MF70

Fast Recovery Diode

Replaces March 1998 version, DS4195-2.1

DS1955-3.0 January 2000

APPLICATIONS

- Inverse Parallel Or Series Connected Diode
- Power Supplies
- High Frequency Applications

KEY PARAMETERS

V_{RRM}	1600V
$I_{F(AV)}$	70A
I_{FSM}	700A
Q_r	26µC
t_{rr}	915ns

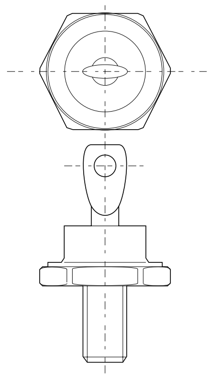
FEATURES

- Glass Passivation
- Fast Recovery Characteristics
- High Voltage Capabilities

VOLTAGE RATINGS

Type Number	Repetitive Peak Reverse Voltage V_{RRM} V	Conditions
MF70-1600 MF70-1400 MF70-1200	1600 1400 1200	$V_{RSM} = V_{RRM}$ + 100V

Lower voltage grades available.
For stud anode add suffix 'R' to type number.



Outline type code: DO5.
See Package Details for further information.

CURRENT RATINGS

Symbol	Parameter	Conditions	Max.	Units
$I_{F(AV)}$	Mean forward current	Half wave resistive load, T_{case} = 75°C	70	A
$I_{F(RMS)}$	RMS value	T_{case} = 75°C	110	A
I_F	Continuous (direct) forward current	T_{case} = 75°C	90	A

SURGE RATINGS

Symbol	Parameter	Conditions	Max.	Units
I_{FSM}	Surge (non-repetitive) forward current	10ms half sine; with 100% $V_{RRM,}$ T_j = 125°C	700	A
I^2t	I^2t for fusing	10ms half sine; T_j = 125°C	2450	A^2s

THERMAL AND MECHANICAL DATA

Symbol	Parameter	Conditions	Min.	Max.	Units
$R_{th(j-c)}$	Thermal resistance - junction to case	dc	-	0.37	°C/W
$R_{th(c-h)}$	Thermal resistance - case to heatsink	Mounting torque 3.5Nm with mounting compound	-	0.2	°C/W
T_{vj}	Virtual junction temperature	Forward (conducting)	-	125	°C
		Reverse (blocking)	-	125	°C
T_{stg}	Storage temperature range		-55	125	˚C
-	Mounting torque	Use torque wrench	3.2	3.8	Nm

CHARACTERISTICS

Symbol	Parameter	Conditions	Typ.	Max.	Units
V_{FM}	Forward voltage	At 210A peak, T_{case} = 25°C	-	2.0	V
I_{RM}	Peak reverse current	At V_{RRM}, T_{case} = 100°C	-	10	mA
t_{rr}	Reverse recovery time	I_F = 1A, di_{RR}/dt = 25A/µs T_{case} = 25°C, V_R = 100V	-	300	ns
Q_r	Recovered charge	I_F = 100A, di_{RR}/dt = 100A/µs	-	26	µC
t_{rr}	Reverse recovery time	T_{case} = 25°C, V_R = 100V	-	915	ns
V_{TO}	Threshold voltage	At T_{vj} = 125°C	-	1.3	V
r_T	Slope resistance	At T_{vj} = 125°C	-	3.34	mΩ
V_{FRM}	Forward recovery voltage	di/dt = 1000A/µs, T_j = 125°C	80	-	V

CURVES

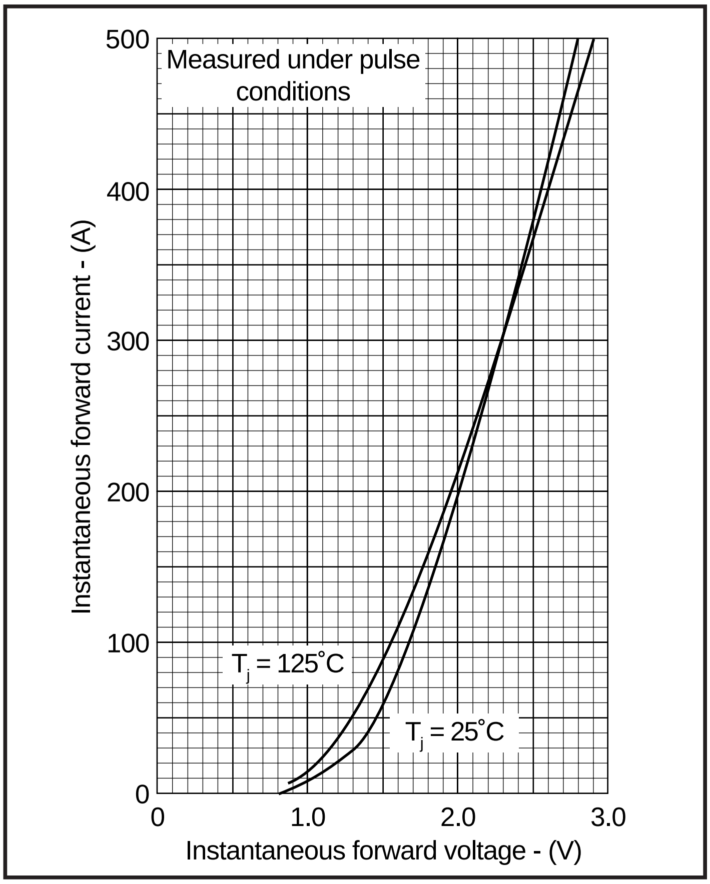


Fig.1 Maximum (limit) forward characteristics

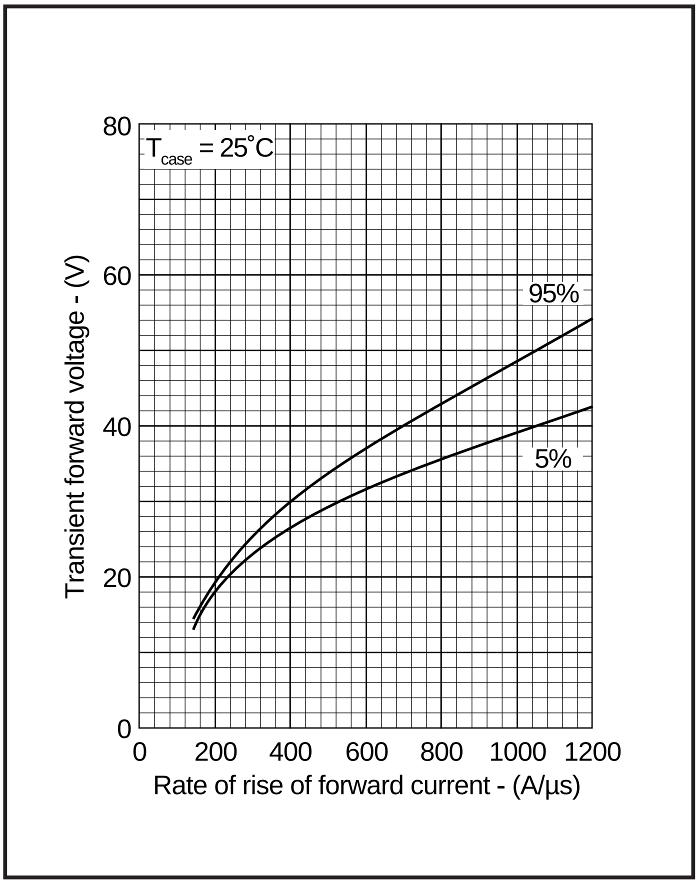


Fig.2 Forward recovery voltage vs rate of rise of forward voltage

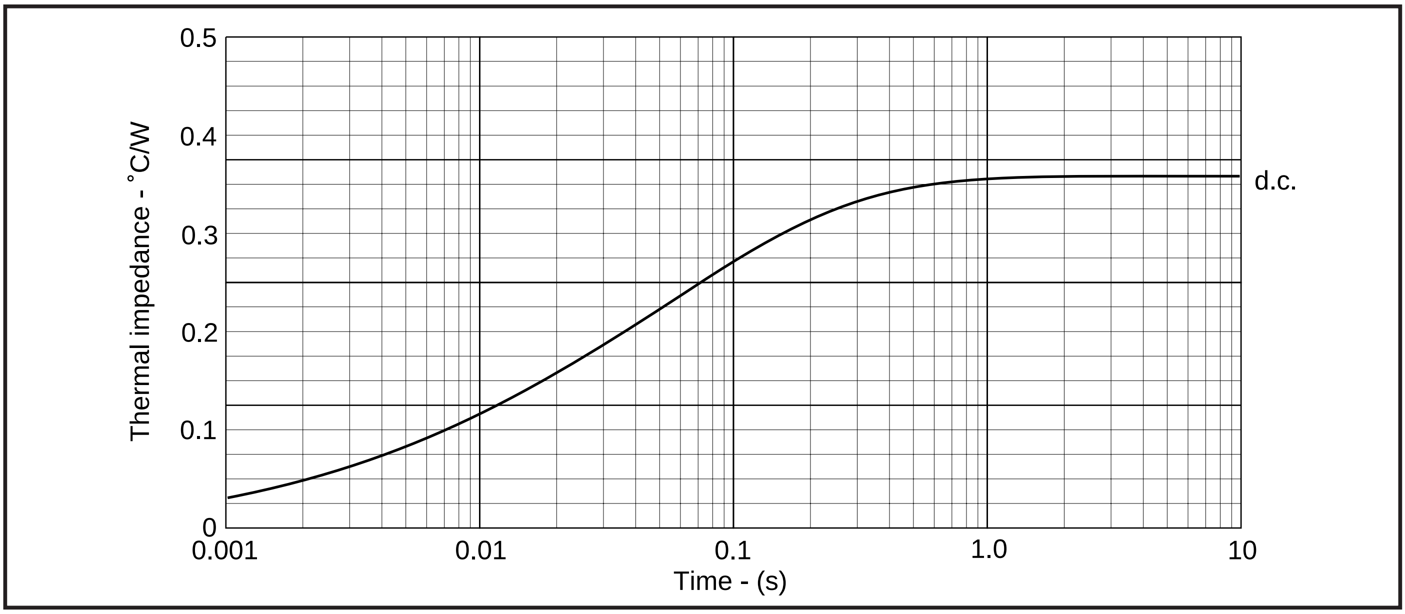


Fig.3 Maximum transient thermal impedance - junction to case

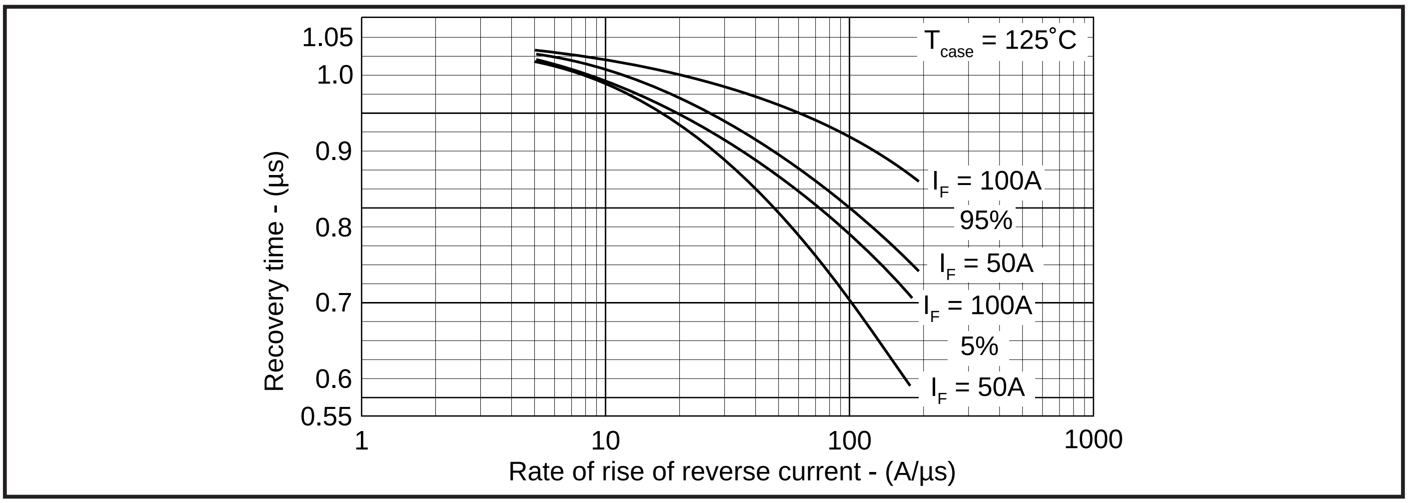


Fig.4 Recovery time vs dI_R/dt

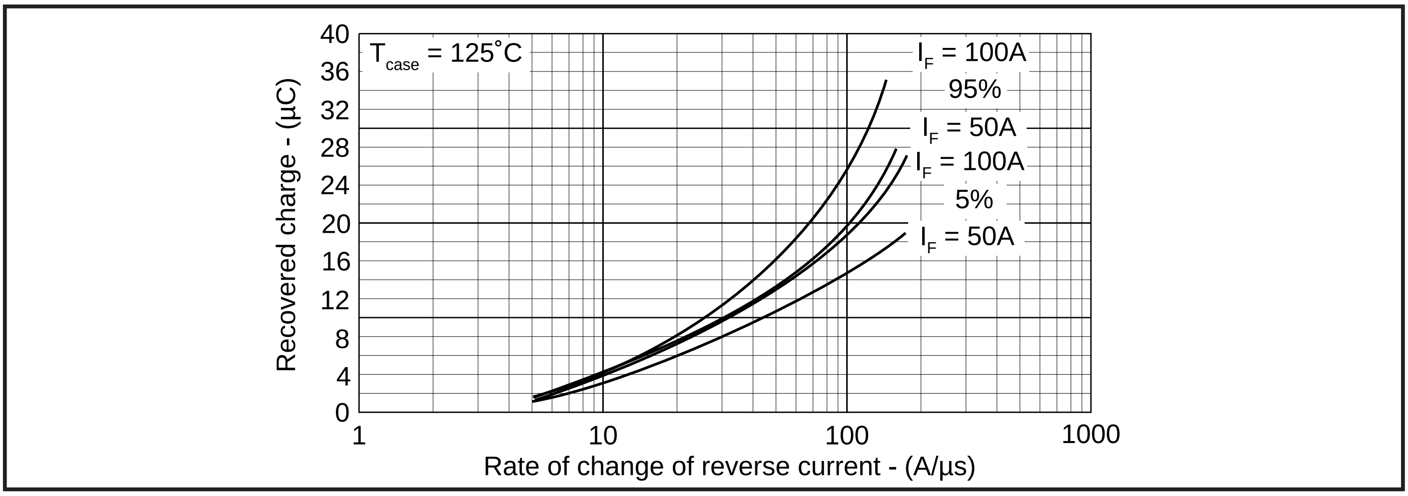


Fig.5 Recovered charge vs dI_R/dt

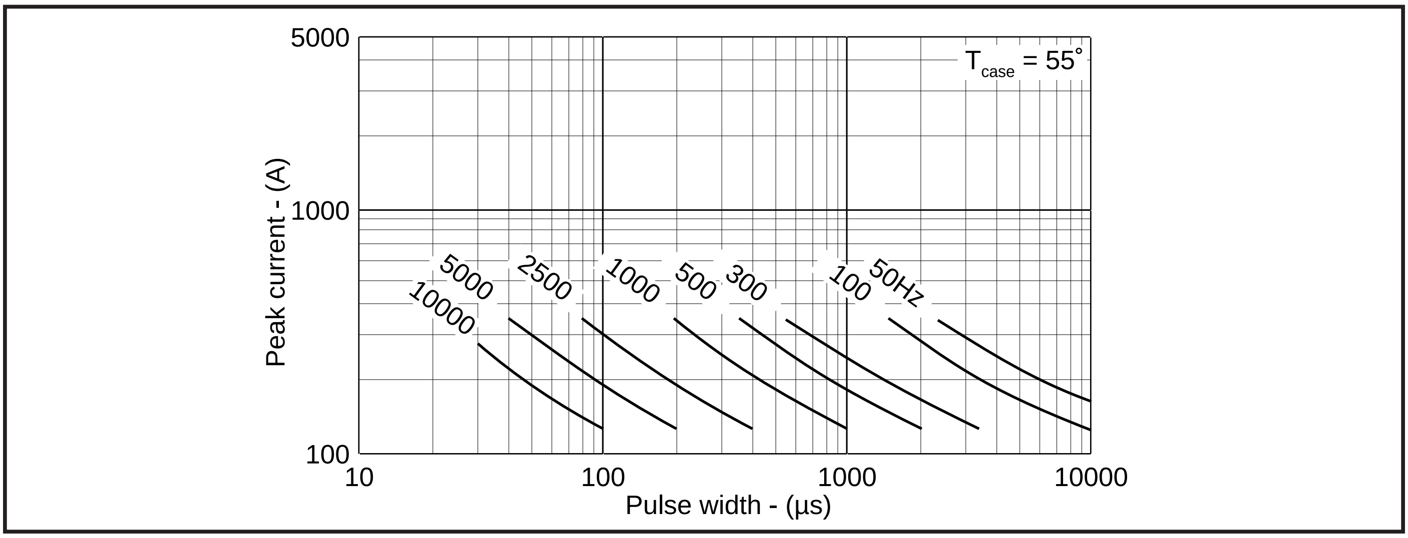


Fig.6 Frequency curves - square waveform

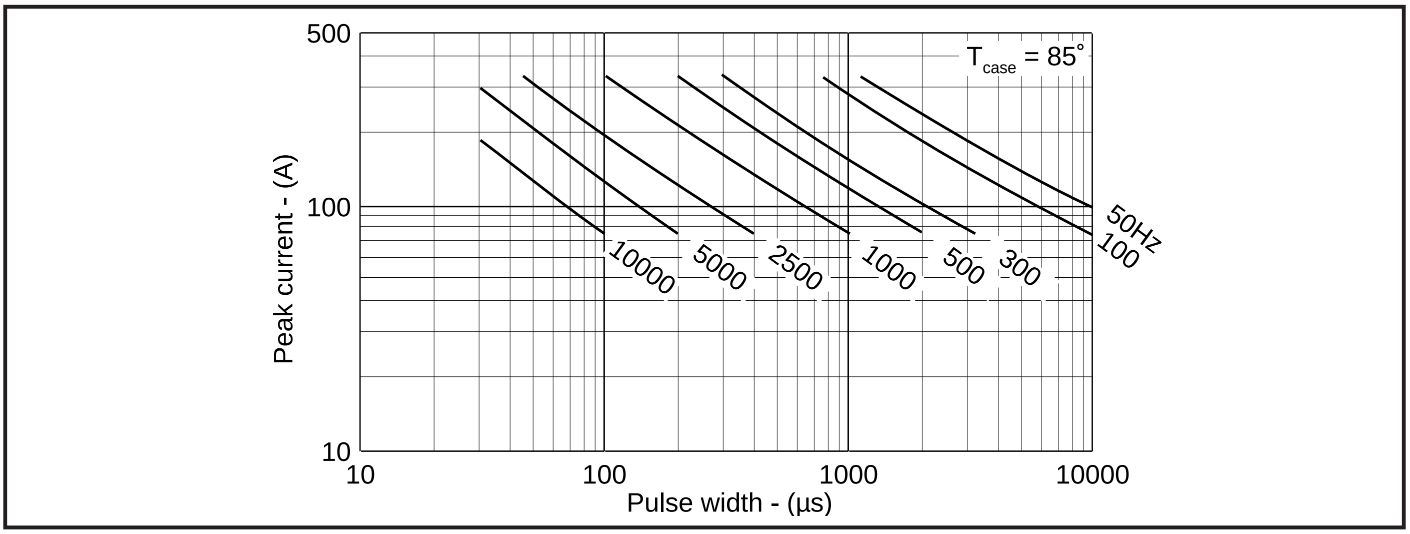


Fig.7 Frequency curves - square waveform

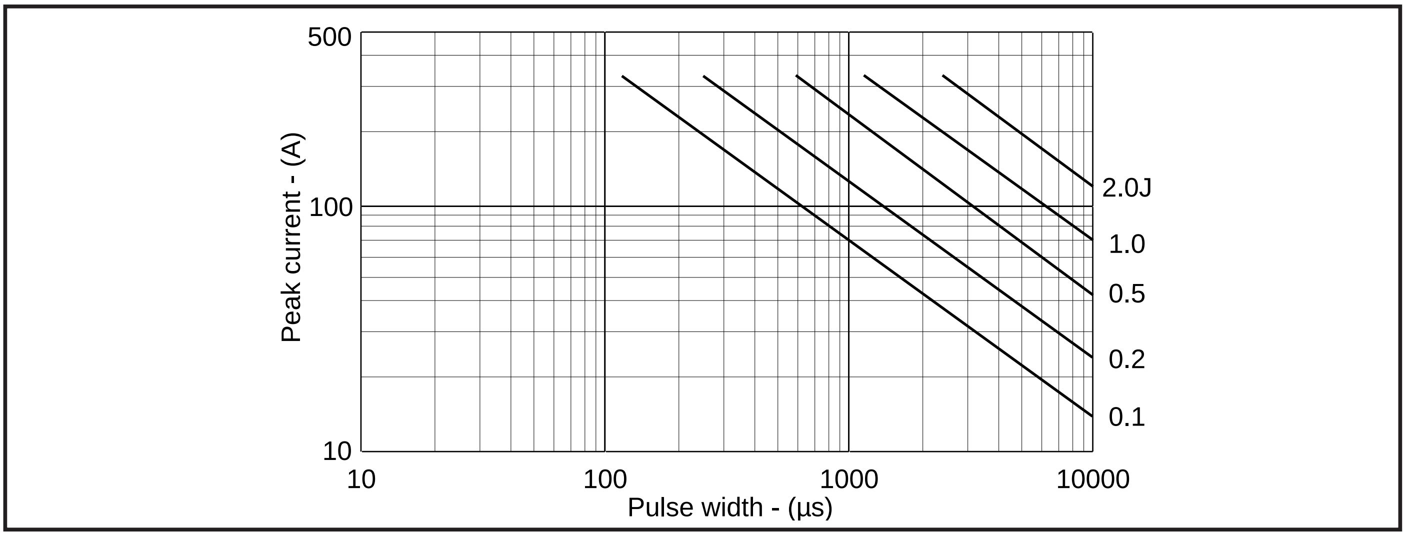


Fig.8 Energy per pulse - square waveform

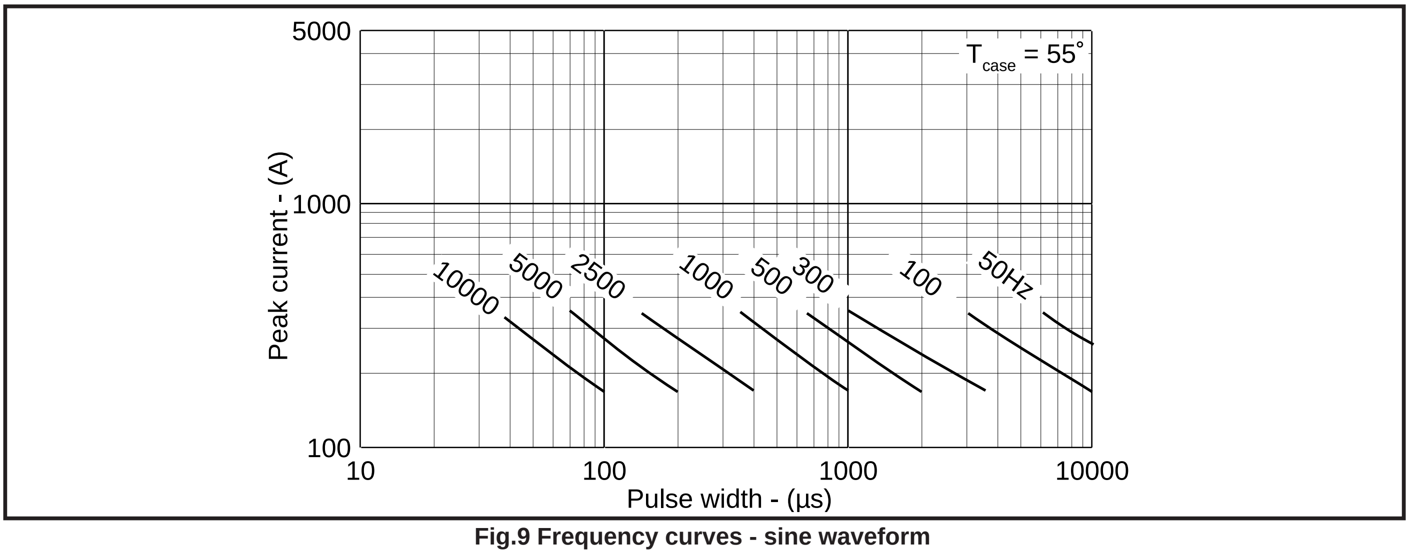


Fig.9 Frequency curves - sine waveform

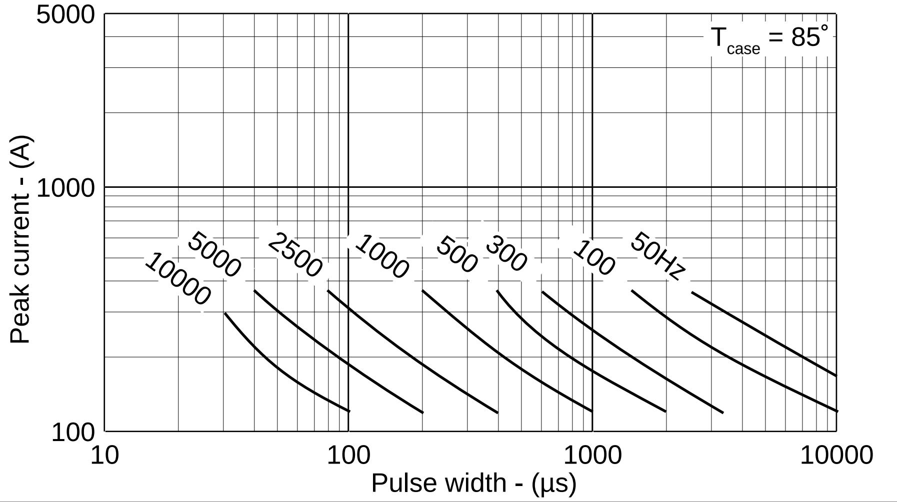


Fig.10 Frequency curves - sine waveform

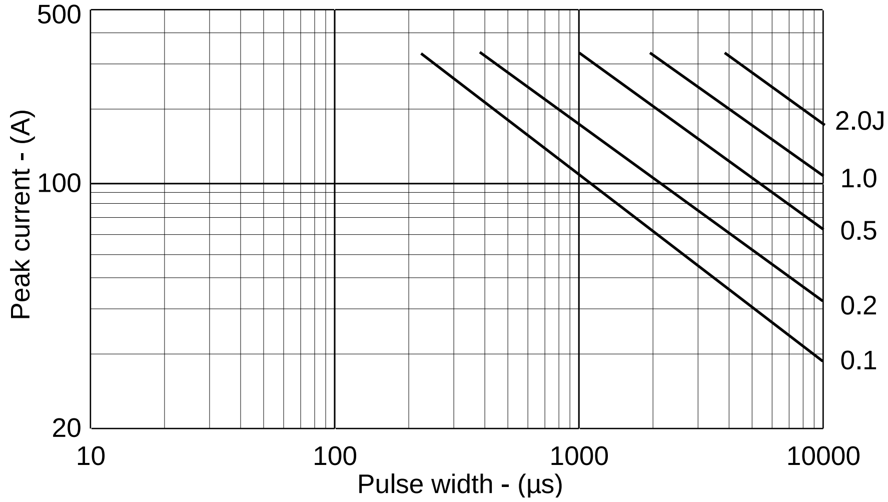
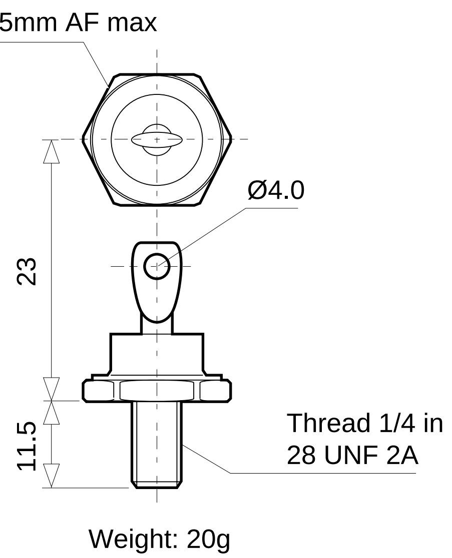


Fig.11 Energy per pulse - sine waveform

PACKAGE DETAILS

For further package information, please contact your local Customer Service Centre. All dimensions in mm, unless stated otherwise. DO NOT SCALE.



ASSOCIATED PUBLICATIONS

Title	Application Note Number
Calculating the junction temperature or power semiconductors	AN4506
Thyristor and diode measurement with a multi-meter	AN4853
Use of V_{TO}, r_T on-state characteristic	AN5001

POWER ASSEMBLY CAPABILITY

The Power Assembly group was set up to provide a support service for those customers requiring more than the basic semiconductor, and has developed a flexible range of heatsink / clamping systems in line with advances in device types and the voltage and current capability of our semiconductors.

We offer an extensive range of air and liquid cooled assemblies covering the full range of circuit designs in general use today. The Assembly group continues to offer high quality engineering support dedicated to designing new units to satisfy the growing needs of our customers.

Using the up to date CAD methods our team of design and applications engineers aim to provide the Power Assembly Complete solution (PACs).

HEATSINKS

Power Assembly has it's own proprietary range of extruded aluminium heatsinks. They have been designed to optimise the performance or our semiconductors. Data with respect to air natural, forced air and liquid cooling (with flow rates) is available on request.

For further information on device clamps, heatsinks and assemblies, please contact your nearest Sales Representative or the factory.

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Preliminary Information: The product is in design and development. The datasheet represents the product as it is understood but details may change.

Advance Information: The product design is complete and final characterisation for volume production is well in hand.

No Annotation: The product parameters are fixed and the product is available to datasheet specification.