SIEMENS

SIEMENS AKTIENGESELLSCHAF 47E D

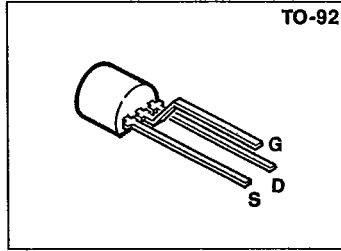## SIPMOS® Small-Signal Transistor

BS 107

V_{DS} = 200 V
I_D = 0.13 A
$R_{DS(on)}$ = 26 Ω

- N channel
- Enhancement mode
- Package: TO-92 [1])

TO-92

G
D
S

Type	Ordering code for version on tape	Ordering code for version in bulk
BS 107	Q67000-S078	Q67000-S060

Maximum Ratings

Parameter	Symbol	Values	Unit
Drain-source voltage	V_{DS}	200	V
Drain-gate voltage, R_{GS} = 20 kΩ	V_{DGR}	200	
Gate-source voltage	V_{GS}	± 10	
Gate-source peak voltage, aperiodic	V_{gs}	± 20	
Continuous drain current, T_A = 31 °C	I_D	0.13	A
Pulsed drain current, T_A = 25 °C	$I_{D\,puls}$	0.52	
Operating and storage temperature range	T_j T_{stg}	−55...+150	°C
Thermal resistance chip‑ambient (without heat sink)	R_{thJA}	≤ 125	K/W
Max. power dissipation, T_A = 25 °C	P_{tot}	1.0	W
DIN humidity category, DIN 40 040	–	E	–
IEC climatic category, DIN IEC 68-1	–	55/150/56	

[1]) See chapter Package Outlines.

T=27-25

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

Static characteristics

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Drain-source breakdown voltage $V_{GS} = 0$, $I_D = 0.25$ mA	$V_{(BR)DSS}$	200	–	–	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 $V_{DS} = 200$ V, $V_{GS} = 0$ $T_j = 25\ °C$ $T_j = 125\ °C$	I_{DSS}	– –	1 2	15 60	µA
$V_{DS} = 130$ V, $V_{GS} = 0$ $T_j = 25\ °C$		–	–	30	nA
$V_{DS} = 70$ V, $V_{GS} = 0.2$ V $T_j = 25\ °C$		–	–	1	µA
Gate-source leakage current $V_{GS} = 25$ V, $V_{DS} = 0$	I_{GSS}	–	1	10	nA
Drain-source on-resistance $V_{GS} = 4.5$ V, $I_D = 0.12$ A $V_{GS} = 2.8$ V, $I_D = 0.02$ A	$R_{DS(on)}$	– –	14 14.5	26 28	Ω

Dynamic characteristics

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Forward transconductance $V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$, $I_D = 0.12$ A	g_{fs}	0.06	0.16	–	S
Input capacitance $V_{GS} = 0$, $V_{DS} = 25$ V, $f = 1$ MHz	C_{iss}	–	60	90	pF
Output capacitance $V_{GS} = 0$, $V_{DS} = 25$ V, $f = 1$ MHz	C_{oss}	–	8	12	
Reverse transfer capacitance $V_{GS} = 0$, $V_{DS} = 25$ V, $f = 1$ MHz	C_{rss}	–	2.5	5.0	
Turn-on time t_{on}, ($t_{on} = t_{d(on)} + t_r$) $V_{CC} = 30$ V, $V_{GS} = 10$ V, $R_{GS} = 50\ Ω$, $I_D = 0.24$ A	$t_{d(on)}$	–	5	8	ns
	t_r	–	8	12	
Turn-off time t_{off}, ($t_{off} = t_{d(off)} + t_f$) $V_{CC} = 30$ V, $V_{GS} = 10$ V, $R_{GS} = 50\ Ω$, $I_D = 0.24$ A	$t_{d(off)}$	–	12	16	
	t_f	–	15	20	

Electrical Characteristics (continued)
at $T_j = 25$ °C, unless otherwise specified.

T-27-25

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Reverse Diode					
Continuous reverse drain current $T_A = 25$ °C	I_S	–	–	0.13	A
Pulsed reverse drain current $T_A = 25$ °C	I_{SM}	–	–	0.52	
Diode forward on-voltage $I_F = 0.5$ A, $V_{GS} = 0$	V_{SD}	–	0.9	1.2	V
Reverse recovery time $V_R = 100$ V, $I_F = 0.5$ A, $di_F/dt = 100$ A/µs	t_{rr}	–	115	–	ns
Reverse recovery charge $V_R = 100$ V, $I_F = 0.5$ A, $di_F/dt = 100$ A/µs	Q_{rr}	–	300	–	nC

T-27-25

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

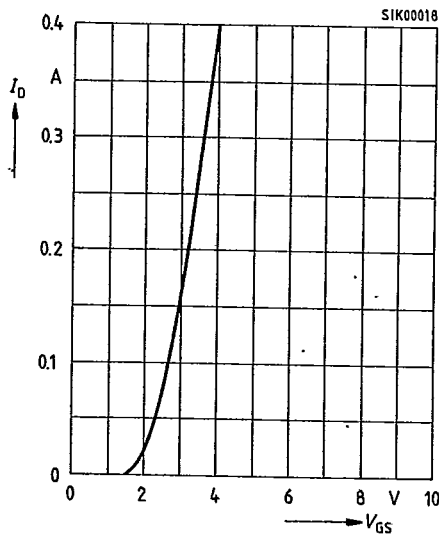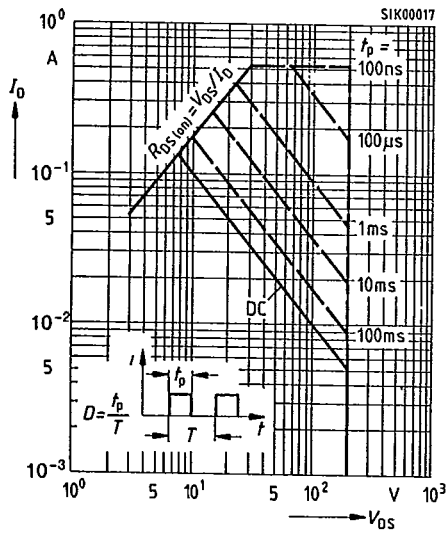**Total power dissipation $P_{tot} = f(T_A)$**

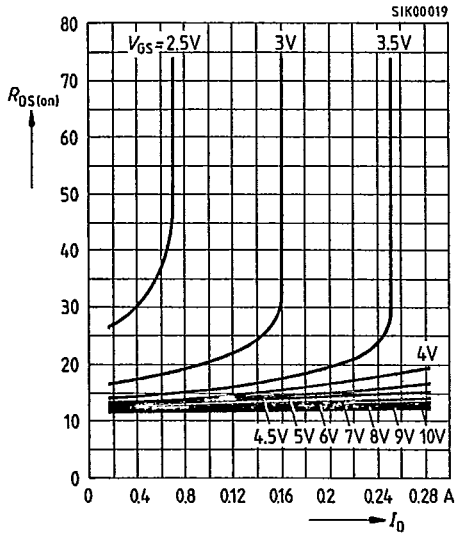**Typ. output characteristics $I_D = f(V_{DS})$**
parameter: $t_p = 80$ μs
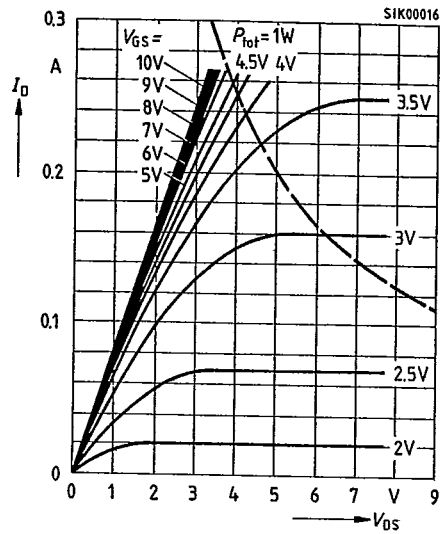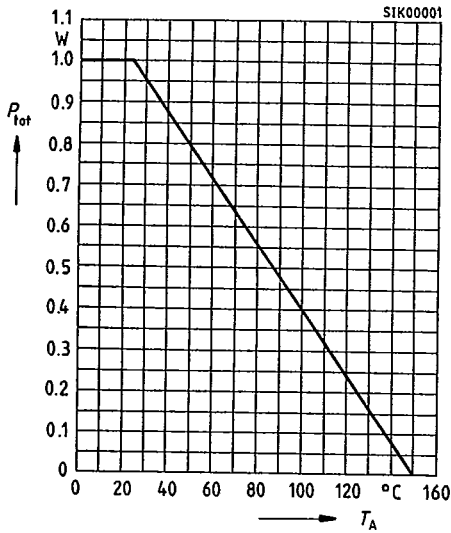
Safe operating area $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_C = 25$ °C

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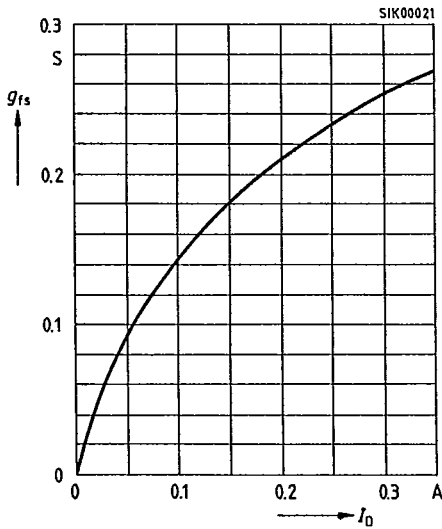parameter: $t_p = 80$ μs, $V_{DS} = 25$ V

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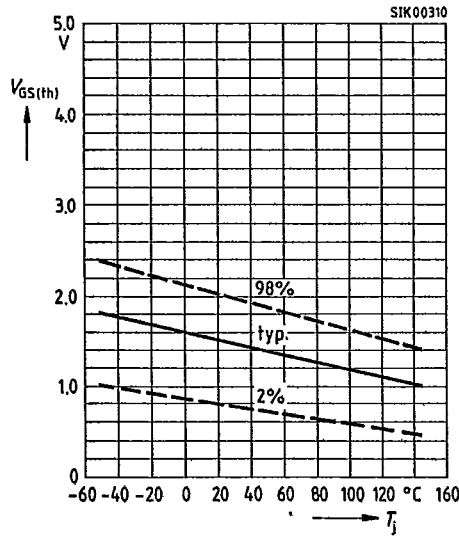$R_{DS(on)} = f(I_D)$
parameter: V_{GS}

Drain-source on-resistance
$R_{DS(on)} = f(T_j)$
parameter: $I_D = 0.12$ A, $V_{GS} = 4.5$ V, (spread)
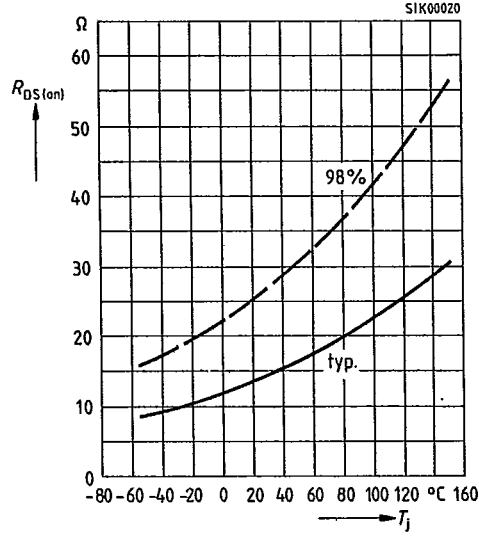
Typ. forward transconductance $g_{fs} = f(I_D)$
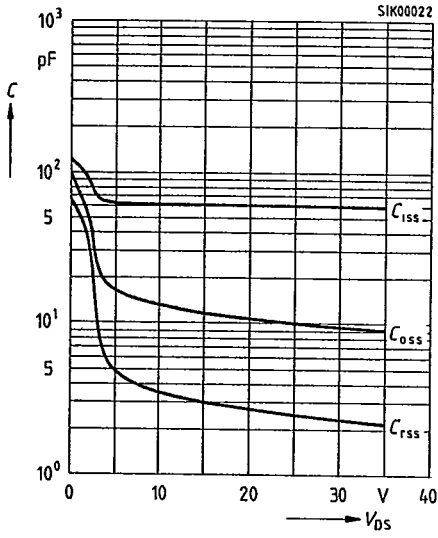parameter: $V_{DS} \geq 2 \times I_D \times R_{DS(on)max.}$, $t_p = 80$ μs

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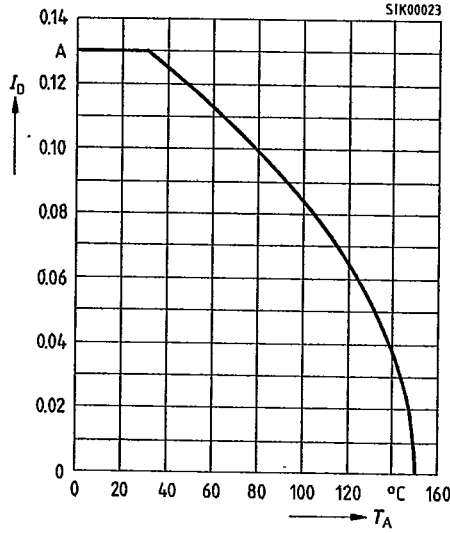parameter: $V_{DS} = V_{GS}$, $I_D = 1$ mA, (spread)

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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

SIK00022

SIK00023

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

SIK00024

$T_j =$
25°C typ.
150°C typ.

$T_j =$
25°C (98%)
150°C (98%)