

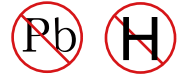


YEA SHIN TECHNOLOGY CO., LTD

YS3712VBB

N+P-Channel Enhancement MOSFET

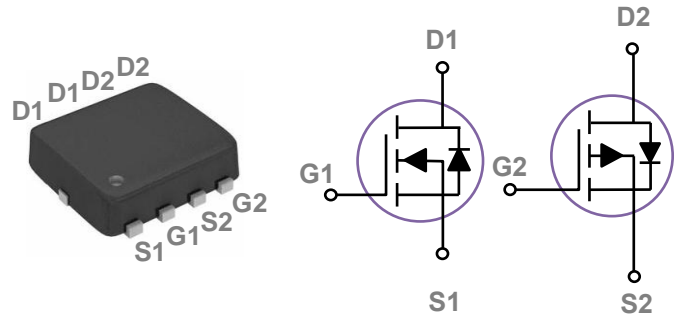
N-ch: VDS= 30V, ID= 12A / P-ch: VDS= -30V, ID= -5A



Features

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

PPAK3x3 Dual 2EP Pin Configuration



Applications

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

Absolute Maximum Rating $T_c=25^\circ\text{C}$ 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 ($T_c=25^\circ\text{C}$)	12	-8	A
	Drain Current – Continuous ($T_c=100^\circ\text{C}$)	7.2	-4.8	A
I _{DM}	Drain Current – Pulsed ¹	48	-32	A
EAS	Single Pulse Avalanche Energy ^{2,6}	14	5	mJ
IAS	Single Pulse Avalanche Current ^{2,6}	17	10	A
P _D	Power Dissipation ($T_c=25^\circ\text{C}$)	20		W
	Power Dissipation – Derate above 25°C	0.16		W/°C
T _{STG}	Storage Temperature Range	-55 to 150		°C
T _J	Operating Junction Temperature Range	-55 to 150		°C

Thermal Characteristics $T_j=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Typ.	Max.	Unit
R _{θJA}	Thermal Resistance Junction to ambient	---	62.5	°C / W
R _{θJC}	Thermal Resistance Junction to Case	---	6.4	°C / W

DEVICE CHARACTERISTICS

YS3712VBB

N-CH 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 =250μA	30	---	---	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =30V, V _{GS} =0V, T _J =25°C	---	---	1	μA
		V _{DS} =24V, V _{GS} =0V, T _J =125°C	---	---	10	μA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA

On Characteristics

R _{DS(ON)}	Static Drain-source On-Resistance ³	V _{GS} =10V, I _D =10A	---	15	20	mΩ
		V _{GS} =4.5V, I _D =6A	---	21	30	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250μA	1.2	1.5	2.5	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	-4	---	mV/°C
g _{fs}	Forward Transconductance	V _{DS} =5V, I _D =6A	---	13	---	S

Dynamic and Switching Characteristics

Q _g	Total Gate Charge ^{3,4}	V _{DS} =15V, V _{GS} =4.5V, I _D =8A	---	4.1	6	nC
Q _{gs}	Gate-Source Charge ^{3,4}		---	1	1.4	
Q _{gd}	Gate-Drain Charge ^{3,4}		---	2.1	4	
T _{d(on)}	Turn-On Delay Time ^{3,4}	V _{DD} =15V, V _{GS} =10V, R _G =6 Ω, I _D =1A	---	2.8	5	ns
T _r	Rise Time ^{3,4}		---	7.2	14	
T _{d(off)}	Turn-Off Delay Time ^{3,4}		---	15.8	30	
T _f	Fall Time ^{3,4}		---	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	55	
R _g	Gate Resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz	---	3.2	6.4	Ω

Drain-Source Diode Characteristics and Maximum Ratings

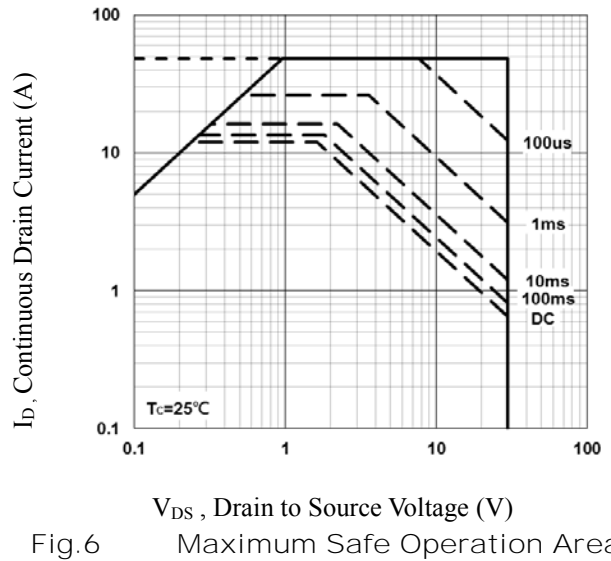
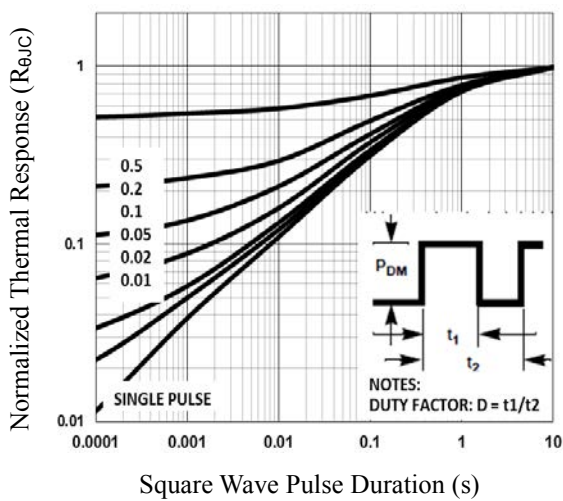
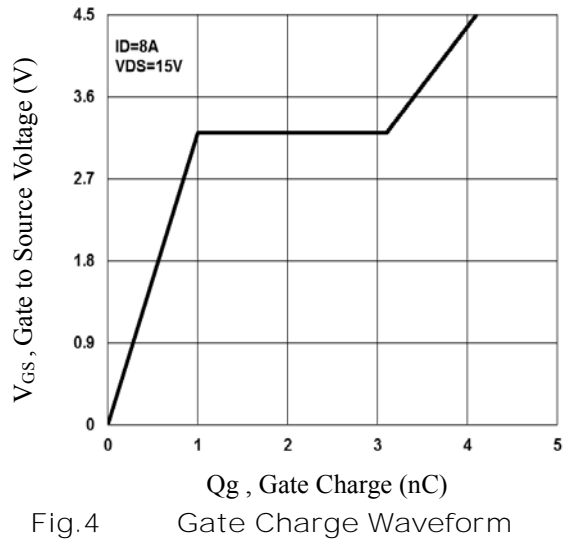
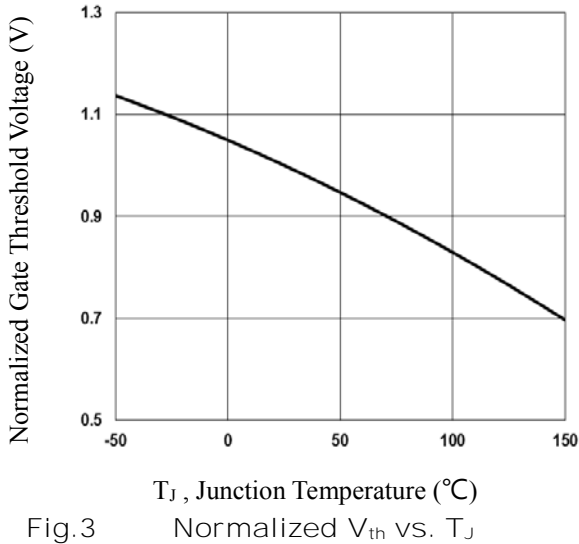
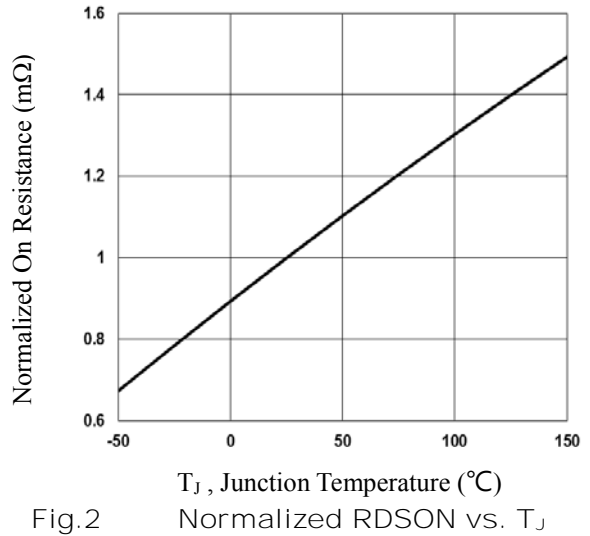
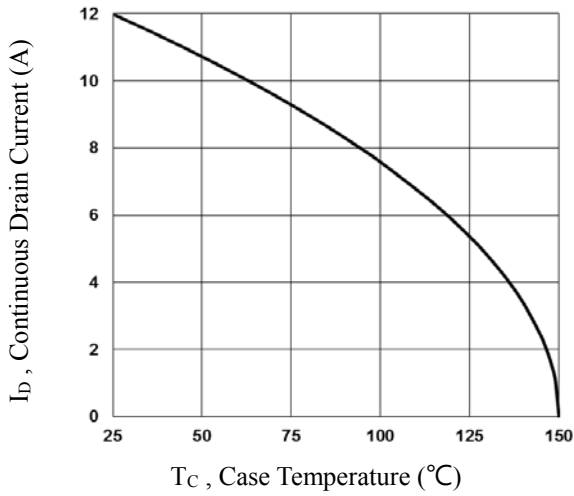
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _G =V _D =0V, Force Current	---	---	12	A
I _{SM}	Pulsed Source Current ³		---	---	24	A
V _{SD}	Diode Forward Voltage ³	V _{GS} =0V, I _S =1A, T _J =25°C	---	---	1	V

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=17A, R_G=25Ω, Starting T_J=25°C.
3. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%.
4. Essentially independent of operating temperature.

DEVICE CHARACTERISTICS

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P-CH 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	-30	---	---	V
ΔBV _{DSS} /ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25°C, I _D =-1mA	---	-0.03	---	V/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-30V, V _{GS} =0V, T _J =25°C	---	---	-1	uA
		V _{DS} =-24V, V _{GS} =0V, T _J =125°C	---	---	-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 =-5A	---	40	60	mΩ
		V _{GS} =-4.5V, I _D =-3A	---	60	75	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250uA	-1.2	-1.6	-2.5	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	4	---	mV/°C
g _{fs}	Forward Transconductance	V _{DS} =-10V, I _D =-3A	---	3.5	---	S

Dynamic and Switching Characteristics

Q _g	Total Gate Charge ^{7,8}	V _{DS} =-15V, V _{GS} =-4.5V, I _D =-3A	---	5.1	7	nC
Q _{gs}	Gate-Source Charge ^{7,8}		---	2	3	
Q _{gd}	Gate-Drain Charge ^{7,8}		---	2.2	4	
T _{d(on)}	Turn-On Delay Time ^{7,8}	V _{DD} =-15V, V _{GS} =-10V, R _G =6Ω, I _D =-1A	---	3.4	6	ns
T _r	Rise Time ^{7,8}		---	10.8	21	
T _{d(off)}	Turn-Off Delay Time ^{7,8}		---	26.9	51	
T _f	Fall Time ^{7,8}		---	6.9	13	
C _{iss}	Input Capacitance	V _{DS} =-15V, V _{GS} =0V, f=1MHz	---	560	810	pF
C _{oss}	Output Capacitance		---	55	80	
C _{rss}	Reverse Transfer Capacitance		---	40	60	

Drain-Source Diode Characteristics and Maximum Ratings

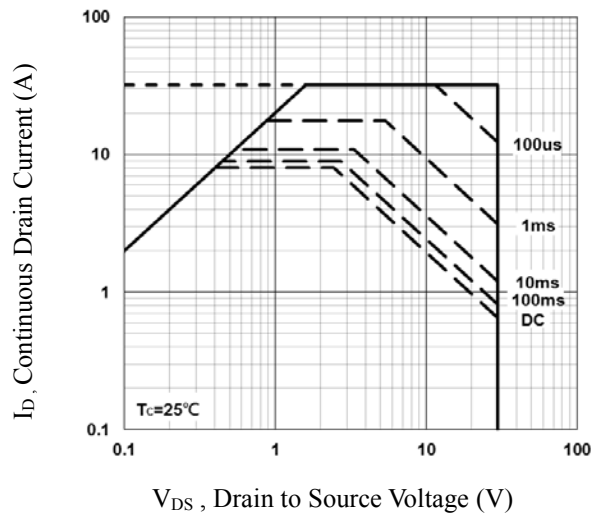
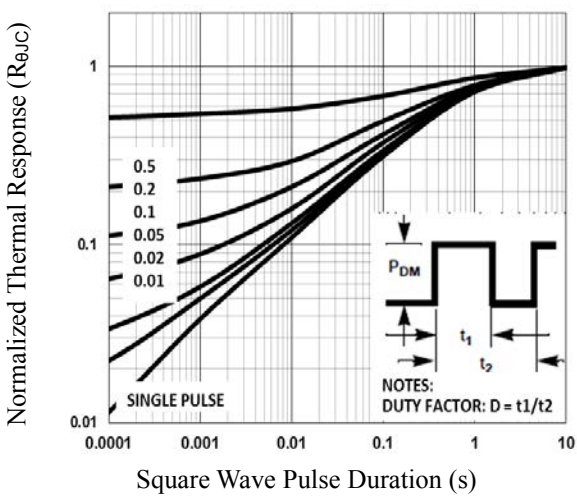
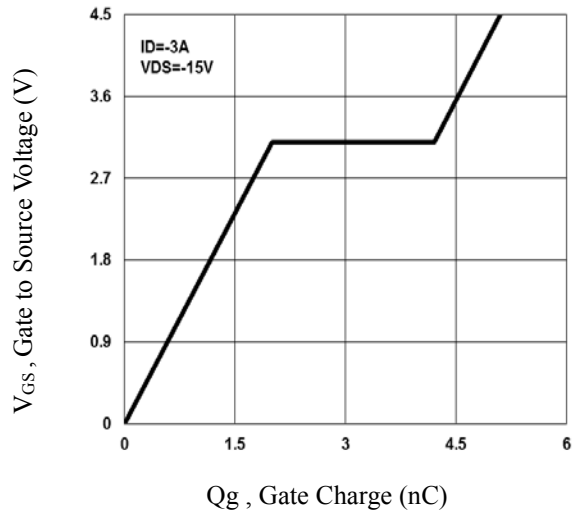
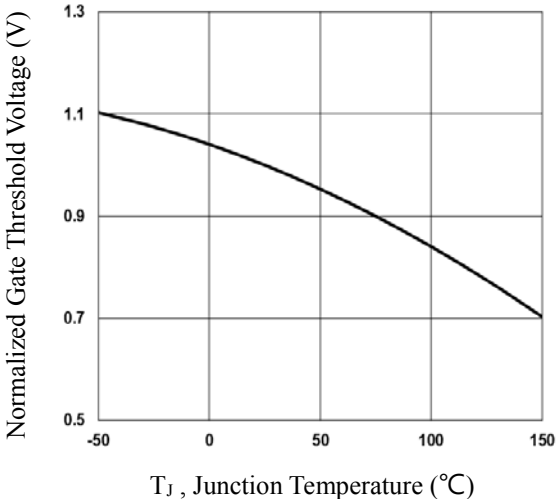
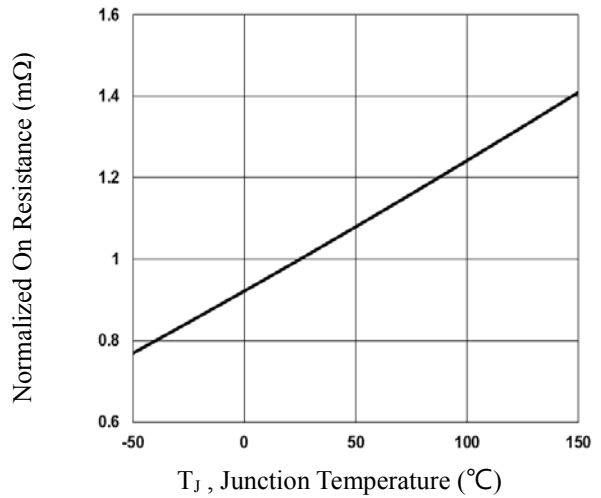
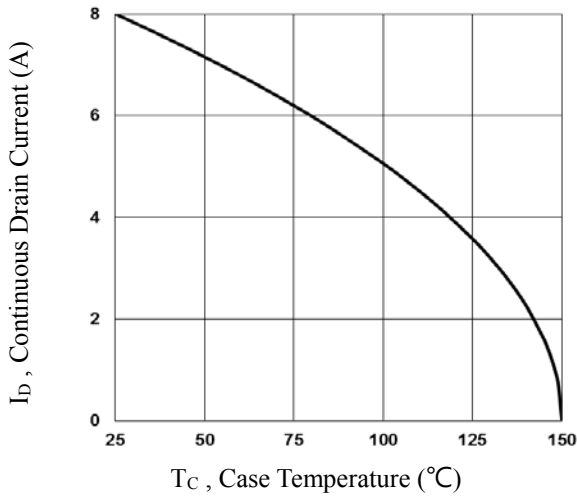
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _G =V _D =0V, Force Current	---	---	-8	A
I _{SM}	Pulsed Source Current		---	---	-16	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =-1A, T _J =25°C	---	---	-1	V

Note :

5. Repetitive Rating : Pulsed width limited by maximum junction temperature.
6. V_{DD}=-25V, V_{GS}=-10V, L=0.1mH, I_{AS}=-10A, R_G=25Ω, Starting T_J=25°C
7. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%.
8. Essentially independent of operating temperature.

DEVICE CHARACTERISTICS

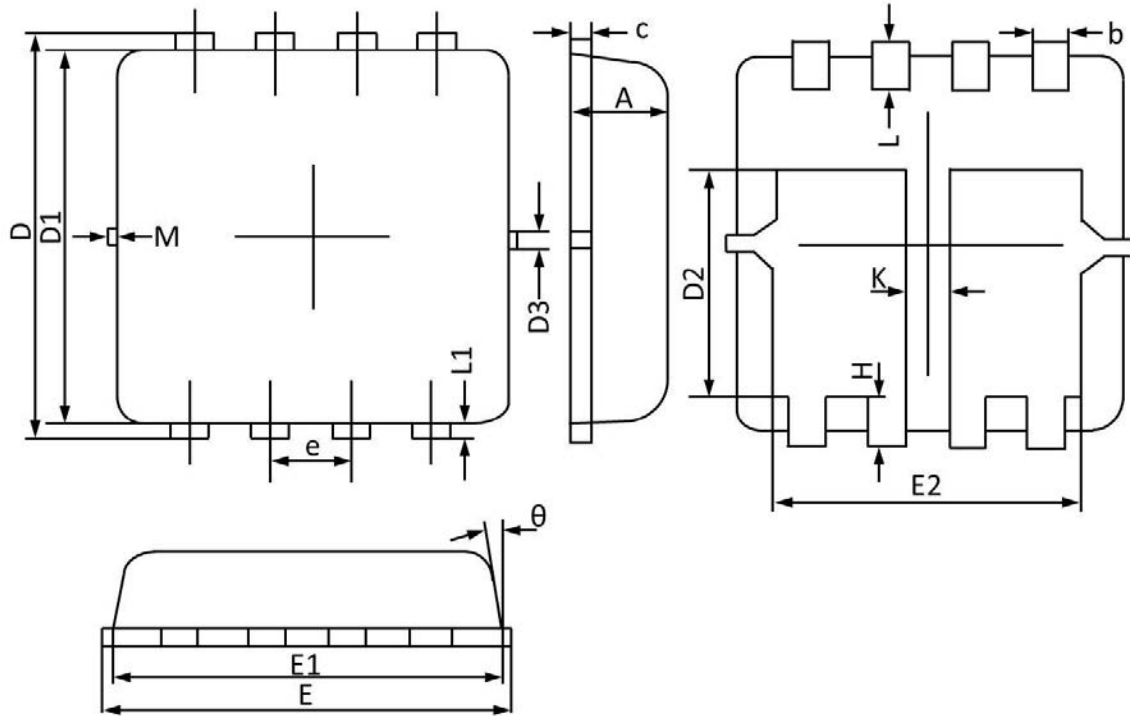
YS3712VBB



PACKAGE OUTLINE & DIMENSIONS

YS3712VBB

PPAK3x3 Dual PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.700	0.800	0.028	0.031
b	0.250	0.350	0.010	0.013
c	0.100	0.250	0.004	0.009
D	3.250	3.450	0.128	0.135
D1	3.000	3.200	0.119	0.125
D2	1.780	1.980	0.070	0.077
D3	0.130 REF		0.005 REF	
E	3.200	3.400	0.126	0.133
E1	3.000	3.200	0.119	0.125
E2	2.390	2.590	0.094	0.102
e	0.650 BSC		0.026 BSC	
H	0.300	0.500	0.011	0.019
L	0.300	0.500	0.011	0.019
L1	0.130 REF		0.005 REF	
K	0.300 REF		0.012 REF	
θ	0°	12°	0°	12°
M	0.150 REF		0.006 REF	