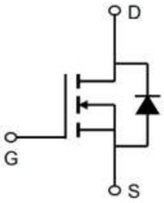
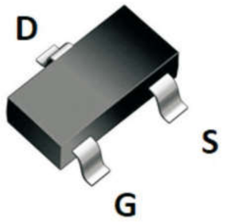
20V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	4.5A
V_{DSS}	20V
R_{DSON}-typ(@V_{GS}=4.5V)	< 30mΩ**(Type:22 mΩ)**





SOT-23

Application

- Battery protection
- Load switch
- Uninterruptible power supply

Product Specification Classification

Part Number	Package	Marking	Pack
YFW2300A	SOT-23	2300	3000PCS/Tape

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	20	V
Gate - Source Voltage	V_{GS}	±12	V
Continuous Drain Current, V_{GS} @ 4.5V[1] @T_A=25℃	I_D	4.5	A
Continuous Drain Current, V_{GS} @ 4.5V[1] @T_A=70℃	I_D	2.8	A
Pulsed Drain Current [2]	I_{DM}	14.4	A
Total Power Dissipation[3] @T_A=25℃	P_D	1	W
Storage Temperature Range	T_{STG}	-55 to +150	°C
Operating Junction Temperature Range	T_J	-55 to +150	°C
Thermal Resistance Junction-ambient [1]	$R_{\theta JA}$	125	°C/W
Thermal Resistance Junction Case [1]	$R_{\theta JC}$	80	°C/W

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	**BV_{DSS}**	20	22	-	**V**
Static Drain-Source On-Resistance [2]	V_{GS}=4.5V, I_D=3A	**$R_{DS(ON)}$**	-	22	30	**mΩ**
	V_{GS}=2.5V, I_D=2A		-	28	35	
Gate -Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	**$V_{GS(th)}$**	0.5	0.75	1.2	**V**
Drain-Source Leakage Current	V_{DS}=16V , V_{GS}=0V , T_J=25℃	**I_{DSS}**	-	-	1	**μA**
	V_{DS}=16V , V_{GS}=0V , T_J=55℃		-	-	5	
Gate-Source Leakage Current	V_{GS}=±12V, V_{DS}=0V	**I_{GSS}**	-	-	±100	**nA**
Forward Transconductance	V_{DS}=5V , I_D=3A	**g_{fs}**	-	10.5	-	**S**
Total Gate Charge(4.5V)	V_{DS}=15V V_{GS}=4.5V I_D=3A	**Q_g**	-	4.6	-	**nC**
Gate-Source Charge		**Q_{gs}**	-	0.7	-	
Gate-Drain Charge		**Q_{gd}**	-	1.5	-	
Turn-on delay time	V_{DD}=10V V_{GS} =4.5V R_G =3.3Ω I_D= 3A	**$t_{d(on)}$**	-	1.6	-	**ns**
Rise Time		**T_r**	-	42	-	
Turn-Off Delay Time		**$t_{d(OFF)}$**	-	14	-	
Fall Time		**t_f**	-	7	-	
Input Capacitance	V_{DS}=15V V_{GS}=0V f=1.0MHz	**C_{iss}**	-	310	-	**pF**
Output Capacitance		**C_{oss}**	-	49	-	
Reverse Transfer Capacitance		**C_{rss}**	-	35	-	
Continuous Source Current [1,4]	V_G=V_D=0V , Force Current	**I_S**	-	**-**	3.6	**A**
Diode Forward Voltage [2]	V_{GS}=0V , I_S=1A , T_J=25℃	**V_{SD}**	-	**-**	1.2	**V**

Note :

1、The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.

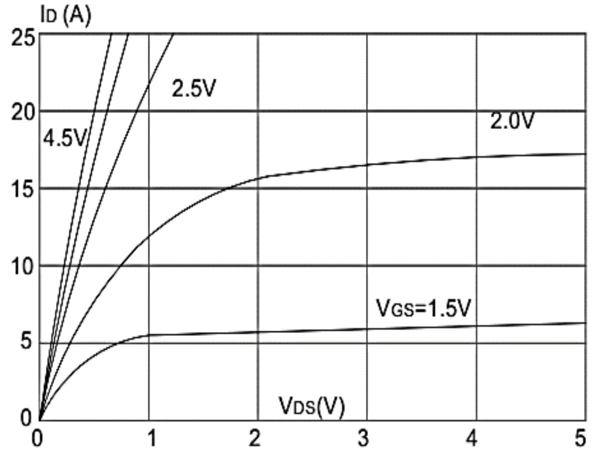
2、The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

3、The power dissipation is limited by 150℃ junction temperature

4、The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

Ratings and Characteristic Curves

Typical Characteristics



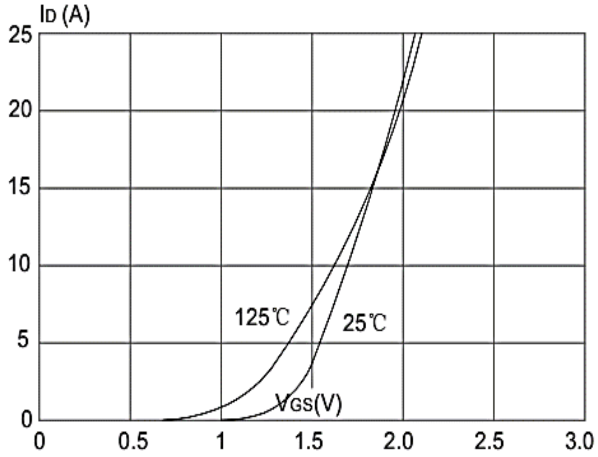
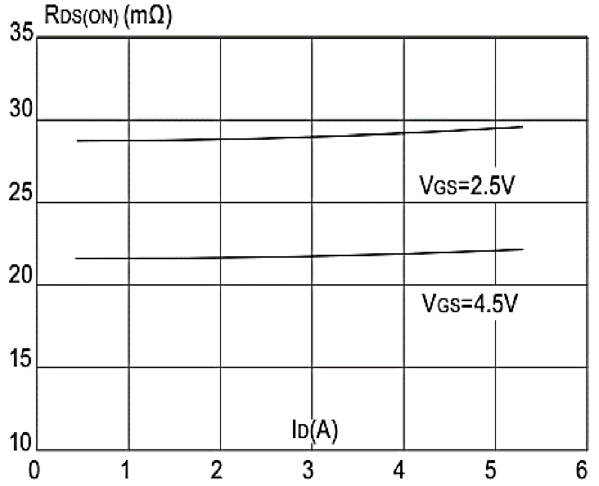


Figure1: Output Characteristics

Figure 2: Typical Transfer Characteristics



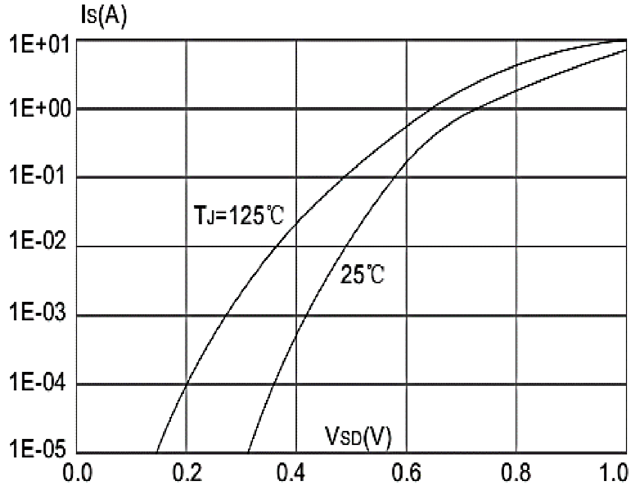
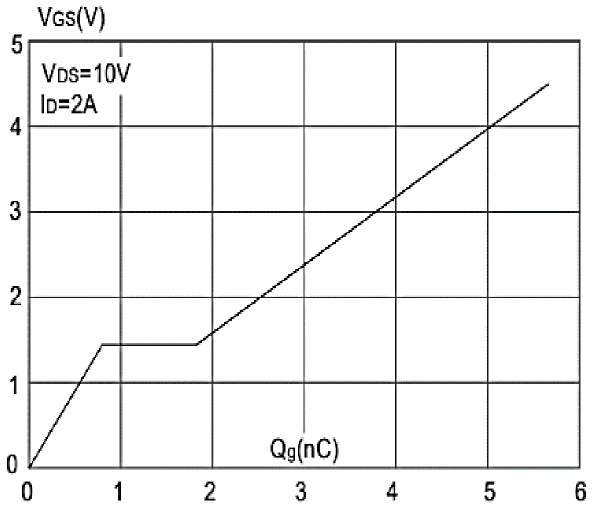


Figure 3:On-resistance vs. Drain Current

Figure 4: Body Diode Characteristics



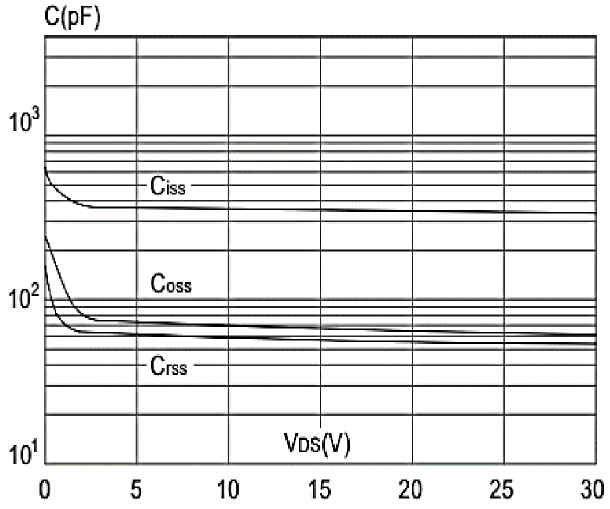


Figure 5: Gate Charge Characteristics

Figure 6: Capacitance Characteristics

Ratings and Characteristic Curves

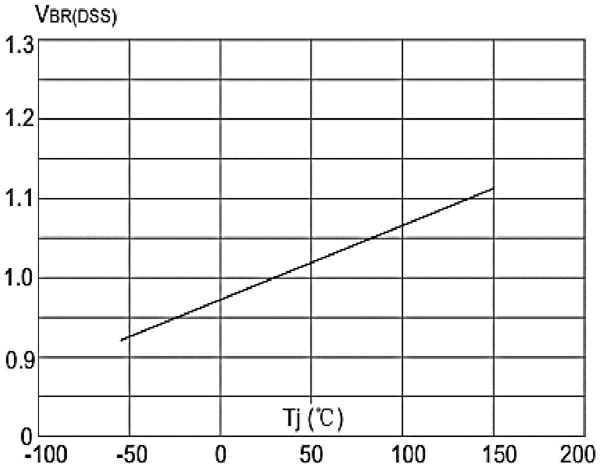


Figure 7: Normalized Breakdown Voltage vs Junction Temperature

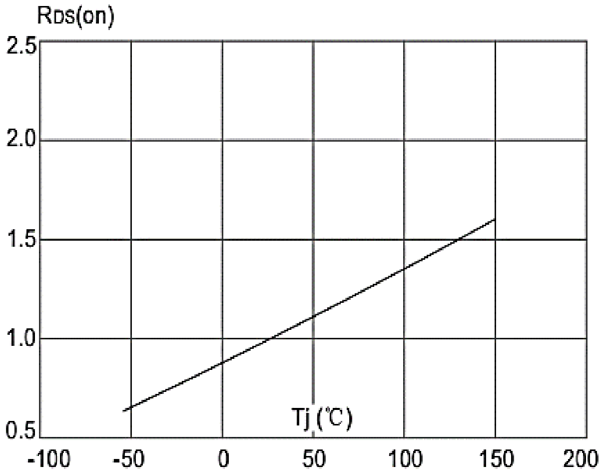


Figure 8: Normalized on Resistance vs. Junction Temperature

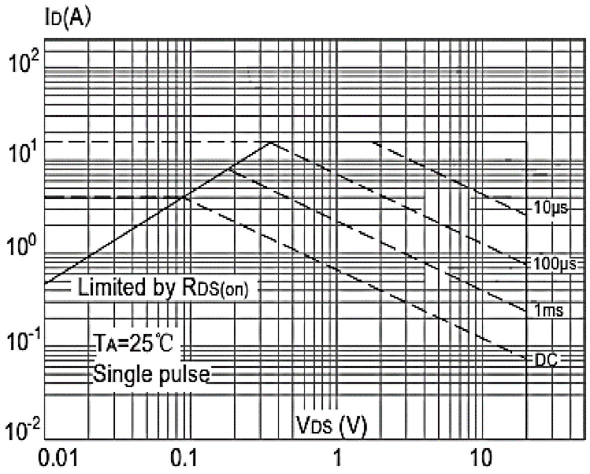


Figure 9: Maximum Safe Operating Area

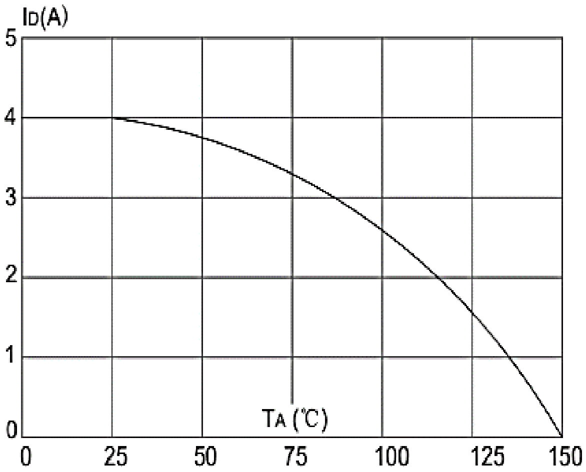


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

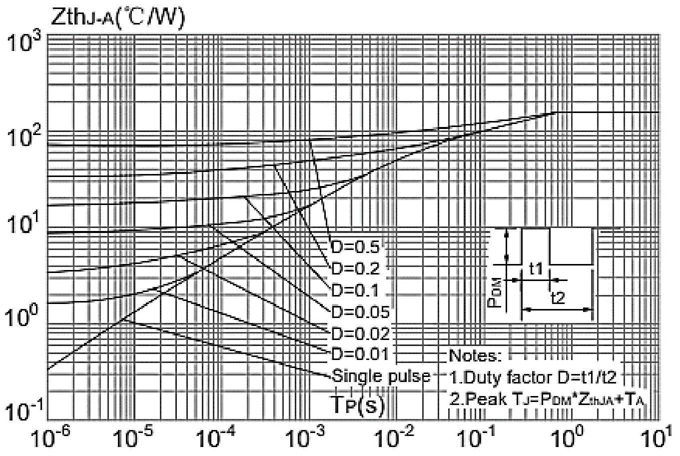
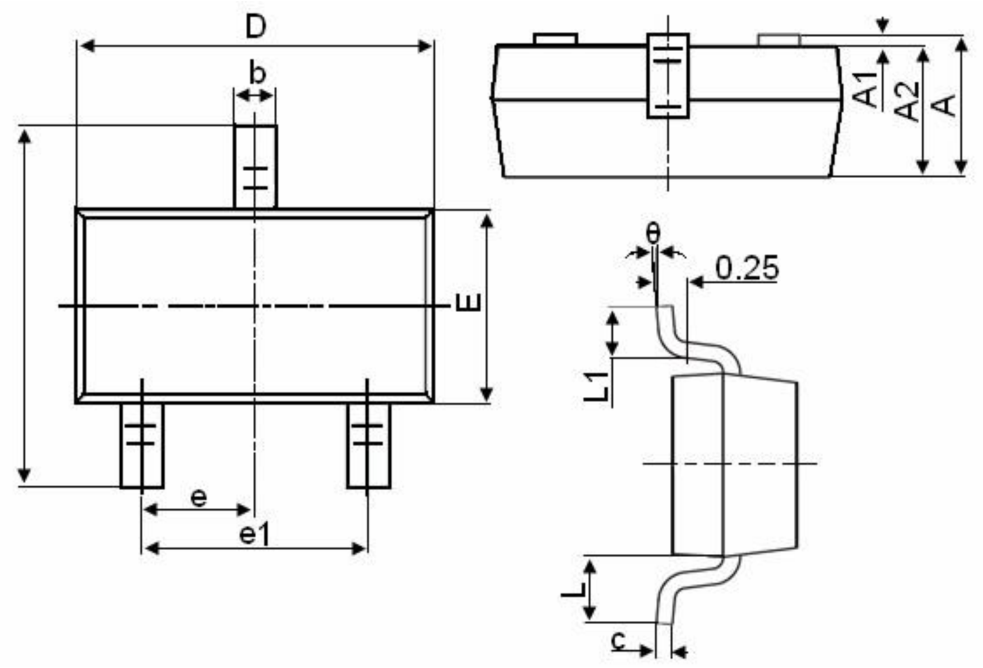


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambien

Package Outline Dimensions Millimeters

SOT-23



Symbol	Dimensions in Millimeters	
	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°