IGBT

TRENCHSTOP™ IGBT3 Chip

SIGC76T60R3E

Data Sheet

Industrial Power Control

Table of Contents

SIGC76T60R3E

TRENCHSTOP™ IGBT3 Chip

Features:

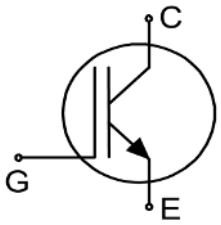
- 600V trench & field stop technology
- Low V_{CEsat}
- Low turn-off losses
- Short tail current
- Positive temperature coefficient
- Easy paralleling

Recommended for:

- Power modules
- Discrete components

Applications:

- Drives
- White goods
- Resonant applications



Chip Type	V_{CE}	I_{Cn}	Die Size	Package
SIGC76T60R3E	600V	150A	7.87mm x 9.69mm	Sawn on foil

Mechanical Parameters

Die size		7.87 x 9.69	mm^2
Emitter pad size		See chip drawing	
Gate pad size		1.62 x 0.82	
Area total		76.26	
Silicon thickness		70	µm
Wafer size		200	mm
Maximum possible chips per wafer		335	
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		∅ 0.65mm; max. 1.2mm	
Storage environment (<6 months)	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.	

Maximum Ratings

In general, from reliability and lifetime point of view, the lower the operation junction temperature and/or the applied voltage, the greater the expected lifetime of any semiconductor device.

Parameter	Symbol	Value	Unit
Collector-emitter voltage, T_{vj}=25°C	V_{CE}	600	V
DC collector current, limited by $T_{vj\,max}$ [1]	I_C	-	A
Pulsed collector current, t_p limited by $T_{vj\,max}$ [2]	$I_{C,puls}$	450	A
Gate-emitter voltage	V_{GE}	±20	V
Virtual junction temperature	T_{vj}	-40 ... +175	°C
Short circuit data [1/2/3] V_{GE}=15V, V_{CC}=360V, T_{vj}=150°C	t_{sc}	6	µs
Reverse bias safe operating area (RBSOA) [2]	$I_{C,max}$ = 300A, V_{CEmax} = 600V, $T_{vj} \leq$ 150°C		

Static Characteristics (tested on wafer), T_{vj}=25°C

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
Collector-emitter breakdown voltage	$V_{(BR)CES}$	V_{GE}=0V, I_C=4mA	600	-	-	V
Collector-emitter saturation voltage	V_{CEsat}	V_{GE}=15V, I_C=45A	0.86	1.03	1.20	
Gate-emitter threshold voltage	$V_{GE(th)}$	I_C=2.4mA, V_{GE}=V_{CE}	5.0	5.8	6.5	
Zero gate voltage collector current	I_{CES}	V_{CE}=600V, V_{GE}=0V	-	-	7.6	µA
Gate-emitter leakage current	I_{GES}	V_{CE}=0V, V_{GE}=20V	-	-	600	nA
Integrated gate resistor	r_G		-	2	-	Ω

Electrical Characteristics [2]

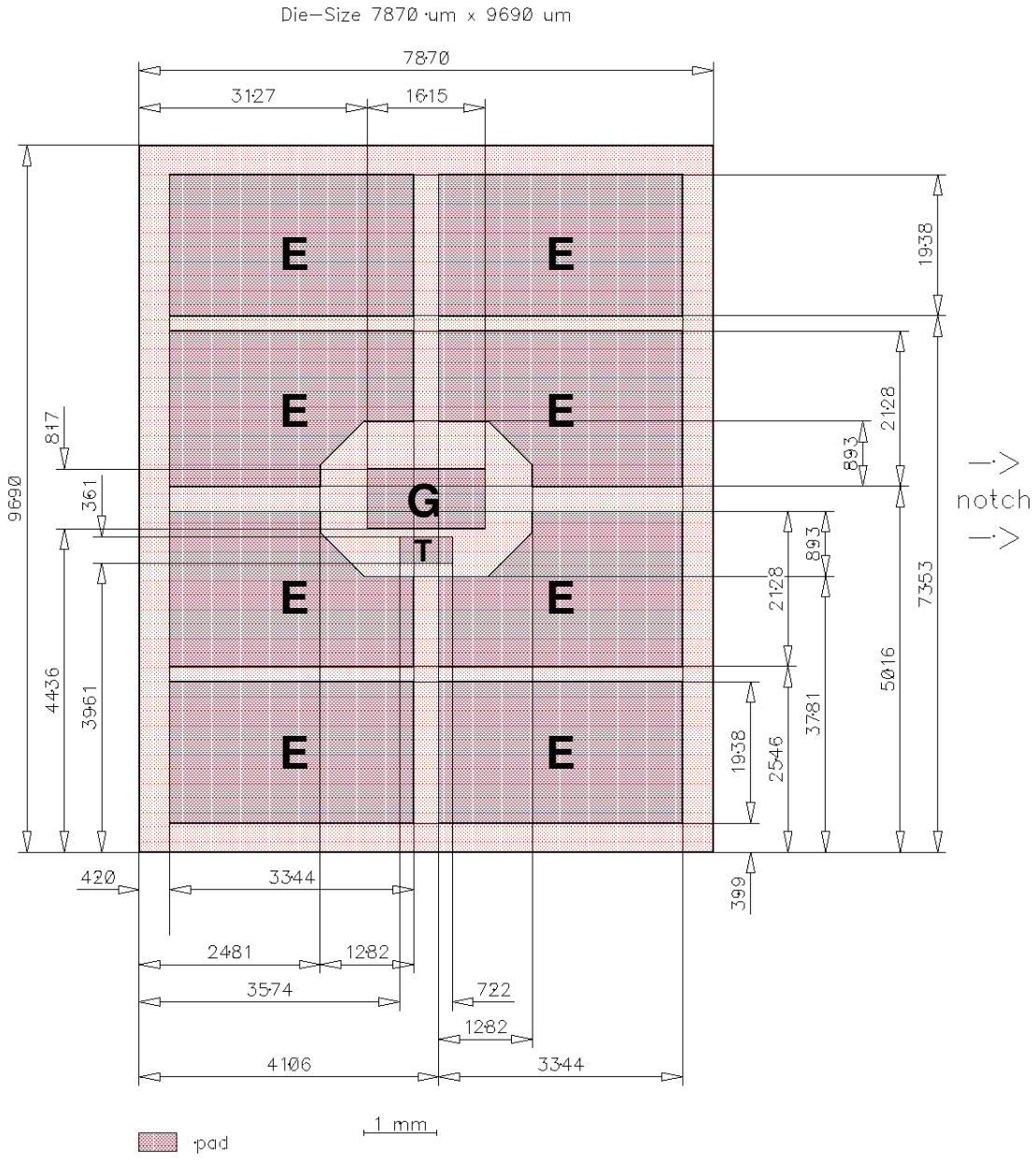
Parameter		Symbol	Conditions	Value			Unit
				min.	typ.	max.	
Collector-emitter saturation voltage	T_{vj}=25°C	V_{CEsat}	V_{GE}=15V, I_C=150A	-	1.45	1.9	V
	T_{vj}=150°C			-	1.7	-	
Input capacitance		C_{ies}	V_{CE}=25V, V_{GE}=0V, f=1MHz T_{vj}=25°C	-	9240	-	pF
Output capacitance		C_{oes}		-	576	-	
Reverse transfer capacitance		C_{res}		-	274	-	

[1] Depending on thermal properties of assembly.
[2] Not subject to production test - verified by design/characterization.
[3] 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	-	-

Chip Drawing



E = Emitter
G = Gate
T = Test pad do not contact

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	Release of final data sheet, change of wafer size to 200 mm	09.04.2010
2.1	Additional Basic Type, editorial changes, V_{CEsat} tested at 30% of I_C and additional V_{CEsat} specification at T_{vj} 150°C	26.07.2017

Relevant Application Notes

Published by
Infineon Technologies AG
81726 München, Germany

IMPORTANT NOTICE

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics ("Beschaffenheitsgarantie"). With respect to any examples, hints or any typical values stated herein and/or any information regarding the application of the product, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation warranties of non-infringement of intellectual property rights of any third party.

In addition, any information given in this document is subject to customer's compliance with its obligations stated in this document and any applicable legal requirements, norms and standards concerning customer's products and any use of the product of Infineon Technologies in customer's applications.

The data contained in this document is exclusively intended for technically trained staff. It is the responsibility of customer's technical departments to evaluate the suitability of the product for the intended application and the completeness of the product information given in this document with respect to such application.

For further information on the product, technology, delivery terms and conditions and prices please contact your nearest Infineon Technologies office (**www.infineon.com**).

Please note that this product is not qualified according to the AEC Q100 or AEC Q101 documents of the Automotive Electronics Council.

WARNINGS

Due to technical requirements products may contain dangerous substances. For information on the types in question please contact your nearest Infineon Technologies office.

Except as otherwise explicitly approved by Infineon Technologies in a written document signed by authorized representatives of Infineon Technologies, Infineon Technologies' products may not be used in any applications where a failure of the product or any consequences of the use thereof can reasonably be expected to result in personal injury.

w w w . i n f i n e o n . c o m

Published by Infineon Technologies AG