

## THYRISTOR MODULE

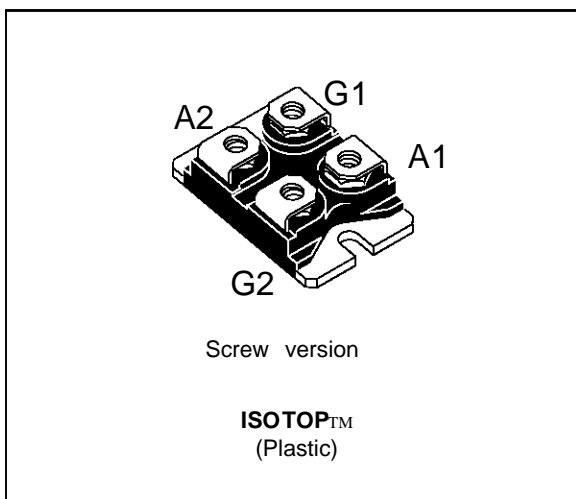
### FEATURES

- $V_{DRM} = V_{RRM}$  UP TO 1400 V
- $I_{T(RMS)} = 55$  A
- HIGH SURGE CAPABILITY
- INSULATED PACKAGE :  
INSULATING VOLTAGE 2500 V<sub>(RMS)</sub>

### DESCRIPTION

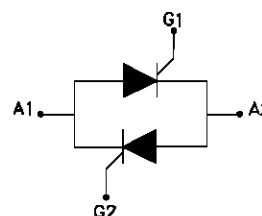
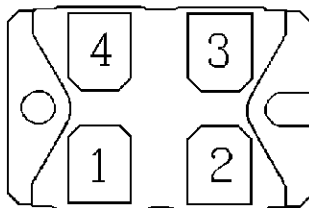
The MSS40 family are constituted of two general purpose SCR. Suitable for AC switching and phase control on resistive and inductive load up to 400 Hz.

The small volume (7cm<sup>3</sup>) and weight (29g) of the isotop package are well adapted to new generation of medium size module market applications.



### PIN CONNECTIONS

- 1 : Thyristor 2 Anode (A2)
- 2 : Thyristor 2 Gate (G2)
- 3 : Thyristor 1 Anode (A1)
- 4 : Thyristor 1 Gate (G1)



### ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit
$I_{T(RMS)}$	RMS on-state current	$T_c = 80^\circ\text{C}$	55	A
$I_{TSM}$	Non repetitive surge peak on-state current ( $T_j$ initial = $25^\circ\text{C}$ )	$t_p = 8.3\text{ms}$	420	A
		$t_p = 10\text{ms}$	400	
$I^2t$	$I^2t$ value for fusing	$t_p = 10\text{ms}$	800	A <sup>2</sup> s
$di/dt$	Critical rate of rise of on-state current Gate supply : $I_G = 400\text{mA}$ - $di_G/dt = 1\text{A}/\mu\text{s}$		100	A/ $\mu\text{s}$
$T_{stg}$ $T_j$	Storage temperature range		- 40 + 150	°C
	Operating junction temperature range		- 40 + 125	

Symbol	Parameter	MSS40			Unit
		-800	-1200	-1400	
$V_{DRM}$ $V_{RRM}$	Repetitive peak off-state voltage $T_j = 125^\circ\text{C}$	800	1200	1400	V

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**THERMAL RESISTANCES**

Symbol	Parameter		Value	Unit
Rth (j-c)	Junction to case	DC	1	°C/W
		AC	0.6	
Rth (c-h)	Contact (case to heatsink) (4)		0.05	°C/W

(4) With contact grease utilisation

**GATE CHARACTERISTICS** (maximum values)

$P_{GM} = 50 \text{ W}$  ( $t_p = 20 \mu\text{s}$ )     $P_G (AV) = 1 \text{ W}$      $I_{FGM} = 4 \text{ A}$  ( $t_p = 20 \mu\text{s}$ )     $V_{RGM} = 5 \text{ V}$ .

**ELECTRICAL CHARACTERISTICS**

Symbol	Test Conditions		Value	Unit	
$I_{GT}$	$V_D=12\text{V}$ (DC) $R_L=33\Omega$	$T_j=25^\circ\text{C}$	MAX	50	mA
$V_{GT}$	$V_D=12\text{V}$ (DC) $R_L=33\Omega$	$T_j=25^\circ\text{C}$	MAX	1.5	V
$V_{GD}$	$V_D=V_{DRM}$ $R_L=3.3\text{k}\Omega$	$T_j=125^\circ\text{C}$	MIN	0.2	V
tgt	$V_D=V_{DRM}$ $I_G = 500\text{mA}$ $di_G/dt = 3\text{A}/\mu\text{s}$	$T_j=25^\circ\text{C}$	TYP	2	$\mu\text{s}$
$I_L$	$I_G=1.2 I_{GT}$	$T_j=25^\circ\text{C}$	TYP	60	mA
			MAX	120	
$I_H$	$I_T= 0.5\text{A}$ gate open	$T_j=25^\circ\text{C}$	TYP	40	mA
			MAX	80	
$V_{TM}$	$I_{TM}= 80\text{A}$ $t_p= 380\mu\text{s}$	$T_j=25^\circ\text{C}$	MAX	1.7	V
$I_{DRM}$ $I_{RRM}$	$V_{DRM}$ Rated $V_{RRM}$ Rated	$T_j=25^\circ\text{C}$	MAX	0.05	mA
		$T_j=125^\circ\text{C}$	MAX	10	
tq	$I_T= 80\text{A}$ $V_R=75\text{V}$ $V_D=67\%V_{DRM}$ $di/dt=30\text{A}/\mu\text{s}$ $dV/dt=20\text{V}/\mu\text{s}$ Gate open	$T_j=125^\circ\text{C}$	TYP	100	$\mu\text{s}$
dV/dt *	Linear slope up to $V_D=67\%V_{DRM}$ gate open	$T_j=125^\circ\text{C}$	MIN	500	V/ $\mu\text{s}$

\* For higher guaranteed values, please consult us.

**Note :** MSS40-1400

- $I_{DRM}$  and  $I_{RRM}$  at  $T_j = 125^\circ\text{C}$  is defined at 1200 V
- dV/dt at  $T_j = 125^\circ\text{C}$  is defined at 67% of 1200 V

Fig. 1 : Maximum RMS power dissipation versus RMS on-state current.  
(F= 50 Hz)

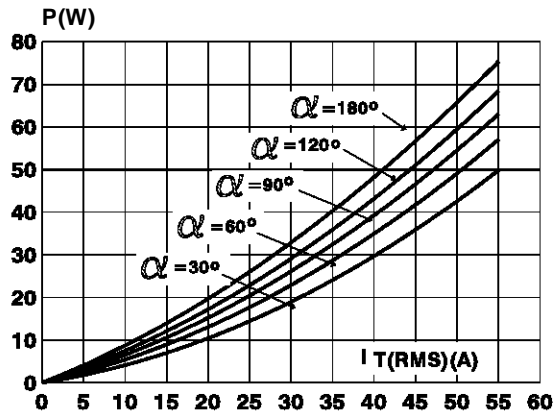


Fig. 3 : RMS on-state current versus case temperature.

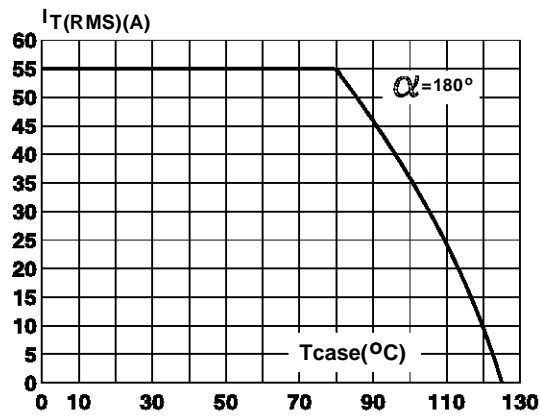


Fig. 5 : Relative variation of gate trigger and holding current versus junction temperature.

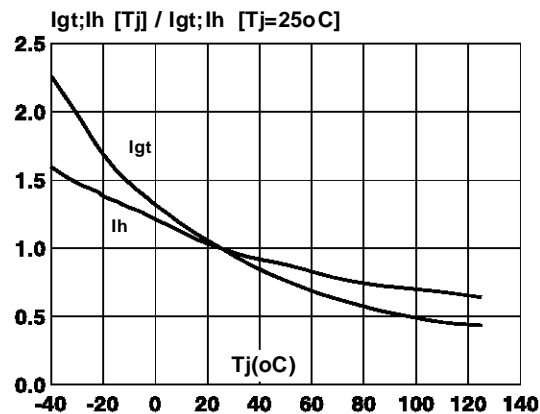


Fig. 2 : Correlation between maximum RMS power dissipation and maximum allowable temperature (Tamb) for different thermal resistances heatsink + contact.

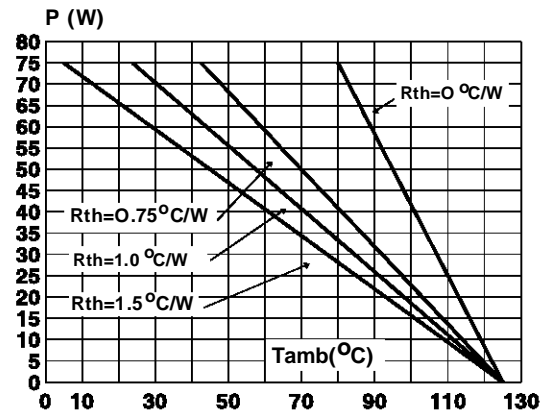


Fig. 4 : Thermal transient impedance junction to case versus pulse duration.

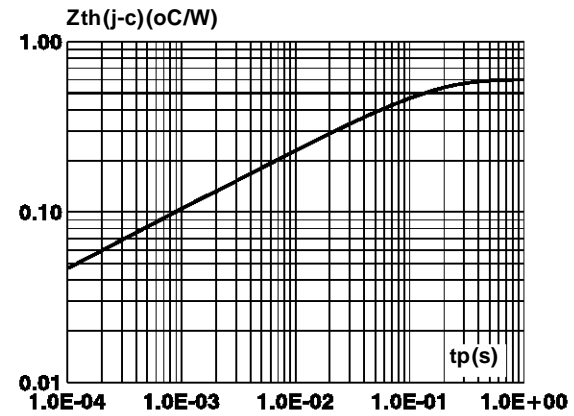
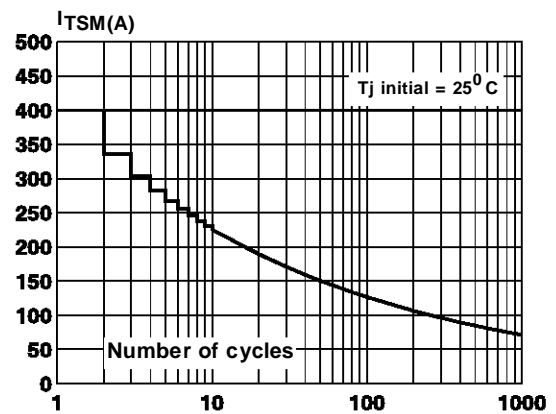
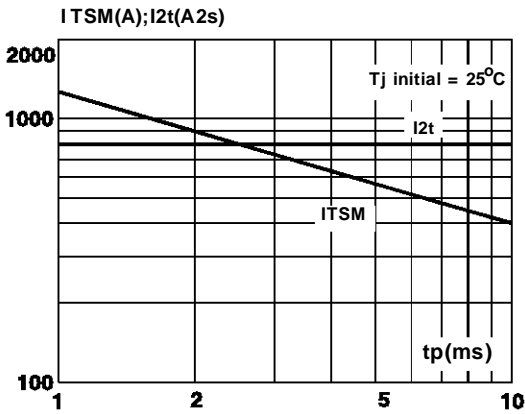


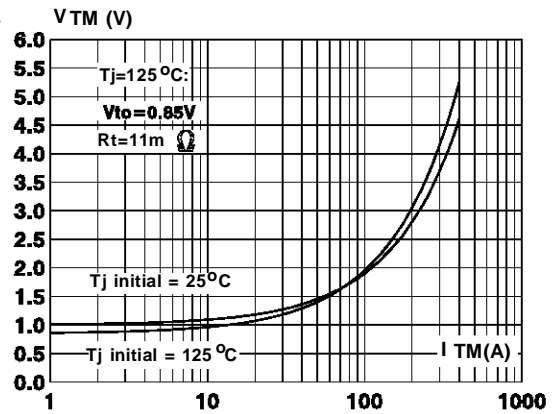
Fig. 6 : Non repetitive surge peak on-state current versus number of cycles.



**Fig.7 :** Non repetitive surge peak on-state current for a sinusoidal pulse with width :  $t_p \leq 10$  ms and corresponding value of  $I^2t$ .

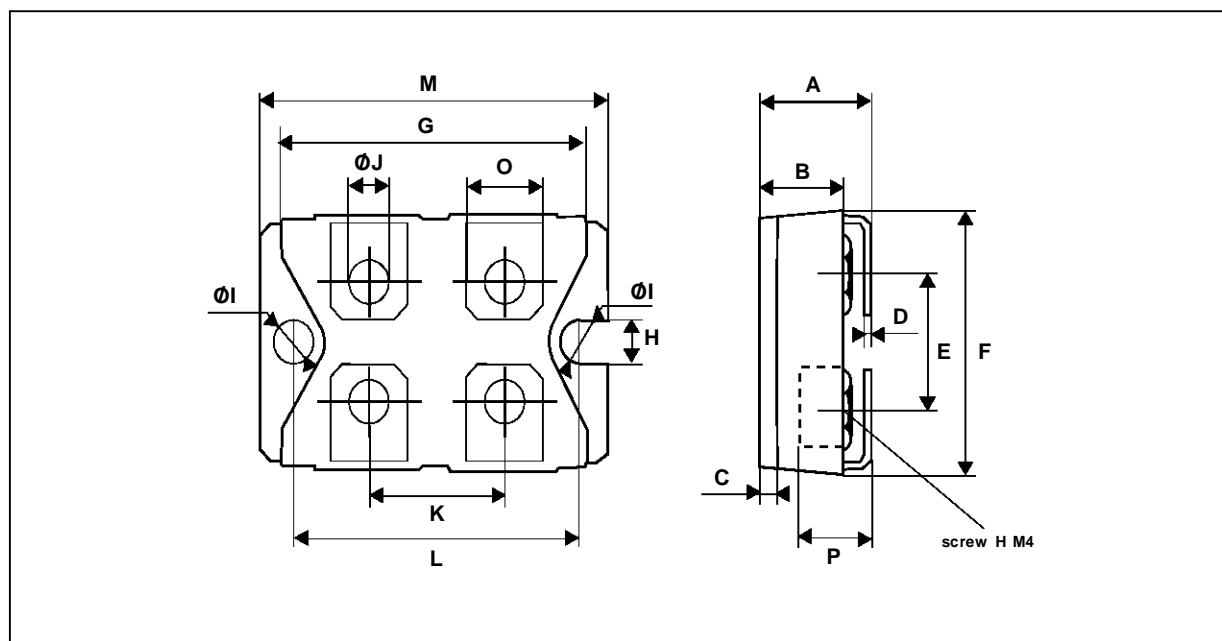


**Fig. 8 :** On-state characteristics .  
(Maximum values)



## PACKAGE MECHANICAL DATA

ISOTOP plastic : SCREW VERSION



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	11.80	12.20	0.465	0.480
B	8.90	9.10	0.350	0.358
C	1.95	2.05	0.077	0.081
D	0.75	0.85	0.029	0.034
E	12.60	12.80	0.496	0.504
F	25.10	25.50	0.988	1.004
G	31.50	31.70	1.240	1.248
H	4.00		0.157	
I	4.10	4.30	0.161	0.169
J	4.10	4.30	0.161	0.169
K	14.90	15.10	0.586	0.595
L	30.10	30.30	1.185	1.193
M	37.80	38.20	1.488	1.504
O	7.80	8.20	0.307	0.323
P	5.50		0.216	

Cooling method : C  
 Marking : Type number  
 Weight : 28 g. (without screws)  
 Electrical isolation : 2500V(RMS)  
 Capacitance : < 45 pF  
 Inductance : < 5 nH

- Recommended torque value : 1.3 N.m (Max 1.5 N.m) for the 6 x M4 screws. (2 x M4 screws recommended for mounting the package on the heatsink and the 4 screws given with the screw version).
- The screws supplied with the package are adapted for mounting on a board (or others types of terminals) with a thickness of 0.6 mm min and 2.2 mm max.

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