

IGBT

TRENCHSTOP™ IGBT4 Low Power Chip IGC13T120T8L

**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	



## TRENCHSTOP<sup>™</sup> IGBT4 Low Power Chip

#### Features:

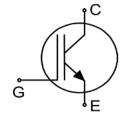
- 1200V trench & field stop technology
- Low switching losses
- Positive temperature coefficient
- Easy paralleling

#### Recommended for:

• Low / medium power modules

### **Applications:**

Low / medium power drives



Chip Type	V <sub>CE</sub>	<b>I</b> Cn	Die Size	Package	
IGC13T120T8L	1200V	10A	3.54mm x 3.81mm	Sawn on foil	
Mechanical Parameters	<b>S</b>			_	
Die size			3.54 x	3.81	
Facilities and aire			O a a alain duassina		

Die size		3.54 x 3.81		
Emitter pad size		See chip drawing	mm <sup>2</sup>	
Gate pad size		0.61 x 1.10		
Area total		13.49		
Silicon thickness		115	μm	
Wafer size		200	mm	
Maximum possible ch	ips per wafer	2036		
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 (<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 Environ	ment.	



### **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 <sub>CE</sub>	1200	V
DC collector current, limited by $T_{\rm vj\ max}$ <sup>1</sup>	I <sub>C</sub>	-	Α
Pulsed collector current, $t_p$ limited by $T_{\rm vj\ max}^{\ \ 2}$	I <sub>C,puls</sub>	30	Α
Gate-emitter voltage	$V_{GE}$	±20	V
Junction temperature	$T_{ m vj}$	-40 +175	°C
Operating junction temperature	$T_{\rm vj~op}$	-40 +150	°C
Short circuit data $^{1/2/3}$ $V_{GE}=15V$ , $V_{CC}=800V$ , $T_{vj}=150$ °C	$t_{ m sc}$	10	μs

Static Characteristics (tested on wafer), T<sub>vi</sub>=25°C

Parameter	Cymbol	Conditions	Value			Unit	
Farameter	Symbol	Conditions	min.	typ.	max.		
Collector-emitter breakdown voltage	$V_{(BR)CES}$	$V_{\rm GE} = 0  \text{V}, I_{\rm C} = 0.5  \text{mA}$	1200	ı	ı		
Collector-emitter saturation voltage	<b>V</b> <sub>CEsat</sub>	V <sub>GE</sub> =15V, I <sub>C</sub> =10A	1.58	1.85	2.07	V	
Gate-emitter threshold voltage	$V_{GE(th)}$	$I_{\rm C}$ =0.35mA, $V_{\rm GE}$ = $V_{\rm CE}$	5.3	5.8	6.3		
Zero gate voltage collector current	I <sub>CES</sub>	$V_{\text{CE}} = 1200 \text{V}, \ V_{\text{GE}} = 0 \text{V}$	-	-	1.2	μΑ	
Gate-emitter leakage current	I <sub>GES</sub>	$V_{CE} = 0V, V_{GE} = 20V$	1	1	120	nA	
Integrated gate resistor	r <sub>G</sub>			none		Ω	

### **Electrical Characteristics** <sup>2</sup>

Parameter	Symbol	Conditions	Value			Unit
- and an letter	Symbol		min.	typ.	max.	Oilit
Collector-emitter saturation voltage	$V_{\sf CEsat}$	$V_{\text{GE}}$ =15V, $I_{\text{C}}$ =10A, $T_{\text{vj}}$ =150°C	-	2.25	-	V
Input capacitance	C <sub>ies</sub>	V <sub>CE</sub> =25V,	-	625	-	nE
Reverse transfer capacitance	$C_{res}$	$V_{\text{GE}}$ =0V, $f$ =1MHz $T_{\text{vj}}$ =25°C	-	40	-	pF

<sup>&</sup>lt;sup>1</sup> Depending on thermal properties of assembly.

L7623P, L7623V 4 Rev. 2.0, 09.09.2016

<sup>&</sup>lt;sup>2</sup> Not subject to production test - verified by design/characterization.

<sup>&</sup>lt;sup>3</sup> Allowed number of short circuits: <1000; time between short circuits: >1s.



### **Further Electrical Characteristics**

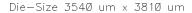
Switching characteristics and thermal properties are depending strongly on module design and mounting technology and can therefore not be specified for a bare die.

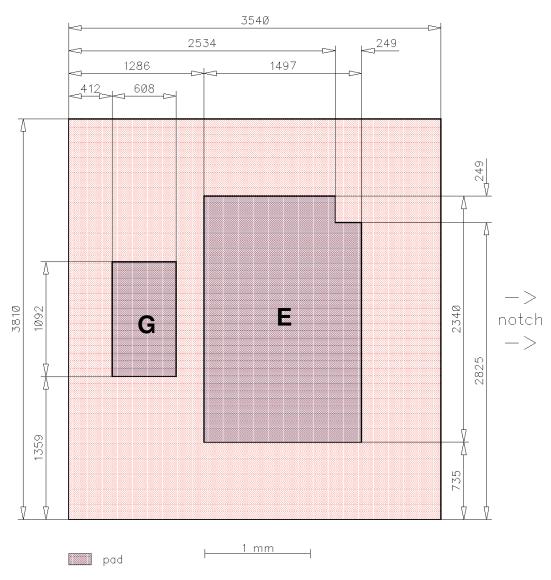
Application example	FP10R12W1T4	Rev. 2.1
---------------------	-------------	----------

L7623P, L7623V 5 Rev. 2.0, 09.09.2016



### **Chip Drawing**





**E** = Emitter

**G** = Gate



Raro	Dia	Dro	duct	Sno	cifics
Bare	Die	Pro	auct	Spe	CITICS

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 His	tory	
Revision	Subjects (major changes since last revision)	Date
2.0	Final data sheet	09.09.2016
Relevant App	plication Notes	

L7623P, L7623V 7 Rev. 2.0, 09.09.2016



Published by Infineon Technologies AG 81726 München, Germany © Infineon Technologies AG 2016. All Rights Reserved.

#### **IMPORTANT NOTICE**

The information given in this document shall in <u>no event</u> 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 <u>not</u> 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 <u>not</u> 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.

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