VS-UFL230FA60

Vishay Semiconductors

Insulated Ultrafast Rectifier Module, 230 A



PRIMARY CHARACTERISTICS					
V _R 600 V					
$I_{F(AV)}$ per module at $T_C = 102 \ ^{\circ}C$	230 A				
t _{rr}	44 ns				
Туре	Modules - diode FRED Pt®				
Package	SOT-227				

FEATURES

- Two fully independent diodes
- · Fully insulated package
- RoHS • Ultrafast, soft reverse recovery, with high COMPLIANT operation junction temperature (T_1 max. = 175 °C)
- Low forward voltage drop
- Optimized for power conversion: welding and industrial SMPS applications
- · Easy to use and parallel
- Industry standard outline
- UL approved file E78996
- · Designed and qualified for industrial level
- · Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

DESCRIPTION / APPLICATIONS

The VS-UFL230FA60 insulated modules integrate two state of the art ultrafast recovery rectifiers in the compact, industry standard SOT-227 package. The diodes structure, and its life time control, provide an ultrasoft recovery current shape, together with the best overall performance, ruggedness and reliability characteristics.

These devices are thus intended for high frequency applications in which the switching energy is designed not to be predominant portion of the total energy, such as in the output rectification stage of welding machines, SMPS, DC/DC converters. Their extremely optimized stored charge and low recovery current reduce both over dissipation in the switching elements (and snubbers) and EMI/RFI.

ABSOLUTE MAXIMUM RATINGS					
PARAMETER	SYMBOL	TEST CONDITIONS	MAX.	UNITS	
Cathode to anode voltage	V _R		600	V	
Continuous forward current per diode	۱ _F	T _C = 85 °C	160	٨	
Single pulse forward current per diode	I _{FSM}	T _C = 25 °C	1500	A	
Maximum power dissipation per module	PD	T _C = 85 °C	416	W	
RMS isolation voltage	VISOL	Any terminal to case, $t = 1 min$	2500	V	
Operating junction and storage temperatures	T _J , T _{Stg}		-55 to +175	°C	







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ELECTRICAL SPECIFICATIONS PER DIODE ($T_J = 25 \text{ °C}$ unless otherwise specified)						
PARAMETER	SYMBOL	L TEST CONDITIONS		TYP.	MAX.	UNITS
Cathode to anode breakdown voltage	V _{BR}	I _R = 100 μA	600	-	-	
Forward voltage	V _{FM}	I _F = 100 A	-	1.28	1.44	V
		$I_F = 100 \text{ A}, \text{T}_\text{J} = 125 \ ^\circ\text{C}$	-	1.13	1.24	
		I _F = 200 A	-	1.48	1.66	
		I _F = 200 A, T _J = 125 °C	-	1.37	1.55	
Reverse leakage current	I _{RM}	V _R = V _R rated	-	0.1	50	μA
		$T_J = 175 \text{ °C}, V_R = V_R \text{ rated}$	-	0.25	2	mA
Junction capacitance	CT	V _R = 600 V	-	72	-	pF

DYNAMIC RECOVERY CHARACTERISTICS ($T_J = 25$ °C unless otherwise specified)							
PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNITS
	$I_F = 1.0 \text{ A}, dI_F/dt = 200 \text{ A}/\mu \text{s}, V_R = 30 \text{ V}$		-	44	-		
Reverse recovery time	t _{rr}	T _J = 25 °C		-	104	-	ns
		T _J = 125 °C		-	210	-	
Peak recovery current I _{RRM}	T _J = 25 °C	I _F = 50 A dI _F /dt = 200 A/μs V _B = 200 V	-	10	-	А	
	T _J = 125 °C		-	22	-	~	
Reverse recovery charge	Q _{rr}	T _J = 25 °C	-n	-	520	-	nC
		T _J = 125 °C		-	2200	-	

THERMAL - MECHANICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Junction to case, single leg conducting	Р		-	-	0.43	
Junction to case, both leg conducting	R _{thJC}		-	-	0.215	°C/W
Case to heatsink	R _{thCS}	Flat, greased surface	-	0.05	-	
Weight			-	30	-	g
		Torque to terminal	-	-	1.1 (9.7)	Nm (lbf.in)
Mounting torque		Torque to heatsink	-	-	1.8 (15.9)	Nm (lbf.in)
Case style					OT-227	



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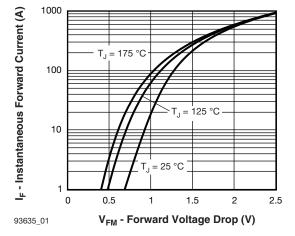
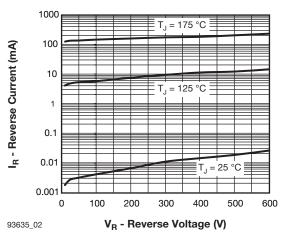
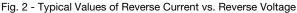


Fig. 1 - Typical Forward Voltage Drop Characteristics





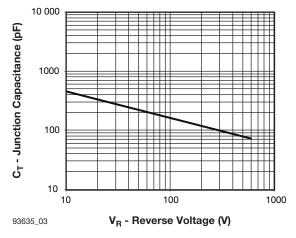
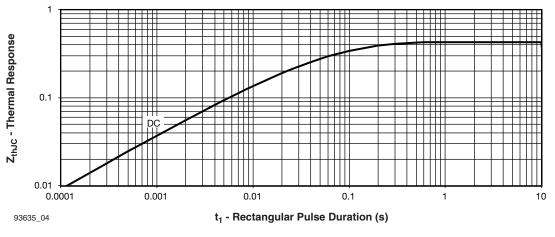


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage



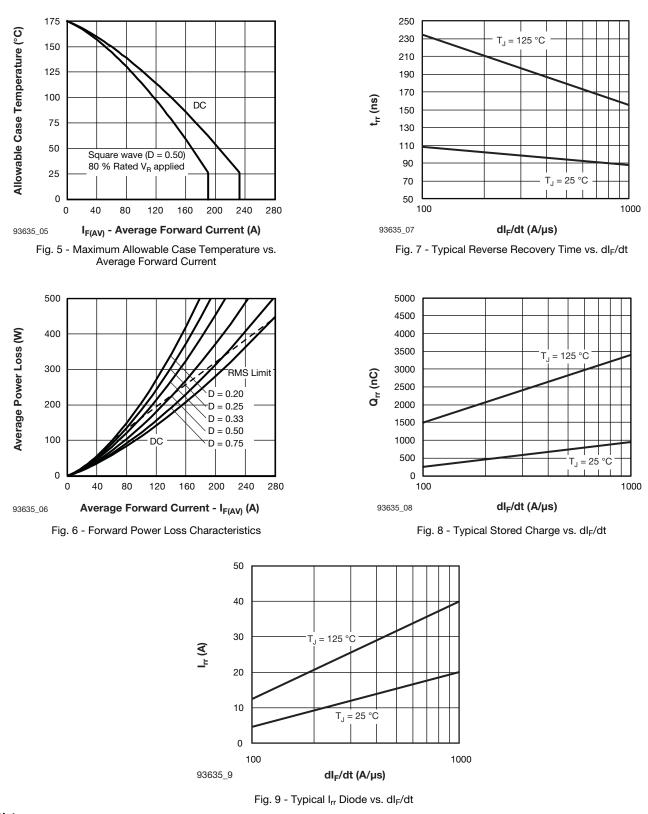


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⁽¹⁾ Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;

 $[\]begin{array}{l} \mathsf{Pd} = \mathsf{forward} \ \mathsf{power} \ \mathsf{loss} = \mathsf{I}_{\mathsf{F}(\mathsf{AV})} \, x \, \mathsf{V}_{\mathsf{FM}} \ \mathsf{at} \ (\mathsf{I}_{\mathsf{F}(\mathsf{AV})}/\mathsf{D}) \ (\mathsf{see} \ \mathsf{fig.} \ \mathsf{6}); \\ \mathsf{Pd}_{\mathsf{REV}} = \mathsf{inverse} \ \mathsf{power} \ \mathsf{loss} = \mathsf{V}_{\mathsf{R1}} \, x \, \mathsf{I}_{\mathsf{R}} \ (\mathsf{1} - \mathsf{D}); \ \mathsf{I}_{\mathsf{R}} \ \mathsf{at} \ \mathsf{V}_{\mathsf{R1}} = \mathsf{rated} \ \mathsf{V}_{\mathsf{R}} \end{array}$



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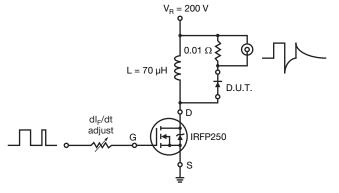


Fig. 10 - Reverse Recovery Parameter Test Circuit

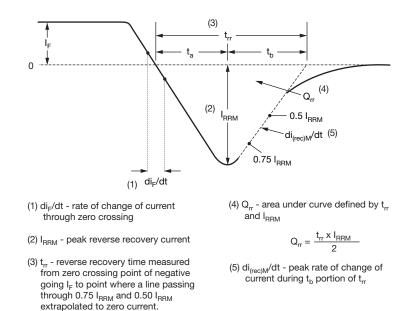
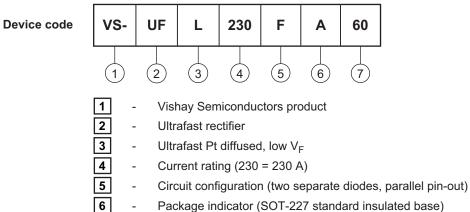


Fig. 11 - Reverse Recovery Waveform and Definitions





ORDERING INFORMATION TABLE



- Package indicator (SOT-227 standard insulated base) -
- Voltage rating (60 = 600 V)

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CIRCUIT CONFIGURATION					
CIRCUIT	CIRCUIT CONFIGURATION CODE	CIRCUIT DRAWING			
Two separate diodes, parallel pin-out	F	Lead Assignment			

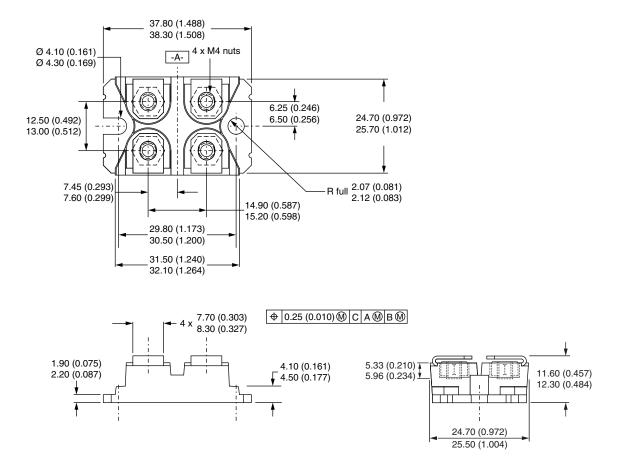
LINKS TO RELATED DOCUMENTS					
Dimensions www.vishay.com/doc?95423					
Packaging information	www.vishay.com/doc?95425				





SOT-227 Generation 2

DIMENSIONS in millimeters (inches)



Note

• Controlling dimension: millimeter



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