

Silicon Dual Diode

BYQ30EX-150

150V/16A

DATASHEET

OEM – Philips

Source: Philips Databook 1999

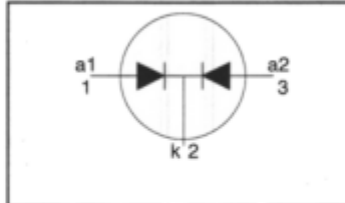
Rectifier diodes ultrafast, rugged

BYQ30EX series

FEATURES

- Low forward volt drop
- Fast switching
- Soft recovery characteristic
- Reverse surge capability
- High thermal cycling performance
- Isolated mounting tab

SYMBOL



QUICK REFERENCE DATA

$$V_R = 150 \text{ V} / 200 \text{ V}$$

$$V_F \leq 0.95 \text{ V}$$

$$I_{O(AV)} = 16 \text{ A}$$

$$I_{RRM} \leq 0.2 \text{ A}$$

$$t_{rr} \leq 25 \text{ ns}$$

GENERAL DESCRIPTION

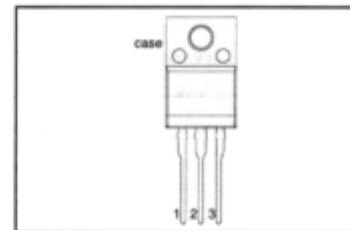
Ultra-fast, epitaxial rectifier diodes intended for use as output rectifiers in high frequency switched mode power supplies.

The BYQ30EX series is supplied in the conventional leaded SOT186A package.

PINNING

PIN	DESCRIPTION
1	anode 1
2	cathode
3	anode 2
tab	isolated

SOT186A



LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.		UNIT
				BYQ30EX		
V_{RRM}	Peak repetitive reverse voltage		-	-150	-200	V
V_{RWM}	Crest working reverse voltage		-	150	200	V
V_R	Continuous reverse voltage		-	150	200	V
$I_{O(AV)}$	Average rectified output current (both diodes conducting) ¹	square wave $\delta = 0.5$; $T_{hj} \leq 59 \text{ }^\circ\text{C}$	-	16		A
I_{FRM}	Repetitive peak forward current per diode	$t = 25 \text{ } \mu\text{s}$; $\delta = 0.5$; $T_{hj} \leq 59 \text{ }^\circ\text{C}$	-	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 $V_{RWM(max)}$	-	110		A
I_{RRM}	Repetitive peak reverse current per diode	$t_p = 2 \text{ } \mu\text{s}$; $\delta = 0.001$	-	0.2		A
I_{RSM}	Non-repetitive peak reverse current per diode	$t_p = 100 \text{ } \mu\text{s}$	-	0.2		A
T_{stg}	Storage temperature		-40	150		$^\circ\text{C}$
T_j	Operating junction temperature		-	150		$^\circ\text{C}$

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

¹ Neglecting switching and reverse current losses.

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ISOLATION LIMITING VALUE & CHARACTERISTIC

$T_{hs} = 25\text{ °C}$ unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_{isol}	R.M.S. isolation voltage from all three terminals to external heatsink	$f = 50\text{-}60\text{ Hz}$; sinusoidal waveform; R.H. $\leq 65\%$; clean and dustfree	-		2500	V
C_{isol}	Capacitance from T2 to external heatsink	$f = 1\text{ MHz}$	-	10	-	pF

THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$R_{th\ j-hs}$	Thermal resistance junction to heatsink	with heatsink compound	-	-	5.0	K/W
$R_{th\ j-a}$	Thermal resistance junction to ambient	without heatsink compound in free air	-	55	7.0	K/W

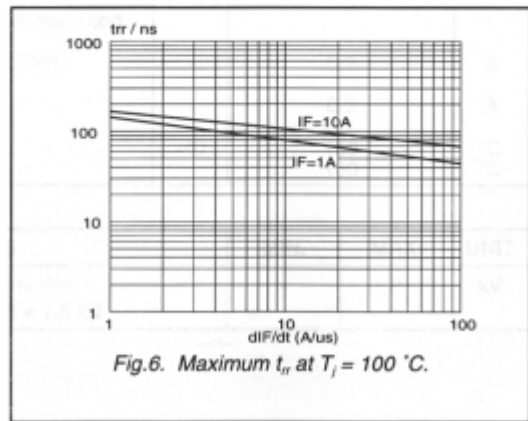
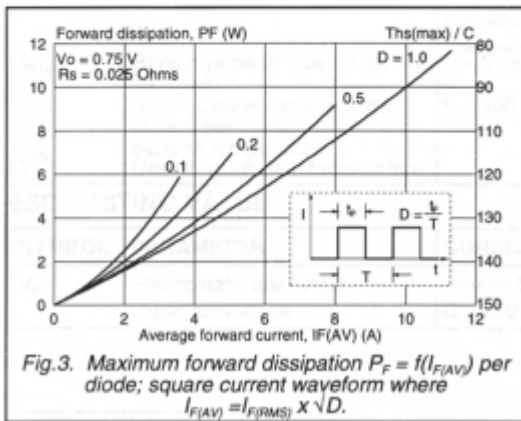
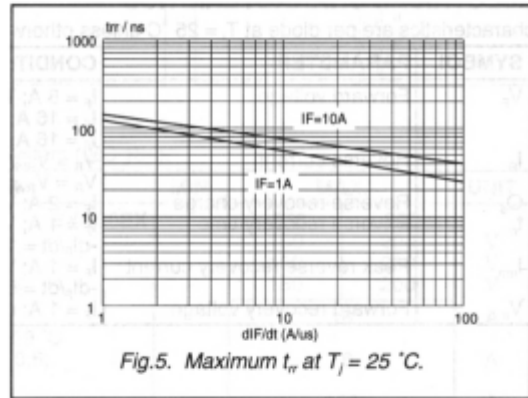
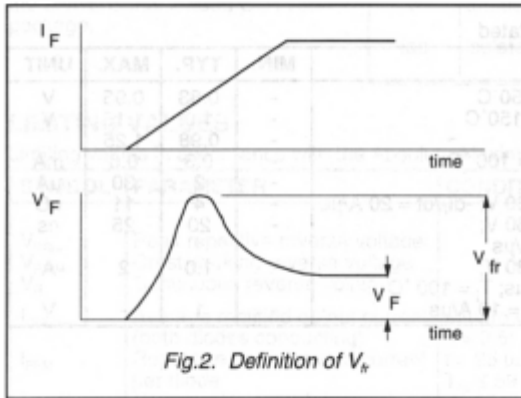
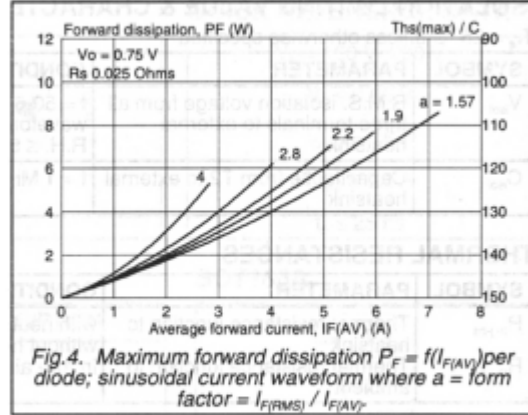
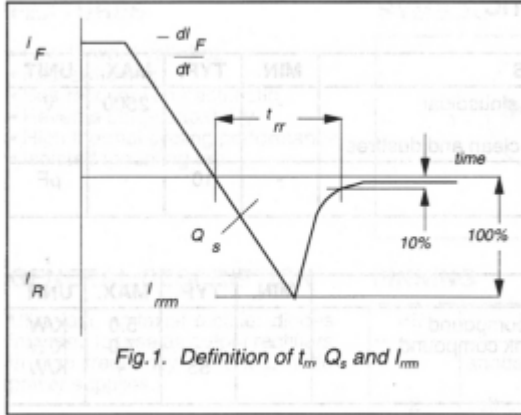
ELECTRICAL CHARACTERISTICS

characteristics are per diode at $T_j = 25\text{ °C}$ unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_f	Forward voltage	$I_f = 8\text{ A}$; $T_j = 150\text{ °C}$	-	0.83	0.95	V
		$I_f = 16\text{ A}$; $T_j = 150\text{ °C}$	-	1.0	1.15	V
I_R	Reverse current	$I_f = 16\text{ A}$; $V_R = V_{RWM}$; $T_j = 100\text{ °C}$	-	0.98	1.25	mA
Q_s	Reverse recovery charge	$V_R = V_{RWM}$	-	0.3	0.6	μA
t_{rr}	Reverse recovery time	$I_f = 2\text{ A}$; $V_R \geq 30\text{ V}$; $-di_f/dt = 20\text{ A}/\mu\text{s}$	-	2	30	nC
I_{rm}	Peak reverse recovery current	$I_f = 1\text{ A}$; $V_R \geq 30\text{ V}$; $-di_f/dt = 100\text{ A}/\mu\text{s}$	-	4	11	ns
V_{fr}	Forward recovery voltage	$I_f = 1\text{ A}$; $V_R \geq 30\text{ V}$; $-di_f/dt = 50\text{ A}/\mu\text{s}$; $T_j = 100\text{ °C}$	-	20	25	A
		$I_f = 1\text{ A}$; $di_f/dt = 10\text{ A}/\mu\text{s}$	-	1	-	V

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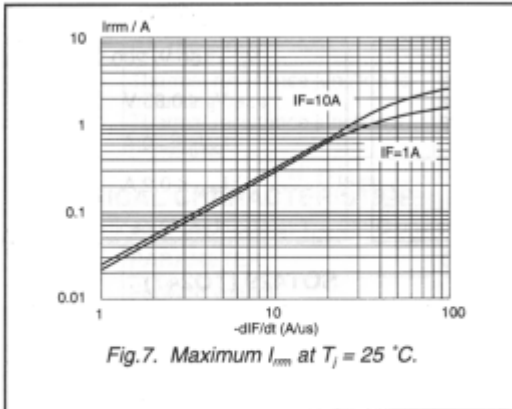


Fig.7. Maximum I_{rm} at $T_j = 25\text{ }^\circ\text{C}$.

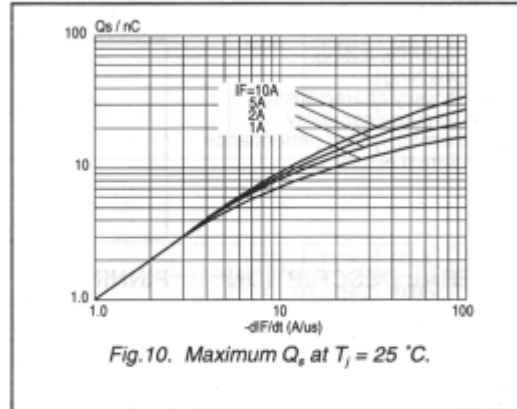


Fig.10. Maximum Q_s at $T_j = 25\text{ }^\circ\text{C}$.

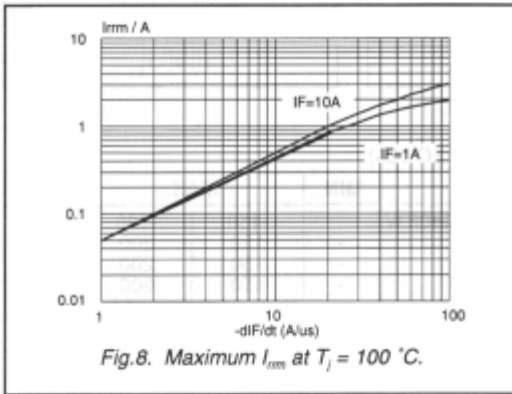


Fig.8. Maximum I_{rm} at $T_j = 100\text{ }^\circ\text{C}$.

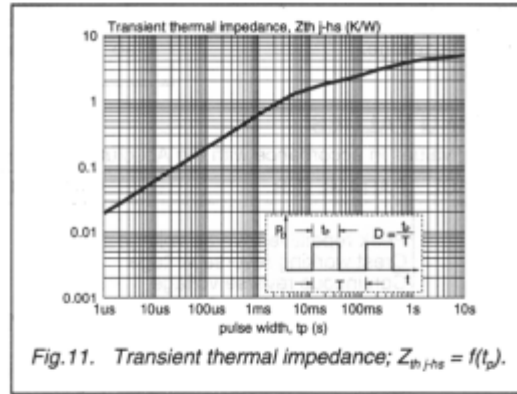


Fig.11. Transient thermal impedance; $Z_{th-jhs} = f(t_p)$.

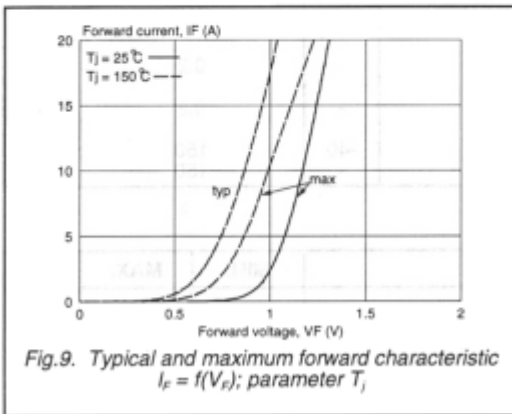


Fig.9. Typical and maximum forward characteristic $I_F = f(V_F)$; parameter T_j