

Characteristics

| Parameter | Rating | Units |
|--|--------|------------------------------------|
| Blocking Voltage | 800 | V _P |
| Load Current, T _A =25°C: | | A _{rms} / A _{DC} |
| With 5°C/W Heat Sink | 1.85 | |
| No Heat Sink | 0.75 | |
| On-Resistance (max) | 2.3 | Ω |
| Thermal Impedance, Junction-to-Case, θ _{JC} | 0.35 | °C/W |

Features

- 1.85A_{rms} Load Current with 5°C/W Heat Sink
- Low 2.3Ω On-Resistance
- 800V_P Blocking Voltage
- 2500V_{rms} Input/Output Isolation
- Low Thermal Impedance: θ_{JC} = 0.35 °C/W
- Isolated, Low Thermal Impedance Ceramic Pad for Heat Sink Applications
- Low Drive Power Requirements
- Arc-Free With No Snubbing Circuits
- No EMI/RFI Generation
- Flammability Rating UL 94 V-0

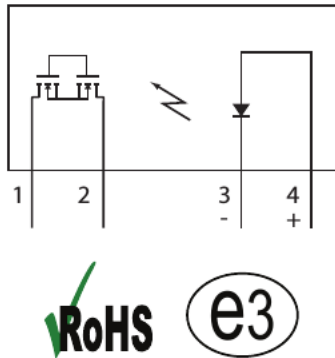
Applications

- 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

Approvals

- UL 508 Recognized Component: File E69938

Pin Configuration



Description

IXYS Integrated Circuits brings OptoMOS® technology, reliability and compact size to a new family of high-power Solid State Relays.

As part of this family, the CPC1978 single-pole normally open (1-Form-A) Solid State Power Relay is rated for up to 1.85A_{rms} continuous load current with a 5°C/W heat sink.

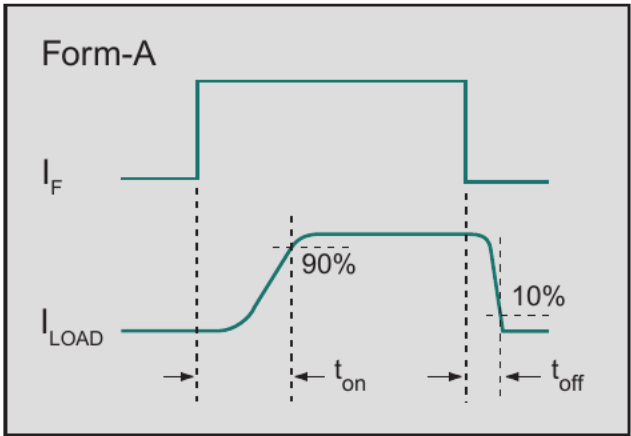
The CPC1978 employs optically coupled MOSFET technology to provide 2500V_{rms} of input to output isolation. The optically coupled outputs, that use patented OptoMOS architecture, are controlled by a highly efficient infrared LED. The combination of low on-resistance and high load current handling capability makes this relay suitable for a variety of high performance switching applications.

The unique i4-PAC package pioneered by IXYS enables Solid State Relays to achieve the highest load current and power ratings. This package features a unique IXYS process where the silicon chips are soft soldered onto the Direct Copper Bond (DCB) substrate instead of the traditional copper leadframe. The DCB ceramic, the same substrate used in high power modules, not only provides 2500V_{rms} isolation but also very low junction-to-case thermal impedance (0.35 °C/W).

Ordering Information

| Part | Description |
|----------|------------------------------|
| CPC1978J | i4-PAC Package (25 per tube) |

Switching Characteristics



1 Specifications

1.1 Absolute Maximum Ratings @ 25°C

| Symbol | Ratings | Units |
|------------------------------------|-------------|------------------|
| Blocking Voltage | 800 | V _P |
| 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 _{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.

Typical values are characteristic of the device at +25°C, and are the result of engineering evaluations. They are provided for information purposes only, and are not part of the manufacturing testing requirements.

1.2 Electrical Characteristics @ 25°C

| Parameter | Conditions | Symbol | Minimum | Typical | Maximum | Units |
|--|--|--------------------|---------|---------|---------|------------------------------------|
| Output Characteristics | | | | | | |
| Load Current ¹ | | | | | | |
| Peak | t≤10ms | I _L | - | - | 10 | A _P |
| Continuous | No Heat Sink | | | | 0.75 | A _{rms} / A _{DC} |
| Continuous | T _C =25°C | | | | 7.25 | |
| Continuous | T _C =99°C | I _{L(99)} | | | 0.825 | |
| On-Resistance ² | I _F =10mA, I _L =1A | R _{ON} | - | 1.7 | 2.3 | Ω |
| Off-State Leakage Current | V _L =800V _P | I _{LEAK} | - | - | 1 | μA |
| Switching Speeds | | | | | | |
| Turn-On | I _F =20mA, V _L =10V | t _{on} | - | 8 | 20 | ms |
| Turn-Off | | t _{off} | - | 0.15 | 5 | |
| Output Capacitance | I _F =0mA, V _L =25V, f=1MHz | C _{out} | - | 390 | - | pF |
| Input Characteristics | | | | | | |
| Input Control Current to Activate ³ | I _L =1A | I _F | - | - | 10 | mA |
| Input Control Current to Deactivate | - | I _F | 0.6 | - | - | mA |
| Input Voltage Drop | I _F =10mA | V _F | 0.9 | 1.35 | 1.56 | V |
| Reverse Input Current | V _R =5V | I _R | - | - | 10 | μA |
| Input/Output Characteristics | | | | | | |
| Capacitance, Input-to-Output | V _{IO} =0V, f=1MHz | C _{IO} | - | 1 | - | pF |

¹ Higher load currents possible with proper heat sinking.

² Measurement taken within 1 second of on-time.

³ For applications requiring high temperature operation (T_C > 60°C) a minimum LED drive current of 20mA is recommended.

