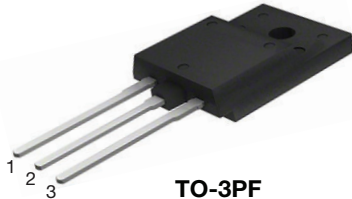
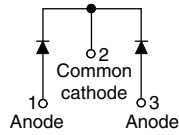


Ultrafast Soft Recovery Diode, 2 x 15 A FRED Pt[®] Gen 4


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
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

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.

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	MAX.	UNITS
Peak repetitive reverse voltage	V_{RRM}		600	V
Average rectified forward current, per leg	$I_{F(AV)}$	$T_C = 120\text{ °C}$	15	A
Non-repetitive peak surge current, per leg	I_{FSM}	$T_C = 25\text{ °C}$, $t_p = 8.3\text{ ms}$ half sine wave	180	
Operating junction and storage temperature	T_J, T_{Stg}		-55 to +175	°C

ELECTRICAL SPECIFICATIONS ($T_J = 25\text{ °C}$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Breakdown voltage, blocking voltage	V_{BR}, V_R	$I_R = 100\ \mu\text{A}$	600	-	-	V
Forward voltage	V_F	$I_F = 15\text{ A}$	-	1.3	1.6	
		$I_F = 30\text{ A}$	-	1.46	1.87	
		$I_F = 15\text{ A}, T_J = 150\text{ °C}$	-	1.08	1.3	
		$I_F = 30\text{ A}, T_J = 150\text{ °C}$	-	1.32	-	
Reverse leakage current	I_R	$V_R = V_R$ rated	-	-	15	μA
		$T_J = 125\text{ °C}$, $V_R = V_R$ rated	-	-	500	
Junction capacitance	C_T	$V_R = 600\text{ V}$	-	15	-	pF



DYNAMIC RECOVERY CHARACTERISTICS ($T_J = 25\text{ }^\circ\text{C}$ unless otherwise specified)							
PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNITS
Reverse recovery time, per leg	t_{rr}	$I_F = 1\text{ A}$, $di_F/dt = 100\text{ A}/\mu\text{s}$, $V_R = 30\text{ V}$		-	37	-	ns
		$T_J = 25\text{ }^\circ\text{C}$	$I_F = 15\text{ A}$ $di_F/dt = 1000\text{ A}/\mu\text{s}$ $V_R = 400\text{ V}$	-	73	-	
		$T_J = 125\text{ }^\circ\text{C}$		-	83	-	
Peak recovery current, per leg	I_{RRM}	$T_J = 25\text{ }^\circ\text{C}$	$I_F = 15\text{ A}$ $di_F/dt = 1000\text{ A}/\mu\text{s}$ $V_R = 400\text{ V}$	-	13	-	A
		$T_J = 125\text{ }^\circ\text{C}$		-	21	-	
Reverse recovery charge, per leg	Q_{rr}	$T_J = 25\text{ }^\circ\text{C}$	$I_F = 15\text{ A}$ $di_F/dt = 1000\text{ A}/\mu\text{s}$ $V_R = 400\text{ V}$	-	500	-	nC
		$T_J = 125\text{ }^\circ\text{C}$		-	1100	-	

THERMAL - MECHANICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Thermal resistance, junction to case	R_{thJC}		-	-	3	$^\circ\text{C}/\text{W}$
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			

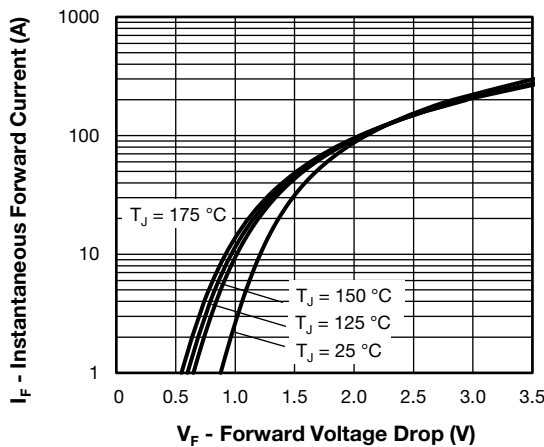


Fig. 1 - Typical Forward Voltage Drop Characteristics

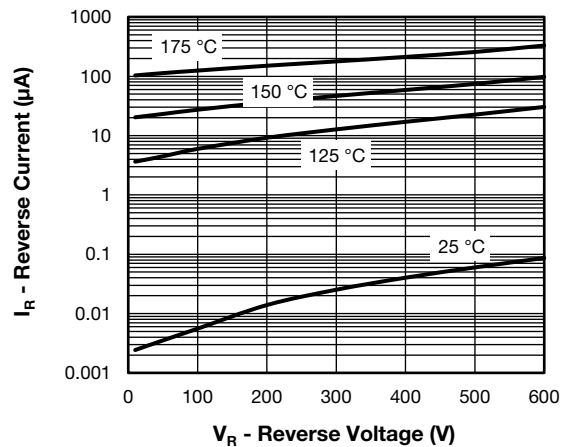


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

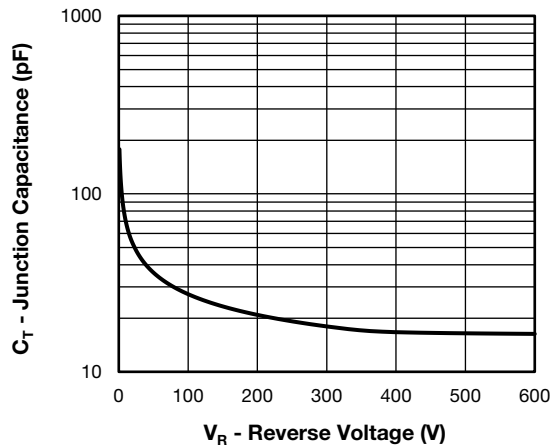


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

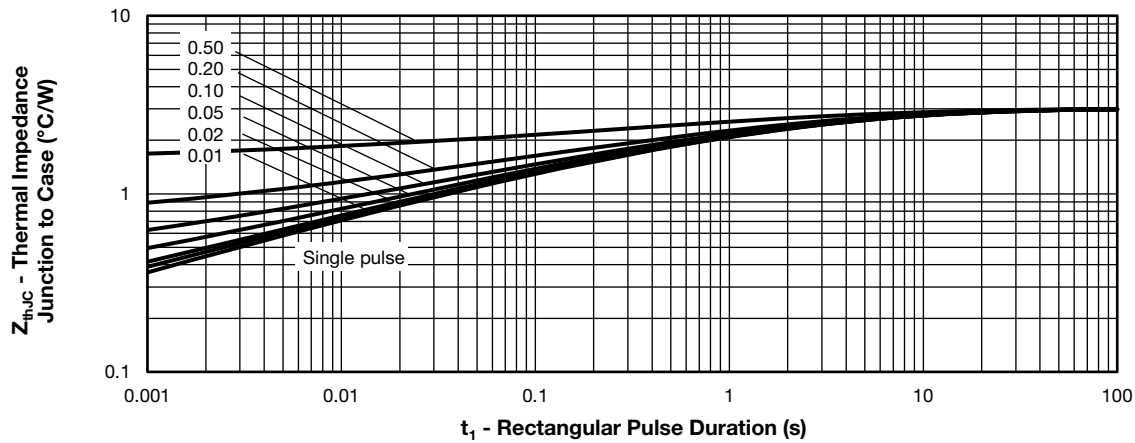


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics

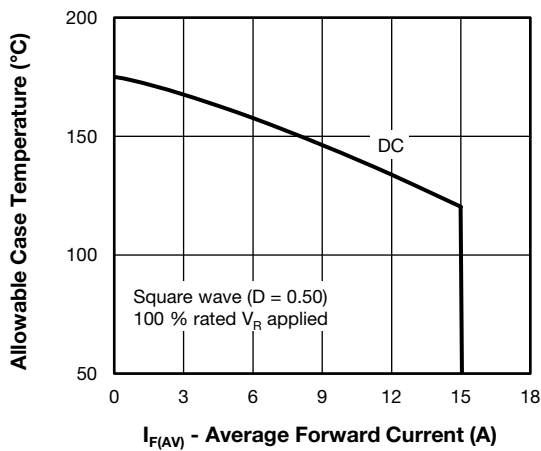


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

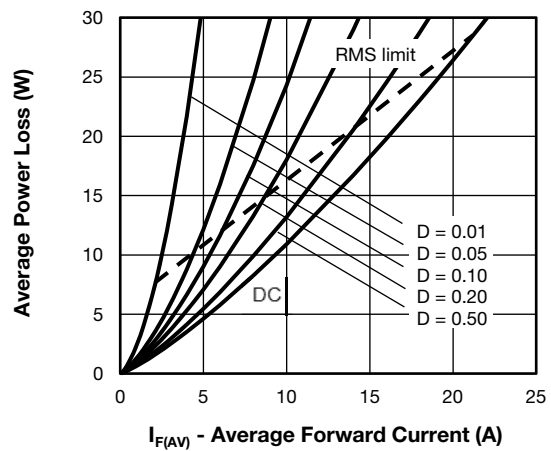


Fig. 6 - Forward Power Loss Characteristics

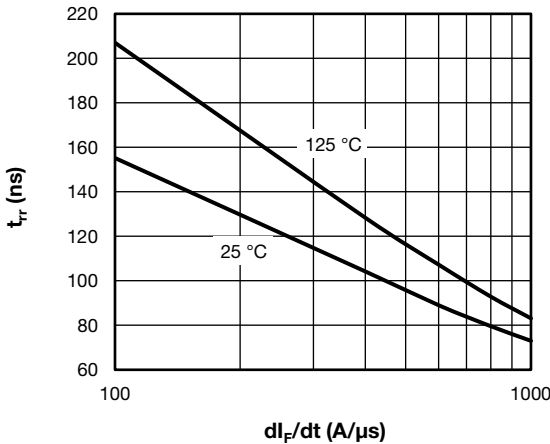


Fig. 7 - Typical Reverse Recovery Time vs. di_F/dt

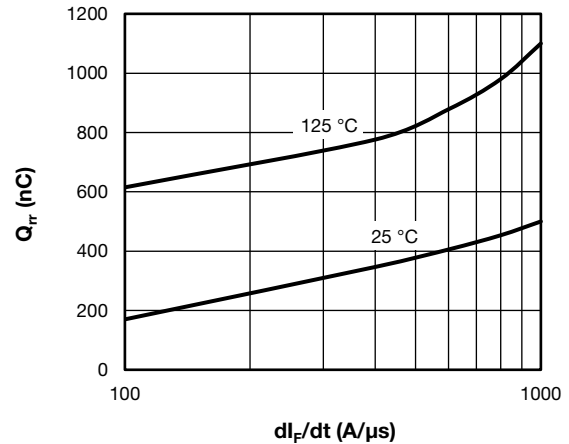


Fig. 8 - Typical Stored Charge vs. di_F/dt

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						

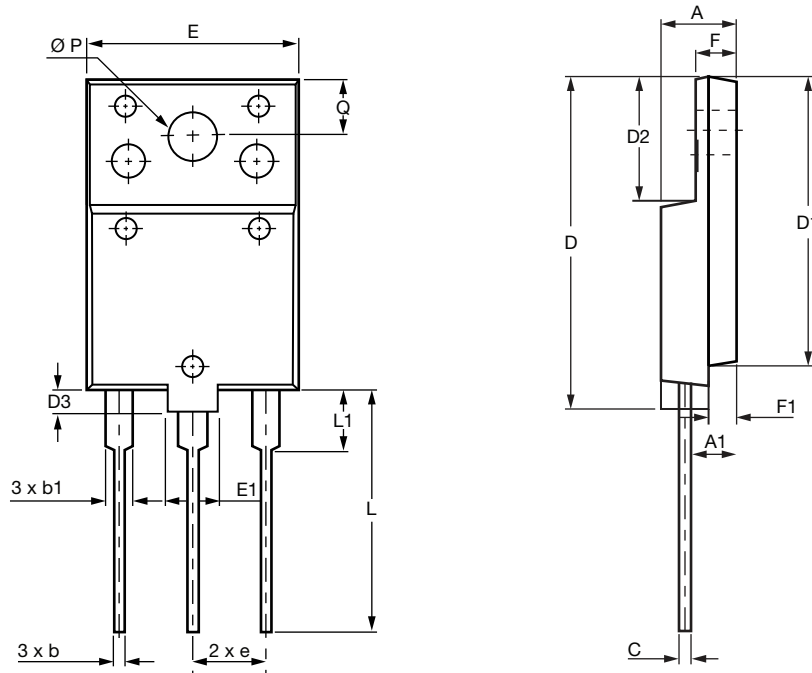
ORDERING INFORMATION (Example)			
PREFERRED P/N	QUANTITY PER TUBE	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION
VS-C4ZU3006FP-M3	25	300	Antistatic plastic tube

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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