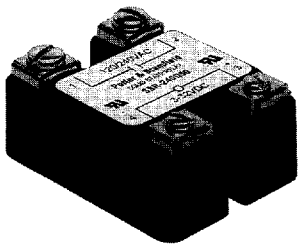


SSR series

"Hocky Puck" Solid State Relay With Paired SCR Output

File E29244
File E29244 UL Recognized for Canada

Features

- Standard "hockey puck" package.
- Inverse parallel SCR output.
- 25, 50, & 125A rms versions.
- 120/240VAC & 480VAC output types.
- Zero voltage and random voltage turn-on versions.
- AC & DC input versions.
- 4,000V rms optical isolation.
- Exposed ceramic base plate for reduced thermal impedance.
- Floating terminal design.

Engineering Data

Form: 1 Form A (SPST-NO).
Duty: Continuous.
Isolation: 4,000V rms minimum.
Isolation Resistance: 10^{10} ohms @ 500VDC minimum.
Capacitance: 10 pf maximum (input to output).
Temperature Range:
Storage: –40°C to +120°C
Operating: –25°C to +80°C
Case Material: Plastic, UL rated 94V-0.
Base Plate Material: Ceramic.
Case and Mounting: Refer to outline dimension.
Termination: Refer to outline dimension.
Approximate Weight: 3.5 oz. (98g).

Ordering Information

Sample Part Number ► **SSR -240 D 25**

1. **Basic Series:** SSR = "hockey puck" inverse parallel SCR output solid state relay
2. **Line Voltage:** 240 = 24 - 240VAC 480 = 48 - 480VAC
3. **Input Type & Voltage:** A = 90-280VAC/VDC
   D = 3-32VDC on zero voltage turn-on types
   = 3.5-26VDC on random voltage turn-on types
4. **Maximum Switching Rating/Output:** 25 = .05-25A rms, mounted to heatsink
   50 = .05-50A rms, mounted to heatsink
   125 = .05-125A rms, mounted to heatsink
5. **Options:** Leave Blank = Zero voltage turn-on
   R = Random voltage turn-on (phase controllable)

Stock Items – The following items are normally maintained in stock for immediate delivery.

SSR-240A25	SSR-240D25	SSR-240D50
SSR-240A50	SSR-240D25R	SSR-480D125

Input Specifications

Parameter	AC/DC Input	DC Input	
	Zero V Turn-on Units	Zero V Turn-on Units	Random V Turn-on Units
Control Voltage Range V_{IN}	90-280VAC/VDC	3-32VDC	3.5-26VDC
Must Operate Voltage $V_{IN(OP)}$ (Min.)	90VAC/VDC	3VDC	3.5VDC
Must Release Voltage $V_{IN(REL)}$ (Min.)	10VAC/VDC	1VDC	1VDC
Input Current (Max.)	15mA @ 90VAC	15mA @ 5VDC	15mA @ 5VDC

Output Specifications (@ 25° C, unless otherwise specified)

Parameter	Nom. Line Voltage	Conditions	Units	25A Models	50A Models	125A Models
Load Voltage Range V_L	120/240V Model		V rms	24-240		
	480V Model		V rms	48-480		
Repetitive Blocking Voltage (Min.)	120/240 Model		V peak	±600		
	480V Model		V peak	±1200		
Load Current Range I_L*	120/240 & 480V Models	Resistive	A rms	.05-25	.05-50	.05-125
Single Cycle Surge Current (Min.)	120/240 & 480V Models		A peak	250	600	1,400
Leakage Current (Off-State) (Max.)	120/240V Model	f = 60 Hz. V_L = 240V rms	mA rms	5		
	480V Model	f = 60 Hz. V_L = 480V rms		5		
On-State Voltage Drop (Max.)	120/240 & 480V Models	I_L = Max.		1.7		
Static dv/dt (Off-State) (Min.)	120/240 & 480V Models		V/µs	500		
Thermal Resistance, Junction to Case ($R_{\theta J-C}$) (Max.)	120/240 & 480V Models		°C/W	0.4	0.35	.25
Turn-On Time (Max.)	120/240 & 480V Models	f = 60 Hz.	ms	8.3 for Zero Voltage Turn-On, 0.02 for Random Voltage Turn-On Models		
Turn-Off Time (Max.)	120/240 & 480V Models	f = 60 Hz.	ms	8.3		
I^2T Rating	120/240 & 480V Models	t = 8.3 ms	A^2 Sec.	600	3,000	12,000
Load Power Factor Rating	120/240 & 480V Models	I_L = Max.		0.5-1.0		

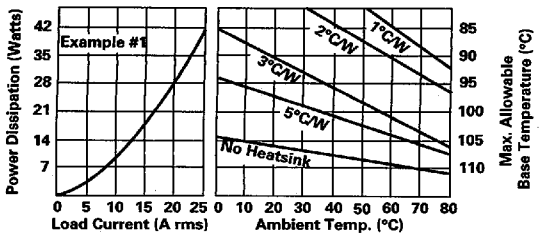
*See Derating Curves

Electrical Characteristics (Thermal Derating Curves)

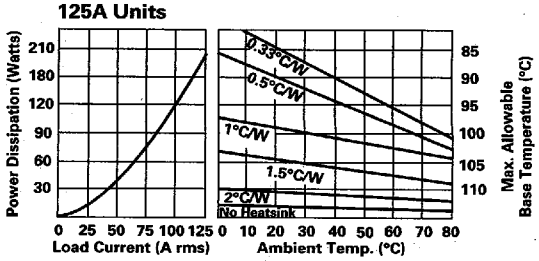
How To Use These Curves

Knowing maximum load current and maximum ambient temperature, use derating curves to determine required heat sink and maximum allowable base plate temperature. On left hand power dissipation curve, locate the point corresponding to maximum load current. Extend a line to the right from that point to the intersection of vertical line on right hand chart corresponding to maximum ambient temperature. From heat sink curve, read directly or extrapolate required heat sink size. Extend the line farther to the right and read on the right hand scale the maximum allowable base plate temperature.

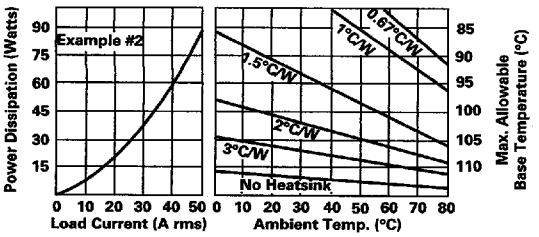
25A Units



125A Units



50A Units



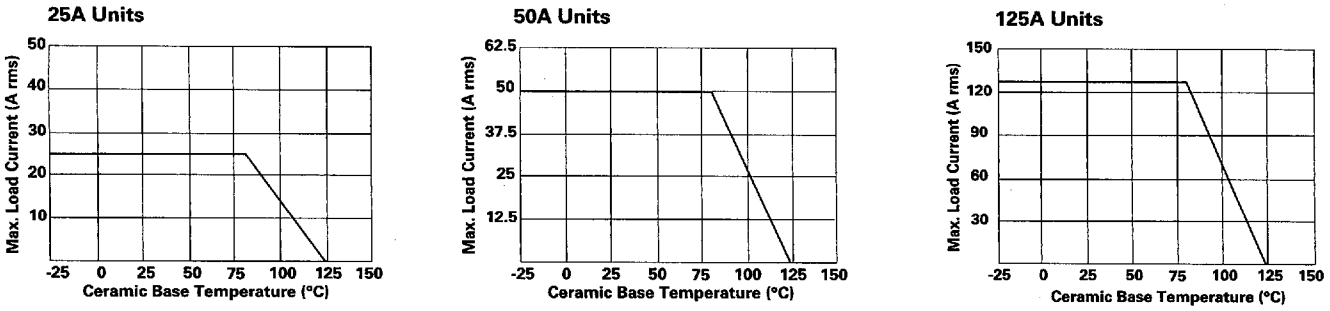
Example #1:
Given: For a 25A unit
IL = 17A @ 50°C
Find: Heatsink required & max. baseplate temperature
Solution: From 25A curve
Heatsink = 3°C/W
Baseplate temperature = 99°C

Example #2:
Given: 50A unit
Find: Free Air Rating @ 45°C
Solution: From 50A Curve
Free Air Rating @ 45°C = 10A
Baseplate Temperature = 113°C

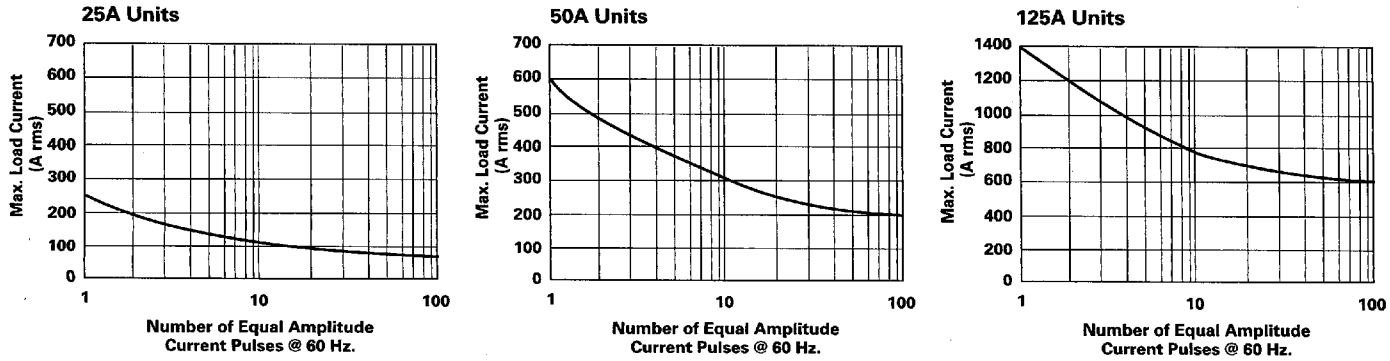
Heatsink Dimensions

- We recommend that solid State Relay Modules be mounted to a heatsink sufficient to maintain the module's base temperature at less than 85°C under worst case ambient temperature and load conditions.
- The heatsink mounting surface should be a smooth (30-40 micro-inch finish), flat (30-40 micro-inch flatness across mating area), un-painted surface which is clean and free of oxidation.
- An even coating of thermal compound (Dow Corning DC340 or equivalent) should be applied to both the heatsink and module mounting surfaces and spread to a uniform depth of .002" to eliminate all air pockets.
- The module should be mounted to the heatsink using two#10 screws. The mounting screws should be torqued to 10 inch-pounds by alternately tightening the screws one quarter turn at a time.

Load Current vs. Base Temperature



Allowable Peak Surge Current vs. Duration/Expected Lifetime



Family of curves shows approximate expected lifetime of relay when subjected to repetitive current surges, i.e., number of surges of a specific magnitude and duration.

Operating Diagrams

† Random Turn-on Units have a Random Turn-on circuit instead of Zero Voltage Circuit

Outline Dimensions