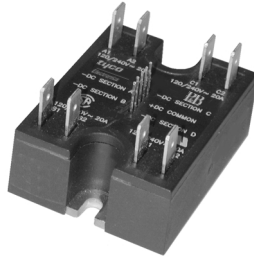


# SSRQ series

## Quad AC Output "Hockey Puck" Solid State Relay With Triac Outputs

US File E29244



Users should thoroughly review the technical data before selecting a product part number. It is recommended that users also seek out the pertinent approvals files of the agencies/laboratories and review them to ensure the product meets the requirements for a given application.

### Features

- Four independent AC output solid state relays in one standard package.
- 20A rms triac outputs.
- 4-15 VDC input control.
- Zero voltage and random voltage turn-on versions.
- 2500V rms optical isolation.
- Quick connect style terminals.

### Engineering Data

- Form:** 4 Form A (4 SPST-NO).
- Duty:** Continuous.
- Isolation:** 2500V rms input-to-output-to-ground.
- Capacitance:** 10.0 pf maximum (input to output).
- Temperature Range:**
  - Storage:** -40°C to +125°C
  - Operating:** -40°C to +80°C
- Case Material:** Plastic, UL rated 94V-0.
- Case and Mounting:** Refer to outline dimension.
- Termination:** Refer to outline dimension.
- Approximate Weight:** 3.5 oz. (98g).

### Ordering Information

Sample Part Number ▶ **SSRQ -240 D 20**

- 1. Basic Series:** SSRQ = Quad output SSR - 4 SPST - NO
- 2. Line Voltage:** 240 = 24 - 280 VAC
- 3. Input Type & Voltage:** D = 4 - 15VDC, zero voltage turn-on types.  
R = 4 - 15VDC, random voltage turn-on types.
- 4. Maximum Switching Rating/Output:** 20 = .05 - 20A rms, mounted to heatsink. NOTE: 60A max. per package.
- 5. Options:** Blank = Zero voltage turn-on (all sections) Requires "D" input type above.  
R = Random voltage turn-on (all sections) Requires "R" input type above.

**Our authorized distributors are more likely to maintain the following items in stock for immediate delivery.**

SSRQ-240D20

### Input Specifications

Parameter	Conditions	Units	Zero V or Random V Turn-on Units
Control Voltage Range $V_{IN}$	@ 25°C	VDC	4-15
Must Operate Voltage $V_{INI(OP)}$ (Min.)	@ 25°C	VDC	4
Must Release Voltage $V_{INI(REL)}$ (Min.)	@ 25°C	VDC	1
Input Current (Typ.)	@ 25°C	mA DC	12
Input Impedance (Nom.)	@ 25°C	ohms	330

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

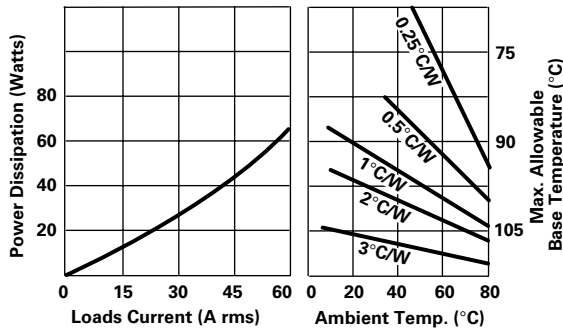
Parameter	Conditions	Units	
Load Voltage Range $V_L$		V rms	24-280
Repetitive Blocking Voltage (Min.)		V peak	±600
Load Current Range $I_L^*$	Resistive	A rms	.15-20
Single Cycle Surge Current (Min.)		A peak	250
Leakage Current (Off-State) (Max.)	$f = 60 \text{ Hz. } V_L = 280\text{Vrms}$	mA rms	10
On-State Voltage Drop (Max.)	$I_L = \text{Max.}$	V peak	1.6
Static dv/dt (Off-State) (Min.)	$V_L = 280\text{Vrms}$	V/ $\mu\text{s}$	200
Thermal Resistance, Junction to Case ( $R_{\theta JC}$ ) (Max.)	All Sections On	°C/W	1.2
Turn-On Time (Max.)	$f = 60 \text{ Hz.}$	ms	8.3 for Zero Voltage Turn-On Models 0.1 for Random Voltage Turn-On Models
Turn-Off Time (Max.)	$f = 60 \text{ Hz.}$	ms	8.3
$I^2 t$ Rating	$t = 8.3 \text{ ms}$	A <sup>2</sup> Sec.	260
Load Power Factor Rating	$I_L = \text{Max.}$		0.5 - 1.0

\*See Thermal Derating Curves. Note: While each output section is rated for a maximum of 20A, the maximum output per package is 60A.

**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.



**Example #1:**

**Given:**  $I_L =$  Four 7.5A loads @ 60°C

**Find:** Minimum heatsink required

**Solution:** From Thermal Dissipation Graph

4 x 7.5A = 30A 4 sections ON

Heatsink = 2°C/W minimum

**Example #2:**

**Given:** SSRQ24020

**Find:** Maximum rating mounting to 1.0°C/W HS @ 60°C All sections ON

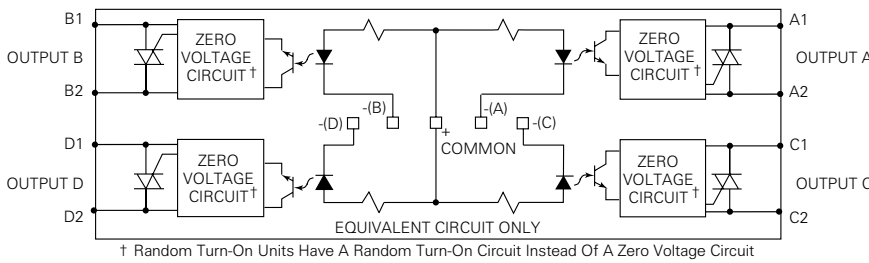
**Solution:** From Thermal Dissipation Graph

Rating mounted to 1.0°C/W HS @ 60°C = 36A total

9A for 4 Sections ON = 36A total

12A for 3 Sections ON = 36A total

**Operating Diagram**



**Heatsink Recommendations**

- 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.

**Outline Dimensions**

