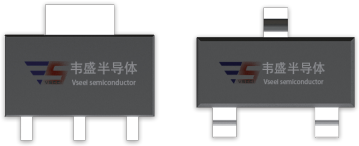
DESCRIPTION:

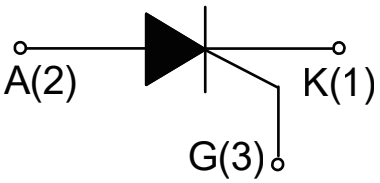
The P0102DN SCR provides high dv/dt rate with strong resistance to electromagnetic interface. They are especially recommended for use on residual current circuit breaker, straight hair, igniter etc.



SOT-89 SOT-23-3

MAIN FEATURES

Symbol	Value	Unit
$I_{T(RMS)}$	0.8	A
I_{GT}	≤200	μA



ABSOLUTE MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Storage junction temperature range		T_{stg}	-40-150	℃
Operating junction temperature range		T_j	-40-125①	℃
Repetitive peak off-state voltage		V_{DRM}	600	V
Repetitive peak reverse voltage		V_{RRM}	600	V
RMS on-state current	SOT-23-3L (T_C=40℃)	$I_{T(RMS)}$	0.8	A
	SOT-89-2L(T_C=70℃)			
	SOT-223-2L (T_C=90℃)			
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/μs
Peak gate current (tp=20μs, T_j=125℃)		I_{GM}	0.2	A
Peak gate power (tp=20μs, T_j=125℃)		P_{GM}	0.5	W
Average gate power dissipation(T_j=125℃)		$P_{G(AV)}$	0.1	W

NOTE 1: When we parallel connect a ≤1KΩ resistor between Gate and Cathode, the Tj can reach 125℃; if without this resistor, the Tj 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=33Ω	20	50	200	μA
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=400V T_j=125℃ R_{GK}=1KΩ	600	-	-	V/μs
dV/dt	V_D=400V T_j=125℃ R_{GK}=220Ω	1000	-	-	V/μs
t_{on}	I_G=10mA I_A=4mA I_R=0.4mA T_j=25℃	-	2	-	μs
t_{off}		-	50	-	μs
R_d	Dynamic Resistance T_j=125℃	-	-	35	mΩ

STATIC CHARACTERISTICS

Symbol	Parameter		Value(MAX)	Unit
V_{TM}	I_T=1.1A tp=380μs	T_j=25℃	1.5	V
I_{DRM}	V_D=V_{DRM} V_R=V_{RRM}	T_j=25℃	5	μA
I_{RRM}		T_j=125℃	100	μA

THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	junction to case	SOT-23-3L	75	℃/W
		SOT-89-2L	45	
		SOT-223-2L	31	
$R_{th(j-a)}$	junction to ambient	SOT-23-3L	125	℃/W
		SOT-89-2L	90	
		SOT-223-2L	60	

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

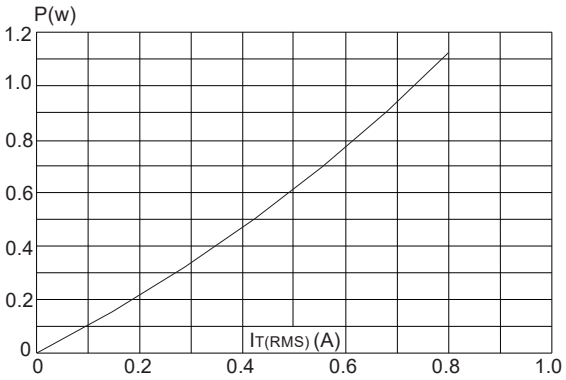


FIG.2: RMS on-state current versus ambient temperature (printed circuit board FR4, copper thickness:35μm)(full cycle)

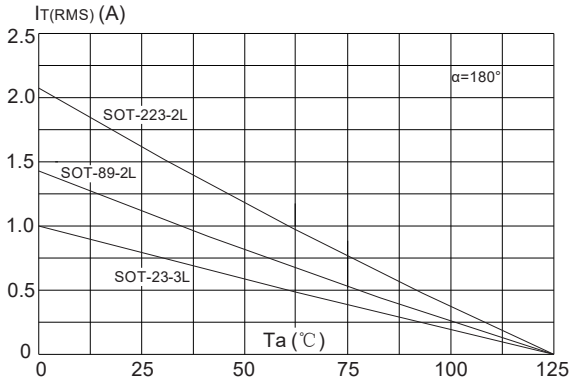


FIG.3: Surge peak on-state current versus number of cycles

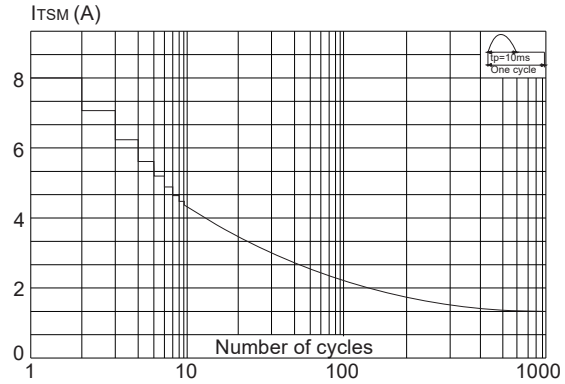


FIG.4: On-state characteristics (maximum values)

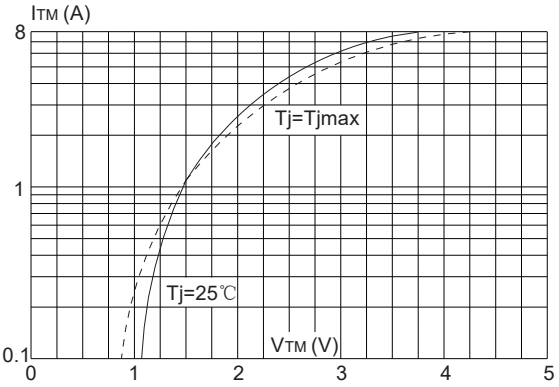


FIG.5: Non-repetitive surge peak on-state current for a sinusoidal pulse with width tp<10ms, and corresponging value of I^2t (dI/dt < 50A/μs)

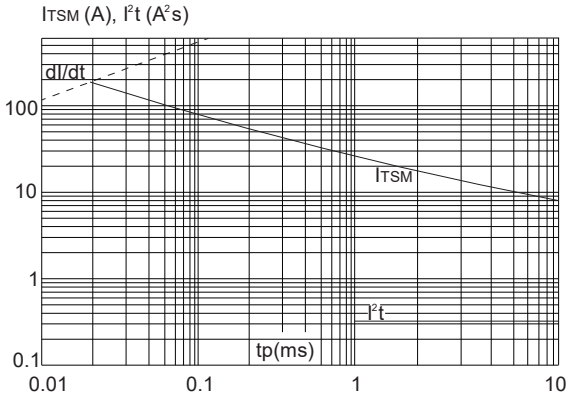
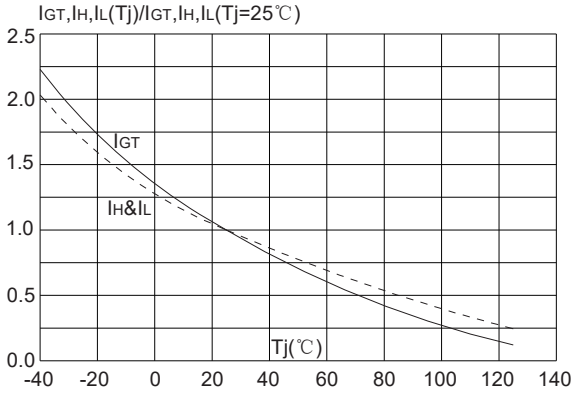


FIG.6: Relative variations of gate trigger current, holding current and latching current versus junction temperature



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) (ts)	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℃