

SiC

Silicon Carbide Diode

thinQ!™ SiC Schottky Diode

1200V SiC Schottky Diode
IDW30S120

Final Datasheet

Rev. 2.0,<2012-03-23>

Power Management & Multimarket

thinQ!™ SiC Schottky Diode

1 Description

The 1200V family of Infineon SiC Schottky diodes has emerged over the years as the industry standard and is now being extended with the IDWxxS120 product family in the TO247 package.

The very good thermal characteristics of the TO247 in combination with the low V_f of the 1200V diodes make it particularly suitable in power applications where relatively high currents are demanded and utmost efficiency is required. With the introduction of this package, Infineon now offers a current capability of up to 30A in the 1200V range.

Features

- Revolutionary semiconductor material - Silicon Carbide
- Benchmark switching behavior
- No reverse recovery/ No forward recovery
- Temperature independent switching behavior
- High surge current capability
- Pb-free lead plating; RoHS compliant
- Qualified according to JEDEC¹⁾ for target applications
- Optimized for high temperature operation

Benefits

- System efficiency improvement over Si diodes
- System cost / size savings due to reduced cooling requirements
- Enabling higher frequency / increased power density solutions
- Higher system reliability due to lower operating temperatures
- Reduced EMI

Applications

- SMPS e.g.; CCM PFC
- Solar applications; UPS; Motor Drives

Table 1 Key Performance Parameters

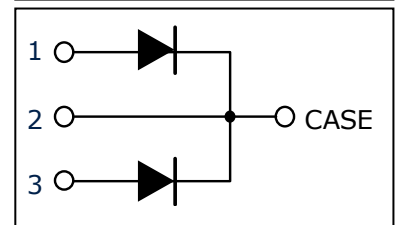
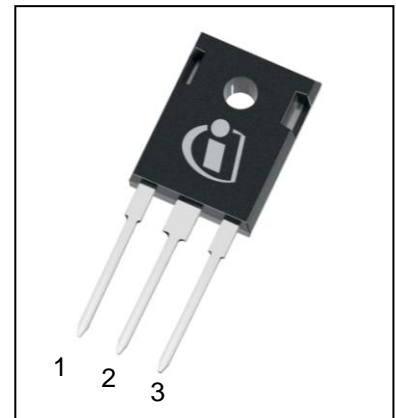
Parameter	Value (leg/device)	Unit
V_{DC}	1200	V
$Q_C @ V_R=400V$	55/110	nC
$I_F @ T_c < 135^\circ C$	15/30	A

Table 2 Pin Definition

Pin 1	Pin 2	Pin 3
A	C	A

Type / ordering Code	Package	Marking	Related links
IDW30S120	PG-TO247-3	D30S120	www.infineon.com/sic

IDW30S120



1) J-STD20 and JEDEC22

Table of Contents

1	Description.....	2
2	Maximum ratings.....	4
3	Thermal characteristics.....	4
4	Electrical characteristics.....	5
5	Electrical characteristics diagrams.....	6
6	Package outlines.....	9
7	Revision History.....	10

2 Maximum ratings

Table 3 Maximum ratings

Parameter	Symbol	Values (leg/device)			Unit	Note/Test Condition
		Min.	Typ.	Max.		
Continuous forward current	I_F	–	–	15/30	A	$T_C < 135^\circ\text{C}$, $D=1$
Surge non-repetitive forward current, sine halfwave	$I_{F,SM}$	–	–	73/146		$T_C = 25^\circ\text{C}$, $t_p=10\text{ ms}$
		–	–	58/116		$T_C = 150^\circ\text{C}$, $t_p=10\text{ ms}$
Non-repetitive peak forward current	$I_{F,max}$	–	–	389/778		$T_C = 25^\circ\text{C}$, $t_p=10\text{ }\mu\text{s}$
i ² t value	$\int i^2 dt$	–	–	27/106	A ² s	$T_C = 25^\circ\text{C}$, $t_p=10\text{ ms}$
		–	–	17/68		$T_C = 150^\circ\text{C}$, $t_p=10\text{ ms}$
Repetitive peak reverse voltage	V_{RRM}	–	–	1200	V	
Diode dv/dt ruggedness	dv/dt	–	–	50	V/ns	$V_R=0..480\text{ V}$
Power dissipation	P_{tot}	–	–	150/300	W	$T_C = 25^\circ\text{C}$
Operating and storage temperature	$T_j; T_{stg}$	-55	–	175	°C	
Mounting torque		–	–	60	Ncm	M3 and M3.5 screws

3 Thermal characteristics

Table 4 Thermal characteristics TO-247-3

Parameter	Symbol	Values (leg/device)			Unit	Note/Test Condition
		Min.	Typ.	Max.		
Thermal resistance, junction-case	R_{thJC}	–	–	1.0/0.5	K/W	
Thermal resistance, junction-ambient	R_{thJA}	–	–	62		leaded
Soldering temperature, wavesoldering only allowed at leads	T_{sold}	–	–	260	°C	1.6mm (0.063 in.) from case for 10 s

4 Electrical characteristics

Table 5 Static characteristics

Parameter	Symbol	Values (leg/device)			Unit	Note/Test Condition
		Min.	Typ.	Max.		
DC blocking voltage	V_{DC}	1200	–	–	V	$I_R = 0.61 \text{ mA}, T_j = 25^\circ\text{C}$
Diode forward voltage	V_F	–	1.5	1.8		$I_F = 30 \text{ A}, T_j = 25^\circ\text{C}$
Reverse current	I_R	–	15/30	305/610	μA	$V_R = 1200 \text{ V}, T_j = 25^\circ\text{C}$
		–	30/60	1500/3000		$V_R = 1200 \text{ V}, T_j = 150^\circ\text{C}$

Table 6 AC characteristics

Parameter	Symbol	Values (leg/device)			Unit	Note/Test Condition
		Min.	Typ.	Max.		
Total capacitive charge	Q_C	–	55/110	–	nC	$V_R = 400 \text{ V}, di/dt = 200 \text{ A}/\mu\text{s}, I_F \leq I_{F,MAX}, T_j = 150^\circ\text{C}.$
			84/168			$V_R = 1000 \text{ V}, di/dt = 200 \text{ A}/\mu\text{s}, I_F \leq I_{F,MAX}, T_j = 150^\circ\text{C}.$
Total Capacitance	C	–	870/1740	–	pF	$V_R = 1 \text{ V}, f = 1 \text{ MHz}$
		–	75/150	–		$V_R = 300 \text{ V}, f = 1 \text{ MHz}$
		–	60/120	–		$V_R = 600 \text{ V}, f = 1 \text{ MHz}$

5 Electrical characteristics diagrams

Table 7

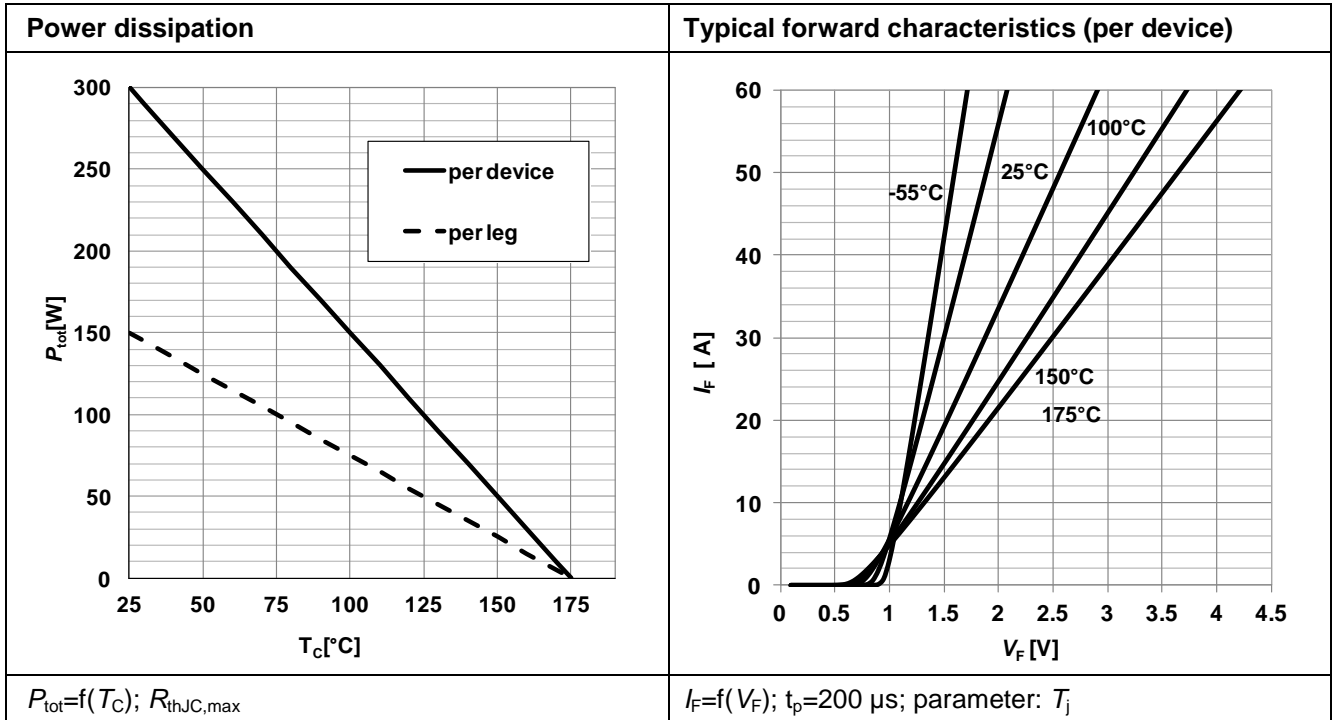


Table 8

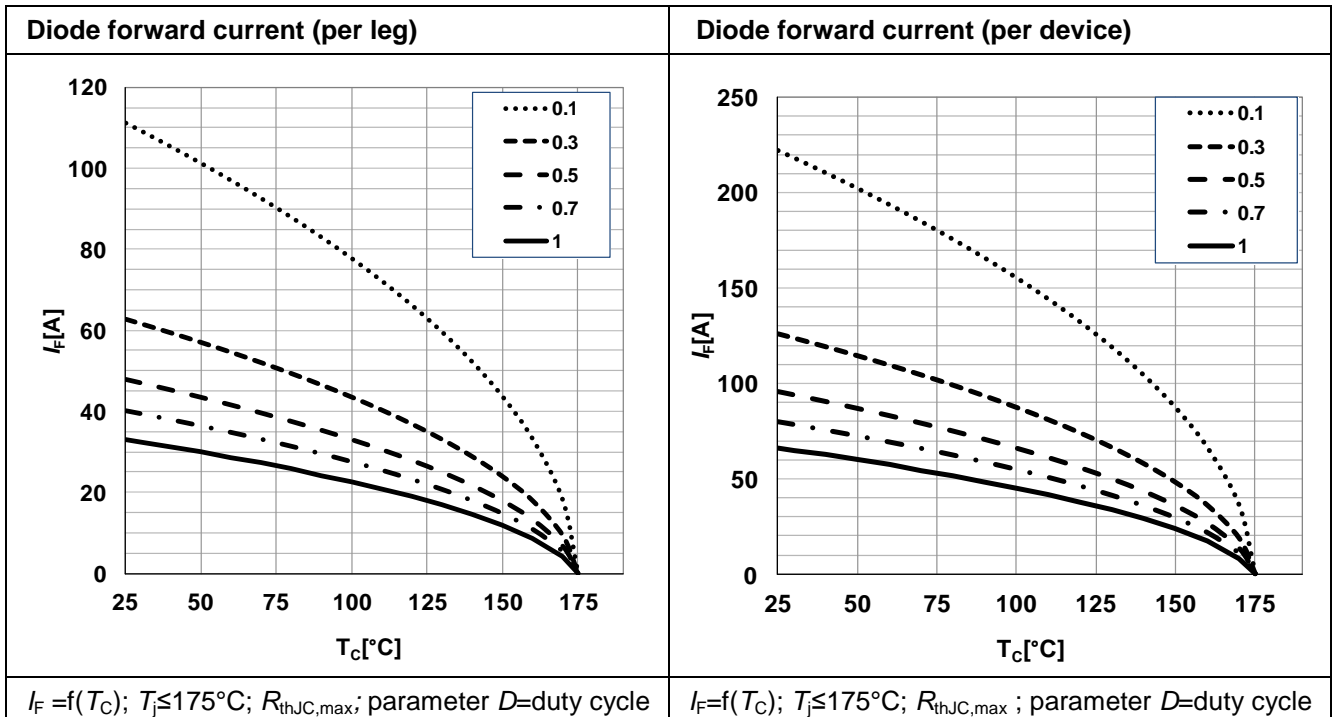


Table 9

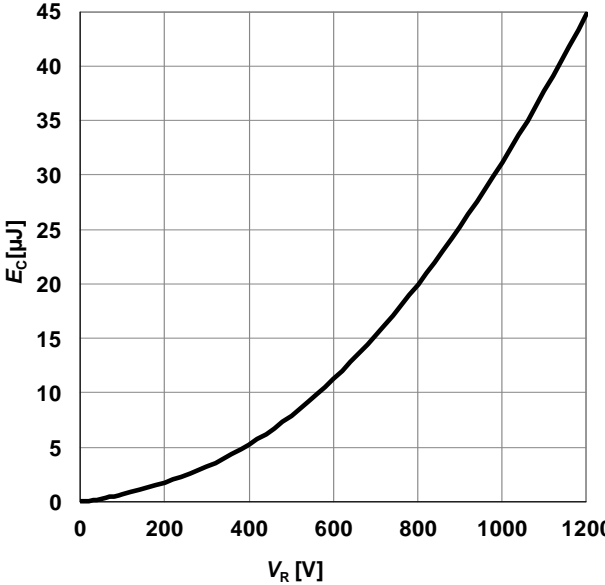
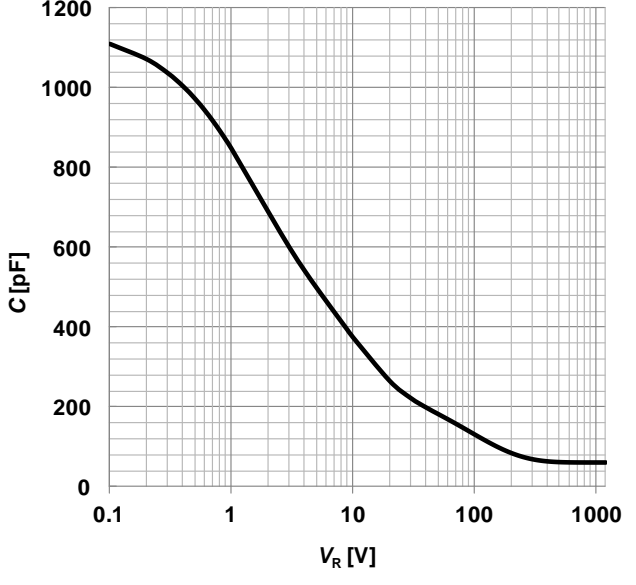
Typ. capacitance charge vs. current slope ¹⁾ (per leg)	Typ. reverse current vs. reverse voltage (per leg)
$Q_C=f(di_F/dt)$; $V_R=400V$; $T_j=150^\circ C$; $I_F \leq I_{F,max}$; per device the values double	$I_R=f(V_R)$; parameter: T_j ; per device the values double

1) Only capacitive charge, guaranteed by design.

Table 10

Max. transient thermal impedance (per leg)	Max. transient thermal impedance (per device)
$Z_{th,jc}=f(t_p)$; parameter: $D=t_p/T$	$Z_{th,jc}=f(t_p)$; parameter: $D=t_p/T$

Table 11

Typ. capacitance stored energy (per leg)	Typ. capacitance vs. reverse voltage (per leg)
	
<p>$E_C=f(V_R)$; per device the values double</p>	<p>$C=f(V_R)$; $T_j=25^\circ\text{C}$; $f=1\text{ MHz}$; per device the values double</p>

6 Package outlines

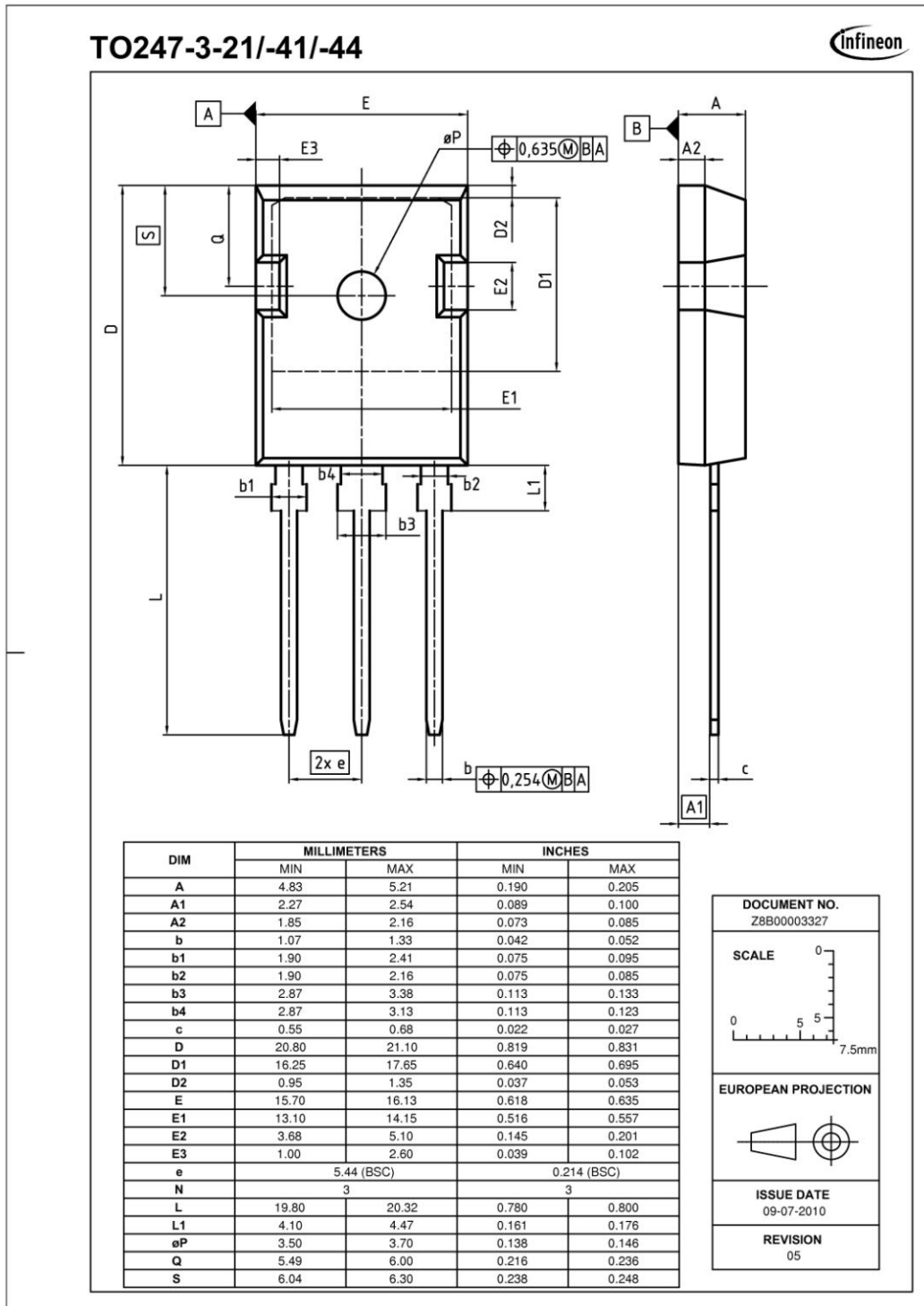


Figure 1 Outlines TO-247, dimensions in mm/inches

7 Revision History

thinQ!™ SiC Schottky Diode

Revision History: 2012-03-23, Rev. 2.0

Previous Revision:

Revision	Subjects (major changes since last version)

We Listen to Your Comments

Any information within this document that you feel is wrong, unclear or missing at all? Your feedback will help us to continuously improve the quality of this document.

Please send your proposal (including a reference to this document) to: erratum@infineon.com

Edition 2012-03-23

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).

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.

www.infineon.com

Published by Infineon Technologies AG

Downloaded From [Oneyac.com](https://www.oneyac.com)

单击下面可查看定价，库存，交付和生命周期等信息

[>>Infineon Technologies\(英飞凌\)](#)