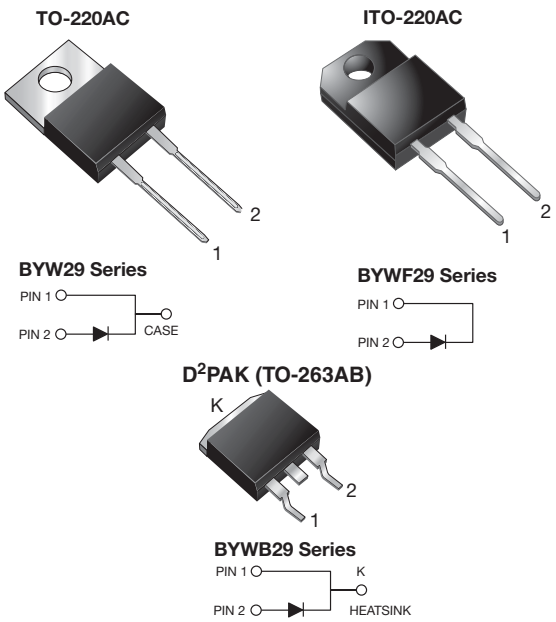
## Ultrafast Rectifier




### FEATURES

- Power pack
- Glass passivated pellet chip junction
- Ultrafast recovery time
- Low switching losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C ($D^2PAK$ (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 $D^2PAK$ (TO-263AB package))
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT

### DESIGN SUPPORT TOOLS AVAILABLE

3D Models

### 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, $D^2PAK$ (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.

| PRIMARY CHARACTERISTICS | |
|---|---|
| $I_{F(AV)}$ | 8.0 A |
| $V_{RRM}$ | 50 V to 200 V |
| $I_{FSM}$ | 100 A |
| $t_{rr}$ | 25 ns |
| $V_F$ | 0.8 V |
| $T_J$ max. | 150 °C |
| Package | TO-220AC, ITO-220AC, $D^2PAK$ (TO-263AB) |
| Circuit configurations | Single |

**MAXIMUM RATINGS** ($T_C$ = 25 °C unless otherwise noted)

| PARAMETER | SYMBOL | BYW29-50 | BYW29-100 | BYW29-150 | BYW29-200 | UNIT |
|---|---|---|---|---|---|---|
| Maximum repetitive peak reverse voltage | $V_{RRM}$ | 50 | 100 | 150 | 200 | V |
| Maximum RMS voltage | $V_{RMS}$ | 35 | 70 | 105 | 140 | V |
| Maximum DC blocking voltage | $V_{DC}$ | 50 | 100 | 150 | 200 | V |
| Maximum average forward rectified current at $T_C$ = 105 °C | $I_{F(AV)}$ | 8.0 | | | | A |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | $I_{FSM}$ | 100 | | | | A |
| Operating and storage 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** | **BYW29-50** | **BYW29-100** | **BYW29-150** | **BYW29-200** | **UNIT** |
| Maximum instantaneous forward voltage | $I_F$ = 20 A | $T_J$ = 25 °C | $V_F$ (1) | 1.3 | | | | V |
| | $I_F$ = 8.0 A | $T_J$ = 150 °C | | 0.8 | | | | |
| 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 | $I_F$ = 1 A, $V_R$ = 30 V, dI/dt = 100 A/µs, $I_{rr}$ = 10 % $I_{RM}$ | | $t_{rr}$ | 25 | | | | ns |
| Typical junction capacitance | 4.0 V, 1 MHz | | $C_J$ | 45 | | | | pF |

**Note**

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

| **THERMAL CHARACTERISTICS** ($T_C$ = 25 °C unless otherwise noted) | | | | | |
|---|---|---|---|---|---|
| **PARAMETER** | **SYMBOL** | **BYW** | **BYWF** | **BYWB** | **UNIT** |
| Typical thermal resistance from junction to case per leg | $R_{\theta JC}$ | 2.5 | 5.5 | 2.5 | °C/W |

| **ORDERING INFORMATION** (Example) | | | | | |
|---|---|---|---|---|---|
| **PACKAGE** | **PREFERRED P/N** | **UNIT WEIGHT (g)** | **PACKAGE CODE** | **BASE QUANTITY** | **DELIVERY MODE** |
| TO-220AC | BYW29-200-E3/45 | 1.80 | 45 | 50/tube | Tube |
| ITO-220AC | BYWF29-200-E3/45 | 1.95 | 45 | 50/tube | Tube |
| $D^2$PAK (TO-263AB) | BYWB29-200-E3/45 | 1.77 | 45 | 50/tube | Tube |
| $D^2$PAK (TO-263AB) | BYWB29-200-E3/81 | 1.77 | 81 | 800/reel | Tape and reel |
| ITO-220AC | BYWF29-200HE3_A/P (1) | 1.95 | P | 50/tube | Tube |
| $D^2$PAK (TO-263AB) | BYWB29-200HE3_A/P (1) | 1.77 | P | 50/tube | Tube |
| $D^2$PAK (TO-263AB) | BYWB29-200HE3_A/I (1) | 1.77 | 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 °C unless otherwise noted)

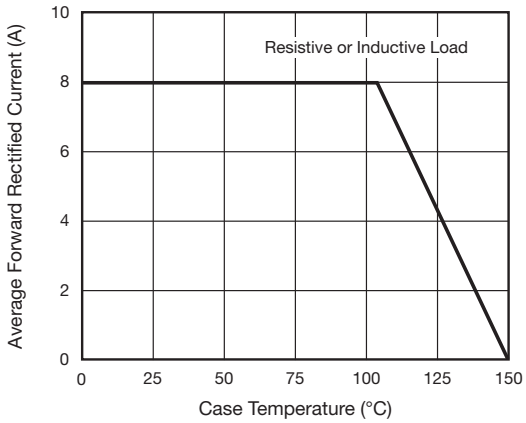



Fig. 1 - Maximum Forward Current Derating Curve

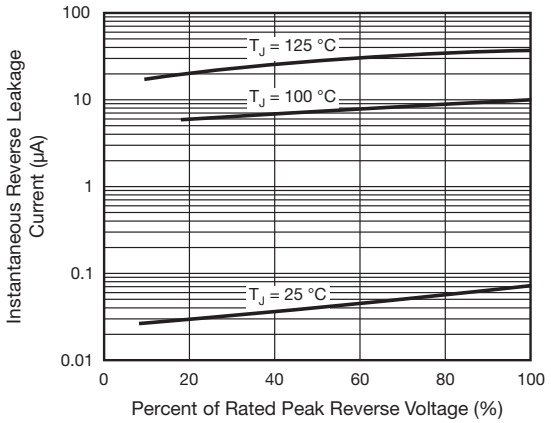



Fig. 4 - Typical Reverse Leakage Characteristics

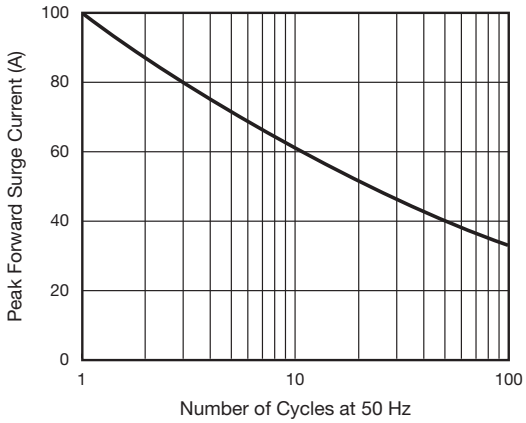



Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

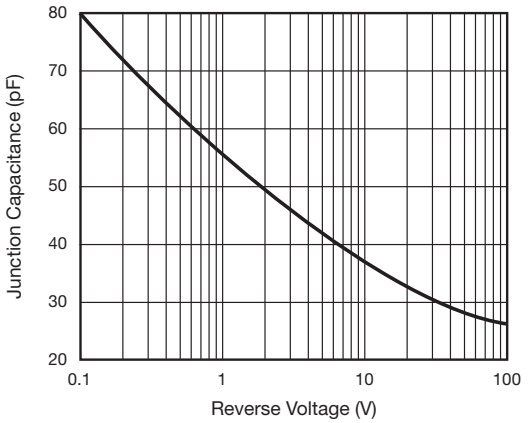



Fig. 5 - Typical Junction Capacitance

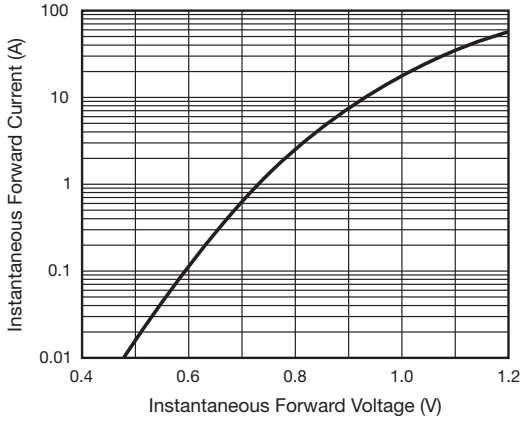
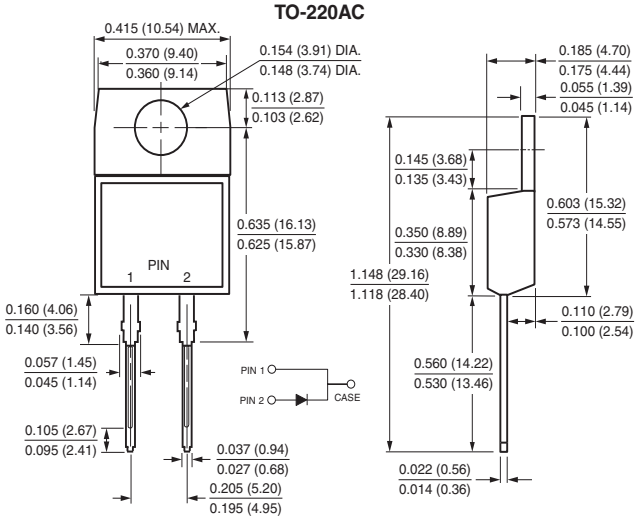


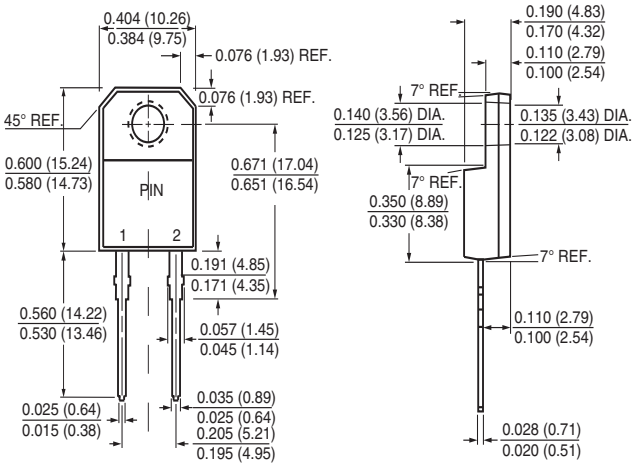

Fig. 3 - Typical Instantaneous Forward Characteristics

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

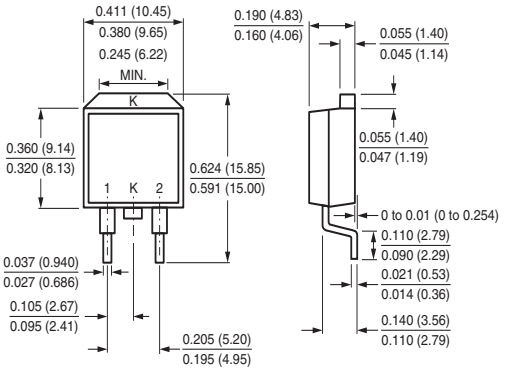
### TO-220AC



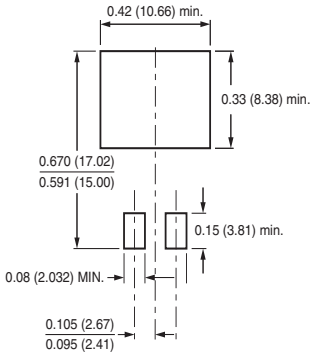

### ITO-220AC




### D²PAK (TO-263AB)




### Mounting Pad Layout



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