CPC1150N
4-Pin SOP OptoMOS® Relay



Parameter	Rating	Units
Blocking Voltage	350	V_P
Load Current	120	mA
Max On-resistance	50	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
- 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

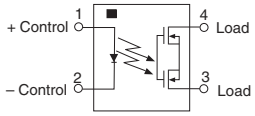
Description
The CPC1150N is a miniature 1-Form-B solid state relay which uses optically coupled MOSFET technology to provide $1500V_{rms}$ of input to output isolation. The efficient MOSFET switches and photovoltaic die use Clare's patented OptoMOS architecture. The optically coupled output is controlled by a highly efficient GaAlAs infrared LED. The CPC1150N uses Clare's state of the art double molded vertical construction packaging to produce one of the world's smallest 4-Pin solid state relays. The CPC1150N offers board space savings over the competitor's larger 4-Pin SOP relay.

Approvals
- UL Recognized Component: File # E76270
- EN/IEC 60950 Compliant
- CSA Certified Component: Certificate # 1172007

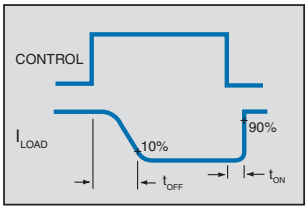
Ordering Information

Part #	Description
CPC1150N	4-Pin SOP (100/tube)
CPC1150NTR	4-Pin SOP (2000/reel)

Pin Configuration



Switching Characteristics of Normally Closed (Form B) Devices



Absolute Maximum Ratings (@ 25˚C)

Parameter	Ratings	Units
Blocking Voltage	350	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.

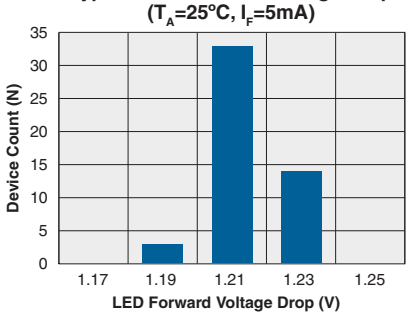
Electrical Characteristics

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	I_L=120mA	R_{ON}	-	-	50	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}	-	-	1	ms
Turn-Off		t_{OFF}	-	-	2	
Output Capacitance	I_F=2mA, 50V, f=1MHz	C_{OUT}	-	25	-	pF
Input Characteristics @ 25°C						
Input Control Current [2]	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

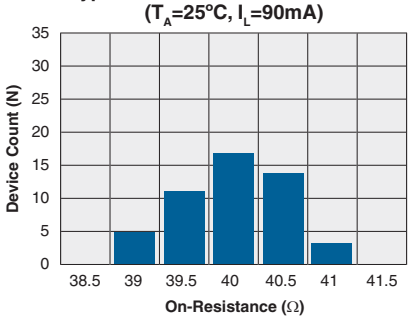
[1] Load current derates linearly from 120mA @ 25ºC to 85mA @ 85ºC.
[2] For applications requiring high temperature operation (greater than 60°C) an LED drive current of 4mA is recommended.

PERFORMANCE DATA*

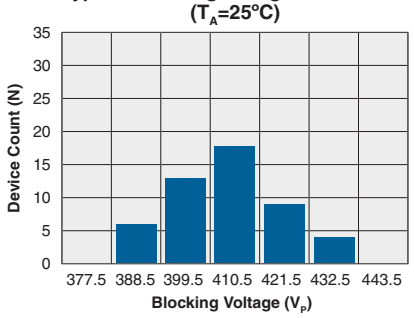
Typical LED Forward Voltage Drop
(T_A=25°C, I_F=5mA)



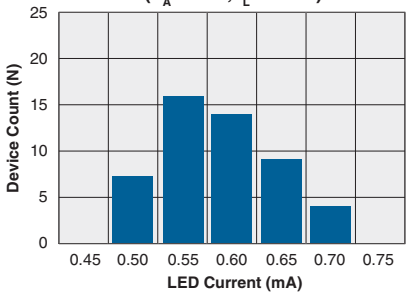
Typical On-Resistance Distribution
(T_A=25°C, I_L=90mA)



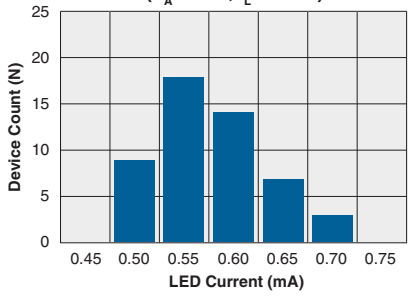
Typical Blocking Voltage Distribution
(T_A=25°C)



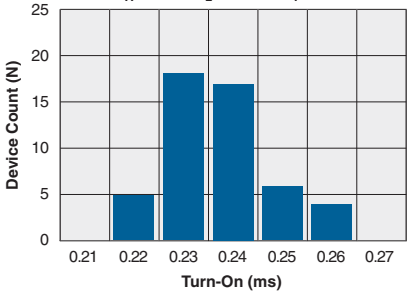
Typical I_F for Switch Operation
(T_A=25°C, I_L=90mA)



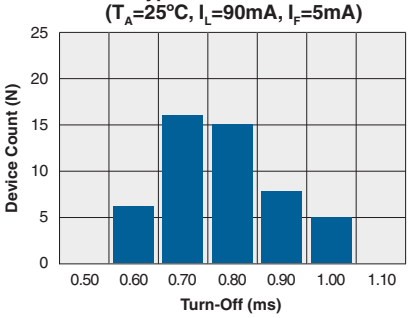
Typical I_F for Switch Dropout
(T_A=25°C, I_L=90mA)



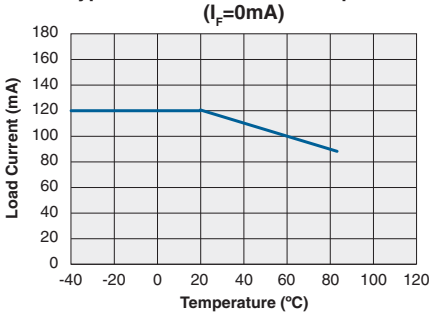
Typical Turn-On Time
(T_A=25°C, I_L=90mA, I_F=5mA)



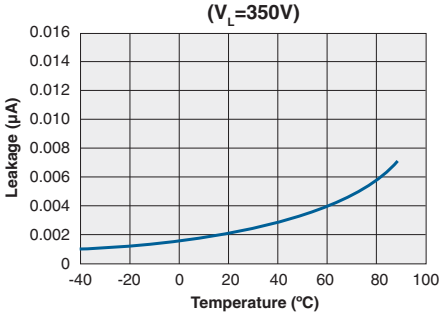
Typical Turn-Off Time
(T_A=25°C, I_L=90mA, I_F=5mA)



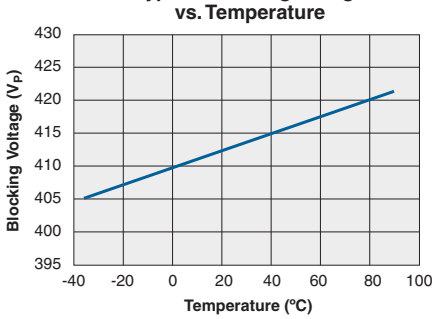
Typical Load Current vs. Temperature
(I_F=0mA)



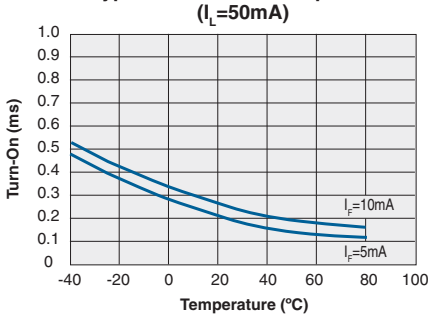
Typical Leakage vs. Temperature
Measured Across Pins 3 & 4
(V_L=350V)



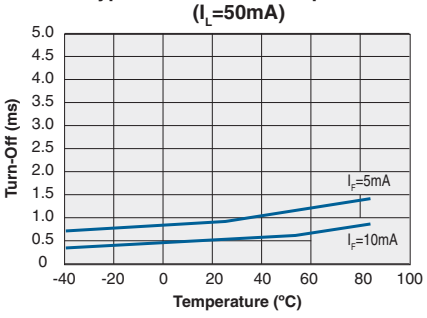
Typical Blocking Voltage
vs. Temperature



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



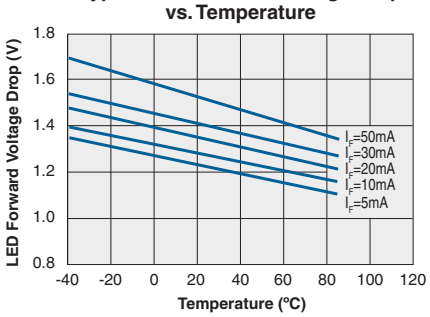
Typical Turn-Off vs. Temperature
(I_L=50mA)



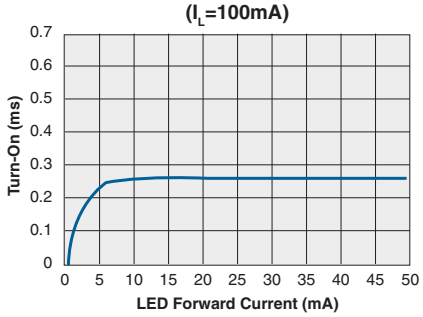
*The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

PERFORMANCE DATA*

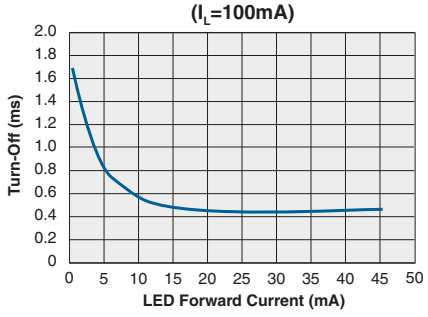
Typical LED Forward Voltage Drop vs. Temperature



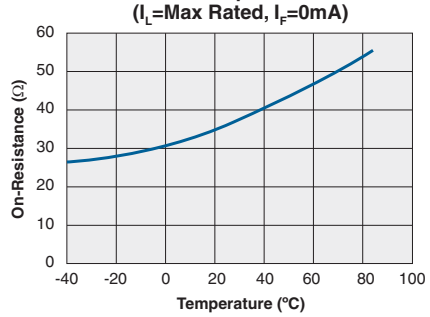
Typical Turn-On vs. LED Forward Current (I_L=100mA)



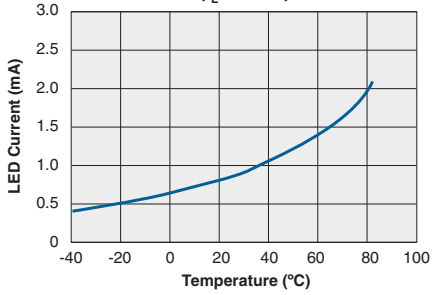
Typical Turn-Off vs. LED Forward Current (I_L=100mA)



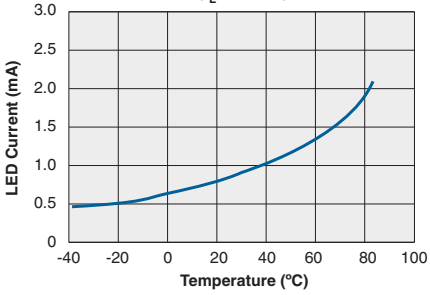
Typical On-Resistance vs. Temperature (I_L=Max Rated, I_F=0mA)



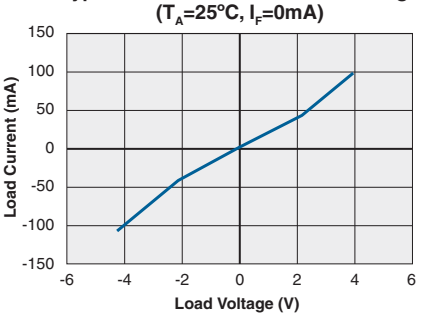
Typical I_F for Switch Operation vs. Temperature (I_L=50mA)



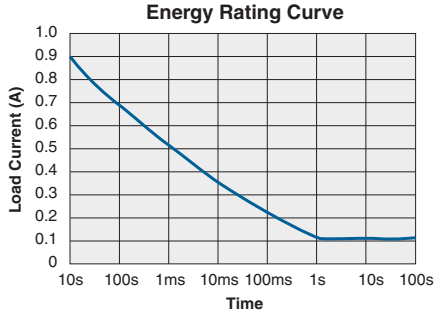
Typical I_F for Switch Turn-On vs. Temperature (I_L=50mA)



Typical Load Current vs. Load Voltage (T_A=25°C, I_F=0mA)



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.

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

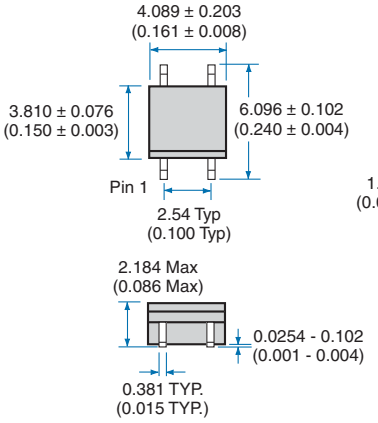
For proper assembly, the component must be processed in accordance with the current revision of IPC/JEDEC standard J-STD-020. Failure to follow the recommended guidelines may cause permanent damage to the device resulting in impaired performance and/or a reduced lifetime expectancy.

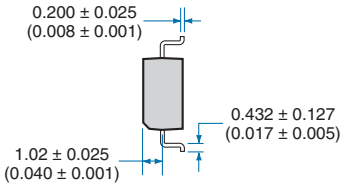
Washing

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

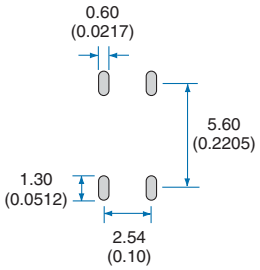
MECHANICAL DIMENSIONS

4-Pin SOP Package



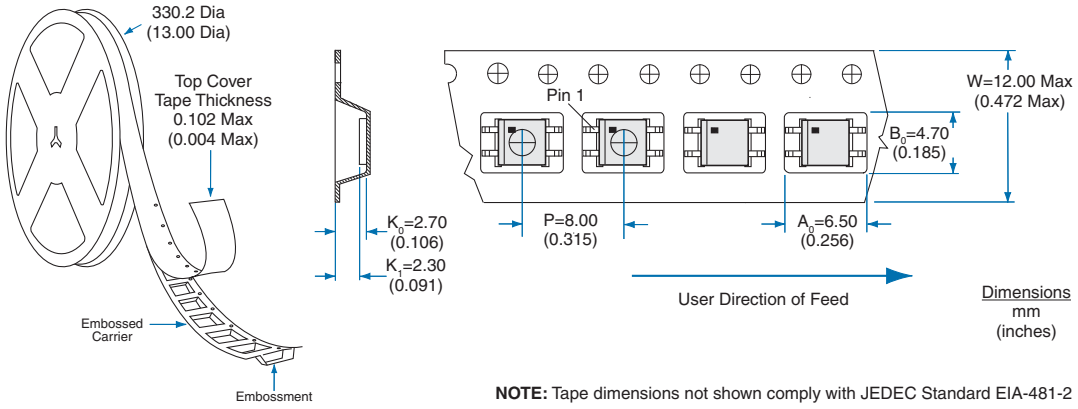


Recommended PCB Land Pattern



Dimensions
mm
(inches)

Tape and Reel Packaging for 4-Pin SOP Package



Dimensions
mm
(inches)

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

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