



- ★ Super Low Gate Charge
- ★ 100% EAS Guaranteed
- ★ Green Device Available
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology

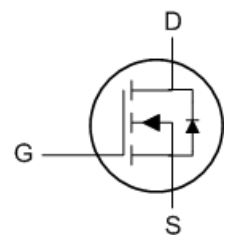
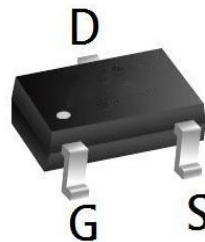
**Product Summary**

BVDSS	RDSON	ID
200V	480mΩ	2A

**Description**

The XR2N20L is the high cell density trenched N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The XR2N20L meet the RoHS and Green Product requirement

**SOT23-3L Pin Configuration**

**Absolute Maximum Ratings**

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	200	V
$V_{GS}$	Gate-Source Voltage	±20	V
$I_D@T_C=25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^{1,6}$	2	A
$I_D@T_C=100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^{1,6}$	1	A
$I_{DM}$	Pulsed Drain Current <sup>2</sup>	6	A
EAS	Single Pulse Avalanche Energy <sup>3</sup>	---	mJ
$I_{AS}$	Avalanche Current	---	A
$P_D@T_C=25^\circ C$	Total Power Dissipation <sup>4</sup>	2.5	W
$T_{STG}$	Storage Temperature Range	-55 to 150	°C
$T_J$	Operating Junction Temperature Range	-55 to 150	°C

**Thermal Data**

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient <sup>1</sup>	---	50	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case <sup>1</sup>	---	---	°C/W

**Electrical Characteristics (T<sub>J</sub>=25 °C, unless otherwise noted)**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	200	---	---	V
ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	BV <sub>DSS</sub> Temperature Coefficient	Reference to 25°C, I <sub>D</sub> =1mA	---	---	---	V/°C
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> =61A	---	480	570	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =61A	---	---	---	
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA	1.3	2.1	2.7	V
ΔV <sub>GS(th)</sub>	V <sub>GS(th)</sub> Temperature Coefficient		---	---	---	mV/°C
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =200V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C	---	---	1	uA
		V <sub>DS</sub> =200V, V <sub>GS</sub> =0V, T <sub>J</sub> =100°C	---	---	100	
I <sub>GSS</sub>	Gate-Source Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	---	---	±100	nA
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =10V, I <sub>D</sub> =31A	---	---	---	S
R <sub>g</sub>	Gate Resistance	V <sub>DS</sub> =0V, V <sub>GS</sub> =0V, f=1MHz	---	---	---	Ω
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =100V, V <sub>GS</sub> =10V, I <sub>D</sub> =1A	---	12	---	nC
Q <sub>gs</sub>	Gate-Source Charge		---	2.5	---	
Q <sub>gd</sub>	Gate-Drain Charge		---	3.8	---	
T <sub>d(on)</sub>	Turn-On Delay Time	V <sub>DD</sub> = 100V, R <sub>L</sub> =1.25Ω R <sub>G</sub> = 3Ω, V <sub>GS</sub> =10V	---	10	---	ns
T <sub>r</sub>	Rise Time		---	12	---	
T <sub>d(off)</sub>	Turn-Off Delay Time		---	15	---	
T <sub>f</sub>	Fall Time		---	15	---	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1MHz	---	495	---	pF
C <sub>oss</sub>	Output Capacitance		---	24	---	
C <sub>rss</sub>	Reverse Transfer Capacitance		---	18	---	

**Diode Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I <sub>S</sub>	Continuous Source Current <sup>1,4</sup>	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current	---	---	2	A
V <sub>SD</sub>	Diode Forward Voltage <sup>2</sup>	V <sub>GS</sub> =0V, I <sub>S</sub> =1A, T <sub>J</sub> =25°C	---	---	1.2	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>F</sub> =1A, di/dt=100A/μs,	---	50	---	nS
Q <sub>rr</sub>	Reverse Recovery Charge	T <sub>J</sub> = 25 °C	---	98	---	nC

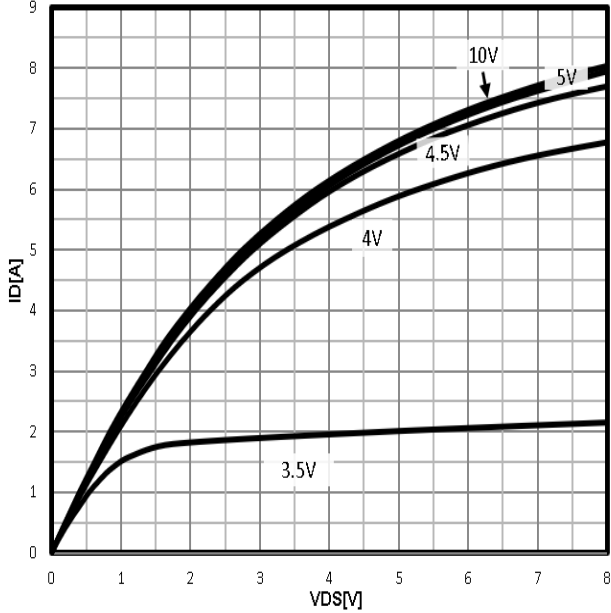
Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature.

Notes 2.E<sub>AS</sub> condition: T<sub>J</sub>=25°C, V<sub>DD</sub>=40V, V<sub>G</sub>=10V, R<sub>G</sub>=25Ω, L=0.5mH.

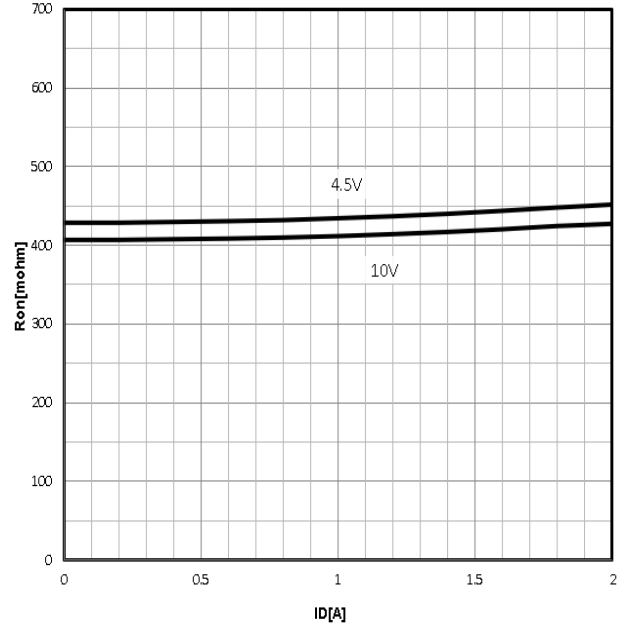
Notes 3.Repetitive Rating: Pulse width limited by maximum junction temperature.

Characteristics Curve:

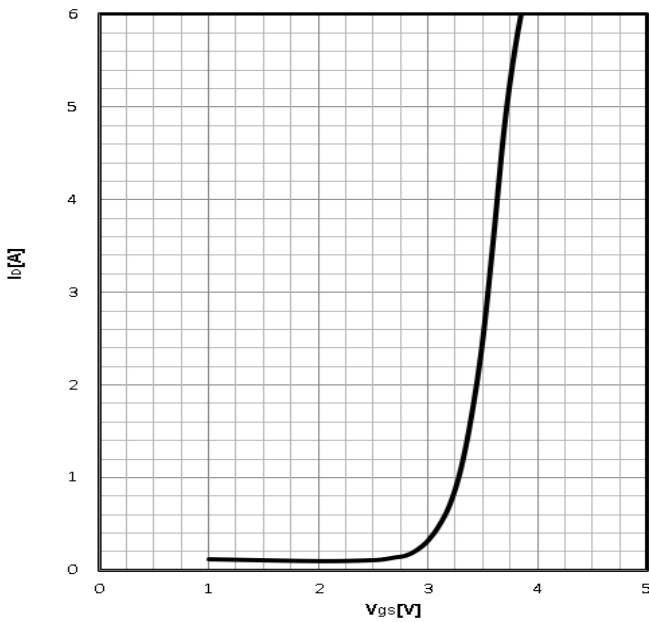
Typ. output characteristics  
 $I_D=f(V_{DS})$



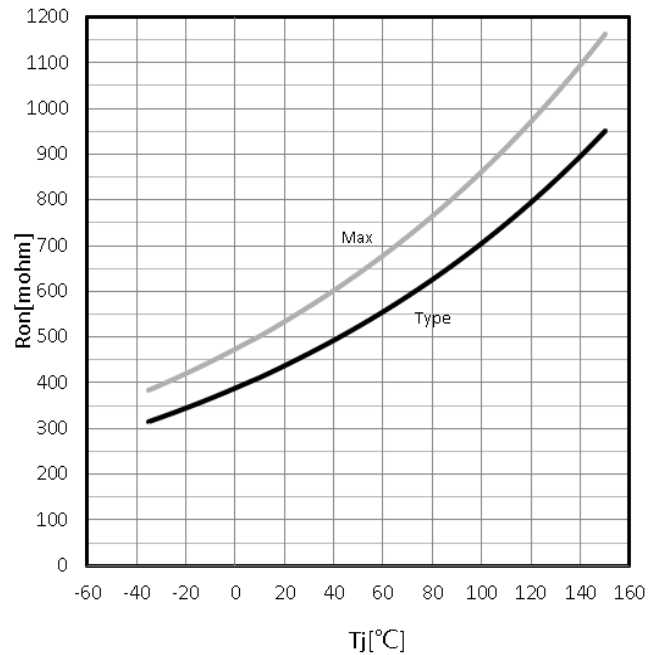
Typ. drain-source on resistance  
 $R_{DS(on)}=f(I_D)$



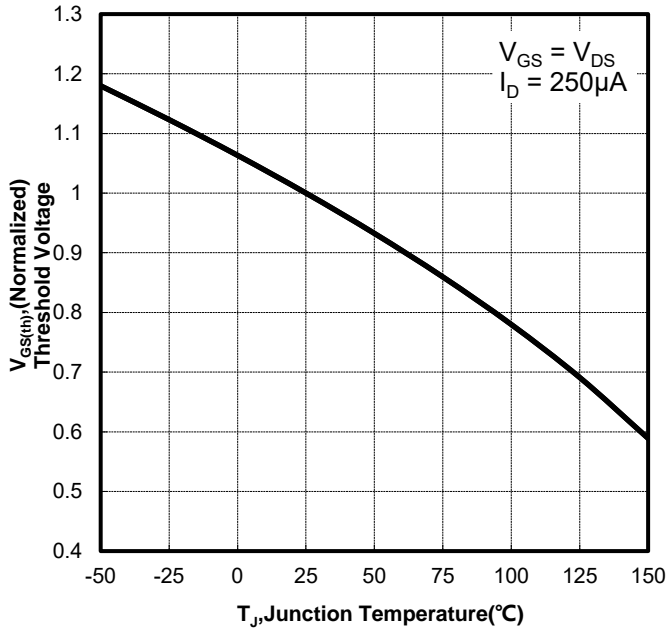
Typ. transfer characteristics  
 $I_D=f(V_{GS})$



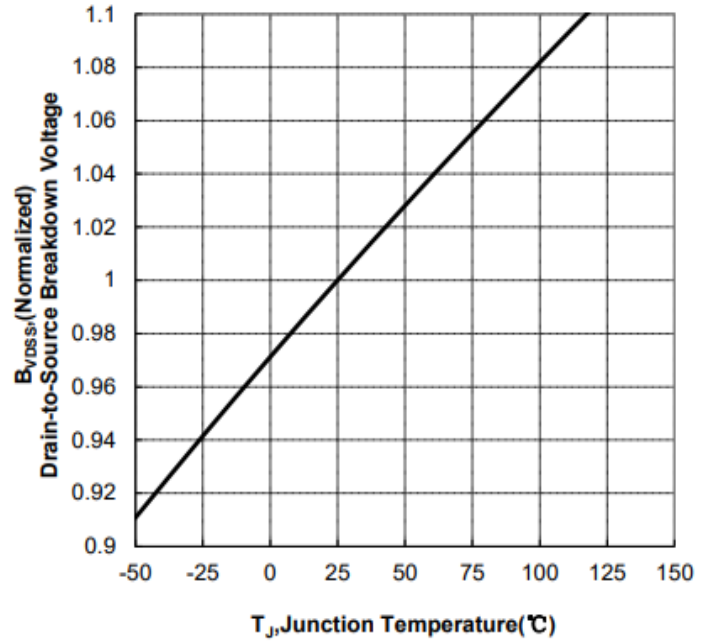
Drain-source on-state resistance  
 $R_{DS(on)}=f(T_j); I_D=2A; V_{GS}=10V$



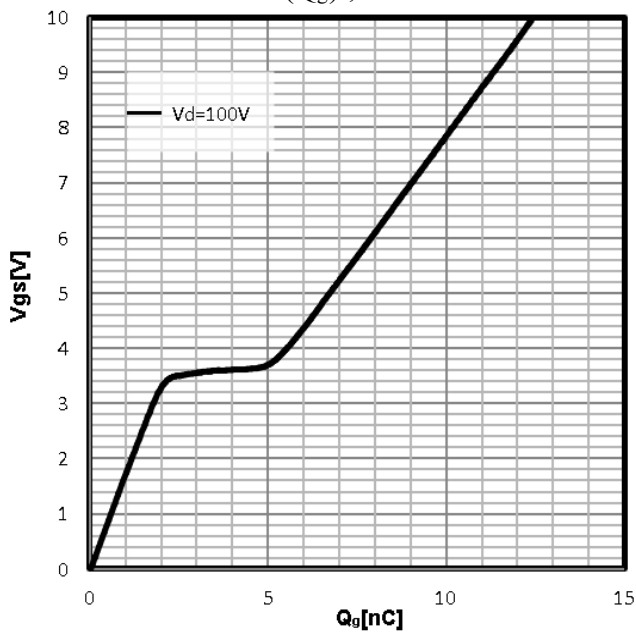
**Gate Threshold Voltage**  
 $V_{TH}=f(T_j); I_D=250\mu A$



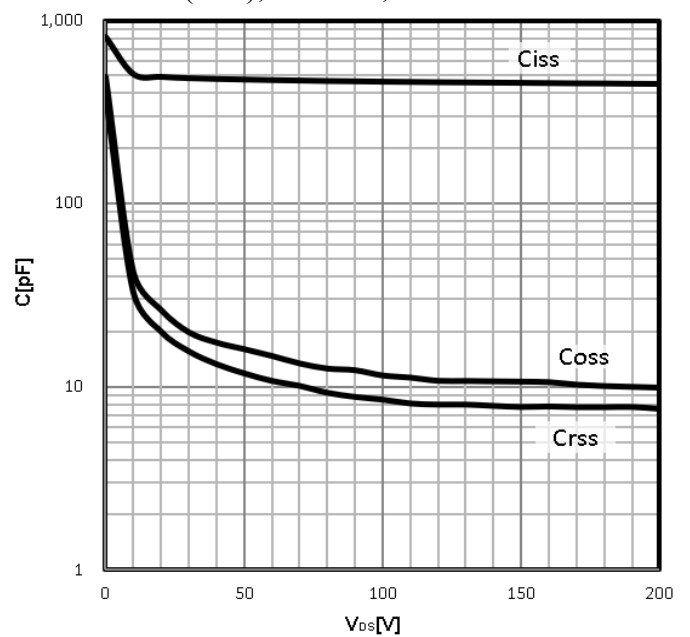
**Drain-source breakdown voltage**  
 $V_{BR(DSS)}=f(T_j); I_D=250\mu A$



**Typ. gate charge**  
 $V_{GS}=f(Q_g); I_D=2A$

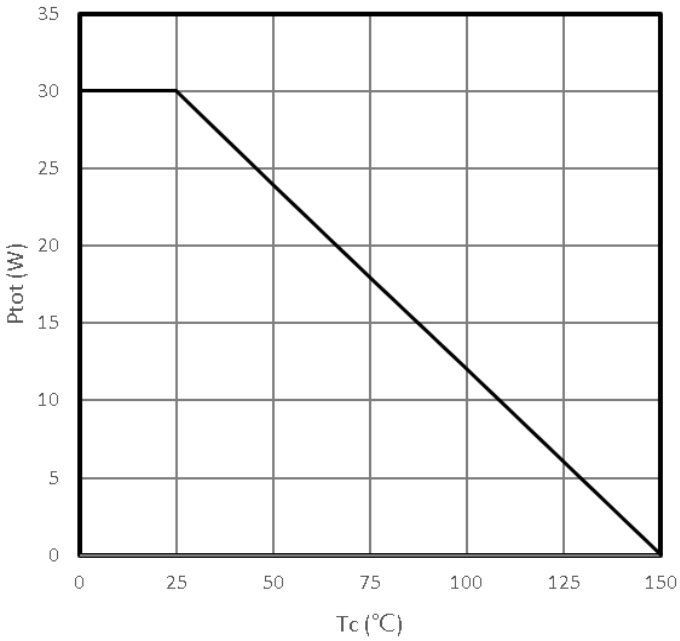


**Typ. capacitances**  
 $C=f(V_{DS}); V_{GS}=0V; f=1MHz$



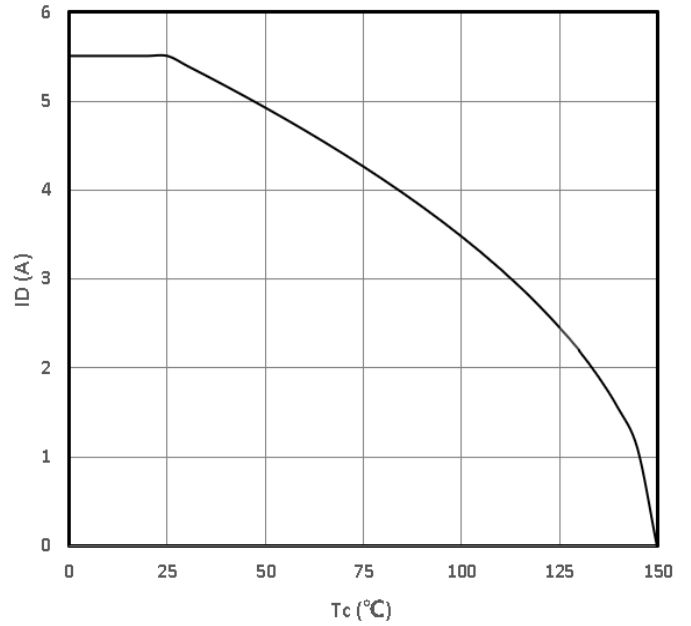
**Power Dissipation**

$P_{tot}=f(T_c)$



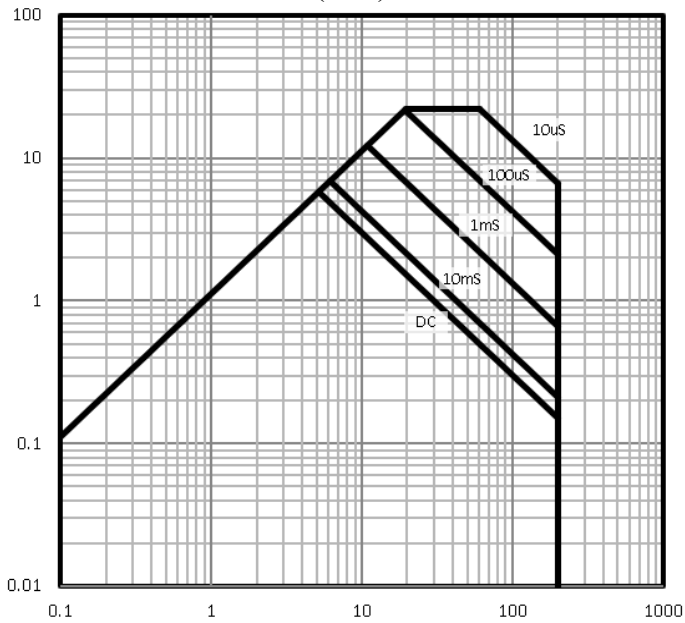
**Maximum Drain Current**

$I_D=f(T_c)$



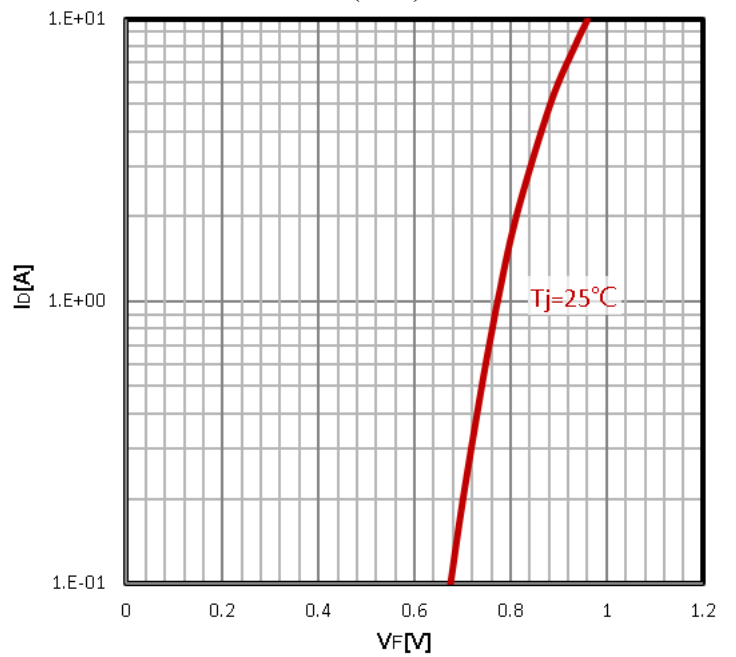
**Safe operating area**

$I_D=f(V_{DS})$



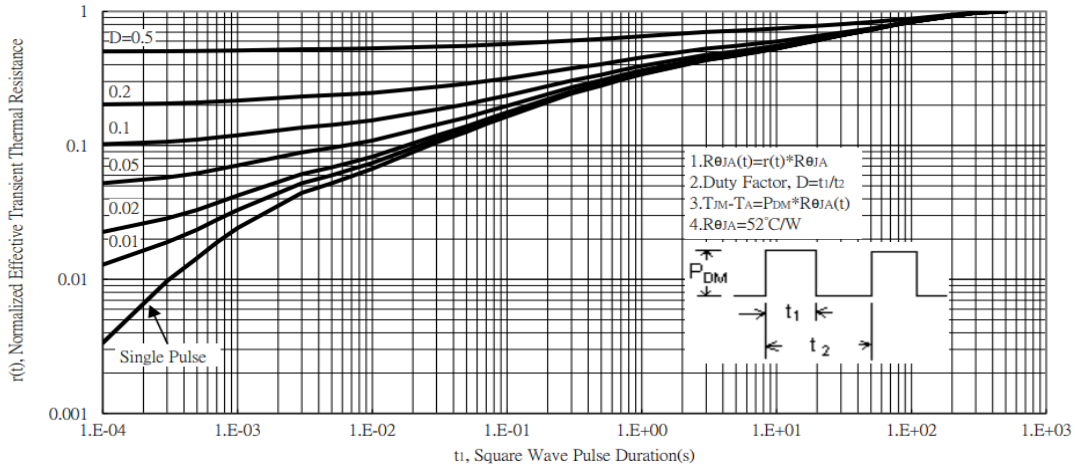
**Body Diode Forward Voltage Variation**

$I_F=f(V_{GS})$

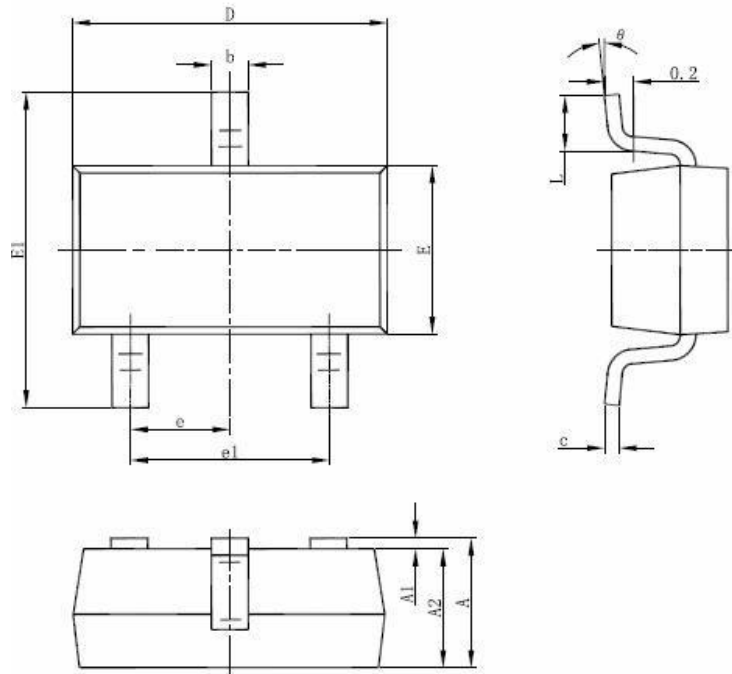


Max. transient thermal impedance

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



SOT-23-3L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
theta	0°	8°	0°	8°