

## TRENCHSTOP™ IGBT4 Medium Power Chip

### Features:

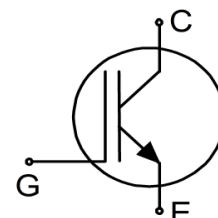
- 1200V trench & field stop technology
- Low switching losses
- Soft turn off
- Positive temperature coefficient
- Easy paralleling

### Recommended for:

- Medium power modules

### Applications:

- Medium power drives



Chip Type	$V_{CE}$	$I_{Cn}^1$	Die Size	Package
IGC193T120T8RM	1200V	200A	15.99mm x 12.08mm	Sawn on foil

### Mechanical Parameters

Die size	15.99 x 12.08	mm <sup>2</sup>
Emitter pad size	See chip drawing	
Gate pad size	1.31 x 0.811	
Area total	193.16	
Thickness	120	μm
Wafer size	200	mm
Maximum possible chips per wafer	121	
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  $T_C = 100^\circ\text{C}$  assuming chip assembly in power module EconoDUAL™3.

## Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-emitter voltage, $T_{vj}=25^{\circ}\text{C}$	$V_{CE}$	1200	V
DC collector current, limited by $T_{vj\text{ max}}^2$	$I_C$	-	A
Pulsed collector current, $t_p$ limited by $T_{vj\text{ max}}^3$	$I_{C,puls}$	600	A
Gate-emitter voltage	$V_{GE}$	$\pm 20$	V
Operating junction temperature	$T_{vj}$	-40 ... +175	$^{\circ}\text{C}$
Short circuit data <sup>3/4</sup> $V_{GE}=15\text{V}$ , $V_{CC}=800\text{V}$ , $T_{vj}=150^{\circ}\text{C}$	$t_{sc}$	10	$\mu\text{s}$

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

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
Collector-emitter breakdown voltage	$V_{(BR)CES}$	$V_{GE}=0\text{V}$ , $I_C=5.7\text{mA}$	1200	-	-	V
Collector-emitter saturation voltage	$V_{CEsat}$	$V_{GE}=15\text{V}$ , $I_C=60\text{A}$	0.97	1.15	1.32	
Gate-emitter threshold voltage	$V_{GE(th)}$	$I_C=7.4\text{mA}$ , $V_{GE}=V_{CE}$	5.1	5.8	6.3	
Zero gate voltage collector current	$I_{CES}$	$V_{CE}=1200\text{V}$ , $V_{GE}=0\text{V}$	-	-	2.6	$\mu\text{A}$
Gate-emitter leakage current	$I_{GES}$	$V_{CE}=0\text{V}$ , $V_{GE}=20\text{V}$	-	-	120	nA
Integrated gate resistor	$r_G$		3.5			$\Omega$

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

Parameter	Symbol	Conditions	Value			Unit	
			min.	typ.	max.		
Collector-emitter saturation voltage	$V_{CEsat}$	$V_{GE}=15\text{V}$ , $I_C=200\text{A}$	$T_{vj}=25^{\circ}\text{C}$	1.55	1.8	2.05	V
			$T_{vj}=150^{\circ}\text{C}$		2.05		
Input capacitance	$C_{ies}$	$V_{CE}=25\text{V}$ , $V_{GE}=0\text{V}$ , $f=1\text{MHz}$ $T_{vj}=25^{\circ}\text{C}$	-	12500	-	pF	
Reverse transfer capacitance	$C_{res}$		-	680	-		

<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.