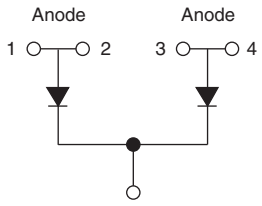
Not Insulated SOT-227 Power Module
U-Series FRED Pt® Gen 4, 600 V

SOT-227



Base common cathode

FEATURES

- Gen 4 FRED Pt® dices technology
- Ultrasoft reverse recovery characteristics
- Low I_{RRM} and reverse recovery charge
- Very low forward voltage drop
- Not insulated package
- 175 °C operating junction temperature
- Optimized for power conversion: welding and industrial SMPS applications
- Plug-in compatible with other SOT-227 packages
- Easy to assemble
- Direct mounting to heatsink
- Designed and qualified for industrial level
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free

RoHS COMPLIANT

DESCRIPTION

Gen 4 FRED technology, state of the art, ultra low V_F, soft switching optimized for IGBT F/W diode.
The minimized conduction loss, optimized storage charge and low recovery current minimized the switching losses and reduce the over dissipation in the switching element and snubbers.

PRIMARY CHARACTERISTICS	
V_R	600 V
$I_{F(AV)}$ at T_C = 124 °C per module (1)	450 A
t_{rr}	97 ns
Type	Modules - Diode FRED Pt®
Package	SOT-227
Circuit configuration	Common cathode

Note

(1) All 4 anode terminals connected

ABSOLUTE MAXIMUM RATINGS (T_J = 25 °C unless otherwise specified)				
PARAMETER	**SYMBOL**	**TEST CONDITIONS**	**MAX.**	**UNITS**
Cathode to anode voltage	V_R		600	V
Continuous forward current per diode	I_F	T_C = 133 °C	250	A
Single pulse forward current per diode	I_{FSM}	T_C = 25 °C, 10 ms sine or 6 ms rectangular pulse	1170	
Maximum power dissipation per module	P_D	T_C = 135 °C	727	W
Operating junction and storage temperatures	T_J, T_{Stg}		-55 to +175	°C

ELECTRICAL SPECIFICATIONS PER DIODE (T_J = 25 °C unless otherwise specified)						
PARAMETER	**SYMBOL**	**TEST CONDITIONS**	**MIN.**	**TYP.**	**MAX.**	**UNITS**
Cathode to anode breakdown voltage	V_{BR}	I_R = 500 µA	600	-	-	V
Forward voltage, per leg	V_{FM}	I_F = 100 A	-	1.18	1.32	
		I_F = 100 A, T_J = 125 °C	-	1.00	-	
		I_F = 100 A, T_J = 175 °C	-	0.91	-	
		I_F = 200 A	-	1.34	1.60	
		I_F = 200 A, T_J = 125 °C	-	1.19	-	
		I_F = 200 A, T_J = 175 °C	-	1.11	-	
Reverse leakage current, per leg	I_{RM}	V_R = V_R = 600 V,	-	0.2	150	µA
		V_R = V_R = 600 V, T_J = 125 °C	-	169	-	
		V_R = V_R = 600 V, T_J = 175 °C	-	2.1	-	mA
Junction capacitance, per leg	C_T	V_R = 600 V, f = 1 MHz	-	173	-	pF

DYNAMIC RECOVERY CHARACTERISTICS PER DIODE (T_J = 25 °C unless otherwise specified)							
PARAMETER	**SYMBOL**	**TEST CONDITIONS**		**MIN.**	**TYP.**	**MAX.**	**UNITS**
Reverse recovery time, per leg	t_{rr}	T_J = 25 °C	I_F = 50 A dI_F/dt = 500 A/µs V_R = 200 V	-	97	-	ns
		T_J = 125 °C		-	164	-	
Peak recovery current, per leg	I_{RRM}	T_J = 25 °C		-	16	-	A
		T_J = 125 °C		-	33	-	
Reverse recovery charge, per leg	Q_{rr}	T_J = 25 °C		-	794	-	nC
		T_J = 125 °C		-	2736	-	

THERMAL - MECHANICAL SPECIFICATIONS						
PARAMETER	**SYMBOL**	**TEST CONDITIONS**	**MIN.**	**TYP.**	**MAX.**	**UNITS**
Junction to case, single leg conducting	R_{thJC}		-	-	0.11	°C/W
Junction to case, both leg conducting			-	-	0.055	
Case to heatsink, per module	R_{thCS}	Flat, greased surface	-	0.1	-	
Weight			-	30	-	g
Mounting torque		Torque to terminal	-	-	1.1 (9.7)	Nm (lbf. in)
		Torque to heatsink	-	-	1.3 (11.5)	Nm (lbf. in)
Case style			SOT-227			

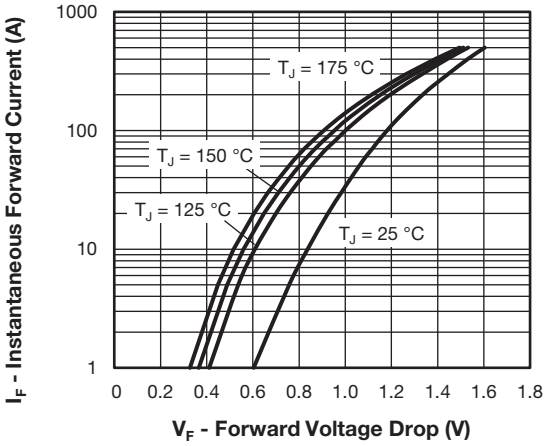


Fig. 1 - Typical Forward Voltage Drop vs. Instantaneous Forward Current (Per Diode)

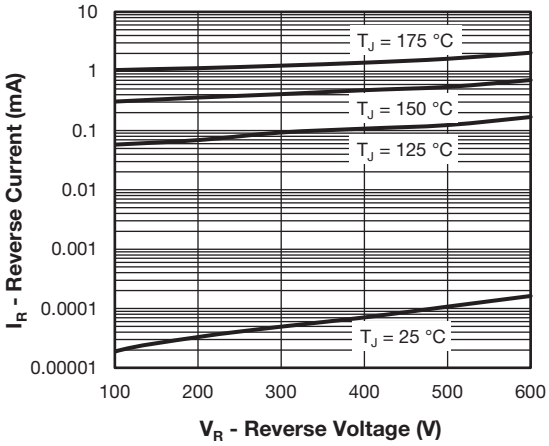


Fig. 2 - Typical Reverse Current vs. Reverse Voltage (Per Diode)

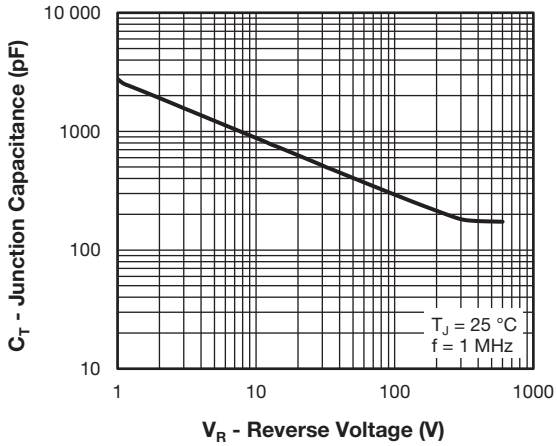


Fig. 3 - Typical Junction Capacitance vs Reverse Voltage (Per Diode)

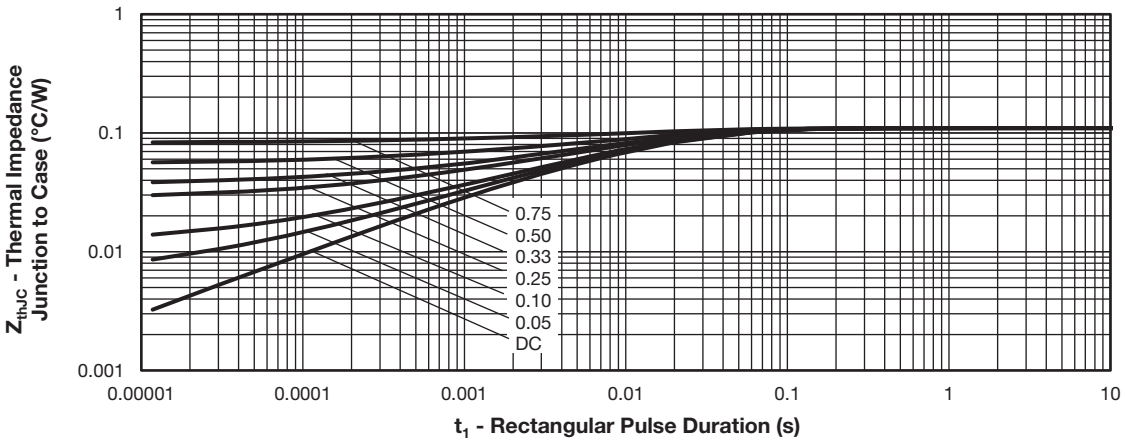


Fig. 4 - Maximum Thermal Impedance Junction-to-Case Characteristics (Per Diode)

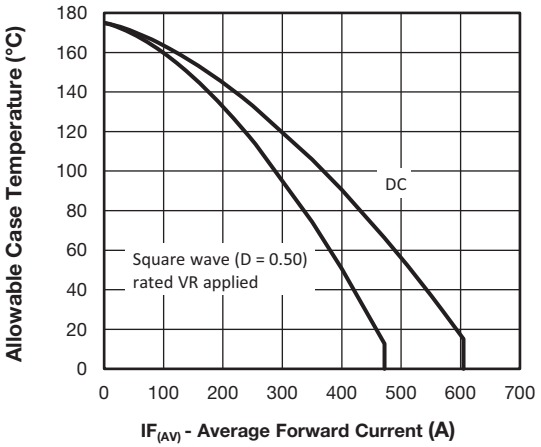


Fig. 5 - Maximum Current Rating Capability (Per Diode)

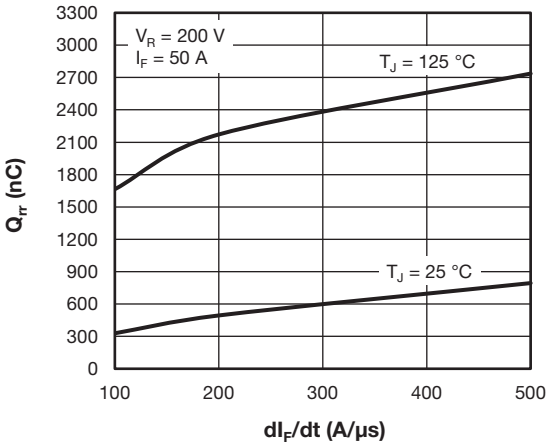


Fig. 7 - Typical Reverse Recovery Charge vs. dI_F/dt (Per Diode)

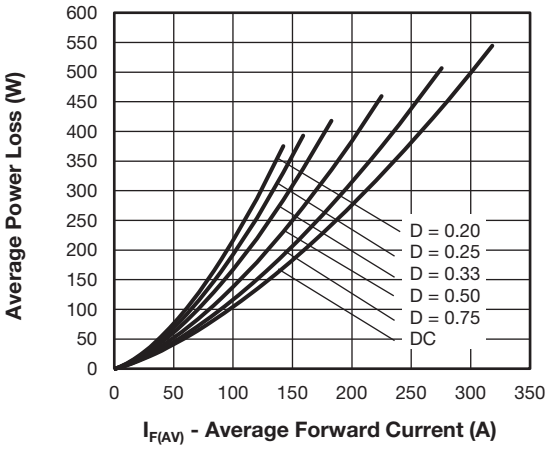


Fig. 6 - Forward Power Loss Characteristics (Per Diode)

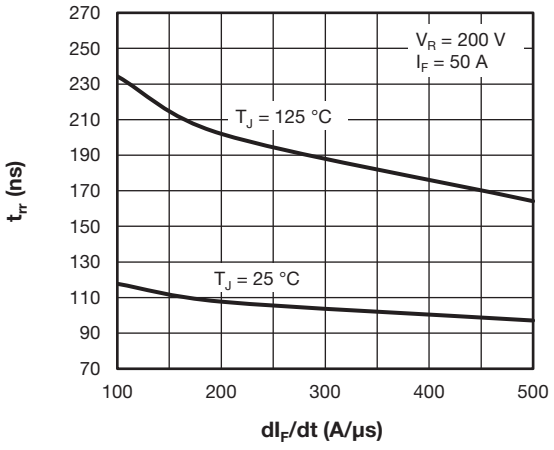


Fig. 8 - Typical Reverse Recovery Time vs. dI_F/dt (Per Diode)

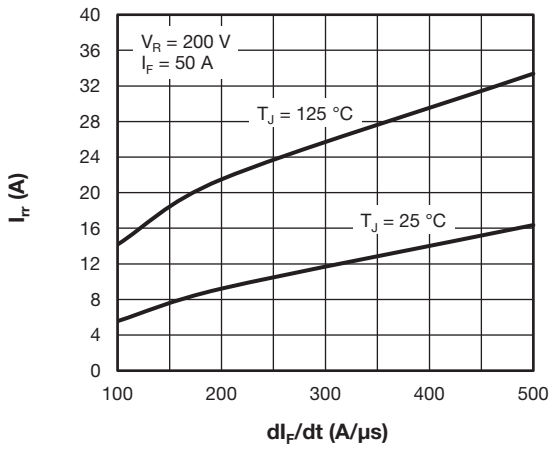


Fig. 9 - Typical Reverse Recovery Current vs. dI_F/dt (Per Diode)

ORDERING INFORMATION TABLE

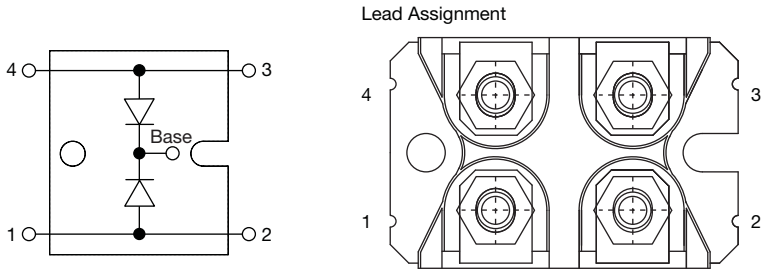
Device code

VS-	UF	L	450	C	B	60
1	2	3	4	5	6	7

1 - Vishay Semiconductors product
2 - Ultrafast rectifier
3 - Ultrafast Pt diffused, low V_F
4 - Current rating (450 = 450 A)
5 - Circuit configuration (2 common cathode diodes)
6 - Package indicator (SOT-227 standard not insulated)
7 - Voltage rating (60 = 600 V)

Quantity per tube is 10 pcs, M4 screw and washer included

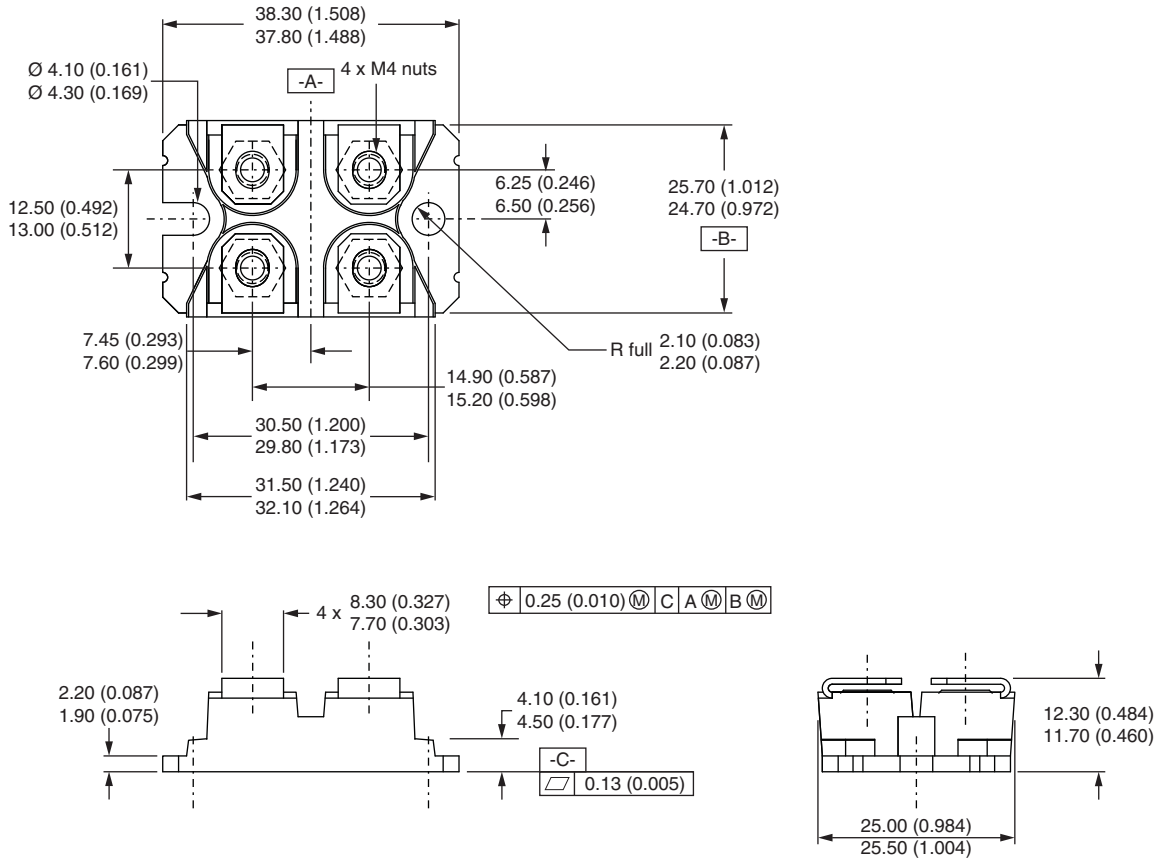
CIRCUIT CONFIGURATION

CIRCUIT	CIRCUIT CONFIGURATION CODE	CIRCUIT DRAWING
Common cathode	C	

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95423
Part marking information	www.vishay.com/doc?95425

SOT-227 Generation II

DIMENSIONS in millimeters (inches)



Note

- Controlling dimension: millimeter

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