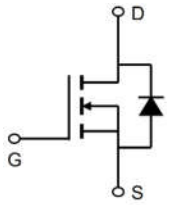
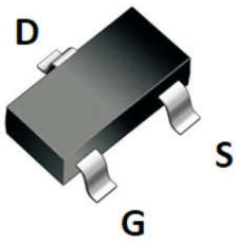
40V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	5.0A
V_{DSS}	40V
R_{DSON}-typ(@V_{GS}=10V)	< 37mΩ(Type:30 mΩ)





SOT23-3L

Application

- Battery protection
- Load switch
- Uninterruptible power supply

Marking Code	
YFW5N04MI	MD4-5A

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	40	V
Gate - Source Voltage	V_{GS}	±20	V
Continuous Drain Current, V_{GS} @ 10V[1] @T_A=25℃	I_D	5.0	A
Continuous Drain Current, V_{GS} @ 10V[1] @T_A=100℃	I_D	3.5	A
Pulsed Drain Current [2]	I_{DM}	14	A
Total Power Dissipation[4] @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}	40	-	-	V
BVDSS Temperature Coefficient	Reference to 25℃ , I_D=1mA	$\Delta BV_{DSS/\Delta TJ}$	-	0.032	-	V/°C
Static Drain-Source On-Resistance [2]	V_{GS}=10V, I_D=4A	$R_{DS(ON)}$	-	30	37	mΩ
	V_{GS}=4.5V, I_D=3A		-	40	50	
Gate -Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	$V_{GS(th)}$	1.0	1.5	2.5	V
V_{GS}(th) Temperature Coefficient		$\Delta V_{GS(th)}$	-	-4.5	-	mV/°C
Drain-Source Leakage Current	V_{DS}=32V , V_{GS}=0V , T_J=25℃	I_{DSS}	-	-	1	μA
	V_{DS}=32V , V_{GS}=0V , T_J=55℃		-	-	5	
Gate –Source Leakage Current	V_{GS}=±20V, V_{DS}=0V	I_{GSS}	-	-	±100	nA
Forward Transconductance	V_{DS}=5V , I_D=4A	g_{fs}	-	8	-	S
Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	R_g	-	2.4	4.8	Ω
Total Gate Charge(4.5V)	V_{DS}=15V V_{GS}=4.5V I_D=3A	Q_g	-	5	-	nC
Gate-Source Charge		Q_{gs}	-	1.54	-	
Gate-Drain Charge		Q_{gd}	-	1.84	-	
Turn-on delay time	V_{DD} =15V V_{GS}=10V R_G=3.3 I_D=1A	$t_{d(on)}$	-	7.8	-	ns
Rise Time		T_r	-	2.1	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	29	-	
Fall Time		t_f	-	2.1	-	
Input Capacitance	V_{DS}=15V V_{GS}=0V f=1.0MHz	C_{iss}	-	452	-	pF
Output Capacitance		C_{oss}	-	51	-	
Reverse Transfer Capacitance		C_{rss}	-	38	-	
Continuous Source Current[1,4]	V_G=V_D=0V , Force Current	I_S	-	-	4.5	A
Pulsed Source Current[2,4]		I_{SM}	-	-	14	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

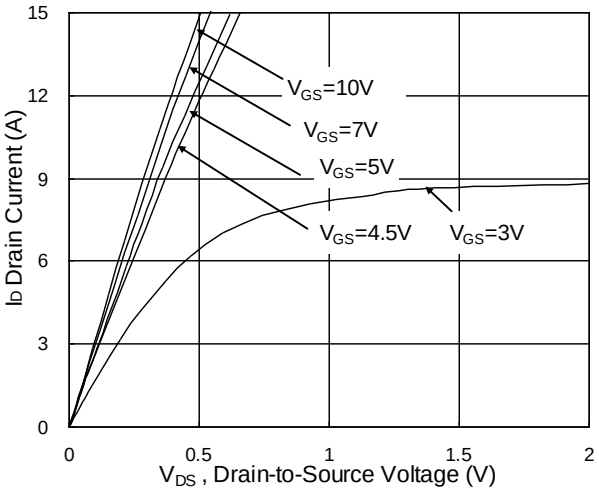


Fig.1 Typical Output Characteristics

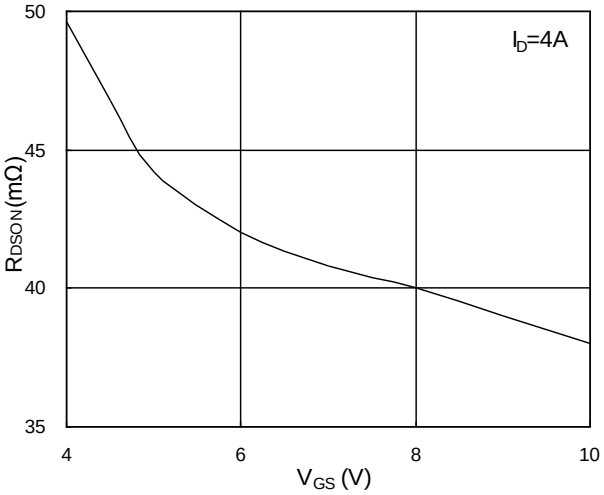


Fig.2 On-Resistance vs. Gate-Source

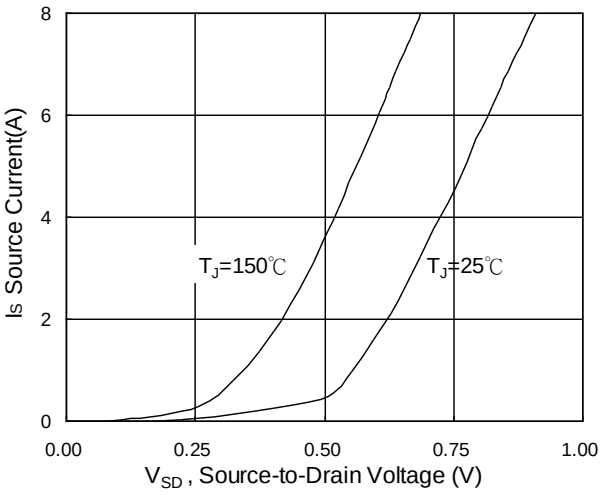


Fig.3 Forward Characteristics Of Reverse

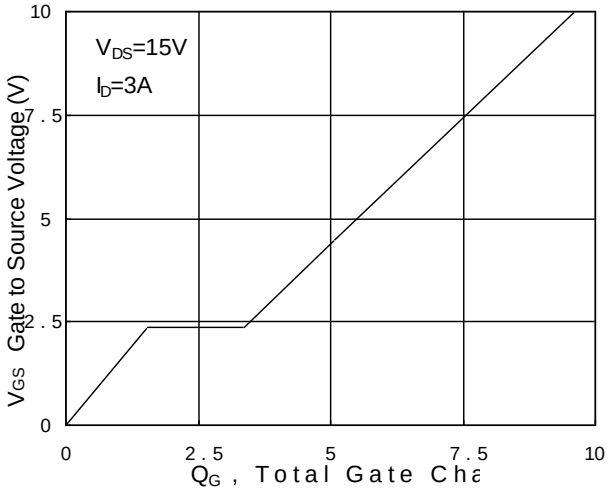


Fig.4 Gate-Charge Characteristics

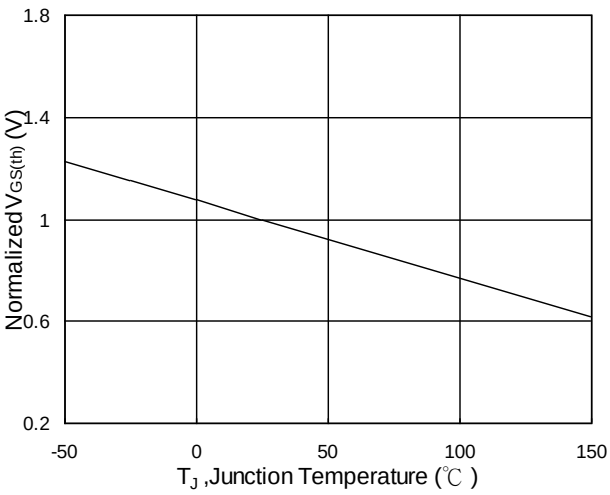


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

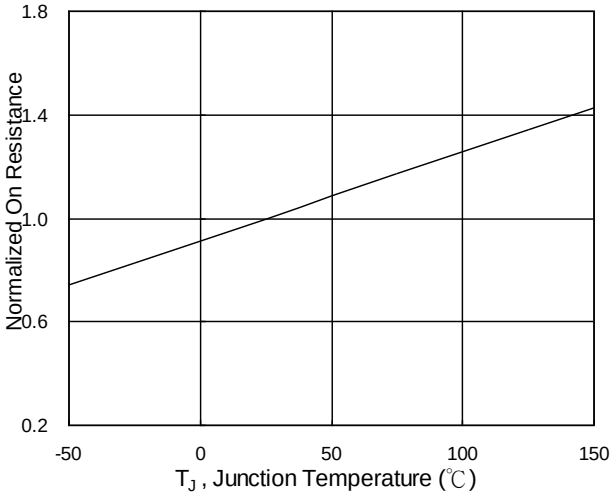


Fig.6 Normalized R_{DSON} vs. T_J

Ratings and Characteristic Curves

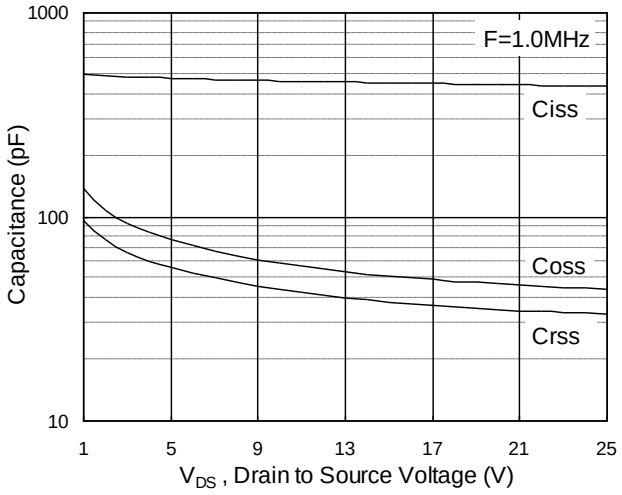


Fig.7 Capacitance

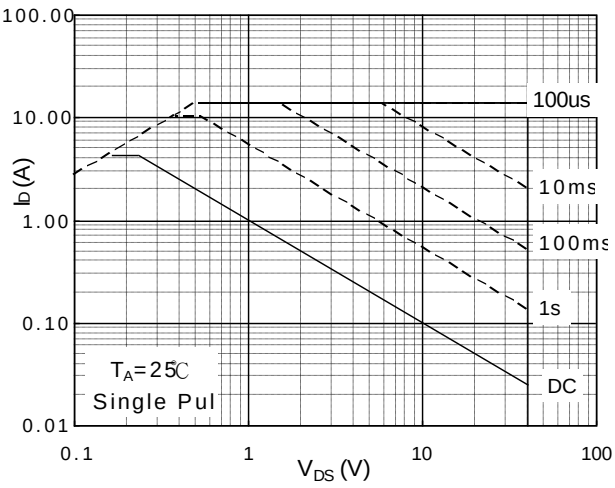


Fig.8 Safe Operating Area

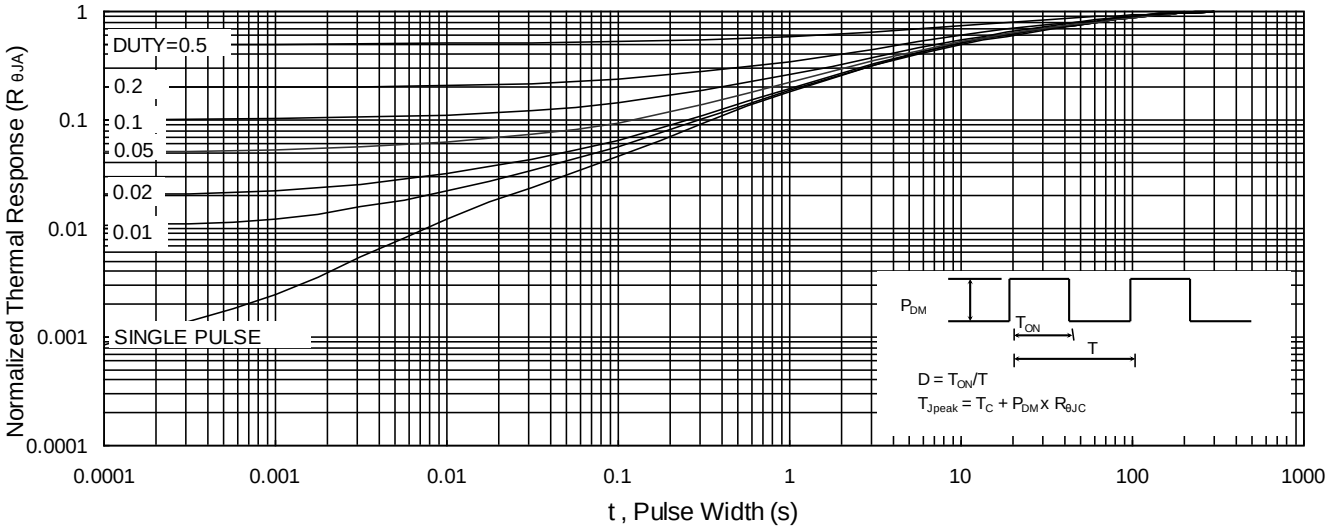


Fig.9 Normalized Maximum Transient Thermal Impedance

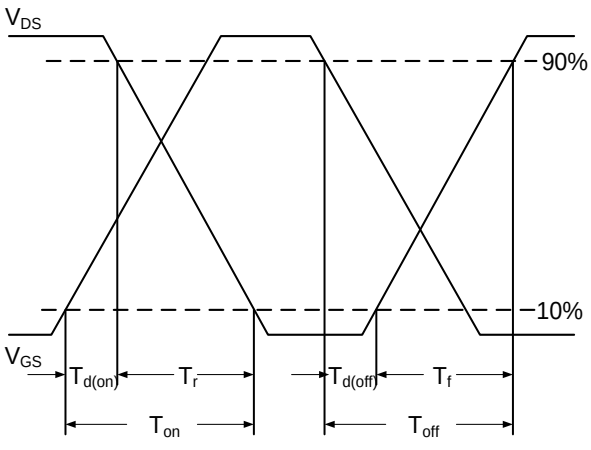


Fig.10 Switching Time Waveform

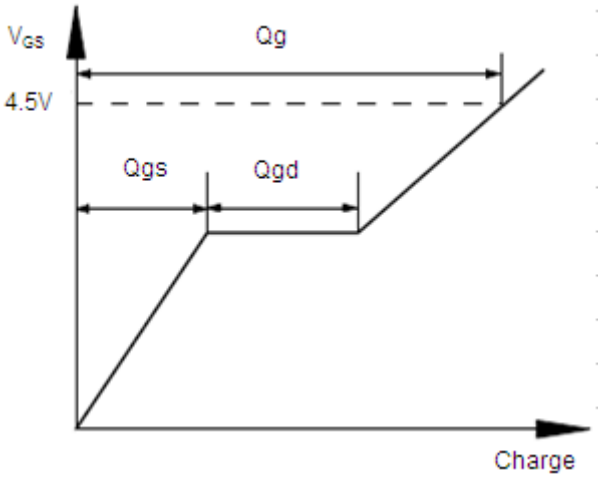


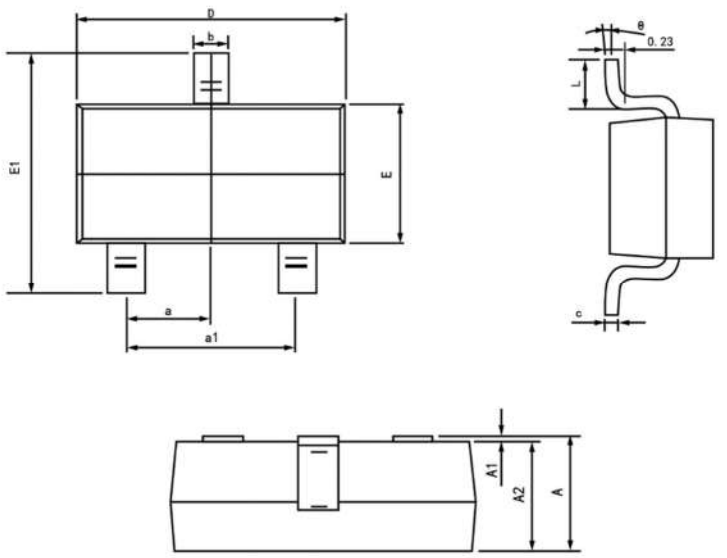
Fig.11 Gate Charge Waveform

Ordering information

Package	Packing Description	Base Quantity	Packing Quantity
SOT23-3L	Tape/Reel,7"reel	3000pcs/Reel	24000PCS/Box 120000PCS/Carton

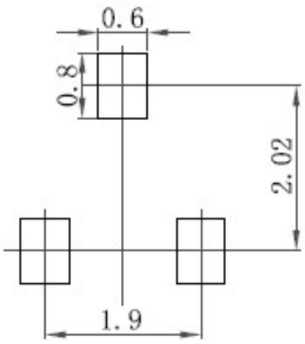
Package Dimensions

SOT23-3L



Dim.	Millimeter (mm)		mil	
	Min.	Max.	Min.	Max.
A	1.05	1.25	41	49.2
A1	0.10		3.93	
A2	1.05	1.15	41	45
b	0.30	0.50	12	20
c	0.10	0.20	3.93	7.9
D	2.82	3.02	111	119
E	1.50	1.70	59	67
E1	2.65	2.95	104	116
e	0.95		37.4	
e1	1.80	2.00	71	78
L	0.30	0.066	12	26
Θ	8°			

The recommended mounting pad size



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