

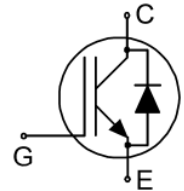
IGBT chip with monolithically integrated diode in packages offering space saving advantage

Features:

TRENCHSTOP™ Reverse Conducting (RC) technology for 600V applications offering:

- Optimised V_{CEsat} and V_F for low conduction losses
- Smooth switching performance leading to low EMI levels
- Very tight parameter distribution
- Operating range of 1 to 20kHz
- Maximum junction temperature 175°C
- Short circuit capability of 5 μ s
- Best in class current versus package size performance
- Qualified according to JEDEC for target applications
- Complete product spectrum and PSpice Models:

<http://www.infineon.com/igbt/>



Applications:

Motor drives

Used for:

Discrete components and molded modules

Chip Type	V_{CE}	I_{Cn}	Die Size	Package
IGC10R60DE	600V	15A	2.70 x 3.73 mm ²	sawn on foil

Mechanical Parameters

Raster size	2.70 x 3.73		mm ²
Emitter pad size	see chip drawing		
Gate pad size	see chip drawing		
Area: total / active IGBT / active Diode	10.071 / 5.544 / 1.317		
Thickness	70		μ m
Wafer size	200		mm
Max.possible chips per wafer	2759		
Passivation frontside	Photoimide		
Pad metal	3200 nm AlSiCu		
Backside metal	Ni Ag –system		
Die bond	Electrically conductive epoxy glue and soft solder (temperature budget: 290°C for 1min. or 260°C for 1.5min.)		
Wire bond	Al, <350 μ m		
Reject ink dot size	\varnothing 0.65mm ; max 1.2mm		
Storage environment	for original and sealed MBB bags	Ambient atmosphere air, Temperature 17°C – 25°C, < 6 month	
	for open MBB bags	Acc. to IEC62258-3: Atmosphere >99% Nitrogen or inert gas, Humidity <25%RH, Temperature 17°C – 25°C, < 6 month	

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-Emitter voltage, $T_{vj} = 25\text{ °C}$	V_{CE}	600	V
DC collector current, limited by $T_{vj, max}$	I_C	1)	A
Pulsed collector current, t_p limited by $T_{vj, max}$	$I_{C, puls}$	45	A
Gate emitter voltage	V_{GE}	± 20	V
Junction temperature range	$T_{vj, max}$	-40 ... +175	°C
Operating junction temperature	$T_{vj, op, max}$	-40 ... +175	°C
Short circuit data ²⁾³⁾ $V_{GE} = 15V, V_{CC} = 400V, T_{vj} = 150\text{ °C}$	t_{SC}	5	μs
Safe operating area IGBT ²⁾³⁾	$I_{C, max} = 30A, V_{CE, max} = 600V, T_{vj, op} \leq T_{vj, op, max}$		
Safe operating area Diode ²⁾	$I_{F, max} = 30A, V_{R, max} = 600V,$ $P_{max} = 12\text{ kW}, T_{vj, op} \leq T_{vj, op, max}$		

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

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

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
Collector-Emitter breakdown voltage	$V_{(BR)CES}$	$V_{GE}=0V, I_C=0.2\text{ mA}$	600			V
Collector-Emitter saturation voltage	V_{CEsat}	$V_{GE}=15V, I_C=15A$		1.65	2.1	
Diode Forward Voltage	V_F	$V_{GE}=0V, I_F=15A$		1.7	2.1	
Gate-Emitter threshold voltage	$V_{GE(th)}$	$I_C=0.25mA, V_{GE}=V_{CE}$	4.3	5	5.7	
Zero gate voltage collector current	I_{CES}	$V_{CE}=600V, V_{GE}=0V$			40	μA
Gate-Emitter leakage current	I_{GES}	$V_{CE}=0V, V_{GE}=20V$			100	nA
Integrated gate resistor	r_G			none		Ω

Electrical Characteristics (not subject to production test - verified by design / characterization)

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
Collector-Emitter saturation voltage	V_{CEsat}	$V_{GE}=15V, I_C=15A$		1.85		V
Input capacitance	C_{ies}	$V_{CE}=25V,$ $V_{GE}=0V, f=1\text{ MHz}$ $T_{vj}=25\text{ °C}$		961		pF
Output capacitance	C_{oes}			53		
Reverse transfer capacitance	C_{res}			33		



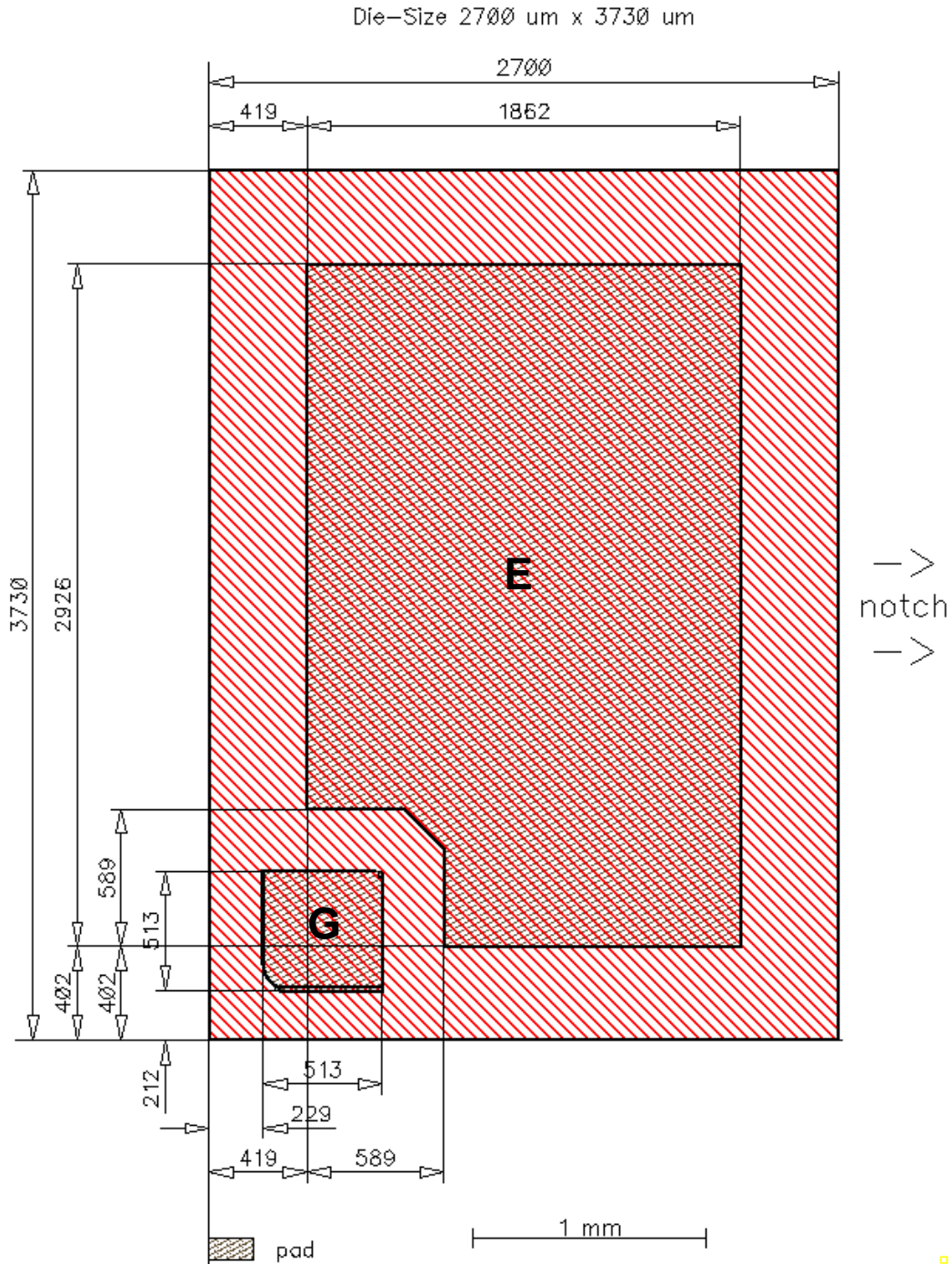
Further Electrical Characteristic

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

Further technical information about the performance of this chip in package PG-TO252-3 is given exemplarily at www.infineon.com/igbt. The chip qualification is independent of the qualification which is performed for the Discretetes.

This chip data sheet refers to the device data sheet	IKD15N60R	Rev. 2.2
--	-----------	----------

Chip Drawing



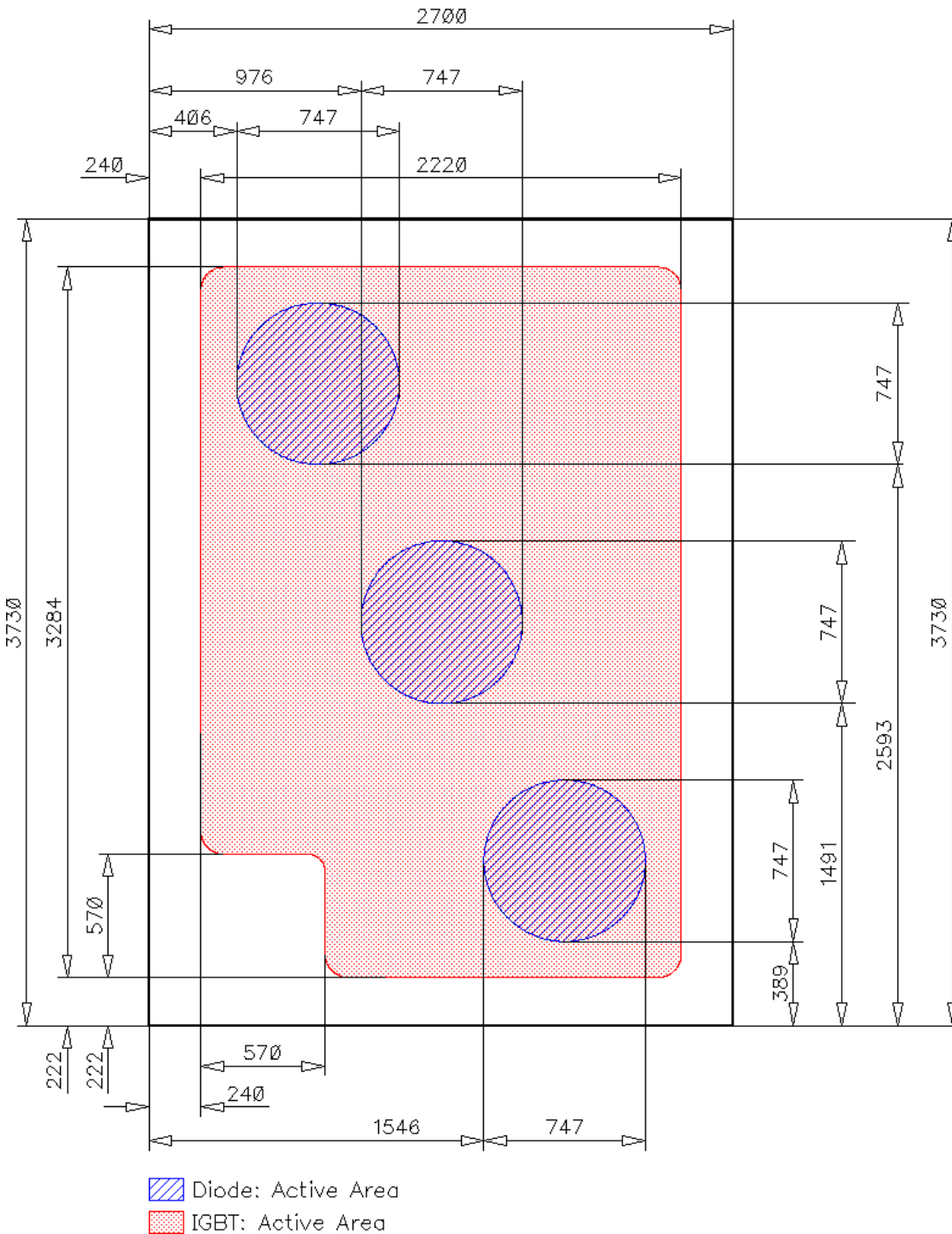
E = Emitter

G = Gate

Chip Drawing active areas

Die-Size 2700 um x 3730 um

L7386



**Description**

AQL 0,65 for visual inspection according to failure catalogue

Electrostatic Discharge Sensitive Device according to MIL-STD 883

Revision History

Version	Subjects (major changes since last revision)	Date

Published by
Infineon Technologies AG
81726 Munich, Germany
© 2013 Infineon Technologies AG
All Rights Reserved.

Legal Disclaimer

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics. With respect to any examples or hints given herein, any typical values stated herein and/or any information regarding the application of the device, 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.

Information

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

Warnings

Due to technical requirements, components may contain dangerous substances. For information on the types in question, please contact the nearest Infineon Technologies Office.

The Infineon Technologies component described in this Data Sheet may be used in life-support devices or systems and/or automotive, aviation and aerospace applications or systems only with the express written approval of Infineon Technologies, if a failure of such components can reasonably be expected to cause the failure of that life-support, automotive, aviation and aerospace device or system or to affect the safety or effectiveness of that device or system. Life support devices or systems are intended to be implanted in the human body or to support and/or maintain and sustain and/or protect human life. If they fail, it is reasonable to assume that the health of the user or other persons may be endangered.