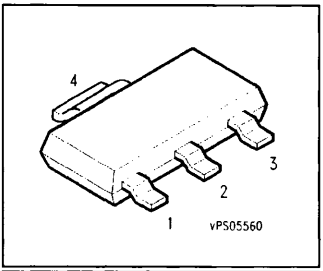
SIPMOS ® Small-Signal Transistor

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



Pin 1	Pin 2	Pin 3	Pin 4
G	D	S	D

Type	V_{DS}	I_D	$R_{DS(on)}$	Package	Marking
BSP 295	50 V	1.8 A	0.3 Ω	SOT-223	BSP 295

Type	Ordering Code	Tape and Reel Information
BSP 295	Q67000-S066	E6327

Maximum Ratings

Parameter	Symbol	Values	Unit
Drain source voltage	V_{DS}	50	V
Drain-gate voltage R_{GS} = 20 kΩ	V_{DGR}	50	
Gate source voltage	V_{GS}	± 14	
Gate-source peak voltage,aperiodic	V_{gs}	± 20	
Continuous drain current T_A = 34 °C	I_D	1.8	A
DC drain current, pulsed T_A = 25 °C	I_{Dpuls}	7.2	
Power dissipation T_A = 25 °C	P_{tot}	1.8	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}	≤ 70	K/W
Therminal resistance, junction-soldering point 1)	R_{thJS}	≤ 10	
DIN humidity category, DIN 40 040		E	
IEC climatic category, DIN IEC 68-1		55 / 150 / 56	

1) Transistor on epoxy pcb 40 mm x 40 mm x 1,5 mm with 6 cm^2 copper area for drain connection

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Static Characteristics					
Drain- source breakdown voltage	$V_{(BR)DSS}$				V
V_{GS} = 0 V, I_D = 0.25 mA, T_j = 25 °C		50	-	-	
Gate threshold voltage	$V_{GS(th)}$				
V_{GS}=V_{DS}, I_D = 1 mA		0.8	1.4	2	
Zero gate voltage drain current	I_{DSS}				
V_{DS} = 50 V, V_{GS} = 0 V, T_j = 25 °C		-	0.1	1	µA
V_{DS} = 50 V, V_{GS} = 0 V, T_j = 125 °C		-	8	50	
V_{DS} = 30 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} = 10 V, I_D = 1.8 A		-	0.25	0.3	
V_{GS} = 4.5 V, I_D = 1.8 A		-	0.45	0.5	

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

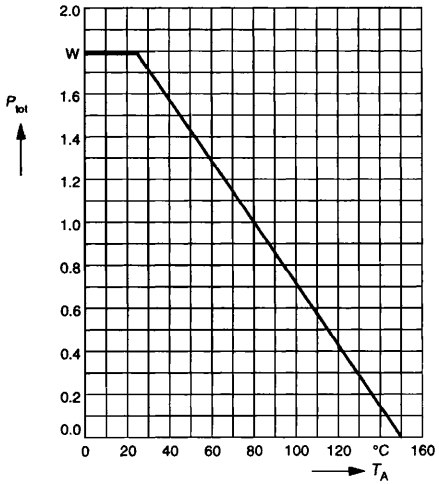
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Dynamic Characteristics					
Transconductance $V_{DS} \geq 2 * I_D * R_{DS(on)max}$, $I_D = 1.7$ A	g_{fs}	0.5	1.7	-	S
Input capacitance $V_{GS} = 0$ V, $V_{DS} = 25$ V, $f = 1$ MHz	C_{iss}	-	320	425	pF
Output capacitance $V_{GS} = 0$ V, $V_{DS} = 25$ V, $f = 1$ MHz	C_{oss}	-	110	170	
Reverse transfer capacitance $V_{GS} = 0$ V, $V_{DS} = 25$ V, $f = 1$ MHz	C_{rss}	-	50	75	
Turn-on delay time $V_{DD} = 30$ V, $V_{GS} = 10$ V, $I_D = 0.29$ A $R_{GS} = 50\ \Omega$	$t_{d(on)}$	-	8	12	ns
Rise time $V_{DD} = 30$ V, $V_{GS} = 10$ V, $I_D = 0.29$ A $R_{GS} = 50\ \Omega$	t_r	-	20	30	
Turn-off delay time $V_{DD} = 30$ V, $V_{GS} = 10$ V, $I_D = 0.29$ A $R_{GS} = 50\ \Omega$	$t_{d(off)}$	-	120	160	
Fall time $V_{DD} = 30$ V, $V_{GS} = 10$ V, $I_D = 0.29$ A $R_{GS} = 50\ \Omega$	t_f	-	85	115	

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	-	-	1.8	A
Inverse diode direct current,pulsed T_A = 25 °C	I_{SM}	-	-	7.2	
Inverse diode forward voltage V_{GS} = 0 V, I_F = 3.6 A, T_j = 25 °C	V_{SD}	-	1.1	1.5	V

Power dissipation

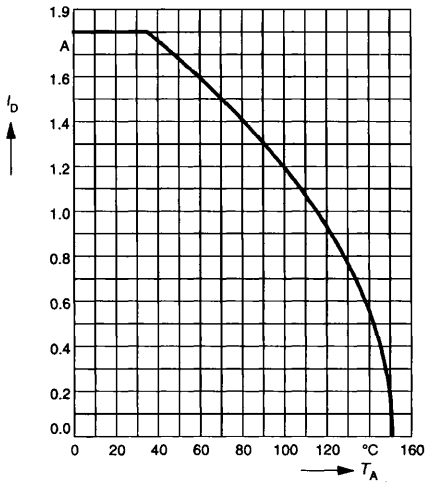
$P_{tot} = f(T_A)$



Drain current

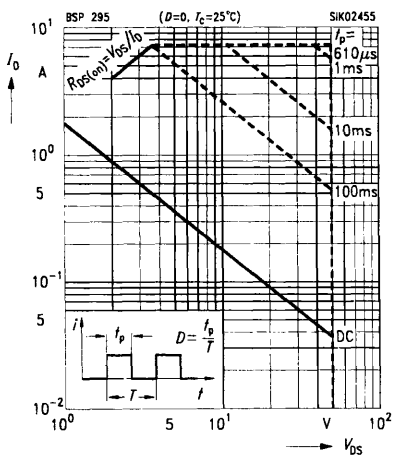
$I_D = f(T_A)$

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



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

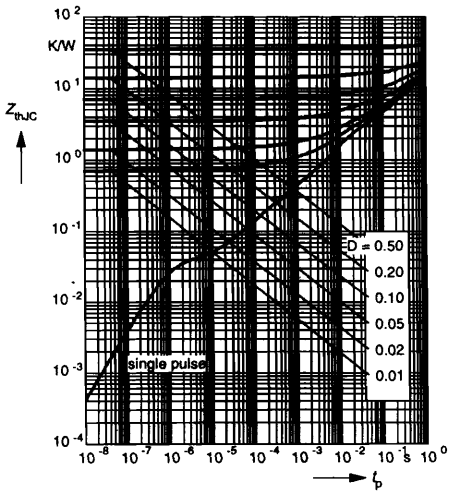
parameter : $D = 0$, $T_C = 25°C$



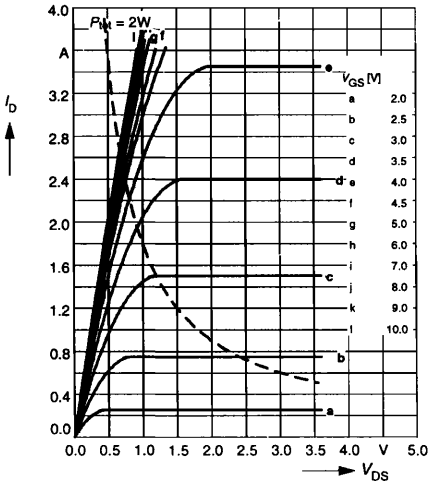
Transient thermal impedance

$Z_{th\,JA} = f(t_p)$

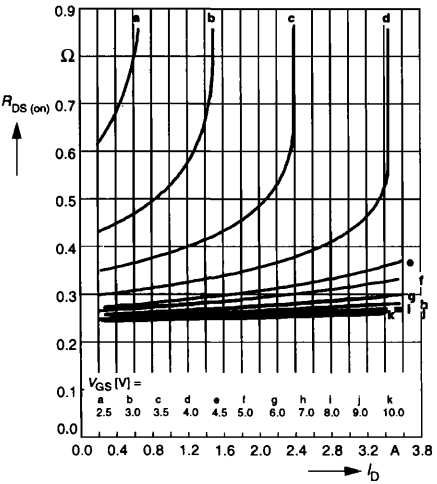
parameter: $D = t_p / T$



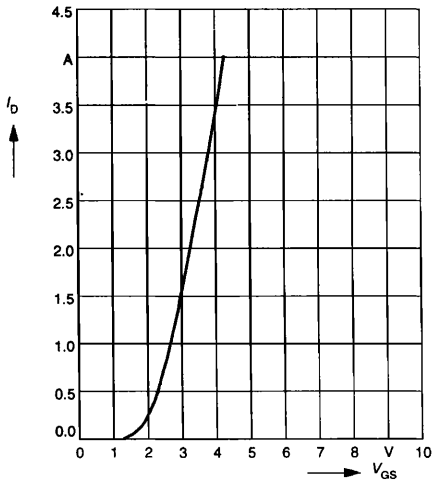
Typ. output characteristics
$I_D = f(V_{DS})$
parameter: t_p = 80 µs , T_j = 25 °C



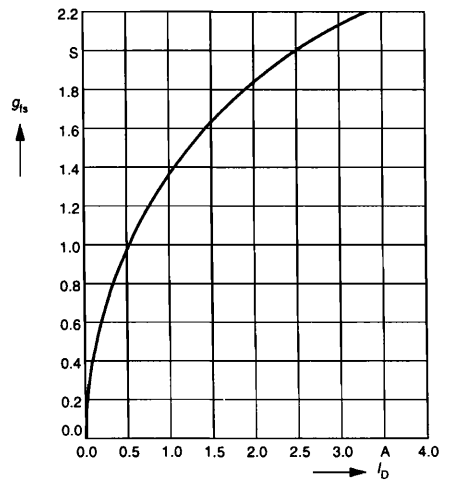
Typ. drain-source on-resistance
$R_{DS\,(on)} = f(I_D)$
parameter: t_p = 80 µs, T_j = 25 °C



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



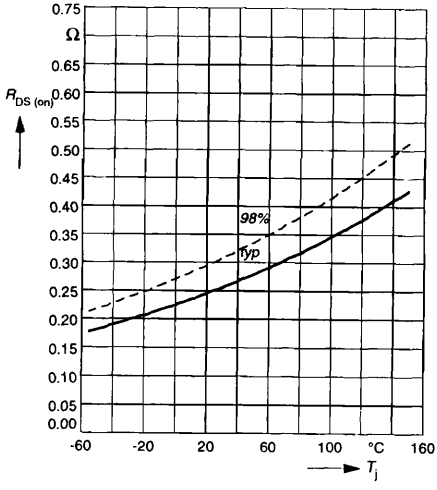
Typ. forward transconductance $g_{fs} = f(I_D)$
parameter: t_p = 80 µs,



Drain-source on-resistance

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

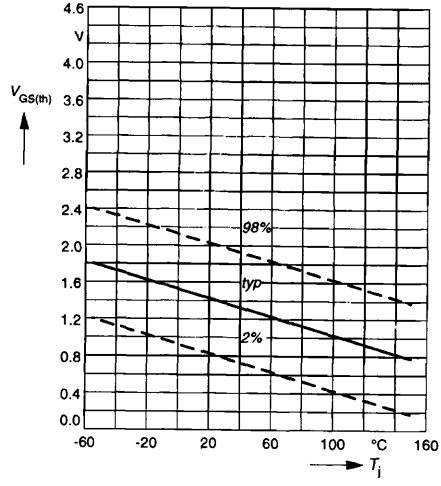
parameter: I_D = 1.8 A, V_{GS} = 10 V



Gate threshold voltage

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

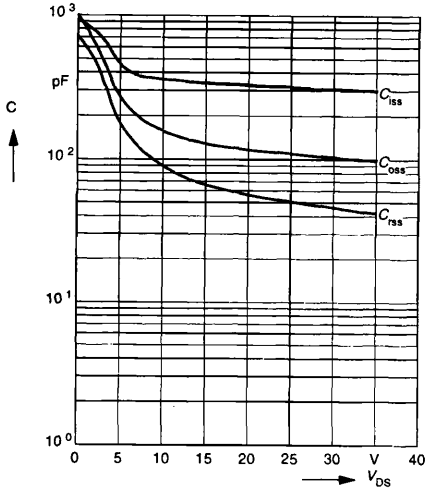
parameter: $V_{GS} = V_{DS}$, I_D = 1 mA



Typ. capacitances

$C = f(V_{DS})$

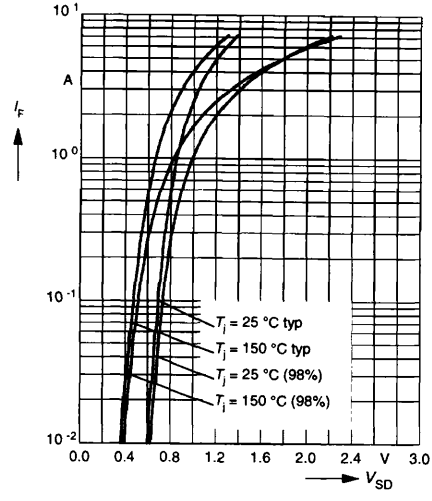
parameter: V_{GS}=0V, f = 1 MHz



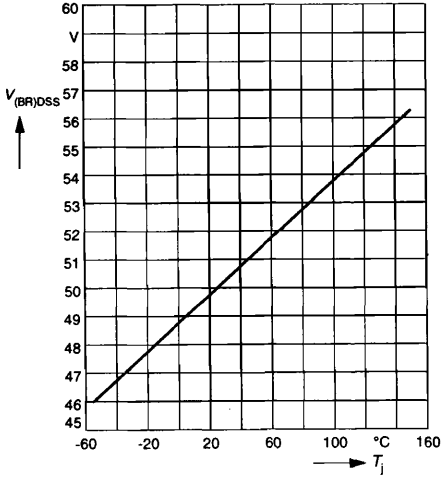
Forward characteristics of reverse diode

$I_F = f(V_{SD})$

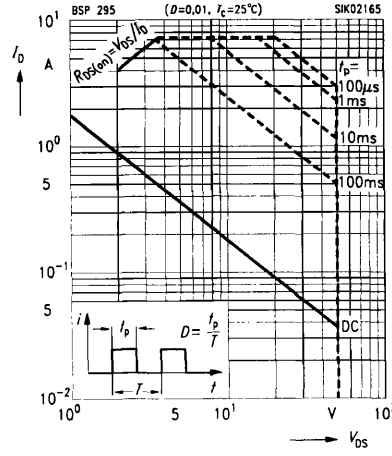
parameter: T_j, t_p = 80 µs



Drain-source breakdown voltage
$V_{(BR)DSS} = f(T_j)$



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



Package outlines

SOT-223

Dimensions in mm