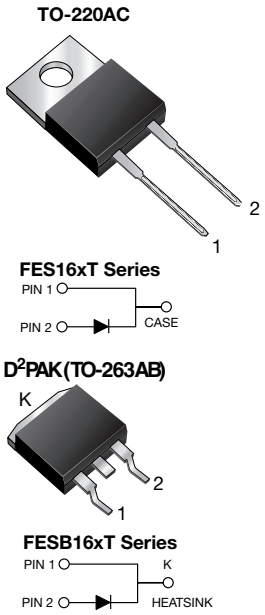
# Ultrafast Plastic Rectifier




## LINKS TO ADDITIONAL RESOURCES

3D Models

| 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, D²PAK (TO-263AB) |
| Circuit configurations | Single |

## FEATURES

RoHS COMPLIANT
HALOGEN FREE Available

- 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 package)
- AEC-Q101 qualified available
  - Automotive ordering code: base P/NHM3(for D2PAK (TO-263AB package))
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

## 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, D²PAK (TO-263AB)

Molding compound meets UL 94 V-0 flammability rating

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

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, HM3 suffix meets JESD 201 class 2 whisker test

**Polarity:** as marked

**Mounting Torque:** 10 in-lbs max.



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| MAXIMUM RATINGS ($T_C$ = 25 °C unless otherwise noted) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| PARAMETER | SYMBOL | FES16AT | FES16BT | FES16CT | FES16DT FESB16DT | FES16FT | FES16GT FESB16GT | FES16HT | FES16JT FESB16JT | 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 |

| ELECTRICAL CHARACTERISTICS ($T_C$ = 25 °C unless otherwise noted) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PARAMETER | TEST CONDITIONS | SYMBOL | FES16AT | FES16BT | FES16CT | FES16DT FESB16DT | FES16FT | FES16GT FESB16GT | FES16HT | FES16JT FESB16JT | 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 | FESB | UNIT |
| Typical thermal resistance, junction to case | $R_{\theta JC}$ | 1.2 | 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 |
| $D^2PAK$ (TO-263AB) | FESB16JT-M3/I | 1.33 | I | 800/reel | Tape and reel |
| $D^2PAK$ (TO-263AB) | FESB16JTHM3/I (1) | 1.33 | I | 800/reel | Tape and reel |

**Note**

(1) AEC-Q101 qualified


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## RATINGS AND CHARACTERISTICS CURVES ($T_A$ = 25 °C unless otherwise noted)

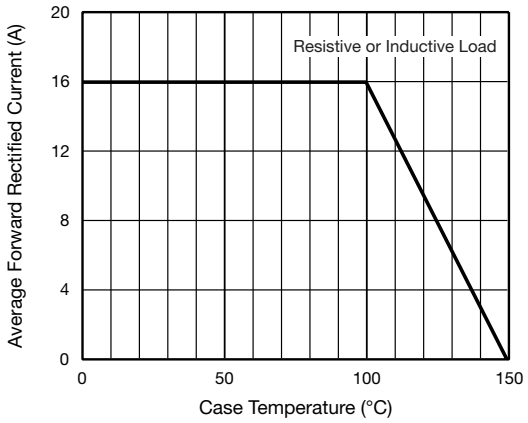



Fig. 1 - Maximum Forward Current Derating Curve

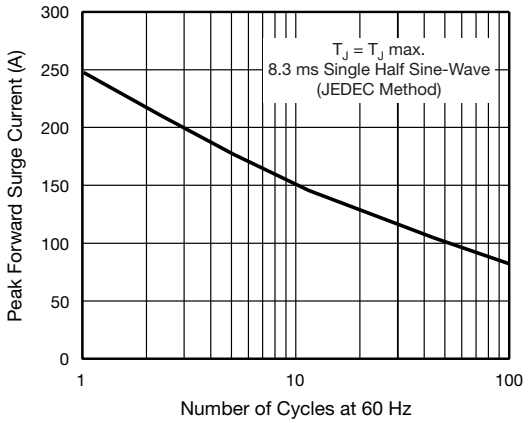



Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

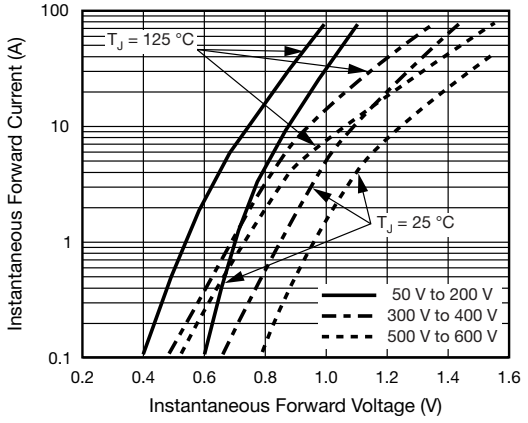



Fig. 3 - Typical Instantaneous Forward Characteristics

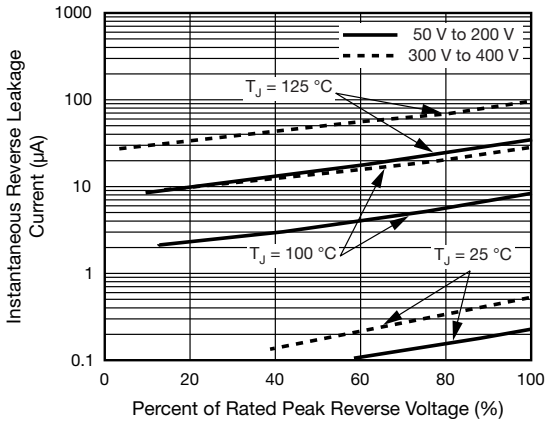



Fig. 4 - Typical Reverse Leakage Characteristics

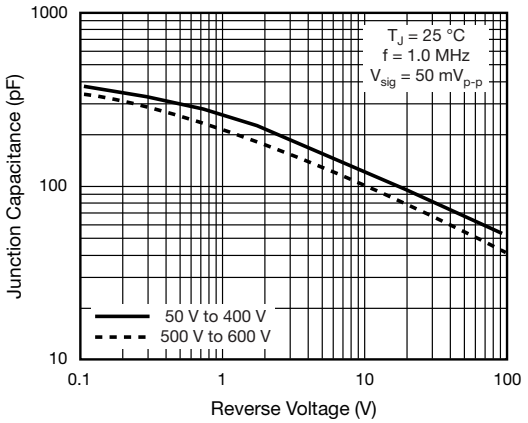
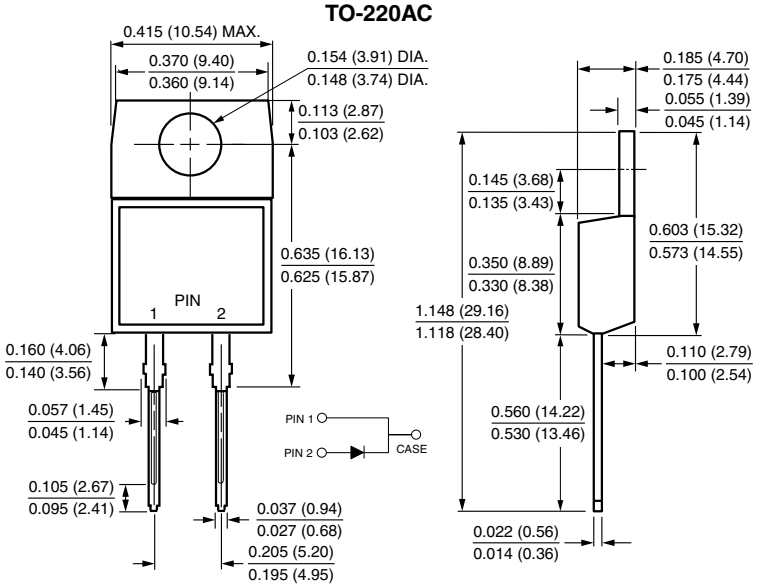



Fig. 5 - Typical Junction Capacitance

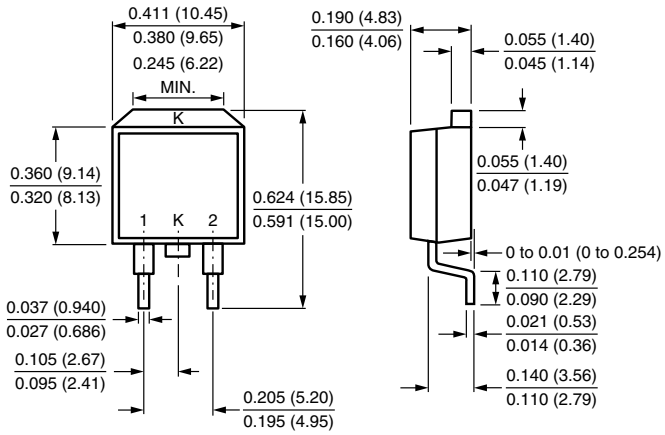

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## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

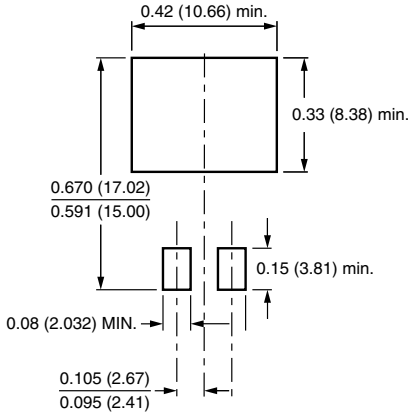
### TO-220AC




### D²PAK (TO-263AB)




### Mounting Pad Layout






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