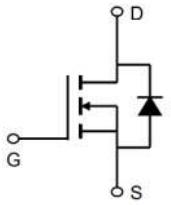
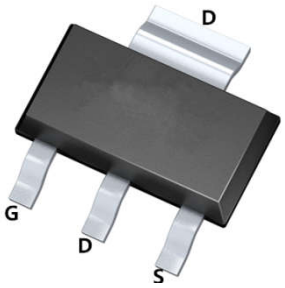
40V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	10A
V_{DSS}	40V
R_{DSON}-typ(@V_{GS}=10V)	< 20mΩ(Type:15mΩ)





SOT-223

Pb lead-free ROHS

Application

- Automative lighting
- Load switch
- Uninterruptible power supply

Product Specification Classification

Part Number	Package	Marking	Pack
YFW10N04MSI	SOT-223	YFW 10N04MSI XXXXX	3000PCS/Tape

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	40	V
Gate - Source Voltage	V_{GS}	±20	V
Continuous Drain Current [1] @T_A=25℃	I_D	10	A
Continuous Drain Current [1] @T_A=70℃	I_D	6.7	A
Pulsed Drain Current [2]	I_{DM}	50	A
Single Pulse Avalanche Energy [3]	E_{AS}	31	mJ
Avalanche Current	I_{AS}	25	A
Total Power Dissipation [4] @T_A=25℃	P_D	1.9	W
Storage Temperature Range	T_{STG}	-55 to +150	°C
Operating Junction Temperature Range	T_J	-55 to +150	°C
Thermal Resistance, Junction-to-Ambient [1]	$R_{\theta JA}$	65	°C/W

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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}	40	44	-	V
BVDSS Temperature Coefficient	Reference to 25℃ , I_D=1mA	$\Delta BV_{DSS/\Delta TJ}$	-	0.032	-	V/°C
Static Drain-Source On-Resistance[2]	V_{GS}=10V, I_D=7A	$R_{DS(ON)}$	-	15	20	mΩ
	V_{GS}=4.5V, I_D=6A		-	18	25	
Gate -Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	$V_{GS(th)}$	1.0	-	2.5	V
VGS(th) Temperature Coefficient		$\Delta V_{GS(th)}$	-	-4.8	-	mV/°C
Drain -Source Leakage Current	V_{DS}=32V , V_{GS}=0V , T_J=25℃	I_{DSS}	-	-	1	μA
	V_{DS}=32V , V_{GS}=0V , T_J=55℃		-	-	5	
Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0V	I_{GSS}	-	-	±100	nA
Forward Transconductance	V_{DS}=5V, I_D=7A	g_{FS}	-	32	-	S
Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	R_g	-	2.1	-	Ω
Total Gate Charge(4.5V)	V_{DS}=32V V_{GS}=4.5V I_D=7A	Q_g	-	9.8	-	nC
Gate-Source Charge		Q_{gs}	-	2.8	-	
Gate-Drain Charge		Q_{gd}	-	3.9	-	
Turn-on delay time	V_{DD}=20V V_{GS}=10V R_G=3.3Ω I_D=7A	$t_{d(on)}$	-	2.8	-	ns
Rise Time		T_r	-	40.4	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	22.8	-	
Fall Time		t_f	-	6.4	-	
Input Capacitance	V_{DS}=15V V_{GS}=0V f=1.0MHz	C_{iss}	-	1013	-	pF
Output Capacitance		C_{oss}	-	107	-	
Reverse Transfer Capacitance		C_{rss}	-	76	-	
Continuous Source Current[1,5]	V_G=V_D=0V , Force Current	I_S	-	-	8.4	A
Pulsed Source Current[2,5]	V_{GS}=0V , I_S=1A , T_J=25℃	I_{SM}	-	-	50	A
Diode Forward Voltage [2]		V_{SD}	-	-	1	V
Reverse Recovery Time	I_F=7A , dI/dt=100A/μs , T_J=25℃	t_{rr}	-	10	-	ns
Reverse Recovery Charge		Q_{rr}	-	3.3	-	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

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Ratings and Characteristic Curves

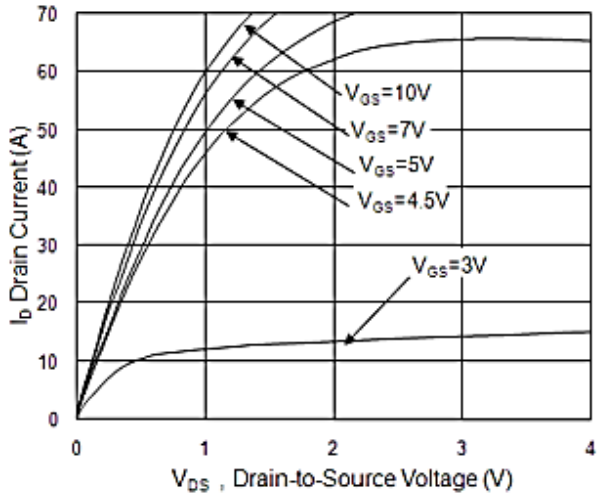


Fig.1 Typical Output Characteristics

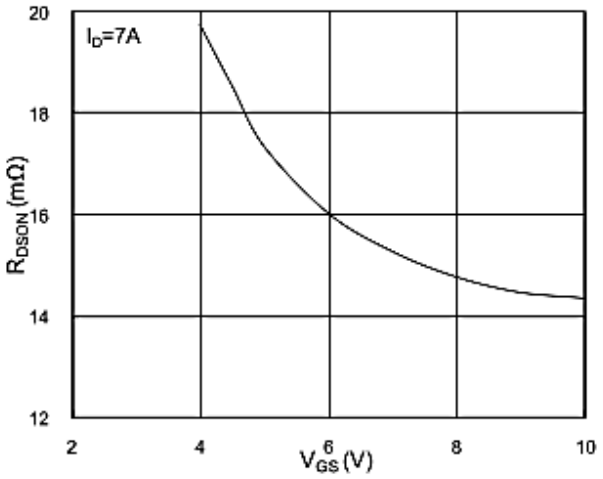


Fig.2 On-Resistance vs. G-S Voltage

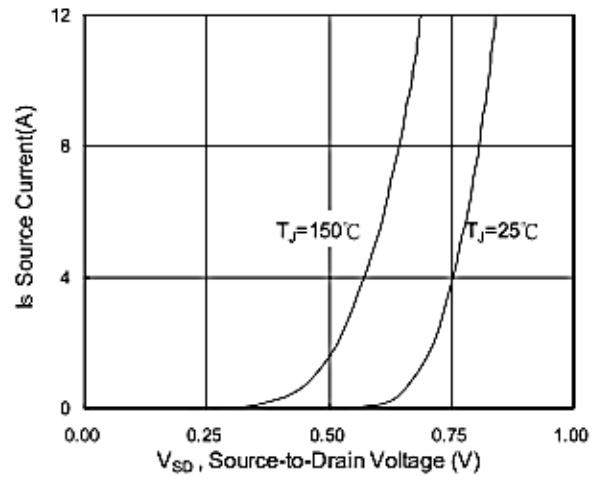


Fig.3 Forward Characteristics of Reverse

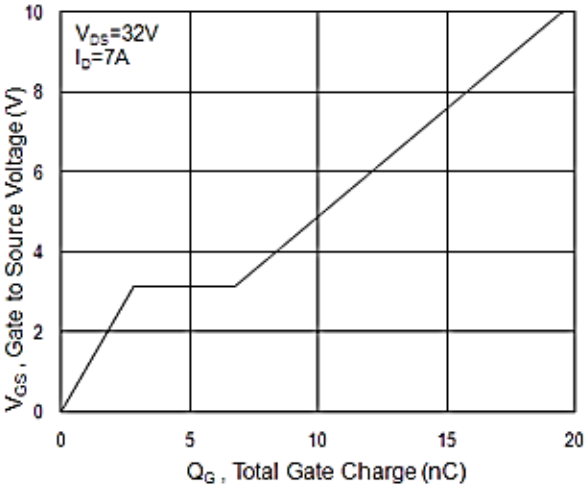


Fig.4 Gate-Charge Characteristics

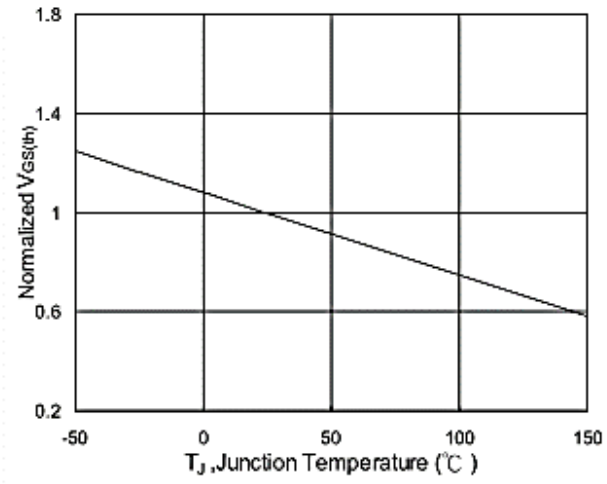


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

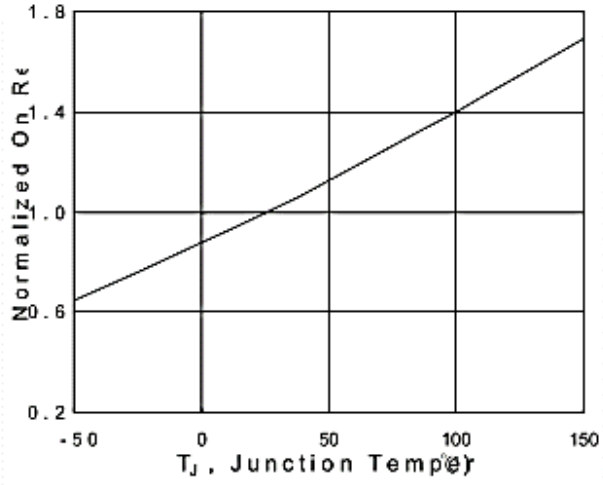


Fig.6 Normalized R_{DSON} vs. T_J

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Ratings and Characteristic Curves

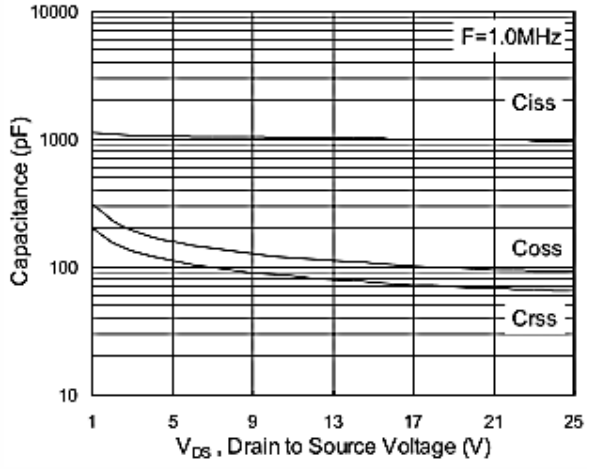


Fig.7 Capacitance

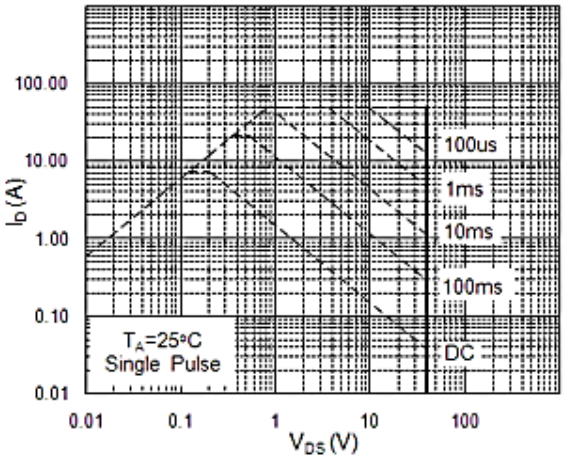


Fig.8 Safe Operating Area

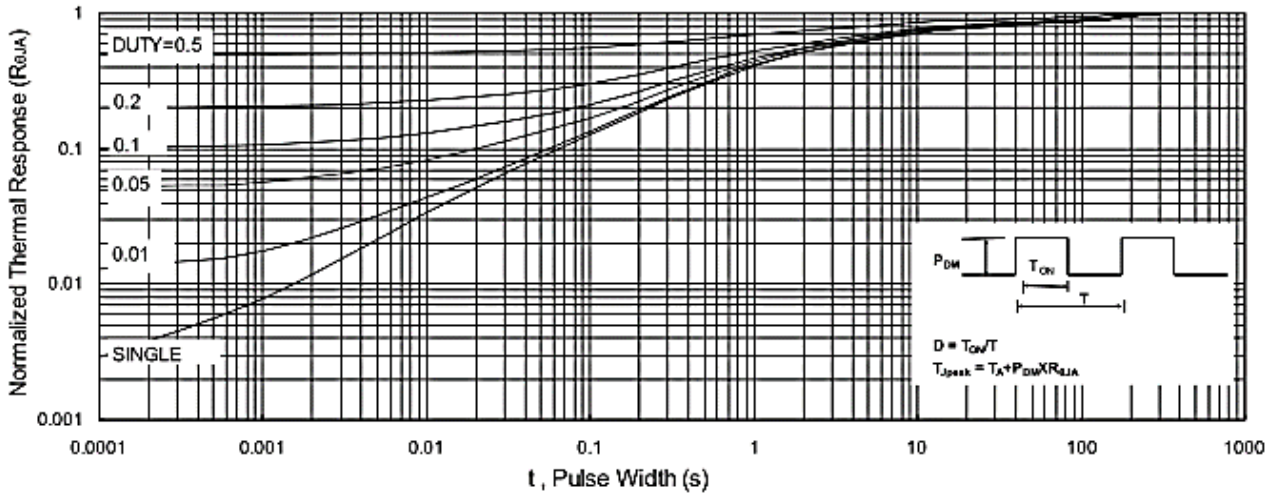


Fig.9 Normalized Maximum Transient Thermal Impedance

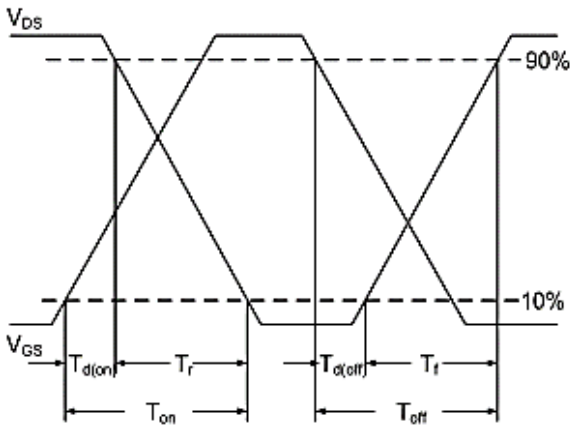


Fig.10 Switching Time Waveform

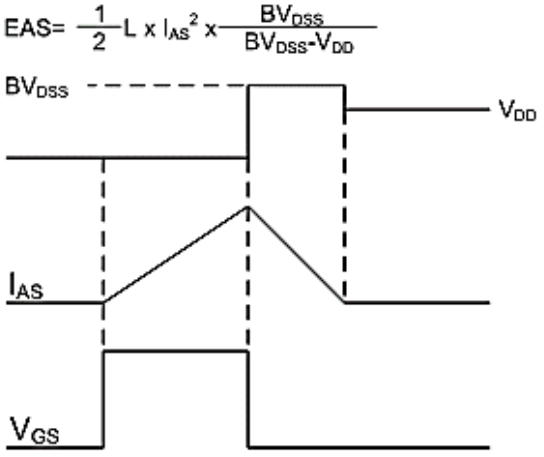
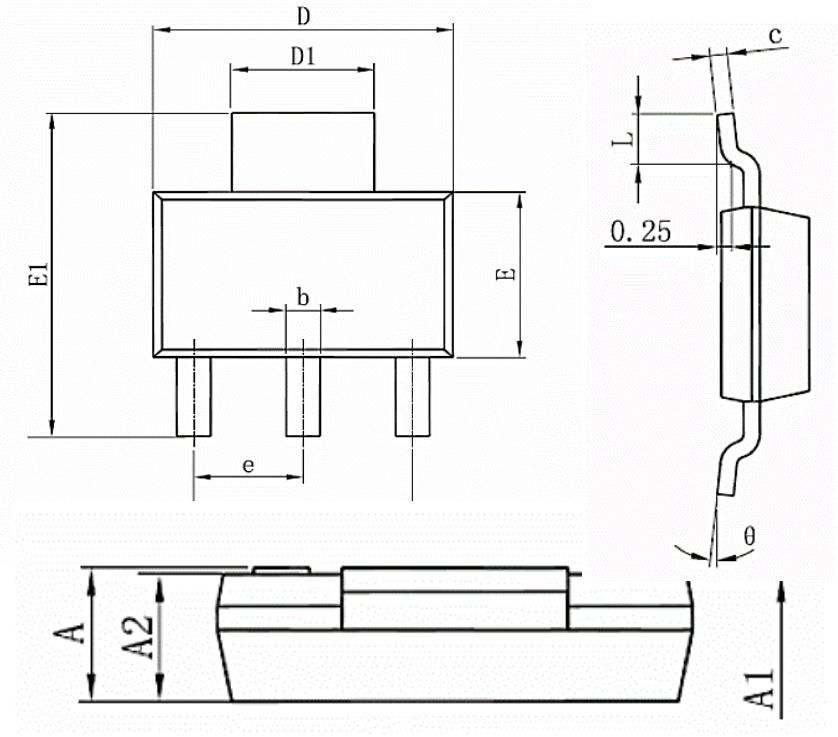


Fig.11 Unclamped Inductive Switching Waveform

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Package Outline Dimensions Millimeters

SOT-223



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°

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