



MCR100-6 0.8A Sensitive SCR

Rev.A.1.0

DESCRIPTION:

The MCR100-6 SCR provides high dV/dt rate with strong resistance to electromagnetic interface. It is especially recommended for use on residual current circuit breaker, straight hair, igniter etc. Package SOT-223 is RoHS compliant.

MAIN FEATURES

Symbol	Value	Unit
$I_{T(RMS)}$	0.8	A
V_{DRM} / V_{RRM}	800	V
I_{GT}	200	A

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Storage junction temperature range	T_{stg}	-40-150	
Operating junction temperature range	T_j	-40-125	

Peak gate power	P_{GM}	2	W
Peak pulse voltage ($T_j=25$; non-repetitive, off-state; FIG.8)	V_{pp}	1	kV

NOTE 1: When we parallel connect a 1K resistor between Gate and Cathode, the T_j can reach 125 ; if without this resistor, the T_j only can reach 110 .

ELECTRICAL CHARACTERISTICS ($T_j=25$ unless otherwise specified)

Symbol	Test Condition	Value			Unit
		MIN.	TYP.	MAX.	
I_{GT}	$V_D=12V R_L=33$	-	50	200	A
V_{GT}		-	0.6	0.8	V
V_{GD}	$V_D=V_{DRM} T_j=125$	0.2	-	-	V
I_L	$I_G=1.2 I_{GT}$	-	-	4	mA
I_H	$I_T=0.05A$	-	-	3	mA
dV/dt	$V_D=540V T_j=125 R_{GK}=1K$	200	-	-	V/s
	$V_D=540V T_j=125 R_{GK}=$	500	-	-	
t_{on}	$I_G=10mA I_A=20mA I_R=2mA$	-	2	-	s
t_{off}	$T_j=25$	-	50	-	s

STATIC CHARACTERISTICS

Symbol	Parameter		Value(MAX.)	Unit
V_{TM}	$I_T=1A t_p=380 \text{ s}$	$T_j=25$	1.35	V
V_{TO}	Threshold voltage	$T_j=125$	0.93	V
R_D	Dynamic Resistance	$T_j=125$	0.34	
I_{DRM}	$V_D=V_{DRM} V_R=V_{RRM}$	$T_j=25$	2	A
I_{RRM}		$T_j=125$	0.2	mA

THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	junction to case (DC)	35	/W
$R_{th(j-a)}$	junction to ambient (DC)	120	/W

MARKING

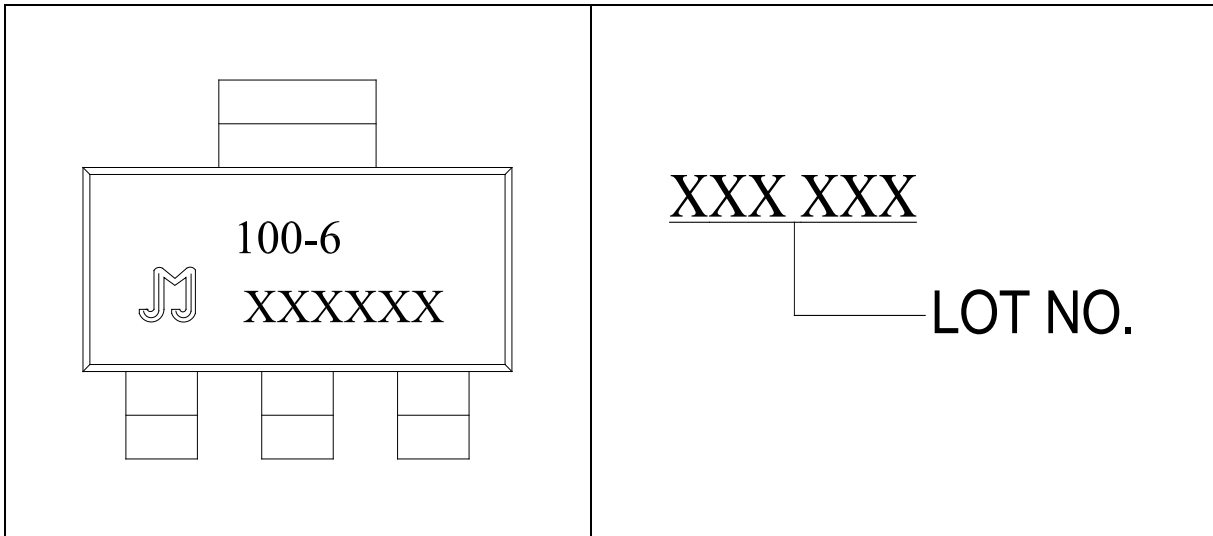


FIG.1 Maximum power dissipation versus RMS on-state current

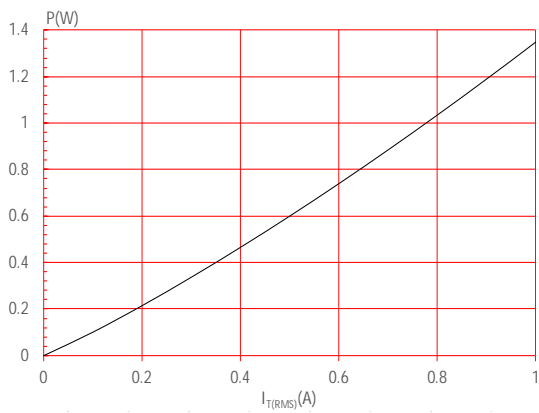


FIG.2: RMS on-state current versus case temperature

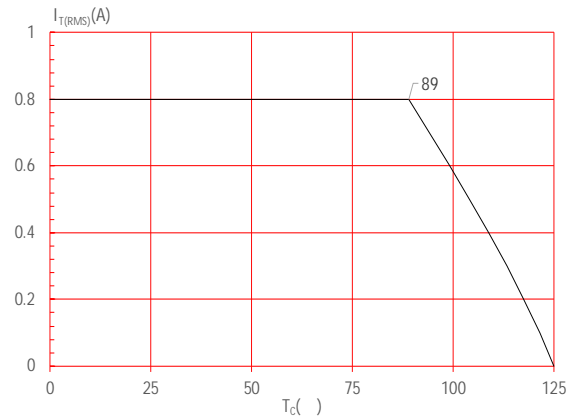


FIG.3: RMS on-state current versus ambient temperature (printed circuit board FR4,copper)

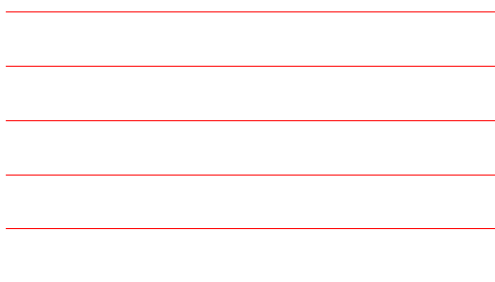


FIG.4: Surge peak on-state current versus number of cycles

FIG.5: On-state characteristics

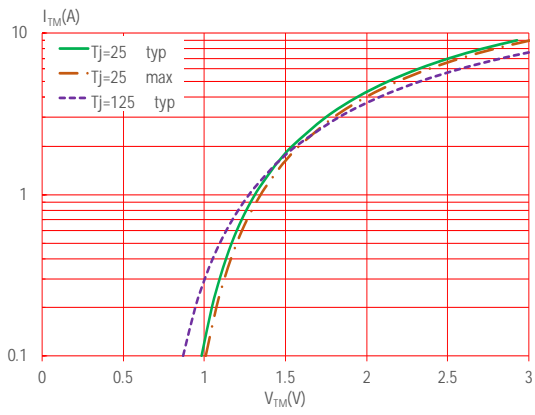
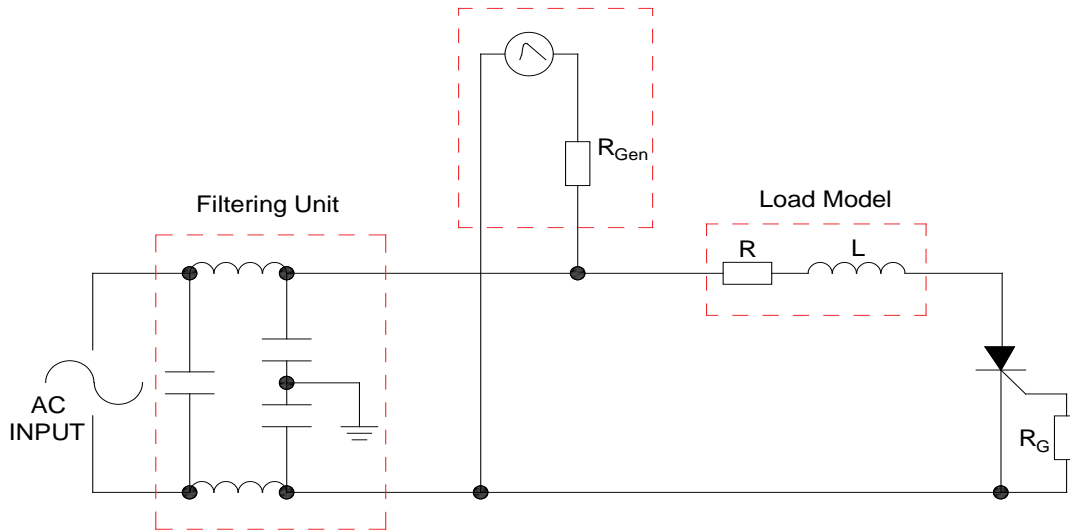


FIG.6: Non-repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 10ms$, and corresponding value of I^2t ($di/dt < 5$)

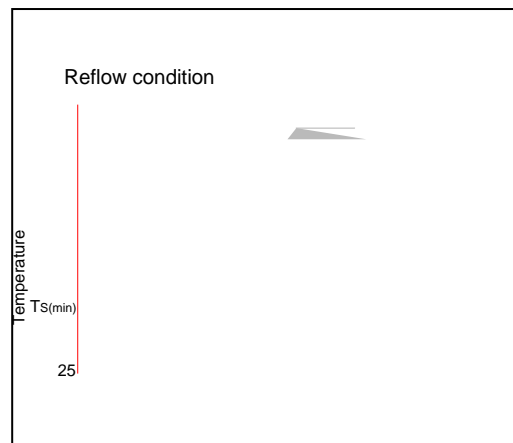
FIG.8 Test circuit for inductive and resistive loads to IEC-61000-4-5 standards.

IEC61000-4-5 Standards
Surge Generator



SOLDERING PARAMETERS

Reflow Condition		Pb-Free assembly (see figure at right)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150
	-Temperature Max ($T_{s(max)}$)	+200
	-Time (Min to Max) (t_s)	60-180 secs.
Average ramp up rate (Liquidus Temp (T_L) to peak)		3 /sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3 /sec. Max
Reflow	-Temperature(T_L) (Liquidus)	+217
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_p)		+260(+0/-5)
Time within 5 of actual Peak Temp (t_p)		20-40secs.
Ramp-down Rate		6 /sec. Max
Time 25 to Peak Temp (T_p)		8 min. Max
Do not exceed		+260



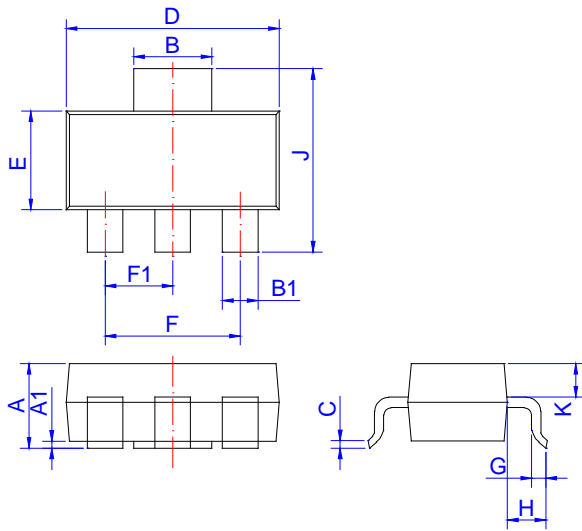
ORDERING INFORMATION

Order code	Voltage V_{DRM}/V_{RRM} (V)	IGT)	Package	Base qty. (pcs)	Delivery mode
MCR100-6	800	200	SOT-223	4,000	Tape & Reel

Document Revision History

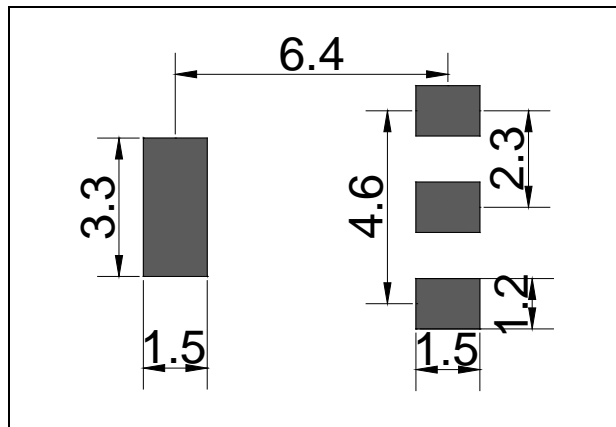
Date	Revision	Changes
May.19, 2023	A.1.0	Last update

PACKAGE MECHANICAL DATA



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	1.5	1.6	1.8	0.059	0.063	0.071
A1	0.01	0.06	0.10	0.001	0.002	0.004
B	2.9	3.0	3.1	0.114	0.118	0.122
B1	0.6	0.7	0.8	0.024	0.028	0.031
C	0.22	0.26	0.32	0.009	0.010	0.013
D	6.3	6.5	6.7	0.248	0.256	0.264
E	3.3	3.5	3.7	0.130	0.138	0.146
F	4.4		4.8	0.173		0.189
F1	2.2		2.4	0.087		0.094
G	0.5		1.0	0.020		0.039
H	1.5	1.75	2.0	0.059	0.069	0.079
J	6.7	7.0	7.3	0.264	0.276	0.287
K	0.8	0.9	1.0	0.031	0.035	0.039


FOOTPRINT-SOT-223 (dimensions in mm)



DELIVERY MODE

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
W	-		12.30			
E	1.65	1.75	1.85			
F	5.45	5.50	5.55			
D0		1.55	1.60			
D1		-				
P0	3.90	4.00	4.10			
P1	7.90	8.00	8.10			
P2	1.95	2.00	2.05			
10P0	39.80	40.00	40.20			
A0	6.85	6.95	7.05			
B0		7.25	7.35			
K0						
T						

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