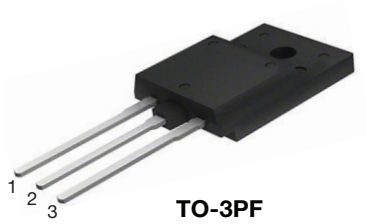
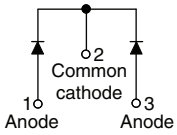
Hyperfast Rectifier, 2 x 30 A FRED Pt®



TO-3PF



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})
- Designed and qualified according to JEDEC®-JESD 47
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT
HALOGEN FREE

LINKS TO ADDITIONAL RESOURCES

3D Models

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.

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-3PF
Circuit configuration	Common cathode

MECHANICAL DATA

Case: TO-3PF

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, per leg	$I_{F(AV)}$		30	A
Non-repetitive peak surge current, per leg	I_{FSM}	T_J = 25 °C, both anodes connection	280	
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	I_R = 100 µA	600	-	-	V
Forward voltage, per leg	V_F	I_F = 30 A	-	1.70	2.15	V
		I_F = 30 A, T_J = 150 °C	-	1.40	1.65	
Reverse leakage current, per leg	I_R	V_R = V_R rated	-	0.02	10	µA
		T_J = 150 °C, V_R = V_R rated	-	36	300	
Junction capacitance, per leg	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**
Reverse recovery time, per leg	t_{rr}	I_F = 1 A, dI_F/dt = 100 A/µs, V_R = 30 V		-	22	-	ns
		T_J = 25 °C	I_F = 30 A, dI_F/dt = 200 A/µs, V_R = 400 V	-	90	-	
		T_J = 125 °C		-	110	-	
Peak recovery current, per leg	I_{RRM}	T_J = 25 °C		-	4.1	-	A
		T_J = 125 °C		-	9.4	-	
Reverse recovery charge, per leg	Q_{rr}	T_J = 25 °C		-	230	-	nC
		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, per leg	R_{thJC}		-	2.30	2.90	°C/W
Thermal resistance, junction-to-ambient, per leg	R_{thJA}	Typical socket mount	-	30	-	
Typical thermal resistance, case-to-heatsink	R_{thCS}	Mounting surface, flat, smooth, and greased	-	0.5	-	
Weight			-	6.2	-	g
			-	0.21	-	oz.
Mounting torque			4 (3.5)	-	6 (5.3)	kgf · cm (lbf · in)
Marking device		Case style TO-3PF	CZH6106FP			

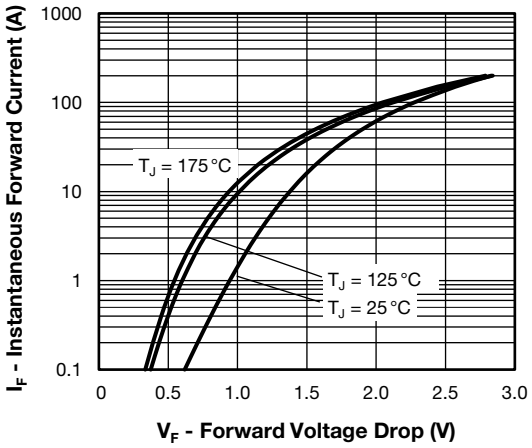


Fig. 1 - Forward Voltage Drop Characteristics, Per Leg

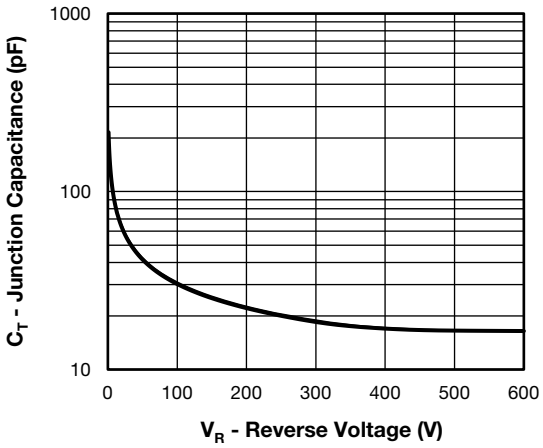


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage, Per Leg

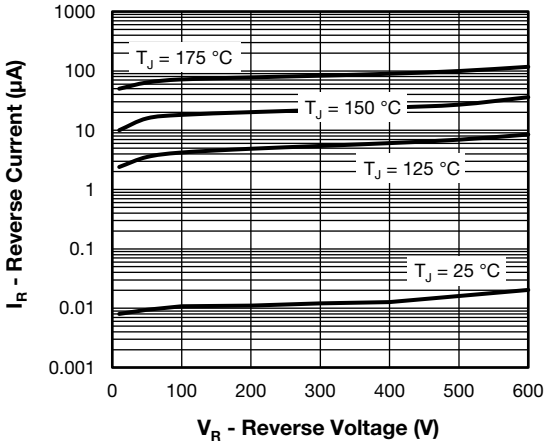


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage, Per Leg

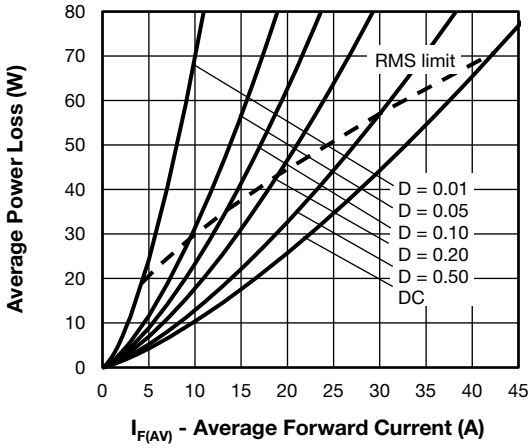


Fig. 4 - Forward Power Loss Characteristics, Per Leg

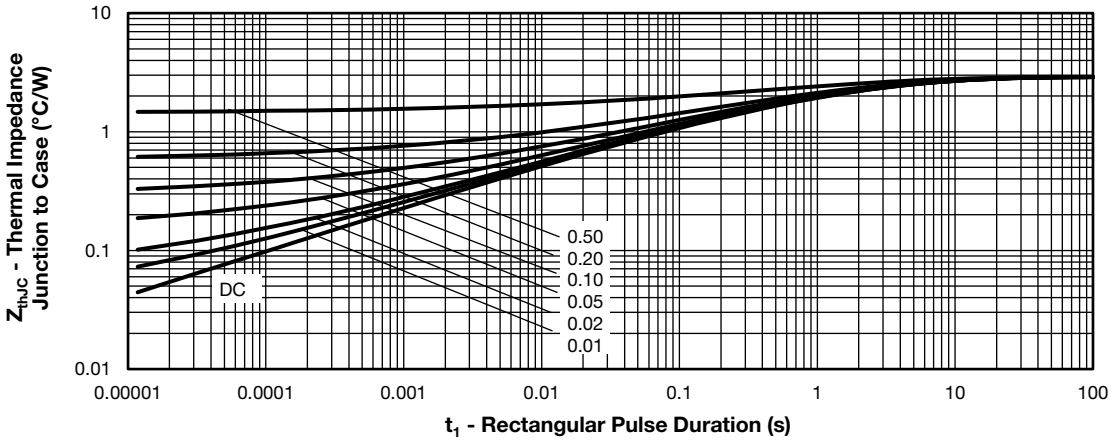


Fig. 5 - Transient Thermal Impedance, Junction to Case, Per Leg

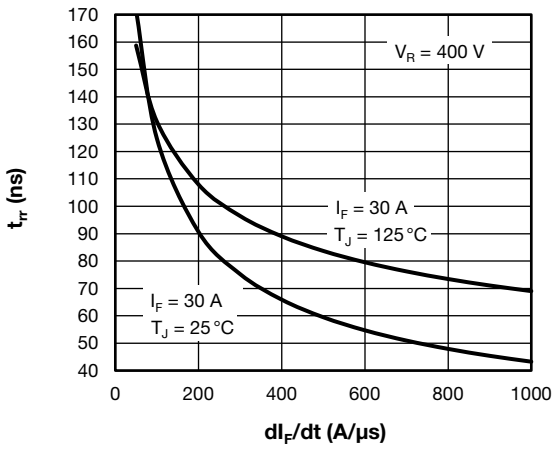


Fig. 6 - Typical Reverse Recovery Time vs. dI_F/dt, Per Leg

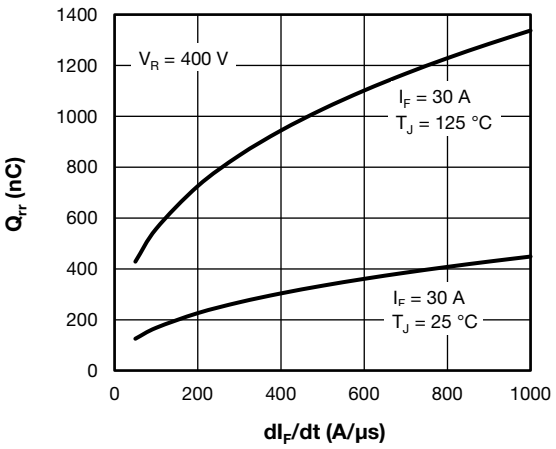


Fig. 7 - Typical Reverse Recovery Charge vs. dI_F/dt, Per Leg

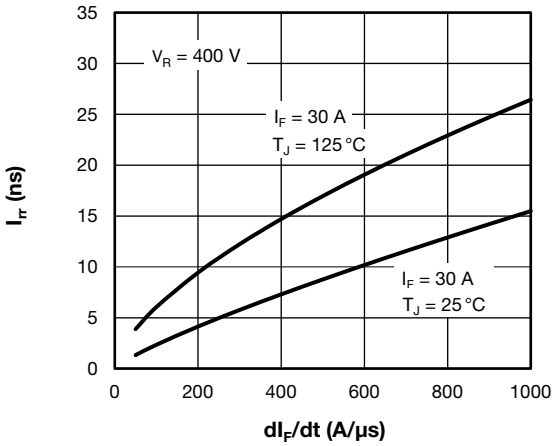


Fig. 8 - Typical Reverse Recovery Current vs. dI_F/dt, Per Leg

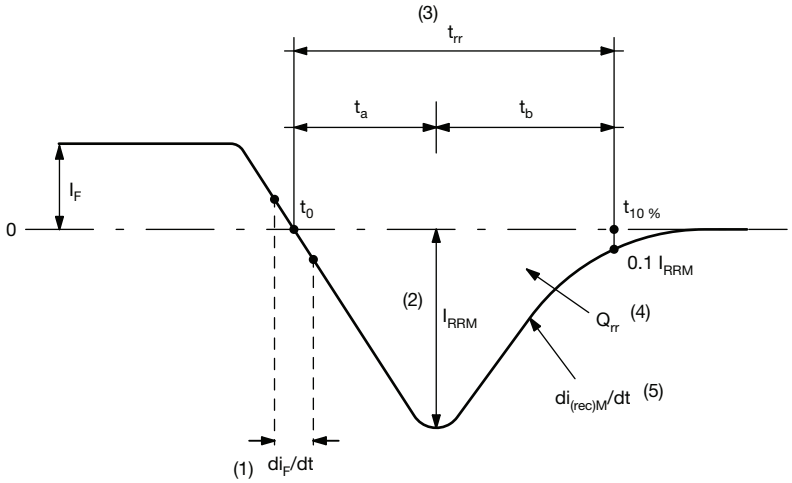


Fig. 9 - Reverse Recovery Waveform and Definitions

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 t_0, 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

Device code

VS-	C	Z	H	61	06	FP	-M3
1	2	3	4	5	6	7	8

1 - Vishay Semiconductors product

2 - Circuit configuration:
C = common cathode

3 - Z = TO-3FP package

4 - H = hyperfast recovery time

5 - Current code: 61 = 60 A (2 x 30 A)

6 - Voltage code: 06 = 600 V

7 - FP = FullPAK

8 - Environmental digit:
-M3 = halogen-free, RoHS-compliant, and terminations lead (Pb)-free

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?96691
Part marking information	www.vishay.com/doc?96690

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