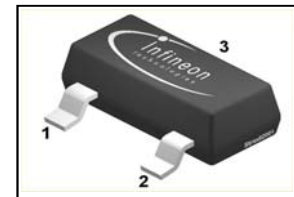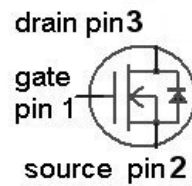# SIPMOS® Small-Signal-Transistor

Features

• N-channel

• Depletion mode

• dv/dt rated

• Available with $V_{GS(th)}$ indicator on reel

• Pb-free lead plating; RoHS compliant

• Qualified according to AEC Q101

• Halogen-free according to IEC61249-2-21

Product Summary

V_{DS}	600	V
$R_{DS(on),max}$	700	Ω
$I_{DSS,min}$	0.007	A

PG-SOT-23

drain pin 3
gate pin 1
source pin 2

Type	Package	Pb-free	Tape and Reel Information	Marking
BSS126	PG-SOT-23	Yes	H6327: 3000 pcs/reel	SHs
BSS126	PG-SOT-23	Yes	H6906: 3000 pcs/reel sorted in $V_{GS(th)}$ bands [1]	SHs

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

Parameter	Symbol	Conditions	Value	Unit
Continuous drain current	I_D	T_A=25 °C	0.021	A
		T_A=70 °C	0.017	
Pulsed drain current	$I_{D,pulse}$	T_A=25 °C	0.085	
Reverse diode dv/dt	dv/dt	I_D=0.016 A, V_{DS}=20 V, di/dt=200 A/µs, $T_{j,max}$=150 °C	6	kV/µs
Gate source voltage	V_{GS}		±20	V
ESD sensitivity (HBM) as per JESD22-A114			Class 0 (0 >250 V)	
Power dissipation	P_{tot}	T_A=25 °C	0.50	W
Operating and storage temperature	T_j, T_{stg}		-55 ... 150	°C
IEC climatic category; DIN IEC 68-1			55/150/56	

[1] see table on next page and diagram 11

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	

Thermal characteristics

Parameter	Symbol	Conditions	min.	typ.	max.	Unit
Thermal resistance, junction - ambient	R_{thJA}	minimal footprint	-	-	250	K/W

Electrical characteristics, at T_j=25 °C, unless otherwise specified

Static characteristics

Parameter	Symbol	Conditions	min.	typ.	max.	Unit
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS}=-5 V, I_D=250 µA	600	-	-	V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=3 V, I_D=8 µA	-2.7	-2.0	-1.6	
Drain-source cutoff current	$I_{D(off)}$	V_{DS}=600 V, V_{GS}=-5 V, T_j=25 °C	-	-	0.1	µA
		V_{DS}=600 V, V_{GS}=-5 V, T_j=125 °C	-	-	10	
Gate-source leakage current	I_{GSS}	V_{GS}=20 V, V_{DS}=0 V	-	-	100	nA
On-state drain current	I_{DSS}	V_{GS}=0 V, V_{DS}=25 V	7	-	-	mA
Drain-source on-state resistance	$R_{DS(on)}$	V_{GS}=0 V, I_D=3 mA	-	320	700	Ω
		V_{GS}=10 V, I_D=16 mA	-	280	500	
Transconductance	g_{fs}	$|V_{DS}|>2|I_D|R_{DS(on)max}$, I_D=0.01 A	0.008	0.017	-	S

Threshold voltage $V_{GS(th)}$ sorted in bands[2]

	Symbol	Conditions	min.	typ.	max.	Unit
J	$V_{GS(th)}$	V_{DS}=3 V, I_D=8 µA	-1.8	-	-1.6	V
K			-1.95	-	-1.75	
L			-2.1	-	-1.9	
M			-2.25	-	-2.05	
N			-2.4	-	-2.2	

[2] Each reel contains transistors out of one band whose identifying letter is printed on the reel label. A specific band cannot be ordered separately.

| Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Dynamic characteristics						
I_D=f(V_{GS}); V_{DS}=3 V; T_j=25 °C	C_{iss}	V_{GS}=-5 V, V_{DS}=25 V, f=1 MHz	-	21	28	pF
Output capacitance	C_{oss}		-	2.4	3.2	
Reverse transfer capacitance	C_{rss}		-	1.0	1.5	
Turn-on delay time	$t_{d(on)}$	V_{DD}=300 V, V_{GS}=-3…7 V, I_D=0.01 A, R_G=6 Ω	-	6.1	9.2	ns
Rise time	t_r		-	9.7	14.5	
Turn-off delay time	$t_{d(off)}$		-	14	21	
Fall time	t_f		-	115	170	
Gate Charge Characteristics						
Gate to source charge	Q_{gs}	V_{DD}=400 V, I_D=10 mA, V_{GS}=-3 to 5 V	-	0.05	0.08	nC
Gate to drain charge	Q_{gd}		-	1.2	1.8	
Gate charge total	Q_g		-	1.4	2.1	
Gate plateau voltage	$V_{plateau}$		-	0.10	-	V
Reverse Diode						
Diode continous forward current	I_S	T_A=25 °C	-	-	0.016	A
Diode pulse current	$I_{S,pulse}$		-	-	0.064	
Diode forward voltage	V_{SD}	V_{GS}=-5 V, I_F=16 mA, T_j=25 °C	-	0.81	1.2	V
Reverse recovery time	t_{rr}	V_R=300 V, I_F=0.01 A, di_F/dt=100 A/µs	-	160	240	ns
Reverse recovery charge	Q_{rr}		-	13.2	19.8	nC

1 Power dissipation

$P_\text{tot}=\text{f}(T_\text{A})$
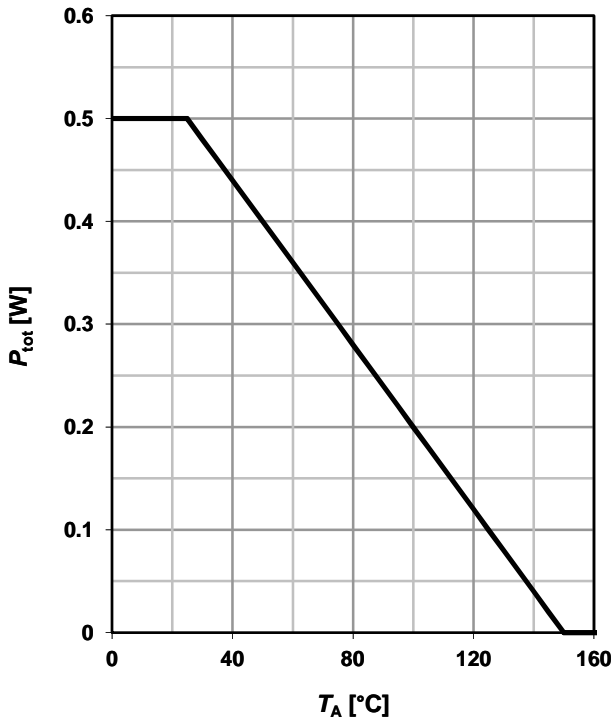
2 Drain current

$I_\text{D}=\text{f}(T_\text{A})$; $V_\text{GS}\geq10$ V
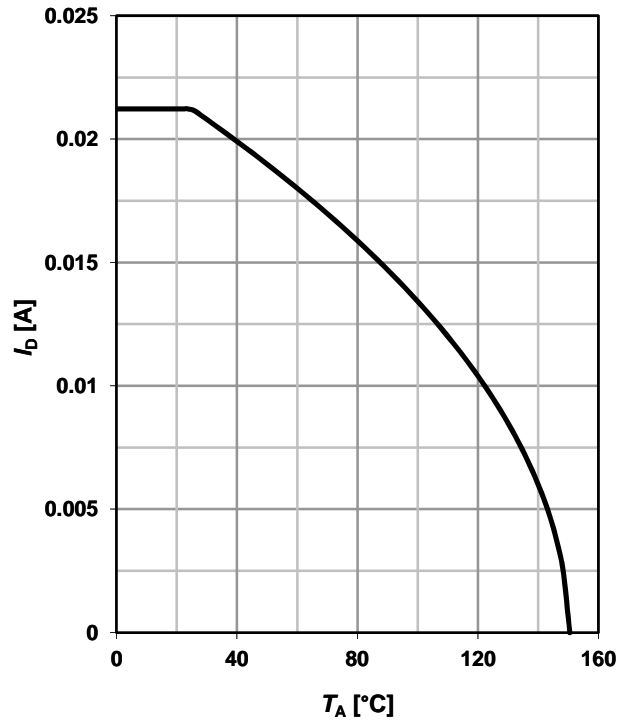
3 Safe operating area

$I_\text{D}=\text{f}(V_\text{GS})$; $V_\text{DS}=3$ V; $T_\text{j}=25$ °C

parameter: t_p
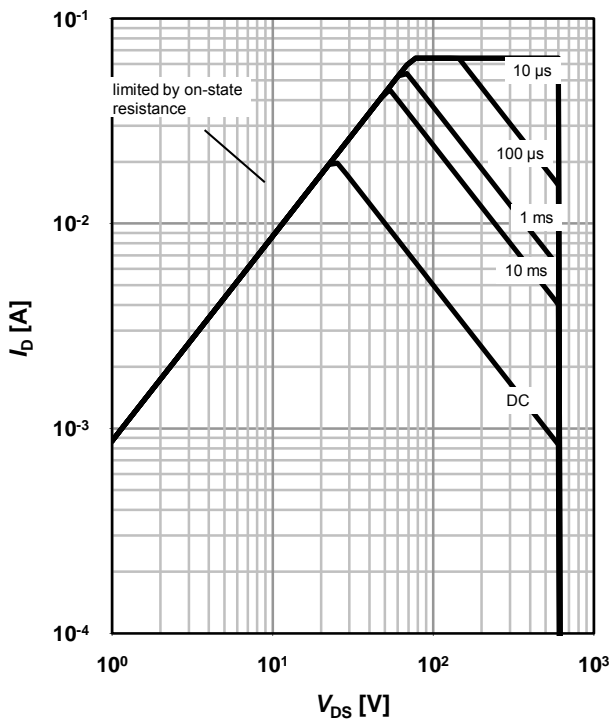
4 Max. transient thermal impedance

$Z_\text{thJA}=\text{f}(t_\text{p})$

parameter: $D=t_\text{p}/T$
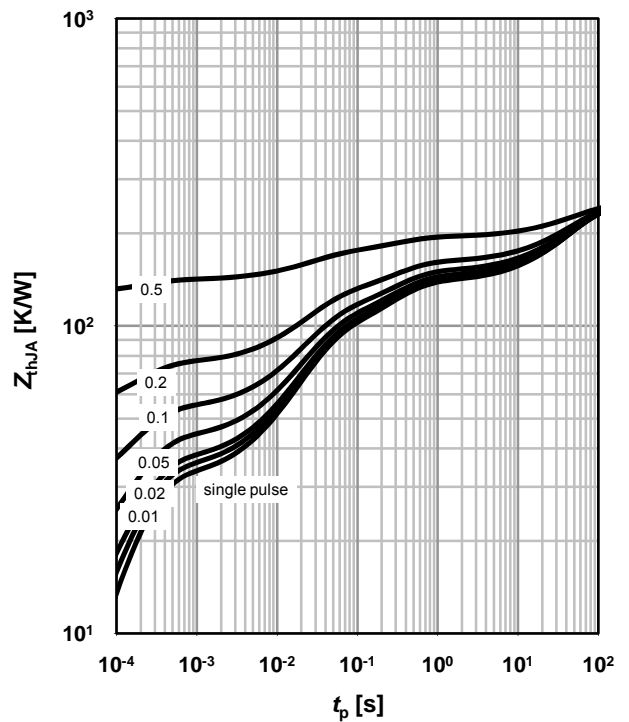
5 Typ. output characteristics

I_D=f(V_{DS}); T_j=25 °C

parameter: V_{GS}
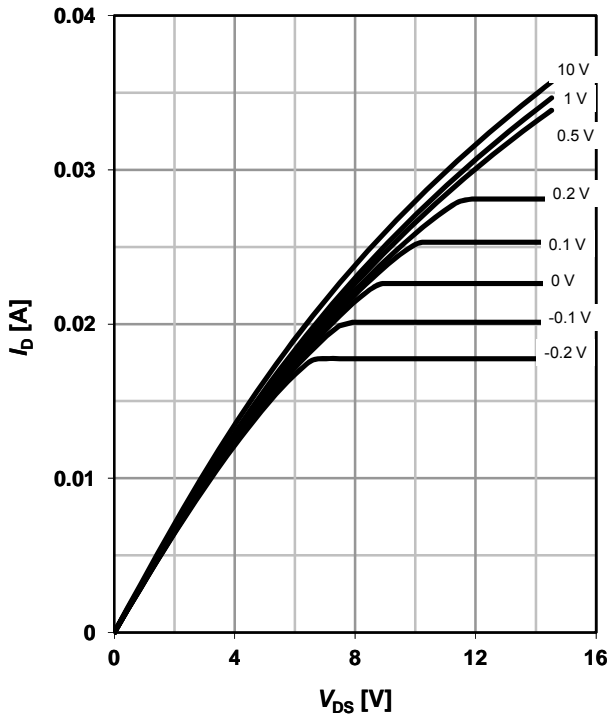
6 Typ. drain-source on resistance

$R_{DS(on)}$=f(I_D); T_j=25 °C

parameter: V_{GS}
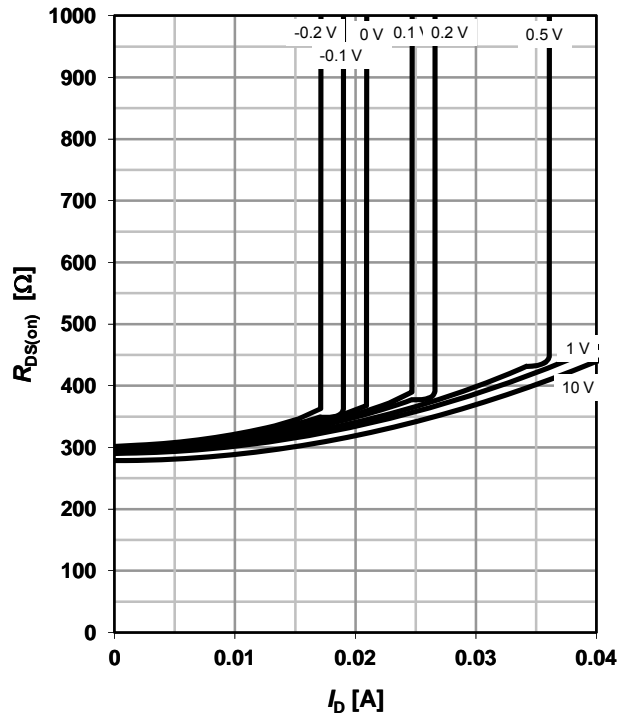
7 Typ. transfer characteristics
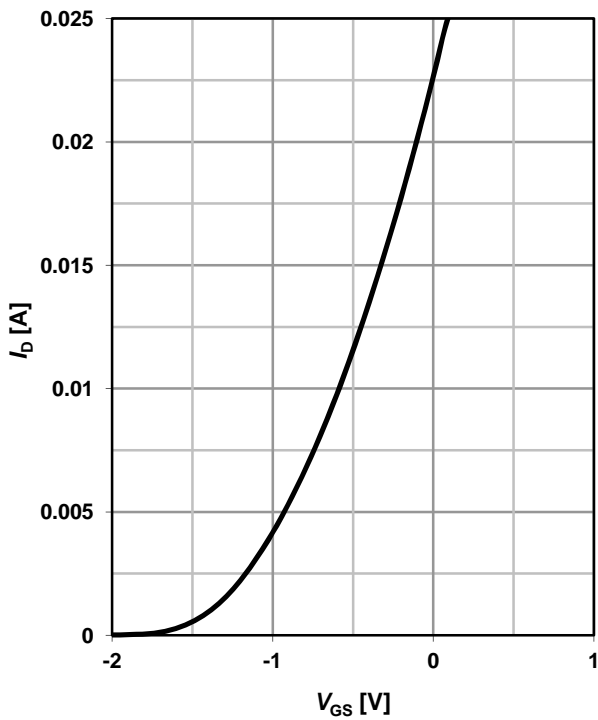
I_D=f(V_{GS}); V_{DS}=3 V; T_j=25 °C

8 Typ. forward transconductance

g_{fs}=f(I_D); T_j=25 °C
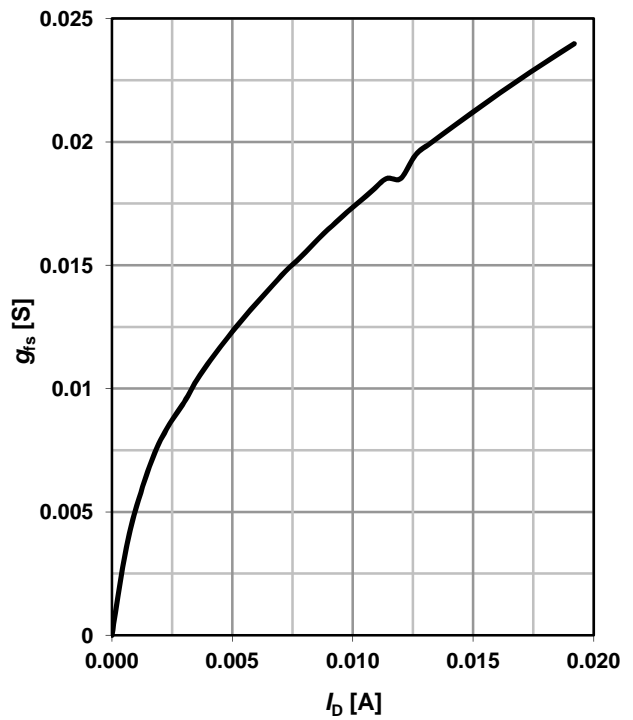
9 Drain-source on-state resistance

$R_{DS(on)}$=f(T_j); I_D= 0.016mA; V_{GS}=0 V
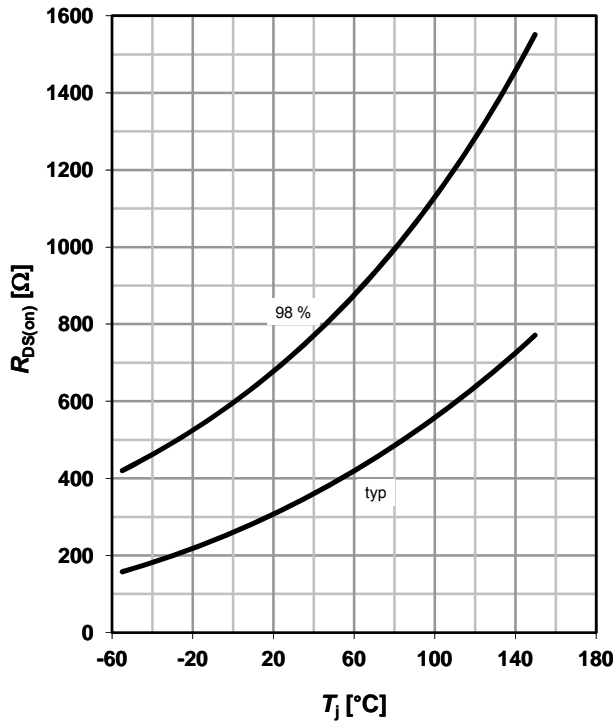
10 Typ. gate threshold voltage

$V_{GS(th)}$=f(T_j); V_{DS}=3 V; I_D = 8 µA
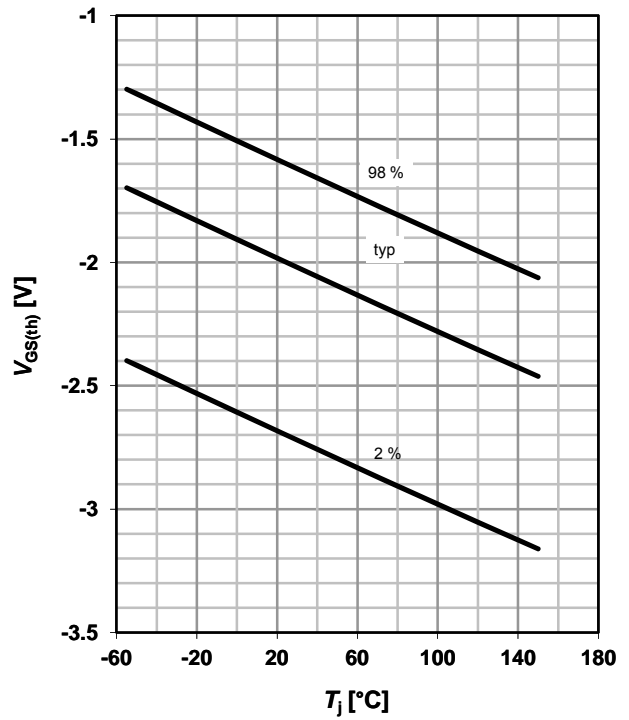
parameter: I_D

11 Threshold voltage bands

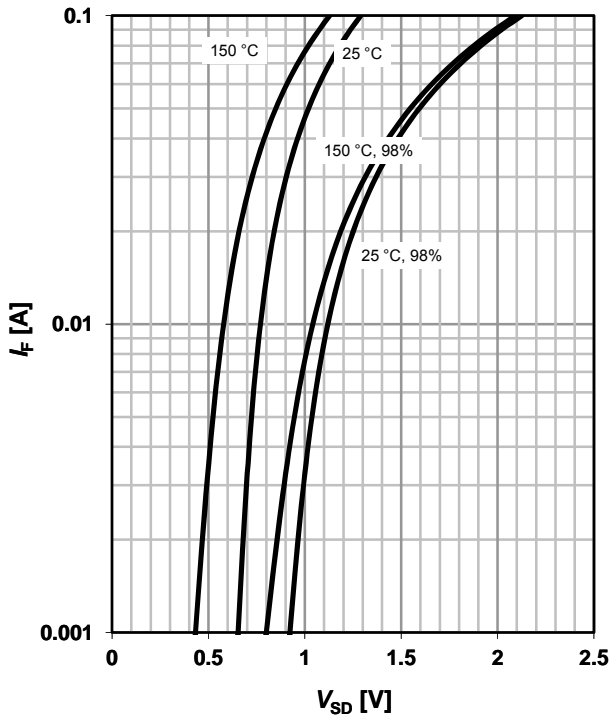I_D=f(V_{GS}); V_{DS}=3 V; T_j=25 °C
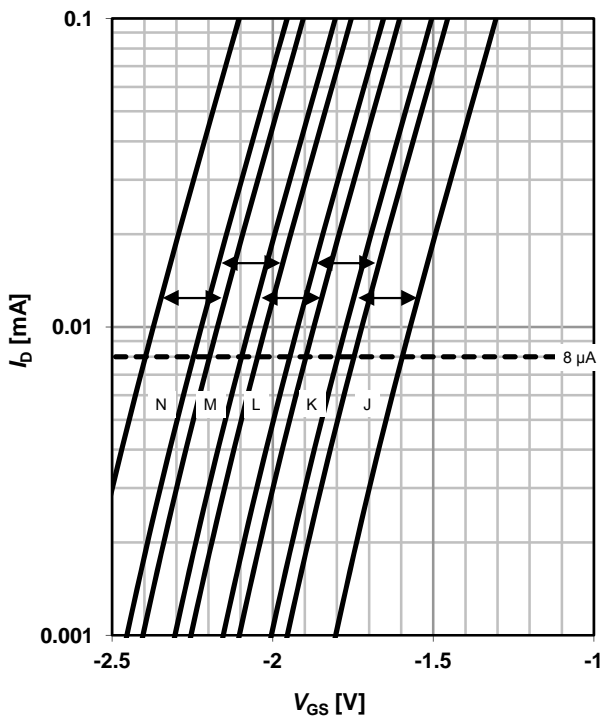
12 Typ. capacitances

C=f(V_{DS}); V_{GS}=-3 V; f=1 MHz
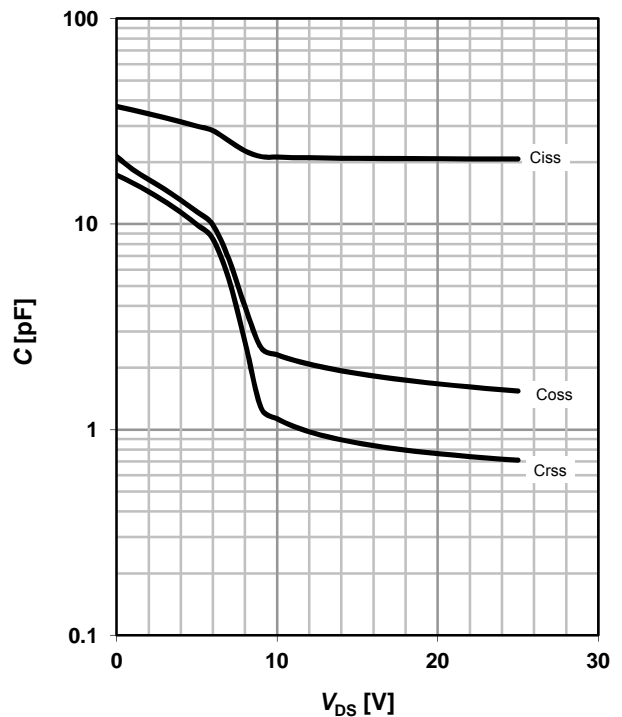
13 Forward characteristics of reverse diode
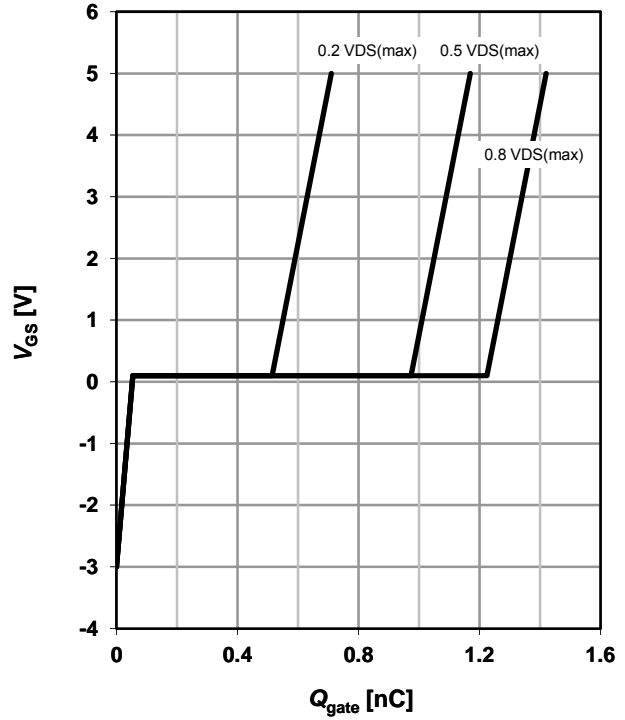
I_F=f(V_{SD})
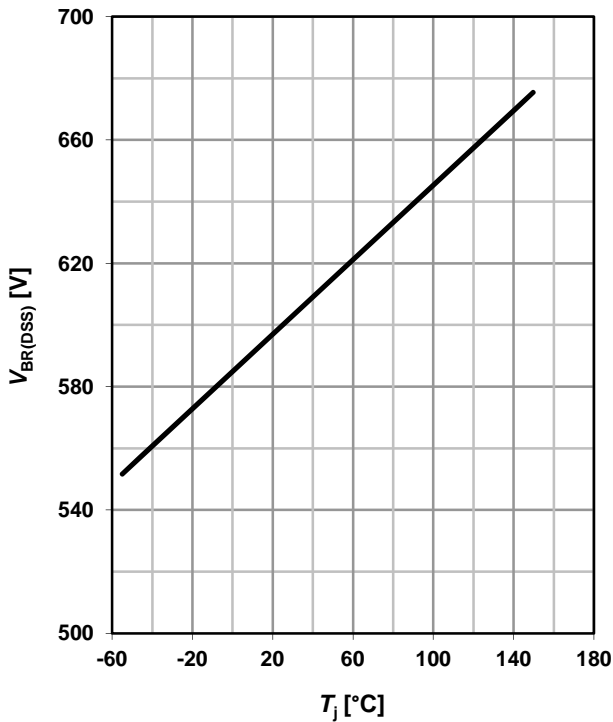
parameter: T_j

15 Typ. gate charge

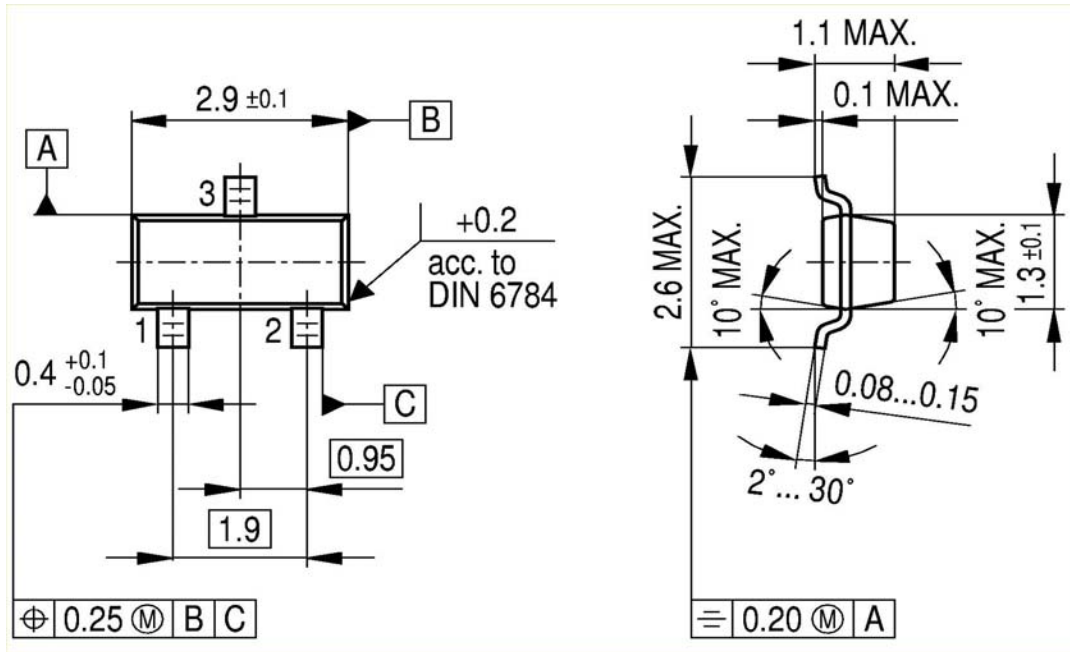V_{GS}=f(Q_{gate}); I_D=0.1 A pulsed

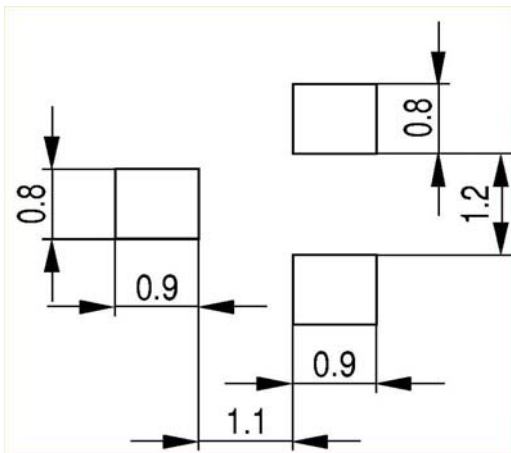parameter: V_{DD}

16 Drain-source breakdown voltage

I_D=f(V_{GS}); V_{DS}=3 V; T_j=25 °C

Package Outline:

Footprint:

Packaging:
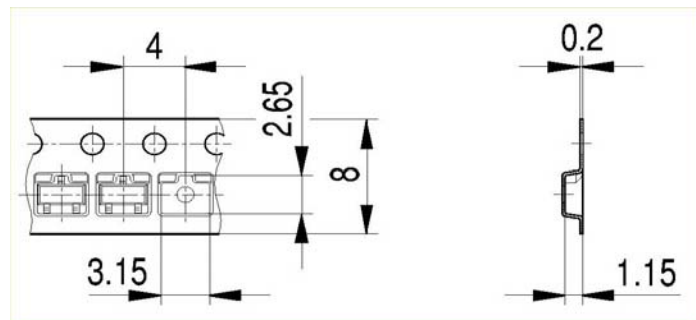
Dimensions in mm

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