

AN5700

Part Numbering Nomenclature for IGBT & FRD Modules

Application Note

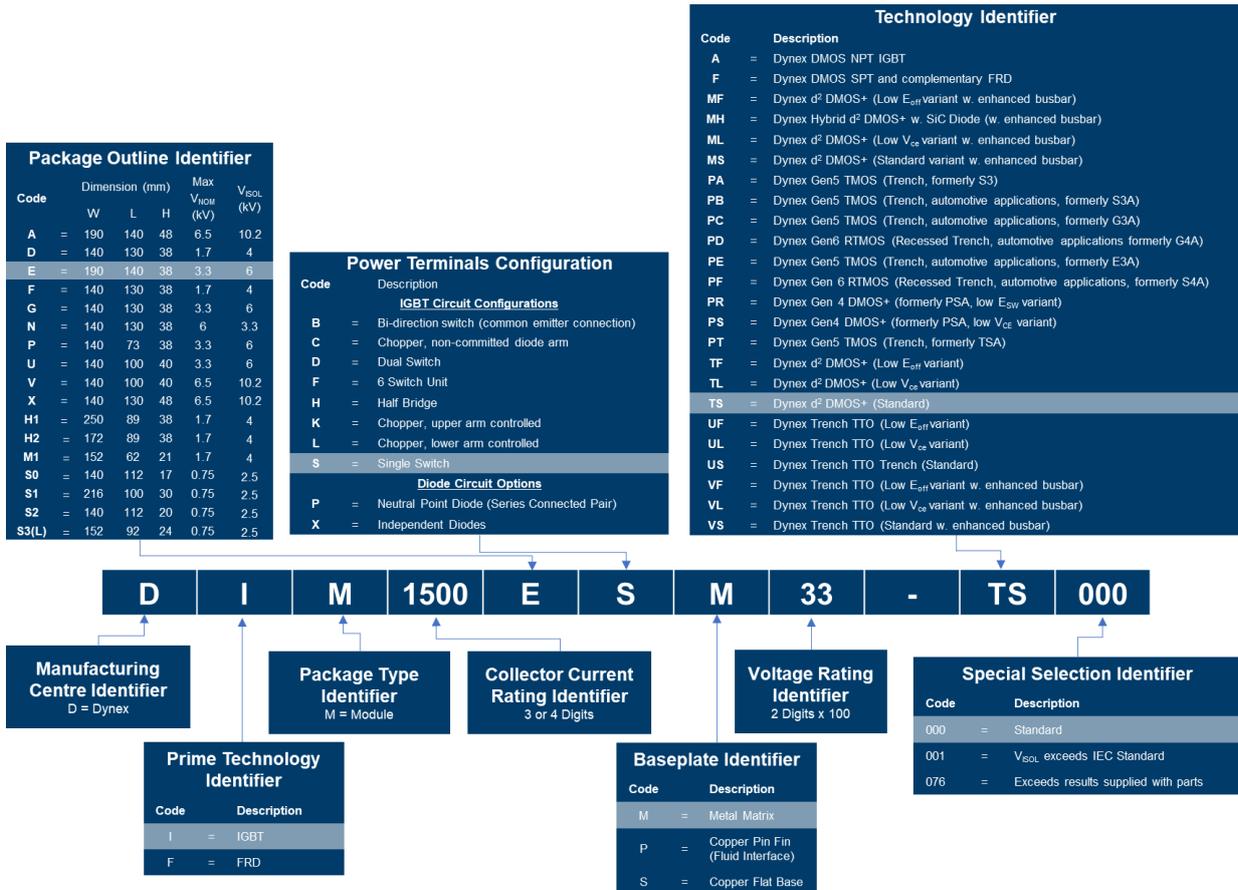
Replaces AN5700-3

AN5700-4 February 2021 LN40639

Introduction

Dynex IGBT modules come in a variety of blocking voltages, current capacity, circuit configuration dimensions and isolation voltages; this application note is intended to explain Dynex's module nomenclature regime.





IGBT & FRD Module Nomenclature

Example Model Number
DIM1000ASM65-US000

Manufacturing Centre Identifier

DIM1000ASM65-US000

Code	Description
D	= Dynex

Prime Technology Identifier

DIM1000ASM65-US000

Code	Description
I	= IGBT
F	= FRD

Collector Current Rating Identifier

DIM1000ASM65-US000

Collector current I_C rating may be three or four characters in length; i.e. a 500A module will read as a DIM500XSM65-TS000.

Package Outline IdentifierDIM1000ASM65-US000

Code		Dimension (mm)			Max V _{NOM} (kV)	V _{ISOL} (kV)
		W	L	H		
A	=	190	140	48	6.5	10.2
D	=	140	130	38	1.7	4
E	=	190	140	38	3.3	6
F	=	140	130	38	1.7	4
G	=	140	130	38	3.3	6
N	=	140	130	38	6	3.3
P	=	140	73	38	3.3	6
U	=	140	100	40	3.3	6
V	=	140	100	40	6.5	10.2
X	=	140	130	48	6.5	10.2
H1	=	250	89	38	1.7	4
H2	=	172	89	38	1.7	4
M1	=	152	62	21	1.7	4
S0	=	140	112	17	0.75	2.5
S1	=	216	100	30	0.75	2.5
S2	=	140	112	20	0.75	2.5
S3*	=	152	92	24	0.75	2.5

*Standard tab option use special selection 500, for Long tab option use special selection 502

Power Terminals Configuration IdentifierDIM1000ASM65-US000

Modules may be configured in the following options:

IGBT Circuit Configuration

Code	Configuration
B	= Bi-direction switch (common emitter connection)
D	= Dual Switch
C	= Chopper, non-committed diode arm
F	= 6 Switch Unit
K	= Chopper, upper arm controlled
L	= Chopper, lower arm controlled
S	= Single Switch
H	= Half Bridge

Diode Circuit Configuration

P	= Neutral Point Diode (Series Connected Pair)
X	= Independent Diodes

Baseplate Material Identifier

DIM1000ASM65-US000

Letter		Baseplate Material
M	=	Metal Matrix
P	=	Copper Pin Fin Base (Fluid interface)
S	=	Copper Flat Base

Voltage Rating Identifier

DIM1000ASM65-US000

Multiply two-digit voltage rating identifier by 100.

Technology Identifier

DIM1000ASM65-US000

Code		Description
A	=	Dynex DMOS NPT IGBT
F	=	Dynex DMOS SPT and complementary FRD
MF	=	Dynex d ² DMOS+ (Low E _{off} variant w. enhanced busbar)
MH	=	Dynex Hybrid d ² DMOS+ w. SiC Diode (w. enhanced busbar)
ML	=	Dynex d ² DMOS+ (Low V _{ce} variant w. enhanced busbar)
MS	=	Dynex d ² DMOS+ (Standard variant w. enhanced busbar)
PA	=	Dynex Gen5 TMOS (Trench, formerly S3)
PB	=	Dynex Gen5 TMOS (Trench, automotive applications, formerly S3A)
PC	=	Dynex Gen5 TMOS (Trench, automotive applications, formerly G3A)
PD	=	Dynex Gen6 RTMOS (Recessed Trench, automotive applications formerly G4A)
PE	=	Dynex Gen5 TMOS (Trench, automotive applications, formerly E3A)
PF	=	Dynex Gen 6 RTMOS (Trench, automotive applications, formerly S4A)
PR	=	Dynex Gen4 DMOS+ (formerly PSA012, low E _{sw} variant)
PS	=	Dynex Gen4 DMOS+ (formerly PSA011 low V _{CE} variant)
PT	=	Dynex Gen5 TMOS (Trench, formerly TSA)
TF	=	Dynex d ² DMOS+ (Low E _{off} variant)
TL	=	Dynex d ² DMOS+ (Low V _{ce} variant)
TS	=	Dynex d ² DMOS+ (Standard)
UF	=	Dynex Trench TSPT (Low E _{off} variant)
UL	=	Dynex Trench TSPT (Low V _{ce} variant)
US	=	Dynex Trench TSPT Trench (Standard)
VF	=	Dynex Trench TSPT (Low E _{off} variant w. enhanced busbar)
VL	=	Dynex Trench TSPT (Low V _{ce} variant w. enhanced busbar)
VS	=	Dynex Trench TSPT (Standard w. enhanced busbar)

Special Selection Identifier
DIM1000ASM65-US000

Code	Description
000	= Standard Product
001	= Isolation voltage exceeds IEC standard for blocking voltage
076	= Electrical result supplied with module.
XXX	= Special Selection

Annex 1: Package Outline Detailed Description

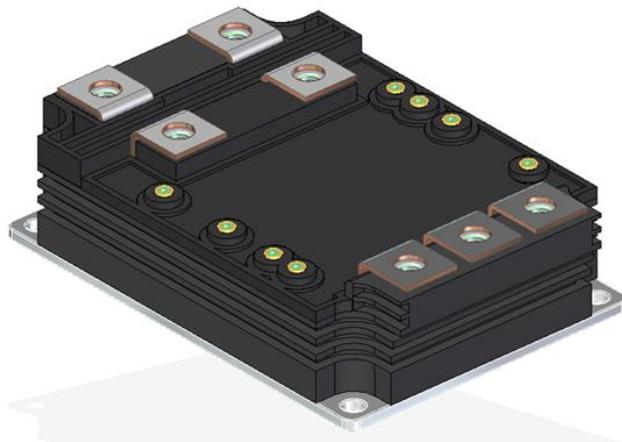
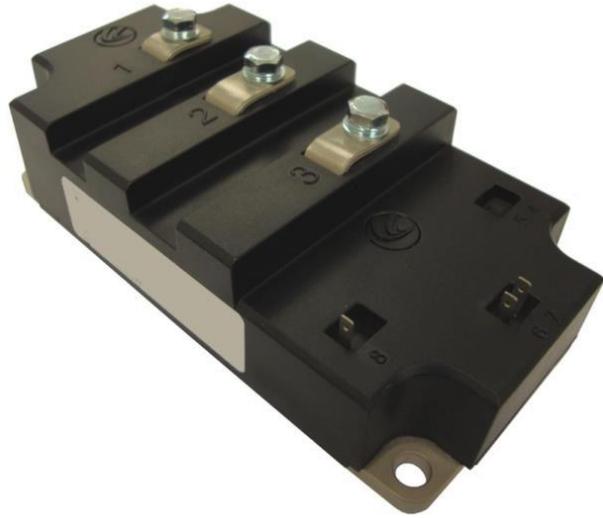
Code	Dimension	Module Appearance
	Max V_{NOM}	
	Max V_{ISOL}	
A =	W (mm)	140
	L (mm)	190
	H (mm)	48
	Max V_{NOM} (kV)	6.5
	Max V_{ISOL} (kV)	10.2
D =	W (mm)	140
	L (mm)	130
	H (mm)	38
	Max V_{NOM} (kV)	1.7
	Max V_{ISOL} (kV)	4

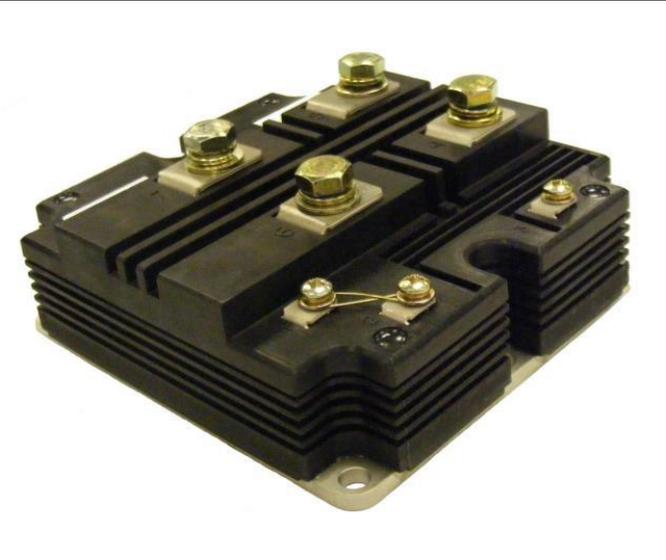
Code	Dimension	Module Appearance
	Max V_{NOM}	
	Max V_{ISOL}	
E =	W (mm)	140
	L (mm)	190
	H (mm)	38
	Max V_{NOM} (kV)	3.3
	Max V_{ISOL} (kV)	6
F =	W (mm)	140
	L (mm)	130
	H (mm)	38
	Max V_{NOM} (kV)	1.7
	Max V_{ISOL} (kV)	4



Code	Dimension	Module Appearance	
G =	Max V_{NOM}		
	Max V_{ISOL}		
	W (mm)		140
	L (mm)		130
	H (mm)		38
	Max V_{NOM} (kV)		3.3
N =	Max V_{ISOL} (kV)		
	W (mm)		140
	L (mm)		130
	H (mm)		38
	Max V_{NOM} (kV)		3.3
	Max V_{ISOL} (kV)		6

Code	Dimension	Module Appearance
	Max V_{NOM}	
	Max V_{ISOL}	
P =	W (mm)	140
	L (mm)	73
	H (mm)	38
	Max V_{NOM} (kV)	3.3
	Max V_{ISOL} (kV)	6
U	W (mm)	140
	L (mm)	100
	H (mm)	40
	Max V_{NOM} (kV)	3.3
	Max V_{ISOL} (kV)	6

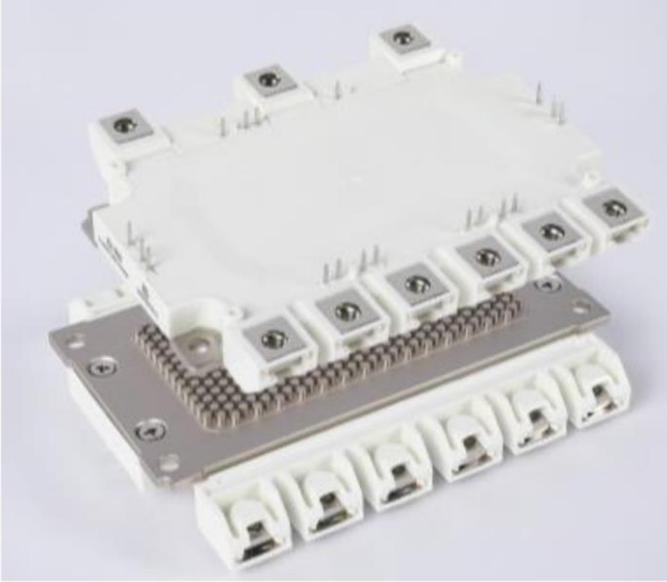


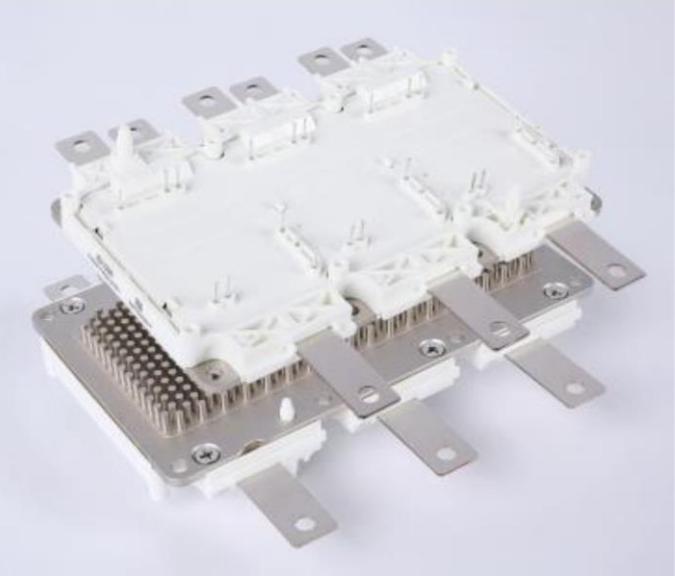
Code	Dimension	Module Appearance	
V =	Max V_{NOM}		
	Max V_{ISOL}		
	W (mm)		140
	L (mm)		100
	H (mm)		40
	Max V_{NOM} (kV)		6.5
X =	Max V_{ISOL} (kV)		
	W (mm)		140
	L (mm)		130
	H (mm)		48
	Max V_{NOM} (kV)		6.5
	Max V_{ISOL} (kV)		10.2
H1 =	Max V_{ISOL} (kV)		
	W (mm)		250
	L (mm)		89
	H (mm)		38
	Max V_{NOM} (kV)		1.7
	Max V_{ISOL} (kV)		4

Code	Dimension	Module Appearance
	Max V_{NOM}	
	Max V_{ISOL}	
H2 =	W (mm)	172
	L (mm)	89
	H (mm)	38
	Max V_{NOM} (kV)	1.7
	Max V_{ISOL} (kV)	4
M1 =	W (mm)	156
	L (mm)	62
	H (mm)	21
	Max V_{NOM} (kV)	1.7
	Max V_{ISOL} (kV)	4

Code	Dimension	Module Appearance
	Max V_{NOM}	
	Max V_{ISOL}	
S0 =	W (mm)	140
	L (mm)	112
	H (mm)	17
	Max V_{NOM} (kV)	0.75
	Max V_{ISOL} (kV)	2.5



Code	Dimension Max V_{NOM} Max V_{ISOL}		Module Appearance Flat base Option	
S2	W (mm)	140		
	L (mm)	112		
	H (mm)	20	Pin Fin Option	
	Max V_{NOM} (kV)	0.75		
	Max V_{ISOL} (kV)	2.5		

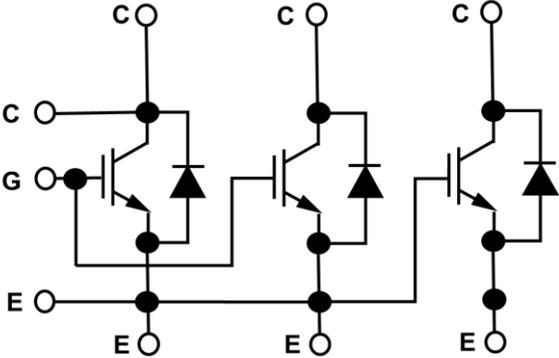
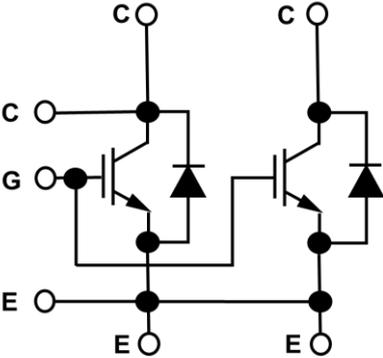
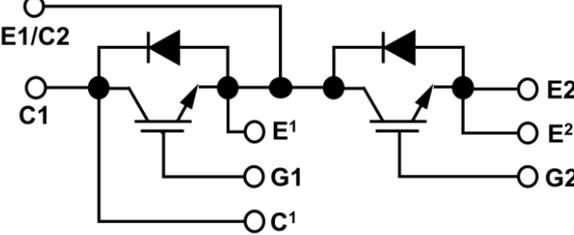
Code	Dimension Max V_{NOM} Max V_{ISOL}	Module Appearance Pin Fin Base with Short Tab Option
S3	<p>Special Selection 500</p> <p>W (mm) 152</p> <p>L (mm) 92</p> <p>H (mm) 24</p> <p>Max V_{NOM} (kV) 0.75</p> <p>Max V_{ISOL} (kV) 2.5</p>	
	<p>Special selection 502</p> <p>W (mm) 152</p> <p>L (mm) 92</p> <p>H (mm) 24</p> <p>Max V_{NOM} (kV) 0.75</p> <p>Max V_{ISOL} (kV) 2.5</p>	

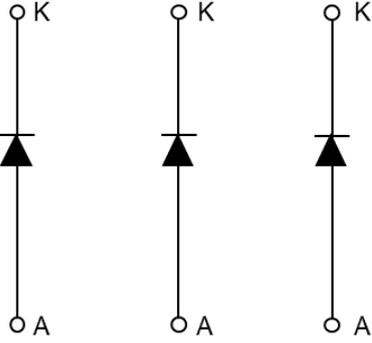
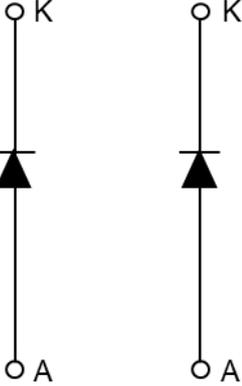
Annex 2: Circuit Configuration

Note: Terminal identifiers may change dependent on selected package, refer to individual datasheet for correct terminal alias.

Code	Configuration	Circuit
B	= Bi-directional switch	
D	= Dual Switch	
C	= Chopper non-committed diode arm	<p data-bbox="751 1464 1334 1496">Available in Packages Outlines: D, G, N & X</p> <p data-bbox="799 1883 1283 1912">Available in Package Outlines: A & E</p>

Code	Configuration	Circuit
F	= 6 Switch Unit	
Available in Package Outlines: S0, S2 & S3		
K	= Chopper, upper arm controlled	
L	= Chopper, lower arm controlled	

Code	Configuration	Circuit
S	= Single Switch	 <p data-bbox="810 651 1273 678">Available in Package Outlines: A, E</p>  <p data-bbox="794 1104 1289 1131">Available in Package Outlines: F, N, X</p>
H	= Half Bridge	
P	= Neutral Point Connection (Series Connected Pair)	 <p data-bbox="839 1552 1241 1585">Available in Package Outline P</p>

Code	Configuration	Circuit
X	= Independent Diodes	 <p data-bbox="804 600 1278 629">Available in Package Outlines A & E</p>  <p data-bbox="804 1088 1278 1122">Available in Package Outlines D & X</p>

IMPORTANT INFORMATION:

This publication is provided for information only and not for resale.

The products and information in this publication are intended for use by appropriately trained technical personnel.

Due to the diversity of product applications, the information contained herein is provided as a general guide only and does not constitute any guarantee of suitability for use in a specific application. The user must evaluate the suitability of the product and the completeness of the product data for the application. The user is responsible for product selection and ensuring all safety and any warning requirements are met. Should additional product information be needed please contact Customer Service.

Although we have endeavoured to carefully compile the information in this publication it may contain inaccuracies or typographical errors. The information is provided without any warranty or guarantee of any kind.

This publication is an uncontrolled document and is subject to change without notice. When referring to it please ensure that it is the most up to date version and has not been superseded.

The products are not intended for use in applications where a failure or malfunction may cause loss of life, injury or damage to property. The user must ensure that appropriate safety precautions are taken to prevent or mitigate the consequences of a product failure or malfunction.

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.

Product Status & Product Ordering:

We annotate datasheets in the top right-hand corner of the front page, to indicate product status if it is not yet fully approved for production. The annotations are as follows: -

Target Information:	This is the most tentative form of information and represents a very preliminary specification. No actual design work on the product has been started.
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.
No Annotation:	The product has been approved for production and unless otherwise notified by Dynex any product ordered will be supplied to the current version of the data sheet prevailing at the time of our order acknowledgement.

All products and materials are sold and services provided subject to Dynex's conditions of sale, which are available on request.

Any brand names and product names used in this publication are trademarks, registered trademarks or trade names of their respective owners.

HEADQUARTERS OPERATIONS

DYNEX SEMICONDUCTOR LIMITED
Doddington Road, Lincoln, Lincolnshire, LN6 3LF
United Kingdom.
Phone: +44 (0) 1522 500500
Fax: +44 (0) 1522 500550
Web: <http://www.dynexsemi.com>

CUSTOMER SERVICE

Phone: +44 (0) 1522 502753 / 502901
Fax: +44 (0) 1522 500020
e-mail: powersolutions@dynexsemi.com