


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**
PRODUCT SUMMARY

$I_{F(AV)}$ at T_C	300 A at 48 °C
Type	Modules - Diode, High Voltage
Package	INT-A-PAK
Circuit	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	$T_C = 25\text{ °C}$	435	A
		$T_C = 100\text{ °C}$	230	
Single pulse forward current	I_{FSM}	Limited by junction temperature	TBD	
Maximum power dissipation per leg	P_D	$T_C = 25\text{ °C}$	781	W
		$T_C = 100\text{ °C}$	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, $t = 1\text{ s}$	3500	V

ELECTRICAL SPECIFICATIONS ($T_J = 25\text{ °C}$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Cathode to anode breakdown voltage	V_{BR}	$I_R = 500\text{ }\mu\text{A}$	600	-	-	V
Forward voltage drop per leg	V_{FM}	$I_F = 150\text{ A}$	-	1.23	1.53	
		$I_F = 300\text{ A}$	-	1.43	1.96	
		$I_F = 150\text{ A}, T_J = 125\text{ °C}$	-	1.11	1.29	
		$I_F = 300\text{ A}, T_J = 125\text{ °C}$	-	1.39	1.73	
Maximum reverse leakage current	I_{RM}	$T_J = 150\text{ °C}, V_R = 600\text{ V}$	-	-	50	m

DYNAMIC RECOVERY CHARACTERISTICS ($T_J = 25\text{ }^\circ\text{C}$ unless otherwise specified)							
PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNITS
Reverse recovery time	t_{rr}	$T_J = 25\text{ }^\circ\text{C}$	$I_F = 50\text{ A}$ $di/dt = 200\text{ A}/\mu\text{s}$ $V_R = 400\text{ V (per leg)}$	-	130	165	ns
		$T_J = 125\text{ }^\circ\text{C}$		-	195	260	
Peak recovery current	I_{rr}	$T_J = 25\text{ }^\circ\text{C}$		-	11	18	A
		$T_J = 125\text{ }^\circ\text{C}$		-	20	30	
Reverse recovery charge	Q_{rr}	$T_J = 25\text{ }^\circ\text{C}$		-	670	1485	nC
		$T_J = 125\text{ }^\circ\text{C}$		-	1800	3900	
Peak rate of recovery current	$di_{(rec)M}/dt$	$T_J = 125\text{ }^\circ\text{C}$	-	-	400	$\text{A}/\mu\text{s}$	
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	

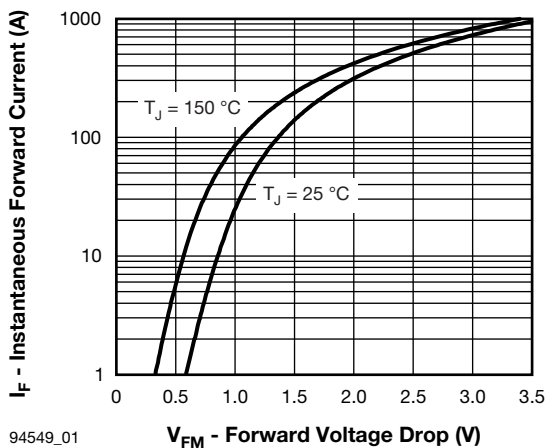


Fig. 1 - Maximum Forward Voltage Drop Characteristics

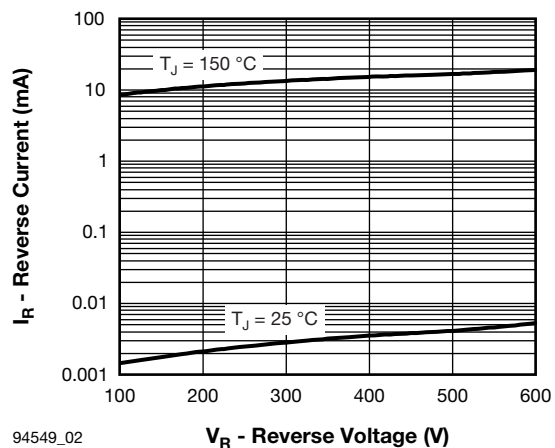
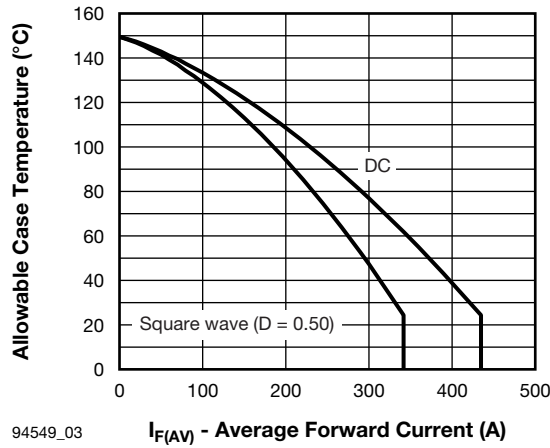
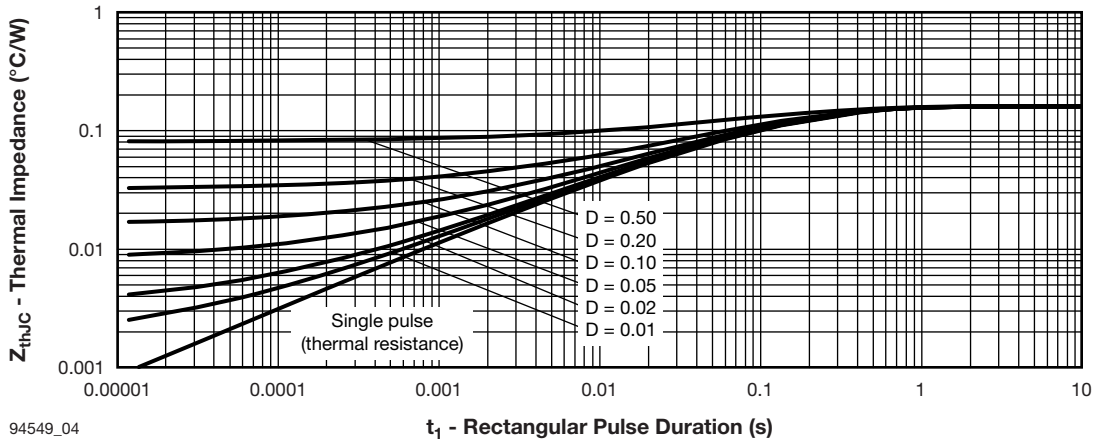


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage



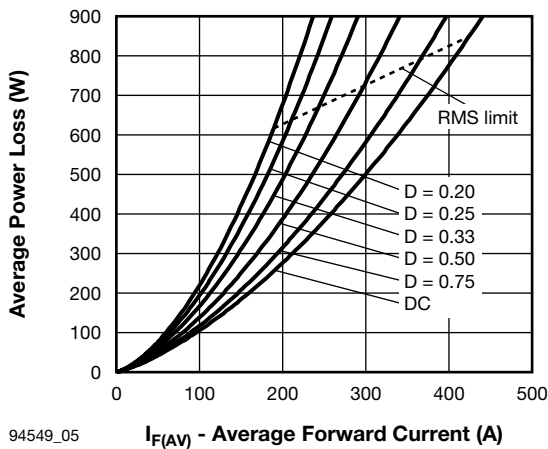
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Fig. 3 - Maximum Allowable Case Temperature vs. Average Forward Current



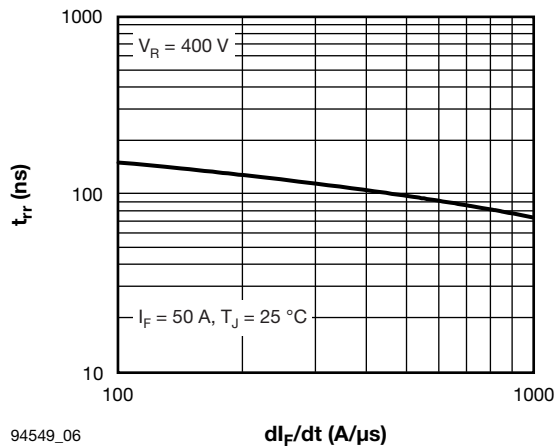
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Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics



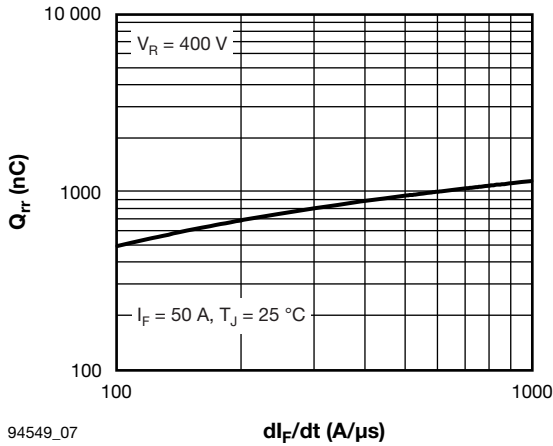
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Fig. 5 - Forward Power Loss Characteristics



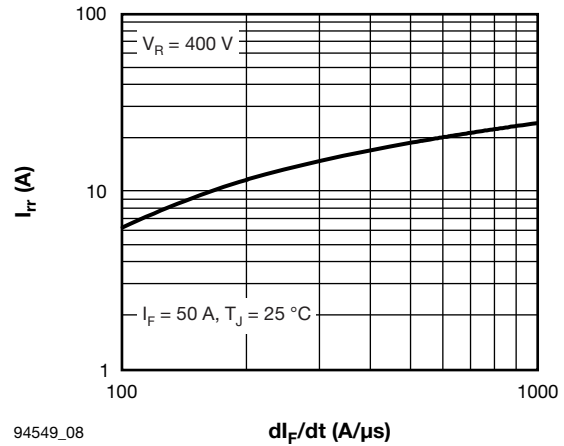
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Fig. 6 - Typical Reverse Recovery Time vs. di_F/dt (Per Leg)



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



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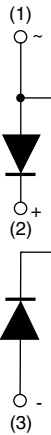
Fig. 8 - Typical Reverse Recovery Current vs. di_F/dt (Per Leg)

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



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



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