MSDT100

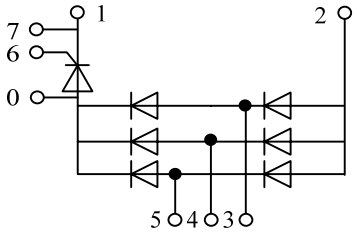
Three Phase Bridge + Thyristor

VRRM / VDRM	800 to 1600V
IFAV / ITAV	100Amp

Features

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

Circuit



Applications

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

Module Type

TYPE	VRRM / VDRM	VRSM
MSDT100-08 MSDT100-12 MSDT100-16	800V 1200V 1600V	900V 1300V 1700V

◆Diode

Maximum Ratings

Symbol	Item	Conditions	Values	Units
ID	Output Current(D.C.)	Tc=100℃ Three phase full wave	100	A
IFSM	Surge forward current	t=10mS Tvj =45℃	1200	A
i^2t	Circuit Fusing Consideration		7200	A^2s
Visol	Isolation Breakdown Voltage(R.M.S)	a.c.50HZ;r.m.s.;1min	3000	V
Tvj	Operating Junction Temperature		-40 to +150	℃
Tstg	Storage Temperature		-40 to +125	℃
Mt	Mounting Torque	To terminals(M5)	3±15%	Nm
Ms		To heatsink(M5)	3±15%	Nm
Weight		Module（Approximately）	210	g

Thermal Characteristics

Symbol	Item	Conditions	Values	Units
Rth(j-c)	Thermal Impedance, max.	Junction to Case(TOTAL)	0.18	℃/W
Rth(c-s)	Thermal Impedance, max.	Case to Heatsink	0.10	℃/W

Electrical Characteristics

Symbol	Item	Conditions	Values	Units
VFM	Forward Voltage Drop, max.	T=25℃ IF =100A	1.35	V
IRRM	Repetitive Peak Reverse Current, max.	Tvj =25℃ VRD=VRRM Tvj =150℃ VRD=VRRM	≤0.5 ≤6	mA mA

◆Thyristor

Maximum Ratings

Symbol	Item	Conditions	Values	Units
I_{TAV}	Average On-State Current	Tc=92℃, Single Phase half wave 180° conduction	100	A
I_{TSM}	Surge On-State Current	TVJ=45℃ t=10ms (50Hz), sine VR=0	1200	A
i^2t	Circuit Fusing Consideration		7200	A^2s
Visol	Isolation Breakdown Voltage(R.M.S)	a.c.50HZ;r.m.s.;1 min	3000	V
Tvj	Operating Junction Temperature		-40 to +125	℃
Tstg	Storage Temperature		-40 to +125	℃
Mt	Mounting Torque	To terminals(M5)	3±15%	Nm
Ms		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 =100mA d_{iG}/d_t=0.1A/μs	150	A/μs
dv/dt	Critical Rate of Rise of Off-State Voltage, min.	$T_J=T_{VJM}$,$V_D=2/3V_{DRM}$,linear voltage rise	500	V/μs

Electrical and Thermal Characteristics

Symbol	Item	Conditions	Values			Units
			Min.	Typ.	Max.	
V_{TM}	Peak On-State Voltage, max.	T=25℃ I_T =300A			1.70	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_{TO}	Threshold voltage	T_{VJ} = T_{VJM}			0.9	V
r_T	Slope resistance				2	mΩ
V_{GT}	Gate Trigger Voltage, max.	T_{VJ} =25℃ , V_D =6V			3	V
I_{GT}	Gate Trigger Current, max.	T_{VJ} =25℃ , V_D =6V			150	mA
V_{GD}	Max. required DC gate voltage	T_{VJ} =125℃ , V_D =2/3V_{DRM}			0.25	V
I_{GD}	Max. required DC gate current	T_{VJ} =125℃ , V_D =2/3V_{DRM}			6	mA
I_L	Maximum latching current	T_{VJ} =25℃ , R_G=33Ω		300	600	mA
I_H	Maximum holding current	T_{VJ} =25℃ , V_D =6V		150	250	mA
tgd	Gate controlled delay time	T_{VJ} =25℃,I_G=1A,di_G/dt=1A/us		1		us
tq	Circuit commutated turn-off time	T_{VJ} = T_{VJM}		100		us
Rth(j-c)	Thermal Impedance, max.	Junction to Case			0.26	℃/W
Rth(c-s)	Thermal Impedance, max.	Case to Heatsink			0.10	℃/W

Performance Curves

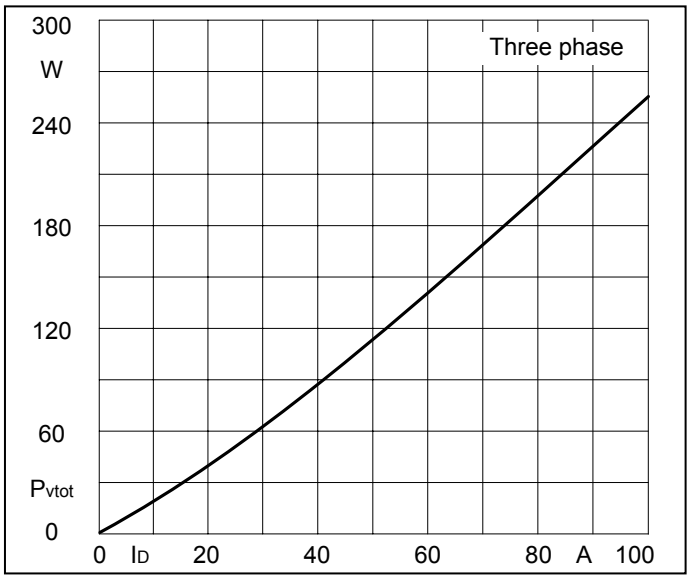


Fig1. Power dissipation

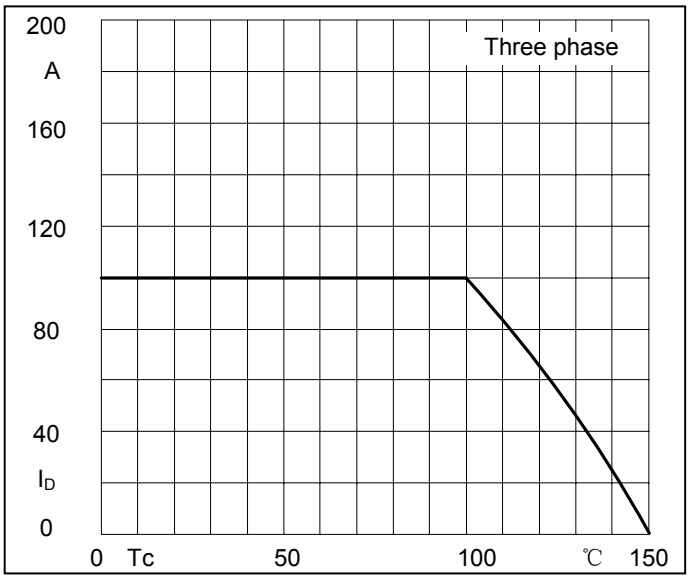


Fig2. Forward Current Derating Curve

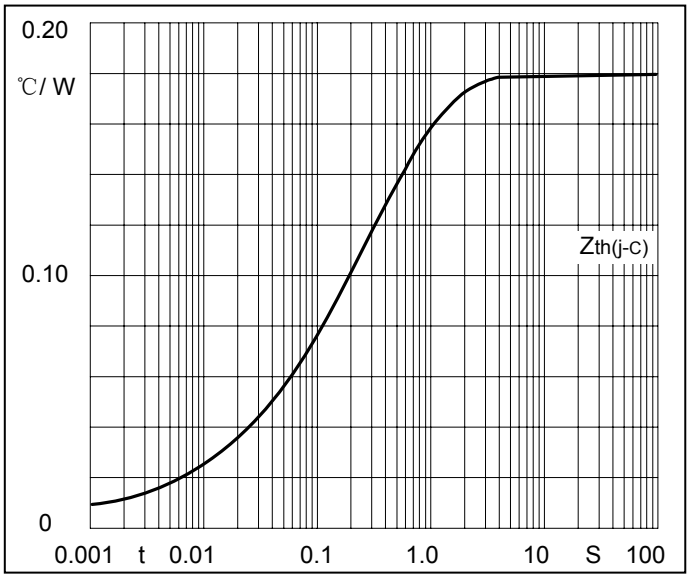


Fig3. Transient thermal impedance

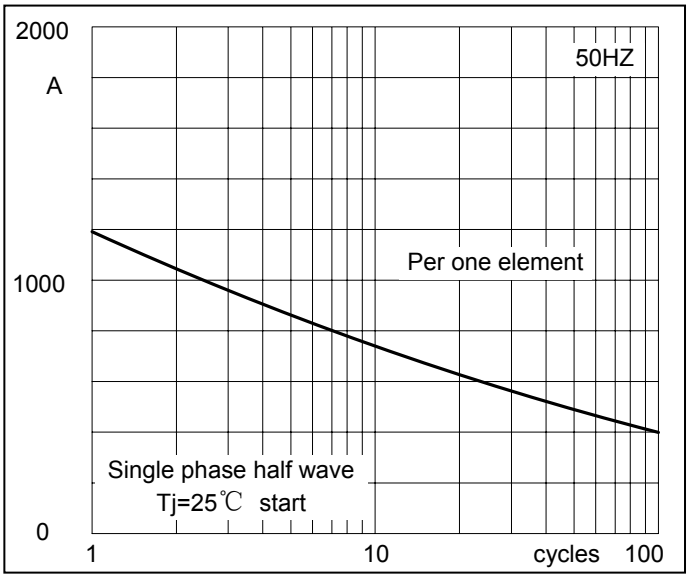


Fig4. Max Non-Repetitive Forward Surge Current

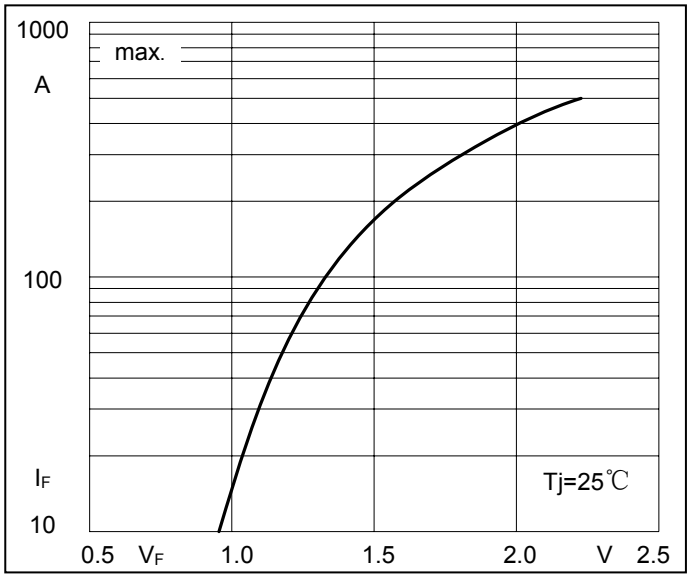


Fig5. Forward Characteristics

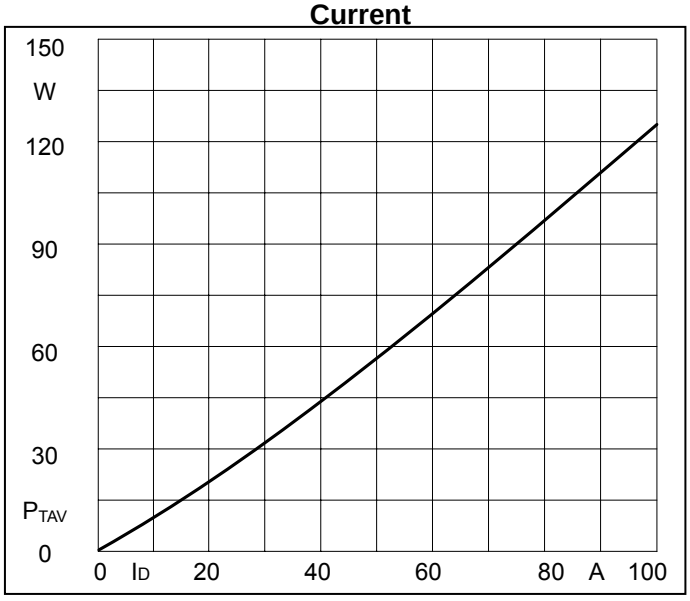


Fig6. SCR Power dissipation

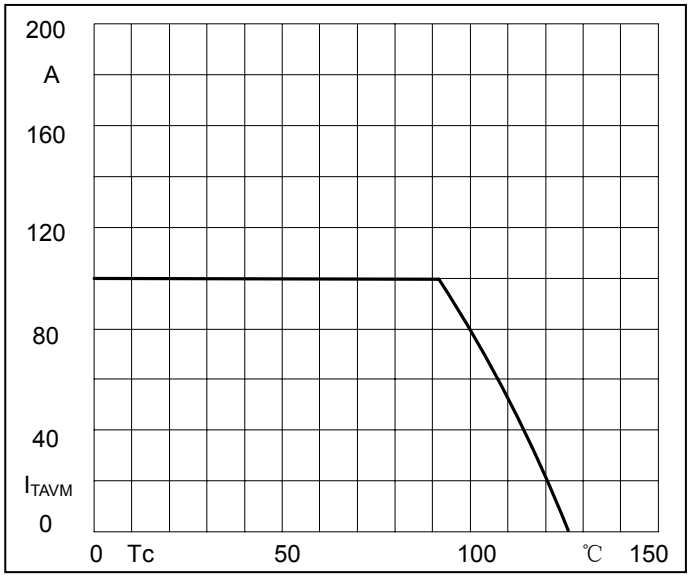


Fig7. SCR Forward Current Derating Curve

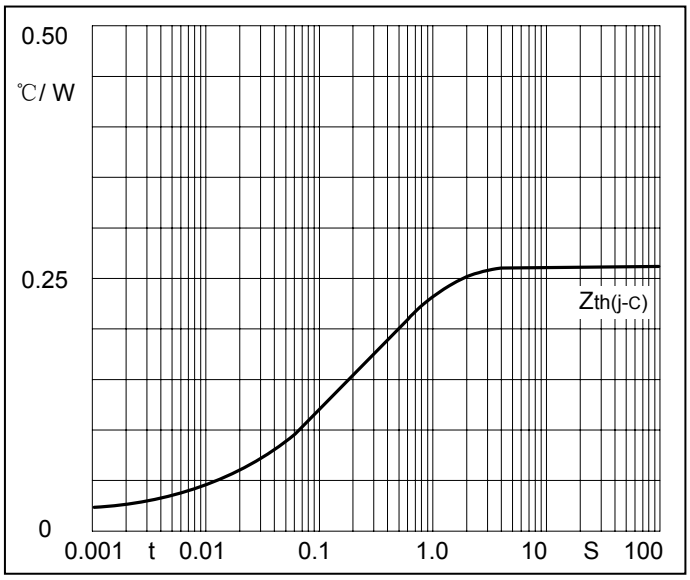


Fig8. SCR Transient thermal impedance

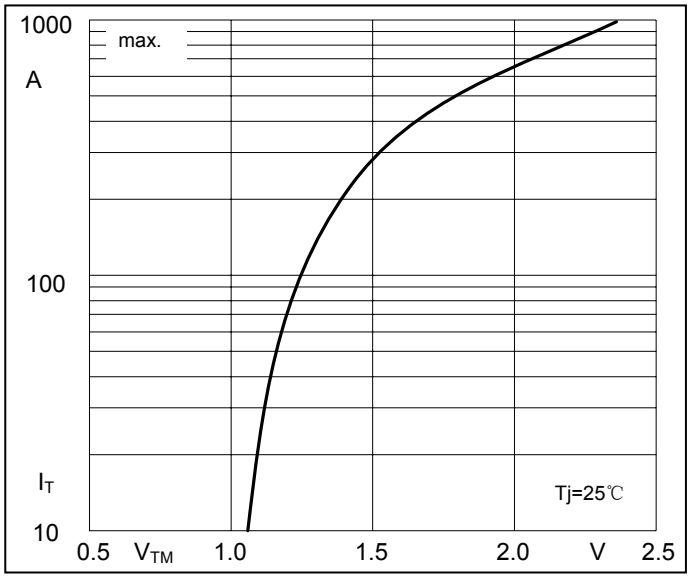


Fig9. SCR Forward Characteristics

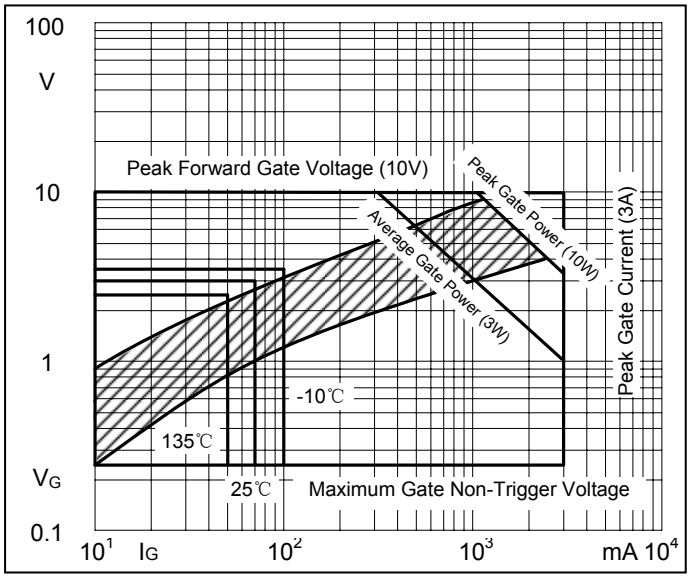
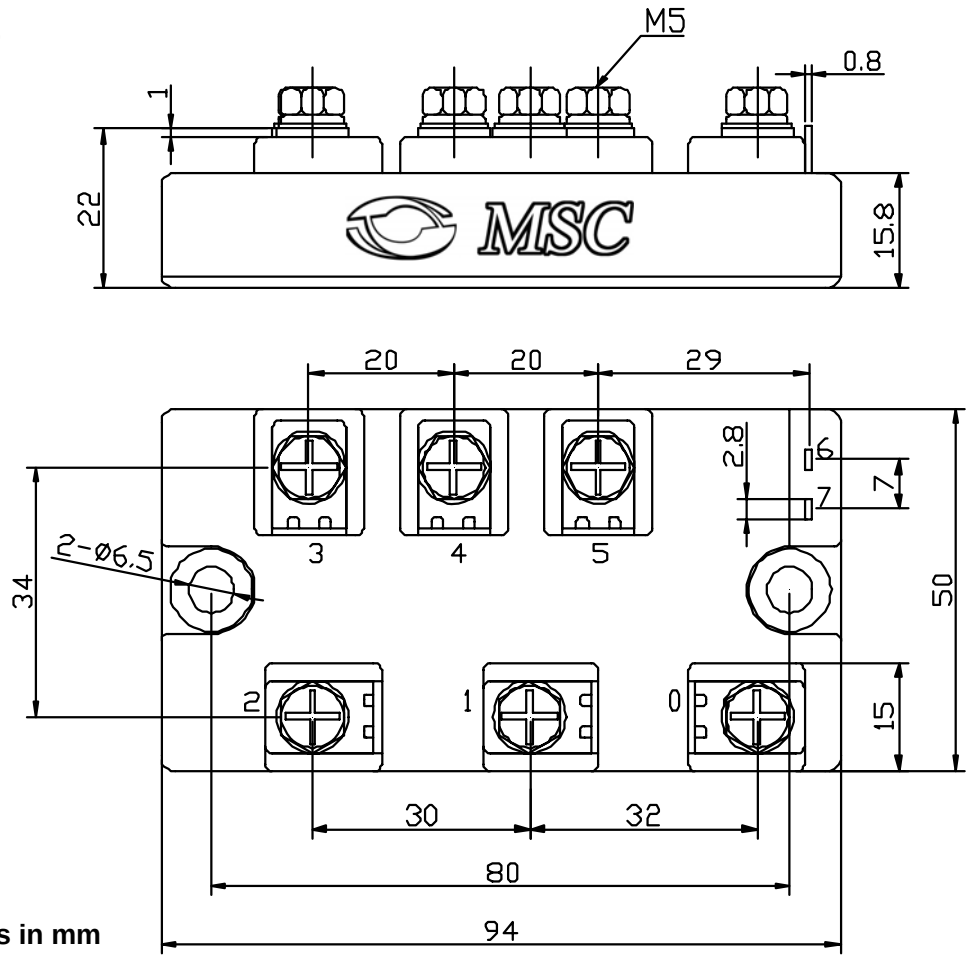


Fig10. Gate trigger Characteristics

Package Outline Information

CASE: M4



Dimensions in mm