# SIGC109T120R3

IGBT$^3$ Chip

**FEATURES:**

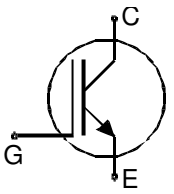
- 1200V Trench + Field Stop technology
- low turn-off losses
- short tail current
- positive temperature coefficient
- easy paralleling

**This chip is used for:**

- power module

**Applications:**

- drives




| Chip Type | $V_{CE}$ | $I_{Cn}$ | Die Size | Package | Ordering Code |
|---|---|---|---|---|---|
| SIGC109T120R3 | 1200V | 100A | 10.47 x 10.44 mm$^2$ | sawn on foil | Q67050-A4108-A001 |

**MECHANICAL PARAMETER:**

| | | |
|---|---|---|
| Raster size | 10.47 x 10.44 | mm |
| Emitter pad size | 8x(2.114 x 4.391) | |
| Gate pad size | 1.139 x 1.139 | |
| Area total / active | 109.3 / 85.8 | mm$^2$ |
| Thickness | 140 | µm |
| Wafer size | 150 | mm |
| Flat position | 90 | grd |
| Max.possible chips per wafer | 124 pcs | |
| Passivation frontside | Photoimide | |
| Emitter metallization | 3200 nm AlSiCu | |
| Collector metallization | 1400 nm Ni Ag –system<br>suitable for epoxy and soft solder die bonding | |
| Die bond | electrically conductive glue or solder | |
| Wire bond | Al, <500µm | |
| Reject Ink Dot Size | ∅ 0.65mm ; max 1.2mm | |
| Recommended Storage Environment | store in original container, in dry nitrogen,<br>< 6 month at an ambient temperature of 23°C | |

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**MAXIMUM RATINGS**:

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Collector-emitter voltage, $T_j$=25 °C | $V_{CE}$ | 1200 | V |
| DC collector current, limited by $T_{jmax}$ | $I_C$ | 1) | A |
| Pulsed collector current, $t_p$ limited by $T_{jmax}$ | $I_{cpuls}$ | 300 | A |
| Gate emitter voltage | $V_{GE}$ | ±20 | V |
| Operating junction and storage temperature | $T_j$, $T_{stg}$ | -55 ... +150 | °C |

1) depending on thermal properties of assembly

**STATIC CHARACTERISTICS (tested on chip)**, $T_j$=25 °C, unless otherwise specified:

| Parameter | Symbol | Conditions | Value | | | Unit |
|---|---|---|---|---|---|---|
| | | | min. | typ. | max. | |
| Collector-emitter breakdown voltage | $V_{(BR)CES}$ | $V_{GE}$=0V , $I_C$= 4mA | 1200 | | | V |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $V_{GE}$=15V, $I_C$=100A | 1.4 | 1.7 | 2.1 | |
| Gate-emitter threshold voltage | $V_{GE(th)}$ | $I_C$=4mA , $V_{GE}$=$V_{CE}$ | 5.0 | 5.8 | 6.5 | |
| Zero gate voltage collector current | $I_{CES}$ | $V_{CE}$=1200V , $V_{GE}$=0V | | | 13.4 | µA |
| Gate-emitter leakage current | $I_{GES}$ | $V_{CE}$=0V , $V_{GE}$=20V | | | 600 | nA |
| Integrated gate resistor | $R_{Gint}$ | | | 7.5 | | Ω |

**ELECTRICAL CHARACTERISTICS** (tested at component):

| Parameter | Symbol | Conditions | Value | | | Unit |
|---|---|---|---|---|---|---|
| | | | min. | typ. | max. | |
| Input capacitance | $C_{iss}$ | $V_{CE}$=25V, | | 7210 | | pF |
| Output capacitance | $C_{oss}$ | $V_{GE}$=0V, | | 377 | | |
| Reverse transfer capacitance | $C_{rss}$ | $f$=1MHz | | 327 | | |

**SWITCHING CHARACTERISTICS** (tested at component), Inductive Load

| Parameter | Symbol | Conditions 1) | Value | | | Unit |
|---|---|---|---|---|---|---|
| | | | min. | typ. | max. | |
| Turn-on delay time | $t_{d(on)}$ | $T_j$=125°C | | 285 | | ns |
| Rise time | $t_r$ | $V_{CC}$=600V, | | 45 | | |
| Turn-off delay time | $t_{d(off)}$ | $I_C$=100A, $V_{GE}$=-15/15V, | | 520 | | |
| Fall time | $t_f$ | $R_G$= 3.9Ω | | 90 | | |

1) values also influenced by parasitic L- and C- in measurement and package.

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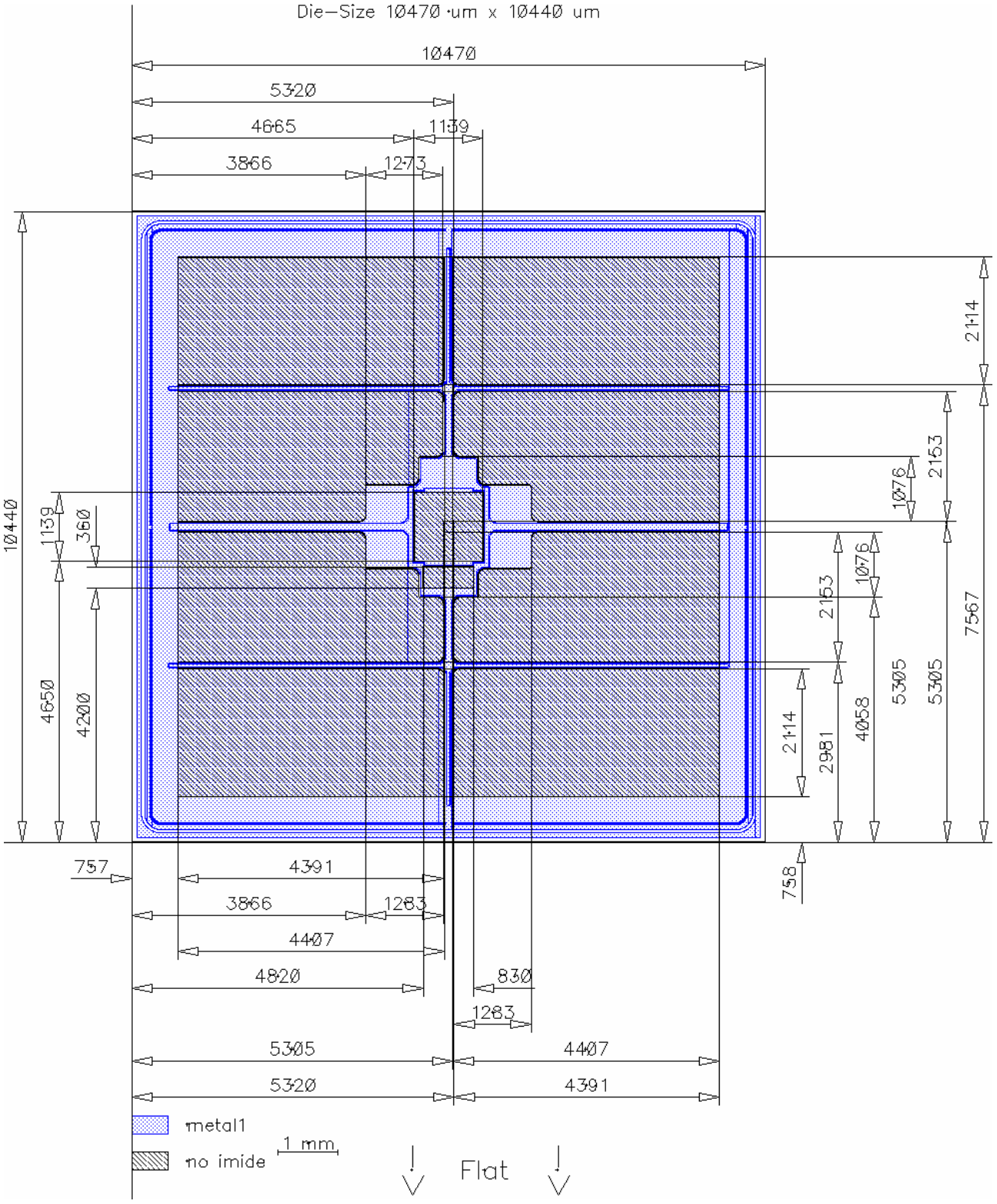
**CHIP DRAWING:**



**FURTHER ELECTRICAL CHARACTERISTICS:**

| | | |
|---|---|---|
| This chip data sheet refers to the device data sheet | tbd | |

**DESCRIPTION:**

| |
|---|
| AQL 0,65 for visual inspection according to failure catalog |
| Electrostatic Discharge Sensitive Device according to MIL-STD 883 |
| Test-Normen Villach/Prüffeld |

**Published by**
**Infineon Technologies AG,**
**Bereich Kommunikation**
**St.-Martin-Strasse 53,**
**D-81541 München**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