OptiMOS™ P3 + Optimos™ 2 Small Signal Transistor

Features

· Complementary P + N channel

· Enhancement mode

· Logic level (4.5V rated)

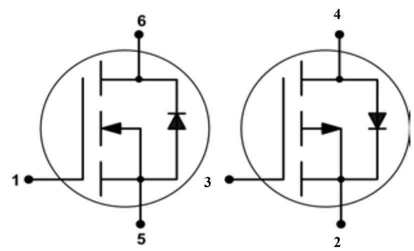
· Avalanche rated

· Qualified according to AEC Q101

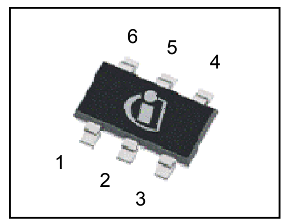
· 100% Lead-free; RoHS compliant

Product Summary

		P	N	
V_{DS}		-30	30	V
$R_{DS(on),max}$	V_{GS}=±10 V	80	57	mΩ
	V_{GS}=±4.5 V	130	93	
I_D		-2.0	2.3	A



PG-TSOP-6



Type	Package	Tape and Reel Information	Marking	Lead Free	Packing
BSL308C	PG-TSOP-6	L6327: 3000 pcs / reel	sPS	Yes	Non dry

Maximum ratings, at T_j=25 °C, unless otherwise specified [1)]

Parameter	Symbol	Conditions	Value		Unit
			P	N	
Continuous drain current	I_D	T_A=25 °C	-2.0	2.3	A
		T_A=70 °C	-1.6	1.8	
Pulsed drain current	$I_{D,pulse}$	T_A=25 °C	-8.0	9	
Avalanche energy, single pulse	E_{AS}	P: I_D=-2.0 A, N: I_D=2.3 A, R_{GS}=25 Ω	10.7	10.8	mJ
Gate source voltage	V_{GS}		±20		V
Power dissipation [2)]	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	class 0 (<250V)		
Soldering temperature	T_{solder}		260		°C
IEC climatic category; DIN IEC 68-1			55/150/56		

[1)] Remark: only one of both transistors active

Parameter		Symbol	Conditions	Values			Unit
				min.	typ.	max.	
Thermal characteristics							
Thermal resistance, junction - ambient[1]	P	R_{thJA}	minimal footprint [2]	-	-	250	K/W
	N						
Electrical characteristics, at T_j=25 °C, unless otherwise specified							
Static characteristics							
Drain-source breakdown voltage	P	$V_{(BR)DSS}$	V_{GS}=0 V, I_D=-250 µA	-	-	-30	V
	N		V_{GS}=0 V, I_D=250 µA	30	-	-	
Gate threshold voltage	P	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-11µA	-2	-1.5	-1	
	N		V_{DS}=V_{GS}, I_D=11 µA	1.2	1.6	2	
Zero gate voltage drain current	P	I_{DSS}	V_{DS}=-30 V, V_{GS}=0 V, T_j=25 °C	-	-	-1	µA
	N		V_{DS}=30 V, V_{GS}=0 V, T_j=25 °C	-	-	1	
	P		V_{DS}=-30 V, V_{GS}=0 V, T_j=150 °C	-	-	-100	
	N		V_{DS}=30 V, V_{GS}=0 V, T_j=150 °C	-	-	100	
Gate-source leakage current	P	I_{GSS}	V_{GS}=±20 V, V_{DS}=0 V	-	-	±100	nA
	N						
Drain-source on-state resistance	P	$R_{DS(on)}$	V_{GS}=-4.5 V, I_D=-1.7 A	-	88	130	mΩ
	N		V_{GS}=4.5 V, I_D=1.85 A	-	67	93	
	P		V_{GS}=-10 V, I_D=-2.0 A	-	62	80	
	N		V_{GS}=10 V, I_D=2.3 A	-	44	57	
Transconductance	P	g_{fs}	$\|V_{DS}\|>2\|I_D\|R_{DS(on)max}$, I_D=-1.6 A	-	4.6	-	S
	N		$\|V_{DS}\|>2\|I_D\|R_{DS(on)max}$, I_D=1.8 A	-	5	-	

[2] 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	P	C_{iss}	V_{GS}=0 V, P: V_{DS}=-15 V, N: V_{DS}= 15 V, f=1 MHz	-	376	500	pF
	N			-	207	275	
Output capacitance	P	C_{oss}		-	196	261	
	N			-	75	100	
Reverse transfer capacitance	P	C_{rss}		-	12	18	
	N			-	12	17	
Turn-on delay time	P	$t_{d(on)}$	P: V_{DD}=-15 V, V_{GS}=-10 V, R_G=6 Ω, I_D=-2 A N: V_{DD}=15 V, V_{GS}=10 V, R_G=6 Ω, I_D=2.3 A	-	5.6	-	ns
	N			-	4.4	-	
Rise time	P	t_r		-	7.7	-	
	N			-	2.3	-	
Turn-off delay time	P	$t_{d(off)}$		-	15.3	-	
	N			-	8.3	-	
Fall time	P	t_f		-	2.8	-	
	N			-	1.4	-	
Gate Charge Characteristics							
Gate to source charge	P	Q_{gs}	V_{DD}=-15 V, I_D=-2 A, V_{GS}=0 to 10 V	-	-1.2	-	nC
Gate to drain charge		Q_{gd}		-	-0.6	-	
Switching charge		Q_g		-	-5.0	-	
Gate plateau voltage		$V_{plateau}$		-	-3.1	-	
Gate to source charge	N	Q_{gs}	V_{DD}=15 V, I_D=2.3 A, V_{GS}=0 to 10 V	-	0.65	-	
Gate to drain charge		Q_{gd}		-	0.45	-	
Switching charge		Q_g			1.5	-	
Gate plateau voltage		$V_{plateau}$			3.1	-	

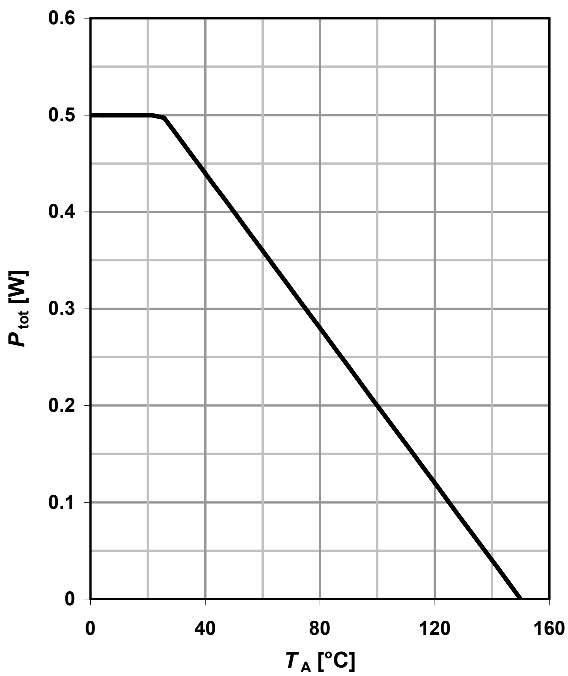
Parameter		Symbol	Conditions	Values			Unit
				min.	typ.	max.	

Reverse Diode

Parameter		Symbol	Conditions	min.	typ.	max.	Unit
Diode continuous forward current	P	I_S	T_C=25 °C	-	-	-0.4	A
	N			-	-	0.5	
Diode pulse current	P	$I_{S,pulse}$		-	-	-8.4	
	N			-	-	9	
Diode forward voltage	P	V_{SD}	V_{GS}=0 V, I_F=-2 A, T_j=25 °C	-	-0.8	-1.1	V
	N		V_{GS}=0 V, I_F=2.3 A, T_j=25 °C	-	0.83	1.1	
Reverse recovery time	P	t_{rr}	V_R=-15 V, I_F=-2A, di_F/dt=-100 A/µs	-	14	-	ns
		Q_{rr}		-	-5.9	-	nC
Reverse recovery charge	N	t_{rr}	V_R=15 V, I_F=2.3A di_F/dt=100 A/µs	-	14.4	-	ns
		Q_{rr}		-	2.9	-	nC

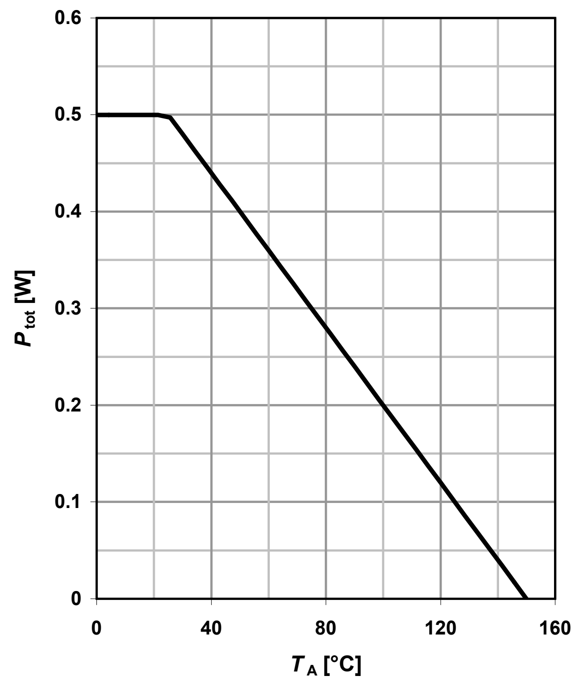
1 Power dissipation (P)

P_{tot}=f(T_A)



2 Power dissipation (N)

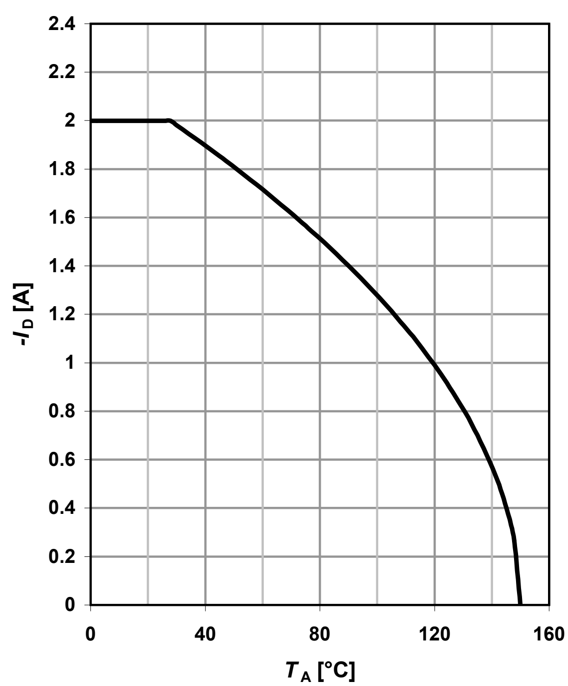
P_{tot}=f(T_A)



3 Drain current (P)

I_D=f(T_A)

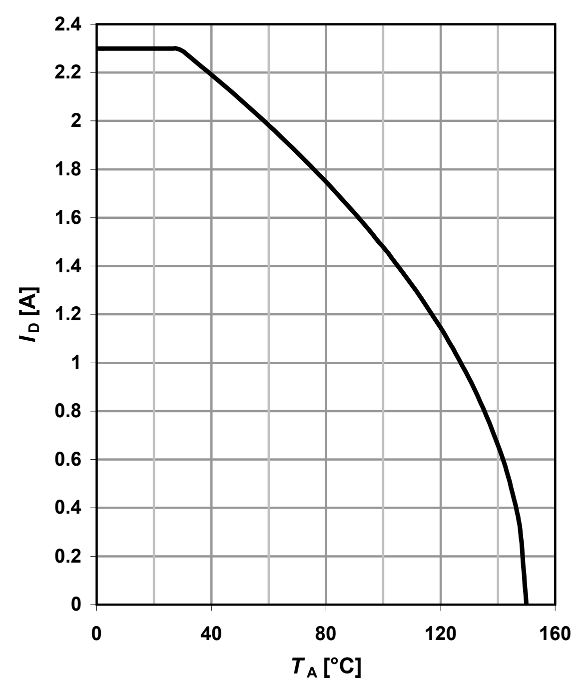
parameter: V_{GS}≤-10 V



4 Drain current (N)

I_D=f(T_A)

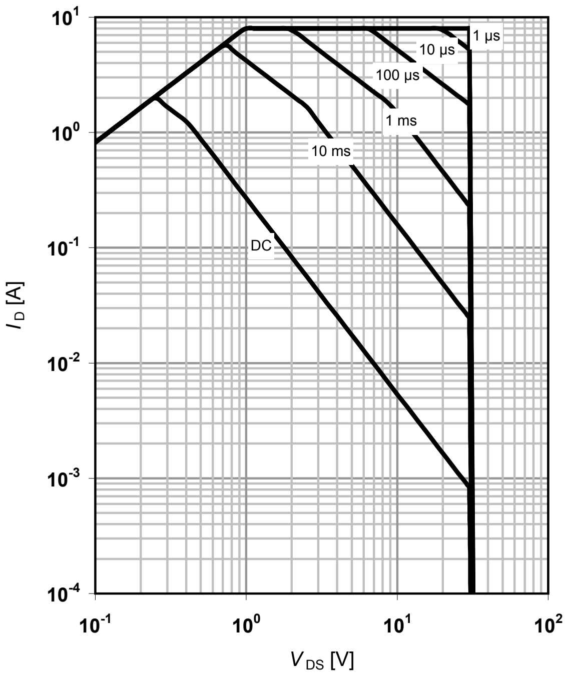
parameter: V_{GS}≥10 V



5 Safe operating area (P)

I_D=f(V_{DS}); T_A=25 °C; D=0

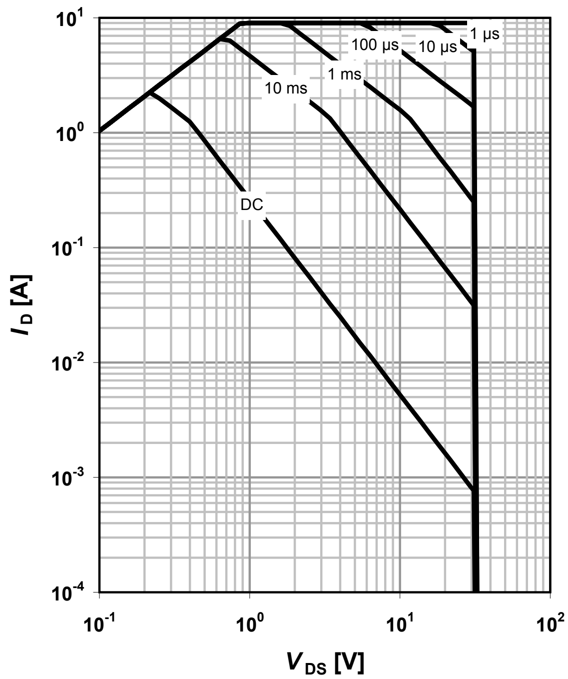
parameter: t_p



6 Safe operating area (N)

I_D=f(V_{DS}); T_A=25 °C; D=0

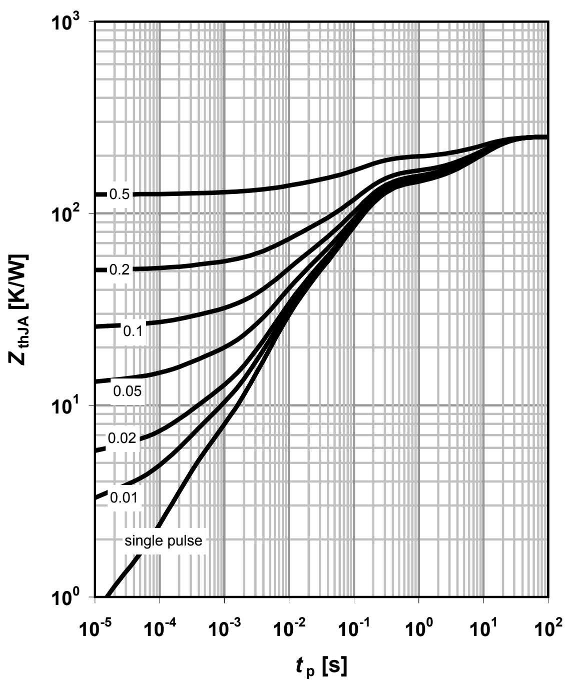
parameter: t_p



7 Max. transient thermal impedance (P)

Z_{thJA}=f(t_p)

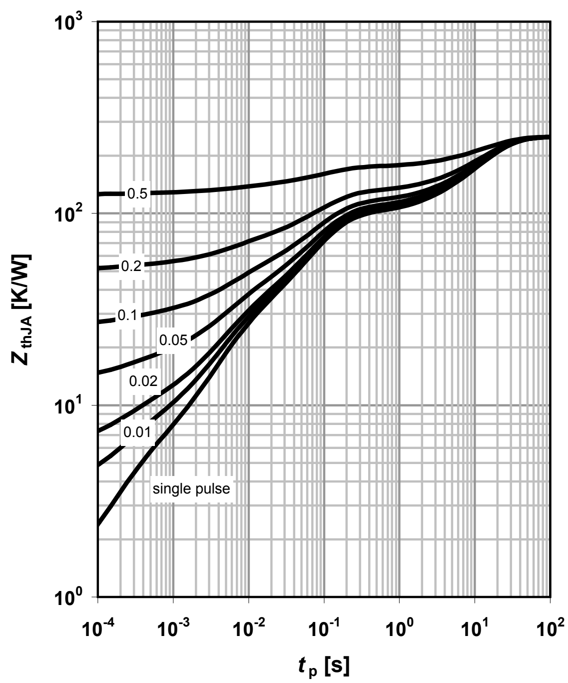
parameter: $D=t_p/T$



8 Max. transient thermal impedance (N)

Z_{thJA}=f(t_p)

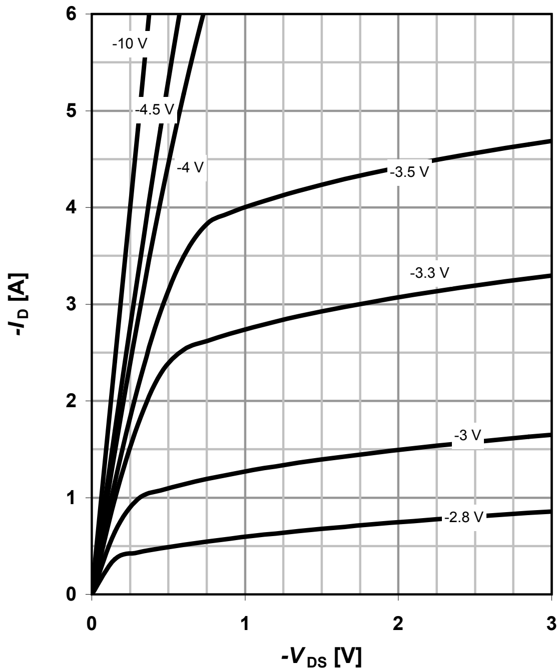
parameter: $D=t_p/T$



9 Typ. output characteristics (P)

I_D=f(V_{DS}); T_j=25 °C

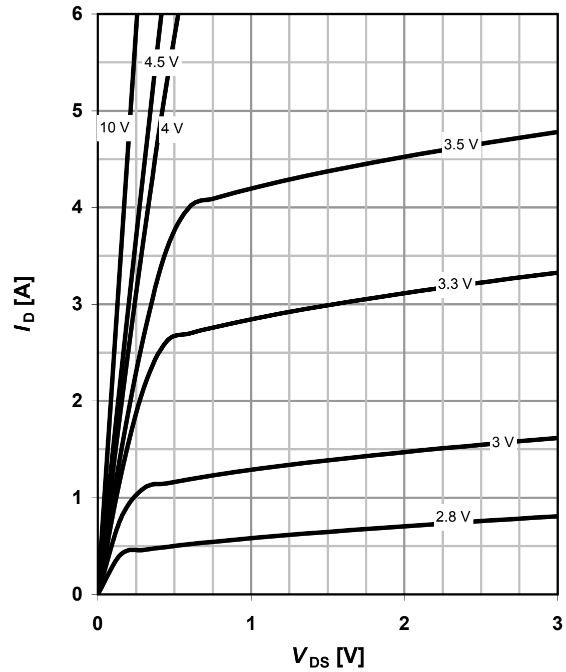
parameter: V_{GS}



10 Typ. output characteristics (N)

I_D=f(V_{DS}); T_j=25 °C

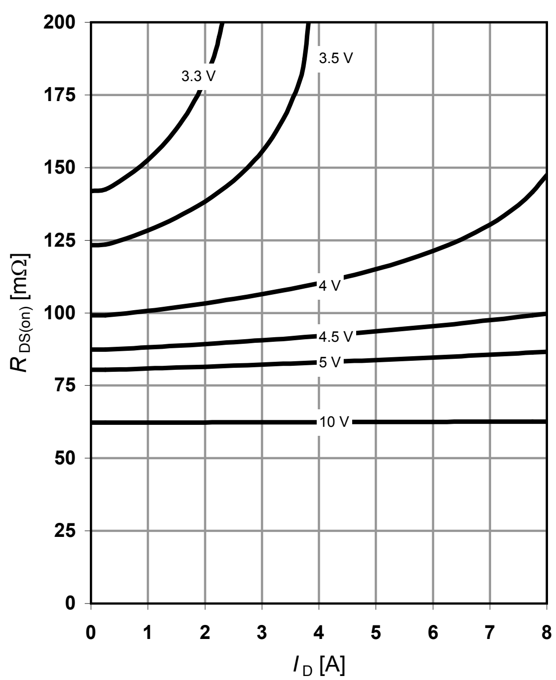
parameter: V_{GS}



11 Typ. drain-source on resistance (P)

$R_{DS(on)}$=f(I_D); T_j=25 °C

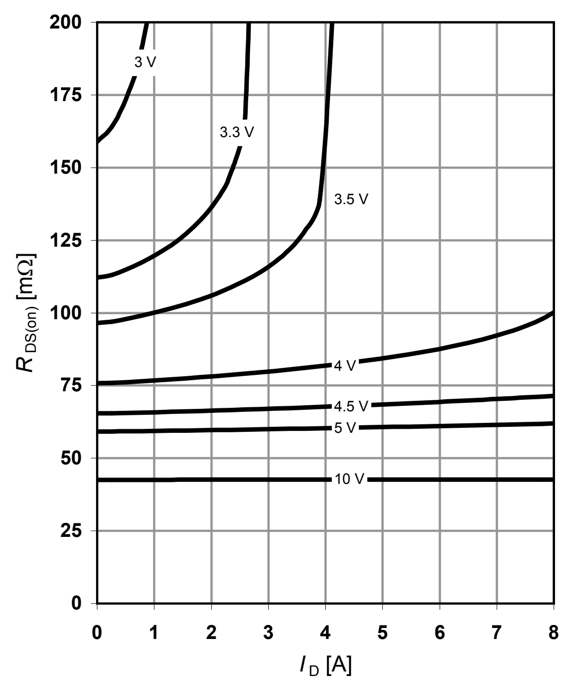
parameter: V_{GS}



12 Typ. drain-source on resistance (N)

$R_{DS(on)}$=f(I_D); T_j=25 °C

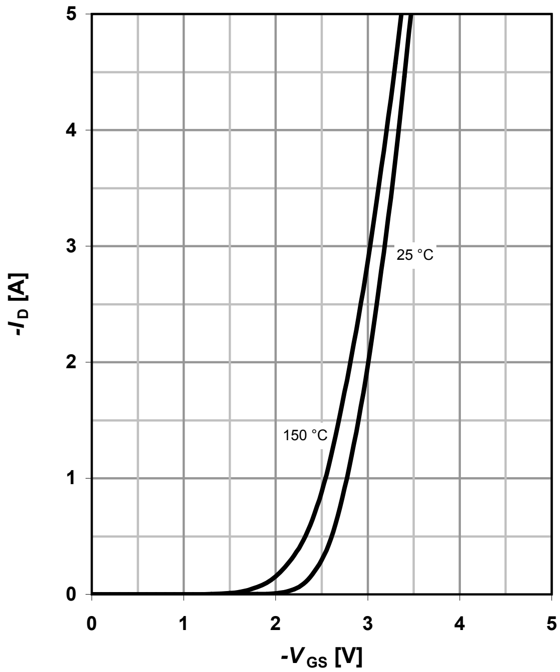
parameter: V_{GS}



13 Typ. transfer characteristics (P)

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

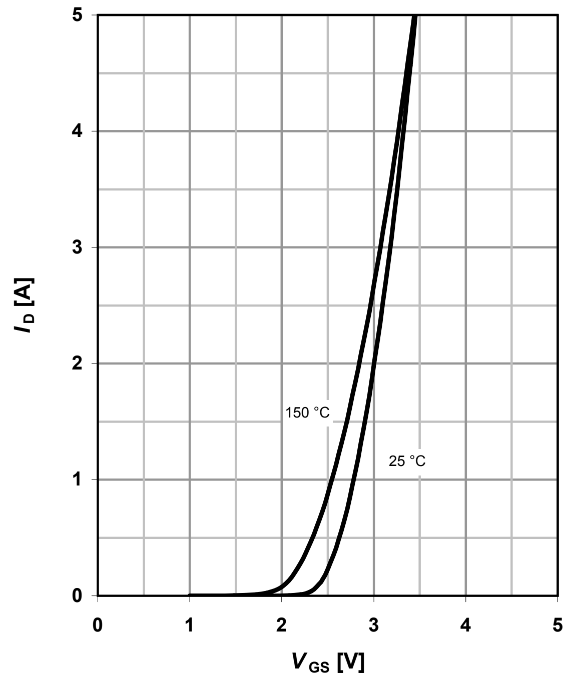
parameter: T_j



14 Typ. transfer characteristics (N)

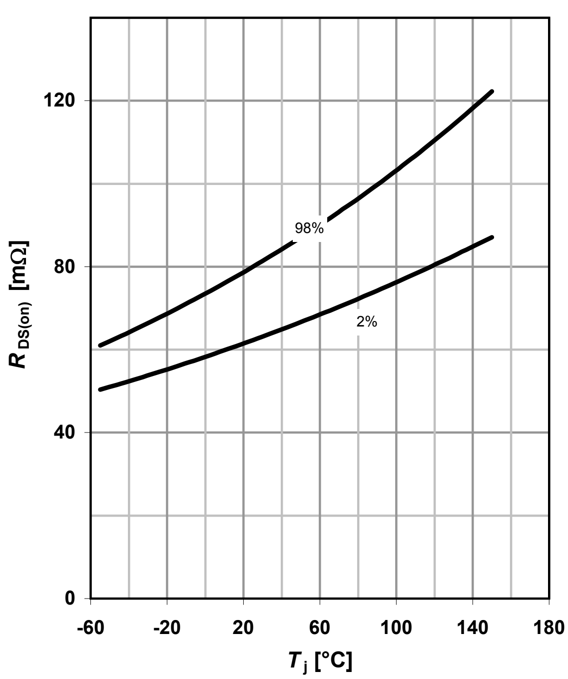
I_D=f(V_{GS}); |V_{DS} |>2 | I_D | $R_{DS(on)max}$

parameter: T_j



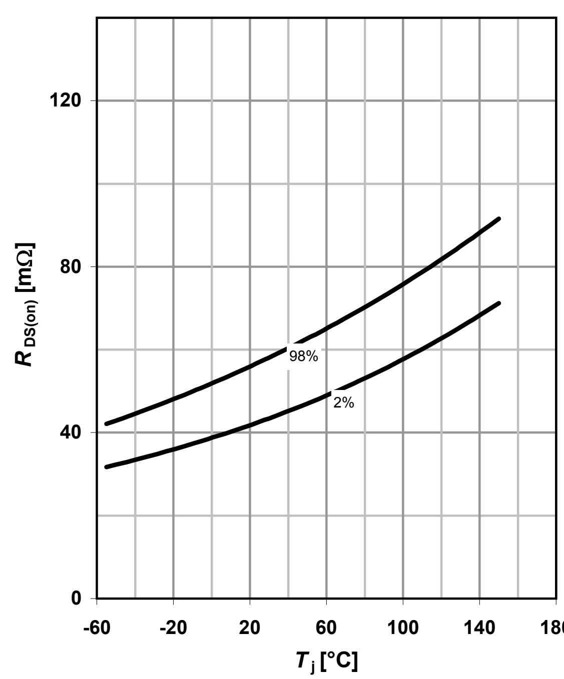
15 Drain-source on-state resistance (P)

$R_{DS(on)}$=f(T_j); I_D=-2.0 A; V_{GS}=-10 V



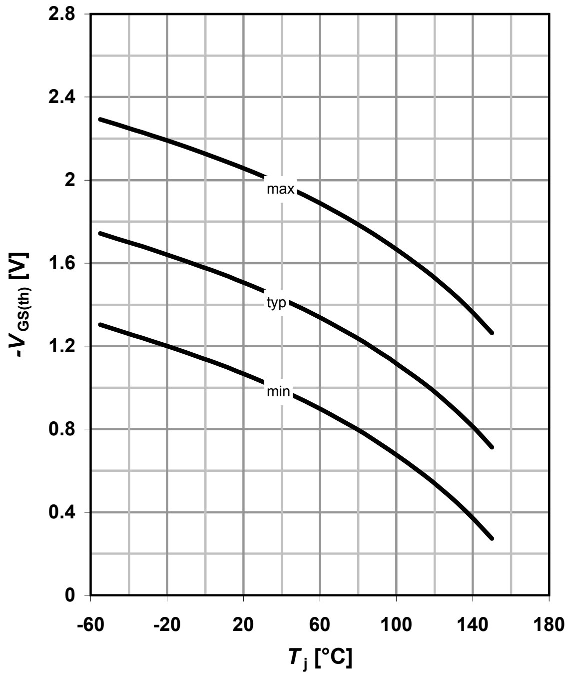
16 Drain-source on-state resistance (N)

$R_{DS(on)}$=f(T_j); I_D=2.3 A; V_{GS}=10 V



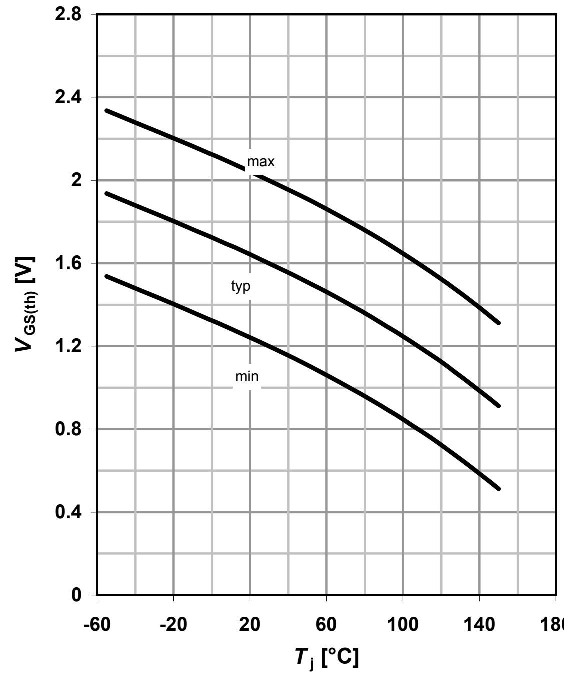
17 Typ. gate threshold voltage (P)

$V_{GS(th)}$=f(T_j); V_{GS}=V_{DS}; I_D=-11 µA



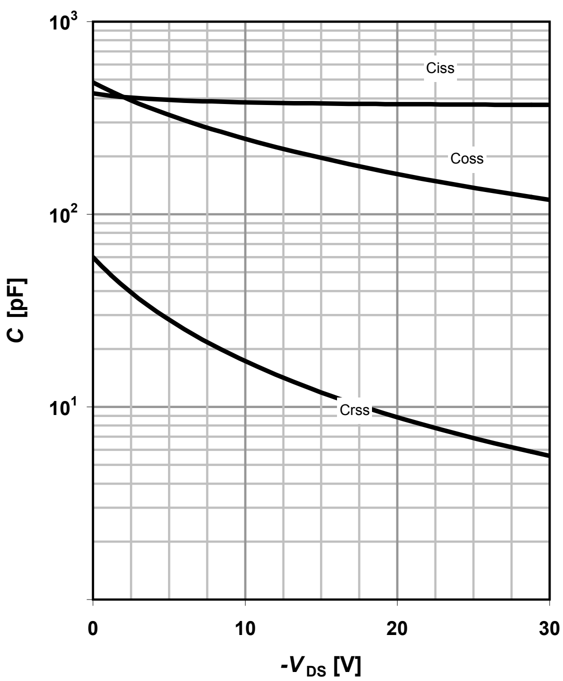
18 Typ. gate threshold voltage (N)

$V_{GS(th)}$=f(T_j); V_{GS}=V_{DS}; I_D=11 µA



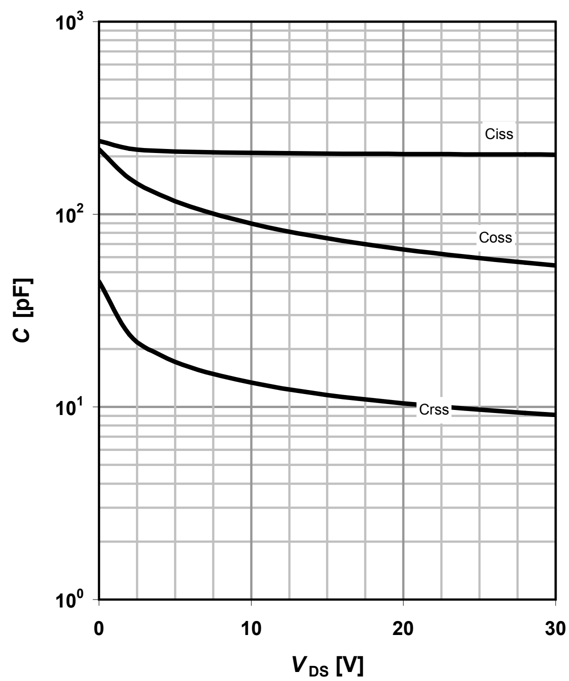
19 Typ. capacitances (P)

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



20 Typ. capacitances (N)

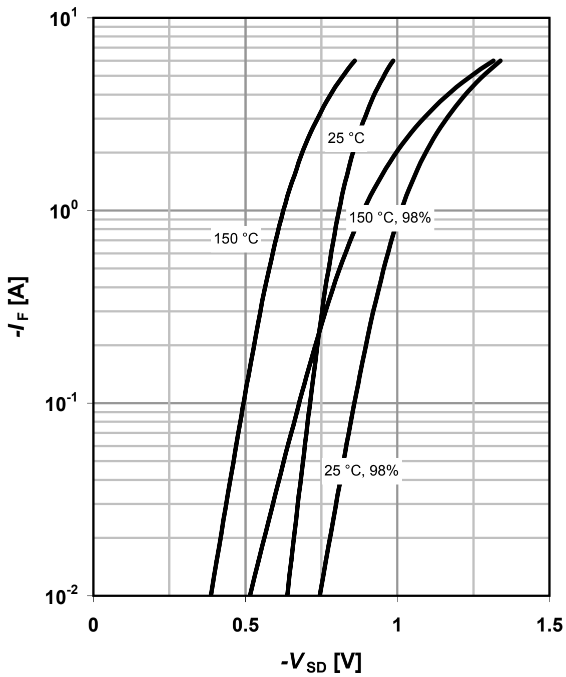
C=f(V_{DS}); V_{GS}=0 V; f=1 MHz



21 Forward characteristics of reverse diode (P)

I_F=f(V_{SD})

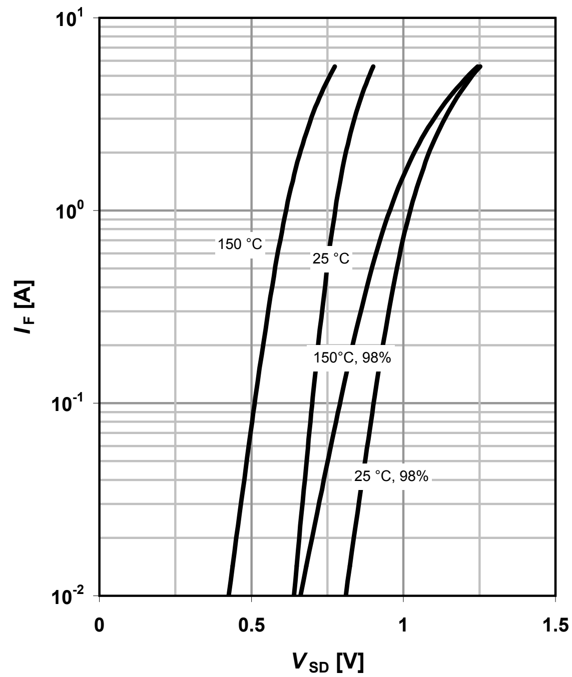
parameter: T_j



22 Forward characteristics of reverse diode (N)

I_F=f(V_{SD})

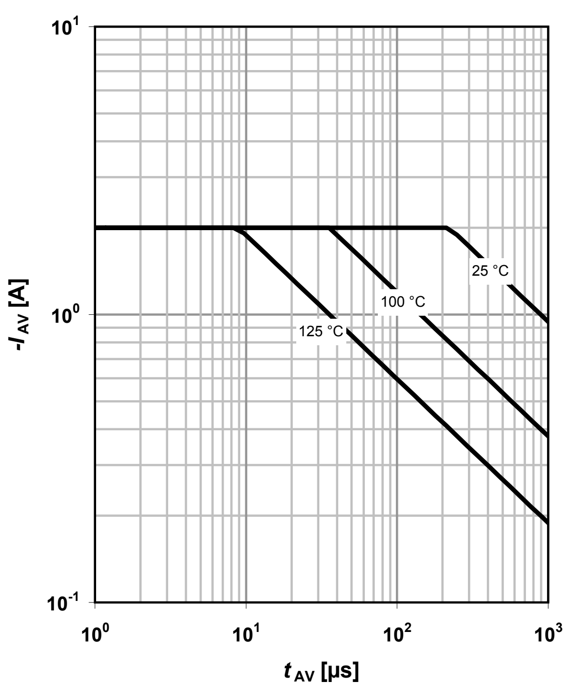
parameter: T_j



23 Avalanche characteristics (P)

I_{AS}=f(t_{AV}); R_{GS}=25 Ω

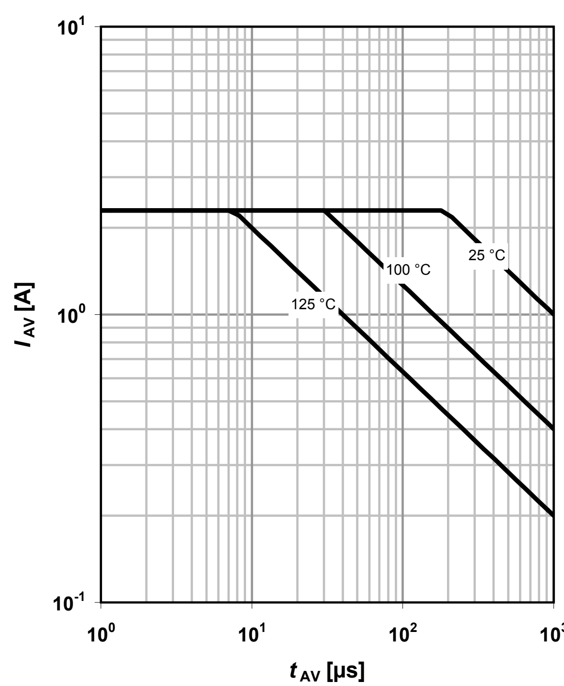
parameter: $T_{j(start)}$



24 Avalanche characteristics (N)

I_{AS}=f(t_{AV}); R_{GS}=25 Ω

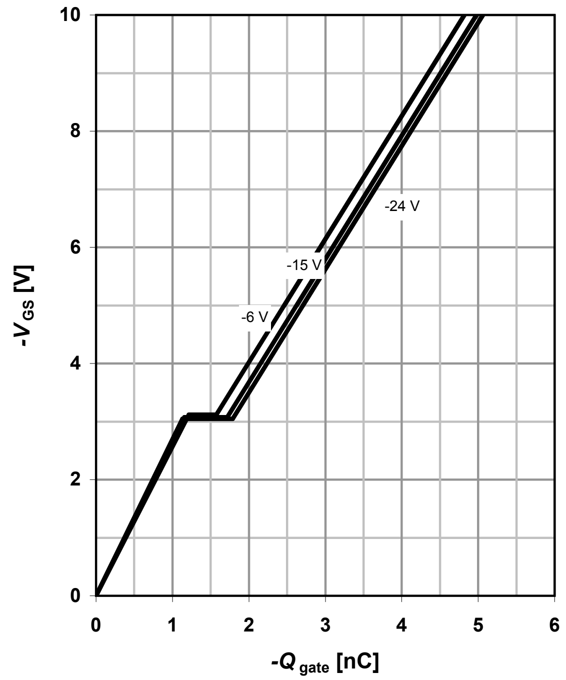
parameter: $T_{j(start)}$



25 Typ. gate charge (P)

V_{GS}=f(Q_{gate}); I_D=-2.0 A pulsed

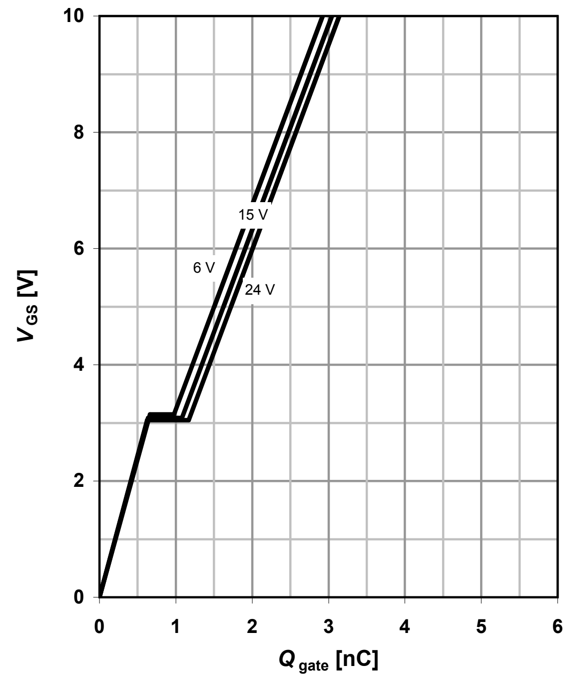
parameter: V_{DD}



26 Typ. gate charge (N)

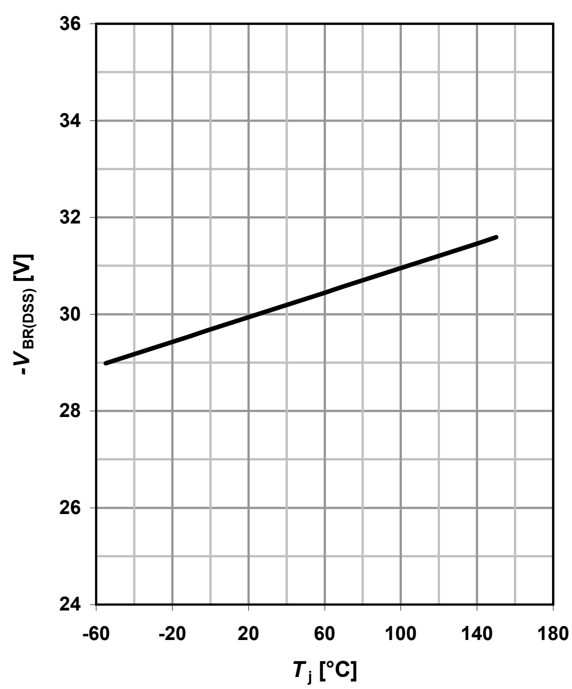
V_{GS}=f(Q_{gate}); I_D=2.3 A pulsed

parameter: V_{DD}



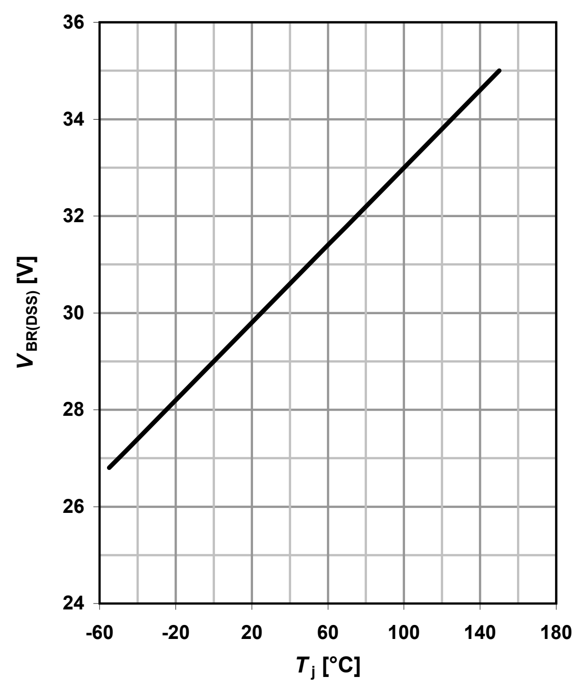
27 Drain-source breakdown voltage (P)

$V_{BR(DSS)}$=f(T_j); I_D=-250 µA



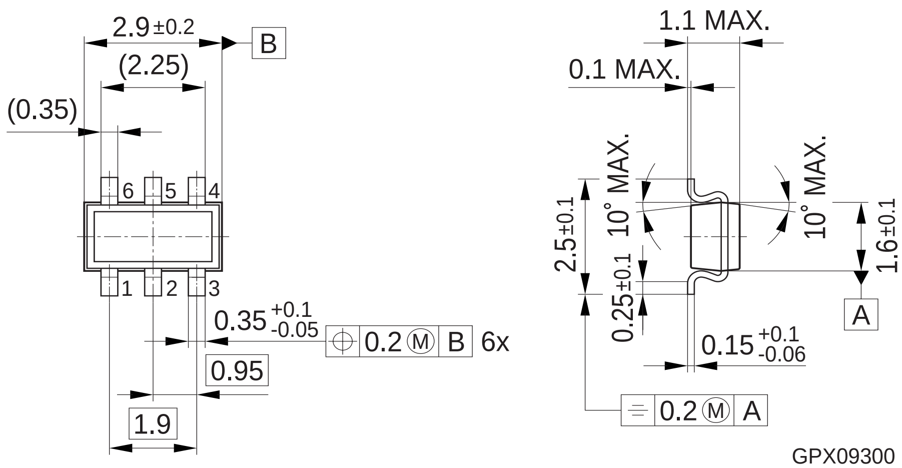
28 Drain-source breakdown voltage (N)

$V_{BR(DSS)}$=f(T_j); I_D=250 µA

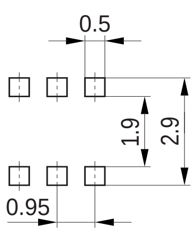


TSOP-6

Package Outline:



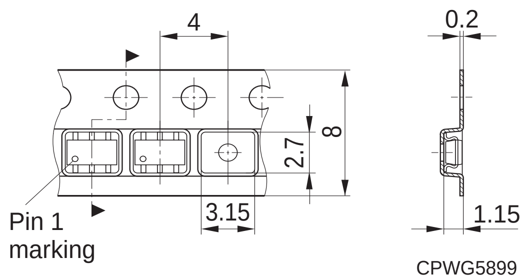
Footprint:



Remark: Wave soldering possible dep. on customers process conditions

HLG09283

Packaging:



Dimensions in mm

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