

IGBT³ Chip

FEATURES:

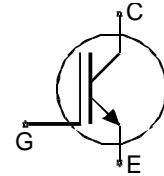
- 600V Trench & Field Stop technology
- low $V_{CE(sat)}$
- low turn-off losses
- short tail current
- positive temperature coefficient
- easy paralleling

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
SIGC10T60S	600V	20A	3.19 x 3.21 mm ²	sawn on foil	Q67050- A4361-A101

MECHANICAL PARAMETER:

Raster size	3.19 x 3.21	mm ²
Emitter pad size	2.004 x 2.413	
Gate pad size	0.361 x 0.513	
Area total / active	10.2 / 7.1	mm ²
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	1)	A
Pulsed collector current, t_p limited by T_{jmax}	I_{cpuls}	60	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	$V_{CE(sat)}$	$V_{GE}=15\text{V}$, $I_C=20\text{A}$		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	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}	$V_{CE}=25\text{V}$,		1100		pF
Output capacitance	C_{oss}	$V_{GE}=0\text{V}$,		71		
Reverse transfer capacitance	C_{rss}	$f=1\text{MHz}$		32		

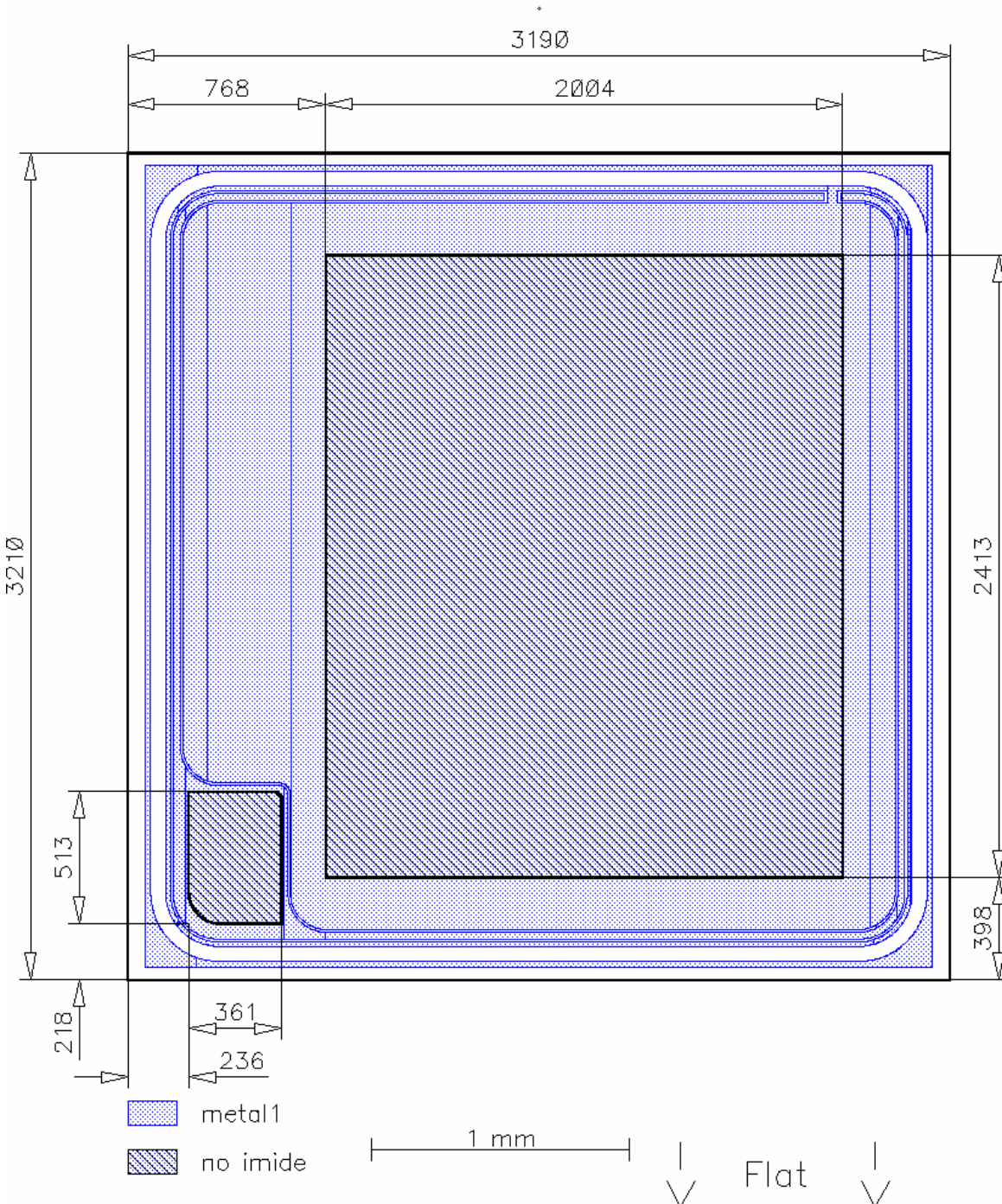
SWITCHING CHARACTERISTICS (verified by design/characterization), inductive load

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

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

CHIP DRAWING:

Die-Size 3190 um x 3210 um



FURTHER ELECTRICAL CHARACTERISTICS:

This chip data sheet refers to the device data sheet	IKB20N60T	
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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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