DFM600FXS12-A000

Fast Recovery Diode Module

Replaces DS5847-1.1

DS5847-2 April 2010 (LN26757)

FEATURES

- Low Reverse Recovery Charge
- High Switching Speed
- Low Forward Volt Drop
- Isolated Cu Base with Al_2O_3 Substrates
- Dual Diodes can be paralleled for 1200A Rating
- Lead Free Construction

APPLICATIONS

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

The DFM600FXS12-A000 is a dual 1200V, 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

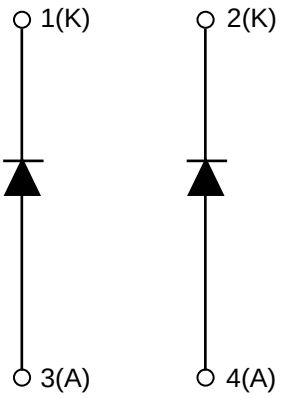
Order As:

DFM600FXS12-A000

Note: When ordering, please use the complete part number

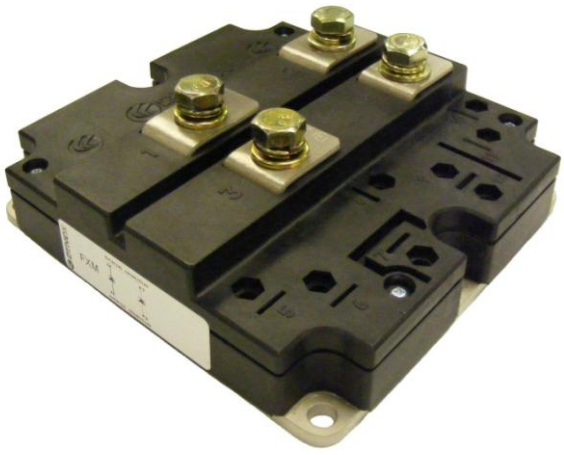
KEY PARAMETERS

V_{RRM}		**1200V**
V_F	**(typ)**	**1.9V**
I_F	**(max)**	**600A**
I_{FM}	**(max)**	**1200A**



External connection required for a single 1200A diode

Fig. 1 Circuit configuration



Outline type code: F

(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	1200	V
I_F	Forward current (per arm)	DC, T_{case} = 75°C, T_j = 125°C	600	A
I_{FM}	Max. forward current	T_{case} = 110°C, t_p = 1ms	1200	A
I^2t	I^2t value fuse current rating	V_R = 0, t_p = 10ms, T_j = 125°C	100	kA^2s
P_{max}	Max. transistor power dissipation	T_{case} = 25°C, T_j = 125°C	2500	W
V_{isol}	Isolation voltage – per module	Commoned terminals to base plate. AC RMS, 1 min, 50Hz	2500	V

THERMAL AND MECHANICAL RATINGS

Internal insulation material: Al_2O_3

Baseplate material: Cu

Creepage distance: 20mm

Clearance: 10mm

CTI (Comparative Tracking Index): 350

Symbol	Parameter	Test Conditions	Min	Typ.	Max	Units
$R_{th(j-c)}$	Thermal resistance (per arm)	Continuous dissipation – junction to case	-	-	40	°C/kW
$R_{th(c-h)}$	Thermal resistance – case to heatsink (per module)	Mounting torque 5Nm (with mounting grease)	-	-	8	°C/kW
T_j	Junction temperature		-	-	125	°C
T_{stg}	Storage temperature range		-40	-	125	°C
	Screw Torque	Mounting – M6	-	-	5	Nm
		Electrical connections – M8	-	-	10	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 = 1200V, T_j = 125°C			15	mA
V_F	Forward voltage	I_F = 600A		1.9	2.2	V
		I_F = 600A, T_j = 125°C		2.1	2.4	V
L_M	Inductance			20		nH

STATIC ELECTRICAL CHARACTERISTICS

T_{case} = 25°C unless stated otherwise.

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
L_M	Module inductance (externally connected in parallel)			15		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 = 600A V_R = 600V dI_F/dt = 4500A/µs		100		µC
I_{rr}	Peak reverse recovery current			400		A
E_{rec}	Reverse recovery energy			40		mJ

T_{case} = 125°C unless stated otherwise

Symbol	Parameter	Test Conditions	Min	Typ.	Max	Units
Q_{rr}	Reverse recovery charge	I_F = 600A V_R = 600V dI_F/dt = 4200A/µs		150		µC
I_{rr}	Peak reverse recovery current			475		A
E_{rec}	Reverse recovery energy			75		mJ

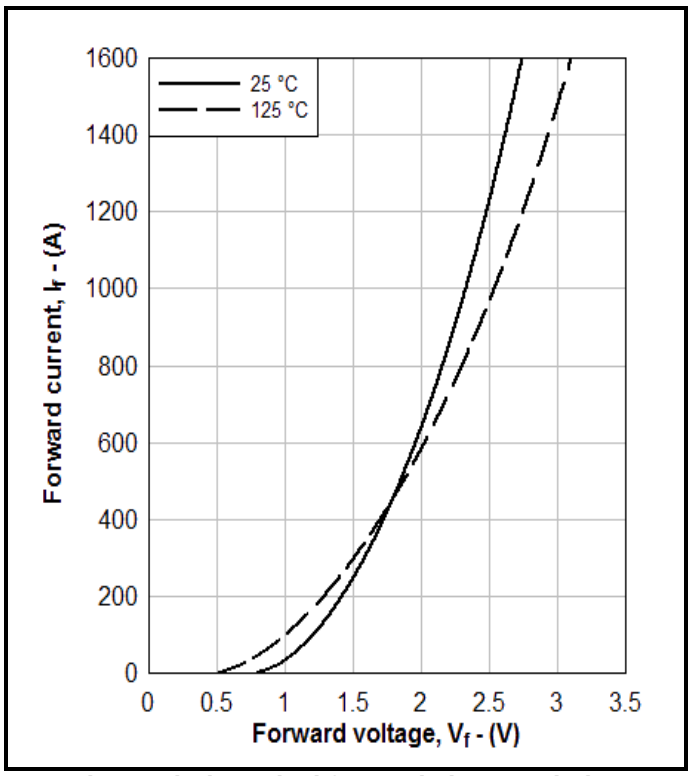


Fig. 3 Diode typical forward characteristics

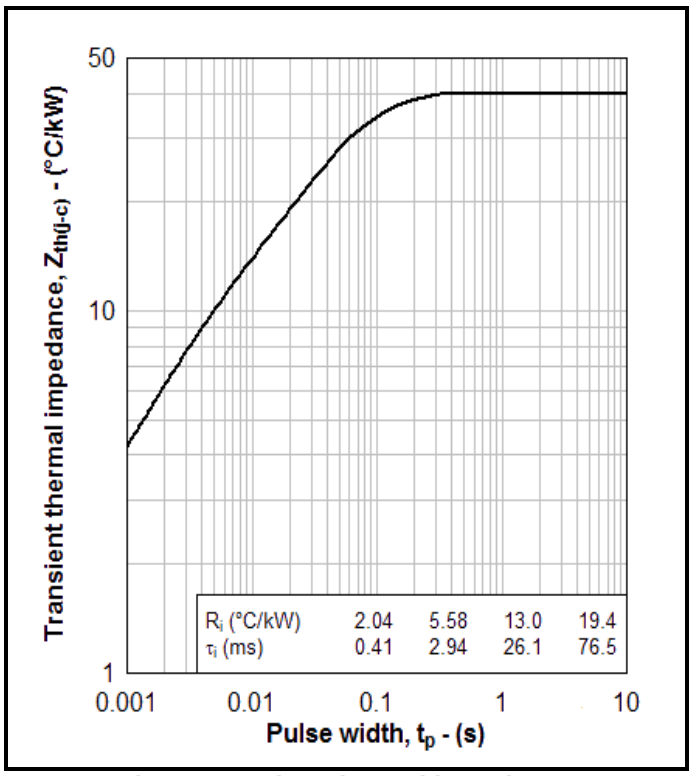


Fig. 4 Transient thermal impedance

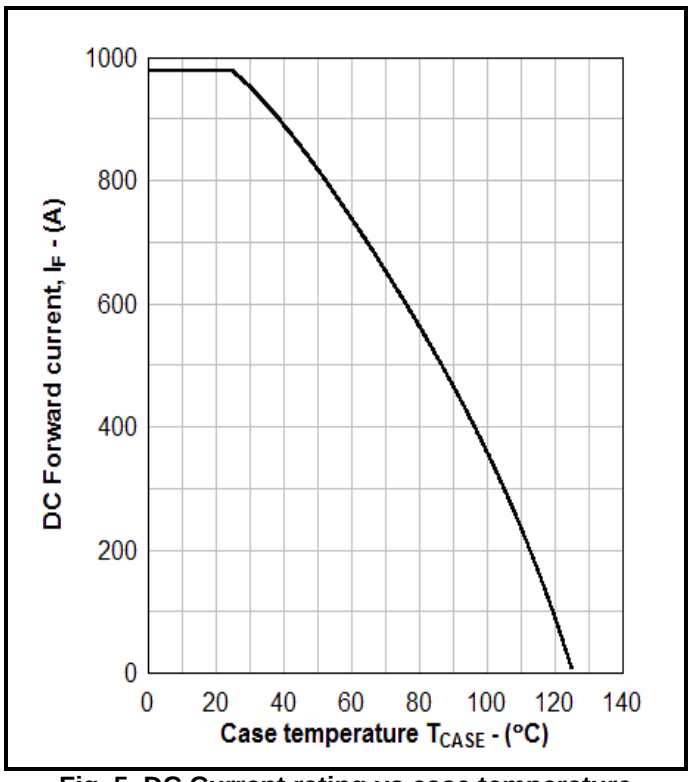


Fig. 5 DC Current rating vs case temperature

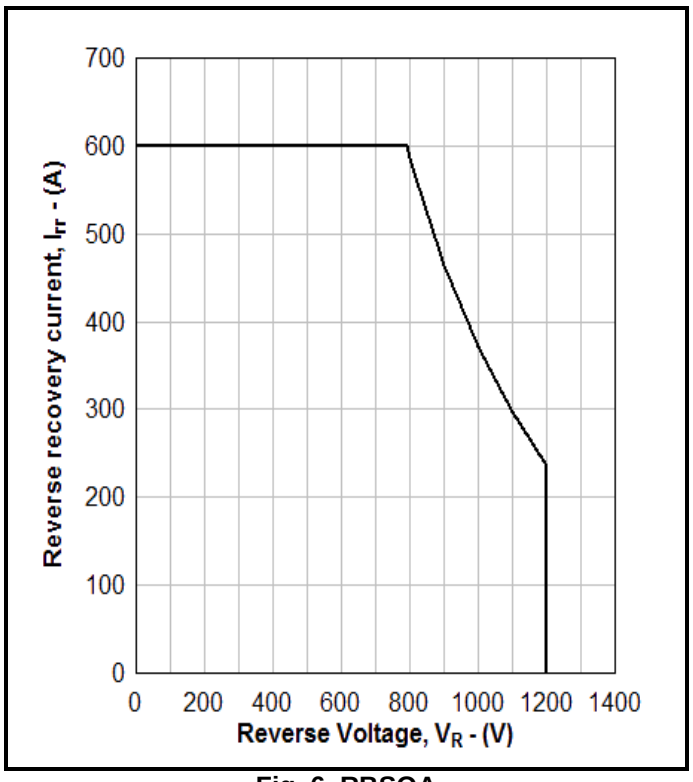
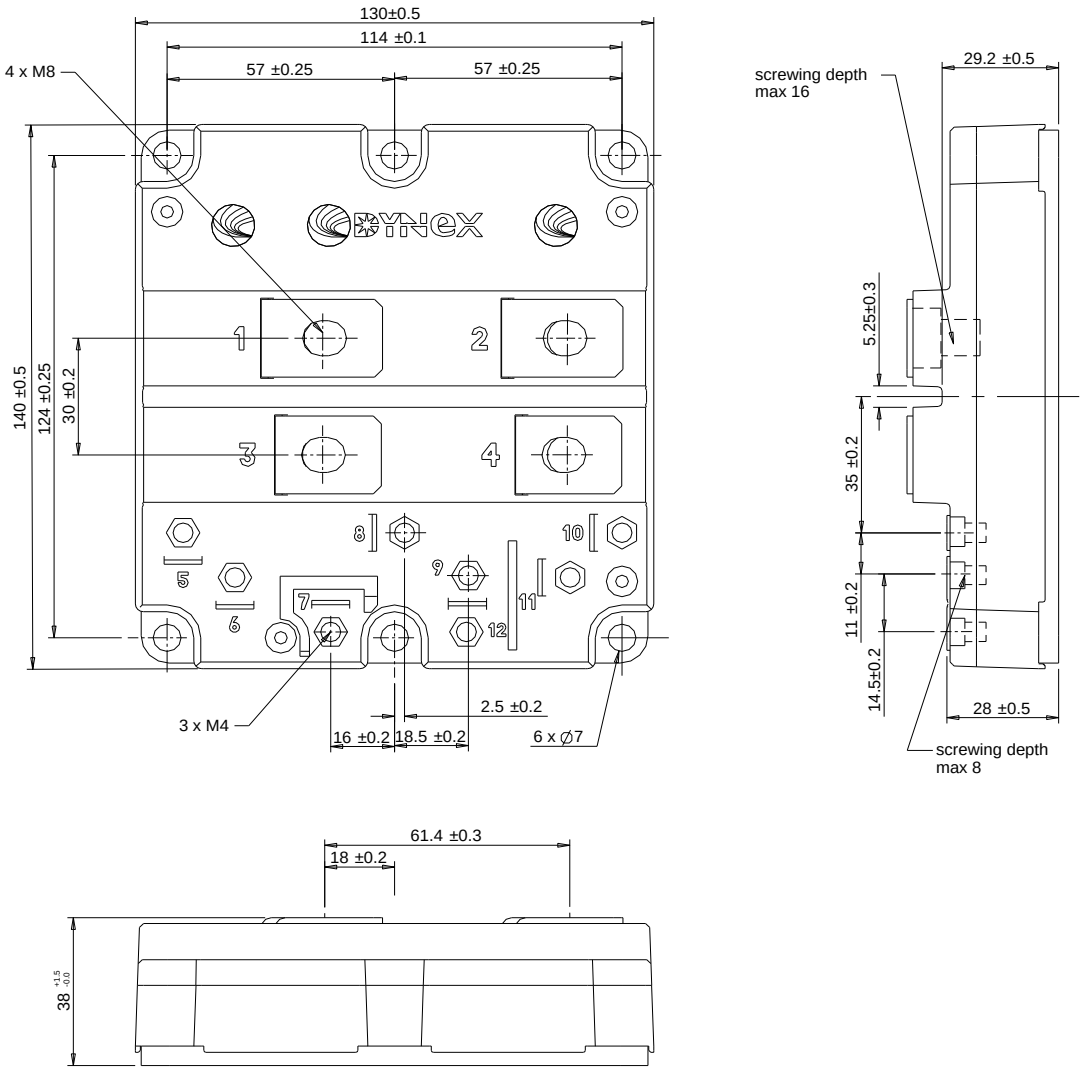


Fig. 6 RBSOA

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: 1450g

Module Outline Type Code: F

Fig. 7 Module outline drawing

HEADQUARTERS OPERATIONS

DYNEX SEMICONDUCTOR LTD
Doddington Road, Lincoln
Lincolnshire, LN6 3LF, United Kingdom

Fax: +44(0)1522 500550
Tel: +44(0)1522 500500

CUSTOMER SERVICE

DYNEX SEMICONDUCTOR LTD
Doddington Road, Lincoln
Lincolnshire, LN6 3LF, United Kingdom

Fax: +44(0)1522 500020
Tel: +44(0)1522 502901 / 502753

email: power_solutions@dynexsemi.com

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The annotations are as follows:-

Target Information:	This is the most tentative form of information and represents a very preliminary specification. No actual work on the product has been started.
Preliminary Information:	The product is in design and development. The datasheet represents the product as it is understood but 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.