DYNEX

Power through Innovation

Power Semiconductor Product Guide

Dynex Semiconductor Ltd
www.dynexsemi.com

INTRODUCTION

TO DYNEX SEMICONDUCTOR LTD

Dynex Semiconductor Ltd has a rich history in the design, development and production of High Power Semiconductor modules and Power Assemblies. Throughout the years, Dynex products have been applied in projects that vary from transportation, power grid, renewables, industrial, custom equipment, hydrogen electrolyser and other specialist applications.

The Power Semiconductor and Power Assemblies operation is located in Lincoln, England, manufacturing a range of high power IGBT modules, Bipolar capsule devices and power assemblies.

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IGBT Modules

Power Cycling with the latest generation IGBT die

The Dynex manufacturing plant is a vertically integrated facility with device design, wafer fab, packaging, qualification and testing available on site.

The modules work with high reliability at temperature conditions from -40/-50°C up to +150°C.

Great emphasis is placed on low inductance power bus bar designs, enabling the modules to function under fast switching transients such as, those of next generation Trench Gate IGBT's and SiC MOSFET.

KEY FEATURES

- ✓ High DC stability via advanced edge termination design and passivation
- ✓ High short circuit capability-wide SCSOA
- ✓ Self-limiting short circuit current
- ✓ Low switching losses
- ✓ T(vj op) = 150°C
- ✓ AlSiC Baseplate for increased thermal cycling capability
- ✓ Package design with CTI > 600
- ✓ Isolated base plate
- ✓ 200A to 3600A at 950V to 6500V

APPLICATIONS

- ✓ High reliability inverters
- ✓ Motor controllers
- ✓ Traction drives
- ✓ Different circuit topologies (half bridge, single switch, chopper)

Scan this for a list of IGBT Modules to download data-sheets and application notes

1200V IGBT Modules

Part Number	Configuration	Production Status	IC (A)	at TC (°C)	VCE (sat) @ Tc=25°C (V)	Total Esw @ Tc=150 °C (mJ)	Rth(j-c) (per switch) (°C/kW)	Baseplate Dims (mm)	Isolation Voltage	Tech
H1 Module										
DIM1400H1HS12-PA500	Half Bridge	New	1400	100	1.8	486	20	250 x 89	4kV	TMOS
H2 Module										
DIM900H2HS12-PA500	Half Bridge	MP	900	90	1.8	300	29.5	172 x 89	4kV	TMOS

Part Number	Configuration	Production Status	IC (A)	at TC (°C)	VCE (sat) @ Tc=25°C (V)	Total Esw @ Tc=150 °C (mJ)	Rth(j-c) (per switch) (°C/kW)	Baseplate Dims (mm)	Isolation Voltage	Tech
W1 Module										
DIM800WHS12-PG500	Half Bridge	New	800	90	1.4	264	48.5	106 x 61	4kV	STMOS
DIM800WHS12-PF500	Half Bridge	New	800	90	1.2	301.1	48.5	106 x 61	4kV	RTMOS
DIM600WHS12-PC500	Half Bridge	New	600	100	1.2	209.5	48.5	106 x 61	4kV	TMOS
DIM600WBHS12-PA500	Half Bridge	New	600	100	1.75	209.5	48.5	106 x 61	4kV	TMOS
DIM300WHS12-PH500	Half Bridge	MP	300	100	1.65	106.9	80.6	106 x 61	4kV	TMOS
DIM300WHS12-PA500	Half Bridge	MP	300	100	1.2	86	97	106 x 61	4kV	TMOS

Part Number	Configuration	Production Status	IC (A)	at TC (°C)	VCE (sat) @ Tc=25°C (V)	Total Esw @ Tc=175 °C (mJ)	Rth(j-c) (per switch) (°C/kW)	Isolation Voltage	Gate Thres-hold Voltage $VGE_{(TH)}$	Tech
Discrete IGBT Device										
TG340SW08L6-S5A00	Discrete	New	340	120	1.45	47.0	97	4.2kV		TMOS
TG140SW12B2-S501	Discrete	New	140	100	1.50	22.2	115		6.3V	TMOS
TG100SW12B2-S500	Discrete	New	100	100	1.70	38.9	180			TMOS

Scan this for a list of 1200V IGBT Modules to download datasheets and application notes

Automotive IGBT Modules - 1200V

Part Number	Configuration	Production Status	IC (A)	at TC (°C)	VCE (sat) @ Tc=25°C (V)	Total Esw @ Tc=150 °C (mJ)	Rth(j-c) (per switch) (°C/kW)	Baseplate Dims (mm)	Isolation Voltage	Tech
M1 Module										
DIM450M1HS12-PB500	Half Bridge	MP	450	100	1.7	133	52	152 x 62	2.5kV	TMOS
DIM300M1HS12-PA500	Half Bridge	New	300	100	1.7	86.5	78	152 x 62	3.4kV	TMOS

Part Number	Configuration	Production Status	IC (A)	at TC (°C)	VCE (sat) @ Tc=25°C (V)	Total Esw @ Tc=175 °C (mJ)	Rth(j-c) (per switch) (°C/kW)	Baseplate Dims (mm)	Isolation Voltage	Tech
M1 Module Generation 7										
TG1000HF12M1-S5A00	Half Bridge	New	1000		1.60	413	35	152 x 62	3.4kV	STMOS
DIM900M1HP12-PG500	Half Bridge	New	900		1.45	327	75	152 x 62	3.4kV	STMOS
DIM900M1HS12-PG500	Half Bridge	New	900		1.45	327	52	152 x 62	3.4kV	STMOS
TG750HF12M1-S5A00	Half Bridge	New	750		1.6	266	55	152 x 62	3.4kV	STMOS
DIM600M1HS12-PG500	Half Bridge	New	600		1.4	182	90	152 x 62	3.4kV	STMOS
DIM600M1HP12-PG500	Half Bridge	New	600		1.4	182	90	152 x 62	3.4kV	STMOS
TG450HF12M1-S500	Half Bridge	New	450		1.45	210.3	52	152 x 62	3.4kV	STMOS

Part Number	Configuration	Production Status	IC (A)	at TC (°C)	VCE (sat) @ Tc=25°C (V)	Total Esw @ Tc=175 °C (mJ)	Rth(j-c) (per switch) (°C/kW)	Baseplate Dims (mm)	Isolation Voltage	Tech
Automotive										
TG1200FF08S3-R6A12	Six Pack	New	1200	100	1.18	59.8	85	154 x 126	4.2kV	RC Trench
TG950FF08S3-S5A01	Six Pack	New	950	95	1.10	50.3	100	154 x 126	4.2kV	STMOS
DIM820S3FP08-PG500	Six Pack	New	820	80	1.10	39.8	110	154 x 126	4.2kV	STMOS
TG820FF08S6-S5A12	Six Pack	New	820	60	1.10	30.0	120	154 x 126	2.5kV	STMOS
TG650FF08S2-S5A02	Six Pack	New	650	75	1.10	40.2	165	140 x 112	2.5kV	STMOS
TG600FF13S3-S5A03	Six Pack	New	600	25	1.40	230.5	85	154 x 126	4.2kV	STMOS
TG600FF12S3L-S5A03	Six Pack	New	600	25	1.40	147.0	85	154 x 126	4.2kV	STMOS
TG600FF12S3-S5A03	Six Pack	New	600	25	1.40	147.0	85	154 x 126	4.2kV	STMOS
TG600FF12S3-S5A02	Six Pack	New	600	25	1.40	147.0	85	154 x 126	4.2kV	STMOS
TG600FF08S3-S5A02	Six Pack	New	600	85	1.10	33.5	160	154 x 126	4.2kV	TMOS
TG600FF08S3-S3A01	Six Pack	New	600	65	1.55	70*	120	154 x 126	2.5kV	TMOS
TG560FF08S7-S5A12	Six Pack	New	560	85	1.20	37.4	165	112.6 x 23	4.2kV	STMOS
TG400FF08S2-S3A11	Six Pack	New	400	60	1.70	55*	165	154 x 126	2.5kV	TMOS
DIM400S3FP12-PG500	Six Pack	New	400	25	1.40	67.4	133	140 x 112	4.2kV	STMOS
DIM400S0FS08-PF500	Six Pack	New	400	80	1.35	54.0	120	154 x 126	2.5kV	RTMOS

*** @Tc=150°C (mJ)**

IGBT Modules - 1700V

Part Number	Configuration	Production Status	I_C (A)	at T_C (°C)	$V_{CE(sat)}$ @ T_C=25°C (V)	Total E_{sw} @ T_C=150°C (mJ)	$R_{th(j-c)}$ (per switch) (°C/kW)	Baseplate Dims (mm)	Isolation Voltage	Tech
Standard Range										
DIM3600ESM17-PT500	Single	New	3600	95	1.95	3680	8	190 x 140	4kV	TMOS
DIM2400ESM17-PT500	Single	New	2400	118	1.75	2840	6	190 x 140	4kV	TSPT
DIM1600FSM17-PS500	Single	New	1600	80	2.3	1800	9	140 x 130	4kV	DMOS
DIM1200NSM17-RT500	Single	MP	1200	95	1.8	1615	24	140 x 130	4kV	TMOS+
DIM800DDM17-PS500	Single	MP	800	80	2.3	800	18	140 x 130	4kV	DMOS+

Part Number	Configuration	Production Status	I_C (A)	at T_C (°C)	$V_{CE(sat)}$ @ T_C=25°C (V)	Total E_{sw} @ T_C=150°C (mJ)	$R_{th(j-c)}$ (per switch) (°C/kW)	Baseplate Dims (mm)	Isolation Voltage	Tech
H1 Module										
DIM1000H1HS17-PA500	Half Bridge	MP	1000	104	1.85	980	20	250 x 89	4kV	TMOS
DIM1800H1S17-PH500	Half Bridge	New	1800	85	1.38	1790	16	250 x 89	4kV	STMOS
H2 Module										
DIM650H2HS17-PA500	Half Bridge	MP	650	105	1.85	610	30	172 x 89	4kV	TMOS
DIM650H2LS17-PA500	Chopper	MP	650	95	1.85	610	30	172 x 89	4kV	TMOS
DIM650H2KS17-PA500	Chopper	MP	650	95	1.85	610	30	172 x 89	4kV	TMOS

Part Number	Configuration	Production Status	I_C (A)	at T_C (°C)	$V_{CE(sat)}$ @ T_C=25°C (V)	Total E_{sw} @ T_C=150°C (mJ)	$R_{th(j-c)}$ (per switch) (°C/kW)	Baseplate Dims (mm)	Isolation Voltage	Tech
MI Modules										
DIM600M1HS17-PA501	Half Bridge	New	600	100	1.7	537	46	152 x 62	4.0kV	TMOS
DIM600M1HS17-PA500	Half Bridge	MP	600	100	1.7	537	46	152 x 62	4.0kV	TMOS
DIM450M1HS17-PA510	Half Bridge	MP	450	100	1.8	432	55	152 x 62	3.4kV	TMOS
DIM450M1HS17-PA500	Half Bridge	MP	450	95	1.8	381	55	152 x 62	3.4kV	TMOS
DIM300M1HS17-PA500	Half Bridge	MP	300	100	1.8	235	75	152 X 62	3.4kV	TMOS

Part Number	Configuration	Production Status	I_C (A)	at T_C (°C)	$V_{CE(sat)}$ @ T_C=25°C (V)	Total E_{sw} @ T_C=175°C (mJ)	$R_{th(j-c)}$ (per switch) (°C/kW)	Baseplate Dims (mm)	Isolation Voltage	Tech
M1 Module - 7th Generation										
DIM800M1HS17-PG500	Half Bridge	New	800	80	1.7	738	37	152 x 62	3.4kV	STMOS
TG800HF17M1-S521	Half Bridge	New	800	80	1.7	760	6	137 x 57	3.4kV	TMOS
TG800HF17M1-S520	Half Bridge	New	800	80	1.7	760	37	152 x 62	3.4kV	TMOS
TG1000HF17M1-R600	Half Bridge	New	1000	100	2,0	678	22	152 x 62	4.0kV	STMOS

Scan this for a list of 1700V IGBT Modules to download datasheets and application notes

IGBT Modules - 1700V

Part Number	Configuration	Production Status	IC (A)	at TC (°C)	VCE (sat) @ Tc=25°C (V)	Total Esw @ Tc=150°C (mJ)	Rth(j-c) (per switch) (°C/kW)	Baseplate Dims (mm)	Isolation Voltage	Tech
W Modules										
DIM150WHS17-PA500	Half Bridge	New	150	90	1.7	129	165	106 x 61	4.0kV	TMOS
DIM200WHS17-PA500	Half Bridge	MP	200	90	1.9	163	138	106 x 61	4.0kV	TMOS
DIM300WHS17-PA500	Half Bridge	MP	300	90	1.6	280	83	106 x 61	4.0kV	TMOS

2300V IGBT Modules

Part Number	Configuration	Production Status	IC (A)	at TC (°C)	VCE (sat) @ Tc=25°C (V)	Total Esw @ Tc=150°C (mJ)	Rth(j-c) (per switch) (°C/kW)	Baseplate Dims (mm)	Isolation Voltage	Tech
2300V										
DIM1300UHM23-PG500	Half Bridge	New	1300	80	1.7	1760	21.2	144 x 100	6kV	TMOS

3300V IGBT Modules

Part Number	Configuration	Production Status	IC (A)	at TC (°C)	VCE (sat) @ Tc=25°C (V)	Total Esw @ Tc=150°C (mJ)	Rth(j-c) (per switch) (°C/kW)	Baseplate Dims (mm)	Isolation Voltage	Tech
Standard Range										
DIM2400ESM33-RT500	Single	New	2400	100	2.0	13274	7	190 x 140	6kV	TMOS
DIM1800ESM33-PU400	Single	New	1800	110	2.3	10050	8	190 x 140	6kV	TMOS
DIM1600NSM33-RT500	Single	New	1600	100	2.0	8025	10	140 x 130	6kV	TMOS
DIM1500ESM33-PS400	Single	MP	1500	110	2.4	7700	8	190 x 140	6kV	DMOS+
DIM1500ESM33-RR500	Single	MP	1500	95	2.6	7800	8	190 x 140	6kV	DMOS+
DIM1000XSM33-PS401	Single	New	1000	110	2.4	5170	12	140 x 130	10.2kV	DMOS+
DIM1000NSM33-PS500	Single	MP	1000	112	2.4	5770	12	140 x 130	6kV	DMOS+
DIM1000ECM33-PS500	Chopper	MP	1000	115	2.1	6500	12	190 X 140	6kV	DMOS+
DIM500GDM33-PS500	Dual	MP	500	110	2.4	2850	24	160 X 130	6kV	DMOS+
DIM450VHM33-PT500	Half Bridge	MP	450	100	2.4	1585	32	144 X 100	6kV	TMOS
DIM250PHM33-PS500	Half Bridge	MP	250	100	2.5	1375	48	140 X 73	6kV	DMOS+

Scan this for a list of 3300V IGBT Modules to download datasheets and application notes

IGBT Modules

4500V IGBT Modules

Part Number	Configuration	Production Status	IC (A)	at TC (°C)	VCE (sat) @ Tc=25°C (V)	Total Esw @ Tc=150°C (mJ)	Rth(j-c) (per switch) (°C/kW)	Baseplate Dims (mm)	Isolation Voltage	Tech
Standard Range										
DIM1800ASM45-RT501	Single	New	1800	80	2.1	18289	8	190 x 140	10.2kV	TMOS
DIM1800ESM45-RT500	Single	New	1800	80	1.95	24370	8	190 x 140	6.0kV	TMOS
DIM1500ASM45-RT501	Single	New	1500	80	2.5	15290	8	190 x 140	10.2kV	TMOS
DIM1200ASM45-PS400	Single	New	1200	91	2.8	13050	8	190 x 140	7.4kV	DMOS+
DIM1200ASM45-PS500	Single	MP	1200	85	2.3	14060	8	190 x 140	10.2kV	DMOS+
DIM1200ASM45-PR501	Single	MP	1200	80	2.7	13400	8	190 x 140	10.2kV	DMOS+
DIM1200ESM45-PS500	Single	MP	1200	85	2.3	14060	8	190 x 140	6.0kV	DMOS+
DIM1000XSM45-PT501	Single	New	1000	90	2.9	9980	13	140 x 130	10.2kV	DMOS+
DIM1000XSM45-PT500	Single	New	1000	90	2.9	9980	13	140 x 130	10.2kV	TMOS
DIM800XSM45-PS501	Single	MP	800	85	2.3	9425	13	140 x 130	10.2kV	DMOS+

6500V IGBT Modules

Part Number	Configuration	Production Status	IC (A)	at TC (°C)	VCE (sat) @ Tc=25°C (V)	Total Esw @ Tc=150°C (mJ)	Rth(j-c) (per switch) (°C/kW)	Baseplate Dims (mm)	Isolation Voltage	Tech
Standard Range										
DIM1000ASM65-RT500	Single	New	1000	80	2.45	21133	8.4	190 x 140	10.2kV	TMOS
DIM750ASM65-PS400	Single	MP	750	80	3.1	5050	9	190 x 140	10.2kV	DMOS+
DIM500XSM65-PS400	Single	MP	500	80	3.1	11250	12.8	140 x 130	10.2kV	DMOS+
DIM250LSM65-RR500	Single	MP	250	80	3.2	4890	26	140 x 73	10.2kV	DMOS+

Press Pack IGBT-Diode

Part Number	Configuration	Production Status	VCES (V)	IC (A)	VCE (sat) @ Tc=25°C (V)	VF (V) @ Tc=25°C	IFSM (kA)	Tj (max)°C	Rth(j-c) (per switch) (°C/kW)	Contact OD/ Flange OD/ Height (mm)
DPC1500SW45YB-P200	Co-Pack	New	4500	1500	2.3	2.45	11.2	125	6.0	190/140/34

Scan this for a list of 4500V IGBT Modules to download datasheets and application notes

Scan this for a list of 6500V IGBT Modules to download datasheets and application notes

* $V_{ce(sat)}$ is measured across both arms of the bi-directional switch.
MP: Mass Production NEW: New Products

Press Pack IGBT

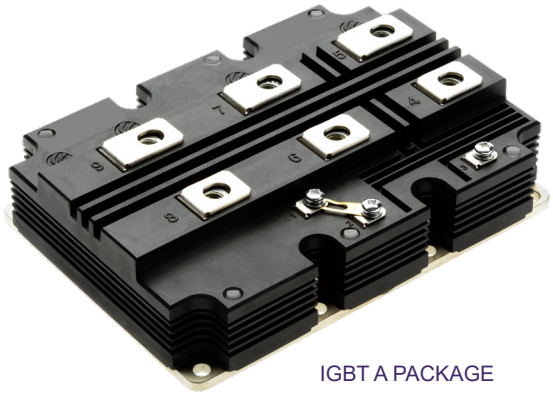
Part Number	Configuration	Production Status	VCES (V)	IC (A)	VCE (sat) @ T_C=25°C (V)	Tj (max)°C	$R_{th(j-c)}$ (per switch) (°C/kW)	Clamping Force (kN)
DPI5000SG45ZF-P200	Press-Pack	New	4500	5000	2.4	125	1.5	85 - 100
DPI2500SW45ZF-P200	Press-Pack	New	4500	2500	2.4	125	3.5	70 - 85
DPC1500SW45ZF-P200	Co-Pack	New	4500	1500	2.6	135	5	65 - 80
DPC2000SW45ZF-P200	Co-Pack	New	4500	2000	2.35	135	3.6	65 - 80
DPC2000SW45ZC-P200	Co-Pack	New	4500	2000	2.3	125	4.3	70 - 85
DPC3000SW45ZC-P200	Co-Pack	New	4500	3000	2.5	135	3	85 - 100
DPC3000SW45ZF-P200	Co-Pack	New	4500	3000	2.3	135	3	85 - 100
DPC3000SW65ZF-T200	Co-Pack	New	6500	3000	2.3	125	3	85 - 100

UK Assembled IGBT Modules

Part Number	Configuration	Production Status	IC (A)	at T_C (°C)	VCE (sat) @ T_C=25°C (V)	Total E_{sw} @ T_C=150°C (mJ)	$R_{th(j-c)}$ (per switch) (°C/kW)	Baseplate Dims (mm)	Isolation Voltage	Tech
3300V IGBT Modules										
DIM1000NSM33-PS400	Single	New	1000	80	2.5	15290	8	190 x 140	10.2kV	TMOS
DIM1000XSM33-PS401	Single	New	1000	91	2.8	13050	8	190 x 140	7.4kV	DMOS+
DIM1500ESM33-PS400	Single	New	1500	85	2.3	14060	8	190 x 140	10.2kV	DMOS+
DIM1800ESM33-PS400	Single	New	1800	80	2.7	13400	8	190 x 140	10.2kV	DMOS+

Part Number	Configuration	Production Status	IC (A)	at T_C (°C)	VCE (sat) @ T_C=25°C (V)	Total E_{sw} @ T_C=125°C (mJ)	$R_{th(j-c)}$ (per switch) (°C/kW)	Baseplate Dims (mm)	Isolation Voltage	Tech
4500V IGBT Modules										
DIM800XSM45-PS400	Single	New	800	91	2.8	8720	12	140 x 130	7.4kV	DMOS+
DIM800XSM45-PS401	Single	New	800	91	2.8	8720	12	140 x 130	10.2kV	DMOS+
DIM1200ASM45-PS400	Single	New	1200	91	2.8	13050	8	190 x 140	7.4kV	DMOS+
DIM1200ASM45-PS4001	Single	New	1200	91	2.8	13050	8	190 x 140	10.2kV	DMOS+
DIM200KHM45-PS400	Half Bridge	New	200	91	2.8	2300	48	124 x 57	7.4 kV	DMOS+

Part Number	Configuration	Production Status	IC (A)	at T_C (°C)	VCE (sat) @ T_C=25°C (V)	Total E_{sw} @ T_C=150°C (mJ)	$R_{th(j-c)}$ (per switch) (°C/kW)	Baseplate Dims (mm)	Isolation Voltage	Tech
6500V IGBT Modules										
DIM500XSM65-PS400	Single	New	500	80	3.1	11250	12.8	140 x 130	10.2kV	DMOS+
DIM750XSM33-PS401	Single	New	750	80	3.1	5050	8.5	190 x 140	10.2kV	DMOS+

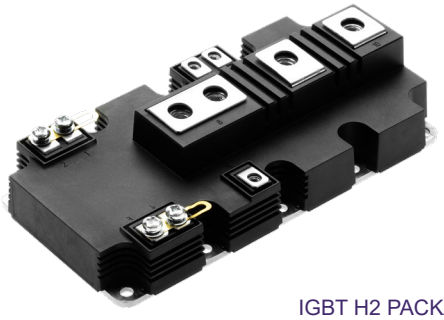


IGBT A PACKAGE

IGBT E PACKAGE

IGBT G PACKAGE

IGBT H1 PACKAGE



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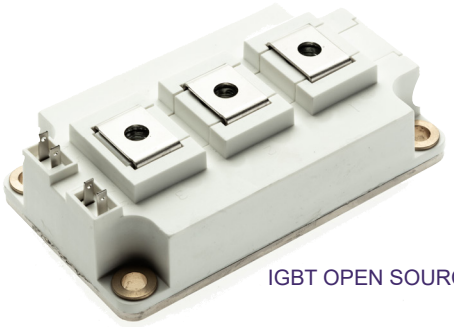
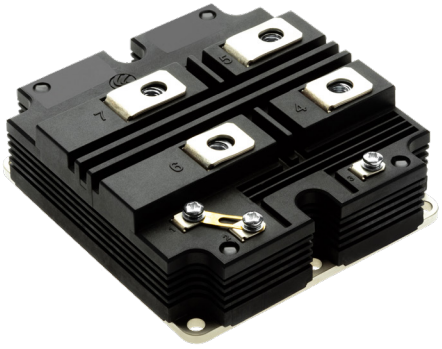


IGBT OPEN SOURCE SHV PACKAGE

IGBT N PACKAGE



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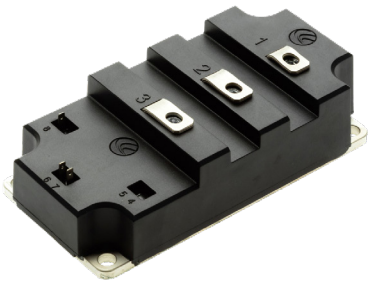

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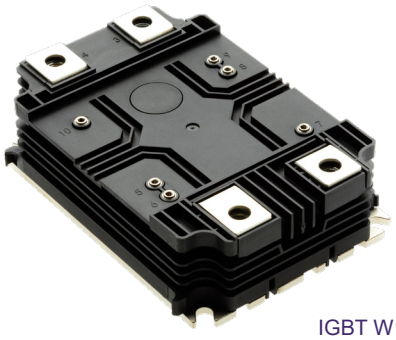
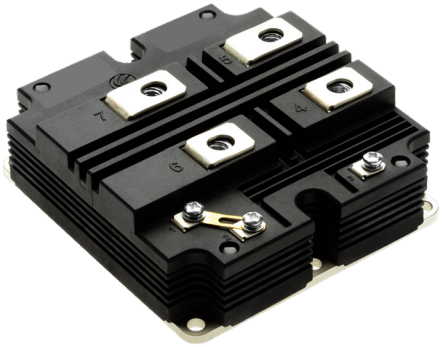


IGBT W1 PACKAGE



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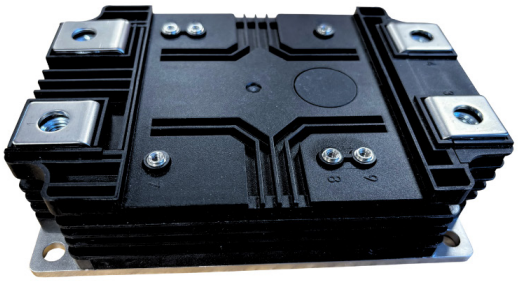
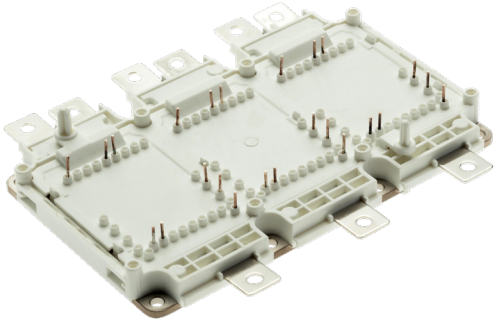


IGBT K PACKAGE

IGBT M1 PACKAGE

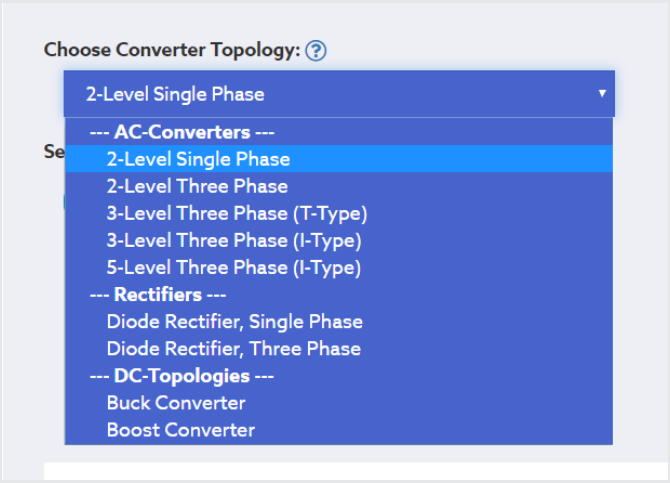


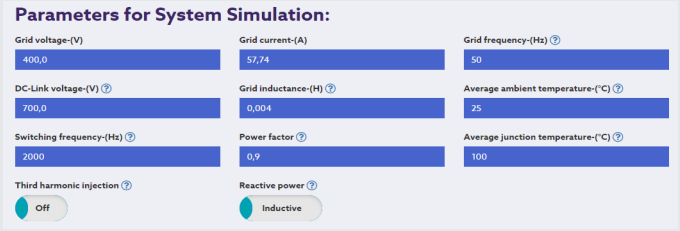
IGBT S3 PACKAGE

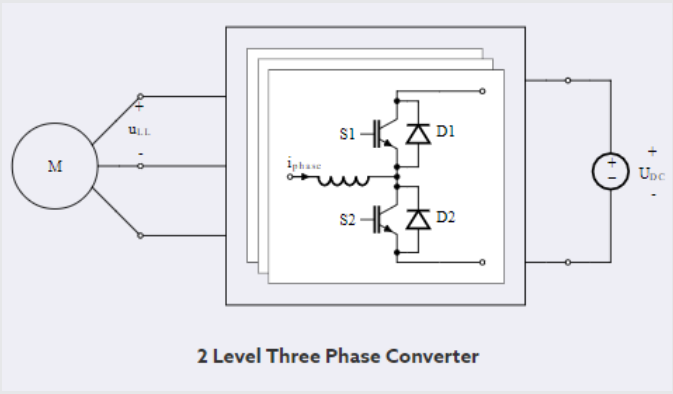
DESIGN TOOL

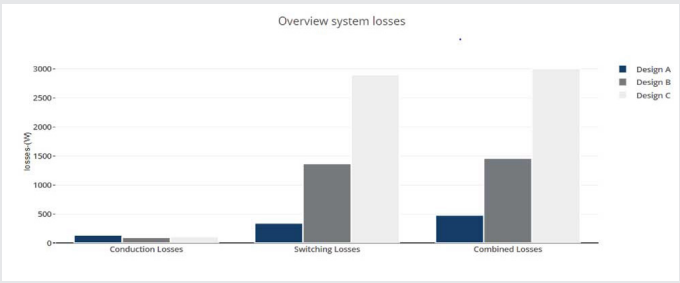
Easy selection of the Dynex device most applicable to your application

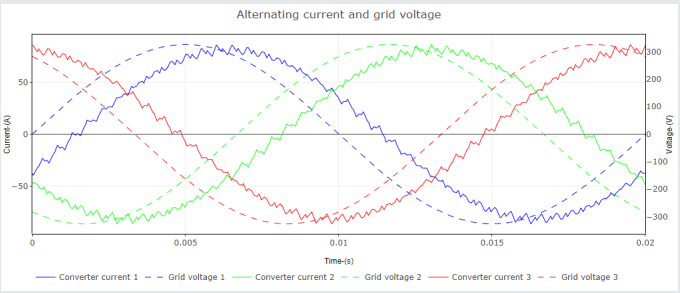
Our Design Tool contains a topology simulator, that provides an analysis of the behavior of our components in your specific application. All typical power electronic typologies are available with system losses, current ripple, and a maximum thermal resistance as a starting point for your thermal design. The Design Tool offers the comparison of different component configurations in each topology within a few clicks.



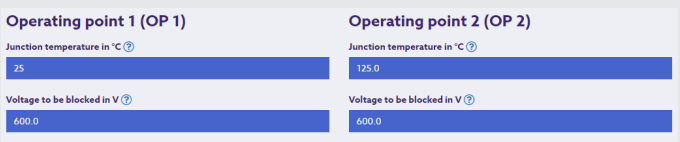








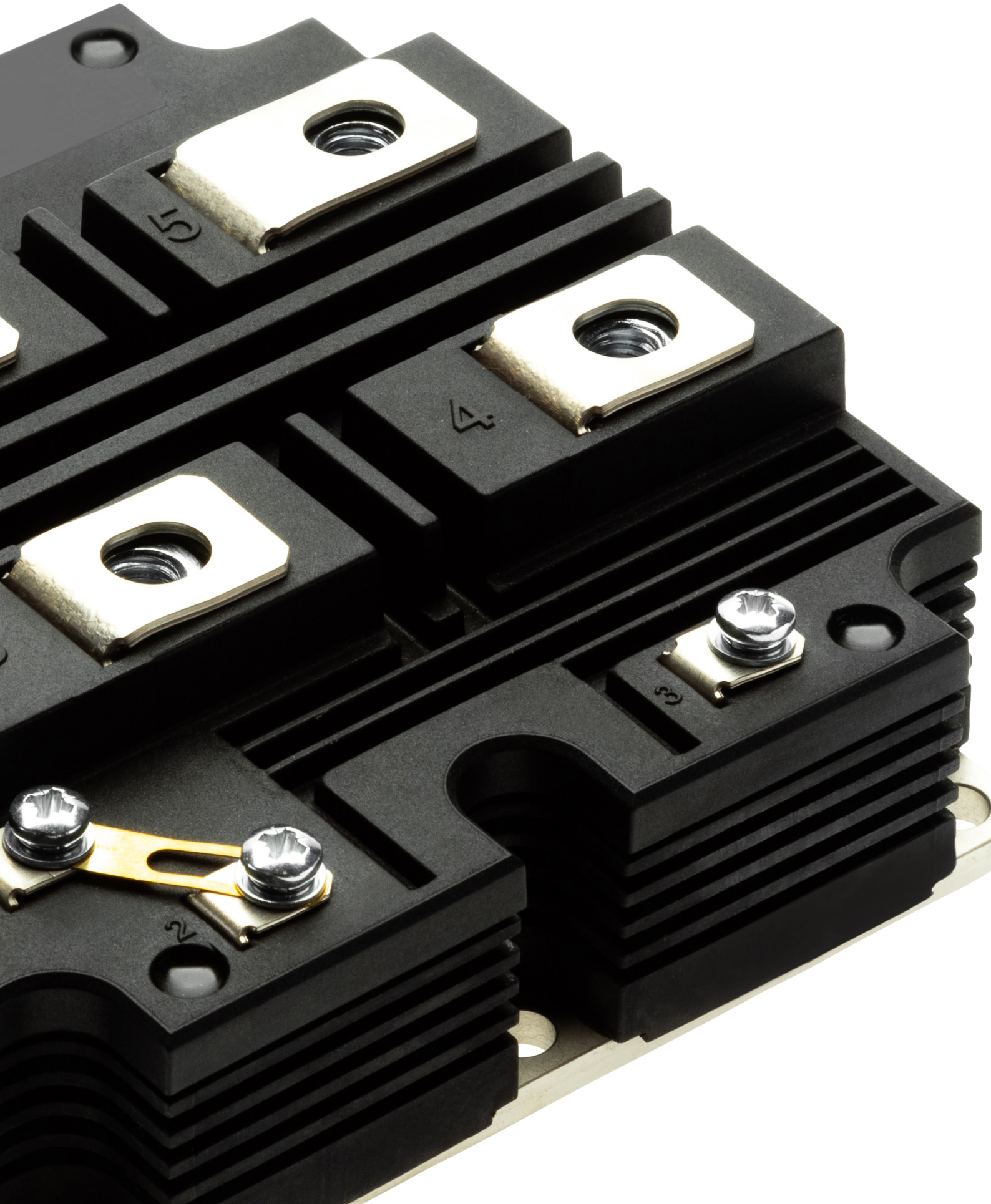
Our Design Tool is designed to assist you in selecting the right Dynex products, using an integrated interactive datasheet, which allows you to analyse our component's properties and performance at a specific operation point considering current, voltage and junction temperature.

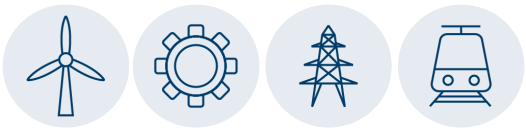


The instantaneous and average power losses in each semiconductor component of the circuit are displayed for each topology, selected alongside other outputs shown below.

- Converter output (pulsed and fundamental) & grid voltage
- Alternating current & grid voltage
- Current separated into actual conducting devices
- Conduction losses
- Switching energies

Access the tool via **www.dynexsemi.com** or directly through **https://dynex.pe-finder.de/**


5
4
3
2



FRD Modules

Regulate electricity flow to ensure higher reliability and increased efficiency

Dynex FRD modules regulate electricity flow to ensure high reliability and increased efficiency in motor drives and other variable speed processes.

The family of high-voltage Fast Recovery Diode modules have been designed for use in rail traction, industrial motor drives, induction heating and power generation.

The FRD modules are designed to match and work as the input rectifiers for the existing Dynex range of IGBT modules.

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.

KEY FEATURES

- ✓ Low reverse recovery charge
- ✓ High switching speed
- ✓ Low forward volt drop
- ✓ Isolated AlSiC base with AlN substrates
- ✓ Single, double and triple diode configurations available with current ratings up to 1500A

APPLICATIONS

- ✓ Chopper diodes
- ✓ Boost and buck circuits
- ✓ Free-wheel circuits
- ✓ Multi-level switch inverters
- ✓ Rail traction
- ✓ Industrial motor drives
- ✓ Induction heating
- ✓ Power generation

FRD Modules

1200V FRD Modules

Part Number	Configuration	Production Status	I_F (A per arm)	at T_C (°C)	Baseplate Dims (mm)	Isolation Voltage	I_F (A as single diode with external connection)	V_f@ T_{vj} =25 °C	I^2t (kA^2s)	Q_{rr}@ T_{vj}	E_{rec}@ T_{vj}	$R_{th(j-c)}$ (per arm) (°C/kW)
Diode												
TF100HF12T1-D300	Diode	New	100	25	94 x 35	2.5kV	100	1.6	3.2			280

1700V FRD Modules

Part Number	Configuration	Production Status	I_F (A per arm)	at T_C (°C)	Baseplate Dims (mm)	Isolation Voltage	I_F (A as single diode with external connection)	V_f@ T_{vj} =25 °C	I^2t (kA^2s)	Q_{rr}@ T_{vj}	E_{rec}@ T_{vj}	$R_{th(j-c)}$ (per arm) (°C/kW)
PS Range												
DFM1200EXM17-PS500	Triple	New	1200		190 x 140	4.0kV	1200	2.1	245	540	375	11

3300V FRD Modules

Part Number	Configuration	Production Status	I_F (A per arm)	at T_C (°C)	Baseplate Dims (mm)	Isolation Voltage	I_F (A as single diode with external connection)	V_f@ T_{vj} =25 °C	I^2t (kA^2s)	Q_{rr}@ T_{vj}	E_{rec}@ T_{vj}	$R_{th(j-c)}$ (per arm) (°C/kW)
TF1500SF33K1-D200	Diode	New	1500	25	130 x 90	6kV	1500	1.6	32	1700	2200	15
DFM1500NXM33-PS500	Diode	New	1500	25	140 x 130	6kV	1500	2.4	720	1710	2600	15

4500V FRD Modules

Part Number	Configuration	Production Status	I_F (A per arm)	at T_C (°C)	Baseplate Dims (mm)	Isolation Voltage	I_F (A as single diode with external connection)	V_f@ T_{vj} =25 °C	I^2t (kA^2s)	Q_{rr}@ T_{vj}	E_{rec}@ T_{vj}	$R_{th(j-c)}$ (per arm) (°C/kW)
PS Range												
DFM1500XXM45-PS501	Dual Diode	MP	1500	65	140 x 130	10.2kV	3000	2.6	720	1400	2300	16
DFM1200XXM45-PS501	Dual Diode	MP	1200	65	140 x 130	10.2kV	2400	2.7	530	2200	1750	16

6500V FRD Modules

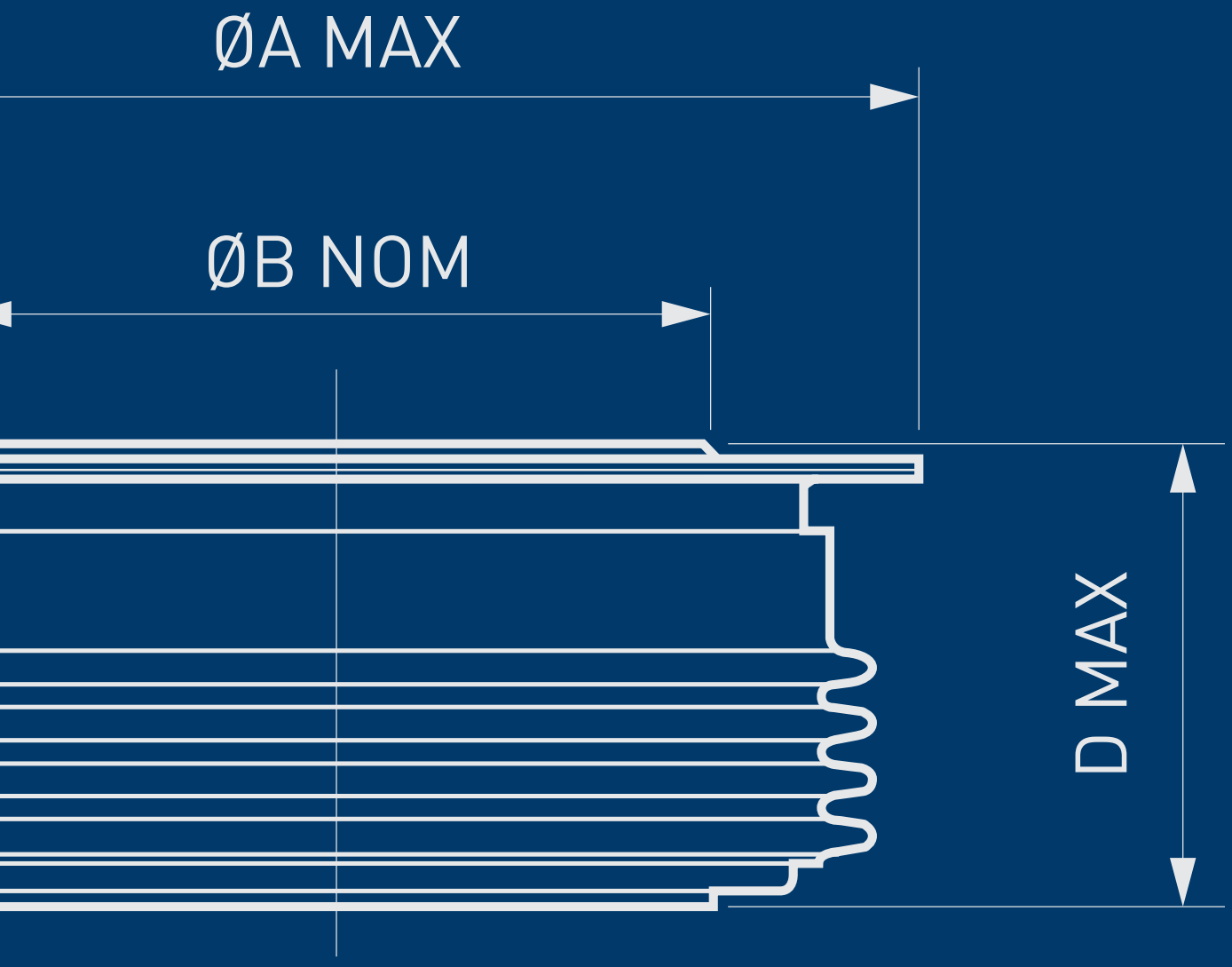
Part Number	Configuration	Production Status	I_F (A per arm)	at T_C (°C)	Baseplate Dims (mm)	Isolation Voltage	I_F (A as single diode with external connection)	V_f@ T_{vj} =25 °C	I^2t (kA^2s)	Q_{rr}@ T_{vj}	E_{rec}@ T_{vj}	$R_{th(j-c)}$ (per arm) (°C/kW)
PS Range												
DFM250XXM65-PS400	Dual Diode	New	250	65	140 x 130	10.2 kV	250	2.7	460	750	1850	54
DFM750XXM65-PS500	Dual Diode	New	750	65	140 x 130	10.2 kV	750	2.7	460	1200	2450	18

Scan this QR code for Fast Recovery Diode Module datasheets

Notes:
* Refer to datasheets for Tvj max values www.dynexsemi.com/products/semiconductors/frd-modules

* $V_{ce(sat)}$ is measured across both arms of the bi-directional switch.
MP: Mass Production NEW: New Products, Samples

Explanation of Part Numbers



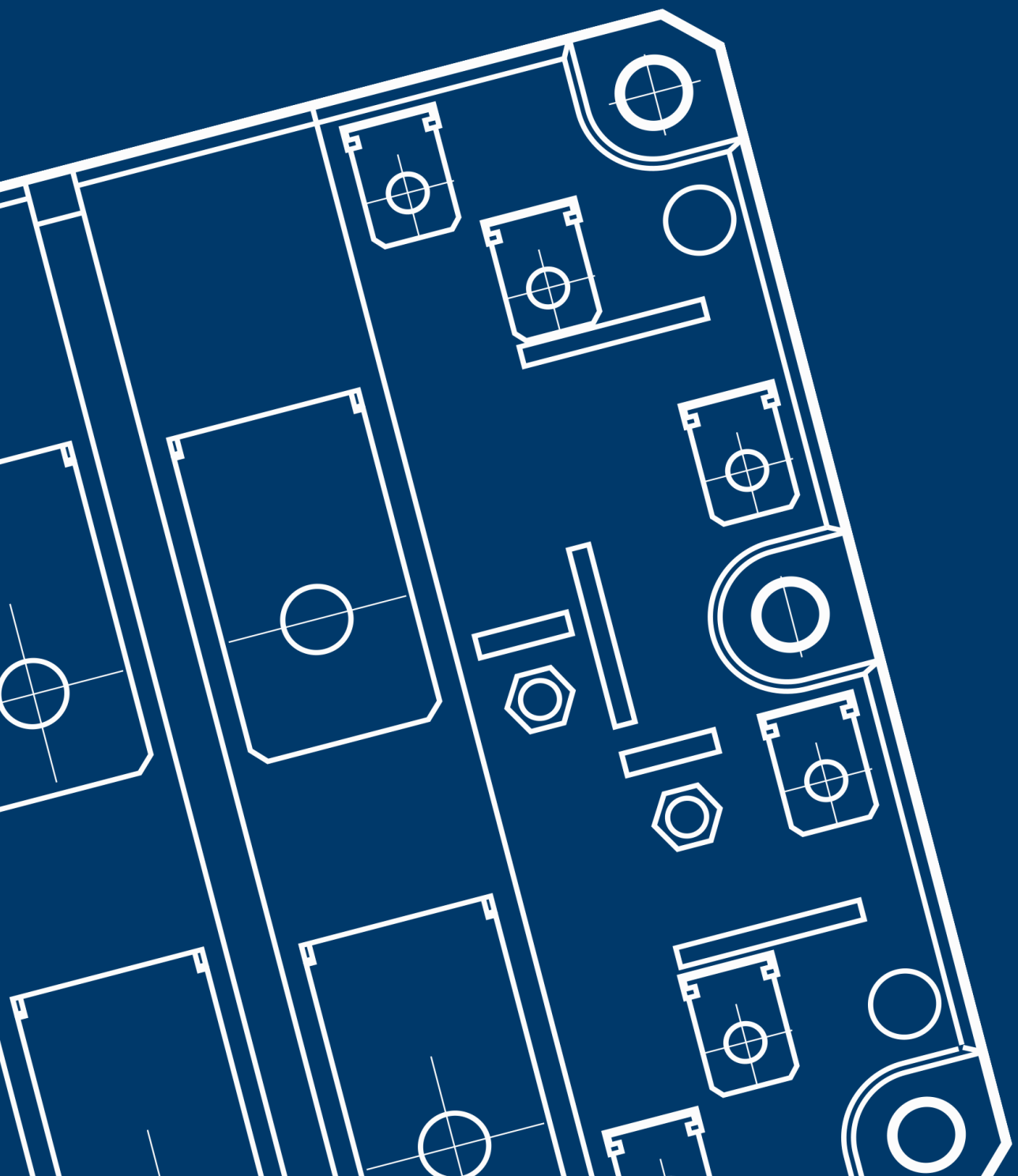
High Power IGBT & FRD Modules

Example Part Number: DFM800DDM18-A000

D	Dynex Semiconductor Identifier
I/F	I = IGBT / F = FRD
M	Module Generic Identifier
800	IC Current Rating
D/X/A/S/M	Package Outline/Power Terminal layout
D/S/C	Circuit configuration
S/M	Base plate technology S=Copper/M=Metal Matrix
18	Voltage rating divided by 100
(-)	
A/TS/TF/TL	Silicon Technology Identifier
US/UF/UL	
MS/MF/ML	
0	Special Selection Number (defaults to 000 for standard product)

***See page 29, 30, 31 for Package outlines**

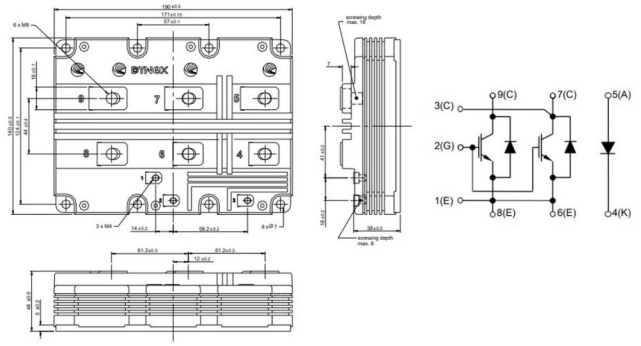
Package Outlines



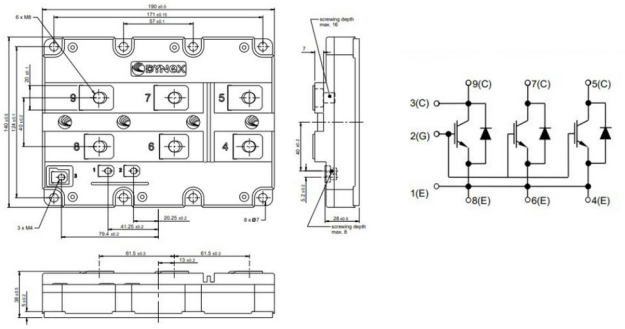
Module Outlines and Circuit Configurations

All dimensions shown in mm unless stated otherwise.

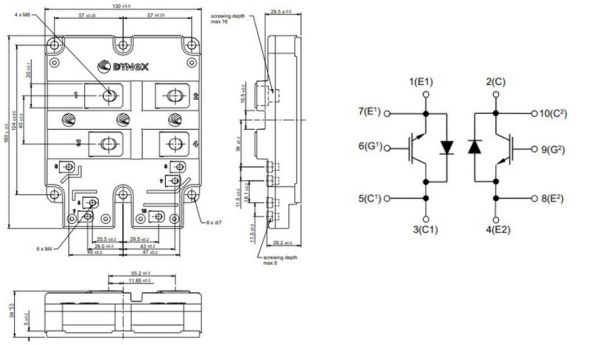
Package Type: A — Nominal Weight: 1700g



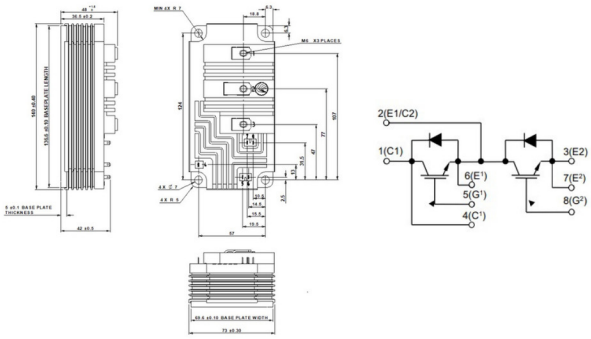
Package Type: E — Nominal Weight: 1400g



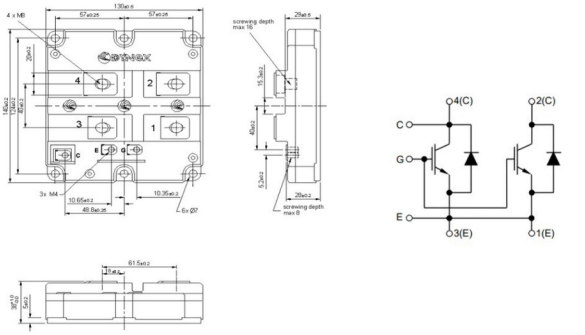
Package Type: G — Nominal Weight: 1000g



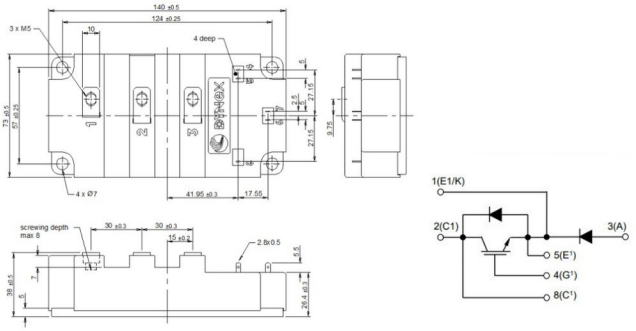
Package Type: K — Nominal Weight: 500g



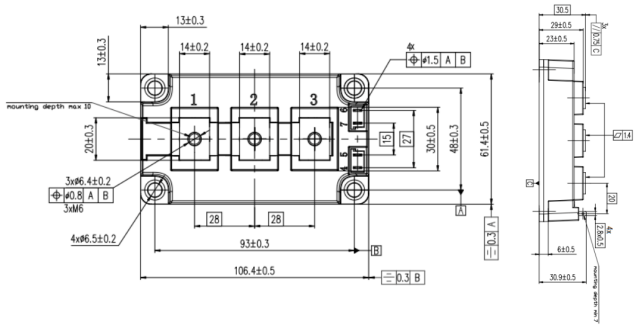
Package Type: N — Nominal Weight: 900g



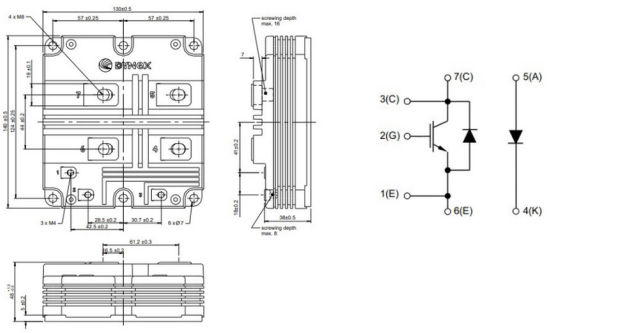
Package Type: P — Nominal Weight: 500g



Package Type: W — Nominal Weight: 335g



Package Type: X — Nominal Weight: 1100g



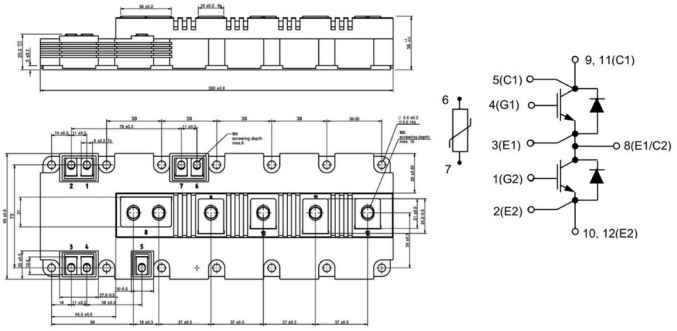
Notes:

1. Mounting recommendations are given in the application note AN4505 ‘Heatsink Issues For IGBT Modules’ available from our website.

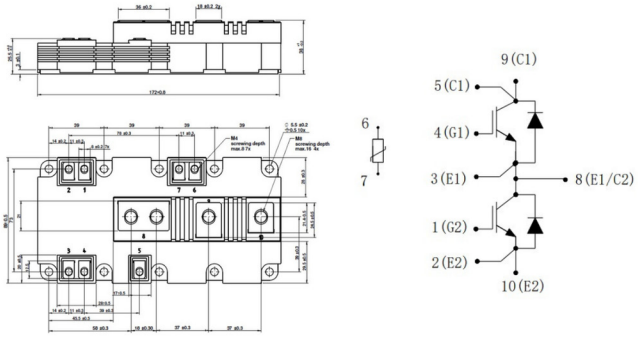
Module Outlines and Circuit Configurations

All dimensions shown in mm unless stated otherwise.

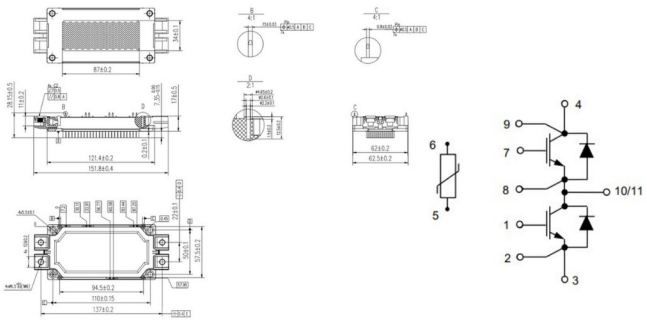
Package Type: H1 — Nominal Weight: 1200g



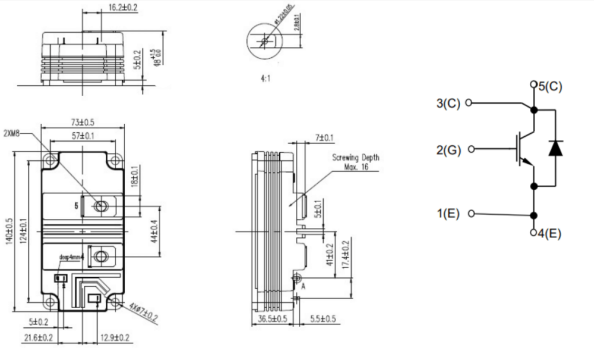
Package Type: H2 — Nominal Weight: 900g



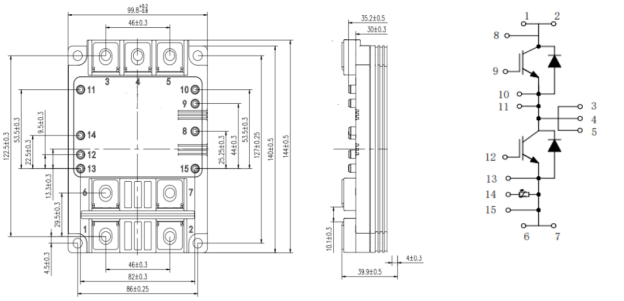
Package Type: M1 — Nominal Weight: 348g



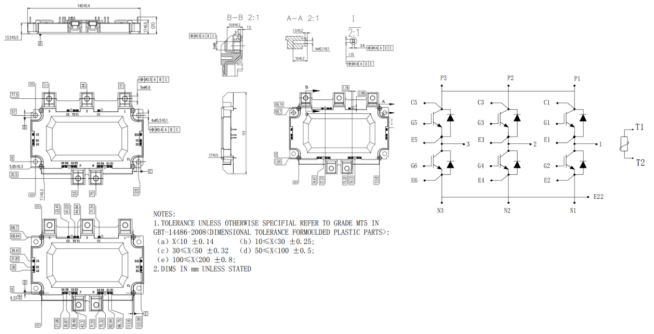
Package Type: L — Nominal Weight: 600g



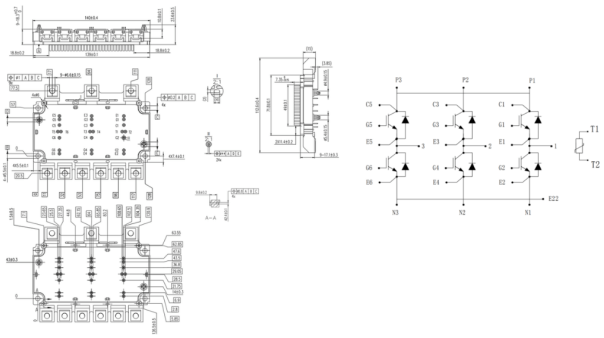
Package Type: U — Nominal Weight: 1050g



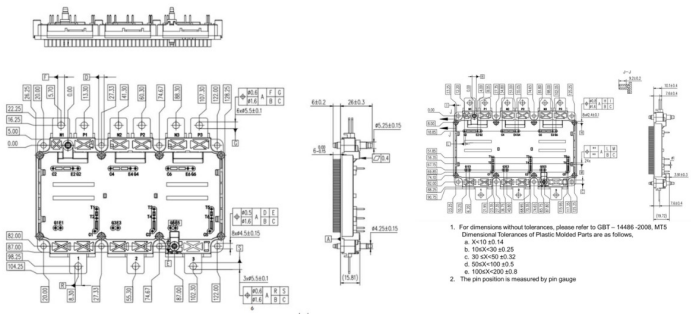
Package Type: S0 — Nominal Weight: 485g



Package Type: S2 — Nominal Weight: 660g



Package Type: S3 — Nominal Weight: 770g

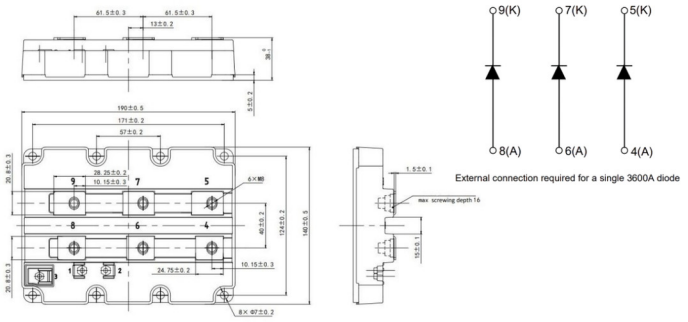


Notes:

1. Mounting recommendations are given in the application note AN4505 ‘Heatsink Issues For IGBT Modules’ available from our website.

Package Outlines - FRD Modules

Package Type: FRD E Module Nominal Weight: 1080g



Symbols and Definitions

C_S	Snubber capacitance
dI/dt	Critical rate of rise of on-state/forward current
dI_{FG}/dt	Rate of rise of positive gate current
dI_{GQ}/dt	Rate of rise of reverse gate current (GTO)
dIT/dt	Critical rate of rise of on-state current (GTO)
dsc	Double side cooled
dV/dt	Critical rate of rise of off-state voltage
dIV_D/dt	Rate of rise of off-state voltage (GTO)
E_{OFF}	Turn-off energy loss
E_{rec}	Reverse recovery energy
$E_{sw(TOT)}$	Total switching energy
F_m/F	Clamping force/mounting torque
I^2t	I^2t value
I_C	Collector current
$I_{C(PK)}$	Peak collector current
I_{DRM}	On-state leakage current (thyristor)
I_F	Forward current (diode)
$I_{F(AV)}$	Mean forward current (diode)
I_{FM}	Peak forward current (diode)
$I_{F(RMS)}$	RMS forward current (diode)
I_{FSM}	Single cycle surge current (diode), (10ms half sinewave)
$I_{G(ON)}$	Gate turn-on current (GTO)
I_{GT}	Gate trigger current
I_{RMS}	RMS line current
I_{PK}	Peak current
I_{RRM}	Peak reverse recovery current
$I_{T(RMS)}$	RMS on-state current (thyristor)
I_T/I_{TM}	On-state current
$I_{T(AV)}$	Mean on-state current (thyristor)
I_{TCM}	Maximum repetitive controllable current (GTO)
I_{TSM}	Single cycle surge current (thyristor), (10ms half sinewave)
P_G	Gate power dissipation
$P_{G(AV)}$	Mean gate power dissipation
P_{GM}	Peak gate power dissipation
Q_r	Recovered charge
Q_{rr}	Reverse recovery charge
r_T	On-state/forward slope resistance
$R_{th(c-hs)}$	Thermal resistance – case to heatsink
$R_{th(j-c)}$	Thermal resistance – junction to case
$R_{th(j-hs)}$	Thermal resistance – junction to heatsink
$R_{th(j-w)}$	Thermal resistance – junction to water
T_c	Case temperature
t_{gq}	Gate controlled turn-off time
t_q	Turn-off time
t_{rr}	Reverse recovery time
T_{HS}	Heatsink temperature
T_{vj}	Virtual junction temperature
T_{vjm}	Maximum virtual junction temperature
T_{water}	Water temperature
$V_{CE(sat)}$	Collector-emitter saturation voltage (IGBT)
V_{CES}	Collector-emitter voltage (IGBT)
V_{DRM}	Repetitive peak off-state voltage
V_{DSM}	Non-repetitive peak off-state voltage
V_F	Forward voltage (diode)
V_{FM}	Peak forward voltage (diode)
V_{isol}	Isolation voltage
V_{GT}	Gate trigger voltage
V_R	Reverse voltage
V_{RRM}	Repetitive peak reverse voltage
V_{RSM}	Non-repetitive peak reverse voltage
V_T	On-state voltage
V_{TM}	Peak on-state voltage
V_{TO}	Threshold voltage (diode)
$V_{T(TO)}$	Threshold voltage (thyristor)

IMPORTANT INFORMATION

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 our Customer Service team. 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.

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Product Status and 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.

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There are counterfeit products on the semiconductor marketplace. Unfortunately, many of these products will have markings and labels that closely resemble those from Dynex's genuine products, making it difficult to realise the difference. Dynex has extensive, proven controls to ensure its products are properly manufactured, tested, handled, and stored to prevent failures. Counterfeit products will not have been subjected to these processes. Therefore, Dynex does not warrant any parts purchased through unauthorised channels nor do we accept any liability for failure of counterfeit products.

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Dynex products should not be purchased if the outer appearance differs from Dynex products you normally receive unless Dynex or a Dynex authorised distributor has provided you with a product change notification or can be seen on datasheets from the Dynex Website. We strongly advise against purchasing extraordinarily low priced Dynex products from unauthorised distributors. Dynex does not support the sale of Dynex products via online auction houses. We will be pleased to confirm the authenticity of the products. To do so please contact Dynex's Customer Services (see reverse for contact information) with the following information:

- Part number, quantity purchased, unit cost
- Name and contact name of the supplier with address, phone, and web/e-mail addresses
- Digital photos of inner and outer label, inner and outer packaging, and front and back of product
- Copy of purchase order and invoice

This is intended to provide you with additional information on counterfeiting and steps that can be taken to better recognize counterfeit products.

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