


Single Phase Fast Recovery Bridge (Power Modules), 61 A



SOT-227

FEATURES

- Fast recovery time characteristic
- Electrically isolated base plate
- Simplified mechanical designs, rapid assembly
- Excellent power/volume ratio
- Designed and qualified for industrial and consumer level
- UL approved file E78996 
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


RoHS
COMPLIANT

DESCRIPTION

The semiconductor in the SOT-227 package is isolated from the copper base plate, allowing for common heatsinks and compact assemblies to be built.

PRODUCT SUMMARY	
V_{RRM}	600 V
I_O	61 A
t_{rr}	170 ns
Type	Modules - Bridge, Fast
Package	SOT-227
Circuit	Single phase bridge

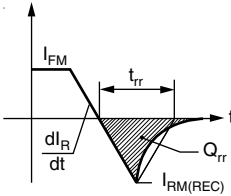
MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
I_O		61	A
	T_C	57	°C
I_{FSM}	50 Hz	300	A
	60 Hz	310	
I^2t	50 Hz	442	A ² s
	60 Hz	402	
V_{RRM}		600	V
T_J		-55 to +150	°C

ELECTRICAL SPECIFICATIONS

VOLTAGE RATINGS				
TYPE NUMBER	VOLTAGE CODE	V_{RRM} , MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE V	V_{RSM} , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V	I_{RRM} MAXIMUM AT T_J MAXIMUM mA
SA61BA60	60	600	700	10

FORWARD CONDUCTION							
PARAMETER	SYMBOL	TEST CONDITIONS			VALUES	UNITS	
Maximum DC output current at case temperature	I _O	Resistive or inductive load			61	A	
					57	°C	
Maximum peak, one-cycle non-repetitive forward current	I _{FSM}	t = 10 ms	No voltage reapplied	Initial T _J = T _J maximum	300	A	
		t = 8.3 ms			310		
		t = 10 ms	100 % V _{RRM}		250		
		t = 8.3 ms	reapplied		260		
Maximum I ² t for fusing	I ² t	t = 10 ms	No voltage reapplied		442	A ² s	
		t = 8.3 ms			402		
		t = 10 ms	100 % V _{RRM}		313		
		t = 8.3 ms	reapplied		284		
Maximum I ² √t for fusing	I ² √t	I ² t for time t _x = I ₂ √t x √t _x ; 0.1 ≤ t _x ≤ 10 ms, V _{RRM} = 0 V			4.4	kA ² √s	
Value of threshold voltage	V _{F(TO)}	T _J maximum			0.914	V	
Forward slope resistance	r _t				10.5	mΩ	
Maximum forward voltage drop	V _{FM}	T _J = 25 °C, I _{FM} = 30 A _{pk}		t _p = 400 μs	1.33	V	
		T _J = T _J maximum, I _{FM} = 30 A _{pk}			1.23		
RMS isolation voltage base plate	V _{ISOL}	f = 50 Hz, t = 1 s			3000		

RECOVERY CHARACTERISTICS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Reverse recovery time, typical	t_{rr}	$T_J = 25\text{ }^{\circ}\text{C}$, $I_F = 20\text{ A}$, $V_R = 30\text{ V}$, $di_F/dt = 100\text{ A}/\mu\text{s}$	170	ns
		$T_J = 125\text{ }^{\circ}\text{C}$, $I_F = 20\text{ A}$, $V_R = 30\text{ V}$, $di_F/dt = 100\text{ A}/\mu\text{s}$	250	
Reverse recovery current, typical	I_{rr}	$T_J = 25\text{ }^{\circ}\text{C}$, $I_F = 20\text{ A}$, $V_R = 30\text{ V}$, $di_F/dt = 100\text{ A}/\mu\text{s}$	10.5	A
		$T_J = 125\text{ }^{\circ}\text{C}$, $I_F = 20\text{ A}$, $V_R = 30\text{ V}$, $di_F/dt = 100\text{ A}/\mu\text{s}$	16	
Reverse recovery charge, typical	Q_{rr}	$T_J = 25\text{ }^{\circ}\text{C}$, $I_F = 20\text{ A}$, $V_R = 30\text{ V}$, $di_F/dt = 100\text{ A}/\mu\text{s}$	900	nC
		$T_J = 125\text{ }^{\circ}\text{C}$, $I_F = 20\text{ A}$, $V_R = 30\text{ V}$, $di_F/dt = 100\text{ A}/\mu\text{s}$	1970	
Snap factor, typical	S	$T_J = 25\text{ }^{\circ}\text{C}$	0.6	-
Junction capacitance, typical	C_T	$V_R = 600\text{ V}$	67	pF



THERMAL AND MECHANICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Junction and storage temperature range	T_J , T_{Stg}		- 55	-	150	°C
Thermal resistance junction to case	R_{thJC}		-	-	0.30	°C/W
Thermal resistance case to heatsink	R_{thCS}	Flat, greased surface	-	0.05	-	
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			

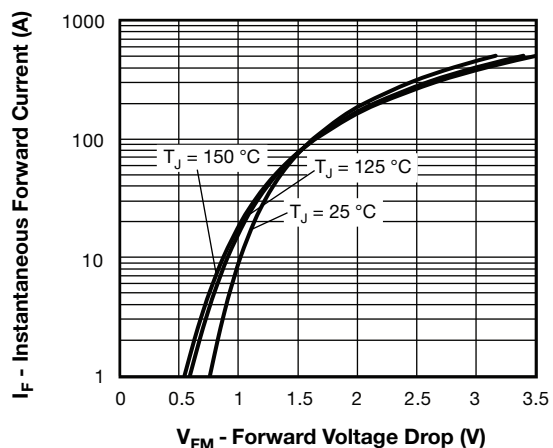


Fig. 1 - Typical Forward Voltage Drop Characteristics

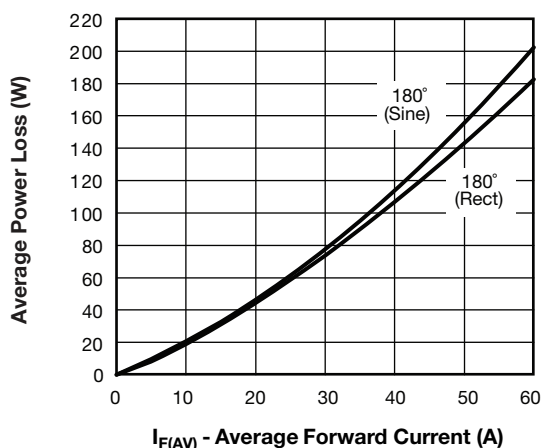


Fig. 4 - Current Rating Characteristics

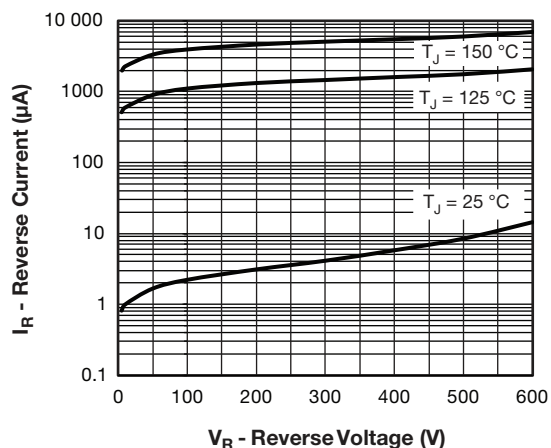


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

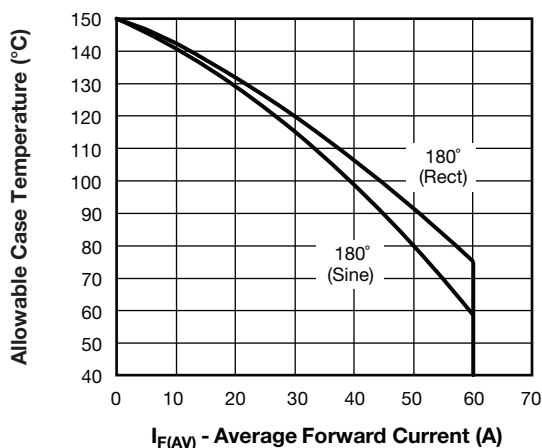


Fig. 5 - Forward Power Loss Characteristics

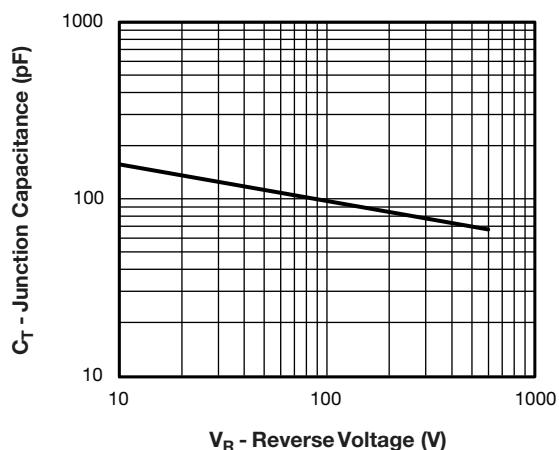


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

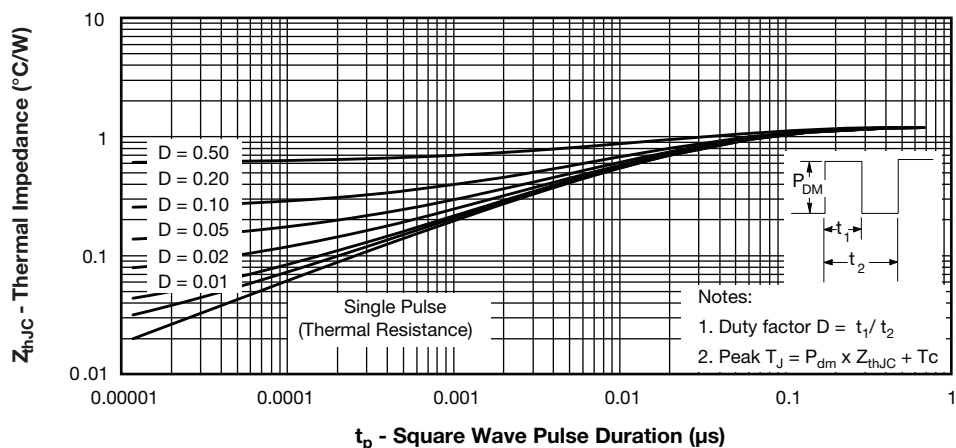
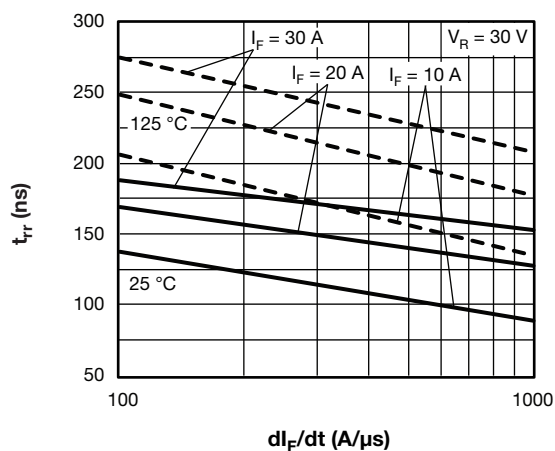
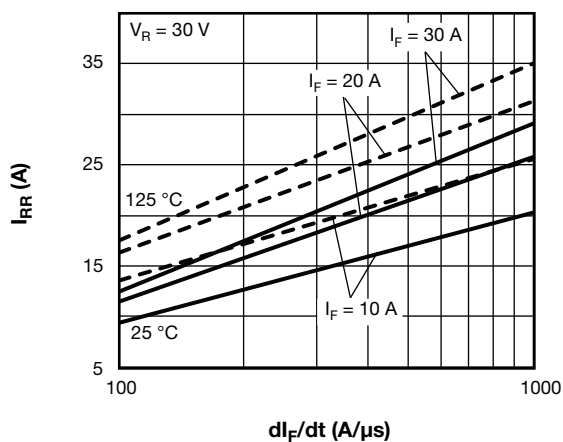
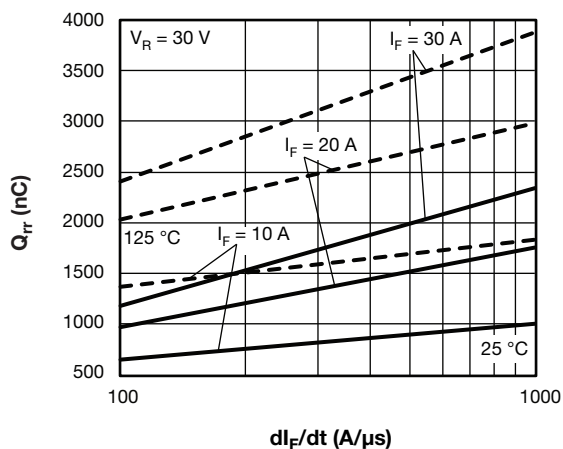


Fig. 6 - Typical Forward Voltage Drop Characteristics


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

Fig. 9 - Typical Reverse Recovery Current vs. dI_F/dt

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

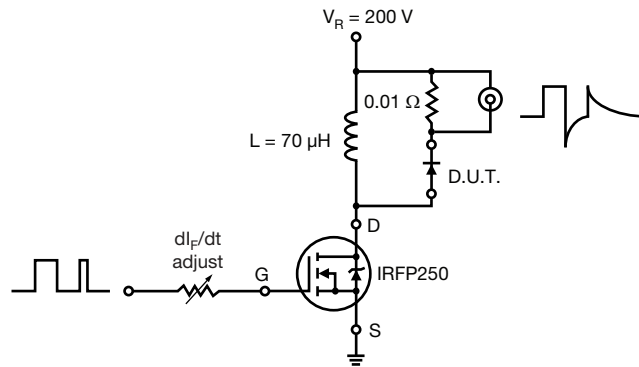


Fig. 10 - Reverse Recovery Parameter Test Circuit

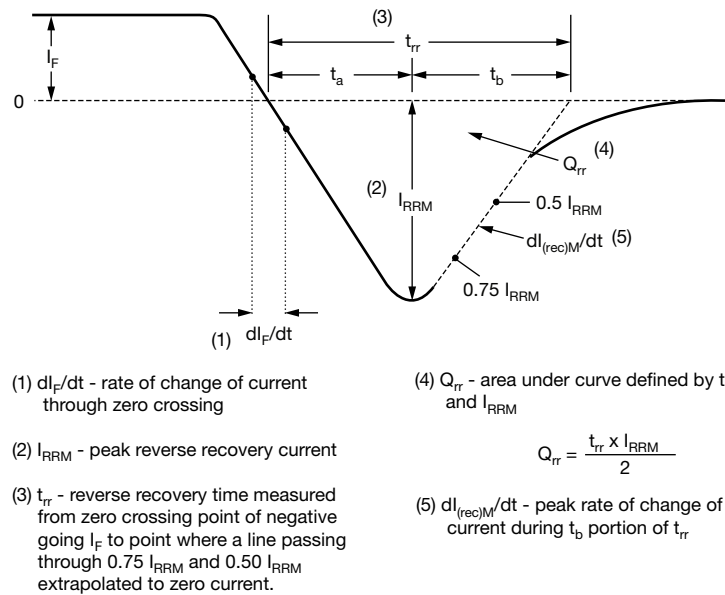
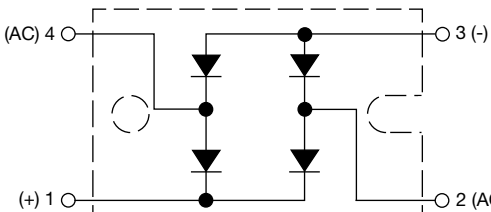
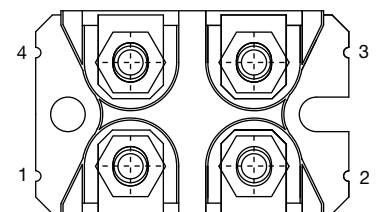


Fig. 11 - Reverse Recovery Waveform and Definitions

ORDERING INFORMATION TABLE

Device code	VS-	S	A	61	B	A	60
	1	2	3	4	5	6	7
1	Vishay Semiconductors product						
2	S = Fast recovery diode						
3	A = Present Silicon Generation						
4	Current rating (61 = 61 A)						
5	Circuit configuration: B = Single phase bridge						
6	Package indicator: A = SOT-227, standard insulated base						
7	Voltage rating (60 = 600 V)						

CIRCUIT CONFIGURATION		
CIRCUIT	CIRCUIT CONFIGURATION CODE	CIRCUIT DRAWING
Single phase bridge	B	 <p>Lead Assignment</p> 

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



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