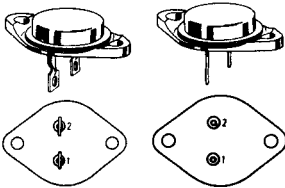


MCR649-1 thru MCR649-7 (SILICON)



CASE 61 **CASE 54**
(TO-41) (TO-3 Modified)

PIN 1. GATE
2. CATHODE
CASE ANODE

PIN 1. ANODE
2. GATE
CASE CATHODE

Industrial-type, silicon controlled rectifiers in a "diamond" package for applications requiring a high surge-current rating or low thermal resistance. For units with pins (TO-3) specify devices MCR649P-1 thru MCR649P-7.

MAXIMUM RATINGS ($T_J = 100^\circ\text{C}$ unless otherwise noted)

Rating	Symbol	Value	Unit
Peak Reverse Blocking Voltage* MCR649-1 -2 -3 -4 -5 -6 -7	V_{ROM}^*	25 50 100 200 300 400 500	Volts
Forward Current RMS (All Conduction Angles)	I_f	20	Amp
Circuit Fusing Considerations ($T_J = -40$ to $+100^\circ\text{C}$; $t \leq 8.3$ ms)	I^2t	275	A^2s
Peak Forward Surge Current (One Cycle, 60 Hz, $T_J = -40$ to $+100^\circ\text{C}$)	$I_{FM}(\text{surge})$	260	Amp
Peak Gate Power - Forward	P_{GFM}	5.0	Watts
Average Gate Power - Forward	$P_{GF(AV)}$	0.5	Watt
Peak Gate Current - Forward	I_{GFM}	2.0	Amp
Peak Gate Voltage - Forward	V_{GFM}	10	Volts
Reverse	V_{GRM}	5.0	Volts
Operating Junction Temperature Range	T_J	-40 to +100	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-40 to +150	$^\circ\text{C}$

* V_{ROM} for all types can be applied on a continuous dc basis without incurring damage.

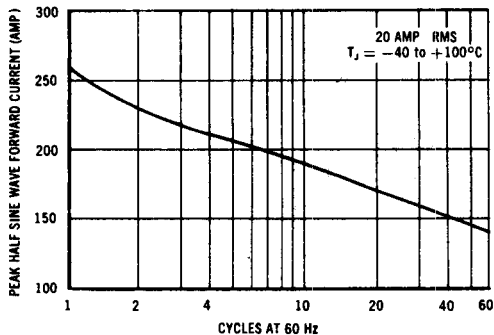
V_{ROM} ratings apply for zero or negative gate voltage.

MCR649-1 thru MCR649-7 (continued)
ELECTRICAL CHARACTERISTICS ($T_C = 25^{\circ}\text{C}$ unless otherwise noted)

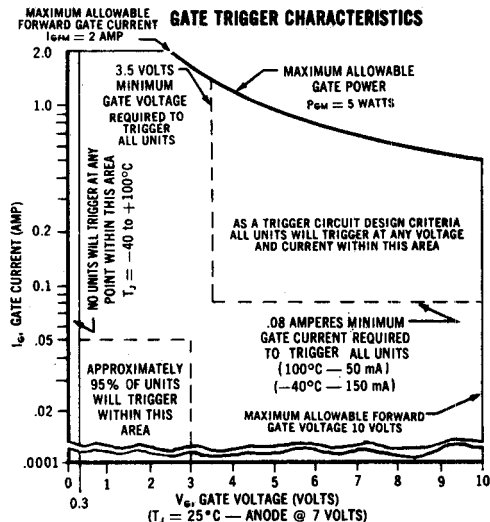
Characteristic	Symbol	Min	Typ	Max	Units
Peak Forward Blocking Voltage ($T_J = 100^{\circ}\text{C}$) MCR649-1 -2 -3 -4 -5 -6 -7	V_{FOM}	25 50 100 200 300 400 500	— — — — — — —	— — — — — — —	Volts
Peak Forward Blocking Current (Rated V_{FOM} with gate open, $T_J = 100^{\circ}\text{C}$)	I_{FOM}	—	—	5.0	mA
Peak Reverse Blocking Current (Rated V_{FOM} with gate open, $T_J = 100^{\circ}\text{C}$)	I_{ROM}	—	—	5.0	mA
Gate Trigger Current (Continuous dc) (Anode Voltage = 7 Vdc, $R_L = 50 \Omega$)	I_{GT}	—	30	80	mA
Gate Trigger Voltage (Continuous dc) (Anode Voltage = 7 Vdc, $R_L = 50 \Omega$) (Anode Voltage = Rated V_{FOM} , $R_L = 50 \Omega$, $T_J = 100^{\circ}\text{C}$)	V_{GT} V_{GNT}	— 0.3	1.0 —	3.5 —	Volts
Holding Current (Anode Voltage = 7 Vdc, Gate Open)	I_{HO}	—	20	—	mA
Forward On Voltage ($I_F = 20 \text{ Adc}$)	V_F	—	1.1	1.5	Volts
Turn-On Time ($t_d + t_r$) ($I_G = 50 \text{ mA}$, $I_F = 10 \text{ A}$)	t_{on}	—	1.0	—	μs
Turn-Off Time ($I_F = 10 \text{ A}$, $I_R = 10 \text{ A}$, $dv/dt = 20 \text{ V}/\mu\text{s min}$, $T_J = 100^{\circ}\text{C}$) (V_{FXM} = rated voltage) (V_{RXM} = rated voltage)	t_{off}	—	25	—	μs
Forward Voltage Application Rate (Gate open, $T_J = 100^{\circ}\text{C}$) MCR649-1 thru MCR649-4 MCR649-5 thru MCR649-7	dv/dt	— —	20 30	— —	$\text{V}/\mu\text{s}$
Thermal Resistance (Junction to Case)	θ_{JC}	—	1.0	1.5	$^{\circ}\text{C}/\text{W}$

MCR649-1 thru MCR649-7 (continued)

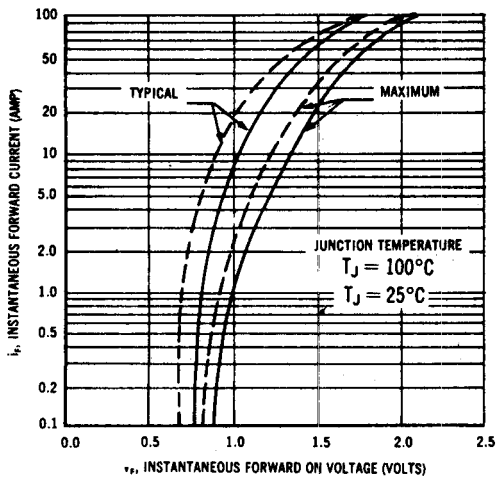
MAXIMUM ALLOWABLE NON-RECURRENT SURGE CURRENT



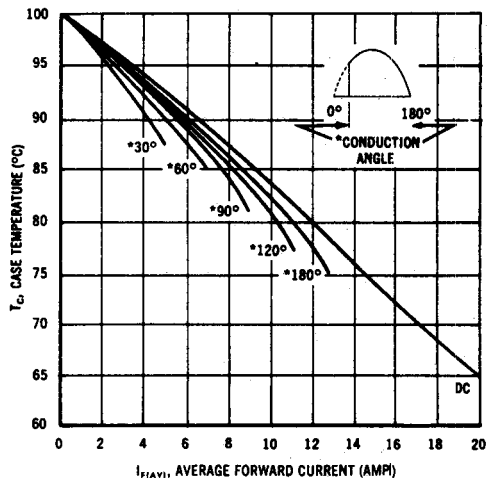
GATE TRIGGER CHARACTERISTICS



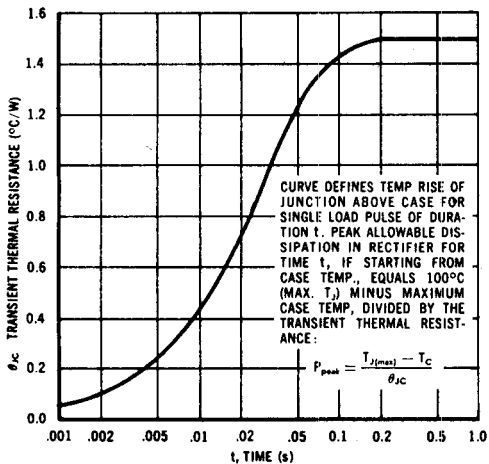
LOW CURRENT LEVEL



MAXIMUM ALLOWABLE CASE TEMPERATURE



MAXIMUM TRANSIENT THERMAL RESISTANCE JUNCTION TO CASE



POWER DERATING CURVE

