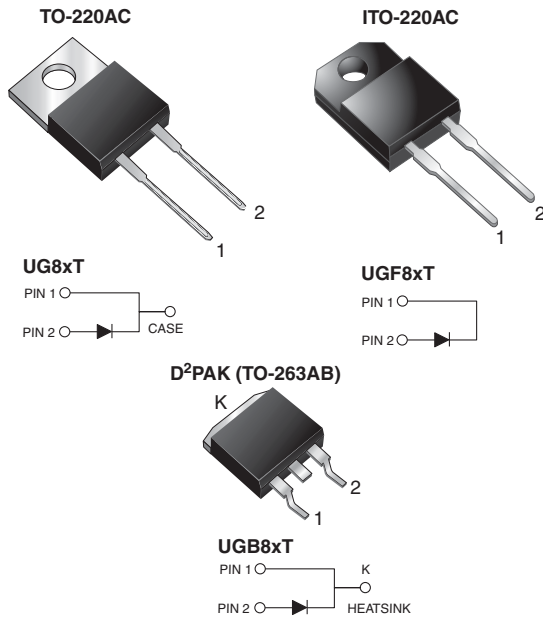


## Ultrafast Rectifier



### FEATURES

- 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 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](http://www.vishay.com/doc?99912)



RoHS  
COMPLIANT

### 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 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
$V_{RRM}$	50 V to 200 V
$I_{FSM}$	150 A
$t_{rr}$	20 ns
$V_F$ at $I_F$	0.95 V
$T_J$ max.	150 °C
Package	TO-220AC, ITO-220AC, D²PAK (TO-263AB)
Circuit configuration	Single

MAXIMUM RATINGS ( $T_C = 25$ °C unless otherwise noted)						
PARAMETER	SYMBOL	UG8AT	UG8BT	UG8CT	UG8DT	UNIT
Max. repetitive peak reverse voltage	$V_{RRM}$	50	100	150	200	V
Max. RMS voltage	$V_{RMS}$	35	70	105	140	V
Max. DC blocking voltage	$V_{DC}$	50	100	150	200	V
Max. average forward rectified current at $T_C = 100$ °C	$I_{F(AV)}$	8.0				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	$I_{FSM}$	150				A
Operating junction and storage temperature range	$T_J, T_{STG}$	-55 to +150				°C
Isolation voltage (ITO-220AC 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	UG8AT	UG8BT	UG8CT	UG8DT	UNIT
Max. instantaneous forward voltage	8.0 A	$T_J = 150\text{ }^\circ\text{C}$	$V_F^{(1)}$	1.0				V
	20.0 A			1.2				
	5.0 A			0.95				
Max. DC reverse current at rated DC blocking voltage			$I_R$	$T_J = 25\text{ }^\circ\text{C}$			10	$\mu\text{A}$
				$T_J = 100\text{ }^\circ\text{C}$			300	
Max. reverse recovery time	$I_F = 0.5\text{ A}, I_R = 1.0\text{ A}, I_{rr} = 0.25\text{ A}$		$t_{rr}$	20			ns	
Max. reverse recovery time	$I_F = 8.0\text{ A}, V_R = 30\text{ V}, dI/dt = 50\text{ A}/\mu\text{s}, I_{rr} = 10\% I_{RM}$		$t_{rr}$	$T_J = 25\text{ }^\circ\text{C}$			30	ns
				$T_J = 100\text{ }^\circ\text{C}$			50	
Max. recovered stored charged	$I_F = 8.0\text{ A}, V_R = 30\text{ V}, dI/dt = 50\text{ A}/\mu\text{s}$		$Q_{rr}$	$T_J = 25\text{ }^\circ\text{C}$			20	nC
				$T_J = 100\text{ }^\circ\text{C}$			45	
Typical junction capacitance	4.0 V, 1 MHz		$C_J$	45			pF	

**Note**(1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS ( $T_C = 25\text{ }^\circ\text{C}$ unless otherwise noted)					
PARAMETER	SYMBOL	UG8xT	UGF8xT	UGB8xT	UNIT
Typical thermal resistance from junction to case	$R_{\theta JC}^{(1)}$	4.0	5.0	4.0	$^\circ\text{C}/\text{W}$

ORDERING INFORMATION (Example)					
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TO-220AC	UG8DT-E3/45	1.80	45	50/tube	Tube
ITO-220AC	UGF8DT-E3/45	1.95	45	50/tube	Tube
D <sup>2</sup> PAK (TO-263AB)	UGB8DT-E3/45	1.33	45	50/tube	Tube
D <sup>2</sup> PAK (TO-263AB)	UGB8DT-E3/81	1.33	81	800/reel	Tape and reel
ITO-220AC	UGF8DTHE3_A/P <sup>(1)</sup>	1.95	P	50/tube	Tube
D <sup>2</sup> PAK (TO-263AB)	UGB8DTHE3_A/P <sup>(1)</sup>	1.33	P	50/tube	Tube
D <sup>2</sup> PAK (TO-263AB)	UGB8DTHE3_A/I <sup>(1)</sup>	1.33	I	800/reel	Tape and reel

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



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

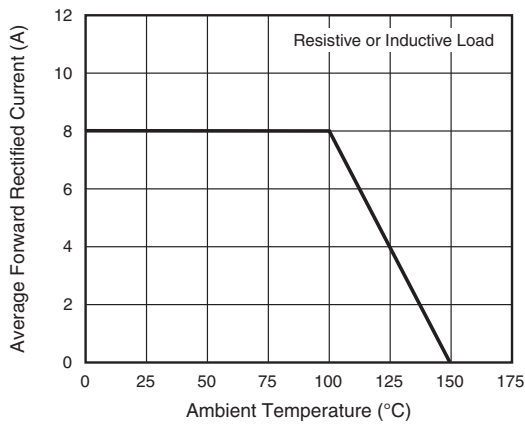


Fig. 1 - Max. Forward Current Derating Curve

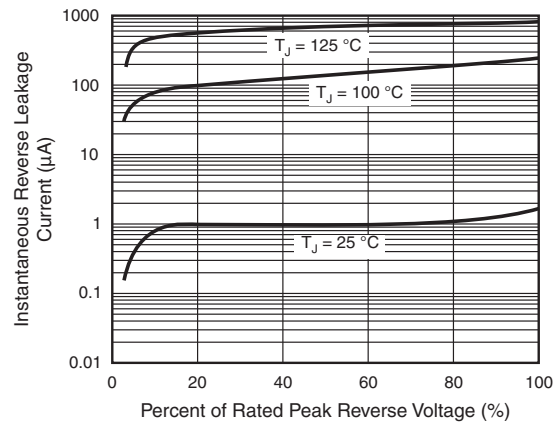


Fig. 4 - Typical Reverse Characteristics

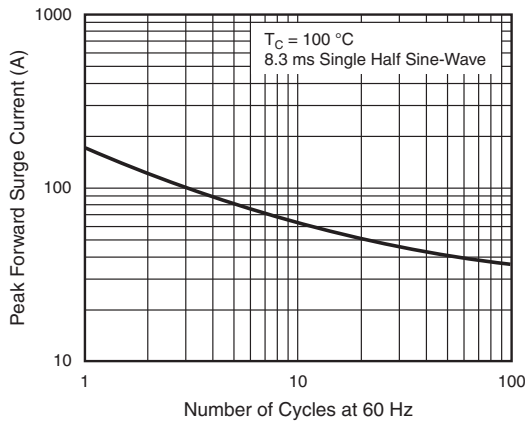


Fig. 2 - Max. Non-Repetitive Peak Forward Surge Current

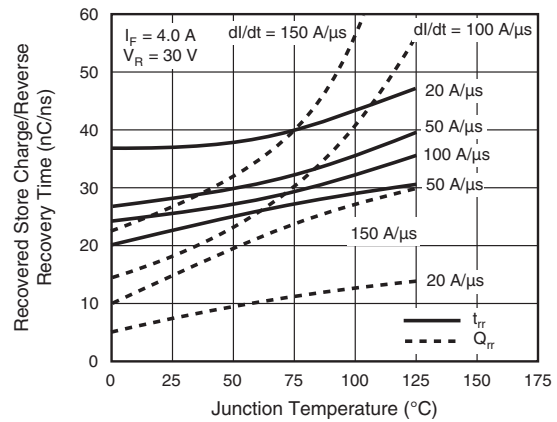


Fig. 5 - Reverse Switching Characteristics

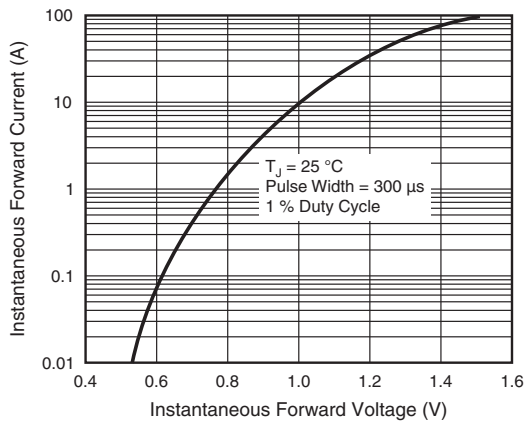


Fig. 3 - Typical Instantaneous Forward Characteristics

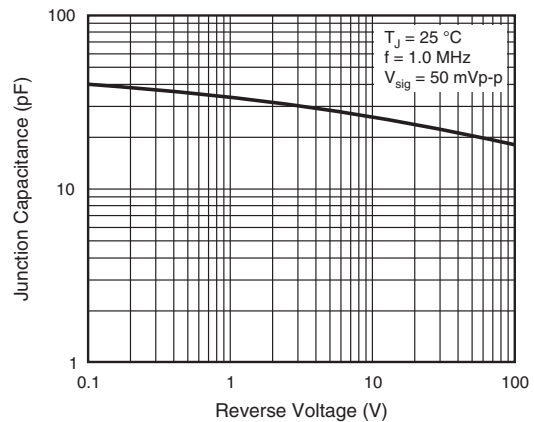
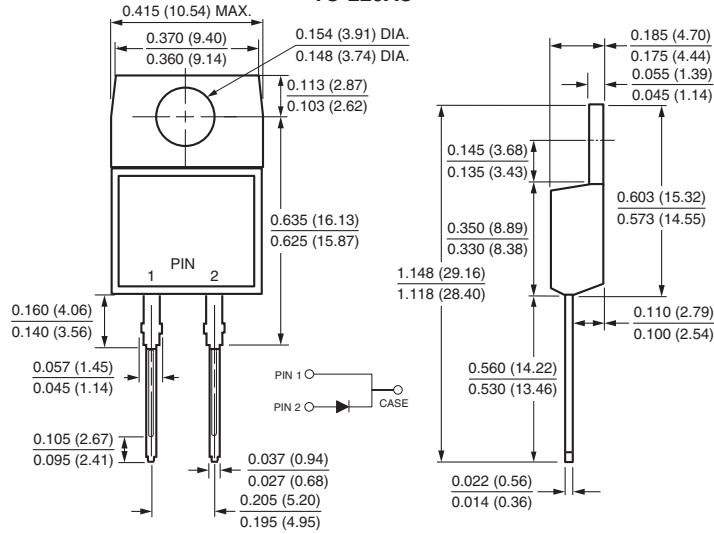


Fig. 6 - Typical Junction Capacitance

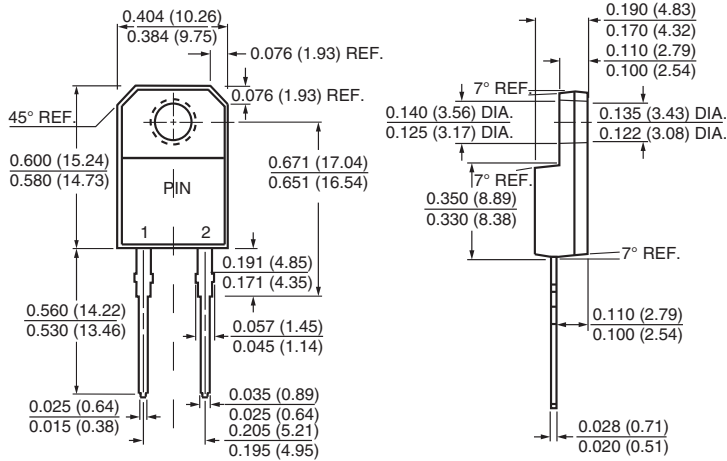


### PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

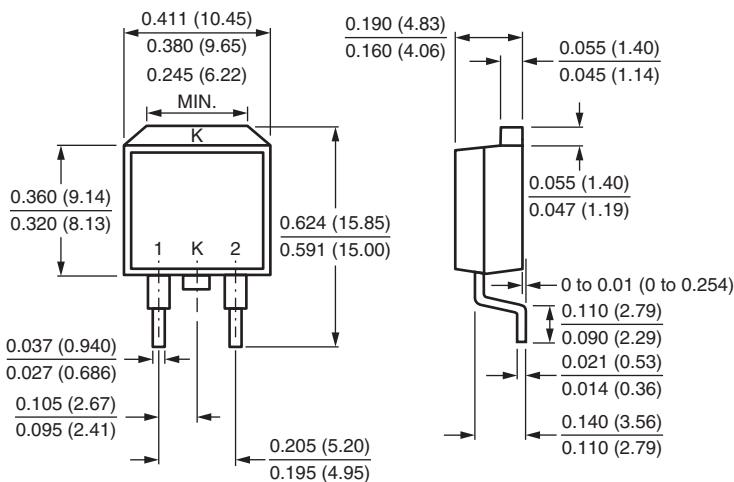
#### TO-220AC



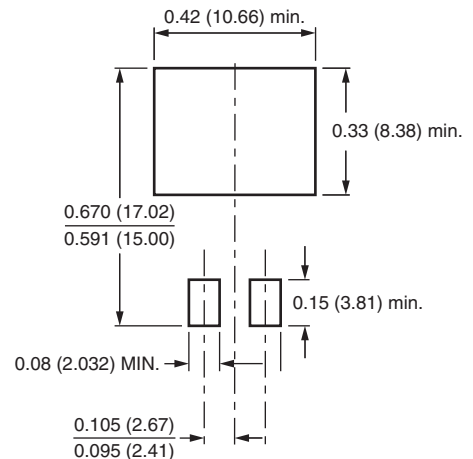
#### ITO-220AC



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



#### Mounting Pad Layout





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