

**Rectifier diodes  
ultrafast, rugged**

**BYQ30EB series**

**GENERAL DESCRIPTION**

Glass passivated high efficiency rugged dual rectifier diodes in a plastic envelope suitable for surface mounting, featuring low forward voltage drop, ultra-fast recovery times and soft recovery characteristic. These devices can withstand reverse voltage transients and have guaranteed reverse surge and ESD capability. They are intended for use in switched mode power supplies and high frequency circuits in general where low conduction and switching losses are essential.

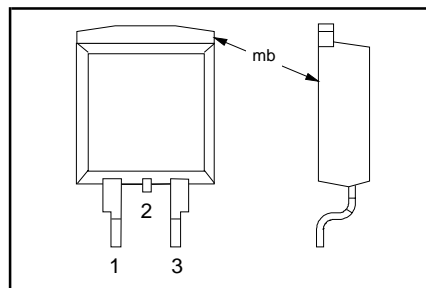
**QUICK REFERENCE DATA**

SYMBOL	PARAMETER	MAX.	MAX.	MAX.	UNIT
$V_{RRM}$	<b>BYQ30EB-</b> Repetitive peak reverse voltage	<b>100</b> 100	<b>150</b> 150	<b>200</b> 200	V
$V_F$	Forward voltage	0.95	0.95	0.95	V
$I_{O(AV)}$	Output current (both diodes conducting)	16	16	16	A
$t_{rr}$	Reverse recovery time	25	25	25	ns
$I_{RRM}$	Repetitive peak reverse current per diode	0.2	0.2	0.2	A

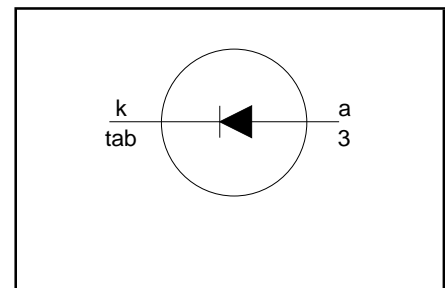
**PINNING - SOT404**

PIN	DESCRIPTION
1	no connection
2	cathode
3	anode
mb	cathode

**PIN CONFIGURATION**



**SYMBOL**



**LIMITING VALUES**

Limiting values in accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.			UNIT
				-100	-150	-200	
$V_{RRM}$	Repetitive peak reverse voltage		-	100	150	200	V
$V_{RWM}$	Crest working reverse voltage		-	100	150	200	V
$V_R$	Continuous reverse voltage		-	100	150	200	V
$I_{O(AV)}$	Output current (both diodes conducting) <sup>1</sup>	square wave $\delta = 0.5; T_{mb} \leq 104^\circ\text{C}$	-	16			A
$I_{O(RMS)}$	RMS forward current		-	23			A
$I_{FRM}$	Repetitive peak forward current per diode	$t = 25 \mu\text{s}; \delta = 0.5;$ $T_{mb} \leq 104^\circ\text{C}$	-	16			A
$I_{FSM}$	Non-repetitive peak forward current per diode	$t = 10 \text{ ms}$	-	100			A
		$t = 8.3 \text{ ms}$ sinusoidal; with reapplied	-	110			A
$I^2t$	$I^2t$ for fusing	$V_{RWM(max)}$ $t = 10 \text{ ms}$	-	50			A <sup>2</sup> s
$I_{RRM}$	Repetitive peak reverse current per diode	$t_p = 2 \mu\text{s}; \delta = 0.001$	-	0.2			A
$I_{RSM}$	Non-repetitive peak reverse current per diode	$t_p = 100 \mu\text{s}$	-	0.2			A
$T_{stg}$	Storage temperature		-40	150			°C
$T_j$	Operating junction temperature		-	150			°C

<sup>1</sup> Neglecting switching and reverse current losses.

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### ESD LIMITING VALUE

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_C$	Electrostatic discharge capacitor voltage	Human body model; $C = 250 \text{ pF}$ ; $R = 1.5 \text{ k}\Omega$	-	8	kV

### THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$R_{th\ j-mb}$	Thermal resistance junction to mounting base	per diode both diodes conducting	-	-	3.0	K/W
$R_{th\ j-a}$	Thermal resistance junction to ambient	minimum footprint, FR4 board	-	50	2.5	K/W
					-	K/W

### STATIC CHARACTERISTICS

$T_j = 25 \text{ }^\circ\text{C}$  unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_F$	Forward voltage (per diode)	$I_F = 8 \text{ A}$ ; $T_j = 150 \text{ }^\circ\text{C}$ $I_F = 16 \text{ A}$ ; $T_j = 150 \text{ }^\circ\text{C}$	-	0.83	0.95	V
		$I_F = 16 \text{ A}$ ;	-	1.0	1.15	V
$I_R$	Reverse current (per diode)	$V_R = V_{RWM}$ ; $T_j = 100 \text{ }^\circ\text{C}$ $V_R = V_{RWM}$	-	0.98	1.25	mA
			-	0.3	0.6	$\mu\text{A}$
			-	2	30	$\mu\text{A}$

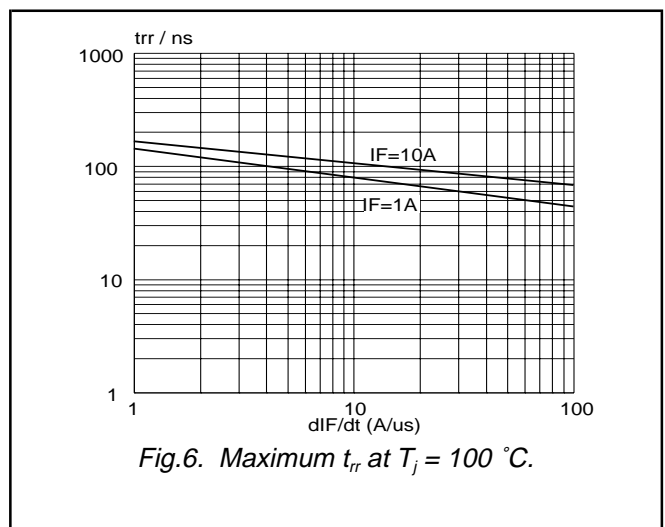
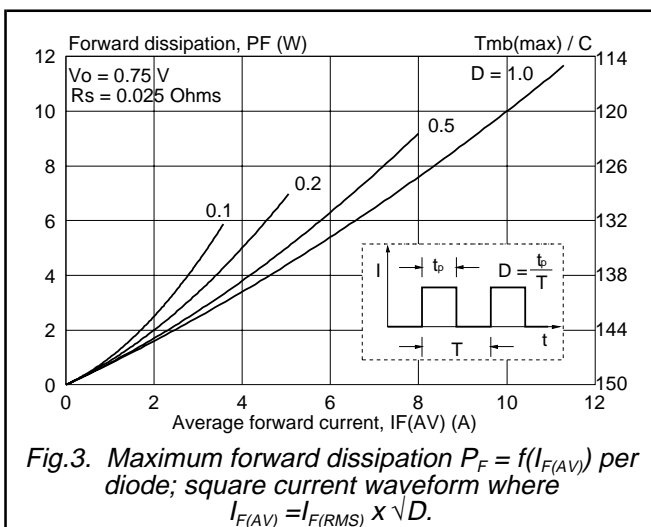
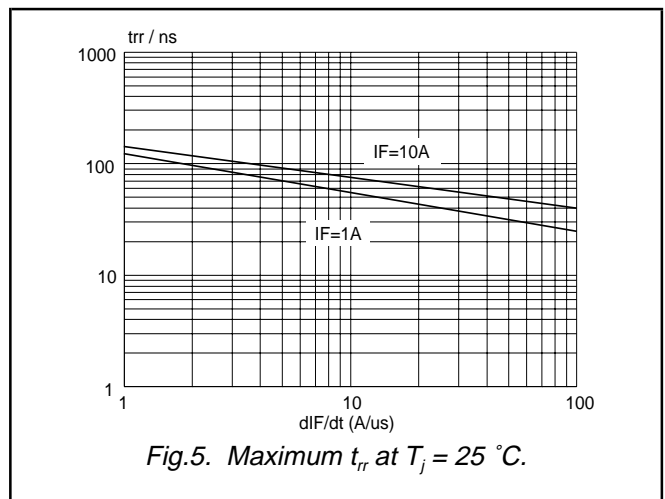
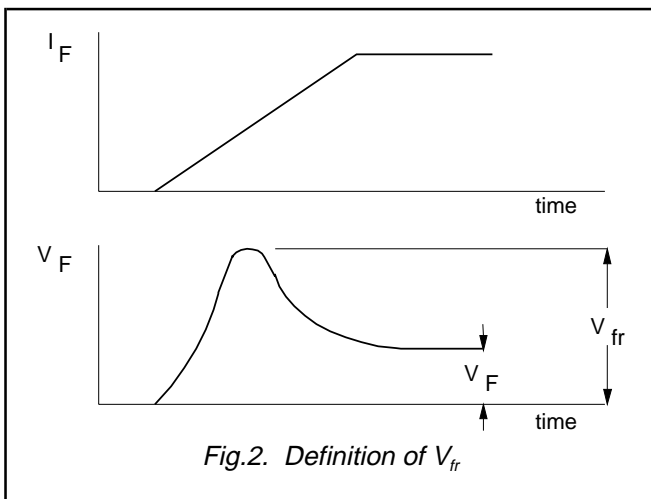
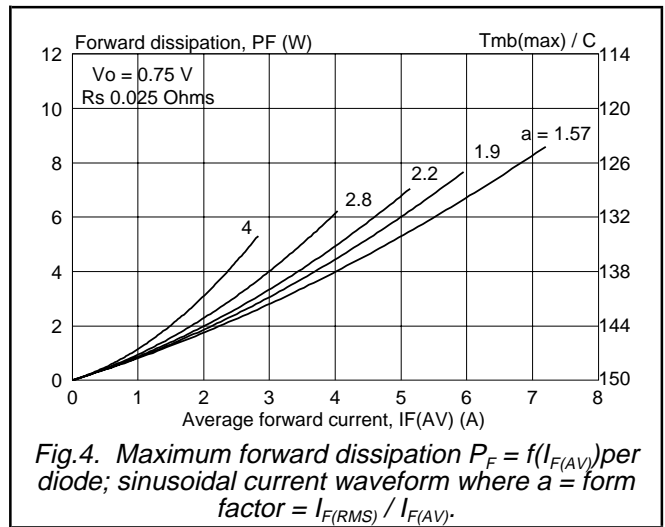
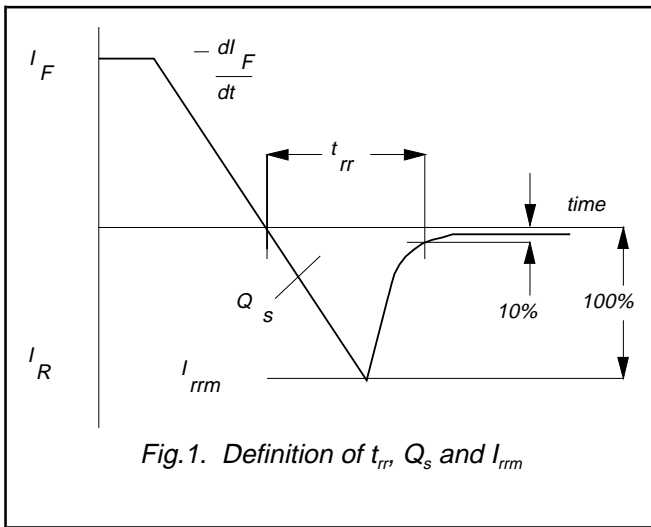
### DYNAMIC CHARACTERISTICS

$T_j = 25 \text{ }^\circ\text{C}$  unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$Q_s$	Reverse recovery charge (per diode)	$I_F = 2 \text{ A}$ ; $V_R \geq 30 \text{ V}$ ; $-di_F/dt = 20 \text{ A}/\mu\text{s}$	-	4	11	nC
$t_{rr}$	Reverse recovery time (per diode)	$I_F = 1 \text{ A}$ ; $V_R \geq 30 \text{ V}$ ; $-di_F/dt = 100 \text{ A}/\mu\text{s}$	-	20	25	ns
$I_{rrm}$	Peak reverse recovery current (per diode)	$I_F = 1 \text{ A}$ ; $V_R \geq 30 \text{ V}$ ; $-di_F/dt = 50 \text{ A}/\mu\text{s}$ ; $T_j = 100 \text{ }^\circ\text{C}$	-	1.0	2	A
$V_{fr}$	Forward recovery voltage (per diode)	$I_F = 1 \text{ A}$ ; $di_F/dt = 10 \text{ A}/\mu\text{s}$	-	1	-	V

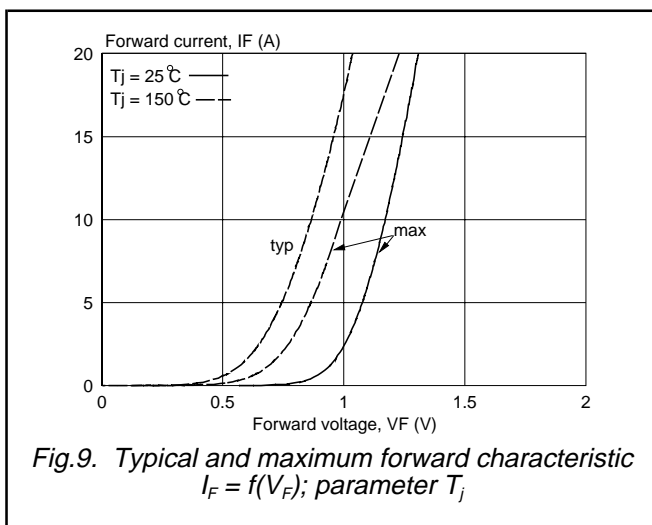
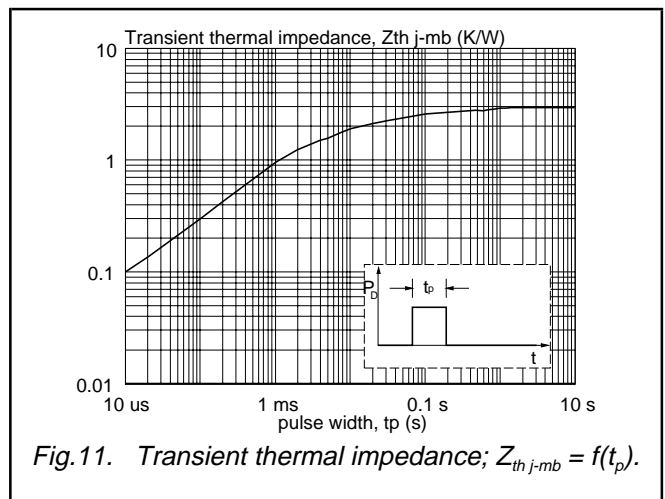
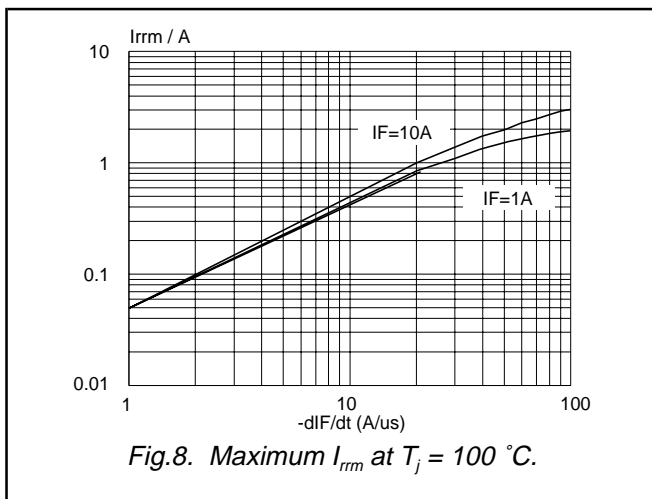
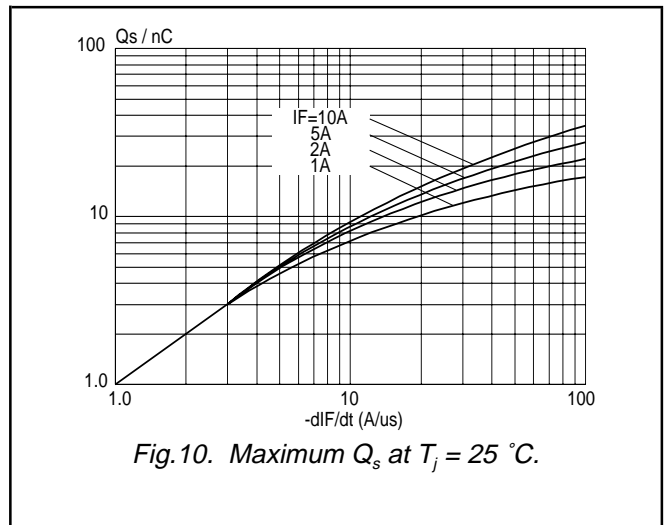
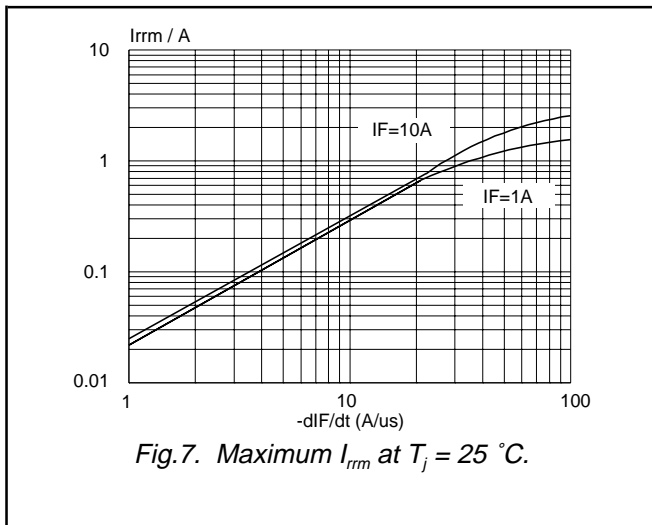
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**MECHANICAL DATA**

*Dimensions in mm*

*Net Mass: 1.4 g*

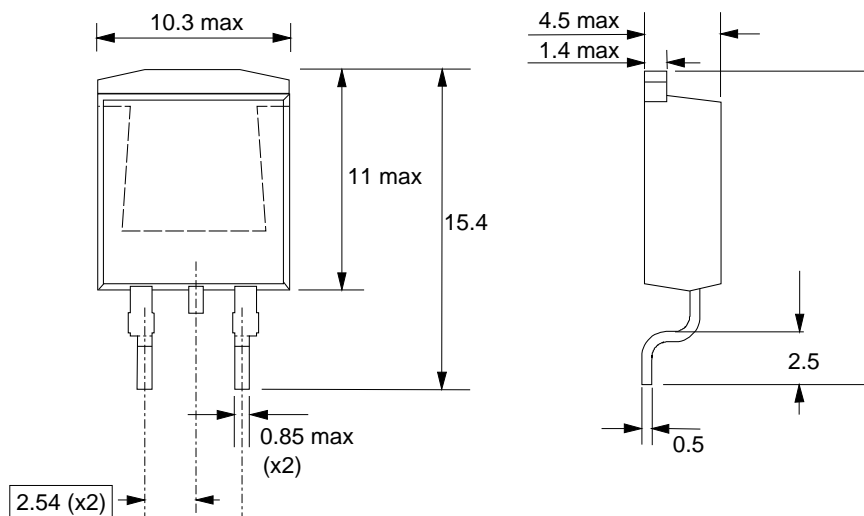


Fig.12. SOT404 : centre pin connected to mounting base.

**Notes**

- 1. Epoxy meets UL94 V0 at 1/8".

**MOUNTING INSTRUCTIONS**

*Dimensions in mm*



Fig.13. SOT404 : minimum pad sizes for surface mounting.

**Notes**

- 1. Plastic meets UL94 V0 at 1/8".

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**DEFINITIONS**

<b>Data sheet status</b>	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
<b>Limiting values</b>	
Limiting values are given in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of this specification is not implied. Exposure to limiting values for extended periods may affect device reliability.	
<b>Application information</b>	
Where application information is given, it is advisory and does not form part of the specification.	
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