

N-Channel Enhancement Mode MOSFET

1. Product Information

Features

- Advanced Trench Technology
- Excellent $R_{DS(ON)}$
- Low gate charge

Applications

- PWM applications
- Load switch

Quick reference

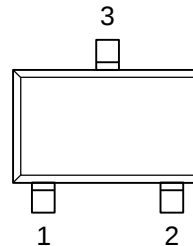
- $V_{DS} = 200V$
- $I_D = 1A$
- $R_{DS(ON)} \leq 1.9\Omega @ V_{GS}=10V$ (Type: 1.65 Ω)
- $R_{DS(ON)} \leq 2.2\Omega @ V_{GS}=4.5V$ (Type: 1.85 Ω)

Pin Description

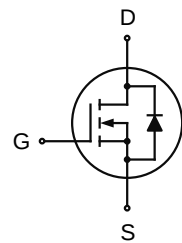
Pin	Description
1	Gate(G)
2	Source(S)
3	Drain(D)

Simplified Outline

Symbol



Top View
SOT23-3L



Package Marking and Ordering Information

Product Name	Package	Marking	Reel Size	Tape width	Quantity
KJ1N20A	SOT23-3L	JX1N20	-	-	3000

2. Absolute Maximum Ratings ($T_A=25^\circ C$ unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-source voltage		V_{DS}	200	V
Gate-source voltage		V_{GS}	± 30	V
Continuous drain current ($T_J = 150^\circ C$) ^a	$T_A = 25^\circ C$	I_D	1.0	A
	$T_A = 70^\circ C$		0.8	
Pulsed drain current ^b		I_{DM}	4	
Power dissipation ^a	$T_A = 25^\circ C$	P_D	1.4	W
	$T_A = 70^\circ C$		0.9	
Operating junction and storage temperature range		T_J, T_{stg}	-55~150	$^\circ C$

3. Thermal Characteristics

Parameter		Symbol	Typ	Max	Unit
Maximum Junction-to-Ambient ^a	$t \leq 10s$	$R_{\theta JA}$	70	90	°C/W
	Steady-State		100	125	
Maximum Junction-to-Foot	Steady-State	$R_{\theta JC}$	63	78	

Notes

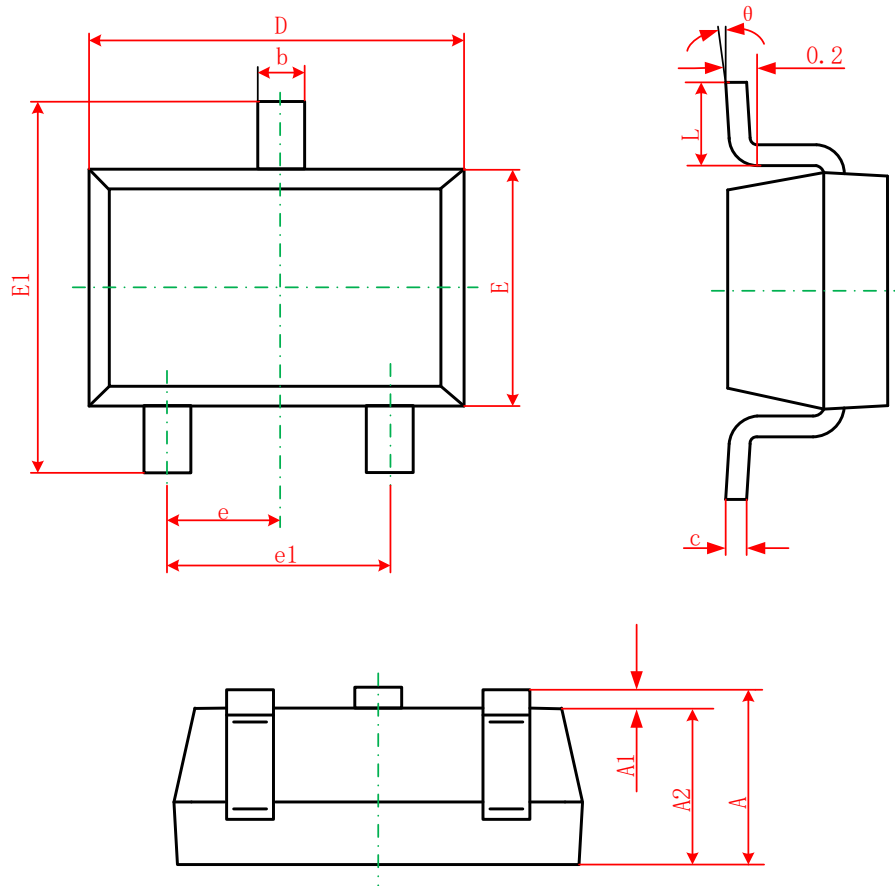
- a. Surface mounted on 1" x 1" FR4 board
- b. Pulse width limited by maximum junction temperature

4. Electrical Characteristics ($T_A=25^{\circ}\text{C}$, unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF Characteristics						
Drain-source breakdown voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	200	-	-	V
Breakdown Voltage Temperature Coefficient	ΔBV _{DSS} /ΔT _J	I _D =250μA, Referenced to 25°C	-	60	200	mV/°C
Zero gate voltage drain current	I _{DSS}	V _{DS} =200V, V _{GS} =0V	-	-	1	μA
Gate-body leakage	I _{GSS}	V _{DS} =0V, V _{GS} =±30V	-	-	±100	nA
ON Characteristics						
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.0	1.7	2.5	V
Gate Threshold Voltage Temperature Coefficient	ΔV _{GS(th)} /ΔT _J	I _D =250μA, Referenced to 25°C	-	-6	-	mV/°C
Static Drain-Source On Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =1A	-	1.65	1.90	Ω
		V _{GS} =4.5V, I _D =0.8A	-	1.85	2.20	
On-State Drain Current	I _{D(ON)}	V _{DS} =5V, V _{GS} =10V	2.0	-	-	A
Forward transconductance	g _{fs}	V _{DS} =15V, I _D =1A	-	8	-	S
Dynamic Characteristics						
Input capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V F=1.0MHz	-	145	-	pF
Output capacitance	C _{oss}		-	88	-	
Reverse transfer capacitance	C _{rss}		-	3	-	
Switching Characteristics						
Turn-on Delay Time	t _{d(on)}	V _{DD} =100V, I _D =1A V _{GS} =10V, R _{GEN} =2.5Ω	-	9	-	nS
Turn-on Rise Time	t _r		-	11	-	
Turn-off Delay Time	t _{d(off)}		-	14	-	
Turn-off Fall Time	t _f		-	14	-	
Total Gate Charge	Q _g	V _{DS} =100V, I _D =1A V _{GS} =10V	-	12	-	nC
Gate-Source Charge	Q _{gs}		-	2.4	-	
Gate-Drain Charge	Q _{gd}		-	3.8	-	
Drain-Source Diode Characteristics and Maximum Ratings						
Maximum Continuous Drain-Source Diode Forward Current	I _S		-	-	1.3	A
Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _{SD} =1.3A	-	0.76	1.2	V
Reverse Recovery Time	t _{rr}	I _F =1A	-	38	-	ns
Reverse Recovery Charge	Q _{rr}	dI _F /dt=100A/μs	-	20	-	nC

5. Package Mechanical Data

SOT23-3L package



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°