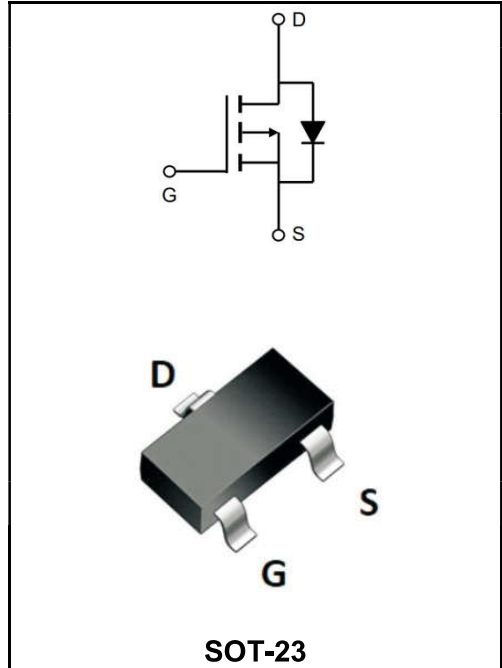


**-20V P-CHANNEL ENHANCEMENT MODE MOSFET**

**MAIN CHARACTERISTICS**

<b>I<sub>D</sub></b>	-4.9A
<b>V<sub>DSS</sub></b>	-20V
<b>R<sub>DS(on)-typ(@V<sub>GS</sub>=-4.5V)</sub></b>	< 38mΩ ( <b>Type:32 mΩ</b> )



**Application**

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

**Product Specification Classification**

Part Number	Package	Marking	Pack
YFW2305A	SOT-23	A5SHB	3000PCS/Tape

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

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V <sub>DS</sub>	-20	V
Gate - Source Voltage	V <sub>GS</sub>	±12	V
Continuous Drain Current, V <sub>GS</sub> @ -4.5V <sup>1</sup> @T <sub>A</sub> =25°C	I <sub>D</sub>	-4.9	A
Continuous Drain Current, V <sub>GS</sub> @ -4.5V <sup>1</sup> @T <sub>A</sub> =70°C	I <sub>D</sub>	-3.9	A
Pulsed Drain Current <sup>2</sup>	I <sub>DM</sub>	-14	A
Total Power Dissipation <sup>3</sup> @T <sub>A</sub> =25°C	P <sub>D</sub>	1.31	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>	120	°C/W
Thermal Resistance Junction-Ambient <sup>1</sup> (t ≤10s)	R <sub>θJA</sub>	95	°C/W

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

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	$BV_{DSS}$	-20	-	-	V
$BV_{DSS}$ Temperature Coefficient	Reference to 25°C, $I_D=-1mA$	$\Delta BV_{DSS}/\Delta T_J$	-	-0.014	-	V/°C
Static Drain-Source On-Resistance <sup>2</sup>	$V_{GS}=-4.5V, I_D=-4.9A$	$R_{DS(ON)}$	-	32	38	mΩ
	$V_{GS}=-2.5V, I_D=-3.4A$		-	45	55	
	$V_{GS}=-1.8V, I_D=-2A$		-	65	85	
Gate -Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	$V_{GS(th)}$	-0.4	-	-1.0	V
$V_{GS(th)}$ Temperature Coefficient		$\Delta V_{GS(th)}$	-	3.95	-	mV/°C
Drain-Source Leakage Current	$V_{DS}=-16V, V_{GS}=0V, T_J=25^\circ C$	$I_{DSS}$	-	-	-1	μA
	$V_{DS}=-16V, V_{GS}=0V, T_J=55^\circ C$		-	-	-5	
Gate -Source Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$	$I_{GSS}$	-	-	±100	nA
Forward Transconductance	$V_{DS}=-5V, I_D=-3A$	$g_{fs}$	-	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	$V_{DD}=-10V$ $V_{GS}=-4.5V$ $I_D=-3A$ $R_G=3.3$	$t_{d(on)}$	-	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 <sup>1,4</sup>	$V_G=V_D=0V, \text{ Force Current}$	$I_S$	-	-	-4.9	A
Pulsed Source Current <sup>2,4</sup>		$I_{SM}$	-	-	-14	A
Diode Forward Voltage <sup>2</sup>	$V_{GS}=0V, I_S=-1A, T_J=25^\circ C$	$V_{SD}$	-	-	-1	V
Reverse Recovery Time	$I_F=-3A, dI/dt=100A/\mu s, T_J=25^\circ C$	$t_{rr}$	-	21.8	-	ns
Reverse Recovery Charge		$Q_{rr}$	-	6.9	-	nC

Note :

1 .The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.

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

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

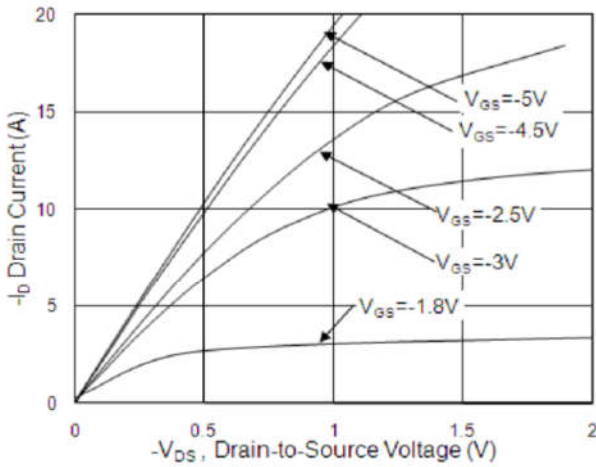


Fig.1 Typical Output Characteristics

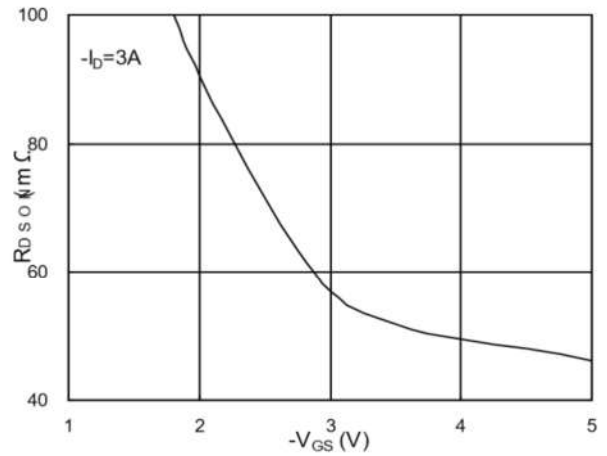


Fig.2 On-Resistance vs. G-S Voltage

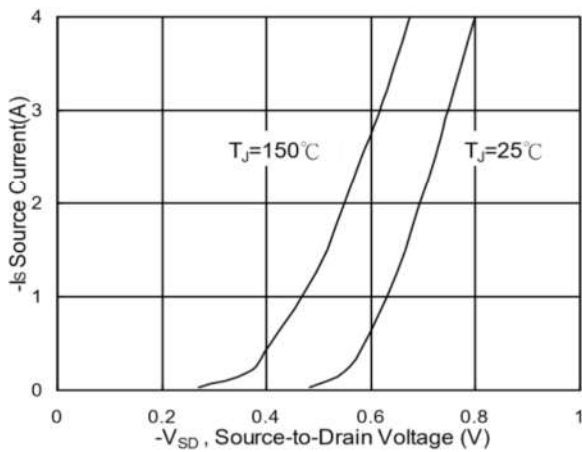


Fig.3 Forward Characteristics of Reverse

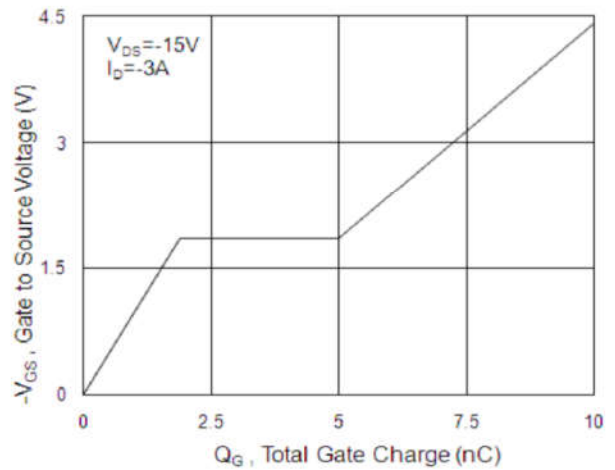


Fig.4 Gate-charge Characteristics

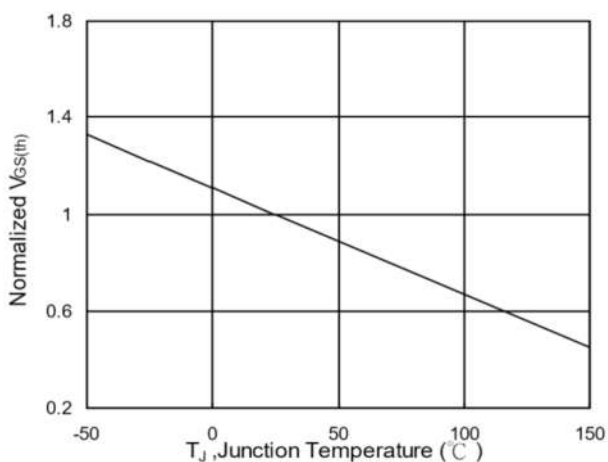


Fig.5 Normalized V<sub>GS(th)</sub> vs. T<sub>J</sub>

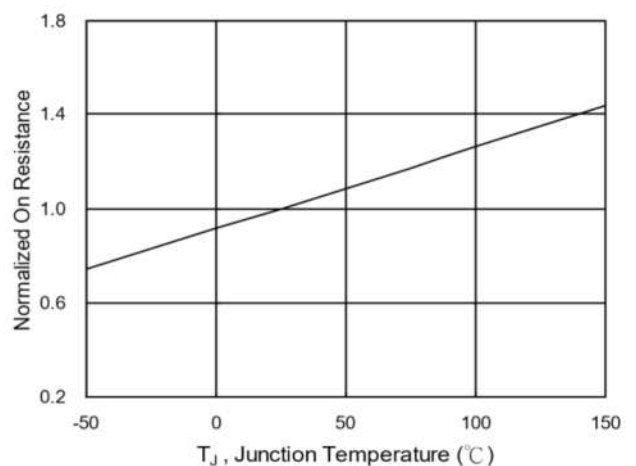


Fig.6 Normalized R<sub>DS(on)</sub> vs. T<sub>J</sub>

Ratings and Characteristic Curves

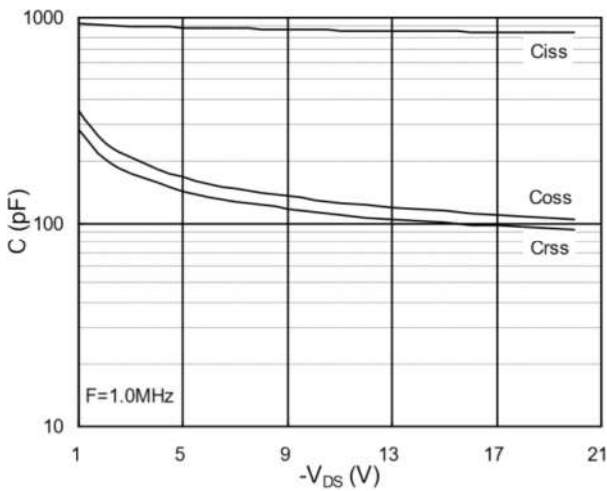


Fig.7 Capacitance

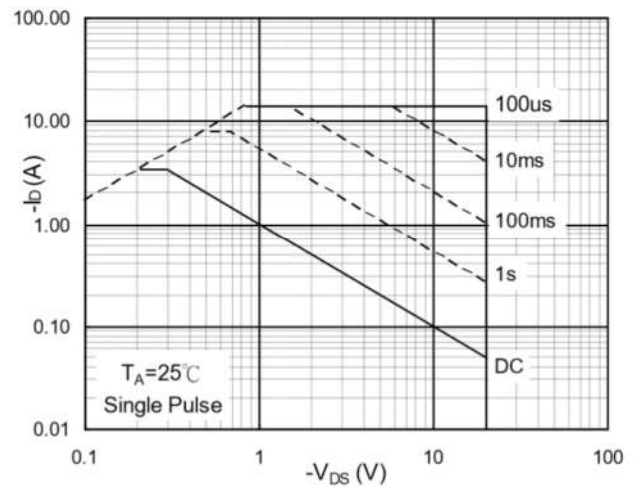


Fig.8 Safe Operating Area

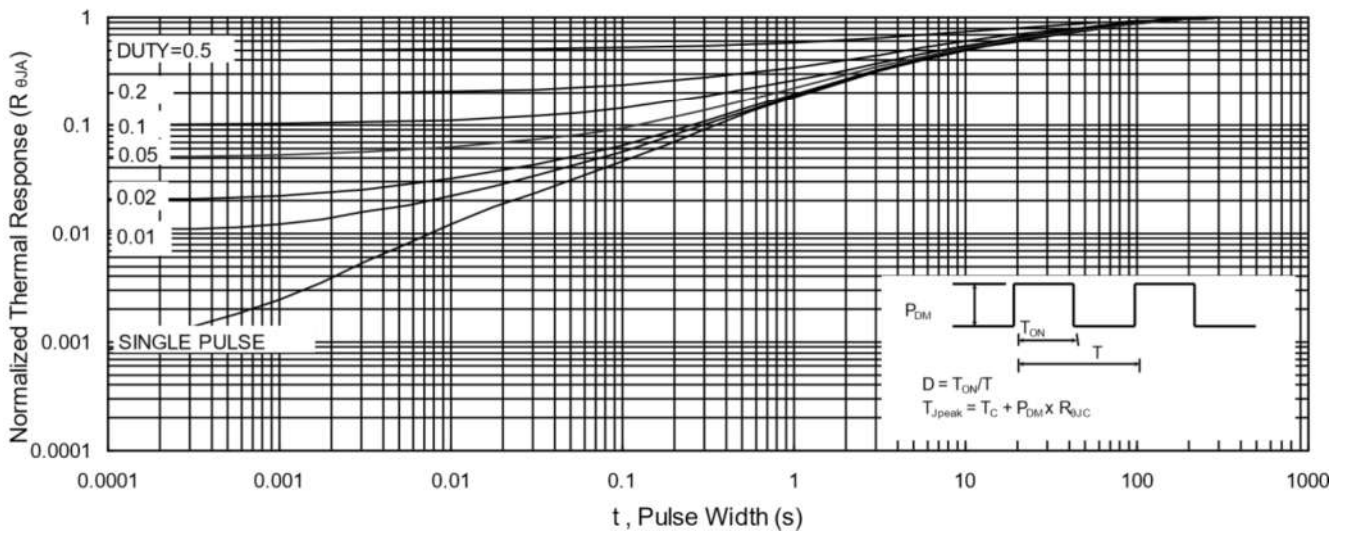


Fig.9 Normalized Maximum Transient Thermal Impedance

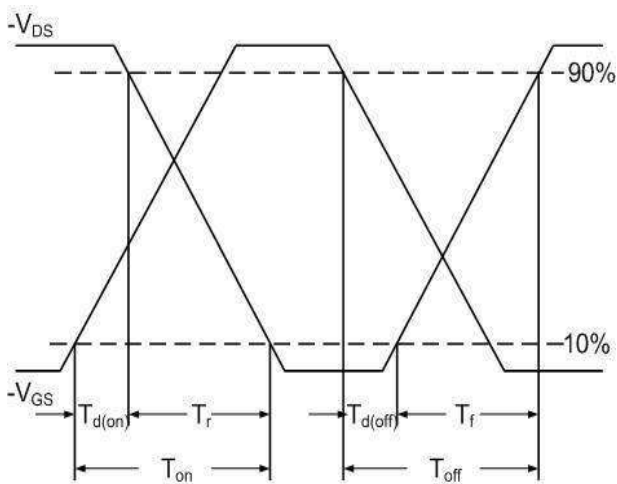


Fig.10 Switching Time Waveform

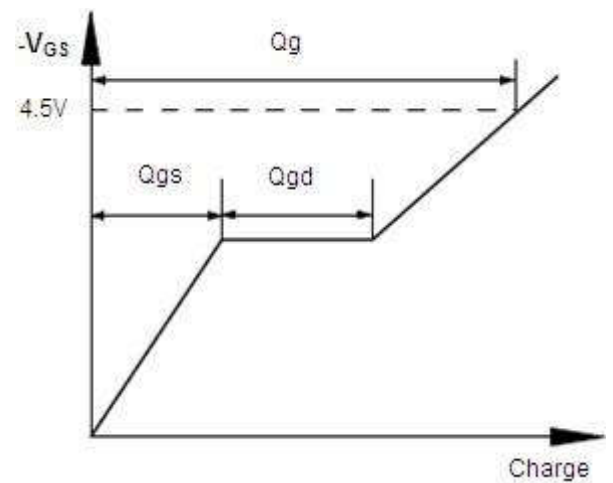
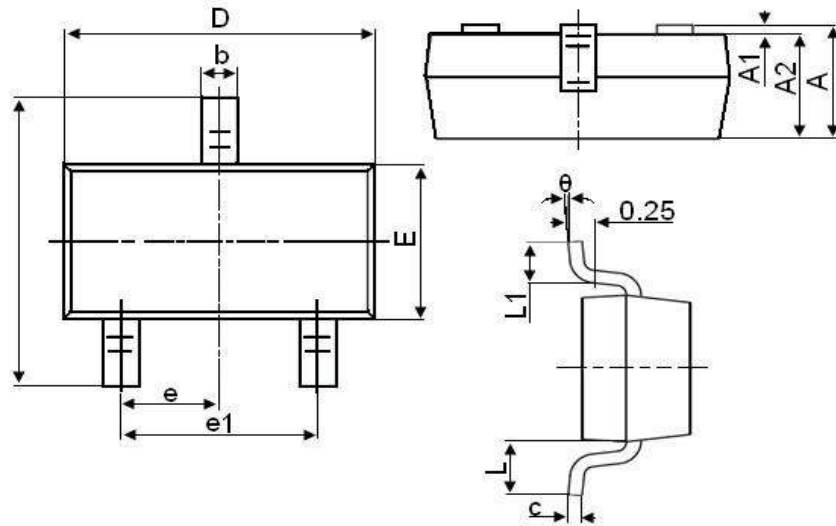


Fig.11 Gate Charge Waveform

**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
θ	0°	8°