

	CPC1978J	Units
Blocking Voltage	800	$V_p$
Load Current	2.5	$A_{rms}$
On-resistance	2.3	$\Omega$
$R_{\theta JC}$	0.35	$^{\circ}C/W$

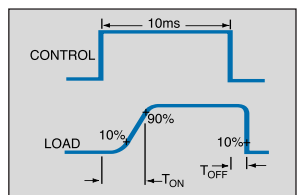
### Features

- Compact i4-PAC™ Power Package
- Low Thermal Resistance
- Heat Sink Option
- Handle Load Currents Up to  $2.5A_{rms}$  (free air)
- 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)
- Transportation Equipment
- Aerospace/Defense

**Switching Characteristics of Normally Open (Form A) Devices**



### Description

Clare and IXYS have combined to bring OptoMOS technology, reliability and compact size to a new family of high power solid state relays. The CPC1978J, a 1-Form-A solid state relay, is part of this new family. The CPC1978J 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 capability makes the relay suitable for a variety of high performance switching applications.

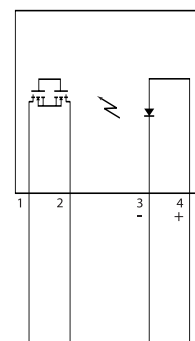
The unique i4-PAC™ package pioneered by IXYS allows solid state relays to achieve the highest current and power ratings. This package features an IXYS unique process where the silicon chips are soft soldered onto the Direct Copper bond (DCB) substrate instead of the usual copper leadframe. The DCB ceramic, the same substrate used in high power modules, not only provides  $2500V_{rms}$  isolation, but also very low thermal resistance.

### Ordering Information

Part #	Description
CPC1978J	i4-PAC™ 25 per tube

### Pin Configuration

**CPC1978J Pinout**



### Absolute Maximum Ratings (@ 25° C)

Parameter	Ratings	Units
Blocking Voltage	800	V <sub>p</sub>
Reverse Input Voltage	5	V
Input Control Current	100	mA
Peak (10ms)	1	A
Input Power Dissipation	150	mW
Isolation Voltage Input to Output	2500	V <sub>RMS</sub>
Operational Temperature	-40 to +85	°C
Storage Temperature	-40 to +125	°C
Soldering Temperature (10 Seconds Max.)	+260	°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.

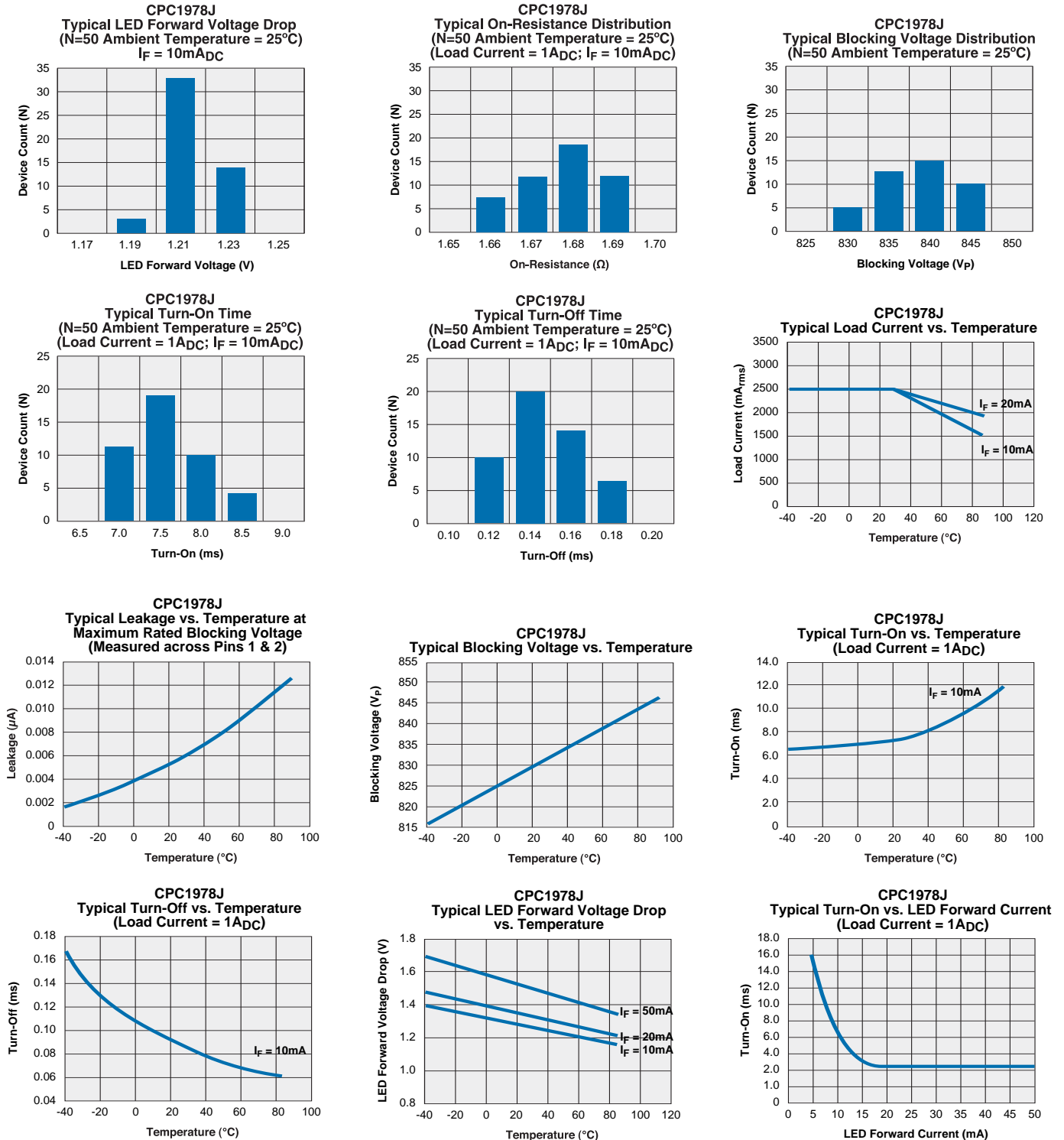
### Electrical Characteristics

Parameter	Conditions	Symbol	Min	Typ	Max	Units
<b>Output Characteristics @ 25°C</b>						
Load Current	Continuous, free air	I <sub>L</sub>	-	-	2.5	A <sub>rms</sub>
Peak Load Current	T ≤ 10ms	I <sub>L</sub>	-	-	10	A <sub>rms</sub>
On-Resistance <sup>1</sup>	I <sub>F</sub> =10mA, I <sub>L</sub> =1.0A	R <sub>ON</sub>	-	1.7	2.3	Ω
Off-State Leakage Current	V <sub>L</sub> =800V	I <sub>LEAK</sub>	-	-	1	μA
Switching Speeds						
Turn-On	I <sub>F</sub> =20mA, V <sub>L</sub> =10V	T <sub>ON</sub>	-	8	20	ms
Turn-Off	I <sub>F</sub> =20mA, V <sub>L</sub> =10V	T <sub>OFF</sub>	-	0.15	5	ms
<b>Input Characteristics @ 25°C</b>						
Input Control Current <sup>2</sup>	I <sub>L</sub> =1.0A	I <sub>F</sub>	10	-	-	mA
Input Dropout Current	-	I <sub>F</sub>	0.6	-	-	mA
Input Voltage Drop	I <sub>F</sub> =5mA	V <sub>F</sub>	0.9	1.2	1.4	V
Reverse Input Current	V <sub>R</sub> =5V	I <sub>R</sub>	-	-	10	μA
<b>Common Characteristics @ 25°C</b>						
Capacitance Input to Output	-	C <sub>I/O</sub>	-	1	-	pF
<b>Thermal Characteristics</b>						
Thermal Resistance, Junction to case	-	R <sub>θJC</sub>	-	0.35	-	°C/W

<sup>1</sup> Measurement taken within 1 second of on time.

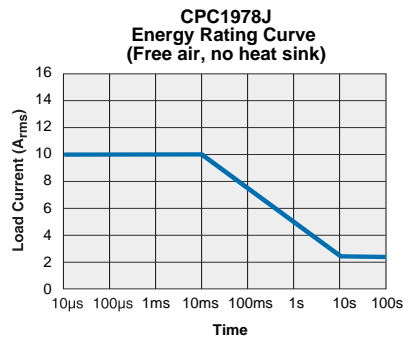
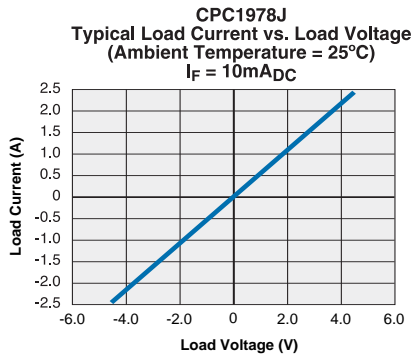
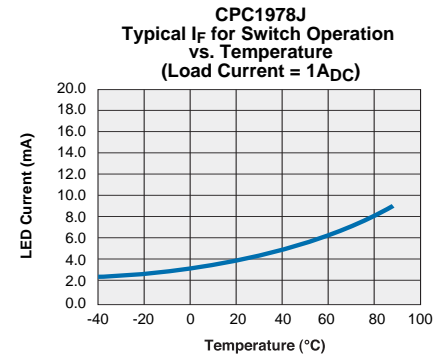
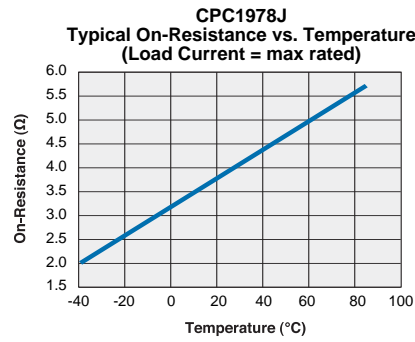
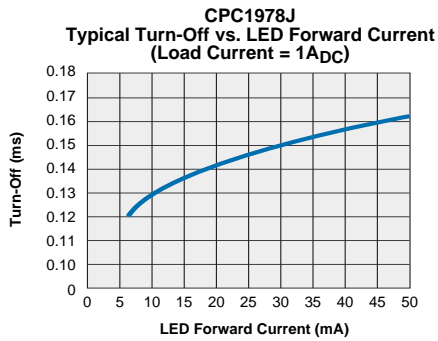
<sup>2</sup> For applications requiring high temperature operation (greater than 60°C) an LED drive current of 20mA is recommended.

PERFORMANCE DATA\*



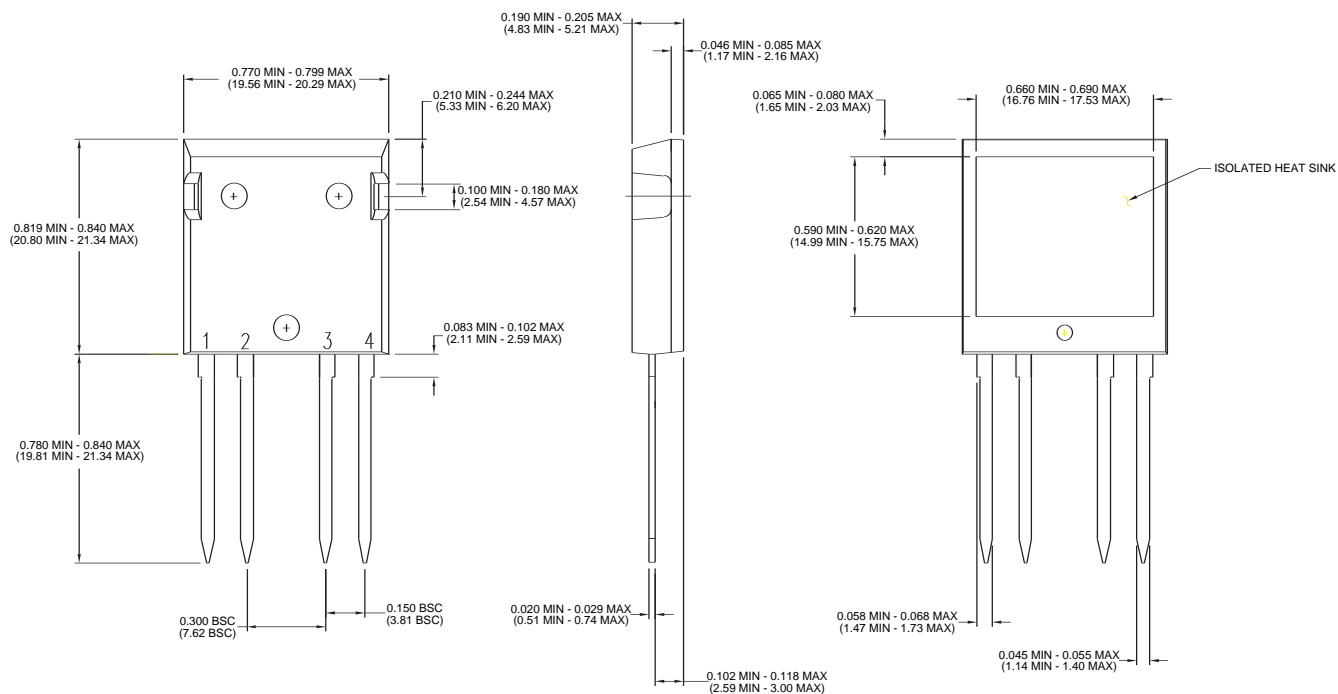
\*The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

## PERFORMANCE DATA\*



\*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.

## MECHANICAL DIMENSIONS



NOTE: Bottom heatsink meets 2500V<sub>rms</sub> isolation to the other pins.

Dimensions  
 inches  
 (mm)

For additional information please visit our website at: [www.clare.com](http://www.clare.com)

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