

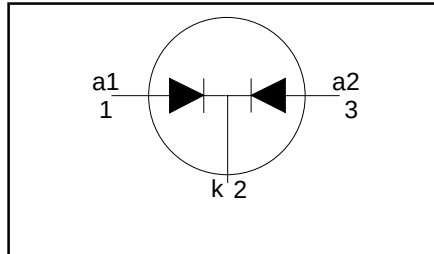
Rectifier diodes ultrafast, rugged

BYQ40EW series

FEATURES

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

SYMBOL



QUICK REFERENCE DATA

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

$$V_F \leq 0.85 \text{ V}$$

$$I_{O(AV)} = 40 \text{ A}$$

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

$$t_{tr} \leq 30 \text{ ns}$$

GENERAL DESCRIPTION

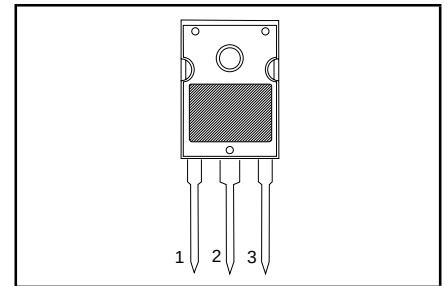
Dual, common cathode, ultra-fast, epitaxial rectifier diodes intended for use as output rectifiers in high frequency switched mode power supplies.

The BYQ40EW series is supplied in the conventional leaded SOT429 (TO247) package.

PINNING

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

SOT429 (TO247)



LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.		UNIT
V_{RRM}	Peak repetitive reverse voltage	BYQ40EW	-	-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)	square wave $\delta = 0.5$; $T_{mb} \leq 110^\circ\text{C}$	-	40		A
I_{FRM}	Repetitive peak forward current per diode	$t = 25 \mu\text{s}$; $\delta = 0.5$; $T_{mb} \leq 110^\circ\text{C}$	-	40		A
I_{FSM}	Non-repetitive peak forward current per diode	$t = 10 \text{ ms}$	-	300		A
		$t = 8.3 \text{ ms}$	-	325		A
I_{RRM}	Repetitive peak reverse current per diode	sinusoidal; with reappplied $V_{RWM(max)}$ $t_p = 2 \mu\text{s}$; $\delta = 0.001$	-	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		$^\circ\text{C}$
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

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THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$R_{th\ j-mb}$	Thermal resistance junction to mounting base	per diode	-	-	1.05	K/W
$R_{th\ j-a}$	Thermal resistance junction to ambient	both diodes conducting in free air	-	-	0.75	K/W
			-	45	-	K/W

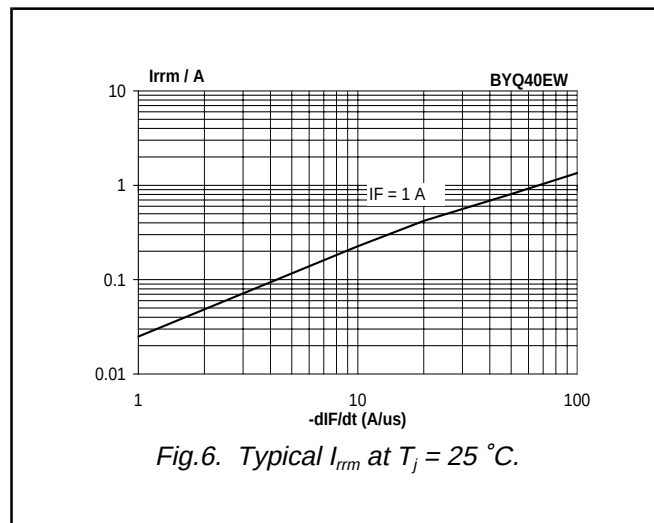
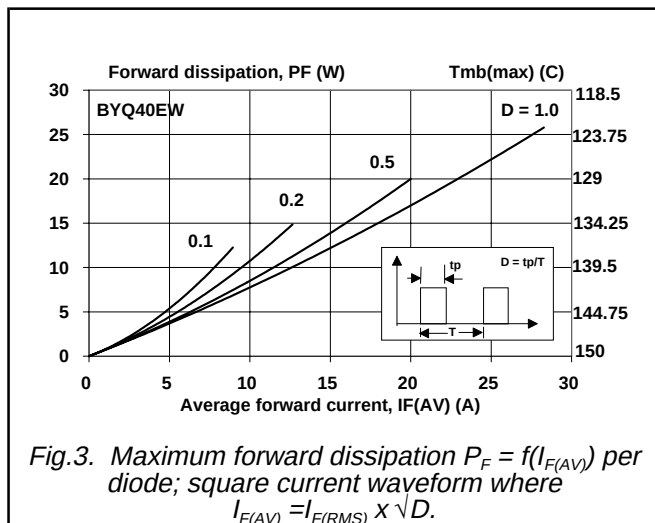
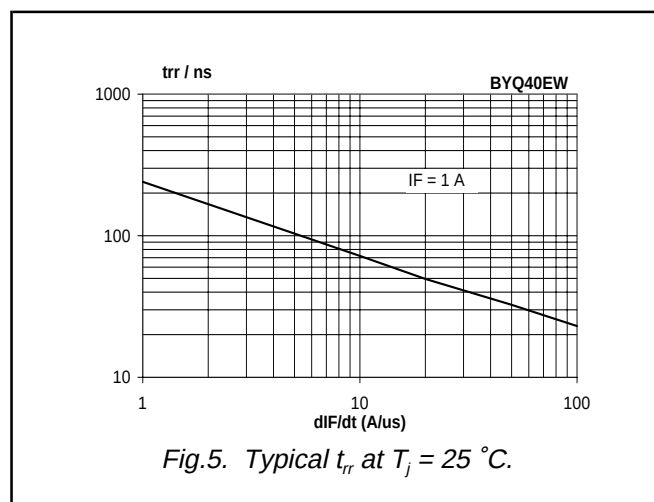
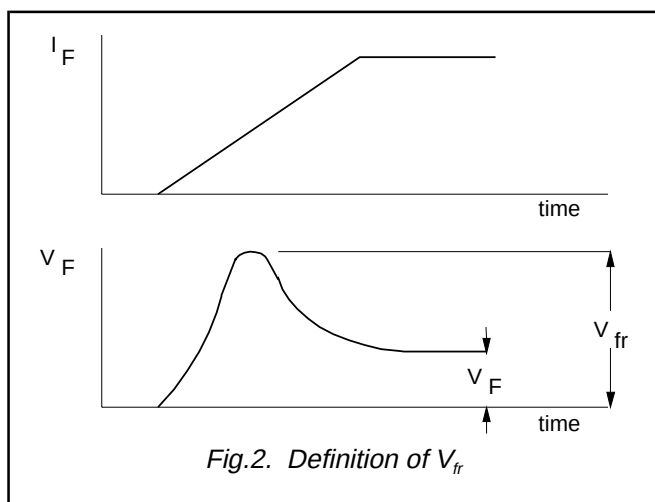
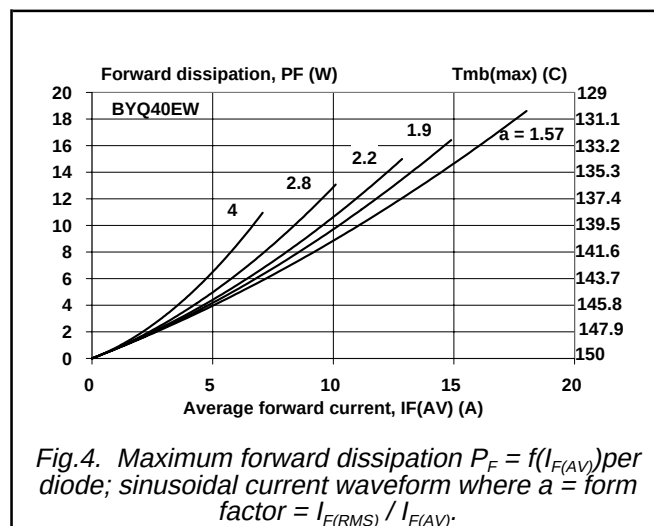
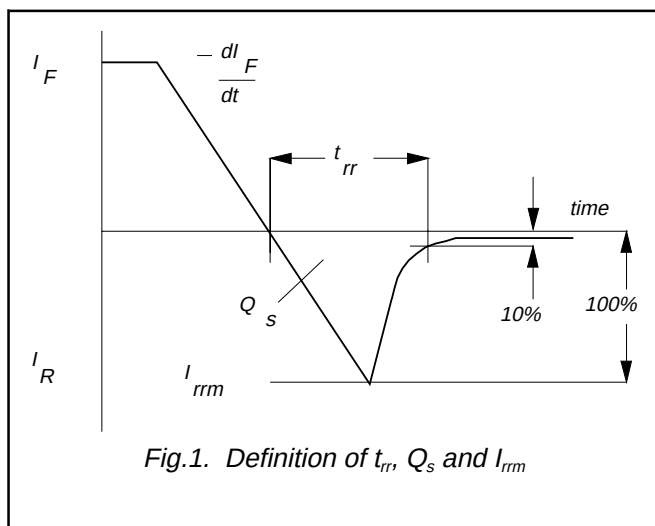
ELECTRICAL CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	Forward voltage	$I_F = 20\text{ A}$; $T_j = 150\text{ °C}$	-	0.8	0.85	V
		$I_F = 20\text{ A}$	-	0.97	1.05	V
		$I_F = 40\text{ A}$	-	1.06	1.20	V
I_R	Reverse current	$V_R = V_{RWM}$	-	6	100	μA
		$V_R = V_{RWM}$; $T_j = 100\text{ °C}$	-	0.7	1	mA
Q_s	Reverse recovery charge	$I_F = 2\text{ A}$; $V_R \geq 30\text{ V}$; $-dI_F/dt = 20\text{ A}/\mu\text{s}$	-	8	18	nC
t_{rr}	Reverse recovery time	$I_F = 1\text{ A}$; $V_R \geq 30\text{ V}$; $-dI_F/dt = 100\text{ A}/\mu\text{s}$	-	23	30	ns
V_{fr}	Forward recovery voltage	$I_F = 1\text{ A}$; $dI_F/dt = 10\text{ A}/\mu\text{s}$	-	0.7	-	V

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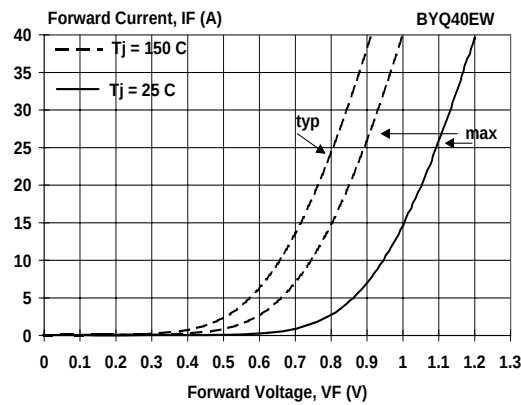


Fig.7. Typical and maximum forward characteristic $I_F = f(V_F)$; parameter T_j

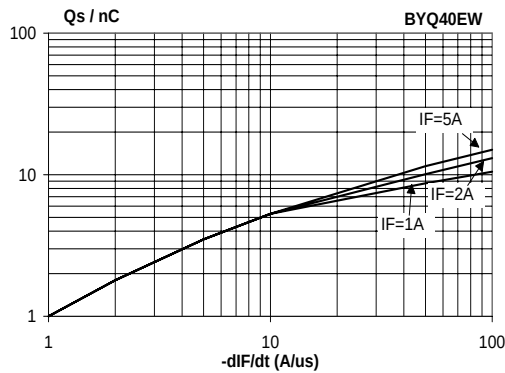


Fig.8. Typical Q_s at $T_j = 25^\circ\text{C}$.

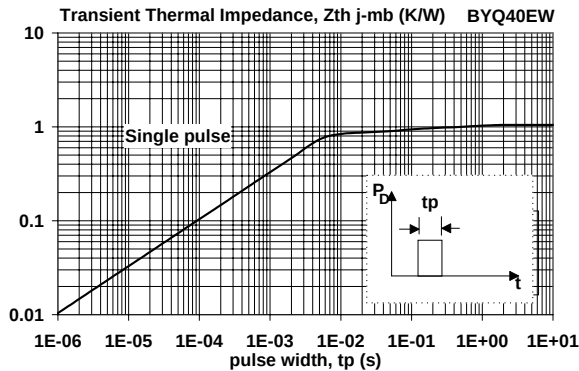
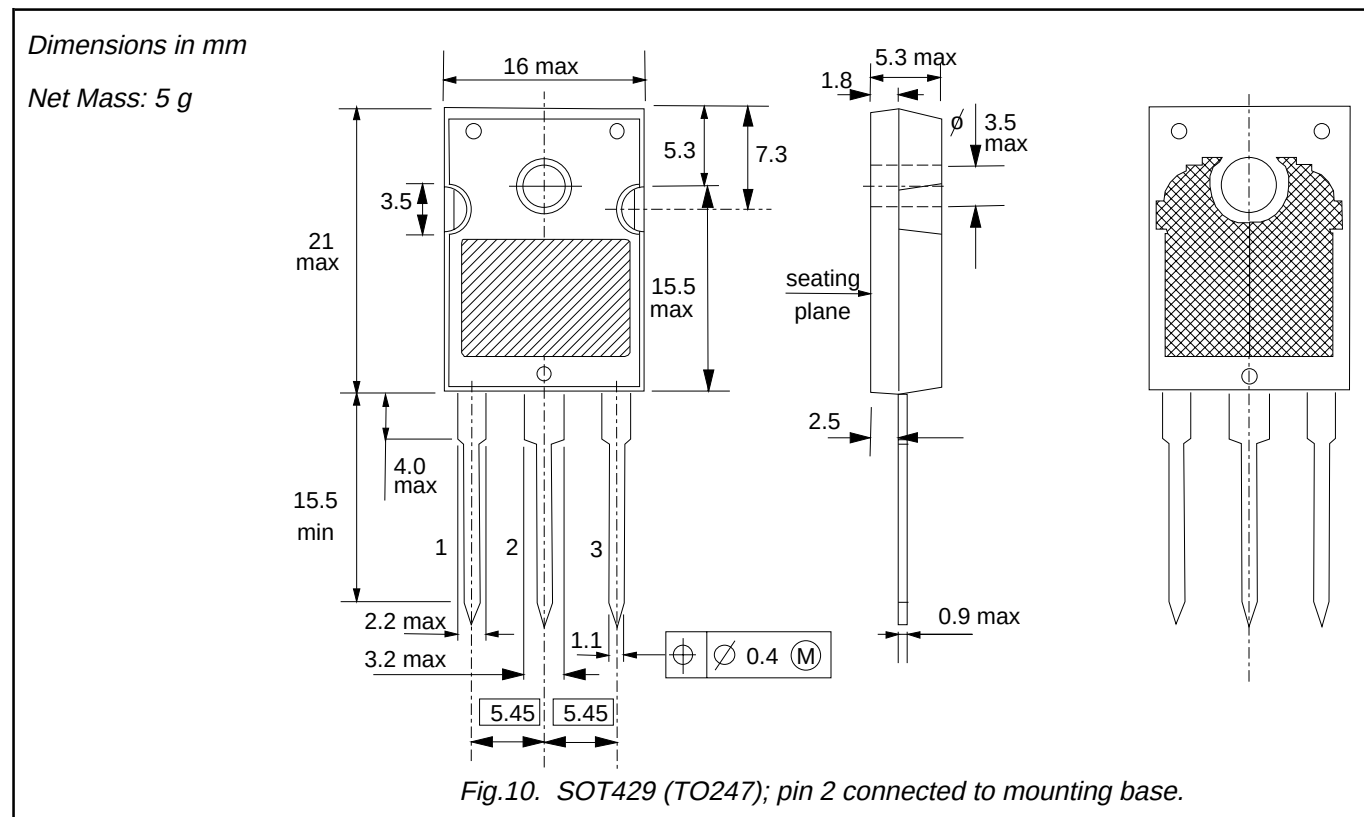


Fig.9. Transient thermal impedance; $Z_{th\ j-hs} = f(t_p)$.

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MECHANICAL DATA



Notes

1. Refer to mounting instructions for SOT429 envelope.
2. Epoxy meets UL94 V0 at 1/8".

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DEFINITIONS

Data sheet status	
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.
Limiting values	
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.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	
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