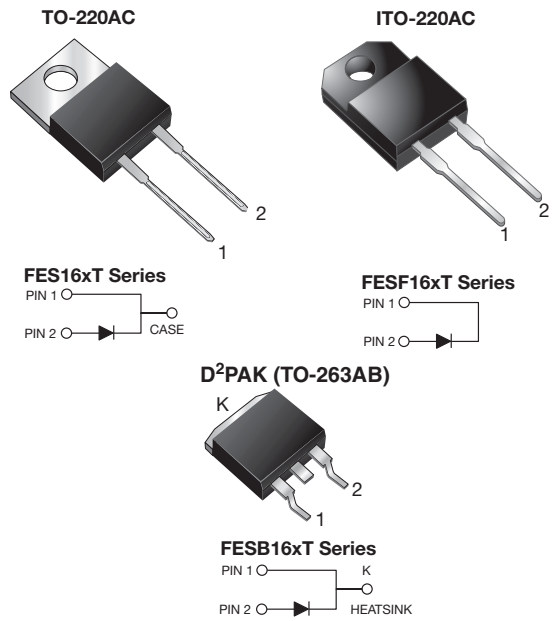
# Ultrafast Plastic Rectifier




## DESIGN SUPPORT TOOLS AVAILABLE

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, ITO-220AC, D²PAK (TO-263AB) |
| Circuit configurations | Single |

## FEATURES

RoHS COMPLIANT

- 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 and 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, ITO-220AC, D²PAK (TO-263AB)
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,....)

**Terminals:** matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 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 |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sales@prom-elec.com / ООО ПРОМЭЛЕКТРОНИКА

| **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 | $R_{\theta JC}$ | 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-E3/45 | 1.33 | 45 | 50/tube | Tube |
| TO-263AB | FESB16JT-E3/81 | 1.33 | 81 | 800/reel | Tape and reel |
| ITO-220AC | FESF16JTHE3_A/P (1) | 1.80 | P | 50/tube | Tube |
| TO-263AB | FESB16JTHE3_A/P (1) | 1.33 | P | 50/tube | Tube |
| TO-263AB | FESB16JTHE3_A/I (1) | 1.33 | I | 800/reel | Tape and reel |

**Note**

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


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

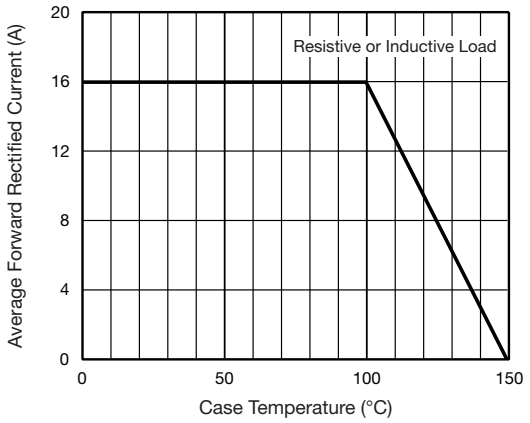


Fig. 1 - Maximum Forward Current Derating Curve

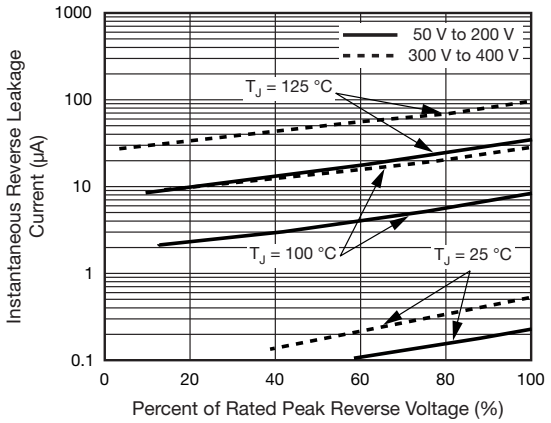


Fig. 4 - Typical Reverse Leakage Characteristics

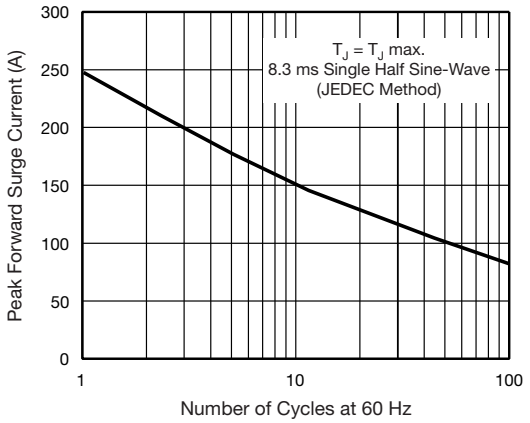


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

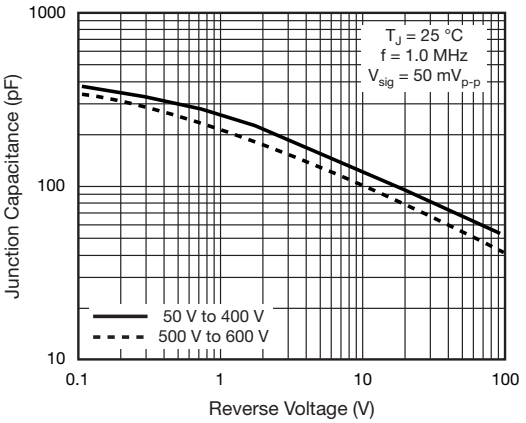


Fig. 5 - Typical Junction Capacitance

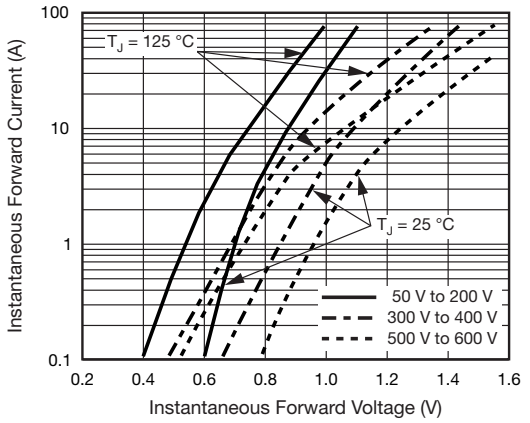


Fig. 3 - Typical Instantaneous Forward Characteristics


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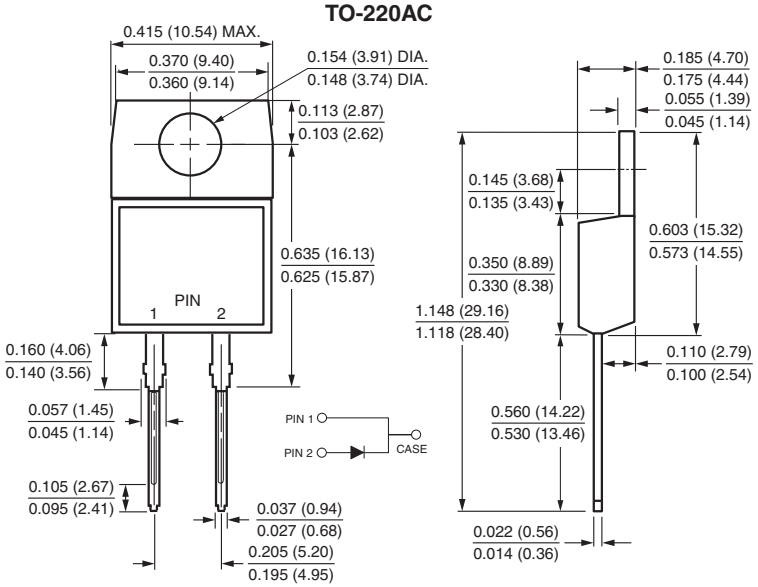
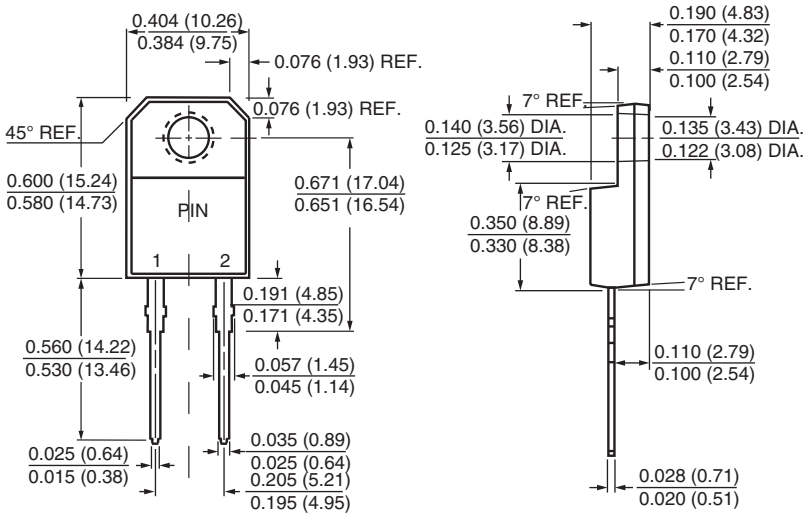
**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

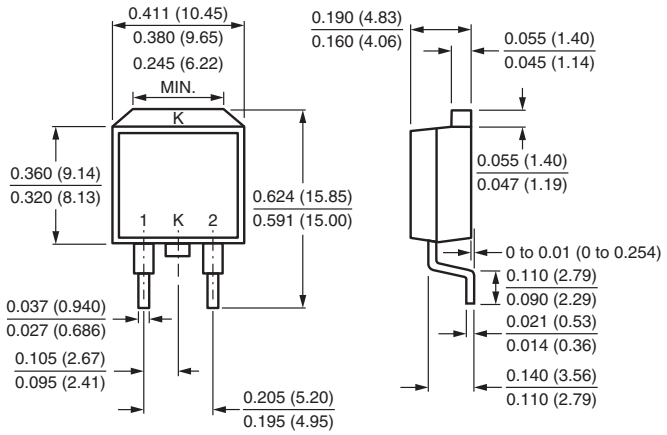
### TO-220AC



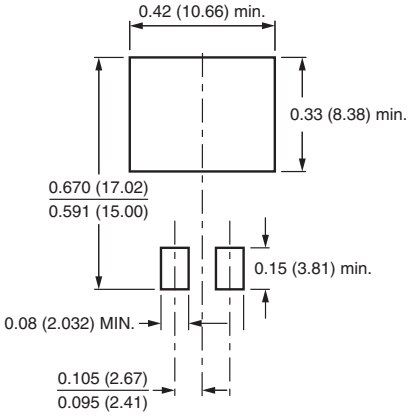

### ITO-220AC




### D²PAK (TO-263AB)




### Mounting Pad Layout





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