

## IGBT Chip in NPT-technology

### Features:

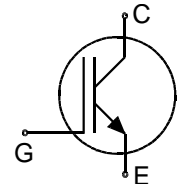
- 1200V NPT technology
- low turn-off losses
- positive temperature coefficient
- easy paralleling
- integrated gate resistor

### This chip is used for:

- power module  
BSM 50GD120DN2

### Applications:

- drives



| Chip Type     | V <sub>CE</sub> | I <sub>C</sub> | Die Size                    | Package      |
|---------------|-----------------|----------------|-----------------------------|--------------|
| SIGC81T120R2C | 1200V           | 50A            | 9.08 X 8.98 mm <sup>2</sup> | sawn on foil |

### Mechanical Parameter

|                                 |  |                 |
|---------------------------------|--|-----------------|
| Raster size                     | 9.08 X 8.98  | mm <sup>2</sup> |
| Emitter pad size                | 8 x ( 2.6 x 1.78 )   |                 |
| Gate pad size                   | 1.46 x 0.8   |                 |
| Area total                      | 81.5   |                 |
| Thickness                       | 200  | µm              |
| Wafer size                      | 150  | mm              |
| Max.possible chips per wafer    | 167  |                 |
| Passivation frontside           | Photoimide   |                 |
| Pad metal                       | 3200 nm AlSiCu   |                 |
| Backside metal                  | 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, in dark environment, < 6 month at an ambient temperature of 23°C |                 |



# SIGC81T120R2C

## Maximum Ratings

| Parameter  | Symbol   | Value         | Unit    |
|--|--|---------------|---------|
| Collector-Emitter voltage, $T_{vj} = 25\text{ °C}$   | $V_{CE}$   | 1200          | V       |
| DC collector current, limited by $T_{vj\text{ max}}$   | $I_C$  | <sup>1)</sup> | A       |
| Pulsed collector current, $t_p$ limited by $T_{vj\text{ max}}$                               | $I_{C,puls}$   | 150           | A       |
| Gate emitter voltage   | $V_{GE}$   | $\pm 20$      | V       |
| Junction temperature range   | $T_{vj}$   | -55 ... +175  | °C      |
| Operating junction temperature   | $T_{vj}$   | -55...+150    | °C      |
| Short circuit data <sup>2)</sup> $V_{GE} = 15V$ , $V_{CC} = 900V$ , $T_{vj} = 150\text{ °C}$ | $t_{SC}$   | 10            | $\mu s$ |
| Reverse bias safe operating area <sup>2)</sup> (RBSOA)                                       | $I_{C,max} = 100A$ , $V_{CE,max} = 1200V$<br>$T_{vj} \leq 150\text{ °C}$ |               |         |

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

<sup>2)</sup> not subject to production test - verified by design/characterization

## Static Characteristic (tested on wafer), $T_{vj} = 25\text{ °C}$

| Parameter                            | Symbol        | Conditions                   | Value |      |      | Unit     |
|--------------------------------------|---------------|------------------------------|-------|------|------|----------|
|                                      |               |                              | min.  | typ. | max. |          |
| Collector-Emitter breakdown voltage  | $V_{(BR)CES}$ | $V_{GE}=0V$ , $I_C=3mA$      | 1200  |      |      | V        |
| Collector-Emitter saturation voltage | $V_{CEsat}$   | $V_{GE}=15V$ , $I_C=50A$     | 2.0   | 2.5  | 3.0  |          |
| Gate-Emitter threshold voltage       | $V_{GE(th)}$  | $I_C=2mA$ , $V_{GE}=V_{CE}$  | 4.5   | 5.5  | 6.5  |          |
| Zero gate voltage collector current  | $I_{CES}$     | $V_{CE}=1200V$ , $V_{GE}=0V$ |       |      | 6.1  | $\mu A$  |
| Gate-Emitter leakage current         | $I_{GES}$     | $V_{CE}=0V$ , $V_{GE}=20V$   |       |      | 300  | nA       |
| Integrated gate resistor             | $r_G$         |                              |       | 5    |      | $\Omega$ |

## Dynamic Characteristic (not subject to production test - verified by design / characterization),

$T_{vj} = 25\text{ °C}$

| Parameter                    | Symbol    | Conditions                                  | Value |      |      | Unit |
|------------------------------|-----------|---|-------|------|------|------|
|                              |           |   | min.  | typ. | max. |      |
| Input capacitance            | $C_{ies}$ | $V_{CE}=25V$ ,<br>$V_{GE}=0V$ ,<br>$f=1MHz$ |       | 3300 |      | pF   |
| Output capacitance           | $C_{oes}$ |   |       | 500  |      |      |
| Reverse transfer capacitance | $C_{res}$ |   |       | 220  |      |      |



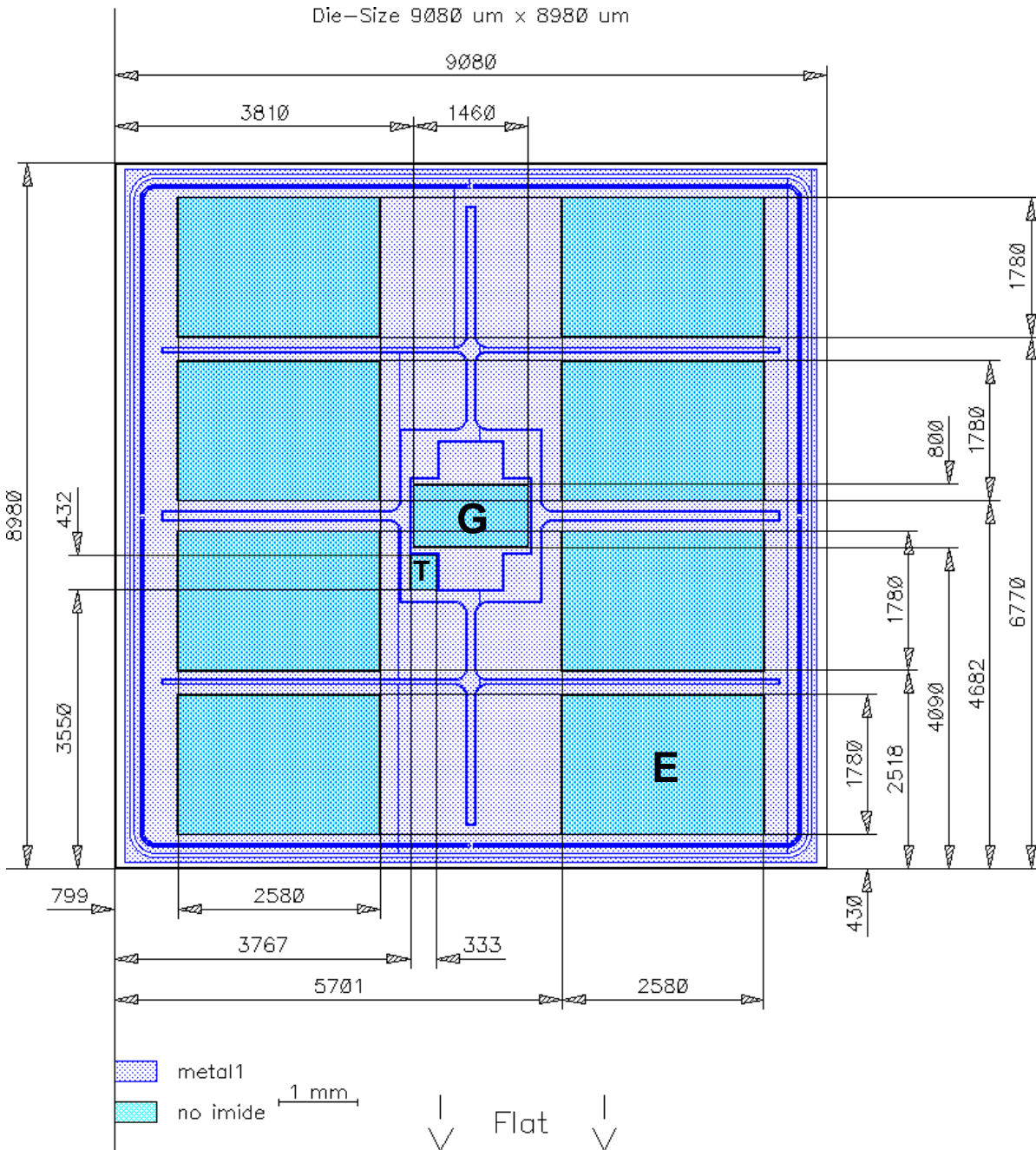
# SIGC81T120R2C

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## **Further Electrical Characteristic**

Switching characteristics and thermal properties are depending strongly on module design and mounting technology and can therefore not be specified for a bare die.

## Chip Drawing



- E** = Emitter pad
- G** = Gate pad
- T** = Test pad do not contact



# SIGC81T120R2C

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## Description

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AQL 0,65 for visual inspection according to failure catalogue

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Electrostatic Discharge Sensitive Device according to MIL-STD 883

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**Infineon Technologies AG**  
**81726 Munich, Germany**  
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