OptiMOS™-P 3 Small-Signal-Transistor

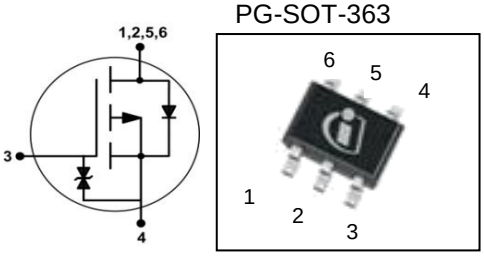
Features

- P-channel
- Enhancement mode
- Logic level (4.5V rated)
- ESD protected
- Qualified according AEC Q101
- 100% Lead-free; RoHS compliant
- Halogen-free according to IEC61249-2-21

Product Summary

V_{DS}		30	V
$R_{DS(on),max}$	V_{GS}=-10 V	140	mΩ
	V_{GS}=-4.5 V	230	
I_D		-1.5	A

PG-SOT-363



Type	Package	Tape and Reel Information	Marking	Lead Free	Packing
BSD314SPE	PG-SOT-363	L6327: 3000 pcs/ reel	XDs	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	-1.5	A
		T_A=70 °C	-1.2	
Pulsed drain current	$I_{D,pulse}$	T_A=25 °C	-6.1	
Avalanche energy, single pulse	E_{AS}	I_D=-1.5A, R_{GS}=25 Ω	6	mJ
Reverse diode dv/dt	dv/dt	I_D=-1.5 A, V_{DS}=-16V, di/dt=-200A/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	0.5	W
Operating and storage temperature	T_j, T_{stg}		-55 ... 150	°C
ESD Class		JESD22-A114 -HBM	1000V to 2000V	
Soldering Temperature			260 °C	°C
IEC climatic category; DIN IEC 68-1			55/150/56	°C

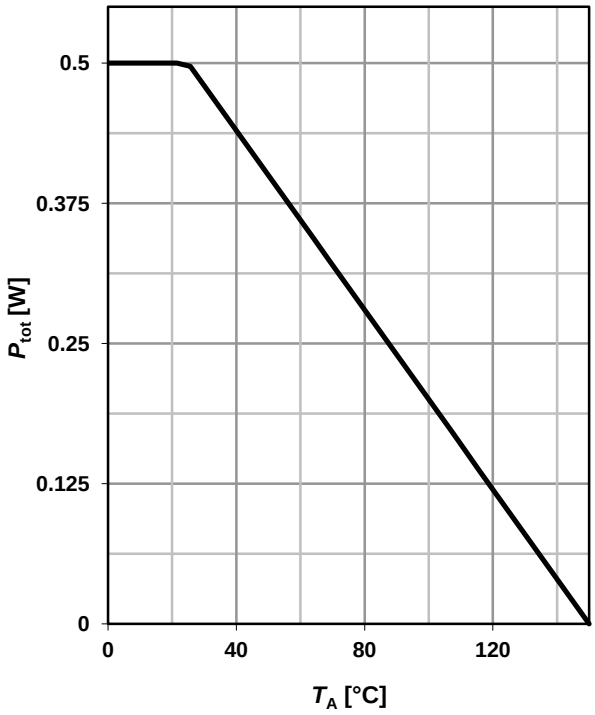
Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Thermal characteristics						
Thermal resistance, junction - ambient	R_{thJA}	minimal footprint [1]	-	-	250	K/W
Electrical characteristics, at T_j=25 °C, unless otherwise specified						
Static characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS}= 0V, I_D=-250µA	-30	-	-	V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-6.3µA	-1	-1.5	-2	
Drain-source leakage current	I_{DSS}	V_{DS}=-30V, V_{GS}=0 V, T_j=25 °C	-	-	-1	µA
		V_{DS}=-30V, V_{GS}=0V, T_j=150 °C	-	-	-100	
Gate-source leakage current	I_{GSS}	V_{GS}=-20V, V_{DS}=0V	-	-	-5	µA
Drain-source on-state resistance	$R_{DS(on)}$	V_{GS}=-4.5V, I_D=-1.2A	-	153	230	mΩ
		V_{GS}=-10V, I_D=-1.5A	-	107	140	
Transconductance	g_{fs}	$\|V_{DS}\|>2\|I_D\|R_{DS(on)max}$, I_D=-1.2 A		3	-	S

[1] Performed on 40mm^2 FR4 PCB. The traces are 1mm wide, 70µm thick and 20mm long; they are present on both sides of the PCB.

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Dynamic characteristics						
Input capacitance	C_{iss}	V_{GS}=0 V, V_{DS}=-15 V, f=1 MHz	-	221	294	pF
Output capacitance	C_{oss}		-	126	168	
Reverse transfer capacitance	C_{rss}		-	7	11	
Turn-on delay time	$t_{d(on)}$	V_{DD}=-15V, V_{GS}=-10 V, I_D=-1.5 A, R_G=6 Ω	-	5.1	-	ns
Rise time	t_r		-	3.9	-	
Turn-off delay time	$t_{d(off)}$		-	12.4	-	
Fall time	t_f		-	2.8	-	
Gate Charge Characteristics						
Gate to source charge	Q_{gs}	V_{DD}=-15 V, I_D=-1.5 A, V_{GS}=0 to -10 V	-	-0.7	-	nC
Gate to drain charge	Q_{gd}		-	-0.3	-	
Gate charge total	Q_g		-	-2.9	-	
Gate plateau voltage	$V_{plateau}$		-	-3.2	-	V
Reverse Diode						
Diode continous forward current	I_S	T_A=25 °C	-	-	-0.5	A
Diode pulse current	$I_{S,pulse}$		-	-	-6.1	
Diode forward voltage	V_{SD}	V_{GS}=0 V, I_F=-1.5A, T_j=25 °C	-	0.8	1.1	V
Reverse recovery time	t_{rr}	V_R=-15 V, I_F=-1.5A, di_F/dt=100 A/µs	-	12.5	-	ns
Reverse recovery charge	Q_{rr}		-	4.3	-	nC

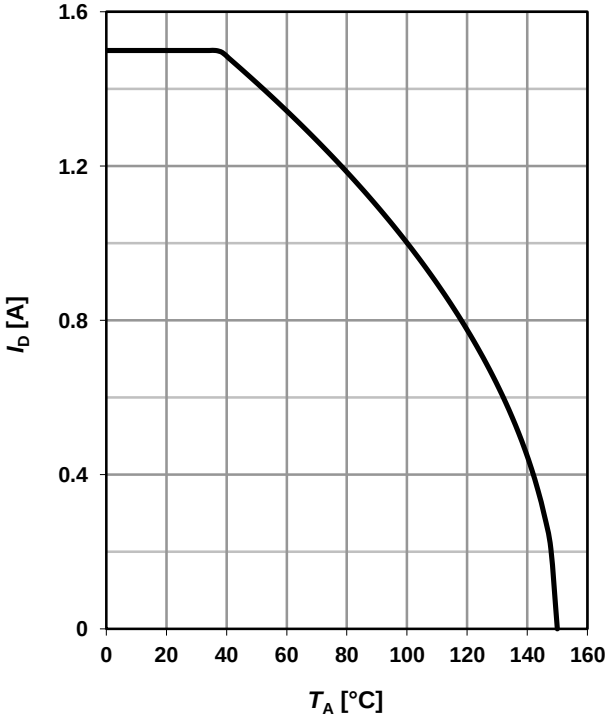
1 Power dissipation

$P_{tot}=f(T_A)$



2 Drain current

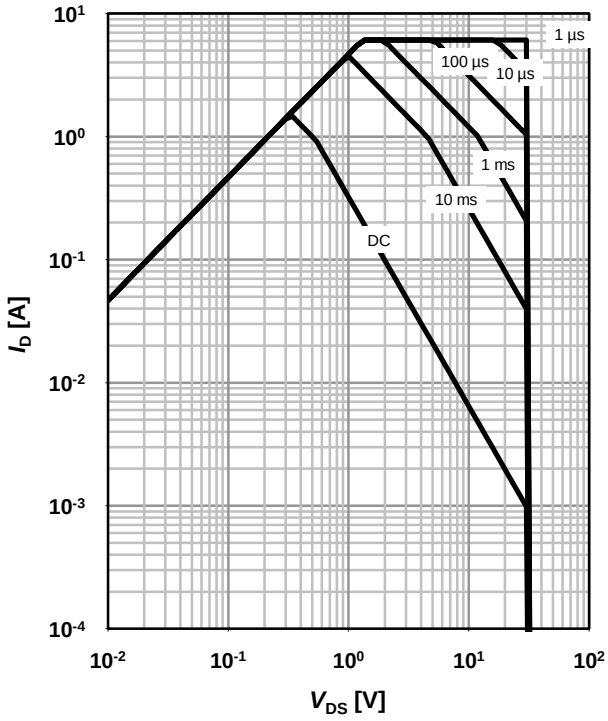
$I_D=f(T_A)$; $V_{GS}\leq$-10 V



3 Safe operating area

$I_D=f(V_{DS})$; T_A=25 °C; D=0

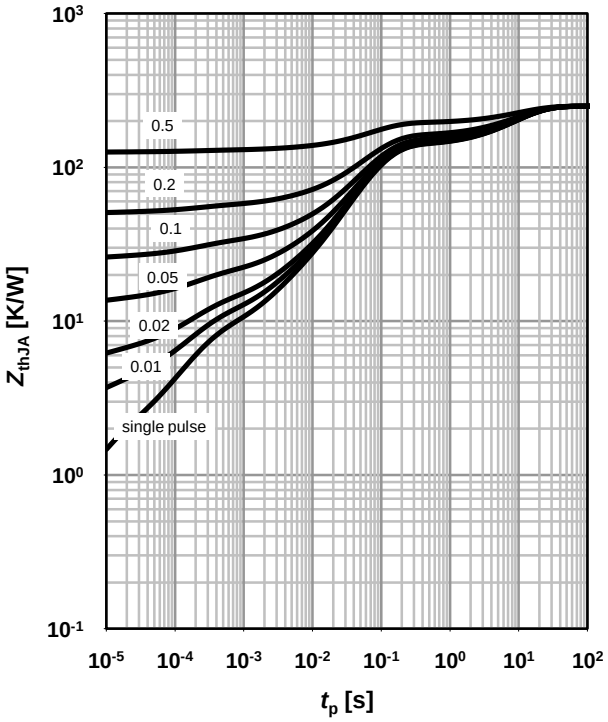
parameter: t_p



4 Max. transient thermal impedance

$Z_{thJA}=f(t_p)$

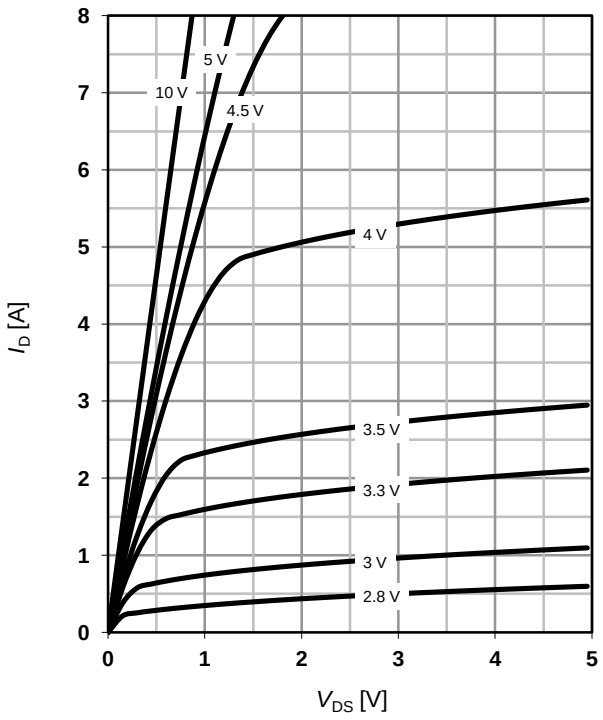
parameter: $D=t_p/T$



5 Typ. output characteristics

$I_D=f(V_{DS})$; $T_j=25$ °C

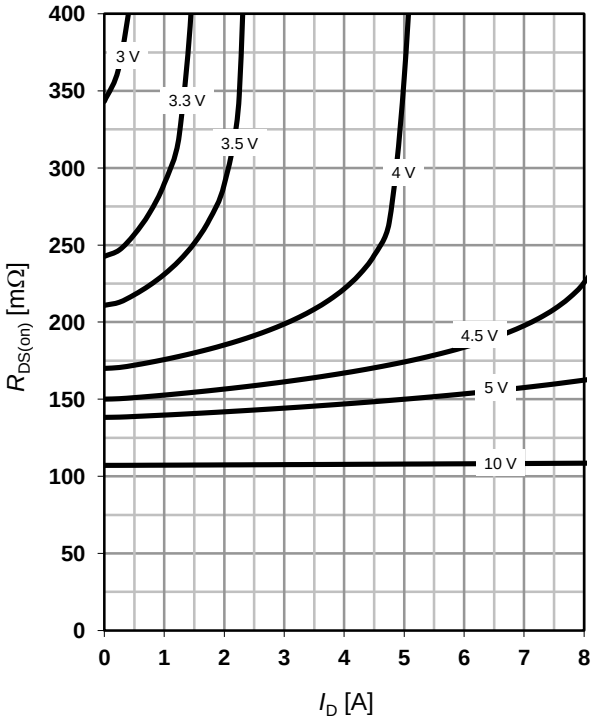
parameter: V_{GS}



6 Typ. drain-source on resistance

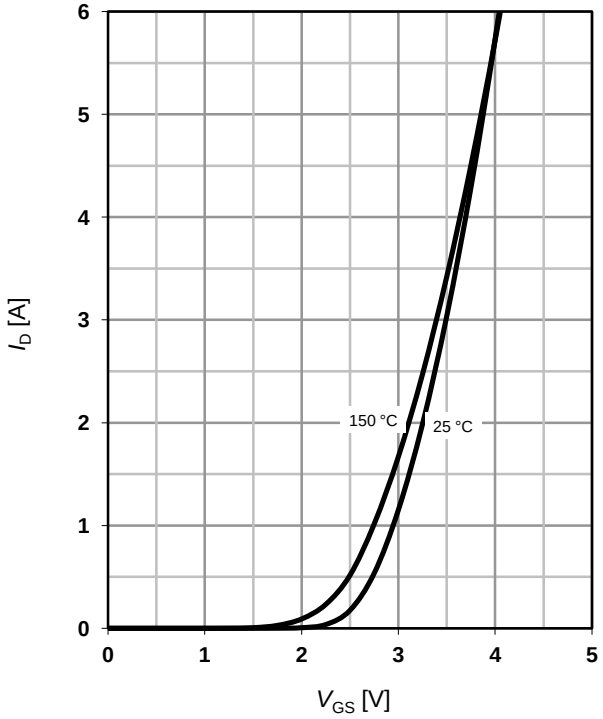
$R_{DS(on)}=f(I_D)$; $T_j=25$ °C

parameter: V_{GS}



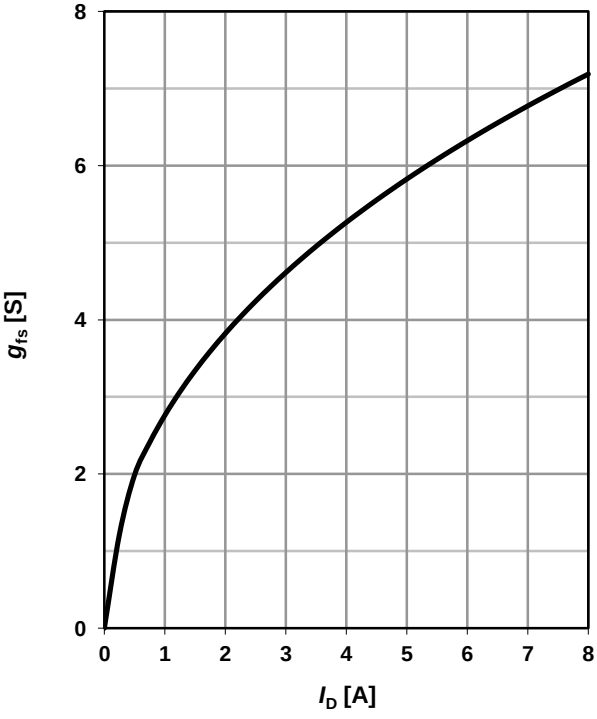
7 Typ. transfer characteristics

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



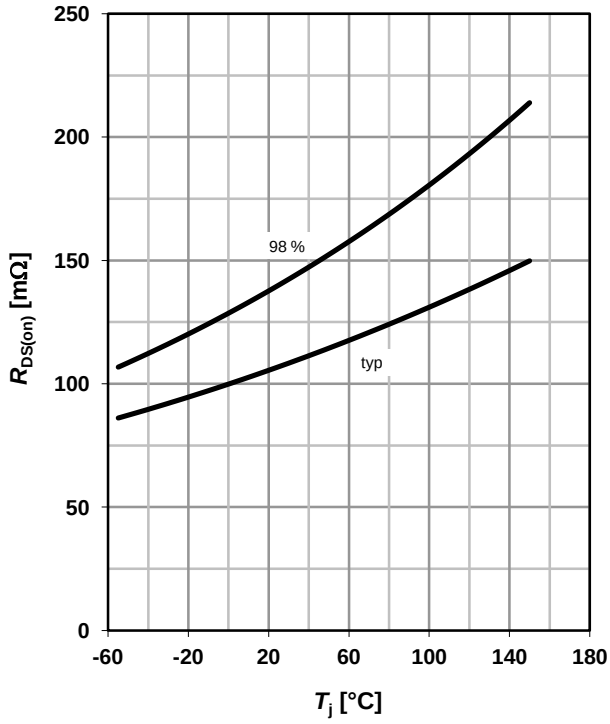
8 Typ. forward transconductance

$g_{fs}=f(I_D)$; $T_j=25$ °C



9 Drain-source on-state resistance

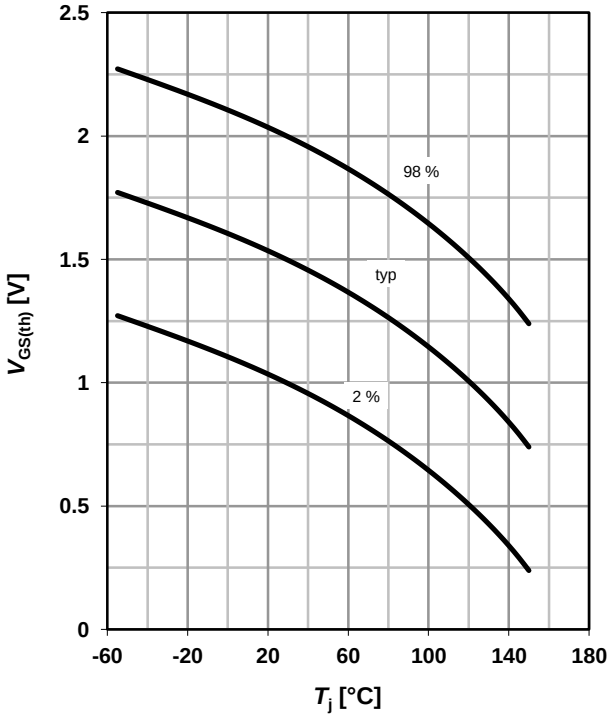
$R_{DS(on)}=f(T_j)$; I_D=-1.5 A; V_{GS}=-10 V



10 Typ. gate threshold voltage

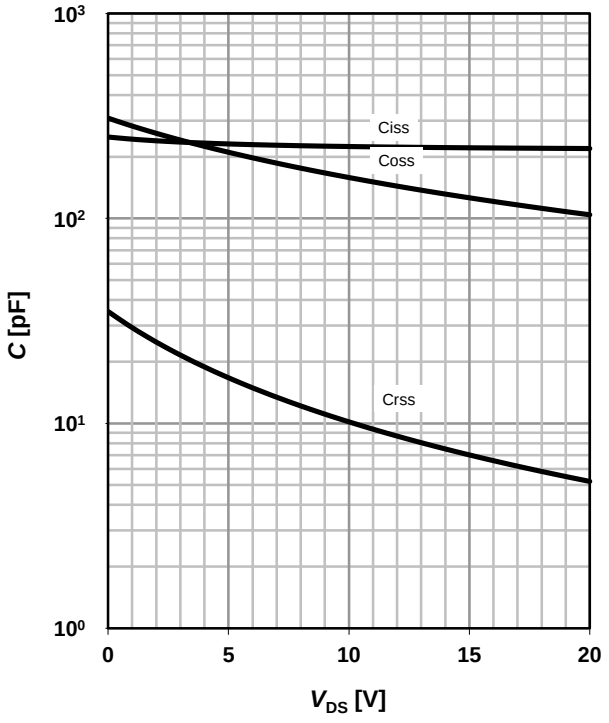
$V_{GS(th)}=f(T_j)$; $V_{DS}=V_{GS}$; I_D=-6.3 µA

parameter: I_D



11 Typ. capacitances

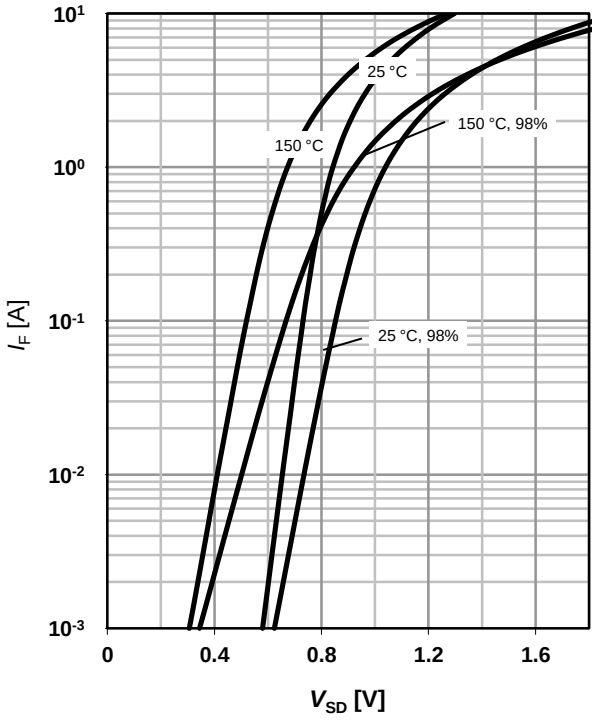
$C=f(V_{DS})$; V_{GS}=0 V; f=1 MHz; T_j=25°C



12 Forward characteristics of reverse diode

$I_F=f(V_{SD})$

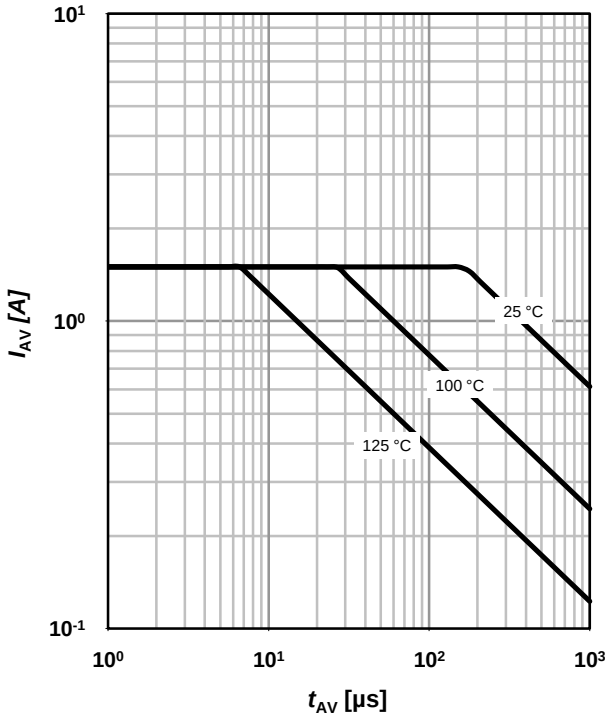
parameter: T_j



13 Avalanche characteristics

I_{AS}=f(t_{AV}); R_{GS}=25 Ω

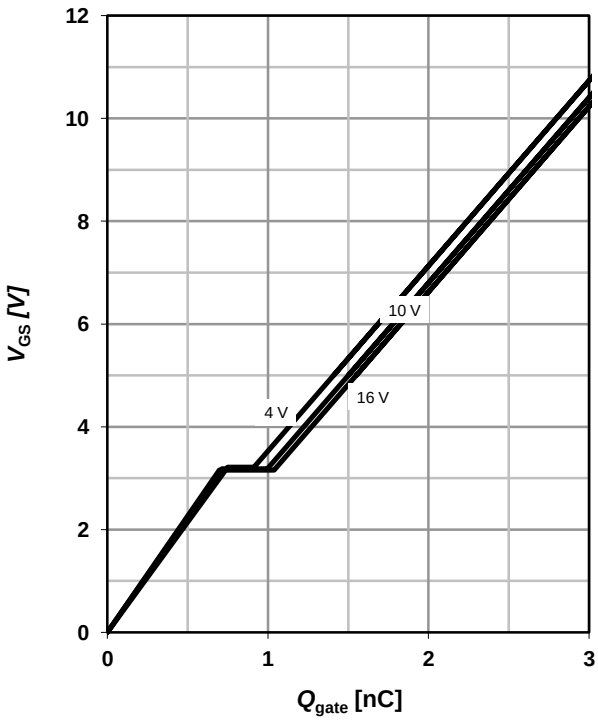
parameter: $T_{j(start)}$



14 Typ. gate charge

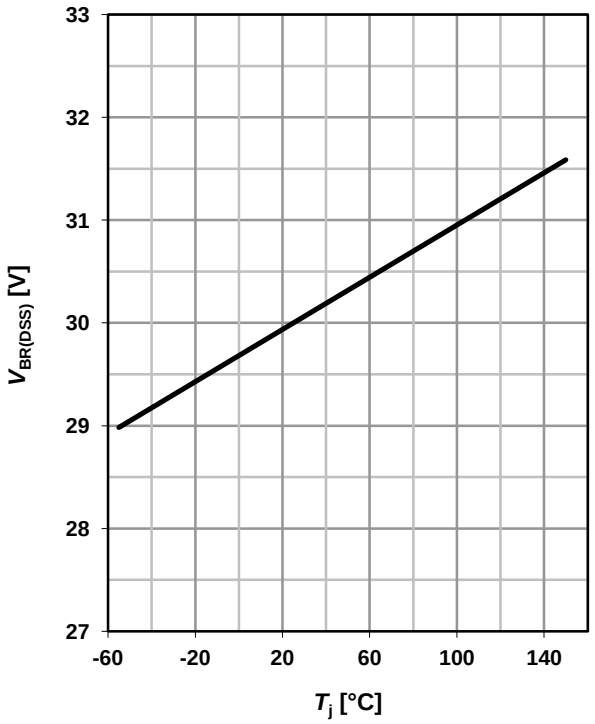
V_{GS}=f(Q_{gate}); I_D=-1.5 A pulsed

parameter: V_{DD}

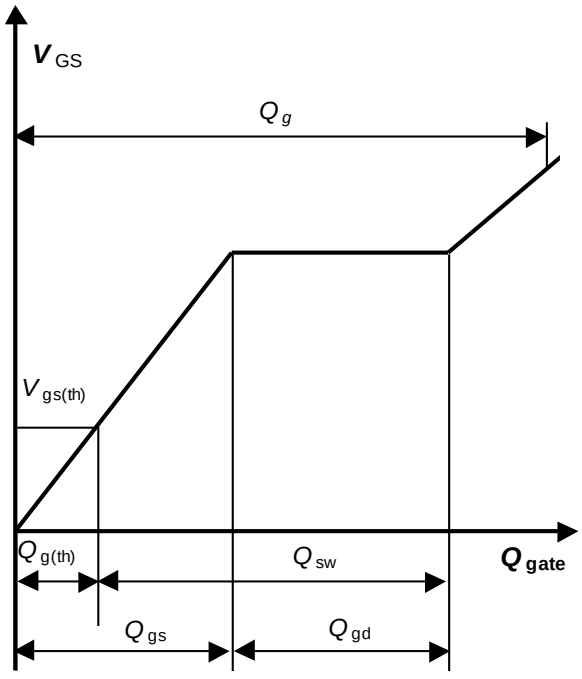


15 Drain-source breakdown voltage

$V_{BR(DSS)}$=f(T_j); I_D=-250 µA



16 Gate charge waveforms



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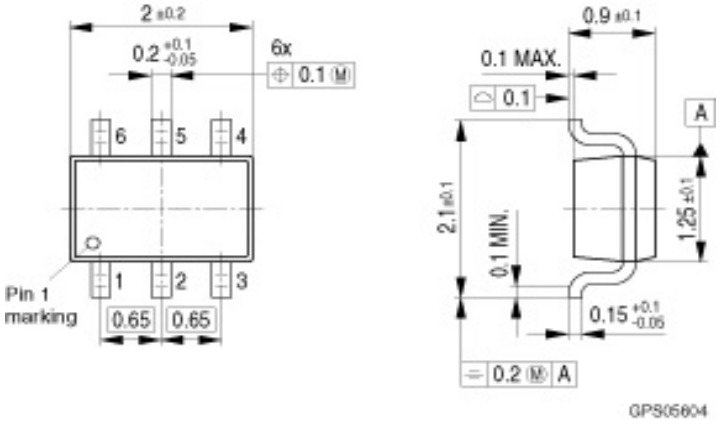
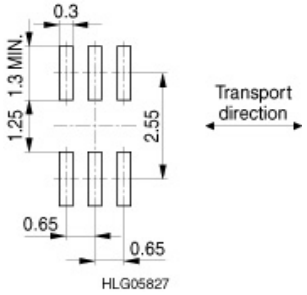
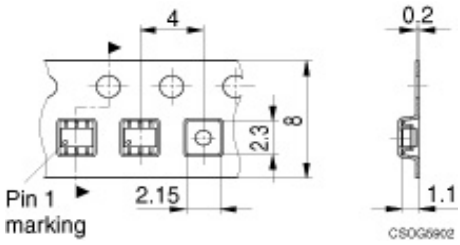
Package Outline:



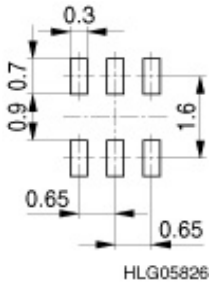
Footprint:



Packing:



Reflow soldering:



Dimensions in mm

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