MOSFET

Metal Oxide Semiconductor Field Effect Transistor

OptiMOS™

OptiMOS™5 Power-Transistor, 80 V

BSZ075N08NS5

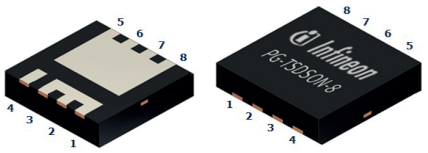
Data Sheet

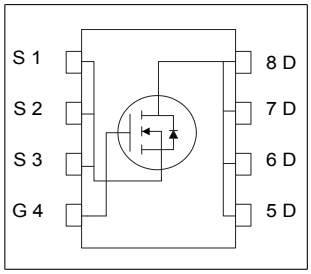
Rev. 2.1
Final

Power Management & Multimarket

1 Description

TSDSON-8 FL
(enlarged source interconnection)





Features

- Ideal for high frequency switching and sync. rec.
- Optimized technology for DC/DC converters
- Excellent gate charge x $R_{DS(on)}$ product (FOM)
- Very low on-resistance $R_{DS(on)}$
- N-channel, normal level
- 100% avalanche tested
- Pb-free plating; RoHS compliant
- Qualified according to JEDEC[1)] for target applications
- Halogen-free according to IEC61249-2-21
- Higher solder joint reliability with enlarged source interconnection

Table 1 Key Performance Parameters

Parameter	Value	Unit
V_{DS}	80	V
$R_{DS(on),max}$	7.5	mΩ
I_D	40	A
Q_{oss}	29	nC
Q_G(0V..10V)	24	nC

Type / Ordering Code	Package	Marking	Related Links
BSZ075N08NS5	PG-TSDSON-8 FL	075N08N	-

[1)] J-STD20 and JESD22

Table of Contents

2 Maximum ratings

at T_j = 25 °C, unless otherwise specified

Table 2 Maximum ratings

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Continuous drain current	I_D	- -	- -	40 40	A	T_C=25 °C T_C=100 °C
Pulsed drain current[1]	$I_{D,pulse}$	-	-	160	A	T_C=25 °C
Avalanche energy, single pulse[2]	E_{AS}	-	-	104	mJ	I_D=20 A, R_{GS}=25 Ω
Gate source voltage	V_{GS}	-20	-	20	V	-
Power dissipation	P_{tot}	-	-	69	W	T_C=25 °C
Operating and storage temperature	T_j, T_{stg}	-55	-	150	°C	IEC climatic category; DIN IEC 68-1: 55/150/56

3 Thermal characteristics

Table 3 Thermal characteristics

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Thermal resistance, junction - case	R_{thJC}	-	1.1	1.8	K/W	-
Device on PCB, 6 cm² cooling area[3]	R_{thJA}	-	-	60	K/W	-

[1] See figure 3 for more detailed information
[2] See figure 13 for more detailed information
[3] Device on 40 mm x 40 mm x 1.5 mm epoxy PCB FR4 with 6 cm² (one layer, 70 µm thick) copper area for drain connection. PCB is vertical in still air.

4 Electrical characteristics

Table 4 Static characteristics

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Drain-source breakdown voltage	$V_{(BR)DSS}$	80	-	-	V	V_{GS}=0 V, I_D=1 mA
Gate threshold voltage	$V_{GS(th)}$	2.2	3	3.8	V	V_{DS}=V_{GS}, I_D=36 µA
Zero gate voltage drain current	I_{DSS}	- -	0.1 10	1 100	µA	V_{DS}=80 V, V_{GS}=0 V, T_j=25 °C V_{DS}=80 V, V_{GS}=0 V, T_j=125 °C
Gate-source leakage current	I_{GSS}	-	1	100	nA	V_{GS}=20 V, V_{DS}=0 V
Drain-source on-state resistance	$R_{DS(on)}$	- -	6.2 8.5	7.5 10.2	mΩ	V_{GS}=10 V, I_D=20 A V_{GS}=6 V, I_D=5 A
Gate resistance	R_G	-	1.3	2	Ω	-
Transconductance	g_{fs}	21	42	-	S	|V_{DS}|>2|I_D|$R_{DS(on)max}$, I_D=20 A

Table 5 Dynamic characteristics

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Input capacitance	C_{iss}	-	1600	2080	pF	V_{GS}=0 V, V_{DS}=40 V, f=1 MHz
Output capacitance[1)]	C_{oss}	-	280	365	pF	V_{GS}=0 V, V_{DS}=40 V, f=1 MHz
Reverse transfer capacitance[1)]	C_{rss}	-	15	26	pF	V_{GS}=0 V, V_{DS}=40 V, f=1 MHz
Turn-on delay time	$t_{d(on)}$	-	10	-	ns	V_{DD}=40 V, V_{GS}=10 V, I_D=20 A, $R_{G,ext}$=1.6 Ω
Rise time	t_r	-	4	-	ns	V_{DD}=40 V, V_{GS}=10 V, I_D=20 A, $R_{G,ext}$=1.6 Ω
Turn-off delay time	$t_{d(off)}$	-	19	-	ns	V_{DD}=40 V, V_{GS}=10 V, I_D=20 A, $R_{G,ext}$=1.6 Ω
Fall time	t_f	-	4	-	ns	V_{DD}=40 V, V_{GS}=10 V, I_D=20 A, $R_{G,ext}$=1.6 Ω

Table 6 Gate charge characteristics[2)]

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Gate to source charge	Q_{gs}	-	7.5	-	nC	V_{DD}=40 V, I_D=20 A, V_{GS}=0 to 10 V
Gate to drain charge[1)]	Q_{gd}	-	5.2	7.8	nC	V_{DD}=40 V, I_D=20 A, V_{GS}=0 to 10 V
Switching charge	Q_{sw}	-	8.1	-	nC	V_{DD}=40 V, I_D=20 A, V_{GS}=0 to 10 V
Gate charge total	Q_g	-	24	29.5	nC	V_{DD}=40 V, I_D=20 A, V_{GS}=0 to 10 V
Gate plateau voltage	$V_{plateau}$	-	4.6	-	V	V_{DD}=40 V, I_D=20 A, V_{GS}=0 to 10 V
Gate charge total, sync. FET	$Q_{g(sync)}$	-	20	-	nC	V_{DS}=0.1 V, V_{GS}=0 to 10 V
Output charge[1)]	Q_{oss}	-	29	38.6	nC	V_{DD}=40 V, V_{GS}=0 V

[1)] Defined by design. Not subject to production test
[2)] See ″Gate charge waveforms″ for parameter definition

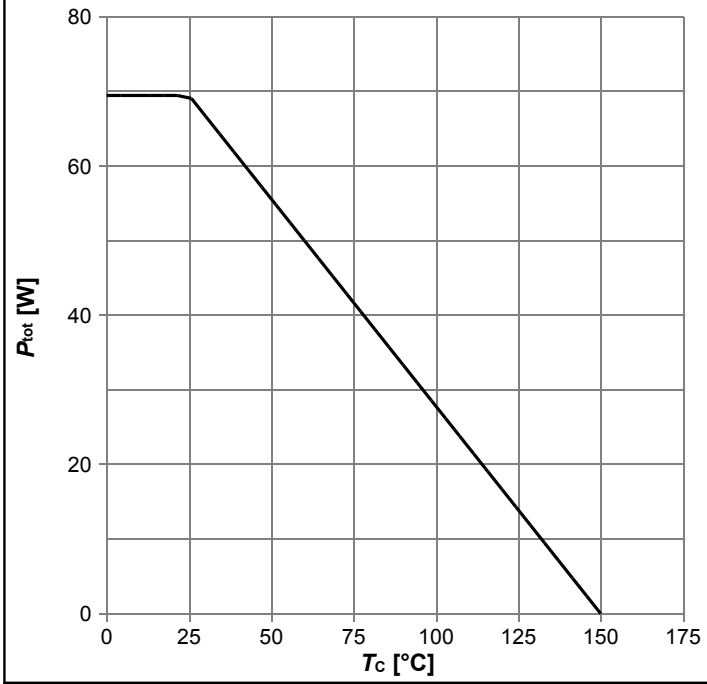
Table 7 Reverse diode

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Diode continous forward current	I_S	-	-	40	A	T_C=25 °C
Diode pulse current	$I_{S,pulse}$	-	-	160	A	T_C=25 °C
Diode forward voltage	V_{SD}	-	0.85	1.2	V	V_{GS}=0 V, I_F=20 A, T_j=25 °C
Reverse recovery time[1)]	t_{rr}	-	37	74	ns	V_R=40 V, I_F=20 A, di_F/dt=100 A/µs
Reverse recovery charge[1)]	Q_{rr}	-	39	78	nC	V_R=40 V, I_F=20 A, di_F/dt=100 A/µs

[1)] Defined by design. Not subject to production test

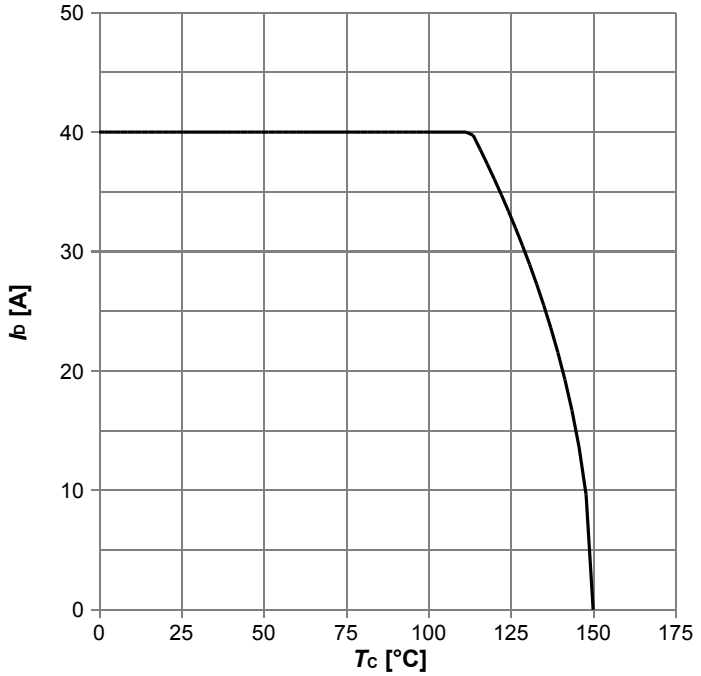
5 Electrical characteristics diagrams

Diagram 1: Power dissipation



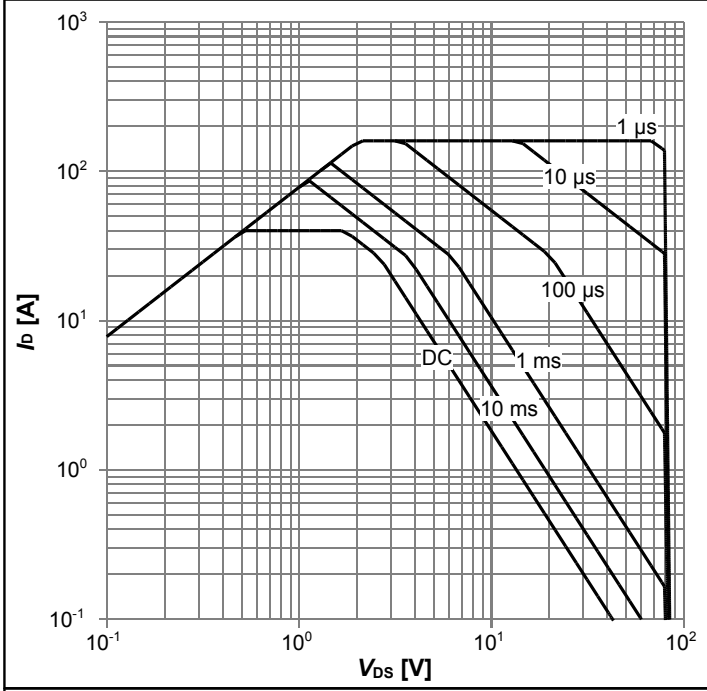
$P_{tot}=f(T_C)$

Diagram 2: Drain current



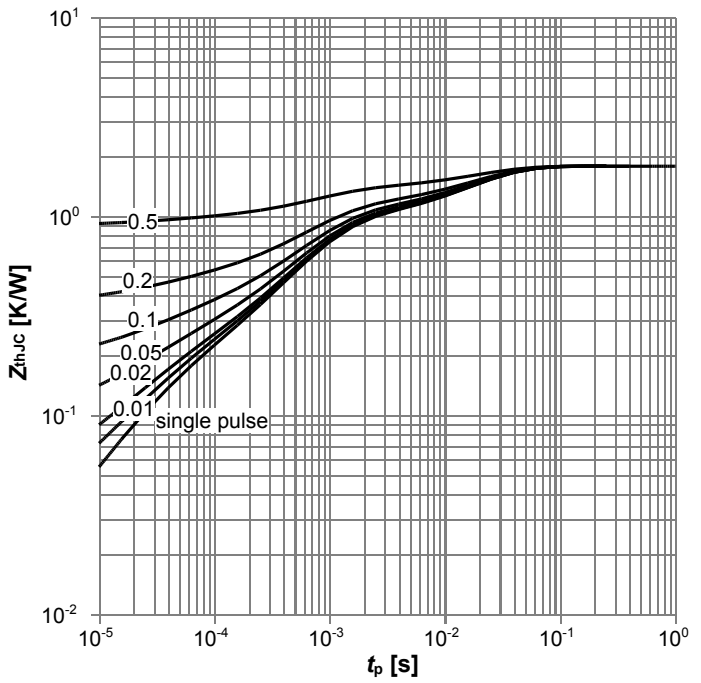
$I_D=f(T_C)$; $V_{GS}\geq 10$ V

Diagram 3: Safe operating area



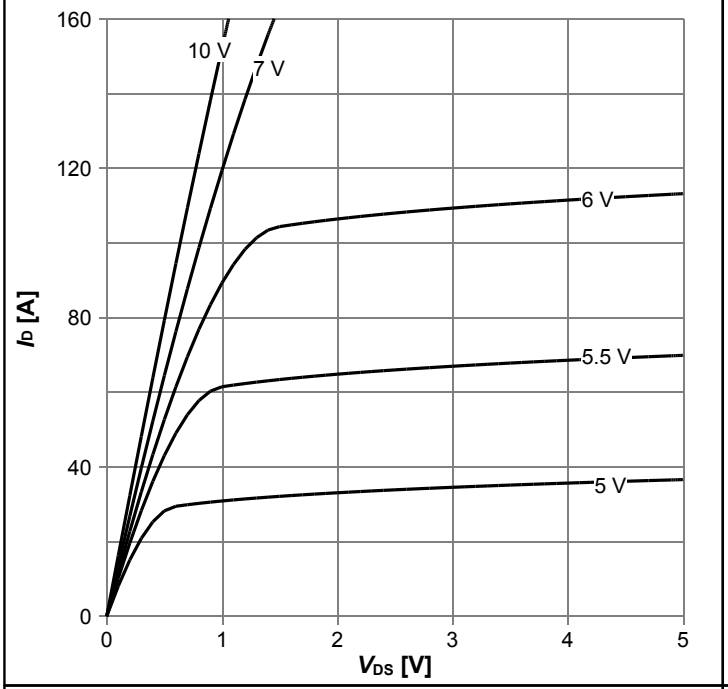
$I_D=f(V_{DS})$; $T_C=25$ °C; $D=0$; parameter: t_p

Diagram 4: Max. transient thermal impedance



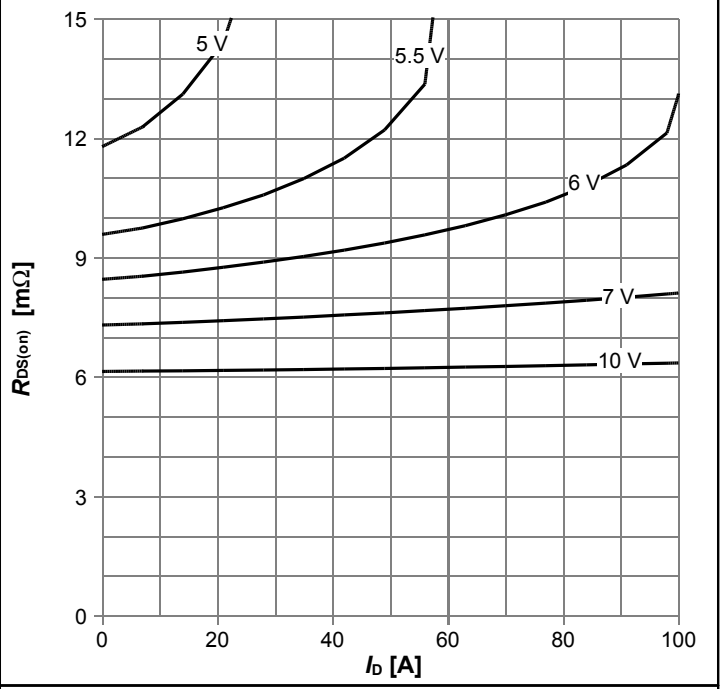
$Z_{thJC}=f(t_p)$; parameter: $D=t_p/T$

Diagram 5: Typ. output characteristics



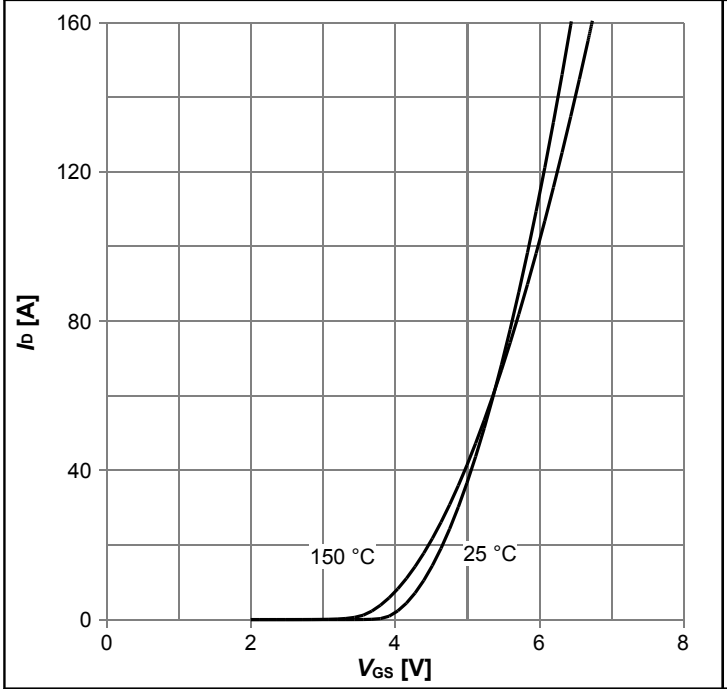
I_D=f(V_{DS}); T_j=25 °C; parameter: V_{GS}

Diagram 6: Typ. drain-source on resistance



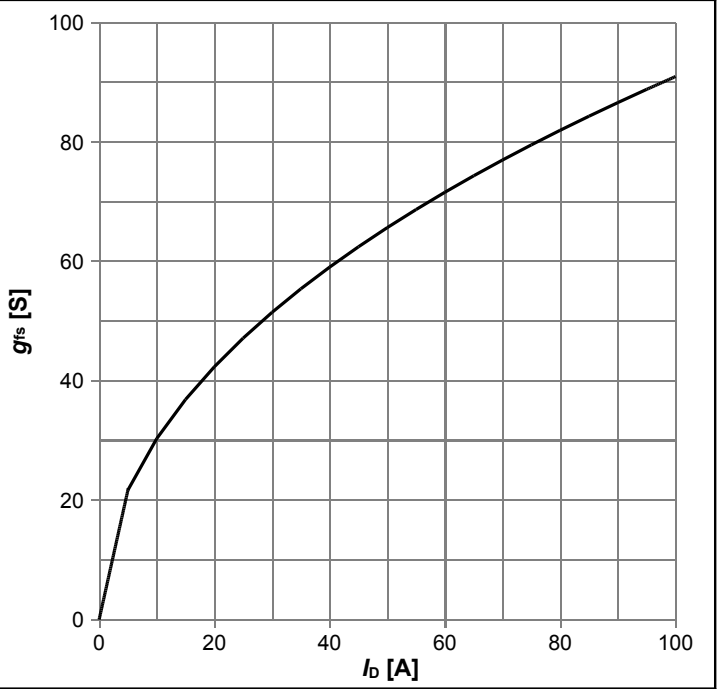
$R_{DS(on)}$=f(I_D); T_j=25 °C; parameter: V_{GS}

Diagram 7: Typ. transfer characteristics



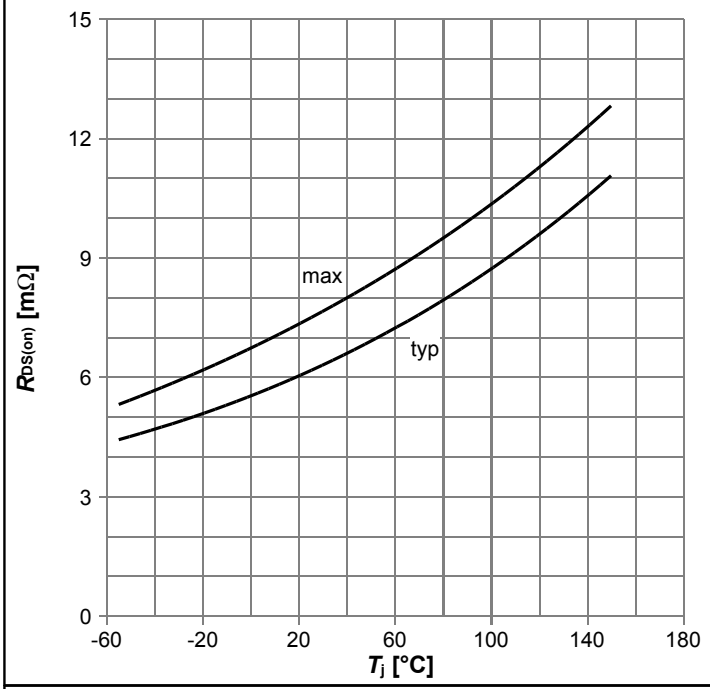
I_D=f(V_{GS}); |V_{DS}|>2|I_D|$R_{DS(on)max}$; parameter: T_j

Diagram 8: Typ. forward transconductance



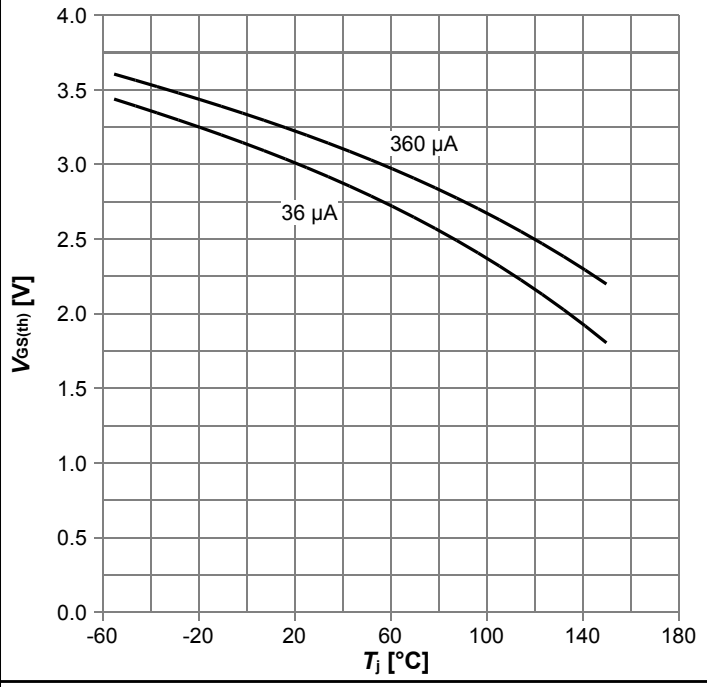
g_{fs}=f(I_D); T_j=25 °C

Diagram 9: Drain-source on-state resistance



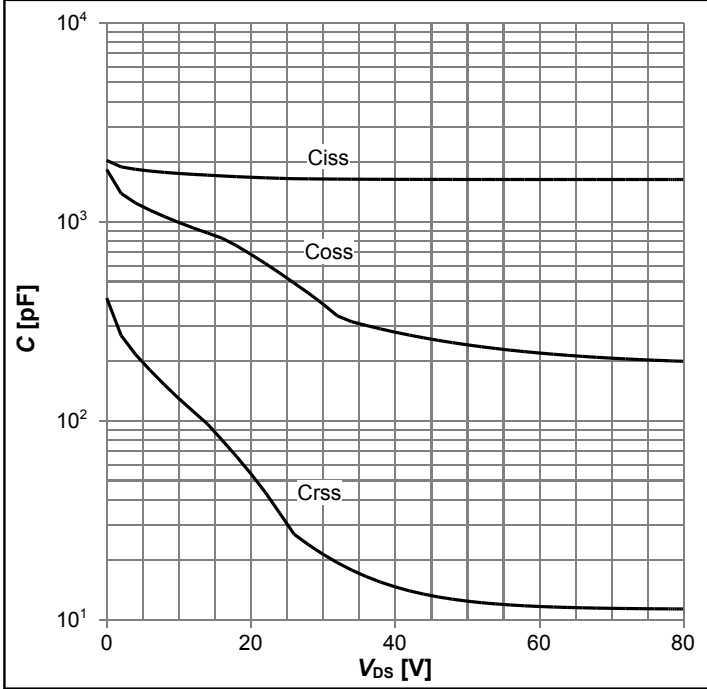
$R_{DS(on)}$=f(T_j); I_D=20 A; V_{GS}=10 V

Diagram 10: Typ. gate threshold voltage



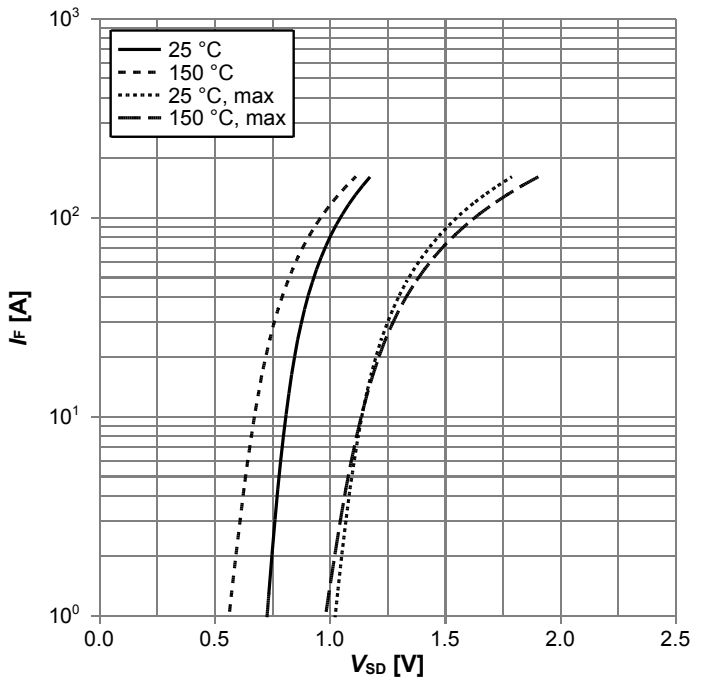
$V_{GS(th)}$=f(T_j); V_{GS}=V_{DS}; parameter: I_D

Diagram 11: Typ. capacitances



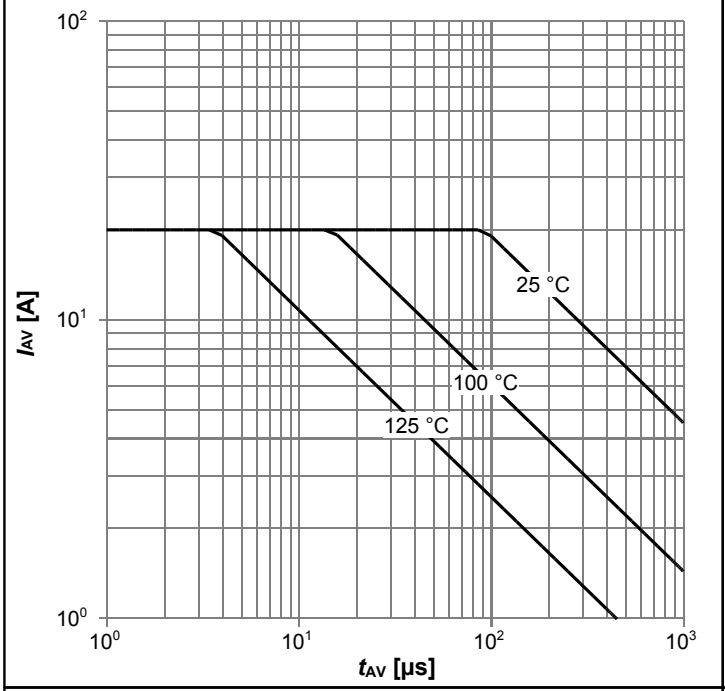
C=f(V_{DS}); V_{GS}=0 V; f=1 MHz

Diagram 12: Forward characteristics of reverse diode



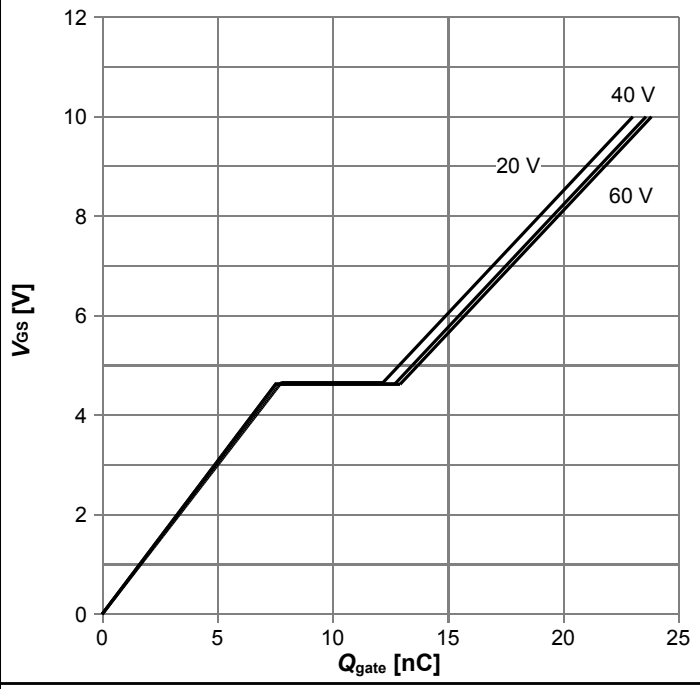
I_F=f(V_{SD}); parameter: T_j

Diagram 13: Avalanche characteristics



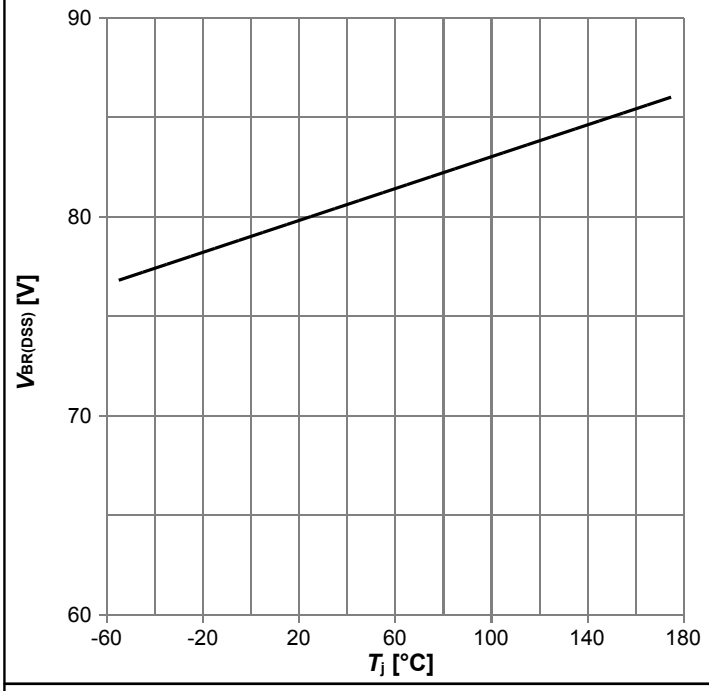
I_{AS}=f(t_{AV}); R_{GS}=25 Ω; parameter: $T_{j(start)}$

Diagram 14: Typ. gate charge



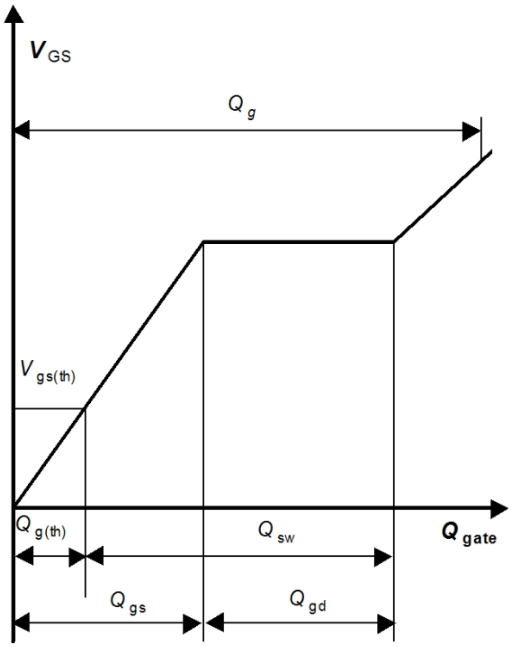
V_{GS}=f(Q_{gate}); I_D=20 A pulsed; parameter: V_{DD}

Diagram 15: Drain-source breakdown voltage

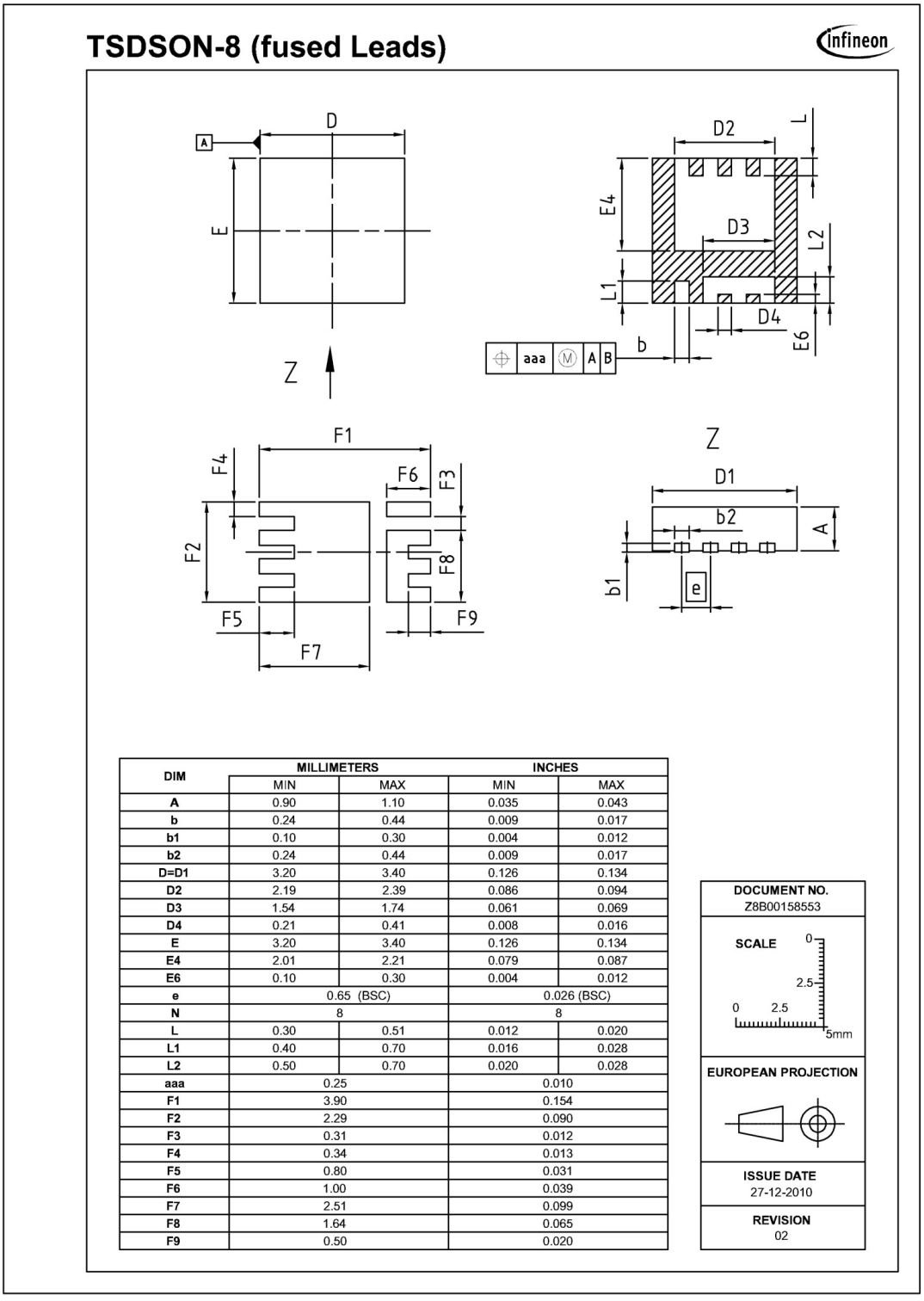


$V_{BR(DSS)}$=f(T_j); I_D=1 mA

Gate charge waveforms



6 Package Outlines



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.90	1.10	0.035	0.043
b	0.24	0.44	0.009	0.017
b1	0.10	0.30	0.004	0.012
b2	0.24	0.44	0.009	0.017
D=D1	3.20	3.40	0.126	0.134
D2	2.19	2.39	0.086	0.094
D3	1.54	1.74	0.061	0.069
D4	0.21	0.41	0.008	0.016
E	3.20	3.40	0.126	0.134
E4	2.01	2.21	0.079	0.087
E6	0.10	0.30	0.004	0.012
e	0.65 (BSC)		0.026 (BSC)	
N	8		8	
L	0.30	0.51	0.012	0.020
L1	0.40	0.70	0.016	0.028
L2	0.50	0.70	0.020	0.028
aaa	0.25		0.010	
F1	3.90		0.154	
F2	2.29		0.090	
F3	0.31		0.012	
F4	0.34		0.013	
F5	0.80		0.031	
F6	1.00		0.039	
F7	2.51		0.099	
F8	1.64		0.065	
F9	0.50		0.020	

DOCUMENT NO.
Z8B00158553

SCALE 0 2.5 0 2.5 5mm

EUROPEAN PROJECTION

ISSUE DATE
27-12-2010

REVISION
02

Figure 1 Outline PG-TSDSON-8 FL, dimensions in mm/inches

Revision History

BSZ075N08NS5

Revision: 2014-05-05, Rev. 2.1

Previous Revision		
Revision	Date	Subjects (major changes since last revision)
2.1	2014-05-05	Release of Final 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

Published by
Infineon Technologies AG
81726 München, Germany

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 your 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.

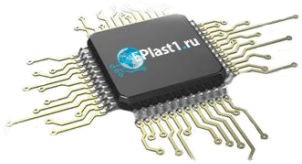
Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)
Факс: 8 (812) 320-02-42
Электронная почта: org@eplast1.ru
Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.