

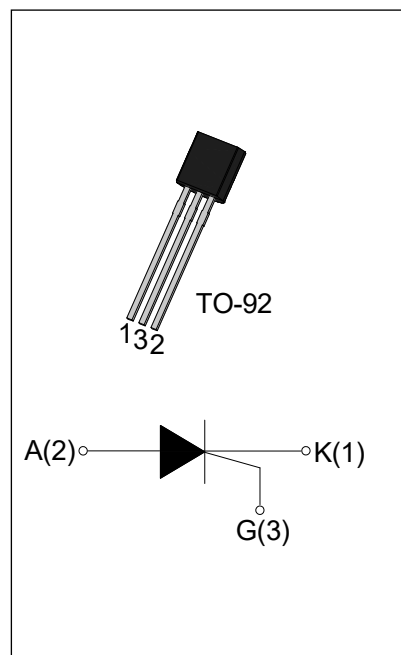


MCR100-8 0.8A Sensitive SCRs

Rev.2

DESCRIPTION:

The MCR100-8 SCR provides high dv/dt rate with strong resistance to electromagnetic interface. They are 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. (2011/65/EU)



MAIN FEATURES

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

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 ^①	$^{\circ}C$	
Repetitive peak off-state voltage	V_{DRM}	800	V	
Repetitive peak reverse voltage	V_{RRM}	800	V	
RMS on-state current	TO-92 ($T_C=60^{\circ}C$)	$I_{T(RMS)}$	0.8	A
Non repetitive surge peak on-state current (F=50Hz tp=10ms)	I_{TSM}	8	A	
Non repetitive surge peak on-state current (F=60Hz tp=8.3ms)	I_{TSM}	9	A	
I^2t value for fusing (tp=10ms)	I^2t	0.32	A^2s	
Critical rate of rise of on-state current	di/dt	50	$A/\mu s$	
Peak gate current (tp=20 μs , $T_j=125^{\circ}C$)	I_{GM}	0.2	A	
Peak gate power (tp=20 μs , $T_j=125^{\circ}C$)	P_{GM}	0.5	W	
Average gate power dissipation($T_j=125^{\circ}C$)	$P_{G(AV)}$	0.1	W	

Peak pulse voltage ($T_j=25^{\circ}\text{C}$; non-repetitive, off-state; FIG.7)	V_{pp}	1	kV
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NOTE 1: When we parallel connect a $\leq 1\text{K}\Omega$ resistor between Gate and Cathode, the T_j can reach 125°C ; if without this resistor, the T_j only can reach 110°C .

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

Symbol	Test Condition	Value			Unit
		MIN.	TYP.	MAX.	
I_{GT}	$V_D=12\text{V}$ $R_L=33\Omega$	20	50	200	μA
V_{GT}		-	0.6	0.8	V
V_{GD}	$V_D=V_{DRM}$ $T_j=125^{\circ}\text{C}$	0.2	-	-	V
I_L	$I_G=1.2 I_{GT}$	-	-	4	mA
I_H	$I_T=0.05\text{A}$	-	-	3	mA
dv/dt	$V_D=540\text{V}$ $T_j=125^{\circ}\text{C}$ $R_{GK}=1\text{K}\Omega$	600	-	-	$\text{V}/\mu\text{s}$
dv/dt	$V_D=540\text{V}$ $T_j=125^{\circ}\text{C}$ $R_{GK}=220\Omega$	1000	-	-	$\text{V}/\mu\text{s}$
t_{on}	$I_G=10\text{mA}$ $I_A=4\text{mA}$ $I_R=0.4\text{mA}$ $T_j=25^{\circ}\text{C}$	-	2	-	μs
t_{off}		-	50	-	μs

STATIC CHARACTERISTICS

Symbol	Parameter		Value(MAX)	Unit
V_{TM}	$I_T=1.1\text{A}$ $t_p=380\mu\text{s}$	$T_j=25^{\circ}\text{C}$	1.5	V
V_{TO}	Threshold voltage	$T_j=125^{\circ}\text{C}$	0.93	V
V_d	Dynamic Resistance	$T_j=125^{\circ}\text{C}$	340	$\text{m}\Omega$
I_{DRM}	$V_D=V_{DRM}$ $V_R=V_{RRM}$	$T_j=25^{\circ}\text{C}$	5	μA
I_{RRM}		$T_j=125^{\circ}\text{C}$	100	μA

THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	junction to case	TO-92	66.8	$^{\circ}\text{C}/\text{W}$

MARKING

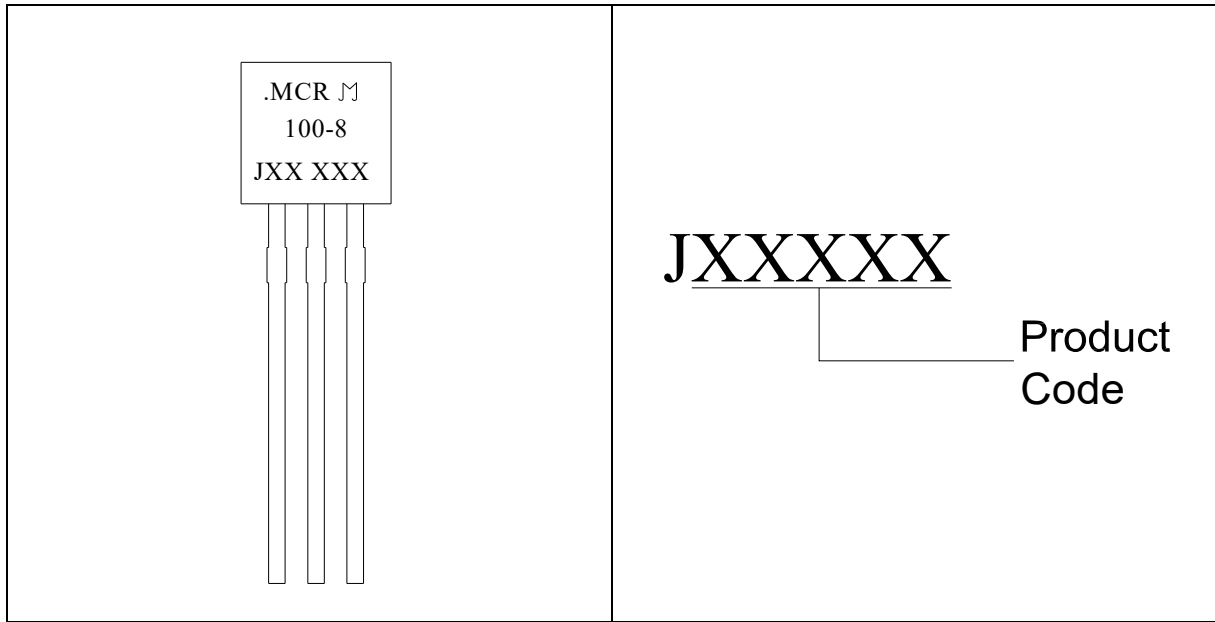


FIG.1 Maximum power dissipation versus RMS on-state current

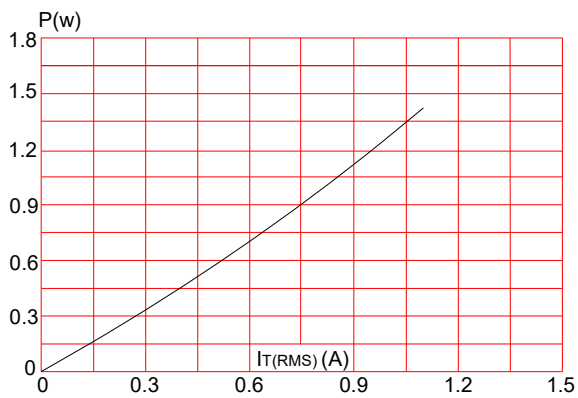


FIG.2: RMS on-state current versus case temperature

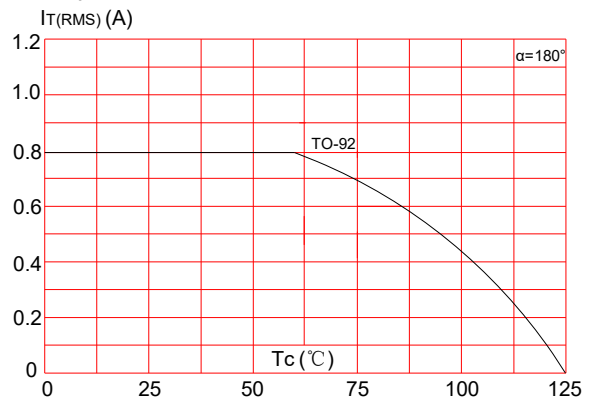


FIG.3: Surge peak on-state current versus number of cycles

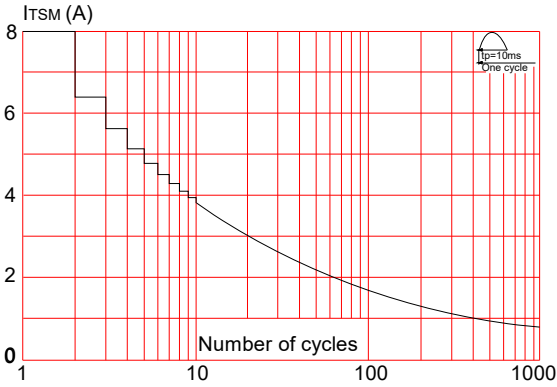


FIG.4: On-state characteristics (maximum values)

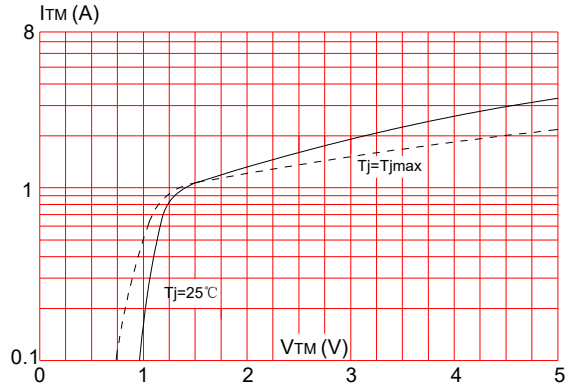


FIG.5: Non-repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 10\text{ms}$, and corresponding value of $f \cdot t$ ($di/dt < 50\text{A}/\mu\text{s}$)

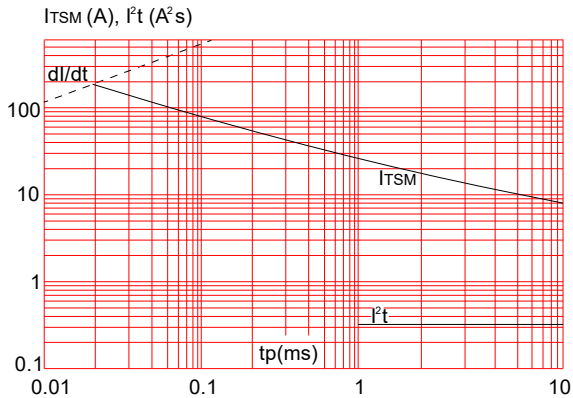


FIG.6: Relative variations of gate trigger current, holding current and latching current versus junction temperature

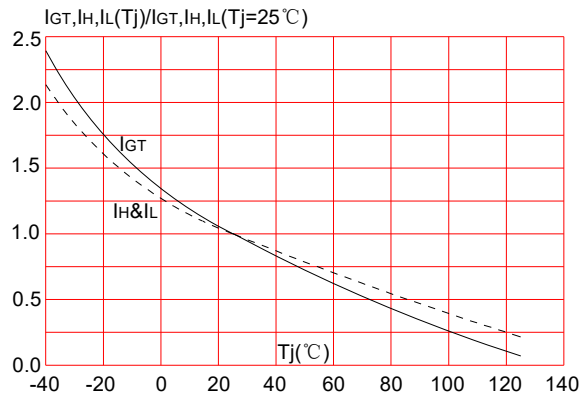
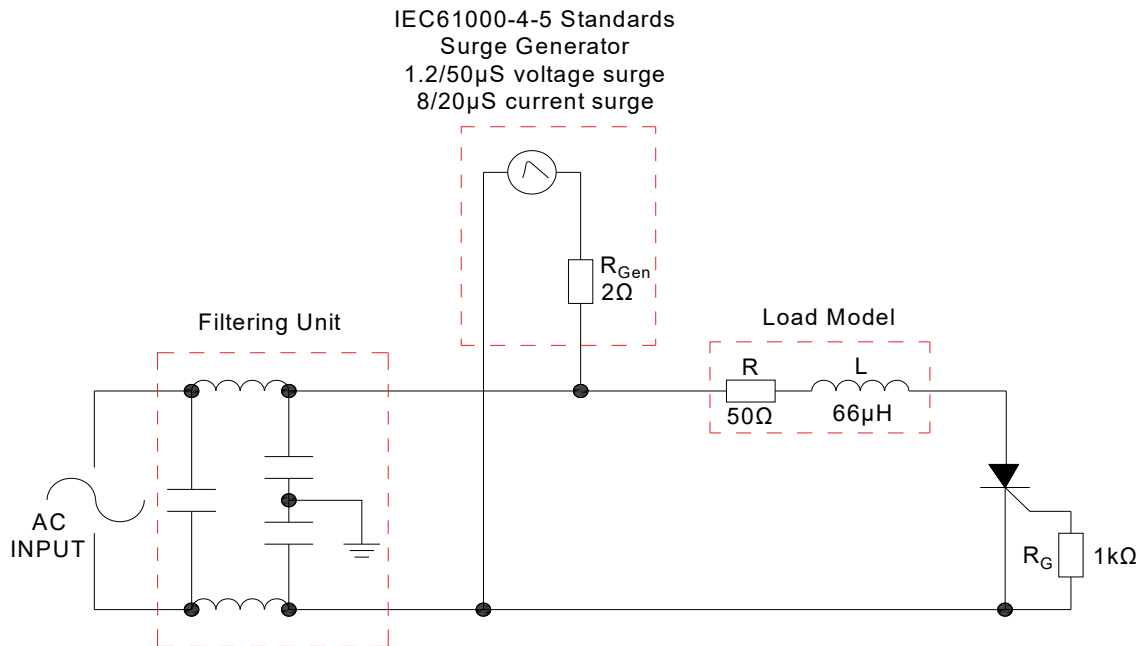


FIG.7: Test circuit for inductive and resistive loads to IEC-61000-4-5 standards.



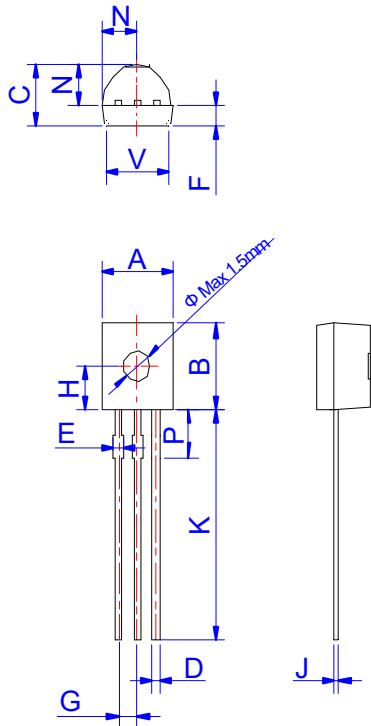
ORDERING INFORMATION

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

Document Revision History

Date	Revision	Changes
Mar 26, 2022	1	Last update
Mar 9, 2022	2	Add V_{pp} & t_{on} & t_{off}

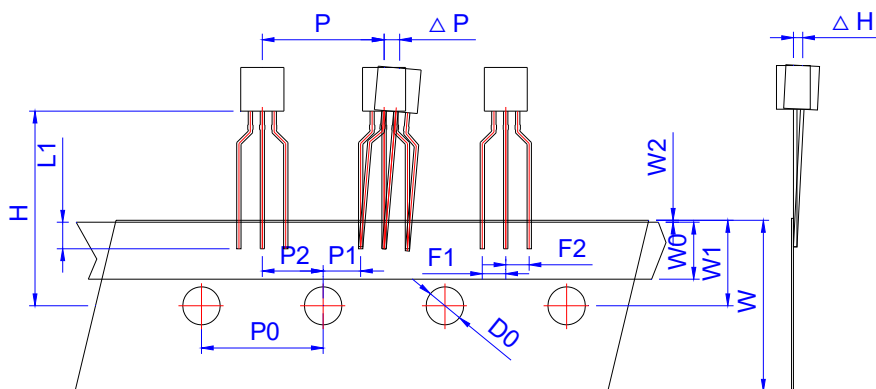
PACKAGE MECHANICAL DATA



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	6.05	6.35	6.65	0.238	0.250	0.262
Δ P	-1.0	0	1.0	-0.039	0	0.039
F1、F2	2.20	2.50	2.80	0.087	0.098	0.110
F1-F2	-0.3	0	0.3	-0.012	0	0.012
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			1.0			0.039
D0	3.80	4.0	4.20	0.150	0.157	0.165
Δ H	-1.0	0	1.0	-0.039	0	0.039
L1	2.5			0.098		
H	18.0	19.0	20.0	0.709	0.748	0.787

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



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