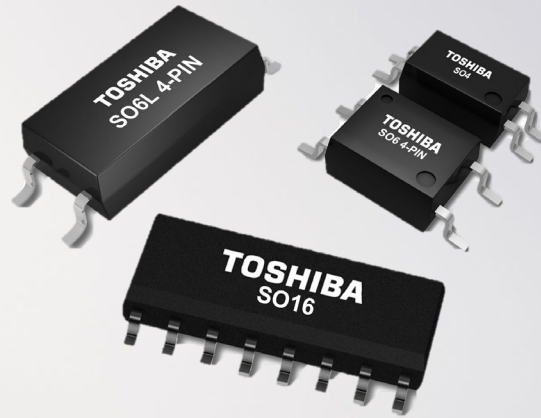


# Transistor Couplers



## Cost Effective Isolation

Toshiba offers a wide variety of photocouplers, that help to reduce product size and power consumption, such as photocouplers in ultra-small, thin packages and those that can be driven with low input currents as well as an operating temperature range of up to 125°C. Transistor-output photocouplers are used for a wide range of applications such as a feedback circuit in a power supply and optoelectronic interfacing in industrial equipment. Toshiba has 50 years of experience in the development and manufacturing of cutting-edge photocouplers.

## Applications

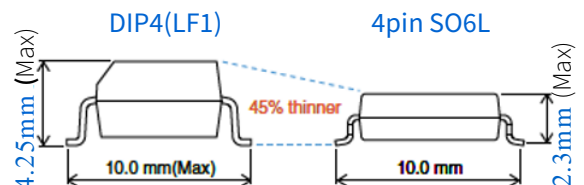
- Factory automation
- Consumer equipment
- PLC
- Renewable energy
- Power supplies
- I/O Interfaces

Features	Advantages	Benefits
<ul style="list-style-type: none"> <li>• Extended temperature range from -55°C up to +125°C</li> <li>• Low input current operation</li> <li>• Small temperature coefficient of CTR</li> <li>• Wide variety of packages for transistor couplers are available</li> <li>• High quality mass production</li> <li>• Fast switching speed</li> </ul>	<ul style="list-style-type: none"> <li>• Products are perfectly applicable in harsh environments</li> <li>• Low power consumption</li> <li>• Stable operation over wide temperature range</li> <li>• Customers have the choice to choose the best fitting product</li> <li>• Variety of safety approvals and certificates from third parties (e.g. VDE, UL, etc.)</li> <li>• Quick signal response</li> </ul>	<ul style="list-style-type: none"> <li>• Higher reliability of end products reduces cost of operation failures</li> <li>• Ability to reduce BOM costs due to selection possibilities of products</li> <li>• High optimization potential for PCB costs</li> <li>• Design gets easy and flexible</li> <li>• Universal application possibilities due to validated quality standards</li> </ul>

## TLP38x transistor couplers in wide-body 4-pin SO6L package

Toshiba's latest transistor couplers are available in a wide-body 4-pin SO6L package. With 8mm clearance and creepage distances and a guaranteed high insulation voltage of 5000Vrms they are ideal replacements for older DIP4 packages. Additionally they are 45% thinner and can be mounted on the backside of a printed circuit board with strict height limit. TLP388 and TLP387 are the latest versions with high VCEO and in case of TLP387 with Darlington output.

Comparison of the package height (DIP package vs. SO6L package)

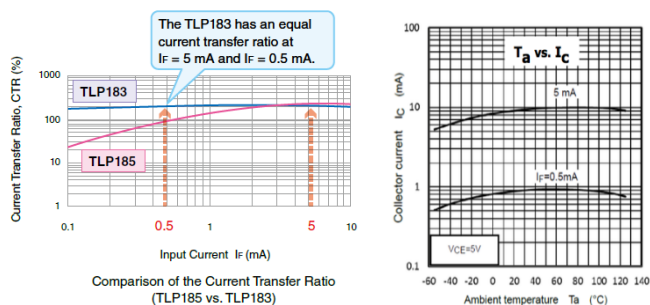


## Advantages of long lifetime high-power infrared LEDs

Toshiba's high-power infrared LEDs show much lower output degradation over time than standard LEDs. In the past a slightly higher input current had to be considered to compensate the CTR degradation over time. With Toshiba's latest high-power infrared LEDs with a MQW structure, this is no longer required. Additionally, the operation temperature range of photocouplers using the new generation of LEDs can be extended to up to +125°C.

## Constant CTR at low input current and high temperature stability

The TLP182, TLP183, TLP292, TLP293 and TLP383 provide a highly constant CTR even at a low input current due to the use of a high-power InGaAs (Indium Gallium Arsenide) LED. This characteristic is valid over a wide temperature range, simplifying functional design even in the low input current region.



## TLP293-4 and TLP292-4: 4-channel transistor couplers

Toshiba has added low input current CTR ranks for its 4-channel transistor couplers TLP292-4 and TLP293-4. These ranks are called LA and LGB (LA Rank=CTR 50-600%, LGB Rank=CTR 100-600% [ $I_f=0.5\text{mA}$ ,  $V_{CE}=5\text{V}$ ]). With clearance and creepage distances of min. 5mm, a guaranteed high insulation voltage of 3750Vrms and an extended operation temperature range from -55 to +125°C, they are the ideal devices in all industrial environments.

## TLP2301 and TLP2701 medium speed transistor couplers

Generally, transistor-output photocouplers provide a data rate of up to a few kbps. With the TLP2301 and TLP2701 in 4-pin SO6 and 4-pin SO6L packages Toshiba is offering two devices with a guaranteed switching performance of 20kbps respectively a guaranteed propagation delay time of max. 30µs. This makes the devices ideal to be used in applications, where general purpose transistor couplers are too slow, but where cost need to be reasonable low.

	Isolation voltage	Package					
		SO4 Single	SO16 Quad	4 pin SO6 Single	DIP4 Single	SO6L Single	
Package							
DC Input	2500 Vrms		TLP291-4				
	3750 Vrms	TLP291(SE)		TLP185(SE)			
	5000 Vrms				TLP785	TLP385	
	Low $I_f$	3750 Vrms	TLP293	TLP293-4	TLP183		
		5000 Vrms					TLP383
High $V_{CEO}$	3750 Vrms			TLP188		TLP388	
AC Input	2500 Vrms		TLP290-4				
	3750 Vrms	TLP290(SE)		TLP184(SE)			
	Low $I_f$	3750 Vrms	TLP292	TLP292-4	TLP182		
Darlington	High $V_{CEO}$	3750 Vrms			TLP187	TLP387	
On-Chip RBE	Low $I_f$ High Speed	3750 Vrms			TLP2301	TLP2701	

Photocouplers with a maximum operating temperature of 125°C