

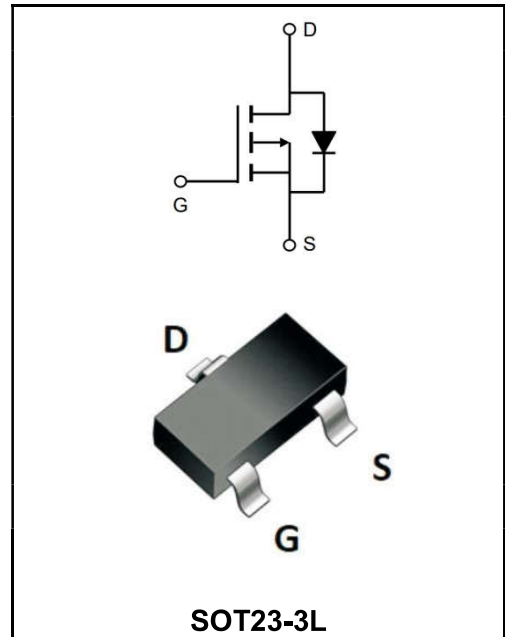
**-60V P-CHANNEL ENHANCEMENT MODE MOSFET**

**MAIN CHARACTERISTICS**

<b>I<sub>D</sub></b>	-6A
<b>V<sub>DSS</sub></b>	-60V
<b>R<sub>DS(on)-typ(@V<sub>GS</sub>=-10V)</sub></b>	< 90mΩ ( <b>Type:80 mΩ</b> )

**Application**

- ◆ Battery protection
- ◆ Load switch
- ◆ Automotive lighting



**Product Specification Classification**

Part Number	Package	Marking	Pack
YFW6P06MI	SOT23-3L	6P06-13	3000PCS/Tape

**Maximum Ratings at Tc=25°C unless otherwise specified**

Characteristics	Symbols	Value	Units
Drain-Source Voltage	<b>V<sub>DS</sub></b>	-60	<b>V</b>
Gate - Source Voltage	<b>V<sub>GS</sub></b>	±20	<b>V</b>
Continuous Drain Current, V <sub>GS</sub> @ -10V <sup>1</sup> @T <sub>A</sub> =25°C	<b>I<sub>D</sub></b>	-6	<b>A</b>
Continuous Drain Current, V <sub>GS</sub> @ -10V <sup>1</sup> @T <sub>A</sub> =100°C	<b>I<sub>D</sub></b>	-4.3	<b>A</b>
Pulsed Drain Current <sup>2</sup>	<b>I<sub>DM</sub></b>	-26	<b>A</b>
Single Pulse Avalanche Energy <sup>3</sup>	<b>E<sub>AS</sub></b>	29.8	<b>mJ</b>
Avalanche Current	<b>I<sub>AS</sub></b>	-24.4	<b>A</b>
Total Power Dissipation <sup>4</sup> @T <sub>A</sub> =25°C	<b>P<sub>D</sub></b>	31.3	<b>W</b>
Storage Temperature Range	<b>T<sub>STG</sub></b>	-55 to +150	<b>°C</b>
Operating Junction Temperature Range	<b>T<sub>J</sub></b>	-55 to +150	<b>°C</b>
Thermal Resistance Junction-Ambient <sup>1</sup>	<b>R<sub>θJA</sub></b>	125	<b>°C/W</b>
Thermal Resistance Junction-Case <sup>1</sup>	<b>R<sub>θJC</sub></b>	40	<b>°C/W</b>

**Maximum Ratings at Tc=25°C unless otherwise specified**

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	$BV_{DSS}$	-60	-	-	V
BVDSS Temperature Coefficient	Reference to 25°C, $I_D=-1mA$	$\Delta BV_{DSS}/\Delta T_J$	-	-0.03	-	V/°C
Static Drain-Source On-Resistance <sup>2</sup>	$V_{GS}=-10V, I_D=-3A$	$R_{DS(ON)}$	-	80	90	mΩ
	$V_{GS}=-4.5V, I_D=-2A$		-	100	115	
Gate -Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	$V_{GS(th)}$	-1.2	-1.75	-2.5	V
$V_{GS(th)}$ Temperature Coefficient						
Drain -Source Leakage Current	$V_{DS}=-48V, V_{GS}=0V, T_J=25^\circ C$	$I_{DSS}$	-	-	1	μA
	$V_{DS}=-48V, V_{GS}=0V, T_J=55^\circ C$		-	-	5	
Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	$I_{GSS}$	-	-	±100	nA
Forward Transconductance	$V_{DS}=-5V, I_D=-3A$	$g_{FS}$	-	8.5	-	S
Total Gate Charge(-4.5V)	$V_{DS}=-48V$ $V_{GS}=-4.5V$ $I_D=-3A$	$Q_g$	-	12.1	-	nC
Gate-Source Charge		$Q_{gs}$	-	2.2	-	
Gate-Drain Charge		$Q_{gd}$	-	6.3	-	
Turn-on delay time	$V_{DD}=-15V$ $V_{GS}=-10V$ $R_G=3.3$ $I_D=-1A$	$t_{d(on)}$	-	9.2	-	nS
Rise Time		$T_r$	-	20.1	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	46.7	-	
Fall Time		$t_f$	-	9.4	-	
Input Capacitance	$V_{DS}=-15V$ $V_{GS}=0V$ $f=1.0MHz$	$C_{iss}$	-	1137	-	pF
Output Capacitance		$C_{oss}$	-	76	-	
Reverse Transfer Capacitance		$C_{rss}$	-	50	-	
Continuous Source Current <sup>1,5</sup>	$V_G=V_D=0V$ , Force Current	$I_S$	-	-	-1.3	A
Diode Forward Voltage <sup>2</sup>	$V_{GS}=0V, I_S=-1A, T_J=25^\circ C$	$V_{SD}$	-	-	-1.2	V

Note :

- 1、 The data tested by surface mounted on a 1 inch 2 FR-4 board with 2OZ copper.
- 2、 The data tested by pulsed , pulse width  $\cong 300\mu s$  , duty cycle  $\cong 2\%$
- 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.

Ratings and Characteristic Curves

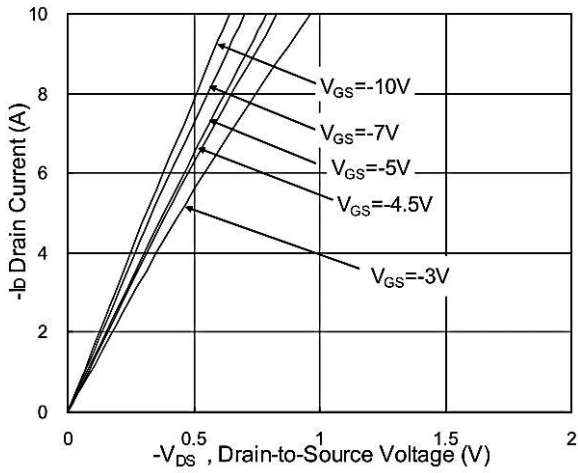


Fig.1 Typical Output Characteristics

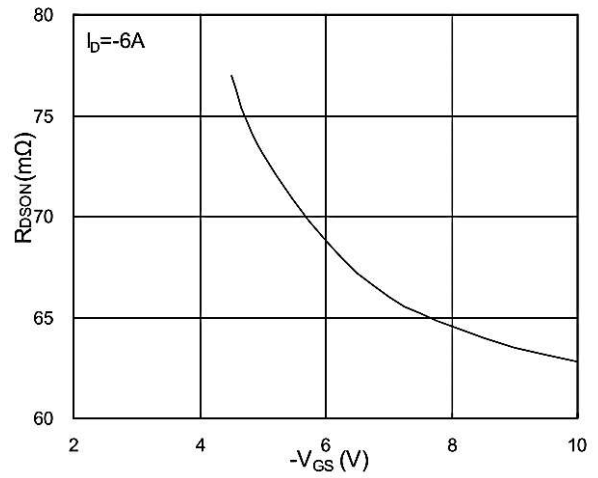


Fig.2 On-Resistance v.s Gate-Source

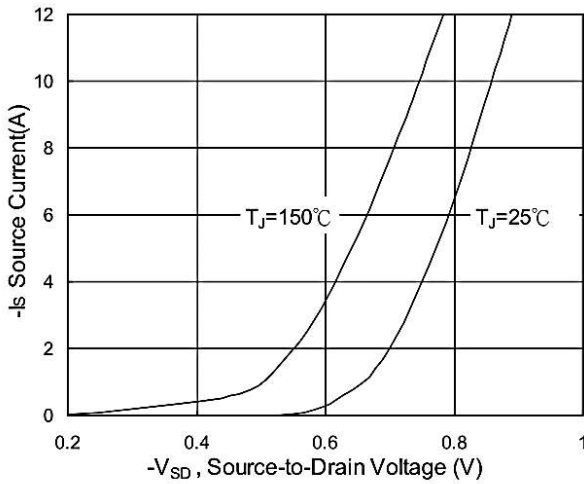


Fig.3 Forward Characteristics of Reverse

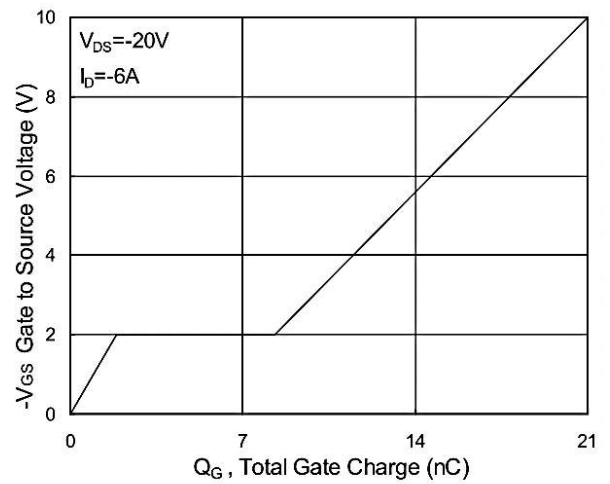


Fig.4 Gate-Charge Characteristics

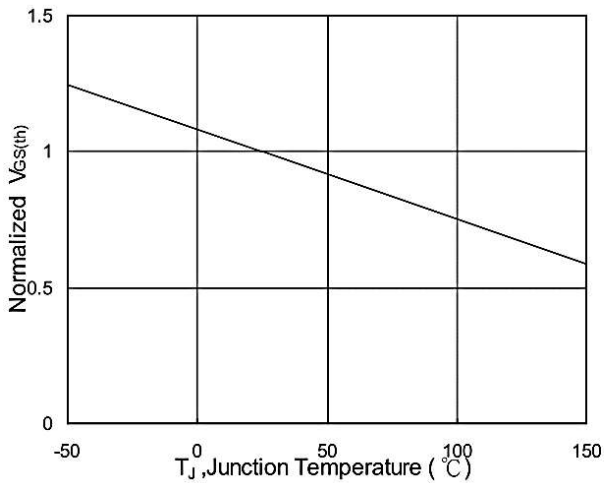


Fig.5 Normalized  $V_{GS(th)}$  v.s  $T_J$

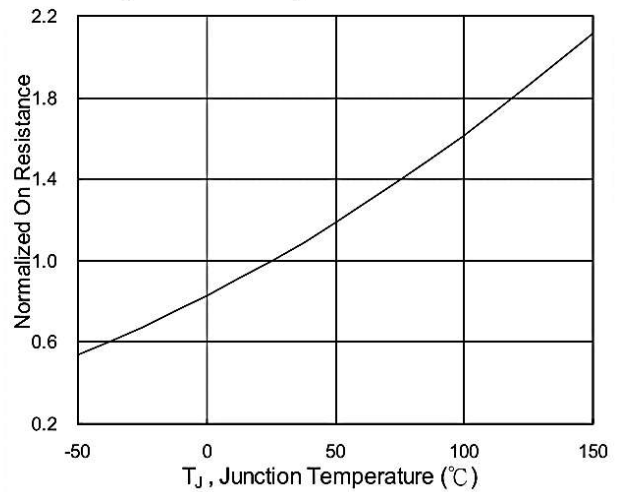
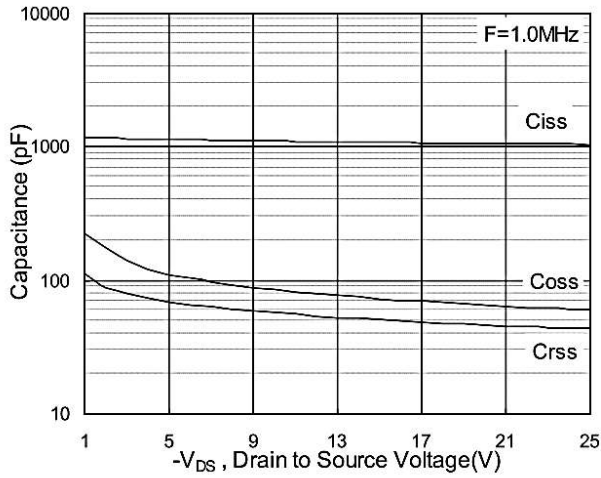
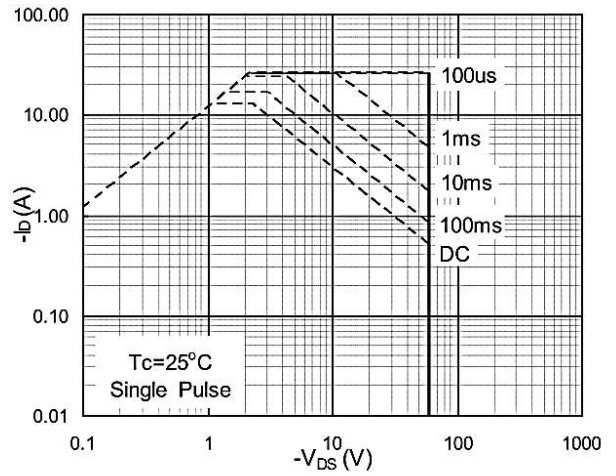


Fig.6 Normalized  $R_{DS(on)}$  v.s  $T_J$

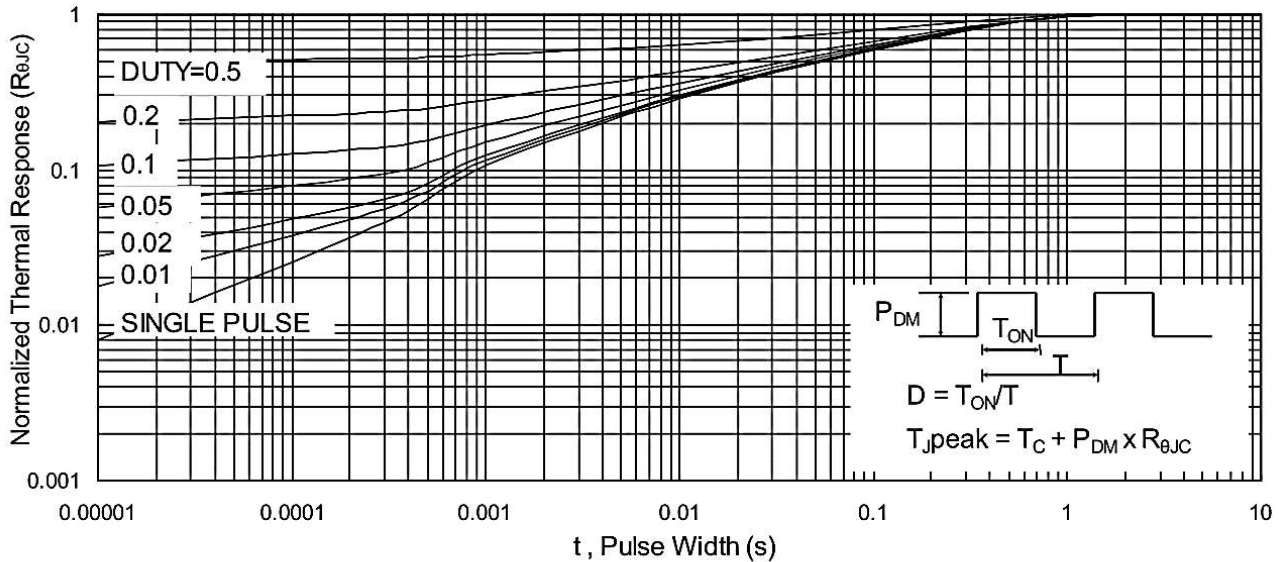
Ratings and Characteristic Curves



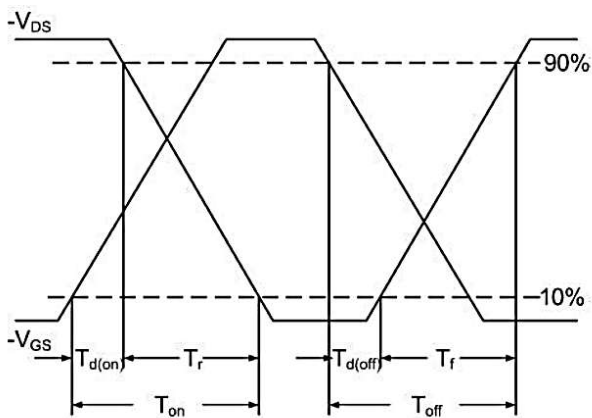
**Fig.7 Capacitance**



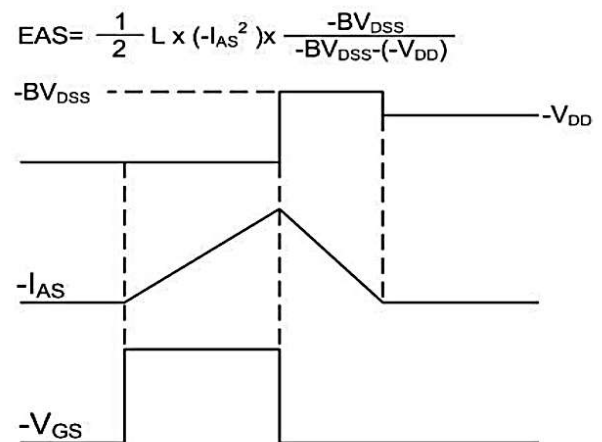
**Fig.8 Safe Operating Area**



**Fig.9 Normalized Maximum Transient Thermal Impedance**

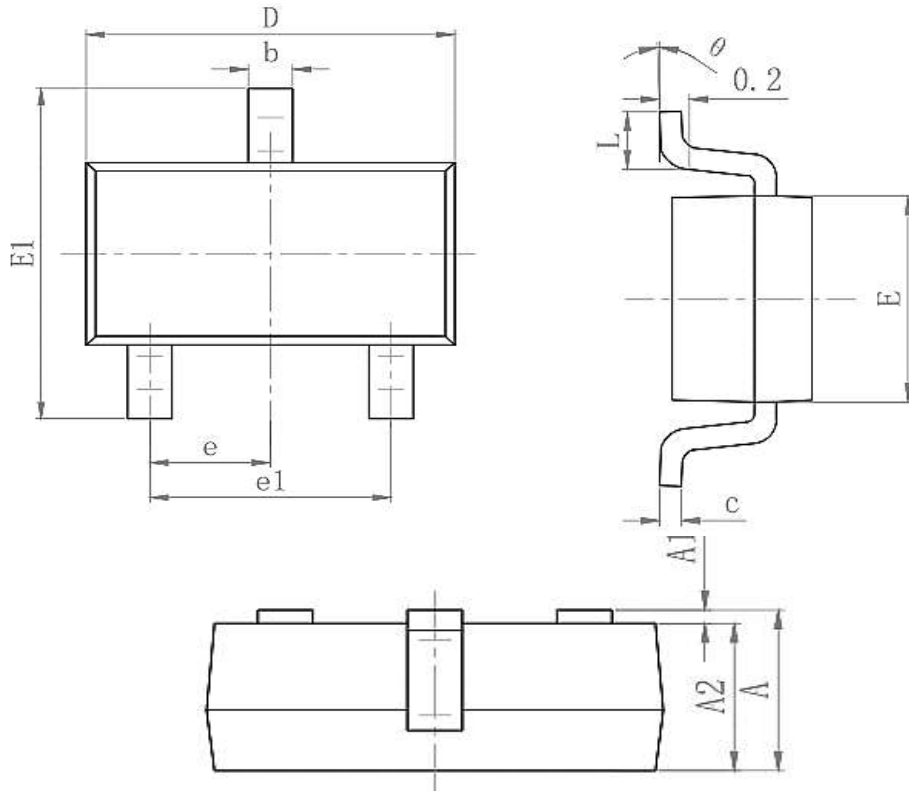


**Fig.10 Switching Time Waveform**



**Fig.11 Unclamped Inductive Switching Waveform**

**SOT23-3L**



Symbol	Dimensions In Millimeters	
	Min.	Max.
A	1.050	1.250
A1	0.000	0.100
A2	1.050	1.150
b	0.25	0.45
c	0.100	0.200
D	2.820	3.020
E	1.5	1.7
E1	2.650	2.950
e	0.950(BSC)	
e1	1.800	2.000
L	0.300	0.500
$\theta$	0°	8°