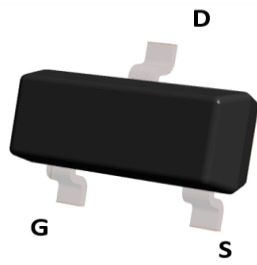
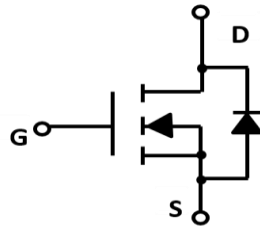
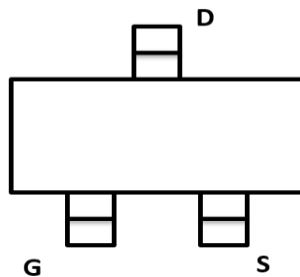


N-Channel Enhancement Mode Field Effect Transistor



Top View

SOT-23



Product Summary

- V_{DS} 20V
- I_D 4.5A
- $R_{DS(ON)}$ (at $V_{GS}=4.5V$) <25 mohm
- $R_{DS(ON)}$ (at $V_{GS}=2.5V$) <32 mohm
- $R_{DS(ON)}$ (at $V_{GS}=1.8V$) <49 mohm

General Description

- Trench Power LV MOSFET technology
- High Power and current handing capability

Applications

- PWM application
- Load switch

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

Parameter	Symbol	Limit	Unit
Drain-source Voltage	V_{DS}	20	V
Gate-source Voltage	V_{GS}	± 10	V
Drain Current	I_D	$T_A=25^\circ C$ @ Steady State	4.5
		$T_A=70^\circ C$ @ Steady State	3.6
Pulsed Drain Current ^A	I_{DM}	18	A
Total Power Dissipation @ $T_A=25^\circ C$	P_D	1.0	W
Thermal Resistance Junction-to-Ambient @ Steady State ^B	$R_{\theta JA}$	125	$^\circ C/W$
Junction and Storage Temperature Range	T_J, T_{STG}	-55~+150	$^\circ C$

■ Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
LM2300A	F2	S0.	3000	30000	120000	7" reel

■ Electrical Characteristics (T_J=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D =250μA	20			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =20V, V _{GS} =0V, T _C =25°C			1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±10V, V _{DS} =0V			±10	μA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =250μA	0.45	0.62	1.0	V
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} = 4.5V, I _D =4.5A		19.5	25	mΩ
		V _{GS} = 2.5V, I _D =3.0A		25	32	
		V _{GS} = 1.8V, I _D =2.7A		33	49	
Diode Forward Voltage	V _{SD}	I _S =4.5A, V _{GS} =0V			1.2	V
Maximum Body-Diode Continuous Current	I _S				4.5	A
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =10V, V _{GS} =0V, f=1MHZ		620		pF
Output Capacitance	C _{oss}			114		
Reverse Transfer Capacitance	C _{riss}			64		
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =4.5V, V _{DS} =10V, I _D =4.5A		7.1		nC
Gate Source Charge	Q _{gs}			1.4		
Gate Drain Charge	Q _{gd}			1.9		
Turn-on Delay Time	t _{D(on)}	V _{GS} =4.5V, V _{DD} =10V, R _L =1.5Ω, R _{GEN} =3Ω		13		ns
Turn-on Rise Time	t _r			54		
Turn-off Delay Time	t _{D(off)}			18		
Turn-off Fall Time	t _f			11		

A. Pulse Test: Pulse Width ≤ 300us, Duty cycle ≤ 2%.

B. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

■ Typical Performance Characteristics

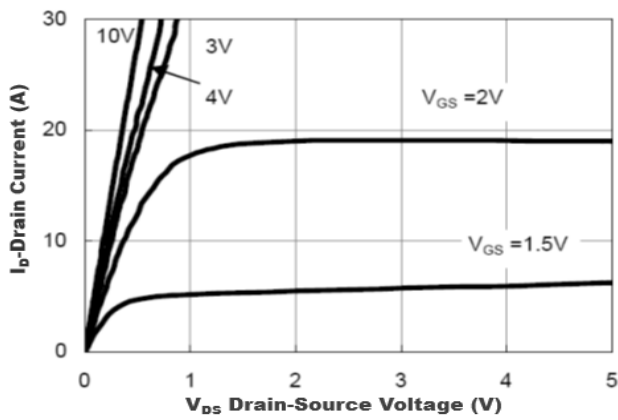


Figure1. Output Characteristics

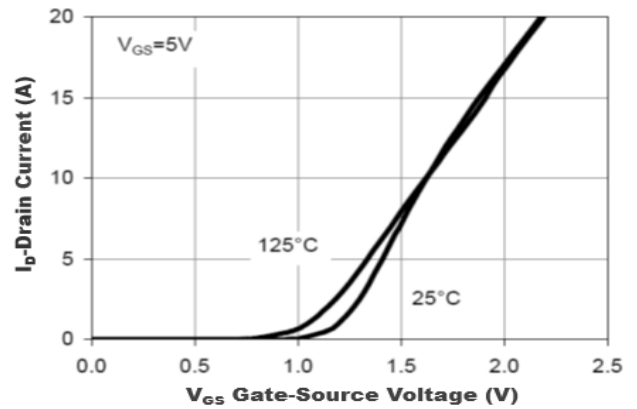


Figure2. Transfer Characteristics

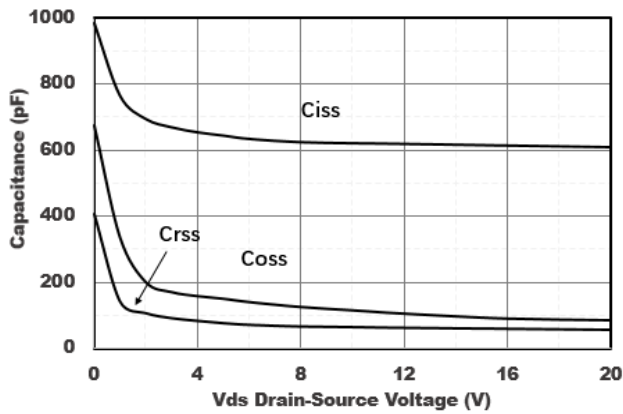


Figure3. Capacitance Characteristics

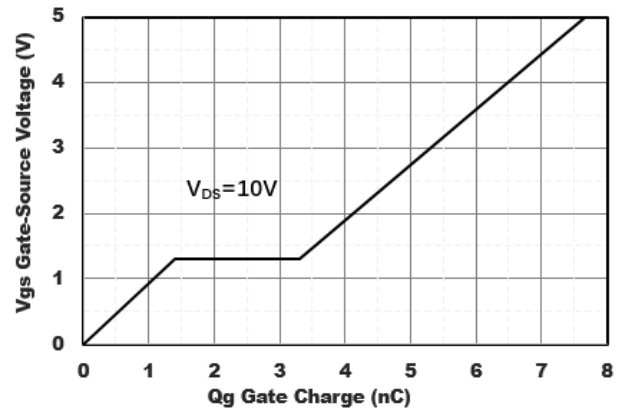


Figure4. Gate Charge

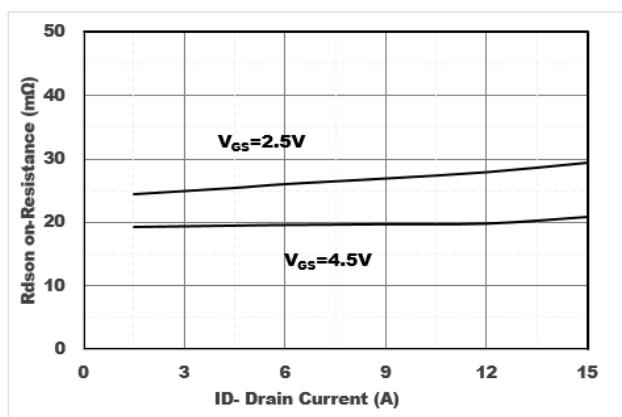


Figure5. Drain-Source on Resistance

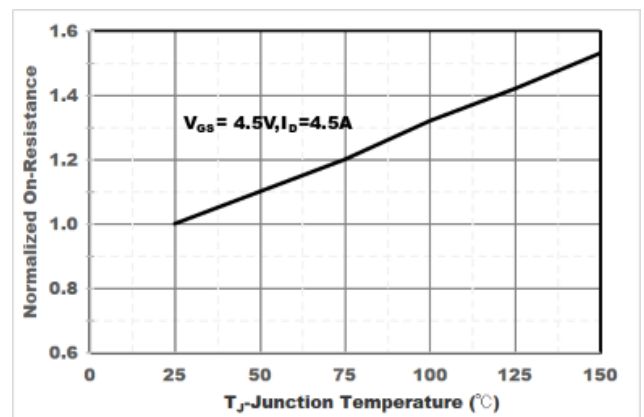


Figure6. Drain-Source on Resistance

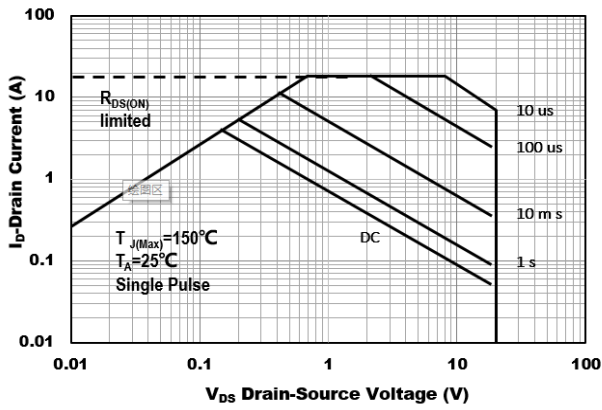


Figure7. Safe Operation Area

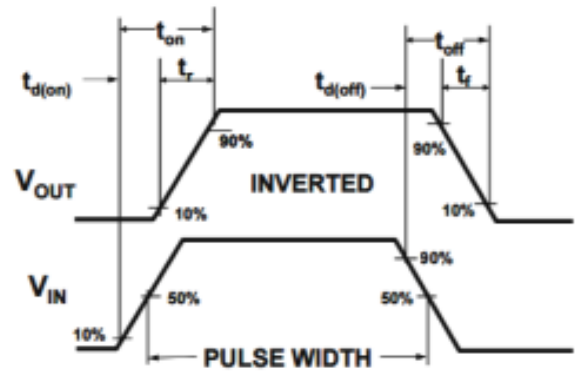
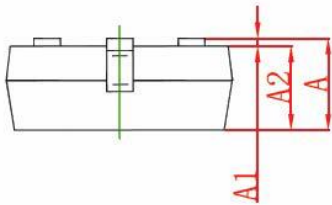
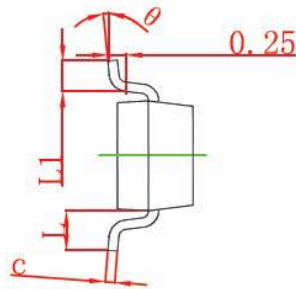
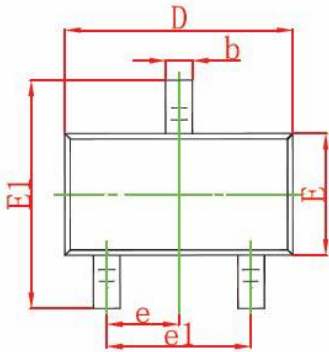


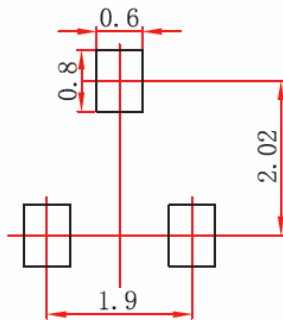
Figure8. Switching wave

■SOT-23 Package information



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°

■SOT-23 Suggested Pad Layout



Note:

1. Controlling dimension: in millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.