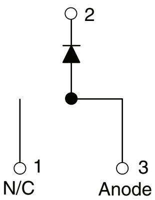
HEXFRED®
Ultrafast Soft Recovery Diode, 8 A

D-PAK



FEATURES

- Ultrafast recovery time
- Ultrasoft recovery
- Very low I_{RRM}
- Very low Q_{rr}
- Guaranteed avalanche
- Specified at operating conditions
- Lead (Pb)-free
- Designed and qualified for Q101 level

Pb Available

RoHS*
COMPLIANT

BENEFITS

- Reduced RFI and EMI
- Reduced power loss in diode and switching transistor
- Higher frequency operation
- Reduced snubbing
- Reduced parts count

DESCRIPTION

These diodes are optimized to reduce losses and EMI/RFI in high frequency power conditioning systems. The softness of the recovery eliminates the need for a snubber in most applications. These devices are ideally suited for freewheeling, flyback, power converters, motor drives, and other applications where high speed and reduced switching losses are design requirements.

PRODUCT SUMMARY	
V_R	600 V
V_F at 8 A at 25 °C	1.7 V
$I_{F(AV)}$	8 A
t_{rr} (typical)	18 ns
T_J (maximum)	150 °C

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Cathode to anode voltage	V_{RRM}		600	V
Maximum continuous forward current	I_F	T_C = 100 °C	8	A
Single pulse forward current	I_{FSM}		60	
Peak repetitive forward current	I_{FRM}		24	
Maximum power dissipation	P_D	T_C = 100 °C	14	W
Operating junction and storage temperature range	T_J, T_{Stg}		- 55 to + 150	°C

ELECTRICAL SPECIFICATIONS (T_J = 25 °C unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNITS
Breakdown voltage, blocking voltage	V_{BR}, V_R	I_R = 100 µA		600	-	-	V
Forward voltage	V_F	I_F = 8 A	See fig. 1	-	1.4	1.7	
		I_F = 16 A		-	1.7	2.1	
		I_F = 8 A, T_J = 125 °C		-	1.4	1.7	
Maximum reverse leakage current	I_R	V_R = V_R rated		-	0.3	5.0	µA
		T_J = 125 °C, V_R = 0.8 x V_R rated		-	100	500	
Junction capacitance	C_T	V_R = 200 V	See fig. 3	-	10	25	pF
Series inductance	L_S	Measured lead to lead 5 mm from package body		-	8.0	-	nH

* Pb containing terminations are not RoHS compliant, exemptions may apply

DYNAMIC RECOVERY CHARACTERISTICS (T_J = 25 °C unless otherwise specified)							
PARAMETER	**SYMBOL**	**TEST CONDITIONS**		**MIN.**	**TYP.**	**MAX.**	**UNITS**
Reverse recovery time	t_{rr}	I_F = 1.0 A, dI_F/dt = 200 A/µs, V_R = 30 V		-	18	-	ns
		T_J = 25 °C	I_F = 8 A dI_F/dt = 200 A/µs V_R = 200 V	-	37	55	
		T_J = 125 °C		-	55	90	
Peak recovery current	I_{RRM}	T_J = 25 °C		-	3.5	5.0	A
		T_J = 125 °C		-	4.5	8.0	
Reverse recovery charge	Q_{rr}	T_J = 25 °C		-	65	138	nC
		T_J = 125 °C		-	124	360	
Rate of fall of recovery current	$dI_{(rec)M}/dt$	T_J = 25 °C		-	240	-	A/µs
		T_J = 125 °C		-	210	-	

THERMAL - MECHANICAL SPECIFICATIONS						
PARAMETER	**SYMBOL**	**TEST CONDITIONS**	**MIN.**	**TYP.**	**MAX.**	**UNITS**
Maximum junction and storage temperature range	T_J, T_{Stg}		- 55	-	150	°C
Lead temperature	T_{lead}		-	-	300	
Thermal resistance, junction to case	R_{thJC}		-	-	3.5	°C/W
Thermal resistance, junction to ambient	R_{thJA}	Typical socket mount	-	-	80	
Weight			-	2.0	-	g
			-	0.07	-	oz.
Marking device		Case style D-PAK	HFA08SD60S			

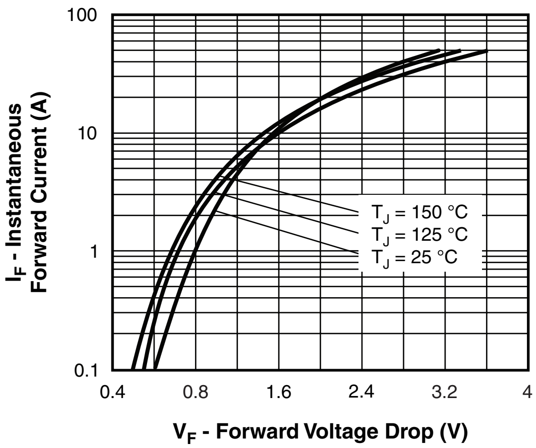


Fig. 1 - Typical Forward Voltage Drop Characteristics

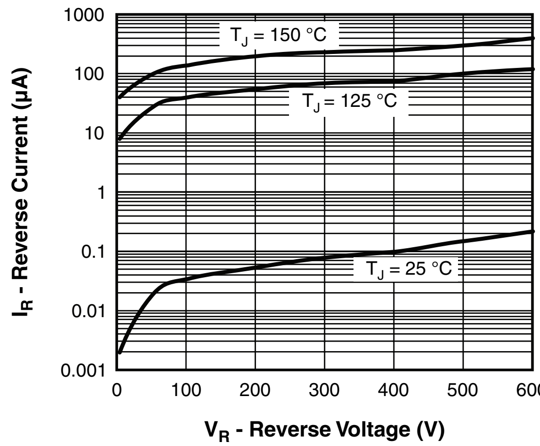


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

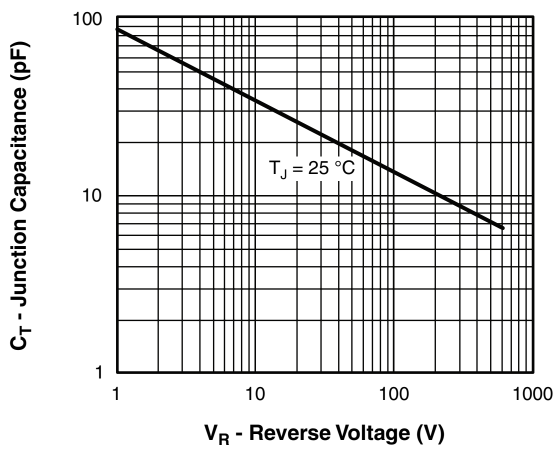


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

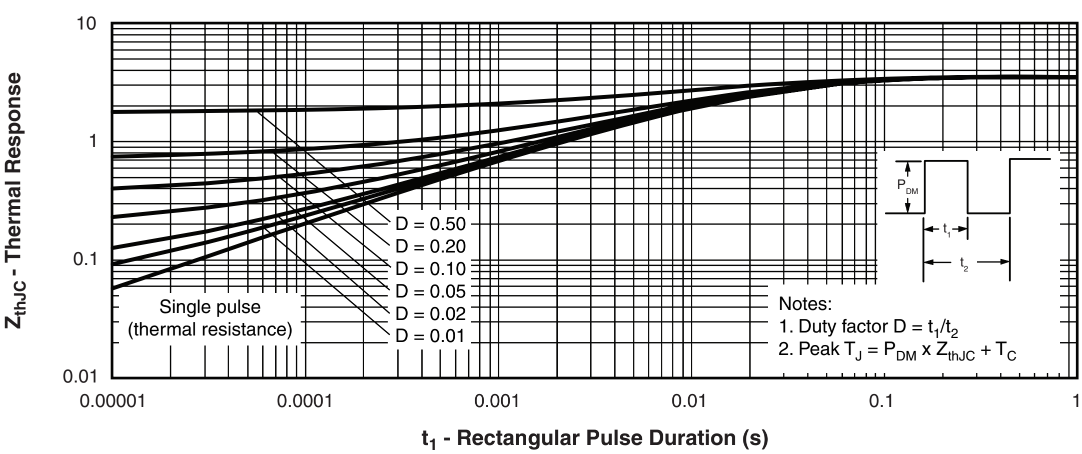


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

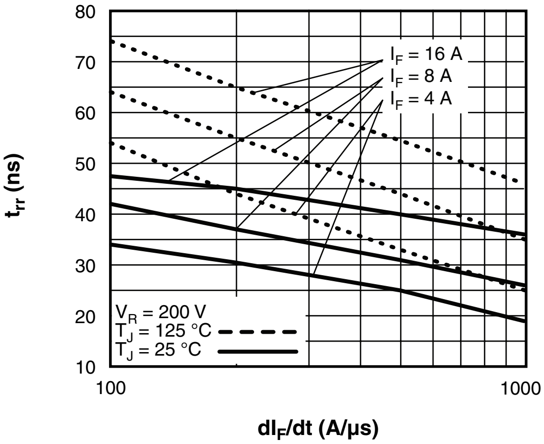


Fig. 5 - Typical Reverse Recovery Time vs. dI_F/dt

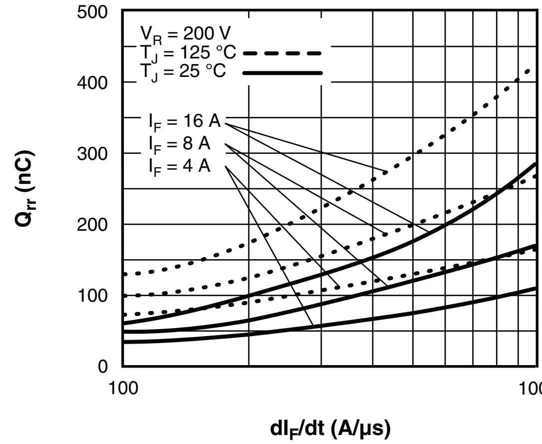


Fig. 7 - Typical Stored Charge vs. dI_F/dt

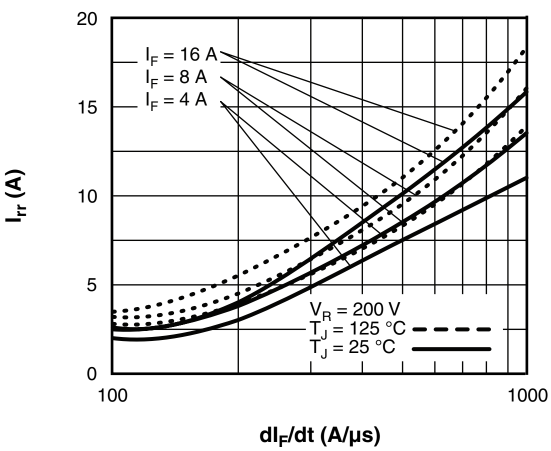


Fig. 6 - Typical Recovery Current vs. dI_F/dt

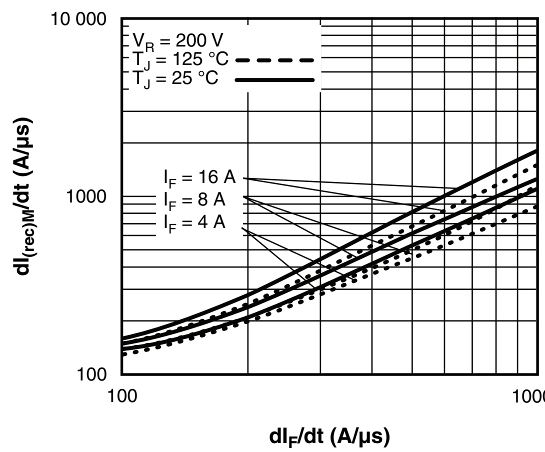


Fig. 8 - Typical $dI_{(rec)M}/dt$ vs. dI_F/dt

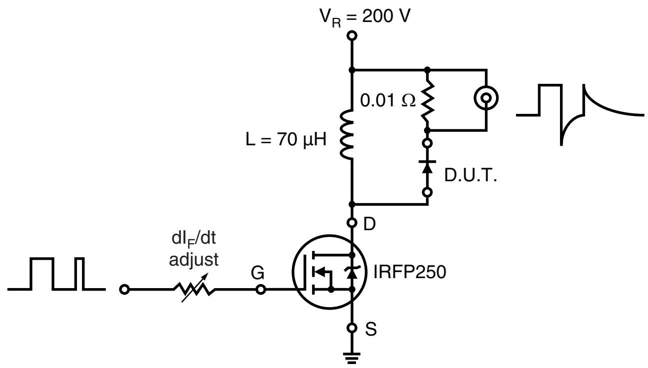
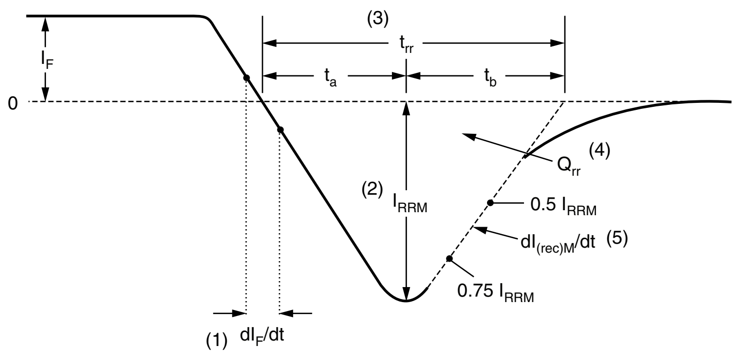


Fig. 9 - Reverse Recovery Parameter Test Circuit



(1) dI_F/dt - rate of change of current through zero crossing

(2) I_{RRM} - peak reverse recovery current

(3) t_{rr} - reverse recovery time measured from zero crossing point of negative going I_F to point where a line passing through 0.75 I_{RRM} and 0.50 I_{RRM} extrapolated to zero current.

(4) Q_{rr} - area under curve defined by t_{rr} and I_{RRM}

$$Q_{rr} = \frac{t_{rr} \times I_{RRM}}{2}$$

(5) $dI_{(rec)M}/dt$ - peak rate of change of current during t_b portion of t_{rr}

Fig. 10 - Reverse Recovery Waveform and Definitions

ORDERING INFORMATION TABLE

Device code	HF	A	08	SD	60	S	PbF
	1	2	3	4	5	6	7

1 - HEXFRED® family
2 - Electron irradiated
3 - Current rating (08 = 8 A)
4 - D-PAK
5 - Voltage rating (60 = 600 V)
6 - Suffix
- S = D^2PAK/D-PAK
- TR = Tape and reel
- TRL = Tape and reel left
- TRR = Tape and reel right

8 -
- None = Standard production
- PbF = Lead (Pb)-free

LINKS TO RELATED DOCUMENTS	
Dimensions	http://www.vishay.com/doc?95016
Part marking information	http://www.vishay.com/doc?95059
Packaging information	http://www.vishay.com/doc?95033

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