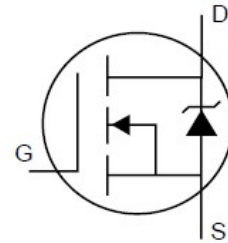


# AP2300

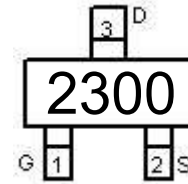
## N-Channel Power MOSFET

### Description

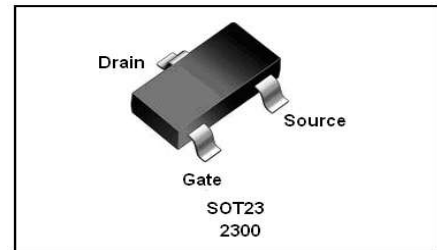
The 2300 designed by the trench processing techniques to achieve extremely low on-resistance. And fast switching speed and improved transfer effective . These features combine to make this design an extremely efficient and reliable device for variety of DC-DC applications.



Schematic diagram



Marking and pin Assignment



### Features

- ◆ Ron(typ.)=25 mΩ @VGS=2.5V
- ◆ Ron(typ.)=21 mΩ @VGS=4.5V
- ◆ Low On-Resistance
- ◆ 150°C Operating Temperature
- ◆ Fast Switching
- ◆ Lead-Free, RoHS Compliant

### Application

- Battery protection
- Load switch
- Power management

Symbol	Parameter		Rating	Unit
<b>Common Ratings (T<sub>c</sub>=25°C Unless Otherwise Noted)</b>				
V <sub>GS</sub>	Gate-Source Voltage		±12	V
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage		20	V
T <sub>J</sub>	Maximum Junction Temperature		150	°C
T <sub>STG</sub>	Storage Temperature Range		-50 to 155	°C
I <sub>S</sub>	Diode Continuous Forward Current	T <sub>c</sub> =25°C	5.2 <sup>①</sup>	A
<b>Mounted on Large Heat Sink</b>				
I <sub>DM</sub>	Pulse Drain Current Tested	T <sub>c</sub> =25°C 1	20	A
I <sub>D</sub>	Continuous Drain Current(VGS=10V)	T <sub>c</sub> =25°C	5.2 <sup>①</sup>	A
		T <sub>c</sub> =100°C	4.0	
P <sub>D</sub>	Maximum Power Dissipation	T <sub>c</sub> =25°C	1.25	W
R <sub>θJA</sub>	Thermal Resistance Junction-Ambient		135	°C/W

**AP2300**
**N-Channel Power MOSFET**

Symbol	Parameter	Condition	Min	Typ	Max	Unit
<b>Static Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	20	--	--	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current (T <sub>c</sub> =25°C)	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V	--	--	1	μA
	Zero Gate Voltage Drain Current (T <sub>c</sub> =125°C)	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V	--	--	100	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> =±12V, V <sub>DS</sub> =0V	--	--	±100	nA
V <sub>GS(TH)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	0.5	0.7	1.5	V
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =2.5V, I <sub>D</sub> =5.2A	--	25	35	mΩ
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =4.5V, I <sub>D</sub> =6A	--	21	25	mΩ
<b>Dynamic Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =10V, V <sub>GS</sub> =0V, f=1MHz	--	630	--	pF
C <sub>oss</sub>	Output Capacitance		--	150	--	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		--	60	--	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =10V, I <sub>D</sub> =2.8A, V <sub>GS</sub> =4.5V	--	11	--	nC
Q <sub>gs</sub>	Gate-Source Charge		--	1.6	--	nC
Q <sub>gd</sub>	Gate-Drain Charge		--	2.7	--	nC
<b>Switching Characteristics</b>						
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DD</sub> =10V, I <sub>D</sub> =1A, R <sub>G</sub> =6Ω, V <sub>GS</sub> =4.5V, R <sub>L</sub> =5Ω,	--	14.5	--	nS
t <sub>r</sub>	Turn-on Rise Time		--	46	--	nS
t <sub>d(off)</sub>	Turn-Off Delay Time		--	52	--	nS
t <sub>f</sub>	Turn-Off Fall Time		--	39	--	nS
<b>Source- Drain Diode Characteristics</b>						
I <sub>SD</sub>	Source-drain current(Body Diode)	T <sub>c</sub> =25°C	--	--	5.2 <sup>①</sup>	A
I <sub>SDM</sub>	Pulsed Source-drain current (Body Diode)		--	--	20 <sup>①</sup>	A
V <sub>SD</sub>	Forward on voltage	T <sub>J</sub> =25°C, I <sub>SD</sub> =2.8A, V <sub>GS</sub> =0V	--	0.85	1.3	V

**AP2300**

**N-Channel Power MOSFET**

**Typical Characteristics**

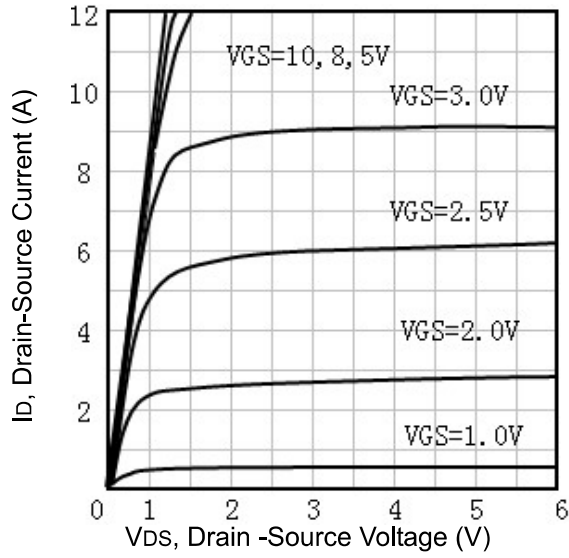


Fig1. Typical Output Characteristics

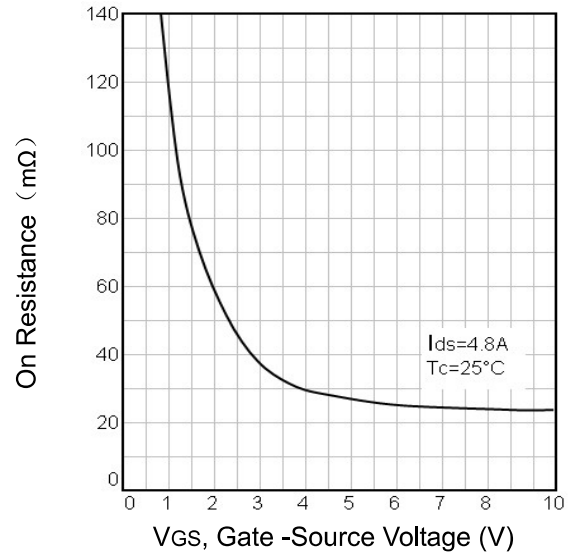


Fig2. Typical Transfer Characteristics

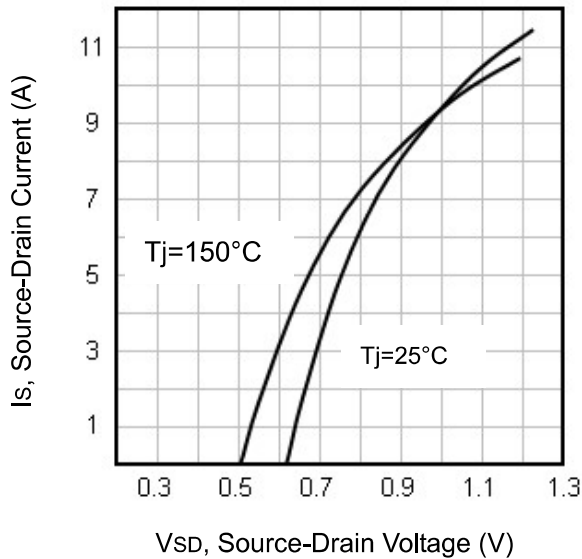


Fig7. Typical Source-Drain Diode Forward Voltage

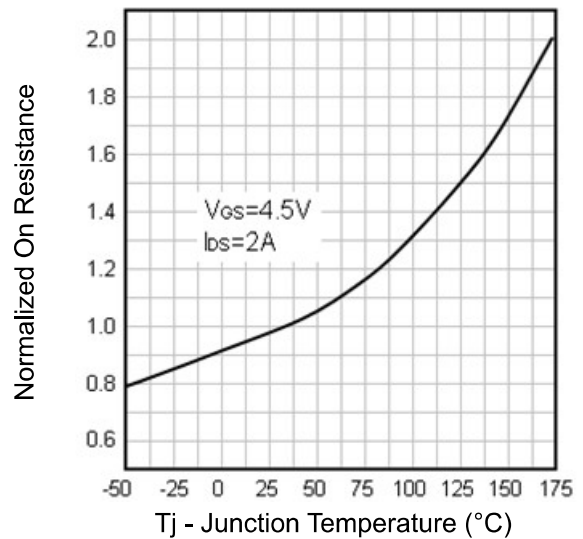


Fig4. Normalized On-Resistance Vs. Temperature

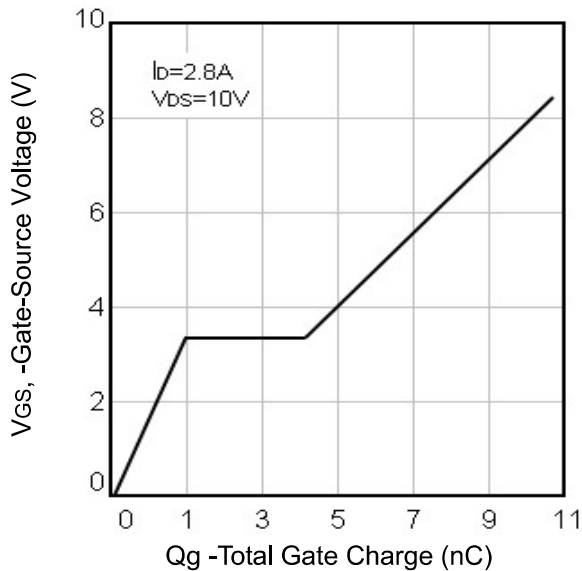


Fig5. Typical Gate Charge Vs. Gate-Source Voltage

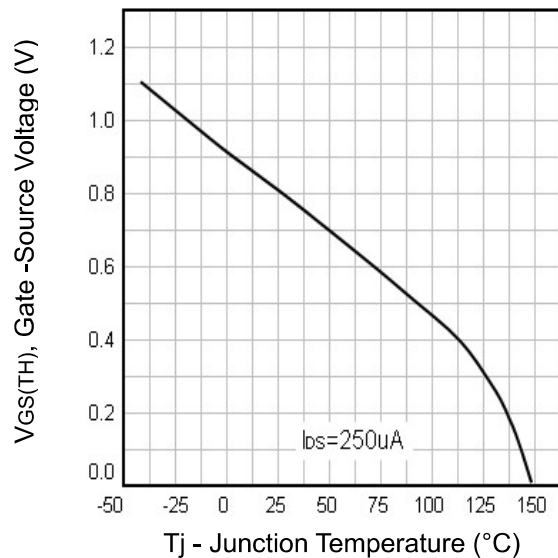


Fig6. Threshold Voltage Vs. Temperature