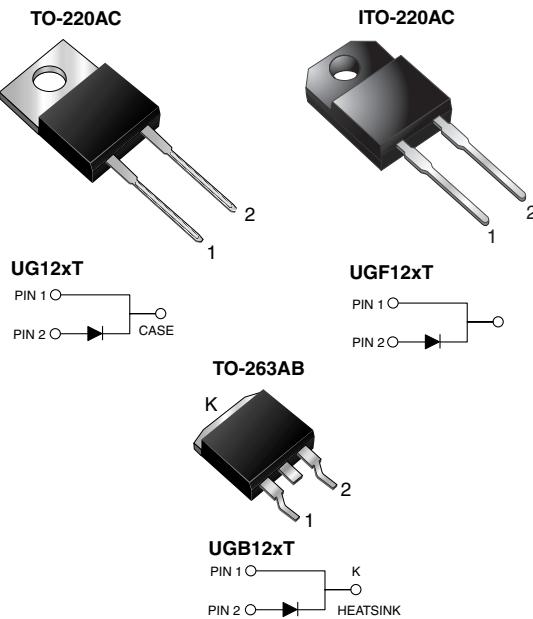


High Voltage Ultrafast Rectifier



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 correction, 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	
$I_{F(AV)}$	12 A
V_{RRM}	500 V to 600 V
I_{FSM}	135 A
t_{rr}	30 ns
V_F at $I_F = 12$ A	1.5 V
T_J max.	150 °C
Package	TO-220AC, ITO-220AC, TO-263AB
Diode variation	Single die

MAXIMUM RATINGS ($T_C = 25$ °C unless otherwise noted)				
PARAMETER	SYMBOL	UG12HT	UG12JT	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)	$I_{F(AV)}$	12		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 terminals to heatsink $t = 1$ min	V_{AC}	1500		V

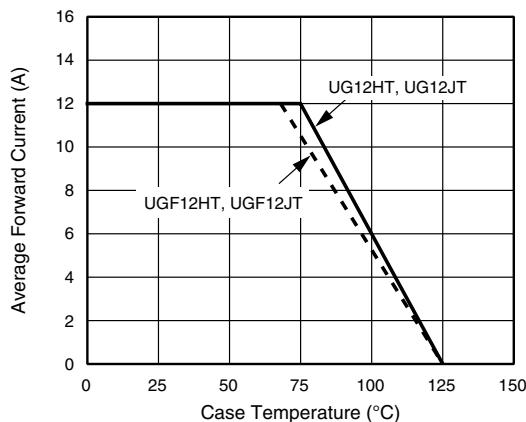
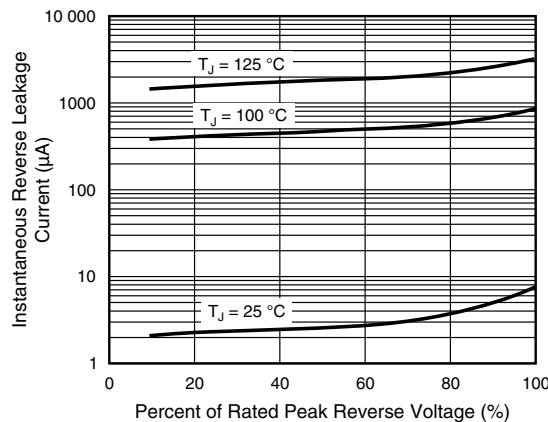
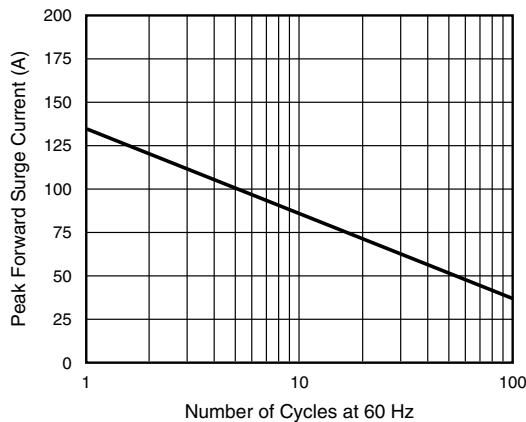
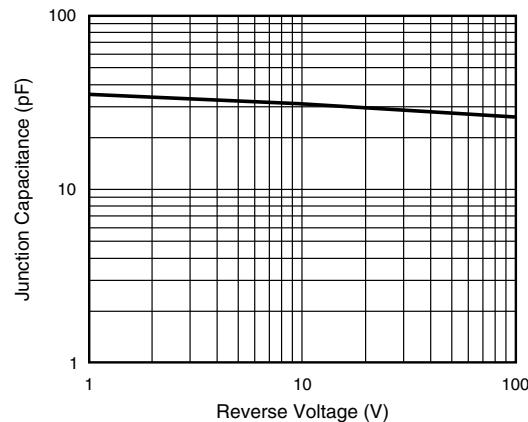
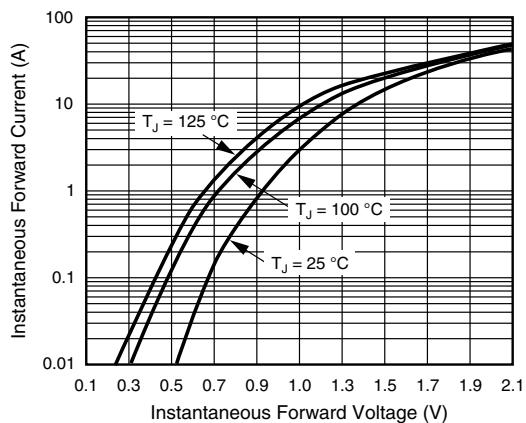
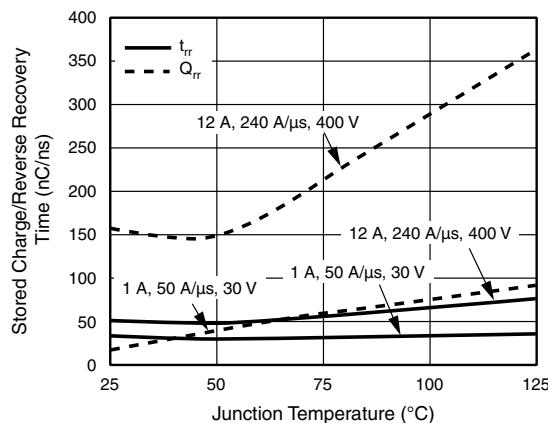
ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	UG12HT	UG12JT	UNIT
Max. instantaneous forward voltage ⁽¹⁾	$I_F = 12 \text{ A}$	$T_J = 25^\circ\text{C}$	V_F	1.75		V
	$I_F = 12 \text{ A}$	$T_J = 125^\circ\text{C}$		1.50		
Max. reverse current		$T_J = 25^\circ\text{C}$	I_R	30		μA
		$T_J = 125^\circ\text{C}$		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}	30		ns
	$I_F = 1.0 \text{ A}$, $dI/dt = 50 \text{ A}/\mu\text{s}$, $V_R = 30 \text{ V}$, $I_{rr} = 0.1 I_{RM}$		t_{rr}	50		ns
Typical softness factor (t_{fb}/t_a)	$I_F = 12 \text{ A}$, $dI/dt = 240 \text{ A}/\mu\text{s}$, $V_R = 400 \text{ V}$, $I_{rr} = 0.1 I_{RM}$		S	0.9		-
Max. reverse recovery current	$I_F = 12 \text{ A}$, $dI/dt = 96 \text{ A}/\mu\text{s}$, $V_R = 400 \text{ V}$, $T_C = 125^\circ\text{C}$		I_{RM}	7.5		A
Peak forward recovery time	$I_F = 12 \text{ A}$, $dI/dt = 96 \text{ A}/\mu\text{s}$, $V_F = 1.1 \text{ V} \times V_F \text{ max.}$		t_{fr}	500		ns

Note
⁽¹⁾ Pulse test: 300 μs pulse width, 1 % duty cycle

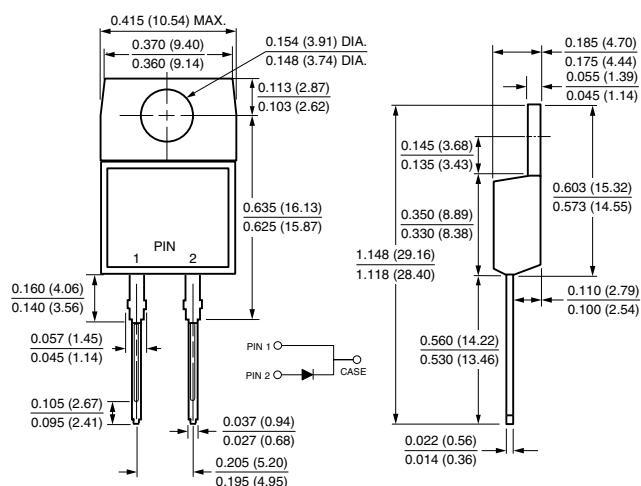
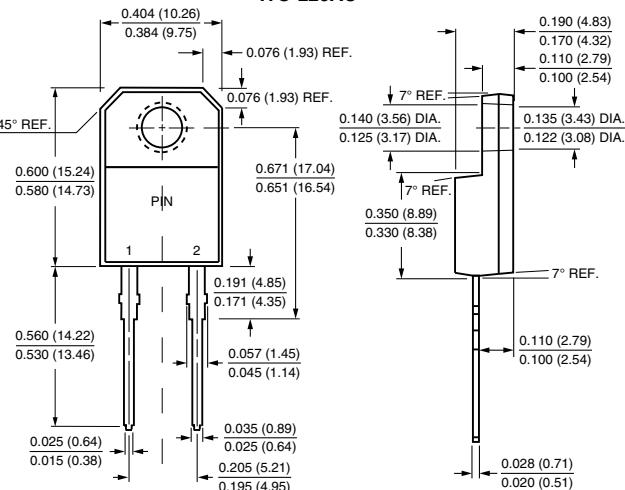
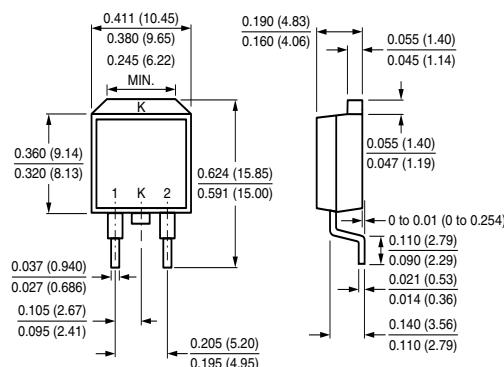
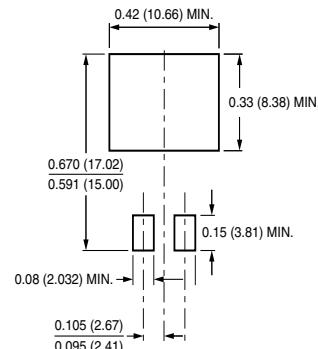
THERMAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted)					
PARAMETER	SYMBOL	UG12	UGF12	UGB12	UNIT
Typical thermal resistance from junction to case	$R_{\theta JC}$	1.73	3.04	1.73	$^\circ\text{C}/\text{W}$

ORDERING INFORMATION (Example)					
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TO-220AC	UG12JT-E3/45	1.80	45	50/tube	Tube
ITO-220AC	UGF12JT-E3/45	1.95	45	50/tube	Tube
TO-263AB	UGB12JT-E3/45	1.33	45	50/tube	Tube
TO-263AB	UGB12JT-E3/81	1.33	81	800/reel	Tape and reel
TO-220AC	UG12JTHER3/45 ⁽¹⁾	1.80	45	50/tube	Tube
ITO-220AC	UGF12JTHER3/45 ⁽¹⁾	1.95	45	50/tube	Tube
TO-263AB	UGB12JTHER3/45 ⁽¹⁾	1.33	45	50/tube	Tube
TO-263AB	UGB12JTHER3/81 ⁽¹⁾	1.33	81	800/reel	Tape and reel

Note
⁽¹⁾ AEC-Q101 qualified

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

Fig. 1 - Forward Current Derating Curve

Fig. 4 - Typical Reverse Leakage Characteristics Per Leg

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

Fig. 5 - Typical Junction Capacitance Per Leg

Fig. 3 - Typical Instantaneous Forward Characteristics Per Leg

Fig. 6 - Reverse Switching Characteristics Per Leg

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-220AC

ITO-220AC

TO-263AB

Mounting Pad Layout


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