



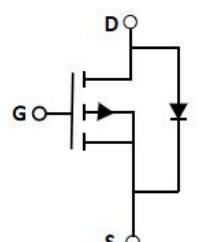
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MLP2301A

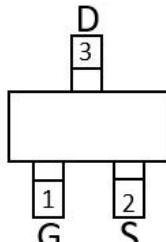
20V P-Channel MOSFET

1. General Description

The MLP2301A uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with low gate voltages. This device is suitable for use as a load switch or in PWM applications.



Schematic Diagram



Pin Assignment



SOT-23 top view

2. Specification Features

- $V_{DS} = -20V$, $I_D = -2.5A$
- $R_{DS(ON)} < 96m\Omega$ @ $V_{GS} = -4.5V$ (Type: 77 m Ω)
- $R_{DS(ON)} < 130m\Omega$ @ $V_{GS} = -2.5V$ (Type: 104 m Ω)
- High Power and current handing capability
- Lead free product is acquired
- Surface Mount Package

3. Application

- PWM applications
- Load switch
- Power management

4. Absolute Maximum Ratings ($T_J = 25^\circ C$)

Characteristics	Symbol	Rating	Unit
DrainSource Voltage	V_{DSS}	-20	V
GateSource Voltage	V_{GSS}	± 12	V
Continuous Drain Current(1)	I_D	-2.5	A
		-1.6	
		-1.2	
Pulsed Drain Current(2)	I_{DM}	-6	
Power Dissipation	P_D	1.4	W
		1.1	
Single Pulse Avalanche Energy(3)	E_{AS}		mJ
Junction and Storage Temperature Range	T_J, T_{stg}	-55~150	°C



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5. Thermal Characteristics

Characteristics	Symbol	Rating	Unit
Thermal Resistance, Junction-to-Ambient ⁽¹⁾	R _{θJA}	78	°C/W
Thermal Resistance, Junction-to-Case	R _{θJC}		

6. Electrical Characteristics (T_J = 25°C)

Symbol	Characteristics	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	I _D =-250μA, V _{GS} =0V	-20	-22		V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-0.45	-0.65	-0.9	V
I _{DSS}	Drain CutOff Current	V _{DS} =-20V, V _{GS} =0V			1	μA
I _{GSS}	Gate Leakage Current	V _{GS} =±12V, V _{DS} =0V			±0.1	μA
R _{D(on)}	Drain-Source On-Resistance	V _{GS} =-4.5V, I _D =-1A		77	96	mΩ
		V _{GS} =-2.5V, I _D =-1A		104	130	mΩ
g _{FS}	Forward Transconductance	V _{DS} =-5V, I _D =-2.5A		8		S
Dynamic Characteristics						
Q _g	Total Gate Charge	V _{DS} =-10V, I _D =-2.5A, V _{GS} =-4.5V		3.6		nc
Q _{gs}	Gate Source Charge			0.4		nc
Q _{gd}	Gate Drain Charge			0.5		nc
C _{iss}	Input Capacitance	V _{DS} =-10V, V _{GS} =0V, f=1.0MHz		450		pF
C _{rss}	Reverse Transfer Capacitance			56		pF
C _{oss}	Output Capacitance			97		pF
t _{D(on)}	Turn-On Delay Time	V _{GS} =-4.5V, V _{DS} =-10V, I _D =-1.33A, R _G =3Ω		8		ns
t _r	Rise Time			42		ns
t _{D(off)}	Turn-Off Delay Time			12		ns
t _f	Fall Time			6		ns
R _g	Gate Resistance	f=1MHz				Ω
Drain-Source Body Diode Characteristics						
V _{SD}	Source-Drain Diode Forward Voltage	I _S = -2A, V _{GS} =0V		-0.9	-1.2	V
t _{rr}	Body Diode Reverse Recovery Time	I _F = -2A,		-4		ns
Q _{rr}	Body Diode Reverse Recovery Charge	dl/dt=100A/μs		-		nc

Notes 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

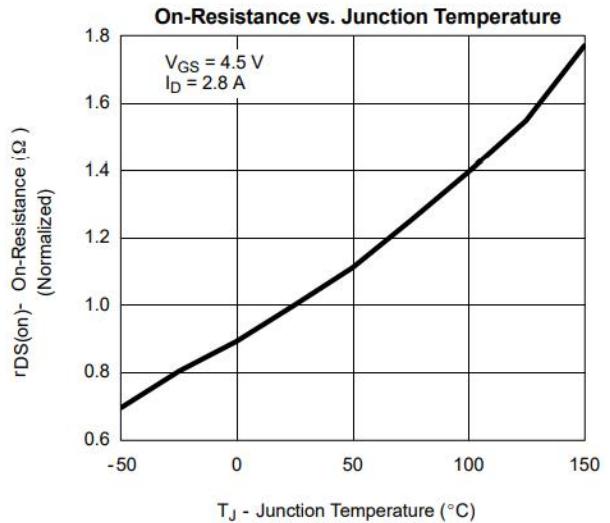
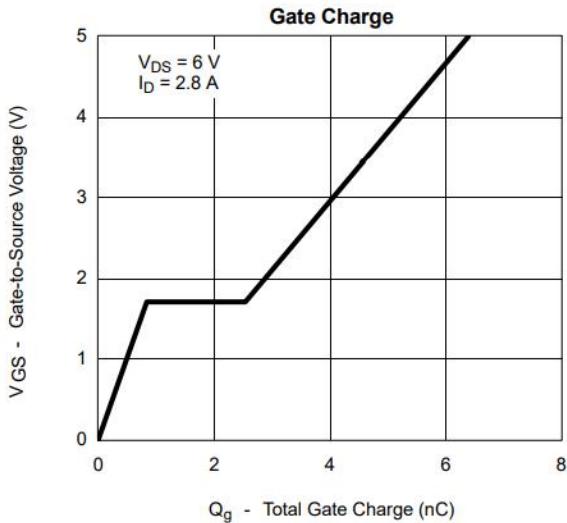
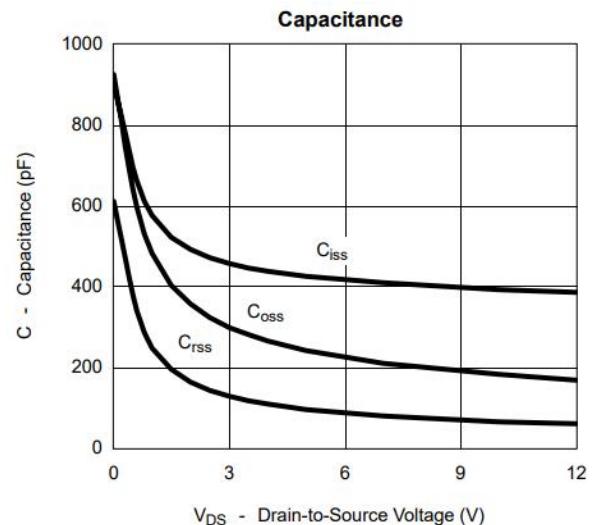
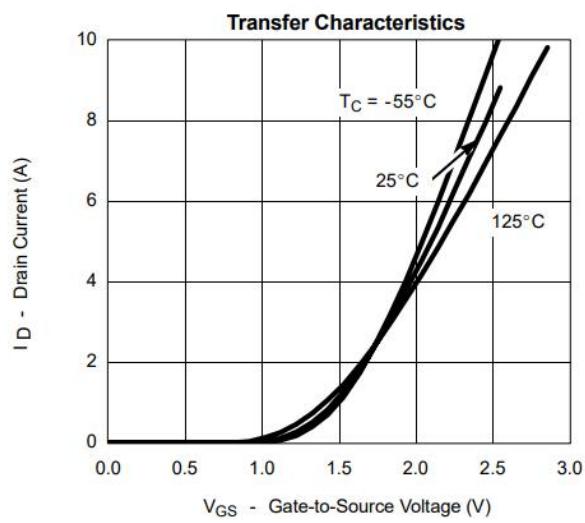
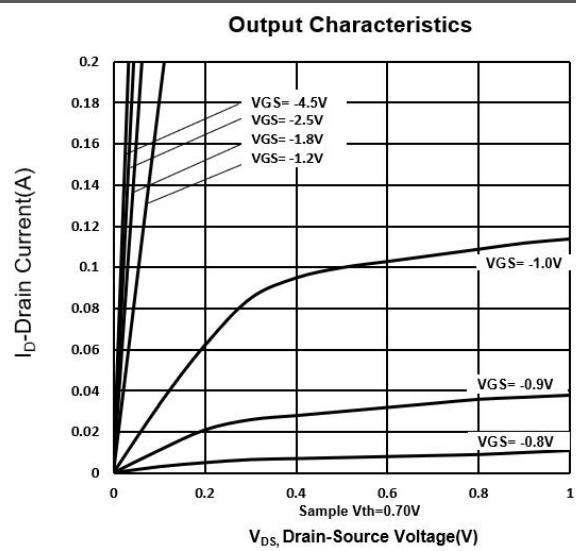
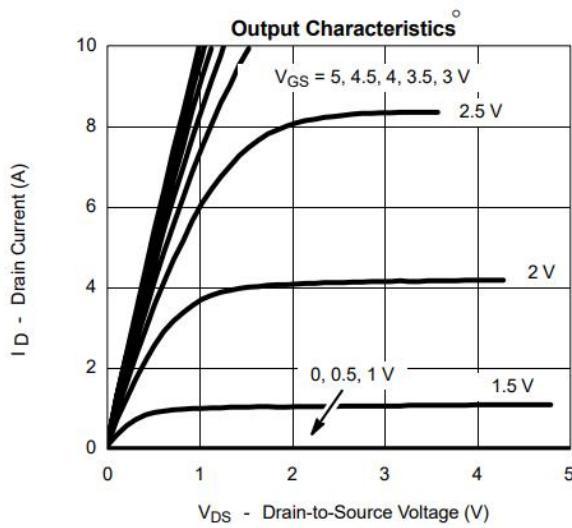


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7. Typical Electrical and Thermal Characteristics (Curves)

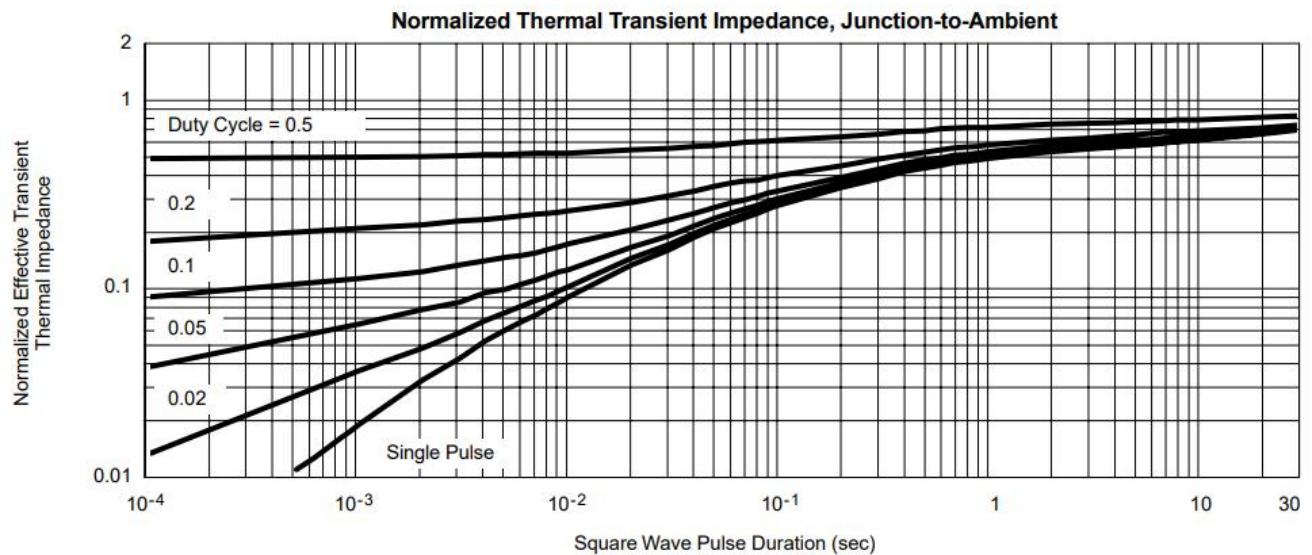
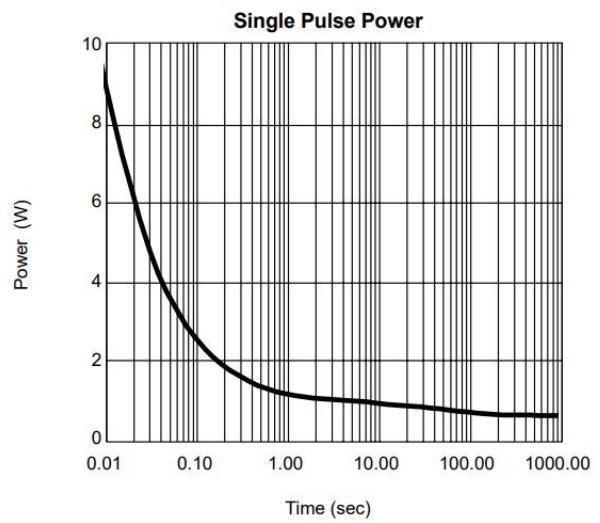
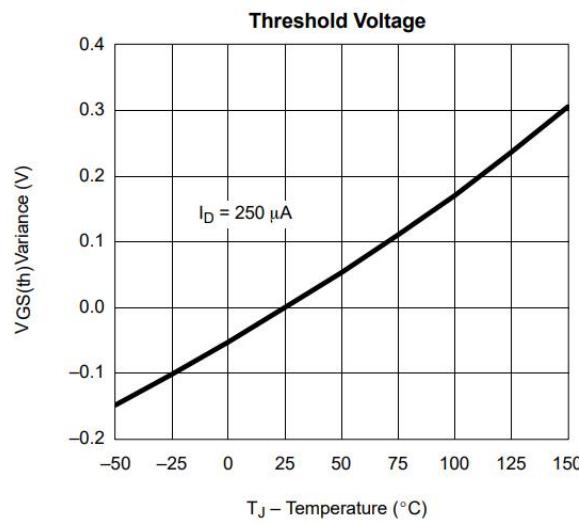
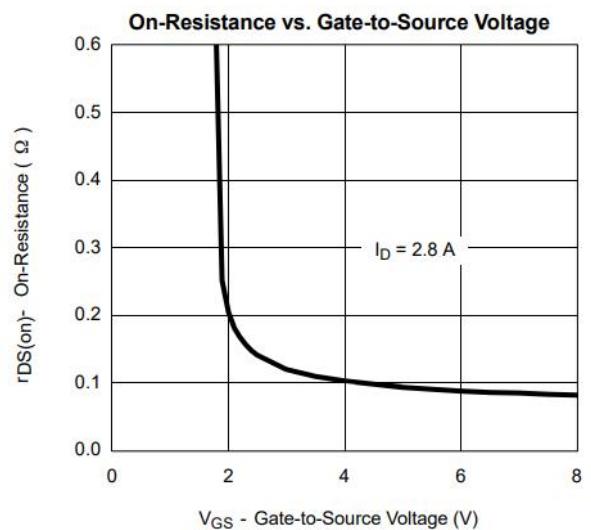
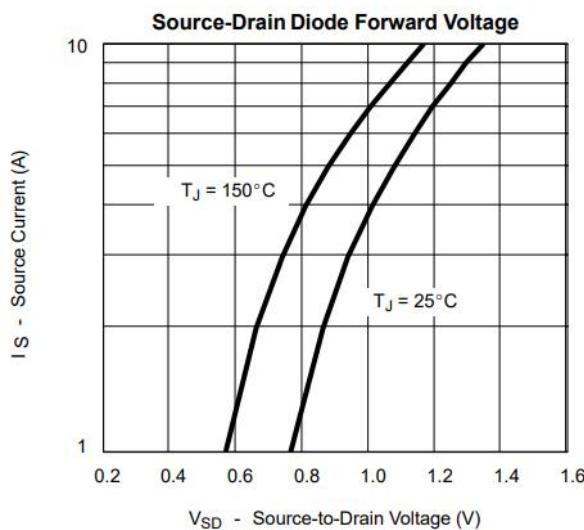




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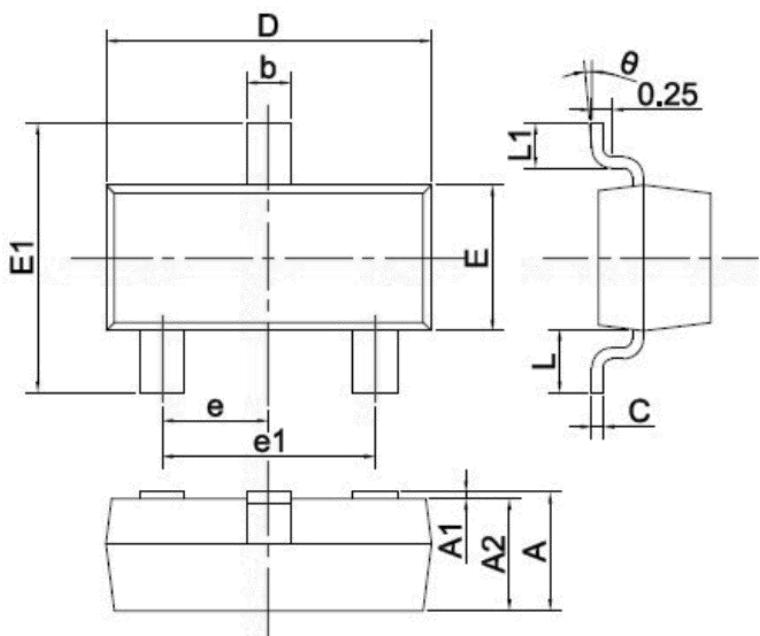
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8. Package Outline Dimensions

Marking	Device	Package	Reel size	Tape width	Quantity
S1	MLP2301A	SOT-23	13inch	12mm	10000



SOT-23 POD (mm)		
Symbol	Min	Max
A	0.90	1.15
A1	0.00	0.10
A2	0.90	1.05
b	0.30	0.50
c	0.08	0.15
D	2.80	3.00
E	1.20	1.40
E1	2.25	2.55
e	0.95Typ	
e1	1.80	2.00
L	0.55Ref	
L1	0.30	0.50
θ	0 °	8 °



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