

## TRENCHSTOP™ IGBT3 Chip

### Features:

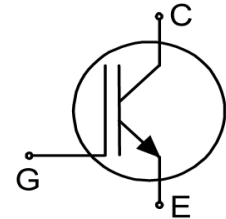
- 1700V trench & field stop technology
- Low switching losses
- Soft turn off
- Positive temperature coefficient
- Easy paralleling

### Recommended for:

- Power modules

### Applications:

- Drives



Chip Type	V <sub>CE</sub>	I <sub>Cn</sub> <sup>1</sup>	Die Size	Package
IGC168T170S8RM	1700V	150A	13.38mm x 12.58mm	Sawn on foil

### Mechanical Parameters

Die size	13.38 x 12.58		mm <sup>2</sup>
Emitter pad size	See chip drawing		
Gate pad size	1.674 x 0.899		
Area total	168.32		
Thickness	190		µm
Wafer size	200		mm
Maximum possible chips per wafer	150		
Passivation frontside	Photoimide		
Pad metal	3200nm AlSiCu		
Backside metal	Ni Ag – system To achieve a reliable solder connection it is strongly recommended not to consume the Ni layer completely during production process		
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 months	
	for open MBB bags	Acc. to IEC62258-3: atmosphere >99% Nitrogen or inert gas, humidity <25%RH, temperature 17°C – 25°C, <6 months	

<sup>1</sup> Nominal collector current at T<sub>C</sub>=100°C for chip packaged in power modules, see application example cited on page 5.

## Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-emitter voltage, $T_{vj}=25^{\circ}\text{C}$	$V_{CE}$	1700	V
DC collector current, limited by $T_{vj\text{ max}}^2$	$I_C$	-	A
Pulsed collector current, $t_p$ limited by $T_{vj\text{ max}}^3$	$I_{C,puls}$	450	A
Gate-emitter voltage	$V_{GE}$	$\pm 20$	V
Junction temperature range	$T_{vj}$	-40 ... +175	$^{\circ}\text{C}$
Operating junction temperature	$T_{vj}$	-40 ... +150	$^{\circ}\text{C}$
Short circuit data <sup>3/4</sup> $V_{GE}=15\text{V}$ , $V_{CC}=1000\text{V}$ , $T_{vj}=150^{\circ}\text{C}$	$t_{sc}$	10	$\mu\text{s}$
Reverse bias safe operating area <sup>3</sup> (RBSOA)	$I_{C,max}=300\text{A}$ , $V_{CE,max}=1700\text{V}$ , $T_{vj}\leq 150^{\circ}\text{C}$		

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

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
Collector-emitter breakdown voltage	$V_{(BR)CES}$	$V_{GE}=0\text{V}$ , $I_C=2\text{mA}$	1700	-	-	V
Collector-emitter saturation voltage	$V_{CEsat}$	$V_{GE}=15\text{V}$ , $I_C=45\text{A}$	1.1	1.27	1.45	
Gate-emitter threshold voltage	$V_{GE(th)}$	$I_C=6\text{mA}$ , $V_{GE}=V_{CE}$	5.2	5.8	6.4	
Zero gate voltage collector current	$I_{CES}$	$V_{CE}=1700\text{V}$ , $V_{GE}=0\text{V}$	-	-	8	$\mu\text{A}$
Gate-emitter leakage current	$I_{GES}$	$V_{CE}=0\text{V}$ , $V_{GE}=20\text{V}$	-	-	300	nA
Integrated gate resistor	$r_G$		5			$\Omega$

## Electrical Characteristics <sup>3</sup>

Parameter	Symbol	Conditions	Value			Unit	
			min.	typ.	max.		
Collector-emitter saturation voltage	$V_{CEsat}$	$V_{GE}=15\text{V}$ , $I_C=150\text{A}$	$T_{vj}=25^{\circ}\text{C}$	1.6	1.9	2.2	V
			$T_{vj}=150^{\circ}\text{C}$	-	2.45	-	
Input capacitance	$C_{ies}$	$V_{CE}=25\text{V}$ , $V_{GE}=0\text{V}$ , $f=1\text{MHz}$ $T_{vj}=25^{\circ}\text{C}$	-	13500	-	pF	
Reverse transfer capacitance	$C_{res}$		-	430	-		

<sup>2</sup> Depending on thermal properties of assembly.

<sup>3</sup> Not subject to production test - verified by design/characterization.

<sup>4</sup> Allowed number of short circuits: <1000; time between short circuits: >1s.