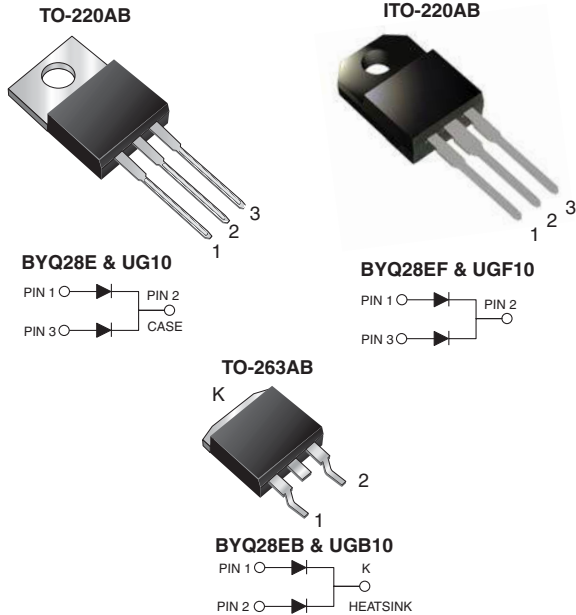




## Dual Common Cathode Ultrafast Rectifier



### 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-020C, LF max peak of 245 °C (for TO-263AB package)
- Solder Dip 260 °C, 40 seconds (for TO-220AB & ITO-220AB package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



### TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching power supplies, free-wheeling 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-002B and JESD22-B102D

E3 suffix for commercial grade, HE3 suffix for high reliability grade (AEC Q101 qualified)

**Polarity:** As marked

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

### MAJOR RATINGS AND 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 ( $T_C = 25$ °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 $T_C = 100$ °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 $t_p = 100$ μs	$I_{RSM}$	0.2			A
Electrostatic discharge capacitor voltage, Human body model: C = 250 pF, R = 1.5 kΩ	$V_C$	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 minute	$V_{AC}$	1500			V

<b>ELECTRICAL CHARACTERISTICS</b> ( $T_C = 25\text{ }^\circ\text{C}$ unless otherwise noted)				
PARAMETER	TEST CONDITIONS	SYMBOL	VALUE	UNIT
Maximum instantaneous forward voltage per diode <sup>(1)</sup>	at $I_F = 10\text{ A}$ , $T_j = 25\text{ }^\circ\text{C}$ at $I_F = 5\text{ A}$ , $T_j = 25\text{ }^\circ\text{C}$ at $I_F = 5\text{ A}$ , $T_j = 150\text{ }^\circ\text{C}$	$V_F$	1.25 1.10 0.895	V
Maximum reverse current per diode at working peak reverse voltage	$T_j = 25\text{ }^\circ\text{C}$ $T_j = 100\text{ }^\circ\text{C}$	$I_R$	10 200	$\mu\text{A}$
Maximum reverse recovery time per diode	at $I_F = 1.0\text{ A}$ , $di/dt = 100\text{ A}/\mu\text{s}$ , $V_R = 30\text{ V}$ , $I_{rr} = 0.1 I_{RM}$	$t_{rr}$	25	ns
Maximum reverse recovery time per diode	at $I_F = 0.5\text{ A}$ , $I_R = 1.0\text{ A}$ , $I_{rr} = 0.25\text{ A}$	$t_{rr}$	20	ns
Maximum stored charge per diode	$I_F = 2\text{ A}$ , $di/dt = 20\text{ A}/\mu\text{s}$ , $V_R = 30\text{ V}$ , $I_{rr} = 0.1 I_{RM}$	$Q_{rr}$	9	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	UG10	UGF10	UGB10	UNIT	
		BYQ28E	BYQ28EF	BYQ28EB		
Typical thermal resistance per diode - junction to ambient - junction to case	$R_{\theta JA}$	50	55	50	$^\circ\text{C}/\text{W}$	
	$R_{\theta JC}$	4.5	6.7	4.8		

<b>ORDERING INFORMATION</b>					
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

**RATINGS AND CHARACTERISTICS CURVES**

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

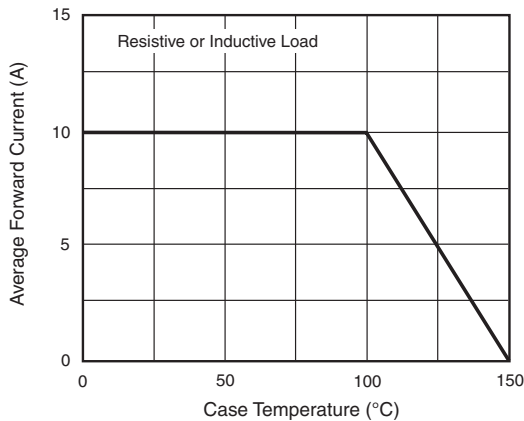


Figure 1. Forward Current Derating Curve

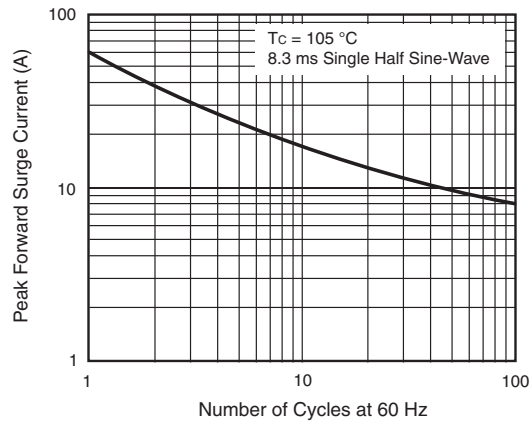


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

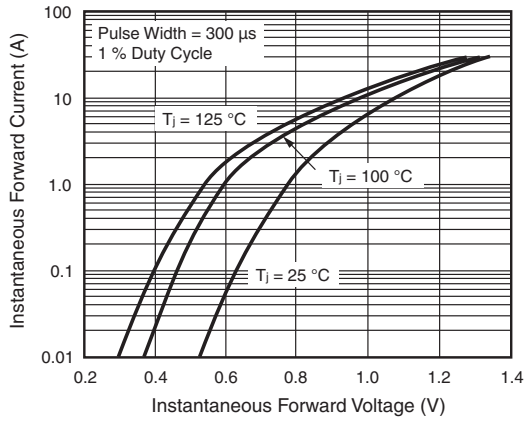


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

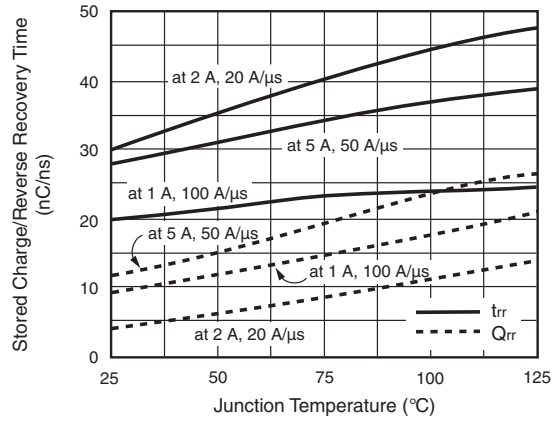


Figure 5. Reverse Switching Characteristics Per Diode

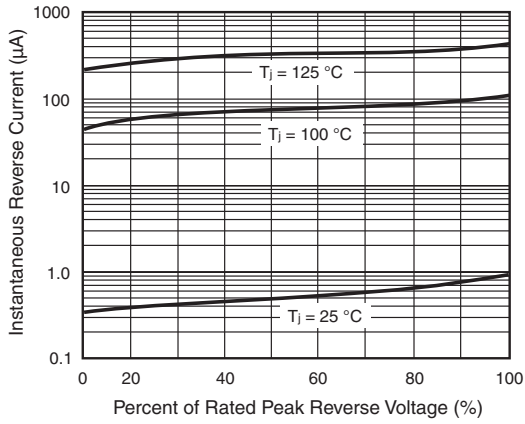


Figure 4. Typical Reverse Characteristics Per Diode

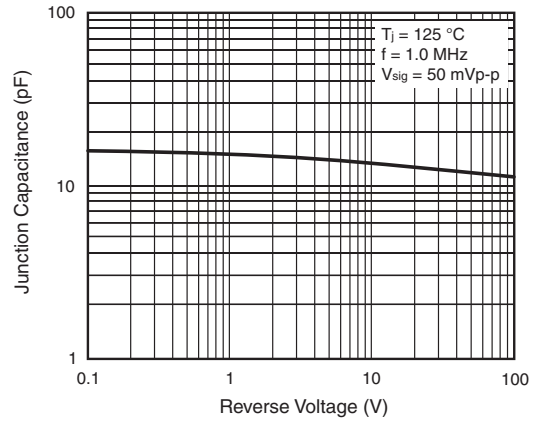
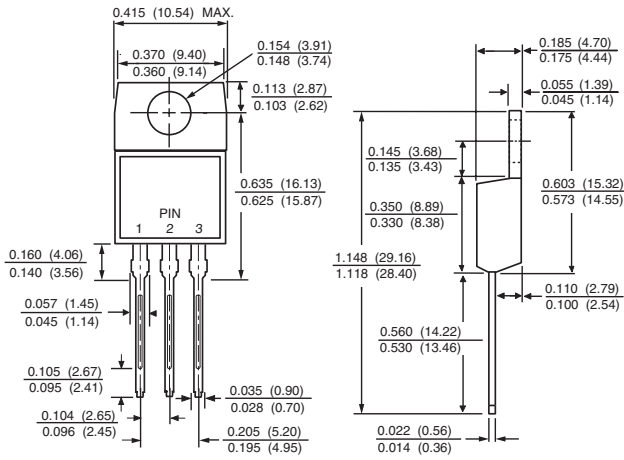


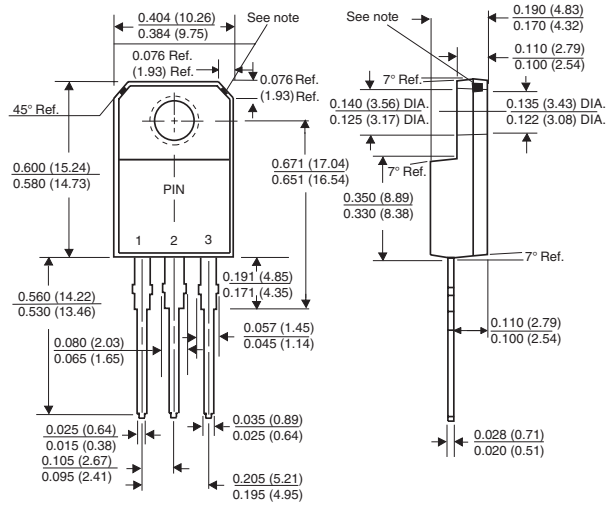
Figure 6. Typical Junction Capacitance Per Diode

**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

**TO-220AB**

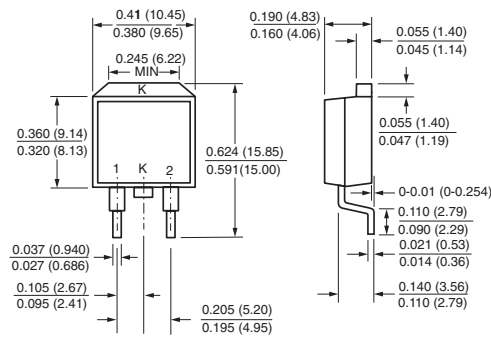


**ITO-220AB**

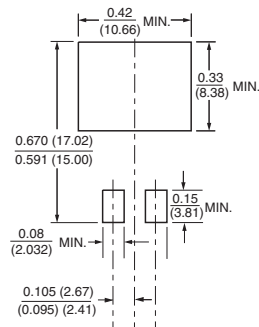


Note: Copper exposure is allowable for 0.005 (0.13) Max. from the body

**TO-263AB**



**Mounting Pad Layout**





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