

P-Channel Enhancement Mode MOSFET

1. Product Information

Features

- Advanced Trench Technology
- Excellent $R_{DS(ON)}$
- Low Gate Charge

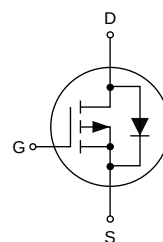
Applications

- PWM Applications
- Load Switch

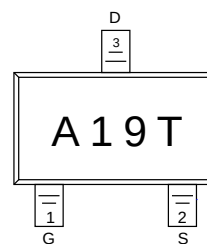
Quick reference

- $V_{DS} = -30\text{ V}$
- $I_D = -4.0\text{ A}$
- $P_D = 0.72\text{ W}$
- $R_{DS(ON)} \leq 70\text{ m}\Omega$ @ $V_{GS}=10\text{ V}$ (Type: 55 m Ω)
- $R_{DS(ON)} \leq 90\text{ m}\Omega$ @ $V_{GS}=4.5\text{ V}$ (Type: 75 m Ω)

Schematic Diagram



Pin Assignment



SOT23-3L

Package Marking and Ordering Information

Product Name	Package	Marking	Reel Size	Tape Width	Quantity(pcs)
KJ3401B	SOT23-3L	A19T	7"	8 mm	3000

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

Symbol	Parameter	Values	Unit
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage	± 12	V
I_D	Continuous Drain Current, $T_A=25^\circ\text{C}$ ¹	-4.0	A
	Continuous Drain Current, $T_A=70^\circ\text{C}$ ¹	-3.2	A
I_{DM}	Pulsed Drain Current ²	-16	A
P_D	Power Dissipation, $T_A=25^\circ\text{C}$ ¹	0.72	W
	Power Dissipation, $T_A=70^\circ\text{C}$ ¹	0.46	W
I_S	Continuous Source Current (diode conduction) ¹	-0.6	A
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55~150	$^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient ¹	125	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance from Junction to Case	80	$^\circ\text{C/W}$

3. Electrical Characteristics (T_A=25°C, unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
OFF Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0 V, I _D =-250 μA	-30		-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-30 V, V _{GS} =0 V	-	-	-1	μA
I _{GSS}	Gate-Source Leakage	V _{DS} =0 V, V _{GS} =±12 V	-	-	±100	nA
ON Characteristics						
V _{GS(th)}	Gate-Threshold Voltage	V _{DS} =V _{GS} , I _D =-250 μA	-0.5	-0.85	-1.3	V
R _{DS(ON)}	Drain-Source On-Resistance ³	V _{GS} =-4.5 V, I _D =-4 A	-	55	70	mΩ
		V _{GS} =-2.5 V, I _D =-3 A	-	75	90	
g _{FS}	Forward transconductance	V _{DS} =-5 V, I _D =-4 A	-	9	-	S
Dynamic Characteristics ⁴						
C _{iss}	Input Capacitance	V _{DS} =-15 V, V _{GS} =0 V, f=1.0 MHz	-	676	-	pF
C _{oss}	Output Capacitance		-	60	-	
C _{rss}	Reverse Transfer Capacitance		-	51	-	
Switching Characteristics ⁴						
t _{d(on)}	Turn-on Delay Time	V _{DS} =-15 V, V _{GS} =-10 V, R _G =6 Ω, R _L =3.6 Ω, I _D =-3 A	-	8	-	ns
t _r	Turn-on Rise Time		-	5	-	
t _{d(off)}	Turn-off Delay Time		-	26	-	
t _f	Turn-off Fall Time		-	11	-	
Q _g	Total Gate Charge	V _{DS} =-8, V _{GS} =-4.5 V, I _D =-3 A	-	8.2	-	nC
Q _{gs}	Gate-Source Charge		-	1.8	-	
Q _{gd}	Gate-Drain Charge		-	2.0	-	
Drain-Source Diode Characteristics ⁴						
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =-1 A	-	-0.75	-1.2	V

Notes:

1. Surface mounted on 1" x 1" FR4 board.
2. Pulse width limited by maximum junction temperature.
3. Pulse test: Pulse width ≤ 300 μs, duty cycle ≤ 2%.
4. Guaranteed by design, not subject to production testing.

4. Typical Characteristics

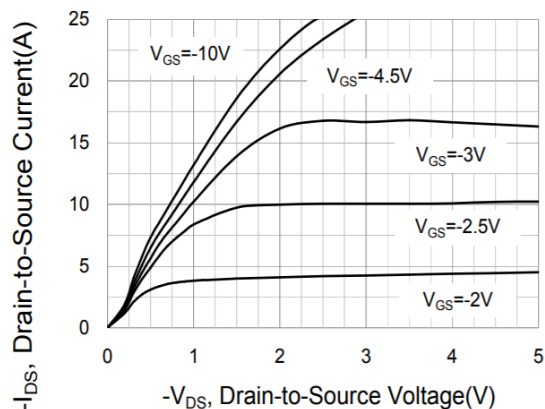


Figure 1. Output Characteristics

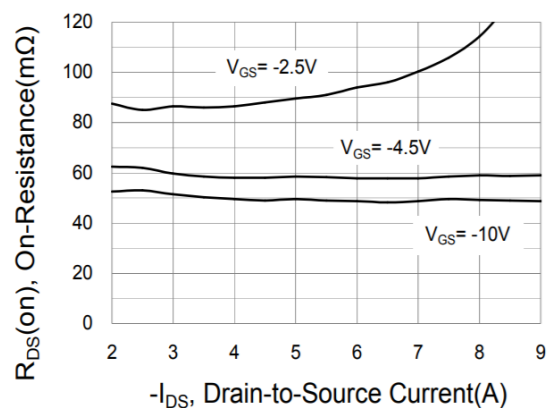


Figure 2. On-Resistance vs. Drain Current

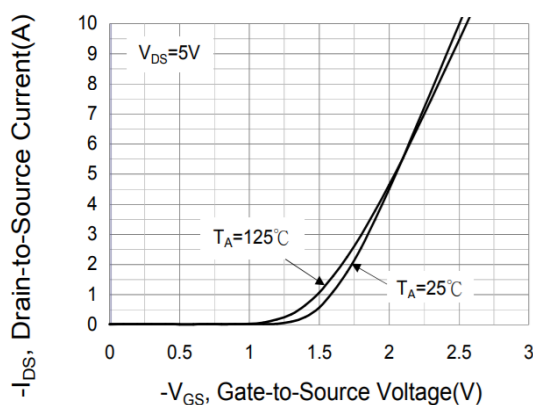


Figure 3. Transfer Characteristic

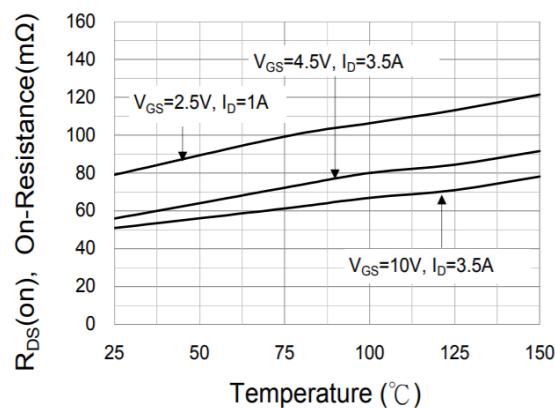


Figure 4. On-Resistance vs. Junction Temperature

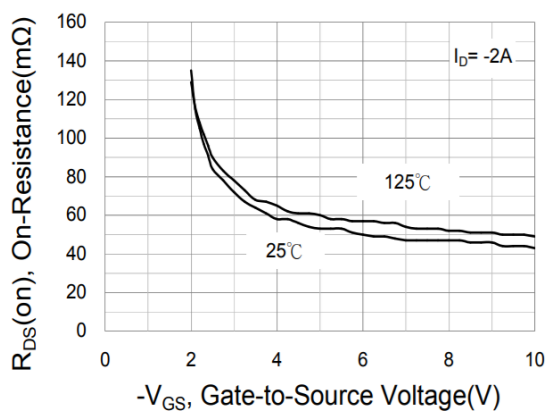


Figure 5 On-Resistance vs. V_{GS}

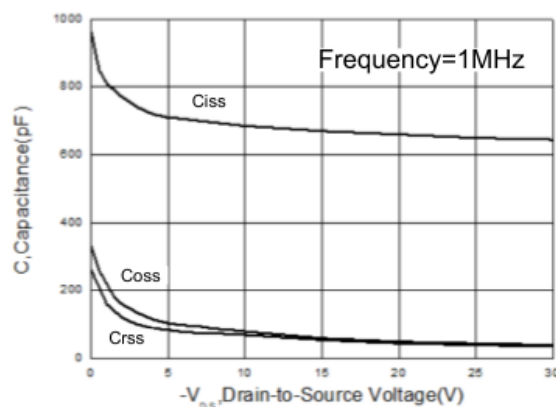


Figure 6 Capacitance Characteristic

4. Typical Characteristics (cont.)

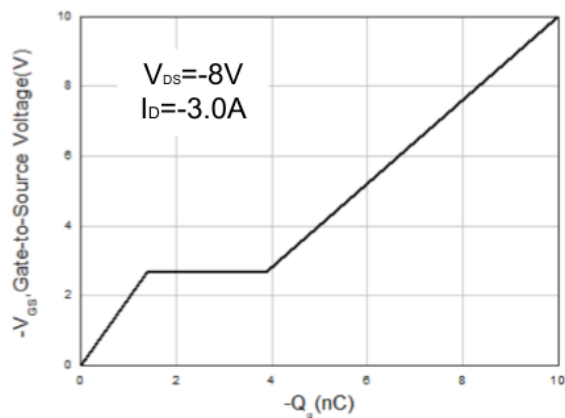


Figure. 7 Gate-Charge Characteristic

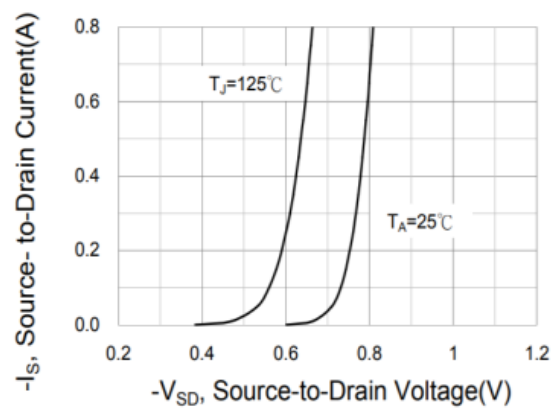
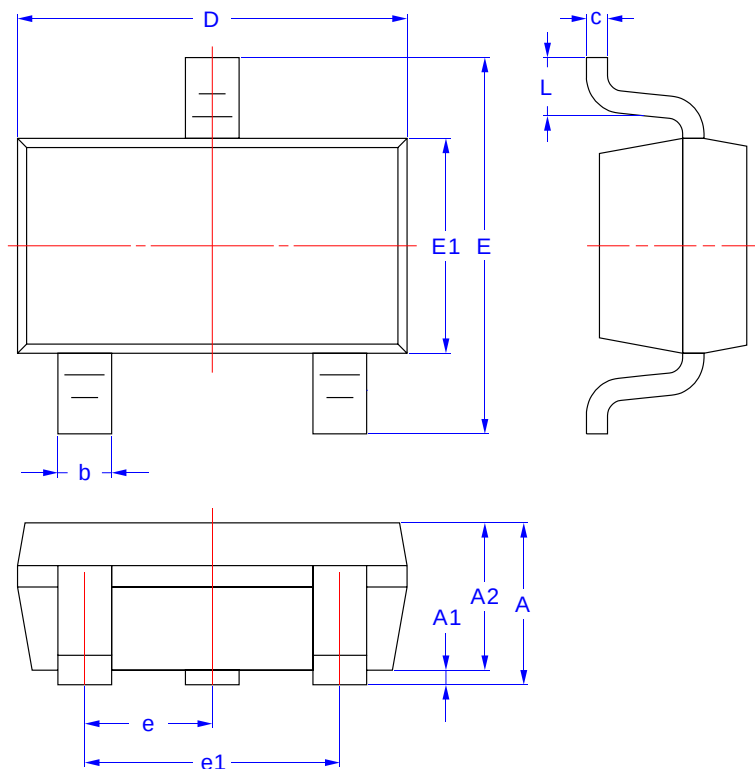


Figure. 8 Body Diode Characteristic

5. Package Mechanical Data

SOT23-3L Package



Symbol	Dimensions in Millimeters	
	MIN	MAX
A	1.00	1.45
A1	0.00	0.15
A2	1.00	1.30
D	2.70	3.10
E	2.60	3.00
E1	1.50	1.70
c	0.08	0.25
b	0.30	0.50
e	0.95 BSC	
e1	1.90 BSC	
L	0.30	0.60