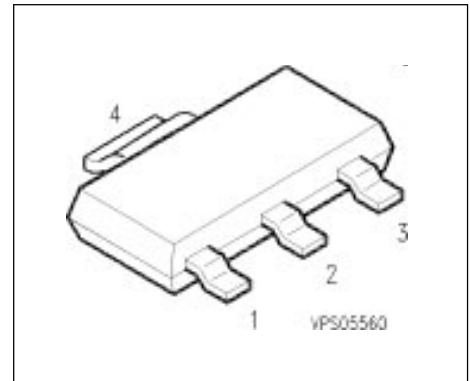


SIPMOS[®] Small-Signal Transistor

- N channel
- Enhancement mode
- Logic Level
- $V_{GS(th)} = 0.8...2.0V$



Pin 1	Pin 2	Pin 3	Pin 4
G	D	S	D

Type	V_{DS}	I_D	$R_{DS(on)}$	Package	Marking
BSP 123	100 V	0.38 A	6 Ω	SOT-223	BSP 123
Type	Ordering Code	Tape and Reel Information			
BSP 123	Q67000-S306	E6327			

Maximum Ratings

Parameter	Symbol	Values	Unit
Drain source voltage	V_{DS}	100	V
Drain-gate voltage	V_{DGR}	100	
$R_{GS} = 20 \text{ k}\Omega$			
Gate source voltage	V_{GS}	± 14	
Gate-source peak voltage, aperiodic	V_{gs}	± 20	
Continuous drain current	I_D	0.38	A
$T_A = 29 \text{ }^\circ\text{C}$			
DC drain current, pulsed	I_{Dpuls}	0.68	
$T_A = 25 \text{ }^\circ\text{C}$			
Power dissipation	P_{tot}	1.7	W
$T_A = 25 \text{ }^\circ\text{C}$			

Maximum Ratings

Parameter	Symbol	Values	Unit
Chip or operating temperature	T_j	-55 ... + 150	°C
Storage temperature	T_{stg}	-55 ... + 150	
Thermal resistance, chip to ambient air	R_{thJA}	≤ 72	K/W
Thermal resistance, junction-soldering point ¹⁾	R_{thJS}	≤ 12	
DIN humidity category, DIN 40 040		E	
IEC climatic category, DIN IEC 68-1		55 / 150 / 56	

1) Transistor on epoxy pcb 40 mm x 40 mm x 1,5 mm with 6 cm² copper area for drain connection

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

Static Characteristics

Drain- source breakdown voltage $V_{GS} = 0 \text{ V}, I_D = 0.25 \text{ mA}, T_j = 25 \text{ }^\circ\text{C}$	$V_{(BR)DSS}$	100	-	-	V
Gate threshold voltage $V_{GS} = V_{DS}, I_D = 1 \text{ mA}$	$V_{GS(th)}$	0.8	1.5	2	
Zero gate voltage drain current $V_{DS} = 100 \text{ V}, V_{GS} = 0 \text{ V}, T_j = 25 \text{ }^\circ\text{C}$ $V_{DS} = 100 \text{ V}, V_{GS} = 0 \text{ V}, T_j = 125 \text{ }^\circ\text{C}$ $V_{DS} = 20 \text{ V}, V_{GS} = 0 \text{ V}, T_j = 25 \text{ }^\circ\text{C}$	I_{DSS}	-	0.1 10 -	1 100 10	μA nA
Gate-source leakage current $V_{GS} = 20 \text{ V}, V_{DS} = 0 \text{ V}$	I_{GSS}	-	10	50	nA
Drain-Source on-state resistance $V_{GS} = 10 \text{ V}, I_D = 0.38 \text{ A}$ $V_{GS} = 4.5 \text{ V}, I_D = 0.38 \text{ A}$	$R_{DS(on)}$	-	4 6	6 10	Ω

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

Dynamic Characteristics

Transconductance $V_{DS} \geq 2 * I_D * R_{DS(on)max}, I_D = 0.38 \text{ A}$	g_{fs}	0.08	0.28	-	S
Input capacitance $V_{GS} = 0 \text{ V}, V_{DS} = 25 \text{ V}, f = 1 \text{ MHz}$	C_{iss}	-	65	85	pF
Output capacitance $V_{GS} = 0 \text{ V}, V_{DS} = 25 \text{ V}, f = 1 \text{ MHz}$	C_{oss}	-	10	15	
Reverse transfer capacitance $V_{GS} = 0 \text{ V}, V_{DS} = 25 \text{ V}, f = 1 \text{ MHz}$	C_{rss}	-	4	6	
Turn-on delay time $V_{DD} = 30 \text{ V}, V_{GS} = 10 \text{ V}, I_D = 0.28 \text{ A}$ $R_{GS} = 50 \Omega$	$t_{d(on)}$	-	5	8	ns
Rise time $V_{DD} = 30 \text{ V}, V_{GS} = 10 \text{ V}, I_D = 0.28 \text{ A}$ $R_{GS} = 50 \Omega$	t_r	-	5	8	
Turn-off delay time $V_{DD} = 30 \text{ V}, V_{GS} = 10 \text{ V}, I_D = 0.28 \text{ A}$ $R_{GS} = 50 \Omega$	$t_{d(off)}$	-	10	13	
Fall time $V_{DD} = 30 \text{ V}, V_{GS} = 10 \text{ V}, I_D = 0.28 \text{ A}$ $R_{GS} = 50 \Omega$	t_f	-	12	16	

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

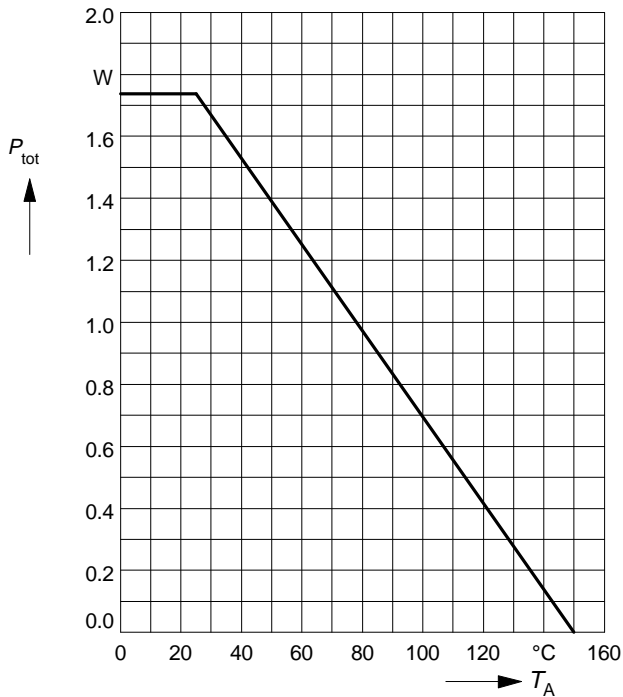
Parameter	Symbol	Values			Unit
		min.	typ.	max.	

Reverse Diode

Inverse diode continuous forward current $T_A = 25^\circ\text{C}$	I_S	-	-	0.38	A
Inverse diode direct current, pulsed $T_A = 25^\circ\text{C}$	I_{SM}	-	-	1.5	
Inverse diode forward voltage $V_{GS} = 0\text{ V}, I_F = 0.76\text{ A}, T_j = 25^\circ\text{C}$	V_{SD}	-	1	1.3	V

Power dissipation

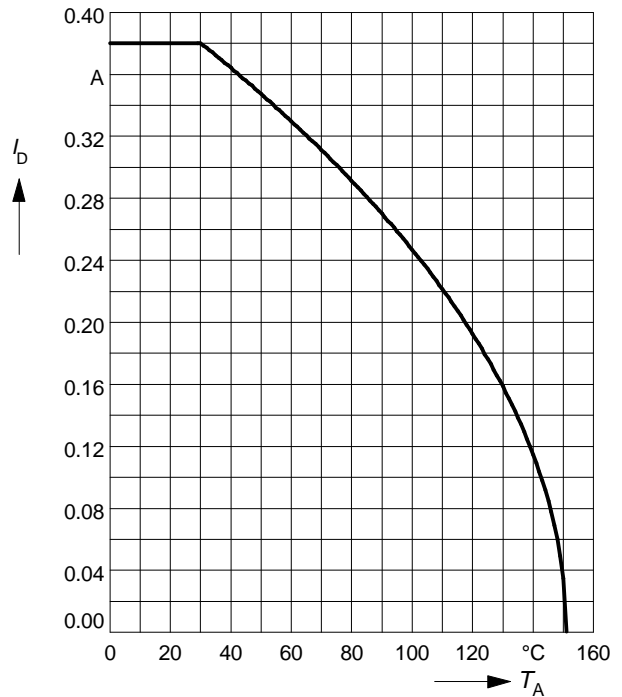
$$P_{\text{tot}} = f(T_A)$$



Drain current

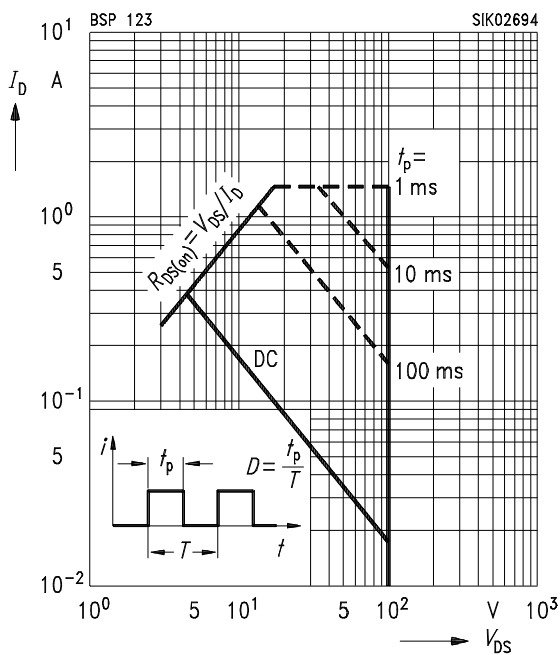
$$I_D = f(T_A)$$

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



Safe operating area $I_D=f(V_{DS})$

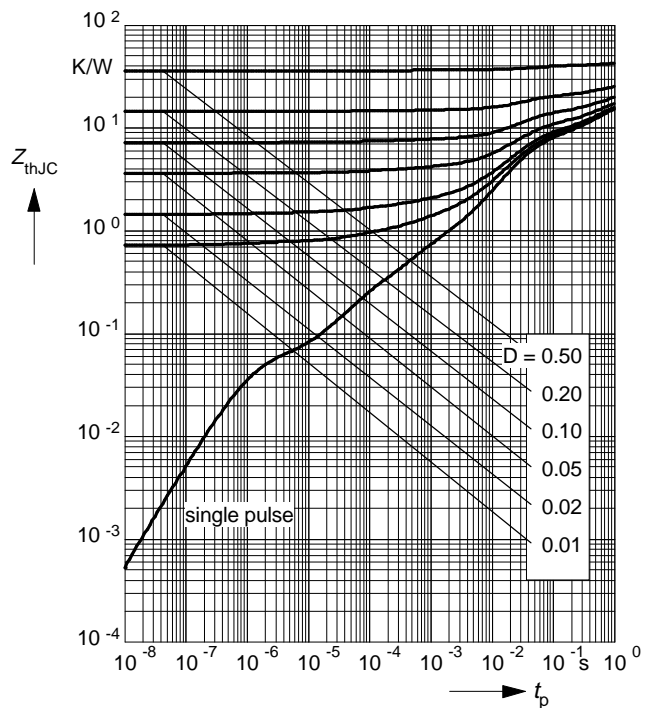
parameter : $D = 0, T_C=25^\circ\text{C}$



Transient thermal impedance

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

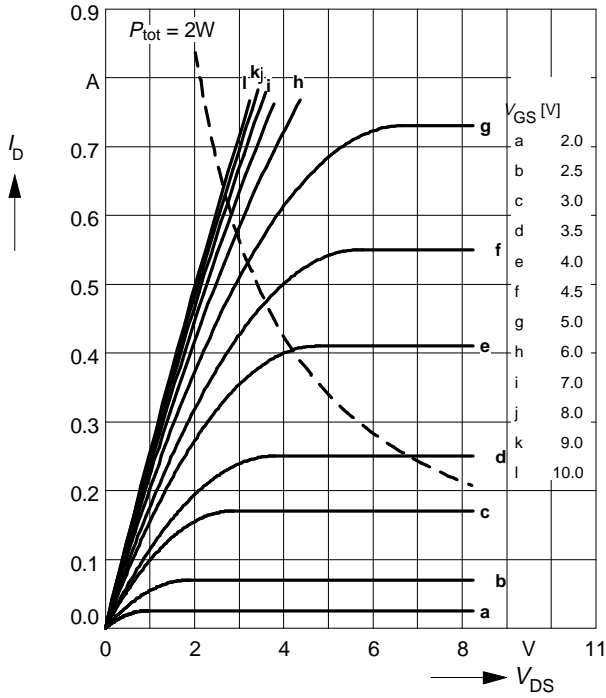
parameter: $D = t_p / T$



Typ. output characteristics

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

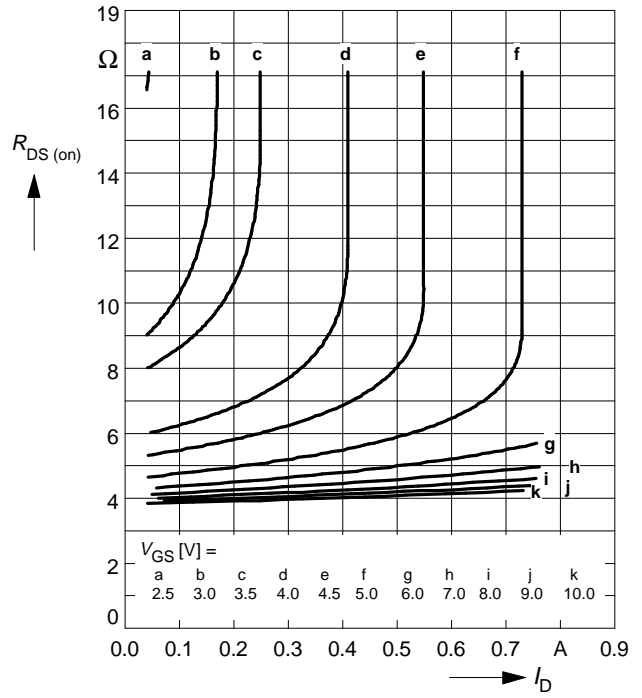
parameter: $t_p = 80 \mu s$, $T_j = 25^\circ C$



Typ. drain-source on-resistance

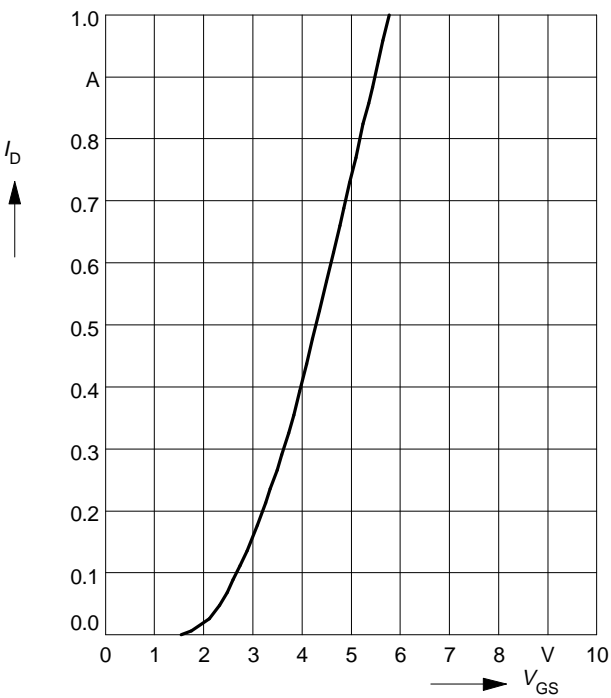
$$R_{DS(on)} = f(I_D)$$

parameter: $t_p = 80 \mu s$, $T_j = 25^\circ C$



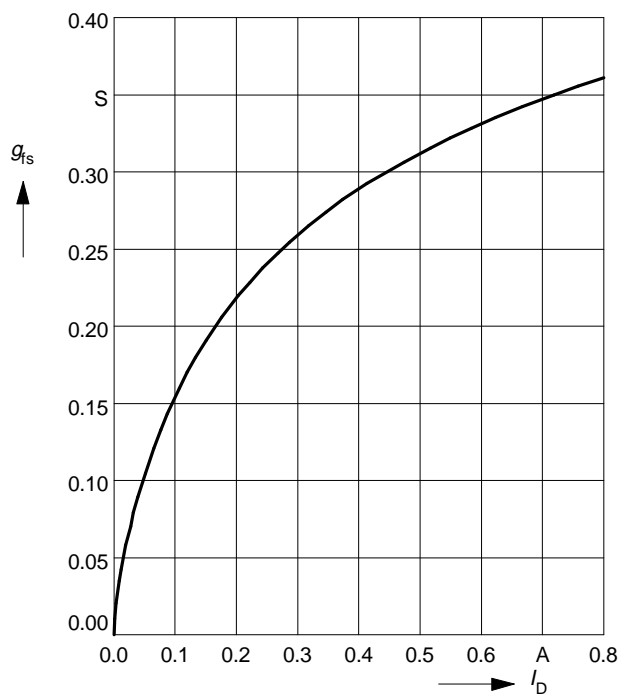
Typ. transfer characteristics $I_D = f(V_{GS})$

parameter: $t_p = 80 \mu s$



Typ. forward transconductance $g_{fs} = f(I_D)$

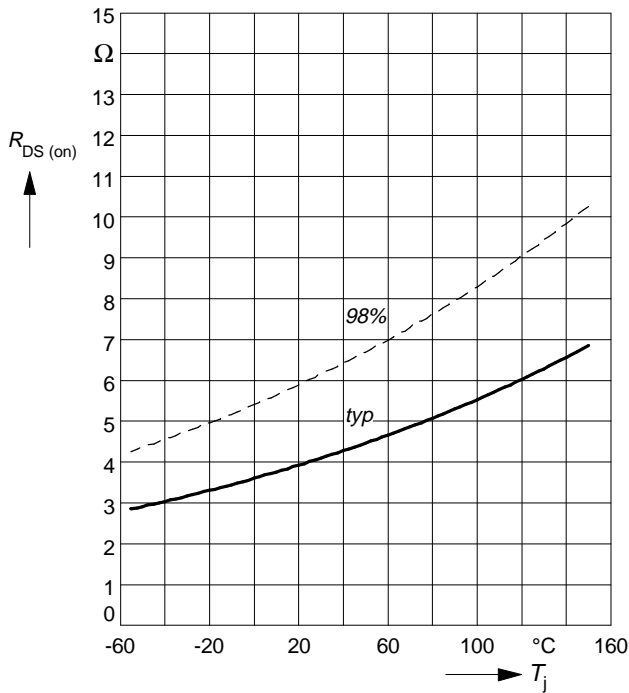
parameter: $t_p = 80 \mu s$



Drain-source on-resistance

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

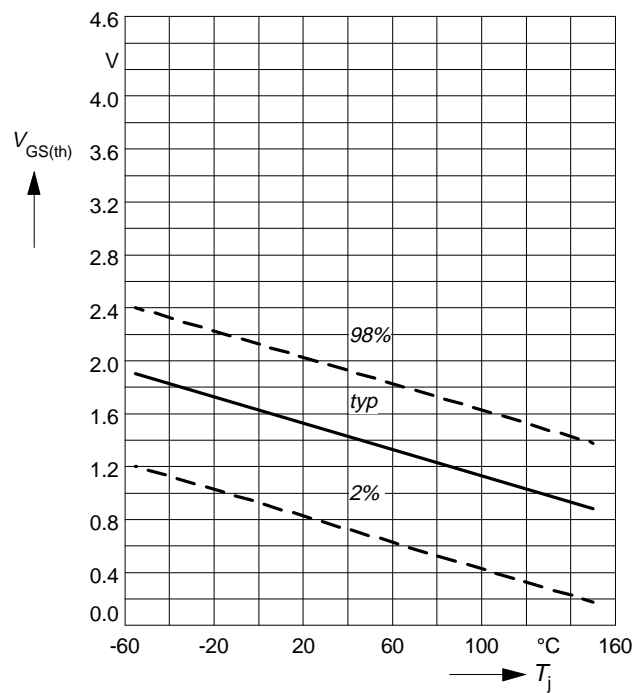
parameter: $I_D = 0.38 \text{ A}$, $V_{GS} = 10 \text{ V}$



Gate threshold voltage

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

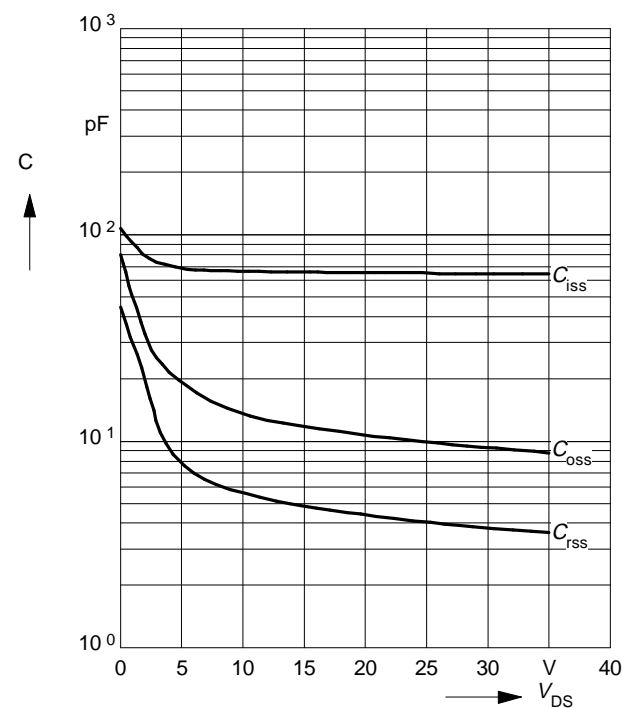
parameter: $V_{GS} = V_{DS}$, $I_D = 1 \text{ mA}$



Typ. capacitances

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

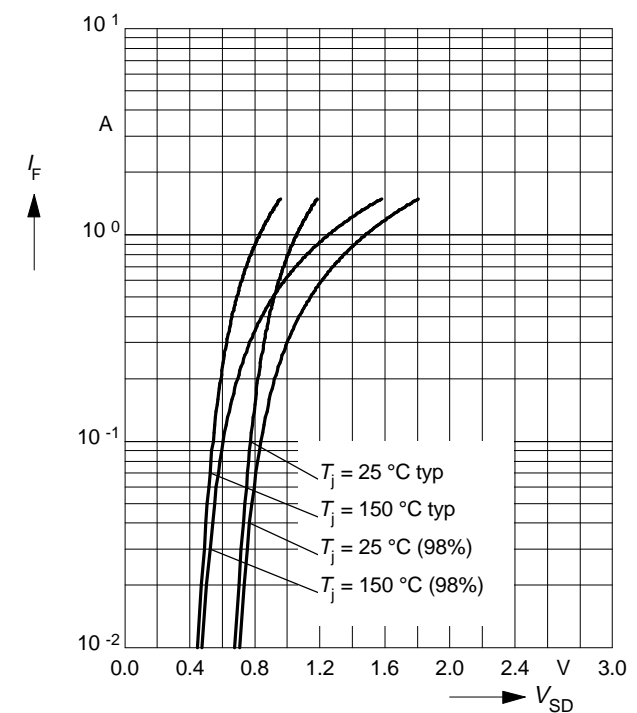
parameter: $V_{GS}=0\text{V}$, $f = 1 \text{ MHz}$



Forward characteristics of reverse diode

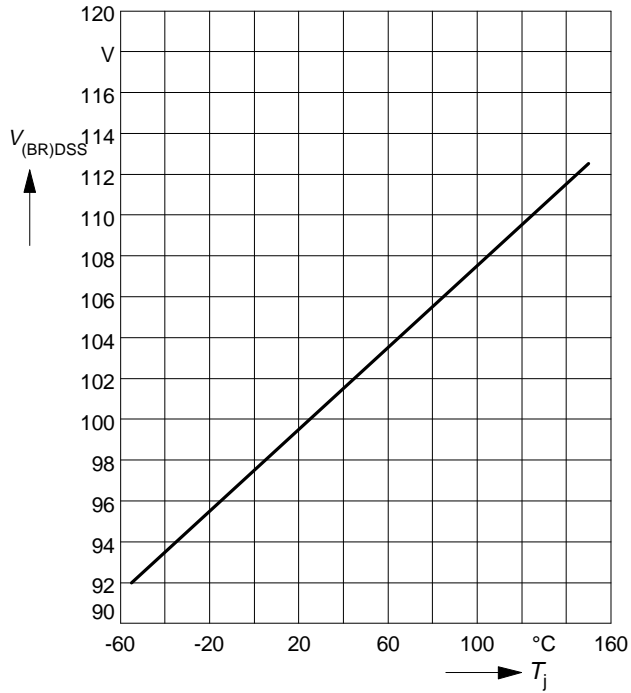
$$I_F = f(V_{SD})$$

parameter: T_j , $t_p = 80 \mu\text{s}$



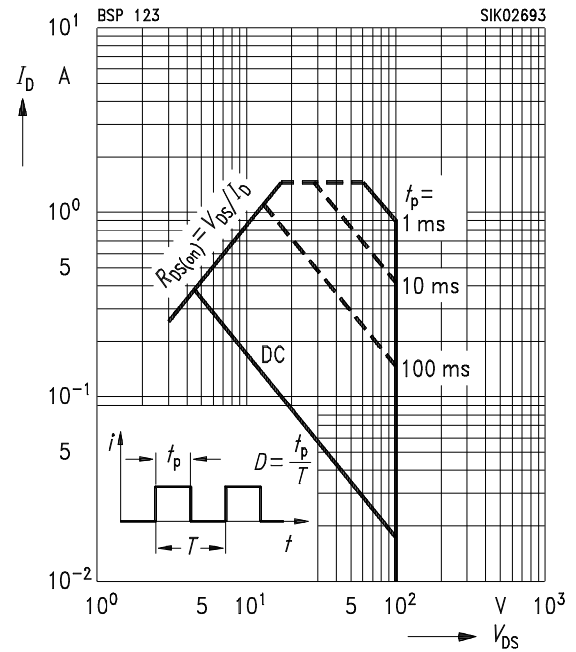
Drain-source breakdown voltage

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



Safe operating area $I_D = f(V_{DS})$

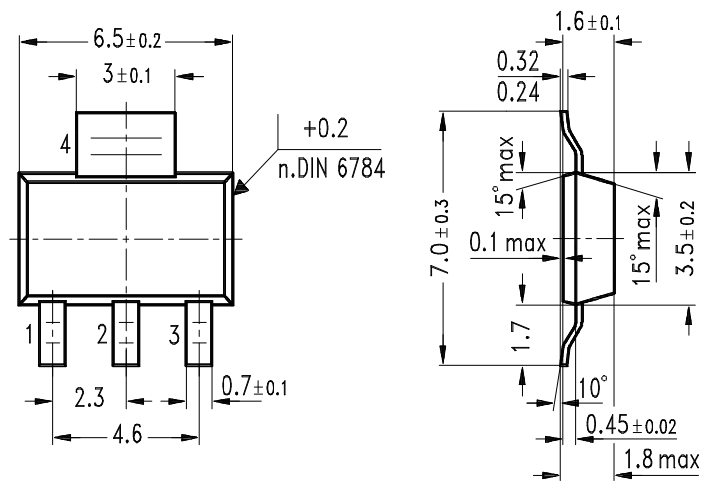
parameter : $D = 0.01$, $T_C = 25^\circ\text{C}$



Package outlines

SOT-223

Dimensions in mm



GPS05560



LittleDiode supplies new, hard to find or obsolete electronic components and semiconductors all over the world.

With over two million different components listed you are sure to find the part you need.

Feel free to visit us today at our online store:

LittleDiode.com

Looking forward to providing you with the best possible service.