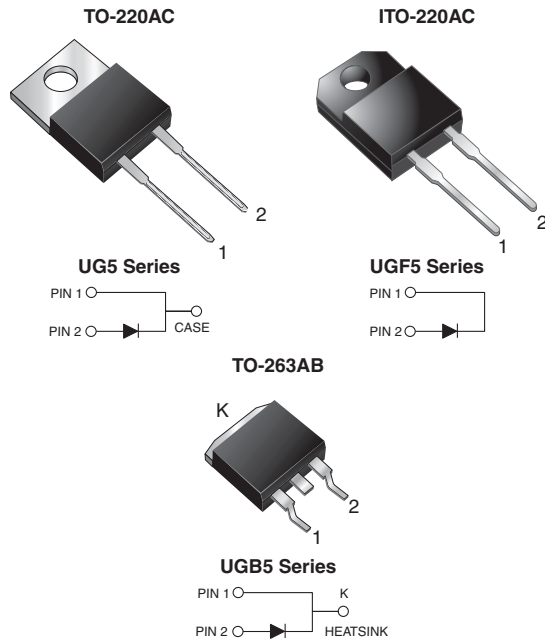


## High Voltage Ultrafast Rectifier



### FEATURES

- Power pack
- Glass passivated pellet 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 TO-263AB package)
- Solder dip 275 °C max., 10 s per JESD 22-B106 (for TO-220AC and ITO-220AC package)
- AEC-Q101 qualified
- 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 corrector, freewheeling diodes and secondary DC/DC rectification application.

### MECHANICAL DATA

**Case:** TO-220AC, ITO-220AC, TO-263AB

Molding compound meets UL 94V-0 flammability rating  
Base P/N-E3 - RoHS-compliant, commercial grade  
Base P/NHE3 - RoHS-compliant, AEC-Q101 qualified

**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.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	5.0 A
$V_{RRM}$	500 V to 600 V
$I_{FSM}$	65 A
$t_{rr}$	25 ns
$V_F$ at $I_F = 5$ A	1.5 V
$T_J$ max.	150 °C
Package	TO-220AC, ITO-220AC, TO-263AB
Diode variations	Single die

MAXIMUM RATINGS ( $T_C = 25$ °C unless otherwise noted)				
PARAMETER	SYMBOL	UG5HT	UG5JT	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	$I_{F(AV)}$	5.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	$I_{FSM}$	65		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	UG5HT	UG5JT	UNIT
Max. instantaneous forward voltage	$I_F = 5\text{ A}$	$T_J = 25\text{ }^\circ\text{C}$	$V_F$	1.75		V
	$I_F = 5\text{ A}$	$T_J = 125\text{ }^\circ\text{C}$		1.50		
Max. DC reverse current at $V_{RWM}$	$T_J = 25\text{ }^\circ\text{C}$		$I_R$	30		$\mu\text{A}$
	$T_J = 100\text{ }^\circ\text{C}$			800		v
	$T_J = 125\text{ }^\circ\text{C}$			4.0		mA
Max. reverse recovery time	$I_F = 0.5\text{ A}, I_R = 1.0\text{ A}, I_{rr} = 0.25\text{ A}$		$t_{rr}$	25		ns
Max. reverse recovery time	$I_F = 1.0\text{ A}, di/dt = 50\text{ A}/\mu\text{s}, V_R = 30\text{ V}, I_{rr} = 0.1 I_{RM}$		$t_{rr}$	50		ns
Typical softness factor ( $t_b/t_a$ )	$I_F = 5.0\text{ A}, di/dt = 240\text{ A}/\mu\text{s}, V_R = 400\text{ V}, I_{rr} = 0.1 I_{RM}$		S	0.9		-
Max. reverse recovery current	$I_F = 5.0\text{ A}, di/dt = 40\text{ A}/\mu\text{s}, V_R = 400\text{ V}, T_C = 125\text{ }^\circ\text{C}$		$I_{RM}$	3.0		A
Max. reverse recovery current	$I_F = 5.0\text{ A}, di/dt = 240\text{ A}/\mu\text{s}, V_R = 400\text{ V}, T_C = 125\text{ }^\circ\text{C}$		$I_{RM}$	9.0		A
Peak forward recovery time	$I_F = 5.0\text{ A}, di/dt = 64\text{ A}/\mu\text{s}, V_F = 1.1 V_{F\text{ max.}}$		$t_{fr}$	500		ns

THERMAL CHARACTERISTICS ( $T_C = 25\text{ }^\circ\text{C}$ unless otherwise noted)					
PARAMETER	SYMBOL	UG5	UGF5	UGB5	UNIT
Typical thermal resistance from junction to case	$R_{\theta JC}^{(1)}$	3.0	5.5	3.0	$^\circ\text{C}/\text{W}$

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

ORDERING INFORMATION					
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TO-220AC	UG5JT-E3/45	1.80	45	50/tube	Tube
ITO-220AC	UGF5JT-E3/45	1.95	45	50/tube	Tube
TO-263AB	UGB5JT-E3/45	1.33	45	50/tube	Tube
TO-263AB	UGB5JT-E3/81	1.33	81	800/reel	Tape and reel
TO-220AC	UG5JT <sup>(1)</sup> E3/45	1.80	45	50/tube	Tube
ITO-220AC	UGF5JT <sup>(1)</sup> E3/45	1.95	45	50/tube	Tube
TO-263AB	UGB5JT <sup>(1)</sup> E3/45	1.33	45	50/tube	Tube
TO-263AB	UGB5JT <sup>(1)</sup> E3/81	1.33	81	800/reel	Tape and reel

**Note**

(1) AEC-Q101 qualified



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

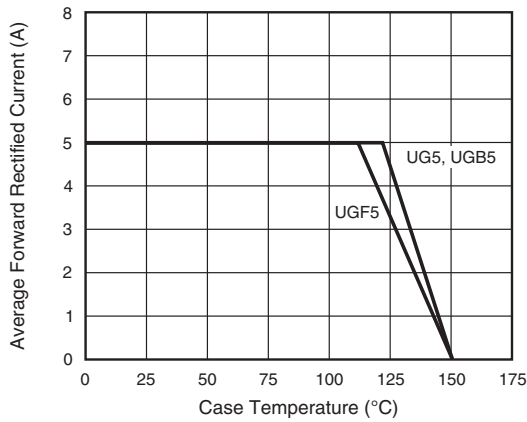


Fig. 1 - Forward Current Derating Curve

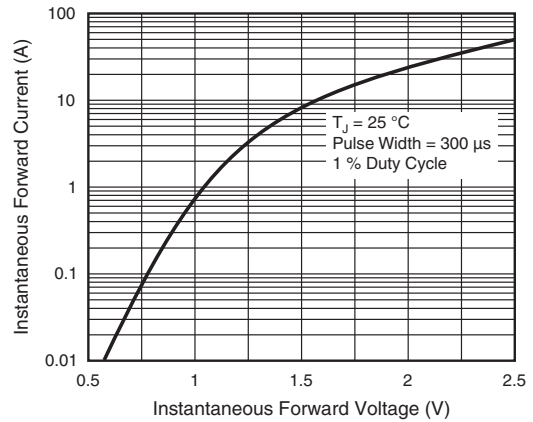


Fig. 4 - Typical Instantaneous Forward Characteristics

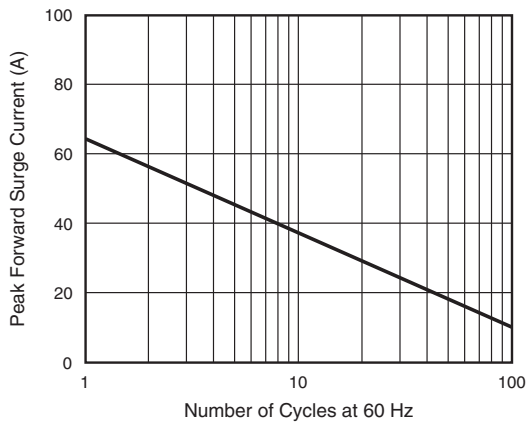


Fig. 2 - Max. Non-Repetitive Peak Forward Surge Current

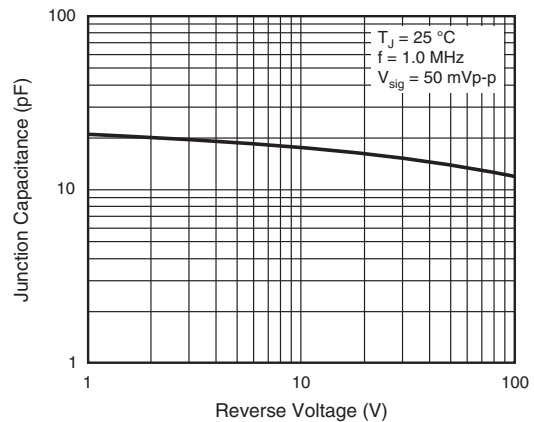


Fig. 5 - Typical Junction Capacitance

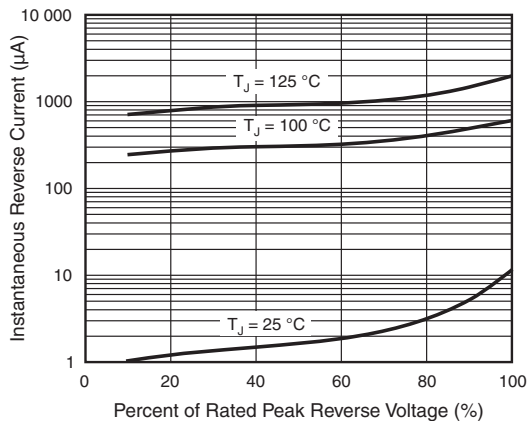


Fig. 3 - Typical Reverse Characteristics

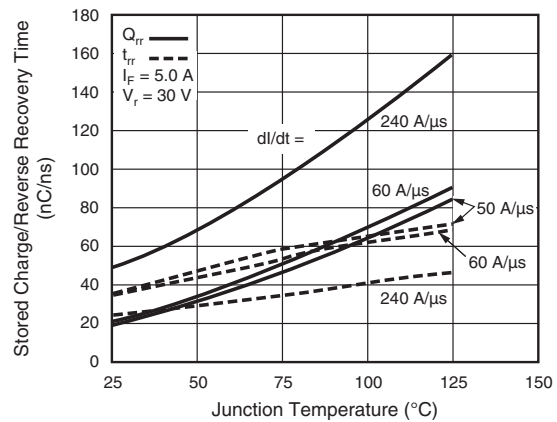
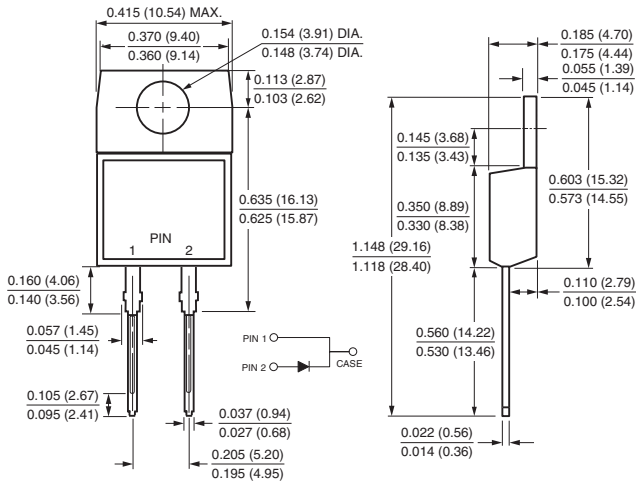


Fig. 6 - Reverse Switching Characteristics

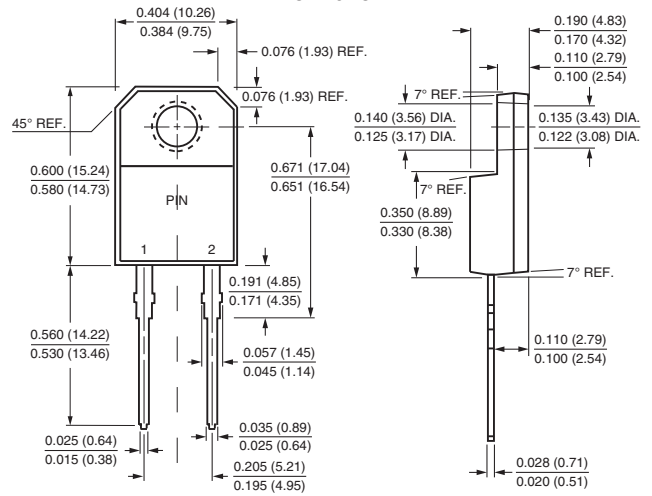


### PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

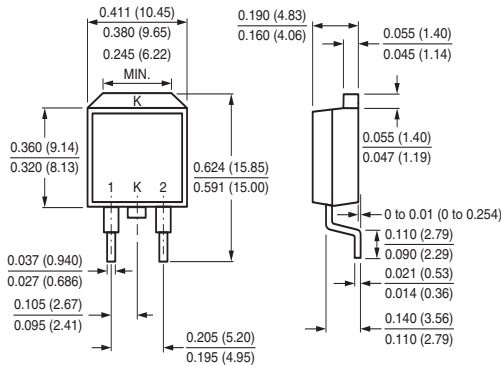
#### TO-220AC



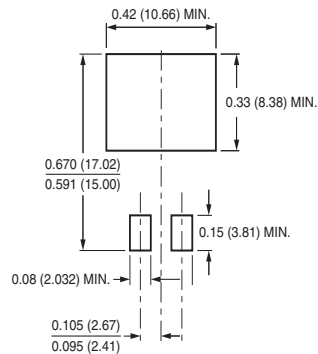
#### ITO-220AC



#### TO-263AB



#### Mounting Pad Layout





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