

# MiniPack 2 - IGBT Modules

**CBI**

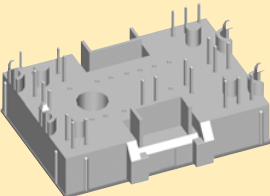
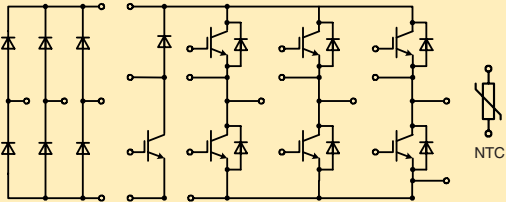


Fig. X110  
Outline drawings on page 188 - 224  
See data sheet for pin arrangements



| Type                      | Rectifier 3~ |  |                    | Inverter 3~ |                                   |                                   |                       |                    | Brake chopper             |                                   |                    |
|---------------------------|--------------|--|--------------------|-------------|-----------------------------------|-----------------------------------|-----------------------|--------------------|---------------------------|-----------------------------------|--------------------|
|                           | $V_{RRM}$    | $I_{FAVM}$<br>$T_H = 80^\circ\text{C}$ | $R_{thJC}$<br>typ. | $V_{CES}$   | $I_C$<br>$T_C = 25^\circ\text{C}$ | $I_C$<br>$T_C = 90^\circ\text{C}$ | $V_{CE(sat)}$<br>typ. | $R_{thJC}$<br>typ. | $V_{CES}$                 | $I_C$<br>$T_C = 90^\circ\text{C}$ | $R_{thJC}$<br>typ. |
| ► New                     | V            | A                                      | K/W                | V           | A                                 | A                                 | V                     | K/W                | V                         | A                                 | K/W                |
| <b>600 V NPT IGBT</b>     |              |  |                    |             |                                   |                                   |                       |                    |                           |                                   |                    |
| ► MIAA10WB600TMH          | 1600         | 62                                     | 2.1                | 600         | 18                                | 13                                | 2.1                   | 1.8                | 600                       | 13                                | 1.8                |
| ► MIAA10WF600TMH          | 1600         | 62                                     | 2.1                | 600         | 18                                | 13                                | 2.1                   | 1.8                | No brake chopper included |                                   |                    |
| ► MIAA15WB600TMH          | 1600         | 62                                     | 2.1                | 600         | 23                                | 16                                | 2.1                   | 1.6                | 600                       | 16                                | 1.6                |
| ► MIAA20WB600TMH          | 1600         | 62                                     | 2.1                | 600         | 29                                | 20                                | 2.1                   | 1.3                | 600                       | 20                                | 1.3                |
| <b>600 V Trench IGBT</b>  |              |  |                    |             |                                   |                                   |                       |                    |                           |                                   |                    |
| ► MITA30WB600TMH          | 1600         | 90                                     | 1.4                | 600         | 40                                | 27                                | 1.5                   | 1.4                | 600                       | 27                                | 1.4                |
| <b>1200 V Trench IGBT</b> |              |  |                    |             |                                   |                                   |                       |                    |                           |                                   |                    |
| ► MITA10WB1200TMH         | 1600         | 62                                     | 2.1                | 1200        | 16                                | 11                                | 1.8                   | 2.2                | 1200                      | 11                                | 2.2                |
| ► MITB10WB1200TMH         | 1600         | 62                                     | 2.1                | 1200        | 17                                | 12                                | 1.9                   | 1.95               | 1200                      | 12                                | 1.95               |
| ► MITB15WB1200TMH         | 1600         | 62                                     | 2.1                | 1200        | 24                                | 17                                | 1.7                   | 1.6                | 1200                      | 17                                | 1.6                |

**CBI**

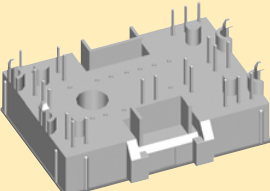
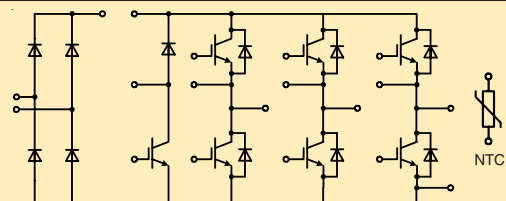


Fig. X110  
Outline drawings on page 188 - 224  
See data sheet for pin arrangements



| Type                  | Rectifier |  |                    | Inverter  |                                   |                                   |                       |                    | Brake chopper             |                                   |                    |
|-----------------------|-----------|--|--------------------|-----------|-----------------------------------|-----------------------------------|-----------------------|--------------------|---------------------------|-----------------------------------|--------------------|
|                       | $V_{RRM}$ | $I_{FAVM}$<br>$T_H = 80^\circ\text{C}$ | $R_{thJC}$<br>typ. | $V_{CES}$ | $I_C$<br>$T_C = 25^\circ\text{C}$ | $I_C$<br>$T_C = 90^\circ\text{C}$ | $V_{CE(sat)}$<br>typ. | $R_{thJC}$<br>typ. | $V_{CES}$                 | $I_C$<br>$T_C = 90^\circ\text{C}$ | $R_{thJC}$<br>typ. |
| ► New                 | V         | A                                      | K/W                | V         | A                                 | A                                 | V                     | K/W                | V                         | A                                 | K/W                |
| <b>600 V NPT IGBT</b> |           |  |                    |           |                                   |                                   |                       |                    |                           |                                   |                    |
| ► MIAA10WE600TMH      | 1600      | 23                                     | 2.1                | 600       | 18                                | 13                                | 2.1                   | 1.8                | 600                       | 13                                | 1.8                |
| ► MIAA10WD600TMH      | 1600      | 23                                     | 2.1                | 600       | 18                                | 13                                | 2.1                   | 1.8                | No brake chopper included |                                   |                    |
| ► MIAA15WE600TMH      | 1600      | 23                                     | 2.1                | 600       | 23                                | 16                                | 2.1                   | 1.6                | 600                       | 16                                | 1.6                |
| ► MIAA15WD600TMH      | 1600      | 23                                     | 2.1                | 600       | 23                                | 16                                | 2.1                   | 1.6                | No brake chopper included |                                   |                    |
| ► MIAA20WE600TMH      | 1600      | 23                                     | 2.1                | 600       | 29                                | 20                                | 2.1                   | 1.3                | 600                       | 20                                | 1.3                |
| ► MIAA20WD600TMH      | 1600      | 23                                     | 2.1                | 600       | 29                                | 20                                | 2.1                   | 1.3                | No brake chopper included |                                   |                    |

## Nomenclature

| M | I | AA | 10 | WB | 600 | T | MH | Sample                            |
|---|---|----|----|----|-----|---|----|-----------------------------------|
| M |   |    |    |    |     |   |    | Module                            |
|   | I |    |    |    |     |   |    | IGBT                              |
|   |   | AA |    |    |     |   |    | NPT                               |
|   |   | TA |    |    |     |   |    | Trench standard version           |
|   |   | TB |    |    |     |   |    | Trench fast version               |
|   |   |    | 10 |    |     |   |    | Current                           |
|   |   |    |    | W  |     |   |    | Six-Pack                          |
|   |   |    |    | WB |     |   |    | Six-Pack with 3~ bridge and brake |
|   |   |    |    | WE |     |   |    | Six-Pack with 1~ bridge and brake |
|   |   |    |    |    | 600 |   |    | Voltage                           |
|   |   |    |    |    |     | T |    | NTC inside                        |
|   |   |    |    |    |     |   | MH | MiniPack 2 housing                |

# CBI Modules

CBI = Converter Brake Inverter

three phase rectifier, IGBT brake chopper, three phase IGBT inverter, temperature sensor

| <b>CBI 1</b><br>IGBT Modules       |              |  |                    |  |                                   |                                   |                       |                    |               |                                   |                    |  |
|------------------------------------|--------------|--|--------------------|--|-----------------------------------|-----------------------------------|-----------------------|--------------------|---------------|-----------------------------------|--------------------|--|
|                                    |              |  |                    | <b>Package style</b><br>Outline drawings on page 188 - 224 |                                   |                                   |                       |                    |               |                                   |                    |  |
| Type                               | Rectifier 3~ |  |                    | Inverter 3~  |                                   |                                   |                       |                    | Brake chopper |                                   |                    |  |
|                                    | $V_{RRM}$    | $I_{DAVM}$<br>$T_H = 80^\circ\text{C}$ | $R_{thJC}$<br>typ. | $V_{CES}$  | $I_C$<br>$T_C = 25^\circ\text{C}$ | $I_C$<br>$T_C = 80^\circ\text{C}$ | $V_{CE(sat)}$<br>typ. | $R_{thJC}$<br>typ. | $V_{CES}$     | $I_C$<br>$T_C = 80^\circ\text{C}$ | $R_{thJC}$<br>typ. |  |
| ► New                              | V            | A                                      | K/W                | V  | A                                 | A                                 | V                     | K/W                | V             | A                                 | K/W                |  |
| <b>600 V NPT IGBT</b>              |              |  |                    |  |                                   |                                   |                       |                    |               |                                   |                    |  |
| MUBW 10-06A6K                      | 1600         | 61                                     | 2.1                | 600  | 12                                | 8                                 | 2.5                   | 2.8                | 600           | 8                                 | 2.8                |  |
| MUBW 15-06A6K                      |              | 65                                     | 1.9                |  | 19                                | 14                                | 2.4                   | 1.7                |               | 8                                 | 2.8                |  |
| MUBW 20-06A6K                      |              | 65                                     | 1.9                |  | 25                                | 17                                | 2.0                   | 1.5                |               | 8                                 | 2.8                |  |
| MUBW 25-06A6K                      |              | 65                                     | 1.9                |  | 31                                | 21                                | 2.1                   | 1.25               |               | 14                                | 1.7                |  |
| MUBW 35-06A6K                      |              | 89                                     | 1.4                |  | 42                                | 29                                | 2.3                   | 0.95               |               | 17                                | 1.5                |  |
| <b>1200 V NPT IGBT</b>             |              |  |                    |  |                                   |                                   |                       |                    |               |                                   |                    |  |
| MUBW 15-12A6K                      | 1600         | 89                                     | 1.4                | 1200   | 19                                | 13                                | 3.0                   | 1.35               | 1200          | 13                                | 1.35               |  |
| MUBW 30-12A6K                      |              | 89                                     | 1.4                |  | 30                                | 21                                | 3.0                   | 0.95               |               | 13                                | 1.35               |  |
| <b>1200 V NPT<sup>3</sup> IGBT</b> |              |  |                    |  |                                   |                                   |                       |                    |               |                                   |                    |  |
| ► MUBW 30-12E6K                    | 1600         | 89                                     | 1.4                | 1200   | 30                                | 21                                | 3.1                   | 0.95               | 1200          | 13                                | 1.35               |  |
| <b>1200 V Trench IGBT</b>          |              |  |                    |  |                                   |                                   |                       |                    |               |                                   |                    |  |
| ► MUBW 45-12T6K                    | 1600         | 104                                    | 1.1                | 1200   | 43                                | 31                                | 2.5                   | 0.8                | 1200          | 13                                | 1.35               |  |

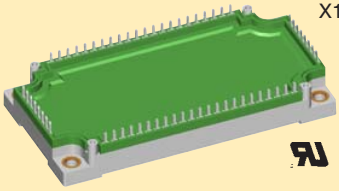
| <b>CBI 2</b><br>IGBT Modules       |              |   |                    |  |                                   |                                   |                       |                    |               |                                   |                    |  |
|------------------------------------|--------------|---|--------------------|--|-----------------------------------|-----------------------------------|-----------------------|--------------------|---------------|-----------------------------------|--------------------|--|
|                                    |              |   |                    | <b>Package style</b><br>Outline drawings on page 188 - 224 |                                   |                                   |                       |                    |               |                                   |                    |  |
| Type                               | Rectifier 3~ |   |                    | Inverter 3~  |                                   |                                   |                       |                    | Brake chopper |                                   |                    |  |
|                                    | $V_{RRM}$    | $I_{DAVM}$<br>$T_C = 80^\circ\text{C}$<br>$d = 1/3$ | $R_{thJC}$<br>max. | $V_{CES}$  | $I_C$<br>$T_C = 25^\circ\text{C}$ | $I_C$<br>$T_C = 80^\circ\text{C}$ | $V_{CE(sat)}$<br>typ. | $R_{thJC}$<br>max. | $V_{CES}$     | $I_C$<br>$T_C = 80^\circ\text{C}$ | $R_{thJC}$<br>max. |  |
| ► New                              | V            | A   | K/W                | V  | A                                 | A                                 | V                     | K/W                | V             | A                                 | K/W                |  |
| <b>600 V NPT IGBT</b>              |              |   |                    |  |                                   |                                   |                       |                    |               |                                   |                    |  |
| MUBW 10-06A7                       | 1600         | 18  | 1.5                | 600  | 20                                | 15                                | 1.9                   | 1.5                | 600           | 15                                | 1.5                |  |
| MUBW 15-06A7                       |              | 18  | 1.5                |  | 25                                | 18                                | 1.9                   | 1.3                |               | 15                                | 1.5                |  |
| MUBW 20-06A7                       |              | 24  | 1.3                |  | 35                                | 25                                | 1.9                   | 1.0                |               | 18                                | 1.4                |  |
| MUBW 30-06A7                       |              | 24  | 1.3                |  | 50                                | 35                                | 1.9                   | 0.7                |               | 18                                | 1.3                |  |
| MUBW 50-06A7                       |              | 29  | 1.1                |  | 75                                | 50                                | 1.9                   | 0.5                |               | 25                                | 1.0                |  |
| <b>1200 V NPT IGBT</b>             |              |   |                    |  |                                   |                                   |                       |                    |               |                                   |                    |  |
| MUBW 10-12A7                       | 1600         | 18  | 1.5                | 1200   | 20                                | 15                                | 2.3                   | 1.2                | 1200          | 15                                | 1.2                |  |
| MUBW 15-12A7                       |              | 24  | 1.3                |  | 35                                | 25                                | 2.0                   | 0.7                |               | 15                                | 1.2                |  |
| MUBW 25-12A7                       |              | 24  | 1.3                |  | 50                                | 35                                | 2.2                   | 0.55               |               | 15                                | 1.2                |  |
| MUBW 35-12A7                       |              | 29  | 1.1                |  | 50                                | 35                                | 2.5                   | 0.55               |               | 25                                | 0.7                |  |
| <b>1200 V NPT<sup>3</sup> IGBT</b> |              |   |                    |  |                                   |                                   |                       |                    |               |                                   |                    |  |
| MUBW 35-12E7                       | 1600         | 29  | 1.1                | 1200   | 52                                | 36                                | 2.2                   | 0.55               | 1200          | 25                                | 0.7                |  |
| <b>1200 V Trench IGBT</b>          |              |   |                    |  |                                   |                                   |                       |                    |               |                                   |                    |  |
| ► MUBW 15-12T7                     | 1600         | 24  | 1.3                | 1200   | 25                                | 15                                | 1.7                   | 1.2                | 1200          | 15                                | 1.2                |  |
| ► MUBW 25-12T7                     |              | 24  | 1.3                |  | 40                                | 25                                | 1.7                   | 0.8                |               | 15                                | 1.2                |  |
| ► MUBW 40-12T7                     |              | 80  | 1.3                |  | 62                                | 44                                | 2.0                   | 0.6                |               | 25                                | 0.7                |  |

# CBI Modules

CBI = Converter Brake Inverter

three phase rectifier, IGBT brake chopper, three phase IGBT inverter, temperature sensor

**CBI 3**  
IGBT Modules



X113

**Package style**  
Outline drawings on page 188 - 224

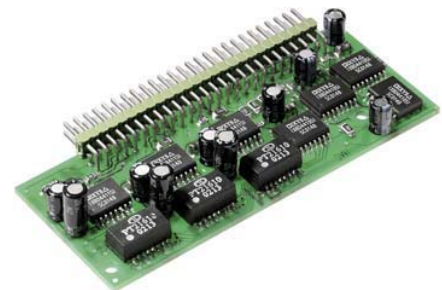


| Type                               | Rectifier 3~ |   |                    | Inverter 3~ |                                   |                                   |                       |                    | Brake chopper |                                   |                    |
|------------------------------------|--------------|---|--------------------|-------------|-----------------------------------|-----------------------------------|-----------------------|--------------------|---------------|-----------------------------------|--------------------|
|                                    | $V_{RRM}$    | $I_{DAVM}$<br>$T_C = 80^\circ\text{C}$<br>$d = 1/3$ | $R_{thJC}$<br>max. | $V_{CES}$   | $I_C$<br>$T_C = 25^\circ\text{C}$ | $I_C$<br>$T_C = 80^\circ\text{C}$ | $V_{CE(sat)}$<br>typ. | $R_{thJC}$<br>max. | $V_{CES}$     | $I_C$<br>$T_C = 80^\circ\text{C}$ | $R_{thJC}$<br>max. |
| ► New                              | V            | A   | K/W                | V           | A                                 | A                                 | V                     | K/W                | V             | A                                 | K/W                |
| <b>600 V NPT IGBT</b>              |              |   |                    |             |                                   |                                   |                       |                    |               |                                   |                    |
| MUBW 50-06A8                       | 1600         | 40  | 1.1                | 600         | 75                                | 50                                | 1.9                   | 0.5                | 600           | 25                                | 1.0                |
| MUBW 75-06A8                       |              | 46  | 0.94               |             | 100                               | 65                                | 2.0                   | 0.39               |               | 35                                | 0.75               |
| MUBW 100-06A8                      |              | 60  | 0.73               |             | 125                               | 85                                | 1.9                   | 0.3                |               | 50                                | 0.55               |
| <b>1200 V NPT IGBT</b>             |              |   |                    |             |                                   |                                   |                       |                    |               |                                   |                    |
| MUBW 35-12A8                       | 1600         | 27  | 1.3                | 1200        | 50                                | 35                                | 2.5                   | 0.55               | 1200          | 25                                | 0.7                |
| MUBW 50-12A8                       |              | 46  | 0.94               |             | 85                                | 60                                | 2.2                   | 0.35               |               | 35                                | 0.55               |
| <b>1200 V NPT<sup>3</sup> IGBT</b> |              |   |                    |             |                                   |                                   |                       |                    |               |                                   |                    |
| MUBW 50-12E8                       | 1600         | 50  | 0.94               | 1200        | 90                                | 62                                | 1.9                   | 0.35               | 1200          | 35                                | 0.55               |
| <b>1200 V Trench IGBT</b>          |              |   |                    |             |                                   |                                   |                       |                    |               |                                   |                    |
| ► MUBW 50-12T8                     | 1600         | 50  | 0.94               | 1200        | 75                                | 50                                | 1.7                   | 0.45               | 1200          | 35                                | 0.55               |
| ► MUBW 75-12T8                     |              | 50  | 0.94               |             | 105                               | 75                                | 1.7                   | 0.35               |               | 35                                | 0.55               |
| <b>1700 V Trench IGBT</b>          |              |   |                    |             |                                   |                                   |                       |                    |               |                                   |                    |
| ► MUBW 50-17T8                     | 2200         | 120   | 1.1                | 1700        | 74                                | 53                                | 2.0                   | 0.43               | 1700          | 34                                | 0.62               |
| ► MUBW 75-17T8                     |              | 140   | 0.95               |             | 113                               | 80                                | 2.0                   | 0.28               |               | 34                                | 0.62               |

## Gate Driver Board GDBD 4410

Drives 7 Gates of a Converter – Brake – Inverter IGBT Power Module for Industrial Applications

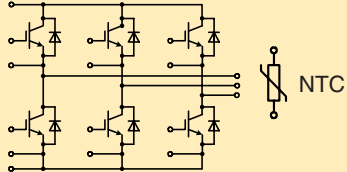
GDBD 4410 simplifies driving CBI2 and CBI3 module types. Pin locations of the driver board match that of the CBI modules. Thus it can be mounted very close to the gate control pins of the module, providing the shortest possible traces from driver to the gate and an easy routing on the main inverter board. GDBD4410 is a fast and easy to use solution and ideal for small and medium inverter series.

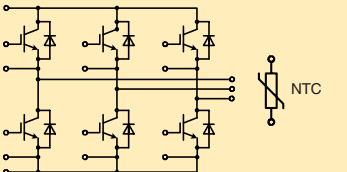


### Main features are:

- Drives CBI modules up to 100A/600V and 50A/1200V
- Driver for brake IGBT included
- Design is based on IXBD4410/11 chipset
- High output gate current up to  $\pm 2\text{A}$  peak per gate
- Integrated charge pump for negative gate drive to speed up IGBT turn off and the suppress spurious gate noise triggering
- Noise immune pulse transformer for high  $dV/dt$  applications ( $>50\text{kV}/\mu\text{s}$ )
- $V_{CE(sat)}$  sensing for short circuit protection
- Failure status signal
- Ground referenced and TTL/CMOS compatible interface for control signals
- +15V unipolar power supply required
- Operating frequency up to 25 kHz

# IGBT Modules - Six-Pack configuration

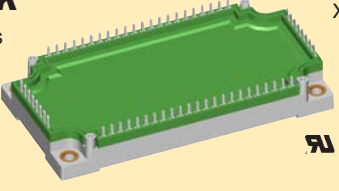
| <b>Six-Pack</b><br>IGBT Modules    |                | <b>X111</b><br>Package style<br>Outline drawings on page 188 - 224<br>See data sheet for pin arrangements |  |  |  |  |   |   |               |
|------------------------------------|----------------|---|--|--|--|---|---|---|---------------|
| Type                               | $V_{CES}$<br>V | $I_{C25}$<br>A<br>$T_C = 25^\circ\text{C}$<br>IGBT  | $I_{C80}$<br>A<br>$T_C = 80^\circ\text{C}$<br>IGBT | $V_{CE(sat)}$ typ<br>V<br>$T_J = 25^\circ\text{C}$<br>IGBT | $E_{off}$<br>mJ<br>$T_J = 125^\circ\text{C}$<br>IGBT | $R_{thJC}$<br>K/W<br>IGBT   | $I_{F25}$<br>A<br>$T_C = 25^\circ\text{C}$<br>diode | $I_{F80}$<br>A<br>$T_C = 80^\circ\text{C}$<br>diode | NTC<br>inside |
| <b>600 V PT IGBT</b>               |                |   |  |  |  |   |   |   |               |
| ► MWI 60-06G6K                     | 600            | 60  | 41   | 2.3  | 0.5  | 0.7   | 48  | 33  | yes           |
| <b>1200 V NPT IGBT</b>             |                |   |  |  |  |   |   |   |               |
| ► MWI 15-12A6K                     | 1200           | 19  | 13   | 3.0  | 1.1  | 1.37  | 24  | 16  | yes           |
| <b>1200 V NPT<sup>3</sup> IGBT</b> |                |   |  |  |  |   |   |   |               |
| ► MWI 30-12E6K                     | 1200           | 29  | 21   | 2.5  | 1.8  | 0.95  | 24  | 16  | yes           |
| ► MWI 50-12E6K                     |                | 51  | 36   | 2.4  | 2.6  | 0.6   | 49  | 32  | yes           |
| <b>1200 V Trench IGBT</b>          |                |   |  |  |  |   |   |   |               |
| ► MWI 45-12T6K                     | 1200           | 43  | 31   | 1.9  | 3.4  | 0.8   | 49  | 32  | yes           |
| ► MWI 60-12T6K                     |                | 58  | 41   | 1.9  | 4.8  | 0.62  | 49  | 32  | yes           |
| ► MWI 80-12T6K                     |                | 80  | 56   | 2.0  | 6.5  | 0.46  | 80  | 51  | yes           |

| <b>Six-Pack</b><br>IGBT Modules    |                | <b>X112</b><br>Package style<br>Outline drawings on page 188 - 224 |  |  |  |  |   |   |               |
|------------------------------------|----------------|--|--|--|--|---|---|---|---------------|
| Type                               | $V_{CES}$<br>V | $I_{C25}$<br>A<br>$T_C = 25^\circ\text{C}$<br>IGBT                 | $I_{C80}$<br>A<br>$T_C = 80^\circ\text{C}$<br>IGBT | $V_{CE(sat)}$ typ<br>V<br>$T_C = 25^\circ\text{C}$<br>IGBT | $E_{off}$<br>mJ<br>$T_J = 125^\circ\text{C}$<br>IGBT | $R_{thJC}$<br>K/W<br>IGBT   | $I_{F25}$<br>A<br>$T_C = 25^\circ\text{C}$<br>diode | $I_{F80}$<br>A<br>$T_C = 80^\circ\text{C}$<br>diode | NTC<br>inside |
| <b>600 V NPT IGBT</b>              |                |  |  |  |  |   |   |   |               |
| MWI 30-06A7                        | 600            | 45   | 30   | 1.9  | 1.0  | 0.88  | 36  | 24  | optional      |
| MWI 50-06A7                        |                | 75   | 50   | 1.9  | 1.7  | 0.55  | 72  | 45  | optional      |
| MWI 75-06A7                        |                | 90   | 60   | 2.1  | 2.5  | 0.44  | 140   | 85  | optional      |
| <b>1200 V NPT IGBT</b>             |                |  |  |  |  |   |   |   |               |
| MWI 15-12A7                        | 1200           | 30   | 20   | 1.0  | 1.8  | 0.88  | 25  | 17  | no            |
| MWI 25-12A7                        |                | 50   | 35   | 2.2  | 2.8  | 0.55  | 50  | 33  | optional      |
| MWI 35-12A7                        |                | 62   | 44   | 2.2  | 4.2  | 0.44  | 50  | 33  | optional      |
| MWI 50-12A7                        |                | 85   | 60   | 2.2  | 5.6  | 0.35  | 110   | 70  | optional      |
| <b>1200 V NPT<sup>3</sup> IGBT</b> |                |  |  |  |  |   |   |   |               |
| ► MWI 25-12E7                      | 1200           | 52   | 36   | 1.9  | 2.5  | 0.55  | 50  | 33  | no            |
| ► MWI 50-12E7                      |                | 90   | 62   | 2.1  | 4.0  | 0.35  | 110   | 70  | no            |
| <b>1200 V Trench IGBT</b>          |                |  |  |  |  |   |   |   |               |
| ► MWI 50-12T7                      | 1200           | 75   | 50   | 1.7  | 6.5  | 0.49  | 110   | 70  | yes           |
| ► MWI 75-12T7                      |                | 105  | 75   | 1.7  | 9.5  | 0.35  | 150   | 100   | yes           |

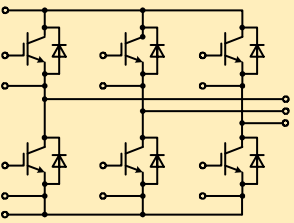
# IGBT Modules - Six-Pack configuration

**Six-Pack**  
IGBT Modules

X113



**Package style**  
Outline drawings on page 188 - 224

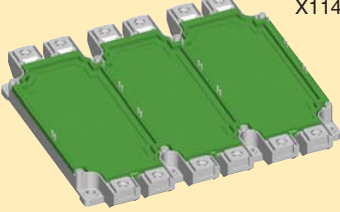


► New

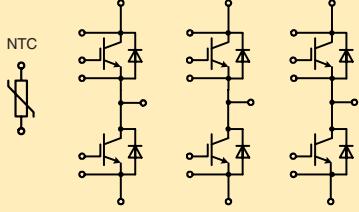
| Type                               | $V_{CES}$<br>V | $I_{C25}$<br>A<br>$T_C = 25^\circ\text{C}$<br>IGBT | $I_{C80}$<br>A<br>$T_C = 80^\circ\text{C}$<br>IGBT | $V_{CE(sat)}$ typ<br>V<br>$T_J = 25^\circ\text{C}$<br>IGBT | $E_{off}$<br>mJ<br>$T_J = 125^\circ\text{C}$<br>IGBT | $R_{thJC}$<br>K/W<br>IGBT | $I_{F25}$<br>A<br>$T_C = 25^\circ\text{C}$<br>diode | $I_{F80}$<br>A<br>$T_C = 80^\circ\text{C}$<br>diode | NTC<br>inside |
|------------------------------------|----------------|--|--|--|--|---------------------------|---|---|---------------|
| <b>600 V NPT IGBT</b>              |                |  |  |  |  |                           |   |   |               |
| MWI 100-06A8                       | 600            | 130  | 88   | 2.0  | 2.9  | 0.3                       | 140   | 88  | optional      |
| MWI 150-06A8                       |                | 170  | 115  | 2.0  | 4.6  | 0.24                      | 210   | 130   | optional      |
| MWI 200-06A8                       |                | 215  | 155  | 2.0  | 6.3  | 0.18                      | 260   | 165   | optional      |
| <b>1200 V NPT IGBT</b>             |                |  |  |  |  |                           |   |   |               |
| MWI 75-12A8                        | 1200           | 125  | 85   | 2.2  | 10.5   | 0.25                      | 150   | 100   | optional      |
| MWI 100-12A8                       |                | 160  | 110  | 2.2  | 14.6   | 0.19                      | 200   | 130   | optional      |
| <b>1200 V NPT<sup>3</sup> IGBT</b> |                |  |  |  |  |                           |   |   |               |
| MWI 75-12E8                        | 1200           | 130  | 90   | 2.0  | 7.5  | 0.25                      | 150   | 100   | no            |
| MWI 100-12E8                       |                | 165  | 115  | 2.0  | 10.0   | 0.19                      | 200   | 130   | no            |
| <b>1200 V Trench IGBT</b>          |                |  |  |  |  |                           |   |   |               |
| ► MWI 75-12T8                      | 1200           | 100  | 75   | 1.7  | 9.5  | 0.35                      | 150   | 100   | yes           |
| ► MWI 100-12T8                     |                | 140  | 100  | 1.7  | 12.0   | 0.26                      | 200   | 130   | yes           |
| ► MWI 150-12T8                     |                | 200  | 150  | 1.7  | 17.0   | 0.18                      | tbd   | tbd   | yes           |

**Six-Pack**  
IGBT Modules

X114



**Package style**  
Outline drawings on page 188 - 224



► New

| Type                               | $V_{CES}$<br>V | $I_{C25}$<br>A<br>$T_C = 25^\circ\text{C}$<br>IGBT | $I_{C80}$<br>A<br>$T_C = 80^\circ\text{C}$<br>IGBT | $V_{CE(sat)}$ typ<br>V<br>$T_J = 25^\circ\text{C}$<br>IGBT | $E_{off}$<br>mJ<br>$T_J = 125^\circ\text{C}$<br>IGBT | $R_{thJC}$<br>K/W<br>IGBT | $I_{F25}$<br>A<br>$T_C = 25^\circ\text{C}$<br>diode | $I_{F80}$<br>A<br>$T_C = 80^\circ\text{C}$<br>diode | NTC<br>inside |
|------------------------------------|----------------|--|--|--|--|---------------------------|---|---|---------------|
| <b>1200 V NPT<sup>3</sup> IGBT</b> |                |  |  |  |  |                           |   |   |               |
| ► MWI 225-12E9                     | 1200           | 355  | 250  | 2.1  | 20   | 0.09                      |   | 205   | yes           |
| ► MWI 300-12E9                     |                | 530  | 375  | 2.0  | 30   | 0.06                      |   | 300   | yes           |
| ► MWI 450-12E9                     |                | 640  | 440  | 2.2  | 45   | 0.057                     |   | 450   | yes           |
| <b>1700 V NPT<sup>3</sup> IGBT</b> |                |  |  |  |  |                           |   |   |               |
| ► MWI 225-17E9                     | 1700           | 335  | 235  | 2.5  | 54   | 0.085                     |   | 200   | yes           |
| ► MWI 300-17E9                     |                | 500  | 350  | 2.3  | 80   | 0.057                     |   | 290   | yes           |
| ► MWI 450-17E9                     |                | 580  | 405  | 2.25   | 90   | 0.057                     |   | 450   | yes           |

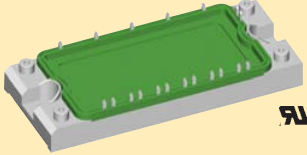
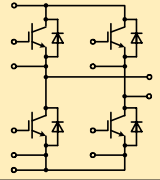
# IGBT Modules - Full Bridge configuration

**Full Bridge**  
IGBT Modules

X112

Package style  
Outline drawings on page 188 - 224

► New

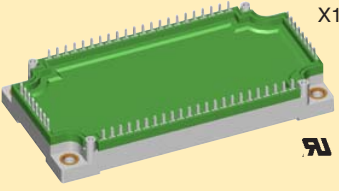
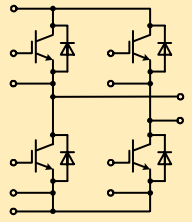
| Type                               | $V_{CES}$<br>V | $I_{C25}$<br>A<br>25°C<br>IGBT | $I_{C80}$<br>A<br>80°C<br>IGBT | $V_{CE(sat)}$ typ<br>V<br>25°C<br>IGBT | $E_{off}$<br>mJ<br>125°C<br>IGBT | $R_{thJC}$<br>K/W<br>IGBT | $I_{F25}$<br>A<br>25°C<br>diode | $I_{F80}$<br>A<br>80°C<br>diode |
|------------------------------------|----------------|--------------------------------|--------------------------------|--|----------------------------------|---------------------------|---------------------------------|---------------------------------|
| <b>600 V NPT IGBT</b>              |                |                                |                                |  |                                  |                           |                                 |                                 |
| MKI 50-06A7<br>MKI 75-06A7         | 600            | 72<br>90                       | 50<br>60                       | 1.9<br>2.1                             | 1.7<br>2.5                       | 0.55<br>0.44              | 72<br>140                       | 45<br>85                        |
| <b>1200 V Fast NPT IGBT</b>        |                |                                |                                |  |                                  |                           |                                 |                                 |
| ► MKI 50-12F7                      | 1200           | 65                             | 45                             | 3.2                                    | 2.5                              | 0.35                      | 110                             | 70                              |
| <b>1200 V NPT<sup>3</sup> IGBT</b> |                |                                |                                |  |                                  |                           |                                 |                                 |
| ► MKI 50-12E7                      | 1200           | 90                             | 62                             | 1.9                                    | 4.0                              | 0.35                      | 110                             | 70                              |

**Full Bridge**  
IGBT Modules

X113

Package style  
Outline drawings on page 188 - 224

► New

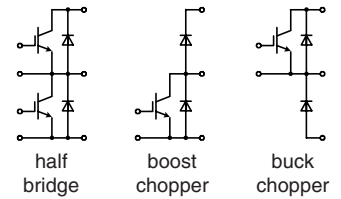



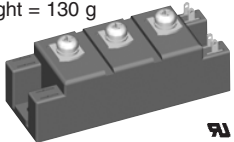
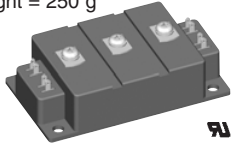
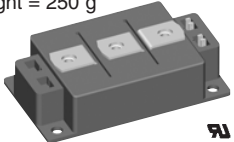
| Type                               | $V_{CES}$<br>V | $I_{C25}$<br>A<br>$T_c = 25^\circ\text{C}$<br>IGBT | $I_{C80}$<br>A<br>$T_c = 80^\circ\text{C}$<br>IGBT | $V_{CE(sat)}$ typ<br>V<br>$T_J = 25^\circ\text{C}$<br>IGBT | $E_{off}$<br>mJ<br>$T_J = 125^\circ\text{C}$<br>IGBT | $R_{thJC}$<br>K/W<br>IGBT | $I_{F25}$<br>A<br>$T_c = 25^\circ\text{C}$<br>diode | $I_{F80}$<br>A<br>$T_c = 80^\circ\text{C}$<br>diode |
|------------------------------------|----------------|--|--|--|--|---------------------------|---|---|
| <b>1200 V Fast NPT IGBT</b>        |                |  |  |  |  |                           |   |   |
| ► MKI 100-12F8                     | 1200           | 125  | 85   | 3.3  | 5.0  | 0.19                      | 200   | 130   |
| <b>1200 V NPT<sup>3</sup> IGBT</b> |                |  |  |  |  |                           |   |   |
| MKI 75-12E8<br>MKI 100-12E8        | 1200           | 130<br>165   | 90<br>115  | 2.0<br>2.0   | 7.5<br>10.0  | 0.25<br>0.19              | 150<br>200  | 100<br>130  |

# IGBT Modules

## NPT IGBT Modules

NPT IGBT = non-punch through insulated gate bipolar transistor, square RBSOA, short circuit rated

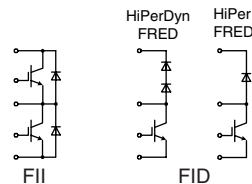


| Type  | V <sub>CEs</sub><br>V | I <sub>C25</sub><br>A<br>T <sub>C</sub> = 25°C | I <sub>C80</sub><br>A<br>T <sub>C</sub> = 80°C | V <sub>CE(sat) typ</sub><br>V<br>T <sub>J</sub> = 25°C | E <sub>off</sub><br>mJ<br>T <sub>J</sub> = 125°C | R <sub>thJC</sub><br>K/W | I <sub>F25</sub><br>A<br>T <sub>C</sub> = 25°C | I <sub>F80</sub><br>A<br>T <sub>C</sub> = 80°C | Thermistor | Fig. No. | Package style  |
|---|-----------------------|--|--|--|--|--------------------------|--|--|------------|----------|--|
| ▶ New   |                       |  |  |  |  |                          |  |  |            |          |  |
| 1200 V Half Bridge  |                       |  |  |  |  |                          |  |  |            |          |  |
| MII 75-12A3   | 1200                  | 90   | 60   | 2.2  | 5.6  | 0.33                     | 100  | 60   |            | X127a    | X127a/b/c<br>Weight = 130 g<br>   |
| MII 100-12A3  | 1200                  | 135  | 90   | 2.2  | 10.5   | 0.22                     | 150  | 100  |            | X127a    |  |
| MII 145-12A3  | 1200                  | 160  | 110  | 2.2  | 15.0   | 0.18                     | 150  | 100  |            | X127a    |  |
| MII 150-12A4  | 1200                  | 180  | 120  | 2.2  | 11.5   | 0.17                     | 200  | 130  |            | X128a    |  |
| MII 200-12A4  | 1200                  | 270  | 180  | 2.2  | 21.0   | 0.11                     | 300  | 200  |            | X128a    |  |
| MII 300-12A4  | 1200                  | 330  | 220  | 2.2  | 29.0   | 0.09                     | 450  | 270  |            | X128a    |  |
| 1200 V Boost chopper  |                       |  |  |  |  |                          |  |  |            |          |  |
| MID 75-12A3   | 1200                  | 90   | 60   | 2.2  | 5.6  | 0.33                     | 100  | 60   |            | X127b    | X128a/b/c/d<br>Weight = 250 g<br> |
| MID 100-12A3  | 1200                  | 135  | 90   | 2.2  | 10.5   | 0.22                     | 150  | 100  |            | X127b    |  |
| MID 145-12A3  | 1200                  | 160  | 110  | 2.2  | 15.0   | 0.18                     | 150  | 100  |            | X127b    |  |
| MID 150-12A4  | 1200                  | 180  | 120  | 2.2  | 11.5   | 0.17                     | 200  | 130  |            | X128b    |  |
| MID 200-12A4  | 1200                  | 270  | 180  | 2.2  | 21.0   | 0.11                     | 300  | 200  |            | X128b    |  |
| MID 300-12A4  | 1200                  | 330  | 220  | 2.2  | 29.0   | 0.09                     | 450  | 270  |            | X128b    |  |
| MID 550-12A4  | 1200                  | 670  | 460  | 2.3  | 59.0   | 0.05                     | 750  | 460  |            | X128b    |  |
| 1200 V Buck chopper   |                       |  |  |  |  |                          |  |  |            |          |  |
| MDI 75-12A3   | 1200                  | 90   | 60   | 2.2  | 5.6  | 0.33                     | 100  | 60   |            | X127c    | X130a/b/c<br>Weight = 250 g<br> |
| MDI 100-12A3  | 1200                  | 135  | 90   | 2.2  | 10.5   | 0.22                     | 150  | 100  |            | X127c    |  |
| MDI 145-12A3  | 1200                  | 160  | 110  | 2.2  | 15.0   | 0.18                     | 150  | 100  |            | X127c    |  |
| MDI 150-12A4  | 1200                  | 180  | 120  | 2.2  | 11.5   | 0.17                     | 200  | 130  |            | X128c    |  |
| MDI 200-12A4  | 1200                  | 270  | 180  | 2.2  | 21.0   | 0.11                     | 300  | 200  |            | X128c    |  |
| MDI 300-12A4  | 1200                  | 330  | 220  | 2.2  | 29.0   | 0.09                     | 450  | 270  |            | X128c    |  |
| MDI 550-12A4  | 1200                  | 670  | 460  | 2.3  | 59.0   | 0.05                     | 750  | 460  |            | X128c    |  |
| 1200 V Half Bridge with 3 <sup>rd</sup> generation NPT <sup>3</sup>   |                       |  |  |  |  |                          |  |  |            |          |  |
| MII 400-12E4  | 1200                  | 420  | 300  | 2.2  | 30.0   | 0.08                     | 450  | 290  |            | X130a    |  |
| 1200 V Boost chopper with 3 <sup>rd</sup> generation NPT <sup>3</sup> |                       |  |  |  |  |                          |  |  |            |          |  |
| MID 400-12E4 ①  | 1200                  | 420  | 300  | 2.2  | 30.0   | 0.08                     | 450  | 290  |            | X130b    |  |
| 1200 V Buck chopper with 3 <sup>rd</sup> generation NPT <sup>3</sup>  |                       |  |  |  |  |                          |  |  |            |          |  |
| MDI 400-12E4 ①  | 1200                  | 420  | 300  | 2.2  | 30.0   | 0.08                     | 450  | 290  |            | X130c    |  |

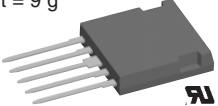
① I<sub>F80</sub> of IGBT free wheeling diode: 95 A

## ISOPLUS i4-PAC™ Package

- isolated back surface (DCB)
- low inductive path
- high reliability



## NPT IGBT Modules in i4-PAC

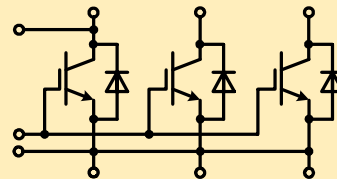
| Type       | Configuration   | Technology              | V <sub>CEs</sub><br>V | I <sub>C25</sub><br>A<br>@ 25°C | I <sub>C80</sub><br>A<br>@ 90°C | V <sub>CE(sat) typ.</sub><br>T <sub>C</sub> = 25°C | Fig. No. | Package style   |
|------------|-----------------|-------------------------|-----------------------|---------------------------------|---------------------------------|--|----------|---|
| ▶ New      |                 |                         |                       |                                 |                                 |  |          |   |
| FII 30-06D | <i>phaseleg</i> | NPT IGBT                | 600                   | 30                              | 18                              | 1.9  | X024a    | X024a <b>ISOPLUS i4-PAC™</b><br>Weight = 9 g<br> |
| FII 40-06D | <i>phaseleg</i> | NPT IGBT                | 600                   | 40                              | 25                              | 1.8  |          |   |
| FII 30-12E | <i>phaseleg</i> | NPT <sup>3</sup> IGBT   | 1200                  | 32                              | 20                              | 2.4  |          |   |
| FII 50-12E | <i>phaseleg</i> | NPT <sup>3</sup> IGBT   | 1200                  | 50                              | 32                              | 2.0  |          |   |
| FID 35-06C | <i>boost</i>    | NPT IGBT & HiPerDynFRED | 600                   | 38                              | 24                              | 1.9  |          |   |
| FID 36-06D | <i>boost</i>    | NPT IGBT & HiPerFRED    | 600                   | 38                              | 24                              | 1.9  |          |   |
| FID 60-06D | <i>boost</i>    | NPT IGBT & HiPerFRED    | 600                   | 65                              | 40                              | 1.6  |          |   |

# IGBT Modules

## NPT<sup>3</sup> IGBT Modules

- low loss and smooth switching
- AlSiC base plate for high power cycling capacity
- AlN substrate for low thermal resistance

### High Power Single Switch

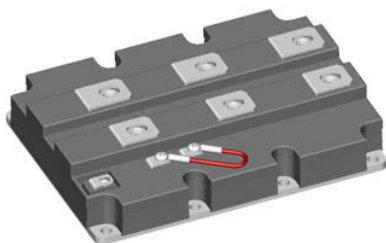


| Type   | V <sub>CES</sub><br>V | I <sub>C25</sub><br>A<br>T <sub>C</sub> =<br>25°C<br>IGBT | I <sub>C80</sub><br>A<br>T <sub>C</sub> =<br>80°C<br>IGBT | V <sub>CE(sat) typ</sub><br>V<br>T <sub>J</sub> =<br>25°C<br>IGBT | E <sub>off</sub><br>mJ<br>T <sub>J</sub> =<br>125°C<br>IGBT | R <sub>thJC</sub><br>K/W<br>IGBT | I <sub>F25</sub><br>A<br>T <sub>C</sub> =<br>25°C<br>diode | I <sub>F80</sub><br>A<br>T <sub>C</sub> =<br>80°C<br>diode | Fig.<br>No. |
|--|-----------------------|---|---|---|---|----------------------------------|--|--|-------------|
| ► New  |                       |   |   |   |   |                                  |  |  |             |
| MIO 1800-17E10   | 1700                  | 2500  | 1800  | 2.3   | 670   | 0,009                            | tbd  | 1800   | X134        |
| MIO 2400-17E10   | 1700                  | 3300  | 2400  | 2.3   | 980   | 0,007                            |  | 2400   |             |
| ► MIO 1200-25E10   | 2500                  | 1650  | 1200  | 2.5   | 1250  | 0,009                            |  | 1200   |             |
| ► MIO 1500-25E10   | 2500                  | 2100  | 1500  | 2.7   | 1450  | 0,008                            |  | 1500   |             |
| MIO 1200-33E10   | 3300                  | 1650  | 1200  | 3.1   | 1950  | 0,0085                           |  | 1200   |             |
| <b>High Voltage Package with enlarged strike and creepage distance</b> |                       |   |   |   |   |                                  |  |  |             |
| ► MIO 1200-33E11   | 3300                  | 1650  | 1200  | 3.1   | 2000  | 0,0085                           | tbd  | 1200   | X135        |
| ► MIO 600-65E11  | 6500                  | 840   | 600   | 4.2   | 3500  | 0,011                            |  | 600  |             |

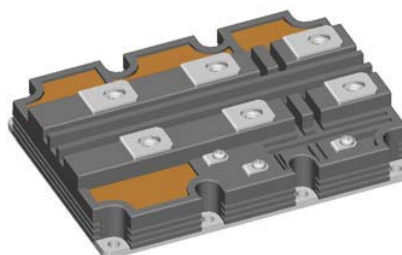
#### Package style

Outline drawings on  
page 188 - 224

X134  
Weight = 1500 g

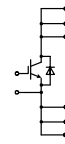


X135  
Weight = 1500 g

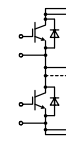




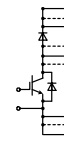
# IGBT Modules



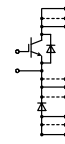
single switch



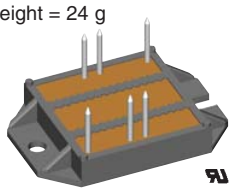
phase leg



boost chopper



buck chopper

| Type                         | V <sub>CES</sub> | I <sub>C25</sub><br>T <sub>C</sub> = 25 °C | I <sub>C80</sub><br>T <sub>C</sub> = 80 °C | V <sub>CE(sat)</sub><br>typical<br>T <sub>J</sub> = 25 °C | t <sub>d(on)</sub> t <sub>d(off)</sub><br>delay time<br>Switching<br>Characteristics<br>ns | R <sub>thJC</sub><br>per<br>IGBT<br>K/W | I <sub>F25</sub><br>T <sub>J</sub> = 25°C<br>diode<br>A | I <sub>F80</sub><br>T <sub>J</sub> = 80°C<br>diode<br>A | R <sub>thJC</sub><br>per<br>diode<br>K/W | Fig. No. | Package style  |  |  |
|------------------------------|------------------|--|--|---|--|---|---|---|--|----------|--|--|--|
| ► New                        | V                | IGBT<br>A                                  | IGBT<br>A                                  | IGBT<br>V   |  |   |   |   |  |          | Outline drawings on page 188 - 224   |  |  |
| <b>Single switch modules</b> |                  |  |  |   |  |   |   |   |  |          |  |  |  |
| VIO 25-06P1                  | 600              | 25   | 17   | 2.4   | 30 270   | 1.5                                     | 19  | 12  | 3.5                                      | X102     | <b>ECO-PAC 2</b><br>Weight = 24 g<br><br>See data sheet for pin arrangement |  |  |
| VIO 25-12P1                  | 1200             | 30   | 21   | 2.6   | 100 500  | 0.95                                    | 26  | 17  | 2.3                                      |          |  |  |  |
| VIO 50-06P1                  | 600              | 43   | 29   | 2.4   | 50 270   | 0.95                                    | 39  | 19  | 2.3                                      |          |  |  |  |
| VIO 50-12P1                  | 1200             | 49   | 33   | 3.1   | 100 500  | 0.6                                     | 49  | 31  | 1.3                                      |          |  |  |  |
| VIO 75-06P1                  | 600              | 69   | 48   | 2.3   | 50 300   | 0.6                                     | 56  | 35  | 1.3                                      |          |  |  |  |
| VIO 75-12P1                  | 1200             | 92   | 62   | 2.7   | 100 500  | 0.33                                    | 103   | 65  | 0.66                                     |          |  |  |  |
| VIO 100-06P1                 | 600              | 93   | 63   | 2.4   | 150 450  | 0.43                                    | 132   | 82  | 0.66                                     |          |  |  |  |
| VIO 125-12P1                 | 1200             | 138  | 94   | 2.8   | 100 650  | 0.22                                    | 154   | 97  | 0.45                                     |          |  |  |  |
| VIO 130-06P1                 | 600              | 121  | 83   | 2.3   | 25 150   | 0.33                                    | 134   | 82  | 0.66                                     |          |  |  |  |
| VIO 160-12P1                 | 1200             | 169  | 117  | 2.9   | 100 600  | 0.18                                    | 154   | 97  | 0.45                                     |          |  |  |  |
| <b>Phase leg modules</b>     |                  |  |  |   |  |   |   |   |  |          |  |  |  |
| VII 25-06P1                  | 600              | 25   | 17   | 2.4   | 30 270   | 1.5                                     | 19  | 12  | 3.5                                      |          |  |  |  |
| VII 25-12P1                  | 1200             | 30   | 21   | 2.6   | 100 500  | 0.95                                    | 26  | 17  | 2.3                                      |          |  |  |  |
| VII 50-06P1                  | 600              | 43   | 29   | 2.4   | 50 270   | 0.95                                    | 39  | 19  | 2.3                                      |          |  |  |  |
| VII 50-12P1                  | 1200             | 49   | 33   | 3.1   | 100 500  | 0.6                                     | 49  | 31  | 1.3                                      |          |  |  |  |
| VII 75-06P1                  | 600              | 69   | 48   | 2.3   | 50 300   | 0.6                                     | 56  | 35  | 1.3                                      |          |  |  |  |
| VII 75-12P1                  | 1200             | 92   | 62   | 2.7   | 100 500  | 0.33                                    | 103   | 65  | 0.66                                     |          |  |  |  |
| VII 100-06P1                 | 600              | 93   | 63   | 2.4   | 150 450  | 0.43                                    | 132   | 82  | 0.66                                     |          |  |  |  |
| VII 130-06P1                 | 600              | 121  | 83   | 2.3   | 25 150   | 0.33                                    | 134   | 82  | 0.66                                     |          |  |  |  |
| <b>Boost chopper modules</b> |                  |  |  |   |  |   |   |   |  |          |  |  |  |
| VID 25-06P1                  | 600              | 25   | 17   | 2.4   | 30 270   | 1.5                                     | 19  | 12  | 3.5                                      |          |  |  |  |
| VID 25-12P1                  | 1200             | 30   | 21   | 2.6   | 100 500  | 0.95                                    | 26  | 17  | 2.3                                      |          |  |  |  |
| VID 50-06P1                  | 600              | 43   | 29   | 2.4   | 50 270   | 0.95                                    | 39  | 19  | 2.3                                      |          |  |  |  |
| VID 50-12P1                  | 1200             | 49   | 33   | 3.1   | 100 500  | 0.6                                     | 49  | 31  | 1.3                                      |          |  |  |  |
| VID 75-06P1                  | 600              | 69   | 48   | 2.3   | 50 300   | 0.6                                     | 56  | 35  | 1.3                                      |          |  |  |  |
| VID 75-12P1                  | 1200             | 92   | 62   | 2.7   | 100 500  | 0.33                                    | 103   | 65  | 0.66                                     |          |  |  |  |
| VID 100-06P1                 | 600              | 93   | 63   | 2.4   | 150 450  | 0.43                                    | 132   | 82  | 0.66                                     |          |  |  |  |
| VID 125-12P1                 | 1200             | 138  | 94   | 2.8   | 100 650  | 0.22                                    | 154   | 97  | 0.45                                     |          |  |  |  |
| VID 130-06P1                 | 600              | 121  | 83   | 2.3   | 25 150   | 0.33                                    | 134   | 82  | 0.66                                     |          |  |  |  |
| VID 160-12P1                 | 1200             | 169  | 117  | 2.9   | 100 600  | 0.18                                    | 154   | 97  | 0.45                                     |          |  |  |  |
| <b>Buck chopper modules</b>  |                  |  |  |   |  |   |   |   |  |          |  |  |  |
| VDI 25-06P1                  | 600              | 25   | 17   | 2.4   | 30 270   | 1.5                                     | 19  | 12  | 3.5                                      |          |  |  |  |
| VDI 25-12P1                  | 1200             | 30   | 21   | 2.6   | 100 500  | 0.95                                    | 26  | 17  | 2.3                                      |          |  |  |  |
| VDI 50-06P1                  | 600              | 43   | 29   | 2.4   | 50 270   | 0.95                                    | 39  | 19  | 2.3                                      |          |  |  |  |
| VDI 50-12P1                  | 1200             | 49   | 33   | 3.1   | 100 500  | 0.6                                     | 49  | 31  | 1.3                                      |          |  |  |  |
| VDI 75-06P1                  | 600              | 69   | 48   | 2.3   | 50 300   | 0.6                                     | 56  | 35  | 1.3                                      |          |  |  |  |
| VDI 75-12P1                  | 1200             | 92   | 62   | 2.7   | 100 500  | 0.33                                    | 103   | 65  | 0.66                                     |          |  |  |  |
| VDI 100-06P1                 | 600              | 93   | 63   | 2.4   | 150 450  | 0.43                                    | 132   | 82  | 0.66                                     |          |  |  |  |
| VDI 125-12P1                 | 1200             | 138  | 94   | 2.8   | 100 650  | 0.22                                    | 154   | 97  | 0.45                                     |          |  |  |  |
| VDI 130-06P1                 | 600              | 121  | 83   | 2.3   | 25 150   | 0.33                                    | 134   | 82  | 0.66                                     |          |  |  |  |
| VDI 160-12P1                 | 1200             | 169  | 117  | 2.9   | 100 600  | 0.18                                    | 154   | 97  | 0.45                                     |          |  |  |  |

# IGBT Modules

## IGBT Modules - Full Bridge configuration

| Type        | $V_{CES}$<br>V | $I_{C25}$<br>A<br>$T_C = 25^\circ\text{C}$<br>IGBT | $I_{C80}$<br>A<br>$T_C = 80^\circ\text{C}$<br>IGBT | $V_{CE(sat)}$ typ<br>V<br>$T_J = 25^\circ\text{C}$<br>IGBT | $E_{off}$<br>mJ<br>$T_J = 125^\circ\text{C}$<br>IGBT | $R_{thJC}$<br>K/W<br>IGBT | $I_{F25}$<br>A<br>$T_C = 25^\circ\text{C}$<br>diode | $I_{F80}$<br>A<br>$T_C = 80^\circ\text{C}$<br>diode | Circuit diagram | Fig. No. |
|-------------|----------------|--|--|--|--|---------------------------|---|---|-----------------|----------|
| ► New       |                |  |  |  |  |                           |   |   |                 |          |
| VKI 50-06P1 | 600            | 45   | 30   | 1.9  | 1.0  | 0.88                      | 36  | 24  | A               | X102     |
| VKI 75-06P1 | 600            | 72   | 50   | 1.9  | 1.7  | 0.55                      | 72  | 45  |                 |          |
| VKI 50-12P1 | 1200           | 50   | 35   | 2.5  | 2.8  | 0.55                      | 50  | 35  |                 |          |

Further modules see page 68 "IGBT Modules - Full Bridge Configuration"

## Six- Pac in ECO-PAC

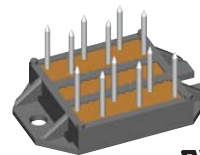
| Type           | $V_{CES}$<br>V | $I_{C25}$<br>A<br>$T_C = 25^\circ\text{C}$<br>IGBT | $I_{C80}$<br>A<br>$T_C = 80^\circ\text{C}$<br>IGBT | $V_{CE(sat)}$ typ<br>V<br>$T_J = 25^\circ\text{C}$<br>IGBT | $E_{off}$<br>mJ<br>$T_J = 125^\circ\text{C}$<br>IGBT | $R_{thJC}$<br>K/W<br>IGBT | $I_{F25}$<br>A<br>$T_C = 25^\circ\text{C}$<br>diode | $I_{F80}$<br>A<br>$T_C = 80^\circ\text{C}$<br>diode | Circuit diagram | Fig. No. |
|----------------|----------------|--|--|--|--|---------------------------|---|---|-----------------|----------|
| ► New          |                |  |  |  |  |                           |   |   |                 |          |
| VWI 20-06P1    | 600            | 19   | 14   | 1.9  | 0.3  | 1.7                       | 21  | 14  | B               | X102     |
| VWI 35-06P1    | 600            | 35   | 25   | 1.9  | 0.68   | 1.0                       | 35  | 24  |                 |          |
| VWI 15-12P1    | 1200           | 18   | 14   | 2.3  | 1.1  | 1.2                       | 12  | 8   |                 |          |
| VWI 6-12P1     | 1200           | 6  | 4.1  | 3.9  | 0.2  | 3.1                       | 12  | 8   |                 |          |
| VWI 3x20-06P1* | 600            | 20   | 15   | 1.9  | 0.3  | 1.5                       | 20  | 15  | C               | X101     |

\* NTC optional

### Package style

Outline drawings on page 188 - 224

X101 ECO-PAC 1



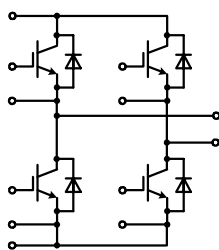
X102 ECO-PAC 2



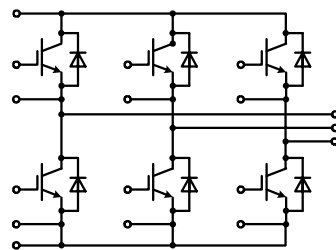
See data sheet for pin arrangements

### Circuit diagrams

A



B



C

