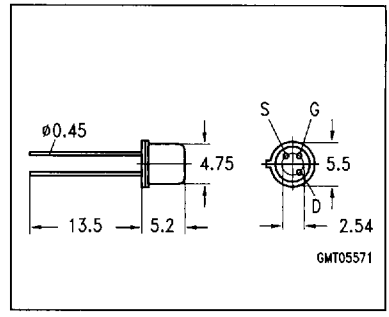
SIEMENS

SIPMOS® Small-Signal Transistor — BSS 91

V_{DS} = 240 V
I_D = 0.35 A
$R_{DS(on)}$ = 6.0 Ω

- N channel
- Enhancement mode
- Package: TO-18 [1]

Not for new design!



Type	Ordering code for version in bulk
BSS 91	Q 62702-S457

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}	± 14	
Gate-source peak voltage, aperiodic	V_{gs}	± 20	
Continuous drain current, T_C = 25 °C	I_D	0.35	A
Pulsed drain current, T_C = 25 °C	$I_{D\,puls}$	1.4	
Max. power dissipation, T_A = 25 °C	P_{tot}	1.5	W
Operating and storage temperature range	T_j, T_{stg}	– 55 ... + 150	°C

Thermal resistance, chip-ambient (without heat sink), chip-case	R_{thJA} R_{thJC}	≤ 300 ≤ 83	K/W
DIN humidity category, DIN 40 040	–	E	–
IEC climatic category, DIN IEC 68-1	–	55/150/56	

[1] See chapter Package Outlines.

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Electrical Characteristics

at T_j = 25 °C, unless otherwise specified.

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Static Characteristics					
Drain-source breakdown voltage V_{GS} = 0, I_D = 0.25 mA	$V_{(BR)DSS}$	240	–	–	V
Gate threshold voltage V_{GS} = V_{DS}, I_D = 1 mA	$V_{GS(th)}$	0.8	1.5	2.0	
Zero gate voltage drain current V_{DS} = 240 V, V_{GS} = 0 T_j = 25 °C T_j = 125 °C	I_{DSS}	 – –	 0.1 10	 1.0 100	µA
V_{DS} = 60 V, V_{GS} = 0 T_j = 25 °C		–	–	200	nA
Gate-source leakage current V_{GS} = 20 V, V_{DS} = 0	I_{GSS}	–	10	100	nA
Drain-source on-resistance V_{GS} = 10 V, I_D = 0.35 A V_{GS} = 4.5 V, I_D = 0.35 A	$R_{DS(on)}$	 –	 3.5 5.0	 6.0 10.0	Ω
Dynamic Characteristics					
Forward transconductance $V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$, I_D = 0.35 A	g_{fs}	0.14	0.37	–	S
Input capacitance V_{GS} = 0, V_{DS} = 25 V, f = 1 MHz	C_{iss}	–	115	155	pF
Output capacitance V_{GS} = 0, V_{DS} = 25 V, f = 1 MHz	C_{oss}	–	15	25	
Reverse transfer capacitance V_{GS} = 0, V_{DS} = 25 V, f = 1 MHz	C_{rss}	–	8	12	
Turn-on time t_{on}, ($t_{on} = t_{d(on)} + t_r$) V_{DD} = 30 V, V_{GS} = 10 V, R_{GS} = 50 Ω, I_D = 0.28 A	$t_{d(on)}$	–	6	9	ns
	t_r	–	10	15	
Turn-off time t_{off}, ($t_{off} = t_{d(off)} + t_f$) V_{DD} = 30 V, V_{GS} = 10 V, R_{GS} = 50 Ω, I_D = 0.28 A	$t_{d(off)}$	–	33	45	
	t_f	–	22	30	

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Electrical Characteristics (cont'd)

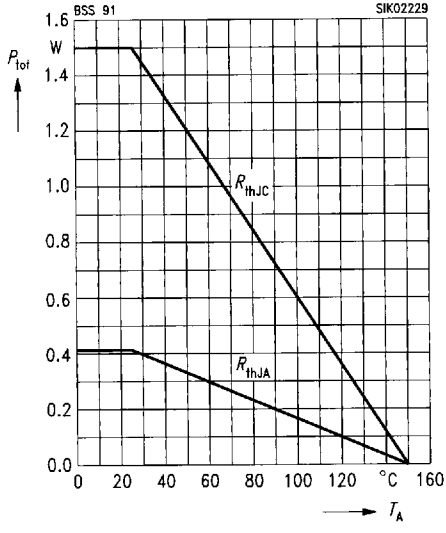
at T_j = 25 °C, unless otherwise specified.

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Reverse Diode					
Continuous reverse drain current T_A = 25 °C	I_S	–	–	0.35	A
Pulsed reverse drain current T_A = 25 °C	I_{SM}	–	–	1.4	
Diode forward on-voltage I_F = 0.7 A, V_{GS} = 0	V_{SD}	–	0.9	1.4	V

Characteristics

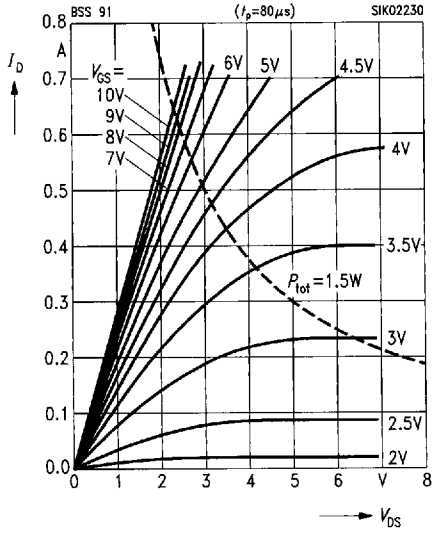
at T_j = 25 °C, unless otherwise specified.

Total power dissipation $P_{tot} = f(T_A)$



Typ. output characteristics $I_D = f(V_{DS})$

parameter: t_p = 80 µs



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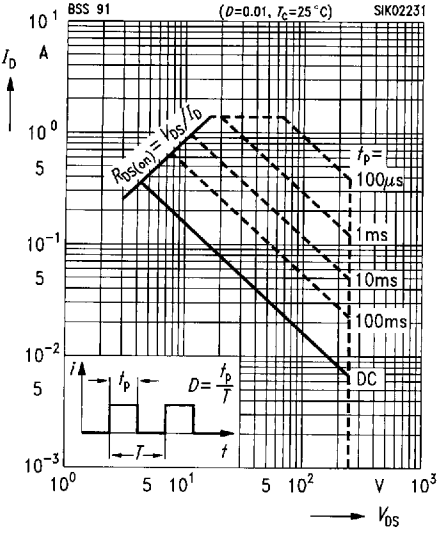
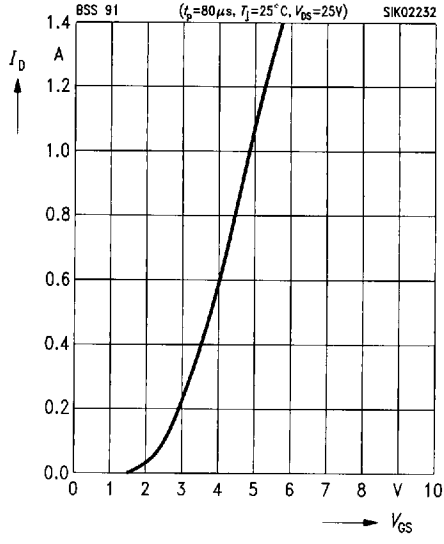
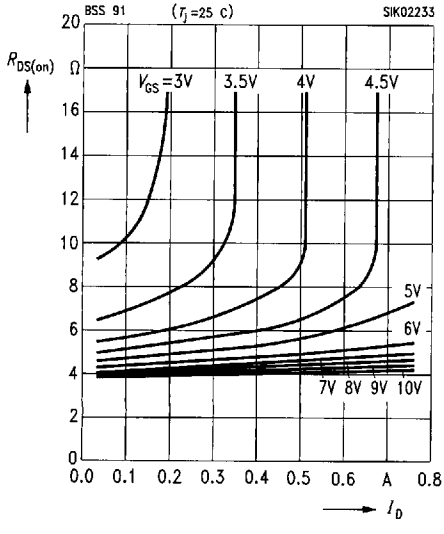
Safe operating area $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_C = 25$ °C



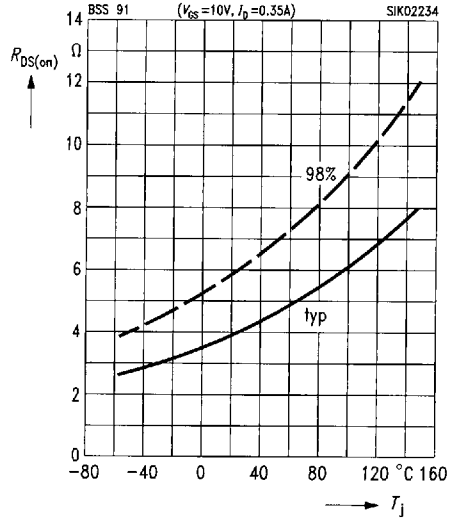
Typ. transfer characteristics $I_D = f(V_{GS})$
parameter: $t_p = 80$ µs, $V_{DS} = 25$ V



Typ. drain-source on-resistance
$R_{DS(on)} = f(I_D)$
parameter: V_{GS}



Drain-source on-resistance
$R_{DS(on)} = f(T_j)$
parameter: $I_D = 0.35$ A, $V_{GS} = 10$ V, (spread)



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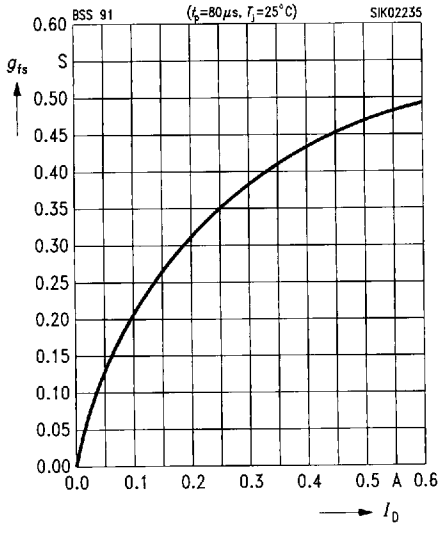
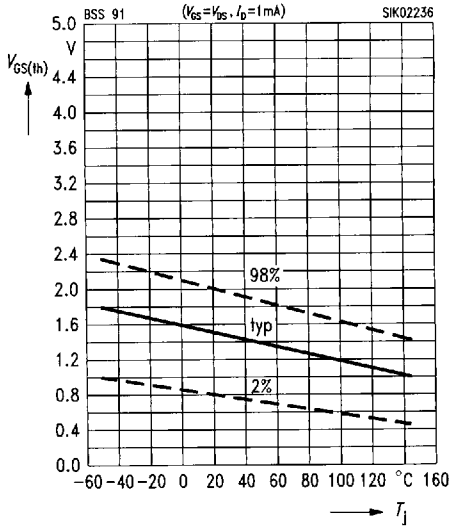
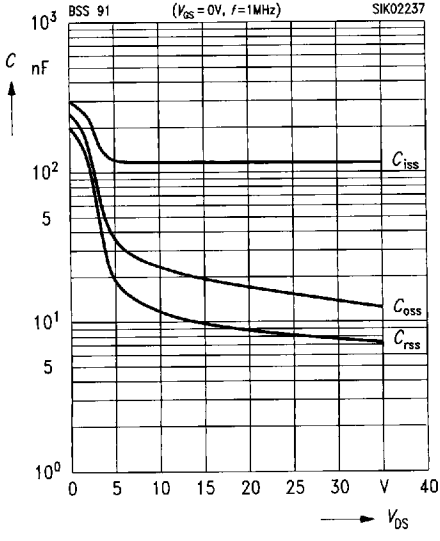
Typ. forward transconductance $g_{fs} = f(I_D)$
parameter: $V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$, $t_p = 80\ \mu s$



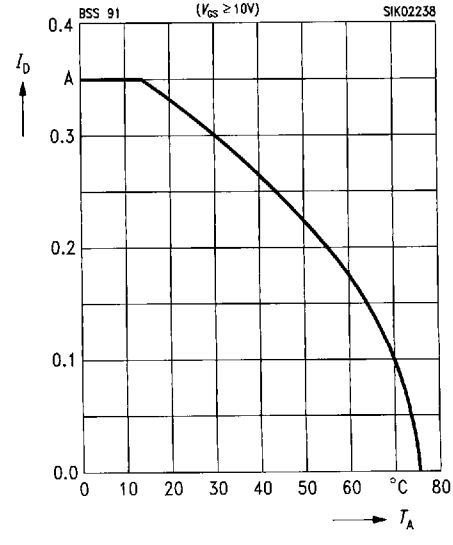
Gate threshold voltage $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 1$ mA, (spread)



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



Drain current $I_D = f(T_A)$
parameter: $V_{GS} \geq 10$ V



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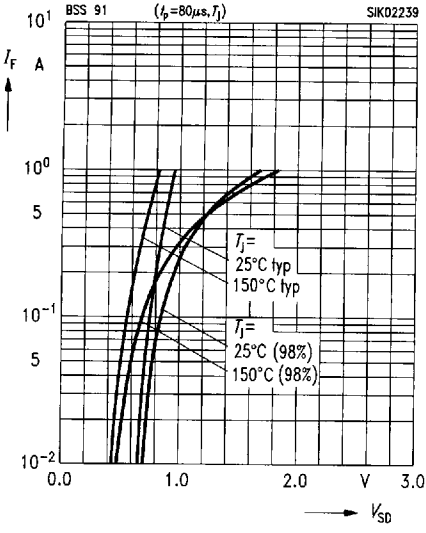
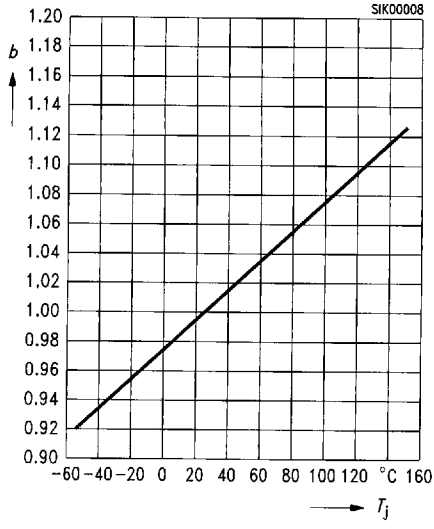
Forward characteristics of reverse diode
$I_F = f(V_{SD})$
parameter: t_p = 80 µs, T_j, (spread)



Drain-source breakdown voltage
$V_{(BR)\,DSS} = b \times V_{(BR)DSS}$ (25 °C)



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