Three Phase Diode Bridge & Thyristor Module

V_{DRM} / V_{RRM} 800 to 1600V

I_{FAV} / I_{TAV} 150 Amp

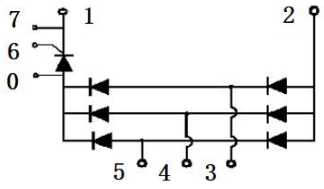
Features

- Aluminum oxide DBC
- Glass passivated chip

Applications

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

Circuit



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℃	150	A
I_{FSM}	Surge Forward Current	T_j = 25℃, t = 50Hz(10ms), V_R = 0V	1800	A
I^2t	Circuit Fusing Consideration	t = 10ms T_j =25℃	16200	A^2s
V_{ISO}	Isolation Breakdown Voltage	AC 50Hz/60Hz; R.M.S; 1min	3000	V
T_j	Operating Junction Temperature		-40 to +150	℃
T_{stg}	Storage Temperature		-40 to +125	℃
M_t	Mounting Torque	To Terminals(M5)	3±15%	N·m
M_s		To Heatsink(M5)	3±15%	
Weight	Module (Approximately)		220	g

■ Thermal Characteristics

Symbol	Item	Conditions	Values	Unit
$R_{th(j-c)}$	Thermal Impedance, Max	Junction to Case(Per Module)	0.15	℃/W
$R_{th(c-s)}$	Thermal Impedance, Max	Case to Heat Sink	0.10	℃/W

■ Electrical Characteristics

Symbol	Item	Conditions	Values			Unit
			Min.	Typ.	Max.	
V_{FM}	Forward Voltage Drop, Max	T_j = 25℃ I_F = 150A	—	—	1.30	V
I_{RRM}	Repetitive Peak Reverse Current, Max	T_j = 25℃ V_R = V_{RRM}	—	—	0.5	mA
		T_j = 150℃ V_R = V_{RRM}	—	—	10	
V_{T0}	Threshold Voltage, for power loss calculation only	T_j = 125℃		0.80		V
r_T	Slope Resistance, for power loss calculation only	T_j = 125℃		2.6		mΩ

Thyristor

■ Maximum Ratings

Symbol	Item	Conditions	Values	Unit
I_{TAV}	Average On-state Current	T_c = 92℃, Three Phase Full Wave Rectified	150	A
I_{TSM}	Surge On-state Current	T_j = 25℃, t = 50Hz(10ms), V_R = 0V	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	℃
T_{stg}	Storage Temperature		-40 to + 125	℃
di/dt	Critical Rate of Rise of On-state Current, Max	T_j= 125℃, V_D = 1/2V_{DRM}, I_G = 150mA, di_G/dt = 0.1A/μs	150	A/μs

■ Thermal Characteristics

Symbol	Item	Conditions	Values	Unit
$R_{th(j-c)}$	Thermal Impedance, Max	Junction to Case	0.17	℃/W
$R_{th(c-s)}$	Thermal Impedance, Max	Case to Heat Sink	0.10	℃/W

■ Electrical Characteristics

Symbol	Item	Conditions	Values			Unit
			Min.	Typ.	Max.	
V_{TM}	Peak On-State Voltage, Max	T_j = 25℃, I_T = 150A	-	-	1.35	V
I_{DRM} /I_{RRM}	Repetitive Peak Reverse Current, Max /Repetitive Peak Off-state Current, Max	T_j = 125℃, V_R = V_{RRM}, V_D = V_{DRM}	-	-	25	mA
V_{GT}	Gate Trigger Voltage, Max	T_j = 25℃, V_D = 6V	-	-	3.0	V
I_{GT}	Gate Trigger Current, Max	T_j = 25℃, V_D = 6V	-	-	150	mA
V_{GD}	Gate Non-Trigger Voltage, Max	T_j = 125℃, V_D = 2/3V_{DRM}	-	-	0.25	V
I_L	Latching Current	T_j = 25℃	-	200	-	mA
I_H	Holding Current	T_j = 25℃	-	150	-	mA
t_{gt}	Turn On Time	T_j = 25℃	-	3	-	μs
dv/dt	Critical Rate of Rise of Off-state Voltage, Min	T_j = 125℃, V_D = 2/3V_{DRM} Linear Voltage Rise	500			V/μs
V_{T0}	Threshold Voltage, for power loss calculation only	T_j = 125℃	0.87			V
r_T	Slope Resistance, for power loss calculation only	T_j = 125℃	2.8			mΩ

Performance Curves

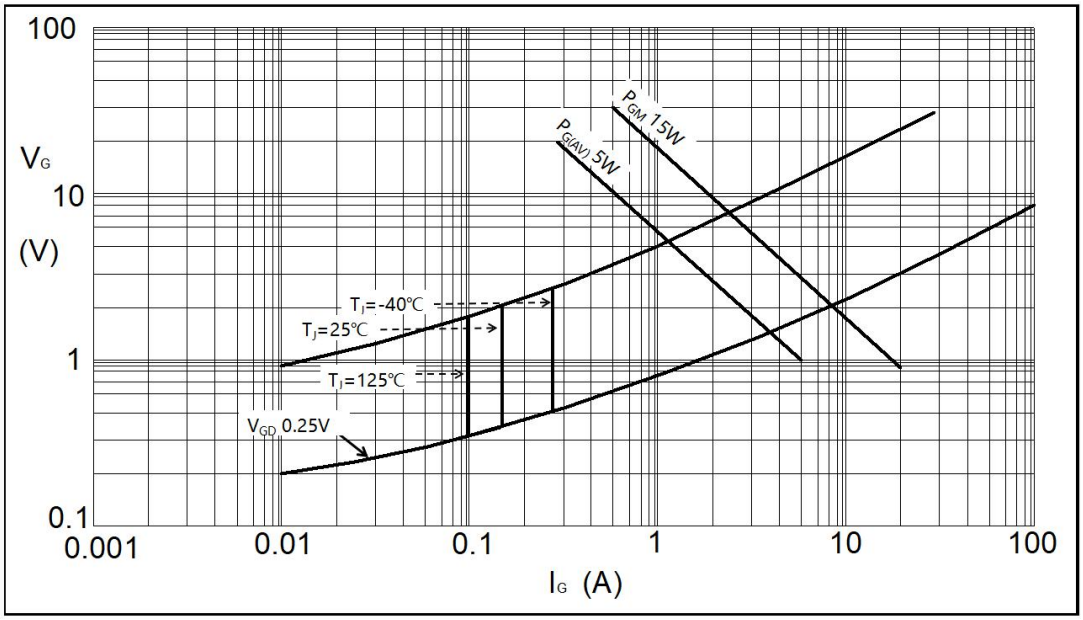


Fig1. Gate Trigger Characteristics

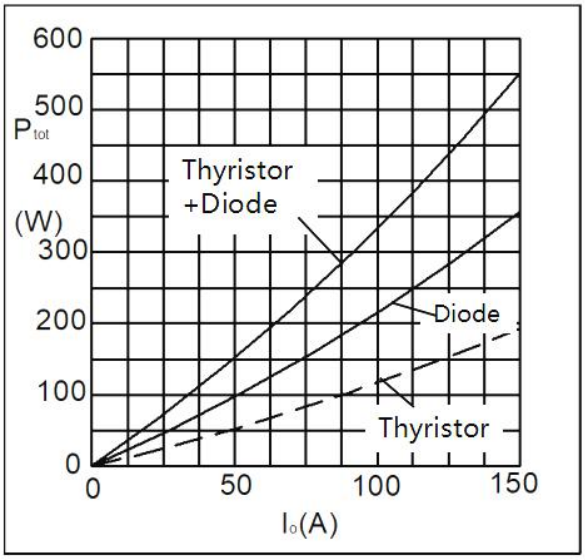


Fig2. Power Dissipation

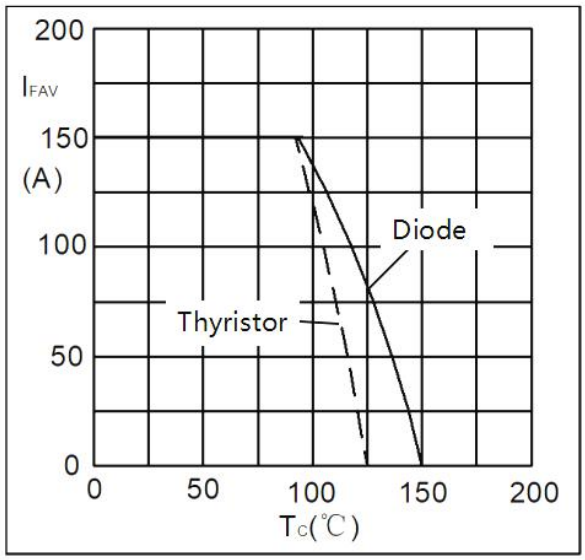
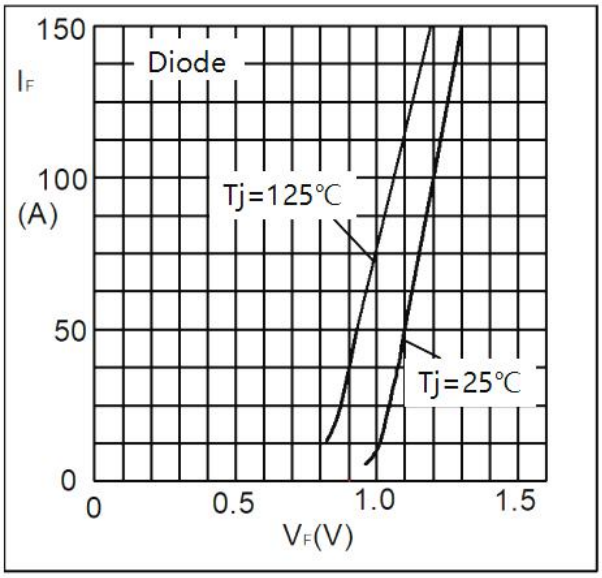


Fig3. Forward Current Derating Curve



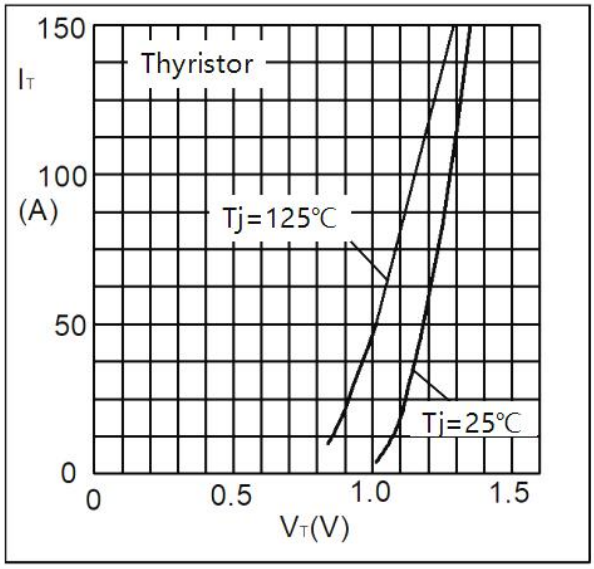


Fig4. Forward Characteristics

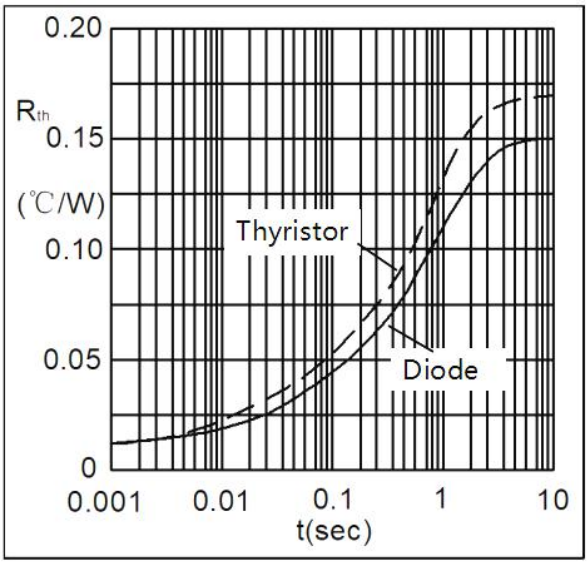


Fig5. Transient Thermal impedance

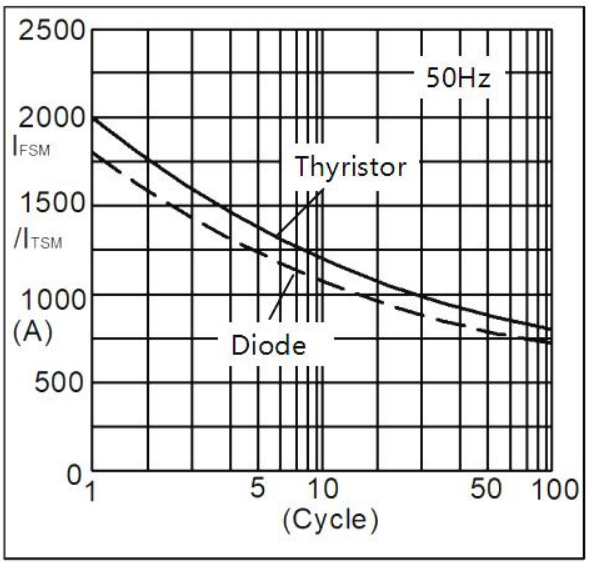
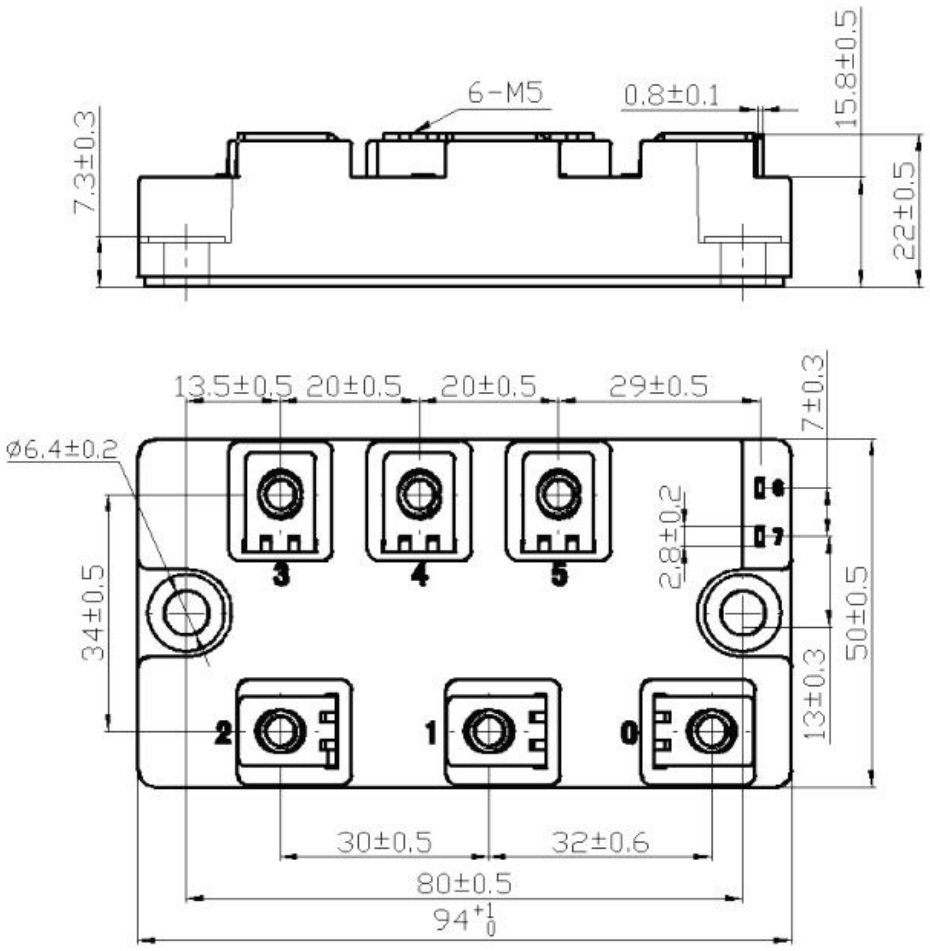


Fig6. Max Non-Repetitive Forward Surge Current

Package Outline Information

CASE: M56B



Dimensions in mm

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