

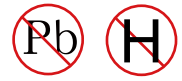


YEA SHIN TECHNOLOGY CO., LTD

YS6988Z-5BB

N-Channel Enhancement MOSFET

VDS= 65V, ID= 35A



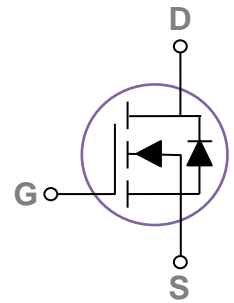
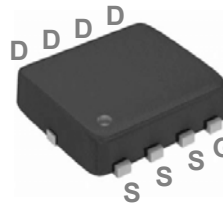
Features

- 65V, 35A, $R_{DS(ON)} = 16m\Omega$ @ $V_{GS} = 10V$
- Improved dv/dt capability
- Fast switching
- 100% EAS Guaranteed
- Green Device Available

Applications

- Motor Drive
- Power Tools
- LED Lighting
- Quick Charger

PPAK3x3 Pin Configuration



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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	65	V
V_{GS}	Gate-Source Voltage	+20/-12	V
I_D	Drain Current – Continuous ($T_c=25^\circ\text{C}$)	35	A
	Drain Current – Continuous ($T_c=100^\circ\text{C}$)	22	A
I_{DM}	Drain Current – Pulsed ¹	140	A
EAS	Single Pulse Avalanche Energy ²	9.1	mJ
IAS	Single Pulse Avalanche Current ²	13.5	A
P_D	Power Dissipation ($T_c=25^\circ\text{C}$)	33.8	W
	Power Dissipation – Derate above 25°C	0.27	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	---	62	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	3.7	$^\circ\text{C}/\text{W}$

DEVICE CHARACTERISTICS

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

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	65	---	---	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} =60V, V _{GS} =0V, T _J =25°C	---	---	1	uA
		V _{DS} =48V, V _{GS} =0V, T _J =85 °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 ³	V _{GS} =10V, I _D =12A	---	12.6	16	mΩ
		V _{GS} =4.5V, I _D =5A	---	19	24	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1	1.6	2.5	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	-5.1	---	mV/°C
g _{fs}	Forward Transconductance	V _{DS} =10V, I _D =3 A	---	5	---	S

Dynamic and Switching Characteristics

Q _g	Total Gate Charge ^{3,4}	V _{DS} =30V, V _{GS} =10V, I _D =12A	---	10.9	22	nC
Q _{gs}	Gate-Source Charge ^{3,4}		---	1.5	3	
Q _{gd}	Gate-Drain Charge ^{3,4}		---	4.4	9	
T _{d(on)}	Turn-On Delay Time ^{3,4}	V _{DD} =30V, V _{GS} =10V, R _G =3.3Ω, I _D =1A	---	8	16	ns
T _r	Rise Time ^{3,4}		---	12	24	
T _{d(off)}	Turn-Off Delay Time ^{3,4}		---	25	50	
T _f	Fall Time ^{3,4}		---	18	36	
C _{iss}	Input Capacitance	V _{DS} =30V, V _{GS} =0V, f=1MHz	---	653	1300	pF
C _{oss}	Output Capacitance		---	192	380	
C _{rss}	Reverse Transfer Capacitance		---	27	60	
R _g	Gate Resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz	---	0.3	---	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	---	---	35	A
I _{SM}	Pulsed Source Current ³		---	---	70	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}=50V, V_{GS}=10V, L=0.1mH, I_{AS}=13.5A., 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.

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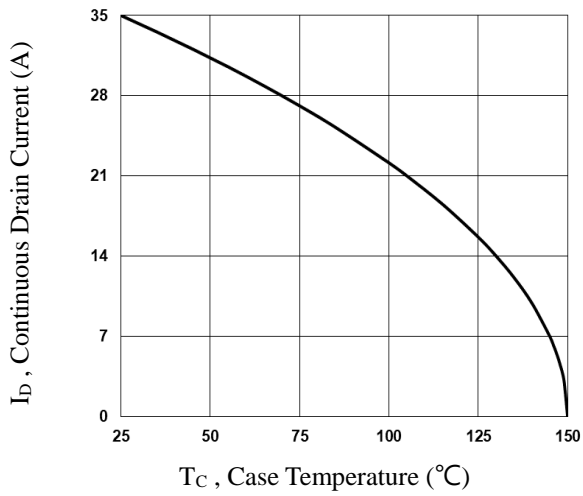


Fig.1 Continuous Drain Current vs. T_c

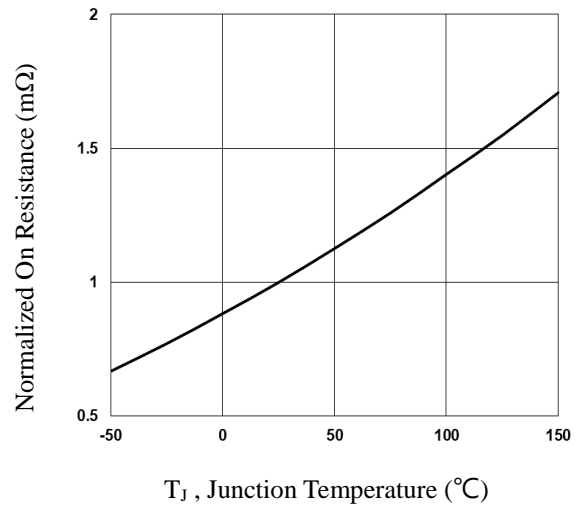


Fig.2 Normalized $R_{DS(on)}$ vs. T_j

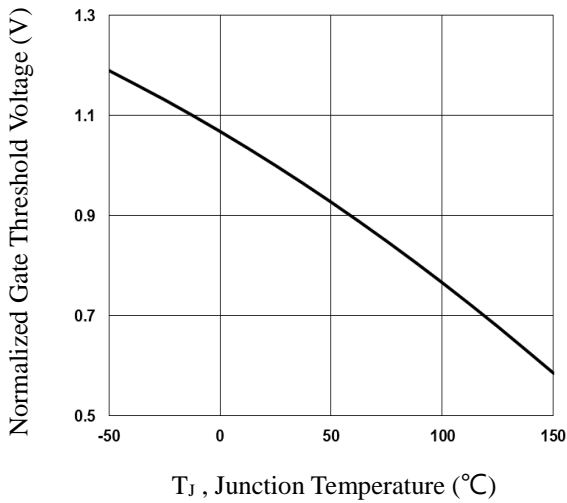


Fig.3 Normalized V_{th} vs. T_j

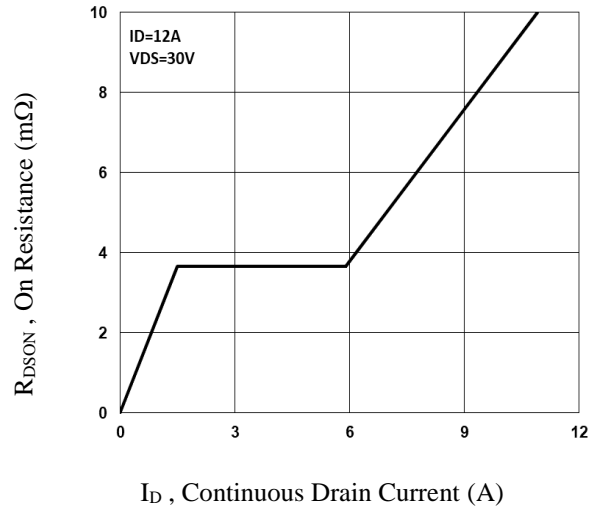


Fig.4 $R_{DS(on)}$ vs. Continuous Drain Current

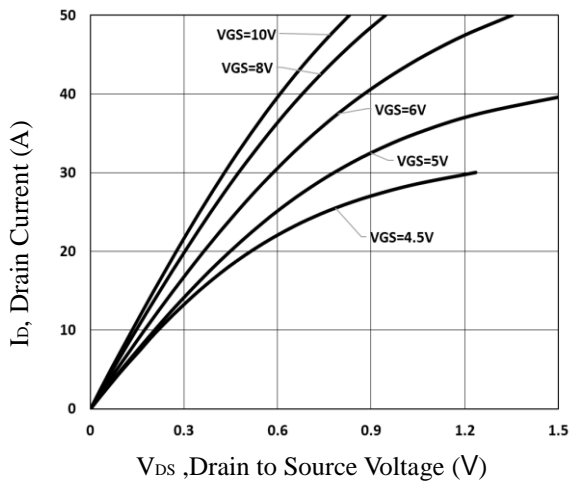


Fig.5 Typical Output Characteristics

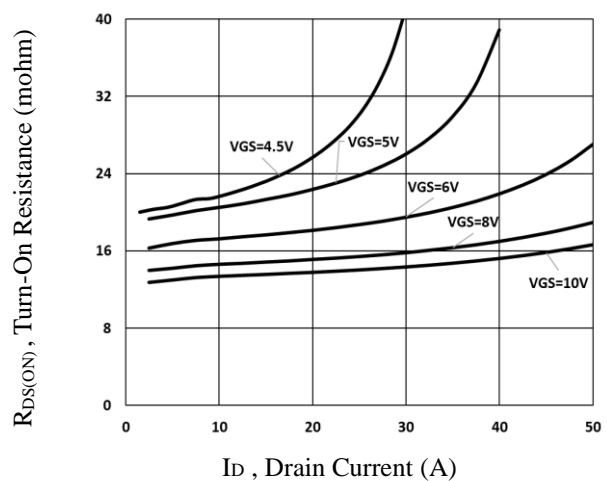


Fig.6 Turn-On Resistance vs. I_D

DEVICE CHARACTERISTICS

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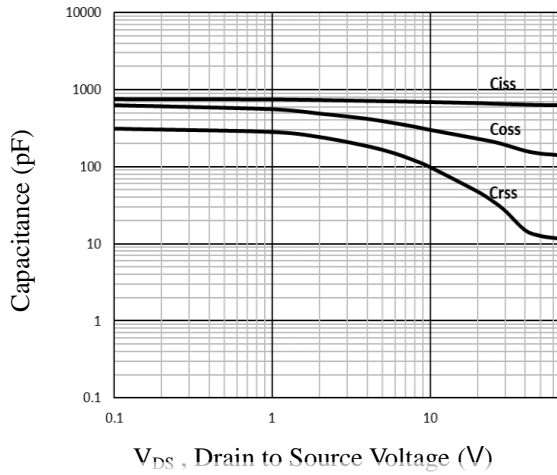


Fig.7 Capacitance Characteristics

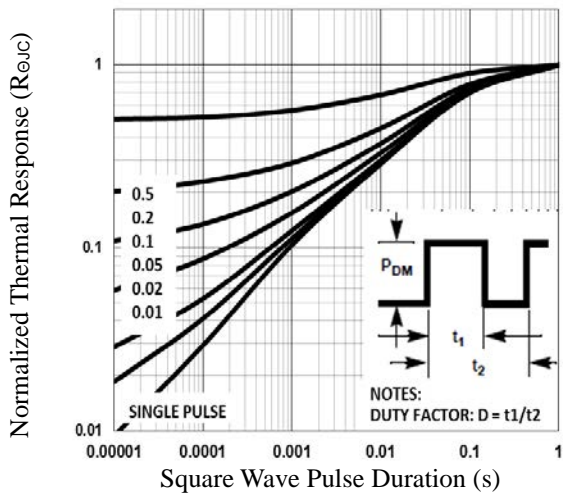


Fig.8 Normalized Transient Response

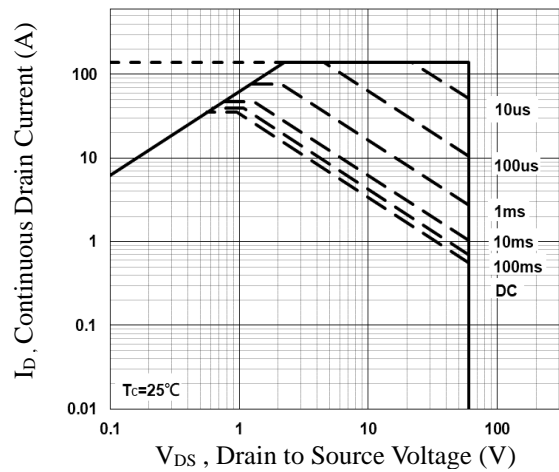


Fig.9 Maximum Safe Operation Area

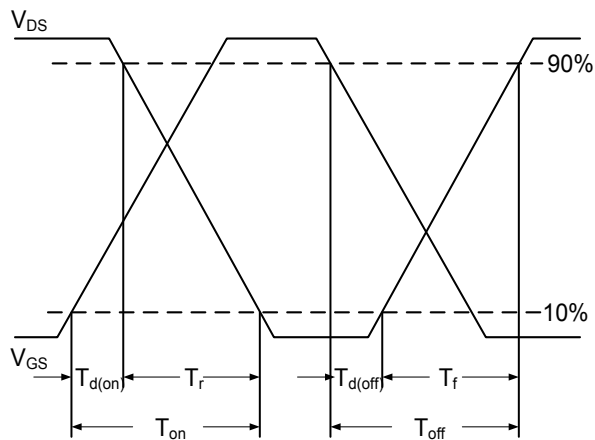


Fig.10 Switching Time Waveform

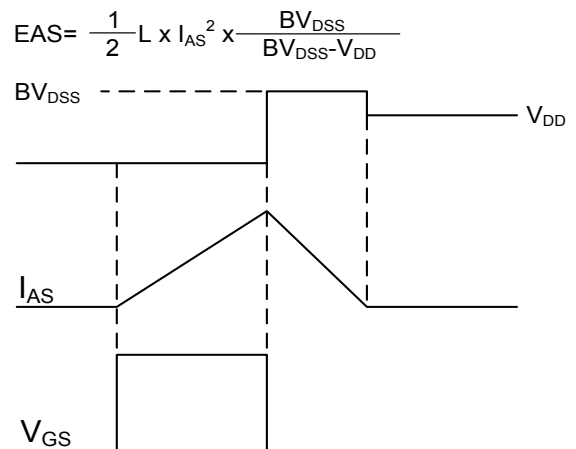
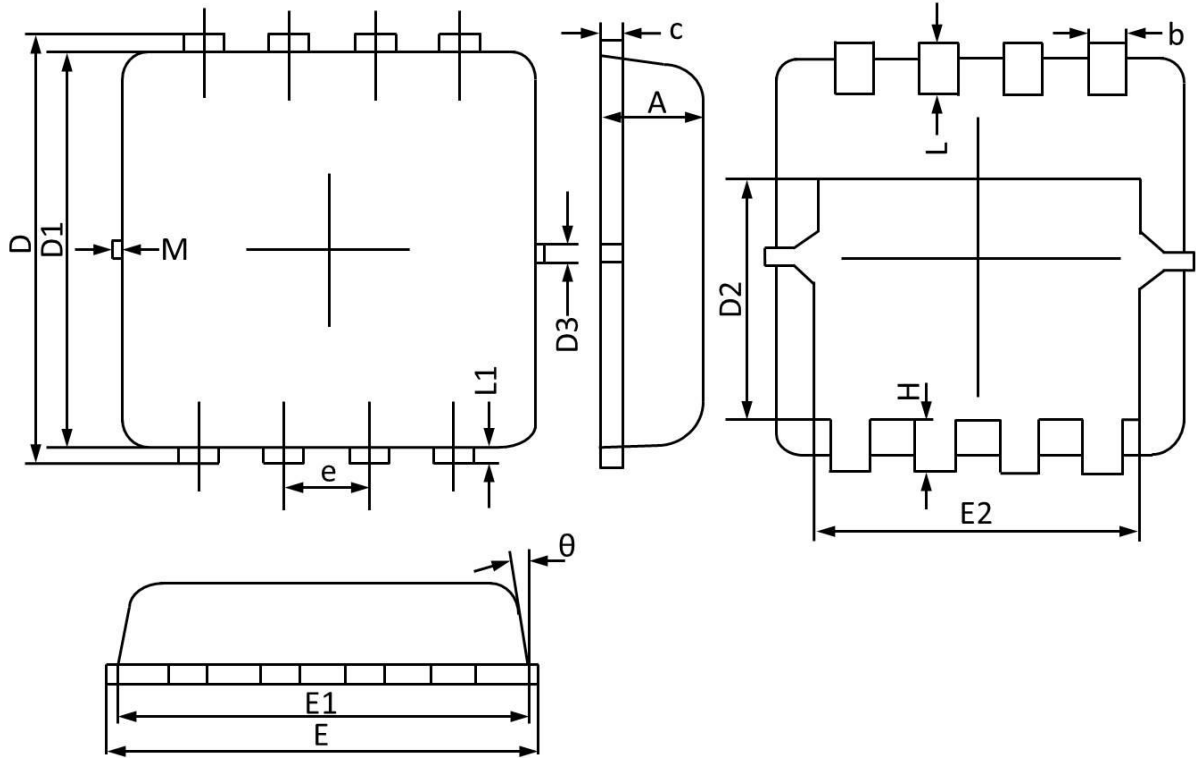


Fig.11 EAS Waveform

PACKAGE OUTLINE & DIMENSIONS

YS6988Z-5BB

PPAK3x3 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	
θ	0°	12°	0°	12°
M	0.150 REF		0.006 REF	