NEW PRODUCT

US1KSAFS

1.0A SURFACE MOUNT ULTRA-FAST RECTIFIER

Product Summary (@ T_A = +25°C)

V_{RRM} (V)	I_O (A)	$V_{F(MAX)}$ (V)	$I_{R(MAX)}$ (µA)
800	1	1.85	5

Features and Benefits

- Glass Passivated Die Construction
- Ideally Suited for Use in Very High Frequency Switching
- Ultra-Fast Recovery Time for High Efficiency
- Soft Recovery Characteristics
- Surge Overload Rating to 30A Peak
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Description and Applications

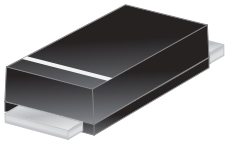
The US1KSAFS is a rectifier packaged in the SMA-FS package. Providing ultra-fast recovery time for high efficiency, this device is ideal for use in applications such as:

- Power Supply
- Smartphone Chargers
- Inverters
- Free Wheeling Diodes

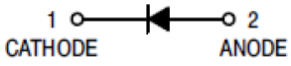
Mechanical Data

- Case: SMA-FS
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 e3
- Polarity: Cathode Band
- Weight: 0.033 grams (Approximate)

SMA-FS



Top View



Schematic View

Ordering Information (Note 4)

Part Number	Qualification	Case	Packaging
US1KSAFS-13	Commercial	SMA-FS	10,000/Tape & Reel

Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
2. See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information

U1KS = Product Type Marking Code
= Manufacturers' Code Marking
YWW = Date Code Marking
Y = Last Digit of Year (ex: 6 for 2016)
WW = Week Code (01 to 53)

NEW PRODUCT

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Single phase, half wave, 60Hz, resistive or inductive load.
For capacitive load, derate current by 20%.

Characteristic	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage (Note 5)	V_{RRM} V_{RWM} V_R	800	V
RMS Reverse Voltage	$V_{R(RMS)}$	560	V
Average Rectified Output Current @T_A = +40°C	I_O	1.0	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	I_{FSM}	30	A
Maximum Full Load Reverse Current, Full Cycle Average, 0.375”(9.5mm) Length at T_A = +55°C	$I_{R(AV)}$	100	μA

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Typical Thermal Resistance, Junction to Case (Note 8)	$R_{\theta JC}$	25	°C/W
Typical Thermal Resistance, Junction to Ambient (Note 8)	$R_{\theta JA}$	150	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Reverse Breakdown Voltage (Note 5)	@I_R = 5μA	$V_{(BR)R}$	800	V
Maximum Forward Voltage Drop	@I_F = 1.0A	V_F	1.85	V
Peak Reverse Current at Rated DC Blocking Voltage (Note 5)	@T_A = +25°C @T_A = +100°C	I_R	5.0 50	μA
Maximum Reverse Recovery Time (Note 6)		t_{RR}	75	ns
Typical Total Capacitance (Note 7)		C_T	5	pF

Notes:
5. Short duration pulse test used to minimize self-heating effect.
6. Measured with I_F = 0.5A, I_R = 1.0A, I_{RR} = 0.25A. See figure 7.
7. Measured at 1.0MHz and applied reverse voltage of 4.0V DC.
8. Device mounted on FR-4 substrate, 1"x1", 2oz, single-sided, PC boards with 0.1"x0.15" copper pad.
9. Device mounted on FR-4 substrate, 0.4"x0.5", 2oz, single-sided, PC boards with 0.2"x0.25" copper pad.

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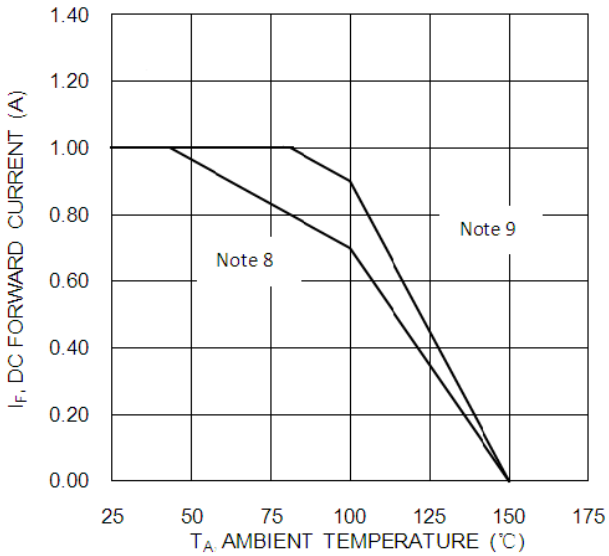

Figure 1. DC Forward Current Derating

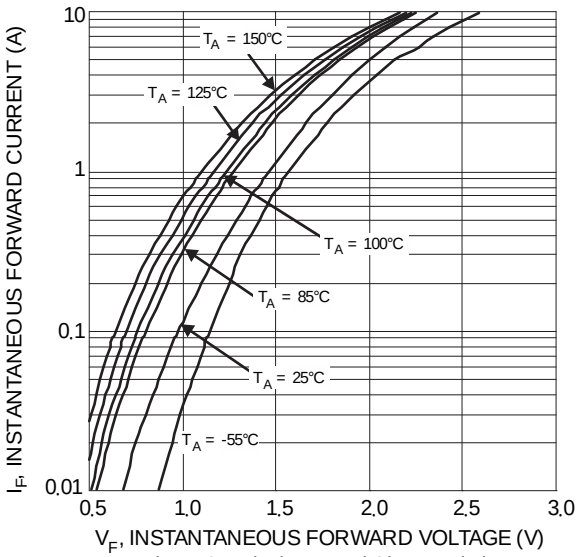

Figure 2 Typical Forward Characteristics

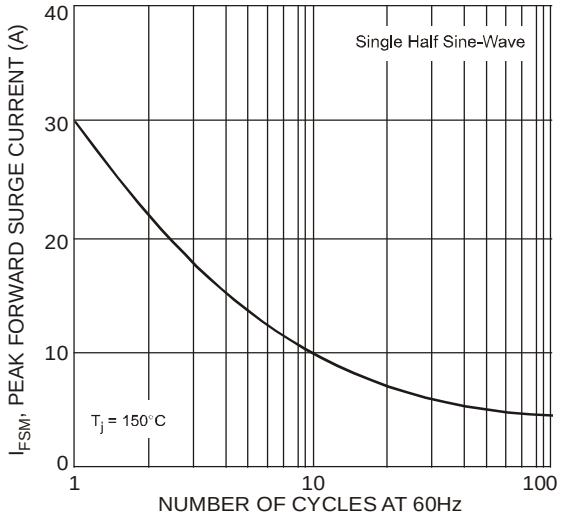

Figure 3. Forward Surge Current Derating Curve

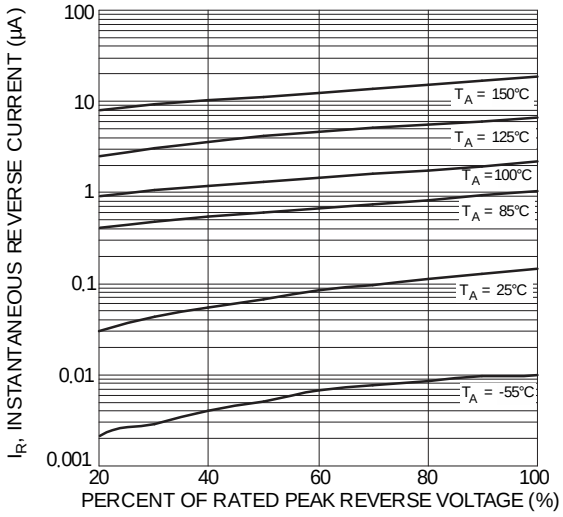

Figure 4 Typical Reverse Characteristics

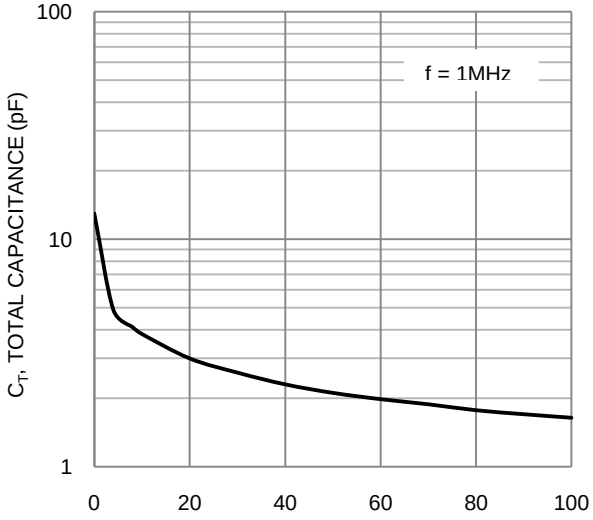

Figure 5. Total Capacitance

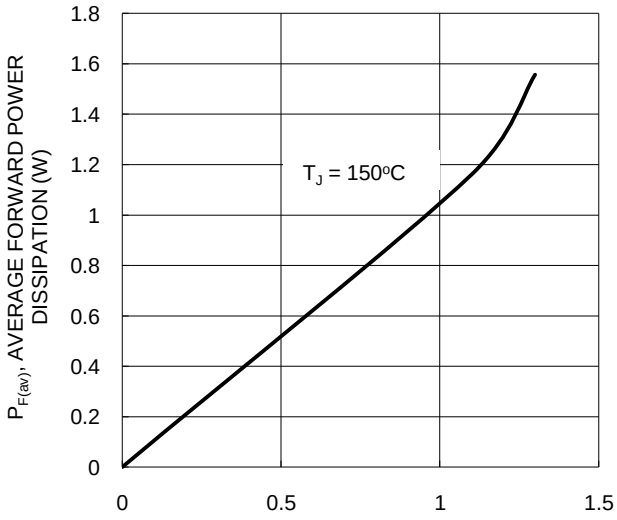

Figure 6. Forward Power Dissipation

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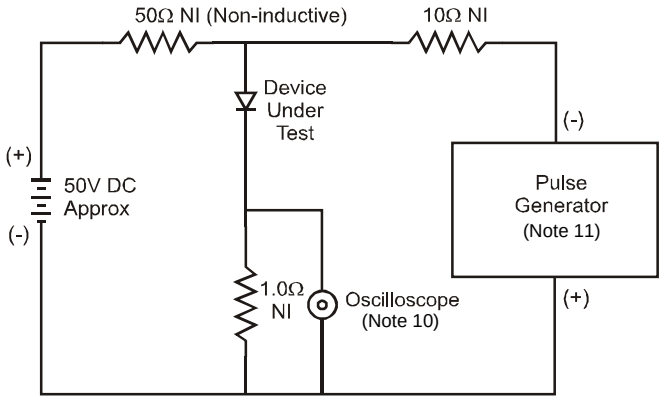


Notes:
10. Rise Time = 7.0ns max. Input Impedance = 1.0MΩ, 22pF.
11. Rise Time = 10ns max. Input Impedance = 50Ω.

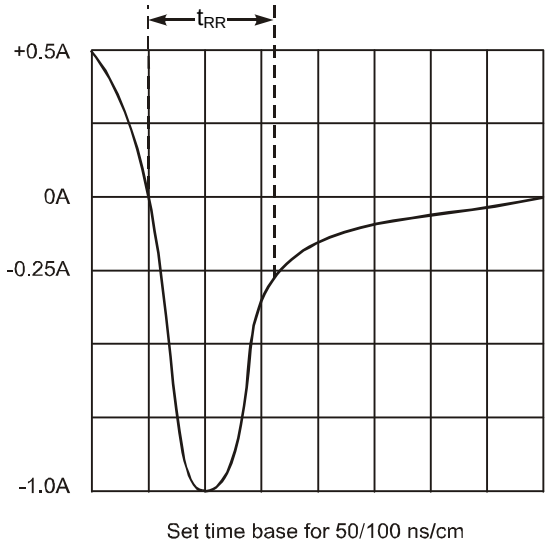
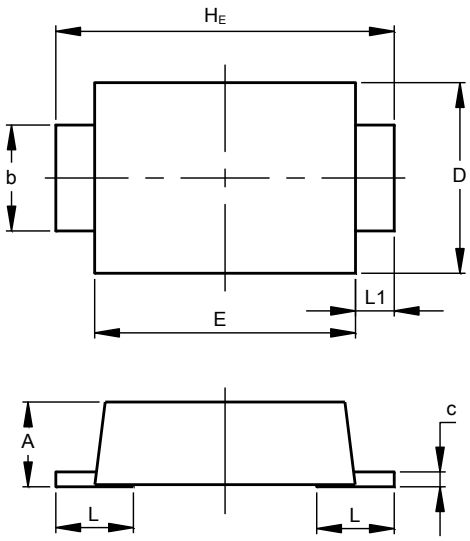


Figure 7. Reverse Recovery Time Characteristic and Test Circuit

Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

SMA-FS



SMA-FS		
Dim	**Min**	**Max**
A	0.90	1.20
b	1.30	1.50
c	0.11	0.21
D	2.30	2.70
E	3.30	3.70
H_E	4.40	4.80
L	0.70	1.10
L1	0.45	0.65
All Dimensions in mm		

Suggested Pad Layout

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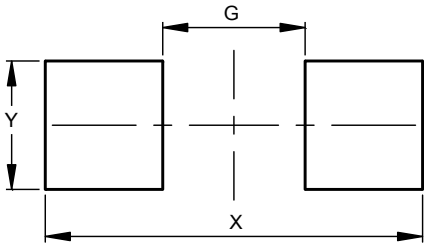
SMA-FS



Dimensions	Value (in mm)
G	2.10
X	5.30
Y	1.77

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