

## Three Phase Bridge + Thyristor

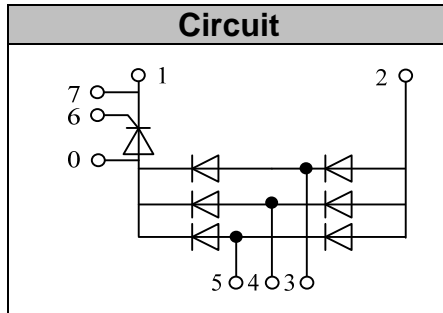
**V<sub>RRM</sub> / V<sub>DRM</sub>** 800 to 1600V  
**I<sub>FAV</sub> / I<sub>TAV</sub>** 75Amp

### Features

- Blocking voltage:800 to 1600V
- Three Phase Bridge and a Thyristor
- Isolated Module package

### Applications

- Inverter for AC or DC motor control
- Current stabilized power supply
- Switching power supply
- UL E243882 approved



### Module Type

TYPE	V <sub>RRM</sub> / V <sub>DRM</sub>	V <sub>RSM</sub>
MSDT75-08	800V	900V
MSDT75-12	1200V	1300V
MSDT75-16	1600V	1700V

### ◆ Diode

#### Maximum Ratings

Symbol	Item	Conditions	Values	Units
I <sub>D</sub>	Output Current(D.C.)	T <sub>c</sub> =101°C Three phase full wave	75	A
I <sub>FSM</sub>	Surge forward current	t=10mS T <sub>vj</sub> =45°C	920	A
i <sup>2</sup> t	Circuit Fusing Consideration		4200	A <sup>2</sup> s
Visol	Isolation Breakdown Voltage(R.M.S)	a.c.50HZ;r.m.s.;1min	3000	V
T <sub>vj</sub>	Operating Junction Temperature		-40 to +150	°C
T <sub>stg</sub>	Storage Temperature		-40 to +125	°C
M <sub>t</sub>	Mounting Torque	To terminals(M5)	3±15%	Nm
M <sub>s</sub>		To heatsink(M5)	3±15%	Nm
Weight		Module (Approximately)	210	g

#### Thermal Characteristics

Symbol	Item	Conditions	Values	Units
R <sub>th(j-c)</sub>	Thermal Impedance, max.	Junction to Case(TOTAL)	0.20	°C/W
R <sub>th(c-s)</sub>	Thermal Impedance, max.	Case to Heatsink	0.10	°C/W

#### Electrical Characteristics

Symbol	Item	Conditions	Values	Units
V <sub>FM</sub>	Forward Voltage Drop, max.	T=25°C I <sub>F</sub> =100A	1.40	V
I <sub>RRM</sub>	Repetitive Peak Reverse Current, max.	T <sub>vj</sub> =25°C V <sub>RD</sub> =V <sub>RRM</sub> T <sub>vj</sub> =150°C V <sub>RD</sub> =V <sub>RRM</sub>	≤0.5 ≤6	mA mA

## ◆ Thyristor

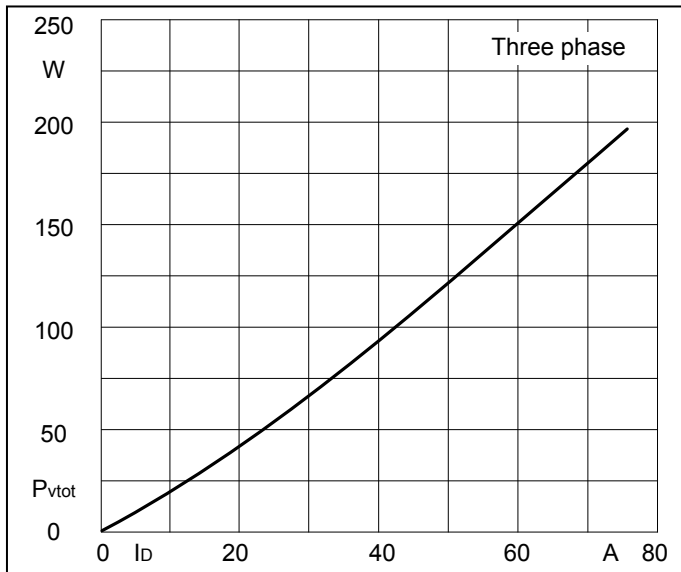
### Maximum Ratings

Symbol	Item	Conditions	Values	Units
$I_{TAV}$	Average On-State Current	$T_c=99^{\circ}\text{C}$ , Single Phase half wave 180° conduction	75	A
$I_{TSM}$	Surge On-State Current	$T_{VJ}=45^{\circ}\text{C}$ , $t=10\text{ms}$ (50Hz), sine $V_R=0$	920	A
$i^2t$	Circuit Fusing Consideration		4200	$\text{A}^2\text{s}$
Visol	Isolation Breakdown Voltage(R.M.S)	a.c.50HZ;r.m.s.;1 min	3000	V
$T_{vj}$	Operating Junction Temperature		-40 to +125	$^{\circ}\text{C}$
$T_{stg}$	Storage Temperature		-40 to +125	$^{\circ}\text{C}$
$M_t$	Mounting Torque	To terminals(M5)	3±15%	Nm
$M_s$		To heatsink(M5)	3±15%	Nm
$di/dt$	Critical Rate of Rise of On-State Current	$T_{VJ}=T_{VJM}$ , $V_D=1/2V_{DRM}$ , $I_G=100\text{mA}$ $d_{iG}/d_t=0.1\text{A}/\mu\text{s}$	150	$\text{A}/\mu\text{s}$
$dv/dt$	Critical Rate of Rise of Off-State Voltage, min.	$T_J=T_{VJM}$ , $V_D=2/3V_{DRM}$ , linear voltage rise	500	$\text{V}/\mu\text{s}$

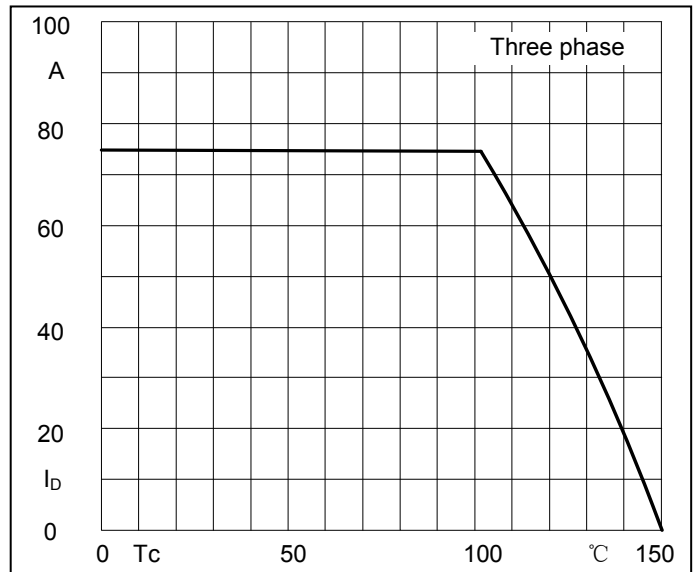
### Electrical and Thermal Characteristics

Symbol	Item	Conditions	Values			Units
			Min.	Typ.	Max.	
$V_{TM}$	Peak On-State Voltage, max.	$T=25^{\circ}\text{C}$ $I_T=100\text{A}$			1.30	V
$I_{RRM}/I_{DRM}$	Repetitive Peak Reverse Current, max. / Repetitive Peak Off-State Current, max.	$T_{VJ}=T_{VJM}$ , $V_R=V_{RRM}$ , $V_D=V_{DRM}$			20	mA
$V_{GT}$	Gate Trigger Voltage, max.	$T_{VJ}=25^{\circ}\text{C}$ , $V_D=6\text{V}$			3	V
$I_{GT}$	Gate Trigger Current, max.	$T_{VJ}=25^{\circ}\text{C}$ , $V_D=6\text{V}$			150	mA
$R_{th(j-c)}$	Thermal Impedance, max.	Junction to Case			0.30	$^{\circ}\text{C}/\text{W}$
$R_{th(c-s)}$	Thermal Impedance, max.	Case to Heatsink			0.10	$^{\circ}\text{C}/\text{W}$

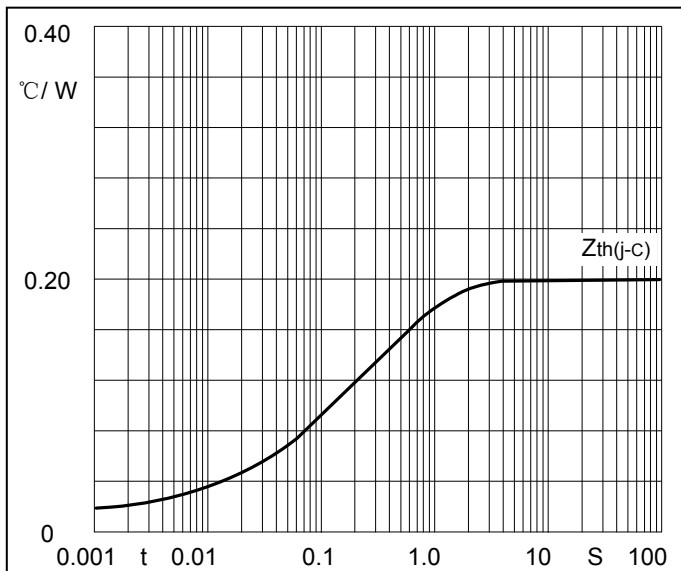
## Performance Curves



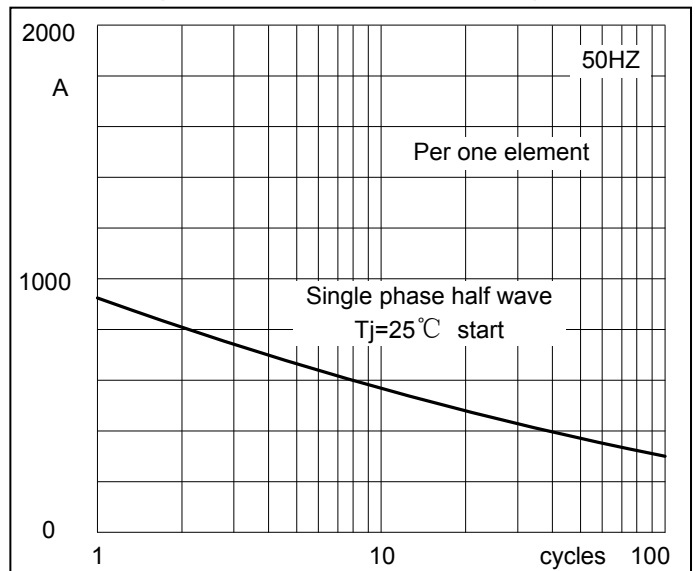
**Fig1. Power dissipation**



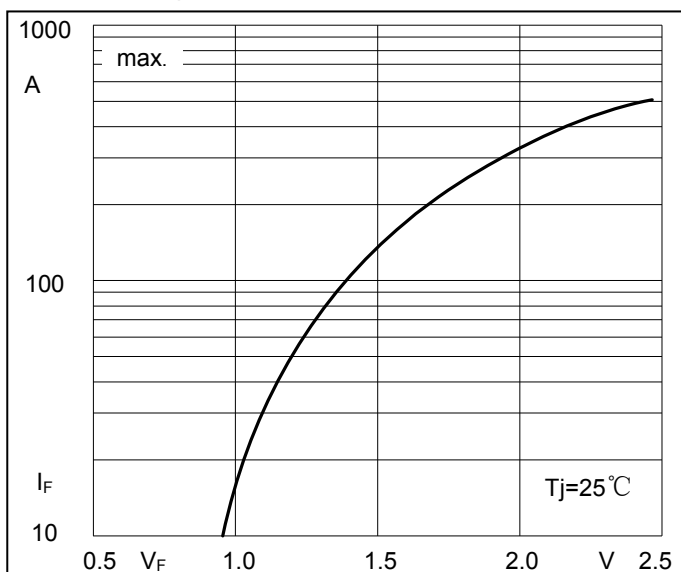
**Fig2. Forward Current Derating Curve**



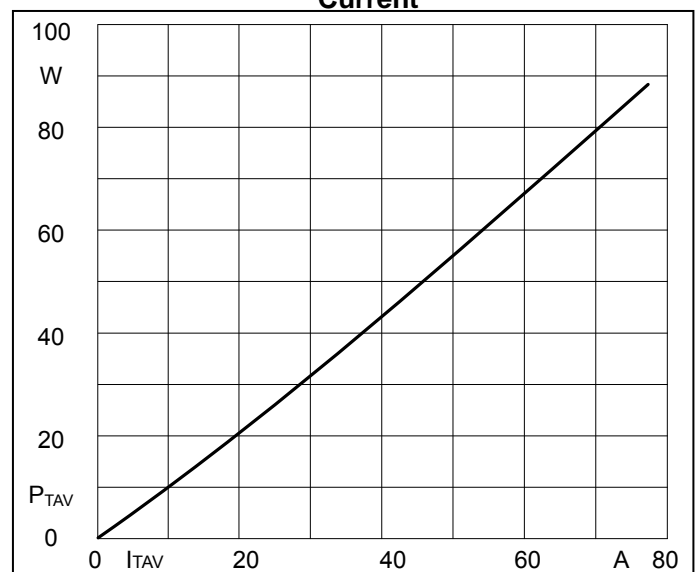
**Fig3. Transient thermal impedance**



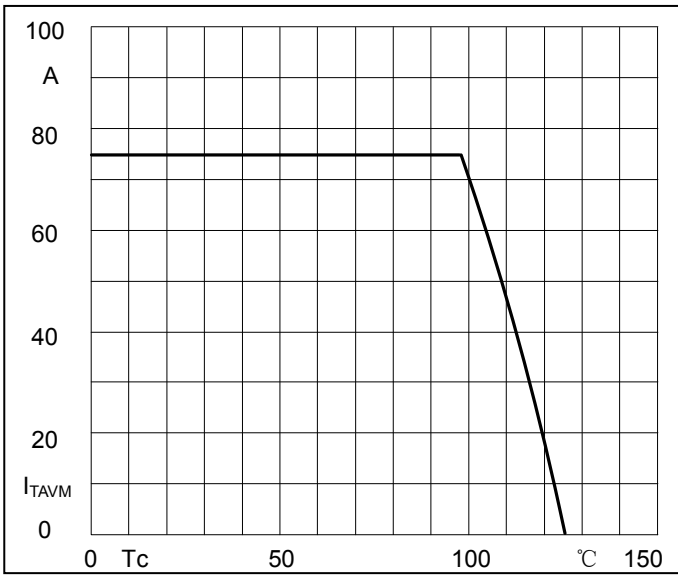
**Fig4. Max Non-Repetitive Forward Surge Current**



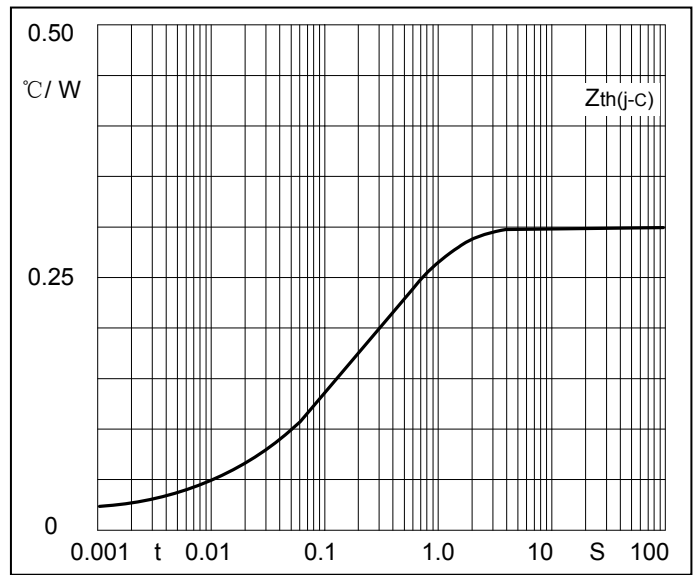
**Fig5. Forward Characteristics**



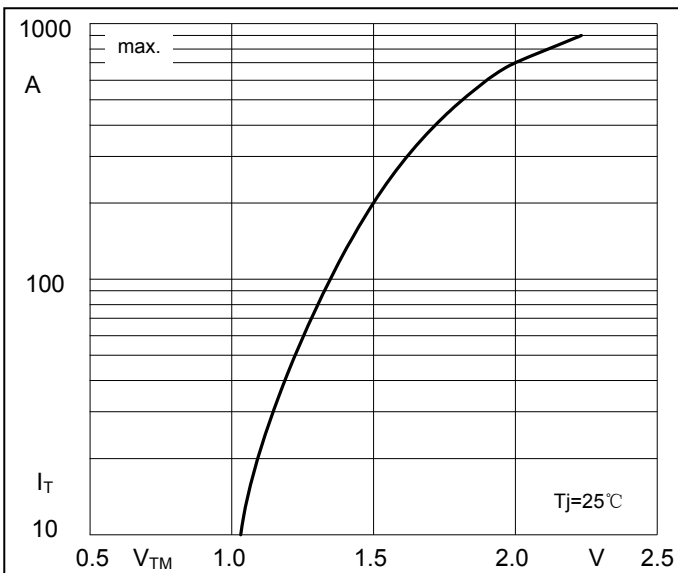
**Fig6. SCR Power dissipation**



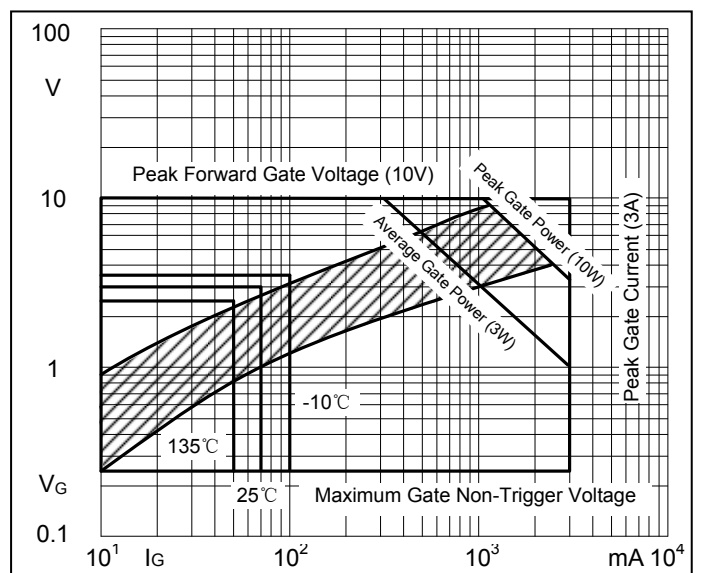
**Fig7. SCR Forward Current Derating Curve**



**Fig8. SCR Transient thermal impedance**



**Fig9. SCR Forward Characteristics**



**Fig10. Gate trigger Characteristics**

## Package Outline Information

