

General Descriptions

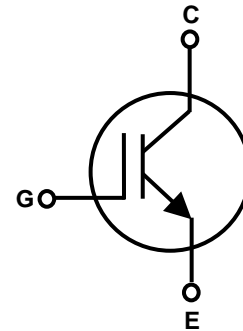
This IGBT is produced using advanced MagnaChip's Field Stop Trench IGBT Technology, which provides low $V_{CE(SAT)}$, high switching performance and excellent quality.

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)	Package
MBW50T120PHF	1200V	50A	Sawn on foil or Wafer

Mechanical Parameters

Parameter	Condition/ Material	Value	Unit
Die size	L x W	7.333 x 6.923	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		477	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 $T_{vj\text{ max}}$	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	μs
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

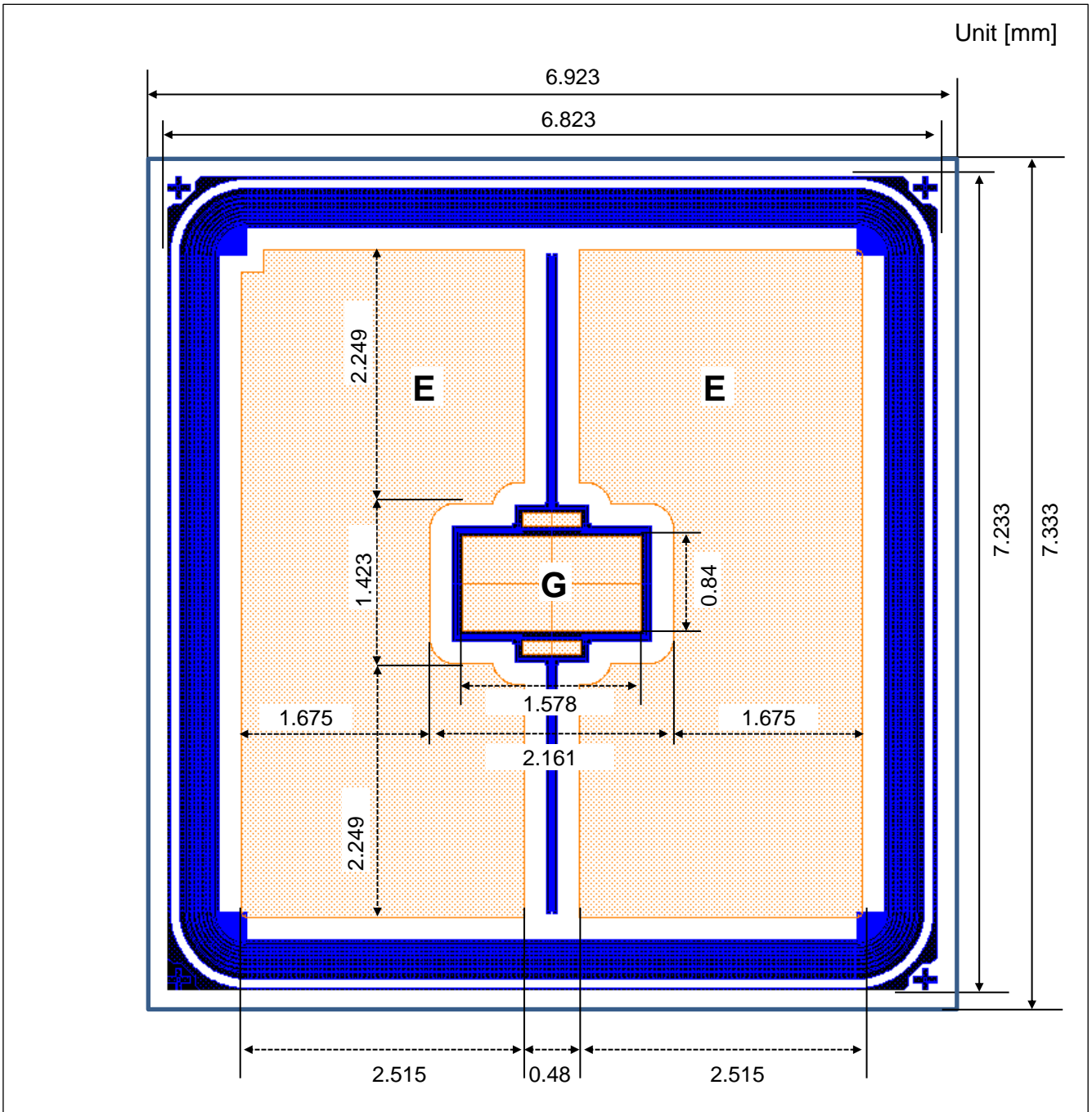
Static Characteristics ($T_{vj} = 25^{\circ}\text{C}$ unless otherwise specified and Tested on wafer)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit.
Collector-emitter breakdown voltage	BV_{CES}	$I_C = 1.7\text{mA}$, $V_{GE} = 0\text{V}$	1200	-	-	V
Gate-emitter threshold voltage	$V_{GE(th)}$	$I_C = 1.7\text{mA}$, $V_{CE} = V_{GE}$	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	$V_{CE(sat)}$	$V_{GE} = 15\text{V}$, $I_C = 50\text{A}$	1.50	1.85	2.20	V
Integrated gate resistor	r_G			4.0		Ω

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


Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit.
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 50\text{A}$, $V_{GE} = 15\text{V}$, $T_{vj} = 175^{\circ}\text{C}$		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:

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