Mosfet

Metal Oxide Semiconductor Field Effect Transistor

OptiMOS™ Power-Transistor, -30V

BSL305SPE

Data Sheet

Rev. 2.0
Final

Industrial & Multimarket

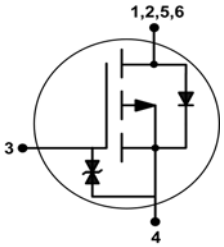
OptiMOS™-P 3 Small-Signal-Transistor

Features

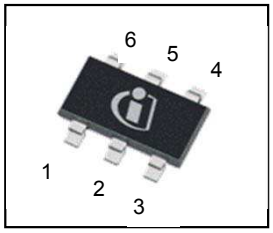
- P-channel
- Enhancement mode
- Logic level (4.5V rated)
- ESD protected
- Avalanche rated
- Qualified according to AEC Q101
- 100% Lead-free; RoHS compliant, Halogen-free

Product Summary

V_{DS}		-30	V
$R_{DS(on),max}$	V_{GS}=-10 V	45	mΩ
	V_{GS}=-4.5 V	80	
I_D		-5.3	A



PG-TSOP-6



Type	Package	Tape and Reel Information	Marking	Halogen Free	Packing
BSL305SPE	PG-TSOP-6	H6327: 3000 pcs/ reel	sPU	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	-5.3	A
		T_A=70 °C	-4.2	
Pulsed drain current	$I_{D,pulse}$	T_A=25 °C	-21.2	
Avalanche energy, single pulse	E_{AS}	I_D=-5.3A, R_{GS}=25 Ω	20	mJ
Reverse diode dv/dt	dv/dt	I_D=-5.3 A, V_{DS}=-15 V, di/dt=100A/µs, $T_{j,max}$=150 °C	6	kV/µs
Gate source voltage	V_{GS}		±20	V
Power dissipation	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	1C (1KV to 2kV)	V
Soldering Temperature			260 °C	°C
IEC climatic category; DIN IEC 68-1			55/150/56	°C

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Thermal characteristics						
Thermal resistance, junction - minimal footprint	R_{thJS}		-	-	50	K/W
SMD version, device on PCB	R_{thJA}	minimal footprint	-	-	230	
		6 cm^2 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}= 0V, I_D=-250µA	-30	-	-	V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=0V, I_D=-20µA	-2	-1.50	-1	
Drain-source leakage current	I_{DSS}	V_{DS}=-30V, V_{GS}=0 V, T_j=25 °C	-	-	-0.1	µA
		V_{DS}=-30V, V_{GS}=0V, T_j=150 °C	-	-	-20	
Gate-source leakage current	I_{GSS}	V_{GS}=-20V, V_{DS}=0V	-	-	-5	µA
Drain-source on-state resistance	$R_{DS(on)}$	V_{GS}=-4.5 V, I_D=-4.3 A	-	49	80	mΩ
		V_{GS}=-10 V, I_D=-5.3 A	-	34	45	
Transconductance	g_{fs}	$\|V_{DS}\|>2\|I_D\|R_{DS(on)max}$, I_D=-4.2 A		10.0	-	S

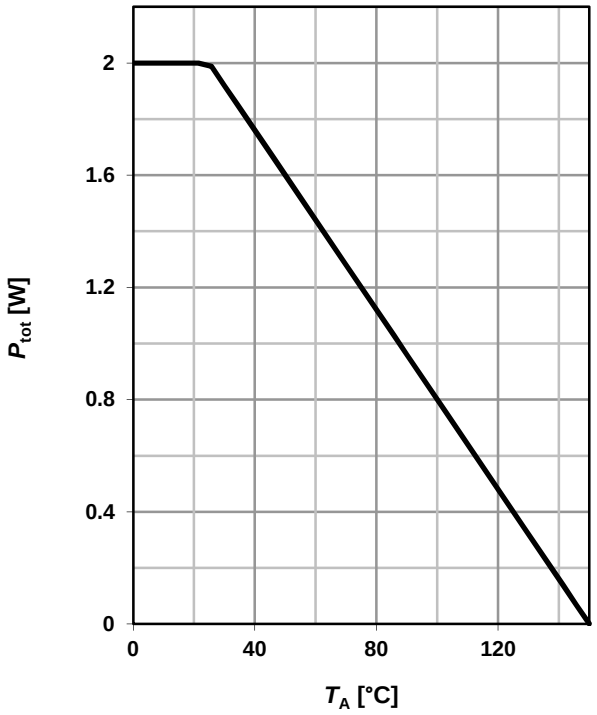
[1)] Device on 40 mm x 40 mm x 1.5 mm epoxy PCB FR4 with 6 cm^2 (single layer, 70 µm thick) copper area for drain connection. PCB is vertical in still air. (t < 5 sec.)

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Dynamic characteristics[2]						
Input capacitance	C_{iss}	V_{GS}=0 V, V_{DS}=-15 V, f=1 MHz	-	706	939	pF
Output capacitance	C_{oss}		-	338	449	
Reverse transfer capacitance	C_{rss}		-	22	34	
Turn-on delay time	$t_{d(on)}$	V_{DD}=-15V, V_{GS}=-10 V, I_D=-5.3 A, $R_{G,ext}$=6 Ω	-	6.4	9.6	ns
Rise time	t_r		-	8.0	12.0	
Turn-off delay time	$t_{d(off)}$		-	20.5	30.8	
Fall time	t_f		-	5.1	7.7	
Gate Charge Characteristics[2]						
Gate to source charge	Q_{gs}	V_{DD}=-15 V, I_D=-5.3 A, V_{GS}=0 to -10 V	-	2.3	3.0	nC
Gate to drain charge	Q_{gd}		-	1.1	1.6	
Gate charge total	Q_g		-	9.4	14.0	
Gate plateau voltage	$V_{plateau}$		-	3.2	-	V
Reverse Diode						
Diode continous forward current	I_S	T_A=25 °C	-	-	-5.3	A
Diode pulse current	$I_{S,pulse}$		-	-	-21.2	
Diode forward voltage	V_{SD}	V_{GS}=0 V, I_F=-5.3 A, T_j=25 °C	-	-0.9	-1.1	V
Reverse recovery time[2]	t_{rr}	V_R=-15 V, I_F=-5.3 A, di_F/dt =100 A/µs	-	23	-	ns
Reverse recovery charge[2]	Q_{rr}		-	17	-	nC

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

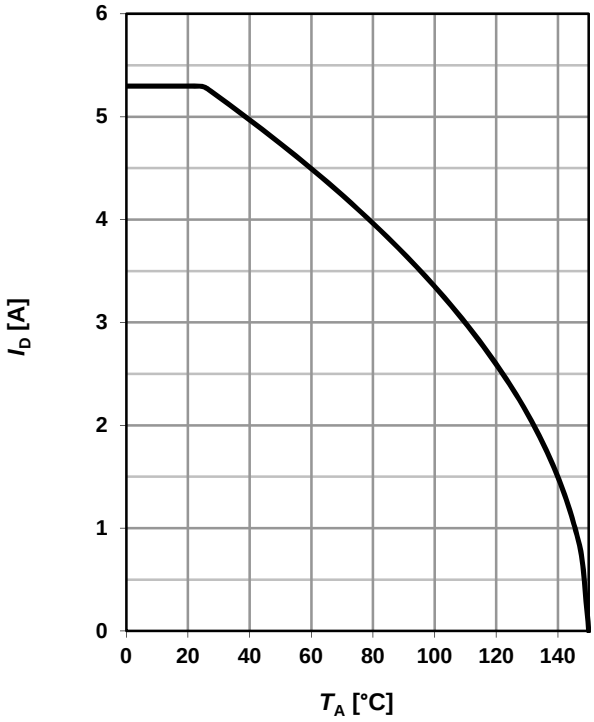
1 Power dissipation

$P_{tot}=f(T_A)$



2 Drain current

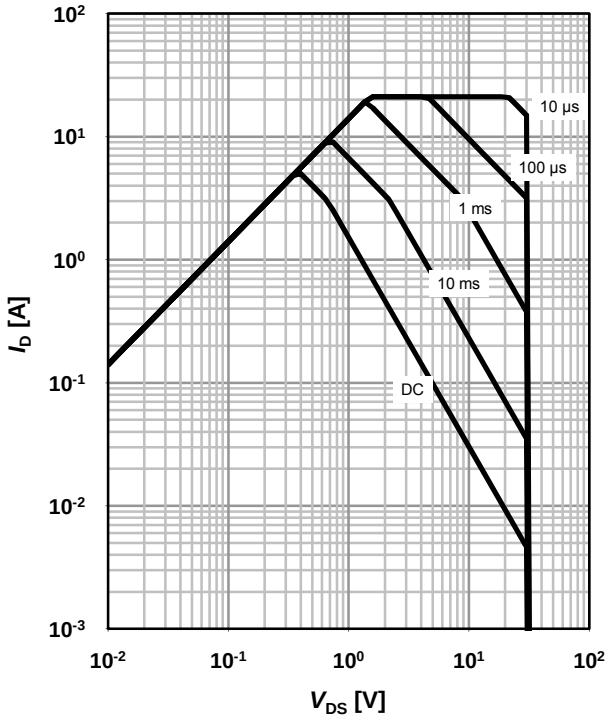
$I_D=f(T_A)$; $V_{GS}\geq$-10 V



3 Safe operating area

$I_D=f(V_{DS})$; T_A=25 °C; D=0

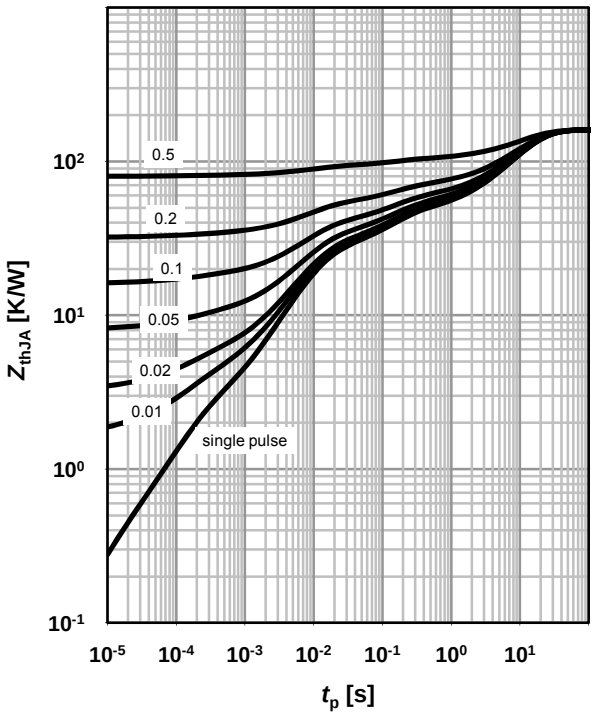
parameter: t_p



4 Max. transient thermal impedance

$Z_{thJA}=f(t_p)$

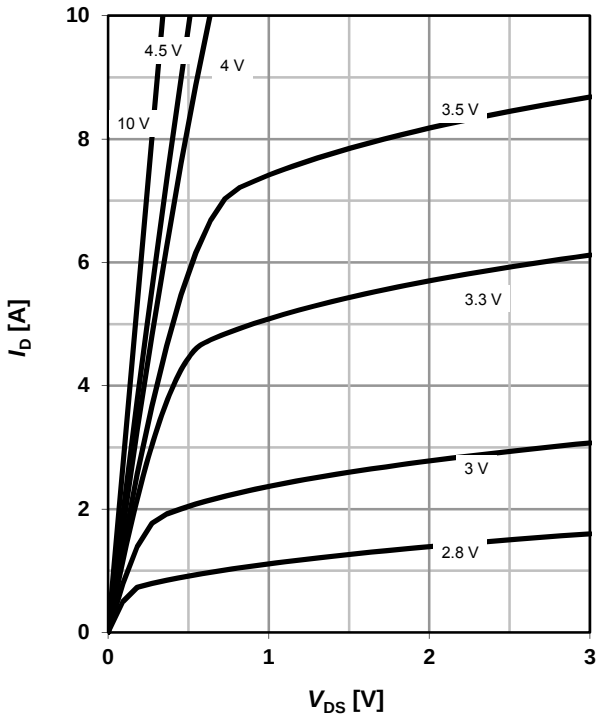
parameter: $D=t_p/T$



5 Typ. output characteristics

I_D=f(V_{DS}); T_j=25 °C

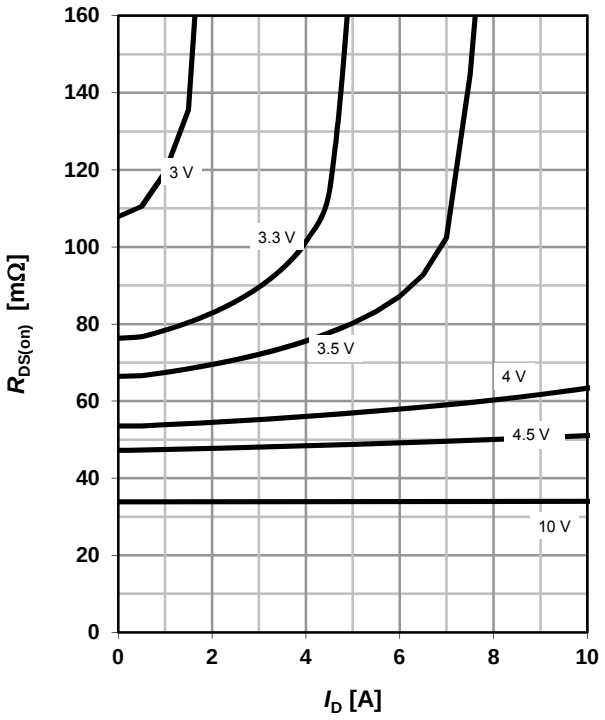
parameter: V_{GS}



6 Typ. drain-source on resistance

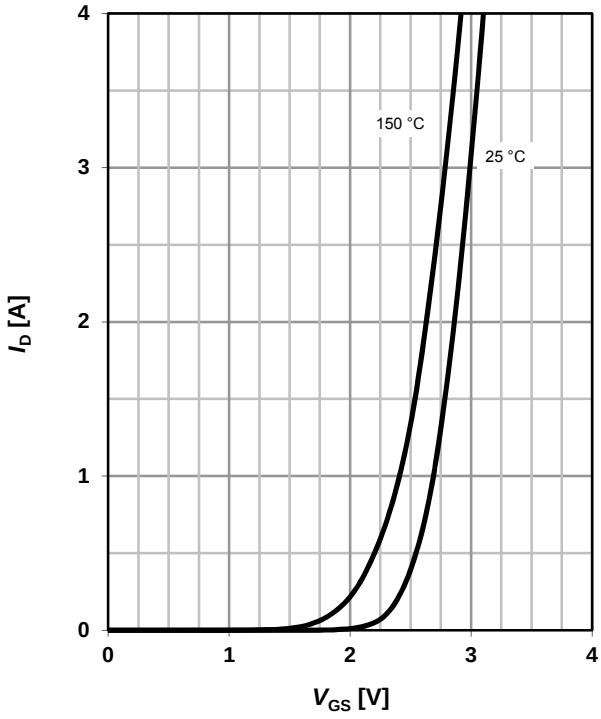
$R_{DS(on)}$=f(I_D); T_j=25 °C

parameter: V_{GS}



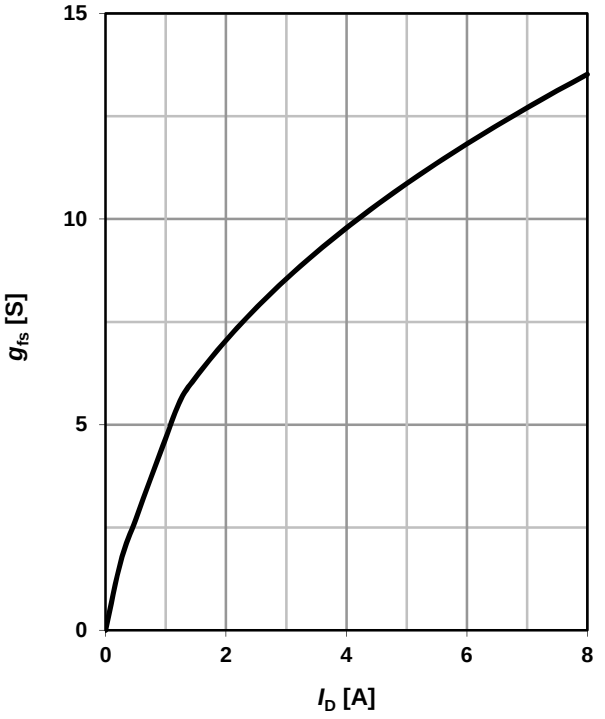
7 Typ. transfer characteristics

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



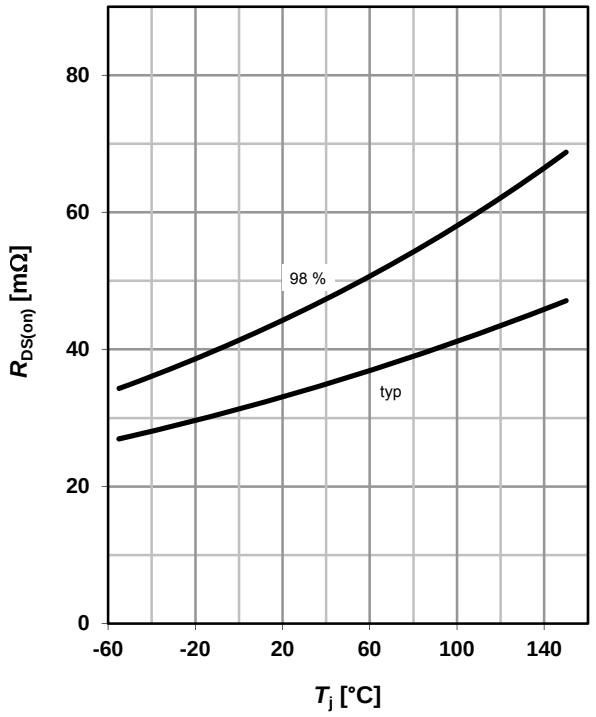
8 Typ. forward transconductance

g_{fs}=f(I_D); T_j=25 °C



9 Drain-source on-state resistance

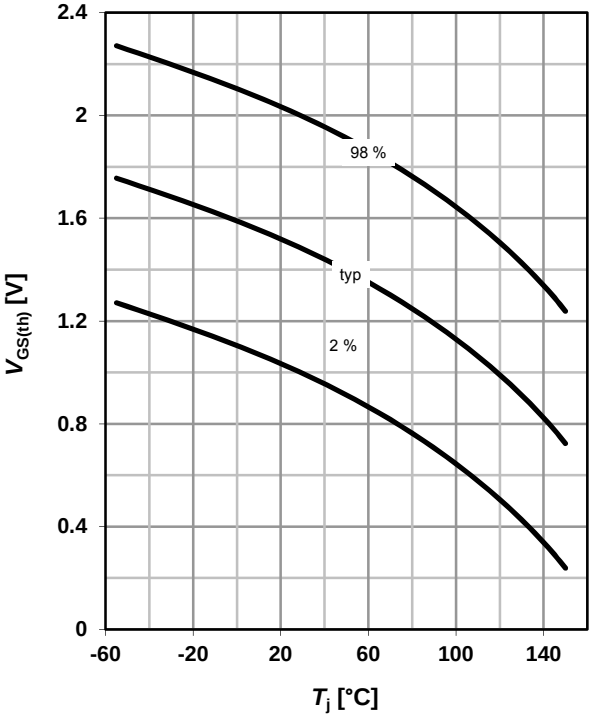
$R_{DS(on)}$=f(T_j); I_D=-5.3 A; V_{GS}=-10 V



10 Typ. gate threshold voltage

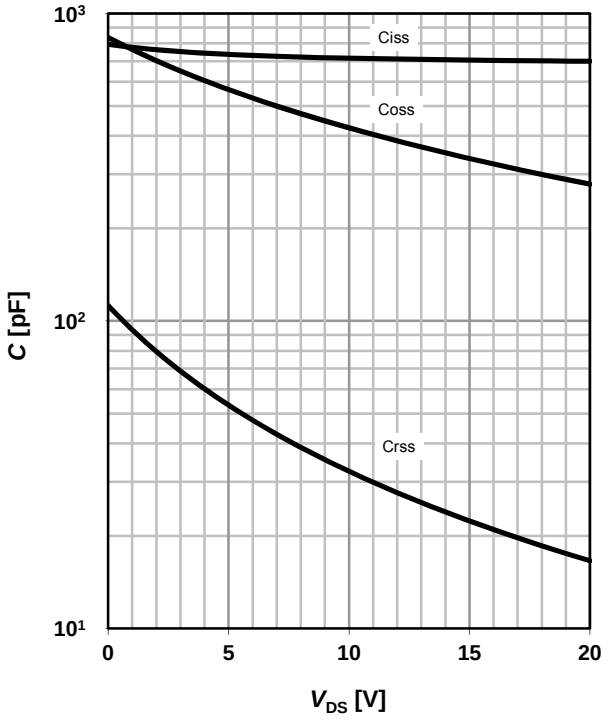
$V_{GS(th)}$=f(T_j); V_{DS}=V_{GS}; I_D=-20 µA

parameter: I_D



11 Typ. capacitances

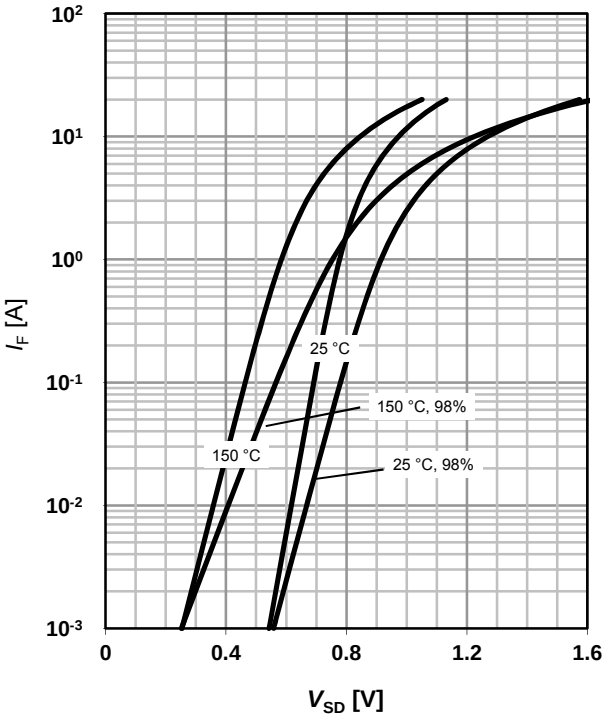
C=f(V_{DS}); V_{GS}=0 V; f=1 MHz; T_j=25°C



12 Forward characteristics of reverse diode

I_F=f(V_{SD})

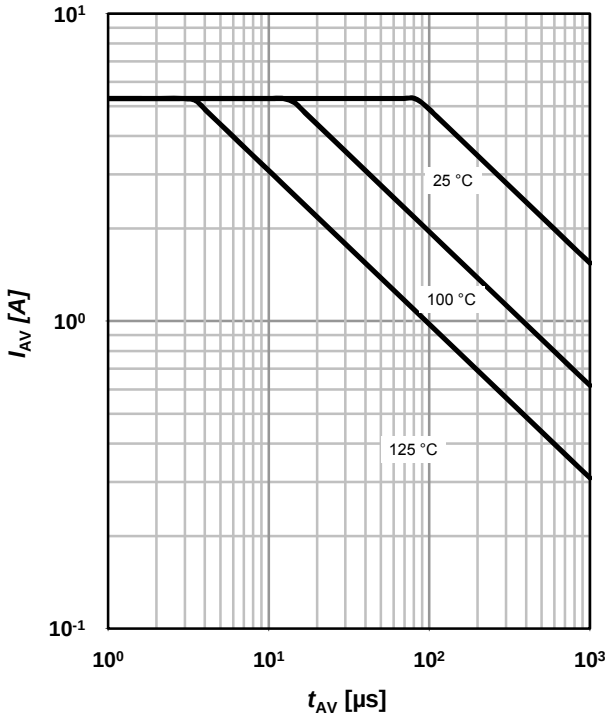
parameter: T_j



13 Avalanche characteristics

I_{AS}=f(t_{AV}); R_{GS}=25 Ω

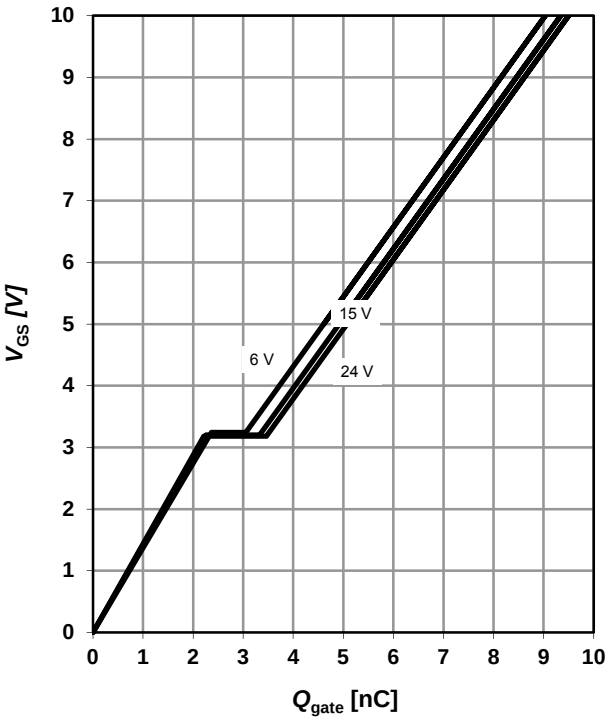
parameter: $T_{j(start)}$



14 Typ. gate charge

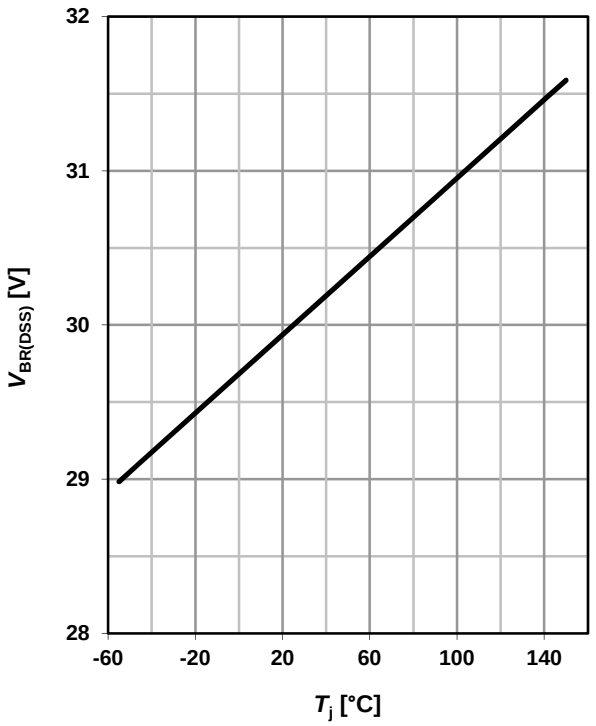
V_{GS}=f(Q_{gate}); I_D=-5.3 A pulsed

parameter: V_{DD}

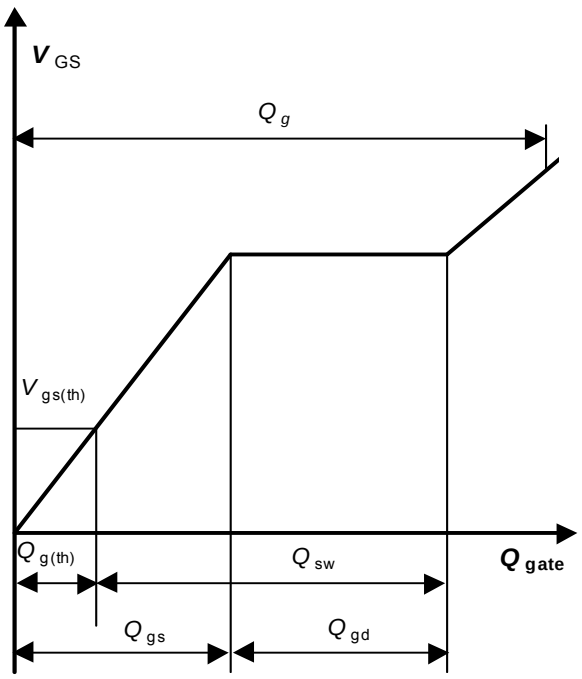


15 Drain-source breakdown voltage

$V_{BR(DSS)}$=f(T_j); I_D=250 µA

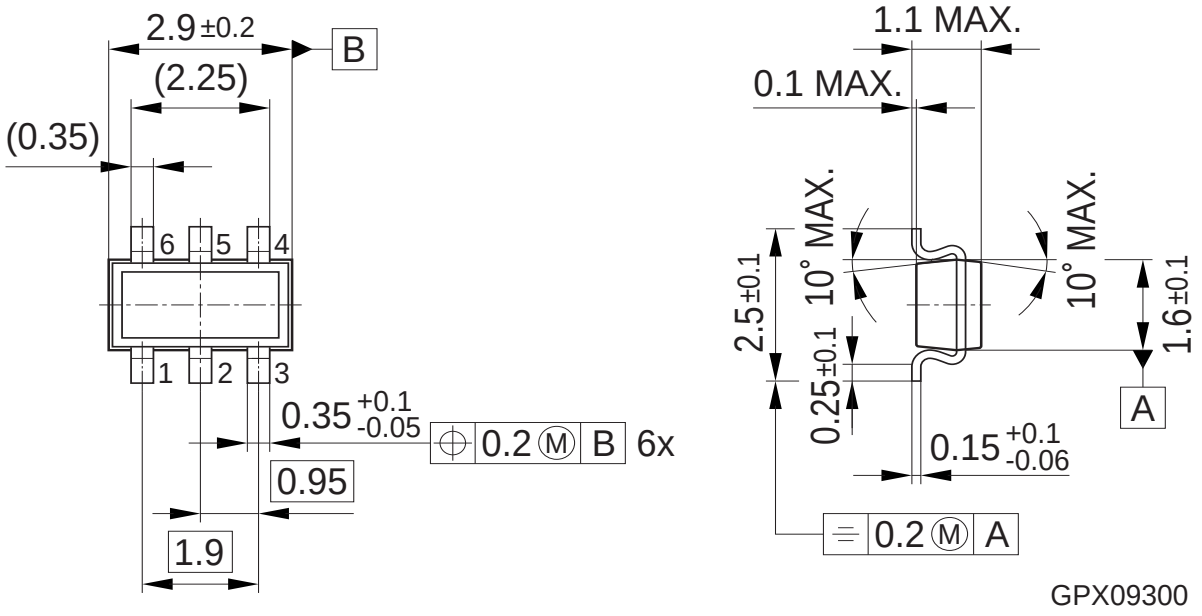


16 Gate charge waveforms

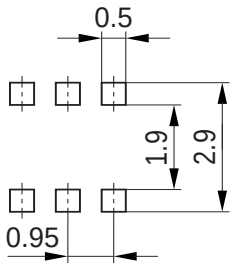


Package Outline:

TSOP-6



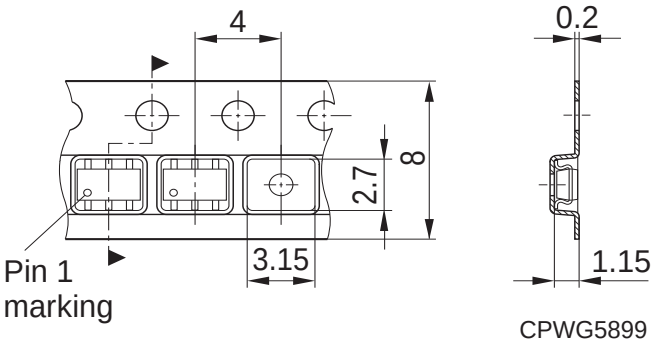
Footprint:



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

BSL305SPE

Revision: 2014-12-10, Rev. 2.0

Previous Revision

Revision	Date	Subjects (major changes since last revision)
2.0	2014-12-10	Release of final version

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