

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.
- 150 A for 2 μ s Safe Area

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak repetitive off-state voltage⁽¹⁾ ($R_{GK} = 1K$, $T_J = -40$ to $+110^\circ\text{C}$, sine wave, 50 to 60Hz)			
MCR22-2		50	
MCR22-3		100	
MCR22-4	V_{DRM}	200	V
MCR22-5	V_{RRM}	300	
MCR22-6		400	
MCR22-7		500	
MCR22-8		600	
On-state RMS current (180° conduction angles, $T_C = 80^\circ\text{C}$)	$I_{T(RMS)}$	1.5	A
Peak non-repetitive surge current (half-cycle, sine wave, 60Hz, $T_A = 25^\circ\text{C}$)	I_{TSM}	15	A
Circuit fusing consideration ($t = 8.3\text{ms}$)	I^2t	0.9	A ² s
Forward peak gate power (pulse width $\leq 1.0\mu\text{s}$, $T_A = 25^\circ\text{C}$)	P_{GM}	0.5	W
Forward average gate power ($t = 8.3\text{ms}$, $T_A = 25^\circ\text{C}$)	$P_{G(AV)}$	0.1	W
Forward peak gate current (pulse width $\leq 1.0\mu\text{s}$, $T_A = 25^\circ\text{C}$)	I_{GM}	0.2	A
Reverse peak gate voltage (pulse width $\leq 1.0\mu\text{s}$, $T_A = 25^\circ\text{C}$)	V_{RGM}	5.0	V
Operating temperature range @ rated V_{RRM} and V_{DRM}	T_J	-40 to +110	$^\circ\text{C}$
Storage temperature range	T_{stg}	-40 to +150	$^\circ\text{C}$

Note 1: V_{DRM} and V_{RRM} for all types can be applied on a continuous basis. Ratings apply for zero or negative gate voltage; positive gate voltage shall not be applied concurrent with negative potential on the anode. Blocking voltages shall not be tested with a constant current source such that the voltage ratings of the devices are exceeded.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Maximum	Unit
Thermal resistance, junction to case	$R_{\theta JC}$	50	$^\circ\text{C}/\text{W}$
Thermal resistance, junction to ambient	$R_{\theta JA}$	160	$^\circ\text{C}/\text{W}$
Lead solder temperature (lead length $\geq 1/16''$ from case, 10s max)	T_L	260	$^\circ\text{C}$

ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$ unless otherwise specified)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Peak forward or reverse blocking current ($V_{AK} = \text{Rated } V_{DRM} \text{ or } V_{RRM}$, $R_{GK} = 1000 \Omega$) $T_C = 25^\circ\text{C}$ $T_C = 110^\circ\text{C}$	I_{DRM} , I_{RRM}	- -	- -	10 200	μA
ON CHARACTERISTICS					
Peak forward on-state voltage* ($I_{TM} = 1\text{A}$)	V_{TM}	-	1.2	1.7	V

MCR22 SERIES

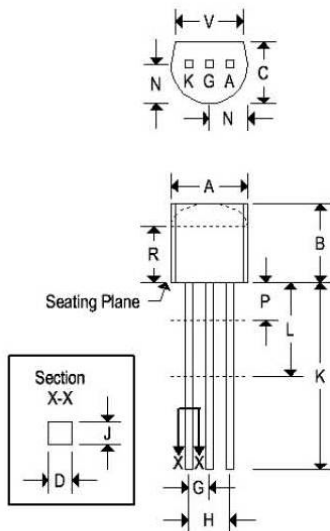
SILICON CONTROLLED RECTIFIERS

Gate trigger current (continuous dc) ⁽²⁾ $(V_{AK} = 6V, R_L = 100\Omega)$ $T_C = 25^\circ C$ $T_C = -40^\circ C$	I_{GT}	-	30	200	μA
		-	-	500	
Gate trigger voltage (continuous dc) ⁽²⁾ $(V_{AK} = 7V, R_L = 100\Omega)$ $T_C = 25^\circ C$ $T_C = -40^\circ C$	V_{GT}	-	-	0.8	V
		-	-	1.2	
Gate non-trigger voltage* $(V_{AK} = 12V, R_L = 100\Omega, T_C = 110^\circ C)$	V_{GD}	0.1	-	-	V
Holding current $(V_{AK} = 12V, \text{gate open, initiating current} = 200mA)$ $T_C = 25^\circ C$ $T_C = -40^\circ C$	I_H	-	2.0	5.0	mA
		-	-	10	
DYNAMIC CHARACTERISTICS					
Critical rate of rise of off-state voltage ($T_C = 110^\circ C$)	dv/dt	-	25	-	V/ μs

* Pulse width $\leq 1.0ms$, duty cycle $\leq 1\%$.
 Note 2: R_{GK} current not included in measurement.

MECHANICAL CHARACTERISTICS

Case:	TO-92
Marking:	Body painted, alpha-numeric
Pin out:	See below



	TO-92			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.175	0.205	4.450	5.200
B	0.170	0.210	4.320	5.330
C	0.125	0.165	3.180	4.190
D	0.016	0.022	0.410	0.550
F	0.016	0.019	0.410	0.480
G	0.045	0.055	1.150	1.390
H	0.095	0.105	2.420	2.660
J	0.015	0.020	0.390	0.500
K	0.500	-	12.700	-
L	0.250	-	6.350	-
N	0.080	0.105	2.040	2.660
P	-	0.100	-	2.540
R	0.115	-	2.930	-
V	0.135	-	3.430	-

CURRENT DERATING

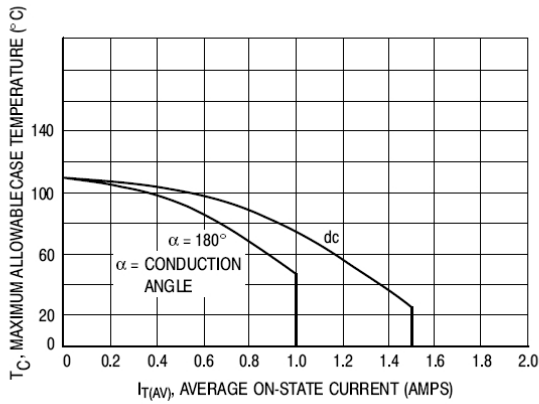


Figure 1. Maximum Case Temperature

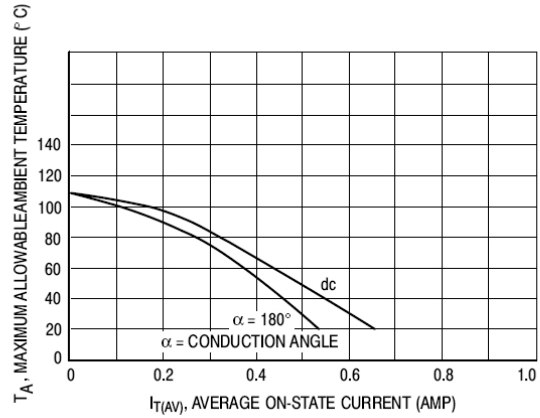


Figure 2. Maximum Ambient Temperature

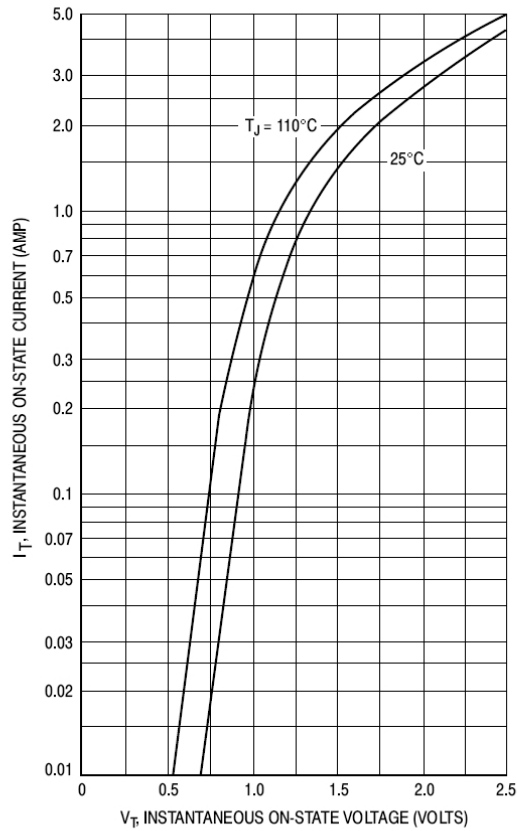


Figure 3. Typical Forward Voltage

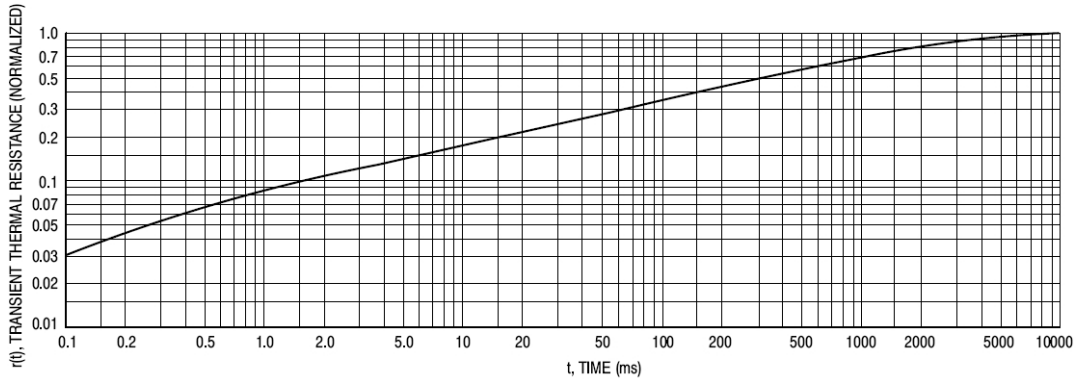


Figure 4. Thermal Response

TYPICAL CHARACTERISTICS

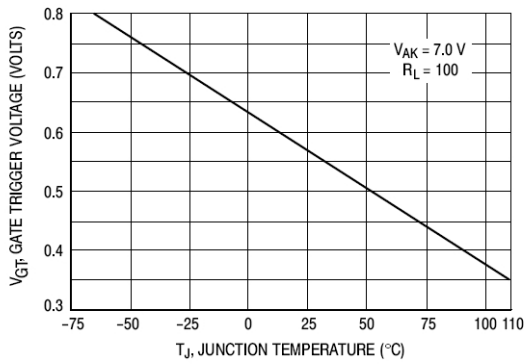


Figure 5. Typical Gate Trigger Voltage

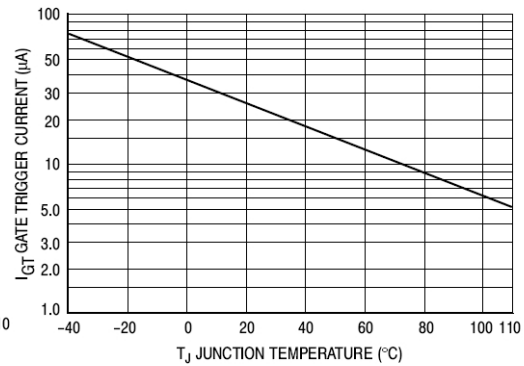


Figure 6. Typical Gate Trigger Current

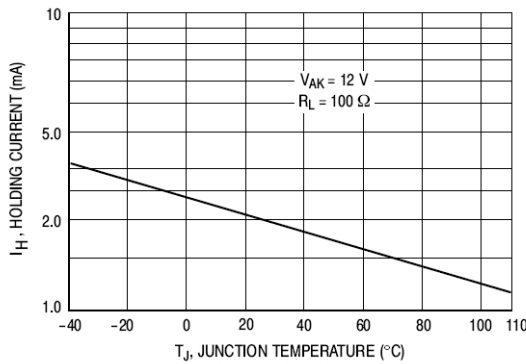


Figure 7. Typical Holding Current

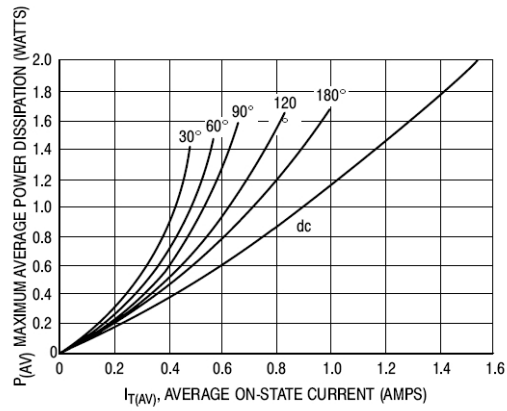


Figure 8. Power Dissipation