

N-Channel Enhancement Mode Field Effect Transistor

General Description

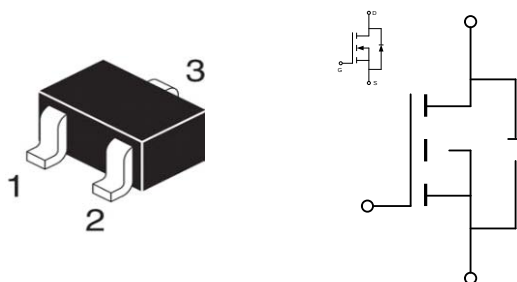
Product Summary		
V_{DS}	I_D	$R_{DS(ON)}(m\Omega)TYP$
20V	4.5A	22 @ $V_{GS} = 4.5V$
		40 @ $V_{GS} = 2.5V$

Features

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

Package

- Schematic diagram



- Pin configuration

Pin Name	SOT23-3L	Description
G	1	Gate
D	3	Drain
S	2	Source

Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
LN2312MR	-55°C to +150°C	SOT-23-3L	3000

Absolute Maximum Ratings

($T_A = 25^\circ\text{C}$ unless otherwise noted)

parameter	symbol	limit	unit
Drain-source voltage	V_{DS}	20	V
Gate-source voltage	V_{GS}	± 10	V
Drain current-continuous ^a @ $T_J = 125^\circ\text{C}$ -pulse d^b	I_D	5	A
	I_{DM}	13.5	A
Maximum power dissipation	P_D	1.25	W
Operating junction Temperature range	T_J	-55—150	$^\circ\text{C}$

■ Electrical Characteristics

(TA=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF Characteristics						
Drain-source breakdown voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	20	22		V
Zero gate voltage drain current	I _{DSS}	V _{DS} =20V, V _{GS} =0V			1	μA
Gate-body leakage	I _{GSS}	V _{DS} =0V, V _{GS} =±10V			±100	nA
ON Characteristics						
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.5	0.7	1.2	V
Drain-source on-state resistance	R _{DS(ON)}	V _{GS} =4.5V, I _D =5A		22	28	mΩ
		V _{GS} =2V, I _D =4.5A		30	35	
Forward transconductance	g _{fs}	V _{DS} =15V, I _D =5A	25			S
Dynamic Characteristics						
Input capacitance	C _{ISS}	V _{DS} =10V ,V _{GS} =0V f=1.0MHz		800		pF
Output capacitance	C _{OSS}			120		
Reverse transfer capacitance	C _{RSS}			65		
Switching Characteristics						
Turn-on delay time	t _{D(ON)}	V _{DD} =10V I _D =1A V _{GS} =4.5V R _{GEN} =3ohm		7.5		ns
Rise time	tr			9.6		
Turn-off delay time	t _{D(OFF)}			60		
Fall time	tf			9		
Total gate charge	Qg	V _{DS} =-15V,I _D =-4A V _{GS} =-4.5V		11.4		nC
Gate-source charge	Qgs			2.3		
Gate-drain charge	Qgd			2.9		
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode forward voltage	V _{SD}	V _{GS} =0V,I _S =-1A		0.81	1.2	V

Notes:

- surface mounted on FR4 board, $t \leq 10\text{sec}$
- pulse test: pulse width $\leq 300\mu s$, duty $\leq 2\%$
- guaranteed by design, not subject to production testing

■ Thermal Characteristics

Thermal Resistance junction-to ambient	$R_{th JA}$	100	$^{\circ}C/W$
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■ Typical Performance Characteristics

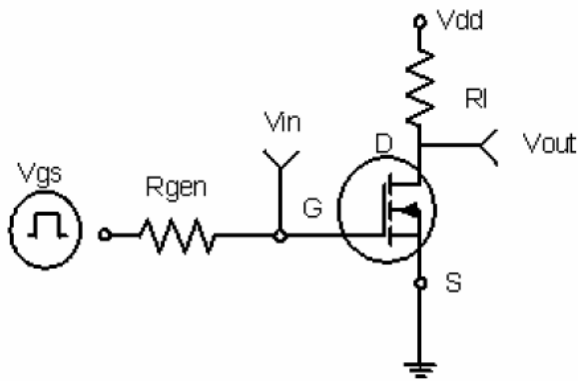


Figure1.Switching Test Circuit

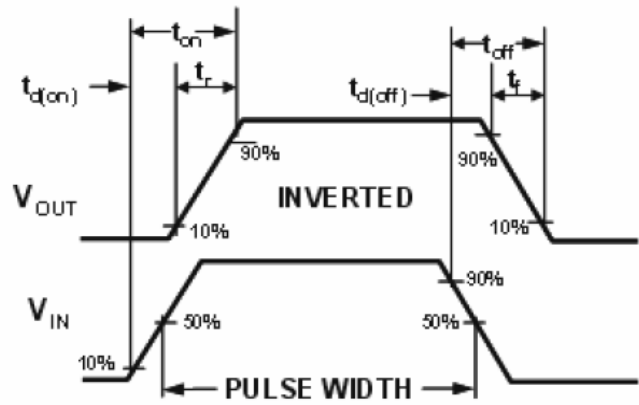
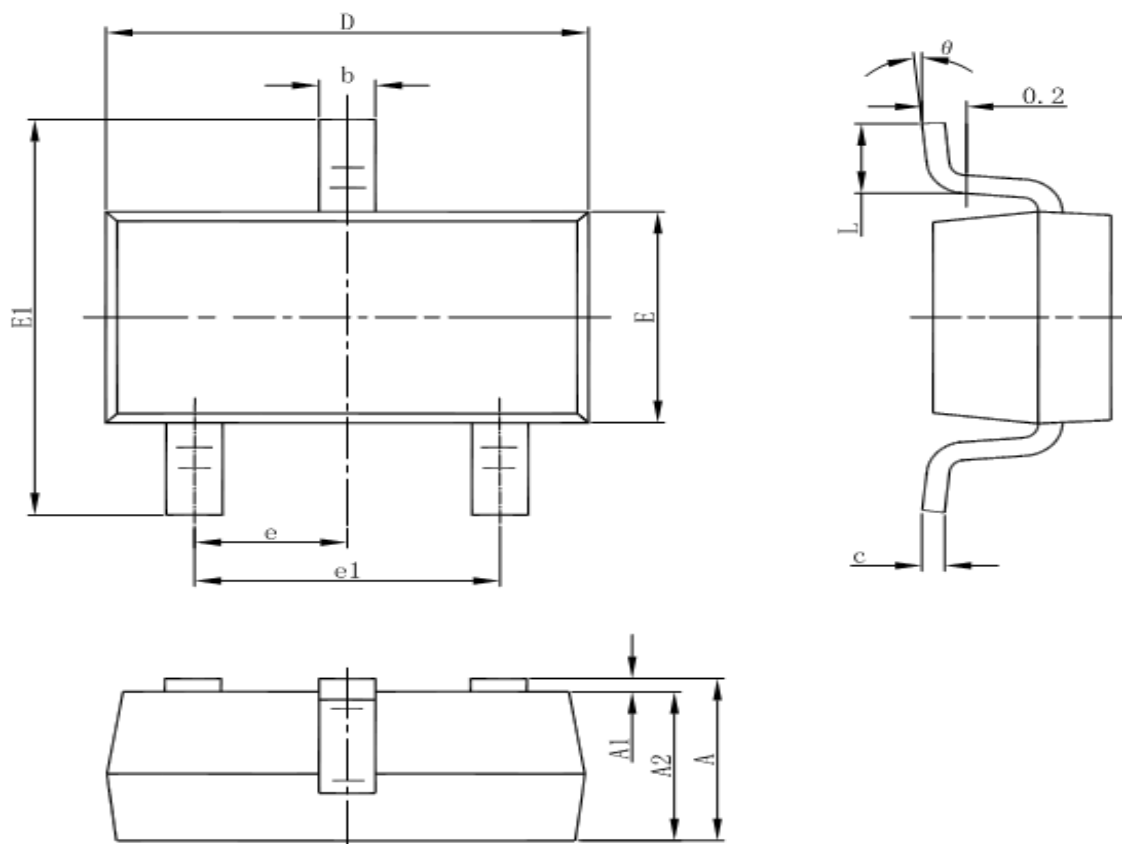


Figure 2.Switching waveforms

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°