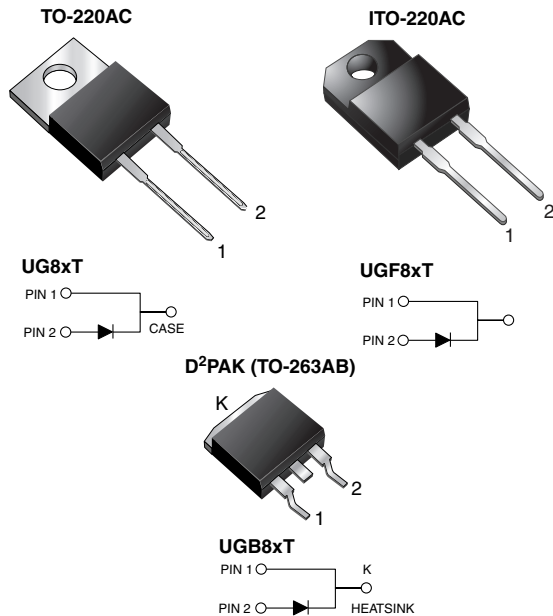




## High Voltage Ultrafast Rectifier



### 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 D<sup>2</sup>PAK (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<sup>2</sup>PAK (TO-263AB package))
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



RoHS  
COMPLIANT

### TYPICAL APPLICATIONS

For use in high voltage and high frequency power factor correction application.

### MECHANICAL DATA

**Case:** TO-220AC, ITO-220AC, D<sup>2</sup>PAK (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.

### LINKS TO ADDITIONAL RESOURCES



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 <sup>2</sup> 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 <sub>C</sub> = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	UG8HT	UG8JT	UNIT
Max. instantaneous forward voltage <sup>(1)</sup>	I <sub>F</sub> = 8 A	T <sub>J</sub> = 25 °C	V <sub>F</sub>	1.75		V
	I <sub>F</sub> = 8 A	T <sub>J</sub> = 125 °C		1.50		
Max. DC reverse current at V <sub>RWM</sub>	T <sub>J</sub> = 25 °C		I <sub>R</sub>	30		μA
	T <sub>J</sub> = 100 °C			800		μA
	T <sub>J</sub> = 125 °C			4.0		mA
Max. reverse recovery time	I <sub>F</sub> = 0.5 A, I <sub>R</sub> = 1.0 A, I <sub>rr</sub> = 0.25 A		t <sub>rr</sub>	25		ns
	I <sub>F</sub> = 1.0 A, dI/dt = 50 A/μs, V <sub>R</sub> = 30 V, I <sub>rr</sub> = 0.1 I <sub>RM</sub>		t <sub>rr</sub>	50		ns
Typical softness factor (t <sub>b</sub> /t <sub>a</sub> )	I <sub>F</sub> = 8.0 A, dI/dt = 240 A/μs, V <sub>R</sub> = 400 V, I <sub>rr</sub> = 0.1 I <sub>RM</sub>		S	1.0		-
Max. reverse recovery current	I <sub>F</sub> = 8.0 A, dI/dt = 64 A/μs, V <sub>R</sub> = 400 V, T <sub>C</sub> = 125 °C		I <sub>RM</sub>	5.5		A
	I <sub>F</sub> = 8.0 A, dI/dt = 240 A/μs, V <sub>R</sub> = 400 V, T <sub>C</sub> = 125 °C		I <sub>RM</sub>	10		A
Peak forward recovery time	I <sub>F</sub> = 8.0 A, dI/dt = 64 A/μs, V <sub>F</sub> = 1.1 x V <sub>F max.</sub>		t <sub>fr</sub>	500		ns

**Note**

<sup>(1)</sup> Pulse test: 300 μs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T <sub>C</sub> = 25 °C unless otherwise noted)					
PARAMETER	SYMBOL	UG8	UGF	UGB8	UNIT
Typical thermal resistance from junction to case	R <sub>θJC</sub>	2.2	5.0	2.2	°C/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 <sup>2</sup> PAK (TO-263AB)	UGB8JT-E3/45	1.33	45	50/tube	Tube
D <sup>2</sup> PAK (TO-263AB)	UGB8JT-E3/81	1.33	81	800/reel	Tape and reel
ITO-220AC	UGF8JT <sub>HE3</sub> _A/P <sup>(1)</sup>	1.95	P	50/tube	Tube
D <sup>2</sup> PAK (TO-263AB)	UGB8JT <sub>HE3</sub> _A/P <sup>(1)</sup>	1.33	P	50/tube	Tube
D <sup>2</sup> PAK (TO-263AB)	UGB8JT <sub>HE3</sub> _A/I <sup>(1)</sup>	1.33	I	800/reel	Tape and reel

**Note**

<sup>(1)</sup> AEC-Q101 qualified available in ITO-220 and D<sup>2</sup>PAK (TO-263AB) package



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

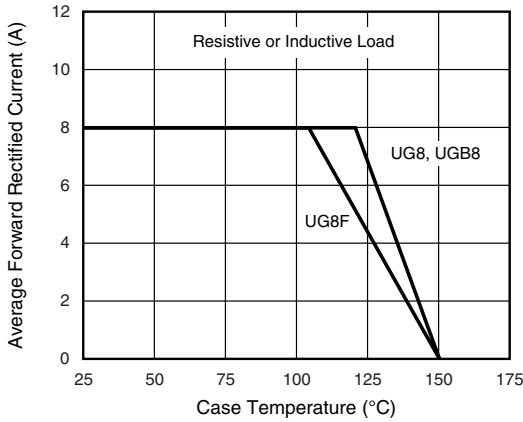


Fig. 1 - Max. Forward Current Derating Curve

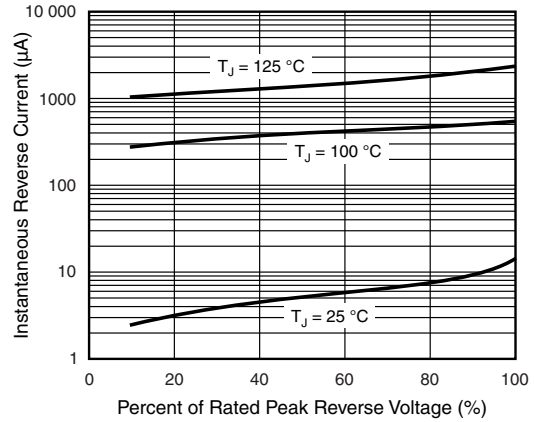


Fig. 4 - Typical Reverse Leakage Characteristics

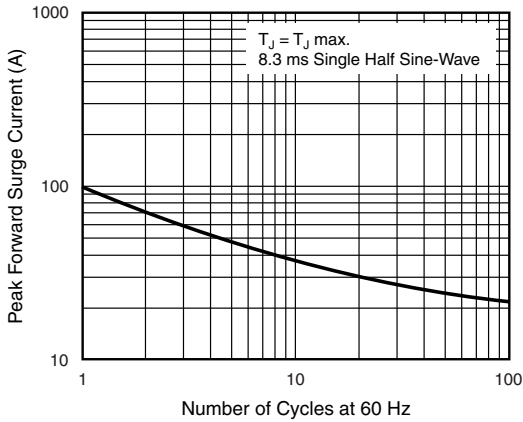


Fig. 2 - Max. Non-Repetitive Peak Forward Surge Current

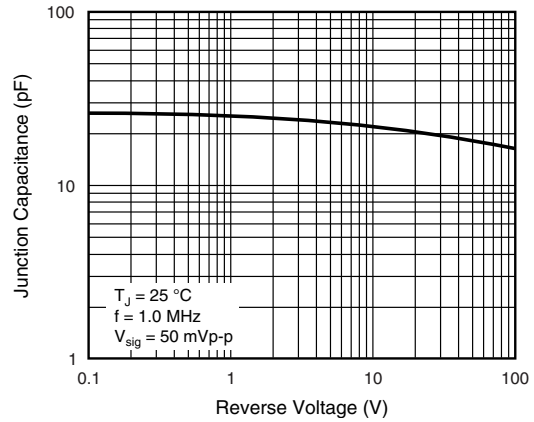


Fig. 5 - Typical Junction Capacitance

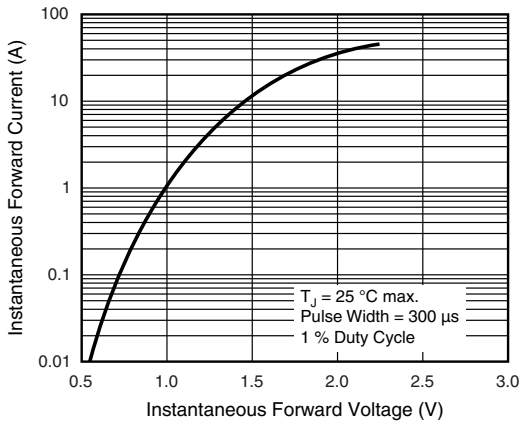


Fig. 3 - Typical Instantaneous Forward Characteristics

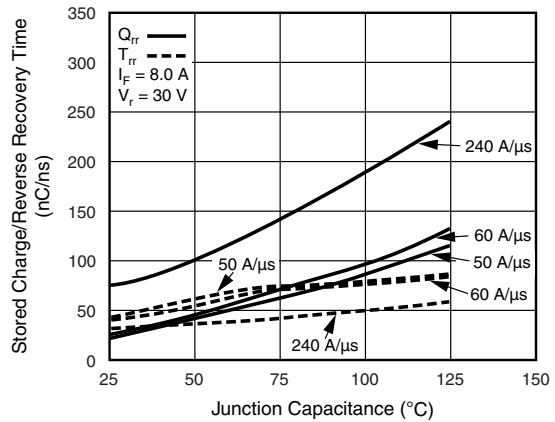
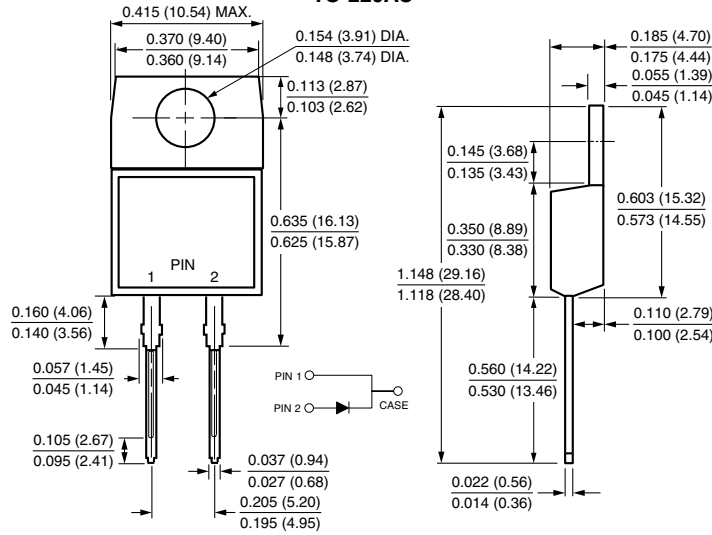


Fig. 6 - Reverse Switching Characteristics

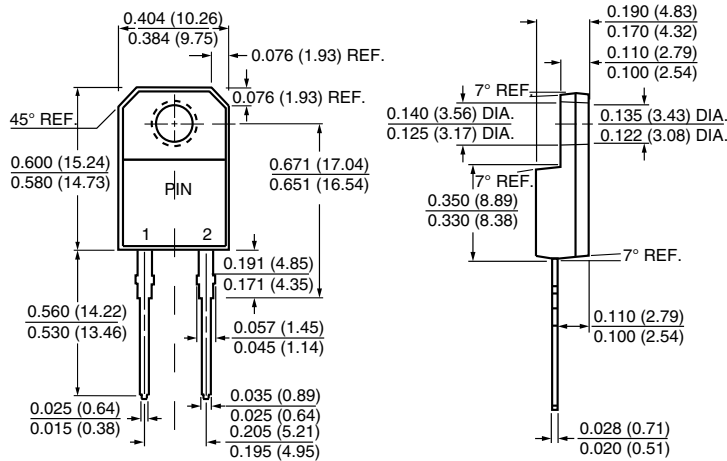


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

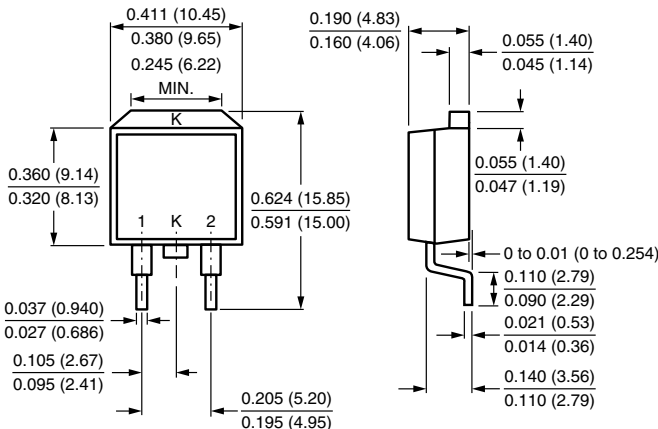
TO-220AC



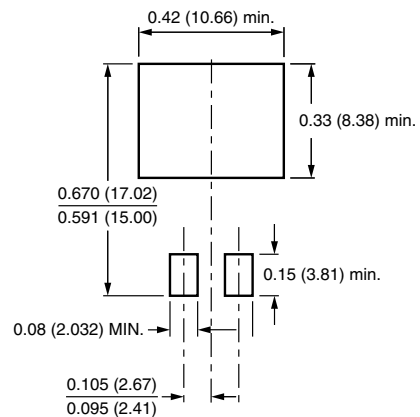
ITO-220AC



D<sup>2</sup>PAK (TO-263AB)



Mounting Pad Layout





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