

DP2301S

DP2301S P-Channel MOSFET

General description

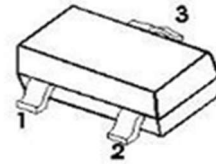
P-Channel MOSFET

Features:

- $V_{DS} : -20V$
- $I_D : -2.3A$
- $R_{DS(ON)}$ (at $V_{GS}=-4.5V$) < 140 mohm
- $R_{DS(ON)}$ (at $V_{GS}=-2.5V$) < 210 mohm
- Trench Power MOSFET technology
- Low $R_{DS(ON)}$ @ $V_{GS} = -4.5V$
- High Current Handling Capability
- Halogen-free 、RoHS Compliant

Applications

- DC/DC Converter for Portable Devices
- High-side Load Switch
- High Speed line Driver



1. Gate
2. Source
3. Drain

Package : SOT-23

Device Marking Code:

Device Type	Device Marking
DP2301S	A1SHB

Absolute Maximum Ratings (TA=25°C unless otherwise noted)

Parameters	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 10	V
Continuous Drain Current	I_D	-2.3	A
Pulsed Drain Current (note 1)	I_{DM}	-9	A
Maximum Power Dissipation	P_D	1.0	W
Thermal Resistance from Junction to Ambient (note 2)	$R_{\theta JA}$	125	$^{\circ}C/W$
Junction and Storage Temperature	T_J, T_{STG}	-50~+150	$^{\circ}C$

Electrical Characteristics (T_j=25°C unless otherwise noted)

Parameters	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = - 250μA	-20	--	--	V
Zero gate voltage drain current	I _{DSS}	V _{DS} = - 20V, V _{GS} = 0V	--	--	-1	μA
Gate-body leakage current	I _{GSS}	V _{GS} = ± 10V, V _{DS} = 0V	--	--	±100	nA
Gate threshold voltage (note 3)	V _{GS(th)}	V _{DS} =V _{GS} , I _D = - 250μA	-0.4	-0.6	-1.0	V
Drain-source on-resistance (note 3)	R _{DS(on)}	V _{GS} = - 4.5V, I _D = - 2A	--	125	140	mΩ
		V _{GS} = - 3.3V, I _D = - 1A	--	140	170	mΩ
		V _{GS} = - 2.5V, I _D = - 1A	--	170	210	mΩ
Diode forward voltage (note 3)	V _{SD}	I _S = - 1A, V _{GS} = 0V	--	-0.83	-1.2	V
Dynamic Characteristics (note 4)						
Input Capacitance	C _{iss}	V _{DS} = -10V, V _{GS} = 0V, f = 1MHz	--	177	--	pF
Output Capacitance	C _{oss}		--	30	--	pF
Reverse Transfer Capacitance	C _{rss}		--	25	--	pF
Switching Characteristics (note 4)						
Turn-on delay time	td(on)	V _{DD} = -10V, I _D = -2A, R _G = 3.3Ω, V _{GS} = -4.5V	--	11	--	ns
Turn-on rise time	tr		--	32	--	ns
Turn-off delay time	td(off)		--	25	--	ns
Turn-off fall time	tf		--	38	--	ns
Total Gate Charge	Q _g	V _{DS} = -10V, I _D = -2A, V _{GS} = -4.5V	--	5.3	--	nC
Gate-Source Charge	Q _{gs}		--	0.7	--	nC
Gate-Drain Charge	Q _{gd}		--	1.4	--	nC

Note:

- 1.Repetitive rating: Pluse width limited by maximum junction temperature
- 2.Surface Mounted on FR4 board, t ≤ 10 sec.
- 3.Pulse test : Pulse width ≤ 300μs, duty cycle ≤ 2%. Guaranteed by design, not subject to production.

Typical Performance Characteristics

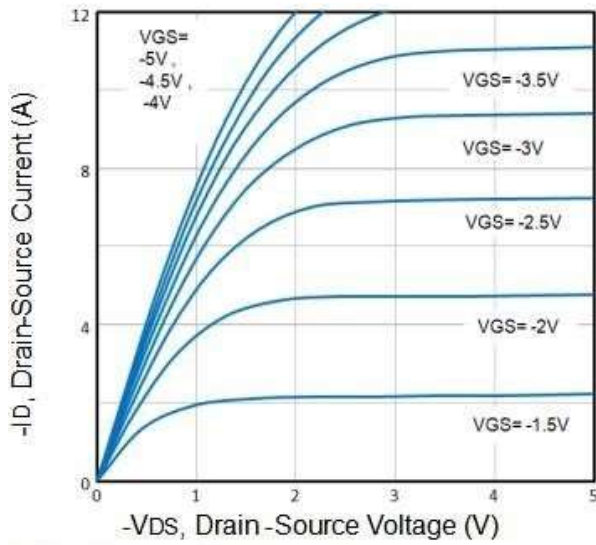


Fig1. Typical Output Characteristics

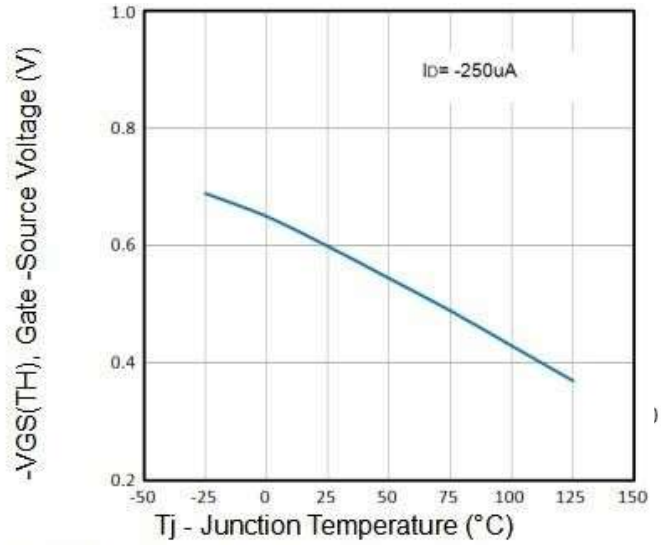


Fig2. Normalized Threshold Voltage Vs. Temperature

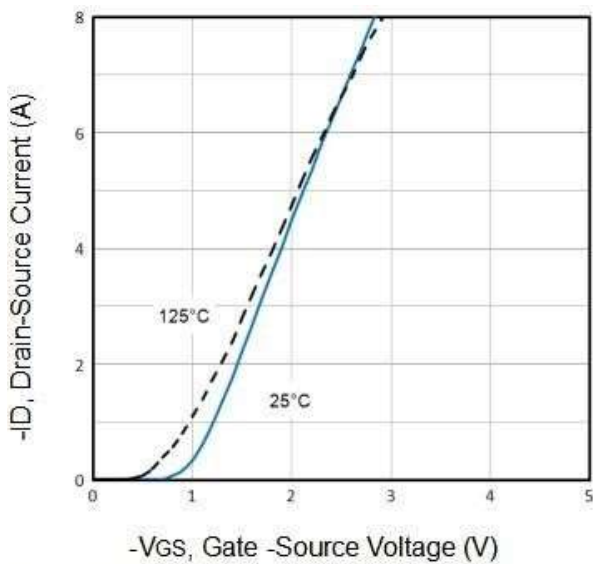


Fig3. Typical Transfer Characteristics

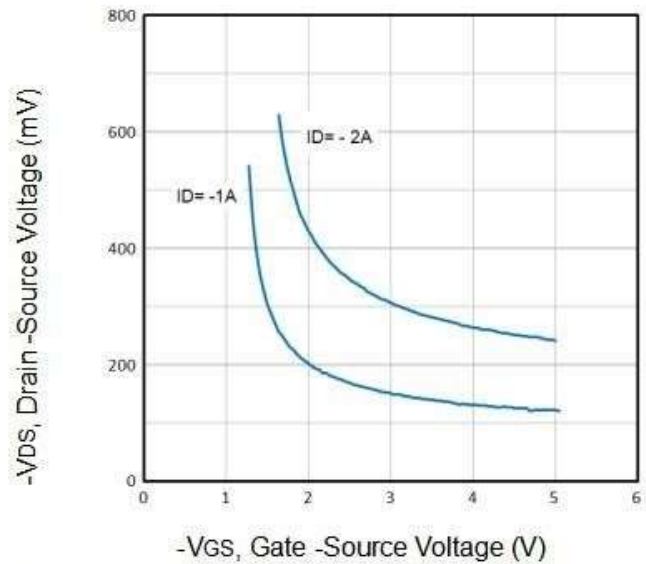


Fig4. Drain-Source Voltage vs Gate -Source Voltage

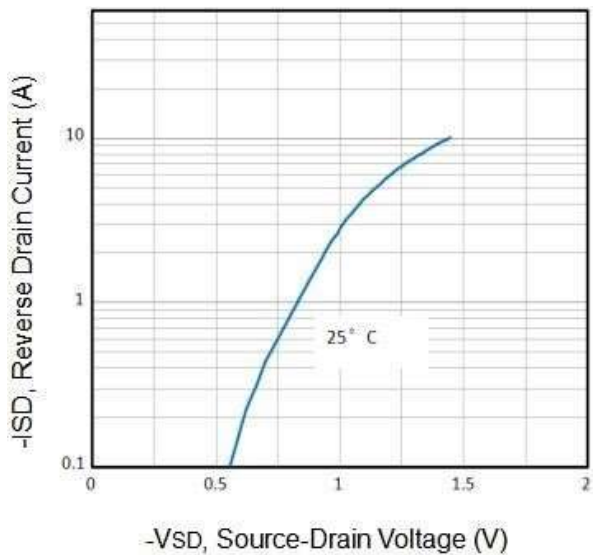


Fig5. Typical Source-Drain Diode Forward Voltage

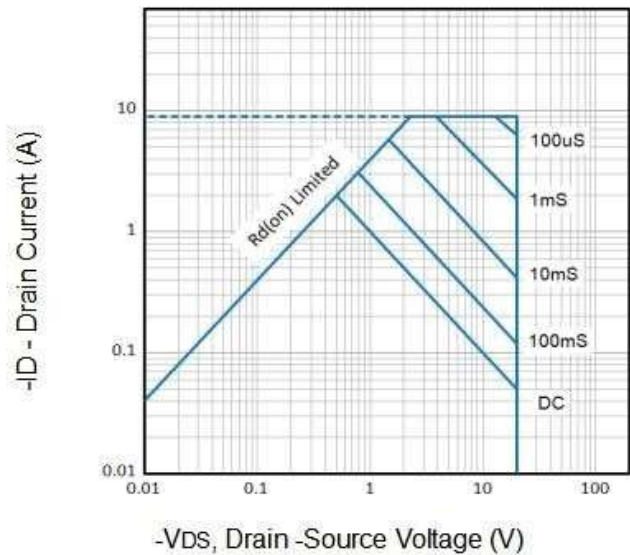


Fig6. Maximum Safe Operating Area

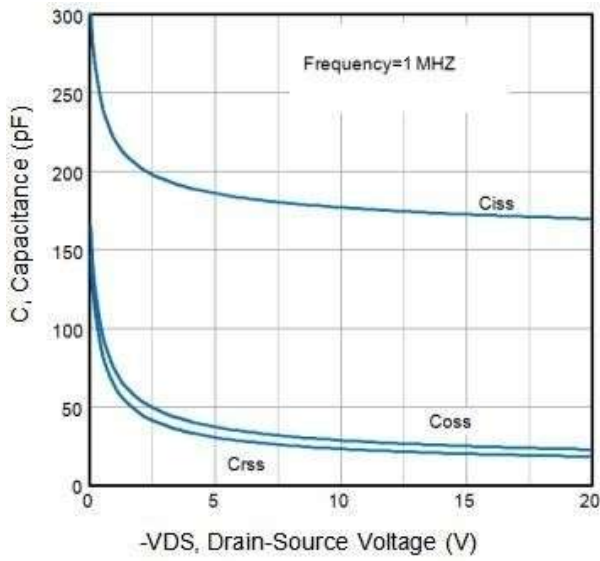


Fig7. Typical Capacitance Vs. Drain-Source Voltage

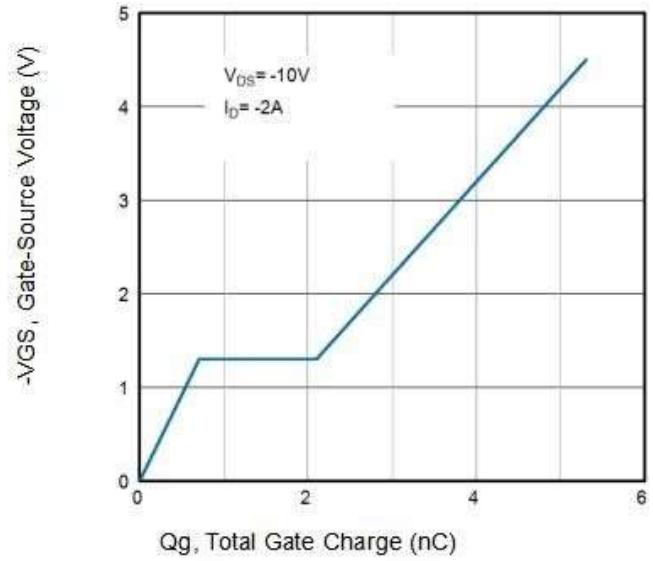
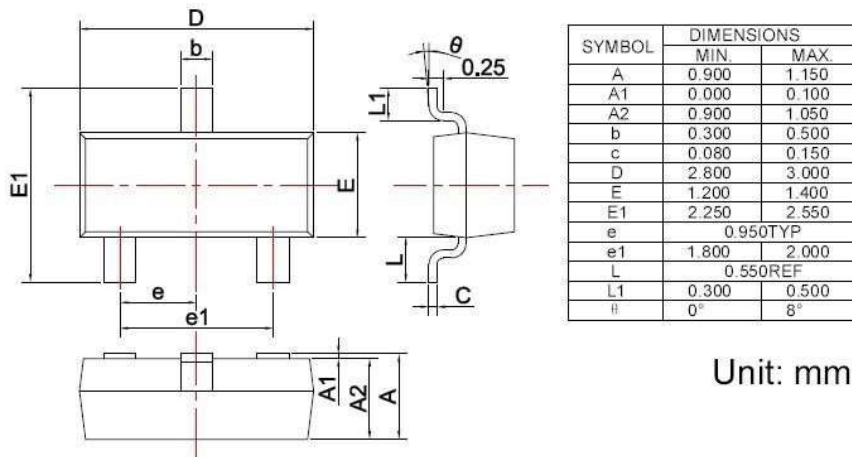
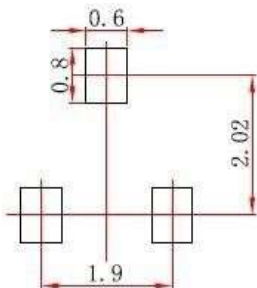


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

SOT-23 Package Outline Dimensions



Precautions: PCB Design



Note:

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

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