

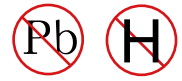


YEA SHIN TECHNOLOGY CO., LTD

YS2314S

## N-Channel Enhancement MOSFET

VDS= 20V, ID= 5.8A



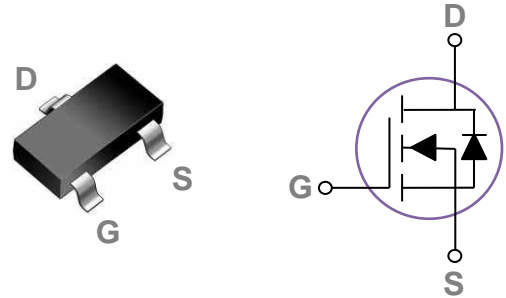
### Features

- 20V, 5.8A,  $R_{DS(ON)} = 25m\Omega @ V_{GS} = 4.5V$
- Improved  $dv/dt$  capability
- Fast switching
- Green Device Available
- Suit for 1.8V Gate Drive Applications

### Applications

- Notebook
- Load Switch
- Hand-Held Instruments

### SOT-23 Pin Configuration



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

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	20	V
$V_{GS}$	Gate-Source Voltage	$\pm 10$	V
$I_D$	Drain Current – Continuous ( $T_c=25^\circ\text{C}$ )	5.8	A
	Drain Current – Continuous ( $T_c=100^\circ\text{C}$ )	3.7	A
$I_{DM}$	Drain Current – Pulsed <sup>1</sup>	23.2	A
$P_D$	Power Dissipation ( $T_c=25^\circ\text{C}$ )	1.56	W
	Power Dissipation – Derate above $25^\circ\text{C}$	0.012	W/ $^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

### Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	80	$^\circ\text{C}/\text{W}$

# DEVICE CHARACTERISTICS

## YS2314S

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	$V_{GS}=0V, I_D=250\mu A$	20	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	$BV_{DSS}$ Temperature Coefficient	Reference to $25^\circ\text{C}$ , $I_D=1mA$	---	0.02	---	$V/^\circ\text{C}$
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=20V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	$\mu A$
		$V_{DS}=16V, V_{GS}=0V, T_J=85^\circ\text{C}$	---	---	10	$\mu A$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 10V, V_{DS}=0V$	---	---	$\pm 100$	nA

### On Characteristics

$R_{DS(ON)}$	Static Drain-source On-Resistance	$V_{GS}=4.5V, I_D=4A$	---	20	25	$m\Omega$
		$V_{GS}=2.5V, I_D=3A$	---	27	35	$m\Omega$
		$V_{GS}=1.8V, I_D=2A$	---	39	55	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	0.4	0.6	0.8	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-2	---	$mV/^\circ\text{C}$
$g_{fs}$	Forward Transconductance	$V_{DS}=10V, I_D=3A$	---	6.5	---	S

### Dynamic and Switching Characteristics

$Q_g$	Total Gate Charge <sup>2,3</sup>	$V_{DS}=10V, V_{GS}=4.5V, I_D=4A$	---	7.7	11	nC
$Q_{gs}$	Gate-Source Charge <sup>2,3</sup>		---	0.9	1	
$Q_{gd}$	Gate-Drain Charge <sup>2,3</sup>		---	2.4	5	
$T_{d(on)}$	Turn-On Delay Time <sup>2,3</sup>	$V_{DD}=10V, V_{GS}=4.5V, R_G=25\Omega, I_D=1A$	---	4.1	8	ns
$T_r$	Rise Time <sup>2,3</sup>		---	11.6	22	
$T_{d(off)}$	Turn-Off Delay Time <sup>2,3</sup>		---	23.9	45	
$T_f$	Fall Time <sup>2,3</sup>		---	7.6	14	
$C_{iss}$	Input Capacitance	$V_{DS}=10V, V_{GS}=0V, f=1MHz$	---	535	775	pF
$C_{oss}$	Output Capacitance		---	60	85	
$C_{rss}$	Reverse Transfer Capacitance		---	34	50	

### 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	---	---	5.8	A
$I_{SM}$	Pulsed Source Current		---	---	23.2	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

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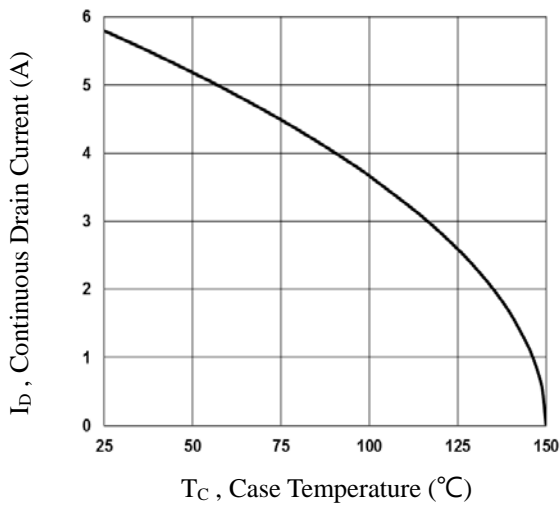


Fig.1 Continuous Drain Current vs.  $T_C$

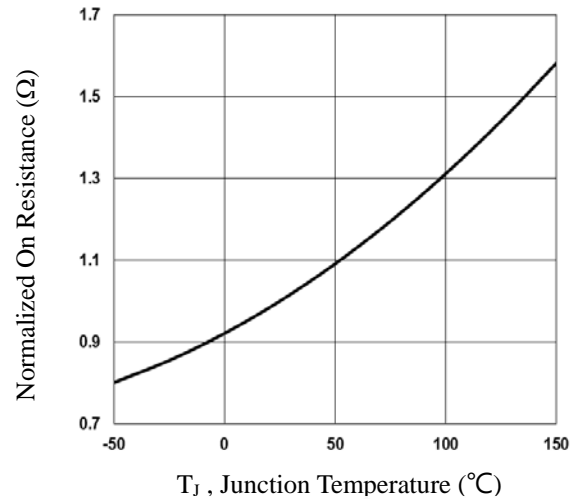


Fig.2 Normalized  $R_{DS(on)}$  vs.  $T_J$

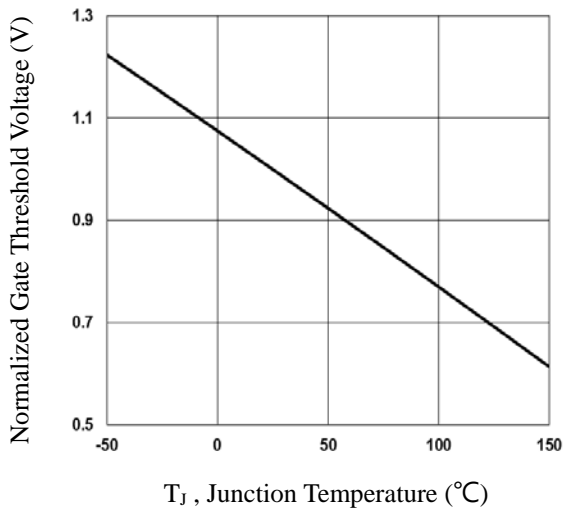


Fig.3 Normalized  $V_{th}$  vs.  $T_J$

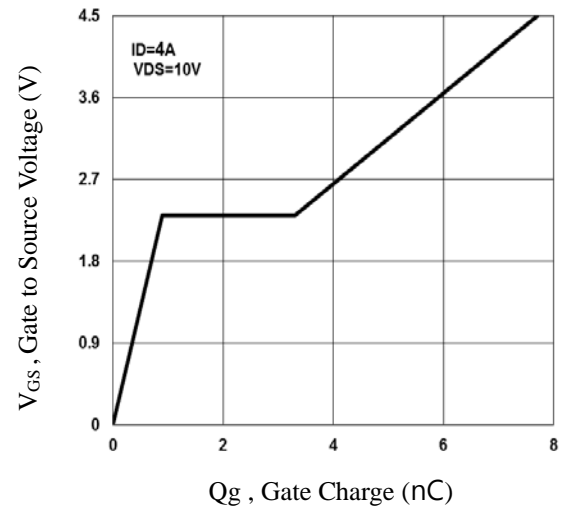


Fig.4 Gate Charge Waveform

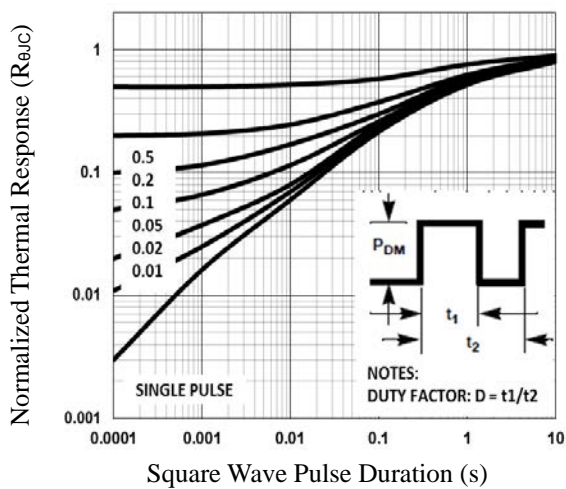


Fig.5 Normalized Transient Impedance

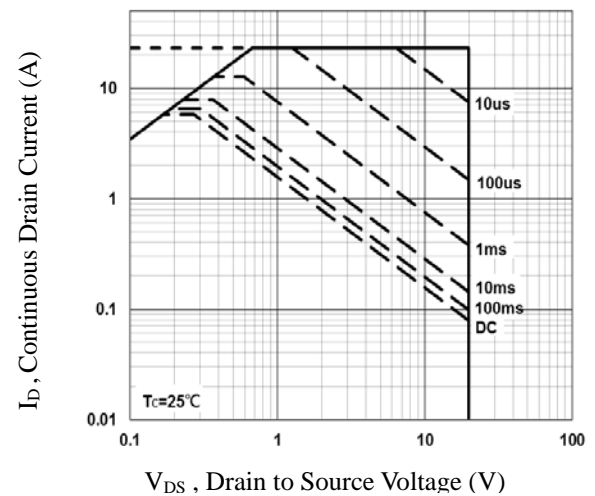


Fig.6 Maximum Safe Operation Area

# DEVICE CHARACTERISTICS

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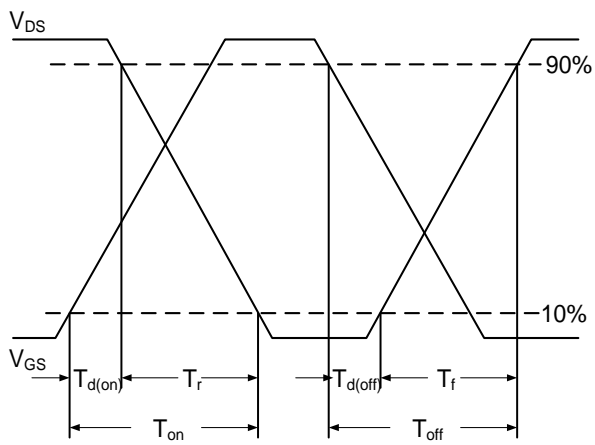


Fig.7 Switching Time Waveform

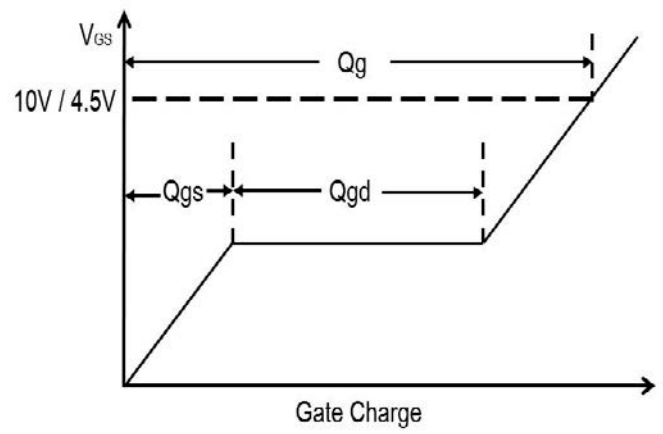
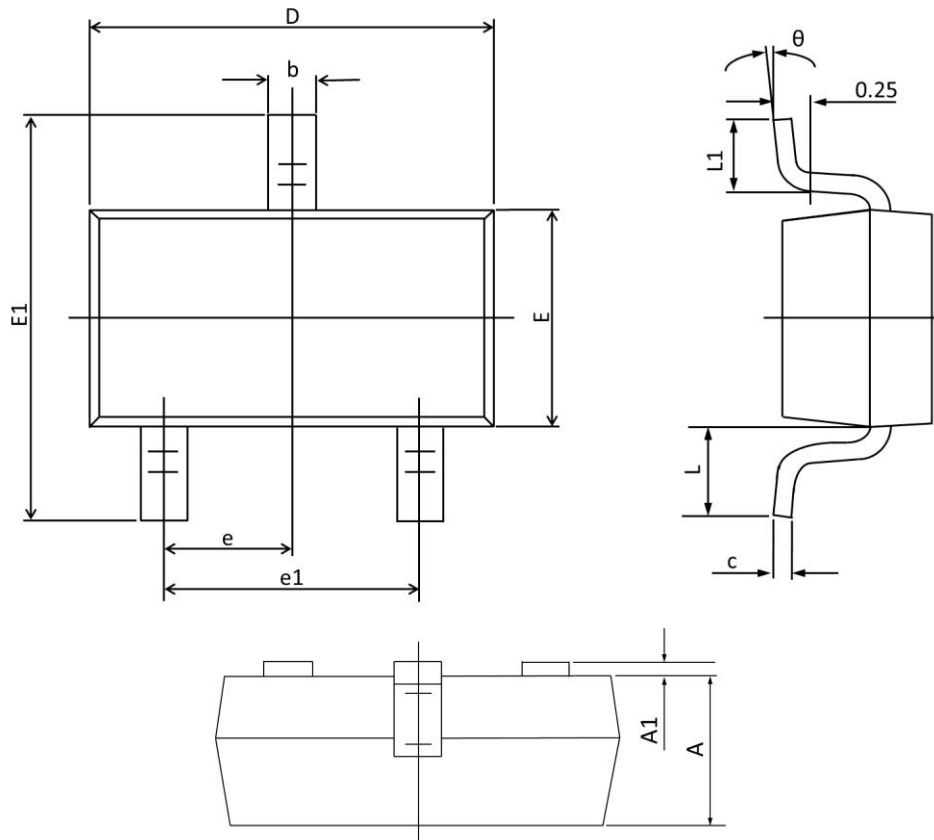


Fig.8 Gate Charge Waveform

# PACKAGE OUTLINE & DIMENSIONS

YS2314S



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°