

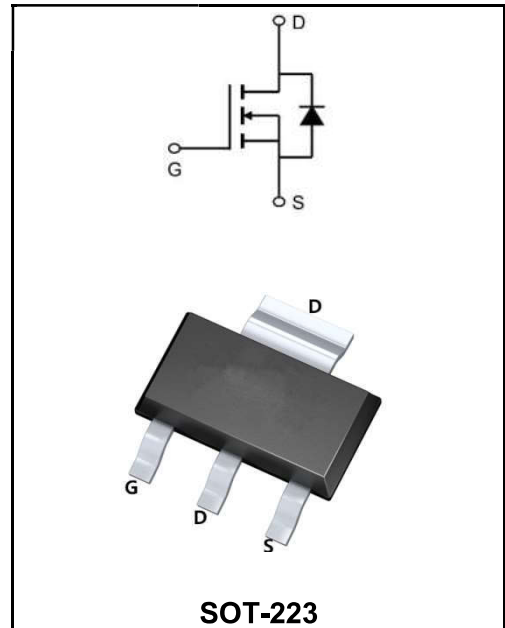
200V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	4.2A
V_{DSS}	200V
R_{DS(on)-typ(@V_{GS}=10V)}	< 580mΩ (Type:450 mΩ)

Application

- ◆Automotive lighting
- ◆Load switch
- ◆Uninterruptible power supply



Product Specification Classification

Part Number	Package	Marking	Pack
YFW4N20MSI	SOT-223	YFW 4N20MSI XXXXX	3000PCS/Tape

Maximum Ratings at T_c=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°C	I_D	4.2	A
Drain Current, V _{GS} @ 10V @T _C =100°C	I_D	2.8	A
Pulsed Drain Current ¹	I_{DM}	10	A
Total Power Dissipation @T _C =25°C	P_D	2	W
Total Power Dissipation ³ @T _A =25°C	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_{θJA}	85	°C/W
Maximum Thermal Resistance, Junction-case	R_{θJA}	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	$V_{GS}=0V, I_D=250\mu A$	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	$V_{DS}=V_{GS}, I_D=250\mu A$	$V_{GS(th)}$	1.2	2	2.5	V
Drain-Source Leakage Current	$V_{DS}=200V, V_{GS}=0V, T_J=25^\circ C$	I_{DSS}	-	-	1	μA
Gate- Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	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}	$V_G=V_D=0V, \text{ Force Current}$	I_S	-	-	1	A
Diode Forward Voltage ²	$V_{GS}=0V, I_S=1A, T_J=25^\circ C$	V_{SD}	-	-	1	V
Reverse Recovery Time	$I_F=1A, dI/dt=100A/\mu s, T_J=25^\circ C$	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 $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3、 The power dissipation is limited by 150°C junction temperature
- 4、 The data is theoretically the same as I D and I DM , in real applications , should be limited by total power dissipation.

Ratings and Characteristic Curves

Typical Characteristics

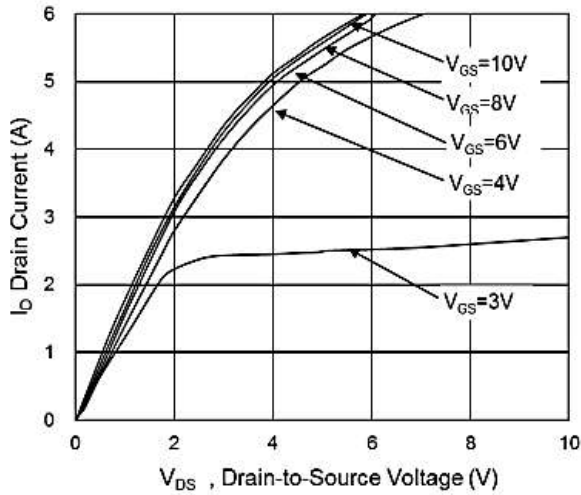


Fig.1 Typical Output Characteristics

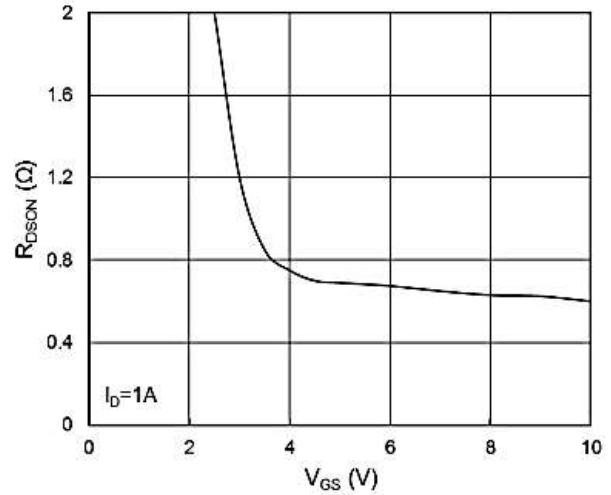


Fig.2 On-Resistance vs. G-S Voltage

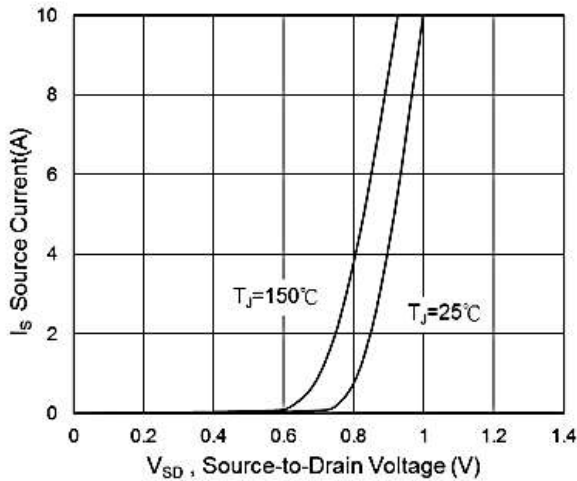


Fig.3 Forward Characteristics of Reverse

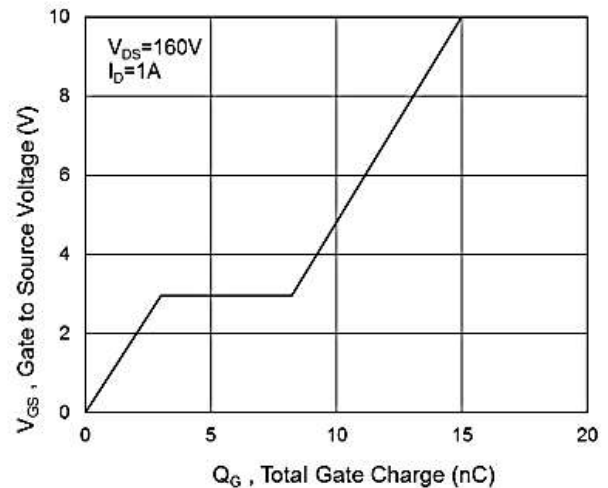


Fig.4 Gate-Charge Characteristics

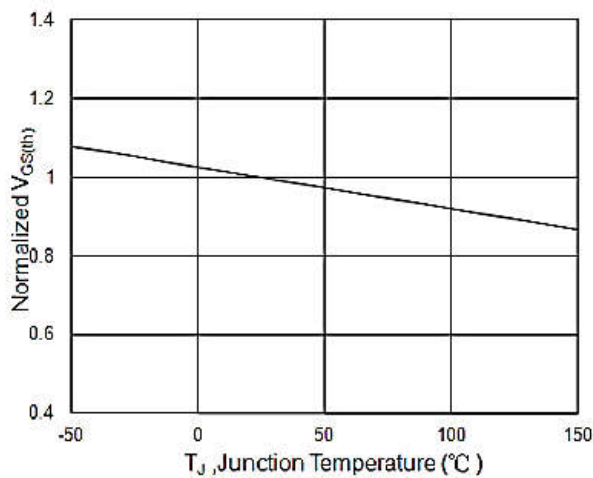


Fig.5 V_{GS(th)} vs. T_J

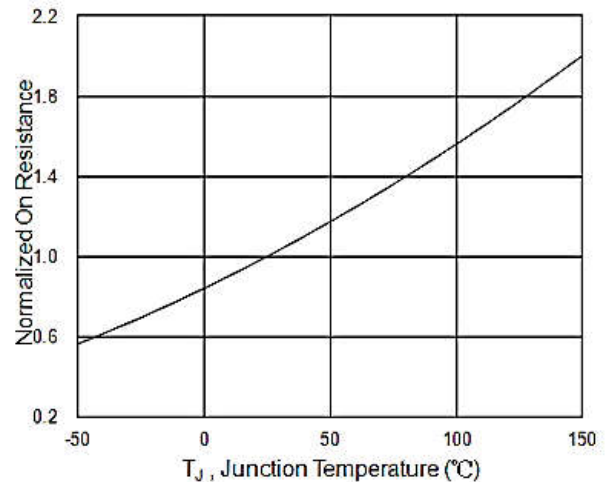


Fig.6 Normalized R_{DS(on)} vs. T_J

Ratings and Characteristic Curves

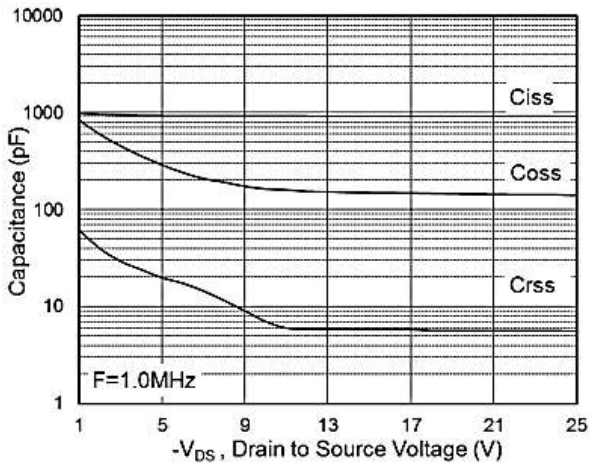


Fig.7 Capacitance

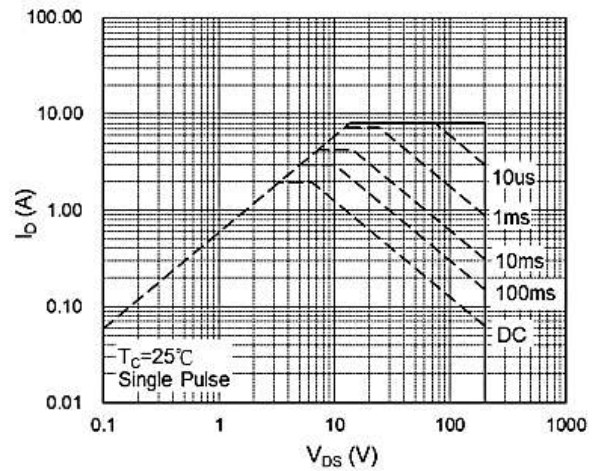


Fig.8 Safe Operating Area

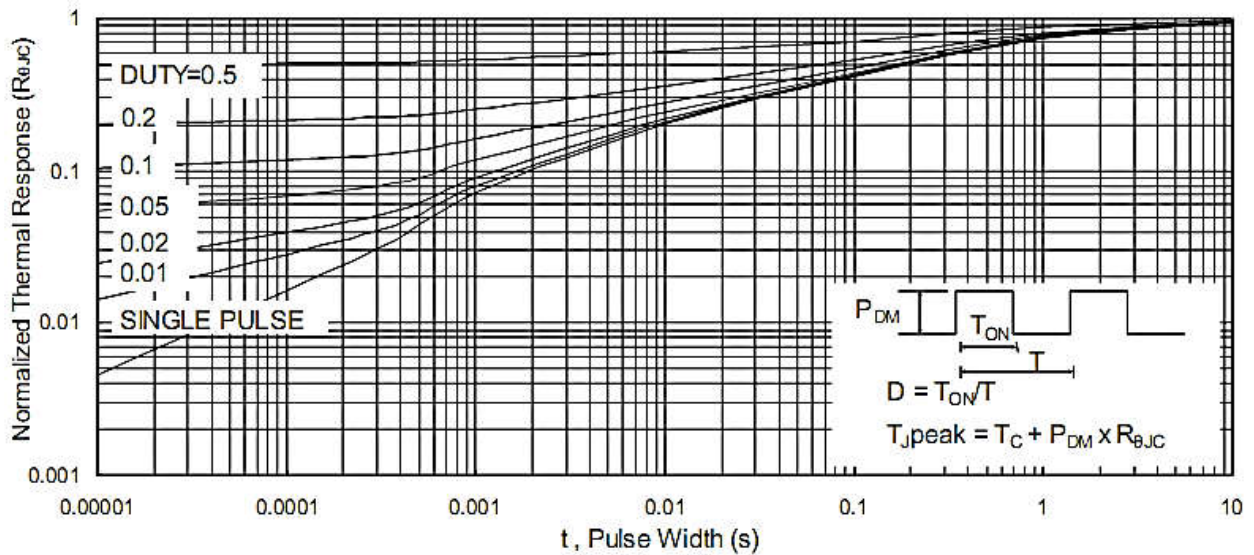


Fig.9 Normalized Maximum Transient Thermal Impedance

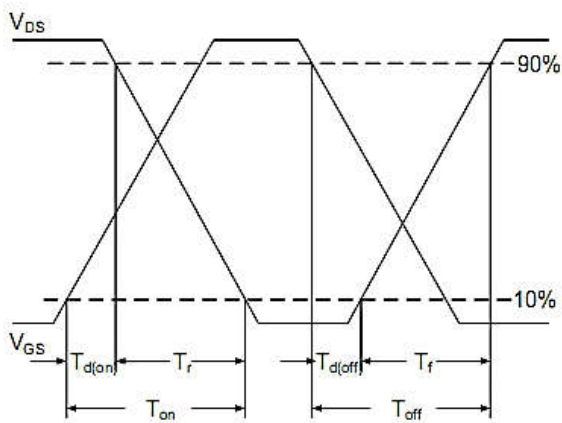


Fig.10 Switching Time Waveform

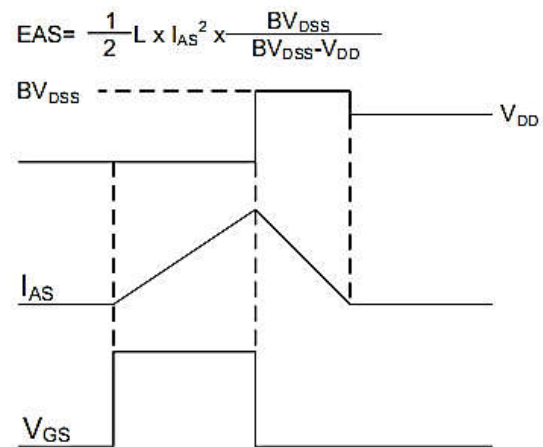
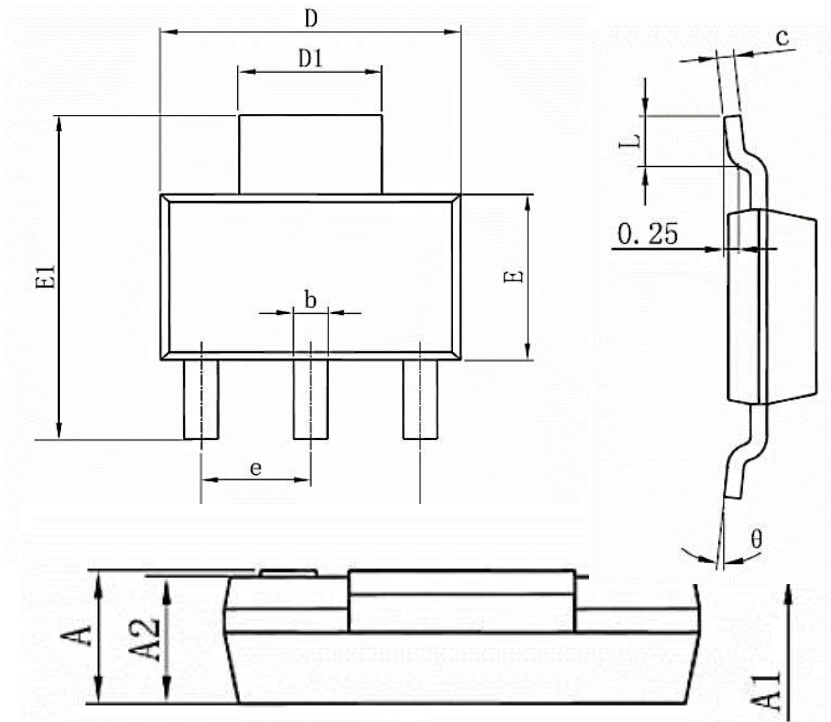


Fig.11 Unclamped Inductive Switching Waveform

SOT23-3L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.52	1.8	0.06	0.049
A1	0.000	0.100	0.000	0.004
A2	1.5	1.7	0.059	0.045
b	0.66	0.82	0.026	0.032
c	0.25	0.35	0.010	0.014
D	6.2	6.4	0.244	0.252
D1	2.9	3.1	0.114	0.122
E	3.3	3.7	0.130	0.146
E1	6.83	7.07	0.269	0.278
e	2.300(BSC)		0.037(BSC)	
e1	4.500	4.700	0.177	0.185
L	0.900	1.15	0.035	0.045
θ	0°	10°	0°	10°