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**Maximum Ratings**

For optimum lifetime and reliability, Infineon recommends operating conditions that do not exceed 80% of the maximum ratings stated in this datasheet.

| Parameter  | Symbol      | Value                | Unit               |
|--|-------------|----------------------|--------------------|
| Collector-emitter voltage, $T_{vj} \geq 25^{\circ}\text{C}$  | $V_{CE}$    | 650                  | V                  |
| DC collector current, limited by $T_{vjmax}$<br>$T_C = 25^{\circ}\text{C}$<br>$T_C = 100^{\circ}\text{C}$            | $I_C$       | 55.0<br>35.0         | A                  |
| Pulsed collector current, $t_p$ limited by $T_{vjmax}$   | $I_{Cpuls}$ | 90.0                 | A                  |
| Turn off safe operating area<br>$V_{CE} \leq 650\text{V}$ , $T_{vj} \leq 175^{\circ}\text{C}$ , $t_p = 1\mu\text{s}$ | -           | 90.0                 | A                  |
| Gate-emitter voltage<br>Transient Gate-emitter voltage ( $t_p \leq 10\mu\text{s}$ , $D < 0.010$ )                    | $V_{GE}$    | $\pm 20$<br>$\pm 30$ | V                  |
| Power dissipation $T_C = 25^{\circ}\text{C}$<br>Power dissipation $T_C = 100^{\circ}\text{C}$                        | $P_{tot}$   | 188.0<br>93.0        | W                  |
| Operating junction temperature   | $T_{vj}$    | -40...+175           | $^{\circ}\text{C}$ |
| Storage temperature  | $T_{stg}$   | -55...+150           | $^{\circ}\text{C}$ |
| Soldering temperature,<br>wave soldering 1.6mm (0.063in.) from case for 10s  |             | 260                  | $^{\circ}\text{C}$ |
| Mounting torque, M3 screw<br>Maximum of mounting processes: 3  | $M$         | 0.6                  | Nm                 |

**Thermal Resistance**

| Parameter                                   | Symbol        | Conditions | Max. Value | Unit |
|---|---------------|------------|------------|------|
| <b>Characteristic</b>                       |               |            |            |      |
| IGBT thermal resistance,<br>junction - case | $R_{th(j-c)}$ |            | 0.80       | K/W  |
| Thermal resistance<br>junction - ambient    | $R_{th(j-a)}$ |            | 62         | K/W  |

**Electrical Characteristic, at  $T_{vj} = 25^{\circ}\text{C}$ , unless otherwise specified**

| Parameter                            | Symbol        | Conditions  | Value       |                      |                | Unit          |
|--------------------------------------|---------------|---|-------------|----------------------|----------------|---------------|
|                                      |               |   | min.        | typ.                 | max.           |               |
| <b>Static Characteristic</b>         |               |   |             |                      |                |               |
| Collector-emitter breakdown voltage  | $V_{(BR)CES}$ | $V_{GE} = 0\text{V}$ , $I_C = 0.20\text{mA}$  | 650         | -                    | -              | V             |
| Collector-emitter saturation voltage | $V_{CEsat}$   | $V_{GE} = 15.0\text{V}$ , $I_C = 30.0\text{A}$<br>$T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 175^{\circ}\text{C}$ | -<br>-<br>- | 1.60<br>1.80<br>1.90 | 2.10<br>-<br>- | V             |
| Gate-emitter threshold voltage       | $V_{GE(th)}$  | $I_C = 0.30\text{mA}$ , $V_{CE} = V_{GE}$   | 3.2         | 4.0                  | 4.8            | V             |
| Zero gate voltage collector current  | $I_{CES}$     | $V_{CE} = 650\text{V}$ , $V_{GE} = 0\text{V}$<br>$T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 175^{\circ}\text{C}$                                    | -<br>-      | -<br>-               | 40.0<br>4000.0 | $\mu\text{A}$ |
| Gate-emitter leakage current         | $I_{GES}$     | $V_{CE} = 0\text{V}$ , $V_{GE} = 20\text{V}$  | -           | -                    | 100            | nA            |
| Transconductance                     | $g_{fs}$      | $V_{CE} = 20\text{V}$ , $I_C = 30.0\text{A}$  | -           | 38.0                 | -              | S             |