLP597G	A
AQV214EH	TLP797GA	A
AQV214H	TLP797GA	A
AQV214S	TLP197GA	A
AQV215	TLP597A	B
AQV216	TLP797J	A
AQV217S	TLP197D	A
AQV410EH	TLP4592G	A
AQV414	TLP4592G	A
AQV414E	TLP4597G	A
AQV414S	TLP4197G	A
AQW210	TLP222G-2	A
AQW210S	TLP202G	A
AQW212	TLP222A-2	A
AQW214	TLP227GA-2	A
AQW214S	TLP206GA	A
AQW215	TLP222A-2	B
AQW217	TLP222G-2	A
AQW414	TLP4222G-2	A
AQW610S	TLP4026G	A
AQW614	TLP4007G	A
AQY210EH	TLP227G	A
AQY210LS	TLP174G	A
AQY210S	TLP174G	A
AQY214EH	TLP227G	A
AQY214S	TLP176GA	A
AQY410EH	TLP4227G	A
AQY414EH	TLP4227G	B
AQY414S	TLP4176G	A
AQY221N1S	TLP3113/TLP3116	B
AQY221N2S	TLP3113/TLP3116	B
AQY221R2V	TLP3215	A
AQY221N2V	TLP3216	A

Code

A: Direct replacement

B: Electrical improvement

C: Electrical improvement (pin layout changed)

*: Refer to the relevant technical datasheets for more details.

1 Discontinued and Final-Phase Products

1 Discontinued Products

Part Number	Replacement	Code
TLP101	TLP181	B
TLP120-4	TLP180 × 4 pcs	E
TLP121-4	TLP181 × 4 pcs	E
TLP124-4	TLP124 × 4 pcs	E
TLP127-4	TLP127 × 4 pcs	E
TLP190	TLP190B	C
TLP191	TLP191B	C
TLP215	–	
TLP216	–	
TLP270D	–	
TLP270G	–	
TLP501	TLP521-1	A
TLP503	TLP531	B
TLP504	TLP504A	B
TLP505D	TLP541G	B
TLP505G	TLP541G	B
TLP506D	TLP511GA	B
TLP506G	TLP511GA	B
TLP508	TLP531	C
TLP509	TLP532	B
TLP510G	TLP541G	B
TLP511G	TLP511GA	C
TLP516G	TLP3520A	A
TLP516J	TLP3526	A
TLP519	TLP532	C
TLP533	TLP733	D
TLP534	TLP734	D
TLP546G	TLP3520A	A
TLP547G	TLP747G	D
TLP547J	TLP747J	D
TLP573	–	

Part Number	Replacement	Code
TLP580	TLP734F	A
TLP581	TLP733F	A
TLP582	–	
TLP590	TLP590B	A
TLP590A	TLP590B	A
TLP591	TLP591B	A
TLP591A	TLP591B	A
TLP595A	TLP598AA	A
TLP595B	–	
TLP595G	TLP598GA	A
TLP596A	TLP597A	C
TLP596B	–	
TLP596G	TLP597GA	C
TLP598A	TLP598AA	A
TLP598B	–	
TLP598G	TLP598GA	A
TLP599A	TLP597A	C
TLP599B	–	
TLP599G	TLP597GA	C
TLP633	TLP733	D
TLP634	TLP734	D
TLP647G	TLP747G	D
TLP647J	TLP747J	D
TLP3022	TLP3022 (S)	A
TLP3052	TLP3052 (S)	A
TLP3042	TLP3042 (S)	A
TLP3062	TLP3062 (S)	A
TLP3063	TLP3063 (S)	A
TLP796G	TLP798GA/TLP797GA	C
TLP798G	TLP798GA	A

2 Final-Phase Products

Part Number	Replacement	Code
TLP321-3	TLP321 × 3 pcs	E
TLP520-3	TLP520 × 3 pcs	E
TLP521-3	TLP521-1 × 3 pcs	E
TLP523-3	TLP523 × 3 pcs	E
TLP525G-3	TLP525G × 3 pcs	E
TLP620-3	TLP620 × 3 pcs	E
TLP621-3	TLP621 × 3 pcs	E
TLP624-3	TLP624 × 3 pcs	E
TLP627-3	TLP627 × 3 pcs	E
TLP628-3	TLP628 × 3 pcs	E

Code

A: Compact package

B: High isolation voltage

C: High CTR or low trigger LED current

D: Meet the Safety Standards

E: Other

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