CPC1981Y
Power SIP Relay

	CPC1981Y	Units
Blocking Voltage	1000	V_P
Load Current	0.18	A_{rms}
On-Resistance	18	Ω

Features

- Power SIP Package
- Handle Load Currents Up to 0.25A
- High Reliability
- No Moving Parts
- Low Drive Power Requirements (TTL/CMOS Compatible)
- Arc-Free With No Snubbing Circuits
- 2500V_{rms} Input/Output Isolation
- 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 that family, the CPC1981Y is a 1-Form-A solid state relay. The CPC1981Y employs optically coupled MOSFET technology to provide 2500V_{rms} of input to output isolation. The efficient MOSFET switches and photovoltaic die use Clare's patented OptoMOS architecture while the input is controlled by a highly efficient GaAlAs infrared LED. The combination of low on resistance and high load current handling capabilities makes the relay suitable for a variety of high performance switching applications.

Approvals

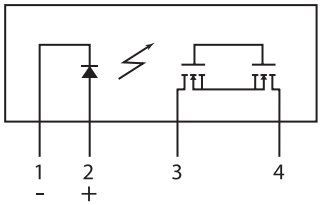
- UL recognized component: File # E69938
- Certified to: UL 508

Ordering Information

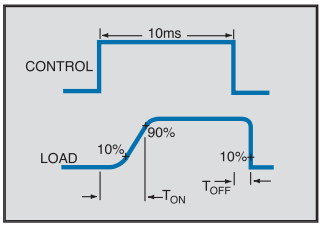
Part #	Description
CPC1981Y	Power SIP Package (25 per tube)

Pin Configuration

CPC1981Y Pinout



Switching Characteristics of Normally Open (Form A) Devices



Absolute Maximum Ratings (@ 25˚ C)

Parameter	Ratings	Units
Blocking Voltage	1000	V_P
Reverse Input Voltage	5	V
Input control Current	50	mA
Peak (10ms)	1	A
Input Power Dissipation [1]	150	mW
Isolation Voltage Input to Output	2500	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						
Operating Voltage	-	V_L	5	-	600	V_{rms} or V_{DC}
Load Current, Continuous	free air	I_L	-	-	0.18	A_{rms}
Peak Load Current	10ms	I_{LPK}	-	-	1.1	A_{rms}
On-Resistance[1]	I_L=10mA	R_{ON}	-	12.3	18	Ω
Off-State Leakage Current	V_L=1000V	I_{LEAK}	-	-	1	µA
Switching Speeds Turn-On	I_F=10mA, V_L=10V	T_{ON}	-	-	10	ms
Turn-Off	I_F=10mA, V_L=10V	T_{OFF}	-	-	5	ms
Output Capacitance	30V, f=10MHz	C_{OUT}	-	31	-	pF
Input Characteristics @ 25°C						
Input Control Current	I_L=1.0A	I_F	10	-	-	mA
Input Dropout Current	-	I_F	0.6	-	-	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	$C_{I/O}$	-	2	-	pF

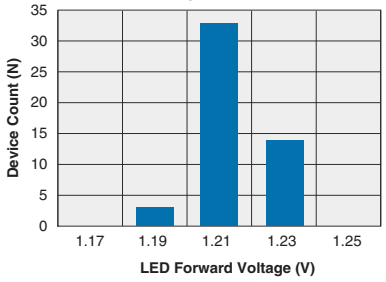
[1] Measurement taken within 1 second of on time.

Thermal Characteristics

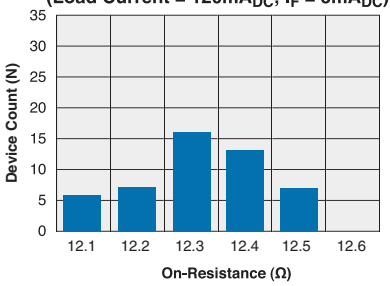
Parameter	Conditions	Symbol	Min	Typ	Max	Units
Thermal Resistance (junction to case)	-	$R_{\theta JC}$	-	1.5	-	°C/W

PERFORMANCE DATA*

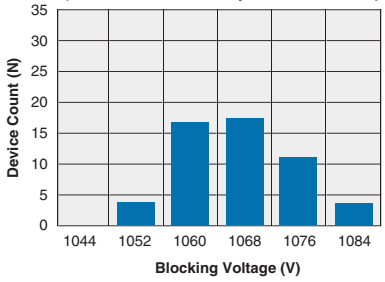
CPC1981Y
Typical LED Forward Voltage Drop
(N=50 Ambient Temperature = 25°C)
I_F = 5mA



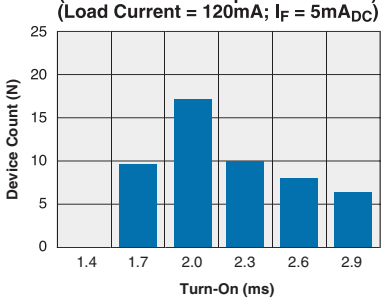
CPC1981Y
Typical On-Resistance Distribution
(N=50 Ambient Temperature = 25°C)
(Load Current = 120mA$_{DC}$; I_F = 5mA$_{DC}$)



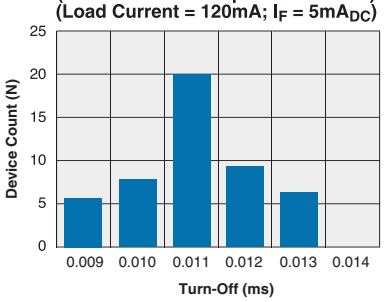
CPC1981Y
Typical Blocking Voltage Distribution
(N=50 Ambient Temperature = 25°C)



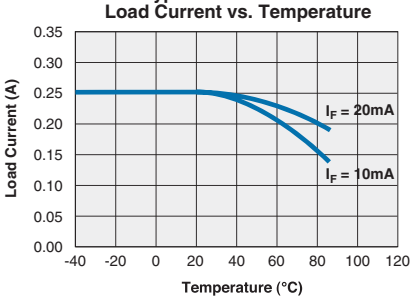
CPC1981Y
Typical Turn-On Time
(N=50 Ambient Temperature = 25°C)
(Load Current = 120mA; I_F = 5mA$_{DC}$)



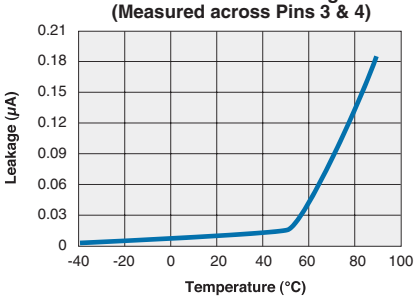
CPC1981Y
Typical Turn-Off Time
(N=50 Ambient Temperature = 25°C)
(Load Current = 120mA; I_F = 5mA$_{DC}$)



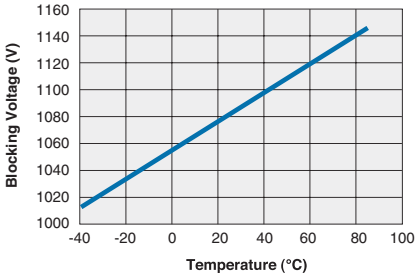
CPC1981Y
Typical Maximum DC
Load Current vs. Temperature



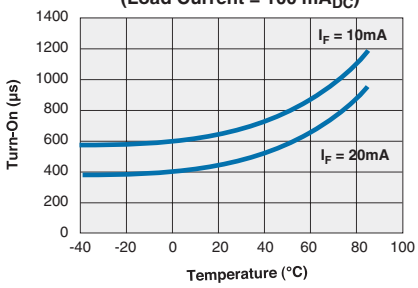
CPC1981Y
Typical Leakage vs. Temperature at
Maximum Rated Voltage
(Measured across Pins 3 & 4)



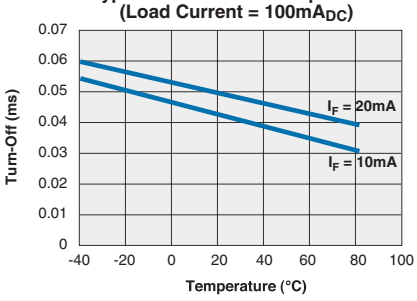
CPC1981Y
Blocking Voltage vs. Temperature



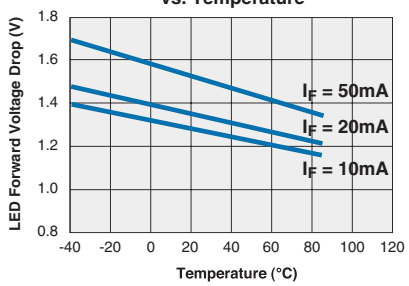
CPC1981Y
Typical Turn-On vs. Temperature
(Load Current = 100 mA$_{DC}$)



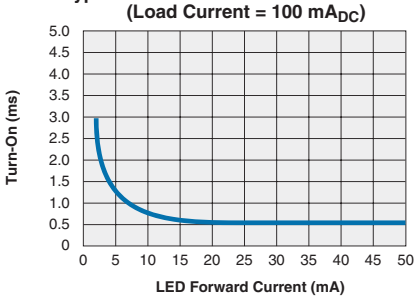
CPC1981Y
Typical Turn-Off vs. Temperature
(Load Current = 100mA$_{DC}$)



CPC1981Y
Typical LED Forward Voltage Drop
vs. Temperature



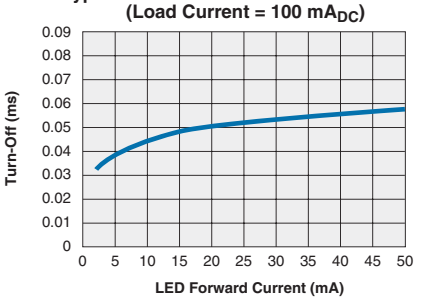
CPC1981Y
Typical Turn-On vs.LED Forward Current
(Load Current = 100 mA$_{DC}$)



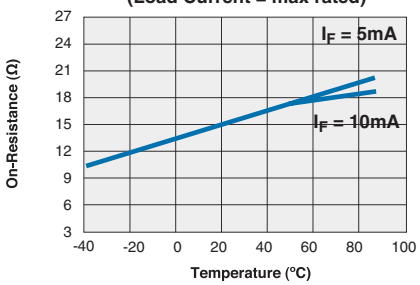
*The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

PERFORMANCE DATA*

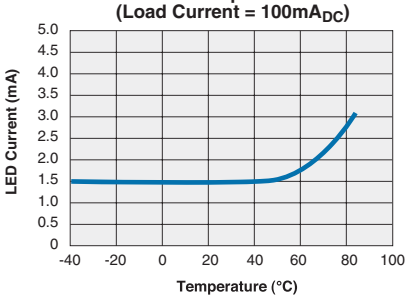
CPC1981Y
Typical Turn-Off vs. LED Forward Current
(Load Current = 100 mA_{DC})



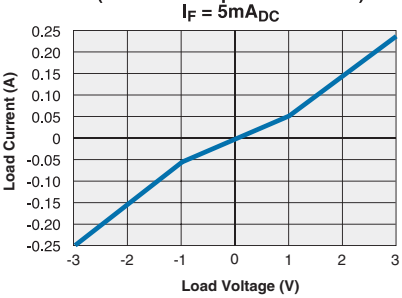
CPC1981Y
Typical On-Resistance vs. Temperature
(Load Current = max rated)



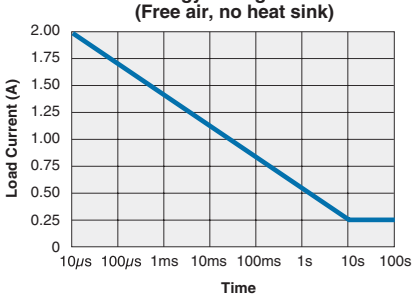
CPC1981Y
Typical I_F for Switch Operation
vs. Temperature
(Load Current = 100mA_{DC})



CPC1981Y
Typical Load Current vs. Load Voltage
(Ambient Temperature = 25°C)
I_F = 5mA_{DC}



CPC1981Y
Energy Rating Curve
(Free air, no heat sink)



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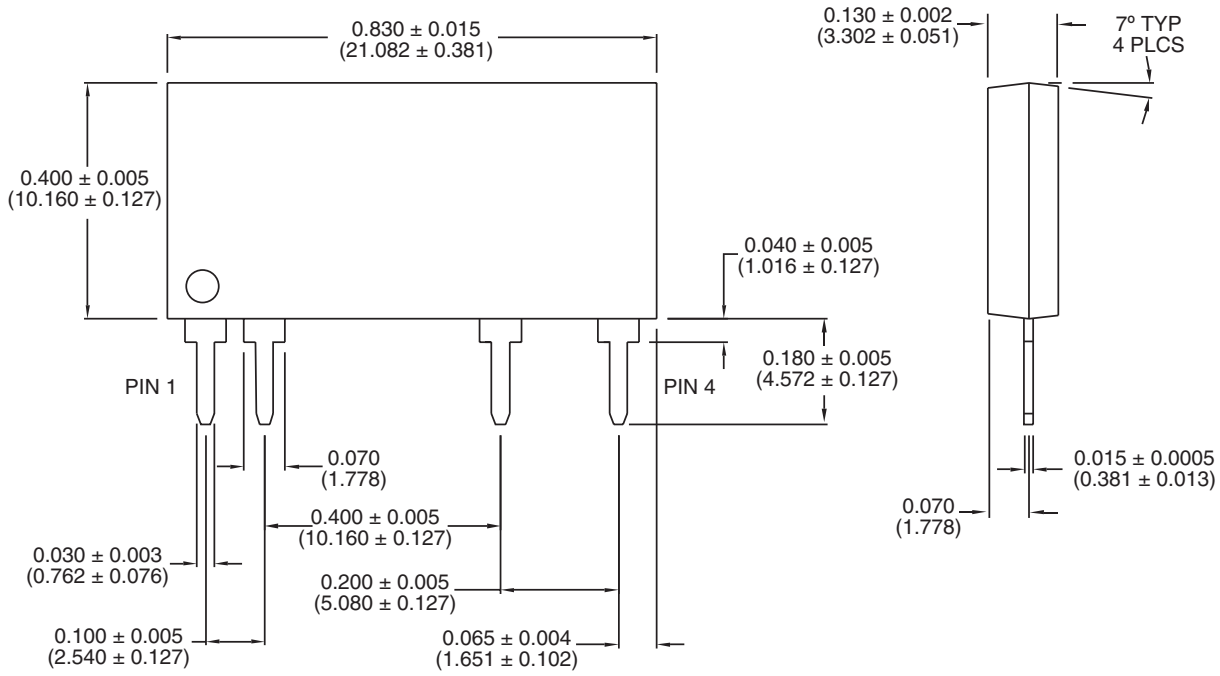
Manufacturing Information

Soldering
Recommended soldering processes are limited to 245ºC component body temperature for 10 seconds.

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

MECHANICAL DIMENSIONS



NOTE: Pin location tolerances are non-cumulative.

Dimensions:
inches
(mm)

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