

# IGBT

TRENCHSTOP™ IGBT4 Low Power Chip

**IGC70T120T8RL**

Data Sheet

Industrial Power Control

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# IGC70T120T8RL

## TRENCHSTOP™ IGBT4 Low Power Chip

### Features:

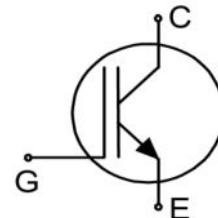
- 1200V trench & field stop technology
- Low switching losses
- Positive temperature coefficient
- Easy paralleling

### Recommended for:

- Low / medium power modules

### Applications:

- Low / medium power drives



Chip Type	$V_{CE}$	$I_{Cn}$ <sup>1</sup>	Die Size	Package
IGC70T120T8RL	1200V	75A	9.12mm x 7.71mm	Sawn on foil

### Mechanical Parameters

Die size	9.12 x 7.71	
Emitter pad size	See chip drawing	
Gate pad size	0.811 x 1.31	
Area total	70.32	
Thickness	115	
Wafer size	200	
Maximum possible chips per wafer	370	
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, $\leq 500\mu\text{m}$	
Reject ink dot size	$\varnothing 0.65\text{mm}$ ; max. $1.2\text{mm}$	
Storage environment	for original and sealed MBB bags	Ambient atmosphere air, temperature $17^\circ\text{C} - 25^\circ\text{C}$ , $< 6$ months
	for open MBB bags	Acc. to IEC62258-3: atmosphere $>99\%$ Nitrogen or inert gas, humidity $<25\%$ RH, temperature $17^\circ\text{C} - 25^\circ\text{C}$ , $< 6$ months

<sup>1</sup> Nominal collector current at  $T_C=100^\circ\text{C}$  for chip packaged in power modules, 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 $T_{vj \text{ max}}^3$	$I_{C,\text{puls}}$	225	A
Gate-emitter voltage	$V_{GE}$	$\pm 20$	V
Operating junction 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	$V_{(BR)CES}$	$V_{GE}=0\text{V}$ , $I_C=2.6\text{mA}$	1200	-	-	V
Collector-emitter saturation voltage	$V_{CESat}$	$V_{GE}=15\text{V}$ , $I_C=75\text{A}$	1.58	1.85	2.07	
Gate-emitter threshold voltage	$V_{GE(\text{th})}$	$I_C=2.6\text{mA}$ , $V_{GE}=V_{CE}$	5.3	5.8	6.3	
Zero gate voltage collector current	$I_{CES}$	$V_{CE}=1200\text{V}$ , $V_{GE}=0\text{V}$	-	-	1	
Gate-emitter leakage current	$I_{GES}$	$V_{CE}=0\text{V}$ , $V_{GE}=20\text{V}$	-	-	120	
Integrated gate resistor	$r_G$		10			$\Omega$

**Electrical Characteristics <sup>3</sup>**

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
Collector-emitter saturation voltage	$V_{CESat}$	$V_{GE}=15\text{V}$ , $I_C=75\text{A}$ , $T_{vj}=150^{\circ}\text{C}$	-	2.25	-	V
Input capacitance	$C_{ies}$	$V_{CE}=25\text{V}$ , $V_{GE}=0\text{V}$ , $f=1\text{MHz}$ $T_{vj}=25^{\circ}\text{C}$	-	4300	-	pF
Reverse transfer capacitance	$C_{res}$		-	160	-	

<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.

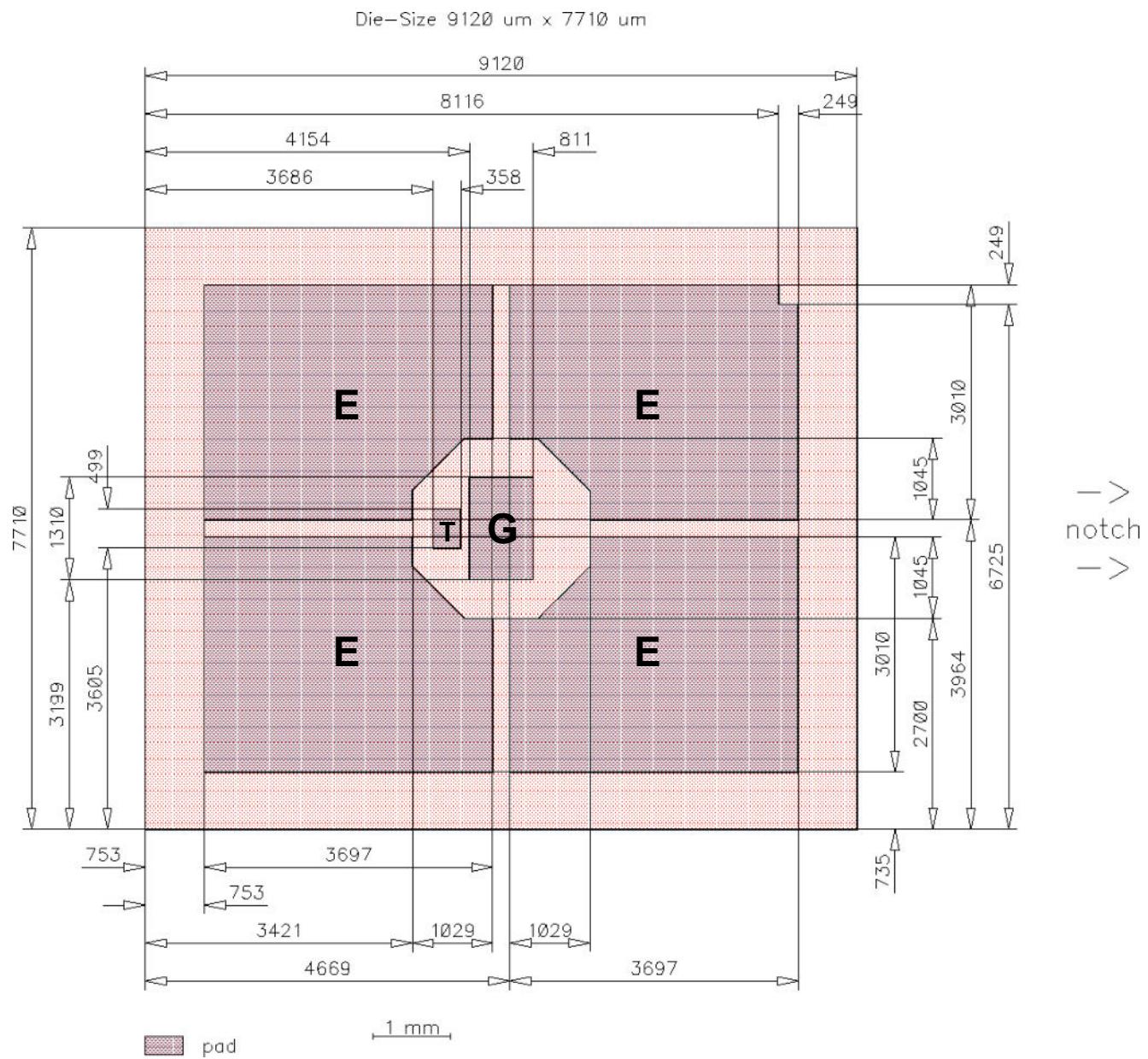


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## Further Electrical Characteristics

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	FP75R12KT4_B11	Rev. 3.0
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**Chip Drawing**

**E** = Emitter

**G** = Gate

**T** = Test pad do not contact



# IGC70T120T8RL

## 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	18.02.2015
2.1	Update disclaimer	20.08.2015

## Relevant Application Notes

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