



Parameter	Rating	Units
Breakdown Voltage - BV_{CEO}	350	V_P
Current Transfer Ratio - CTR	1000-8000	%

Features

- $5000V_{rms}$ Input/Output Isolation
- Small 4-Pin Package
- $350V_P$ Breakdown Voltage
- Machine Insertable, Wave Solderable
- Surface Mount Tape & Reel Version Available

Applications

- Telecom Switching
- Tip/Ring Circuits
- Hook Switch
- Modem Switching (Laptop, Notebook, Pocket Size)
- Loop Detect
- Ringing Detect
- Current Sensing

Description

The CPC1301 is a unidirectional input optocoupler with a high-voltage Darlington output. Light output from the highly efficient GaAlAs infrared LED activates the optically coupled silicon NPN photo-Darlington output transistor. The input LED and the output transistor are separated by a $5000V_{rms}$ isolation barrier.

With an LED current of only 1mA, a current transfer ratio of 1000% to 8000% is guaranteed at the collector of the 350V Darlington output transistor.

The CPC1301's low input current, high current transfer ratio, high output voltage capability, and large isolation barrier rating make it ideal for many applications such as telecom, industrial, and power control.

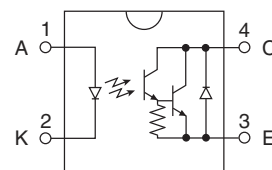
Approvals

- UL Recognized Component: File # E76270
- UL 1577 Double Protection
- CSA Certified Component:
Certificate # 156092 (LR 43639)
- EN/IEC 60950-1 compliant

Ordering Information

Part Number	Description
CPC1301G	4-Pin DIP (100/Tube)
CPC1301GR	4-Pin Surface Mount (100/Tube)
CPC1301GRTR	4-Pin Surface Mount (1000/Reel)

Pin Configuration



Absolute Maximum Ratings

Parameter	Ratings	Units
Breakdown Voltage, BV_{CEO}	350	V_P
Reverse Input Voltage	5	V
Input Control Current	50	mA
Peak (10ms)	1	A
Input Power Dissipation ¹	150	mW
Phototransistor Power Dissipation ²	150	mW
Isolation Voltage Input to Output	5000	V_{rms}
Operational Temperature	-40 to +85	$^{\circ}C$
Storage Temperature	-40 to +125	$^{\circ}C$

¹ Derate Linearly 1.33 mW/ $^{\circ}C$
² Derate Linearly 1.5 mW/ $^{\circ}C$

Absolute Maximum Ratings are stress ratings. Stresses in excess of these ratings can cause permanent damage to the device. Functional operation of the device at conditions beyond those indicated in the operational sections of this data sheet is not implied.

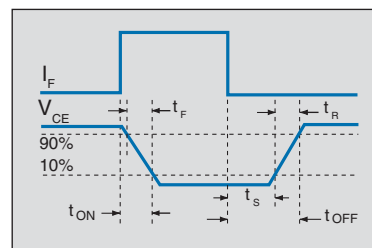
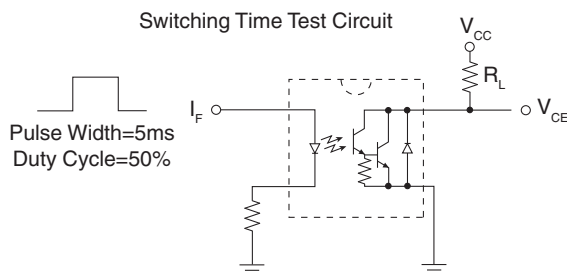
Electrical absolute maximum ratings are at 25 $^{\circ}C$

Electrical Characteristics

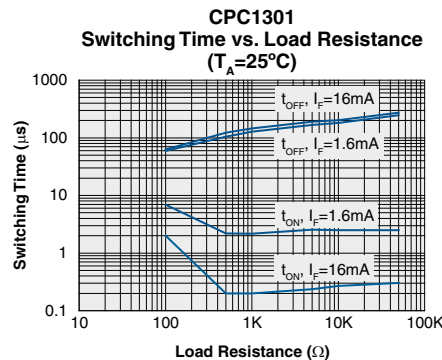
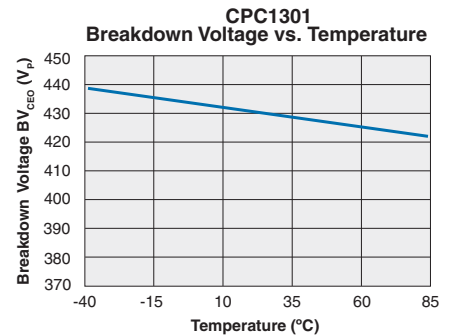
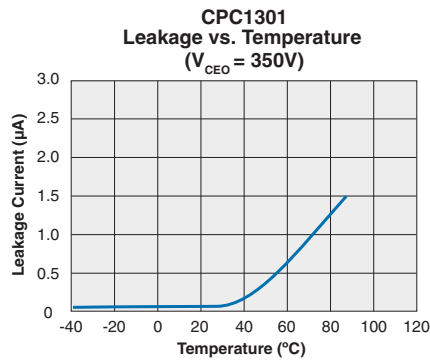
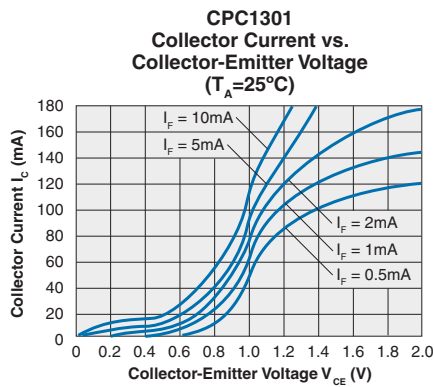
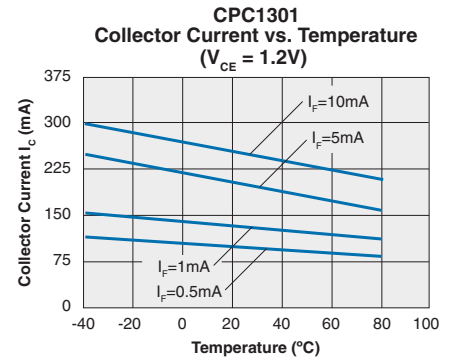
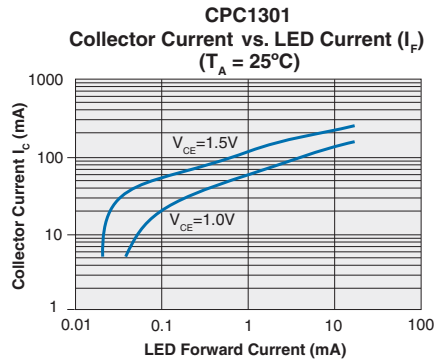
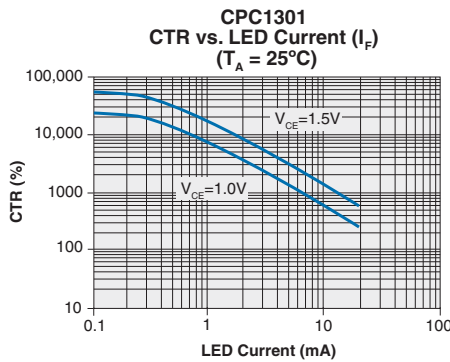
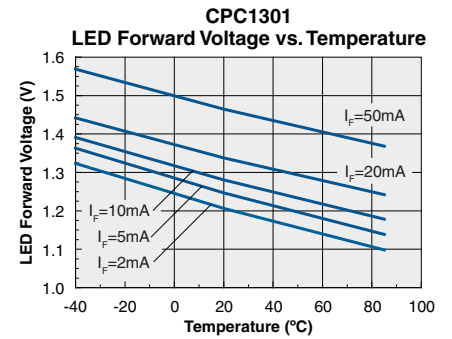
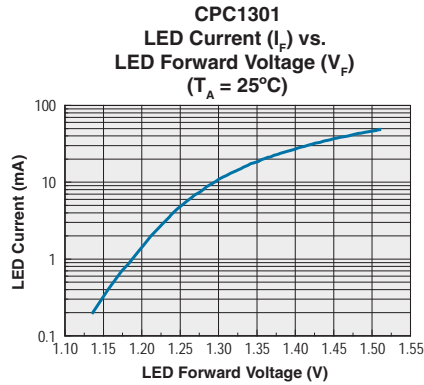
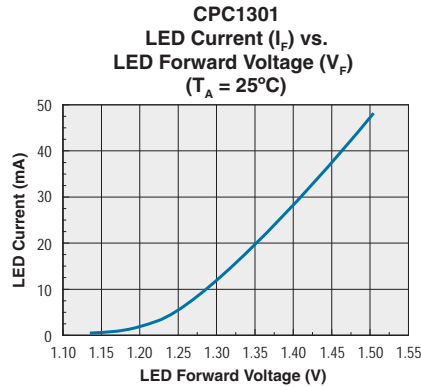
Parameters	Conditions	Symbol	Min	Typ	Max	Units
Output Characteristics @ 25$^{\circ}C$						
Phototransistor Breakdown Voltage	$I_{CEO}=100\mu A$	BV_{CEO}	350	-	-	V_P
Emitter-Collector Breakdown Voltage	$I_E=0.1mA$	BV_{ECO}	0.3	-	-	V
Phototransistor Output (Dark) Current	$V_{CEO}=200V, I_F=0mA$	I_{CEO}	-	-	100	nA
Saturation Voltage	$I_C=10mA, I_F=1mA$	$V_{CE(Sat)}$	-	-	1	V
	$I_C=100mA, I_F=10mA$		-	-	1.2	V
Current Transfer Ratio	$I_F=1mA, V_{CE}=1V$	CTR	1000	5500	8000	%
Output Capacitance	$V_{CEO}=50V, f=1MHz$	C_{OUT}	-	13	-	pF
Input Characteristics @ 25$^{\circ}C$						
Input Control Current	$I_C=10mA, V_{CE}=1V$	I_F	-	0.07	1	mA
Input Voltage Drop	$I_F=5mA$	V_F	0.9	1.2	1.4	V
Input Reverse Current	$V_R=5V$	I_R	-	-	10	μA
Common Characteristics @ 25$^{\circ}C$						
Input to Output Capacitance	-	C_{IO}	-	3	-	pF

Switching Characteristics @ 25 $^{\circ}C$

Characteristic	Symbol	Test Condition	Typ	Units
Rise Time	t_R	$V_{CC}=10V$ $I_F=10mA$ $R_L=100\Omega$	40	μs
Fall Time	t_F		2.6	
Turn-On Time	t_{ON}		2.75	
Storage Time	t_S		20	
Turn-Off Time	t_{OFF}		60	
Turn-On Time	t_{ON}	$V_{CC}=10V$	1	
Storage Time	t_S	$I_F=16mA$	40	
Turn-Off Time	t_{OFF}	$R_L=180\Omega$	80	



PERFORMANCE DATA *



*The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

Manufacturing Information

Soldering

For proper assembly, the component must be processed in accordance with the current revision of IPC/JEDEC standard J-STD-020. Failure to follow the recommended guidelines may cause permanent damage to the device resulting in impaired performance and/or a reduced lifetime expectancy.

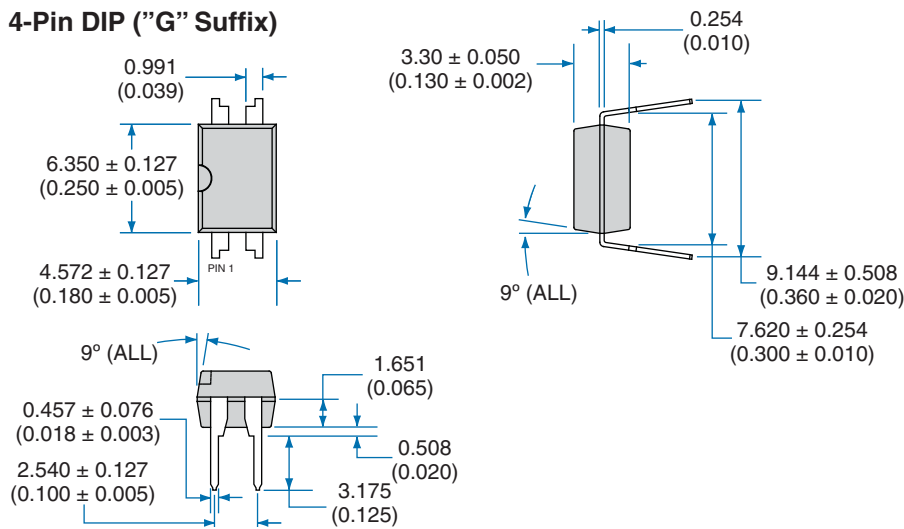
Washing

Clare does not recommend ultrasonic cleaning or the use of chlorinated solvents.

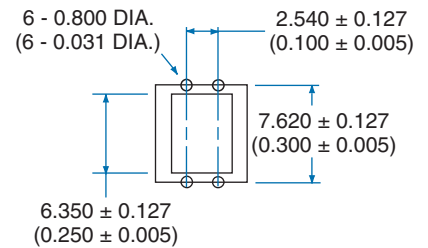


MECHANICAL DIMENSIONS

4-Pin DIP ("G" Suffix)

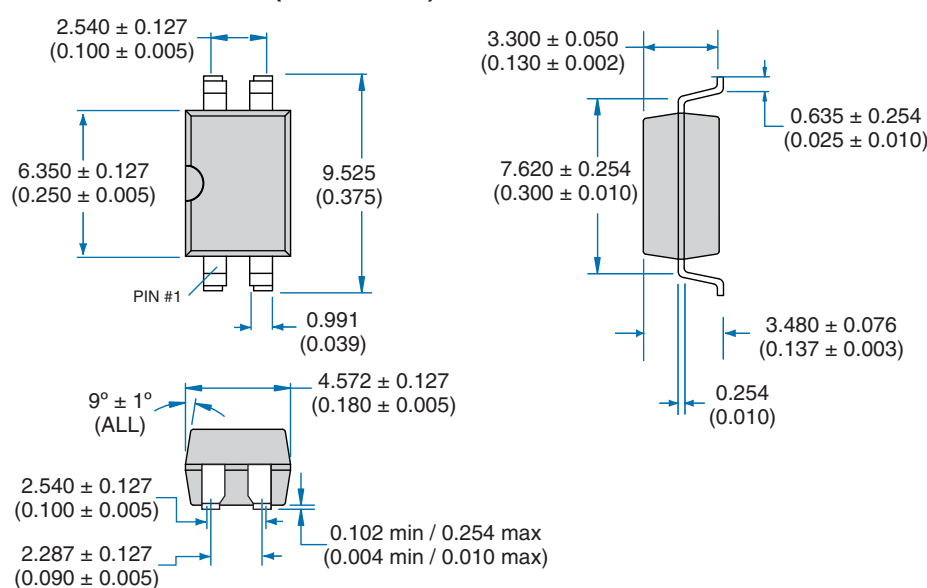


PC Board Pattern (Top View)

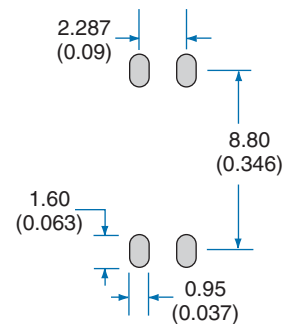


Dimensions
mm
(inches)

4-Pin Surface Mount ("GR" Suffix)

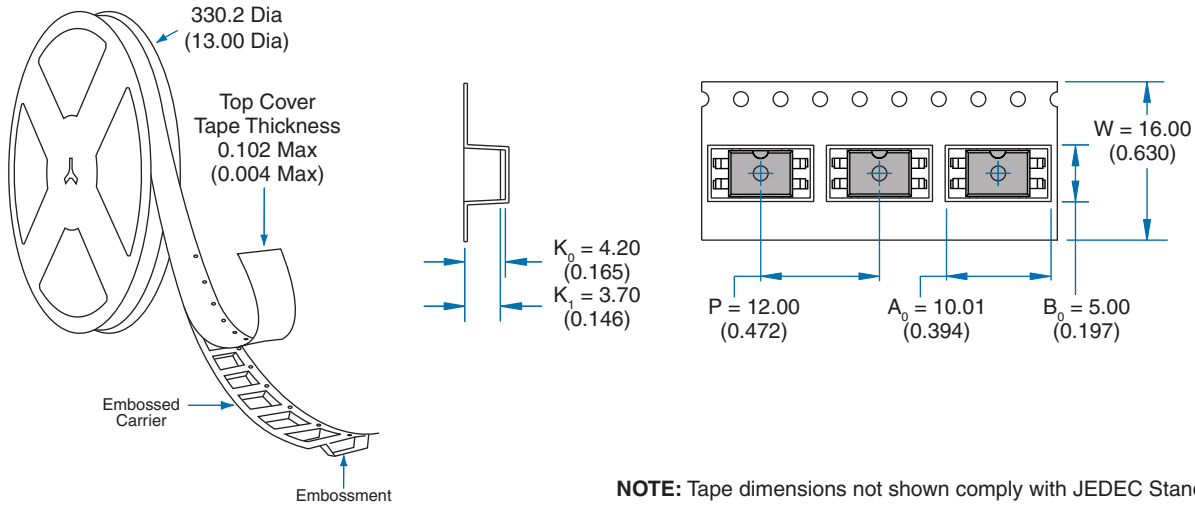


Recommended PCB Land Pattern



Dimensions
mm
(inches)

Tape and Reel Packaging for 4-Pin Surface Mount Package



NOTE: Tape dimensions not shown comply with JEDEC Standard EIA-481-2

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