

100V N-CHANNEL ENHANCEMENT MODE MOSFET

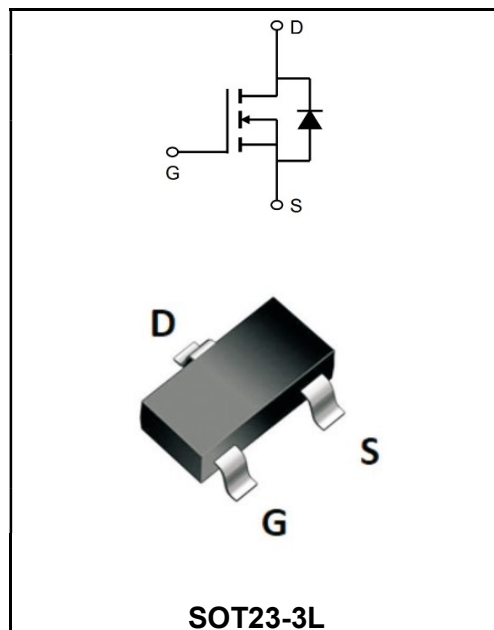
MAIN CHARACTERISTICS

I_D	5A
V_{DSS}	100V
$R_{DS(on)-typ}(@V_{GS}=10V)$	< 125mΩ (Type:105 mΩ)



Application

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



Product Specification Classification

Part Number	Package	Marking	Pack
YFW5N10MI	SOT23-3L	1005	3000PCS/Tape

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

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	100	V
Gate - Source Voltage	V_{GS}	± 20	V
Continuous Drain Current, $V_{GS} @ 10V^1$ @ $T_A=25^{\circ}\text{C}$	I_D	5	A
Continuous Drain Current, $V_{GS} @ 10V^1$ @ $T_A=70^{\circ}\text{C}$	I_D	4.6	A
Pulsed Drain Current ²	I_{DM}	20	A
Total Power Dissipation ³ @ $T_A=25^{\circ}\text{C}$	P_D	1.5	W
Storage Temperature Range	T_{STG}	-55 to +150	$^{\circ}\text{C}$
Operating Junction Temperature Range	T_J	-55 to +150	$^{\circ}\text{C}$
Thermal Resistance Junction-ambient(steady state) ¹	$R_{\theta JA}$	135	$^{\circ}\text{C/W}$
Thermal Resistance Junction-ambient($t<10s$) ¹	$R_{\theta JA}$	85	$^{\circ}\text{C/W}$

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	V(BR)DSS	100	107	-	V
Zero Gate Voltage Drain Current	$V_{DS}=100V, V_{GS}=0V$	I_{DSS}	-	-	1.0	μA
Gate to Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	I_{GSS}	-	-	±100	nA
Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	V_{GS(th)}	1.0	1.5	2.5	V
Static Drain-Source on-Resistance note3	$V_{GS}=10V, I_D=10A$	R_{DS(ON)}	-	105	125	mΩ
	$V_{GS}=4.5V, I_D=8A$		-	125	135	
Input Capacitance	$V_{DS}=25V$ $V_{GS}=0V$ $f=1.0MHz$	C_{iss}	-	610	-	pF
Output Capacitance		C_{oss}	-	40	-	
Reverse Transfer Capacitance		C_{rss}	-	25	-	
Total Gate Charge	$V_{DS}=30V$ $V_{GS}=10V$ $I_D=10A$	Q_g	-	12	-	nC
Gate-Source Charge		Q_{gs}	-	2.2	-	
Gate-Drain("Miller") Charge		Q_{gd}	-	2.5	-	
Turn-on delay time	$V_{DS}=30V$ $I_D=5A$ $R_G=1.8\Omega$ $V_{GS}=10V$	t_{d(on)}	-	7	-	ns
Turn-on Rise Time		T_r	-	5	-	
Turn-Off Delay Time		t_{d(OFF)}	-	16	-	
Turn-Off Fall Time		t_f	-	6	-	
Continuous Source Current ^{1,5}	$V_G=V_D=0V$, Force Current	I_S	-	-	10	A
Pulsed Source Current ^{2,5}		I_{SM}	-	-	40	A
Diode Forward Voltage ²	$V_{GS}=0V, I_S=10A$	V_{SD}	-	-	1.2	V
Body Diode Reverse Recovery Time	$I_F=10A, dI/dt=100A/\mu s$	t_{rr}	-	21	-	ns
Body Diode Reverse Recovery Charge		Q_{rr}	-	21	-	nC

Note :

1.The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.

2.The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$

3.The EAS data shows Max. rating . The test condition is VDD=25V,VGS=10V,L=0.1mH,IAS=11A

4.The power dissipation is limited by 150°C junction temperature

5 .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

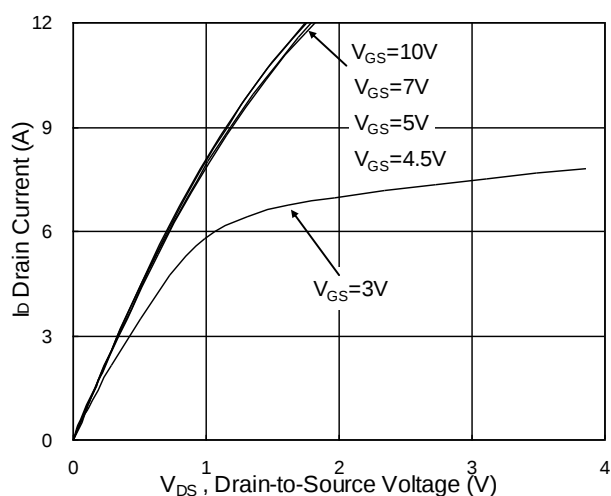


Fig.1 Typical Output Characteristics

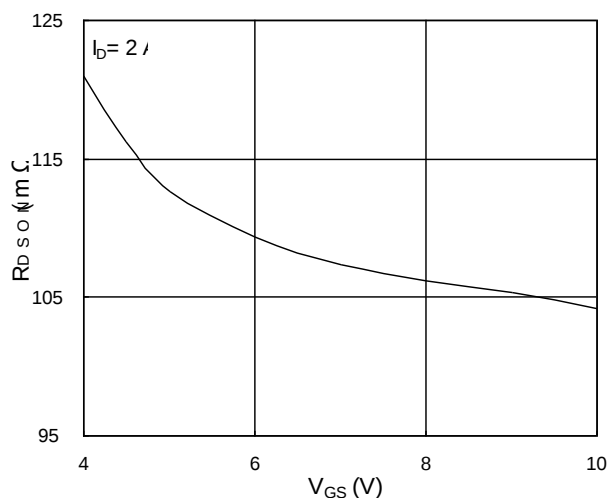


Fig.2 On-Resistance vs. Gate-Source

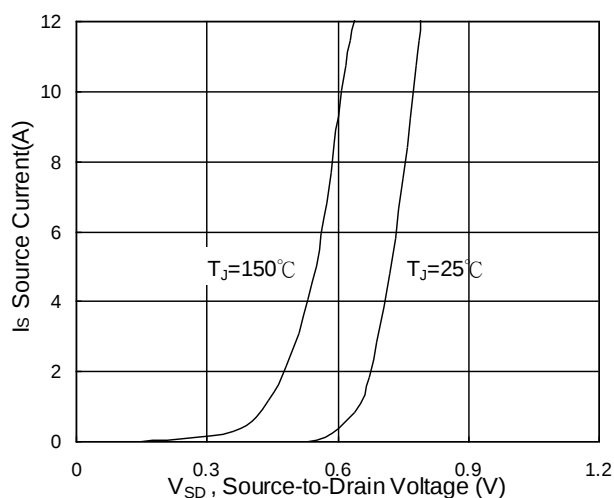


Fig.3 Forward Characteristics Of Reverse

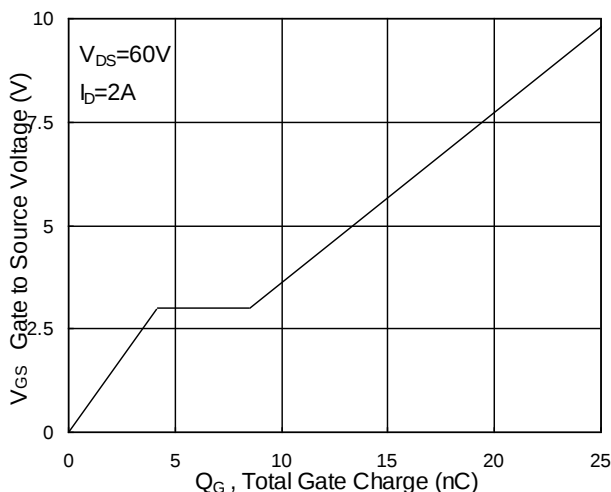


Fig.4 Gate-Charge Characteristics

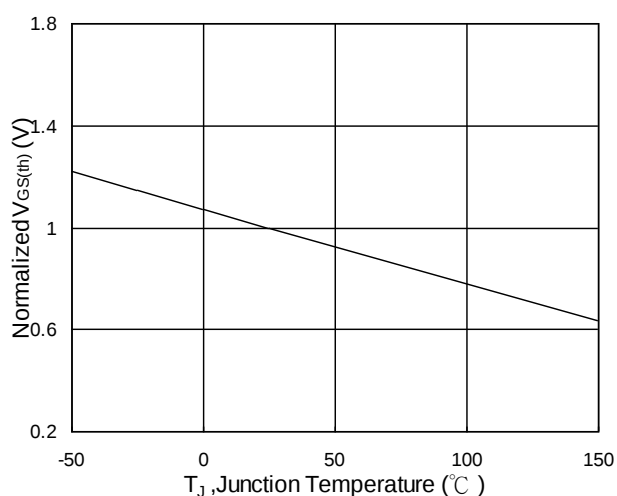


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

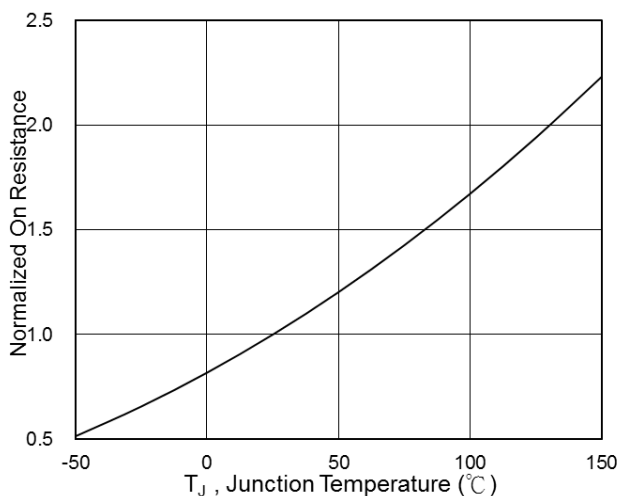


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

Ratings and Characteristic Curves

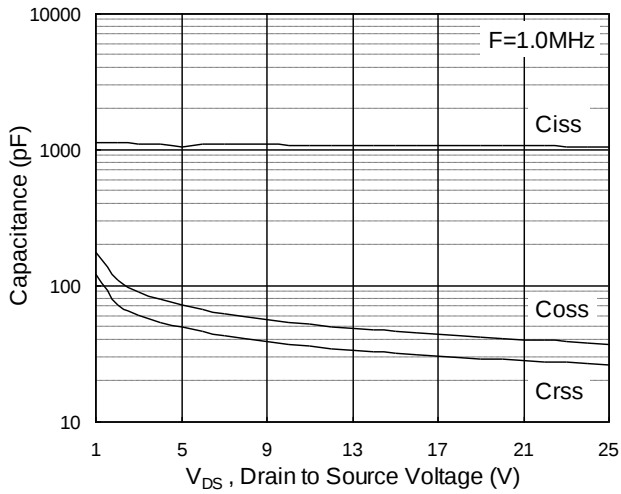


Fig.7 Capacitance

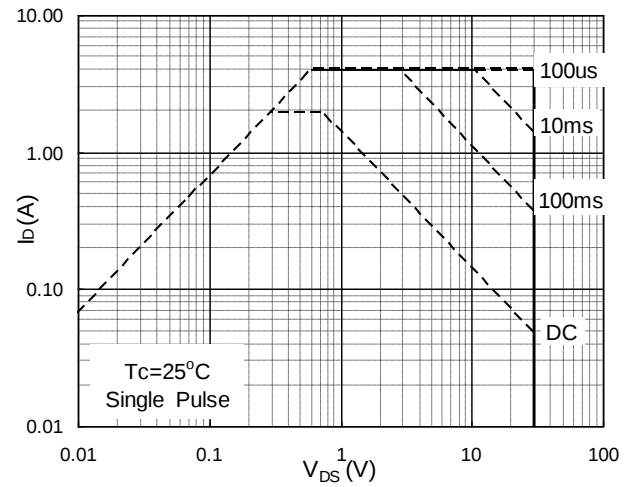


Fig.8 Safe Operating Area

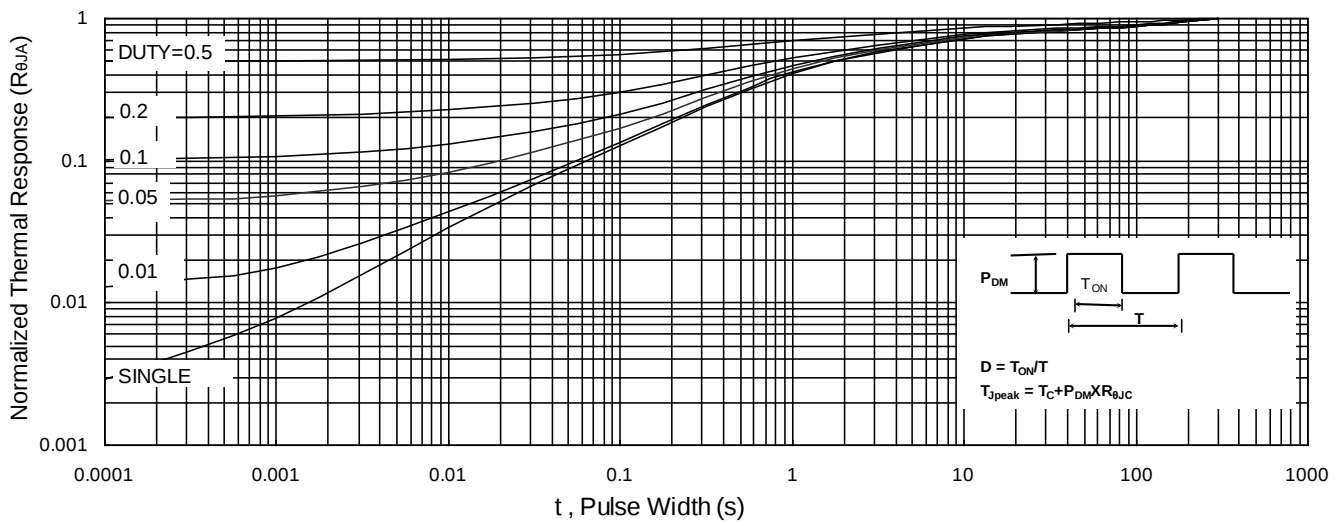


Fig.9 Normalized Maximum Transient Thermal Impedance

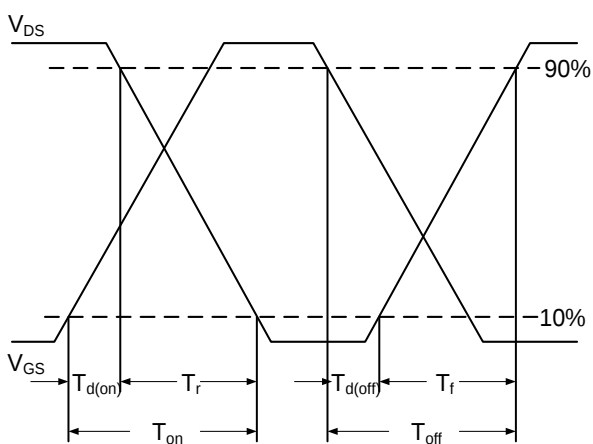


Fig.10 Switching Time Waveform

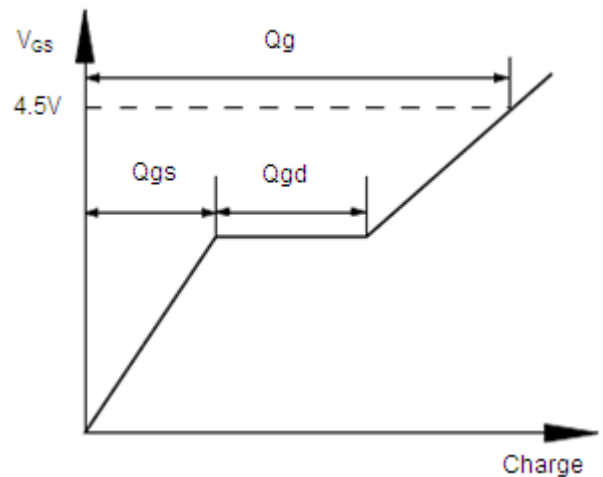
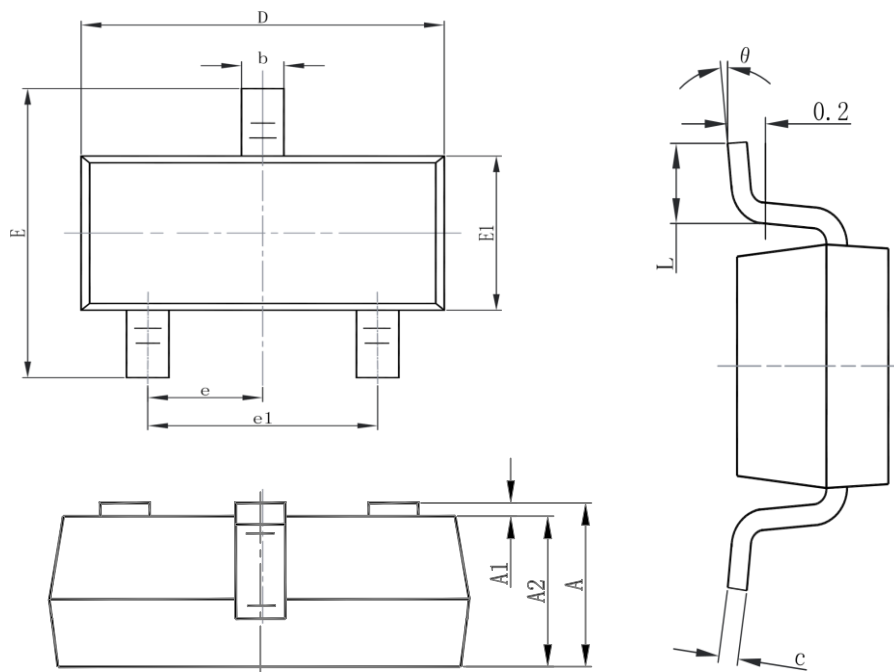


Fig.11 Gate Charge Waveform

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°