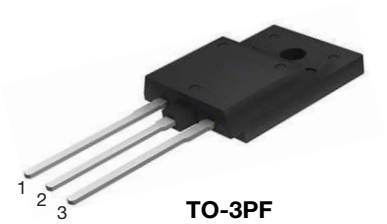
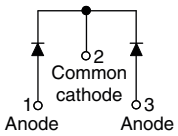
Ultrafast Soft Recovery Diode, 2 x 15 A FRED Pt® Gen 4



TO-3PF



FEATURES

- Gen 4 FRED Pt technology
- Low I_{RRM} and reverse recovery charge
- Very low forward voltage drop
- Polyimide passivated chip for high reliability standard
- Fully isolated package (V_{INS} = 2500 V_{RMS})
- 175 °C operating junction temperature
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT
HALOGEN FREE

DESCRIPTION

Gen 4 Fred Pt technology, state of the art, ultralow V_F, soft switching optimized for Discontinuous (Critical) Mode (DCM) and IGBT F/W diode.
The minimized conduction loss, optimized stored charge and low recovery current minimize the switching losses and reduce over dissipation in the switching element and snubbers.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$ per leg	15 A
V_R	600 V
V_F at I_F	1.08 V
t_{rr} typ.	37 ns
T_J max.	175 °C
Package	TO-3PF
Circuit configuration	Common cathode

ABSOLUTE MAXIMUM RATINGS				
PARAMETER	SYMBOL	TEST CONDITIONS	MAX.	UNITS
Peak repetitive reverse voltage	V_{RRM}		600	V
Average rectified forward current, per leg	$I_{F(AV)}$	T_C = 120 °C	15	A
Non-repetitive peak surge current, per leg	I_{FSM}	T_C = 25 °C, t_p = 8.3 ms half sine wave	180	
Operating junction and storage temperature	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	V_F	I_F = 15 A	-	1.3	1.6	
		I_F = 30 A	-	1.46	1.87	
		I_F = 15 A, T_J = 150 °C	-	1.08	1.3	
		I_F = 30 A, T_J = 150 °C	-	1.32	-	
Reverse leakage current	I_R	V_R = V_R rated	-	-	15	µA
		T_J = 125 °C, V_R = V_R rated	-	-	500	
Junction capacitance	C_T	V_R = 600 V	-	15	-	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		-	37	-	ns
		T_J = 25 °C	I_F = 15 A dI_F/dt = 1000 A/µs V_R = 400 V	-	73	-	
		T_J = 125 °C		-	83	-	
Peak recovery current, per leg	I_{RRM}	T_J = 25 °C		-	13	-	A
		T_J = 125 °C		-	21	-	
Reverse recovery charge, per leg	Q_{rr}	T_J = 25 °C		-	500	-	nC
		T_J = 125 °C		-	1100	-	

THERMAL - MECHANICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Thermal resistance, junction to case	R_{thJC}		-	-	3	°C/W
Thermal resistance, case to heatsink	R_{thCS}		-	0.5	-	
Weight			-	6.2	-	g
			-	0.21	-	oz.
Mounting torque			4.0 (3.5)	-	6.0 (5.3)	kgf · cm (lbf · in)
Marking device		Case style TO-3PF	C4ZU3006FP			

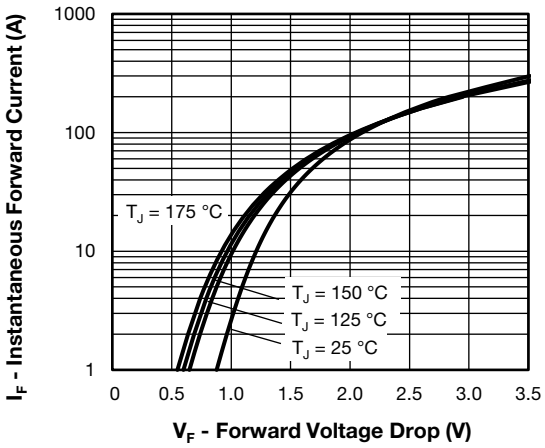


Fig. 1 - Typical Forward Voltage Drop Characteristics

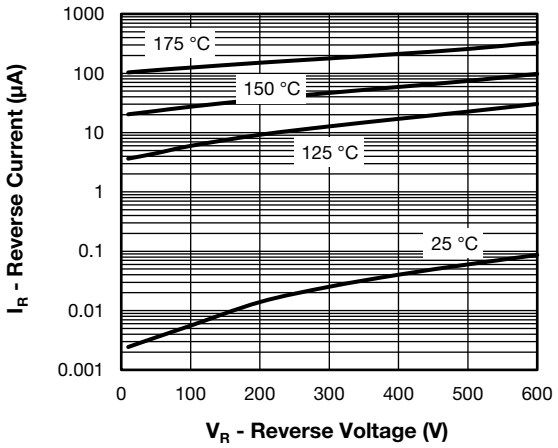


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

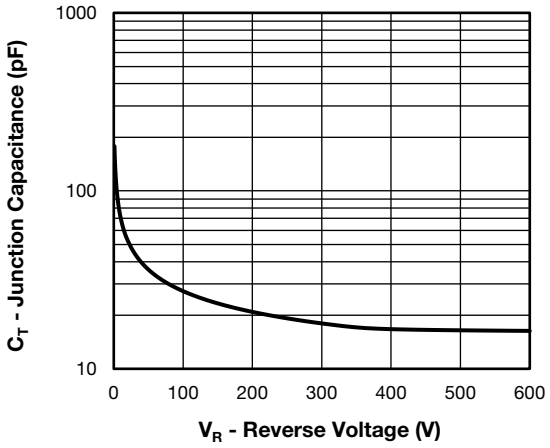


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

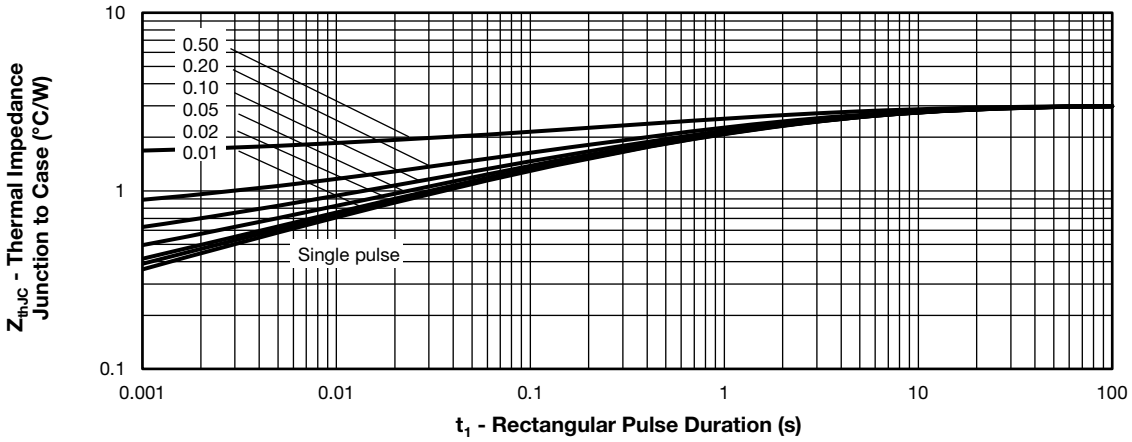


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics

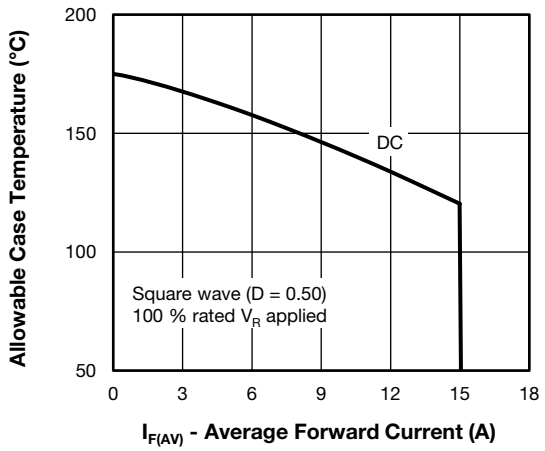


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

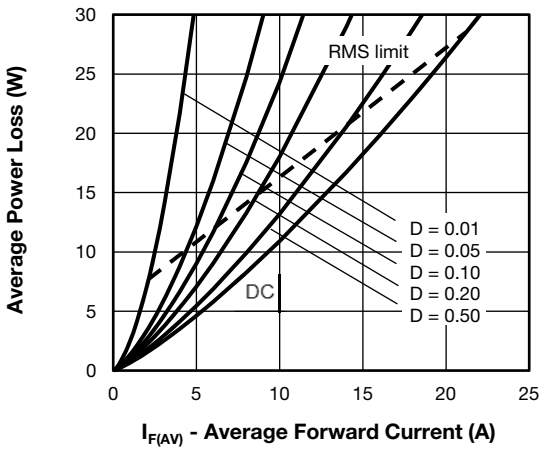


Fig. 6 - Forward Power Loss Characteristics

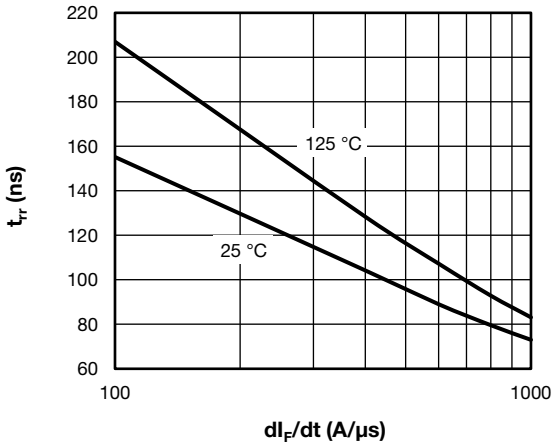


Fig. 7 - Typical Reverse Recovery Time vs. dI_F/dt

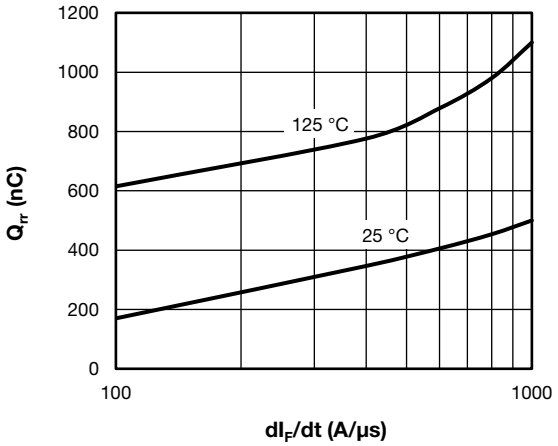


Fig. 8 - Typical Stored Charge vs. dI_F/dt

ORDERING INFORMATION TABLE

Device code	VS-	C	4	Z	U	30	06	FP	-M3
	1	2	3	4	5	6	7	8	9

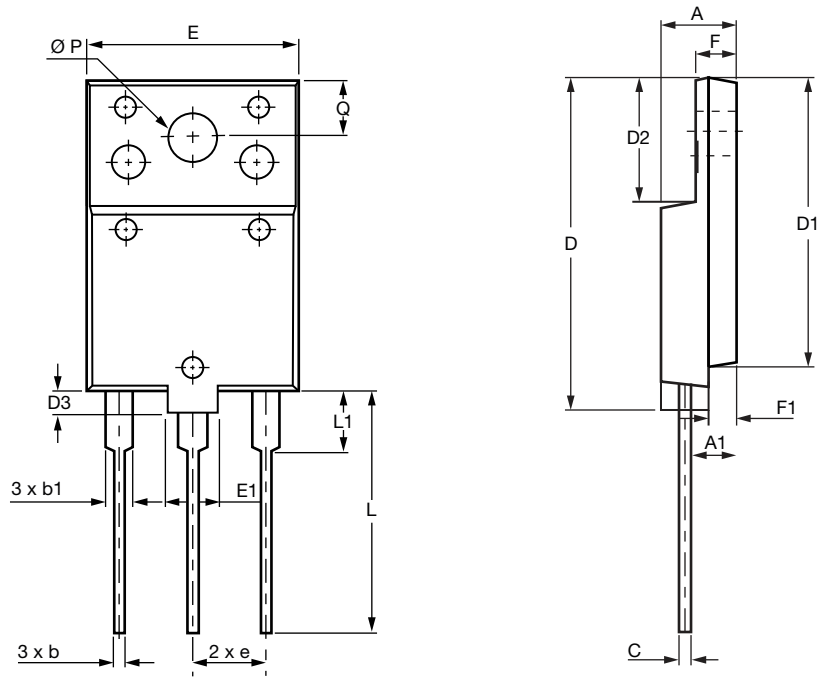
- 1 - Vishay Semiconductors product
- 2 - Circuit configuration:
  C = common cathode
- 3 - FRED Pt Gen 4
- 4 - Z = TO-3PF package
- 5 - Process type:
  U = ultrafast recovery
- 6 - Current rating (30 = 2 x 15 A)
- 7 - Voltage rating (06 = 600 V)
- 8 - FULL-PAK
- 9 - Environmental digit:
  -M3 = halogen-free, RoHS-compliant, terminations lead (Pb)-free

ORDERING INFORMATION (Example)			
PREFERRED P/N	**QUANTITY PER TUBE**	**MINIMUM ORDER QUANTITY**	**PACKAGING DESCRIPTION**
VS-C4ZU3006FP-M3	25	300	Antistatic plastic tube

LINKS TO RELATED DOCUMENTS		
Dimensions	TO-3PF	www.vishay.com/doc?96691
Part marking information	TO-3PF	www.vishay.com/doc?96690

TO-3PF

DIMENSIONS in millimeters



SYMBOL	MIN.	NOM.	MAX.
A	5.30	5.50	5.70
A1	3.10	3.30	3.50
b	0.65	0.85	0.95
b1	1.80	2.00	2.20
c	0.80	0.90	1.10
D	26.30	26.50	26.70
D1	22.80	23.00	23.20
D2	9.80	10.00	10.20
D3	1.80	2.00	2.20
E	15.30	15.50	15.70
E1	3.80	4.00	4.20
e		5.45 BSC	
F	2.80	3.00	3.20
F1	1.80	2.00	2.20
L	19.10	19.30	19.50
L1	4.20	4.50	5.20
Q	4.30	4.50	4.70
Ø P	3.40	3.60	3.80

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