

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

### FEATURES:

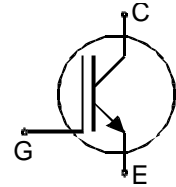
- 600V Trench & Field Stop technology
- low  $V_{CE(sat)}$
- low turn-off losses
- short tail current
- positive temperature coefficient
- easy paralleling

### 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
SIGC10T60S	600V	20A	3.19 x 3.21 mm <sup>2</sup>	sawn on foil	Q67050- A4361-A101

### MECHANICAL PARAMETER:

Raster size	3.19 x 3.21	mm <sup>2</sup>
Emitter pad size	2.004 x 2.413	
Gate pad size	0.361 x 0.513	
Area total / active	10.2 / 7.1	mm <sup>2</sup>
Thickness	70	µm
Wafer size	150	mm
Flat position	0	deg
Max. possible chips per wafer	1363 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 $T_{jmax}$	$I_C$	<sup>1)</sup>	A
Pulsed collector current, $t_p$ limited by $T_{jmax}$	$I_{cpuls}$	60	A
Gate emitter voltage	$V_{GE}$	$\pm 20$	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	$\mu\text{s}$

<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	$V_{(BR)CES}$	$V_{GE}=0\text{V}$ , $I_C=2\text{mA}$	600			V
Collector-emitter saturation voltage	$V_{CE(sat)}$	$V_{GE}=15\text{V}$ , $I_C=20\text{A}$		1.5	2.05	
Gate-emitter threshold voltage	$V_{GE(th)}$	$I_C=290\mu\text{A}$ , $V_{GE}=V_{CE}$	4.1	4.9	5.7	
Zero gate voltage collector current	$I_{CES}$	$V_{CE}=600\text{V}$ , $V_{GE}=0\text{V}$			1.1	$\mu\text{A}$
Gate-emitter leakage current	$I_{GES}$	$V_{CE}=0\text{V}$ , $V_{GE}=20\text{V}$			300	nA
Integrated gate resistor	$R_{Gint}$			none		$\Omega$

## ELECTRICAL CHARACTERISTICS (verified by design/characterization):

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
Input capacitance	$C_{iss}$	$V_{CE}=25\text{V}$ , $V_{GE}=0\text{V}$ , $f=1\text{MHz}$		1100		pF
Output capacitance	$C_{oss}$			71		
Reverse transfer capacitance	$C_{riss}$			32		

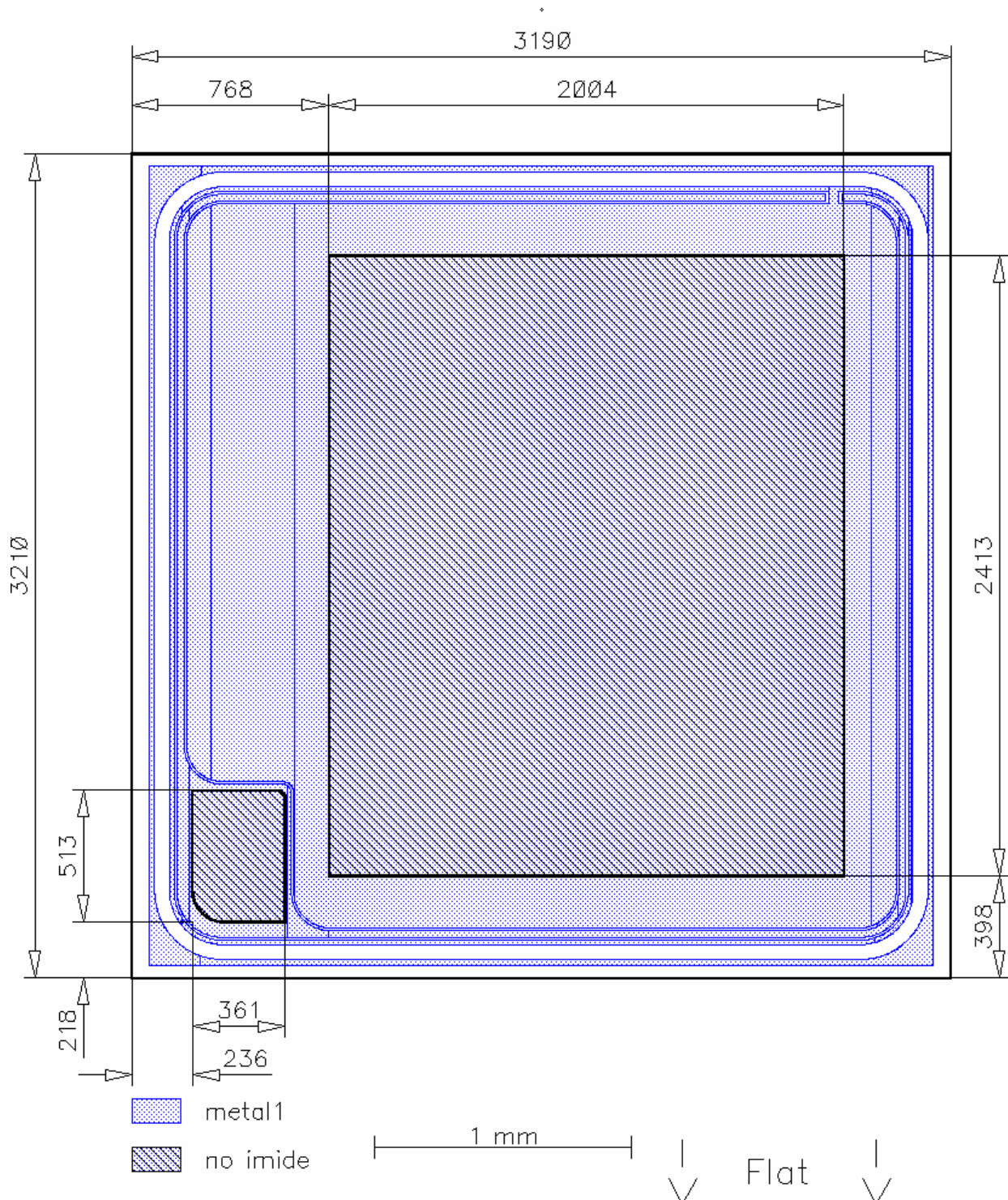
## SWITCHING CHARACTERISTICS (verified by design/characterization), inductive load

Parameter	Symbol	Conditions	Value <sup>2)</sup>			Unit
			min.	typ.	max.	
Turn-on delay time	$t_{d(on)}$	$T_j=175\text{ °C}$ $V_{CC}=400\text{V}$ , $I_C=20\text{A}$ , $V_{GE}=0/15\text{V}$ , $R_G=12\Omega$		18		ns
Rise time	$t_r$			18		
Turn-off delay time	$t_{d(off)}$			223		
Fall time	$t_f$			76		

<sup>2)</sup> values also influenced by parasitic L- and C- in measurement and package.

**CHIP DRAWING:**

Die-Size 3190 um x 3210 um





# SIGC10T60S

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**FURTHER ELECTRICAL CHARACTERISTICS:**

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This chip data sheet refers to the device data sheet	IKB20N60T	
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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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