

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


RoHS
COMPLIANT

REMARKS

- Product reliability results valid for $T_J = 150\text{ }^{\circ}\text{C}$
- Recommended operation temperature $T_{op} = 150\text{ }^{\circ}\text{C}$

PRIMARY CHARACTERISTICS

V_R	1200 V
V_F (typical) at 300 A at $25\text{ }^{\circ}\text{C}$	2.18 V
t_{rr} (typical) at 45 A	233 ns
$I_{F(DC)}$ at T_C	300 A at $60\text{ }^{\circ}\text{C}$
Package	INT-A-PAK
Circuit configuration	Single diode

ABSOLUTE MAXIMUM RATINGS

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

ELECTRICAL SPECIFICATIONS PER LEG ($T_J = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)

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

**DYNAMIC RECOVERY CHARACTERISTICS** ($T_J = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Diode reverse recovery charge	Q_{rr}	$T_J = 25\text{ }^{\circ}\text{C}$	-	3.5	-	μC
		$T_J = 125\text{ }^{\circ}\text{C}$	-	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	-	

THERMAL - MECHANICAL SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum internal thermal resistance, junction to case per leg	R_{thJC}	DC operation	0.12	$^{\circ}\text{C/W}$
Typical thermal resistance, case to heatsink per module	R_{thCS}	Mounting surface flat, smooth, and greased	0.05	
Mounting torque $\pm 10\%$ to heatsink busbar		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 to 6	Nm
Approximate weight			200	g
			7.1	oz.
Case style			INT-A-PAK	

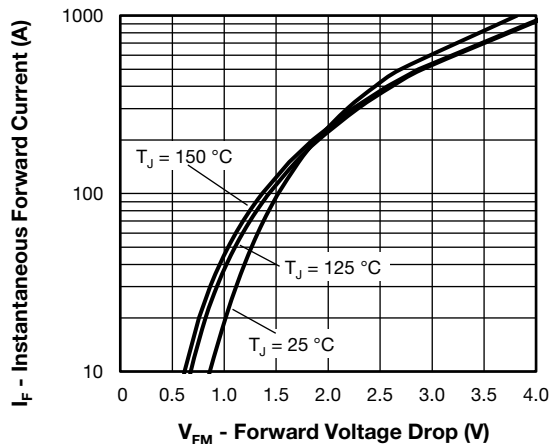


Fig. 1 - Typical Forward Voltage Drop Characteristics

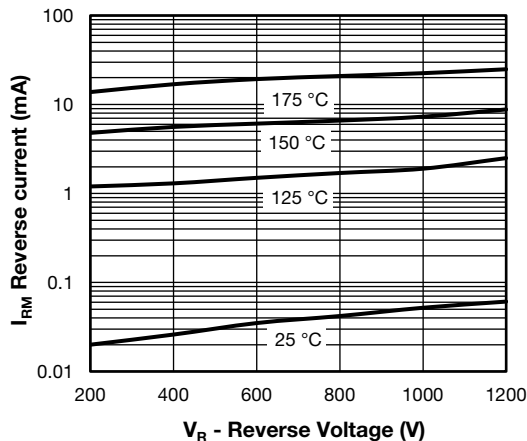


Fig. 2 - Typical Value of Reverse Current vs. Reverse Voltage

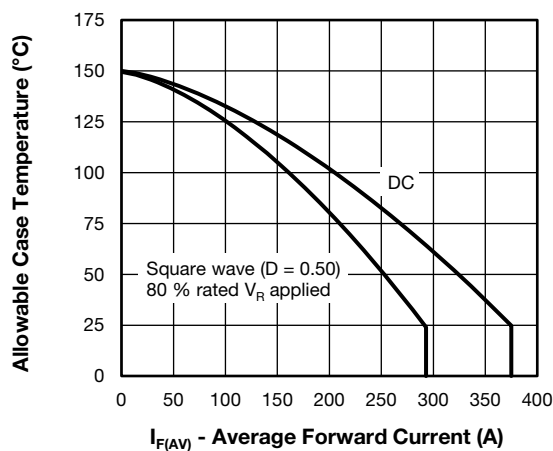


Fig. 3 - Maximum Allowable Case Temperature vs. Average Forward Current

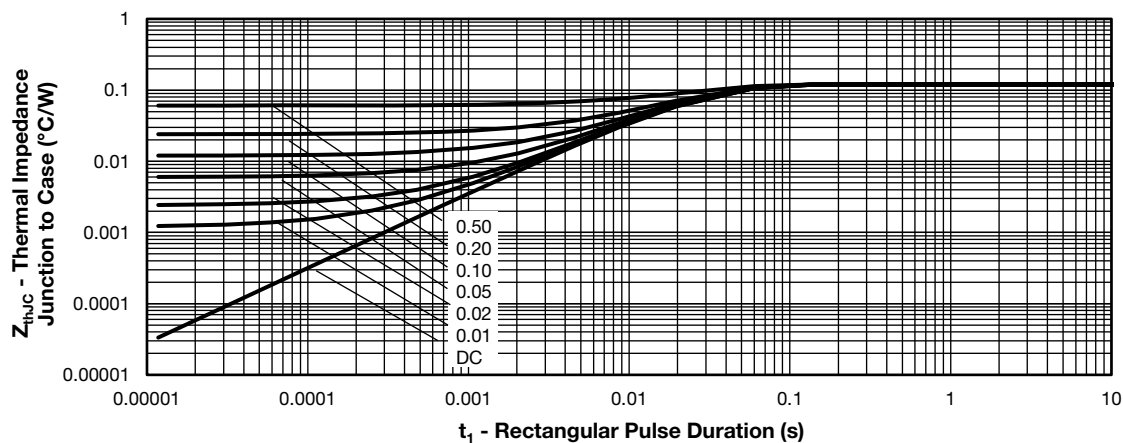
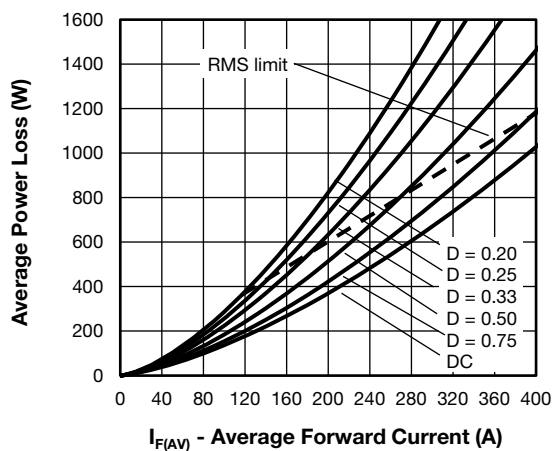
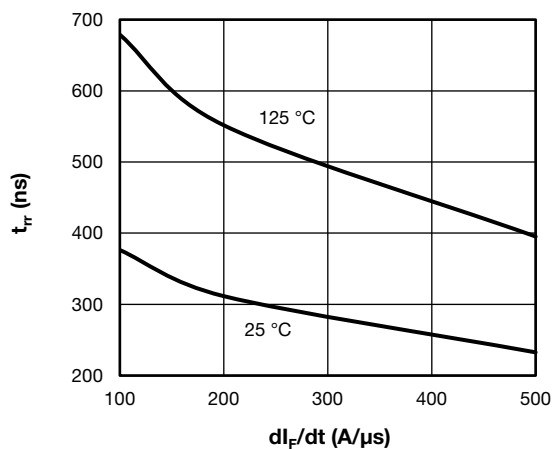
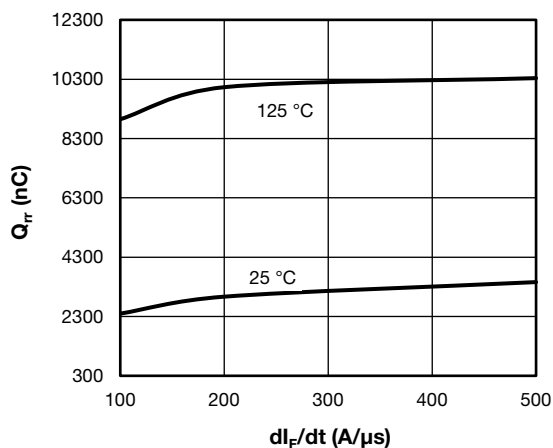
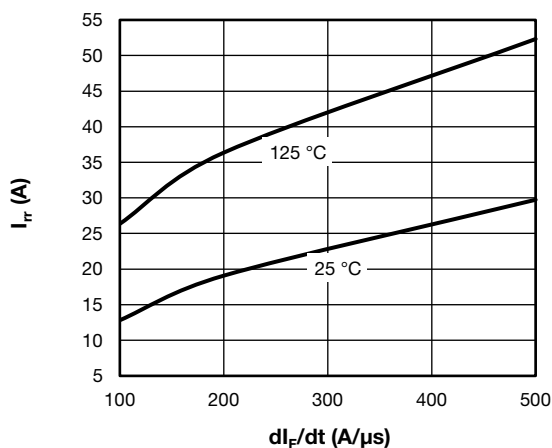

Fig. 4 - Maximum Thermal Impedance R_{thJC} Characteristics


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

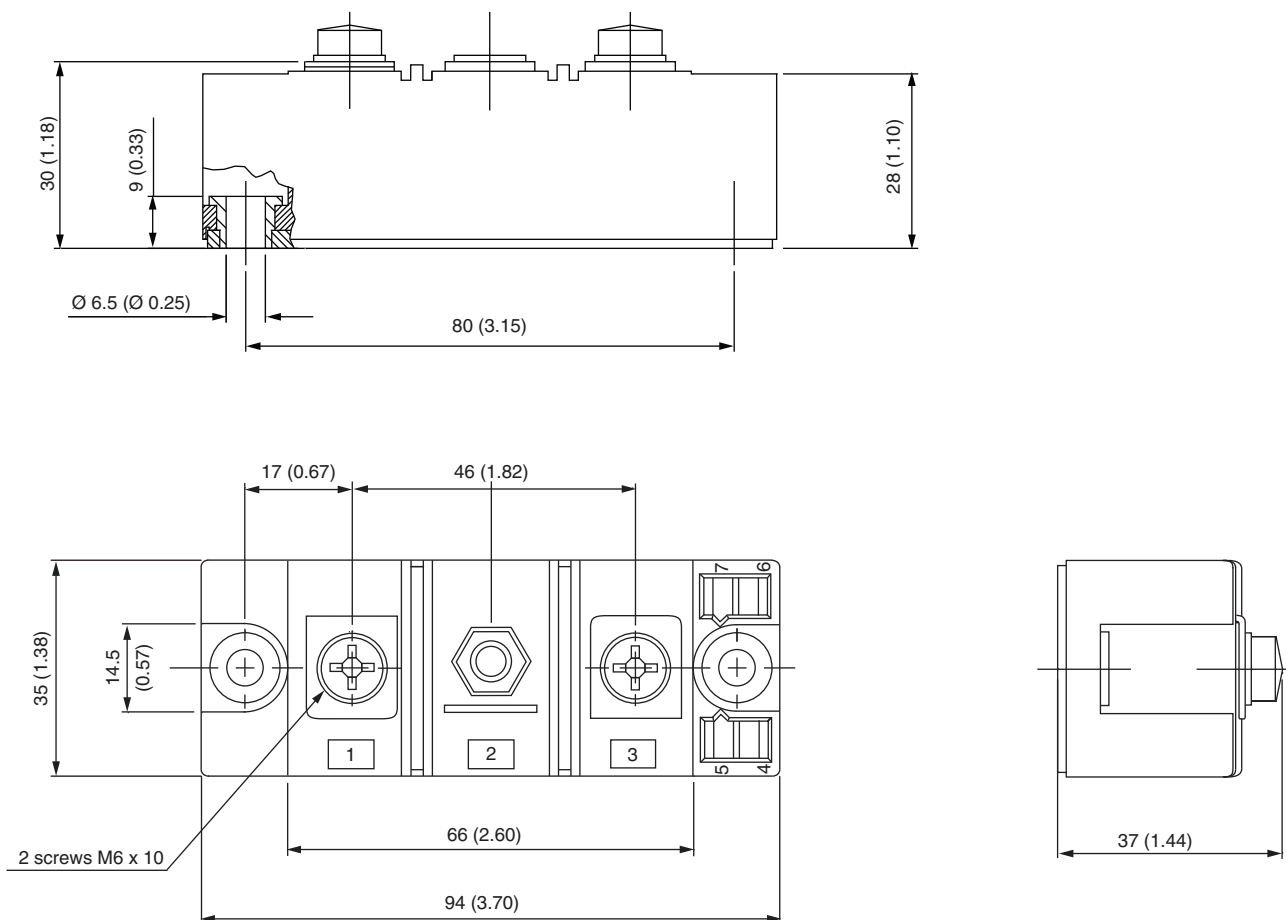
VS-VS	KE	U	300	/	12	PbF
①	②	③	④		⑤	⑥

- 1** - Vishay Semiconductors product
- 2** - KE = circuit configuration
- 3** - U = ultrafast diode
- 4** - Current rating 300 = 300 A
- 5** - Voltage rating (12 = 1200 V)
- 6** - PbF = lead (Pb)-free

CIRCUIT CONFIGURATION

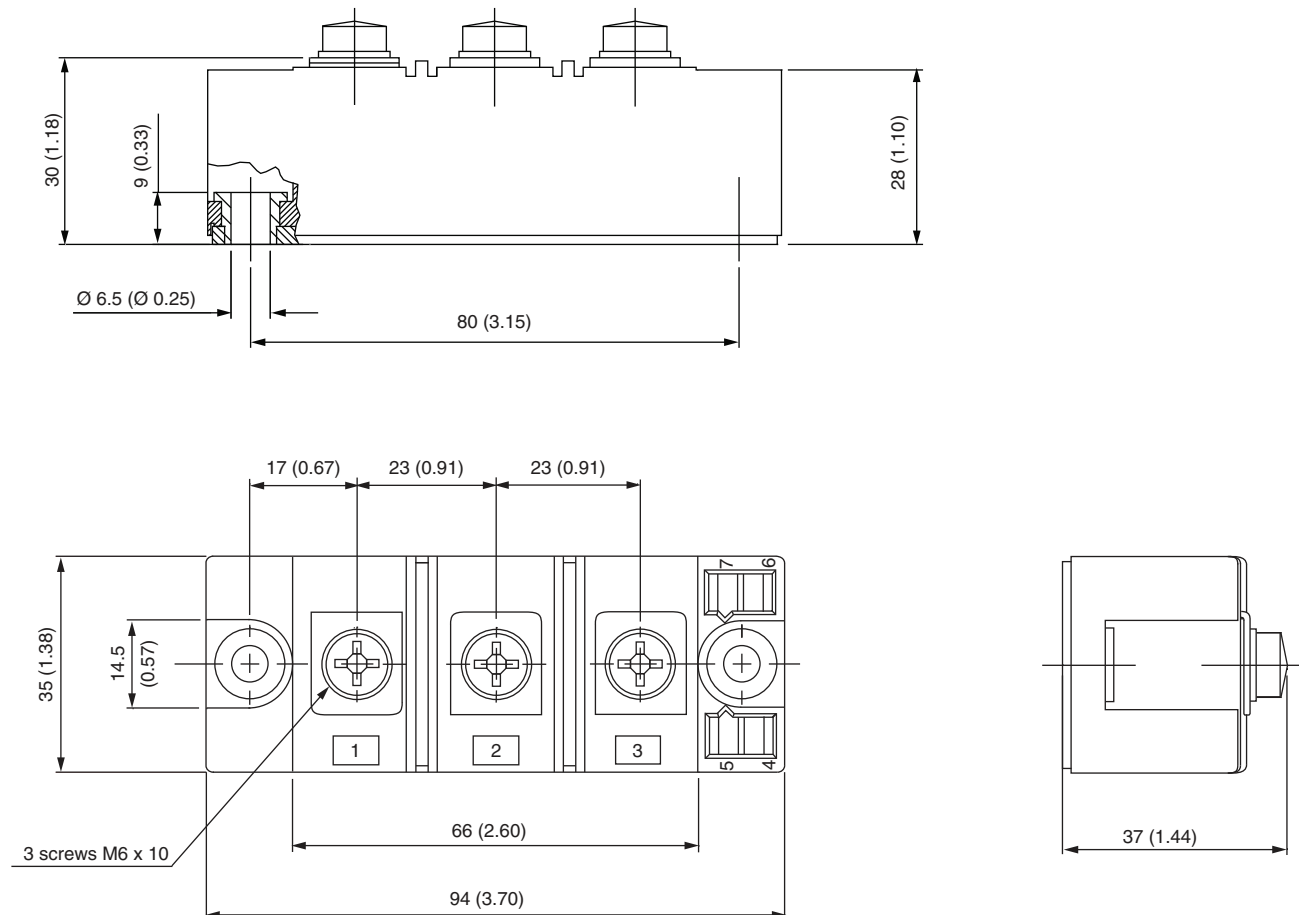


DIMENSIONS in (inches) millimeters **INT-A-PAK DBC**



INT-A-PAK DBC

DIMENSIONS in millimeters (inches)





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