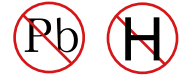




YEA SHIN TECHNOLOGY CO., LTD

YS3911L

P-Channel Enhancement MOSFET



VDS= -30V, ID= -4.5A

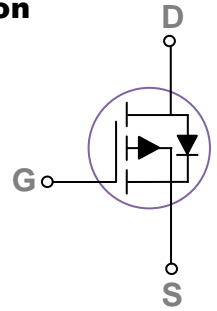
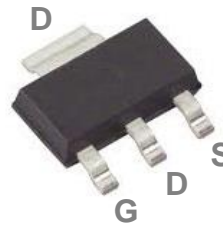
Features

- -30V,-4.5A, $R_{DS(ON)} = 55m\Omega @ V_{GS} = -10V$
- Fast switching
- Green Device Available
- Suit for -4.5V Gate Drive Applications

Applications

- Notebook
- Load Switch
- Battery Protection
- Hand-held Instruments

SOT-223 Pin Configuration



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

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	-30	V
V _{GS}	Gate-Source Voltage	±20	V
I _D	Drain Current – Continuous ($T_c=25^\circ C$)	-4.5	A
	Drain Current – Continuous ($T_c=100^\circ C$)	-2.85	A
I _{DM}	Drain Current – Pulsed ¹	-18	A
P _D	Power Dissipation ($T_c=25^\circ C$)	1.78	W
	Power Dissipation – Derate above 25°C	0.014	W/°C
T _{STG}	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
R _{θJA}	Thermal Resistance Junction to ambient	---	70	°C/W
R _{θJC}	Thermal Resistance Junction to Case	---	45	°C/W

DEVICE CHARACTERISTICS

YS3911L

Electrical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-30	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BV_{DSS} Temperature Coefficient	Reference to 25°C , $I_D=-1\text{mA}$	---	-0.03	---	$V/^\circ\text{C}$
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-30V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	-1	μA
		$V_{DS}=-24V, V_{GS}=0V, T_J=125^\circ\text{C}$	---	---	-10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 20	μA

On Characteristics

$R_{DS(ON)}$	Static Drain-source On-Resistance	$V_{GS}=-10V, I_D=-4A$	---	45	55	$\text{m}\Omega$
		$V_{GS}=-4.5V, I_D=-3A$	---	65	85	$\text{m}\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1.2	-1.6	-2.2	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	4	---	$\text{mV}/^\circ\text{C}$
g_{fs}	Forward Transconductance	$V_{DS}=-10V, I_D=-3A$	---	3.5	---	S

Dynamic and Switching Characteristics

Q_g	Total Gate Charge ^{2,3}	$V_{DS}=-15V, V_{GS}=-4.5V, I_D=-3A$	---	5.1	7	nC
Q_{gs}	Gate-Source Charge ^{2,3}		---	2	3	
Q_{gd}	Gate-Drain Charge ^{2,3}		---	2.2	4	
$T_{d(on)}$	Turn-On Delay Time ^{2,3}	$V_{DD}=-15V, V_{GS}=-10V, R_G=6\Omega, I_D=-1A$	---	3.4	6	ns
T_r	Rise Time ^{2,3}		---	10.8	21	
$T_{d(off)}$	Turn-Off Delay Time ^{2,3}		---	26.9	51	
T_f	Fall Time ^{2,3}		---	6.9	13	
C_{iss}	Input Capacitance	$V_{DS}=-15V, V_{GS}=0V, f=1\text{MHz}$	---	560	810	pF
C_{oss}	Output Capacitance		---	55	80	
C_{rss}	Reverse Transfer Capacitance		---	40	60	

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	---	---	-4.1	A
I_{SM}	Pulsed Source Current		---	---	-8.2	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_S=-1A, T_J=25^\circ\text{C}$	---	---	-1	V

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
3. Essentially independent of operating temperature.

DEVICE CHARACTERISTICS

YS3911L

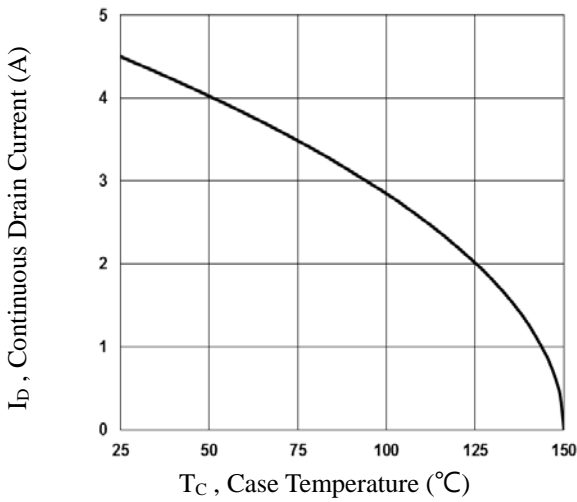


Fig.1 Continuous Drain Current vs. T_c

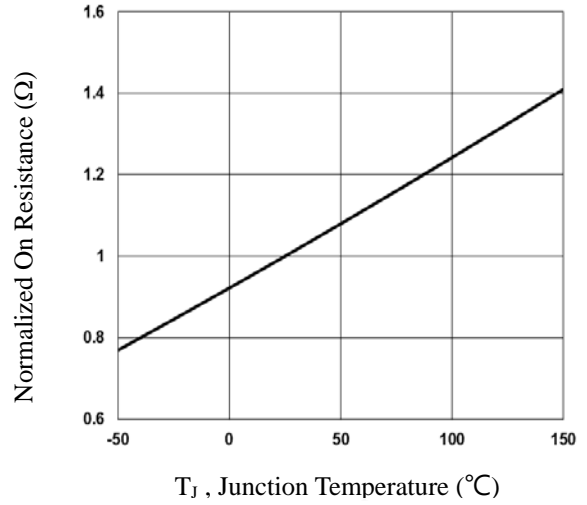


Fig.2 Normalized $R_{DS(on)}$ vs. T_j

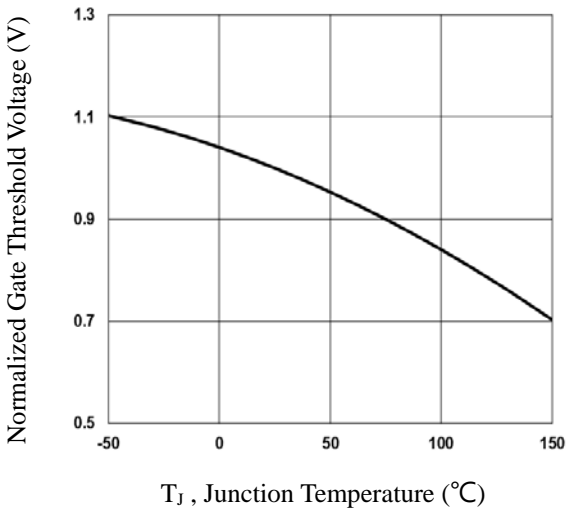


Fig.3 Normalized V_{th} vs. T_j

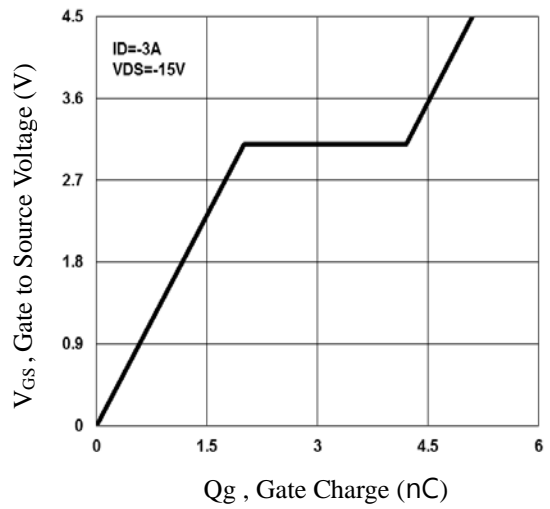


Fig.4 Gate Charge Waveform

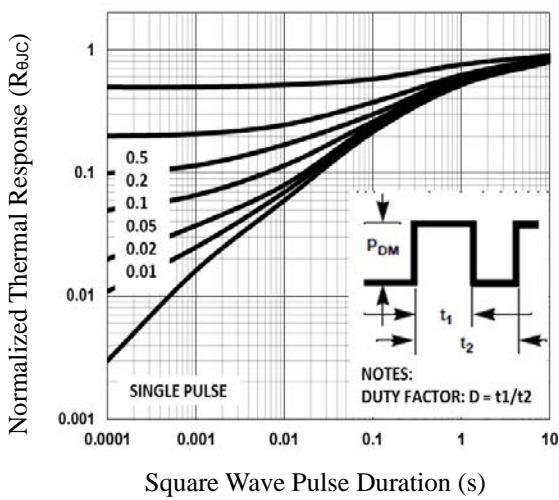


Fig.5 Normalized Transient Impedance

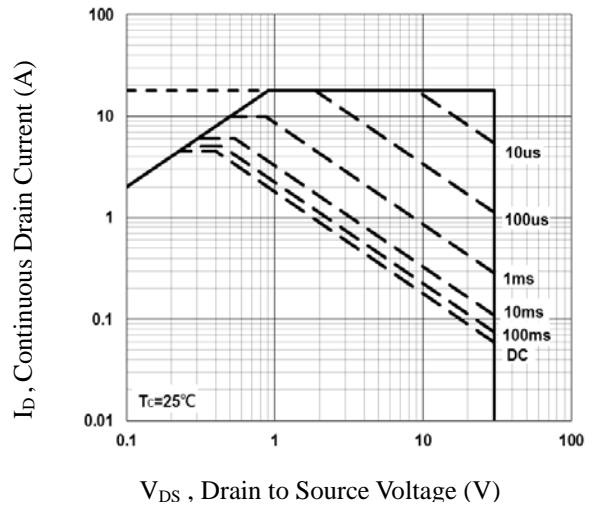


Fig.6 Maximum Safe Operation Area

DEVICE CHARACTERISTICS

YS3911L

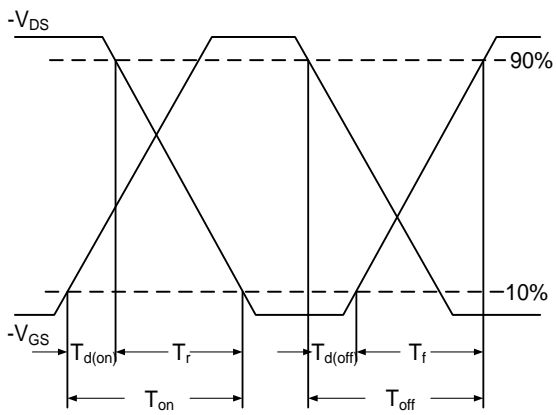


Fig.7 Switching Time Waveform

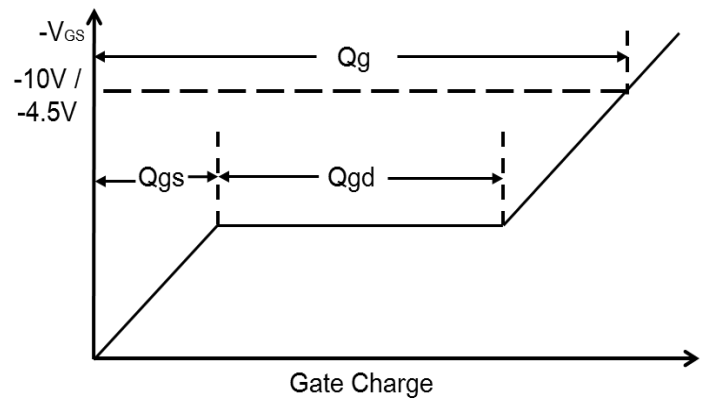
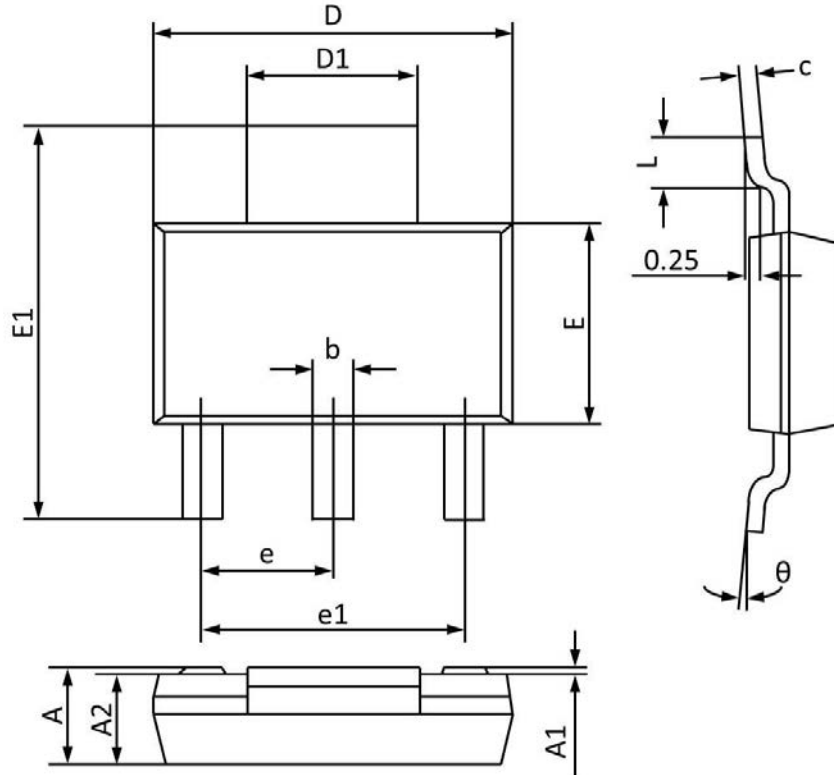


Fig.8 Gate Charge Waveform

PACKAGE OUTLINE & DIMENSIONS

YS3911L

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°