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**BSS127**

**SIPMOS® Small-Signal-Transistor**

**Features**

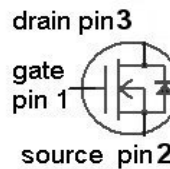
- n-channel
- enhancement mode
- Logic level (4.5V rated)
- dv/dt rated
- Qualified according to AEC Q101
- 100%lead-free; RoHS compliant



**Product Summary**

$V_{DS}$	600	V
$R_{DS(on),max}$	500	$\Omega$
$I_D$	0.021	A

PG-SOT-23



Type	Package	Pb-free	Tape and Reel Information	Marking
BSS127	PG-SOT-23	Yes	L6327: 3000PCS/reel	Sis

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

Parameter	Symbol	Conditions	Value	Unit
Continuous drain current	$I_D$	$T_A=25\text{ °C}$	0.021	A
		$T_A=70\text{ °C}$	0.017	
Pulsed drain current	$I_{D,pulse}$	$T_A=25\text{ °C}$	0.09	
Reverse diode dv/dt	dv/dt	$I_D=0.09\text{ A}$ , $V_{DS}=480\text{ V}$ , $di/dt=200\text{ A}/\mu\text{s}$ , $T_{j,max}=150\text{ °C}$	6	kV/ $\mu\text{s}$
Gate source voltage	$V_{GS}$		$\pm 20$	V
ESD class (JESD22-A114-HBM)			0 (<250V)	
Power dissipation	$P_{tot}$	$T_A=25\text{ °C}$	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	



**BSS127**

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	

**Thermal characteristics**

Thermal resistance, junction - minimal footprint	$R_{thJA}$		-	-	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	$V_{(BR)DSS}$	$V_{GS}=0\text{ V}, I_D=250\text{ }\mu\text{A}$	600	-	-	V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=8\text{ }\mu\text{A}$	1.4	2.0	2.6	
Drain-source leakage current	$I_{D(off)}$	$V_{DS}=600\text{ V}, V_{GS}=0\text{ V}, T_j=25\text{ }^\circ\text{C}$	-	-	0.1	$\mu\text{A}$
		$V_{DS}=600\text{ V}, V_{GS}=0\text{ V}, T_j=150\text{ }^\circ\text{C}$	-	-	10	
Gate-source leakage current	$I_{GSS}$	$V_{GS}=20\text{ V}, V_{DS}=0\text{ V}$	-	10	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS}=4.5\text{ V}, I_D=0.016\text{ A}$	-	330	600	$\Omega$
		$V_{GS}=10\text{ V}, I_D=0.016\text{ A}$	-	310	500	
Transconductance	$g_{fs}$	$ V_{DS} >2 I_D R_{DS(on)max}, I_D=0.01\text{ A}$	0.007	0.015	-	S


**BSS127**

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	

**Dynamic characteristics**

Input capacitance	$C_{iss}$	$V_{GS}=0\text{ V}, V_{DS}=25\text{ V},$ $f=1\text{ MHz}$	-	21	28	pF
Output capacitance	$C_{oss}$		-	2.4	3	
Reverse transfer capacitance	$C_{rss}$		-	1.0	1.5	
Turn-on delay time	$t_{d(on)}$	$V_{DD}=300\text{ V},$ $V_{GS}=10\text{ V}, I_D=0.01\text{ A},$ $R_G=6\ \Omega$	-	6.1	19.0	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	$Q_{gs}$	$V_{DD}=300\text{ V},$ $I_D=0.01\text{ A},$ $V_{GS}=0\text{ to }10\text{ V}$	-	0.07	0.10	nC
Gate to drain charge	$Q_{gd}$		-	0.31	0.5	
Gate charge total	$Q_g$		-	0.65	1.0	
Gate plateau voltage	$V_{plateau}$		-	3.56	-	V

**Reverse Diode**

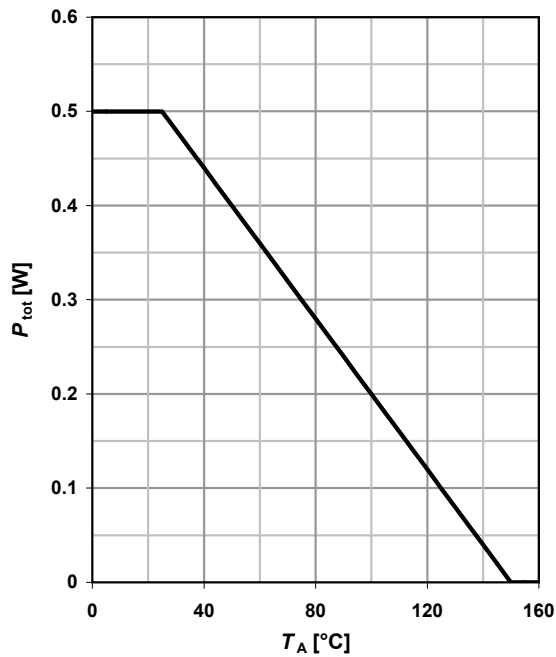
Diode continuous forward current	$I_S$	$T_A=25\text{ }^\circ\text{C}$	-	-	0.016	A
Diode pulse current	$I_{S,pulse}$		-	-	0.09	
Diode forward voltage	$V_{SD}$	$V_{GS}=0\text{ V}, I_F=0.016\text{ A},$ $T_j=25\text{ }^\circ\text{C}$	-	0.82	1.2	V
Reverse recovery time	$t_{rr}$	$V_R=300\text{ V},$ $I_F=0.016\text{ A},$ $di_F/dt=100\text{ A}/\mu\text{s}$	-	160	240	ns
Reverse recovery charge	$Q_{rr}$		-	13.2	19.8	



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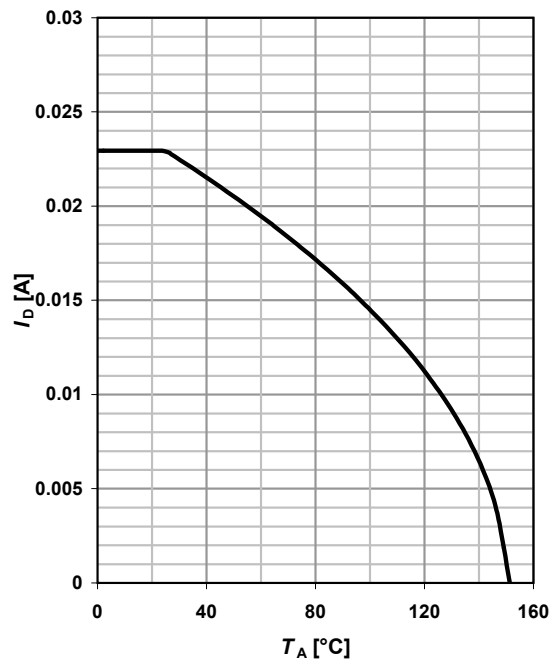
**1 Power dissipation**

$P_{tot}=f(T_A)$



**2 Drain current**

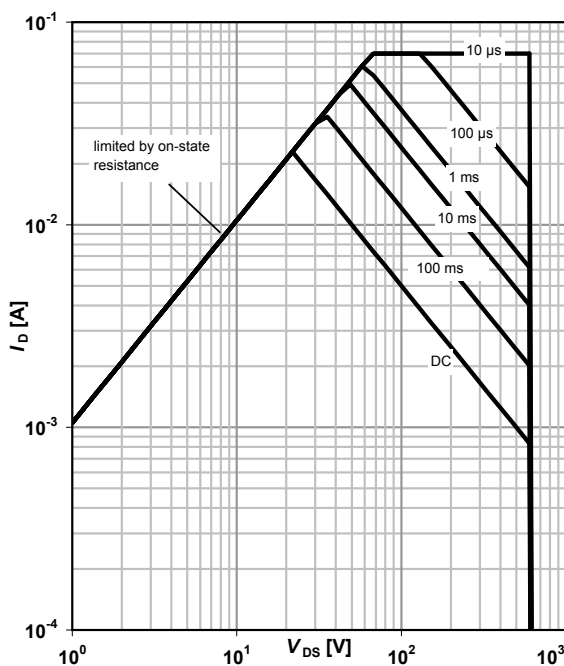
$I_D=f(T_A); V_{GS} \geq 10\text{ V}$



**3 Safe operating area**

$I_D=f(V_{DS}); T_A=25\text{ °C}; D=0$

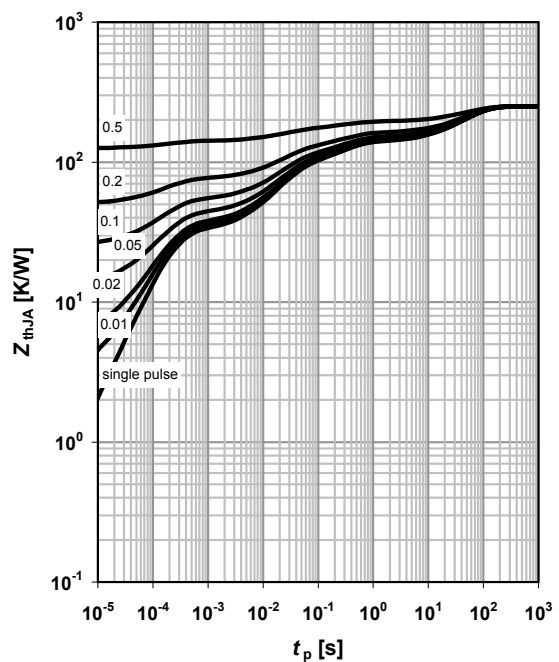
parameter:  $t_p$



**4 Max. transient thermal impedance**

$Z_{thJA}=f(t_p)$

parameter:  $D=t_p/T$



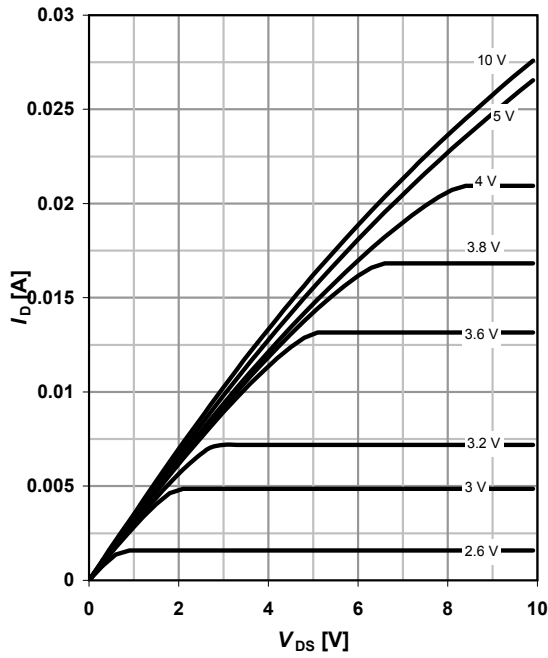


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**5 Typ. output characteristics**

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

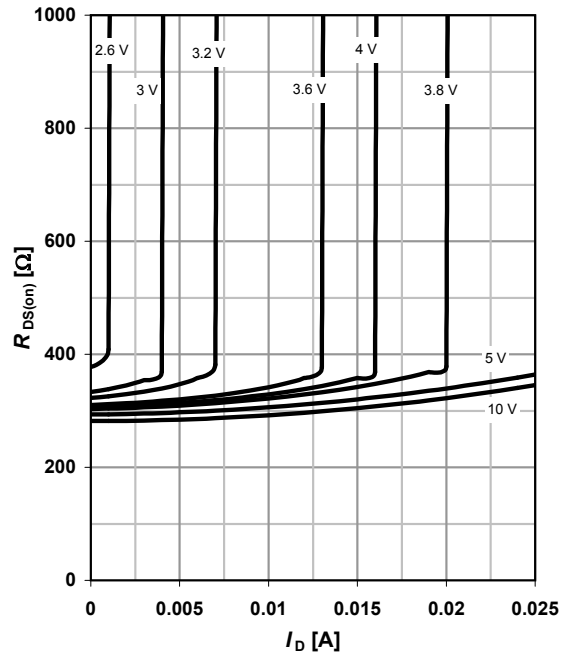
parameter:  $V_{GS}$



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

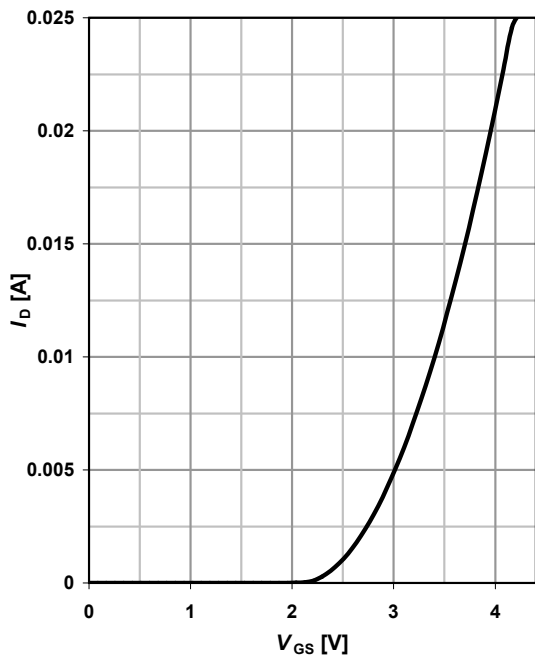
$R_{DS(on)} = f(I_D); T_j = 25\text{ }^\circ\text{C}$

parameter:  $V_{GS}$



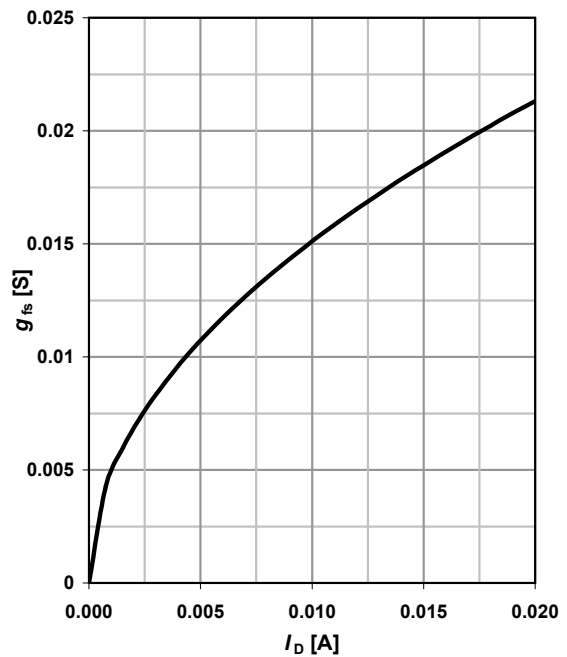
**7 Typ. transfer characteristics**

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



**8 Typ. forward transconductance**

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

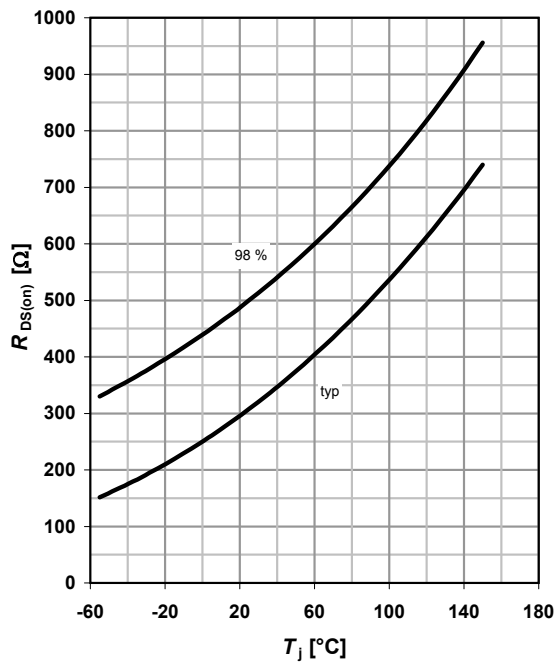




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**9 Drain-source on-state resistance**

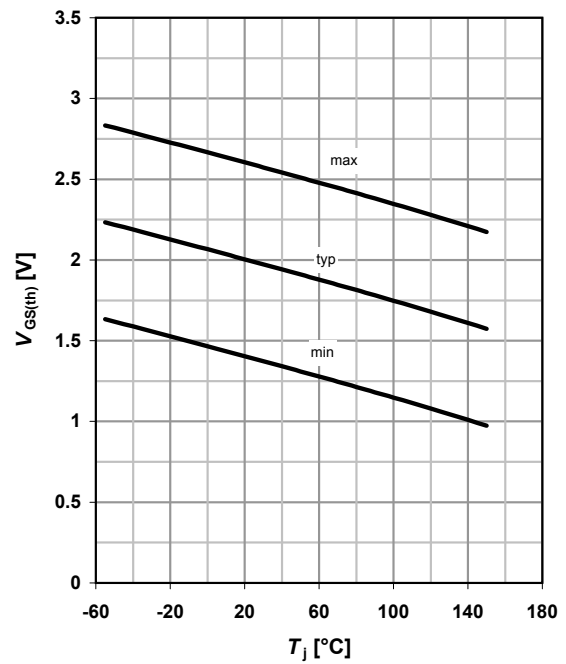
$R_{DS(on)}=f(T_j); I_D=0.016\text{ A}; V_{GS}=10\text{ V}$



**10 Typ. gate threshold voltage**

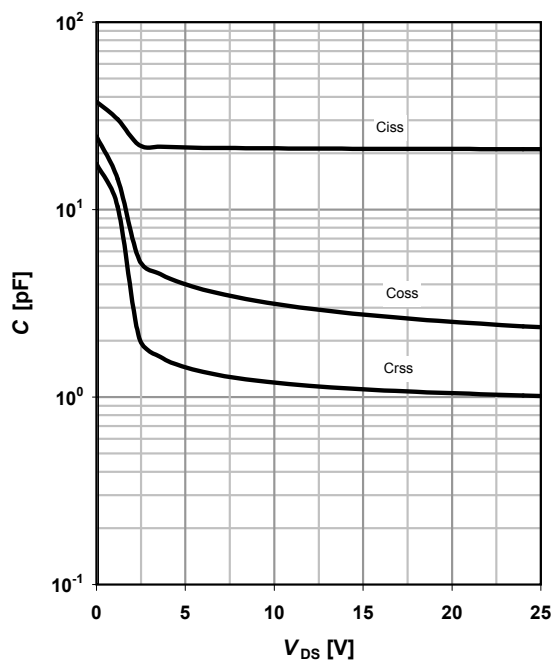
$V_{GS(th)}=f(T_j); V_{DS}=V_{GS}; I_D=8\ \mu\text{A}$

parameter:  $I_D$



**11 Typ. capacitances**

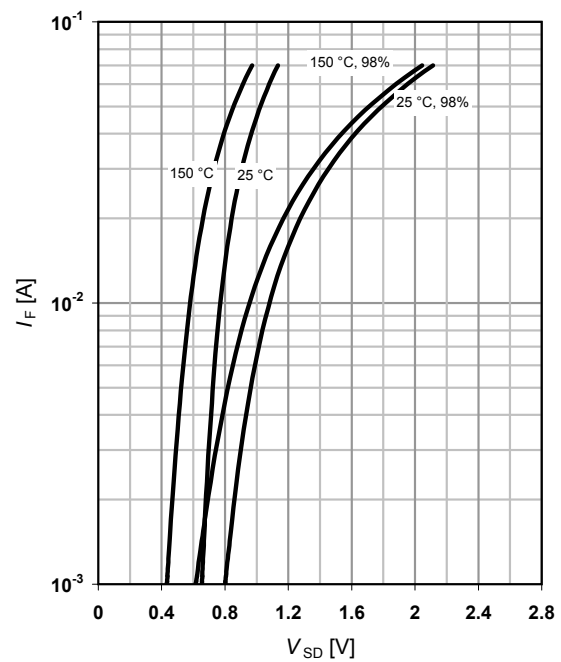
$C=f(V_{DS}); V_{GS}=0\text{ V}; f=1\text{ MHz}; T_j=25^\circ\text{C}$



**12 Forward characteristics of reverse diode**

$I_F=f(V_{SD})$

parameter:  $T_j$



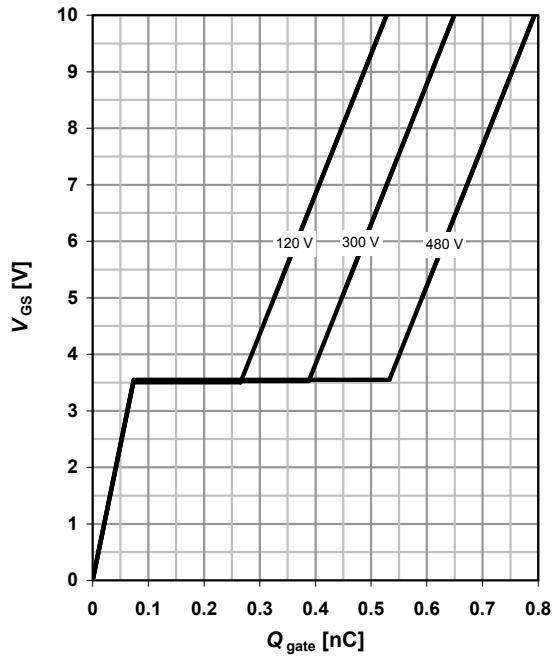


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**13 Typ. gate charge**

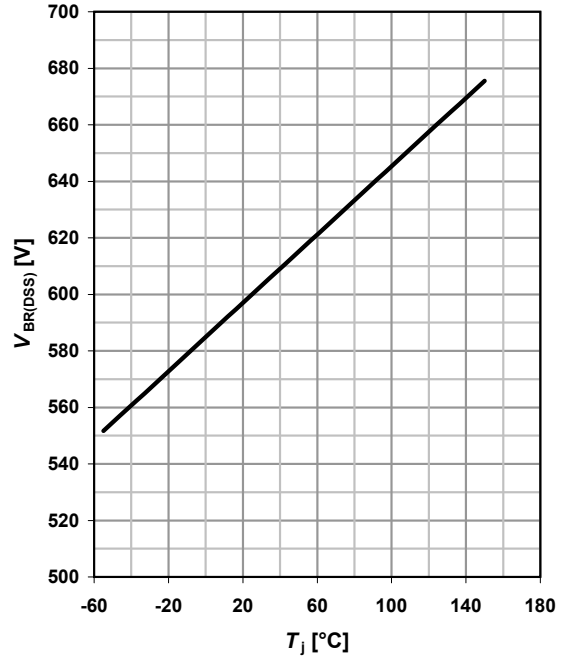
$V_{GS}=f(Q_{gate}); I_D=0.01\text{ A pulsed}$

parameter:  $V_{DD}$

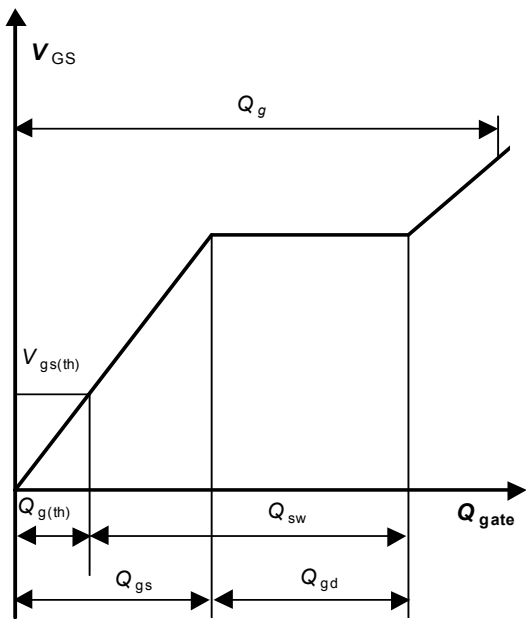


**14 Drain-source breakdown voltage**

$V_{BR(DSS)}=f(T_j); I_D=250\ \mu\text{A}$



**15 Gate charge waveforms**



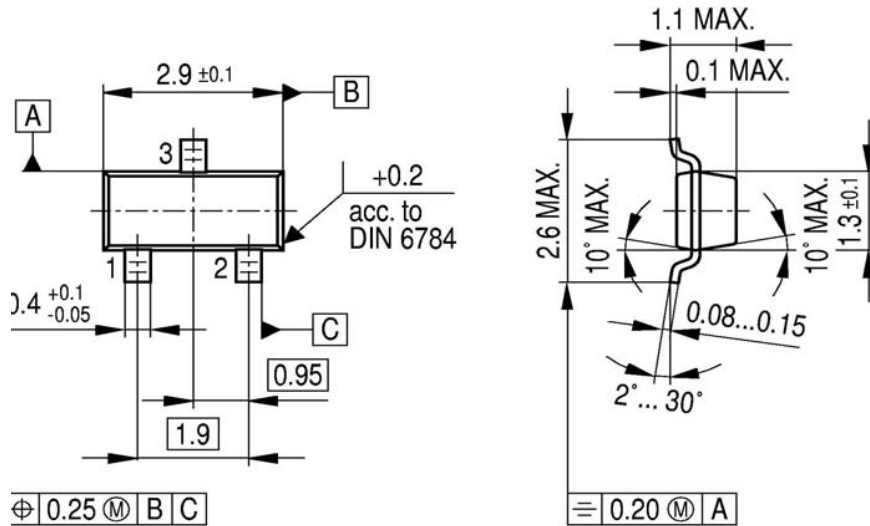




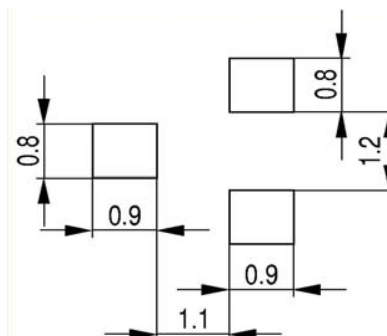
**BSS127**

**SOT-23**

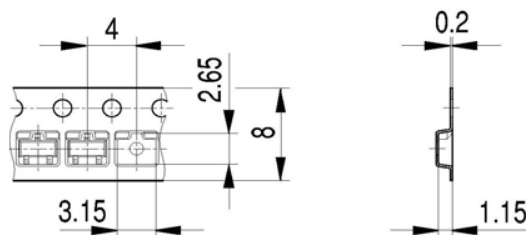
**Package Outline:**



**Footprint:**



**Packaging:**





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