

## AK Trench-FS IGBT

### Features

- Trench FS technology
- Low  $V_{CE(sat)}$
- Low EMI

### Application

- Converters
- Power drivers

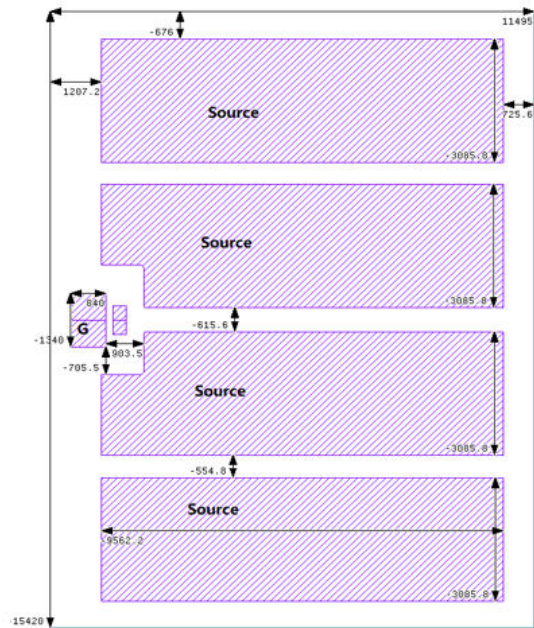
|  |  |
|--|--|
| Wafer Size (inch)                        | 8  |
| Chip Size with scribe (mm <sup>2</sup> ) | 11.575 x 15.5  |
| Wafer Thickness (um)                     | 120±10   |
| Gate PAD Size (mm <sup>2</sup> )         | 0.84 x 1.34  |
| Emitter PAD Size (mm <sup>2</sup> )      | 3.085 x 9.562  |
| Top Metal                                | AlCu   |
| Top Metal Thickness (µm)                 | 5  |
| Back Metal                               | Al/Ti/Ni/Ag  |
| Scribe Line (µm)                         | 80   |
| Passivation                              | Polyimide  |
| Gross Die                                | 144  |
| Recommended Storage Environment          | Store in original container, in dry nitrogen, <3months at an ambient temperature of 23±3°C |

### 1200V200A Trench FS IGBT

| Parameter   | Value | Unit |
|---|-------|------|
| $V_{CE}$  | 1200  | V    |
| $I_c$   | 200   | A    |
| $V_{CE(sat)}$ at $I_c=200A$<br>(Wafer level test) | 2.1   | V    |

Unit: um

Die Size Without 80um scribe line



## Maximum Ratings (T<sub>j</sub>=25°C, unless otherwise specified)

| Parameter   | Symbol            | Value    | Unit |
|---|-------------------|----------|------|
| Collector-emitter voltage   | V <sub>CE</sub>   | 1200     | V    |
| Gate-emitter voltage  | V <sub>GE</sub>   | +/-20    | V    |
| DC collector current  | I <sub>C</sub>    | 400      | A    |
| T <sub>j</sub> =25°C  |                   | 200      |      |
| T <sub>j</sub> =100°C   | I <sub>CM</sub>   | 600      | A    |
| Pulsed collector current  | t <sub>SC</sub>   | 20       | us   |
| Short circuit withstand time<br>(V <sub>GE</sub> =15V, V <sub>CC</sub> =600V) | T <sub>vj</sub>   | -40~+175 | °C   |
| Junction temperature range  | T <sub>vjop</sub> | -40~+150 | °C   |
| Operating junction temperature  |                   |          |      |

## Electrical Characteristics at T<sub>j</sub>=25°C (unless otherwise specified)

| Parameter                                    | Symbol               | Conditions  | Value |      |      | Unit |
|--|----------------------|---|-------|------|------|------|
|  |                      |   | Min.  | Typ. | Max. |      |
| <b>Static Characteristic (Test on wafer)</b> |                      |   |       |      |      |      |
| Collector-emitter breakdown voltage          | V <sub>(BR)CES</sub> | V <sub>GE</sub> =0V, I <sub>C</sub> =1mA                            | 1200  | -    | -    | V    |
| Gate-emitter threshold voltage               | V <sub>GE(th)</sub>  | I <sub>C</sub> =7.5mA, V <sub>CE</sub> =V <sub>GE</sub>             | 5     | 5.8  | 6.6  | V    |
| Collector-emitter saturation voltage         | V <sub>CE(sat)</sub> | V <sub>GE</sub> =15V, I <sub>C</sub> =200A                          | -     | 2.1  | 2.45 | V    |
| Gate leakage current                         | I <sub>GES</sub>     | V <sub>CE</sub> =0V, V <sub>GE</sub> =+/-20V                        | -     | -    | 500  | nA   |
| Collector leakage current                    | I <sub>CES</sub>     | V <sub>CE</sub> =1200V, V <sub>GE</sub> =0V                         | -     | -    | 250  | uA   |
| <b>Dynamic Characteristic <sup>(a)</sup></b> |                      |   |       |      |      |      |
| Input capacitance                            | C <sub>ies</sub>     | V <sub>GE</sub> =0V, V <sub>CE</sub> =25V<br>f=1MHz                 | -     | 14.5 | -    | nF   |
| Output capacitance                           | C <sub>oes</sub>     |   | -     | 490  | -    | pF   |
| Reverse transfer capacitance                 | C <sub>res</sub>     |   | -     | 420  | -    | pF   |
| Gate charge                                  | Q <sub>g</sub>       | V <sub>CC</sub> =960V, I <sub>C</sub> =200A<br>V <sub>GE</sub> =15V | -     | 4.5  | -    | uC   |

(a) Dynamic and switching test data depending on TO264 package, not subject to production test