

# SIGC42T170R3

## IGBT<sup>3</sup> Chip

### FEATURES:

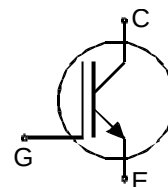
- 1700V Trench + Field Stop technology
- low turn-off losses
- short tail current
- positive temperature coefficient
- easy paralleling

### This chip is used for:

- power module

### Applications:

- drives



| Chip Type    | V <sub>CE</sub> | I <sub>Cn</sub> | Die Size                   | Package      | Ordering Code     |
|--------------|-----------------|-----------------|----------------------------|--------------|-------------------|
| SIGC42T170R3 | 1700V           | 29A             | 6.5 x 6.46 mm <sup>2</sup> | sawn on foil | Q67050-A4151-A001 |

### MECHANICAL PARAMETER:

|                                 |                                                                                              |                 |
|---------------------------------|----------------------------------------------------------------------------------------------|-----------------|
| Raster size                     | 6.5 x 6.46                                                                                   | mm              |
| Emitter pad size                | 4.27 x 4.27                                                                                  |                 |
| Gate pad size                   | 1.18 x 1.09                                                                                  |                 |
| Area total / active             | 42 / 28.7                                                                                    | mm <sup>2</sup> |
| Thickness                       | 190                                                                                          | µm              |
| Wafer size                      | 150                                                                                          | mm              |
| Flat position                   | 180                                                                                          | grd             |
| Max.possible chips per wafer    | 338 pcs                                                                                      |                 |
| Passivation frontside           | Photoimide                                                                                   |                 |
| Emitter metalization            | 3200 nm AlSiCu                                                                               |                 |
| Collector metalization          | 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             | Ø 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 |                 |

## MAXIMUM RATINGS:

| Parameter                                             | Symbol         | Value         | Unit |
|-------------------------------------------------------|----------------|---------------|------|
| Collector-emitter voltage, $T_j=25\text{ °C}$         | $V_{CE}$       | 1700          | V    |
| DC collector current, limited by $T_{jmax}$           | $I_C$          | <sup>1)</sup> | A    |
| Pulsed collector current, $t_p$ limited by $T_{jmax}$ | $I_{cpuls}$    | 87            | A    |
| Gate emitter voltage                                  | $V_{GE}$       | $\pm 20$      | V    |
| Operating junction and storage temperature            | $T_j, T_{stg}$ | -55 ... +150  | °C   |

<sup>1)</sup> depending on thermal properties of assembly

## STATIC CHARACTERISTICS (tested on chip), $T_j=25\text{ °C}$ , unless otherwise specified:

| Parameter                            | Symbol        | Conditions                 | Value |      |      | Unit     |
|--------------------------------------|---------------|----------------------------|-------|------|------|----------|
|                                      |               |                            | min.  | typ. | max. |          |
| Collector-emitter breakdown voltage  | $V_{(BR)CES}$ | $V_{GE}=0V, I_C=1.5mA$     | 1700  |      |      | V        |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $V_{GE}=15V, I_C=29A$      | 1.6   | 2    | 2.4  |          |
| Gate-emitter threshold voltage       | $V_{GE(th)}$  | $I_C=1.2mA, V_{GE}=V_{CE}$ | 5.2   | 5.8  | 6.4  |          |
| Zero gate voltage collector current  | $I_{CES}$     | $V_{CE}=1700V, V_{GE}=0V$  |       |      | 2    | $\mu A$  |
| Gate-emitter leakage current         | $I_{GES}$     | $V_{CE}=0V, V_{GE}=20V$    |       |      | 600  | nA       |
| Integrated gate resistor             | $R_{Gint}$    |                            |       | 8    |      | $\Omega$ |

## ELECTRICAL CHARACTERISTICS (tested at component):

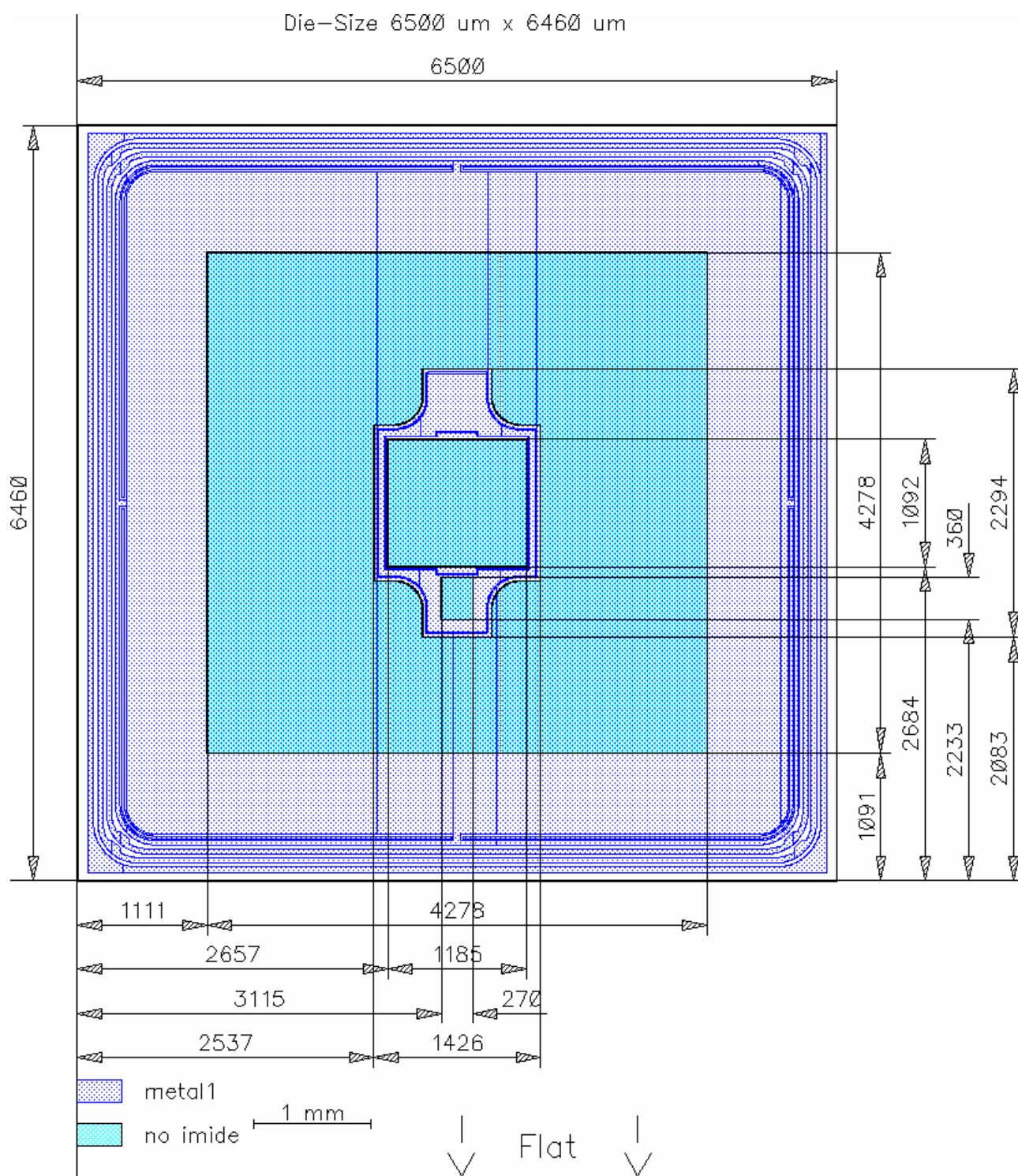
| Parameter                    | Symbol    | Conditions    | Value |      |      | Unit |
|------------------------------|-----------|---------------|-------|------|------|------|
|                              |           |               | min.  | typ. | max. |      |
| Input capacitance            | $C_{iss}$ | $V_{CE}=25V,$ |       | 2500 |      | pF   |
| Output capacitance           | $C_{oss}$ | $V_{GE}=0V,$  |       | 105  |      |      |
| Reverse transfer capacitance | $C_{rss}$ | $f=1MHz$      |       | 84   |      |      |

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

| Parameter           | Symbol       | Conditions <sup>1)</sup> | Value |      |      | Unit |
|---------------------|--------------|--------------------------|-------|------|------|------|
|                     |              |                          | min.  | typ. | max. |      |
| Turn-on delay time  | $t_{d(on)}$  | $T_j=125\text{ °C}$      |       | 400  |      | ns   |
| Rise time           | $t_r$        | $V_{CC}=900V,$           |       | 50   |      |      |
| Turn-off delay time | $t_{d(off)}$ | $I_C=29A,$               |       | 800  |      |      |
| Fall time           | $t_f$        | $V_{GE}=-15/15V,$        |       | 300  |      |      |
|                     |              | $R_G=18\Omega$           |       |      |      |      |

<sup>1)</sup> values also influenced by parasitic L- and C- in measurement and package.

## CHIP DRAWING:



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**FURTHER ELECTRICAL CHARACTERISTICS:**

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

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**DESCRIPTION:**

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AQL 0,65 for visual inspection according to failure catalog

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Electrostatic Discharge Sensitive Device according to MIL-STD 883

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Test-Normen Villach/Prüffeld

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