

IGBT³ Chip

FEATURES:

- 600V Trench & Field Stop technology
- low $V_{CE(sat)}$
- low turn-off losses
- short tail current
- positive temperature coefficient
- easy paralleling

This chip is used for:

- power module
- discrete components

Applications:

- drives
- white goods
- resonant applications



| Chip Type | V_{CE} | I_{Cn} | Die Size | Package | Ordering Code |
|-------------|----------|----------|-----------------------------|--------------|-----------------------|
| SIGC06T60GS | 600V | 10A | 2.44 x 2.42 mm ² | sawn on foil | Q67050- A4333-A101 |

MECHANICAL PARAMETER:

| | | |
|---------------------------------|--|-----------------|
| Raster size | 2.44 x 2.42 | mm ² |
| Emitter pad size | 1.558 x 1.577 | |
| Gate pad size | 0.361 x 0.513 | |
| Area total / active | 5.9 / 3.6 | mm ² |
| Thickness | 70 | µm |
| Wafer size | 150 | mm |
| Flat position | 270 | deg |
| Max. possible chips per wafer | 2485 pcs | |
| Passivation frontside | Photoimide | |
| Emitter metallization | 3200 nm AlSiCu | |
| Collector metallization | 1400 nm Ni Ag –system 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, < 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 | ¹⁾ | A |
| Pulsed collector current, t_p limited by T_{jmax} | I_{cpuls} | 30 | A |
| Gate emitter voltage | V_{GE} | ± 20 | V |
| Operating junction and storage temperature | T_j, T_{stg} | -40 ... +175 | °C |
| SC data, $V_{GE} = 15V, V_{CC} = 360V, T_{vj} = 150\text{ °C}$ | t_p | 5 | μs |

¹⁾ 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 | $V_{CE(sat)}$ | $V_{GE}=15V, I_C=10A$ | | 1.5 | 2.05 | |
| Gate-emitter threshold voltage | $V_{GE(th)}$ | $I_C=150\mu A, V_{GE}=V_{CE}$ | 4.1 | 4.9 | 5.7 | |
| Zero gate voltage collector current | I_{CES} | $V_{CE}=600V, V_{GE}=0V$ | | | 0.6 | μA |
| Gate-emitter leakage current | I_{GES} | $V_{CE}=0V, V_{GE}=20V$ | | | 300 | nA |
| Integrated gate resistor | R_{Gint} | | | none | | Ω |

ELECTRICAL CHARACTERISTICS (verified by design/characterization):

| Parameter | Symbol | Conditions | Value | | | Unit |
|------------------------------|------------|---|-------|------|------|------|
| | | | min. | typ. | max. | |
| Input capacitance | C_{iss} | $V_{CE}=25V,$ $V_{GE}=0V,$ $f=1MHz$ | | 551 | | pF |
| Output capacitance | C_{oss} | | | 40 | | |
| Reverse transfer capacitance | C_{riss} | | | 17 | | |

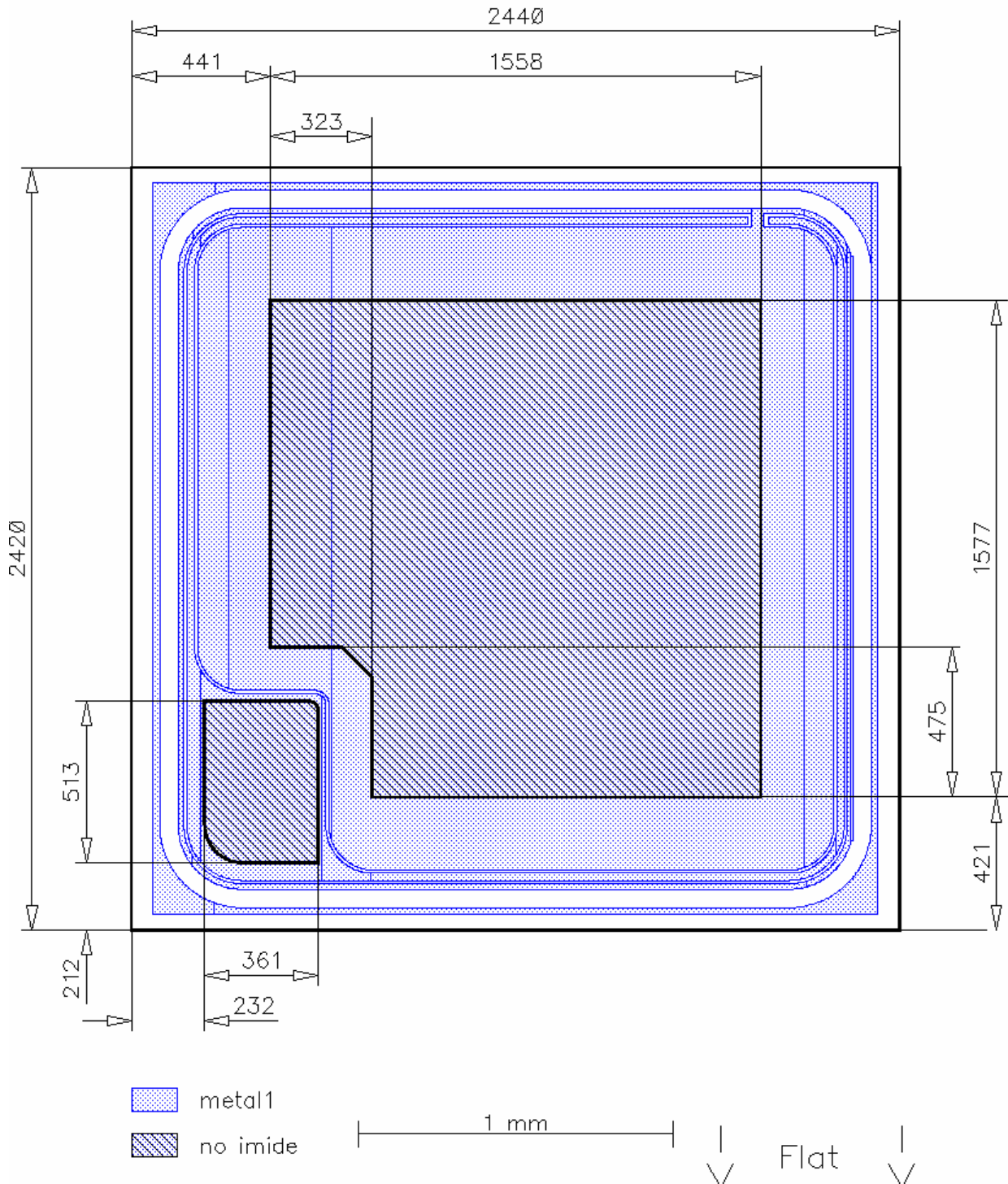
SWITCHING CHARACTERISTICS (verified by design/characterization), inductive load

| Parameter | Symbol | Conditions | Value ²⁾ | | | Unit |
|---------------------|--------------|--|---------------------|------|------|------|
| | | | min. | typ. | max. | |
| Turn-on delay time | $t_{d(on)}$ | $T_j=175\text{ °C}$ $V_{CC}=400V,$ $I_C=10A,$ $V_{GE}=-15/15V,$ $R_G=23\Omega$ | | 10 | | ns |
| Rise time | t_r | | | 11 | | |
| Turn-off delay time | $t_{d(off)}$ | | | 233 | | |
| Fall time | t_f | | | 63 | | |

²⁾ values also influenced by parasitic L- and C- in measurement and package.

CHIP DRAWING:

Die-Size 2440 um x 2420 um



FURTHER ELECTRICAL CHARACTERISTICS:

| | | |
|--|-----------|--|
| This chip data sheet refers to the device data sheet | IKP10N60T | |
|--|-----------|--|

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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