YEA SHIN TECHNOLOGY CO., LTD

YS3714Q

N+P-Channel Enhancement MOSFET

N-ch: VDS= 30V, ID= 4.0A / P-ch: VDS= -30V, ID= -3.0A

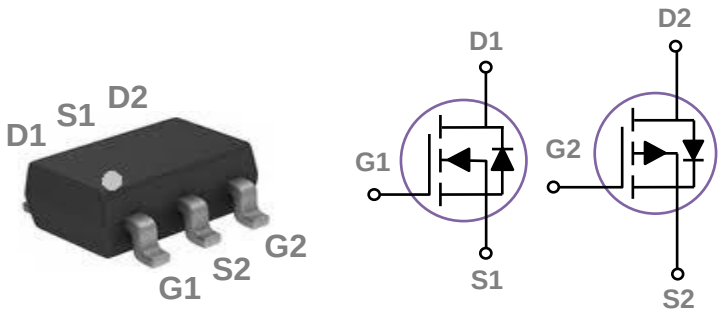
Features

- *Fast switching*
- *Green Device Available*
- *Suit for 4.5V Gate Drive Applications*

Applications

- *DC Fan*
- *Motor Drive Applications*
- *Networking*
- *Half / Full Bridge Topology*

SOT-26 Dual Pin Configuration



Absolute Maximum Rating T_C=25℃ **unless otherwise noted**

Symbol	Parameter	Rating		Units
V_{DS}	Drain-Source Voltage	30	-30	V
V_{GS}	Gate-Source Voltage	±20	±20	V
I_D	Drain Current – Continuous (T_C=25℃)	4.0	-3.0	A
	Drain Current – Continuous (T_C=100℃)	2.5	-1.8	A
I_{DM}	Drain Current – Pulsed[1]	16	-12	A
P_D	Power Dissipation (T_C=25℃)	2		W
	Power Dissipation – Derate above 25℃	0.016		W/℃
T_{STG}	Storage Temperature Range	-55 to 150		℃
T_J	Operating Junction Temperature Range	-55 to 150		℃

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	62.5	℃/W

DEVICE CHARACTERISTICS

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N-CH Electrical Characteristics **(T_J=25 ℃, unless otherwise noted)**

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	30	---	---	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=30V, V_{GS}=0V, T_J=25℃	---	---	1	uA
		V_{DS}=24V, V_{GS}=0V, T_J=125℃	---	---	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	V_{GS}=10V, I_D=4A	---	22	30	mΩ
		V_{GS}=4.5V, I_D=2A	---	35	46	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS}, I_D=250uA	1.2	1.6	2.5	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-4	---	mV/℃
gfs	Forward Transconductance	V_{DS}=10V, I_D=3A	---	6.5	---	S

Dynamic and Switching Characteristics

Q_g	Total Gate Charge[2,3]	V_{DS}=15V, V_{GS}=4.5V, I_D=3A	---	4.1	8	nC
Q_{gs}	Gate-Source Charge[2,3]		---	1	2	
Q_{gd}	Gate-Drain Charge[2,3]		---	2.1	4	
$T_{d(on)}$	Turn-On Delay Time[2,3]	V_{DD}=15V, V_{GS}=10V, R_G=6Ω, I_D=1A	---	2.8	5	ns
T_r	Rise Time[2,3]		---	7.2	14	
$T_{d(off)}$	Turn-On Delay Time[2,3]		---	15.8	30	
T_f	Fall Time[2,3]		---	4.6	9	
C_{iss}	Input Capacitance	V_{DS}=25V, V_{GS}=0V, f=1MHz	---	345	500	pF
C_{oss}	Output Capacitance		---	55	80	
C_{rss}	Reverse Transfer Capacitance		---	32	45	
Rg	Gate resistance	V_{GS}=0V, V_{DS}=0V, F=1MHz	---	3.2	6.4	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	---	---	4	A
I_{SM}	Pulsed Source Current		---	---	8	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V, I_S=1A, T_J=25℃	---	---	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.

DEVICE CHARACTERISTICS

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N-CH

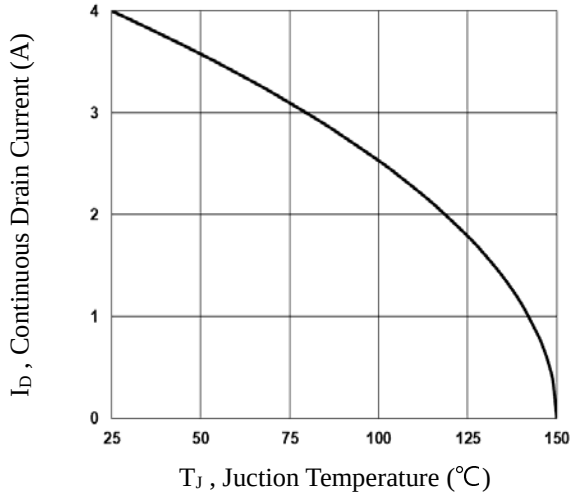

Fig.1 Continuous Drain Current vs. T_C

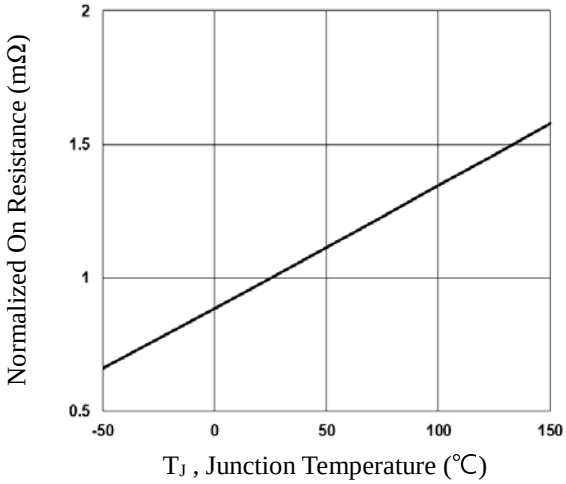

Fig.2 Normalized RDSON vs. T_J

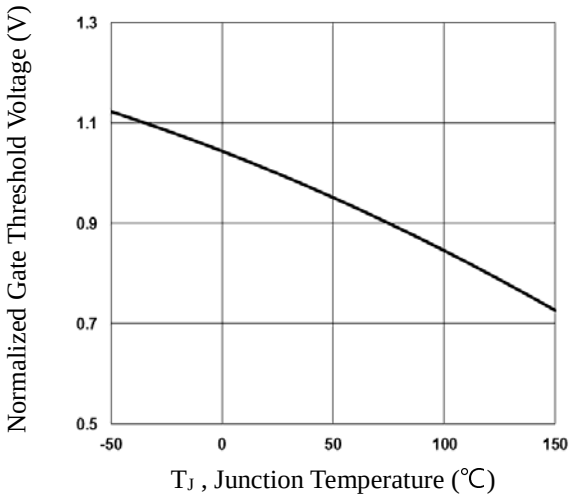

Fig.3 Normalized V_{th} vs. T_J

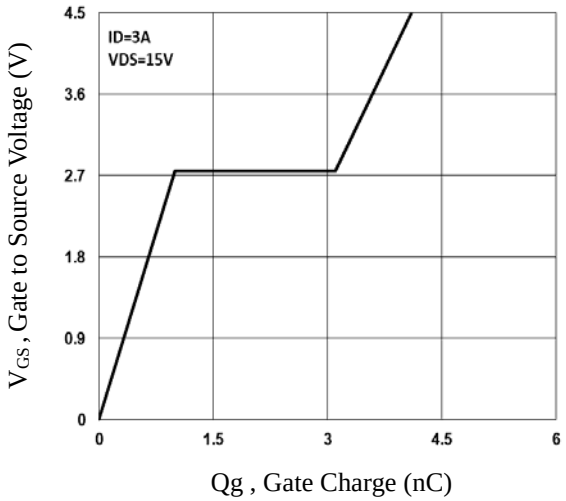

Fig.4 Gate Charge Waveform

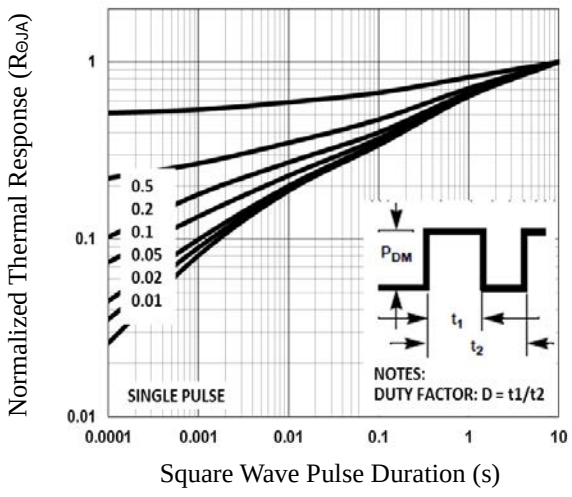

Fig.5 Normalized Transient Response

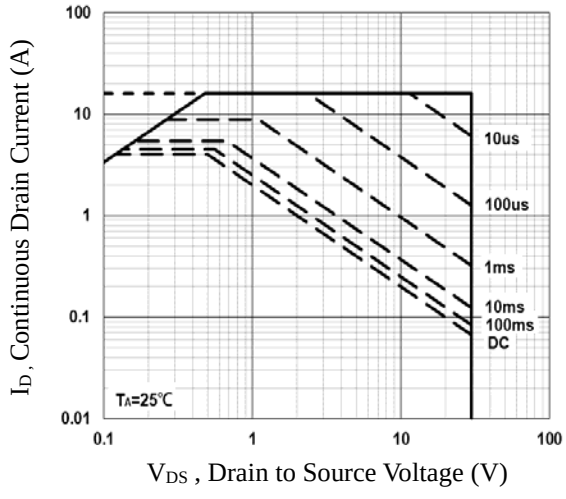

Fig.6 Maximum Safe Operation Area

DEVICE CHARACTERISTICS

YS3714Q

P-CH Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=-250uA	-30	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BV_{DSS} Temperature Coefficient	Reference to 25℃, I_D=-1mA	---	-0.03	---	V/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-30V, V_{GS}=0V, T_J=25℃	---	---	-1	uA
		V_{DS}=-24V, V_{GS}=0V, T_J=125℃	---	---	-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	V_{GS}=-10V, I_D=-3A	---	45	65	mΩ
		V_{GS}=-4.5V, I_D=-2A	---	65	90	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS}, I_D=-250uA	-1.2	-1.6	-2.2	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	4	---	mV/℃
gfs	Forward Transconductance	V_{DS}=-10V, I_S=-3A	---	3.7	---	S

Dynamic and Switching Characteristics

Q_g	Total Gate Charge[2,3]	V_{DS}=-30V, V_{GS}=-4.5V, I_D=-2A	---	5	8	nC
Q_{gs}	Gate-Source Charge[2,3]		---	1.4	3	
Q_{gd}	Gate-Drain Charge[2,3]		---	1.7	4	
$T_{d(on)}$	Turn-On Delay Time[2,3]	V_{DD}=-30V, V_{GS}=-10V, R_G=6Ω, I_D=-1A	---	3.4	6	ns
T_r	Rise Time[2,3]		---	10.8	21	
$T_{d(off)}$	Turn-On Delay Time[2,3]		---	26.9	51	
T_f	Fall Time[2,3]		---	6.9	13	
C_{iss}	Input Capacitance	V_{DS}=-30V, V_{GS}=0V, f=1MHz	---	420	810	pF
C_{oss}	Output Capacitance		---	50	80	
C_{rss}	Reverse Transfer Capacitance		---	35	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	---	---	-3	A
I_{SM}	Pulsed Source Current		---	---	-6	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V, I_S=-1A, T_J=25℃	---	---	-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.

DEVICE CHARACTERISTICS

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P-CH

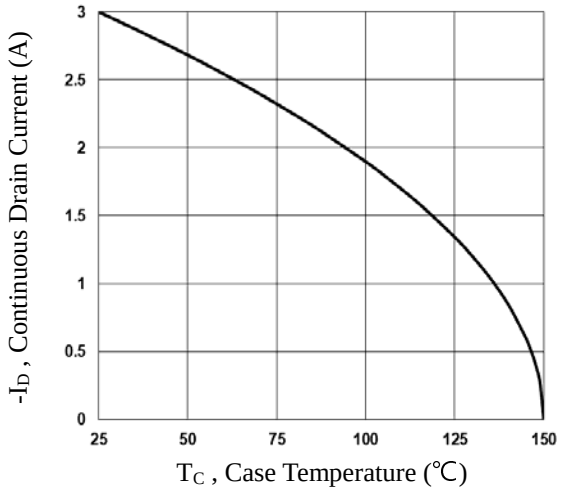


Fig.1 Continuous Drain Current vs. T_C

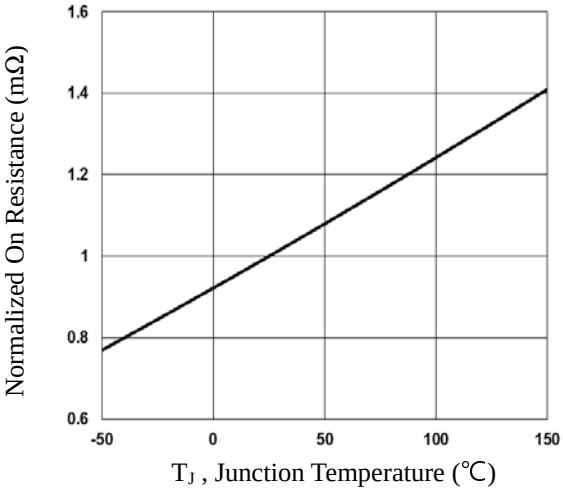


Fig.2 Normalized RDSON vs. T_J

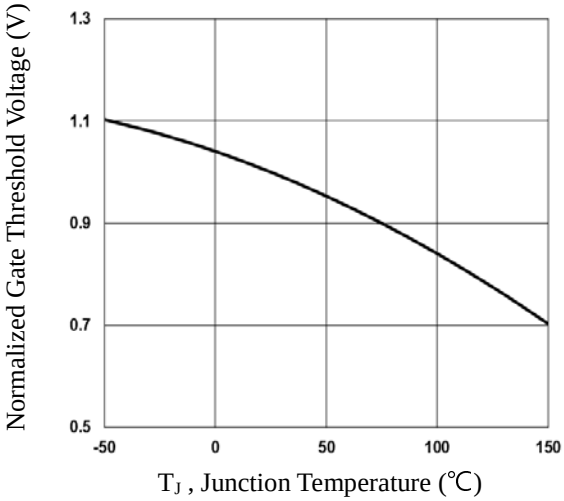


Fig.3 Normalized V_{th} vs. T_J

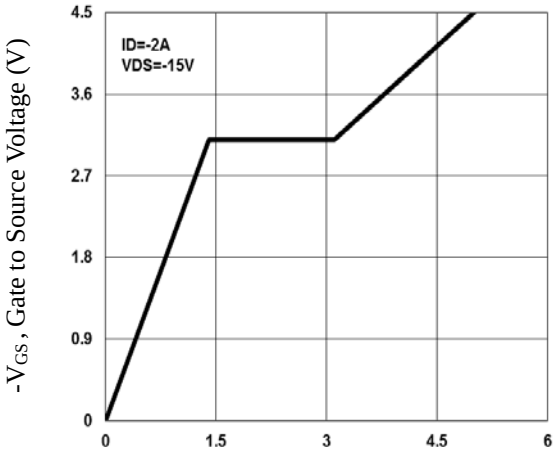


Fig.4 Gate Charge Waveform

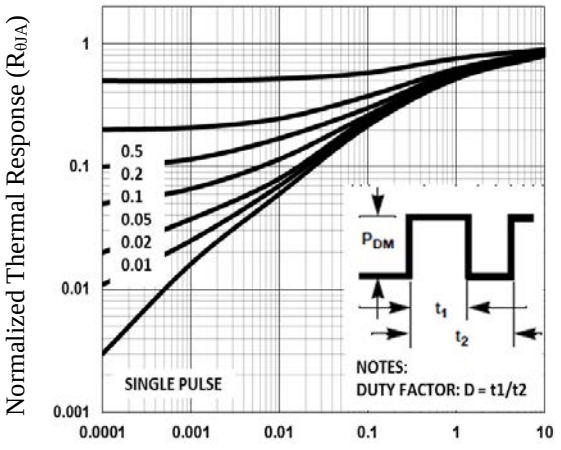


Fig.5 Normalized Transient Impedance

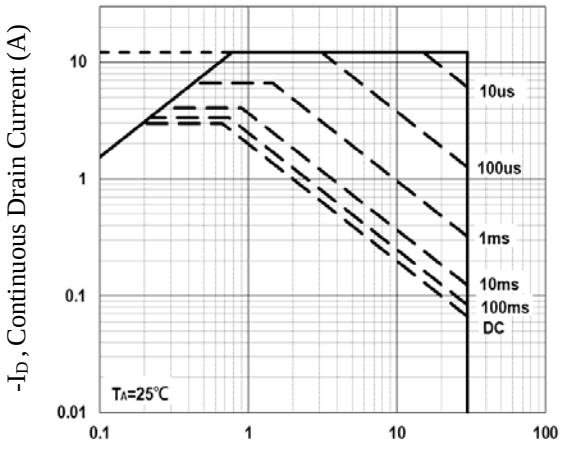
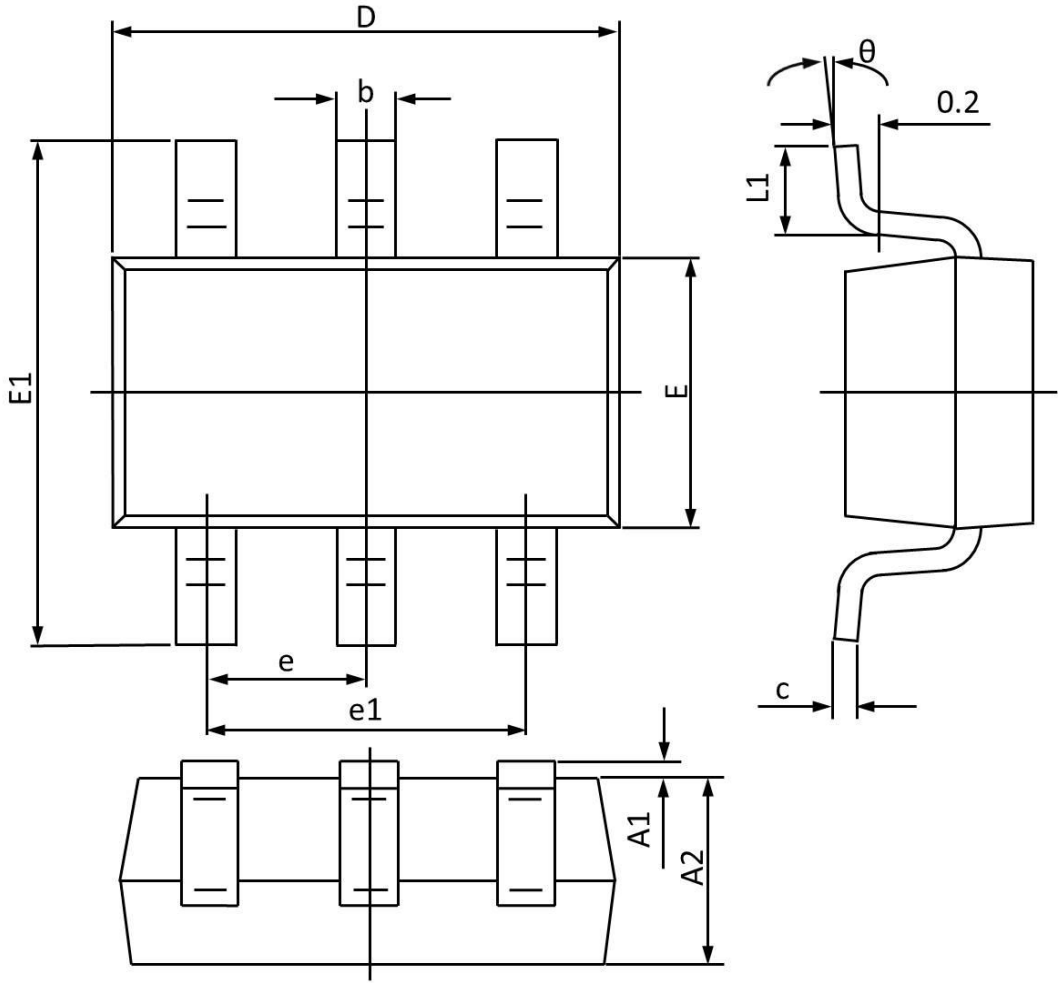


Fig.6 Maximum Safe Operation Area

PACKAGE OUTLINE & DIMENSIONS

YS3714Q

SOT-26 Dual PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A1	0.000	0.100	0.000	0.004
A2	1.000	1.200	0.040	0.047
b	0.300	0.500	0.012	0.019
c	0.047	0.207	0.002	0.008
D	2.800	3.000	0.110	0.118
E	1.500	1.800	0.059	0.070
E1	2.600	3.000	0.103	0.118
e	0.950 TYP		0.037 TYP	
e1	1.900 TYP		0.075 TYP	
L1	0.250	0.550	0.010	0.021
θ	0°	8°	0°	8°