

IGBT Chip in NPT-technology

**FEATURES:**

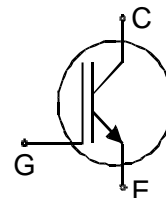
- 600V NPT technology
- 100µm chip
- positive temperature coefficient
- easy paralleling

**This chip is used for:**

- IGBT-Modules

**Applications:**

- drives



| Chip Type    | V <sub>CE</sub> | I <sub>Cn</sub> | Die Size                  | Package      | Ordering Code     |
|--------------|-----------------|-----------------|---------------------------|--------------|-------------------|
| SIGC42T60SNC | 600V            | 50A             | 6.5 x 6.5 mm <sup>2</sup> | sawn on foil | Q67050-A4181-A001 |
| SIGC42T60SNC | 600V            | 50A             | 6.5 x 6.5 mm <sup>2</sup> | unsawn       | Q67050-A4181-A002 |

**MECHANICAL PARAMETER:**

|                                 |                                                                                              |                 |
|---------------------------------|----------------------------------------------------------------------------------------------|-----------------|
| Raster size                     | 6.5 x 6.5                                                                                    | mm <sup>2</sup> |
| Area total / active             | 42.25 / 35.6                                                                                 |                 |
| Emitter pad size                | 2x( 3.0x2.85 )                                                                               |                 |
| Gate pad size                   | 0.8 x 1.5                                                                                    |                 |
| Thickness                       | 100                                                                                          | µm              |
| Wafer size                      | 150                                                                                          | mm              |
| Flat position                   | 90                                                                                           | deg             |
| Max.possible chips per wafer    | 334                                                                                          |                 |
| Passivation frontside           | Photoimide                                                                                   |                 |
| Emitter metallization           | 3200 nm Al Si 1%                                                                             |                 |
| 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             | 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, $T_j=25\text{ °C}$         | $V_{CE}$       | 600           | V                  |
| DC collector current, limited by $T_{jmax}$           | $I_C$          | <sup>1)</sup> | A                  |
| Pulsed collector current, $t_p$ limited by $T_{jmax}$ | $I_{Cpuls}$    | 150           | A                  |
| Gate emitter voltage                                  | $V_{GE}$       | $\pm 20$      | V                  |
| Operating junction and storage temperature            | $T_j, T_{stg}$ | -55 ... +150  | $^{\circ}\text{C}$ |

<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  | $V_{(BR)CES}$ | $V_{GE}=0V, I_C=2mA$     | 600   |      |      | V             |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $V_{GE}=15V, I_C=50A$    | 1.7   | 2    | 2.5  |               |
| Gate-emitter threshold voltage       | $V_{GE(th)}$  | $I_C=1mA, V_{GE}=V_{CE}$ | 3     | 4    | 5    |               |
| Zero gate voltage collector current  | $I_{CES}$     | $V_{CE}=600V, V_{GE}=0V$ |       |      | 3.5  | $\mu\text{A}$ |
| Gate-emitter leakage current         | $I_{GES}$     | $V_{CE}=0V, V_{GE}=20V$  |       |      | 120  | nA            |

## DYNAMIC CHARACTERISTICS (tested at component):

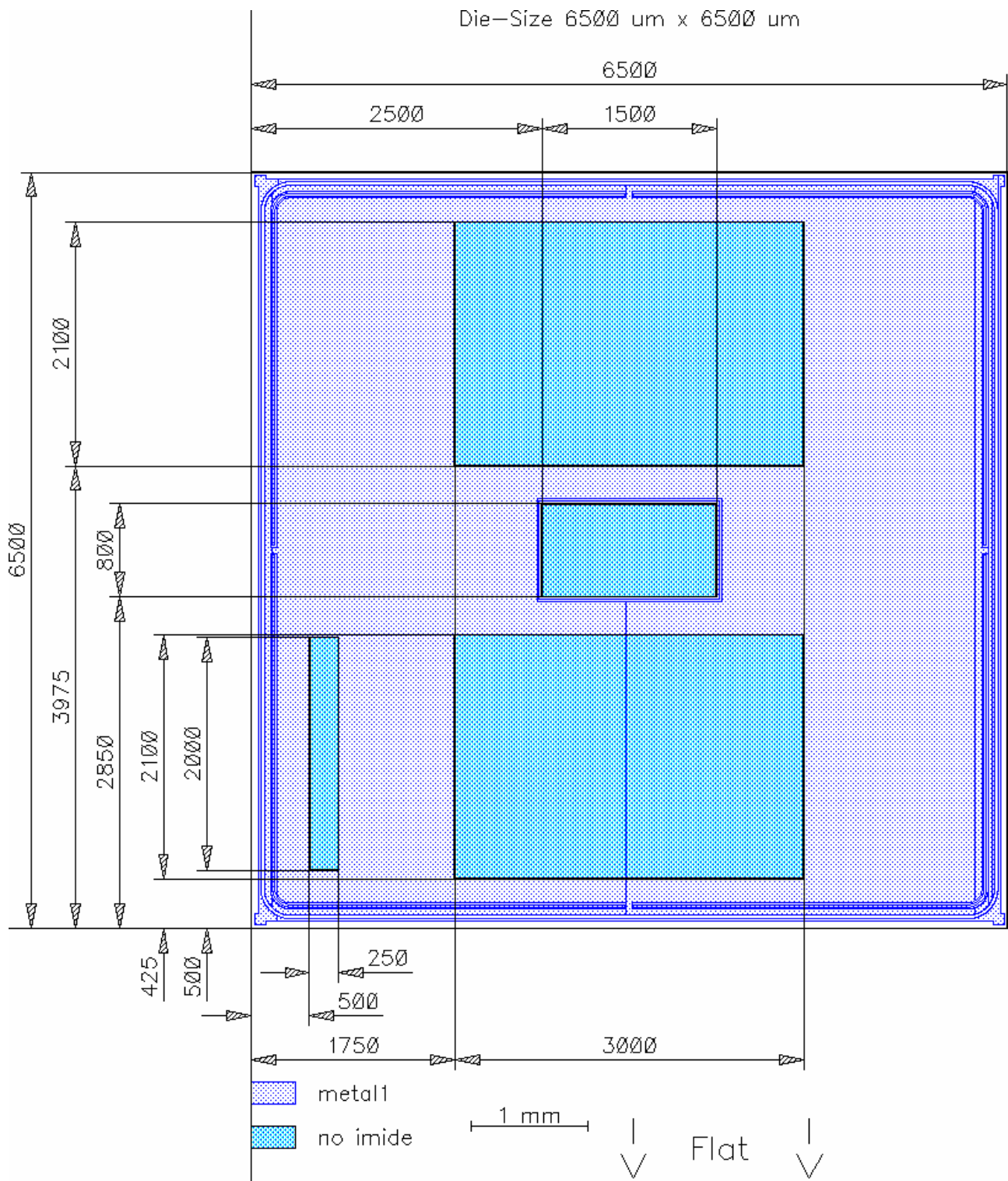
| Parameter                    | Symbol     | Conditions      | Value |      |      | Unit |
|------------------------------|------------|-----------------|-------|------|------|------|
|                              |            |                 | min.  | typ. | max. |      |
| Input capacitance            | $C_{iss}$  | $V_{CE}=25V$    | -     | 2660 | 3190 | pF   |
| Output capacitance           | $C_{oss}$  | $V_{GE}=0V$     | -     | 250  | 300  |      |
| Reverse transfer capacitance | $C_{riss}$ | $f=1\text{MHz}$ | -     | 153  | 182  |      |

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

| Parameter           | Symbol       | Conditions <sup>2)</sup>             | Value |      |      | Unit |
|---------------------|--------------|--------------------------------------|-------|------|------|------|
|                     |              |                                      | min.  | typ. | max. |      |
| Turn-on delay time  | $t_{d(on)}$  | $T_j=150\text{ °C}$<br>$V_{CC}=400V$ | -     | 55   | 77   | ns   |
| Rise time           | $t_r$        | $I_C=50A$                            | -     | 40   | 56   |      |
| Turn-off delay time | $t_{d(off)}$ | $V_{GE}=+15/0V$<br>$R_G=6.8\Omega$   | -     | 380  | 532  |      |
| Fall time           | $t_f$        |                                      | -     | 80   | 112  |      |

<sup>2)</sup> switching conditions different to 600V Standard IGBT 2, under comparable switching conditions 40% faster turnoff than Standard IGBT 2. Values also influenced by parasitic L- and C- in measurement and package.

**CHIP DRAWING:**





# SIGC42T60SNC

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**FURTHER ELECTRICAL CHARACTERISTICS:**

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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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