

FEATURES

- Available as "HR" (high reliability) screened per MIL-PRF-19500, JANTX level. Add "HR" suffix to base part number.
- Available as non-RoHS (Sn/Pb plating), standard, and as RoHS by adding "-PBF" suffix.

MAXIMUM RATINGS

Rating	Symbol	Value	Unit		
Peak repetitive forward and reverse blocking voltage ⁽¹⁾					
MCR649AP-1	V_{DRM} or V_{RRM}	25	Volts		
MCR649AP-2		50			
MCR649AP-3		100			
MCR649AP-4		200			
MCR649AP-6		400			
MCR649AP-8		600			
MCR649AP-9		700			
MCR649AP-10		800			
On-state current		$I_{T(RMS)}$		20	Amps
Circuit fusing (8.3ms)		I^2t		235	A ² s
Peak surge current (Half cycle, 60Hz, $T_J = -65^\circ$ to $+125^\circ$ C)	I_{TSM}	235	Amps		
Peak gate power – forward	P_{GM}	5	Watts		
Average gate power – forward	$P_{G(AVG)}$	0.5	Watts		
Peak gate current – forward	I_{GM}	2	Amps		
Peak gate voltage					
Forward	V_{GFM}	10	Volts		
Reverse	V_{GRM}	5			
Operating junction temperature range	T_J	-65 to +125	°C		
Storage temperature range	T_{stg}	-65 to +150	°C		
Thermal resistance, junction to case	$R_{\theta JC}$	1.5	°C/W		

Note 1: V_{DRM} and V_{RRM} for all types can be applied on a continuous basis without incurring damage. Ratings apply for zero or negative gate voltage.

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Min	Typ	Max	Unit
Peak forward or reverse blocking current (Rated V_{DRM} or V_{RRM} , gate open) $T_J = 25^\circ$ C $T_J = 125^\circ$ C	I_{DRM}, I_{RRM}	-	-	10	μ A mA
		-	0.6	5	
Gate trigger current (continuous dc) ($V_D = 7V, R_L = 100\Omega$)	I_{GT}	-	-	40	mA
Gate trigger voltage (continuous dc) ($V_D = 7V, R_L = 100\Omega$) ($V_D = \text{rated } V_{DRM}, R_L = 100\Omega, T_J = 125^\circ$ C)	V_{GT}	-	0.7	3.5	Volts
		0.3	-	-	
Forward on voltage ($I_{TM} = 20A$)	V_{TM}	-	1.1	1.4	Volts
Holding current ($V_D = 7V$, gate open)	I_H	-	10	-	mA

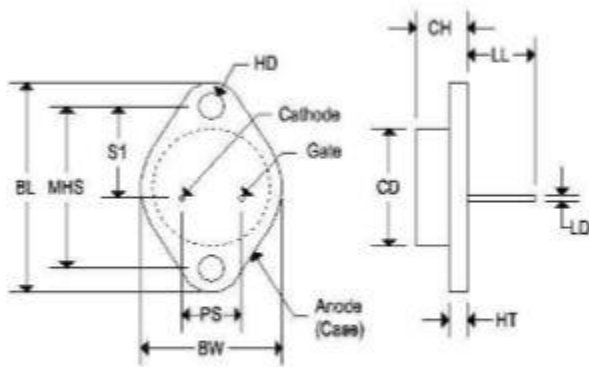
MCR649AP SERIES

SILICON CONTROLLED RECTIFIERS

Turn-on time ($t_d + t_r$) ($I_{GT} = 50\text{mA}$, $I_T = 10\text{A}$, $V_D = \text{rated } V_{DRM}$)	t_{gt}	-	1	-	μs
Turn-off time $I_T = 10\text{A}$, $I_R = 10\text{A}$, $dv/dt = 20\text{V}/\mu\text{s}$, $T_J = 125^\circ\text{C}$ ($V_D = \text{rated voltage } V_{DRM}$)	t_q	-	30	-	μs
Forward voltage application rate (exponential) (Gate open, $T_J = 125^\circ\text{C}$, $V_D = \text{rated } V_{DRM}$)	dv/dt	-	30	-	$\text{V}/\mu\text{s}$

MECHANICAL CHARACTERISTICS

Case:	TO-3
Marking:	Body painted, alpha-numeric
Pin out:	See below



	TO-3			
	Inches		Millimeters	
	Min	Max	Min	Max
CD	-	0.875	-	22.220
CH	0.250	0.380	6.860	9.650
HT	-	0.135	-	3.430
BW	-	1.050	-	26.670
HD	0.131	0.188	3.330	4.780
LD	0.038	0.043	0.970	1.090
LL	0.312	0.500	7.920	12.700
BL	1.550	REF	39.370	REF
MHS	1.177	1.197	29.900	30.400
PS	0.420	0.440	10.670	11.180
S1	0.655	0.675	16.640	17.150

FIGURE 1 – CURRENT DERATING

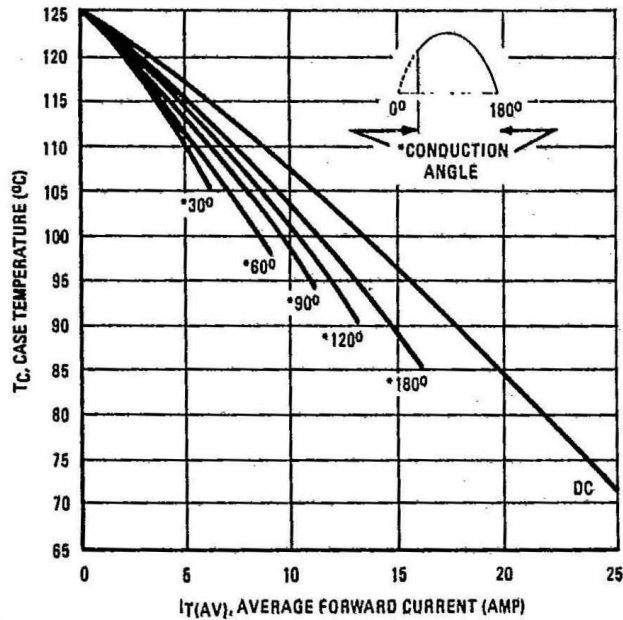


FIGURE 2 – GATE TRIGGER CHARACTERISTICS

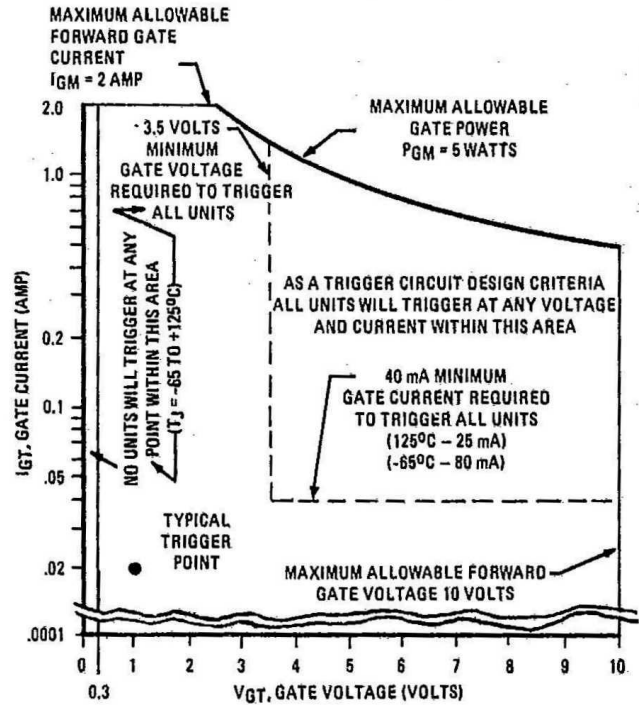


FIGURE 3 – ON-STATE CHARACTERISTICS

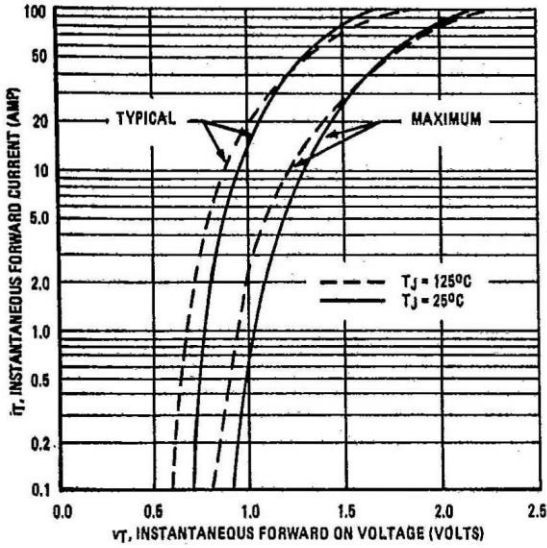


FIGURE 5 – EFFECT OF TEMPERATURE ON TYPICAL HOLDING CURRENT

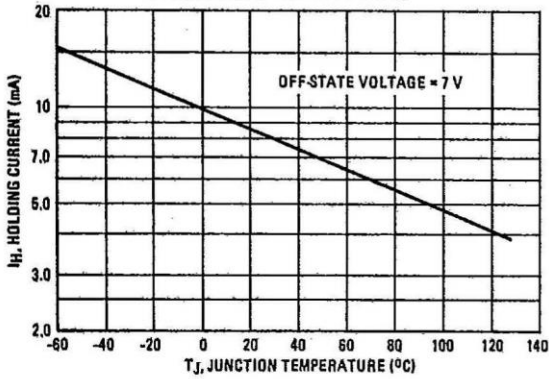


FIGURE 7 – EFFECT OF TEMPERATURE ON TYPICAL GATE VOLTAGE

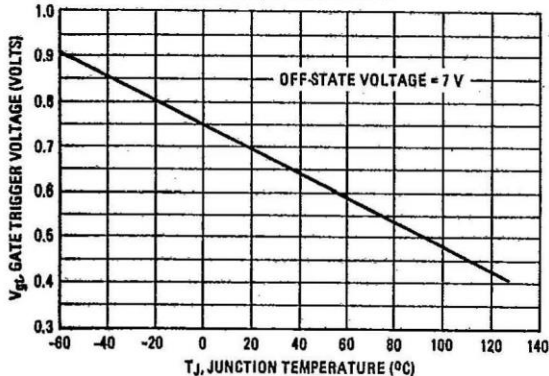


FIGURE 4 – MAXIMUM ALLOWABLE NON-RECURRENT SURGE CURRENT

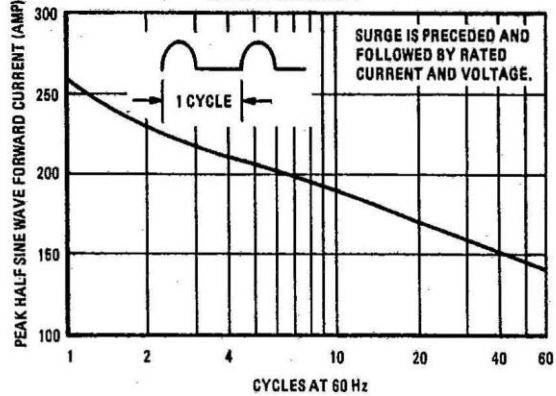


FIGURE 6 – EFFECT OF TEMPERATURE ON TYPICAL GATE CURRENT

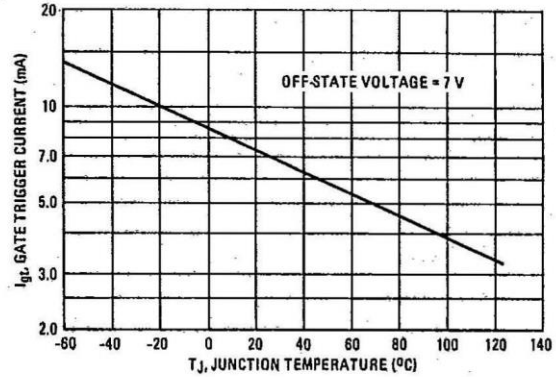


FIGURE 8 – MAXIMUM TRANSIENT THERMAL RESISTANCE JUNCTION TO CASE

