



Power Semiconductor Product Guide 2024



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.

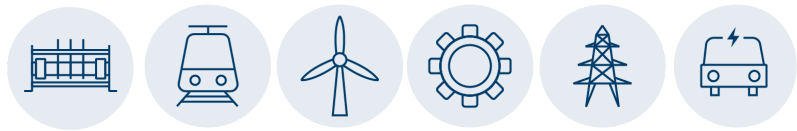
End-user Applications



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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
- ✓ $T(vj\ op) = 150^{\circ}\text{C}$
- ✓ AlSiC Baseplate for increased thermal cycling capability
- ✓ Package design with CTI > 600
- ✓ Isolated base plate
- ✓ 400A to 3600A at 750V 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

IGBT Modules

1200V IGBT Modules

Part Number	Configuration	Production Status	IC (A)	at TC (°C)	VCE (sat) @ TC=25°C (V)	Total Esw @ TC=125°C (mJ)	Rth(j-c) (per switch) (°C/kW)	Baseplate Dims (mm)	Isolation Voltage	Tech
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M1 Module

DIM900M1HS12-PG500	Half Bridge	New	900	80	1.5	281 (=175°C)	52	152 x 62	3.4kV	TSPT
DIM600M1HS12-PC500	Half Bridge	MP	600	100	1.9	109	49	152 x 62	3.4kV	TSPT
DIM450M1HS12-PB500	Half Bridge	MP	450	100	1.7	74	52	152 x 62	2.5kV	TSPT

W1 Module

DIM600WHS12-PC500	Half Bridge	New	600	100	1.2	128.7	48.5	106 x 61	4kV	TSPT
DIM800WHS12-PF500	Half Bridge	New	800	90	1.2	205	48.5	106 x 61	4kV	TSPT

H1 Module

DIM1400H1HS12-PA500	Half Bridge	New	1400	100	1.8	472	20	250 x 89	4kV	TSPT
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H2 Module

DIM900H2HS12-PA500	Half Bridge	MP	900	90	1.8	349	29.5	172 x 89	4kV	TSPT
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AlSiC Baseplate

DIM2400ESM12-A	Single	MP	2400	85	2.2	800	6	190 x 140	2.5kV	DNPT
DIM1800ESM12-A	Single	MP	1800	85	2.2	570	8	190 x 140	2.5kV	DNPT
DIM1600NSM12-A	Single	MP	1600	85	2.2	660	9	140 X 130	2.5kV	DNPT
DIM1600FSM12-A	Single	MP	1600	85	2.2	500	9	140 x 130	2.5kV	DNPT
DIM1200NSM12-A	Single	MP	1200	85	2.2	510	12	140 X 130	2.5kV	DNPT
DIM1200FSM12-A	Single	MP	1200	85	2.2	400	12	140 x 130	2.5kV	DNPT
DIM800NSM12-A	Single	MP	800	85	2.2	340	18	140 X 130	2.5kV	DNPT
DIM800FSM12-A	Single	MP	800	85	2.2	280	18	140 x 130	2.5kV	DNPT
DIM800DDM12-A	Dual	MP	800	85	2.2	280	18	140 x 130	2.5kV	DNPT
DIM800DCM12-A	Chopper	MP	800	85	2.2	280	18	140 x 130	2.5kV	DNPT
DIM600DDM12-A	Dual	MP	600	85	2.2	200	24	140 x 130	2.5kV	DNPT
DIM400DDM12-A	Dual	MP	400	85	2.2	120	36	140 x 130	2.5kV	DNPT

1700V IGBT Modules

Part Number	Configuration	Production Status	IC (A)	at TC (°C)	VCE (sat) @ TC=25°C (V)	Total Esw @ TC=125°C (mJ)	Rth(j-c) (per switch) (°C/kW)	Baseplate Dims (mm)	Isolation Voltage	Tech
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M1 Module

DIM800M1HS17-PG500	Half Bridge	New	800	80	1.65	544 (=175°C)	37	152 x 62	3.4kV	TSPT
DIM600M1HS17-PA500	Half Bridge	New	600	100	1.8	180	46	152 x 62	3.4kV	TSPT
DIM450M1HS17-PA500	Half Bridge	MP	450	95	1.8	265	55	152 x 62	3.4kV	TSPT

H1 Module

DIM1000H1HS17-PA500	Half Bridge	MP	1000	104	1.85	720	20	250 x 89	4kV	TSPT
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Scan this for a list of 1200V IGBT Modules to download datasheets and application notes



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



1700V IGBT Modules

Part Number	Configuration	Production Status	IC (A)	at TC (°C)	VCE (sat) @ TC=25°C (V)	Total Esw @ TC=125°C (mJ)	Rth(j-c) (per switch) (°C/kW)	Baseplate Dims (mm)	Isolation Voltage	Tech
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H2 Module

DIM650H2HS17-PA500	Half Bridge	MP	650	105	1.85	395	30	172 x 89	4kV	TSPT
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AlSiC Baseplate

DIM3600ESM17-PT500	Single	New	3600	95	1.95	2330	7.5	190 x 140	4kV	TSPT
DIM2400ESM17-A	Single	MP	2400	75	2.7	1950	6	190 x 140	4kV	DNPT
DIM2400ESM17-PT500	Single	MP	2400	118	1.75	1980	6	190 x 140	4kV	TSPT
DIM1600FSM17-PS500	Single	New	1600	80	2.3	1950	6	190 x 140	4kV	DSPT
DIM1600FSM17-A	Single	New	1600	75	2.7	1320	9	140 x 130	4kV	DNPT
DIM1600NSM17-A	Single	New	1600	75	2.7	1320	9	140 x 130	4kV	DNPT
DIM1600ECM17-A	Chopper	New	1600	75	2.7	1250	9	190 x 140	4kV	DNPT
DIM1200DDM17-PT500	Dual	MP	1200	140	1.8	756	22	140 x 130	4kV	DSPT
DIM1200FSM17-A	Single	MP	1200	105	2.7	1000	12	140 x 130	4kV	DNPT
DIM1200FSS17-A	Single	New	1200	75	2.7	630	14	140 x 130	4kV	DNPT
DIM1200NSM17-A	Single	MP	1200	75	2.7	1400	12	140 x 130	4kV	DNPT
DIM800DDM17-PS500	Dual	MP	800	80	2.3	520	18	140 x 130	4kV	DSPT
DIM800DDM17-A	Dual	MP	800	75	2.3	700	18	140 x 130	4kV	DNPT
DIM800DCM17-A	Chopper	MP	800	75	2.7	785	18	140 x 130	4kV	DNPT
DIM800FSM17-A	Single	New	800	75	2.7	700	18	140 x 130	4kV	DNPT
DIM800NCM17-A	Chopper	New	800	85	2.7	340	18	140 x 130	4kV	DNPT
DIM800NSM17-A	Single	New	800	75	2.7	900	18	140 x 130	4kV	DNPT
DIM600DDM17-A	Dual	MP	600	75	2.7	620	24	140 x 130	4kV	DNPT
DIM600DCM17-A	Chopper	MP	600	75	2.7	620	24	140 x 130	4kV	DNPT
DIM600NCM17-A	Chopper	New	600	75	2.7	620	24	140 x 130	4kV	DNPT
DIM400DDM17-A	Dual	MP	400	75	2.7	350	36	140 x 130	4kV	DNPT
DIM400DCM17-A	Chopper	MP	400	75	2.7	350	36	140 x 130	4kV	DNPT
DIM400PHM17-A	Half Bridge	MP	400	75	2.7	350	36	140 X 73	4kV	DNPT
DIM400PBM17-A	Bi-directional	MP	400	75	4.9	350	36	140 x 73	4kV	DNPT
DIM400NCM17-A	Chopper	New	400	75	2.7	350	36	140 x 130	4kV	DNPT

3300V IGBT Modules

Part Number	Configuration	Production Status	IC (A)	at TC (°C)	VCE (sat) @ TC=25°C (V)	Total Esw @ TC=125°C (mJ)	Rth(j-c) (per switch) (°C/kW)	Baseplate Dims (mm)	Isolation Voltage	Tech
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Standard Range

DIM1500ESM33-TS	Single	MP	1500	110	2.2	5750	8	190 x 140	6kV	DSPT
DIM1500ASM33-TS001	Single	MP	1500	110	2.2	5750	8	190 x 140	10.2kV	DSPT
DIM1000XSM33-TS	Single	MP	1000	110	2.2	3600	12	140 x 130	10.2kV	DSPT
DIM1000NSM33-TS	Single	MP	1000	110	2.2	3600	12	140 x 130	6kV	DSPT
DIM1000ECM33-TS	Chopper	MP	1000	110	2.2	3600	12	190 X 140	6kV	DSPT
DIM1000ACM33-TS001	Chopper	MP	1000	110	2.2	3900	12	190 X 140	10.2kV	DSPT
DIM500GDM33-TS	Dual	MP	500	110	2.2	1950	24	140 X 130	6kV	DSPT
DIM250PHM33-TS	Half Bridge	MP	250	110	2.2	960	48	140 X 73	6kV	DSPT
DIM250PLM33-TS	Chopper	MP	250	110	2.2	960	48	140 X 73	6kV	DSPT
DIM125PHM33-TS	Half Bridge	MP	125	110	2.2	480	96	140 X 73	6kV	DSPT

IGBT Modules

3300V IGBT Modules

Part Number	Configuration	Production Status	IC (A)	at TC (°C)	VCE (sat) @ TC=25°C (V)	Total Esw @ TC=125°C (mJ)	Rth(j-c) (per switch) (°C/kW)	Baseplate Dims (mm)	Isolation Voltage	Tech
Low Conduction Loss Range										
DIM1500ESM33-TL	Single	MP	1500	115	2.0	7150	8	190 x 140	6kV	DSPT
DIM1500ASM33-TL001	Single	MP	1500	115	2.0	7150	8	190 x 140	10.2kV	DSPT
DIM1000ACM33-TL001	Chopper	MP	1000	115	2.0	4750	12	190 x 140	10.2kV	DSPT
DIM1000ECM33-TL	Chopper	MP	1000	115	2.0	4750	12	190 x 140	6kV	DSPT
DIM1000XSM33-TL001	Single	MP	1000	115	2.0	4750	12	140 x 130	10.2kV	DSPT
DIM1000NSM33-TL	Single	MP	1000	115	2.0	4750	12	140 x 130	6kV	DSPT
DIM500GCM33-TL	Chopper	MP	500	115	2.0	2400	24	160 x 130	6kV	DSPT
DIM500GDM33-TL	Dual	MP	500	115	2.0	2400	24	140 x 73	6kV	DSPT
DIM250PHM33-TL	Half Bridge	MP	250	115	2.0	1200	48	140 x 73	6kV	DSPT
DIM250PLM33-TL	Chopper	MP	250	115	2.0	1200	48	140 x 73	6kV	DSPT
DIM250PKM33-TL	Chopper	MP	250	115	2.0	1200	48	140 x 73	6kV	DSPT
DIM125PHM33-TL	Half Bridge	MP	125	115	2.0	600	96	140 x 73	6kV	DSPT
Low Switching Loss Range										
DIM1500ASM33-TF	Single	New	1500	104	3.2	4130	8	190 x 140	10.2kV	DSPT+
DIM1500ESM33-TF	Single	New	1500	104	3.2	4130	8	190 x 140	6.0kV	DSPT+
DIM1000ACM33-TF	Chopper	New	1000	110	3.2	2800	12	190 x 140	10.2kV	DSPT+
DIM1000ECM33-TF	Chopper	New	1000	110	3.2	2800	12	190 x 140	6.0kV	DSPT+
DIM1000NSM33-TF	Single	New	1000	104	3.2	2800	12	140 x 130	6.0kV	DSPT+
DIM1000XSM33-TF	Single	New	1000	104	3.2	2800	12	140 x 130	10.2kV	DSPT+
DIM125PHM33-TF	Half Bridge	MP	125	104	3.2	343	96	140 x 73	6.0kV	DSPT+
Maintenance Applications										
DIM1200ASM33-F	Single	NRND	1200	90	2.8	4400	48	140 x 73	6kV	DSPT
DIM1200ESM33-F	Single	NRND	1200	90	2.8	4400	8	190 x 140	6kV	DSPT
DIM800NSM33-F	Single	NRND	800	90	2.8	2950	12	140 x 130	6kV	DSPT
DIM800XSM33-F	Single	NRND	800	90	2.8	2950	12	140 x 130	10.2kV	DSPT
DIM800ECM33-F	Chopper	NRND	800	90	2.8	2950	12	190 x 140	6kV	DSPT
DIM400NSM33-F	Single	NRND	400	90	2.8	1470	24	140 x 130	6kV	DSPT
DIM400GDM33-F	Dual	NRND	400	90	2.8	1470	24	140 x 130	6kV	DSPT
DIM400GCM33-F	Chopper	NRND	400	90	2.8	1470	24	140 x 130	6kV	DSPT
DIM400XCM33-F	Chopper	NRND	400	90	2.8	1470	24	140 x 130	10.2kV	DSPT
DIM200PLM33-F	Chopper	NRND	200	90	2.8	655	48	140 x 73	6kV	DSPT
DIM200PKM33-F	Chopper	NRND	200	90	2.8	655	48	140 x 73	6kV	DSPT
DIM200PHM33-F	Half Bridge	NRND	200	90	2.8	655	48	140 x 73	6kV	DSPT
DIM100PHM33-F	Half Bridge	NRND	100	90	2.8	335	96	140 x 73	6kV	DSPT

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



4500V IGBT Modules

Part Number	Configuration	Production Status	IC (A)	at TC (°C)	VCE (sat) @ TC=25°C (V)	Total Esw @ TC=125°C (mJ)	Rth(j-c) (per switch) (°C/kW)	Baseplate Dims (mm)	Isolation Voltage	Tech
Standard Range										
DIM1200ASM45-TS	Single	MP	1200	94	2.5	11100	8	190 x 140	7.4kV	DSPT
DIM1200ASM45-TS001	Single	MP	1200	94	2.5	11100	8	190 x 140	10.2kV	DSPT
DIM800ACM45-TS	Chopper	MP	800	90	2.5	7400	12	190 x 140	7.4kV	DSPT
DIM800ACM45-TS001	Chopper	MP	800	90	2.5	7400	12	190 x 140	10.2kV	DSPT
DIM800XSM45-TS	Single	MP	800	90	2.5	7400	12	140 x 130	7.4kV	DSPT
DIM800XSM45-TS001	Single	MP	800	90	2.5	7400	12	140 x 130	10.2kV	DSPT
DIM400XCM45-TS	Chopper	MP	400	90	2.5	3700	24	140 x 130	7.4kV	DSPT
DIM400XCM45-TS001	Chopper	MP	400	90	2.5	3700	24	140 x 130	10.2kV	DSPT
DIM400XSM45-TS	Single	MP	400	90	2.5	3700	24	140 x 130	7.4kV	DSPT
DIM400XSM45-TS001	Single	MP	400	90	2.5	3700	24	140 x 130	10.2kV	DSPT
Low Conduction Loss Range										
DIM1200ASM45-TL	Single	MP	1200	90	2.3	11650	8	190 x 140	7.4kV	DSPT
DIM1200ASM45-TL001	Single	MP	1200	90	2.3	11650	8	190 x 140	10.2kV	DSPT
DIM800XSM45-TL	Single	MP	800	90	2.3	9100	12	140 x 130	7.4kV	DSPT
DIM800XSM45-TL001	Single	MP	800	90	2.3	9100	12	140 x 130	10.2kV	DSPT
Low Switching Loss Range										
DIM1200ASM45-TF	Single	MP	1200	80	3.5	8950	8	190 x 140	7.4kV	DSPT
DIM1200ASM45-TF001	Single	MP	1200	80	3.5	8950	8	190 x 140	10.2kV	DSPT
DIM800XSM45-TF000	Single	NEW	800	80	3.5	6000	12	140 x 130	7.4kV	DSPT
DIM800XSM45-TF001	Single	NEW	800	80	3.5	6000	12	140 X 130	10.2kV	DSPT

Scan this for a list of 4500V 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, Samples NRND: Not Recommended for New Design

TSPT - Trench Soft Punch Through DNPT - Dynex Non Punch Through DSPT - Soft Punch Through

6500V IGBT Modules

Part Number	Configuration	Production Status	IC (A)	at TC (°C)	VCE (sat) @ T _c =25°C (V)	Total Esw @ T _c =125°C (mJ)	R _{th(j-c)} (per switch) (°C/kW)	Baseplate Dims (mm)	Isolation Voltage	Tech
Standard Range										
DIM750ASM65-TS	Single	MP	750	100	2.8	11600	9	190 x 140	10.2kV	DSPT
DIM500XSM65-TS	Single	MP	500	90	3.0	7700	13.5	140 x 130	10.2kV	DSPT
DIM500ACM65-TS	Chopper	MP	500	90	3.0	7700	13.5	190 x 140	10.2kV	DSPT
DIM250XCM65-TS	Chopper	MP	250	90	3.0	3350	30	140 x 130	10.2kV	DSPT

Low Conduction Loss Range

DIM750ASM65-TL	Single	MP	750	100	2.5	16200	9	190 x 140	10.2kV	DSPT
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Low Switching Loss Range

DIM1000ASM65-UF	Single	NEW	1000	112	3.6	12300	9	190 x 140	10.2 kV	TSPT
DIM670XSM65-UF	Single	NEW	670	123	3.6	10100	14	130 X 140	10.2kV	TSPT
DIM670ACM65-UF	Chopper	NEW	670	125	3.6	10100	14	190 X 140	10.2kV	TSPT
DIM500XSM65-TF	Single	NEW	500	95	3.6	5900	13.5	130 X 140	10.2kV	DSPT
DIM335XCM65-UF	Chopper	NEW	335	125	3.6	5010	27	130 x 140	10.2kV	TSPT

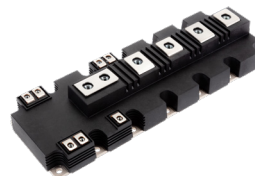
Scan this for a list of 6500V IGBT Modules to download datasheets and application notes



W1 Package



M1 Package



H1 Package



H2 Package



P Package



N Package



X Package



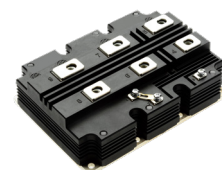
G Package



E Package



F Package



A 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.

Choose Converter Topology: ?

2-Level Single Phase

--- AC-Converters ---

2-Level Single Phase

2-Level Three Phase

3-Level Three Phase (T-Type)

3-Level Three Phase (I-Type)

5-Level Three Phase (I-Type)

--- Rectifiers ---

Diode Rectifier, Single Phase

Diode Rectifier, Three Phase

--- DC-Topologies ---

Buck Converter

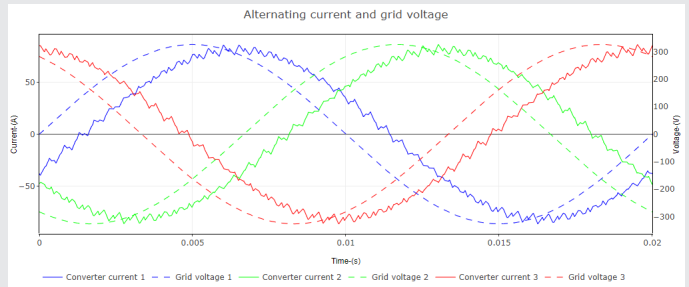
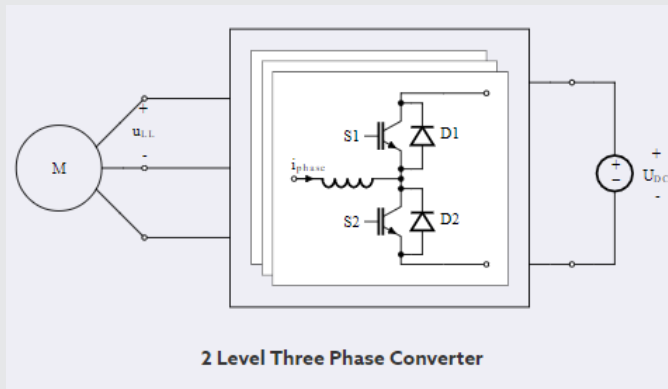
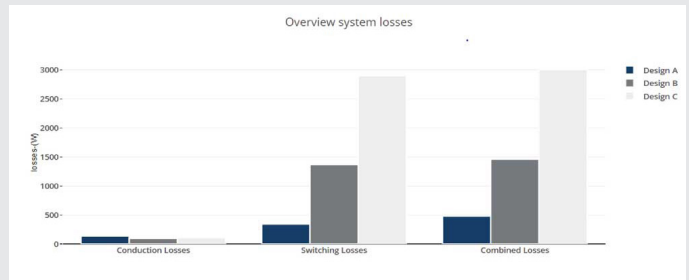
Boost Converter

Parameters for System Simulation:

Grid voltage-(V)	Grid current-(A)	Grid frequency-(Hz)
400,0	57,74	50
DC-Link voltage-(V)	Grid inductance-(H)	Average ambient temperature-(°C)
700,0	0,004	25
Switching frequency-(Hz)	Power factor	Average junction temperature-(°C)
2000	0,9	100

Third harmonic injection: Off

Reactive power: Inductive



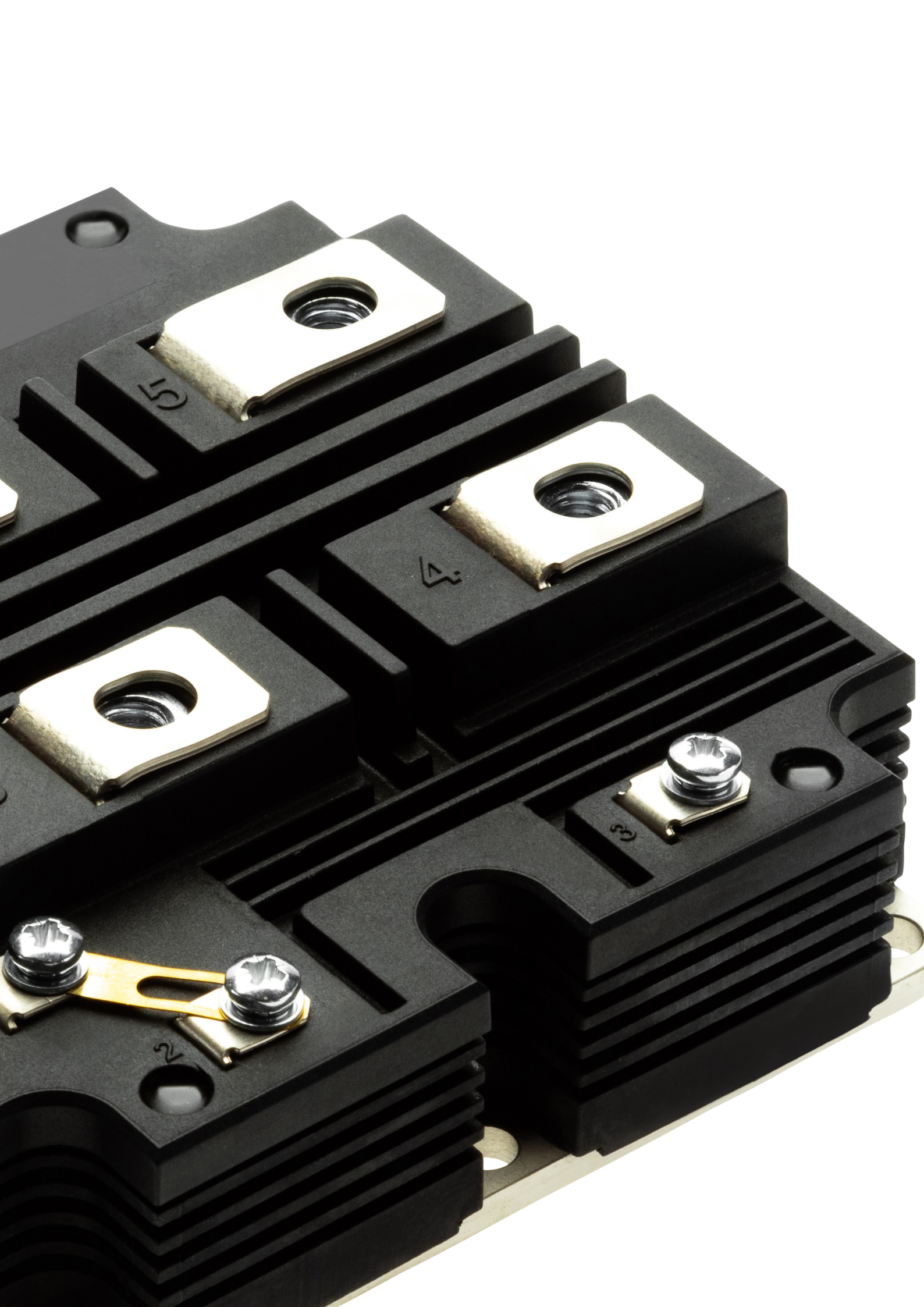
Our Design Tool is designed to assist you in selecting the right Dynex products, using an integrated interactive datasheet, which allows you to analyse our component's properties and performance at a specific operation point considering current, voltage and junction temperature.

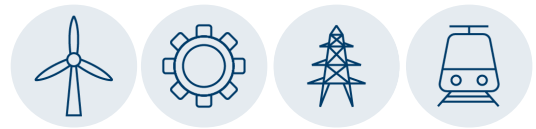
The instantaneous and average power losses in each semiconductor component of the circuit are displayed for each topology, selected alongside other outputs shown below.

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

Operating point 1 (OP 1)	Operating point 2 (OP 2)
Junction temperature in °C	Junction temperature in °C
75	125,0
Voltage to be blocked in V	Voltage to be blocked in V
600,0	600,0

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





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 AISiC base with AlN substrates
- ✓ Single, double and triple diode configurations available with current ratings up to 3600A

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	IF (A per arm)	at TC (°C)	Baseplate Dims (mm)	Isolation Voltage	IF (A as single diode with external connection)	Vf@ Tvj =25 °C	I ² t	Qrr@ Tvj	Erec@ Tvj	Rth(j-c) (per arm) (°C/kW)
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AISiC Baseplate

DFM1200EXM12-A	Triple Diode	MP	1200	75	190 x 140	2.5 kV	3600	1.9	200	300	140	20
DFM1200FXM12-A	Dual Diode	MP	1200	75	140 x 130	2.5 kV	2400	1.9	200	300	140	20
DFM900FXM12-A	Dual Diode	MP	900	75	140 x 130	2.5 kV	1800	1.9	150	225	105	27
DFM600FXM12-A	Dual Diode	MP	600	75	140 x 130	2.5 kV	1200	1.9	100	150	70	40

1800V FRD Modules

Part Number	Configuration	Production Status	IF (A per arm)	at TC (°C)	Baseplate Dims (mm)	Isolation Voltage	IF (A as single diode with external connection)	Vf@ Tvj =25 °C	I ² t	Qrr@ Tvj	Erec@ Tvj	Rth(j-c) (per arm) (°C/kW)
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AISiC Baseplate

DFM1200EXM18-A	Triple Diode	MP	1200	75	190 x 140	4 kV	3600	2.0	480	540	360	20
DFM1200FXM18-A	Dual Diode	MP	1200	75	140 x 130	4 kV	2400	2.0	480	540	360	20
DFM900FXM18-A	Dual Diode	MP	900	75	140 x 130	4 kV	1800	2.0	270	410	270	27
DFM600FXM18-A	Dual Diode	MP	600	75	140 x 130	4 kV	1200	2.0	120	160	120	40
DFM400PXM18-A	Series Pair	New	400	75	140 x 73	4 kV	400	2.0	270	205	135	54
DFM300PXM18-A	Series Pair	New	300	75	140 x 73	4 kV	300	2.0	30	150	100	80

Scan this for Fast Recovery Diode Module datasheets and link to Dynex Design Tool



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 NRND: Not Recommended for New Design

3300V FRD Modules

Part Number	Configuration	Production Status	IF (A per arm)	at TC (°C)	Baseplate Dims (mm)	Isolation Voltage	IF (A as single diode with external connection)	Vf@ Tvj =25 °C	I ² t (kA ² s)	Qrr@ Tvj	Erec@ Tvj	Rth(j-c) (per arm) (°C/kW)
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TS Range

DFM1000EXM33-TS001	Triple Diode	MP	1000	90	190 x 140	6 kV	3000	2.4	320	1070	1300	24
DFM1000NXM33-TS	Dual Diode	MP	1000	90	140 x 130	6 kV	2000	2.4	320	1070	1300	24
DFM500NXM33-TS	Dual Diode	MP	500	90	140 x 130	6 kV	1000	2.4	80	540	650	48
DFM250PXM33-TS	Series Pair	MP	250	90	140 x 73	6 kV	N/A	2.4	20	270	330	96

4500V FRD Modules

Part Number	Configuration	Production Status	IF (A per arm)	at TC (°C)	Baseplate Dims (mm)	Isolation Voltage	IF (A as single diode with external connection)	Vf@ Tvj =25 °C	I ² t (kA ² s)	Qrr@ Tvj	Erec@ Tvj	Rth(j-c) (per arm) (°C/kW)
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TS Range

DFM1200AXM45-TS	Triple Diode	MP	1200	65	190 x 140	7.4kV	3600	2.8	460	2200	4000	16
DFM1200AXM45-TS001	Triple Diode	MP	1200	65	190 x 140	10.2 kV	3600	2.8	460	2200	4000	16
DFM1200XXM45-TS	Dual Diode	MP	1200	65	140 x 130	7.4kV	2400	2.8	460	2200	4000	16
DFM1200XXM45-TS001	Dual Diode	MP	1200	65	140 x 130	10.2 kV	2400	2.8	460	2200	4000	16
DFM800XXM45-TS	Dual Diode	MP	800	65	140 x 130	7.4 kV	1600	2.8	300	1450	2700	24
DFM800XXM45-TS001	Dual Diode	MP	800	65	140 x 130	10.2 kV	1600	2.8	300	1450	2700	24
DFM400XXM45-TS	Dual Diode	MP	400	65	140 x 130	7.4kV	800	2.8	150	750	1350	48
DFM400XXM45-TS001	Dual Diode	MP	400	65	140 x 130	10.2kV	800	2.8	150	750	1350	48

6500V FRD Modules

Part Number	Configuration	Production Status	IF (A per arm)	at TC (°C)	Baseplate Dims (mm)	Isolation Voltage	IF (A as single diode with external connection)	Vf@ Tvj =25 °C	I ² t (kA ² s)	Qrr@ Tvj	Erec@ Tvj	Rth(j-c) (per arm) (°C/kW)
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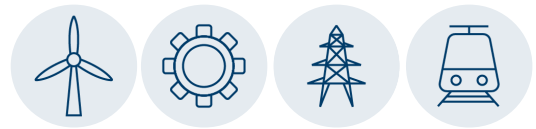
TS Range

DFM750XXM65-TS	Dual Diode	New	750	60	140 x 130	10.2 kV	1500	3.6	200	1300	3000	20
DFM500XXM65-TS	Dual Diode	MP	500	60	140 x 130	10.2 kV	1000	3.6	97	1000	2000	30
DFM250XXM65-TS	Dual Diode	MP	250	60	140 x 130	10.2 kV	500	3.6	24	500	1000	60
DFM750AXM65-TS	Triple Diode	MP	750	60	190 x 130	10.2kV	2250	3.6	218	1500	3000	20

* V_{ce(sat)} is measured across both arms of the bi-directional switch.

MP: Mass Production NEW: New Products, Samples NRND: Not Recommended for New Design





Bipolar Devices

Reliable and efficient transfer of energy for a range of applications

The Bipolar range of products are produced in both Lincoln, England and Zhuzhou, China. Dynex continue to design and manufacture devices tailored for particular applications with lower losses, higher blocking voltages and higher current capability.

The range consists of Phase Control, Gate Turn Off, Pulse Power, Asymmetric Thyristors, Rectifier fast Recovery and Flat Base Rectifier Diodes.

KEY FEATURES

- ✓ Thinner silicon, lower conduction losses
- ✓ Unique bevel maximises current and surge ratings
- ✓ Advanced implanted aluminium diffusion techniques
- ✓ Current ratings from 370A to 7610A
- ✓ Voltage ratings from 1300V to 8500V with custom designs
- ✓ Full blocking voltage capability at line frequencies from -40°C to 125°C

APPLICATIONS

- ✓ High power drives
- ✓ High voltage power supplies
- ✓ Static switches
- ✓ Industrial AC and DC drives
- ✓ Wind energy systems
- ✓ Soft starters, STATS



Scan this for a list of Bipolar Device part numbers and links to datasheets.

Phase Control Thyristors

Part Number	VDRM (V)	VRRM (V)	IT (AV) at TC= 60°C (A)	ITSM at T _{vj} V _R = 0 (kA)	dV/dt (V/μs)	Non Rep. di/dt (A/μs)	R _{th(j-c)} (°C/kW)	Outline Type Code	Flange OD Contact OD Height (mm)	Clamping Force (kN) min - max
Up to 1400V										
DCR470T	1400	1400	470	6.3	1000	1000	80	T	42/19/13.5	4 - 6
DCR780E14	1400	1400	780	9.1	1000	1000	41	E	42/25/14.5	4 - 6
DCR950D14	1400	1400	950	12.8	1000	1000	35	D	47/29/14.5	8 - 12
DCR1010G14	1400	1400	1010	15	1000	1000	35	G	58/35/26.5	12 - 18
DCR1910F14	1400	1400	1910	26	1000	1000	20	F	75/47/26.5	18 - 26
DCR2150X14	1400	1400	2150	29	1000	1000	18	X	85/53/26.5	26 - 34
DCR2980C14	1400	1400	2980	47	1000	1000	13	C	100/63/26.5	40 - 50
DCR3710V14	1400	1400	3710	60	1000	1000	10	V	110/73/26.5	50 - 62
Up to 1800V										
DCR370T18	1800	1800	370	5	1000	1000	80	T	42/19/13.5	4 - 6
DCR720E18	1800	1800	720	8.3	1000	1000	41	E	42/25/14.5	4 - 6
DCR860D18	1800	1800	860	11.5	1000	1000	35	D	47/29/14.5	8 - 12
DCR960G18	1800	1800	960	14	1000	1000	35	G	58/35/26.5	12 - 18
DCR1710F18	1800	1800	1710	25	1000	1000	20	F	75/47/26.5	18 - 26
DCR1800F18	1800	1800	1800	32	1000	1000	20	F	75/47/26.5	18 - 26
DCR1970X18	1800	1800	1970	28	1000	1000	18	X	85/53/26.5	26 - 34
DCR2830C18	1800	1800	2830	45	1000	1000	13	C	100/63/26.5	40 - 50
DCR3370C18	1800	1800	3360	43	1500	300	10	C	98.9/63/26.3	33 - 41
DCR3400V18	1800	1800	3400	60	1000	1000	10	V	110/73/26.5	50 - 62
DCR4740Y18	1800	1800	4740	63.1	2000	300	8	Y	112.5/73/35.7	48 - 59
DCR4940V18	1800	1800	4920	63.1	2000	300	7	V	110/73/27.2	48 - 59
Up to 2400V										
DCR1080G22	2200	2200	1083	14.4	1500	500	27	G	57/34/26.5	10 - 13
DCR2860C22	2200	2200	2860	38	1500	400	10.1	C	98.9/62.85/26.4	33 - 41
DCR3910Y22	2200	2200	3890	54	1500	300	8	Y	112.5/73/35	48 - 59
DCR4060V22	2200	2200	4040	54	1500	300	8	V	110/73/27.3	48 - 59
DCR4440W22	2200	2200	4440	64.5	1000	1000	7	W	120/84/26.5	62 - 78
DCR5050B22	2200	2200	5050	72.5	2000	500	7	B	120/84.6/34.6	68 - 84
DCR5450W22	2200	2200	5250	72.5	2000	500	6	W	120/84.6/27.3	68 - 84
DCR5900A22	2200	2200	5900	80	1000	1000	6	A	150/100/35	74 - 91
DCR6430M22	2200	2200	6430	80	1000	1000	5	M	150/100/26.5	80 - 100
DCR590E24	2400	2400	590	7.8	1000	1000	41	E	42/25/14.5	4 - 6
DCR750D24	2400	2400	750	10	1000	1000	35	D	47/29/14.5	8 - 12
DCR1700X24	2400	2400	1700	23	1000	1000	18	X	85/53/26.5	26 - 34
DCR2360C24	2400	2400	2360	35	1000	1000	13	C	100/63/26.5	40 - 50
DCR3060V24	2400	2400	3060	45	1000	1000	10	V	110/73/26.5	50 - 62
Up to 3000V										
DCR850G26	2600	2600	850	11	1000	1000	35	G	58/35/26.5	12 - 18
DCR1560F26	2600	2600	1560	24	1000	1000	20	F	75/47/26.5	18 - 26
DCR960G28	2800	2800	960	13	1500	500	27	G	57/34/26.5	10 - 13
DCR1610F28	2800	2800	1610	21.5	1500	1000	18	F	73/47/26.5	22 - 25
DCR2060C28	2800	2800	2060	30	1000	1000	13	C	100/63/26.5	40 - 50
DCR2480L28	2800	2800	2480	35.2	1500	300	1	L	98.9/62.8/34.6	33 - 41
DCR2630C28	2800	2800	2630	35.2	1500	300	1	C	98.9/62.8/34.6	33 - 41
DCR2760V28	2800	2800	2760	43	1000	1000	10	V	110/73/26.5	50 - 62
DCR3650Y28	2800	2800	3620	50.2	1500	300	8	Y	112.5/73/35.1	48 - 59
DCR3780V28	2800	2800	3760	50.2	1500	300	8	V	110/73/27.4	68 - 84
DCR4590B28	2800	2800	4590	63	2000	500	7	B	120/84.6/34.7	68 - 84
DCR4910W28	2800	2800	4910	63	2000	500	6	W	120/84/27.4	68 - 84
DCR5900A28	2800	2800	5900	79	2000	500	6	A	150/100/35	80 - 100
DCR5790M28	2800	2800	5790	75	1000	1000	5	M	150/100/26.5	80 - 100
DCR7610H28	2800	2800	7610	105	1000	1000	4	H	172/110/35	110 - 130
DCR780G30	3000	3000	780	10.5	1000	1000	35	G	58/35/26.5	12 - 18
DCR1460F30	3000	3000	1460	23	1000	1000	20	F	75/47/26.5	18 - 26
Low Conduction Loss										
DCR5480A28	2800	2800	5480	73.1	2000	500	6	A	148/100/35.3	74 - 91
DCR5960M28	2800	2800	5960	73.1	2000	500	5	M	148/100/25.9	74 - 91

Phase Control Thyristors

Part Number	VDRM (V)	VRRM (V)	IT (AV) at TC= 60°C (A)	ITSM at T _{vj} V _R = 0 (kA)	dV/dt (V/μs)	Non Rep. di/dt (A/μs)	R _{th(j-c)} (°C/kW)	Outline Type Code	Flange OD Contact OD Height (mm)	Clamping Force (kN) min - max
Up to 3400V										
DCR470E34	3400	3400	470	6.3	1000	1000	41	E	42/25/14.5	4-6
DCR610D34	3400	3400	610	8	1000	1000	35	D	47/29/14.5	8-12
DCR650G34	3400	3400	650	8.4	1000	1000	35	G	58/35/26.5	12-18
DCR1120F34	3400	3400	1120	17	1000	1000	20	F	75/47/26.5	18-26
DCR1430X34	3400	3400	1430	19.2	1000	1000	18	X	85/53/26.5	26-34
DCR1970C34	3400	3400	1970	30	1000	1000	13	C	100/63/26.5	40-50
DCR2440V34	3400	3400	2440	33	1000	1000	10	V	110/73/26.5	50-62
DCR3640W34	3400	3400	3640	54	1000	1000	7	W	120/84/26.5	62-78
DCR4720A34	3400	3400	4720	69	1000	1000	57	A	150/100/35	80-100
DCR5110M34	3400	3400	5110	69	1000	1000	50	M	150/100/26.5	80-100
Up to 4200V										
DCR780G42	4200	4200	780	10.5	1500	400	27	G	58.5/34/26.72	10-13
DCR1150N42	4200	4200	1150	16.8	1500	1000	22	N	73/47/34.89	20-25
DCR1260F42	4200	4200	1260	16.8	1500	1000	18	F	73/47/26.72	20-25
DCR2040L42	4200	4200	2040	29	1500	400	12	L	98.9/62.85/34.82	33-41
DCR2150C42	4200	4200	2160	29	1500	400	10	C	98.9/62.85/26.76	33-41
DCR2930Y42	4200	4200	2910	40.6	1500	400	8	Y	112.5/73/35.4	48 - 59
DCR3030V42	4200	4200	3020	40.6	1500	400	7	V	110/73/27.6	48 - 59
DCR3790B42	4200	4200	3740	53.5	1500	400	7	B	120/84.6/34.9	68 - 84
DCR4100W42	4200	4200	3880	53.5	1500	400	6	W	120/84.6/27.6	68 - 84
Low Conduction Loss										
DCR4500A42	4200	4200	4450	60	2000	500	6	A	148/100/35.5	74 - 91
DCR4880M42	4200	4200	4810	60	2000	500	5	M	148/100/26.1	74 - 91
DCR6650H42	4200	4200	6610	98	2000	500	4	H	170/115/35.0	120 - 155
Low Switching Loss										
DCR4160A42	4200	4200	4160	56.1	2000	500	6	A	148/100/35.5	74 - 91
DCR4510M42	4200	4200	4500	56.1	2000	500	5	M	148/100/26.1	74 - 91
DCR6140H42	4200	4200	6070	90.0	2000	500	4	H	170/115/35.0	120 - 155
Up to 5200V										
DCR690G52	5200	5200	690	9.45	1500	300	27	G	57/34/26.84	10 - 13
DCR1020N52	5200	5200	1018	14.8	1500	800	22	N	73/47/34.89	20 - 25
DCR1110F52	5200	5200	1107	14.8	1500	800	18	F	73/47/26.84	20 - 25
DCR1850L52	5200	5200	1845	26.25	1500	300	12	L	98.9/62.85/34.94	33 - 41
DCR1950C52	5200	5200	1950	26.25	1500	300	10	C	98.9/62.85/26.84	33 - 41
DCR2630Y52	5200	5200	2620	36.7	1500	300	8	Y	112.5/73/35.47	48 - 59
DCR2720V52	5200	5200	2710	36.7	1500	300	7	V	110/73/27.7	48 - 59
DCR3480B52	5200	5200	3440	49	1500	400	7	B	120/84.6/35.0	68 - 84
DCR3640W52	5200	5200	3560	49	1500	400	6	W	120/84.6/27.7	68 - 84
Low Conduction Loss										
DCR3990A52	5200	5200	3990	53.4	2000	1000	6	A	148/100/35.61	74 - 91
DCR4330M52	5200	5200	4325	53.4	2000	1000	5	M	148/100/26.26	74 - 91
DCR5890H52	5200	5200	5890	86.97	2000	500	4	H	170/115/35.27	120 - 155
Low Switching Loss										
DCR3700A52	5200	5200	3700	49.4	2000	1000	6	A	148/100/35.6	74 - 91
DCR4000M52	5200	5200	4000	49.4	2000	1000	5	M	148/100/26.3	74 - 91
DCR5240H52	5200	5200	5160	76.6	2000	500	4	H	170/115/35.1	120 - 155

Phase Control Thyristors

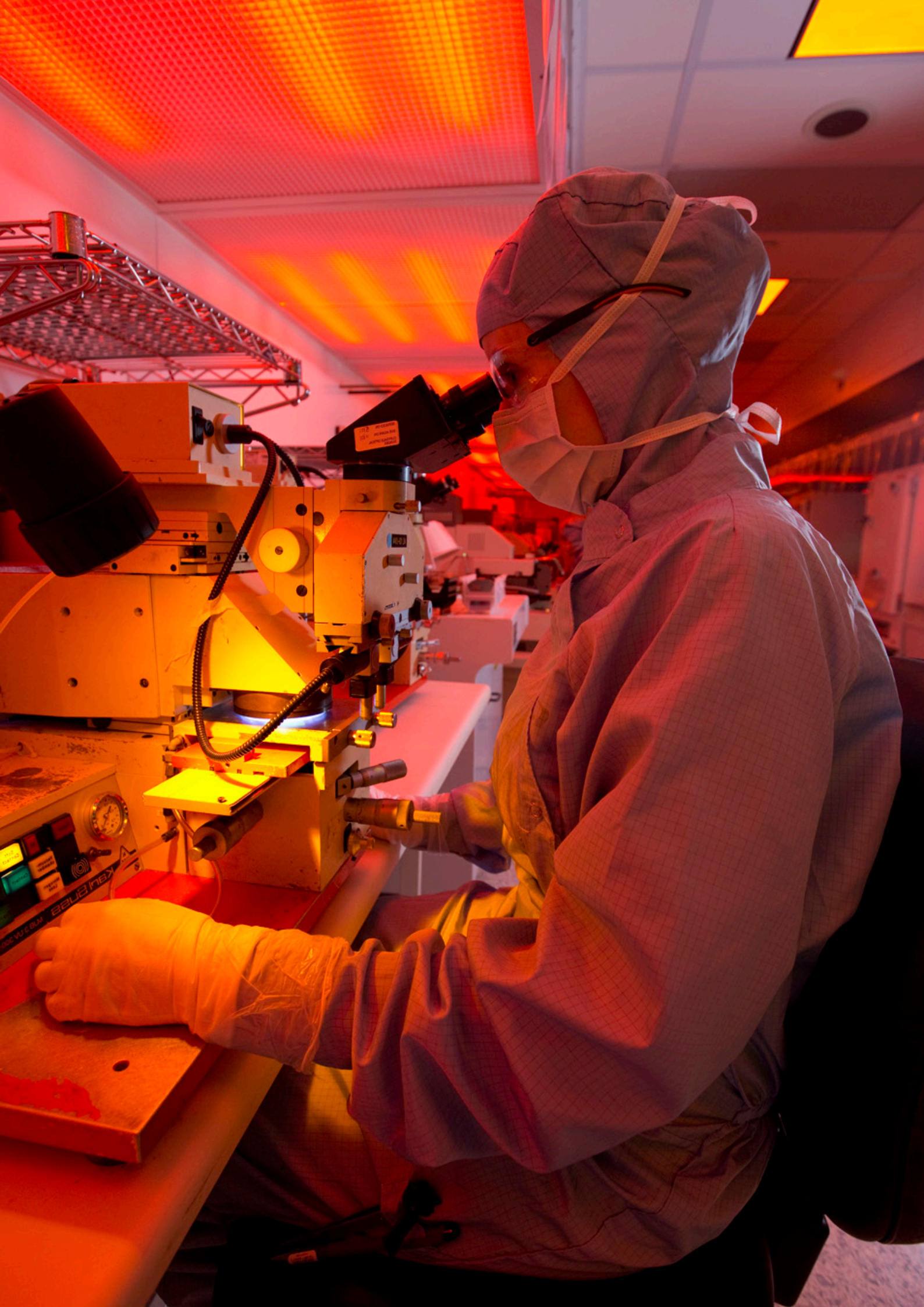
Part Number	VDRM (V)	VRRM (V)	IT (AV) at TC= 60°C (A)	ITSM at T _{vj} VR = 0 (kA)	dV/dt (V/μs)	Non Rep. di/dt (A/μs)	R _{th(j-c)} (°C/kW)	Outline Type Code	Flange OD Contact OD Height (mm)	Clamping Force (kN) min - max
Up to 6500V										
DCR490J65	6500	6500	490	6.6	1500	200	38	J	57/33.95/35.15	10 - 13
DCR590G65	6500	6500	595	6.6	1500	200	27	G	58.5/34/27.1	10 - 13
DCR820N65	6500	6500	820	12	1500	200	22	N	73/47/35.15	20 - 25
DCR890F65	6500	6500	894	12	1500	200	18	F	73/47/27.1	20 - 25
DCR1570L65	6500	6500	1570	22	1500	300	12	L	98.9/62.85/35.2	33 - 41
DCR1650C65	6500	6500	1650	22	1500	300	10	C	98.9/62.9/27.1	33 - 41
DCR2220Y65	6500	6500	2220	30	1500	300	8	Y	112.5/73/35.7	48 - 59
DCR2290V65	6500	6500	2280	30	1500	500	8	V	110/73/28	48 - 59
DCR2880B65	6500	6500	2840	38.9	1500	300	7	B	120/84.6/35.3	68 - 84
DCR2950W65	6500	6500	2940	38.9	1500	300	6	W	120/84.6/28	68 - 84
DCR3220A65	6500	6500	3220	43	2000	500	6	A	148/100/35.9	74 - 91
DCR3480M65	6500	6500	3480	43	2000	500	5	M	148/100/26.5	74 - 91
Low Conduction Loss										
DCR3360A65	6500	6500	3360	44.7	2000	500	6.0	A	148 / 100 / 35.9	74 - 91
DCR3620M65	6500	6500	3620	44.7	2000	500	5.2	M	148 / 100 / 26.5	74 - 91
DCR4660H65	6500	6500	4650	69.1	2000	500	4.3	H	170 / 115 / 35.4	120 - 155
Low Switching Loss										
DCR3120A65	6500	6500	3120	41.5	2000	500	6.0	A	148 / 100 / 35.9	74 - 91
DCR3370M65	6500	6500	3370	41.5	2000	500	5.2	M	148 / 100 / 26.5	74 - 91
DCR4420H65	6500	6500	4350	64.6	2000	500	4.3	H	170 / 115 / 35.4	120 - 155
8500V										
DCR390J85	8500	8500	387	5.25	1500	200	38	J	57 / 33.95 / 35.51	10 - 13
DCR470G85	8500	8500	467	5.25	1500	200	27	G	58.5 / 34 / 27.4	10 - 13
DCR680N85	8500	8500	677	9.8	1500	200	22	N	73 / 47 / 35.51	20 - 25
DCR750F85	8500	8500	740	9.8	1500	200	18	F	73 / 47 / 27.4	20 - 25
DCR1300L85	8500	8500	1300	17.6	1500	400	12	L	98.9/62.85/35.56	33 - 41
DCR1370C85	8500	8500	1370	17.6	1500	400	10	C	98.9/ 62.85/ 27.4	33 - 41
DCR1840Y85	8500	8500	1830	25	1500	300	8	Y	112.5 / 73 / 35.1	48 - 59
DCR1910V85	8500	8500	1900	25	1500	300	8	V	110 / 73 / 28.3	48 - 59
DCR2400B85	8500	8500	2370	33.5	1500	300	7	B	120 / 84.6 / 35.6	68 - 84
DCR2450W85	8500	8500	2450	33.5	1500	300	6	W	120 / 84.6 / 28.3	68 - 84
Low Conduction Loss										
DCR2770A85	8500	8500	2770	36.6	1500	200	6	A	148 / 100 / 36.2	74 - 91
DCR2990M85	8500	8500	2990	36.6	1500	500	5	M	148 / 100 / 26.8	74 - 91
DCR3980H85	8500	8500	3910	58.1	2000	500	4	H	170 / 115 / 35.7	120 - 155
Low Switching Loss										
DCR2560A85	8500	8500	2610	34.5	1500	200	6	A	148 / 100 / 36.2	74 - 91
DCR2760M85	8500	8500	2810	34.5	1500	200	5	M	148 / 100 / 26.8	74 - 91
DCR3640H85	8500	8500	3620	53.7	2000	500	4	H	170 / 115 / 35.7	120 - 155

Scan this for a list of 6500V Phase Control Thyristors to download datasheets and application notes



Scan this for a list of 8500V Phase Control Thyristors to download datasheets and application notes





Gate Turn Off Thyristors

Part Number	VDRM (V)	VRRM (V)	IT (AV) at TC=80°C (A)	ITSM (kA)	dV/dt (V/μs)	di/dt (A/μs)	Rth(j-c) (°C/kW)	Outline Type Code	Flange OD Contact OD Height (mm)	Snubber Diode	Anti-parallel and Freewheel Diode	Clamping Force (kN) min - max
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Asymmetric Types

Up to 1300V

DGT304SE	1300	16	250	700	500	500	75	E	41.9/25/15	-	DF451	5-6
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Up to 1800V

DGT305SE	1800	16	240	700	500	500	75	E	41.9/25/15	-	DF451	5-6
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Up to 2500V

DG306AE	2500	16	225	600	1000	300	75	E	41.9/25/15	-	DFS454	5-6
DG406BP	2500	16	500	1200	1000	300	41	P	56/38/27	DSF8025SE	DSF8025SE	11-15
DG646BH	2500	16	867	2500	1000	300	18	H	100/63/26.5	DSF8025SE	DF051	18-22

Up to 4500V

DG408BP	4500	16	320	1000	1000	300	41	P	56/38/27	DSF8045SK	DSF8045SK	11-15
DG648BH	4500	16	745	2000	1000	300	18	H	100/63/26.5	DSF8045SK	DSF20545SF	18-22
DG758BX	4500	16	870	3000	1000	300	15	X	112/66/27	DSF8045SK	DSF21545SV	33-37
DG808BC	4500	16	780	3000	1000	400	14	C	108/77.2/27	DSF8045SK	DSF21545SV	28-44
DG858BW	4500	16	1180	4000	1000	300	11	W	120/84/27	DSF8045SK	DSF21545SV	36-44
DG858DW	4500	16	1100	3000	750	300	11	W	120/84/27	DSF8045SK	DSF21545SV	36-44

Reverse Blocking

Up to 1300V

DGT304RE	1300	1300	250	700	500	500	75	E	41.9/25/15	-	DF451	5-6
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Up to 1800V

DGT305RE	1800	1800	240	700	500	500	75	E	41.9/25/15	-	DF451	5-6
----------	------	------	-----	-----	-----	-----	----	---	------------	---	-------	-----

Asymmetric Bypass Thyristors

Part Number	VDRM (V)	VRRM (V)	IT (AV) at TC=80°C (A)	ITSM (kA)	dV/dt (V/μs)	Non Rep. di/dt (A/μs)	Rth(j-c) (°C/kW)	Outline Type Code	Flange OD Contact OD Height (mm)	DC Cosmic Ray Failure Rate @ 50% VRRM (FITs)	Clamping Force (kN) min - max
ACR3200VR33	1000	3300	3200	43	10	1500	8	V	110/73/27.57	9	48-59
ACR2900VR45	1000	4500	2900	39	10	1300	8	V	110/73/27.69	8	48-59

The Bypass Thyristor range are specifically designed for protection of IGBT modules in VSC multi-level applications, where a reduced forward blocking voltage is required. In these applications, a thyristor must rapidly divert fault currents from an IGBT diode to protect it from damage. Dynex have designed devices with improved current and surge ratings to assist fault diversion.

Such protective thyristors are required to block in parallel with the IGBT diode, and as such experience waveforms that are non typical of thyristor applications. They are resistant to fast voltage transients, which can be exposed to due to the switching of the IGBT diode. The device structures also have greatly enhanced hardness to cosmic ray induced failures, which become significant at high DC voltage duty cycles.

Pulsed Power Thyristors

Part Number	VDRM (V)	VRRM (V)	IT (AV) at TC= 80°C (A)	ITSM at T _{vj} , VR = 0 (kA)	dV/dt (V/μs)	di/dt (A/μs)	to Ipk (kA)	Rth(j-c) (°C/kW)	Outline Type Code	Flange OD Contact OD Height (mm)	Clamping Force (kN) min - max
Pulsed Power Thyristors (SCR)											
ACR300SG33	3300	20	493	6.5	3000	2000	0.125	42	G	58.5 / 34 / 27	6 - 8
PT40QPX45	4500	16	760	13	200	5000	20	33	P	56 / 38 / 26	10 - 13
PT60QHX45	4500	16	1000	22.5	175	10000	40	13	H	100 / 63 / 26.5	18 - 22
PT85QWX45	4500	16	1670	37	200	22000	90	10	W	120 / 84.6 / 27.7	36 - 44

Note: 1. Please contact customer services for the availability of clamps for these devices.

The PT family of Pulsed Power Thyristors (PPTs) are based on Dynex's GTO technology, designed for long term stability under DC voltages. The structures are resistant to cosmic ray induced failures at normal working voltages.

The Pulsed Power Thyristor range may be used to connect a source of stored energy such as a capacitor to a load, or to bypass and protect the load in the case of a crowbar circuit. In pulsed power applications where the rate of current is very fast, the pulsed power switch acts as a closing switch and standard phase control thyristors (SCRs) are likely to fail due to the high di/dt experienced.

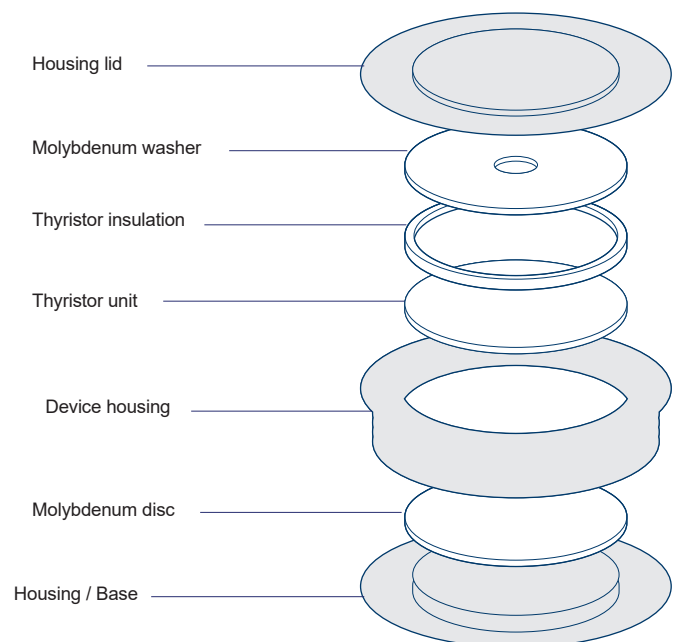
Pulsed Power Thyristors may also be required to act in the opening switch mode. Such applications may include; those where voltage is reapplied to the pulsed power switch shortly after closing, and the switch needs to have recovered blocking capability, or the transferred energy needs to be controlled. In these applications, the switch needs to have turn-off capability to reduce the natural turn-off time (t_q) of the device. The device is operated in GTO mode with the appropriate commutating gate drive. Dynex has been supplying thyristors used as crowbars to protect other high power circuitry in railway propulsion units for many years.

In the field of ignitron replacements and weld switches, Dynex has been a leader in the application of solid state devices. Dynex has been involved in the design and manufacture of assemblies for the pulsed power academic communities on the West Coast of America and at CERN, Switzerland.

For more information on how Dynex can help with your pulsed power needs, please e-mail us at powersolutions@dynexsemi.com

Thyristor Components

Take a look at the components that make up our encapsulated device. The devices are fully floating and therefore are not bonded together and are clamped together to achieve electrical and thermal contact instead. This allows our products to have an excellent temperature cycling life expectancy.





Part Number	VRRM (V)	IF (AV) at TC = 100° (A)	IFSM at Tvj VR=0	I ² t at Tvj VR = 0 (MA ² s)	Rth(j-c) (°C/kW)	IFM (A)	VFM@ IFM & Tc= 25°C (V)	Outline Type Code	Flange OD Contact OD Height (mm)	Clamping Force (kN) min - max
Up to 1400V										
DRD520T14	1400	520	5.9	0.17	80	800	1.45	T	42/19/13.5	4-6
DRD710T14	1400	866	8.0	0.3	70	600	1.20	T	42/19/15	3.5-5
DRD1360D14	1400	1360	15.2	1.16	35	1500	1.3	D	47/29/14.5	8-12
DRD1510G14	1400	1510	16.8	1.41	35	1500	1.2	G	58/34/26.5	12-18
DRD2770F14	1400	2770	31	4.81	20	1500	1.05	F	75/47/26.5	18-26
DRD3220X14	1400	3220	35.8	6.41	18	3000	1.15	X	85/53/26.5	26-34
DRD4650C14	1400	4650	45	10.13	13	3000	1.05	C	100/63/26.5	40-50
DRD6080V14	1400	6080	60	18.00	10	3000	1.05	V	110/73/26.5	50-62
Up to 2200V										
DRD4890L15	1500	5794	57.0	16.2	13	3000	1.05	L	102/63/32.9	40-48
DRD2460F18	1800	2996	41.3	8.5	22	3400	1.18	F	76/48/26.5	18-22
DRD5460Y20	2000	6654	100.0	50.0	10	3000	1.00	Y	112.5/73/36.7	38-47
DRD410T22	2200	410	4.9	0.12	80	800	1.85	T	42/19/13.5	4-6
DRD990D22	2200	990	12.5	0.78	35	1500	1.60	D	47/29/14.5	8-12
DRD1100G22	2200	1100	13.9	0.966	35	1500	1.45	G	58/34/26.5	12-18
DRD2030F22	2200	2030	25.7	3.30	20	1500	1.20	F	75/47/26.5	18-26
DRD2360X22	2200	2360	29.8	4.44	18	3000	1.35	X	85/53/26.5	26-34
DRD3430C22	2200	3430	42.2	8.9	13	3000	1.20	C	100/63/26.5	40-50
DRD4460V22	2200	4460	56.4	15.90	10	3000	1.15	V	110/73/26.5	50-62
DRD6380W22	2200	6380	78	30.42	7	6000	1.09	W	120/84/26.5	62-78
DRD6800A22	2200	6800	94	44.18	6	6000	1.03	A	150/100/35	80-100
DRD8880H22	2200	8880	125	78.13	4	6000	0.98	H	172/110/35	110-130
Up to 3000V										
DRD2880L25	2500	3438	32.0	5.12	13	1500	1.05	L	102/63/34.1	40-48
DRD4780Y26	2600	5788	81.0	33.0	10	3000	1.05	Y	112/73/37.7	38-47
DRD1960F28	2800	2372	31.3	4.9	22	3400	1.30	F	76/48/27	18-22
DRD6990M28	2800	8790	95.0	45.1	6	3000	0.97	M	148/100/26	75-91
DRD1320G30	3000	1850	20.0	2.0	32	1800	1.30	G	58.5/34/27	11.5-13.5
Up to 3400V										
DRD850D34	3400	850	10.8	0.583	35	1500	1.95	D	47/29/14.5	8-12
DRD960G34	3400	960	12	0.72	35	1500	1.7	G	58/34/26.5	12-18
DRD1830F34	3400	1830	23	2.65	20	1500	1.35	F	75/47/26.5	18-26
DRD2050X34	3400	2050	25.8	3.33	18	3000	1.55	X	85/53/26.5	26-34
DRD2980C34	3400	2980	36.5	6.66	13	3000	1.35	C	100/63/26.5	40-50
DRD3920V34	3400	3920	49.5	12.25	10	3000	1.25	V	110/73/26.5	50-62
DRD5240W34	3400	5240	64.2	20.61	7	6000	1.29	W	120/84/26.5	62-78
DRD6140A34	3400	6140	84.4	35.62	6	6000	1.1	A	150/100/35	80-100
DRD7810H34	3400	7810	118	69.62	4	6000	1.1	H	172/110/35	110-130
Up to 4000V										
DRD870G40	4000	870	15	1.13	32	1800	1.6	G	58.5/34/27	11.5-13.5
DRD1230F40	4000	1225	25	3.13	22	3400	1.6	F	76/48/27	18-22
DRD2960Y40	4000	2960	62.5	19.53	10	3000	1.25	Y	112.5/73/37.7	38-47
DRD3390V40	4000	3388	62.5	19.53	8	3000	1.25	V	112.5/73/27	38-47
DRD4350A40	4000	4350	83	34.50	7	3000	1.06	A	148/100/35	75-91

Rectifier Diodes

Part Number	VRRM (V)	IF (AV) at TC = 100° (A)	IFSM at Tvj VR=0	I ² t at Tvj VR = 0 (MA ² s)	Rth(j-c) (°C/KW)	IFM (A)	VFM@ IFM & Tc= 25°C (V)	Outline Type Code	Flange OD Contact OD Height (mm)	Clamping Force (kN) min - max
Up to 5000V										
DRD2000L45	4500	2000	31	3.92	13	3000	1.4	L	102/63/32.9	40-48
DRD6290H45	4500	6290	99.4	49.4	4	6000	1.19	H	172/110/35	110-130
DRD1100F48	4800	1105	20.5	2.13	22	3400	1.8	F	76/48/27	18-22
DRD710G50	5000	710	11.5	0.66	32	1800	1.8	G	58.5/34/ 27	11.5-13.5
DRD2690Y50	5000	2691	55	15.12	10	3000	1.21	Y	112.5/73/37.7	38-47
DRD3080V50	5000	3083	55	15.12	8	3000	1.21	V	112.5/73/27	38-47
Up to 6000V										
DRD5940H55	5500	5940	93.60	43.8	4	6000	1.26	H	172/110/36	110-130
DRD3770A52	5200	3768	70	24.50	7	3000	1.17	A	148/100 /35.0	75-91
DRD3120B55	5500	3120	51.7	13.364	9	3000	1.31	B	120/78/35	62-78
DRD630G60	6000	630	10.5	0.555	32	1800	2.1	G	58.5/34/27	11.5-13.5
DRD1010F60	6000	1015	16.5	1.425	22	3400	2.1	F	76/48/27	18-22
Up to 7200V										
DRD5150H65	6500	5150	82.5	34	4	6000	1.65	H	172/110/36	110-130
DRD4950H72	7200	4950	79	31.2	4	6000	1.71	H	172/110/36	110-130
Up to 9000V										
DRD4690H85	8500	4690	74.5	27.75	4	6000	1.31	H	172/110/36	110-130
DRD560G90	9000	530	76.5	0.29	32	1200	2.95	G	58/34/26.5	11-13

Fast Recovery Diodes

Part Number	VRRM (V)	IT (AV) at TC= 65°C (A)	IFSM at Tvj VR=0 (kA)	I ² t at Tvj VR = 0 (MA ² s)	IFM (A)	VF (V)	Qr (μC)	t _{rr} (μs)	Outline Type Code	Flange OD Contact OD Height (mm)	Clamping Force (kN) min - max
Up to 1400V											
DF451	1600	295	3.5	0.061	600	2.65	25	1.22	T	42/19/15	4.5-5.5
Up to 2500V											
DSF8025SE	2500	650	7.5	0.281	1000	2.3	540	5	E	42/25/15	7-9
DF051	2500	1490	14	0.98	1500	1.85	800	5	F	76/48/27	21-25
Up to 4500V											
DSF8045SK	4500	430	3.5	0.061	1000	4	440	3.07	K	42/25/27	7-9
DSF20545SF	4500	1250	16	1.28	1800	2.1	1250	7	F	76/48/27	17.5-21.5
DSF21545SV	4500	3200	20	2	3000	2	1800	7	V	112.5/73/27	34-48
Up to 6000V											
DSF11060SG	6000	400	4.2	0.09	600	3.8	700	6	G	58.5/34/27	10.8-13.2

Part Number	VRRM (V)	IF (AV) at TC = 100° (A)	IFSM at Tvj VR=0 (kA)	I ² t at Tvj VR = 0 (MA ² s)	Rth(j-c) (°C/KW)	IFM (A)	VFM@ IFM & TC= 25°C (V)	Outline Type Code	Clamping Force (kN) min - max
Up to 4500V									
S1104SXU30	3000	860	16	1.28	650	1800	1.225	Z	0-22
S1107SXU40	4000	570	12	0.72	650	1800	1.55	Z	0-22
S1109SXU50	5000	470	9.2	0.441	650	1800	2.1	Z	0-22
S1112SXU60	6000	412	8.5	0.361	650	1800	2.6	Z	0-22

Rectifier Diodes

The Dynex range of Rectifier Diodes are suitable for DC motor control, power supplies, welding and battery charges.

KEY FEATURES

- ✓ Current ratings of 410A average to to 8800A average
- ✓ Voltage ratings of 1.4kV to 9kV
- ✓ Double side cooling
- ✓ High surge capability

Fast Recovery Diodes

The Dynex range of Fast Recovery Diodes are designed to be used as snubber and anti-parallel diodes for use with its GTO.

KEY FEATURES

- ✓ Voltage ratings from 1.6KV to 6kV
- ✓ Lifetime controlled for fast recovery, low recovery charge
- ✓ Low transient turn-on voltage
- ✓ High surge capability
- ✓ Double side cooling

Flat Base Rectifier Diodes

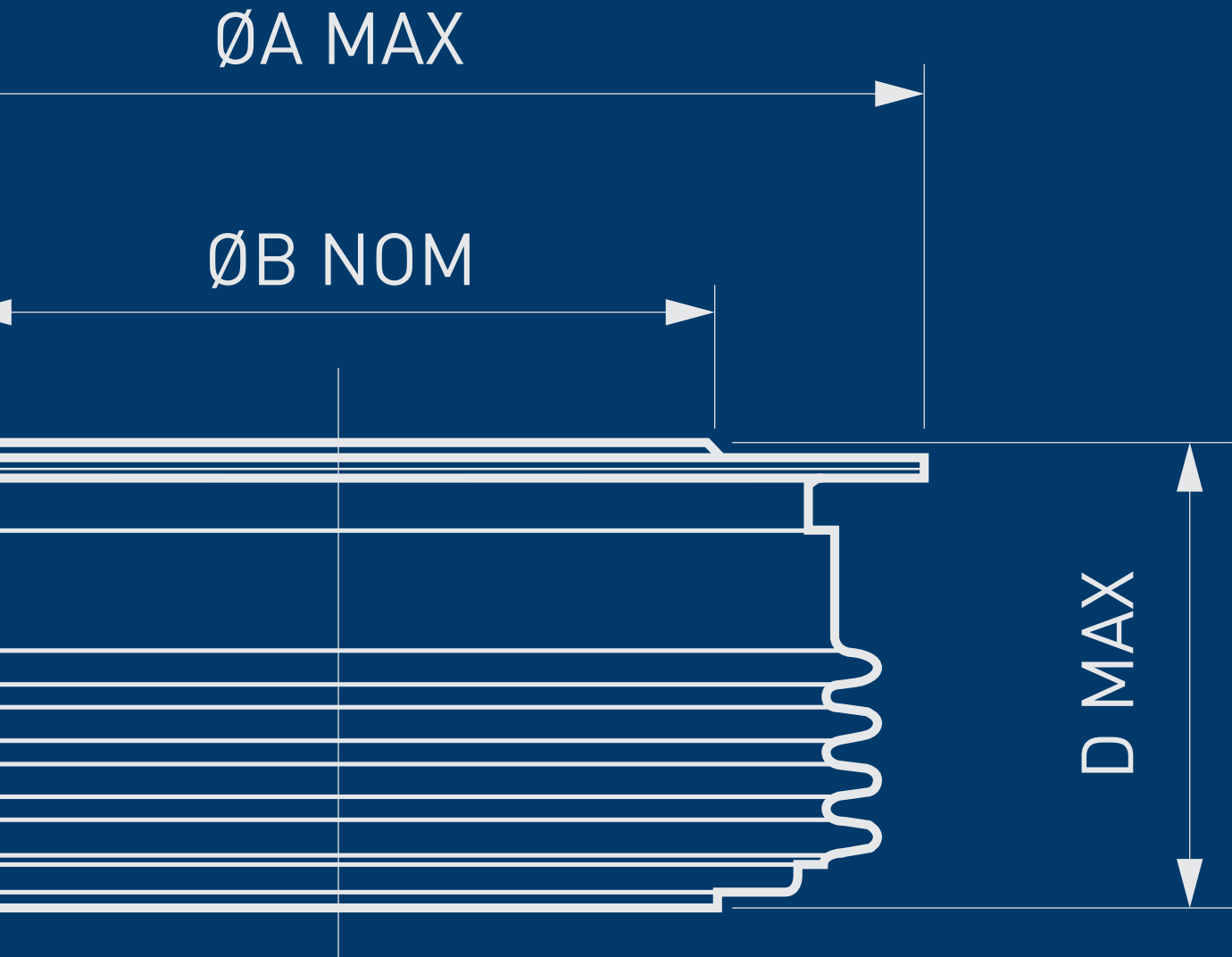
The Dynex range of Flat Base Rectifier Diodes convert AC to DC, for the refurbishment of industrial and chemical rectifiers and aluminium pot lines.

KEY FEATURES

- ✓ Current ratings of 412A average to 860A average
- ✓ Voltage ratings of 3kV to 6kV
- ✓ Low losses for high efficiency
- ✓ Hermetically sealed for long operational life
- ✓ Easily mounted down with M8 bolts on 46mm centres
- ✓ Available anode to base and cathode to base
- ✓ Selections available for parallel operation



Explanation of Part Numbers



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

Rectifier Diodes

Example Part Number: DRD2690Y50-1234

D	Dynex Semiconductor Identifier
RD	Rectifier Diode
2690	Average current rating at 100°C case temperature
Y	Case Outline
50	Vrrm/100
-1234	Special Selection Number

*See page 32 for Package outlines

Gate Turn-off Thyristors

Example Part Number: DGT304SE13-123

D	Dynex Semiconductor Identifier
G	GTO
T	Optional indicates reverse blocking
30	Pellet size code
4	Factory code
S	Iteration A,B,C etc
E	Case Outline
13	Vdrm
-123	Special Selection Number

*See page 33 for Package outlines

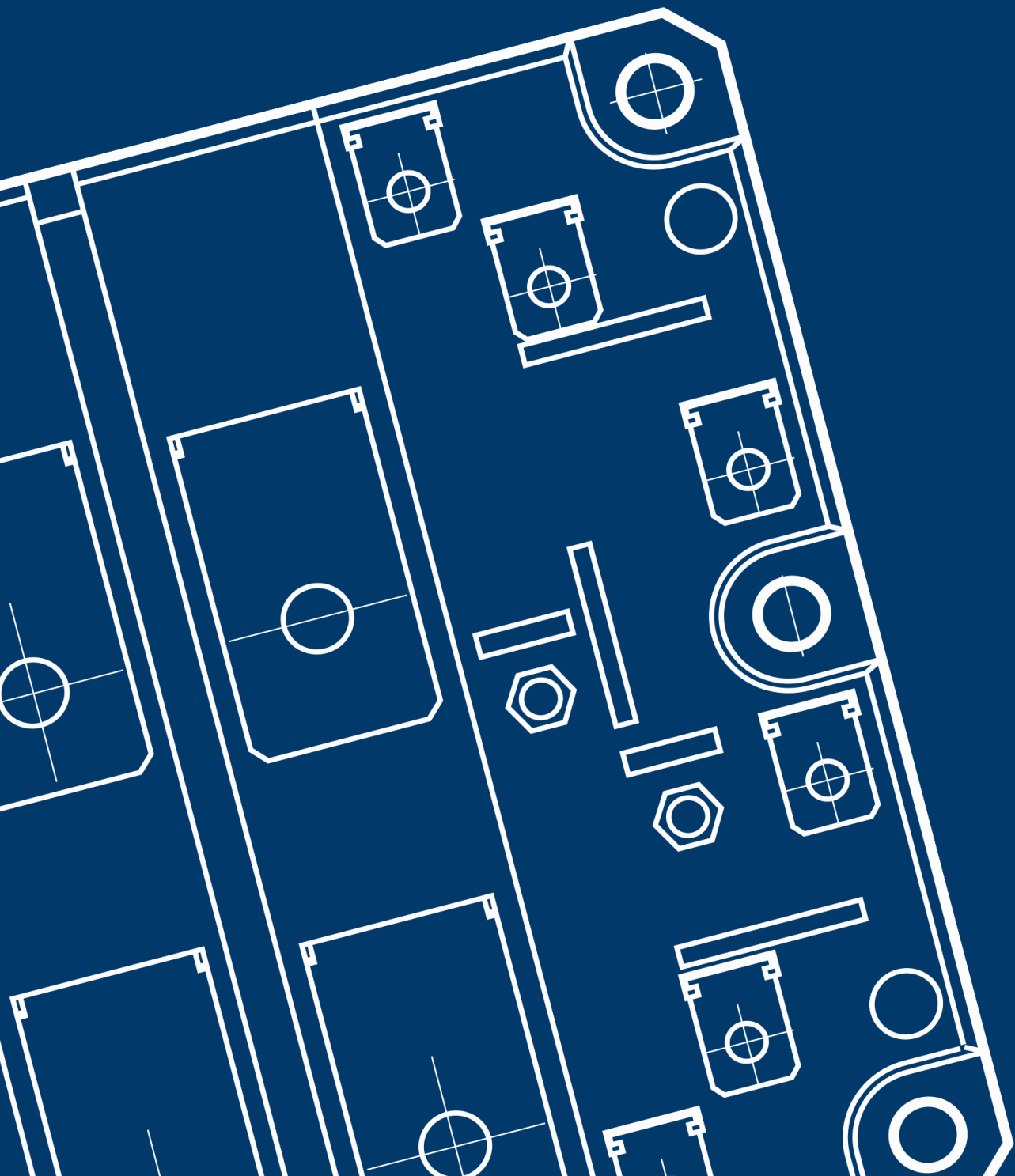
Asymmetric Thyristors

Example Part Number: ACR2900VR45-1234

A	Asymmetric
CR	Controlled Rectifier (Thyristor)
2900	Average current rating at 60°C case temperature
V	Case Outline
R/F	Reverse/Forward Blocking type
45	Vrrm /100 or Vdrm /100
-1234	Special Selection Number

*See page 32 for Package outlines

Package Outlines



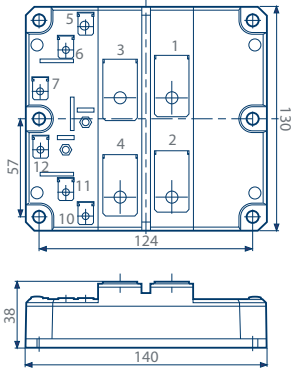
Package Outlines - IGBT Modules

Module Outlines and Circuit Configurations

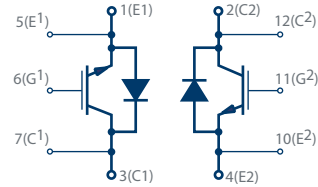
All dimensions shown in mm unless stated otherwise.

Package Type: D

Nominal weight: 1000g/1600g

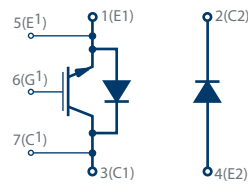


Dual Switch - DDM/S



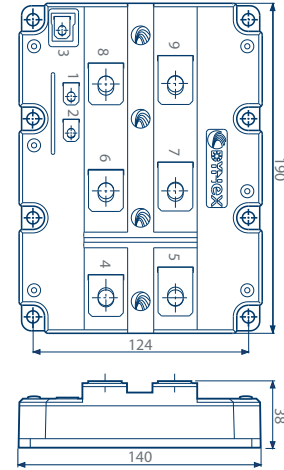
C1 and C2 - Aux Collector
E1 and E2 - Aux Emitter
G1 and G2 - Gate

Chopper switch - DCM/S

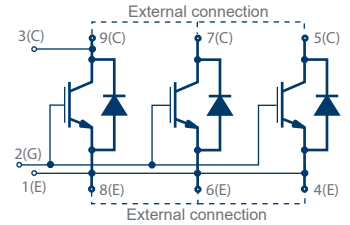


Package Type: E

Nominal weight: 1700g



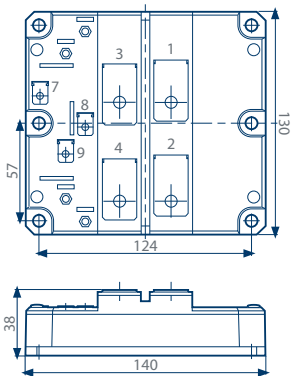
Single Switch - ESM



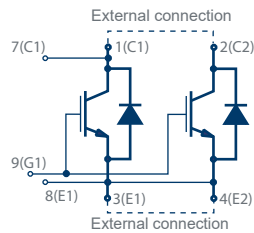
3 - Aux Collector
2 - Gate
1 - Aux Emitter

Package Type: F

Nominal weight: 1000g/1600g



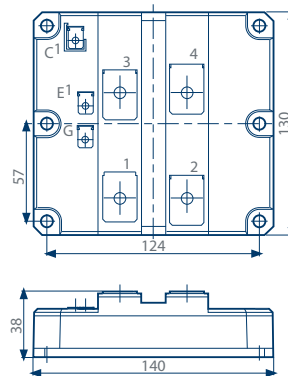
Single Switch - FSM/S



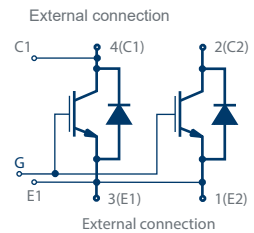
C1 - Aux Collector
E1 - Aux Emitter
G1 - Gate

Package Type: N

Nominal weight: 1000g



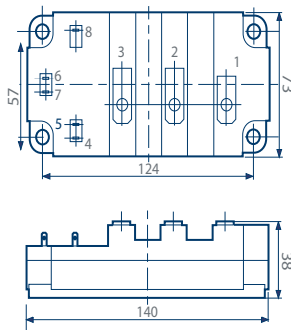
Single Switch - NSM



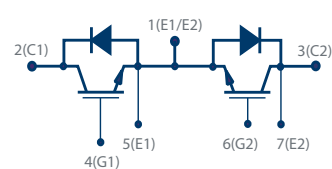
C1 - Aux Collector
E1 - Aux Emitter
G - Gate

Package Type: P

Nominal weight: 500/750g

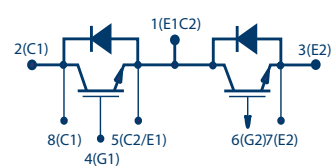


Bi-directional Switch - PBM



C1 - Aux Collector
E1 and E2 - Aux Emitter
G1 and G2 - Gate

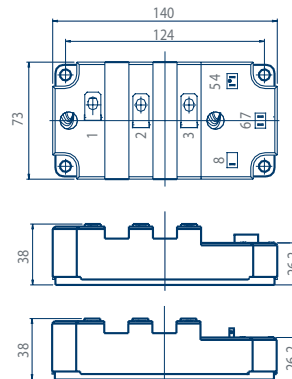
Half Bridge - PHM



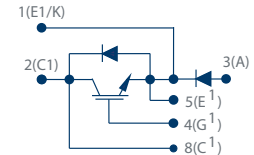
C1 - Aux Collector
E1 and E2 - Aux Emitter
G1 and G2 - Gate

Package Type: P

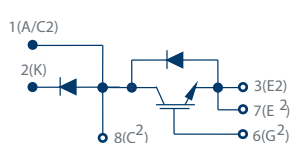
Nominal weight: 500g



Chopper High Side - PKM



Chopper Low Side - PLM



Notes:

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

Package Outlines - IGBT Modules

Module Outlines and Circuit Configurations

All dimensions shown in mm unless stated otherwise.

Package Type: G Nominal weight: 1000g

Dual Switch - GDM

C1 and C2 - Aux Collector
E1 and E2 - Aux Emitter
G1 and G2 - Gate

Chopper Switch - GCM

C1 and C2 - Aux Collector
E1 and E2 - Aux Emitter
G1 and G2 - Gate

Package Type: X Nominal weight: 1100g

Single Switch - XSM

External connection

Chopper Switch - XCM

Package Type: A Nominal weight: 1700g

Single Switch - ASM

External connection

Chopper Switch - ACM

External connection

3 - Aux Collector
2 - Gate
1 - Aux Emitter

Package Type: H2 Nominal weight: 900g

Half Bridge - H2HM

C1 - Aux Collector
E1 and E2 - Aux Emitter
G1 and G2 - Gate

Package Type: H1 Nominal weight: 1700g

Half Bridge - H1HM

C1 - Aux Collector
E1 and E2 - Aux Emitter
G1 and G2 - Gate

Package Type: M1 Nominal weight: 345g

Half Bridge - M1HM

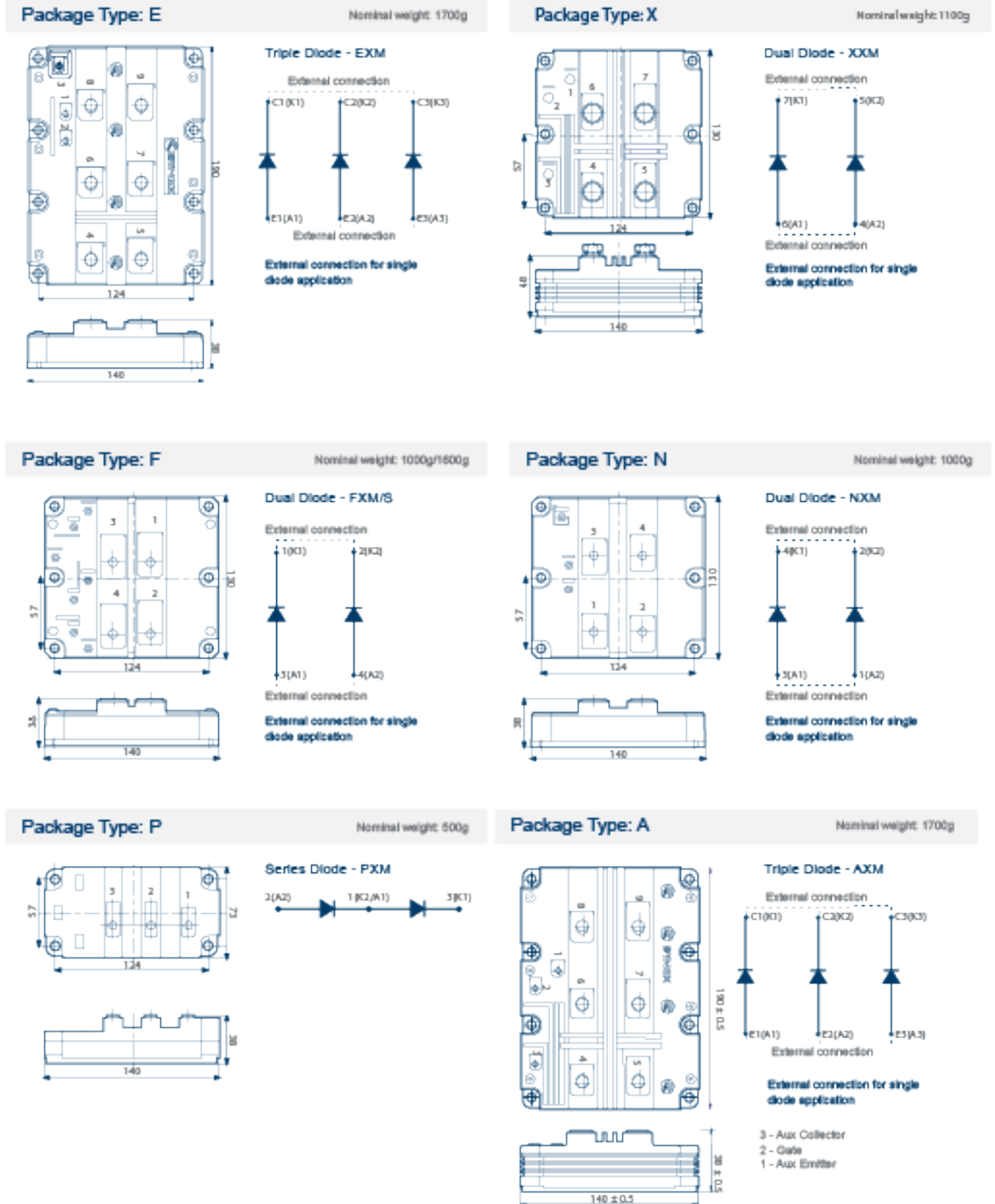
Notes:

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

Package Outlines - FRD Modules

Module Outlines and Circuit Configurations

All dimensions shown in mm unless stated otherwise.



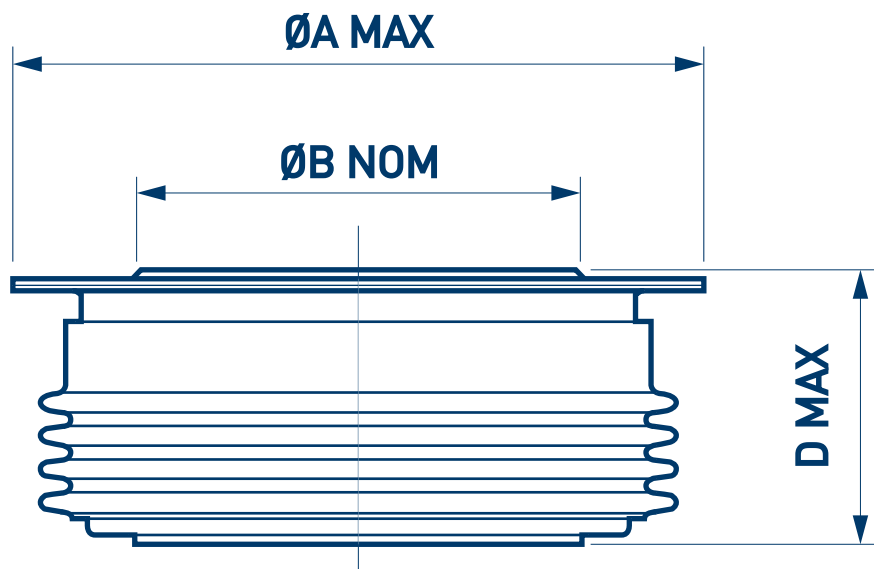
Notes:

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

Package Outlines - Thyristor & Diodes

Thyristor and Diode Outlines

For detailed dimensions, see datasheet on www.dynexsemi.com



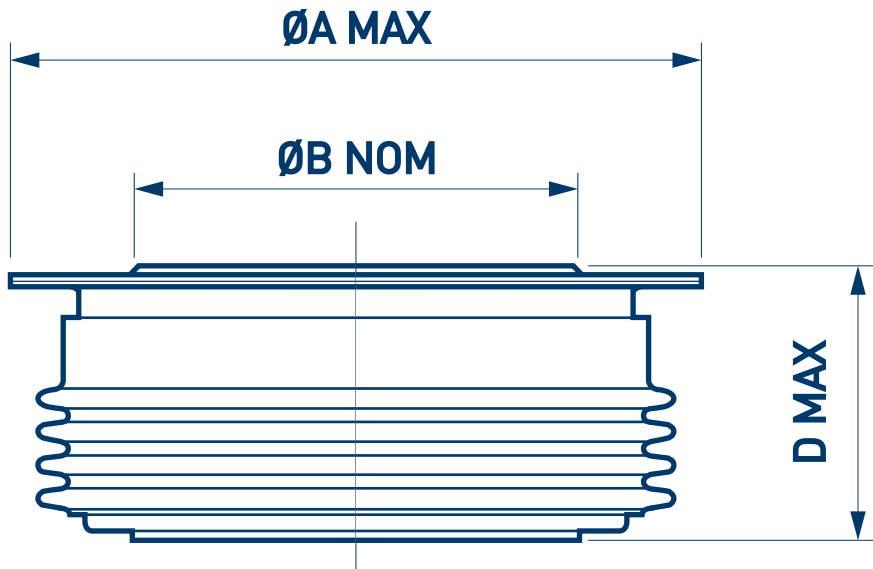
Outline	Flange (A) [mm] Max*	Pole (B) [mm] Nominal*	Depth (D) [mm] Maximum	Weight (kg)
A	148 & 150	100	37	2.6
B	120	85	36	1.5
C	99 & 102	63	28	0.8
D	47	29	15	0.24
E	42	25	15	0.082
F	73 & 75	47	28	0.433
G	57 & 58	35	28	0.25
H	172	110	36	3.5
J	57 & 58	34	36	0.322
K	42	25	27	0.16
L	99 & 100 & 102	63	36	1.05
M	148 & 150	100	27	1.95
N	73 & 75	47	36	0.48
T	42	19	15	0.055
V	110 & 112	73	29	1.1
W	120	84	29	1.55
X	85	53	27	0.6
Y	112 & 120	73 & 78	36	1.45

Notes:

*The character '&' denotes we manufacture products in a generic outline, some of which have one flange/contact diameter and others that have a slightly different flange/contact diameter. There is no choice of flange/contact diameter for a specific device.

GTO Outlines

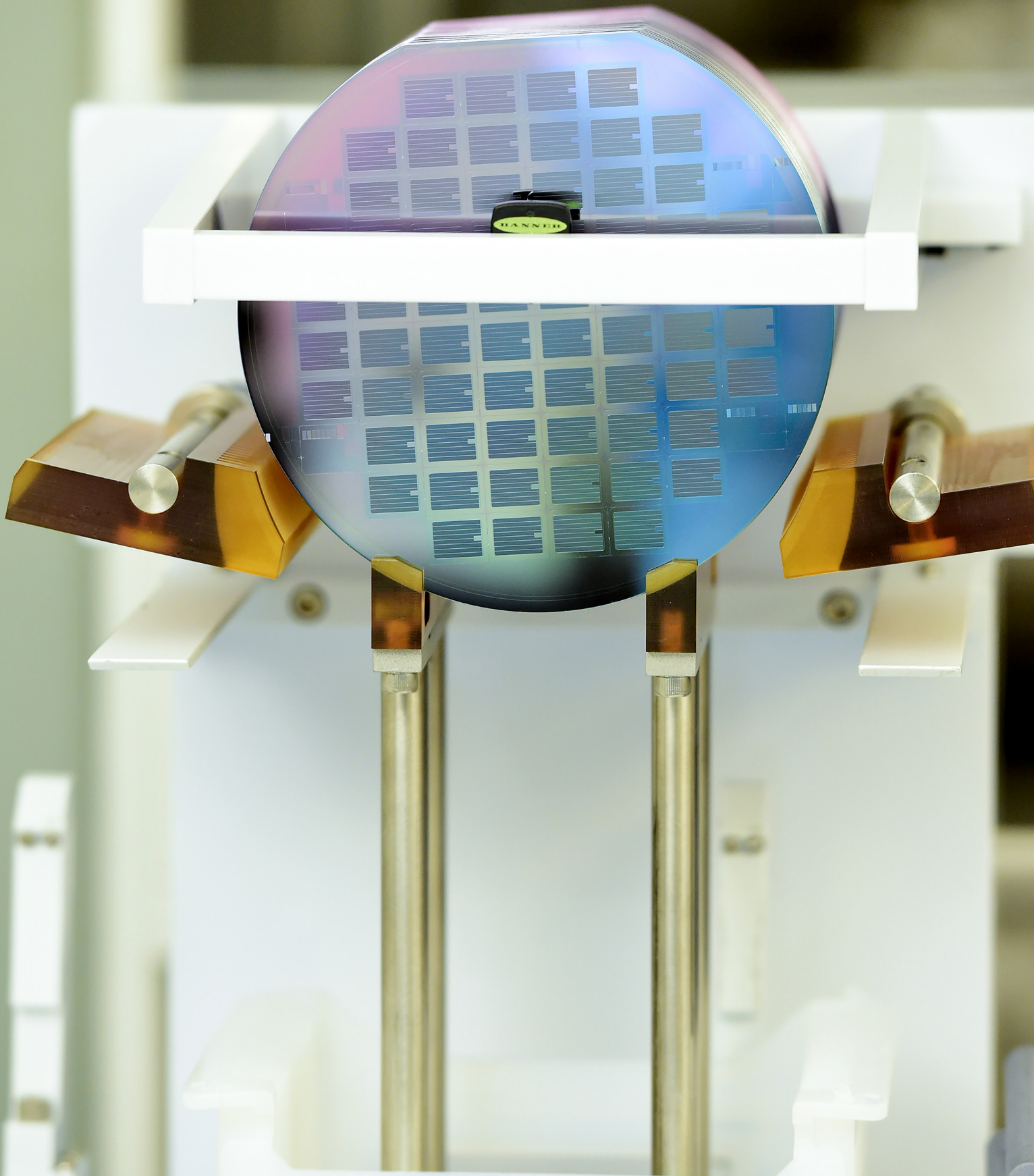
For detailed dimensions, see datasheet on www.dynexsemi.com



Outline	Flange/Max OD (A) [mm]	Pole (B) [mm]	Depth (D) [mm]	Weight (kg)
C	108	77	27	1.4
E	42	25	15	0.082
CA	56	38	36	0.46
H	100	63	27	0.82
P	56	38	27	0.35
W	120	85	27	1.7
v	85	53	27	1.2

Symbols and Definitions

C_S	Snubber capacitance	P_G	Gate power dissipation
di/dt	Critical rate of rise of on-state/forward current	P_{G(AV)}	Mean gate power dissipation
di_{FG}/dt	Rate of rise of positive gate current	P_{GM}	Peak gate power dissipation
di_{GQ}/dt	Rate of rise of reverse gate current (GTO)	Q_r	Recovered charge
di_T/dt	Critical rate of rise of on-state current (GTO)	Q_{rr}	Reverse recovery charge
dsc	Double side cooled	r_T	On-state/forward slope resistance
dV/dt	Critical rate of rise of off-state voltage	R_{th(c-hs)}	Thermal resistance – case to heatsink
dV_D/dt	Rate of rise of off-state voltage (GTO)	R_{th(j-c)}	Thermal resistance – junction to case
E_{OFF}	Turn-off energy loss	R_{th(j-hs)}	Thermal resistance – junction to heatsink
E_{rec}	Reverse recovery energy	R_{th(j-w)}	Thermal resistance – junction to water
E_{sw(TOT)}	Total switching energy	T_c	Case temperature
F_m/F	Clamping force/mounting torque	t_{gq}	Gate controlled turn-off time
I²t	I ² t value	t_q	Turn-off time
I_C	Collector current	t_{rr}	Reverse recovery time
I_{C(PK)}	Peak collector current	T_{HS}	Heatsink temperature
I_{DRM}	On-state leakage current (thyristor)	T_{vj}	Virtual junction temperature
I_F	Forward current (diode)	T_{vjm}	Maximum virtual junction temperature
I_{F(AV)}	Mean forward current (diode)	T_{water}	Water temperature
I_{FM}	Peak forward current (diode)	V_{CE(sat)}	Collector-emitter saturation voltage (IGBT)
I_{F(RMS)}	RMS forward current (diode)	V_{CES}	Collector-emitter voltage (IGBT)
I_{FSM}	Single cycle surge current (diode), (10ms half sinewave)	V_{DRM}	Repetitive peak off-state voltage
I_{G(ON)}	Gate turn-on current (GTO)	V_{DSM}	Non-repetitive peak off-state voltage
I_{GT}	Gate trigger current	V_F	Forward voltage (diode)
I_{RMS}	RMS line current	V_{FM}	Peak forward voltage (diode)
I_{PK}	Peak current	V_{isol}	Isolation voltage
I_{RRM}	Peak reverse recovery current	V_{GT}	Gate trigger voltage
I_{T(RMS)}	RMS on-state current (thyristor)	V_R	Reverse voltage
I_{T/I_{TM}}	On-state current	V_{RRM}	Repetitive peak reverse voltage
I_{T(AV)}	Mean on-state current (thyristor)	V_{RSM}	Non-repetitive peak reverse voltage
I_{TCM}	Maximum repetitive controllable current (GTO)	V_T	On-state voltage
I_{TSM}	Single cycle surge current (thyristor), (10ms half sinewave)	V_{TM}	Peak on-state voltage
		V_{TO}	Threshold voltage (diode)
		V_{T(TO)}	Threshold voltage (thyristor)



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