CPC1302

Dual Optocoupler, High-Voltage Darlington Output

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

Features

- 3750V_{rms} Input/Output Isolation
- Machine Insertable, Wave Solderable
- Surface Mount Tape & Reel Version Available
- 350V_P Breakdown Voltage

Applications

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

Description

The CPC1302 is a dual optocoupler with two identical, independent channels, each having a unidirectional input and a high-voltage Darlington output. Light output from the highly efficient GaAlAs infrared LED activates its associated, optically coupled silicon NPN photo-Darlington output transistor. The input LED and the output transistor are separated by a 3750V_{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 CPC1302's low input current capability with high current transfer ratios, output voltage capability, and isolation barrier rating make it ideal for many applications such as telecom, industrial, and power control.

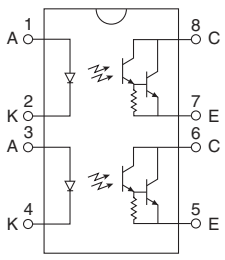
Approvals

- UL Recognized: File # E76270
- CSA Certified: File # 156092 (LR436.39)
- EN/IEC 60950-1 compliant

Ordering Information

Part Number	Description
CPC1302G	8-Pin DIP (50/Tube)
CPC1302GS	8-Pin Surface Mount (50/Tube)
CPC1302GSTR	8-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	3750	V_{rms}
Operational Temperature	-40 to +85	°C
Storage Temperature	-40 to +125	°C

[1] Derate Linearly 1.33 mW/°C
[2] Derate Linearly 1.5 mW/°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°C

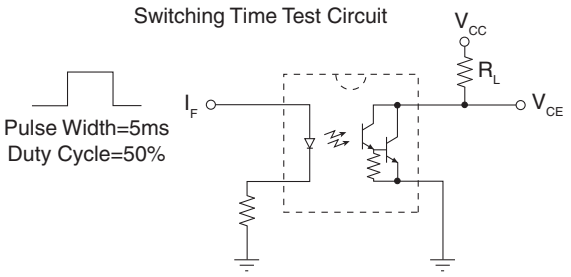
Electrical Characteristics

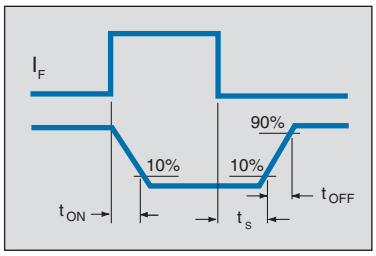
Parameters	Conditions	Symbol	Min	Typ	Max	Units
Output Characteristics @ 25°C						
Phototransistor Breakdown Voltage	I_{CEO}=100µA	BV_{CEO}	350	-	-	V_P
Phototransistor Output (Dark) Current	V_{CEO}=200V, I_F=0mA	I_{CEO}	-	-	100	nA
Saturation Voltage	I_C=10mA, I_F=1mA	$V_{CE(sat)}$	-	-	1	V
	I_C=100mA, 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°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°C						
Input to Output Capacitance	-	$C_{I/O}$	-	3	-	pF

Switching Characteristics @ 25°C

Characteristic	Symbol	Test Condition	Typ	Units
Rise Time	t_R	V_{CC}=10V, I_F=10mA, R_L=100Ω	40	µs
Fall Time	t_F		5	
Turn-On Time	t_{ON}		5	
Turn-Off Time	t_{OFF}		60	
Turn-On Time	t_{ON}	V_{CC}=10V, I_F=16mA, R_L=180Ω	1	
Storage Time	t_S		40	
Turn-Off Time	t_{OFF}		80	

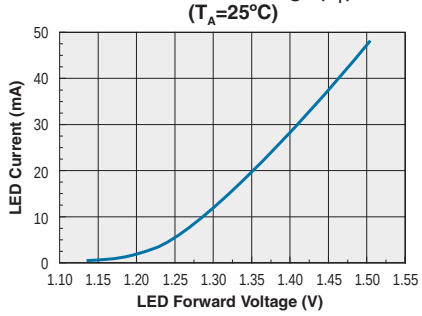
Switching Time Test Circuit



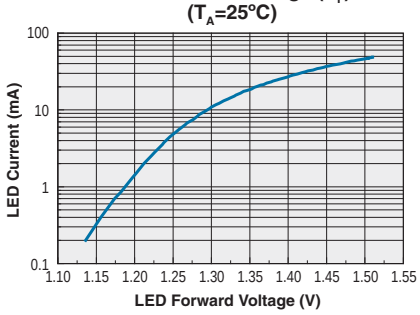


PERFORMANCE DATA*

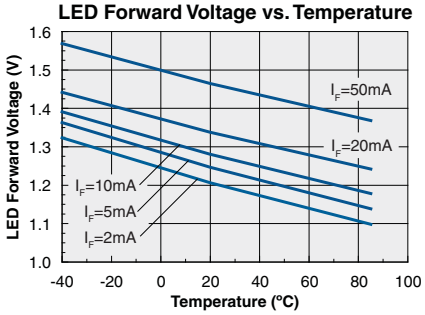
CPC1302
LED Current (I_F) vs.
LED Forward Voltage (V_F)
(T_A=25°C)



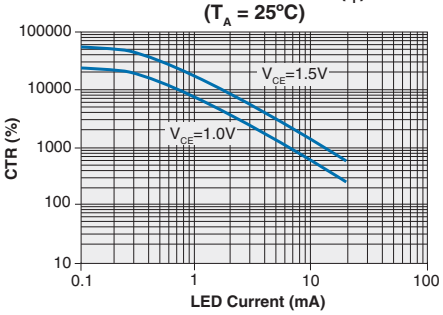
CPC1302
LED Current (I_F) vs.
LED Forward Voltage (V_F)
(T_A=25°C)



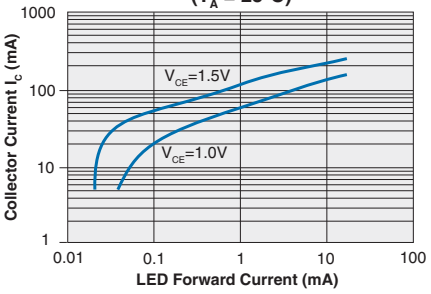
CPC1302
LED Forward Voltage vs. Temperature



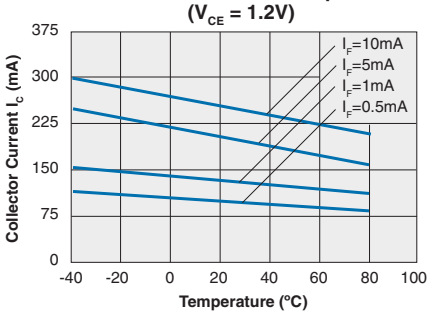
CPC1302
CTR vs. LED Current (I_F)
(T_A = 25°C)



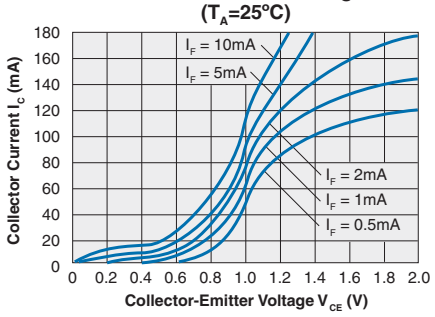
CPC1302
Collector Current vs. LED Current (I_F)
(T_A = 25°C)



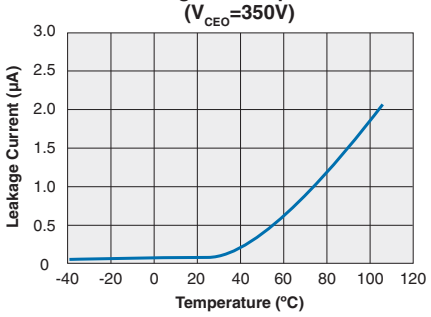
CPC1302
Collector Current vs. Temperature
(V_{CE} = 1.2V)



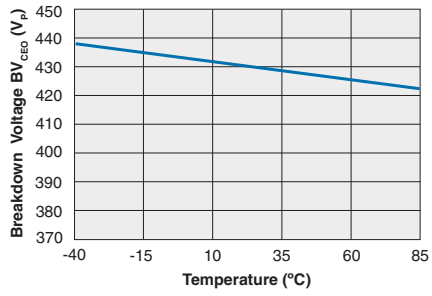
CPC1302
Collector Current vs.
Collector-Emitter Voltage
(T_A=25°C)



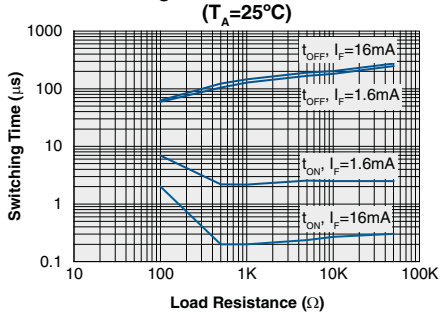
CPC1302
Leakage vs. Temperature
(V_{CEO}=350V)



CPC1302
Breakdown Voltage vs. Temperature



CPC1302
Switching Time vs. Load Resistance
(T_A=25°C)



*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

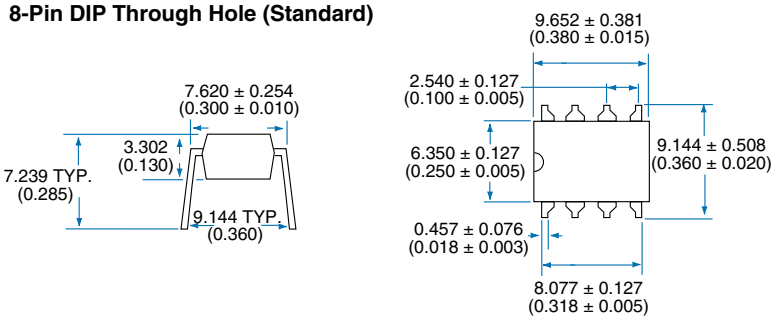
For proper assembly, the component must be processed in accordance with the current revision of IPC/JEDEC standard J-STD-020. Failure to follow the recommended guidelines may cause permanent damage to the device resulting in impaired performance and/or a reduced lifetime expectancy.

Washing

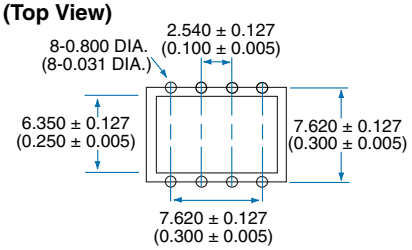
Clare does not recommend ultrasonic cleaning or the use of chlorinated solvents.

MECHANICAL DIMENSIONS

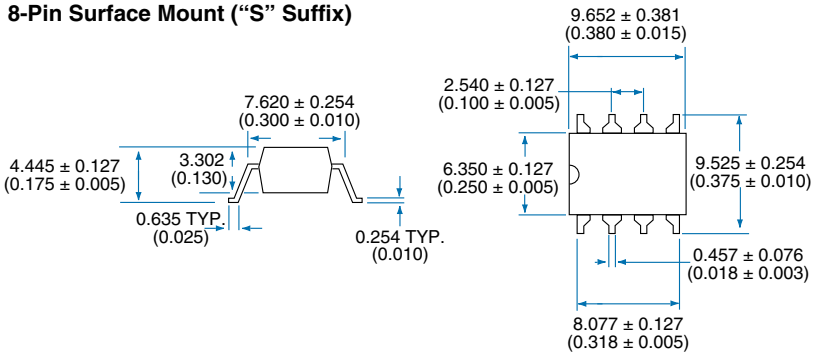
8-Pin DIP Through Hole (Standard)



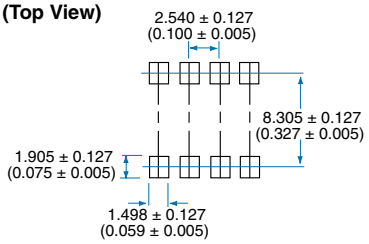
PC Board Pattern
(Top View)



8-Pin Surface Mount ("S" Suffix)

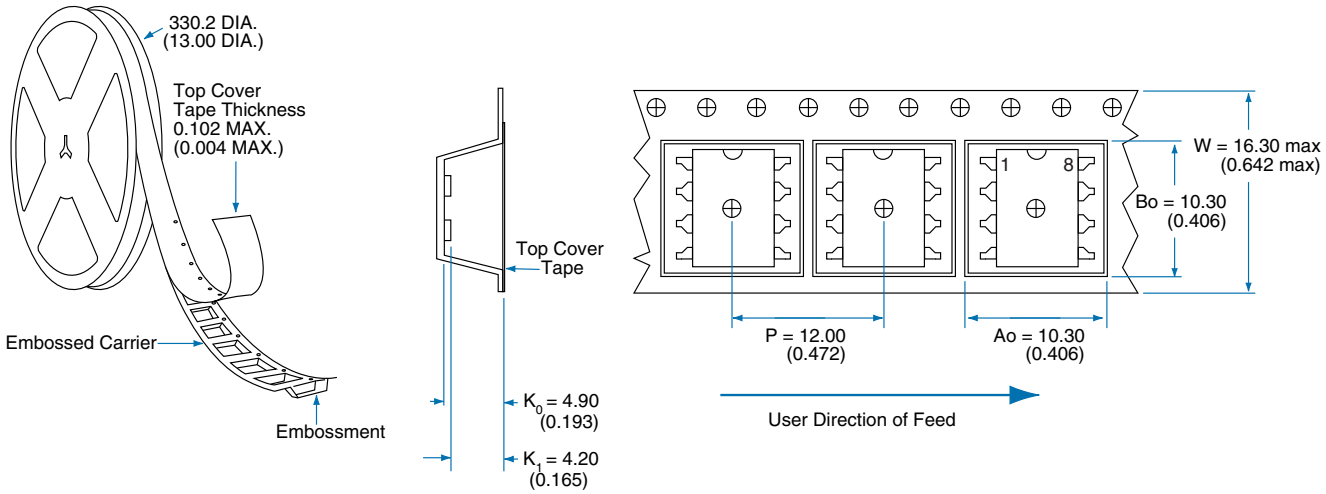


PC Board Pattern
(Top View)



Dimensions:
mm
(inches)

Tape and Reel Packaging for 8-Pin Surface Mount Package



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

Dimensions:
mm
(inches)

Specification: DS-CPC1302-R01

5/3/07