

Three Phase Diode Bridge & Thyristor Module

V_{DRM} / V_{RRM} 800 to 1600V
 I_{FAV} / I_{TAV} 150 Amp



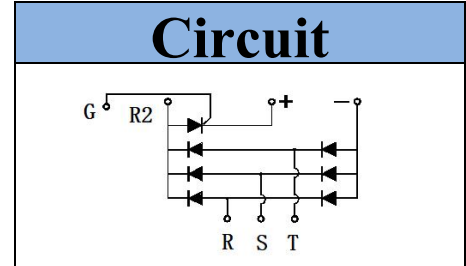
Features

- 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}
MDST150-08	800V	900V
MDST150-12	1200V	1300V
MDST150-16	1600V	1700V

Diode

Maximum Ratings

Symbol	Item	Conditions	Values	Unit
I_D	Output Current	Three Phase, Full Wave $T_c = 96^\circ\text{C}$	150	A
I_{FSM}	Surge Forward Current	$t = 10\text{ms } T_j = 25^\circ\text{C}$	1800	A
I^2t	Circuit Fusing Consideration	$t = 10\text{ms } T_j = 25^\circ\text{C}$	16200	A^2s
V_{ISO}	Isolation Breakdown Voltage	AC 50Hz; 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)	0.15	$^\circ\text{C/W}$
$R_{th(c-s)}$	Thermal Impedance, Max	Case to Heat Sink	0.05	$^\circ\text{C/W}$

Electrical Characteristics

Symbol	Item	Conditions	Values			Unit
			Min.	Typ.	Max.	
V_{FM}	Forward Voltage Drop, Max	$T_j = 25^\circ\text{C } I_F = 150\text{A}$	—	—	1.30	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_{TO}	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	$T_j = 125^\circ\text{C}$	2.6			m Ω

Thyristor

■ Maximum Ratings

Symbol	Item	Conditions	Values	Unit
I_{TAV}	Average On-state Current	$T_c = 92^\circ\text{C}$, Three Phase Full Wave Rectified	150	A
I_{TSM}	Surge On-state Current	$T_j = 25^\circ\text{C}$, $t = 50\text{Hz}(10\text{ms})$, $V_R = 0\text{V}$	2000	A
I^2t	Circuit Fusing Consideration		20000	A^2s
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	$T_j = 125^\circ\text{C}$, $V_D = 1/2V_{DRM}$, $I_G = 100\text{mA}$, $di_G/dt = 0.1\text{A}/\mu\text{s}$	150	$\text{A}/\mu\text{s}$

■ Thermal Characteristics

Symbol	Item	Conditions	Values	Unit
$R_{th(j-c)}$	Thermal Impedance, Max	Junction to Case	0.17	$^\circ\text{C}/\text{W}$
$R_{th(c-s)}$	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	$T_j = 25^\circ\text{C}$, $I_T = 150\text{A}$	-	-	1.35	V
I_{DRM} I_{RRM}	Repetitive Peak Reverse Current, Max /Repetitive Peak Off-state Current, Max	$T_j = 125^\circ\text{C}$, $V_R = V_{RRM}$, $V_D = V_{DRM}$	-	-	25	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	$T_j = 25^\circ\text{C}$	-	150	-	mA
I_H	Holding Current	$T_j = 25^\circ\text{C}$	-	100	-	mA
t_{gt}	Turn On Time	$T_j = 25^\circ\text{C}$	-	3	-	μs
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	$T_j = 125^\circ\text{C}$	0.87			V
r_T	Slope Resistance, for power loss calculation only	$T_j = 125^\circ\text{C}$	2.8			$\text{m}\Omega$

Performance Curves

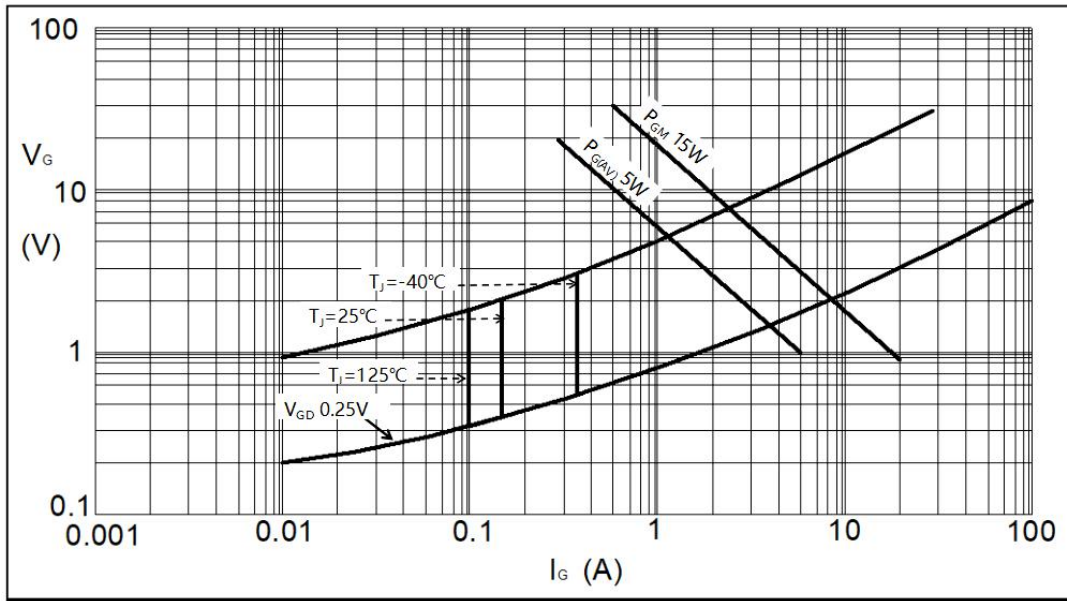


Fig1. Gate Trigger Characteristics

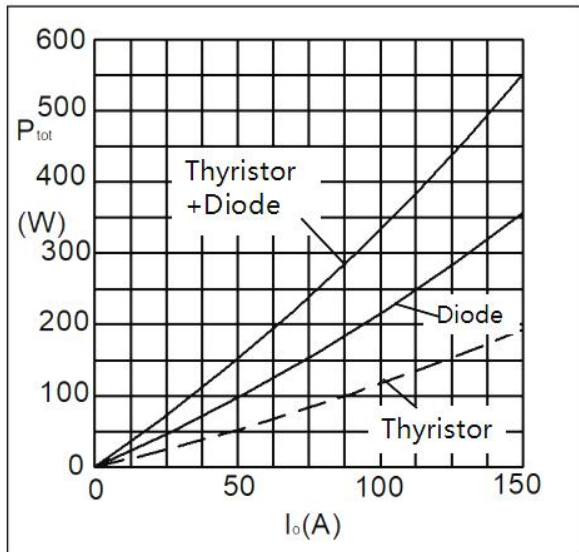


Fig2. Power Dissipation

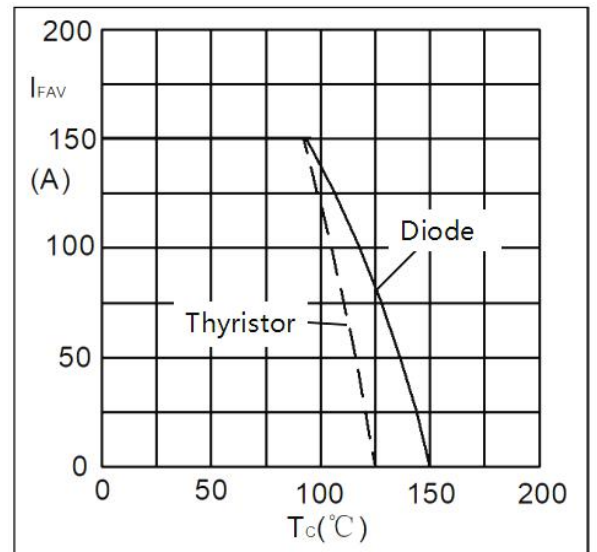


Fig3. Forward Current Derating Curve

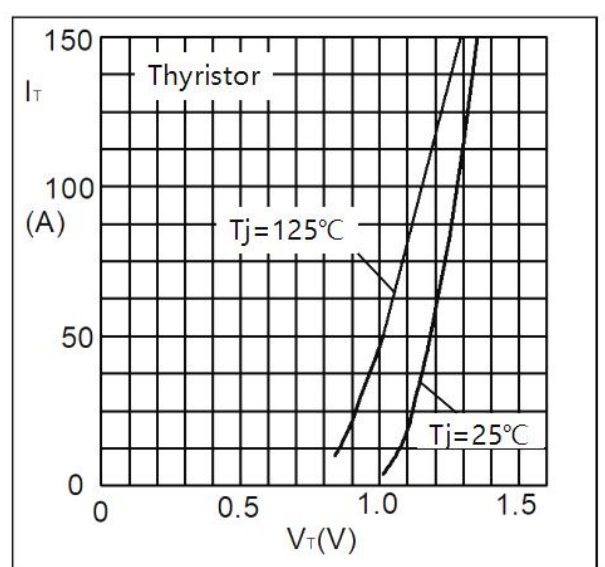
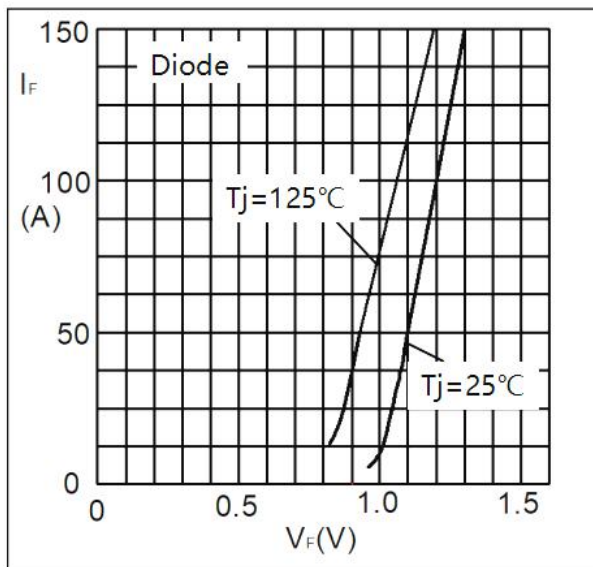


Fig4. Forward Characteristics

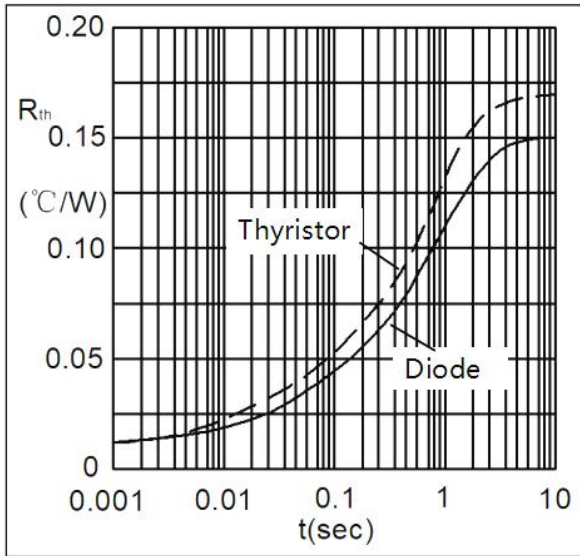


Fig5. Transient Thermal impedance

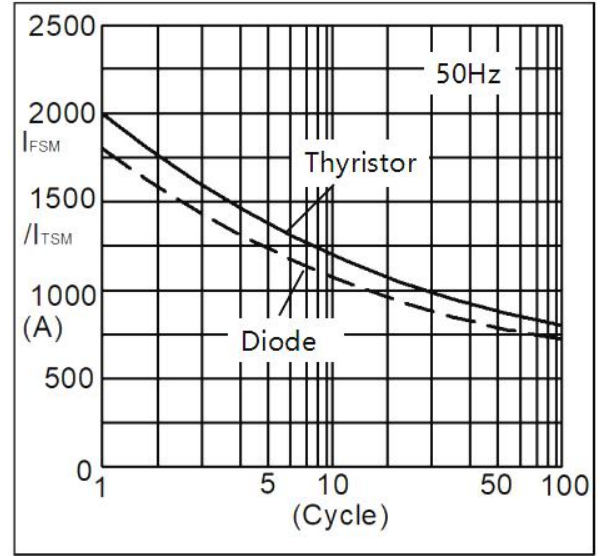
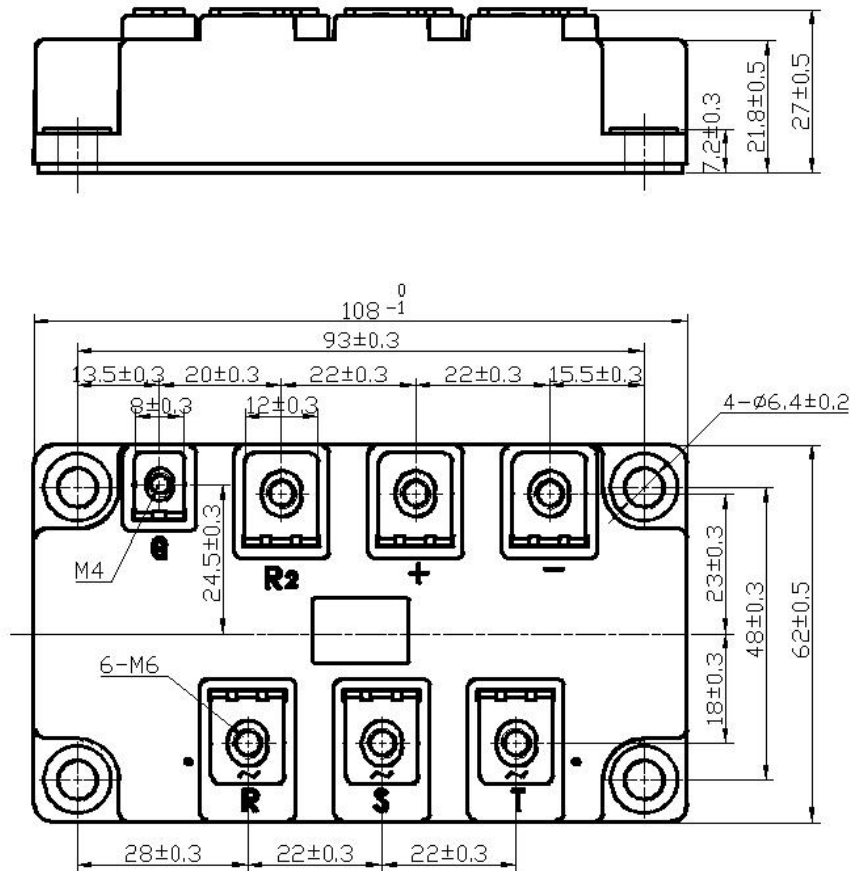


Fig6. Max Non-Repetitive Forward Surge Current

Package Outline Information

CASE: M51B



Dimensions in mm