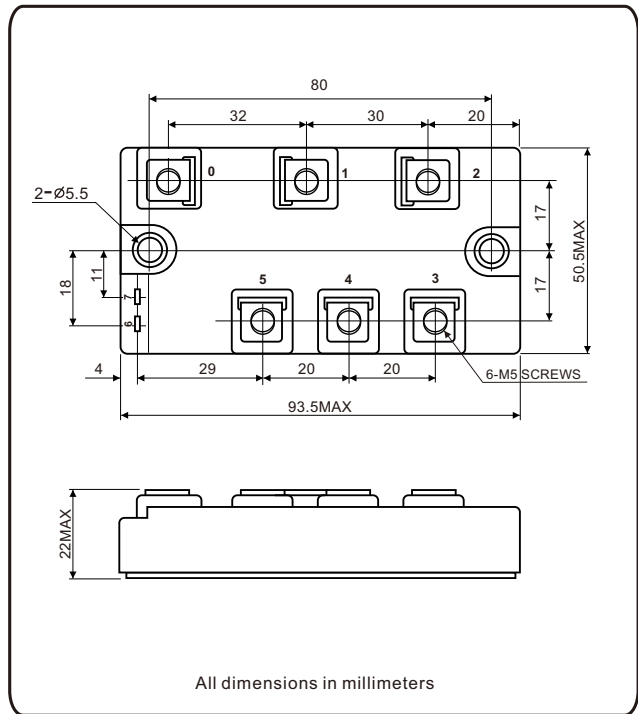
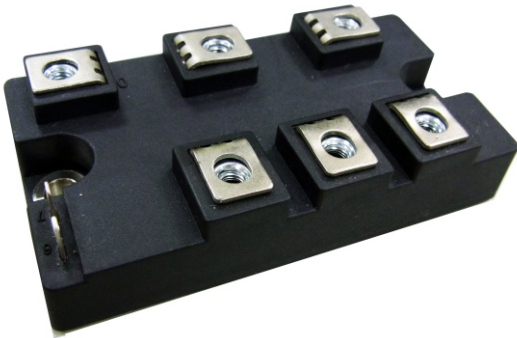


Three-Phase Bridge + Thyristor, 100A

MTPT10008 Thru MTPT10016



FEATURES

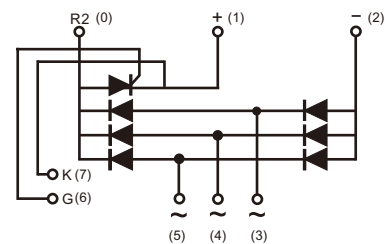
- UL recognition file number E320098
- Three-phase bridge and a thyristor
- High surge current capability
- Low thermal resistance
- Compliant to RoHS
- Isolation voltage up to 2500V
- Glass passivated chip junction

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: 250g (8.8 ozs)



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	100A
V_{RRM}	800V to 1600V
I_{FSM}/I_{TSM}	920A/1200A
I_R	20 μ A
V_{FM}/V_{TM}	1.3V/1.6V
$T_{Jmax.}$	150°C

⊙ Maximum Ratings for Diodes

MAJOR RATINGS AND CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)					
PARAMETER	SYMBOL	MTPT100			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, $T_c = 100^\circ\text{C}$	I_O	100			A
Peak forward surge current single sine-wave superimposed on rated load	I_{FSM}	920			A
Rating (non-repetitive, for t greater than 1 ms and less than 8.3 ms) for fusing	I^2t	4230			A^2s
Operating junction temperature range	T_J	-40 to 150			$^\circ\text{C}$
Storage temperature range	T_{STG}	-40 to 125			$^\circ\text{C}$
Thermal Impedance, junction to case	R_{thJC}	0.20			$^\circ\text{C}/\text{W}$
Thermal Impedance, case to heatsink	R_{thCS}	0.10			$^\circ\text{C}/\text{W}$

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)						
PARAMETER	TEST CONDITIONS	SYMBOL	MTPT100			UNIT
			08	12	16	
Maximum instantaneous forward drop per diode	$I_F = 100\text{A}$	V_F	1.3			V
Maximum reverse DC current at rated DC blocking voltage per diode	$T_A = 25^\circ\text{C}$	I_R	20			μA
	$T_A = 150^\circ\text{C}$		6			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		100	A
				85	$^\circ\text{C}$
Maximum peak, one-cycle, on-state non-repetitive surge current	I_{TSM}	t = 10 ms	No voltage reappplied	1200	A
		t = 8.3 ms		1260	
		t = 10 ms	100% V_{RRM} reappplied	1008	
		t = 8.3 ms		1058	
Maximum I^2t for fusing	I^2t	t = 10 ms	No voltage reappplied	7200	A^2s
		t = 8.3 ms		6590	
		t = 10 ms	100% V_{RRM} reappplied	5080	
		t = 8.3 ms		4645	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 ms to 10 ms, no voltage reappplied		72	$\text{kA}^2\sqrt{\text{s}}$
Maximum on-state voltage drop	V_{TM}	$I_{TM} = 300\text{A}$, $T_J = 25^\circ\text{C}$, 180° conduction		1.6	V
Maximum holding current	I_H	Anode supply = 6 V, initial $I_T = 30\text{A}$, $T_J = 25^\circ\text{C}$		150	mA
Maximum latching current	I_L	Anode supply = 6 V Gate pulse: 10 V, 100 μs , $T_J = 25^\circ\text{C}$		400	

SWITCHING					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Typical delay time	t_d	$T_J = 25^\circ\text{C}$, gate current = 1A $dI_g/dt = 1\text{A}/\mu\text{s}$ $V_d = 0.67 V_{DRM}$		1	μs
Typical rise time	t_r			2	
Typical turn-off time	t_q	$I_{TM} = 300\text{A}$; $dI/dt = 15\text{A}/\mu\text{s}$; $T_J = T_J$ maximum, $V_R = 50\text{V}$; $dV/dt = 20\text{V}/\mu\text{s}$; gate 0V, 100 Ω		50 to 150	

BLOCKING					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum peak reverse and off-state leakage current	I_{RRM} I_{DRM}	$T_J = 125\text{ }^\circ\text{C}$		20	mA
RMS isolation Voltage	V_{ISO}	50 Hz, circuit to base, all terminals shorted, $25\text{ }^\circ\text{C}$, 60s		2500	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 = 6V, 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	$T_J = 125\text{ }^\circ\text{C}$, $V_D = 0.5V_{DRM}$, $I_G = 100\text{ mA}$, $dI_G/dt = 0.1\text{ A}/\mu\text{s}$		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		0.36	$^\circ\text{C}/\text{W}$
Typical thermal resistance, case to heatsink per module	R_{thCS}	Mounting surface, smooth, flat and greased		0.10	
Mounting torque $\pm 10\%$ to heatsink, M5 to terminal, M5		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.		3	N.m
				3	
Approximate weight				250	g
				8.8	oz.

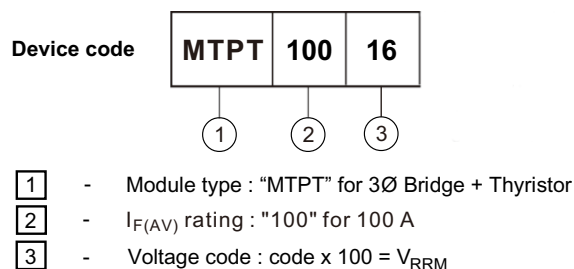


Fig.1 Power dissipation (For Diodes)

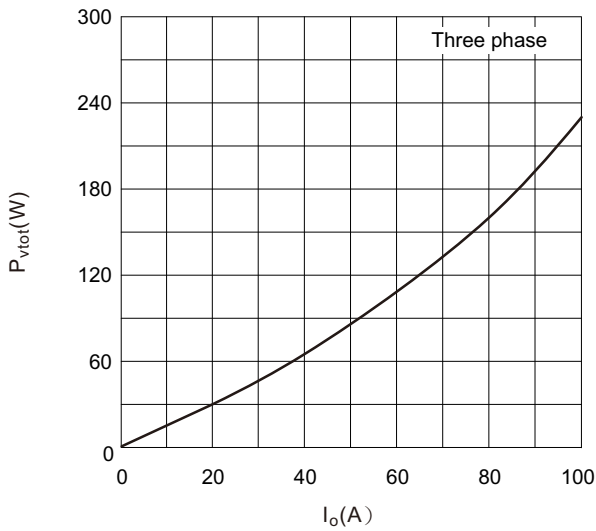


Fig.2 Forward current derating curve (For Diodes)

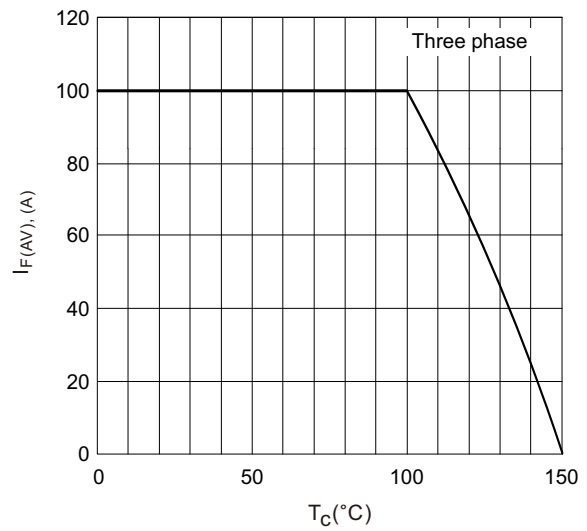


Fig.3 Transient thermal impedance (For Diodes)

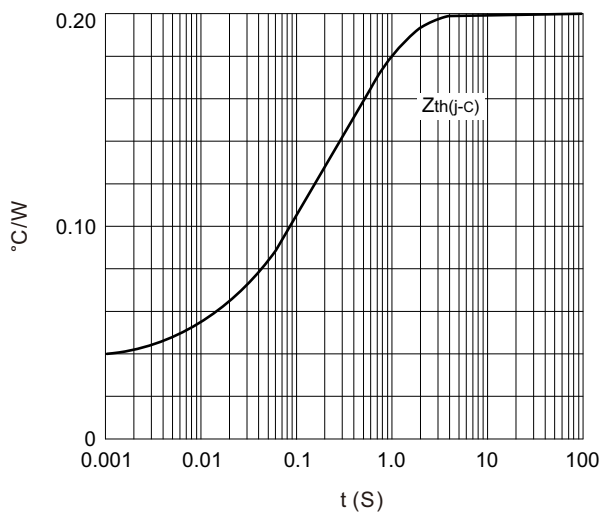


Fig.4 Max non-repetitive forward surge current (For Diodes)

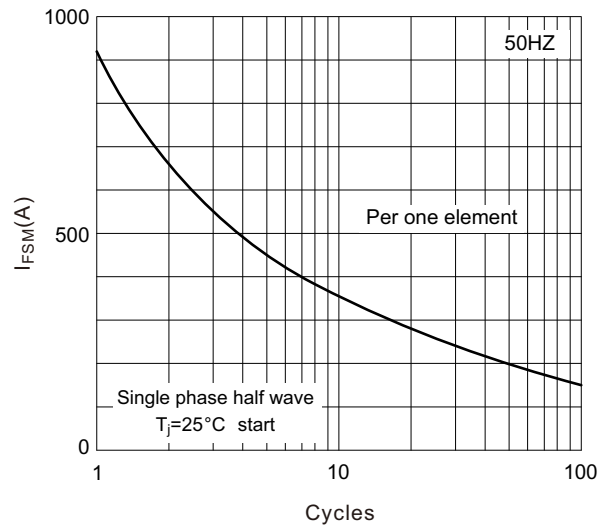


Fig.5 Forward characteristics (For Diodes)

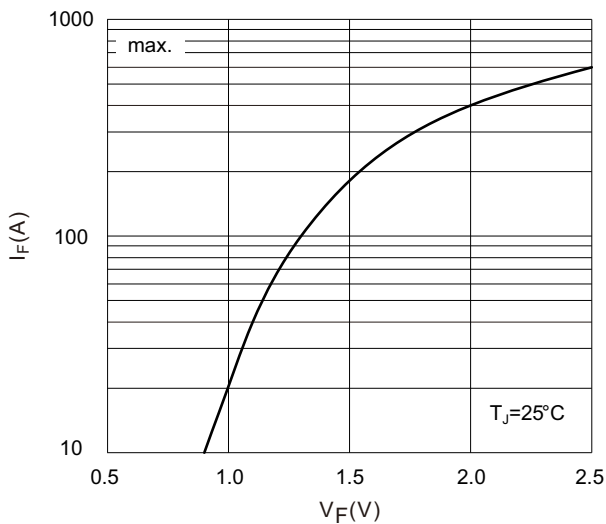


Fig.6 SCR power dissipation

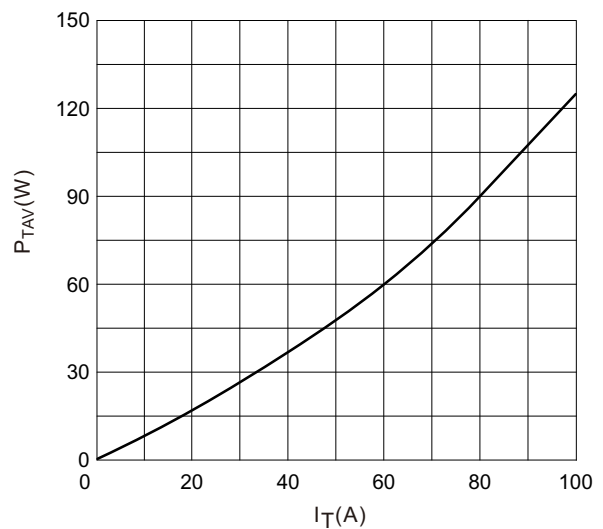


Fig.7 SCR forward current derating curve

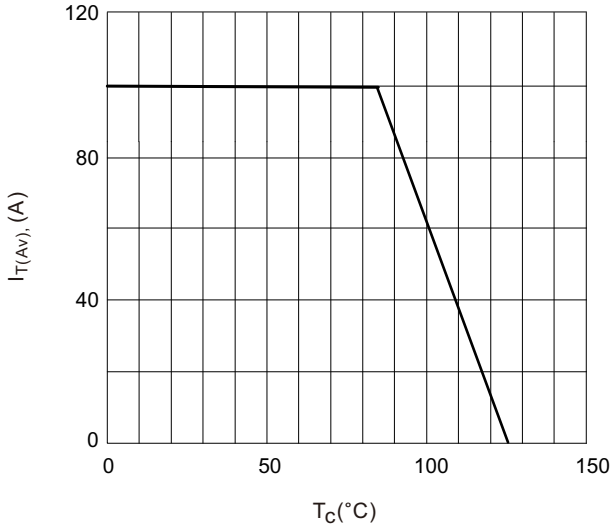


Fig.8 SCR transient thermal impedance

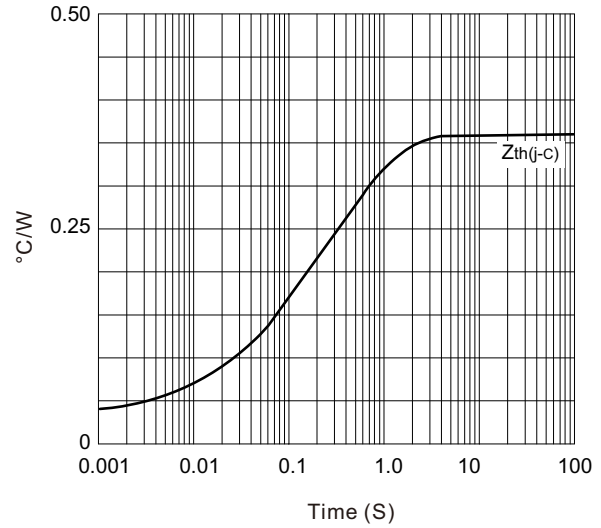


Fig.9 SCR forward characteristics

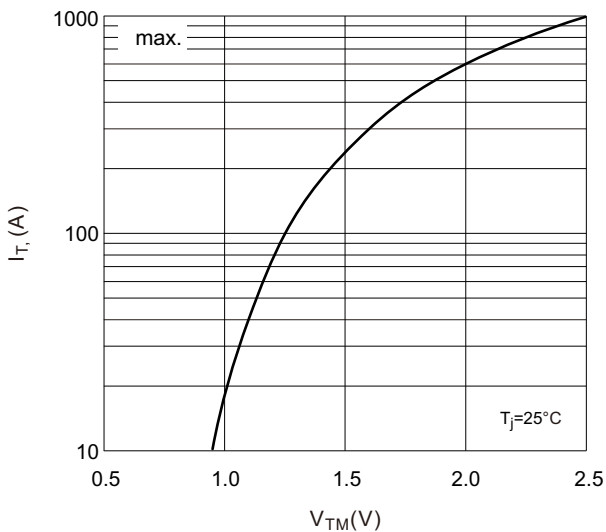


Fig.10 Gate trigger characteristics

