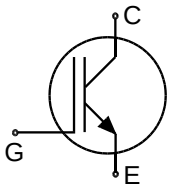
SIGC20T120E

IGBT3 Power Chip

Features:
- 1200V Trench + Field Stop technology
- low turn-off losses
- short tail current
- positive temperature coefficient
- easy paralleling

This chip is used for:
- power modules

Applications:
- drives



Chip Type	V_{CE}	I_C	Die Size	Package
SIGC20T120E	1200V	15A	4.41 x 4.47 mm^2	sawn on foil

Mechanical Parameters

Raster size	4.41 x 4.47	mm^2
Emitter pad size (incl. gate pad)	2.995 x 2.901	
Gate pad size	1.107 x 0.702	
Area total	19.7	
Thickness	140	µm
Wafer size	200	mm
Max.possible chips per wafer	1381	
Passivation frontside	Photoimide	
Pad metal	3200 nm AlSiCu	
Backside metal	Ni Ag –system suitable for epoxy and soft solder die bonding	
Die bond	Electrically conductive glue or solder	
Wire bond	Al, <500µm	
Reject ink dot size	∅ 0.65mm ; max 1.2mm	
Recommended storage environment	Store in original container, in dry nitrogen, in dark environment, < 6 month at an ambient temperature of 23°C	

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-Emitter voltage, T_{vj} =25 °C	V_{CE}	1200	V
DC collector current, limited by $T_{vj\,max}$	I_C	1)	A
Pulsed collector current, t_p limited by $T_{vj\,max}$	$I_{c,puls}$	45	A
Gate emitter voltage	V_{GE}	±20	V
Junction temperature range	T_{vj}	-40 ... +175	°C
Operating junction temperature	T_{vj}	-40...+150	°C
Short circuit data 2) V_{GE} = 15V, V_{CC} = 900V, T_{vj} = 150°C	t_{SC}	10	µs
Reverse bias safe operating area 2) (RBSOA)	$I_{C,max}$ = 30A, $V_{CE,max}$ = 1200V $T_{vj} \leq 150°C$		

1) depending on thermal properties of assembly

2) not subject to production test - verified by design/characterization

Static Characteristics (tested on wafer), T_{vj} =25 °C

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
Collector-Emitter breakdown voltage	$V_{(BR)CES}$	V_{GE}=0V , I_C= 0.5 mA	1200			V
Collector-Emitter saturation voltage	V_{CEsat}	V_{GE}=15V, I_C=15A	1.4	1.7	2.1	
Gate-Emitter threshold voltage	$V_{GE(th)}$	I_C=600µA , V_{GE}=V_{CE}	5.0	5.8	6.5	
Zero gate voltage collector current	I_{CES}	V_{CE}=1200V , V_{GE}=0V			2.16	µA
Gate-Emitter leakage current	I_{GES}	V_{CE}=0V , V_{GE}=20V			120	nA
Integrated gate resistor	r_G			--		Ω

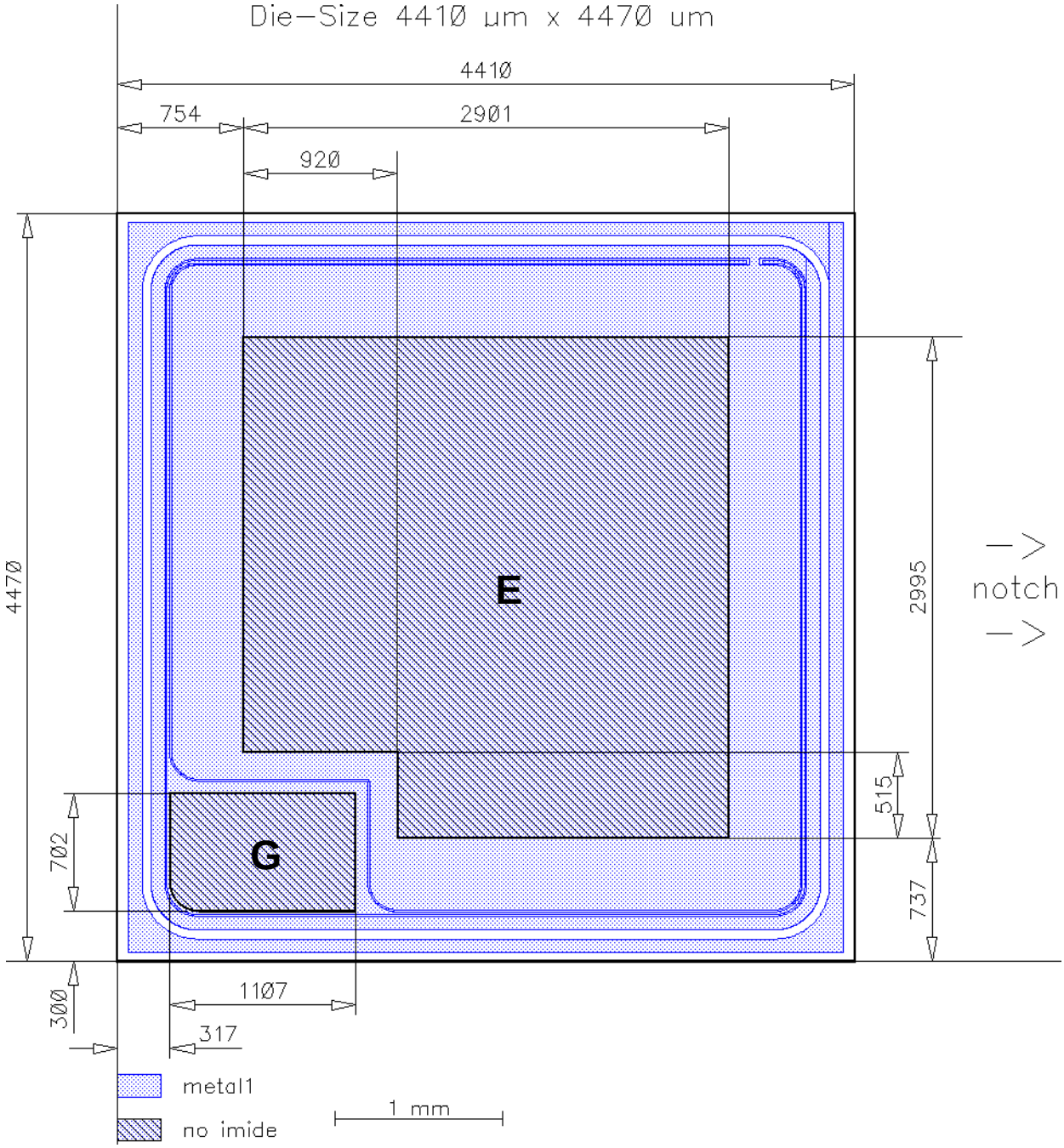
Dynamic Characteristics (not subject to production test - verified by design / characterization), T_{vj} =25 °C

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
Input capacitance	C_{ies}	V_{CE}=25V,		1090		pF
Output capacitance	C_{oes}	V_{GE}=0V,		58		
Reverse transfer capacitance	C_{res}	f=1MHz		48		

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.

Chip Drawing



E = Emitter
G = Gate

SIGC20T120E

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
2.2	Wafer diameter change to 200 mm	06.07.2010
2.3	Additional basic types L7631M, L7631T, L7631E	27.06.2014

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