

FEATURES

- Low Reverse Recovery Charge
- High Switching Speed
- Low Forward Volt Drop
- Isolated Cu Base with Al₂O₃ 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}		1200V
V_F	(typ)	1.9V
I_F	(max)	1200A
I_{FM}	(max)	2400A

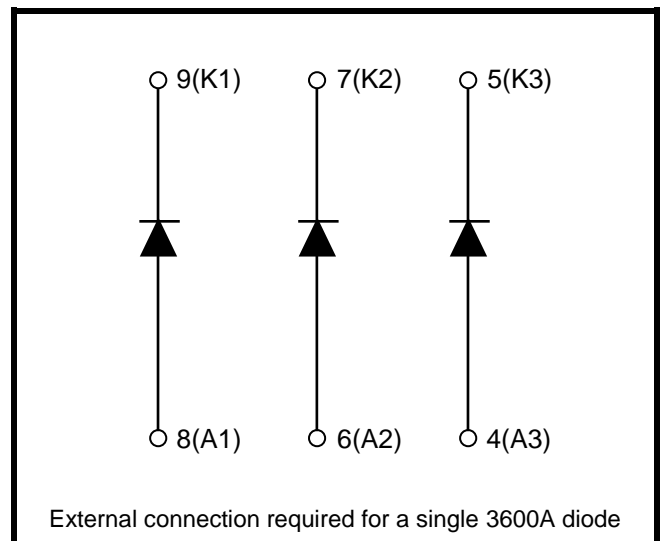


Fig. 1 Circuit configuration

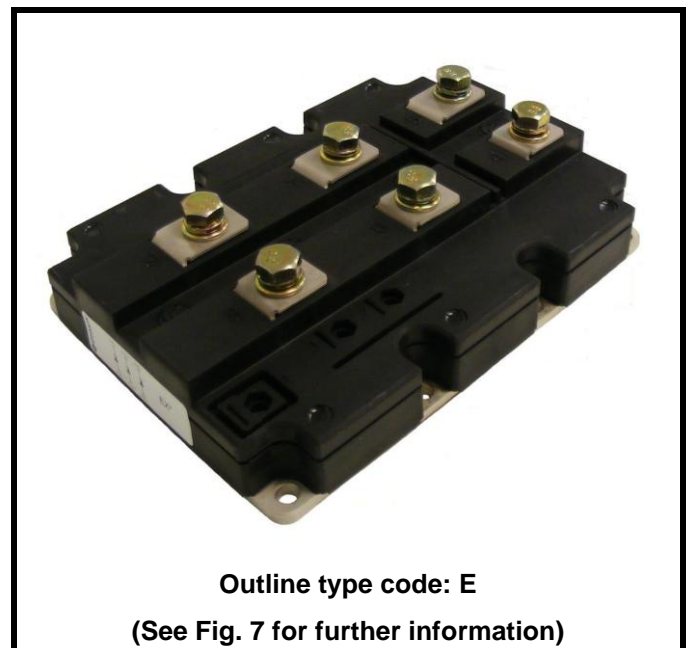


Fig. 2 Package

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.

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

Symbol	Parameter	Test Conditions	Max.	Units
V_{RRM}	Repetitive peak reverse voltage	$T_j = 125^{\circ}\text{C}$	1200	V
I_{F}	Forward current	DC, $T_{\text{case}} = 75^{\circ}\text{C}$, $T_j = 125^{\circ}\text{C}$	1200	A
I_{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	kA^2s
P_{max}	Max. transistor power dissipation	$T_{\text{case}} = 25^{\circ}\text{C}$, $T_j = 125^{\circ}\text{C}$	7520	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:	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_{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_{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			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		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 = 1200A V _R = 600V di _F /dt = 9000A/μs		200		μC
I _{rr}	Peak reverse recovery current			800		A
E _{rec}	Reverse recovery energy			80		mJ

T_{case} = 125°C unless stated otherwise

Symbol	Parameter	Test Conditions	Min	Typ.	Max	Units
Q _{rr}	Reverse recovery charge	I _F = 1200A V _R = 600V di _F /dt = 8400A/μs		300		μC
I _{rr}	Peak reverse recovery current			920		A
E _{rec}	Reverse recovery energy			140		mJ

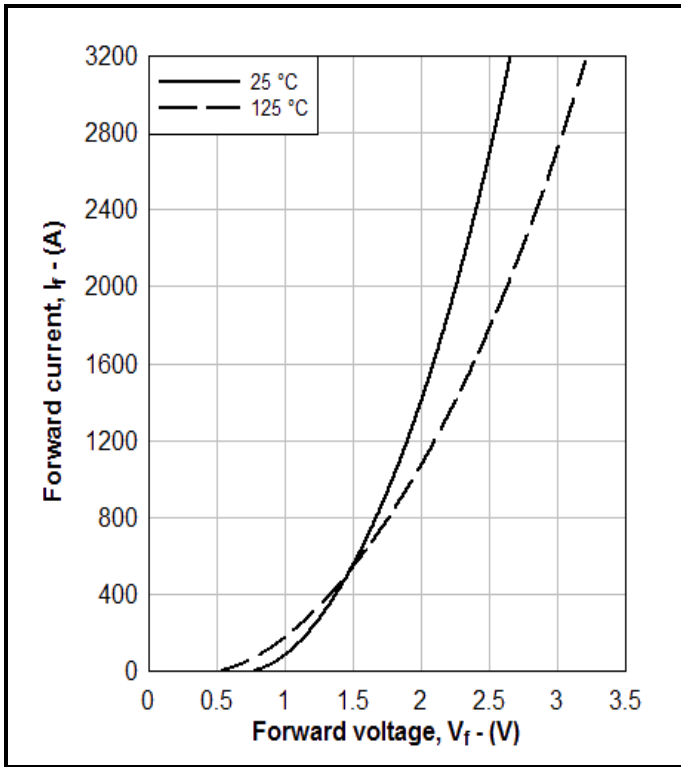


Fig. 3 Diode typical forward characteristics

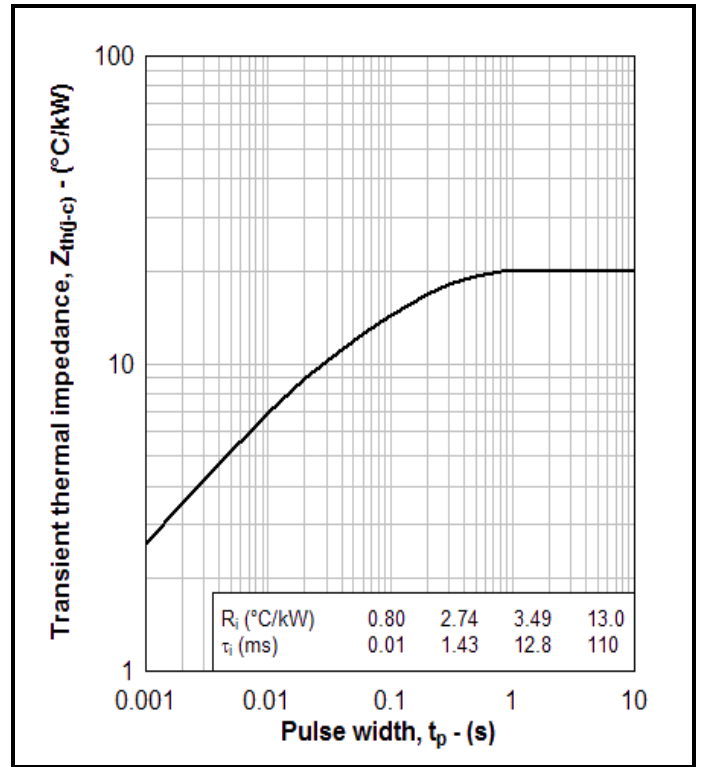


Fig. 4 Transient thermal impedance

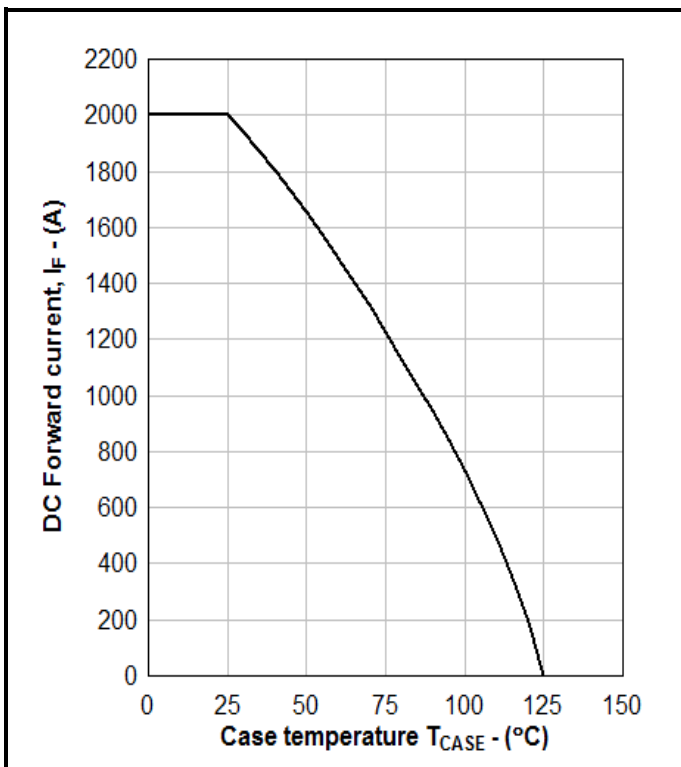


Fig. 5 DC Current rating vs case temperature

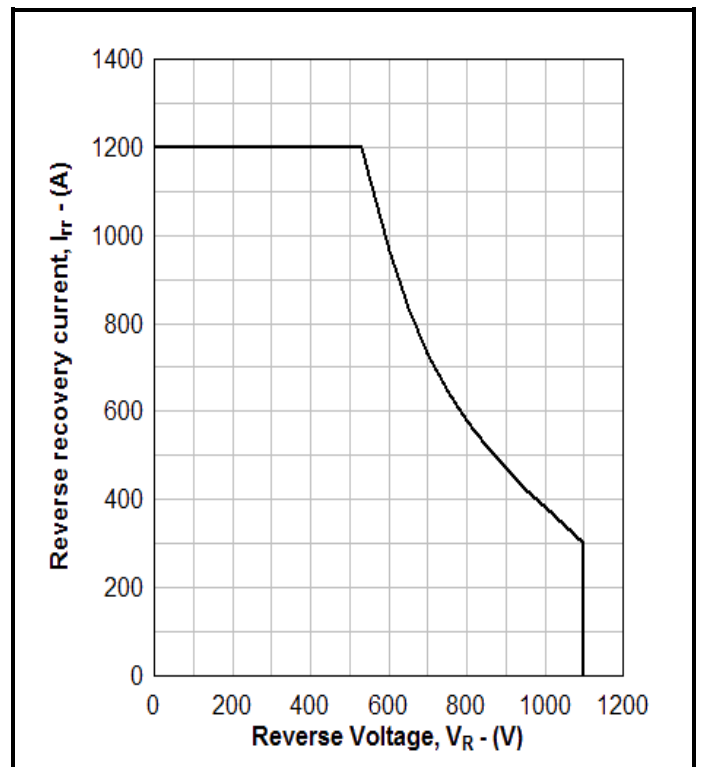
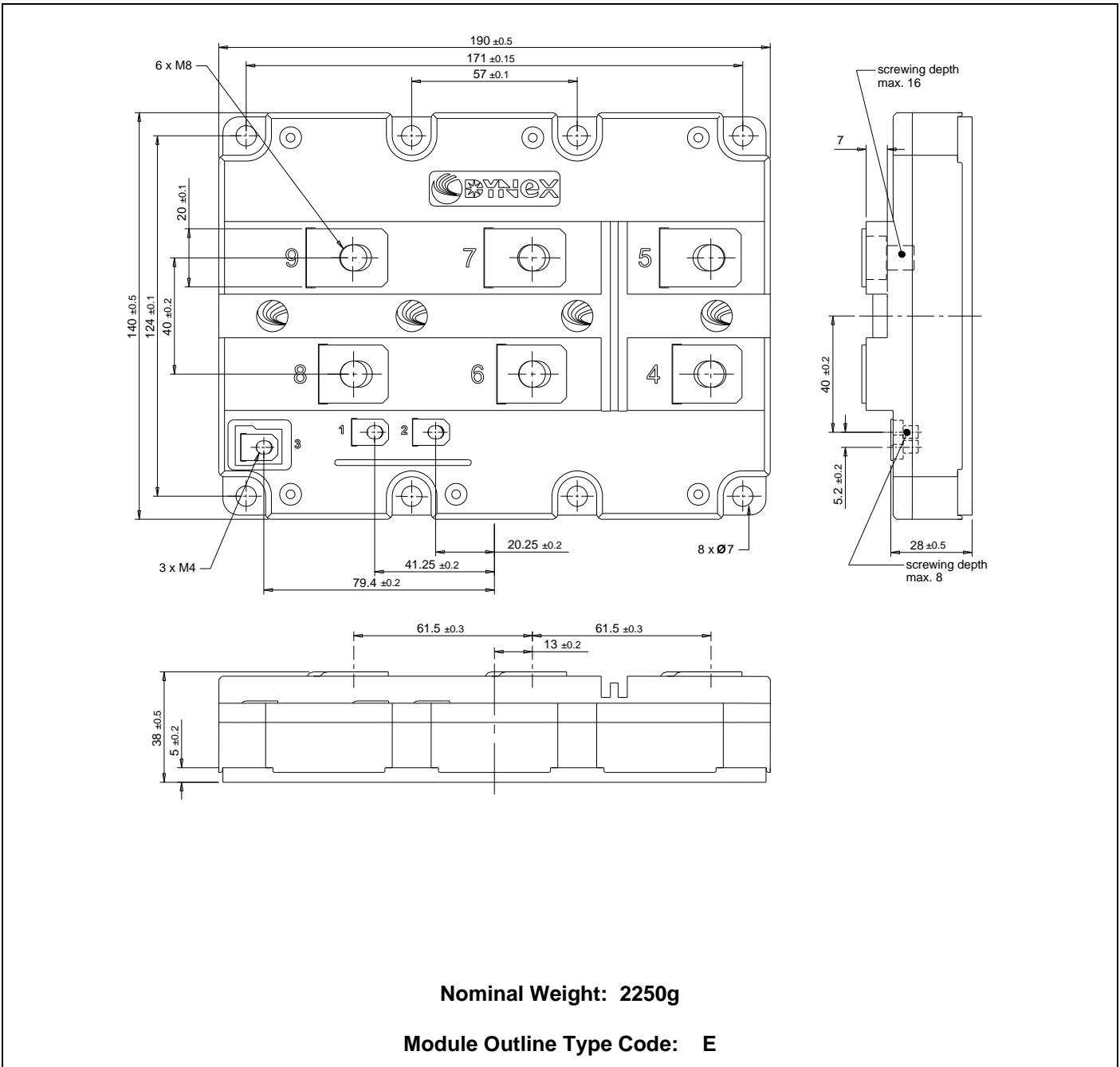


Fig. 6 RBSOA

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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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.

Extended exposure to conditions outside the product ratings may affect reliability leading to premature product failure. Use outside the product ratings is likely to cause permanent damage to the product. In extreme conditions, as with all semiconductors, this may include potentially hazardous rupture, a large current to flow or high voltage arcing, resulting in fire or explosion. Appropriate application design and safety precautions should always be followed to protect persons and property.

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