

## IGBT 3 Chip

### Features:

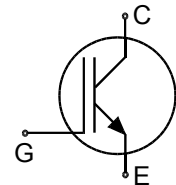
- 600V Trench & Field Stop technology
- low  $V_{CE(sat)}$
- low turn-off losses
- short tail current
- positive temperature coefficient
- easy paralleling
- Qualified according to JEDEC for target applications

### Recommended for:

- power module
- discrete components

### Applications:

- drives
- white goods
- resonant applications



Chip Type	$V_{CE}$	$I_{Cn}^{(1)}$	Die Size	Package
SIGC19T60SE	600V	40A	4.84 x 3.98 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	4.84 x 3.98	
Emitter pad size (incl. gate pad)	See chip drawing	
Gate pad size	0.608 x 0.646	
Area total	19.26	
Thickness	70	$\mu\text{m}$
Wafer size	200	mm
Max.possible chips per wafer	1403	
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, <500 $\mu\text{m}$	
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 $T_{vj\text{ max}}$	$I_C$	<sup>1)</sup>	A
Pulsed collector current, $t_p$ limited by $T_{vj\text{ max}}$ <sup>2)</sup>	$I_{C,puls}$	120	A
Gate emitter voltage	$V_{GE}$	±20	V
Operating junction temperature	$T_{vj}$	-40 ... +150	°C
Short circuit data <sup>2)3)</sup> $V_{GE} = 15V, V_{CC} = 380V, T_{vj} = 150\text{ °C}$	$t_{SC}$	5	µs

<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	$V_{(BR)CES}$	$V_{GE}=0V, I_C=2\text{ mA}$	600			V
Collector-Emitter saturation voltage	$V_{CEsat}$	$V_{GE}=15V, I_C=40A$	1.13	1.55	1.97	
Gate-Emitter threshold voltage	$V_{GE(th)}$	$I_C=0.58mA, V_{GE}=V_{CE}$	4.2	4.9	5.6	
Zero gate voltage collector current	$I_{CES}$	$V_{CE}=600V, V_{GE}=0V$			1.6	µA
Gate-Emitter leakage current	$I_{GES}$	$V_{CE}=0V, V_{GE}=20V$			300	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	$V_{CEsat}$	$V_{GE}=15V, I_C=40A, T_{vj}=175\text{ °C}$		1.9		V
Input capacitance	$C_{ies}$	$V_{CE}=25V, V_{GE}=0V, f=1\text{ MHz}, T_{vj}=25\text{ °C}$		2423		pF
Output capacitance	$C_{oes}$			113		
Reverse transfer capacitance	$C_{res}$			72		



# SIGC19T60SE

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## Further Electrical Characteristic

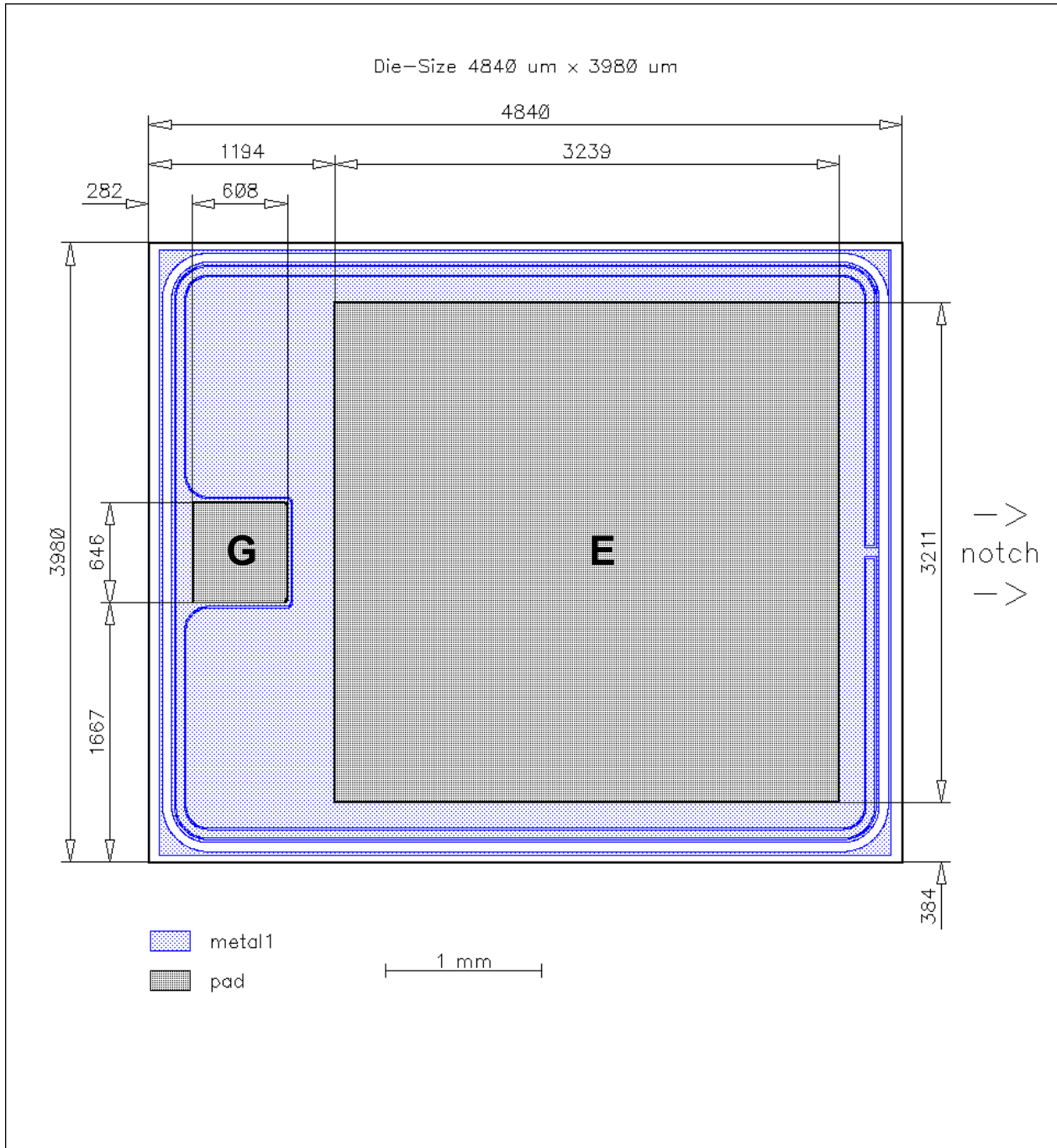
Switching characteristics and thermal properties are depending strongly on module design and mounting technology and can therefore not be specified for a bare die.

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This chip data sheet refers to the device data sheet	IHW40T60	Rev. 2.0
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## Chip Drawing



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



# SIGC19T60SE

## 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**  
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