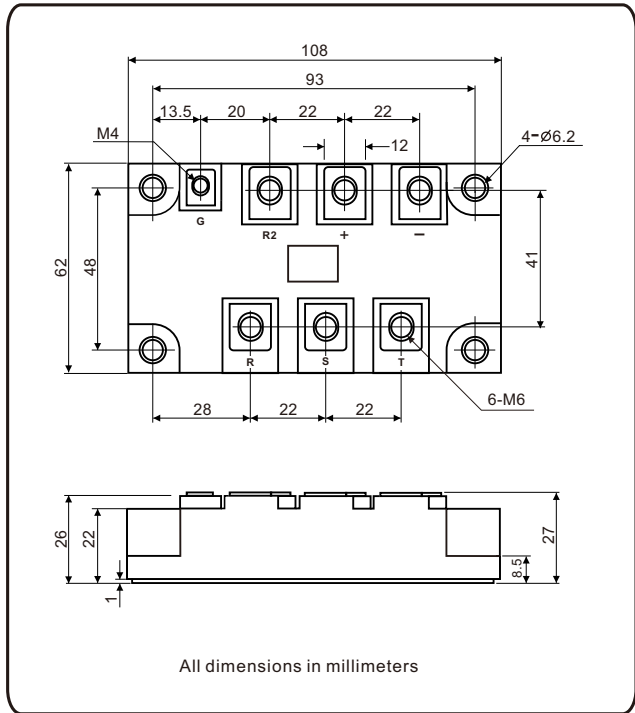


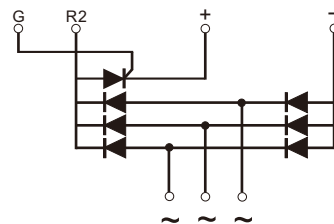
Three-Phase Bridge + Thyristor, 200A

MTPT20008 Thru MTPT20016



FEATURES

- UL recognition file number E320098
- Three-phase bridge and a thyristor
- High surge current capability
- Low thermal resistance
- Compliant to RoHS
- Isolation voltage up to 2500V
- Glass passivated chip junctions



Applications

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

ADVANTAGE

- International standard package
Epoxy meets UL 94 V-O flammability rating
- Small volume, light weight
- Small thermal resistance
- Weight: 470g (16.6 ozs)

PRIMARY CHARACTERISTICS

$I_{F(AV)}$	200A
V_{RRM}	800V to 1600V
I_{FSM}	2240A
I_R	20 μ A
V_{FM}/V_{TM}	1.45V/1.65V
$T_{J \text{ max.}}$	150°C

⊙ Maximum Ratings for Diodes

MAJOR RATINGS AND CHARACTERISTICS (T _A = 25°C unless otherwise noted)					
PARAMETER	SYMBOL	MTPT200			UNIT
		08	12	16	
Maximum repetitive peak reverse voltage	V _{RRM}	800	1200	1600	V
Peak reverse non-repetitive voltage	V _{RSM}	900	1300	1700	V
Output DC current three-phase full wave, T _c = 100°C	I _O	200			A
Peak forward surge current single sine-wave superimposed on rated load	I _{FSM}	2240			A
Rating (non-repetitive, for t greater than 1 ms and less than 8.3 ms) for fusing	I ² t	25090			A ² s
Operating junction temperature range	T _J	-40 to 150			°C
Storage temperature range	T _{STG}	-40 to 125			°C
Thermal Impedance, junction to case	R _{thJC}	0.11			°C/W
Thermal Impedance, case to heatsink	R _{thCS}	0.10			°C/W

ELECTRICAL CHARACTERISTICS (T _A = 25°C unless otherwise noted)						
PARAMETER	TEST CONDITIONS	SYMBOL	MTPT200			UNIT
			08	12	16	
Maximum instantaneous forward drop per diode	I _F = 200A	V _F	1.45			V
Maximum reverse DC current at rated DC blocking voltage per diod	T _A = 25°C	I _R	20			μA
	T _A = 150°C		10			mA

⊙ Maximum Ratings for Thyristor

FORWARD CONDUCTION					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum average on-state current at case temperature	I _{T(AV)}	180° conduction, half sine wave ,50Hz		200	A
				90	°C
Maximum peak, one-cycle, on-state non-repetitive surge current	I _{TSM}	t = 10 ms	No voltage reappplied	1900	A
		t = 8.3 ms		1990	
		t = 10 ms	100% V _{RRM} reappplied	1596	
		t = 8.3 ms		1670	
Maximum I ² t for fusing	I ² t	t = 10 ms	No voltage reappplied	18.0	kA ² s
		t = 8.3 ms		16.4	
		t = 10 ms	100% V _{RRM} reappplied	12.7	
		t = 8.3 ms		11.6	
Maximum I ² √t for fusing	I ² √t	t = 0.1 ms to 10 ms, no voltage reappplied		180.5	kA ² √s
Maximum on-state voltage drop	V _{TM}	I _{TM} = 600A, T _J = 25 °C, 180° conduction		1.65	V
Maximum holding current	I _H	Anode supply = 6 V, initial I _T = 30 A, T _J = 25 °C		250	mA
Maximum latching current	I _L	Anode supply = 6 V, R _G = 33Ω, T _J = 25 °C		600	

SWITCHING					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Typical delay time	t _d	T _J = 25 °C ,gate current = 1A dI _g /dt = 1 A/μs		1	μs
Typical rise time	t _r	V _d = 0.67 V _{DRM}		2	
Typical turn-off time	t _q	I _{TM} = 300A ; dI/dt = 15 A/μs ; T _J = T _J maximum, V _R = 50V ; dV/dt = 20V/μs ; gate 0V ,100Ω		50 to 150	

BLOCKING					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum peak reverse and off-state leakage current	I_{RRM} I_{DRM}	$T_J = 125\text{ }^\circ\text{C}$		30	mA
RMS isolation Voltage	V_{ISO}	50 Hz, circuit to base, all terminals shorted, $25\text{ }^\circ\text{C}$, 60s		3000	V
Critical rate of rise of off-state voltage	dV/dt	$T_J = T_J$ maximum, exponential to 67 % rated V_{DRM}		500	V/ μs

TRIGGERING					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum peak gate power	P_{GM}	$t_p \leq 5\text{ ms}$, $T_J = T_J$ maximum		15	W
Maximum average gate power	$P_{G(AV)}$	$f = 50\text{ Hz}$, $T_J = T_J$ maximum		5	
Maximum peak gate current	I_{GM}	$t_p \leq 5\text{ ms}$, $T_J = T_J$ maximum		3	A
Maximum peak negative gate voltage	$-V_{GT}$			10	V
Maximum required DC gate voltage to trigger	V_{GT}	$T_J = 25\text{ }^\circ\text{C}$	Anode supply = 6 V, resistive load; $R_a = 1\ \Omega$	3	mA
Maximum required DC gate current to trigger	I_{GT}			150	
Maximum gate voltage that will not trigger	V_{GD}	$T_J = T_J$ maximum, 67% V_{DRM} applied		0.25	V
Maximum gate current that will not trigger	I_{GD}			10	mA
Maximum rate of rise of turned-on current	di/dt	$T_J = T_J$ maximum, $V_D = 0.5\ V_{DRM}$, $I_G = 0.1\text{ A}$, $di_G/dt = 0.1\text{ A}/\mu\text{s}$		150	A/ μs

THERMAL AND MECHANICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
junction operating and storage temperature range	T_J , T_{stg}			- 40 to 125	$^\circ\text{C}$
Maximum thermal resistance, junction to case per junction	R_{thJC}	DC operation		0.14	$^\circ\text{C}/\text{W}$
Typical thermal resistance, case to heatsink per module	R_{thCS}	Mounting surface, smooth, flat and greased		0.10	
Mounting torque $\pm 10\%$ to heatsink, M6 to terminal, M6/M4		A mounting compound is recommended and the torque should be rechecked after a period of about 3 hours to allow for the spread of the compound.		5	N.m
				5 / 2	
Approximate weight				470	g
				16.6	oz.

Device code

MTPT	200	16
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① ② ③

- ① - Module type : "MTPT" for 3Ø Bridge + Thyristor
- ② - $I_{F(AV)}$ rating : "200" for 200 A
- ③ - Voltage code : code x 100 = V_{RRM}

Fig.1 Power dissipation (For Diodes)

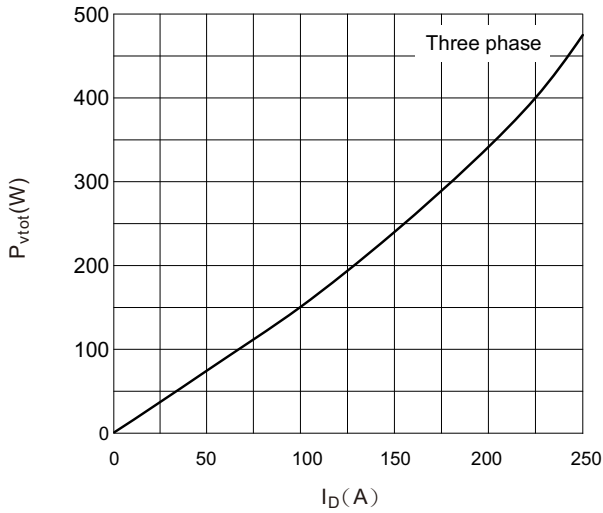


Fig.2 Forward current derating curve (For Diodes)

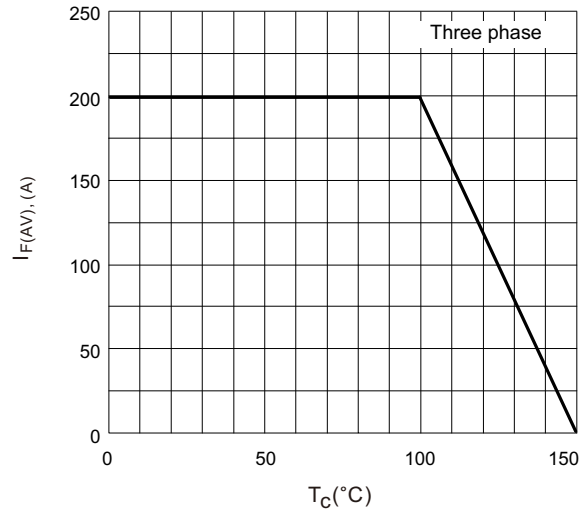


Fig.3 Transient thermal impedance (For Diodes)

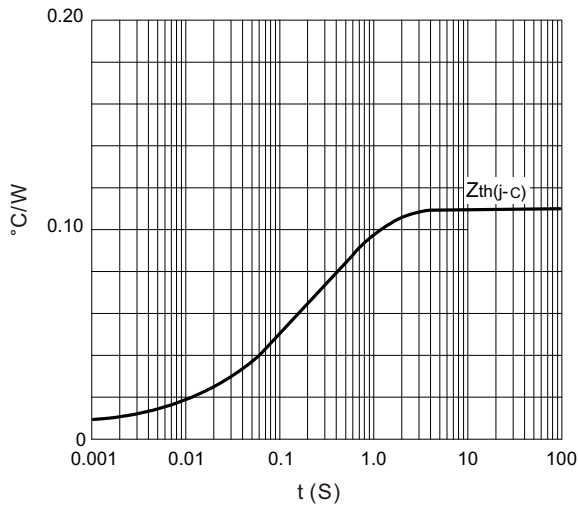


Fig.4 Max non-repetitive forward surge current (For Diodes)

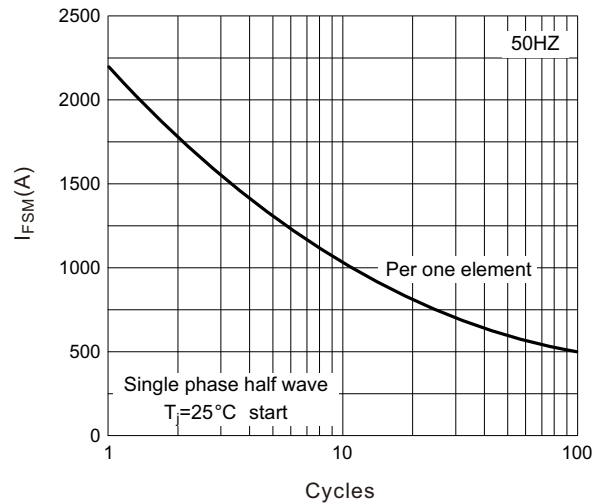


Fig.5 Forward characteristics (For Diodes)

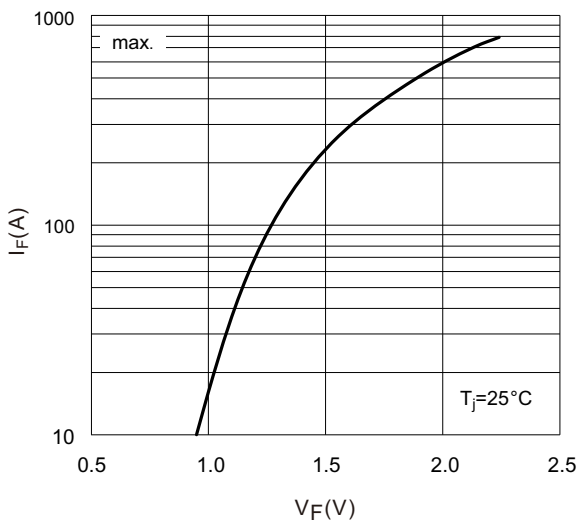


Fig.6 SCR power dissipation

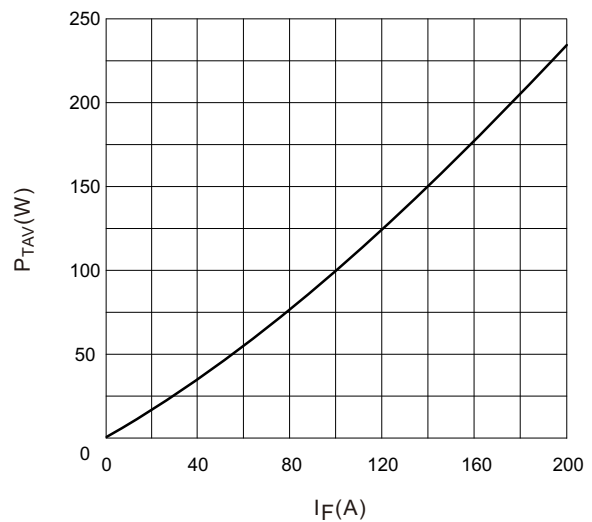


Fig.7 SCR forward current derating curve

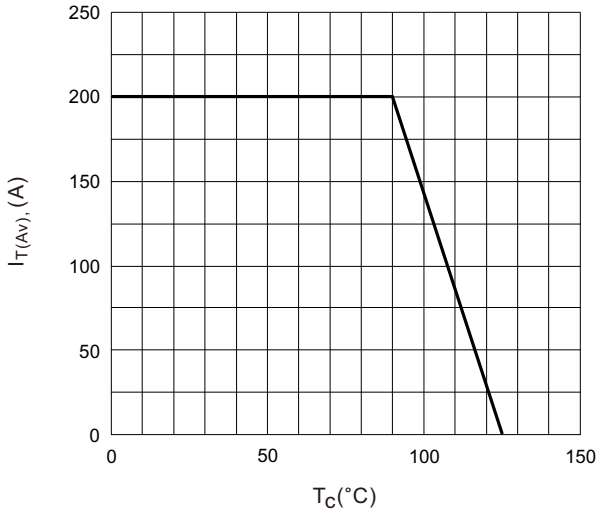


Fig.8 SCR transient thermal impedance

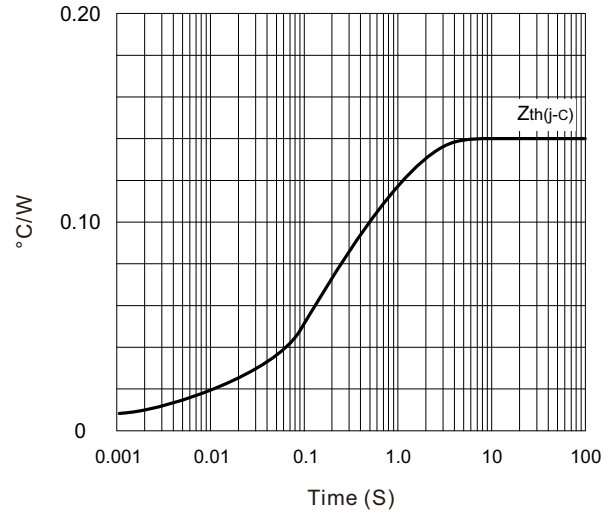


Fig.9 SCR forward characteristics

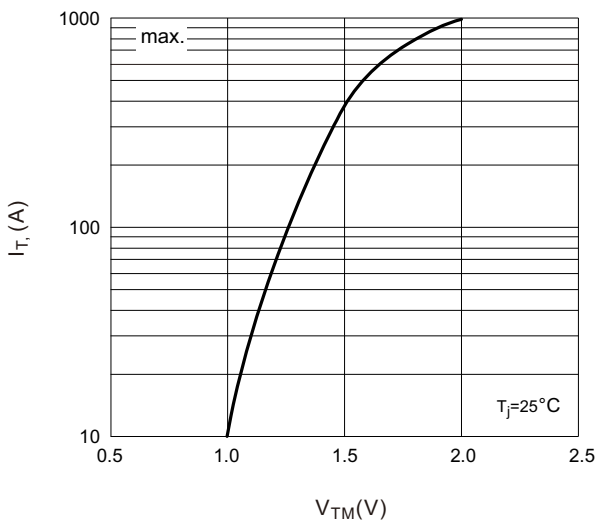


Fig.10 Gate trigger characteristics

