

**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.

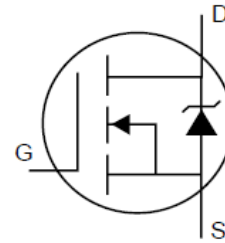
**Features**

◆	$V_{DSS}$	$R_{DS(ON)}$ @4.5V (Typ)	$R_{DS(ON)}$ @10V(Typ)	$I_D$
	20V	28mΩ	22mΩ	5.2A

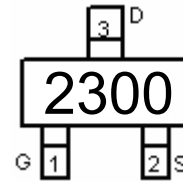
- ◆ Low On-Resistance
- ◆ 150°C Operating Temperature
- ◆ Fast Switching
- ◆ Lead-Free, RoHS Compliant

**Application**

- Battery protection
- Load switch
- Power management



Schematic diagram



Marking and pin Assignment



SOT-23

Symbol	Parameter	Rating	Unit
<b>Common Ratings (T<sub>c</sub>=25°C Unless Otherwise Noted)</b>			
$V_{GS}$	Gate-Source Voltage	±12	V
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	20	V
$T_J$	Maximum Junction Temperature	150	°C
$T_{STG}$	Storage Temperature Range	-50 to 155	°C
$I_S$	Diode Continuous Forward Current	$T_c = 25^\circ C$ 5.2 <sup>①</sup>	A
<b>Mounted on Large Heat Sink</b>			
$I_{DM}$	Pulse Drain Current Tested	$T_c = 25^\circ C$ 1 20	A
$I_D$	Continuous Drain Current(VGS=10V)	$T_c = 25^\circ C$ 5.2 <sup>①</sup>	A
		$T_c = 100^\circ C$ 4.0	
$P_D$	Maximum Power Dissipation	$T_c = 25^\circ C$ 1.25	W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	135	°C/W

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
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> =10V, I <sub>D</sub> =5.2A	--	22	25	mΩ
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =4.5V, I <sub>D</sub> =4.8A	--	28	32	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

Typical Characteristics

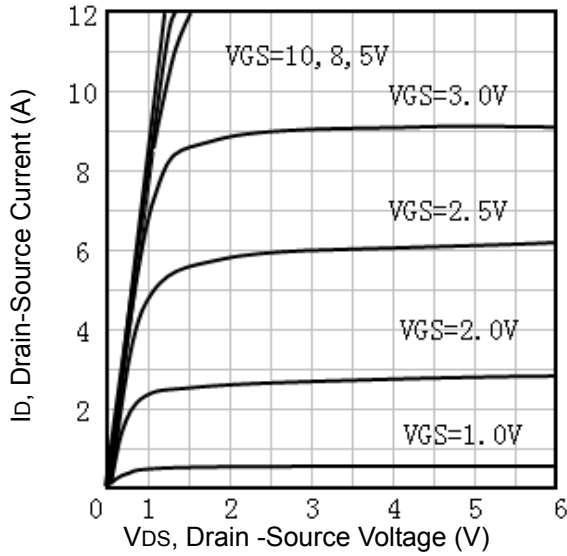


Fig1. Typical Output Characteristics

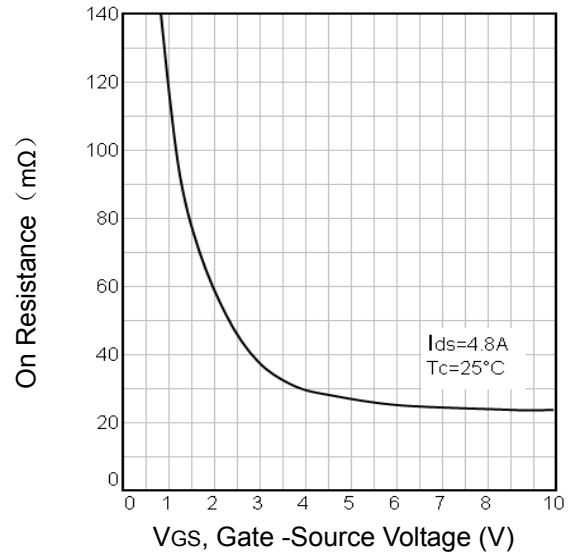


Fig2. Typical Transfer Characteristics

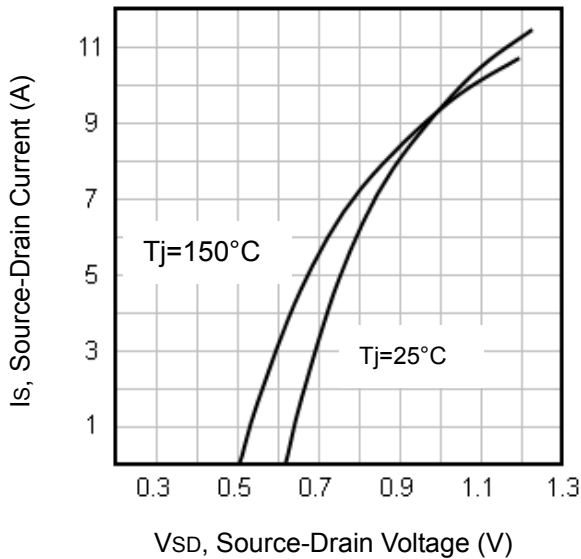


Fig7. Typical Source-Drain Diode Forward Voltage

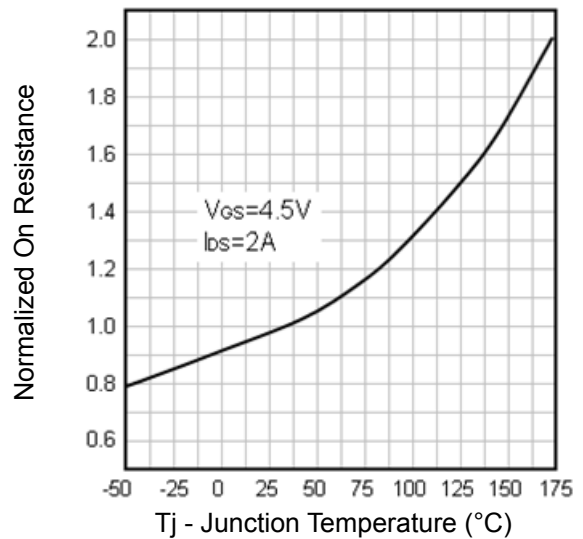


Fig4. Normalized On-Resistance Vs. Temperature

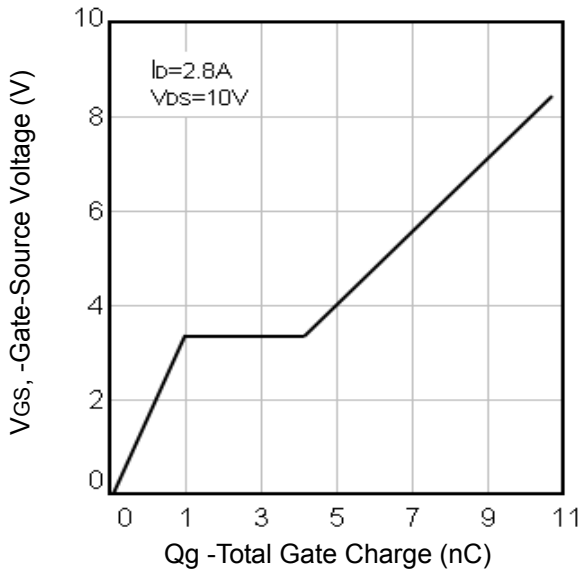


Fig5. Typical Gate Charge Vs. Gate-Source Voltage

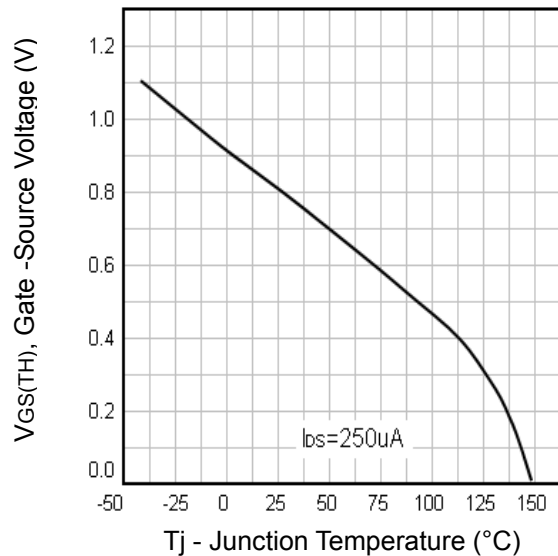


Fig6. Threshold Voltage Vs. Temperature