

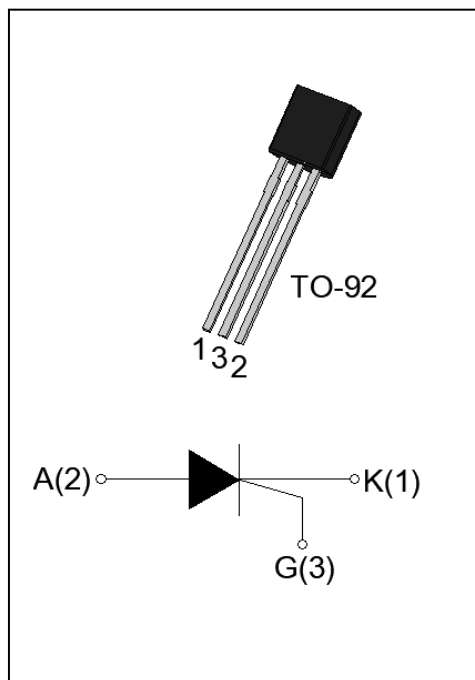


## MCR100-8 1A Sensitive SCR

Rev.A.2.0

### DESCRIPTION:

The MCR100-8 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. Complying with UL standards (File ref: E252906). Package TO-92 is RoHS compliant.



### MAIN FEATURES

Symbol	Value	Unit
$I_{T(RMS)}$	1	A
$V_{DRM} / V_{RRM}$	800	V
$I_{GT}$	$\leq 200$	$\mu A$

### ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Storage junction temperature range	$T_{stg}$	-40-150	$^{\circ}C$
Operating junction temperature range	$T_j$	-40-125 <sup>①</sup>	$^{\circ}C$
Repetitive peak off-state voltage ( $T_j=25^{\circ}C$ )	$V_{DRM}$	800	V
Repetitive peak reverse voltage ( $T_j=25^{\circ}C$ )	$V_{RRM}$	800	V
Average on-state current ( $T_c \leq 54^{\circ}C$ )	$I_{T(AV)}$	0.6	A
RMS on-state current ( $T_c \leq 54^{\circ}C$ )	$I_{T(RMS)}$	1	A
Non repetitive surge peak on-state current ( $t_p=10ms, T_j=25^{\circ}C$ )	$I_{TSM}$	12	A
Non repetitive surge peak on-state current ( $t_p=8.3ms, T_j=25^{\circ}C$ )		13	
$I^2t$ value for fusing ( $t_p=10ms, T_j=25^{\circ}C$ )	$I^2t$	0.72	$A^2s$
Critical rate of rise of on-state current ( $I_G=2 \times I_{GT}, f=100Hz, T_j=125^{\circ}C$ )	$di/dt$	100	$A/\mu s$
Peak gate current ( $t_p=20\mu s, T_j=125^{\circ}C$ )	$I_{GM}$	1	A

Average gate power dissipation ( $T_j=125^\circ\text{C}$ )	$P_{G(AV)}$	0.1	W
Peak gate power	$P_{GM}$	2	W
Peak pulse voltage ( $T_j=25^\circ\text{C}$ ; non-repetitive, off-state; FIG.7)	$V_{pp}$	1	kV

**NOTE 1:** When we parallel connect a  $\leq 1\text{K}\Omega$  resistor between Gate and Cathode, the  $T_j$  can reach  $125^\circ\text{C}$ ; if without this resistor, the  $T_j$  only can reach  $110^\circ\text{C}$ .

### ELECTRICAL CHARACTERISTICS ( $T_j=25^\circ\text{C}$ unless otherwise specified)

Symbol	Test Condition	Value			Unit
		MIN.	TYP.	MAX.	
$I_{GT}$	$V_D=12\text{V } R_L=33\Omega$	-	40	200	$\mu\text{A}$
$V_{GT}$		-	0.6	0.8	V
$V_{GD}$	$V_D=V_{DRM} T_j=125^\circ\text{C}$	0.2	-	-	V
$I_L$	$I_G=1.2 I_{GT}$	-	-	5	mA
$I_H$	$I_T=0.05\text{A}$	-	-	4	mA
dV/dt	$V_D=540\text{V } T_j=125^\circ\text{C } R_{GK}=1\text{K}\Omega$	200	-	-	V/ $\mu\text{s}$
	$V_D=540\text{V } T_j=125^\circ\text{C } R_{GK}=220\Omega$	500	-	-	
$t_{on}$	$I_G=10\text{mA } I_A=20\text{mA } I_R=2\text{mA}$	-	2	-	$\mu\text{s}$
$t_{off}$	$T_j=25^\circ\text{C}$	-	50	-	$\mu\text{s}$

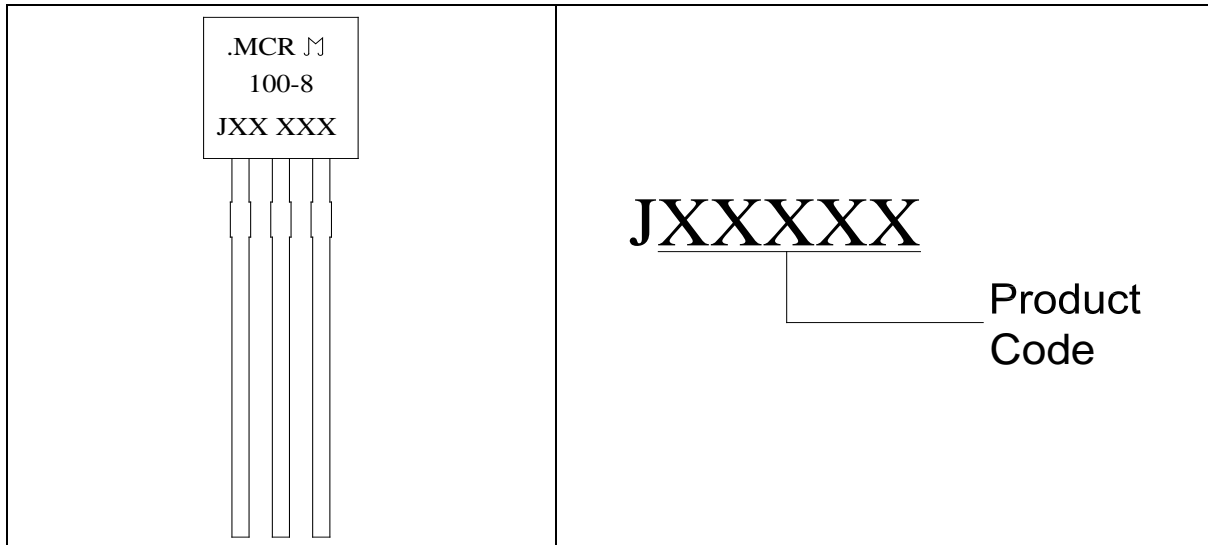
### STATIC CHARACTERISTICS

Symbol	Parameter	Value(MAX.)	Unit	
$V_{TM}$	$I_T=2\text{A } t_p=380\mu\text{s}$	$T_j=25^\circ\text{C}$	1.4	V
$V_{TO}$	Threshold voltage	$T_j=125^\circ\text{C}$	0.8	V
$R_D$	Dynamic Resistance	$T_j=125^\circ\text{C}$	0.1	$\Omega$
$I_{DRM}$	$V_D=V_{DRM} V_R=V_{RRM}$	$T_j=25^\circ\text{C}$	5	$\mu\text{A}$
$I_{RRM}$		$T_j=125^\circ\text{C}$	0.2	mA

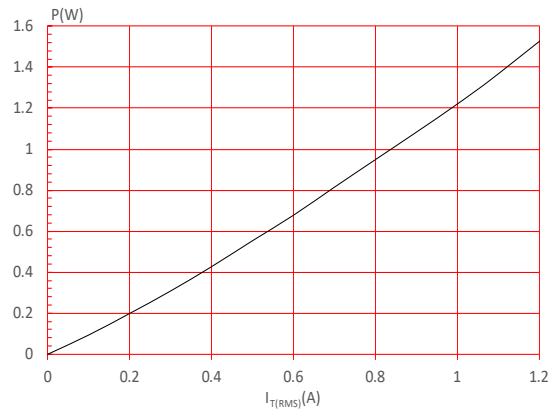
### THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	junction to case (DC)	61	$^\circ\text{C/W}$
$R_{th(j-a)}$	junction to ambient (DC)	130	$^\circ\text{C/W}$

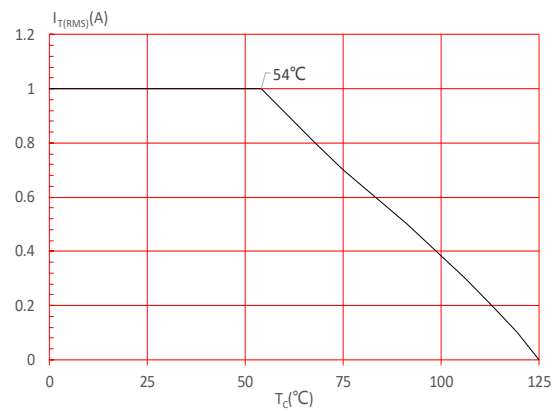
MARKING



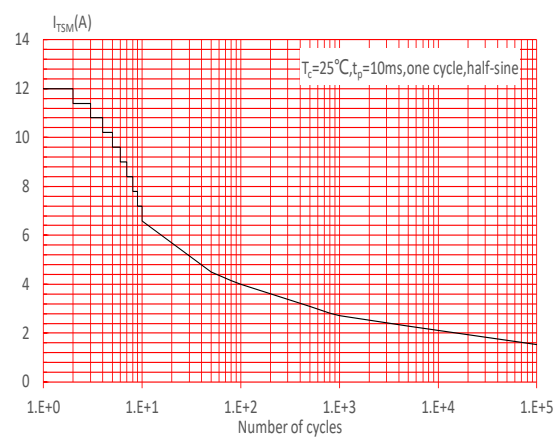
**FIG.1:** Maximum power dissipation versus RMS on-state current



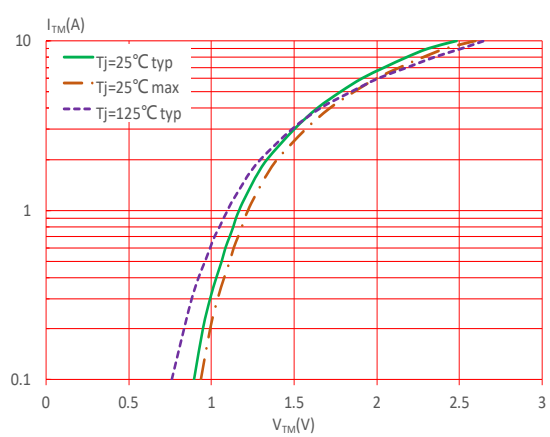
**FIG.2:** RMS on-state current versus case temperature



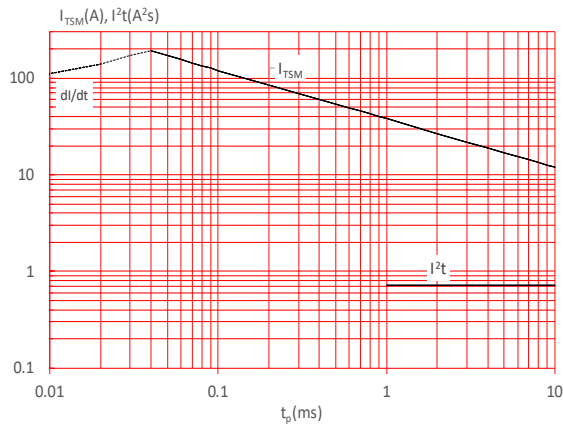
**FIG.3:** Surge peak on-state current versus number of cycles



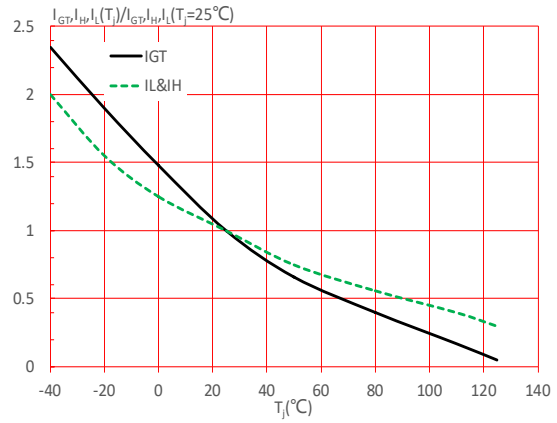
**FIG.4:** On-state characteristics



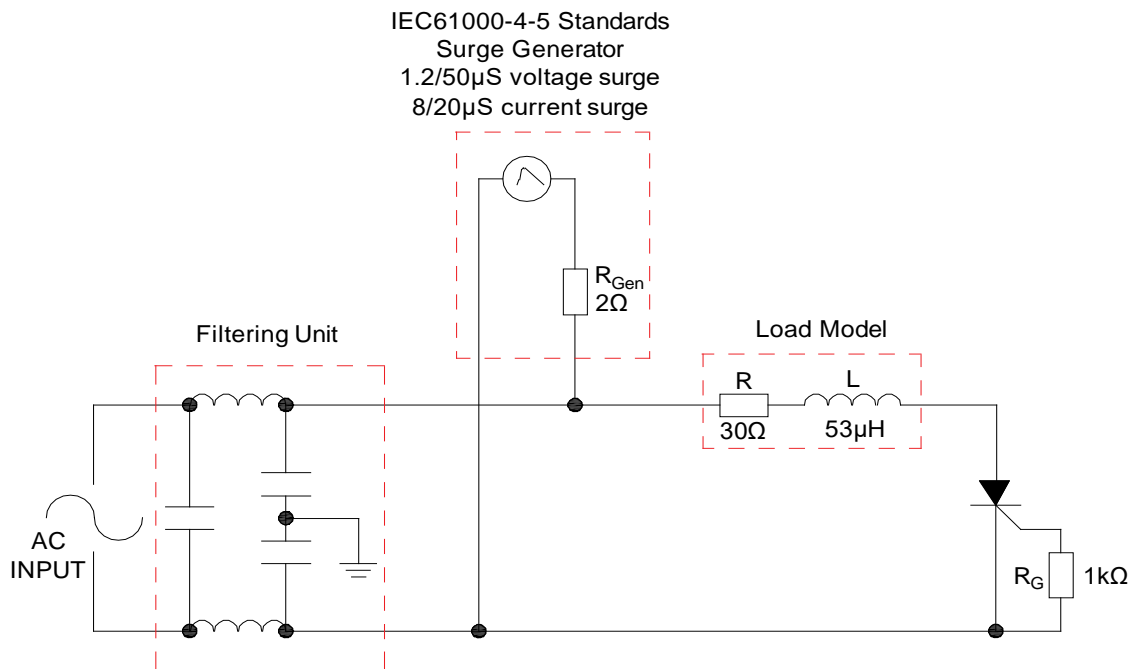
**FIG.5:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 10\text{ms}$ , and corresponding value of  $I^2t$  ( $di/dt < 100\text{A}/\mu\text{s}$ )



**FIG.6:** Relative variations of gate trigger current, holding current and latching current versus junction temperature



**FIG.7:** Test circuit for inductive and resistive loads to IEC-61000-4-5 standards.



### LEAD FORMING AND SOLDERING

Refer to the application note “Assembly Instructions for Thyristors in Through-hole Package” released by JieJie Microelectronics

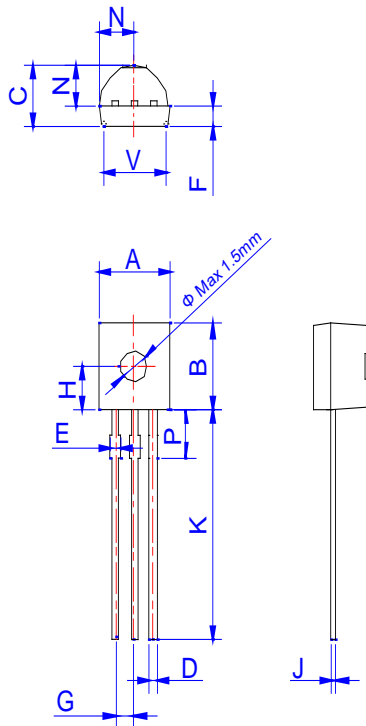
**ORDERING INFORMATION**

Order code	Voltage $V_{DRM}/V_{RRM}$ (V)	IGT( $\mu$ A)	Package	Base qty. (pcs)	Delivery mode
MCR100-8	800	$\leq 200$	TO-92	1,000	Bulk Pack
MCR100-8-TR				2,000	Tape & Reel

**Document Revision History**

Date	Revision	Changes
Apr.12, 2023	A.1.0	Last update
Mar.28, 2025	A.2.0	Renew PACKAGE MECHANICAL DATA

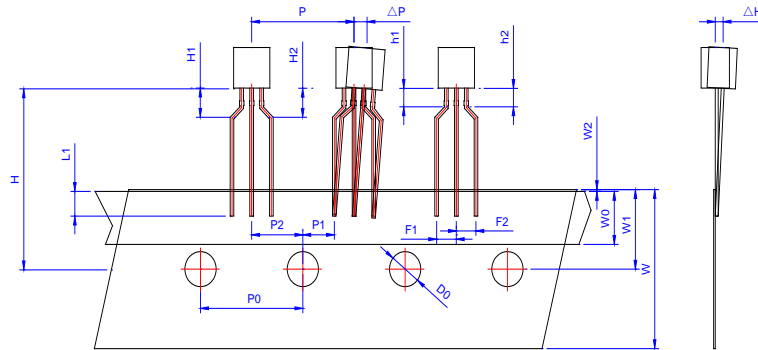
PACKAGE MECHANICAL DATA



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.45		5.20	0.175		0.205
B	4.32		5.33	0.170		0.210
C	3.18		4.19	0.125		0.165
D	0.407		0.533	0.016		0.021
E	0.50		0.70	0.020		0.028
F	1.10		1.30			0.051
G	1.10		1.40	0.043		0.055
H	2.20		2.40	0.087		0.094
J	0.36		0.50	0.014		0.020
K	12.70		15.0	0.500		0.591
N	2.04		2.66	0.080		0.105
P	1.80		2.30	0.071		0.091
V	4.10		4.50	0.161		0.177

DELIVERY MODE

PACKAGE	OUTLINE	BAG (PCS)	INNER BOX (PCS)	CARTON BOX (PCS)
TO-92	Bulk Pack	1,000	10,000	50,000



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
P	12.40	12.70	13.00	0.488	0.500	0.512
P0	12.40	12.70	13.00	0.488	0.500	0.512
P1	3.55	3.85	4.15	0.140	0.152	0.163
P2	5.95	6.35	6.75	0.233	0.250	0.265
ΔP	-1.00	0	1.00	-0.039	0	0.039
F1、F2	2.30	2.50	2.70	0.090	0.098	0.106
F1-F2	-0.10	0	0.10	-0.004	0	0.004
W	17.50	18.00	19.00	0.689	0.709	0.748
W0	5.50	6.00	6.50	0.217	0.236	0.256
W1	8.50	9.00	9.50	0.335	0.354	0.374
W2			1.00			0.039
D0	3.80	4.00	4.20	0.150	0.157	0.165
ΔH	-1.00	0	1.00	-0.039	0	0.039
L1	2.50			0.098		
H	18.00	19.00	20.00	0.709	0.748	0.787
H1、H2			3.00			0.119
H1-H2	-0.50		0.50	-0.020		0.020
h1、h2			1.00			0.040
h1-h2	-0.20		0.20	-0.008		0.008

PACKAGE	OUTLINE	REEL (PCS)	INNER BOX (PCS)	CARTON BOX (PCS)
TO-92	Tape & Reel	/	2,000	20,000

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