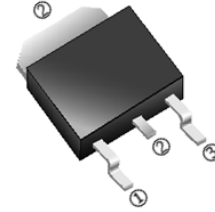


RoHS Compliant Product  
A suffix of "-C" specifies halogen & lead-free

## DESCRIPTION

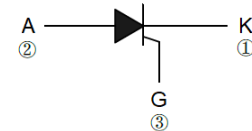
Passivated thyristors in a plastic envelope, intended for use in applications requiring high bidirectional blocking voltage capability and high thermal cycling performance. Typical applications include motor control, industrial and domestic lighting, heating and static switching.

## TO-252(D-Pack)



## ORDER INFORMATION

Part Number	Type
SCR1680D1	Lead (Pb)-free
SCR1680D1-C	Lead (Pb)-free and Halogen-free



## ABSOLUTE MAXIMUM RATINGS

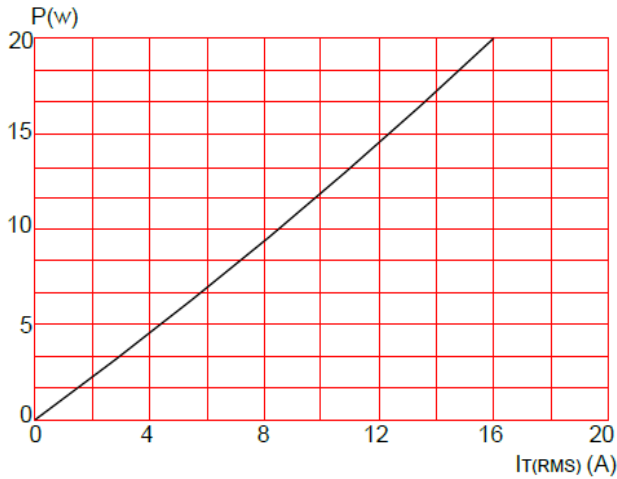
Parameter	Symbol	Rating	Unit
Repetitive Peak Off-State Voltage $T_J=25^\circ\text{C}$	$V_{DRM}$	800	V
Repetitive Peak Reverse Voltage $T_J=25^\circ\text{C}$	$V_{RRM}$	800	V
RMS On-State Current $T_C=103^\circ\text{C}$	$I_{T(RMS)}$	16	A
Non-Repetitive Surge Peak On-State Current @ $t_p=10\text{ms}$	$I_{TSM}$	190	A
$I^2t$ Value for Fusing @ $t_p=10\text{ms}$	$I^2t$	180	$\text{A}^2\text{s}$
Critical Rate of Rise of On-State Current ( $I_G=2 \times I_{GT}$ )	$di/dt$	50	$\text{A}/\mu\text{s}$
Peak Gate Current	$I_{GM}$	4	A
Average Gate Power Dissipation	$P_{G(AV)}$	1	W
Peak Gate Power	$P_{GM}$	5	W
Thermal Resistance Junction-Case	$R_{\theta JC}$	1.4	$^\circ\text{C}/\text{W}$
Operating Junction Temperature Range	$T_J$	-40~125	$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-40~150	

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

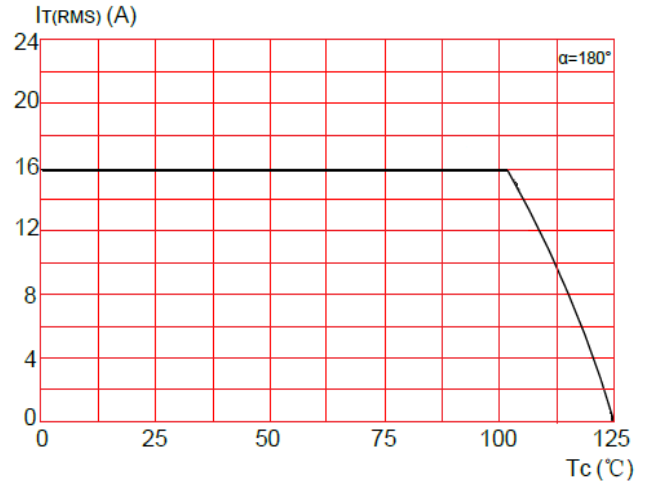
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions	
Gate Trigger Current	$I_{GT}$	-	-	25	mA	$V_D=12\text{V}$ , $R_L=33\Omega$	
Gate Trigger Voltage	$V_{GT}$	-	-	1	V		
Gate Voltage That Will Not Trigger $T_J=125^\circ\text{C}$	$V_{GD}$	0.2	-	-	V	$V_D=V_{DRM}$ , $R_L=3.3\text{k}\Omega$	
Latching Current	$I_L$	-	-	60	mA	$I_G=1.2I_{GT}$	
Holding Current	$I_H$	-	-	40	mA	$I_T=500\text{mA}$	
Critical Rate of Rise of Off-State Voltage $T_J=125^\circ\text{C}$	$dV/dt$	200	-	-	$\text{V}/\mu\text{s}$	$V_D=2/3V_{DRM}$ Gate Open	
Maximum On-State Voltage Drop $T_J=25^\circ\text{C}$	$V_{TM}$	-	-	1.6	V	$I_{TM}=32\text{A}$ , $t_p=380\mu\text{s}$	
Maximum Peak Reverse and Off-State Leakage Current	$T_J=25^\circ\text{C}$	$I_{DRM}$	-	-	5	$\mu\text{A}$	$V_D=V_{DRM}$ , $V_R=V_{RRM}$
	$T_J=125^\circ\text{C}$	$I_{RRM}$	-	-	1	mA	

**TYPICAL CHARACTERISTICS**

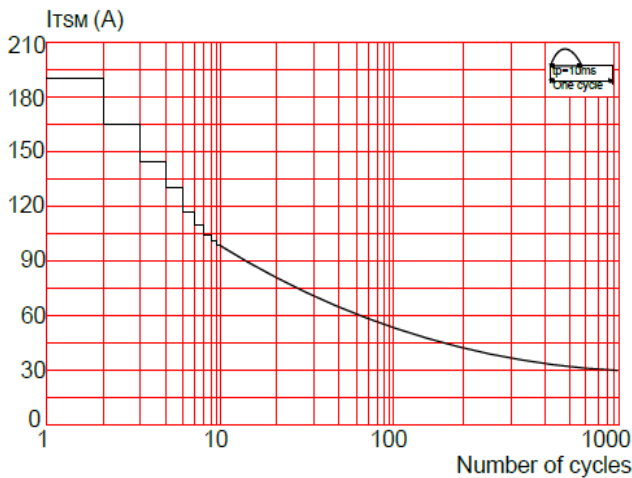
**FIG.1** Maximum power dissipation versus RMS on-state current



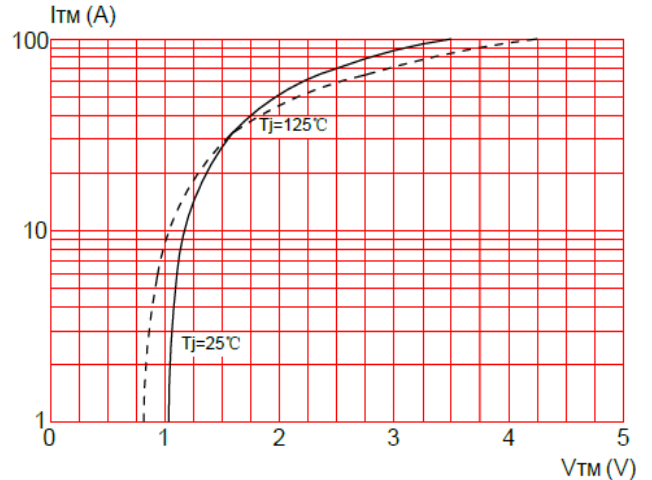
**FIG.2:** RMS on-state current versus case temperature



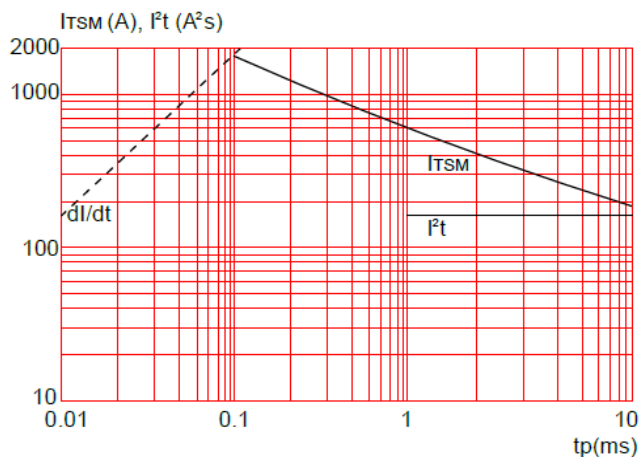
**FIG.3:** Surge peak on-state current versus number of cycles



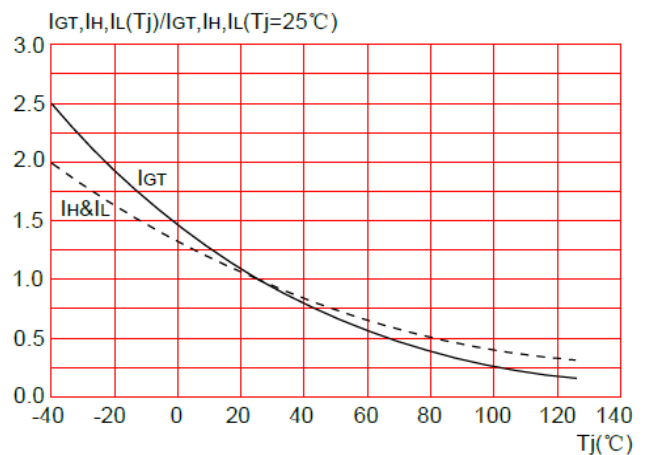
**FIG.4:** On-state characteristics (maximum values)



**FIG.5:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 10ms$ , and corresponding value of  $I^2t$  ( $di/dt < 50A/\mu s$ )

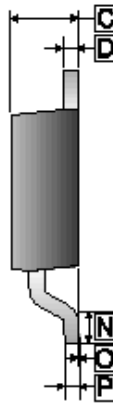
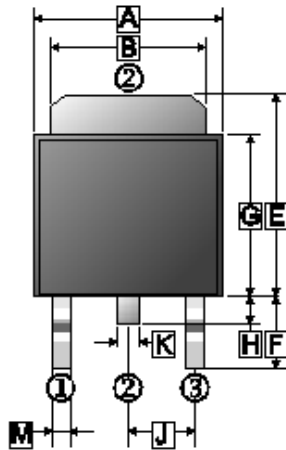


**FIG.6:** Relative variations of gate trigger current, holding current and latching current versus junction temperature



**PACKAGE OUTLINE DIMENSIONS**

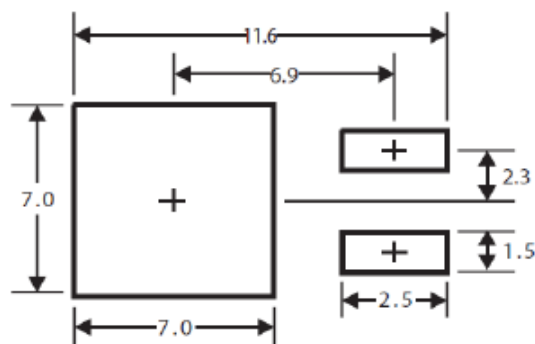
TO-252



REF.	Millimeter	
	Min.	Max.
A	6.30	6.90
B	4.95	5.53
C	2.10	2.50
D	0.40	0.90
E	6.00	7.70
F	2.90 REF.	
G	5.40	6.40
H	0.60	1.20
J	2.30 REF.	
K	0.89 REF.	
M	0.45	1.14
N	1.55 TYP.	
O	0	0.15
P	0.58 REF.	

**MOUNTING PAD LAYOUT**

TO-252



\*Dimensions in millimeters