Type C714 reverse blocking thyristor is suitable for inverter applications which do not employ an inverse parallel free wheeling diode and for which reverse recovery losses at elevated frequencies can be significant. The silicon junction is manufactured by the proven multi-diffusion process and utilizes the exclusive involute gate structure. It is supplied in an industry accepted disc-type package, ready to mount using commercially available heat dissipators and mechanical clamping hardware.
## LIMITING CHARACTERISTICS

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>SYMBOL</th>
<th>TEST CONDITIONS</th>
<th>LIMIT</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average on-state current</td>
<td>$I_{T(\text{av})}$</td>
<td>$T_{\text{case}} = 70^\circ\text{C}$</td>
<td>925</td>
<td>A</td>
</tr>
<tr>
<td>Repetitive peak off-state &amp; reverse voltage</td>
<td>$V_{\text{DRM}/V_{\text{RRM}}}$</td>
<td>$T_J = -40 \text{ to } +125^\circ\text{C}$</td>
<td>2000</td>
<td>volts</td>
</tr>
<tr>
<td>Off-state &amp; reverse current</td>
<td>$I_{\text{DRM}/I_{\text{RRM}}}$</td>
<td>$T_J = 125^\circ\text{C}$</td>
<td>60</td>
<td>ma</td>
</tr>
<tr>
<td>Peak half cycle non-repetitive surge current</td>
<td>$I_{\text{TM}}$</td>
<td>$60\text{Hz (8.3ms)}$</td>
<td>16</td>
<td>kA</td>
</tr>
<tr>
<td>On-state voltage</td>
<td>$V_{\text{TM}}$</td>
<td>$L_C = 1000\text{A}$</td>
<td>1.95</td>
<td>volts</td>
</tr>
<tr>
<td>Critical rate of rise of on-state current</td>
<td>$\frac{dI}{dt}$</td>
<td>$V_{\text{C}} = 1500\text{V}$</td>
<td>200</td>
<td>A/\text{us}</td>
</tr>
<tr>
<td>Critical rate of rise of off-state voltage</td>
<td>$\frac{dV}{dt}$</td>
<td>$V_{\text{D}} = 80%V_{\text{DRM}}$</td>
<td>500</td>
<td>v/\text{us}</td>
</tr>
<tr>
<td>Peak recovery current</td>
<td>$I_{\text{RM}}$</td>
<td>$T_J = 125^\circ\text{C}$</td>
<td>56</td>
<td>A</td>
</tr>
<tr>
<td>Circuit commutated turn-off time</td>
<td>$\tau_Q$</td>
<td>$V_r = &gt; 50\text{V}$</td>
<td>40</td>
<td>\text{us}</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_r = 2\text{V}$</td>
<td>45</td>
<td></td>
</tr>
</tbody>
</table>

### Half-Sine Pulses

- **Energy (watt-sec per pulse)**
  - $I_t$ vs. $t_p$
  - $E$ vs. $t_p$

### Trapezoidal Pulses

- **Energy (watt-sec per pulse)**
  - $I_t$ vs. $t_p$
  - $E$ vs. $t_p$

### Graphs

- **Graph 1**: Peak Current, $I_t$ (A) vs. Pulse Width, $t_p$ (us)
- **Graph 2**: Peak Current, $I_t$ (A) vs. Pulse Width, $t_p$ (us)

---

*P2 7/20/99*
AVERAGE POWER LOSS

half sine wave

Full Cycle Average Power, (W)

<table>
<thead>
<tr>
<th>T case = 65 C</th>
<th>Tj = 125 C</th>
</tr>
</thead>
<tbody>
<tr>
<td>2608 watts maximum allowable</td>
<td></td>
</tr>
<tr>
<td>50% duty cycle @ freq</td>
<td></td>
</tr>
</tbody>
</table>

R_tj-water = 0.32 degC/watt
inlet water = 45 deg

Peak Current, I_{tm} (A)

Operating Frequency, Hz.

correction: R_{th-water} = 0.032 degC/watt

AVERAGE POWER LOSS

trapezoidal current wave

di/dt = 50A/us

Full Cycle Average Power (W)

<table>
<thead>
<tr>
<th>NO REVERSE LOSSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>50% duty cycle @ freq</td>
</tr>
</tbody>
</table>

Peak Current, I_{tm} (A)

Operating Frequency, Hz.

di/dt (A/us)

25
50
75
100

2608 watts maximum allowable

correction: R_{th-water} = 0.032 degC/watt

AVERAGE POWER LOSS

trapezoidal current wave

di/dt = 100A/us

Full Cycle Average Power (W)

<table>
<thead>
<tr>
<th>NO REVERSE LOSSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>50% duty cycle @ freq</td>
</tr>
</tbody>
</table>

Peak Current, I_{tm} (A)

Operating Frequency, Hz.

di/dt (A/us)

25
50
75
100

2608 watts maximum allowable

V845snp
V845tc1
V845Ptr2
V845Ptr1

P3 7/20/99
Maximum Peak Recovery Current and Reverse Commutation Energy
for recommended circuit conditions

Surge On-State Current
Peak Half-Sine vs. Pulse Length
non-repetitive

Recommended Gate Drive

Maximum Repetitive Snubber Discharge

---

Snubber Dump, (A)

Recommended Gate Drive
30V open circuit
3A short circuit
in 0.5 us

---

Energy (watt-sec-per single)
Commutating voltage = 800 Vdc
Snubber: R=13 ohms, C=1.0uF
Snappiness S = 0.5

---

P4 7/20/99