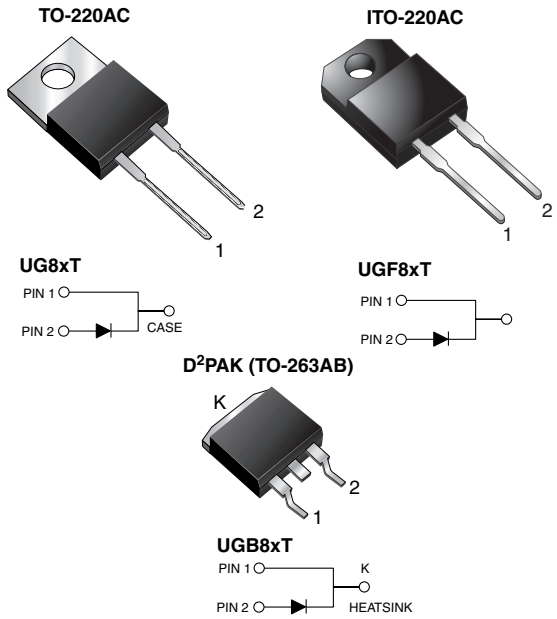
High Voltage Ultrafast Rectifier



LINKS TO ADDITIONAL RESOURCES

3D Models

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, D²PAK (TO-263AB)
Circuit configuration	Single

FEATURES

RoHS COMPLIANT

- 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.

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

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ELECTRICAL CHARACTERISTICS (T_C = 25 °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 °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	°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^2PAK (TO-263AB)	UGB8JT-E3/45	1.33	45	50/tube	Tube
D^2PAK (TO-263AB)	UGB8JT-E3/81	1.33	81	800/reel	Tape and reel
ITO-220AC	UGF8JTHE3_A/P [1]	1.95	P	50/tube	Tube
D^2PAK (TO-263AB)	UGB8JTHE3_A/P [1]	1.33	P	50/tube	Tube
D^2PAK (TO-263AB)	UGB8JTHE3_A/I [1]	1.33	I	800/reel	Tape and reel

Note

[1] AEC-Q101 qualified available in ITO-220 and D^2PAK (TO-263AB) package

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RATINGS AND CHARACTERISTCS CURVES (T_A = 25 °C unless otherwise noted)

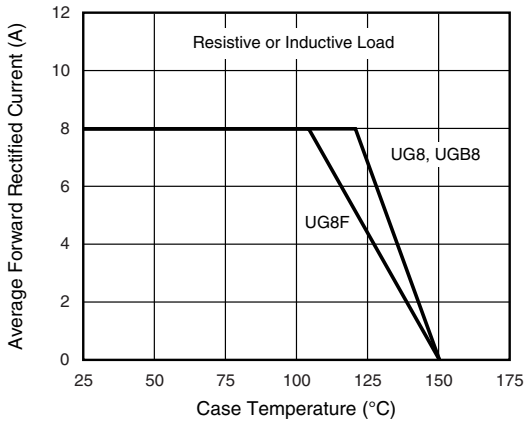

Fig. 1 - Max. Forward Current Derating Curve

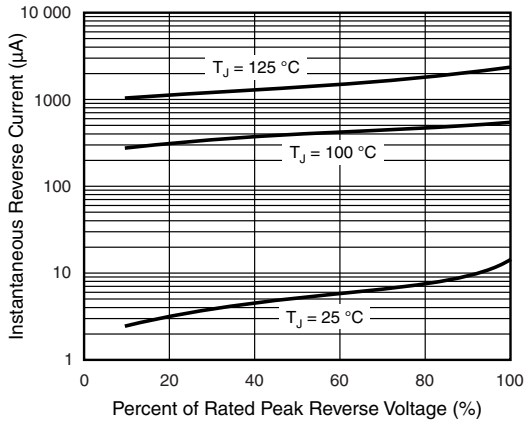

Fig. 4 - Typical Reverse Leakage Characteristics

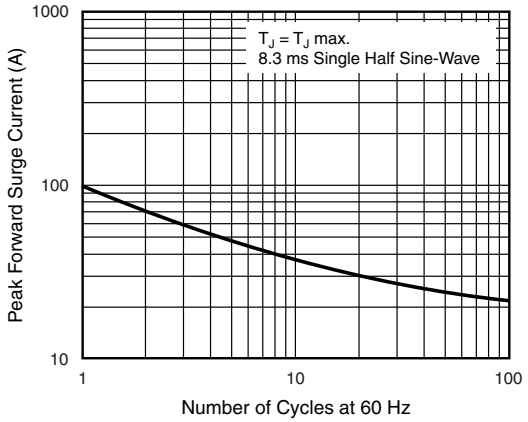

Fig. 2 - Max. Non-Repetitive Peak Forward Surge Current

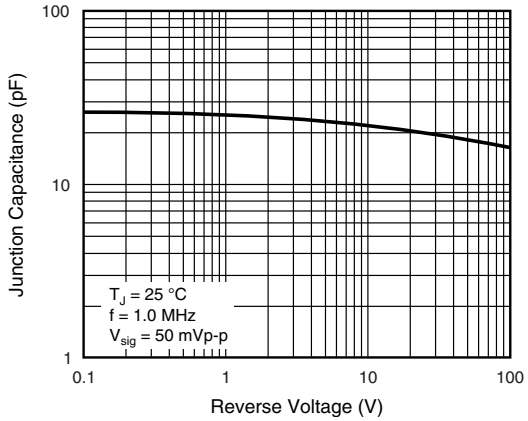

Fig. 5 - Typical Junction Capacitance

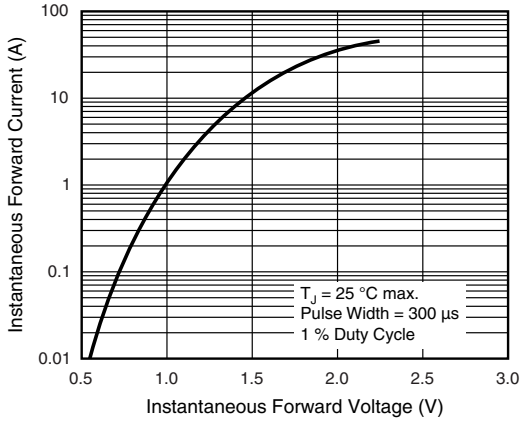

Fig. 3 - Typical Instantaneous Forward Characteristics

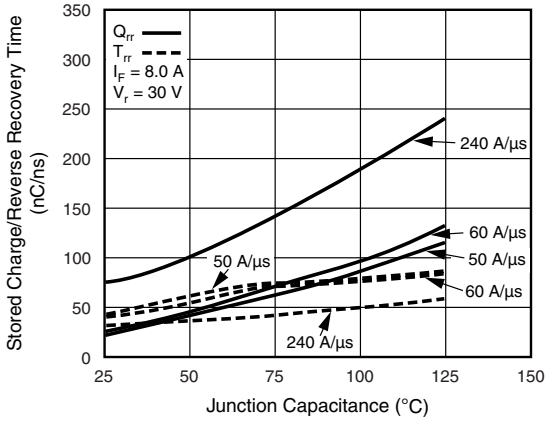

Fig. 6 - Reverse Switching Characteristics

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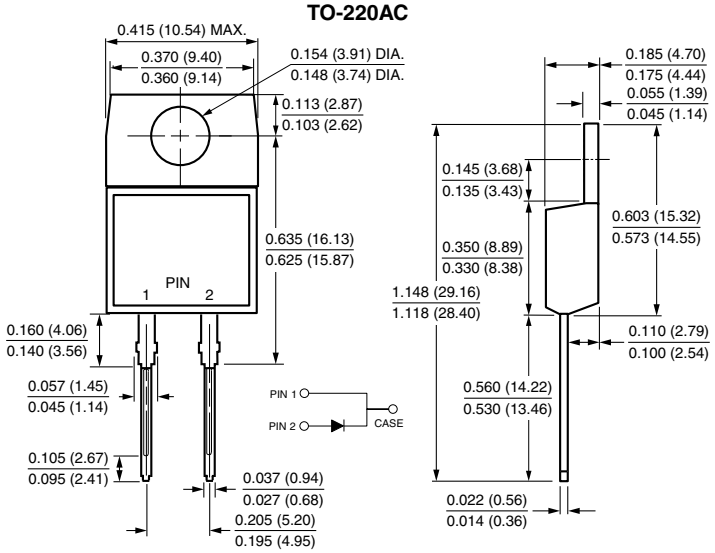
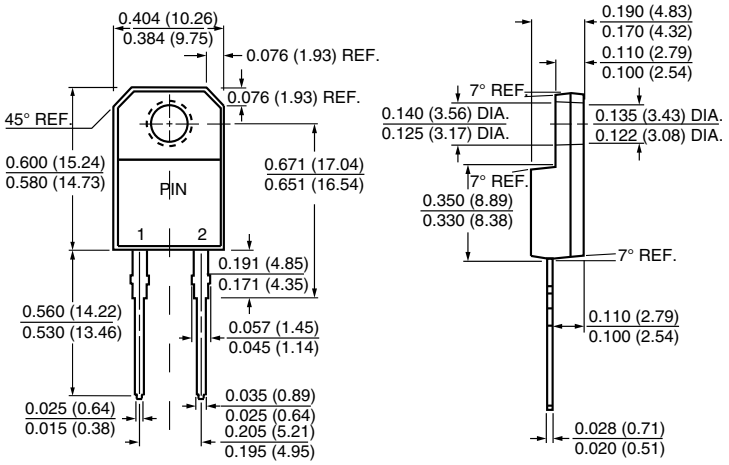
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

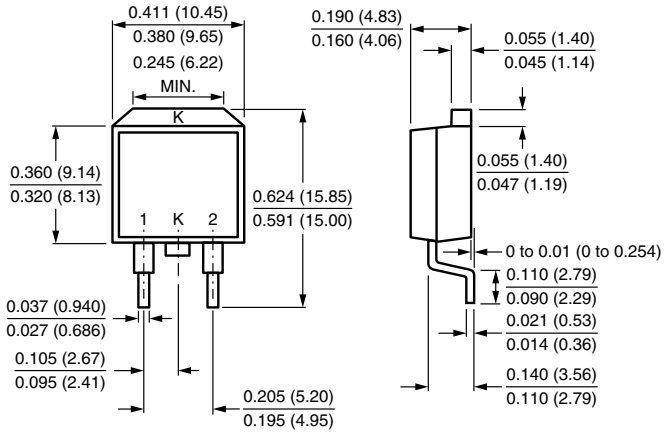
TO-220AC



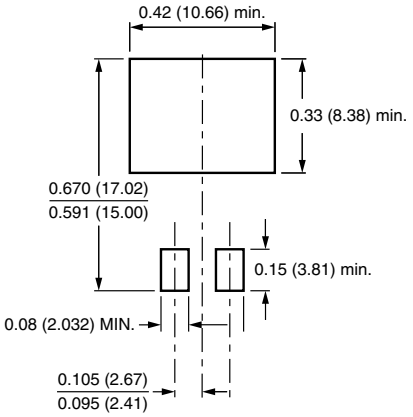
ITO-220AC



D²PAK (TO-263AB)



Mounting Pad Layout



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