



	CPC1231N	Units
Blocking Voltage	350	V
Load Current	120	mA
Max On-resistance	30	Ω

Features

- Small 4 Pin SOP Package
- Low Drive Power Requirements (TTL/CMOS Compatible)
- No Moving Parts
- High Reliability
- Arc-Free With No Snubbing Circuits
- 1500V_{rms} Input/Output Isolation
- 0.4mm distance through insulation (supplementary isolation requirement of EN60950)
- No EMI/RFI Generation
- Machine Insertable, Wave Solderable
- Tape & Reel Version Available

Applications

- Telecommunications
 - Telecom Switching
 - Tip/Ring Circuits
 - Modem Switching (Laptop, Notebook, Pocket Size)
 - Hookswitch
 - Dial Pulsing
 - Ground Start
 - Ringing Injection
- Instrumentation
 - Multiplexers
 - Data Acquisition
 - Electronic Switching
 - I/O Subsystems
 - Meters (Watt-Hour, Water, Gas)
- Medical Equipment-Patient/Equipment Isolation
- Security
- Aerospace
- Industrial Controls

Description

The CPC1231N is a miniature 1-Form-B solid state relay which uses optically coupled MOSFET technology to provide 1500V_{rms} of input to output isolation and is certified for Supplemented Isolation in accordance with EN60950. The efficient MOSFET switches and photovoltaic die use Clare's patented OptoMOS[®] architecture. The optically-coupled input is controlled by a highly efficient GaAlAs infrared LED. The CPC1231N offers board space savings of at least 20% versus competitive 4 Pin SOP solid state relay.

Approvals

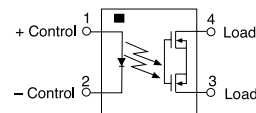
- UL Recognized Component: File #E76270
- Certified to EN60950, Supplemental Isolation

Ordering Information

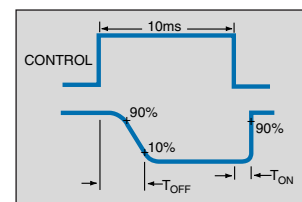
Part #	Description
CPC1231N	4-Pin SOP (100/tube)
CPC1231NTR	4-Pin SOP (2000/reel)

Pin Configuration

CPC1231N Pinout



Switching Characteristics of Normally Closed (Form B) Devices



Absolute Maximum Ratings (@ 25°C)

Parameter	Ratings	Units
Blocking Voltage	350	V
Reverse Input Voltage	5	V
Input Control Current	50	mA
Peak (10ms)	1	A
Input Power Dissipation	150	mW
Total Power Dissipation ¹	400	mW
Capacitance Input to Output	1	pF
Isolation Voltage Input to Output	1500	V _{rms}
Operational Temperature	-40 to +85	°C
Storage Temperature	-40 to +125	°C

¹ Derate Linearly 3.33 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 Characteristics

Parameter	Conditions	Symbol	Min	Typ	Max	Units
Output Characteristics @ 25°C						
Load Current AC Peak ¹ , Continuous	-	I _L	-	-	120	mA
Peak Load Current	10ms	I _{LPK}	-	-	350	mA
On-Resistance ²	I _L =120mA	R _{ON}	-	25	30	Ω
Off-State Leakage Current	V _L =350V, I _F =2mA	I _{LEAK}	-	-	5	μA
Switching Speeds						
Turn-On	I _F =5mA, V _L =10V	T _{ON}	-	-	2	ms
Turn-Off	I _F =5mA, V _L =10V	T _{OFF}	-	-	2	ms
Output Capacitance	50V; f=1MHz	C _{OUT}	-	25	-	pF
Input Characteristics @ 25°C						
Input Control Current ³	I _L =120mA	I _F	2	-	50	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

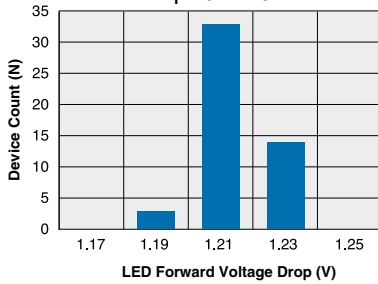
¹ Load current derates linearly from 120mA @ 25°C to 80mA @ 85°C.

² Measurement taken within 1 second of on time.

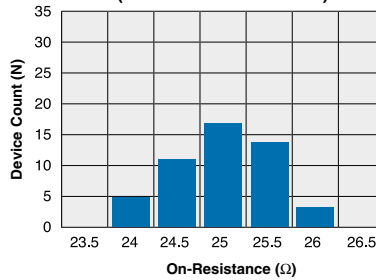
³ For applications requiring high temperature operation (greater than 60°C) an LED drive current of 5mA is recommended.

PERFORMANCE DATA*

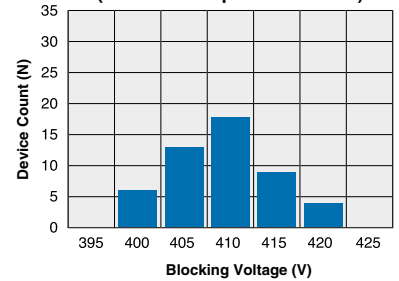
CPC1231N
Typical LED Forward Voltage Drop
(Ambient Temperature = 25°C)
 $I_F = 5\text{mA}$



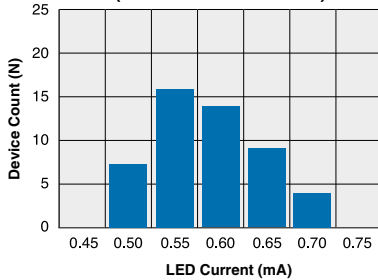
CPC1231N
Typical On-Resistance Distribution
(Ambient Temperature = 25°C)
(Load Current = 120mA)



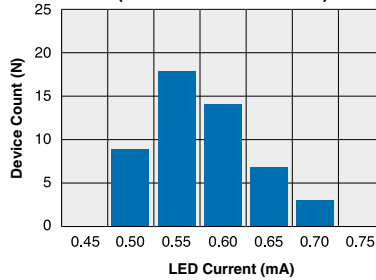
CPC1231N
Typical Blocking Voltage Distribution
(Ambient Temperature = 25°C)



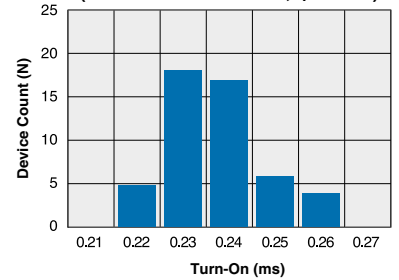
CPC1231N
Typical I_F for Switch Operation
(Ambient Temperature = 25°C)
(Load Current = 120mA)



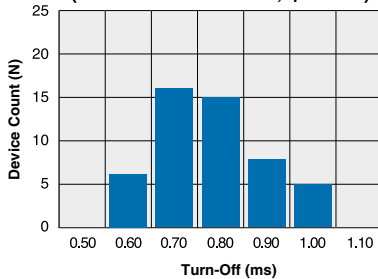
CPC1231N
Typical I_F for Switch Dropout
(Ambient Temperature = 25°C)
(Load Current = 120mA)



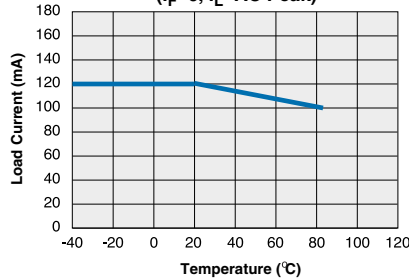
CPC1231N
Typical Turn-On Time
(Ambient Temperature = 25°C)
(Load Current = 120mA; $I_F = 5\text{mA}$)



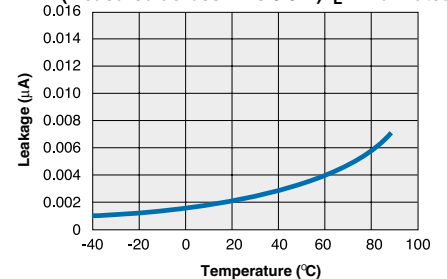
CPC1231N
Typical Turn-Off Time
(Ambient Temperature = 25°C)
(Load Current = 120mA; $I_F = 5\text{mA}$)



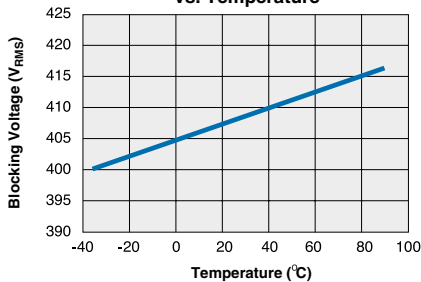
CPC1231N
Typical Load Current vs. Temperature
($I_F=0$, $I_L=AC$ Peak)



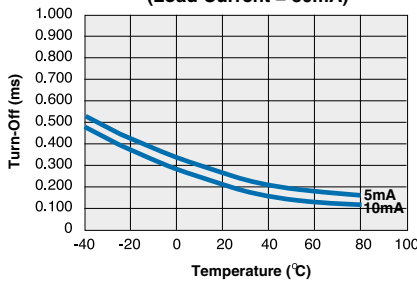
CPC1231N
Typical Leakage vs. Temperature
(Measured across Pins 3 & 4) $I_L = \text{max rated}$



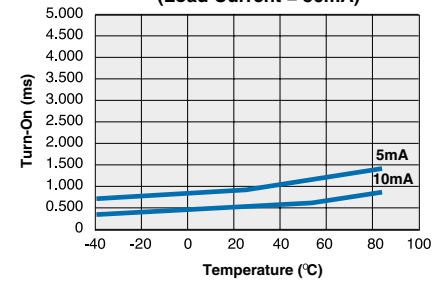
CPC1231N
Typical Blocking Voltage vs. Temperature



CPC1231N
Typical Turn-On vs. Temperature
(Load Current = 50mA)

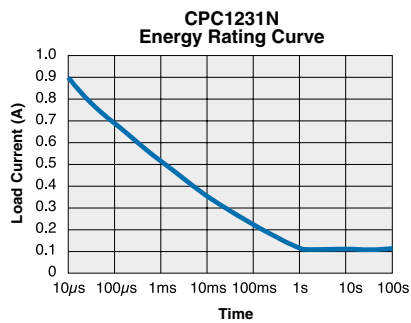
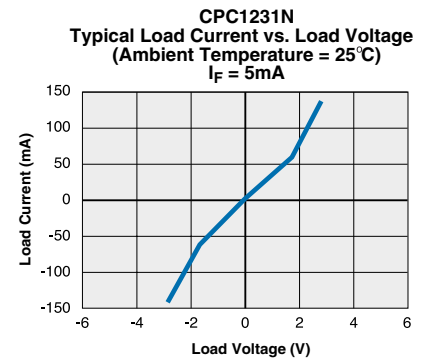
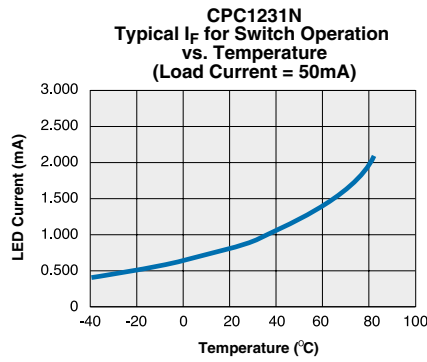
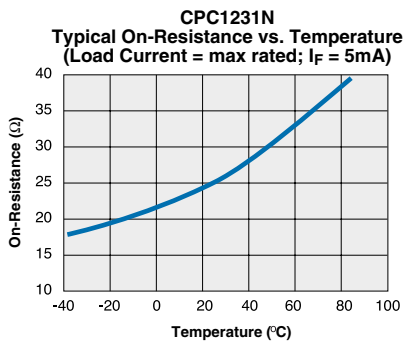
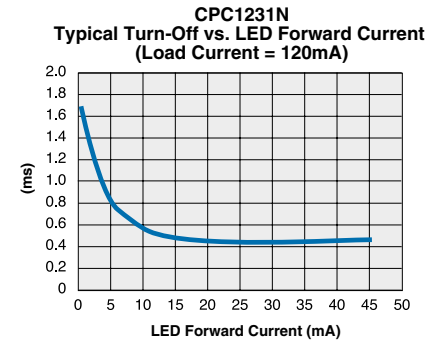
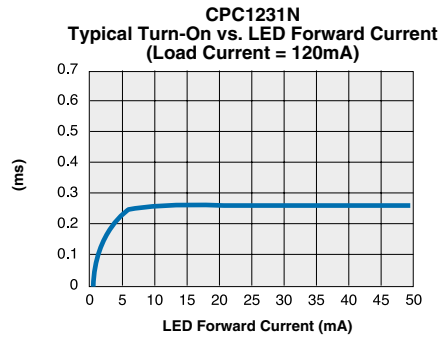
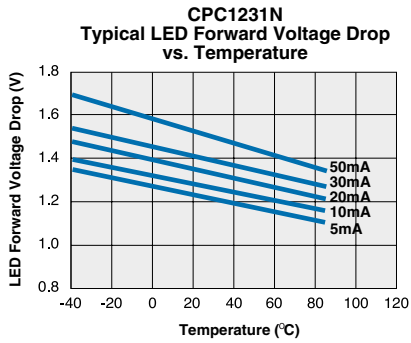


CPC1231N
Typical Turn-Off vs. Temperature
(Load Current = 50mA)



*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.

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

Recommended soldering processes are limited to 260°C component body temperature for 10 seconds.

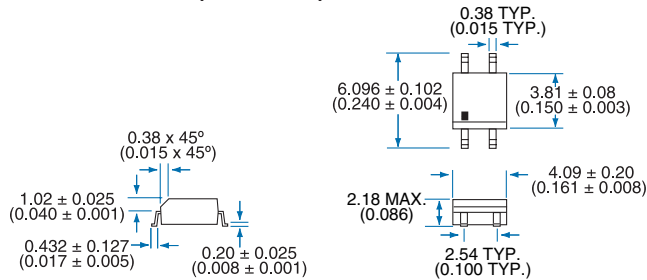


Washing

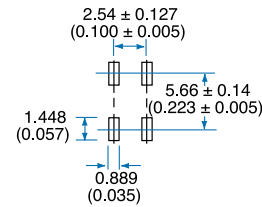
Clare does not recommend ultrasonic cleaning or the use of chlorinated solvents.

MECHANICAL DIMENSIONS

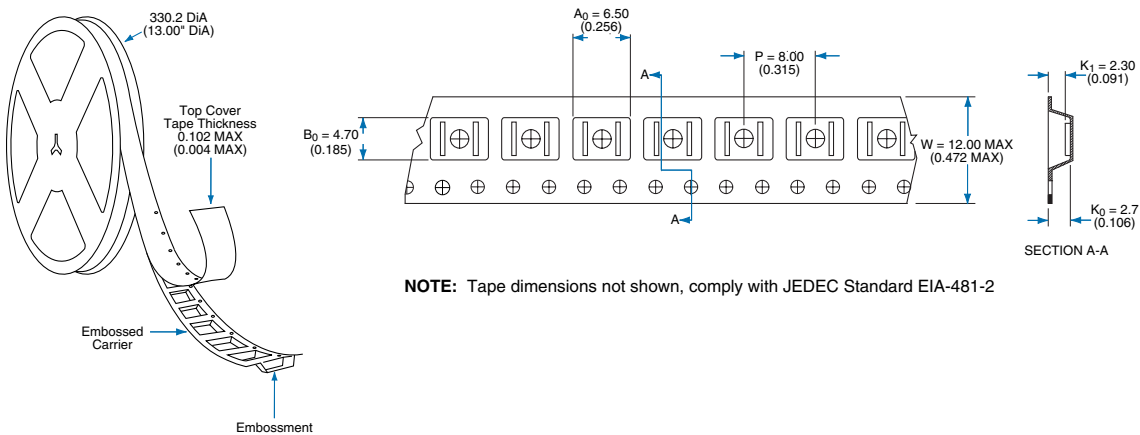
4-Pin SOIC Narrow ("N" Suffix)



PC Board Pattern (Top View)



Tape and Reel Packaging for 4 pin SOIC package



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

Dimensions:
mm
(inches)

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