

Insulated Single Phase Hyperfast Bridge (Power Modules), 60 A

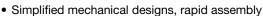


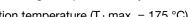
SOT-227

PRIMARY CHARACTERISTICS					
V _{RRM}	650 V				
I _O at T _C = 123 °C	60 A				
t _{rr}	63 ns				
Туре	Modules - Bridge, Hyperfast				
Package	SOT-227				
Circuit configuration	Single phase bridge				

FEATURES

- · Hyperfast and soft recovery characteristic
- · Electrically isolated base plate





- High operation junction temperature (T_J max. = 175 °C)
- 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

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.

MAJOR RATINGS AND CHARACTERISTICS						
SYMBOL	CHARACTERISTICS	VALUES	UNITS			
1		60	Α			
10	T _C	123	°C			
I _{FSM}	50 Hz	360	^			
	60 Hz	377	A			
l ² t	50 Hz	648	A ² s			
I - 1	60 Hz	589	A ^z s			
V_{RRM}		650	V			
TJ		-55 to +175	°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				
UFH60BA65	65	650	700	2				

ELECTRICAL SPECIFICATIONS (T _J = 25 °C unless otherwise specified)							
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS	
Cathode to anode breakdown voltage	V_{BR}	I _R = 250 μA	650	-	-	V	
Forward voltage, per diode	V_{FM}	I _F = 60 A	-	1.7	2.35	v	
Reverse leakage current, per leg	I _{RM}	$V_{R} = 650 \text{ V}$	-	1.0	100	μA	
neverse leakage current, per leg		V _R = 650 V, T _J = 150 °C	-	250	-	μΑ	
RMS isolation voltage base plate	V_{ISOL}	f = 50 Hz, any terminal to case, t = 1 min	2500	-	-	V	



FORWARD CONDUCTION						
PARAMETER	SYMBOL	TEST CONDITIONS			VALUES	UNITS
Maximum DC output current	_	Resistive or inc	ductive load		60	Α
at case temperature	I _O				123	°C
		t = 10 ms	No voltage		360	A
Maximum peak, one-cycle		t = 8.3 ms	reapplied		377	
non-repetitive forward current	I _{FSM}	t = 10 ms	100 % V _{RRM}		303	
		t = 8.3 ms	reapplied	Initial T 05 °C	317	
	l ² t	t = 10 ms	No voltage	Initial T _J = 25 °C	648	A ² s
Maximum I ² t for fusing		t = 8.3 ms	reapplied		589	
waxiinain i-t for fusing		t = 10 ms	100 % V _{RRM}		458	
		t = 8.3 ms	reapplied		417	
Maximum I ² √t for fusing	l²√t	I^2t for time $t_x = I_2\sqrt{t} \times \sqrt{t_x}$; $0.1 \le t_x \le 10$ ms, $V_{RRM} = 0$ V			6.4	kA²√s
Low level of threshold voltage, per leg	V _{F(T0)1}	(40.7.0/		0.88	V	
Low level value of forward slope resistance	r _{f1}	(16.7 % x π x $I_{F(AV)}$) < I < π x $I_{F(AV)}$, $T_J = T_J$ maximum			16.49	mΩ
High level of threshold voltage, per leg	V _{F(T0)2}	4			1.16	V
High level value of forward slope resistance	r _{f2}	$(1 > 1 \times 1 + (\Delta \setminus 1)), 1 = 1 = 1 = 1 = 1 = 1 = 1 = 1 = 1 = 1 $				mΩ
Maximum forward voltage, per diode	V_{FM}	I _F = 60 A 2.35			V	

RECOVERY CHARACTERISTIC	S				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS	
T. dad	+	$T_J = 25$ °C, $I_F = 50$ A, $V_R = 200$ V, $dI_F/dt = 200$ A/ μ s	63	20	I _{FM} t _{rr}
Typical reverse recovery time, per diode	t _{rr}	T_J = 125 °C, I_F = 50 A, V_R = 200 V, dI_F/dt = 200 A/ μ s	134	ns	
Tunical rayona raceyony current per diode	I _{rr}	$T_J = 25$ °C, $I_F = 50$ A, $V_R = 200$ V, $dI_F/dt = 200$ A/ μ s	4.1	А	
Typical reverse recovery current, per diode		$T_J = 125$ °C, $I_F = 50$ A, $V_R = 200$ V, $dI_F/dt = 200$ A/ μ s	11.4		
Tunical variance vacaviant above a pay diada	Q _{rr}	$T_J = 25$ °C, $I_F = 50$ A, $V_R = 200$ V, $dI_F/dt = 200$ A/ μ s	130	0	$\frac{\mathrm{dI}_{\mathrm{R}}}{\mathrm{dt}} / \mathbf{Q}_{\mathrm{rr}}$
Typical reverse recovery charge, per diode		$T_J = 125 ^{\circ}\text{C}, I_F = 50 \text{A}, V_R = 200 \text{V}, \\ dI_F/dt = 200 \text{A/}\mu\text{s}$	765	nC	
Typical junction capacitance	C _T	V _R = 650 V	77	pF	

THERMAL AND MECHANICAL SPECIFICATIONS							
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS	
Junction and storage temperature range	T _J , T _{Stg}		-55	-	175	°C	
Thermal resistance junction to case, per diode	R _{thJC}		-	-	0.91	°C/W	
Thermal resistance case to heatsink	R _{thCS}	Flat, greased surface	-	0.1	-		
Weight			-	30	-	g	
Mounting torque		Torque to terminal	-	-	1.1 (9.7)	Nm (lbf.in)	
Mounting torque		Torque to heatsink	-	-	1.3 (11.5)	Nm (lbf.in)	
Case style			SOT-227				

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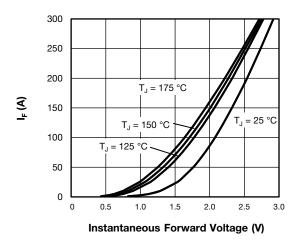


Fig. 1 - Typical Forward Voltage Characteristics

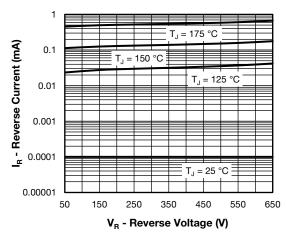


Fig. 2 - Typical Reverse Current vs. Reverse Voltage (Per Diode)

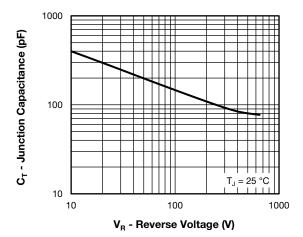


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Diode)

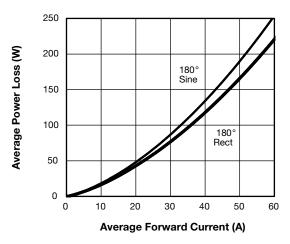


Fig. 4 - Forward Power Loss Characteristics

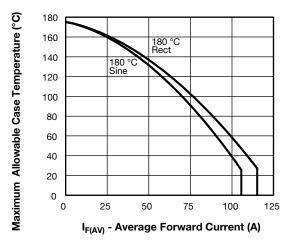


Fig. 5 - Current Rating Characteristics (A)

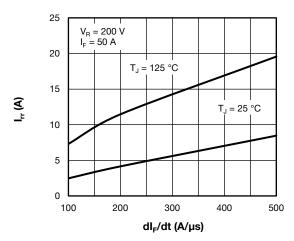
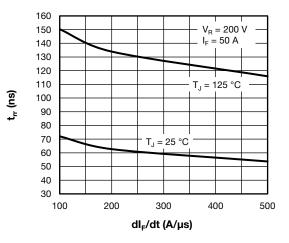


Fig. 6 - Typical Reverse Recovery Current vs. dI_F/dt



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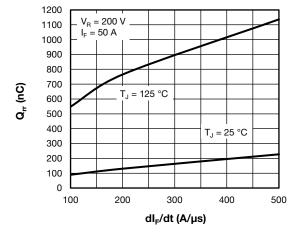


Fig. 7 - Typical Reverse Recovery Time vs. dl_F/dt

Fig. 8 - Reverse Recovery Charge vs. dl_F/dt

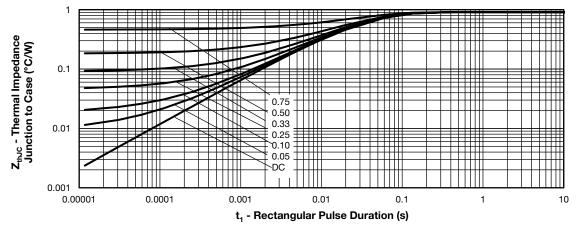
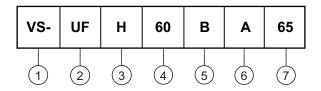


Fig. 9 - Maximum Thermal Impedance Junction-to-Case Characteristics (Per Diode)

ORDERING INFORMATION TABLE

Device code



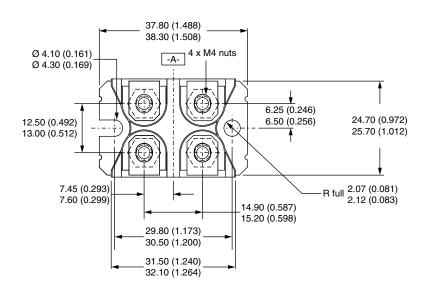
- 1 Vishay Semiconductors product
- 2 Ultra fast rectifier
- 3 Hyper fast FRED Pt® diffused
- Current rating (60 = 60 A)
- 5 Circuit configuration:
 - B = Single phase bridge
- 6 Package indicator:
 - A = SOT-227, standard insulated base
- 7 Voltage rating (65 = 650 V)

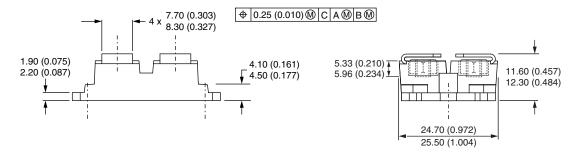
CIRCUIT CONF	CIRCUIT CONFIGURATION							
CIRCUIT	CIRCUIT CONFIGURATION CODE	CIRCUIT DRAWING						
Single phase bridge	В	Lead Assignment (AC) 4 0 4 0 4 0 4 0 4 0 4 0 4 0 4 0 4 0 4						

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

SOT-227 Generation 2

DIMENSIONS in millimeters (inches)





Note

· Controlling dimension: millimeter



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