DIGITRON™
Semiconductors

High-reliability discrete products
and engineering services since 1977

MCR225-5, MCR225-7, MCR225-9, MCR225-12

SILICON CONTROLLED RECTIFIERS

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 off state voltage (1) MCR225-5 MCR225-7 MCR225-9 MCR225-12	V_{DRM}, V_{RRM}	 300 500 700 1000	V
On-state current RMS (all conduction angles; T_C = 85°C)	$I_{T(RMS)}$	25	A
Average on-state current (all conduction angles; T_C = 85°C)	$I_{T(AV)}$	16	A
Peak non-repetitive surge current (1/2 cycle, sine wave 60 Hz, t = 8.3ms)	I_{TSM}	300	A
Forward peak gate power	P_{GM}	20	W
Forward average gate power	$P_{G(AV)}$	0.5	W
Forward peak gate current	I_{GM}	2.0	A
Operating junction temperature range	T_J	-40 to +125	°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; however, 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	Max	Unit
Thermal resistance, junction-to-case	$R_{\theta JC}$	1.5	°C/W

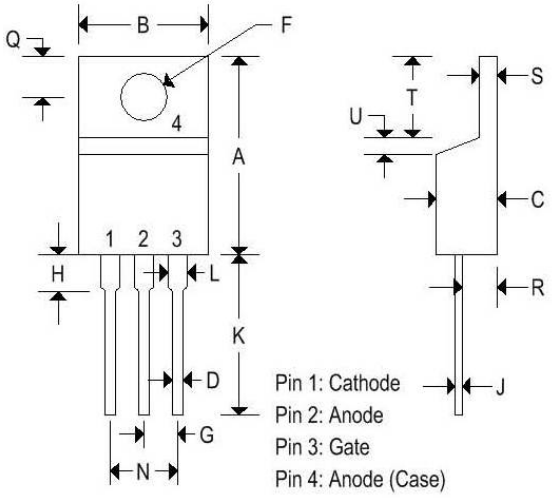
ELECTRICAL CHARACTERISTICS

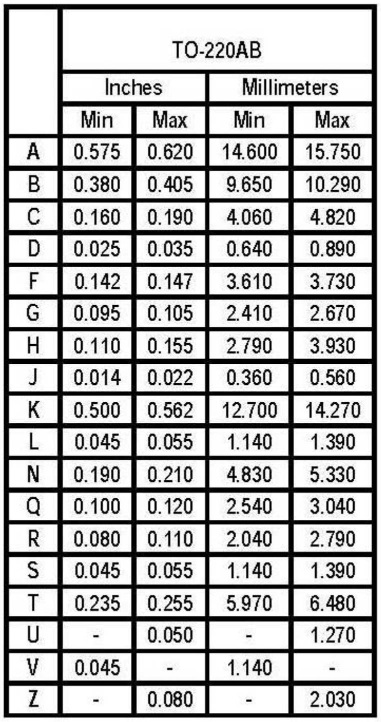
Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Peak repetitive forward or reverse blocking current (V_{AK} = rated V_{DRM} or V_{RRM}, gate open)	T_J = 25°C T_J = 125°C	I_{DRM}, I_{RRM}	- -	- -	10 2.0	µA mA
ON CHARACTERISTICS						
Forward on-state voltage (2) (I_{TM} = 50A)		V_{TM}	-	-	1.8	V
Gate trigger current (continuous dc) (V_{AK} = 12Vdc, R_L = 100Ω)	T_C = 25°C T_C = -40°C	I_{GT}	- -	- 25	40 75	mA
Gate trigger voltage (continuous dc) (V_{AK} = 12 Vdc, R_L = 100Ω, T_C = -40°C)		V_{GT}	-	1.0	1.5	V
Gate non-trigger voltage (V_{AK} = rated V_{DRM}, R_L = 100Ω, T_J = 125°C)		V_{GD}	0.2	-	-	V
Holding current (V_{AK} = 12Vdc, T_C = -40°C)		I_H	-	35	40	mA
Turn-on time (I_{TM} = 25A, I_{GT} = 50mAdc)		t_{gt}	-	1.5	2.0	µs
Turn-off time (V_{DRM} = rated voltage) (I_{TM} = 25A, I_R = 25A) (I_{TM} = 25A, I_R = 25A, T_J = 125°C)		t_q	 - -	 15 35	 - -	µs

DYNAMIC CHARACTERISTICS					
Critical rate of rise of off state voltage (Gate open, rated V_{DRM}, exponential waveform)	dv/dt	-	50	-	V/µs

MECHANICAL CHARACTERISTICS

Case:	TO-220AB
Marking:	Body painted, 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

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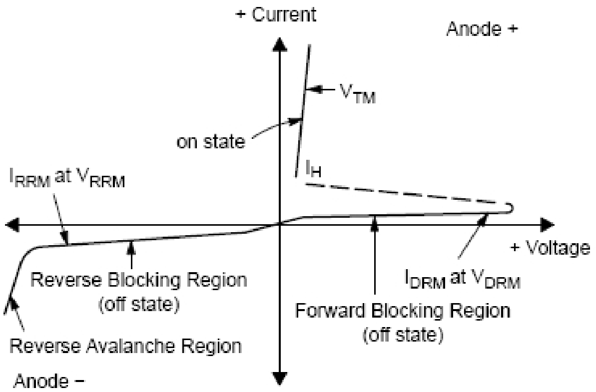
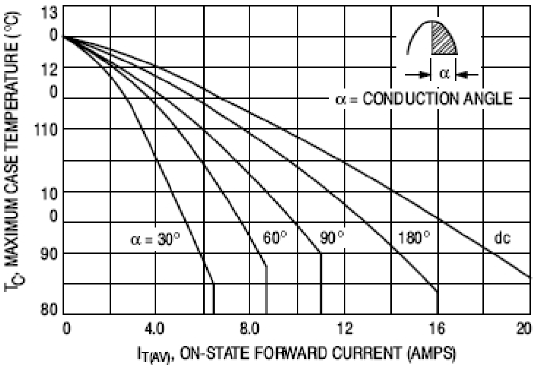
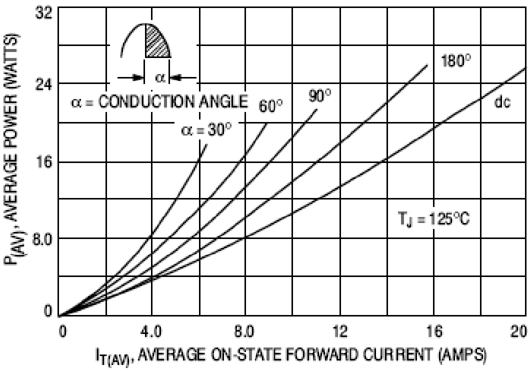


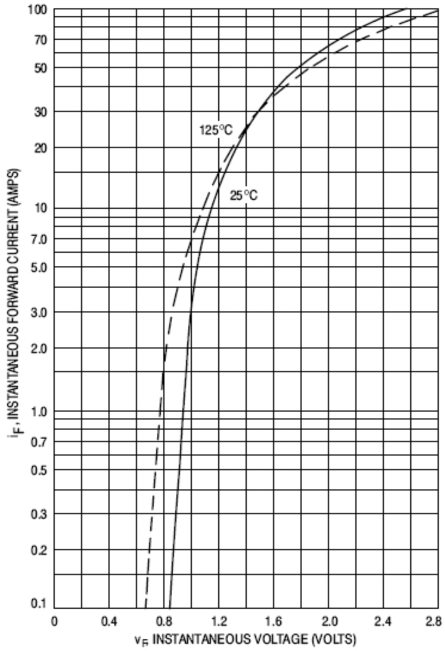
Symbol	Parameter
V_{DRM}	Peak repetitive off state forward voltage
I_{DRM}	Peak forward blocking current
V_{RRM}	Peak repetitive off state reverse voltage
I_{RRM}	Peak reverse blocking current
V_{TM}	Peak on state voltage
I_H	Holding current



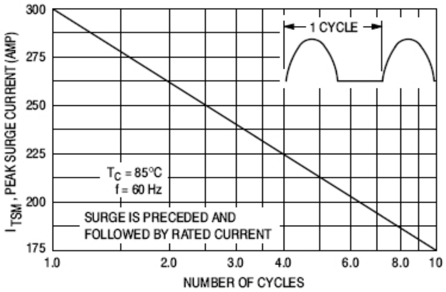
Average Current Derating



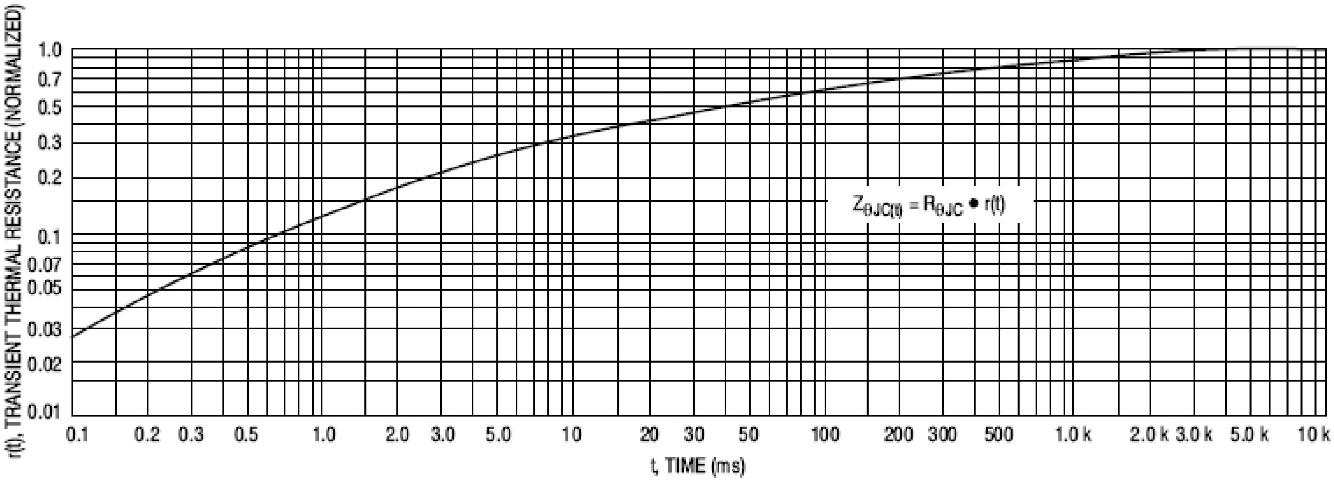
Maximum On-State Power Dissipation



Typical On-State Characteristics



Maximum Non-Repetitive Surge Current



Thermal Response

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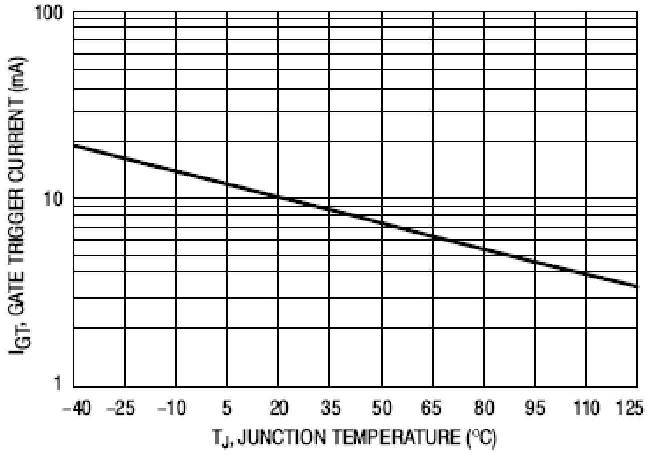
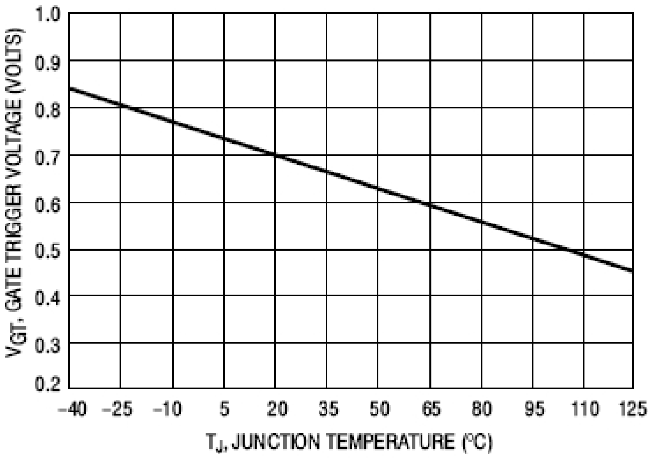
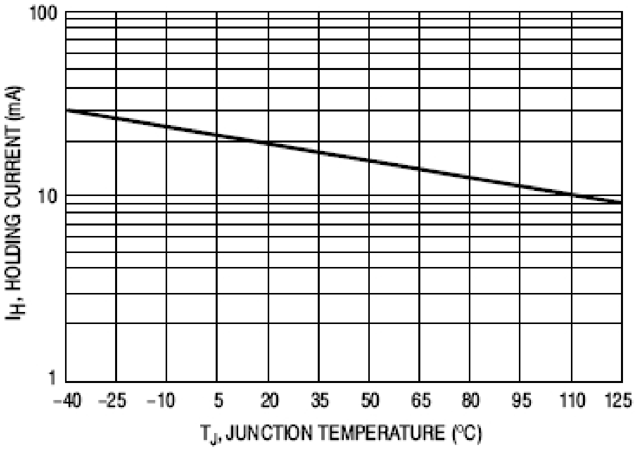


Typical Gate Trigger Current vs. Junction Temperature



Typical Gate Trigger Voltage vs. Junction Temperature



Typical Holding Current vs. Junction Temperature