

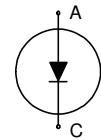
## 2<sup>nd</sup> generation thinQ!<sup>TM</sup> SiC Schottky Diode

### Features:

- Revolutionary Semiconductor Material - Silicon Carbide
- Switching Behaviour Benchmark
- No Reverse Recovery / No Forward Recovery
- Temperature Independent Switching Behaviour
- Qualified According to JEDEC<sup>1)</sup> Based on Target Applications

### Applications:

- SMPS, PFC, snubber



| Chip Type  | $V_R$ | $I_{Fn}$ | Die Size                     | Package      |
|------------|-------|----------|------------------------------|--------------|
| IDC05S60CE | 600V  | 5A       | 1.45 x 1.162 mm <sup>2</sup> | sawn on foil |

### Mechanical Parameters

|                                   |  |  |                 |
|-----------------------------------|--|--|-----------------|
| Die size                          | 1.45x 1.162  |  | mm <sup>2</sup> |
| Area total                        | 1.68   |  |                 |
| Anode pad size                    | 1.213 x 0.925                                      |  |                 |
| Thickness                         | 355  |  | µm              |
| Wafer size                        | 100  |  | mm              |
| Max. possible chips per wafer     | 4051   |  |                 |
| Passivation frontside             | Photoimide   |  |                 |
| Pad metal                         | 3200 nm AlSiCu                                     |  |                 |
| Backside metal                    | Ni Ag –system                                      |  |                 |
| Die bond                          | Electrically conductive epoxy glue and soft solder |  |                 |
| Wire bond                         | Al, ≤500µm   |  |                 |
| Reject ink dot size               | Ø 0.65mm; max 1.2mm                                |  |                 |
| Storage environment <sup>1)</sup> | for original and sealed MBB bags                   | Ambient atmosphere air, Temperature 17°C – 25°C, < 6 month   |                 |
|                                   | for open MBB bags                                  | Acc. to IEC60721-3-3: Atmosphere >99% Nitrogen or inert gas, Humidity <25%RH, Temperature 17°C – 25°C, < 6 month |                 |

<sup>1)</sup> Designed for storage conditions according to Infineon TR14 (Application Note "Storage of Products Supplied by Infineon Technologies")

Designed for climate condition under operation according to IEC60721-3-3, class 3K3



# IDC05S60CE

## Maximum Ratings

| Parameter   | Symbol            | Condition  | Value      | Unit             |
|---|-------------------|--|------------|------------------|
| Repetitive peak reverse voltage   | $V_{RRM}$         | $T_{vj} = 25\text{ °C}$                                | 600        | V                |
| DC blocking voltage   | $V_{DC}$          |  | 600        |                  |
| Continuous forward current, limited by $T_{vjmax}$                      | $I_F$             | $T_{vj} < 150\text{ °C}$                               | 5          | A                |
| Surge non repetitive forward current, sine halfwave                     | $I_{F,SM}$        | $T_C = 25\text{ °C}, t_p = 10\text{ ms}$               | 42         |                  |
|   |                   | $T_C = 150\text{ °C}, t_p = 10\text{ ms}$              |            |                  |
| Repetitive peak forward current, limited by thermal resistance $R_{th}$ | $I_{F,RM}$        | $T_C = 100\text{ °C}, T_{vj} = 150\text{ °C}, D = 0.1$ | 21         |                  |
| Non-repetitive peak forward current                                     | $I_{F,max}$       | $T_C = 25\text{ °C}, t_p = 10\text{ }\mu\text{s}$      | 180        |                  |
| $i^2t$ value  | $\int i^2 dt$     | $T_C = 25\text{ °C}, t_p = 10\text{ ms}$               | 9          | A <sup>2</sup> s |
|   |                   | $T_C = 150\text{ °C}, t_p = 10\text{ ms}$              |            |                  |
| Operating junction and storage temperature range                        | $T_{vj}, T_{stg}$ |  | -55...+175 | °C               |

## Static Characteristics (tested on wafer), $T_{vj} = 25\text{ °C}$

| Parameter             | Symbol | Conditions           | Value |      |      | Unit          |
|-----------------------|--------|----------------------|-------|------|------|---------------|
|                       |        |                      | min.  | Typ. | max. |               |
| Reverse current       | $I_R$  | $V_R = 600\text{ V}$ |       | 0.6  | 70   | $\mu\text{A}$ |
| Diode forward voltage | $V_F$  | $I_F = 5\text{ A}$   |       | 1.5  | 1.7  | V             |

## Static Characteristics (not subject to production test - verified by design / characterization)

| Parameter             | Symbol | Conditions                                   | Value |      |      | Unit          |
|-----------------------|--------|--|-------|------|------|---------------|
|                       |        |  | min.  | Typ. | max. |               |
| Reverse current       | $I_R$  | $V_R = 600\text{ V}, T_{vj} = 150\text{ °C}$ |       | 2.5  | 700  | $\mu\text{A}$ |
| Diode forward voltage | $V_F$  | $I_F = 5\text{ A}, T_{vj} = 150\text{ °C}$   |       | 1.7  | 2.1  | V             |



# IDC05S60CE

**Dynamic Characteristics** (not subject to production test - verified by design / characterization)

| Parameter                             | Symbol | Conditions   |                        | Value |      |      | Unit |
|---------------------------------------|--------|--|------------------------|-------|------|------|------|
|                                       |        |  |                        | min.  | Typ. | max. |      |
| Total capacitive charge <sup>3)</sup> | $Q_C$  | $I_F \leq I_{F,max}$<br>$di/dt = 200 A/\mu s$<br>$V_R = 400 V$ | $T_{vj} = 150^\circ C$ |       | 12   |      | nC   |
| Switching time <sup>2)</sup>          | $t_c$  |  | $T_{vj} = 150^\circ C$ |       |      | <10  | ns   |
| Total capacitance                     | $C$    | $f = 1 MHz$  | $V_R = 1 V$            |       | 240  |      | pF   |
|                                       |        |  | $V_R = 300 V$          |       | 30   |      |      |
|                                       |        |  | $V_R = 600 V$          |       | 30   |      |      |

<sup>1)</sup> J-STD20 and JESD22

<sup>2)</sup>  $t_c$  is the time constant for the capacitive displacement current waveform (independent from  $T_{vj} = 150^\circ C$ ,  $I_{LOAD}$  and  $di/dt$ ), different from  $t_{rr}$ , which is dependent on  $T_{vj} = 150^\circ C$ ,  $I_{LOAD}$ ,  $di/dt$ . No reverse recovery time constant  $t_{rr}$  due to absence of minority carrier inject.

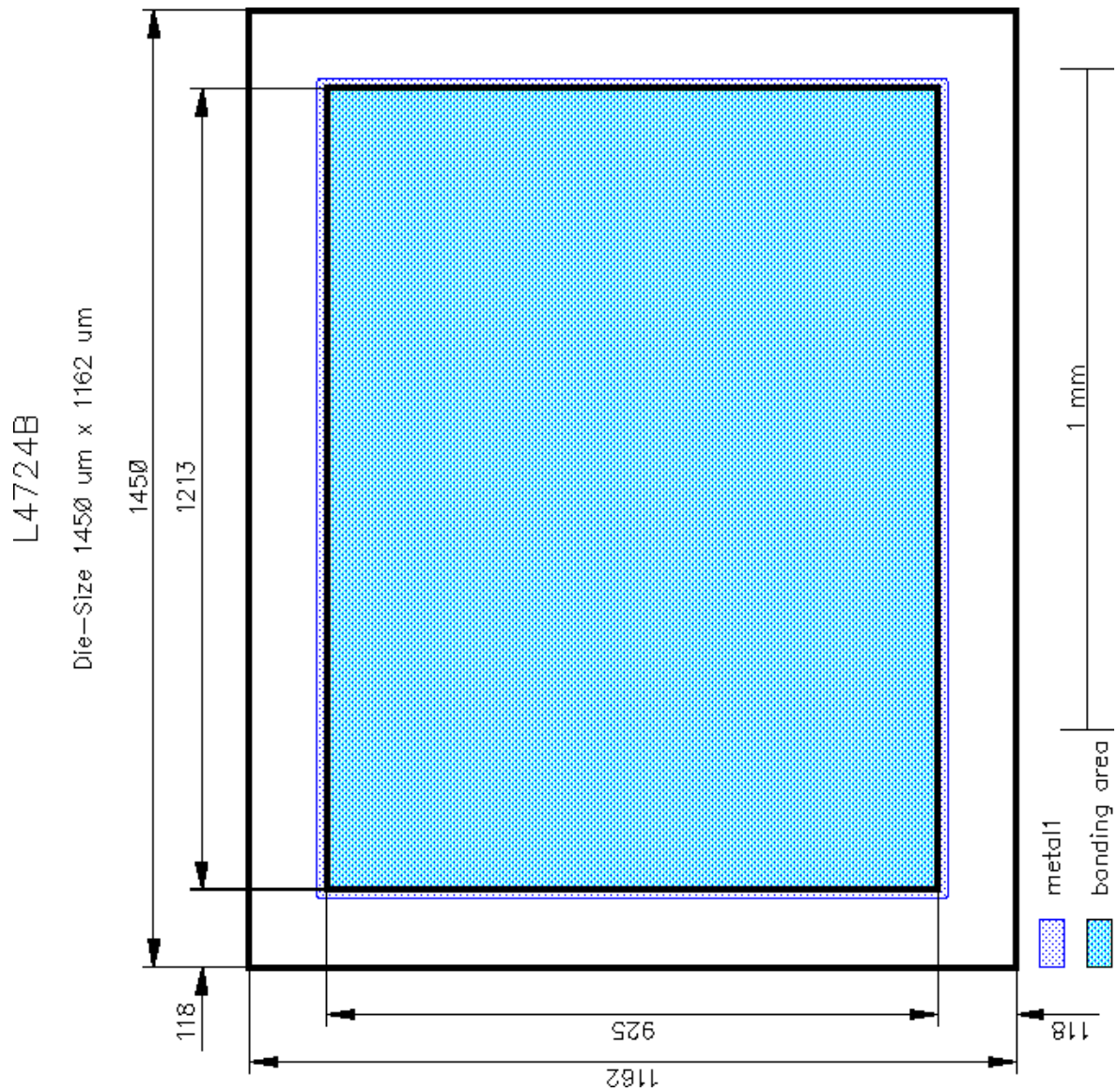
<sup>3)</sup> Only capacitive charge occurring, guaranteed by design (independent from  $T_{vj}$ ,  $I_{LOAD}$  and  $di/dt$ ).

## Further Electrical Characteristics

Switching characteristics and thermal properties are depending strongly on module design and mounting technology and can therefore not be specified for a bare die.

|  |           |          |
|--|-----------|----------|
| This chip data sheet refers to the device data sheet | IDT05S60C | Rev. 2.1 |
|--|-----------|----------|

## Chip Drawing



A: Anode pad



# IDC05S60CE

## Description

AQL 0,65 for visual inspection according to failure catalogue

Electrostatic Discharge Sensitive Device according to MIL-STD 883

## Revision History

| Version | Subjects (major changes since last revision) | Date |
|---------|--|------|
|         |  |      |
|         |  |      |

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