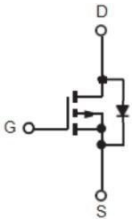
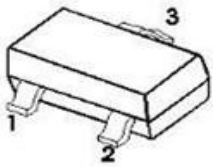
DP2301
P-Channel MOSFET

General description
P-Channel MOSFET

Features:
- V_{DS} : -20V
- I_D : -3.1A
- $R_{DS(ON)}$(at V_{GS}=-4.5V) ＜90 mohm
- $R_{DS(ON)}$(at V_{GS}=-3,3V) ＜100 mohm
- Trench Power MOSFET technology
- Low $R_{DS(ON)}$ @V_{GS}= -4.5V
- High Current Handing 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
DP2301	S1 or A1SHB

Absolute Maximum Ratings (TA=25℃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	-3.1	A
Pulsed Drain Current (note 1)	I_{DM}	-12	A
Maximum Power Dissipation	P_D	1.2	W
Thermal Resistance from Junction to Ambient (note 2)	$R_{\theta JA}$	100	℃/W
Junction and Storage Temperature	T_J、T_{STG}	-50~+150	℃

Electrical Characteristics (T_J=25℃ 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 = -3A	--	70	90	mΩ
		V_{GS} = - 3.3V, I_D = - 2A	--	78	100	mΩ
Diode forward voltage (note 3)	V_{SD}	I_S= - 2A, V_{GS} = 0V	--	-0.85	-1.2	V
Dynamic Characteristics (note 4)						
Input Capacitance	Ciss	V_{DS}= -10V,V_{GS}=0V, f =1MHz	--	330	--	pF
Output Capacitance	Coss		--	50	--	pF
Reverse Transfer Capacitance	Crss		--	45	--	pF
Switching Characteristics (note 4)						
Turn-on delay time	td(on)	V_{DD}= -10V,I_D= -3A,R_G= 3.3Ω, V_{GS}= -4.5V	--	11	--	ns
Turn-on rise time	tr		--	12	--	ns
Turn-off delay time	td(off)		--	18	--	ns
Turn-off fall time	tf		--	30	--	ns
Total Gate Charge	Q_g	V_{DS}= -10V,I_D=-3A, V_{GS}=-4.5V	--	6.6	--	nC
Gate-Source Charge	Qgs		--	0.8	--	nC
Gate-Drain Charge	Qgd		--	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

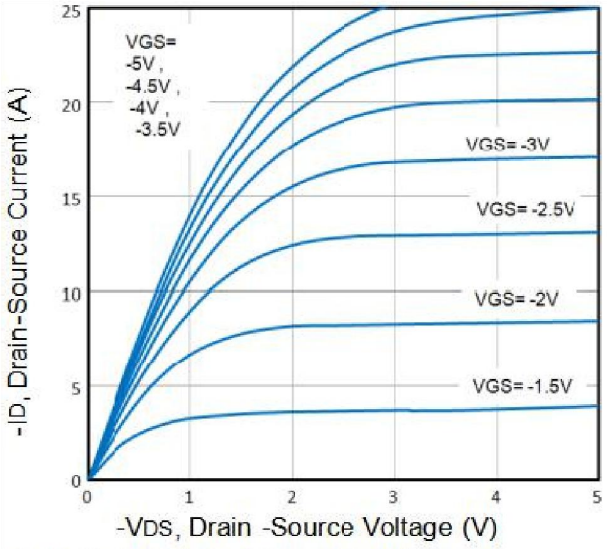


Fig1. Typical Output Characteristics

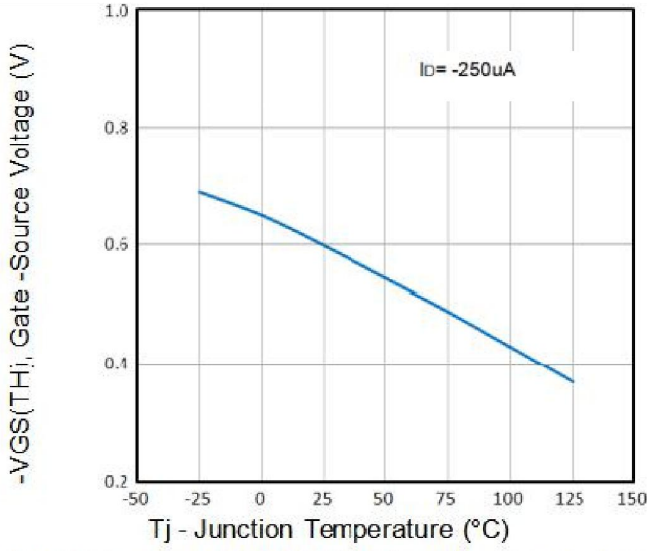


Fig2. Normalized Threshold Voltage Vs. Temperature

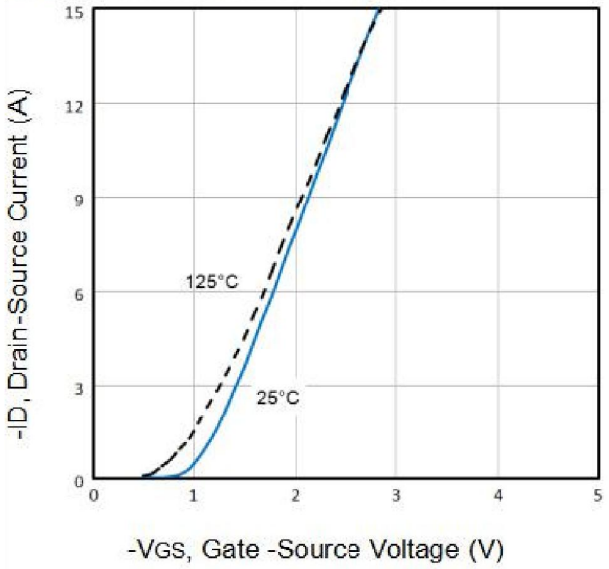


Fig3. Typical Transfer Characteristics

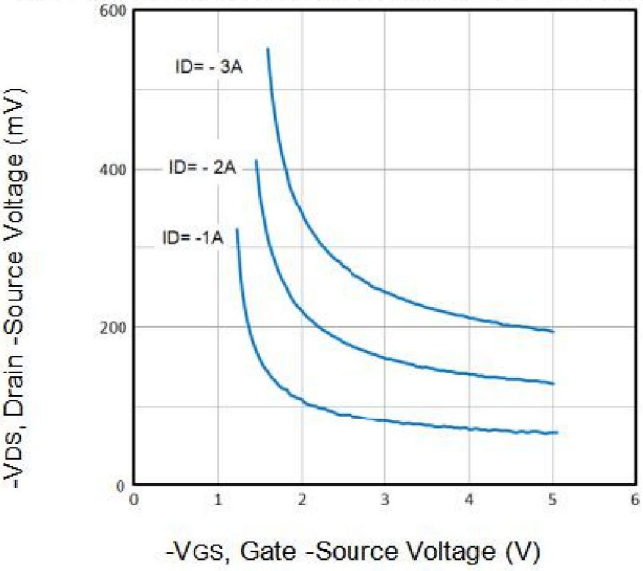


Fig4. Drain -Source Voltage vs Gate -Source Voltage

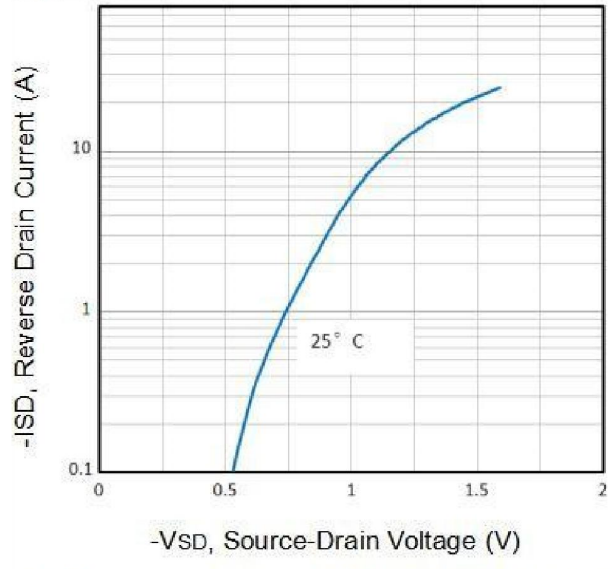


Fig5. Typical Source-Drain Diode Forward Voltage

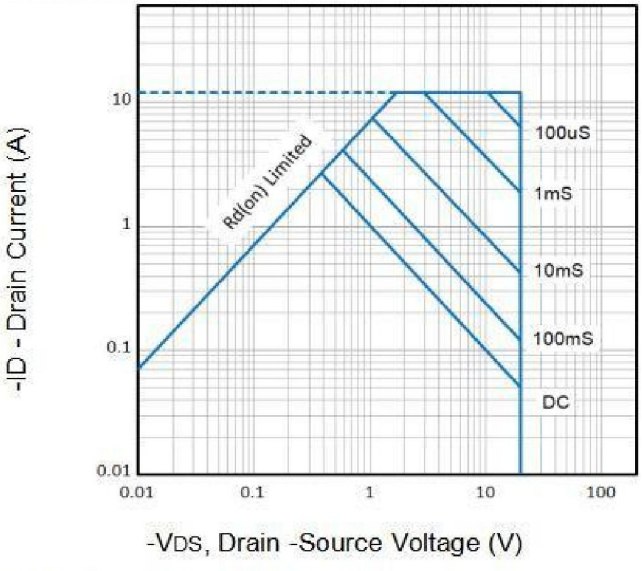


Fig6. Maximum Safe Operating Area

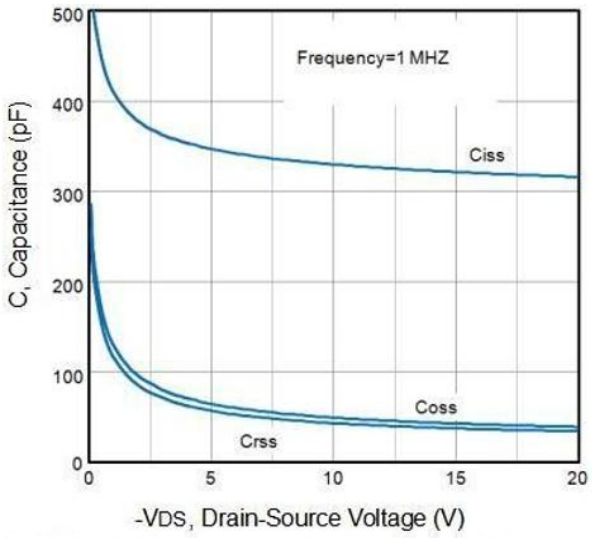


Fig7. Typical Capacitance Vs. Drain-Source Voltage

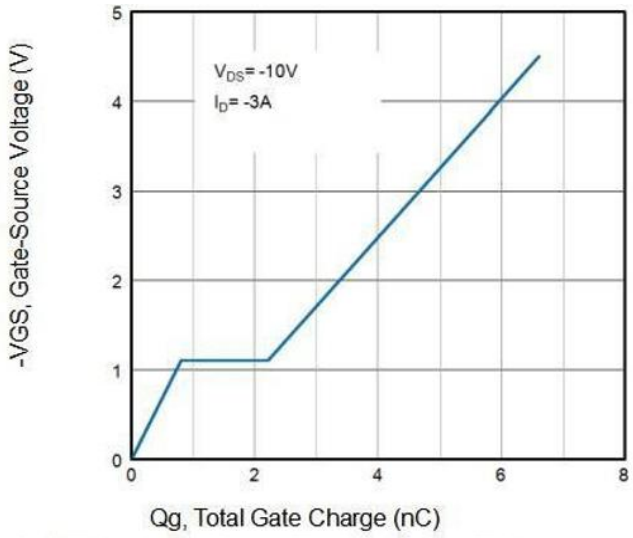
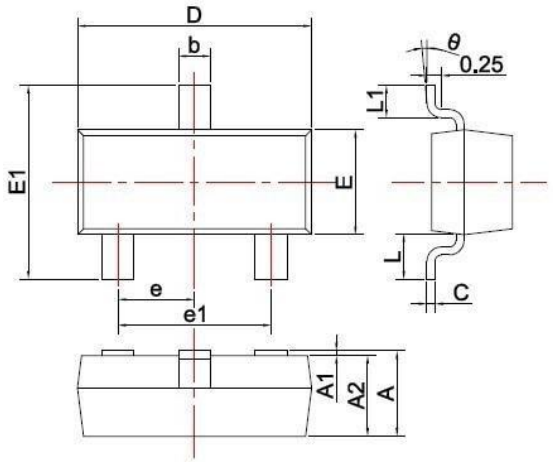


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

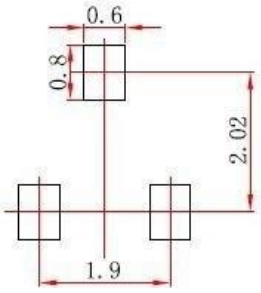
SOT-23 Package Outline Dimensions



SYMBOL	DIMENSIONS	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°

Unit: mm

Precautions: PCB Design



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

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