



YEA SHIN TECHNOLOGY CO., LTD

YS2314K

N-Channel Enhancement MOSFET



VDS= 20V, ID= 5.6A

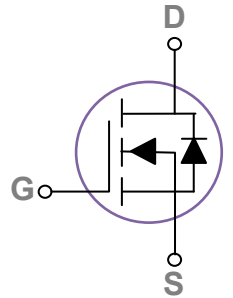
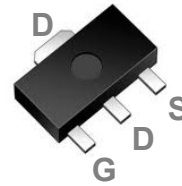
Features

- 20V, 5.6A, $R_{DS(ON)} = 26m\Omega @ V_{GS} = 4.5V$
- Improved dv/dt capability
- Fast switching
- Green Device Available
- Suit for 1.8V Gate Drive Applications

Applications

- Notebook
- Load Switch
- Hand-Held Instruments

SOT-89 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	±10	V
I _D	Drain Current – Continuous ($T_c=25^\circ\text{C}$)	5.6	A
	Drain Current – Continuous ($T_c=100^\circ\text{C}$)	3.5	A
I _{DM}	Drain Current – Pulsed ¹	22.4	A
P _D	Power Dissipation ($T_c=25^\circ\text{C}$)	1.47	W
	Power Dissipation – Derate above 25°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 _{θJA}	Thermal Resistance Junction to ambient	---	85	$^\circ\text{C}/\text{W}$

DEVICE CHARACTERISTICS

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

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	20	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BV _{DSS} Temperature Coefficient	Reference to 25°C, I _D =1mA	---	0.02	---	V/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =20V, V _{GS} =0V, T _J =25°C	---	---	1	uA
		V _{DS} =16V, V _{GS} =0V, T _J =125°C	---	---	10	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±10V, V _{DS} =0V	---	---	±100	nA

On Characteristics

R _{DS(ON)}	Static Drain-source On-Resistance ²	V _{GS} =4.5V, I _D =4A	---	22	26	mΩ
		V _{GS} =2.5V, I _D =3A	---	28	36	mΩ
		V _{GS} =1.8V, I _D =2A	---	39	51	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	0.4	0.6	1	V
$\Delta V_{GS(th)}$	V _{GS(th)} Temperature Coefficient		---	-2	---	mV/°C
g _{fs}	Forward Transconductance	V _{DS} =10V, I _D =3A	---	7	---	S

Dynamic and Switching Characteristics

Q _g	Total Gate Charge ^{2,3}	V _{DS} =10V, V _{GS} =4.5V, I _D =4A	---	7.7	11	nC
Q _{gs}	Gate-Source Charge ^{2,3}		---	0.9	1	
Q _{gd}	Gate-Drain Charge ^{2,3}		---	2.4	5	
T _{d(on)}	Turn-On Delay Time ^{2,3}	V _{DD} =10V, V _{GS} =4.5V, R _G =25Ω, I _D =1A	---	4.1	8	ns
T _r	Rise Time ^{2,3}		---	11.6	22	
T _{d(off)}	Turn-Off Delay Time ^{2,3}		---	23.9	45	
T _f	Fall Time ^{2,3}		---	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	---	---	5.6	A
I _{SM}	Pulsed Source Current ²		---	---	22.4	A
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V, I _S =1A, T _J =25°C	---	---	1	V

Note :

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

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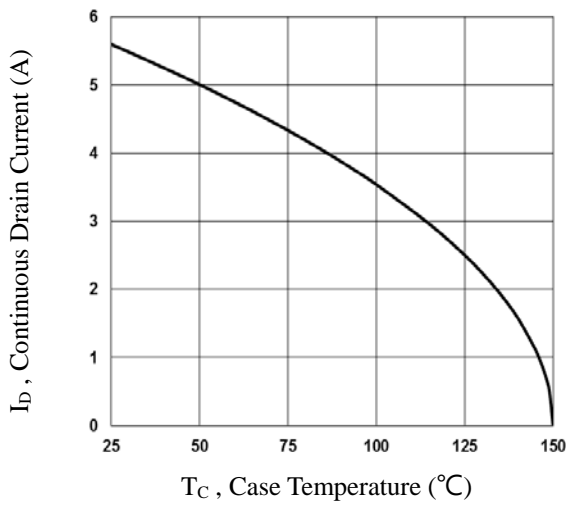


Fig.1 Continuous Drain Current vs. T_C

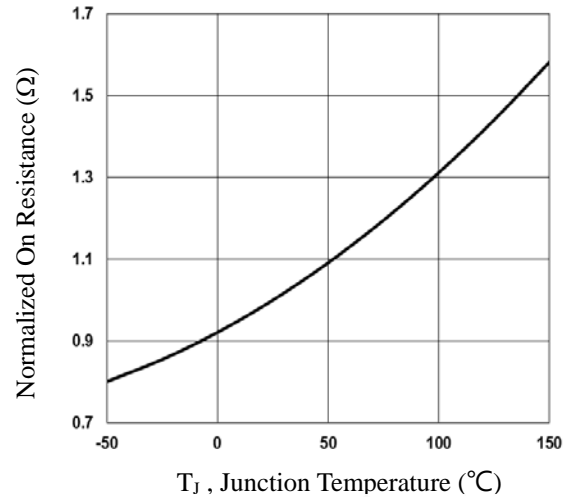


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

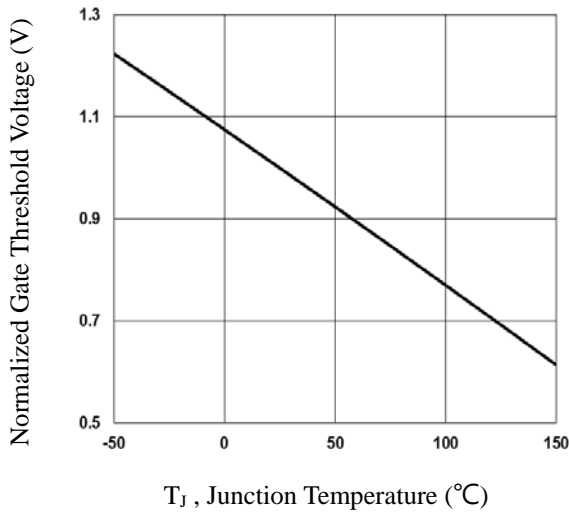


Fig.3 Normalized V_{th} vs. T_J

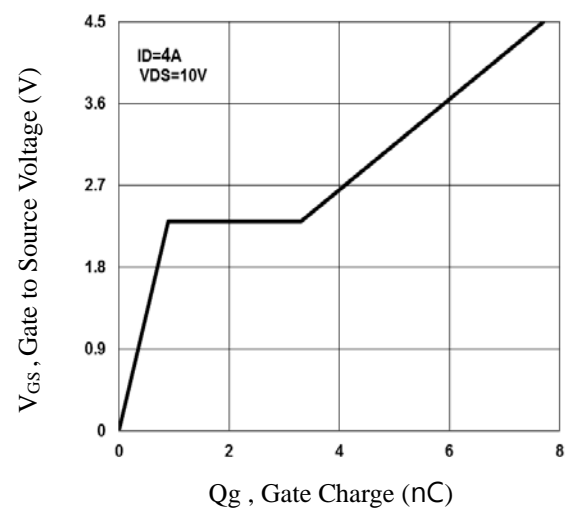


Fig.4 Gate Charge Waveform

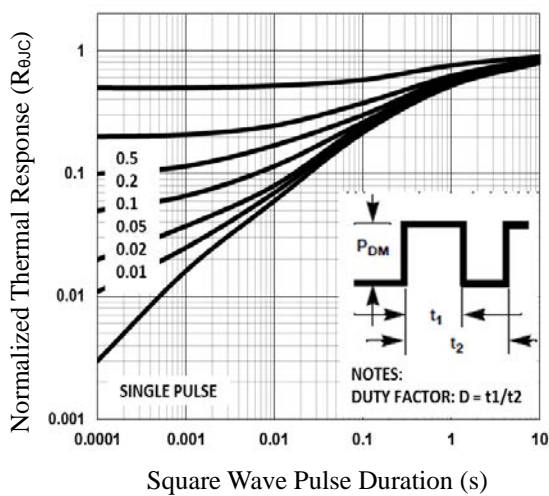


Fig.5 Normalized Transient Impedance

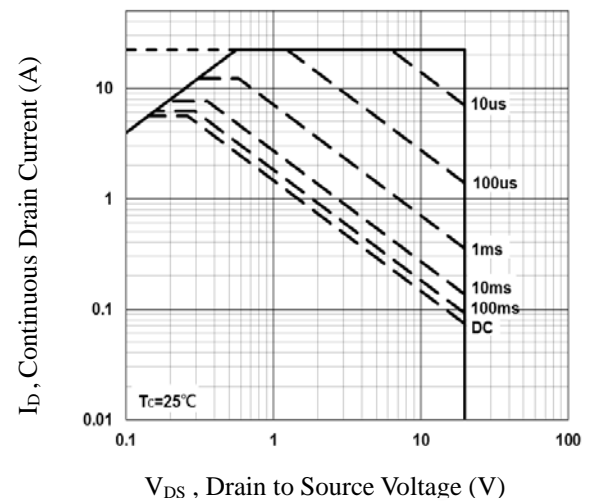


Fig.6 Maximum Safe Operation Area

DEVICE CHARACTERISTICS

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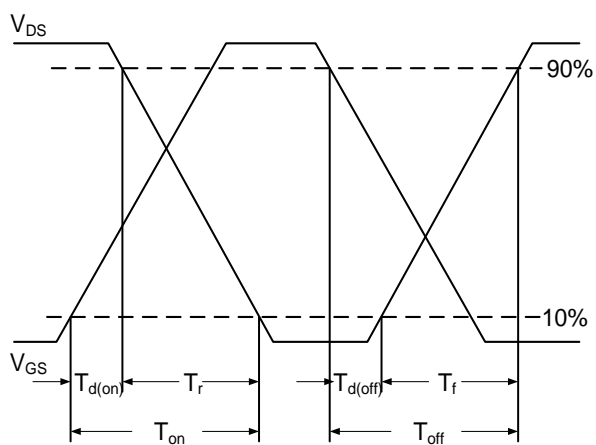


Fig.7 Switching Time Waveform

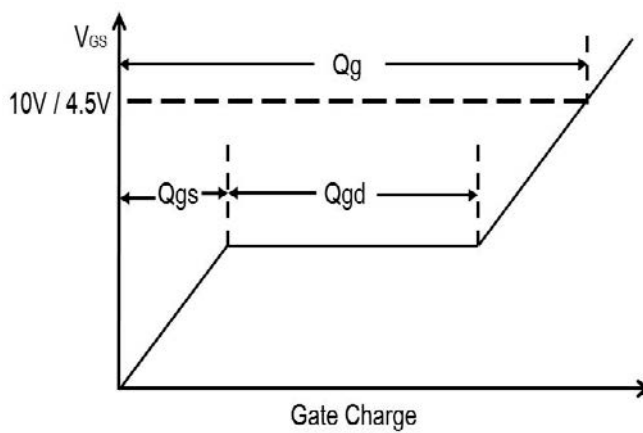
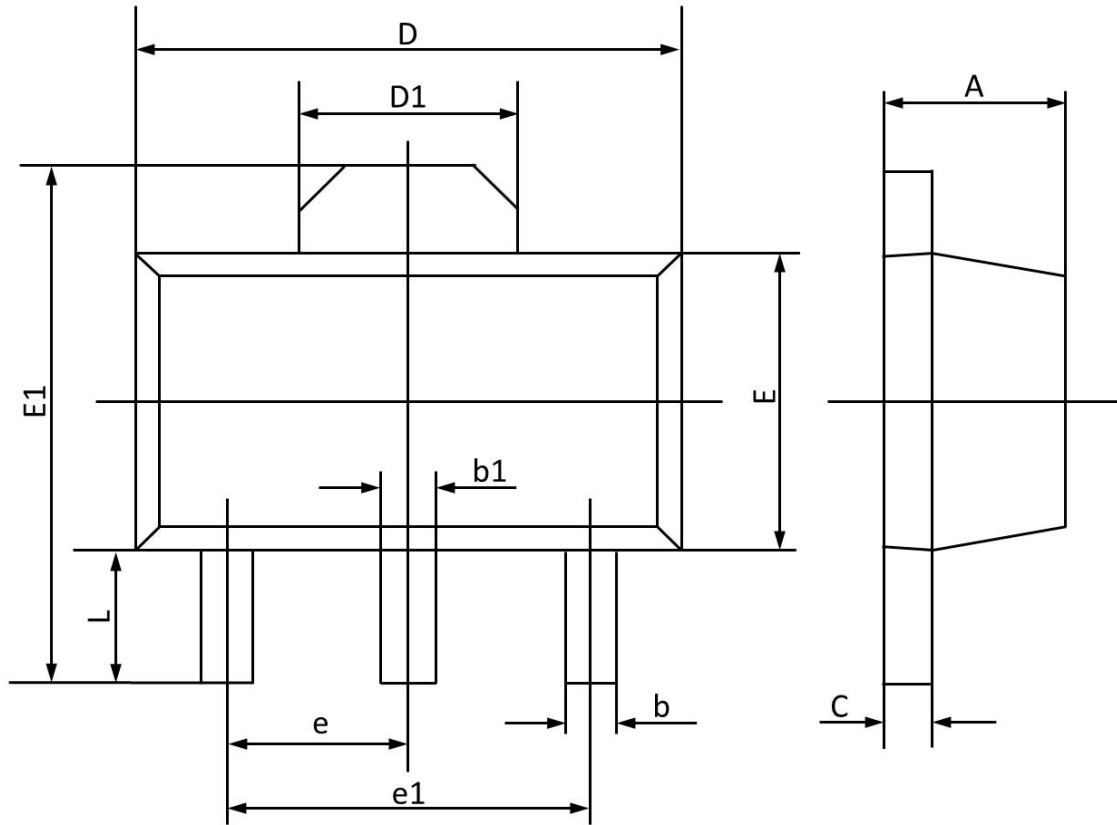


Fig.8 Gate Charge Waveform

PACKAGE OUTLINE & DIMENSIONS

YS2314K

SOT-89 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF		0.061 REF	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP.		0.060 TYP.	
e1	3.000 TYP		0.118 TYP	
L	0.900	1.200	0.035	0.047