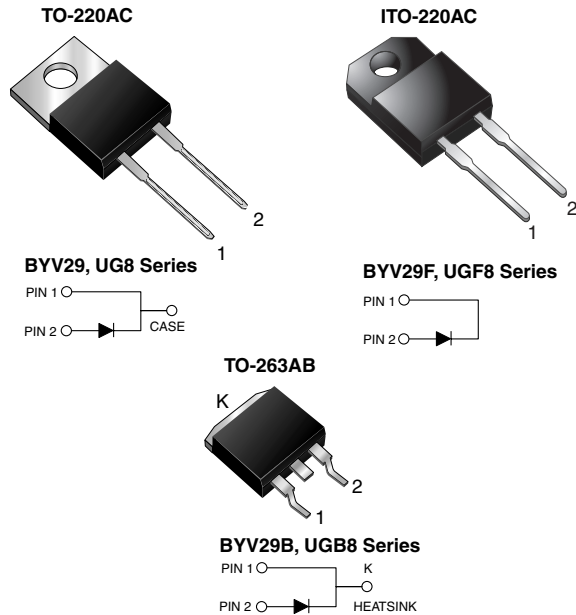


## Ultrafast Rectifier



### FEATURES

- Glass passivated chip junction
- Ultrafast recovery time
- Low switching losses, high efficiency
- Low forward voltage drop
- 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 frequency rectifier of switching mode power supplies, inverters, freewheeling diodes, dc-to-dc converters, and other power switching application.

### PRIMARY CHARACTERISTICS

$I_{F(AV)}$	8.0 A
$V_{RRM}$	300 V, 400 V
$I_{FSM}$	110 A
$t_{tr}$	35 ns
$V_F$	1.03 V
$T_J \text{ max.}$	150 °C

### 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

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

PARAMETER	SYMBOL	BYV29-300 UG8FT	BYV29-400 UG8GT	UNIT
Maximum repetitive peak reverse voltage	$V_{RRM}$	300	400	V
Maximum working reverse voltage	$V_{RWM}$	300	400	V
Maximum RMS voltage	$V_{RMS}$	210	280	V
Maximum DC blocking voltage	$V_{DC}$	300	400	V
Maximum average forward rectified current at $T_C = 100 \text{ °C}$	$I_{F(AV)}$	8.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	$I_{FSM}$	110		A
Operating junction and storage temperature range	$T_J, T_{STG}$	- 40 to + 150		°C
Isolation voltage (ITO-220AC only) from terminal to heatsink $t = 1 \text{ min}$	$V_{AC}$	1500		V



<b>ELECTRICAL CHARACTERISTICS</b> ( $T_C = 25\text{ }^\circ\text{C}$ unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	BYV29-300 UG8FT	BYV29-400 UG8GT	UNIT
Maximum instantaneous forward voltage <sup>(1)</sup>	$I_F = 8\text{ A}$ $I_F = 8\text{ A}$ $I_F = 20\text{ A}$	$T_J = 25\text{ }^\circ\text{C}$ $T_J = 150\text{ }^\circ\text{C}$ $T_J = 25\text{ }^\circ\text{C}$	$V_F$	1.25 1.03 1.40		V
Maximum DC reverse current at $V_{RRM}$		$T_C = 25\text{ }^\circ\text{C}$ $T_C = 100\text{ }^\circ\text{C}$	$I_R$	10 350		$\mu\text{A}$
Maximum reverse recovery time	$I_F = 0.5\text{ A}$ , $I_R = 1.0\text{ A}$ , $I_{rr} = 0.25\text{ A}$		$t_{rr}$	35		ns
Maximum reverse recovery time	$I_F = 1.0\text{ A}$ , $di/dt = 100\text{ A}/\mu\text{s}$ , $V_R = 30\text{ V}$ , $I_{rr} = 0.1 I_{RM}$		$t_{rr}$	50		ns
Maximum reverse recovery current	$I_F = 10\text{ A}$ , $di/dt = 50\text{ A}/\mu\text{s}$ , $V_R = 30\text{ V}$ , $T_C = 100\text{ }^\circ\text{C}$		$I_{RM}$	5.5		A
Maximum recovered stored charged	$I_F = 2\text{ A}$ , $di/dt = 20\text{ A}/\mu\text{s}$ , $V_R = 30\text{ V}$ , $I_{rr} = 0.1 I_{RM}$		$Q_{rr}$	55		nC

**Note:**

(1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle

<b>THERMAL CHARACTERISTICS</b> ( $T_C = 25\text{ }^\circ\text{C}$ unless otherwise noted)					
PARAMETER	SYMBOL	BYV29 UG8	BYV29F UGF8	BYV29B UGB8	UNIT
Typical thermal resistance from junction to case	$R_{\theta JC}$	2.5	5.5	2.5	$^\circ\text{C}/\text{W}$

<b>ORDERING INFORMATION</b> (Example)					
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TO-220AC	BYV29-400-E3/45	1.80	45	50/tube	Tube
ITO-220AC	BYV29F-400-E3/45	1.95	45	50/tube	Tube
TO-263AB	BYV29B-400-E3/45	1.77	45	50/tube	Tube
TO-263AB	BYV29B-400-E3/81	1.77	81	800/reel	Tape and reel
TO-220AC	BYV29-400HE3/45 <sup>(1)</sup>	1.80	45	50/tube	Tube
ITO-220AC	BYV29F-400HE3/45 <sup>(1)</sup>	1.95	45	50/tube	Tube
TO-263AB	BYV29B-400HE3/45 <sup>(1)</sup>	1.77	45	50/tube	Tube
TO-263AB	BYV29B-400HE3/81 <sup>(1)</sup>	1.77	81	800/reel	Tape and reel

**Note:**

(1) Automotive grade AEC Q101 qualified



## RATINGS AND CHARACTERISTICS CURVES

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

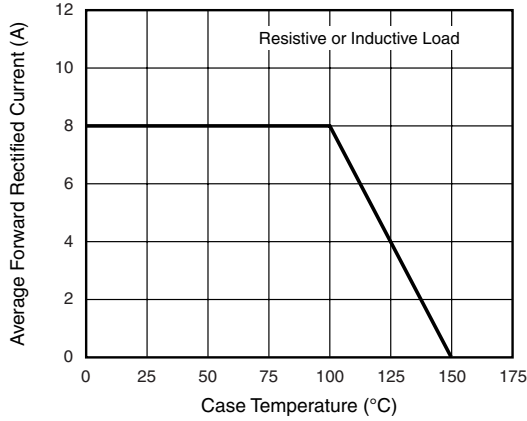


Figure 1. Maximum Forward Current Derating Curve

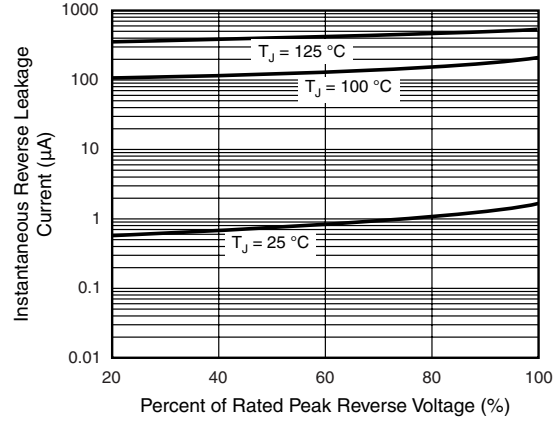


Figure 4. Typical Reverse Leakage Characteristics

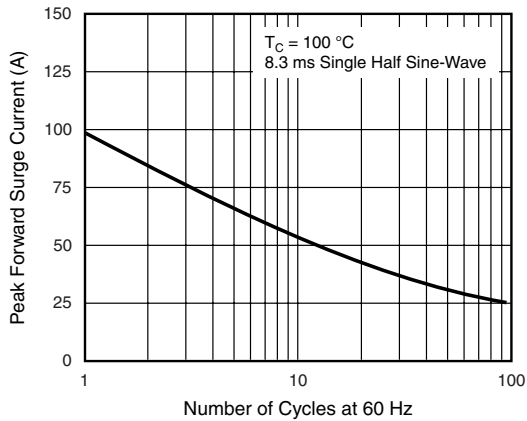


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

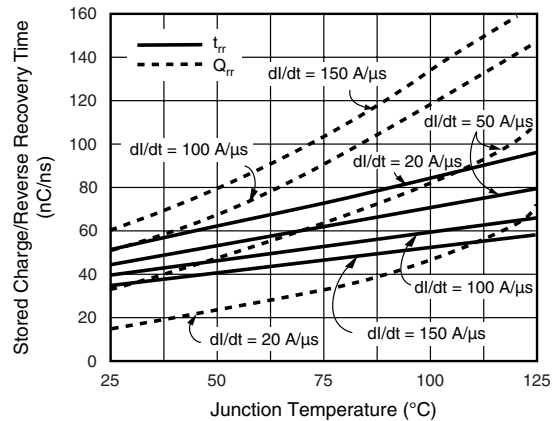


Figure 5. Reverse Switching Characteristics Per Leg

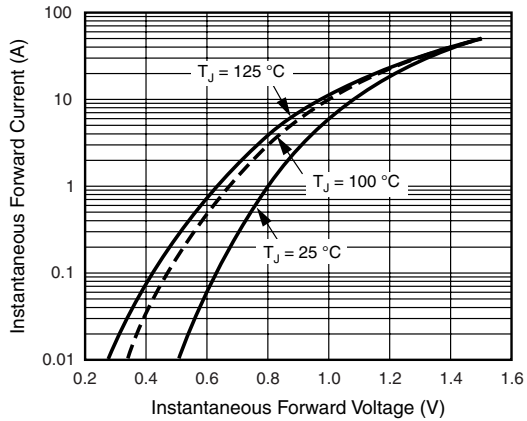


Figure 3. Typical Instantaneous Forward Characteristics

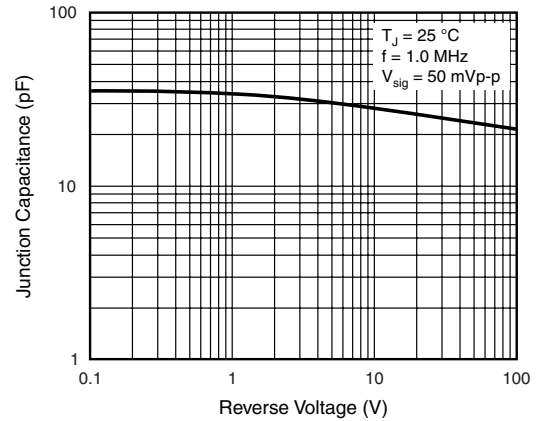
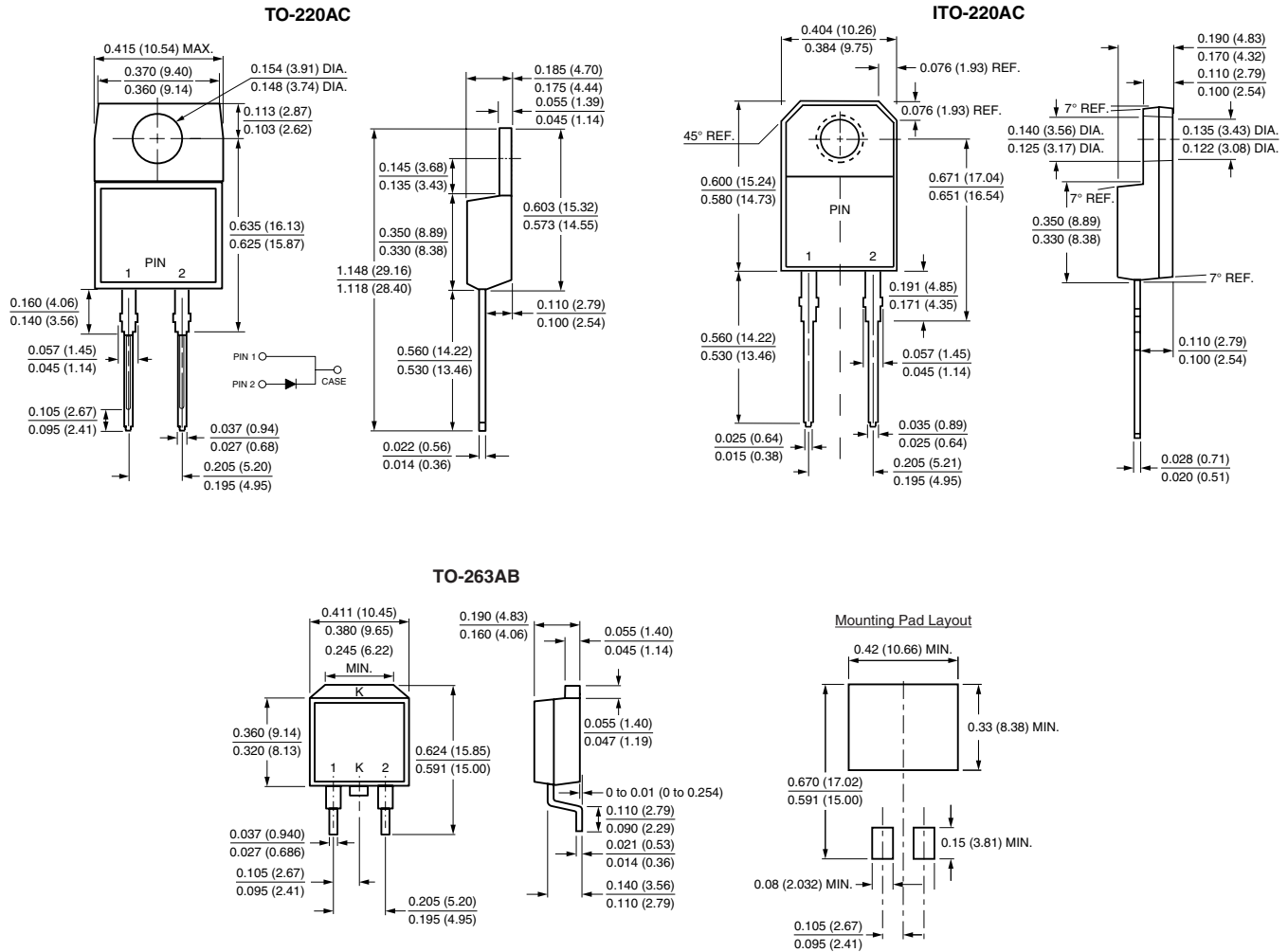


Figure 6. Typical Junction Capacitance



## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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