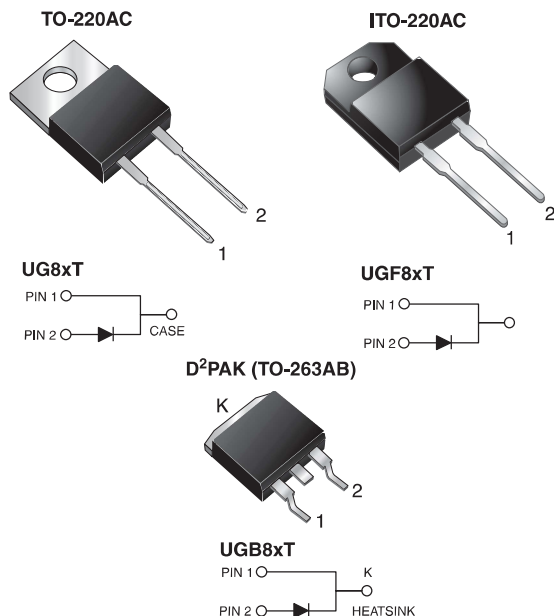


High Voltage Ultrafast Rectifier



FEATURES

- Power pack
- Glass passivated chip junction
- Ultrafast recovery time
- Soft recovery characteristics
- 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 voltage and high frequency power factor correction application.

MECHANICAL DATA

Case: TO-220AC, ITO-220AC, D²PAK (TO-263AB)
Molding compound meets UL 94V-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 JESD22-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.

DESIGN SUPPORT TOOLS AVAILABLE



| PRIMARY CHARACTERISTICS | |
|-------------------------|--|
| $I_{F(AV)}$ | 8.0 A |
| V_{RRM} | 500 V to 600 V |
| I_{FSM} | 100 A |
| t_{rr} | 25 ns |
| t_{fr} | 500 ns |
| V_F at $I_F = 8$ A | 1.5 V |
| T_J max. | 150 °C |
| Package | TO-220AC, ITO-220AC, D ² PAK (TO-263AB) |
| Circuit configuration | Single |

| MAXIMUM RATINGS ($T_C = 25$ °C unless otherwise noted) | | | | |
|--|----------------|-------------|-------|------|
| PARAMETER | SYMBOL | UG8HT | UG8JT | UNIT |
| Max. repetitive peak reverse voltage | V_{RRM} | 500 | 600 | V |
| Max. working reverse voltage | V_{RWM} | 400 | 480 | V |
| Max. RMS voltage | V_{RMS} | 350 | 420 | V |
| Max. DC blocking voltage | V_{DC} | 500 | 600 | V |
| Max. average forward rectified current | $I_{F(AV)}$ | 8.0 | | A |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | I_{FSM} | 100 | | A |
| Operating junction and storage temperature range | T_J, T_{STG} | -55 to +150 | | °C |
| Isolation voltage (ITO-220AB only) from terminals to heatsink $t = 1$ min | V_{AC} | 1500 | | V |

**ELECTRICAL CHARACTERISTICS** ($T_C = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)

| PARAMETER | TEST CONDITIONS | | SYMBOL | UG8HT | UG8JT | UNIT |
|---|---|-------------------------|-----------------|-------|-------|------|
| Max. instantaneous forward voltage ⁽¹⁾ | I _F = 8 A | T _J = 25 °C | V _F | 1.75 | | V |
| | I _F = 8 A | T _J = 125 °C | | 1.50 | | |
| Max. DC reverse current at V _{RWM} | | T _J = 25 °C | I _R | 30 | | μA |
| | | T _J = 100 °C | | 800 | | μA |
| | | T _J = 125 °C | | 4.0 | | mA |
| Max. reverse recovery time | I _F = 0.5 A, I _R = 1.0 A, I _{rr} = 0.25 A | | t _{rr} | 25 | | ns |
| | I _F = 1.0 A, dI/dt = 50 A/μs, V _R = 30 V, I _{rr} = 0.1 I _{RM} | | t _{rr} | 50 | | ns |
| Typical softness factor (t _b /t _a) | I _F = 8.0 A, dI/dt = 240 A/μs, V _R = 400 V, I _{rr} = 0.1 I _{RM} | | S | 1.0 | | - |
| Max. reverse recovery current | I _F = 8.0 A, dI/dt = 64 A/μs, V _R = 400 V, T _C = 125 °C | | I _{RM} | 5.5 | | A |
| | I _F = 8.0 A, dI/dt = 240 A/μs, V _R = 400 V, T _C = 125 °C | | I _{RM} | 10 | | A |
| Peak forward recovery time | I _F = 8.0 A, dI/dt = 64 A/μs, V _F = 1.1 x V _{F max.} | | t _{fr} | 500 | | ns |

Note

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

THERMAL CHARACTERISTICS ($T_C = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)

| PARAMETER | SYMBOL | UG8 | UGF | UGB8 | UNIT |
|--|-----------------|-----|-----|------|-----------------------------|
| Typical thermal resistance from junction to case | $R_{\theta JC}$ | 2.2 | 5.0 | 2.2 | $^{\circ}\text{C}/\text{W}$ |

ORDERING INFORMATION (Example)

| PACKAGE | PREFERRED P/N | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
|-------------------------------|------------------------------|-----------------|--------------|---------------|---------------|
| TO-220AC | UG8JT-E3/45 | 1.80 | 45 | 50/tube | Tube |
| ITO-220AC | UGF8JT-E3/45 | 1.95 | 45 | 50/tube | Tube |
| D ² PAK (TO-263AB) | UGB8JT-E3/45 | 1.33 | 45 | 50/tube | Tube |
| D ² PAK (TO-263AB) | UGB8JT-E3/81 | 1.33 | 81 | 800/reel | Tape and reel |
| ITO-220AC | UGF8JT-E3_A/P ⁽¹⁾ | 1.95 | P | 50/tube | Tube |
| D ² PAK (TO-263AB) | UGB8JT-E3_A/P ⁽¹⁾ | 1.33 | P | 50/tube | Tube |
| D ² PAK (TO-263AB) | UGB8JT-E3_AI ⁽¹⁾ | 1.33 | I | 800/reel | Tape and reel |

Note

⁽¹⁾ AEC-Q101 qualified available in ITO-220 and D²PAK (TO-263AB) package



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

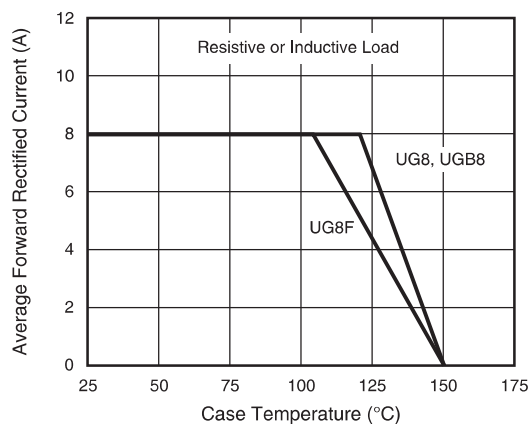


Fig. 1 - Max. Forward Current Derating Curve

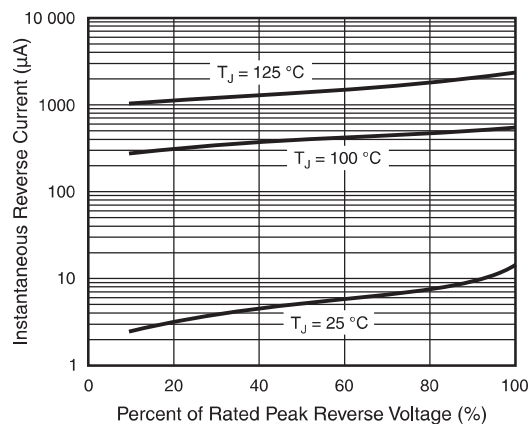


Fig. 4 - Typical Reverse Leakage Characteristics

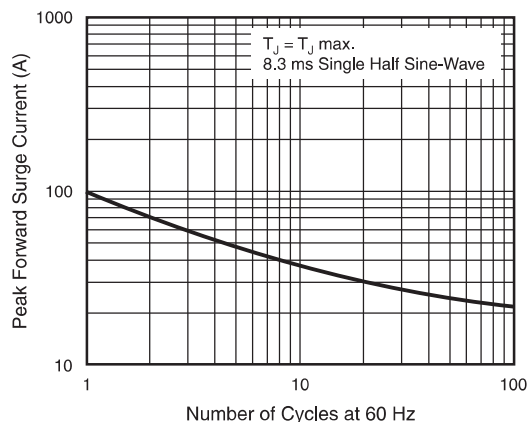


Fig. 2 - Max. Non-Repetitive Peak Forward Surge Current

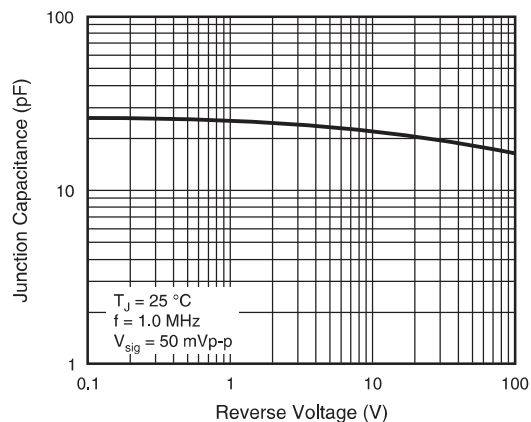


Fig. 5 - Typical Junction Capacitance

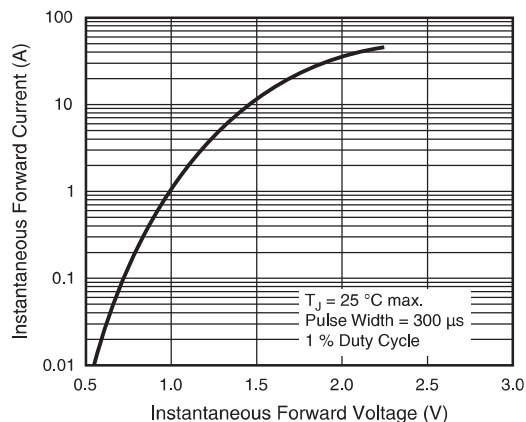


Fig. 3 - Typical Instantaneous Forward Characteristics

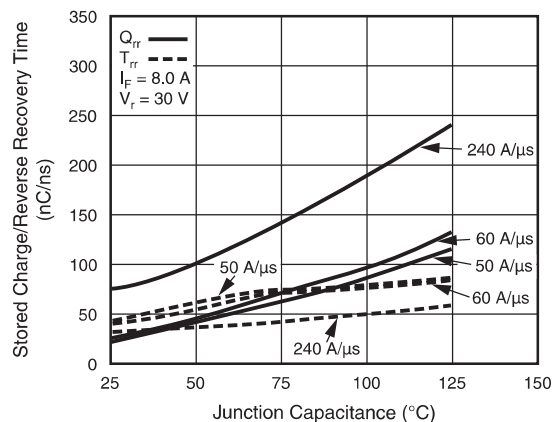
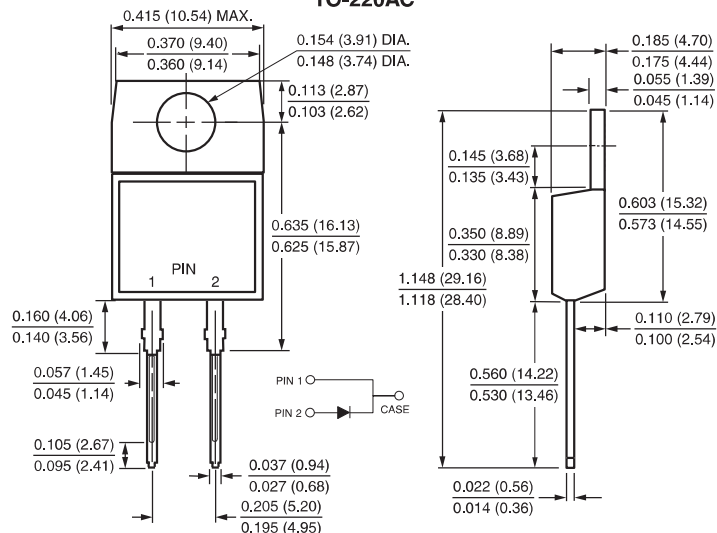


Fig. 6 - Reverse Switching Characteristics

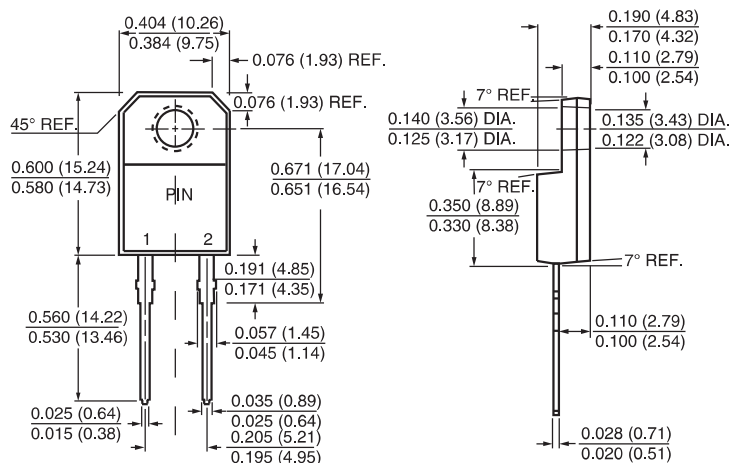


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

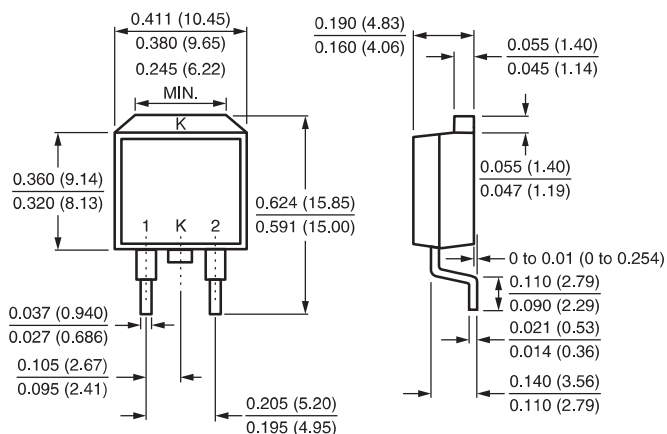
TO-220AC



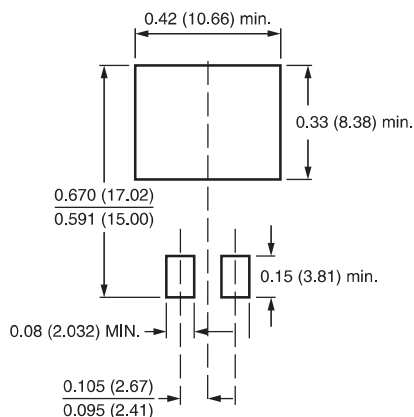
ITO-220AC



D²PAK (TO-263AB)



Mounting Pad Layout





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