

IGBT

TRENCHSTOP™ IGBT4 High Speed Chip  
IGC18T120T8Q

Data Sheet

Industrial Power Control

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## TRENCHSTOP™ IGBT4 High Speed Chip

### Features:

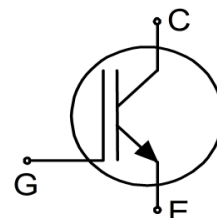
- 1200V trench & field stop technology
- Low switching losses
- Positive temperature coefficient
- Easy paralleling

### Recommended for:

- Discrete components

### Applications:

- High frequency drives
- Uninterruptible power supplies
- Welding
- Solar inverters



Chip Type	$V_{CE}$	$I_{Cn}^1$	Die Size	Package
IGC18T120T8Q	1200V	15A	4.16mm x 4.34mm	Sawn on foil

### Mechanical Parameters

Die size		4.16 x 4.34	mm <sup>2</sup>
Emitter pad size		See chip drawing	
Gate pad size		1.185 x 0.702	
Area total		18.05	
Thickness		115	µm
Wafer size		200	mm
Maximum possible chips per wafer		1510	
Passivation frontside		Photoimide	
Pad metal		3200nm AlSiCu	
Backside metal		Ni Ag – system To achieve a reliable solder connection it is strongly recommended not to consume the Ni layer completely during production process	
Die bond		Electrically conductive epoxy glue and soft solder	
Wire bond		Al, ≤500µm	
Reject ink dot size		Ø 0.65mm; max. 1.2mm	
Storage environment ( <b>&lt;6 months</b> )	for original and sealed MBB bags	Ambient atmosphere air, temperature 17°C – 25°C	
	for open MBB bags	Acc. IEC 62258-3; Section 9.4 Storage Environment.	

<sup>1</sup> Nominal collector current at  $T_C=100^\circ\text{C}$  for chip packaged in TO packages, see application example cited on page 5.

## Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-emitter voltage, $T_{vj}=25^{\circ}\text{C}$	$V_{CE}$	1200	V
DC collector current, limited by $T_{vj\text{ max}}^2$	$I_C$	-	A
Pulsed collector current, $t_p$ limited by $T_{vj\text{ max}}^3$	$I_{C,puls}$	45	A
Gate-emitter voltage	$V_{GE}$	$\pm 20$	V
Virtual junction operating temperature	$T_{vj}$	-40 ... +175	$^{\circ}\text{C}$
Short circuit data <sup>3/4</sup> $V_{GE}=15\text{V}$ , $V_{CC}=800\text{V}$ , $T_{vj}=150^{\circ}\text{C}$	$t_{sc}$	10	$\mu\text{s}$

## Static Characteristics (tested on wafer), $T_{vj}=25^{\circ}\text{C}$

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
Collector-emitter breakdown voltage	$V_{(BR)CES}$	$V_{GE}=0\text{V}$ , $I_C=0.5\text{mA}$	1200	-	-	V
Collector-emitter saturation voltage	$V_{CEsat}$	$V_{GE}=15\text{V}$ , $I_C=15\text{A}$	1.78	2.05	2.42	
Gate-emitter threshold voltage	$V_{GE(th)}$	$I_C=0.5\text{mA}$ , $V_{GE}=V_{CE}$	5.3	5.8	6.3	
Zero gate voltage collector current	$I_{CES}$	$V_{CE}=1200\text{V}$ , $V_{GE}=0\text{V}$	-	-	2	$\mu\text{A}$
Gate-emitter leakage current	$I_{GES}$	$V_{CE}=0\text{V}$ , $V_{GE}=20\text{V}$	-	-	120	nA
Integrated gate resistor	$r_G$		none			$\Omega$

## Electrical Characteristics <sup>3</sup>

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
Collector-emitter saturation voltage	$V_{CEsat}$	$V_{GE}=15\text{V}$ , $I_C=15\text{A}$ , $T_{vj}=175^{\circ}\text{C}$	-	2.70	-	V
Input capacitance	$C_{ies}$	$V_{CE}=25\text{V}$ , $V_{GE}=0\text{V}$ , $f=1\text{MHz}$ , $T_{vj}=25^{\circ}\text{C}$	-	875	-	pF
Reverse transfer capacitance	$C_{res}$		-	45	-	

<sup>2</sup> Depending on thermal properties of assembly.

<sup>3</sup> Not subject to production test - verified by design/characterization.

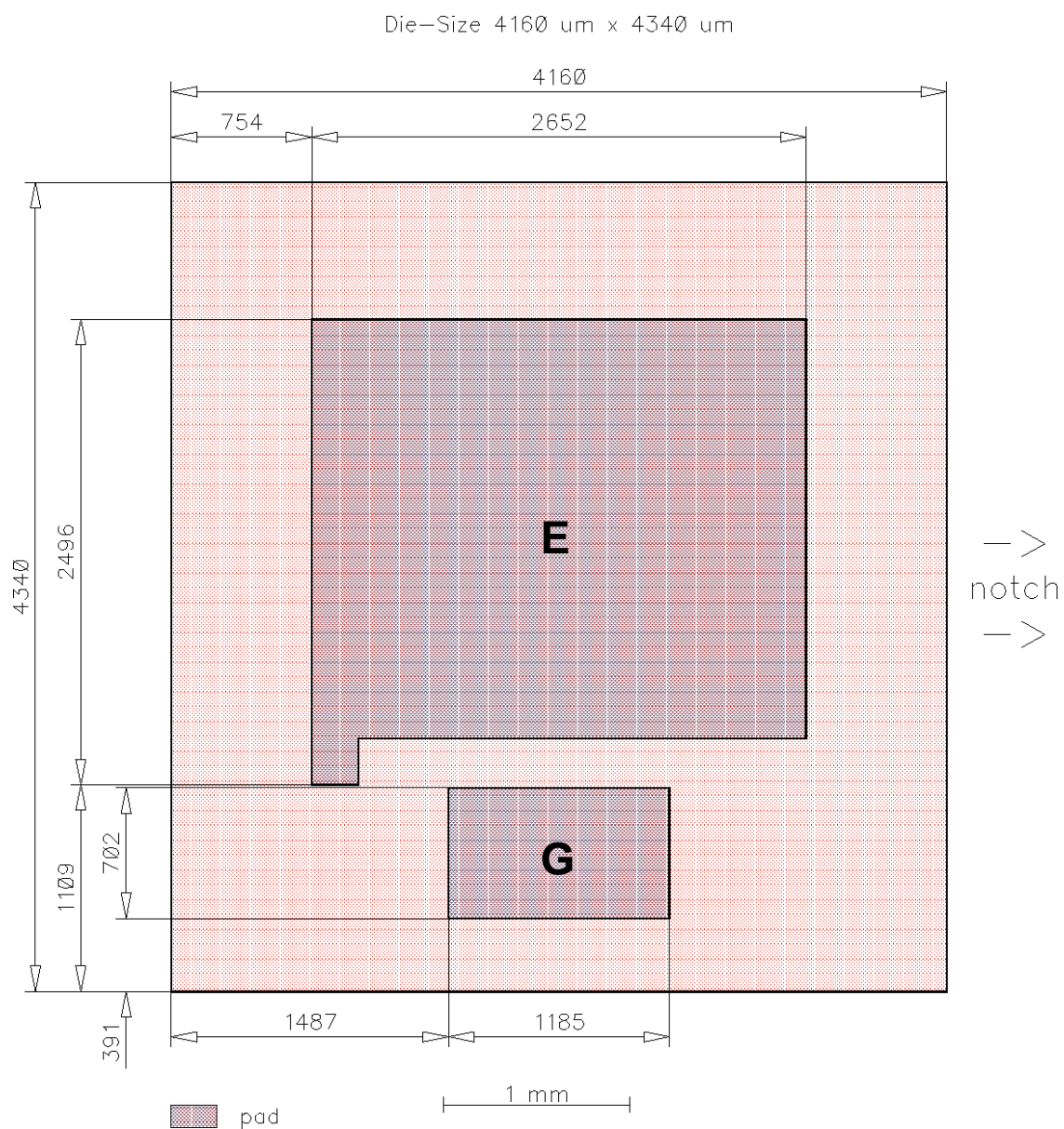
<sup>4</sup> Allowed number of short circuits: <1000; time between short circuits: >1s.

**Further Electrical Characteristics**

Switching characteristics and thermal properties are depending strongly on module design and mounting technology and can therefore not be specified for a bare die.

Application example	IKW15N120H3	Rev. 1.2
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## Chip Drawing



**E** = Emitter  
**G** = Gate

**Bare Die Product Specifics**

Test coverage at wafer level cannot cover all application conditions. Therefore it is recommended to test all characteristics which are relevant for the application at package level, including RBSOA and SCSOA.

**Description**

AQL 0.65 for visual inspection according to failure catalogue

Electrostatic Discharge Sensitive Device according to MIL-STD 883

**Revision History**

Revision	Subjects (major changes since last revision)	Date
2.0	Final data sheet	13.10.2015

**Relevant Application Notes**

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