

Smart Gate Driver Photocoupler Features Improved Desaturation Sensing

[Toshiba America Electronic Components](#) has introduced a highly integrated, 4.0-A output current smart gate driver photocoupler. Designed for use in driving medium-power IGBTs and power MOSFETs, the TLP5214A (see Fig. 1) improves upon the desaturation sensing characteristics of current photocouplers. By suppressing short-time pulse noise during switching and desaturation sensing, the TLP5214A contributes to safer operation.

The table shows the photocoupler's desaturation characteristics and other performance characteristics at a typical ambient temperature of 25°C. The TLP5214A incorporates smart features, such as desaturation leading edge blanking time, desaturation filter time, and optimization of soft turn-off performance. The TLP5214A brings high-current, high-speed output control and provides output fault status feedback, making it suitable for applications including industrial inverters, solar energy inverters, servo amplifiers, and air conditioner inverters. It also contributes to a reduction of system cost and board space, while improving overall power efficiency and reliability in these applications.

Some of the photocoupler's specifications include a peak output current of ± 4.0 A, a supply voltage of 15 V to 30 V, a propagation delay time of 150 ns, and an isolation voltage of 5,000 Vrms. The TLP5214A comes in a wide-creepage distance SO16L package.

Table. Performance characteristics for Toshiba's TLP5214A optocoupler.

Part number		TLP5214A
Electrical characteristics	Peak output current	± 4.0 A (Max.)
	Supply voltage	15 to 30V
	Supply current	3.8mA (Max.)
	Threshold input current	6mA (Max.)
Switching characteristics	Propagation delay time	150ns (Max.)
	Propagation delay skew	-80 to 80ns
Protection function	IGBT desaturation detection	DESAT threshold voltage: 6.5V (typ.)
		DESAT leading edge blanking time: 1.1 μ s (typ.)
		DESAT filter time: 90ns (typ.)
	Soft turn-off	DESAT sense to 10% delay time: 7 μ s (typ.) *Cg=25nF
		DESAT sense to 10% delay time: 3.5 μ s (typ.) *Cg=10nF
	Miller clamp (off)	Clamp pin threshold voltage: 2.5V (typ.)
Undervoltage-lockout (UVLO)	VUVLO+: 11.6V (typ.)	
	VUVLO-: 10.3V (typ.)	
Isolation characteristics (@T _a =25°C)	Isolation voltage	5000Vrms (Min.)
	Clearance distance	8.0mm (Min.)
	Creepage distance	8.0mm (Min.)
	Isolation thickness	0.4mm (Min.)

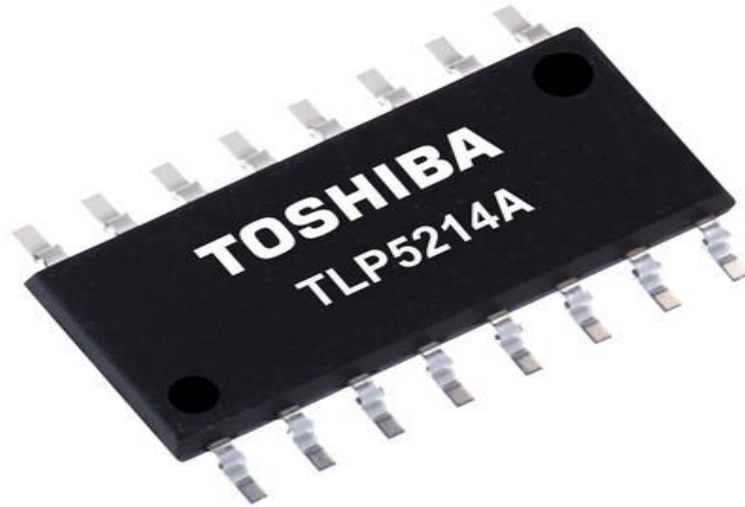


Figure. The TLP5214A photocoupler suppresses short-time pulse noise during switching and desaturation sensing, thus contributing to safer operation. It brings high-current, high-speed output control and provides output fault status feedback, suiting it for industrial inverters, solar energy inverters, servo amplifiers, and air conditioner inverters