

FEATURES

- Low Reverse Recovery Charge
- High Switching Speed
- Low Forward Volt Drop
- Isolated AISiC Base with AlN Substrates
- Dual Diodes can be paralleled for 1500A Rating
- Lead Free Construction
- 10.2kV Isolation Package

APPLICATIONS

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

The DFM750XXM65-TS000 is a dual 6500V, 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:

DFM750XXM65-TS000

Note: When ordering, please use the complete part number

KEY PARAMETERS

V_{RRM}		6500V
V_F	(typ)	3.3V
I_F	(max)	750A
I_{FM}	(max)	1500A

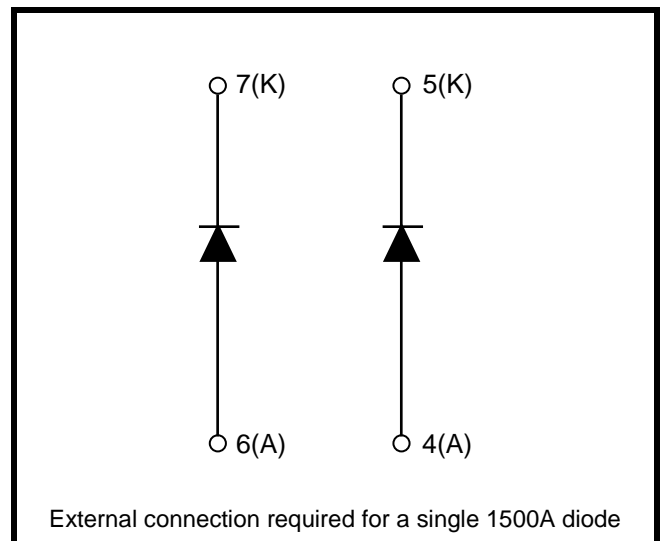


Fig. 1 Circuit configuration

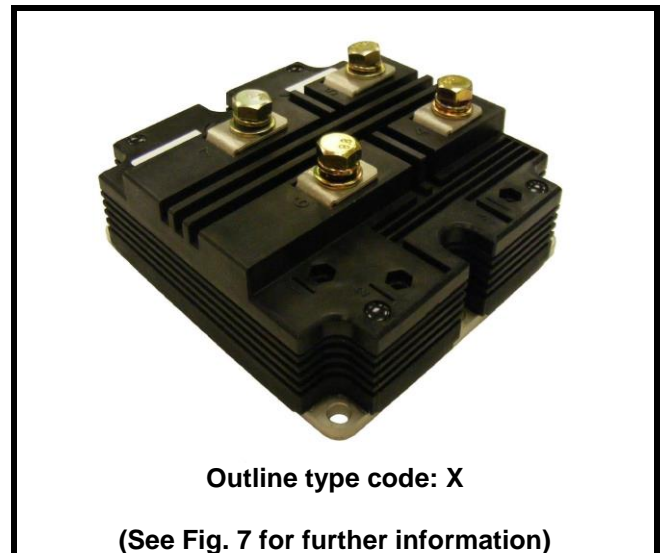


Fig. 2 Package

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.

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

Symbol	Parameter	Test Conditions	Max.	Units
V_{RRM}	Repetitive peak reverse voltage	$T_j = 125^{\circ}\text{C}$	6500	V
		$T_j = 25^{\circ}\text{C}$	6500	V
		$T_j = -40^{\circ}\text{C}$	6000	V
I_F	Forward current (per arm)	DC, $T_{case} = 75^{\circ}\text{C}$, $T_j = 125^{\circ}\text{C}$	750	A
I_{FM}	Max. forward current	$T_{case} = 105^{\circ}\text{C}$, $t_p = 1\text{ms}$	1500	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. power dissipation	$T_{case} = 25^{\circ}\text{C}$, $T_j = 125^{\circ}\text{C}$	5000	W
V_{isol}	Isolation voltage – per module	Commoned terminals to base plate. AC RMS, 1 min, 50Hz	10.2	kV
Q_{PD}	Partial discharge – per module	IEC1287, $V_1 = 6900\text{V}$, $V_2 = 5100\text{V}$, 50Hz RMS	10	pC

THERMAL AND MECHANICAL RATINGS

Internal insulation material:	AlN
Baseplate material:	AlSiC
Creepage distance:	56mm
Clearance:	26mm
CTI (Comparative Tracking Index):	> 600

Symbol	Parameter	Test Conditions	Min	Typ.	Max	Units
$R_{th(j-c)}$	Thermal resistance (per arm)	Continuous dissipation – junction to case	-	-	18	$^{\circ}\text{C}/\text{kW}$
$R_{th(c-h)}$	Thermal resistance – case to heatsink (per module)	Mounting torque 5Nm (with mounting grease)	-	-	8	$^{\circ}\text{C}/\text{kW}$
T_j	Junction temperature		-40	-	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 = 6500V, T _j = 125°C			50	mA
V _F	Forward voltage	I _F = 750A		3.3		V
		I _F = 750A, T _j = 125°C		3.7		V
L _M	Inductance	-		40		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)	-		20		nH
R _{INT}	Internal resistance (per arm)	-		370		μΩ

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 = 750A V _R = 3600V di _F /dt = 4000A/μs		1500		μC
I _{rr}	Peak reverse recovery current			1550		A
E _{rec}	Reverse recovery energy			2700		mJ

T_{case} = 125°C unless stated otherwise

Symbol	Parameter	Test Conditions	Min	Typ.	Max	Units
Q _{rr}	Reverse recovery charge	I _F = 750A V _R = 3600V di _F /dt = 4200A/μs		2500		μC
I _{rr}	Peak reverse recovery current			2350		A
E _{rec}	Reverse recovery energy			4300		mJ

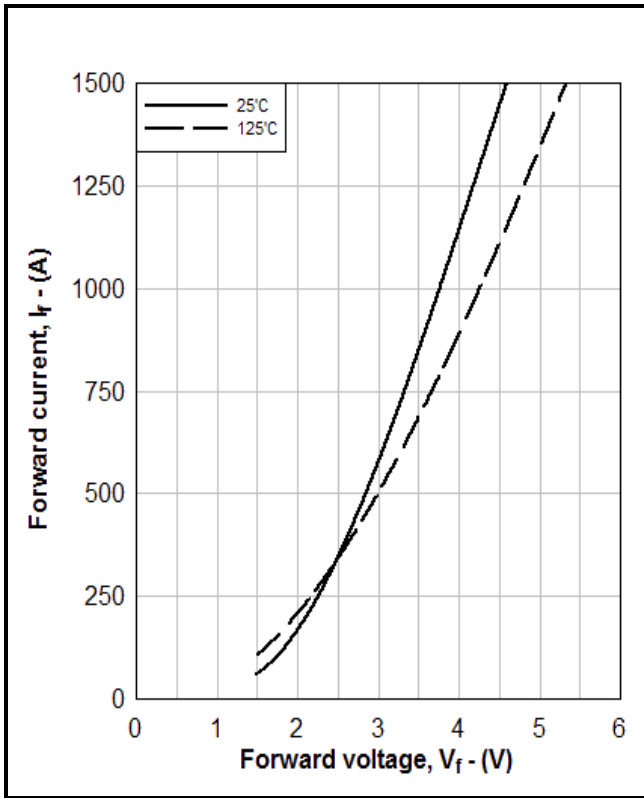


Fig. 3 Diode typical forward characteristics

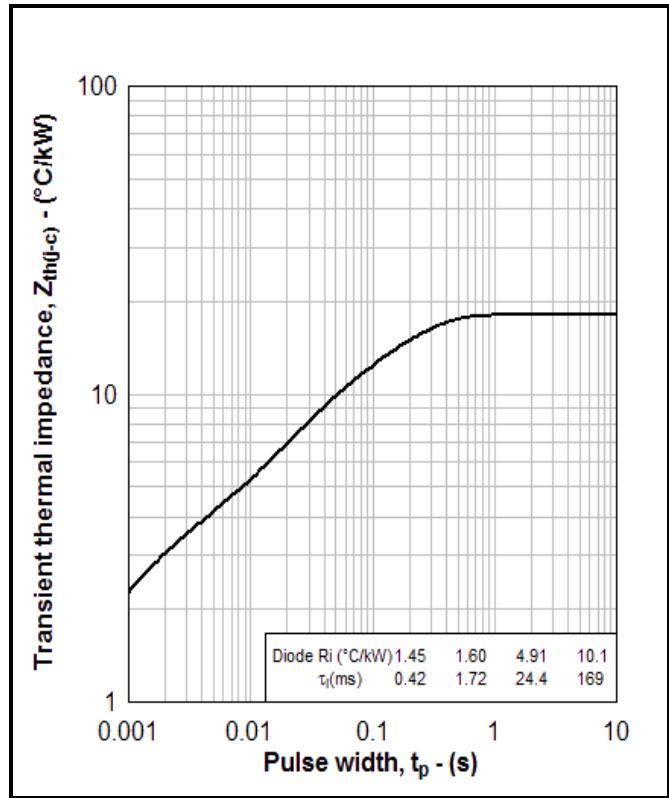


Fig. 4 Transient thermal impedance

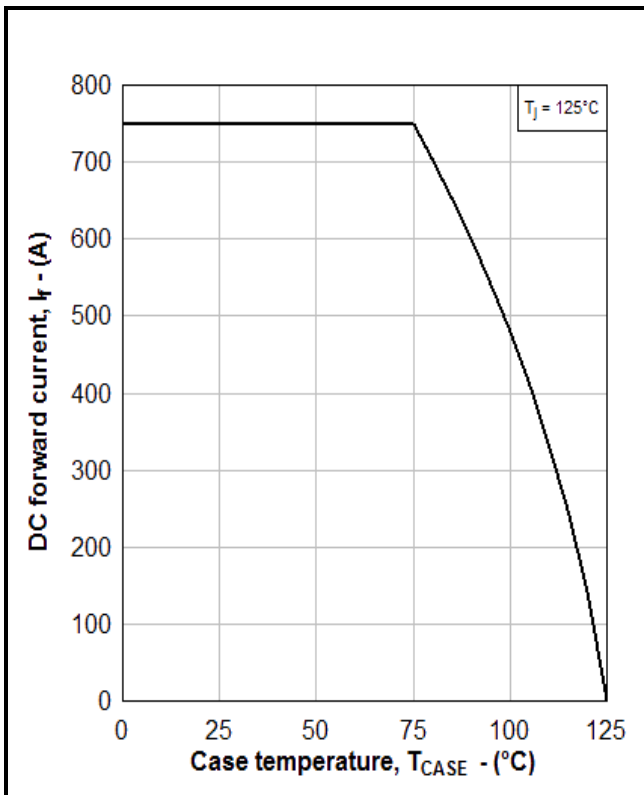


Fig. 5 DC current rating vs case temperature

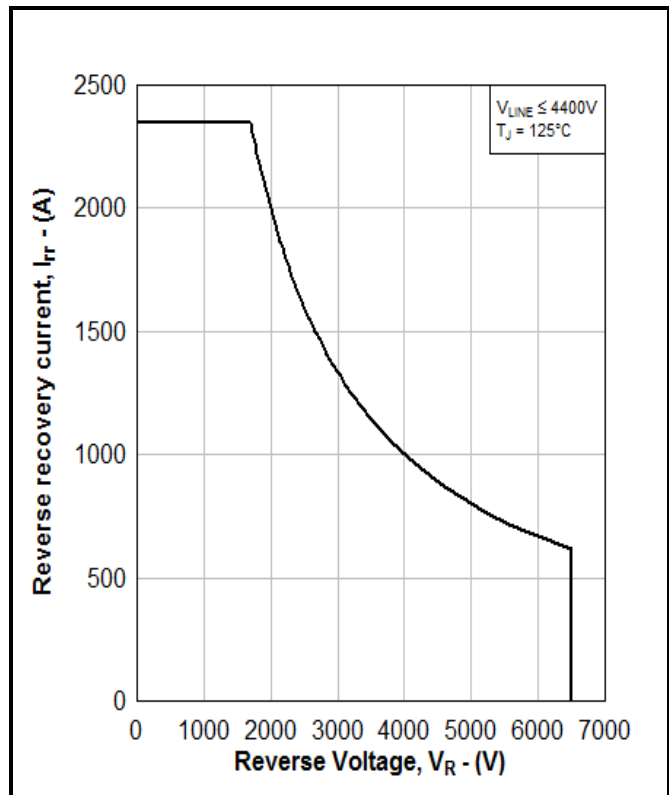


Fig. 6 Reverse Bias Safe Operating Area (RBSOA)

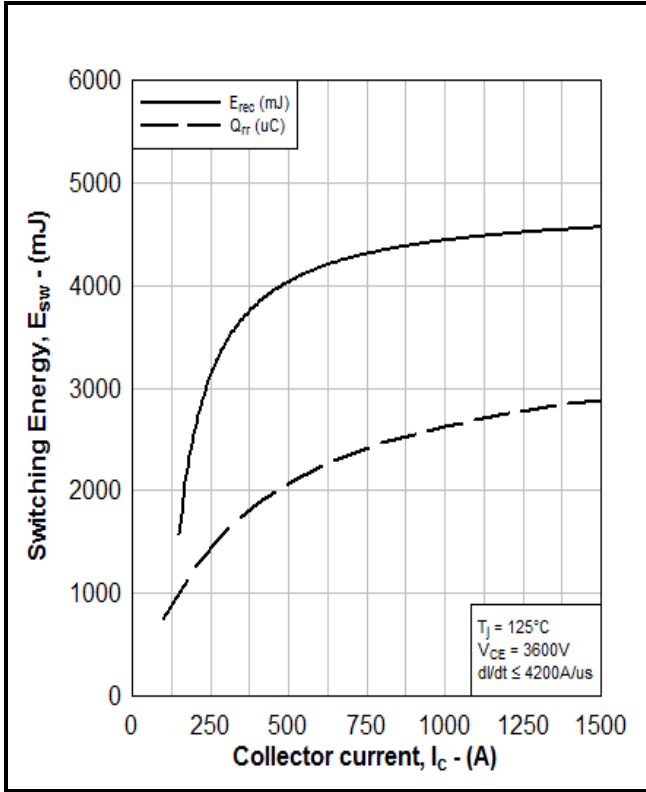


Fig. 7 Characteristics vs. current

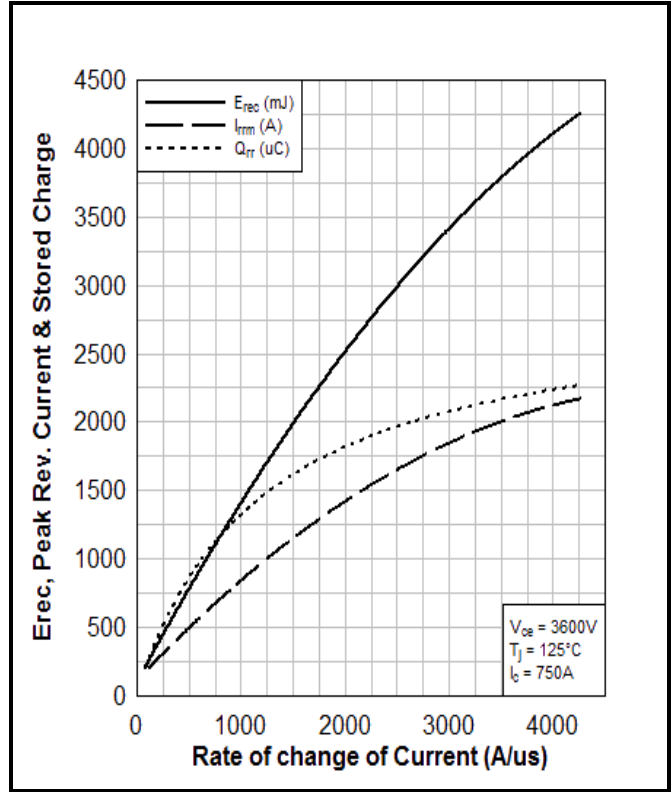
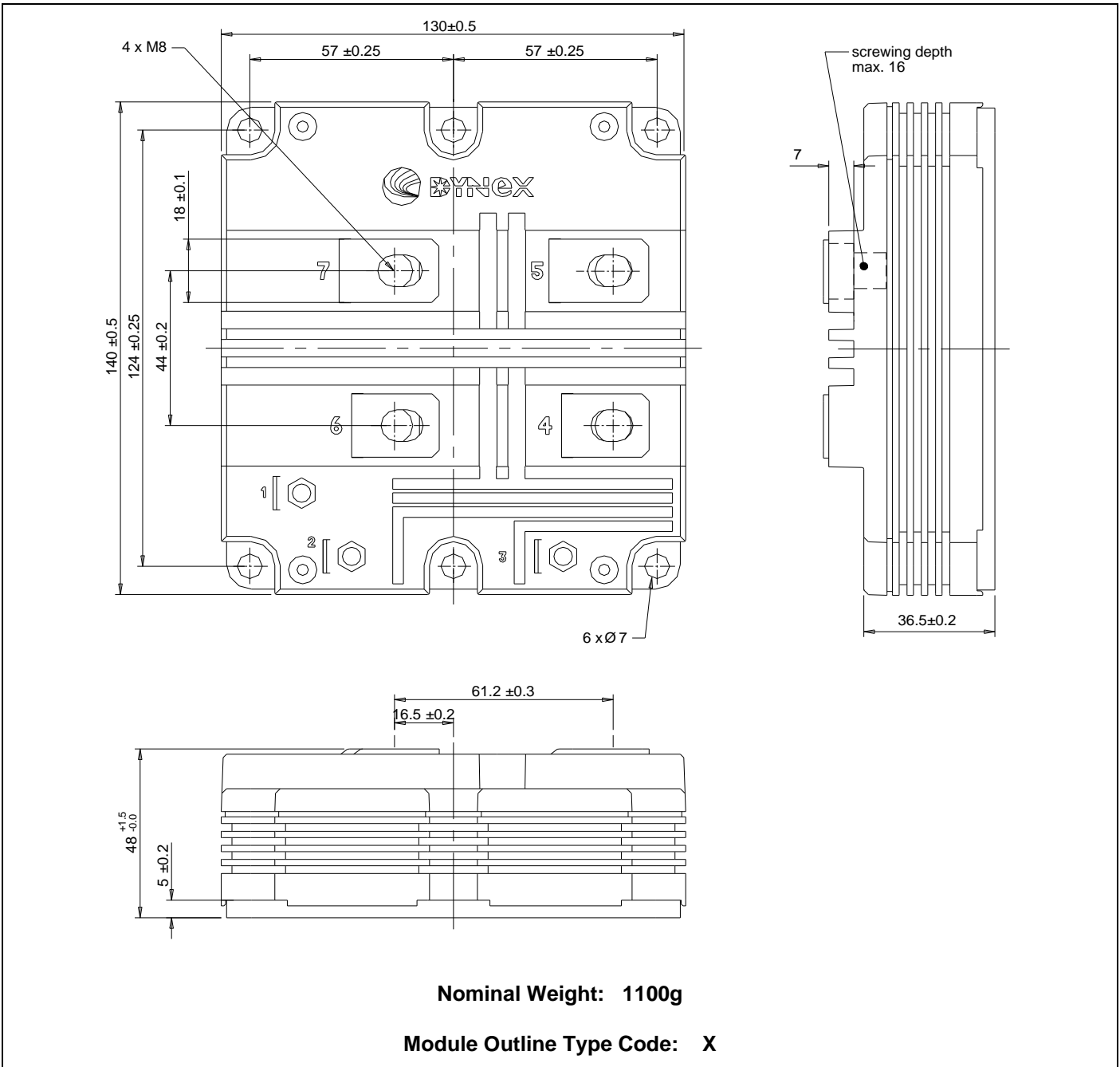


Fig. 8 Characteristic vs. di/dt

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: 1100g

Module Outline Type Code: X

Fig. 9 Module outline drawing

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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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Preliminary Information:	The product design is complete and final characterisation for volume production is in progress. The datasheet represents the product as it is now understood but details may change.
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HEADQUARTERS OPERATIONS**DYNEX SEMICONDUCTOR LTD**

Doddington Road, Lincoln, Lincolnshire, LN6 3LF,
United Kingdom

Fax: +44(0)1522 500550

Tel: +44(0)1522 500500

Web: <http://www.dynexsemi.com>

CUSTOMER SERVICE**DYNEX SEMICONDUCTOR LTD**

Doddington Road, Lincoln, Lincolnshire, LN6 3LF,
United Kingdom

Fax: +44(0)1522 500020

Tel: +44(0)1522 502753 / 502901

Email: Power_solutions@dynexsemi.com