

	CPC1777J	Units
Blocking Voltage	600	$V_{DC}$
Load Current	6.0	$A_{DC}$
On-resistance	0.5	$\Omega$
$R_{\theta JC}$	0.35	$^{\circ}C/W$

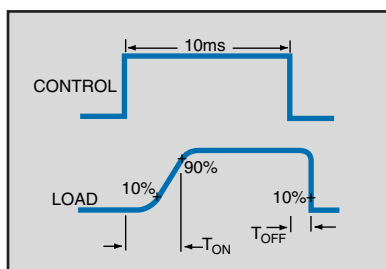
### Features

- 100% Solid State
- Compact i4-PAC Power Package
- Low Thermal Resistance (0.35 $^{\circ}C/W$  typ.)
- Heat Sink Option
- Handle Load Currents Up to 6 $A_{DC}$  (free air)
- Low Drive Power Requirements (TTL/CMOS Compatible)
- Arc-Free With No Snubbing Circuits
- 2500 $V_{rms}$  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
  - Utility Meters (gas, oil, electric and water)
- 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. As part of this new family, the CPC1777J 1-Form-A DC Solid State Relay employs optically coupled MOSFET technology to provide 2500 $V_{rms}$  of input to output isolation.

The output is constructed with an efficient MOSFET switch and photovoltaic die that use Clare's patented OptoMOS architecture while the input GaAlAs infrared LED provides the optically-coupled control. The combination of low on-resistance and high load current handling capability makes this relay suitable for a variety of high performance DC switching applications.

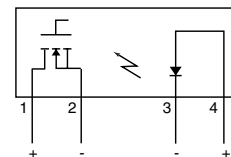
The unique i4-PAC package pioneered by IXYS allows solid state relays to achieve the highest load current and power ratings. This package features an IXYS unique process where the silicon chips are soft soldered onto the Direct Copper Bond (DCB) substrate instead of the usual copper leadframe. The DCB ceramic, the same substrate used in high power modules, not only provides 2500 $V_{rms}$  isolation but also very low thermal resistance (0.35 $^{\circ}C/W$ ).

### Ordering Information

Part #	Description
CPC1777J	i4-PAC (25 per tube)

### Pin Configuration

#### CPC1777J Pinout



### Absolute Maximum Ratings (@ 25°C)

Parameter	Ratings	Units
Blocking Voltage	600	$V_{DC}$
Reverse Input Voltage	5	V
Input control Current	50	mA
Peak (10ms)	1	A
Input Power Dissipation	150	mW
Isolation Voltage Input to Output	2500	$V_{rms}$
Operational Temperature	-40 to +85	°C
Storage Temperature	-40 to +125	°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

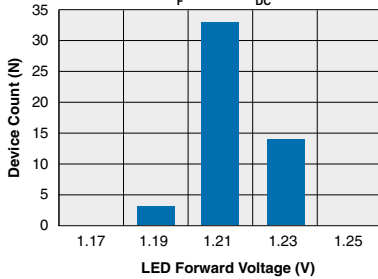
Parameter	Conditions	Symbol	Min	Typ	Max	Units
<b>Output Characteristics @ 25°C</b>						
Load Current, Continuous	free air	$I_L$	-	-	6	$A_{DC}$
Peak Load Current	$T \leq 10ms$	$I_{LPK}$	-	-	16	$A_{DC}$
On-Resistance <sup>1</sup>	$I_L=1A, I_F=10mA$	$R_{ON}$	-	0.35	0.5	$\Omega$
Off-State Leakage Current	$V_L=600V$	$I_{LEAK}$	-	-	1	$\mu A$
Switching Speeds						
Turn-On	$I_F=20mA, V_L=10V$	$T_{ON}$	-	8	20	ms
Turn-Off	$I_F=20mA, V_L=10V$	$T_{OFF}$	-	0.15	5	ms
<b>Input Characteristics @ 25°C</b>						
Input Control Current <sup>2</sup>	$I_L=1.0A$	$I_F$	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	$\mu A$
<b>Common Characteristics @ 25°C</b>						
Capacitance Input to Output	-	$C_{I/O}$	-	1	-	pF
<b>Thermal Characteristics @ 25°C</b>						
Thermal Resistance, Junction to Case	-	$R_{\theta JC}$	-	0.35	-	°C/W

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

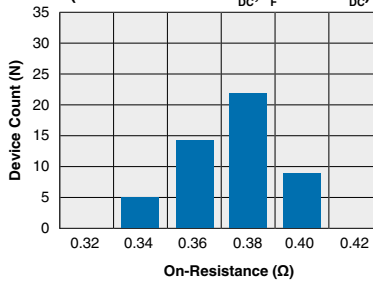
<sup>2</sup> For applications requiring high temperature operation (greater than 60°C) an LED drive current of 20mA is recommended.

**PERFORMANCE DATA\***

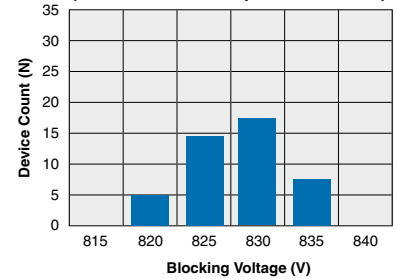
**CPC1777J**  
Typical LED Forward Voltage Drop  
(N=50 Ambient Temperature = 25°C)  
 $I_F = 10\text{mA}_{DC}$



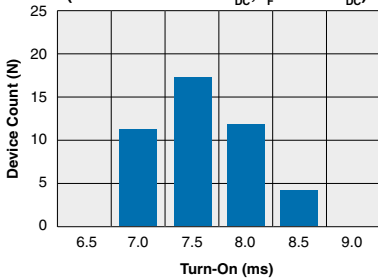
**CPC1777J**  
Typical On-Resistance Distribution  
(N=50 Ambient Temperature = 25°C)  
(Load Current =  $1\text{A}_{DC}$ ;  $I_F = 10\text{mA}_{DC}$ )



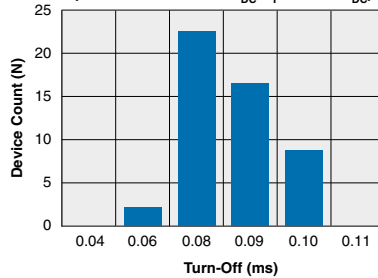
**CPC1777J**  
Typical Blocking Voltage Distribution  
(N=50 Ambient Temperature = 25°C)



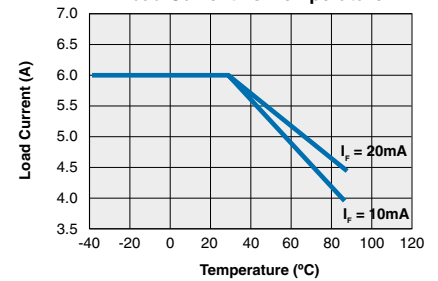
**CPC1777J**  
Typical Turn-On Time  
(N=50 Ambient Temperature = 25°C)  
(Load Current =  $1\text{A}_{DC}$ ;  $I_F = 10\text{mA}_{DC}$ )



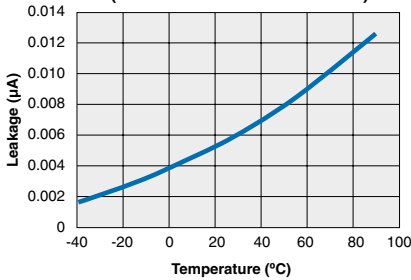
**CPC1777J**  
Typical Turn-Off Time  
(N=50 Ambient Temperature = 25°C)  
(Load Current =  $1\text{A}_{DC}$ ;  $I_F = 10\text{mA}_{DC}$ )



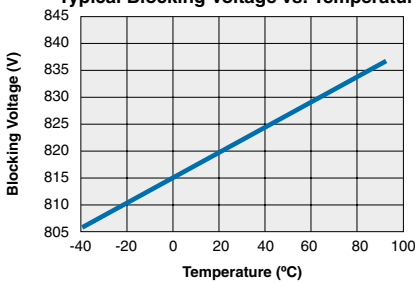
**CPC1777J**  
Typical Maximum Load Current vs. Temperature



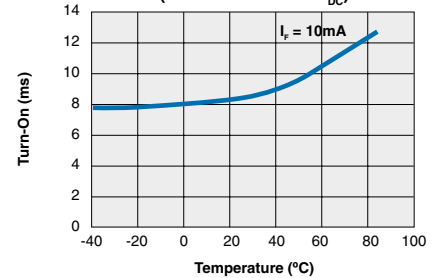
**CPC1777J**  
Typical Leakage vs. Temperature at Maximum Rated Voltage  
(Measured across Pins 1 & 2)



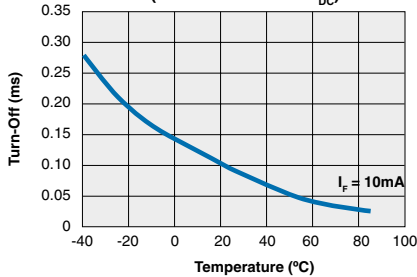
**CPC1777J**  
Typical Blocking Voltage vs. Temperature



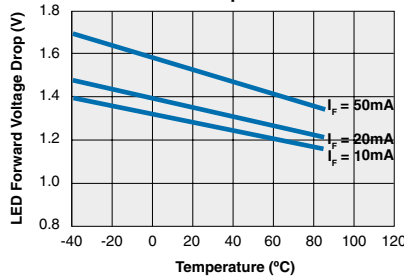
**CPC1777J**  
Typical Turn-On vs. Temperature  
(Load Current =  $1\text{A}_{DC}$ )



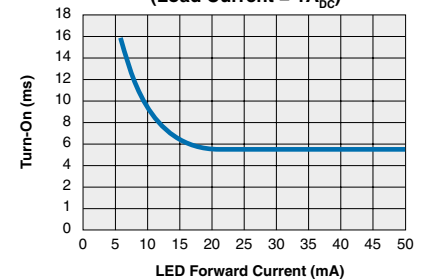
**CPC1777J**  
Typical Turn-Off vs. Temperature  
(Load Current =  $1\text{A}_{DC}$ )



**CPC1777J**  
Typical LED Forward Voltage Drop vs. Temperature

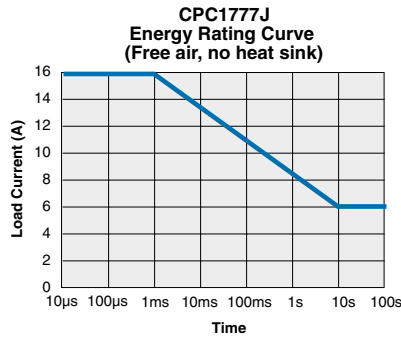
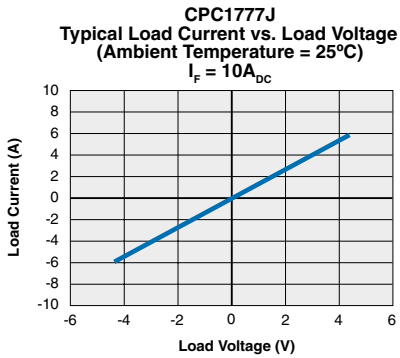
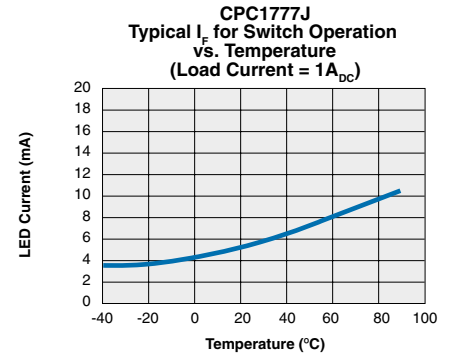
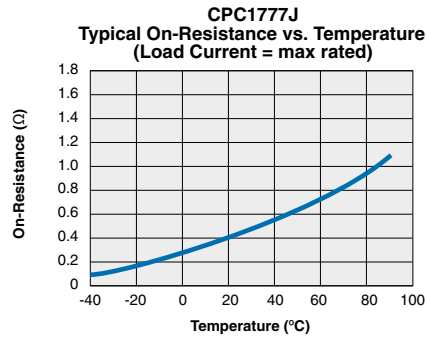
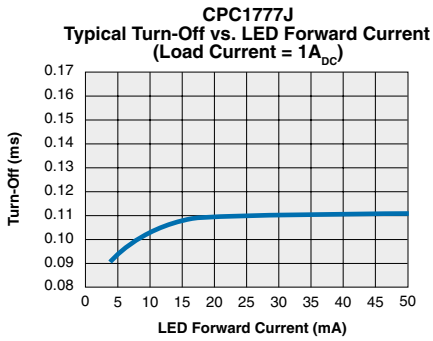


**CPC1777J**  
Typical Turn-On vs. LED Forward Current  
(Load Current =  $1\text{A}_{DC}$ )



\*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\*



\*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

### Soldering

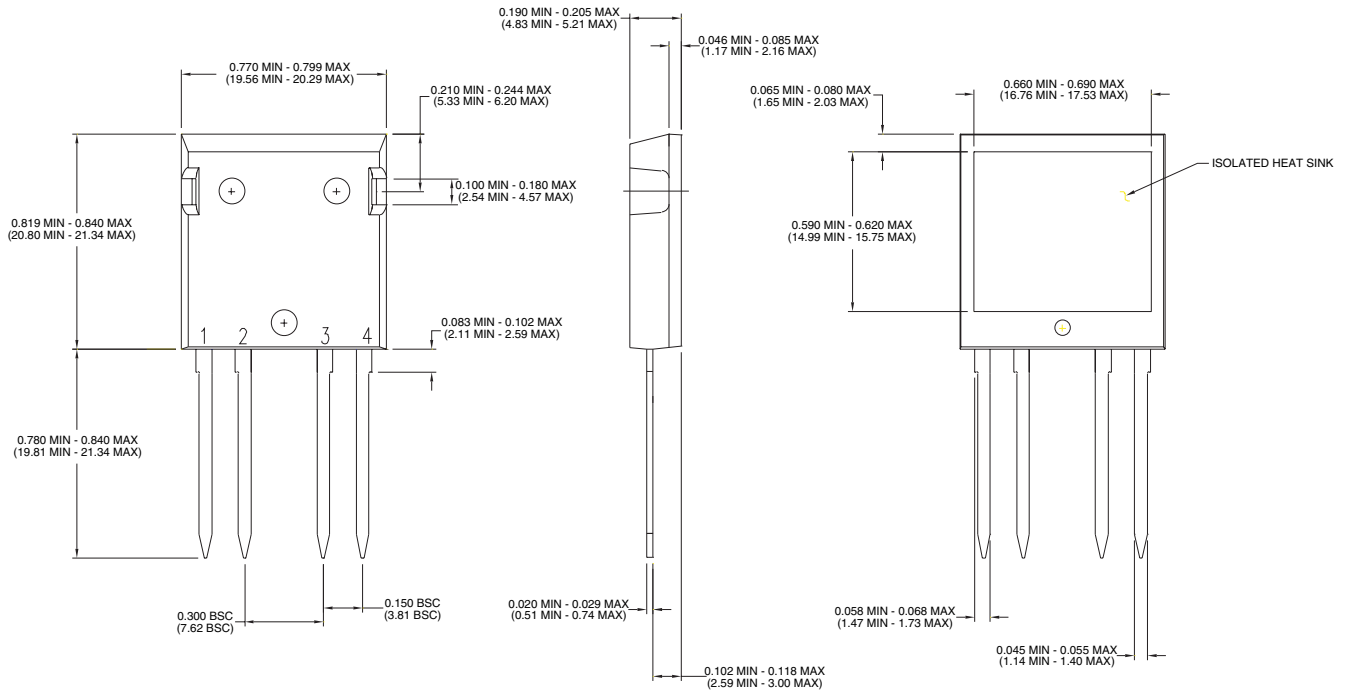
Recommended soldering processes are limited to 245°C component body temperature for 10 seconds.

### Washing

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

## MECHANICAL DIMENSIONS:

### i4-PAC



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

Dimensions:  
inches  
(mm)

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