MOSEL VITELIC INC.

IGBT

Trench & Field Stop IGBT Chip

MWGC040N120H1

Data Sheet

Industrial Power Module & Discrete Transistor

Table of Contents

MOSEL VITELIC INC.

MWGC040N120H1

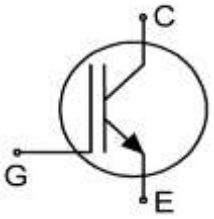
1200V / 40A Field-Stop IGBT

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
MWGC040N120H1	**1200 V**	**40 A**	**5.82 x 6.42 mm^2**	**Bare Wafer**

Mechanical Parameters

Die size	5.82 x 6.42	mm^2
Emitter pad size	See chip drawing (Size-mm^2)	
Gate pad size	0.803 X 1.201	
Area total	37.364	
Silicon thickness	130	µm
Wafer size	150	mm
Maximum possible chips per wafer	384 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	Ø 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℃.	

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-emitter voltage, T_j=25°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]	$I_{C,puls}$	120	A
Gate-emitter voltage	V_{GE}	±30	V
Virtual junction temperature	T_{vj}	-40～+150	°C
Short circuit data [2] V_{GE}=15V, V_{CC}=800V, T_{vj}=25°C	t_{sc}	10	µs

Static Characteristics (tested on wafer) , T_j=25°C

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Collector-emitter breakdown voltage	$V_{(BR)CES}$	V_{GE}=0V, I_C=1.0mA	1200	-	-	V
Collector-emitter saturation voltage	$V_{CE(sat)}$	V_{GE}=15V, I_C=30A	1.30	1.75	2.40	
Gate-emitter threshold voltage	$V_{GE(th)}$	I_C=1.0mA, V_{GE}=V_{CE}	5.3	6.0	6.7	
Zero gate voltage collector current	I_{CES}	V_{CE}=1200V, V_{GE}=0V	-	-	1	uA
Gate-emitter leakage current	I_{GES}	V_{CE}=0V, V_{GE}=30V	-	-	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}=25V, V_{GE}=0V, f=1MHz, T_{vj} =25℃	-	2370	-	pF
Output capacitance	C_{oss}		-	231	-	
Reverse transfer capacitance	C_{res}		-	126	-	

[1] Depending on thermal properties of assembly.
[2] Not subject to production test - verified by design/characterization.

MOSEL VITELIC INC.

MWGC040N120H1

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

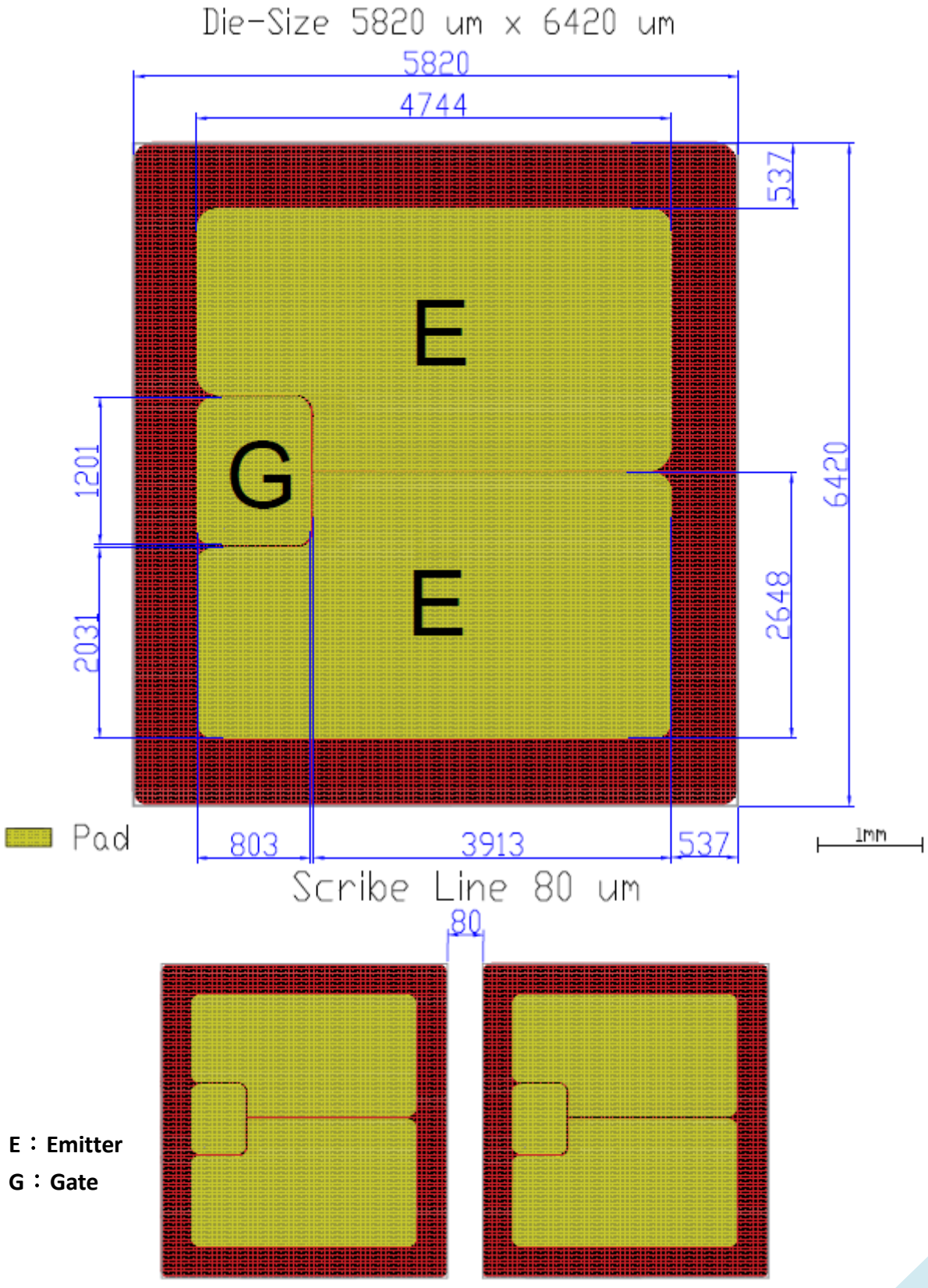
Application example		Rev.

Without Anti-Parallel Diode

Application example		Rev.

MWGC040N120H1

Chip Drawing (Size-mm)



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	Oct.,2022

Relevant Application Notes Information

Revision	Summary	Date

Attention

- MOSEL VITELIC INC. ("MVI") believes that the information on the specification is accurate and represents the most current information available to MVI. Nonetheless, MVI makes no representation or warranty on the accuracy of the information contained within this document. MVI will not be responsible for loss and damage resulting from the use of or reliance upon this information. For any questions on the information contained in this document, please contact MVI.
- While MVI products are RoHS compliant, they may possibly contain dangerous substances. For more information on such substances, please contact MVI. MVI will not be liable for any loss and damage arising from the dangerous substances.
- MVI reserves the right to make changes, corrections, enhancements, modifications and improvements to MVI products and/or to this document at any time without prior notice. While MVI may upload the updated version of this document onto its website (available at: www.mosel.com.tw) periodically, MVI does not guarantee that the updates on the website is always up-to-date. Purchasers should be responsible for obtaining the latest version of this document from MVI before placing orders.
- In the event that the version of MVI products to be purchased is not expressly specified by purchasers, MVI will by default deem that the Purchaser has placed purchase orders on the latest version of MVI products. MVI assumes no responsibility for any compatibility issue resulting from different versions of MVI products.
- MVI products are sold on MVI's sales terms and conditions in place at the time of order acknowledgement.

Legal Disclaimer

- MVI assumes no responsibility for equipment failures or loss and damage that result from using the products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products' specifications of any and all MVI products described or contained herein.
- The MVI products' applications are described in this document for reference only. MVI assumes no liabilities for application assistance or the design of purchasers' products. MVI also does not guarantee the suitability of using MVI products for such applications.
- Given that the semiconductor product may fail due to a variety of causes, purchasers should be responsible for the safety of their applications embedding MVI products. MVI does not assume the liability for any loss and damage caused by the failure in conformance.
- MVI products are not intended or warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury. Purchasers should solely bear all the relevant risks for their use of MVI products other than the initially intended usage above.
- The content of this document is only for reference, MVI is not and shall not be intended to grant any rights including but not limited to patent, copyright, or any other intellectual property right. MVI hereby disclaims any and all warranties and liabilities of any kind, including without limitation warranties of non-infringement of intellectual property rights of any third party.
- Please acknowledge that this document is provided on an "as is" basis, without warranties of any kind. MVI has no warranties, express, implied or otherwise, regarding its accuracy, completeness or performance. MVI also assumes no responsibility for possible errors or omissions of this document, or for any consequential losses arising from the aforesaid errors or omissions.
- To the maximum extent permitted by applicable laws, MVI expressly disclaims any direct, indirect, incidental, consequential or exemplary damages of any nature related to MVI products provided hereunder, including but not limited to the circuits design, merchantability, and suitability of a particular purpose, title and non-infringement of third party rights.

MOSEL VITELIC INC.

MWGC040N120H1

Service Information

For further information on technology, delivery terms and conditions and prices, please contact the MOSEL VITELIC INC. (www.mosel.com.tw).

Edited by

MOSEL VITELIC INC. CTOG MWGC040-17
Hsinchu Science Park , 300-77 , Taiwan , R.O.C.

The Shining Power
to The Green Future

MOSEL VITELIC INC.

MOSEL VITCLIC INC.

No.1, Creation Rd.1 ,
HsinChu Science Park ,
HsinChu , Taiwan, R.O.C.

T：+886 (3) 578-3344
F：+886 (3) 579-2953

www.mosel.com.tw

Mosel Vitelic Inc.

IGBT Product