

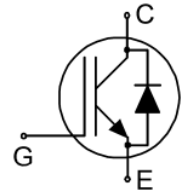
### IGBT chip with monolithically integrated diode in packages offering space saving advantage

#### 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 5µs
- 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
IGC07R60DE	600V	10A	2.65 x 2.68 mm <sup>2</sup>	sawn on foil

#### Mechanical Parameters

Raster size	2.65 x 2.68		mm <sup>2</sup>
Emitter pad size	see chip drawing		
Gate pad size	see chip drawing		
Area: total / active IGBT / active Diode	7.102 / 3.647 / 0.871		
Thickness	70		µm
Wafer size	200		mm
Max.possible chips per wafer	3920		
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, <350µm		
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 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 $T_{vj, max}$	$I_{C, puls}$	30	A
Gate emitter voltage	$V_{GE}$	$\pm 20$	V
Junction temperature range	$T_{vj, max}$	-40 ... +175	°C
Operating junction temperature	$T_{vj, op, max}$	-40 ... +175	°C
Short circuit data <sup>2)3)</sup> $V_{GE} = 15V, V_{CC} = 400V, T_{vj} = 150\text{ °C}$	$t_{SC}$	5	$\mu s$
Safe operating area IGBT <sup>2)3)</sup>	$I_{C, max} = 20A, V_{CE, max} = 600V, T_{vj, op} \leq T_{vj, op, max}$		
Safe operating area Diode <sup>2)</sup>	$I_{F, max} = 20A, V_{R, max} = 600V,$ $P_{max} = 8\text{ kW}, T_{vj, op} \leq T_{vj, op, max}$		

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	$V_{CEsat}$	$V_{GE}=15V, I_C=10A$		1.65	2.1	
Diode Forward Voltage	$V_F$	$V_{GE}=0V, I_F=10A$		1.7	2.1	
Gate-Emitter threshold voltage	$V_{GE(th)}$	$I_C=0.17mA, V_{GE}=V_{CE}$	4.3	5	5.7	
Zero gate voltage collector current	$I_{CES}$	$V_{CE}=600V, V_{GE}=0V$			40	$\mu A$
Gate-Emitter leakage current	$I_{GES}$	$V_{CE}=0V, V_{GE}=20V$			100	nA
Integrated gate resistor	$r_G$			none		$\Omega$

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

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
Collector-Emitter saturation voltage	$V_{CEsat}$	$V_{GE}=15V, I_C=10A$		1.85		V
Input capacitance	$C_{ies}$	$V_{CE}=25V,$ $V_{GE}=0V, f=1\text{ MHz}$ $T_{vj}=25\text{ °C}$		655		pF
Output capacitance	$C_{oes}$			37		
Reverse transfer capacitance	$C_{res}$			22		



**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.

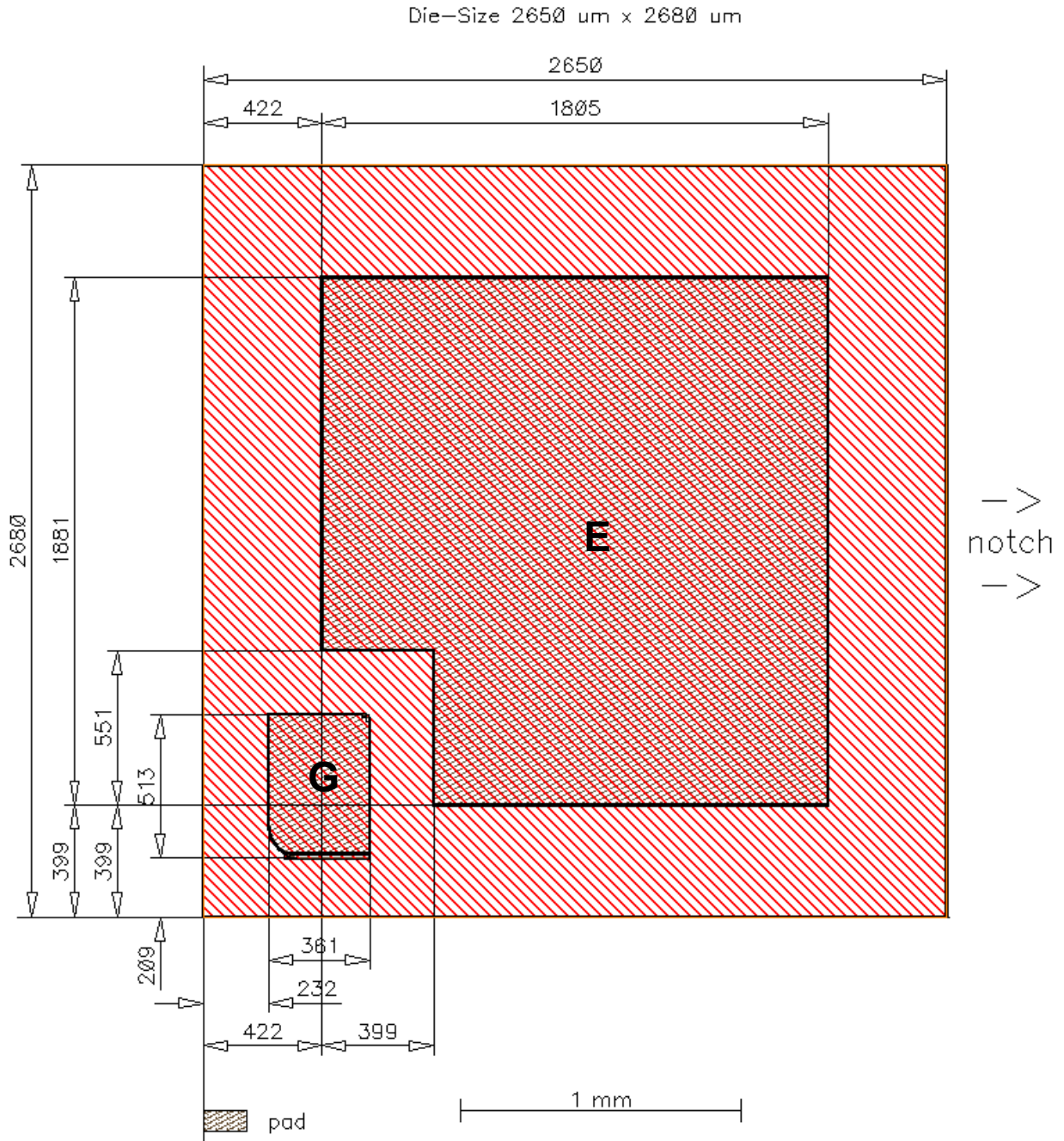
Further technical information about the performance of this chip in package PG-TO252-3 is given exemplarily at [www.infineon.com/igbt](http://www.infineon.com/igbt). The chip qualification is independent of the qualification which is performed for the Discretetes.

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This chip data sheet refers to the device data sheet	IKD10N60R	Rev. 2.2
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Chip Drawing

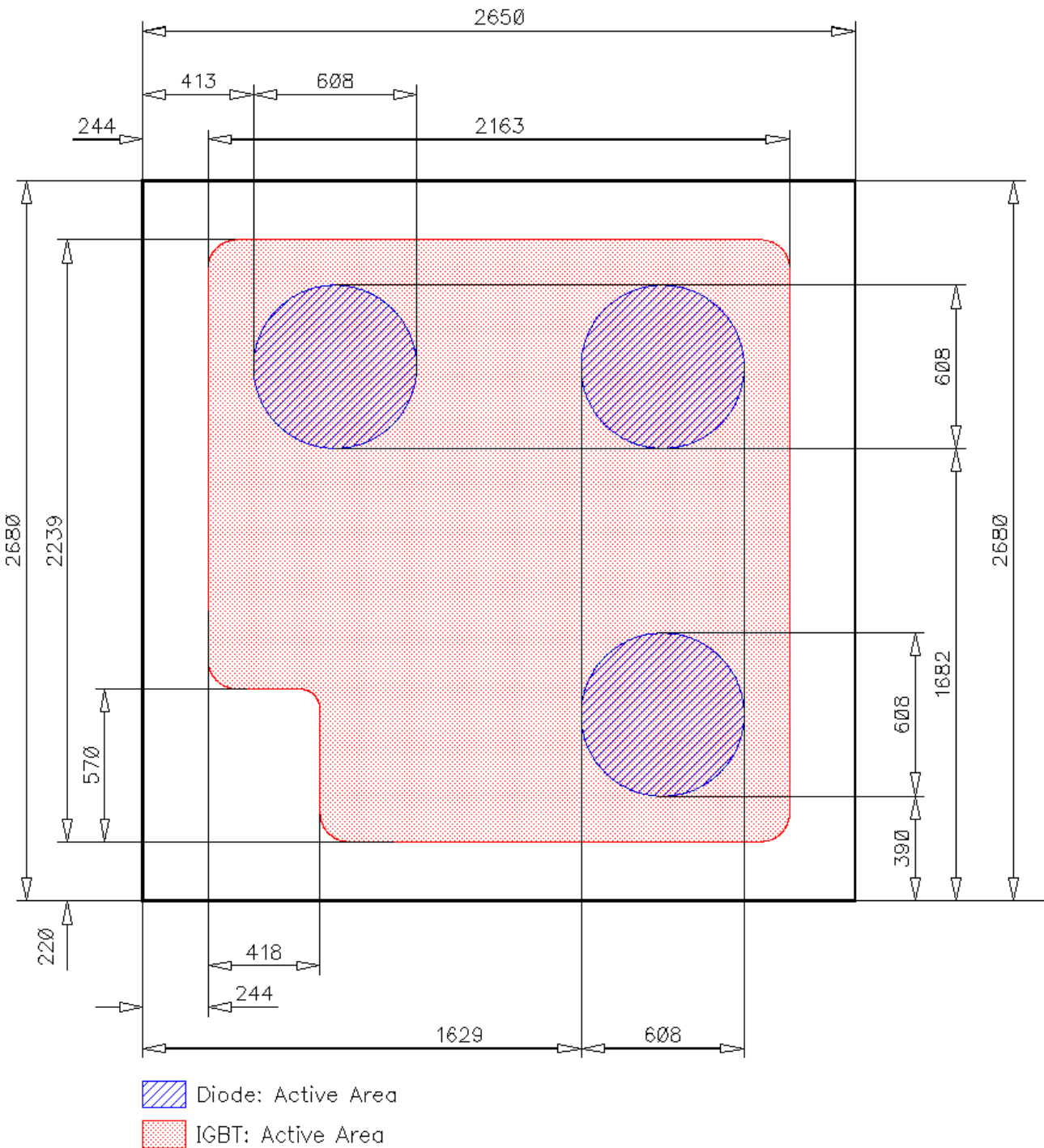


**E** = Emitter  
**G** = Gate

Chip Drawing active areas

Die-Size 2650 um x 2680 um

L7385



**Description**

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AQL 0,65 for visual inspection according to failure catalogue

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Electrostatic Discharge Sensitive Device according to MIL-STD 883

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**Revision History**

Version	Subjects (major changes since last revision)	Date

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