

**Product Summary** (@ T<sub>A</sub> = +25°C)

V <sub>RRM</sub> (V)	I <sub>O</sub> (A)	V <sub>F(MAX)</sub> (V)	I <sub>R(MAX)</sub> (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**

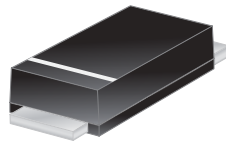
The US1KSAFS is a rectifier packaged in the SMA-FS package. Providing ultra-fast recovery time for high efficiency, this device is ideal for use in applications such as:

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

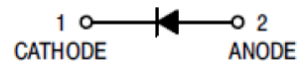
**Mechanical Data**

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

**Maximum Ratings** (@T<sub>A</sub> = +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	V <sub>RRM</sub>	800	V
Working Peak Reverse Voltage	V <sub>RWM</sub>		
DC Blocking Voltage (Note 5)	V <sub>R</sub>		
RMS Reverse Voltage	V <sub>R(RMS)</sub>	560	V
Average Rectified Output Current @T <sub>A</sub> = +40°C	I <sub>O</sub>	1.0	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	I <sub>FSM</sub>	30	A
Maximum Full Load Reverse Current, Full Cycle Average, 0.375"(9.5mm) Length at T <sub>A</sub> = +55°C	I <sub>R(AV)</sub>	100	μA

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Typical Thermal Resistance, Junction to Case (Note 8)	R <sub>θJC</sub>	25	°C/W
Typical Thermal Resistance, Junction to Ambient (Note 8)	R <sub>θJA</sub>	150	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Reverse Breakdown Voltage (Note 5) @I <sub>R</sub> = 5μA	V <sub>(BR)R</sub>	800	V
Maximum Forward Voltage Drop @I <sub>F</sub> = 1.0A	V <sub>F</sub>	1.85	V
Peak Reverse Current @T <sub>A</sub> = +25°C	I <sub>R</sub>	5.0	μA
at Rated DC Blocking Voltage (Note 5) @T <sub>A</sub> = +100°C		50	
Maximum Reverse Recovery Time (Note 6)	t <sub>RR</sub>	75	ns
Typical Total Capacitance (Note 7)	C <sub>T</sub>	5	pF

- Notes:
5. Short duration pulse test used to minimize self-heating effect.
  6. Measured with I<sub>F</sub> = 0.5A, I<sub>R</sub> = 1.0A, I<sub>RR</sub> = 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.

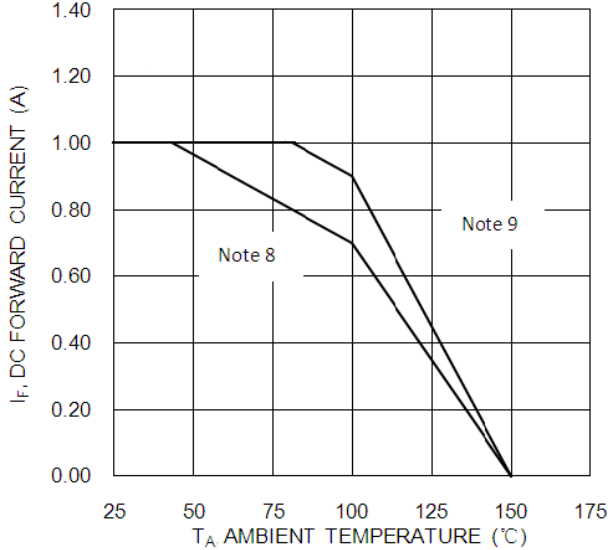


Figure 1. DC Forward Current Derating

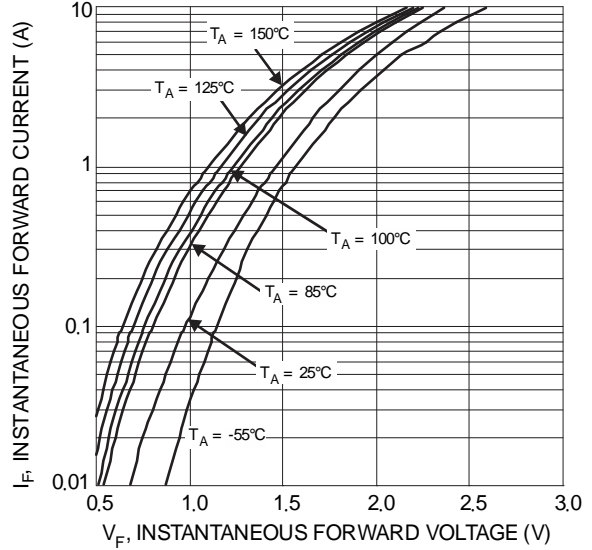


Figure 2 Typical Forward Characteristics

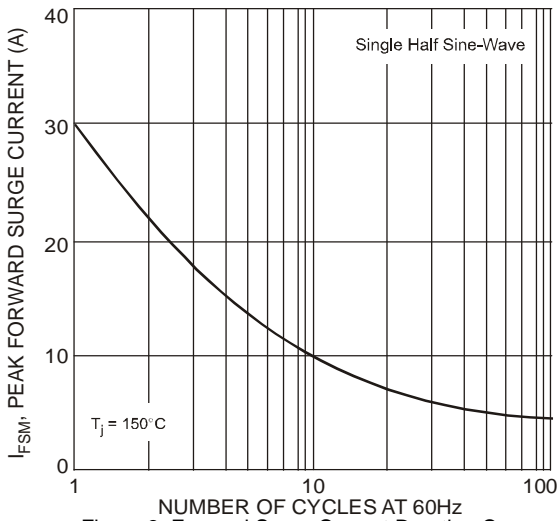


Figure 3. Forward Surge Current Derating Curve

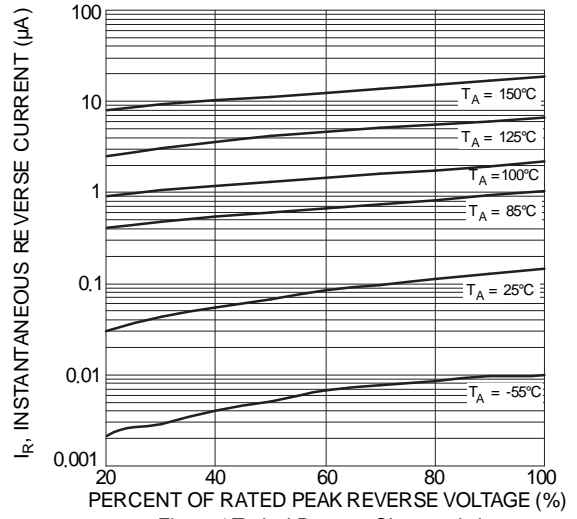


Figure 4 Typical Reverse Characteristics

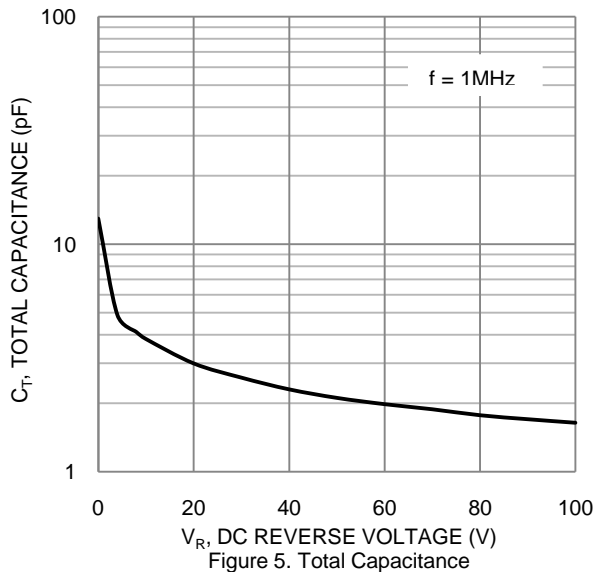


Figure 5. Total Capacitance

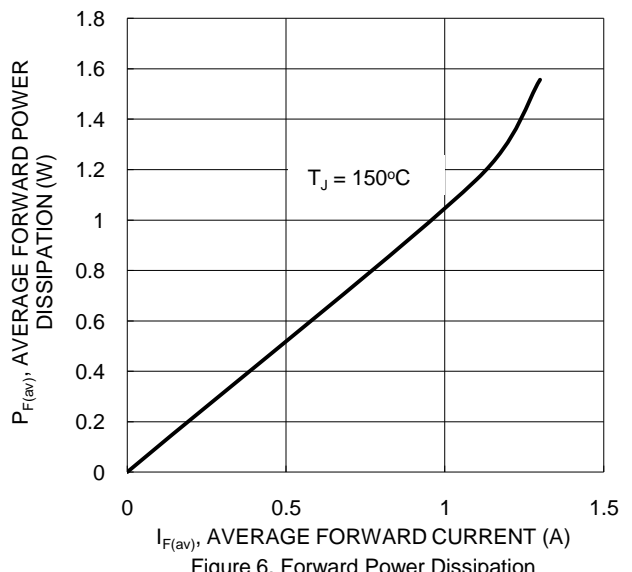
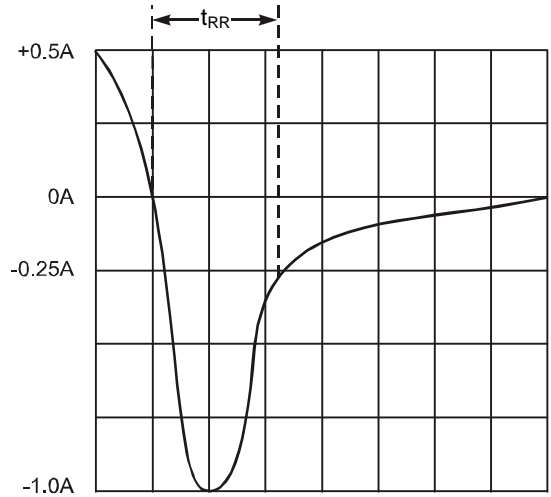
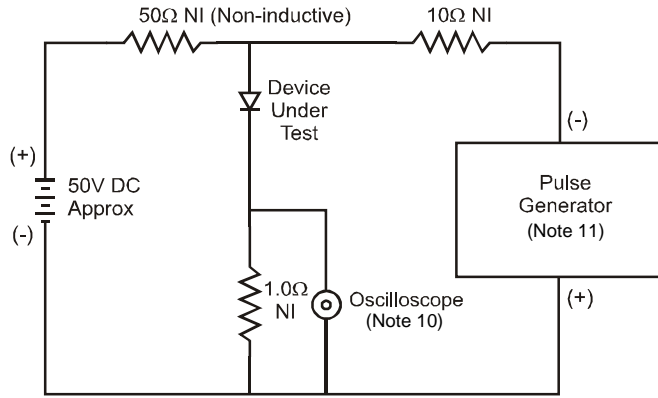


Figure 6. Forward Power Dissipation



Set time base for 50/100 ns/cm

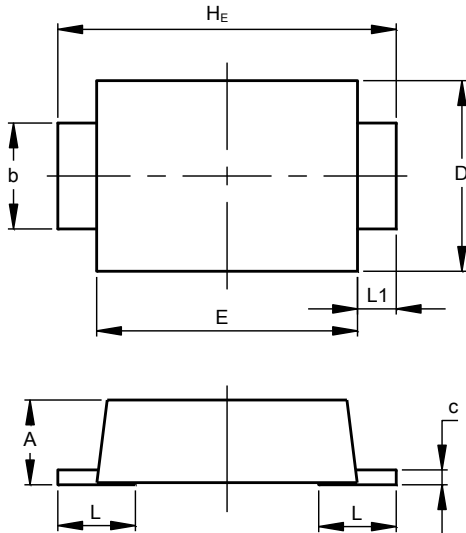
Notes:  
10. Rise Time = 7.0ns max. Input Impedance = 1.0MΩ, 22pF.  
11. Rise Time = 10ns max. Input Impedance = 50Ω.

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

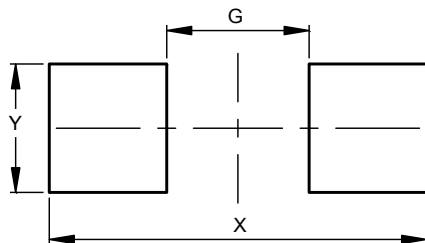


SMA-FS		
Dim	Min	Max
A	0.90	1.20
b	1.30	1.50
c	0.11	0.21
D	2.30	2.70
E	3.30	3.70
HE	4.40	4.80
L	0.70	1.10
L1	0.45	0.65
All Dimensions in mm		

## Suggested Pad Layout

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

### SMA-FS



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

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