

# DFM600FXM18-A000

# **Fast Recovery Diode Module**

Replaces DS5438-1.4

DS5438-2 April 2010 (LN26762)

# **FEATURES**

- · Low Reverse Recovery Charge
- High Switching Speed
- Low Forward Volt Drop
- Isolated AISiC Base with AIN 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 DFM600FXM18-A000 is a dual 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:

### DFM600FXM18-A000

Note: When ordering, please use the complete part number

#### **KEY PARAMETERS**

$V_{RRM}$		1800V
$V_{F}$	(typ)	2.0V
I <sub>F</sub>	(max)	600A
I <sub>FM</sub>	(max)	1200A

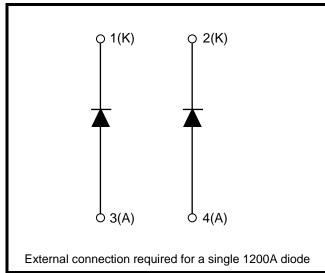


Fig. 1 Circuit configuration

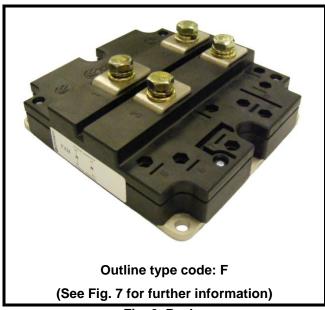


Fig. 2 Package



# **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<sub>case</sub> = 25°C unless stated otherwise

Symbol	Parameter	Test Conditions	Max.	Units
$V_{RRM}$	Repetitive peak reverse voltage	T <sub>j</sub> = 125°C	1800	V
I <sub>F</sub>	Forward current (per arm)	DC, T <sub>case</sub> = 75°C, T <sub>j</sub> = 125°C	600	Α
I <sub>FM</sub>	Max. forward current	$T_{case} = 110$ °C, $t_p = 1$ ms	1200	Α
l <sup>2</sup> t	I <sup>2</sup> t value fuse current rating	$V_R = 0$ , $t_p = 10$ ms, $T_j = 125$ °C	120	kA <sup>2</sup> s
P <sub>max</sub>	Max. transistor power dissipation	$T_{case} = 25^{\circ}C, T_{j} = 125^{\circ}C$	2500	W
V <sub>isol</sub>	Isolation voltage – per module	Commoned terminals to base plate. AC RMS, 1 min, 50Hz	4000	V
$Q_{PD}$	Partial discharge – per module	IEC1287, V <sub>1</sub> = 1900V, V <sub>2</sub> = 1400V, 50Hz RMS	10	рC

### THERMAL AND MECHANICAL RATINGS

Internal insulation material:

Baseplate material:

Creepage distance:

Clearance:

CTI (Comparative Tracking Index):

AIN

AISiC

20mm

10mm

350

Symbol	Parameter	Test Conditions	Min	Тур.	Max	Units
R <sub>th(j-c)</sub>	Thermal resistance (per arm)	Continuous dissipation – junction to case	-	-	40	°C/kW
R <sub>th(c-h)</sub>	Thermal resistance – case to heatsink (per module)	Mounting torque 5Nm (with mounting grease)	ı	-	8	°C/kW
$T_j$	Junction temperature		-	-	125	°C
T <sub>stg</sub>	Storage temperature range		-40	-	125	°C
	Sorow Torquo	Mounting – M6	-	-	5	Nm
	Screw Torque	Electrical connections – M8	-	-	10	Nm



# STATIC ELECTRICAL CHARACTERISTICS - PER ARM

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

Symbol	Parameter	Test Conditions	Min	Тур	Max	Units
I <sub>RM</sub>	Peak reverse current	$V_R = 1800V, T_j = 125^{\circ}C$			10	mA
V <sub>F</sub>	Forward voltage	I <sub>F</sub> = 600A		2.0	2.3	V
		I <sub>F</sub> = 600A, T <sub>j</sub> = 125°C		2.0	2.3	V
L <sub>M</sub>	Inductance			20		nΗ

# STATIC ELECTRICAL CHARACTERISTICS

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

Symbol	Parameter	Test Conditions	Min	Тур	Max	Units
L <sub>M</sub>	Module inductance (externally connected in parallel)			15		nΗ

# **DYNAMIC ELECTRICAL CHARACTERISTICS - PER ARM**

# T<sub>case</sub> = 25°C unless stated otherwise

Symbol	Parameter	Test Conditions	Min	Тур.	Max	Units
$Q_{rr}$	Reverse recovery charge	$I_F = 600A$ $V_R = 900V$ $dI_F/dt = 4000A/\mu s$		160		μC
I <sub>rr</sub>	Peak reverse recovery current			440		Α
E <sub>rec</sub>	Reverse recovery energy			120		mJ

# T<sub>case</sub> = 125°C unless stated otherwise

Symbol	Parameter	Test Conditions	Min	Тур.	Max	Units
$Q_{rr}$	Reverse recovery charge	$I_F = 600A$ $V_R = 900V$ $dI_F/dt = 4000A/\mu s$		270		μC
I <sub>rr</sub>	Peak reverse recovery current			510		Α
E <sub>rec</sub>	Reverse recovery energy			180		mJ



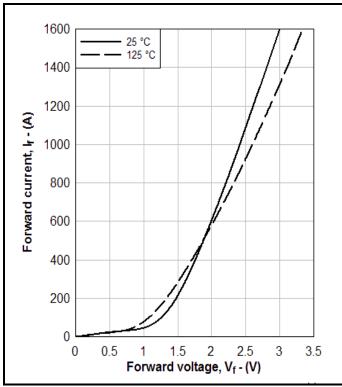


Fig. 3 Diode typical forward characteristics

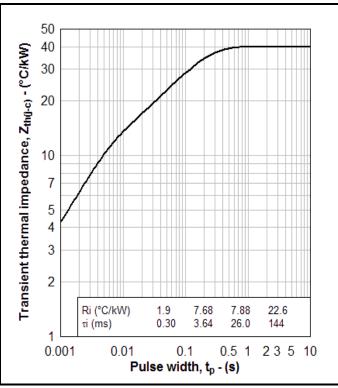


Fig. 4 Transient thermal impedance

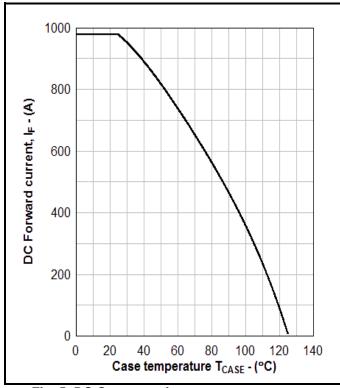


Fig. 5 DC Current rating vs case temperature

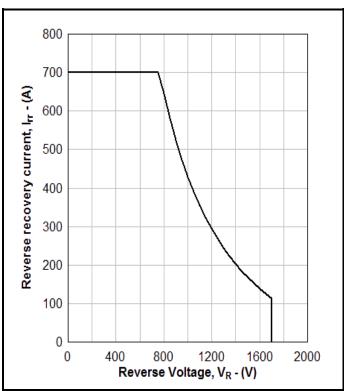


Fig. 6 RBSOA



# **PACKAGE DETAILS**

For further package information, please visit our website or contact Customer Services. All dimensions in mm, unless stated otherwise.

# DO NOT SCALE.

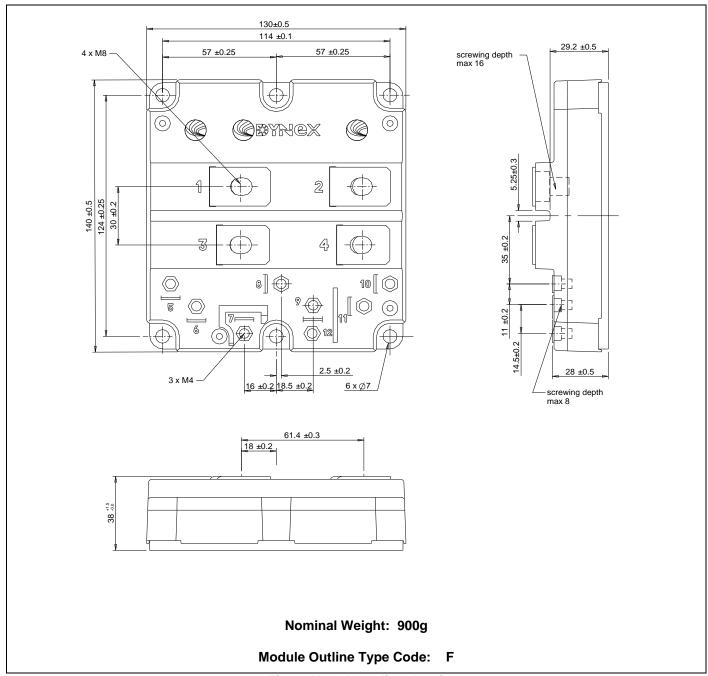


Fig. 7 Module outline drawing



### **HEADQUARTERS OPERATIONS**

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