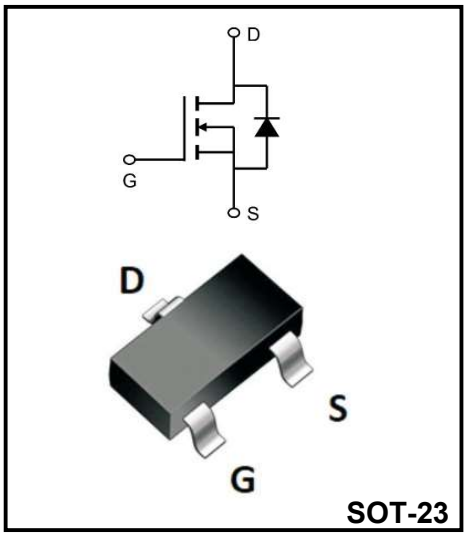
40V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	3A
V_{DSS}	40V
R_{DSON}-typ(@V_{GS}=10V)	＜40mΩ(Type:28 mΩ)



Description

The YFW3N04A uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

Application

- Wireless charging
- Boost driver
- LED

Product Specification Classification

Part Number	Package	Marking	Pack
YFW3N04A	SOT-23	3N04A AP	3000PCS/Tape

Absolute Maximum Ratings (TC=25℃unless otherwise noted)

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current, V_{GS} @ 10V[1]	I_D@T_A=25℃	3	A
Continuous Drain Current, V_{GS} @ 10V[1]	I_D@T_A=70℃	2.9	A
Pulsed Drain Current[2]	I_{DM}	15	A
Single Pulse Avalanche Energy[3]	EAS	16.2	mJ
Total Power Dissipation[4]	P_D@T_A=25℃	1.67	W
Storage Temperature Range	T_{STG}	-55 to 150	℃
Operating Junction Temperature Range	T_J	-55 to 150	℃
Thermal Resistance Junction-Ambient [1]	$R_{\theta JA}$	125	℃/W
Thermal Resistance Junction-Case[1]	$R_{\theta JC}$	30	℃/W

Maximum Ratings at Tc=25°C unless otherwise specified

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	**BVDSS**	V_{GS}=0V , I_D=250uA	40	44	---	**V**
BVDSS Temperature Coefficient	**$\triangle BV_{DSS}/\triangle T_J$**	Reference to 25℃ , I_D=1mA	---	0.032	---	**V/℃**
Static Drain-Source On-Resistance[2]	**$R_{DS(ON)}$**	V_{GS}=10V , I_D=4A	---	28	40	**mΩ**
		V_{GS}=4.5V , I_D=3A	---	35	50	
Gate Threshold Voltage	**$V_{GS(th)}$**	V_{GS}=V_{DS} , I_D =250uA	1.0	1.5	2.5	**V**
$V_{GS(th)}$ Temperature Coefficient	**$\triangle V_{GS(th)}$**		---	-4.5	---	**mV/℃**
Drain-Source Leakage Current	**I_{DSS}**	V_{DS}=32V , V_{GS}=0V , T_J=25℃	---	---	1	**uA**
		V_{DS}=32V , V_{GS}=0V , T_J=55℃	---	---	5	
Gate-Source Leakage Current	**I_{GSS}**	V_{GS}=±20V , V_{DS}=0V	---	---	±100	**nA**
Forward Transconductance	**g_{fs}**	V_{DS}=5V , I_D=4A	---	8	---	**S**
Gate Resistance	**R_g**	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	2.4	4.8	**Ω**
Total Gate Charge (4.5V)	**Q_g**	V_{DS}=15V , V_{GS}=4.5V , I_D=3A	---	5	---	**nC**
Gate-Source Charge	**Q_{gs}**		---	1.54	---	
Gate-Drain Charge	**Q_{gd}**		---	1.84	---	
Turn-On Delay Time	**$T_{d(on)}$**	V_{DD}=15V , V_{GS}=10V , R_G=3.3Ω I_D=1A	---	7.8	---	**ns**
Rise Time	**T_r**		---	2.1	---	
Turn-Off Delay Time	**Td(off)**		---	29	---	
Fall Time	**T_f**		---	2.1	---	
Input Capacitance	**C_{iss}**	V_{DS}=15V , V_{GS}=0V , f=1MHz	---	452	---	**pF**
Output Capacitance	**C_{oss}**		---	51	---	
Reverse Transfer Capacitance	**C_{rss}**		---	38	---	
Continuous Source Current[1,4]	**I_S**	V_G=V_D=0V , Force Current	---	---	4.5	**A**
Pulsed Source Current[2,4]	**I_{SM}**		---	---	14	**A**
Diode Forward Voltage[2]	**V_{SD}**	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1.2	**V**

Note :

1、The data tested by surface mounted on a 1 inch^2 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˚C junction temperature

4、The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

N-Typical Characteristics

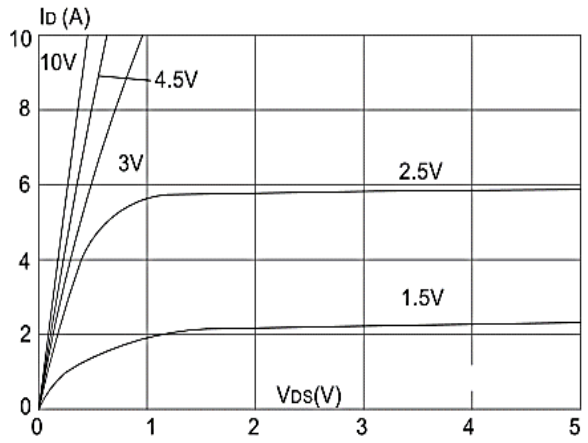


Figure1: Output Characteristics

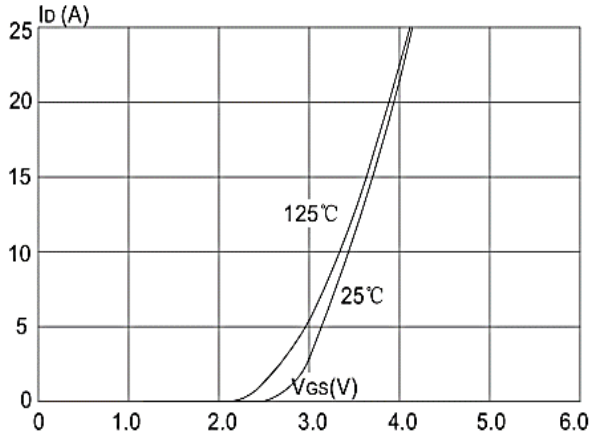


Figure 2: Typical Transfer Characteristics

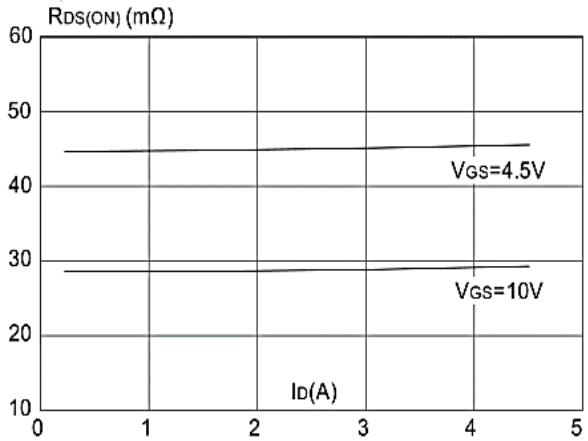


Figure 3:On-resistance vs. Drain Current

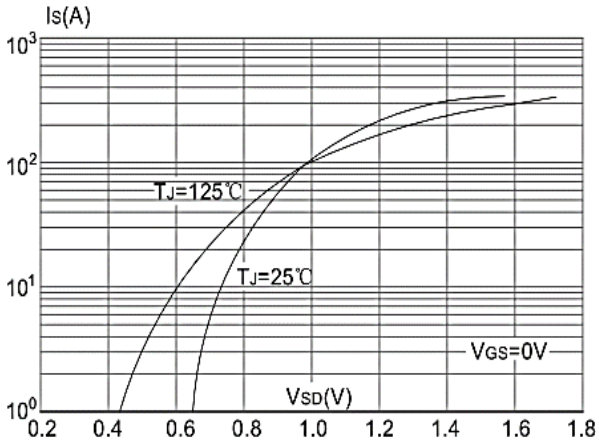


Figure 4: Body Diode Characteristics

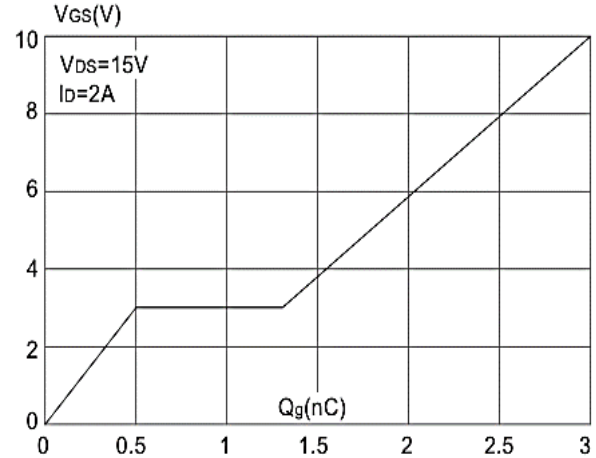


Figure 5: Gate Charge Characteristics

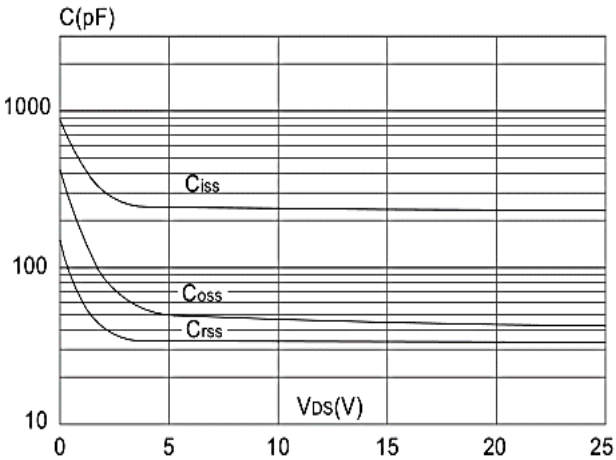


Figure 6: Capacitance Characteristics

N-Typical Characteristics

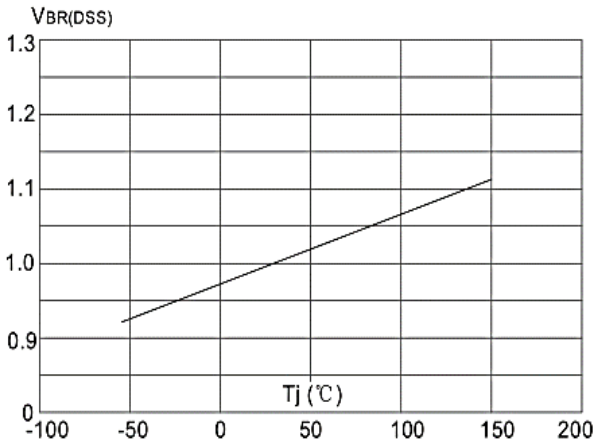


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

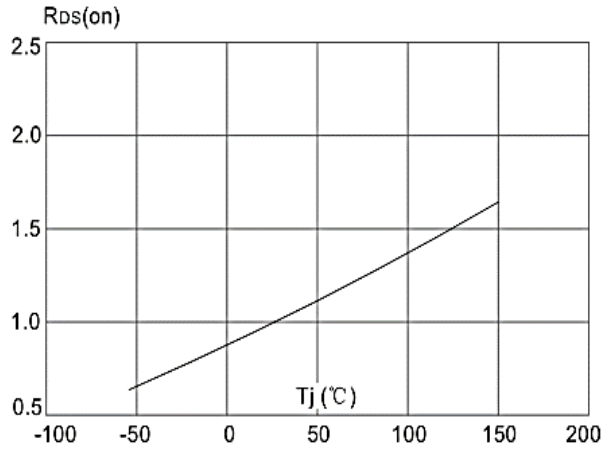


Figure 8: Normalized on Resistance vs Junction Temperature

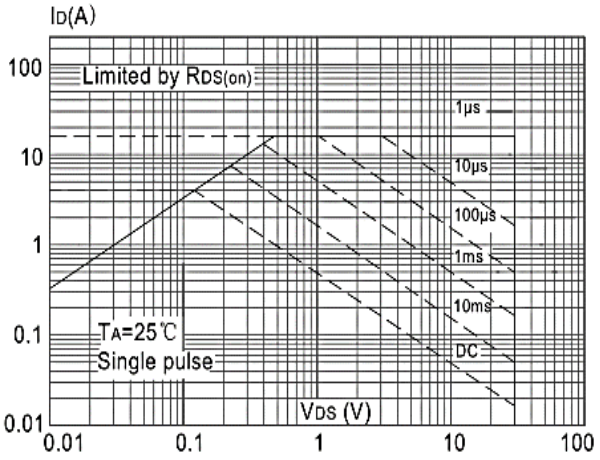


Figure 9: Maximum Safe Operating Area vs. Case Temperature

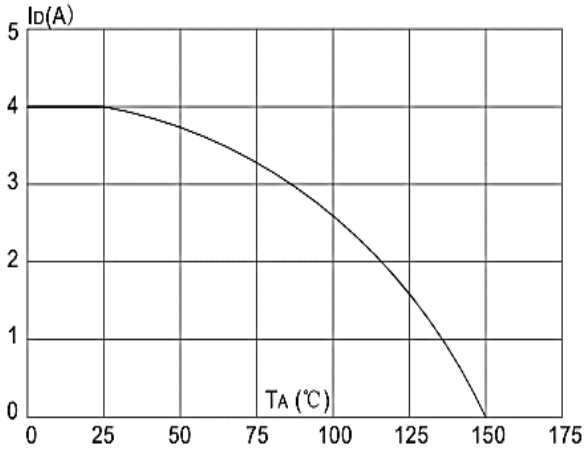


Figure 10: Maximum Continuous Drain Current

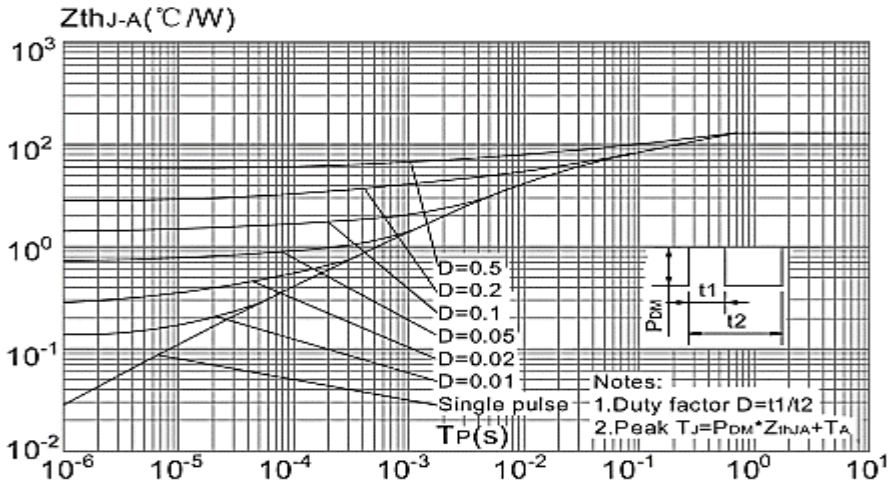
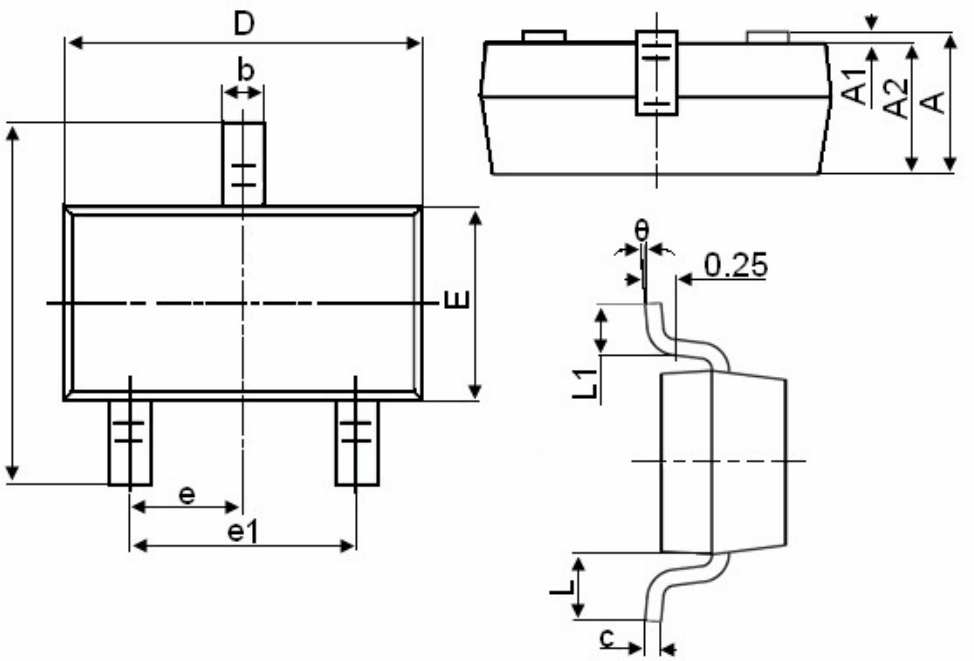


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

Package Outline 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°