P-Channel Enhancement Mode Field Effect Transistor

■ General Description

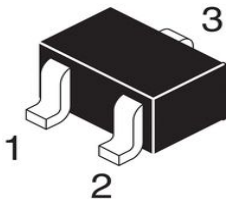
Product Summary		
V_{DSS}	I_D	$R_{DS(ON)}$(mΩ)TYP
-20V	-0.45A	300 @ V_{GS}=-4.5V
	-0.35A	450 @ V_{GS}=-2.5V

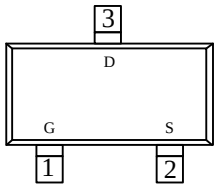
■ Features

- Super high dense cell design for low $R_{DS(ON)}$
- Rugged and reliable
- Simple drive requirement
- SOT-23-3L/B package

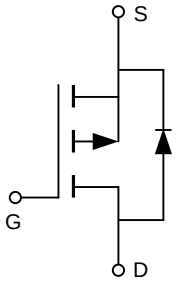
■ Package

- **SOT-23-3L/B**





SOT-23-3L/B
(Top View)



■ Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
LN2307	-55°C to +150°C	SOT-23-3L/B	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	-0.8	A
	TA=80℃		-0.7	A
Pulsed drain current		I_{DM}	-2.8	A
Drain-source Diode forward current		Is	-0.58	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		-0.8	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=-0.45A		0.23	0.30	Ω
		V_{GS}=-2.5V, I_D=-0.35A		0.37	0.45	
		V_{GS}=-1.8V, I_D=-0.25A		0.51	0.58	
Forward transconductance	gfs	V_{DS}=-10V, I_D=-0.25A		0.4		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		1.5	2.0	nC
Gate-source charge	Q_{gs}			0.3		
Gate-drain charge	Q_{gd}			0.35		
Turn-on delay time	$t_{d(ON)}$	V_{DD}=-10V V_{GEN}=-4.5V I_D=-0.4A R_L=10Ω R_G=6Ω		5	10	ns
Rise time	tr			15	25	
Turn-off delay time	$t_{d(OFF)}$			8	15	
Fall time	tf			1.4	1.8	

Notes:

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

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

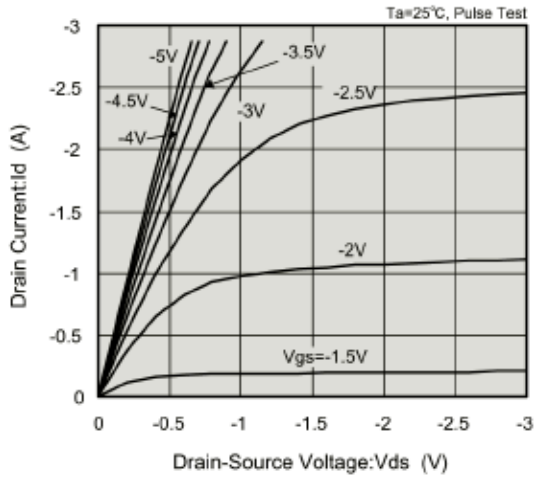
c. guaranteed by design, not subject to production testing

■ Thermal Characteristics

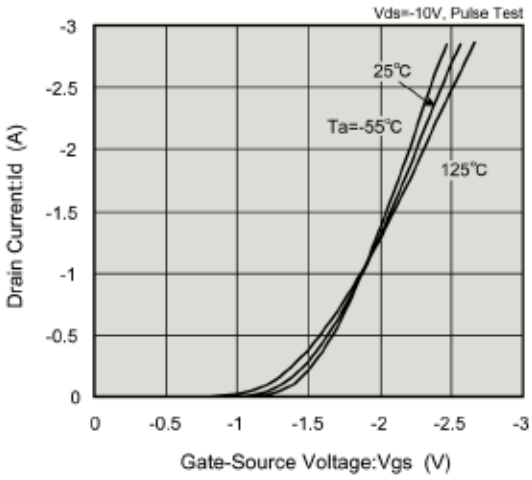
Thermal Resistance junction-to ambient	Rth JA	100	℃/W

■ Typical Performance Characteristics

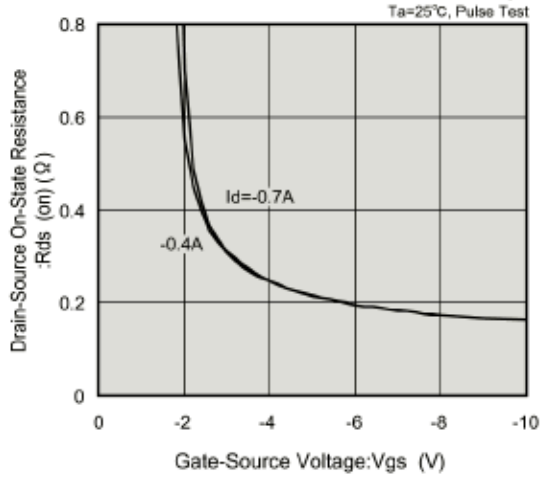
(1) Drain Current vs. Drain-Source Voltage



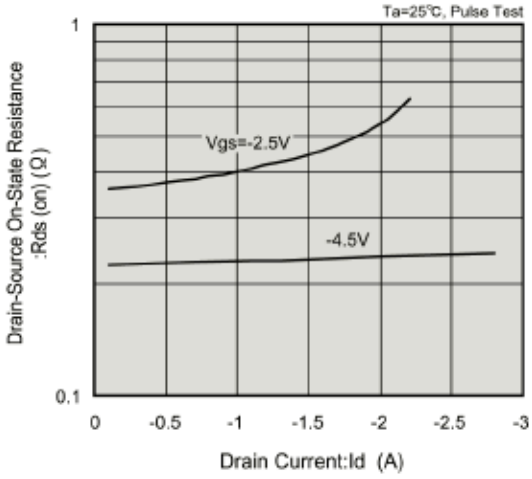
(2) Drain Current vs. Gate-Source Voltage



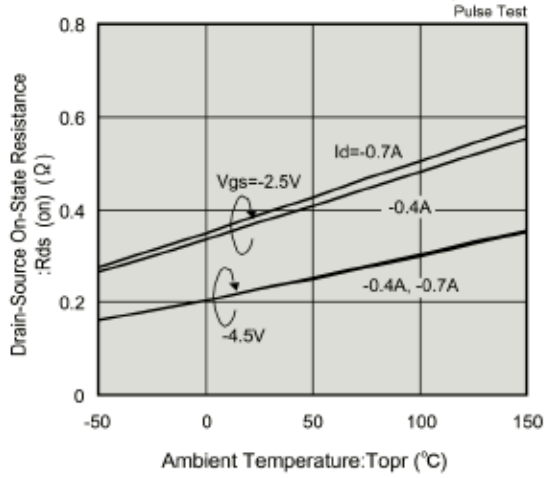
(3) Drain-Source On-State Resistance vs. Gate-Source Voltage



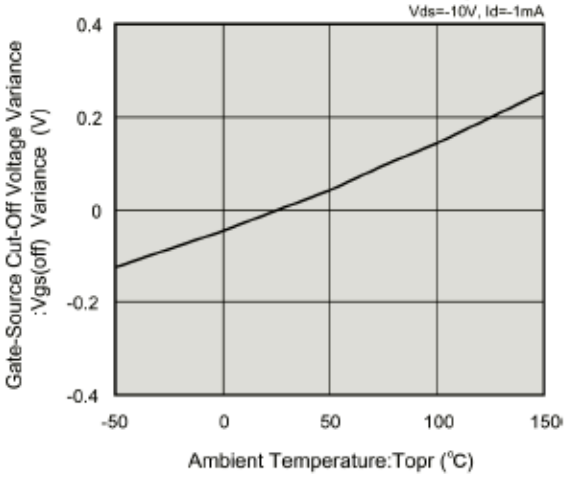
(4) Drain-Source On-State Resistance vs. Drain Current



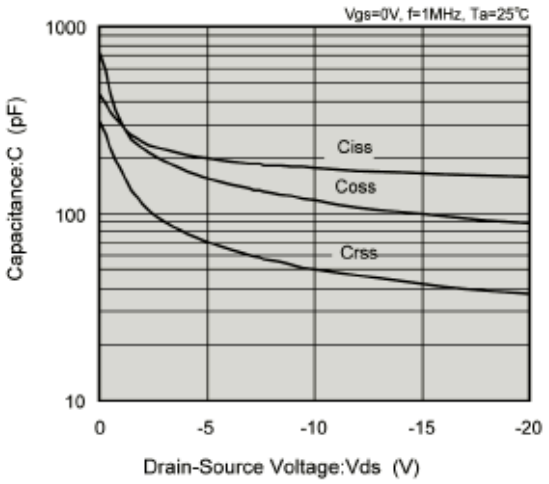
(5) Drain-Source On-State Resistance vs. Ambient Temperature



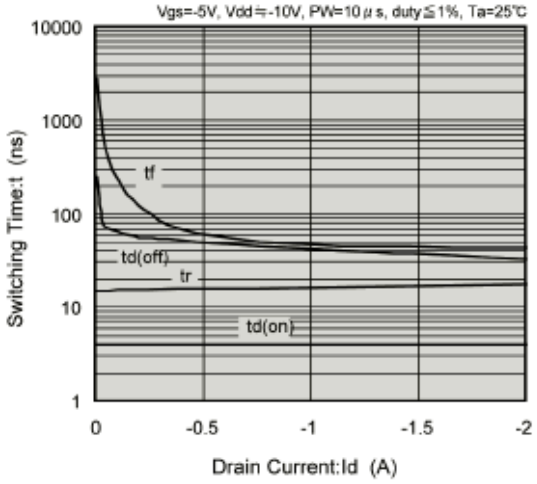
(6) Gate Source Cut-Off Voltage Variance vs. Ambient Temperature



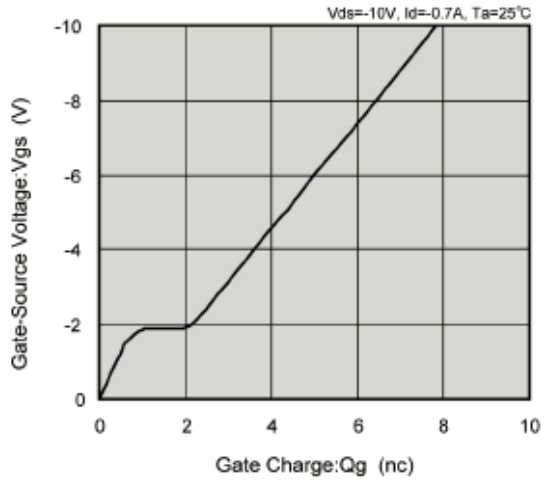
(7) Capacitance vs. Drain-Source Voltage



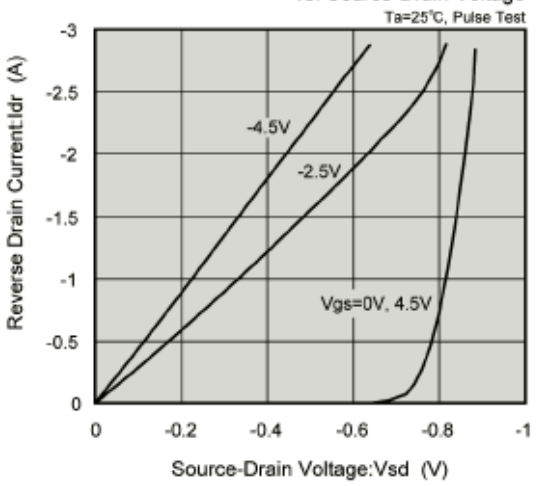
(8) SwitchingTime vs. Drain Current



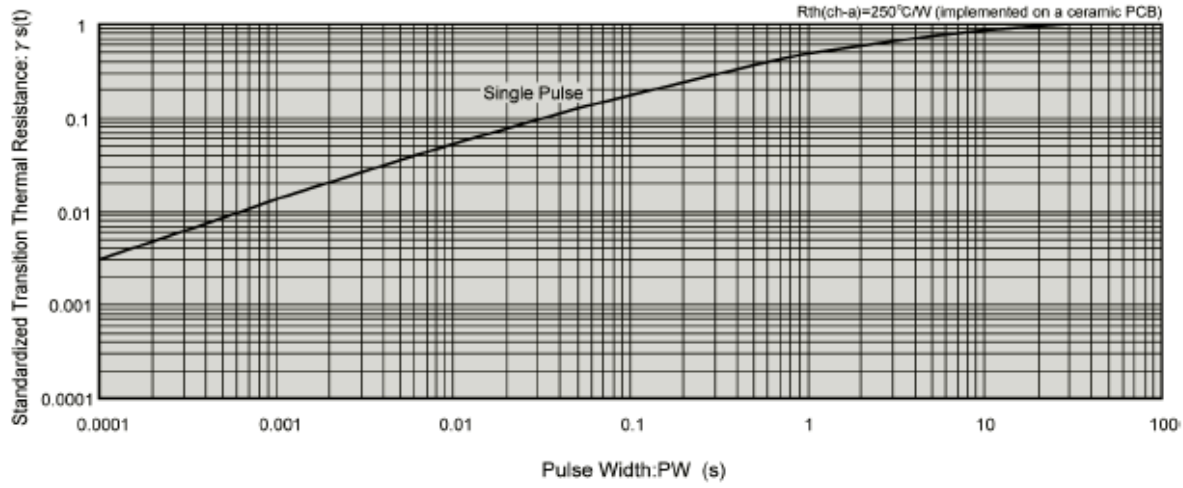
(9) Gate-Source Voltage vs. Gate Charge



(10) Reverse Drain Current vs. Source-Drain Voltage

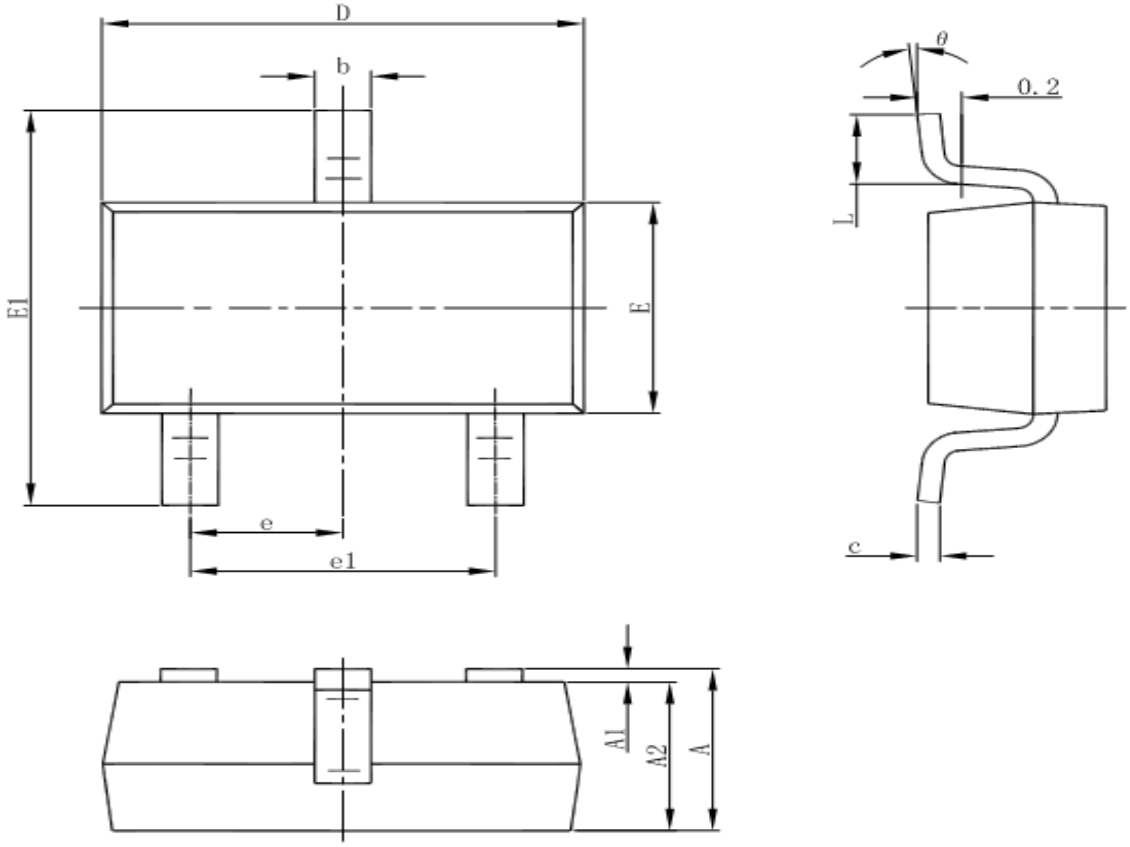


(11) Standardized Transition Thermal Resistance vs. Pulse Width



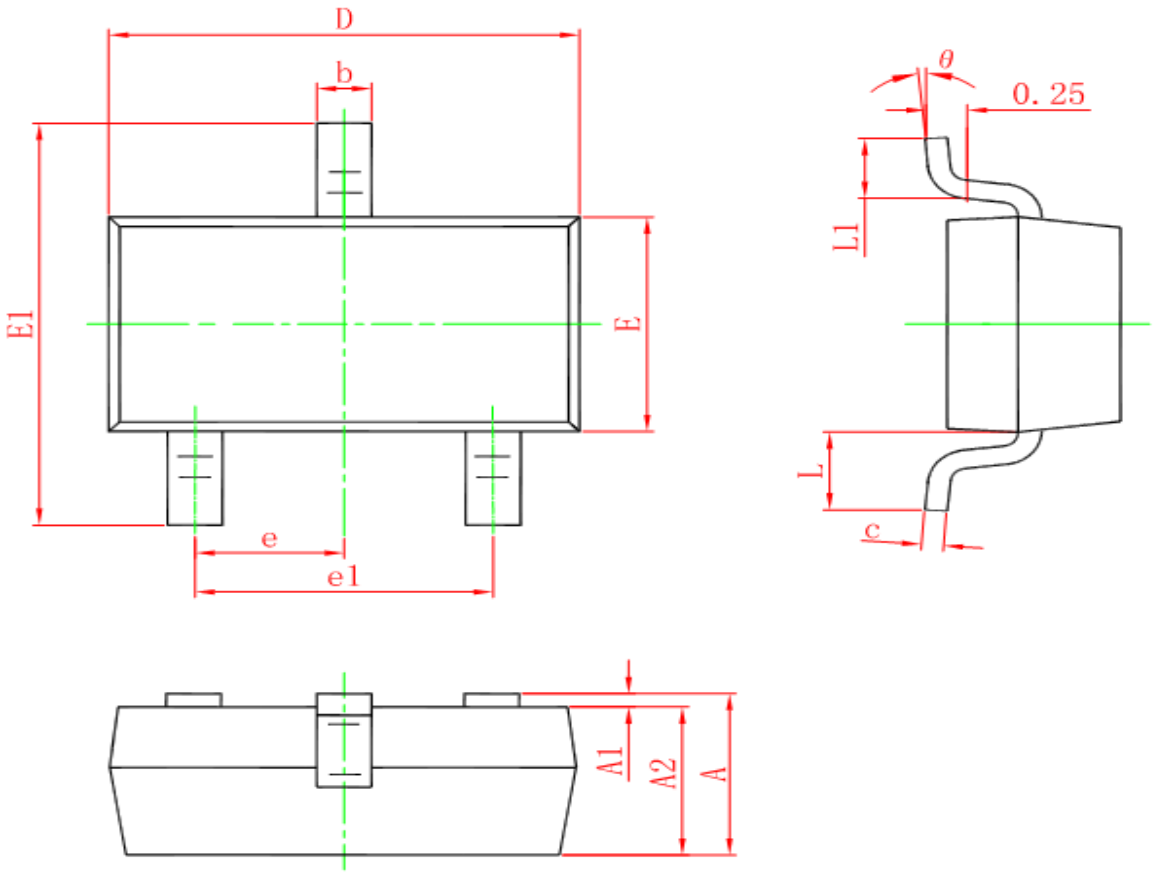
■Package Information

- SOT-23-3L



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
θ	0°	8°	0°	8°

- SOT-23-3B



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°