



# IDC04S60CE

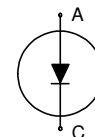
## 2<sup>nd</sup> generation thinQ!<sup>TM</sup> SiC Schottky Diode

### 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
IDC04S60CE	600V	4A	1.146 x 0.968 mm <sup>2</sup>	sawn on foil

### Mechanical Parameters

Die size	1.146x 0.968		mm <sup>2</sup>
Area total	1.11		
Anode pad size	0.909 x 0.731		
Thickness	355		µm
Wafer size	100		mm
Max. possible chips per wafer	6190		
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



# IDC04S60CE

## 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 $T_{vjmax}$	$I_F$	$T_{vj} < 150\text{ °C}$	4	A
Surge non repetitive forward current, sine halfwave	$I_{F,SM}$	$T_C = 25\text{ °C}, t_p = 10\text{ ms}$	32	
		$T_C = 150\text{ °C}, t_p = 10\text{ ms}$		
Repetitive peak forward current, limited by thermal resistance $R_{th}$	$I_{F,RM}$	$T_C = 100\text{ °C}, T_{vj} = 150\text{ °C}, D = 0.1$	18	
Non-repetitive peak forward current	$I_{F,max}$	$T_C = 25\text{ °C}, t_p = 10\text{ }\mu\text{s}$	132	
$i^2t$ value	$\int i^2 dt$	$T_C = 25\text{ °C}, t_p = 10\text{ ms}$	5.1	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	$I_R$	$V_R = 600\text{ V}$		0.5	50	$\mu\text{A}$
Diode forward voltage	$V_F$	$I_F = 4\text{ A}$		1.7	1.9	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	500	$\mu\text{A}$
Diode forward voltage	$V_F$	$I_F = 4\text{ A}, T_{vj} = 150\text{ °C}$		2	2.4	V



# IDC04S60CE

## 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>	$Q_C$	$I_F \leq I_{F,max}$ $di/dt = 200 A/\mu s$ $V_R = 400 V$	$T_{vj} = 150^\circ C$		8		nC
Switching time <sup>2)</sup>	$t_c$		$T_{vj} = 150^\circ C$			<10	ns
Total capacitance	$C$	$f = 1 MHz$	$V_R = 1 V$		130		pF
			$V_R = 300 V$		20		
			$V_R = 600 V$		20		

<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  $t_{tr}$ , 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.

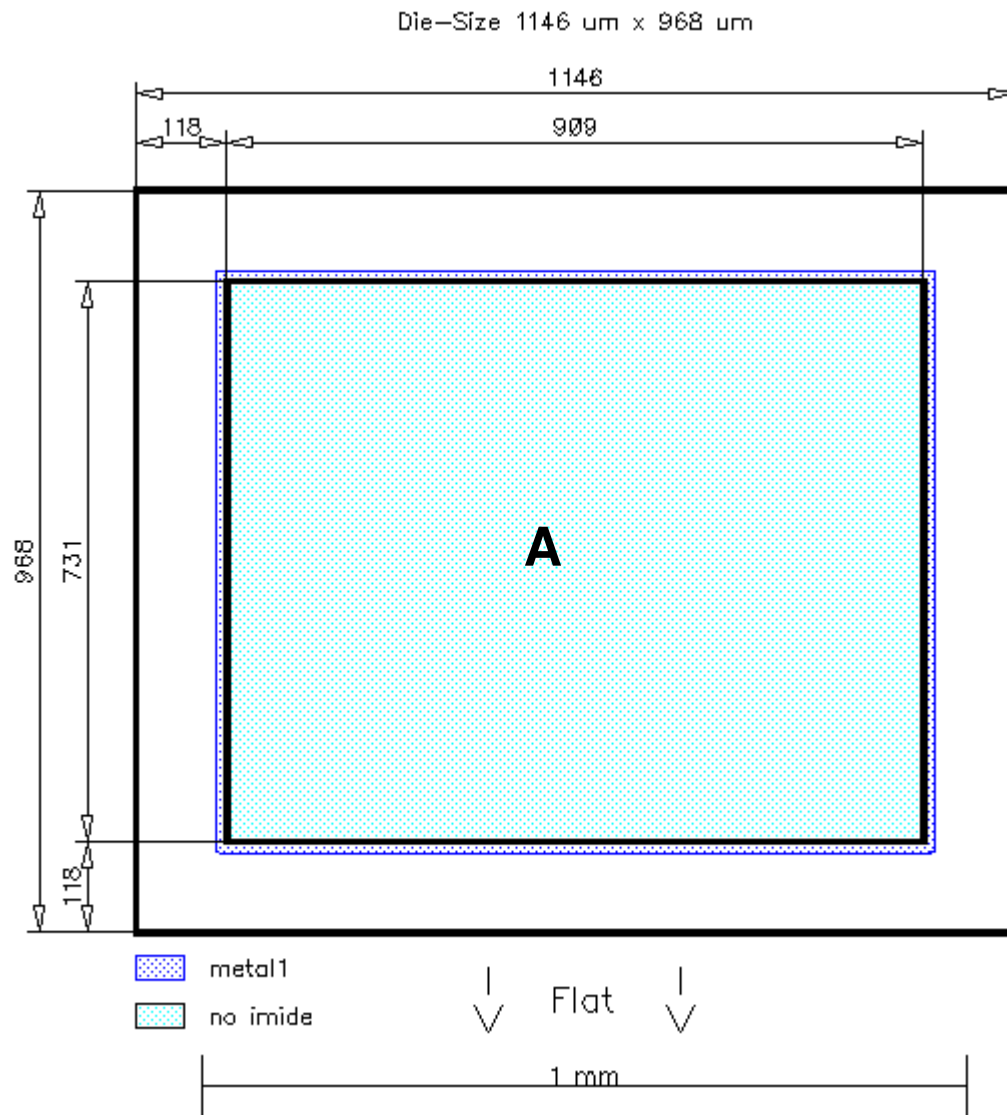
<sup>3)</sup> Only capacitive charge occurring, guaranteed by design (independent from  $T_{vj}$ ,  $I_{LOAD}$  and  $di/dt$ ).

## 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	IDT04S60C	Rev. 2.1
--	-----------	----------

## Chip Drawing



A: Anode pad



# IDC04S60CE

## 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

**Published by**  
**Infineon Technologies AG**  
**81726 Munich, Germany**  
**© 2012 Infineon Technologies AG**  
**All Rights Reserved.**

## Legal Disclaimer

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics. With respect to any examples or hints given herein, any typical values stated herein and/or any information regarding the application of the device, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation, warranties of non-infringement of intellectual property rights of any third party.

## Information

For further information on technology, delivery terms and conditions and prices, please contact the nearest Infineon Technologies Office ([www.infineon.com](http://www.infineon.com)).

## Warnings

Due to technical requirements, components may contain dangerous substances. For information on the types in question, please contact the nearest Infineon Technologies Office.  
The Infineon Technologies component described in this Data Sheet may be used in life-support devices or systems and/or automotive, aviation and aerospace applications or systems only with the express written approval of Infineon Technologies, if a failure of such components can reasonably be expected to cause the failure of that life-support, automotive, aviation and aerospace device or system or to affect the safety or effectiveness of that device or system. Life support devices or systems are intended to be implanted in the human body or to support and/or maintain and sustain and/or protect human life. If they fail, it is reasonable to assume that the health of the user or other persons may be endangered.