HCPL-817

Phototransistor Optocoupler High Density Mounting Type



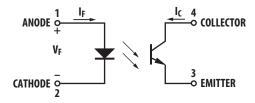
Data Sheet



Description

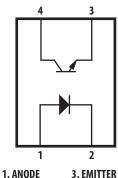
The HCPL-817 contains a light emitting diode optically coupled to a phototransistor. It is packaged in a 4-pin DIP package and available in wide-lead spacing option and lead bend SMD option. Input-output isolation voltage is 5000 Vrms. Response time, t_r , is typically 4 μs and minimum CTR is 50% at input current of 5 mA.

Schematic



Functional Diagram

PIN NO. AND INTERNAL CONNECTION DIAGRAM



1. ANODE 3. EMITTER
2. CATHODE 4. COLLECTOR

Features

- Current Transfer Ratio (CTR: min. 50% at I_F = 5 mA, V_{CE} = 5 V)
- High input-output isolation voltage (V_{iso} = 5000 V_{rms})
- Response time (tr: typ., 4 μs at VCE = 2 V, IC = 2 mA, RL = 100 Ω)
- Compact dual-in-line package
- UL approved
- CSA approved
- IEC/EN/DIN EN 60747-5-2 approved
- Options available:
 - Leads with 0.4" (10.16 mm) spacing (W00)
 - Leads bends for surface mounting (300)
 - Tape and reel for SMD (500)
 - IEC/EN/DIN EN 60747-5-2 approvals (060)

Applications

- Signal transmission between circuits of different potentials and impedances
- I/O interfaces for computers
- Feedback circuit in power supply

Ordering Information

HCPL-817-xxxx is UL Recognized with 5000 Vrms for 1 minute per UL1577 and is approved under CSA Component Acceptance Notice #5, File CA 88324.

	RoHS Compliant Option											
Part number	Rank '0' 50% <ctr< 600%<="" th=""><th>Rank 'A' 80% <ctr< 160%<="" th=""><th>Rank 'B' 130% <ctr< 260%<="" th=""><th>Rank 'C' 200% <ctr< 400%</ctr< </th><th>Rank 'D' 300% <ctr< 600%</ctr< </th><th>Rank 'L' 50% <ctr< 100%</ctr< </th><th>Package</th><th>Surface Mount</th><th>Gull Wing</th><th>Tape & Reel</th><th>IEC/EN/ DIN EN 60747- 5-2</th><th>Quantity</th></ctr<></th></ctr<></th></ctr<>	Rank 'A' 80% <ctr< 160%<="" th=""><th>Rank 'B' 130% <ctr< 260%<="" th=""><th>Rank 'C' 200% <ctr< 400%</ctr< </th><th>Rank 'D' 300% <ctr< 600%</ctr< </th><th>Rank 'L' 50% <ctr< 100%</ctr< </th><th>Package</th><th>Surface Mount</th><th>Gull Wing</th><th>Tape & Reel</th><th>IEC/EN/ DIN EN 60747- 5-2</th><th>Quantity</th></ctr<></th></ctr<>	Rank 'B' 130% <ctr< 260%<="" th=""><th>Rank 'C' 200% <ctr< 400%</ctr< </th><th>Rank 'D' 300% <ctr< 600%</ctr< </th><th>Rank 'L' 50% <ctr< 100%</ctr< </th><th>Package</th><th>Surface Mount</th><th>Gull Wing</th><th>Tape & Reel</th><th>IEC/EN/ DIN EN 60747- 5-2</th><th>Quantity</th></ctr<>	Rank 'C' 200% <ctr< 400%</ctr< 	Rank 'D' 300% <ctr< 600%</ctr< 	Rank 'L' 50% <ctr< 100%</ctr< 	Package	Surface Mount	Gull Wing	Tape & Reel	IEC/EN/ DIN EN 60747- 5-2	Quantity
HCPL- 817	-000E	-00AE	-00BE	-00CE	-00DE	-00LE	- _ 300mil _ DIP-4 -					100 pcs per tube
	-300E	-30AE	-30BE	-30CE	-30DE	-30LE		Х	Х			100 pcs per tube
	-500E	-50AE	-50BE	-50CE	-50DE	-50LE		Х	Х	Х		1000 pcs per reel
	-060E	-06AE	-06BE	-06CE	-06DE	-06LE					Х	100 pcs per tube
	-360E	-36AE	-36BE	-36CE	-36DE	-36LE		X	Х		Х	100 pcs per tube
	-560E	-56AE	-56BE	-56CE	-56DE	-56LE		Х	Х	Х	Х	1000 pcs per reel
	-W00E	-W0AE	-W0BE	-W0CE	-W0DE	-W0LE	_ 400mil DIP-4					100 pcs per tube
	-W60E	-W6AE	-W6BE	-W6CE	-W6DE	-W6LE					Х	100 pcs per tube

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:

HCPL-817-360E to order product of 300mil DIP-4 DC Gull Wing Surface Mount package in Tube packaging with 50%<CTR<600%, IEC/EN/DIN EN 60767-5-2 Safety Approval and RoHS compliant.

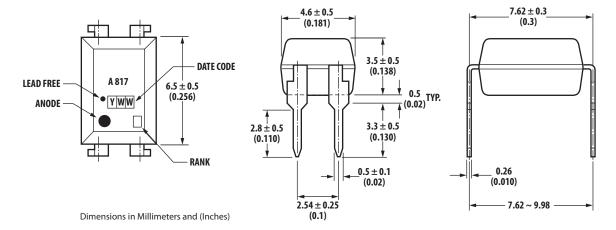
Example 2:

HCPL-817-50BE to order product of 300mil DIP-4 DC Gull Wing Surface Mount package in Tape and Reel packaging with 130%<CTR<260% and RoHS compliant.

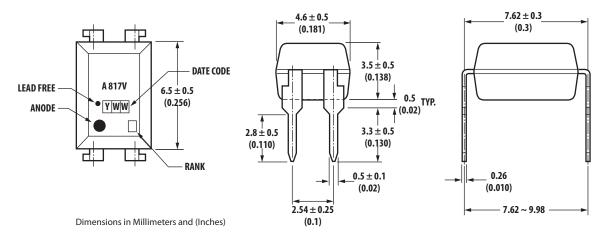
Option datasheets are available. Contact your Avago sales representative or authorized distributor for information.

Package Outline Drawings

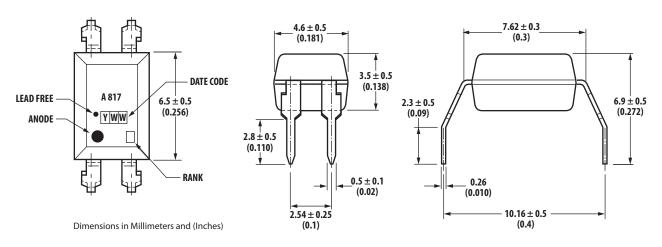
HCPL-817-000E



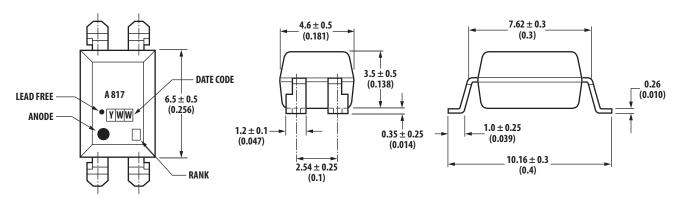
HCPL-817-060E



HCPL-817-W00E

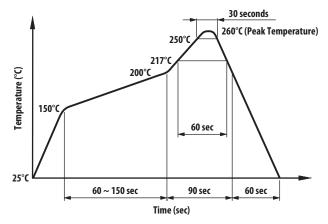


HCPL-817-300E



Dimensions in Millimeters and (Inches)

Solder Reflow Temperature Profile



Note: Non-halide flux should be used.

- 1. One-time soldering reflow is recommended within the condition of temperature and time profile shown.
- 2. When using another soldering method such as infrared ray lamp, the temperature may rise partially in the mold of thedevice. Keep the temperature on the package of the device within the condition of (1) above.

Absolute Maximum Ratings ($T_A = 25$ °C)

−55°C to +125°C			
−30°C to +100°C			
260°C for 10 s			
50 mA			
6 V			
70 mW			
50 mA			
70 V			
6 V			
150 mW			
200 mW			
5000 Vrms			

Electrical Specifications ($T_A = 25$ °C)

Parameter	Symbol	Min.	Тур.	Max.	Units	Test Conditions	
Forward Voltage	V _F	_	1.2	1.4	V	$I_F = 20 \text{ mA}$	
Reverse Current	I _R	-	-	10	μΑ	$V_R = 4 V$	
Terminal Capacitance	Ct	_	30	250	pF	V = 0, f = 1 KHz	
Collector Dark Current	I _{CEO}	-	-	100	nA	V _{CE} = 20 V	
Collector-Emitter Breakdown Voltage	BV_{CEO}	70	-	-	V	$I_C = 0.1 \text{ mA}$	
Emitter-Collector Breakdown Voltage	BV _{ECO}	6	_	-	V	$I_E = 10 \mu A$	
Collector Current	lc	2.5	_	30	mA	$I_F = 5 \text{ mA}, V_{CE} = 5 \text{ V},$	
*Current Transfer Ratio	CTR	50	_	600	%	R _{BE} = ∞	
Collector-Emitter Saturation Voltage	V _{CE(sat)}	_	0.1	0.2	V	$I_F = 20 \text{ mA}, I_C = 1 \text{ mA}$	
Response Time (Rise)	t _r	-	4	18	μs	$V_{CE} = 2 \text{ V, } I_{C} = 2 \text{ mA}$	
Response Time (Fall)	t _f	-	3	18	μs	$R_L = 100 \Omega$	
Cut-off Frequency	f _c	-	80	_	KHz	$V_{CC} = 5 \text{ V, } I_{C} = 2 \text{ mA}$ $R_{L} = 100 \Omega, -3 \text{ dB}$	
Isolation Resistance	R _{iso}	5 x 10 ¹⁰	1 x 10 ¹¹	_	Ω	DC 500 V 40 ~ 60% R.H.	
Floating Capacitance	C _f	-	0.6	1.0	pF	V = 0, f = 1 MHz	

* CTR =
$$\frac{I_C}{I_F}$$
 x 100%

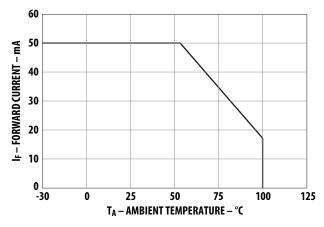


Figure 1. Forward current vs. temperature.

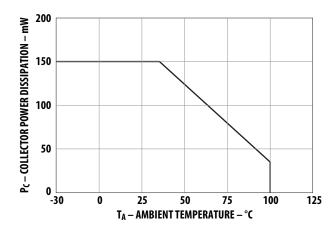


Figure 2. Collector power dissipation vs. temperature.

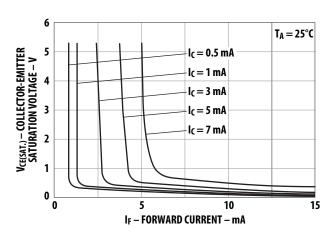


Figure 3. Collector-emitter saturation voltage vs. forward current.

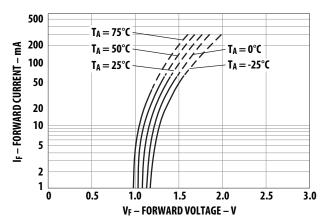


Figure 4. Forward current vs. forward voltage.

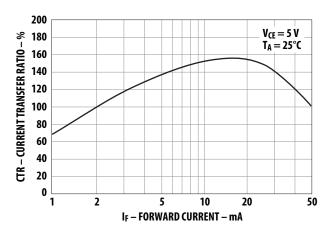


Figure 5. Current transfer ratio vs. forward current.

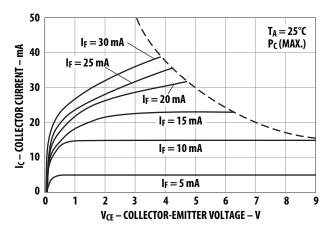


Figure 6. Collector current vs. collector-emitter voltage.

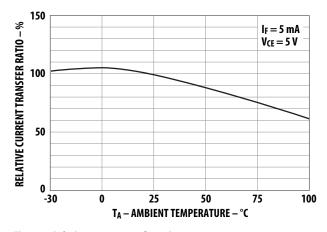


Figure 7. Relative current transfer ratio vs. temperature.

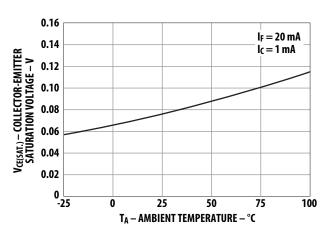


Figure 8. Collector-emitter saturation voltage vs. temperature.

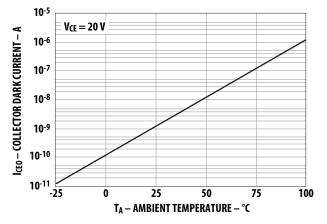


Figure 9. Collector dark current vs. temperature.

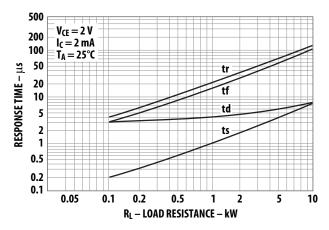
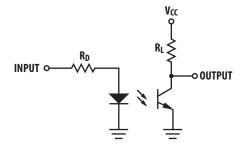


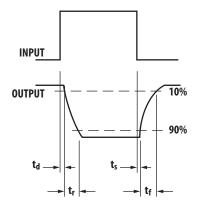
Figure 10. Response time vs. load resistance.

$V_{CE} = 2 V$ $I_C = 2 mA$ $T_A = 25^{\circ}C$ VOLTAGE GAIN AV – dB -10 $R_L = 1 k\Omega$ $R_L = 100 \Omega$ -20 2 20 0.5 10 50 100 200 500 1 f – FREQUENCY – kHz

Figure 11. Frequency response.

Test Circuit for Response Time





Test Circuit for Frequency Response

