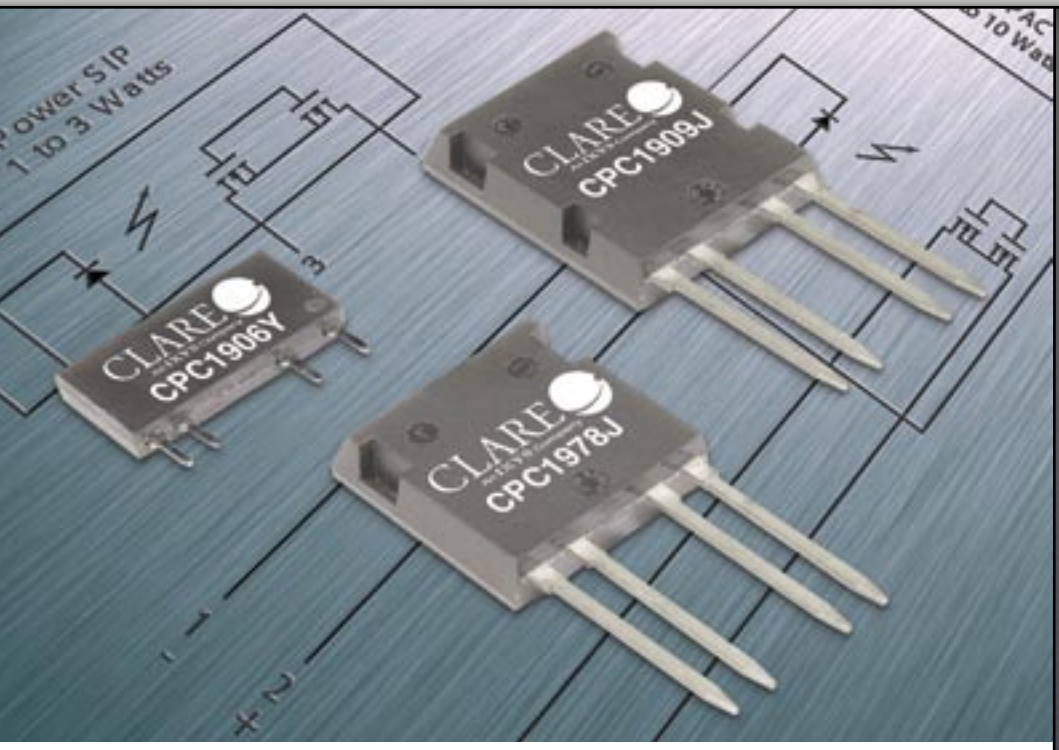
Power Solid State Relays

i4-PAC™, ISOPLUS264, and the Power SIP Relays

CLARE
An IXYS Company



Features

- Solid State Reliability
- Handle loads up to $15A_{rms}$
- Voltage ratings from 60V - 1000V
- Low On Resistance
- Compact i4-PAC™ Package with low thermal resistance and heat sink
- Industry Standard 4-Pin SIP Package
- Low input control current (≤ 10mA)
- UL 508 Approval Pending

Applications

- Motor controls
- Power Supplies
- Robotics
- Medical equipment
- Transportation equipment
- Consumer appliances
- Industrial control
- Test and Measurement Equipment
- Aerospace/Defense

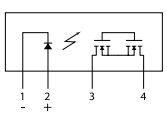
Description

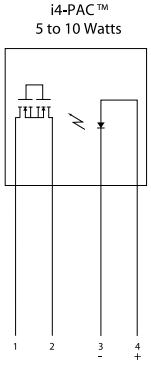
This unique family of 1-Form-A high power Solid State Relays (SSRs) combines Clare's proven optical isolation with IXYS advanced power MOSFET devices to deliver the industry's highest power MOSFET based SSRs. The efficient MOSFET switches and photovoltaic die employ Clare's patented OptoMOS™ architecture which is based on an optically-coupled input controlled by a highly efficient GaAlAs infrared LED. The combination of low on resistance and high load current handling capabilities makes these relays suitable for a variety of high performance switching applications. As with all Clare SSRs, they are ideal EMR replacements and offer higher reliability, lower drive current, no contact bounce and peak performance in the harshest shock, vibration and magnetic environments.

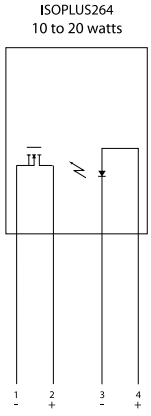
With the recent expansion of the power relay family, Clare provides maximum flexibility for designers as it now offers a full range of current (up to $15A_{rms}$) and voltage (60V to 1000V) options, full AC/DC or reduced cost DC-only operation in 3 different package types (Power SIP, i4-PAC™ and the ISOPLUS264).

The SIP package offers pin for pin compatibility with other power solid state relays, allowing designers to bring Clare's superior reliability to existing designs without changing printed circuit boards. What distinguishes Clare's offerings from other power solid state relays are the unique package options, the i4-PAC™ and the ISOPLUS264. Both are part of the IXYS family of ISOPLUS packages. These packages feature the IXYS unique (patent pending) process where the silicon chips are soft soldered onto the Direct Copper Bond (DCB) substrate instead of the usual copper lead frame. The DCB ceramic, the same substrate material used in high power modules, not only provides isolation capability ($2500V_{rms}$) but also unbeatable low thermal resistance (0.30 ºC/W for the ISOPLUS264) compared to conventional external mounted isolation material. Along with the ability to attach a heat sink, these factors combine to give Clare's new power relays unbeatable current handling capability in a compact package.

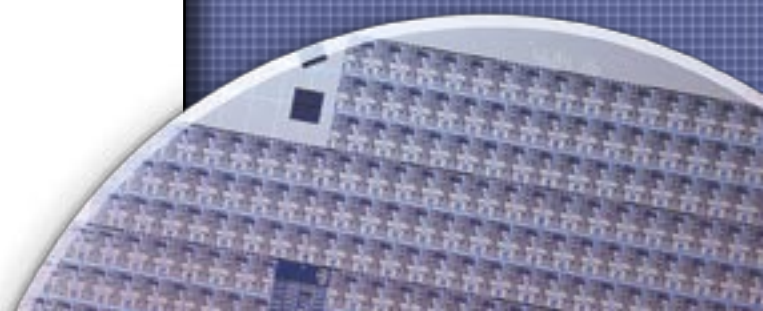
Block Diagrams:







* i4-PAC™ and ISOPLUS264 have both AC/DC and DC-only versions



i4-PAC™, ISOPLUS264, and the Power SIP Relays

Many electronic designs can take advantage of the improved performance of solid-state relays (SSRs) relative to the electro-mechanical relays (EMRs) that perform the same circuit function. The advantages of solid-state relays include the following:

- SSRs are typically smaller than EMRs, preserving valuable real estate in printed-circuit board applications.
- SSRs offer improved system reliability since they have no moving parts or contacts to degrade.
- SSRs provide state-of-the-art performance, including no requirement for driver electronics and bounce-free switching.
- SSRs provide improved system life-cycle costs, including simplified designs with reduced power supply and heat dissipation requirements.
- SIP style package allows for maximum density/minimal PCB space

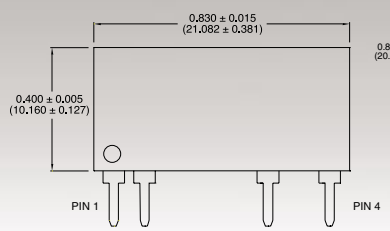
Application Notes

- AN-145, "Advantages of solid state relays over electromechanical relays."

Part Number	Output Type	Blocking Voltage (V_P)	Load Current (A_{rms})	On Resistance (Ohms)	Switching Speeds T_{ON}/T_{OFF} (ms)	Package	Thermal Resistance $R_{\theta JC}$ (°C/W)
CPC1908J	AC/DC	60	8	0.3	20/5	i4-PAC™	0.35
CPC1928J	AC/DC	200	6	0.2	20/5	i4-PAC™	0.35
CPC1967J	AC/DC	400	3	0.85	20/5	i4-PAC™	0.35
CPC1977J	AC/DC	600	4	1	20/5	i4-PAC™	0.35
CPC1978J	AC/DC	800	2.5	2.3	20/5	i4-PAC™	0.35
CPC1986J	AC/DC	1000	1.2	3	20/5	i4-PAC™	0.35
CPC1909J	AC/DC	60	10	0.1	20/5	ISOPLUS264	0.3
CPC1918J	AC/DC	100	9	0.12	25/10	ISOPLUS264	0.3
CPC1927J	AC/DC	250	7	0.20	25/10	ISOPLUS264	0.3
CPC1979J	AC/DC	600	5	0.75	25/10	ISOPLUS264	0.3
CPC1988J	AC/DC	1000	1.5	2.5	25/10	ISOPLUS264	0.3
CPC1906Y	AC/DC	60	2	0.3	10/5	Power SIP	1.5
CPC1916Y	AC/DC	100	2.5	0.34	10/10	Power SIP	1.5
CPC1926Y	AC/DC	250	0.7	1.4	10/10	Power SIP	1.5
CPC1972Y	AC/DC	600	0.30	6.5	10/5	Power SIP	1.5
CPC1973Y	AC/DC	400	0.35	5	5/3	Power SIP	1.5
CPC1981Y	AC/DC	1000	0.18	18	10/5	Power SIP	1.5
CPC1976Y	AC	600	2	n/a	1/2 cycle	Power SIP	1.5
CPC1708J*	DC	60	11	0.08	20/5	i4-PAC™	0.35
CPC1728J*	DC	200	10	0.10	20/5	i4-PAC™	0.35
CPC1767J*	DC	400	8	0.3	20/5	i4-PAC™	0.35
CPC1777J*	DC	600	6	0.5	20/5	i4-PAC™	0.35
CPC1778J*	DC	800	3	1.3	20/5	i4-PAC™	0.35
CPC1786J	DC	1000	1.5	1.5	20/5	i4-PAC™	0.35
CPC1709J*	DC	60	15	0.05	25/10	ISOPLUS264	0.3
CPC1718J*	DC	100	13	0.075	25/10	ISOPLUS264	0.3
CPC1727J*	DC	250	12	0.09	25/10	ISOPLUS264	0.3
CPC1779J*	DC	600	6.5	0.4	25/10	ISOPLUS264	0.3
CPC1788J*	DC	1000	2	1.25	25/10	ISOPLUS264	0.3

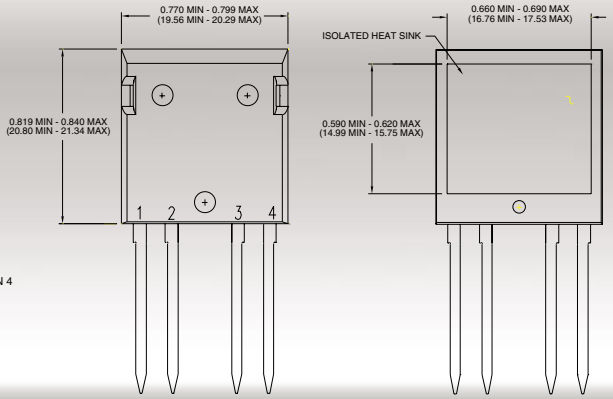
* In Development - Samples Available in Q1-05

Power SIP

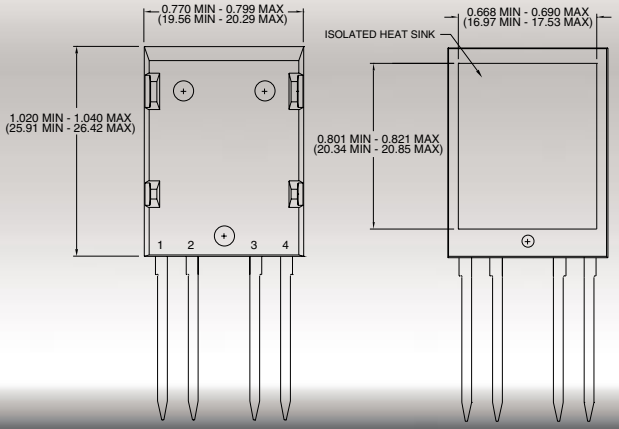


Dimensions:
inches
(mm)

i4-PAC™



ISOPLUS264



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