BSS 88

SIPMOS ® Small-Signal Transistor

• N channel

• Enhancement mode

• Logic Level

• $V_{GS(th)}$ = 0.8...2.0V

Pin 1	Pin 2	Pin 3
G	D	S
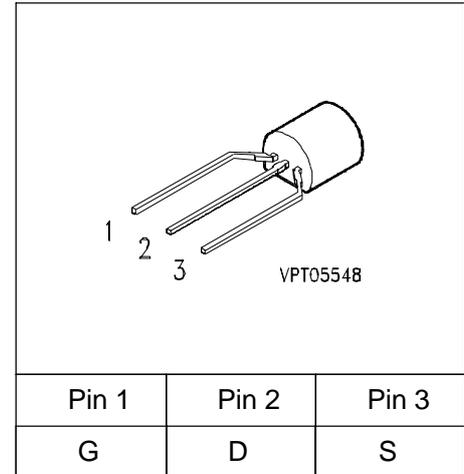
Type	V_{DS}	I_D	$R_{DS(on)}$	Package	Marking
BSS 88	240 V	0.25 A	8 Ω	TO-92	SS88

Type	Ordering Code	Tape and Reel Information
BSS 88	Q62702-S287	E6288
BSS 88	Q62702-S303	E6296
BSS 88	Q62702-S576	E6325

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	
ESD Sensitivity (HBM) as per MIL-STD 883		Class 1	
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}	1	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}	≤ 125	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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Drain- source breakdown voltage	$V_{(BR)DSS}$				V
V_{GS} = 0 V, I_D = 0.25 mA, T_j = 25 °C		240	-	-	
Gate threshold voltage	$V_{GS(th)}$				
V_{GS}=V_{DS}, I_D = 1 mA		0.6	0.8	1.2	
Zero gate voltage drain current	I_{DSS}				
V_{DS} = 240 V, V_{GS} = 0 V, T_j = 25 °C		-	0.1	1	µA
V_{DS} = 240 V, V_{GS} = 0 V, T_j = 125 °C		-	10	100	
V_{DS} = 100 V, V_{GS} = 0 V, T_j = 25 °C		-	-	100	nA
Gate-source leakage current	I_{GSS}				nA
V_{GS} = 20 V, V_{DS} = 0 V		-	10	100	
Drain-Source on-state resistance	$R_{DS(on)}$				Ω
V_{GS} = 4.5 V, I_D = 0.25 A		-	5	8	
V_{GS} = 1.8 V, I_D = 14 mA		-	7	15	

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Dynamic Characteristics					
Transconductance $V_{DS} \geq 2 * I_D * R_{DS(on)max}$, $I_D = 0.25$ A	g_{fs}	0.14	0.31	-	S
Input capacitance $V_{GS} = 0$ V, $V_{DS} = 25$ V, $f = 1$ MHz	C_{iss}	-	80	110	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}	-	8	12	
Turn-on delay time $V_{DD} = 30$ V, $V_{GS} = 10$ V, $I_D = 0.28$ A $R_G = 50$ Ω	$t_{d(on)}$	-	5	8	ns
Rise time $V_{DD} = 30$ V, $V_{GS} = 10$ V, $I_D = 0.28$ A $R_G = 50$ Ω	t_r	-	10	15	
Turn-off delay time $V_{DD} = 30$ V, $V_{GS} = 10$ V, $I_D = 0.28$ A $R_G = 50$ Ω	$t_{d(off)}$	-	30	40	
Fall time $V_{DD} = 30$ V, $V_{GS} = 10$ V, $I_D = 0.28$ A $R_G = 50$ Ω	t_f	-	25	35	

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	-	-	0.25	A
Inverse diode direct current,pulsed $T_A = 25 °C$	I_{SM}	-	-	1	
Inverse diode forward voltage $V_{GS} = 0 V$, $I_F = 0.5 A$	V_{SD}	-	0.9	1.3	V

Power dissipation

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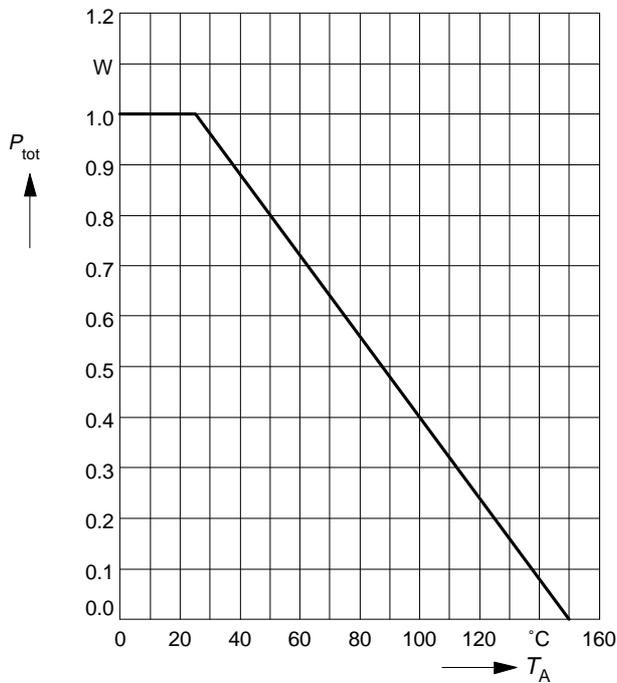
Drain current

$I_D = f(T_A)$

parameter: $V_{GS} \geq 4$ V
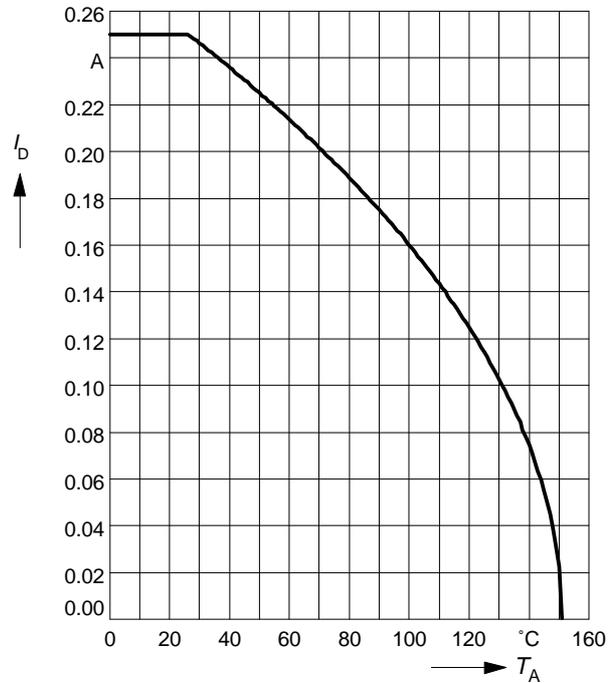
Safe operating area $I_D = f(V_{DS})$

parameter : $D = 0.01$, $T_C = 25°C$
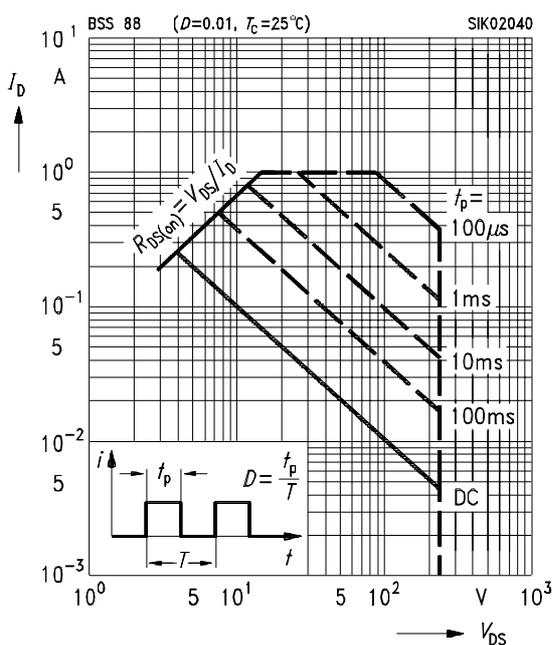
Drain-source breakdown voltage

$V_{(BR)DSS} = f(T_j)$
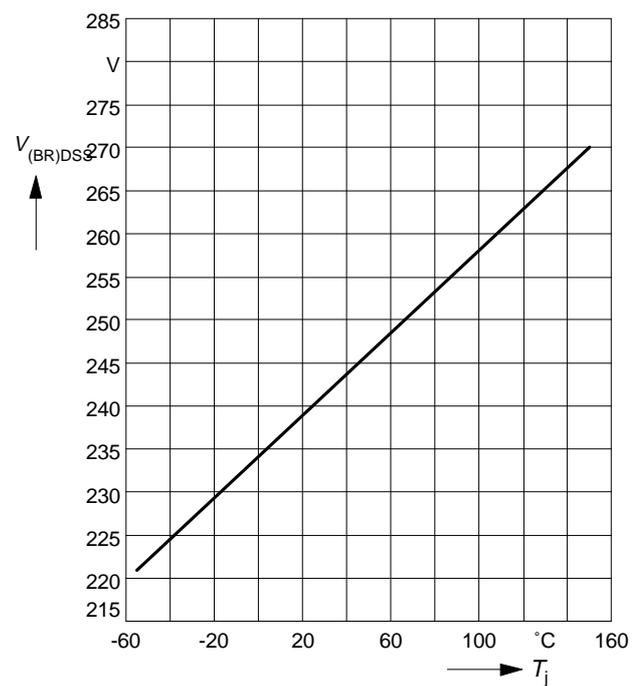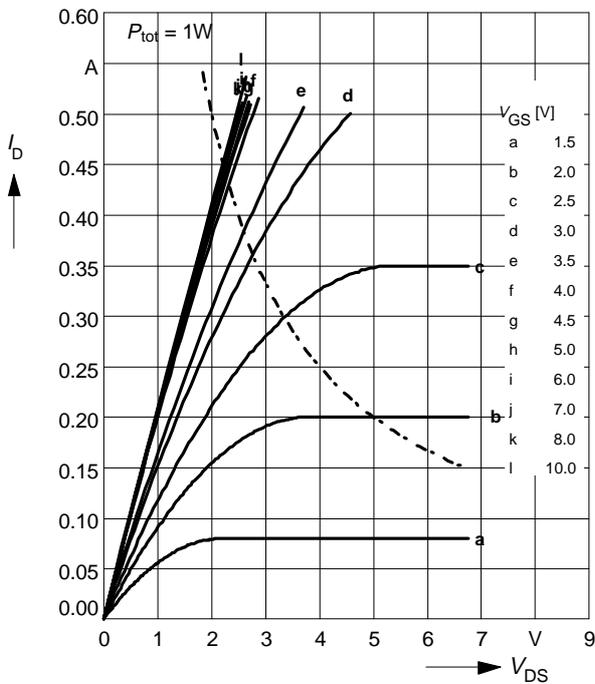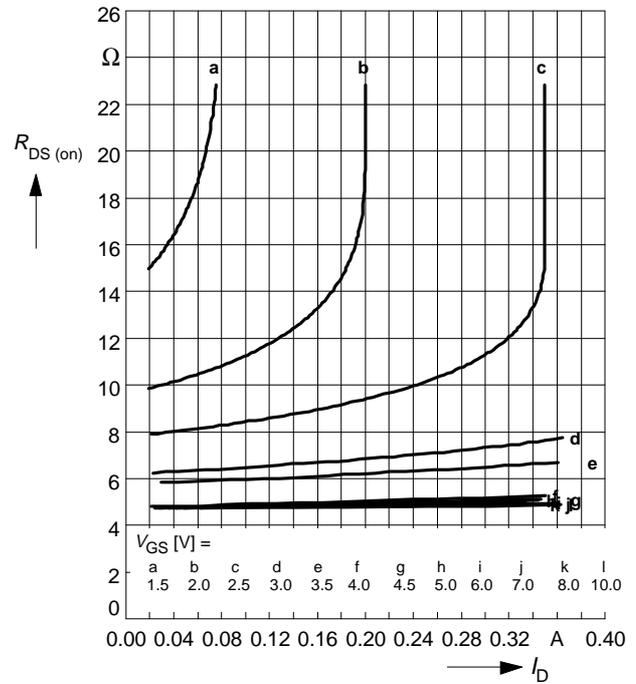
Typ. output characteristics

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

	V_{GS} [V]
a	1.5
b	2.0
c	2.5
d	3.0
e	3.5
f	4.0
g	4.5
h	5.0
i	6.0
j	7.0
k	8.0
l	10.0

Typ. drain-source on-resistance

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

V_{GS} [V] =											
a	b	c	d	e	f	g	h	i	j	k	l
1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	6.0	7.0	8.0	10.0

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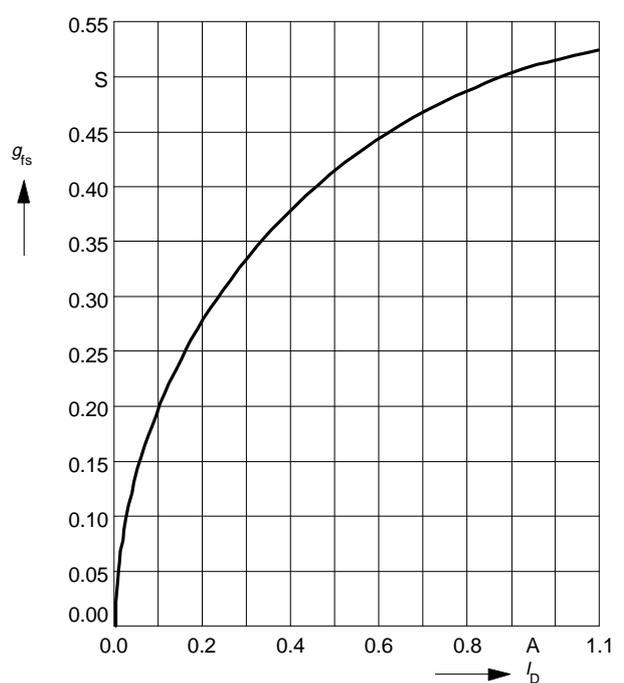
parameter: $t_p = 80\ \mu s$
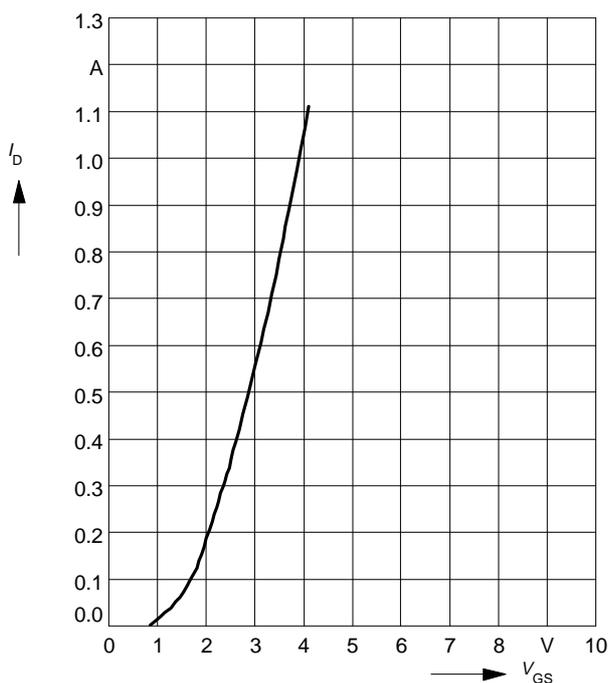
$V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$

Typ. forward transconductance $g_{fs} = f(I_D)$
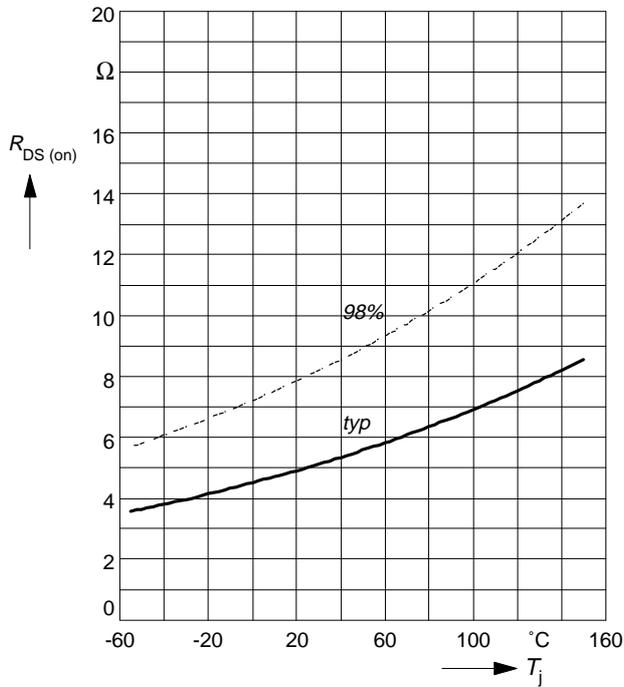
parameter: $t_p = 80\ \mu s$,

$V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$

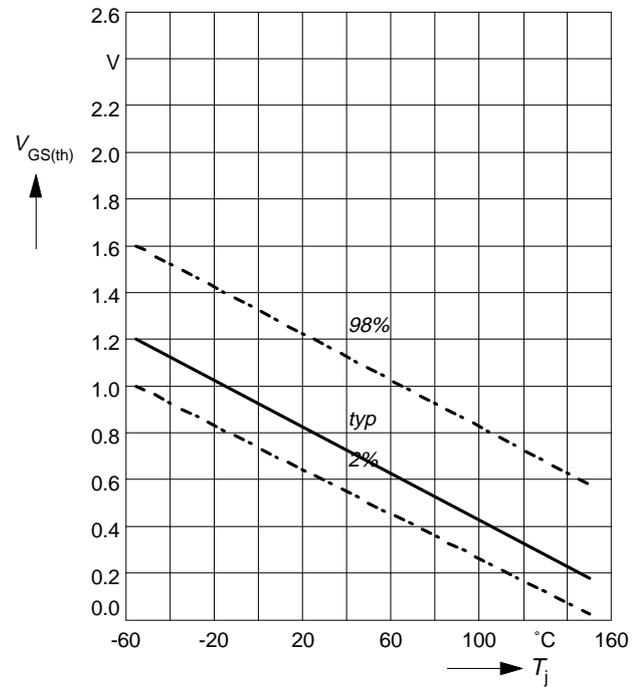## Drain-source on-resistance

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

parameter: $I_D = 0.25$ A, $V_{GS} = 4.5$ V

Gate threshold voltage

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

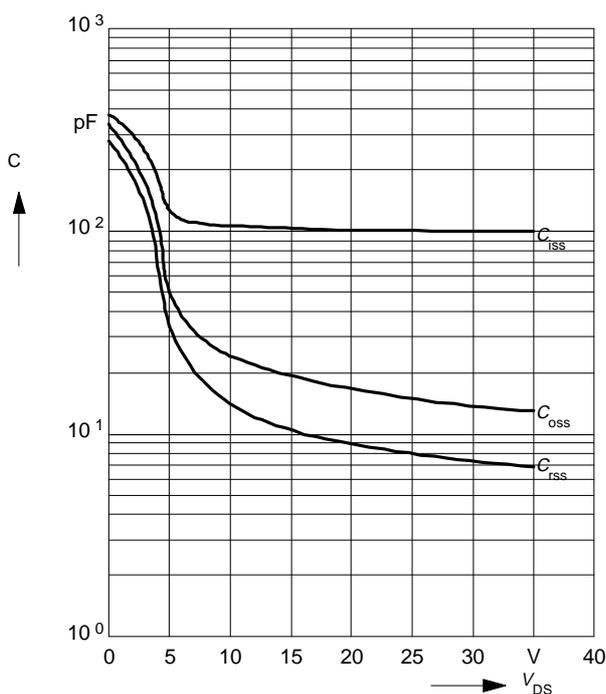parameter: $V_{GS} = V_{DS}$, $I_D = 1$ mA

Typ. capacitances

$C = f(V_{DS})$

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

Forward characteristics of reverse diode

$I_F = f(V_{SD})$

parameter: T_j, $t_p = 80$ µs