

High Speed IGBT3 Chip

Features:

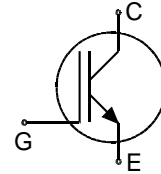
- 600V Trench & Field Stop technology
- high speed switching series third generation
- low $V_{CE(sat)}$
- low EMI
- low turn-off losses
- positive temperature coefficient
- qualified according to JEDEC for target applications

Recommended for:

- discrete components and modules

Applications:

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



Chip Type	V_{CE}	I_{Cn}	Die Size	Package
IGC19T60Q	600V	40A	4.84 x 3.98 mm ²	sawn on foil

Mechanical Parameters

Die size	4.84 x 3.98	mm ²
Emitter pad size	See chip drawing	
Gate pad size	0.608 x 0.646	
Area total	19.26	
Thickness	70	µm
Wafer size	150	mm
Max.possible chips per wafer	738	
Passivation frontside	Photoimide	
Pad metal	3200 nm AlSiCu	
Backside metal ¹⁾	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, <500µm	
Reject ink dot size	∅ 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

¹⁾ collector

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	1)	A
Pulsed collector current, t_p limited by $T_{vj\text{ max}}$ 2)	$I_{C,puls}$	120	A
Gate emitter voltage	V_{GE}	± 20	V
Operating junction temperature	T_{vj}	-40 ... +175	°C
Short circuit data 2)3) $V_{GE} = 15V, V_{CC} = 400V, T_{vj} = 150\text{ °C}$	t_{SC}	5	μs

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	$V_{(BR)CES}$	$V_{GE}=0V, I_C=2\text{ mA}$	600			V
Collector-Emitter saturation voltage	V_{CEsat}	$V_{GE}=15V, I_C=40A$	1.48	1.95	2.32	
Gate-Emitter threshold voltage	$V_{GE(th)}$	$I_C=0.58mA, V_{GE}=V_{CE}$	4.2	5.1	5.6	
Zero gate voltage collector current	I_{CES}	$V_{CE}=600V, V_{GE}=0V$			2	μA
Gate-Emitter leakage current	I_{GES}	$V_{CE}=0V, V_{GE}=20V$			150	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}	$V_{GE}=15V, I_C=40A, T_{vj}=175\text{ °C}$		2.5		V
Input capacitance	C_{ies}	$V_{CE}=25V, V_{GE}=0V, f=1\text{ MHz}$		2500		pF
Reverse transfer capacitance	C_{res}	$T_{vj}=25\text{ °C}$		75		



IGC19T60Q

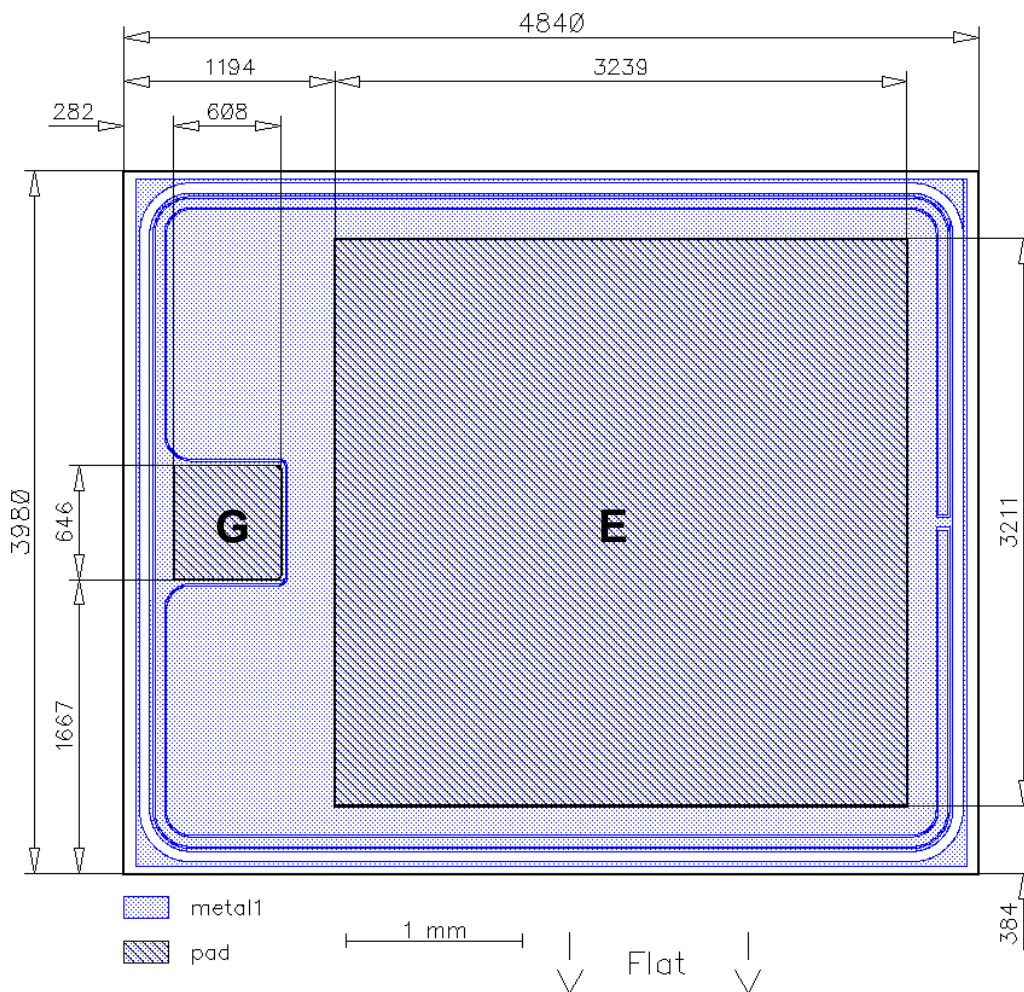
Further Electrical Characteristic

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

This chip data sheet refers to the device data sheet	IKW40N60H3	Rev 2.2
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Chip Drawing

Die-Size 4840 μm x 3980 μm



E = Emitter

G = Gate



IGC19T60Q

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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