

## INT-A-PAK Power Modules Ultrafast Diodes, 300 A



INT-A-PAK

### FEATURES

- Electrically insulated by DBC ceramic
- 3500 V<sub>RMS</sub> 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
- Compliant to RoHS directive 2002/95/EC
- Designed and qualified for industrial level


**RoHS**  
COMPLIANT

PRODUCT SUMMARY	
$I_{F(AV)}$ at $T_C$	300 A at 48 °C
$V_R$	600 V
$t_{rr}$ (typical)	130 ns
$I_{F(DC)}$ at $T_C$	230 A at 100 °C

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	$V_{BR}$	$I_R = 500\ \mu\text{A}$	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	mA

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	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	

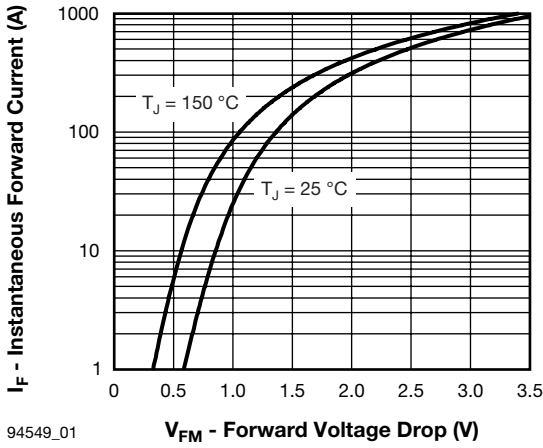


Fig. 1 - Maximum Forward Voltage Drop Characteristics

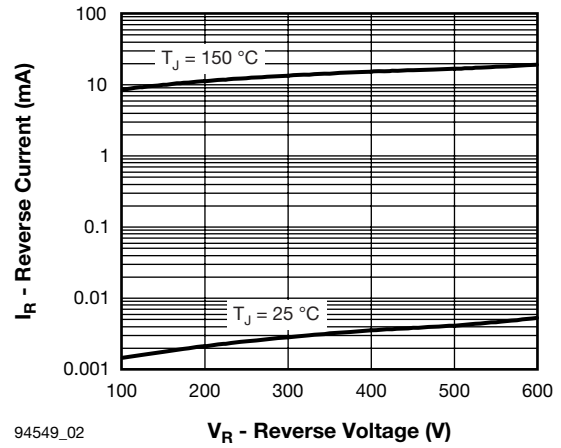


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

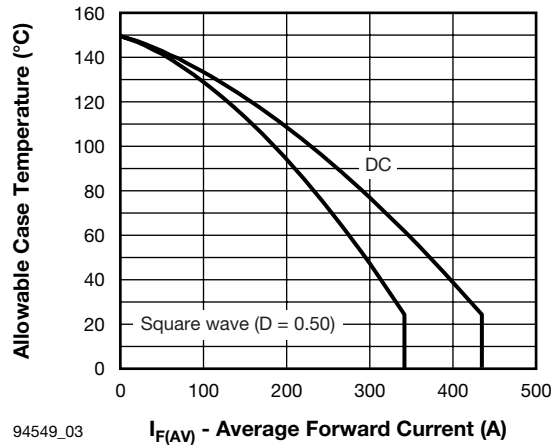


Fig. 3 - Maximum Allowable Case Temperature vs. Average Forward Current

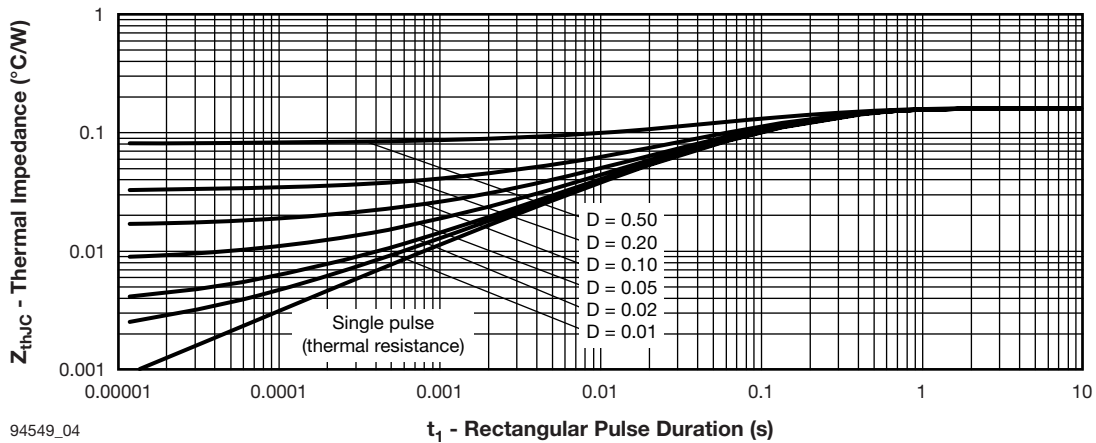


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics

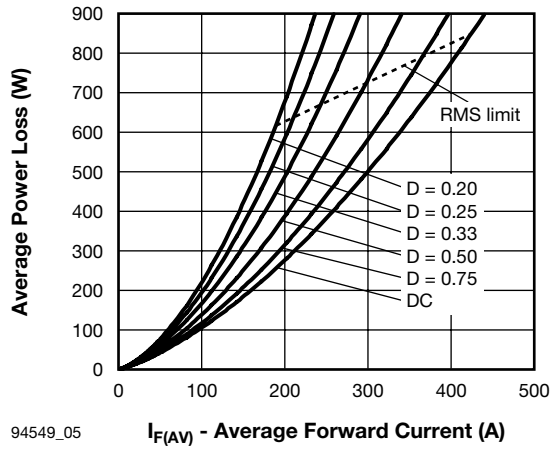


Fig. 5 - Forward Power Loss Characteristics

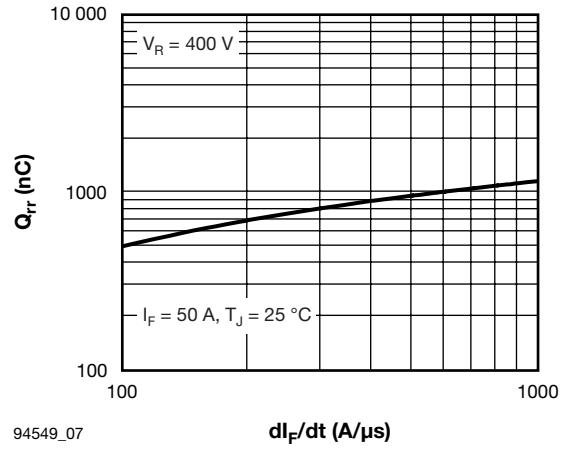


Fig. 7 - Typical Reverse Recovery Charge vs.  $di_F/dt$  (Per Leg)

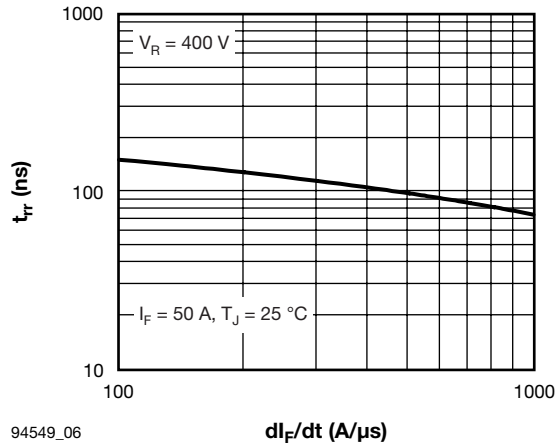


Fig. 6 - Typical Reverse Recovery Time vs.  $di_F/dt$  (Per Leg)

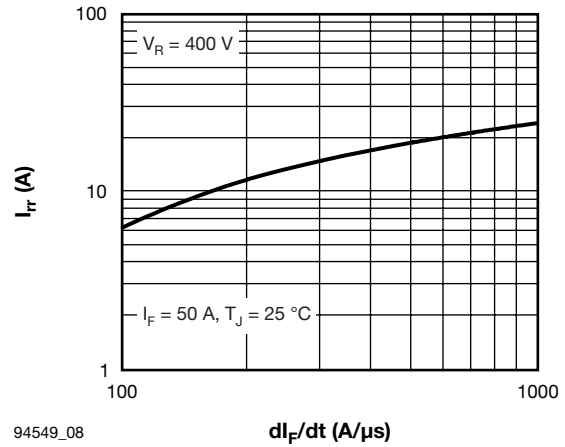


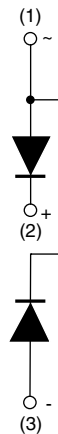
Fig. 8 - Typical Reverse Recovery Current vs.  $di_F/dt$  (Per Leg)

## ORDERING INFORMATION TABLE

Device code	<b>VSK</b>	<b>D</b>	<b>U</b>	<b>300</b>	<b>/</b>	<b>06</b>	<b>PbF</b>
	①	②	③	④		⑤	⑥

- 1** - Module type
- 2** - Circuit configuration:  
D = Doubler, 2 diodes in series
- 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	<a href="http://www.vishay.com/doc?95254">www.vishay.com/doc?95254</a>
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