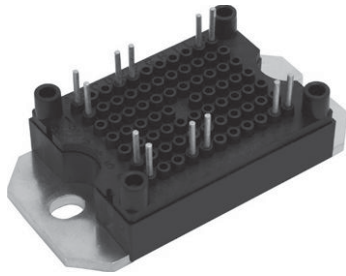



## HEXFRED® Ultrafast Diodes, 30 A (Single Phase Bridge MTP Power Modules)



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](http://www.vishay.com/doc?99912)


**RoHS  
COMPLIANT**

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/ $\mu$ s
Package	MTP
Circuit configuration	Single phase bridge

### 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.

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

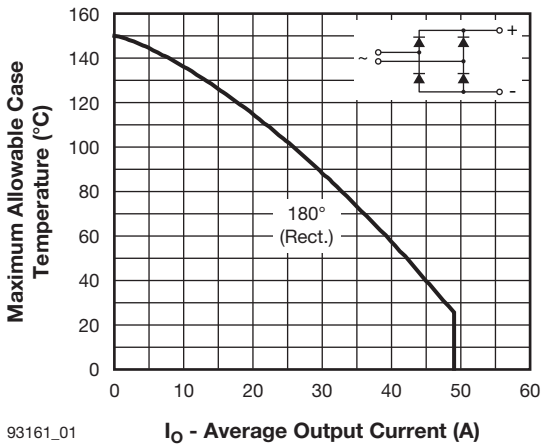
ELECTRICAL SPECIFICATIONS ( $T_J = 25$ °C unless otherwise specified)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Cathode to anode breakdown voltage	$V_{BR}$	$I_R = 100$ $\mu$ A	1200	-	-	V
Forward voltage	$V_F$	$I_F = 30$ A	-	2.46	3.34	V
		$I_F = 60$ A	-	3.11	4.45	
		$I_F = 30$ A, $T_J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



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

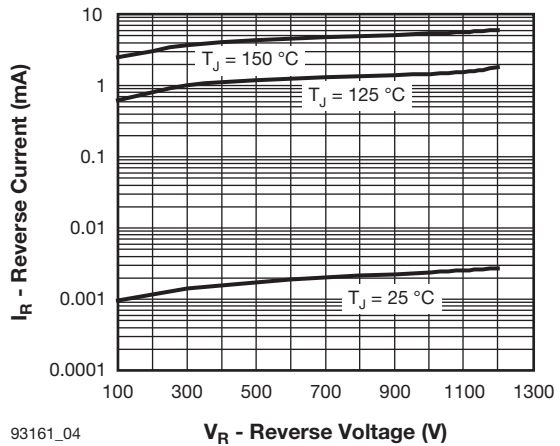
<b>INSULATION TABLE</b>				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
RMS insulation voltage	$V_{INS}$	$T_J = 25\text{ }^\circ\text{C}$ , all terminals shorted, $f = 50\text{ Hz}$ , $t = 1\text{ s}$	3500	V

<b>THERMAL - MECHANICAL SPECIFICATIONS</b>				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction and storage temperature range	$T_J, T_{Stg}$		-40 to +150	$^\circ\text{C}$
Maximum thermal resistance, per module junction to case per junction	$R_{thJC}$	DC operation	0.18	$^\circ\text{C}/\text{W}$
			0.73	
Typical thermal resistance, case to heatsink	$R_{thCS}$	Mounting surface, smooth and greased	0.06	
Approximate weight			65	g
Mounting torque, $\pm 10\%$ 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



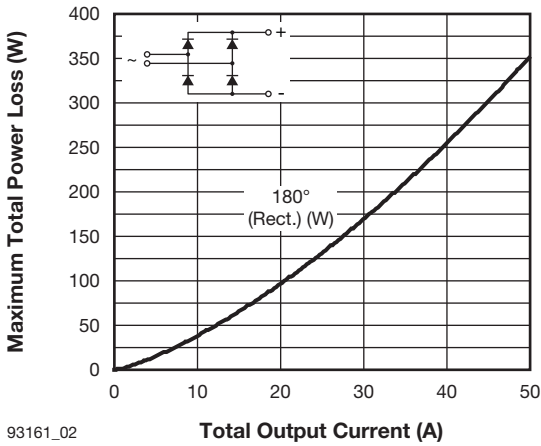
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Fig. 1 - Output Current Ratings Characteristics



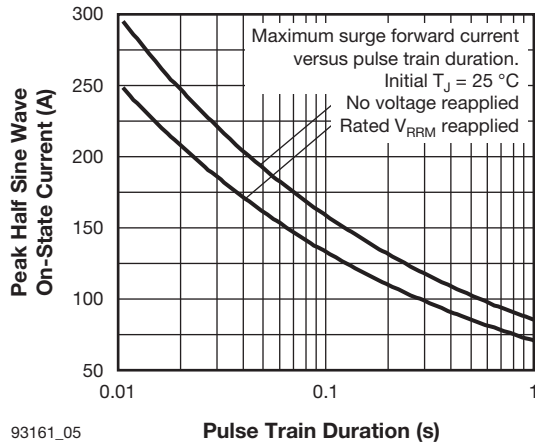
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Fig. 4 - Typical Values of Reverse Current vs. Reverse Voltage (Per Diode)



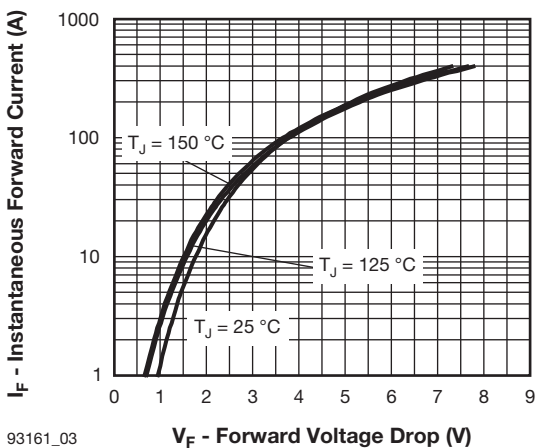
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Fig. 2 - On-State Power Loss Characteristics



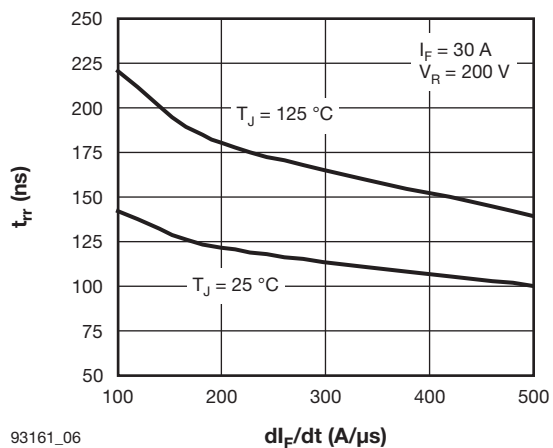
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Fig. 5 - Maximum Surge Forward Current (Per Diode)



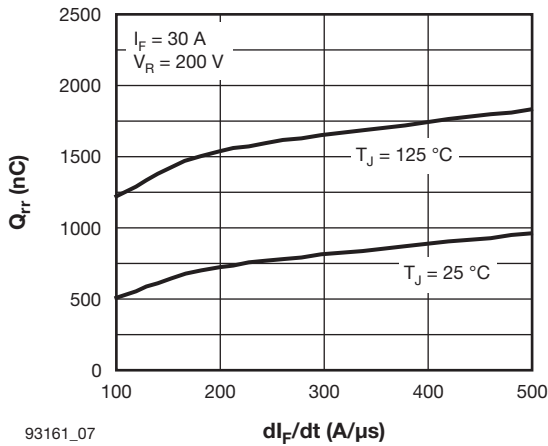
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Fig. 3 - Typical Forward Voltage Drop Characteristics (Per Diode)



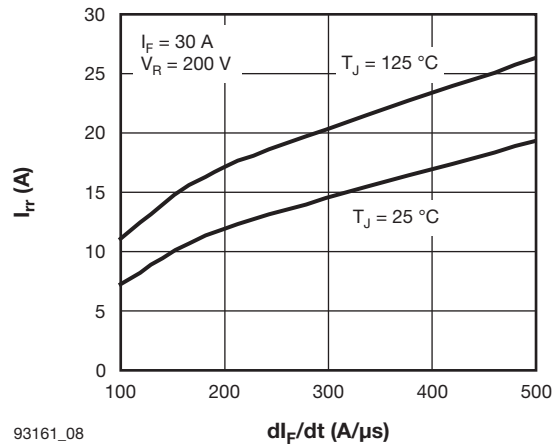
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Fig. 6 - Typical Reverse Time vs. di<sub>F</sub>/dt (Per Diode)



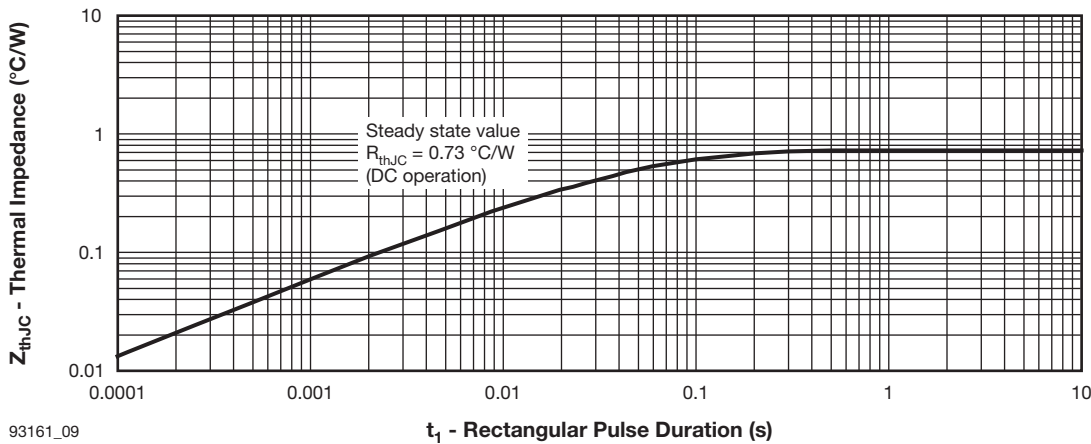
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Fig. 7 - Typical Stored Charge vs.  $di_F/dt$  (Per Diode)



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



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

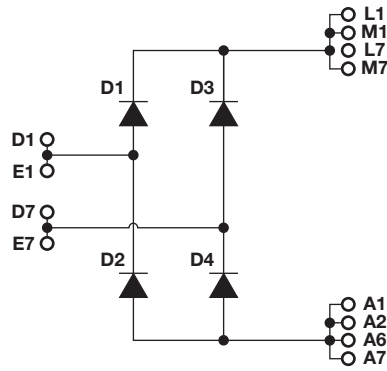
**ORDERING INFORMATION TABLE**

Device code	<b>VS-</b>	<b>3</b>	<b>5</b>	<b>MT</b>	<b>120</b>	<b>P</b>	<b>B</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**



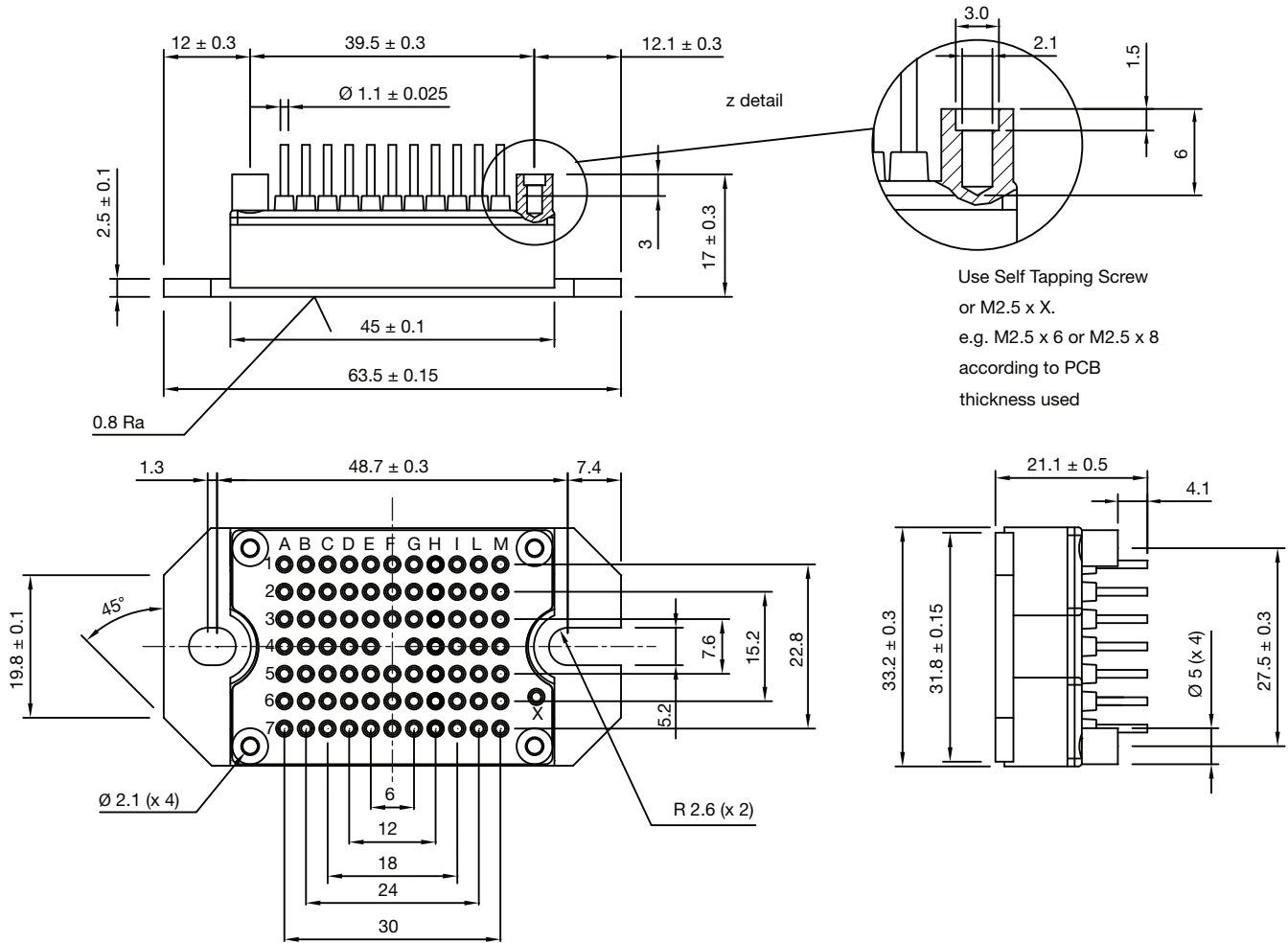
**LINKS TO RELATED DOCUMENTS**

<b>LINKS TO RELATED DOCUMENTS</b>	
Dimensions	<a href="http://www.vishay.com/doc?95383">www.vishay.com/doc?95383</a>



### MTP - Full Pin

**DIMENSIONS** in millimeters



Use Self Tapping Screw  
or M2.5 x X.  
e.g. M2.5 x 6 or M2.5 x 8  
according to PCB  
thickness used

PINS POSITION  
WITH TOLERANCE  $\varnothing 0.6$



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