

IGBT³ Chip

FEATURES:

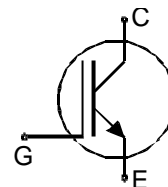
- 600V Trench & Field Stop technology
- low $V_{CE(sat)}$
- low turn-off losses
- short tail current
- positive temperature coefficient
- easy paralleling

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 |
|-------------|----------|----------|-----------------------------|--------------|-----------------------|
| SIGC04T60GS | 600V | 6A | 1.98 x 2.17 mm ² | sawn on foil | Q67050- A4332-A101 |

MECHANICAL PARAMETER:

| | | |
|---------------------------------|--|-----------------|
| Raster size | 1.98 x 2.17 | mm ² |
| Emitter pad size | 1.007 x 1.33 | |
| Gate pad size | 0.361 x 0.513 | |
| Area total / active | 4.1 / 2.15 | mm ² |
| Thickness | 70 | µm |
| Wafer size | 150 | mm |
| Flat position | 270 | deg |
| Max. possible chips per wafer | 3659 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} | 18 | A |
| Gate emitter voltage | V_{GE} | ± 20 | V |
| Operating junction and storage temperature | T_j, T_{stg} | -40 ... +175 | $^{\circ}\text{C}$ |
| SC data, $V_{GE} = 15\text{V}$, $V_{CC} = 360\text{V}$, $T_vj = 150^{\circ}\text{C}$ | 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 | $V_{(BR)CES}$ | $V_{GE}=0\text{V}$, $I_C=2\text{mA}$ | 600 | | | V |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $V_{GE}=15\text{V}$, $I_C=6\text{A}$ | | 1.5 | 2.05 | |
| Gate-emitter threshold voltage | $V_{GE(th)}$ | $I_C=90\mu\text{A}$, $V_{GE}=V_{CE}$ | 4.1 | 4.9 | 5.7 | |
| Zero gate voltage collector current | I_{CES} | $V_{CE}=600\text{V}$, $V_{GE}=0\text{V}$ | | | 0.4 | μA |
| Gate-emitter leakage current | I_{GES} | $V_{CE}=0\text{V}$, $V_{GE}=20\text{V}$ | | | 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} | $V_{CE}=25\text{V}$, $V_{GE}=0\text{V}$, $f=1\text{MHz}$ | | 368 | | pF |
| Output capacitance | C_{oss} | | | 28 | | |
| Reverse transfer capacitance | C_{riss} | | | 11 | | |

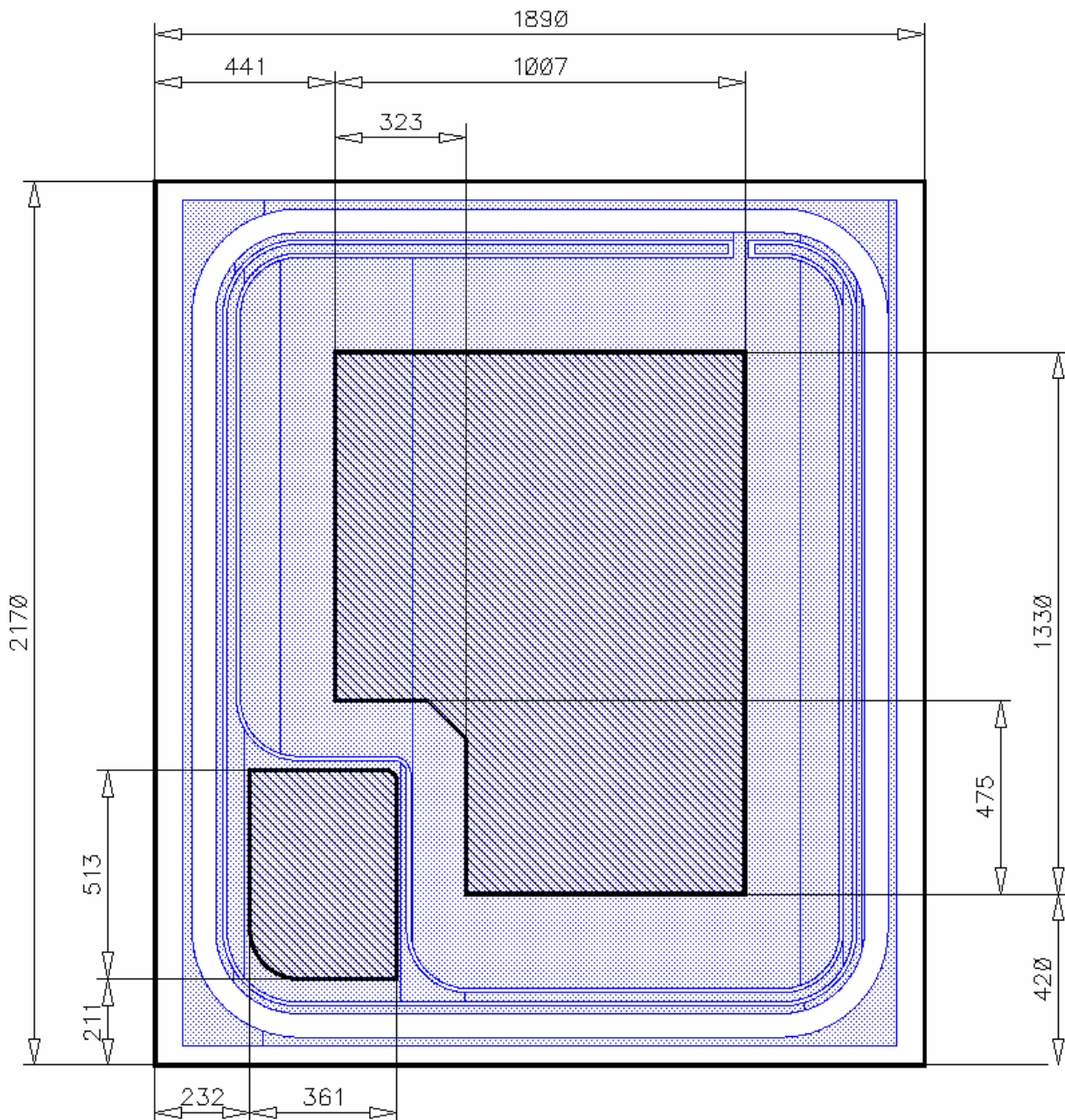
SWITCHING CHARACTERISTICS (verified by design/characterization), inductive load



| Parameter | Symbol | Conditions | Value ²⁾ | | | Unit |
|---------------------|--------------|---|---------------------|------|------|------|
| | | | min. | typ. | max. | |
| Turn-on delay time | $t_{d(on)}$ | $T_j=175\text{ °C}$ $V_{CC}=400\text{V}$, $I_C=6\text{A}$, $V_{GE}= -15/15\text{V}$, $R_G= 23\Omega$ | | 9 | | ns |
| Rise time | t_r | | | 8 | | |
| Turn-off delay time | $t_{d(off)}$ | | | 165 | | |
| Fall time | t_f | | | 84 | | |

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

CHIP DRAWING:

Die-Size 1890 um x 2170 um



-  metal1
-  no imide

1 mm

↓ Flat ↓

FURTHER ELECTRICAL CHARACTERISTICS:

| | | |
|--|-----------|--|
| This chip data sheet refers to the device data sheet | IKP06N60T | |
|--|-----------|--|

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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