



Thyristor/Diode Modules

V_{RRM} / V_{DRM} 800 to 1600V
I_{FAV} / I_{TAV} 40Amp

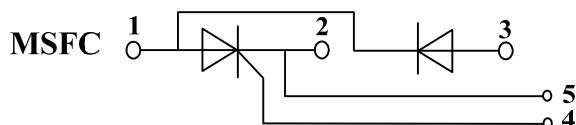
Applications

- Power Converters
- Lighting Control
- DC Motor Control and Drives
- Heat and temperature control

Features

- International standard package
- High Surge Capability
- Glass passivated chip
- Simple Mounting
- Heat transfer through aluminum oxide DBC ceramic isolated metal baseplate
- UL E243882 approved

Circuit



Module Type

TYPE	V _{RRM} /V _{DRM}	V _{RSM}
MSFC40-08	800V	900V
MSFC40-12	1200V	1300V
MSFC40-16	1600V	1700V

◆Diode

Maximum Ratings

Symbol	Item	Conditions	Values	Units
I _D	Output Current(D.C.)	T _c =85℃	40	A
I _{FSM}	Surge forward current	t=10mS T _{vj} =45℃	1000	A
i ² t	Circuit Fusing Consideration		5000	A ² s
Visol	Isolation Breakdown Voltage(R.M.S)	a.c.50HZ;r.m.s.;1min	3000	V
T _{vj}	Operating Junction Temperature		-40 to +125	℃
T _{stg}	Storage Temperature		-40 to +125	℃
M _t	Mounting Torque	To terminals(M5)	3±15%	Nm
M _s		To heatsink(M6)	5±15%	Nm
Weight	Module (Approximately)		100	g

Thermal Characteristics

Symbol	Item	Conditions	Values	Units
R _{th(j-c)}	Thermal Impedance, max.	Junction to Case	0.33	℃/W
R _{th(c-s)}	Thermal Impedance, max.	Case to Heatsink	0.10	℃/W

Electrical Characteristics

Symbol	Item	Conditions	Values			Units
			Min.	Typ.	Max.	
V _{FM}	Forward Voltage Drop, max.	T=25℃ I _F =200A			1.95	V
I _{RRM}	Repetitive Peak Reverse Current, max.	T _{vj} =25℃ V _{RD} =V _{RRM} T _{vj} =125℃ V _{RD} =V _{RRM}	≤0.5 ≤6			mA mA

◆Thyristor

Maximum Ratings

Symbol	Item	Conditions	Values	Units
I_{TAV}	Average On-State Current	Sine 180°; $T_c=85^{\circ}\text{C}$	40	A
I_{TSM}	Surge On-State Current	$T_{VJ}=45^{\circ}\text{C}$ $t=10\text{ms}$, sine $T_{VJ}=125^{\circ}\text{C}$ $t=10\text{ms}$, sine	1000 850	A
i^2t	Circuit Fusing Consideration	$T_{VJ}=45^{\circ}\text{C}$ $t=10\text{ms}$, sine $T_{VJ}=125^{\circ}\text{C}$ $t=10\text{ms}$, sine	5000 3600	A ² s
V_{isol}	Isolation Breakdown Voltage(R.M.S)	a.c.50HZ;r.m.s.;1min	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)	$3 \pm 15\%$	Nm
M_s		To heatsink(M6)	$5 \pm 15\%$	Nm
di/dt	Critical Rate of Rise of On-State Current	$T_{VJ}=T_{VJM}$, $2/3V_{DRM}$, $I_G=500\text{mA}$ $T_r<0.5\mu\text{s}$, $t_p>6\mu\text{s}$	150	A/ μs
dv/dt	Critical Rate of Rise of Off-State Voltage, min.	$T_J=T_{VJM}$, $2/3V_{DRM}$ linear voltage rise	1000	V/ μs
a	Maximum allowable acceleration		50	m/s^2

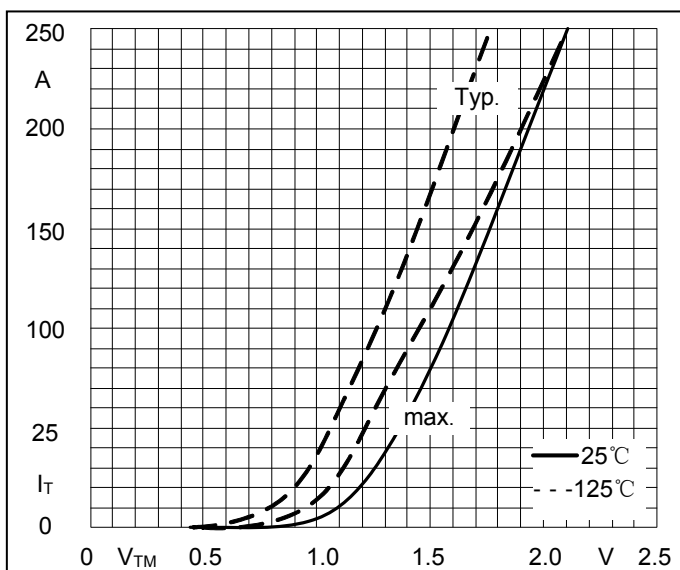
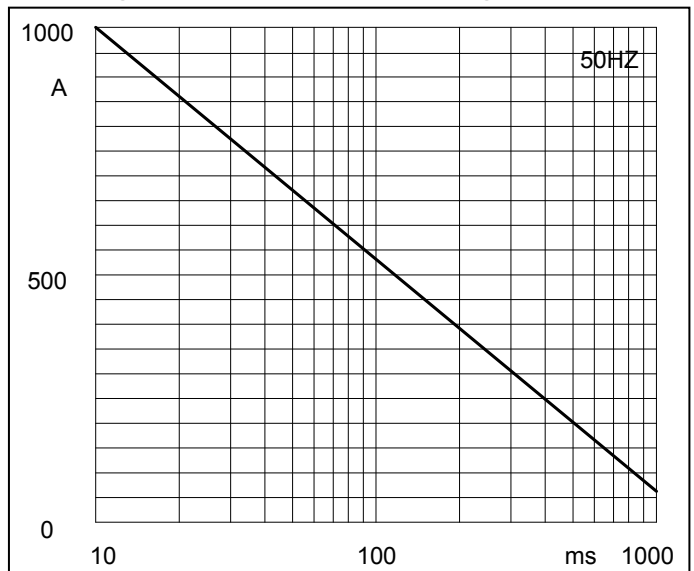
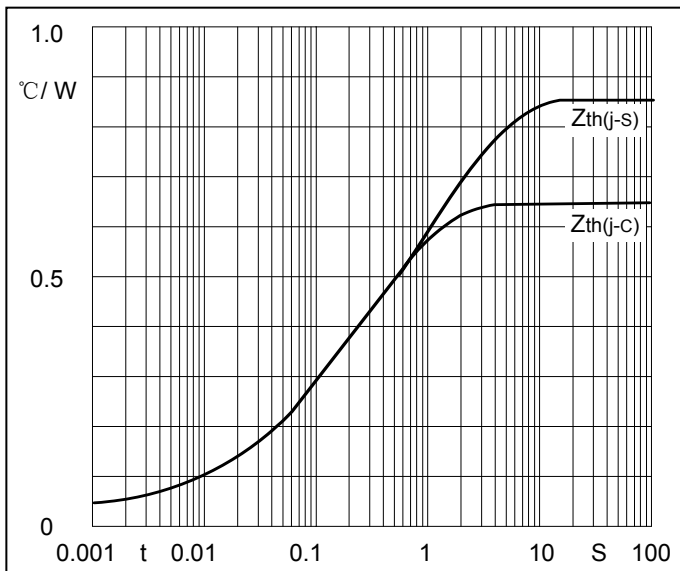
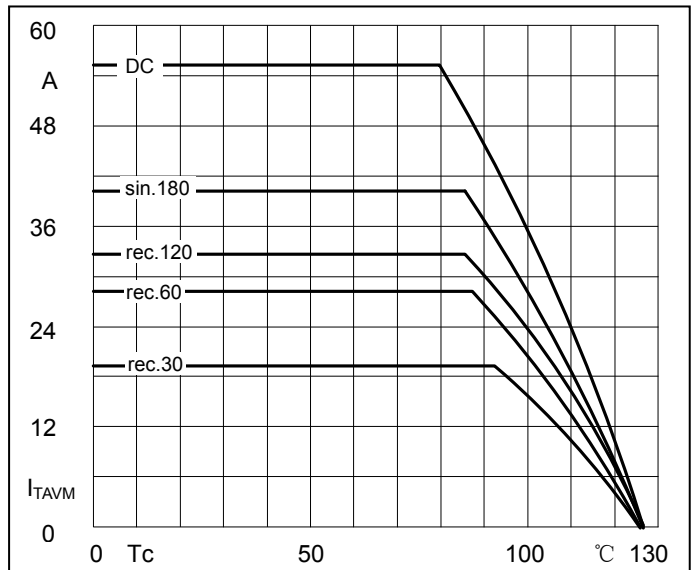
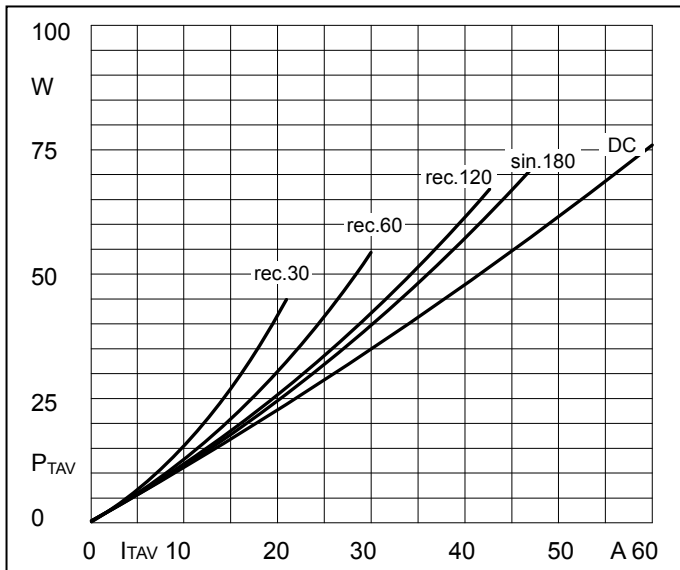
Thermal Characteristics

Symbol	Item	Conditions	Values	Units
$R_{th(j-c)}$	Thermal Impedance, max.	Junction to Case	0.65	$^{\circ}\text{C/W}$
$R_{th(c-s)}$	Thermal Impedance, max.	Case to Heatsink	0.20	$^{\circ}\text{C/W}$

Electrical Characteristics

Symbol	Item	Conditions	Values			Units
			Min.	Typ.	Max.	
V_{TM}	Peak On-State Voltage, max.	$T=25^{\circ}\text{C}$ $I_T=200\text{A}$			1.95	V
I_{RRM}/I_{DRM}	Repetitive Peak Reverse Current, max. / Repetitive Peak Off-State Current, max.	$T_{VJ}=T_{VJM}$, $V_R=V_{RRM}$, $V_D=V_{DRM}$			15	mA
V_{TO}	On state threshold voltage	For power-loss calculations only ($T_{VJ}=125^{\circ}\text{C}$)			1.0	V
r_T	Value of on-state slope resistance. max	$T_{VJ}=T_{VJM}$			4.5	m Ω
V_{GT}	Gate Trigger Voltage, max.	$T_{VJ}=25^{\circ}\text{C}$, $V_D=6\text{V}$			2.5	V
I_{GT}	Gate Trigger Current, max.	$T_{VJ}=25^{\circ}\text{C}$, $V_D=6\text{V}$			150	mA
V_{GD}	Non-triggering gate voltage, max.	$T_{VJ}=125^{\circ}\text{C}$, $V_D=2/3V_{DRM}$			0.25	V
I_{GD}	Non-triggering gate current, max.	$T_{VJ}=125^{\circ}\text{C}$, $V_D=2/3V_{DRM}$			6	mA
I_L	Latching current, max.	$T_{VJ}=25^{\circ}\text{C}$, $R_G=33\Omega$		300	600	mA
I_H	Holding current, max.	$T_{VJ}=25^{\circ}\text{C}$, $V_D=6\text{V}$		150	250	mA
tgd	Gate controlled delay time	$T_{VJ}=25^{\circ}\text{C}$, $I_G=1\text{A}$, $di/dt=1\text{A}/\mu\text{s}$	1			μs
tq	Circuit commutated turn-off time	$T_{VJ}=T_{VJM}$	80			μs

Performance Curves



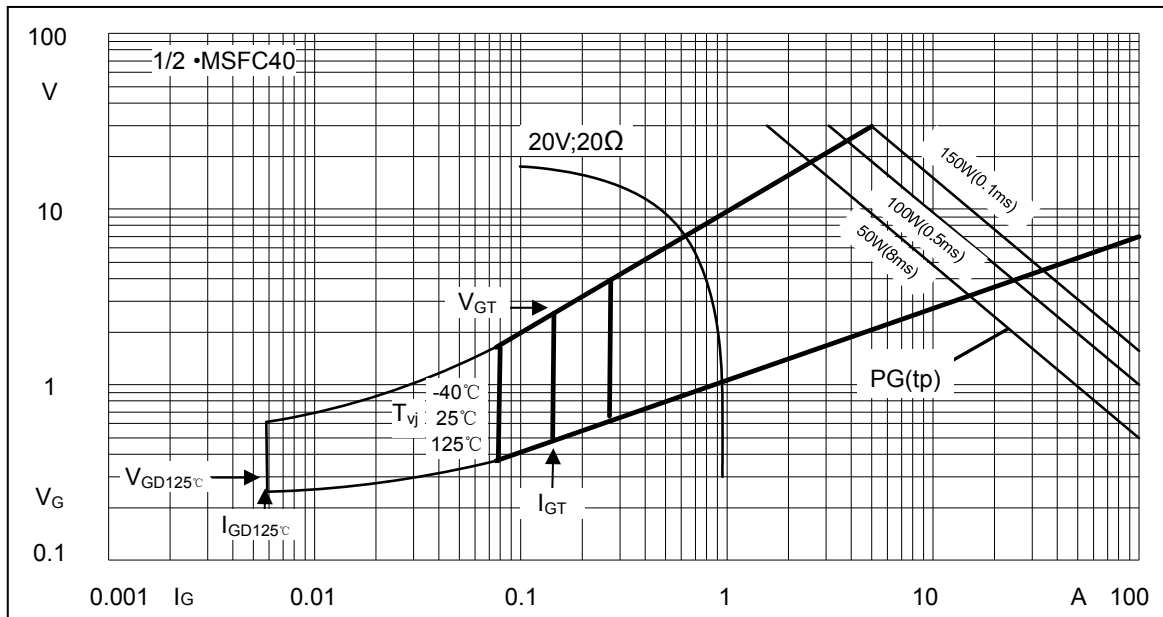
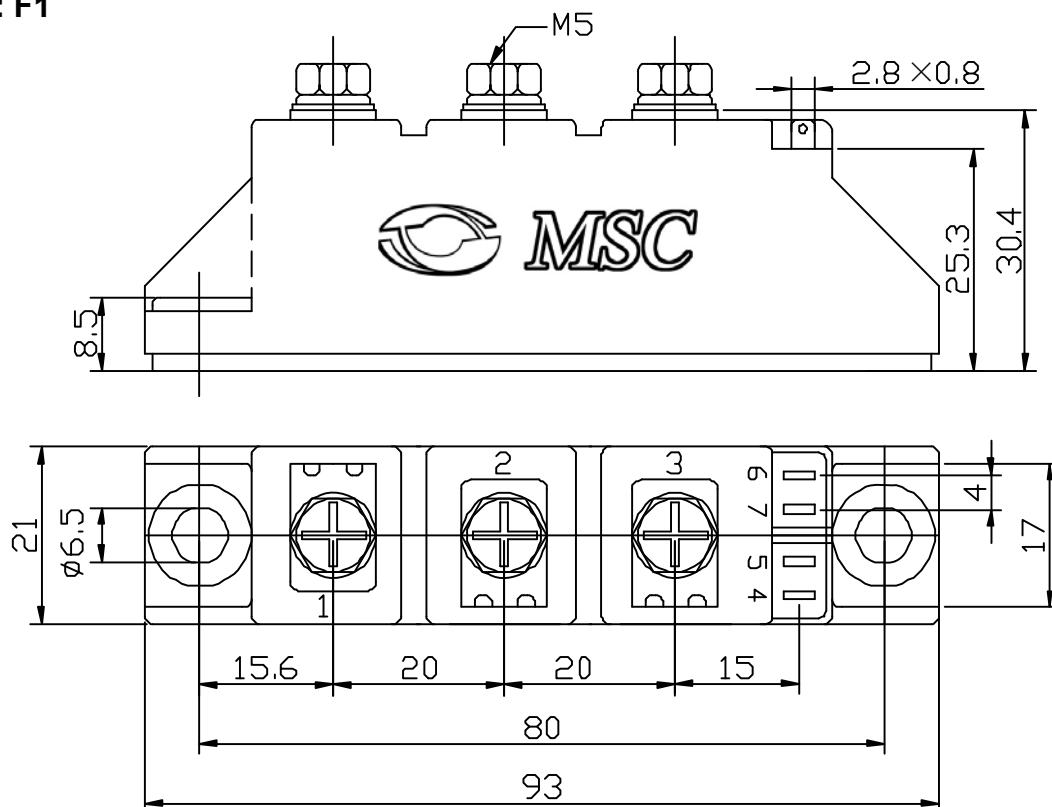


Fig6. Gate trigger Characteristics

Package Outline Information

CASE: F1



Dimensions in mm