

### FEATURES

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

### APPLICATIONS

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

The DFM1200EXM18-A000 is a triple 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

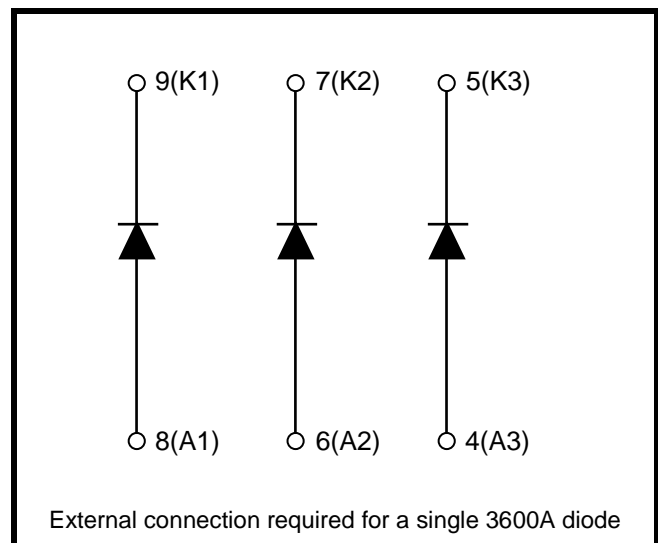
Order As:

#### DFM1200EXM18-A000

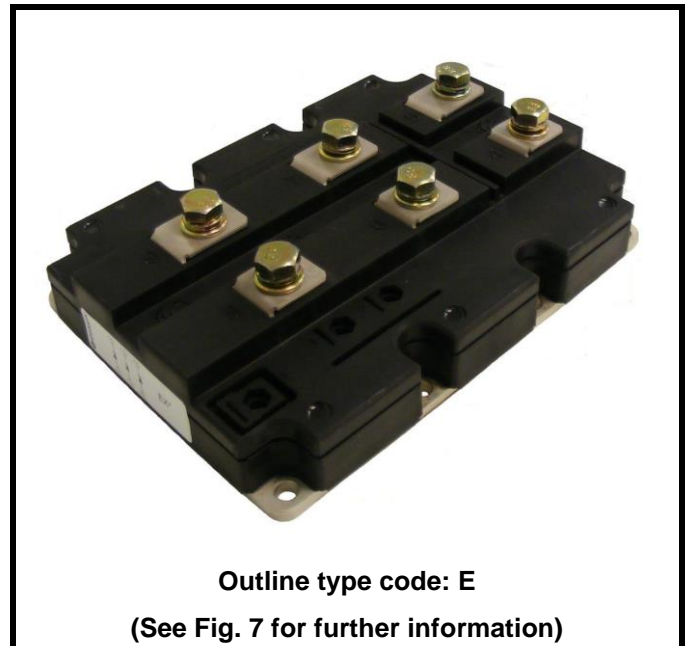
Note: When ordering, please use the complete part number

### KEY PARAMETERS

$V_{RRM}$		<b>1800V</b>
$V_F$	(typ)	<b>2.0V</b>
$I_F$	(max)	<b>1200A</b>
$I_{FM}$	(max)	<b>2400A</b>



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

Symbol	Parameter	Test Conditions	Max.	Units
V <sub>RRM</sub>	Repetitive peak reverse voltage	T <sub>j</sub> = 125°C	1800	V
I <sub>F</sub>	Forward current	DC, T <sub>case</sub> = 75°C, T <sub>j</sub> = 125°C	1200	A
I <sub>FM</sub>	Max. forward current	T <sub>case</sub> = 110°C, t <sub>p</sub> = 1ms	2400	A
I <sup>2</sup> t	I <sup>2</sup> t value fuse current rating	V <sub>R</sub> = 0, t <sub>p</sub> = 10ms, T <sub>j</sub> = 125°C	480	kA <sup>2</sup> s
P <sub>max</sub>	Max. transistor power dissipation	T <sub>case</sub> = 25°C, T <sub>j</sub> = 125°C	5000	W
V <sub>isol</sub>	Isolation voltage – per module	Commoned terminals to base plate. AC RMS, 1 min, 50Hz	4000	V
Q <sub>PD</sub>	Partial discharge – per module	IEC1287, V <sub>1</sub> = 1900V, V <sub>2</sub> = 1400V, 50Hz RMS	10	pC

**THERMAL AND MECHANICAL RATINGS**

Internal insulation material: AIN  
 Baseplate material: AISiC  
 Creepage distance: 33mm  
 Clearance: 20mm  
 CTI (Comparative Tracking Index): >600

Symbol	Parameter	Test Conditions	Min	Typ.	Max	Units
R <sub>th(j-c)</sub>	Thermal resistance (per arm)	Continuous dissipation – junction to case	-	-	20	°C/kW
R <sub>th(c-h)</sub>	Thermal resistance – case to heatsink (per module)	Mounting torque 5Nm (with mounting grease)	-	-	6	°C/kW
T <sub>j</sub>	Junction temperature		-	-	125	°C
T <sub>stg</sub>	Storage temperature range		-40	-	125	°C
	Screw Torque	Mounting – M6	-	-	5	Nm
		Electrical connections – M8	-	-	10	Nm

## STATIC ELECTRICAL CHARACTERISTICS – PER ARM

$T_{case} = 25^{\circ}\text{C}$  unless stated otherwise.

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
$I_{RM}$	Peak reverse current	$V_R = 1800\text{V}$ , $T_j = 125^{\circ}\text{C}$			20	mA
$V_F$	Forward voltage	$I_F = 1200\text{A}$		2.0	2.3	V
		$I_F = 1200\text{A}$ , $T_j = 125^{\circ}\text{C}$		2.0	2.3	V
$L_M$	Inductance			20		nH

## STATIC ELECTRICAL CHARACTERISTICS

$T_{case} = 25^{\circ}\text{C}$  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

$T_{case} = 25^{\circ}\text{C}$  unless stated otherwise

Symbol	Parameter	Test Conditions	Min	Typ.	Max	Units
$Q_{rr}$	Reverse recovery charge	$I_F = 1200\text{A}$ $V_R = 900\text{V}$ $di_F/dt = 8000\text{A}/\mu\text{s}$		320		$\mu\text{C}$
$I_{rr}$	Peak reverse recovery current			880		A
$E_{rec}$	Reverse recovery energy			240		mJ

$T_{case} = 125^{\circ}\text{C}$  unless stated otherwise

Symbol	Parameter	Test Conditions	Min	Typ.	Max	Units
$Q_{rr}$	Reverse recovery charge	$I_F = 1200\text{A}$ $V_R = 900\text{V}$ $di_F/dt = 8000\text{A}/\mu\text{s}$		540		$\mu\text{C}$
$I_{rr}$	Peak reverse recovery current			1020		A
$E_{rec}$	Reverse recovery energy			360		mJ

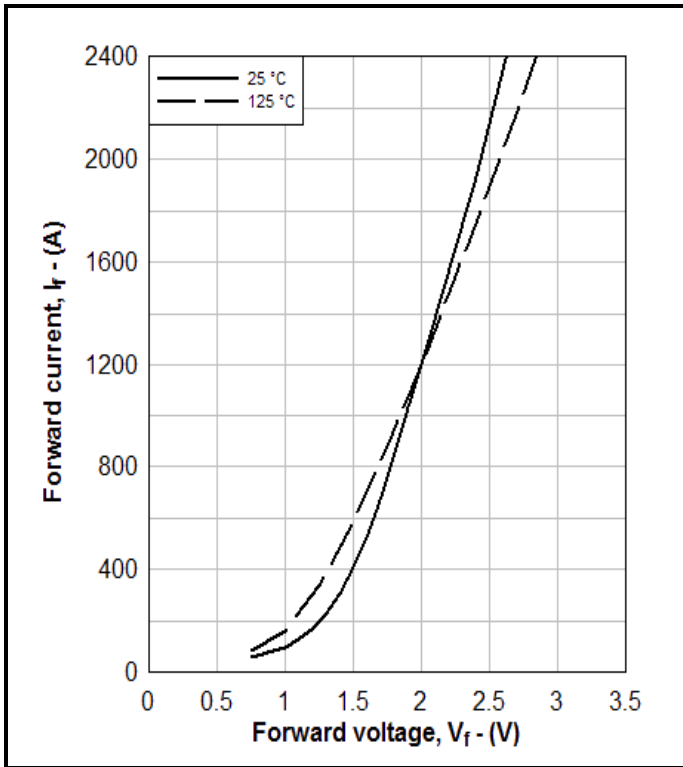


Fig. 3 Diode typical forward characteristics

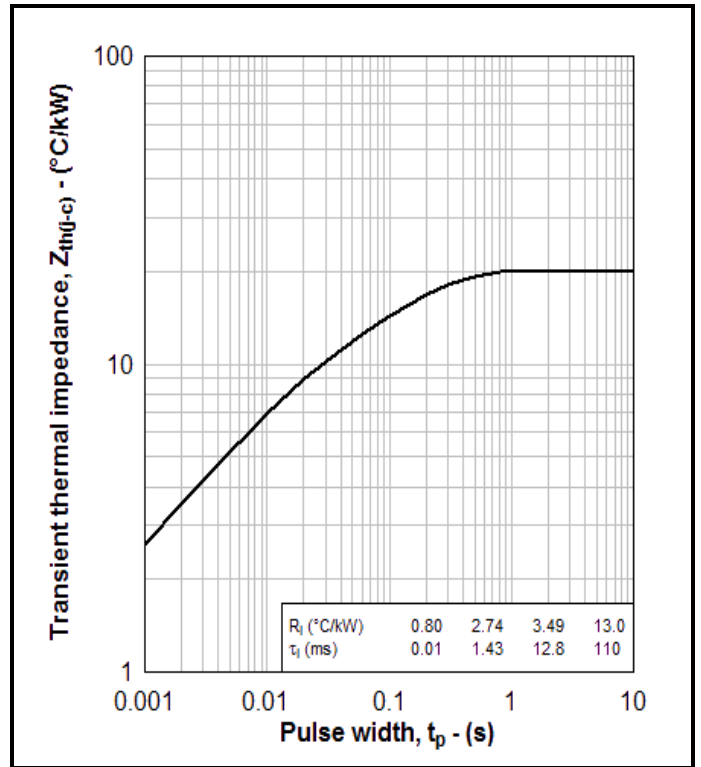


Fig. 4 Transient thermal impedance

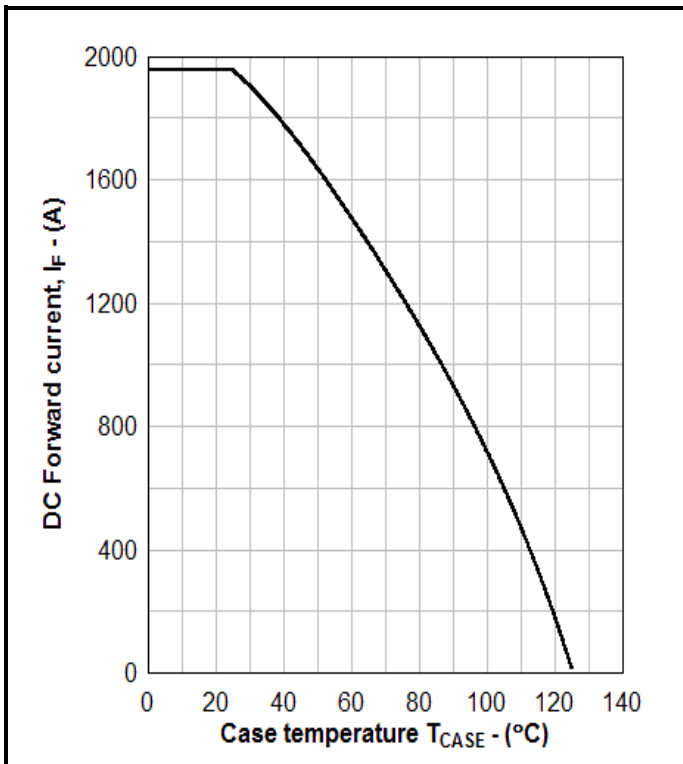


Fig. 5 DC Current rating vs case temperature

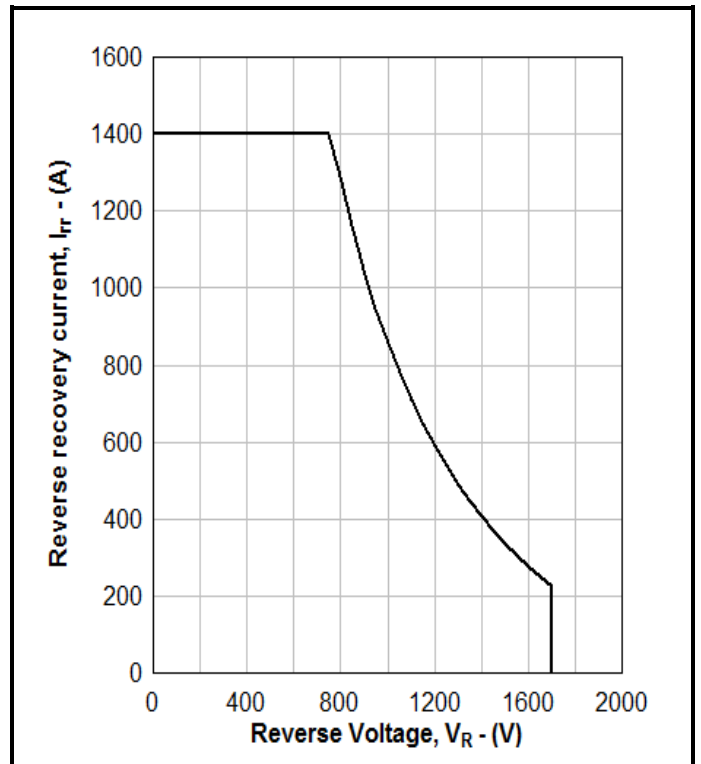


Fig. 6 RBSOA

PACKAGE DETAILS

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

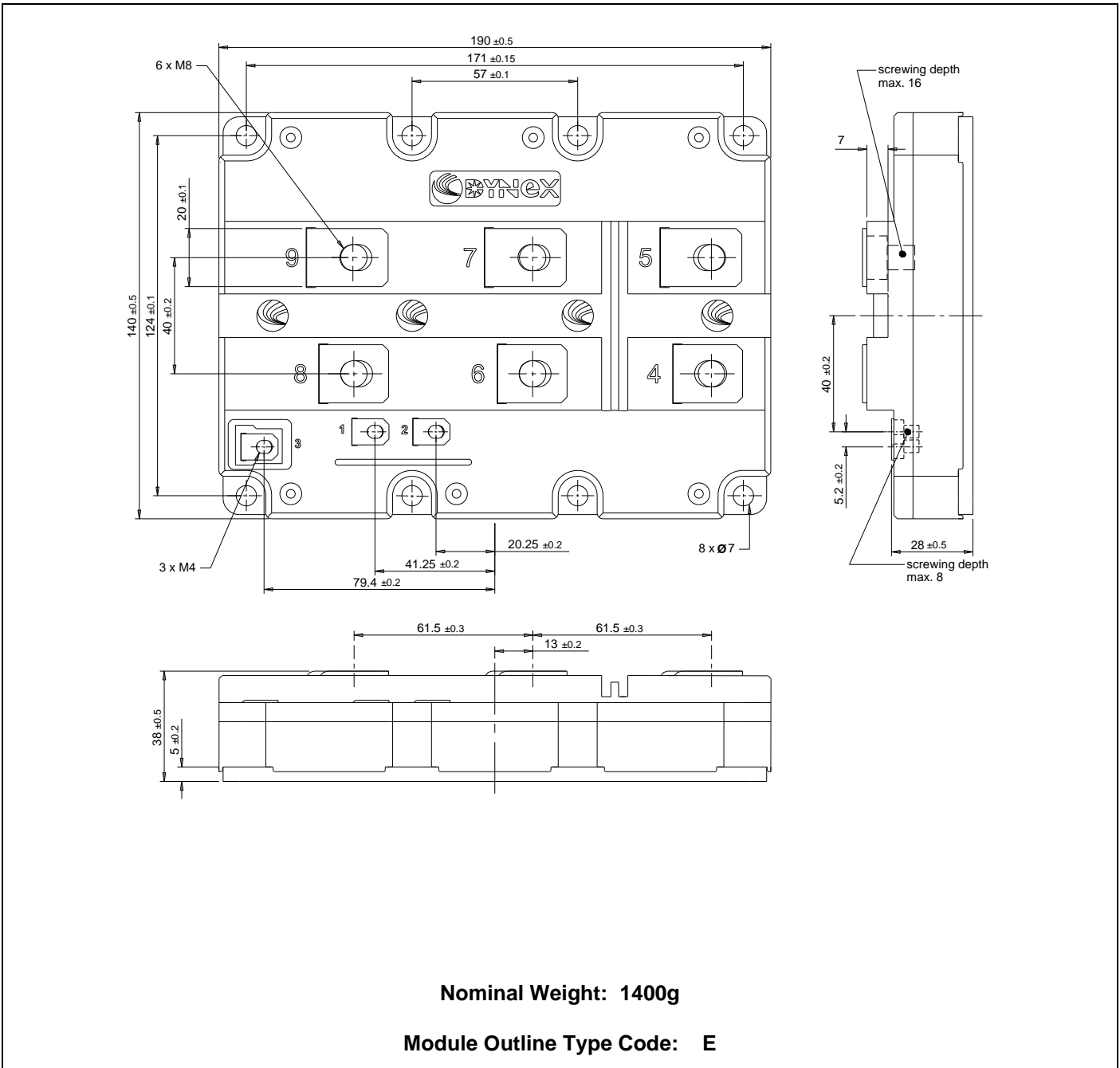


Fig. 7 Module outline drawing

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The products must not be touched when operating because there is a danger of electrocution or severe burning. Always use protective safety equipment such as appropriate shields for the product and wear safety glasses. Even when disconnected any electric charge remaining in the product must be discharged and allowed to cool before safe handling using protective gloves.

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