

General Descriptions

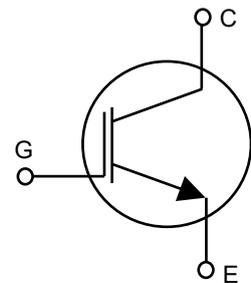
This IGBT is produced using advanced Magnachip's Field Stop Trench IGBT Technology, which provides low $V_{CE(SAT)}$, high switching performance and excellent quality.

Features

- 1200V Trench + Field stop technology
- Low switching losses
- Positive temperature coefficient
- High Input Impedance

Applications

- High power & High speed drives
- Welder
- Induction Heating



Chip Type	V_{CE}	I_C (Note 1, 2)	Die Size	Package
MBW100T120PSF	1200V	100A	9.588 X 10.490 mm ²	Sawn on foil

Mechanical Parameters

Parameter	Condition/ Material	Value	Unit
Die size	L x W	9.588 x 10.49	mm ²
Scribe lane	Width	0.1	mm ²
Emitter pad size	-	See chip drawing	mm ²
Gate pad size	L x W	1.578 x 0.84	mm ²
Thickness		133	um
Wafer size		190	mm
Net die		242	EA
Pad metal	AlSiCu	4000	nm
Backside metal	Al/NiV/Ag	1400	nm
Passivation frontside		Polyimide	
Die bond		Conductive epoxy glue and soft solder	
Wire bond		Al < 500um	
Reject die identification		Mapping or Inking	
Storage environment		Sawn on foil product is intended for immediate use and have a limited shelf life. this is based on standard condition of temperature atmosphere below 25 °C	

Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Collector-emitter voltage $T_{vj} = 25^\circ\text{C}$	V_{CE}	1200	V
Gate-emitter voltage	V_{GE}	± 20	V
DC collector current, limited by $T_{vj \max}$	I_C	(Note 2)	A
Pulsed collector current, t_p limited by $T_{vj \max}$ (Note 3)	$I_{C, \text{Pulse}}$	300	A
Operating Junction temperature	T_{vj}	-40~175	$^\circ\text{C}$

Note 1: nominal collector current at $T_C = 100^\circ\text{C}$, not subject to production test-verified by design/characterization

Note 2: depending on thermal properties of assembly

Note 3: not subject to production test - verified by design/characterization

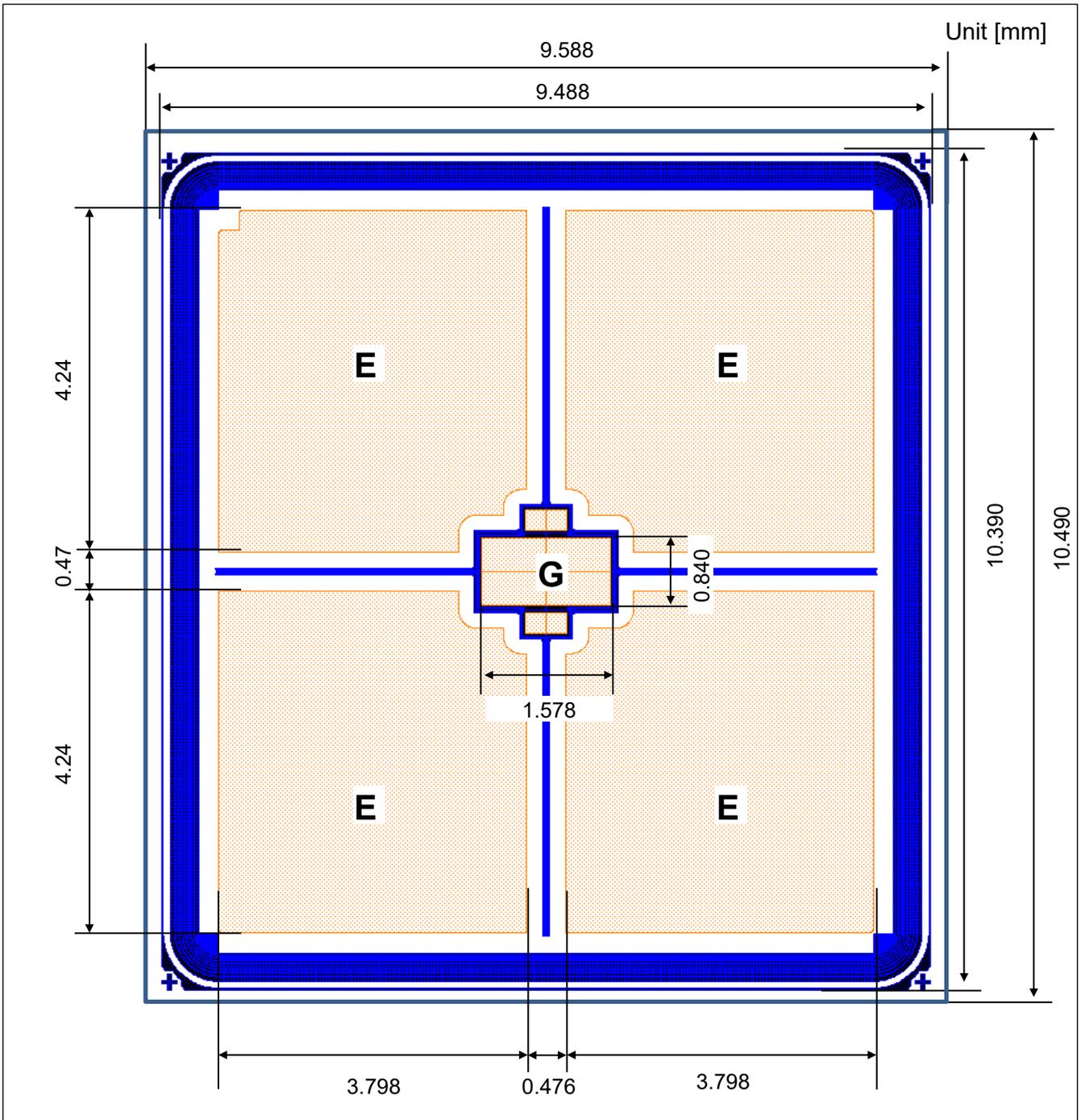
Static Characteristics ($T_{vj} = 25^\circ\text{C}$ unless otherwise specified and Tested on wafer)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit.
Collector-emitter breakdown voltage	BV_{CES}	$I_C = 5\text{mA}, V_{GE} = 0\text{V}$	1200	-	-	V
Gate-emitter threshold voltage	$V_{GE(th)}$	$I_C = 4\text{mA}, V_{CE} = V_{GE}$	4.8	-	6.8	V
Zero gate voltage collector current	I_{CES}	$V_{CE} = 1200\text{V}, V_{GE} = 0\text{V}$	-	-	10	μA
Gate-emitter leakage current, Forward	$I_{GES(F)}$	$V_{GE} = 20\text{V}, V_{CE} = 0\text{V}$	-	-	120	nA
Gate-emitter leakage current, Reverse	$I_{GES(R)}$	$V_{GE} = -20\text{V}, V_{CE} = 0\text{V}$	-	-	120	nA
Collector-emitter saturation voltage	$V_{CE(sat)}$	$V_{GE} = 15\text{V}, I_C = 100\text{A}$	-	2.1	2.5	V
Integrated gate resistor	r_G			5.0		Ω

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

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit.
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 100\text{A}, V_{GE} = 15\text{V}, T_{vj} = 150^\circ\text{C}$		2.5		V
Input capacity	C_{ies}	$f = 1\text{MHz}, T_{vj} = 25^\circ\text{C}, V_{CE} = 25\text{V}$		5700		pF
Reverse transfer capacitance	C_{res}			360		pF

Chip Outline



DISCLAIMER:

The Products are not designed for use in hostile environments, including, without limitation, aircraft, nuclear power generation, medical appliances, and devices or systems in which malfunction of any Product can reasonably be expected to result in a personal injury. Seller's customers using or selling Seller's products for use in such applications do so at their own risk and agree to fully defend and indemnify Seller.

Magnachip reserves the right to change the specifications and circuitry without notice at any time. Magnachip does not consider responsibility for use of any circuitry other than circuitry entirely included in a Magnachip product.  Magnachip is a registered trademark of Magnachip Semiconductor Ltd.