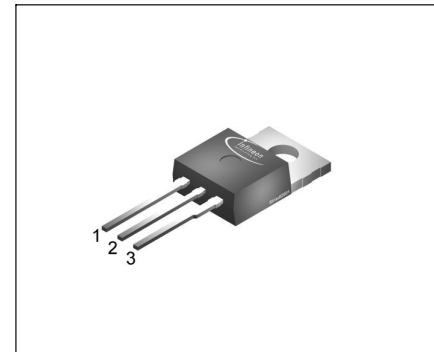


SIPMOS[®] Power Transistor

- N channel
- Enhancement mode
- Avalanche-rated
- Logic Level
- Pb-free lead plating; RoHS compliant

BUZ 73AL


Pin 1	Pin 2	Pin 3
G	D	S

Type	V _{DS}	I _D	R _{DS(on)}	Package	Pb-free
BUZ 73 AL	200 V	5.5 A	0.6 Ω	PG-TO220-3	Yes

Maximum Ratings

Parameter	Symbol	Values	Unit
Continuous drain current <i>T_C</i> = 37 °C	<i>I_D</i>	5.5	A
Pulsed drain current <i>T_C</i> = 25 °C	<i>I_{Dpuls}</i>	22	
Avalanche current, limited by <i>T_{jmax}</i>	<i>I_{AR}</i>	7	
Avalanche energy, periodic limited by <i>T_{jmax}</i>	<i>E_{AR}</i>	6.5	mJ
Avalanche energy, single pulse <i>I_D</i> = 7 A, <i>V_{DD}</i> = 50 V, <i>R_{GS}</i> = 25 Ω <i>L</i> = 3.67 mH, <i>T_j</i> = 25 °C	<i>E_{AS}</i>	120	
Gate source voltage	<i>V_{GS}</i>	± 20	V
ESD-Sensitivity HBM as per MIL-STD 883		Class 1	
Power dissipation <i>T_C</i> = 25 °C	<i>P_{tot}</i>	40	W
Operating temperature	<i>T_j</i>	-55 ... + 150	°C
Storage temperature	<i>T_{stg}</i>	-55 ... + 150	
Thermal resistance, chip case	<i>R_{thJC}</i>	≤ 3.1	K/W
Thermal resistance, chip to ambient	<i>R_{thJA}</i>	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 $V_{GS} = 0\text{ V}, I_D = 0.25\text{ mA}, T_j = 25^\circ\text{C}$	$V_{(BR)DSS}$	200	-	-	V
Gate threshold voltage $V_{GS}=V_{DS}, I_D = 1\text{ mA}$	$V_{GS(th)}$	1.2	1.6	2	
Zero gate voltage drain current $V_{DS} = 200\text{ V}, V_{GS} = 0\text{ V}, T_j = 25^\circ\text{C}$ $V_{DS} = 200\text{ V}, V_{GS} = 0\text{ V}, T_j = 125^\circ\text{C}$	I_{DSS}	-	0.1 10	1 100	μA
Gate-source leakage current $V_{GS} = 20\text{ V}, V_{DS} = 0\text{ V}$	I_{GSS}	-	10	100	nA
Drain-Source on-resistance $V_{GS} = 5\text{ V}, I_D = 3.5\text{ A}$	$R_{DS(on)}$	-	0.5	0.6	Ω

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

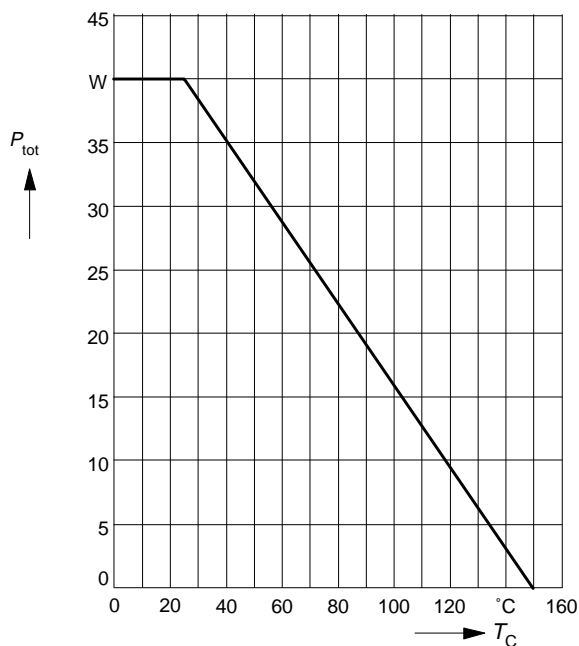
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Dynamic Characteristics					
Transconductance $V_{DS} \geq 2 \cdot I_D \cdot R_{DS(on)max}$, $I_D = 3.5\text{ A}$	g_{fs}	5	6.5	-	S
Input capacitance $V_{GS} = 0\text{ V}$, $V_{DS} = 25\text{ V}$, $f = 1\text{ MHz}$	C_{iss}	-	630	840	pF
Output capacitance $V_{GS} = 0\text{ V}$, $V_{DS} = 25\text{ V}$, $f = 1\text{ MHz}$	C_{oss}	-	120	200	
Reverse transfer capacitance $V_{GS} = 0\text{ V}$, $V_{DS} = 25\text{ V}$, $f = 1\text{ MHz}$	C_{rss}	-	60	90	
Turn-on delay time $V_{DD} = 30\text{ V}$, $V_{GS} = 5\text{ V}$, $I_D = 3\text{ A}$ $R_{GS} = 50\ \Omega$	$t_{d(on)}$	-	15	20	ns
Rise time $V_{DD} = 30\text{ V}$, $V_{GS} = 5\text{ V}$, $I_D = 3\text{ A}$ $R_{GS} = 50\ \Omega$	t_r	-	60	90	
Turn-off delay time $V_{DD} = 30\text{ V}$, $V_{GS} = 5\text{ V}$, $I_D = 3\text{ A}$ $R_{GS} = 50\ \Omega$	$t_{d(off)}$	-	100	130	
Fall time $V_{DD} = 30\text{ V}$, $V_{GS} = 5\text{ V}$, $I_D = 3\text{ A}$ $R_{GS} = 50\ \Omega$	t_f	-	40	50	

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	-	-	5.5	A
Inverse diode direct current, pulsed $T_C = 25^\circ\text{C}$	I_{SM}	-	-	22	
Inverse diode forward voltage $V_{GS} = 0\text{ V}$, $I_F = 14\text{ A}$	V_{SD}	-	1.1	1.7	V
Reverse recovery time $V_R = 100\text{ V}$, $I_F = I_S$, $di_F/dt = 100\text{ A}/\mu\text{s}$	t_{rr}	-	140	-	ns
Reverse recovery charge $V_R = 100\text{ V}$, $I_F = I_S$, $di_F/dt = 100\text{ A}/\mu\text{s}$	Q_{rr}	-	0.7	-	μC

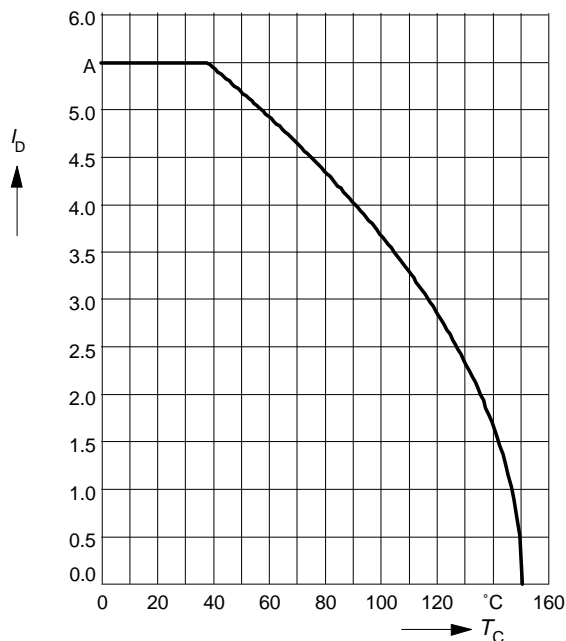
Power dissipation

$P_{tot} = f(T_C)$



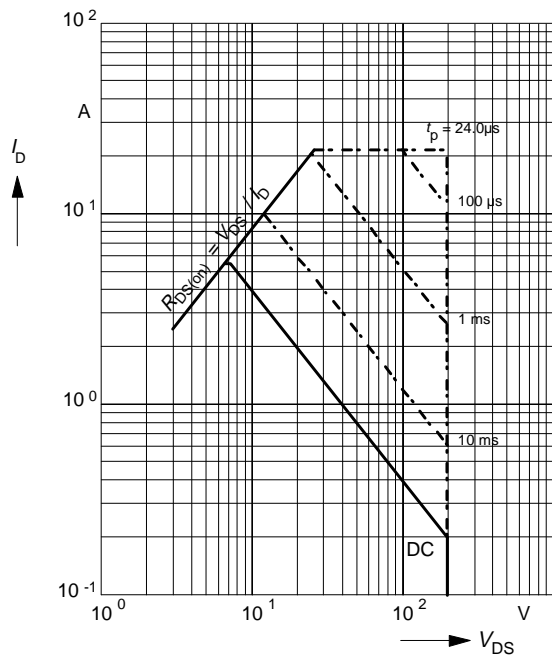
Drain current

$I_D = f(T_C)$
parameter: $V_{GS} \geq 5\text{ V}$



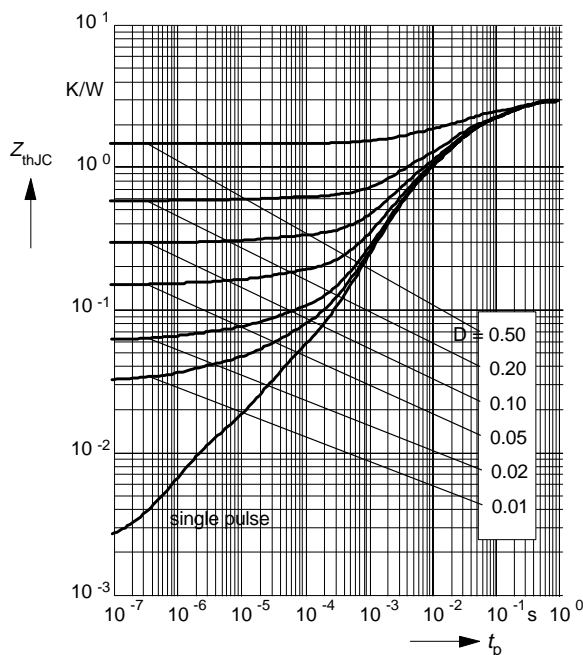
Safe operating area

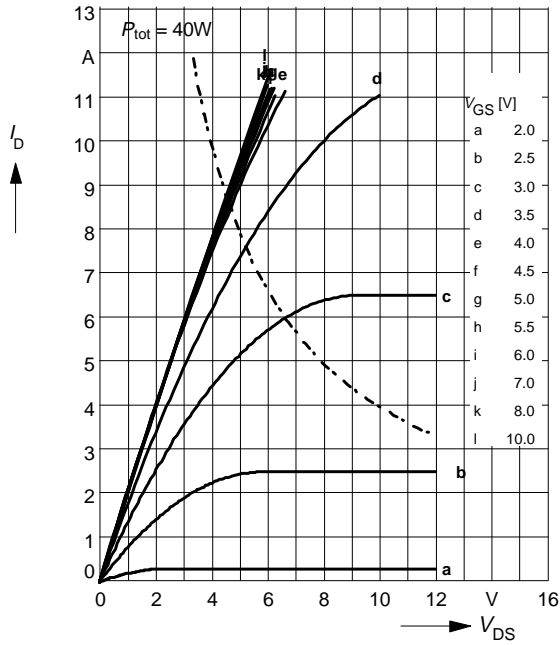
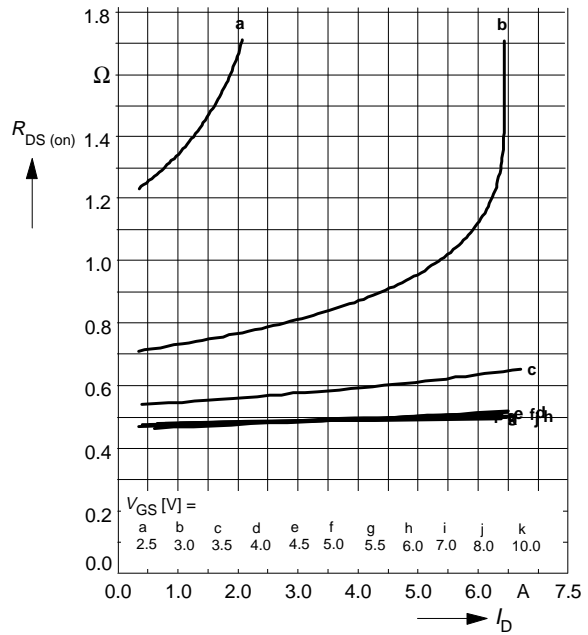
$I_D = f(V_{DS})$
parameter: $D = 0.01, T_C = 25^\circ\text{C}$

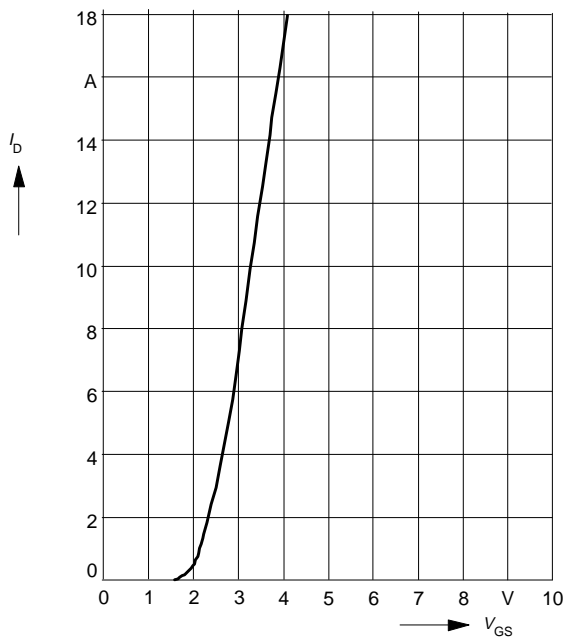


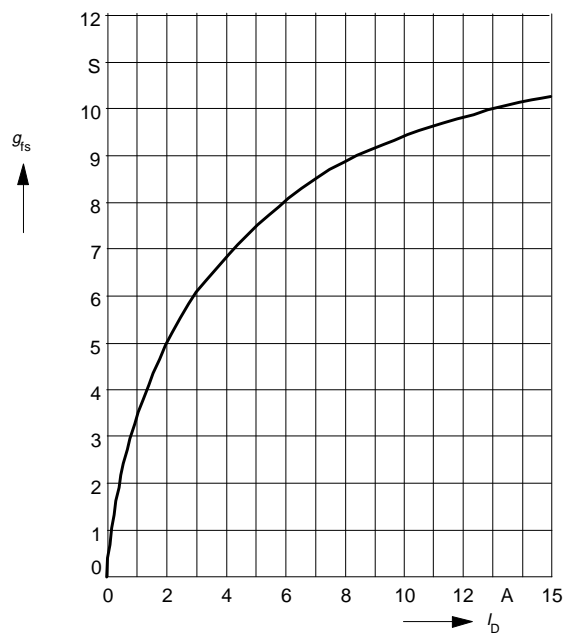
Transient thermal impedance

$Z_{thJC} = f(t_p)$
parameter: $D = t_p / T$



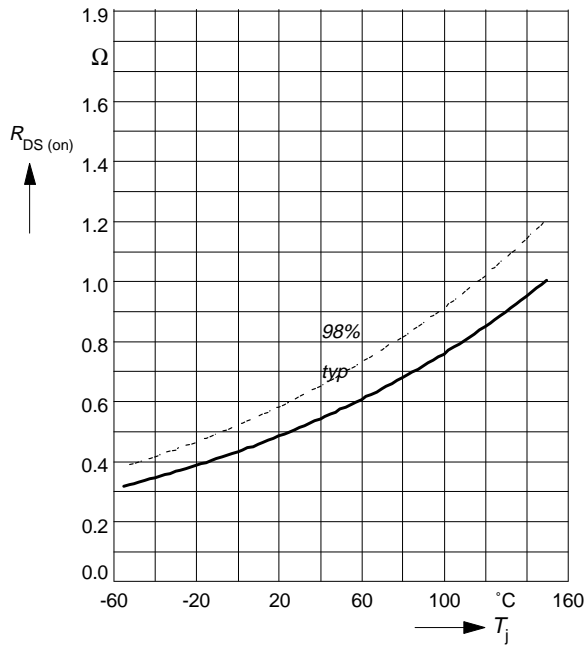
Typ. output characteristics
 $I_D = f(V_{DS})$
 parameter: $t_p = 80 \mu s$

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 $g_{fs} = f(I_D)$

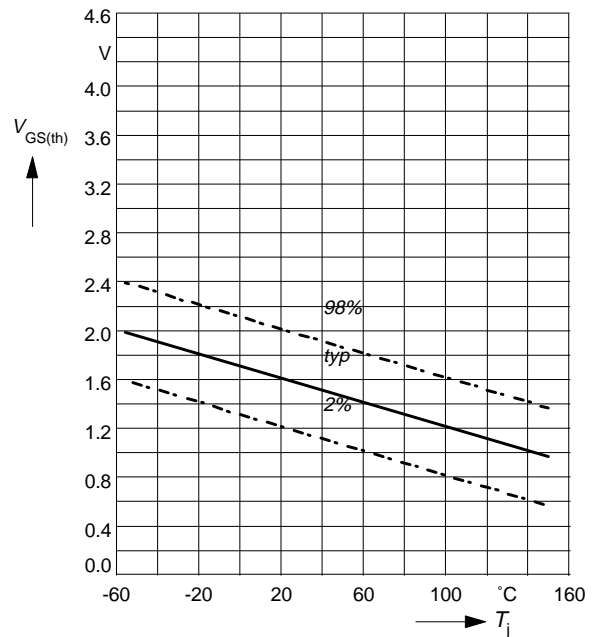
 parameter: $t_p = 80 \mu s$,
 $V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$


Drain-source on-resistance

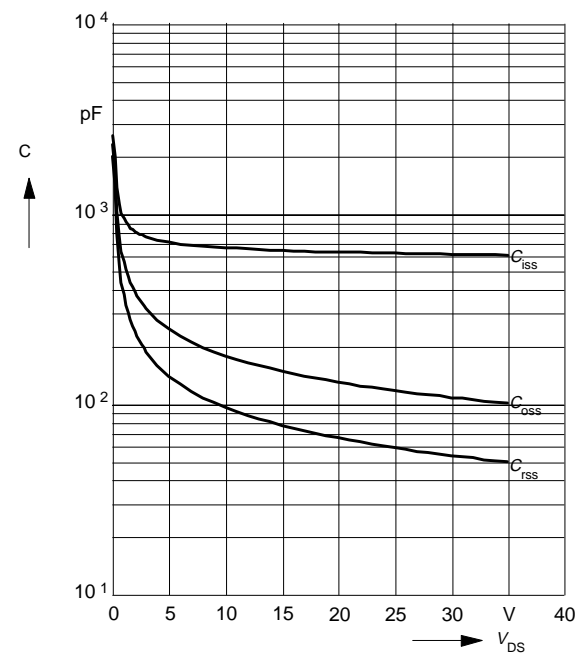
$$R_{DS(on)} = f(T_j)$$

 parameter: $I_D = 3.5 \text{ A}$, $V_{GS} = 5 \text{ V}$

Gate threshold voltage

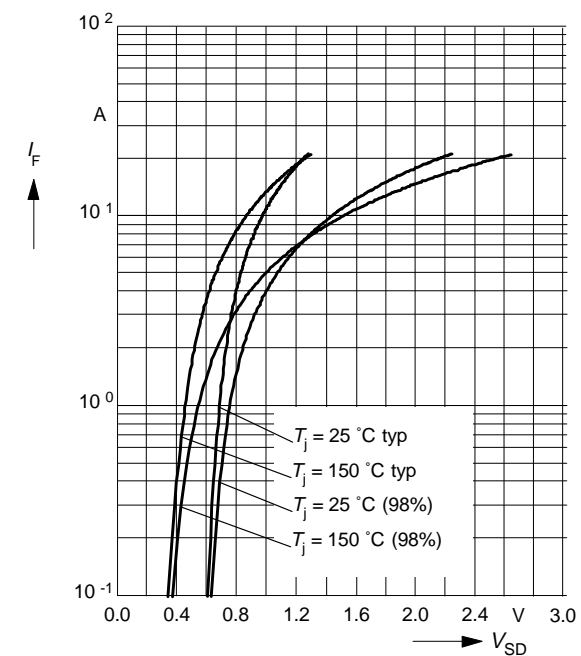
$$V_{GS(th)} = f(T_j)$$

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

Typ. capacitances

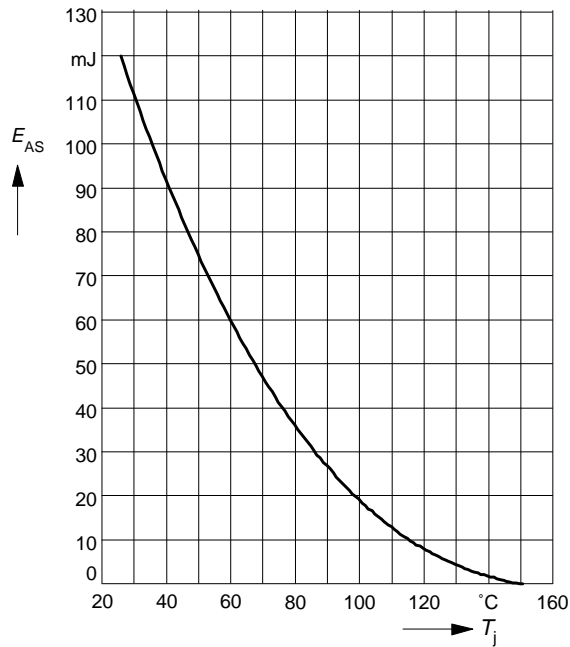
$$C = f(V_{DS})$$

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

Forward characteristics of reverse diode

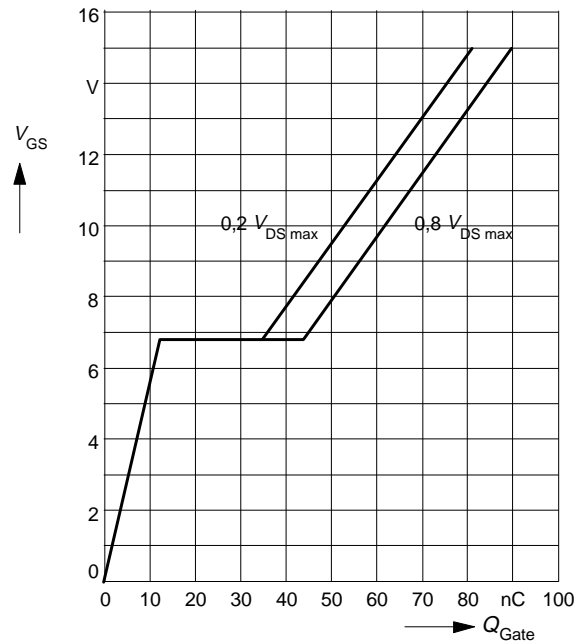
$$I_F = f(V_{SD})$$

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


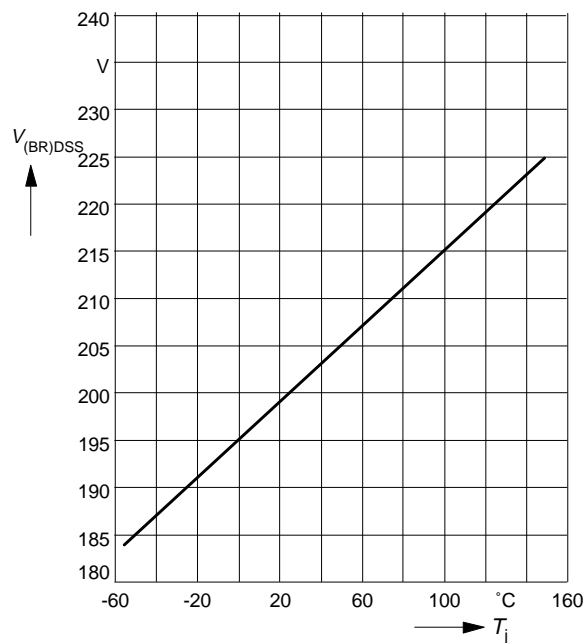
Avalanche energy $E_{AS} = f(T_j)$
 parameter: $I_D = 7\text{ A}$, $V_{DD} = 50\text{ V}$
 $R_{GS} = 25\ \Omega$, $L = 3.67\text{ mH}$

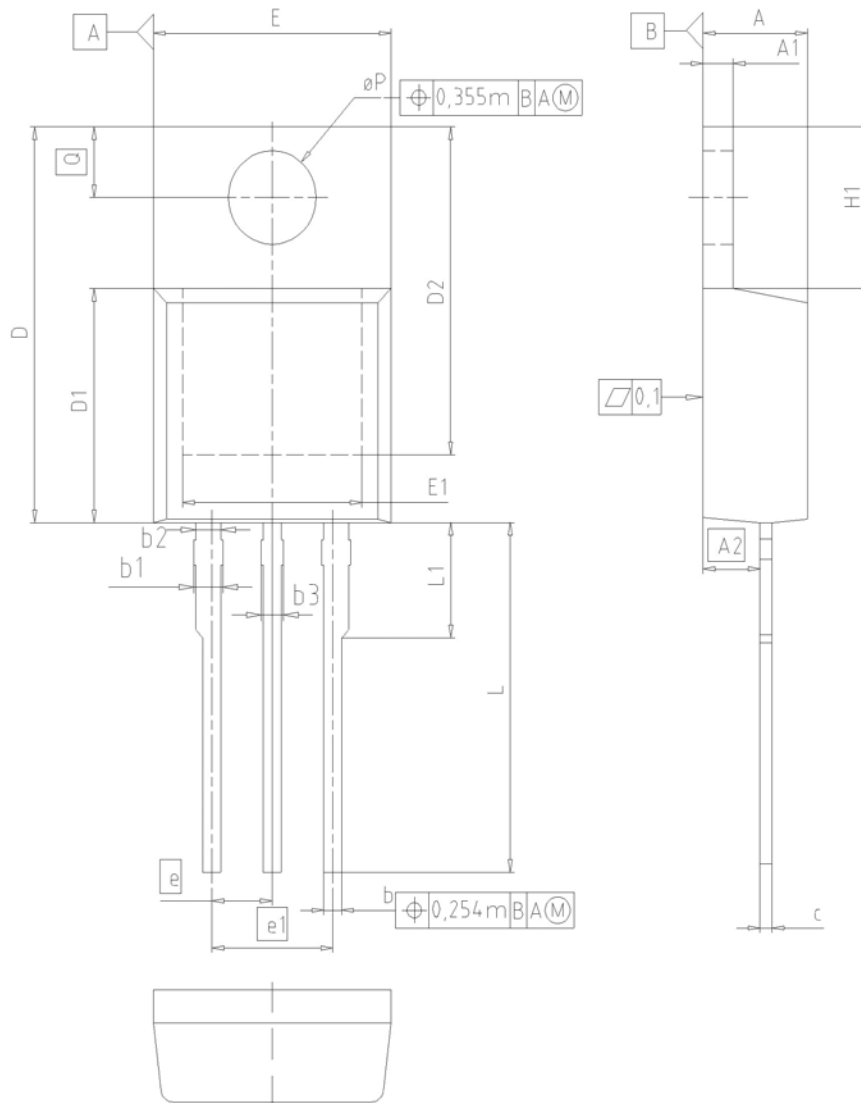


Typ. gate charge
 $V_{GS} = f(Q_{Gate})$
 parameter: $I_{D\text{ puls}} = 63\text{ A}$



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





DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.30	4.57	0.169	0.180
A1	1.17	1.40	0.046	0.055
A2	2.15	2.72	0.085	0.107
b	0.65	0.86	0.026	0.034
b1	0.95	1.40	0.037	0.055
b2	0.95	1.15	0.037	0.045
b3	0.65	1.15	0.026	0.045
c	0.33	0.60	0.013	0.024
D	14.81	15.95	0.583	0.628
D1	8.51	9.45	0.335	0.372
D2	12.19	13.10	0.480	0.516
E	9.70	10.36	0.382	0.408
E1	6.50	8.60	0.256	0.339
e	2.54		0.100	
e1	5.08		0.200	
N	3		3	
H1	5.90	6.90	0.232	0.272
L	13.00	14.00	0.512	0.551
L1	-	4.80	-	0.189
ϕP	3.60	3.89	0.142	0.153
Q	2.60	3.00	0.102	0.118

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SCALE

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