



Solid State Devices, Inc.

14701 Firestone Blvd * La Mirada, Ca 90638
 Phone: (562) 404-4474 * Fax: (562) 404-1773
 ssdi@ssdi-power.com * www.ssdi-power.com

Designer's Data Sheet

Part Number/Ordering Information^{1/}

SHF23

L Screening^{2/}

— = Not Screened

TX = TX Level

TXV = TXV Level

S = S Level

Package Type

— = Axial Leaded

SMS = Surface Mount Square Tab

GW = Gullwing

Voltage/Family

40 = 400V

50 = 500V

60 = 600V

SHF2340 thru SHF2360

3 AMP HYPERFAST RECOVERY RECTIFIER

400 — 600 VOLTS, 18 ns

FEATURES:

- Hyper fast reverse recovery: 18 ns maximum^{4/}
- Low switching losses
- Hermetically sealed
- Void free ceramic frit glass construction
- High temperature category I eutectic metallurgical bond
- Solid silver leads
- Available in axial leaded, surface mount square tab, and gullwing versions
- TX, TXV, and S-level screening available^{2/}

TYPICAL APPLICATIONS:

- Power Factor Correction
- High Frequency Rectification

MAXIMUM RATINGS^{3/}

RATING	SYMBOL	VALUE	UNIT
Peak Repetitive Reverse Voltage and DC Blocking Voltage	V_{RRM}	400	Volts
	V_{RWM}	500	
	V_R	600	
Average Rectified Forward Current (Axial $T_L \leq 50^\circ\text{C}$; SMS $T_{EC} \leq 120^\circ\text{C}$; GW $T_{EGW} \leq 100^\circ\text{C}$) ^{5/}	I_O	3	Amps
Peak Surge Current (8.3 ms pulse, half sine wave, superimposed on I_O , V_{RWM} = rated, allow junction to reach equilibrium between pulses, $T_A = 25^\circ\text{C}$)	I_{FSM}	35	Amps
Operating & Storage Temperature	T_J and T_{STG}	-65 to +175	$^\circ\text{C}$
Thermal Resistance	Axial Leaded, L = .375" $R_{\theta JL}$	32	$^\circ\text{C/W}$
	Surface Mount Square Tab (SMS) $R_{\theta JE}$	8.5	
	Gullwing (GW) $R_{\theta JGW}$	17	

NOTES:

1/ For ordering information, price, operating curves, and availability—contact factory.

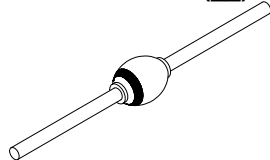
2/ Screening based on MIL-PRF-19500. Screening flows available on request.

3/ Unless otherwise specified, all electrical characteristics @ 25°C .

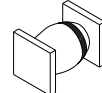
4/ $I_F = 0.5\text{A}$, $I_R = 1\text{A}$, $I_{RR} = 0.25\text{A}$, $T_A = 25^\circ\text{C}$

5/ Operating at higher I_O currents may be achieved based on specific application and device mounting if T_J is maintained below 175°C .

Axial Leaded (L)



Surface Mount
Square Tab (SMS)



Gullwing
(GW)



NOTE: All specifications are subject to change without notification.
 SCD's for these devices should be reviewed by SSDI prior to release.

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ELECTRICAL CHARACTERISTICS ^{3/}		SYMBOL	MIN	TYP	MAX	UNIT
Instantaneous Forward Voltage Drop 300 μ s pulse	$I_F = 1$ Adc	V_{F1}	--	2.4	3.0	Vdc
	$I_F = 3$ Adc	V_{F2}	--	2.6	3.2	
	$I_F = 1$ Adc, $T_A = +125^\circ\text{C}$	V_{F3}	--	1.3	2.0	
	$I_F = 3$ Adc, $T_A = +125^\circ\text{C}$	V_{F4}	--	1.7	2.3	
Reverse Leakage Current At rated V_R , 300 μ s pulse	$T_A = +25^\circ\text{C}$	I_{R1}	--	35	200	μ A
	$T_A = +125^\circ\text{C}$	I_{R2}	--	17	70	mA
Breakdown Voltage $I_R = 100$ μ A	SHF2340	BV_R	410	--	--	V
	SHF2350		510	--	--	
	SHF2360		610	--	--	
Junction Capacitance $V_R = 10$ Vdc, $f = 1$ MHz		C_J	--	20	50	pF
Reverse Recovery Time $I_F = 0.5$ A, $I_R = 1$ A, $I_{RR} = 0.25$ A		t_{rr}	--	11 20	18 --	ns
			$T_A = +25^\circ\text{C}$ $T_A = +100^\circ\text{C}$			

Axial Leaded () Dimensions (in.)			Surface Mount Square Tab (SMS)			Gullwing (GW)		
DIM	MIN	MAX	DIM	MIN	MAX	DIM	MIN	MAX
A	--	.130	A	.127	.140	A	--	.140
B	.130	.180	B	.180	.230	B	.130	.180
C	.027	.031	C	.020	.030	C	.040	.080
D	1.00	--	D	.003	--	D	.100	--
						E	.002	--
						F	.008	.016

Fig. 1 Typical Forward Voltage
 I_F vs V_F vs T_C

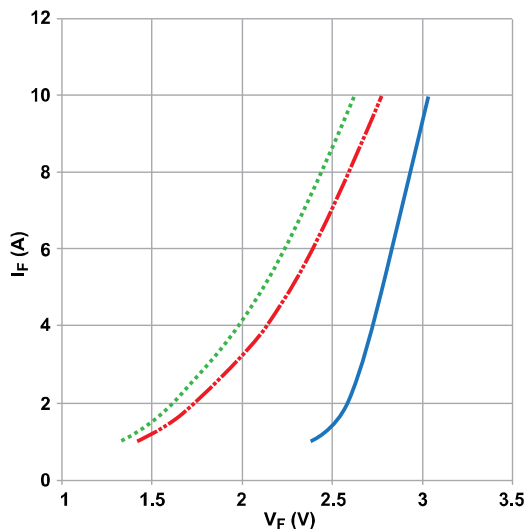
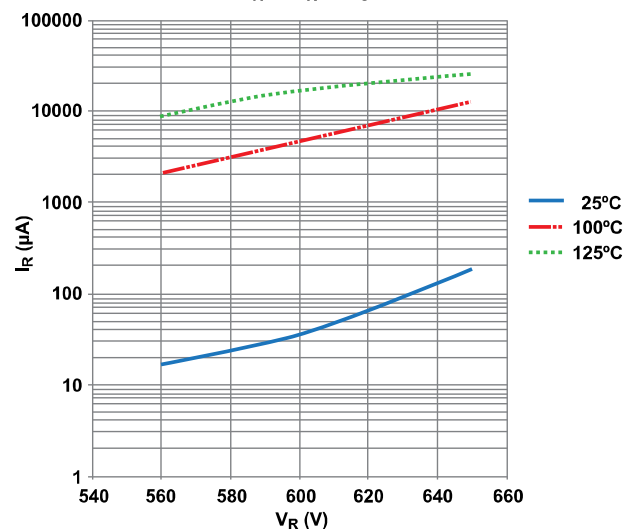


Fig. 2 Typical Leakage Current
 I_R vs V_R vs T_C



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Fig. 3 Typical t_{RR} response at 25°C (0.5A/1A/0.25A)

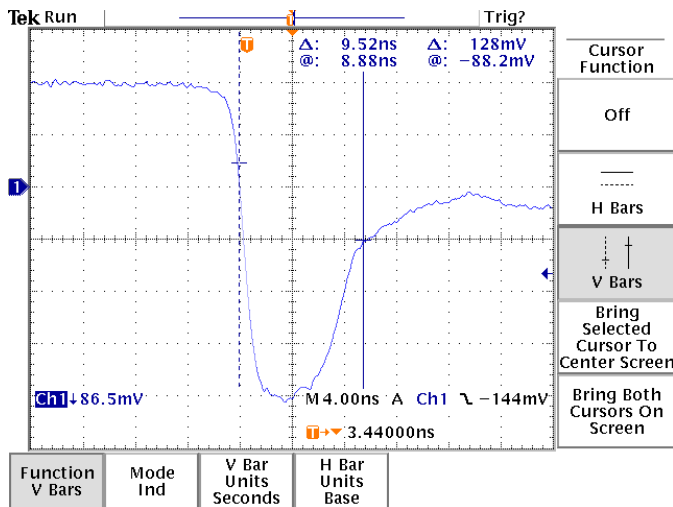


Fig. 4 Typical t_{RR} response at 95°C (0.5A/1A/0.25A)

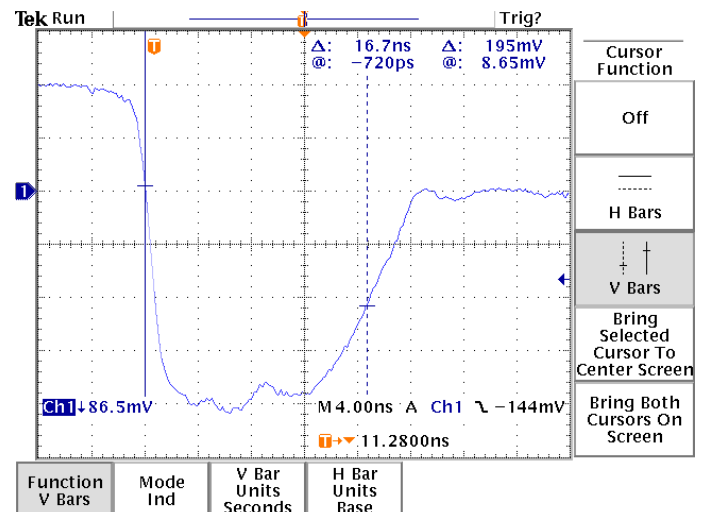
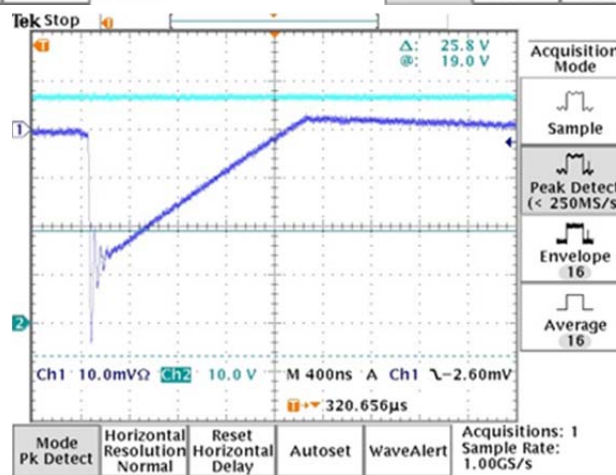
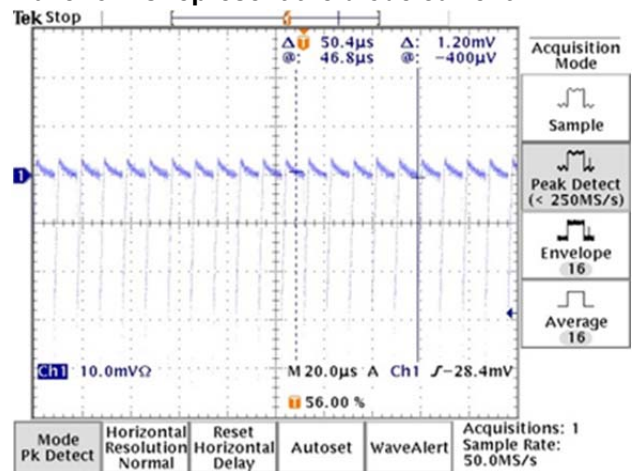
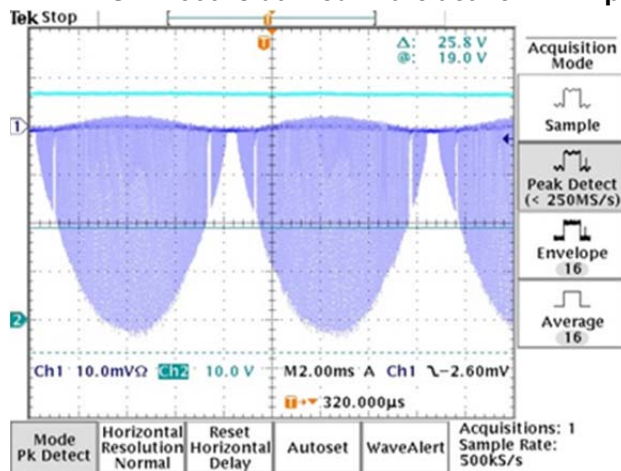


Fig. 5 Actual In-circuit Performance in a 48V/7.5A Switch-Mode Power Supply ($I_{LOAD}=1A$). SHF2360 is utilized in the active PFC input stage. Wave forms represent the diode current.



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