SIPMOS ® Small-Signal Transistor

• P channel

• Enhancement mode

• Logic Level

• $V_{GS(th)}$ = -0.8...-2.0 V

	Pin 1	Pin 2	Pin 3	Pin 4
	G	D	S	D
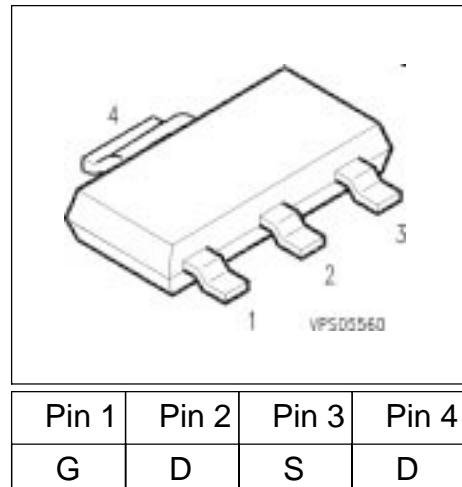
Type	V_{DS}	I_D	$R_{DS(on)}$	Package	Marking
BSP 92	-240 V	-0.2 A	20 Ω	SOT-223	BSP 92

Type	Ordering Code	Tape and Reel Information			
BSP 92	Q62702-S653	E6327			

Maximum Ratings

Parameter	Symbol	Values	Unit
Drain source voltage	V_{DS}	-240	V
Drain-gate voltage R_{GS} = 20 kΩ	V_{DGR}	-240	
Gate source voltage	V_{GS}	± 20	
Gate-source peak voltage, aperiodic	V_{gs}	±	
Continuous drain current T_A = 35 °C	I_D	-0.2	A
DC drain current, pulsed T_A = 25 °C	I_{Dpuls}	-0.8	
Power dissipation T_A = 25 °C	P_{tot}	1.7	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 [1]	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 cm^2 copper area for drain connection

Electrical Characteristics, at T_j = 25°C, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

Static Characteristics

Parameter	Symbol	min.	typ.	max.	Unit
Drain- source breakdown voltage V_{GS} = 0 V, I_D = -0.25 mA, T_j = 25 °C	$V_{(BR)DSS}$	-240	-	-	V
Gate threshold voltage V_{GS}=V_{DS}, I_D = -1 mA	$V_{GS(th)}$	-0.8	-1.5	-2	
Zero gate voltage drain current	I_{DSS}				µA
V_{DS} = -240 V, V_{GS} = 0 V, T_j = 25 °C		-	-0.1	-1	
V_{DS} = -240 V, V_{GS} = 0 V, T_j = 125 °C		-	-10	-100	
V_{DS} = -60 V, V_{GS} = 0 V, T_j = 25 °C		-	-	-0.2	
Gate-source leakage current V_{GS} = -20 V, V_{DS} = 0 V	I_{GSS}	-	-10	-100	nA
Drain-Source on-state resistance V_{GS} = -10 V, I_D = -0.2 A	$R_{DS(on)}$	-	12	20	Ω

Electrical Characteristics, at $T_j = 25°C$, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Dynamic Characteristics					
Transconductance $V_{DS} \geq 2 * I_D * R_{DS(on)max}$, $I_D = -0.2$ A	g_{fs}	0.06	0.13	-	S
Input capacitance $V_{GS} = 0$ V, $V_{DS} = -25$ V, $f = 1$ MHz	C_{iss}	-	95	130	pF
Output capacitance $V_{GS} = 0$ V, $V_{DS} = -25$ V, $f = 1$ MHz	C_{oss}	-	20	30	
Reverse transfer capacitance $V_{GS} = 0$ V, $V_{DS} = -25$ V, $f = 1$ MHz	C_{rss}	-	10	15	
Turn-on delay time $V_{DD} = -30$ V, $V_{GS} = -10$ V, $I_D = -0.25$ A $R_{GS} = 50 \ \Omega$	$t_{d(on)}$	-	8	12	ns
Rise time $V_{DD} = -30$ V, $V_{GS} = -10$ V, $I_D = -0.25$ A $R_{GS} = 50 \ \Omega$	t_r	-	25	40	
Turn-off delay time $V_{DD} = -30$ V, $V_{GS} = -10$ V, $I_D = -0.25$ A $R_{GS} = 50 \ \Omega$	$t_{d(off)}$	-	25	33	
Fall time $V_{DD} = -30$ V, $V_{GS} = -10$ V, $I_D = -0.25$ A $R_{GS} = 50 \ \Omega$	t_f	-	42	55	

Electrical Characteristics, at T_j = 25°C, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Reverse Diode					
Inverse diode continuous forward current T_A = 25 °C	I_S	-	-	-0.2	A
Inverse diode direct current,pulsed T_A = 25 °C	I_{SM}	-	-	-0.8	
Inverse diode forward voltage V_{GS} = 0 V, I_F = -0.4 A, T_j = 25 °C	V_{SD}	-	-0.9	-1.2	V

Power dissipation

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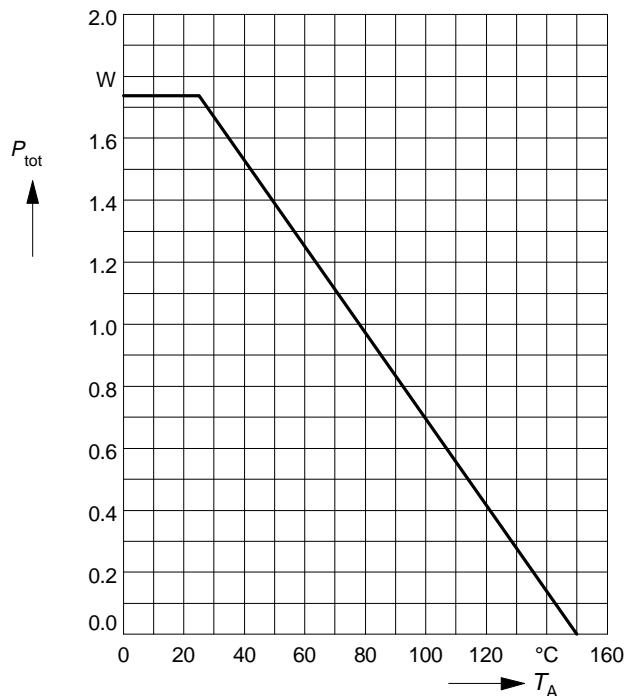
Drain current

$I_D = f(T_A)$
parameter: $V_{GS} \geq$ -10 V
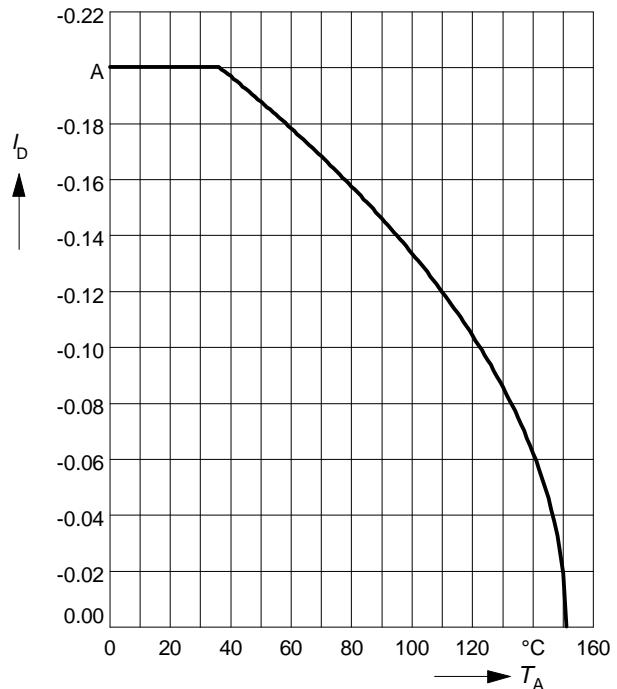
Safe operating area $I_D = f(V_{DS})$

parameter : $D = 0$, $T_C = 25°C$
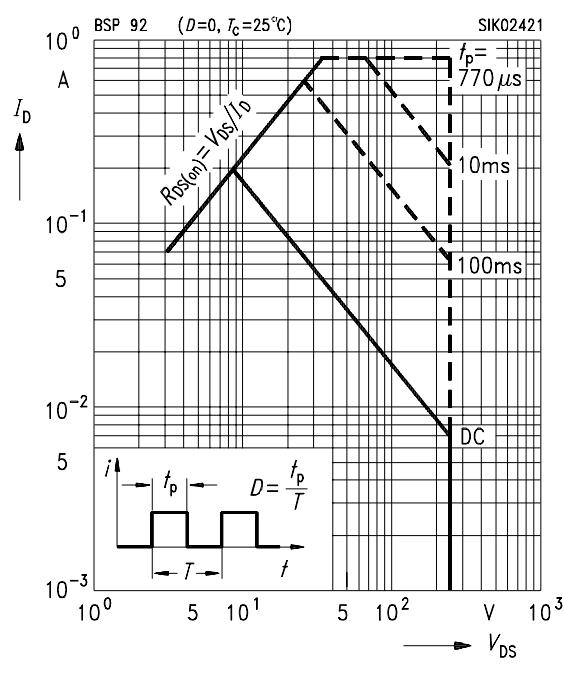
Transient thermal impedance

$Z_{th\,JA} = f(t_p)$
parameter: $D = t_p / T$
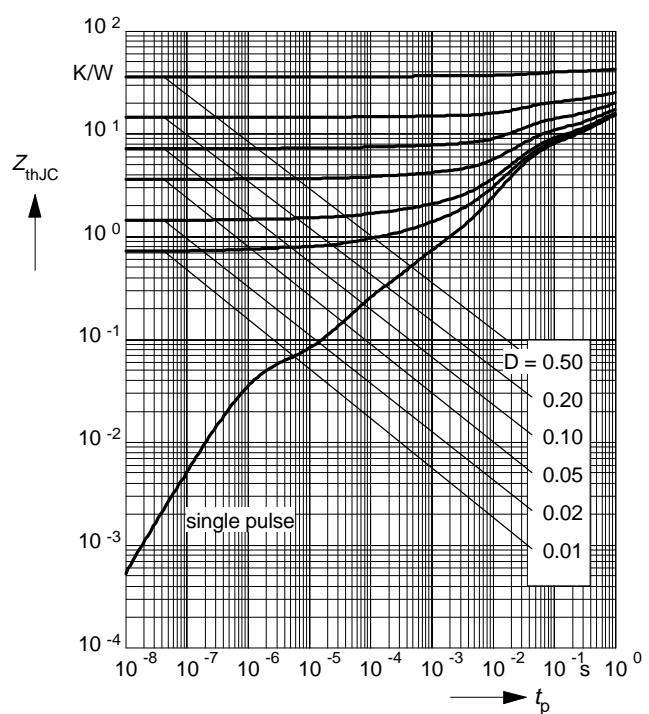
Typ. output characteristics

$I_D = f(V_{DS})$
parameter: $t_p = 80\ \mu s$

$P_{tot} = 2W$

V_{GS} [V]
a -2.0
b -2.5
c -3.0
d -3.5
e -4.0
f -4.5
g -5.0
h -6.0
i -7.0
j -8.0
k -9.0
l -10.0
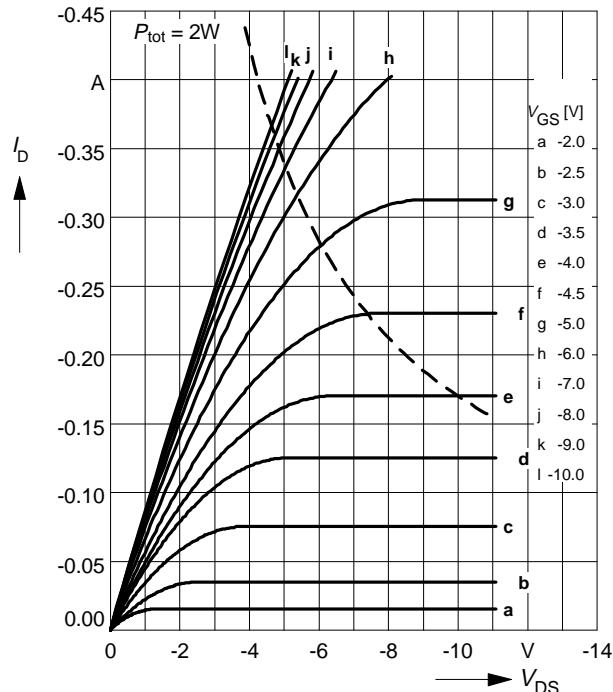
Typ. drain-source on-resistance

$R_{DS\,(on)} = f(I_D)$
parameter: $t_p = 80\ \mu s$, $T_j = 25\ °C$

V_{GS} [V] =
a -2.5
b -3.0
c -3.5
d -4.0
e -4.5
f -5.0
g -6.0
h -7.0
i -8.0
j -9.0
k -10.0
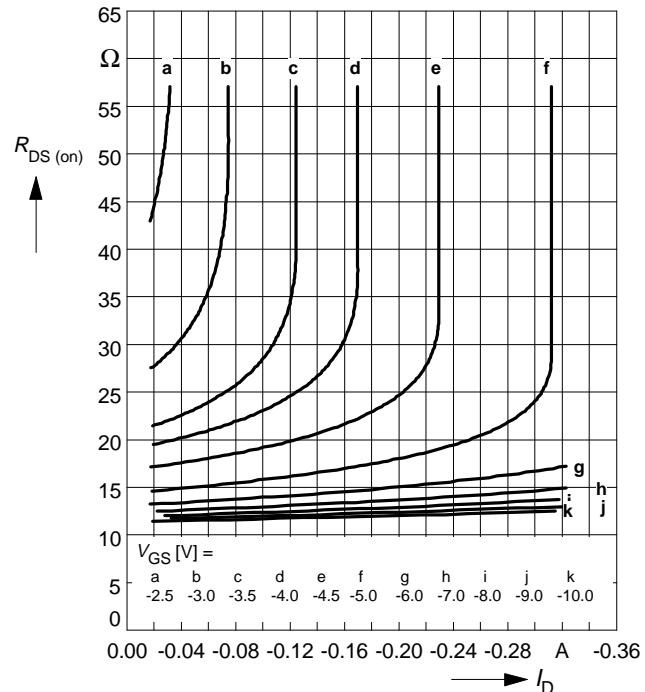
## Typ. transfer characteristics $I_D = f(V_{GS})$

parameter: $t_p = 80\ \mu s$
$V_{DS} \geq 2\ x\ I_D\ x\ R_{DS(on)max}$
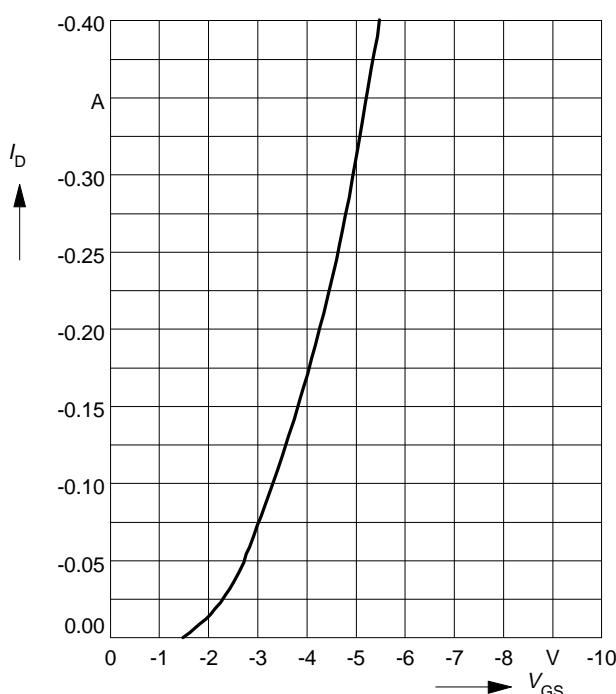
## Typ. forward transconductance $g_{fs} = f(I_D)$

parameter: $t_p = 80\ \mu s$,
$V_{DS} \geq 2\ x\ I_D\ x\ R_{DS(on)max}$
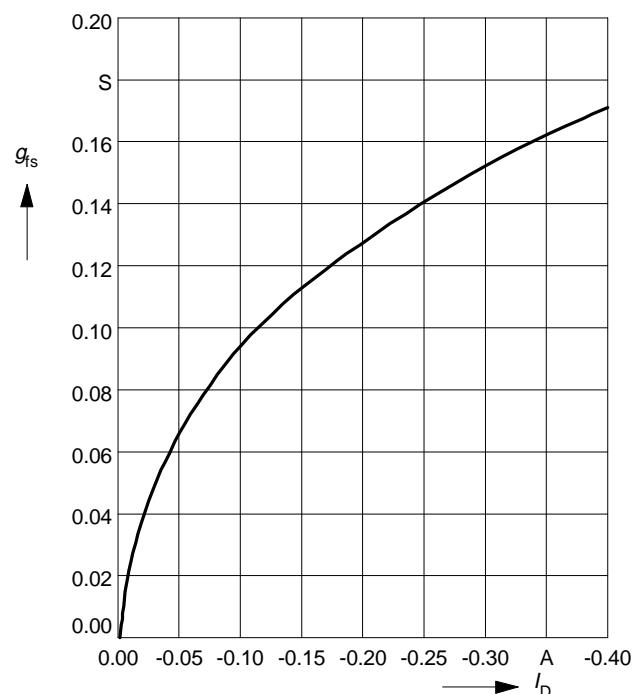
Drain-source on-resistance

$R_{DS\,(on)} = f(T_j)$
parameter: I_D = -0.2 A, V_{GS} = -10 V
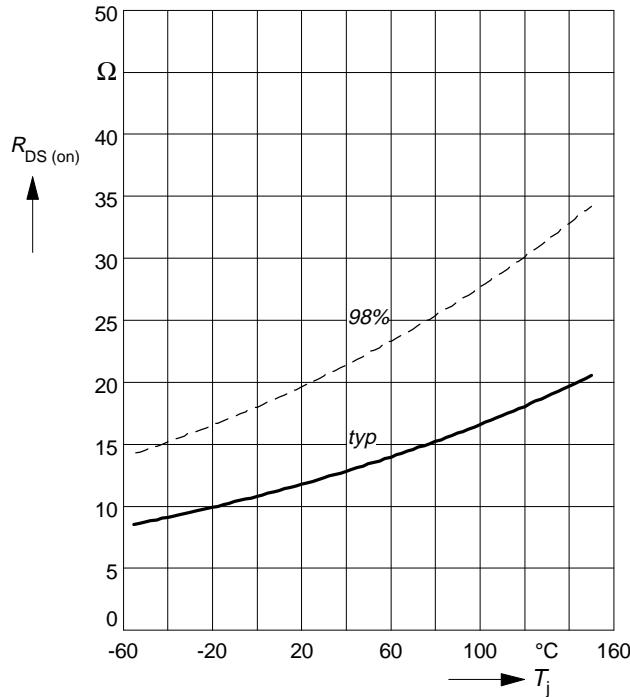

Gate threshold voltage

$V_{GS\,(th)} = f(T_j)$
parameter: V_{GS} = V_{DS}, I_D = -1 mA
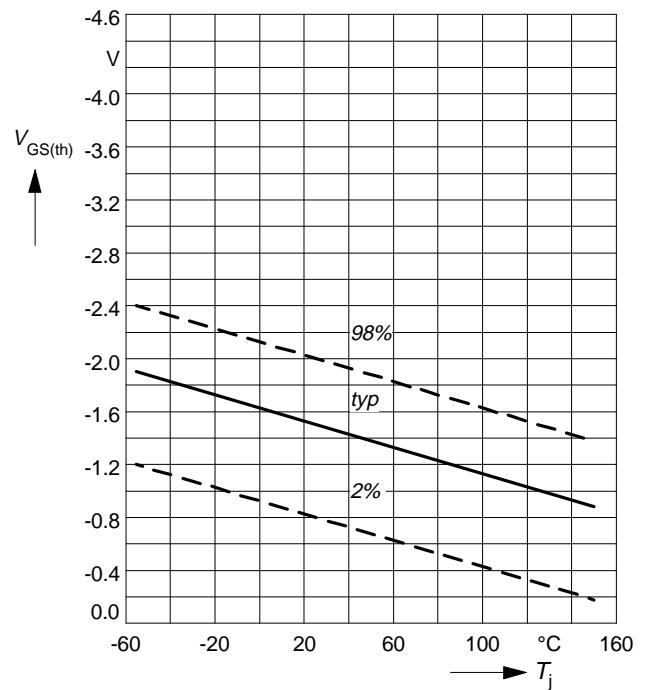

Typ. capacitances

$C = f(V_{DS})$
parameter: V_{GS}=0V, f = 1 MHz
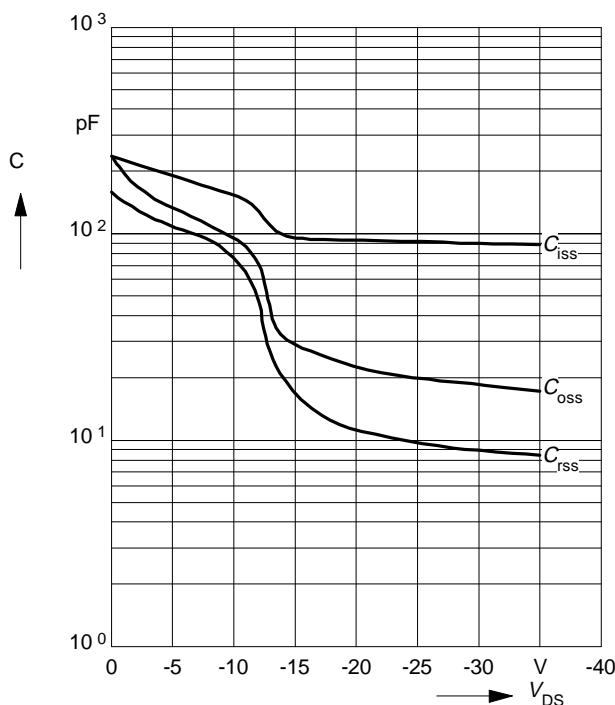

Forward characteristics of reverse diode

$I_F = f(V_{SD})$
parameter: T_j, t_p = 80 µs

T_j = 25 °C typ
T_j = 150 °C typ
T_j = 25 °C (98%)
T_j = 150 °C (98%)

SIEMENS

BSP 92

Drain-source breakdown voltage

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

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

parameter : $D = 0.01$, $T_C = 25°C$

SIEMENS

BSP 92

Drain-source breakdown voltage

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

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

parameter : $D = 0.01$, $T_C = 25°C$

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