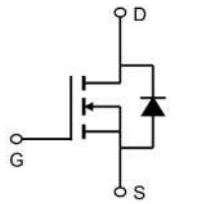
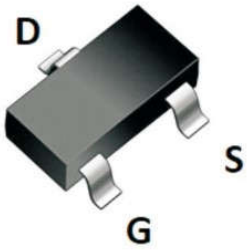
200V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	3.8A
V_{DS}	200V
R_{DSON}-typ(@V_{GS}=10V)	< 580mΩ(Typ:450 mΩ)





SOT23-3L

Marking Code	
YFW4N20MI	4N20

Application

- Automative lighting
- Load switch
- Uninterruptible power supply

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	200	V
Gate - Source Voltage	V_{GS}	±20	V
Drain Current, V_{GS} @ 10V @T_C=25℃	I_D	3.8	A
Drain Current, V_{GS} @ 10V @T_C=100℃	I_D	1.85	A
Pulsed Drain Current[1]	I_{DM}	10	A
Total Power Dissipation @T_C=25℃	P_D	2	W
Total Power Dissipation[3] @T_A=25℃	P_D	1.1	W
Storage Temperature Range	T_{STG}	-55 to +150	°C
Operating Junction Temperature Range	T_J	-55 to +150	°C
Maximum Thermal Resistance, Junction ambient	$R_{\theta JA}$	85	°C/W
Maximum Thermal Resistance, Junction-case	$R_{\theta JA}$	3.9	°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=250uA	BV_{DSS}	200	230	-	V
Static Drain-Source On-Resistance[2]	V_{GS}=10V, I_D=1A	$R_{DS(ON)}$	-	450	580	mΩ
	V_{GS}=4.5V, I_D=1A		-	680	850	
Gate Threshold Voltage	V_{DS}= V_{GS}, I_D=250μA	$V_{GS(th)}$	1.2	2	2.5	V
Drain-Source Leakage Current	V_{DS}=200V , V_{GS}=0V , T_J=25℃	I_{DSS}	-	-	1	μA
Gate- Source Leakage Current	V_{GS}=±20V, V_{DS}=0V	I_{GSS}	-	-	±100	nA
Forward Transconductance	V_{DS}=10V , I_D =1V	g_{fs}	-	10	-	S
Total Gate Charge(10V)	V_{DS}=160V V_{GS}=10V I_D=1A	Q_g	-	15	-	nC
Gate-Source Charge		Q_{gs}	-	3.0	-	
Gate-Drain Charge		Q_{gd}	-	5.2	-	
Turn-on delay time	V_{DD}=100V V_{GS}=10V R_G=3 I_D=1A	$t_{d(on)}$	-	22	-	ns
Rise Time		T_r	-	34	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	45	-	
Fall Time		t_f	-	11	-	
Input Capacitance	V_{DS}=25V V_{GS}=0V f=1MHz	C_{iss}	-	900	-	pF
Output Capacitance		C_{oss}	-	130	-	
Reverse Transfer Capacitance		C_{rss}	-	4.6	-	
Continuous Source Current[1,6]	V_G=V_D=0V , Force Current	I_S	-	-	1	A
Diode Forward Voltage [2]	V_{GS}=0V , I_S=1A , T_J=25℃	V_{SD}	-	-	1	V
Reverse Recovery Time	I_F=1A, dI/dt=100A/μs, T_J=25℃	t_{rr}	-	85	-	ns
Reverse Recovery Charge		Q_{rr}	-	257	-	nC

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 ≦ 300us , duty cycle ≦ 2%
3、The power dissipation is limited by 150℃ 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

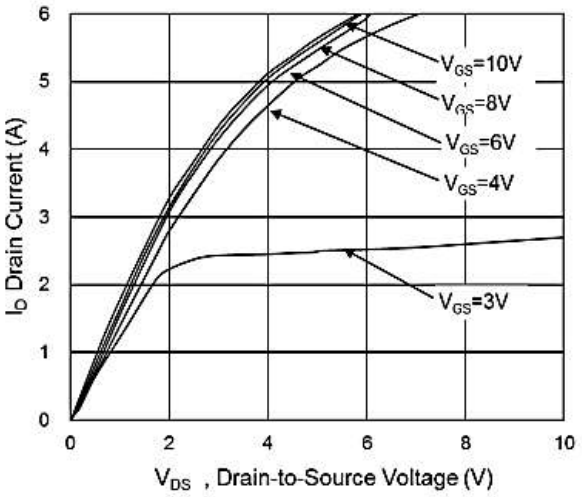


Fig.1 Typical Output Characteristics

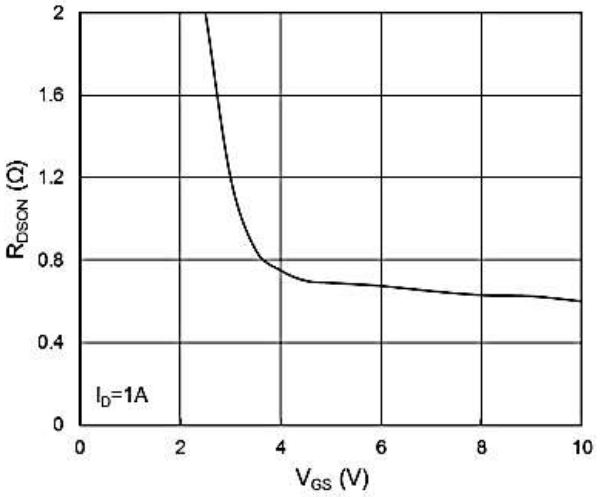


Fig.2 On-Resistance vs. G-S Voltage

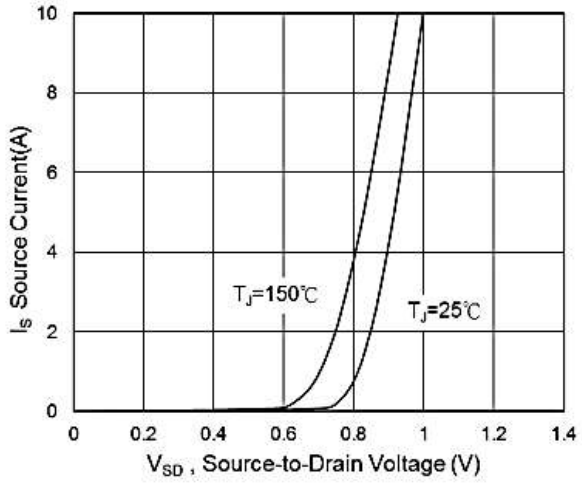


Fig.3 Forward Characteristics of Reverse

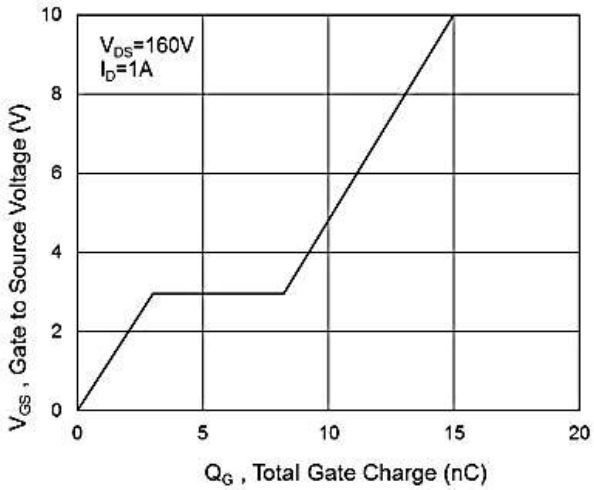


Fig.4 Gate-Charge Characteristics

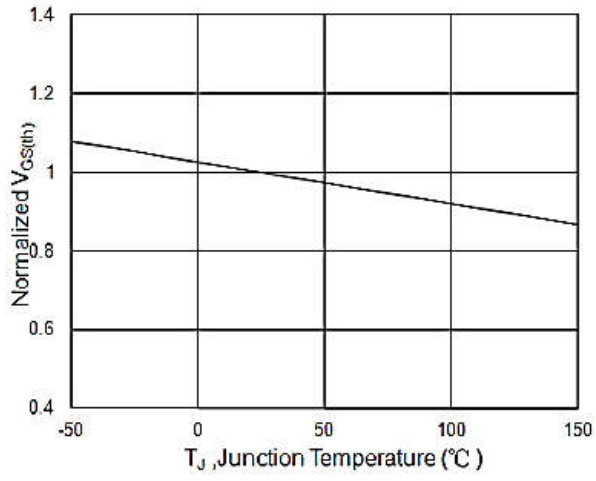


Fig.5 $V_{GS(th)}$ vs. T_J

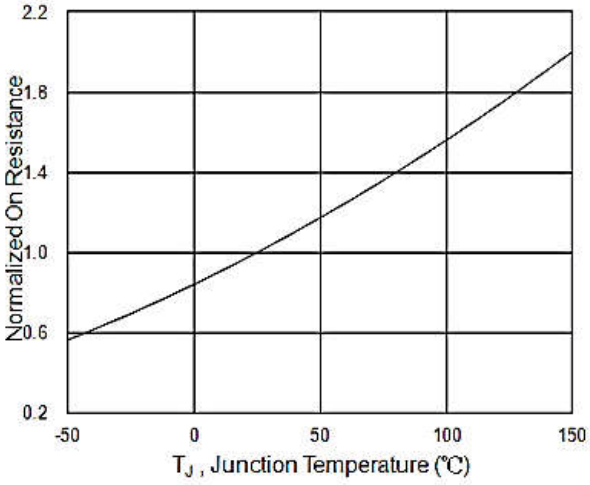


Fig.6 Normalized R_{DSON} vs. T_J

Ratings and Characteristic Curves

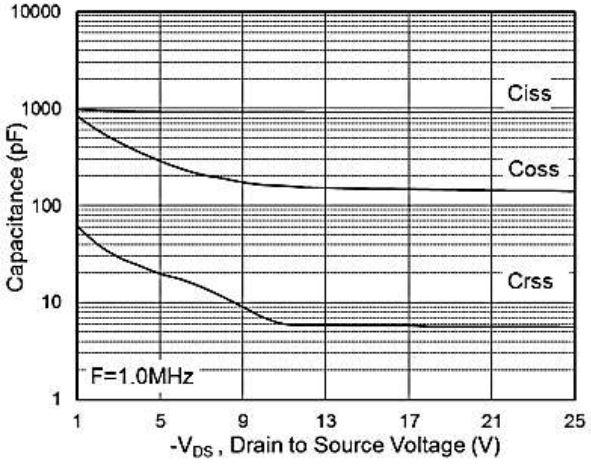


Fig.7 Capacitance

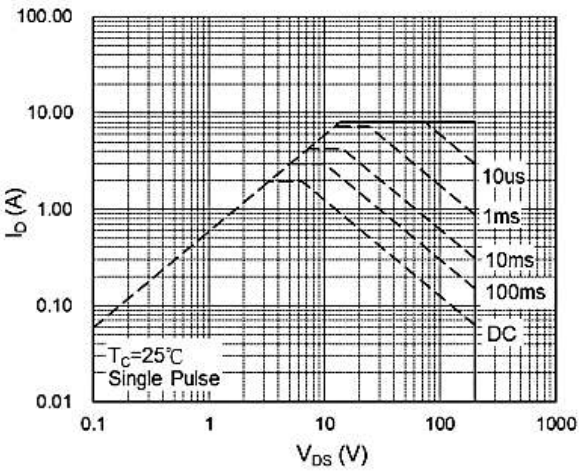


Fig.8 Safe Operating Area

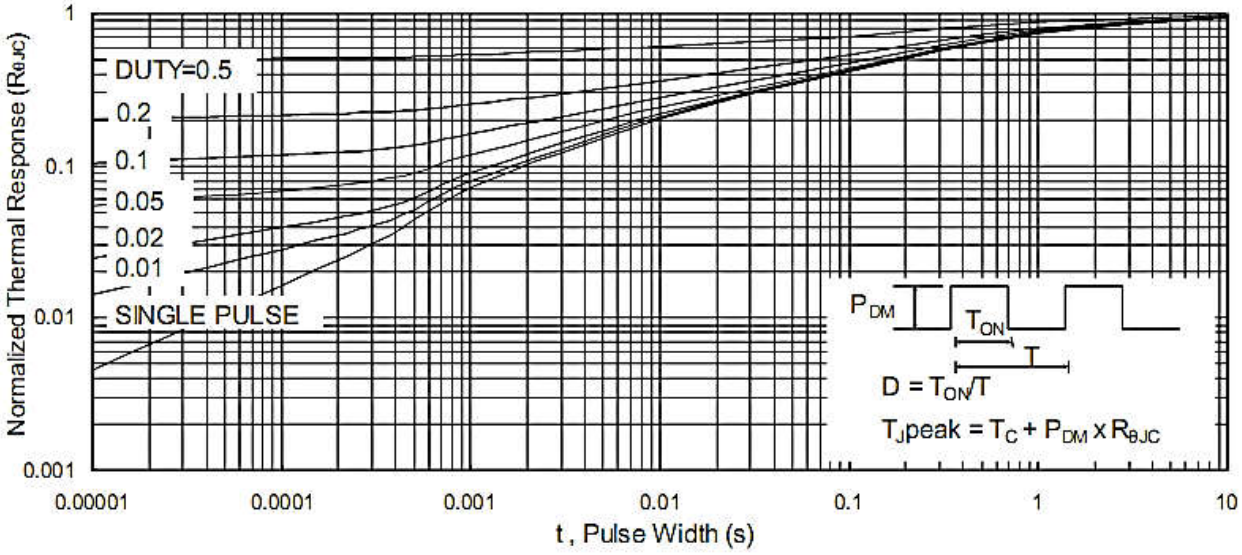


Fig.9 Normalized Maximum Transient Thermal Impedance

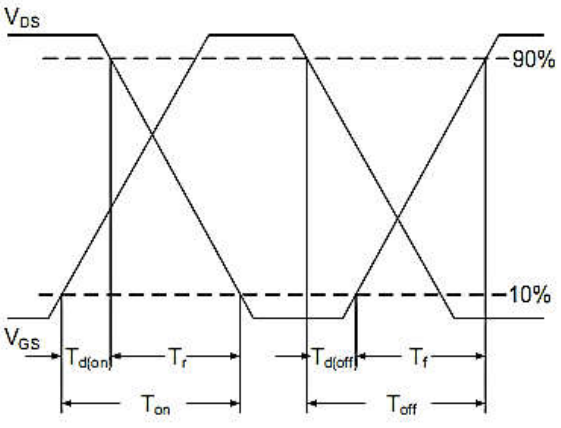


Fig.10 Switching Time Waveform

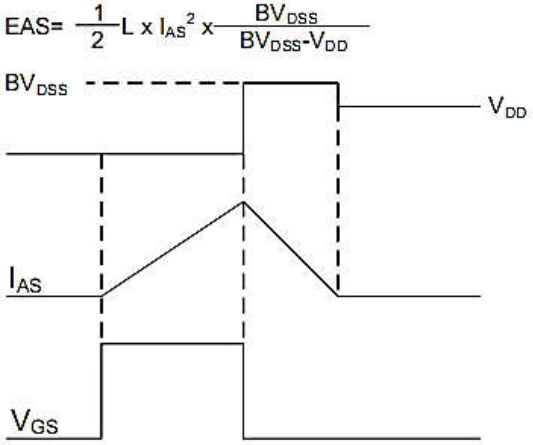


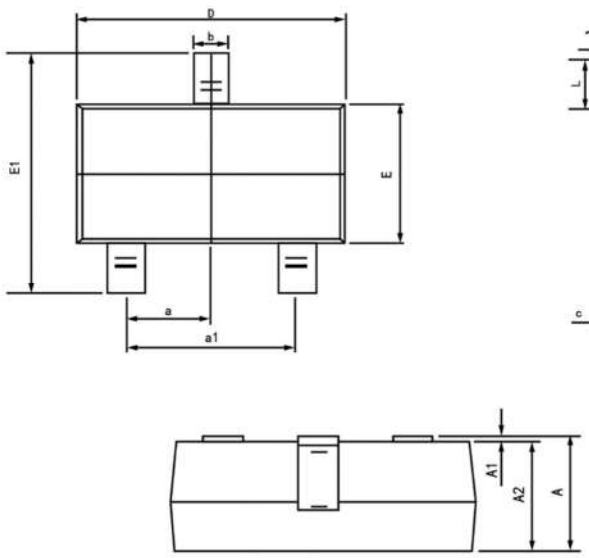
Fig.11 Unclamped Inductive Switching Waveform

Ordering information

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

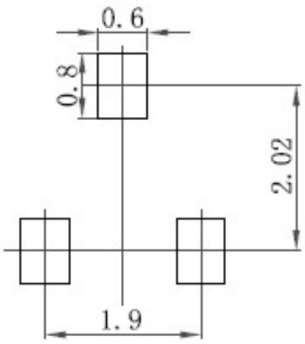
Package Dimensions

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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