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June 2016



# ES3A - ES3J Fast Rectifiers

## Features

- For Surface Mount Applications
- Glass-Passivated Junction
- Low-Profile Package
- Easy Pick and Place
- Built-in Strain Relief
- Superfast Recovery Times for High Efficiency



**SMC/DO-214AB**  
COLOR BAND DENOTES CATHODE

## Ordering Information

| Part Number | Top Mark | Package        | Packing Method |
|-------------|----------|----------------|----------------|
| ES3A        | ES3A     | DO-214AB (SMC) | Tape and Reel  |
| ES3B        | ES3B     | DO-214AB (SMC) | Tape and Reel  |
| ES3C        | ES3C     | DO-214AB (SMC) | Tape and Reel  |
| ES3D        | ES3D     | DO-214AB (SMC) | Tape and Reel  |
| ES3J        | ES3J     | DO-214AB (SMC) | Tape and Reel  |

## Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

| Symbol         | Parameter   | Value       |      |      |      |      | Unit             |
|----------------|---|-------------|------|------|------|------|------------------|
|                |   | ES3A        | ES3B | ES3C | ES3D | ES3J |                  |
| $V_{RRM}$      | Maximum Repetitive Reverse Voltage  | 50          | 100  | 150  | 200  | 600  | V                |
| $I_{F(AV)}$    | Average Rectified Forward Current,<br>.375" Lead Length at $T_A = 75^\circ\text{C}$ | 3.0         |      |      |      |      | A                |
| $I_{FSM}$      | Non-Repetitive Peak Forward Surge Current<br>8.3 ms Single Half-Sine Wave           | 100         |      |      |      |      | A                |
| $T_J, T_{STG}$ | Operating Junction and Storage Temperature Range                                    | -50 to +150 |      |      |      |      | $^\circ\text{C}$ |

## Thermal Characteristics

Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

| Symbol          | Parameter   | Value                              | Unit |
|-----------------|---|------------------------------------|------|
| $P_D$           | Power Dissipation   | 1.66                               | W    |
| $R_{\theta JA}$ | Thermal Resistance,<br>Junction to Ambient <sup>(1)</sup> | Maximum Land Pattern: 16 x 16 mm   | 47   |
|                 |   | Minimum Land Pattern: 2.6 x 3.2 mm | 125  |
| $R_{\theta JL}$ | Thermal Resistance,<br>Junction to Lead <sup>(1)</sup>    | Maximum Land Pattern: 16 x 16 mm   | 12   |
|                 |   | Minimum Land Pattern: 2.6 x 3.2 mm | 16   |

### Note:

1. Device mounted on FR-4 PCB 0.013 mm.

## Electrical Characteristics

Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

| Symbol   | Parameter                                 | Conditions   | Value |      |      |               |      | Unit |
|----------|---|--|-------|------|------|---------------|------|------|
|          |   |  | ES3A  | ES3B | ES3C | ES3D          | ES3J |      |
| $V_F$    | Maximum Forward Voltage                   | $I_F = 3.0\text{ A}$   | 0.95  |      |      | 1.70          | V    |      |
| $t_{rr}$ | Reverse Recovery Time                     | $I_F = 0.5\text{ A},$<br>$I_R = 1.0\text{ A},$<br>$I_{RR} = 0.25\text{ A}$ | Typ.  | 20   |      | 35            | ns   |      |
|          |   |  | Max.  | 30   |      | 45            |      |      |
| $I_R$    | Maximum Reverse Current<br>at Rated $V_R$ | $T_A = 25^\circ\text{C}$   | 10    |      |      | $\mu\text{A}$ |      |      |
|          |   | $T_A = 100^\circ\text{C}$  | 500   |      |      |               |      |      |
| $C_T$    | Total Capacitance                         | $V_R = 4.0\text{ V}, f = 1.0\text{ MHz}$                                   | 45    |      |      | pF            |      |      |

## Typical Performance Characteristics



Figure 1. Forward Current Derating Curve

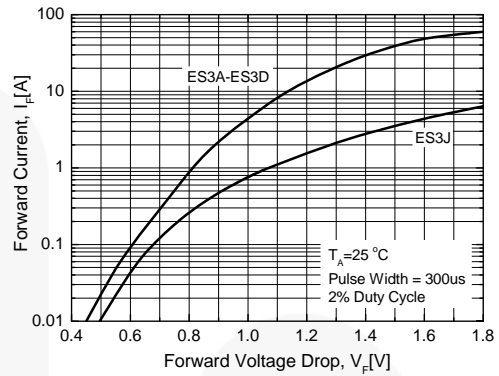


Figure 2. Forward Voltage Characteristics



Figure 3. Total Capacitance

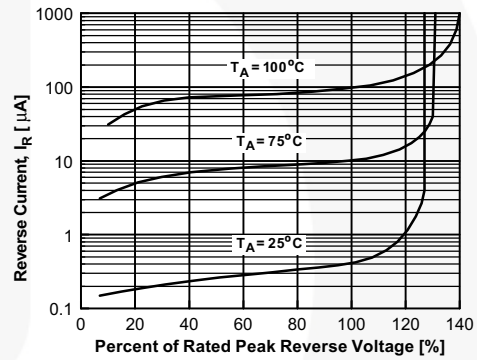


Figure 4. Reverse Current vs. Reverse Voltage



**NOTES:**

1. Rise time = 7.0 ns max; Input impedance = 1.0 megaohm 22 pf.
2. Rise time = 10 ns max; Source impedance = 50 ohms.

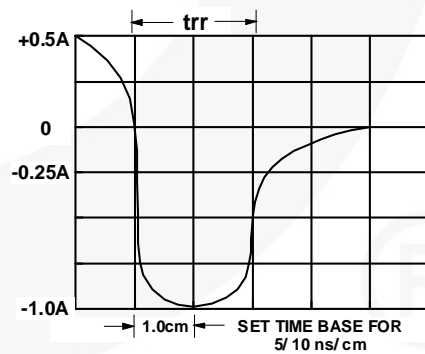


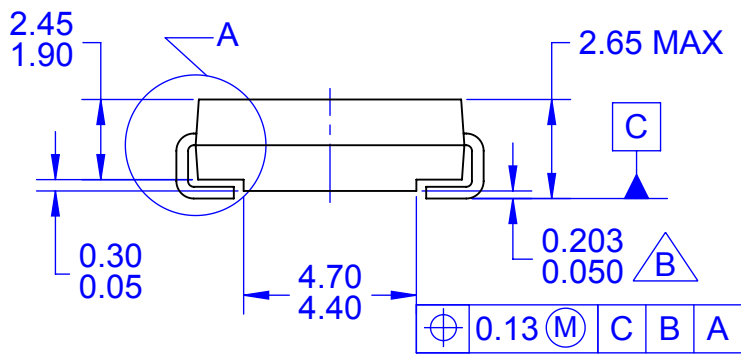
Figure 5. Reverse Recovery Time Characteristic and Test Circuit Diagram



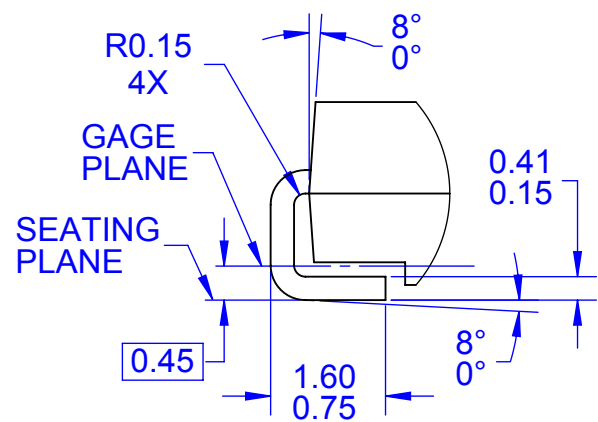
TOP VIEW



LAND PATTERN RECOMMENDATION



SIDE VIEW



DETAIL A  
SCALE 2:1

NOTES:

A. EXCEPT WHERE NOTED, CONFORMS TO JEDEC DO-214, VARIATION AB

$\triangle B$  DOES NOT COMPLY TO JEDEC STD. VALUE

C. ALL DIMENSIONS ARE IN MILLIMETERS

D. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR PROTRUSIONS.

E. DIMENSIONS AND TOLERANCING AS PER ASME Y14.5-2009

F. LAND PATTERN STANDARD: DIOM7957X241M

G. DRAWING FILENAME: MKT-DO214ABrev2



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