SIPMOS® Small-Signal-Transistor

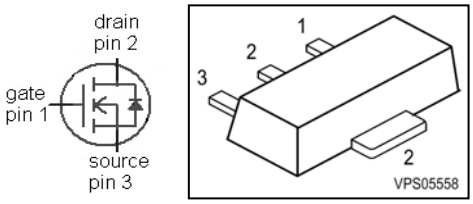
Feature

- n-channel
- enhancement mode
- Logic level
- d*v*/d*t* rated
- Pb-free lead-plating; RoHS compliant

Product Summary

V_{DS} [1)]	600	V
$R_{DS(on),max}$	45	Ω
I_D	0.09	A

PG-SOT89



Type	Package	Ordering Code	Tape and Reel Information	Marking
BSS225	PG-SOT89	Q67042-S4266	E6327: 3000PCS/reel	KD

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

Parameter	Symbol	Conditions	Value	Unit
Continuous drain current	I_D	T_A=25 °C	0.09	A
		T_A=70 °C	0.073	
Pulsed drain current	$I_{D,pulse}$	T_A=25 °C	0.36	
Reverse diode d*v*/d*t*	d*v*/d*t*	I_D=0.09 A, V_{DS}=480 V, d*i*/d*t*=200 A/µs, $T_{j,max}$=150 °C	6	kV/µs
Gate source voltage	V_{GS}		±20	V
ESD sensitivity (HBM) as per MIL-STD 883			Class 1a	
Power dissipation	P_{tot}	T_A=25 °C	1.00	W
Operating and storage temperature	T_j, T_{stg}		-55 ... 150	°C
IEC climatic category; DIN IEC 68-1			55/150/56	

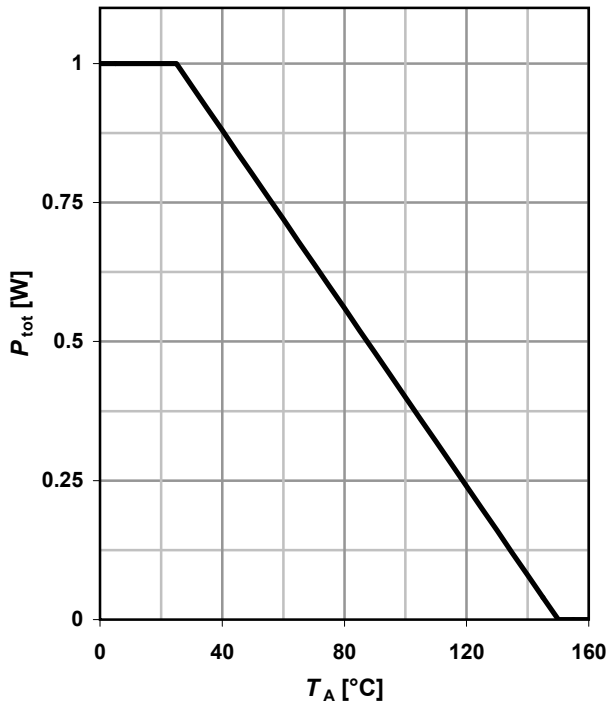
Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Thermal characteristics						
Thermal resistance, junction - minimal footprint	R_{thJA}		-	-	125	K/W
Electrical characteristics, at T_j=25 °C, unless otherwise specified						
Static characteristics						
Drain-source breakdown voltage [1)]	$V_{(BR)DSS}$	V_{GS}=0 V, I_D=250 µA	600	-	-	V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=0 V, I_D=94 µA	1.3	1.9	2.3	
Drain-source leakage current	$I_{D (off)}$	V_{DS}=600 V, V_{GS}=0 V, T_j=25 °C	-	-	0.1	µA
		V_{DS}=600 V, V_{GS}=0 V, T_j=150 °C	-	-	5	
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}=4.5 V, I_D=0.09 A	-	28	45	Ω
		V_{GS}=10 V, I_D=0.09 A	-	30	45	
Transconductance	g_{fs}	$\|V_{DS}\|>2\|I_D\|R_{DS(on)max}$, I_D=0.075 A	0.05	0.14	-	S

[1)] V_{DS} is zero-hour rated, see note at p.8

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	-	99	131	pF
Output capacitance	C_{oss}		-	7.6	11	
Reverse transfer capacitance	C_{rss}		-	3.1	4.4	
Turn-on delay time	$t_{d(on)}$	V_{DD}=300 V, V_{GS}=10 V, I_D=0.09 A, R_G=6 Ω	-	14.0	20.0	ns
Rise time	t_r		-	38.0	57.0	
Turn-off delay time	$t_{d(off)}$		-	62.0	93	
Fall time	t_f		-	41.0	62	
Gate Charge Characteristics						
Gate to source charge	Q_{gs}	V_{DD}=400 V, I_D=0.09 A, V_{GS}=0 to 10 V	-	0.32	0.43	nC
Gate to drain charge	Q_{gd}		-	1.4	2.1	
Gate charge total	Q_g		-	3.9	5.8	
Gate plateau voltage	$V_{plateau}$		-	3.3	-	V
Reverse Diode						
Diode continous forward current	I_S	T_A=25 °C	-	-	0.09	A
Diode pulse current	$I_{S,pulse}$		-	-	0.36	
Diode forward voltage	V_{SD}	V_{GS}=0 V, I_F=0.09 A, T_j=25 °C	-	0.75	1.2	V
Reverse recovery time	t_{rr}	V_R=300 V, I_F=0.09 A, di_F/dt=100 A/µs	-	246	370	ns
Reverse recovery charge	Q_{rr}		-	248	373	nC

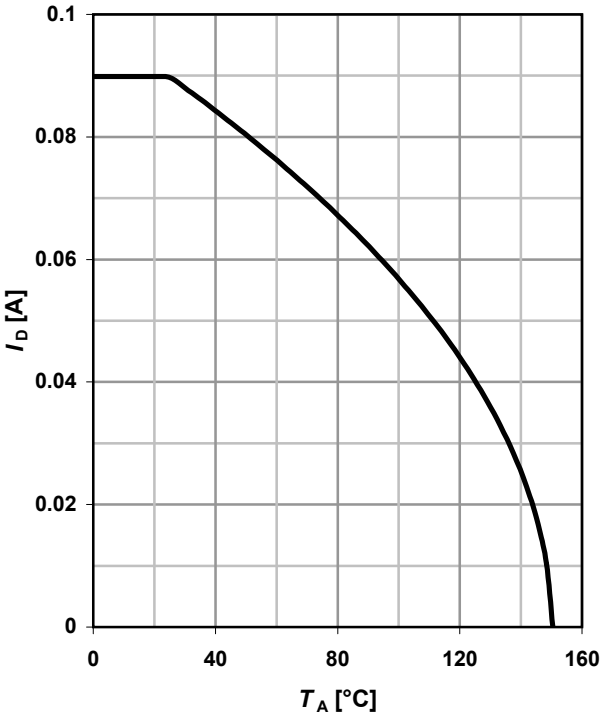
1 Power dissipation

$P_{tot}=f(T_A)$



2 Drain current

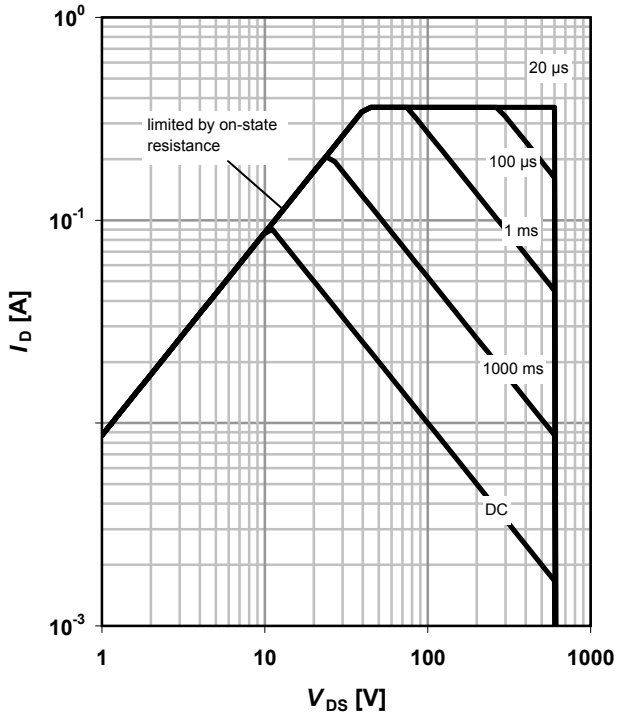
$I_D=f(T_A)$; $V_{GS}\geq 10$ V



3 Safe operating area

$I_D=f(V_{DS})$; $T_A=25$ °C; $D=0$

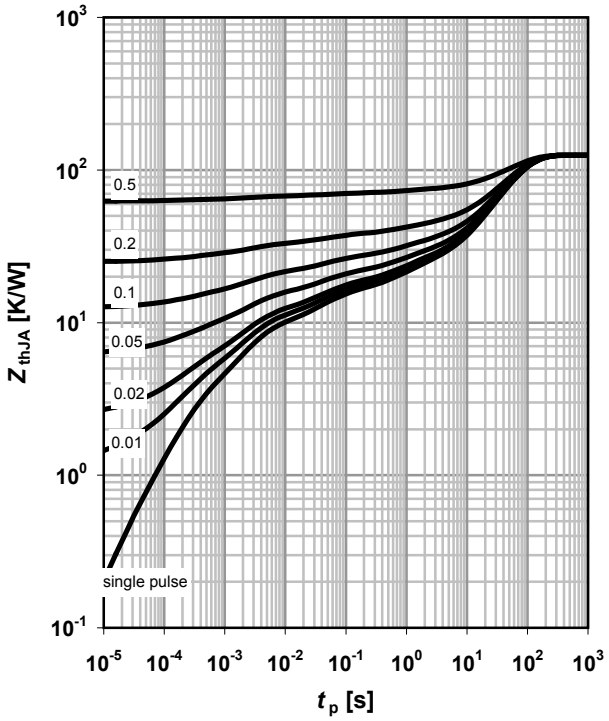
parameter: t_p



4 Max. transient thermal impedance

$Z_{thJA}=f(t_p)$

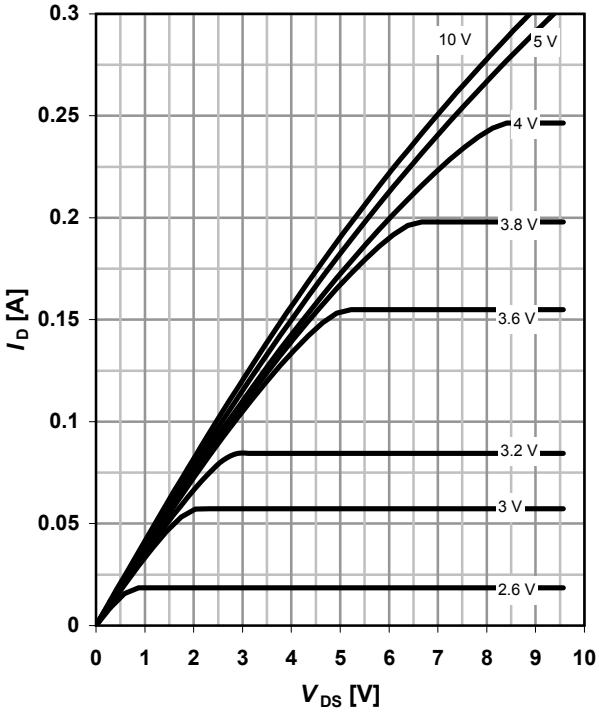
parameter: $D=t_p/T$



5 Typ. output characteristics

I_D=f(V_{DS}); T_j=25 °C

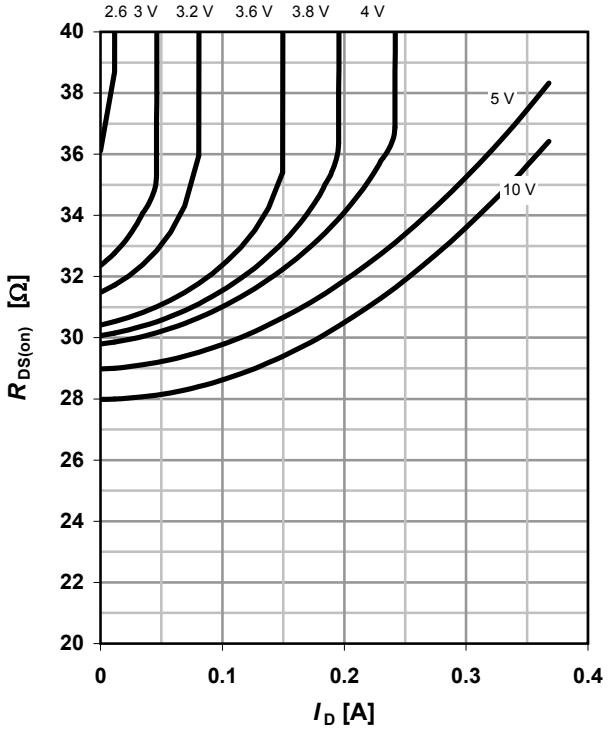
parameter: V_{GS}



6 Typ. drain-source on resistance

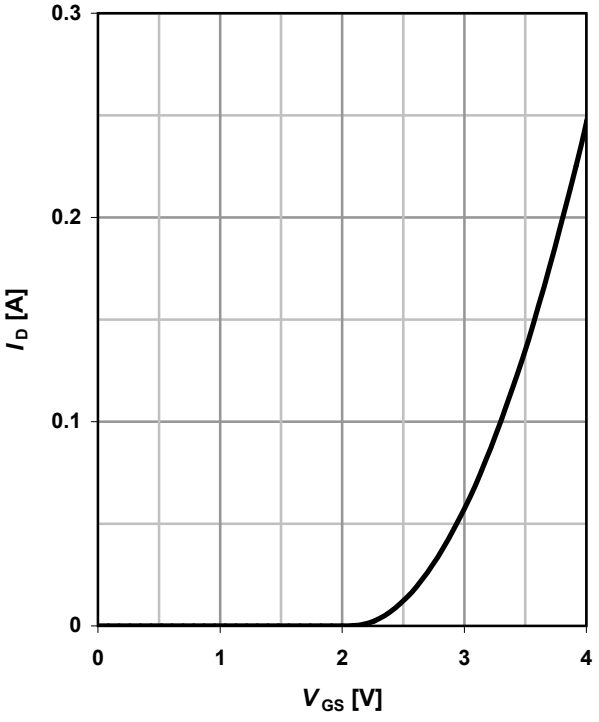
$R_{DS(on)}$=f(I_D); T_j=25 °C

parameter: V_{GS}



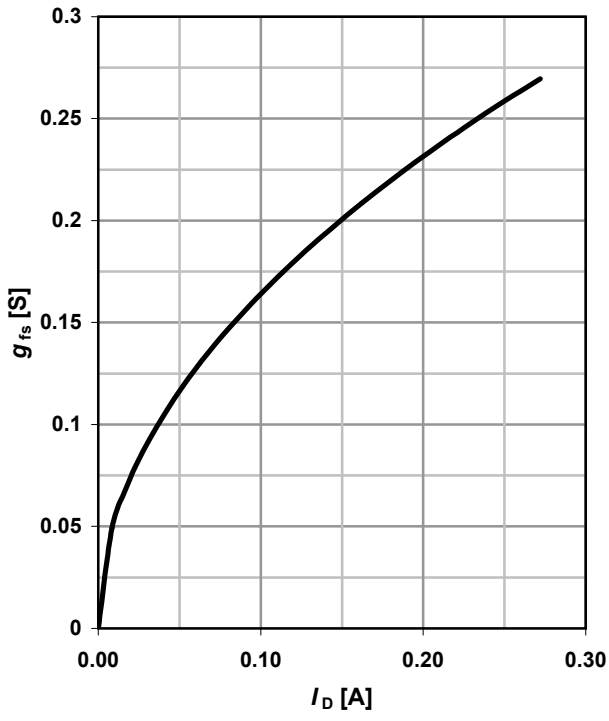
7 Typ. transfer characteristics

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



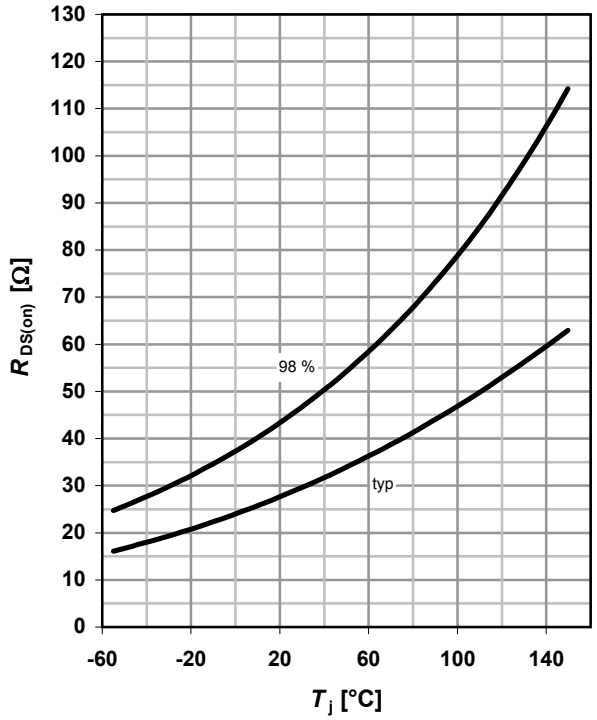
8 Typ. forward transconductance

g_{fs}=f(I_D); T_j=25 °C



9 Drain-source on-state resistance

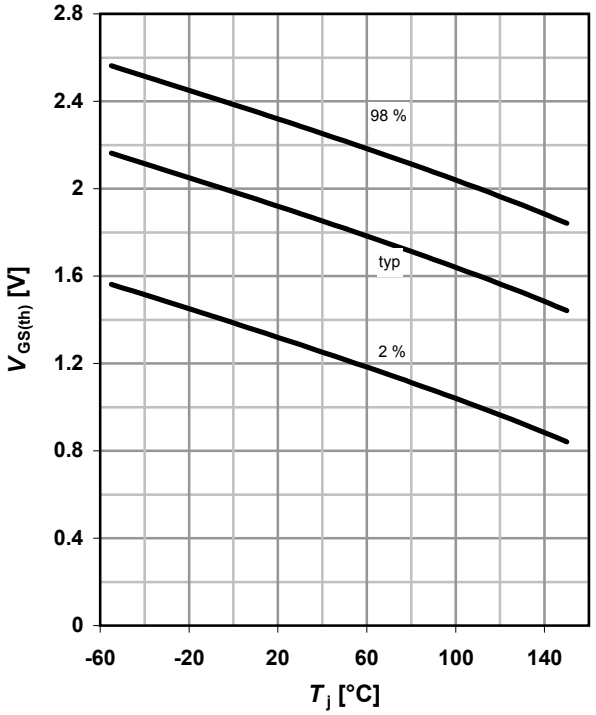
$R_{DS(on)}=f(T_j)$; $I_D=0.1$ A; $V_{GS}=10$ V



10 Typ. gate threshold voltage

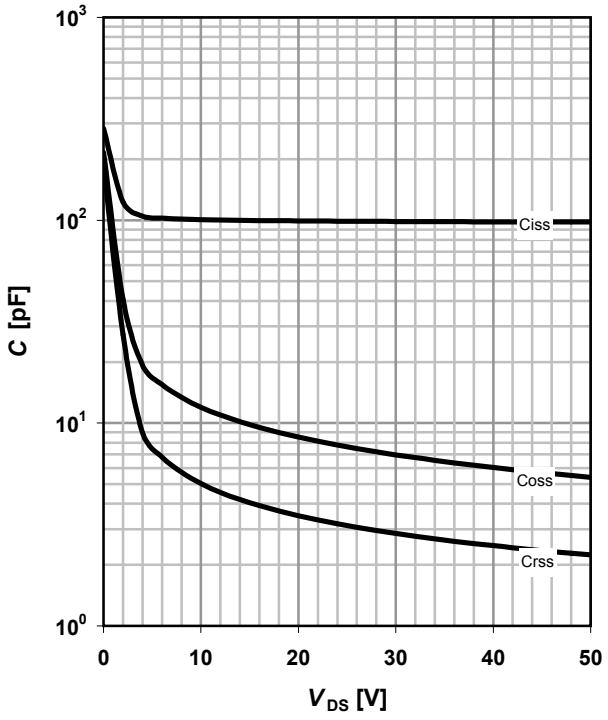
$V_{GS(th)}=f(T_j)$; $V_{DS}=V_{GS}$; $I_D=94$ µA

parameter: I_D



11 Typ. capacitances

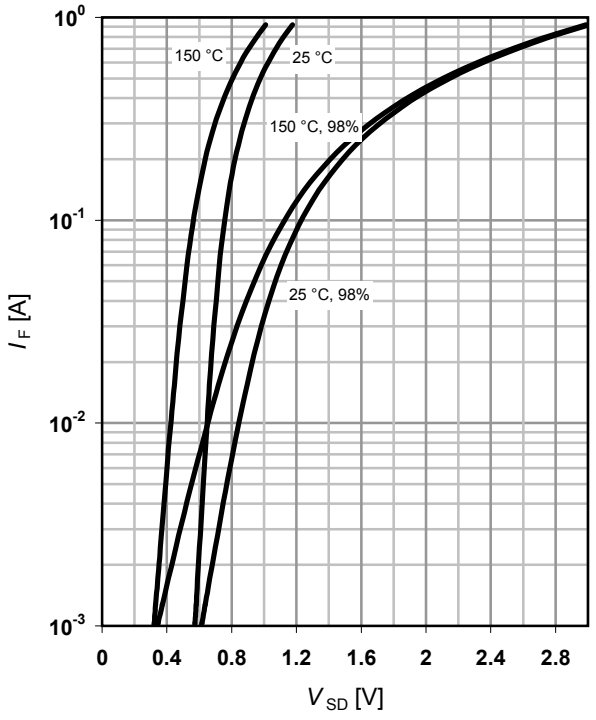
$C=f(V_{DS})$; $V_{GS}=0$ V; $f=1$ MHz; $T_j=25$°C



12 Forward characteristics of reverse diode

$I_F=f(V_{SD})$

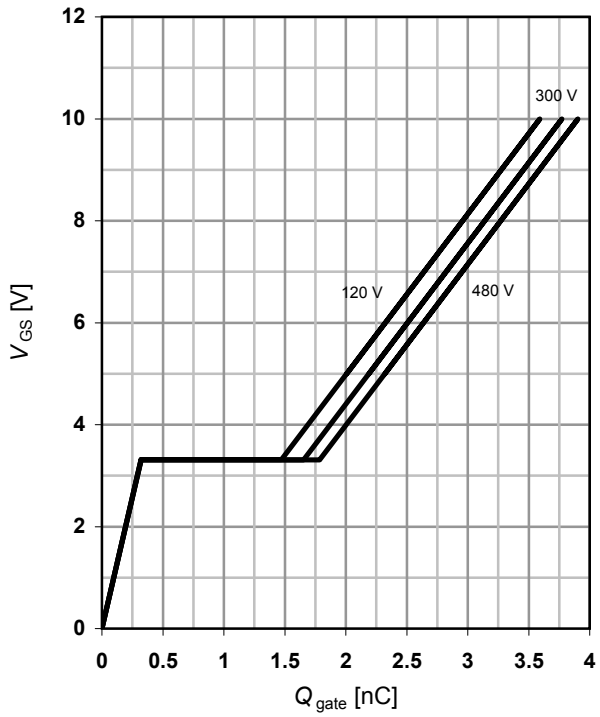
parameter: T_j



13 Typ. gate charge

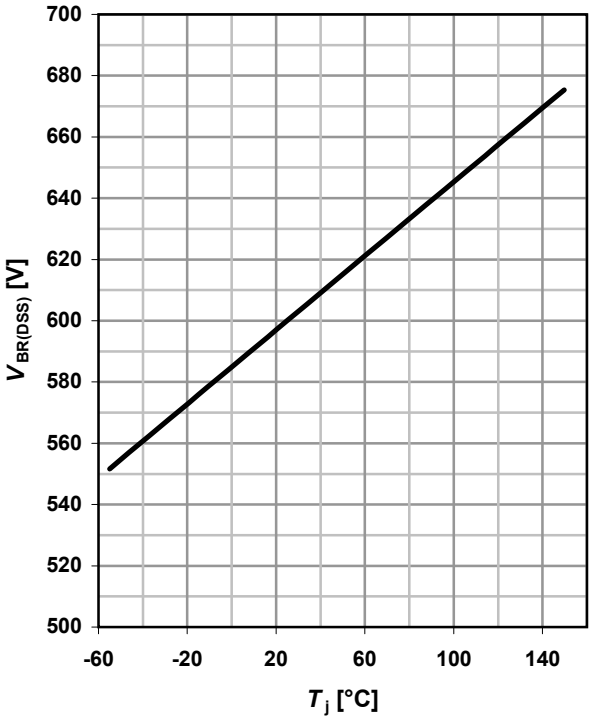
V_{GS}=f(Q_{gate}); I_D=0.1 A pulsed

parameter: V_{DD}

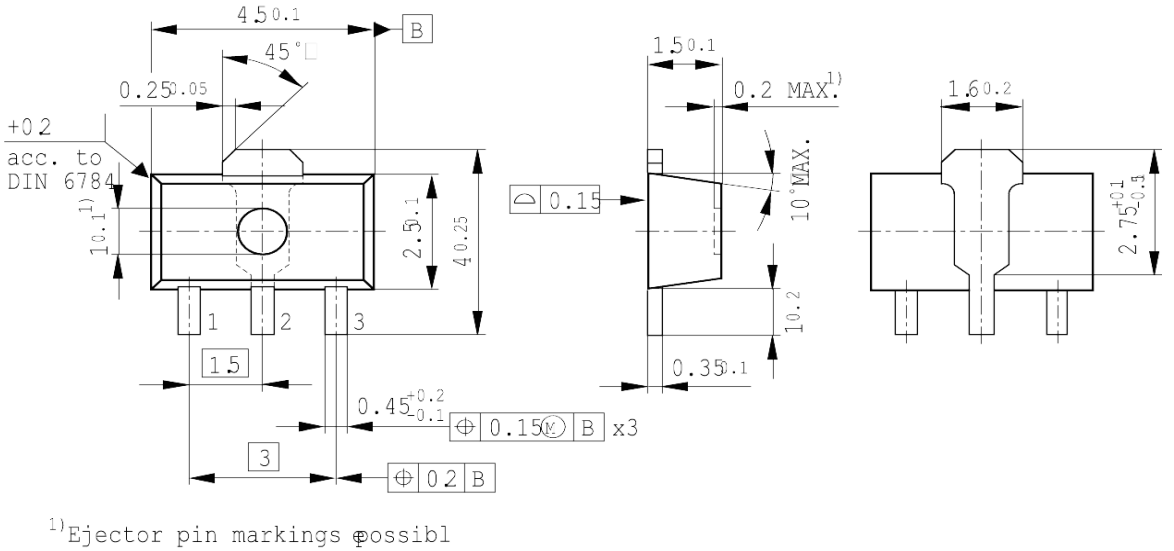


14 Drain-source breakdown voltage

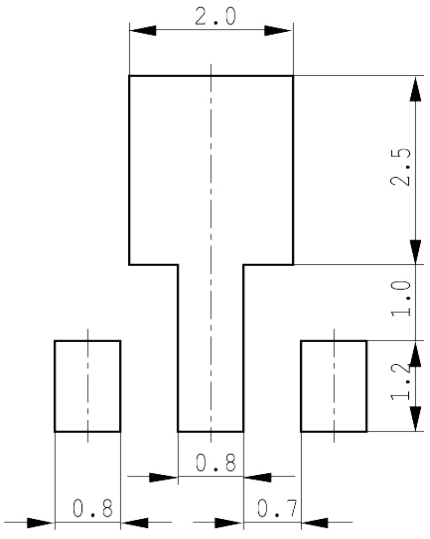
$V_{BR(DSS)}$=f(T_j); I_D=250 µA



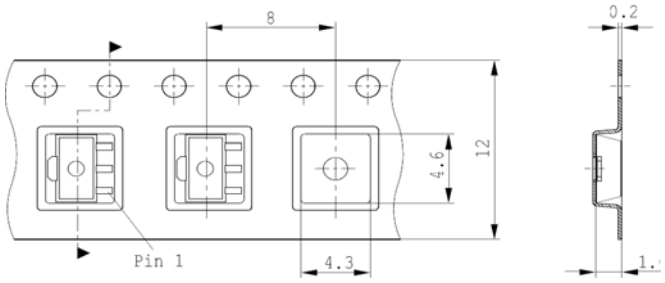
Package Outline:



Footprint:



Packaging:



Dimensions in mm

note:

Due to small size of the package, creeping currents between leads external to the package can occur in the application. Extra protection from contamination for the package (i.e. protective laquer) is necessary to maintain the values, specified in this document. Values given in this document are only valid for 0 hour lifetime, if no suitable external protection is applied.

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