MOSFET

Metal Oxide Semiconductor Field Effect Transistor

OptiMOS™ Small-Signal-Transistor, 100V

BSL296SN

Data Sheet

Rev. 2.0
Final

Industrial & Multimarket

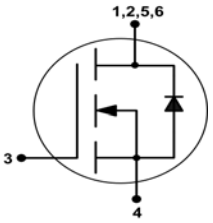
OptiMOS™ Small-Signal-Transistor

Features

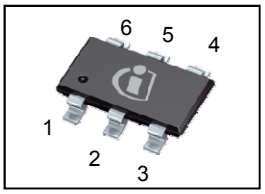
- N-channel
- Enhancement mode
- Logic level (4.5V rated)
- Avalanche rated
- Qualified according to AEC Q101
- RoHS compliant
- Halogen-free according to IEC61249-2-21

Product Summary

V_{DS}		100	V
$R_{DS(on),max}$	V_{GS}=10 V	460	mΩ
	V_{GS}=4.5 V	560	
I_D		1.4	A



PG-TSOP6



Type	Package	Tape and Reel Info	Marking	Halogen Free	Packing
BSL296SN	TSOP6	H6327: 3000 pcs/ reel	sLZ	Yes	Non dry

Maximum ratings, at T_j=25 °C, unless otherwise specified

Parameter	Symbol	Conditions	Value	Unit
Continuous drain current	I_D	T_A=25 °C	1.4	A
		T_A=70 °C	1.1	
Pulsed drain current	$I_{D,pulse}$	T_A=25 °C	5.6	
Avalanche energy, single pulse	E_{AS}	I_D=1.4 A, R_{GS}=25 Ω	15.0	mJ
Reverse diode dv/dt	dv/dt	I_D=1.4 A, V_{DS}=50 V, di/dt=200 A/µs, $T_{j,max}$=150 °C	6	kV/µs
Gate source voltage	V_{GS}		±20	V
Power dissipation[1)]	P_{tot}	T_A=25 °C	2.0	W
Operating and storage temperature	T_j, T_{stg}		-55 ... 150	°C
ESD Class		JESD22-A114 -HBM	0 (<250V)	
Soldering Temperature			260 °C	
IEC climatic category; DIN IEC 68-1			55/150/56	

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Thermal characteristics						
Thermal resistance, junction - soldering point	R_{thJS}		-	-	50	K/W
Thermal resistance junction - ambient	R_{thJA}	minimal footprint	-	-	230	
		6 cm² cooling area[1)]	-	-	62.5	
Electrical characteristics, at T_j=25 °C, unless otherwise specified						
Static characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS}=0 V, I_D=250 µA	100	-	-	V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=Vgs V, I_D=100 µA	0.8	1.4	1.8	
Drain-source leakage current	I_{DSS}	V_{DS}=100 V, V_{GS}=0 V, T_j=25 °C	-	-	0.02	µA
		V_{DS}=100 V, V_{GS}=0 V, T_j=150 °C	-	-	10	
Gate-source leakage current	I_{GSS}	V_{GS}=20 V, V_{DS}=0 V	-	-	10	nA
Drain-source on-state resistance	$R_{DS(on)}$	V_{GS}=4.5 V, I_D=1.4 A	-	357	560	mΩ
		V_{GS}=10 V, I_D=1.26 A	-	314	460	
Transconductance	g_{fs}	$\|V_{DS}\|>2\|I_D\|R_{DS(on)max}$, I_D=1.1 A		3.04	-	S

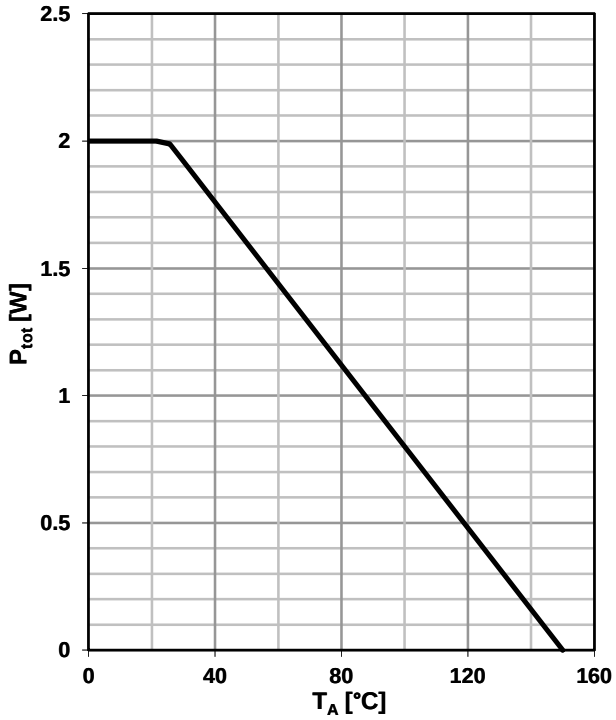
[1)] Device on 40mm x 40mm x 1.5mm epoxy PCB FR4 with 6cm² (one layer, 70µm thick) copper area for drain connection. PCB is vertical in still air. (t < 5 sec.)

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Dynamic characteristics[2]						
Input capacitance	C_{iss}	V_{GS}=0 V, V_{DS}=25 V, f=1 MHz	-	114.8	152.7	pF
Output capacitance	C_{oss}		-	19.7	26.3	
Reverse transfer capacitance	C_{rss}		-	9.8	14.7	
Turn-on delay time	$t_{d(on)}$	V_{DD}=50 V, V_{GS}=10 V, I_D=1.4 A, $R_{G,ext}$=6 Ω	-	3.5	5.6	ns
Rise time	t_r		-	3.0	4.5	
Turn-off delay time	$t_{d(off)}$		-	17.1	25.65	
Fall time	t_f		-	4.5	8.1	
Gate Charge Characteristics[2]						
Gate to source charge	Q_{gs}	V_{DD}=50 V, I_D=1.4 A, V_{GS}=0 to 5 V	-	0.27	0.4	nC
Gate to drain charge	Q_{gd}		-	1.47	2.2	
Gate charge total	Q_g		-	2.7	4.0	
Gate plateau voltage	$V_{plateau}$		-	2.5	-	V
Reverse Diode						
Diode continous forward current	I_S	T_A=25 °C	-	-	1.4	A
Diode pulse current	$I_{S,pulse}$		-	-	5.6	
Diode forward voltage	V_{SD}	V_{GS}=0 V, I_F=1.4 A, T_j=25 °C	-	0.8	1.1	V
Reverse recovery time[2]	t_{rr}	V_R=50 V, I_F=1.4 A, di_F/dt=200 A/µs	-	20	30	ns
Reverse recovery charge[2]	Q_{rr}		-	37	55	nC

[2] Defined by design. Not subjected to production test

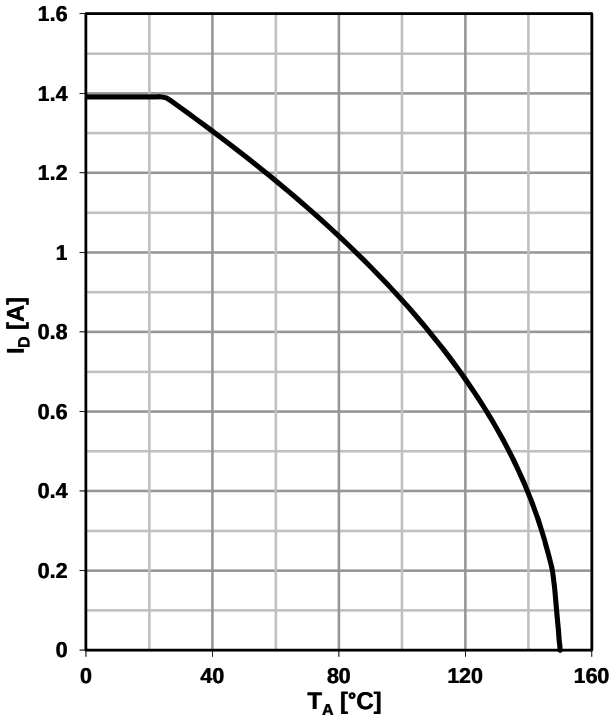
1 Power dissipation

$P_{tot}=f(T_A)$



2 Drain current

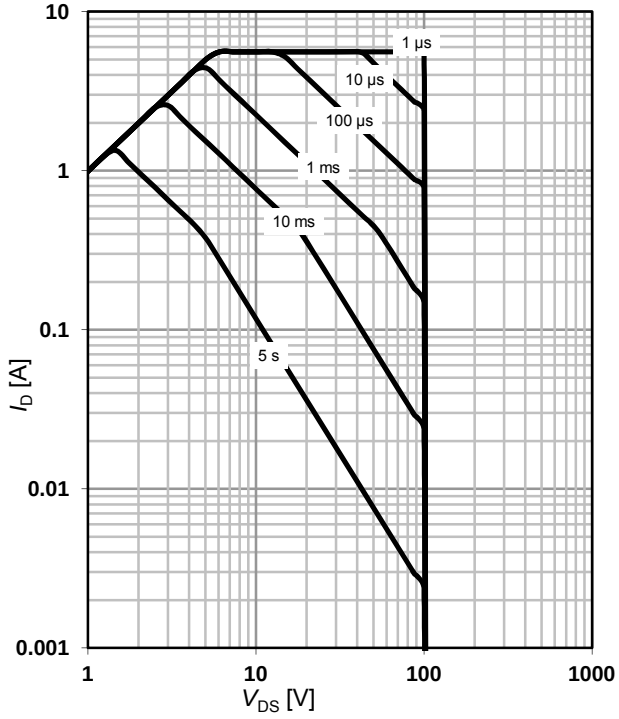
$I_D=f(T_A)$; $V_{GS}\geq 10$ V



3 Safe operating area

$I_D=f(V_{DS})$; T_A=25 °C; D=0

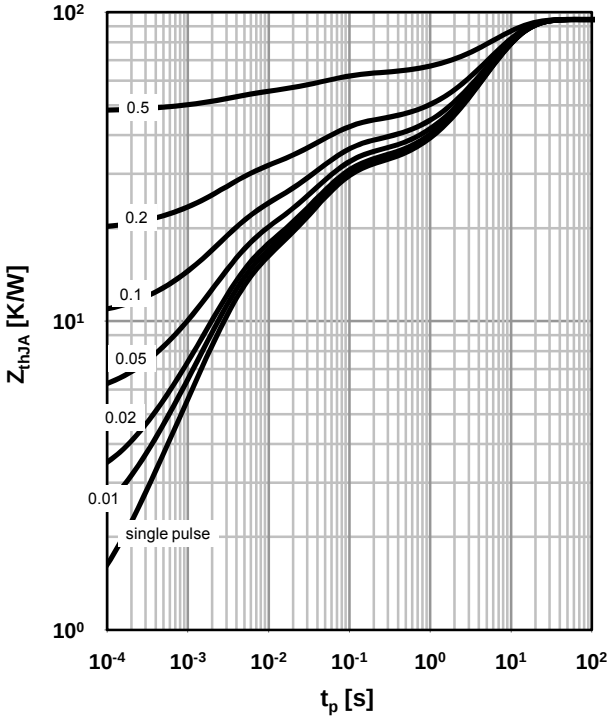
parameter: t_p



4 Max. transient thermal impedance

$Z_{thJA}=f(t_p)$

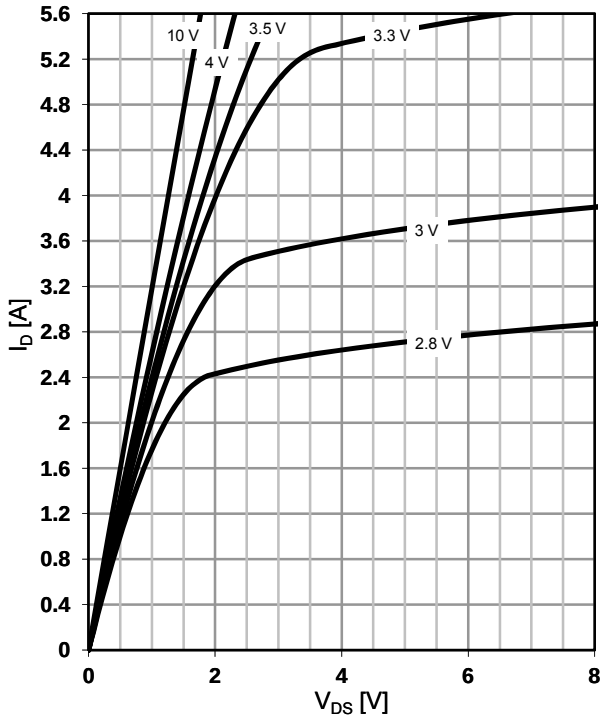
parameter: $D=t_p/T$



5 Typ. output characteristics

$I_D=f(V_{DS})$; $T_j=25$ °C

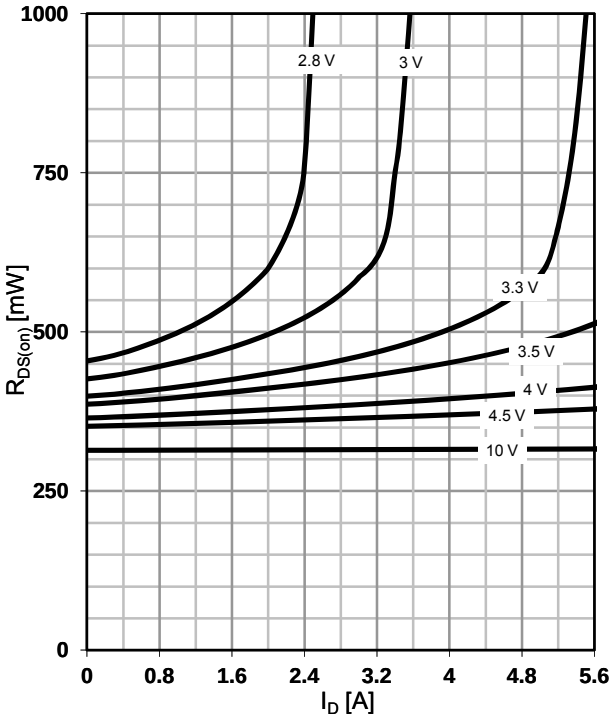
parameter: V_{GS}



6 Typ. drain-source on resistance

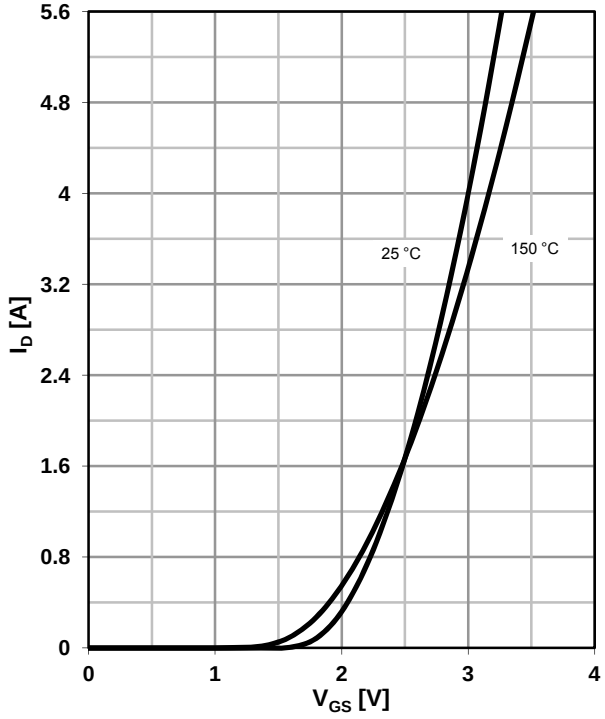
$R_{DS(on)}=f(I_D)$; $T_j=25$ °C

parameter: V_{GS}



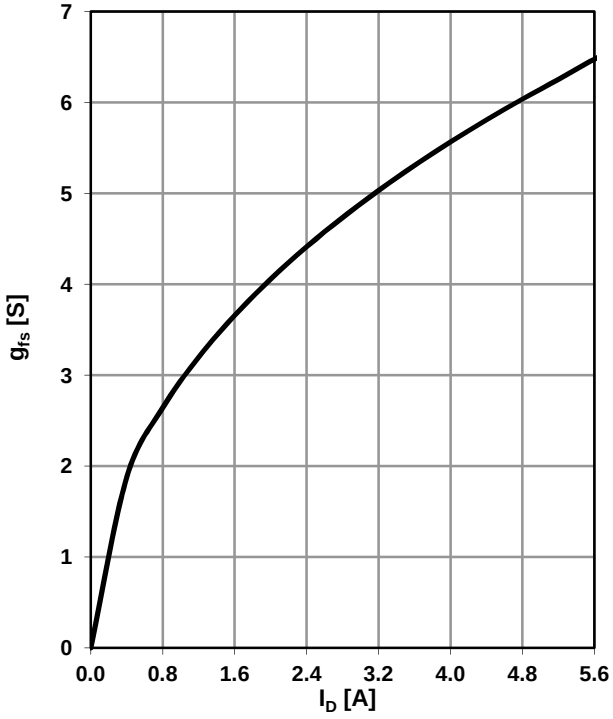
7 Typ. transfer characteristics

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



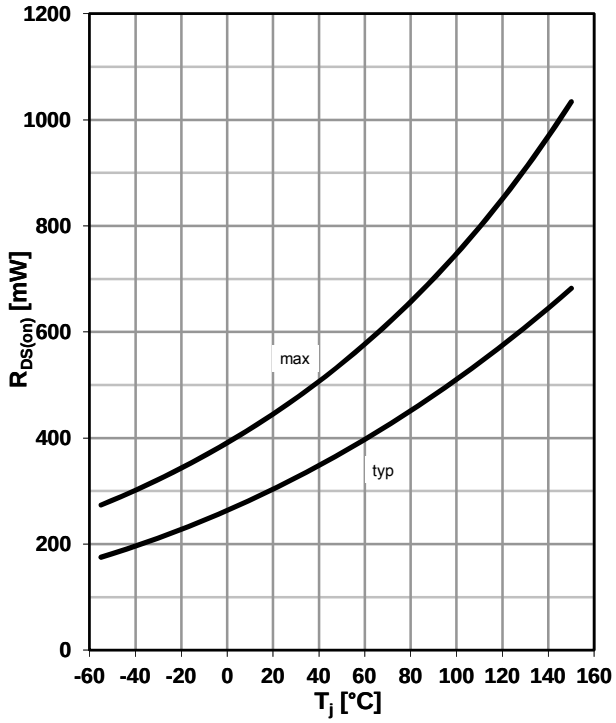
8 Typ. forward transconductance

$g_{fs}=f(I_D)$; $T_j=25$ °C



9 Drain-source on-state resistance

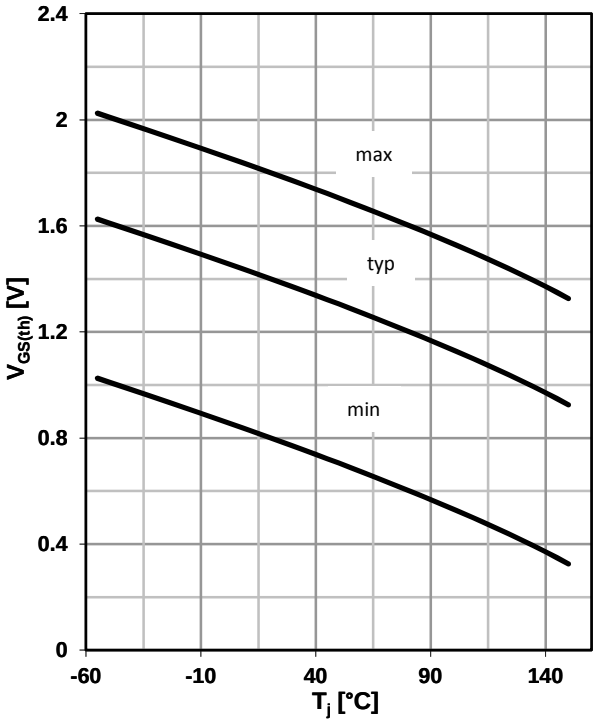
$R_{DS(on)}=f(T_j)$; I_D=1.4 A; V_{GS}=10 V



10 Typ. gate threshold voltage

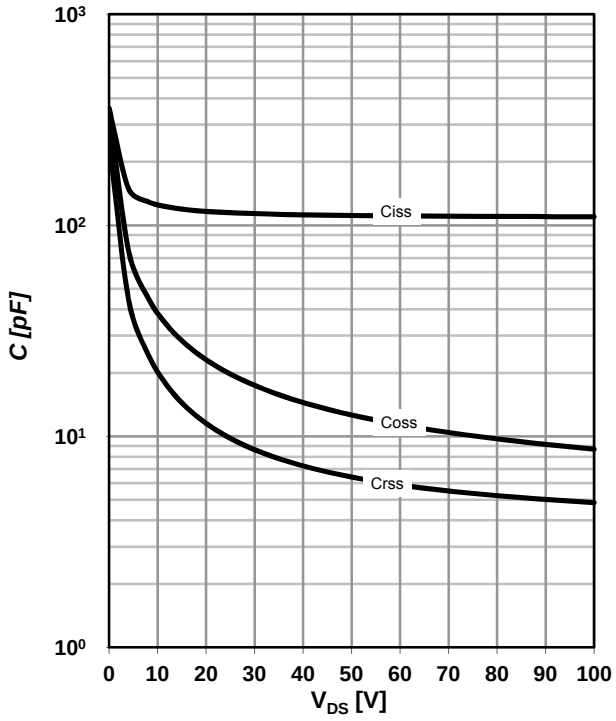
$V_{GS(th)}=f(T_j)$; $V_{DS}=V_{GS}$; I_D=100 µA

parameter: I_D



11 Typ. capacitances

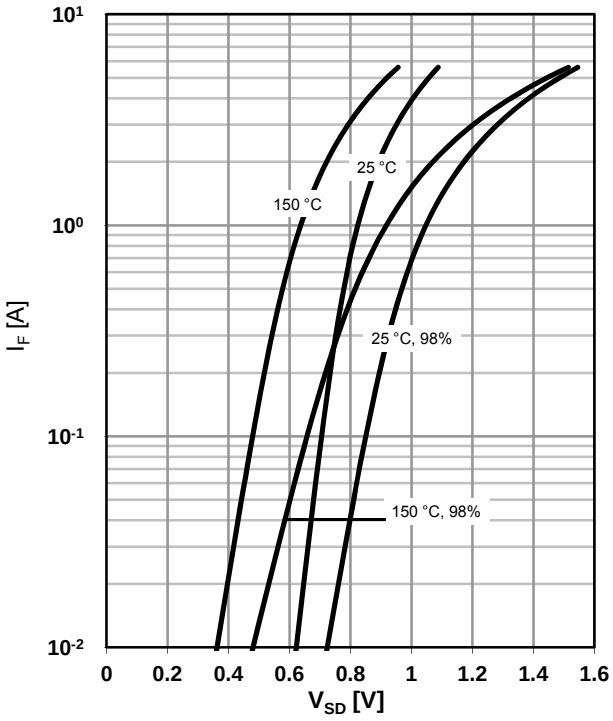
$C=f(V_{DS})$; V_{GS}=0 V; f=1 MHz; T_j=25°C



12 Forward characteristics of reverse diode

$I_F=f(V_{SD})$

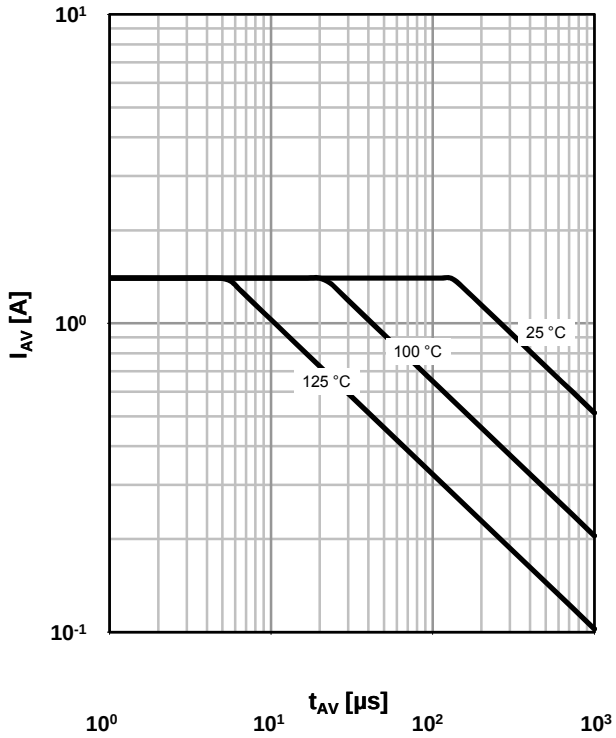
parameter: T_j



13 Avalanche characteristics

I_{AS}=f(t_{AV}); R_{GS}=25 Ω

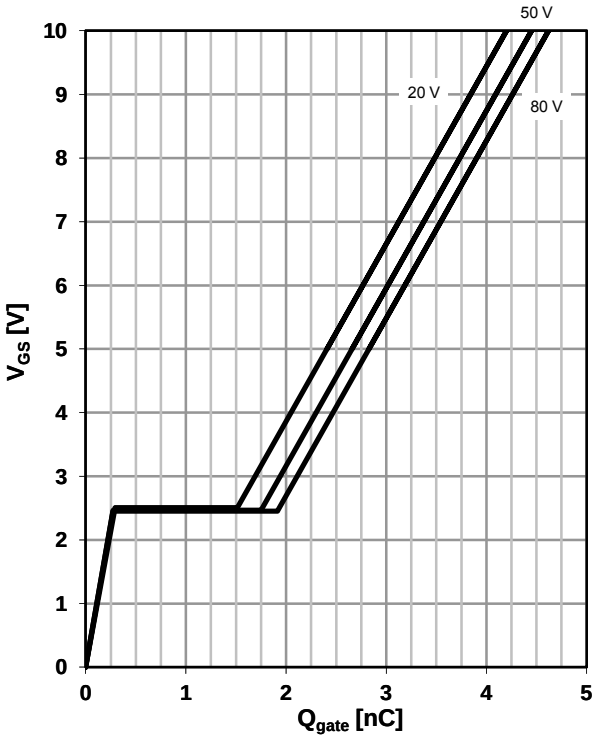
parameter: $T_{j(start)}$



14 Typ. gate charge

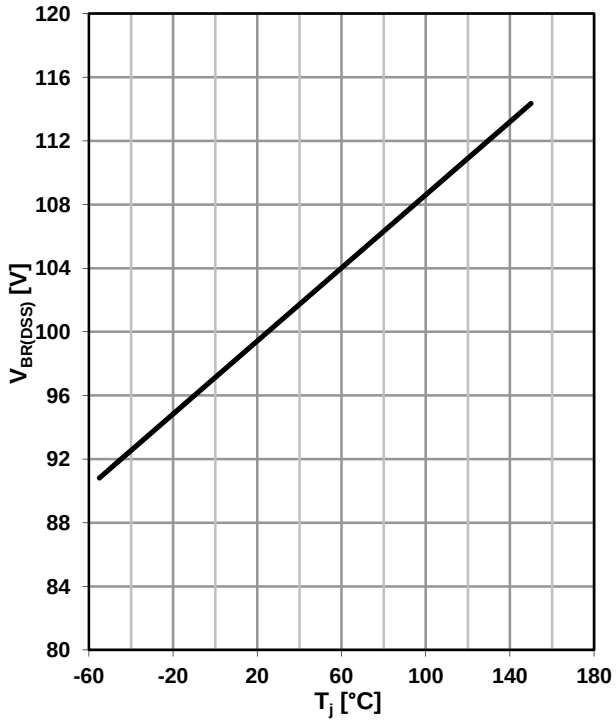
V_{GS}=f(Q_{gate}); I_D=1.4 A pulsed

parameter: V_{DD}

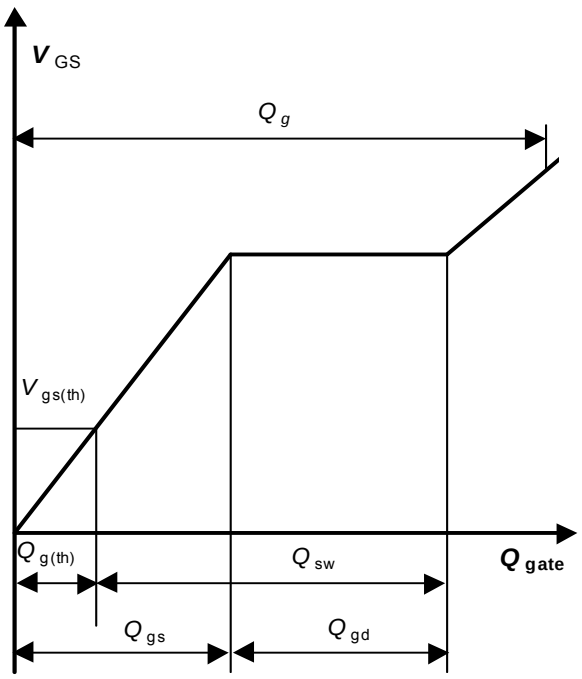


15 Drain-source breakdown voltage

$V_{BR(DSS)}$=f(T_j); I_D=250 µA

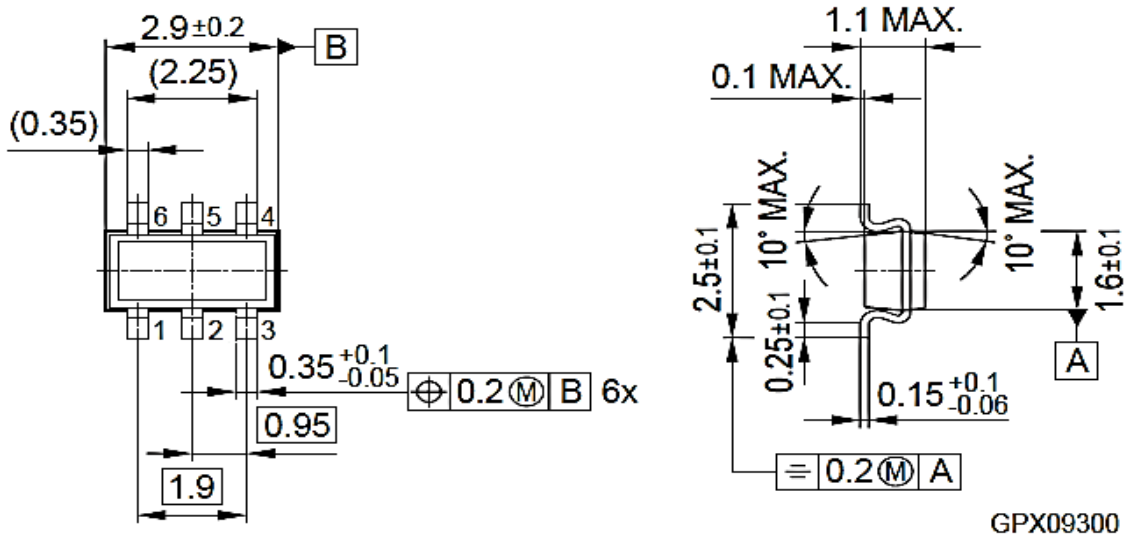


16 Gate charge waveforms

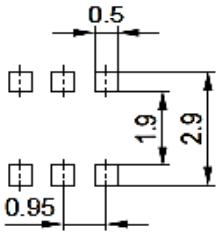


TSOP6

Package Outline:



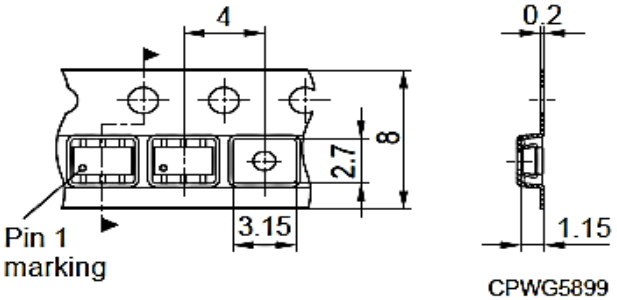
Footprint:



Remark: Wave soldering possible dep. on customers process conditions

HLG09283

Packaging:



Dimensions in mm

Note: For symmetric types there is no defined Pin 1 orientation in the reel.

Revision History

BSL296SN

Revision: 2014-10-22, Rev. 2.0

Previous Revision		
Revision	Date	Subjects (major changes since last revision)
2.0	2014-10-22	Release of final version

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Published by
Infineon Technologies AG
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