Preferred Device

Sensitive Gate Silicon Controlled Rectifiers

Reverse Blocking Thyristors

Designed for high volume, low cost, industrial and consumer applications such as motor control; process control; temperature, light and speed control.

Features

- Small Size
- Passivated Die for Reliability and Uniformity
- Low Level Triggering and Holding Characteristics
- Available in Two Package Styles
 Surface Mount Lead Form Case 369C
 Miniature Plastic Package Straight Leads Case 369
- Epoxy Meets UL 94 V-0 @ 0.125 in
- ESD Ratings: Human Body Model, 3B > 8000 VMachine Model, C > 400 V
- Pb-Free Packages are Available

MAXIMUM RATINGS (T_J = 25°C unless otherwise noted)

Rating	Symbol	Value	Unit
	V _{DRM,} V _{RRM}	600 800	>
On–State RMS Current (180° Conduction Angles; T _C = 90°C)	I _{T(RMS)}	8.0	Α
Average On-State Current (180° Conduction Angles; T _C = 90°C)	I _{T(AV)}	5.1	Α
Peak Non-Repetitive Surge Current (1/2 Cycle, Sine Wave 60 Hz, T _J = 110°C)	I _{TSM}	90	Α
Circuit Fusing Consideration (t = 8.3 msec)	l ² t	34	A ² sec
Forward Peak Gate Power (Pulse Width \leq 10 μ sec, $T_C = 90$ °C)	P _{GM}	5.0	W
Forward Average Gate Power (t = 8.3 msec, T _C = 90°C)	P _{G(AV)}	0.5	W
Forward Peak Gate Current (Pulse Width \leq 10 μ sec, T_C = 90°C)	I _{GM}	2.0	Α
Operating Junction Temperature Range	T_J	-40 to 110	°C
Storage Temperature Range	T _{stg}	-40 to 150	°C

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

 V_{DRM} and V_{RRM} for all types can be applied on a continuous basis. Ratings apply for 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 device are exceeded.



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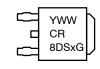
SCRs 8 AMPERES RMS 600 – 800 VOLTS



MARKING DIAGRAM



DPAK CASE 369C STYLE 4



PIN ASSIGNMENT		
1	Cathode	
2	Anode	
3	Gate	
4	Anode	
	· · · · · · · · · · · · · · · · · · ·	

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 2 of this data sheet.

Preferred devices are recommended choices for future use and best overall value.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance - Junction-to-Case - Junction-to-Ambient - Junction-to-Ambient (Note 2)	$egin{aligned} & R_{ hetaJC} \ & R_{ hetaJA} \ & R_{ hetaJA} \end{aligned}$	2.2 88 80	°C/W
Maximum Lead Temperature for Soldering Purposes 1/8" from Case for 10 Seconds	T_L	260	°C

Characteristics	Symbol	Min	Тур	Max	Unit	
OFF CHARACTERISTICS						
Peak Repetitive Forward or Reverse Blocking Current (V_{AK} = Rated V_{DRM} or V_{RRM} ; R_{GK} = 1.0 k Ω) (Note 3)	T _J = 25°C T _J = 110°C	I _{DRM} I _{RRM}	- -	- -	10 500	μΑ
ON CHARACTERISTICS						
Peak Reverse Gate Blocking Voltage (I _{GR} = 10 μA)		V_{GRM}	10	12.5	18	V
Peak Reverse Gate Blocking Current (V _{GR} = 10 V)		I _{RGM}	_	_	1.2	μΑ
Peak Forward On-State Voltage (Note 4) (I _{TM} = 16 A)		V_{TM}	-	1.4	1.8	V
Gate Trigger Current (Continuous dc) (Note 5) $(V_D = 12 \text{ V}, \text{ R}_L = 100 \ \Omega)$	$T_J = 25^{\circ}C$ $T_J = -40^{\circ}C$	I _{GT}	5.0 -	12 -	200 300	μΑ
Gate Trigger Voltage (Continuous dc) (Note 5) $(V_D = 12 \text{ V}, \text{ R}_L = 100 \ \Omega)$	$T_J = 25^{\circ}C$ $T_J = -40^{\circ}C$ $T_J = 110^{\circ}C$	V _{GT}	0.45 - 0.2	0.65 - -	1.0 1.5 -	V
Holding Current (V_D = 12 V, Initiating Current = 200 mA, R_{GK} = 1 k Ω)	$T_J = 25^{\circ}C$ $T_J = -40^{\circ}C$	lн	0.5 -	1.0 -	6.0 10	mA
Latching Current (V_D = 12 V, I_G = 2.0 mA, R_{GK} = 1 k Ω)	$T_J = 25^{\circ}C$ $T_J = -40^{\circ}C$	IL	0.5	1.0 -	6.0 10	mA
Total Turn–On Time (Source Voltage = 12 V, R_S = 6.0 k Ω , I_T = 16 A(pk), R_{GK} = 1.0 k Ω) (V_D = Rated V_{DRM} , Rise Time = 20 ns, Pulse Width = 10 μ s)		tgt	-	2.0	5.0	μs
YNAMIC CHARACTERISTICS						
Critical Rate of Rise of Off–State Voltage (V _D = 0.67 X Rated V _{DRM} , Exponential Waveform, Roy = 1.0 kg T ₁ = 110°C)		dv/dt	2.0	10	_	V/μs

Critical Rate of Rise of Off-State Voltage	dv/dt				V/μs
$(V_D = 0.67 \text{ X Rated } V_{DRM}, \text{ Exponential Waveform,}$		2.0	10	-	
$R_{GK} = 1.0 \text{ k}\Omega, T_{J} = 110^{\circ}\text{C}$					

- 2. Surface mounted on minimum recommended pad size.
- Ratings apply for negative gate voltage or R_{GK} = 1.0 kΩ. Devices shall not have a positive gate voltage concurrently with a negative voltage on the anode. Devices should not be tested with a constant current source for forward and reverse blocking capability such that the voltage applied exceeds the rated blocking voltage.
- 4. Pulse Test; Pulse Width \leq 2.0 msec, Duty Cycle \leq 2%. 5. R_{GK} current not included in measurements.

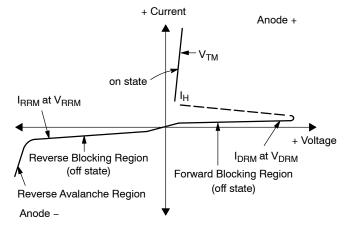
ORDERING INFORMATION

Device	Package	Shipping [†]
MCR8DSMT4	DPAK	
MCR8DSMT4G	DPAK (Pb-Free)	0500 / Tana & Baal
MCR8DSNT4	DPAK	2500 / Tape & Reel
MCR8DSNT4G	DPAK (Pb-Free)	

[†]For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

Voltage Current Characteristic of SCR

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



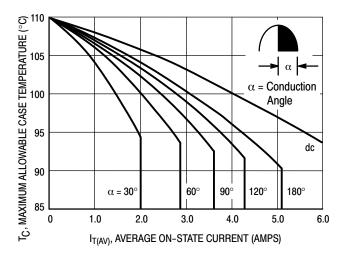


Figure 1. Average Current Derating

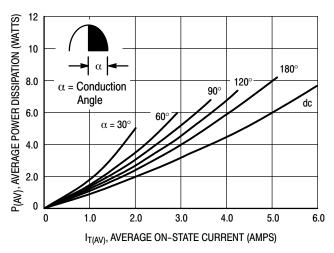


Figure 2. On-State Power Dissipation

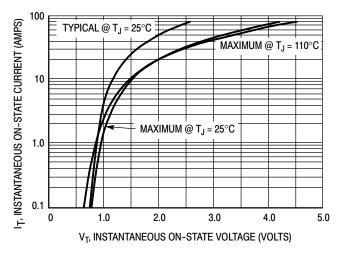


Figure 3. On-State Characteristics

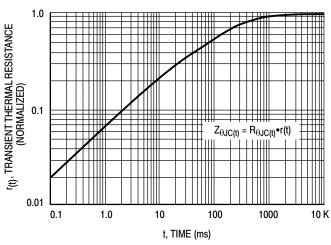


Figure 4. Transient Thermal Response

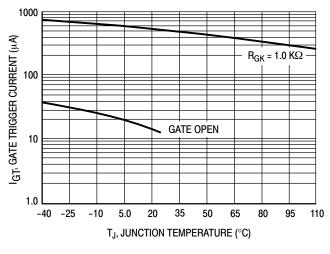


Figure 5. Typical Gate Trigger Current versus Junction Temperature

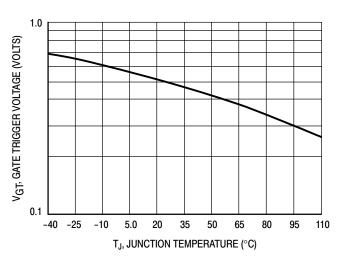


Figure 6. Typical Gate Trigger Voltage versus
Junction Temperature

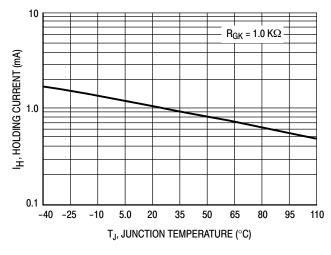


Figure 7. Typical Holding Current versus Junction Temperature

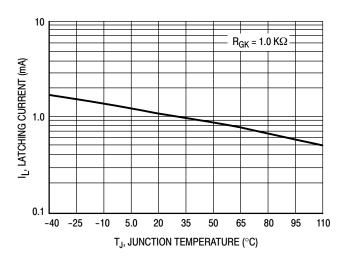


Figure 8. Typical Latching Current versus Junction Temperature

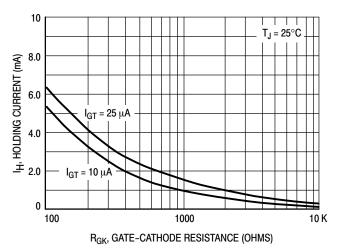
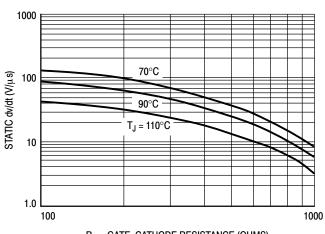


Figure 9. Holding Current versus Gate-Cathode Resistance



R_{GK}, GATE-CATHODE RESISTANCE (OHMS)

Figure 10. Exponential Static dv/dt versus Gate-Cathode Resistance and Junction Temperature

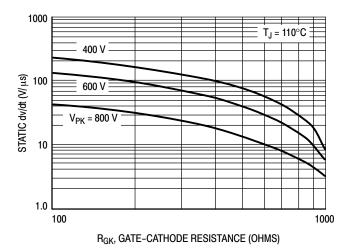
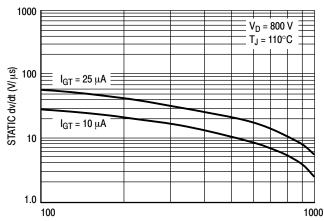


Figure 11. Exponential Static dv/dt versus Gate-Cathode Resistance and Peak Voltage



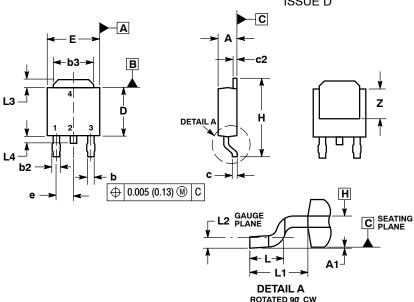
R_{GK}, GATE-CATHODE RESISTANCE (OHMS)

Figure 12. Exponential Static dv/dt versus Gate-Cathode Resistance and Gate Trigger Current Sensitivity

PACKAGE DIMENSIONS

DPAK (SINGLE GAUGE)

CASE 369C-01 ISSUE D



NOTES:

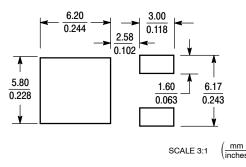
- 1. DIMENSIONING AND TOLERANCING PER ASME
- Y14.5M, 1994. CONTROLLING DIMENSION: INCHES.
- 3. THERMAL PAD CONTOUR OPTIONAL WITHIN DI-MENSIONS b3, L3 and Z.
- DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR BURRS. MOLD FLASH, PROTRUSIONS, OR GATE BURRS SHALL NOT EXCEED 0.006 INCHES PER SIDE.
- DIMENSIONS D AND E ARE DETERMINED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY.
- DATUMS A AND B ARE DETERMINED AT DATUM PLANE H.

	INC	HES	MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
Α	0.086	0.094	2.18	2.38
A1	0.000	0.005	0.00	0.13
b	0.025	0.035	0.63	0.89
b2	0.030	0.045	0.76	1.14
b3	0.180	0.215	4.57	5.46
С	0.018	0.024	0.46	0.61
c2	0.018	0.024	0.46	0.61
D	0.235	0.245	5.97	6.22
Е	0.250	0.265	6.35	6.73
е	0.090	BSC	2.29	BSC
Н	0.370	0.410	9.40	10.41
L	0.055	0.070	1.40	1.78
L1	0.108	0.108 REF		REF
L2	0.020	BSC	0.51 BSC	
L3	0.035	0.050	0.89	1.27
L4		0.040		1.01
Z	0.155		3.93	

STYLE 4: PIN 1. CATHODE 2. ANODE

- GATE
- ANODE

SOLDERING FOOTPRINT*



*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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