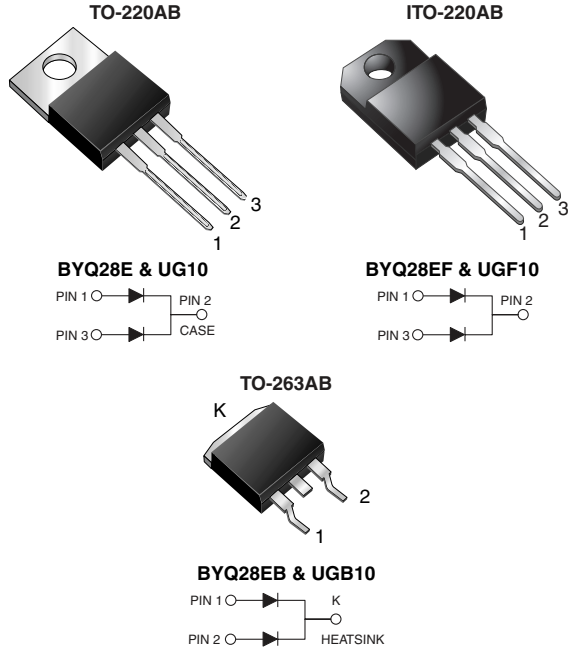




## Dual Common Cathode Ultrafast Rectifier



### FEATURES

- Glass passivated chip junction
- Ultrafast recovery times
- 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-220AB and ITO-220AB package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



RoHS COMPLIANT

### TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching power supplies, freewheeling diodes, dc-to-dc converters and polarity protection application.

### MECHANICAL DATA

**Case:** TO-220AB, ITO-220AB, 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

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	5 A x 2
$V_{RRM}$	100 V, 150 V, 200 V
$I_{FSM}$	55 A
$t_{rr}$	25 ns
$V_F$	0.895 V
$T_J$ max.	150 °C

MAXIMUM RATINGS ( $T_C = 25\text{ °C}$ unless otherwise noted)					
PARAMETER	SYMBOL	UG10BCT	UG10CCT	UG10DCT	UNIT
		BYQ28E-100	BYQ28E-150	BYQ28E-200	
Maximum repetitive peak reverse voltage	$V_{RRM}$	100	150	200	V
Working peak reverse voltage	$V_{RWM}$	100	150	200	V
Maximum DC blocking voltage	$V_{DC}$	100	150	200	V
Maximum average forward rectified current at $T_C = 100\text{ °C}$ total device per diode	$I_{F(AV)}$	10 5			A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	$I_{FSM}$	55			A
Non-repetitive peak reverse current per diode at $t_p = 100\text{ }\mu\text{s}$	$I_{RSM}$	0.2			A
Electrostatic discharge capacitor voltage, human body model: C = 250 pF, R = 1.5 k $\Omega$	$V_C$	8			kV
Operating junction and storage temperature range	$T_J, T_{STG}$	- 40 to + 150			°C
Isolation voltage (ITO-220AB only) from terminal to heatsink $t = 1\text{ min}$	$V_{AC}$	1500			V

# BYQ28E(F,B)-100 thru BYQ28E(F,B)-200, UG(F,B)10BCT

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ELECTRICAL CHARACTERISTICS (T <sub>C</sub> = 25 °C unless otherwise noted)					
PARAMETER	TEST CONDITIONS		SYMBOL	VALUE	UNIT
Maximum instantaneous forward voltage per diode <sup>(1)</sup>	I <sub>F</sub> = 10 A	T <sub>J</sub> = 25 °C	V <sub>F</sub>	1.25	V
	I <sub>F</sub> = 5 A	T <sub>J</sub> = 25 °C		1.10	
	I <sub>F</sub> = 5 A	T <sub>J</sub> = 150 °C		0.895	
Maximum reverse current per diode at working peak reverse voltage		T <sub>J</sub> = 25 °C T <sub>J</sub> = 100 °C	I <sub>R</sub>	10 200	μA
Maximum reverse recovery time per diode	I <sub>F</sub> = 1.0 A, dI/dt = 100 A/μs, V <sub>R</sub> = 30 V, I <sub>rr</sub> = 0.1 I <sub>RM</sub>		t <sub>rr</sub>	25	ns
Maximum reverse recovery time per diode	I <sub>F</sub> = 0.5 A, I <sub>R</sub> = 1.0 A, I <sub>rr</sub> = 0.25 A		t <sub>rr</sub>	20	ns
Maximum stored charge per diode	I <sub>F</sub> = 2 A, dI/dt = 20 A/μs, V <sub>R</sub> = 30 V, I <sub>rr</sub> = 0.1 I <sub>RM</sub>		Q <sub>rr</sub>	9	nC

**Note:**

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

THERMAL CHARACTERISTICS (T <sub>C</sub> = 25 °C unless otherwise noted)					
PARAMETER	SYMBOL	UG10	UGF10	UGB10	UNIT
		BYQ28E	BYQ28EF	BYQ28EB	
Typical thermal resistance per diode, junction to ambient	R <sub>θJA</sub>	50	55	50	°C/W
Typical thermal resistance per diode, junction to case	R <sub>θJC</sub>	4.5	6.7	4.8	

ORDERING INFORMATION (Example)					
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TO-220AB	BYQ28E-200-E3/45	1.80	45	50/tube	Tube
ITO-220AB	BYQ28EF-200-E3/45	1.95	45	50/tube	Tube
TO-263AB	BYQ28EB-200-E3/45	1.77	45	50/tube	Tube
TO-263AB	BYQ28EB-200-E3/81	1.77	81	800/reel	Tape reel
TO-220AB	BYQ28E-200HE3/45 <sup>(1)</sup>	1.80	45	50/tube	Tube
ITO-220AB	BYQ28EF-200HE3/45 <sup>(1)</sup>	1.95	45	50/tube	Tube
TO-263AB	BYQ28EB-200HE3/45 <sup>(1)</sup>	1.77	45	50/tube	Tube
TO-263AB	BYQ28EB-200HE3/81 <sup>(1)</sup>	1.77	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)

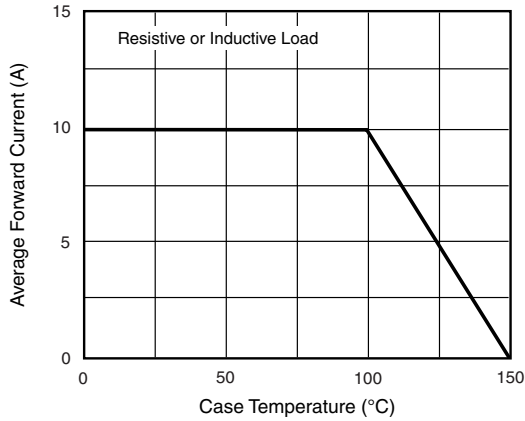


Figure 1. Forward Current Derating Curve

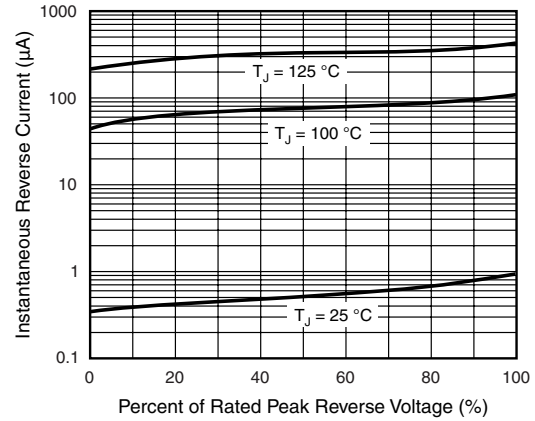


Figure 4. Typical Reverse Characteristics Per Diode

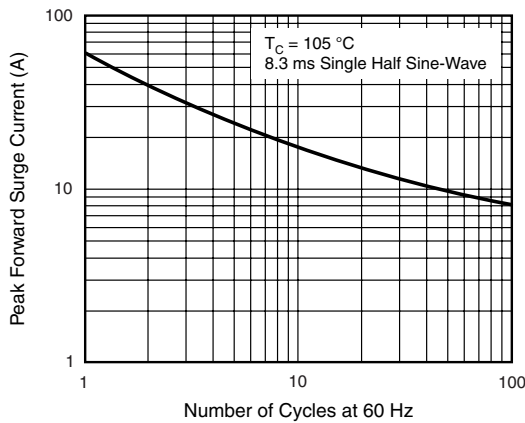


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

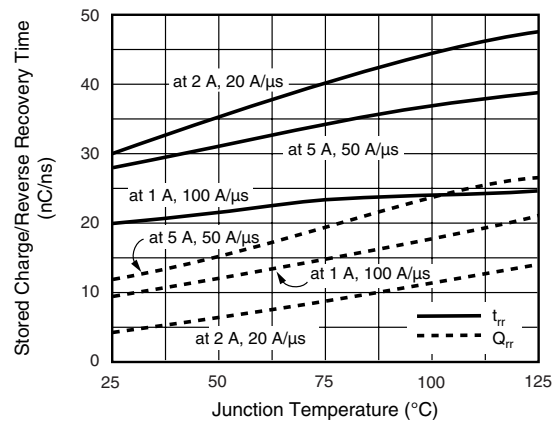


Figure 5. Reverse Switching Characteristics Per Diode

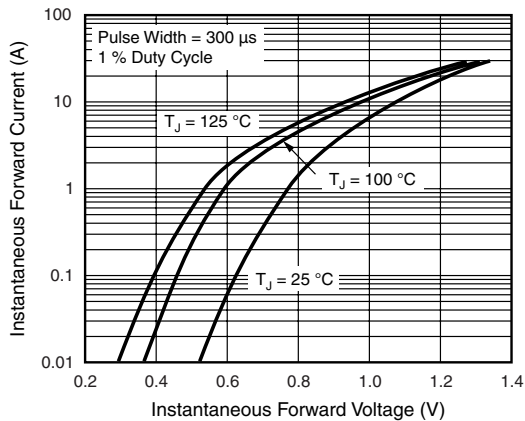


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

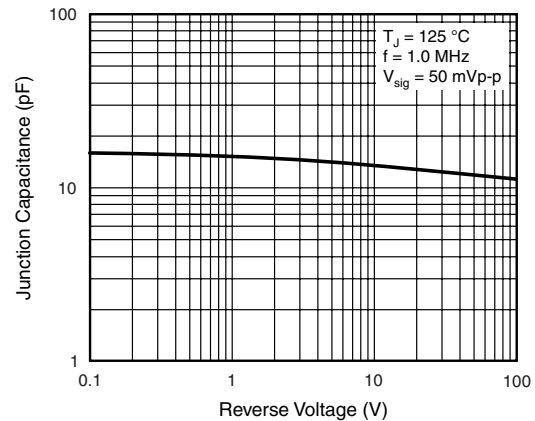


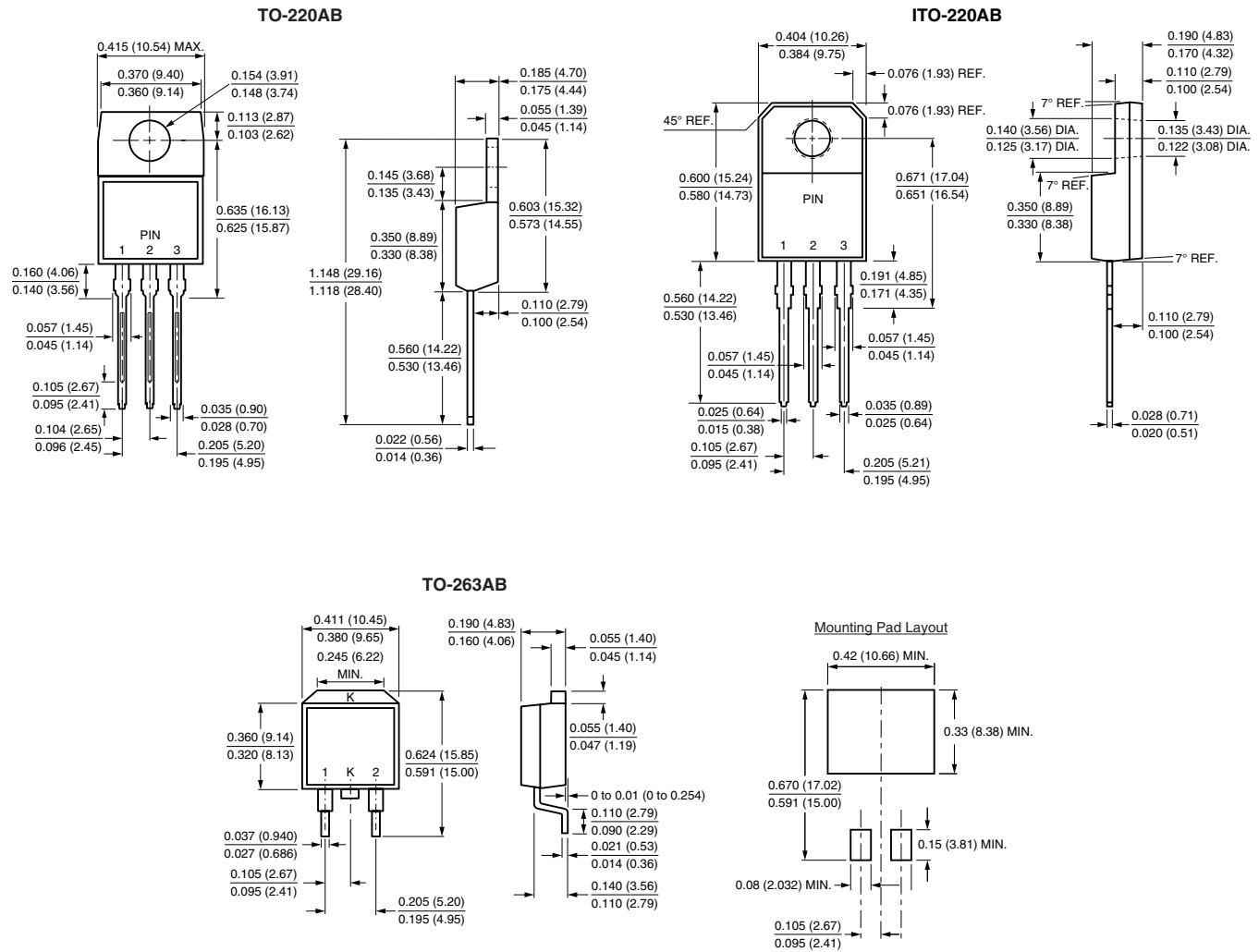
Figure 6. Typical Junction Capacitance Per Diode

# BYQ28E(F,B)-100 thru BYQ28E(F,B)-200, UG(F,B)10BCT

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## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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