

# NOT RECOMMENDED FOR NEW DESIGNS

MOTOROLA SC (DIODES/OPTO) 25E D ■ 6367255 0080897 T ■ T-25-15

## Silicon Controlled Rectifiers Reverse Blocking Triode Thyristors

... designed for industrial applications such as motor controls, heater controls, and power supplies, wherever half-wave or dc silicon gate controlled devices are needed.

- Glass Passivated Junctions for Maximum Reliability
- Center Gate Geometry for Parameter Uniformity
- High Surge Current,  $I_{TSM} = 260$  A, for Crowbar Service

**2N2574  
thru  
2N2578  
MCR649AP  
1 thru 10**

SCRs  
20 and 25 AMPERES RMS  
25 thru 800 VOLTS



CASE 61-04  
STYLE 1  
2N2573 thru 2N2579



CASE 54-05  
STYLE 2  
MCR649AP1 thru  
MCR649AP10

MAXIMUM RATINGS ( $T_J = 125^\circ\text{C}$  unless otherwise noted.)

Rating	Symbol	Value	Unit
Peak Repetitive Forward and Reverse Blocking Voltage, Note 1 MCR649AP1 2N2574, MCR649AP2 2N2575, MCR649AP3 2N2576, MCR649AP4 2N2578, MCR649AP6 MCR649AP8 MCR649AP9 MCR649AP10	V <sub>DRM</sub> or V <sub>RRM</sub>	25 50 100 200 400 600 700 800	Volts
On-State Current 2N Series MCR Series	I <sub>T(RMS)</sub>	25 20	Amps
Circuit Fusing (t = 8.3 ms)	i <sup>2</sup> t	280 235	A <sup>2</sup> s
Peak Surge Current (Half Cycle, 60 Hz, $T_J = -65^\circ$ to $+125^\circ\text{C}$ )	I <sub>TSM</sub>	260 235	Amps
Peak Gate Power — Forward	P <sub>GM</sub>	5	Watts
Average Gate Power — Forward	P <sub>G(AVG)</sub>	0.5	Watt
Peak Gate Current — Forward	I <sub>GM</sub>	2	Amps
Peak Gate Voltage — Forward Reverse	V <sub>GFM</sub> V <sub>GRM</sub>	10 5	Volts
Operating Junction Temperature	T <sub>J</sub>	-65 to +125	°C
Storage Temperature	T <sub>stg</sub>	-65 to +150	°C
Thermal Resistance, Junction to Case	R <sub>θJC</sub>	1.5	°C/W

Note 1. V<sub>DRM</sub> and V<sub>RRM</sub> for all types can be applied on a continuous basis without incurring damage. Ratings apply for zero or negative gate voltage.

3

ELECTRICAL CHARACTERISTICS (T<sub>C</sub> = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
Peak Forward or Reverse Blocking Current (Rated V <sub>DRM</sub> or V <sub>RRM</sub> , gate open) T <sub>J</sub> = 25°C T <sub>J</sub> = 125°C	I <sub>DRM</sub> , I <sub>RRM</sub>	—	—	10 5	μA mA
Gate Trigger Current (Continuous dc) (V <sub>D</sub> = 7 Vdc, R <sub>L</sub> = 100 Ω)	I <sub>GT</sub>	—	—	40	mA
Gate Trigger Voltage (Continuous dc) (V <sub>D</sub> = 7 Vdc, R <sub>L</sub> = 100 Ω) (V <sub>D</sub> = Rated V <sub>DRM</sub> , R <sub>L</sub> = 100 Ω, T <sub>J</sub> = 125°C)	V <sub>GT</sub>	— 0.3	0.7 —	3.5 —	Volts
Forward On Voltage (I <sub>TM</sub> = 20 Adc)	V <sub>TM</sub>	—	1.1	1.4	Volts
Holding Current (V <sub>D</sub> = 7 Vdc, Gate Open)	I <sub>H</sub>	—	10	—	mA
Turn-On Time (t <sub>d</sub> + t <sub>r</sub> ) (I <sub>GT</sub> = 50 mA, I <sub>T</sub> = 10 A, V <sub>D</sub> = Rated V <sub>DRM</sub> )	t <sub>gt</sub>	—	1	—	μs
Turn-Off Time (I <sub>T</sub> = 10 A, I <sub>R</sub> = 10 A, dv/dt = 20 V/μs, T <sub>J</sub> = 125°C) (V <sub>D</sub> = Rated Voltage V <sub>DRM</sub> )	t <sub>q</sub>	—	30	—	μs
Forward Voltage Application Rate (Exponential) (Gate Open, T <sub>J</sub> = 125°C, V <sub>D</sub> = Rated V <sub>DRM</sub> )	dv/dt	—	30	—	V/μs

FIGURE 1 - CURRENT DERATING

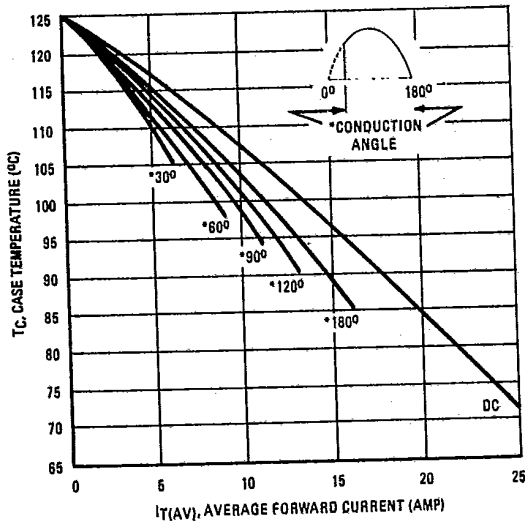
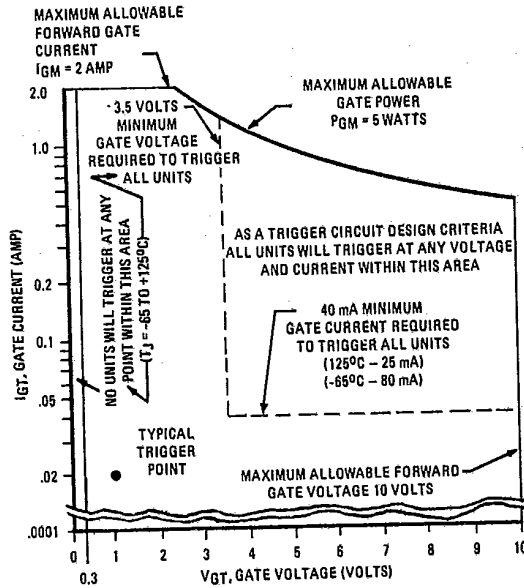


FIGURE 2 - GATE TRIGGER CHARACTERISTICS



3

T-25-15

FIGURE 3 - ON-STATE CHARACTERISTICS

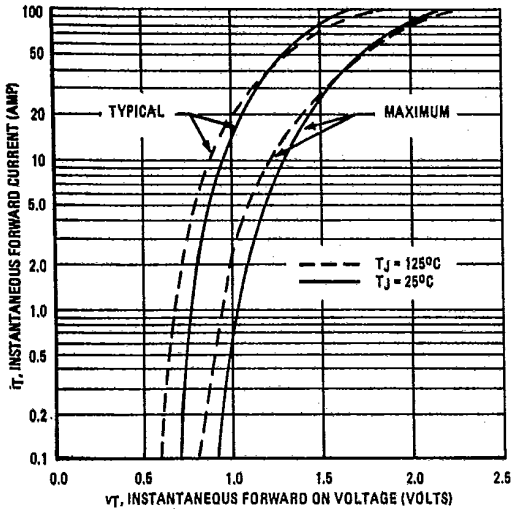


FIGURE 4 - MAXIMUM ALLOWABLE NON-RECURRENT SURGE CURRENT

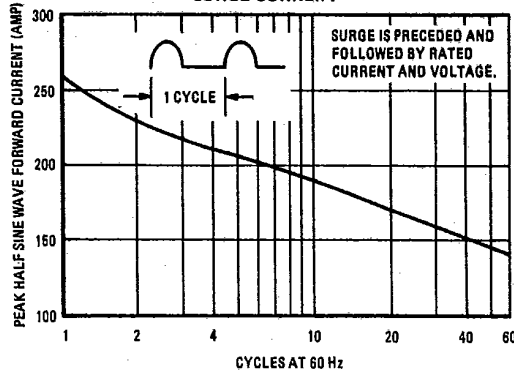


FIGURE 5 - EFFECT OF TEMPERATURE ON TYPICAL HOLDING CURRENT

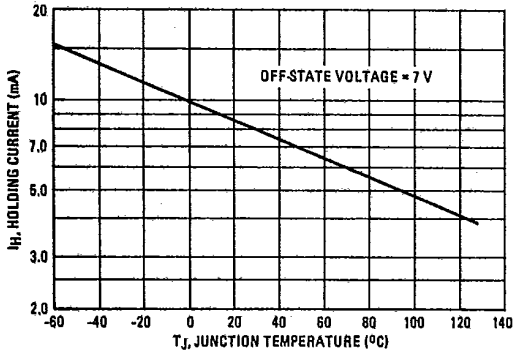


FIGURE 6 - EFFECT OF TEMPERATURE ON TYPICAL GATE CURRENT

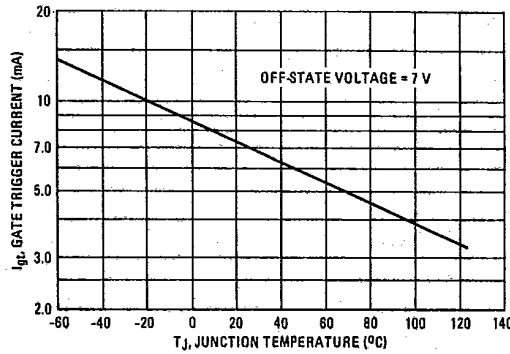
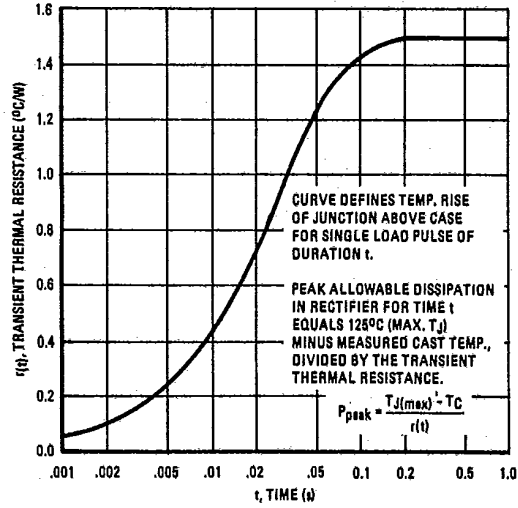


FIGURE 8 - MAXIMUM TRANSIENT THERMAL RESISTANCE JUNCTION TO CASE



3

FIGURE 7 - EFFECT OF TEMPERATURE ON TYPICAL GATE VOLTAGE

