



Parameter	Rating	Units
Blocking Voltage	400	V _P
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)
 - Hook Switch
 - 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 CPC1225N is a miniature 1-Form-A solid state relay in a 4-pin SOP package that employs optically coupled MOSFET technology to provide 1500V_{rms} of input-to-output isolation. The device also complies with the Supplementary Isolation requirements of EN/IEC 60950-1.

The MOSFET switches and photovoltaic die use Clare's patented OptoMOS® architecture to provide 1500 V_{rms} of input-to-output isolation. The optically coupled output is controlled by a highly efficient GaAlAs infrared LED.

The CPC1225N uses Clare's state of the art double molded vertical construction to produce one of the world's smallest 4-pin relays. The CPC1225N offers board space savings of 20% over the competitor's larger 4-pin SOP relay.

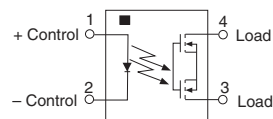
Approvals

- UL Recognized Component File #: E76270
- EN/IEC 60950-1 Supplementary Isolation compliant

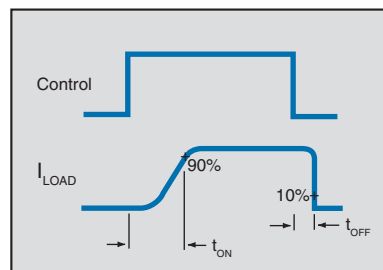
Ordering Information

Part #	Description
CPC1225N	4 Pin SOP (100/tube)
CPC1225NTR	4 Pin SOP (2000/reel)

Pin Configuration



Switching Characteristics of Normally Open (Form A) Devices



Absolute Maximum Ratings (@ 25°C)

Parameter	Ratings	Units
Blocking Voltage (Peak)	400	V _P
Reverse Input Voltage	5	V
Input Control Current	50	mA
Peak (10ms)	1	A
Input Power Dissipation	70	mW
Total Power Dissipation ¹	400	mW
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						
Continuous ¹	-	I _L	-	-	120	mA
Peak	t=10ms	I _{LPK}	-	-	350	
On-Resistance ²	I _L =120mA	R _{ON}	-	20	30	Ω
Off-State Leakage Current	V _L =400V	I _{LEAK}	-	-	1	μA
Switching Speeds						
Turn-On	I _F =5mA, V _L =10V	t _{ON}	-	1.25	2	ms
Turn-Off		t _{OFF}	-	0.35	1	
Output Capacitance	50V; f=1MHz	C _{OUT}	-	25	-	pF
Input Characteristics @ 25°C						
Input Control Current ³	I _L =120mA	I _F	-	0.6	2	mA
Input Dropout Current	-	I _F	0.3	0.55	-	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 @ 25°C						
Capacitance Input to Output	-	C _{I/O}	-	1	-	pF

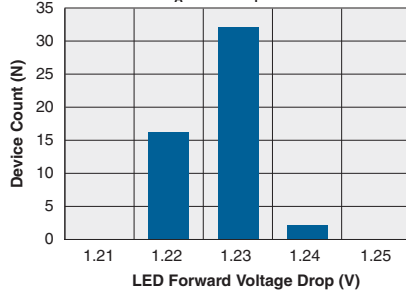
¹ Load current derates linearly from 120mA @ 25°C to 80mA @ 85°C.

² Measurement taken within 1 second of on time.

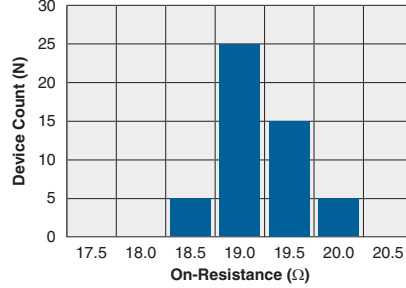
³ For applications requiring high temperature operation (greater than 60°C) an LED drive current of 4mA is recommended.

PERFORMANCE DATA*

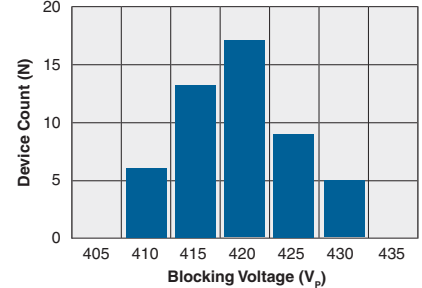
CPC1225N
Typical LED Forward Voltage Drop
($T_A=25^\circ\text{C}$, $I_F=5\text{mA}$)



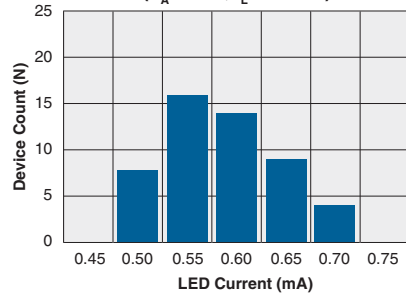
CPC1225N
Typical On-Resistance Distribution
($T_A=25^\circ\text{C}$, $I_L=120\text{mA}$, $I_F=2\text{mA}$)



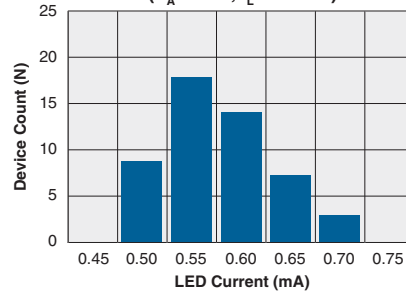
CPC1225N
Typical Blocking Voltage Distribution
($T_A=25^\circ\text{C}$)



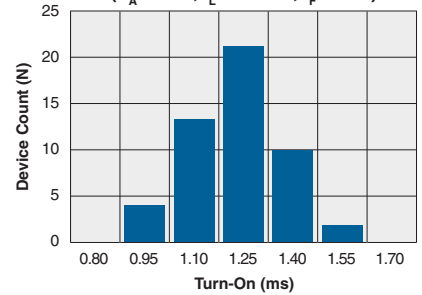
CPC1225N
Typical IF For Switch Operation
($T_A=25^\circ\text{C}$, $I_L=120\text{mA}$)



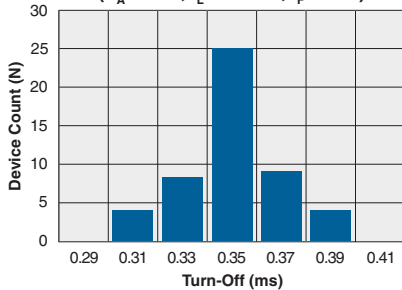
CPC1225N
Typical I_F For Switch Dropout
($T_A=25^\circ\text{C}$, $I_L=120\text{mA}$)



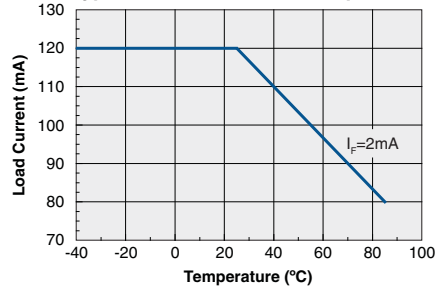
CPC1225N
Typical Turn-On Time
($T_A=25^\circ\text{C}$, $I_L=120\text{mA}$, $I_F=5\text{mA}$)



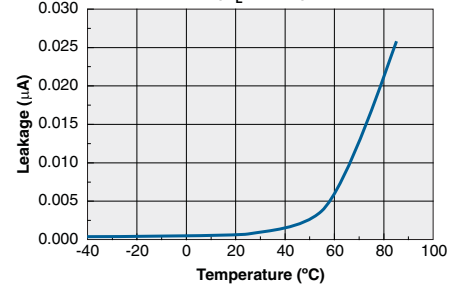
CPC1225N
Typical Turn-Off Time
($T_A=25^\circ\text{C}$, $I_L=120\text{mA}$, $I_F=5\text{mA}$)



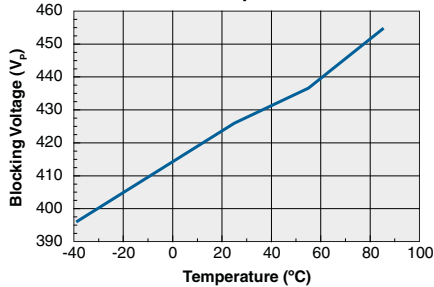
CPC1225N
Typical Load Current vs. Temperature



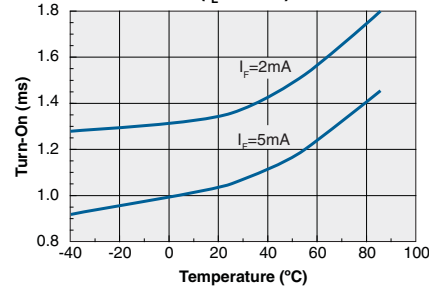
CPC1225N
Typical Leakage vs. Temperature
(Measured Across Pins 3 & 4)
($V_L=400\text{V}$)



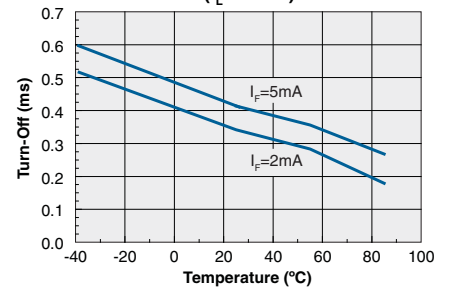
CPC1225N
Typical Blocking Voltage vs. Temperature



CPC1225N
Typical Turn-On vs. Temperature
($I_L=80\text{mA}$)

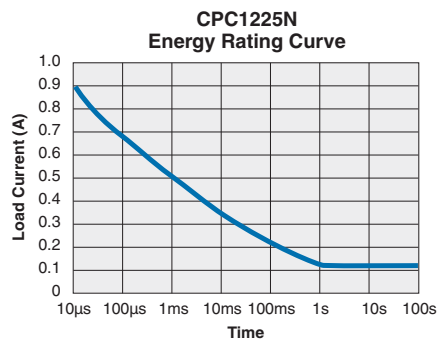
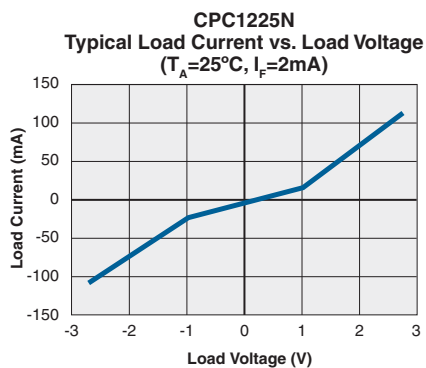
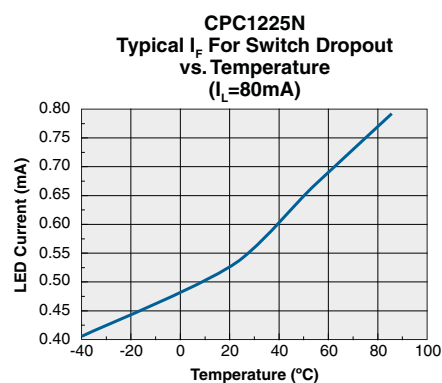
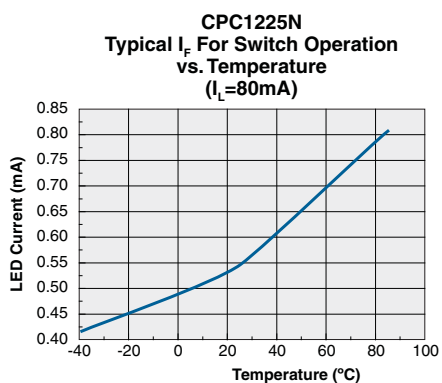
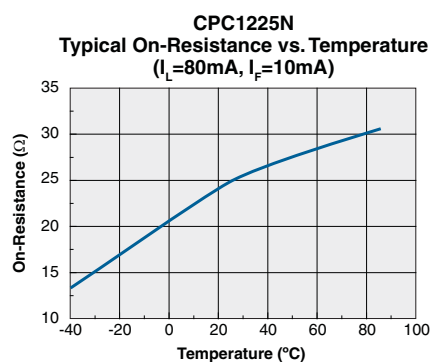
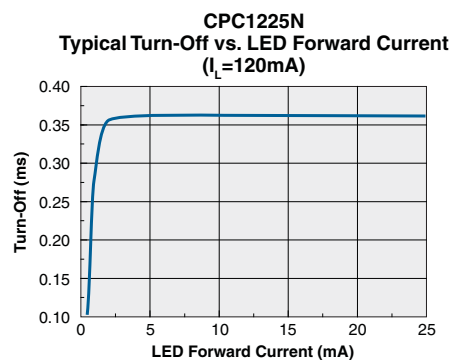
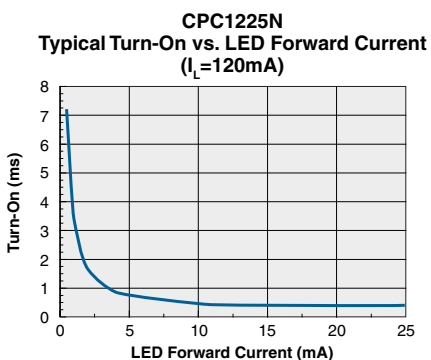
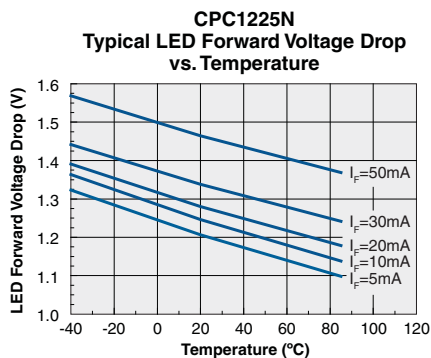


CPC1225N
Typical Turn-Off vs. Temperature
($I_L=80\text{mA}$)



*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

Moisture Sensitivity

Clare has characterized the moisture reflow sensitivity of this package, and has determined that this component must be handled in accordance with IPC/JEDEC standard J-STD-033 moisture sensitivity level (MSL), level 3 classification.



Soldering Reflow Profile

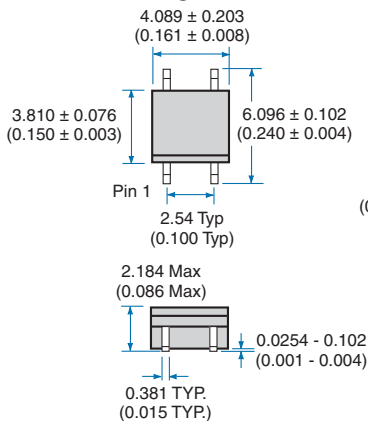
For proper assembly, the component must be processed in accordance with the current revision of IPC/JEDEC standard J-STD-020. Failure to follow the recommended guidelines may cause permanent damage to the device resulting in impaired performance and/or a reduced lifetime expectancy.

Washing

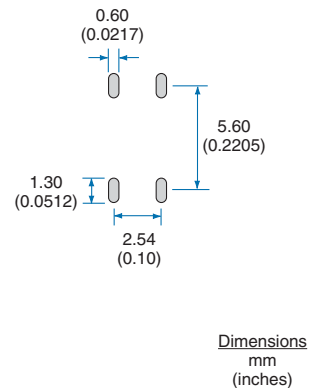
Clare does not recommend ultrasonic cleaning or the use of chlorinated solvents.

MECHANICAL DIMENSIONS

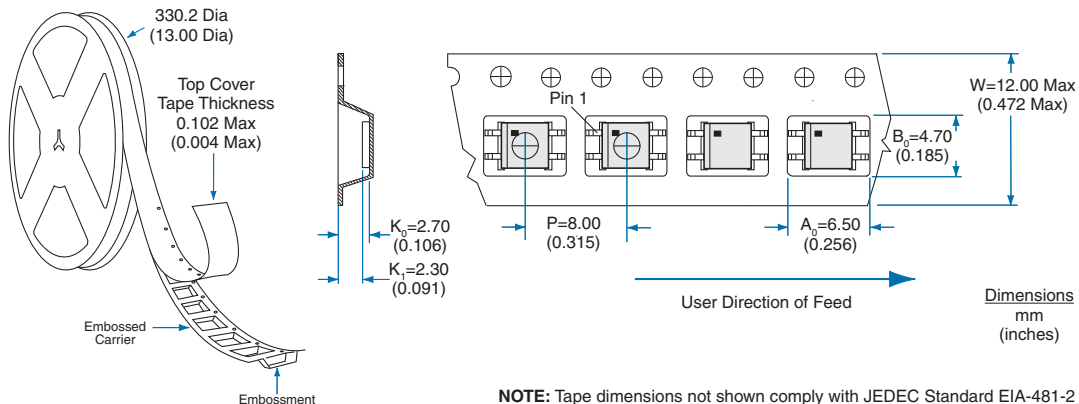
4-Pin SOP Package



Recommended PCB Land Pattern



Tape and Reel Packaging for 4-Pin SOP Package



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

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Specification: DS-CPC1225N-R03
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