

TRENCHSTOP™ IGBT3 Chip

Features:

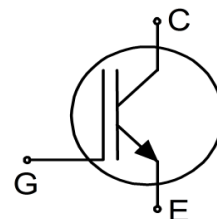
- 650V trench & field stop technology
- Low V_{CEsat}
- Low turn-off losses
- Short tail current
- Positive temperature coefficient
- Easy paralleling

Recommended for:

- Power modules

Applications:

- Drives



| Chip Type | V_{CE} | I_{Cn} | Die Size | Package |
|------------|----------|----------|-----------------|--------------|
| SIGC15T65E | 650V | 30A | 3.92mm x 3.88mm | Sawn on foil |

Mechanical Parameters

| | | | |
|----------------------------------|---|--|-----------------|
| Die size | 3.92 x 3.88 | | mm ² |
| Emitter pad size | See chip drawing | | |
| Gate pad size | 0.608 x 1.083 | | |
| Area total | 15.21 | | |
| Silicon thickness | 70 | | μm |
| Wafer size | 200 | | mm |
| Maximum possible chips per wafer | 1806 | | |
| Passivation frontside | Photoimide | | |
| Pad metal | 3200nm AlSiCu | | |
| Backside metal | Ni Ag – system To achieve a reliable solder connection it is strongly recommended not to consume the Ni layer completely during production process | | |
| Die bond | Electrically conductive epoxy glue and soft solder | | |
| Wire bond | Al, ≤500μm | | |
| Reject ink dot size | Ø 0.65mm; max. 1.2mm | | |
| Storage environment (<6 months) | for original and sealed MBB bags | Ambient atmosphere air, temperature 17°C – 25°C | |
| | for open MBB bags | Acc. IEC 62258-3; Section 9.4 Storage Environment. | |

Maximum Ratings

In general, from reliability and lifetime point of view, the lower the operation junction temperature and/or the applied voltage, the greater the expected lifetime of any semiconductor device.

| Parameter | Symbol | Value | Unit |
|---|--------------|--------------|--------------------|
| Collector-emitter voltage, $T_{vj}=25^{\circ}\text{C}$ | V_{CE} | 650 | V |
| DC collector current, limited by $T_{vj\text{ max}}^1$ | I_C | - | A |
| Pulsed collector current, t_p limited by $T_{vj\text{ max}}^2$ | $I_{C,puls}$ | 90 | A |
| Gate-emitter voltage | V_{GE} | ± 20 | V |
| Virtual junction temperature | T_{vj} | -40 ... +175 | $^{\circ}\text{C}$ |
| Short circuit data ^{1/2/3} $V_{GE}=15\text{V}$, $V_{CC}=360\text{V}$, $T_{vj}=150^{\circ}\text{C}$ | t_{sc} | 6 | μs |

Static Characteristics (tested on wafer), $T_{vj}=25^{\circ}\text{C}$

| Parameter | Symbol | Conditions | Value | | | Unit |
|--------------------------------------|---------------|---|-------|------|------|---------------|
| | | | min. | typ. | max. | |
| Collector-emitter breakdown voltage | $V_{(BR)CES}$ | $V_{GE}=0\text{V}$, $I_C=2\text{mA}$ | 650 | - | - | V |
| Collector-emitter saturation voltage | V_{CEsat} | $V_{GE}=15\text{V}$, $I_C=30\text{A}$ | 1.03 | 1.45 | 1.87 | |
| Gate-emitter threshold voltage | $V_{GE(th)}$ | $I_C=430\mu\text{A}$, $V_{GE}=V_{CE}$ | 5.1 | 5.8 | 6.4 | |
| Zero gate voltage collector current | I_{CES} | $V_{CE}=650\text{V}$, $V_{GE}=0\text{V}$ | - | - | 1.6 | μA |
| Gate-emitter leakage current | I_{GES} | $V_{CE}=0\text{V}$, $V_{GE}=20\text{V}$ | - | - | 300 | nA |
| Integrated gate resistor | r_G | | none | | | Ω |

Electrical Characteristics ²

| Parameter | Symbol | Conditions | Value | | | Unit |
|--------------------------------------|-------------|--|-------|------|------|------|
| | | | min. | typ. | max. | |
| Collector-emitter saturation voltage | V_{CEsat} | $V_{GE}=15\text{V}$, $I_C=30\text{A}$, $T_{vj}=175^{\circ}\text{C}$ | - | 1.9 | - | V |
| Input capacitance | C_{ies} | $V_{CE}=25\text{V}$, $V_{GE}=0\text{V}$, $f=1\text{MHz}$ | - | 1630 | - | pF |
| Reverse transfer capacitance | C_{res} | $T_{vj}=25^{\circ}\text{C}$ | - | 50 | - | |

¹ Depending on thermal properties of assembly.

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

³ Allowed number of short circuits: <1000; time between short circuits: >1s.