

### Electrical Features

- Trench/Fieldstop IGBT
- $V_{CEsat}$  with positive Temperature Coefficient
- Low  $V_{CEsat}$

### Typical Applications

- Auxiliary inverters
- Motor drives
- Servo drives



### Mechanical Features

- High power density
- Integrated NTC temperature sensor
- Copper base plate
- Solder contact technology
- Standard housing

### IGBT, Inverter

| Maximum Rated Values   |                                      |                                                                                                  |                        |        |      |      |      |
|------------------------|--------------------------------------|--------------------------------------------------------------------------------------------------|------------------------|--------|------|------|------|
| Symbol                 | Item                                 | Conditions                                                                                       |                        | Rating |      | Unit |      |
| IGBT                   |                                      |                                                                                                  |                        |        |      |      |      |
| V <sub>CES</sub>       | Collector-emitter voltage            | T <sub>vj</sub> =25°C                                                                            |                        | 1200   |      | V    |      |
| V <sub>GES</sub>       | Gate-emitter voltage                 | -                                                                                                |                        | ±20    |      | V    |      |
| I <sub>C</sub>         | Collector current,DC                 | T <sub>C</sub> =100°C,T <sub>vj</sub> =175°C                                                     |                        | 150    |      | A    |      |
| I <sub>CRM</sub>       | Repetitive peak collector current    | t <sub>p</sub> =1ms                                                                              |                        | 300    |      | A    |      |
| P <sub>tot</sub>       | Total power dissipation              | T <sub>C</sub> =25°C,T <sub>vj</sub> =175°C                                                      |                        | 872    |      | W    |      |
| Characteristics Values |                                      |                                                                                                  |                        |        |      |      |      |
| Symbol                 | Item                                 | Conditions                                                                                       |                        | Values |      |      | Unit |
| IGBT                   |                                      |                                                                                                  |                        | Min.   | Typ. | Max. |      |
| I <sub>CES</sub>       | Collector-emitter cut-off current    | V <sub>CE</sub> =1200V,V <sub>GE</sub> =0V,T <sub>vj</sub> =25°C                                 |                        | -      | -    | 1    | mA   |
| I <sub>GES</sub>       | Gate leakage current                 | V <sub>CE</sub> =0V,V <sub>GE</sub> =20V,T <sub>vj</sub> =25°C                                   |                        | -      | -    | 500  | nA   |
| V <sub>GE(th)</sub>    | Gate-emitter threshold voltage       | I <sub>C</sub> =5.7mA,V <sub>CE</sub> =V <sub>GE</sub> ,T <sub>vj</sub> =25°C                    |                        | 5.2    | 5.71 | 6.2  | V    |
| V <sub>CESat</sub>     | Collector-emitter saturation voltage | I <sub>C</sub> =150A<br>V <sub>GE</sub> =15V                                                     | T <sub>vj</sub> =25°C  | -      | 1.9  | -    | V    |
|                        |                                      |                                                                                                  | T <sub>vj</sub> =125°C | -      | 2.1  | -    |      |
|                        |                                      |                                                                                                  | T <sub>vj</sub> =150°C | -      | 2.2  | -    |      |
| C <sub>ies</sub>       | Input capacitance                    | V <sub>CE</sub> =25V,V <sub>GE</sub> =0V<br>f=1MHz,T <sub>vj</sub> =25°C                         |                        | -      | 10.6 | -    | nF   |
| C <sub>oes</sub>       | Output capacitance                   |                                                                                                  |                        | -      | 0.69 | -    |      |
| C <sub>res</sub>       | Reverse transfer capacitance         |                                                                                                  |                        | -      | 0.36 | -    |      |
| Q <sub>G</sub>         | Gate charge                          | V <sub>CC</sub> =600V, I <sub>C</sub> =150A<br>V <sub>GE</sub> =-15...+15V,T <sub>vj</sub> =25°C |                        | -      | 939  | -    | nC   |
| R <sub>g</sub>         | Internal gate resistance             | T <sub>vj</sub> =25°C                                                                            |                        | -      | 1.2  | -    | Ω    |

|                     |                                        |                                                                                                                               |                        |     |        |       |     |
|---------------------|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|------------------------|-----|--------|-------|-----|
| t <sub>d(on)</sub>  | Turn-on delay time                     | V <sub>CC</sub> =600V<br>I <sub>C</sub> =150A<br>V <sub>GE</sub> =±15V<br>R <sub>G(on)</sub> =10Ω<br>R <sub>G(off)</sub> =10Ω | T <sub>vj</sub> =25°C  | -   | 133.0  | -     | ns  |
|                     |                                        |                                                                                                                               | T <sub>vj</sub> =125°C | -   | 101.2  | -     |     |
|                     |                                        |                                                                                                                               | T <sub>vj</sub> =150°C | -   | 98.5   | -     |     |
| t <sub>r</sub>      | Rise time                              |                                                                                                                               | T <sub>vj</sub> =25°C  | -   | 99.4   | -     |     |
|                     |                                        |                                                                                                                               | T <sub>vj</sub> =125°C | -   | 112.3  | -     |     |
|                     |                                        |                                                                                                                               | T <sub>vj</sub> =150°C | -   | 125.8  | -     |     |
| t <sub>d(off)</sub> | Turn-off delay time                    |                                                                                                                               | T <sub>vj</sub> =25°C  | -   | 480.2  | -     |     |
|                     |                                        |                                                                                                                               | T <sub>vj</sub> =125°C | -   | 539.2  | -     |     |
|                     |                                        |                                                                                                                               | T <sub>vj</sub> =150°C | -   | 550.4  | -     |     |
| t <sub>f</sub>      | Fall time                              |                                                                                                                               | T <sub>vj</sub> =25°C  | -   | 116.5  | -     |     |
|                     |                                        |                                                                                                                               | T <sub>vj</sub> =125°C | -   | 126.4  | -     |     |
|                     |                                        |                                                                                                                               | T <sub>vj</sub> =150°C | -   | 126.3  | -     |     |
| E <sub>on</sub>     | Turn-on energy (per pulse)             |                                                                                                                               | T <sub>vj</sub> =25°C  | -   | 21.24  | -     | mJ  |
|                     |                                        |                                                                                                                               | T <sub>vj</sub> =125°C | -   | 26.83  | -     |     |
|                     |                                        |                                                                                                                               | T <sub>vj</sub> =150°C | -   | 31.79  | -     |     |
| E <sub>off</sub>    | Turn-off energy (per pulse)            |                                                                                                                               | T <sub>vj</sub> =25°C  | -   | 11.0   | -     |     |
|                     |                                        |                                                                                                                               | T <sub>vj</sub> =125°C | -   | 16.99  | -     |     |
|                     |                                        |                                                                                                                               | T <sub>vj</sub> =150°C | -   | 20.76  | -     |     |
| SC data             | Short-circuit current                  | V <sub>CC</sub> =600V,V <sub>GE</sub> ≤15V,T <sub>vj</sub> =125°C<br>V <sub>CES</sub> ≤1200V,t <sub>p</sub> ≤10μs             |                        | -   | 473    | -     | A   |
| R <sub>thJC</sub>   | Thermal resistance,junction to case    | Per IGBT                                                                                                                      |                        | -   | -      | 0.172 | K/W |
| R <sub>thCH</sub>   | Thermalresistance,case to heatsink     | Per IGBT λgrease=1 W/(m·K)                                                                                                    |                        | -   | 0.0785 | -     | K/W |
| T <sub>vjop</sub>   | Temperature under switching conditions |                                                                                                                               |                        | -40 |        | 150   | °C  |

**Diode, Inverter**
**Maximum Rated Values**

| Symbol    | Item                            | Conditions                              | Rating | Unit   |
|-----------|---------------------------------|-----------------------------------------|--------|--------|
| $V_{RRM}$ | Repetitive peak reverse voltage | $T_{vj}=25^{\circ}C$                    | 1200   | V      |
| $I_F$     | Forward current, DC             |                                         | 150    | A      |
| $I_{FRM}$ | Repetitive peak forward current | $t_p=1ms$                               | 300    | A      |
| $I^2t$    | $I^2t$ -value                   | $V_R=0V, t_p=10ms, T_{vj}=150^{\circ}C$ | 2950   | $A^2s$ |

**Characteristic Values**

|                 |                               |                                                                       |                        |   |       |   |    |
|-----------------|-------------------------------|-----------------------------------------------------------------------|------------------------|---|-------|---|----|
| V <sub>F</sub>  | Continuous forward voltage    | I <sub>F</sub> =150A<br>V <sub>GE</sub> =0V                           | T <sub>vj</sub> =25°C  | - | 1.36  | - | V  |
|                 |                               |                                                                       | T <sub>vj</sub> =125°C | - | 1.62  | - |    |
|                 |                               |                                                                       | T <sub>vj</sub> =150°C | - | 1.67  | - |    |
| I <sub>RM</sub> | Peak reverse recovery current | V <sub>R</sub> =600V<br>I <sub>F</sub> =150A<br>V <sub>GE</sub> =-15V | T <sub>vj</sub> =25°C  | - | 51.0  | - | A  |
|                 |                               |                                                                       | T <sub>vj</sub> =125°C | - | 72.8  | - |    |
|                 |                               |                                                                       | T <sub>vj</sub> =150°C | - | 77.0  | - |    |
| t <sub>rr</sub> | Reverse recovery time         |                                                                       | T <sub>vj</sub> =25°C  | - | 112   | - | ns |
|                 |                               |                                                                       | T <sub>vj</sub> =125°C | - | 902   | - |    |
|                 |                               |                                                                       | T <sub>vj</sub> =150°C | - | 976   | - |    |
| Q <sub>r</sub>  | Recovered charge              |                                                                       | T <sub>vj</sub> =25°C  | - | 6.29  | - | μC |
|                 |                               |                                                                       | T <sub>vj</sub> =125°C | - | 17.81 | - |    |
|                 |                               |                                                                       | T <sub>vj</sub> =150°C | - | 18.13 | - |    |

|            |                                        |                                                                    |                              |     |       |       |                    |
|------------|----------------------------------------|--------------------------------------------------------------------|------------------------------|-----|-------|-------|--------------------|
| $E_{rec}$  | Reverse recovery energy                |                                                                    | $T_{vj}=25^{\circ}\text{C}$  | -   | 1.54  | -     | mJ                 |
|            |                                        |                                                                    | $T_{vj}=125^{\circ}\text{C}$ | -   | 4.81  | -     |                    |
|            |                                        |                                                                    | $T_{vj}=150^{\circ}\text{C}$ | -   | 5.66  | -     |                    |
| $R_{thJC}$ | Thermal resistance, junction to case   | per diode                                                          |                              | -   | -     | 0.299 | K/W                |
| $R_{thCH}$ | Thermal resistance, case to heatsink   | per diode, $\lambda_{grease}=1\text{ W}/(\text{m} \cdot \text{K})$ |                              | -   | 0.105 | -     | K/W                |
| $T_{vjop}$ | Temperature under switching conditions |                                                                    |                              | -40 |       | 150   | $^{\circ}\text{C}$ |

**Diode, Rectifier**

| Maximum Rated Values  |                                         |                                              |           |        |        |       |      |
|-----------------------|-----------------------------------------|----------------------------------------------|-----------|--------|--------|-------|------|
| Symbol                | Item                                    | Conditions                                   |           | Rating |        |       | Unit |
| V <sub>RRM</sub>      | Repetitive peak reverse voltage         | T <sub>vj</sub> =25°C                        |           | 1600   |        |       | V    |
| I <sub>FRMSM</sub>    | Maximum RMS forward current per chip    | T <sub>C</sub> =100°C,T <sub>vj</sub> =175°C |           | 150    |        |       | A    |
| I <sub>RMSM</sub>     | Maximum RMS current at rectifier output | T <sub>C</sub> = 100°C                       |           | 150    |        |       | A    |
| I <sub>FSM</sub>      | Surge forward current                   | tp = 10 ms, Tvj = 25° C                      |           | 1320   |        |       | A    |
| I²t                   | I²t-value                               | V <sub>R</sub> =0V,tp=10ms,Tvj=150°C         |           | 9800   |        |       | A²s  |
| Characteristic Values |                                         |                                              |           |        |        |       |      |
| Symbol                | Item                                    | Conditions                                   |           | Values |        |       | Unit |
|                       |                                         |                                              |           | Min.   | Typ.   | Max.  |      |
| V <sub>F</sub>        | Continuous forward voltage              | I <sub>F</sub> =150A<br>V <sub>GE</sub> =0V  | Tvj=25°C  | -      | 1.1    | -     | V    |
|                       |                                         |                                              | Tvj=125°C | -      | -      | -     |      |
|                       |                                         |                                              | Tvj=150°C | -      | -      | -     |      |
| I <sub>R</sub>        | Reverse current                         | V <sub>R</sub> =1600V                        | Tvj=25°C  | -      | -      | 10    | uA   |
|                       |                                         |                                              | Tvj=125°C | -      | -      | -     |      |
|                       |                                         |                                              | Tvj=150°C | -      | -      | -     |      |
| R <sub>thJC</sub>     | Thermal resistance, junction to case    | per diode                                    |           | -      | -      | 0.284 | K/W  |
| R <sub>thCH</sub>     | Thermal resistance, case to heatsink    | per diode, λ <sub>grease</sub> =1 W/(m • K)  |           | -      | 0.0887 | -     | K/W  |
| Tvjop                 | Temperature under switching conditions  |                                              |           | -40    |        | 150   | °C   |

**IGBT, Brake-Chopper**

| Maximum Rated Values  |                                   |                                                                               |        |      |      |      |
|-----------------------|-----------------------------------|-------------------------------------------------------------------------------|--------|------|------|------|
| Symbol                | Item                              | Conditions                                                                    | Values |      |      | Unit |
| V <sub>CES</sub>      | Collector-emitter voltage         | T <sub>vj</sub> =25°C                                                         | 1200   |      |      | V    |
| V <sub>GES</sub>      | Gate-emitter voltage              | -                                                                             | ±20    |      |      | V    |
| I <sub>C</sub>        | Collector current,DC              | T <sub>C</sub> =100°C,T <sub>vj</sub> =175°C                                  | 100    |      |      | A    |
| I <sub>CRM</sub>      | Repetitive peak collector current | t <sub>p</sub> =1ms                                                           | 200    |      |      | A    |
| P <sub>tot</sub>      | Total power dissipation           | T <sub>C</sub> =25°C,T <sub>vj</sub> =175°C                                   | 652    |      |      | W    |
| Characteristic Values |                                   |                                                                               |        |      |      |      |
| Symbol                | Item                              | Conditions                                                                    | Values |      |      | Unit |
| IGBT                  |                                   |                                                                               | Min.   | Typ. | Max. |      |
| I <sub>CES</sub>      | Collector-emitter cut-off current | V <sub>CE</sub> =1200V,V <sub>GE</sub> =0V,T <sub>vj</sub> =25°C              | -      | -    | 1    | mA   |
| I <sub>GES</sub>      | Gate leakage current              | V <sub>CE</sub> =0V,V <sub>GE</sub> =20V,T <sub>vj</sub> =25°C                | -      | -    | 500  | nA   |
| V <sub>GE(th)</sub>   | Gate-emitter threshold voltage    | I <sub>C</sub> =3.8mA,V <sub>CE</sub> =V <sub>GE</sub> ,T <sub>vj</sub> =25°C | 5.2    | 5.56 | 6.2  | V    |

|                     |                                        |                                                                                                                               |                        |     |        |      |     |  |
|---------------------|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|------------------------|-----|--------|------|-----|--|
| V <sub>CEsat</sub>  | Collector-emitter saturation voltage   | I <sub>C</sub> =100A<br>V <sub>GE</sub> =15V                                                                                  | T <sub>vj</sub> =25°C  | -   | 1.83   | -    |     |  |
|                     |                                        |                                                                                                                               | T <sub>vj</sub> =125°C | -   | 2.11   | -    |     |  |
|                     |                                        |                                                                                                                               | T <sub>vj</sub> =150°C | -   | 2.22   | -    |     |  |
| C <sub>ies</sub>    | Input capacitance                      | V <sub>CE</sub> =25V,V <sub>GE</sub> =0V<br>f=1MHz,T <sub>vj</sub> =25°C                                                      |                        | -   | 7.07   | -    | nF  |  |
| C <sub>oes</sub>    | Output capacitance                     |                                                                                                                               |                        | -   | 0.46   | -    |     |  |
| C <sub>res</sub>    | Reverse transfer capacitance           |                                                                                                                               |                        | -   | 0.24   | -    |     |  |
| Q <sub>G</sub>      | Gate charge                            | V <sub>CC</sub> =600V,I <sub>C</sub> =100A<br>V <sub>GE</sub> =-15...+15V,T <sub>vj</sub> =25°C                               |                        | -   | 640    | -    | nC  |  |
| R <sub>g</sub>      | Internal gate resistance               | T <sub>vj</sub> =25°C                                                                                                         |                        | -   | 1.8    | -    | Ω   |  |
| t <sub>d(on)</sub>  | Turn-on delay time                     | V <sub>CC</sub> =600V<br>I <sub>C</sub> =100A<br>V <sub>GE</sub> =±15V<br>R <sub>G(on)</sub> =10Ω<br>R <sub>G(off)</sub> =10Ω | T <sub>vj</sub> =25°C  | -   | 105    | -    | ns  |  |
|                     |                                        |                                                                                                                               | T <sub>vj</sub> =125°C | -   | 115    | -    |     |  |
|                     |                                        |                                                                                                                               | T <sub>vj</sub> =150°C | -   | 114    | -    |     |  |
| t <sub>r</sub>      | Rise time                              |                                                                                                                               | T <sub>vj</sub> =25°C  | -   | 59.2   | -    |     |  |
|                     |                                        |                                                                                                                               | T <sub>vj</sub> =125°C | -   | 67.8   | -    |     |  |
|                     |                                        |                                                                                                                               | T <sub>vj</sub> =150°C | -   | 72.0   | -    |     |  |
| t <sub>d(off)</sub> | Turn-off delay time                    |                                                                                                                               | T <sub>vj</sub> =25°C  | -   | 471.2  | -    |     |  |
|                     |                                        |                                                                                                                               | T <sub>vj</sub> =125°C | -   | 676.2  | -    |     |  |
|                     |                                        |                                                                                                                               | T <sub>vj</sub> =150°C | -   | 708.8  | -    |     |  |
| t <sub>f</sub>      | Fall time                              |                                                                                                                               | T <sub>vj</sub> =25°C  | -   | 161    | -    |     |  |
|                     |                                        |                                                                                                                               | T <sub>vj</sub> =125°C | -   | 210    | -    |     |  |
|                     |                                        |                                                                                                                               | T <sub>vj</sub> =150°C | -   | 268    | -    |     |  |
| E <sub>on</sub>     | Turn-on energy (per pulse)             |                                                                                                                               | T <sub>vj</sub> =25°C  | -   | 10.01  | -    | mJ  |  |
|                     |                                        |                                                                                                                               | T <sub>vj</sub> =125°C | -   | 18.93  | -    |     |  |
|                     |                                        |                                                                                                                               | T <sub>vj</sub> =150°C | -   | 21.59  | -    |     |  |
| E <sub>off</sub>    | Turn-off energy (per pulse)            |                                                                                                                               | T <sub>vj</sub> =25°C  | -   | 8.03   | -    |     |  |
|                     |                                        |                                                                                                                               | T <sub>vj</sub> =125°C | -   | 10.21  | -    |     |  |
|                     |                                        |                                                                                                                               | T <sub>vj</sub> =150°C | -   | 10.94  | -    |     |  |
| SC data             | Short-circuit current                  | V <sub>CC</sub> =600V,V <sub>GE</sub> ≤15V,T <sub>vj</sub> =125°C<br>V <sub>CES</sub> ≤1200V,t <sub>p</sub> ≤10μs             |                        | -   | 244    | -    | A   |  |
| R <sub>thJC</sub>   | Thermal resistance,junction to case    | Per IGBT                                                                                                                      |                        | -   | -      | 0.23 | K/W |  |
| R <sub>thCH</sub>   | Thermalresistance,case to heatsink     | Per IGBT λgrease=1W/(m·K)                                                                                                     |                        | -   | 0.0941 | -    | K/W |  |
| T <sub>vjop</sub>   | Temperature under switching conditions |                                                                                                                               |                        | -40 |        | 150  | °C  |  |

**Diode, Brake-Chopper****Maximum Rated Values**

| Symbol    | Item                            | Conditions                              | Rating | Unit   |
|-----------|---------------------------------|-----------------------------------------|--------|--------|
| $V_{RRM}$ | Repetitive peak reverse voltage | $T_{vj}=25^{\circ}C$                    | 1200   | V      |
| $I_F$     | Forward current, DC             |                                         | 50     | A      |
| $I_{FRM}$ | Repetitive peak forward current | $t_p=1ms$                               | 100    | A      |
| $I^2t$    | $I^2t$ -value                   | $V_R=0V, t_p=10ms, T_{vj}=125^{\circ}C$ | 560    | $A^2s$ |

**Characteristic Values**

|       |                            |                          |                       |   |      |   |   |
|-------|----------------------------|--------------------------|-----------------------|---|------|---|---|
| $V_F$ | Continuous forward voltage | $I_F=50A$<br>$V_{GE}=0V$ | $T_{vj}=25^{\circ}C$  | - | 1.52 | - | V |
|       |                            |                          | $T_{vj}=125^{\circ}C$ | - | 1.43 | - |   |
|       |                            |                          | $T_{vj}=150^{\circ}C$ | - | 1.35 | - |   |

|                   |                                        |                                                                      |                        |     |        |       |     |
|-------------------|----------------------------------------|----------------------------------------------------------------------|------------------------|-----|--------|-------|-----|
| I <sub>RM</sub>   | Peak reverse recovery current          | V <sub>R</sub> =600V<br>I <sub>F</sub> =50A<br>V <sub>GE</sub> =-15V | T <sub>vj</sub> =25°C  | -   | 83.12  | -     | A   |
|                   |                                        |                                                                      | T <sub>vj</sub> =125°C | -   | 108.37 | -     |     |
|                   |                                        |                                                                      | T <sub>vj</sub> =150°C | -   | 121.12 | -     |     |
| t <sub>rr</sub>   | Reverse recovery time                  |                                                                      | T <sub>vj</sub> =25°C  | -   | 59.2   | -     | ns  |
|                   |                                        |                                                                      | T <sub>vj</sub> =125°C | -   | 63.8   | -     |     |
| Q <sub>r</sub>    | Recovered charge                       |                                                                      | T <sub>vj</sub> =25°C  | -   | 7.03   | -     | μC  |
|                   |                                        |                                                                      | T <sub>vj</sub> =125°C | -   | 9.5    | -     |     |
| E <sub>rec</sub>  | Reverse recovery energy                |                                                                      | T <sub>vj</sub> =25°C  | -   | 1.87   | -     | mJ  |
|                   |                                        |                                                                      | T <sub>vj</sub> =125°C | -   | 4.9291 | -     |     |
| R <sub>thJC</sub> | Thermal resistance, junction to case   | per diode                                                            |                        | -   | -      | 0.682 | K/W |
| R <sub>thCH</sub> | Thermal resistance, case to heatsink   | per diode, λ <sub>grease</sub> =1 W/(m • K)                          |                        | -   | 0.123  | -     | K/W |
| T <sub>vjop</sub> | Temperature under switching conditions |                                                                      |                        | -40 |        | 150   | °C  |

Note:

IGBT electrical characteristics according to IEC 60747 – 9

Diode electrical characteristics according to IEC 60747 – 2

### NTC Thermistor Characteristics

| Symbol       | Item                    | Conditions                                      | Values |      |      | Unit       |
|--------------|-------------------------|-------------------------------------------------|--------|------|------|------------|
|              |                         |                                                 | Min.   | Typ. | Max. |            |
| $R_{25}$     | Rated resistance        | $T_C=25^{\circ}C$                               | -      | 5    | -    | k $\Omega$ |
| $\Delta R/R$ | Deviation of resistance | $T_C=100^{\circ}C, R_{100}=493\Omega$           | -5     | -    | 5    | %          |
| $P_{25}$     | Power dissipation       | $T_C=25^{\circ}C$                               | -      | -    | 20   | mW         |
| $B_{25/50}$  | B-constant              | $R_2=R_{25}\exp[B_{25/50}(1/T_2-1/(298.15K))]$  | -      | 3375 | -    | K          |
| $B_{25/80}$  | B-constant              | $R_2=R_{25}\exp[B_{25/80}(1/T_2-1/(298.15K))]$  | -      | 3411 | -    |            |
| $B_{25/100}$ | B-constant              | $R_2=R_{25}\exp[B_{25/100}(1/T_2-1/(298.15K))]$ | -      | 3433 | -    |            |

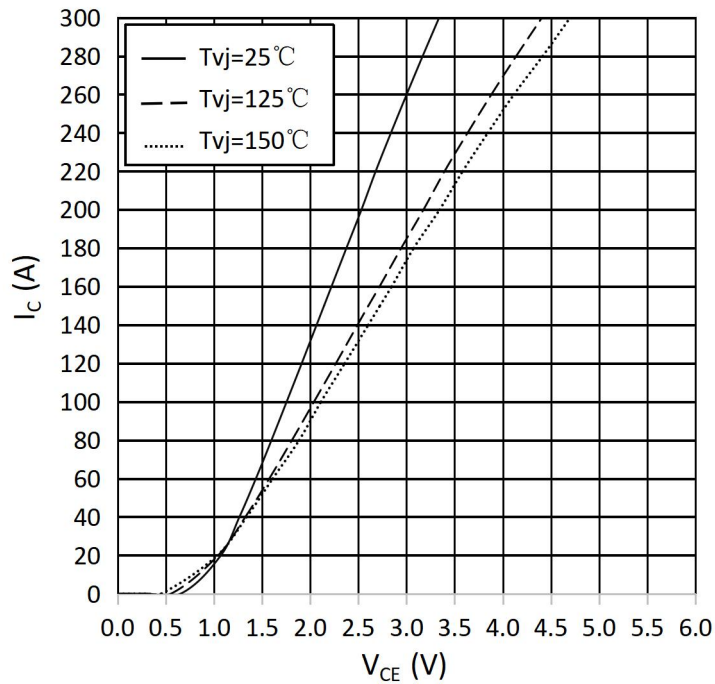
### Module

| Symbol        | Item                                | Conditions                                       | Rating  |      |      | Unit        |
|---------------|-------------------------------------|--------------------------------------------------|---------|------|------|-------------|
| $V_{ISOL}$    | Isolation voltage                   | Terminals to baseplate,<br>RMS, $f=50Hz, t=1min$ | 2500    |      |      | V           |
| $T_{vj\ max}$ | Maximum junction temperature        | -                                                | 175     |      |      | $^{\circ}C$ |
| $T_{vj\ op}$  | Operating junction temperature      | Continuous operationg(underswitching)            | -40~150 |      |      | $^{\circ}C$ |
| $T_{stg}$     | Storage temperature                 | -                                                | -40~125 |      |      | $^{\circ}C$ |
| Symbol        | Item                                | Conditions                                       | Values  |      |      | Unit        |
|               |                                     |                                                  | Min.    | Typ. | Max. |             |
| M             | Mounting torque for module mounting | -                                                | 3       | -    | 6    | Nm          |
| ds            | Creepage distance                   | Terminal to terminal                             | -       | -    | -    | mm          |
|               |                                     | Terminal to base plate                           | -       | 10   | -    |             |
| da            | Clearance                           | Terminal to terminal                             | -       | -    | -    | mm          |
|               |                                     | Terminal to base plate                           | -       | 7.5  | -    |             |
| m             | Weight                              | -                                                | -       | 290  | -    | g           |

**output characteristic IGBT, Inverter (typical)**

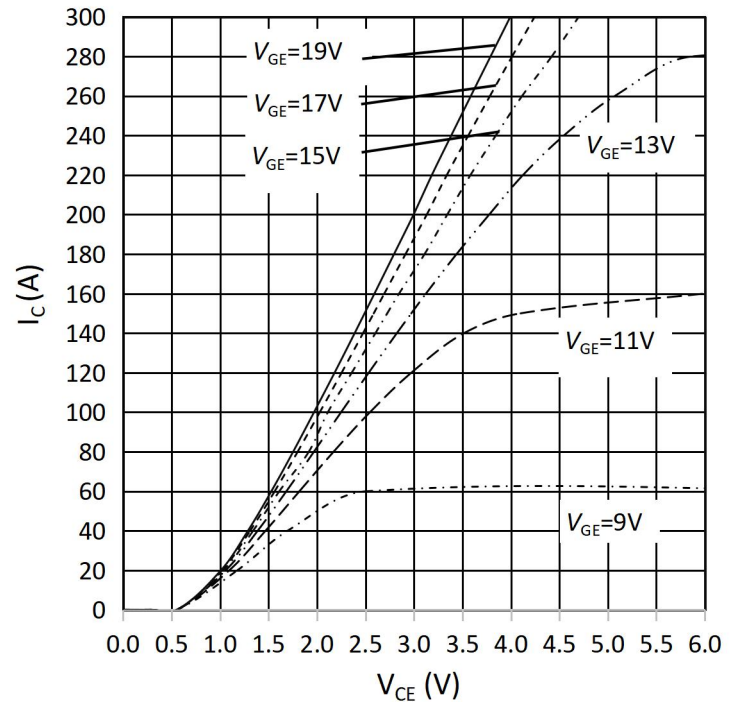
$$I_C = f(V_{CE})$$

$$V_{GE} = 15V$$


**output characteristic IGBT, Inverter (typical)**

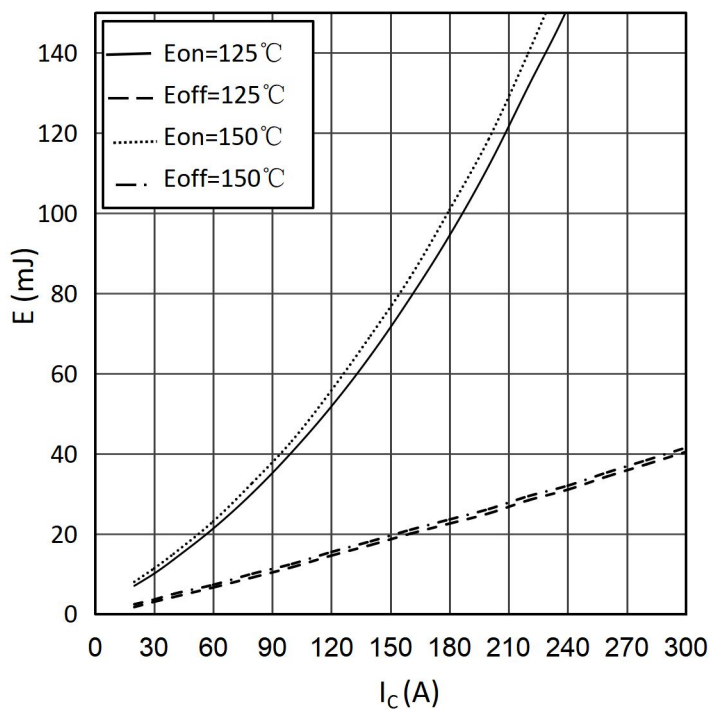
$$I_C = f(V_{CE})$$

$$T_{vj} = 150^{\circ}C$$


**switching losses IGBT, Inverter (typical)**

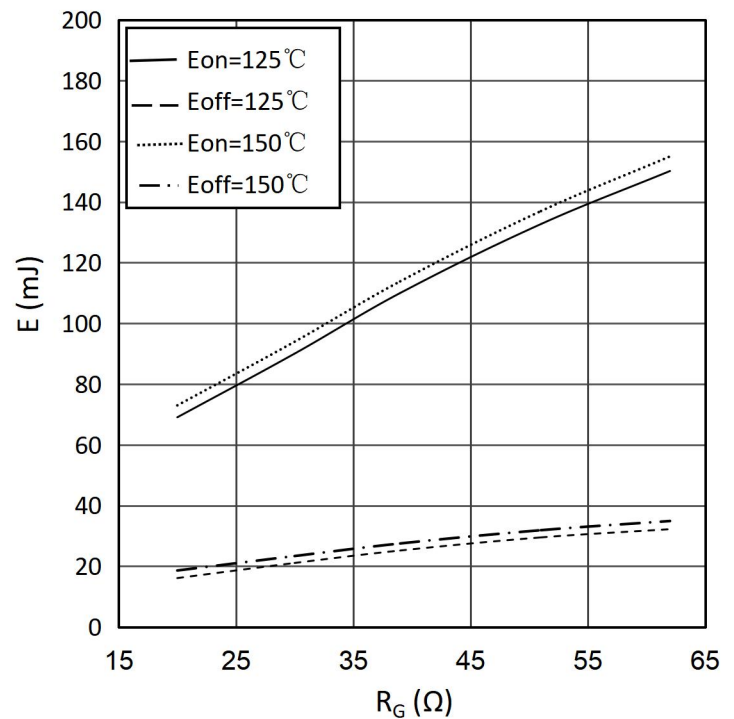
$$E_{on} = f(I_C), E_{off} = f(I_C)$$

$$V_{GE} = \pm 15V, R_{Gon} = 30\Omega, R_{Goff} = 30\Omega, V_{CE} = 600V$$


**switching losses IGBT, Inverter (typical)**

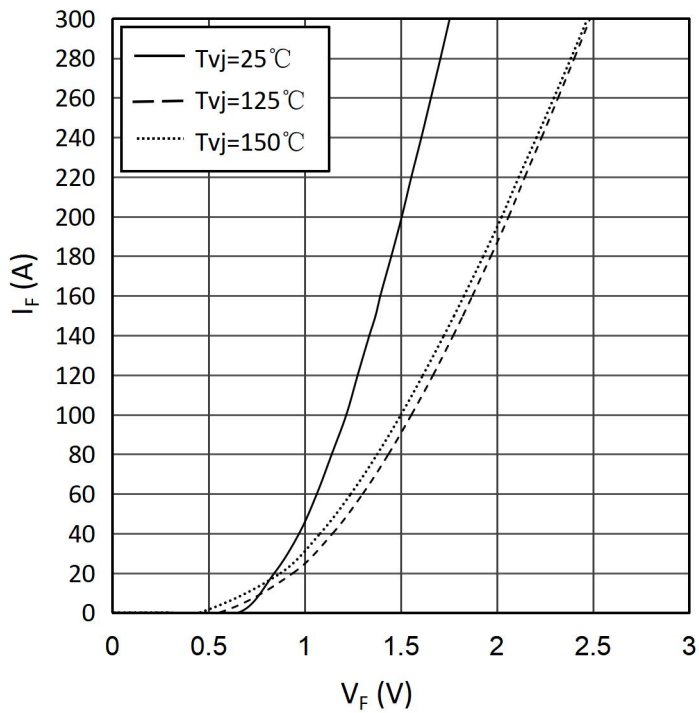
$$E_{on} = f(R_G), E_{off} = f(R_G)$$

$$V_{GE} = \pm 15V, I_C = 150A, V_{CE} = 600V$$



**forward characteristic of Diode, Inverter (typical)**

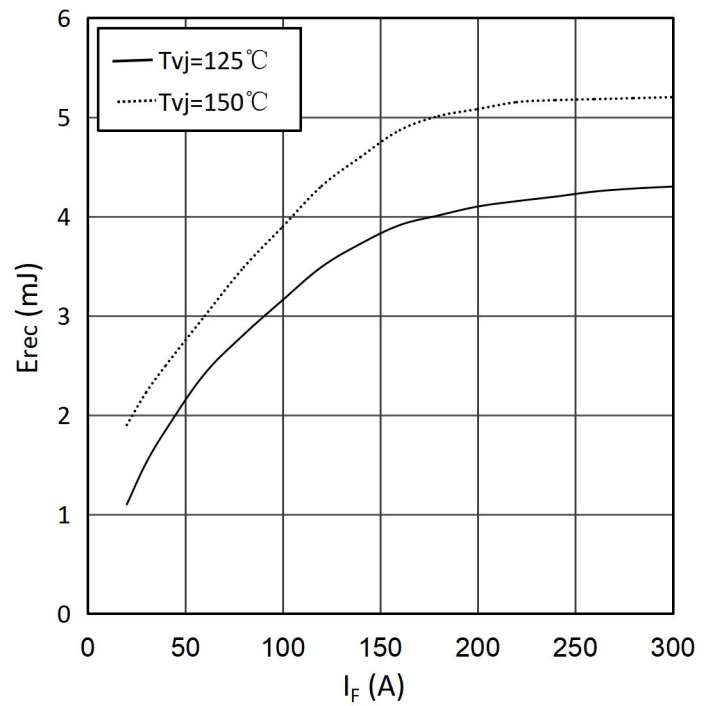
$$I_F = f(V_F)$$



**switching losses Diode, Inverter (typical)**

$$E_{rec} = f(I_F)$$

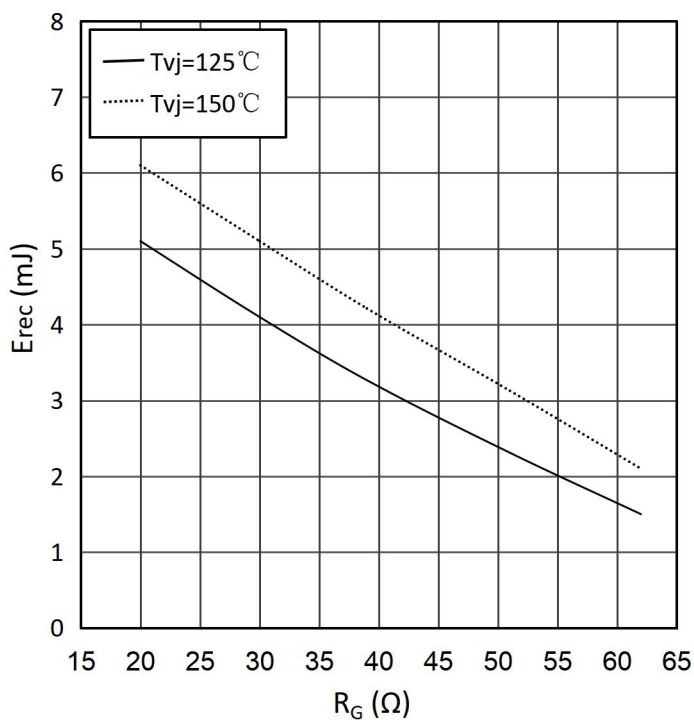
$$R_{Gon} = 30\Omega, V_{CE} = 600\text{ V}$$



**switching losses Diode, Inverter (typical)**

$$E_{rec} = f(R_G)$$

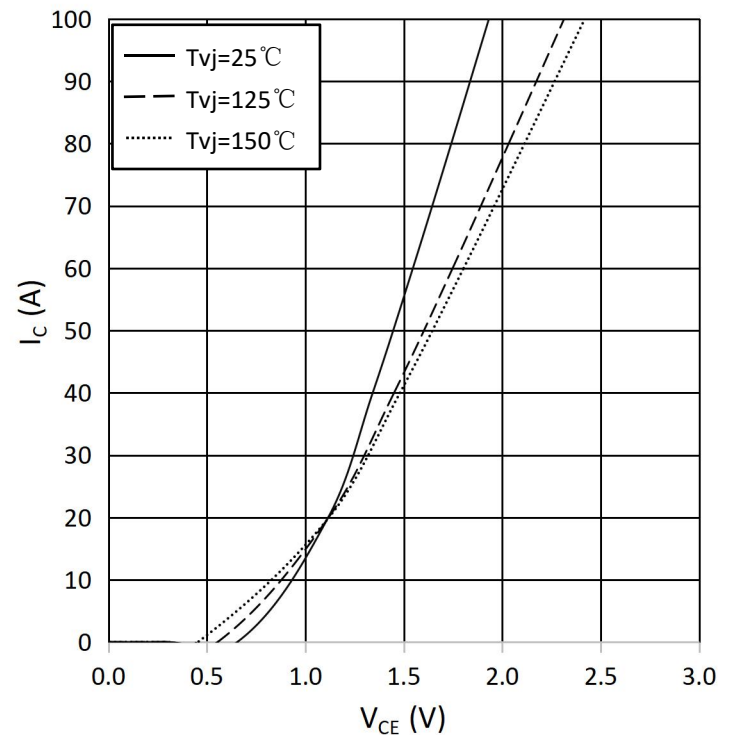
$$I_F = 150\text{ A}, V_{CE} = 600\text{ V}$$



**output characteristic IGBT, Brake-Chopper (typical)**

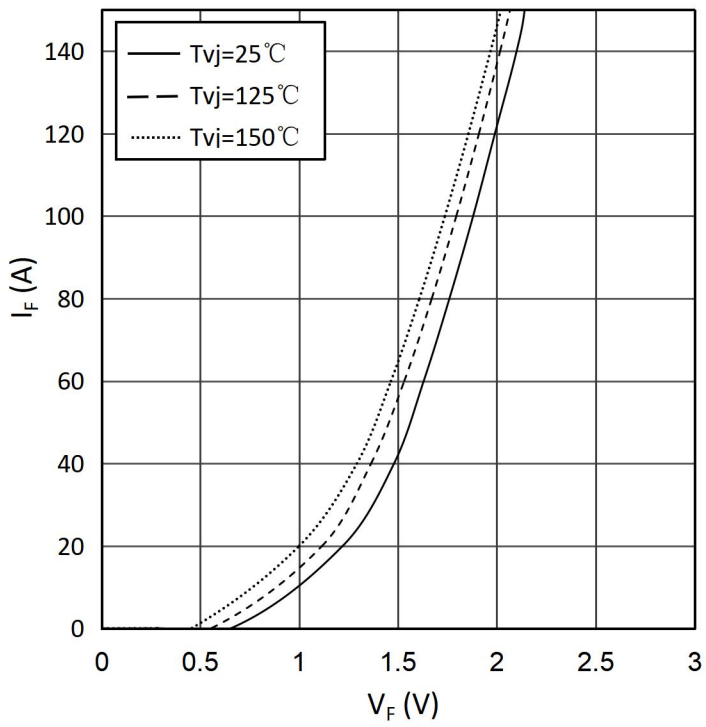
$$I_C = f(V_{CE})$$

$$V_{GE} = 15\text{ V}$$



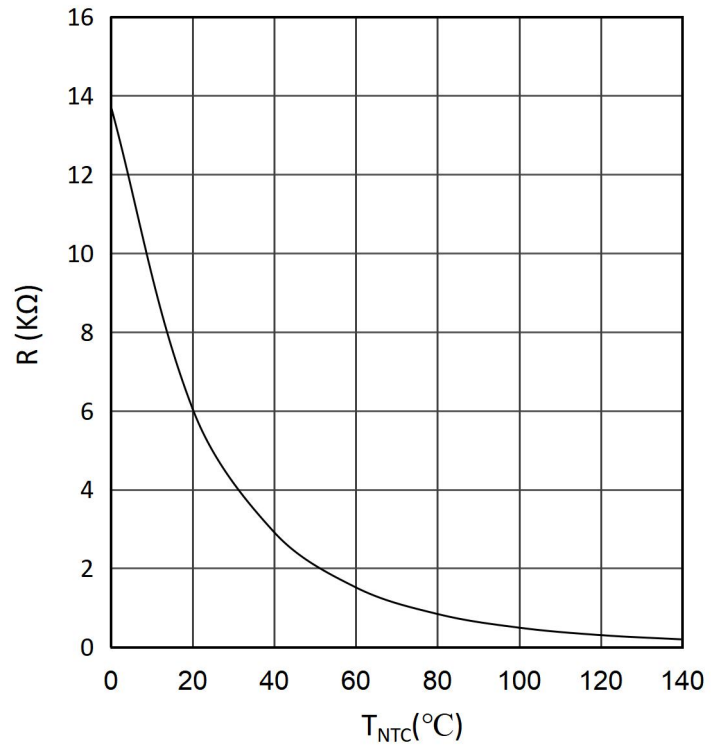
**forward characteristic of Diode, Brake-Chopper (typical)**

$$I_F = f(V_F)$$



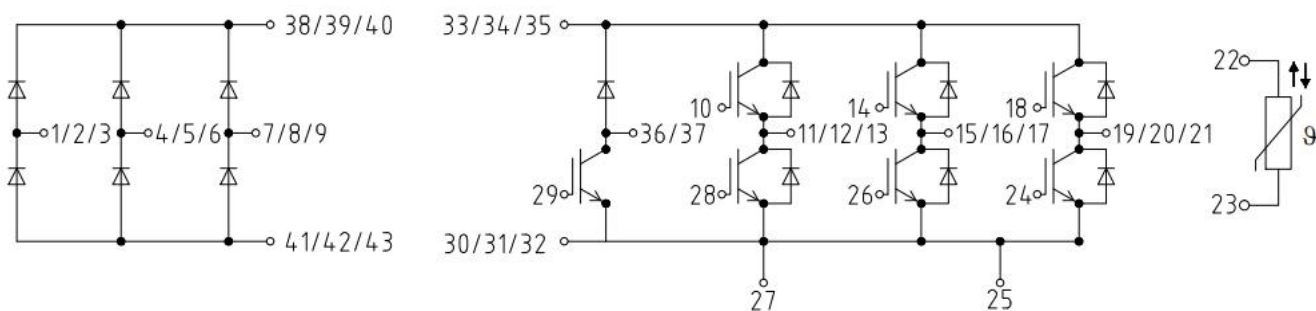
**NTC-Thermistor-temperature characteristic(typical)**

$$R = f(T)$$

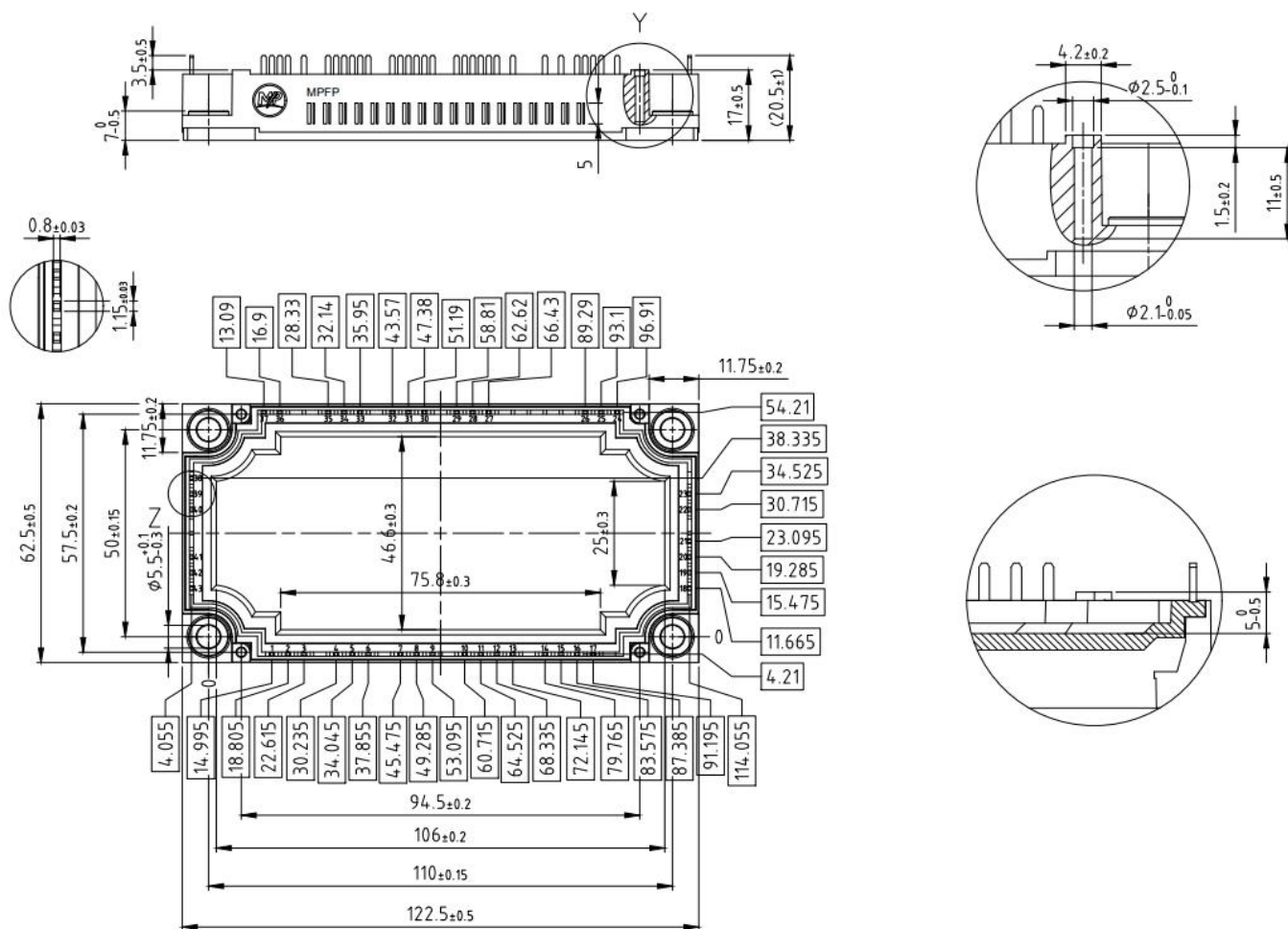




### Circuit Diagram



### Package Outlines



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