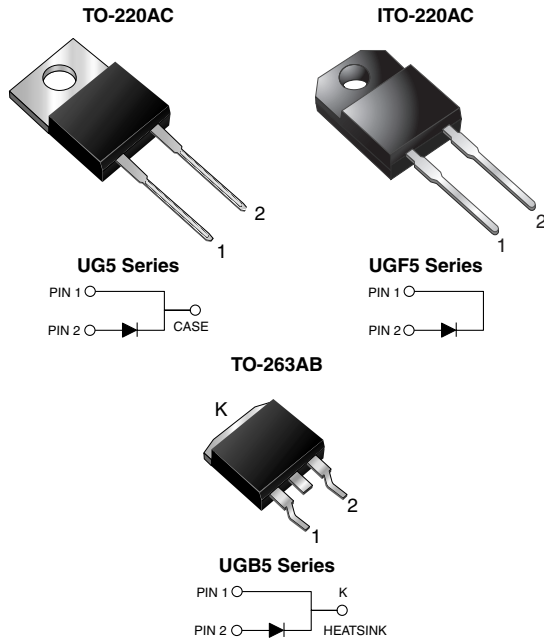




**THE DATASHEET OF  
UGB5JTHE3/45**



## High Voltage Ultrafast Rectifier



### FEATURES

- 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 TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AC and ITO-220AC package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



**RoHS**  
COMPLIANT

### TYPICAL APPLICATIONS

For use in high voltage and high frequency power factor corrector, freewheeling diodes and secondary dc-to-dc rectification application.

### MECHANICAL DATA

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

Epoxy meets UL 94V-0 flammability rating

**Terminals:** Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC Q101 qualified), meets JESD 201 class 2 whisker test

**Polarity:** As marked

**Mounting Torque:** 10 in-lbs maximum

### PRIMARY CHARACTERISTICS

$I_{F(AV)}$	5.0 A
$V_{RRM}$	500 V, 600 V
$I_{FSM}$	65 A
$t_{rr}$	25 ns
$V_F$	1.5 V
$T_J \text{ max.}$	150 °C

### MAXIMUM RATINGS ( $T_C = 25 \text{ °C}$ unless otherwise noted)

PARAMETER	SYMBOL	UG5HT	UG5JT	UNIT
Maximum repetitive peak reverse voltage	$V_{RRM}$	500	600	V
Maximum working reverse voltage	$V_{RWM}$	400	480	V
Maximum RMS voltage	$V_{RMS}$	350	420	V
Maximum DC blocking voltage	$V_{DC}$	500	600	V
Maximum 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 $t = 1 \text{ min}$	$V_{AC}$	1500		V

# UG(F,B)5HT & UG(F,B)5JT

Vishay General Semiconductor



<b>ELECTRICAL CHARACTERISTICS</b> ( $T_C = 25\text{ }^\circ\text{C}$ unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	UG5HT	UG5JT	UNIT
Maximum instantaneous forward voltage <sup>(1)</sup>	$I_F = 5\text{ A}$ $I_F = 5\text{ A}$	$T_J = 25\text{ }^\circ\text{C}$ $T_J = 125\text{ }^\circ\text{C}$	$V_F$	1.75 1.50		V
Maximum DC reverse current at $V_{RWM}$		$T_J = 25\text{ }^\circ\text{C}$ $T_J = 100\text{ }^\circ\text{C}$ $T_J = 125\text{ }^\circ\text{C}$	$I_R$	30 800 4.0		$\mu\text{A}$ $\mu\text{A}$ mA
Maximum 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
Maximum 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		-
Maximum 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
Maximum 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

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

**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	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 reel
TO-220AC	UG5JT-E3/45 <sup>(1)</sup>	1.80	45	50/tube	Tube
ITO-220AC	UGF5JT-E3/45 <sup>(1)</sup>	1.95	45	50/tube	Tube
TO-263AB	UGB5JT-E3/45 <sup>(1)</sup>	1.33	45	50/tube	Tube
TO-263AB	UGB5JT-E3/81 <sup>(1)</sup>	1.33	81	800/reel	Tape reel

**Note:**

(1) Automotive grade AEC Q101 qualified

## RATINGS AND CHARACTERISTICS CURVES

( $T_A = 25\text{ }^\circ\text{C}$  unless otherwise noted)

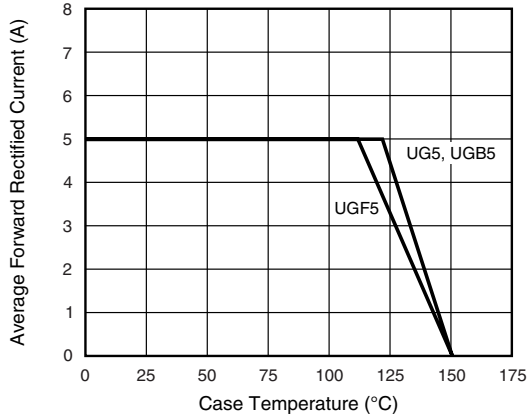


Figure 1. Forward Current Derating Curve

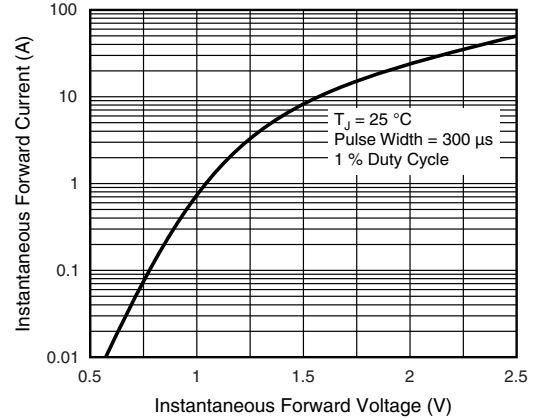


Figure 4. Typical Instantaneous Forward Characteristics

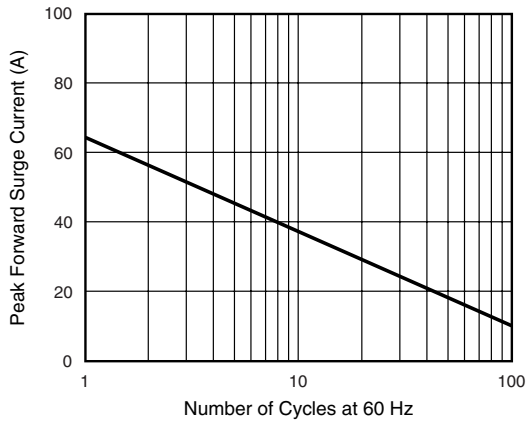


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

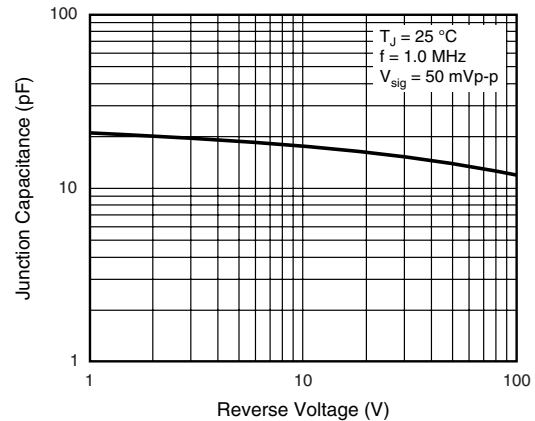


Figure 5. Typical Junction Capacitance

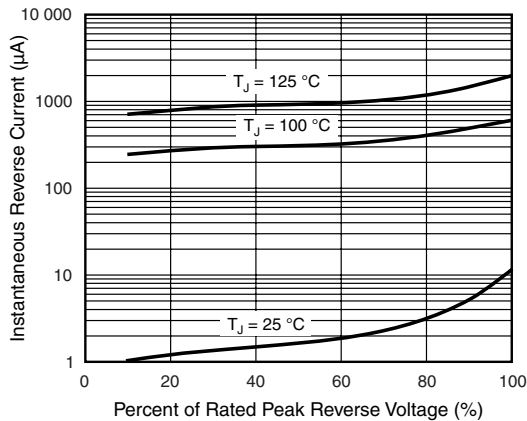


Figure 3. Typical Reverse Characteristics

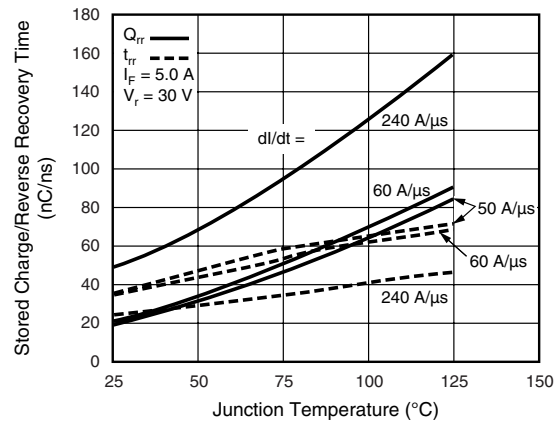
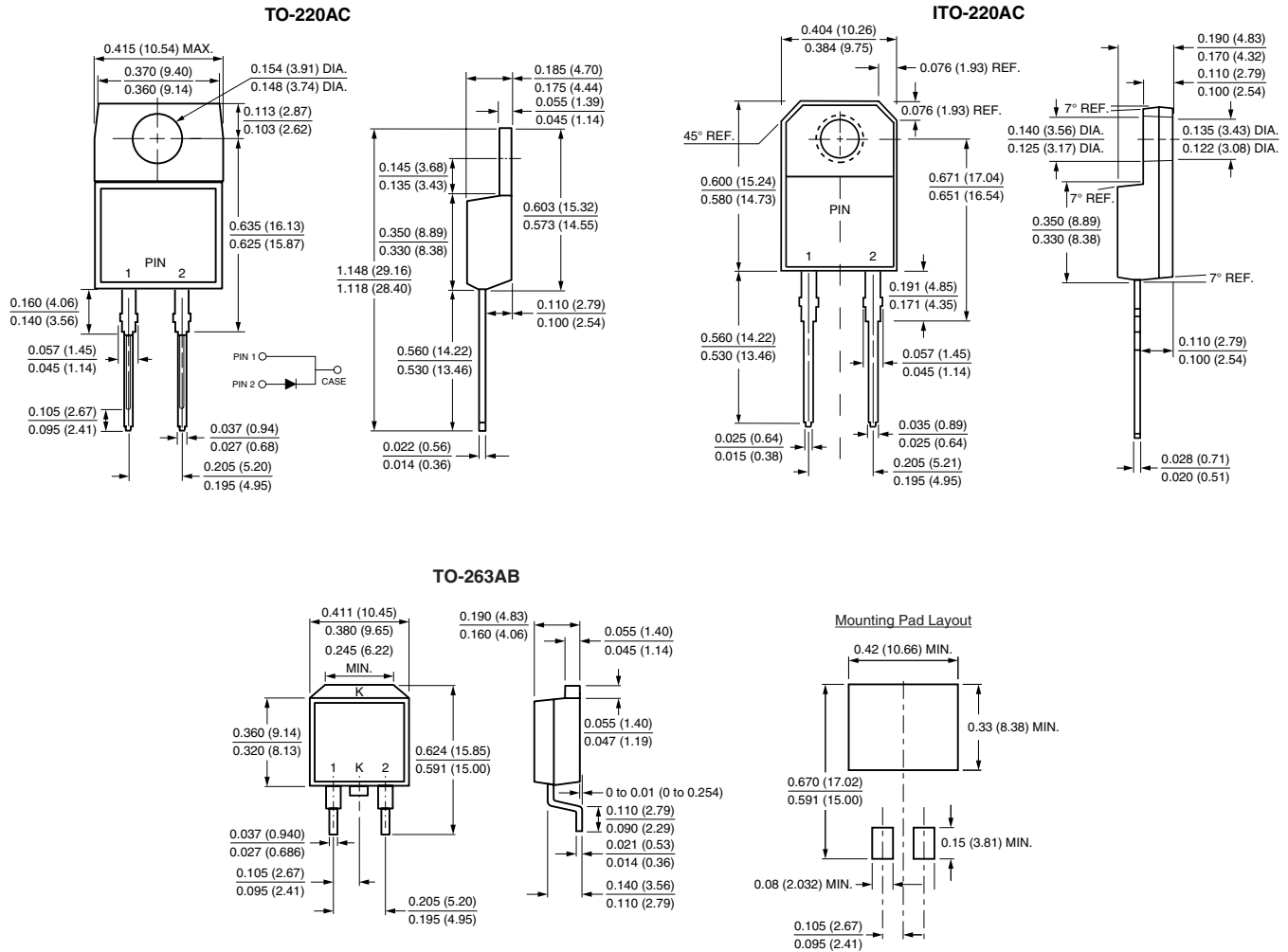


Figure 6. Reverse Switching Characteristics

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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