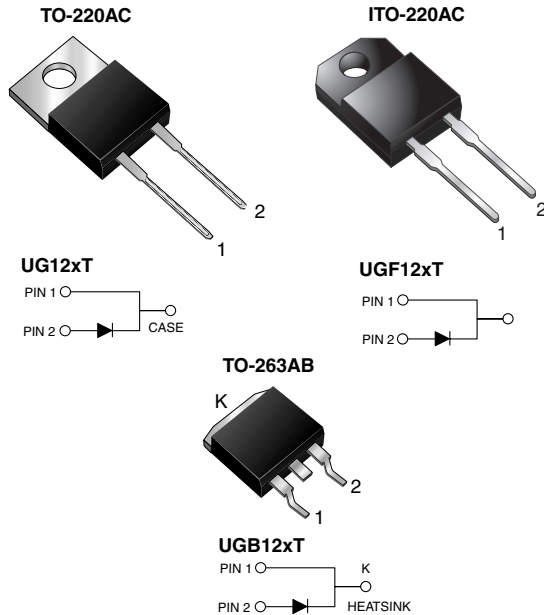


High Voltage Ultrafast Rectifier



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 correction, 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 commercial 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

$I_{F(AV)}$	12 A
V_{RRM}	500 V, 600 V
V_{FSM}	135 A
t_{rr}	30 ns
V_F	1.5 V
$T_J \text{ max.}$	150 °C

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

PARAMETER	SYMBOL	UG12HT	UG12JT	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 (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 $t = 1 \text{ min}$	V_{AC}	1500		V



ELECTRICAL CHARACTERISTICS ($T_C = 25\text{ }^\circ\text{C}$ unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	UG12HT	UG12JT	UNIT
Maximum instantaneous forward voltage ⁽¹⁾	$I_F = 12\text{ A}$ $I_F = 12\text{ A}$	$T_J = 25\text{ }^\circ\text{C}$ $T_J = 125\text{ }^\circ\text{C}$	V_F	1.75 1.50		V
Maximum reverse current		$T_J = 25\text{ }^\circ\text{C}$ $T_J = 125\text{ }^\circ\text{C}$	I_R	30 4.0		μA 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}	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_b/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		-
Maximum reverse recovery current	$I_F = 12\text{ A}$, $dI/dt = 96\text{ A}/\mu\text{s}$, $V_R = 400\text{ V}$, $T_C = 125\text{ }^\circ\text{C}$		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 ($T_C = 25\text{ }^\circ\text{C}$ 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 reel
TO-220AC	UG12JT ^{HE} 3/45 ⁽¹⁾	1.80	45	50/tube	Tube
ITO-220AC	UGF12JT ^{HE} 3/45 ⁽¹⁾	1.95	45	50/tube	Tube
TO-263AB	UGB12JT ^{HE} 3/45 ⁽¹⁾	1.33	45	50/tube	Tube
TO-263AB	UGB12JT ^{HE} 3/81 ⁽¹⁾	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)

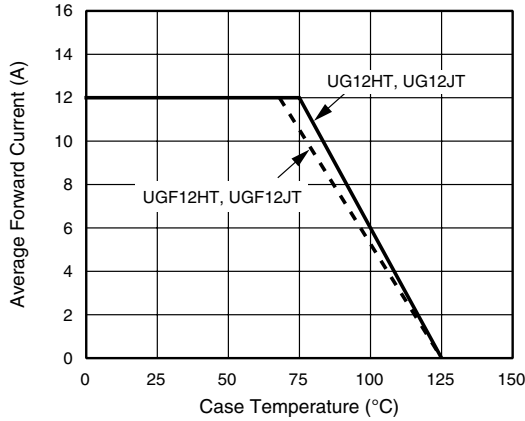


Figure 1. Forward Current Derating Curve

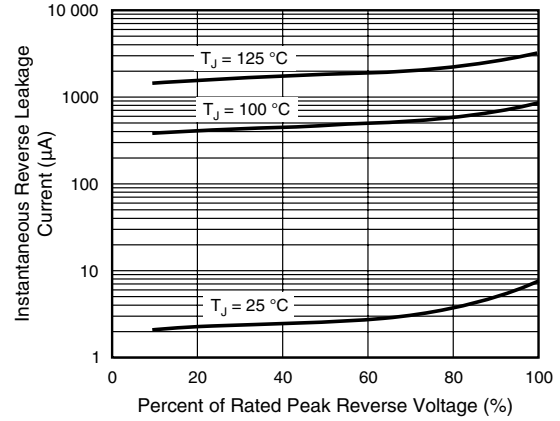


Figure 4. Typical Reverse Leakage Characteristics Per Leg

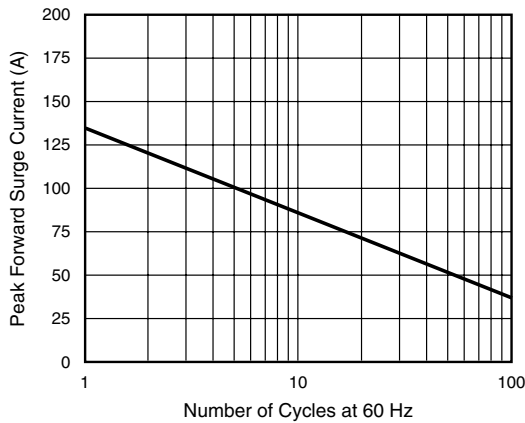


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

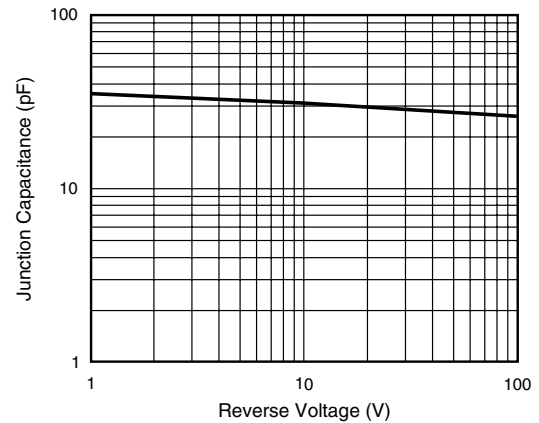


Figure 5. Typical Junction Capacitance Per Leg

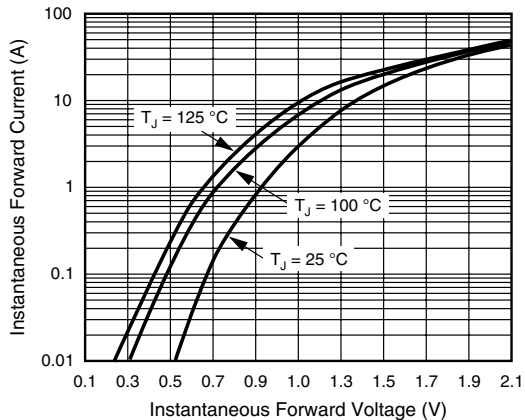


Figure 3. Typical Instantaneous Forward Characteristics Per Leg

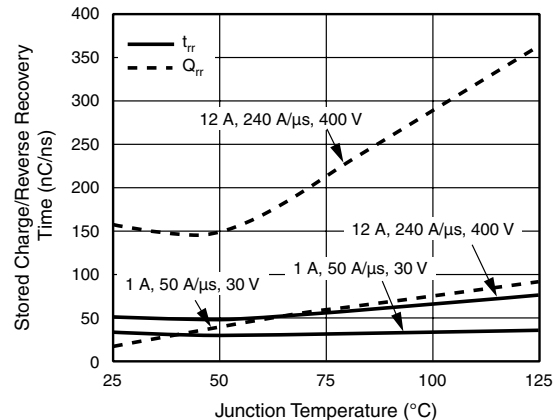
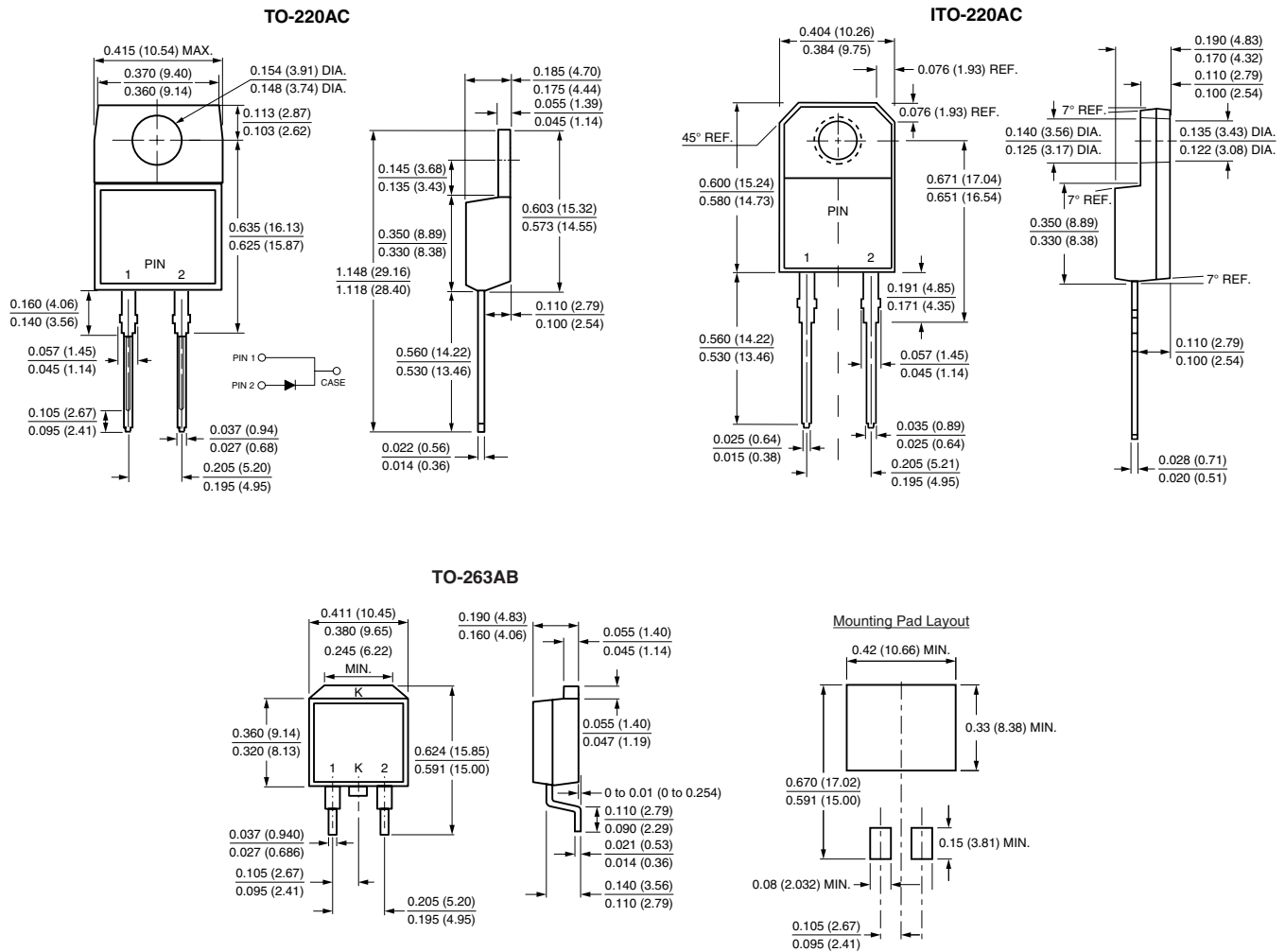


Figure 6. Reverse Switching Characteristics Per Leg

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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