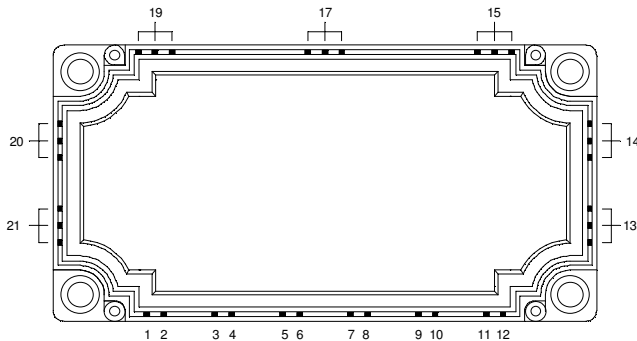
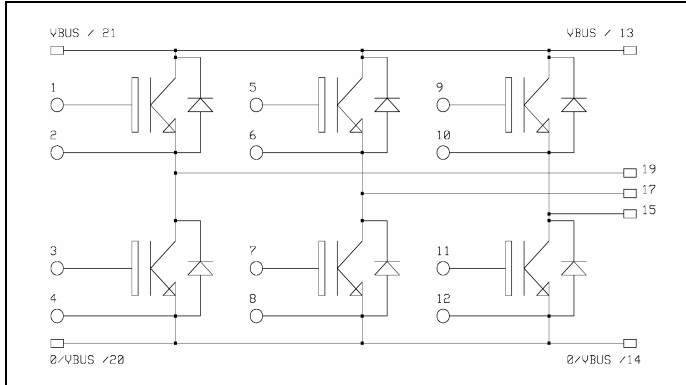


## 3 Phase bridge NPT IGBT Power Module

$V_{CES} = 1700V$   
 $I_C = 75A @ T_c = 80^\circ C$



### Application

- AC Motor control

### Features


- Non Punch Through (NPT) Low Loss IGBT®
  - Low voltage drop
  - Low tail current
  - Switching frequency up to 20 kHz
  - Soft recovery parallel diodes
  - Low diode VF
  - Low leakage current
  - Avalanche energy rated
  - RBSOA and SCSOA rated
- Kelvin emitter for easy drive
- Very low stray inductance
- High level of integration

### Benefits

- Stable temperature behavior
- Very rugged
- Solderable terminals for easy PCB mounting
- Direct mounting to heatsink (isolated package)
- Low junction to case thermal resistance
- Easy paralleling due to positive TC of VCEsat
- Low profile

### Absolute maximum ratings

| Symbol    | Parameter                             | Max ratings         | Unit       |
|-----------|---------------------------------------|---------------------|------------|
| $V_{CES}$ | Collector - Emitter Breakdown Voltage | 1700                | V          |
| $I_C$     | Continuous Collector Current          | $T_C = 25^\circ C$  | 150        |
|           |                                       | $T_C = 80^\circ C$  | 75         |
| $I_{CM}$  | Pulsed Collector Current              | $T_C = 25^\circ C$  | 250        |
| $V_{GE}$  | Gate - Emitter Voltage                | $\pm 20$            | V          |
| $P_D$     | Maximum Power Dissipation             | $T_C = 25^\circ C$  | 625        |
| RBSOA     | Reverse Bias Operating Area           | $T_j = 125^\circ C$ | 150A@1600V |

 **CAUTION:** These Devices are sensitive to Electrostatic Discharge. Proper Handling Procedures Should Be Followed.

## Electrical Characteristics

All ratings @  $T_j = 25^\circ\text{C}$  unless otherwise specified

| Symbol       | Characteristic                        | Test Conditions                 | Min                       | Typ  | Max  | Unit |
|--------------|---------------------------------------|---------------------------------|---------------------------|------|------|------|
| $BV_{CES}$   | Collector - Emitter Breakdown Voltage | $V_{GE} = 0V, I_C = 1mA$        | 1700                      |      |      | V    |
| $I_{CES}$    | Zero Gate Voltage Collector Current   | $V_{GE} = 0V$                   |                           | 0.03 | 0.15 | mA   |
|              |                                       | $V_{CE} = 1700V$                | $T_j = 25^\circ\text{C}$  |      |      |      |
| $V_{CE(on)}$ | Collector Emitter on Voltage          | $V_{GE} = 15V$                  |                           | 2.7  | 3.3  | V    |
|              |                                       | $I_C = 75A$                     | $T_j = 125^\circ\text{C}$ |      |      |      |
| $V_{GE(th)}$ | Gate Threshold Voltage                | $V_{GE} = V_{CE}, I_C = 3.5 mA$ | 4.5                       |      | 6.5  | V    |
| $I_{GES}$    | Gate - Emitter Leakage Current        | $V_{GE} = 20V, V_{CE} = 0V$     |                           |      | 100  | nA   |

## Dynamic Characteristics

| Symbol       | Characteristic      | Test Conditions  | Min | Typ  | Max | Unit |
|--------------|---------------------|--|-----|------|-----|------|
| $C_{ies}$    | Input Capacitance   | $V_{GE} = 0V, V_{CE} = 25V$<br>$f = 1MHz$  |     | 5000 |     | pF   |
| $T_{d(on)}$  | Turn-on Delay Time  | Inductive Switching ( $25^\circ\text{C}$ )<br>$V_{GE} = \pm 15V$<br>$V_{Bus} = 900V$<br>$I_C = 75A$<br>$R_G = 20\Omega$  |     | 100  |     | ns   |
| $T_r$        | Rise Time           |  |     | 100  |     |      |
| $T_{d(off)}$ | Turn-off Delay Time |  |     | 800  |     |      |
| $T_f$        | Fall Time           |  |     | 30   |     |      |
| $T_{d(on)}$  | Turn-on Delay Time  | Inductive Switching ( $125^\circ\text{C}$ )<br>$V_{GE} = \pm 15V$<br>$V_{Bus} = 900V$<br>$I_C = 75A$<br>$R_G = 20\Omega$ |     | 100  |     | ns   |
| $T_r$        | Rise Time           |  |     | 100  |     |      |
| $T_{d(off)}$ | Turn-off Delay Time |  |     | 900  |     |      |
| $T_f$        | Fall Time           |  |     | 30   |     |      |
| $E_{off}$    | Turn off Energy     |  |     | 22   |     | mJ   |

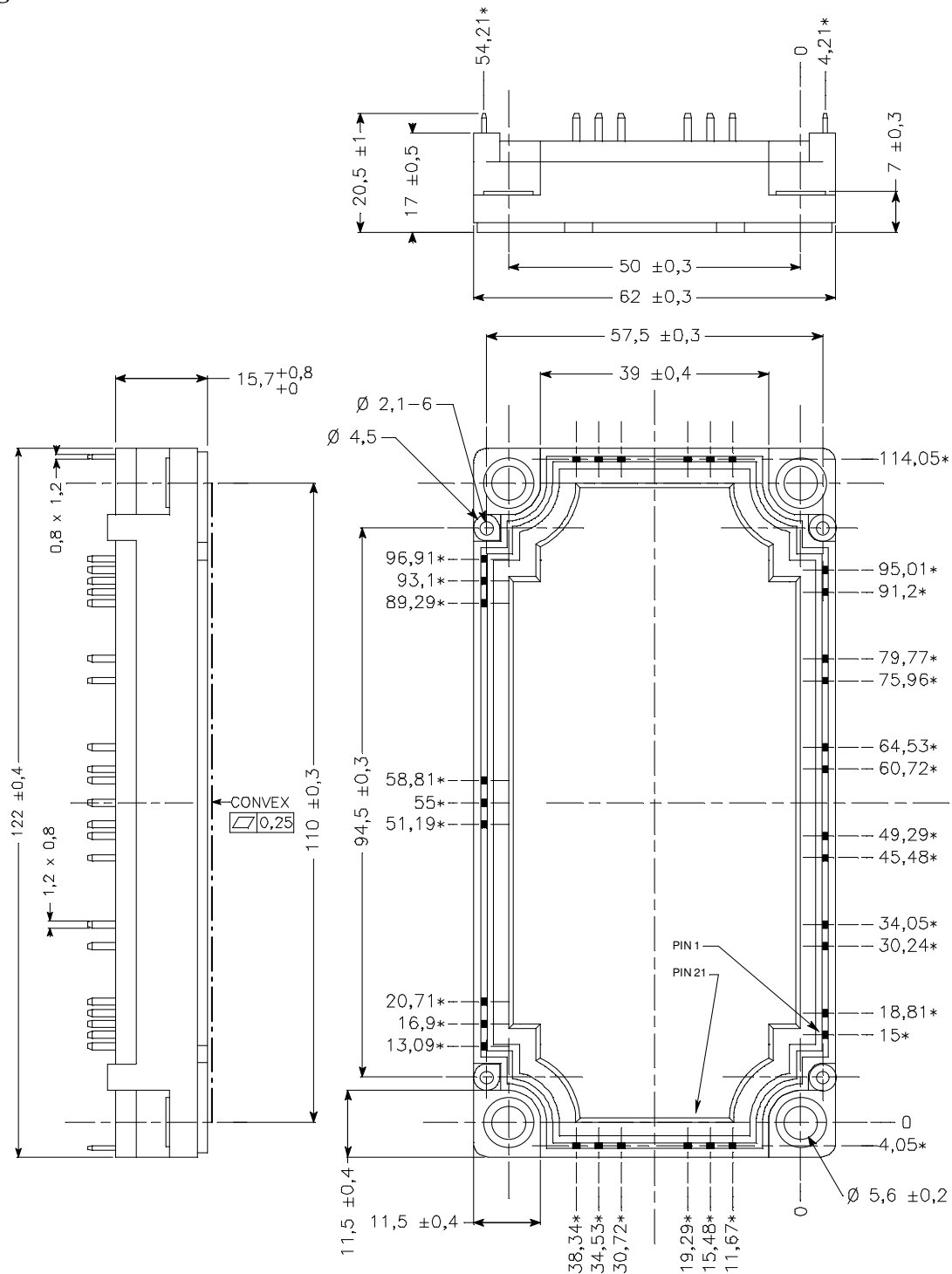
## Reverse diode ratings and characteristics

| Symbol   | Characteristic          | Test Conditions                      | Min                       | Typ | Max | Unit    |   |
|----------|-------------------------|--------------------------------------|---------------------------|-----|-----|---------|---|
| $V_F$    | Diode Forward Voltage   | $I_F = 75A$                          | $T_j = 25^\circ\text{C}$  |     | 2.2 | 2.6     | V |
|          |                         | $V_{GE} = 0V$                        | $T_j = 125^\circ\text{C}$ |     | 2.0 |         |   |
| $E_r$    | Reverse Recovery Energy | $I_F = 75A$                          | $T_j = 25^\circ\text{C}$  |     | 3.5 | mJ      |   |
|          |                         | $V_R = 900V$<br>$di/dt = 900A/\mu s$ | $T_j = 125^\circ\text{C}$ |     | 6.5 |         |   |
| $Q_{rr}$ | Reverse Recovery Charge | $I_F = 75A$                          | $T_j = 25^\circ\text{C}$  |     | 9   | $\mu C$ |   |
|          |                         | $V_R = 900V$<br>$di/dt = 900A/\mu s$ | $T_j = 125^\circ\text{C}$ |     | 19  |         |   |

## Thermal and package characteristics

| Symbol     | Characteristic  | Min         | Typ | Max  | Unit               |     |
|------------|---|-------------|-----|------|--------------------|-----|
| $R_{thJC}$ | Junction to Case  | IGBT        |     | 0.2  | $^\circ\text{C/W}$ |     |
|            |   | Diode       |     | 0.47 |                    |     |
| $V_{ISOL}$ | RMS Isolation Voltage, any terminal to case $t = 1$ min,<br>$I_{isol} < 1mA, 50/60Hz$ | 2500        |     |      | V                  |     |
| $T_j$      | Operating junction temperature range  | -40         |     | 150  | $^\circ\text{C}$   |     |
| $T_{STG}$  | Storage Temperature Range   | -40         |     | 125  |                    |     |
| $T_C$      | Operating Case Temperature  | -40         |     | 125  |                    |     |
| Torque     | Mounting torque   | To Heatsink | M5  | 3    | 4.5                | N.m |
| Wt         | Package Weight  |             |     |      | 300                | g   |

## Package outline



ALL DIMENSIONS MARKED \* \* \* ARE TOLERENCED AS :  $\text{Ø } 0,4$

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