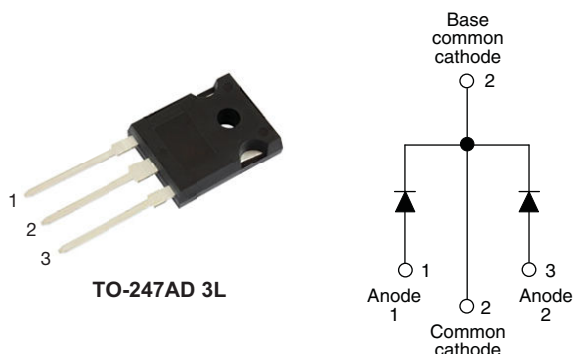


Ultrafast Soft Recovery Diode, 2 x 30 A FRED Pt® Gen 4



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
- 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 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 power dissipation in the switching element and snubbers.

PRIMARY CHARACTERISTICS

$I_{F(AV)}$	2 x 30 A
V_R	600 V
V_F at I_F	1.19 V
t_{rr} typ.	See Recovery table
T_J max.	175 °C
Package	TO-247AD 3L
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	$I_{F(AV)}$	$T_C = 131$ °C	30	A
Non-repetitive peak surge current, per leg	I_{FSM}	$T_C = 25$ °C, $t_p = 8.3$ ms, half sine wave	240	
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	$I_R = 100$ μ A	600	-	-	V
Forward voltage	V_F	$I_F = 30$ A	-	1.36	1.6	
		$I_F = 60$ A	-	1.6	-	
		$I_F = 30$ A, $T_J = 125$ °C	-	1.23	-	
		$I_F = 60$ A, $T_J = 125$ °C	-	1.5	-	
		$I_F = 30$ A, $T_J = 150$ °C	-	1.19	1.35	
		$I_F = 60$ A, $T_J = 150$ °C	-	1.48	-	
Reverse leakage current	I_R	$V_R = V_R$ rated	-	-	50	μ A
		$T_J = 125$ °C, $V_R = V_R$ rated	-	-	500	
Junction capacitance	C_T	$V_R = 600$ V	-	18.3	-	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	t_{rr}	$T_J = 25\text{ }^{\circ}\text{C}$	-	65	-	ns
		$T_J = 125\text{ }^{\circ}\text{C}$	-	90	-	
Peak recovery current	I_{RRM}	$T_J = 25\text{ }^{\circ}\text{C}$	-	18	-	A
		$T_J = 125\text{ }^{\circ}\text{C}$	-	32	-	
Reverse recovery charge	Q_{rr}	$T_J = 25\text{ }^{\circ}\text{C}$	-	850	-	nC
		$T_J = 125\text{ }^{\circ}\text{C}$	-	1850	-	

THERMAL - MECHANICAL SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Thermal resistance, junction to case	R_{thJC}		-	-	1	$^{\circ}\text{C/W}$
Thermal resistance, case to heat sink	R_{thCS}		-	0.4	-	
Weight			-	6.0	-	g
			-	0.21	-	oz.
Mounting torque			6.0 (5)	-	12 (10)	kgf · cm (lbf · in)
Marking device		Case style TO-247AD 3L	C4PU3006L			

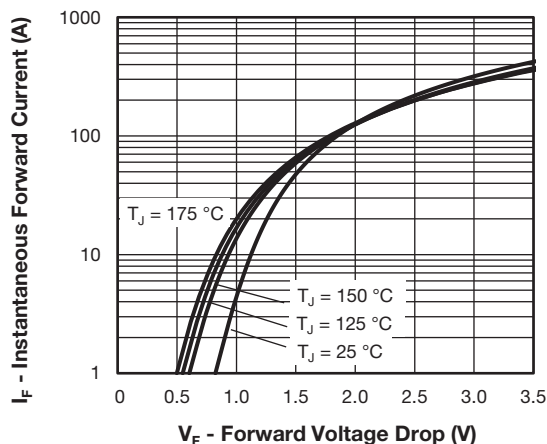


Fig. 1 - Typical Forward Voltage Drop Characteristics

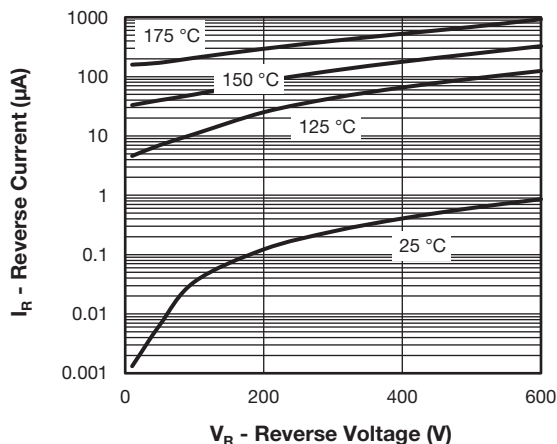


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

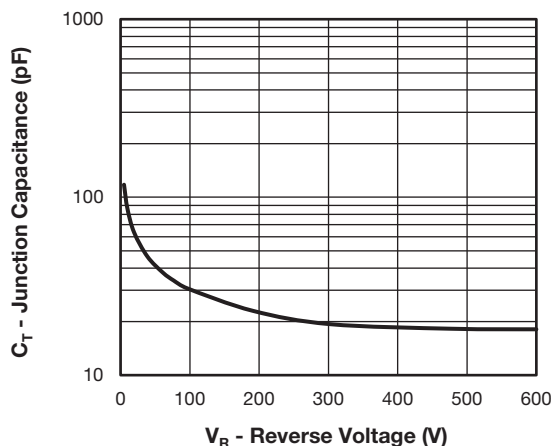


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

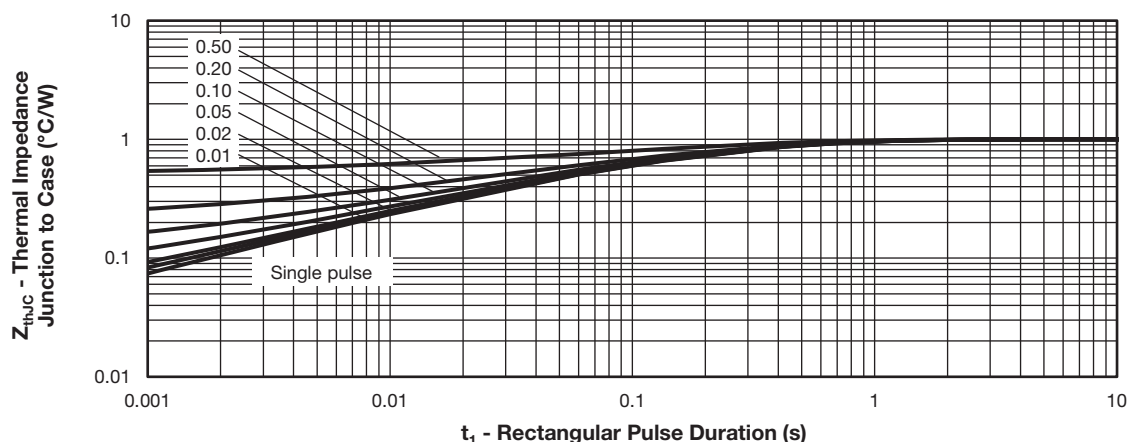
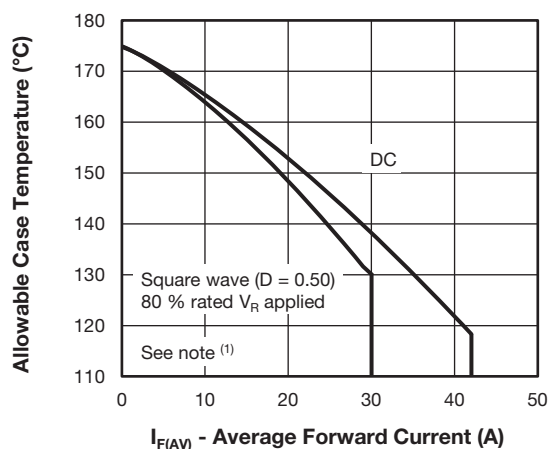

Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics


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

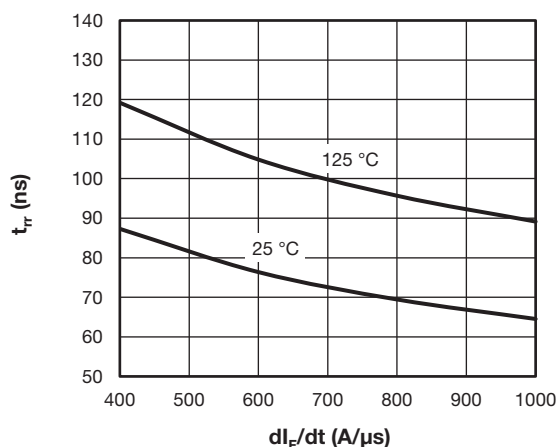
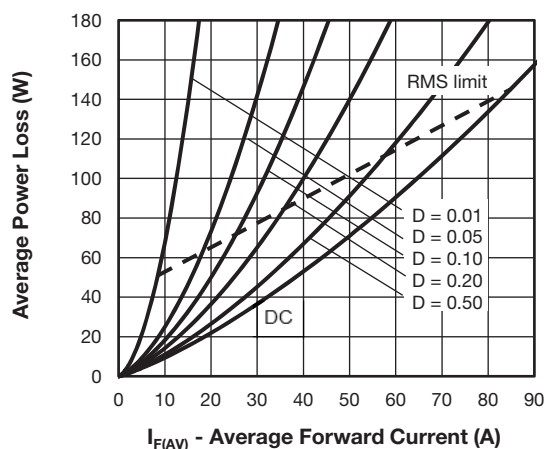
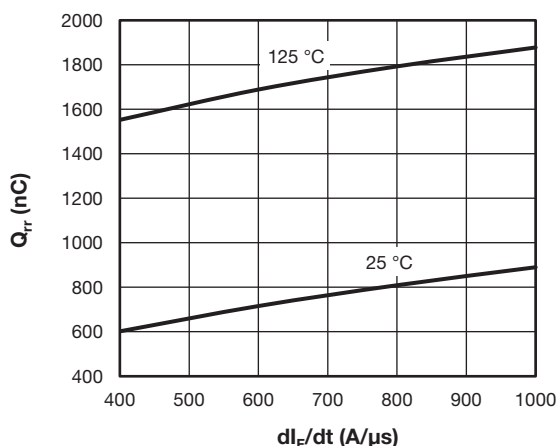

Fig. 7 - Typical Reverse Recovery Time vs. dI_F/dt


Fig. 6 - Forward Power Loss Characteristics


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

- (1) Formula used: $T_C = T_J - (P_d + P_{dREV}) \times R_{thJC}$;
 P_d = forward power loss = $I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see Fig.5)
 P_{dREV} = inverse power loss = $V_{R1} \times I_R (1 - D)$; I_R at V_R = rated V_R

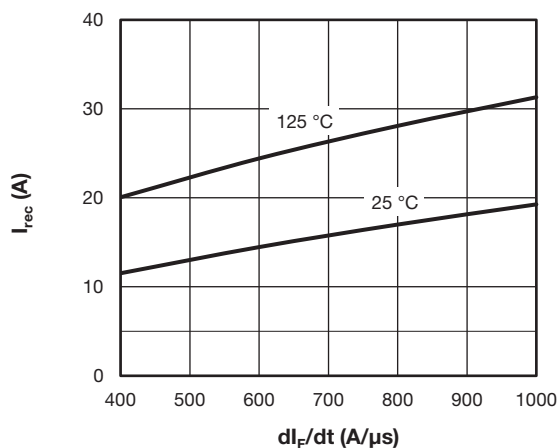


Fig. 9 - Typical Reverse Current vs. dl_F/dt

ORDERING INFORMATION TABLE

Device code	VS-	C	4	P	U	60	06	L	-N3
	1	2	3	4	5	6	7	8	9

- 1 - Vishay Semiconductors product
- 2 - Circuit configuration:
C = common diode
- 3 - FRED Pt Gen 4
- 4 - P = TO-247 package
- 5 - Process type:
U = ultrafast recovery
- 6 - Current rating ($60 = 2 \times 30 \text{ A}$)
- 7 - Voltage rating ($06 = 600 \text{ V}$)
- 8 - Package: L = long lead
- 9 - Environmental digit:
-N3 = halogen-free, RoHS-compliant, and totally lead (Pb)-free

ORDERING INFORMATION (Example)			
PREFERRED P/N	QUANTITY PER TUBE	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION
VS-C4PU6006L-N3	25	500	Antistatic plastic tube

LINKS TO RELATED DOCUMENTS		
Dimensions	TO-247AD 3L	www.vishay.com/doc?95626
Part marking information	TO-247AD 3L	www.vishay.com/doc?95007



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Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: ocean@oceanchips.ru

Web: <http://oceanchips.ru/>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А