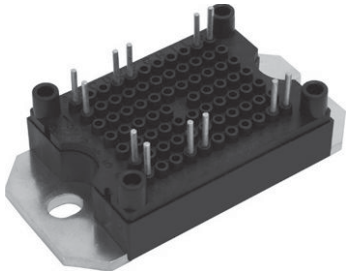
HEXFRED® Ultrafast Diodes, 30 A (Single Phase Bridge MTP Power Modules)



MTP

FEATURES

- Low profile package
- Low t_{rr} and Q_{rr}
- Soft reverse recovery
- Direct mounting to heatsink
- Round pin with PCB solderable terminals
- UL approved file E78996
- Low junction to case thermal resistance
- 3500 V_{RMS} insulation voltage
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free

RoHS COMPLIANT

DESCRIPTION

A range of extremely compact single-phase rectifier bridges offering efficient and reliable operation.

The low profile package has been specifically conceived to maximize space saving and optimize the electrical layout of the application specific power supplies.

PRIMARY CHARACTERISTICS	
V_R	1200 V
V_F (typical) at I_F = 30 A	2.46 V
I_O at 88 °C	30 A
Q_{rr} (typical)	720 nC
I_{RRM} (typical)	12 A
t_{rr} (typical)	121 ns
$dI_{(rec)M}/dt$ (typical)	300 A/µs
Package	MTP
Circuit configuration	Single phase bridge

ABSOLUTE MAXIMUM RATINGS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Cathode to anode voltage	V_R		1200	V
Continuous forward current per diode	I_F	T_C = 88 °C	30	A
Single pulse forward current per diode	I_{FSM}	10 ms sine or 6 ms rectangular pulse, T_J = 25 °C	300	
Maximum repetitive forward current per diode	I_{FRM}		200	
Maximum power dissipation per diode	P_D	T_C = 88 °C	85	W
Operating junction temperature range	T_J		-40 to +150	°C

ELECTRICAL SPECIFICATIONS (T_J = 25 °C unless otherwise specified)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Cathode to anode breakdown voltage	V_{BR}	I_R = 100 µA	1200	-	-	V
Forward voltage	V_F	I_F = 30 A	-	2.46	3.34	V
		I_F = 60 A	-	3.11	4.45	
		I_F = 30 A, T_J = 125 °C	-	2.32	2.96	
		I_F = 60 A, T_J = 125 °C	-	3.07	3.96	
Reverse leakage current	I_R	V_R = 1200 V	-	2.8	50	µA
		V_R = 1200 V, T_J = 125 °C	-	2	10	mA
Junction capacitance	C_T	V_R = 200 V	-	50	75	pF

DYNAMIC RECOVERY CHARACTERISTICS (T_J = 25 °C unless otherwise specified)							
PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNITS
Reverse recovery time	t_{rr}	T_J = 25 °C	I_F = 30 A dI_F/dt = 200 A/µs V_R = 200 V	-	121	170	ns
		T_J = 125 °C		-	180	260	
Peak recovery current	I_{RR}	T_J = 25 °C		-	12	16	A
		T_J = 125 °C		-	17	24	
Reverse recovery charge	Q_{rr}	T_J = 25 °C		-	720	1350	nC
		T_J = 125 °C		-	1540	2310	
Peak rate of fall of recovery current during t_b	$dI_{(rec)M}/dt$	T_J = 25 °C		-	300	-	A/µs
		T_J = 125 °C		-	265	-	

INSULATION TABLE				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
RMS insulation voltage	V_{INS}	T_J = 25 °C, all terminals shorted, f = 50 Hz, t = 1 s	3500	V

THERMAL - MECHANICAL SPECIFICATIONS					
PARAMETER		SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction and storage temperature range		T_J, T_{Stg}		-40 to +150	°C
Maximum thermal resistance, junction to case	per module	R_{thJC}	DC operation	0.18	°C/W
	per junction			0.73	
Typical thermal resistance, case to heatsink		R_{thCS}	Mounting surface, smooth and greased	0.06	
Approximate weight				65	g
Mounting torque, ± 10 % to heatsink			A mounting compound is recommended and the torque should be rechecked after a period of 3 hours to allow for the spread of the compound. Lubricated threads.	4	Nm

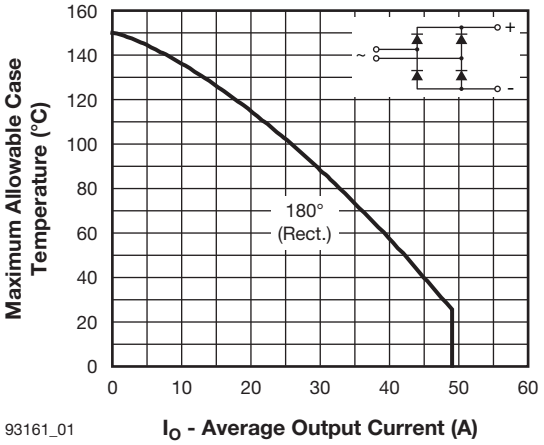


Fig. 1 - Output Current Ratings Characteristics

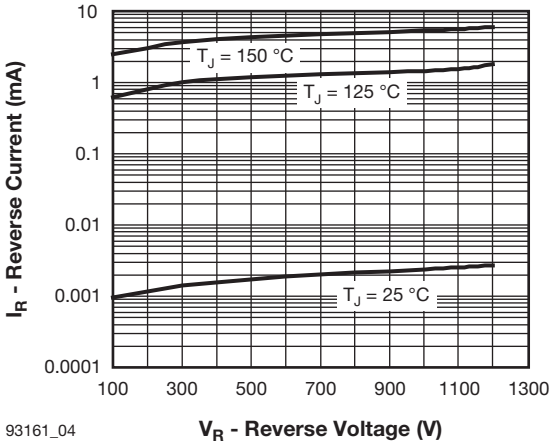


Fig. 4 - Typical Values of Reverse Current vs. Reverse Voltage (Per Diode)

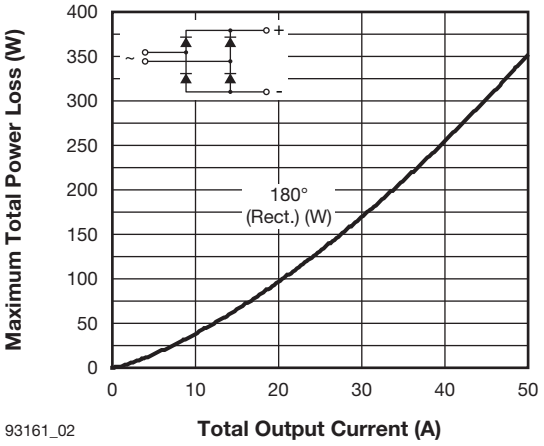


Fig. 2 - On-State Power Loss Characteristics

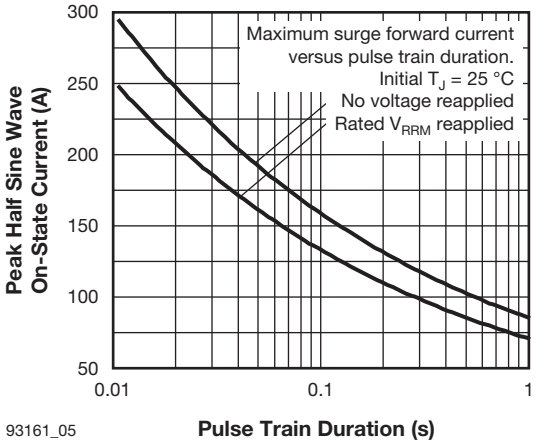


Fig. 5 - Maximum Surge Forward Current (Per Diode)

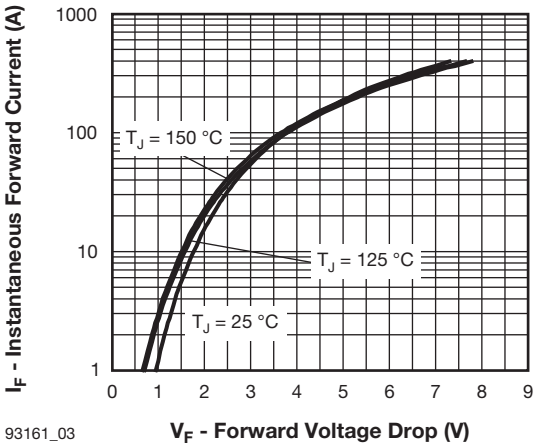


Fig. 3 - Typical Forward Voltage Drop Characteristics (Per Diode)

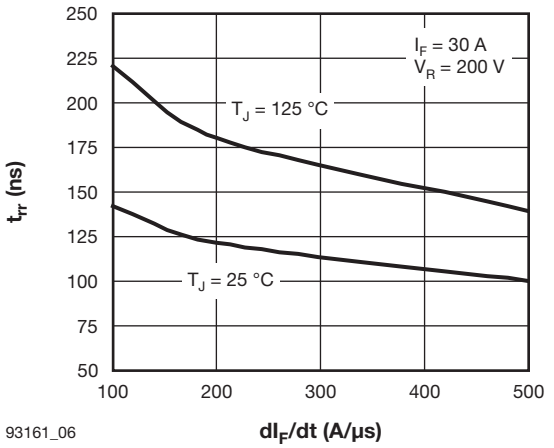


Fig. 6 - Typical Reverse Time vs. dI_F/dt (Per Diode)

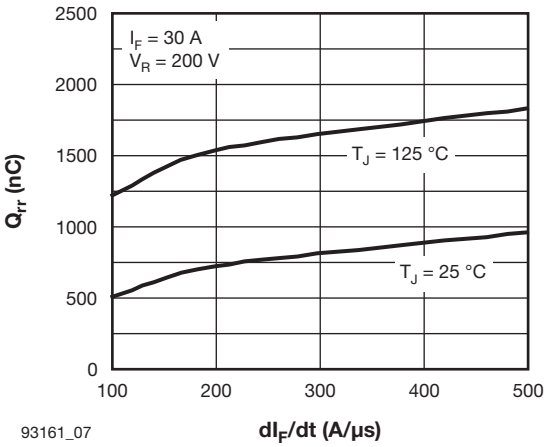


Fig. 7 - Typical Stored Charge vs. dI_F/dt (Per Diode)

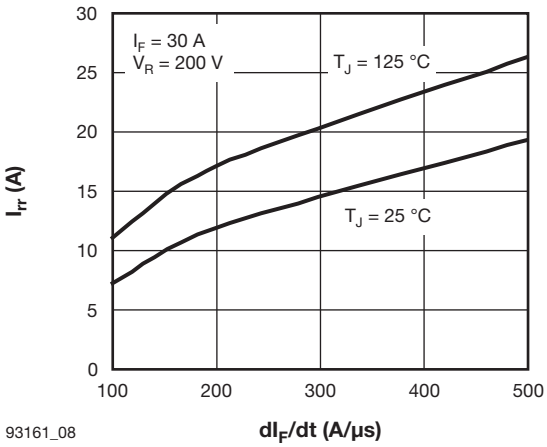


Fig. 8 - Typical Recovery Current vs. dI_F/dt (Per Diode)

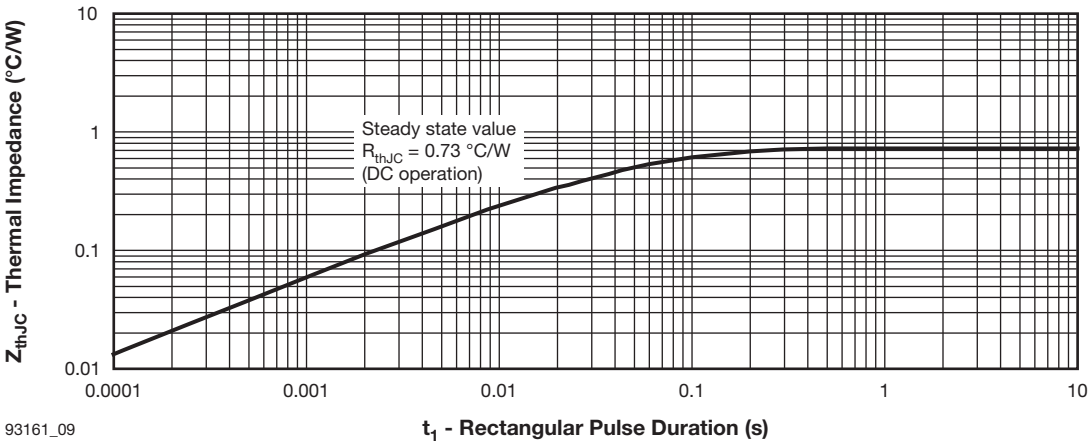


Fig. 9 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Diode)

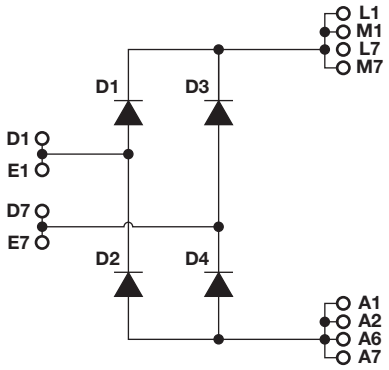
ORDERING INFORMATION TABLE

Device code

VS-	3	5	MT	120	P	B
1	2	3	4	5		6

- 1 - Vishay Semiconductors product
- 2 - Current rating (3 = 30 A)
- 3 - Circuit configuration code: 5 = single phase bridge
- 4 - Package indicator: MT = MTP
- 5 - Voltage code: code x 10 (120 = 1200 V)
- 6 - Pinout code: B = round pins

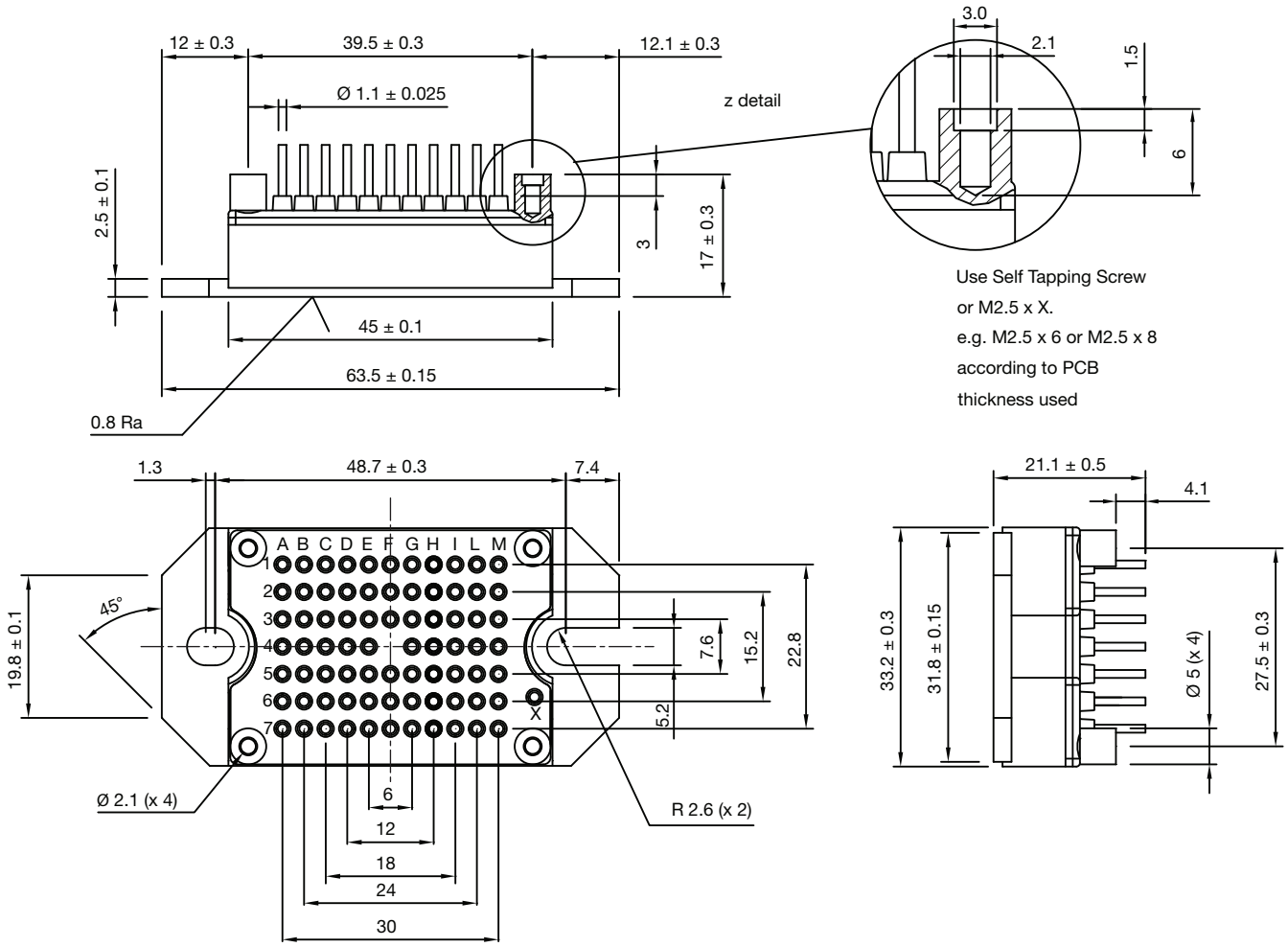
CIRCUIT CONFIGURATION



LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95383

MTP - Full Pin

DIMENSIONS in millimeters



PINS POSITION
WITH TOLERANCE ⌖ Ø 0.6

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