

RoHS

COMPLIANT

HALOGEN FREE

Hyperfast Rectifier, 30 A FRED Pt®



LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS					
I _{F(AV)}	30 A				
V _R	600 V				
V _F at I _F	1.40 V				
t _{rr} (typ.)	22 ns				
T _J max.	175 °C				
Package	TO-220 FullPAK 2L				
Circuit configuration	Single				

FEATURES

- · Hyperfast soft recovery time
- Low forward voltage drop
- 175 °C operating junction temperature
- · Low leakage current
- Fully isolated package (V_{INS} = 2500 V_{RMS})
- True 2 pin package
- Designed and qualified according to JEDEC®-JESD 47
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>

DESCRIPTION / APPLICATIONS

Hyperfast recovery rectifiers designed with optimized performance of forward voltage drop, hyperfast recovery time, and soft recovery.

The planar structure and the platinum doped life time control guarantee the best overall performance, ruggedness and reliability characteristics.

These devices are intended for use in PFC boost stage in the AC/DC section of switch mode power supplies and inverters (air conditioning, high-frequency welding, UPS, and motor drives)

The extremely optimized stored charge and low recovery current minimize the switching losses and reduce over dissipation in the switching element and snubbers.

MECHANICAL DATA

Case: TO-220 FullPACK 2L

Molding compound meets UL 94 V-0 flammability rating

Terminals: matte tin plated leads, solderable per

J-STD-002

ABSOLUTE MAXIMUM RATINGS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Peak repetitive reverse voltage	V_{RRM}		600	V
Average rectified forward current in DC	I _{F(AV)}		30	۸
Non-repetitive peak surge current	I _{FSM}	T _J = 25 °C	280	A
Operating junction and storage temperatures	T _J , T _{Stg}		-55 to +175	°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	Ι _R = 100 μΑ	600	-	-	.,
Forward voltage	V _F	I _F = 30 A	-	1.70	2.15	V
Forward voltage		٧F	I _F = 30 A, T _J = 150 °C	-	1.40	1.65
Reverse leakage current	I _R	$V_R = V_R$ rated	-	0.02	10	μА
		$T_J = 150 ^{\circ}\text{C}, V_R = V_R \text{rated}$	-	36	300	
Junction capacitance	C _T	V _R = 600 V	-	19	-	pF





DYNAMIC RECOVERY CHARACTERISTICS (T _J = 25 °C unless otherwise specified)							
PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNITS
		$I_F = 1 \text{ A, } dI_F/dt = 100 \text{ A/}\mu\text{s, } V_R = 30 \text{ V}$		-	22	-	
Reverse recovery time	t _{rr}	T _J = 25 °C	I _F = 30 A, dI _F /dt = 200 A/μs, V _R = 400 V	-	90	-	ns
		T _J = 125 °C		-	110	-	
Darly was a support		T _J = 25 °C		-	4.1	-	A
Peak recovery current	urrent I _{RRM}	T _J = 125 °C		-	9.4	-	
Poverse receivery charge	0	T _J = 25 °C		-	230	-	nC
Reverse recovery charge	recovery charge Q _{rr}	T _J = 125 °C		-	730	-	

THERMAL - MECHANICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Maximum junction and storage temperature range	T _J , T _{Stg}		-55	-	175	°C
Thermal resistance, junction-to-case	R _{thJC}		-	2.40	3.10	
Thermal resistance, junction-to-ambient	R _{thJA}	Typical socket mount	-	45	-	°C/W
Typical thermal resistance, case-to-heatsink	R _{thCS}	Mounting surface, flat, smooth, and greased	-	0.5	-	
Walaht			-	2	-	g
Weight			-	0.07	-	OZ.
Mounting torque			6 (5)	-	12 (10)	kgf · cm (lbf · in)
Marking device		Case style TO-220 FullPAK 2L	ETH3106FP			



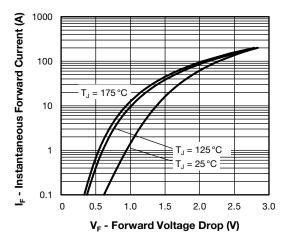


Fig. 1 - Forward Voltage Drop Characteristics

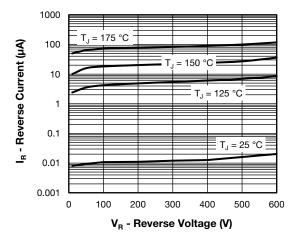


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

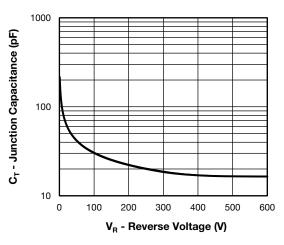


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

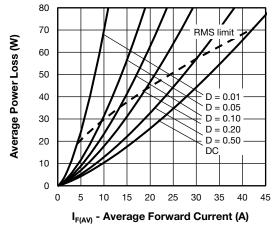


Fig. 4 - Forward Power Loss Characteristics

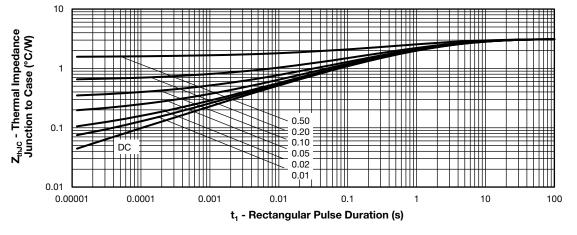
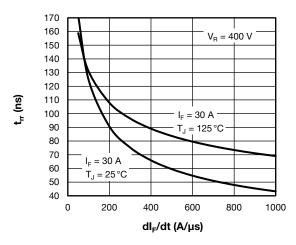


Fig. 5 - Transient Thermal Impedance, Junction to Case





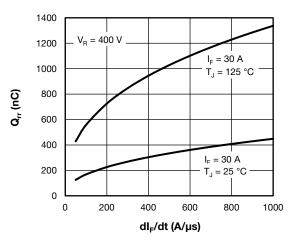


Fig. 7 - Typical Reverse Recovery Charge vs. dl_F/dt

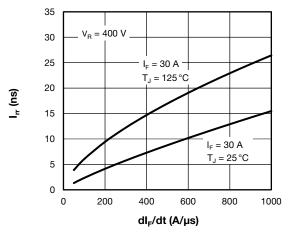


Fig. 8 - Typical Reverse Recovery Current vs. dl_F/dt

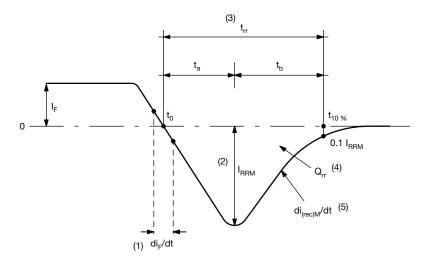


Fig. 9 - Reverse Recovery Waveform and Definitions

Notes

- (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 t₀, crossing point of negative going I_F, to point t_{10%}, 0.1 I_{RRM}
- $^{(4)}$ Q_{rr} area under curve defined by t_0 and t_{10} %

$$Q_{rr} = \int_{t_0}^{t_{10}\%} I(t)dt$$

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

ORDERING INFORMATION TABLE

Vishay Semiconductors product

2 - Circuit configuration:

E = single

3 - T = TO-220

4 - H = hyperfast recovery time

5 - Current code: 31 = 30 A

Voltage code: 06 = 600 V

7 - FP = TO-220 FullPAK 2L

8 - Environmental digit:

-N3 = halogen-free, RoHS-compliant, and totally lead (Pb)-free

LINKS TO RELATED DOCUMENTS					
Dimensions <u>www.vishay.com/doc?96157</u>					
Part marking information	www.vishay.com/doc?95392				



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