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

Pb-free

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 common cathode

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	

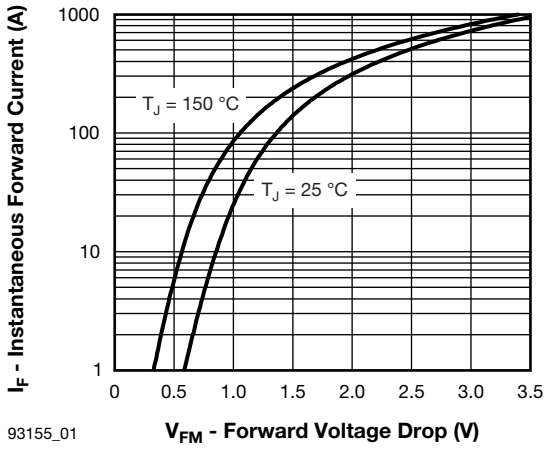


Fig. 1 - Maximum Forward Voltage Drop Characteristics

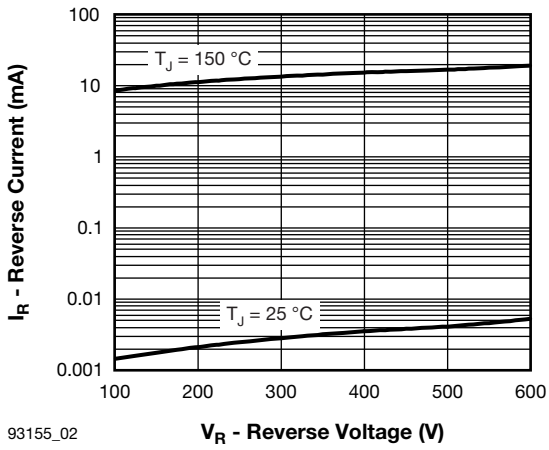


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

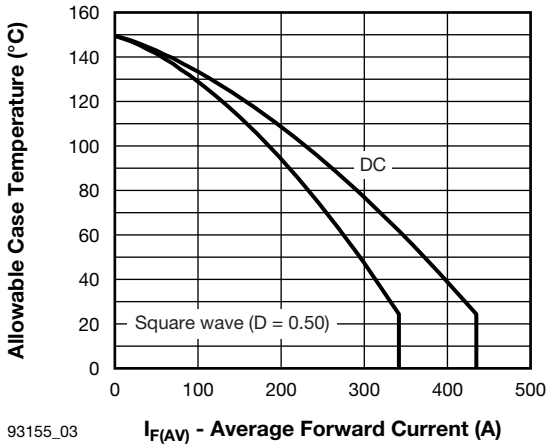


Fig. 3 - Maximum Allowable Case Temperature vs. Average Forward Current

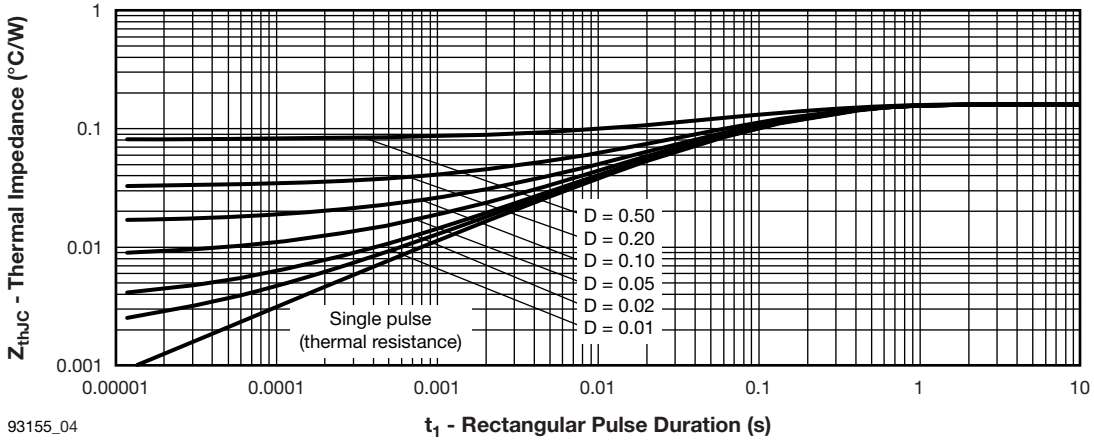


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

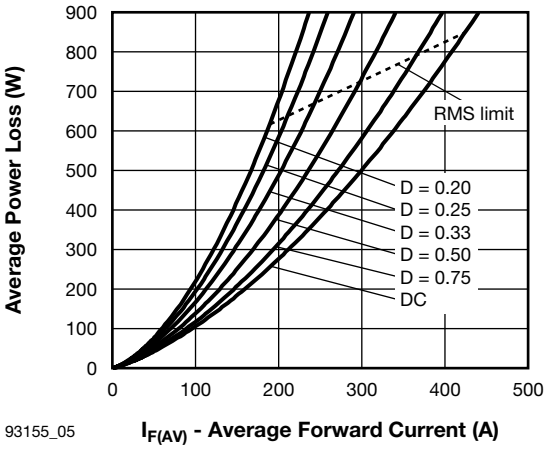


Fig. 5 - Forward Power Loss Characteristics

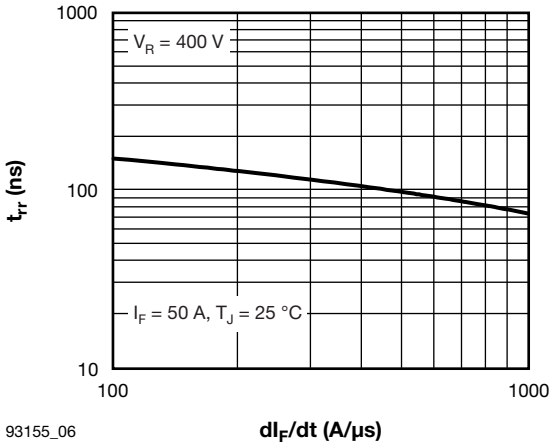


Fig. 6 - Typical Reverse Recovery Time vs. dI_F/dt (Per Leg)

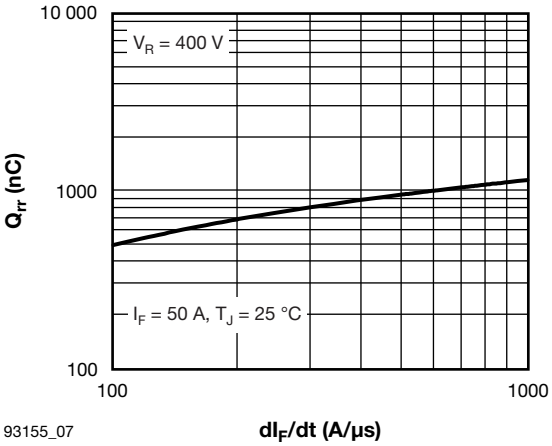


Fig. 7 - Typical Reverse Recovery Charge vs. dI_F/dt (Per Leg)

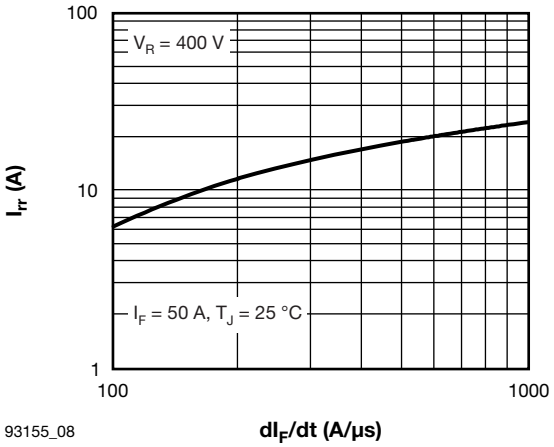


Fig. 8 - Typical Reverse Recovery Current vs. dI_F/dt (Per Leg)

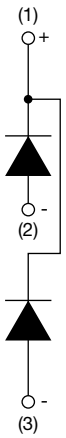
ORDERING INFORMATION TABLE

Device code

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

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

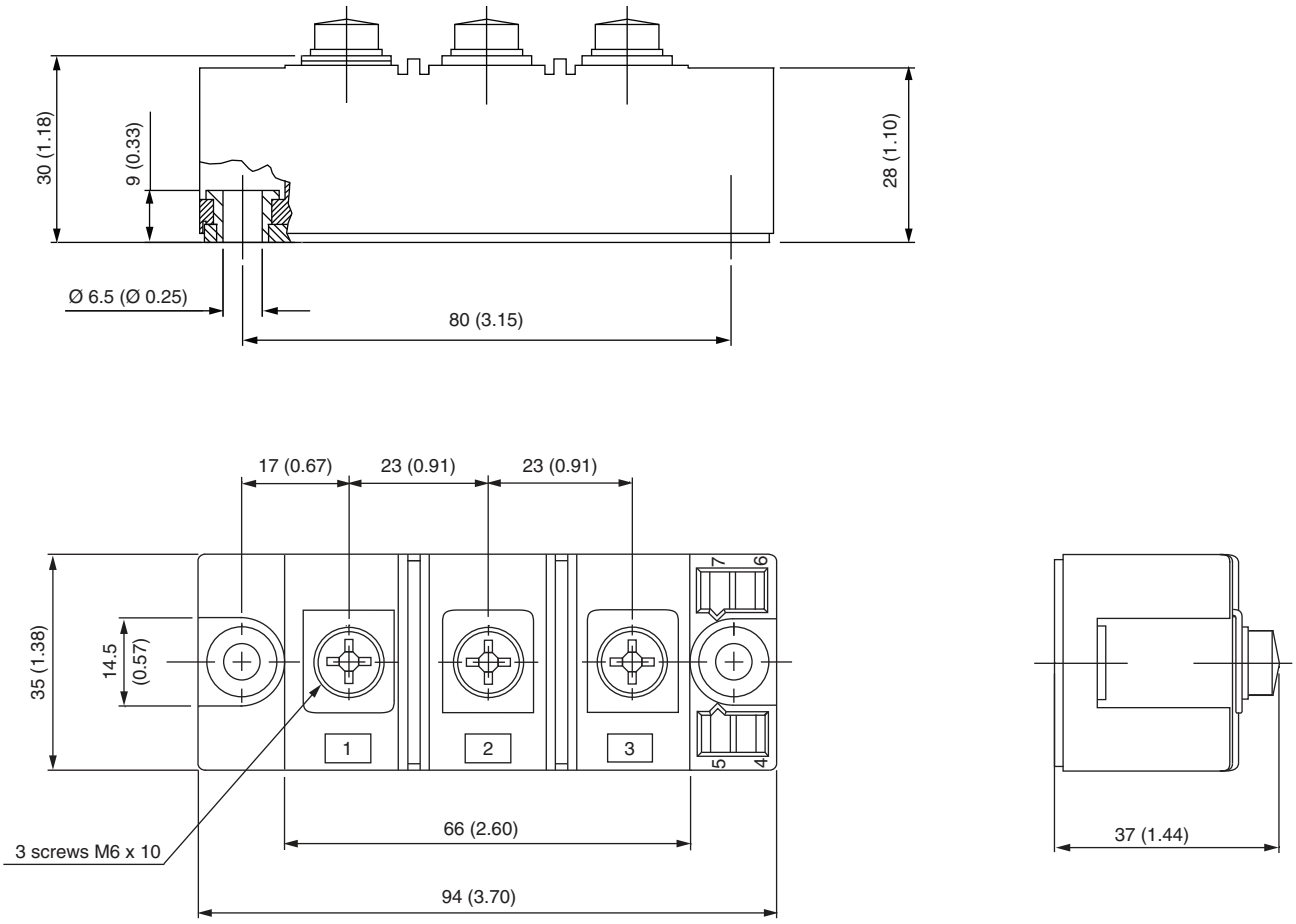
CIRCUIT CONFIGURATION



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

INT-A-PAK DBC

DIMENSIONS in millimeters (inches)



Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, “Vishay”), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay’s knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer’s responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer’s technical experts. Product specifications do not expand or otherwise modify Vishay’s terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.

Material Category Policy

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.

Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.