AT010SN060MSG

N-Channel Enhancement Mode MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
60V	36mΩ@10V	10A
	45mΩ@4.5V	

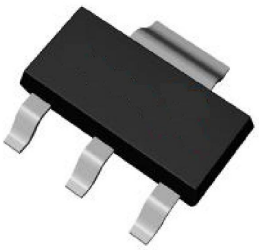
Feature

- Advanced trench technology
- Excellent $R_{DS(ON)}$
- Low gate charge

Application

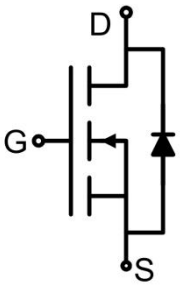
- LED lamp
- Load switch
- Uninterruptible power supply

Package

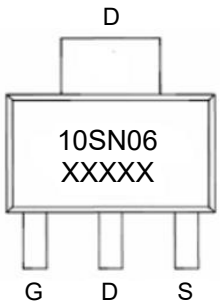


SOT-223

Circuit diagram



Marking



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Absolute maximum ratings (T_J=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current[1] (V_{GS} =10V, T_C =25℃)	I_D	10	A
Continuous Drain Current[1] (V_{GS} =10V, T_C =100℃)	I_D	8	A
Pulsed Drain Current	I_{DM}	30	A
Single Pulse Avalanche Energy[2]	E_{AS}	22	mJ
Power Dissipation[3] (T_C=25℃)	P_D	31.3	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	4	℃/W
Operating Junction Temperature	T_J	-55 ~ +150	℃
Storage Temperature	T_{STG}	-55 ~ +150	℃

Electrical characteristics (T_J=25 °C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} =0V, I_D =250μA	60			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =48V, V_{GS} =0V			1	μA
Gate-body leakage current	I_{GSS}	V_{DS} =0V, V_{GS} =±20V			±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	1.2	1.6	2.5	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =15A		28	36	mΩ
		V_{GS} =4.5V, I_D =7A		38	45	
Dynamic characteristics[5]						
Input Capacitance	C_{iss}	V_{DS} =15V, V_{GS} =0V, f =1MHz		1027		pF
Output Capacitance	C_{oss}			65		
Reverse Transfer Capacitance	C_{rss}			46		
Total Gate Charge	Q_g	V_{DS} =48V, V_{GS} =10V, I_D =15A		19		nC
Gate-Source Charge	Q_{gs}			2.5		
Gate-Drain Charge	Q_{gd}			5		
Turn-on delay time	$t_{d(on)}$	V_{DS} =30V, V_{GS} =10V, I_D =15A R_G =3.3Ω		2.8		nS
Turn-on rise time	t_r			16.6		
Turn-off delay time	$t_{d(off)}$			21.2		
Turn-off fall time	t_f			5.6		
Source-Drain Diode characteristics						
Diode Forward Current[1,4]	I_S				10	A
Diode Forward voltage	V_{SD}	V_{GS} =0V, I_S =1A, T_J =25℃			1.2	V
Reverse Recovery Time	T_{rr}	I_F =15A, di/dt =100A/us T_J =25℃		12.2		nS
Reverse Recovery Charge	Q_{rr}			7.3		nC

Notes:

1) The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.

2) The test condition is T_J =25℃, V_{DD} =48V, V_G =10V, R_G =25Ω, L=0.1mH, I_{AS} =13A.

3) The power dissipation is limited by 150℃ junction temperature.

4) The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

5) Guaranteed by design, not subject to production.

Typical Characteristics

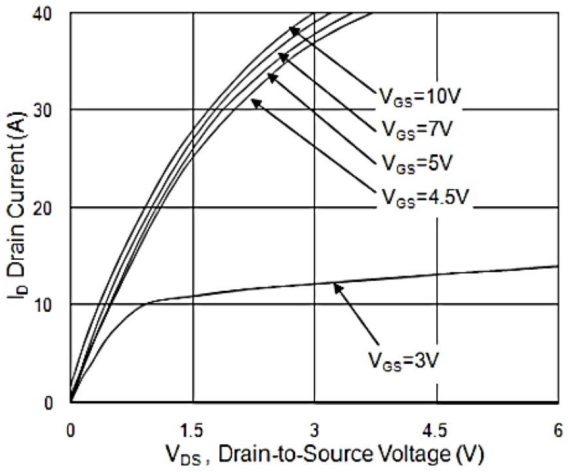


Fig.1 Typical Output Characteristics

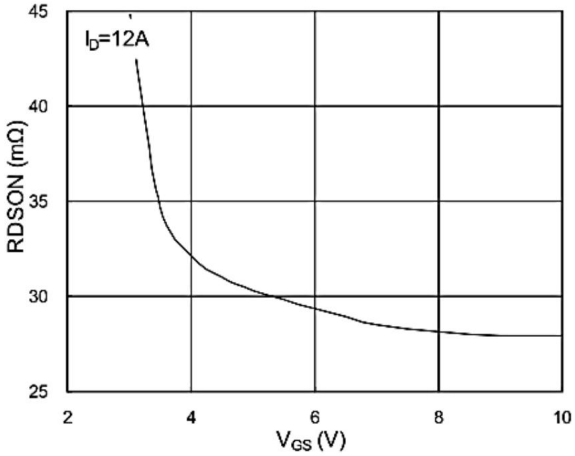


Fig.2 On-Resistance vs. Gate-Source

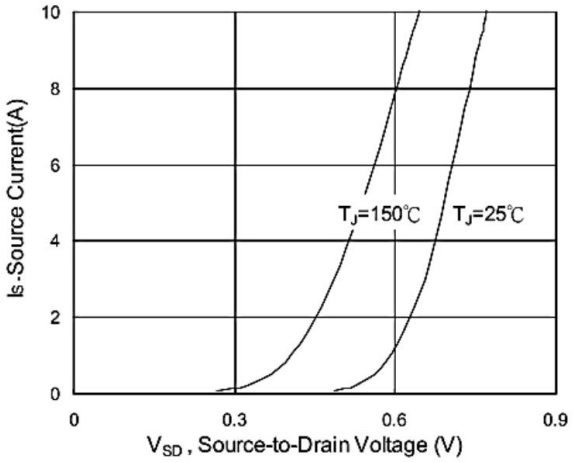


Fig.3 Forward Characteristics Of Reverse

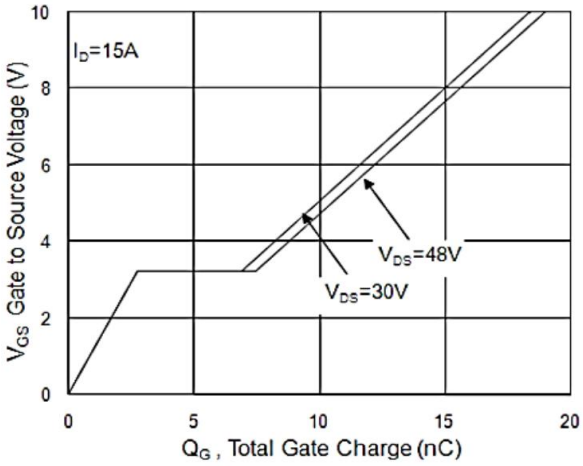


Fig.4 Gate-Charge Characteristics

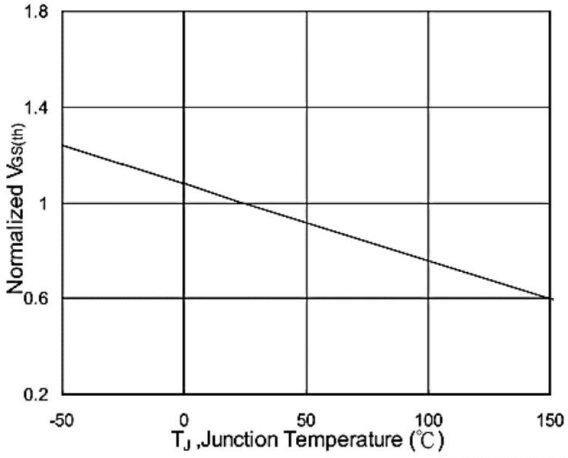


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

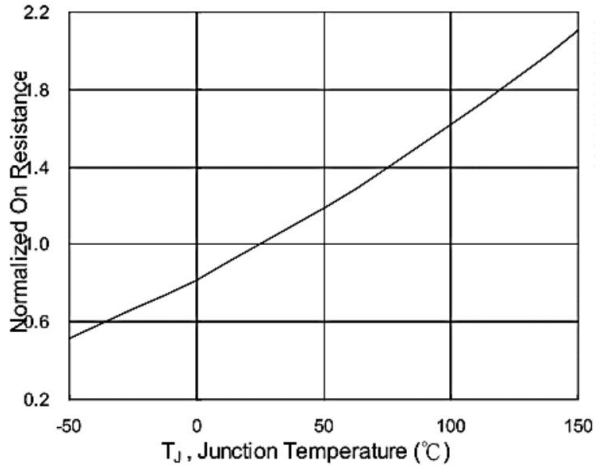


Fig.6 Normalized R_{DSON} vs. T_J

Typical Characteristics

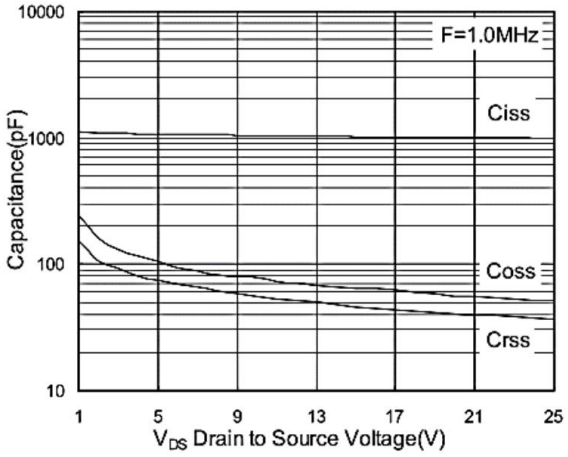


Fig.7 Capacitance

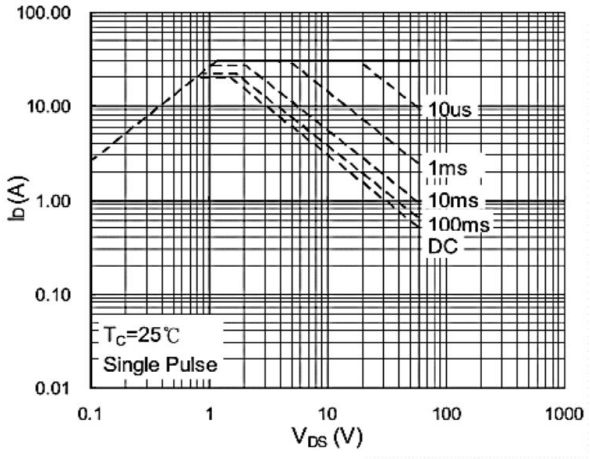


Fig.8 Safe Operating Area

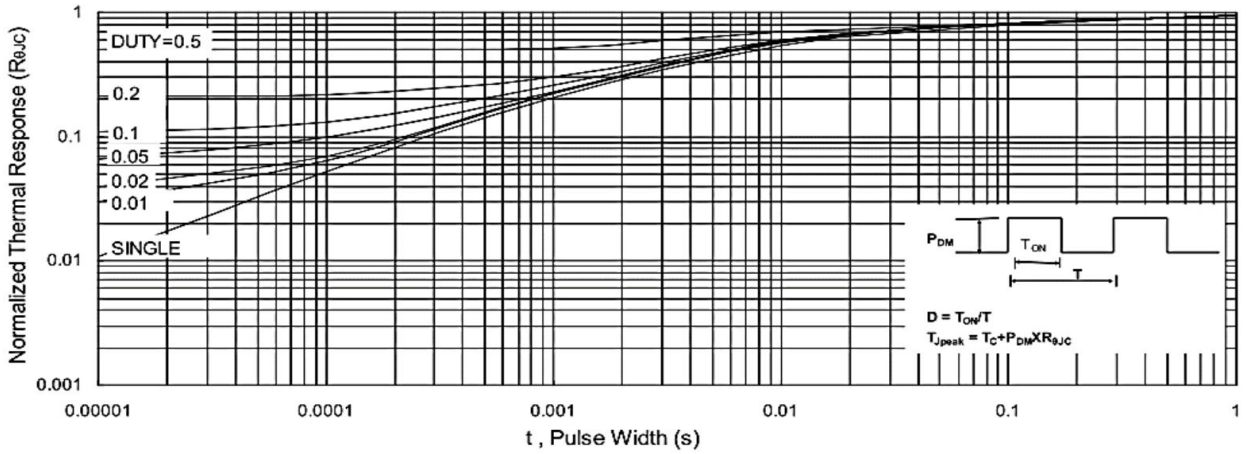


Fig.9 Normalized Maximum Transient Thermal Impedance

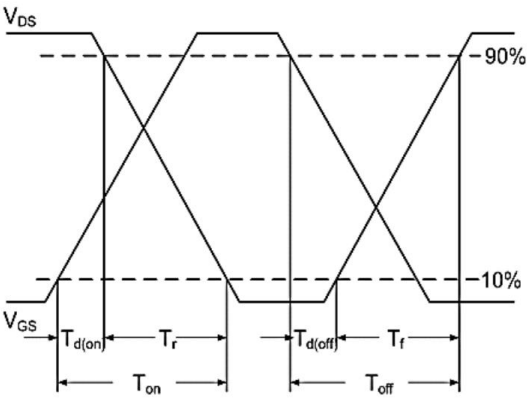


Fig.10 Switching Time Waveform

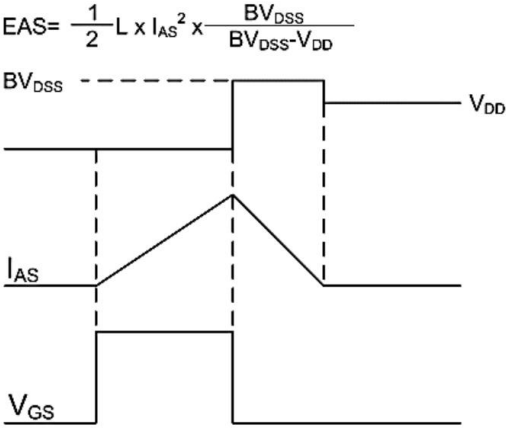
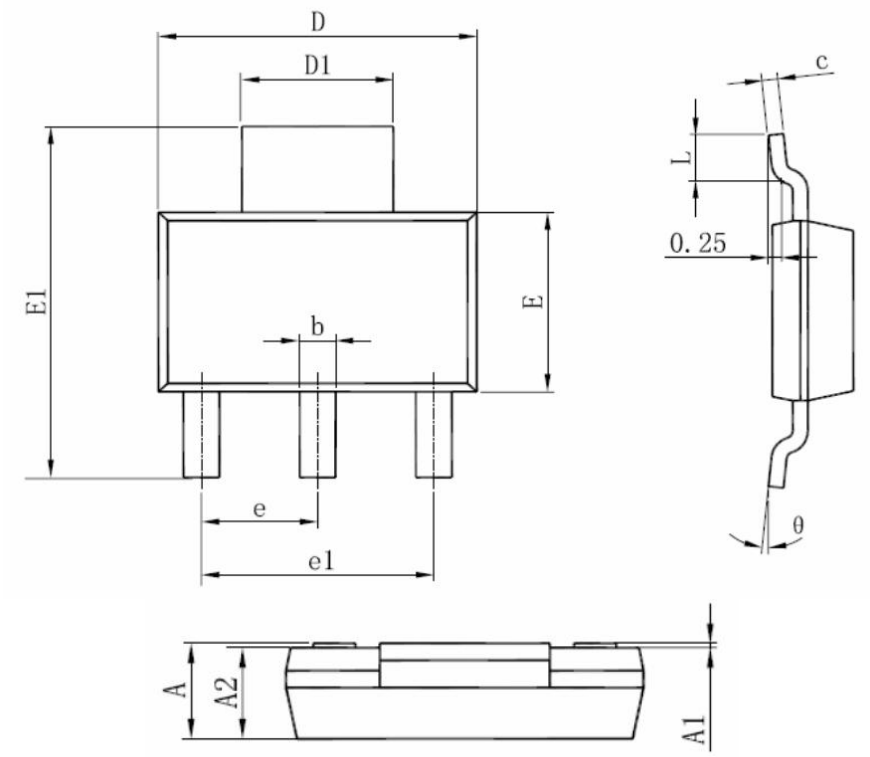


Fig.11 Unclamped Inductive Switching Waveform

SOT-223 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.520	1.800	0.060	0.071
A1	0.000	0.100	0.000	0.004
A2	1.500	1.700	0.059	0.067
b	0.660	0.820	0.026	0.032
c	0.250	0.350	0.010	0.014
D	6.200	6.400	0.244	0.252
D1	2.900	3.100	0.114	0.122
E	3.300	3.700	0.130	0.146
E1	6.830	7.070	0.269	0.278
e	2.300 BSC.		0.091 BSC.	
e1	4.500	4.700	0.177	0.185
L	0.900	1.150	0.035	0.045
θ	0°	10°	0°	10°