

OptiMOS™ 2 + OptiMOS™ P 2 Small Signal Transistor

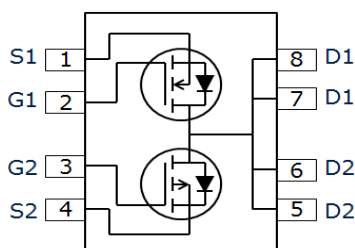
Features

- Complementary P + N channel
- Enhancement mode
- Super Logic level (2.5V rated)
- Common drain
- Avalanche rated
- 175 °C operating temperature
- Qualified according to AEC Q101
- 100% lead-free; RoHS compliant
- Halogen-free according to IEC61246-21

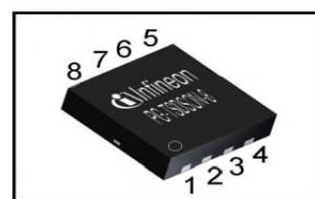


Product Summary

		P	N	
V_{DS}		-20	20	V
$R_{DS(on),max}$	$V_{GS}=\pm 4.5\text{ V}$	150	55	$m\Omega$
	$V_{GS}=\pm 2.5\text{ V}$	310	95	
I_D		-3.2	5.1	A



PG-TSDSON-8



Type	Package	Marking	Lead Free	Halogen Free	Packing
BSZ15DC02KD H	PG-TSDSON-8	15DC02K	Yes	Yes	Non dry

Maximum ratings, at $T_A=25\text{ °C}$, unless otherwise specified ¹⁾

Parameter	Symbol	Conditions	Value		Unit
			P	N	
Continuous drain current	I_D	$T_A=25\text{ °C}$	-3.2	5.1	A
		$T_A=100\text{ °C}$	-2.2	3.6	
Pulsed drain current	$I_{D,pulse}$	$T_A=25\text{ °C}$	-13	20	
Avalanche energy, single pulse	E_{AS}	P: $I_D=-3.2\text{ A}$, N: $I_D=5.1\text{ A}$, $R_{GS}=25\text{ }\Omega$	11	11	mJ
Gate source voltage	V_{GS}		± 12		V
Power dissipation	$P_{tot}^{2)}$	$T_A=25\text{ °C}$	2.5		W
Operating and storage temperature	T_j, T_{stg}		-55 ... 175		°C
ESD class		JESD22-A114-HBM	0 (<250V)		
Soldering temperature	T_{solder}		260		°C
IEC climatic category; DIN IEC 68-1			55/175/56		

¹⁾ Remark: only one of both transistors active

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	

Thermal characteristics

Thermal resistance, junction - case	P	R_{thJC}		-	-	8	K/W
	N						
Device on PCB		R_{thJA}	6 cm ² cooling area ²⁾	-	-	60	K/W

Electrical characteristics, at $T_j=25\text{ }^{\circ}\text{C}$, unless otherwise specified

Static characteristics

Drain-source breakdown voltage	P	$V_{(BR)DSS}$	$V_{GS}=0\text{ V}, I_D=-250\text{ }\mu\text{A}$	-	-	-20	V
	N		$V_{GS}=0\text{ V}, I_D=250\text{ }\mu\text{A}$	20	-	-	
Gate threshold voltage	P	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-110\text{ }\mu\text{A}$	-1.4	-1.0	-0.7	
	N		$V_{DS}=V_{GS}, I_D=110\text{ }\mu\text{A}$	0.8	1.1	1.4	
Zero gate voltage drain current	P	I_{DSS}	$V_{DS}=-20\text{ V}, V_{GS}=0\text{ V}, T_j=25\text{ }^{\circ}\text{C}$	-	-	-0.1	μA
	N		$V_{DS}=20\text{ V}, V_{GS}=0\text{ V}, T_j=25\text{ }^{\circ}\text{C}$	-	-	0.1	
	P		$V_{DS}=-20\text{ V}, V_{GS}=0\text{ V}, T_j=175\text{ }^{\circ}\text{C}$	-	-	-50	
	N		$V_{DS}=20\text{ V}, V_{GS}=0\text{ V}, T_j=175\text{ }^{\circ}\text{C}$	-	-	50	
Gate-source leakage current	P	I_{GSS}	$V_{GS}=\pm 12\text{ V}, V_{DS}=0\text{ V}$	-	-	± 100	nA
	N						
Drain-source on-state resistance	P	$R_{DS(on)}$	$V_{GS}=-2.5\text{ V}, I_D=2.1\text{ A}$	-	164	310	m Ω
	N		$V_{GS}=2.5\text{ V}, I_D=1.9\text{ A}$	-	63	95	
	P		$V_{GS}=-4.5\text{ V}, I_D=-3.2\text{ A}$	-	97	150	
	N		$V_{GS}=4.5\text{ V}, I_D=5.1\text{ A}$	-	41	55	
Transconductance	P	g_{fs}	$ V_{DS} >2 I_D R_{DS(on)max}, I_D=-2.2\text{ A}$	3.4	6.9	-	S
	N		$ V_{DS} >2 I_D R_{DS(on)max}, I_D=3.6\text{ A}$	5.5	11	-	

²⁾ 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.

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	

Dynamic characteristics

Input capacitance	P	C_{iss}	$V_{GS}=0\text{ V}$, P: $V_{DS}=-10\text{ V}$, N: $V_{DS}=10\text{ V}$, $f=1\text{ MHz}$	-	270	360	pF
	N			-	315	419	
Output capacitance	P	C_{oss}		-	110	150	
	N			-	114	152	
Reverse transfer capacitance	P	C_{rss}		-	94	140	
	N			-	16	24	
Turn-on delay time	P	$t_{d(on)}$	P: $V_{DD}=-10\text{ V}$, $V_{GS}=-4.5\text{ V}$, $R_G=6\ \Omega$, $I_D=-3.2\text{ A}$ N: $V_{DD}=10\text{ V}$, $V_{GS}=4.5\text{ V}$, $R_G=6\ \Omega$, $I_D=5.1\text{ A}$	-	7.4	-	ns
	N			-	4.9	-	
Rise time	P	t_r		-	3.7	-	
	N			-	2.0	-	
Turn-off delay time	P	$t_{d(off)}$		-	11.3	-	
	N			-	12.2	-	
Fall time	P	t_f		-	4.7	-	
	N			-	1.4	-	

Gate Charge Characteristics

Gate to source charge	P	Q_{gs}	$V_{DD}=-10\text{ V}$, $I_D=-3.2\text{ A}$, $V_{GS}=0\text{ to }-4.5\text{ V}$	-	-0.59	-0.8	nC
Gate to drain charge		Q_{gd}		-	-1.4	-1.8	
Switching charge		Q_g		-	-3.0	-4.5	
Gate plateau voltage		$V_{plateau}$		-	-2.2	-	
Gate to source charge	N	Q_{gs}	$V_{DD}=10\text{ V}$, $I_D=5.1\text{ A}$, $V_{GS}=0\text{ to }4.5\text{ V}$	-	0.7	1.0	
Gate to drain charge		Q_{gd}		-	0.4	-	
Switching charge		Q_g			2.1	2.8	
Gate plateau voltage		$V_{plateau}$			2.3		

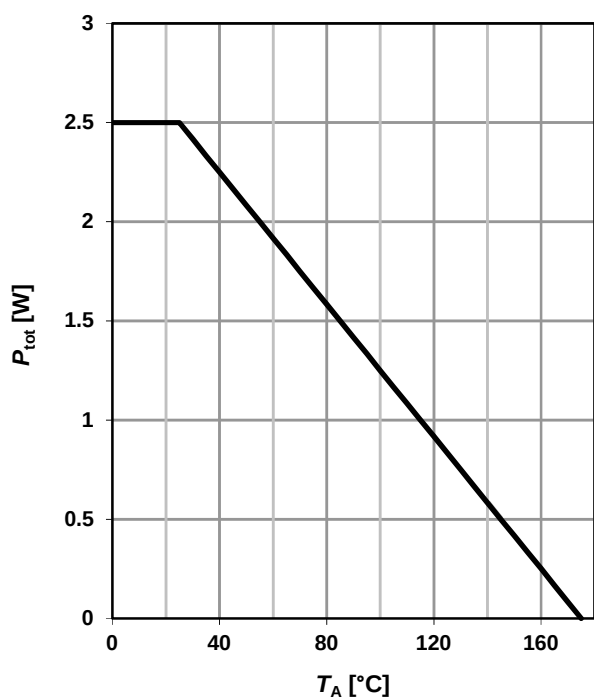
Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	

Reverse Diode

Diode continuous forward current	P	I_S	$T_C=25\text{ °C}$	-	-	-2.1	A
	N					2.3	
Diode pulse current	P	$I_{S,pulse}$		-	-	-13	
	N					20	
Diode forward voltage	P	V_{SD}	$V_{GS}=0\text{ V}, I_F=3.2\text{ A}, T_j=25\text{ °C}$	-	-0.98	-1.2	V
	N		$V_{GS}=0\text{ V}, I_F=5.1\text{ A}, T_j=25\text{ °C}$	-	0.9	1.2	
Reverse recovery time	P	t_{rr}	$V_R=\pm 10\text{ V}, I_F=I_S, di_F/dt=100\text{ A}/\mu\text{s}$		12.2		ns
	N			-	10.9	-	
Reverse recovery charge	P	Q_{rr}			4.6		nC
	N			-	3.4	-	

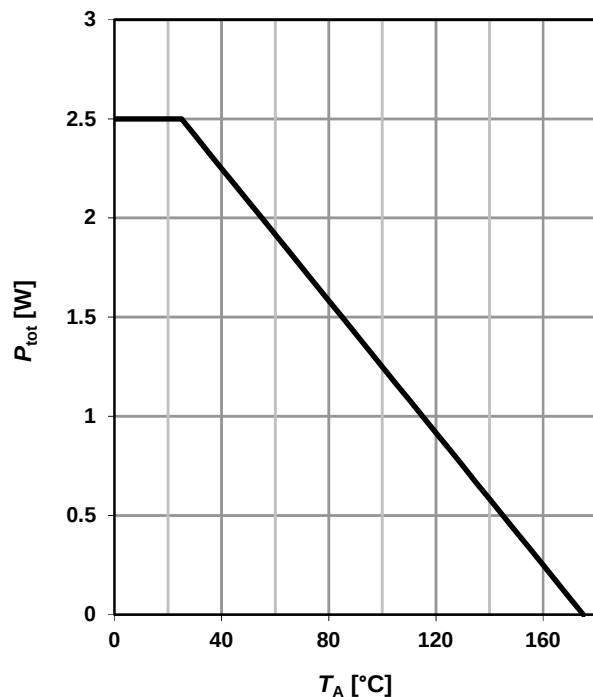
1 Power dissipation (P)

$$P_{\text{tot}} = f(T_A)$$



2 Power dissipation (N)

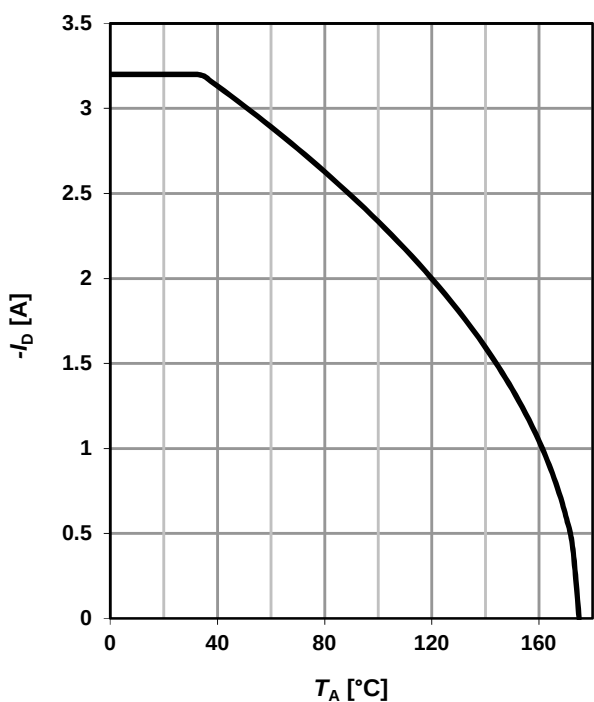
$$P_{\text{tot}} = f(T_A)$$



3 Drain current (P)

$$I_D = f(T_A)$$

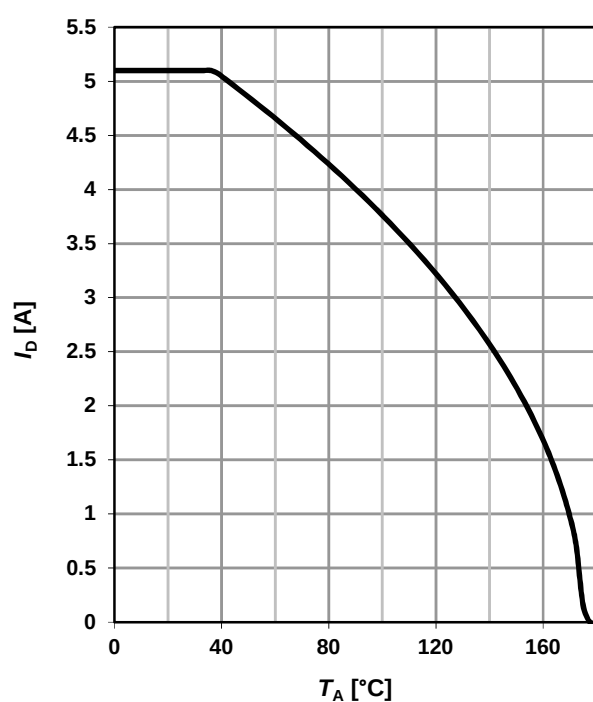
parameter: $V_{GS} \leq -4.5$ V



4 Drain current (N)

$$I_D = f(T_A)$$

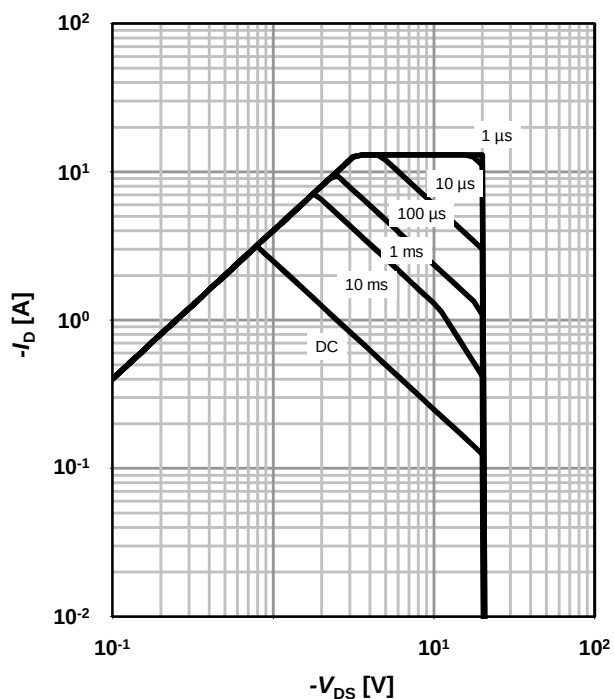
parameter: $V_{GS} \geq 4.5$ V



6 Safe operating area (P)

$$I_D = f(V_{DS}); T_A = 25^\circ\text{C}; D = 0$$

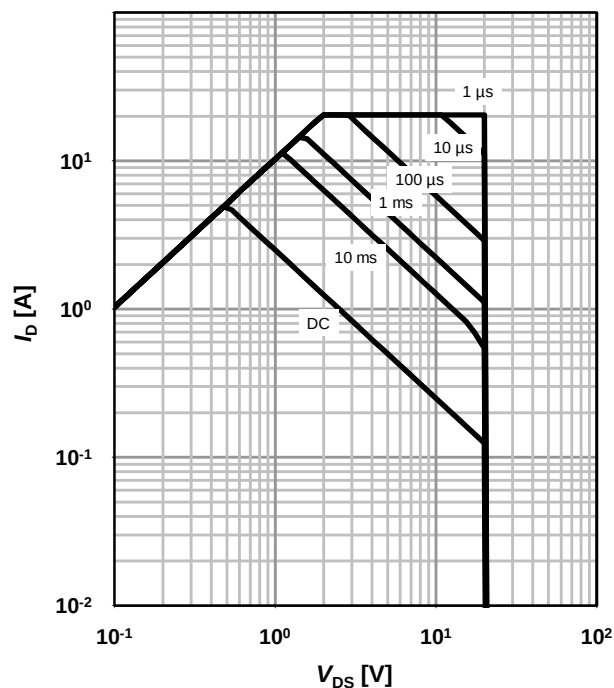
parameter: t_p



6 Safe operating area (N)

$$I_D = f(V_{DS}); T_A = 25^\circ\text{C}; D = 0$$

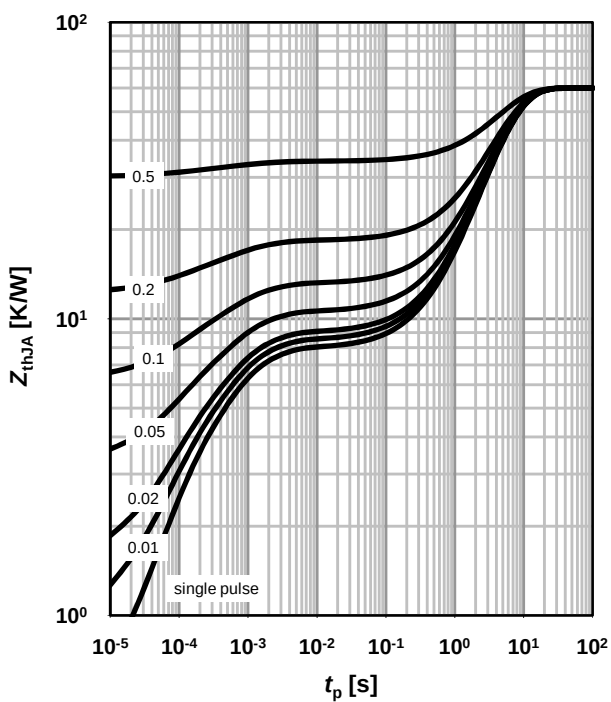
parameter: t_p



7 Max. transient thermal impedance (P)

$$Z_{thJA} = f(t_p)$$

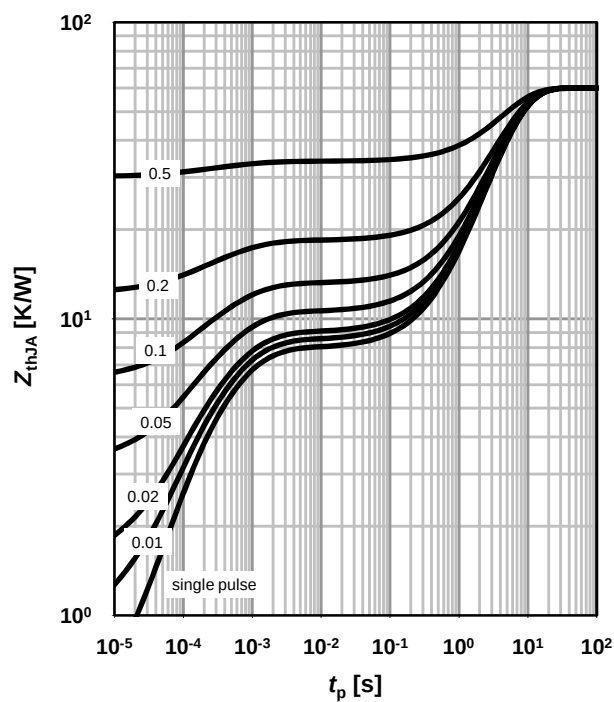
parameter: $D = t_p/T$



8 Max. transient thermal impedance (N)

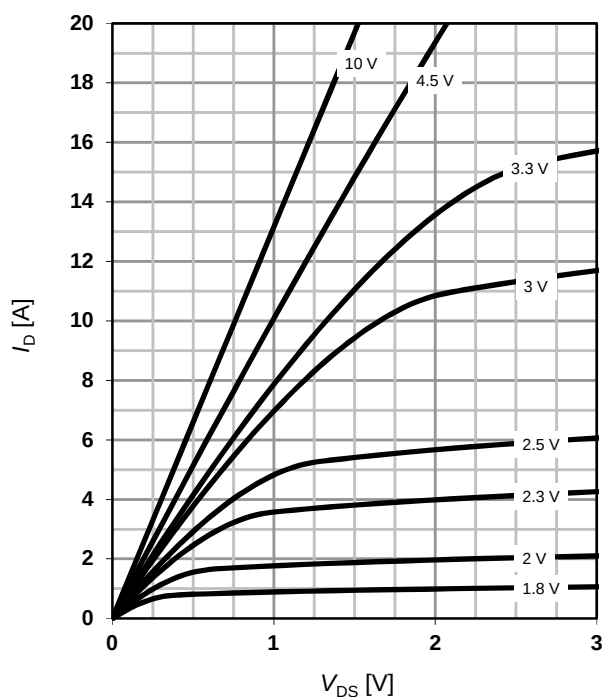
$$Z_{thJA} = f(t_p)$$

parameter: $D = t_p/T$



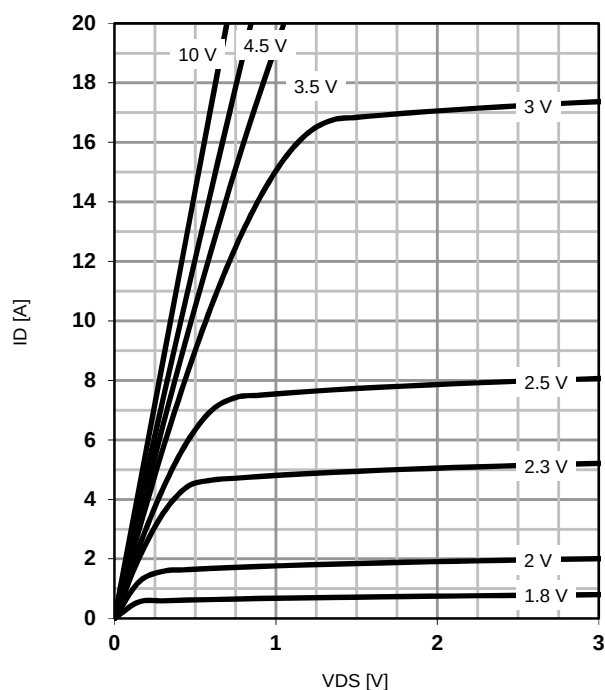
10 Typ. Output characteristics (P)

 $I_D = f(V_{DS}); T_j = 25^\circ\text{C}$

parameter: V_{GS}


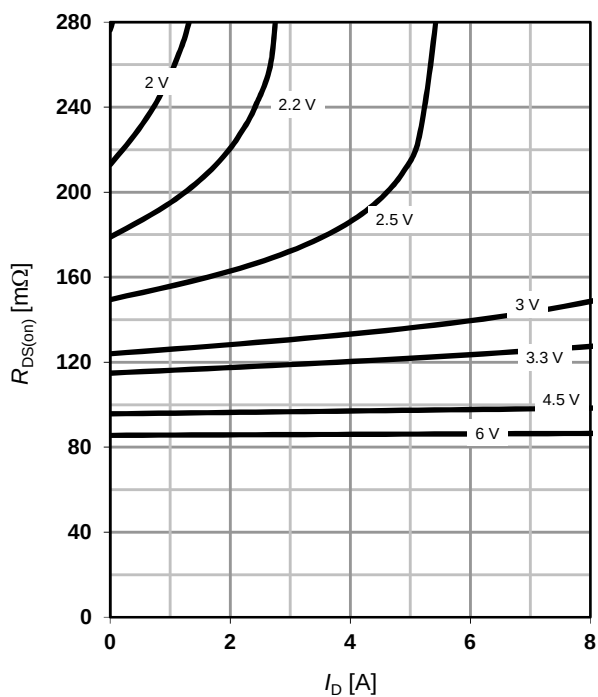
10 Typ. output characteristics (N)

 $I_D = f(V_{DS}); T_j = 25^\circ\text{C}$

parameter: V_{GS}


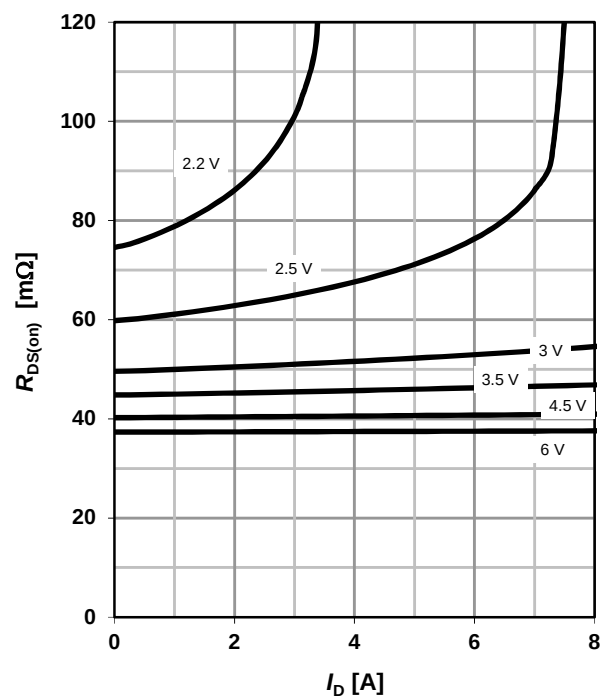
11 Typ. drain-source on resistance (P)

 $R_{DS(on)} = f(I_D); T_j = 25^\circ\text{C}$

parameter: V_{GS}


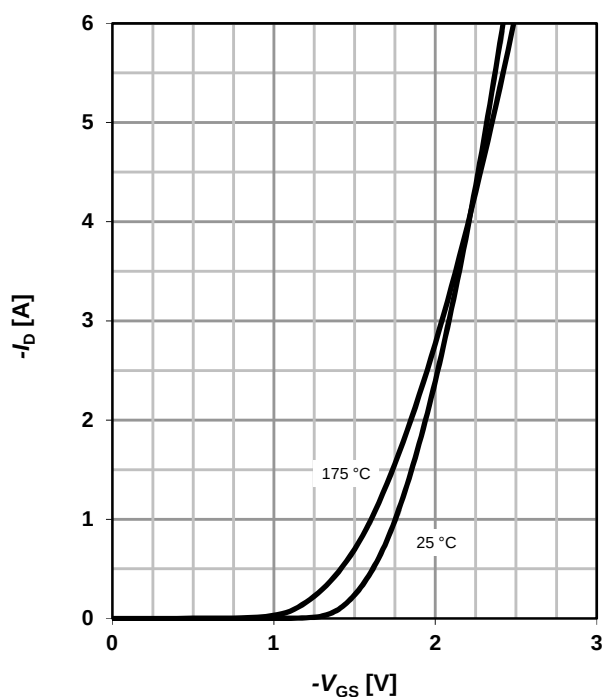
12 Typ. drain-source on resistance (N)

 $R_{DS(on)} = f(I_D); T_j = 25^\circ\text{C}$

parameter: V_{GS}


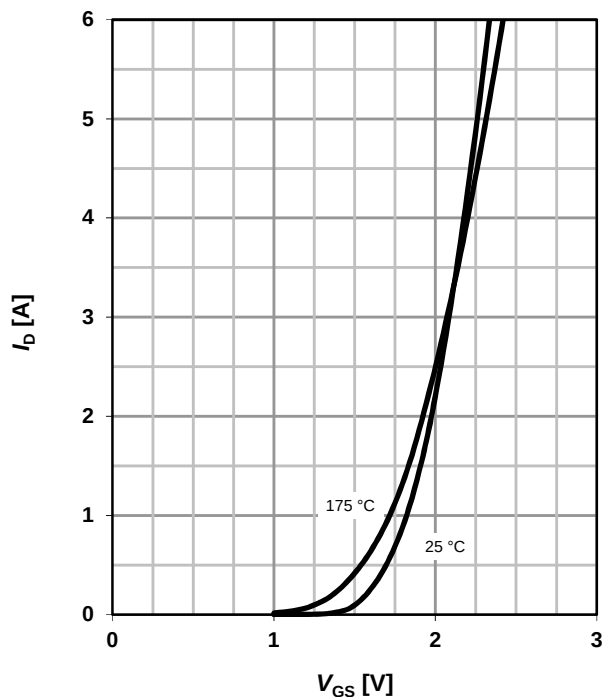
14 Typ. Transfer characteristics (P)

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

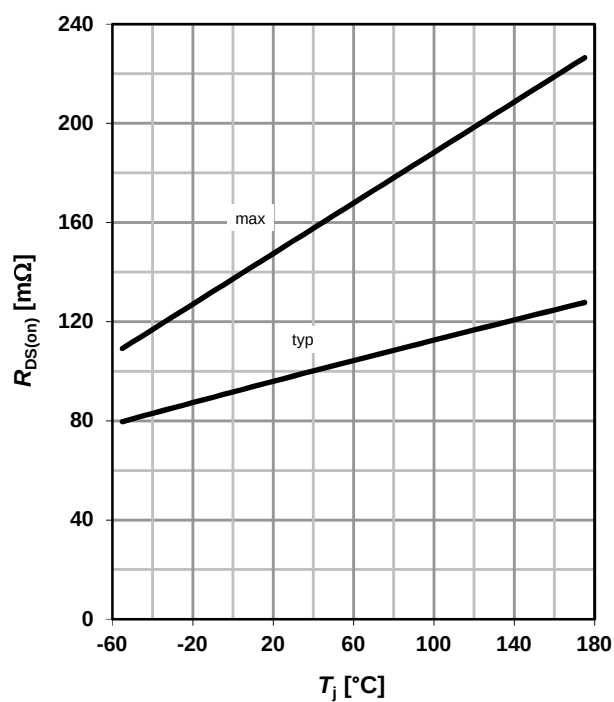
parameter: T_j


14 Typ. transfer characteristics (N)

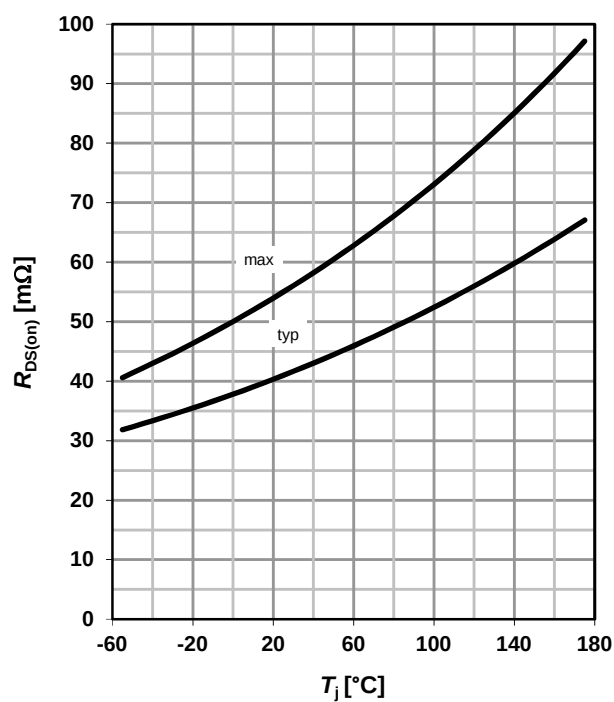
 $I_D = f(V_{GS}); |V_{DS}| > 2 |I_D| R_{DS(on)max}$

parameter: T_j


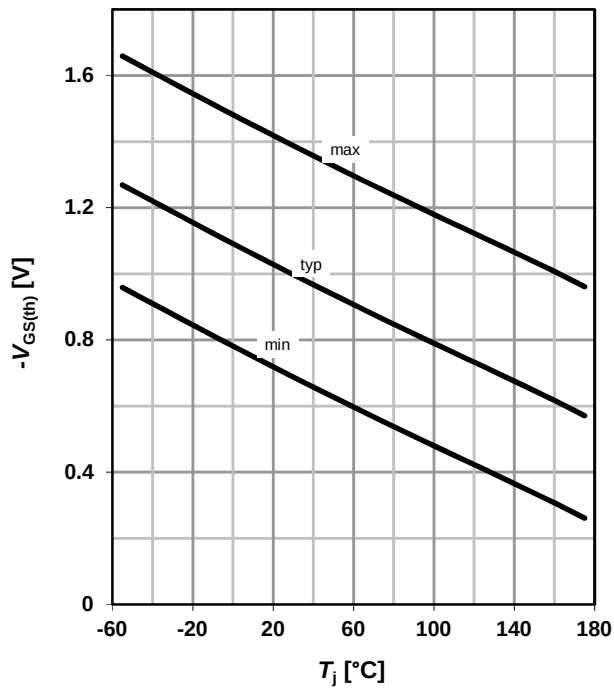
15 Drain-source on-state resistance (P)

 $R_{DS(on)} = f(T_j); I_D = -3.2 \text{ A}; V_{GS} = -4.5 \text{ V}$


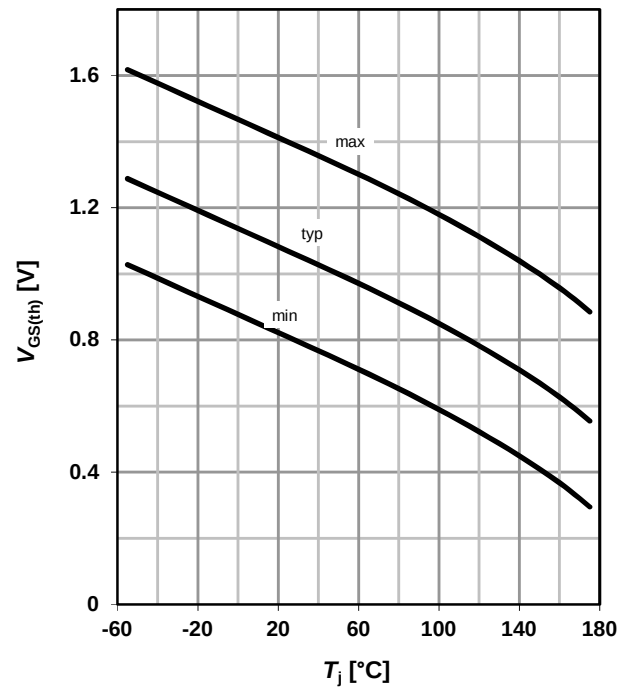
16 Drain-source on-state resistance (N)

 $R_{DS(on)} = f(T_j); I_D = 5.1 \text{ A}; V_{GS} = 4.5 \text{ V}$


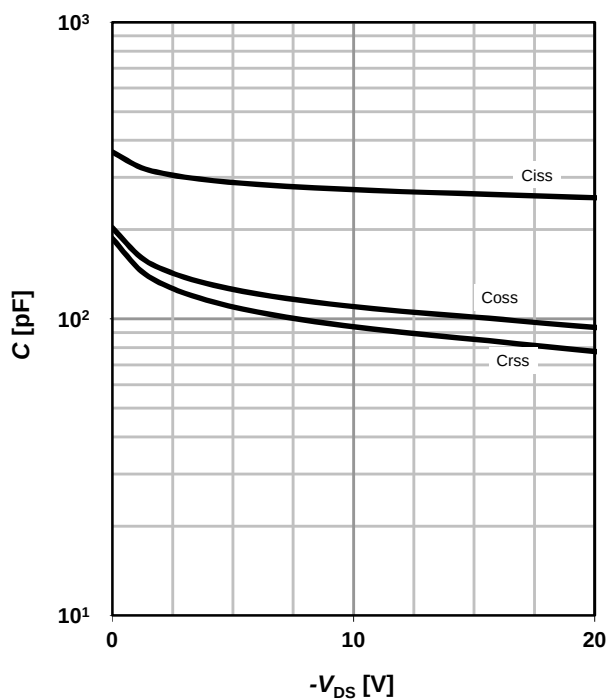
18 Typ. gate threshold voltage (P)

 $V_{GS(th)} = f(T_j); V_{GS} = V_{DS}; I_D = -110 \mu A$


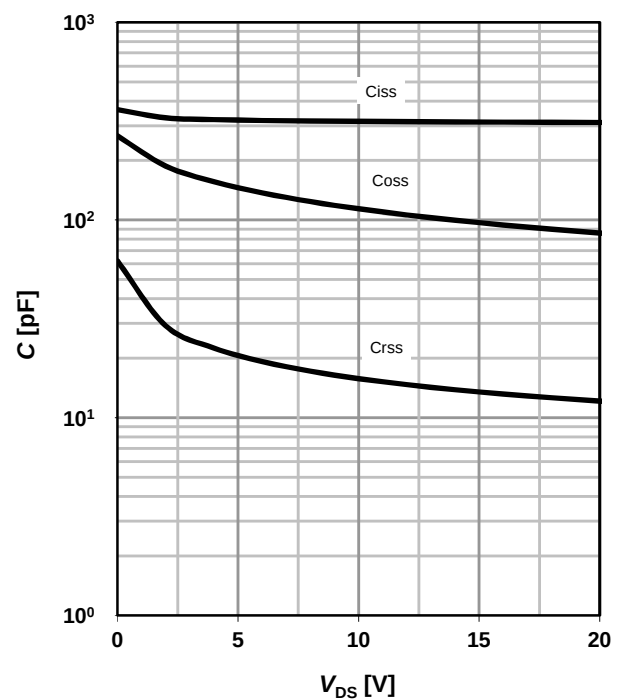
18 Typ. gate threshold voltage (N)

 $V_{GS(th)} = f(T_j); V_{GS} = V_{DS}; I_D = 110 \mu A$


19 Typ. capacitances (P)

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


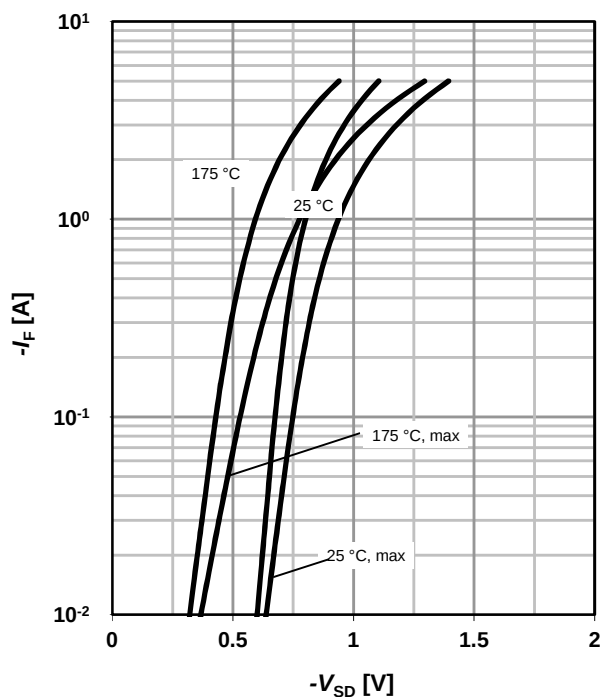
20 Typ. capacitances (N)

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


22 Forward characteristics of reverse diode (P)

$$I_F = f(V_{SD})$$

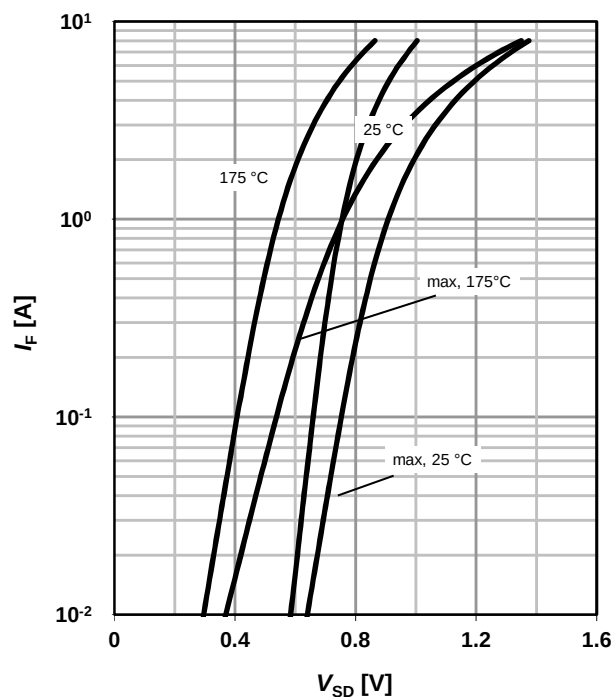
parameter: T_j



22 Forward characteristics of reverse diode (N)

$$I_F = f(V_{SD})$$

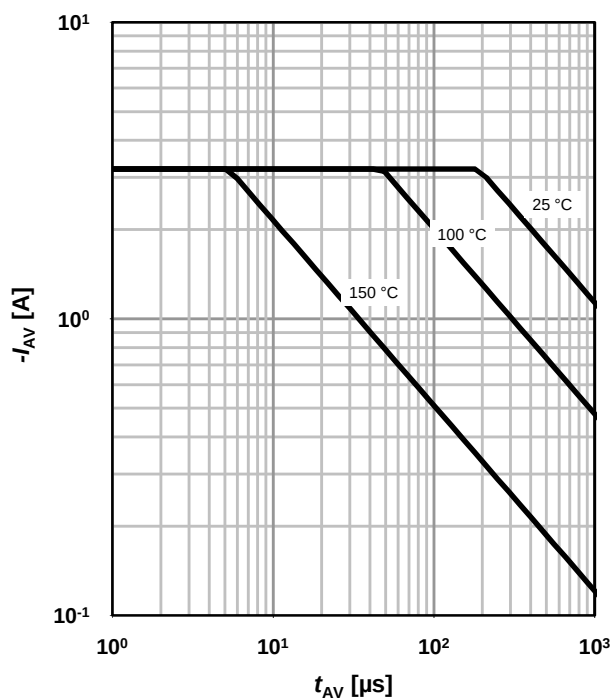
parameter: T_j



23 Avalanche characteristics (P)

$$I_{AS} = f(t_{AV}); R_{GS} = 25 \Omega$$

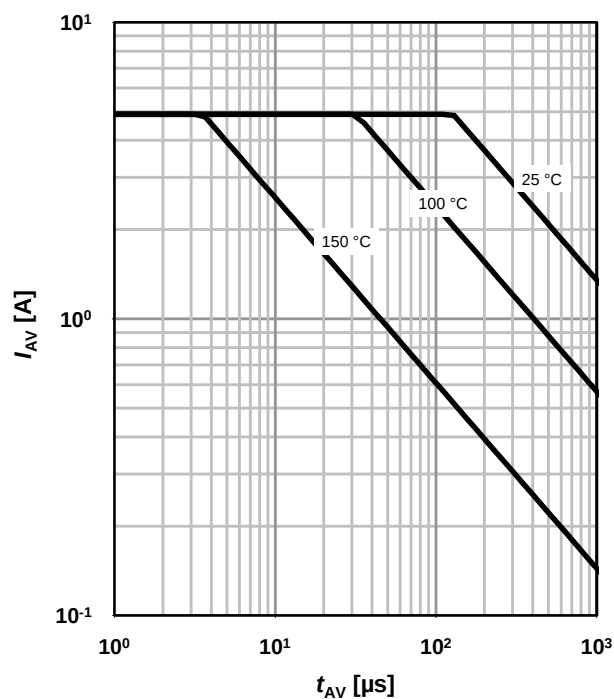
parameter: $T_{j(start)}$



24 Avalanche characteristics (N)

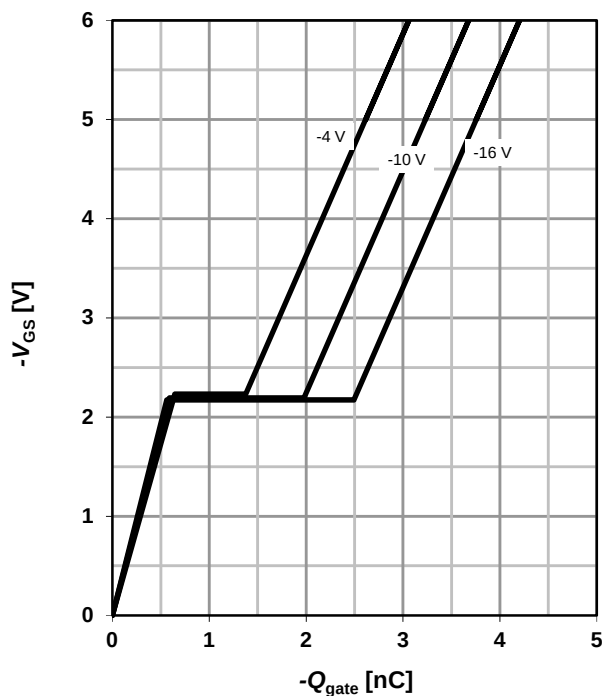
$$I_{AS} = f(t_{AV}); R_{GS} = 25 \Omega$$

parameter: $T_{j(start)}$



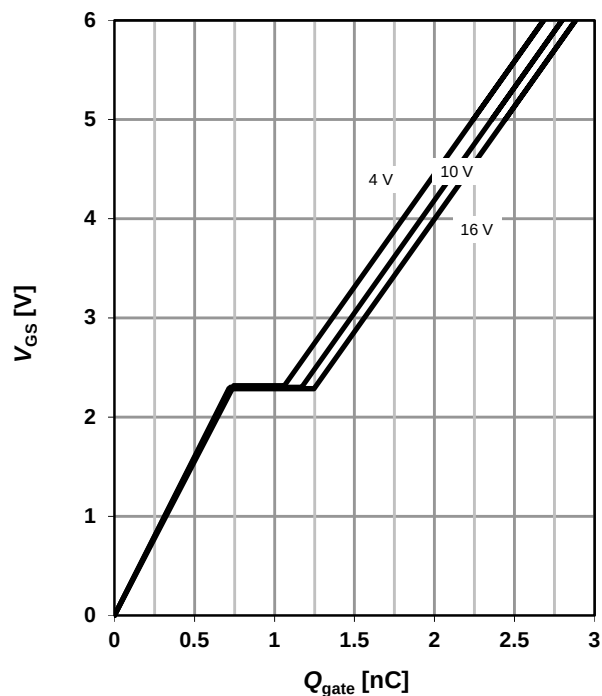
26 Typ. gate charge (P)

 $V_{GS}=f(Q_{gate}); I_D=-3.2A$ pulsed

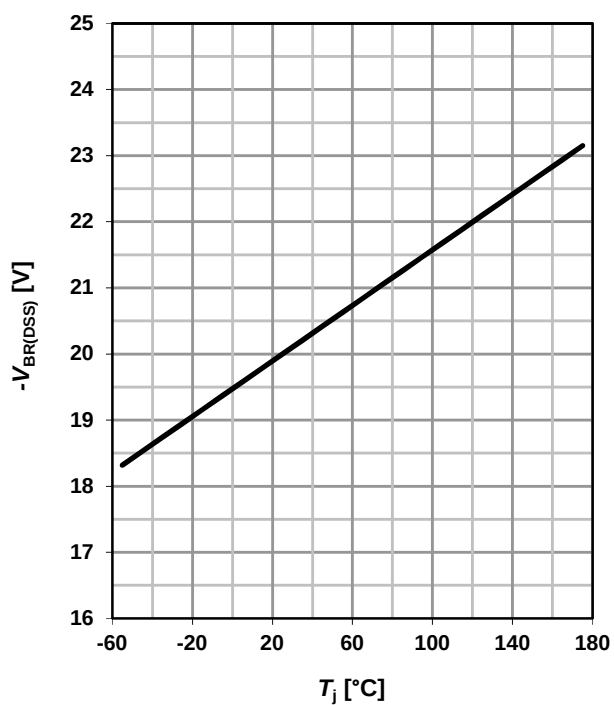
parameter: V_{DD}


26 Typ. gate charge (N)

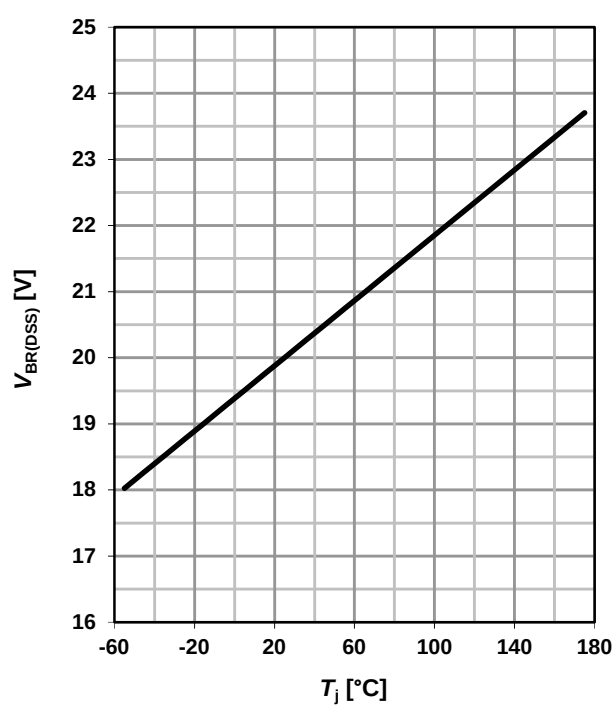
 $V_{GS}=f(Q_{gate}); I_D=5.1A$ pulsed

parameter: V_{DD}


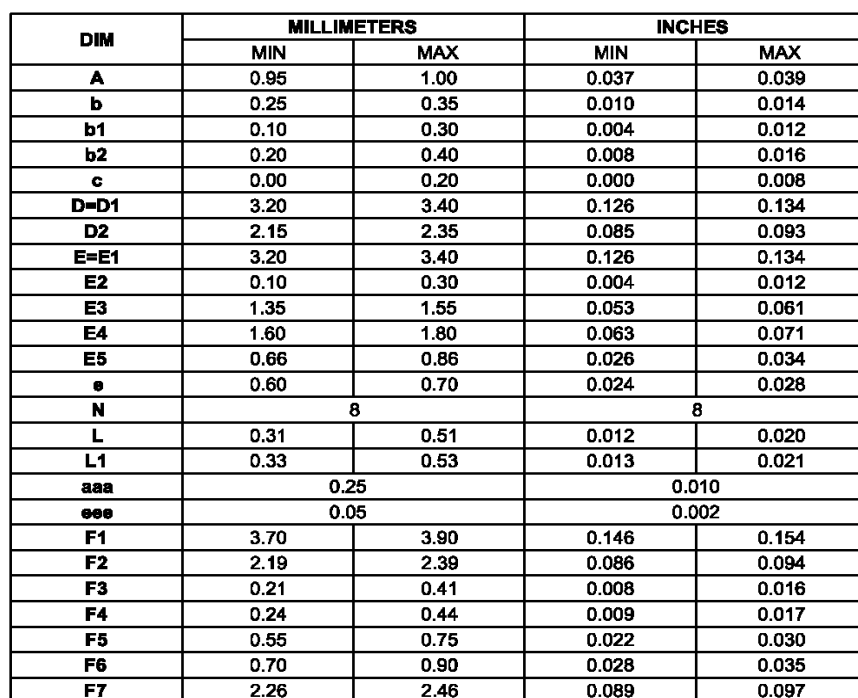
27 Drain-source breakdown voltage (P)

 $V_{BR(DSS)}=f(T_j); I_D=-250 \mu A$


28 Drain-source breakdown voltage (N)

 $V_{BR(DSS)}=f(T_j); I_D=250 \mu A$


PG-TSDSON-8



DOCUMENT NO. Z8B00131645	
SCALE 	
EUROPEAN PROJECTION 	
ISSUE DATE 09-03-2007	
REVISION 01	

Revision History

BSZ15DC02KD H

Revision: 2019-01-30, Rev. 2.3

Previous Revision

Revision	Date	Subjects (major changes since last revision)
2.3	2019-01-30	Update Marking

Trademarks

All referenced product or service names and trademarks are the property of their respective owners.

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

© 2018 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 ("Beschaffenheitsgarantie").

With respect to any examples, hints or any typical values stated herein and/or any information regarding the application of the product, 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.

In addition, any information given in this document is subject to customer's compliance with its obligations stated in this document and any applicable legal requirements, norms and standards concerning customer's products and any use of the product of Infineon Technologies in customer's applications.

The data contained in this document is exclusively intended for technically trained staff. It is the responsibility of customer's technical departments to evaluate the suitability of the product for the intended application and the completeness of the product information given in this document with respect to such application.

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 «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «JONHON», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «FORSTAR».



JONHON

«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели,
кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: ocean@oceanchips.ru

Web: <http://oceanchips.ru/>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А