



YEA SHIN TECHNOLOGY CO., LTD

YS6912L

N-Channel Enhancement MOSFET



VDS= 60V, ID= 5A

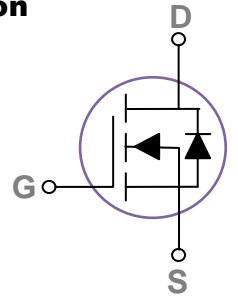
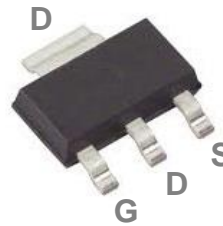
Features

- 60V,5A, $R_{DS(ON)} = 75m\Omega @ V_{GS} = 10V$
- Improved dv/dt capability
- Fast switching
- 100% EAS Guaranteed
- Green Device Available

Applications

- Motor Drive
- Power Tools
- LED Lighting

SOT-223 Pin Configuration



Absolute Maximum Rating $T_c=25^\circ C$ unless otherwise noted

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	60	V
V _{GS}	Gate-Source Voltage	±20	V
I _D	Drain Current – Continuous ($T_c=25^\circ C$)	5	A
	Drain Current – Continuous ($T_c=100^\circ C$)	3.2	A
I _{DM}	Drain Current – Pulsed ¹	20	A
EAS	Single Pulse Avalanche Energy ²	25	mJ
IAS	Single Pulse Avalanche Current ²	7	A
P _D	Power Dissipation ($T_c=25^\circ C$)	1.79	W
	Power Dissipation – Derate above 25 $^\circ C$	0.014	W/ $^\circ C$
T _{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T _J	Operating Junction Temperature Range	-55 to 150	$^\circ C$

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
R _{θJA}	Thermal Resistance Junction to ambient	---	70	$^\circ C/W$
R _{θJC}	Thermal Resistance Junction to Case	---	30	$^\circ C/W$

DEVICE CHARACTERISTICS

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

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	60	---	---	V
ΔBV _{DSS} /ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25°C, I _D =1mA	---	0.05	---	V/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =60V, V _{GS} =0V, T _J =25°C	---	---	1	uA
		V _{DS} =48V, V _{GS} =0V, T _J =125°C	---	---	10	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA

On Characteristics

R _{DS(ON)}	Static Drain-source On-Resistance ³	V _{GS} =10V, I _D =5A	---	60	75	mΩ
		V _{GS} =4.5V, I _D =3A	---	70	90	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1.2	1.8	2.5	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	-5	---	mV/°C
g _{fs}	Forward Transconductance	V _{DS} =10V, I _S =3A	---	7	---	S

Dynamic and Switching Characteristics

Q _g	Total Gate Charge ^{3,4}	V _{DS} =48V, V _{GS} =10V, I _D =5A	---	9.3	14	nC
Q _{gs}	Gate-Source Charge ^{3,4}		---	2.1	4	
Q _{gd}	Gate-Drain Charge ^{3,4}		---	1.8	4	
T _{d(on)}	Turn-On Delay Time ^{3,4}	V _{DD} =30V, V _{GS} =10V, R _G =3.3Ω, I _D =1A	---	2.9	6	ns
T _r	Rise Time ^{3,4}		---	9.5	18	
T _{d(off)}	Turn-Off Delay Time ^{3,4}		---	18.4	35	
T _f	Fall Time ^{3,4}		---	5.3	10	
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	---	500	725	pF
C _{oss}	Output Capacitance		---	45	65	
C _{rss}	Reverse Transfer Capacitance		---	16	30	
R _g	Gate Resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz	---	2	4	Ω

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _G =V _D =0V, Force Current	---	---	5	A
I _{SM}	Pulsed Source Current ³		---	---	20	A
V _{SD}	Diode Forward Voltage ³	V _{GS} =0V, I _S =1A, T _J =25°C	---	---	1	V

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V, V_{GS}=10V, L=1mH, I_{AS}=7A., R_G=25Ω, Starting T_J=25°C
3. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
4. Essentially independent of operating temperature.

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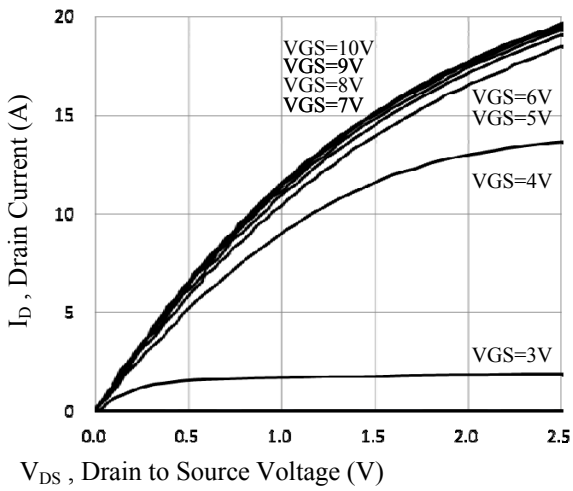


Fig.1 Typical Output Characteristics

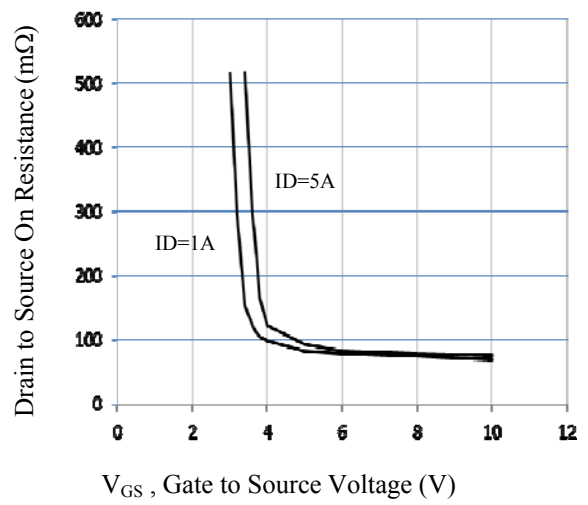


Fig.2 $R_{DS(on)}$ vs. Gate Voltage

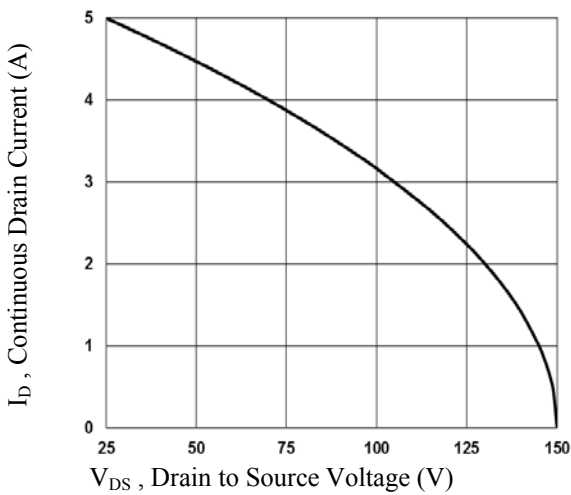


Fig.3 Output Characteristics

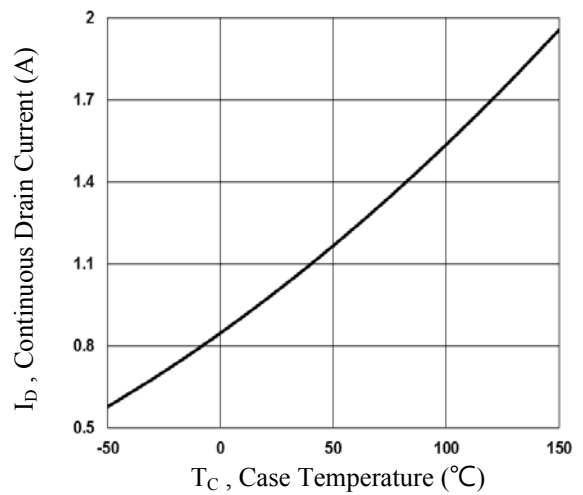


Fig.4 Continuous Drain Current vs. T_c

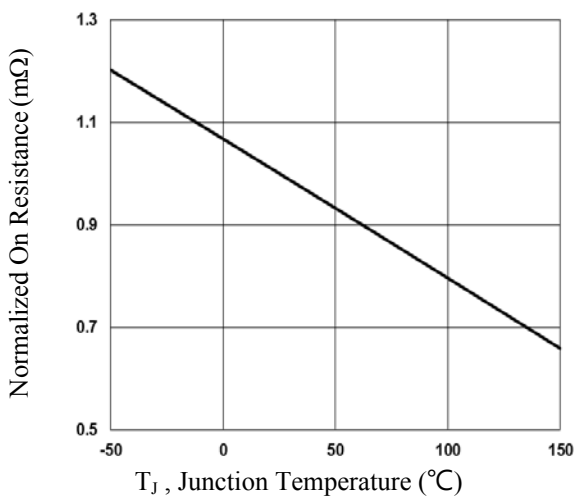


Fig.5 Normalized $R_{DS(on)}$ vs. T_j

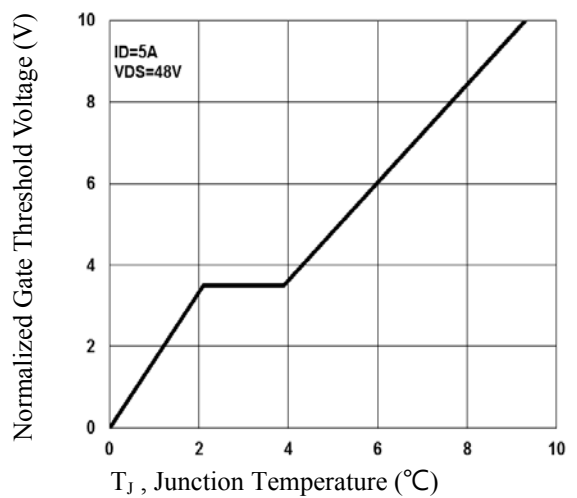


Fig.6 Normalized V_{th} vs. T_j

DEVICE CHARACTERISTICS

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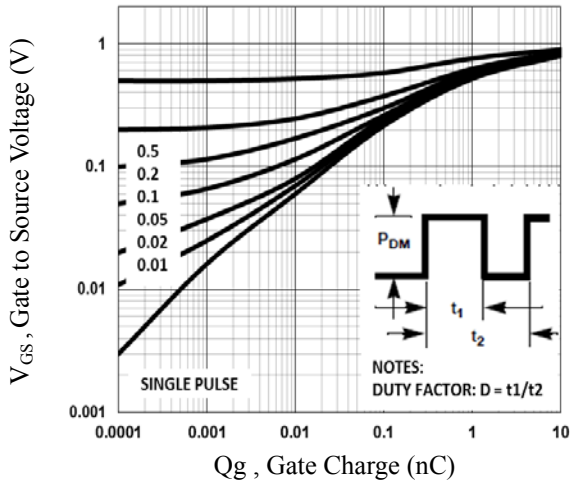


Fig.7 Gate Charge Waveform

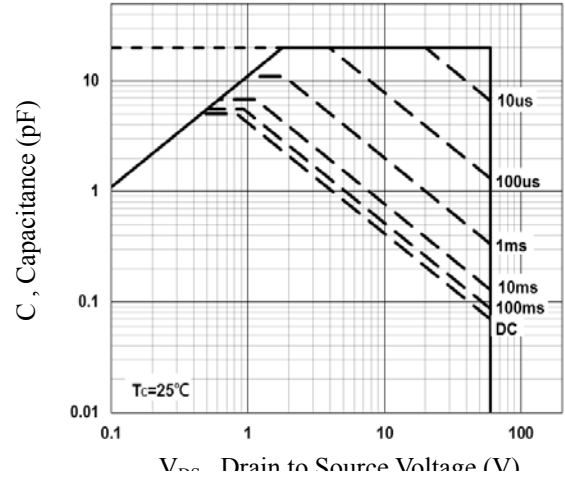


Fig.8 Capacitance Characteristics

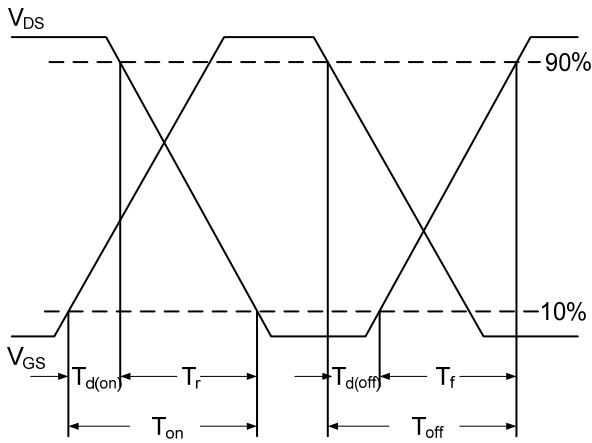


Fig.9 Switching Time Waveform

$$EAS = \frac{1}{2} L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$

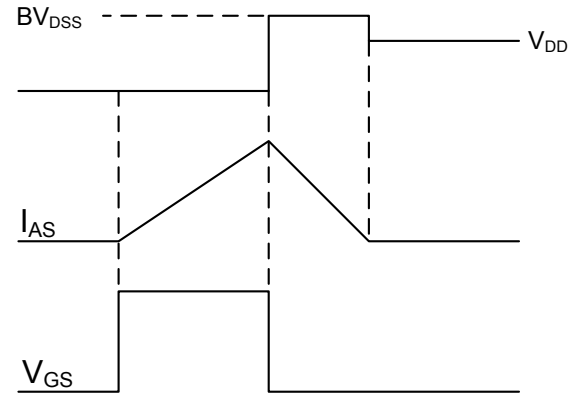
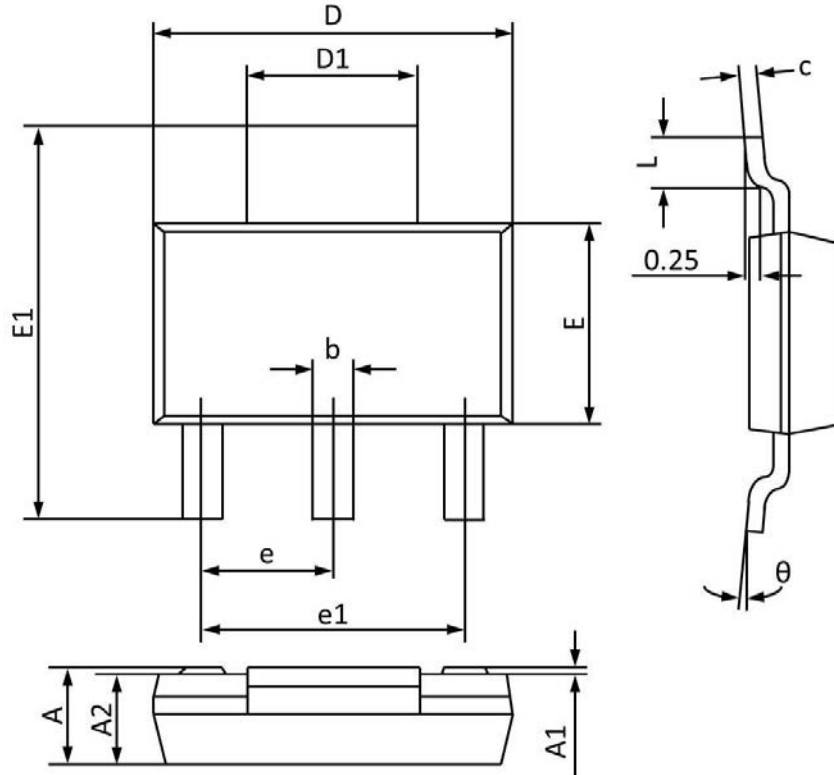


Fig.10 EAS Waveform

PACKAGE OUTLINE & DIMENSIONS

YS6912L

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°