

### FEATURES

- Low Reverse Recovery Charge
- High Switching Speed
- Low Forward Volt Drop
- Isolated Cu Base with Al<sub>2</sub>O<sub>3</sub> 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 DFM1200EXS12-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

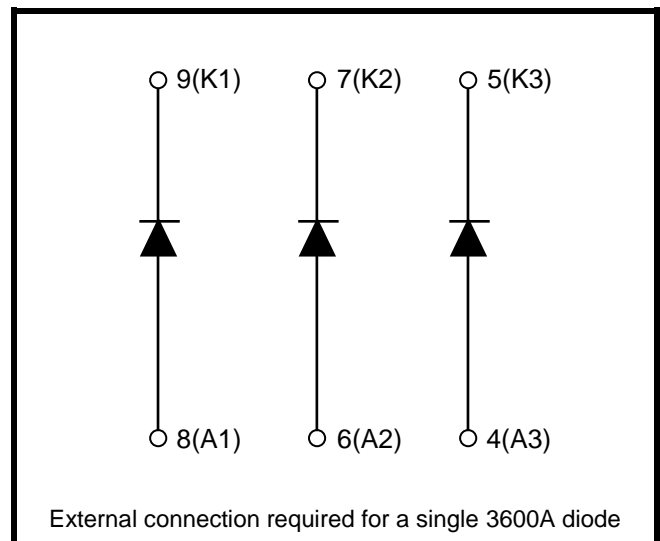
Order As:

### DFM1200EXS12-A000

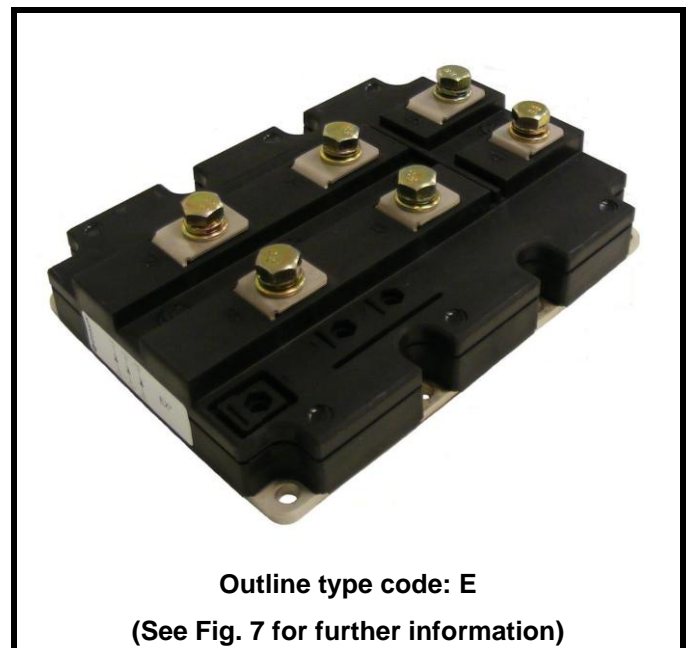
Note: When ordering, please use the complete part number

### KEY PARAMETERS

$V_{RRM}$		<b>1200V</b>
$V_F$	(typ)	<b>1.9V</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.

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

Symbol	Parameter	Test Conditions	Max.	Units
$V_{\text{RRM}}$	Repetitive peak reverse voltage	$T_j = 125^{\circ}\text{C}$	1200	V
$I_{\text{F}}$	Forward current	DC, $T_{\text{case}} = 75^{\circ}\text{C}$ , $T_j = 125^{\circ}\text{C}$	1200	A
$I_{\text{FM}}$	Max. forward current	$T_{\text{case}} = 110^{\circ}\text{C}$ , $t_p = 1\text{ms}$	2400	A
$I^2t$	$I^2t$ value fuse current rating	$V_R = 0$ , $t_p = 10\text{ms}$ , $T_j = 125^{\circ}\text{C}$	400	$\text{kA}^2\text{s}$
$P_{\text{max}}$	Max. transistor power dissipation	$T_{\text{case}} = 25^{\circ}\text{C}$ , $T_j = 125^{\circ}\text{C}$	7520	W
$V_{\text{isol}}$	Isolation voltage – per module	Commoned terminals to base plate. AC RMS, 1 min, 50Hz	2500	V

## THERMAL AND MECHANICAL RATINGS

Internal insulation material:	$\text{Al}_2\text{O}_3$
Baseplate material:	Cu
Creepage distance:	33mm
Clearance:	20mm
CTI (Comparative Tracking Index):	>600

Symbol	Parameter	Test Conditions	Min	Typ.	Max	Units
$R_{\text{th}(j-c)}$	Thermal resistance (per arm)	Continuous dissipation – junction to case	-	-	20	$^{\circ}\text{C}/\text{kW}$
$R_{\text{th}(c-h)}$	Thermal resistance – case to heatsink (per module)	Mounting torque 5Nm (with mounting grease)	-	-	6	$^{\circ}\text{C}/\text{kW}$
$T_j$	Junction temperature		-	-	125	$^{\circ}\text{C}$
$T_{\text{stg}}$	Storage temperature range		-40	-	125	$^{\circ}\text{C}$
	Screw Torque	Mounting – M6	-	-	5	Nm
		Electrical connections – M8	-	-	10	Nm

**STATIC ELECTRICAL CHARACTERISTICS – PER ARM**
**T<sub>case</sub> = 25°C unless stated otherwise.**

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
I <sub>RM</sub>	Peak reverse current	V <sub>R</sub> = 1200V, T <sub>j</sub> = 125°C			30	mA
V <sub>F</sub>	Forward voltage	I <sub>F</sub> = 1200A		1.9	2.2	V
		I <sub>F</sub> = 1200A, T <sub>j</sub> = 125°C		2.1	2.4	V
L <sub>M</sub>	Inductance			20		nH

**STATIC ELECTRICAL CHARACTERISTICS**
**T<sub>case</sub> = 25°C unless stated otherwise.**

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

**DYNAMIC ELECTRICAL CHARACTERISTICS – PER ARM**
**T<sub>case</sub> = 25°C unless stated otherwise**

Symbol	Parameter	Test Conditions	Min	Typ.	Max	Units
Q <sub>rr</sub>	Reverse recovery charge	I <sub>F</sub> = 1200A V <sub>R</sub> = 600V di <sub>F</sub> /dt = 9000A/μs		200		μC
I <sub>rr</sub>	Peak reverse recovery current			800		A
E <sub>rec</sub>	Reverse recovery energy			80		mJ

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

Symbol	Parameter	Test Conditions	Min	Typ.	Max	Units
Q <sub>rr</sub>	Reverse recovery charge	I <sub>F</sub> = 1200A V <sub>R</sub> = 600V di <sub>F</sub> /dt = 8400A/μs		300		μC
I <sub>rr</sub>	Peak reverse recovery current			920		A
E <sub>rec</sub>	Reverse recovery energy			140		mJ

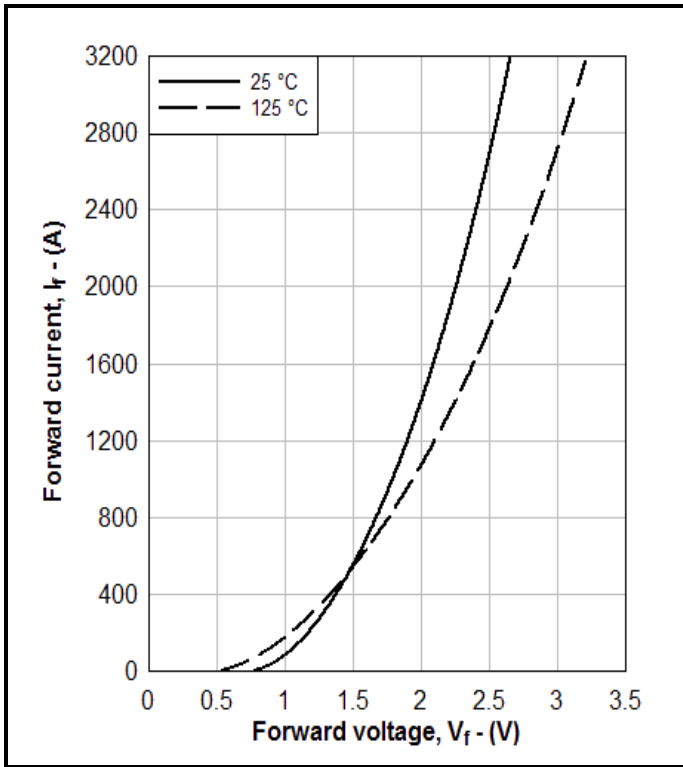


Fig. 3 Diode typical forward characteristics

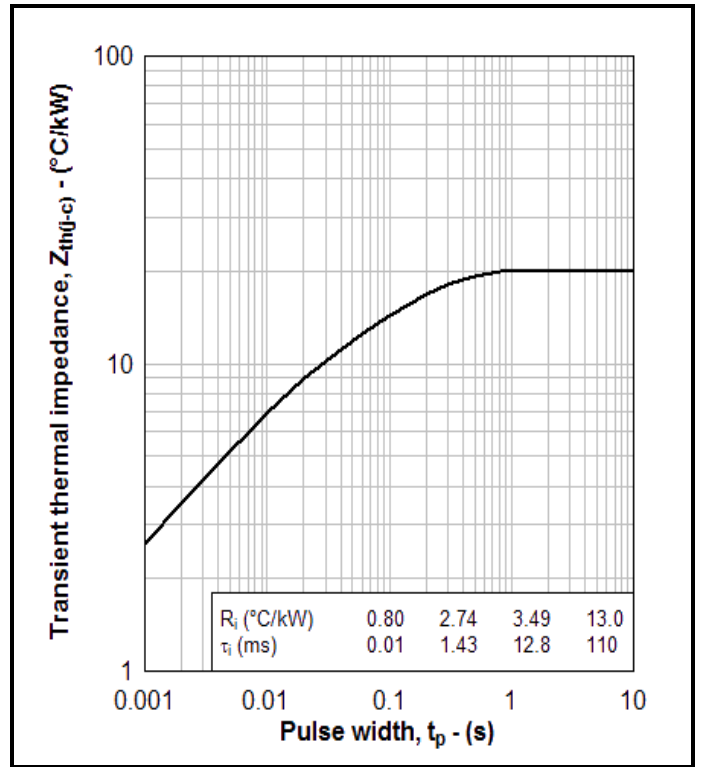


Fig. 4 Transient thermal impedance

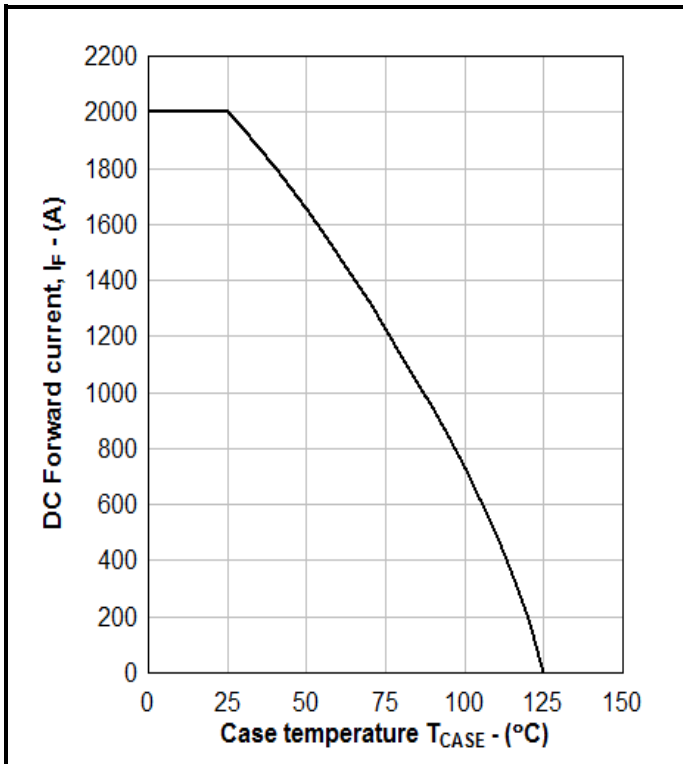


Fig. 5 DC Current rating vs case temperature

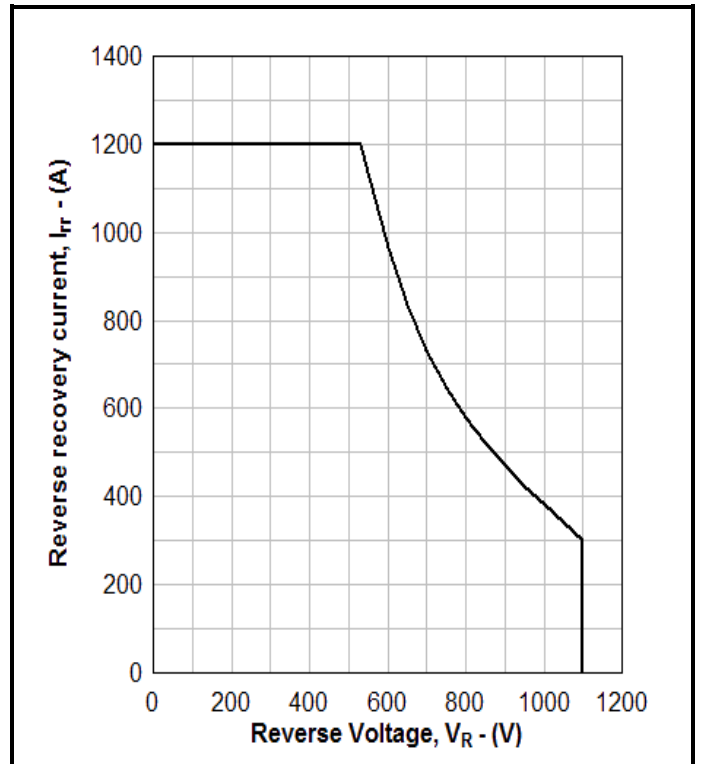
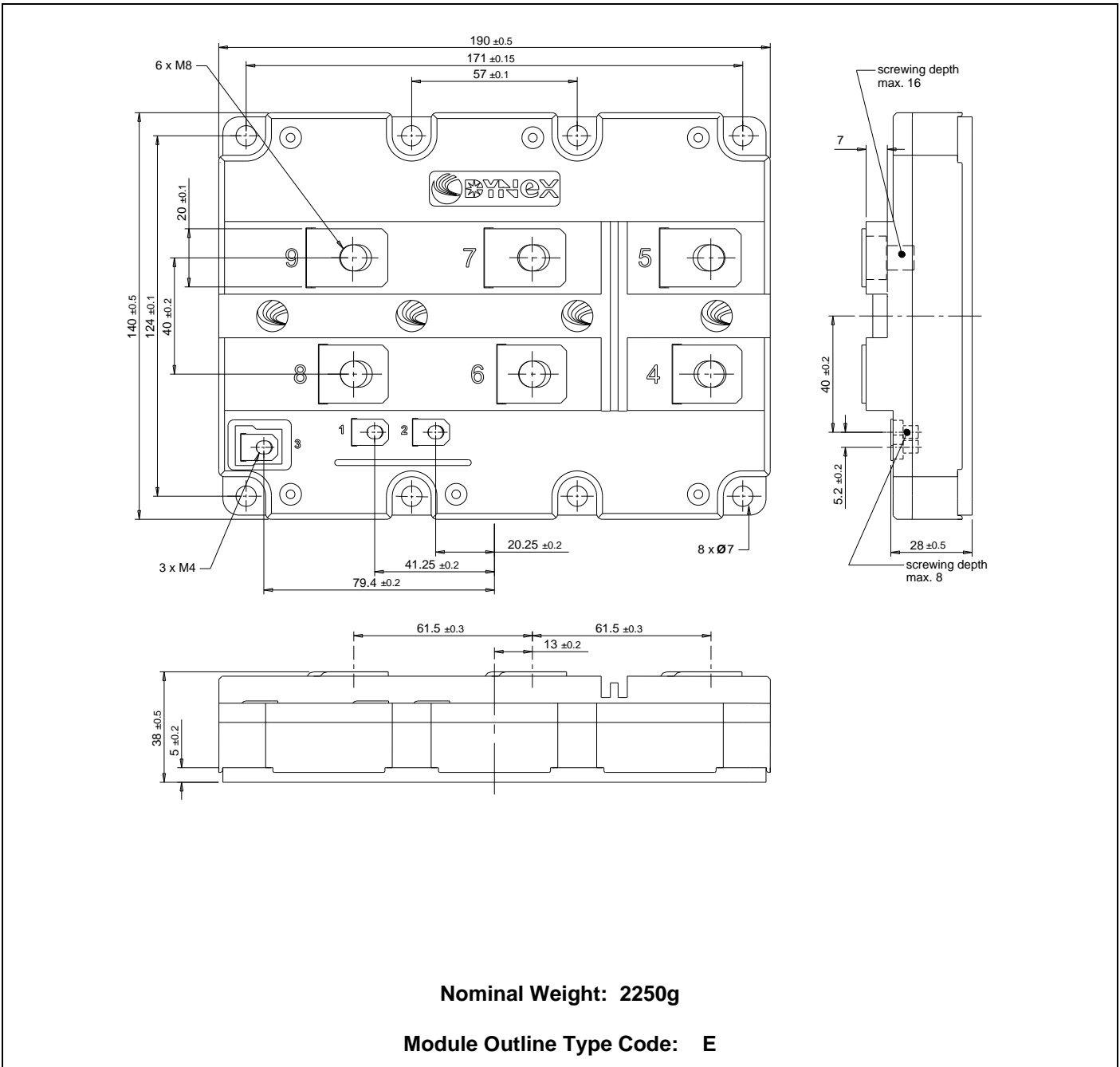


Fig. 6 RBSOA

**PACKAGE DETAILS**

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



**Nominal Weight: 2250g**

**Module Outline Type Code: E**

**Fig. 7 Module outline drawing**

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