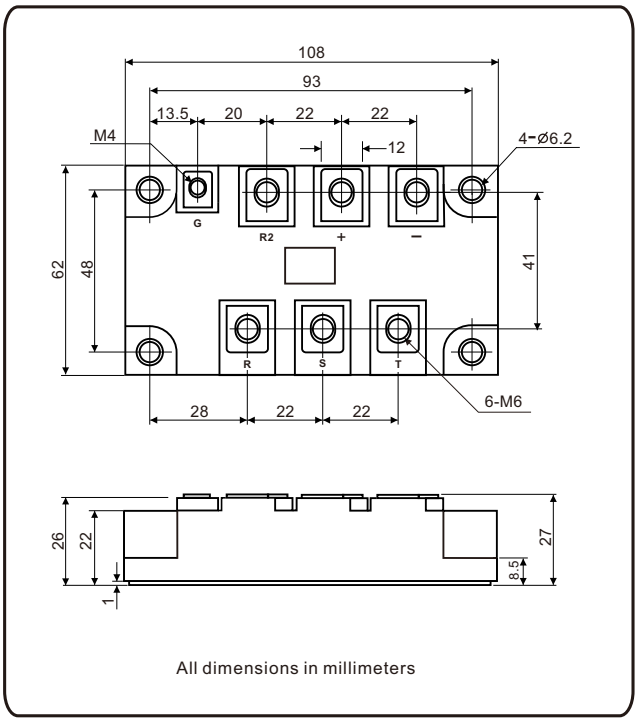
Three-Phase Bridge + Thyristor, 150A

MTPT15008 Thru MTPT15016

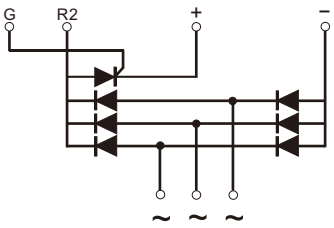




FEATURES

- 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

RoHS COMPLIANT



Applications

- Inverter for AC or DC motor control
- Current stablilzed 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 CHARACTERRISTICS	
$I_{F(AV)}$	150A
V_{RRM}	800V to 1600V
I_{FSM}/I_{TSM}	1800A/1500A
I_R	20 μA
V_{FM}/V_{TM}	1.4V/1.6V
$T_{J\ max.}$	150°C

◎ Maximum Ratings for Diodes

MAJOR RATINGS AND CHARACTERISTICS (T_A = 25°C unless otherwise noted)					
PARAMETER	SYMBOL	MTPT150			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	150			A
Peak forward surge current single sine-wave superimposed on rated load	I_{FSM}	1800			A
Rating (non-repetitive, for t greater than 1 ms and less than 8.3 ms) for fusing	I^2t	16200			A^2s
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}	0.14			°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	MTPT150			UNIT
			08	12	16	
Maximum instantaneous forward drop per diode	I_F = 150A	V_F	1.4			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			150	A
					90	°C
Maximum peak, one-cycle, on-state non-repetitive surge current	I_{TSM}	t = 10 ms	No voltage reapplied	Sine half wave, initial T_J = T_J maximum	1500	A
		t = 8.3 ms			1570	
		t = 10 ms	100%V_{RRM} reapplied		1260	
		t = 8.3 ms			1319	
Maximum I^2t for fusing	I^2t	t = 10 ms	No voltage reapplied		11.25	kA^2s
		t = 8.3 ms			10.23	
		t = 10 ms	100%V_{RRM} reapplied		7 . 94	
		t = 8.3 ms			7.22	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 ms to 10 ms, no voltage reapplied			112.5	$kA^2\sqrt{s}$
Maximum on-state voltage drop	V_{TM}	I_{TM} = 450A , T_J = 25 °C, 180° conduction			1.60	V
Maximum holding current	I_H	Anode supply = 6 V, initial I_T= 30 A, T_J = 25 °C			200	mA
Maximum latching current	I_L	Anode supply = 6 V Gate pulse: 10 V, 100 μs, T_J = 25 °C			400	

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 V_d = 0.67 V_{DRM}	1	μs
Typical rise time	t_r		2	
Typical tum-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 °C	25	mA
RMS isolation Voltage	V_{ISO}	50 Hz, circuit to base, all terminals shorted, 25 ºC ,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}	$t_p \leq 5$ ms, T_J = T_J maximum		10	W
Maximum average gate power	$P_{G(AV)}$	f = 50 Hz, T_J = T_J maximum		3	W
Maximum peak gate current	I_{GM}	$t_p \leq 5$ 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 °C	Anode supply = 6V, resistive load; R_a = 1 Ω	3	V
Maximum required DC gate current to trigger	I_{GT}			150	mA
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 = 125ºC, V_D = 0.5V_{DRM}, I_G=100mA dI_G/dt = 0.1A/µs		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	°C
Maximum thermal resistance, junction to case per junction	R_{thJC}	DC operation	0.18	°C/W
Typical thermal resistance, case to heatsink per module	R_{thCS}	Mounting surface, smooth , flat and greased	0.10	°C/W
Mounting torque ± 10 % — to heatsink, M6		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
Mounting torque ± 10 % — to terminal, M6/M4			5 / 2	N.m
Approximate weight			470	g
			16.6	oz.

Device code

MTPT	150	16
①	②	③

1 - Module type : "MTPT" for 3Ø Bridge + Thyristor

2 - $I_{F(AV)}$ rating : "150" for 150 A

3 - Voltage code : code x 100 = V_{RRM}

Fig.1 Power dissipation

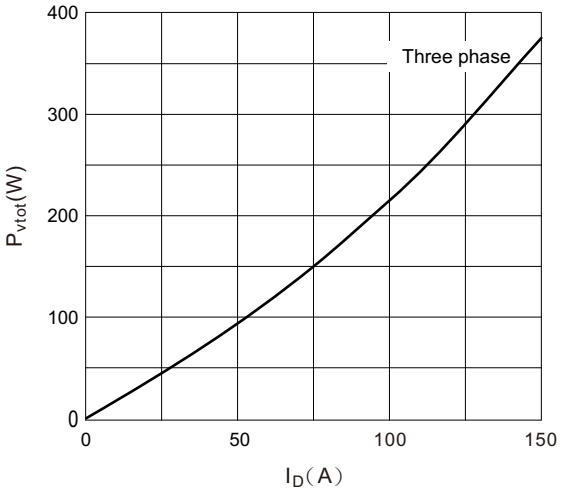


Fig.2 Forward current derating curve

Three phase

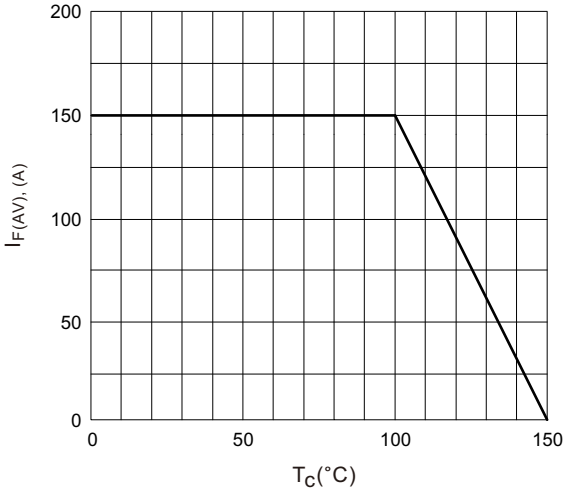


Fig.3 Transient thermal impedance

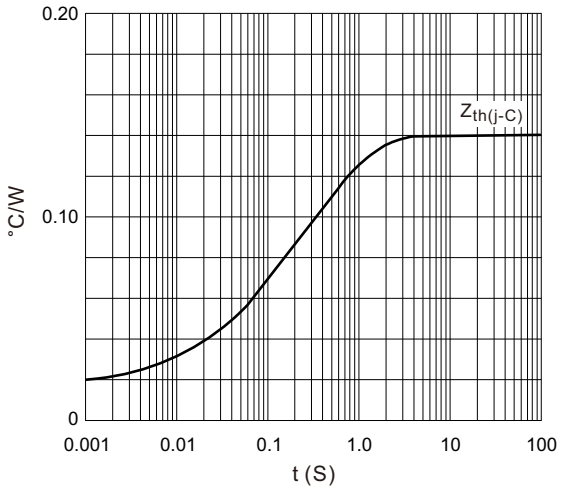


Fig.4 Max non-repetitive forward surge current

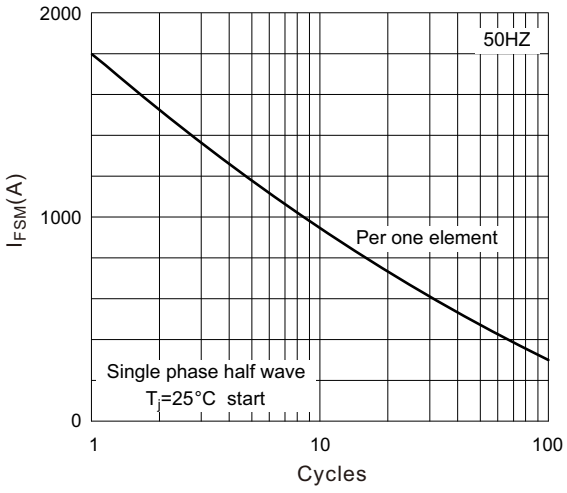


Fig.5 Forward characteristics

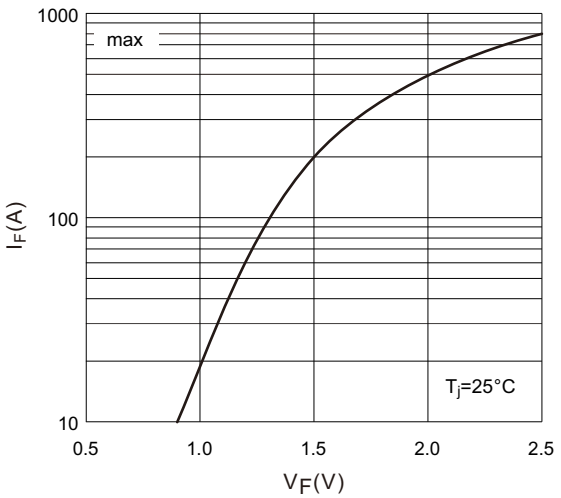


Fig.6 SCR power dissipation

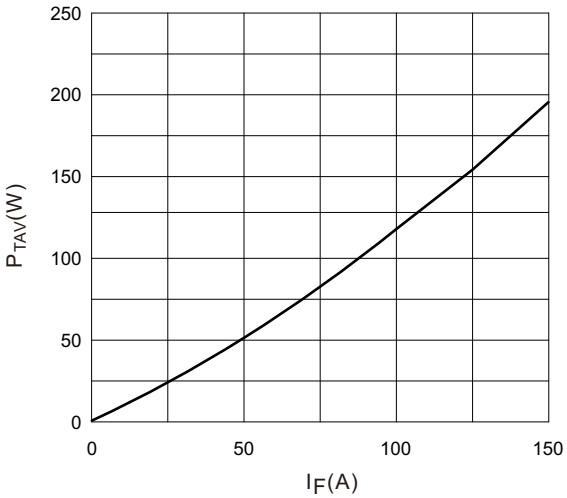


Fig.7 SCR forward current derating curve

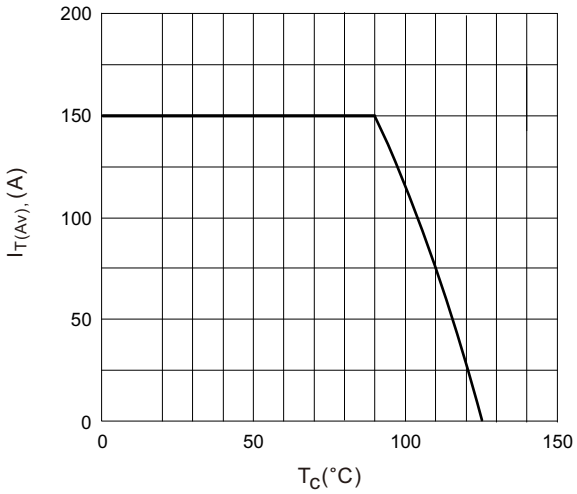


Fig.8 SCR transient thermal impedance

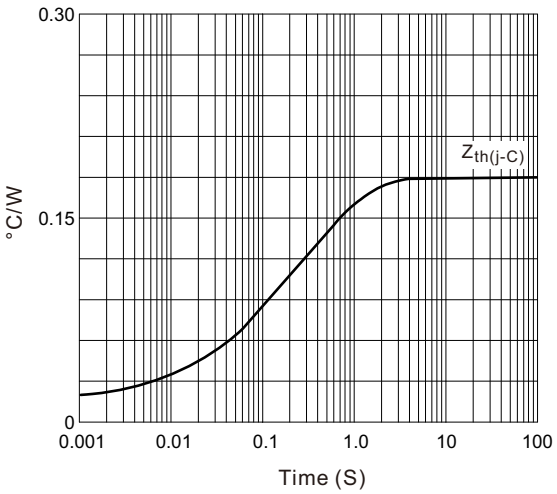


Fig.9 SCR forward characteristics

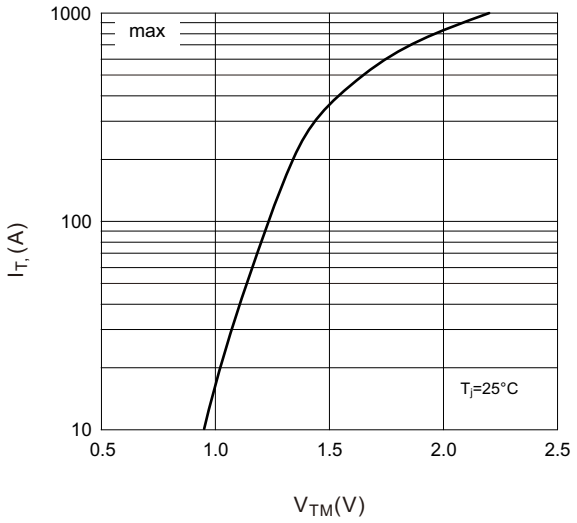


Fig.10 Gate trigger characteristics

