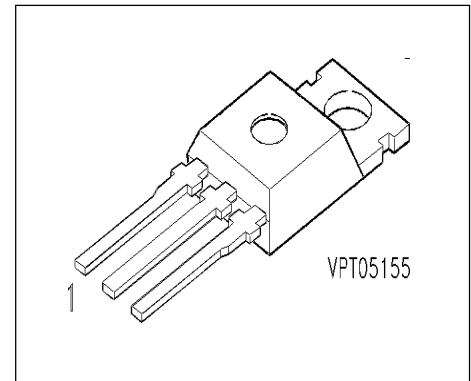


### SIPMOS<sup>®</sup> Power Transistor

- 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 74 A	500 V	2.1 A	4 $\Omega$	TO-220 AB	C67078-S1314-A3

#### Maximum Ratings

Parameter	Symbol	Values	Unit
Continuous drain current $T_C = 27\text{ }^\circ\text{C}$	$I_D$	2.1	A
Pulsed drain current $T_C = 25\text{ }^\circ\text{C}$	$I_{Dpuls}$	8.5	
Avalanche current, limited by $T_{jmax}$	$I_{AR}$	2.4	
Avalanche energy, periodic limited by $T_{jmax}$	$E_{AR}$	5	mJ
Avalanche energy, single pulse $I_D = 2.4\text{ A}$ , $V_{DD} = 50\text{ V}$ , $R_{GS} = 25\text{ }\Omega$ $L = 56.3\text{ mH}$ , $T_j = 25\text{ }^\circ\text{C}$	$E_{AS}$	180	
Gate source voltage	$V_{GS}$	$\pm 20$	V
Power dissipation $T_C = 25\text{ }^\circ\text{C}$	$P_{tot}$	40	W
Operating temperature	$T_j$	-55 ... + 150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 ... + 150	
Thermal resistance, chip case	$R_{thJC}$	$\leq 3.1$	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  $T_j = 25^\circ\text{C}$ , unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>Static Characteristics</b>					
Drain- source breakdown voltage $V_{GS} = 0\text{ V}, I_D = 0.25\text{ mA}, T_j = 25\text{ }^\circ\text{C}$	$V_{(BR)DSS}$	500	-	-	V
Gate threshold voltage $V_{GS}=V_{DS}, I_D = 1\text{ mA}$	$V_{GS(th)}$	2.1	3	4	
Zero gate voltage drain current $V_{DS} = 500\text{ V}, V_{GS} = 0\text{ V}, T_j = 25\text{ }^\circ\text{C}$ $V_{DS} = 500\text{ V}, V_{GS} = 0\text{ V}, T_j = 125\text{ }^\circ\text{C}$	$I_{DSS}$	-	0.1 10	1 100	$\mu\text{A}$
Gate-source leakage current $V_{GS} = 20\text{ V}, V_{DS} = 0\text{ V}$	$I_{GSS}$	-	10	100	nA
Drain-Source on-resistance $V_{GS} = 10\text{ V}, I_D = 1.5\text{ A}$	$R_{DS(on)}$	-	3.5	4	$\Omega$

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

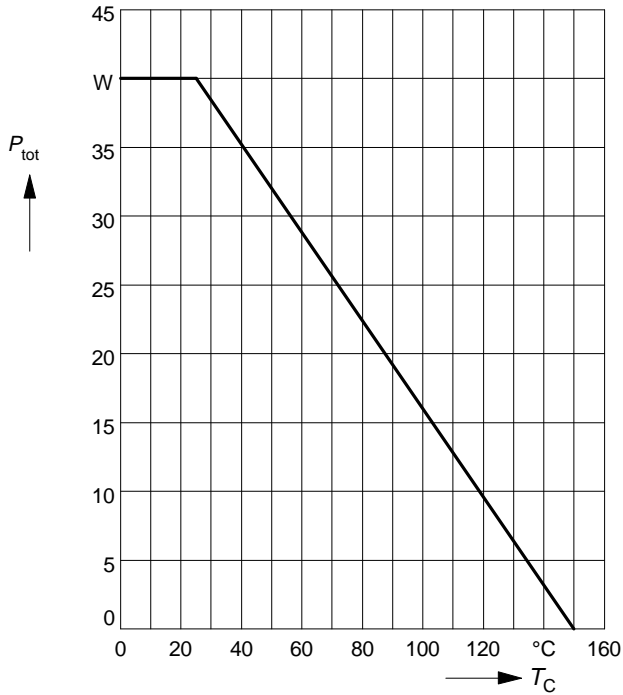
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>Dynamic Characteristics</b>					
Transconductance $V_{DS} \geq 2 * I_D * R_{DS(on)max}, I_D = 1.5 \text{ A}$	$g_{fs}$	1.8	2.1	-	S
Input capacitance $V_{GS} = 0 \text{ V}, V_{DS} = 25 \text{ V}, f = 1 \text{ MHz}$	$C_{iss}$	-	450	675	pF
Output capacitance $V_{GS} = 0 \text{ V}, V_{DS} = 25 \text{ V}, f = 1 \text{ MHz}$	$C_{oss}$	-	50	75	
Reverse transfer capacitance $V_{GS} = 0 \text{ V}, V_{DS} = 25 \text{ V}, f = 1 \text{ MHz}$	$C_{rss}$	-	20	30	
Turn-on delay time $V_{DD} = 30 \text{ V}, V_{GS} = 10 \text{ V}, I_D = 2.1 \text{ A}$ $R_{GS} = 50 \Omega$	$t_{d(on)}$	-	8	12	ns
Rise time $V_{DD} = 30 \text{ V}, V_{GS} = 10 \text{ V}, I_D = 2.1 \text{ A}$ $R_{GS} = 50 \Omega$	$t_r$	-	40	60	
Turn-off delay time $V_{DD} = 30 \text{ V}, V_{GS} = 10 \text{ V}, I_D = 2.1 \text{ A}$ $R_{GS} = 50 \Omega$	$t_{d(off)}$	-	50	65	
Fall time $V_{DD} = 30 \text{ V}, V_{GS} = 10 \text{ V}, I_D = 2.1 \text{ A}$ $R_{GS} = 50 \Omega$	$t_f$	-	30	40	

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>Reverse Diode</b>					
Inverse diode continuous forward current $T_C = 25^\circ\text{C}$	$I_S$	-	-	2.1	A
Inverse diode direct current, pulsed $T_C = 25^\circ\text{C}$	$I_{SM}$	-	-	8.5	
Inverse diode forward voltage $V_{GS} = 0\text{ V}, I_F = 4.8\text{ A}$	$V_{SD}$	-	1	1.3	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

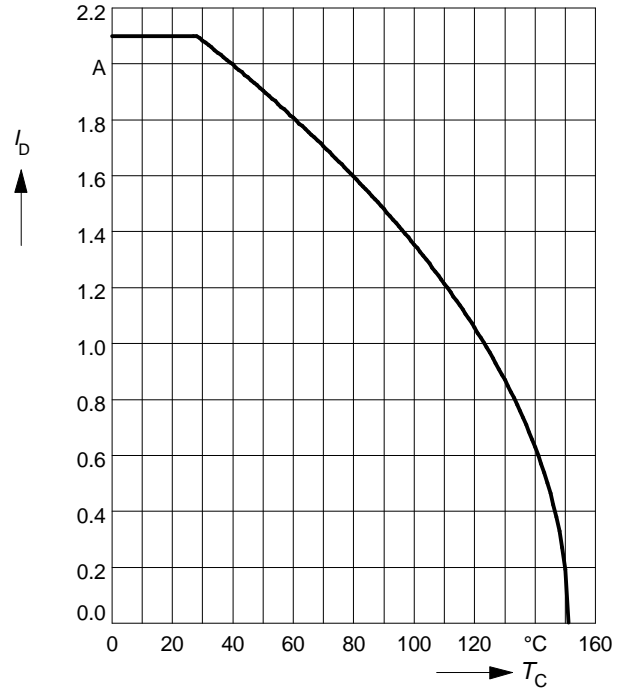
$$P_{\text{tot}} = f(T_C)$$



### Drain current

$$I_D = f(T_C)$$

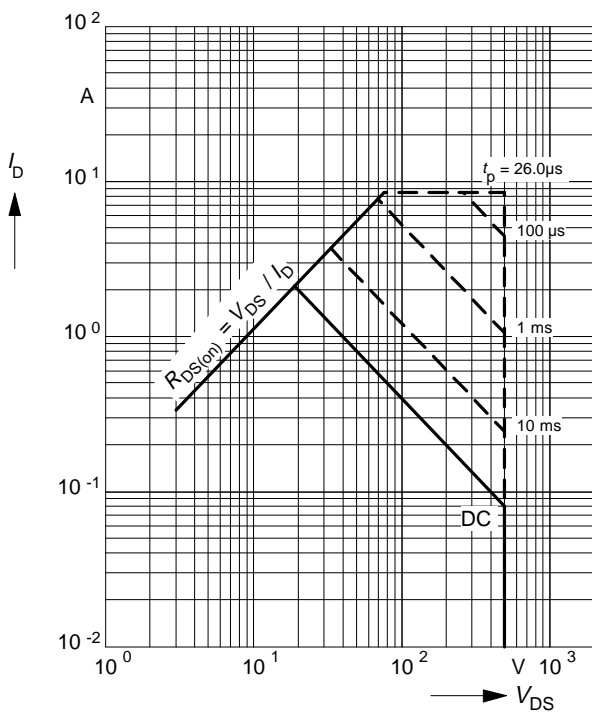
parameter:  $V_{GS} \geq 10 \text{ V}$



### Safe operating area

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

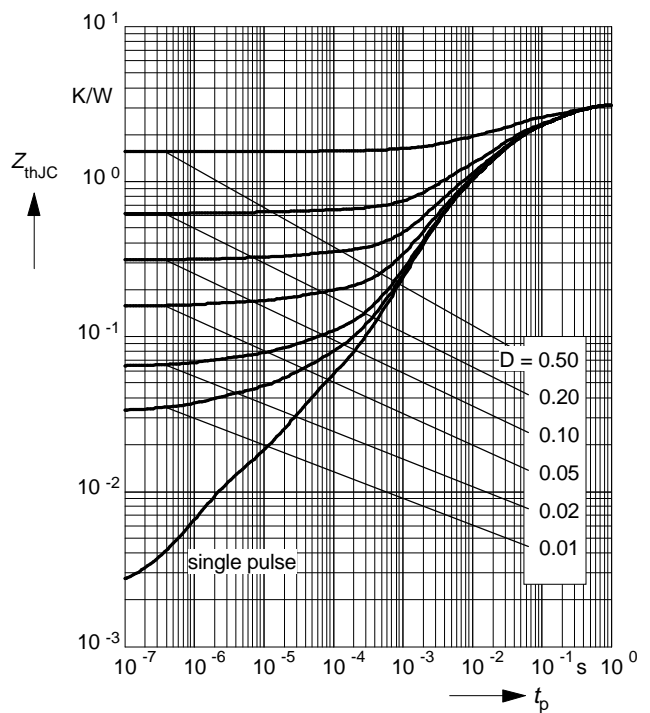
parameter:  $D = 0.01$ ,  $T_C = 25^\circ\text{C}$



### Transient thermal impedance

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

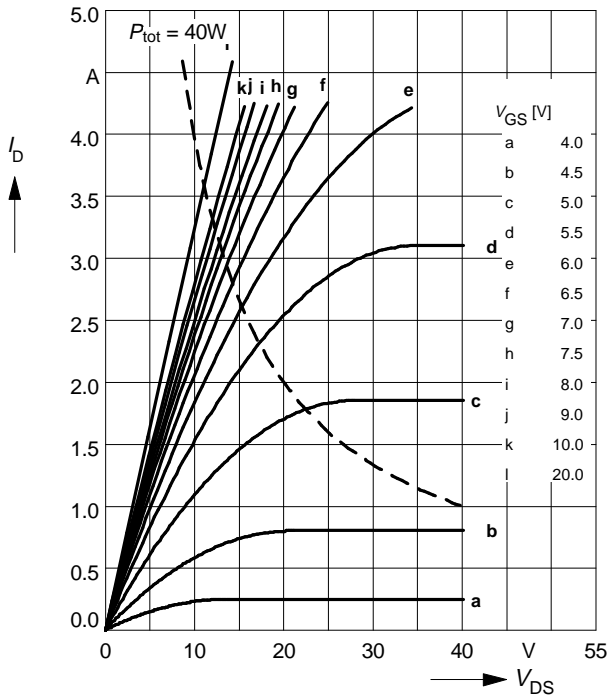
parameter:  $D = t_p / T$



### Typ. output characteristics

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

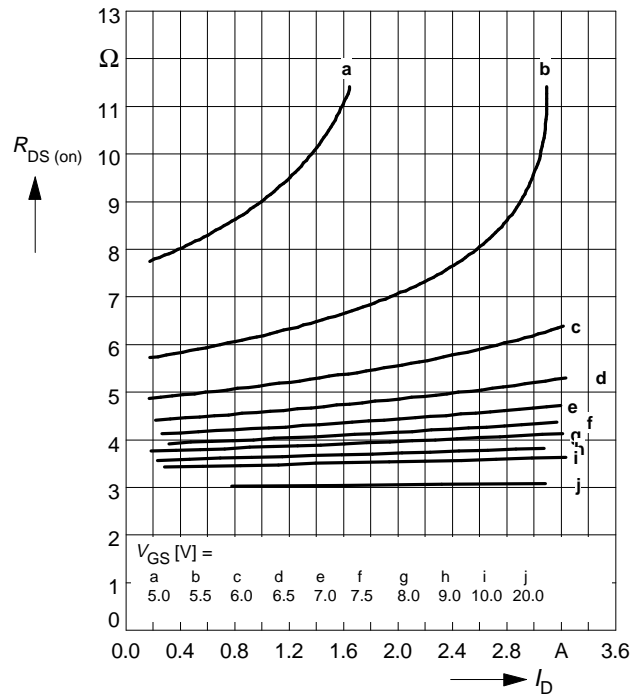
parameter:  $t_p = 80 \mu s$



### Typ. drain-source on-resistance

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

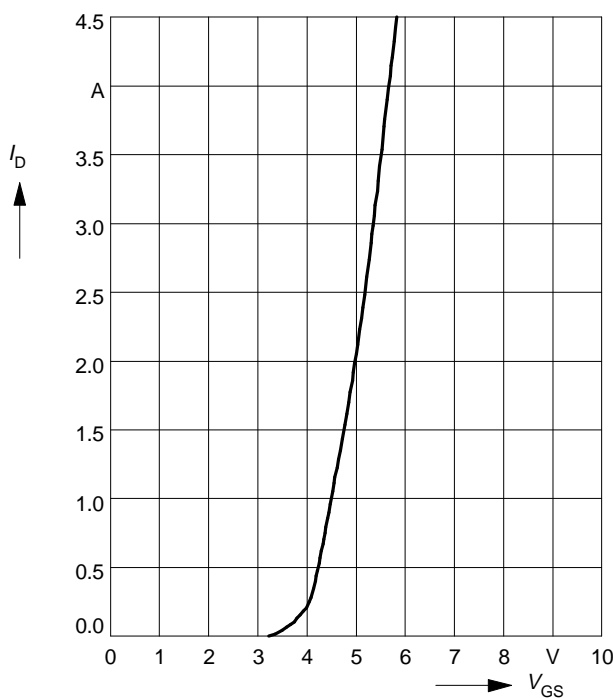
parameter:  $V_{GS}$



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

parameter:  $t_p = 80 \mu s$

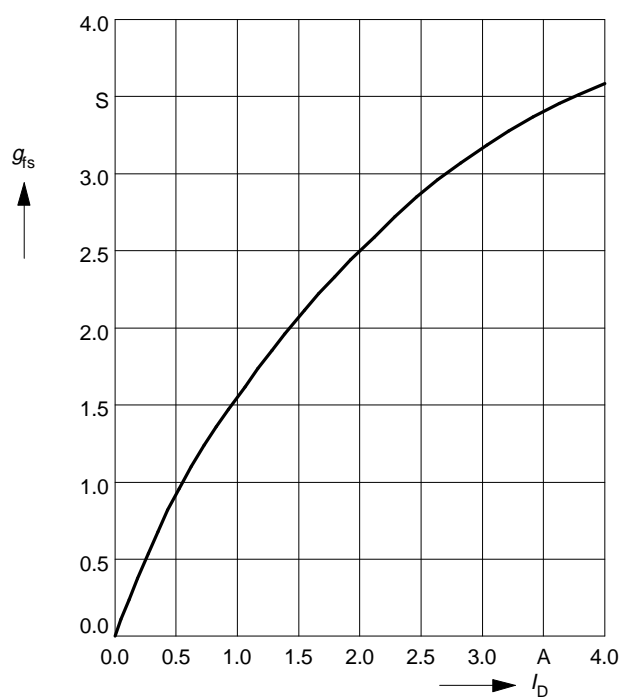
$$V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$$



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

parameter:  $t_p = 80 \mu s$ ,

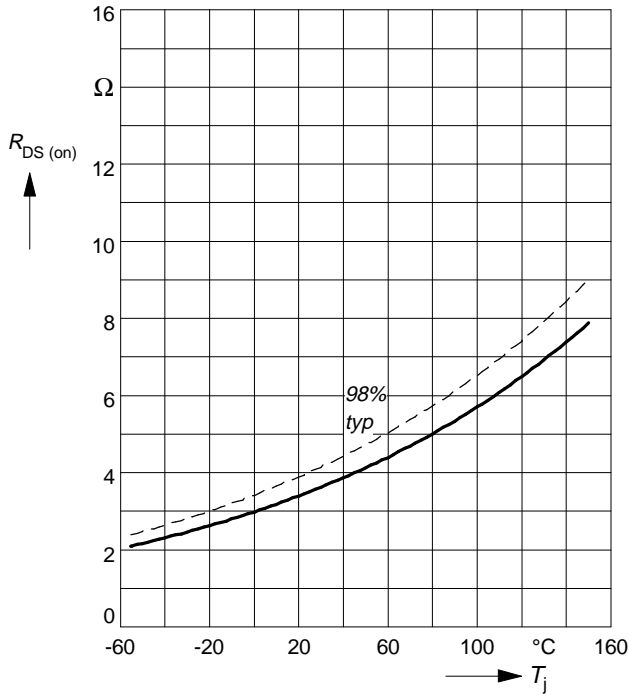
$$V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$$



### Drain-source on-resistance

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

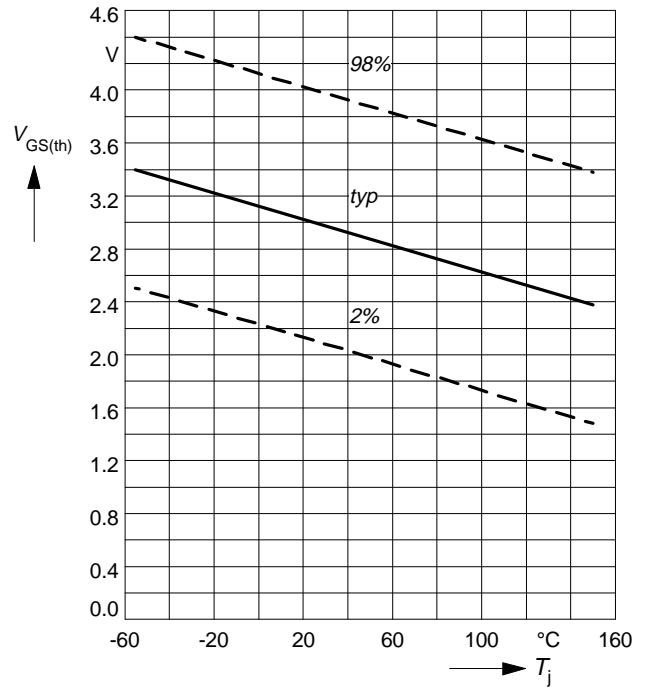
parameter:  $I_D = 1.5 \text{ A}$ ,  $V_{GS} = 10 \text{ V}$



### Gate threshold voltage

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

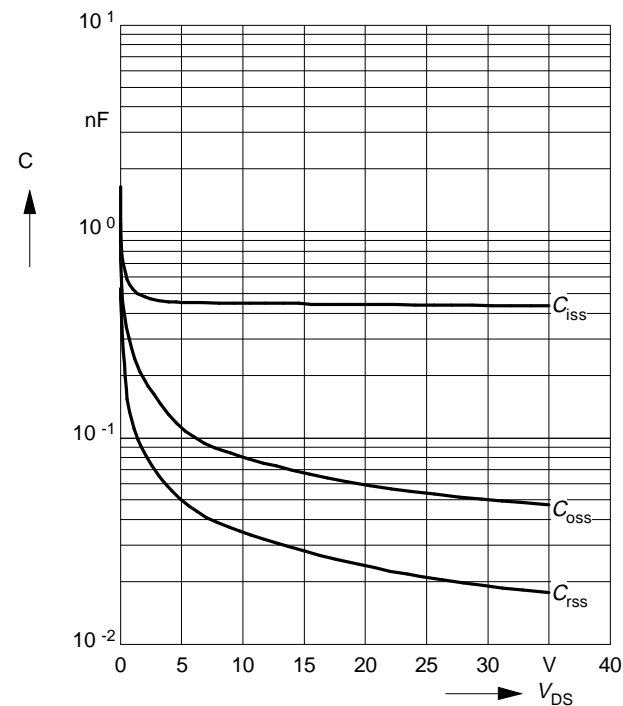
parameter:  $V_{GS} = V_{DS}$ ,  $I_D = 1 \text{ mA}$



### Typ. capacitances

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

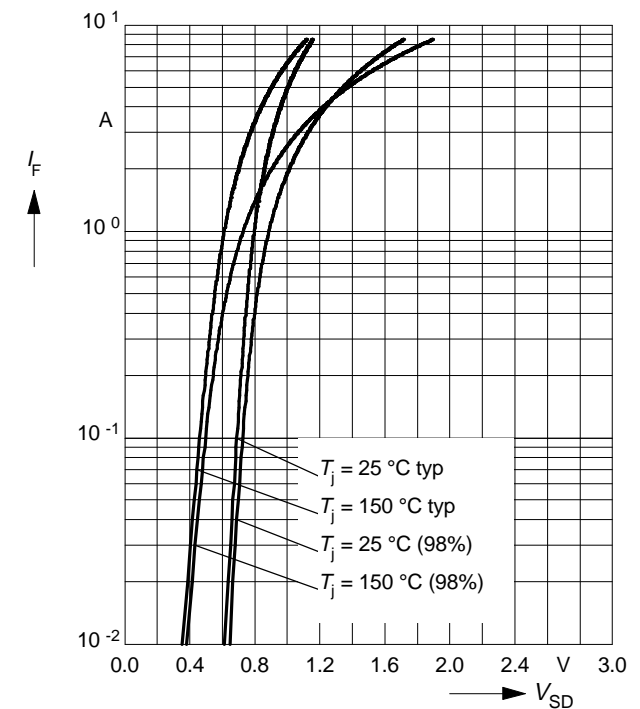
parameter:  $V_{GS} = 0 \text{ V}$ ,  $f = 1 \text{ MHz}$



### Forward characteristics of reverse diode

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

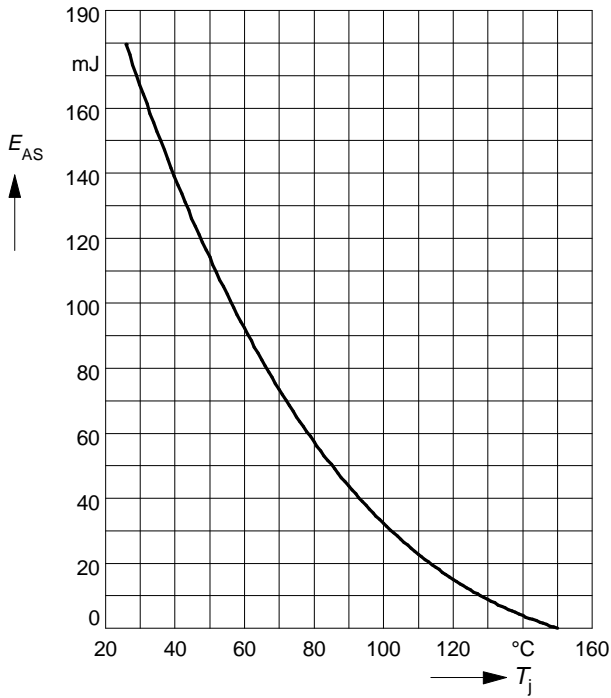
parameter:  $T_j$ ,  $t_p = 80 \mu\text{s}$



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

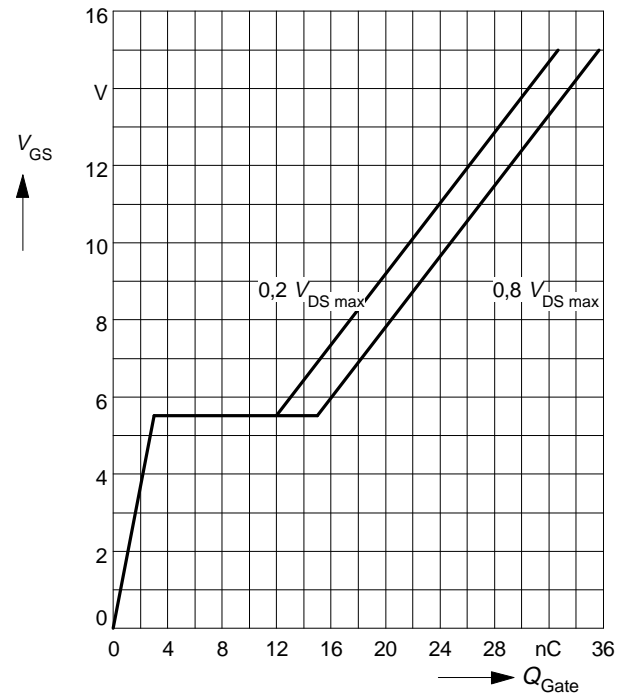
parameter:  $I_D = 2.4 \text{ A}$ ,  $V_{DD} = 50 \text{ V}$

$R_{GS} = 25 \text{ } \Omega$ ,  $L = 56.3 \text{ mH}$

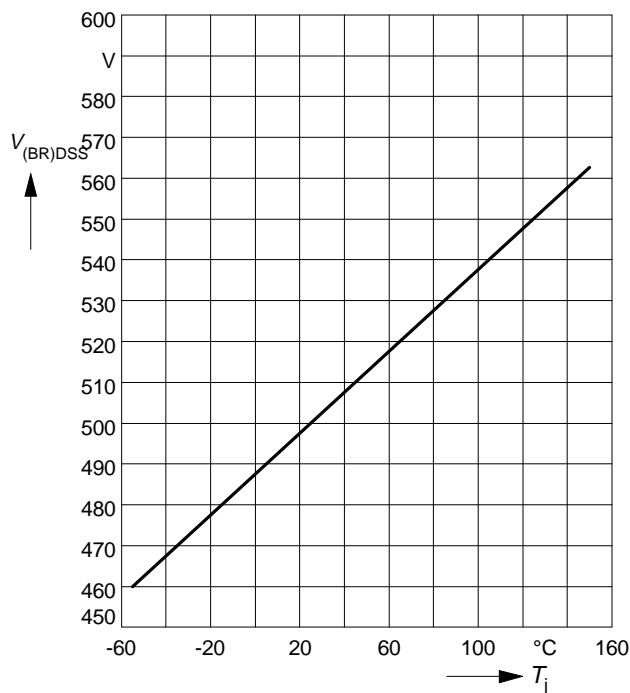


### Typ. gate charge $V_{GS} = f(Q_{Gate})$

parameter:  $I_{D \text{ puls}} = 4 \text{ A}$



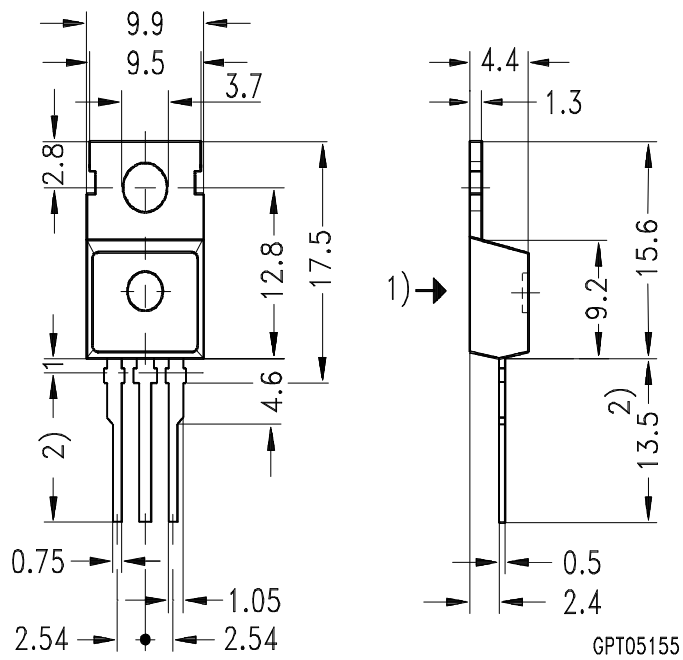
### Drain-source breakdown voltage $V_{(BR)DSS} = f(T_j)$



## Package Outlines

TO-220 AB

Dimension in mm



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



LittleDiode supplies new, hard to find or obsolete electronic components and semiconductors all over the world.

With over two million different components listed you are sure to find the part you need.

Feel free to visit us today at our online store:

[LittleDiode.com](http://LittleDiode.com)

Looking forward to providing you with the best possible service.