ULTRA FAST-RECOVERY DOUBLE RECTIFIER DIODES

Glass-passivated, high-efficiency epitaxial rectifier diodes in ISOTOP envelopes, featuring low forward voltage drop, ultra fast reverse recovery times, very low stored charge and soft-recovery characteristic. They are intended for use in switched-mode power supplies and high-frequency circuits in general, where both low conduction and low switching losses are essential. Their electrical isolation makes them ideal for mounting on a common heatsink alongside other components without the need for additional insulators.

QUICK REFERENCE DATA

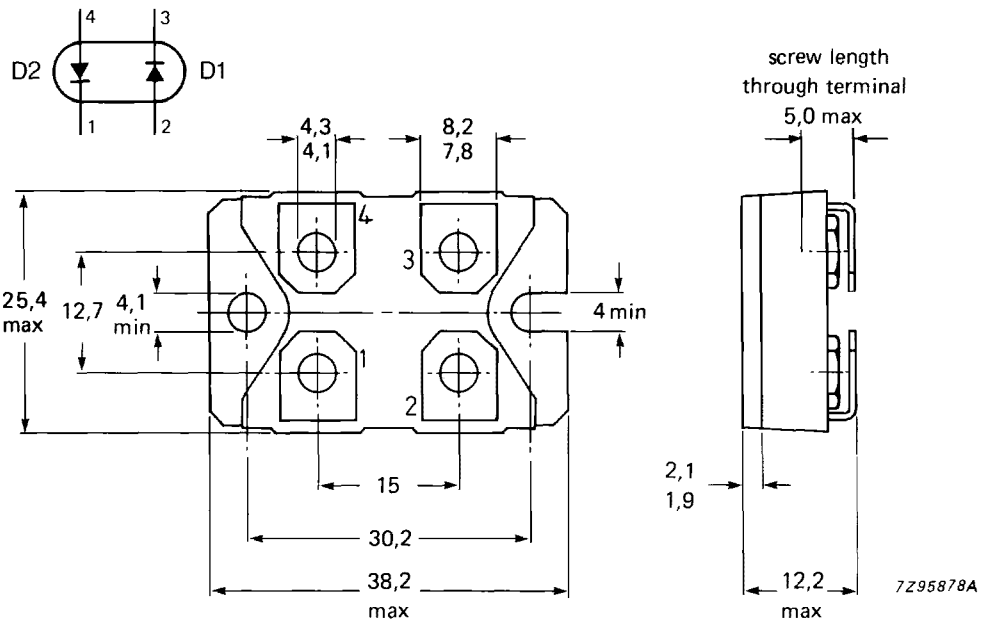
Per diode, unless otherwise stated			BYV54V–	50	100	150	200	
Repetitive peak reverse voltage	V_{RRM}	max.		50	100	150	200	V
Average forward current	$I_{F(AV)}$	max.			2 x 50			A
Forward voltage	V_F	<			0.80			V
Reverse recovery time	t_{rr}	<			60			ns

MECHANICAL DATA

Dimensions in mm

Fig.1 SOT-227B.

Types with Faston terminals are available on request (see overleaf).



Baseplate is electrically isolated.
Isolation voltage: 2500 V RMS.
Capacitance: 45 pF.

Supplied with device: 4 x M4 screws.

RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC134).

			BYV54V–50	100	150	200	
Voltages (per diode)							
Repetitive peak reverse voltage	V_{RRM}	max.	50	100	150	200	V
Non repetitive peak reverse voltage	V_{RSM}	max.	55	110	165	220	V
Currents (per diode)							
Average forward current; switching losses negligible up to 100 kHz square wave, δ = 0.5, up to T_{mb} = 92 °C	$I_{F(AV)}$	max.		50			A
RMS forward current	$I_{F(RMS)}$	max.		100			A
Repetitive peak forward current t_p = 10 μs, δ = 0.02	I_{FRM}	max.		1000			A
Non-repetitive peak forward current half sine-wave t = 10 ms	I_{FSM}	max.		1000			A
I^2t for fusing (t = 10 ms)	I^2t	max.		3200			A^2s
Temperatures							
Storage temperature	T_{stg}			−40 to +150			°C
Junction temperature	T_j			−40 to +150			°C

THERMAL RESISTANCE

From junction to mounting base per diode	$R_{th\ j\text{-}mb}$	=	1.2	K/W
From junction to mounting base total	$R_{th\ j\text{-}mb}$	=	0.65	K/W
From mounting base to heatsink with heatsink compound	$R_{th\ mb\text{-}h}$	=	0.1	K/W

ORDERING NOTE

Types with Faston terminals are available on request (see Fig.2).
Omit suffix V from the type number when ordering, e.g. BYV54-100.

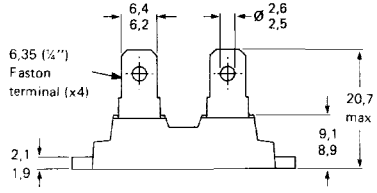
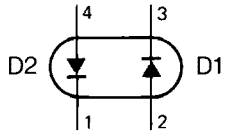
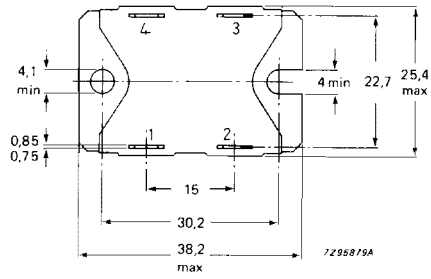


Fig.2 SOT-227A.
Dimensions in mm.





CHARACTERISTICS (per diode)

T_j = 25 °C unless otherwise stated

Forward voltage				
I_F = 50 A; T_j = 150 °C	V_F	<	0.80	V*
I_F = 160 A	V_F	<	1.25	V*
Reverse current				
$V_R = V_{RRM\ max}$; T_j = 100 °C	I_R	<	5	mA
$V_R = V_{RRM\ max}$	I_R	<	200	μA
Reverse recovery when switched from				
I_F = 1 A to $V_R \geqslant$ 30 V with $-dI_F/dt$ = 50 A/μs; recovery time	t_{rr}	<	60	ns
I_F = 2 A to $V_R \geqslant$ 30 V with $-dI_F/dt$ = 20 A/μs; recovered charge (see note 1)	Q_s	<	30	nC
I_F = 10 A to $V_R \geqslant$ 30 V with $-dI_F/dt$ = 50 A/μs; T_j = 100 °C; peak recovery current	I_{RRM}	<	6	A

DEVELOPMENT DATA

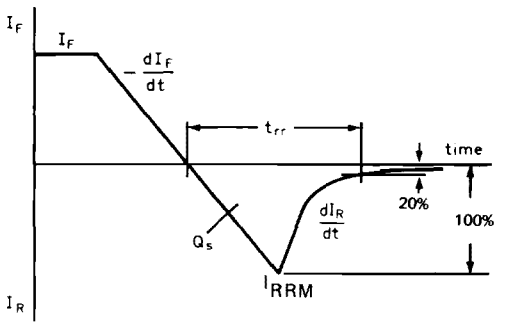


Fig.3 Definition of t_{rr}, Q_s and I_{RRM}.

Note 1: Q_s is corrected for non-dissipative capacitance contribution

*Measured under pulse conditions to avoid excessive dissipation.

SQUARE-WAVE OPERATION

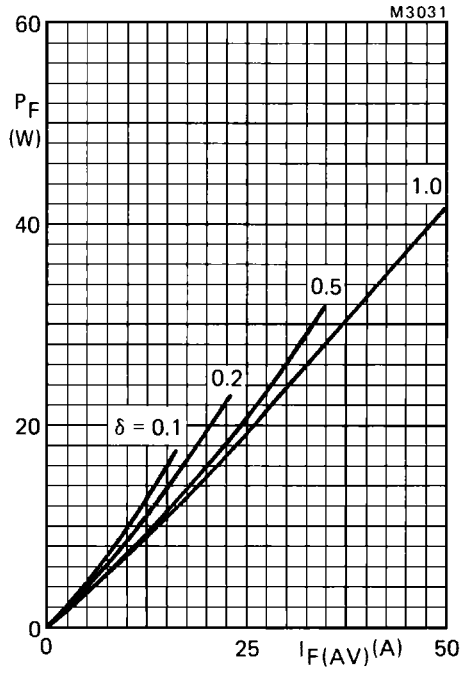
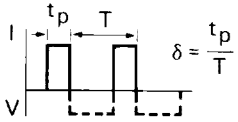


Fig.4 Forward power losses versus average forward current; per diode.



$$I_{F(AV)} = I_{F(RMS)} \times \sqrt{\delta}$$

DEVELOPMENT DATA

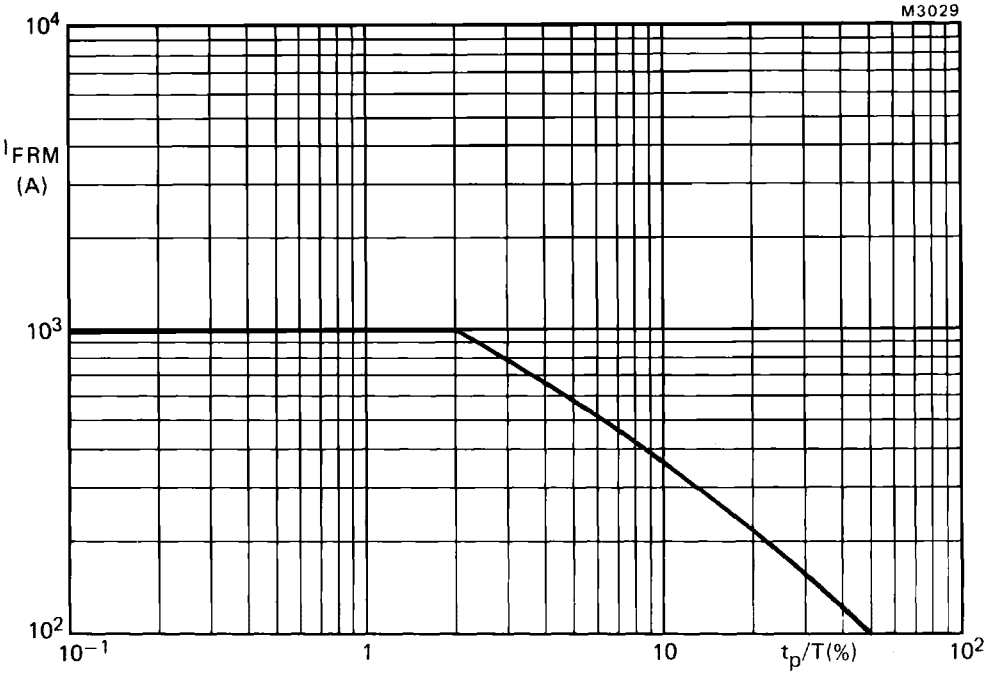
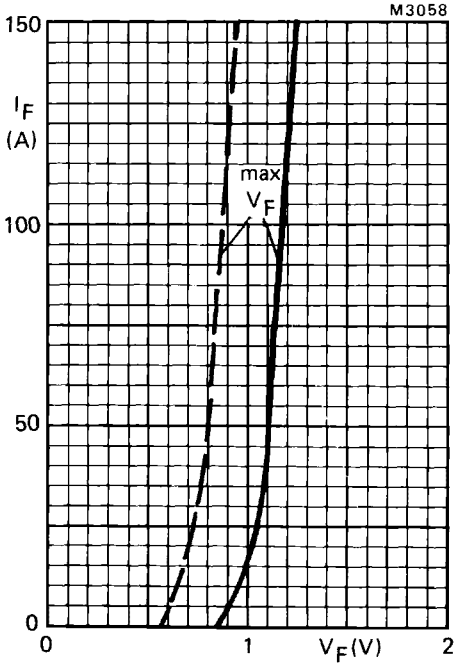
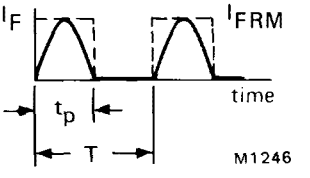


Fig.5 Maximum permissible repetitive peak forward current for square or sinusoidal currents; 1 μs < t_p < 1 ms; per diode.





Definition of I_{FRM} and t_p/T.

Fig.6 —— T_j = 25 °C; – – – T_j = 150 °C; per diode.

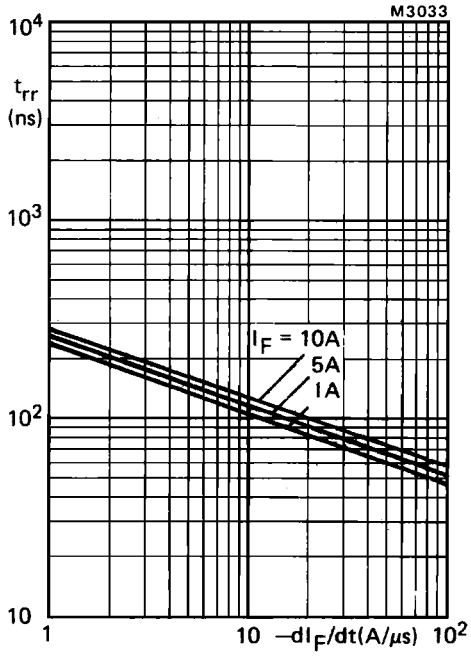


Fig.7 Maximum t_{rr} at T_j = 25 °C; per diode.

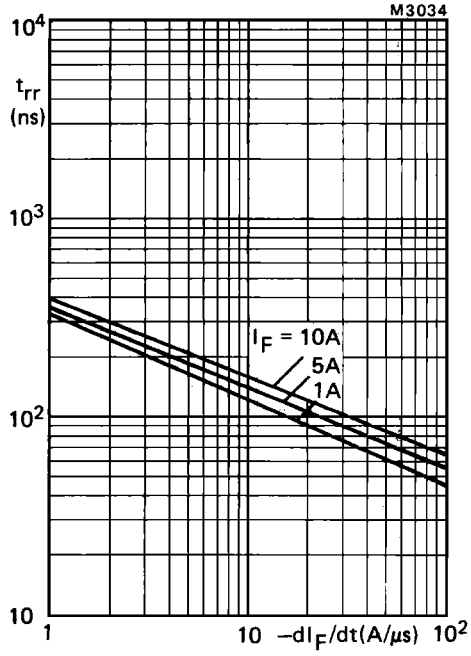


Fig.8 Maximum t_{rr} at T_j = 100 °C; per diode.

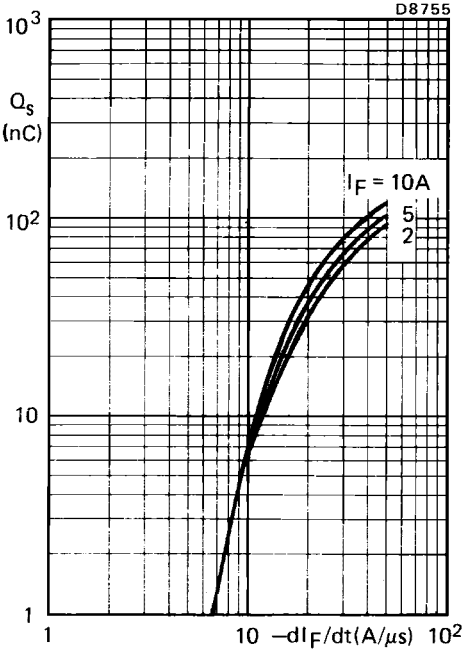


Fig.9 Maximum Q_s at T_j = 25 °C; per diode.

DEVELOPMENT DATA

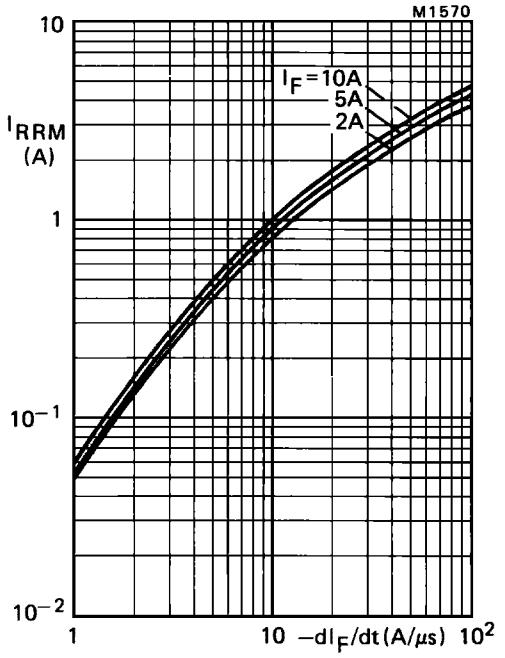


Fig.10 Maximum I_{RRM} at T_j = 25 °C; per diode.

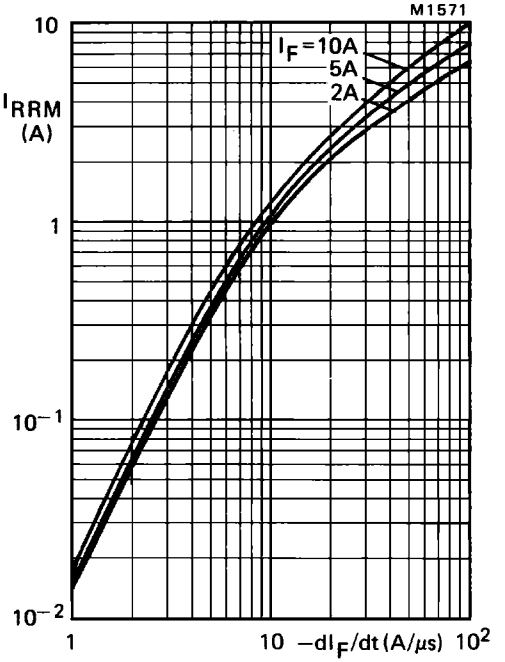


Fig.11 Maximum I_{RRM} at T_j = 100 °C; per diode.

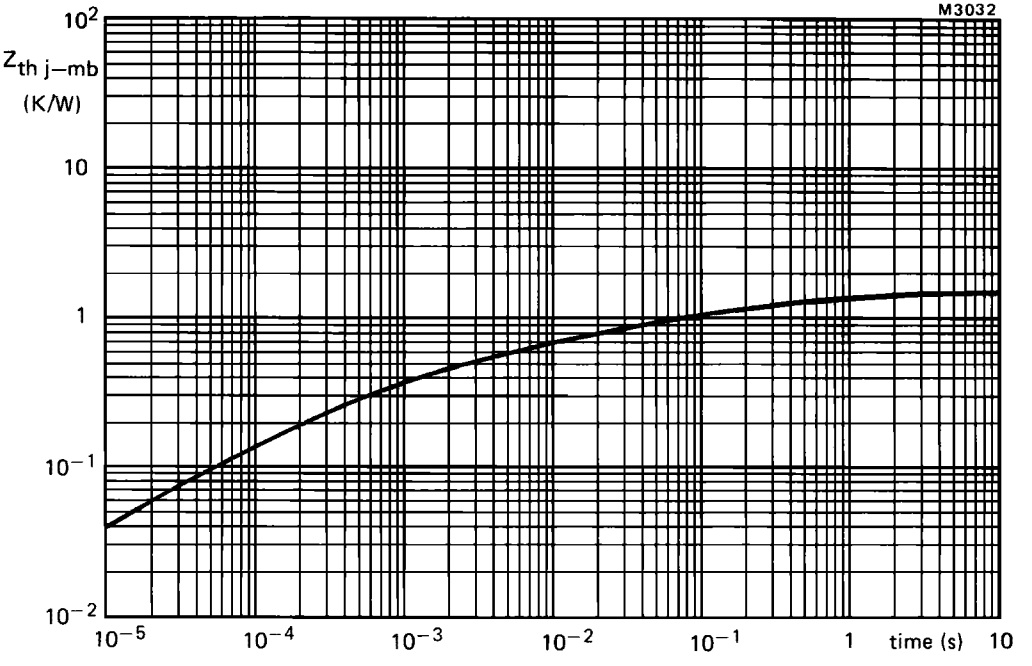


Fig.12 Transient thermal impedance; per diode.