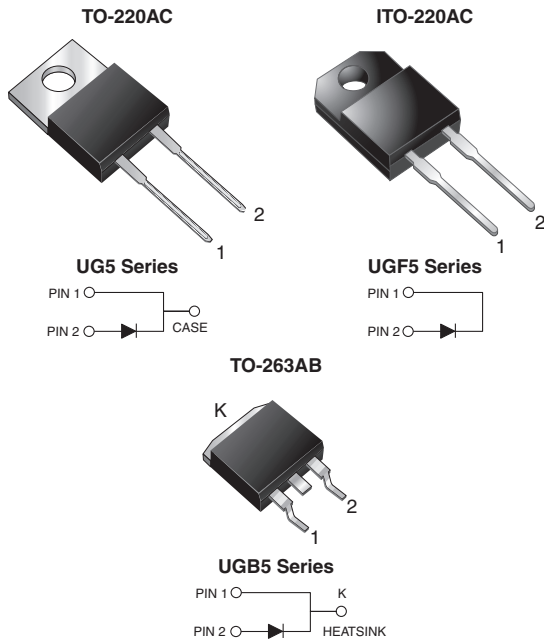


High Voltage Ultrafast Rectifier



FEATURES

- 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 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



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	1.5 V
T_J max.	150 °C
Package	TO-220AC, ITO-220AC, TO-263AB
Diode variations	Single die

MAXIMUM RATINGS ($T_C = 25\text{ °C}$ 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}			I_R	$T_J = 25\text{ }^\circ\text{C}$	30	μA	
				$T_J = 100\text{ }^\circ\text{C}$	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} 50	0			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 μs 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 ^{HE} 3/45 ⁽¹⁾	1.80	45	50/tube	Tube
ITO-220AC	UGF5JT ^{HE} 3/45 ⁽¹⁾	1.95	45	50/tube	Tube
TO-263AB	UGB5JT ^{HE} 3/45 ⁽¹⁾	1.33	45	50/tube	Tube
TO-263AB	UGB5JT ^{HE} 3/81 ⁽¹⁾	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)

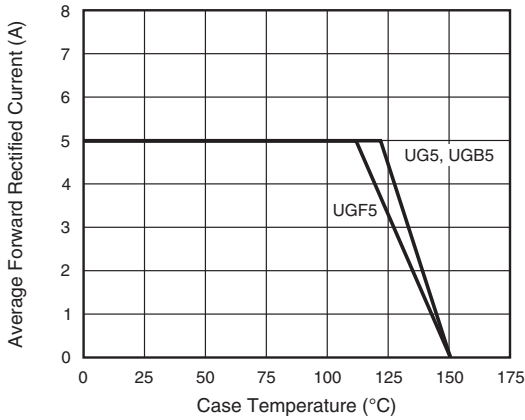


Fig. 1 - Forward Current Derating Curve

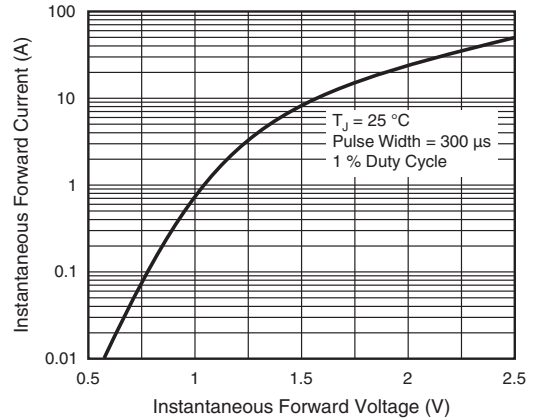


Fig. 4 - Typical Instantaneous Forward Characteristics

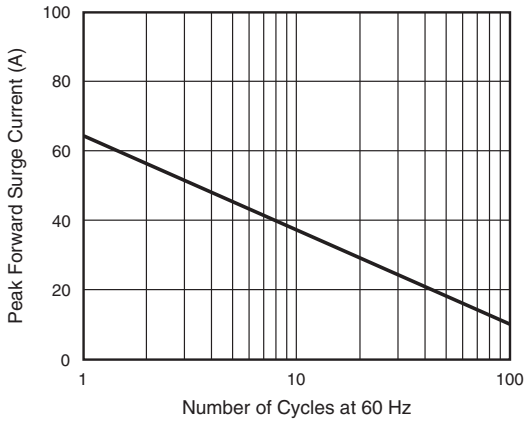


Fig. 2 - Max. Non-Repetitive Peak Forward Surge Current

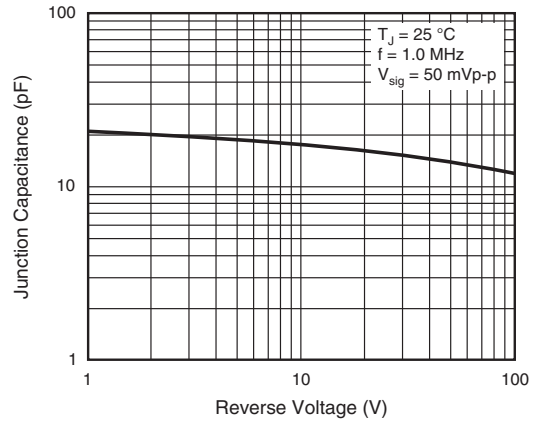


Fig. 5 - Typical Junction Capacitance

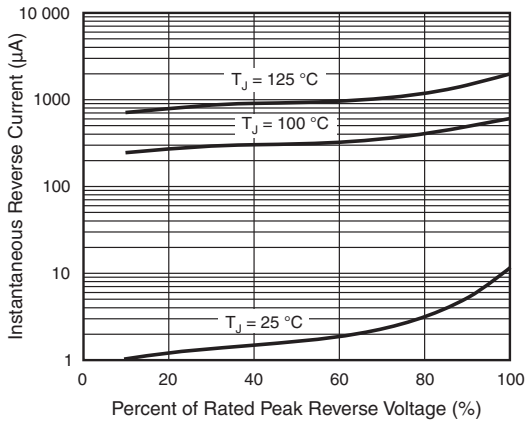


Fig. 3 - Typical Reverse Characteristics

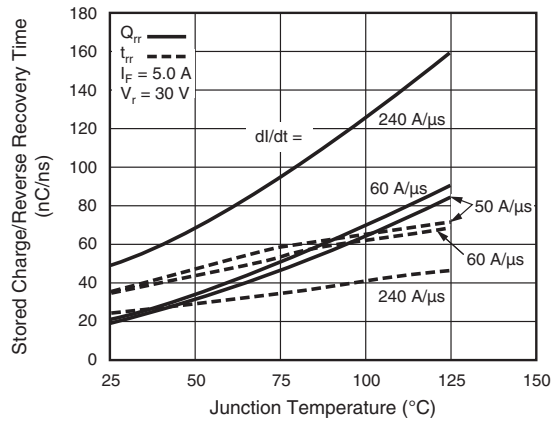
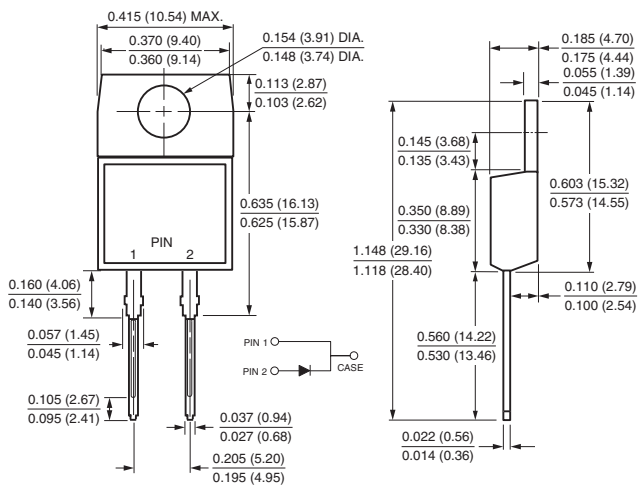


Fig. 6 - Reverse Switching Characteristics

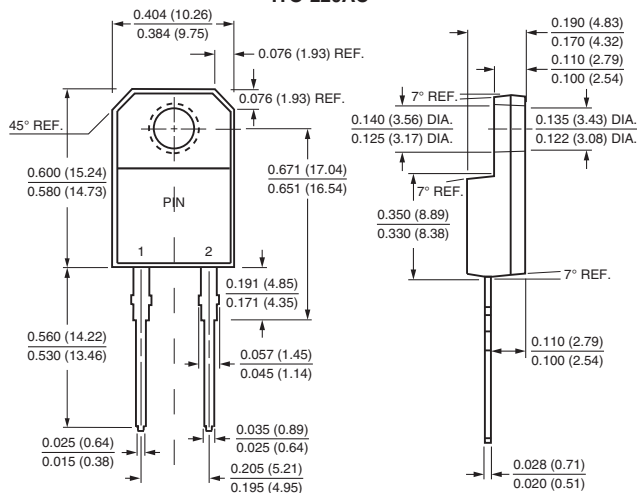


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

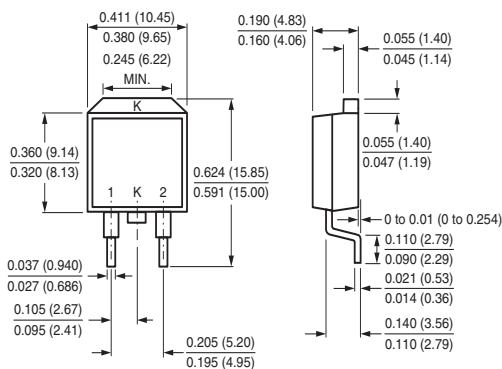
TO-220AC



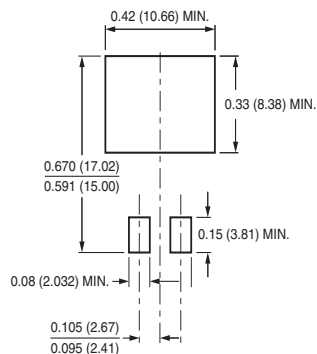
ITO-220AC



TO-263AB



Mounting Pad Layout





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