DIGITRON™ Semiconductors

High-reliability discrete products
and engineering services since 1977

MCR106 SERIES

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 off-state voltage[1] (T_J = -40 to +110°C, sine wave, 50 to 60Hz, gate open)			
MCR106-1		30	
MCR106-2		60	
MCR106-3	V_{DRM}	100	V
MCR106-4	V_{RRM}	200	
MCR106-5		300	
MCR106-6		400	
MCR106-7		500	
MCR106-8		600	
On-state RMS current (180° conduction angles, T_C = 93°C)	$I_{T(RMS)}$	4.0	A
Average on-state current (180° conduction angles, T_C = 93°C)	$I_{T(AV)}$	2.55	A
Peak non-repetitive surge current (half-cycle, sine wave, 60Hz, T_J = 110°C)	I_{TSM}	25	A
Circuit fusing consideration (t = 8.3ms)	I^2t	2.6	A^2s
Forward peak gate power (pulse width ≤ 1.0µs, T_C = 93°C)	P_{GM}	0.5	W
Forward average gate power (t = 8.3ms, T_C = 93°C)	$P_{G(AV)}$	0.1	W
Forward peak gate current (pulse width ≤ 1.0µs, T_C = 93°C)	I_{GM}	0.2	A
Peak reverse gate voltage (pulse width ≤ 1.0µs, T_C = 93°C)	V_{RGM}	6.0	V
Operating junction temperature range	T_J	-40 to +110	°C
Storage temperature range	T_{stg}	-40 to +150	°C
Mounting torque[2]	-	6.0	In. lb.

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.
Note 2: Torque rating applies with use of compression washer. Mounting torque in excess of 6 in. lb. does not appreciably lower case-to-sink thermal resistance. Anode lead and heatsink contact pad are common. For soldering purposes, soldering temperatures should not exceed +200°C. For optimum results, an activated flux is recommended.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Maximum	Unit
Thermal resistance, junction to case	$R_{\Theta JC}$	3.0	°C/W
Thermal resistance, junction to ambient	$R_{\Theta JA}$	75	°C/W
Lead solder temperature (lead length ≥ 1/8" from case, 10s max)	T_L	260	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Peak forward or reverse blocking current (V_{AK} = Rated V_{DRM} or V_{RRM}, R_{GK} = 1000Ω)	I_{DRM}, I_{RRM}				µA

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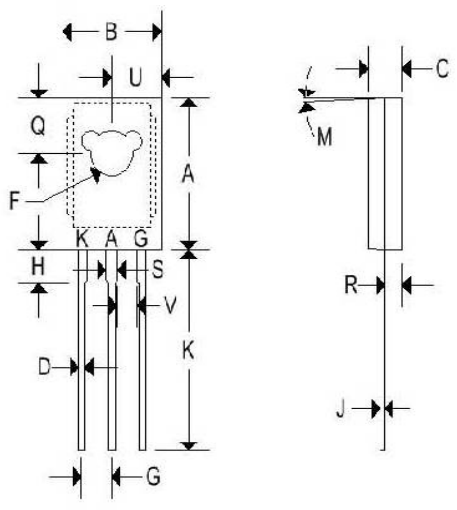
T_C = 25°C T_C = 110°C		- -	- -	10 200	
ON CHARACTERISTICS					
Peak forward on-state voltage (3) (I_{TM} = 4.0A peak)	V_{TM}	-	-	2.0	V
Gate trigger current (continuous dc) (4) (V_{AK} = 7V, R_L = 100Ω) (T_C = -40°C)					
Gate trigger voltage (continuous dc)(4) (V_{AK} = 7V, R_L = 100Ω)					
Gate non-trigger voltage(4) (V_{AK} = 12V, R_L = 100Ω, T_J = 110°C)					
Holding current (V_{AK} = 7V, initiating current = 200mA, gate open)					
DYNAMIC CHARACTERISTICS					
Critical rate of rise of off-state voltage (T_C = 110°C)	dv/dt	-	10	-	V/µs

Note 3: Pulse width ≤ 1.0ms, duty cycle ≤ 1%.
Note 4: R_{GK} current is not included in measurement.

MECHANICAL CHARACTERISTICS

Case:	TO-126
Marking:	Body painted, alpha-numeric
Pin out:	See below



	TO-126			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.425	0.435	10.80	11.050
B	0.295	0.305	7.490	7.750
C	0.095	0.105	2.410	2.670
D	0.020	0.026	0.510	0.660
F	0.115	0.125	2.920	3.180
G	0.091	0.097	2.310	2.460
H	0.050	0.095	1.270	2.410
J	0.015	0.025	0.380	0.640
K	0.595	0.655	15.110	16.640
M	3° TYP		3° TYP	
Q	0.148	0.158	3.760	4.010
R	0.045	0.055	1.140	1.400
S	0.025	0.035	0.640	0.890
U	0.145	0.155	3.680	3.940
V	0.040	-	1.020	-

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CURRENT DERATING

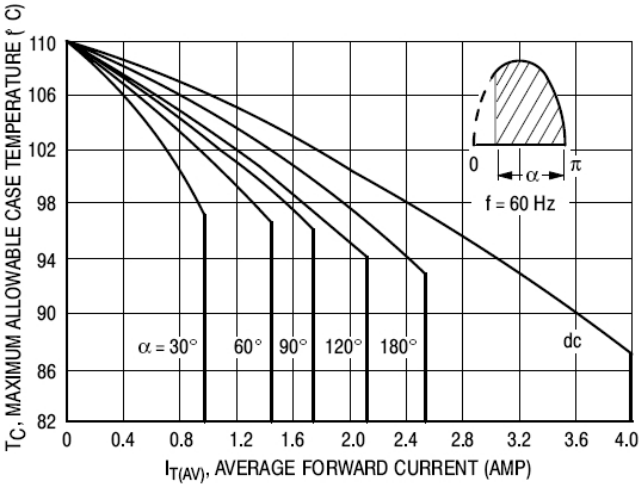

Figure 1. Maximum Case Temperature

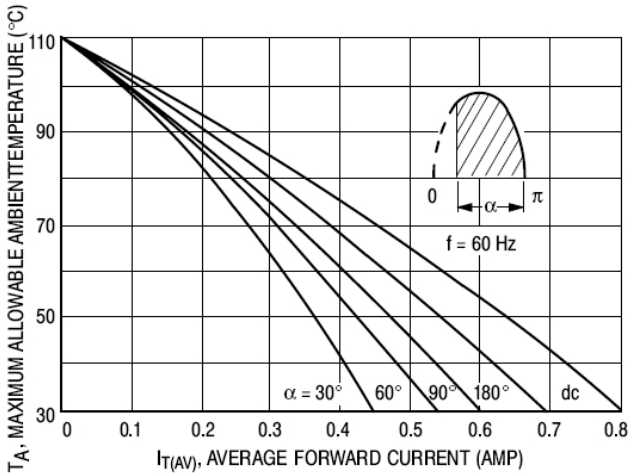

Figure 2. Maximum Ambient Temperature