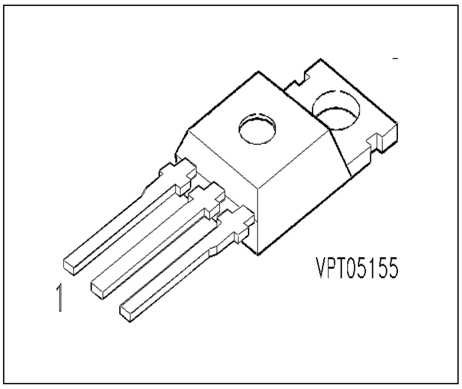
SIEMENS

BUZ 255

Not for new design

SIPMOS ® Power Transistor



Pin 1	Pin 2	Pin 3
G	D	S

- N channel
- Enhancement mode
- Avalanche-rated

Type	V_{DS}	I_D	$R_{DS(on)}$	Package	Ordering Code
BUZ 255	200 V	13 A	0.24 Ω	TO-220 AB	C67078-S1406-A2

Maximum Ratings

Parameter	Symbol	Values	Unit
Continuous drain current T_C = 31 °C	I_D	13	A
Pulsed drain current T_C = 25 °C	I_{Dpuls}	52	
Avalanche current,limited by T_{jmax}	I_{AR}	13	
Avalanche energy,periodic limited by T_{jmax}	E_{AR}	9	mJ
Avalanche energy, single pulse I_D = 13 A, V_{DD} = 50 V, R_{GS} = 25 Ω L = 1.89 mH, T_j = 25 °C	E_{AS}	200	
Gate source voltage	V_{GS}	± 20	V
Power dissipation T_C = 25 °C	P_{tot}	95	W
Operating temperature	T_j	-55 ... + 150	°C
Storage temperature	T_{stg}	-55 ... + 150	
Thermal resistance, chip case	R_{thJC}	≤ 1.32	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	$V_{(BR)DSS}$	250	-	-	V
Gate threshold voltage V_{GS}=$V_{DS,}$ I_D = 1 mA	$V_{GS(th)}$	2.1	3	4	
Zero gate voltage drain current	I_{DSS}				µA
V_{DS} = 250 V, V_{GS} = 0 V, T_j = 25 °C		-	0.1	1	
V_{DS} = 250 V, V_{GS} = 0 V, T_j = 125 °C		-	10	100	
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 = 8.5 A	$R_{DS(on)}$	-	0.22	0.24	Ω

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

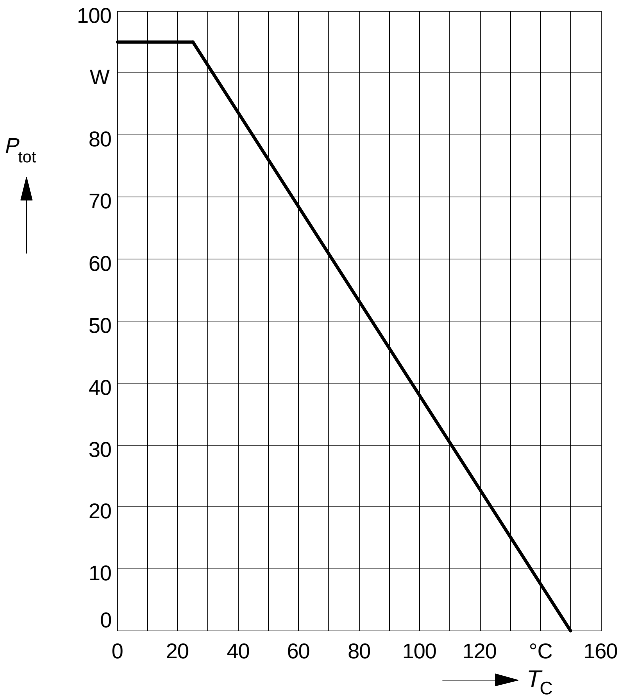
Parameter	Symbol	Values			Unit
		min.	**typ.**	**max.**	
Dynamic Characteristics					
Transconductance $V_{DS} \geq 2 * I_D * R_{DS(on)max}$, I_D = 8.5 A	g_{fs}	5	9.4	-	S
Input capacitance V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	C_{iss}	-	970	1300	pF
Output capacitance V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	C_{oss}	-	165	250	
Reverse transfer capacitance V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	C_{rss}	-	85	130	
Turn-on delay time V_{DD} = 30 V, V_{GS} = 10 V, I_D = 3 A R_{GS} = 50 Ω	$t_{d(on)}$	-	15	25	ns
Rise time V_{DD} = 30 V, V_{GS} = 10 V, I_D = 3 A R_{GS} = 50 Ω	t_r	-	60	90	
Turn-off delay time V_{DD} = 30 V, V_{GS} = 10 V, I_D = 3 A R_{GS} = 50 Ω	$t_{d(off)}$	-	160	250	
Fall time V_{DD} = 30 V, V_{GS} = 10 V, I_D = 3 A R_{GS} = 50 Ω	t_f	-	60	80	

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	-	-	13	A
Inverse diode direct current,pulsed T_C = 25 °C	I_{SM}	-	-	52	
Inverse diode forward voltage V_{GS} = 0 V, I_F = 26 A	V_{SD}	-	1.3	1.6	V
Reverse recovery time V_R = 100 V, I_F=I_S, di_F/dt = 100 A/µs	t_{rr}	-	200	-	ns
Reverse recovery charge V_R = 100 V, I_F=I_S, di_F/dt = 100 A/µs	Q_{rr}	-	1.7	-	µC

Power dissipation

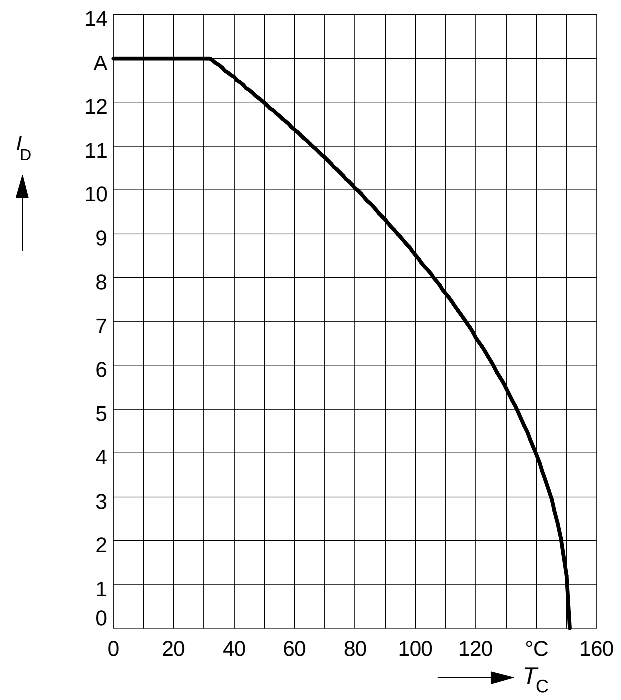
$P_{tot} = f(T_C)$



Drain current

$I_D = f(T_C)$

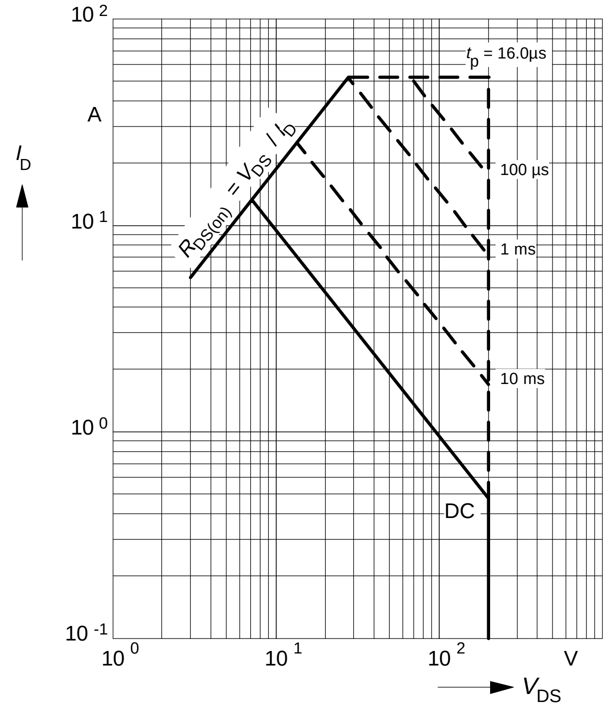
parameter: $V_{GS} \geq 10$ V



Safe operating area

$I_D = f(V_{DS})$

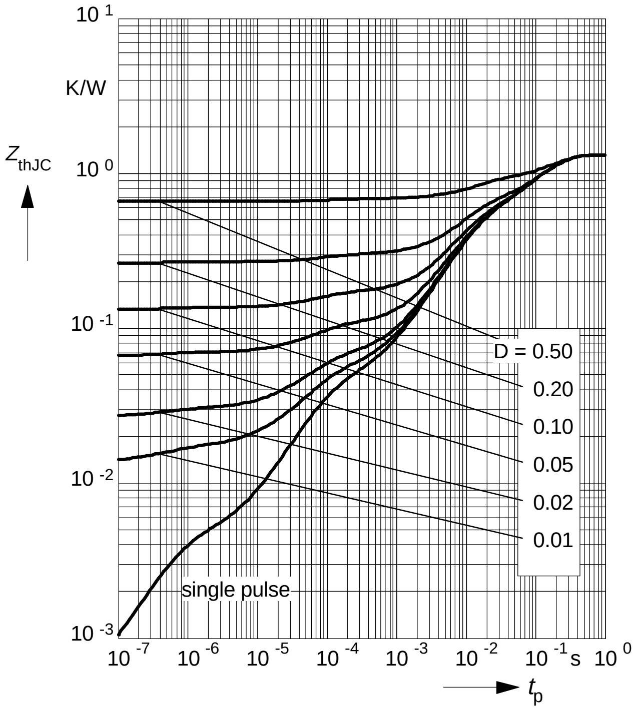
parameter: $D = 0.01$, $T_C = 25$°C



Transient thermal impedance

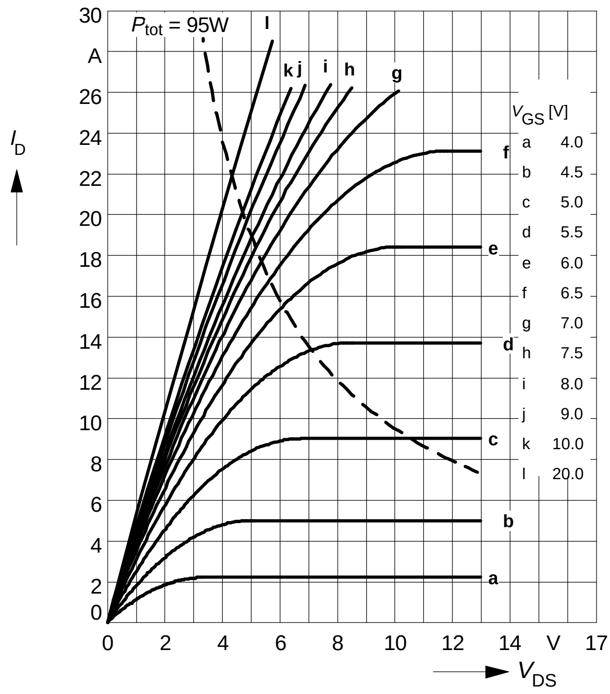
$Z_{th\,JC} = f(t_p)$

parameter: $D = t_p / T$



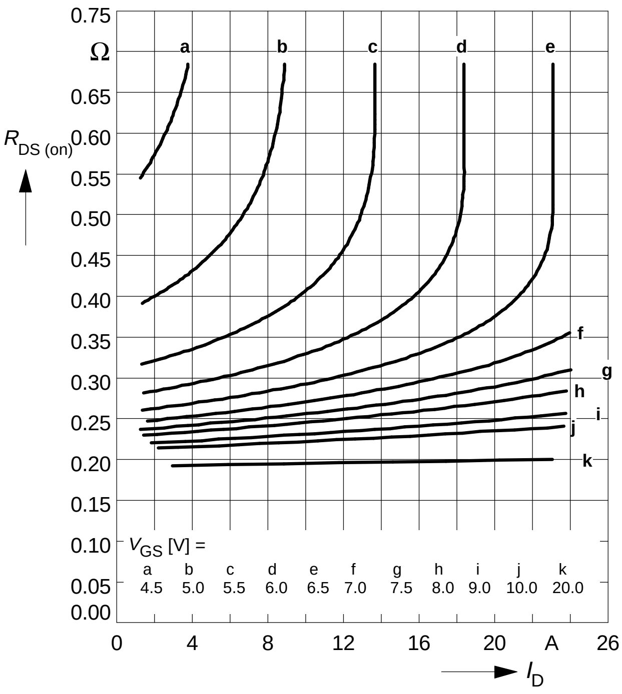
Typ. output characteristics

$I_D = f(V_{DS})$
parameter: t_p = 80 µs



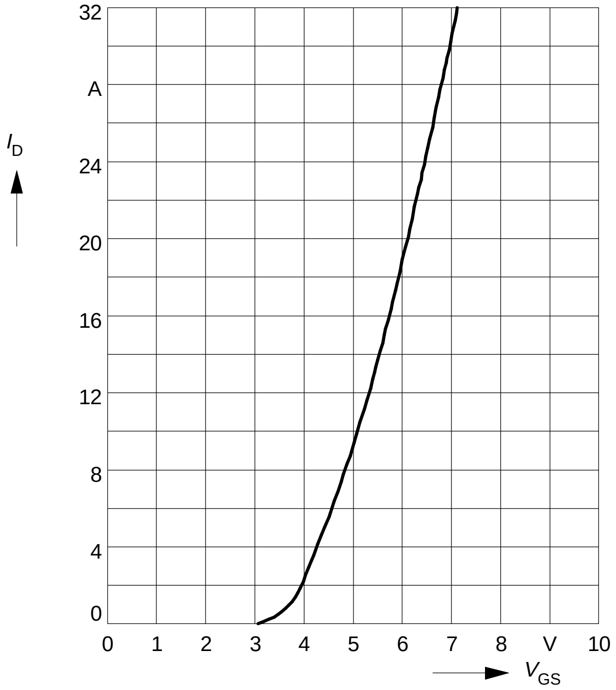
Typ. drain-source on-resistance

$R_{DS\,(on)} = f(I_D)$
parameter: V_{GS}



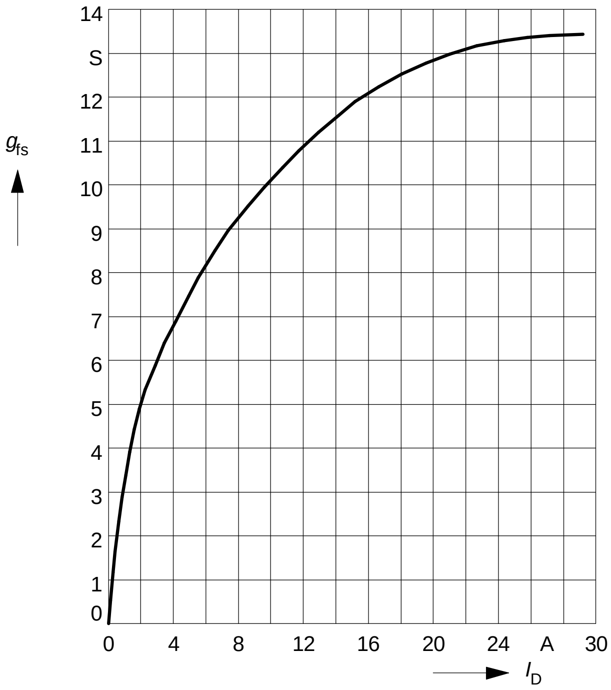
Typ. transfer characteristics $I_D = f(V_{GS})$

parameter: t_p = 80 µs
$V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$



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

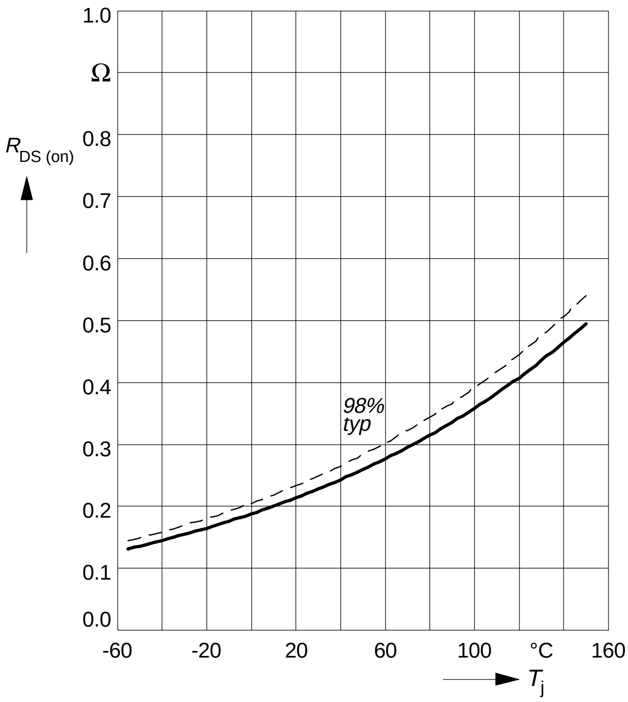
parameter: t_p = 80 µs,
$V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$



Drain-source on-resistance

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

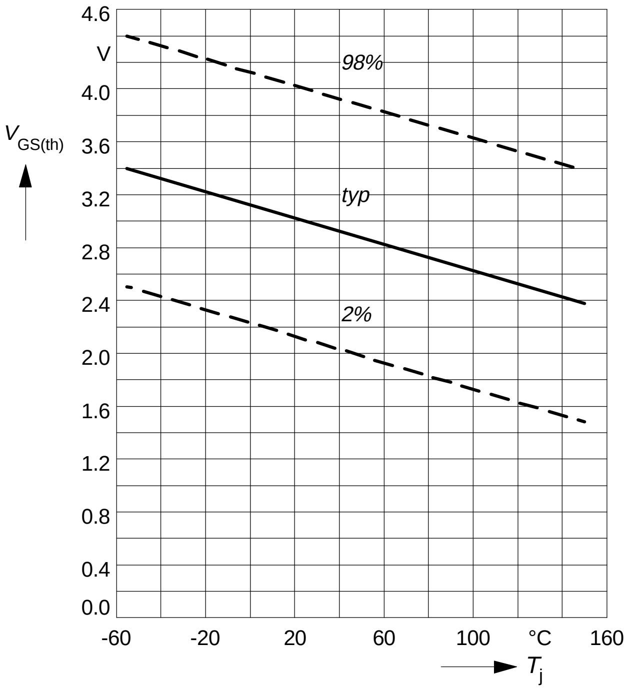
parameter: I_D = 8.5 A, V_{GS} = 10 V



Gate threshold voltage

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

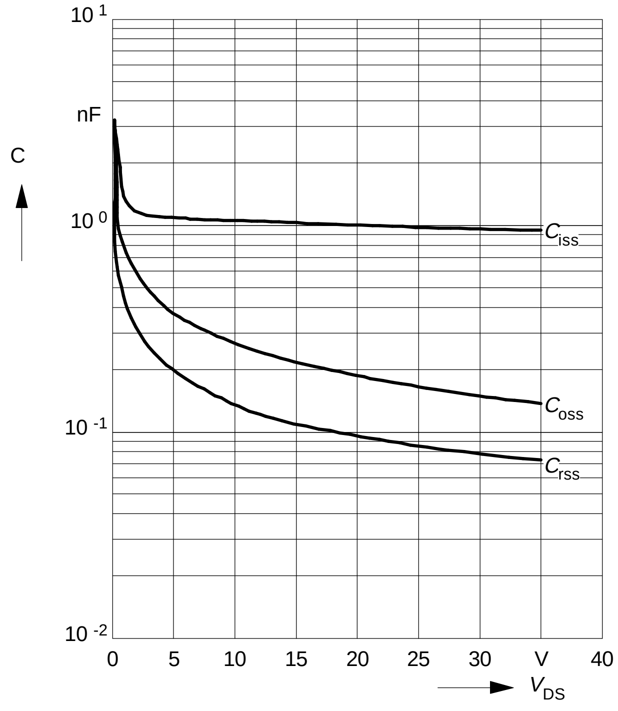
parameter: $V_{GS} = V_{DS}$, I_D = 1 mA



Typ. capacitances

$C = f(V_{DS})$

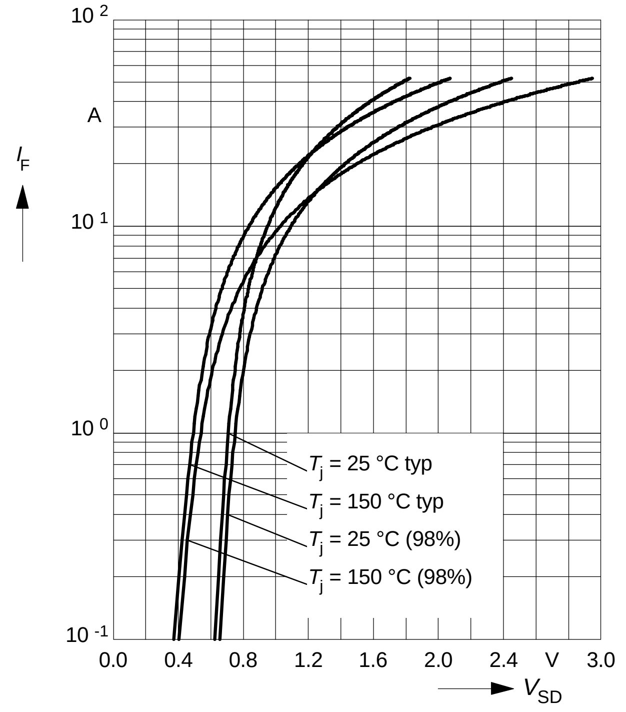
parameter: V_{GS} = 0V, f = 1MHz



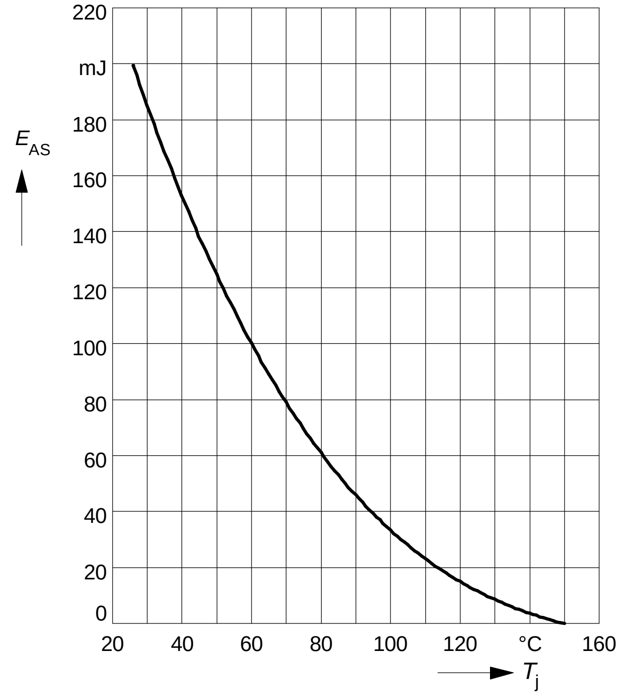
Forward characteristics of reverse diode

$I_F = f(V_{SD})$

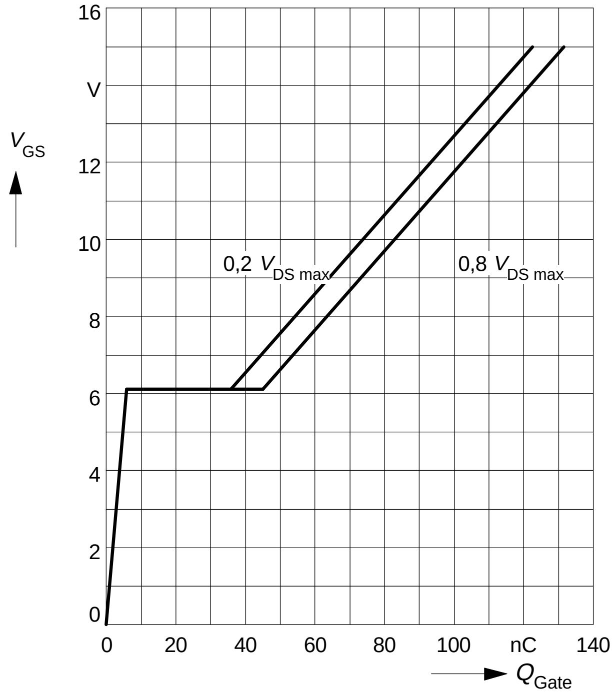
parameter: T_j, t_p = 80 µs



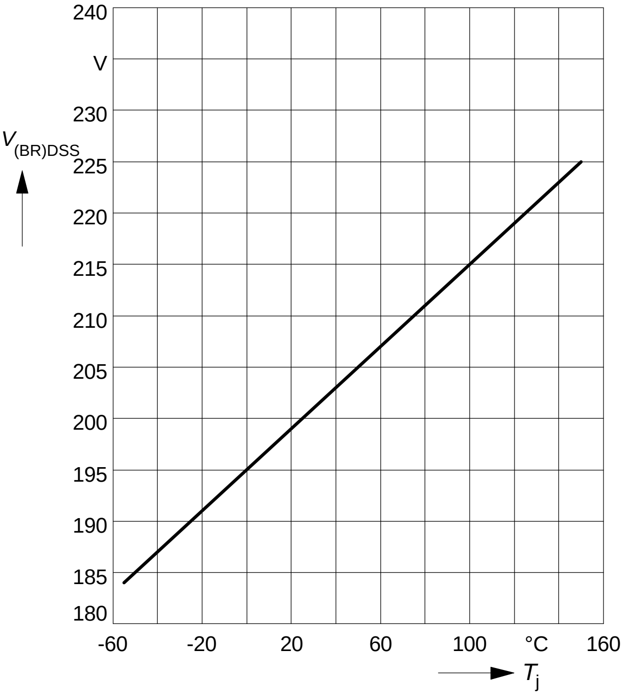
Avalanche energy $E_{AS} = f(T_j)$
parameter: I_D = 13 A, V_{DD} = 50 V
R_{GS} = 25 Ω, L = 1.89 mH



Typ. gate charge
$V_{GS} = f(Q_{Gate})$
parameter: $I_{D\ puls}$ = 20 A



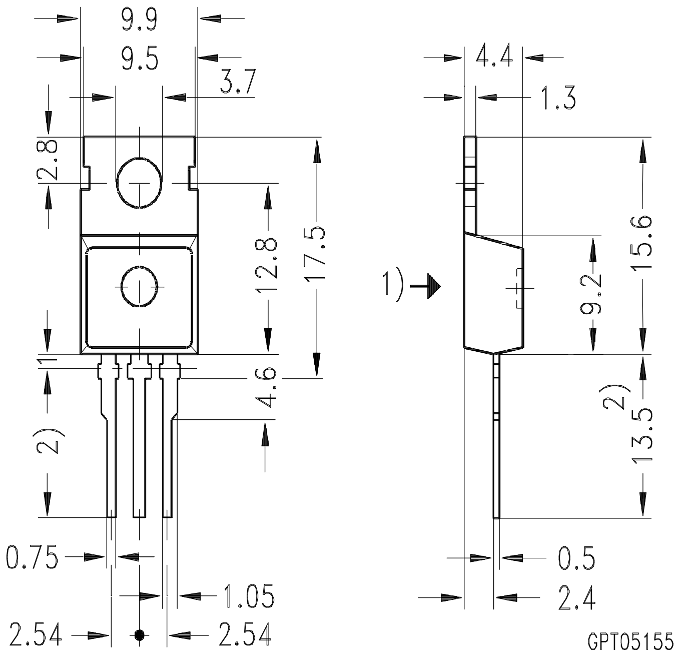
Drain-source breakdown voltage
$V_{(BR)DSS} = f(T_j)$



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