CPC2317N
Dual Single-Pole 8-Pin SOIC OptoMOS® Relay

Parameter	Rating	Units
Blocking Voltage	60	V_P
Load Current	120	mA
Max On-resistance	16	Ω
LED Current to operate	1	mA

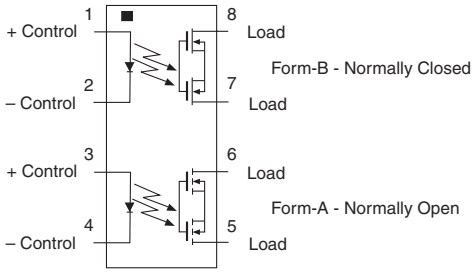
Features

- 1500V_{rms} Input/Output Isolation
- TTL/CMOS Compatible input
- Arc-Free With No Snubbing Circuits
- No EMI/RFI Generation
- Immune to radiated EM fields
- SMD Pick & Place, Wave Solderable
- Small 8-Pin SOIC Package
- Tape & Reel Version Available

Applications

- Security
  - Passive Infrared Detectors (PIR)
  - Data Signaling
  - Sensor Circuitry
- Instrumentation
  - Multiplexers
  - Data Acquisition
  - Electronic Switching
  - I/O Subsystems
- Medical Equipment—Patient/Equipment Isolation
- Aerospace
- Industrial Controls

Pin Configuration



Description

The CPC2317N is a miniature device with one independent normally open (1-Form-A) solid state relay and one independent normally closed (1-Form-B) solid state relay in an 8-pin SOIC package. It uses Clare's patented, optically coupled, OptoMOS architecture to provide 1500V_{rms} of input/output isolation.

The relay outputs are constructed with efficient MOSFET switches and photovoltaic die that use Clare's patented OptoMOS architecture while the input, a highly efficient GaAlAs infrared LED, provides the optically coupled control.

CPC2317N uses Clare's state of the art, double-molded vertical construction packaging to produce one of the world's smallest relays. It is ideal for replacing larger, less-reliable reed and electromechanical relays.

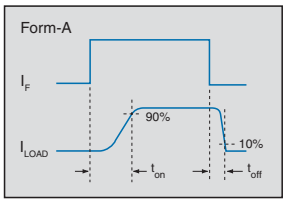
Approvals

- UL Certified Component: File E76270
- CSA Certified Component: Certificate 1172007
- EN/IEC 60950-1 Certified Component: TUV Certificate B 10 05 49410 006

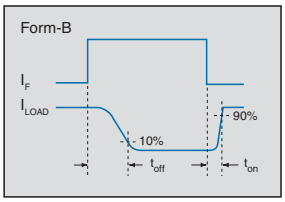
Ordering Information

Part #	Description
CPC2317N	8-Pin SOIC (50/tube)
CPC2317NTR	8-Pin SOIC (2000/reel)

Switching Characteristics of Normally Open (Form-A) Devices



Switching Characteristics of Normally Closed (Form-B) Devices



Absolute Maximum Ratings @ 25°C

Parameter	Ratings	Units
Blocking Voltage	60	V_P
Reverse Input Voltage	5	V
Input Control Current	50	mA
Peak (10ms)	1	A
Total Power Dissipation [1]	600	mW
Isolation Voltage, Input to Output	1500	V_{rms}
Operational Temperature	-40 to +85	°C
Storage Temperature	-40 to +125	°C
Soldering Temperature (10 Seconds)	260	°C

[1] Derate linearly 5mW / °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.

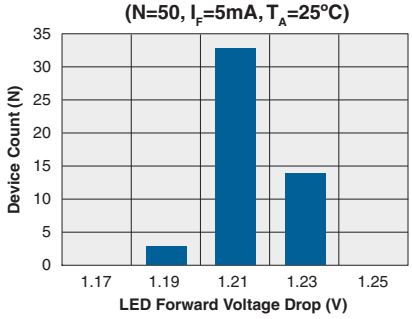
Electrical Characteristics @ 25°C

Parameter	Conditions	Symbol	Min	Typ	Max	Units
Output Characteristics						
Load Current						
Normally Open (Form-A) Continuous [1]	I_F=1mA	I_L	-	-	120	mA
Normally Closed (Form-B) Continuous [1]	I_F=0mA					
Peak	t =10ms	I_{LPK}	-	-	350	mA_P
On-Resistance [2]	I_L=120mA	R_{ON}	-	-	16	Ω
Switching Speeds						
Turn-On	I_F=5mA, V_L=10V	t_{on}	-	-	3	ms
Turn-Off		t_{off}	-	-	3	
Off-State Leakage Current	V_L=60V_P	I_{LEAK}	-	-	1	µA
Output Capacitance						
Normally Open (Form-A)	I_F=0mA, V_L=50V, f=1MHz	C_{OUT}	-	25	-	pF
Normally Closed (Form-B)	I_F=5mA, V_L=50V, f=1MHz					
Input Characteristics						
Input Control Current [3]	I_L=100mA	I_F	-	0.40	1	mA
Input Dropout Current	-	I_F	0.1	0.35	-	mA
Input Voltage Drop	I_F=5mA	V_F	0.9	1.2	1.4	V
Reverse Input Current	V_R=5V	I_R	-	-	10	µA
Common Characteristics						
Capacitance, Input to Output	-	-	-	1	-	pF

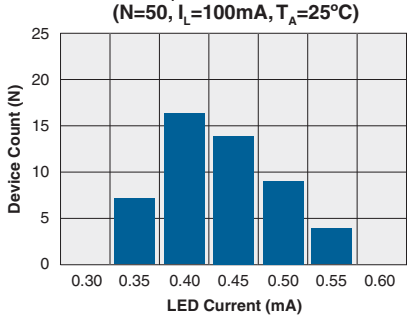
[1] Load current derates linearly from 120mA @ 25ºC to 60mA @ 85ºC, and must be derated for both poles operating simultaneously.
[2] Measurement taken within 1 second of on-time.
[3] For applications requiring high temperature operation (greater than 60ºC) a LED drive current of 3mA is recommended.

COMMON PERFORMANCE DATA*

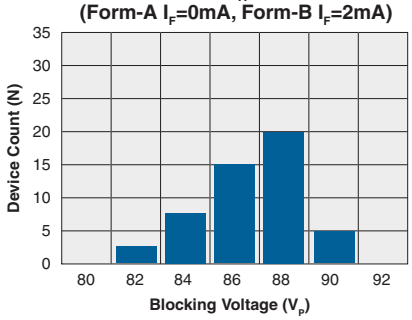
Typical LED Forward Voltage Drop (N=50, I_F=5mA, T_A=25°C)



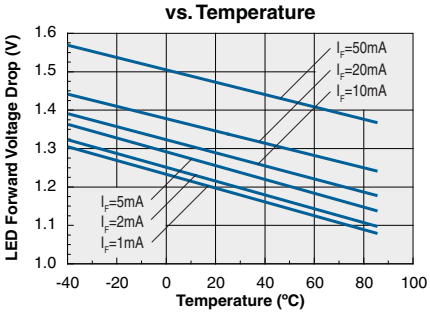
Typical I_F for Switch Operation (N=50, I_L=100mA, T_A=25°C)



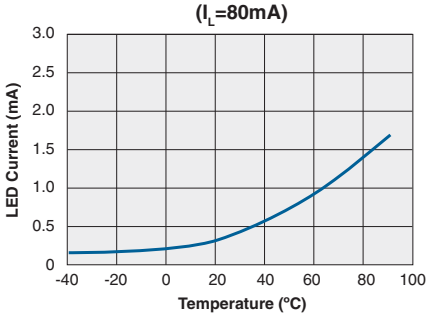
Typical Blocking Voltage Distribution (N=50, T_A=25°C) (Form-A I_F=0mA, Form-B I_F=2mA)



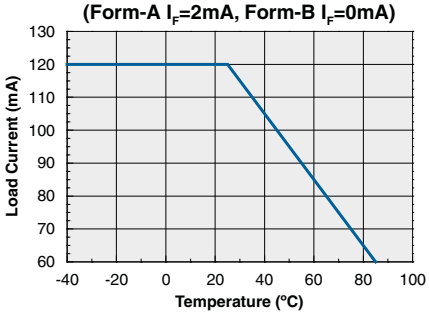
Typical LED Forward Voltage Drop vs. Temperature



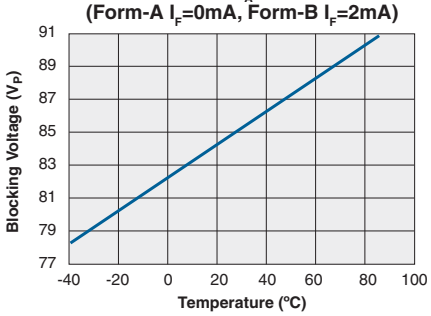
Typical I_F for Switch Operation vs. Temperature (I_L=80mA)



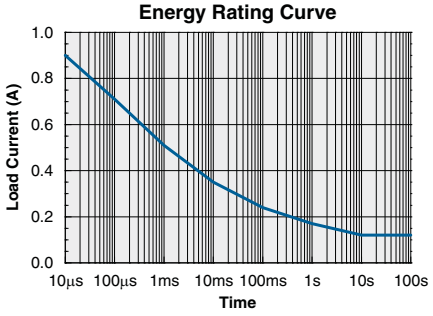
Maximum Load Current vs. Temperature (Form-A I_F=2mA, Form-B I_F=0mA)



Typical Blocking Voltage vs. Temperature (N=50, T_A=25°C) (Form-A I_F=0mA, Form-B I_F=2mA)



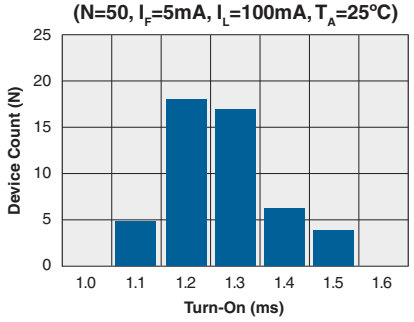
Energy Rating Curve



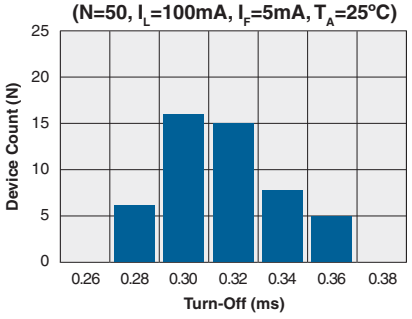
*The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

FORM-A PERFORMANCE DATA*

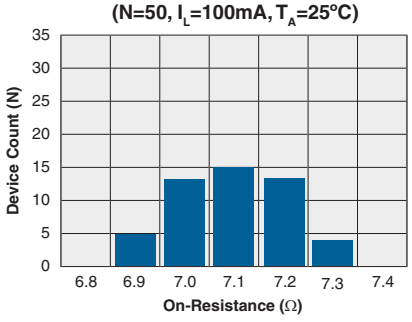
Typical Turn-On Time
(N=50, I_F=5mA, I_L=100mA, T_A=25°C)



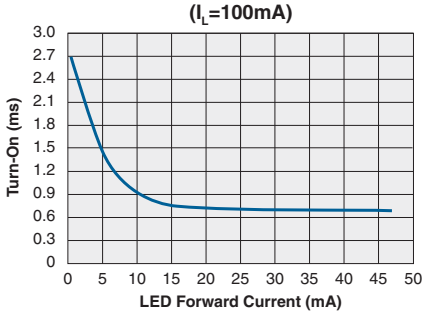
Typical Turn-Off Time
(N=50, I_L=100mA, I_F=5mA, T_A=25°C)



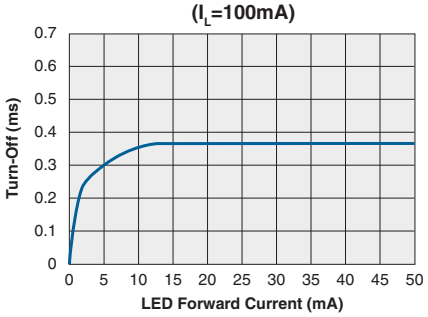
Typical On-Resistance Distribution
(N=50, I_L=100mA, T_A=25°C)



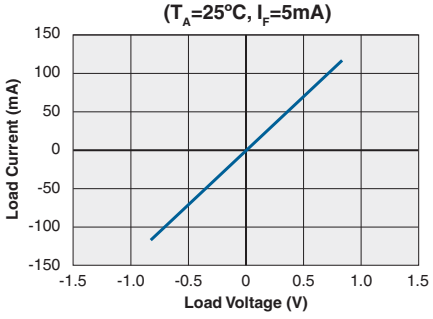
Typical Turn-On vs. LED Forward Current
(I_L=100mA)



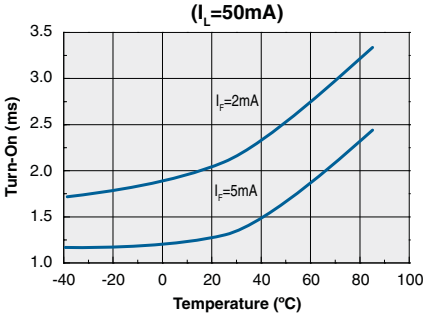
Typical Turn-Off vs. LED Forward Current
(I_L=100mA)



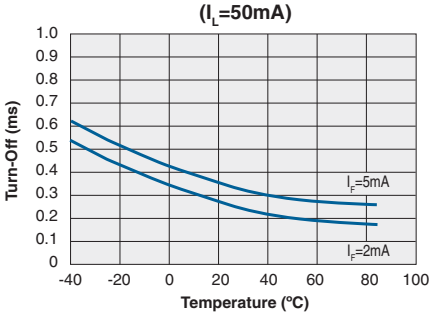
Typical Load Current vs. Load Voltage
(T_A=25°C, I_F=5mA)



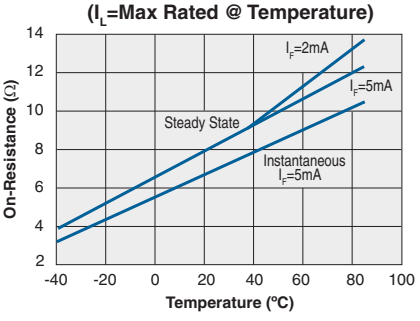
Typical Turn-On vs. Temperature
(I_L=50mA)



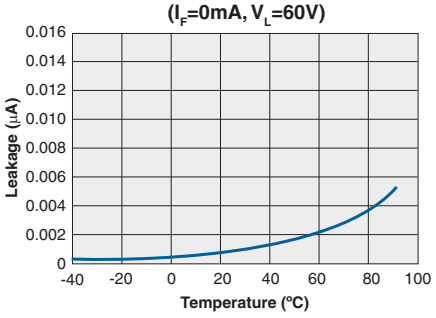
Typical Turn-Off vs. Temperature
(I_L=50mA)



Typical On-Resistance vs. Temperature
(I_L=Max Rated @ Temperature)



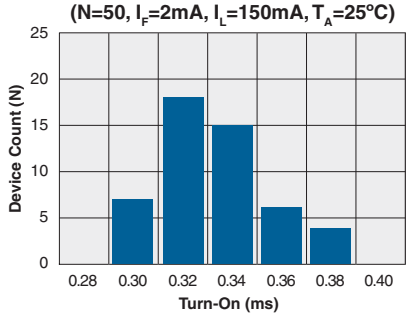
Typical Leakage vs. Temperature
(Measured Across Pins 5&6)
(I_F=0mA, V_L=60V)



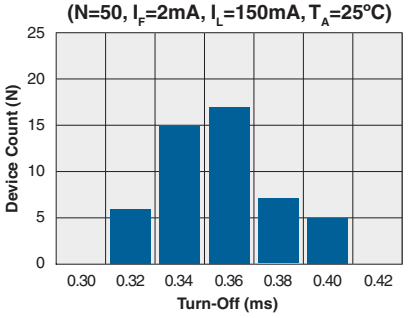
*The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

FORM-B PERFORMANCE DATA*

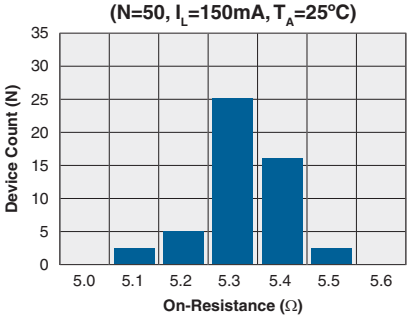
Typical Turn-On Time
(N=50, I_F=2mA, I_L=150mA, T_A=25°C)



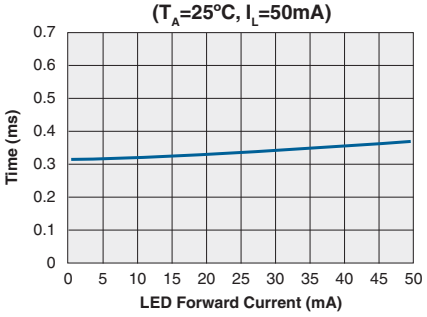
Typical Turn-Off Time
(N=50, I_F=2mA, I_L=150mA, T_A=25°C)



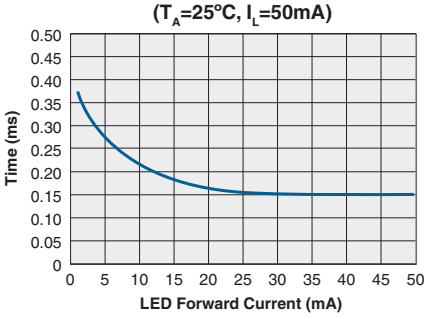
Typical On-Resistance Distribution
(N=50, I_L=150mA, T_A=25°C)



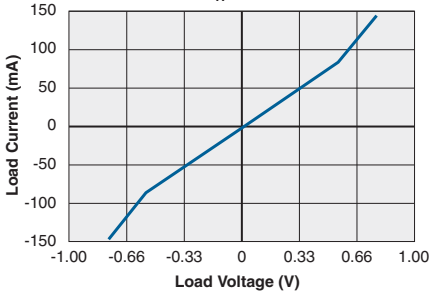
Typical Turn-On vs. LED Forward Current
(T_A=25°C, I_L=50mA)



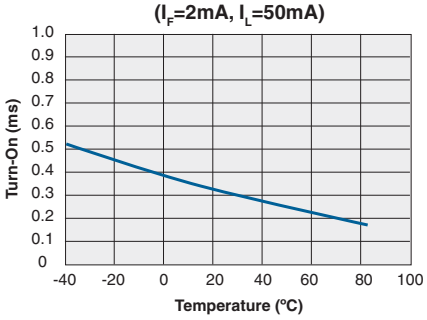
Typical Turn-Off vs. LED Forward Current
(T_A=25°C, I_L=50mA)



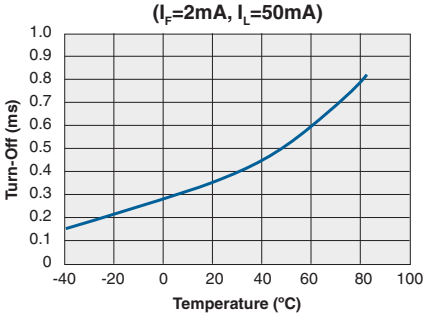
Typical Load Current vs. Load Voltage
(T_A=25°C)



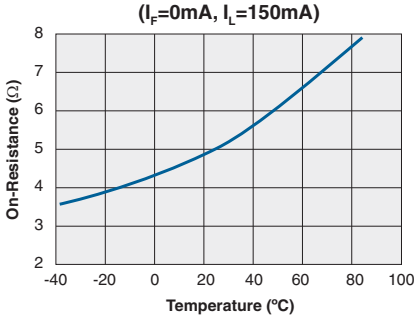
Typical Turn-On vs. Temperature
(I_F=2mA, I_L=50mA)



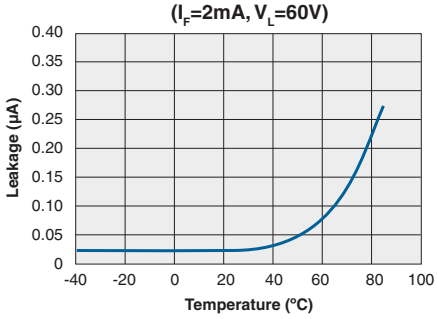
Typical Turn-Off vs. Temperature
(I_F=2mA, I_L=50mA)



Typical On-Resistance vs. Temperature
(I_F=0mA, I_L=150mA)



Typical Leakage vs. Temperature
Measured Across Pins 7&8
(I_F=2mA, V_L=60V)



*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

Moisture Sensitivity

All plastic encapsulated semiconductor packages are susceptible to moisture ingression. Clare classified all of its plastic encapsulated devices for moisture sensitivity according to the latest version of the joint industry standard, **IPC/JEDEC J-STD-020**, in force at the time of product evaluation. We test all of our products to the maximum conditions set forth in the standard, and guarantee proper operation of our devices when handled according to the limitations and information in that standard as well as to any limitations set forth in the information or standards referenced below.

Failure to adhere to the warnings or limitations as established by the listed specifications could result in reduced product performance, reduction of operable life, and/or reduction of overall reliability.

This product carries a **Moisture Sensitivity Level (MSL) rating** as shown below, and should be handled according to the requirements of the latest version of the joint industry standard **IPC/JEDEC J-STD-033**.

Device	Moisture Sensitivity Level (MSL) Rating
CPC2317N	MSL 3

ESD Sensitivity

This product is **ESD Sensitive**, and should be handled according to the industry standard **JESD-625**.

Reflow Profile

This product has a maximum body temperature and time rating as shown below. All other guidelines of **J-STD-020** must be observed.

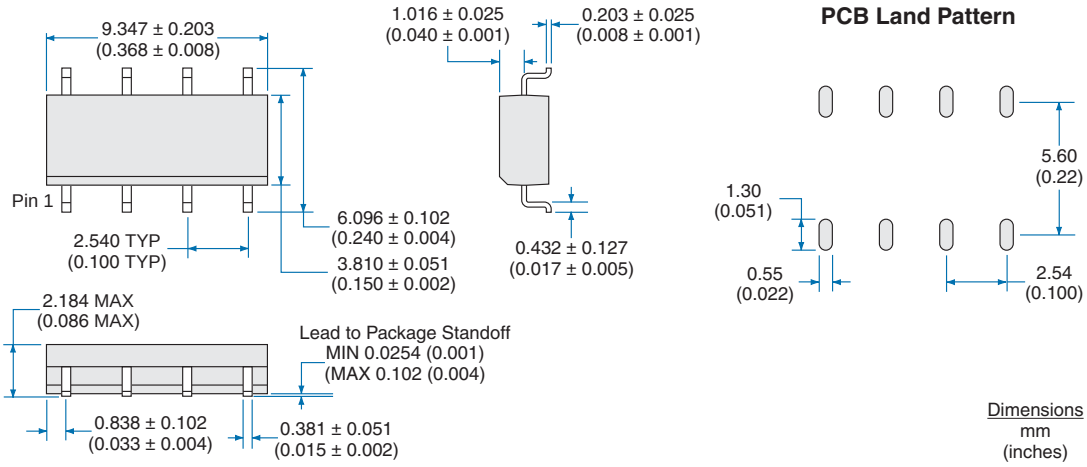
Device	Maximum Temperature x Time
CPC2317N	260°C for 30 seconds

Board Wash

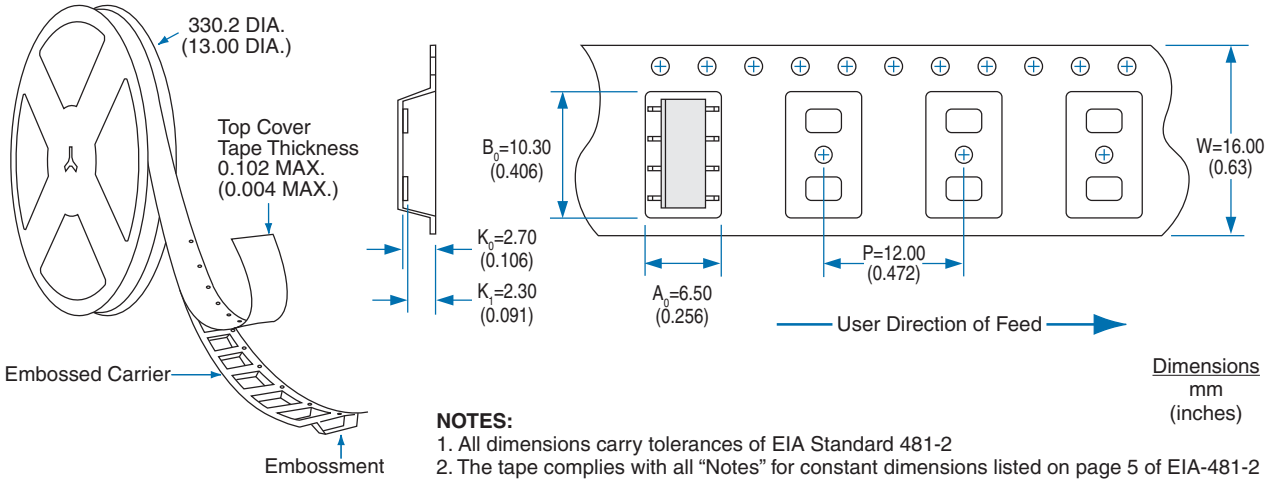
Clare recommends the use of no-clean flux formulations. However, board washing to remove flux residue is acceptable. Since Clare employs the use of silicone coating as an optical waveguide in many of its optically isolated products, the use of a short drying bake may be necessary if a wash is used after solder reflow processes. Chlorine-based or Fluorine-based solvents or fluxes should not be used. Cleaning methods that employ ultrasonic energy should not be used.

MECHANICAL DIMENSIONS

CPC2317N



CPC2317N Tape & Reel



NOTES:
1. All dimensions carry tolerances of EIA Standard 481-2
2. The tape complies with all "Notes" for constant dimensions listed on page 5 of EIA-481-2

For additional information please visit our website at: www.clare.com

Specification: DS-CPC2317N-R02

5/11/2011