

## 1A, 50V - 1000V High Efficient Surface Mount Rectifiers

### FEATURES

- Glass passivated chip junction
- Ideal for automated placement
- Low forward voltage drop
- Ultrafast recovery time for high efficiency
- Built-in strain relief
- Compliant to RoHS Directive 2011/65/EU and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21 definition



**DO-214AC (SMA)**

### MECHANICAL DATA

**Case:** DO-214AC (SMA)

Molding compound, UL flammability classification rating 94V-0

Moisture sensitivity level: level 1, per J-STD-020

Part No. with suffix "H" means AEC-Q101 qualified

Packing code with suffix "G" means green compound (halogen-free)

**Terminal:** Matte tin plated leads, solderable per JESD22-B102

Meet JESD 201 class 2 whisker test

**Polarity:** Indicated by cathode band

**Weight:** 0.06 g (approximately)

| MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS (T <sub>A</sub> =25°C unless otherwise noted)    |                                      |              |          |          |          |          |          |          |      |
|-------------------------------------------------------------------------------------------------|--------------------------------------|--------------|----------|----------|----------|----------|----------|----------|------|
| PARAMETER                                                                                       | SYMBOL                               | US<br>1A     | US<br>1B | US<br>1D | US<br>1G | US<br>1J | US<br>1K | US<br>1M | UNIT |
| Maximum repetitive peak reverse voltage                                                         | V <sub>RRM</sub>                     | 50           | 100      | 200      | 400      | 600      | 800      | 1000     | V    |
| Maximum RMS voltage                                                                             | V <sub>RMS</sub>                     | 35           | 70       | 140      | 280      | 420      | 560      | 700      | V    |
| Maximum DC blocking voltage                                                                     | V <sub>DC</sub>                      | 50           | 100      | 200      | 400      | 600      | 800      | 1000     | V    |
| Maximum average forward rectified current                                                       | I <sub>F(AV)</sub>                   | 1            |          |          |          |          |          |          | A    |
| Peak forward surge current, 8.3 ms single half sine-wave superimposed on rated load             | I <sub>FSM</sub>                     | 30           |          |          |          |          |          |          | A    |
| Maximum instantaneous forward voltage (Note 1)<br>@ 1 A                                         | V <sub>F</sub>                       | 1.0          |          |          |          | 1.7      |          |          | V    |
| Maximum reverse current @ rated V <sub>R</sub><br>T <sub>J</sub> =25°C<br>T <sub>J</sub> =125°C | I <sub>R</sub>                       | 5<br>150     |          |          |          |          |          |          | μA   |
| Maximum reverse recovery time (Note 2)                                                          | t <sub>rr</sub>                      | 50           |          |          |          | 75       |          |          | ns   |
| Typical junction capacitance (Note 3)                                                           | C <sub>J</sub>                       | 15           |          |          |          | 10       |          |          | pF   |
| Typical thermal resistance                                                                      | R <sub>θJL</sub><br>R <sub>θJA</sub> | 27<br>75     |          |          |          |          |          |          | °C/W |
| Operating junction temperature range                                                            | T <sub>J</sub>                       | - 55 to +150 |          |          |          |          |          |          | °C   |
| Storage temperature range                                                                       | T <sub>STG</sub>                     | - 55 to +150 |          |          |          |          |          |          | °C   |

Note 1: Pulse test with  $PW=300\mu\text{s}$ , 1% duty cycle

Note 2: Reverse Recovery Test Conditions:  $I_F=0.5\text{A}$ ,  $I_R=1.0\text{A}$ ,  $I_{RR}=0.25\text{A}$

Note 3: Measured at 1 MHz and Applied Reverse Voltage of 4.0V D.C.

| ORDERING INFORMATION |                 |              |                     |            |                          |
|----------------------|-----------------|--------------|---------------------|------------|--------------------------|
| PART NO.             | PART NO. SUFFIX | PACKING CODE | PACKING CODE SUFFIX | PACKAGE    | PACKING                  |
| US1x<br>(Note 1)     | H               | R3           | G                   | SMA        | 1,800 / 7" Plastic reel  |
|                      |                 | R2           |                     | SMA        | 7,500 / 13" Paper reel   |
|                      |                 | M2           |                     | SMA        | 7,500 / 13" Plastic reel |
|                      |                 | F3           |                     | Folded SMA | 1,800 / 7" Plastic reel  |
|                      |                 | F2           |                     | Folded SMA | 7,500 / 13" Paper reel   |
|                      |                 | F4           |                     | Folded SMA | 7,500 / 13" Plastic reel |
|                      | N/A             | E3           |                     | Clip SMA   | 1,800 / 7" Plastic reel  |
|                      |                 | E2           |                     | Clip SMA   | 7,500 / 13" Plastic reel |

Note 1: "x" defines voltage from 50V (US1A) to 1000V (US1M)

| EXAMPLE       |          |                 |              |                     |                                      |
|---------------|----------|-----------------|--------------|---------------------|--------------------------------------|
| PREFERRED P/N | PART NO. | PART NO. SUFFIX | PACKING CODE | PACKING CODE SUFFIX | DESCRIPTION                          |
| US1MHR3G      | US1M     | H               | R3           | G                   | AEC-Q101 qualified<br>Green compound |

## RATINGS AND CHARACTERISTICS CURVES

(T<sub>A</sub>=25°C unless otherwise noted)

FIG.1 MAXIMUM FORWARD CURRENT DERATING CURVE

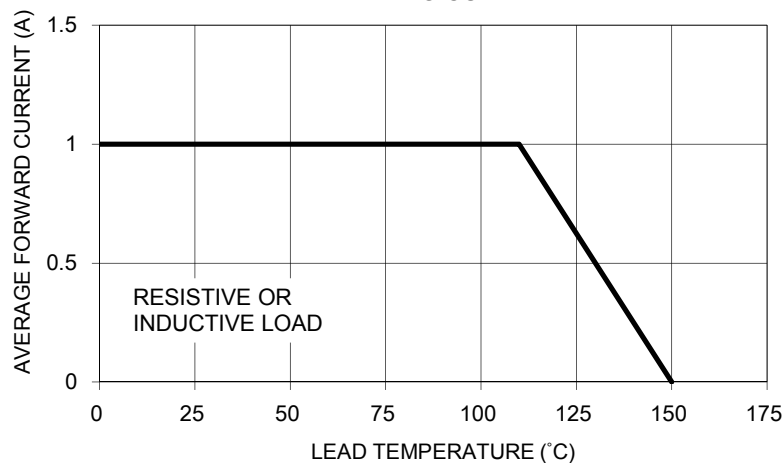


FIG. 2 MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT

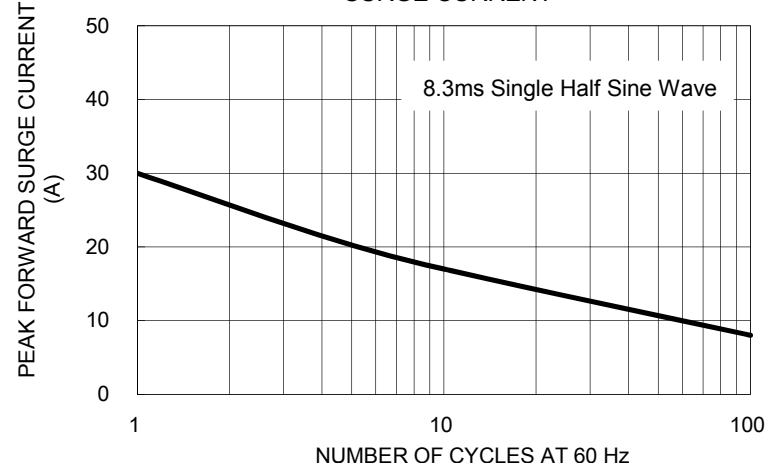


FIG. 3 TYPICAL FORWARD CHARACTERISTICS

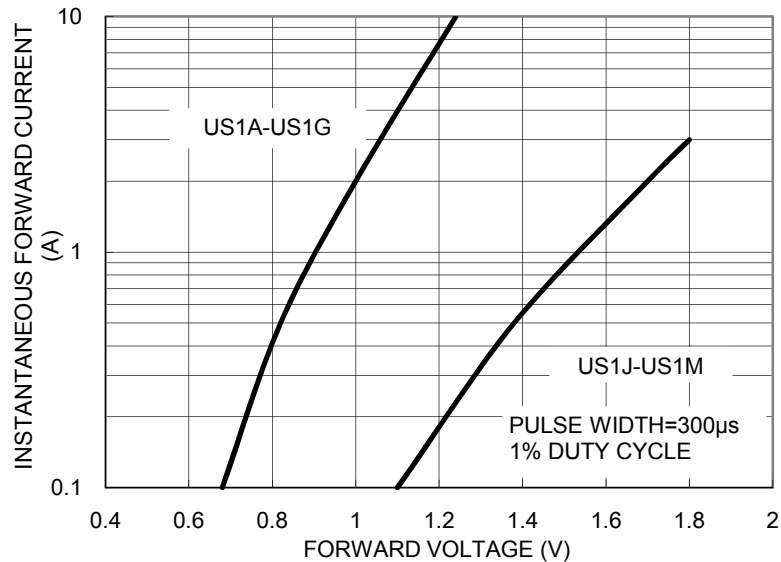


FIG. 4 TYPICAL REVERSE CHARACTERISTICS

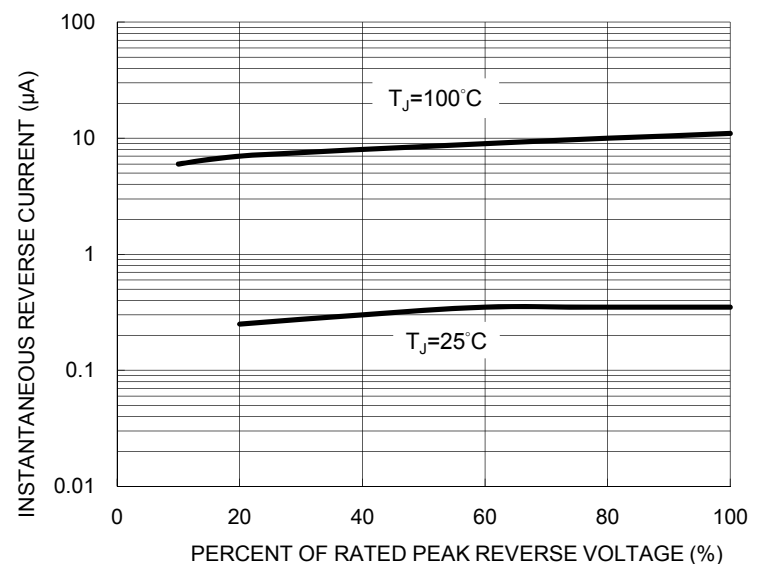


FIG. 5 TYPICAL JUNCTION CAPACITANCE

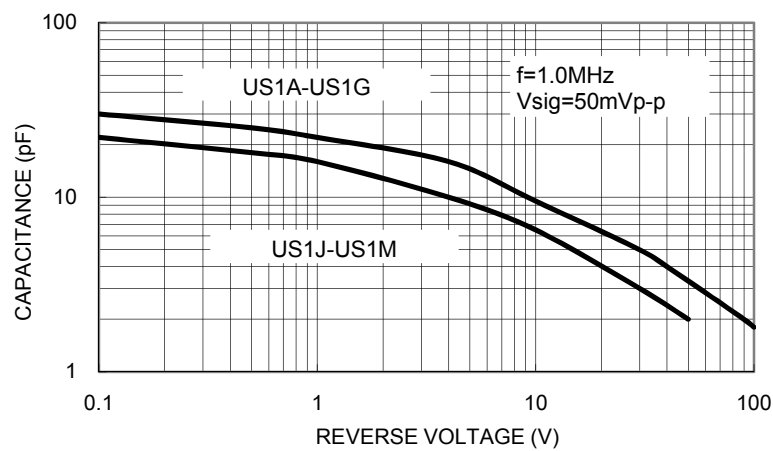


FIG. 6 TYPICAL TRANSIENT THERMAL IMPEDANCE

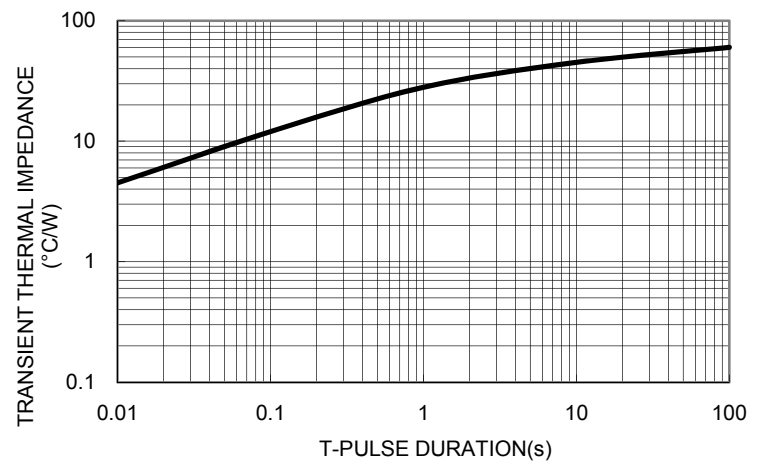
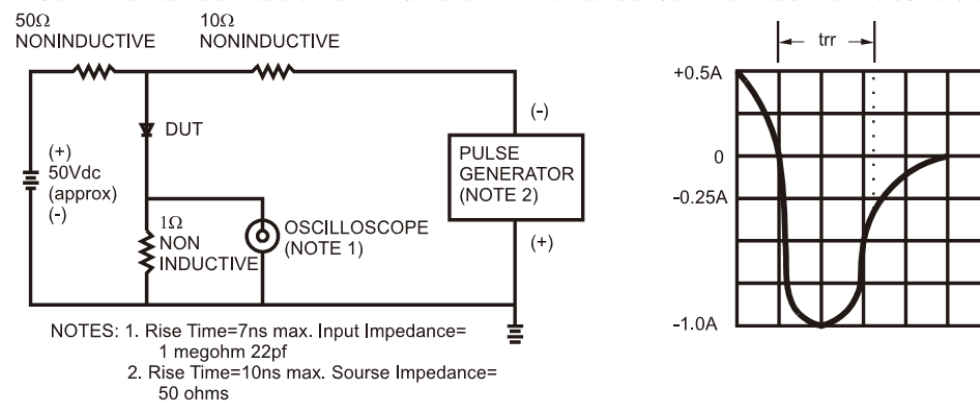
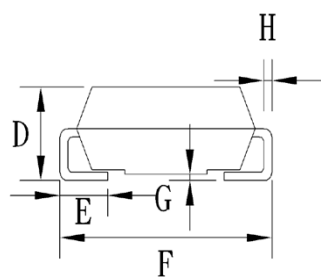
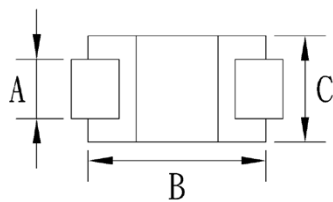


FIG.7- REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT DIAGRAM



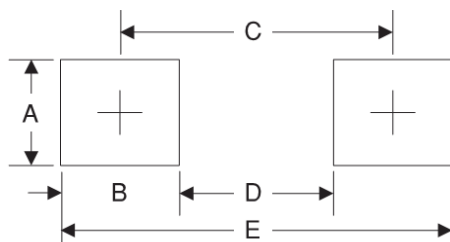
## PACKAGE OUTLINE DIMENSIONS

### DO-214AC (SMA)



| DIM. | Unit (mm) |      | Unit (inch) |       |
|------|-----------|------|-------------|-------|
|      | Min       | Max  | Min         | Max   |
| A    | 1.27      | 1.58 | 0.050       | 0.062 |
| B    | 4.06      | 4.60 | 0.160       | 0.181 |
| C    | 2.29      | 2.83 | 0.090       | 0.111 |
| D    | 1.99      | 2.50 | 0.078       | 0.098 |
| E    | 0.90      | 1.41 | 0.035       | 0.056 |
| F    | 4.95      | 5.33 | 0.195       | 0.210 |
| G    | 0.10      | 0.20 | 0.004       | 0.008 |
| H    | 0.15      | 0.31 | 0.006       | 0.012 |

## SUGGESTED PAD LAYOUT



| Symbol | Unit (mm) | Unit (inch) |
|--------|-----------|-------------|
| A      | 1.68      | 0.066       |
| B      | 1.52      | 0.060       |
| C      | 3.93      | 0.155       |
| D      | 2.41      | 0.095       |
| E      | 5.45      | 0.215       |

## MARKING DIAGRAM



P/N = Specific Device Code  
G = Green Compound  
YW = Date Code  
F = Factory Code

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