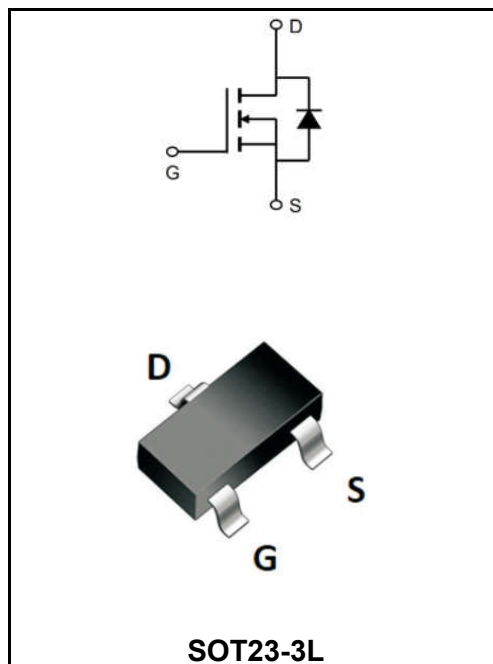


40V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	5.0A
V_{DSS}	40V
$R_{DS(on)-typ}(@V_{GS}=10V)$	$< 37m\Omega$ (Type:30 mΩ)



Application

- ◆ Battery protection
- ◆ Load switch
- ◆ Uninterruptible power supply

Product Specification Classification

Part Number	Package	Marking	Pack
YFW5N04MI	SOT23-3L	MD4-5A	3000PCS/Tape

Maximum Ratings at $T_c=25^{\circ}C$ unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	40	V
Gate - Source Voltage	V_{GS}	± 20	V
Continuous Drain Current, $V_{GS} @ 10V^1$ @ $T_A=25^{\circ}C$	I_D	5.0	A
Continuous Drain Current, $V_{GS} @ 10V^1$ @ $T_A=100^{\circ}C$	I_D	3.5	A
Pulsed Drain Current ²	I_{DM}	14	A
Total Power Dissipation ⁴ @ $T_A=25^{\circ}C$	P_D	1	W
Storage Temperature Range	T_{STG}	-55 to +150	$^{\circ}C$
Operating Junction Temperature Range	T_J	-55 to +150	$^{\circ}C$
Thermal Resistance Junction-ambient ¹	$R_{\theta JA}$	125	$^{\circ}C/W$
Thermal Resistance Junction-Case ¹	$R_{\theta JC}$	80	$^{\circ}C/W$

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	BV_{DSS}	40	-	-	V
BVDSS Temperature Coefficient	Reference to 25°C, $I_D=1mA$	$\Delta BV_{DSS}/\Delta T_J$	-	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	$V_{DS}=V_{GS}, I_D=250\mu A$	$V_{GS(th)}$	1.0	1.5	2.5	V
$V_{GS(th)}$ Temperature Coefficient		$\Delta V_{GS(th)}$	-	-4.5	-	mV/°C
Drain-Source Leakage Current	$V_{DS}=32V, V_{GS}=0V, T_J=25^\circ C$	I_{DSS}	-	-	1	μA
	$V_{DS}=32V, V_{GS}=0V, T_J=55^\circ C$		-	-	5	
Gate -Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	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	$V_{GS}=0V, I_S=1A, T_J=25^\circ C$	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 $\leq 300\mu s$, duty cycle $\leq 2\%$

3 .The power dissipation is limited by 150°C 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

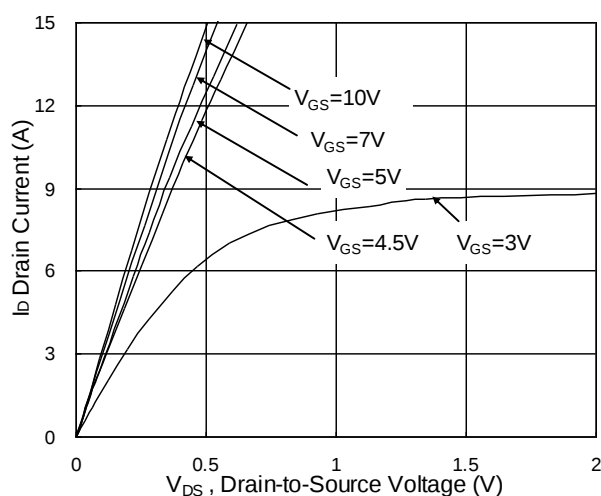


Fig.1 Typical Output Characteristics

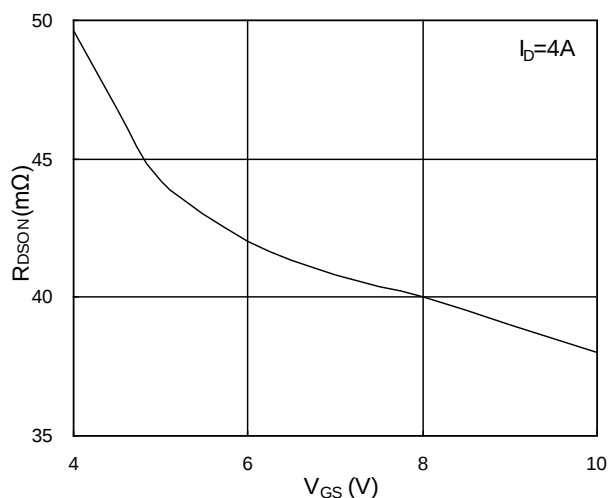


Fig.2 On-Resistance vs. Gate-Source

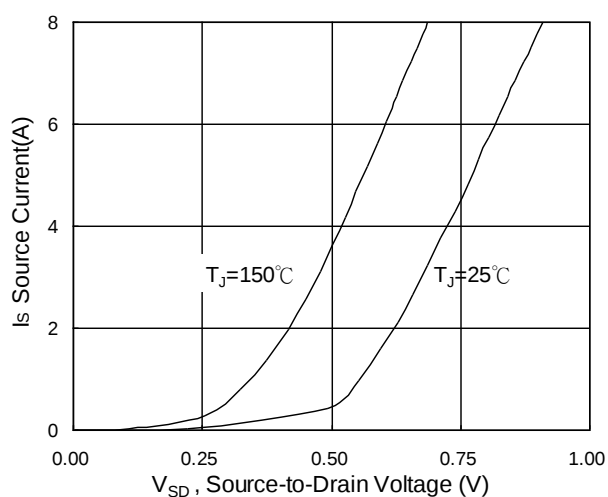


Fig.3 Forward Characteristics Of Reverse

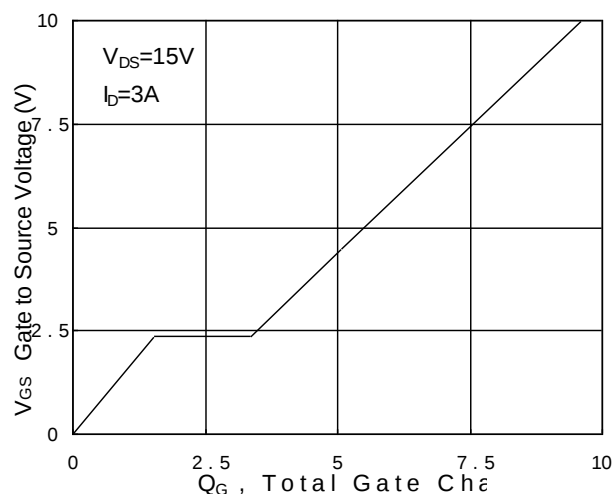


Fig.4 Gate-Charge Characteristics

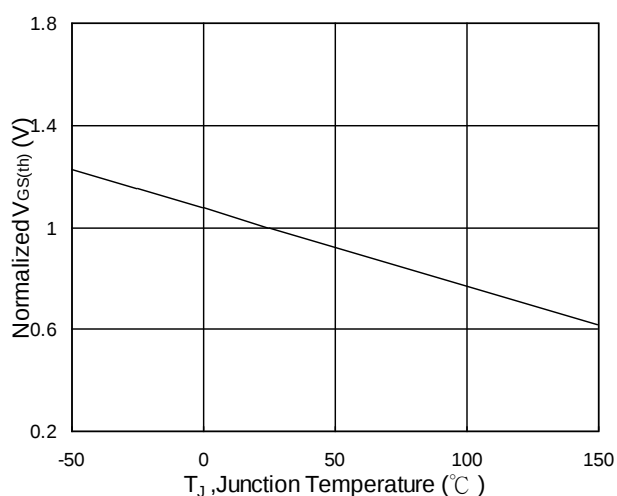


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

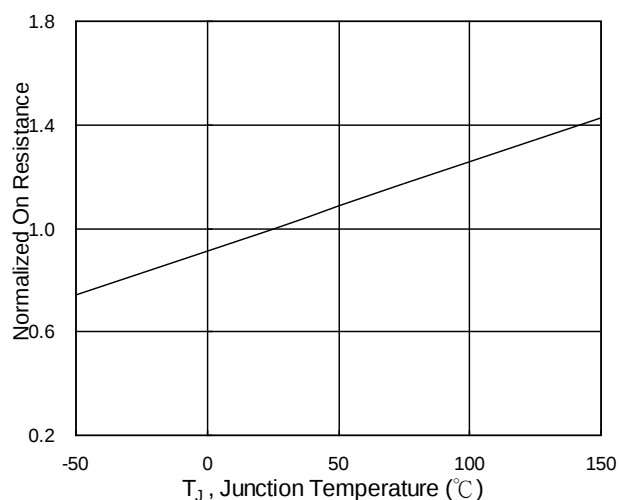


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

Ratings and Characteristic Curves

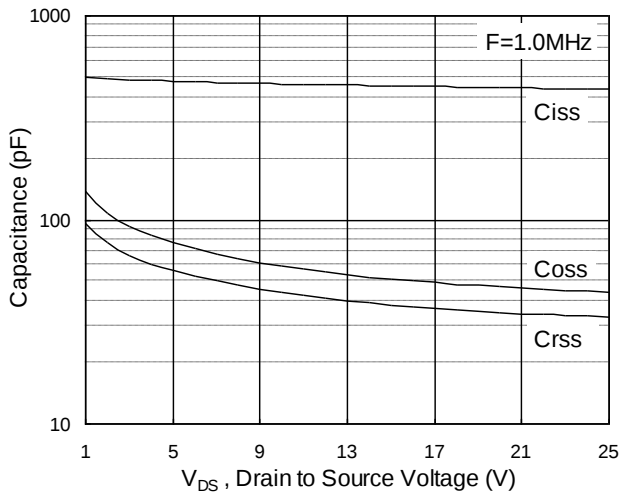


Fig.7 Capacitance

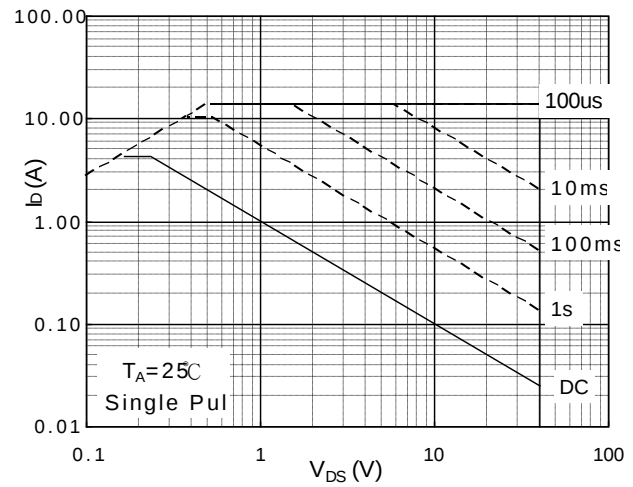


Fig.8 Safe Operating Area

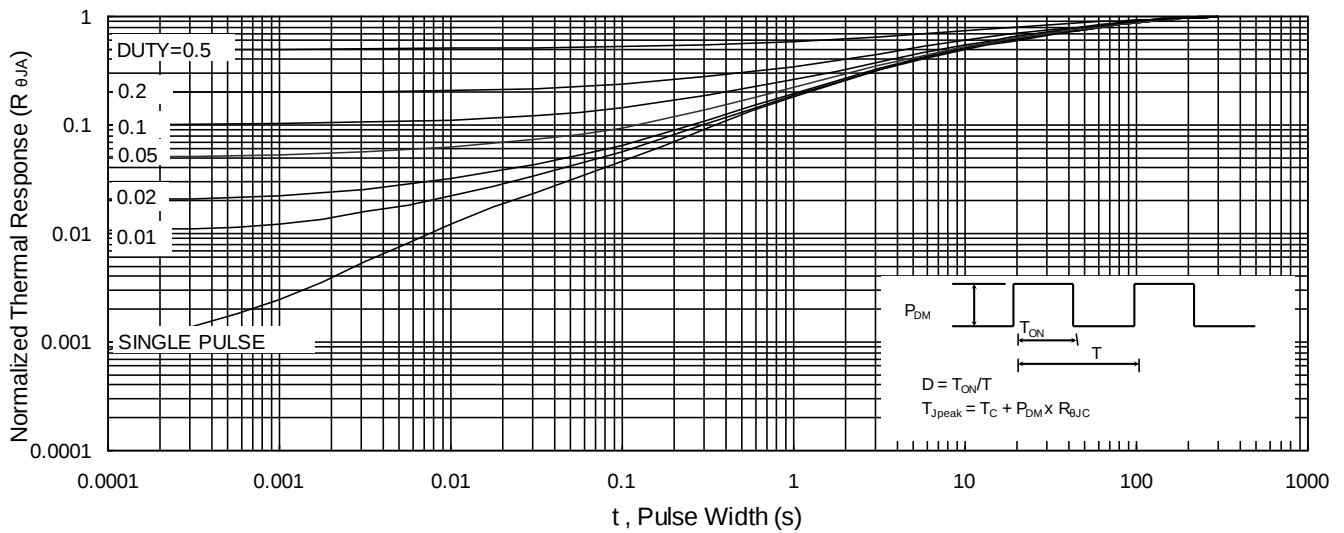


Fig.9 Normalized Maximum Transient Thermal Impedance

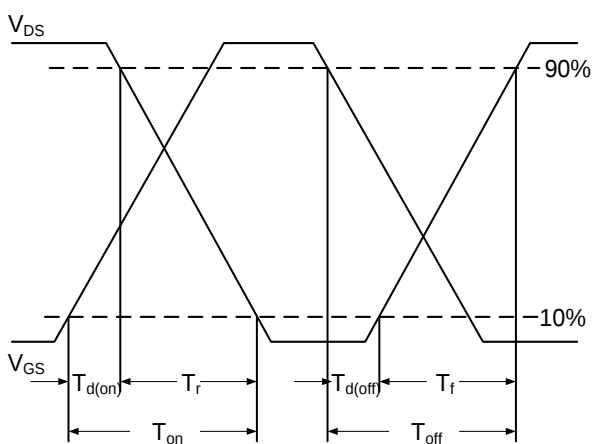


Fig.10 Switching Time Waveform

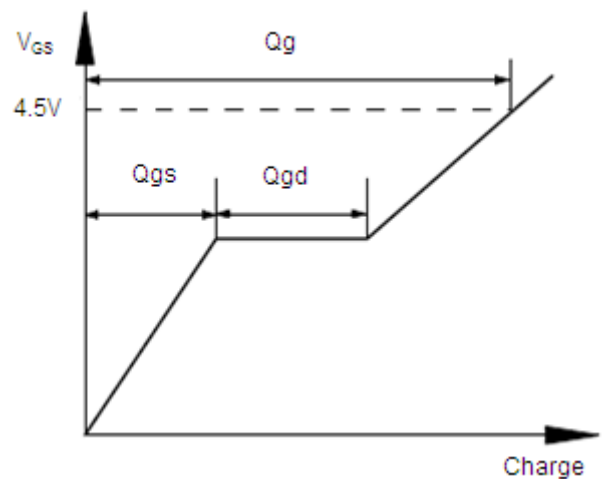
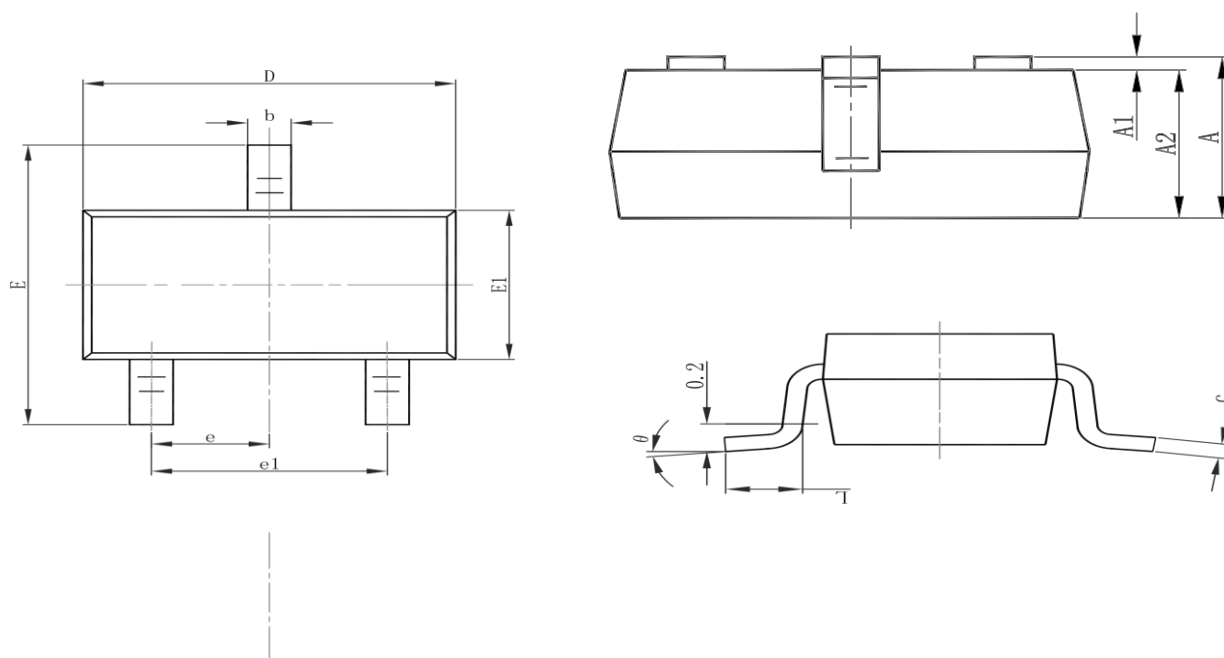


Fig.11 Gate Charge Waveform

SOT23-3L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E1	1.500	1.700	0.059	0.067
E	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°