N-Channel Enhancement Mode Field Effect Transistor

■ General Description

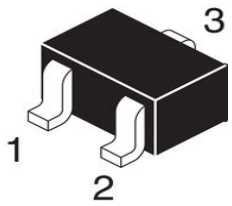
Product Summary		
V_{DSS}	I_D	$R_{DS(ON)}$(mΩ)TYP
20V	0.65A	260 @ VGS= 4.5V
	0.55A	320 @ VGS= 2.5V

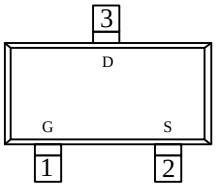
■ Features

- Super high dense cell design for low $R_{DS(ON)}$
- Rugged and reliable
- Simple drive requirement
- SOT-523 package

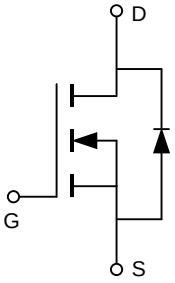
■ Package

- **SOT-523**





SOT-523
(Top View)



■ Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
LN2308B	-55°C to +150°C	SOT-523	3000

■ Absolute Maximum Ratings

(TA=25℃ unless otherwise noted)

parameter		symbol	limit	unit
Drain-source voltage		V_{DSS}	20	V
Gate-source voltage		V_{GSS}	±12	V
Coutinuous drain current (Tj=150℃)	TA=25℃	I_D	0.65	A
	TA=80℃		0.45	A
Pulsed drain current		I_{DM}	2.5	A
Drain-source Diode forward current		Is	0.3	A
Power dissipation	TA=25℃	P_D	0.27	W
	TA=70℃		0.16	
Operating junction Temperature range		T_j	-55—150	℃

■ Electrical Characteristics

(TA=25℃ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Static						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250μA	20			V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	0.35		1.0	V
Gate leakage current	I_{GSS}	V_{DS}=0V, V_{GS}=±12V			100	nA
Zero gate voltage drain current	I_{DSS}	V_{DS}=20V, V_{GS}=0V			1	μA
		V_{DS}=20V, V_{GS}=0V Tj=55℃			5	
On-state drain current	$I_{D(ON)}$	V_{DS}≥4.5V,V_{GS}=5V	0.7			A
Drain-source on-state resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=0.65A		0.15	0.25	Ω
		V_{GS}=2.5V, I_D=0.55A		0.19	0.30	
		V_{GS}=1.8V, I_D=0.45A		0.42	0.80	
Forward transconductance	gfs	V_{DS}=10V, I_D=0.4A		1.0		S
Diode forward voltage	V_{SD}	I_S=0.15A,V_{GS}=0V		0.8	1.2	V
Dynamic						
Total gate charge	Q_g	V_{DS}=10V I_D=0.6A V_{GS}=4.5V		1.2	1.5	nC
Gate-source charge	Q_{gs}			0.2		
Gate-drain charge	Q_{gd}			0.3		
Turn-on delay time	$t_{d(ON)}$	V_{DD}=10V V_{GEN}=4.5V I_D=0.5A R_L=10Ω R_G=6Ω		5	10	ns
Rise time	tr			8	15	
Turn-off delay time	$t_{d(OFF)}$			10	18	
Fall time	tf			1.2	2.8	

Notes:

a. surface mounted on FR4 board,t≤10sec

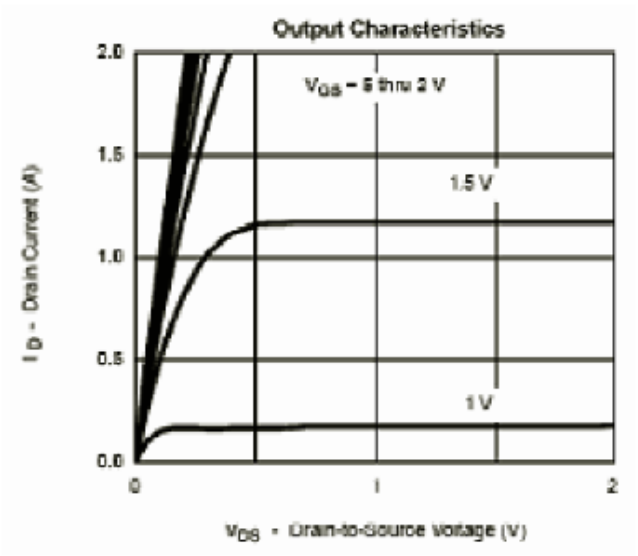
b. pulse test:pulse width≤300μs,duty≤2%

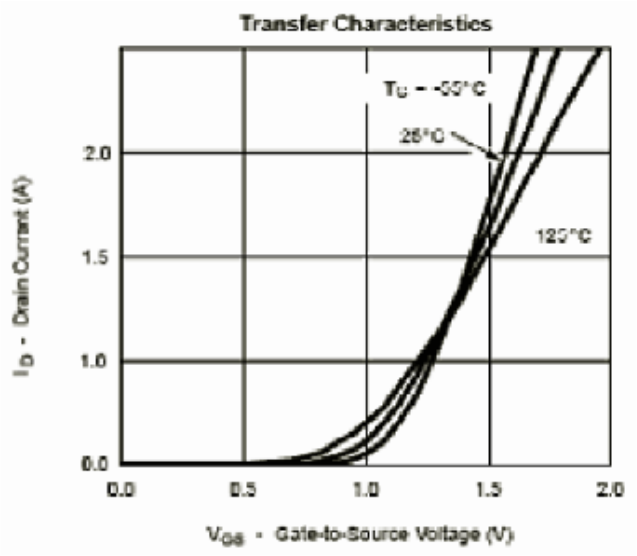
c. guaranteed by design, not subject to production testing

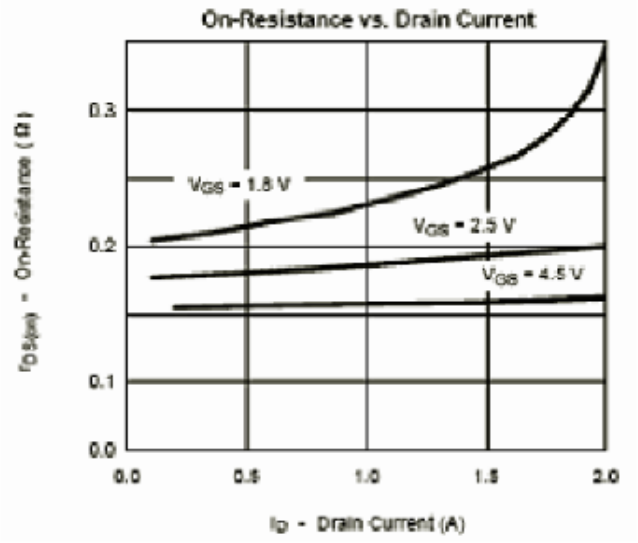
■ Thermal Characteristics

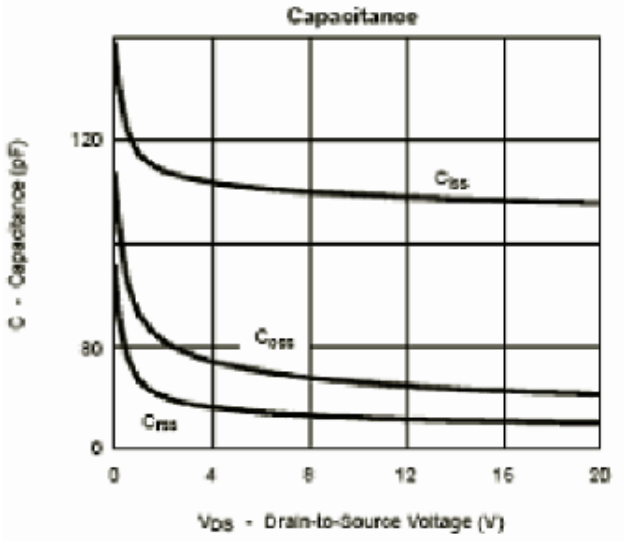
Thermal Resistance junction-to ambient	Rth JA	100	℃/W

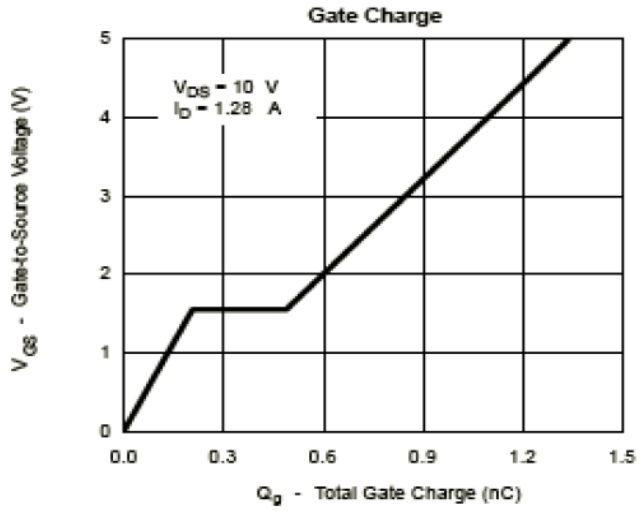
■ Typical Performance Characteristics

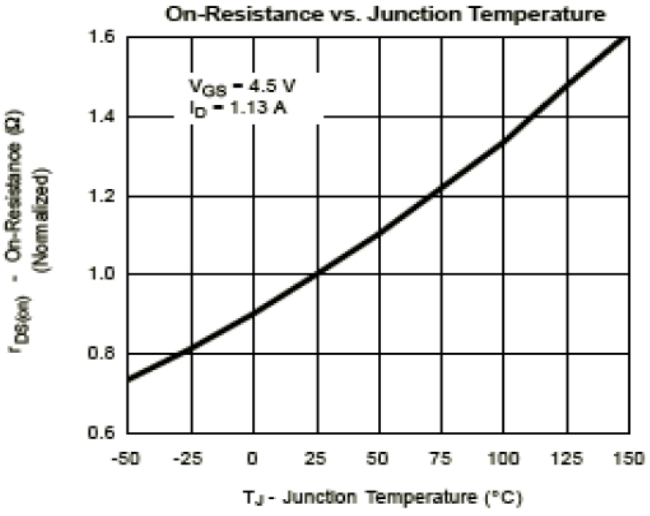


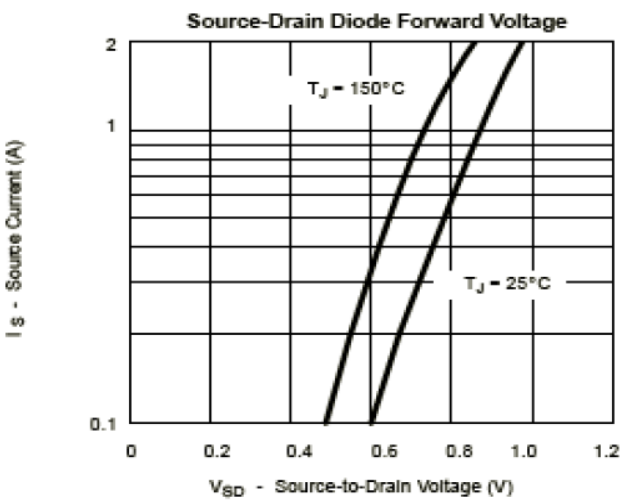


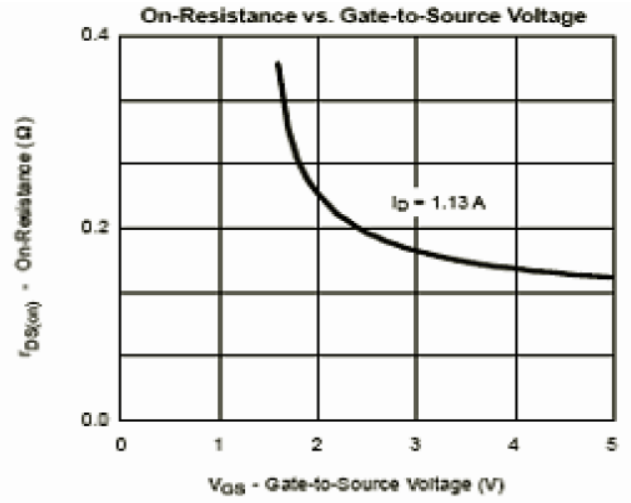


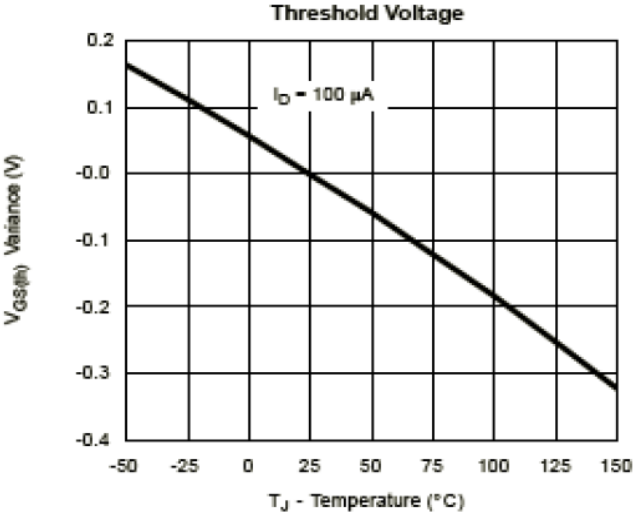


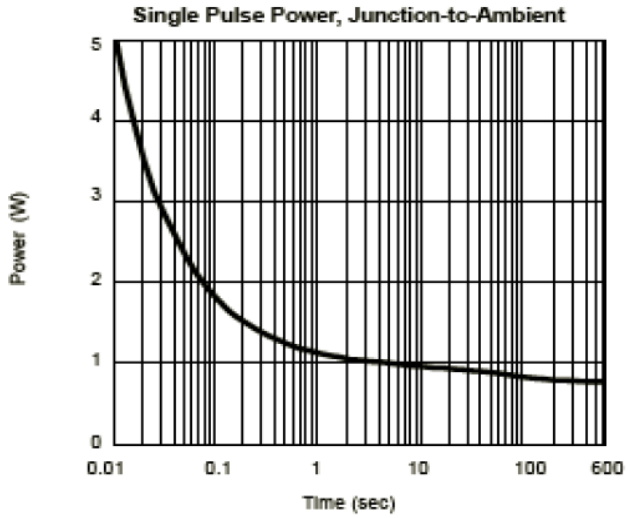


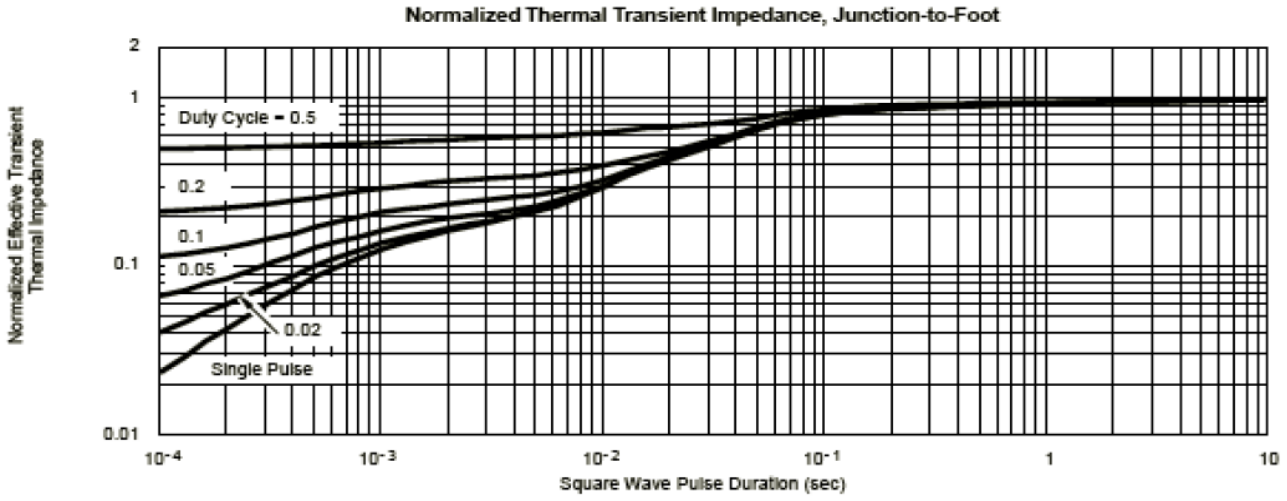



Source-Drain Diode Forward Voltage
T_J = 150°C
T_J = 25°C
I_S - Source Current (A)
V_{SD} - Source-to-Drain Voltage (V)
2
1
0.1
0
0.2
0.4
0.6
0.8
1.0
1.2


On-Resistance vs. Gate-to-Source Voltage
I_D = 1.13 A
$r_{DS(on)}$ - On-Resistance (Ω)
V_{GS} - Gate-to-Source Voltage (V)
0.4
0.2
0.0
0
1
2
3
4
5

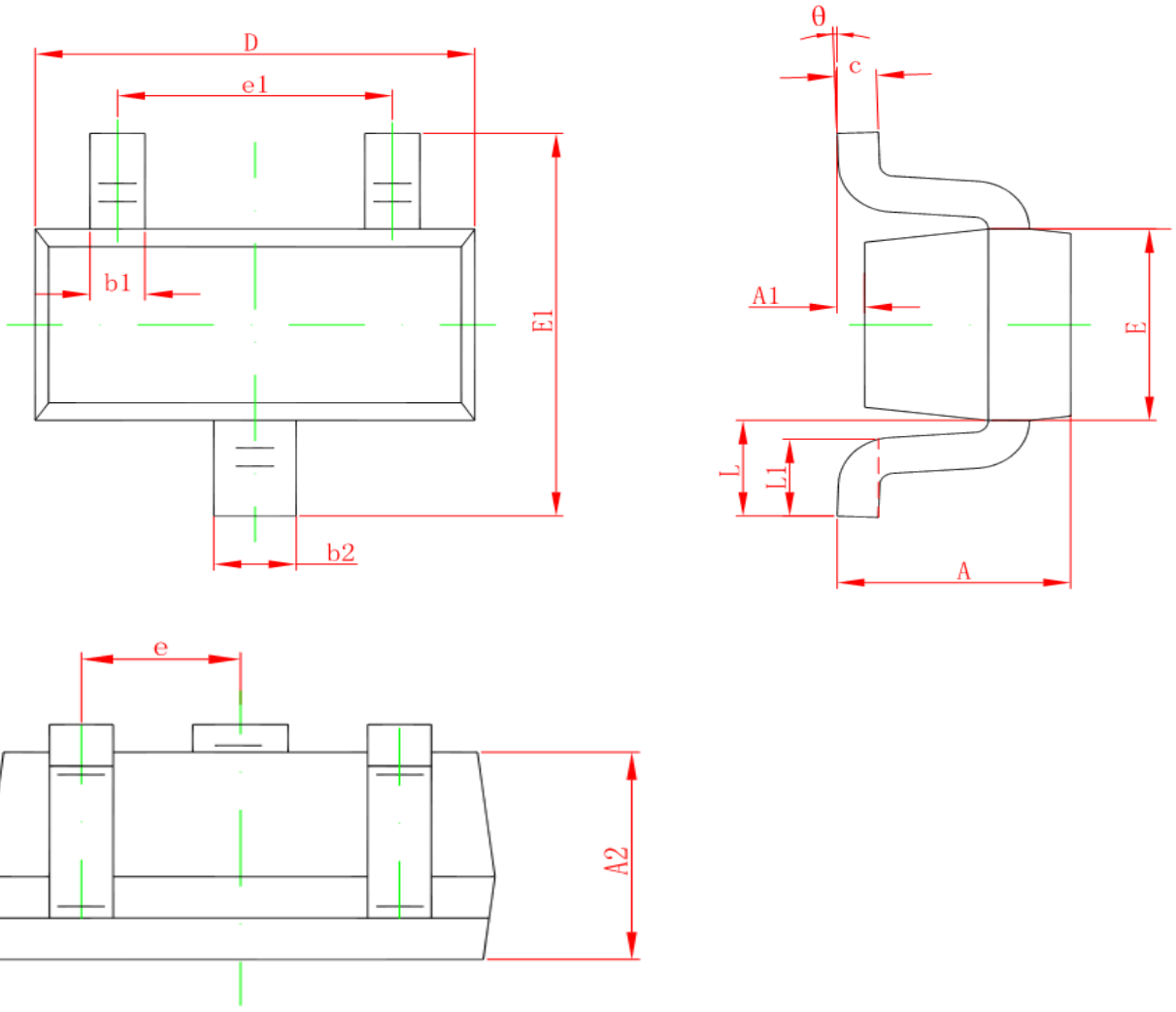

Threshold Voltage
I_D = 100 µA
$V_{GS(th)}$ Variance (V)
T_J - Temperature (°C)
0.2
0.1
-0.0
-0.1
-0.2
-0.3
-0.4
-50
-25
0
25
50
75
100
125
150


Single Pulse Power, Junction-to-Ambient
Power (W)
Time (sec)
5
4
3
2
1
0
0.01
0.1
1
10
100
600


Normalized Thermal Transient Impedance, Junction-to-Foot
Normalized Effective Transient Thermal Impedance
Duty Cycle = 0.5
0.2
0.1
0.05
0.02
Single Pulse
Square Wave Pulse Duration (sec)
2
1
0.1
0.01
10^{-4}
10^{-3}
10^{-2}
10^{-1}
1
10

■ Package Information

- SOT-523



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.900	0.028	0.035
A1	0.000	0.100	0.000	0.004
A2	0.700	0.800	0.028	0.031
b1	0.150	0.250	0.006	0.010
b2	0.250	0.350	0.010	0.014
c	0.100	0.200	0.004	0.008
D	1.500	1.700	0.059	0.067
E	0.700	0.900	0.028	0.035
E1	1.450	1.750	0.057	0.069
e	0.500 TYP.		0.020 TYP.	
e1	0.900	1.100	0.035	0.043
L	0.400 REF.		0.016 REF.	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°