

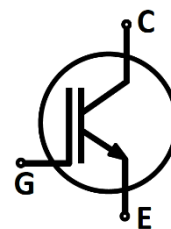
### Features:

- 1200V Trench & field stop technology
- Low switching losses
- Positive Temperature coefficient

### Recommended for:

### Applications:

- UPS
- Solar inverters
- Welding
- PFC



### Mechanical parameters

|                                  |                   |                  |                 |
|----------------------------------|-------------------|------------------|-----------------|
| Die size                         | L x W             | 11.30×12.00      | mm <sup>2</sup> |
| Emitter pad size                 | L x W             | See chip drawing | mm <sup>2</sup> |
| Gate pad size                    | L x W             | 1.31×0.811       | mm <sup>2</sup> |
| Silicon thickness                |                   | 125              | μm              |
| Wafer size                       |                   | 200              | mm              |
| Scribe line                      |                   | 80               | um              |
| Maximum possible chips per wafer |                   | 189              |                 |
| Passivation frontside            |                   | Polyimide        |                 |
| Pad Metallization                | AlCu              | 4                | μm              |
| Backside Metallization           | Al / Ti / Ni / Ag | 1.7              | μm              |

### Maximum Ratings

| Parameter                                                  | Symbol        | Value            | Unit |
|------------------------------------------------------------|---------------|------------------|------|
| Collector-emitter voltage                                  | $V_{CE}$      | 1200             | V    |
| DC collector current, limited by $T_{vj\ max}$             | $I_C$         | 150 <sup>1</sup> | A    |
| Pulsed collector current, $t_p$ limited by $T_{vj\ max}^2$ | $I_{C\ puls}$ | 450              | A    |
| Gate-emitter voltage                                       | $V_{GE}$      | ± 20             | V    |
| Operating junction temperature                             | $T_{vj\ op}$  | -40~150          | °C   |
| Storage temperature                                        | $T_{stg}$     | -40~150          | °C   |

### Static Characteristics ( $T_j=25^\circ\text{C}$ , unless otherwise noted)

| Parameter                            | Symbol        | Conditions                       | Min. | Typ. | Max. | Unit |
|--------------------------------------|---------------|----------------------------------|------|------|------|------|
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $V_{GE}=15V$ ,<br>$I_C=25A$      | -    | 1.16 | -    | V    |
| Gate-emitter threshold voltage       | $V_{GE(th)}$  | $I_C=5.7mA$ ,<br>$V_{CE}=V_{GE}$ | 5.3  | 5.8  | 6.3  | V    |
| Collector-emitter leakage            | $I_{CES}$     | $V_{CE}=1200V$ ,<br>$V_{GE}=0V$  | -    | -    | 20   | μA   |
| Gate-emitter leakage                 | $I_{GES}$     | $V_{CE}=0V$ ,<br>$V_{GE}=20V$    | -    | -    | 100  | nA   |
| Integrated gate resistor             | $R_{Gint}$    |                                  | -    | 3.0  | -    | Ω    |

<sup>1</sup> Depending on thermal properties of assembly.

<sup>2</sup> Not subject to production test - verified by design/characterization.

<sup>3</sup> Allowed number of short circuit: <1000; time between short circuit: >1s.

## Electrical Characteristic <sup>1</sup>

| Parameter                               |                              | Symbol        | Conditions                                                                                  | Min. | Typ.  | Max. | Unit          |
|-----------------------------------------|------------------------------|---------------|---------------------------------------------------------------------------------------------|------|-------|------|---------------|
| Collector-emitter saturation voltage    | $T_{vj}=25^{\circ}\text{C}$  | $V_{CE(sat)}$ | $V_{GE}=15\text{V}, I_C=150\text{A}$                                                        | 1.80 | 2.10  | 2.40 | V             |
|                                         | $T_{vj}=125^{\circ}\text{C}$ |               |                                                                                             |      | 2.68  |      | V             |
| Input capacitance                       |                              | $C_{ies}$     | $V_{CE}=25\text{V},$<br>$V_{GE}=0\text{V}, f=100\text{kHz},$<br>$T_{vj}=25^{\circ}\text{C}$ | -    | 16500 | -    | pF            |
| Reverse transfer capacitance            |                              | $C_{res}$     |                                                                                             | -    | 160   | -    | pF            |
| Turn-on delay time<br>(inductive load)  | $T_{vj}=25^{\circ}\text{C}$  | $t_{don}$     | $V_{CC}=600\text{V}, V_{GE}=\pm 15\text{V},$<br>$R_g=10\Omega, I_C=150\text{A}$             |      | 520   |      | ns            |
|                                         | $T_{vj}=125^{\circ}\text{C}$ |               |                                                                                             |      | 508   |      | ns            |
| Rise time<br>(inductive load)           | $T_{vj}=25^{\circ}\text{C}$  | $t_r$         |                                                                                             |      | 142   |      | ns            |
|                                         | $T_{vj}=125^{\circ}\text{C}$ |               |                                                                                             |      | 154   |      | ns            |
| Turn-off delay time<br>(inductive load) | $T_{vj}=25^{\circ}\text{C}$  | $t_{doff}$    |                                                                                             |      | 344   |      | ns            |
|                                         | $T_{vj}=125^{\circ}\text{C}$ |               |                                                                                             |      | 349   |      | ns            |
| Fall time<br>(inductive load)           | $T_{vj}=25^{\circ}\text{C}$  | $t_f$         |                                                                                             |      | 65    |      | ns            |
|                                         | $T_{vj}=125^{\circ}\text{C}$ |               |                                                                                             |      | 76    |      | ns            |
| Short circuit withstand time            | $T_{vj}=150^{\circ}\text{C}$ | $T_{SC}$      | $V_{CC}=800\text{V}, V_{GE}=15\text{V},$<br>$R_g=10\Omega$                                  |      | 10    |      | $\mu\text{s}$ |

**Version: 1.0**

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