

n-Channel Power MOSFET

OptiMOS™
BSB280N15NZ3 G

Data Sheet

2.5, 2011-09-16
Final

Industrial & Multimarket

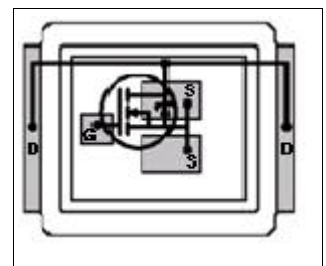
1 Description

OptiMOS™ 150V products are class leading power MOSFETs for highest power density and energy efficient solutions. Ultra low gate- and output charges together with lowest on state resistance in small footprint packages make OptiMOS™ 150V the best choice for the demanding requirements of voltage regulator solutions in Solar, Drives, Datacom and Telecom applications. Super fast switching Control FETs together with low EMI Sync FETs provide solutions that are easy to design in. OptiMOS™ products are available in high performance packages to tackle your most challenging applications giving full flexibility in optimizing space- efficiency and cost.



Features

- Optimized for high switching frequency DC/DC converter
- Very low on-resistance $R_{DS(on)}$
- Qualified according to JEDEC¹⁾ for target applications
- Excellent gate charge x $R_{DS(on)}$ product (FOM)
- Pb-free plating; RoHS compliant
- Halogen-free according to IEC61249-2-21
- Double sided cooling
- Compatible with DirectFET® package MZ footprint and outline
- Low parasitic inductance
- Low profile (<0.7 mm)



Applications

- Synchronous rectification
- Primary side switches
- Power management for high performance computing
- High power density point of load converters



Table 1 Key Performance Parameters

Parameter	Value	Unit	Related Links
V_{DS}	150	V	IFX OptiMOS webpage IFX OptiMOS product brief IFX OptiMOS spice models IFX Design tools
$R_{DS(on),max}$	28	mΩ	
I_D	30	A	
Q_{OSS}	38	nC	
$Q_{g,typ}$	15		

Type	Package	Marking
BSB280N15NZ3 G	MG-WDSO-2	0215

1) J-STD20 and JESD22

2 Maximum ratings

at $T_j = 25\text{ °C}$, unless otherwise specified.

Table 2 Maximum ratings

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Continuous drain current	I_D	-	-	30	A	$V_{GS}=10\text{ V}, T_C=25\text{ °C}$
				19		$V_{GS}=10\text{ V}, T_C=100\text{ °C}$
				9		$V_{GS}=10\text{ V}, T_A=25\text{ °C}, R_{thJA}=45\text{ K/W}^{1)}$
Pulsed drain current ²⁾	$I_{D,pulse}$	-	-	120		$T_C=25\text{ °C}$
Avalanche energy, single pulse	E_{AS}	-	-	120	mJ	$I_D=30\text{ A}, R_{GS}=25\text{ }\Omega$
Gate source voltage	V_{GS}	-20	-	20	V	
Power dissipation	P_{tot}	-	-	57	W	$T_C=25\text{ °C}$
				2.8		$T_A=25\text{ °C}, R_{thJA}=45\text{ K/W}^{1)}$
Operating and storage temperature	T_j, T_{stg}	-40	-	150	°C	
IEC climatic category; DIN IEC 68-1		55/150/56				

1) Device on 40 mm x 40 mm x 1.5 mm epoxy PCB FR4 with 6 cm² (one layer, 70µm thick) copper area for drain connection. PCB is vertical in still air.

2) See figure 3 for more detailed information

3 Thermal characteristics

Table 3 Thermal characteristics

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Thermal resistance, junction - case	R_{thJC}	-	-	2.2	K/W	top
			1	-		bottom
Device on PCB	R_{thJA}	-	-	45		6 cm ² cooling area ¹⁾

1) Device on 40 mm x 40 mm x 1.5 mm epoxy PCB FR4 with 6 cm² (one layer, 70µ, thick) copper area for drain connecton. PCB is vertical in still air.

4 Electrical characteristics

Electrical characteristics, at $T_J=25\text{ °C}$, unless otherwise specified.

Table 4 Static characteristics

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Drain-source breakdown voltage	$V_{(BR)DSS}$	150	-	-	V	$V_{GS}=0\text{ V}$, $I_D=1.0\text{ mA}$
Gate threshold voltage	$V_{GS(th)}$	2	3	4		$V_{DS}=V_{GS}$, $I_D=60\text{ }\mu\text{A}$
Zero gate voltage drain current	I_{DSS}	-	0.1	10	μA	$V_{DS}=120\text{ V}$, $V_{GS}=0\text{ V}$, $T_J=25\text{ °C}$
		-	10	100		$V_{DS}=120\text{ V}$, $V_{GS}=0\text{ V}$, $T_J=125\text{ °C}$
Gate-source leakage current	I_{GSS}	-	10	100	nA	$V_{GS}=20\text{ V}$, $V_{DS}=0\text{ V}$
Drain-source on-state resistance	$R_{DS(on)}$	-	24	28	m Ω	$V_{GS}=10\text{ V}$, $I_D=30\text{ A}$
			24	32		$V_{GS}=8\text{ V}$, $I_D=15\text{ A}$
Gate resistance	R_G	-	0.6	-	Ω	
Transconductance	g_{fs}	18	37		S	$ V_{DS} > 2 I_D R_{DS(on)max}$, $I_D=30\text{ A}$

Table 5 Dynamic characteristics

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Input capacitance	C_{iss}	-	1200	1600	pF	$V_{GS}=0\text{ V}$, $V_{DS}=75\text{ V}$, $f=1\text{ MHz}$
Output capacitance	C_{oss}	-	180	240		
Reverse transfer capacitance	C_{rss}	-	4	-		
Turn-on delay time	$t_{d(on)}$	-	9	-	ns	$V_{DD}=75\text{ V}$, $V_{GS}=10\text{ V}$, $I_D=30\text{ A}$, $R_G=1.6\text{ }\Omega$
Rise time	t_r	-	6	-		
Turn-off delay time	$t_{d(off)}$	-	16	-		
Fall time	t_f	-	3	-		

Table 6 Gate charge characteristics¹⁾

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Gate to source charge	Q_{gs}	-	7	-	nC	$V_{DD}=75\text{ V}$, $I_D=30\text{ A}$, $V_{GS}=0\text{ to }10\text{ V}$
Gate to drain charge	Q_{gd}	-	2.6	-		
Switching charge	Q_{sw}	-	7	-		
Gate charge total	Q_g	-	15	21		
Gate plateau voltage	$V_{plateau}$	-	5.6	-	V	
Output charge	Q_{oss}		41	55		$V_{DD}=75\text{ V}$, $V_{GS}=0\text{ V}$

1) See figure 16 for gate charge parameter definition

Table 7 Reverse diode characteristics

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Diode continuous forward current	I_s			47	A	$T_C=25\text{ °C}$
Diode pulse current	$I_{S,pulse}$			120		
Diode forward voltage	V_{SD}	-	0.9	1.2	V	$V_{GS}=0\text{ V}$, $I_F=47\text{ A}$, $T_j=25\text{ °C}$
Reverse recovery time	t_{rr}	-	100	-	nC	$V_R=75\text{ V}$, $I_F=30\text{ A}$, $di_F/dt=100\text{ A}/\mu\text{s}$
Reverse recovery charge	Q_{rr}		314			

5 Electrical characteristics diagrams

Table 8

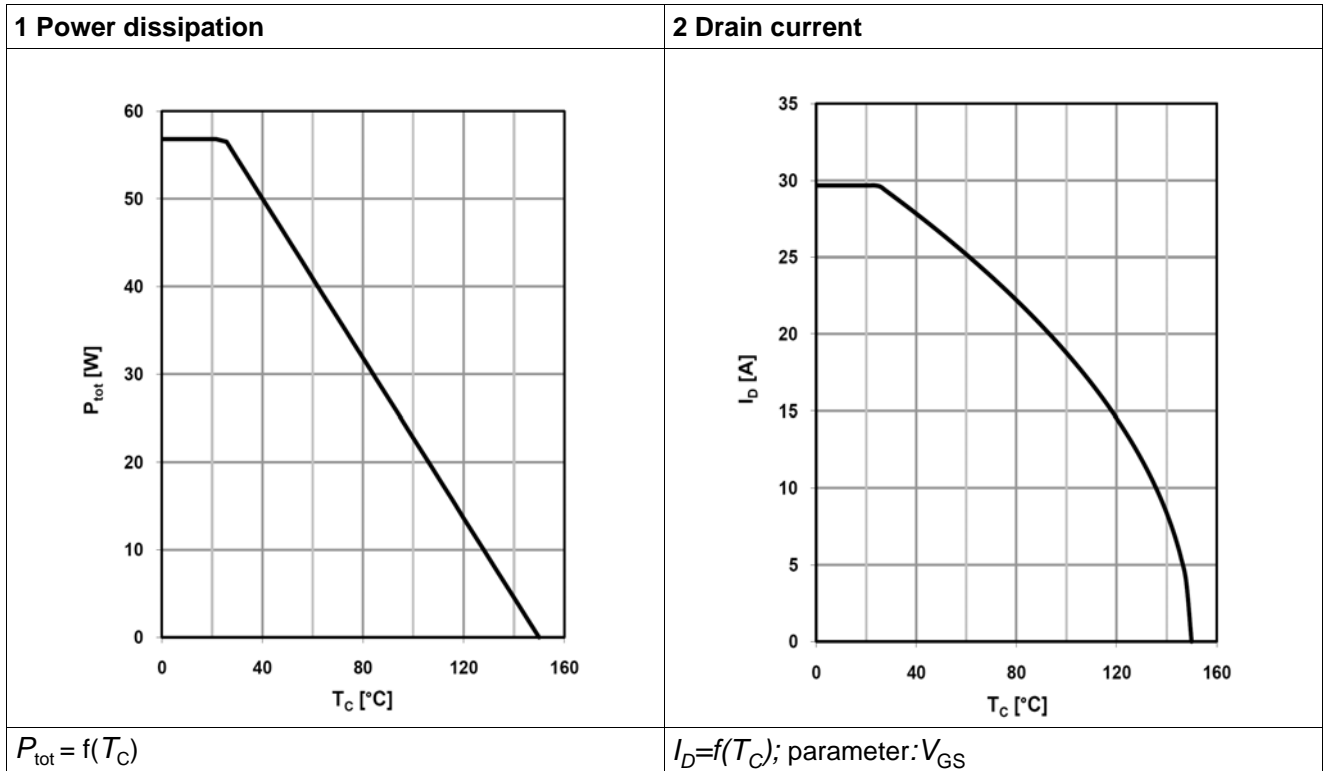


Table 9

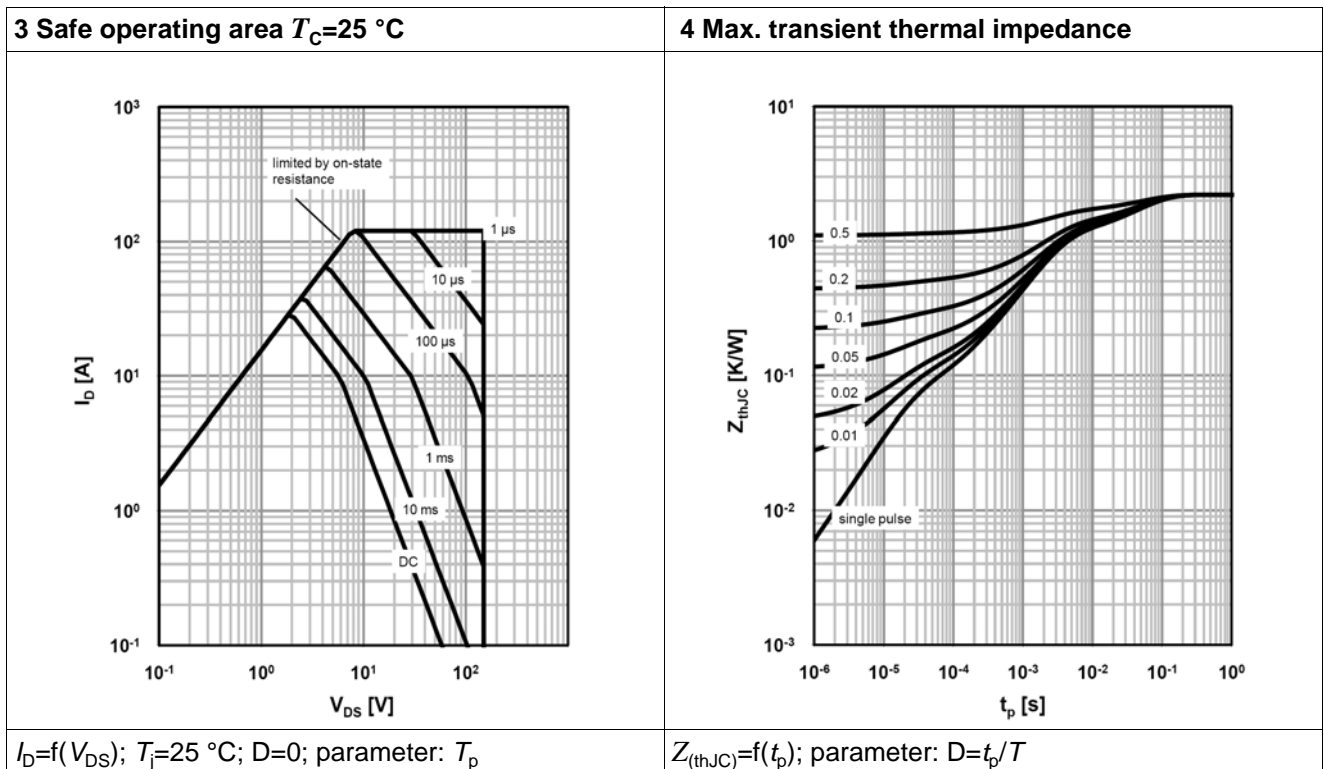


Table 10

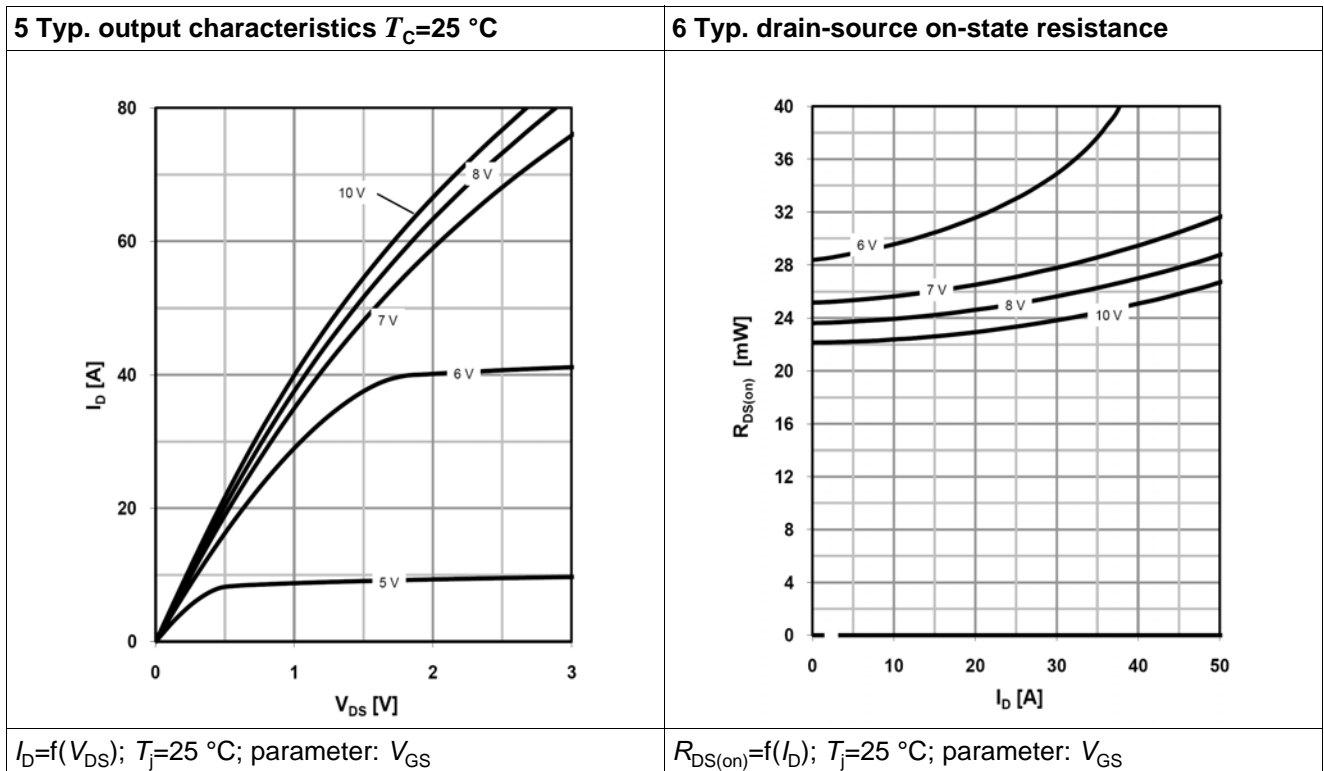


Table 11

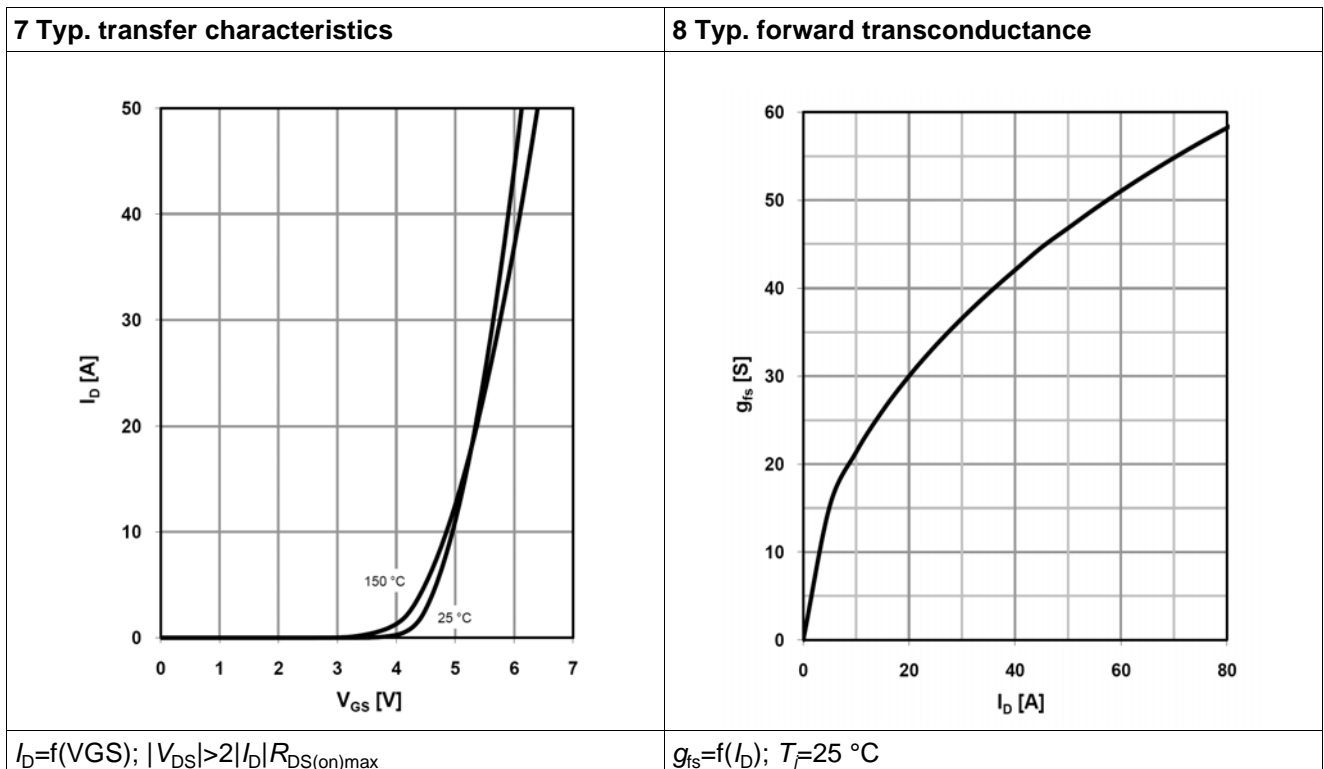


Table 12

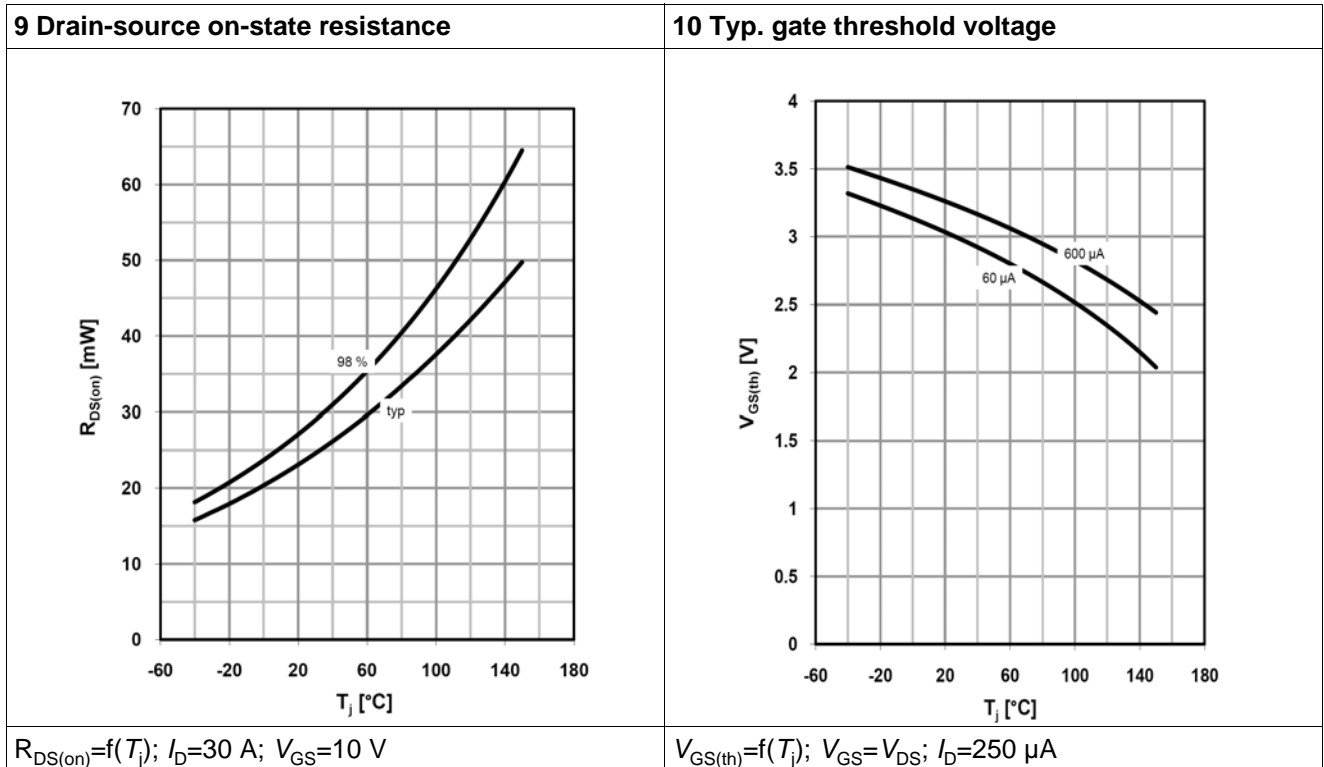


Table 13

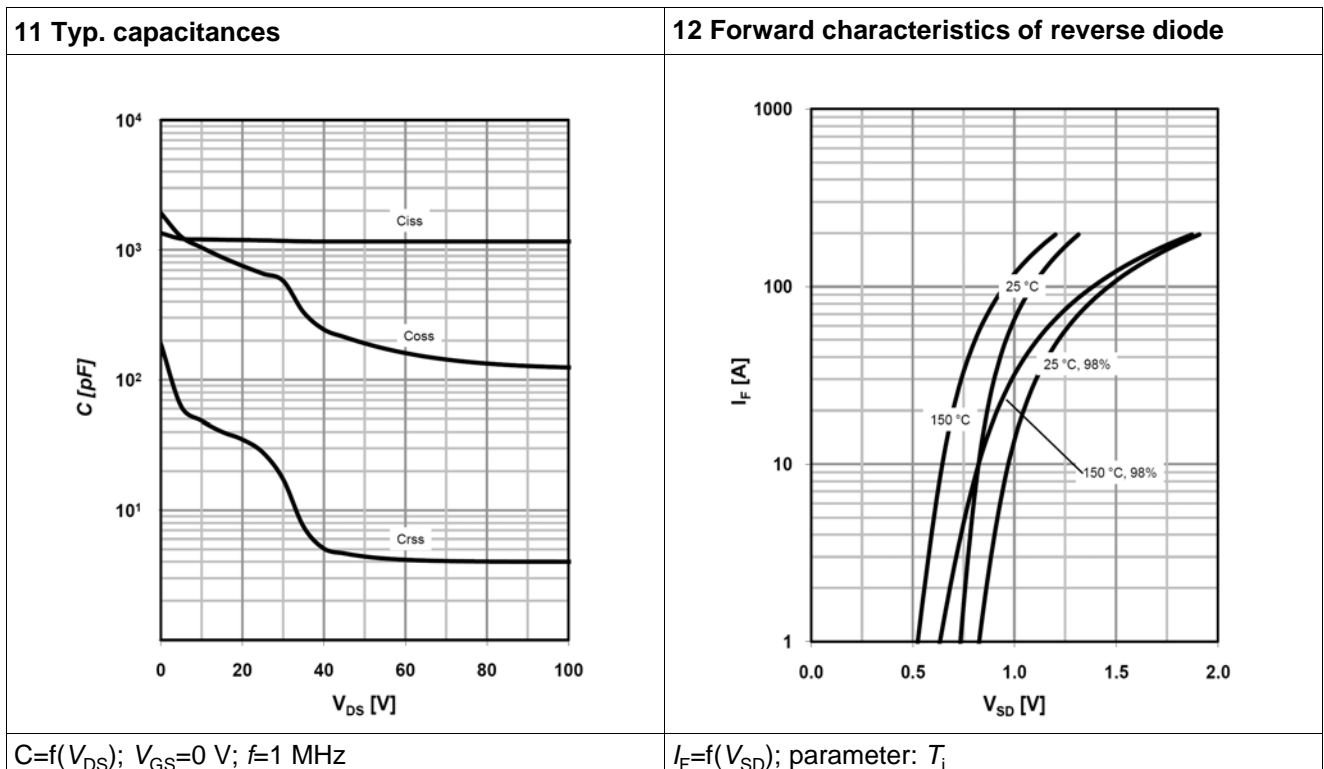


Table 14

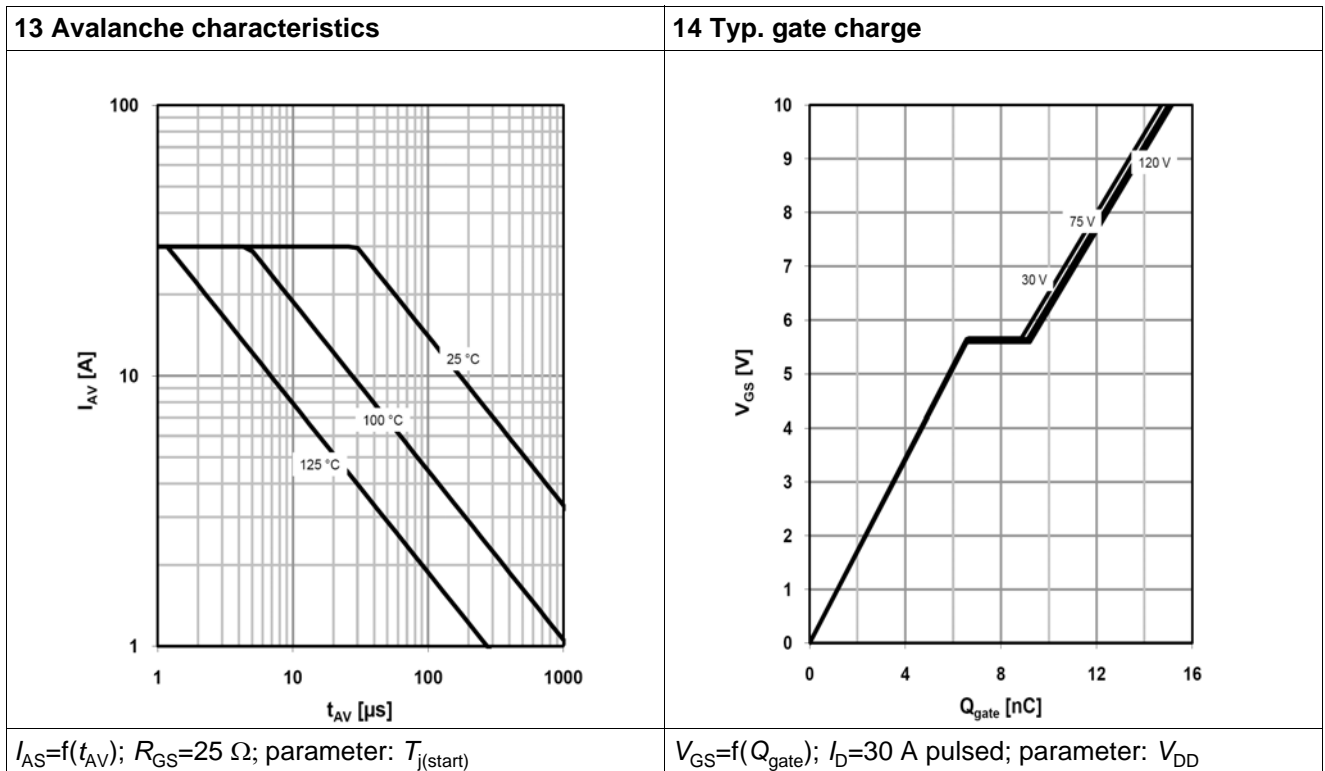
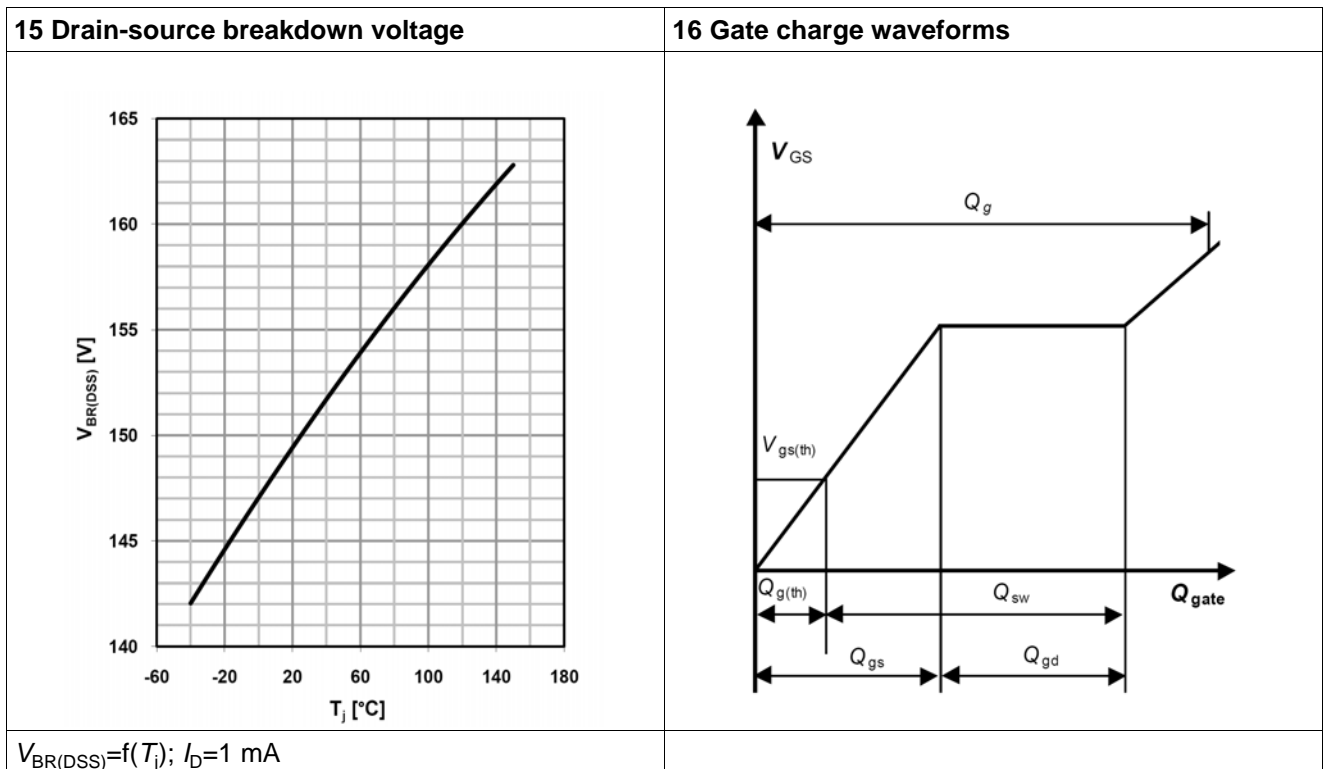


Table 15



6 Package outlines

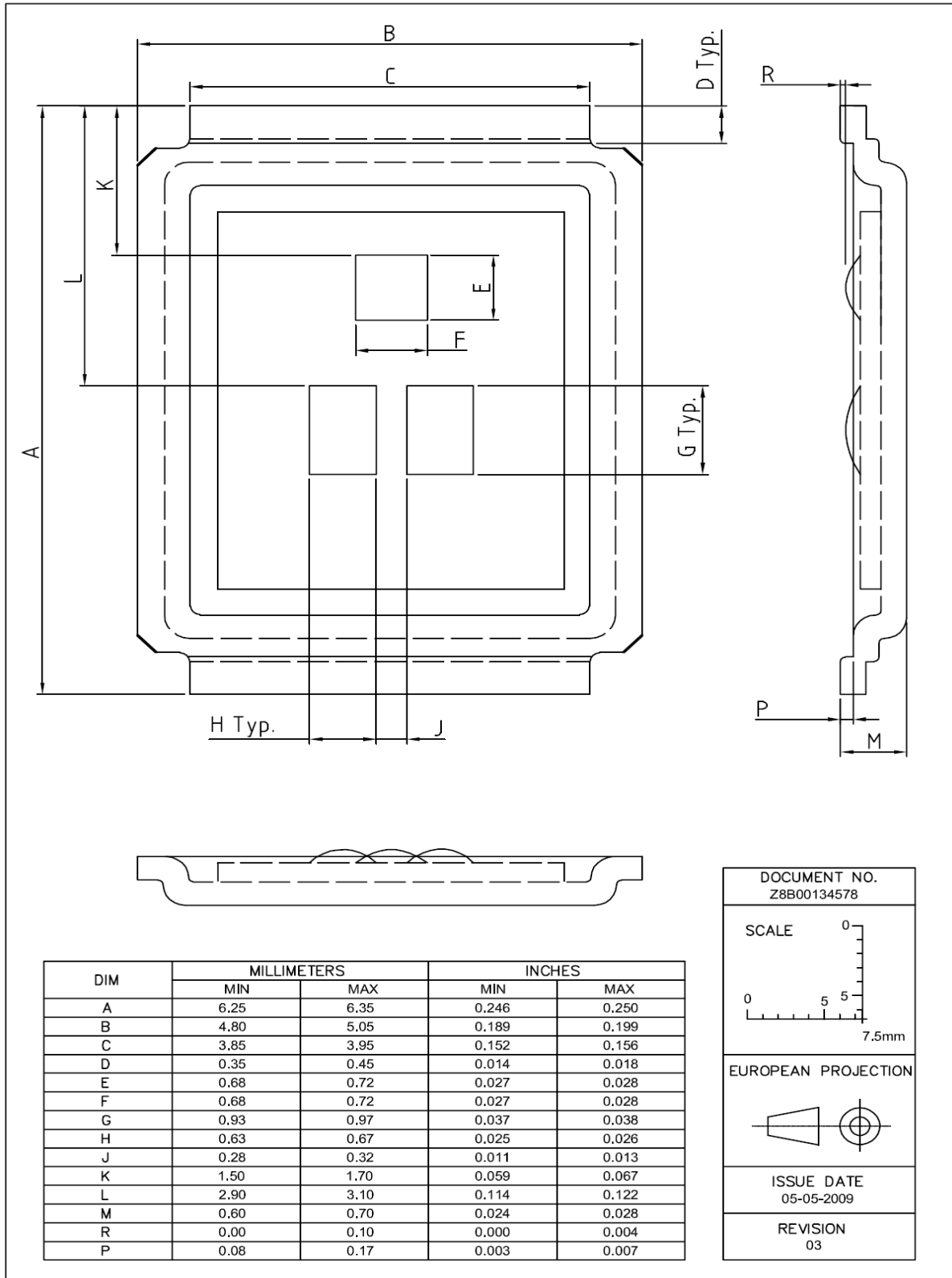


Figure 1 Outlines MG-WDSO-2, dimensions in mm/inches

7 Package outlines

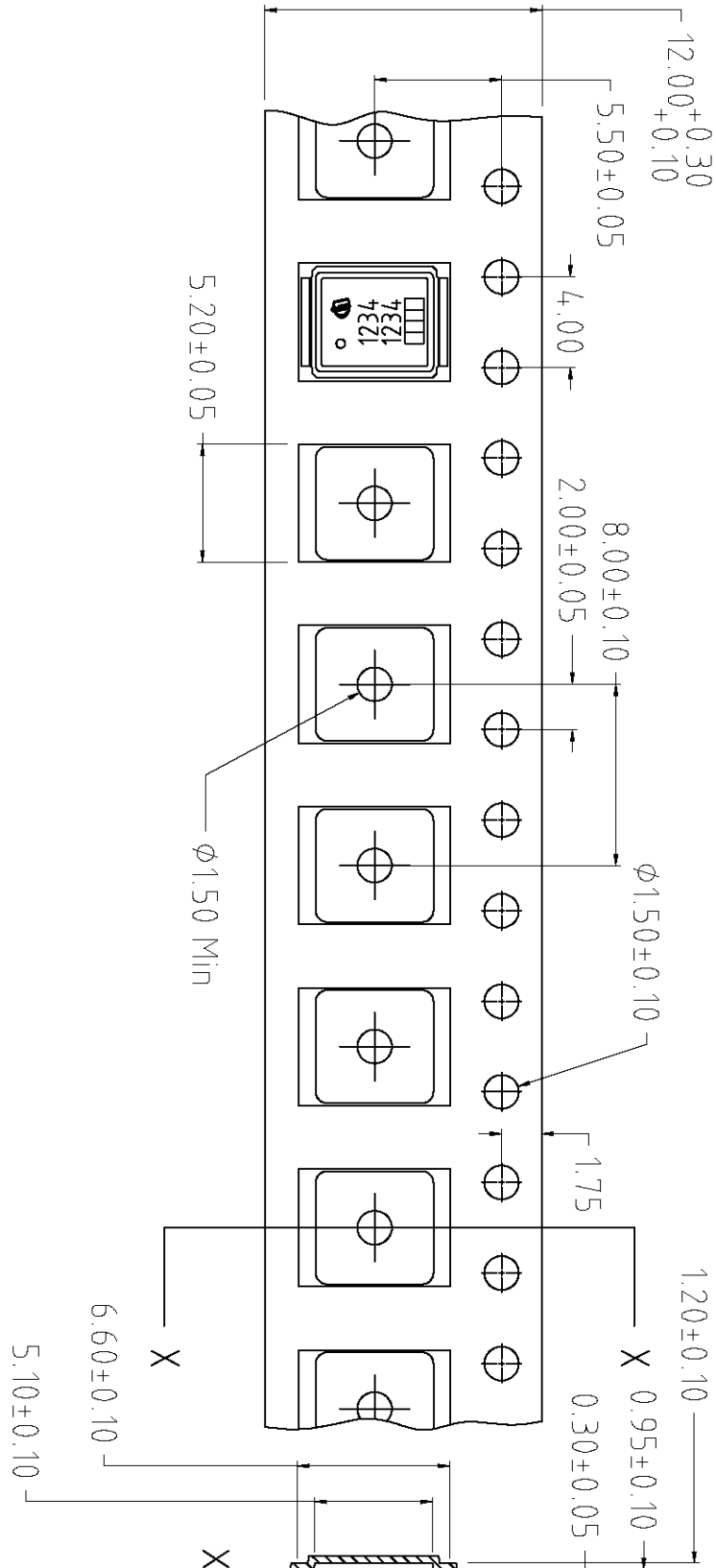


Figure 2 Outlines MG-WDSO-2, dimensions in mm/inches

8 Package outlines

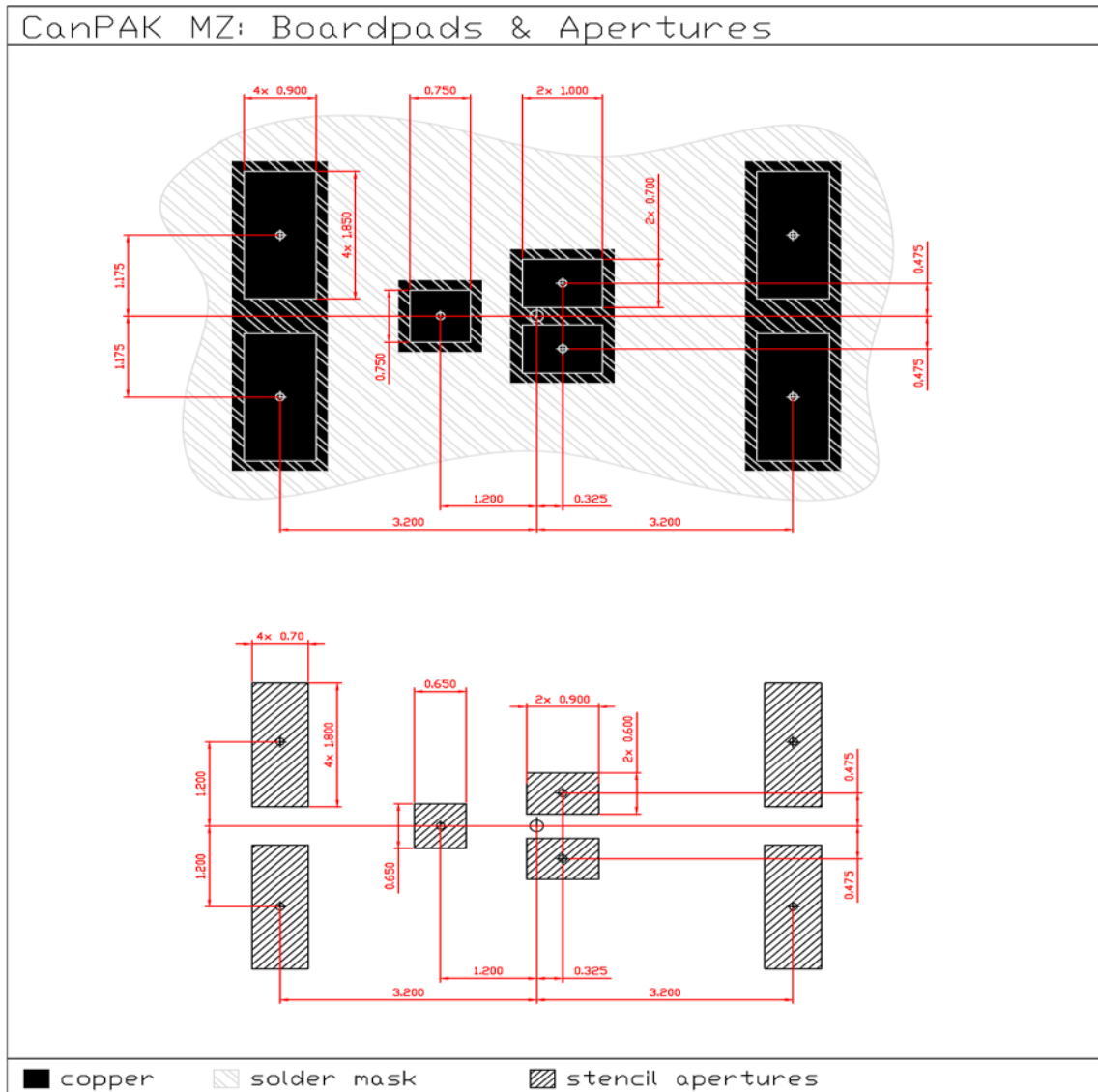
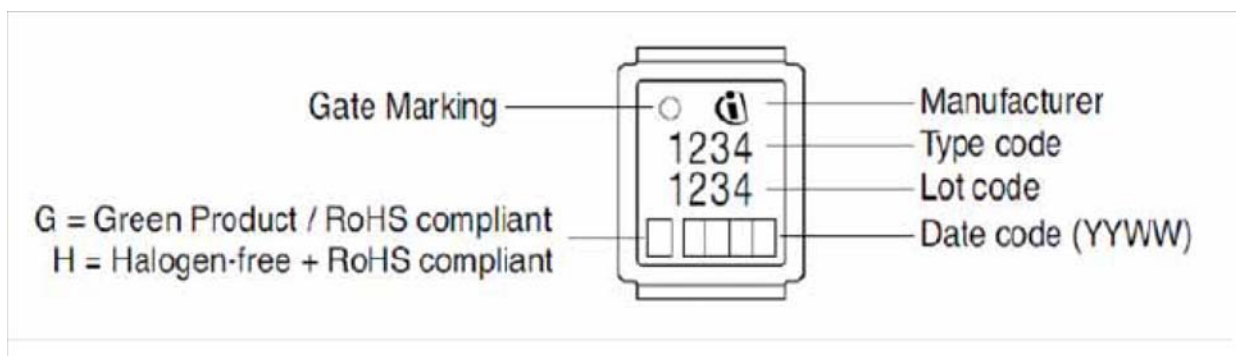


Figure 3 Outlines MG-WDSO-2, dimensions in mm/inches

9 Marking layout



9 Revision History

Revision History: 2011-09-16, 2.5

Previous Revision:

Revision	Subjects (major changes since last revision)
0.1	Release of target data sheet
2.2	Release Final version
2.3	Formating
2.4	DirectFET Disclaimer expired

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 2011-09-16

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



Стандарт Электрон Связь

Мы молодая и активно развивающаяся компания в области поставок электронных компонентов. Мы поставляем электронные компоненты отечественного и импортного производства напрямую от производителей и с крупнейших складов мира.

Благодаря сотрудничеству с мировыми поставщиками мы осуществляем комплексные и плановые поставки широчайшего спектра электронных компонентов.

Собственная эффективная логистика и склад в обеспечивает надежную поставку продукции в точно указанные сроки по всей России.

Мы осуществляем техническую поддержку нашим клиентам и предпродажную проверку качества продукции. На все поставляемые продукты мы предоставляем гарантию .

Осуществляем поставки продукции под контролем ВП МО РФ на предприятия военно-промышленного комплекса России , а также работаем в рамках 275 ФЗ с открытием отдельных счетов в уполномоченном банке. Система менеджмента качества компании соответствует требованиям ГОСТ ISO 9001.

Минимальные сроки поставки, гибкие цены, неограниченный ассортимент и индивидуальный подход к клиентам являются основой для выстраивания долгосрочного и эффективного сотрудничества с предприятиями радиоэлектронной промышленности, предприятиями ВПК и научно-исследовательскими институтами России.

С нами вы становитесь еще успешнее!

Наши контакты:

Телефон: +7 812 627 14 35

Электронная почта: sales@st-electron.ru

Адрес: 198099, Санкт-Петербург,
Промышленная ул, дом № 19, литера Н,
помещение 100-Н Офис 331