

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/doc299912


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 ($T_J = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)						
PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.
Reverse recovery time	t_{rr}	$T_J = 25\text{ }^{\circ}\text{C}$	$I_F = 50\text{ A}$ $di/dt = 200\text{ A}/\mu\text{s}$ $V_R = 400\text{ V (per leg)}$	-	130	165
		$T_J = 125\text{ }^{\circ}\text{C}$		-	195	260
Peak recovery current	I_{rr}	$T_J = 25\text{ }^{\circ}\text{C}$		-	11	18
		$T_J = 125\text{ }^{\circ}\text{C}$		-	20	30
Reverse recovery charge	Q_{rr}	$T_J = 25\text{ }^{\circ}\text{C}$		-	670	1485
		$T_J = 125\text{ }^{\circ}\text{C}$		-	1800	3900
Peak rate of recovery current	$di_{(rec)M}/dt$	$T_J = 125\text{ }^{\circ}\text{C}$		-	-	400
Softness factor per leg	s	$I_F = 50\text{ A}, T_J = 25\text{ }^{\circ}\text{C}, di/dt = 400\text{ A}/\mu\text{s}, V_R = 200\text{ V}$		-	0.2	-
		$I_F = 50\text{ A}, T_J = 125\text{ }^{\circ}\text{C}, di/dt = 400\text{ A}/\mu\text{s}, V_R = 200\text{ V}$		-	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	$^{\circ}\text{C}$
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 $\pm 10\%$ to heatsink busbar		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
Approximate weight			200	g
			7.1	oz.
Case style			INT-A-PAK	

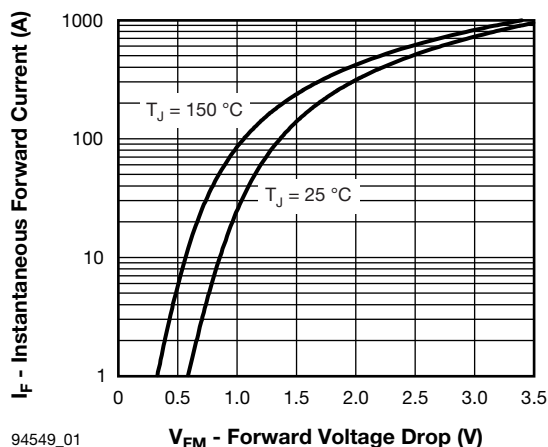


Fig. 1 - Maximum Forward Voltage Drop Characteristics

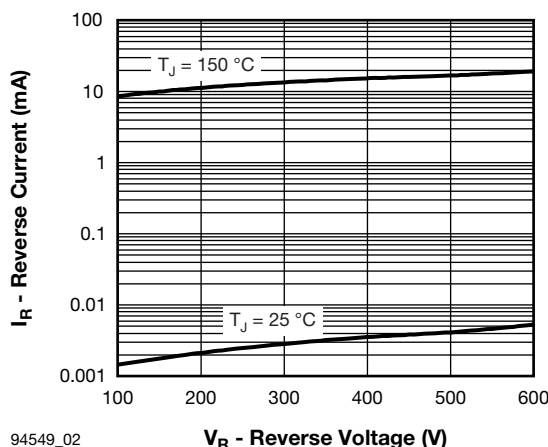


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

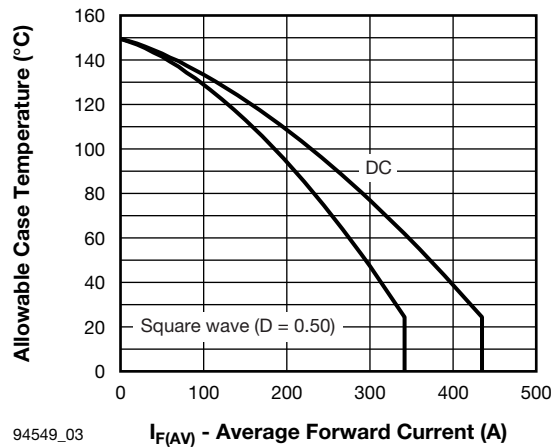


Fig. 3 - Maximum Allowable Case Temperature vs. Average Forward Current

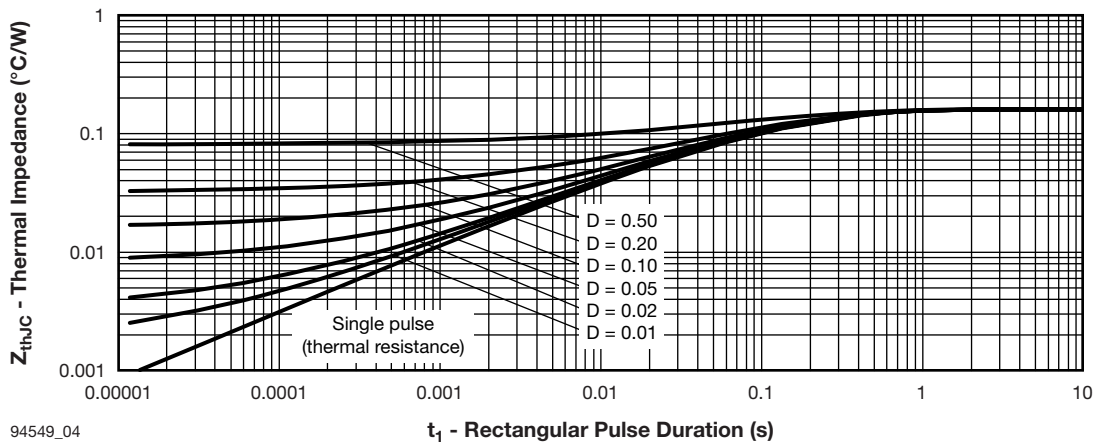
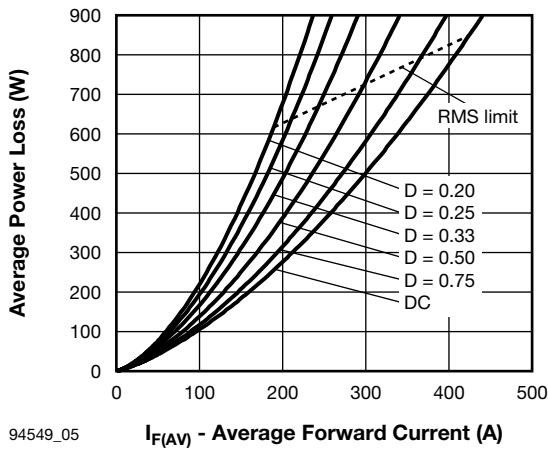
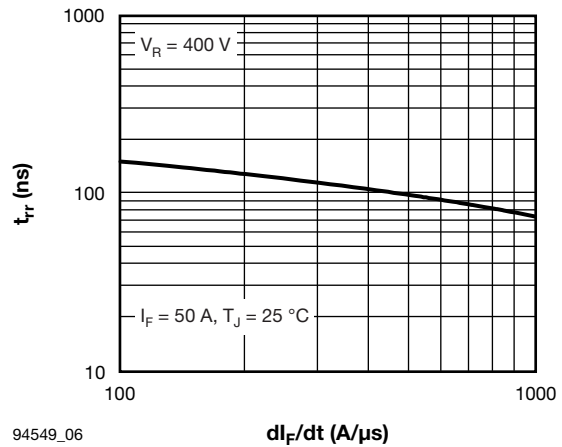
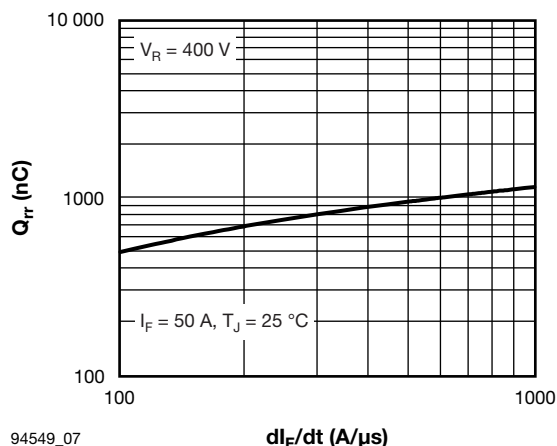
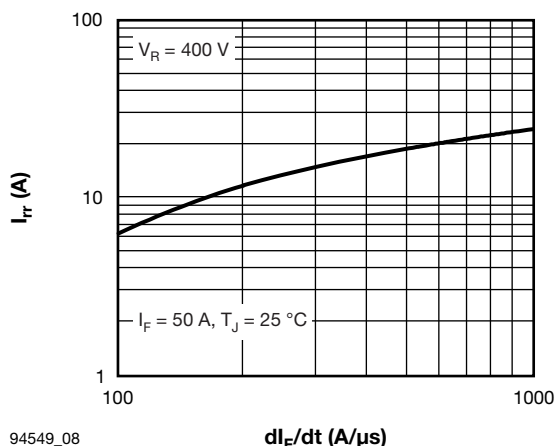

Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics


Fig. 5 - Forward Power Loss Characteristics


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

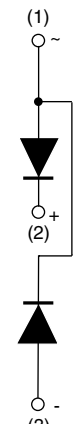

Fig. 7 - Typical Reverse Recovery Charge vs. di_F/dt (Per Leg)

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
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DIMENSIONS in millimeters (inches)





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