

## IGBT3 Power Chip

### Features:

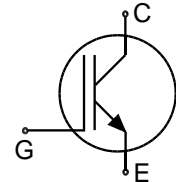
- 1700V Trench & Field Stop technology
- low turn-off losses
- short tail current
- positive temperature coefficient
- easy paralleling

### This chip is used for:

- power modules

### Applications:

- drives



Chip Type	$V_{CE}$	$I_C$	Die Size	Package
SIGC158T170R3E	1700V	125A	12.57 x 12.57 mm <sup>2</sup>	sawn on foil

### Mechanical Parameters

Raster size	12.57 x 12.57	mm <sup>2</sup>
Emitter pad size (incl. gate pad)	4 x ( 5.05 x 2.32 ) 4 x ( 5.05 x 2.54 )	
Gate pad size	1.12 x 1.12	
Area total	158	
Thickness	190	μm
Wafer size	200	mm
Max.possible chips per wafer	159	
Passivation frontside	Photoimide	
Pad metal	3200 nm AlSiCu	
Backside metal	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, in dark environment, < 6 month at an ambient temperature of 23°C	

## Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-Emitter voltage, $T_{vj}=25\text{ °C}$	$V_{CE}$	1700	V
DC collector current, limited by $T_{vj\text{ max}}$	$I_C$	<sup>1)</sup>	A
Pulsed collector current, $t_p$ limited by $T_{vj\text{ max}}$	$I_{C,puls}$	375	A
Gate emitter voltage	$V_{GE}$	$\pm 20$	V
Junction temperature range	$T_{vj}$	-40 ... +175	°C
Operating junction temperature	$T_{vj}$	-40...+150	°C
Short circuit data <sup>2)</sup> $V_{GE} = 15V$ , $V_{CC} = 1000V$ , $T_{vj} = 150\text{ °C}$	$t_{SC}$	10	$\mu s$
Reverse bias safe operating area <sup>2)</sup> (RBSOA)	$I_{C,max} = 250A$ , $V_{CE,max} = 1700V$ $T_{vj} \leq 150\text{ °C}$		

<sup>1)</sup> depending on thermal properties of assembly

<sup>2)</sup> not subject to production test - verified by design/characterization

## Static Characteristic (tested on wafer), $T_{vj}=25\text{ °C}$

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
Collector-Emitter breakdown voltage	$V_{(BR)CES}$	$V_{GE}=0V$ , $I_C=3.8\text{ mA}$	1700			V
Collector-Emitter saturation voltage	$V_{CEsat}$ <sup>3)</sup>	$V_{GE}=15V$ , $I_C=125A$	1.6	2	2.4	
Gate-Emitter threshold voltage	$V_{GE(th)}$	$I_C=6mA$ , $V_{GE}=V_{CE}$	5.2	5.8	6.4	
Zero gate voltage collector current	$I_{CES}$	$V_{CE}=1700V$ , $V_{GE}=0V$			6.9	$\mu A$
Gate-Emitter leakage current	$I_{GES}$	$V_{CE}=0V$ , $V_{GE}=20V$			600	nA
Integrated gate resistor	$r_G$			5		$\Omega$

<sup>3)</sup>  $V_{cesat}$  tested at lower current

## Dynamic Characteristic (not subject to production test - verified by design / characterization), $T_{vj}=25\text{ °C}$

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
Input capacitance	$C_{ies}$	$V_{CE}=25V$ , $V_{GE}=0V$ , $f=1\text{ MHz}$		11001		pF
Reverse transfer capacitance	$C_{res}$			365		



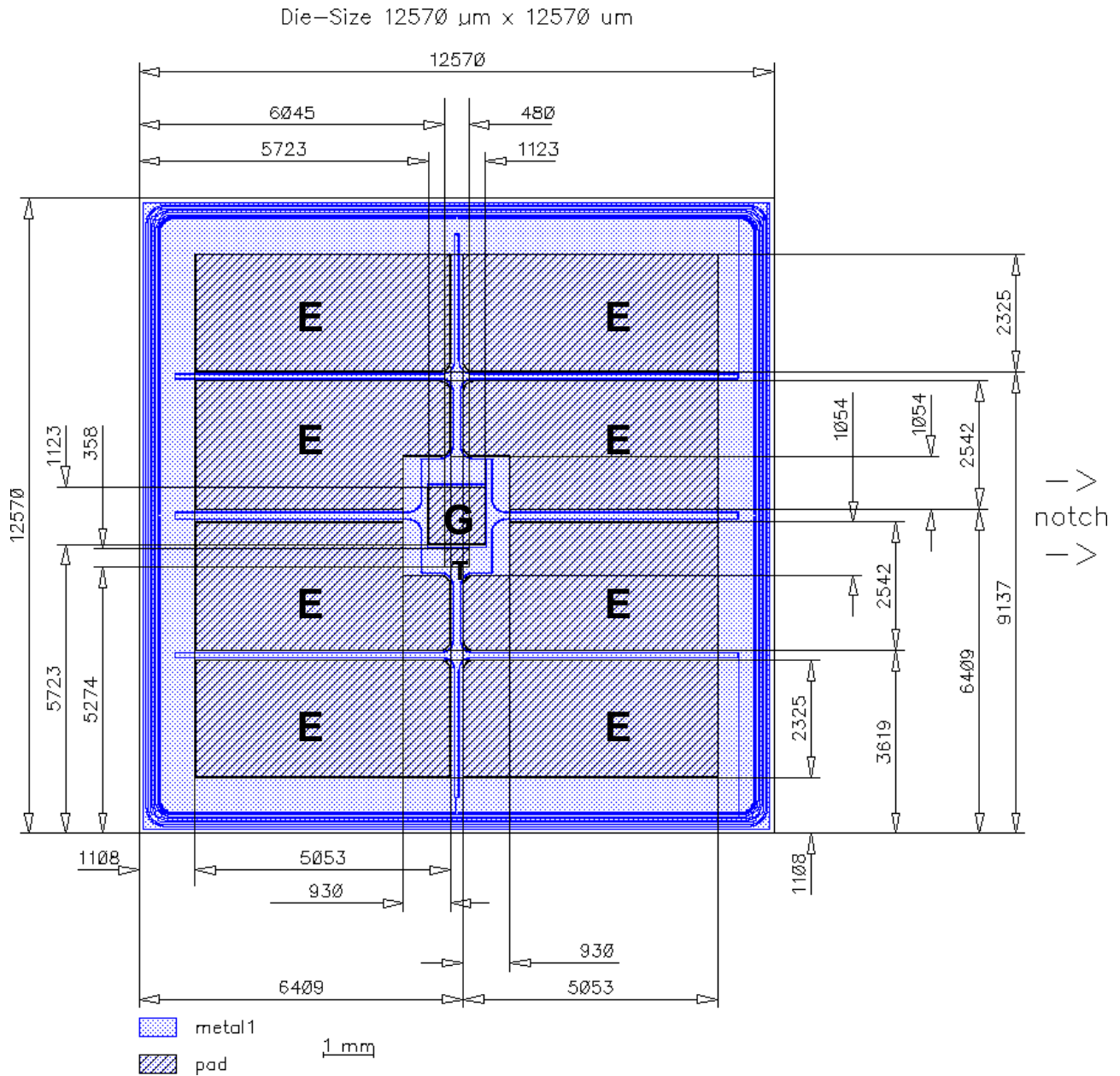
## SIGC158T170R3E

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### **Further Electrical Characteristic**

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

## Chip Drawing



**E** = Emitter

**G** = Gate

**T** = Test pad do not contact



# SIGC158T170R3E

## Description

AQL 0,65 for visual inspection according to failure catalogue

Electrostatic Discharge Sensitive Device according to MIL-STD 883

## Revision History

Version	Subjects (major changes since last revision)	Date
2.1	Change wafer size to 200 mm	14.04.2010
2.2	Additional basic types L7801M, L7801T, L7801E	01.07.2014

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