

# Ultrafast Rectifiers, Surface Mount, 6 A, 200 V - 600 V

## FES6, NRVFES6 Series

### Features

- Very Low Profile: Typical Height of 1.1 mm
- Ultrafast Recovery Time
- Low Forward Voltage Drop
- Low Thermal Resistance
- Very Stable Operation at Industrial Temperature, 150°C
- RoHS Compliant
- Green Molding Compound as per IEC61249 Standard
- Lead Free in Compliance with EU RoHS 2011/65/EU Directive
- With DAP Option Only
- NRV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable

### MAXIMUM RATINGS

| Parameter                                                                                 | Symbol      | Value             | Unit |
|-------------------------------------------------------------------------------------------|-------------|-------------------|------|
| Repetitive Peak Reverse Voltage<br>FES6D<br>FES6G<br>FES6J                                | $V_{RRM}$   | 200<br>400<br>600 | V    |
| Average Forward Rectified Current                                                         | $I_{F(AV)}$ | 6                 | A    |
| Peak Forward Surge Current: 8.3 ms<br>Single Half Sine-Wave Superimposed<br>on Rated Load | $I_{FSM}$   | 80                | A    |
| Operating Junction Temperature Range                                                      | $T_J$       | -55 to +175       | °C   |
| Storage Temperature Range                                                                 | $T_{STG}$   | -55 to +175       | °C   |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

### ORDERING INFORMATION

| Part Number | Top Mark | Package                          | Shipping <sup>†</sup> |
|-------------|----------|----------------------------------|-----------------------|
| FES6D       | FES6D    | TO-277 3L (with DAP Option only) | 5000 / Tape & Reel    |
| NRVFES6D*   |          |                                  |                       |
| FES6G       | FES6G    |                                  |                       |
| NRVFES6G*   |          |                                  |                       |
| FES6J       | FES6J    |                                  |                       |
| NRVFES6J*   |          |                                  |                       |

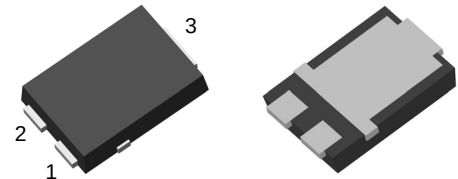
†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

\*NRV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.

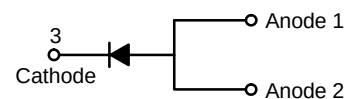


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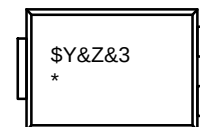
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TO-277-3LD  
CASE 340BQ



### MARKING DIAGRAM



\$Y = ON Semiconductor Logo  
 &Z = Assembly Plant Code  
 &3 = Date Code (Year & Week)  
 \* = Specific Device Code  
 FES6D, FES6G, FES6J

## FES6, NRVFES6 Series

### THERMAL CHARACTERISTICS (Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted) (Note 1)

| Parameter                                                                   | Symbol          | Value | Unit               |
|-----------------------------------------------------------------------------|-----------------|-------|--------------------|
| Thermal Characteristics, Junction-to-Lead, Thermocouple Soldered to Cathode | $\Psi_{JL}$     | 6     | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction-to-Ambient                                     | $R_{\theta JA}$ | 100   | $^\circ\text{C/W}$ |

1. Per JESD51-3 Recommended Thermal Test Board.

### ELECTRICAL CHARACTERISTICS (Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted)

| Symbol          | Parameter                                       | Conditions                                                             | Value |       |       | Unit |
|-----------------|-------------------------------------------------|------------------------------------------------------------------------|-------|-------|-------|------|
|                 |                                                 |                                                                        | FES6D | FES6G | FES6J |      |
| V <sub>F</sub>  | Maximum Instantaneous Forward Voltage (Note 2)  | I <sub>F</sub> = 6 A                                                   | 1.05  | 1.20  | 2.2   | V    |
|                 |                                                 | I <sub>F</sub> = 6 A, T <sub>J</sub> = 125°C                           | 0.90  | 1.00  | 1.80  |      |
| I <sub>R</sub>  | Maximum Reverse Current at Rated V <sub>R</sub> | T <sub>J</sub> = 25°C                                                  | 2     |       |       | μA   |
|                 |                                                 | T <sub>J</sub> = 125°C                                                 | 200   | 500   |       |      |
| C <sub>J</sub>  | Typical Junction Capacitance                    | V <sub>R</sub> = 4 V, f = 1 MHz                                        | 60    |       | 45    | pF   |
| T <sub>rr</sub> | Typical Reverse Recovery Time                   | I <sub>F</sub> = 0.5 A, I <sub>R</sub> = 1 A, I <sub>RR</sub> = 0.25 A | 25    |       |       | ns   |
|                 |                                                 | I <sub>F</sub> = 1 A, di/dt = 50 A/μs, V <sub>R</sub> = 30 V           | 45    |       |       |      |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

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

# FES6, NRVFES6 Series

## TYPICAL CHARACTERISTICS

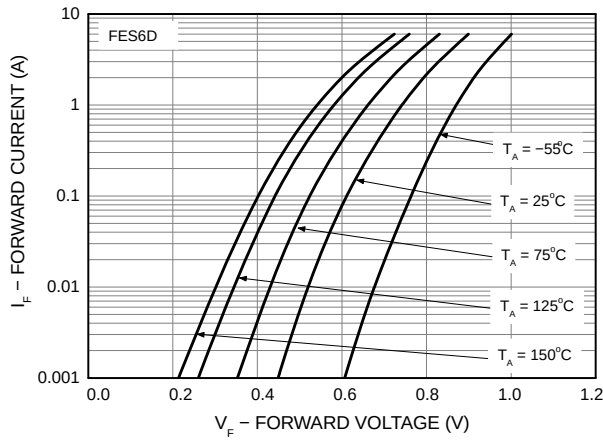


Fig 1. Typical Forward Characteristics for FES6D

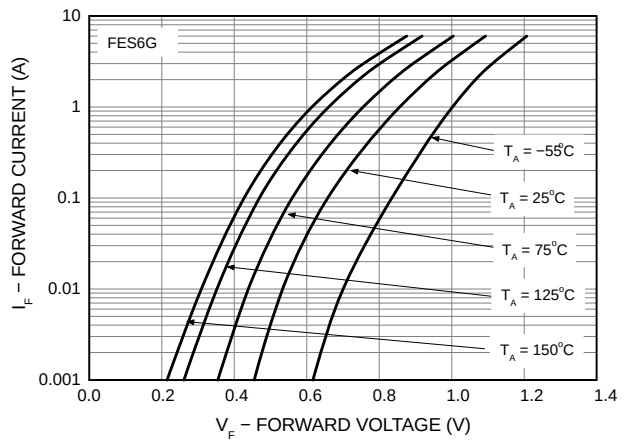


Fig 2. Typical Forward Characteristics for FES6G

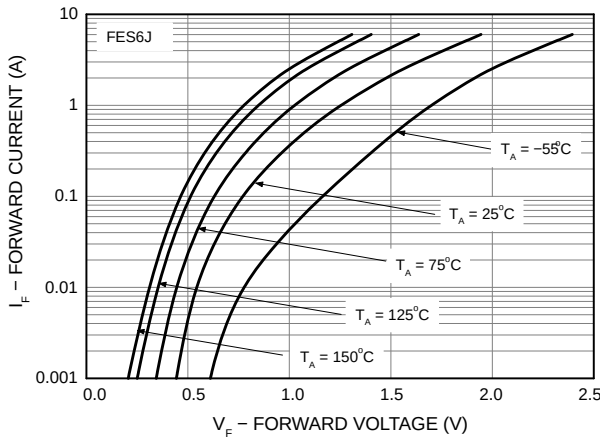


Fig 3. Typical Forward Characteristics for FES6J

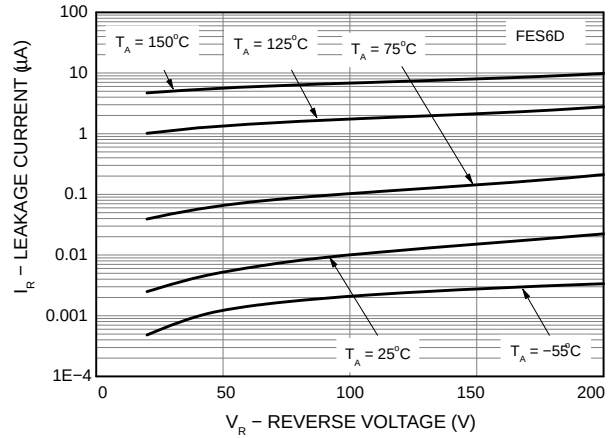


Fig 4. Typical Reverse Characteristics for FES6D

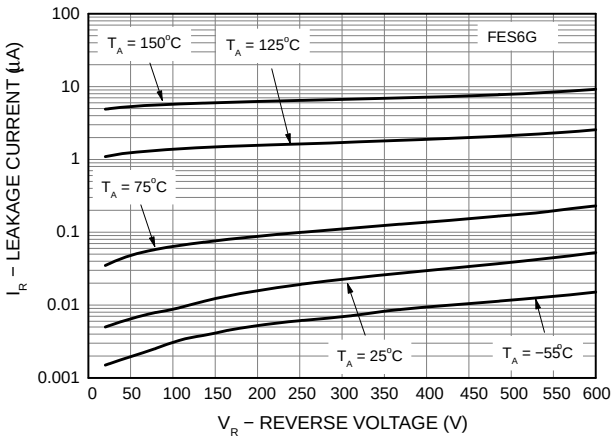


Fig 5. Typical Reverse Characteristics for FES6G

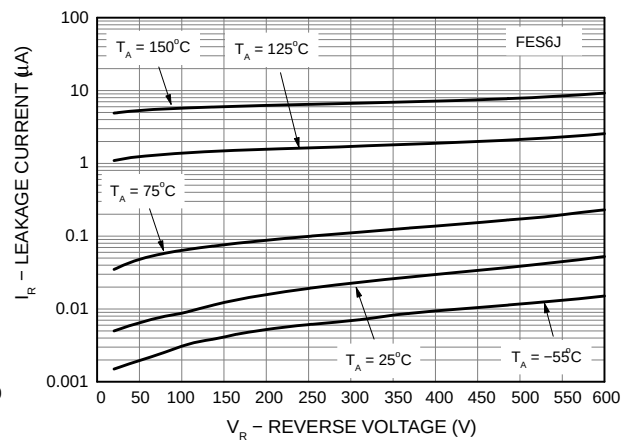


Fig 6. Typical Reverse Characteristics for FES6J

## FES6, NRVFES6 Series

### TYPICAL CHARACTERISTICS

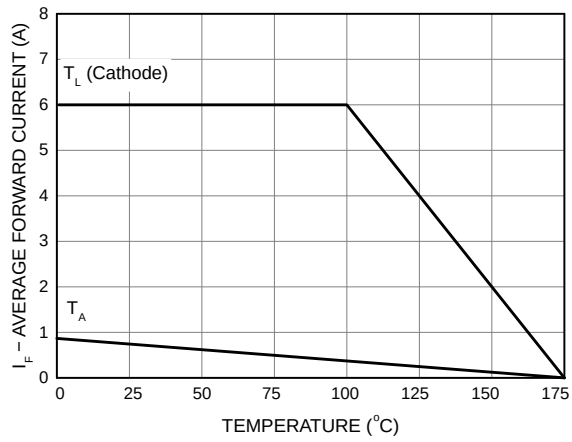


Fig 7. Forward Current Derating Curve

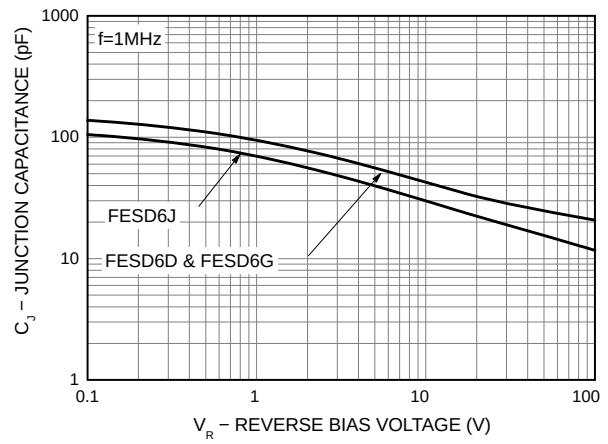
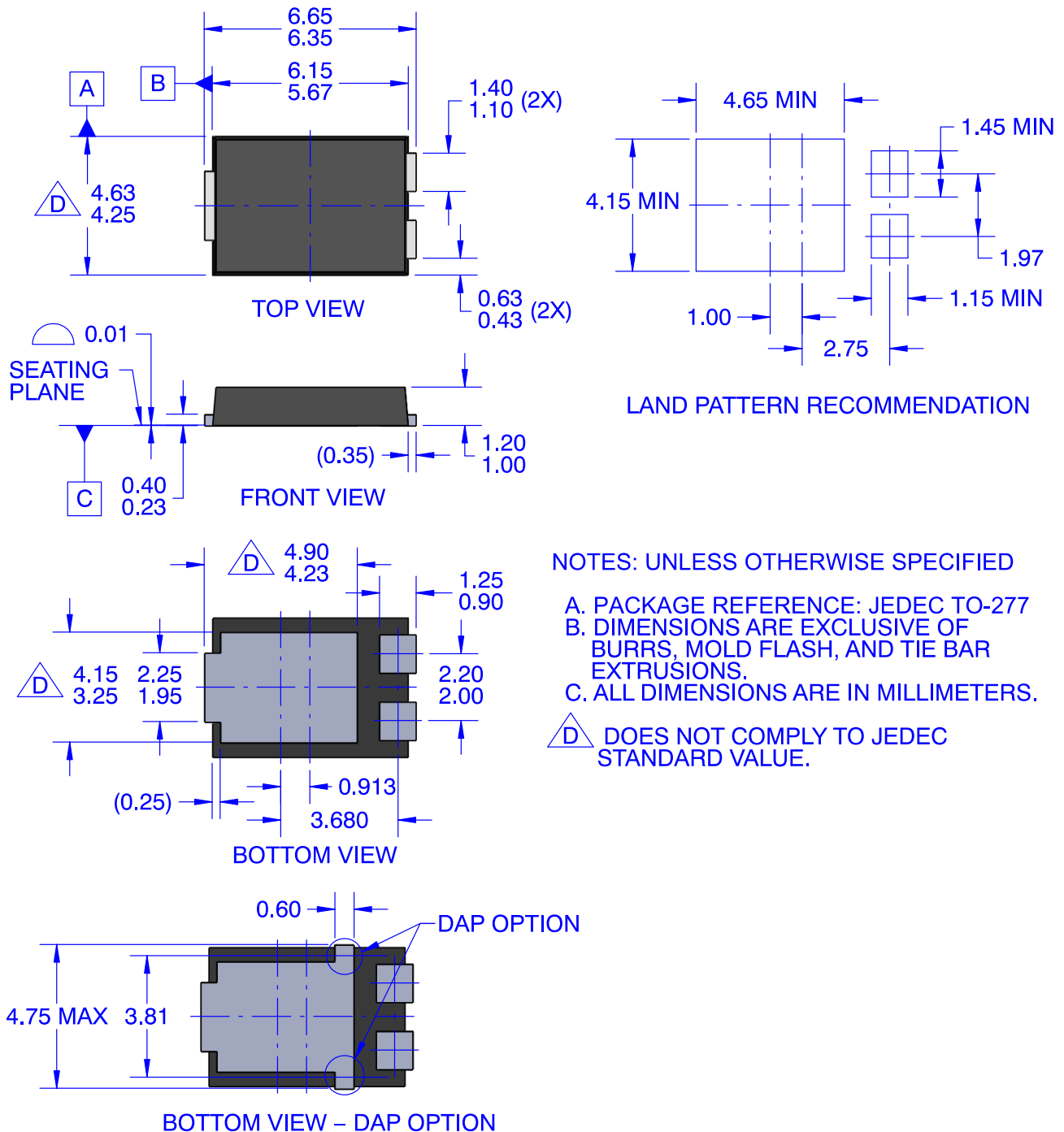


Fig 8. Typical Junction Capacitance

**TO-277-3LD**  
**CASE 340BQ**  
**ISSUE O**

DATE 30 SEP 2016



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|-------------------------|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
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