

IGBT

Trench & Field Stop IGBT Chip

MWGC050N120H1

Data Sheet

Industrial Power Module & Discrete Transistor

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MWGC050N120H1

1200V / 50A Field-Stop IGBT

Features :

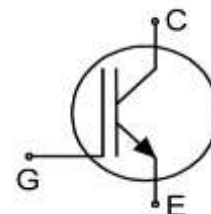
- 1200V Trench & Field Stop technology
- Low switching losses
- Easy paralleling
- Positive temperature coefficient

Recommended for :

- Discrete components

Applications :

- Medium power drivers
- Uninterruptible power supplies
- Welding



Chip Type	V_{CE}	I_{Cn}	Die Size	Package
MWGC050N120H1	1200 V	50 A	7.92 x 5.92 mm ²	Bare Wafer

Mechanical Parameters

Die size	7.92 x 5.92	mm ²
Emitter pad size	See chip drawing (Size-mm ²)	
Gate pad size	0.130 X 0.999	
Area total	46.886	
Silicon thickness	130	μm
Wafer size	150	mm
Maximum possible chips per wafer	294 ea	
Scribe line	80 um	
Passivation frontside	w/o Polyimide	
Pad metal	5000nm AlSiCu	
Backside metal	Al Ti Ni Ag - system	
Reject ink dot size	∅ 0.65 mm ; Max. 0.762 mm	
Die bond	Electrically conductive epoxy glue and solder	
Wire bond	Al, ≤ 400μm	
Recommended storage environment	Store in original container , in dry nitrogen cabinet , in dark environment , in humidity below < 20% , < 6 months at an ambient temperature of 23°C.	

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Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-emitter voltage, $T_j=25^\circ\text{C}$	V_{CE}	1200	V
DC collector current, limited by $T_{j\max}^1$	I_C	-	A
Pulsed collector current, t_p limited by $T_{j\max}^2$	$I_{C,puls}$	150	A
Gate-emitter voltage	V_{GE}	± 30	V
Virtual junction temperature	T_{vj}	$-40 \sim +150$	$^\circ\text{C}$
Short circuit data $^2 V_{GE}=15\text{V}, V_{CC}=600\text{V}, T_{vj}=25^\circ\text{C}$	t_{sc}	10	μs

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

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Collector-emitter breakdown voltage	$V_{(BR)CES}$	$V_{GE}=0\text{V}, I_C=1.0\text{mA}$	1200	-	-	V
Collector-emitter saturation voltage	$V_{CE(sat)}$	$V_{GE}=15\text{V}, I_C=30\text{A}$	1.30	1.75	2.40	
Gate-emitter threshold voltage	$V_{GE(th)}$	$I_C=1.0\text{mA}, V_{GE}=V_{CE}$	5.3	6.0	6.7	
Zero gate voltage collector current	I_{CES}	$V_{CE}=1200\text{V}, V_{GE}=0\text{V}$	-	-	1	μA
Gate-emitter leakage current	I_{GES}	$V_{CE}=0\text{V}, V_{GE}=30\text{V}$	-	-	100	nA
Integrated gate resistor	r_G	-	1			Ω

Electrical Characteristics (not subject to production test - verified by design/characterization)

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Input capacitance	C_{iss}	$V_{CE}=25\text{V},$ $V_{GE}=0\text{V}, f=1\text{MHz},$ $T_{vj}=25^\circ\text{C}$	-	5618	-	pF
Output capacitance	C_{oss}		-	189	-	
Reverse transfer capacitance	C_{res}		-	26	-	

¹ Depending on thermal properties of assembly.

² Not subject to production test - verified by design/characterization.

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More Electrical Characteristics Information

Dynamic Switching characteristics and thermal properties are depending on package design and mounting technology and can therefore not be specified for a bare wafer.

With Anti-Parallel Diode

Application example		Rev.
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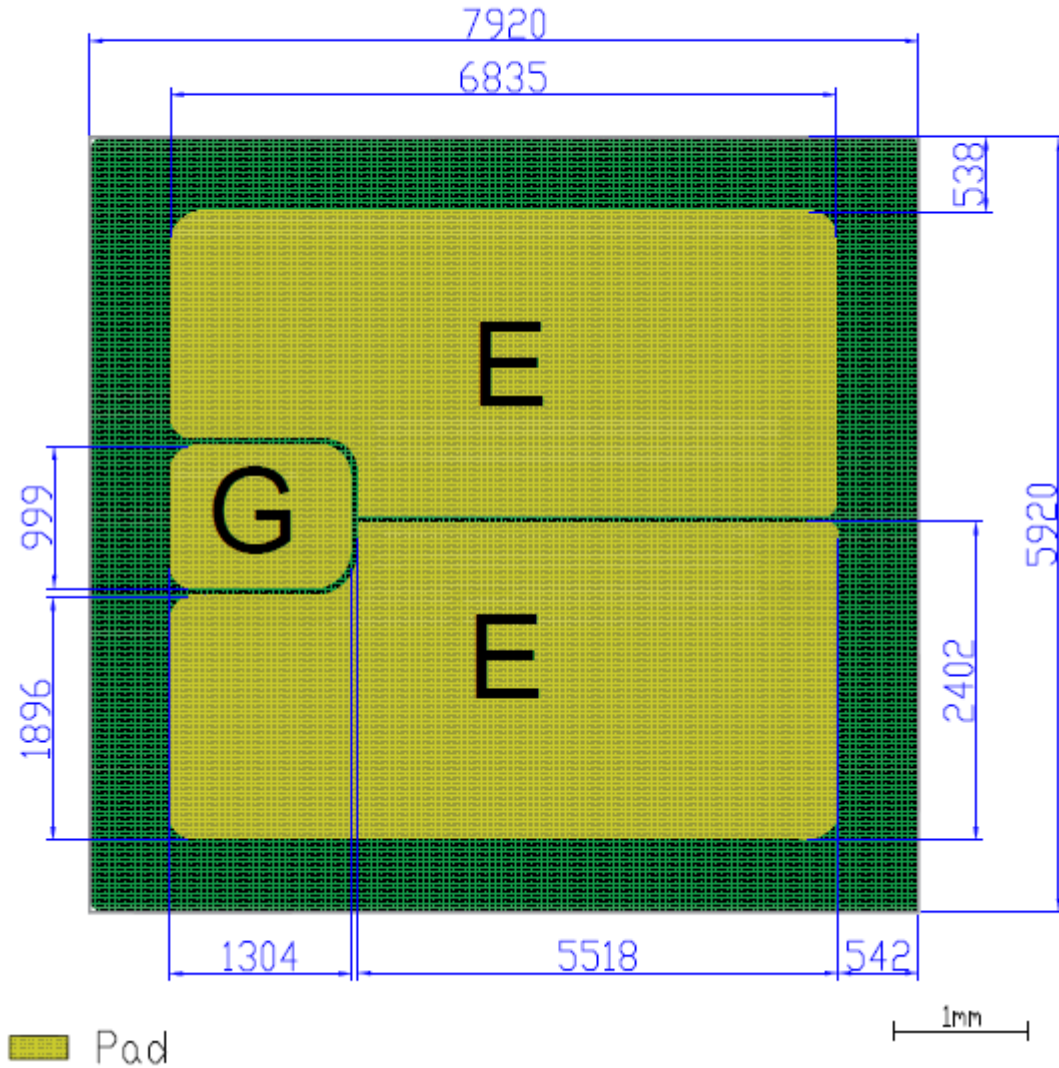
Without Anti-Parallel Diode

Application example		Rev.
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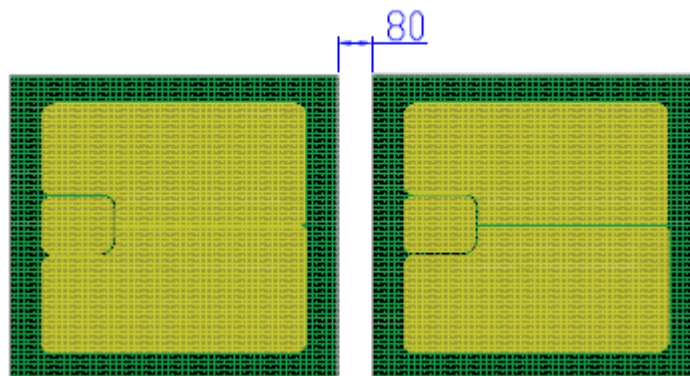
Chip Drawing (Size-mm)

Die-Size 7920 μm x 5920 μm



Scribe Line 80 μm

E : Emitter
G : Gate



Bare Wafer Product Specifics

Dynamic 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 , SCSOA and SSOA.

Revision History

Revision	Subjects (major changes since last revision)	Date
1.0	Final data sheet	Dec.,2022

Relevant Application Notes Information

Revision	Summary	Date

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