

## Surface Mount Super Fast Rectifiers

### FEATURES

- Glass passivated chip junction
- Ideal for automated placement
- Super fast recovery time for high efficiency
- Moisture sensitivity level: level 1, per J-STD-020
- 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-214AB (SMC)**

### MECHANICAL DATA

**Case:** DO-214AB (SMC)

Molding compound, UL flammability classification rating 94V-0

Base P/N with suffix "G" on packing code - green compound (halogen-free)

Base P/N with prefix "H" on packing code - AEC-Q101 qualified

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

Meet JESD 201 class 1A whisker test

with prefix "H" on packing code meet JESD 201 class 2 whisker test

**Polarity:** Indicated by cathode band

**Weight:** 0.21 g (approximately)

| MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS (T <sub>A</sub> =25°C unless otherwise noted) |                                      |              |          |          |          |          |          |          |          |      |
|----------------------------------------------------------------------------------------------|--------------------------------------|--------------|----------|----------|----------|----------|----------|----------|----------|------|
| PARAMETER                                                                                    | SYMBOL                               | ES<br>3A     | ES<br>3B | ES<br>3C | ES<br>3D | ES<br>3F | ES<br>3G | ES<br>3H | ES<br>3J | Unit |
| Maximum repetitive peak reverse voltage                                                      | V <sub>RRM</sub>                     | 50           | 100      | 150      | 200      | 300      | 400      | 500      | 600      | V    |
| Maximum RMS voltage                                                                          | V <sub>RMS</sub>                     | 35           | 70       | 105      | 140      | 210      | 280      | 350      | 420      | V    |
| Maximum DC blocking voltage                                                                  | V <sub>DC</sub>                      | 50           | 100      | 150      | 200      | 300      | 400      | 500      | 600      | V    |
| Maximum average forward rectified current                                                    | I <sub>F(AV)</sub>                   | 3            |          |          |          |          |          |          |          | A    |
| Peak forward surge current, 8.3 ms single half sine-wave superimposed on rated load          | I <sub>FSM</sub>                     | 100          |          |          |          |          |          |          |          | A    |
| Maximum instantaneous forward voltage (Note 1)<br>I <sub>F</sub> = 3 A                       | V <sub>F</sub>                       | 0.95         |          |          |          | 1.3      |          | 1.7      |          | V    |
| Maximum reverse current @ rated VR<br>T <sub>J</sub> =25 °C<br>T <sub>J</sub> =100 °C        | I <sub>R</sub>                       | 10<br>500    |          |          |          |          |          |          |          | μA   |
| Maximum reverse recovery time (Note 2)                                                       | T <sub>rr</sub>                      | 35           |          |          |          |          |          |          |          | ns   |
| Typical junction capacitance (Note 3)                                                        | C <sub>j</sub>                       | 45           |          |          |          | 30       |          |          |          | pF   |
| Typical thermal resistance                                                                   | R <sub>θJL</sub><br>R <sub>θJA</sub> | 12<br>47     |          |          |          |          |          |          |          | °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.             | AEC-Q101 QUALIFIED | PACKING CODE | GREEN COMPOUND CODE | PACKAGE | PACKING                  |
| ES3x<br>(Note 1)     | Prefix "H"         | R7           | Suffix "G"          | SMC     | 850 / 7" Plastic reel    |
|                      |                    | R6           |                     | SMC     | 3,000 / 13" Paper reel   |
|                      |                    | M6           |                     | SMC     | 3,000 / 13" Plastic reel |

Note 1: "xx" defines voltage from 50V (ES3A) to 600V (ES3J)

| EXAMPLE       |          |                    |              |                     |                    |
|---------------|----------|--------------------|--------------|---------------------|--------------------|
| PREFERRED P/N | PART NO. | AEC-Q101 QUALIFIED | PACKING CODE | GREEN COMPOUND CODE | DESCRIPTION        |
| ES3J R7       | ES3J     |                    | R7           |                     |                    |
| ES3J R7G      | ES3J     |                    | R7           | G                   | Green compound     |
| ES3JHR7       | ES3J     | H                  | R7           |                     | AEC-Q101 qualified |

### RATINGS AND CHARACTERISTICS CURVES

(TA=25°C unless otherwise noted)

FIG.1 MAXIMUM FORWARD CURRENT DERATING CURVE

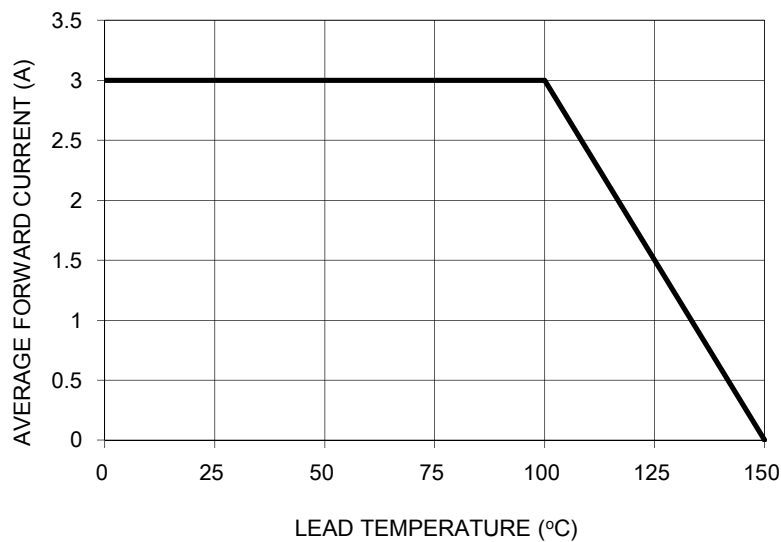


FIG. 2 MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT

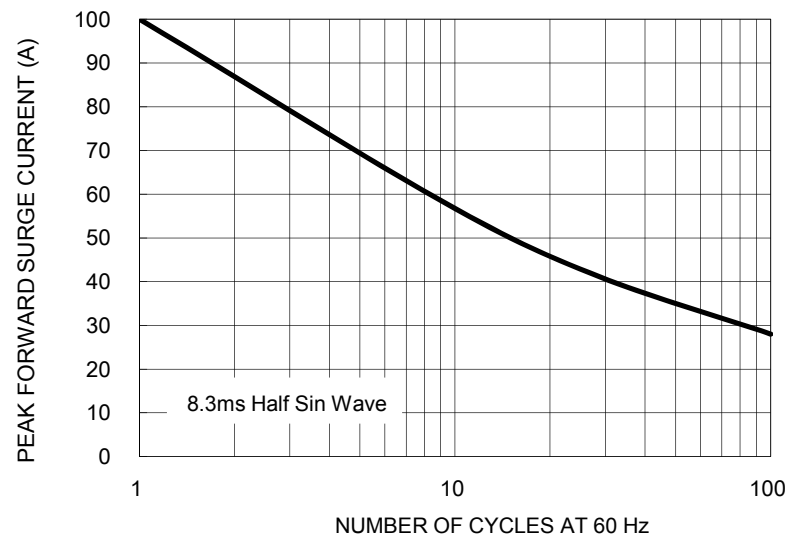


FIG. 3 TYPICAL FORWARD CHARACTERISTICS

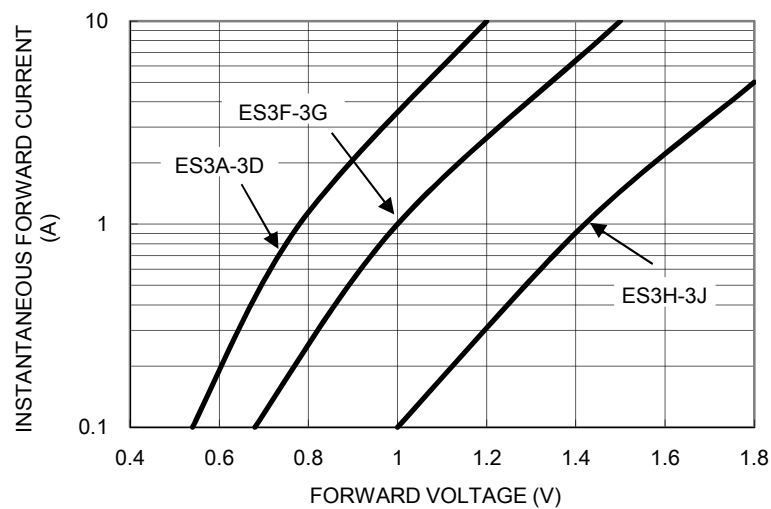


FIG. 4 TYPICAL REVERSE CHARACTERISTICS

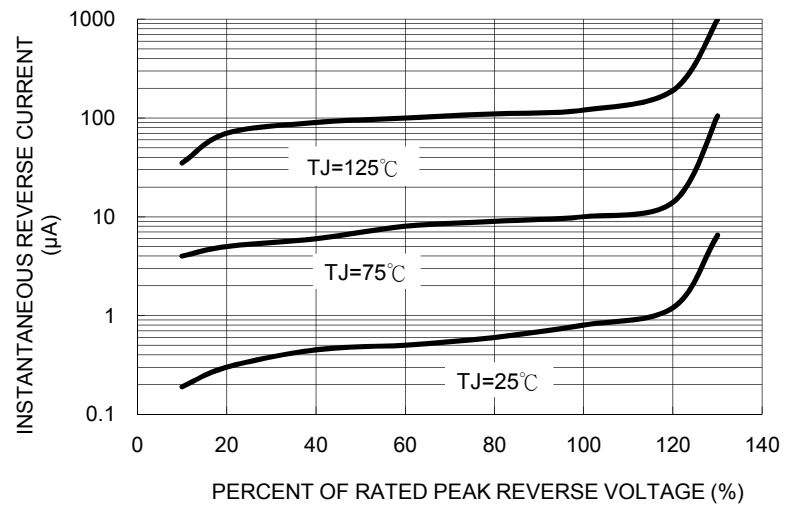


FIG. 5 TYPICAL JUNCTION CAPACITANCE

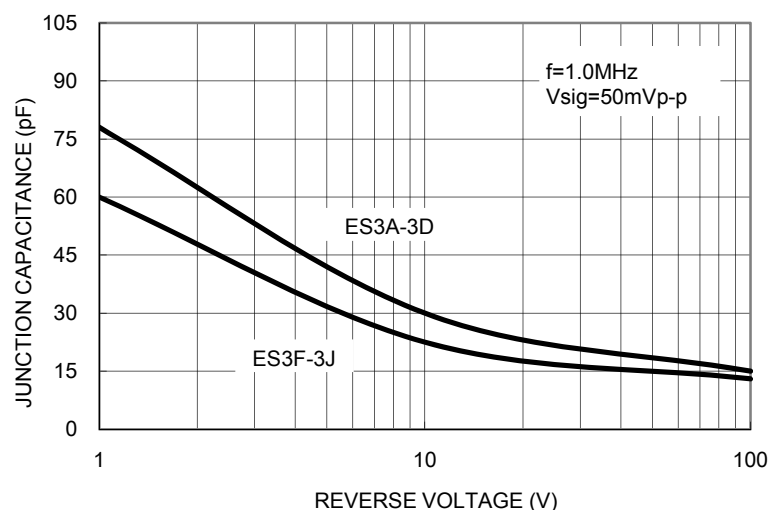


FIG. 6 TYPICAL TRANSIENT THERMAL IMPEDANCE

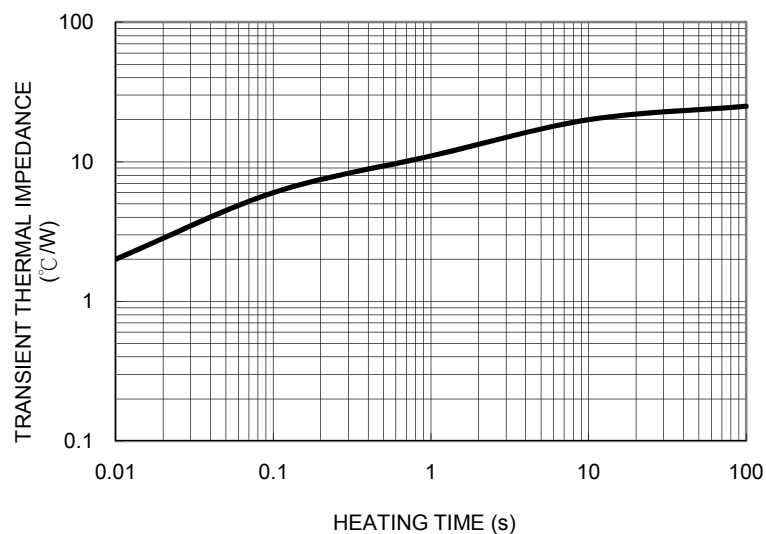
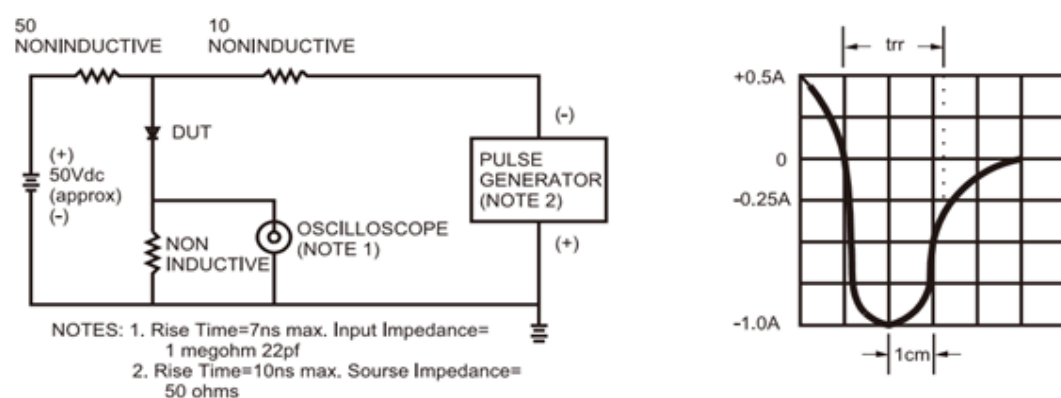
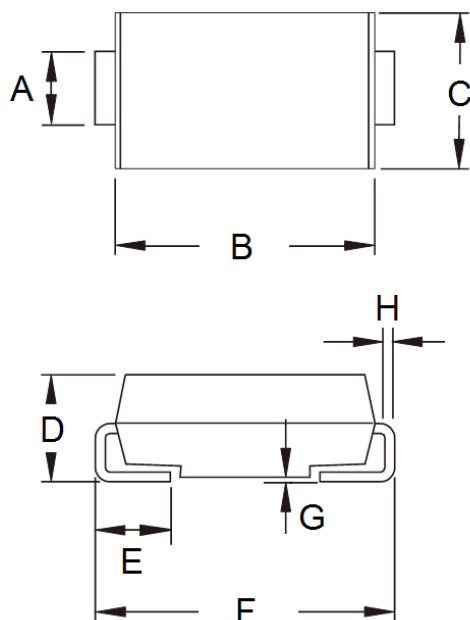


FIG.7- REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT DIAGRAM

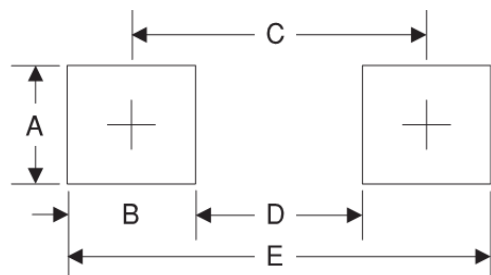


## PACKAGE OUTLINE DIMENSIONS



| DIM. | Unit (mm) |      | Unit (inch) |       |
|------|-----------|------|-------------|-------|
|      | Min       | Max  | Min         | Max   |
| A    | 2.90      | 3.20 | 0.114       | 0.126 |
| B    | 6.60      | 7.11 | 0.260       | 0.280 |
| C    | 5.59      | 6.22 | 0.220       | 0.245 |
| D    | 2.00      | 2.62 | 0.079       | 0.103 |
| E    | 1.00      | 1.60 | 0.039       | 0.063 |
| F    | 7.75      | 8.13 | 0.305       | 0.320 |
| 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      | 3.3       | 0.130       |
| B      | 2.5       | 0.098       |
| C      | 6.8       | 0.268       |
| D      | 4.4       | 0.173       |
| E      | 9.4       | 0.370       |

**MARKING DIAGRAM**



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

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