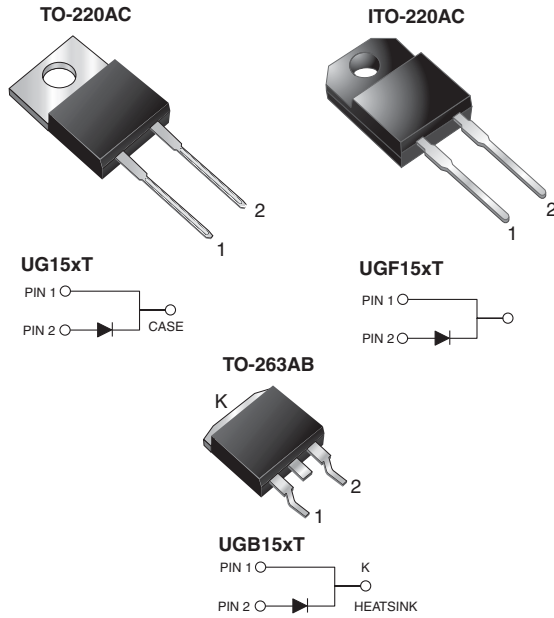


## High Voltage Ultrafast Rectifier



### FEATURES

- Power pack
- Glass passivated pellet chip junction
- Ultrafast recovery times
- 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, high frequency power factor correctors, switching mode power supplies, freewheeling diodes and secondary DC/DC rectification application.

### PRIMARY CHARACTERISTICS

$I_{F(AV)}$	15 A
$V_{RRM}$	500 V to 600 V
$I_{FSM}$	135 A
$t_{rr}$	35 ns
$V_F$ at $I_F$	1.5 V
$T_J$ max.	150 °C
Package	TO-220AC, ITO-220AC, TO-263AB
Diode variations	Single die

### 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.

### MAXIMUM RATINGS ( $T_C = 25$ °C unless otherwise noted)

PARAMETER	SYMBOL	UG15HT	UG15JT	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 (fig. 1)	$I_{F(AV)}$	15		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	$I_{FSM}$	135		A
Operating junction and storage temperature range	$T_J, T_{STG}$	-55 to +150		°C
Isolation voltage (ITO-220AC only) from terminal to heatsink $t = 1$ min	$V_{AC}$	1500		V



<b>ELECTRICAL CHARACTERISTICS</b> ( $T_C = 25\text{ }^\circ\text{C}$ unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	UG15HT	UG15JT	UNIT
Max. instantaneous forward voltage	$I_F = 15\text{ A}$	$T_J = 25\text{ }^\circ\text{C}$	$V_F$	1.75		V
		$T_J = 125\text{ }^\circ\text{C}$		1.50		
Max. DC reverse current at $V_{RWM}$		$T_J = 25\text{ }^\circ\text{C}$	$I_R$	30		$\mu\text{A}$
		$T_J = 125\text{ }^\circ\text{C}$		4.0		mA
Max. reverse recovery time	$I_F = 0.5\text{ A}, I_R = 1.0\text{ A}, I_{rr} = 0.25\text{ A}$		$t_{rr}$	35		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 ( $t_b/t_a$ )	$I_F = 15\text{ A}, di/dt = 240\text{ A}/\mu\text{s}, V_R = 400\text{ V}, I_{rr} = 0.1 I_{RM}$		S	0.9		-
Max. reverse recovery current	$I_F = 15\text{ A}, di/dt = 120\text{ A}/\mu\text{s}, V_R = 400\text{ V}, T_C = 125\text{ }^\circ\text{C}$		$I_{RM}$	9.0		A
Peak forward recovery time	$I_F = 15\text{ A}, di/dt = 120\text{ A}/\mu\text{s}, V_F = 1.1 \times V_F \text{ max.}$		$t_{fr}$	500		ns

<b>THERMAL CHARACTERISTICS</b> ( $T_C = 25\text{ }^\circ\text{C}$ unless otherwise noted)					
PARAMETER	SYMBOL	UG15	UGF15	UGB15	UNIT
Typical thermal resistance from junction to case	$R_{\theta JC}$	1.5	3.0	1.5	$^\circ\text{C}/\text{W}$

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

<b>ORDERING INFORMATION</b> (Example)					
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TO-220AC	UG15JT-E3/45	1.85	45	50/tube	Tube
ITO-220AC	UGF15JT-E3/45	1.98	45	50/tube	Tube
TO-263AB	UGB15JT-E3/45	1.35	45	50/tube	Tube
TO-263AB	UGB15JT-E3/81	1.35	81	800/reel	Tape and reel
TO-220AC	UG15JT <sub>THE3</sub> /45 <sup>(1)</sup>	1.85	45	50/tube	Tube
ITO-220AC	UGF15JT <sub>THE3</sub> /45 <sup>(1)</sup>	1.98	45	50/tube	Tube
TO-263AB	UGB15JT <sub>THE3</sub> /45 <sup>(1)</sup>	1.35	45	50/tube	Tube
TO-263AB	UGB15JT <sub>THE3</sub> /81 <sup>(1)</sup>	1.35	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)

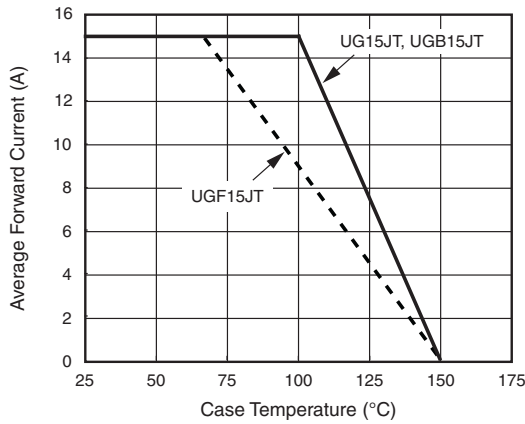


Fig. 1 - Forward Current Derating Curve

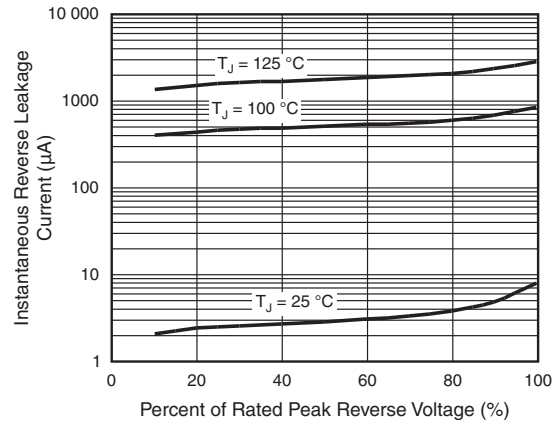


Fig. 4 - Typical Reverse Leakage Characteristics

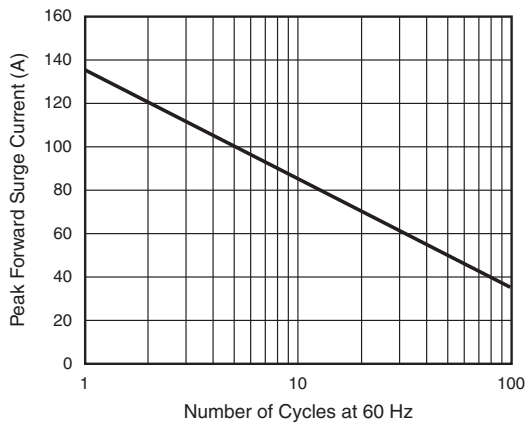


Fig. 2 - Max. Non-Repetitive Peak Forward Surge Current

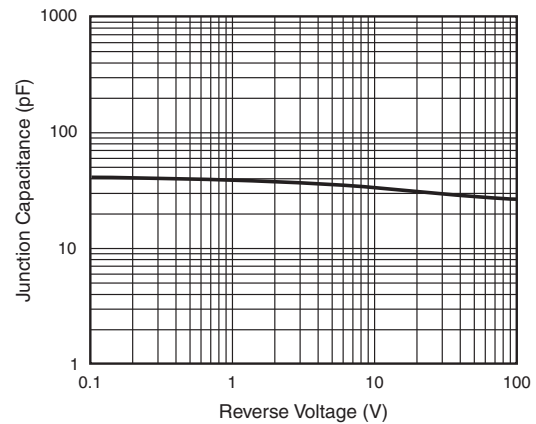


Fig. 5 - Typical Junction Capacitance

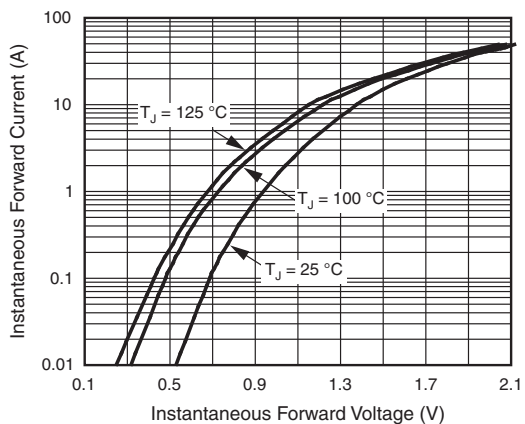


Fig. 3 - Typical Instantaneous Forward Characteristics

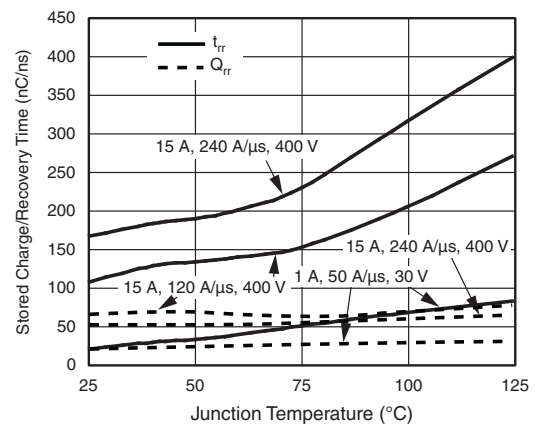
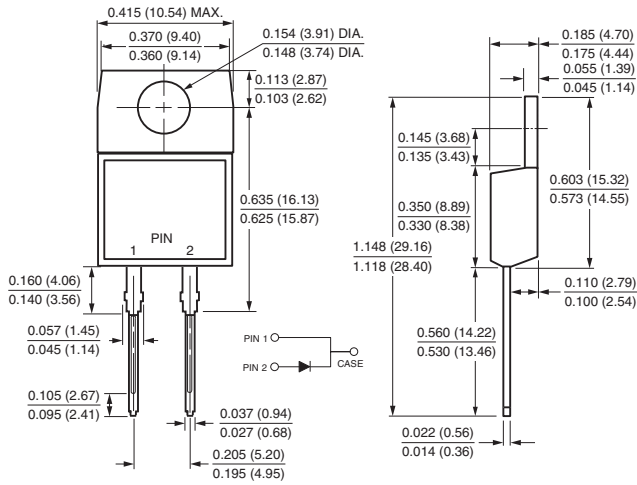


Fig. 6 - Reverse Switching Characteristics

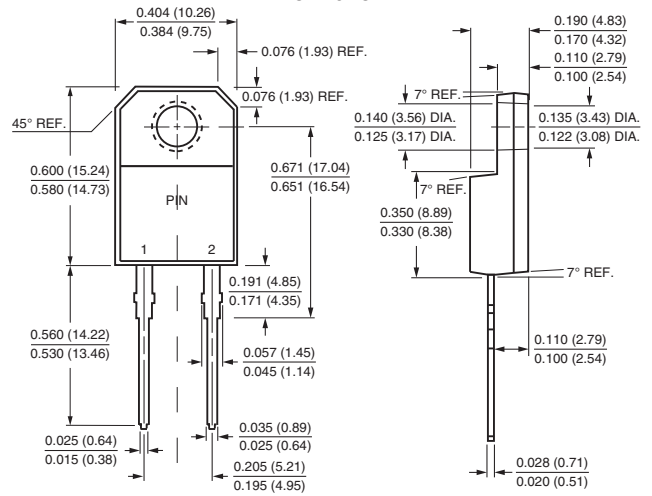


### PACKAGE OUTLINE DIMENSION in inches (millimeters)

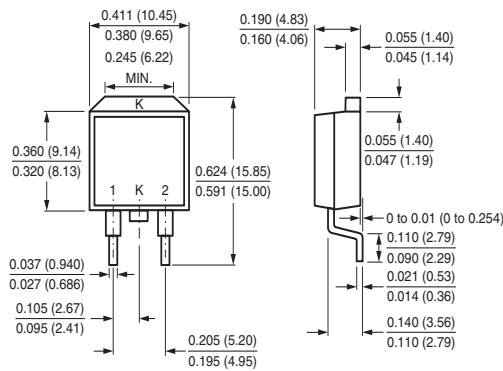
#### TO-220AC



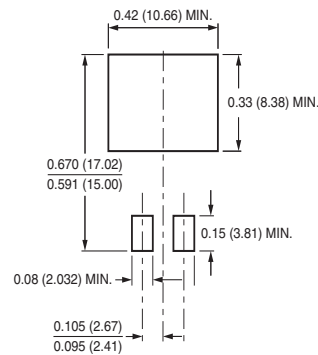
#### ITO-220AC



#### TO-263AB



#### Mounting Pad Layout





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