

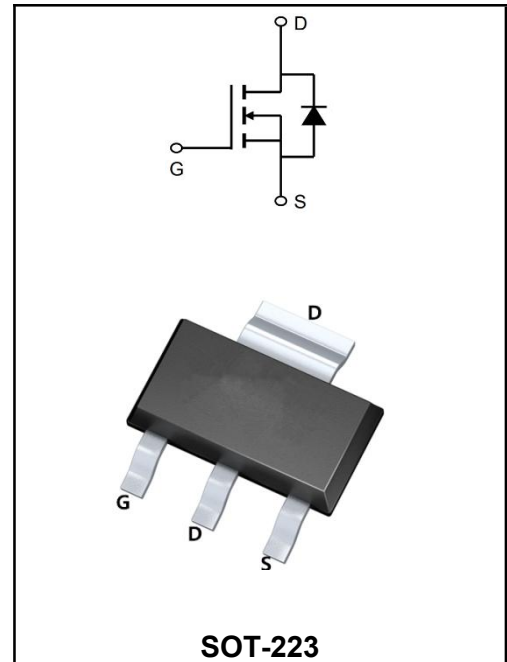
60V N-Channel Enhancement Mode MOSFET

MAIN CHARACTERISTICS

I_D	10A
V_{DSS}	60V
$R_{DS(on)-typ}(@V_{GS}=10V)$	$<35m\Omega$ (Typ:26m Ω)

Application

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



Product Specification Classification

Part Number	Package	Marking	Pack
YFW10N06MSI	SOT-223	YFW10N06MSI XXXXX	3000PCS/Tape

Maximum Ratings at $T_c=25^\circ\text{C}$ unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	60	V
Gate - Source Voltage	V_{GS}	± 20	V
Continuous Drain Current, $V_{GS} @ 10V^1$ @ $T_c=25^\circ\text{C}$	I_D	10	A
Continuous Drain Current, $V_{GS} @ 10V^1$ @ $T_c=100^\circ\text{C}$	I_D	8	A
Pulsed Drain Current	I_{DM}	30	A
Single Pulse Avalanche Energy	E_{AS}	22	mJ
Power Dissipation @ $T_c=25^\circ\text{C}$	P_D	31.3	W
Operating Junction Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$
Thermal Resistance Junction-Ambient ¹	$R_{\theta JA}$	60	$^\circ\text{C/W}$
Thermal Resistance Junction-Case ¹	$R_{\theta JC}$	4	$^\circ\text{C/W}$

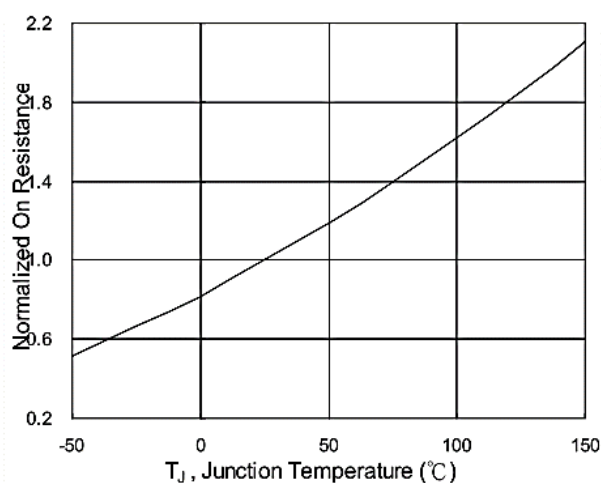
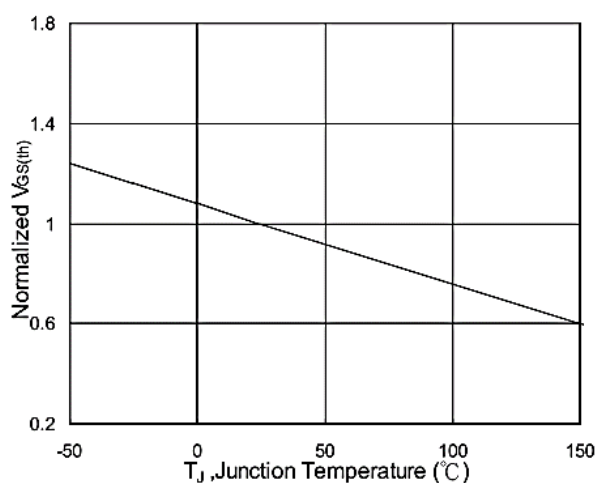
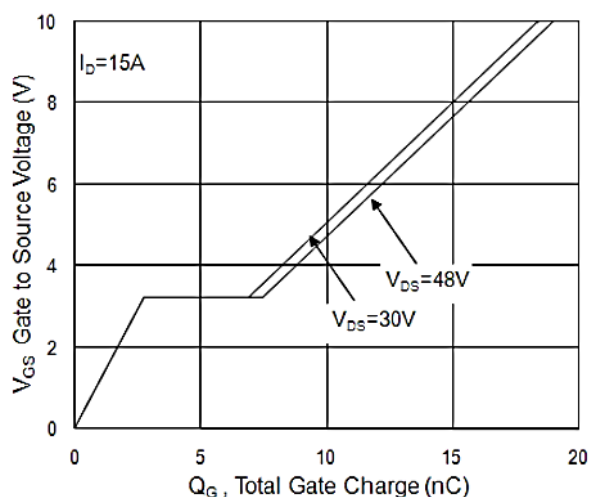
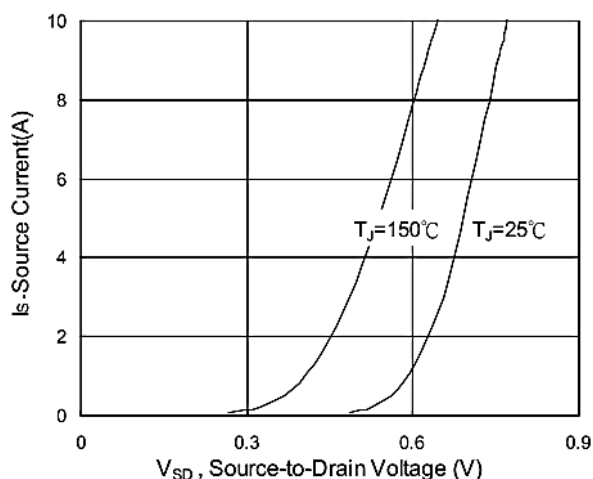
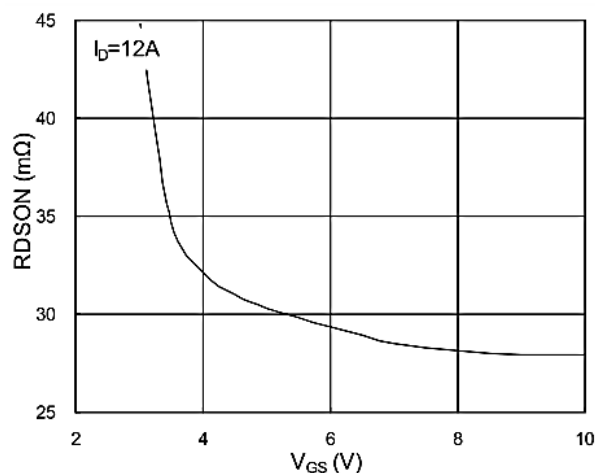
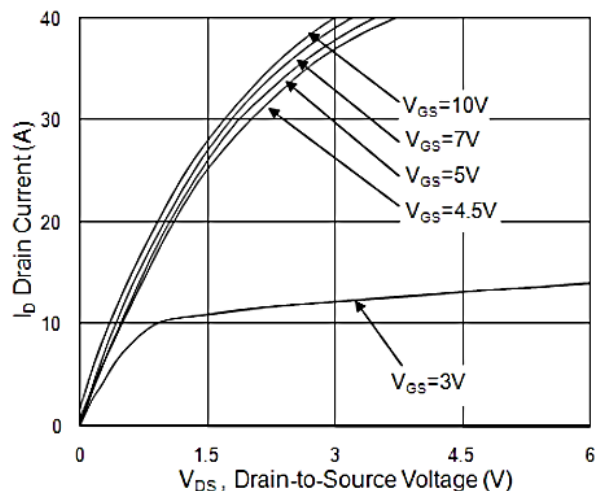
Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	BV_{DSS}	60	65	-	V
BVDSS Temperature Coefficient	Reference to 25°C, $I_D=1mA$	$\Delta BV_{DSS}/\Delta T_J$	-	0.044	-	V/°C
Static Drain-Source On-Resistance ²	$V_{GS}=10V, I_D=15A$	$R_{DS(ON)}$	-	26	35	mΩ
	$V_{GS}=4.5V, I_D=7A$		-	33	45	
Gate -Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	$V_{GS(th)}$	1.2	1.6	2.5	V
$V_{GS(th)}$ Temperature Coefficient		$\Delta V_{GS(th)}$	-	-4.8	-	mV/°C
Drain -Source Leakage Current	$V_{DS}=48V, V_{GS}=0V, T_J=25^\circ C$	I_{DSS}	-	-	1	μA
	$V_{DS}=48V, V_{GS}=0V, T_J=55^\circ C$		-	-	5	
Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	I_{GSS}	-	-	±100	nA
Forward Transconductance	$V_{DS}=5V, I_D=15A$	g_{FS}	-	25.3	-	S
Gate Resistance	$V_{DS}=0V, V_{GS}=0V, f=1MHz$	R_g	-	2.5	-	Ω
Total Gate Charge(10V)	$V_{DS}=48V$ $V_{GS}=10V$ $I_D=15A$	Q_g	-	19	-	nC
Gate-Source Charge		Q_{gs}	-	2.5	-	
Gate-Drain Charge		Q_{gd}	-	5	-	
Turn-on delay time	$V_{DD}=30V$ $V_{GS}=10V$ $R_G=3.3\Omega$ $I_D=15A$	$t_{d(on)}$	-	2.8	-	ns
Rise Time		T_r	-	16.6	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	21.2	-	
Fall Time		t_f	-	5.6	-	
Input Capacitance	$V_{DS}=15V$ $V_{GS}=0V$ $f=1.0MHz$	C_{iss}	-	1027	-	pF
Output Capacitance		C_{oss}	-	65	-	
Reverse Transfer Capacitance		C_{rss}	-	46	-	
Continuous Source Current ^{1,6}	$V_G=V_D=0V$, Force Current	I_S	-	-	20	A
Pulsed Source Current ^{2,6}		I_{SM}	-	-	40	A
Diode Forward Voltage ²	$V_{GS}=0V, I_S=1A, T_J=25^\circ C$	V_{SD}	-	-	1.2	V
Reverse Recovery Time	$I_F=15A, dI/dt=100A/\mu s$, $T_J=25^\circ C$	t_{rr}	-	12.2	-	ns
Reverse Recovery Charge		Q_{rr}	-	7.3	-	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 .The EAS data shows Max. rating .
- 3、The test cond $\leq 300\mu s$ duty cycle $\leq 2\%$, duty cycle ition is $T_J=25^\circ C$, $V_{DD}=48V$, $V_G=10V$, $R_G=25\Omega$, $L=0.1mH$, $I_{AS}=13A$
- 4、The power dissipation is limited by 175°C junction temperature
- 5、The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics



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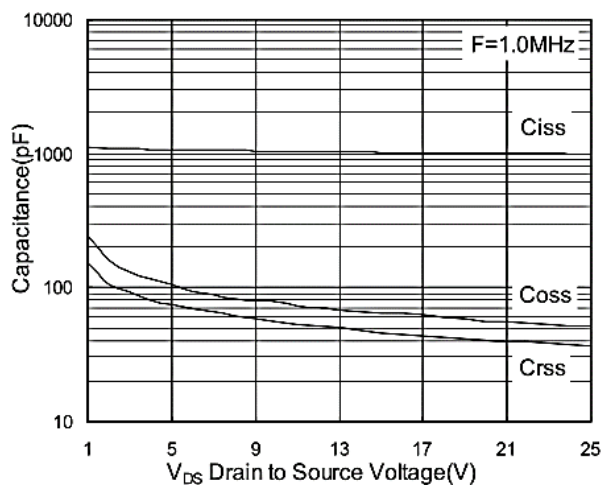


Fig.7 Capacitance

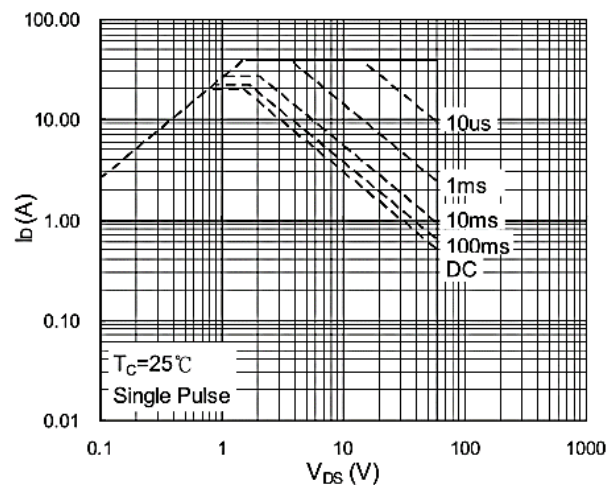


Fig.8 Safe Operating Area

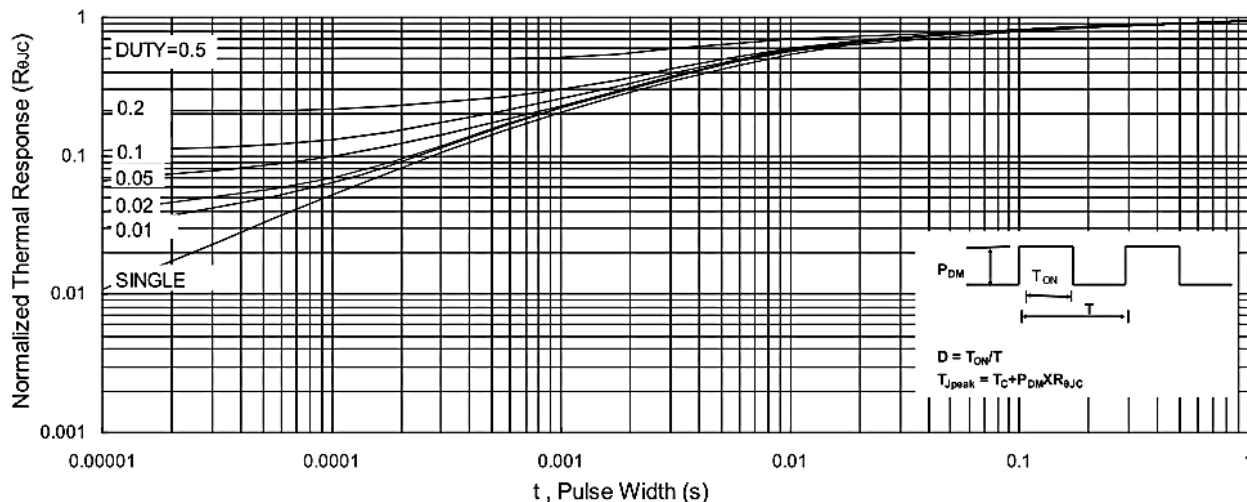


Fig.9 Normalized Maximum Transient Thermal Impedance

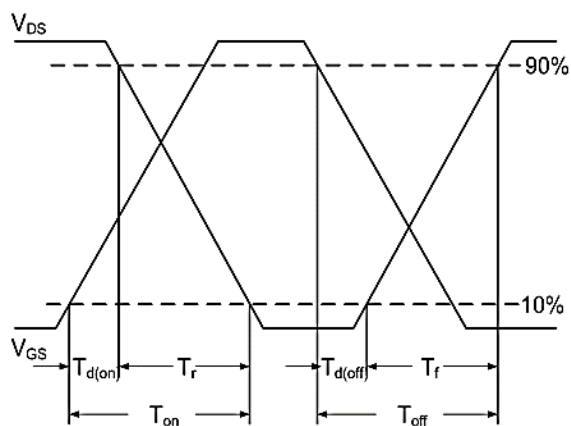


Fig.10 Switching Time Waveform

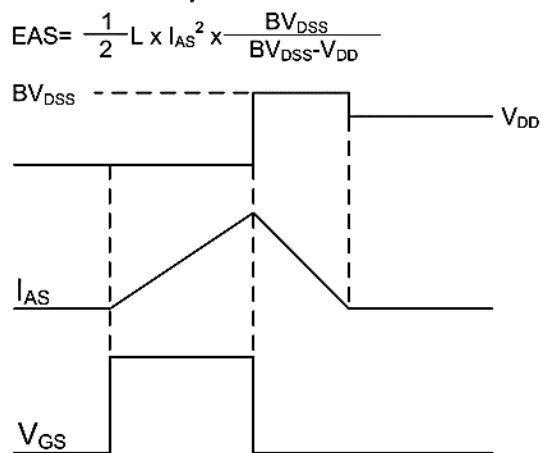
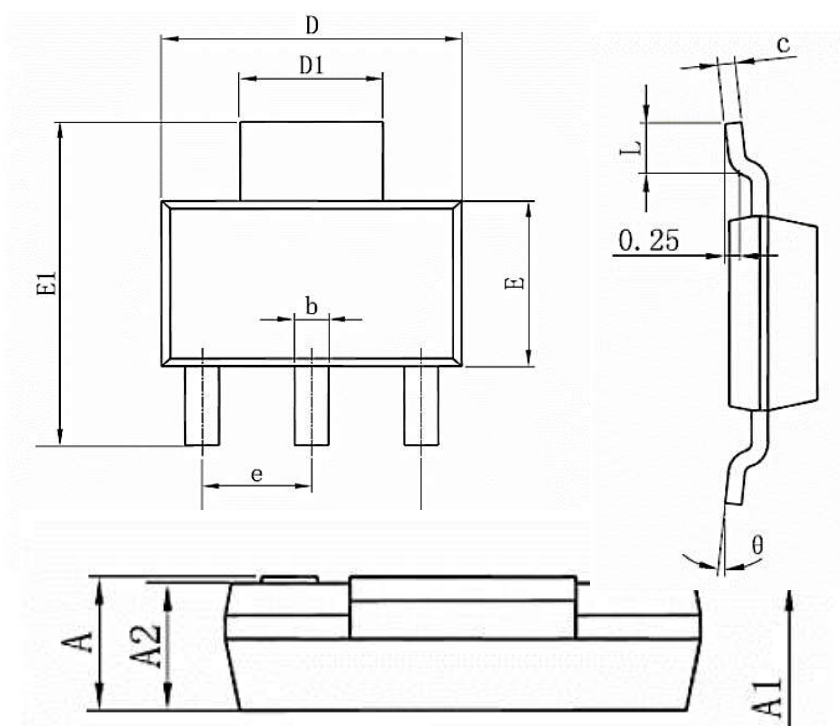


Fig.11 Unclamped Inductive Switching Waveform

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°