



YEA SHIN TECHNOLOGY CO., LTD

YS3915S

# P-Channel Enhancement MOSFET



VDS= -30V, ID= -3.3A

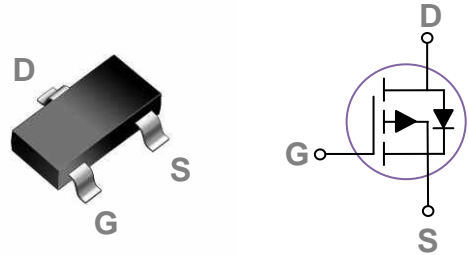
## Features

- -30V,-3.3A,  $R_{DS(ON)} = 90m\Omega @ V_{GS} = -10V$
- Fast switching
- Green Device Available
- Suit for -4.5V Gate Drive Applications

## Applications

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

## SOT-23 Pin Configuration



### Absolute Maximum Rating $T_c=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Rating	Units
V <sub>DS</sub>	Drain-Source Voltage	-30	V
V <sub>GS</sub>	Gate-Source Voltage	±20	V
I <sub>D</sub>	Drain Current – Continuous (T <sub>A</sub> =25°C)	-3.3	A
	Drain Current – Continuous (T <sub>A</sub> =70°C)	-2.64	A
I <sub>DM</sub>	Drain Current – Pulsed <sup>1</sup>	-13.2	A
P <sub>D</sub>	Power Dissipation (T <sub>A</sub> =25°C)	1.56	W
	Power Dissipation – Derate above 25°C	0.012	W/°C
T <sub>STG</sub>	Storage Temperature Range	-55 to 150	°C
T <sub>J</sub>	Operating Junction Temperature Range	-55 to 150	°C

### Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
R <sub>θJA</sub>	Thermal Resistance Junction to ambient	---	80	°C/W

# DEVICE CHARACTERISTICS

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Electrical Characteristics ( $T_J=25\text{ }^\circ\text{C}$ , 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
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=-30V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	-1	$\mu A$
		$V_{DS}=-24V, V_{GS}=0V, T_J=125^\circ\text{C}$	---	---	-10	$\mu A$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	$\pm 100$	nA

### On Characteristics

$R_{DS(ON)}$	Static Drain-source On-Resistance	$V_{GS}=-10V, I_D=-3A$	---	70	90	$m\Omega$
		$V_{GS}=-4.5V, I_D=-2A$	---	110	140	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1.2	-1.6	-2.2	V
$g_{fs}$	Forward Transconductance	$V_{DS}=-10V, I_D=-1A$	---	3	---	S

### Dynamic and Switching Characteristics

$Q_g$	Total Gate Charge <sup>2,3</sup>	$V_{DS}=-24V, V_{GS}=-4.5V, I_D=-2A$	---	2.5	5	nC
$Q_{gs}$	Gate-Source Charge <sup>2,3</sup>		---	0.1	0.3	
$Q_{gd}$	Gate-Drain Charge <sup>2,3</sup>		---	1.8	3.6	
$T_{d(on)}$	Turn-On Delay Time <sup>2,3</sup>	$V_{DD}=-15V, V_{GS}=-10V, R_G=6\Omega, I_D=-1A$	---	6.1	12	ns
$T_r$	Rise Time <sup>2,3</sup>		---	8.7	17	
$T_{d(off)}$	Turn-Off Delay Time <sup>2,3</sup>		---	33.2	66	
$T_f$	Fall Time <sup>2,3</sup>		---	3.7	7	
$C_{iss}$	Input Capacitance	$V_{DS}=-15V, V_{GS}=0V, f=1\text{MHz}$	---	226	450	pF
$C_{oss}$	Output Capacitance		---	39	78	
$C_{rss}$	Reverse Transfer Capacitance		---	29	58	

### Drain-Source Diode Characteristics and Maximum Ratings

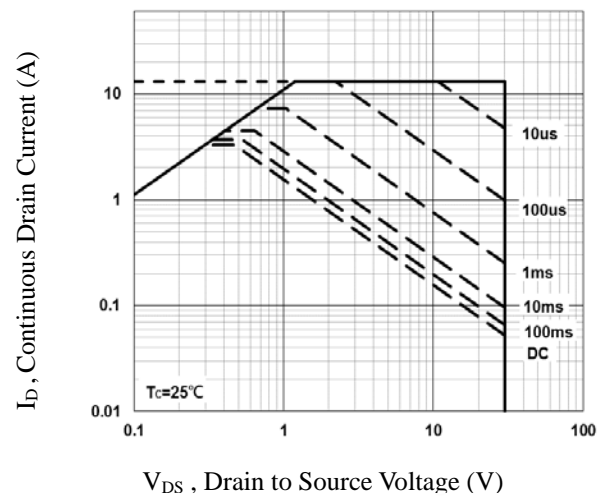
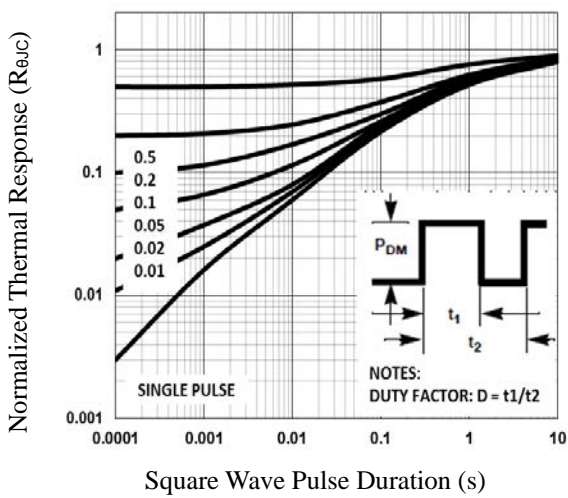
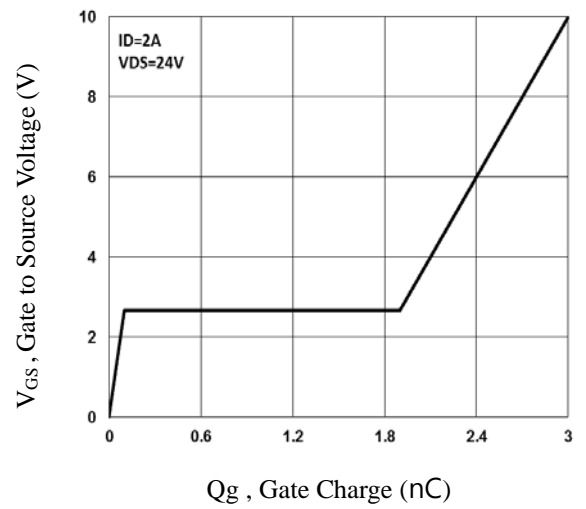
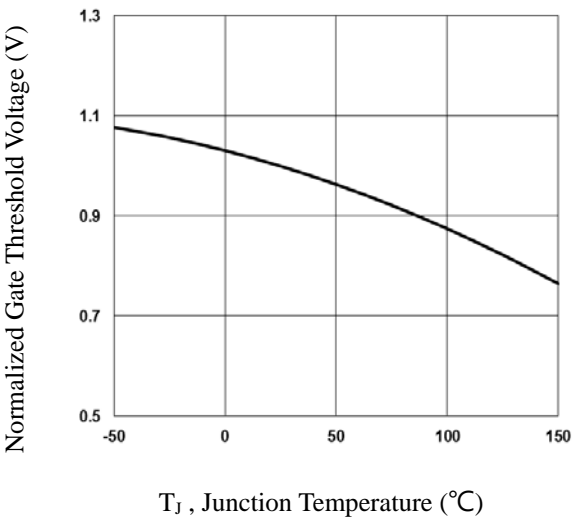
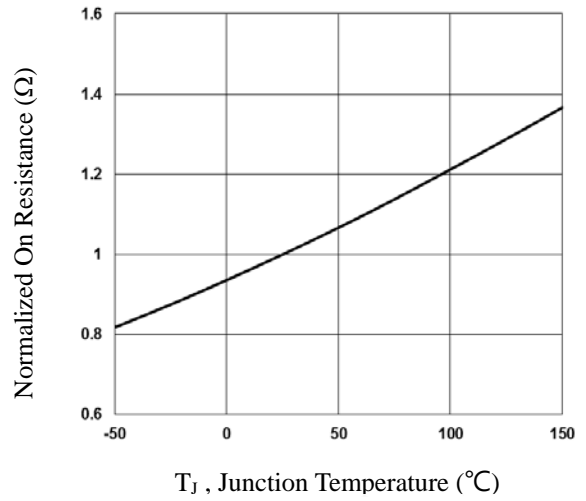
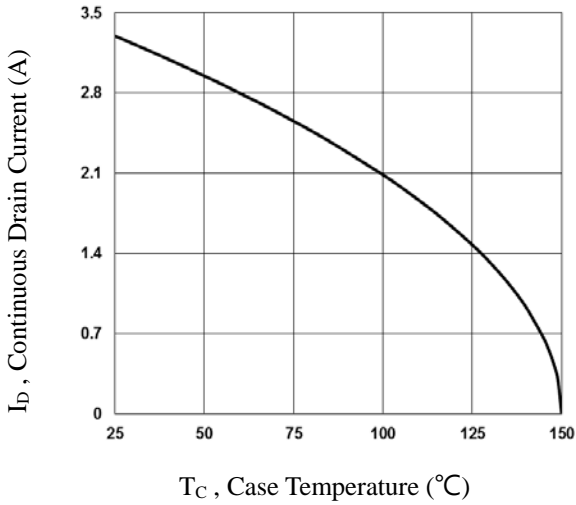
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_S$	Continuous Source Current	$V_G=V_D=0V$ , Force Current	---	---	-3.3	A
$I_{SM}$	Pulsed Source Current		---	---	-6.6	A
$V_{SD}$	Diode Forward Voltage	$V_{GS}=0V, I_S=-1A, T_J=25^\circ\text{C}$	---	---	-1	V

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

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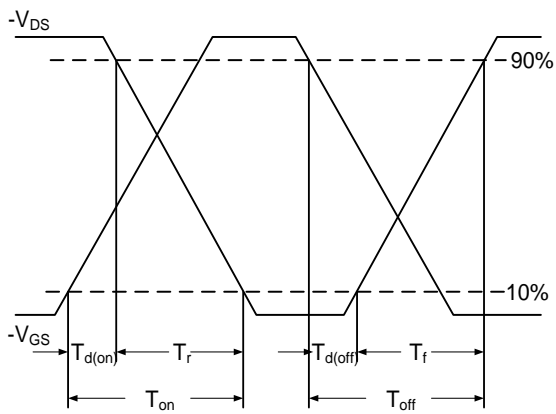


Fig.7 Switching Time Waveform

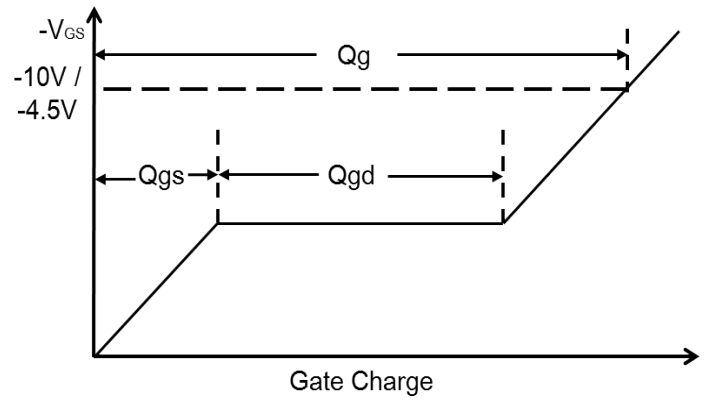
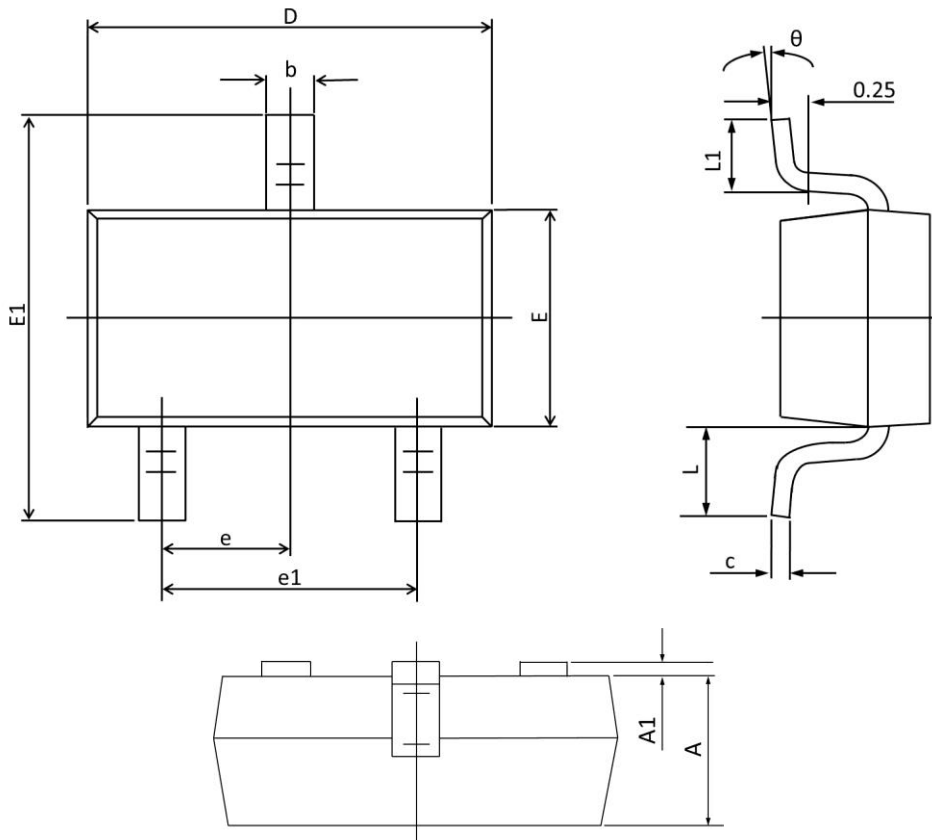


Fig.8 Gate Charge Waveform

# PACKAGE OUTLINE & DIMENSIONS

## YS3915S



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.000	0.035	0.039
A1	0.000	0.100	0.000	0.004
b	0.300	0.500	0.012	0.020
c	0.090	0.110	0.003	0.004
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
$\theta$	1°	7°	1°	7°