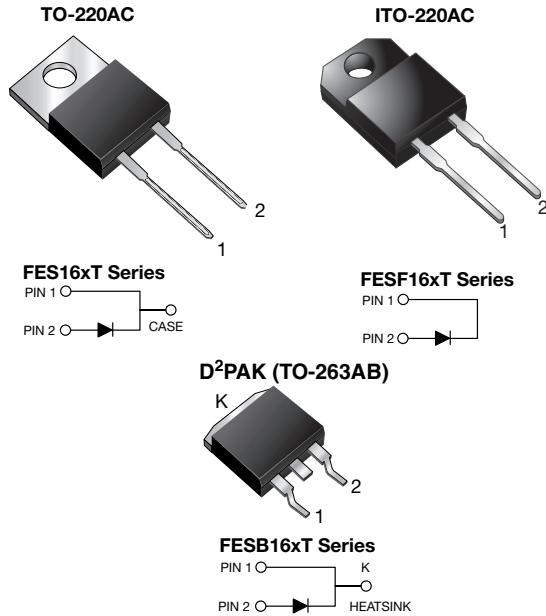


Ultrafast Plastic Rectifier



DESIGN SUPPORT TOOLS AVAILABLE



| PRIMARY CHARACTERISTICS | |
|-------------------------|--|
| $I_{F(AV)}$ | 16 A |
| V_{RRM} | 50 V to 600 V |
| I_{FSM} | 250 A |
| t_{rr} | 35 ns, 50 ns |
| V_F | 0.975 V, 1.30 V, 1.50 V |
| T_J max. | 150 °C |
| Package | TO-220AC, ITO-220AC, D ² PAK (TO-263AB) |
| Circuit configurations | Single |

FEATURES

- Power pack
- Glass passivated pellet chip junction
- Ultrafast recovery time
- Low switching losses, high efficiency
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for D²PAK (TO-263AB) package)
- Solder dip 275 °C max. 10 s, per JESD 22-B106 (for TO-220AC and ITO-220AC package)
- AEC-Q101 qualified available
 - Automotive ordering code:
 - base P/NHE3(for ITO-220AC)
 - base P/NHM3(for D²PAK (TO-263AB) package)
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, inverters, freewheeling diodes, DC/DC converters, and other power switching application.

MECHANICAL DATA

Case: TO-220AC, ITO-220AC, D²PAK (TO-263AB)

TO-220AC Molding compound meets UL 94 V-0 flammability rating

Base P/N-E3 - RoHS-compliant, commercial grade

ITO-220AC Molding compound meets UL 94 V-0 flammability rating

Base P/N-E3 - RoHS-compliant, commercial grade

Base P/NHE3_X - RoHS-compliant and AEC-Q101 qualified ("_X" denotes revision code e.g. A, B,...)

D²PAK (TO-263AB) Molding compound meets UL 94 V-0 flammability rating

Base P/N-M3 - RoHS-compliant, halogen-free, commercial grade

Base P/NHM3 - RoHS-compliant, halogen-free, AEC-Q101 qualified

Terminals: matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

E3 and M3 suffix meets JESD 201 class 1A whisker test, HE3 and HM3 suffix meets JESD 201 class 2 whisker test

Polarity: as marked

Mounting Torque: 10 in-lbs max.



| MAXIMUM RATINGS (T _C = 25 °C unless otherwise noted) | | | | | | | | | | |
|--|-----------------------------------|-------------|----------|----------|----------|----------|----------|----------|----------|------|
| PARAMETER | SYMBOL | FES 16AT | FES 16BT | FES 16CT | FES 16DT | FES 16FT | FES 16GT | FES 16HT | FES 16JT | UNIT |
| Maximum repetitive peak reverse voltage | V _{RRM} | 50 | 100 | 150 | 200 | 300 | 400 | 500 | 600 | V |
| Maximum RMS voltage | V _{RMS} | 35 | 70 | 105 | 140 | 210 | 280 | 350 | 420 | V |
| Maximum DC blocking voltage | V _{DC} | 50 | 100 | 150 | 200 | 300 | 400 | 500 | 600 | V |
| Maximum average forward rectified current at T _C = 100 °C | I _{F(AV)} | 16 | | | | | | | | A |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | I _{FSM} | 250 | | | | | | | | A |
| Operating storage and temperature range | T _J , T _{STG} | -65 to +150 | | | | | | | | °C |
| Isolation voltage (ITO-220AC only) from terminal to heatsink t = 1 min | V _{AC} | 1500 | | | | | | | | V |

| ELECTRICAL CHARACTERISTICS (T _C = 25 °C unless otherwise noted) | | | | | | | | | | | |
|--|--|-------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|------|
| PARAMETER | TEST CONDITIONS | SYMBOL | FES 16AT | FES 16BT | FES 16CT | FES 16DT | FES 16FT | FES 16GT | FES 16HT | FES 16JT | UNIT |
| Maximum instantaneous forward voltage | 16 A | V _F ⁽¹⁾ | 0.975 | | | | 1.30 | | 1.50 | | V |
| Maximum DC reverse current at rated DC blocking voltage | T _C = 25 °C | I _R | 10 | | | | | | | | μA |
| | T _C = 100 °C | | 500 | | | | | | | | |
| Maximum reverse recovery time | I _F = 0.5 A, I _R = 1.0 A, I _{rr} = 0.25 A | t _{rr} | 35 | | | | 50 | | | | ns |
| Typical junction capacitance | 4.0 V, 1 MHz | C _J | 175 | | | | | | 145 | | pF |

Note

(1) Pulse test: 300 μs pulse width, 1 % duty cycle

| THERMAL CHARACTERISTICS (T _C = 25 °C unless otherwise noted) | | | | | |
|---|------------------|-----|------|------|------|
| PARAMETER | SYMBOL | FES | FESF | FESB | UNIT |
| Typical thermal resistance, junction to case | R _{θJC} | 1.2 | 1.7 | 1.2 | °C/W |

| ORDERING INFORMATION (Example) | | | | | |
|--------------------------------|--------------------------------|-----------------|--------------|---------------|---------------|
| PACKAGE | PREFERRED P/N | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-220AC | FES16JT-E3/45 | 1.78 | 45 | 50/tube | Tube |
| ITO-220AC | FESF16JT-E3/45 | 1.80 | 45 | 50/tube | Tube |
| TO-263AB | FESB16JT-M3/P | 1.33 | P | 50/tube | Tube |
| TO-263AB | FESB16JT-M3/I | 1.33 | I | 800/reel | Tape and reel |
| ITO-220AC | FESF16JT3E3_A/P ⁽¹⁾ | 1.80 | P | 50/tube | Tube |
| TO-263AB | FESB16JTHM3/P ⁽¹⁾ | 1.33 | P | 50/tube | Tube |
| TO-263AB | FESB16JTHM3/I ⁽¹⁾ | 1.33 | I | 800/reel | Tape and reel |

Note

(1) AEC-Q101 qualified, available in ITO-220AC and TO-263AB package



RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)

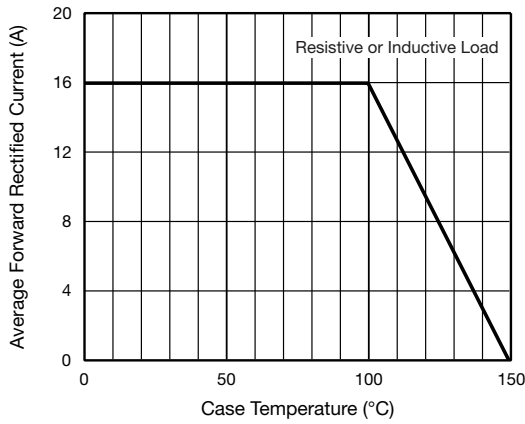


Fig. 1 - Maximum Forward Current Derating Curve

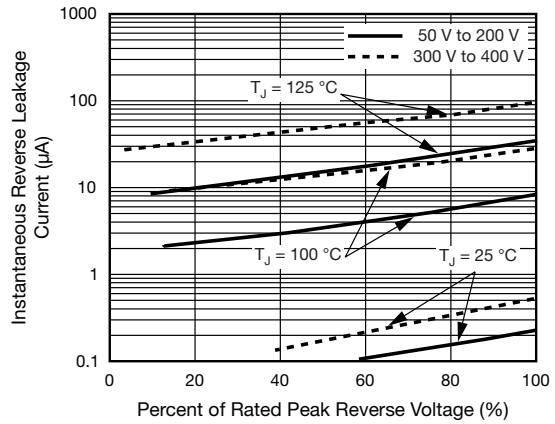


Fig. 4 - Typical Reverse Leakage Characteristics

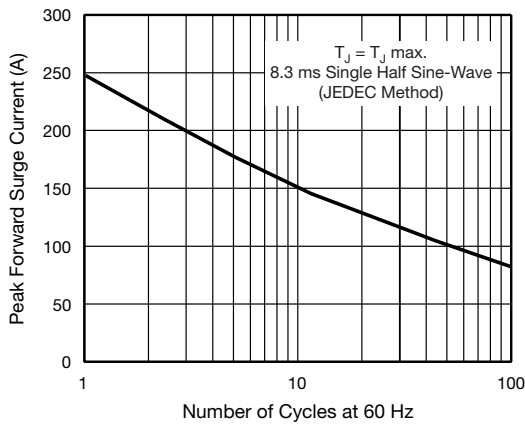


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

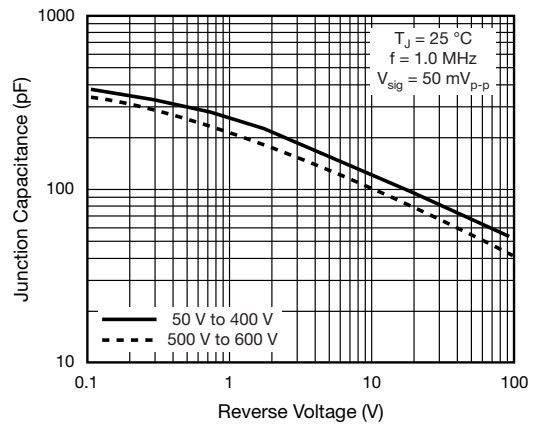


Fig. 5 - Typical Junction Capacitance

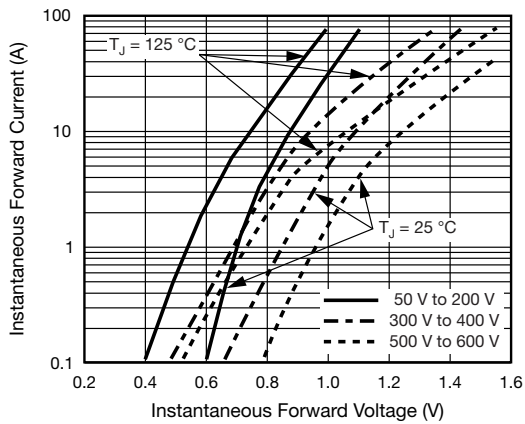
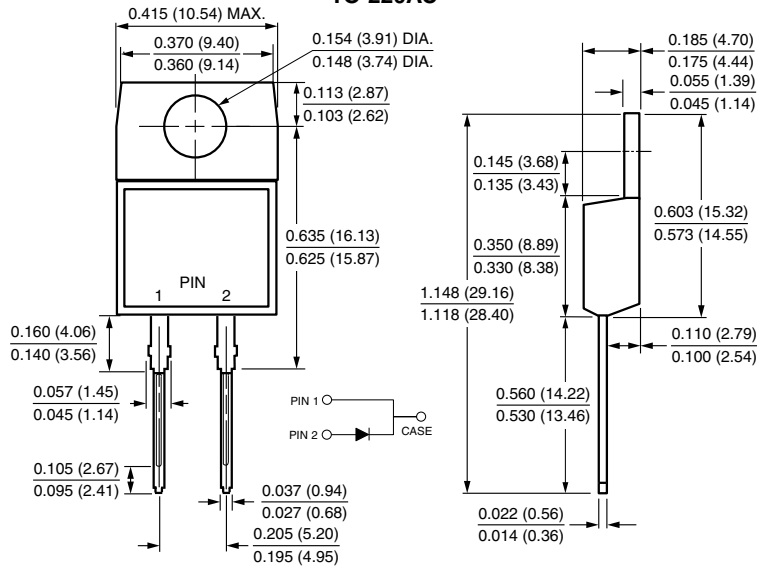


Fig. 3 - Typical Instantaneous Forward Characteristics

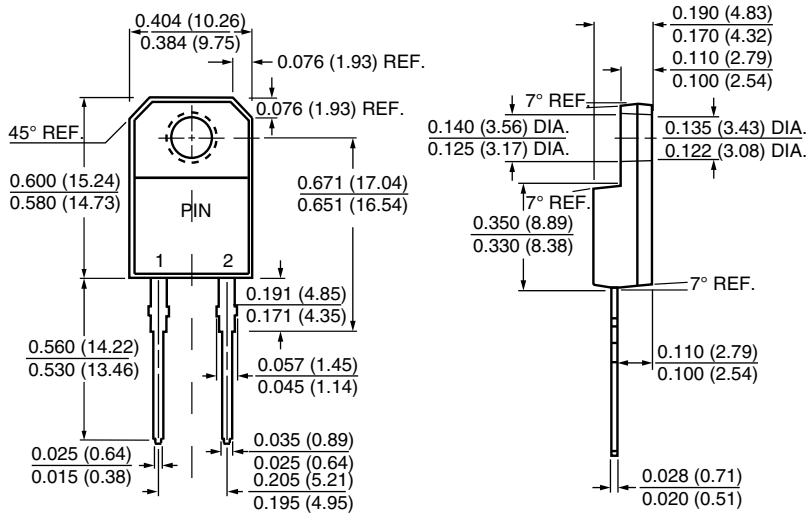


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

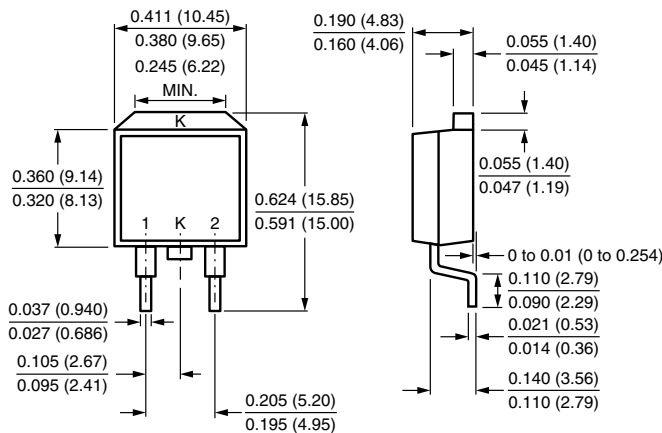
TO-220AC



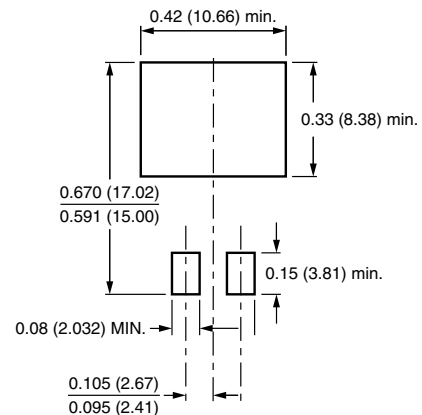
ITO-220AC



D²PAK (TO-263AB)



Mounting Pad Layout





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