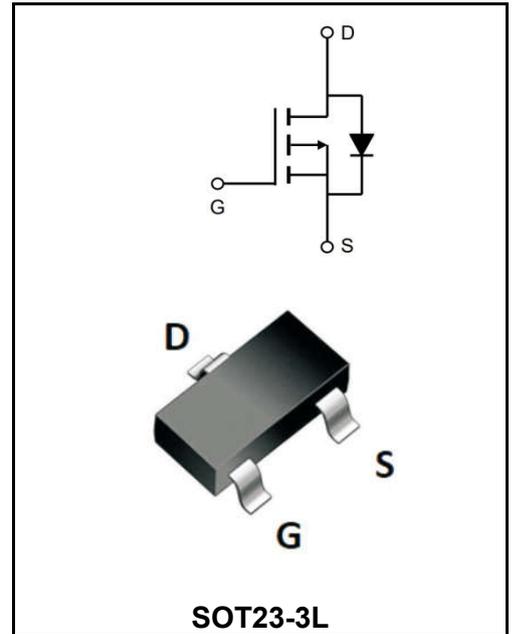


-30V P-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	-12A
V_{DSS}	-30V
R_{DS(on)-typ(@V_{GS}= -10V)}	< 32mΩ (Typ: 25mΩ)



Application

- ◆ Boost driver
- ◆ Brushless motor
- ◆ Molded Plastic: UL Flammability Classification Rating 94V-0

Marking Code	
YFW3409MI	3409M

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V _{DS}	-30	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current, V _{GS} @ -4.5 V ¹	I _{D@T_C=25°C}	-12	A
Continuous Drain Current, V _{GS} @ -4.5V ¹	I _{D@T_C=70°C}	-7.5	A
Pulsed Drain Current ²	I _{DM}	-36	A
Total Power Dissipation ³	P _{D@T_C=25°C}	1.8	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 _{θJA}	125	°C/W
Thermal Resistance Junction-Case ¹	R _{θJC}	110	°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}	-30	-33	-	V
Static Drain-Source On-Resistance ²	$V_{GS}=-10V, I_D=-7A$	R_{DS(ON)}	-	25	32	mΩ
	$V_{GS}=-4.5V, I_D=-5A$		-	37	54	
Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250 \mu A$	V_{GS(th)}	-1.0	-1.5	-2.5	V
Drain-Source Leakage Current	$V_{DS}=-24V, V_{GS}=0V, T_J=25^\circ C$	I_{DSS}	-	-	-1	uA
	$V_{DS}=-24V, V_{GS}=0V, T_J=55^\circ C$		-	-	-5	
Gate-Source Leakage Current	$V_{GS} = \pm 20V, V_{DS} = 0V$	I_{GSS}	-	-	±100	nA
Forward Transconductance	$V_{DS}=-5V, I_D=-7A$	G_{fs}	-	15	-	S
Gate Resistance	$V_{DS}=0V, V_{GS}=0V, f=1MHz$	R_G	-	15	30	Ω
Total Gate Charge (-4.5V)	$V_{DS}=-20V, V_{GS}=-4.5V, I_D=-7A$	Q_g	-	9.8	-	nC
Gate-Source Charge		Q_{gs}	-	2.2	-	
Gate-Drain Charge		Q_{gd}	-	3.4	-	
Turn-on delay time	$V_{DD}=-15V, V_{GS}=-10V, R_G=3.3\Omega, I_D=-5A$	T_{d(on)}	-	16.4	-	nS
Rise Time		T_r	-	20.2	-	nS
Turn-Off Delay Time		td(OFF)	-	55	-	nS
Fall Time		T_f	-	10	-	nS
Input Capacitance	$V_{DS}=-15V, V_{GS}=0V, f=1MHz$	C_{iss}	-	930	-	pF
Output Capacitance		C_{oss}	-	148	-	
Reverse Transfer Capacitance		C_{rss}	-	115	-	
Continuous Source Current ^{1,5}	$V_G=V_D=0V, \text{Force Current}$	I_S	-	-	-8	A
Diode Forward Voltage ²	$V_{GS}=0V, I_S=-1A, T_J=25^\circ C$	V_{SD}	-	-	-1.2	V

Note :

- 1、 The data tested by surface mounted on a 1 inch² 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

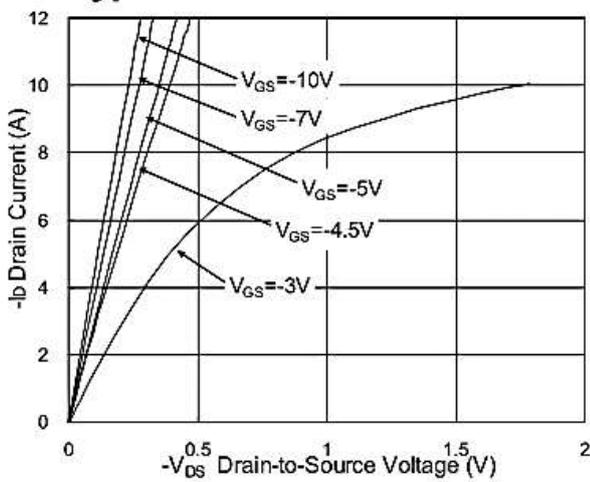


Fig.1 Typical Output Characteristics

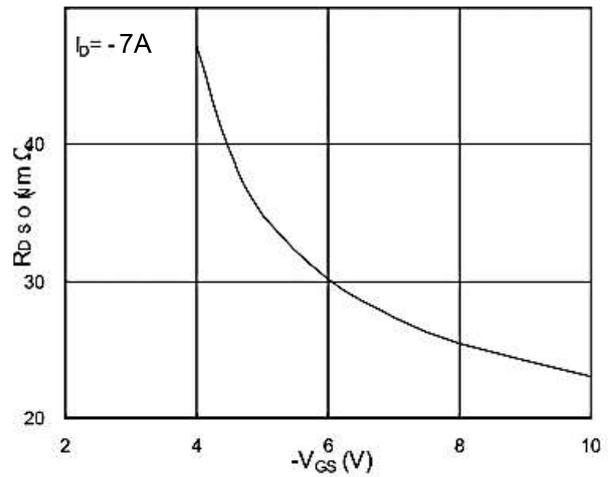


Fig.2 On-Resistance v.s Gate-Source

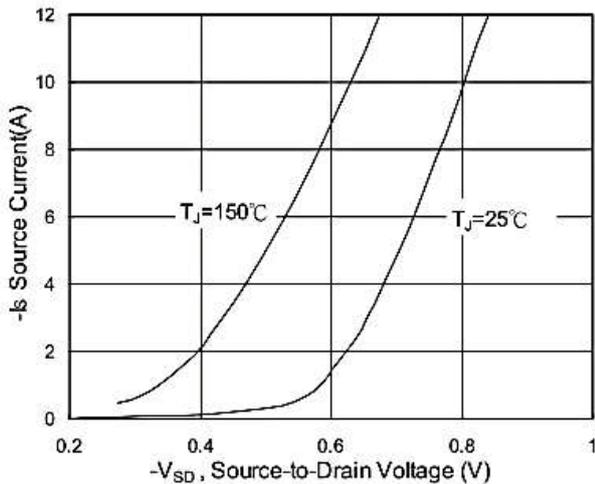


Fig.3 Forward Characteristics Of Reverse

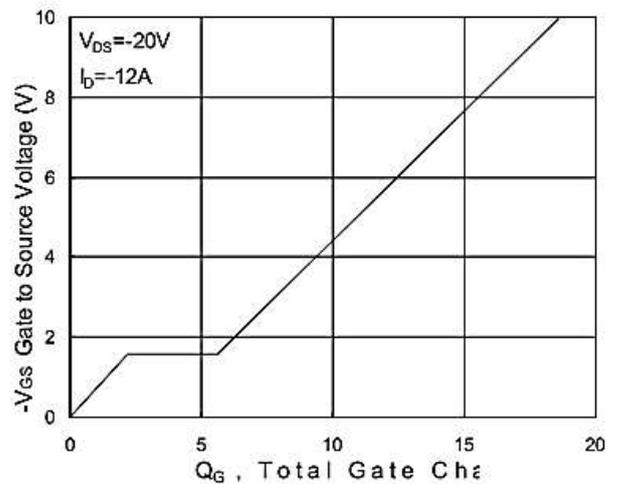


Fig.4 Gate-Charge Characteristics

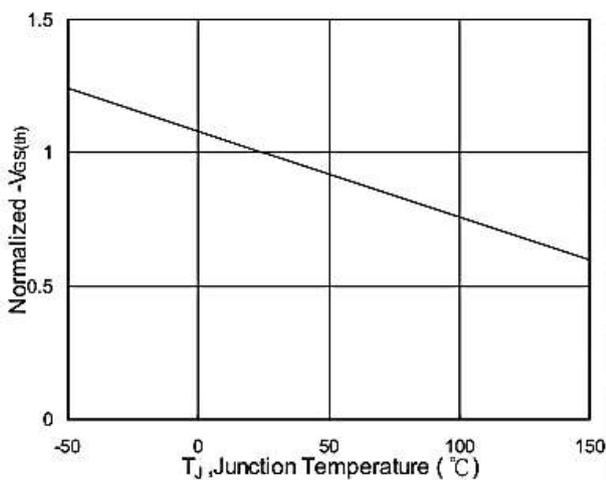


Fig.5 Normalized $V_{GS(th)}$ v.s T_J

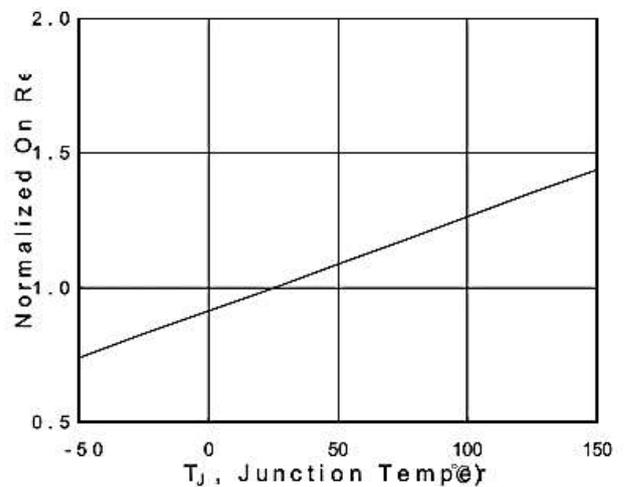


Fig.6 Normalized $R_{DS(on)}$ v.s T_J

Ratings and Characteristic Curves

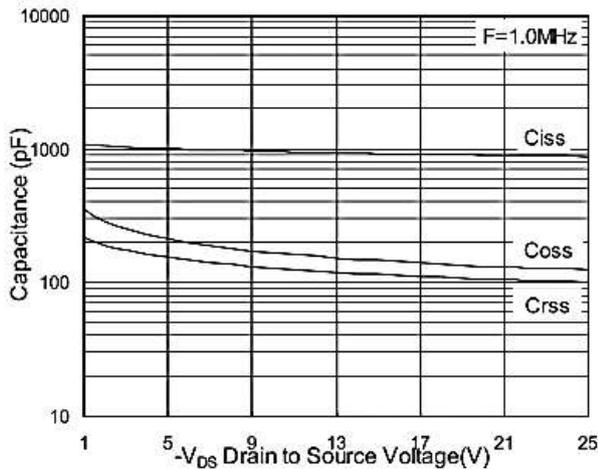


Fig.7 Capacitance

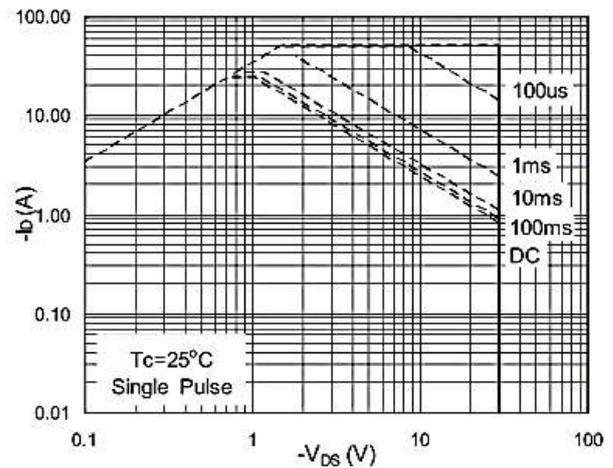


Fig.8 Safe Operating Area

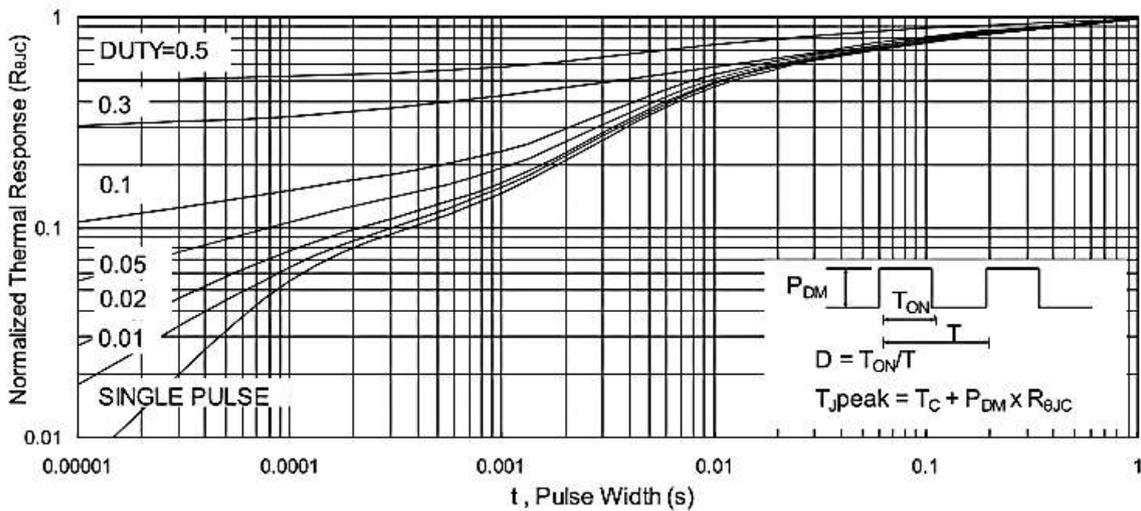


Fig.9 Normalized Maximum Transient Thermal Impedance

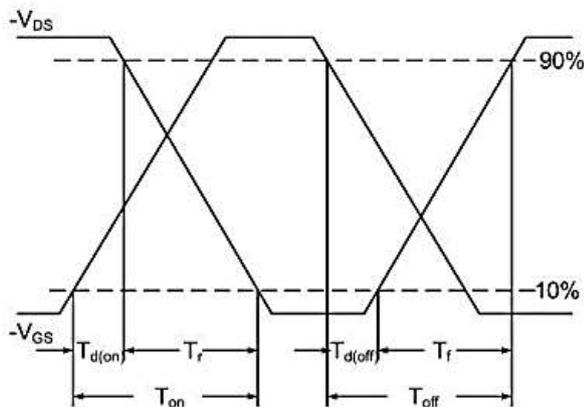


Fig.10 Switching Time Waveform

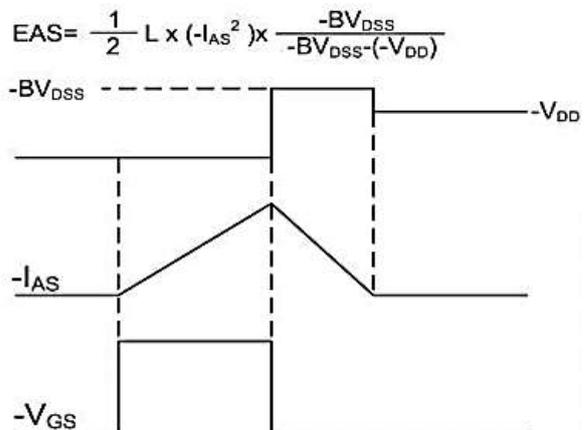


Fig.11 Unclamped Inductive Waveform

Ordering information

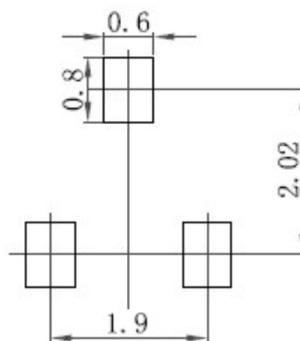
Package	Packing Description	Base Quantity	Packing Quantity
SOT23-3L	Tape/Reel, 7" reel	3000pcs/Reel	24000PCS/Box 120000PCS/Carton

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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