

### Description

The 2300F 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.

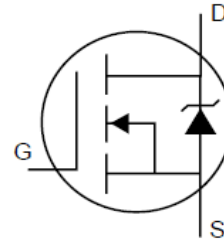
### Features

$V_{DSS}$	$R_{DS(ON)}$ @4.5V (Typ)	$R_{DS(ON)}$ @2.5V(Typ)	$I_D$
20V	20m $\Omega$	25 m $\Omega$	6A

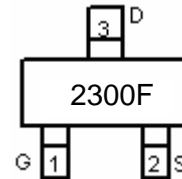
- ◆ Low On-Resistance
- ◆ 150°C Operating Temperature
- ◆ Fast Switching
- ◆ RoHSCompliant

### Application

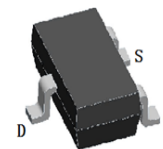
- Battery protection
- Load switch
- Power management



Schematic diagram



Marking and pin Assignment



SOT-23

### Ordering Information

Part Number	Marking	Case	Packaging
2300F	2300F	SOT-23	3000pcs/Reel

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	$T_C = 25^\circ\text{C}$	6	A
<b>Mounted on Large Heat Sink</b>				
$I_{DM}$	Pulse Drain Current Tested	$T_C = 25^\circ\text{C}$	20	A
$I_D$	Continuous Drain Current(VGS=10V)	$T_C = 25^\circ\text{C}$	6	A
		$T_C = 100^\circ\text{C}$	4.0	
$P_D$	Maximum Power Dissipation	$T_C = 25^\circ\text{C}$	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	--	--	0.3	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	0.65	0.9	V
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =4.5V, I <sub>D</sub> =2.3A	--	20	27	mΩ
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =2.5V, I <sub>D</sub> =2.3A	--	25	41	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	A
I <sub>SDM</sub>	Pulsed Source-drain current (Body Diode)		--	--	20	A
V <sub>SD</sub>	Forward on voltage	T <sub>J</sub> =25°C, I <sub>SD</sub> =3A, V <sub>GS</sub> =0V	--	--	1.2	V

Typical Characteristics

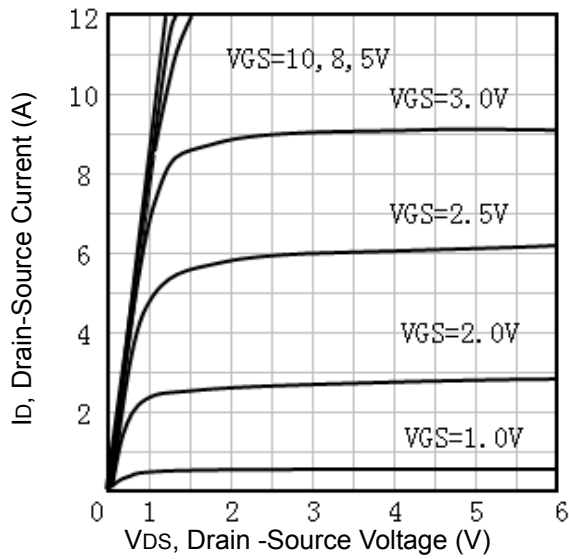


Fig1. Typical Output Characteristics

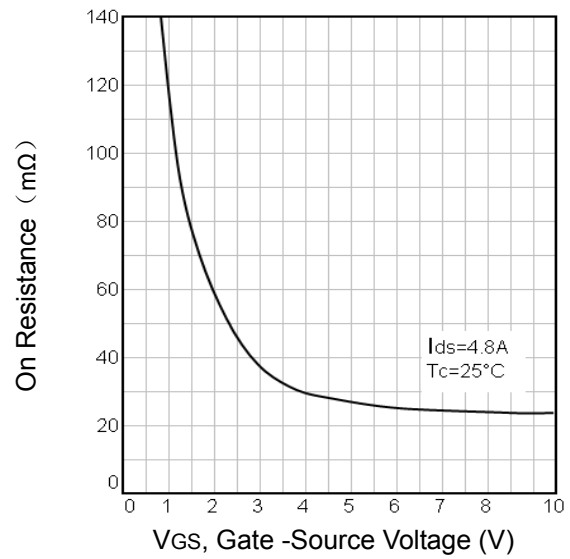


Fig2. Typical Transfer Characteristics

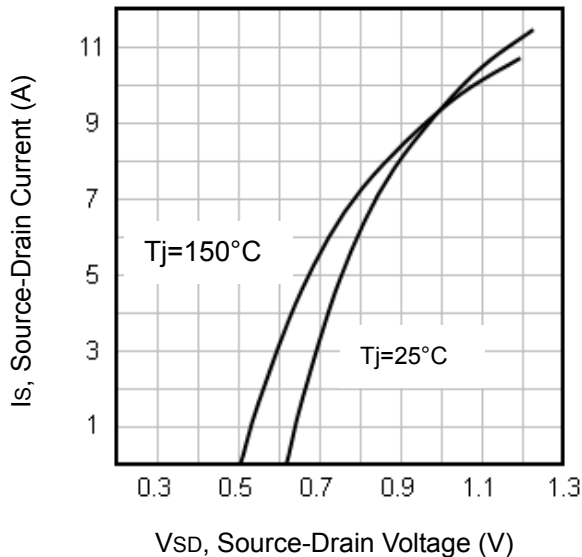


Fig3. Typical Source-Drain Diode Forward Voltage

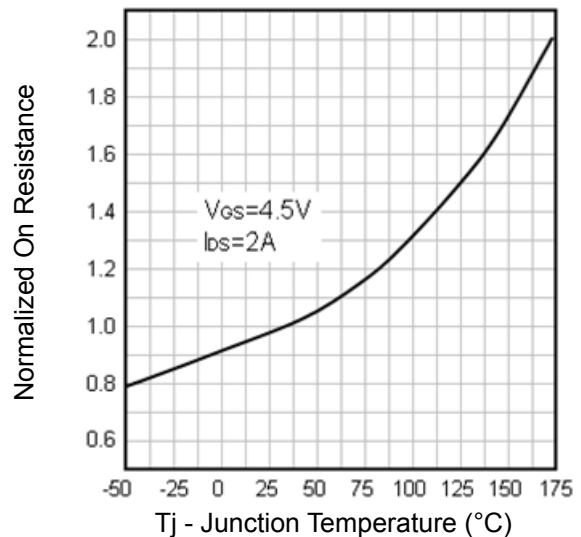
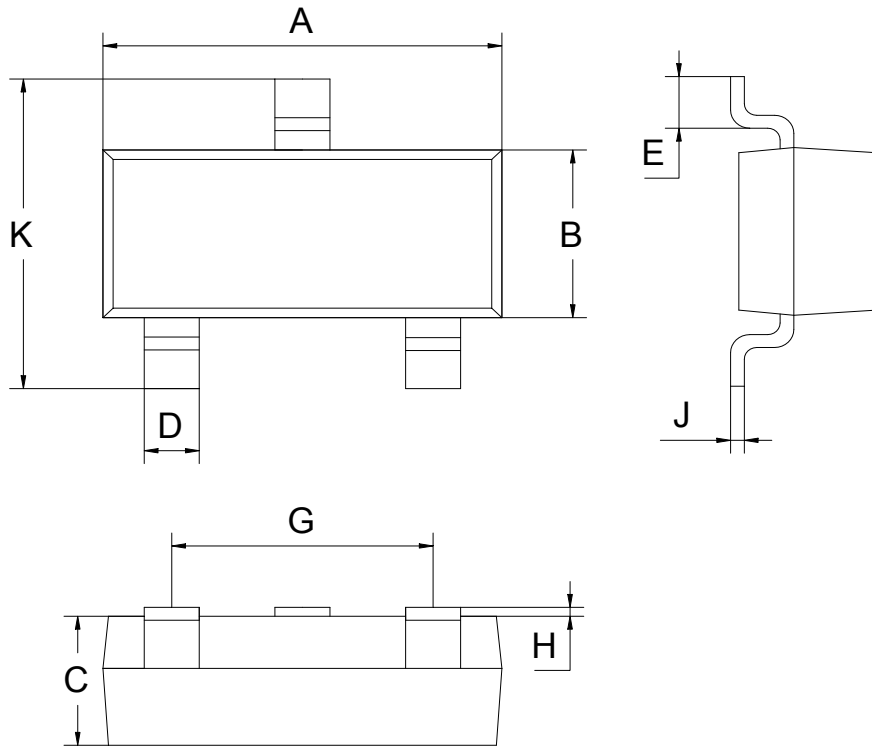


Fig4. Normalized On-Resistance Vs. Temperature

**SOT-23 Package information**



SOT-23			
Dim	MIN	NOM	MAX
A	2.80	2.90	3.00
B	1.20	1.30	1.40
C	0.90	1.00	1.10
D	0.39	0.40	0.45
E	0.20MIN		
G	1.90REF		
H	0.00	-	0.10
J	0.05	0.10	0.15
K	2.30	2.40	2.50
All Dimensions in mm			