IGBT Chip

Die In Wafer Form

1200V
IC（nom）=100A
Vce(sat)typ=3.3V@IC(nom)@25℃
Fast IGBT
ShortCircuit Rated
150mm Wafer

Applications

- Welding Machine/ Cutting Machine
- Induction Heating/HF Power

Features

Non Punch Through (NPT) Technology
Low Etotal
10μs Short Circuit Capability
Square RBSOA
Positive Vce(sat) Temperature Coefficient

Chip Type	Icn	Vce	Die size	Wafer size
SYC100PN120WHF1	100A	1200V	12.40*12.40 mm^2	6 inch

Mechanical Parameters

Die size	12.40mm*12.40mm
Emitter pad size	See chip drawing
Gate pad size	0.909mm*0.925mm
Area total	119.33mm^2
Silicon thickness	180um
Wafer size	150mm
Maximum possible chips per wafer	67pcs
Passivation frontside	Polyimide
Pad metal	4000nm AlSiCu
Backside metal	Al - Ti - Ni/V - Ag, (1kA - 1kA - 2kA - 8kA) suitable for epoxy and soft solder die bonding
Die bond	Soft solder
Wire bond	Al, ≤500um
Reject ink dot size	∅ 0.65mm; max. 1.2mm
Storage environment (<6 months) for original and sealed MBB bags	Ambient atmosphere air, temperature 17°C – 25°C
Storage environment (<6 months) for open MBB bags	Acc. IEC 62258-3; Section 9.4 Storage Environment.

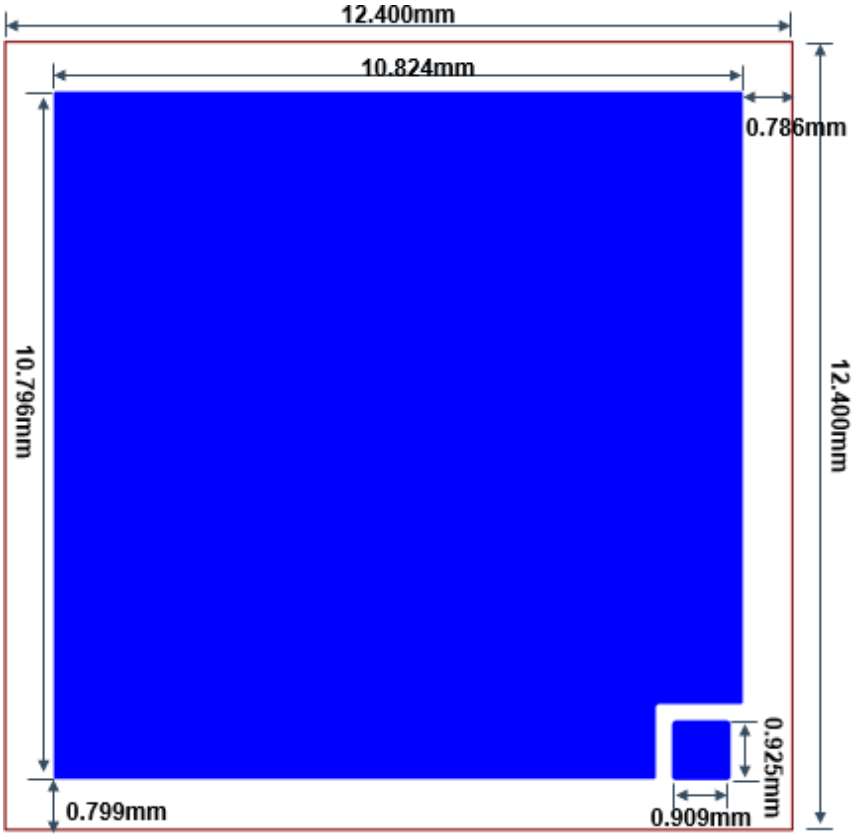
Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-emitter voltage, Tvj=25°C	VCE	1200	V
DC collector current, limited by Tvj max 1	IC	100	A
Pulsed collector current, tp limited by Tvj max 2	IC,puls	200	A
Gate-emitter voltage	VGE	±20	V
Junction temperature	Tvj	150	℃
Operating junction temperature	Tvj op	-40 - 125	℃
Short circuit data [2 / 3] VGE=15V, VCC=600V, Tvj=150°C	tsc	10	μs

Static Characteristics (tested on chip)

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Collector-emitter breakdown voltage	$V_{(BR)CES}$	V_{GE}=0V, I_C=250uA	1200			V
Collector-emitter saturation voltage	$V_{CE(sat)}$	Ic=100A,V_{GE}=15V, T_{vj}=25℃	3.0	3.3	3.8	V
Gate-emitter threshold voltage	$V_{GE(th)}$	V_{GE}=V_{CE}, I_C =1mA, T_{vj}=25℃	5.0	5.5	6.2	V
Collector-emitter cut-off current	I_{CES}	V_{CE}=1200V,V_{GE}=0V, T_{vj}=25℃			20	uA
Gate-emitter leakage current	I_{GES}	V_{CE}=0, V_{GE}=20V, T_{vj}=25℃			100	nA

1. Depending on thermal properties of assembly.
2. Not subject or production test - verified by design/characterization.
3. Allowed number of short circuits: <1000; time between short circuits: >1s.


12.400mm
10.824mm
0.786mm
10.796mm
12.400mm
0.925mm
0.799mm
0.909mm

Bare Die Product Specifics

Test coverage at wafer level cannot cover all application conditions. Therefore, it is recommended to test all characteristics which are relevant for the application at package level, including RBSOA and SCSOA.

Revision History

Revision	Subjects(major changes since last revision)	Date
1.0	Final date sheet	2021.07.20
1.1	Change specification name and company address	2022.10.27