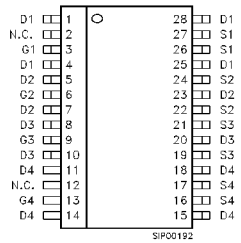
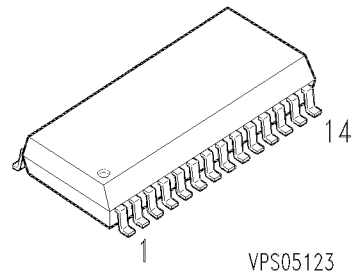
SIEMENS

Preliminary data

BUZ 103S-4

SIPMOS ® Power Transistor





- Quad-channel
- Enhancement mode
- Avalanche-rated
- d*v*/d*t* rated

Type	V_{DS}	I_D	$R_{DS(on)}$	Package	Ordering Code
BUZ 103S-4	55 V	5.3 A	0.045 Ω	P-DSO-28	C67078-S. . . . -A..

Maximum Ratings

Parameter	Symbol	Values	Unit
Continuous drain current *one channel active* T_A = 25 °C	I_D	5.3	A
Pulsed drain current *one channel active* T_A = 25 °C	I_{Dpuls}	21.2	
Avalanche energy, single pulse I_D = 5.3 A, V_{DD} = 25 V, R_{GS} = 25 Ω L = 9.97 mH, T_j = 25 °C	E_{AS}	140	mJ
Reverse diode d*v*/d*t* I_S = 5.3 A, V_{DS} = 40 V, di_F/dt = 200 A/µs T_{jmax} = 175 °C	d*v*/d*t*	6	kV/µs
Gate source voltage	V_{GS}	± 20	V
Power dissipation ,*one channel active* T_A = 25 °C	P_{tot}	2.4	W
Operating temperature	T_j	-55 ... + 175	°C
Storage temperature	T_{stg}	-55 ... + 175	
IEC climatic category, DIN IEC 68-1		55 / 175 / 56	

Thermal Characteristics

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Thermal resistance, junction - soldering point 1)	R_{thJS}	-	tbd	-	K/W
Thermal resistance, junction - ambient 2)	R_{thJA}	-	62.5	-	

1) Device on 50mm*50mm*1.5mm epoxy PCB FR4 with 6 cm^2 (one layer,70µm thick) copper area for Drain connection. PCB is vertical without blown air.

2) one channel active

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	$V_{(BR)DSS}$	55	-	-	V
Gate threshold voltage V_{GS}=V_{DS}, I_D = 50 µA	$V_{GS(th)}$	2.1	3	4	
Zero gate voltage drain current V_{DS} = 55 V, V_{GS} = 0 V, T_j = -40 °C V_{DS} = 55 V, V_{GS} = 0 V, T_j = 25 °C V_{DS} = 55 V, V_{GS} = 0 V, T_j = 150 °C	I_{DSS}	 - - -	 - 0.1 -	 0.1 1 100	µA
Gate-source leakage current V_{GS} = 20 V, V_{DS} = 0 V	I_{GSS}	-	10	100	nA
Drain-Source on-resistance V_{GS} = 10 V, I_D = 5.3 A	$R_{DS(on)}$	-	0.035	0.045	Ω

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

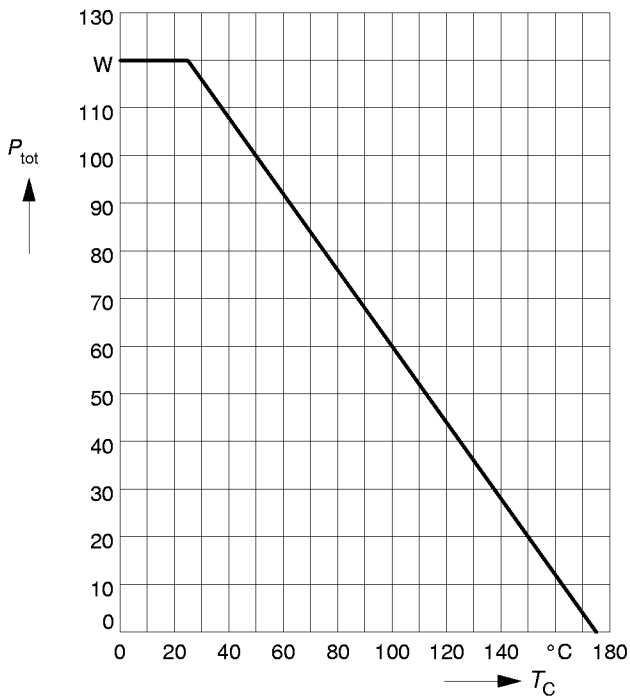
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Dynamic Characteristics					
Transconductance $V_{DS} \geq 2 * I_D * R_{DS(on)max}$, I_D = 5.3 A	g_{fs}	4	-	-	S
Input capacitance V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	C_{iss}	-	720	900	pF
Output capacitance V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	C_{oss}	-	230	300	
Reverse transfer capacitance V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	C_{rss}	-	125	160	
Turn-on delay time V_{DD} = 30 V, V_{GS} = 10 V, I_D = 5.3 A R_G = 13 Ω	$t_{d(on)}$	-	17	25	ns
Rise time V_{DD} = 30 V, V_{GS} = 10 V, I_D = 5.3 A R_G = 13 Ω	t_r	-	17	25	
Turn-off delay time V_{DD} = 30 V, V_{GS} = 10 V, I_D = 5.3 A R_G = 13 Ω	$t_{d(off)}$	-	40	60	
Fall time V_{DD} = 30 V, V_{GS} = 10 V, I_D = 5.3 A R_G = 13 Ω	t_f	-	25	40	
Gate charge at threshold V_{DD} = 40 V, $I_D \geq$ 0.1 A, V_{GS} =0 to 1 V	$Q_{g(th)}$	-	1.3	2	nC
Gate charge at 7.0 V V_{DD} = 40 V, I_D = 5.3 A, V_{GS} =0 to 7 V	$Q_{g(7)}$	-	20	30	
Gate charge total V_{DD} = 40 V, I_D = 5.3 A, V_{GS} =0 to 10 V	$Q_{g(total)}$	-	25	40	
Gate plateau voltage V_{DD} = 40 V, I_D = 5.3 A	$V_{(plateau)}$	-	5.03	-	V

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	- -	- -	5.3 21.2	A
Inverse diode direct current, pulsed T_A = 25 °C	I_{SM}				
Inverse diode forward voltage V_{GS} = 0 V, I_F = 10.6 A	V_{SD}	-	0.95	1.6	V
Reverse recovery time V_R = 30 V, I_F=I_S, di_F/dt = 100 A/µs	t_{rr}	-	60	90	ns
Reverse recovery charge V_R = 30 V, I_F=I_S, di_F/dt = 100 A/µs	Q_{rr}	-	90	140	nC

Power dissipation

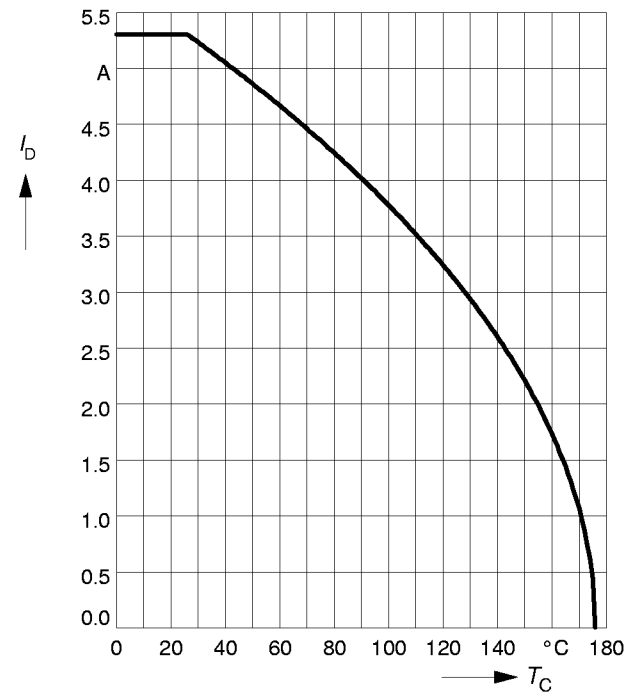
$P_{tot} = f(T_C)$



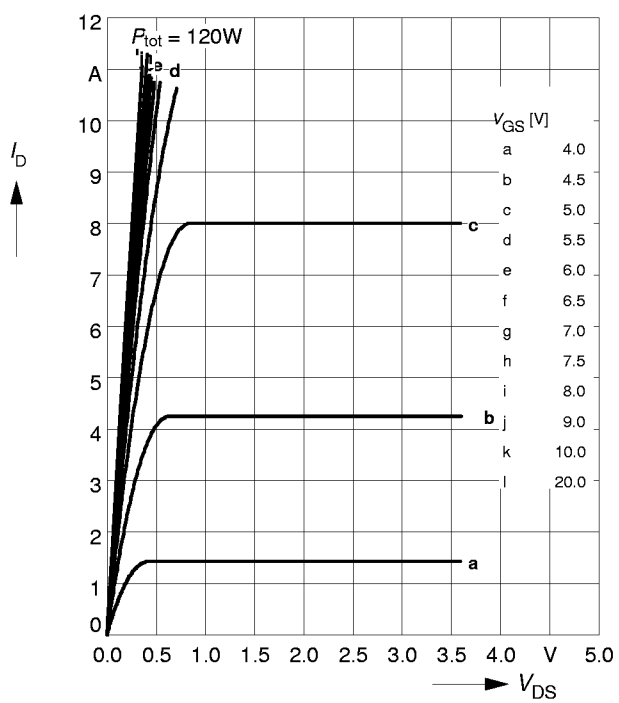
Drain current

$I_D = f(T_C)$

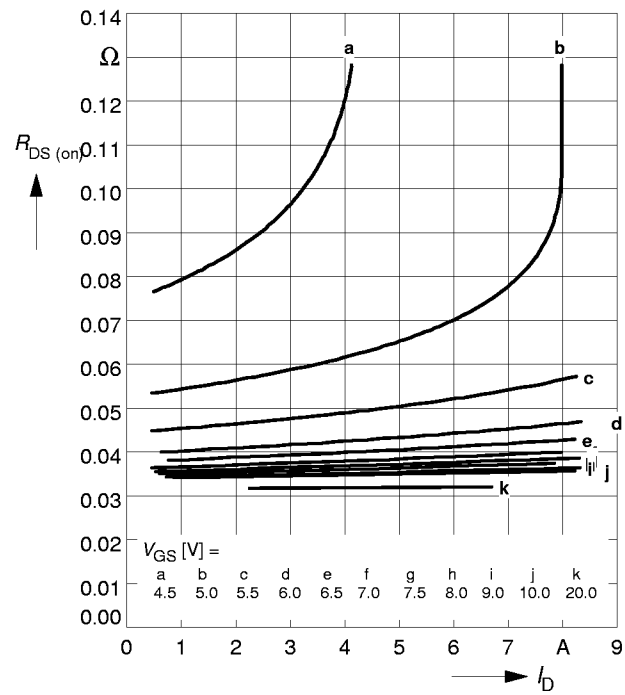
parameter: $V_{GS} \geq 10$ V



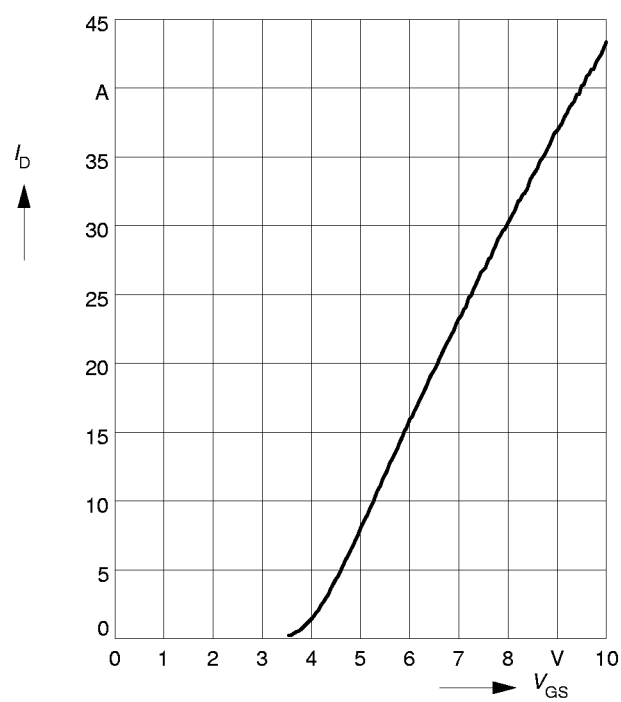
Typ. output characteristics
$I_D = f(V_{DS})$
parameter: t_p = 80 µs



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



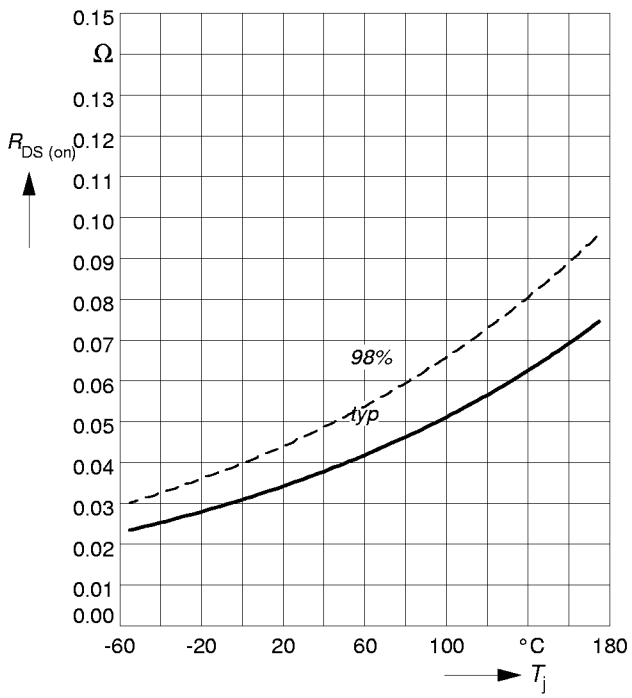
Typ. transfer characteristics $I_D = f(V_{GS})$
parameter: t_p = 80 µs
$V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$



Drain-source on-resistance

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

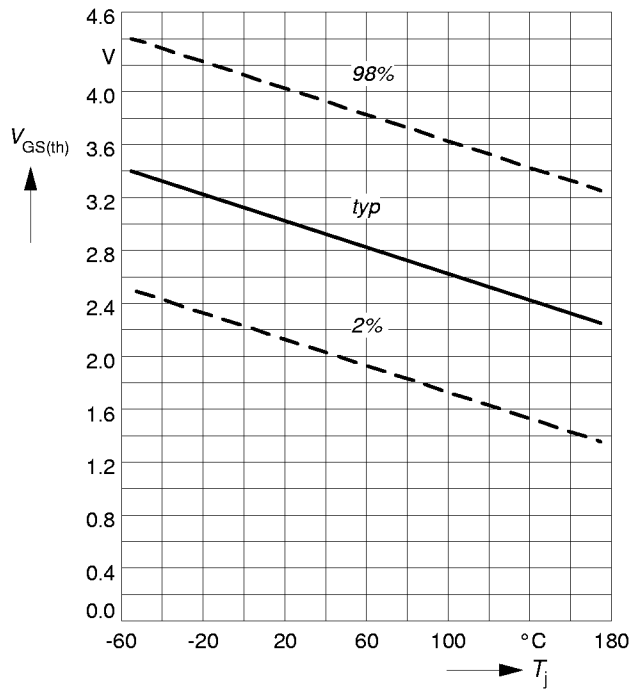
parameter: I_D = 5.3 A, V_{GS} = 10 V



Gate threshold voltage

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

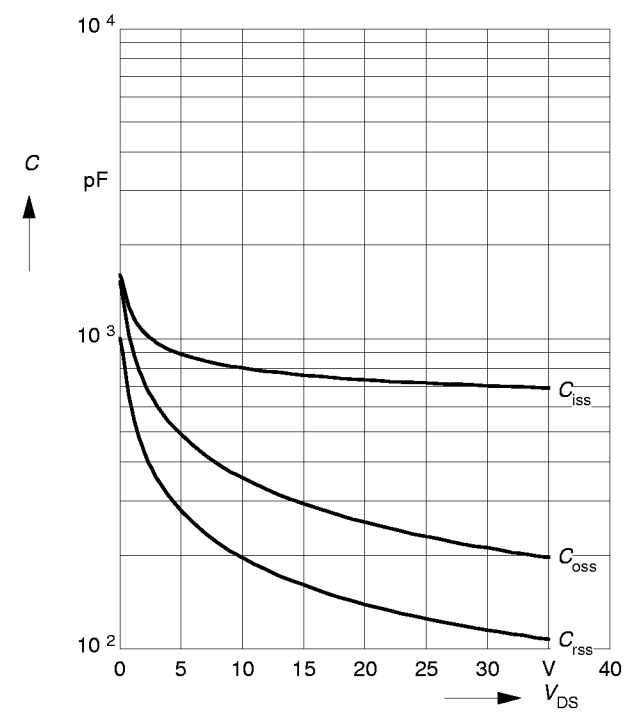
parameter: $V_{GS} = V_{DS}$, I_D = 50 µA



Typ. capacitances

$C = f(V_{DS})$

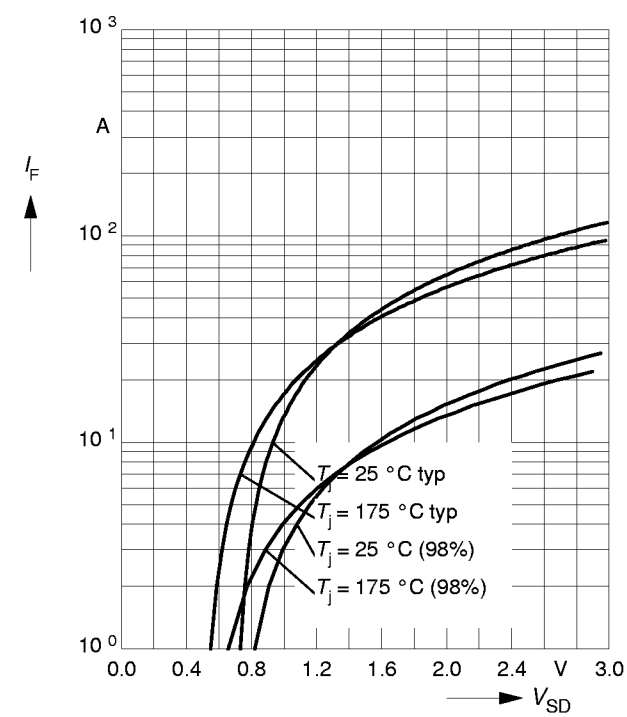
parameter: V_{GS} = 0V, f = 1MHz



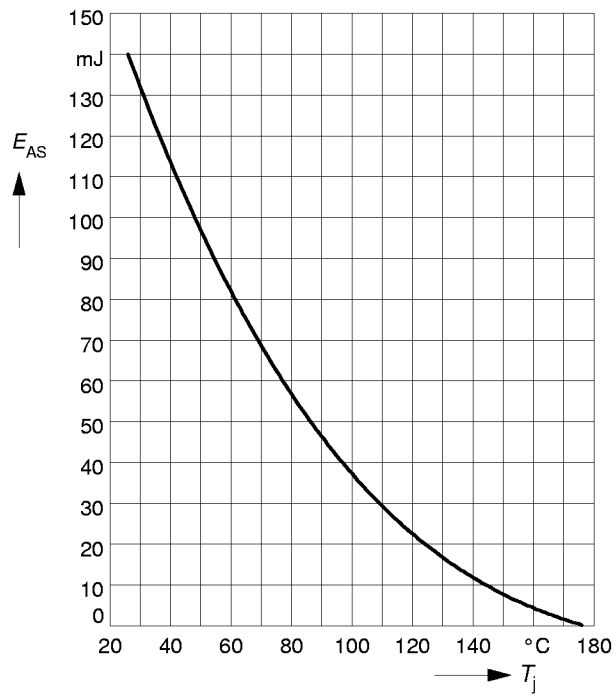
Forward characteristics of reverse diode

$I_F = f(V_{SD})$

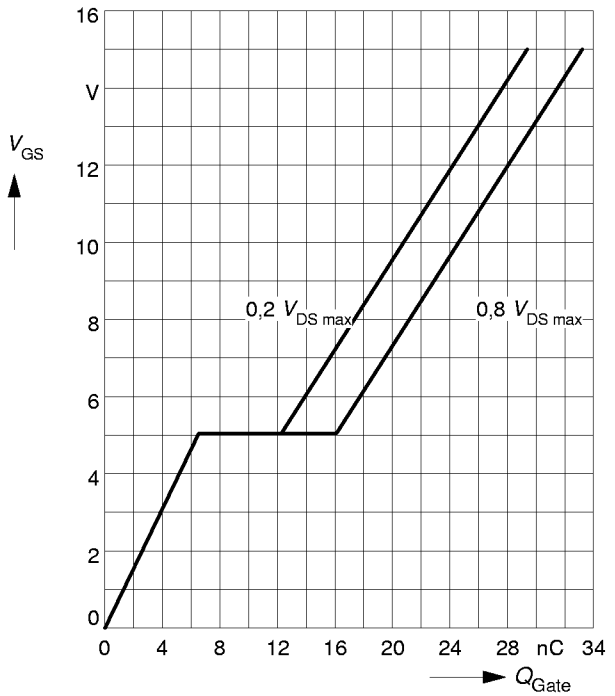
parameter: T_j, t_p = 80 µs



Avalanche energy $E_{AS} = f(T_j)$
parameter: I_D = 5.3 A, V_{DD} = 25 V
R_{GS} = 25 Ω, L = 9.97 mH



Typ. gate charge
$V_{GS} = f(Q_{Gate})$
parameter: $I_{D\ puls}$ = 5 A



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