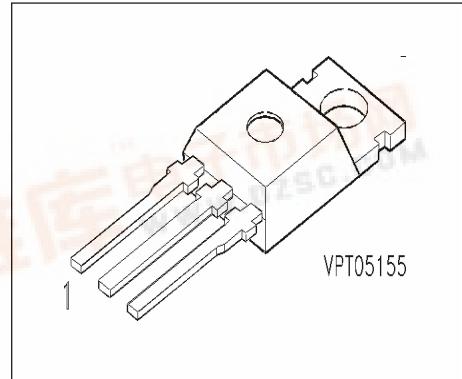


**SIEMENS****BUZ 92****SIPMOS® Power Transistor**

- N 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 92	600 V	3.3 A	3 Ω	TO-220 AB	C67078-S1343-A2

**Maximum Ratings**

Parameter	Symbol	Values	Unit
Continuous drain current $T_C = 25^\circ\text{C}$	$I_D$	3.3	A
Pulsed drain current $T_C = 25^\circ\text{C}$	$I_{D\text{puls}}$	13	
Avalanche current, limited by $T_{j\text{max}}$	$I_{AR}$	3.3	
Avalanche energy, periodic limited by $T_{j\text{max}}$	$E_{AR}$	6	mJ
Avalanche energy, single pulse $I_D = 3.3 \text{ A}, V_{DD} = 50 \text{ V}, R_{GS} = 25 \Omega$ $L = 37 \text{ mH}, T_j = 25^\circ\text{C}$	$E_{AS}$	220	
Gate source voltage	$V_{GS}$	$\pm 20$	V
Power dissipation $T_C = 25^\circ\text{C}$	$P_{\text{tot}}$	80	W
Operating temperature	$T_j$	-55 ... + 150	°C
Storage temperature	$T_{\text{stg}}$	-55 ... + 150	
Thermal resistance, chip case	$R_{\text{thJC}}$	$\leq 1.56$	K/W
Thermal resistance, chip to ambient	$R_{\text{thJA}}$	75	
DIN humidity category, DIN 40 040		E	
IEC climatic category, DIN IEC 68-1		55 / 150 / 56	

**Electrical Characteristics**, at  $T_j = 25^\circ\text{C}$ , unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

#### Static Characteristics

Drain- source breakdown voltage $V_{GS} = 0 \text{ V}, I_D = 0.25 \text{ mA}, T_j = 25^\circ\text{C}$	$V_{(\text{BR})\text{DSS}}$	600	-	-	V
Gate threshold voltage $V_{GS}=V_{DS}, I_D = 1 \text{ mA}$	$V_{GS(\text{th})}$	2.1	3	4	
Zero gate voltage drain current $V_{DS} = 600 \text{ V}, V_{GS} = 0 \text{ V}, T_j = 25^\circ\text{C}$ $V_{DS} = 600 \text{ V}, V_{GS} = 0 \text{ V}, T_j = 125^\circ\text{C}$	$I_{\text{DSS}}$	-	0.1	1	$\mu\text{A}$
-	-	-	10	100	
Gate-source leakage current $V_{GS} = 20 \text{ V}, V_{DS} = 0 \text{ V}$	$I_{GSS}$	-	10	100	nA
Drain-Source on-resistance $V_{GS} = 10 \text{ V}, I_D = 2 \text{ A}$	$R_{\text{DS}(\text{on})}$	-	2.6	3	$\Omega$

**Electrical Characteristics**, at  $T_j = 25^\circ\text{C}$ , unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

**Dynamic Characteristics**

Transconductance $V_{DS} \geq 2 * I_D * R_{DS(on)max}$ , $I_D = 2 \text{ A}$	$g_{fs}$	2.1	3	-	S
Input capacitance $V_{GS} = 0 \text{ V}$ , $V_{DS} = 25 \text{ V}$ , $f = 1 \text{ MHz}$	$C_{iss}$	-	600	900	pF
Output capacitance $V_{GS} = 0 \text{ V}$ , $V_{DS} = 25 \text{ V}$ , $f = 1 \text{ MHz}$	$C_{oss}$	-	65	100	
Reverse transfer capacitance $V_{GS} = 0 \text{ V}$ , $V_{DS} = 25 \text{ V}$ , $f = 1 \text{ MHz}$	$C_{rss}$	-	25	40	
Turn-on delay time $V_{DD} = 30 \text{ V}$ , $V_{GS} = 10 \text{ V}$ , $I_D = 2.3 \text{ A}$ $R_{GS} = 50 \Omega$	$t_{d(on)}$	-	10	15	ns
Rise time $V_{DD} = 30 \text{ V}$ , $V_{GS} = 10 \text{ V}$ , $I_D = 2.3 \text{ A}$ $R_{GS} = 50 \Omega$	$t_r$	-	50	70	
Turn-off delay time $V_{DD} = 30 \text{ V}$ , $V_{GS} = 10 \text{ V}$ , $I_D = 2.3 \text{ A}$ $R_{GS} = 50 \Omega$	$t_{d(off)}$	-	70	95	
Fall time $V_{DD} = 30 \text{ V}$ , $V_{GS} = 10 \text{ V}$ , $I_D = 2.3 \text{ A}$ $R_{GS} = 50 \Omega$	$t_f$	-	40	55	

**Electrical Characteristics**, at  $T_j = 25^\circ\text{C}$ , unless otherwise specified

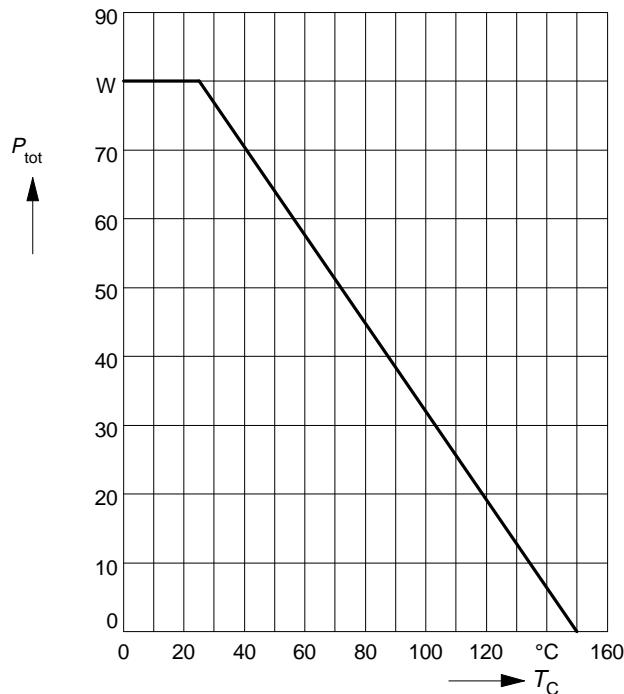
Parameter	Symbol	Values			Unit
		min.	typ.	max.	

**Reverse Diode**

Inverse diode continuous forward current $T_C = 25^\circ\text{C}$	$I_S$	-	-	3.3	A
Inverse diode direct current,pulsed $T_C = 25^\circ\text{C}$	$I_{SM}$	-	-	13	
Inverse diode forward voltage $V_{GS} = 0 \text{ V}, I_F = 6.6 \text{ A}$	$V_{SD}$	-	1	1.4	V
Reverse recovery time $V_R = 100 \text{ V}, I_F=I_S, dI_F/dt = 100 \text{ A}/\mu\text{s}$	$t_{rr}$	-	300	-	ns
Reverse recovery charge $V_R = 100 \text{ V}, I_F=I_S, dI_F/dt = 100 \text{ A}/\mu\text{s}$	$Q_{rr}$	-	2.5	-	$\mu\text{C}$

### Power dissipation

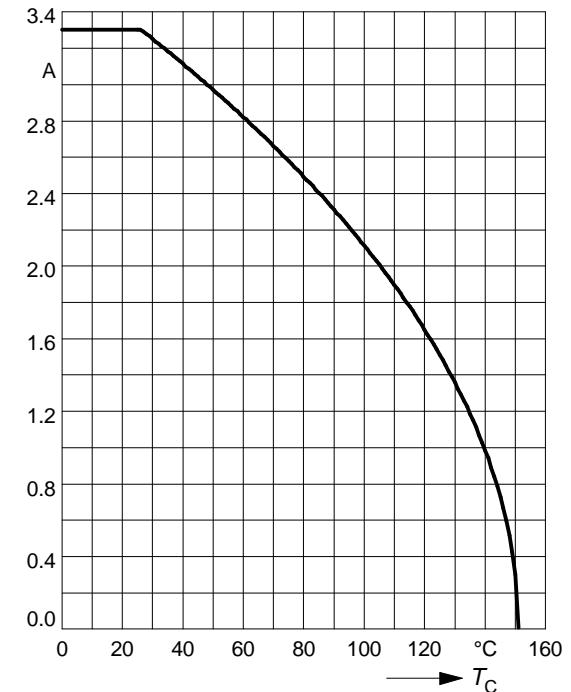
$$P_{\text{tot}} = f(T_C)$$



### Drain current

$$I_D = f(T_C)$$

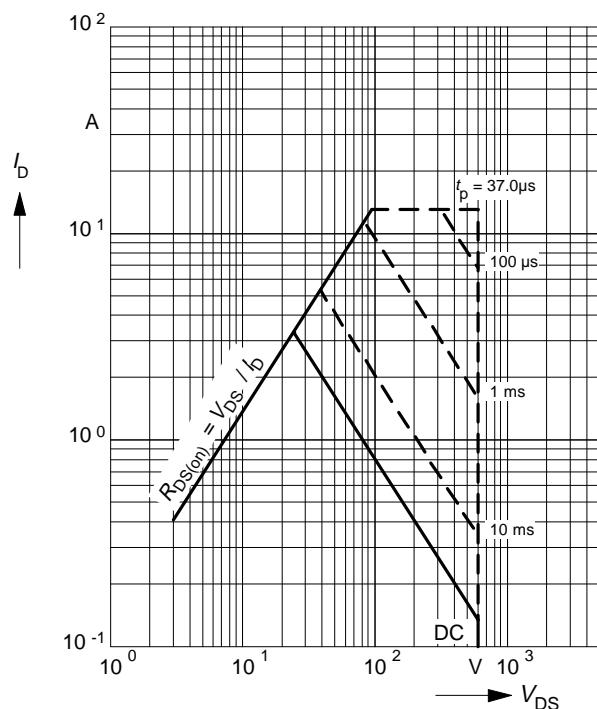
parameter:  $V_{GS} \geq 10$  V



### Safe operating area

$$I_D = f(V_{DS})$$

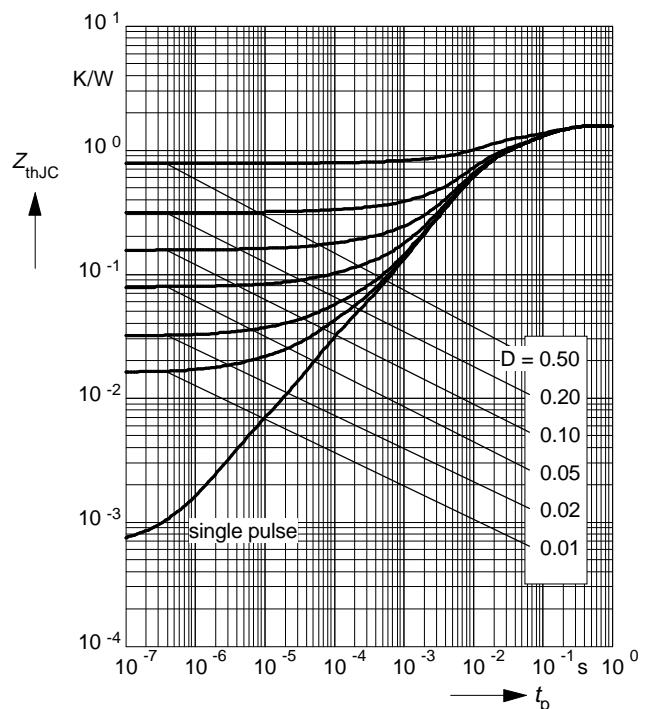
parameter:  $D = 0.01$ ,  $T_C = 25^\circ\text{C}$



### Transient thermal impedance

$$Z_{\text{thJC}} = f(t_p)$$

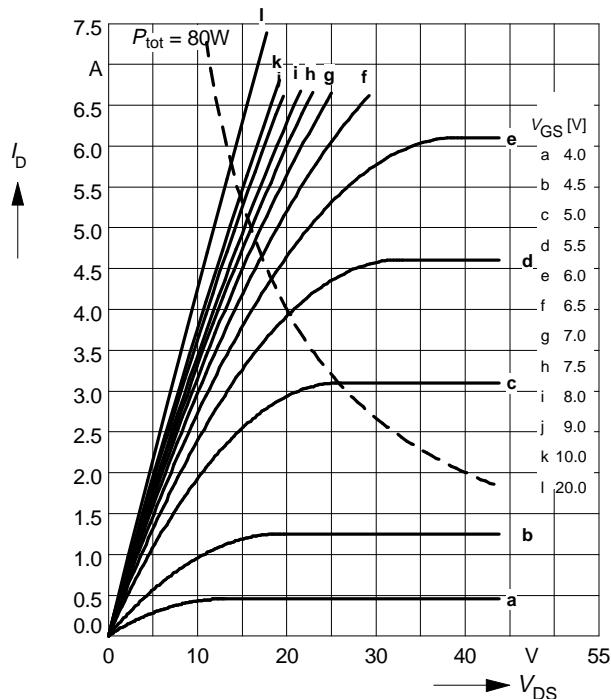
parameter:  $D = t_p / T$



### Typ. output characteristics

$$I_D = f(V_{DS})$$

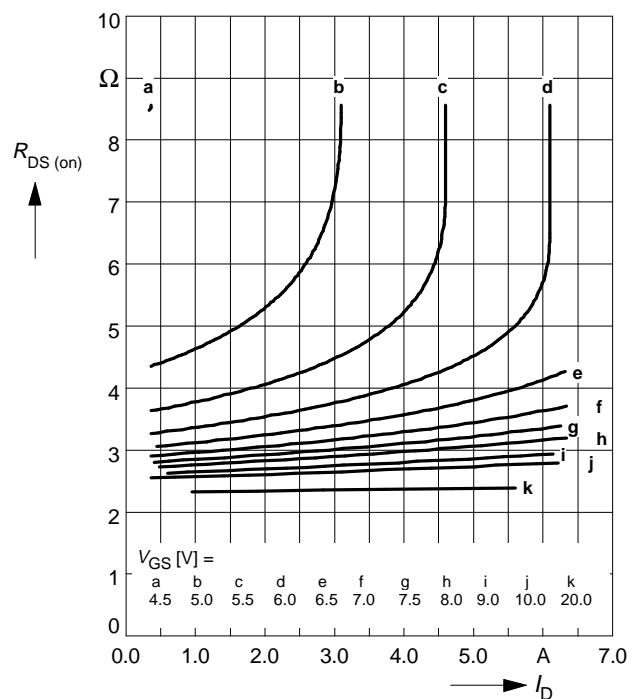
parameter:  $t_p = 80 \mu\text{s}$



### Typ. drain-source on-resistance

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

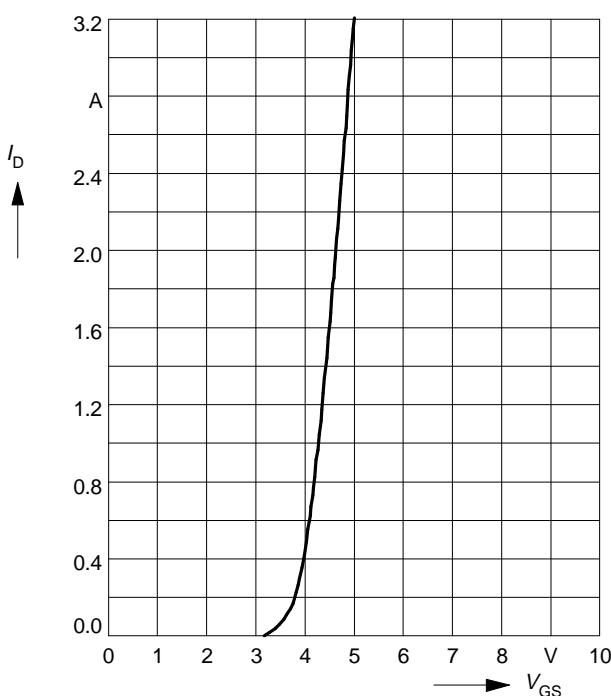
parameter:  $V_{GS}$



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

parameter:  $t_p = 80 \mu\text{s}$

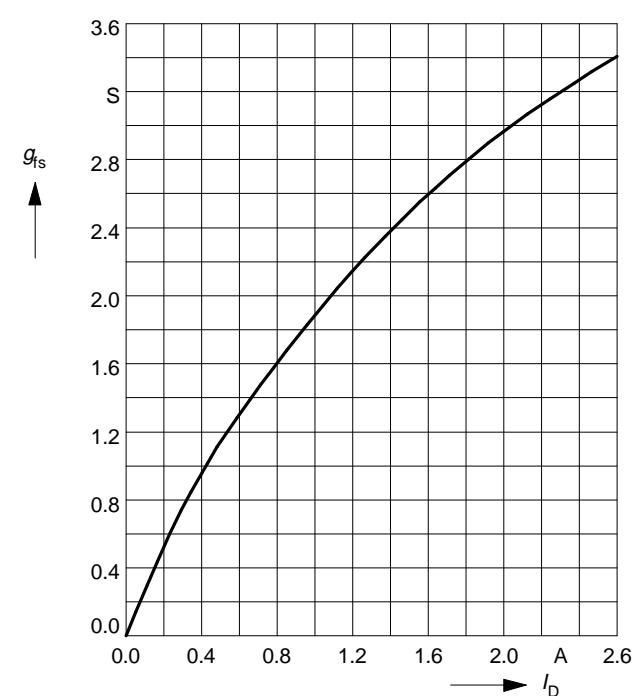
$V_{DS} \geq 2 \times I_D \times R_{DS(on)\max}$



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

parameter:  $t_p = 80 \mu\text{s}$ ,

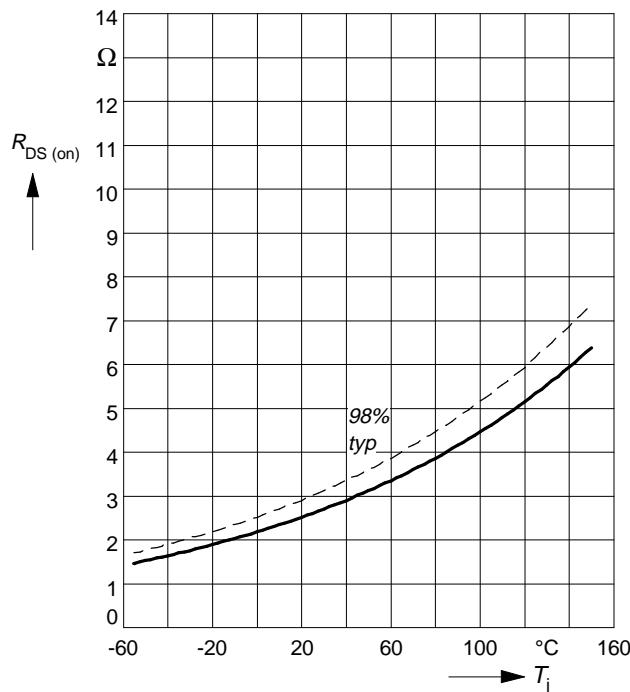
$V_{DS} \geq 2 \times I_D \times R_{DS(on)\max}$



### Drain-source on-resistance

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

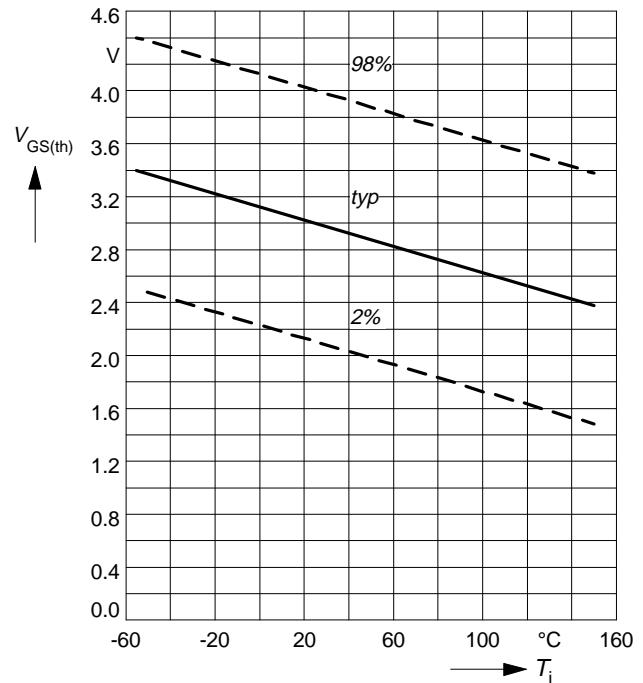
parameter:  $I_D = 2 \text{ A}$ ,  $V_{GS} = 10 \text{ V}$



### Gate threshold voltage

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

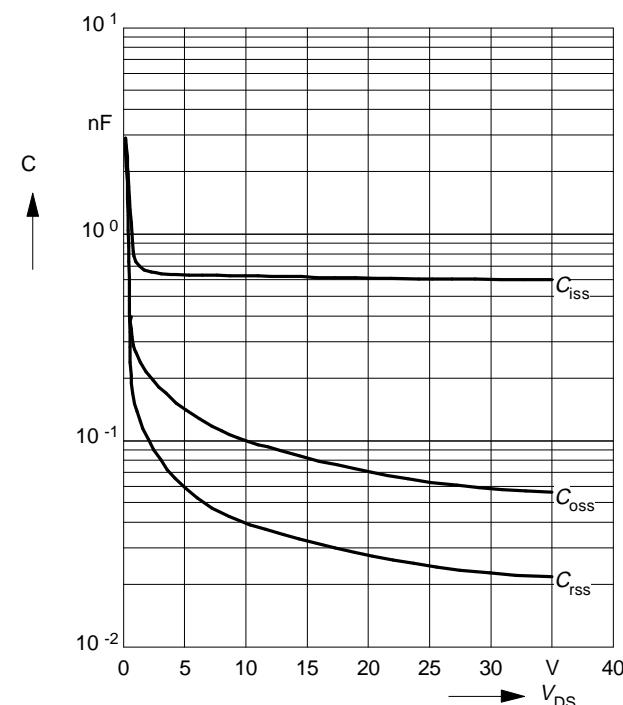
parameter:  $V_{GS} = V_{DS}$ ,  $I_D = 1 \text{ mA}$



### Typ. capacitances

$$C = f(V_{DS})$$

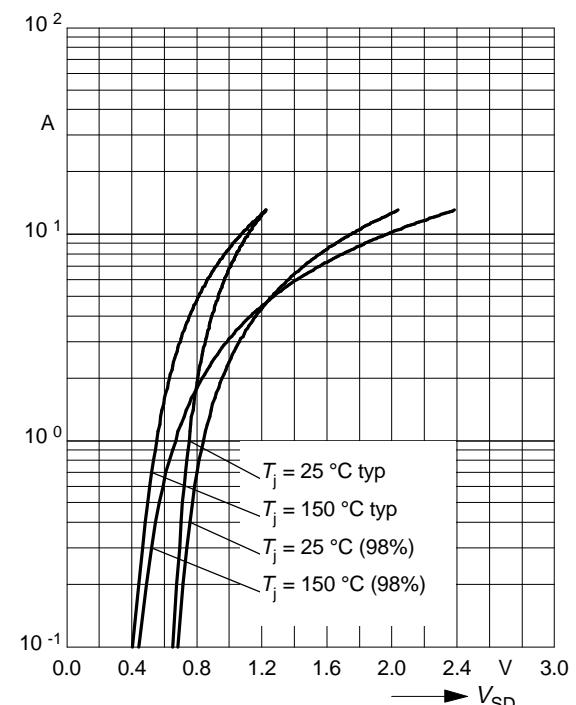
parameter:  $V_{GS} = 0 \text{ V}$ ,  $f = 1 \text{ MHz}$



### Forward characteristics of reverse diode

$$I_F = f(V_{SD})$$

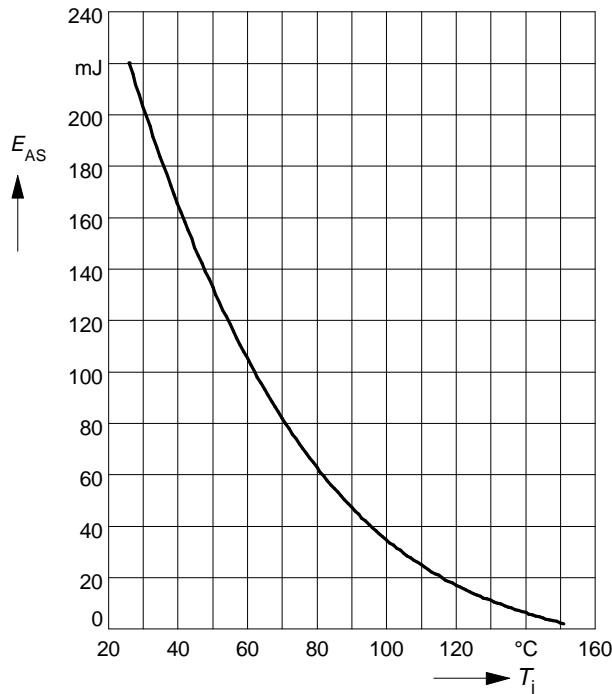
parameter:  $T_j$ ,  $t_p = 80 \mu\text{s}$



### Avalanche energy $E_{AS} = f(T_j)$

parameter:  $I_D = 3.3 \text{ A}$ ,  $V_{DD} = 50 \text{ V}$

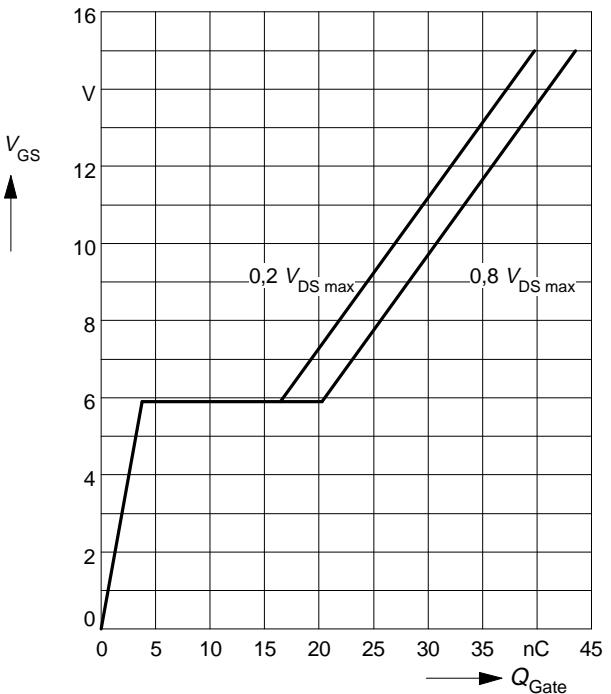
$R_{GS} = 25 \Omega$ ,  $L = 37 \text{ mH}$



### Typ. gate charge

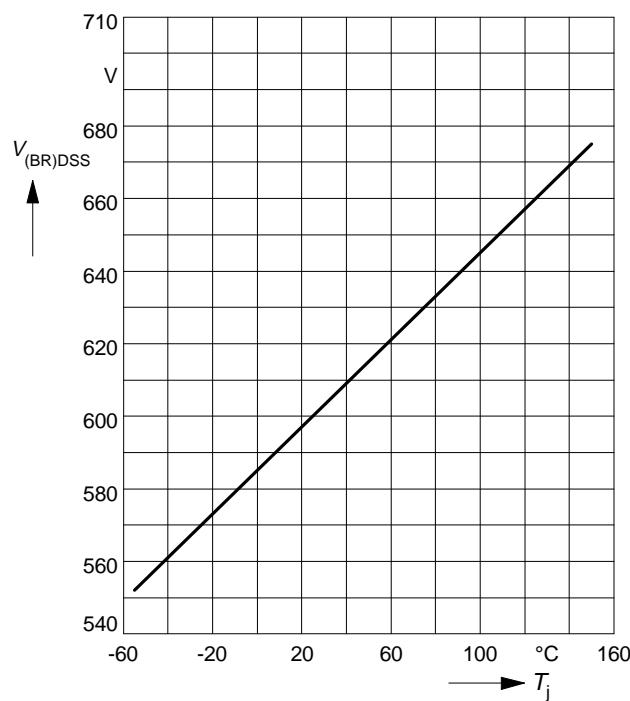
$V_{GS} = f(Q_{Gate})$

parameter:  $I_{D \text{ puls}} = 5 \text{ A}$



### Drain-source breakdown voltage

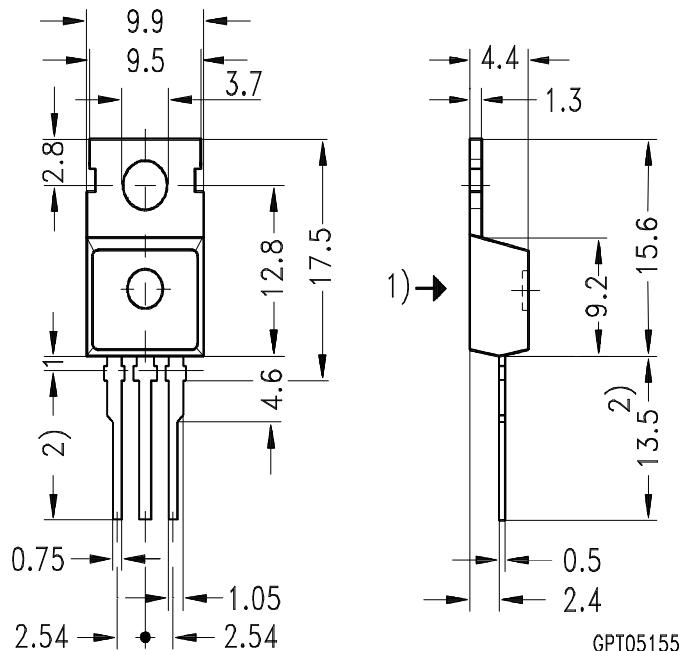
$V_{(BR)DSS} = f(T_j)$



## Package Outlines

TO-220 AB

Dimension in mm



GPT05155

- 1) punch direction, burr max. 0.04
- 2) dip tinning
- 3) max. 14.5 by dip tinning press burr max. 0.05