FAST SOFT-RECOVERY RECTIFIER DIODES

Glass-passivated double-diffused rectifier diodes in TO-238 envelope, featuring fast reverse recovery times with soft recovery characteristics.
They are primarily intended for use in a.c. motor control systems as an anti-parallel diode to switching devices such as GTO, ASCR, etc. They are also suitable for use in high-frequency inverters.
The envelope baseplate is electrically isolated.

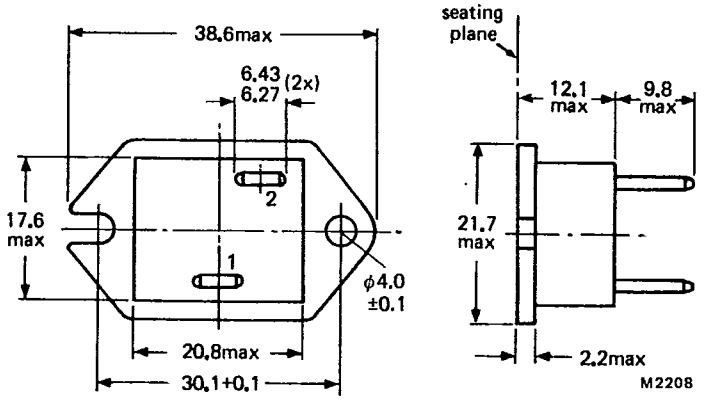
QUICK REFERENCE DATA

		BYV60–	850	1000	1200	
Repetitive peak reverse voltage	V_{RRM}	max.	850	1000	1200	
Average forward current	$I_{F(AV)}$	max.		15		A
Non-repetitive peak forward current	I_{FSM}	max.		150		A
Reverse recovery time	t_{rr}	<		0.6		μs

MECHANICAL DATA

Dimensions in mm

Fig.1 TO-238 (2-pin)



Pin 1 = cathode (AMO 250 series)
2 = anode (AMP 250 series)
Baseplate is electrically isolated.

Net mass = 16.5 g

RATINGS

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

Voltages			BYV60–850	1000	1200	
Non-repetitive peak reverse voltage	V_{RSM}	max.	1000	1100	1300	V
Repetitive peak reverse voltage	V_{RRM}	max.	850	1000	1200	V
Crest working reverse voltage	V_{RWM}	max.	600	800	1000	V
Continuous reverse voltage	V_R	max.	500	650	750	V

Currents				
Average forward current assuming zero switching losses				
square-wave; $\delta = 0.5$; up to $T_{mb} = 76\ ^oC$	$I_{F(AV)}$	max.	15	A
sinusoidal; up to $T_{mb} = 81\ ^oC$	$I_{F(AV)}$	max.	13.5	A
R.M.S. forward current	$I_{F(RMS)}$	max.	21	A
Repetitive peak forward current; $1\ \mu s < t_p < 1$ ms; $\delta \leqslant 0.02$	I_{FRM}	max.	300	A
Non-repetitive peak forward current; t = 10 ms half sine-wave; $T_j = 125\ ^oC$ prior to surge; with reapplied $V_{RWM\ max}$	I_{FSM}	max.	150	A

Temperatures				
Storage temperature	T_{stg}		−40 to +125	°C
Junction temperature	T_j	max.	125	°C

THERMAL RESISTANCE

From mounting base to heatsink; with heatsink compound	$R_{th\ mb\text{-}h}$	=	0.3	K/W
From junction to mounting base	$R_{th\ j\text{-}mb}$	=	2	K/W

ISOLATION*

R.M.S. isolation voltage	V_{isol}	min.	2500	V

*From baseplate to terminals strapped together.

CHARACTERISTICS

Forward voltage				
I_F = 50 A; T_j = 25 °C	V_F	<	2.45	V*
Reverse current				
$V_R = V_{RWMmax}$; T_j = 100 °C	I_R	<	1.2	mA
Reverse recovery when switched from				
I_F = 2 A to $V_R \geqslant$ 30 V with $-dI_F/dt$ = 20 A/μs; T_j = 25 °C				
recovered charge	Q_s	<	2.0	μC
recovery time	t_{rr}	<	0.6	μs
Forward recovery when switched to				
I_F = 5 A with t_r = 0.1 μs; T_j = 25 °C				
recovery time	t_{fr}	<	1.0	μs

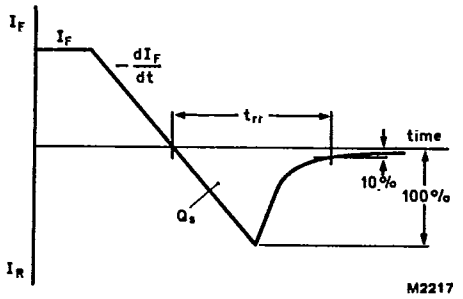


Fig.2 Definition of t_{rr} and Q_s.

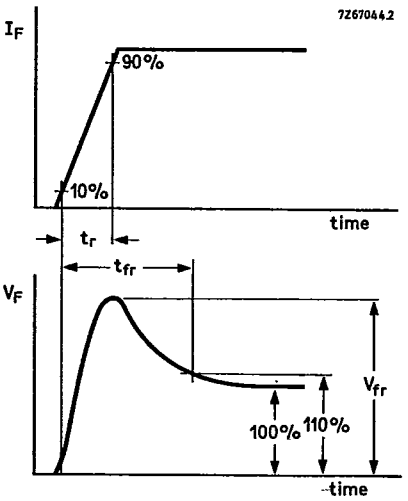


Fig.3 Definition of t_{fr}.

*Measured under pulse conditions to avoid excessive dissipation.

SINUSOIDAL OPERATION

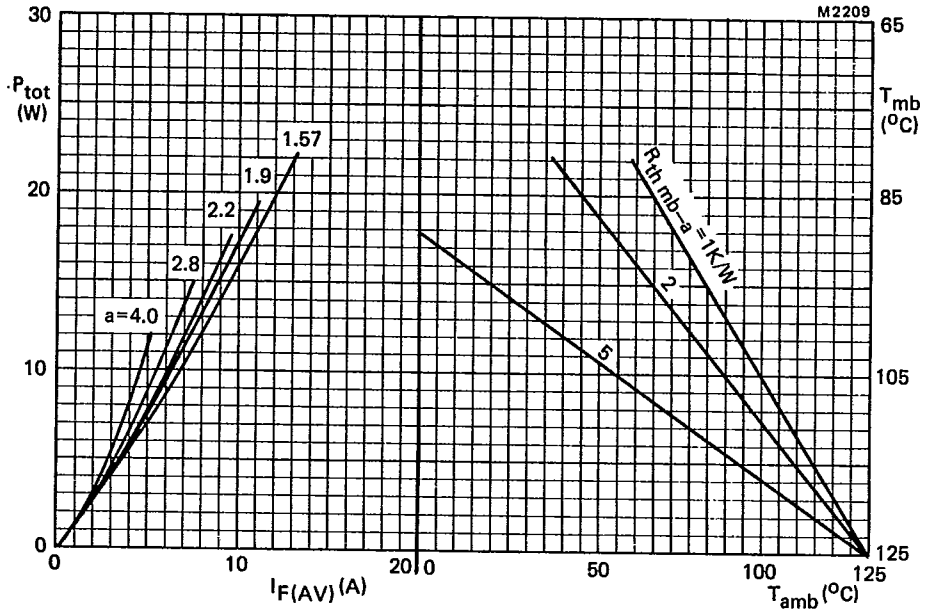


Fig. 4 The right-hand part shows the interrelationship between the power (derived from the left-hand part) and the maximum permissible temperatures.
P = power including reverse current losses but excluding switching losses.
a = form factor = $I_{F(RMS)}/I_{F(AV)}$.

SQUARE-WAVE OPERATION

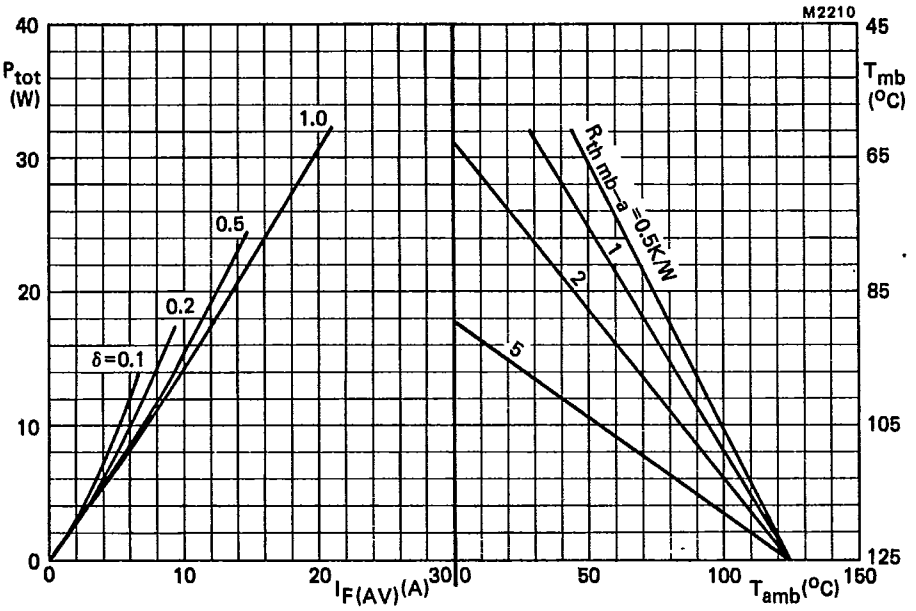
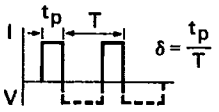


Fig.5 The right-hand part shows the interrelationship between the power (derived from the left-hand part) and the maximum permissible temperatures.
P = power including reverse current losses but excluding switching losses.



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

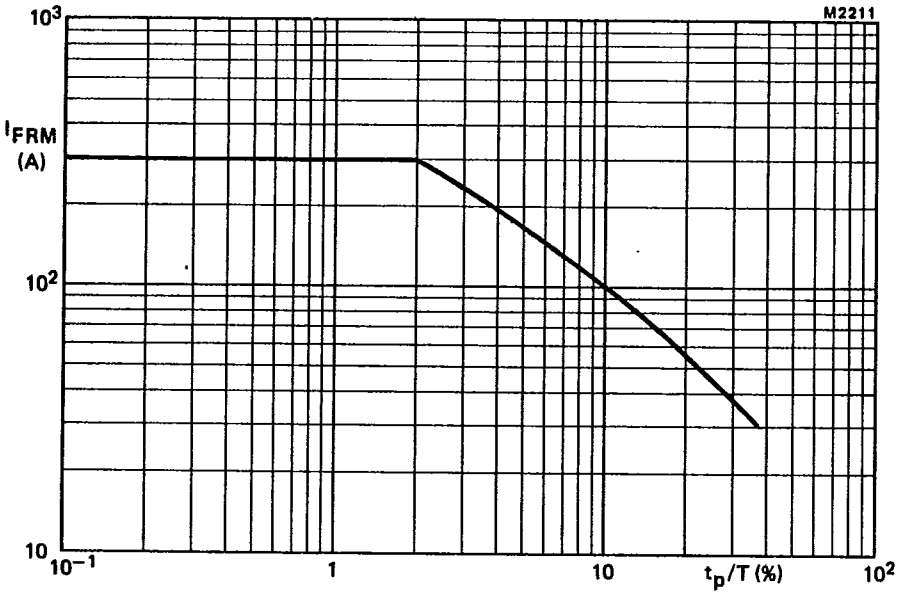


Fig. 6 Maximum permissible repetitive peak forward current based on sinusoidal currents; 1 $\mu s < t_p < 1$ ms.

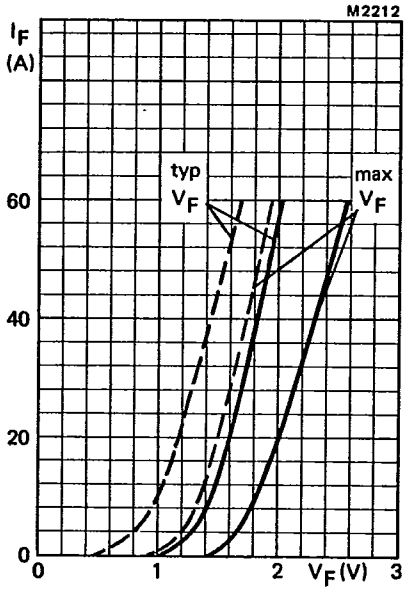


Fig. 7 ——— T_j = 25 °C; – – – – T_j = 100 °C.

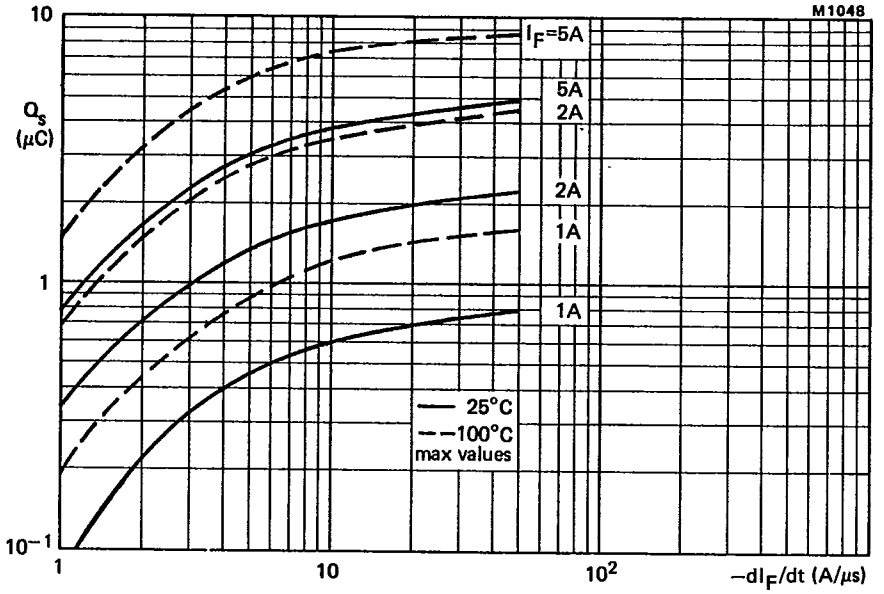

M1048
10
1
10^{-1}
Q_s (μC)
I_F=5A
5A
2A
2A
1A
1A
25°C
100°C
max values
1
10
10^2
$-dI_F/dt$ (A/μs)

Fig.8

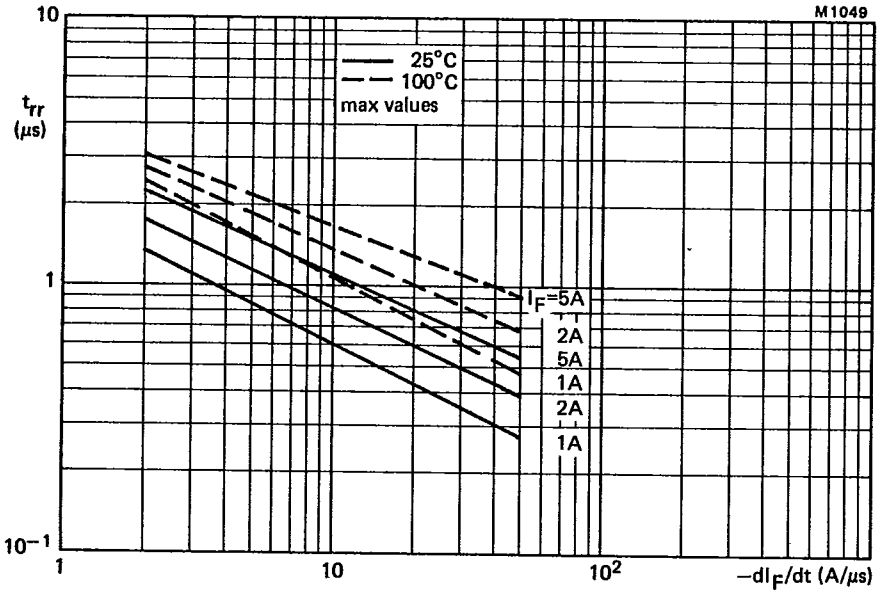

M1049
10
1
10^{-1}
t_{rr} (μs)
25°C
100°C
max values
I_F=5A
2A
5A
1A
2A
1A
1
10
10^2
$-dI_F/dt$ (A/μs)

Fig.9

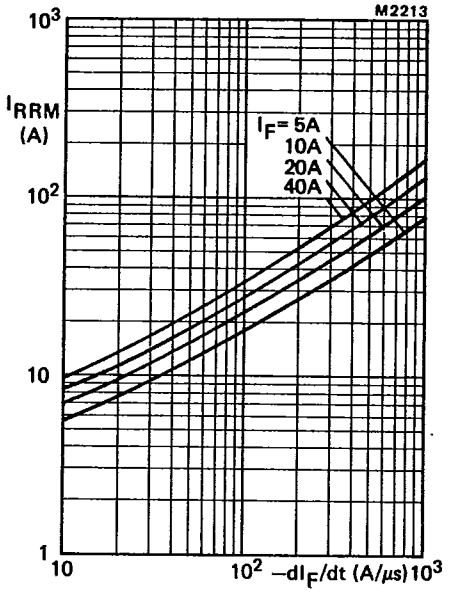


Fig.10