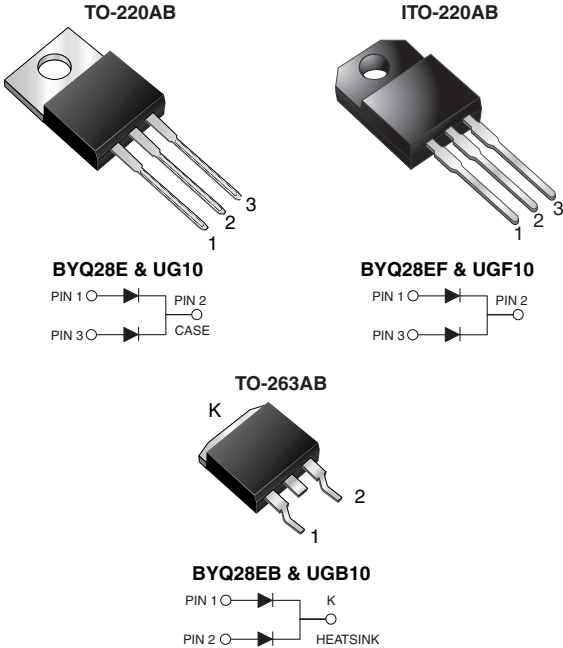




Dual Common Cathode Ultrafast Rectifier



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 Ω	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 ($T_C = 25\text{ }^\circ\text{C}$ unless otherwise noted)					
PARAMETER	TEST CONDITIONS		SYMBOL	VALUE	UNIT
Maximum instantaneous forward voltage per diode ⁽¹⁾	$I_F = 10\text{ A}$	$T_J = 25\text{ }^\circ\text{C}$	V_F	1.25	V
	$I_F = 5\text{ A}$	$T_J = 25\text{ }^\circ\text{C}$		1.10	
	$I_F = 5\text{ A}$	$T_J = 150\text{ }^\circ\text{C}$		0.895	
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	μA
Maximum reverse recovery time per diode	$I_F = 1.0\text{ A}$, $dI/dt = 100\text{ A}/\mu\text{s}$, $V_R = 30\text{ V}$, $I_{rr} = 0.1 I_{RM}$		t_{rr}	25	ns
Maximum reverse recovery time per diode	$I_F = 0.5\text{ A}$, $I_R = 1.0\text{ A}$, $I_{rr} = 0.25\text{ A}$		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 μs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS ($T_C = 25\text{ }^\circ\text{C}$ unless otherwise noted)					
PARAMETER	SYMBOL	UG10	UGF10	UGB10	UNIT
		BYQ28E	BYQ28EF	BYQ28EB	
Typical thermal resistance per diode, junction to ambient	$R_{\theta JA}$	50	55	50	$^\circ\text{C}/\text{W}$
Typical thermal resistance per diode, junction to case	$R_{\theta JC}$	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 ⁽¹⁾	1.80	45	50/tube	Tube
ITO-220AB	BYQ28EF-200HE3/45 ⁽¹⁾	1.95	45	50/tube	Tube
TO-263AB	BYQ28EB-200HE3/45 ⁽¹⁾	1.77	45	50/tube	Tube
TO-263AB	BYQ28EB-200HE3/81 ⁽¹⁾	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)

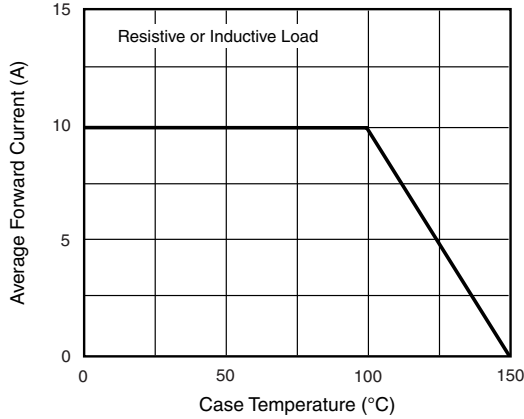


Figure 1. Forward Current Derating Curve

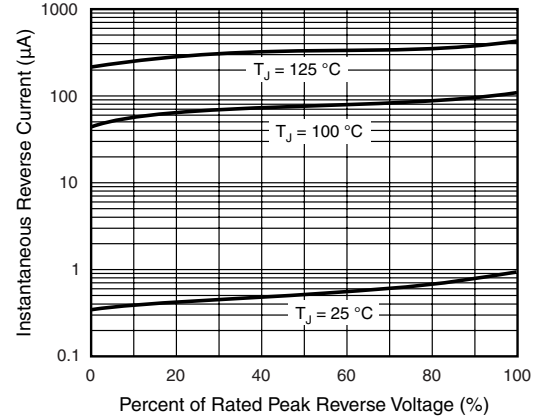


Figure 4. Typical Reverse Characteristics Per Diode

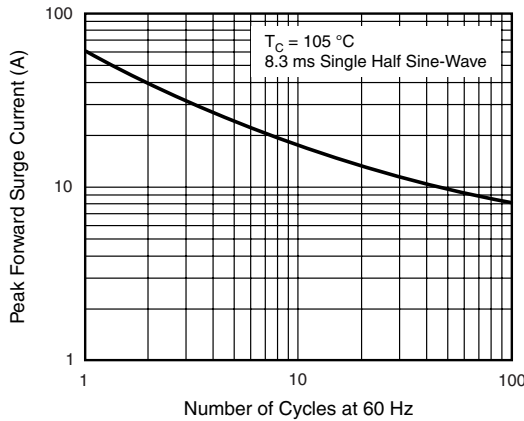


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode

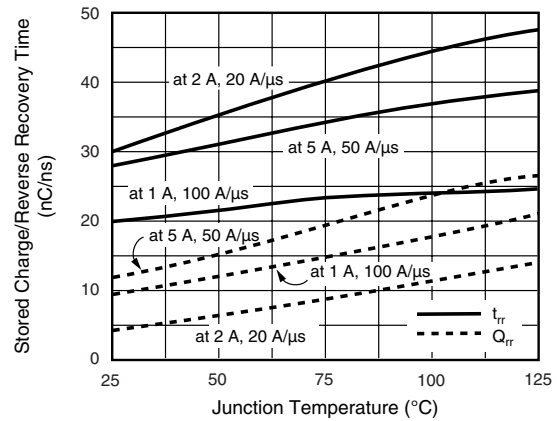


Figure 5. Reverse Switching Characteristics Per Diode

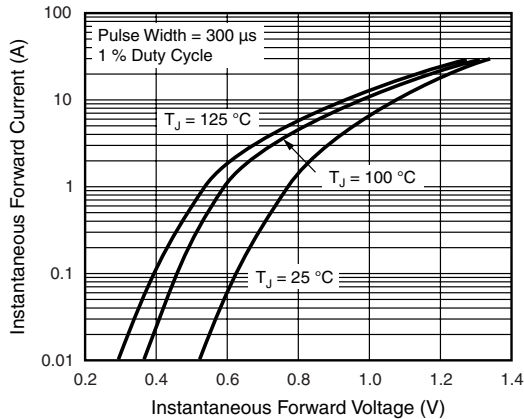


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

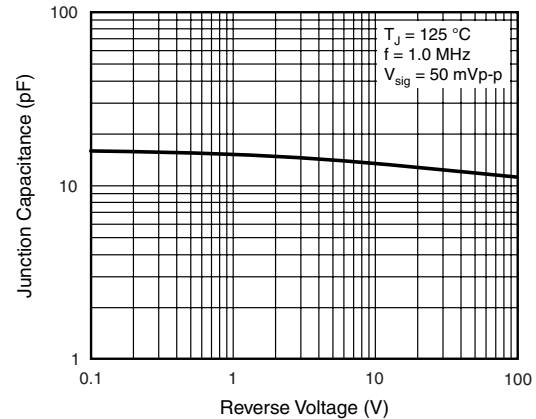


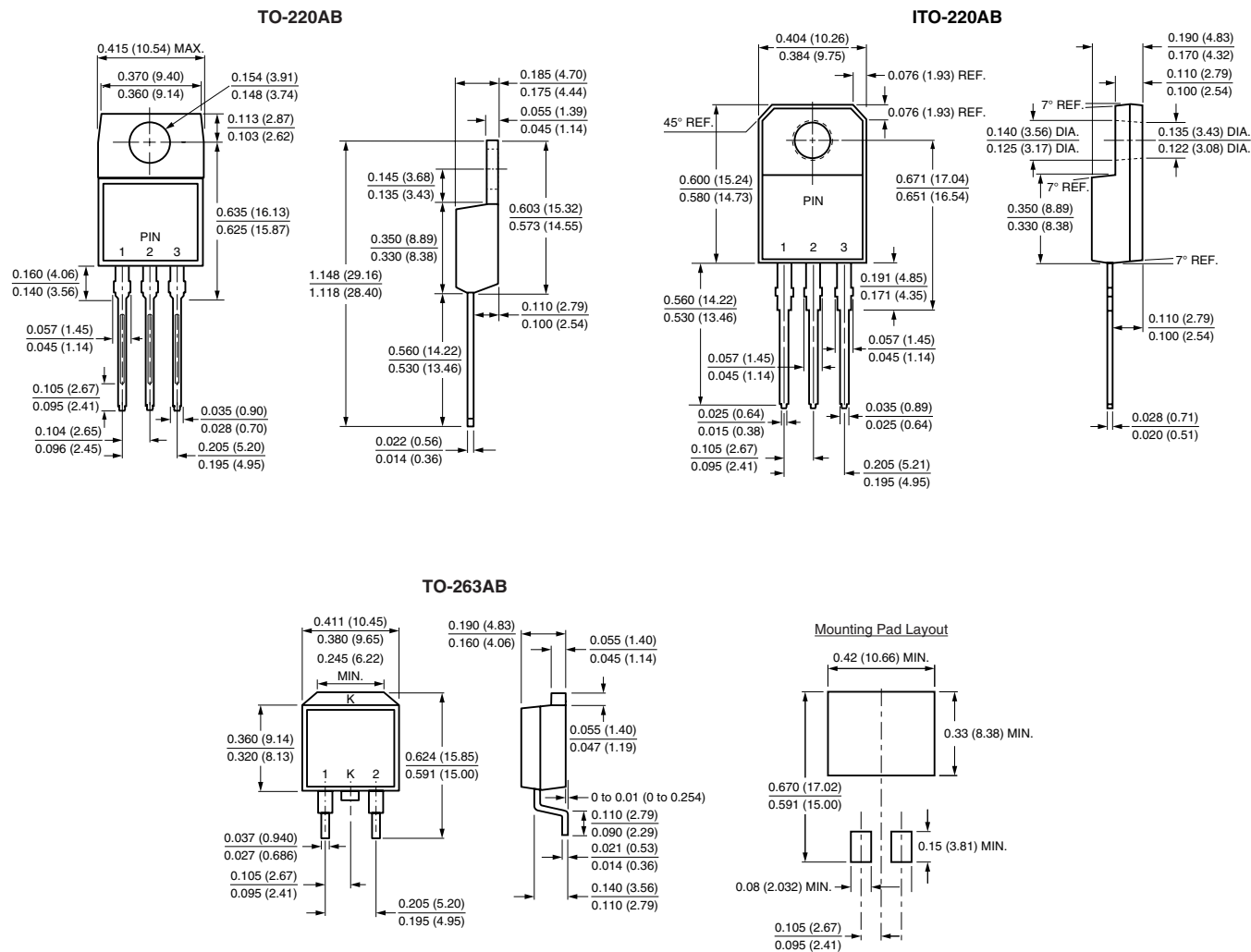
Figure 6. Typical Junction Capacitance Per Diode

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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