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With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

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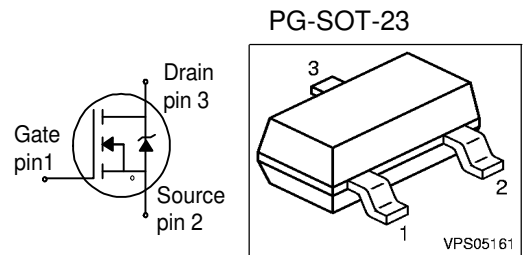


**SIPMOS<sup>®</sup> Small-Signal-Transistor**
**Feature**

- N-Channel
- Enhancement mode
- Logic Level
- dv/dt rated
- Pb-free lead plating; RoHS compliant
- Qualified according to AEC Q101


**Product Summary**

$V_{DS}$	60	V
$R_{DS(on)}$	5	$\Omega$
$I_D$	0.2	A



Type	Package	Pb-free	Tape and Reel Information	Marking
SN7002N	PG-SOT-23	Yes	L6327: 3000 pcs/reel	sSN
SN7002N	PG-SOT-23	Yes	L6433: 10000 pcs/reel	sSN

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

Parameter	Symbol	Value	Unit
Continuous drain current	$I_D$		A
$T_A=25\text{ }^\circ\text{C}$		0.2	
$T_A=70\text{ }^\circ\text{C}$		0.16	
Pulsed drain current	$I_{D\text{ puls}}$	0.8	
$T_A=25\text{ }^\circ\text{C}$			
Reverse diode dv/dt	dv/dt	6	kV/ $\mu\text{s}$
$I_S=0.2\text{ A}$ , $V_{DS}=48\text{ V}$ , $di/dt=200\text{ A}/\mu\text{s}$ , $T_{j\text{max}}=150\text{ }^\circ\text{C}$			
Gate source voltage	$V_{GS}$	$\pm 20$	V
ESD Class (JEDEC22-A114-HBM)		0 (<250V)	
Power dissipation	$P_{tot}$	0.36	W
$T_A=25\text{ }^\circ\text{C}$			
Operating and storage temperature	$T_j, T_{stg}$	-55... +150	$^\circ\text{C}$
IEC climatic category; DIN IEC 68-1		55/150/56	

**Thermal Characteristics**

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>Characteristics</b>					
Thermal resistance, junction - ambient at minimal footprint	$R_{thJA}$	-	-	350	K/W

**Electrical Characteristics, at  $T_j = 25\text{ °C}$ , unless otherwise specified**

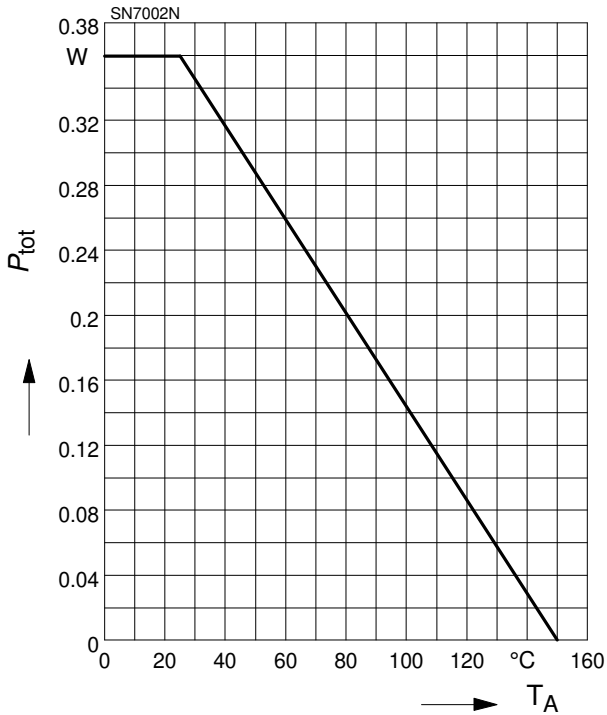
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>Static Characteristics</b>					
Drain-source breakdown voltage $V_{GS}=0, I_D=250\mu A$	$V_{(BR)DSS}$	60	-	-	V
Gate threshold voltage, $V_{GS} = V_{DS}$ $I_D=26\mu A$	$V_{GS(th)}$	0.8	1.4	1.8	
Zero gate voltage drain current $V_{DS}=60V, V_{GS}=0, T_j=25\text{ °C}$ $V_{DS}=60V, V_{GS}=0, T_j=150\text{ °C}$	$I_{DSS}$	-	-	0.1 5	$\mu A$
Gate-source leakage current $V_{GS}=20V, V_{DS}=0$	$I_{GSS}$	-	-	10	nA
Drain-source on-state resistance $V_{GS}=4.5V, I_D=0.17A$	$R_{DS(on)}$	-	3.9	7.5	$\Omega$
Drain-source on-state resistance $V_{GS}=10V, I_D=0.5A$	$R_{DS(on)}$	-	2.5	5	

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

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
<b>Dynamic Characteristics</b>						
Transconductance	$g_{fs}$	$V_{DS} \geq 2 \cdot I_D \cdot R_{DS(on)max}$ , $I_D = 0.16\text{A}$	0.09	0.17	-	S
Input capacitance	$C_{iss}$	$V_{GS} = 0$ , $V_{DS} = 25\text{V}$ , $f = 1\text{MHz}$	-	34	45	pF
Output capacitance	$C_{oss}$		-	7.2	9.6	
Reverse transfer capacitance	$C_{rss}$		-	2.8	4.2	
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 30\text{V}$ , $V_{GS} = 10\text{V}$ , $I_D = 0.5\text{A}$ , $R_G = 6\Omega$	-	2.4	3.6	ns
Rise time	$t_r$		-	3.2	4.8	
Turn-off delay time	$t_{d(off)}$		-	5.3	8	
Fall time	$t_f$		-	3.6	5.4	
<b>Gate Charge Characteristics</b>						
Gate to source charge	$Q_{gs}$	$V_{DD} = 48\text{V}$ , $I_D = 0.5\text{A}$	-	0.14	0.21	nC
Gate to drain charge	$Q_{gd}$		-	0.42	0.63	
Gate charge total	$Q_g$	$V_{DD} = 48\text{V}$ , $I_D = 0.5\text{A}$ , $V_{GS} = 0$ to $10\text{V}$	-	1	1.5	
Gate plateau voltage	$V_{(plateau)}$	$V_{DD} = 48\text{V}$ , $I_D = 0.5\text{A}$	-	4.5	-	V
<b>Reverse Diode</b>						
Inverse diode continuous forward current	$I_S$	$T_A = 25^\circ\text{C}$	-	-	0.2	A
Inv. diode direct current, pulsed	$I_{SM}$		-	-	0.8	
Inverse diode forward voltage	$V_{SD}$	$V_{GS} = 0$ , $I_F = I_S$	-	0.83	1.2	V
Reverse recovery time	$t_{rr}$	$V_R = 30\text{V}$ , $I_F = I_S$ , $di_F/dt = 100\text{A}/\mu\text{s}$	-	14.2	21.3	ns
Reverse recovery charge	$Q_{rr}$		-	5.9	8.8	

### 1 Power dissipation

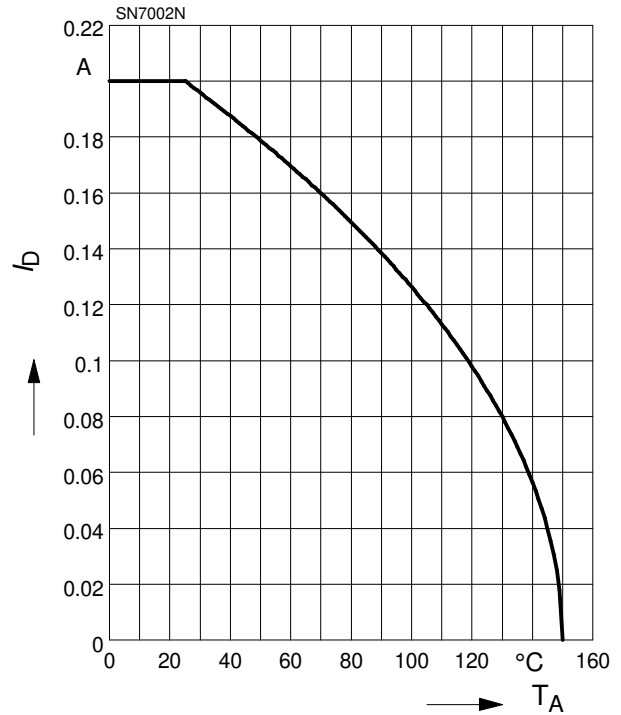
$$P_{tot} = f(T_A)$$



### 2 Drain current

$$I_D = f(T_A)$$

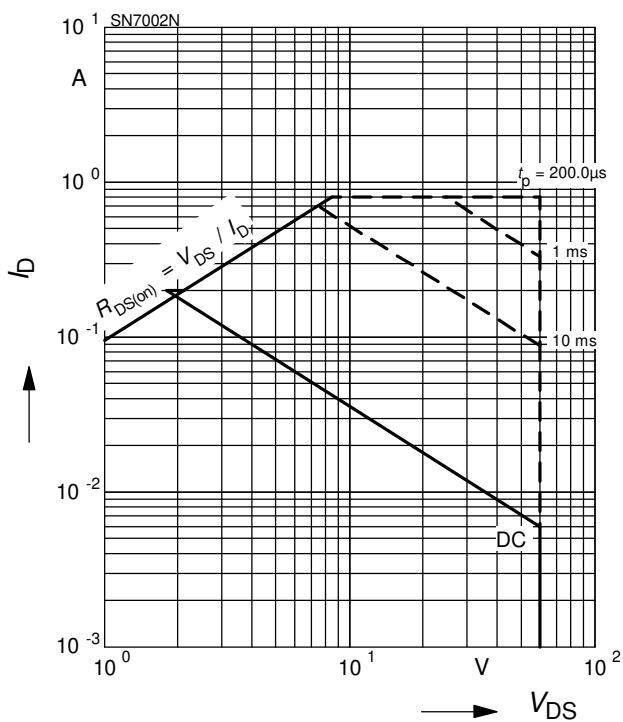
parameter:  $V_{GS} \geq 10\text{ V}$



### 3 Safe operating area

$$I_D = f(V_{DS})$$

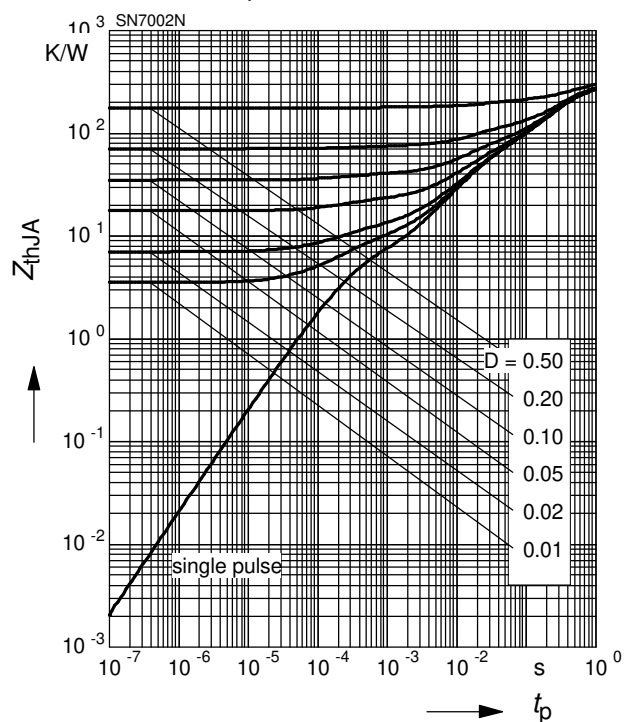
parameter:  $D = 0$ ,  $T_A = 25\text{ °C}$



### 4 Transient thermal impedance

$$Z_{thJA} = f(t_p)$$

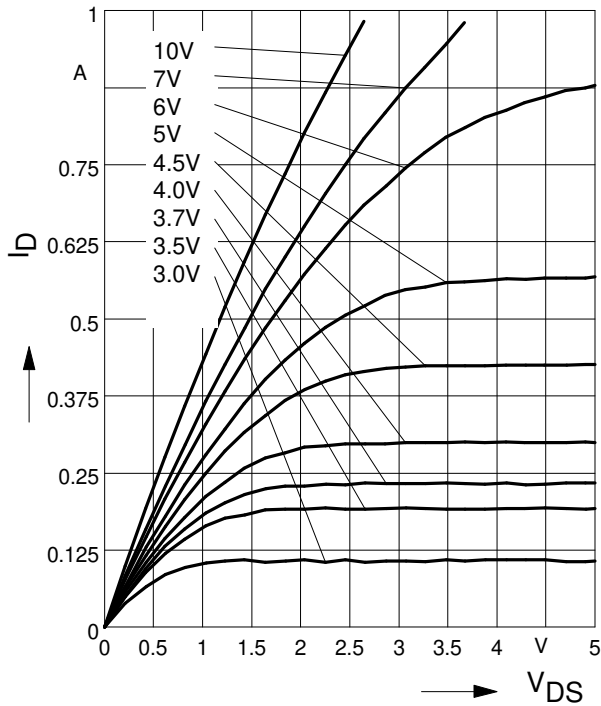
parameter:  $D = t_p/T$



**5 Typ. output characteristic**

$$I_D = f(V_{DS})$$

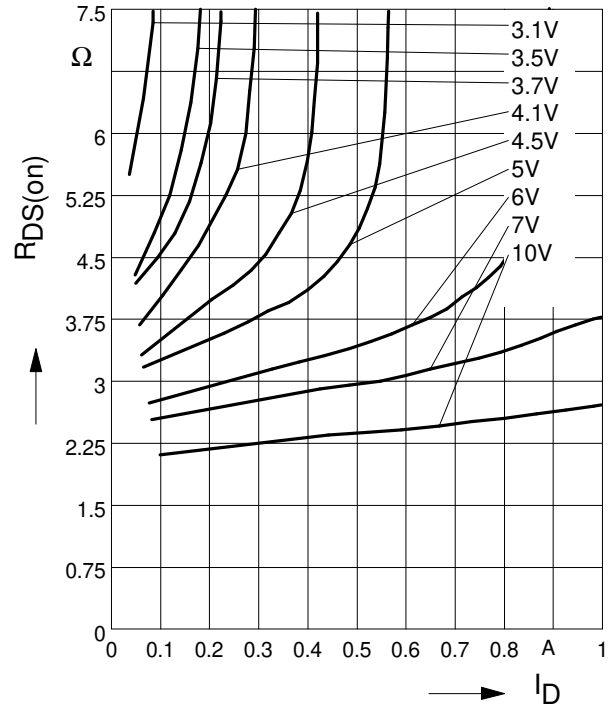
parameter:  $T_j = 25\text{ }^\circ\text{C}$ ,  $V_{GS}$



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

$$R_{DS(on)} = f(I_D)$$

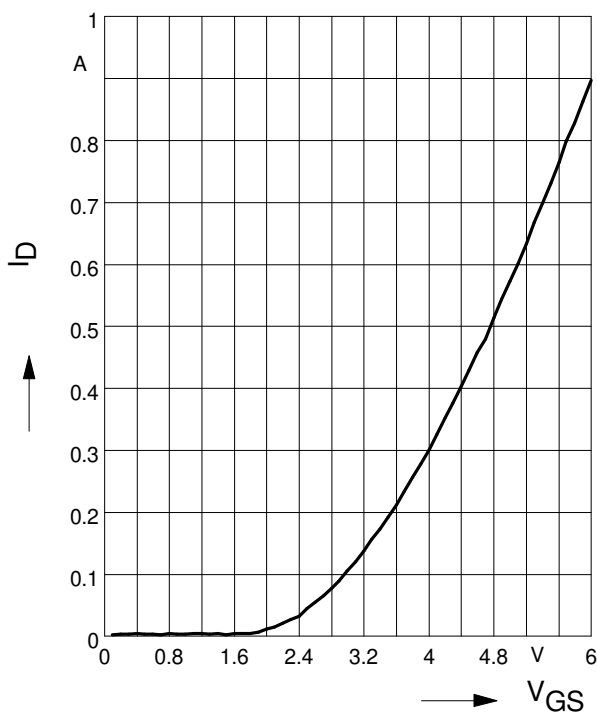
parameter:  $T_j = 25\text{ }^\circ\text{C}$ ,  $V_{GS}$



**7 Typ. transfer characteristics**

$$I_D = f(V_{GS}); V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$$

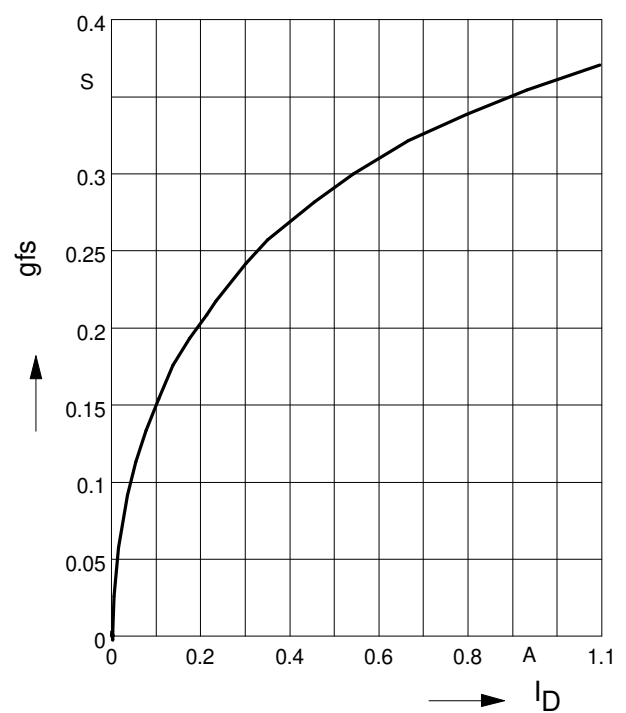
parameter:  $T_j = 25\text{ }^\circ\text{C}$



**8 Typ. forward transconductance**

$$g_{fs} = f(I_D)$$

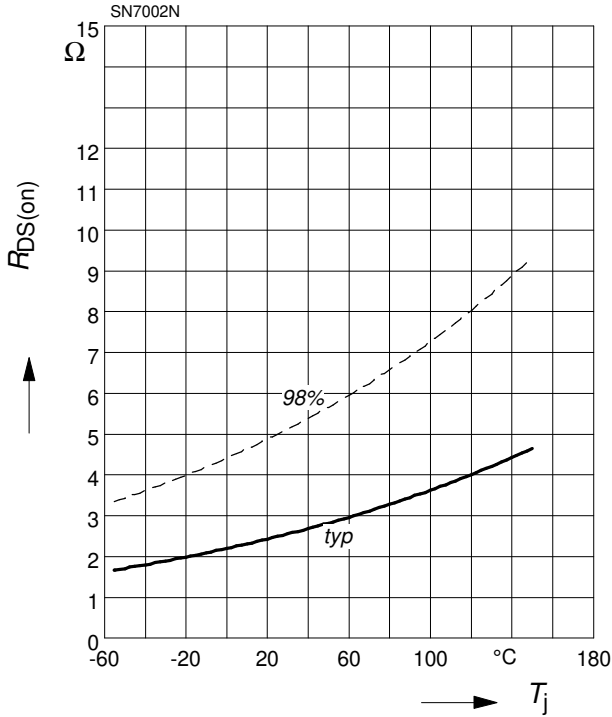
parameter:  $T_j = 25\text{ }^\circ\text{C}$



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

$$R_{DS(on)} = f(T_j)$$

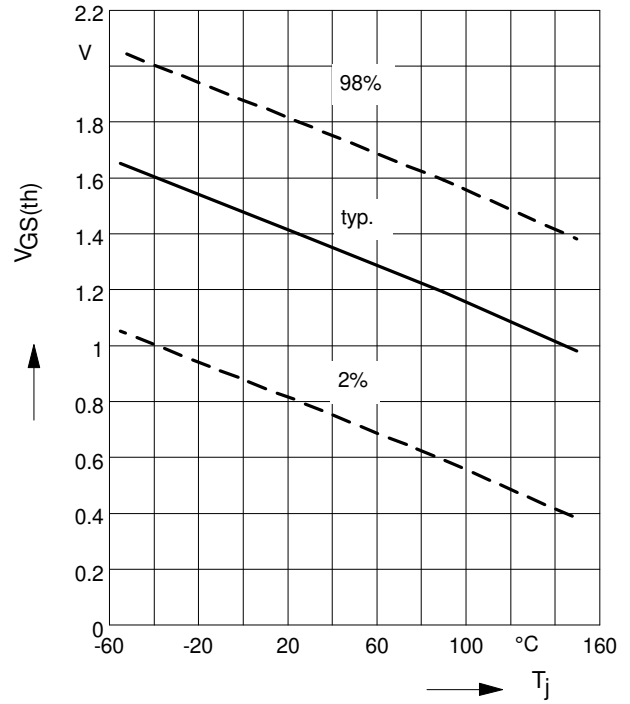
parameter :  $I_D = 0.5 \text{ A}$ ,  $V_{GS} = 10 \text{ V}$



**10 Typ. gate threshold voltage**

$$V_{GS(th)} = f(T_j)$$

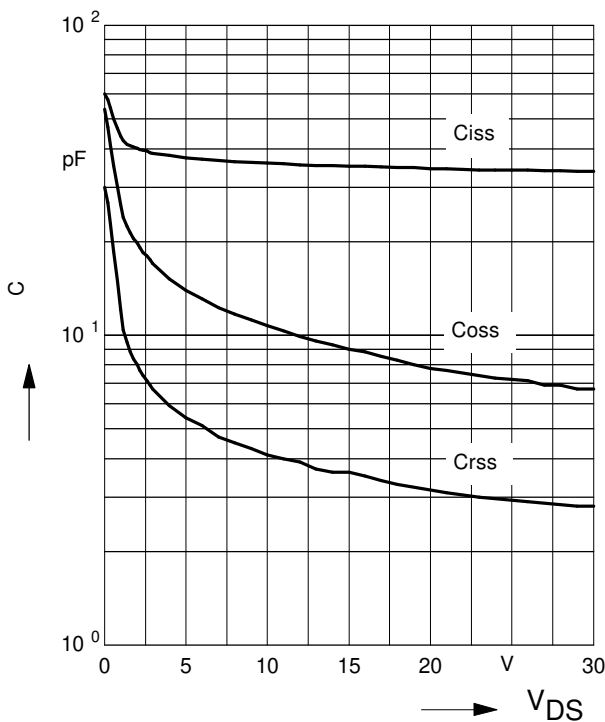
parameter:  $V_{GS} = V_{DS}$ ;  $I_D = 26\mu\text{A}$



**11 Typ. capacitances**

$$C = f(V_{DS})$$

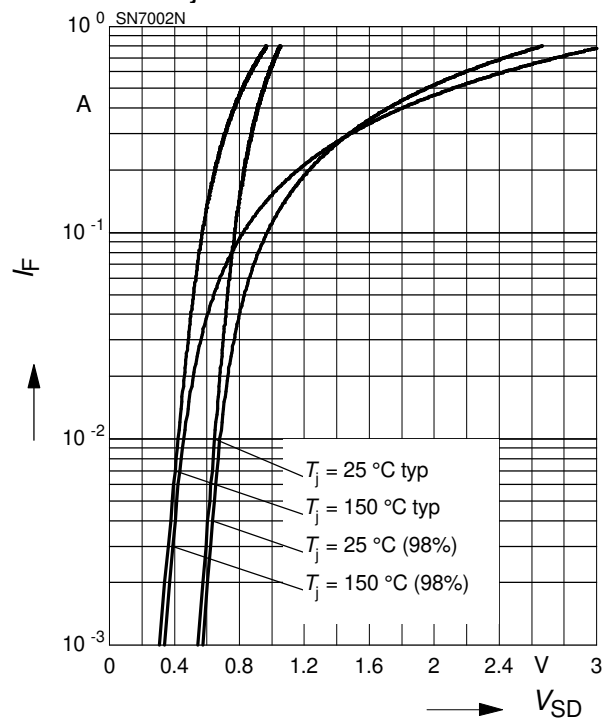
parameter:  $V_{GS}=0$ ,  $f=1 \text{ MHz}$ ,  $T_j = 25 \text{ }^\circ\text{C}$



**12 Forward character. of reverse diode**

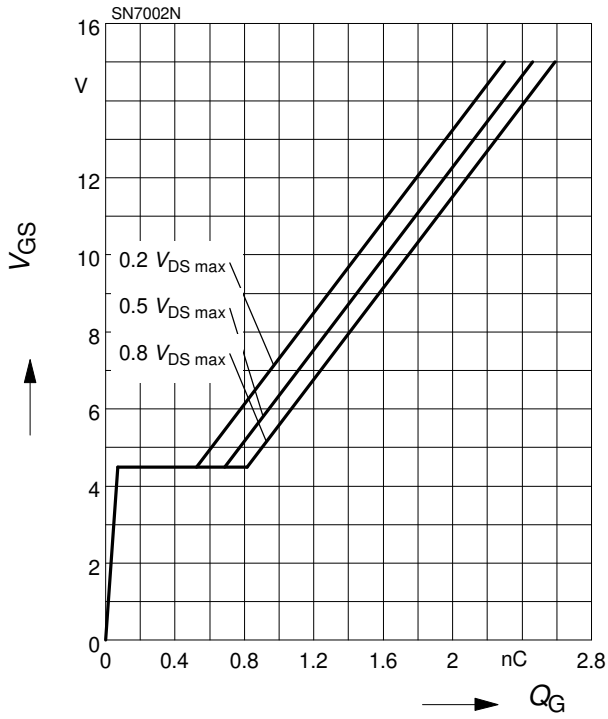
$$I_F = f(V_{SD})$$

parameter:  $T_j$



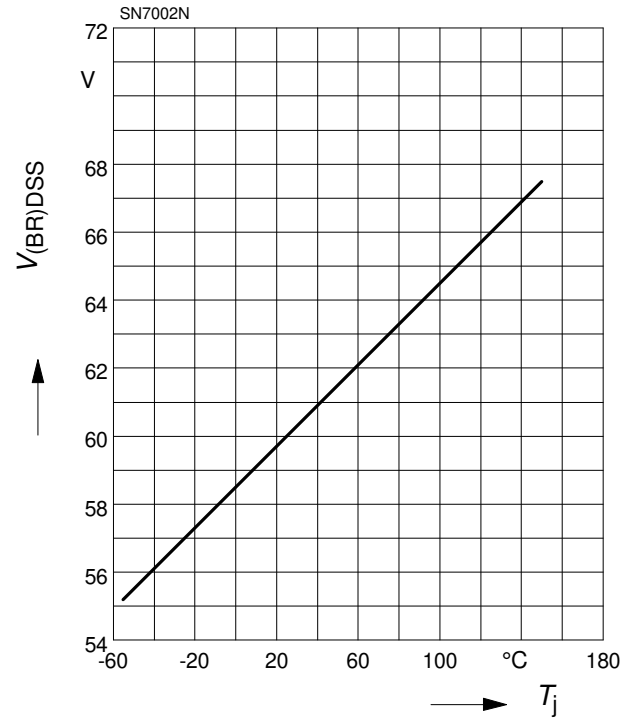
**13 Typ. gate charge**

$V_{GS} = f(Q_G)$ ; parameter:  $V_{DS}$ ,  
 $I_D = 0.2 \text{ A pulsed}$ ,  $T_j = 25 \text{ }^\circ\text{C}$



**14 Drain-source breakdown voltage**

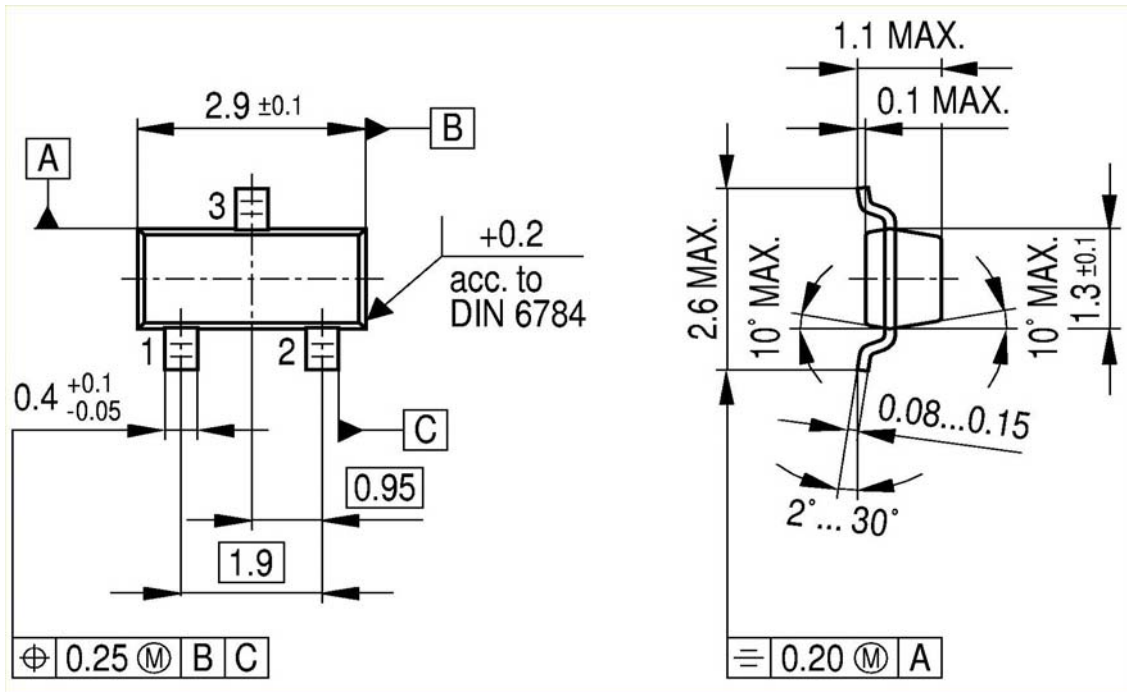
$V_{(BR)DSS} = f(T_j)$



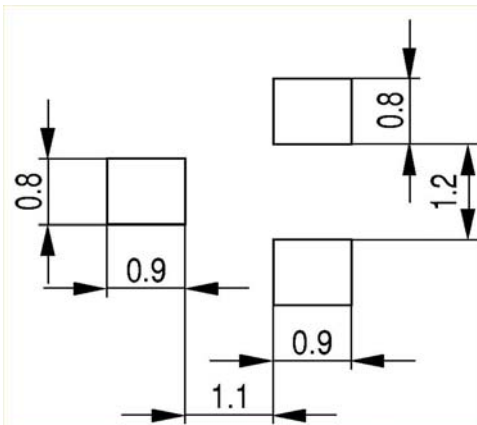


SOT23

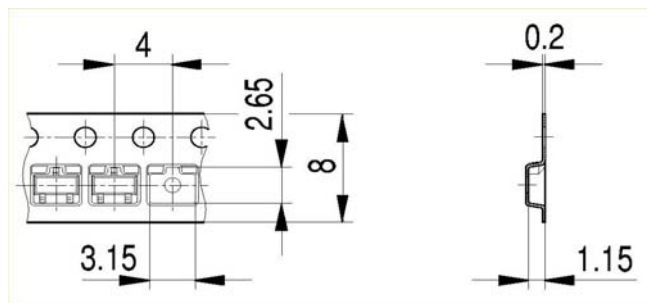
Package Outline:



Footprint:



Packaging:



Dimensions in mm

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