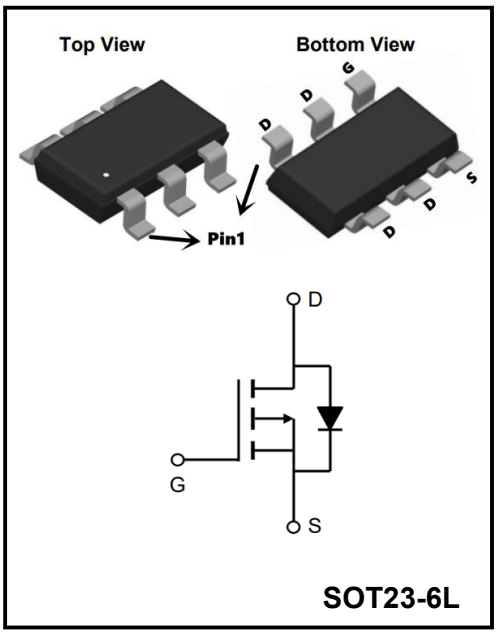
-20V P-Channel Enhancement Mode MOSFET

MAIN CHARACTERISTICS

I_D	-8.1A
V_{DSS}	-20V
R_{DSON}-typ(@V_{GS}=-4.5V)	＜35mΩ(Type:28mΩ)



Description

The YFW 8P02LI 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

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

Package Marking and Ordering Information

Part Number	Package	Marking	Pack
YFW8P02LI	SOT23-6L	YFW 8P02LI	3000PCS/Tape

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

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	±12	V
Continuous Drain Current, V_{GS} @ -4.5V[1]	I_D@T_A=25℃	-8.1	A
Continuous Drain Current, V_{GS} @ -4.5V[1]	I_D@T_A=70℃	-5.9	A
Pulsed Drain Current[2]	I_{DM}	-22	A
Total Power Dissipation[3]	P_D@T_A=25℃	4.31	W
Total Power Dissipation[3]	P_D@T_A=70℃	0.84	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	RθJC	7.4	℃/W

Electrical Characteristics (T_J=25℃, unless otherwise noted)

Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=-250uA	BV_{DSS}	-20	-23	---	V
BV_{DSS} Temperature Coefficient	Reference to 25℃ , I_D=-1mA	△BVDSS/△TJ	---	-0.014	---	V/℃
Static Drain-Source On-Resistance[2]	V_{GS}=-4.5V , I_D=-4.9A	$R_{DS(ON)}$	---	28	35	mΩ
	V_{GS}=-2.5V , I_D=-3.4A		---	35	45	
	V_{GS}=-1.8V , I_D=-2A		---	50	70	
Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =-250uA	$V_{GS(th)}$	-0.5	-0.65	-1.2	V
$V_{GS(th)}$ Temperature Coefficient		△$V_{GS(th)}$	---	3.95	---	mV/℃
Drain-Source Leakage Current	V_{DS}=-16V , V_{GS}=0V , T_J=25℃	I_{DSS}	---	---	-1	uA
	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	gfs	---	12.8	---	S
Total Gate Charge (-4.5V)	V_{DS}=-15V , V_{GS}=-4.5V , I_D=-3A	Q_g	---	10.2	14.3	nC
Gate-Source Charge		Q_{gs}	---	1.89	2.6	
Gate-Drain Charge		Q_{gd}	---	3.1	4.3	
Turn-On Delay Time	V_{DD}=-10V , V_{GS}=-4.5V , R_G=3.3 , I_D=-3A	$T_{d(on)}$	---	5.6	11.2	ns
Rise Time		T_r	---	40.8	73	
Turn-Off Delay Time		$T_{d(off)}$	---	33.6	67	
Fall Time		T_f	---	18	36	
Input Capacitance	V_{DS}=-15V , V_{GS}=0V , f=1MHz	C_{iss}	---	857	1200	pF
Output Capacitance		C_{oss}	---	114	160	
Reverse Transfer Capacitance		C_{rss}	---	108	151	
Continuous Source Current[1,4]	V_G=V_D=0V , Force Current	I_S	---	---	-4.9	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	V
Reverse Recovery Time	IF=-3A , di/dt=100A/μs , T_J=25℃	t_{rr}	---	21.8	---	nS
Reverse Recovery Charge		Q_{rr}	---	6.9	---	nC

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℃ 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.

Typical Characteristics

Typical Characteristics

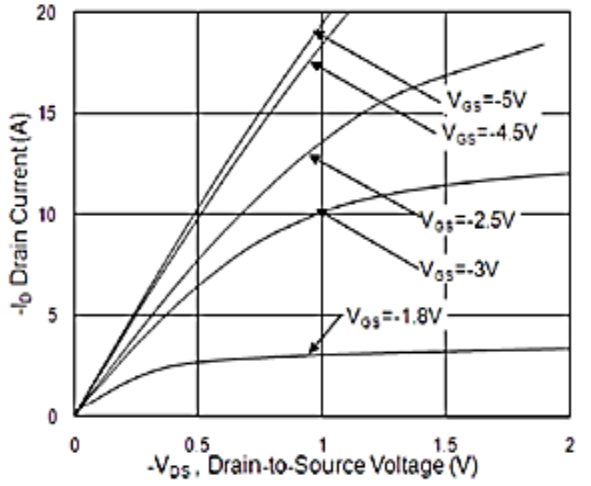


Fig.1 Typical Output Characteristics

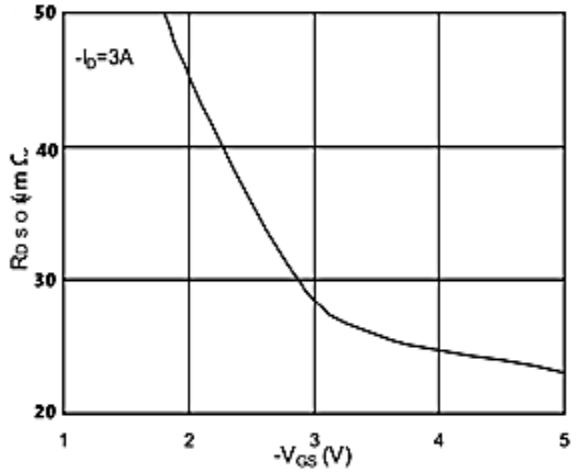


Fig.2 On-Resistance vs. G-S Voltage

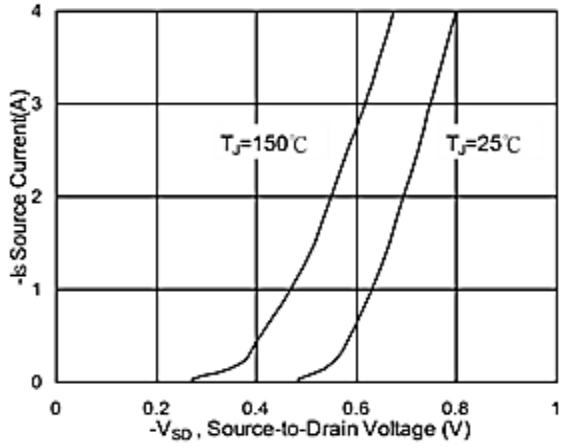


Fig.3 Forward Characteristics of Reverse

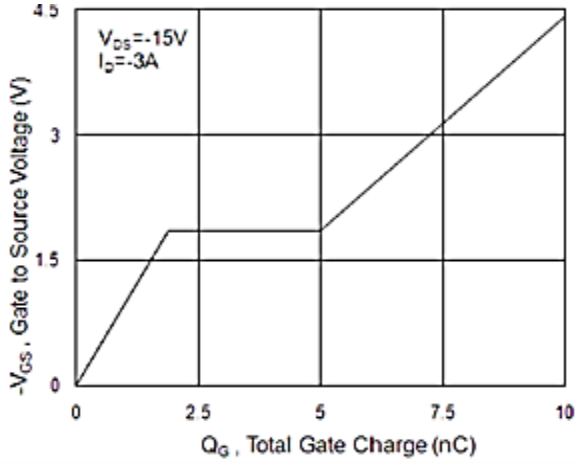


Fig.4 Gate-charge Characteristics

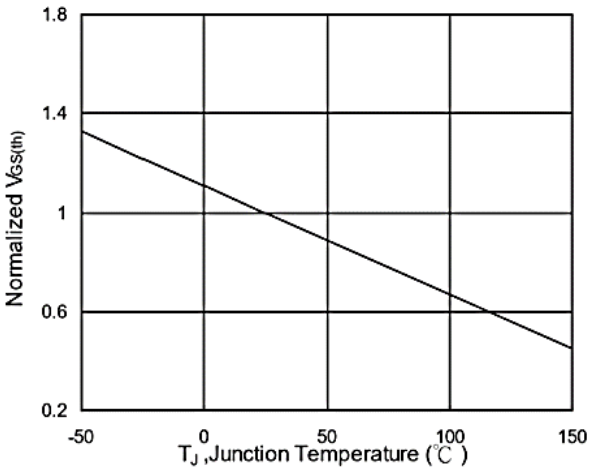


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

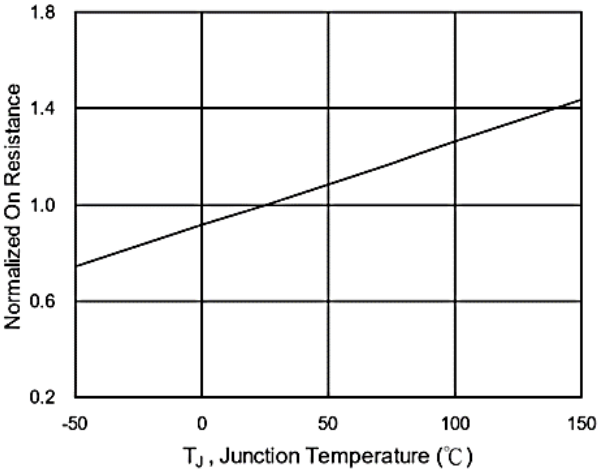


Fig.6 Normalized R_{DSON} vs. T_J

Typical Characteristics

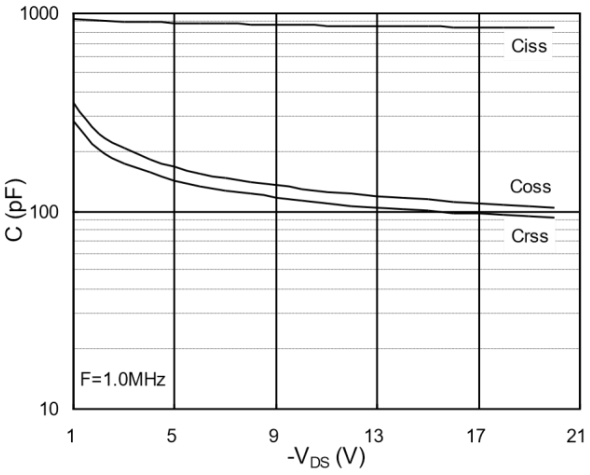


Fig.7 Capacitance

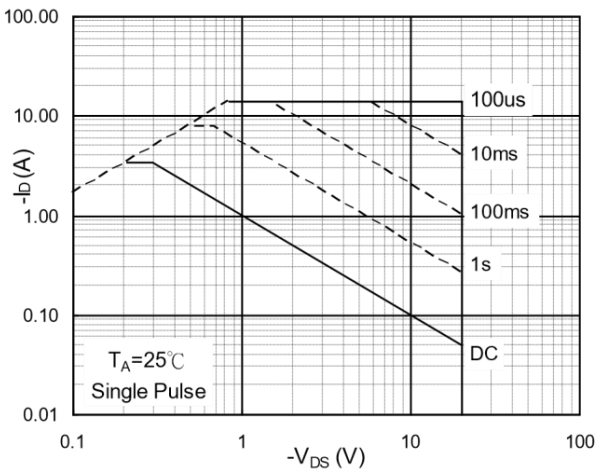


Fig.8 Safe Operating Area

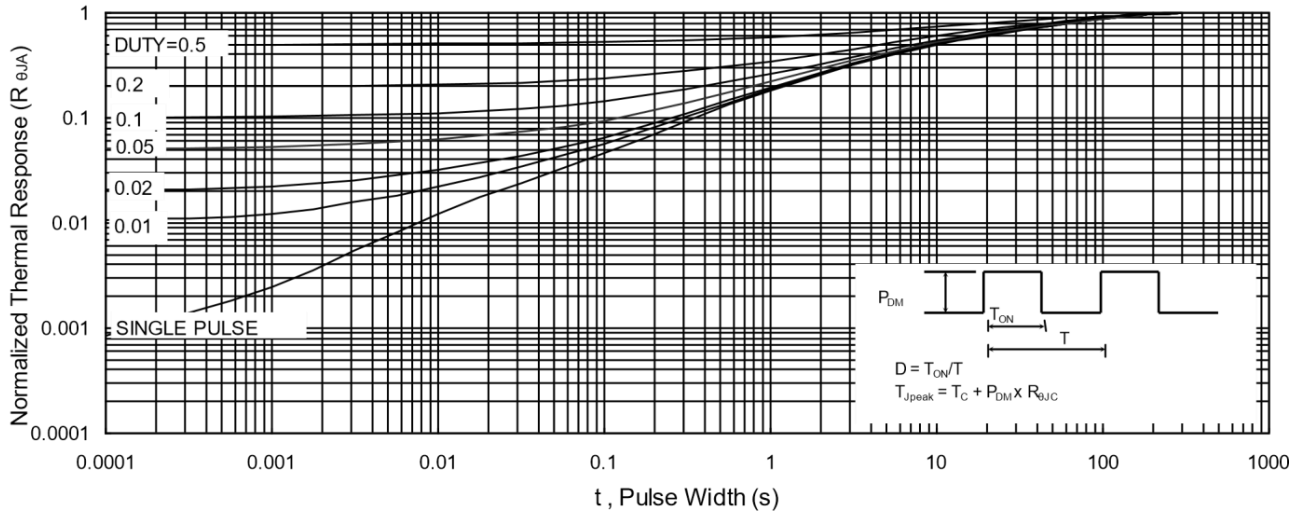


Fig.9 Normalized Maximum Transient Thermal Impedance

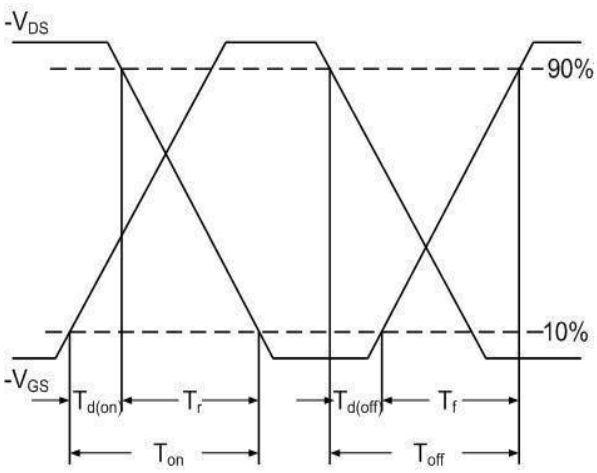


Fig.10 Switching Time Waveform

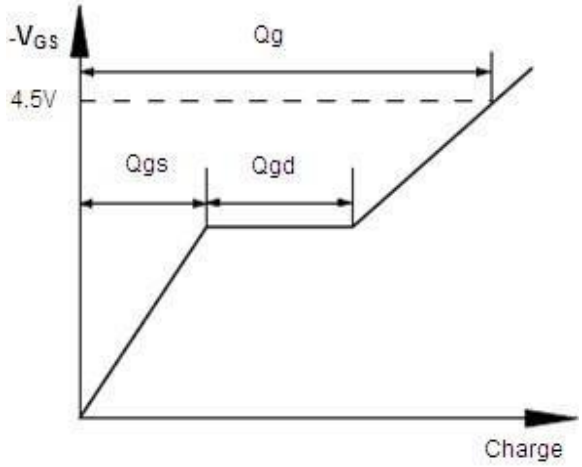
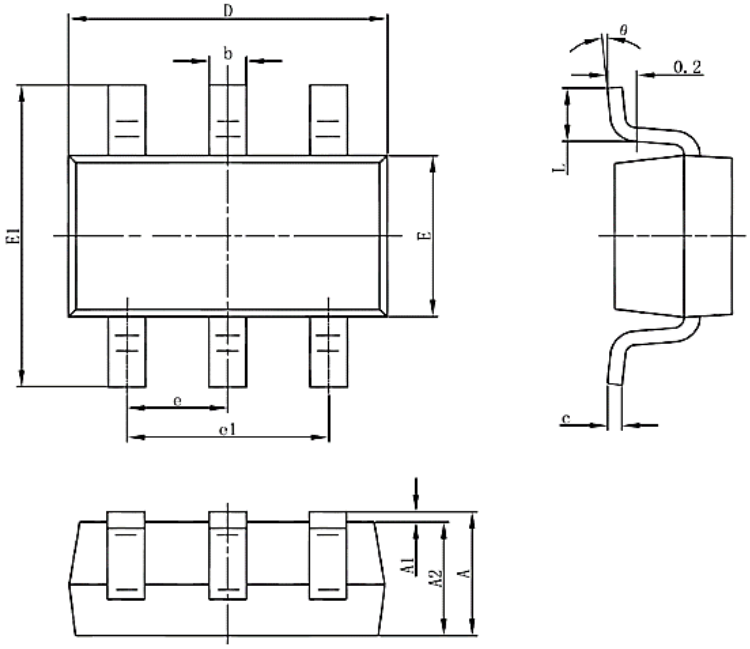


Fig.11 Gate Charge Waveform

Package Outline SOT23-6



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
E	1.500	1.700	0.059	0.067
E1	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