

DFM1200EXM12-A000

Fast Recovery Diode Module

Replaces DS5481-1.4

DS5481-2 August 2011 (LN28650)

FEATURES

- Low Reverse Recovery Charge
- High Switching Speed
- Low Forward Volt Drop
- Isolated AlSiC Base with AlN Substrates
- Triple Diodes can be paralleled for 3600A rating
- Lead Free Construction

APPLICATIONS

- Chopper Diodes
- Boost and Buck Converters
- Free-wheel Circuits
- Snubber Circuits
- Resonant Converters
- Induction Heating
- Multi-level Switch Inverters

The DFM1200EXM12-A000 is a triple 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:

DFM1200EXM12-A000

Note: When ordering, please use the complete part number

KEY PARAMETERS

V_{RRM}		1200V
V_{F}	(typ)	1.9V
I _F	(max)	1200A
I _{FM}	(max)	2400A

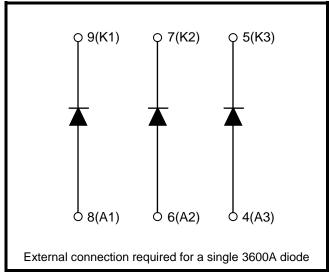


Fig. 1 Circuit configuration

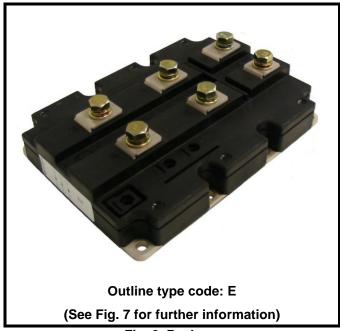


Fig. 2 Package



ABSOLUTE MAXIMUM RATINGS - PER ARM

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	DC, T _{case} = 75°C, T _j = 125°C	1200	Α
I _{FM}	Max. forward current	$T_{case} = 110$ °C, $t_p = 1$ ms	2400	Α
l ² t	I ² t value fuse current rating	$V_R = 0$, $t_p = 10$ ms, $T_j = 125$ °C	400	kA ² s
P _{max}	Max. transistor power dissipation	$T_{case} = 25^{\circ}C, T_{j} = 125^{\circ}C$	7520	W
V _{isol}	Isolation voltage – per module	Commoned terminals to base plate. AC RMS, 1 min, 50Hz	2500	V
QPD	Partial discharge – per module	IEC1287, V1 = 1300V, V2 = 1000V, 50Hz RMS	10	рС

THERMAL AND MECHANICAL RATINGS

Internal insulation material:

Baseplate material:

Creepage distance:

Clearance:

CTI (Comparative Tracking Index):

AIN

AISiC

33mm

20mm

>600

Symbol	Parameter	Test Conditions	Min	Тур.	Max	Units
R _{th(j-c)}	Thermal resistance (per arm)	Continuous dissipation – junction to case	-	-	20	°C/kW
R _{th(c-h)}	Thermal resistance – case to heatsink (per module)	Mounting torque 5Nm (with mounting grease)	-	-	6	°C/kW
T_j	Junction temperature		-	-	125	°C
T _{stg}	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 _{RM}	Peak reverse current	V _R = 1200V, T _j = 125°C			30	mA
V _F	Forward voltage	I _F = 1200A		1.9	2.2	V
		I _F = 1200A, T _j = 125°C		2.1	2.4	V
L _M	Inductance			20		nΗ

STATIC ELECTRICAL CHARACTERISTICS

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

Symbol	Parameter	Test Conditions	Min	Тур	Max	Units
L_M	Module inductance (externally connected in parallel)			15		nΗ

DYNAMIC ELECTRICAL CHARACTERISTICS - PER ARM

T_{case} = 25°C unless stated otherwise

Symbol	Parameter	Test Conditions	Min	Тур.	Max	Units
Q_{rr}	Reverse recovery charge	I _F = 1200A		200		μC
I _{rr}	Peak reverse recovery current	$V_{R} = 600V$ $dI_{F}/dt = 9000A/\mu s$		800		Α
E _{rec}	Reverse recovery energy			80		mJ

T_{case} = 125°C unless stated otherwise

Symbol	Parameter	Test Conditions	Min	Тур.	Max	Units
Q_{rr}	Reverse recovery charge	I _F = 1200A		300		μC
I _{rr}	Peak reverse recovery current	$V_{R} = 600V$ $dI_{F}/dt = 8400A/\mu s$		920		Α
E _{rec}	Reverse recovery energy			140		mJ



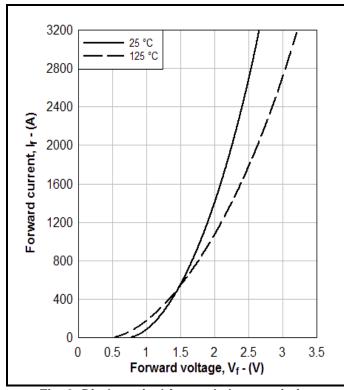


Fig. 3 Diode typical forward characteristics

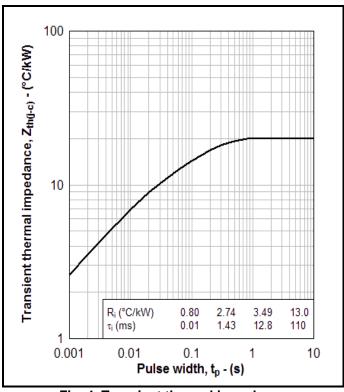


Fig. 4 Transient thermal impedance

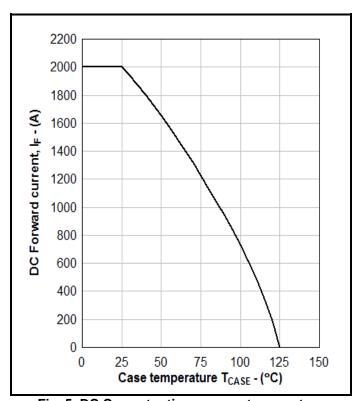


Fig. 5 DC Current rating vs case temperature

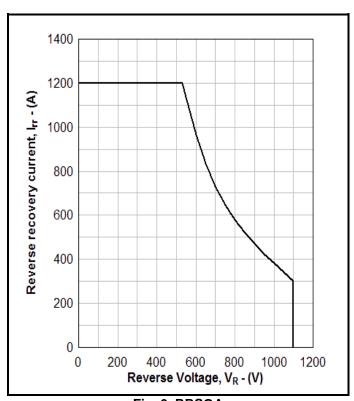


Fig. 6 RBSOA



PACKAGE DETAILS

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

DO NOT SCALE.

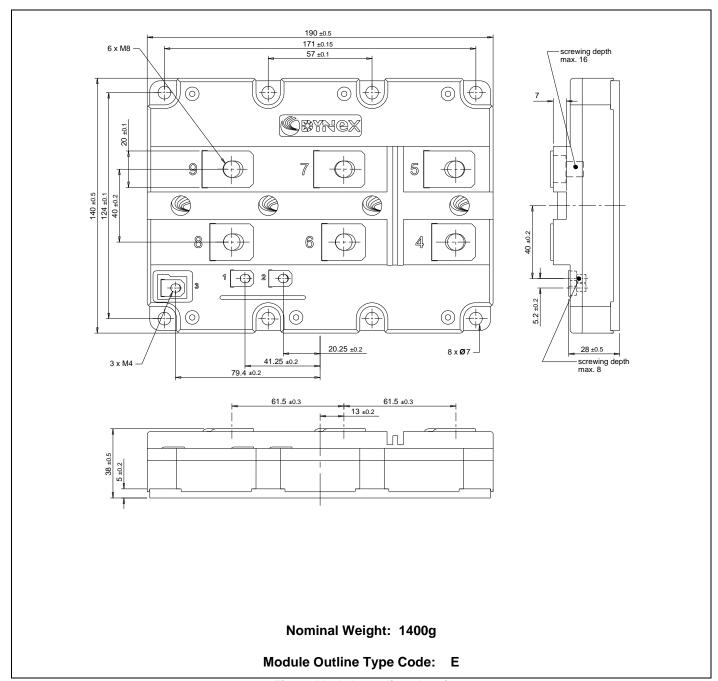


Fig. 7 Module outline drawing



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