

### General Descriptions

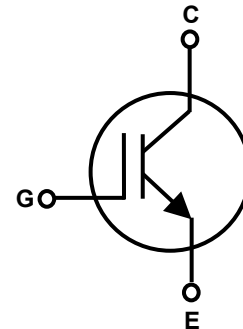
This IGBT is produced using advanced Magnachip's Field Stop Trench IGBT Technology, which provides low  $V_{CE(SAT)}$ , high switching performance and excellent quality.

### Features

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

### Applications

- Low / medium power drives



Chip Type	$V_{CE}$	$I_c$ (Note 1, 2)	Package
MBW50T120PHF	1200V	50A	Sawn on foil

### Mechanical Parameters

Parameter	Condition/ Material	Value	Unit
Die size	L x W	7.333 x 6.923	mm <sup>2</sup>
Scribe lane	Width	0.1	mm <sup>2</sup>
Emitter pad size	-	See chip drawing	mm <sup>2</sup>
Gate pad size	L x W	1.578 x 0.84	mm <sup>2</sup>
Thickness		128±5	um
Wafer size		190	mm
Net die		477	EA
Pad metal	AlSiCu	4000	nm
Backside metal	Al/Ti/Ni/Ag	1600	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	$V_{GE}$	$\pm 20$	V
DC collector current, limited by $T_{vj\text{ max}}$	$I_C$	(Note 2)	A
Pulsed collector current, $t_p$ limited by $T_{vj\text{ max}}$ (Note 3)	$I_{C, Pulse}$	150	A
Short circuit time $V_{CC} \leq 600\text{V}$ , $V_{GE} = 15\text{V}$ , $T_{vj} = 150^{\circ}\text{C}$ (Note 3)	$t_{sc}$	10	$\mu\text{s}$
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

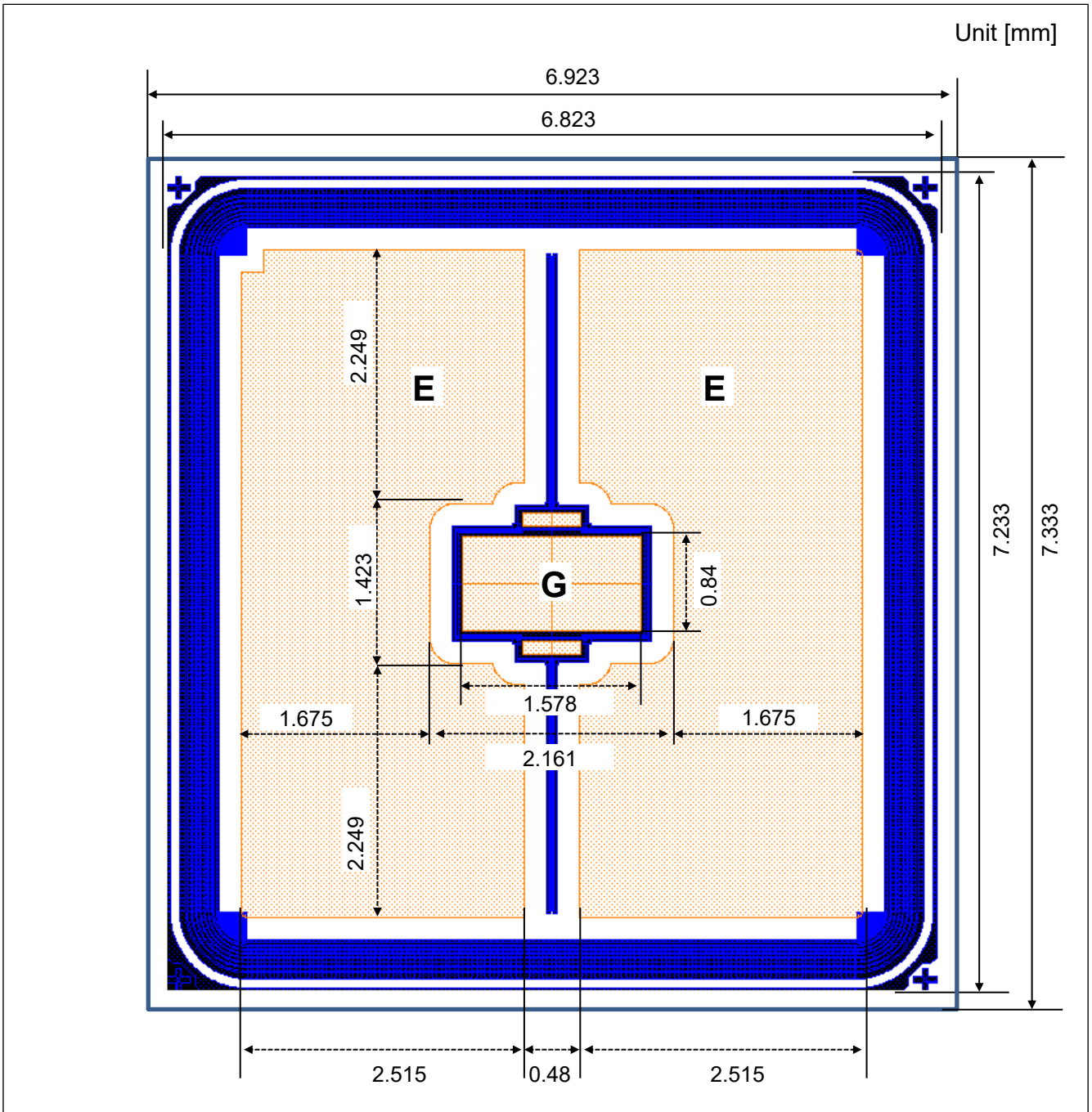
### Static Characteristics ( $T_{vj} = 25^{\circ}\text{C}$ unless otherwise specified and Tested on wafer)

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	$V_{GE(th)}$	$I_C = 1\text{mA}$ , $V_{CE} = V_{GE}$	4.8	-	6.8	V
Zero gate voltage collector current	$I_{CES}$	$V_{CE} = 1200\text{V}$ , $V_{GE} = 0\text{V}$	-	-	10	$\mu\text{A}$
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	$V_{CE(sat)}$	$V_{GE} = 15\text{V}$ , $I_C = 50\text{A}$	1.50	1.85	2.20	V
Integrated gate resistor	$r_G$			4.0		$\Omega$

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


Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit.
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 50\text{A}$ , $V_{GE} = 15\text{V}$ , $T_{vj} = 175^{\circ}\text{C}$		2.20		V
Input capacity	$C_{ies}$	$f = 1\text{MHz}$ , $T_{vj} = 25^{\circ}\text{C}$ , $V_{CE} = 25\text{V}$		3000		pF
Reverse transfer capacitance	$C_{res}$			140		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.

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