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**BSS126**

**SIPMOS® Small-Signal-Transistor**

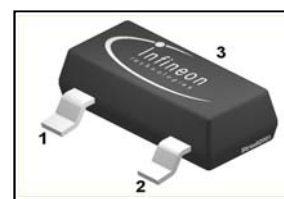
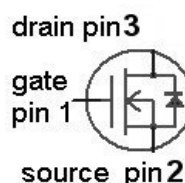
**Features**

- 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	$\Omega$
$I_{DSS,min}$	0.007	A

PG-SOT-23



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 <sup>1)</sup>	SHs

**Maximum ratings, at  $T_j=25\text{ }^\circ\text{C}$ , unless otherwise specified**

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

<sup>1)</sup> see table on next page and diagram 11


**BSS126**

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	

**Thermal characteristics**

Thermal resistance, junction - ambient	$R_{thJA}$	minimal footprint	-	-	250	K/W
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**Electrical characteristics, at  $T_j=25\text{ }^\circ\text{C}$ , unless otherwise specified**
**Static characteristics**

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

**Threshold voltage  $V_{GS(th)}$  sorted in bands<sup>2)</sup>**

J	$V_{GS(th)}$	$V_{DS}=3\text{ V}, I_D=8\text{ }\mu\text{A}$	-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	

<sup>2)</sup> Each reel contains transistors out of one band whose identifying letter is printed on the reel label. A specific band cannot be ordered separately.



## BSS126

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	

### Dynamic characteristics

$I_D=f(V_{GS}); V_{DS}=3\text{ V}; T_j=25\text{ °C}$	$C_{iss}$	$V_{GS}=-5\text{ V}, V_{DS}=25\text{ V}, f=1\text{ MHz}$	-	21	28	pF
Output capacitance	$C_{oss}$		-	2.4	3.2	
Reverse transfer capacitance	$C_{rss}$		-	1.0	1.5	
Turn-on delay time	$t_{d(on)}$	$V_{DD}=300\text{ V}, V_{GS}=-3\dots 7\text{ V}, I_D=0.01\text{ A}, R_G=6\text{ }\Omega$	-	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	$Q_{gs}$	$V_{DD}=400\text{ V}, I_D=10\text{ mA}, V_{GS}=-3\text{ to }5\text{ V}$	-	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

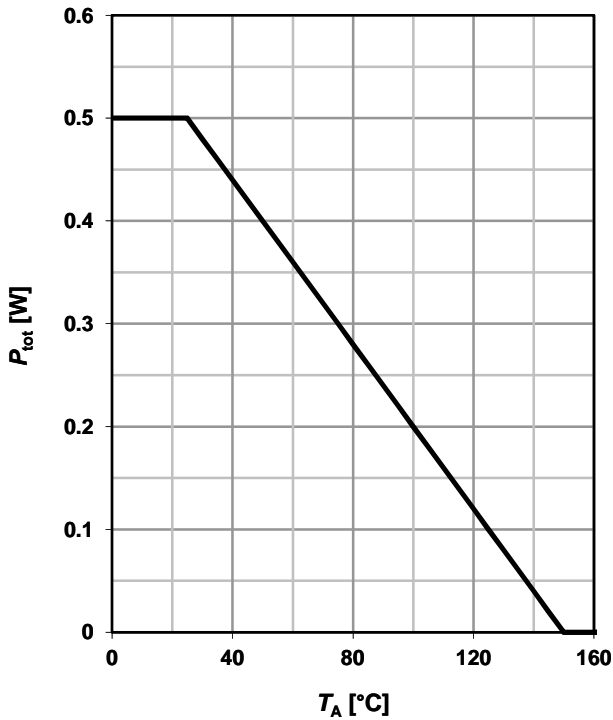
### Reverse Diode

Diode continuous forward current	$I_S$	$T_A=25\text{ °C}$	-	-	0.016	A
Diode pulse current	$I_{S,pulse}$		-	-	0.064	
Diode forward voltage	$V_{SD}$	$V_{GS}=-5\text{ V}, I_F=16\text{ mA}, T_j=25\text{ °C}$	-	0.81	1.2	V
Reverse recovery time	$t_{rr}$	$V_R=300\text{ V}, I_F=0.01\text{ A}, di_F/dt=100\text{ A}/\mu\text{s}$	-	160	240	ns
Reverse recovery charge	$Q_{rr}$		-	13.2	19.8	



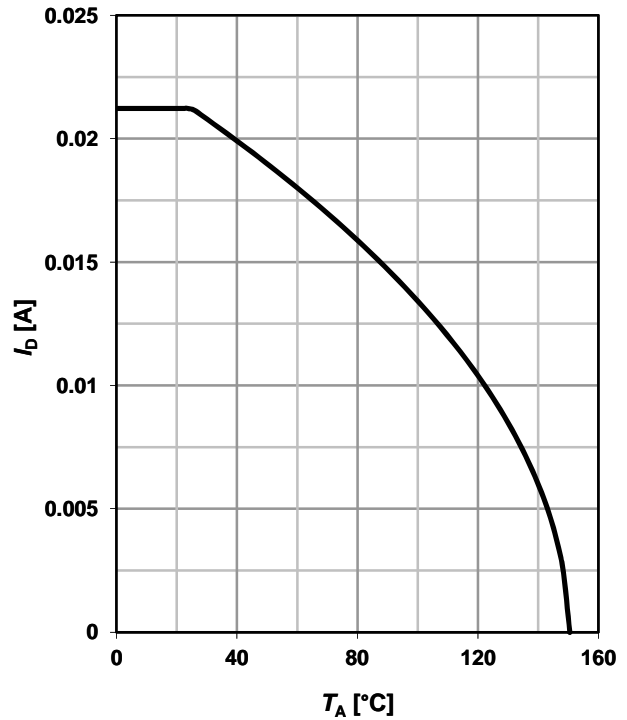
**1 Power dissipation**

$P_{tot}=f(T_A)$



**2 Drain current**

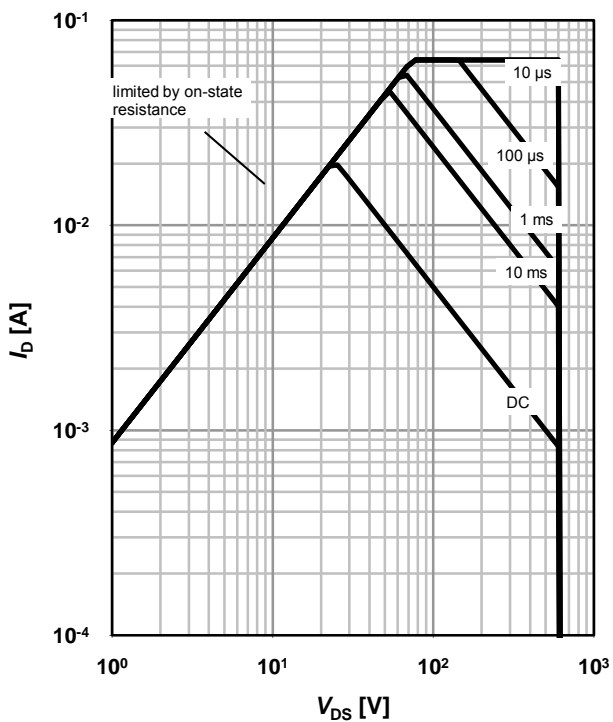
$I_D=f(T_A); V_{GS} \geq 10\text{ V}$



**3 Safe operating area**

$I_D=f(V_{GS}); V_{DS}=3\text{ V}; T_j=25\text{ °C}$

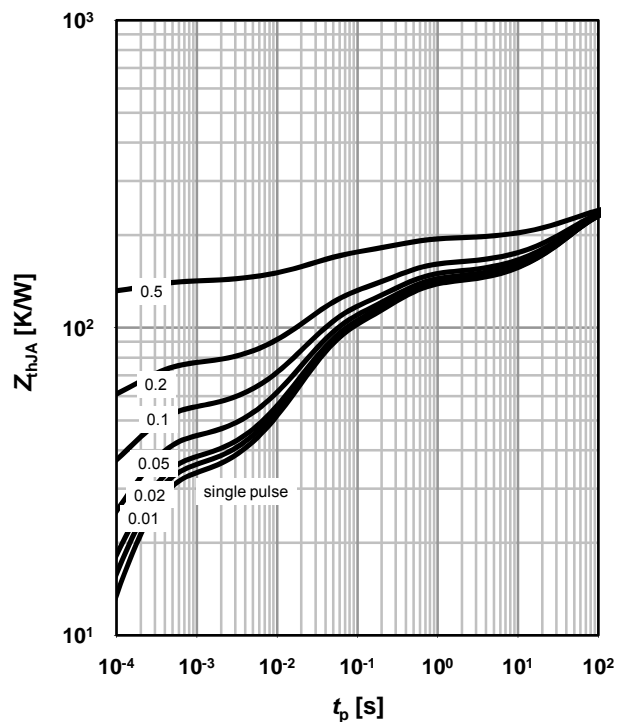
parameter:  $t_p$



**4 Max. transient thermal impedance**

$Z_{thJA}=f(t_p)$

parameter:  $D=t_p/T$

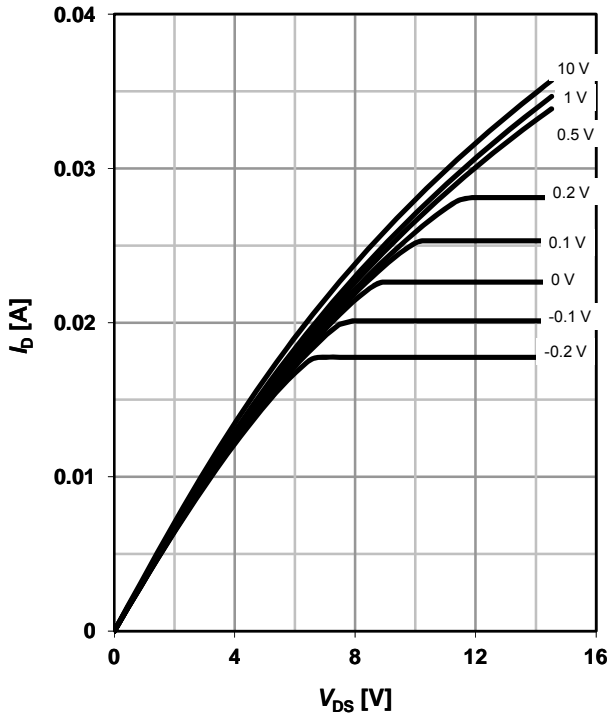




**5 Typ. output characteristics**

$I_D = f(V_{DS}); T_j = 25\text{ }^\circ\text{C}$

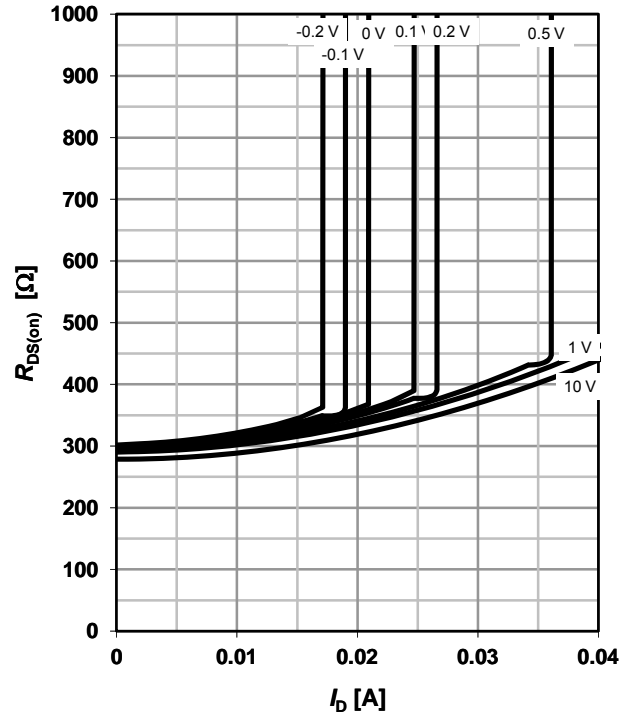
parameter:  $V_{GS}$



**6 Typ. drain-source on resistance**

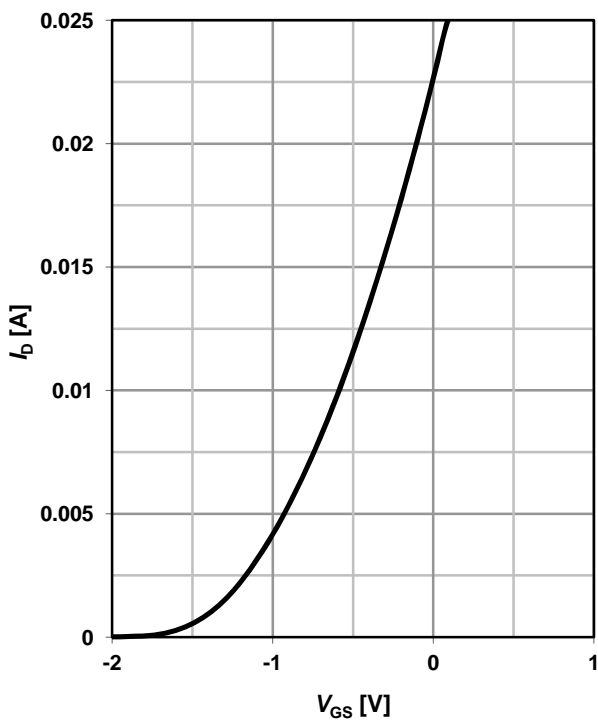
$R_{DS(on)} = f(I_D); T_j = 25\text{ }^\circ\text{C}$

parameter:  $V_{GS}$



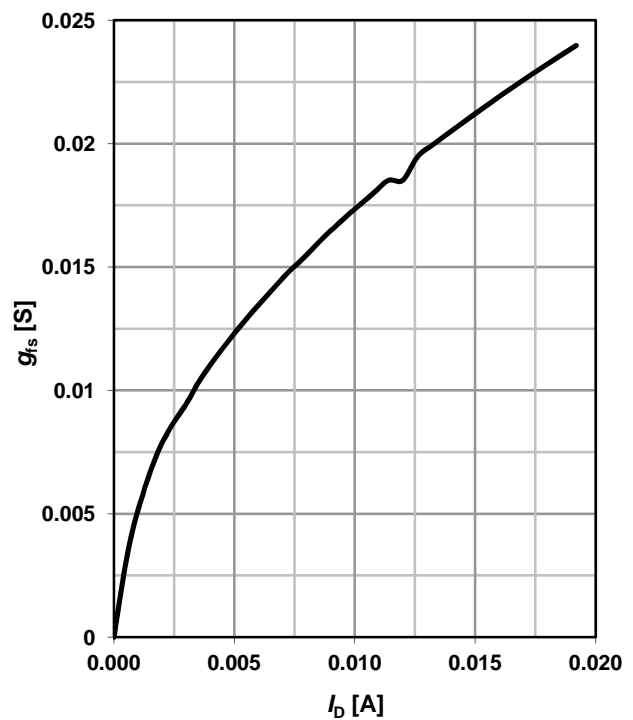
**7 Typ. transfer characteristics**

$I_D = f(V_{GS}); V_{DS} = 3\text{ V}; T_j = 25\text{ }^\circ\text{C}$



**8 Typ. forward transconductance**

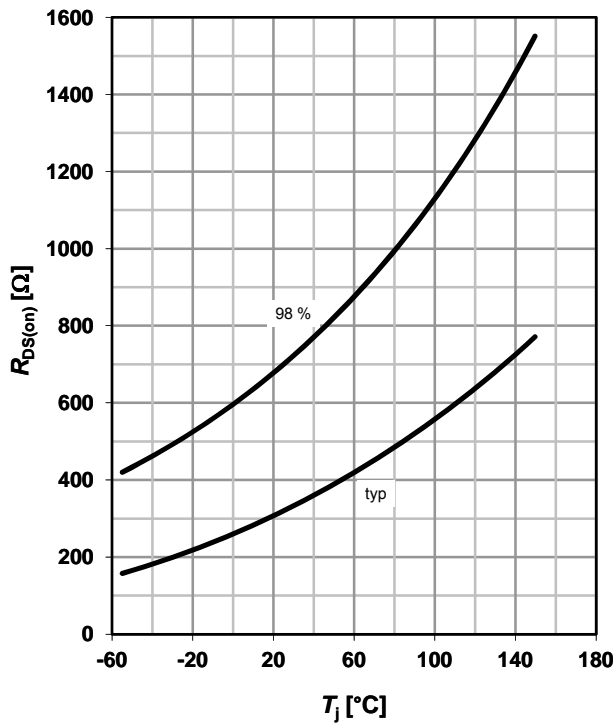
$g_{fs} = f(I_D); T_j = 25\text{ }^\circ\text{C}$





**9 Drain-source on-state resistance**

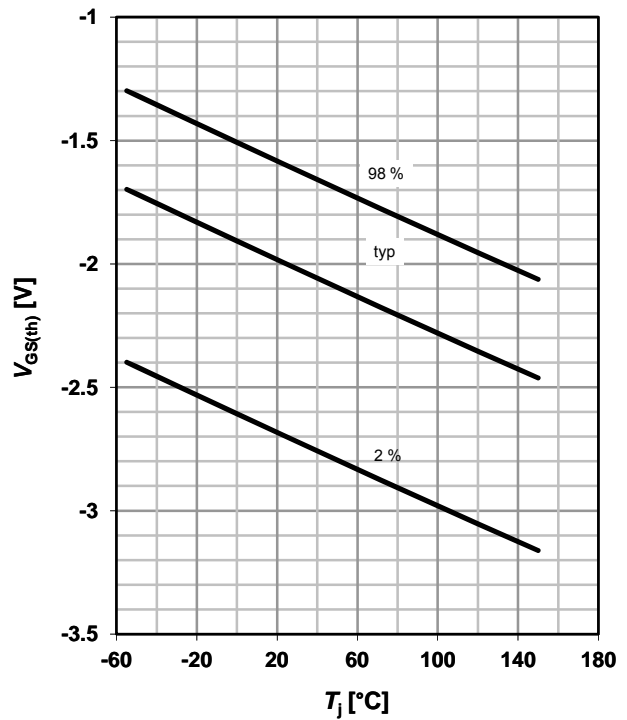
$R_{DS(on)} = f(T_j); I_D = 0.016 \text{ mA}; V_{GS} = 0 \text{ V}$



**10 Typ. gate threshold voltage**

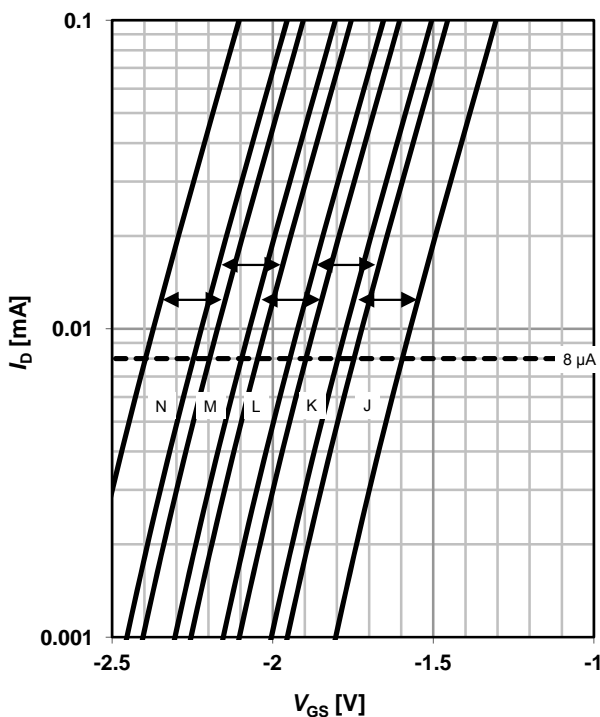
$V_{GS(th)} = f(T_j); V_{DS} = 3 \text{ V}; I_D = 8 \mu\text{A}$

parameter:  $I_D$



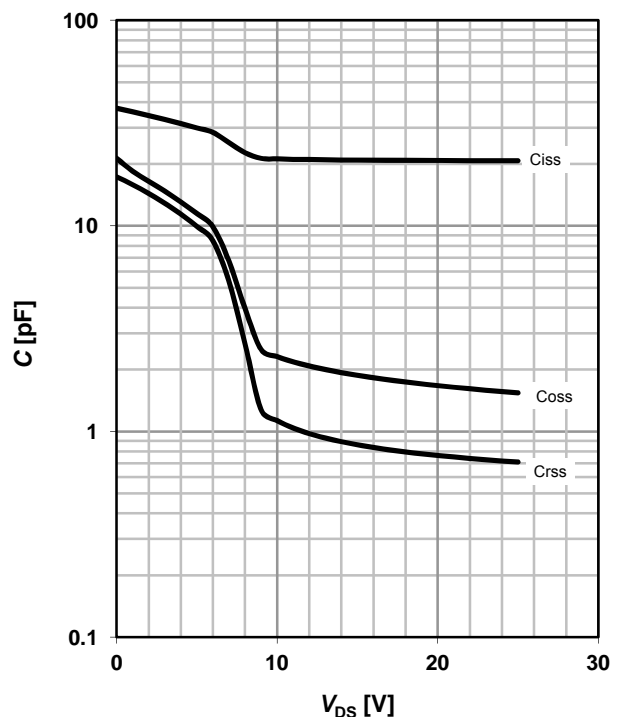
**11 Threshold voltage bands**

$I_D = f(V_{GS}); V_{DS} = 3 \text{ V}; T_j = 25 \text{ °C}$



**12 Typ. capacitances**

$C = f(V_{DS}); V_{GS} = -3 \text{ V}; f = 1 \text{ MHz}$

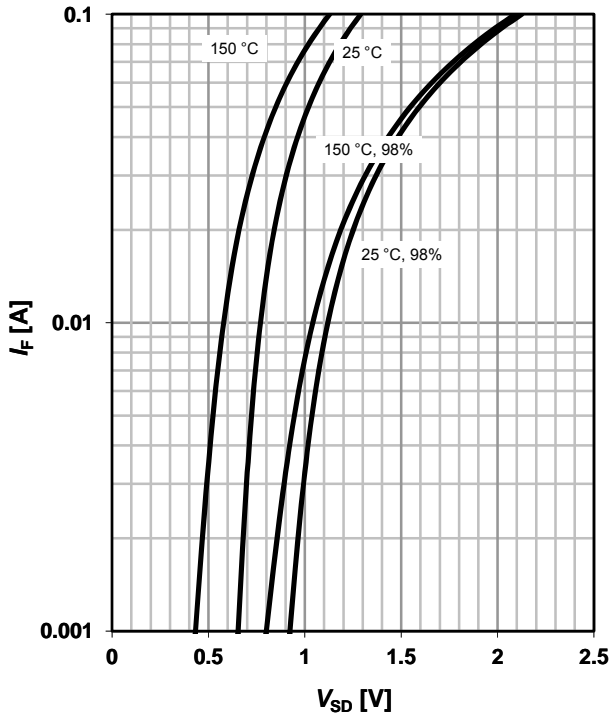




**13 Forward characteristics of reverse diode**

$I_F = f(V_{SD})$

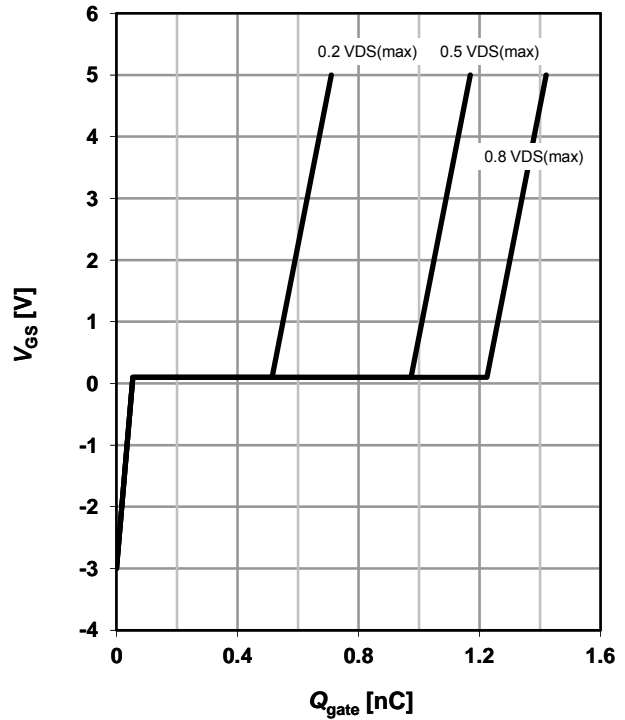
parameter:  $T_j$



**15 Typ. gate charge**

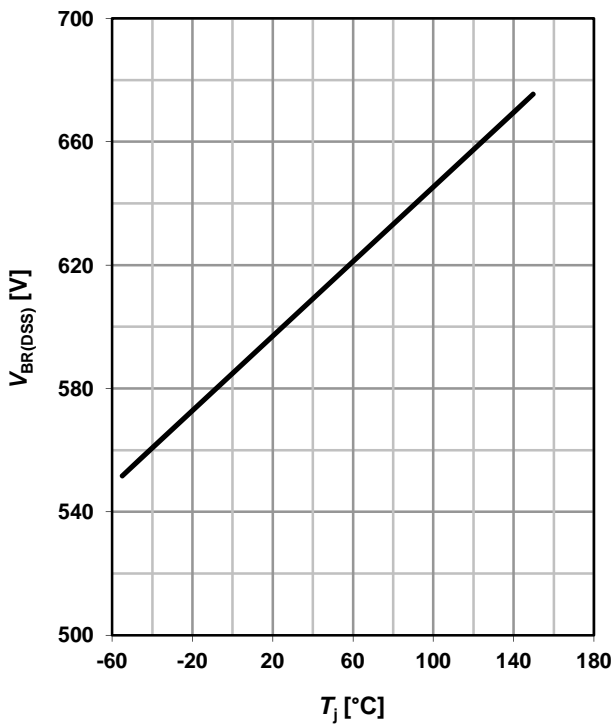
$V_{GS} = f(Q_{gate}); I_D = 0.1 \text{ A pulsed}$

parameter:  $V_{DD}$



**16 Drain-source breakdown voltage**

$I_D = f(V_{GS}); V_{DS} = 3 \text{ V}; T_j = 25 \text{ °C}$

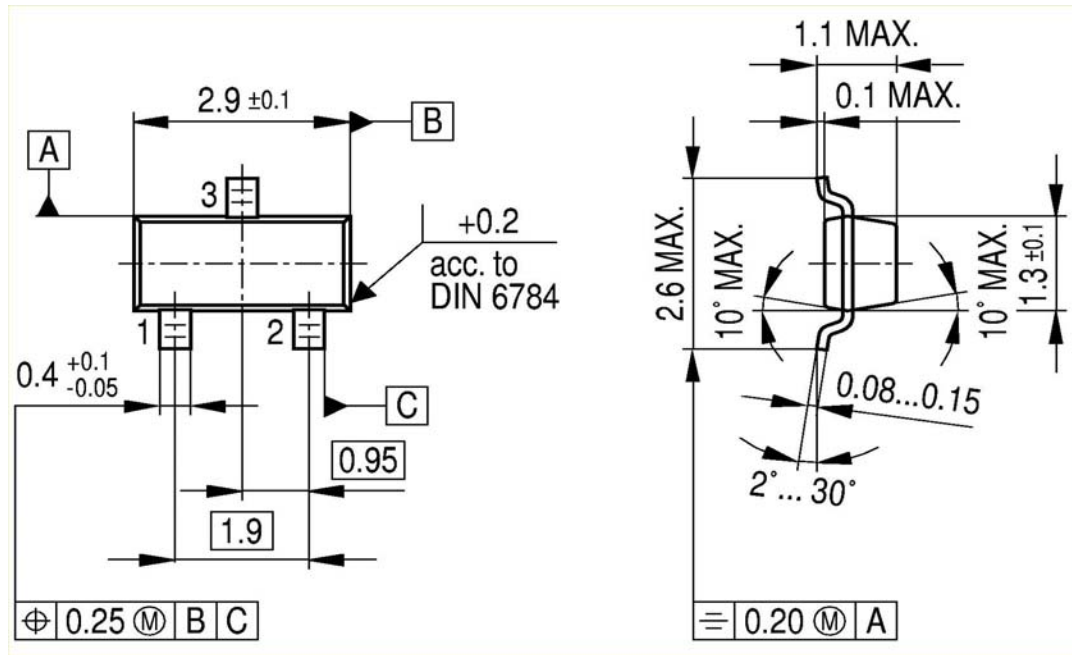




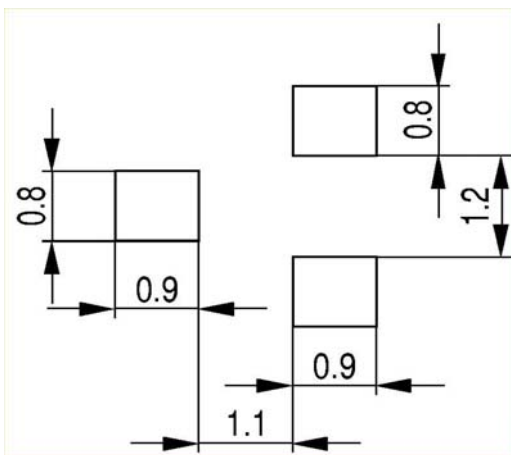


**BSS126**

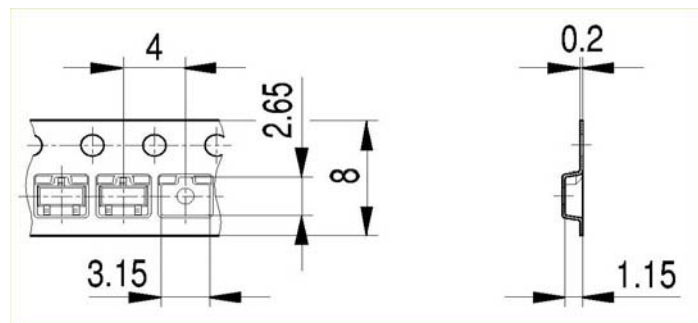
**Package Outline:**



**Footprint:**



**Packaging:**





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