

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 off-state voltage⁽¹⁾ Peak repetitive reverse voltage (T _J = -40 to +110°C, sine wave, 50 to 60Hz, gate open)	V _{DRM} V _{RRM}		V
MCR8SD		400	
MCR8SM		600	
MCR8SN		800	
On-state RMS current (180° conduction angles, T _C = 80°C)	I _{T(RMS)}	8	A
Peak non-repetitive surge current (one half-cycle, sine wave, 60Hz, T _J = 110°C)	I _{TSM}	80	A
Circuit fusing (t = 8.3ms)	I ² t	26.5	A ² s
Forward peak gate power (pulse width ≤ 1.0μs, T _C = 80°C)	P _{GM}	5	W
Forward average gate power (t = 8.3ms, T _C = 80°C)	P _{G(AV)}	0.5	W
Forward peak gate current (pulse width ≤ 1.0μs, T _C = 80°C)	I _{GM}	2	A
Operating temperature range	T _J	-40 to +110	°C
Storage temperature range	T _{stg}	-40 to +150	°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 _{θJC}	2.2	°C/W
Thermal resistance, junction to ambient	R _{θJA}	62.5	°C/W
Maximum lead temperature for soldering purposes 1/8" from case for 10s	T _L	260	°C

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise specified)

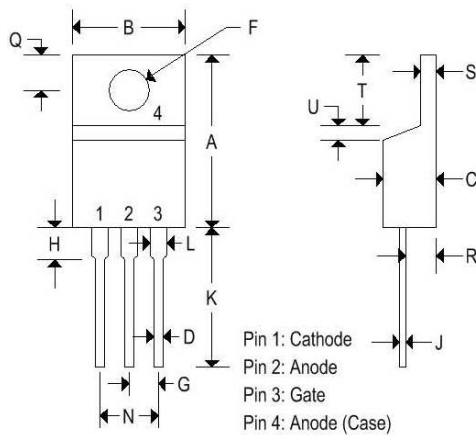
Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Peak forward blocking current or reverse blocking current⁽²⁾ (V _D = Rated V _{DRM} or V _{RRM} , R _{GK} = 1kΩ) T _J = 25°C T _J = 110°C	I _{DRM} I _{RRM}	- -	- -	10 500	μA
ON CHARACTERISTICS					
Peak on-state voltage⁽³⁾ (I _{TM} = 16A)	V _{TM}	-	-	1.8	V
Gate trigger current (continuous dc) ⁽⁴⁾ (V _D = 12V, R _L = 100Ω)	I _{GT}	5.0	25	200	μA

Characteristic	Symbol	Min	Typ	Max	Unit
Holding current ⁽⁴⁾ ($V_D = 12V$, gate open, initiating current = 200mA)	I_H	-	0.5	6.0	mA
Latch current ⁽⁴⁾ ($V_D = 12V$, $I_G = 200\mu A$)	I_L	-	0.6	8.0	mA
Gate trigger voltage (continuous dc) ⁽⁴⁾ ($V_D = 12V$, $R_L = 100\Omega$) $T_J = 25^\circ C$ $T_J = -40^\circ C$	V_{GT}	0.3 -	0.65 -	1.0 1.5	V
DYNAMIC CHARACTERISTICS					
Critical rate of rise of off-state voltage ($V_D = 67\% V_{DRM}$, $R_{GK} = 1K\Omega$, $C_{GK} = 0.1\mu F$, $T_J = 110^\circ C$)	dv/dt	5.0	15	-	V/ μs
Critical rate of rise of on-state current ($I_{PK} = 50A$, $PW = 40\mu sec$, $di_G/dt = 1 A/\mu sec$, $I_{gt} = 10mA$)	di/dt	-	-	100	A/ μs

* Pulse width $\leq 2.0ms$, duty cycle $\leq 2\%$.

MECHANICAL CHARACTERISTICS

Case	TO-220AB
Marking	Alpha-numeric
Pin out	See below



	TO-220AB			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.575	0.620	14.600	15.750
B	0.380	0.405	9.650	10.290
C	0.160	0.190	4.060	4.820
D	0.025	0.035	0.640	0.890
F	0.142	0.147	3.610	3.730
G	0.095	0.105	2.410	2.670
H	0.110	0.155	2.790	3.930
J	0.014	0.022	0.360	0.560
K	0.500	0.562	12.700	14.270
L	0.045	0.055	1.140	1.390
N	0.190	0.210	4.830	5.330
Q	0.100	0.120	2.540	3.040
R	0.080	0.110	2.040	2.790
S	0.045	0.055	1.140	1.390
T	0.235	0.255	5.970	6.480
U	-	0.050	-	1.270
V	0.045	-	1.140	-
Z	-	0.080	-	2.030

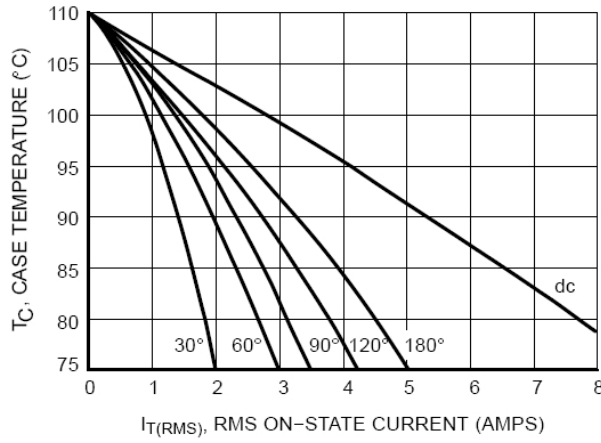


Figure 1. Typical RMS Current Derating

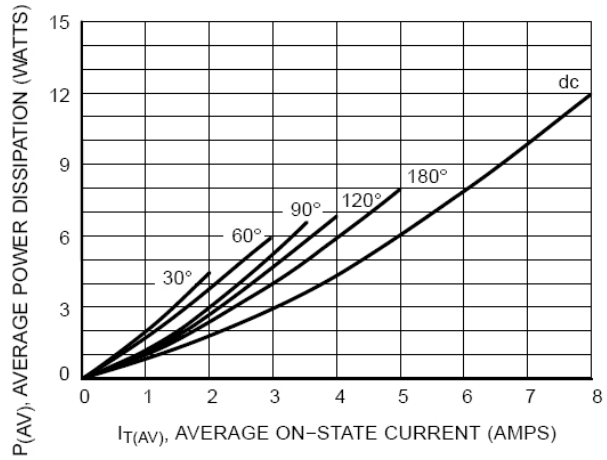


Figure 2. On-State Power Dissipation

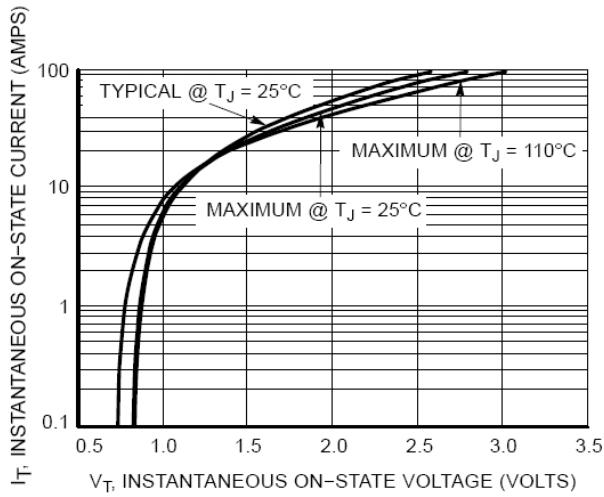


Figure 3. Typical On-State Characteristics

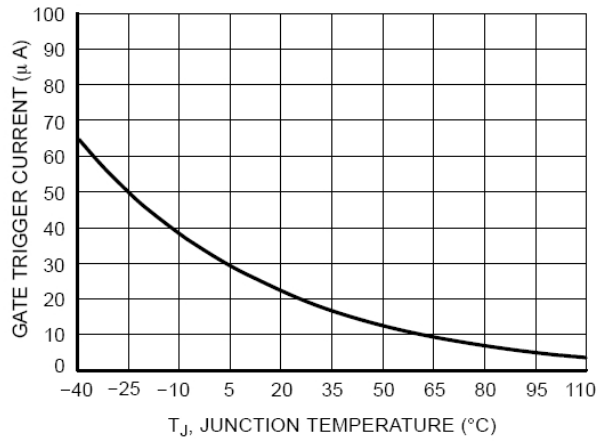


Figure 4. Typical Gate Trigger Current versus Junction Temperature

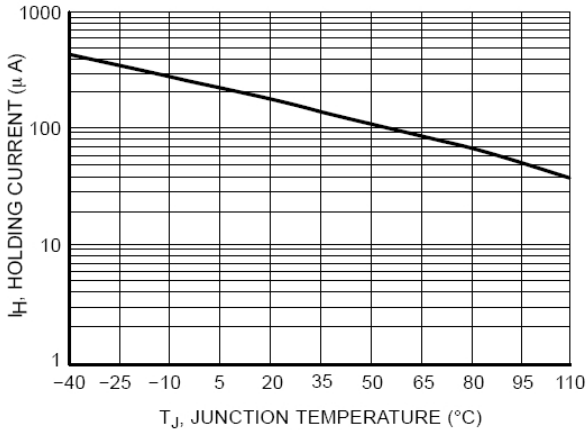


Figure 5. Typical Holding Current versus Junction Temperature

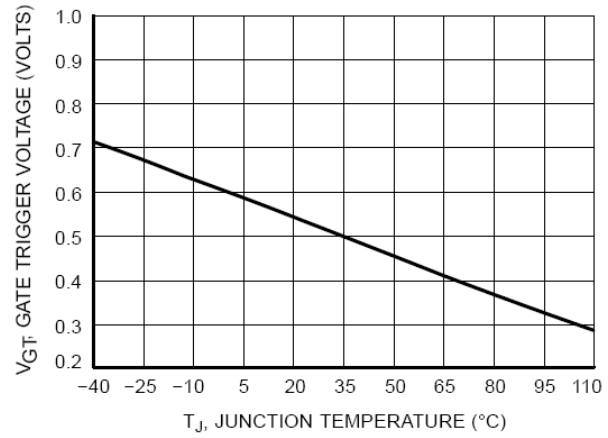


Figure 6. Typical Gate Trigger Voltage versus Junction Temperature

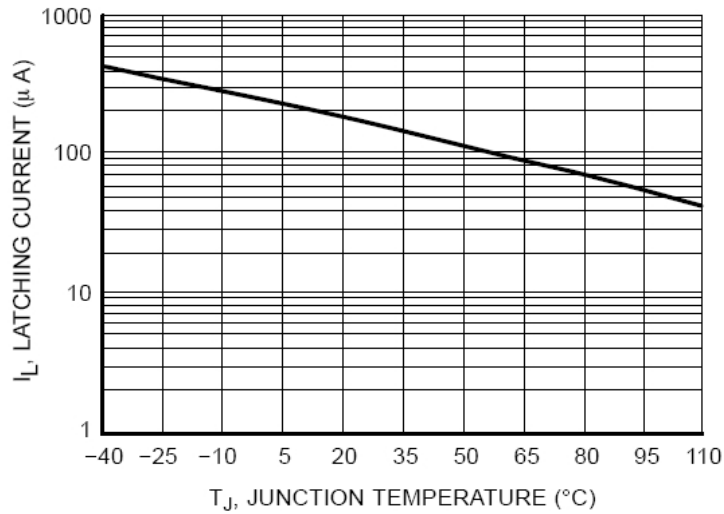


Figure 7. Typical Latching Current versus Junction Temperature