

## HEXFRED® Ultrafast Diodes, 300 A (INT-A-PAK Power Modules)


**INT-A-PAK**
**FEATURES**

- Electrically isolated: DCB base plate
- Standard JEDEC® package
- Simplified mechanical designs, rapid assembly
- High surge capability
- Large creepage distances
- Case style INT-A-PAK
- Designed and qualified for industrial level
- 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 300 A at 25 °C	2.18 V
$t_{rr}$ (typical) at 45 A	233 ns
$I_{F(DC)}$ at $T_C$	300 A at 60 °C
Package	INT-A-PAK
Circuit configuration	Single diode

**REMARKS**

- Product reliability results valid for  $T_J = 150$  °C
- Recommended operation temperature  $T_{op} = 150$  °C

**ABSOLUTE MAXIMUM RATINGS**

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Cathode to anode voltage	$V_R$		1200	V
Continuous forward current	$I_F$	$T_C = 25$ °C	375	A
		$T_C = 60$ °C	300	
Single pulse forward current	$I_{FSM}$	$T_J = 25$ °C	2400	
Maximum power dissipation	$P_D$	$T_C = 25$ °C	1040	W
		$T_C = 60$ °C	750	
RMS isolation voltage	$V_{ISOL}$	50 Hz, circuit to base, all terminal shorted, $t = 1$ s	3500	V
Junction temperature range	$T_J$		-40 to +150	°C
Storage temperature range	$T_{Stg}$		-40 to +150	

**ELECTRICAL SPECIFICATIONS PER LEG ( $T_J = 25$  °C unless otherwise specified)**

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Cathode to anode breakdown voltage	$V_{BR}$	$I_R = 500$ $\mu$ A	1200	-	-	V
Maximum forward voltage	$V_{FM}$	$I_F = 300$ A	-	2.18	2.23	
		$I_F = 300$ A, $T_J = 150$ °C	-	2.24	2.47	
Maximum reverse leakage current	$I_{RM}$	$V_R = 1200$ V	-	0.06	0.2	mA
		$T_J = 150$ °C, $V_R = 1200$ V	-	-	20	



<b>DYNAMIC RECOVERY CHARACTERISTICS</b> ( $T_J = 25\text{ }^\circ\text{C}$ unless otherwise specified)							
PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNITS
Diode reverse recovery charge	$Q_{rr}$	$T_J = 25\text{ }^\circ\text{C}$	$I_F = 45\text{ A}$ $V_R = 400\text{ V}$ $di_F/dt = 500\text{ A}/\mu\text{s}$	-	3.5	-	$\mu\text{C}$
		$T_J = 125\text{ }^\circ\text{C}$		-	10.4	-	
Reverse recovery time	$t_{rr}$	$T_J = 25\text{ }^\circ\text{C}$		-	233	-	ns
		$T_J = 125\text{ }^\circ\text{C}$		-	396	-	
Reverse recovery current	$I_{rr}$	$T_J = 25\text{ }^\circ\text{C}$		-	30	-	A
		$T_J = 125\text{ }^\circ\text{C}$		-	53	-	

<b>THERMAL - MECHANICAL SPECIFICATIONS</b>				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum internal thermal resistance, junction to case per leg	$R_{thJC}$	DC operation	0.12	$^\circ\text{C}/\text{W}$
Typical thermal resistance, case to heatsink per module	$R_{thCS}$	Mounting surface flat, smooth, and greased	0.05	
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.	4	Nm
	busbar		6	
Approximate weight			200	g
			7.1	oz.
Case style			INT-A-PAK	

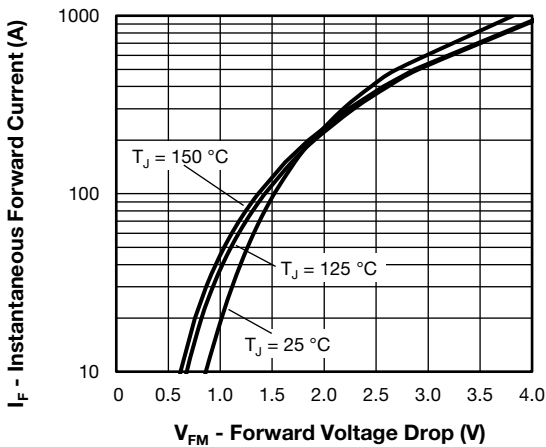


Fig. 1 - Typical Forward Voltage Drop Characteristics

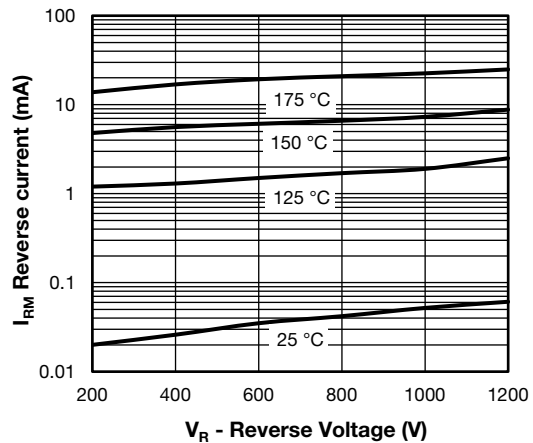


Fig. 2 - Typical Value of Reverse Current vs. Reverse Voltage

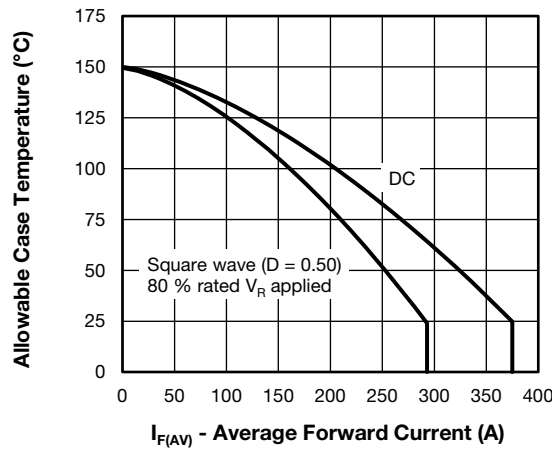


Fig. 3 - Maximum Allowable Case Temperature vs. Average Forward Current

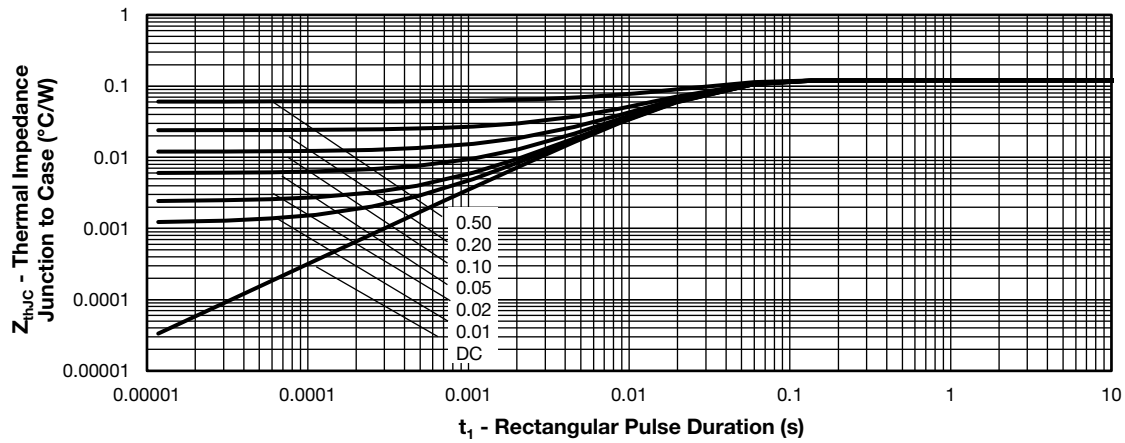


Fig. 4 - Maximum Thermal Impedance  $R_{thJC}$  Characteristics

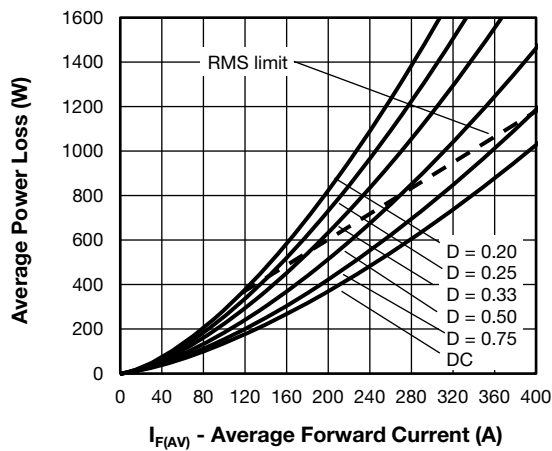


Fig. 5 - Forward Power Loss Characteristics

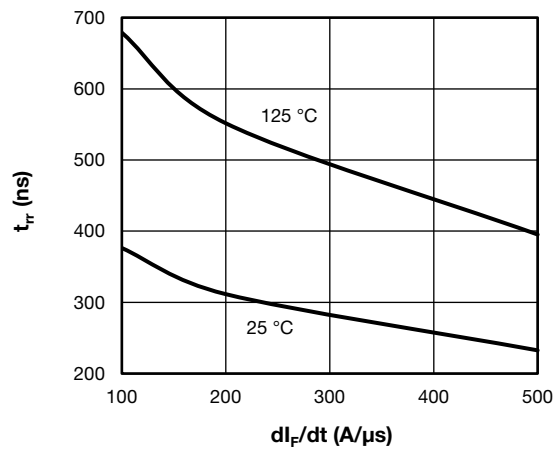


Fig. 6 - Typical Reverse Recovery Time vs.  $di_F/dt$

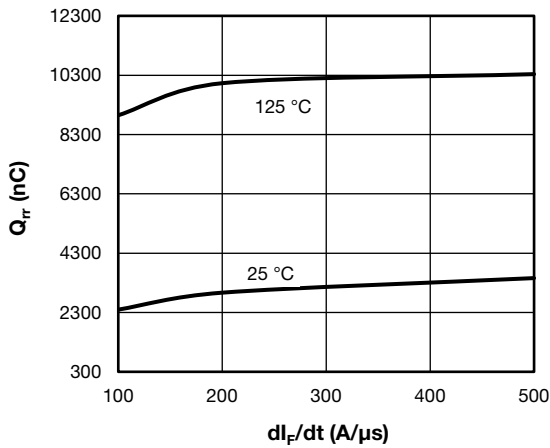


Fig. 7 - Typical Reverse Recovery Charge vs.  $di_F/dt$

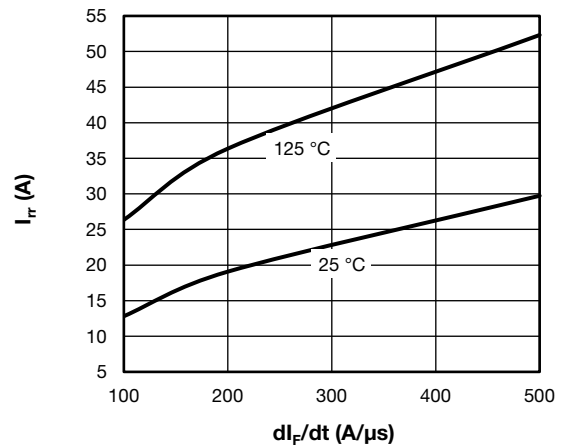


Fig. 8 - Typical Reverse Recovery Current vs.  $di_F/dt$

**ORDERING INFORMATION TABLE**

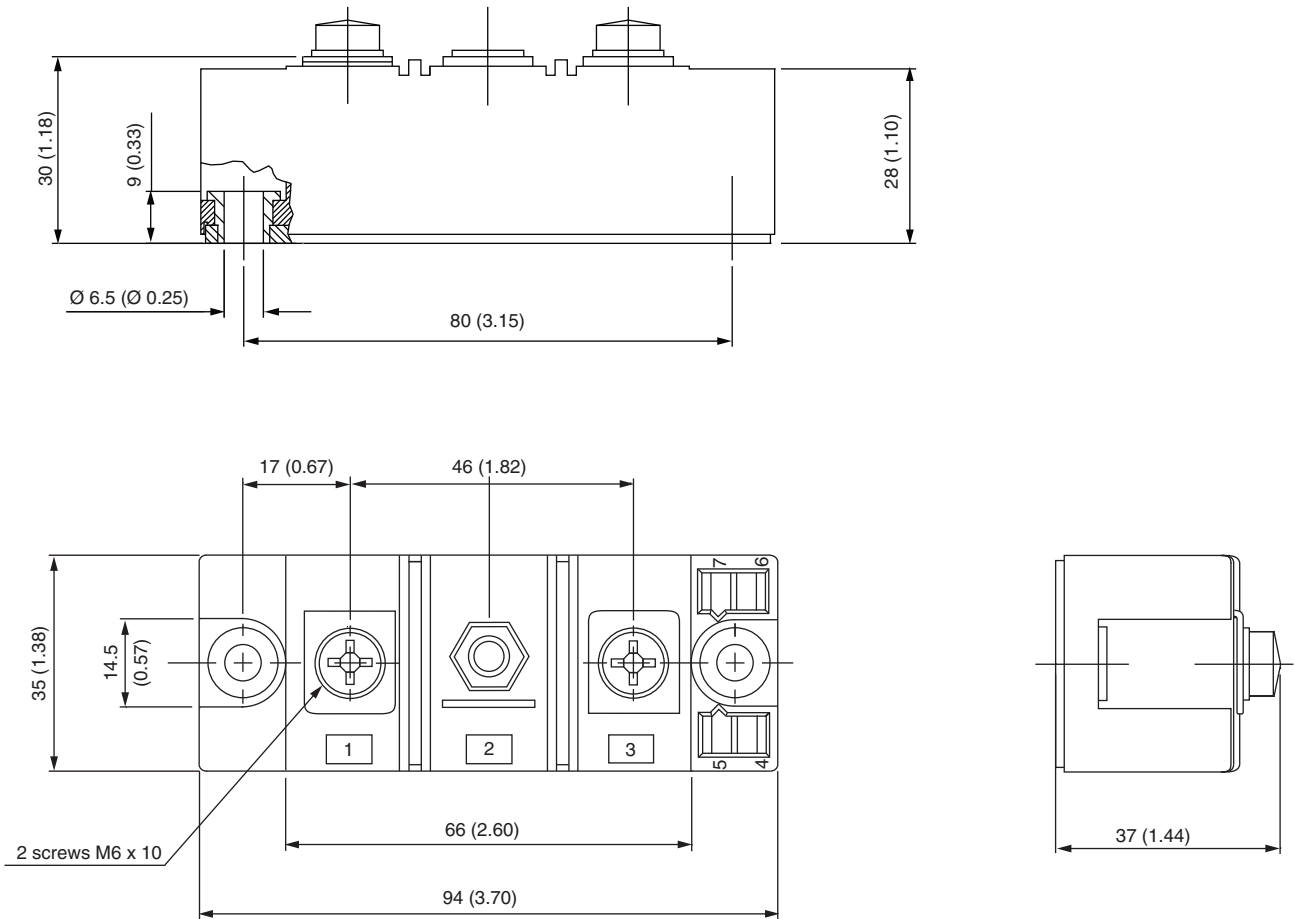
Device code	<b>VS-VS</b>	<b>KE</b>	<b>U</b>	<b>300</b>	<b>/</b>	<b>12</b>	<b>PbF</b>		
	①	②	③	④		⑤	⑥		
	<b>1</b>	-	Vishay Semiconductors product	<b>2</b>	-	KE = circuit configuration	<b>3</b>	-	U = ultrafast diode
	<b>4</b>	-	Current rating 300 = 300 A	<b>5</b>	-	Voltage rating (12 = 1200 V)	<b>6</b>	-	PbF = lead (Pb)-free

**CIRCUIT CONFIGURATION**





**DIMENSIONS** in (inches) millimeters **INT-A-PAK DBC**





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