SIPMOS® Small-Signal-Transistor

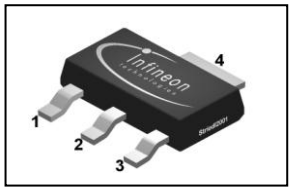
Features

- P-Channel
- Enhancement mode
- Logic level
- Avalanche rated
- Pb-free lead plating; RoHS compliant
- Qualified according to AEC Q101
- Halogen-free according to IEC61249-2-21

Product Summary

V_{DS}	-100	V
$R_{DS(on),max}$	800	mΩ
I_D	-1	A

PG-SOT-223



Type	Package	Tape and Reel Information	Marking	Lead free	Packing
BSP322P	PG-SOT-223	H6327: 1000 pcs/reel	BSP322P	Yes	Non dry

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

Parameter	Symbol	Conditions	Value	Unit
Continuous drain current	I_D	T_C=25 °C	1	A
		T_C=70 °C	0.8	
Pulsed drain current	$I_{D,pulse}$	T_C=25 °C	4	
Avalanche energy, single pulse	E_{AS}	I_D=-1 A, R_{GS}=25 Ω	57	mJ
Gate source voltage	V_{GS}		±20	V
Power dissipation	P_{tot}	T_C=25 °C	1.8	W
Operating and storage temperature	T_j, T_{stg}		-55 ... 150	°C
ESD Class		JESD22-A114-HBM	1A (250V to 500V)	
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 - ambient	R_{thJA}	minimal footprint, steady state	-	-	115	K/W
		6 cm^2 cooling area[1)], steady state	-	-	70	
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}=V_{GS},I_D=-380 µA	-2.0	-1.5	-1.0	
Zero gate voltage drain current	I_{DSS}	V_{DS}=-100 V, V_{GS}=0 V, T_j=25 °C	-	-0.1	-1	µA
		V_{DS}=-100 V, V_{GS}=0 V, T_j=150 °C	-	-10	-100	
Gate-source leakage current	I_{GSS}	V_{GS}=-20 V, V_{DS}=0 V	-	-10	-100	nA
Drain-source on-state resistance	$R_{DS(on)}$	V_{GS}=-10 V, I_D=-1 A	-	600	800	mΩ
		V_{GS}=-4.5 V, I_D=-0.93 A	-	808	1000	
Transconductance	g_{fs}	$\|V_{DS}\|>2\|I_D\|R_{DS(on)max}$, I_D=-0.8 A	0.7	1.4	-	S

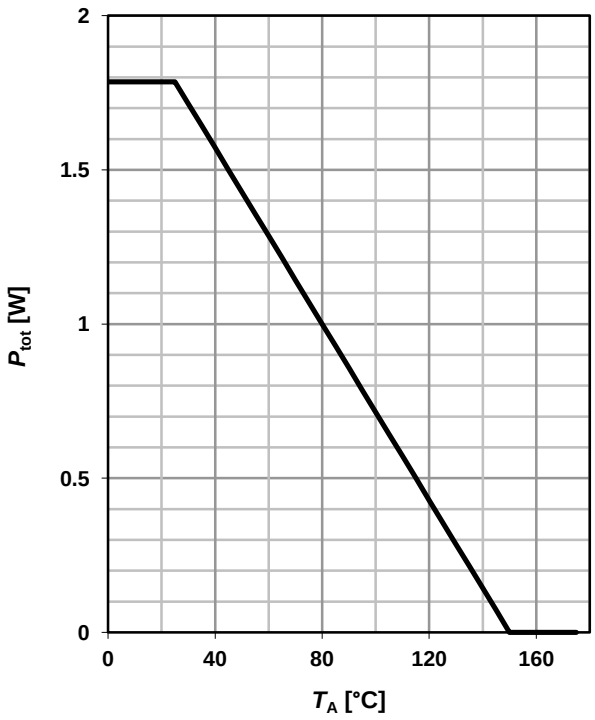
[1)] Device on 40 mm x 40 mm x 1.5 mm epoxy PCB FR4 with 6 cm^2 (one layer, 70 µm thick) copper area for drain connection. PCB is vertical in still air.

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Dynamic characteristics						
Input capacitance	C_{iss}	V_{GS}=0 V, V_{DS}=-25 V, f=1 MHz	-	280	372	pF
Output capacitance	C_{oss}		-	70	94	
Reverse transfer capacitance	C_{rss}		-	34	51	
Turn-on delay time	$t_{d(on)}$	V_{DD}=-50 V, V_{GS}=-10 V, I_D=-1 A, R_G=6 Ω	-	4.6	6.9	ns
Rise time	t_r		-	4.3	6.5	
Turn-off delay time	$t_{d(off)}$		-	21.2	31.8	
Fall time	t_f		-	8.3	12.5	
Gate Charge Characteristics[2)]						
Gate to source charge	Q_{gs}	V_{DD}=-80 V, I_D=-1 A, V_{GS}=0 to -10 V	-	0.8	1.0	nC
Gate to drain charge	Q_{gd}		-	4.3	6.4	
Gate charge total	Q_g		-	12.4	16.5	
Gate plateau voltage	$V_{plateau}$		-	2.9	-	V
Reverse Diode						
Diode continuous forward current	I_S	T_C=25 °C	-	-	-1.0	A
Diode pulse current	$I_{S,pulse}$		-	-	-4.0	
Diode forward voltage	V_{SD}	V_{GS}=0 V, I_F=-1 A, T_j=25 °C	-	0.84	1.2	V
Reverse recovery time	t_{rr}	V_R=50 V, I_F=$\|I_S\|$, di_F/dt=100 A/µs	-	47	-	ns
Reverse recovery charge	Q_{rr}		-	84	-	nC

[2)] See figure 16 for gate charge parameter definition

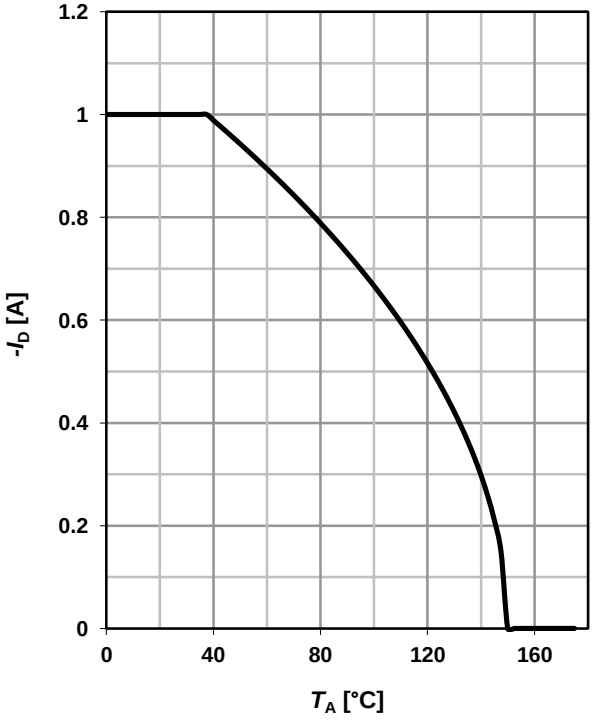
1 Power dissipation

$P_{tot}=f(T_C)$



2 Drain current

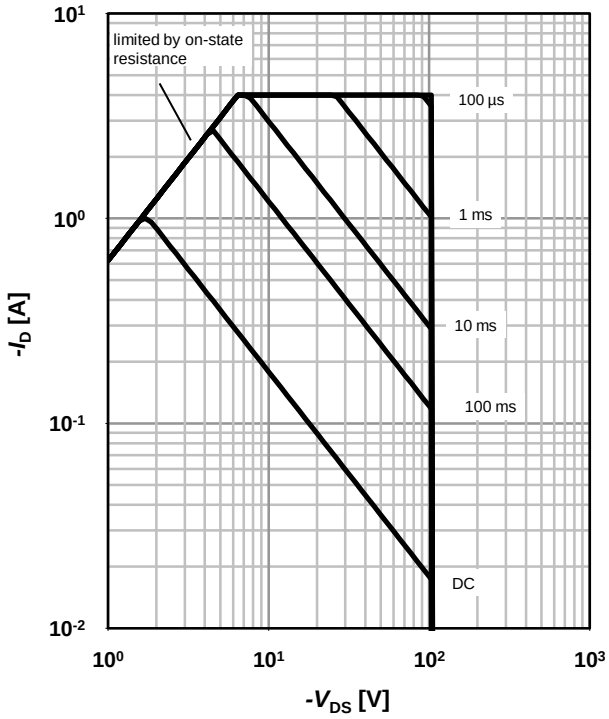
$I_D=f(T_C)$; $|V_{GS}|\geq 10$ V



3 Safe operating area

$I_D=f(V_{DS})$; $T_C=25$ °C; $D=0$

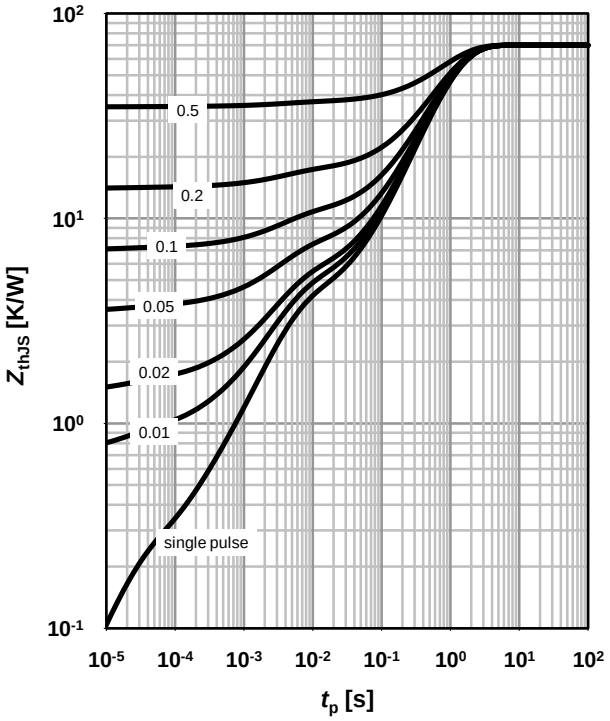
parameter: t_p



4 Max. transient thermal impedance

$Z_{thJC}=f(t_p)$

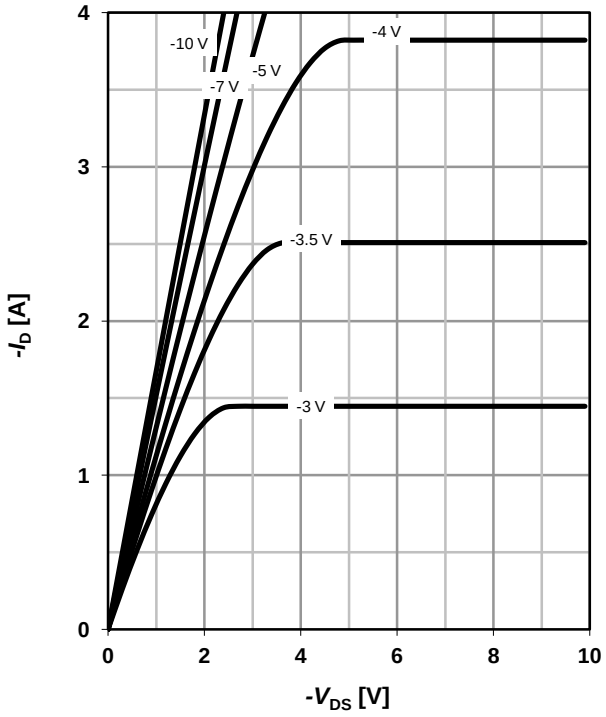
parameter: $D=t_p/T$



5 Typ. output characteristics

I_D=f(V_{DS}); T_j=25 °C

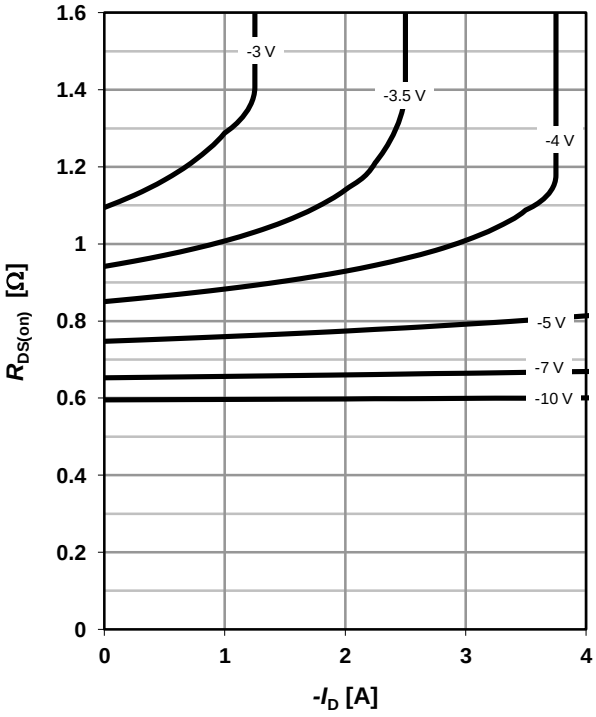
parameter: V_{GS}



6 Typ. drain-source on resistance

$R_{DS(on)}$=f(I_D); T_j=25 °C

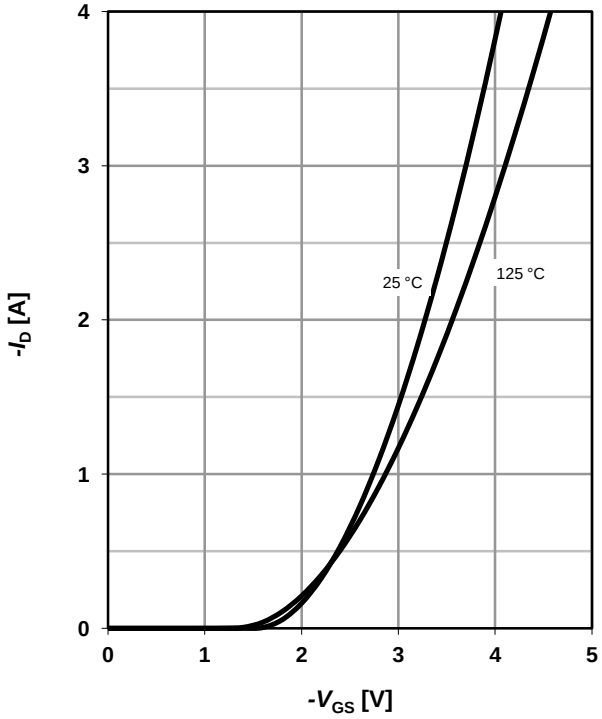
parameter: V_{GS}



7 Typ. transfer characteristics

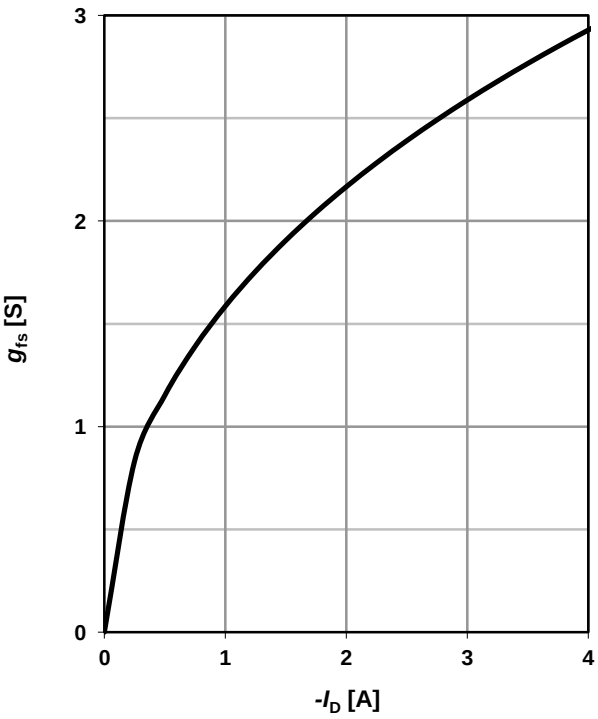
I_D=f(V_{GS}); $|V_{DS}|>2|I_D|R_{DS(on)max}$

parameter: T_j



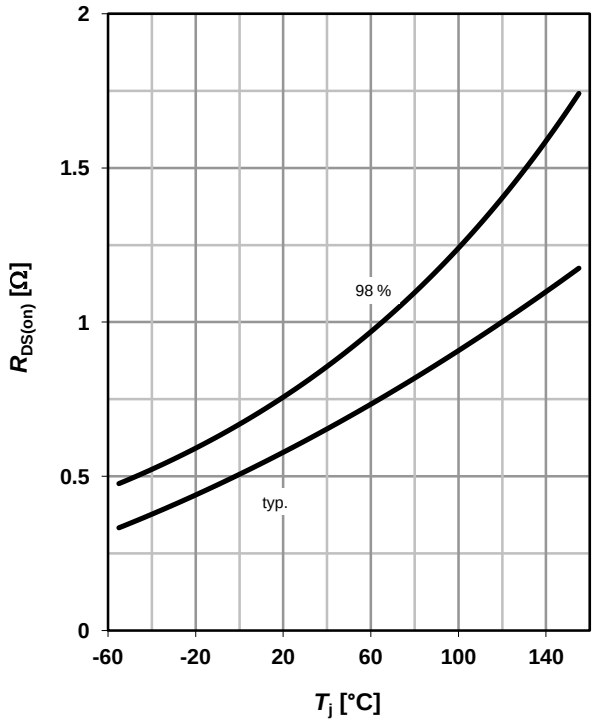
8 Typ. forward transconductance

g_{fs}=f(I_D); T_j=25 °C



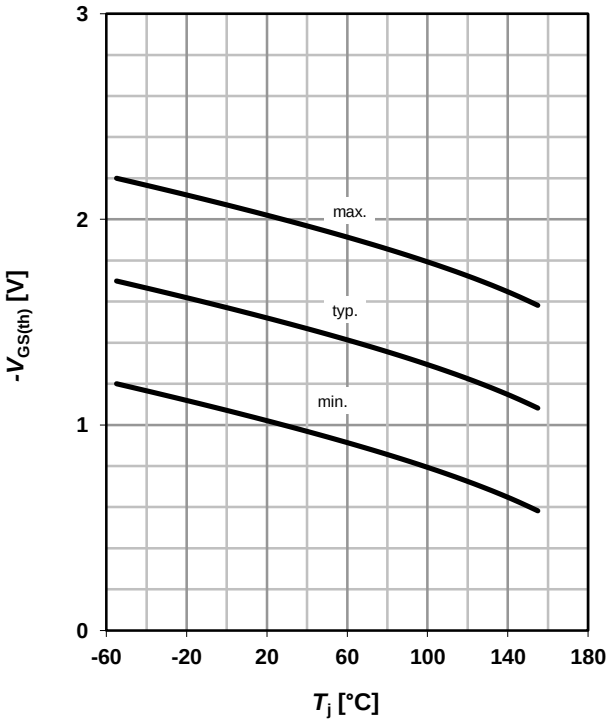
9 Drain-source on-state resistance

$R_{DS(on)}=f(T_j)$; I_D=-1 A; V_{GS}=-10 V



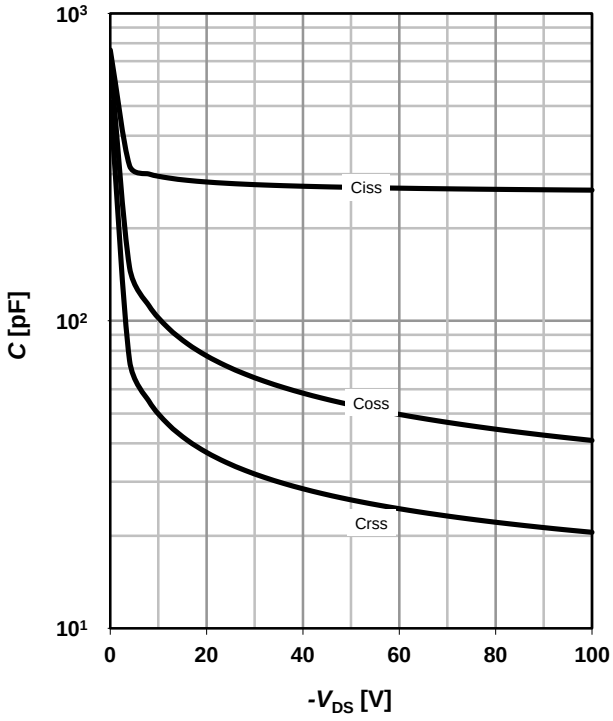
10 Typ. gate threshold voltage

$V_{GS(th)}=f(T_j)$; $V_{GS}=V_{DS}$; I_D=-380 µA



11 Typ. capacitances

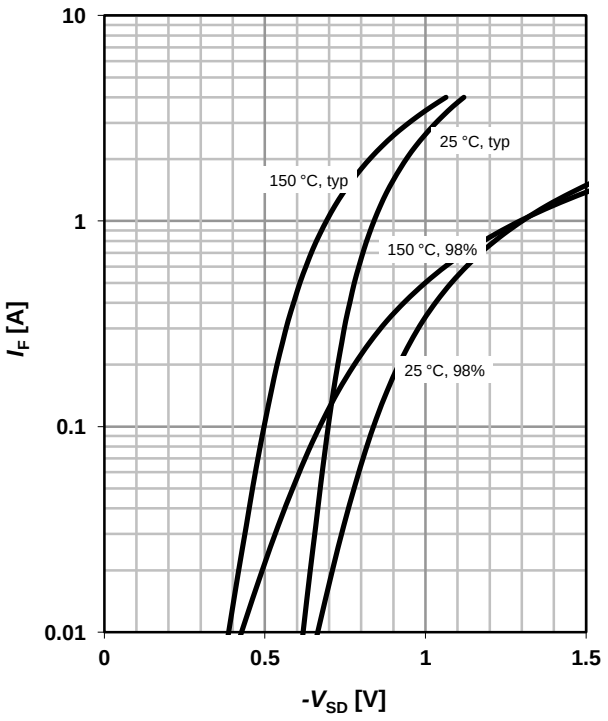
$C=f(V_{DS})$; V_{GS}=0 V; f=1 MHz



12 Forward characteristics of reverse diode

$I_F=f(V_{SD})$

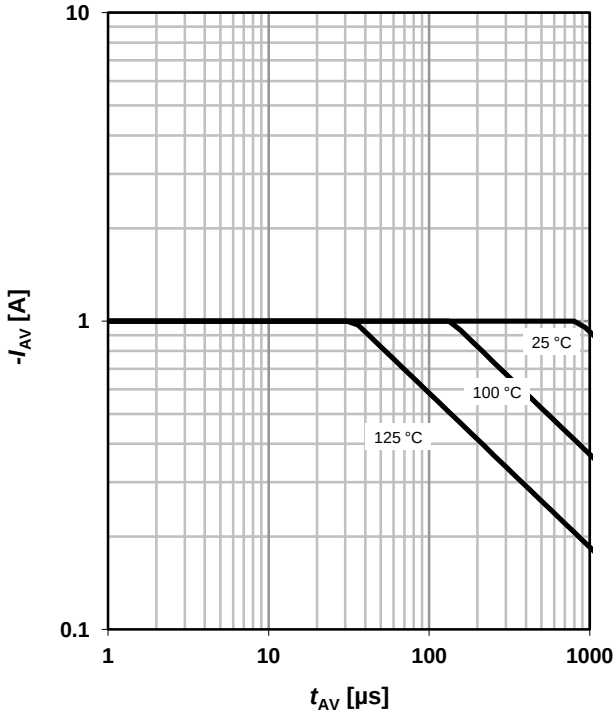
parameter: T_j



13 Avalanche characteristics

I_{AS}=f(t_{AV}); R_{GS}=25 Ω

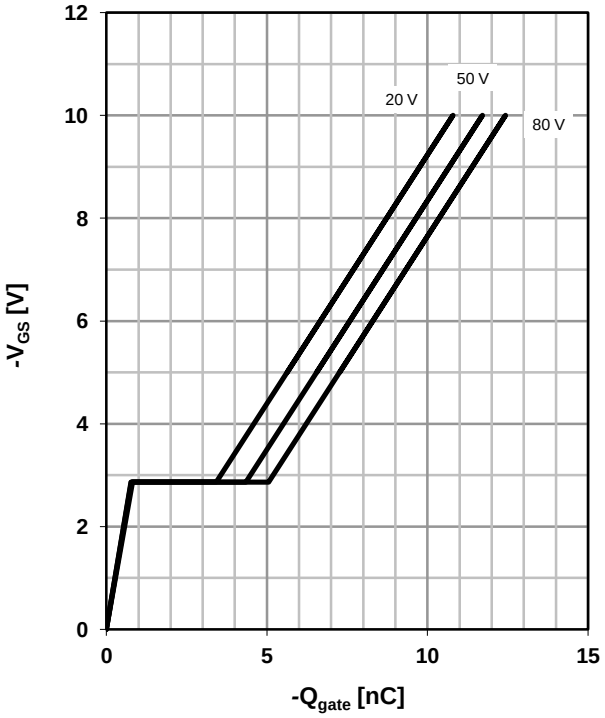
parameter: $T_{j(start)}$



14 Typ. gate charge

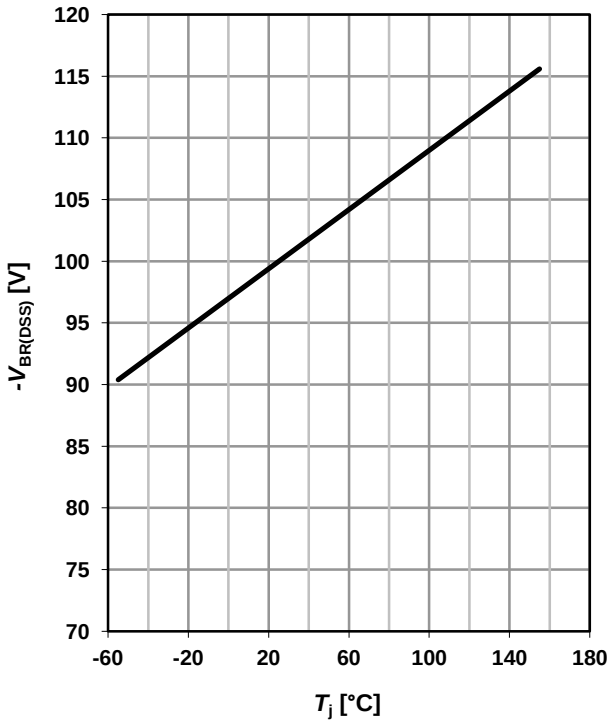
V_{GS}=f(Q_{gate}); I_D=-1 A pulsed

parameter: V_{DD}

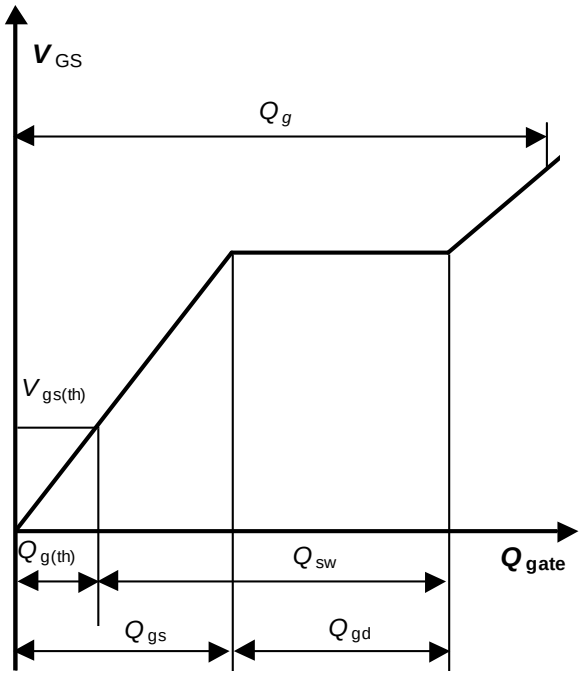


15 Drain-source breakdown voltage

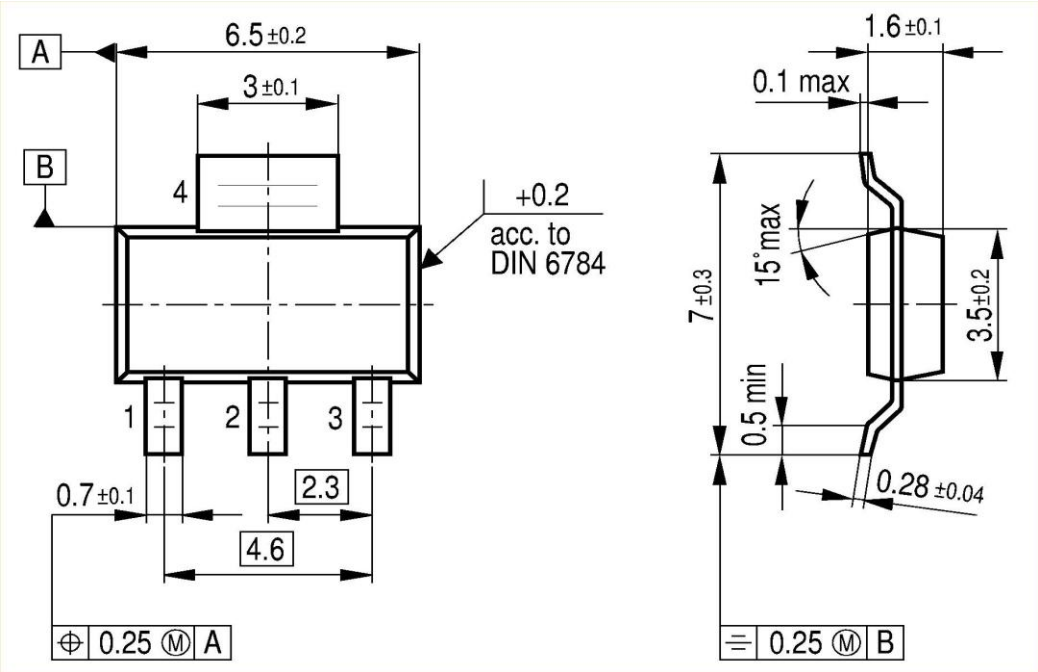
$V_{BR(DSS)}$=f(T_j); I_D=-250 µA



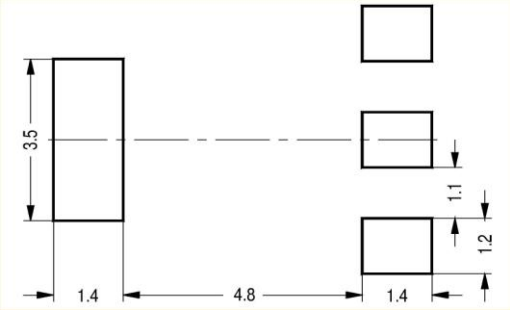
16 Gate charge waveforms



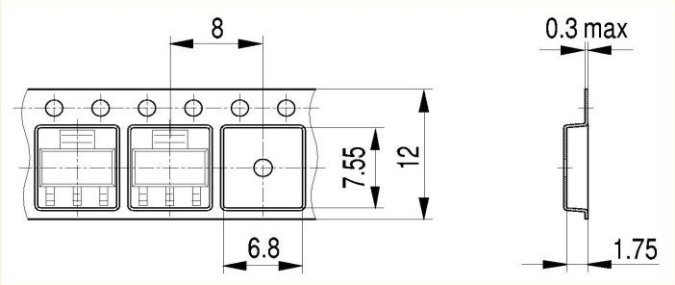
Package Outline: PG-SOT-223



Footprint:



Packaging:



Dimensions in mm

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