

## Trench Field-Stop Technology IGBT

### Features

- 1200V, 25A
- Low Switching Losses
- Low  $V_{CE(sat)}$  with Positive Temperature Coefficient
- Pb-free Lead Plating; RoHS Compliant

### Applications

- Frequency Converters
- Uninterrupted Power Supply
- Air Conditioning
- Motor Drives

### Die Description

	Wafer Diameter	8 inches
	Wafer Thickness	5 mils
	Die Size(including SL)	5076*4671 $\mu\text{m}^2$
	Scribe Line Width	80 $\mu\text{m}$
	Gross Die	1116
Metalization	Frontside	AlSiCu
	Backside	Al/Ti/NiV/Ag
Metal Thickness	Frontside	4 $\mu\text{m}$
	Backside	1.1 $\mu\text{m}$
Bonding Area	Gate	1076*602 $\mu\text{m}^2$
	Emitter	3249*2365 $\mu\text{m}^2$
Recommended Wire Bonding	Gate	Al/5mils*1
	Emitter	Al/15mils*2

### Absolute Maximum Ratings<sup>1</sup> ( $T_C=25^\circ\text{C}$ , unless otherwise noted)

Symbol	Parameter	Value	Unit
$V_{CES}$	Collector-Emitter Voltage	1200	V
$V_{GES}$	Gate-Emitter Voltage	$\pm 20$	V
$I_C$	Continuous Collector Current ( $T_C=25^\circ\text{C}$ )	50	A
	Continuous Collector Current ( $T_C=100^\circ\text{C}$ )	25	A
$I_{CM}$	Pulsed Collector Current <sup>2</sup>	100	A
$t_{sc}$	Short Circuit Withstand Time	10	us
$T_J$	Operating Junction Temperature Range	-40 to 175	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ\text{C}$

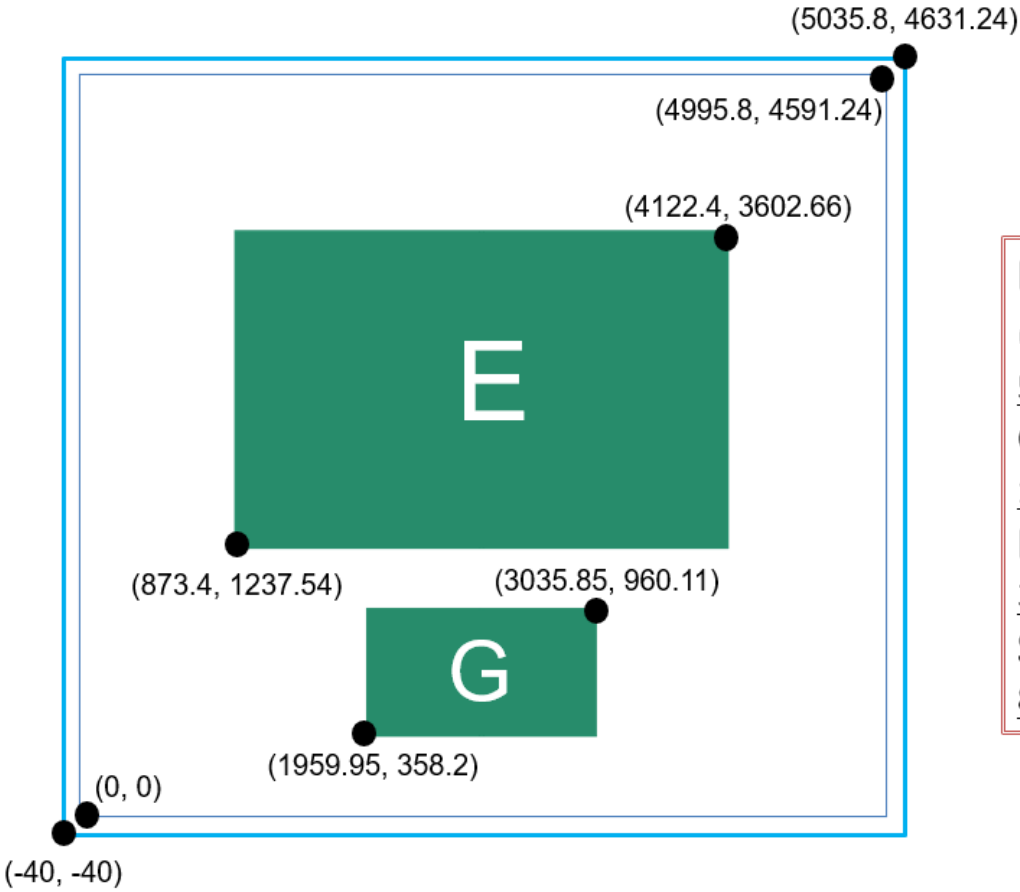
## Electrical Characteristic<sup>1</sup> ( $T_C=25^\circ\text{C}$ , unless otherwise noted)

Symbol	Parameter	Conditions	Values			Unit
			Min.	Typ.	Max.	
$B_{V_{CES}}$	Collector-Emitter Breakdown Voltage	$V_{GE}=0V, I_C=500\mu A$	1200	---	---	V
$I_{CES}$	Collector-Emitter Leakage Current	$V_{CE}=1200V, V_{GE}=0V$	---	---	1	mA
$I_{GES}$	Gate Leakage Current, Forward	$V_{GE}=20V, V_{CE}=0V$	---	---	400	nA
	Gate Leakage Current, Reverse	$V_{GE}=-20V, V_{CE}=0V$	---	---	400	nA
$V_{GE(th)}$	Gate Threshold Voltage	$V_{GE}=V_{CE}, I_C=480\mu A$	5.2	5.8	6.4	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$V_{GE}=15V, I_C=25A$	---	2.00	2.25	V
$Q_G$	Total Gate Charge	$V_{CC}=960V$ $V_{GE}=15V$ $I_C=25A$	---	117	---	nC
$Q_{GE}$	Gate-Emitter Charge		---	16	---	nC
$Q_{GC}$	Gate-Collector Charge		---	90	---	nC
$t_{d(on)}$	Turn-on Delay Time	$V_{CC}=600V$ $V_{GE}=\pm 15V$ $I_C=25A$ $R_G=20\Omega$ Inductive Load $T_C=25^\circ\text{C}$	---	34	---	ns
$t_r$	Turn-on Rise Time		---	42	---	ns
$t_{d(off)}$	Turn-off Delay Time		---	229	---	ns
$t_f$	Turn-off Fall Time		---	242	---	ns
$E_{on}$	Turn-on Switching Loss		---	3.00	---	mJ
$E_{off}$	Turn-off Switching Loss		---	1.99	---	mJ
$E_{ts}$	Total Switching Loss		---	4.99	---	mJ
$C_{ies}$	Input Capacitance	$V_{CE}=25V$ $V_{GE}=0V$ $f=1\text{MHz}$	---	1468	---	pF
$C_{oes}$	Output Capacitance		---	162	---	pF
$C_{res}$	Reverse Transfer Capacitance		---	82	---	pF

Note 1 : Tested on package TO-247

2 : Repetitive Rating, Pulse width limited by maximum junction temperature

## Chip Outline & Information:



<b>Die Size:</b> (including SL) <u>5076 * 4671 <math>\mu\text{m}^2</math></u>
<b>Gate Pad Size:</b> <u>1076 * 602 <math>\mu\text{m}^2</math></u>
<b>Emitter Pad Size:</b> <u>3249 * 2365 <math>\mu\text{m}^2</math></u>
<b>Scribe Line:</b> <u>80 <math>\mu\text{m}</math></u>

## Revision History

Ver.	Date	Change Notice
1.0	2020/11/10	Released