

IGBT

TRENCHSTOP™ IGBT3 Chip
SIGC42T170R3GE

Data Sheet

Industrial Power Control



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TRENCHSTOP™ IGBT3 Chip

Features:

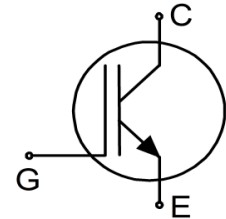
- 1700V trench & field stop technology
- Low turn-off losses
- Short tail current
- Positive temperature coefficient
- Easy paralleling

Recommended for:

- Power modules

Applications:

- Drives



Chip Type	V _{CE}	I _{Cn} ¹	Die Size	Package
SIGC42T170R3GE	1700V	29A	6.5mm x 6.46mm	Sawn on foil

Mechanical Parameters

Die size	6.5 x 6.46		mm ²
Emitter pad size	See chip drawing		
Gate pad size	1.185 x 1.092		
Area total	41.99		
Thickness	190		µm
Wafer size	200		mm
Maximum possible chips per wafer	641		
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	for original and sealed MBB bags	Ambient atmosphere air, temperature 17°C – 25°C, <6 months	
	for open MBB bags	Acc. to IEC62258-3: atmosphere >99% Nitrogen or inert gas, humidity <25%RH, temperature 17°C – 25°C, <6 months	

¹ Nominal collector current at T_C = 100°C assuming chip assembly in power module EconoPACK™ 2.

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-emitter voltage, $T_{vj}=25^{\circ}\text{C}$	V_{CE}	1700	V
DC collector current, limited by $T_{vj\max}^2$	I_C	-	A
Pulsed collector current, t_p limited by $T_{vj\max}^3$	$I_{C,puls}$	87	A
Gate-emitter voltage	V_{GE}	± 20	V
Maximum junction and storage temperature	$T_{vj,max}, T_{stg}$	-55 ... +150	$^{\circ}\text{C}$
Short circuit data ^{3/4} $V_{GE}=15\text{V}, V_{CC}=1200\text{V}, T_{vj}=125^{\circ}\text{C}$	t_{sc}	10	μs
Reverse bias safe operating area ³ (RBSOA)	$I_{C,max}=58\text{A}, V_{CE,max}=1700\text{V}, T_{vj,op}\leq 125^{\circ}\text{C}$		

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

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

Electrical Characteristics ³

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
Collector-emitter saturation voltage	V_{CEsat}	$V_{GE}=15\text{V}, I_C=29\text{A}, T_{vj}=125^{\circ}\text{C}$	-	2.4	-	V
Input capacitance	C_{ies}	$V_{CE}=25\text{V}, V_{GE}=0\text{V}, f=1\text{MHz}, T_{vj}=25^{\circ}\text{C}$	-	2500	-	pF
Reverse transfer capacitance	C_{res}		-	84	-	

² Depending on thermal properties of assembly.

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

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



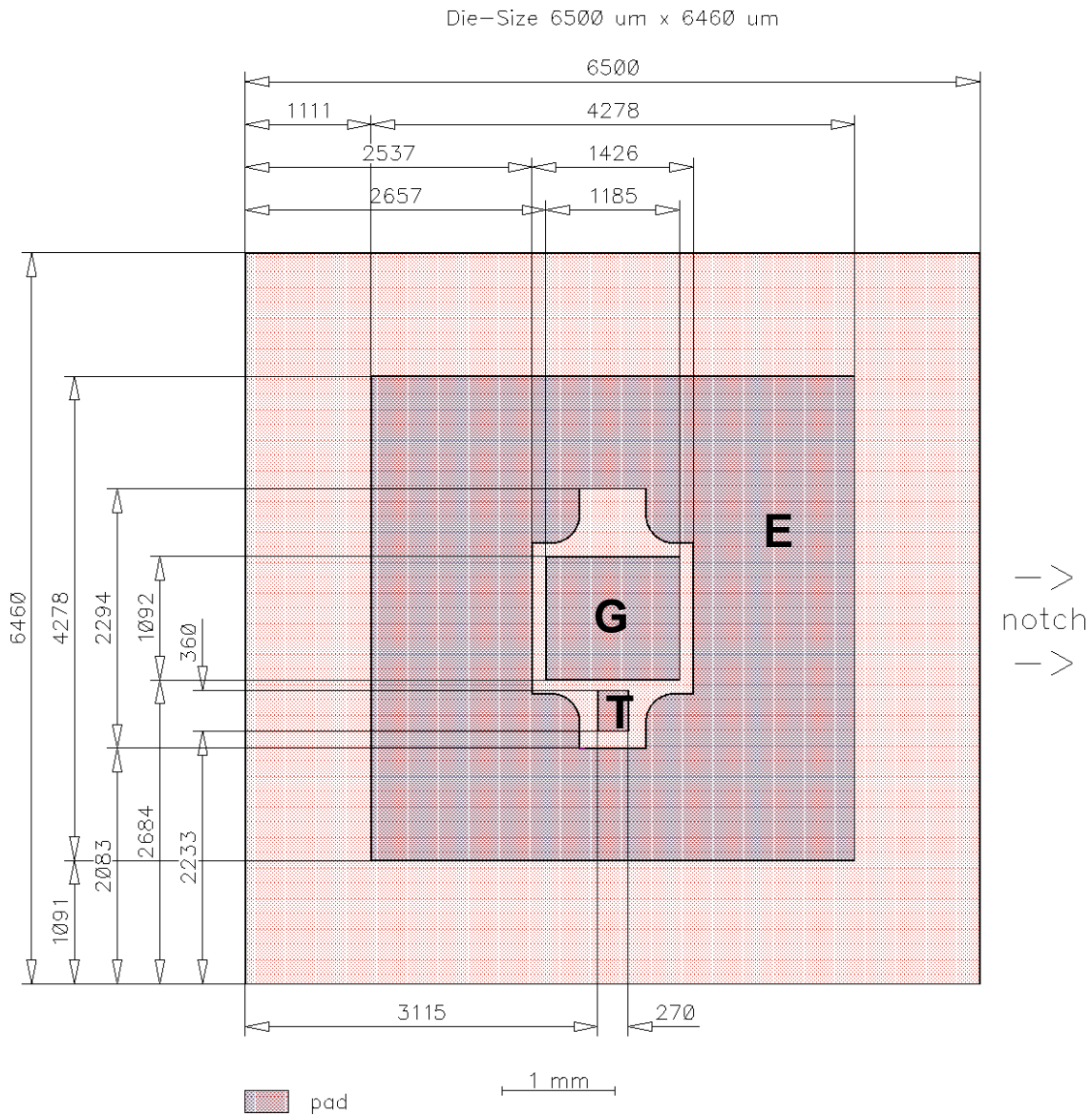
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Further Electrical Characteristics

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	-	-
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Chip Drawing



E = Emitter

G = Gate

T = Test pad do not contact



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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	06.02.2015
2.1	Update disclaimer	19.08.2015

Relevant Application Notes

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