

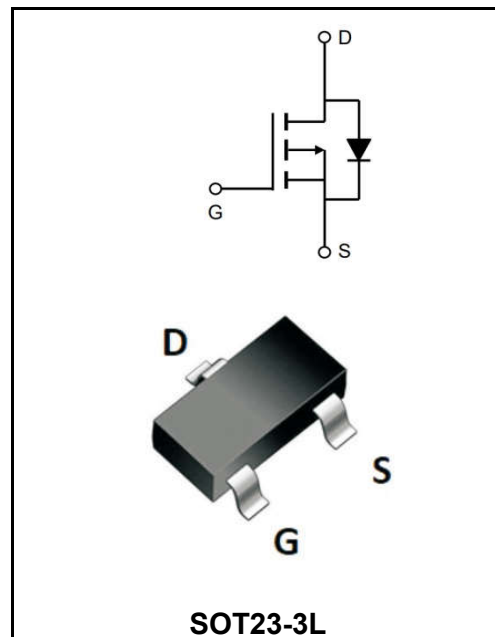
-20V P-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	-4.9A
V_{DSS}	-20V
$R_{DS(on)}-typ(@V_{GS}=-4.5V)$	< 38mΩ (Type:32 mΩ)

Application

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



Marking Code

YFW2305MI

A5SHB

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	-20	V
Gate - Source Voltage	V_{GS}	± 12	V
Continuous Drain Current, V_{GS} @ -4.5V ¹ @T _A =25°C	I_D	-4.9	A
Continuous Drain Current, V_{GS} @ -4.5V ¹ @T _A =70°C	I_D	-3.9	A
Pulsed Drain Current ²	I_{DM}	-14	A
Total Power Dissipation ³ @T _A =25°C	P_D	1.31	W
Total Power Dissipation ³ @T _A =70°C	P_D	0.84	W
Storage Temperature Range	T_{STG}	-55 to +150	°C
Operating Junction Temperature Range	T_J	-55 to +150	°C
Thermal Resistance Junction-Ambient ¹	$R_{\theta JA}$	120	°C/W
Thermal Resistance Junction-Ambient ¹ (t ≤ 10s)	$R_{\theta JA}$	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
BVDSS Temperature Coefficient	Reference to 25°C, $I_D=-1mA$	$\Delta BV_{DSS}/\Delta T_J$	-	-0.014	-	V/°C
Static Drain-Source On-Resistance ²	$V_{GS}=-4.5V, I_D=-4.9A$	$R_{DS(ON)}$	-	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 ^{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	$V_{GS}=0V, I_S=-1A, T_J=25^\circ C$	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 inch² FR-4 board with 2OZ copper.

2、The data tested by pulsed , pulse width Δ 300us , duty cycle Δ 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

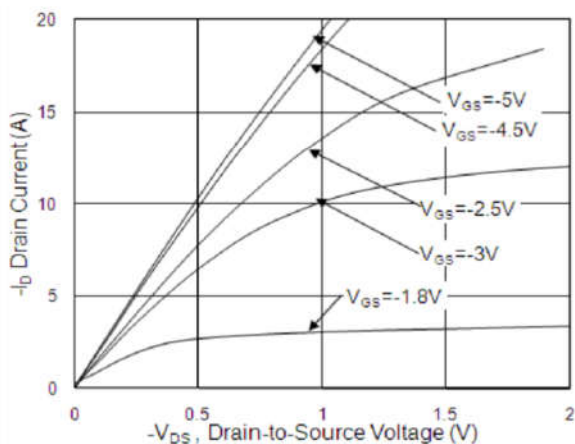


Fig.1 Typical Output Characteristics

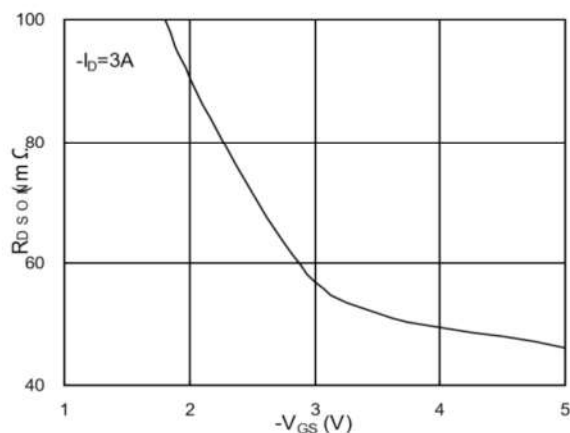


Fig.2 On-Resistance vs. G-S Voltage

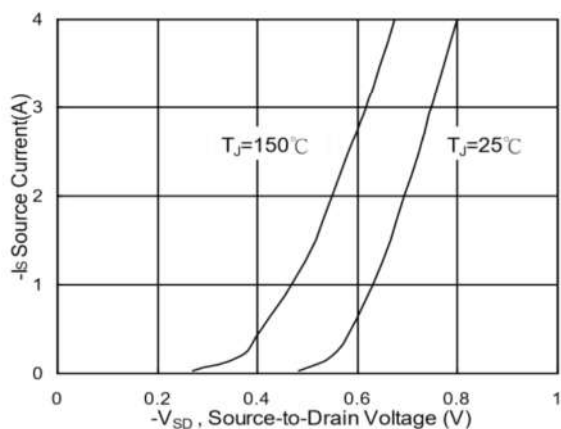


Fig.3 Forward Characteristics of Reverse

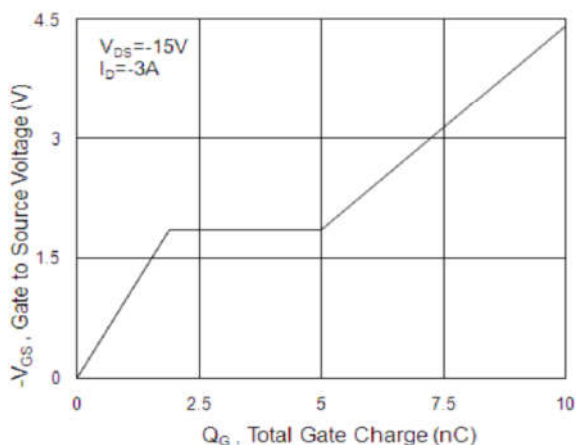


Fig.4 Gate-charge Characteristics

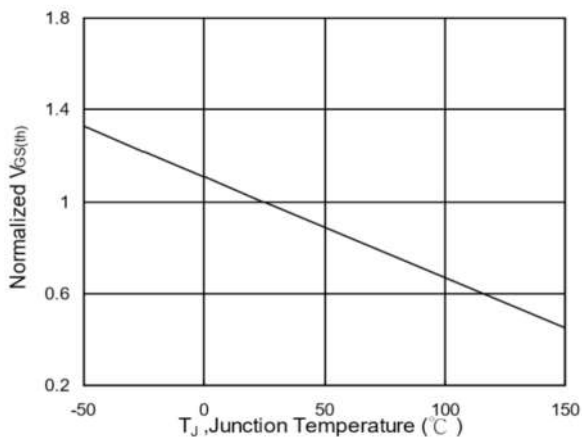


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

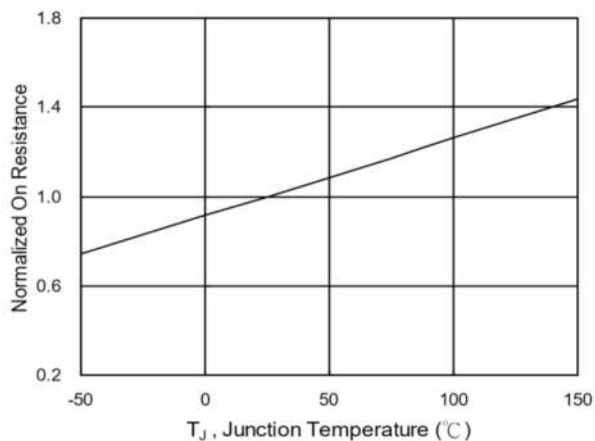


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

Ratings and Characteristic Curves

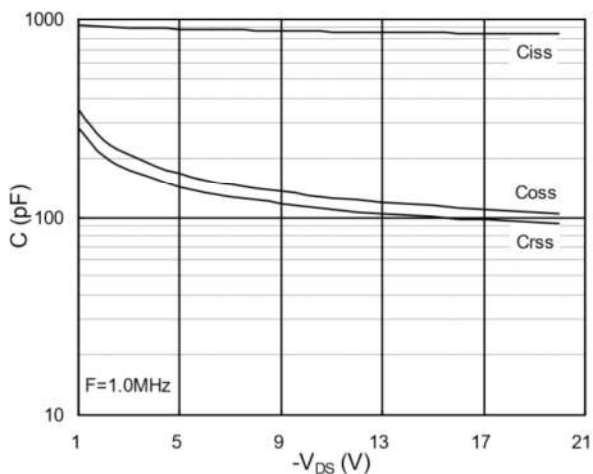


Fig.7 Capacitance

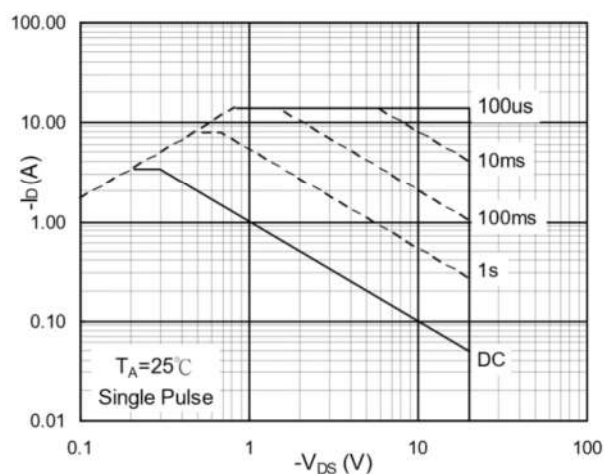


Fig.8 Safe Operating Area

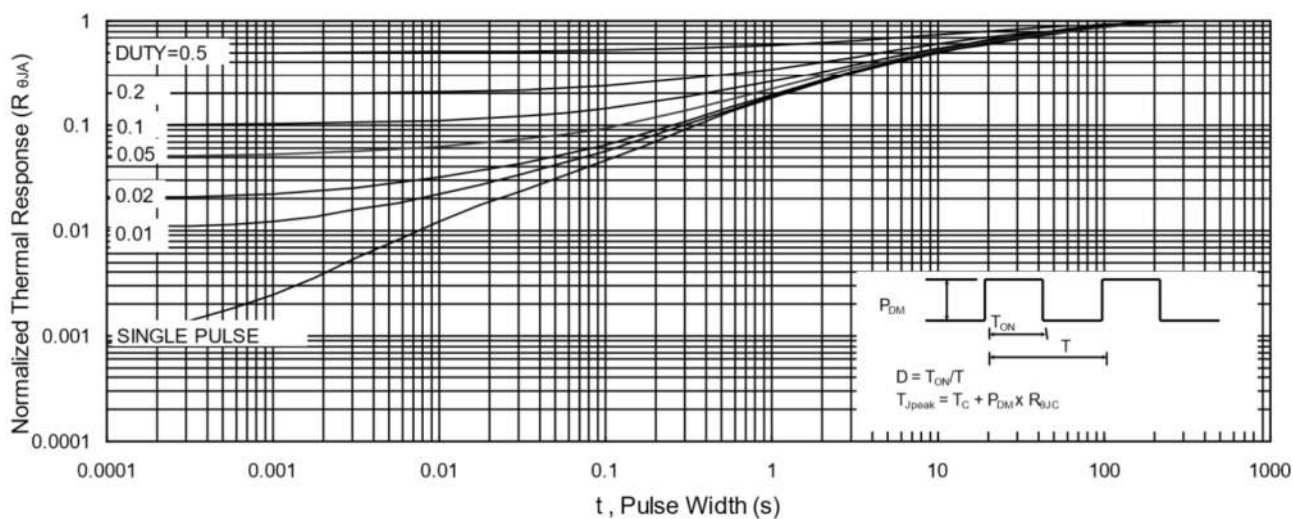


Fig.9 Normalized Maximum Transient Thermal Impedance

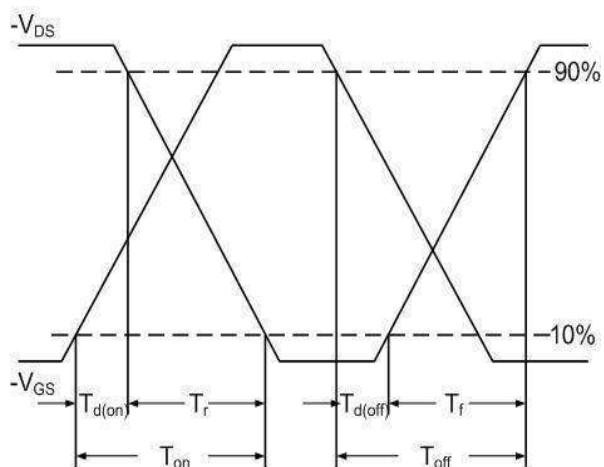


Fig.10 Switching Time Waveform

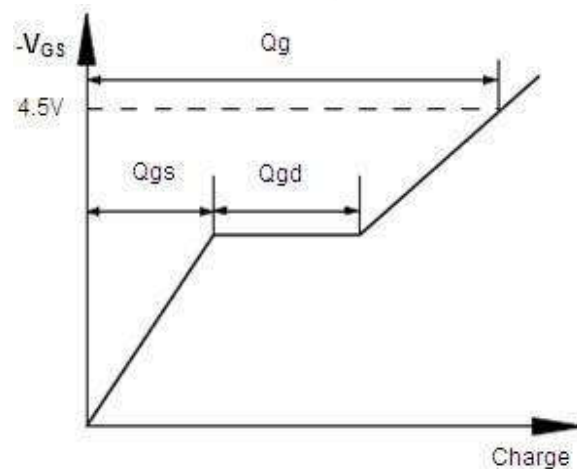


Fig.11 Gate Charge Waveform

Ordering information

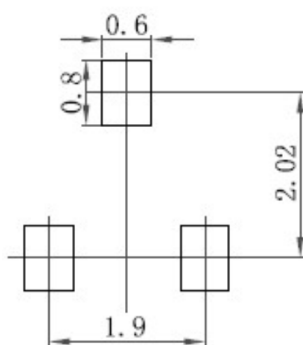
Package	Packing Description	Base Quantity	Packing Quantity
SOT23-3L	Tape/Reel, 7" reel	3000pcs/Reel	24000PCS/Box 120000PCS/Carton

Package Dimensions

SOT23-3L

Dim.	Millimeter (mm)		mil	
	Min.	Max.	Min.	Max.
A	1.05	1.25	41	49.2
A1	0.10		3.93	
A2	1.05	1.15	41	45
b	0.30	0.50	12	20
c	0.10	0.20	3.93	7.9
D	2.82	3.02	111	119
E	1.50	1.70	59	67
E1	2.65	2.95	104	116
e	0.95		37.4	
e1	1.80	2.00	71	78
L	0.30	0.066	12	26
Θ	8°			

The recommended mounting pad size



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