

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
300V	$5\Omega@10V$	1A



合肥矽普半导体

Siliup Semiconductor Technology Co., Ltd

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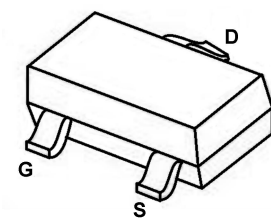
Feature

- Fast Switching
- Low Gate Charge and $R_{DS(on)}$
- 100% Single Pulse avalanche energy Test

Applications

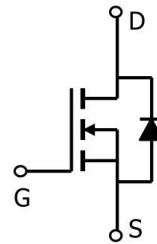
- DC-DC Converter
- Ideal for high-frequency switching and synchronous rectification

Package

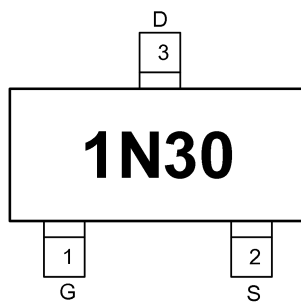


SOT-23-3L

Circuit diagram



Marking



1N30 :Device Code

Order Information

Device	Package	Unit/Tape
SP1N30T1	SOT-23-3L	3000

Absolute maximum ratings (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	300	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_c=25^\circ\text{C}$)	I_D	1	A
Pulsed Drain Current	I_{DM}	4	A
Single Pulse Avalanche Energy	E_{AS}	8	mJ
Power Dissipation ($T_c=25^\circ\text{C}$)	P_D	0.36	W
Thermal Resistance Junction-Ambient	$R_{\theta JA}$	347	$^\circ\text{C/W}$
Operating Junction Temperature Range	T_J	-55 to 150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 to 150	$^\circ\text{C}$

Electrical characteristics (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	VGS=0V , ID=250uA	300	---	---	V
Drain-Source Leakage Current	IDSS	VDS=240V , VGS=0V , TJ=25°C	---	---	1	uA
Gate-Source Leakage Current	IGSS	VGS=±20V , VDS=0V	---	---	±100	nA
Gate Threshold Voltage	VGS(th)	VGS=VDS , ID =250uA	1.1	1.6	2.1	V
Static Drain-Source on-Resistance	RDS(ON)	VGS=10V , ID=0.5A	---	5	6.3	Ω
Dynamic characteristics						
Input Capacitance	Ciss	VDS=25V , VGS=0V , f=1MHz	---	59	---	pF
Output Capacitance	Coss		---	7.5	---	
Reverse Transfer Capacitance	Crss		---	3	---	
Total Gate Charge	Qg	VDS=192V , VGS=10V , ID=1A	---	2	---	nC
Gate-Source Charge	Qgs		---	0.15	---	
Gate-Drain Charge	Qgd		---	0.9	---	
Switching Characteristics						
Turn-On Delay Time	Td(on)	VDD=120V , VGS=10V , RG=6Ω, ID=1A	---	3.4	---	nS
Rise Time	Tr		---	3	---	
Turn-Off Delay Time	Td(off)		---	14	---	
Fall Time	Tf		---	64	---	
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward	VSD	IS = 0.1A, VGS = 0V	-	-	1.2	V
Maximum Body-Diode Continuous Current	IS		-	-	0.1	A
Reverse Recovery Time	Trr	IS=0.1A, di/dt=100A/us, TJ=25°C	-	43	-	nS
Reverse Recovery Charge	Qrr		-	23	-	nC

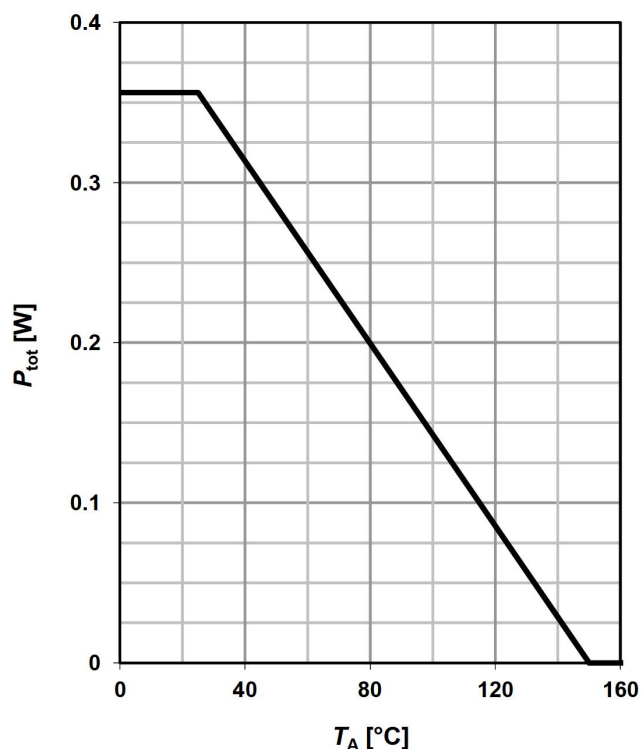
Note :

- The test condition is $V_{DD}=50V, V_{GS}=10V, L=64mH, R_G=25\Omega$

Typical Characteristics

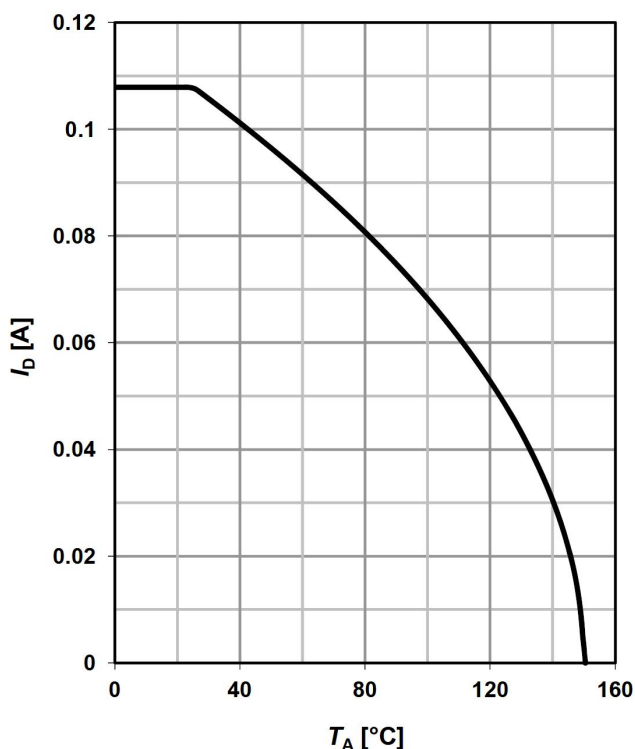
Power dissipation

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



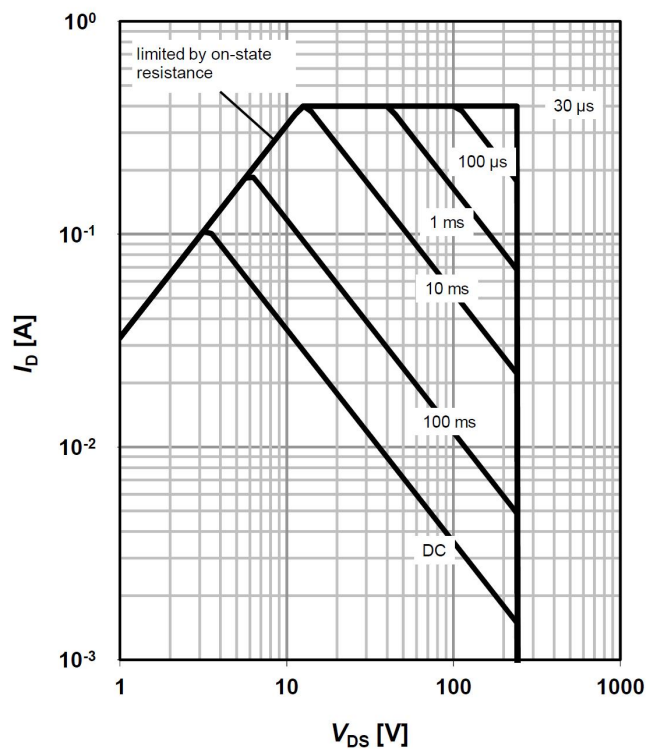
Drain current

$$I_D = f(T_A); V_{\text{GS}} \geq 10 \text{ V}$$



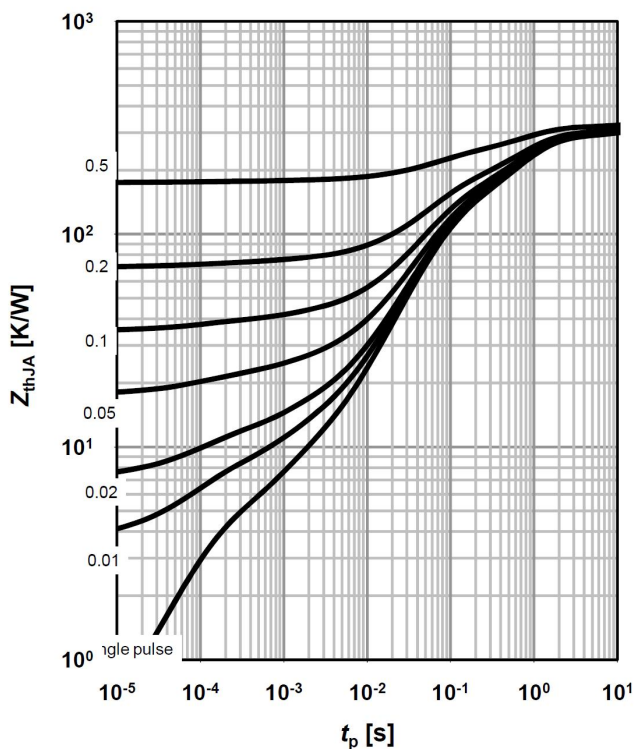
Safe operating area

$$I_D = f(V_{\text{DS}}); T_A = 25^\circ\text{C}; D = 0 \text{ parameter: } t_p$$



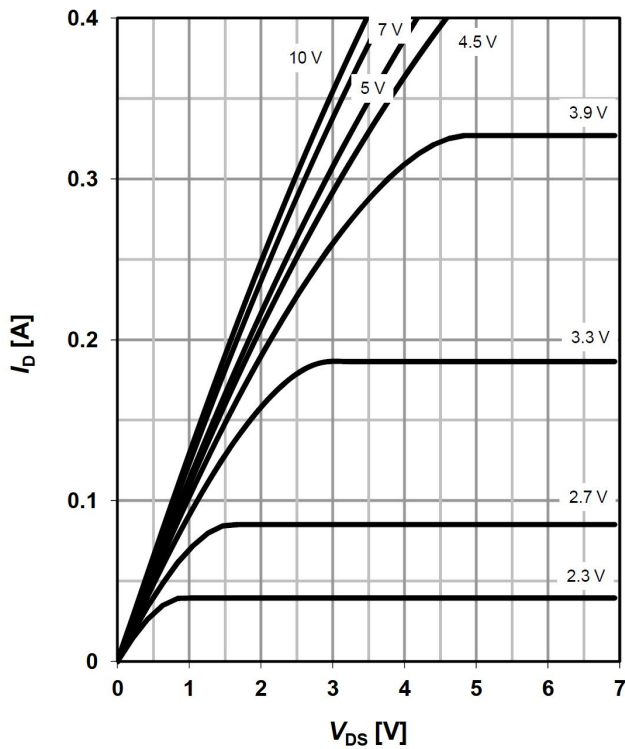
Max. transient thermal impedance

$$Z_{\text{thJA}} = f(t_p) \\ \text{parameter: } D = t_p / T$$



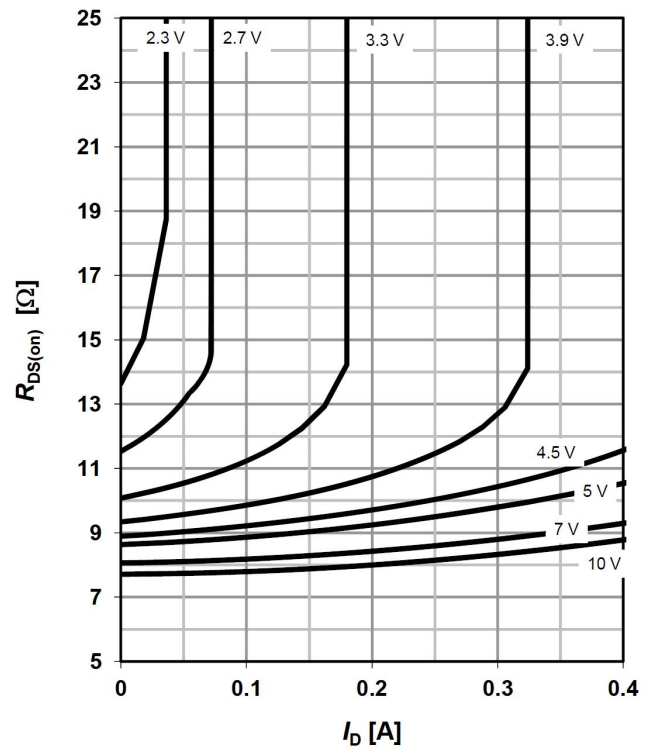
Typ. output characteristics $I_D = f(V_{DS})$;

$T_j = 25^\circ\text{C}$ parameter: V_{GS}



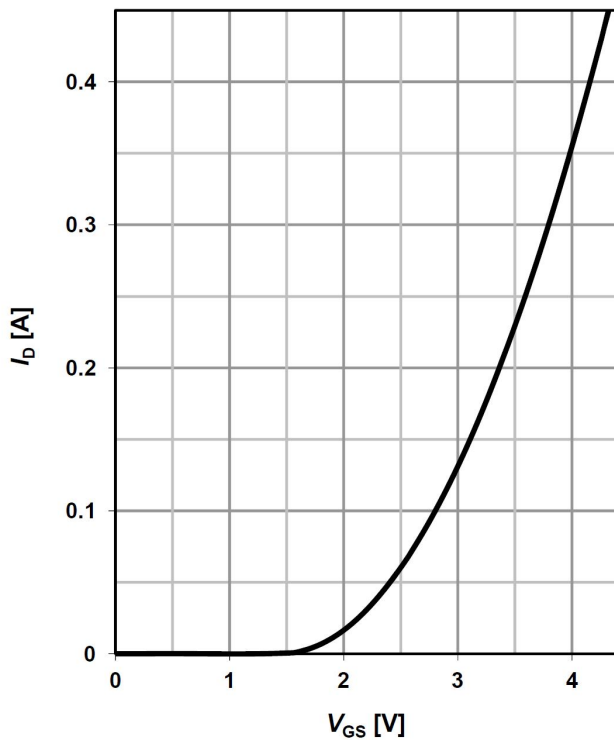
Typ. drain-source on resistance

$R_{DS(on)} = f(I_D)$; $T_j = 25^\circ\text{C}$ parameter: V_{GS}



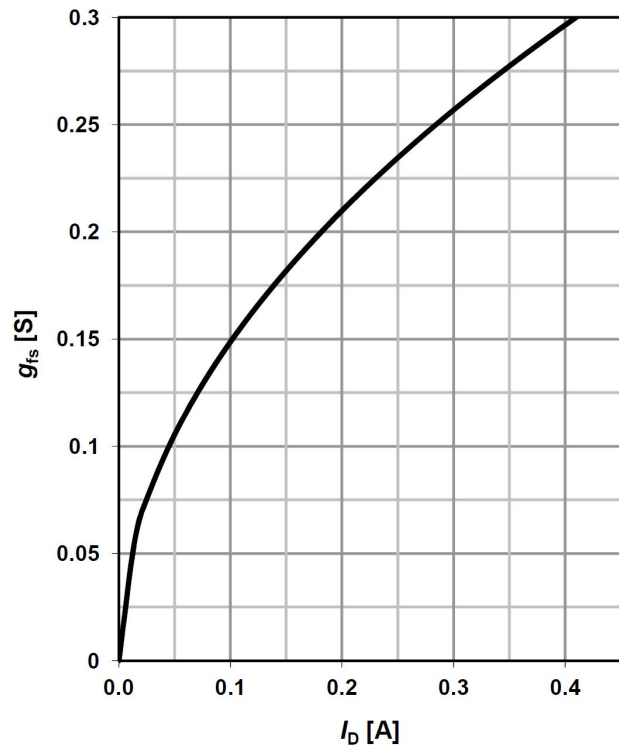
Typ. transfer characteristics

$I_D = f(V_{GS})$; $|V_{DS}| > 2|I_D|R_{DS(on)max}$



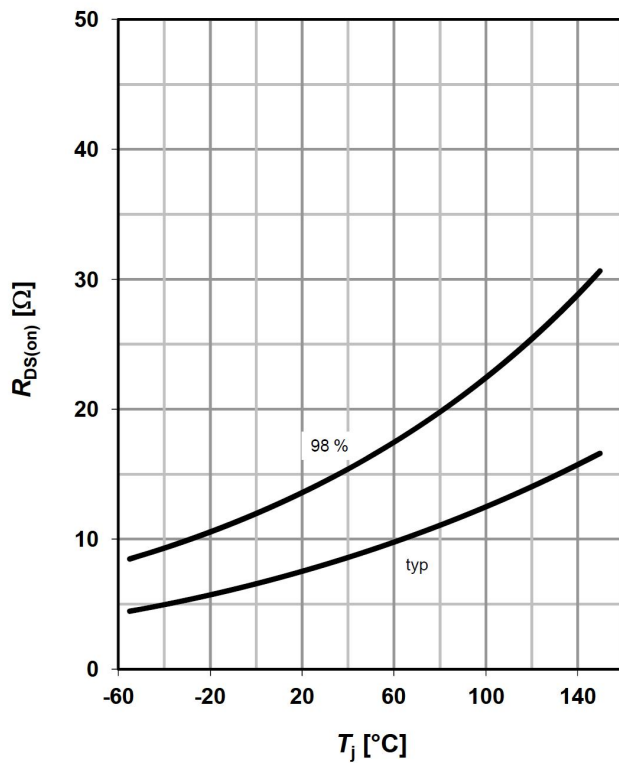
Typ. forward transconductance

$g_{fs} = f(I_D)$; $T_j = 25^\circ\text{C}$



Drain-source on-state resistance

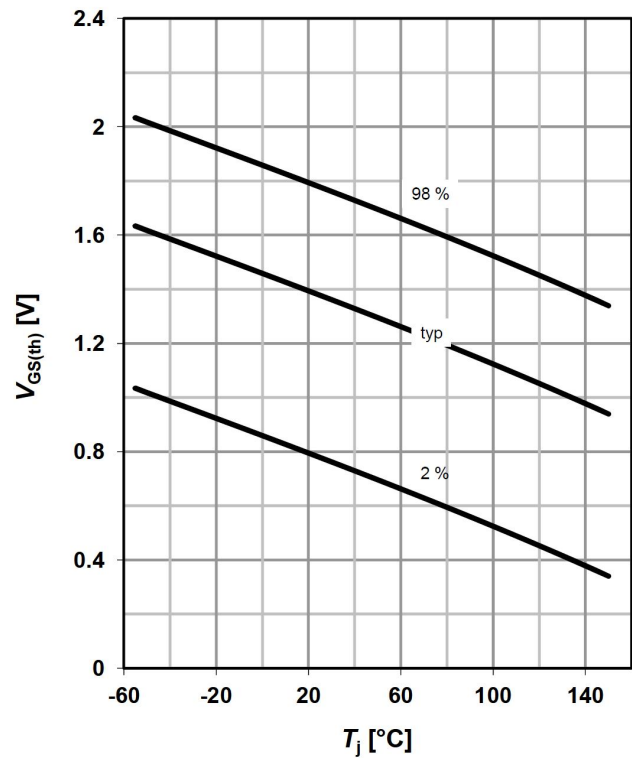
$$R_{DS(on)} = f(T_j); I_D = 0.1 \text{ A}; V_{GS} = 10 \text{ V}$$



Typ. gate threshold voltage

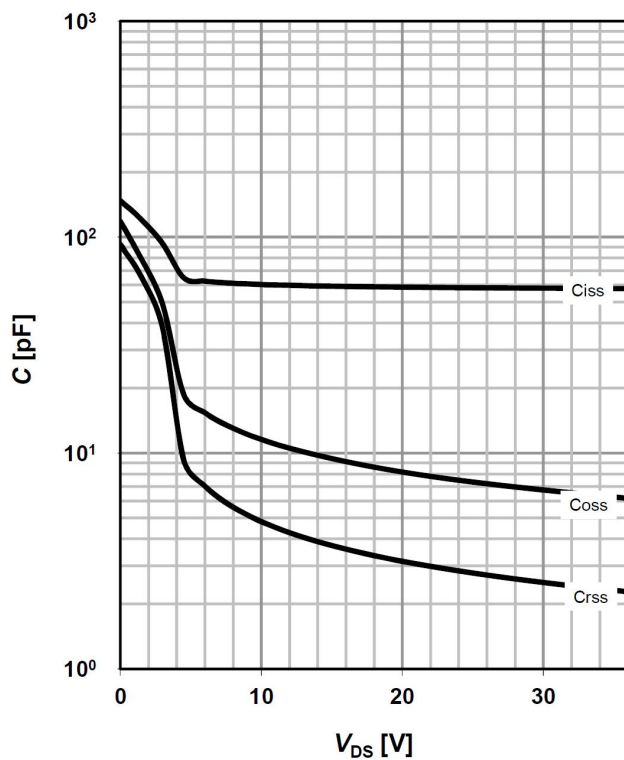
$$V_{GS(th)} = f(T_j); V_{DS} = V_{GS}; I_D = 56 \mu\text{A}$$

parameter: I_D



Typ. capacitances

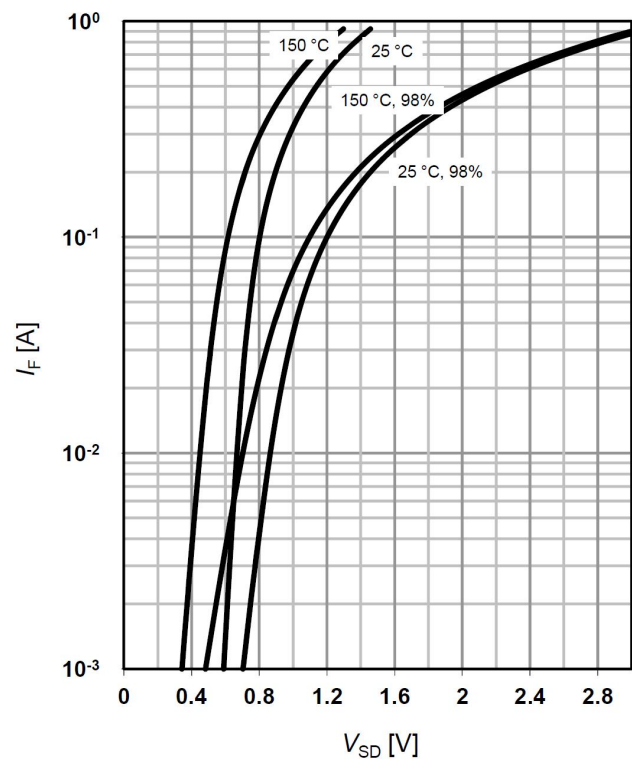
$$C = f(V_{DS}); V_{GS} = 0 \text{ V}; f = 1 \text{ MHz}; T_j = 25^\circ\text{C}$$



Forward characteristics of reverse diode

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

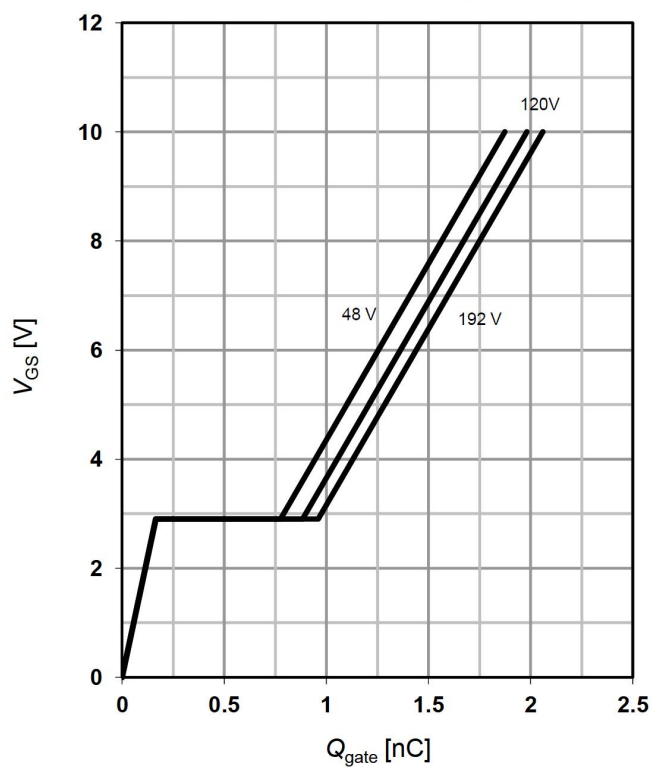
parameter: T_j



Typ. gate charge

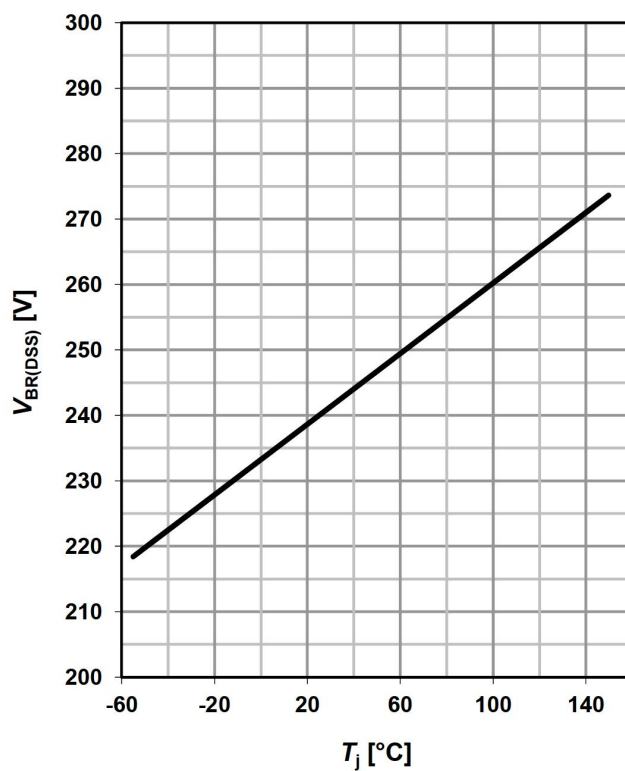
$$V_{GS}=f(Q_{gate}); I_D=0.1 \text{ A pulsed}$$

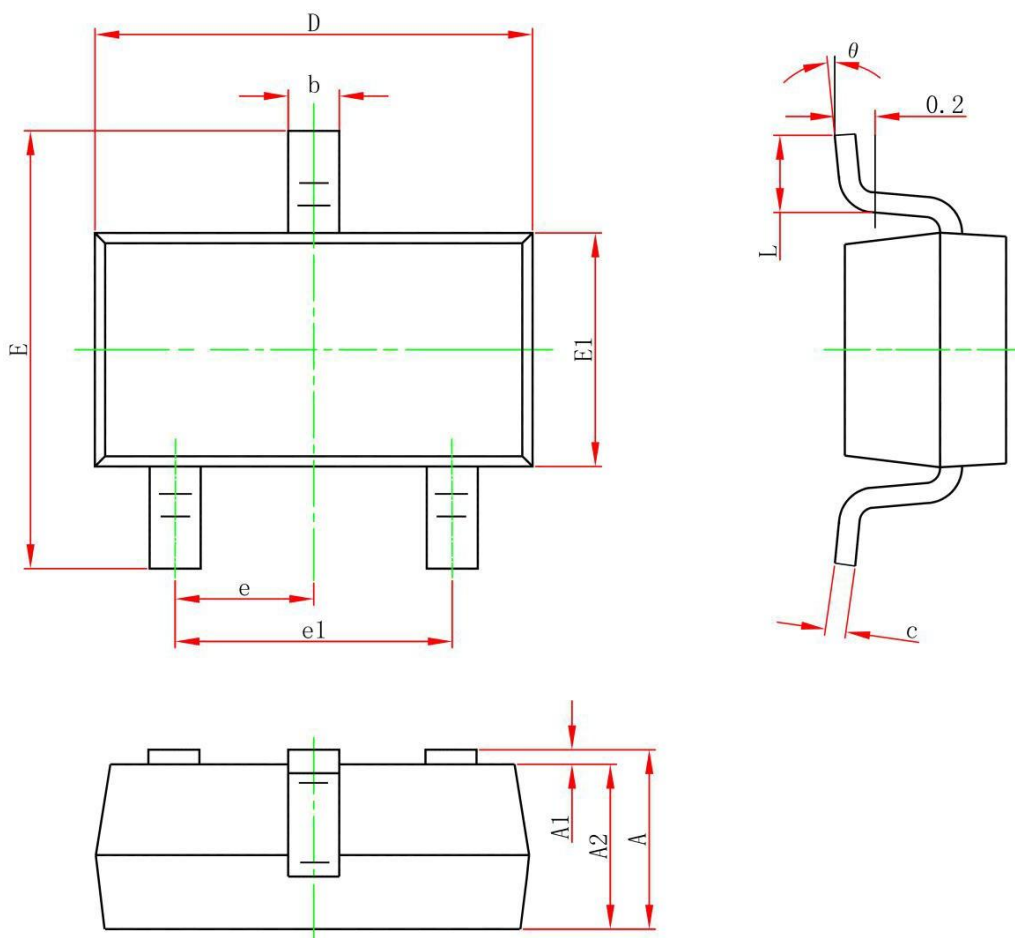
parameter: V_{DD}



Drain-source breakdown voltage

$$V_{BR(DSS)}=f(T_j); I_D=250 \mu\text{A}$$



SOT-23-3L Package Information


Symbol	Dimensions in millimeters	
	Min.	Max.
A	1.050	1.250
A1	0.000	0.100
A2	1.050	1.150
b	0.300	0.500
c	0.100	0.200
D	2.820	3.020
E	1.500	1.700
E1	2.650	2.950
e	0.950 Typ.	
e1	1.800	2.000
L	0.300	0.600
θ	0°	8°