



# SIGC42T170R3GE

## IGBT3 Chip

### Features:

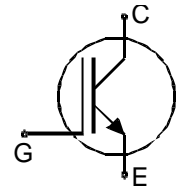
- 1700V Trench + Field Stop technology
- low turn-off losses
- short tail current
- positive temperature coefficient
- easy paralleling

### This chip is used for:

- power module

### Applications:

- drives



Chip Type	V <sub>CE</sub>	I <sub>CN</sub>	Die Size	Package
SIGC42T170R3GE	1700V	29A	6.5 x 6.46 mm <sup>2</sup>	sawn on foil

### MECHANICAL PARAMETER

Raster size	6.5 x 6.46	mm <sup>2</sup>
Emitter pad size (incl. gate pad)	4.27 x 4.27	
Gate pad size	1.18 x 1.09	
Area total / active	42 / 28.7	
Thickness	190	µm
Wafer size	200	mm
Max.possible chips per wafer	641 pcs	
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, < 6 month at an ambient temperature of 23°C	



# SIGC42T170R3GE

## MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Collector-Emitter voltage, $T_j=25\text{ °C}$	$V_{CE}$	1700	V
DC collector current, limited by $T_{j\text{ max}}$	$I_C$	<sup>1)</sup>	A
Pulsed collector current, $t_p$ limited by $T_{j\text{ max}}$	$I_{C,puls}$	87	A
Gate emitter voltage	$V_{GE}$	$\pm 20$	V
Maximum junction and storage temperature	$T_{vj,max}$ , $T_{stg}$	-55 ... +150	°C
Short circuit data <sup>2)</sup> $V_{GE} = 15V$ , $V_{CC} = 1200V$ , $T_{vj} = 125\text{°C}$	$t_{p,max}$	10	$\mu s$
Reverse bias safe operating area <sup>2)</sup> (RBSOA)	$I_{C,max} = 58A$ , $V_{CE,max} = 1700V$ , $T_{vj,op} \leq 125\text{°C}$		

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

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

## STATIC CHARACTERISTICS (tested on wafer), $T_j=25\text{ °C}$

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
Collector-Emitter breakdown voltage	$V_{(BR)CES}$	$V_{GE}=0V$ , $I_C=1.5mA$	1700			V
Collector-Emitter saturation voltage	$V_{CE(sat)}$	$V_{GE}=15V$ , $I_C=29A$	1.6	2	2.4	
Gate-Emitter threshold voltage	$V_{GE(th)}$	$I_C=1.2mA$ , $V_{GE}=V_{CE}$	5.2	5.8	6.4	
Zero gate voltage collector current	$I_{CES}$	$V_{CE}=1700V$ , $V_{GE}=0V$			2	$\mu A$
Gate-Emitter leakage current	$I_{GES}$	$V_{CE}=0V$ , $V_{GE}=20V$			600	nA
Integrated gate resistor	$R_{Gint}$			32		$\Omega$

## ELECTRICAL CHARACTERISTICS (not subject to production test - verified by design / characterization)

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
Input capacitance	$C_{iss}$	$V_{CE}=25V$ , $V_{GE}=0V$ , $f=1MHz$		2500		pF
Output capacitance	$C_{oss}$			105		
Reverse transfer capacitance	$C_{riss}$			84		



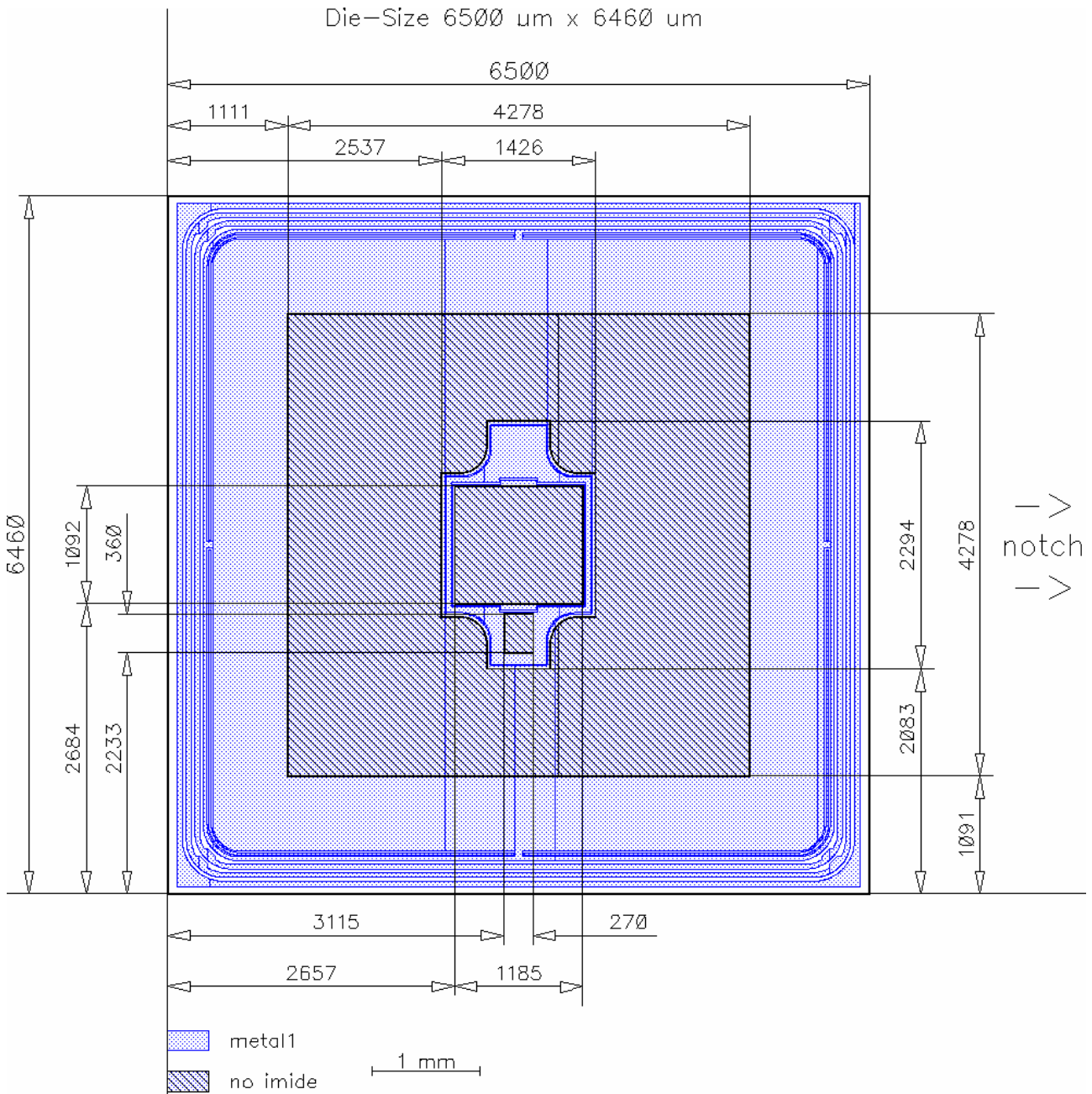
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**SWITCHING CHARACTERISTICS** inductive load (not subject to production test - verified by design / characterization)

Parameter	Symbol	Conditions <sup>1)</sup>	Value			Unit
			min.	typ.	max.	
Turn-on delay time	$t_{d(on)}$	$T_j=125^\circ\text{C}$ $V_{CC}=900\text{V},$ $I_C=29\text{A},$ $V_{GE}=-15/15\text{V},$ $R_G=18\Omega$		400		$\mu\text{s}$
Rise time	$t_r$			50		
Turn-off delay time	$t_{d(off)}$			800		
Fall time	$t_f$			300		

<sup>1)</sup> values also influenced by parasitic L- and C- in measurement and package.

## CHIP DRAWING





# SIGC42T170R3GE

## FURTHER ELECTRICAL CHARACTERISTICS

This chip data sheet refers to the device data sheet		
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## DESCRIPTION

AQL 0,65 for visual inspection according to failure catalogue

Electrostatic Discharge Sensitive Device according to MIL-STD 883

Test-Normen Villach/Prüffeld

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