DFM300PXM18-A000

Fast Recovery Diode Module

DS6422-1 June 2023 (LN42612)

FEATURES

- Low Reverse Recovery Charge
- High Switching Speed
- Low Forward Volt Drop
- Isolated AlSiC Base With AlN Substrates
- Lead Free Construction

APPLICATIONS

- Chopper Diodes
- Boost and Buck Converters
- Free-wheel Circuits
- Multi-level Switch Inverters

The DFM300PXM18-A000 is a series pair 1800V, fast recovery diode (FRD) module. Designed for low power loss, the module is suitable for a variety of high voltage applications in motor drives and power conversion.

Fast switching times and low reverse recovery losses allow high frequency operation, making the device suitable for the latest drive designs employing PWM and high frequency switching.

The module incorporates an electrically isolated base plate and low inductance construction enabling circuit designers to optimise circuit layouts and utilise grounded heat sinks for safety.

ORDERING INFORMATION

Order As:

DFM300PXM18-A000

Note: When ordering, please use the complete part number

KEY PARAMETERS

V_{RRM}		1800V
V_F	(typ)	2.0V
I_F	(max)	300A
I_{FM}	(max)	600A

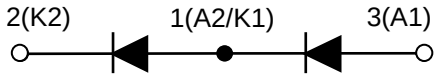
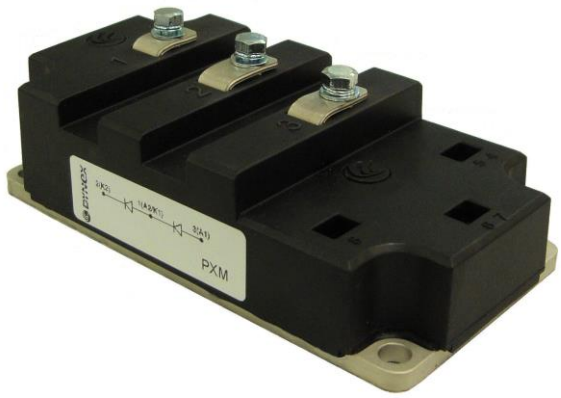


Fig. 1 Circuit configuration



Outline type code: P

(See Fig. 7 for further information)

Fig. 2 Package

ABSOLUTE MAXIMUM RATINGS

Stresses above those listed under 'Absolute Maximum Ratings' may cause permanent damage to the device. In extreme conditions, as with all semiconductors, this may include potentially hazardous rupture of the package. Appropriate safety precautions should always be followed. Exposure to Absolute Maximum Ratings may affect device reliability.

T_{case} = 25°C unless stated otherwise

Symbol	Parameter	Test Conditions	Max.	Units
V_{RRM}	Repetitive peak reverse voltage	T_j = 125°C	1800	V
I_F	Forward current (per arm)	DC, T_{case} = 75°C, T_j = 125°C	300	A
I_{FM}	Max. forward current (per arm)	T_{case} = 110°C, t_p = 1ms	600	A
I^2t	I^2t value fuse current rating	V_R = 0, t_p = 10ms, T_j = 125°C	30	kA^2s
P_{max}	Max. power dissipation	T_{case} = 25°C, T_j = 125°C	1250	W
V_{isol}	Isolation voltage – per module	Commoned terminals to base plate. AC RMS, 1 min, 50Hz	4000	V
Q_{PD}	Partial discharge – per module	IEC1287, V_1 = 1900V, V_2 = 1400V, 50Hz RMS	10	pC

THERMAL AND MECHANICAL RATINGS

Internal insulation material: AlN

Baseplate material: AlSiC

Creepage distance: 33mm

Clearance: 20mm

CTI (Comparative Tracking Index): >600

Symbol	Parameter	Test Conditions	Min	Typ.	Max	Units
$R_{th(j-c)}$	Thermal resistance (per arm)	Continuous dissipation – junction to case	-	-	80	°C/kW
$R_{th(c-h)}$	Thermal resistance – case to heatsink (per module)	Mounting torque 5Nm (with mounting grease)	-	-	16	°C/kW
T_j	Junction temperature		-40	-	125	°C
T_{stg}	Storage temperature range		-40	-	125	°C
	Screw Torque	Mounting – M6	-	-	5	Nm
		Electrical connections – M5	-	-	4	Nm

STATIC ELECTRICAL CHARACTERISTICS – PER ARM

T_{case} = 25°C unless stated otherwise

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
I_{RM}	Peak reverse current	V_R = 1800V, T_j = 125°C			5	mA
V_F	Forward voltage	I_F = 300A		2.0	2.3	V
		I_F = 300A, T_j = 125°C		2.0	2.3	V
L_M	Inductance – per diode	-		40		nH

DYNAMIC ELECTRICAL CHARACTERISTICS – PER ARM

T_{case} = 25°C unless stated otherwise

Symbol	Parameter	Test Conditions	Min	Typ.	Max	Units
Q_{rr}	Reverse recovery charge	I_F = 300A V_R = 900V dI_F/dt = 1500A/µs		90		µC
I_{rr}	Peak reverse recovery current			250		A
E_{rec}	Reverse recovery energy			70		mJ

T_{case} = 125°C unless stated otherwise

Symbol	Parameter	Test Conditions	Min	Typ.	Max	Units
Q_{rr}	Reverse recovery charge	I_F = 300A V_R = 900V dI_F/dt = 1500A/µs		150		µC
I_{rr}	Peak reverse recovery current			285		A
E_{rec}	Reverse recovery energy			100		mJ

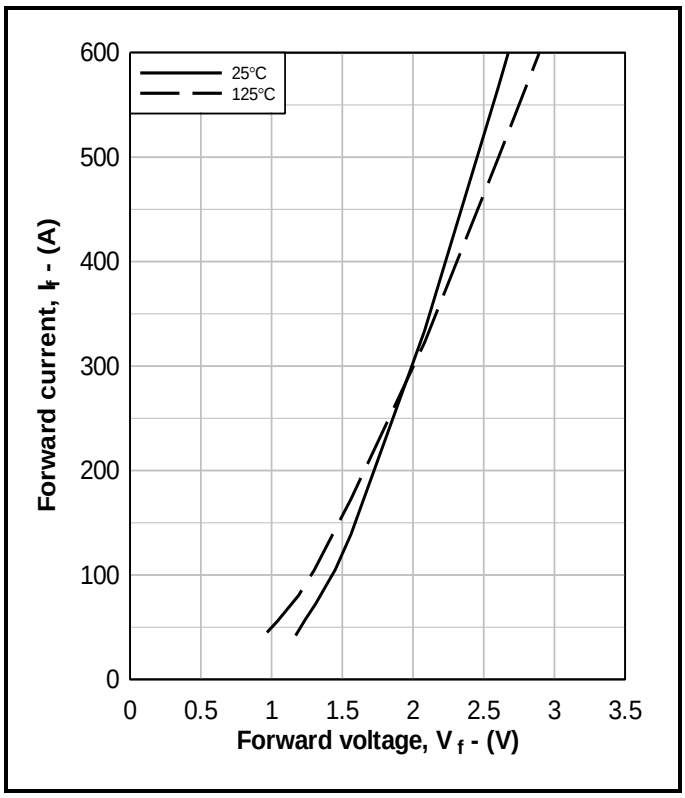


Fig. 3 Diode typical forward characteristics

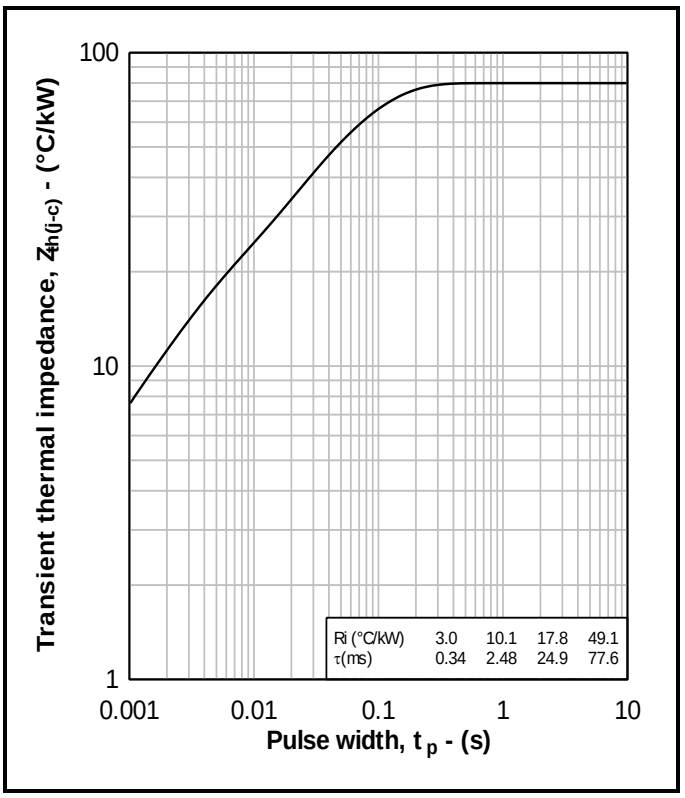


Fig. 4 Transient thermal impedance

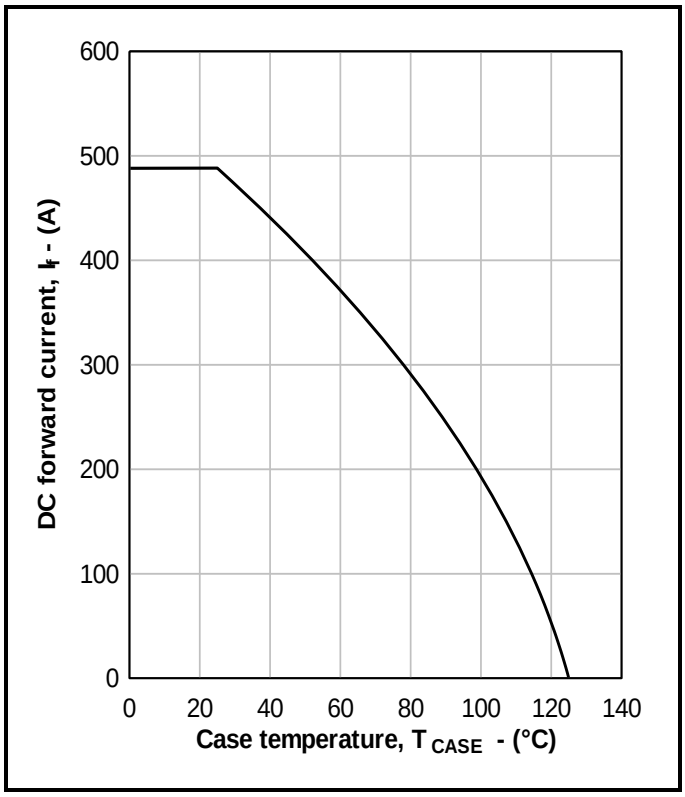


Fig. 5 DC current rating vs case temperature

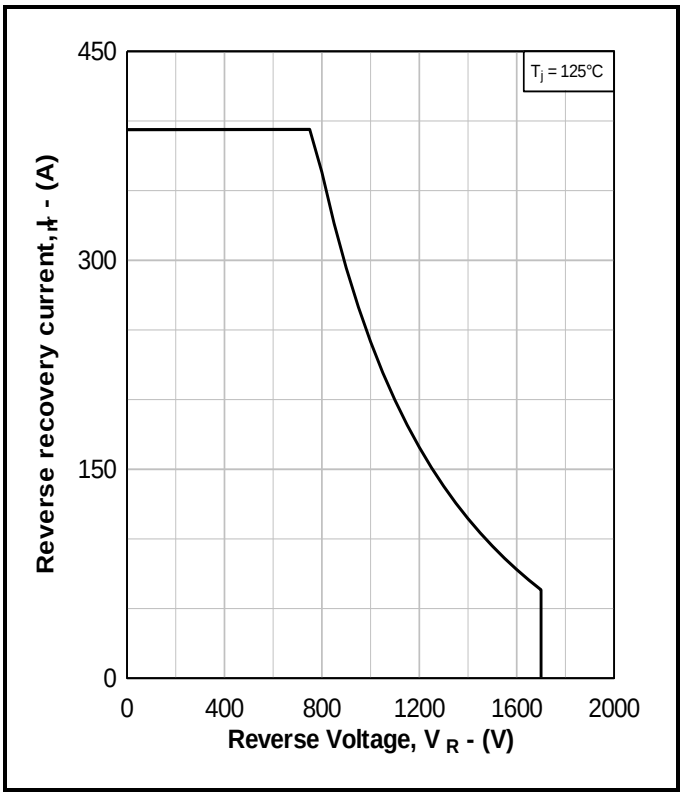
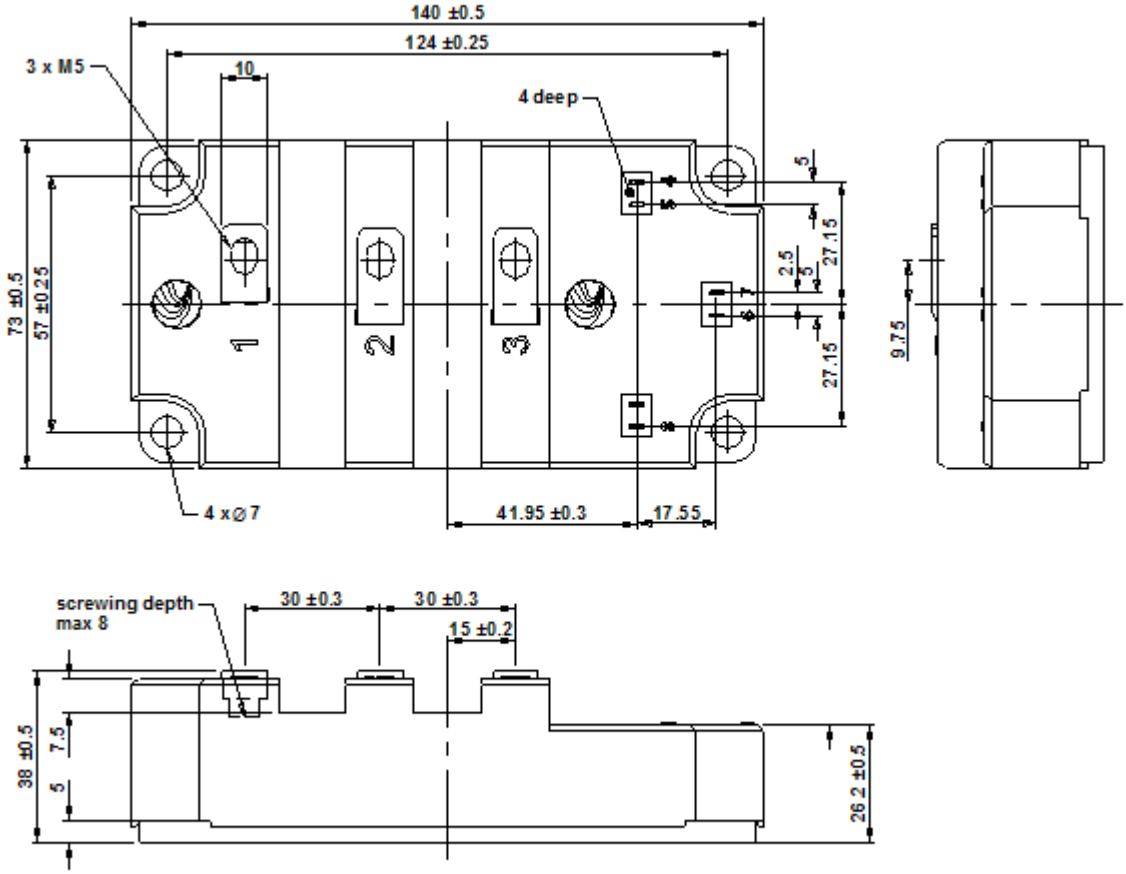


Fig. 6 Reverse Bias Safe Operating Area (RBSOA)

PACKAGE DETAILS

For further package information, please visit our website or contact Customer Services.
All dimensions in mm, unless stated otherwise.
DO NOT SCALE.



Nominal Weight: 500g

Module Outline Type Code: P

Fig. 7 Module outline drawing

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