

A large, stylized white arc graphic that starts from the left, curves upwards and to the right, and then curves back down towards the left, resembling a partial circle or a stylized 'C' shape.

IGBT

TRENCHSTOP™ IGBT3 Chip  
**IGC89T170S8RM**

Data Sheet

Industrial Power Control

## Table of Contents

Features and Applications.....	3
Mechanical Parameters.....	3
Maximum Ratings .....	4
Static and Electrical Characteristics .....	4
Further Electrical Characteristics .....	5
Chip Drawing.....	6
Revision History .....	7
Relevant Application Notes .....	7
Legal Disclaimer .....	8



# IGC89T170S8RM

## TRENCHSTOP™ IGBT3 Chip

### Features:

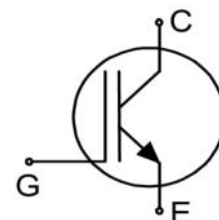
- 1700V trench & field stop technology
- Low switching losses
- Soft turn off
- Positive temperature coefficient
- Easy paralleling

### Recommended for:

- Power modules

### Applications:

- Drives



Chip Type	$V_{CE}$	$I_{Cn}^1$	Die Size	Package
IGC89T170S8RM	1700V	75A	8.85mm x 10.09mm	Sawn on foil

### Mechanical Parameters

Die size		8.85 x 10.09	mm <sup>2</sup>
Emitter pad size		See chip drawing	
Gate pad size		1.674 x 0.899	
Area total		89.3	
Thickness		190	µm
Wafer size		200	mm
Maximum possible chips per wafer		280	
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	

<sup>1</sup> Nominal collector current at  $T_C=100^\circ\text{C}$  assuming chip assembly in 62mm C-series module.

## 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 $T_{vj\max}^3$	$I_{C,puls}$	225	A
Gate-emitter voltage	$V_{GE}$	$\pm 20$	V
Junction temperature range	$T_{vj}$	-40 ... +175	$^{\circ}\text{C}$
Operating junction temperature	$T_{vj}$	-40 ... +150	$^{\circ}\text{C}$
Short circuit data <sup>3/4</sup> $V_{GE}=15\text{V}$ , $V_{CC}=1000\text{V}$ , $T_{vj}=150^{\circ}\text{C}$	$t_{sc}$	10	$\mu\text{s}$
Reverse bias safe operating area <sup>3</sup> (RBSOA)	$I_{C,max}=150\text{A}$ , $V_{CE,max}=1700\text{V}$ , $T_{vj}\leq 150^{\circ}\text{C}$		

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

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
Collector-emitter breakdown voltage	$V_{(BR)CES}$	$V_{GE}=0\text{V}$ , $I_C=2\text{mA}$	1700	-	-	V
Collector-emitter saturation voltage	$V_{CEsat}$	$V_{GE}=15\text{V}$ , $I_C=75\text{A}$	1.6	1.9	2.2	
Gate-emitter threshold voltage	$V_{GE(th)}$	$I_C=3\text{mA}$ , $V_{GE}=V_{CE}$	5.2	5.8	6.4	
Zero gate voltage collector current	$I_{CES}$	$V_{CE}=1700\text{V}$ , $V_{GE}=0\text{V}$	-	-	4	$\mu\text{A}$
Gate-emitter leakage current	$I_{GES}$	$V_{CE}=0\text{V}$ , $V_{GE}=20\text{V}$	-	-	300	nA
Integrated gate resistor	$r_G$		8.5			$\Omega$

## Electrical Characteristics <sup>3</sup>

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
Collector-emitter saturation voltage	$V_{CEsat}$	$V_{GE}=15\text{V}$ , $I_C=75\text{A}$ , $T_{vj}=150^{\circ}\text{C}$	-	2.45	-	V
Input capacitance	$C_{ies}$	$V_{CE}=25\text{V}$ , $V_{GE}=0\text{V}$ , $f=1\text{MHz}$ , $T_{vj}=25^{\circ}\text{C}$	-	6800	-	pF
Reverse transfer capacitance	$C_{res}$		-	220	-	

<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.



# IGC89T170S8RM

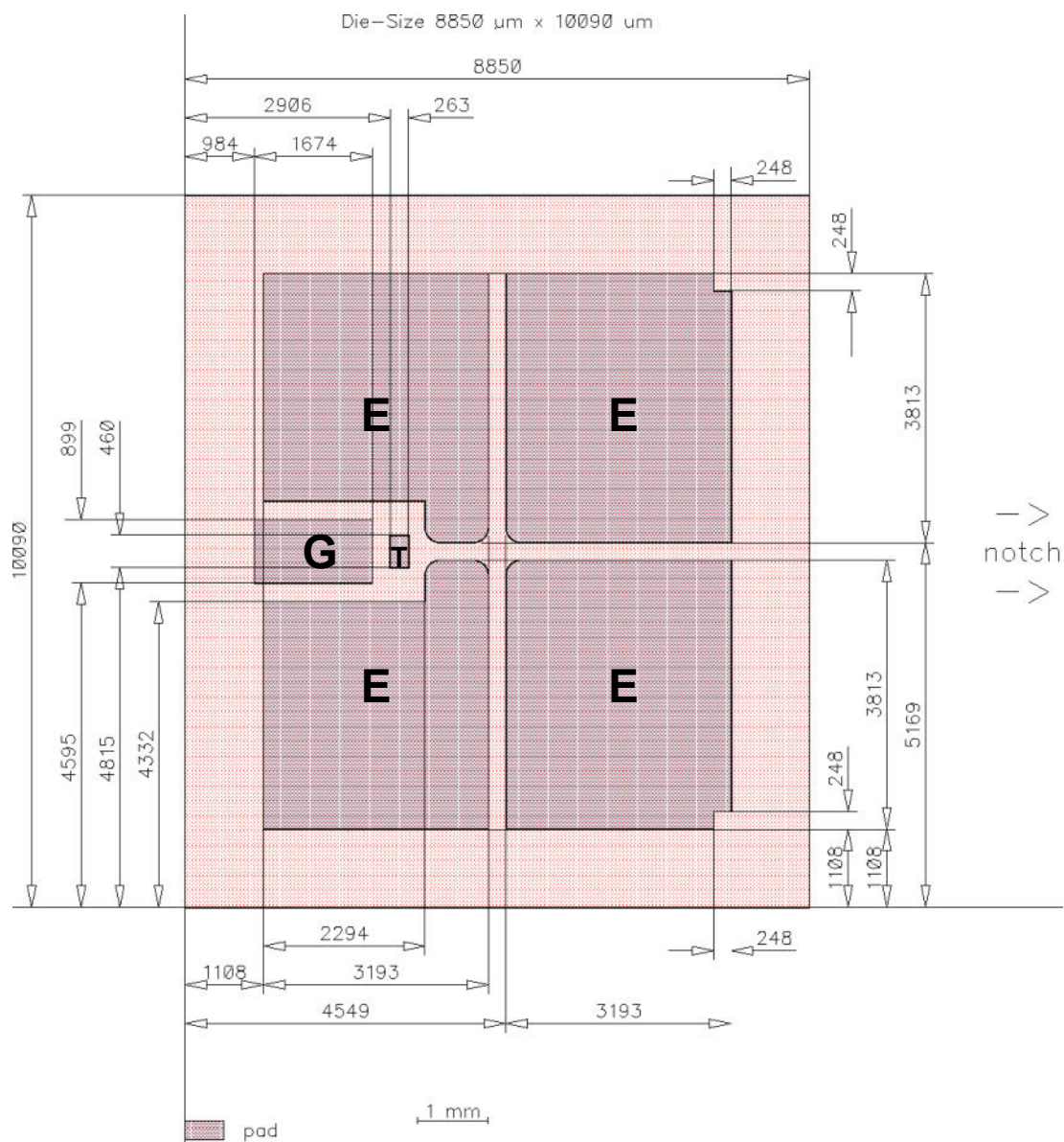
---

**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	FF150R17KE4	Rev. 2.2
---------------------	-------------	----------

## Chip Drawing



E = Emitter

G = Gate

T = Test pad do not contact



# IGC89T170S8RM

## 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

--	--

**Published by**  
**Infineon Technologies AG**  
**81726 München, Germany**  
**© Infineon Technologies AG 2015.**  
**All Rights Reserved.**

## **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](http://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.



[www.infineon.com](http://www.infineon.com)