

## Three Phase Diode Bridge & Thyristor Module

$V_{DRM} / V_{RRM}$  800 to 1600V  
 $I_{FAV} / I_{TAV}$  200 Amp



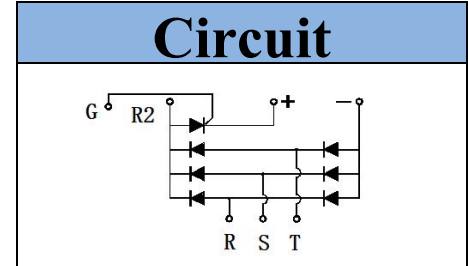
### Features

- Aluminum oxide DBC
- Glass passivated chip

### Applications

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

### Module Type



Type	$V_{RRM} / V_{DRM}$	$V_{RSM}$
MDST200-08	800V	900V
MDST200-12	1200V	1300V
MDST200-16	1600V	1700V

### Diode

#### Maximum Ratings

Symbol	Item	Conditions	Values	Unit
$I_D$	Output Current	Three Phase, Full Wave $T_c = 90^\circ\text{C}$	200	A
$I_{FSM}$	Surge Forward Current	$T_j = 25^\circ\text{C}$ , $t = 50\text{Hz}(10\text{ms})$ , $V_R = 0\text{V}$	2240	A
$I^2t$	Circuit Fusing Consideration	$t = 10\text{ms}$ $T_j = 25^\circ\text{C}$	25088	$\text{A}^2\text{s}$
$V_{ISO}$	Isolation Breakdown Voltage	AC 50Hz/60Hz; R.M.S; 1min	3000	V
$T_j$	Operating Junction Temperature		-40 to +150	$^\circ\text{C}$
$T_{stg}$	Storage Temperature		-40 to +125	$^\circ\text{C}$
$M_t$	Mounting Torque	To Terminals(M4)	$2 \pm 15\%$	N·m
$M_s$		To Terminals(M6)	$5 \pm 15\%$	
		To Heatsink(M6)	$5 \pm 15\%$	
Weight	Module (Approximately)		360	g

#### Thermal Characteristics

Symbol	Item	Conditions	Values	Unit
$R_{th(j-c)}$	Thermal Impedance, Max	Junction to Case(Per Module)	0.12	$^\circ\text{C}/\text{W}$
$R_{th(c-s)}$	Thermal Impedance, Max	Case to Heat Sink	0.05	$^\circ\text{C}/\text{W}$

#### Electrical Characteristics

Symbol	Item	Conditions	Values			Unit
			Min.	Typ.	Max.	
$V_{FM}$	Forward Voltage Drop, Max	$T_j = 25^\circ\text{C}$ $I_F = 200\text{A}$	—	—	1.35	V
$I_{RRM}$	Repetitive Peak Reverse Current, Max	$T_j = 25^\circ\text{C}$ $V_R = V_{RRM}$	—	—	0.5	mA
		$T_j = 150^\circ\text{C}$ $V_R = V_{RRM}$	—	—	10	
$V_{T0}$	Threshold Voltage, for power loss calculation only	$T_j = 125^\circ\text{C}$	0.80			V
$r_T$	Slope Resistance, for power loss calculation only	$T_j = 125^\circ\text{C}$	2.25			m $\Omega$

**Thyristor**

■ Maximum Ratings

Symbol	Item	Conditions	Values	Unit
$I_{TAV}$	Average On-state Current	$T_c = 90^\circ\text{C}$ , Three Phase Full Wave Rectified	200	A
$I_{TSM}$	Surge On-state Current	$T_j = 25^\circ\text{C}$ , $t = 50\text{Hz}(10\text{ms})$ , $V_R = 0\text{V}$	2400	A
$I^2t$	Circuit Fusing Consideration		28800	$\text{A}^2\text{s}$
$V_{ISO}$	Isolation Breakdown Voltage	AC 50Hz; R.M.S;1min	3000	V
$T_j$	Operating Junction Temperature		-40 to + 125	$^\circ\text{C}$
$T_{stg}$	Storage Temperature		-40 to + 125	$^\circ\text{C}$
$di/dt$	Critical Rate of Rise of On-state Current, Max	$T_j = 125^\circ\text{C}$ , $V_D = 1/2V_{DRM}$ , $I_G = 150\text{mA}$ , $di_G/dt = 0.1\text{A}/\mu\text{s}$	150	$\text{A}/\mu\text{s}$

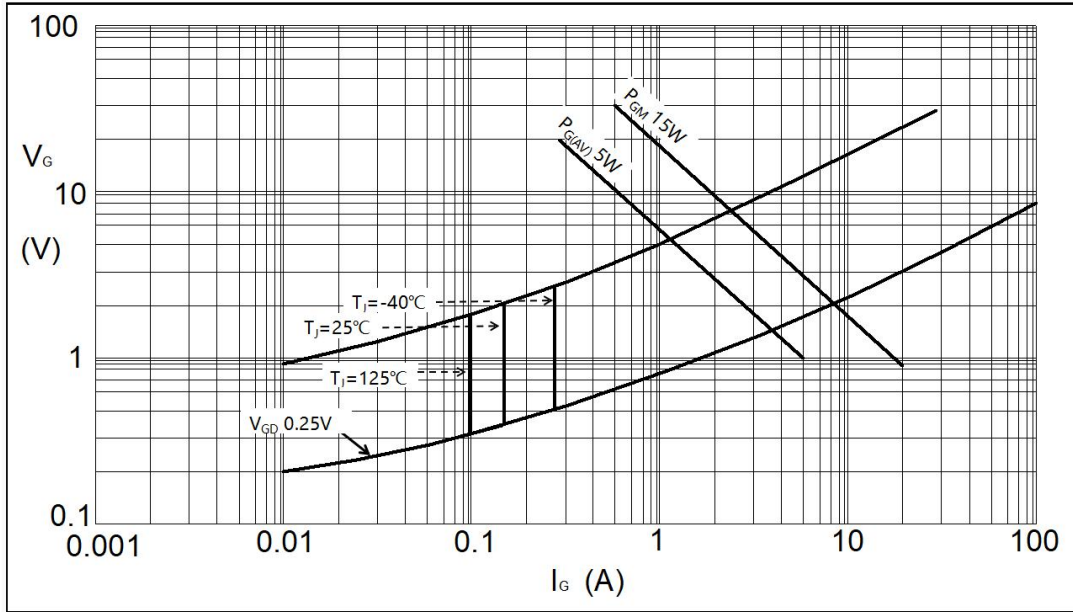
■ Thermal Characteristics

Symbol	Item	Conditions	Values	Unit
$R_{th(j-c)}$	Thermal Impedance, Max	Junction to Case	0.14	$^\circ\text{C}/\text{W}$
$R_{th(c-s)}$	Thermal Impedance, Max	Case to Heat Sink	0.05	$^\circ\text{C}/\text{W}$

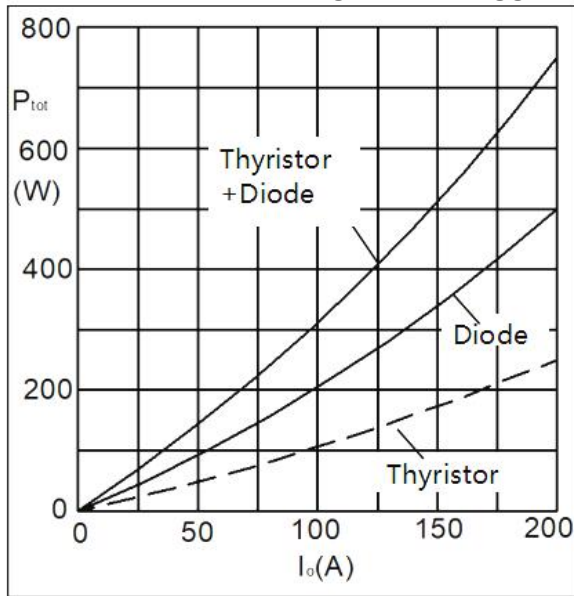
■ Electrical Characteristics

Symbol	Item	Conditions	Values			Unit
			Min.	Typ.	Max.	
$V_{TM}$	Peak On-State Voltage, Max	$T_j = 25^\circ\text{C}$ , $I_T = 200\text{A}$	-	-	1.30	V
$I_{DRM}$ $I_{RRM}$	Repetitive Peak Reverse Current, Max /Repetitive Peak Off-state Current, Max	$T_j = 125^\circ\text{C}$ , $V_R = V_{RRM}$ , $V_D = V_{DRM}$	-	-	30	mA
$V_{GT}$	Gate Trigger Voltage, Max	$T_j = 25^\circ\text{C}$ , $V_D = 6\text{V}$	-	-	3.0	V
$I_{GT}$	Gate Trigger Current, Max	$T_j = 25^\circ\text{C}$ , $V_D = 6\text{V}$	-	-	150	mA
$V_{GD}$	Gate Non-Trigger Voltage, Max	$T_j = 125^\circ\text{C}$ , $V_D = 2/3V_{DRM}$	-	-	0.25	V
$I_L$	Latching Current	$T_j = 25^\circ\text{C}$	-	200	-	mA
$I_H$	Holding Current	$T_j = 25^\circ\text{C}$	-	150	-	mA
$t_{gt}$	Turn On Time	$T_j = 25^\circ\text{C}$	-	3	-	$\mu\text{s}$
$dv/dt$	Critical Rate of Rise of Off-state Voltage, Min	$T_j = 125^\circ\text{C}$ , $V_D = 2/3V_{DRM}$ Linear Voltage Rise	500			$\text{V}/\mu\text{s}$
$V_{TO}$	Threshold Voltage, for power loss calculation only	$T_j = 125^\circ\text{C}$	0.89			V
$r_T$	Slope Resistance, for power loss calculation only	$T_j = 125^\circ\text{C}$	1.8			$\text{m}\Omega$

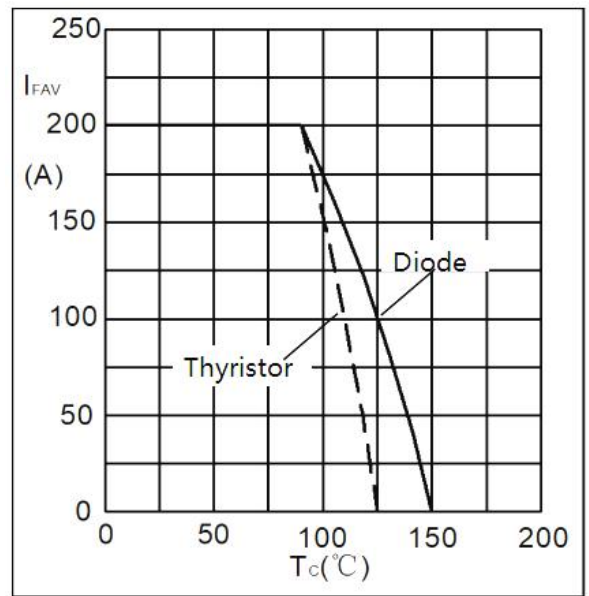
**Performance Curves**



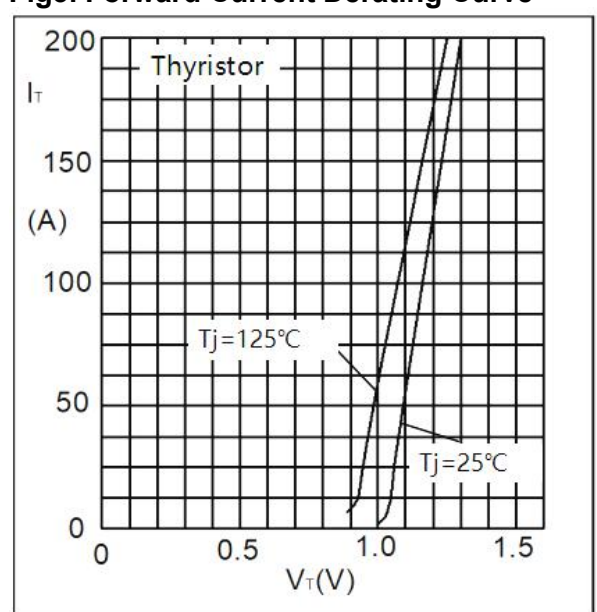
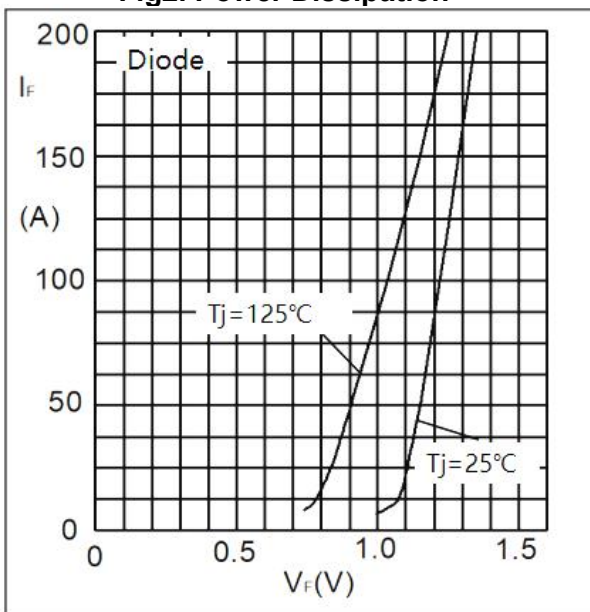
**Fig1. Gate Trigger Characteristics**



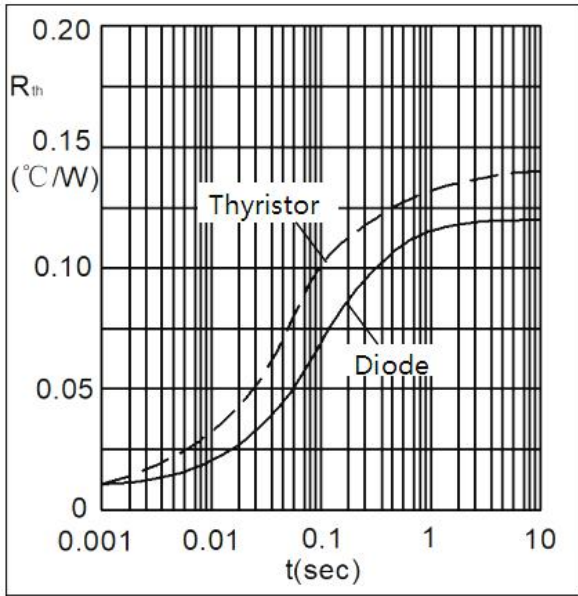
**Fig2. Power Dissipation**



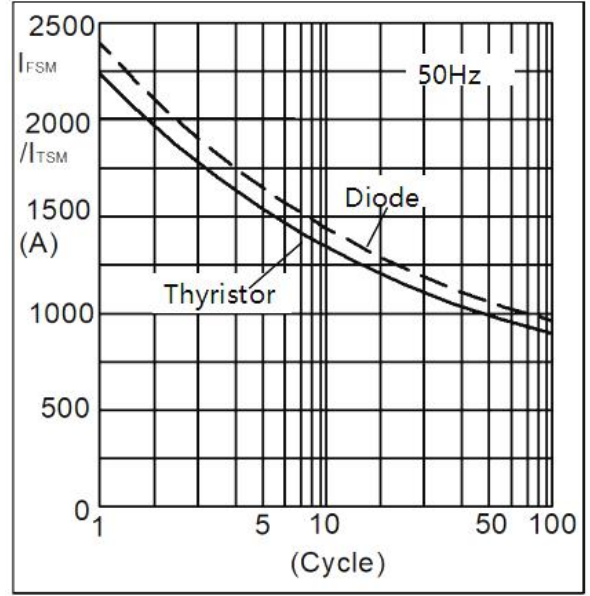
**Fig3. Forward Current Derating Curve**



**Fig4. Forward Characteristics**



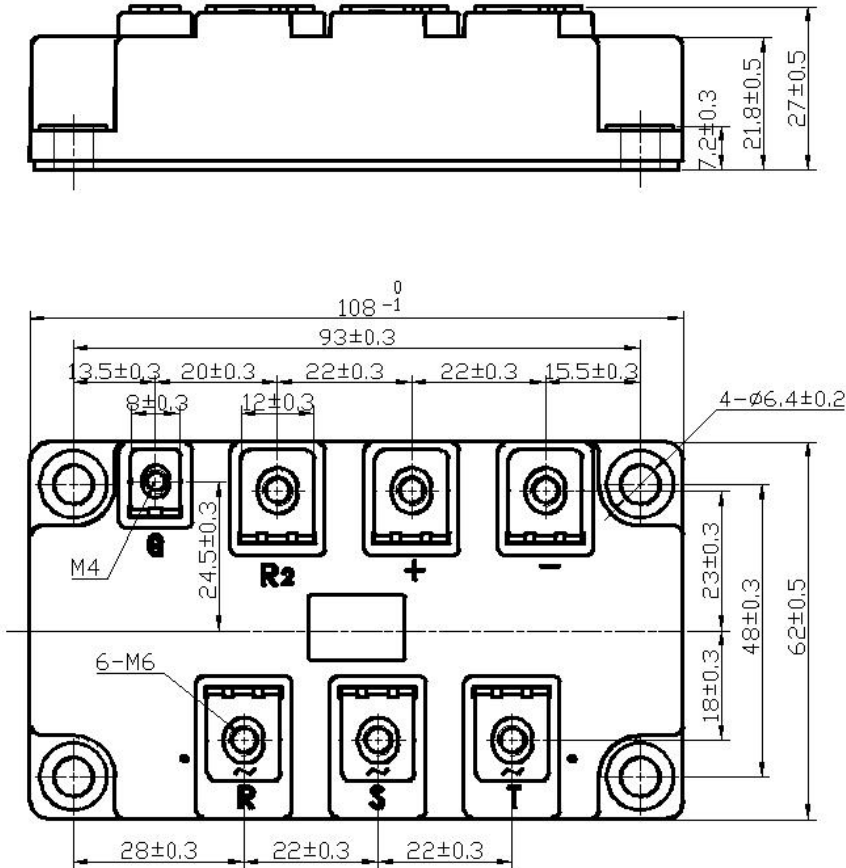
**Fig5. Transient Thermal impedance**



**Fig6. Max Non-Repetitive Forward Surge Current**

**Package Outline Information**

**CASE: M51B**



**Dimensions in mm**

**\*IMPORTANT INFORMATION AND WARNINGS**

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