

TRENCHSTOP™ IGBT4 Medium Power Chip

Features:

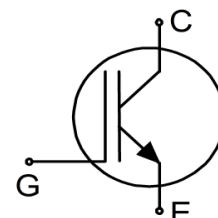
- 1200V trench & field stop technology
- Low switching losses
- Soft turn off
- Positive temperature coefficient
- Easy paralleling

Recommended for:

- Medium power modules

Applications:

- Medium power drives



Chip Type	V_{CE}	I_{Cn}^1	Die Size	Package
IGC142T120T8RM	1200V	150A	11.31mm x 12.56mm	Sawn on foil

Mechanical Parameters

Die size	11.31 x 12.56		mm ²
Emitter pad size	See chip drawing		
Gate pad size	1.31 x 0.811		
Area total	142.05		
Thickness	120		μm
Wafer size	200		mm
Maximum possible chips per wafer	170		
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 (<6 months)	for original and sealed MBB bags	Ambient atmosphere air, temperature 17°C – 25°C	
	for open MBB bags	Acc. IEC62258-3; Section 9.4 Storage Environment	

¹ Nominal collector current at $T_C=100^\circ\text{C}$ 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}	1200	V
DC collector current, limited by $T_{vj\text{ max}}^2$	I_C	-	A
Pulsed collector current, t_p limited by $T_{vj\text{ max}}^3$	$I_{C,puls}$	450	A
Gate-emitter voltage	V_{GE}	± 20	V
Operating junction temperature	T_{vj}	-40 ... +175	$^{\circ}\text{C}$
Short circuit data ^{3/4} $V_{GE}=15\text{V}$, $V_{CC}=800\text{V}$, $T_{vj}=150^{\circ}\text{C}$	t_{sc}	10	μs

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}	$V_{GE}=15\text{V}$, $I_C=45\text{A}$	0.97	1.15	1.32	
Gate-emitter threshold voltage	$V_{GE(th)}$	$I_C=5.7\text{mA}$, $V_{GE}=V_{CE}$	5.3	5.8	6.3	
Zero gate voltage collector current	I_{CES}	$V_{CE}=1200\text{V}$, $V_{GE}=0\text{V}$	-	-	2	μA
Gate-emitter leakage current	I_{GES}	$V_{CE}=0\text{V}$, $V_{GE}=20\text{V}$	-	-	120	nA
Integrated gate resistor	r_G		-	5	-	Ω

Electrical Characteristics ³

Parameter	Symbol	Conditions	Value			Unit	
			min.	typ.	max.		
Collector-emitter saturation voltage	V_{CEsat}	$V_{GE}=15\text{V}$, $I_C=150\text{A}$	$T_{vj}=25^{\circ}\text{C}$	1.55	1.8	2.05	V
			$T_{vj}=150^{\circ}\text{C}$		2.05		
Input capacitance	C_{ies}	$V_{CE}=25\text{V}$, $V_{GE}=0\text{V}$, $f=1\text{MHz}$ $T_{vj}=25^{\circ}\text{C}$	-	9300	-	pF	
Reverse transfer capacitance	C_{res}		-	510	-		

² Depending on thermal properties of assembly.

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

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