

## High Speed IGBT3 Chip

### Features:

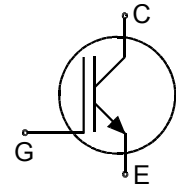
- 650V Trench & Field Stop technology
- high speed switching series third generation
- low  $V_{CE(sat)}$
- low EMI
- low turn-off losses
- positive temperature coefficient
- qualified according to JEDEC for target applications

### Recommended for:

- discrete components and modules

### Applications:

- uninterruptible power supplies
- welding converters
- converters with high switching frequency



Chip Type	$V_{CE}$	$I_{Cn}^{1)}$	Die Size	Package
IGC39T65QE	650V	75A	6.59 x 5.91 mm <sup>2</sup>	sawn on foil

<sup>1)</sup> nominal collector current at  $T_c = 100^\circ\text{C}$ , not subject to production test - verified by design/characterization

### Mechanical Parameters

Die size	6.59 x 5.91		mm <sup>2</sup>
Emitter pad size	See chip drawing		
Gate pad size	1.52 x 0.817		
Area total	38.9		
Thickness	70		µm
Wafer size	200		mm
Max.possible chips per wafer	686		
Passivation frontside	Photoimide		
Pad metal	3200 nm AlSiCu		
Backside metal	Ni Ag –system		
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 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	



# IGC39T65QE

## Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-Emitter voltage, $T_{vj} = 25\text{ °C}$	$V_{CE}$	650	V
DC collector current, limited by $T_{vj\text{ max}}$	$I_C$	<sup>1)</sup>	A
Pulsed collector current, $t_p$ limited by $T_{vj\text{ max}}$ <sup>2)</sup>	$I_{C,puls}$	225	A
Gate emitter voltage	$V_{GE}$	$\pm 20$	V
Operating junction temperature	$T_{vj}$	-40 ... +175	°C
Short circuit data <sup>2) 3)</sup> $V_{GE} = 15V$ , $V_{CC} = 400V$ , $T_{vj} = 150\text{ °C}$	$t_{SC}$	5	$\mu s$

<sup>1)</sup> depending on thermal properties of assembly

<sup>2)</sup> not subject to production test - verified by design/characterization

<sup>3)</sup> 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	$V_{(BR)CES}$	$V_{GE}=0V$ , $I_C=2\text{ mA}$	650			V
Collector-Emitter saturation voltage	$V_{CEsat}$	$V_{GE}=15V$ , $I_C=75A$	1.38	1.85	2.22	
Gate-Emitter threshold voltage	$V_{GE(th)}$	$I_C=1.2mA$ , $V_{GE}=V_{CE}$	4.2	5.1	5.6	
Zero gate voltage collector current	$I_{CES}$	$V_{CE}=650V$ , $V_{GE}=0V$			3.8	$\mu A$
Gate-Emitter leakage current	$I_{GES}$	$V_{CE}=0V$ , $V_{GE}=20V$			150	nA
Integrated gate resistor	$r_G$			none		$\Omega$

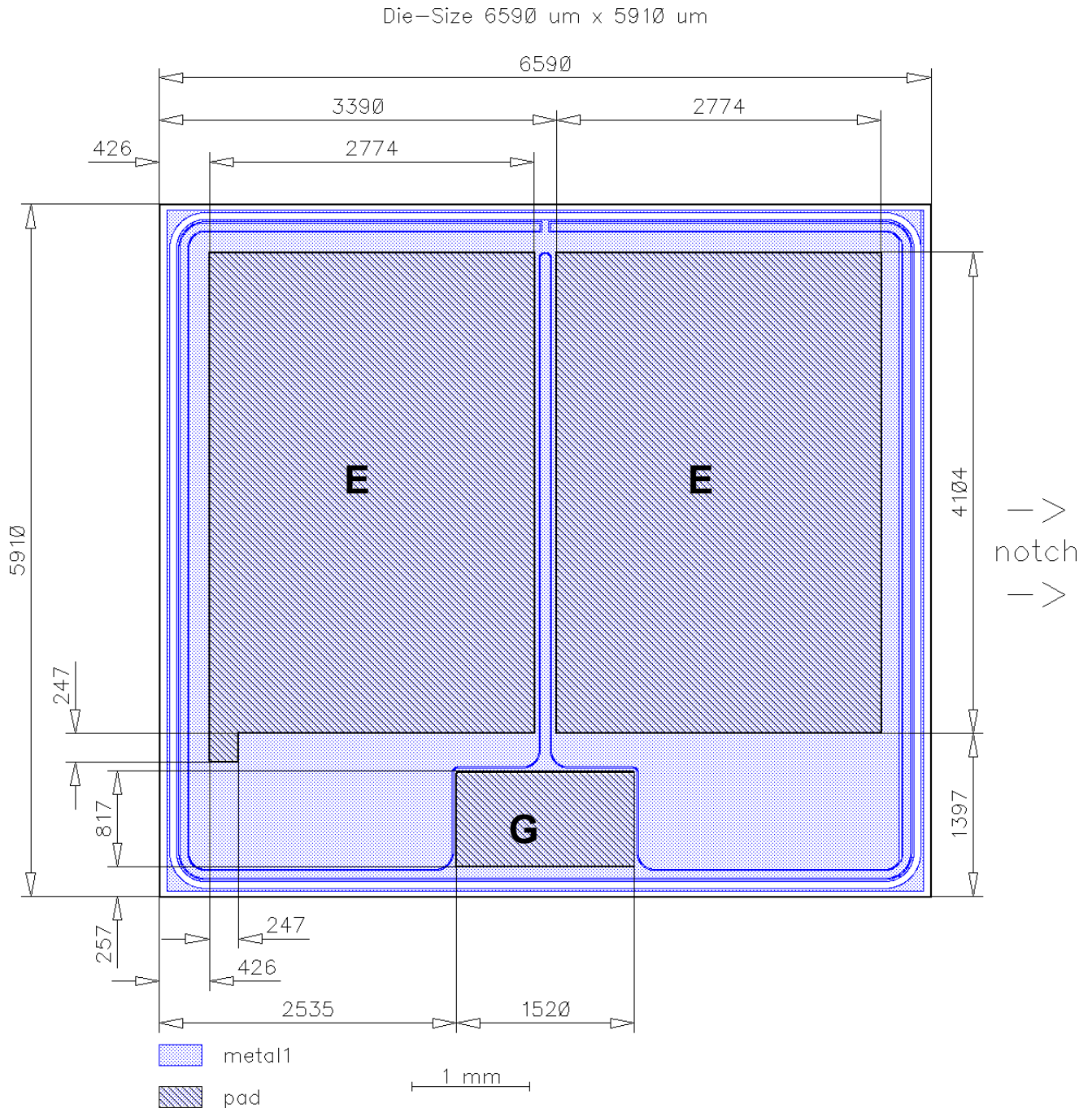
## Electrical Characteristics (not subject to production test - verified by design / characterization)

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
Collector-Emitter saturation voltage	$V_{CEsat}$	$V_{GE}=15V$ , $I_C=75A$ , $T_{vj}=175\text{ °C}$		2.25		V
Input capacitance	$C_{ies}$	$V_{CE}=25V$ ,		4620		pF
Reverse transfer capacitance	$C_{res}$	$V_{GE}=0V$ , $f=1MHz$ $T_{vj}=25\text{ °C}$		137		

## Further Electrical Characteristic

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

## Chip Drawing



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



# IGC39T65QE

## 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

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