## SIPMOS ® Small-Signal Transistor

- N channel
- Enhancement mode
- Logic Level
- $V_{GS(th)} = 0.8...2.0V$
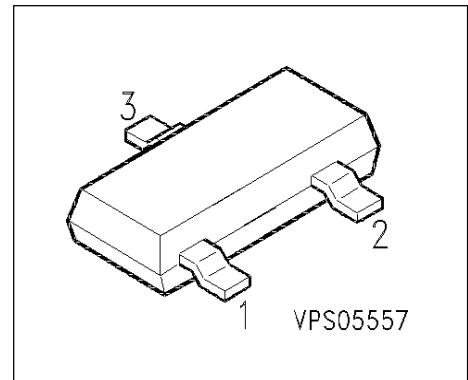
Pin 1	Pin 2	Pin 3
G	S	D

Type	V_{DS}	I_D	$R_{DS(on)}$	Package	Marking
BSS 131	240 V	0.1 A	16 Ω	SOT-23	SRs

Type	Ordering Code	Tape and Reel Information
BSS 131	Q62702-S565	E6327
BSS 131	Q67000-S229	E6433

Maximum Ratings

Parameter	Symbol	Values	Unit
Drain source voltage	V_{DS}	240	V
Drain-gate voltage $R_{GS} = 20\ k\Omega$	V_{DGR}	240	
Gate source voltage	V_{GS}	± 14	
Gate-source peak voltage, aperiodic	V_{gs}	± 20	
Continuous drain current $T_A = 26\ °C$	I_D	0.1	A
DC drain current, pulsed $T_A = 25\ °C$	I_{Dpuls}	0.4	
Power dissipation $T_A = 25\ °C$	P_{tot}	0.36	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	R_{thJA}	≤ 350	K/W
Therminal resistance, chip-substrate- reverse side [1]	R_{thJSR}	≤ 285	
DIN humidity category, DIN 40 040		E	
IEC climatic category, DIN IEC 68-1		55 / 150 / 56	

1) For package mounted on aluminium   15 mm x 16.7 mm x 0.7 mm

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	1.4	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		-	2	60	
V_{DS} = 130 V, V_{GS} = 0 V, T_j = 25 °C		-	-	30	nA
Gate-source leakage current	I_{GSS}				nA
V_{GS} = 20 V, V_{DS} = 0 V		-	1	10	
Drain-Source on-state resistance	$R_{DS(on)}$				Ω
V_{GS} = 10 V, I_D = 0.1 A		-	12	16	
V_{GS} = 4.5 V, I_D = 0.1 A		-	15	26	

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

| Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Dynamic Characteristics					
Transconductance $V_{DS} \geq 2 * I_D * R_{DS(on)max}$, $I_D = 0.1$ A	g_{fs}	0.06	0.14	-	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}	-	8	12	
Reverse transfer capacitance $V_{GS} = 0$ V, $V_{DS} = 25$ V, $f = 1$ MHz	C_{rss}	-	3.5	5	
Turn-on delay time $V_{DD} = 30$ V, $V_{GS} = 10$ V, $I_D = 0.26$ A $R_{GS} = 50$ Ω	$t_{d(on)}$	-	5	8	ns
Rise time $V_{DD} = 30$ V, $V_{GS} = 10$ V, $I_D = 0.26$ A $R_{GS} = 50$ Ω	t_r	-	8	12	
Turn-off delay time $V_{DD} = 30$ V, $V_{GS} = 10$ V, $I_D = 0.26$ A $R_{GS} = 50$ Ω	$t_{d(off)}$	-	12	16	
Fall time $V_{DD} = 30$ V, $V_{GS} = 10$ V, $I_D = 0.26$ A $R_{GS} = 50$ Ω	t_f	-	15	20	

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	-	-	0.1	A
Inverse diode direct current,pulsed T_A = 25 °C	I_{SM}	-	-	0.4	
Inverse diode forward voltage V_{GS} = 0 V, I_F = 0.2 A, T_j = 25 °C	V_{SD}	-	0.8	1.2	V

Power dissipation
$P_{tot} = f(T_A)$
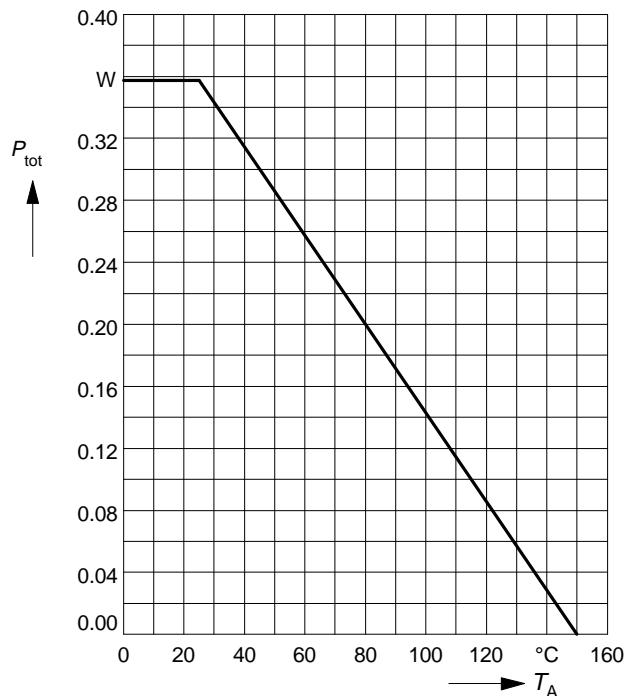
Drain current
$I_D = f(T_A)$
parameter: $V_{GS} \geq 10$ V
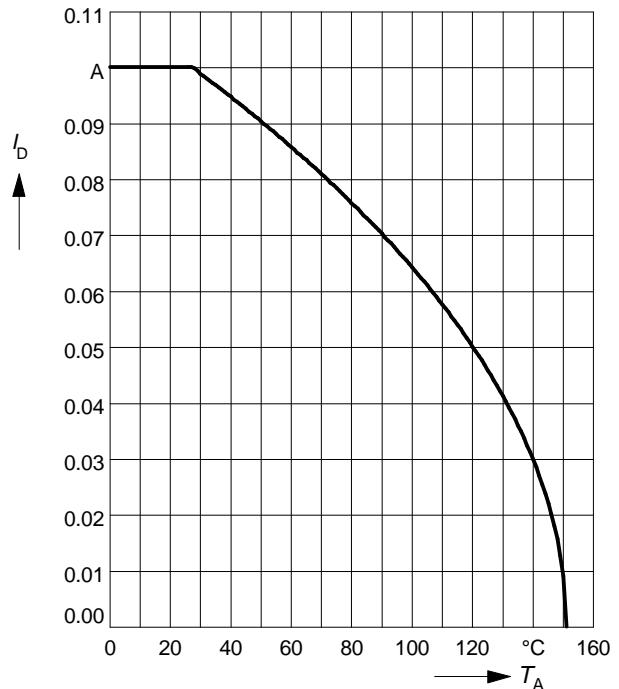
Safe operating area $I_D = f(V_{DS})$
parameter : $D = 0.01$, $T_C = 25°C$
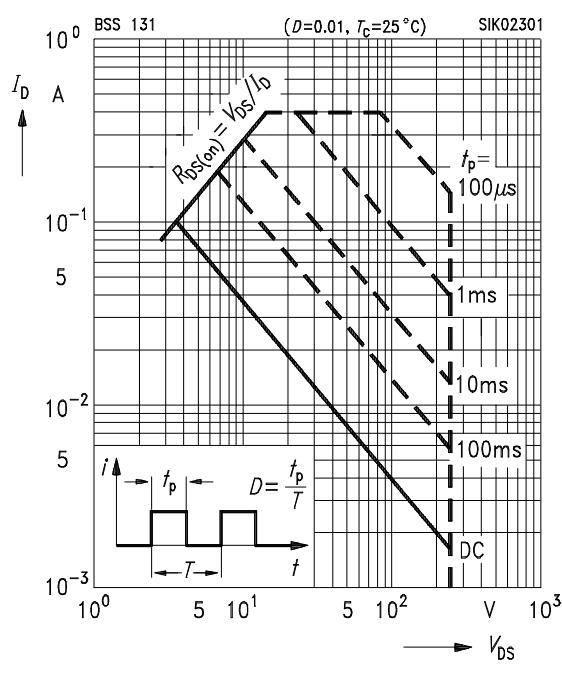
Drain-source breakdown voltage
$V_{(BR)DSS} = f(T_j)$
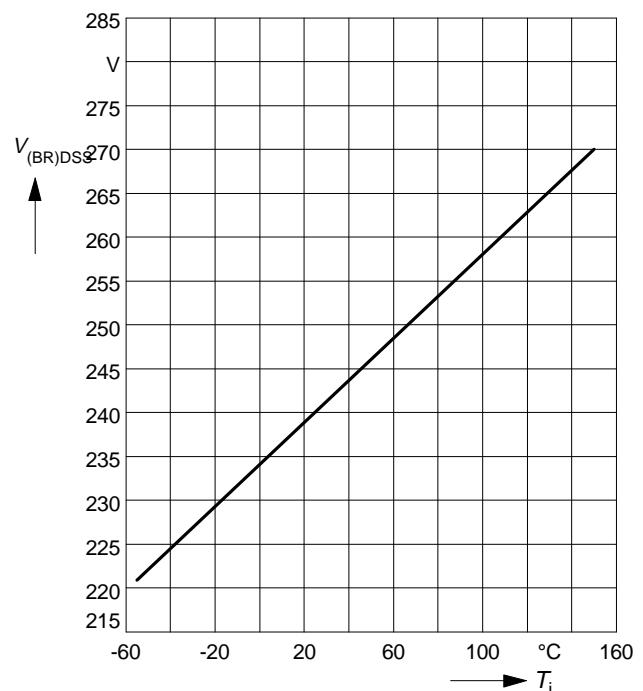
Typ. output characteristics

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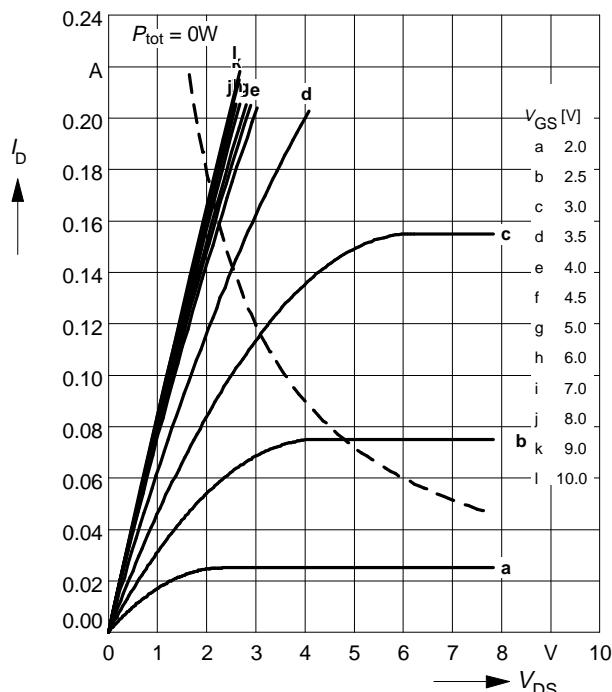
Typ. drain-source on-resistance

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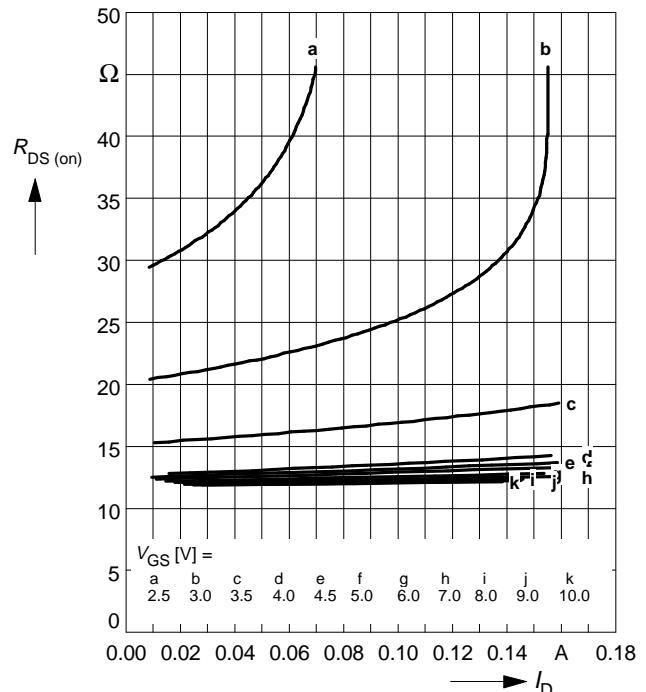
Typ. transfer characteristics $I_D = f(V_{GS})$
parameter: $t_p = 80$ µs
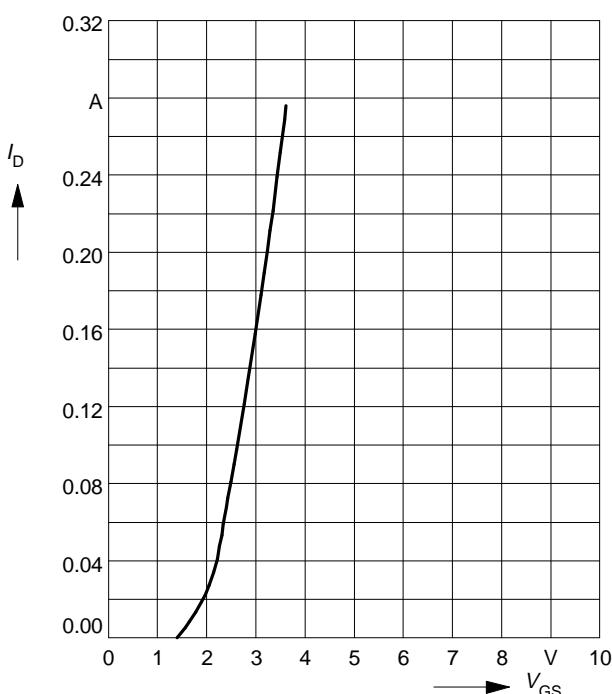

Typ. forward transconductance $g_{fs} = f(I_D)$
parameter: $t_p = 80$ µs,
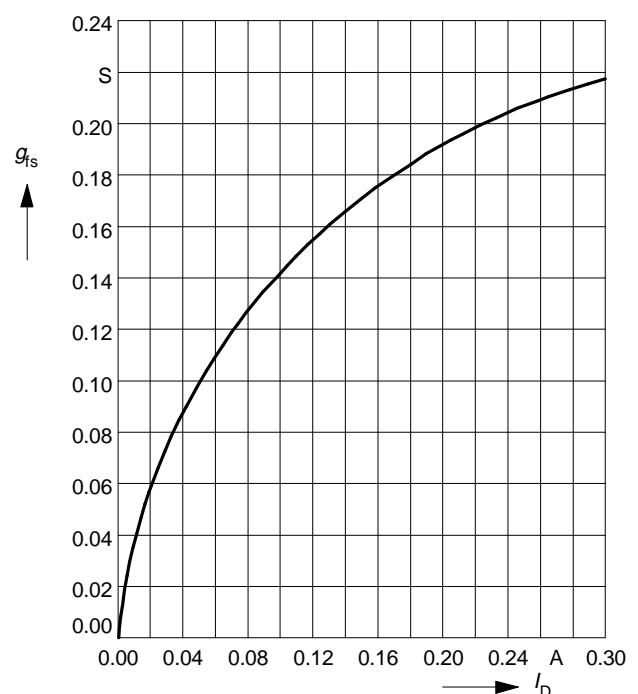
Drain-source on-resistance

$R_{DS\,(on)} = f(T_j)$
parameter: $I_D = 0.1$ A, $V_{GS} = 10$ V
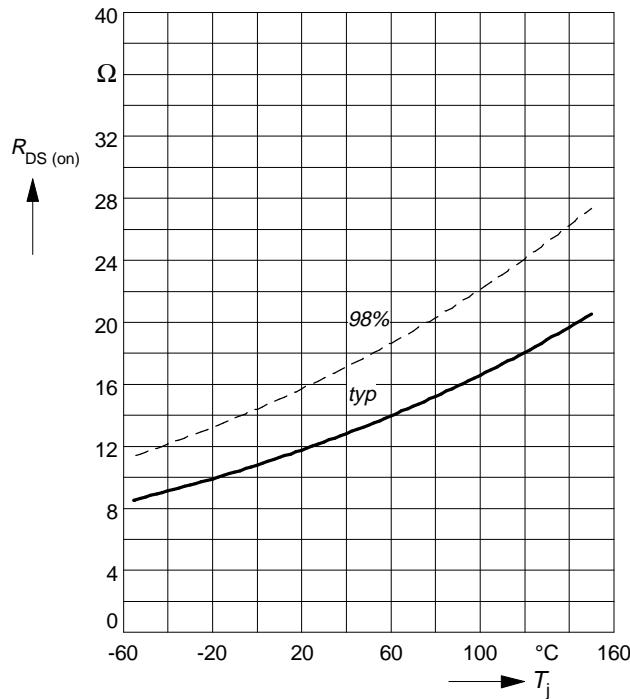

Gate threshold voltage

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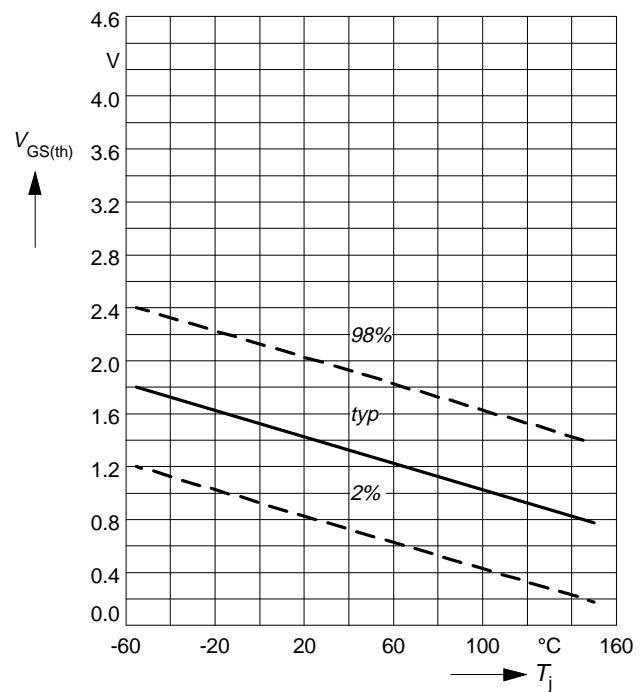

Typ. capacitances

$C = f(V_{DS})$
parameter: $V_{GS} = 0$V, $f = 1$ MHz
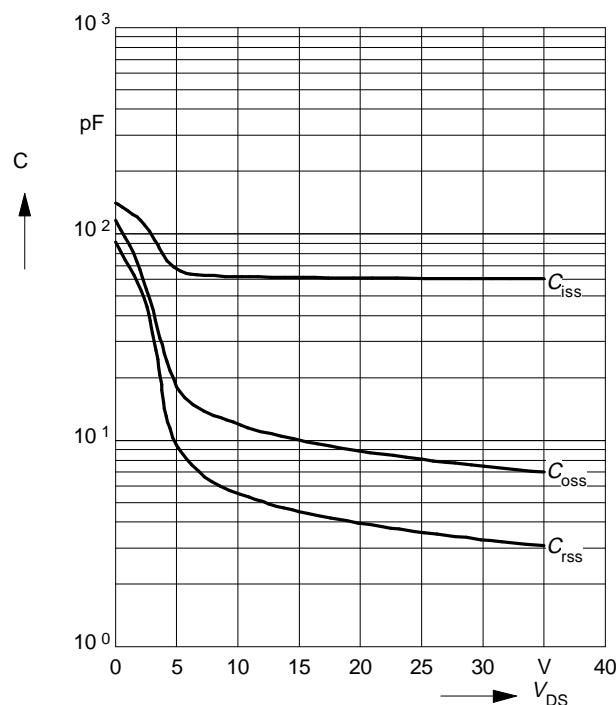
Forward characteristics of reverse diode

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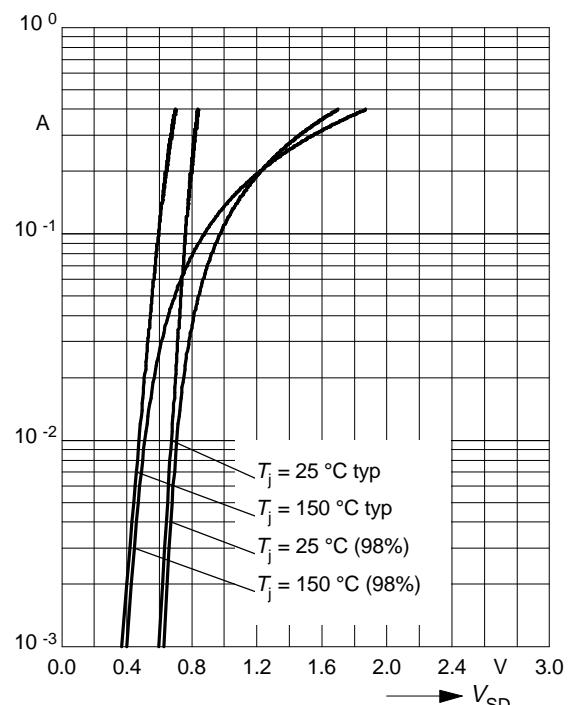
Package outlines

SOT-23

Dimensions in mm

GPS05557