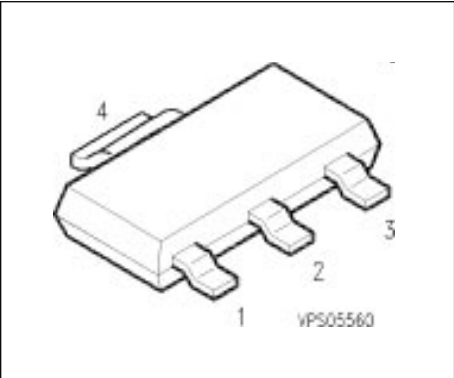


**SIPMOS® Small-Signal Transistor**

- 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 297	200 V	0.65 A	2 $\Omega$	SOT-223	BSP 297
Type	Ordering Code		Tape and Reel Information		
BSP 297	Q67000-S068		E6327		

**Maximum Ratings**

Parameter	Symbol	Values	Unit
Drain source voltage	$V_{DS}$	200	V
Drain-gate voltage $R_{GS} = 20 \text{ k}\Omega$	$V_{DGR}$	200	
Gate source voltage	$V_{GS}$	$\pm 14$	
Gate-source peak voltage, aperiodic	$V_{gs}$	$\pm 20$	
Continuous drain current $T_A = 25 \text{ }^\circ\text{C}$	$I_D$	0.65	A
DC drain current, pulsed $T_A = 25 \text{ }^\circ\text{C}$	$I_{Dpuls}$	2.6	
Power dissipation $T_A = 25 \text{ }^\circ\text{C}$	$P_{tot}$	1.8	W

## 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	$R_{thJA}$	≤ 70	K/W
Thermal resistance, junction-soldering point <sup>1)</sup>	$R_{thJS}$	≤ 10	
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 cm<sup>2</sup> 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 $V_{GS} = 0 \text{ V}$ , $I_D = 0.25 \text{ mA}$ , $T_j = 25^\circ\text{C}$	$V_{(BR)DSS}$	200	-	-	V
Gate threshold voltage $V_{GS} = V_{DS}$ , $I_D = 1 \text{ mA}$	$V_{GS(th)}$	0.8	1.4	2	
Zero gate voltage drain current $V_{DS} = 200 \text{ V}$ , $V_{GS} = 0 \text{ V}$ , $T_j = 25^\circ\text{C}$	$I_{DSS}$	-	0.1	1	μA
$V_{DS} = 200 \text{ V}$ , $V_{GS} = 0 \text{ V}$ , $T_j = 125^\circ\text{C}$		-	8	50	
$V_{DS} = 130 \text{ V}$ , $V_{GS} = 0 \text{ V}$ , $T_j = 25^\circ\text{C}$		-	-	100	nA
Gate-source leakage current $V_{GS} = 20 \text{ V}$ , $V_{DS} = 0 \text{ V}$	$I_{GSS}$	-	10	100	nA
Drain-Source on-state resistance $V_{GS} = 10 \text{ V}$ , $I_D = 0.65 \text{ A}$	$R_{DS(on)}$	-	1.6	2	Ω
$V_{GS} = 4.5 \text{ V}$ , $I_D = 0.65 \text{ A}$		-	2	3.3	

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

### Dynamic Characteristics

Transconductance $V_{DS} \geq 2 * I_D * R_{DS(on)max}$ , $I_D = 0.65 \text{ A}$	$g_{fs}$	0.5	1.15	-	S
Input capacitance $V_{GS} = 0 \text{ V}$ , $V_{DS} = 25 \text{ V}$ , $f = 1 \text{ MHz}$	$C_{iss}$	-	300	400	pF
Output capacitance $V_{GS} = 0 \text{ V}$ , $V_{DS} = 25 \text{ V}$ , $f = 1 \text{ MHz}$	$C_{oss}$	-	40	60	
Reverse transfer capacitance $V_{GS} = 0 \text{ V}$ , $V_{DS} = 25 \text{ V}$ , $f = 1 \text{ MHz}$	$C_{rss}$	-	20	30	
Turn-on delay time $V_{DD} = 30 \text{ V}$ , $V_{GS} = 10 \text{ V}$ , $I_D = 0.29 \text{ A}$ $R_{GS} = 50 \Omega$	$t_{d(on)}$	-	8	12	ns
Rise time $V_{DD} = 30 \text{ V}$ , $V_{GS} = 10 \text{ V}$ , $I_D = 0.29 \text{ A}$ $R_{GS} = 50 \Omega$	$t_r$	-	15	25	
Turn-off delay time $V_{DD} = 30 \text{ V}$ , $V_{GS} = 10 \text{ V}$ , $I_D = 0.29 \text{ A}$ $R_{GS} = 50 \Omega$	$t_{d(off)}$	-	120	160	
Fall time $V_{DD} = 30 \text{ V}$ , $V_{GS} = 10 \text{ V}$ , $I_D = 0.29 \text{ A}$ $R_{GS} = 50 \Omega$	$t_f$	-	50	70	

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

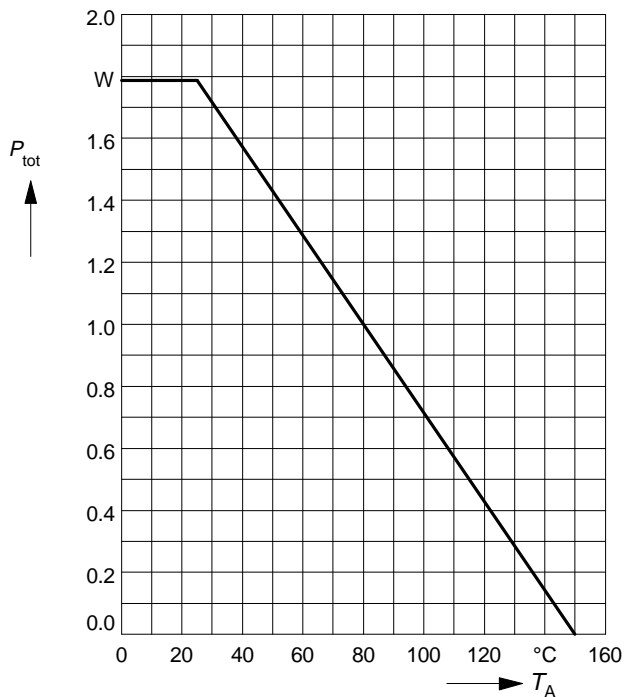
Parameter	Symbol	Values			Unit
		min.	typ.	max.	

### Reverse Diode

Inverse diode continuous forward current $T_A = 25^\circ\text{C}$	$I_S$	-	-	0.65	A
Inverse diode direct current,pulsed $T_A = 25^\circ\text{C}$	$I_{SM}$	-	-	2.6	
Inverse diode forward voltage $V_{GS} = 0\text{ V}$ , $I_F = 1.3\text{ A}$ , $T_j = 25^\circ\text{C}$	$V_{SD}$	-	0.9	1.1	V

## Power dissipation

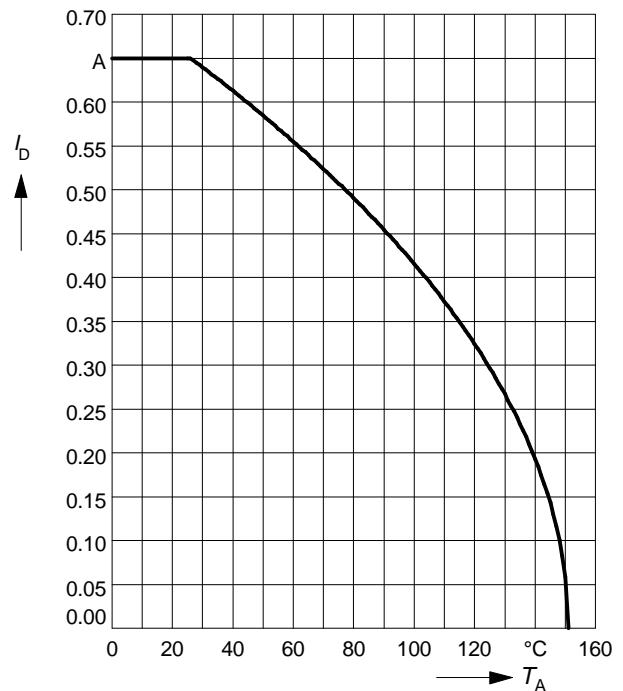
$$P_{\text{tot}} = f(T_A)$$



## Drain current

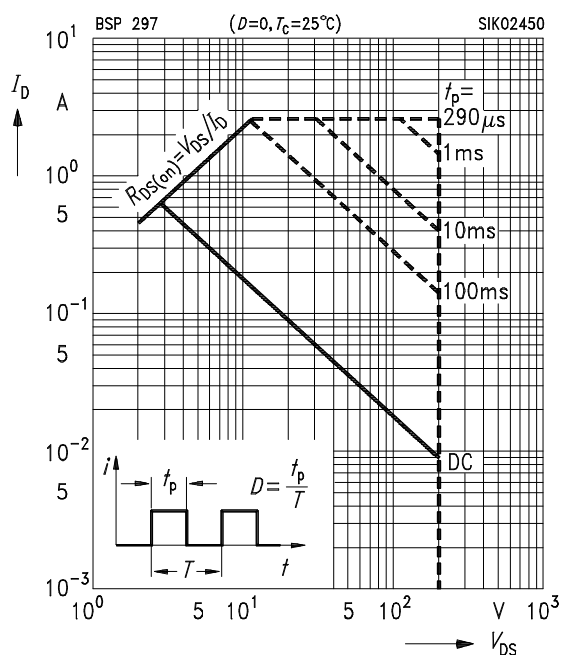
$$I_D = f(T_A)$$

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



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

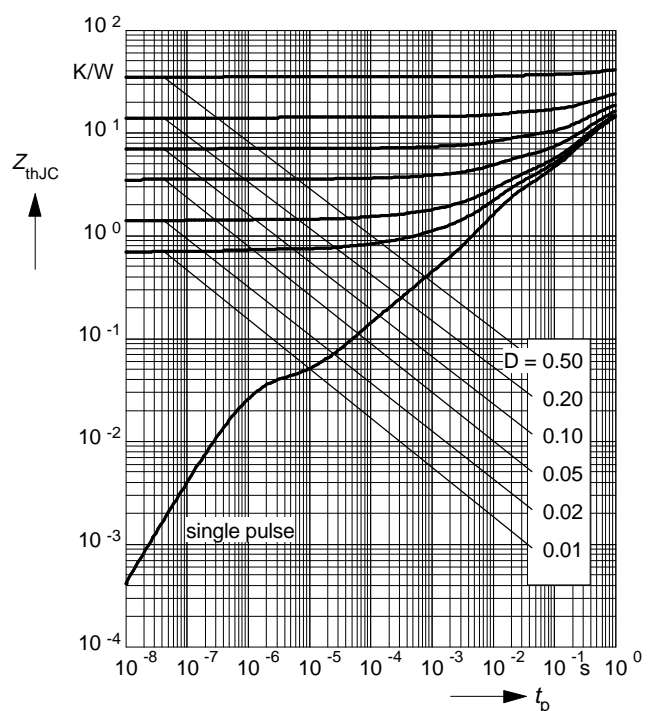
parameter:  $D = 0$ ,  $T_C = 25^\circ\text{C}$



## Transient thermal impedance

$$Z_{\text{th JA}} = f(t_p)$$

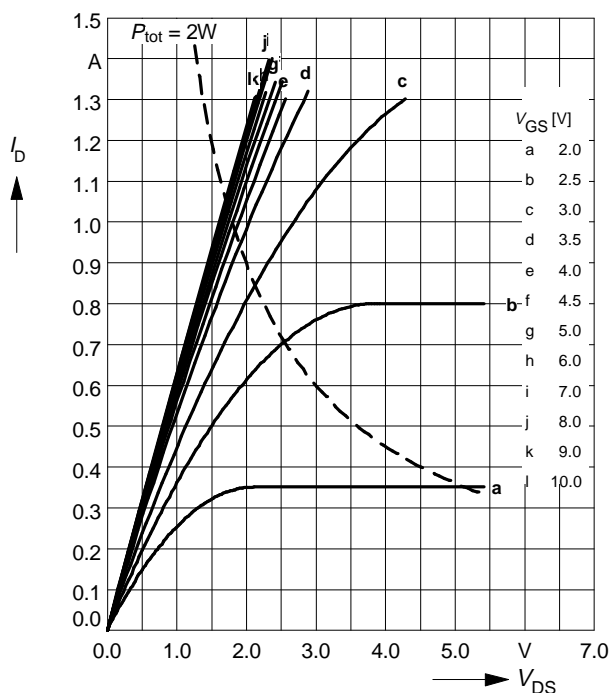
parameter:  $D = t_p / T$



## Typ. output characteristics

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

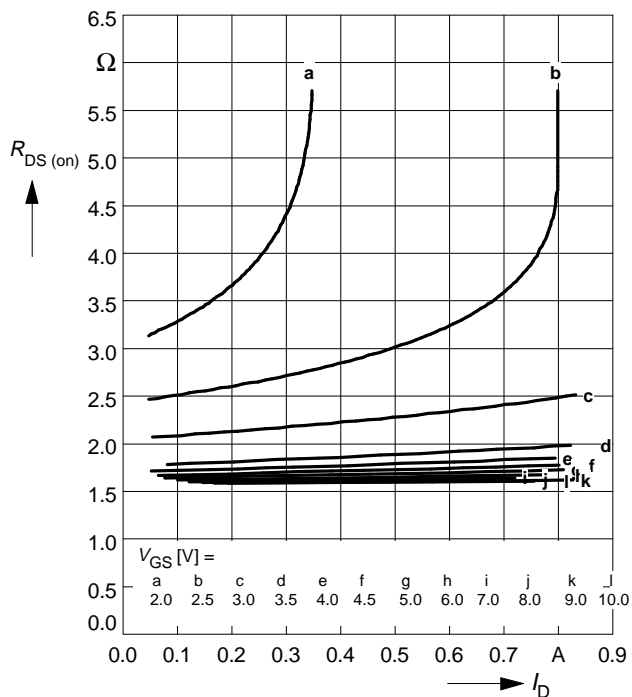
parameter:  $t_p = 80 \mu s$



## Typ. drain-source on-resistance

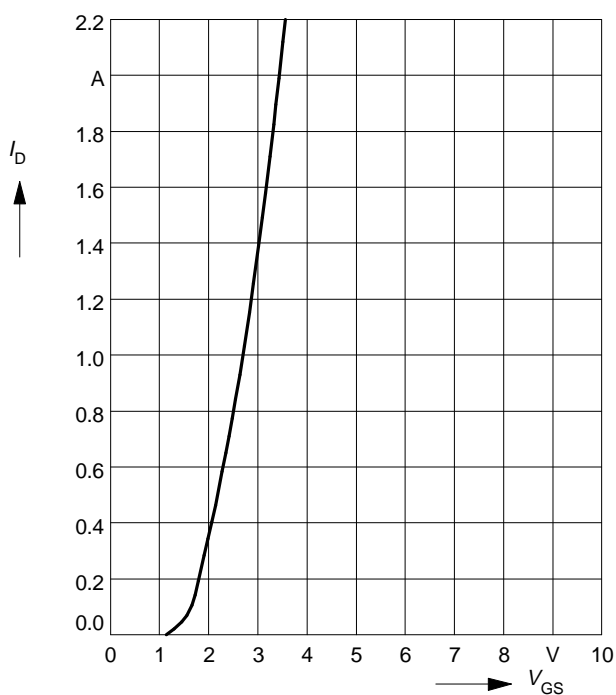
$$R_{DS(on)} = f(I_D)$$

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



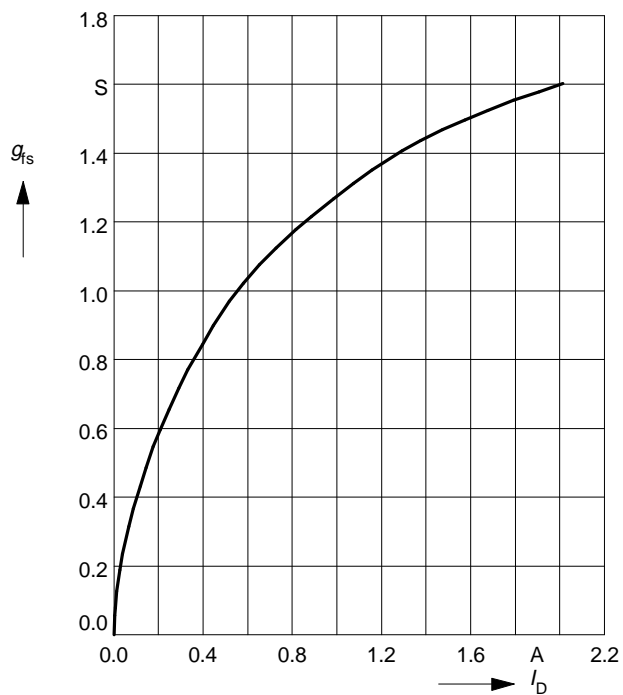
## Typ. transfer characteristics $I_D = f(V_{GS})$

parameter:  $t_p = 80 \mu s$



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

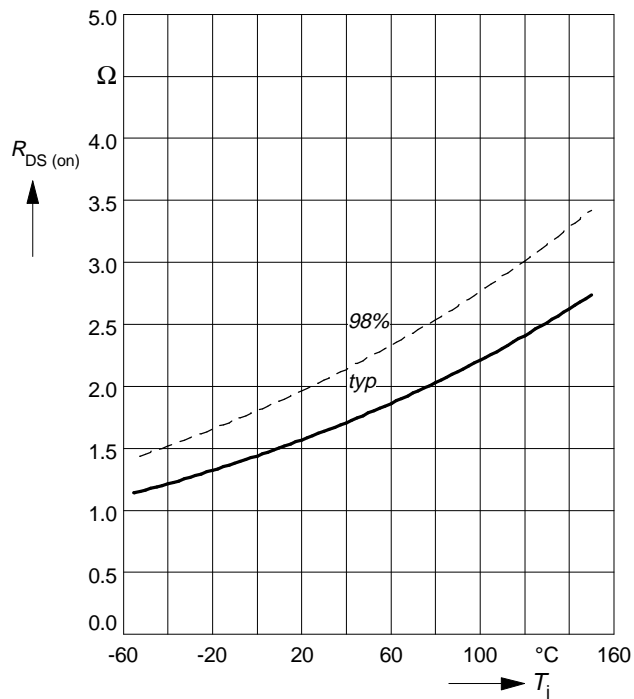
parameter:  $t_p = 80 \mu s$ ,



## Drain-source on-resistance

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

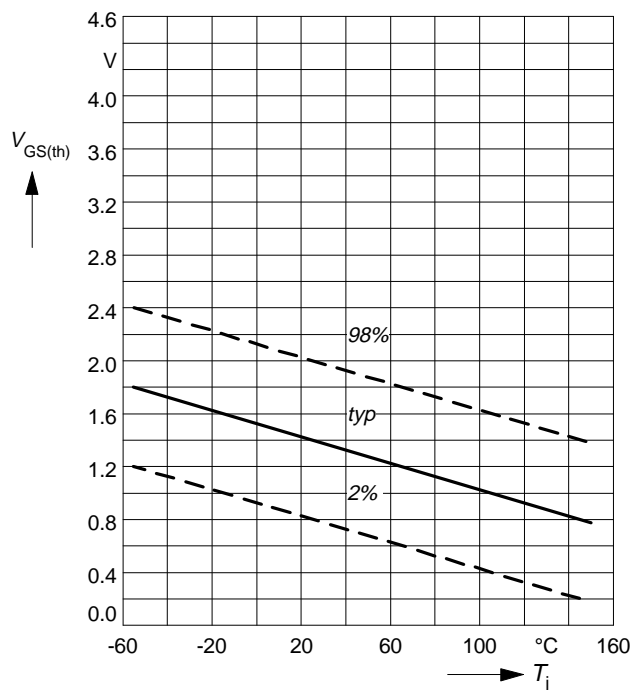
parameter:  $I_D = 0.65 \text{ A}$ ,  $V_{GS} = 10 \text{ V}$



## Gate threshold voltage

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

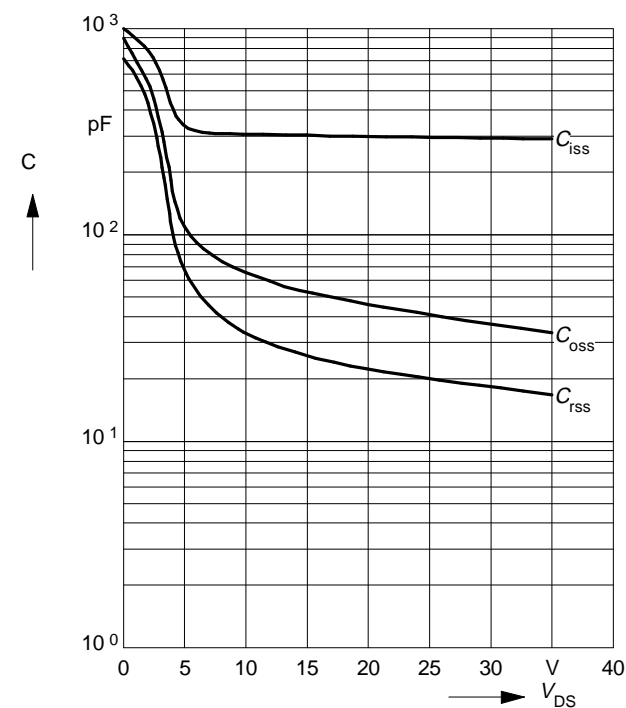
parameter:  $V_{GS} = V_{DS}$ ,  $I_D = 1 \text{ mA}$



## Typ. capacitances

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

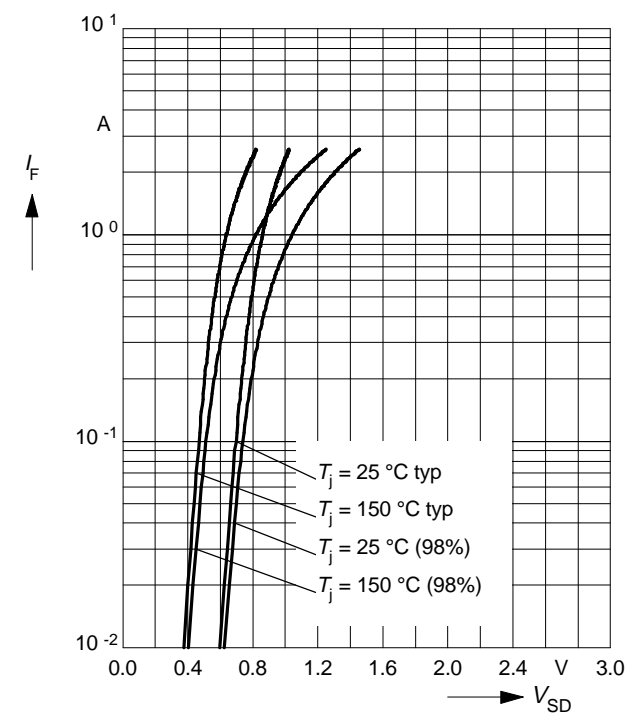
parameter:  $V_{GS} = 0 \text{ V}$ ,  $f = 1 \text{ MHz}$



## Forward characteristics of reverse diode

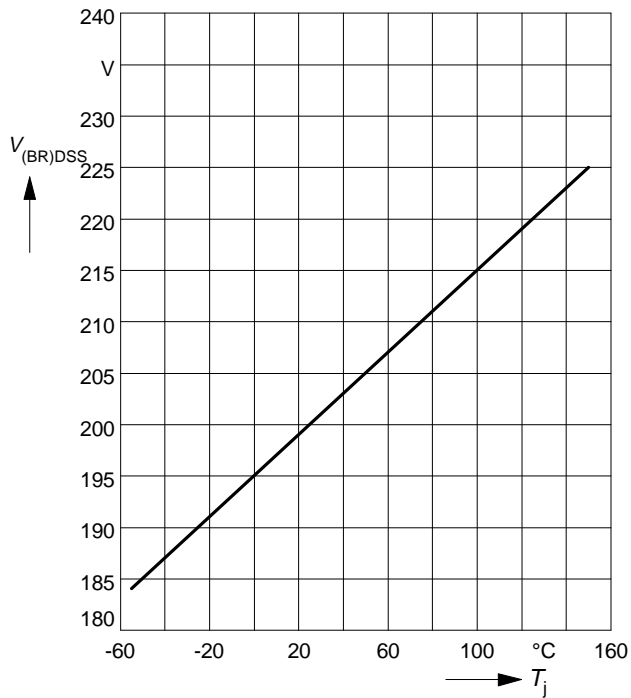
$$I_F = f(V_{SD})$$

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



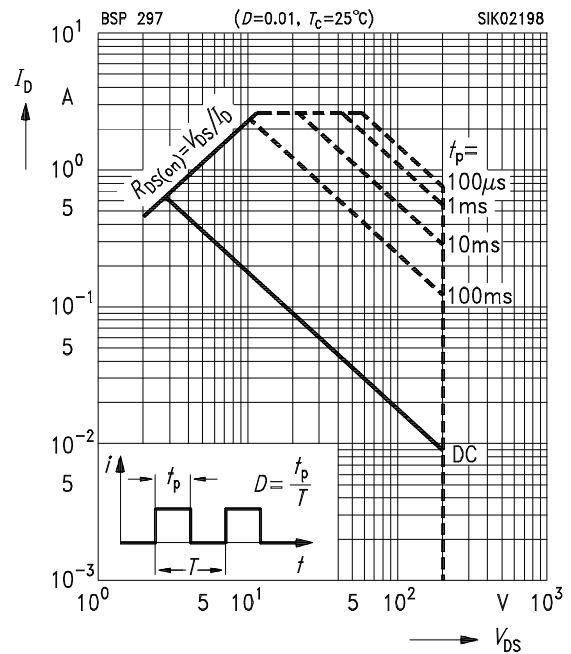
## Drain-source breakdown voltage

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



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

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

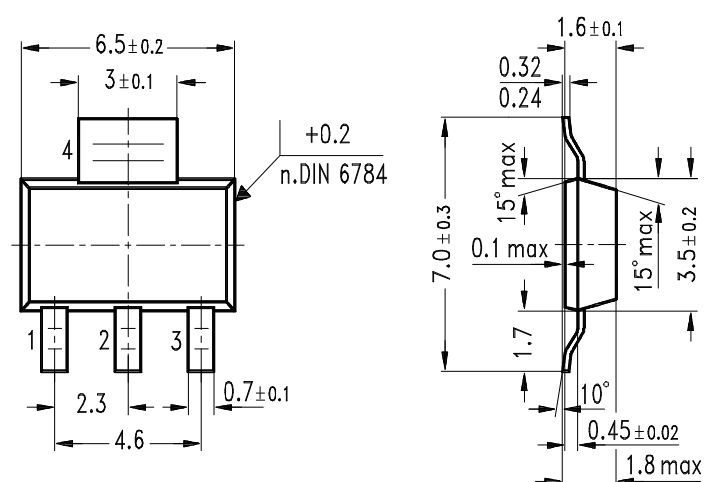




## Package outlines

SOT-223

Dimensions in mm



GPS05560