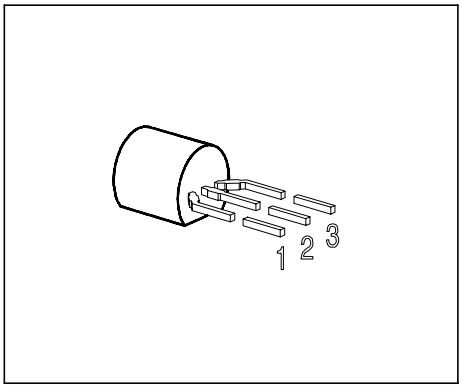
SIPMOS ® Small-Signal Transistor

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



Pin 1	Pin 2	Pin 3
D	G	S

Type	V_{DS}	I_D	$R_{DS(on)}$	Package	Marking
SN 7000	60 V	0.25 A	5 Ω	TO-92	SN 7000

Type	Ordering Code	Tape and Reel Information
SN 7000	Q62702-S638	E6288
SN 7000	Q62702-S637	E6296

Maximum Ratings

Parameter	Symbol	Values	Unit
Drain source voltage	V_{DS}	60	V
Drain-gate voltage R_{GS} = 20 kΩ	V_{DGR}	60	
Gate source voltage	V_{GS}	± 14	
Gate-source peak voltage,aperiodic	V_{gs}	± 20	
Continuous drain current T_A = 25 °C	I_D	0.25	A
DC drain current, pulsed T_A = 25 °C	I_{Dpuls}	1	
Power dissipation T_A = 25 °C	P_{tot}	0.63	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}	≤ 200	K/W
DIN humidity category, DIN 40 040		E	
IEC climatic category, DIN IEC 68-1		55 / 150 / 56	

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 V, I_D = 0.25 mA, T_j = 25 °C	$V_{(BR)DSS}$	60	-	-	V
Gate threshold voltage V_{GS}=V_{DS}, I_D = 1 mA	$V_{GS(th)}$	0.8	1.4	2	
Zero gate voltage drain current V_{DS} = 60 V, V_{GS} = 0 V, T_j = 25 °C V_{DS} = 60 V, V_{GS} = 0 V, T_j = 125 °C	I_{DSS}	- -	0.1 -	1 5	µA
Gate-source leakage current V_{GS} = 20 V, V_{DS} = 0 V	I_{GSS}	-	1	10	nA
Drain-Source on-state resistance V_{GS} = 10 V, I_D = 0.5 A V_{GS} = 4.5 V, I_D = 0.075 A	$R_{DS(on)}$	- -	2 3	5 5.3	Ω

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

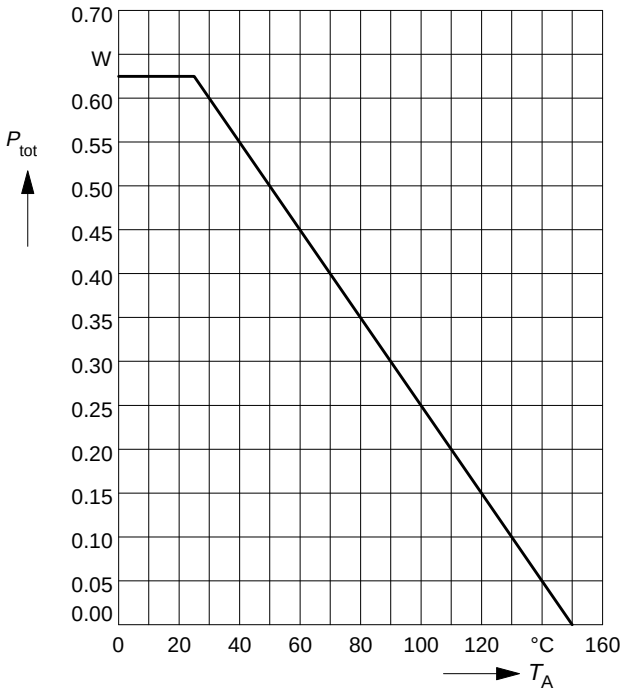
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Dynamic Characteristics					
Transconductance $V_{DS} \geq 2 * I_D * R_{DS(on)max}$, I_D = 0.2 A	g_{fs}	0.1	0.2	-	S
Input capacitance V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	C_{iss}	-	60	80	pF
Output capacitance V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	C_{oss}	-	15	25	
Reverse transfer capacitance V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	C_{rss}	-	15	25	
Turn-on delay time V_{DD} = 30 V, V_{GS} = 10 V, I_D = 0.29 A R_G = 50 Ω	$t_{d(on)}$	-	5	8	ns
Rise time V_{DD} = 30 V, V_{GS} = 10 V, I_D = 0.29 A R_G = 50 Ω	t_r	-	5	8	
Turn-off delay time V_{DD} = 30 V, V_{GS} = 10 V, I_D = 0.29 A R_G = 50 Ω	$t_{d(off)}$	-	12	16	
Fall time V_{DD} = 30 V, V_{GS} = 10 V, I_D = 0.29 A R_G = 50 Ω	t_f	-	13	17	

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	-	-	0.17	A
Inverse diode direct current,pulsed T_A = 25 °C	I_{SM}	-	-	0.68	
Inverse diode forward voltage V_{GS} = 0 V, I_F = 0.5 A	V_{SD}	-	1	1.2	V

Power dissipation

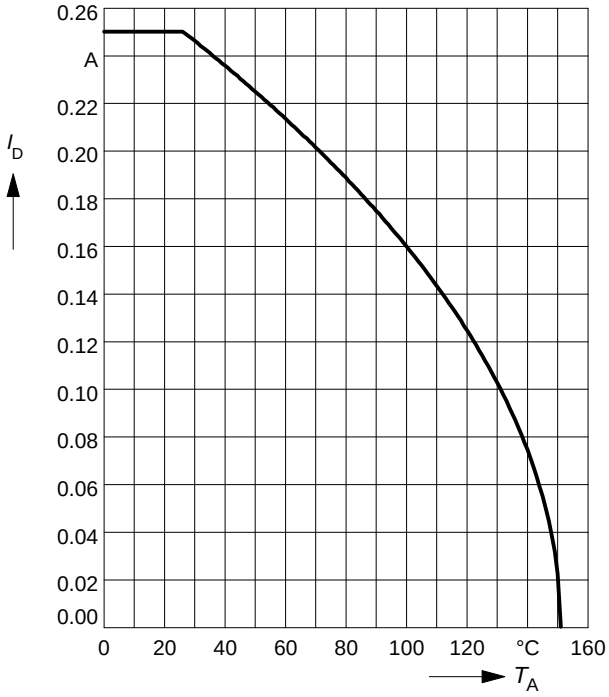
$P_{tot} = f(T_A)$



Drain current

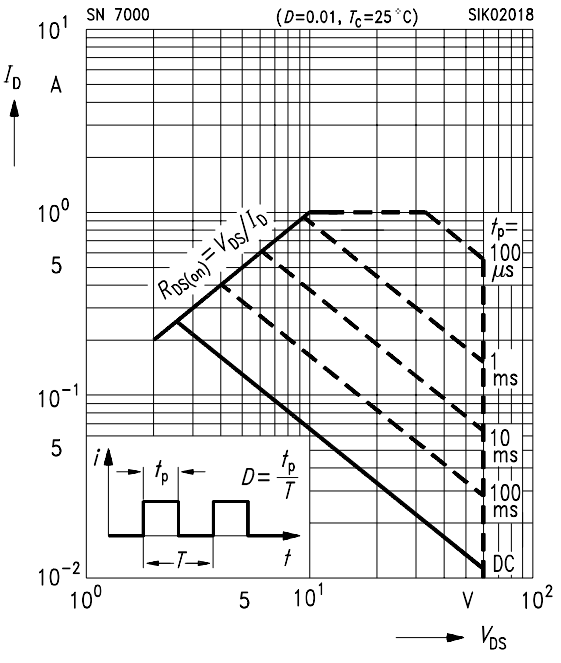
$I_D = f(T_A)$

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



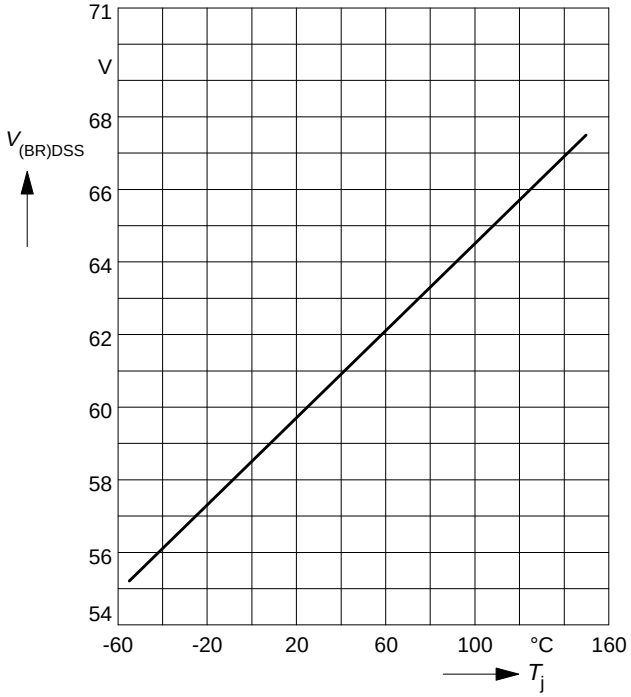
Safe operating area I_D=f(V_{DS})

parameter : D = 0.01, T_C=25°C

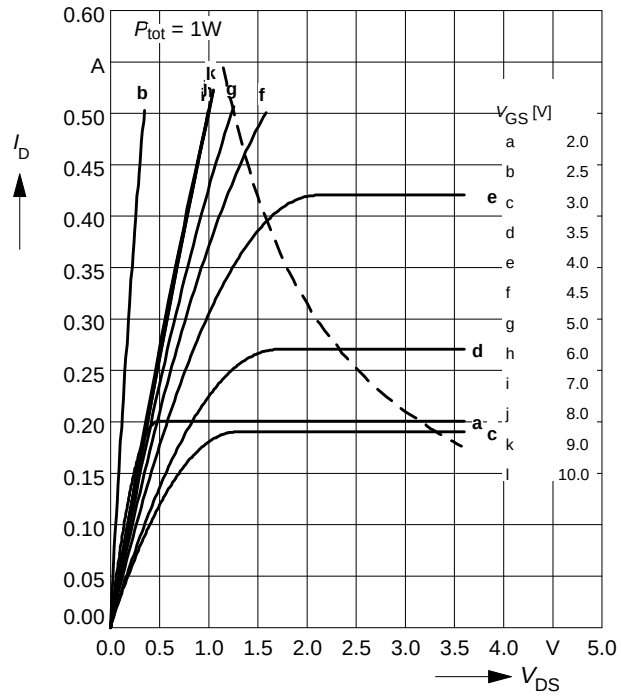


Drain-source breakdown voltage

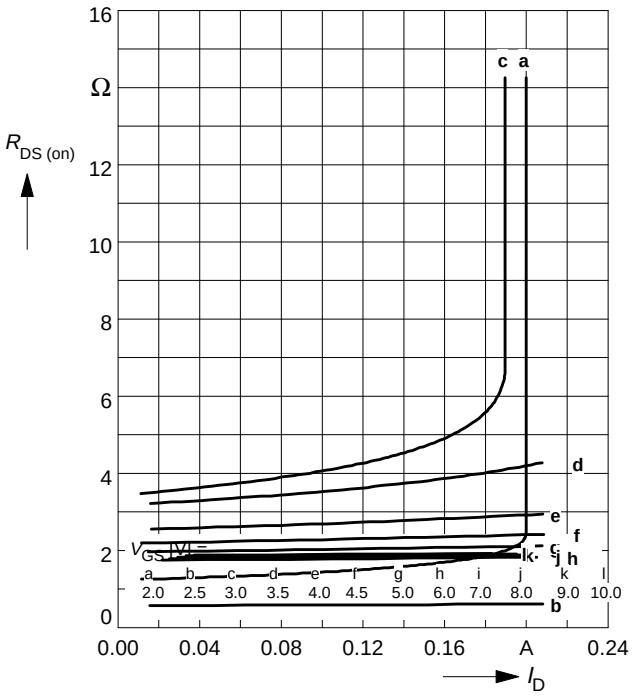
$V_{(BR)DSS} = f(T_j)$



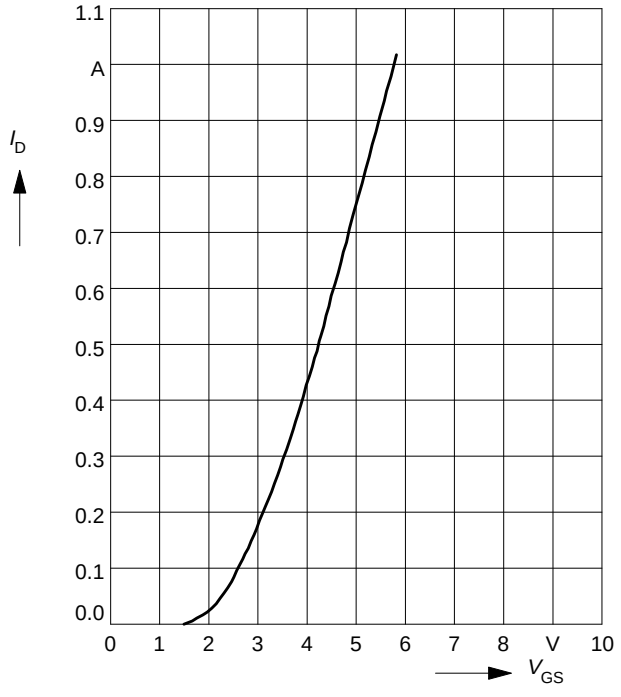
Typ. output characteristics
$I_D = f(V_{DS})$
parameter: t_p = 80 µs , T_j = 25 °C



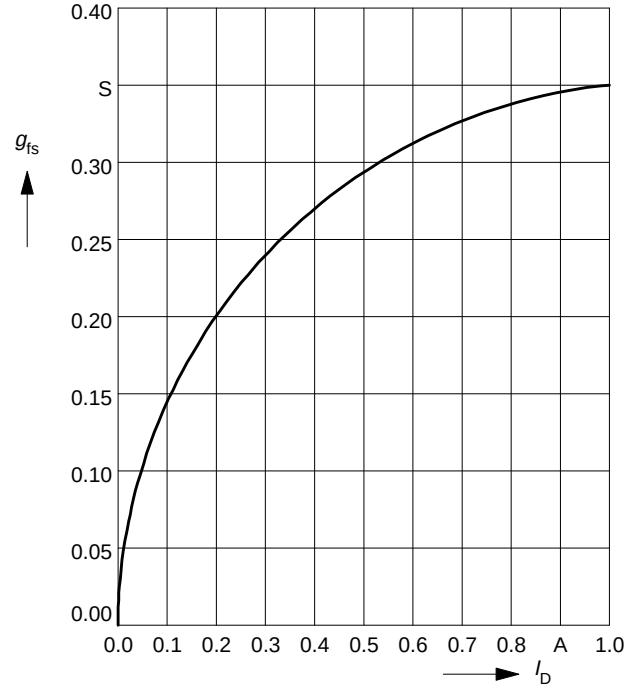
Typ. drain-source on-resistance
$R_{DS\ (on)} = f(I_D)$
parameter: t_p = 80 µs, T_j = 25 °C



Typ. transfer characteristics $I_D = f(V_{GS})$
parameter: t_p = 80 µs
$V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$



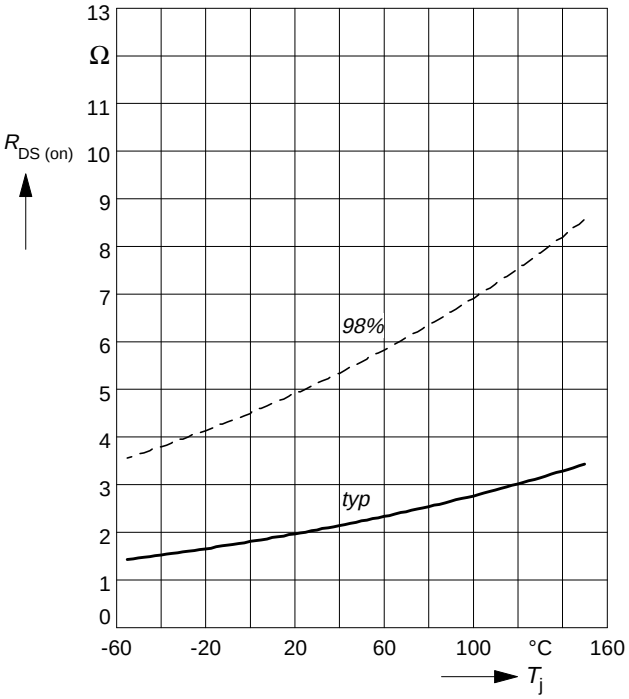
Typ. forward transconductance $g_{fs} = f(I_D)$
parameter: t_p = 80 µs,
$V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$



Drain-source on-resistance

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

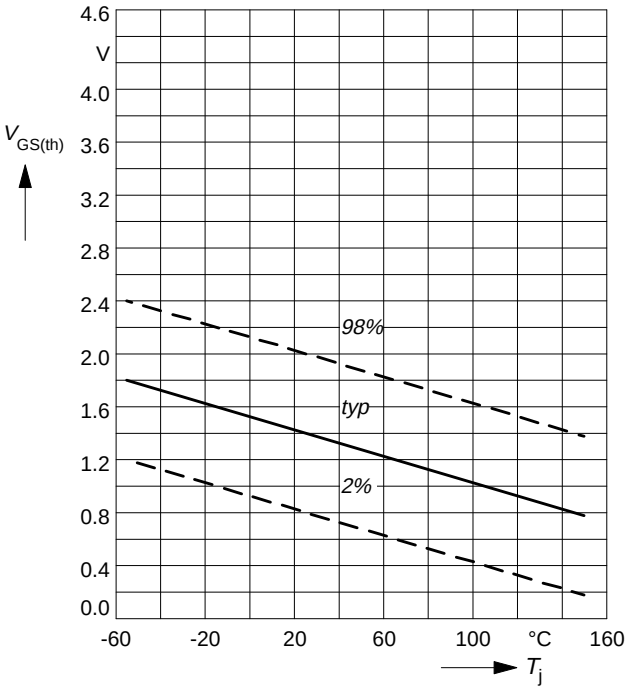
parameter: I_D = 0.5 A, V_{GS} = 10 V



Gate threshold voltage

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

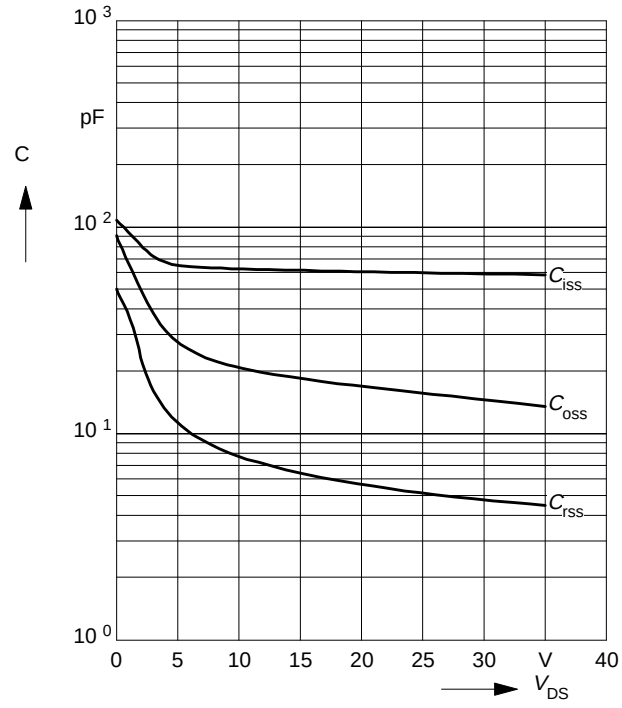
parameter: $V_{GS} = V_{DS}$, I_D = 1 mA



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