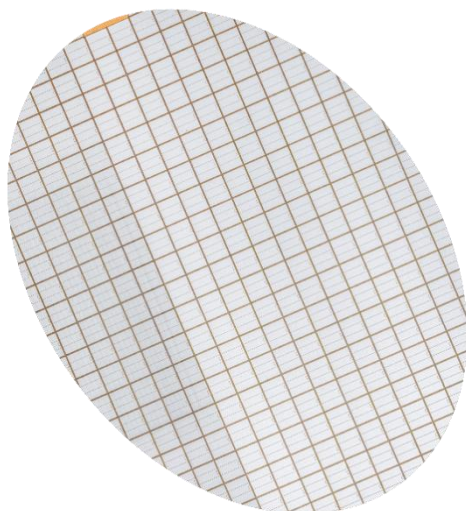


## SIS0200C120i25

i25 LCT IGBT, 11.0 mm x 9.7 mm

精细沟槽栅 i25 IGBT 芯片, 11.0 mm x 9.7 mm

 $V_{CE} = 1200\text{ V}$  $I_C = 200\text{ A}$ 

- i25 ultra-low-loss micro pattern Trench IGBT  
i25 超低损耗精细沟槽栅型 IGBT 芯片组
- Soft switching for a broad application range due to best turn-off controllability
- positive temperature coefficient  
正温度系数
- easy paralleling  
易并联

Maximum ratings<sup>1</sup> 最大额定值

| PARAMETER<br>参数                        | SYMBOL<br>符号 | CONDITIONS<br>工作条件                                                                       | MIN<br>最小值 | MAX<br>最大值 | UNIT<br>单位 |
|----------------------------------------|--------------|------------------------------------------------------------------------------------------|------------|------------|------------|
| Collector-emitter voltage<br>集电极-发射极电压 | $V_{CES}$    | $V_{GE} = 0\text{ V}$ , $T_{vj} \geq 25\text{ °C}$                                       |            | 1200       | V          |
| DC collector current<br>集电极直流电流        | $I_C$        |                                                                                          |            | 200        | A          |
| Peak collector current<br>集电极峰值电流      | $I_{CM}$     | $t_p$ limited by $T_{vj\text{ max}}$<br>脉冲宽度依据 $T_{vj\text{ max}}$ 设定                    |            | 400        | A          |
| Gate-emitter voltage<br>栅极-发射极驱动电压     | $V_{GES}$    |                                                                                          | -20        | 20         | V          |
| Junction temperature<br>结温             | $T_{vj}$     |                                                                                          | -40        | 175        | °C         |
| Junction operating temperature<br>运行结温 | $T_{vj(op)}$ |                                                                                          | -40        | 175        | °C         |
| Short circuit <sup>2</sup><br>短路       | $t_{sc}$     | $V_{GE} = 15\text{ V}$ , $V_{CC} = 800\text{ V}$ , $T_{vj} = 175\text{ °C}$ <sup>3</sup> |            | 3          | μs         |

<sup>1</sup> Maximum rated values indicate limits beyond which damage to the device may occur per IEC 60747<sup>1</sup> 根据标准 IEC 60747 要求, 最大额定值表示超过该限值可能会对器件造成损坏<sup>2</sup> Not subject to production test, capability depending on module design<sup>2</sup> 不从属于生产测试, 性能取决于模块设计<sup>3</sup> Short circuit performance at high temperature requires suitable die assembly process<sup>3</sup> 高温下的短路性能测试, 需要合适的芯片封装工艺。

## IGBT<sup>4</sup>

| PARAMETER<br>参数                                                     | SYMBOL<br>符号  | CONDITIONS<br>条件                                                                                                                                                | MIN<br>最小                | TYP<br>典型 | MAX<br>最大 | UNIT<br>单位    |
|---------------------------------------------------------------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-----------|-----------|---------------|
| Collector(-emitter)<br>breakdown voltage<br>集电极-发射极击穿电压             | $V_{(BR)CES}$ | $V_{GE} = 0\text{ V}$ , $I_C = 0.13\text{ mA}$ , $T_{vj} = 25\text{ °C}$                                                                                        | 1200                     |           |           | V             |
| Collector-emitter<br>saturation voltage <sup>5</sup><br>集电极-发射极饱和电压 | $V_{CESat}$   | $I_C = 200\text{ A}$ , $V_{GE} = 15\text{ V}$                                                                                                                   | $T_{vj} = 25\text{ °C}$  | 1.60      |           | V             |
|                                                                     |               |                                                                                                                                                                 | $T_{vj} = 125\text{ °C}$ | 1.85      |           | V             |
|                                                                     |               |                                                                                                                                                                 | $T_{vj} = 175\text{ °C}$ | 1.95      |           | V             |
| Collector cut-off current<br>集电极截止电流                                | $I_{CES}$     | $V_{CE} = 1200\text{ V}$ , $V_{GE} = 0\text{ V}$                                                                                                                | $T_{vj} = 25\text{ °C}$  |           | 1         | $\mu\text{A}$ |
| Gate leakage current 栅极漏电流                                          | $I_{GES}$     | $V_{CE} = 0\text{ V}$ , $V_{GE} = \pm 20\text{ V}$                                                                                                              | -0.5                     |           | 0.5       | $\mu\text{A}$ |
| Gate-emitter threshold voltage<br>栅极-发射极阈值电压                        | $V_{GE(th)}$  | $I_C = 7\text{ mA}$ , $V_{CE} = V_{GE}$ , $T_{vj} = 25\text{ °C}$                                                                                               |                          | 5.8       |           | V             |
| Gate charge 栅极电荷                                                    | $Q_G$         | $I_C = 200\text{ A}$ , $V_{CE} = 600\text{ V}$ , $V_{GE} = -15\text{ V} \dots 15\text{ V}$                                                                      |                          | tbd       |           | $\mu\text{C}$ |
| Input capacitance 输入电容                                              | $C_{ies}$     | $V_{CE} = 25\text{ V}$ , $V_{GE} = 0\text{ V}$ , $f = 1\text{ MHz}$ , $T_{vj} = 25\text{ °C}$                                                                   |                          | tbd       |           | nF            |
| Output capacitance 输出电容                                             | $C_{oes}$     |                                                                                                                                                                 |                          | tbd       |           | nF            |
| Reverse transfer capacitance<br>反向传输电容                              | $C_{res}$     |                                                                                                                                                                 |                          | tbd       |           | nF            |
| Internal gate resistor 栅极内阻                                         | $R_{Gint}$    | Per switch 每个芯片                                                                                                                                                 |                          | tbd       |           | $\Omega$      |
| Turn-on delay time<br>开通延迟                                          | $t_{d(on)}$   | $V_{CC} = 600\text{ V}$ , $I_C = 200\text{ A}$ ,<br>$R_G = 4.0\text{ }\Omega$ , $V_{GE} = \pm 15\text{ V}$                                                      | $T_{vj} = 25\text{ °C}$  | 203       |           | ns            |
|                                                                     |               |                                                                                                                                                                 | $T_{vj} = 125\text{ °C}$ | 224       |           | ns            |
|                                                                     |               |                                                                                                                                                                 | $T_{vj} = 175\text{ °C}$ | 233       |           | ns            |
| Rise time<br>上升时间                                                   | $t_r$         |                                                                                                                                                                 | $T_{vj} = 25\text{ °C}$  | 76        |           | ns            |
|                                                                     |               |                                                                                                                                                                 | $T_{vj} = 125\text{ °C}$ | 81        |           | ns            |
|                                                                     |               |                                                                                                                                                                 | $T_{vj} = 175\text{ °C}$ | 85        |           | ns            |
| Turn-off delay time<br>关断延迟                                         | $t_{d(off)}$  | $V_{CC} = 600\text{ V}$ , $I_C = 200\text{ A}$ ,<br>$R_G = 2.0\text{ }\Omega$ , $V_{GE} = \pm 15\text{ V}$                                                      | $T_{vj} = 25\text{ °C}$  | 172       |           | ns            |
|                                                                     |               |                                                                                                                                                                 | $T_{vj} = 125\text{ °C}$ | 240       |           | ns            |
|                                                                     |               |                                                                                                                                                                 | $T_{vj} = 175\text{ °C}$ | 260       |           | ns            |
| Fall time<br>下降时间                                                   | $t_f$         |                                                                                                                                                                 | $T_{vj} = 25\text{ °C}$  | 318       |           | ns            |
|                                                                     |               |                                                                                                                                                                 | $T_{vj} = 125\text{ °C}$ | 367       |           | ns            |
|                                                                     |               |                                                                                                                                                                 | $T_{vj} = 175\text{ °C}$ | 410       |           | ns            |
| Turn-on switching energy<br>开通损耗                                    | $E_{on}$      | $V_{CC} = 600\text{ V}$ , $I_C = 200\text{ A}$ ,<br>$R_G = 4.0\text{ }\Omega$ , $V_{GE} = \pm 15\text{ V}$<br>Diode: SID0150C120d23                             | $T_{vj} = 25\text{ °C}$  | 12.5      |           | mJ            |
|                                                                     |               |                                                                                                                                                                 | $T_{vj} = 125\text{ °C}$ | 16.6      |           | mJ            |
|                                                                     |               |                                                                                                                                                                 | $T_{vj} = 175\text{ °C}$ | 18.8      |           | mJ            |
| Turn-off switching energy<br>关断损耗                                   | $E_{off}$     | $V_{CC} = 600\text{ V}$ , $I_C = 200\text{ A}$ ,<br>$R_G = 2.0\text{ }\Omega$ , $V_{GE} = \pm 15\text{ V}$                                                      | $T_{vj} = 25\text{ °C}$  | 18.8      |           | mJ            |
|                                                                     |               |                                                                                                                                                                 | $T_{vj} = 125\text{ °C}$ | 23.7      |           | mJ            |
|                                                                     |               |                                                                                                                                                                 | $T_{vj} = 175\text{ °C}$ | 26.0      |           | mJ            |
| Short circuit current<br>短路电流                                       | $I_{SC}$      | $t_{PCS} \leq 3\text{ }\mu\text{s}$ , $V_{GE} = 15\text{ V}$ , $T_{vj} = 175\text{ °C}$ ,<br>$V_{CC} = 800\text{ V}$ , $V_{CEM\text{ Chip}} \leq 1200\text{ V}$ |                          | 1436      |           | A             |

<sup>4</sup> Characteristic values according to IEC 60747-9

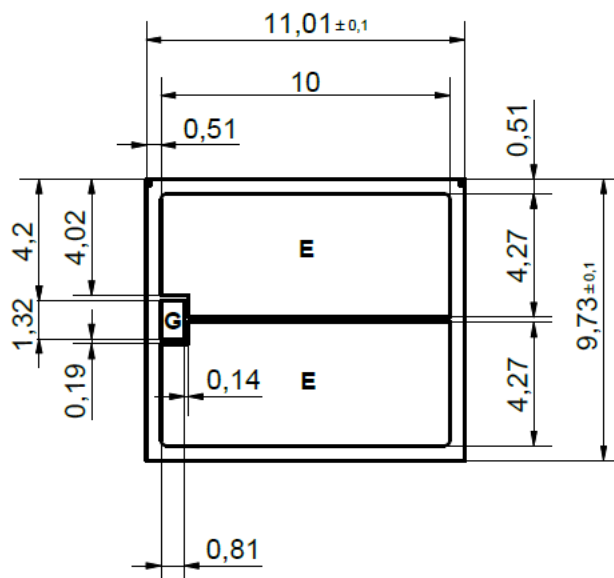
<sup>4</sup> IGBT 特征数值均参考标准 IEC 60747-9

**Mechanical properties<sup>6</sup> 机械特性**

| PARAMETER<br>参数                       |                                | UNIT<br>单位      |
|---------------------------------------|--------------------------------|-----------------|
| Die size<br>芯片面积                      | (11.01 ± 0.01) × (9.73 ± 0.01) | mm <sup>2</sup> |
| Gate pad size<br>栅极焊盘尺寸               | 1.3 × 0.8                      | mm <sup>2</sup> |
| Thickness<br>厚度                       | 125 ± 5                        | µm              |
| Wafer diameter<br>晶圆直径                | 300                            | mm              |
| Maximum chips per wafer<br>每片晶圆的最大芯片数 | 570                            | pcs             |
| Frontside passivation<br>正面钝化层        | Polyimide                      |                 |
| Frontside metal (pads)<br>正面金属 (衬垫)   | Al Cu, 5000nm                  |                 |
| Backside metal<br>背面金属                | Al Ni Ag System, 1100nm        |                 |



## Chip drawing 芯片图



This is an electrostatic sensitive device.  
此为静电敏感器件。

## Ordering Information 订购信息

| OPTION<br>选项          |                     | ARTICLE NUMBER<br>商品编号 |
|-----------------------|---------------------|------------------------|
| Packaging Method 包装方式 | Sawn on tape (_O10) | SIS0200C120i25_O10     |
|                       | Wafer unsawn (_O20) | SIS0200C120i25_O20     |
|                       | Waffle pack (_O30)  | SIS0200C120i25_O30     |