

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
V _F (typical)	1.23
t _{rr} (typical)	130 ns
I _{F(AV)} at T _C	300 A at 48 °C
Package	INT-A-PAK
Circuit configuration	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	$^{\circ}\text{C}$
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	

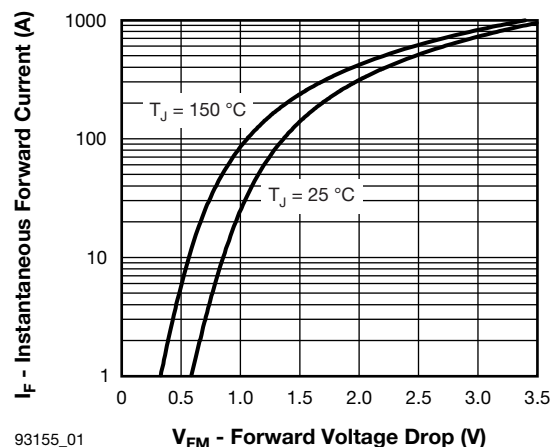


Fig. 1 - Maximum Forward Voltage Drop Characteristics

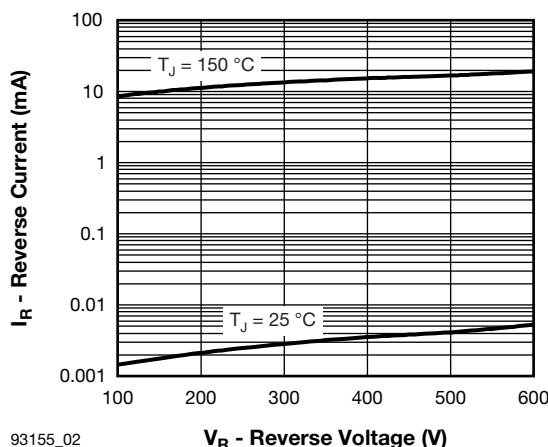


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

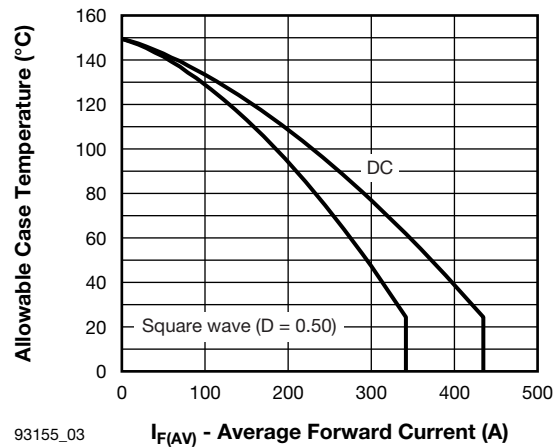


Fig. 3 - Maximum Allowable Case Temperature vs. Average Forward Current

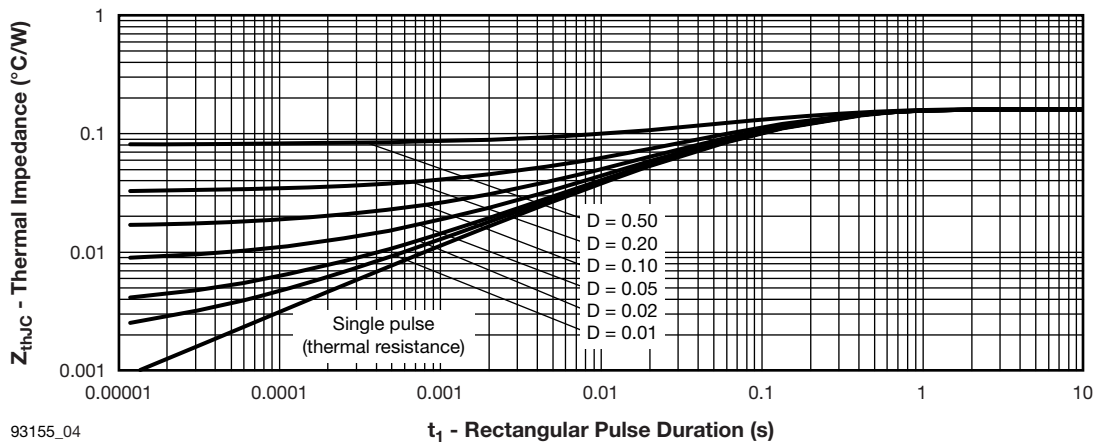
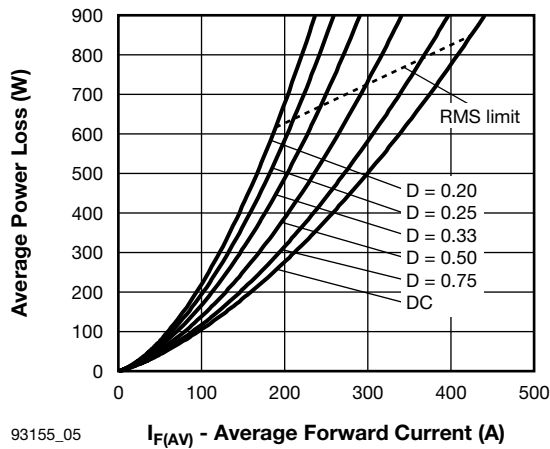
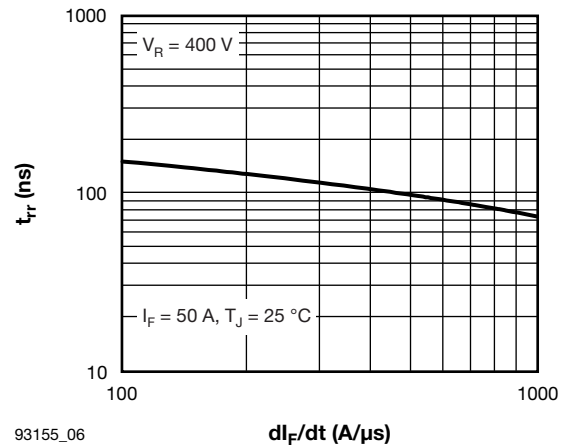
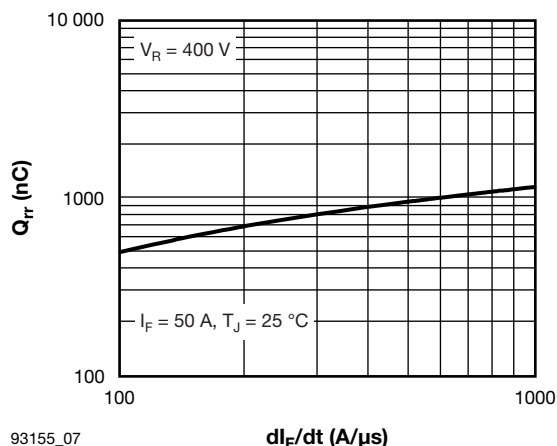
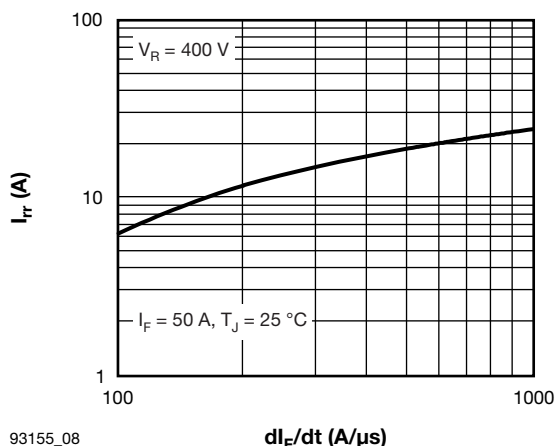

Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics


Fig. 5 - Forward Power Loss Characteristics


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



93155_07

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


93155_08

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 = two diodes common cathode
- ③ - U = ultrafast diode
- ④ - Current rating (300 = 300 A)
- ⑤ - Voltage rating (06 = 600 V)
- ⑥ - PbF = lead (Pb)-free

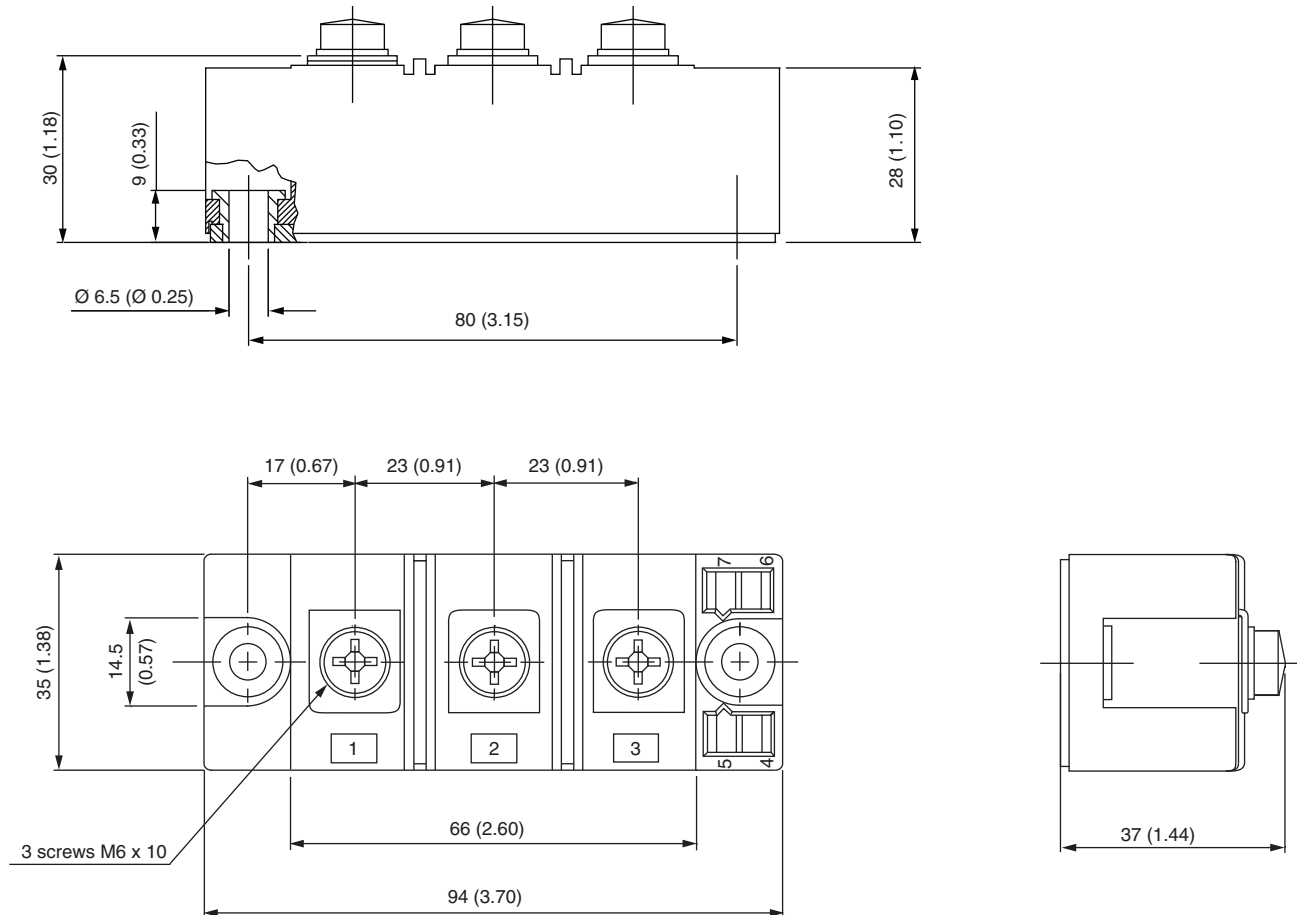
CIRCUIT CONFIGURATION	
CIRCUIT	CIRCUIT DRAWING
Two diodes common cathode	

LINKS TO RELATED DOCUMENTS

Dimensions	www.vishay.com/doc?95254
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INT-A-PAK DBC

DIMENSIONS in millimeters (inches)





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