



# US1A - US1M

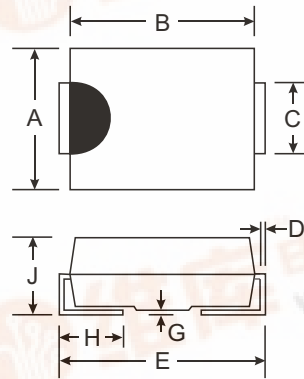
## 1.0A SURFACE MOUNT ULTRA-FAST RECTIFIER

### Features

Glass Passivated Die Construction  
Ultra-Fast Recovery Time for High Efficiency  
Surge Overload Rating to 30A Peak  
High Current Capability  
Ideally Suited for Automated Assembly  
**Lead Free Finish/RoHS Compliant (Note 4)**

### Mechanical Data

Case: SMA  
Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0  
Moisture Sensitivity: Level 1 per J-STD-020C  
Terminals: Lead Free Plating (Matte Tin Finish). Solderable per MIL-STD-202, Method 208 **③**  
Polarity: Cathode Band or Cathode Notch  
Marking: Type Number & Date Code: See Page 3  
Ordering Information: See Page 3  
Weight: 0.064 grams (approximate)



SMA		
Dim	Min	Max
A	2.29	2.92
B	4.00	4.60
C	1.27	1.63
D	0.15	0.31
E	4.80	5.59
G	0.10	0.20
H	0.76	1.52
J	2.01	2.62
All Dimensions in mm		

### Maximum Ratings and Electrical Characteristics $T_A = 25^\circ\text{C}$ unless otherwise specified

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

Characteristic	Symbol	US1A	US1B	US1D	US1G	US1J	US1K	US1M	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage (Note 5)	$V_{RRM}$ $V_{RWM}$ $V_R$	50	100	200	400	600	800	1000	V
RMS Reverse Voltage	$V_{R(RMS)}$	35	70	140	280	420	560	700	V
Average Rectified Output Current @ $T_T = 75\text{ C}$	$I_O$	1.0							A
Non-Repetitive Peak Forward Surge Current 8.3ms Single half sine-wave Superimposed on Rated Load	$I_{FSM}$	30							A
Forward Voltage Drop @ $I_F = 1.0A$	$V_{FM}$	1.0			1.3	1.7			V
Peak Reverse Current @ $T_A = 25\text{ C}$ at Rated DC Blocking Voltage (Note 5) @ $T_A = 100\text{ C}$	$I_{RM}$	5.0 100							A
Reverse Recovery Time (Note 2)	$t_{rr}$	50				75			ns
Typical Total Capacitance (Note 1)	$C_T$	20				10			pF
Typical Thermal Resistance, Junction to Terminal	$R_{JT}$	30							C/W
Operating and Storage Temperature Range	$T_j, T_{STG}$	-65 to +150							C

- Notes:
1. Measured with  $I_F = 0.5\text{A}$ ,  $I_R = 1.0\text{A}$ ,  $I_{rr} = 0.25\text{A}$ . See figure 5.
  2. Measured at 1.0MHz and applied reverse voltage of 4.0V DC.
  3. Unit mounted on PC board with  $5.0\text{ mm}^2$  (0.013 mm thick) copper pad as heat sink.
  4. RoHS revision 13.2.2003. Glass and high temperature solder exemptions applied, see *EU Directive Annex Notes 5 and 7*.
  5. Short duration pulse test used to minimize self-heating effect.

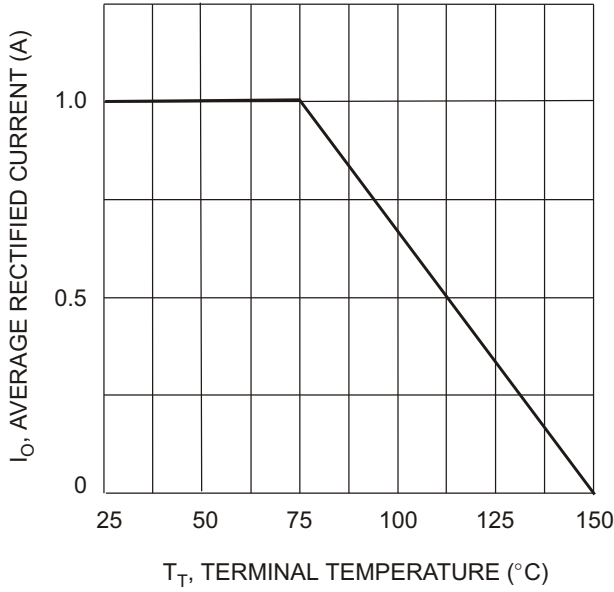


Fig. 1 Forward Current Derating Curve

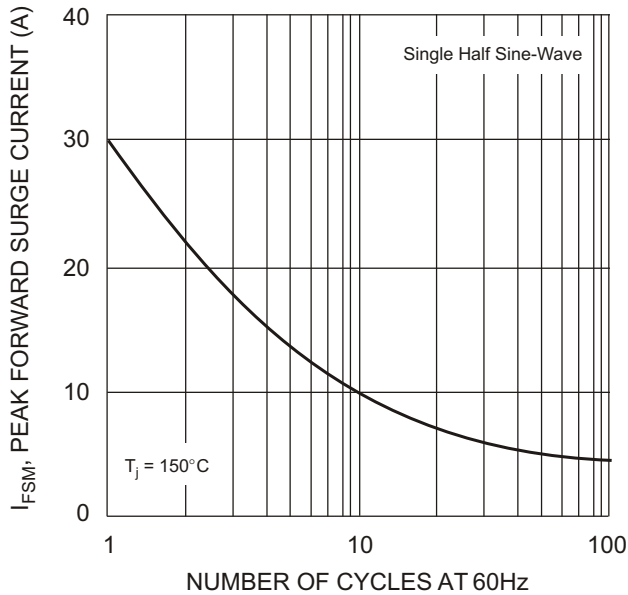
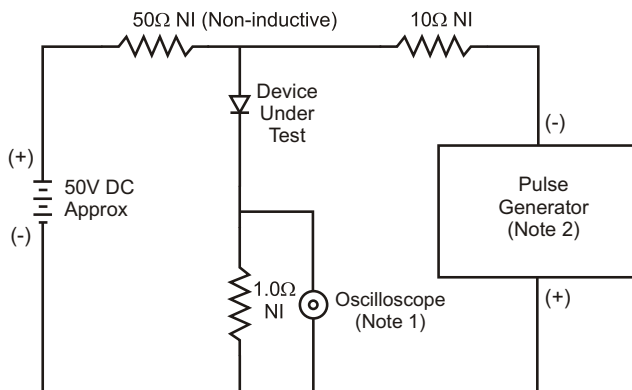


Fig. 3 Forward Surge Current Derating Curve



Notes:

1. Rise Time = 7.0ns max. Input Impedance = 1.0M $\Omega$ , 22pF.
2. Rise Time = 10ns max. Input Impedance = 50 $\Omega$ .

Fig. 5 Reverse Recovery Time Characteristic and Test Circuit

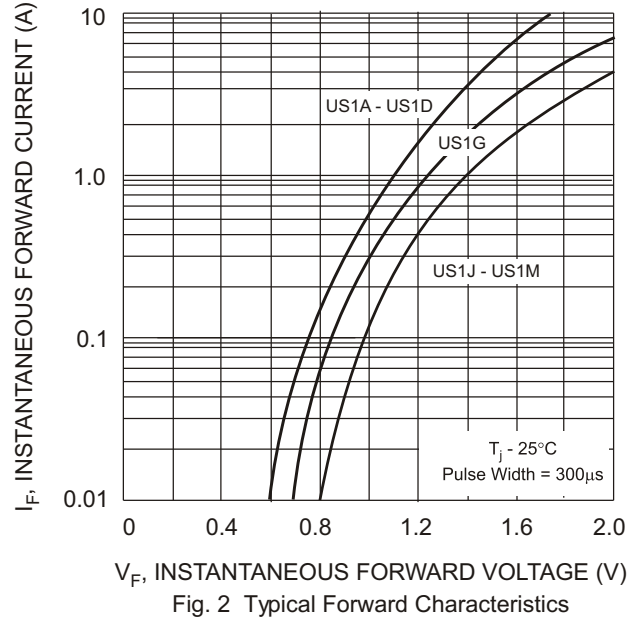


Fig. 2 Typical Forward Characteristics

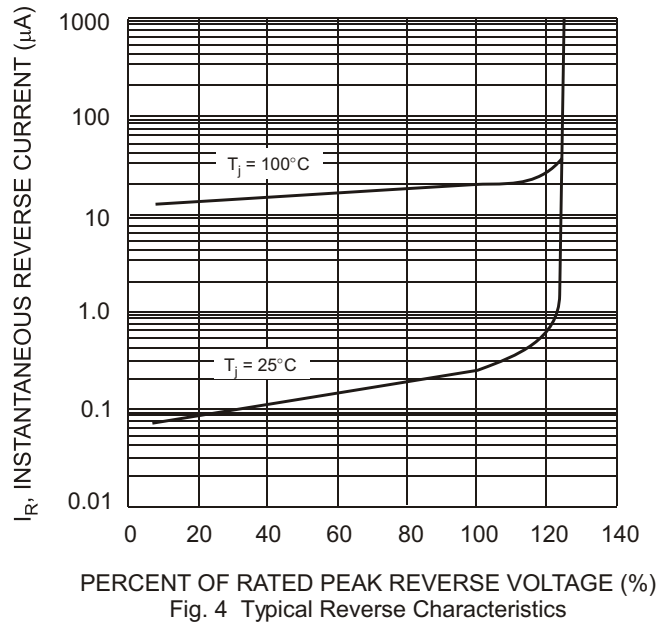
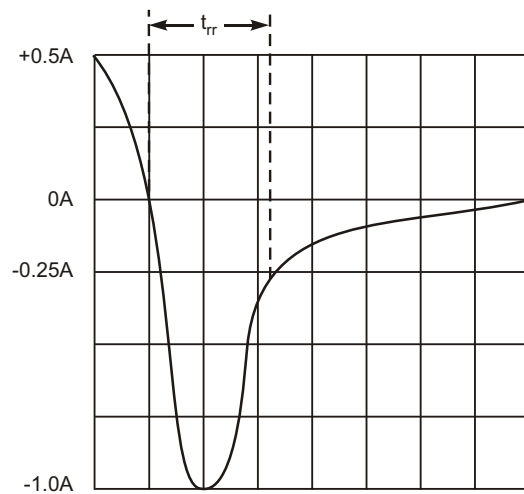


Fig. 4 Typical Reverse Characteristics



Set time base for 50/100 ns/cm

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**Ordering Information** (Note 6)

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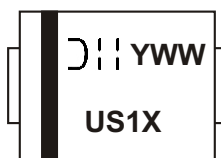
Device*	Packaging	Shipping
US1x-13-F	SMA	5000/Tape & Reel

Notes: 6. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

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**Marking Information**

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US1X = Product type marking code, ex. US1A  
DII = Manufacturers' code marking  
YWW = Date code marking  
Y = Last digit of year ex: 2 for 2002  
WW = Week code 01 to 52

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