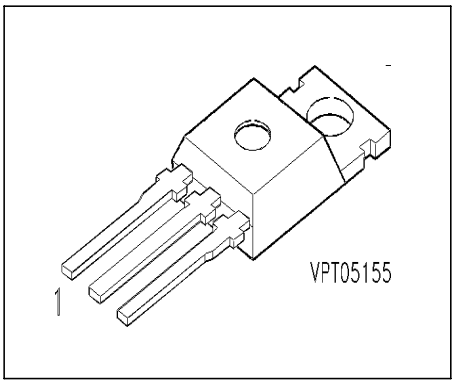
BUZ 172

SIPMOS ® Power Transistor

- P channel
- Enhancement mode
- Avalanche rated



Pin 1	Pin 2	Pin 3
G	D	S

Type	V_{DS}	I_D	$R_{DS(on)}$	Package	Ordering Code
BUZ 172	-100 V	-5.5 A	0.6 Ω	TO-220 AB	C67078-S1451-A2

Maximum Ratings

Parameter	Symbol	Values	Unit
Continuous drain current T_C = 37 ˚C	I_D	-5.5	A
Pulsed drain current T_C = 25 ˚C	I_{Dpuls}	-22	
Avalanche energy, single pulse I_D = -5.5 A, V_{DD} = -25 V, R_{GS} = 25 Ω L = 8.4 mH, T_j = 25 ˚C	E_{AS}	170	mJ
Gate source voltage	V_{GS}	± 20	V
Power dissipation T_C = 25 ˚C	P_{tot}	40	W
Operating temperature	T_j	-55 ... + 150	˚C
Storage temperature	T_{stg}	-55 ... + 150	
Thermal resistance, chip case	R_{thJC}	≤ 3.1	K/W
Thermal resistance, chip to ambient	R_{thJA}	≤ 75	
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	$V_{(BR)DSS}$	-100	-	-	V
Gate threshold voltage V_{GS}=V_{DS}, I_D = 1 mA	$V_{GS(th)}$	-2.1	-3	-4	
Zero gate voltage drain current V_{DS} = -100 V, V_{GS} = 0 V, T_j = 25 ˚C V_{DS} = -100 V, V_{GS} = 0 V, T_j = 125 ˚C	I_{DSS}	- -	-0.1 -10	-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 = -3.7 A	$R_{DS(on)}$	-	0.4	0.6	Ω

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

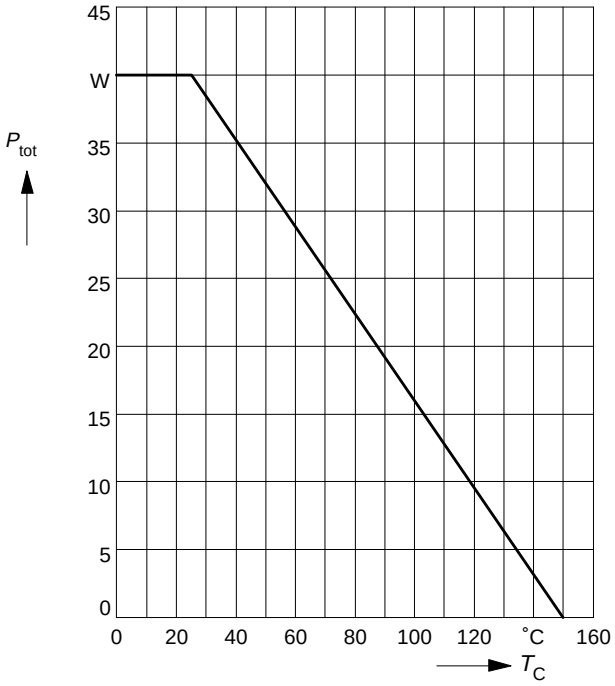
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Dynamic Characteristics					
Transconductance $V_{DS} \geq 2 * I_D * R_{DS(on)max}$, I_D = -3.7 A	g_{fs}	1	2	-	S
Input capacitance V_{GS} = 0 V, V_{DS} = -25 V, f = 1 MHz	C_{iss}	-	800	1200	pF
Output capacitance V_{GS} = 0 V, V_{DS} = -25 V, f = 1 MHz	C_{oss}	-	220	330	
Reverse transfer capacitance V_{GS} = 0 V, V_{DS} = -25 V, f = 1 MHz	C_{rss}	-	90	140	
Turn-on delay time V_{DD} = -30 V, V_{GS} = -10 V, I_D = -2.8 A R_{GS} = 50 Ω	$t_{d(on)}$	-	20	30	ns
Rise time V_{DD} = -30 V, V_{GS} = -10 V, I_D = -2.8 A R_{GS} = 50 Ω	t_r	-	120	180	
Turn-off delay time V_{DD} = -30 V, V_{GS} = -10 V, I_D = -2.8 A R_{GS} = 50 Ω	$t_{d(off)}$	-	70	90	
Fall time V_{DD} = -30 V, V_{GS} = -10 V, I_D = -2.8 A R_{GS} = 50 Ω	t_f	-	55	75	

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_C = 25 °C	I_S	-	-	-5.5	A
Inverse diode direct current,pulsed T_C = 25 °C	I_{SM}	-	-	-22	
Inverse diode forward voltage V_{GS} = 0 V, I_F = -11 A	V_{SD}	-	-1	-1.3	V
Reverse recovery time V_R = -30 V, I_F=I_S, di_F/dt = 100 A/µs	t_{rr}	-	200	-	ns
Reverse recovery charge V_R = -30 V, I_F=I_S, di_F/dt = 100 A/µs	Q_{rr}	-	0.75	-	µC

Power dissipation

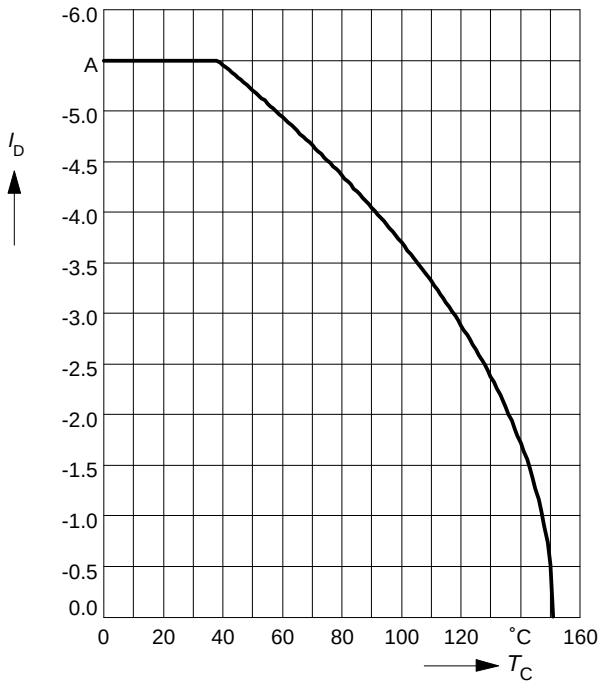
$P_{tot} = f(T_C)$



Drain current

$I_D = f(T_C)$

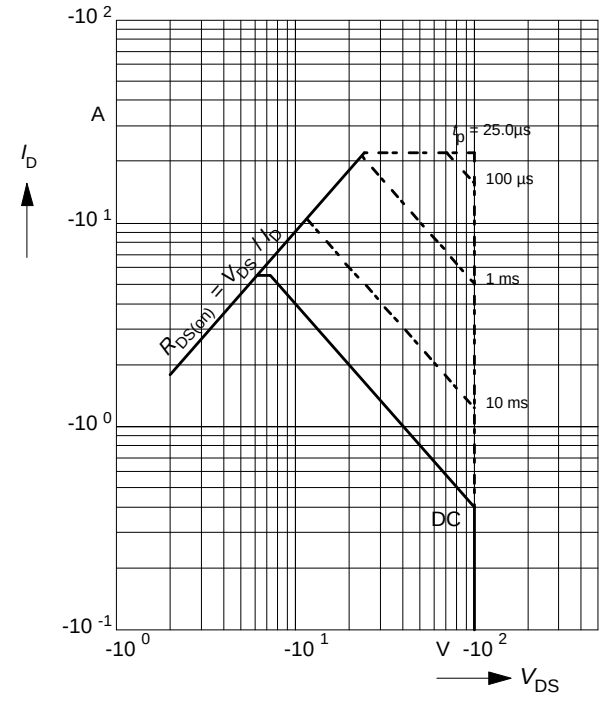
parameter: $V_{GS} \geq -10$ V



Safe operating area

$I_D = f(V_{DS})$

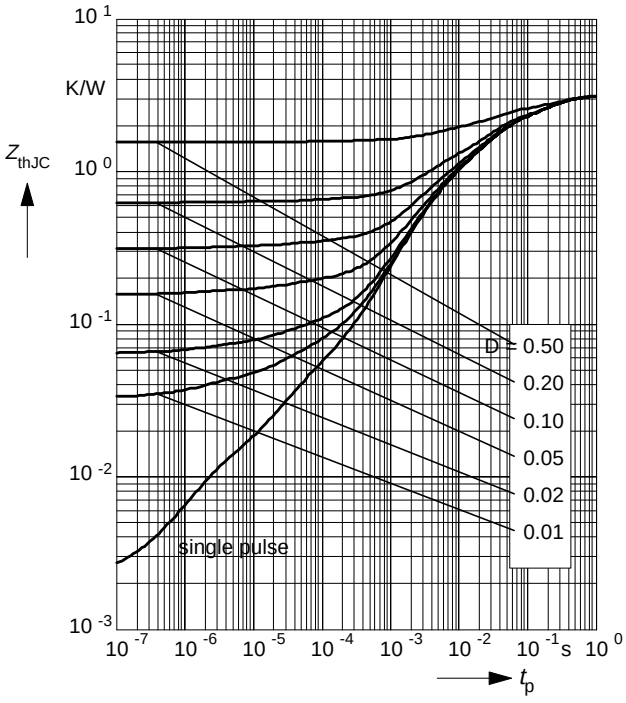
parameter: $D = 0.01$, $T_C = 25$°C



Transient thermal impedance

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

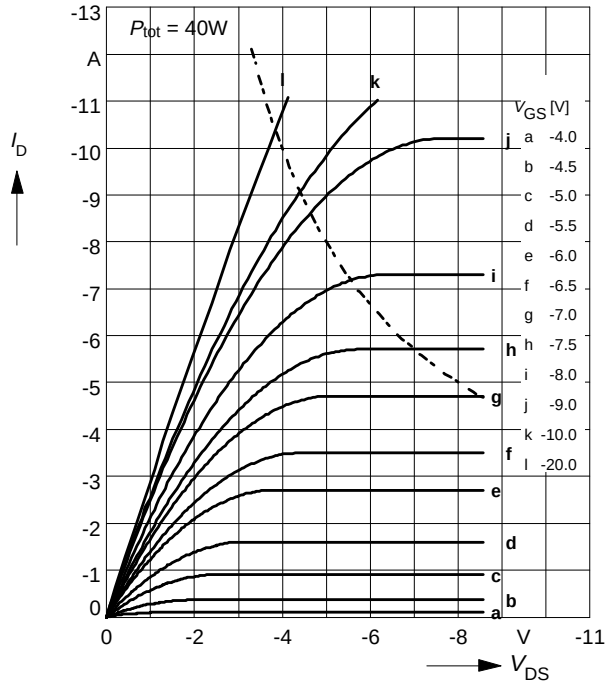
parameter: $D = t_p / T$



Typ. output characteristics

$I_D = f(V_{DS})$

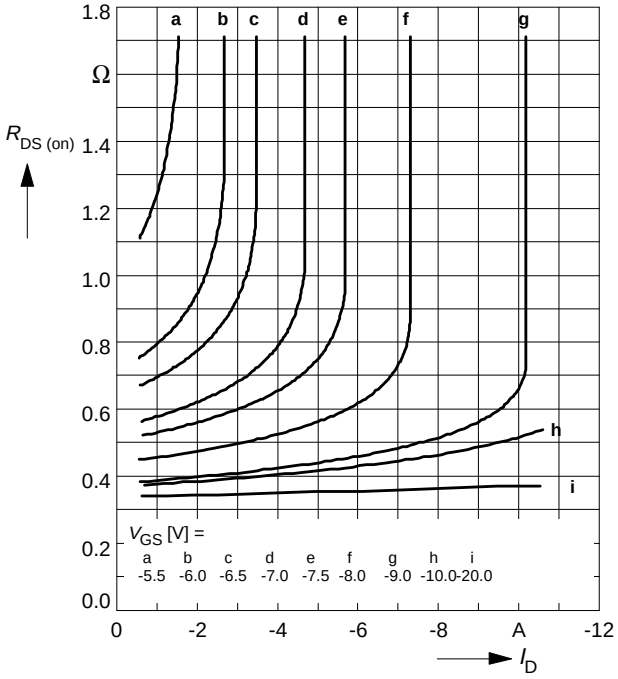
parameter: t_p = 80 µs



Typ. drain-source on-resistance

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

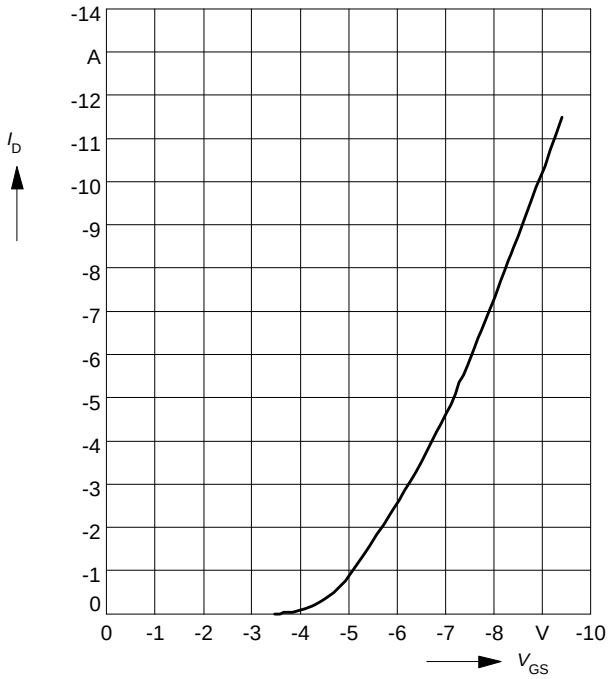
parameter: V_{GS}



Typ. transfer characteristics $I_D = f(V_{GS})$

parameter: t_p = 80 µs

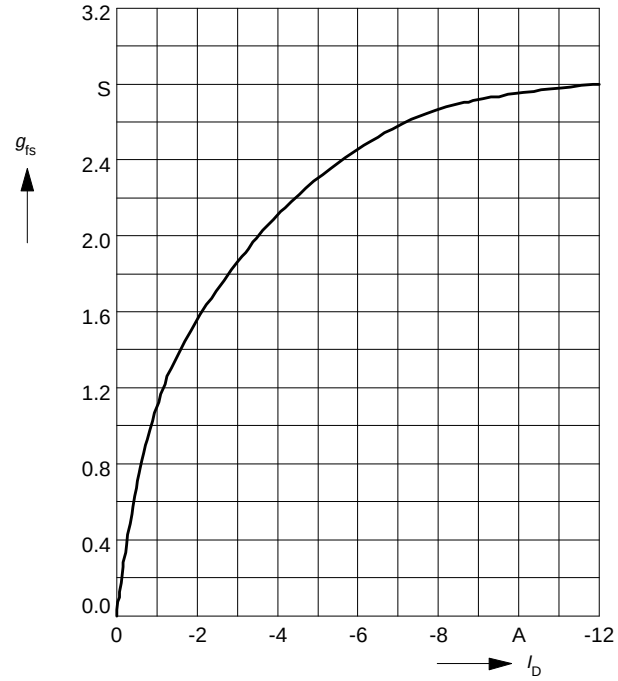
$V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$



Typ. forward transconductance $g_{fs} = f(I_D)$

parameter: t_p = 80 µs,

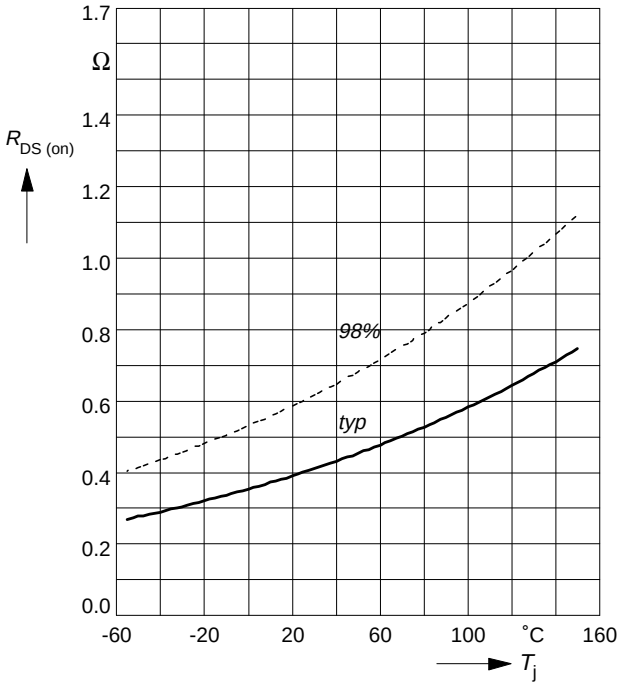
$V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$



Drain-source on-resistance

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

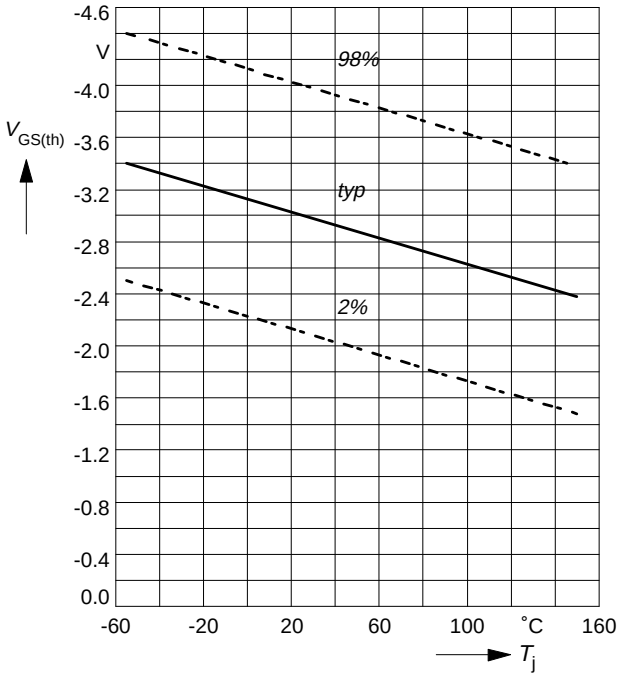
parameter: I_D = -3.7 A, V_{GS} = -10 V



Gate threshold voltage

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

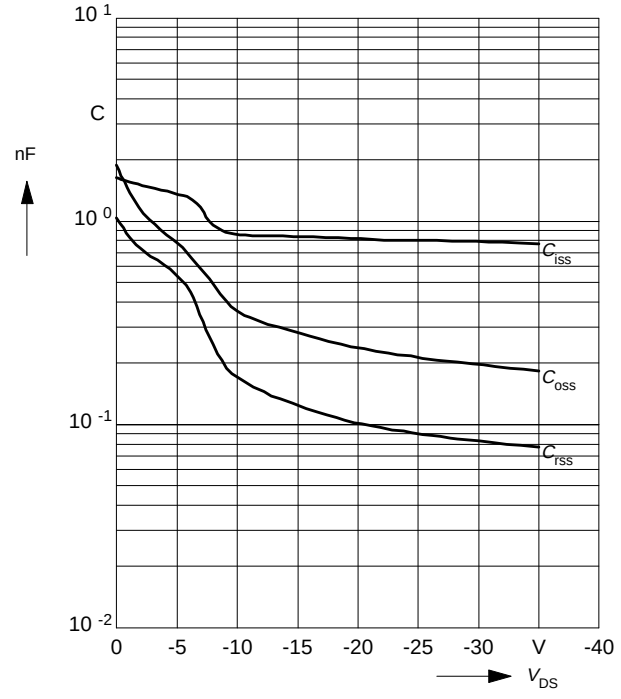
parameter: $V_{GS} = V_{DS}$, I_D = 1 mA



Typ. capacitances

$C = f(V_{DS})$

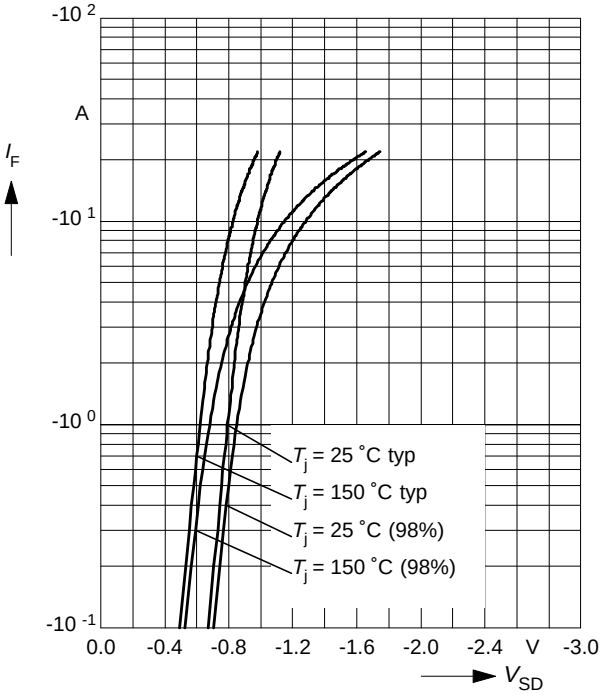
parameter: V_{GS} = 0V, f = 1MHz



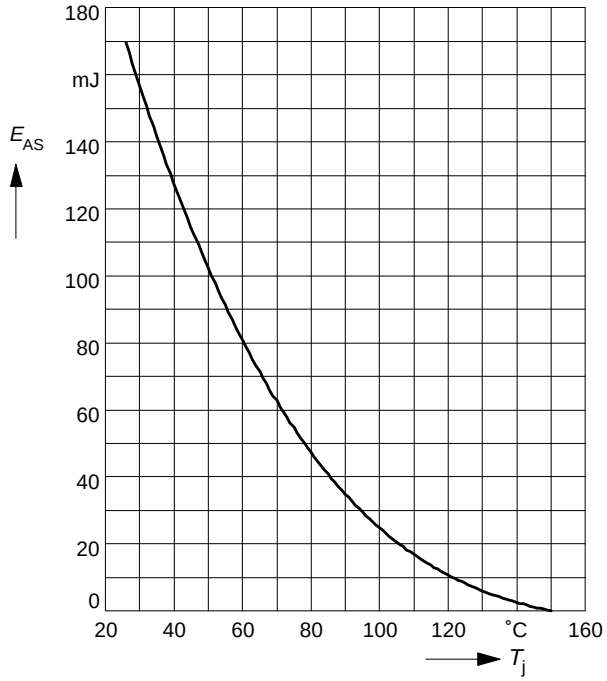
Forward characteristics of reverse diode

$I_F = f(V_{SD})$

parameter: T_j, t_p = 80 µs



Avalanche energy $E_{AS} = f(T_j)$
parameter: I_D = -5.5 A, V_{DD} = -25 V
R_{GS} = 25 Ω, L = 8.4 mH



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