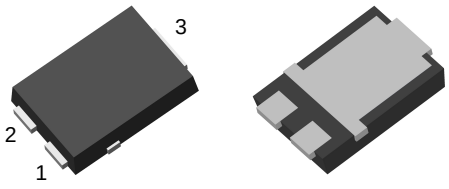
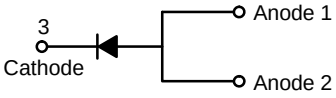
Ultrafast Rectifiers, Surface Mount, 6 A, 200 V - 600 V

FES6, NRVFES6 Series



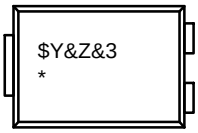
TO−277−3LD
CASE 340BQ



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

MARKING DIAGRAM



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

MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Repetitive Peak Reverse Voltage FES6D FES6G FES6J	V_{RRM}	 200 400 600	V
Average Forward Rectified Current	$I_{F(AV)}$	6	A
Peak Forward Surge Current: 8.3 ms Single Half Sine−Wave Superimposed 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†
FES6D	FES6D	TO−277 3L (with DAP Option only)	5000 / Tape & Reel
FES6G	FES6G		
NRVFES6G*			
FES6J	FES6J		
NRVFES6J*			

DISCONTINUED (Note 1)

NRVFES6D*	FES6D	TO−277 3L (with DAP Option only)	5000 / Tape & Reel

†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.

1. **DISCONTINUED:** This device is not recommended for new design. Please contact your **onsemi** representative for information. The most current information on this device may be available on www.onsemi.com.

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July, 2024 − Rev. 5
Publication Order Number:
FES6D/D

THERMAL CHARACTERISTICS (Values are at T_A = 25°C unless otherwise noted) (Note 2)

Parameter	Symbol	Value	Unit
Thermal Characteristics, Junction−to−Lead, Thermocouple Soldered to Cathode	Ψ_{JL}	6	°C/W
Thermal Resistance, Junction−to−Ambient	$R_{\theta JA}$	100	°C/W

2. Per JESD51−3 Recommended Thermal Test Board.

ELECTRICAL CHARACTERISTICS (Values are at T_A = 25°C unless otherwise noted)

Symbol	Parameter	Conditions	Value			Unit
			FES6D	FES6G	FES6J	
V_F	Maximum Instantaneous Forward Voltage (Note 3)	I_F = 6 A	1.05	1.20	2.2	V
		I_F = 6 A, T_J = 125°C	0.90	1.00	1.80	
I_R	Maximum Reverse Current at Rated V_R	T_J = 25°C	2			μA
		T_J = 125°C	200	500		
C_J	Typical Junction Capacitance	V_R = 4 V, f = 1 MHz	60		45	pF
T_{rr}	Typical Reverse Recovery Time	I_F = 0.5 A, I_R = 1 A, I_{RR} = 0.25 A	25			ns
		I_F = 1 A, di/dt = 50 A/μs, V_R = 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.

3. Pulse test with PW = 300 μs, 1% duty cycle

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TYPICAL CHARACTERISTICS

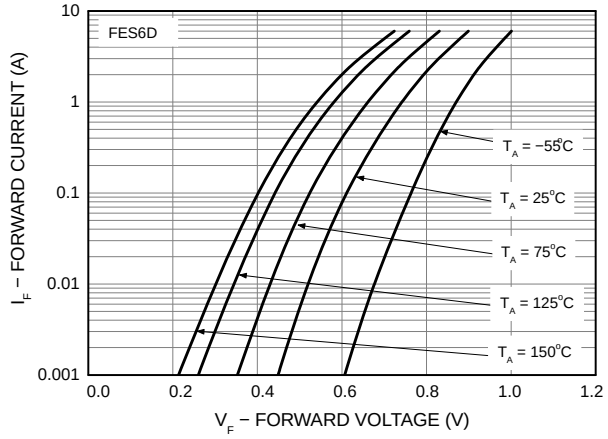

Fig 1. Typical Forward Characteristics for FES6D

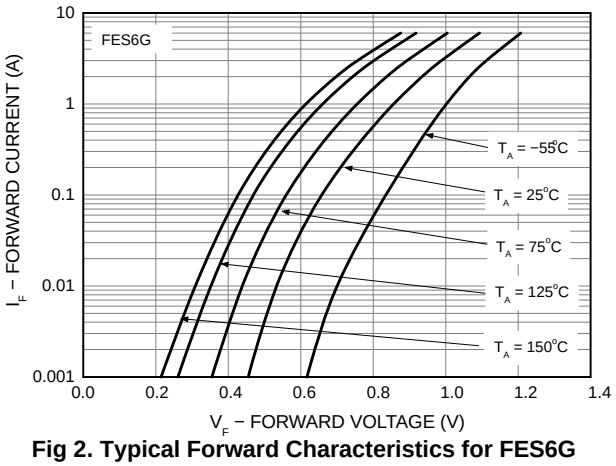

Fig 2. Typical Forward Characteristics for FES6G

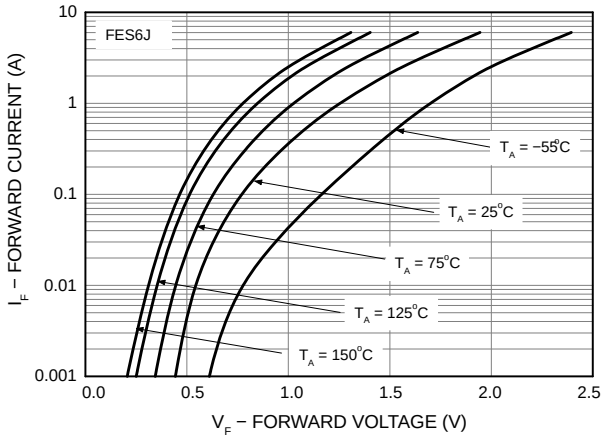

Fig 3. Typical Forward Characteristics for FES6J

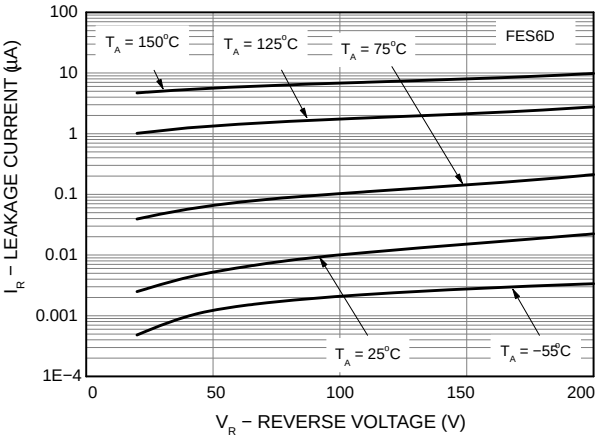

Fig 4. Typical Reverse Characteristics for FES6D

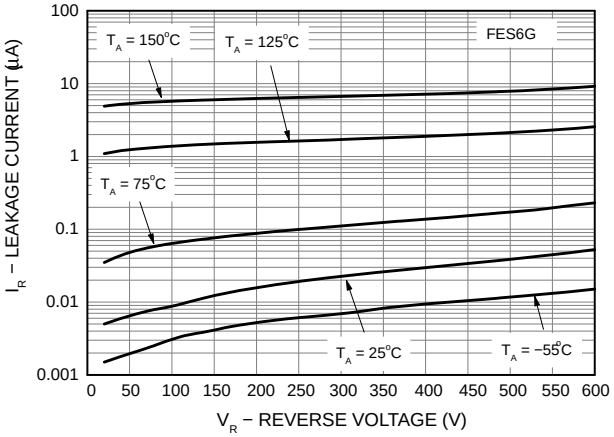

Fig 5. Typical Reverse Characteristics for FES6G

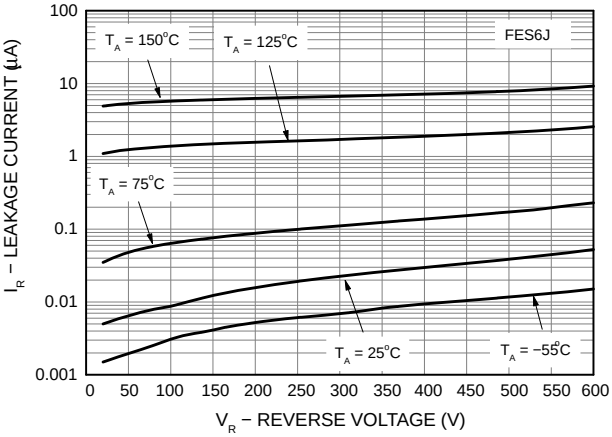

Fig 6. Typical Reverse Characteristics for FES6J

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TYPICAL CHARACTERISTICS

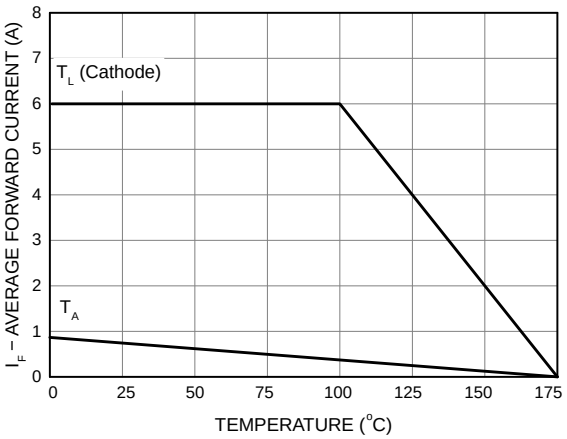

Fig 7. Forward Current Derating Curve

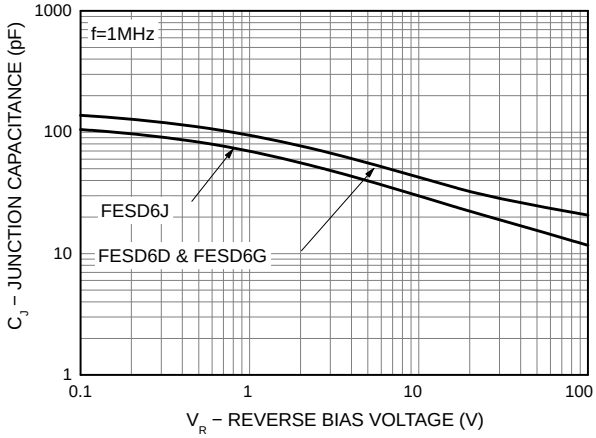

Fig 8. Typical Junction Capacitance

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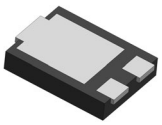

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ISSUE A

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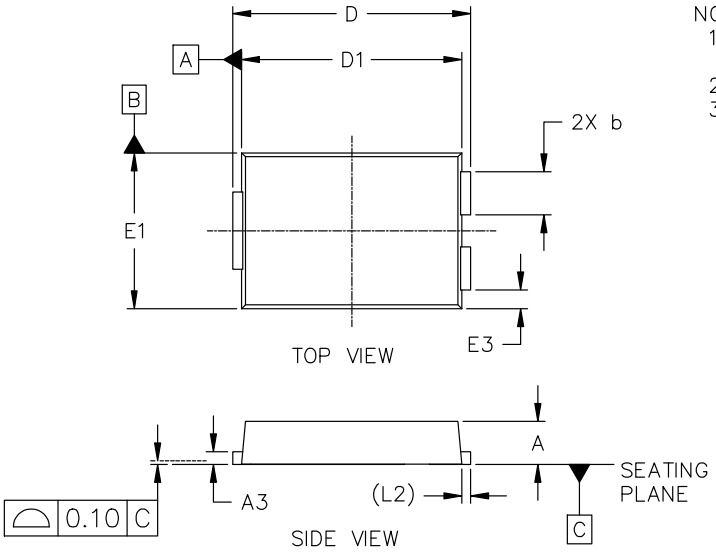
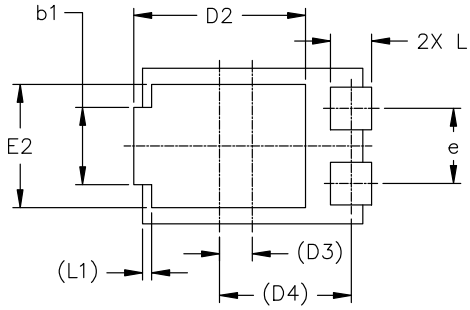
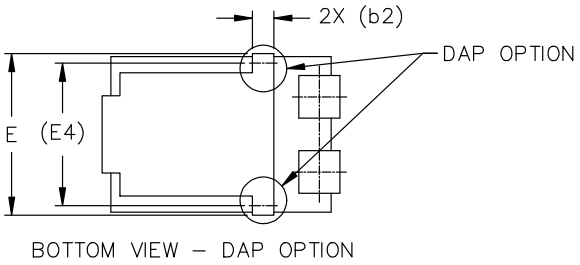
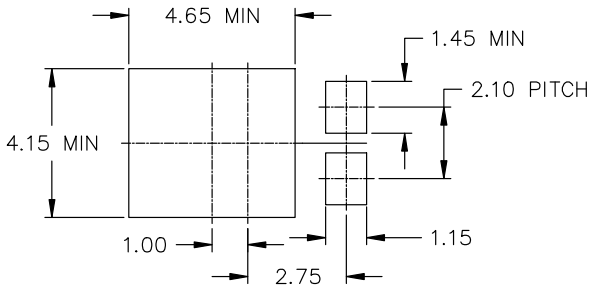






NOTES:
1. DIMENSIONING AND TOLERANCING AS PER ASME Y14.5M, 2018.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. DIMENSIONS D1 AND E1 DO NOT INCLUDE MOLD FLASH, MOLD FLASH SHALL NOT EXCEED 0.13 mm PER SIDE.

MILLIMETERS			
DIM	MIN	NOM	MAX
A	1.00	1.10	1.20
A3	0.23	0.32	0.40
b	1.10	1.25	1.40
b1	1.95	2.10	2.25
b2	0.60 REF		
D	6.35	6.50	6.65
D1	5.67	5.91	6.15
D2	4.23	4.57	4.90
D3	0.913 REF		
D4	3.680 REF		
E	−−−	−−−	4.75
E1	4.25	4.44	4.63
E2	3.25	3.48	3.70
E3	0.43	0.53	0.63
E4	3.680 REF		
e	2.00	2.10	2.20
L	0.90	1.08	1.25
L1	0.25 REF		
L2	0.35 REF		



RECOMMENDED MOUNTING FOOTPRINT

*For additional information on our Pb−Free strategy and soldering details, please download the onsemi Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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