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

INT-A-PAK

FEATURES

- Electrically insulated by DBC ceramic
- 3500 V_{RMS} isolating voltage
- Standard JEDEC® package
- Simplified mechanical designs, rapid assembly
- High surge capability
- Large creepage distances
- UL approved file E78996
- 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

PRIMARY CHARACTERISTICS	
V_R	600 V
$I_{F(AV)}$ at T_C	300 A at 48 °C
Package	INT-A-PAK
Circuit configuration	Two diodes doubler circuit

ABSOLUTE MAXIMUM RATINGS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Cathode to anode voltage	V_R		600	V
Continuous forward current per leg	I_F	T_C = 25 °C	435	A
		T_C = 100 °C	230	
Single pulse forward current	I_{FSM}	Limited by junction temperature	TBD	
Maximum power dissipation per leg	P_D	T_C = 25 °C	781	W
		T_C = 100 °C	313	
Operating junction and storage temperature range	T_J, T_{Stg}		-40 to +150	°C
RMS insulation voltage	V_{INS}	50 Hz, circuit to base, all terminals shorted, t = 1 s	3500	V

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 = 500 µA	600	-	-	V
Forward voltage drop per leg	V_{FM}	I_F = 150 A	-	1.23	1.53	
		I_F = 300 A	-	1.43	1.96	
		I_F = 150 A, T_J = 125 °C	-	1.11	1.29	
		I_F = 300 A, T_J = 125 °C	-	1.39	1.73	
Maximum reverse leakage current	I_{RM}	T_J = 150 °C, V_R = 600 V	-	-	50	mA

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 = 50 A dI/dt = 200 A/µs V_R = 400 V (per leg)	-	130	165	ns
		T_J = 125 °C		-	195	260	
Peak recovery current	I_{rr}	T_J = 25 °C		-	11	18	A
		T_J = 125 °C		-	20	30	
Reverse recovery charge	Q_{rr}	T_J = 25 °C		-	670	1485	nC
		T_J = 125 °C		-	1800	3900	
Peak rate of recovery current	$dI_{(rec)M}/dt$	T_J = 125 °C		-	-	400	A/µs
Softness factor per leg	s	I_F = 50 A, T_J = 25 °C, dI/dt = 400 A/µs, V_R = 200 V		-	0.2	-	
		I_F = 50 A, T_J = 125 °C, dI/dt = 400 A/µs, V_R = 200 V		-	0.22	-	

THERMAL AND MECHANICAL SPECIFICATIONS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction operating and storage temperature range	T_J, T_{Stg}		-40 to +150	°C
Maximum thermal resistance, junction to case per leg	R_{thJC}	DC operation	0.16	K/W
Typical thermal resistance, case to heatsink	R_{thCS}	Mounting surface, flat, smooth and greased	0.05	
Mounting torque ± 10 % to heatsink		A mounting compound is recommended and the torque should be rechecked after a period of 3 hours to allow the spread of the compound.	4 to 6	Nm
Mounting torque ± 10 % busbar				
Approximate weight			200	g
			7.1	oz.
Case style			INT-A-PAK	

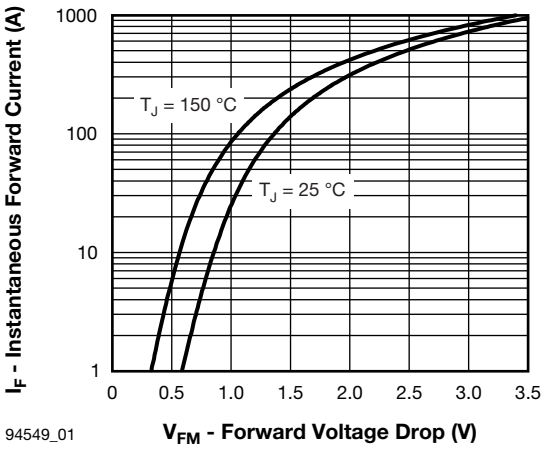


Fig. 1 - Maximum Forward Voltage Drop Characteristics

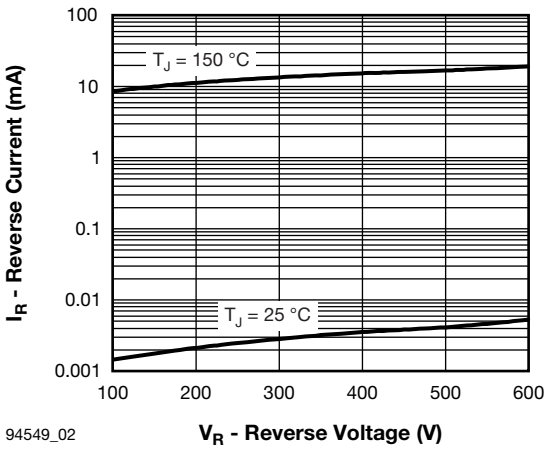


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

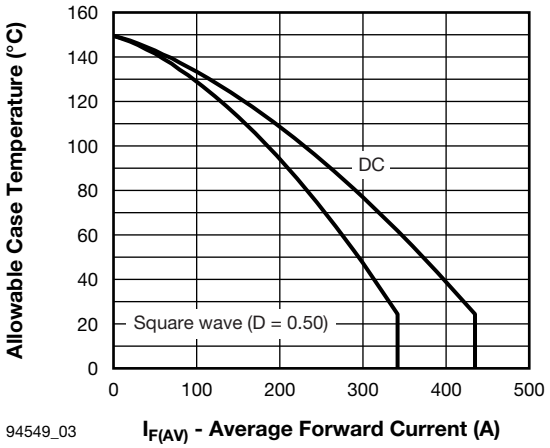


Fig. 3 - Maximum Allowable Case Temperature vs. Average Forward Current

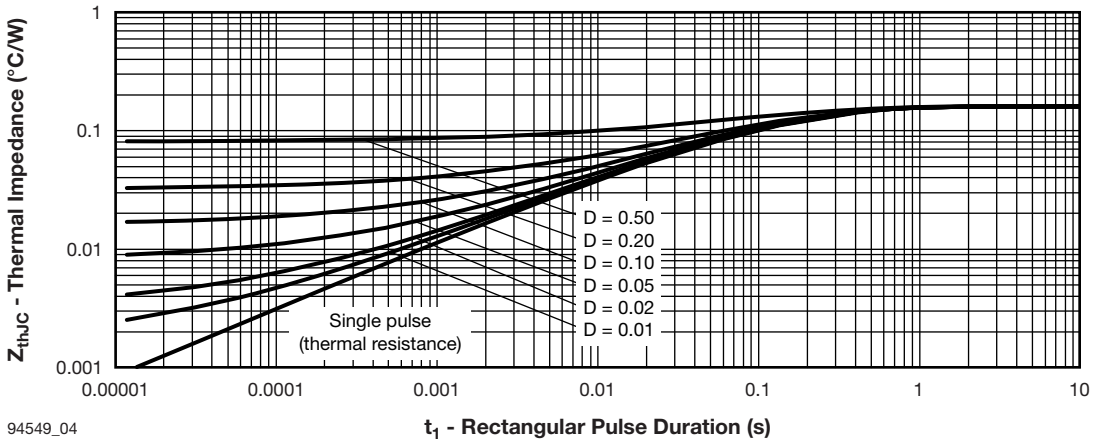


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

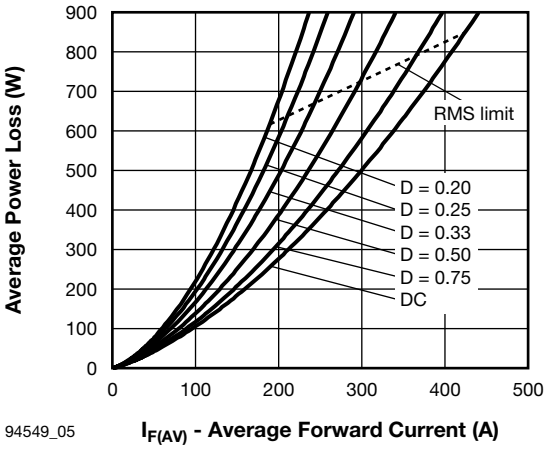


Fig. 5 - Forward Power Loss Characteristics

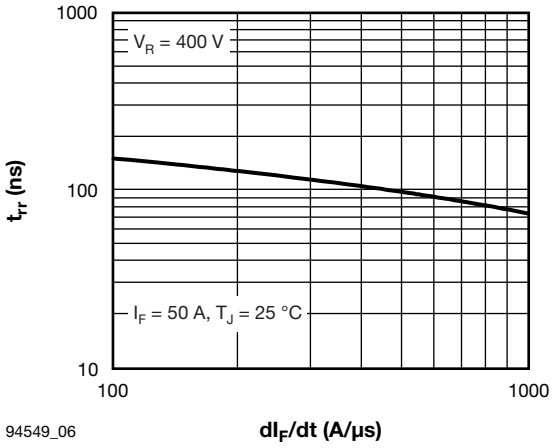


Fig. 6 - Typical Reverse Recovery Time vs. dI_F/dt (Per Leg)

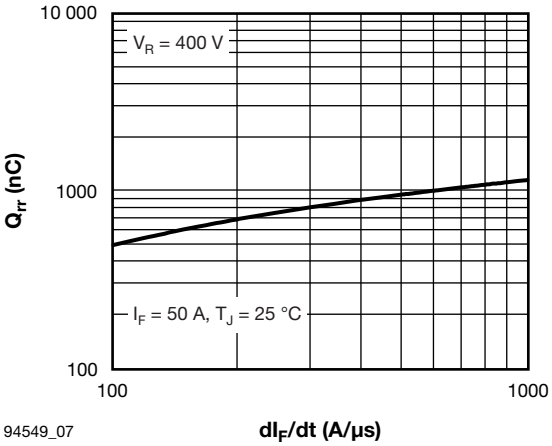


Fig. 7 - Typical Reverse Recovery Charge vs. dI_F/dt (Per Leg)

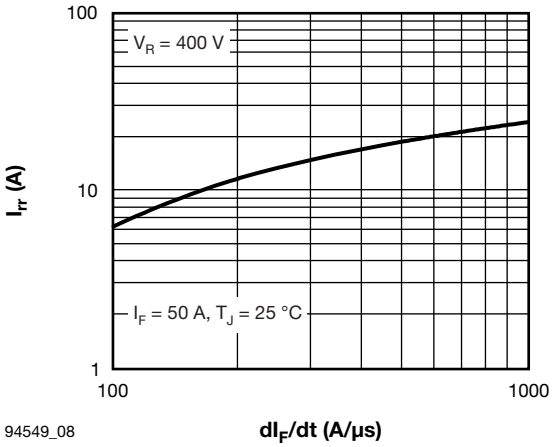


Fig. 8 - Typical Reverse Recovery Current vs. dI_F/dt (Per Leg)

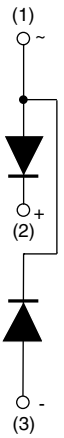
ORDERING INFORMATION TABLE

Device code

VS-VS	KD	U	300	06	PbF
1	2	3	4	5	6

1 - Vishay Semiconductors product
2 - Circuit configuration:
3 - U = Ultrafast diode
4 - Current rating (300 = 300 A)
5 - Voltage rating (06 = 600 V)
6 - PbF = Lead (Pb)-free

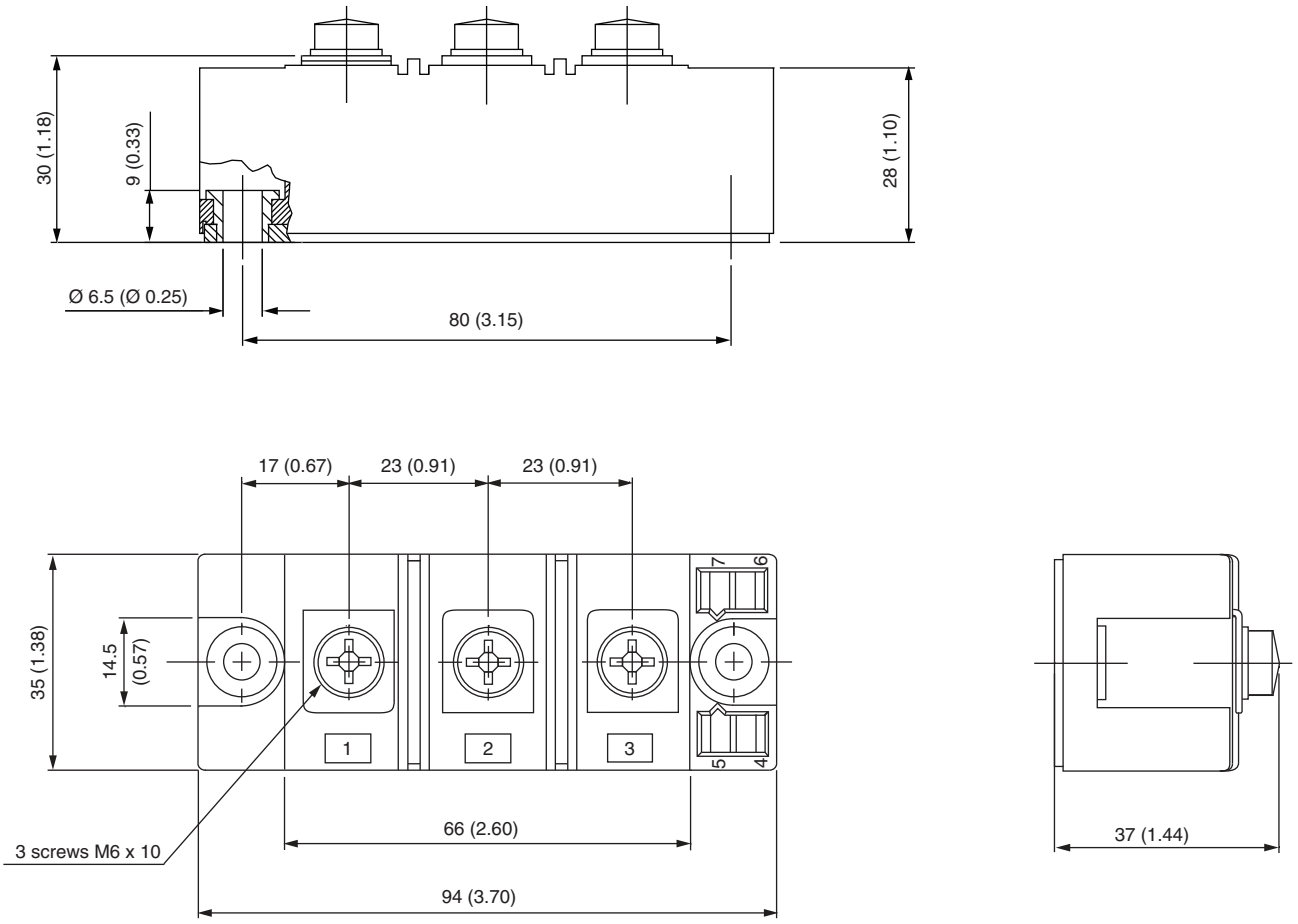
CIRCUIT CONFIGURATION

CIRCUIT	CIRCUIT DRAWING
Two diodes doubler circuit	

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95254

INT-A-PAK DBC

DIMENSIONS in millimeters (inches)



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