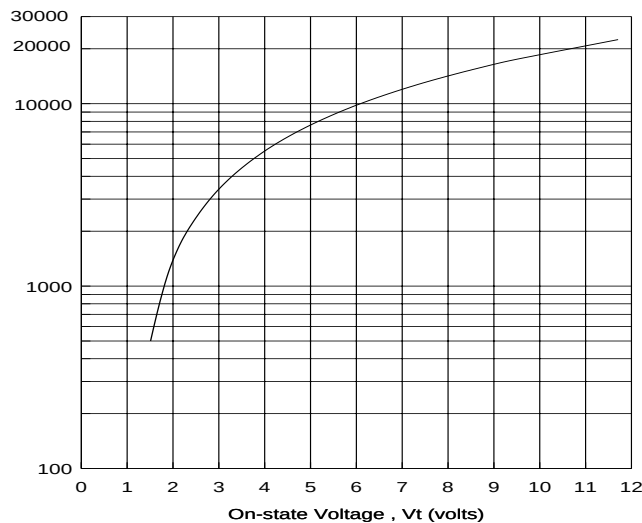


Type C789 thyristor is suitable for phase control applications such as HVDC valves, static VAR compensators and synchronous motor drives.

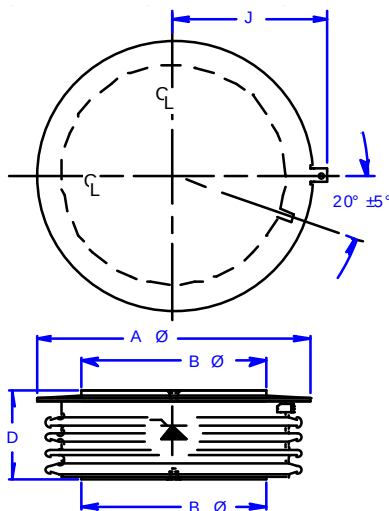
The silicon junction is manufactured by the proven multi-diffusion process and is supplied in an industry standard disc-type package, ready to mount to forced or naturally cooled heat dissipators using commercially available mechanical clamping hardware.

## ON-STATE CHARACTERISTIC

Process Maximum @  $T_j=115^\circ\text{C}$ 

93C:C789 3/24/93

## MECHANICAL OUTLINE



$A\Phi = 4.35 \text{ in (110.5 mm)}$   
 $B\Phi = 2.88 \text{ in (73.2 mm)}$   
 $D = 1.45 \text{ in (36.8 mm)}$

## PRINCIPAL RATINGS AND CHARACTERISTICS

|                                            |                                      |                                                                                     |                                            |            |
|--------------------------------------------|--------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------|------------|
| Repetitive peak off-state & reverse volts  | $V_{\text{DRM}}$<br>$V_{\text{RRM}}$ | $T_j=0$<br>to $115^\circ\text{C}$                                                   | up to<br>6000                              | V          |
| Repetitive working crest voltage           | $V_{\text{DWM}}$<br>$V_{\text{DRM}}$ | $T_j=0$<br>to $115^\circ\text{C}$                                                   | $0.8V_{\text{DRM}}$<br>$0.8V_{\text{RRM}}$ |            |
| Off-state & reverse leakage current        | $I_{\text{DWM}}$<br>$I_{\text{RWM}}$ | $T_j=0$<br>to $115^\circ\text{C}$                                                   | 200<br>200                                 | ma         |
| Average on-state current                   | $I_{\text{T(AV)}}$                   | $T_{\text{case}} = 70^\circ\text{C}$                                                | 1200                                       | A          |
| Peak half-cycle non-rep surge current      | $I_{\text{TSM}}$                     | 60 Hz<br>50 Hz                                                                      | 22.5<br>20                                 | kA         |
| On-state voltage                           | $V_{\text{TM}}$                      | $I_{\text{T}}=2000\text{A}$<br>$t_{\text{p}}=8\text{ms}$<br>$T_j=115^\circ\text{C}$ | 2.3                                        | V          |
| Critical rate of rise of on-state current  | $di/dt$<br>rep                       | $T_j=115^\circ\text{C}$<br>60 Hz<br>$V_{\text{d}}=.67V_{\text{DRM}}$                | 75                                         | A/us       |
| allowable snubber discharge                |                                      |                                                                                     | 50                                         | A          |
| Critical rate of rise of off-state voltage | $dv/dt$                              | $T_j=115^\circ\text{C}$<br>$V_{\text{DCRIT}}=.67V_{\text{DRM}}$                     | 1500                                       | V/us       |
| Recovery current                           | $I_{\text{RM}}$                      | $T_j=115^\circ\text{C}$<br>2A/us<br>5A/us                                           | 97<br>161                                  | A          |
| minimum snap factor                        |                                      | $S = 0.3$                                                                           |                                            |            |
| Turn-on delay                              | $t_{\text{d}}$                       | $V_{\text{d}}=.5V_{\text{DRM}}$                                                     | 5                                          | us         |
| Turn-off time                              | $T_{\text{off}}$                     | 5A/us, 100V<br>20V/us to 2000V                                                      | 600                                        | us         |
| Thermal resistance                         | $R_{\text{thJC}}$                    |                                                                                     | .012                                       | c/w        |
| Externally applied clamping force          | F                                    |                                                                                     | 8000-9000<br>35.6-40.0                     | lbs.<br>kN |

REPETITIVE PEAK REVERSE  
AND OFF-STATE BLOCKING  
VOLTAGE

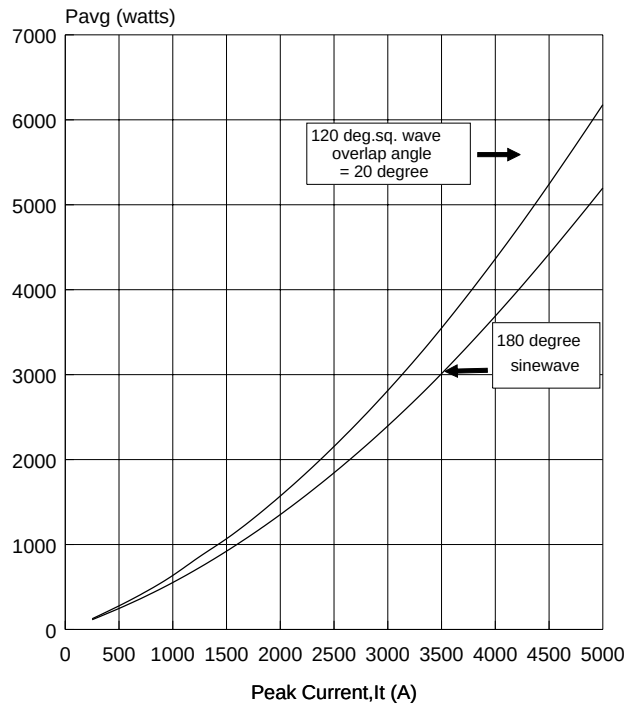
 $T_j = 0 \text{ to } 115^\circ\text{C}$ 

| MODEL  | $V_{\text{DRM}}$<br>(volts) | $V_{\text{RRM}}$<br>(volts) |
|--------|-----------------------------|-----------------------------|
| C789FP | 6000                        | 6000                        |
| C789ET | 5900                        | 5900                        |
| C789EN | 5800                        | 5800                        |
| C789ES | 5700                        | 5700                        |
| C789EM | 5600                        | 5600                        |
| C789EE | 5500                        | 5500                        |

SILICON POWER CORPORATION

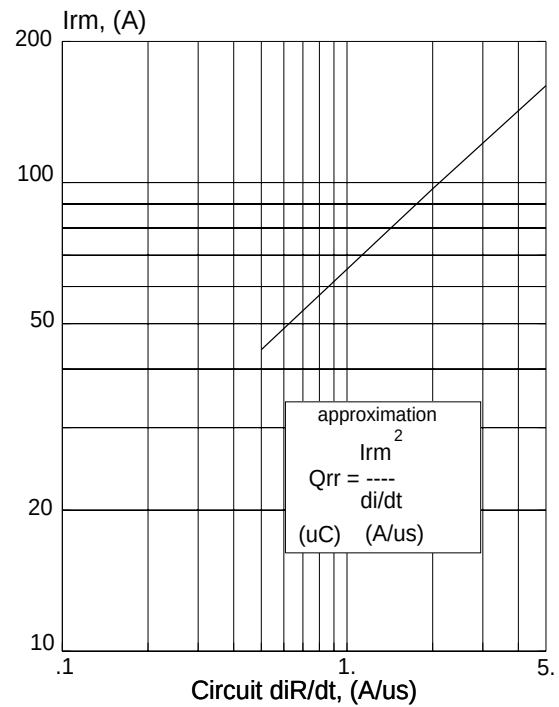
175 GREAT VALLEY PKWY. MALVERN, PA 19355 USA

FULL CYCLE AVERAGE POWER LOSS  
versus  
PEAK CURRENT at 50/60 Hz  
(plasma spreading and conduction loss)



93c:

MAXIMUM PEAK RECOVERY CURRENT  
Tj=115 C



93c:

Full Cycle Power Loss (watts)  
50/60 Hz, Tj=115°C

| I <sub>T</sub> (peak)<br>(A) | Half-sine<br>180° | 3 Phase<br>120° |
|------------------------------|-------------------|-----------------|
| 250                          | 115               | 126             |
| 500                          | 244               | 274             |
| 750                          | 389               | 441             |
| 1000                         | 550               | 628             |
| 1250                         | 727               | 834             |
| 1500                         | 919               | 1060            |
| 1750                         | 1127              | 1304            |
| 2000                         | 1350              | 1568            |
| 2250                         | 1589              | 1850            |
| 2500                         | 1842              | 2152            |
| 2750                         | 2110              | 2471            |
| 3000                         | 2394              | 2810            |
| 3500                         | 3006              | 3542            |
| 4000                         | 3678              | 4348            |
| 5000                         | 5197              | 6178            |

### GATE SUPPLY REQUIREMENTS

|                                      |              |
|--------------------------------------|--------------|
| Open circuit voltage                 | 40 V         |
| Short circuit current<br>- rise time | 4 A<br>0.5us |
| Pulse duration (min)                 | 20 us        |