

# ACPL-312T-000E

## Automotive 2.5 Amp, Output Current IBGP Gate Drive Optocoupler

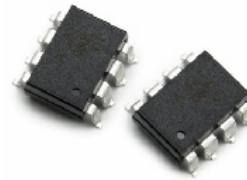


### Product Brief



Lead (Pb) Free  
RoHS 6 fully  
compliant

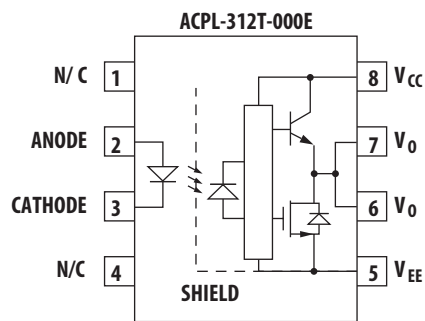
RoHS 6 fully compliant options available;  
-xxxE denotes a lead-free product



### Description

The ACPL-312T device contains an AlGaAs LED. The LED is optically coupled to an integrated circuit with a power output stage. This automotive optocoupler is ideally suited for driving power IGBTs and MOSFETs used in automotive motor control inverter and DC-DC converters applications. The high operating voltage range of the output stage provides the drive voltages required by gate controlled devices. The voltage and current supplied by these optocouplers make them ideally suited for directly driving IGBTs with ratings up to 1200 V/100 A. For IGBTs with higher ratings, the ACPL-312T series can be used to drive a discrete power stage which drives the IGBT gate.

### Functional Diagram



### TRUTH TABLE

LED	$V_{CC} - V_{EE}$ "POSITIVE GOING" (i.e., TURN-ON)	$V_{CC} - V_{EE}$ "NEGATIVE GOING" (i.e., TURN-OFF)	$V_O$
OFF	0 - 30 V	0 - 30 V	LOW
ON	0 - 11 V	0 - 9.5 V	LOW
ON	11 - 13.5 V	9.5 - 12 V	TRANSITION
ON	13.5 - 30 V	12 - 30 V	HIGH

A 0.1  $\mu$ F bypass capacitor must be connected between pins 5 and 8.

### Features

- 2.5 A maximum peak output current
- 2.0 A minimum peak output current
- 25 kV/ $\mu$ s minimum Common Mode Rejection (CMR) at  $V_{CM} = 1500$  V
- 0.5 V maximum low level output voltage ( $V_{OL}$ ) - Eliminates need for negative gate drive
- $I_{CC} = 5$  mA maximum supply current
- Under Voltage Lock-Out protection (UVLO) with hysteresis
- Wide operating  $V_{CC}$  range: 15 to 30 Volts
- 500 ns maximum switching speeds
- Automotive temperature range:
  - -40°C to 125°C
- Safety Approval (Pending):
  - UL Recognized 3750 Vrms for 1 min. (5kV for option x20E available upon request).
  - CSA
  - IEC/EN/DIN EN 60747-5-2

### Applications

- Automotive Motor/DC-DC Converter
- Automotive Isolated IGBT/MOSFET Gate Drive
- AC and Brushless DC Motor Drives
- Industrial Inverters Systems
- Switch mode power supplies

**CAUTION:** It is advised that normal static precautions be taken in handling and assembly of this component to prevent damage and/or degradation which may be induced by ESD.

## Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units	Notes
Storage Temperature	$T_S$	-55	150	°C	
Operating Temperature	$T_A$	-40	125	°C	
Average Input Current	$I_{F(AVG)}$		25	mA	1
Peak Transient Input Current ( $<1 \mu s$ pulse width, 300 pps)	$I_{F(TRAN)}$		1.0	A	
Reverse Input Voltage	$V_R$		5	V	
"High" Peak Output Current	$I_{OH(PEAK)}$		2.5	A	2
"Low" Peak Output Current	$I_{OL(PEAK)}$		2.5	A	2
Supply Voltage	$(V_{CC} - V_{EE})$	0	35	Volts	
Input Current (Rise/Fall Time)	$t_{r(IN)} / t_{f(IN)}$		500	ns	
Output Voltage	$V_{O(PEAK)}$	0	$V_{CC}$	Volts	
Output Power Dissipation	$P_O$		250	mW	3
Total Power Dissipation	$P_T$		295	mW	4
Lead Solder Temperature	260°C for 10 sec., 1.6 mm below seating plane				
Solder Reflow Temperature Profile	See Package Outline Drawings Section				

## Ordering Information

Part Number	Options		Surface Mount	Gullwing	Tape & Reel	UL 5000 Vrms/1 Minute rating	IEC/EN/DIN EN 60747-5-2	Quantity
	RoHS Compliant	Package						
ACPL-312T	-000E	DIP 8					X	50 per tube
	-300E	Gullwing	X	X			X	50 per tube
	-500E		X	X	X		X	1000 per reel

Note:- option x20E for UL1577 5000Vrms for 1minute will be offered upon request

To order, choose a part number from the part number column and combine with the desired option from the option column to form an order entry.

### Example 1:

ACPL-312T-500E to order product of gullwing DIP-8 package in Tape and Reel packaging with RoHS compliant.

### Example 2:

ACPL-312T-000E to order product of DIP-8 package in tube packaging with RoHS compliant.

Option datasheets are available. Contact your Avago sales representative or authorized distributor for information.

For product information and a complete list of distributors, please go to our web site: [www.avagotech.com](http://www.avagotech.com)

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