

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

### FEATURES:

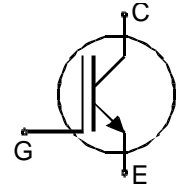
- 1200V Trench + Field Stop technology
- 120µm chip
- low turn-off losses
- short tail current
- positive temperature coefficient
- easy paralleling

### This chip is used for:

- power module

### Applications:

- drives



| Chip Type   | V <sub>CE</sub> | I <sub>Cn</sub> | Die Size                    | Package      | Ordering Code     |
|-------------|-----------------|-----------------|-----------------------------|--------------|-------------------|
| SIGC20T120L | 1200V           | 15A             | 4.41 x 4.47 mm <sup>2</sup> | sawn on foil | Q67050-A4268-A101 |

### MECHANICAL PARAMETER:

|                                 |  |                 |
|---------------------------------|--|-----------------|
| Raster size                     | 4.41 x 4.47  | mm              |
| Emitter pad size                | 2.99 x 2.9   |                 |
| Gate pad size                   | 1.1 x 0.7  |                 |
| Area total / active             | 19.7 / 12.8  | mm <sup>2</sup> |
| Thickness                       | 120  | µm              |
| Wafer size                      | 150  | mm              |
| Flat position                   | 0  | grd             |
| Max.possible chips per wafer    | 748 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             | 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, $T_j=25\text{ °C}$         | $V_{CE}$       | 1200          | V    |
| DC collector current, limited by $T_{jmax}$           | $I_C$          | <sup>1)</sup> | A    |
| Pulsed collector current, $t_p$ limited by $T_{jmax}$ | $I_{cpuls}$    | 45            | 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  | $V_{(BR)CES}$ | $V_{GE}=0V, I_C=0.5mA$        | 1200  |      |      | V        |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $V_{GE}=15V, I_C=15A$         | 1.35  | 1.65 | 2.05 |          |
| Gate-emitter threshold voltage       | $V_{GE(th)}$  | $I_C=600\mu A, V_{GE}=V_{CE}$ | 5.0   | 5.8  | 6.5  |          |
| Zero gate voltage collector current  | $I_{CES}$     | $V_{CE}=1200V, V_{GE}=0V$     |       |      | 100  | $\mu A$  |
| Gate-emitter leakage current         | $I_{GES}$     | $V_{CE}=0V, V_{GE}=20V$       |       |      | 120  | nA       |
| Integrated gate resistor             | $R_{Gint}$    |                               |       | --   |      | $\Omega$ |

## ELECTRICAL CHARACTERISTICS (tested at component):

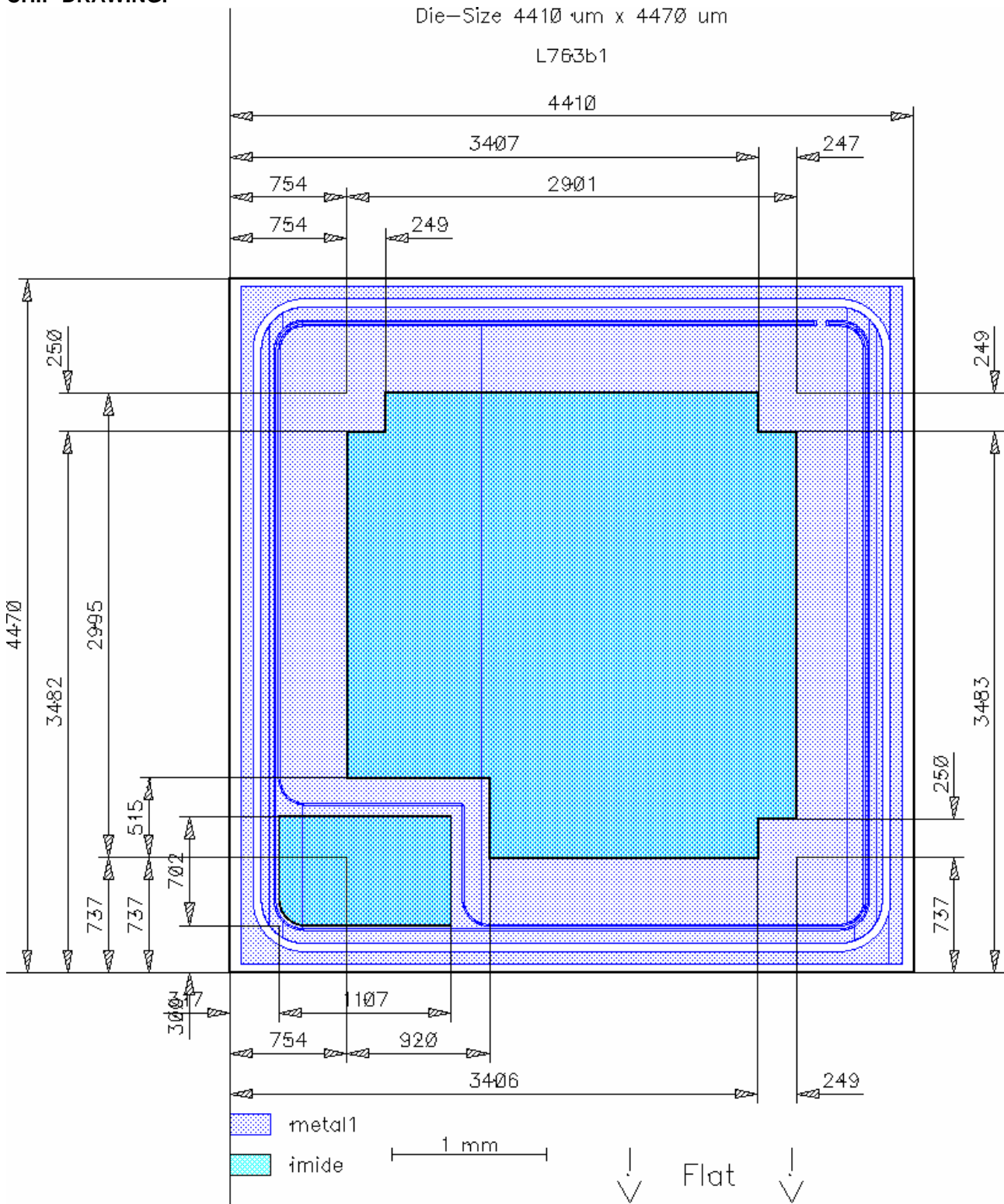
| Parameter                    | Symbol     | Conditions    | Value |      |      | Unit |
|------------------------------|------------|---------------|-------|------|------|------|
|                              |            |               | min.  | typ. | max. |      |
| Input capacitance            | $C_{iss}$  | $V_{CE}=25V,$ |       | 1090 |      | pF   |
| Output capacitance           | $C_{oss}$  | $V_{GE}=0V,$  |       | 58   |      |      |
| Reverse transfer capacitance | $C_{riss}$ | $f=1MHz$      |       | 48   |      |      |

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

| Parameter           | Symbol       | Conditions <sup>1)</sup>            | Value |      |      | Unit |
|---------------------|--------------|-------------------------------------|-------|------|------|------|
|                     |              |                                     | min.  | typ. | max. |      |
| Turn-on delay time  | $t_{d(on)}$  | $T_j=125\text{ °C}$                 |       | tbd  |      | ns   |
| Rise time           | $t_r$        | $V_{CC}=600V,$                      |       | tbd  |      |      |
| Turn-off delay time | $t_{d(off)}$ | $I_C=15A,$                          |       | tbd  |      |      |
| Fall time           | $t_f$        | $V_{GE}=-15/15V,$<br>$R_G=75\Omega$ |       | tbd  |      |      |

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

**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                                      |

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