



Parameter	Rating	Units
Blocking Voltage	600	V_P
Load Current	0.5	A_{DC}
On-Resistance	6	Ω

Features

- Handle Load Currents Up to 0.5A
- 600V_P Blocking Voltage
- 2500V_{rms} Input/Output Isolation
- Power SIP Package
- High Reliability
- No Moving Parts
- Low Drive Power Requirements (TTL/CMOS Compatible)
- Arc-Free With No Snubbing Circuits
- No EMI/RFI Generation
- Machine Insertable, Wave Solderable

Applications

- Industrial Controls
- Motor Control
- Robotics
- Medical Equipment—Patient/Equipment Isolation
- Instrumentation
 - Multiplexers
 - Data Acquisition
 - Electronic Switching
 - I/O Subsystems
 - Meters (Watt-Hour, Water, Gas)
- IC Equipment
- Home Appliances

Description

Clare and IXYS have combined to bring OptoMOS® technology, reliability, and compact size to a new family of high-power Solid State Relays.

As part of this family, the CPC1983 single-pole normally open (1-Form-A) Solid State Power Relay is rated for up to 0.5A_{DC} continuous load current.

The CPC1983 employs optically coupled MOSFET technology to provide 2500V_{rms} of input to output isolation. Its output, constructed with efficient MOSFET switches and photovoltaic die, uses Clare's patented OptoMOS architecture while its input, a highly efficient GaAlAs infrared LED, provides the optically coupled control.

This combination of low on-resistance and high load current handling capability makes this relay suitable for a variety of high performance switching applications.

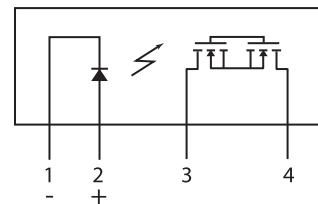
Approvals

- UL recognized component: File # E69938

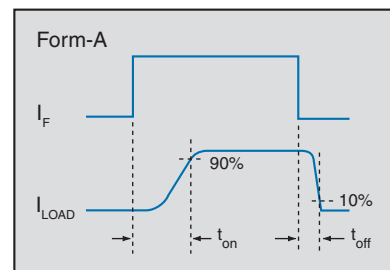
Ordering Information

Part #	Description
CPC1983Y	Power SIP Package (25 per tube)

Pin Configuration



Switching Characteristics of Normally Open Devices



Absolute Maximum Ratings (@ 25° C)

Parameter	Ratings	Units
Blocking Voltage	600	V _P
Reverse Input Voltage	5	V
Input Control Current	50	mA
Peak (10ms)	1	A
Input Power Dissipation ¹	150	mW
Total Power Dissipation ²	1600	mW
Isolation Voltage, Input to Output	2500	V _{rms}
ESD Rating, Human Body Model	8	kV
Operational Temperature	-40 to +85	°C
Storage Temperature	-40 to +125	°C

¹ Derate Linearly 3.33 mW / °C

² Derate linearly 16.667 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

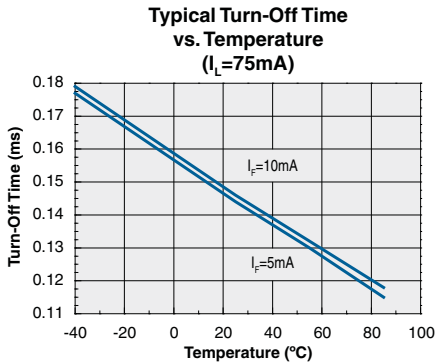
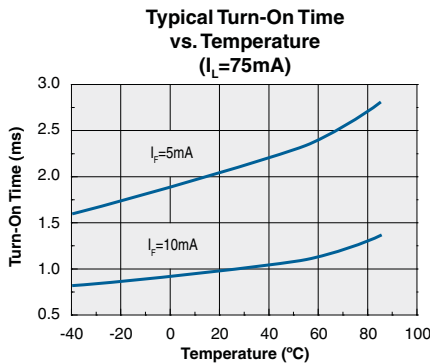
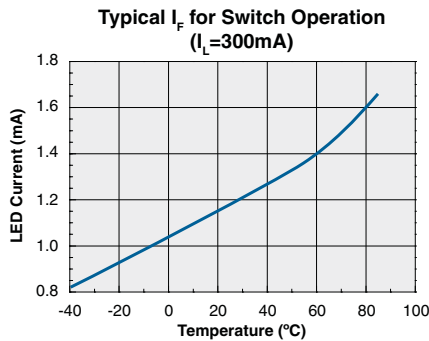
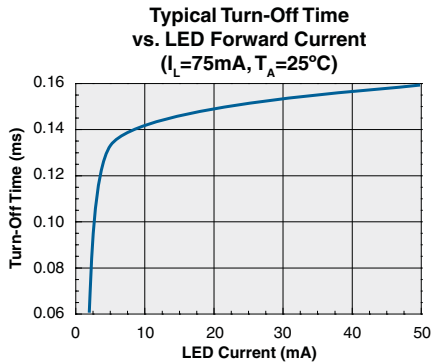
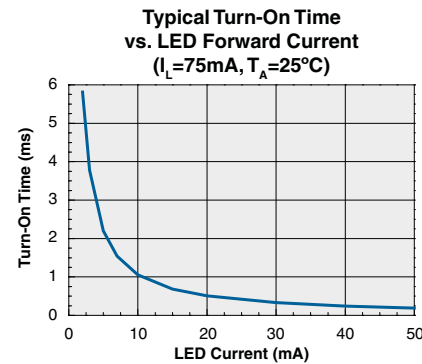
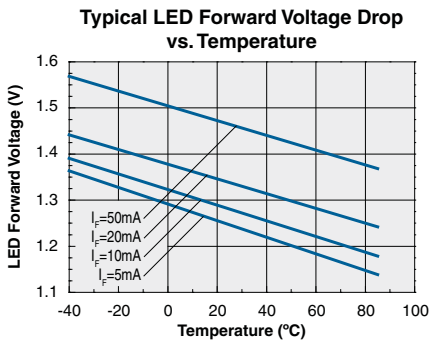
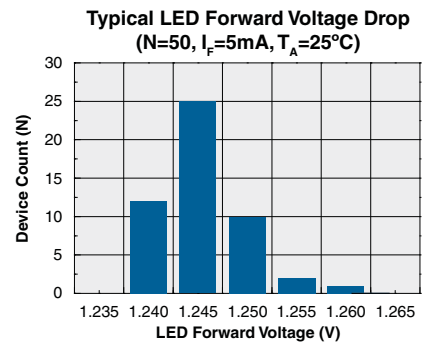
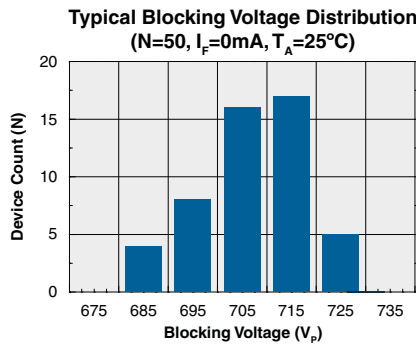
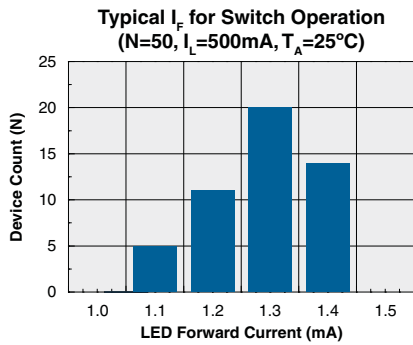
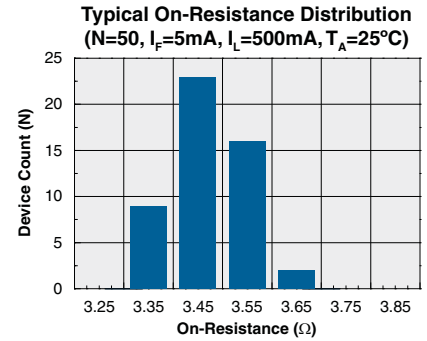
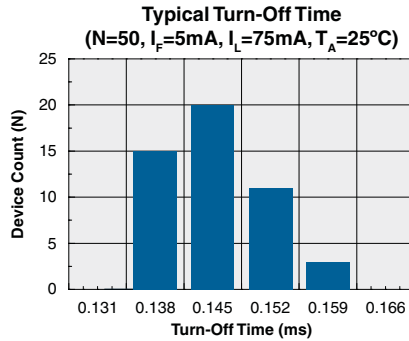
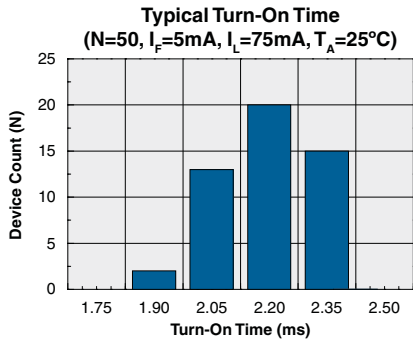
Parameter	Conditions	Symbol	Min	Typ	Max	Units				
Output Characteristics @ 25°C										
Load Current, Continuous	I _F =5mA, Free air	I _L	-	-	0.5	A _{DC}				
Peak Load Current	I _F =5mA, t=10ms	I _{LPK}	-	-	3	A				
On-Resistance ¹	I _F =5mA, I _L =0.5A	R _{ON}	-	3.5	6	Ω				
Off-State Leakage Current	I _F =0mA, V _L =600V _P	I _{LEAK}	-	-	1	μA				
Switching Speeds	I _F =5mA, V _L =10V					ms				
Turn-On							t _{on}	-	2.2	5
Turn-Off							t _{off}	-	0.15	2
Output Capacitance	I _F =0mA, 50V, f=1MHz	C _{OUT}	-	41	-	pF				
Input Characteristics @ 25°C										
Input Control Current	I _L =0.5A	I _F	-	1.3	5	mA				
Input Dropout Current	-	I _F	0.5	-	-	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				
Input/Output Characteristics @ 25°C										
Capacitance Input/Output	f=1MHz	C _{IO}	-	2	-	pF				

¹ Measurement taken within 1 second of on time.

Thermal Characteristics

Parameter	Conditions	Symbol	Min	Typ	Max	Units
Thermal Resistance (junction to case)	-	R _{θJC}	-	1.5	-	°C/W

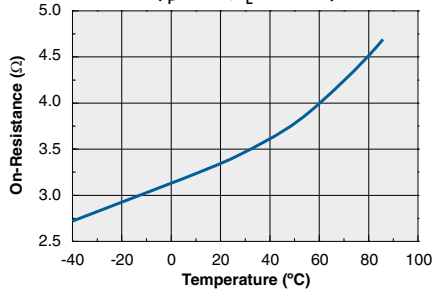
PERFORMANCE DATA*



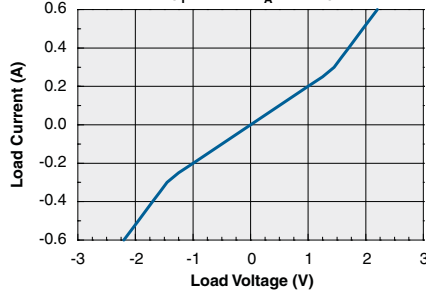
*The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

PERFORMANCE DATA*

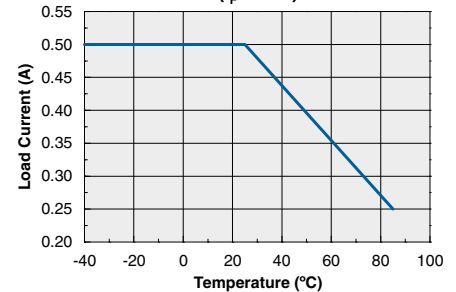
Typical On-Resistance vs. Temperature
($I_F=5mA, I_L=300mA$)



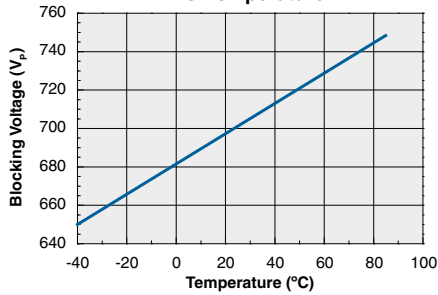
Typical Load Current vs. Load Voltage
($I_F=5mA, T_A=25°C$)



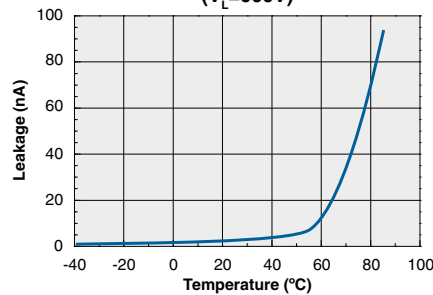
Maximum Load Current vs. Temperature
($I_F=5mA$)



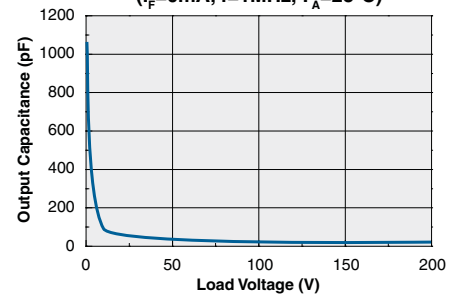
Typical Blocking Voltage vs. Temperature



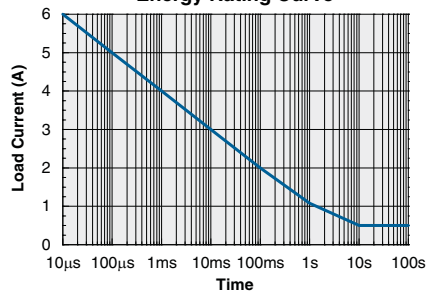
Typical Leakage Current vs. Temperature
($V_L=600V$)



Output Capacitance vs. Load Voltage
($I_F=0mA, f=1MHz, T_A=25°C$)



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



All plastic encapsulated semiconductor packages are susceptible to moisture ingress. 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 is rated **Moisture Sensitivity Level 1 (MSL 1)**, and should be handled according to the requirements of the latest version of the joint industry standard **IPC/JEDEC J-STD-033**.

ESD Sensitivity



This product is tested in accordance with **JESD22-A114**, and should be handled according to the industry standard **JESD-625**.

Reflow Profile

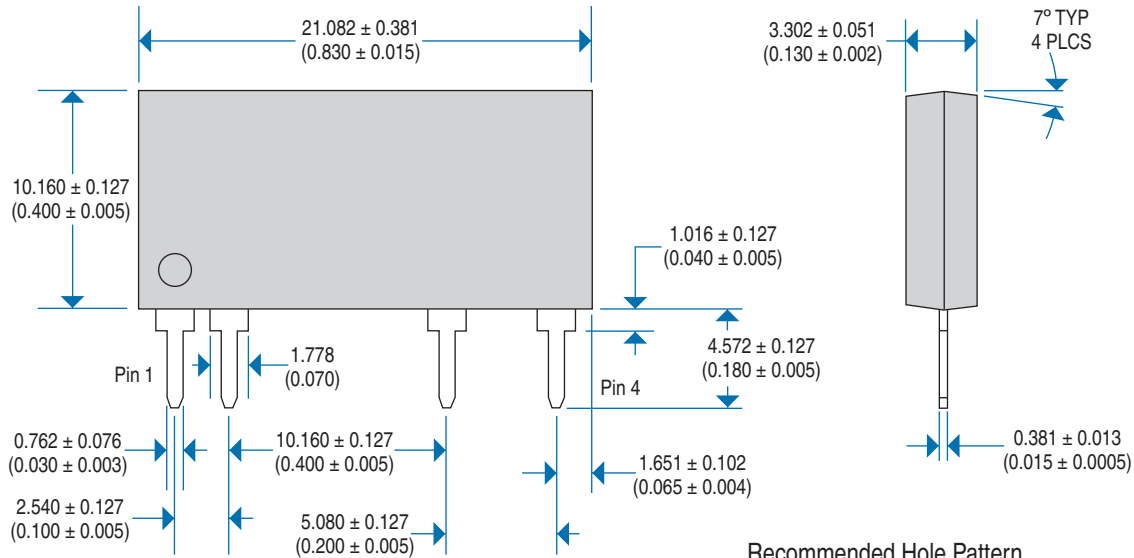
This product has a maximum body temperature rating of **245°C for a maximum of 30 seconds**. All other guidelines of **J-STD-020** must be observed.

Board Wash

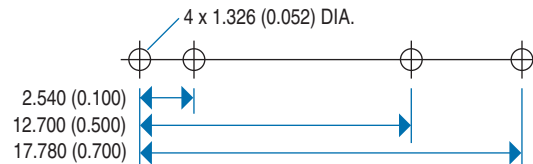
Clare recommends the use of no-clean flux formulations. However, board washing to remove flux residue is acceptable. Since Clare employs the use of silicone coating as an optical waveguide in many of its optically isolated products, the use of a short drying bake could be necessary if a wash is used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



MECHANICAL DIMENSIONS



Recommended Hole Pattern



Dimensions
mm
(inches)

Note: Recommended hole size is based on the maximum cross-section diagonal measure of the pin plus 0.4mm (0.016).

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

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