



## Ultrafast Rectifiers

### Major Ratings and Characteristics

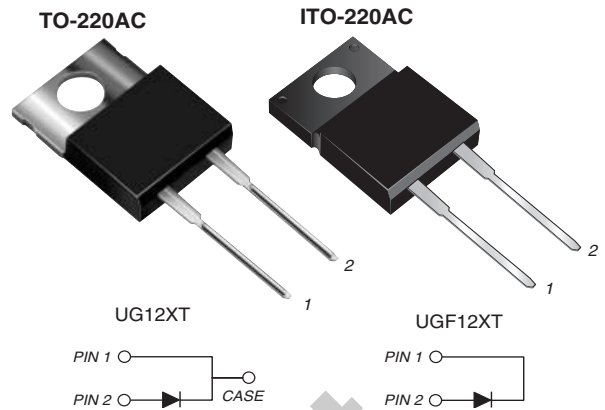
$I_{F(AV)}$	12 A
$V_{RRM}$	500, 600 V
$t_{rr}$	30 ns
$t_{fr}$	500 ns
$V_F$	1.5 V

### Features

- Glass passivated chip junction
- Soft recovery characteristics
- High efficiency, low switching losses
- Meets MSL level 1, per J-STD-020C

### Typical Applications

For use in high voltage and high frequency power factor correction application



### Mechanical Data

**Case:** JEDEC TO-220AC, ITO-220AC

**Terminals:** Matte tin plated (E3 Suffix) leads, solderable per J-STD-002B and MIL-STD-750, Method 2026

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

Epoxy meets UL-94V-0 Flammability rating

### Maximum Ratings

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

Parameter	Test condition	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		$I_{F(AV)}$	12		A
Peak forward surge current	8.3 ms single half sine-wave superimposed on rated load (JEDEC Method)	$I_{FSM}$	135		A
Operating junction and storage temperature range		$T_J, T_{STG}$	-55 to +150		$^\circ\text{C}$
RMS Isolation voltage (UGF types only) from terminals to heatsink	with $t = 1.0$ second, $RH \leq 30\%$	$V_{ISOL}$	4500 <sup>(1)</sup> 3500 <sup>(2)</sup> 1500 <sup>(3)</sup>		V

### Electrical Characteristics

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

Parameter	Test condition	Symbol	UG12HT	UG12JT	Unit
Maximum instantaneous forward voltage <sup>(4)</sup>	$I_F = 12\text{ A}$ , $T_J = 25\text{ }^\circ\text{C}$	$V_F$	1.75		V
	$I_F = 12\text{ A}$ , $T_J = 125\text{ }^\circ\text{C}$		1.50		
Maximum DC reverse current at $V_{RWM}$	$T_J = 25\text{ }^\circ\text{C}$	$I_R$	30		$\mu\text{A}$
	$T_J = 100\text{ }^\circ\text{C}$		800		$\mu\text{A}$
	$T_J = 125\text{ }^\circ\text{C}$		4.0		mA
Maximum reverse recovery time	at $I_F = 0.5\text{ A}$ , $I_R = 1.0\text{ A}$ , $I_{rr} = 0.25\text{ A}$	$t_{rr}$	30		ns
	at $I_F = 1.0\text{ A}$ , $di/dt = 50\text{ A}/\mu\text{s}$ , $V_R = 30\text{ V}$ , $I_{rr} = 0.1 I_{RM}$	$t_{rr}$	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	at $I_F = 12\text{ A}$ , $di/dt = 96\text{ A}/\mu\text{s}$ , $V_R = 400\text{ V}$ , $T_C = 125\text{ }^\circ\text{C}$	$I_{RM}$	7.5		A
Peak forward recovery time	at $I_F = 12\text{ A}$ , $di/dt = 96\text{ A}/\mu\text{s}$ , $V_F = 1.1\text{ V}$	$t_{fr}$	500		ns

Notes:

- (1) Clip mounting (on case), where lead does not overlap heatsink with 0.110" offset
- (2) Clip mounting (on case), where leads do overlap heatsink
- (3) Screw mounting with 4-40 screw, where washer diameter is  $\leq 4.9\text{ mm}$  (0.19")
- (4) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle

### Thermal Characteristics

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

Parameter	Test condition	Symbol	UG12	UGF12	Unit
Typical thermal resistance from junction to case		$R_{\theta JC}$	1.73	3.04	$^\circ\text{C}/\text{W}$

## Ratings and Characteristics Curves

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

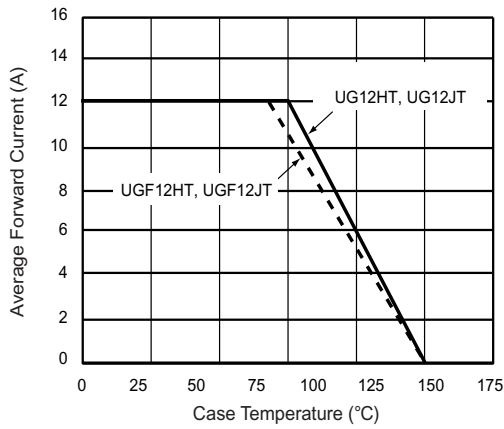


Figure 1. Forward Current Derating Curve

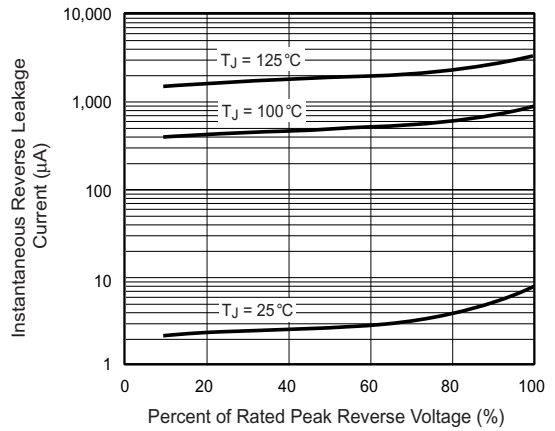


Figure 4. Typical Reverse Leakage Characteristics Per Leg

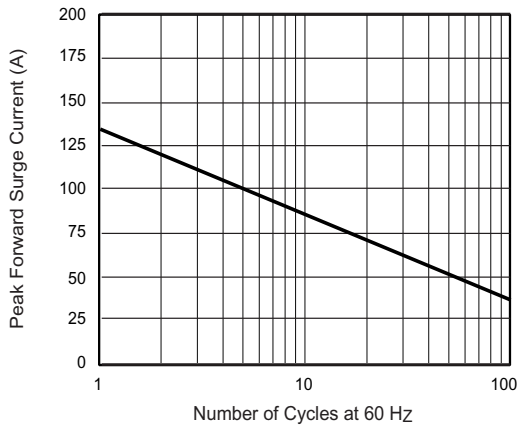


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

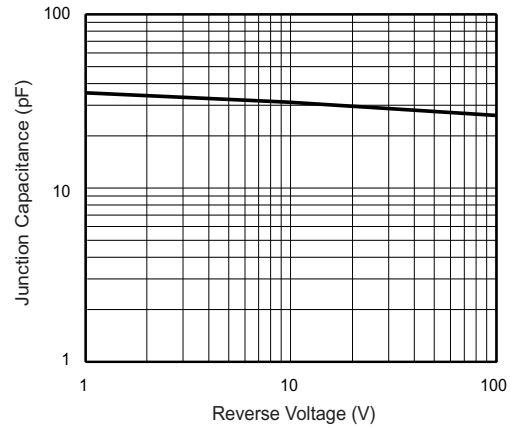


Figure 5. Typical Junction Capacitance Per Leg

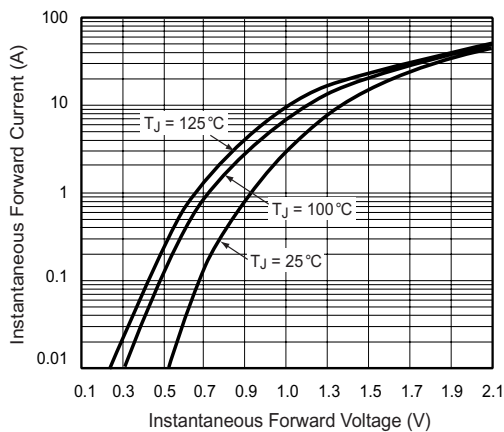


Figure 3. Typical Instantaneous Forward Characteristics Per Leg

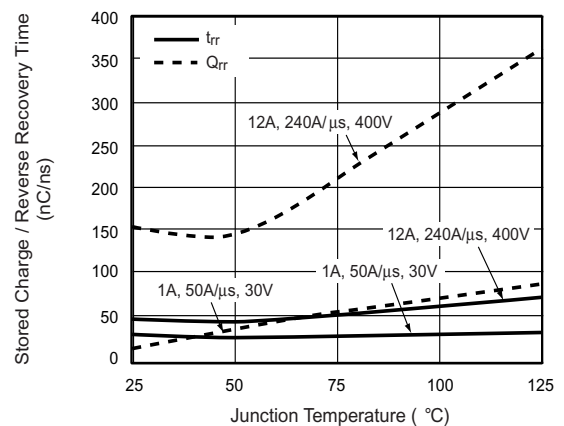
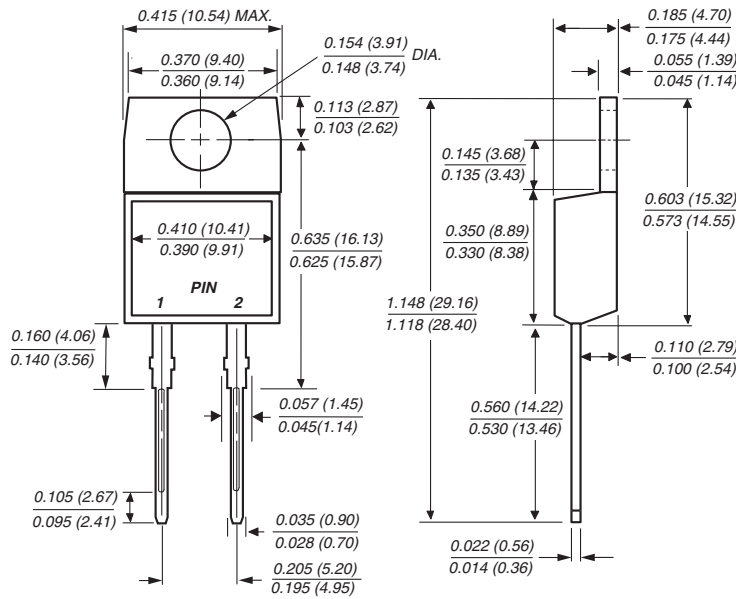


Figure 6. Reverse Switching Characteristics Per Leg

## Dimensions in Inches and (millimeters)

### TO-220AC



### ITO-220AC

