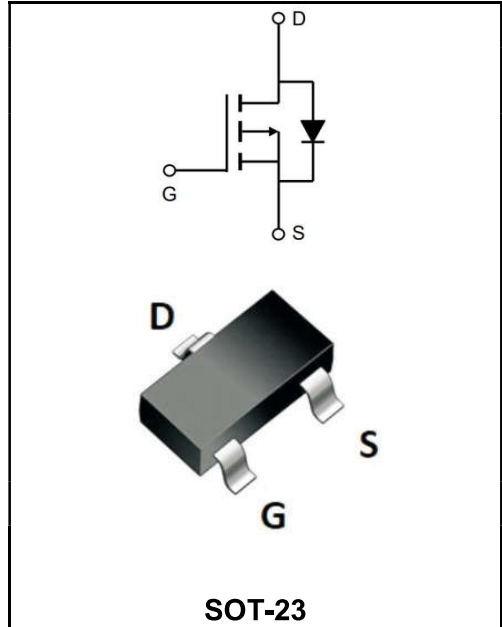


**-40V P-CHANNEL ENHANCEMENT MODE MOSFET**

**MAIN CHARACTERISTICS**

<b>I<sub>D</sub></b>	-3A
<b>V<sub>DSS</sub></b>	-40V
<b>R<sub>DS(on)-typ(@V<sub>GS</sub>=-10V)</sub></b>	< 75mΩ ( <b>Type:62 mΩ</b> )



**Application**

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

**Product Specification Classification**

Part Number	Package	Marking	Pack
YFW3P04A	SOT-23	3P04A	3000PCS/Tape

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

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V <sub>DS</sub>	-40	V
Gate - Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current, V <sub>GS</sub> @ -4.5V <sup>1</sup> @T <sub>A</sub> =25°C	I <sub>D</sub>	-3.7	A
Continuous Drain Current, V <sub>GS</sub> @ -4.5V <sup>1</sup> @T <sub>A</sub> =70°C	I <sub>D</sub>	-3.0	A
Pulsed Drain Current <sup>2</sup>	I <sub>DM</sub>	-16.1	A
Total Power Dissipation <sup>3</sup> @T <sub>A</sub> =25°C	P <sub>D</sub>	1.32	W
Total Power Dissipation <sup>3</sup> @T <sub>A</sub> =70°C	P <sub>D</sub>	0.84	W
Storage Temperature Range	T <sub>STG</sub>	-55 to +150	°C
Operating Junction Temperature Range	T <sub>J</sub>	-55 to +150	°C
Thermal Resistance Junction-Ambient <sup>1</sup>	R <sub>θJA</sub>	125	°C/W
Thermal Resistance Junction-Ambient <sup>1</sup> (t≤10s)	R <sub>θJA</sub>	95	°C/W
Thermal Resistance Junction to Case <sup>1</sup>	R <sub>θJC</sub>	80	°C/W

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

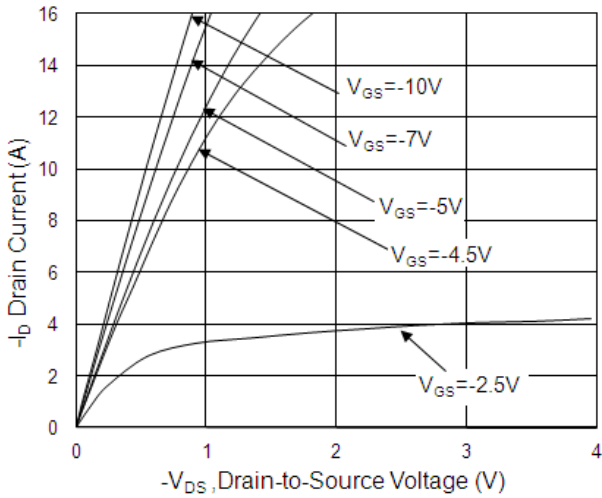
Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	$BV_{DSS}$	-40	-44	-	V
$BV_{DSS}$ Temperature Coefficient	Reference to 25°C, $I_D=-1mA$	$\Delta BV_{DSS}/\Delta T_J$	-	-0.018	-	V/°C
Static Drain-Source On-Resistance <sup>2</sup>	$V_{GS}=-10V, I_D=-3A$	$R_{DS(ON)}$	-	62	75	mΩ
	$V_{GS}=-4.5V, I_D=-2A$		-	81	100	
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		$\Delta V_{GS(th)}$	-	2.5	-	mV/°C
Drain-Source Leakage Current	$V_{DS}=-40V, V_{GS}=0V, T_J=25^\circ C$	$I_{DSS}$	-	-	-1	μA
	$V_{DS}=-40V, V_{GS}=0V, T_J=55^\circ C$		-	-	-5	
Gate -Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	$I_{GSS}$	-	-	±100	nA
Forward Transconductance	$V_{DS}=-5V, I_D=-3V$	$g_{fs}$	-	5.8	-	S
Total Gate Charge(-4.5V)	$V_{DS}=-32V$ $V_{GS}=-4.5V$ $I_D=-3A$	$Q_g$	-	6.4	-	nC
Gate-Source Charge		$Q_{gs}$	-	2.1	-	
Gate-Drain Charge		$Q_{gd}$	-	2.5	-	
Turn-on delay time	$V_{DD}=-20V$ $V_{GS}=-4.5V$ $I_D=-3A$ $R_G=3.3\Omega$	$t_{d(on)}$	-	4.2	-	ns
Rise Time		$T_r$	-	23	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	26.8	-	
Fall Time		$t_f$	-	20.6	-	
Input Capacitance	$V_{DS}=-15V$ $V_{GS}=0V$ $f=1MHz$	$C_{iss}$	-	620	-	pF
Output Capacitance		$C_{oss}$	-	65	-	
Reverse Transfer Capacitance		$C_{rss}$	-	53	-	
Continuous Source Current <sup>1,4</sup>	$V_G=V_D=0V$ , Force Current	$I_S$	-	-	-3.2	A
Pulsed Source Current <sup>2,4</sup>		$I_{SM}$	-	-	-16.1	A
Diode Forward Voltage <sup>2</sup>	$V_{GS}=0V, I_S=-1A, T_J=25^\circ C$	$V_{SD}$	-	-	-1	V

Note :

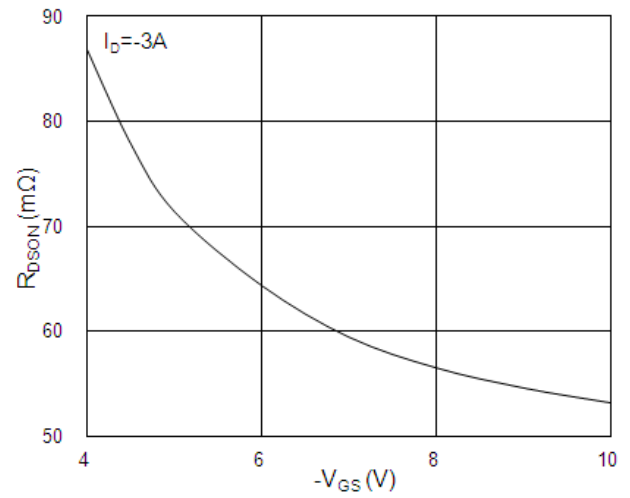
- 1、The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.
- 2、The data tested by pulsed , pulse width  $\leq 300\mu s$  , duty cycle  $\leq 2\%$
- 3、The power dissipation is limited by 150°C junction temperature
- 4、The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

**Ratings and Characteristic Curves**

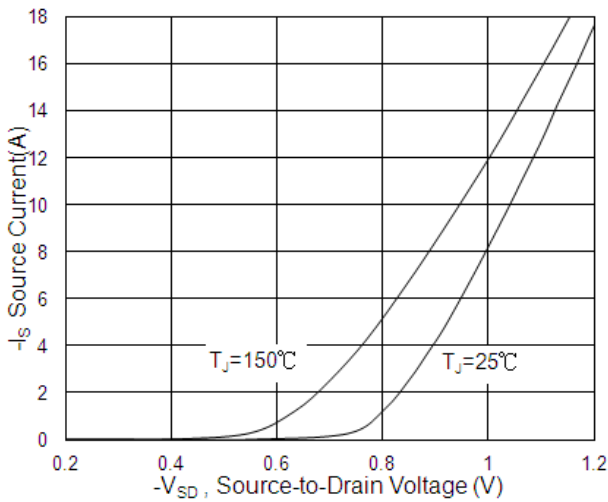
**Typical Characteristics**



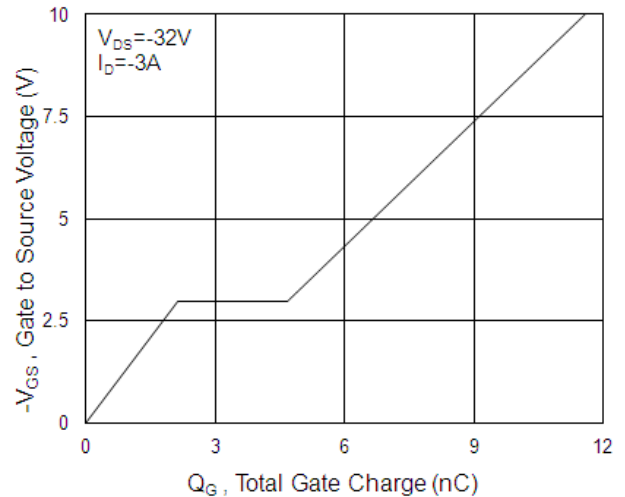
**Fig.1 Typical Output Characteristics**



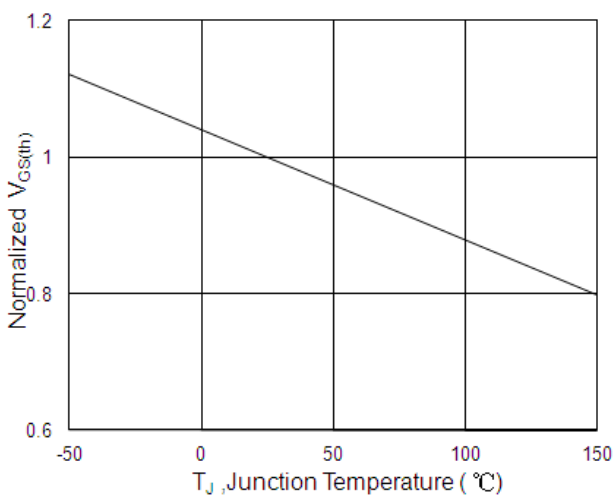
**Fig.2 On-Resistance vs. G-S Voltage**



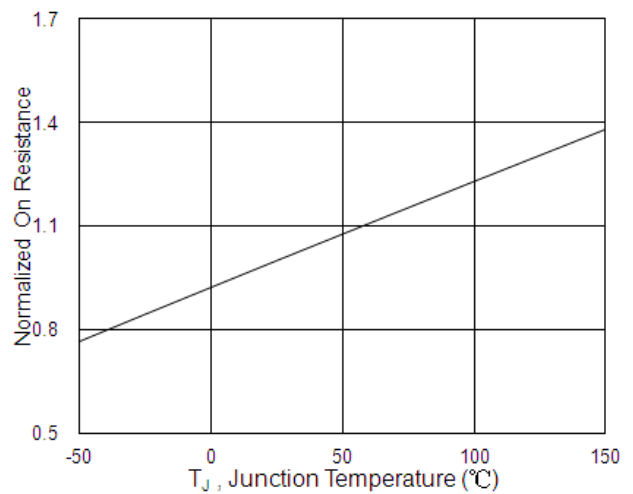
**Fig.3 Forward Characteristics Of Reverse**



**Fig.4 Gate-Charge Characteristics**



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



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

Ratings and Characteristic Curves

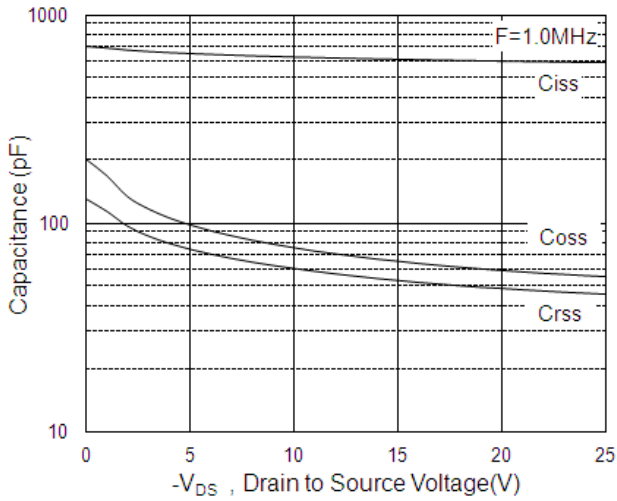


Fig.7 Capacitance

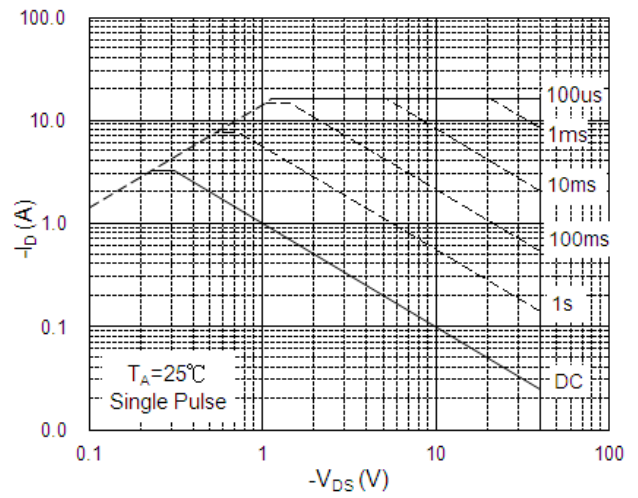


Fig.8 Safe Operating Area

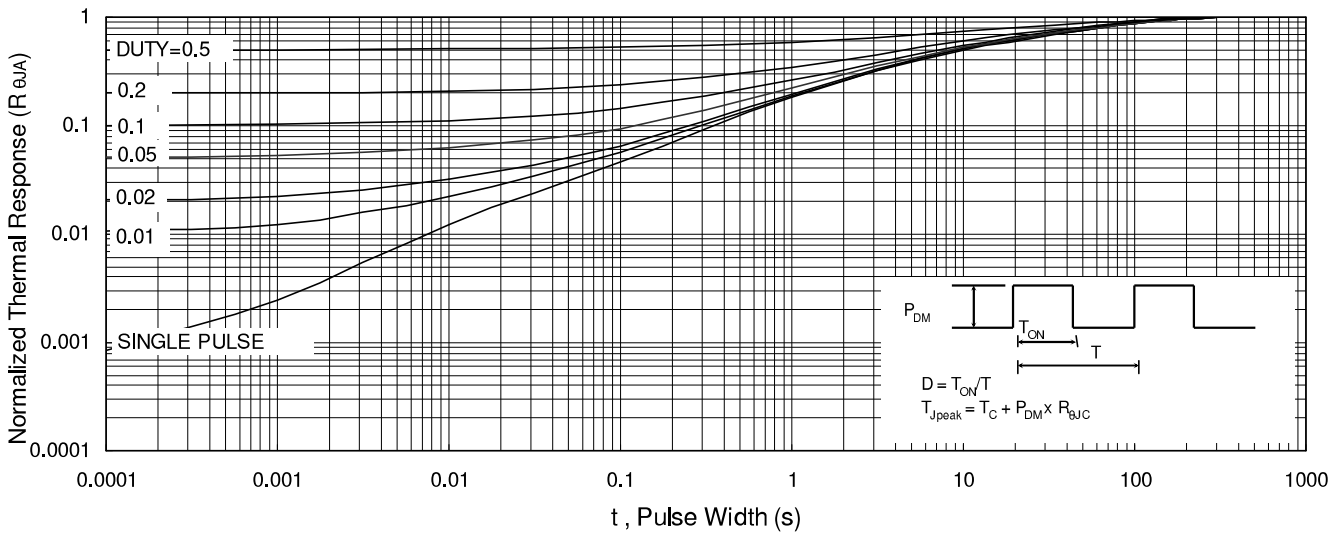


Fig.9 Normalized Maximum Transient Thermal Impedance

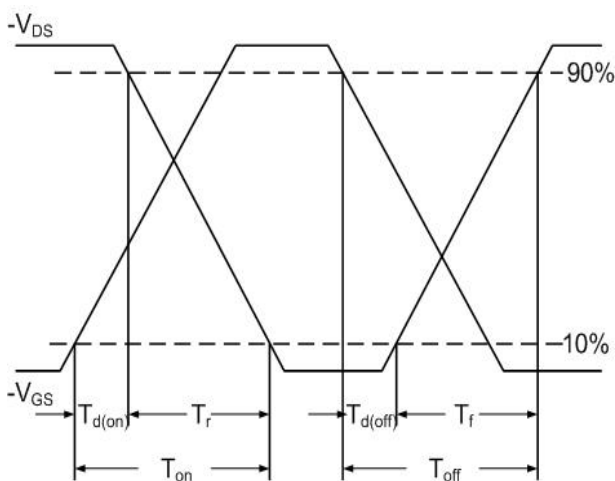


Fig.10 Switching Time Waveform

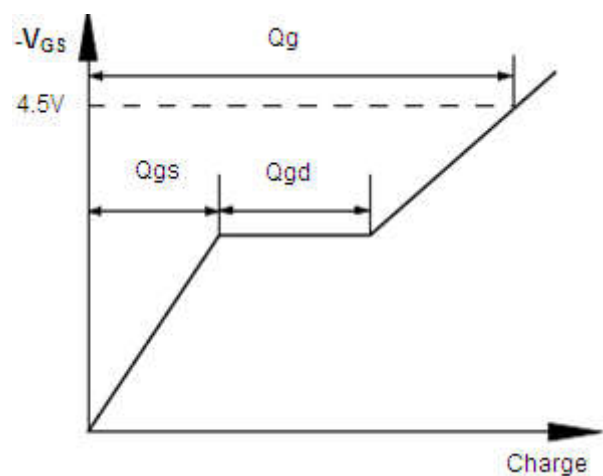
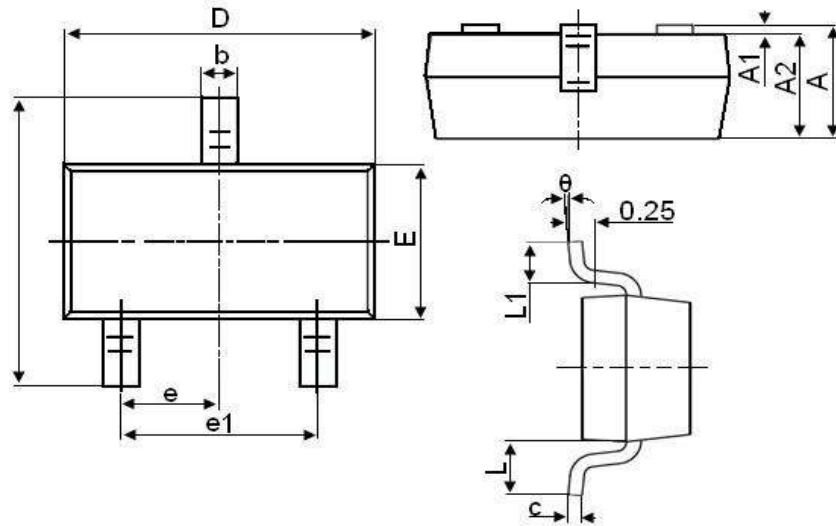


Fig.11 Gate Charge Waveform

**SOT-23**



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
$\theta$	0°	8°