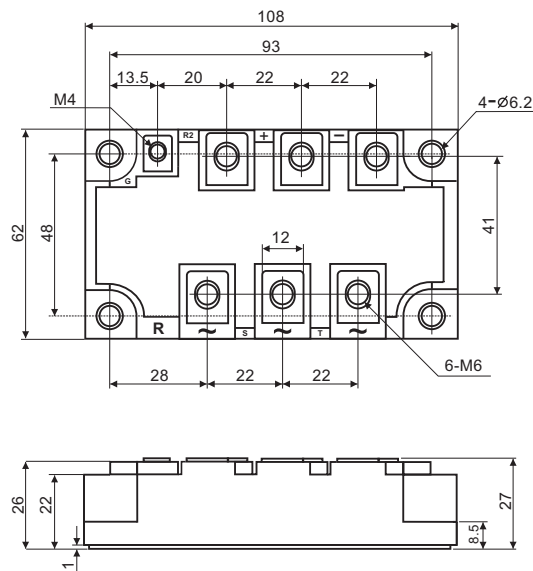


Three-Phase Bridge + Thyristor, 200A

MTPT20008 Thru MTPT20016



All dimensions in millimeters

FEATURES

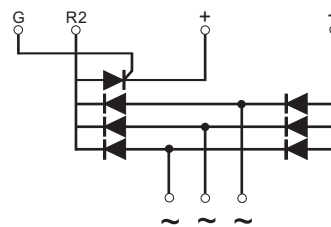
- UL recognition file number E320098 
- Three-phase bridge and a thyristor
- High surge current capability
- Low thermal resistance
- Compliant to RoHS 
- Isolation voltage up to 2500V

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}	1900A
I_R	20 μ A
V_{FM}/V_{TM}	1.3V
$T_{J \max}$	150°C

Nell High Power Products

◎ Maximum Ratings for Diodes

MAJOR RATINGS AND CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)					
PARAMETER	SYMBOL	MTPT200			UNIT
		08	12	16	
Maximum repetitive peak reverse voltage	V_{RRM}/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	200			A
Peak forward surge current single sine-wave superimposed on rated load	I_{FSM}	1900			A
Rating (non-repetitive, for t greater than 1 ms and less than 8.3 ms) for fusing	I^2t	18050			A^2s
Operating junction temperature range	T_J	-40 to 150			$^\circ\text{C}$
Storage temperature range	T_{STG}	-40 to 125			$^\circ\text{C}$

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	1.3			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 fo 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
					85	°C
Maximum peak, one-cycle, on-state non-repetitive surge current	I _{TSM}	t = 10 ms	No voltage reappplied	Sine half wave, initial T _J = T _J maximum	1900	A
		t = 8.3 ms			1995	
Maximum I ² t for fusing	I ² t	t = 10 ms	100%V _{RRM} reappplied		18	kA ² s
		t = 8.3 ms			16.4	
		t = 10 ms			12.6	
		t = 8.3 ms			11.5	
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} = 200A, T _J = 25 °C, 180° conduction			1.3	V
Maximum holding current	I _H	Anode supply = 12 V initial I _T = 30 A, T _J = 25 °C			200	mA
Maximum latching current	I _L	Anode supply = 12 V resistive load = 1 Ω Gate pulse: 10 V, 100 μs, T _J = 25 °C			400	

SWITCHING				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Typical delay time	t_d	$T_J = 25^\circ\text{C}$, 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}	$T_J = 125\text{ }^{\circ}\text{C}$	30	mA
RMS isolation Voltage	V_{ISO}	50 Hz, circuit to base, all terminals shorted, 25 °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 ≤ 5 ms, T _J = T _J maximum		15	W
Maximum average gate power	P _{G(AV)}	f = 50 Hz, T _J = T _J maximum		5	
Maximum peak gate current	I _{GM}	t _p ≤ 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 = 12 V, resistive load; R _a = 1 Ω	3	
Maximum required DC gate current to trigger	I _{GT}			100	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	dl/dt	T _J = 25°C ,I _{GM} = 1.5A ,t _r ≤ 0.5 μs		200	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	0.14	°C/W
Typical thermal resistance, case to heatsink per module	R _{thCS}	Mounting surface, smooth , flat and greased	0.06	
Mounting torque ± 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}

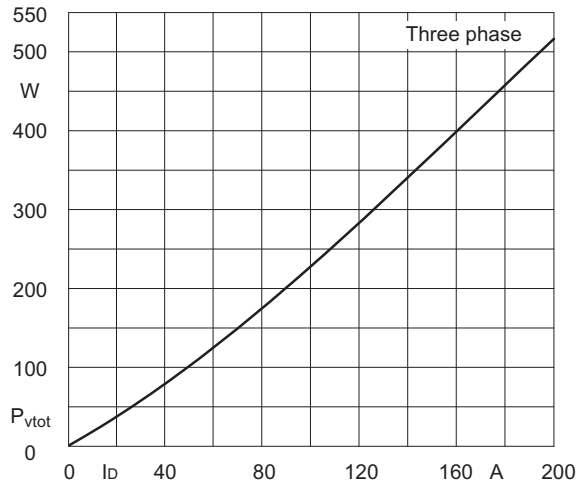
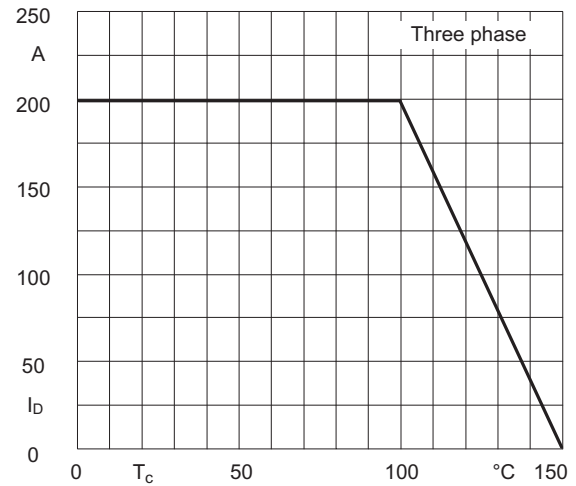
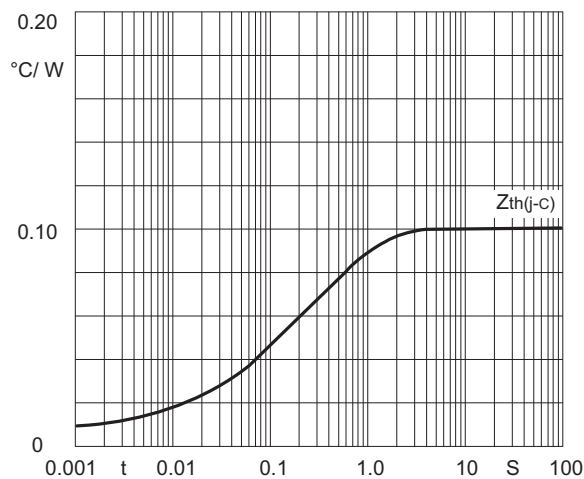
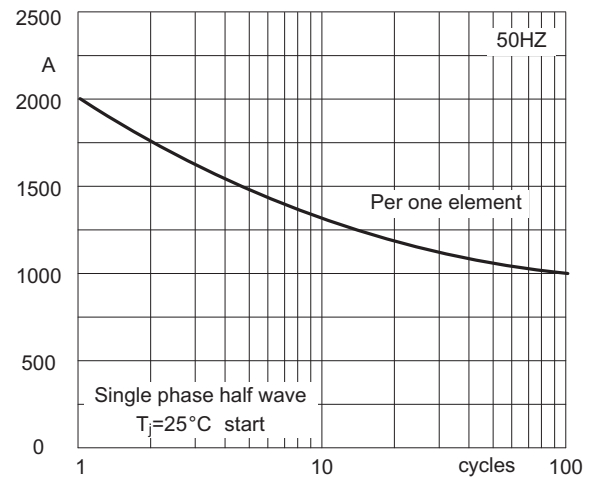
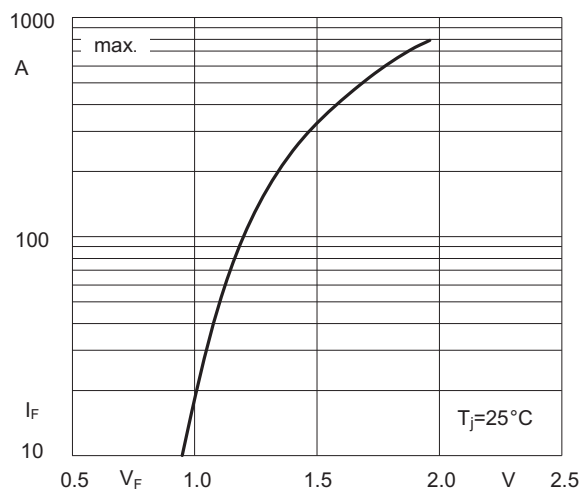
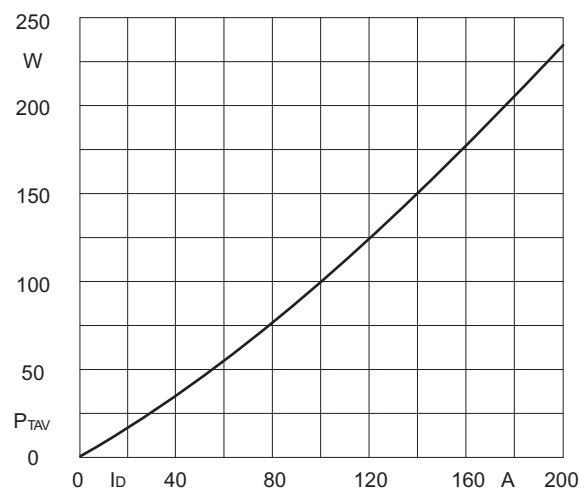
Fig.1 Power dissipation

Fig.2 Forward current derating curve

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

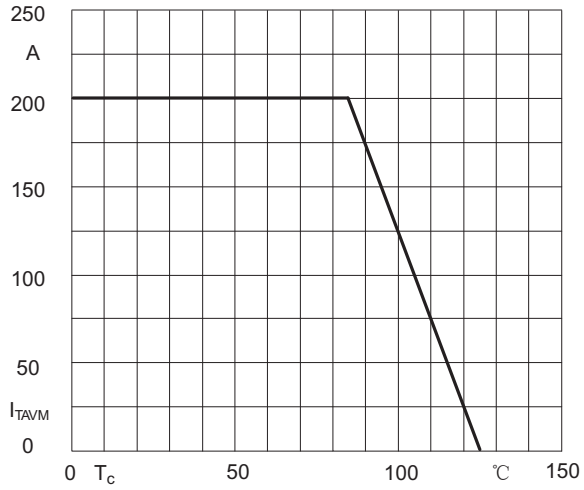


Fig.8 SCR transient thermal impedance

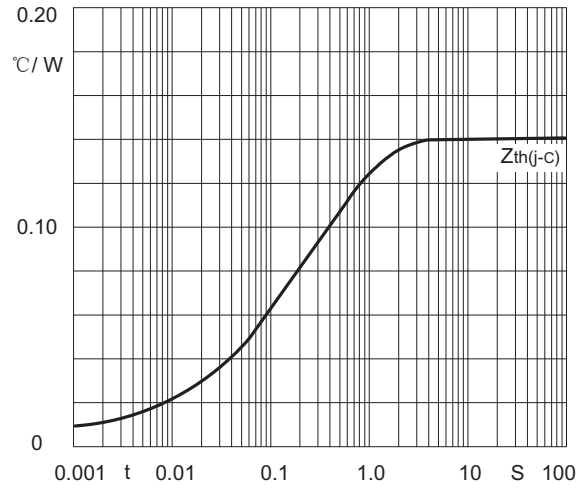


Fig.9 SCR forward characteristics

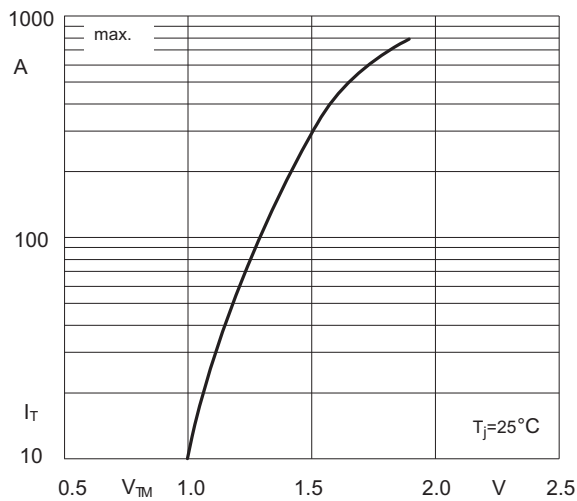


Fig.10 Gate trigger characteristics

