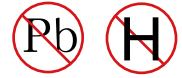




YEA SHIN TECHNOLOGY CO., LTD

YS3907ZBB

# P-Channel Enhancement MOSFET

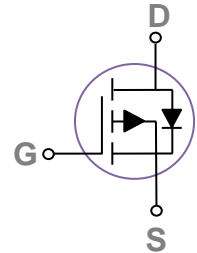
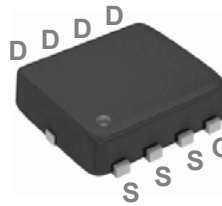


VDS= -30V, ID= -30A

## Features

- -30V,-30A, RDS(ON) =18mΩ@VGS = -10V
- Fast switching
- Green Device Available
- Suit for -4.5V Gate Drive Applications

## PPAK3x3 Pin Configuration



## Applications

- MB / VGA / Vcore
- POL Applications
- Load Switch
- LED Application

## Absolute Maximum Ratings Tc=25°C unless otherwise noted

Symbol	Parameter	Rating	Units
V <sub>DS</sub>	Drain-Source Voltage	-30	V
V <sub>GS</sub>	Gate-Source Voltage	±20	V
I <sub>D</sub>	Drain Current – Continuous (T <sub>c</sub> =25°C)	-30	A
	Drain Current – Continuous (T <sub>c</sub> =100°C)	-19	A
I <sub>DM</sub>	Drain Current – Pulsed <sup>1</sup>	-120	A
P <sub>D</sub>	Power Dissipation (T <sub>c</sub> =25°C)	27	W
	Power Dissipation – Derate above 25°C	0.22	W/°C
T <sub>STG</sub>	Storage Temperature Range	-55 to 150	°C
T <sub>J</sub>	Operating Junction Temperature Range	-55 to 150	°C

## Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
R <sub>θJA</sub>	Thermal Resistance Junction to ambient	---	62	°C /W
R <sub>θJC</sub>	Thermal Resistance Junction to Case	---	4.6	°C /W

# DEVICE CHARACTERISTICS

## YS3907ZBB

Electrical Characteristics ( $T_J=25\text{ }^\circ\text{C}$ , unless otherwise noted)

### Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-30	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	$BV_{DSS}$ Temperature Coefficient	Reference to $25^\circ\text{C}$ , $I_D=-1\text{mA}$	---	-0.03	---	$V/^\circ\text{C}$
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=-27V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	-1	$\mu A$
		$V_{DS}=-24V, V_{GS}=0V, T_J=125^\circ\text{C}$	---	---	-10	$\mu A$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	$\pm 100$	nA

### On Characteristics

$R_{DS(ON)}$	Static Drain-source On-Resistance	$V_{GS}=-10V, I_D=-8A$	---	14.5	18	$m\Omega$
		$V_{GS}=-4.5V, I_D=-6A$	---	23	30	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1.2	-1.6	-2.5	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	4	---	$mV/^\circ\text{C}$
$g_{fs}$	Forward Transconductance	$V_{DS}=-10V, I_D=-8A$	---	6.8	---	S

### Dynamic and Switching Characteristics

$Q_g$	Total Gate Charge <sup>2,3</sup>	$V_{DS}=-15V, V_{GS}=-4.5V, I_D=-5A$	---	11	17	nC
$Q_{gs}$	Gate-Source Charge <sup>2,3</sup>		---	3.4	6	
$Q_{gd}$	Gate-Drain Charge <sup>2,3</sup>		---	4.2	8	
$T_{d(on)}$	Turn-On Delay Time <sup>2,3</sup>	$V_{DD}=-15V, V_{GS}=-10V, R_G=6\Omega, I_D=-1A$	---	5.8	11	ns
$T_r$	Rise Time <sup>2,3</sup>		---	18.8	36	
$T_{d(off)}$	Turn-Off Delay Time <sup>2,3</sup>		---	46.9	90	
$T_f$	Fall Time <sup>2,3</sup>		---	12.3	23	
$C_{iss}$	Input Capacitance	$V_{DS}=-15V, V_{GS}=0V, f=1\text{MHz}$	---	1250	2500	pF
$C_{oss}$	Output Capacitance		---	160	320	
$C_{rss}$	Reverse Transfer Capacitance		---	90	180	

### Drain-Source Diode Characteristics and Maximum Ratings

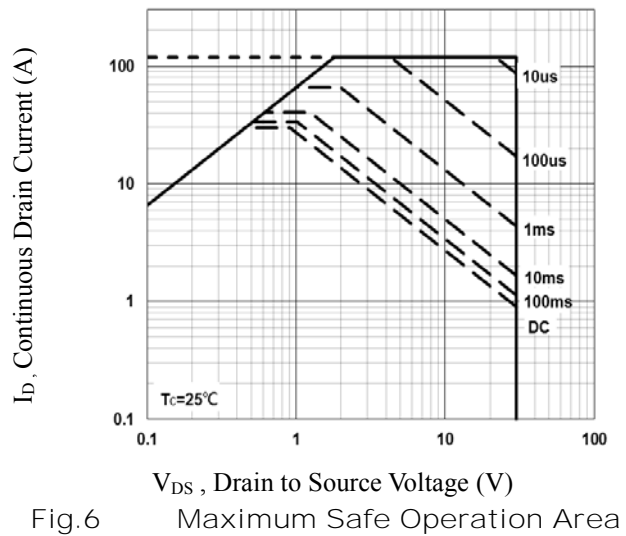
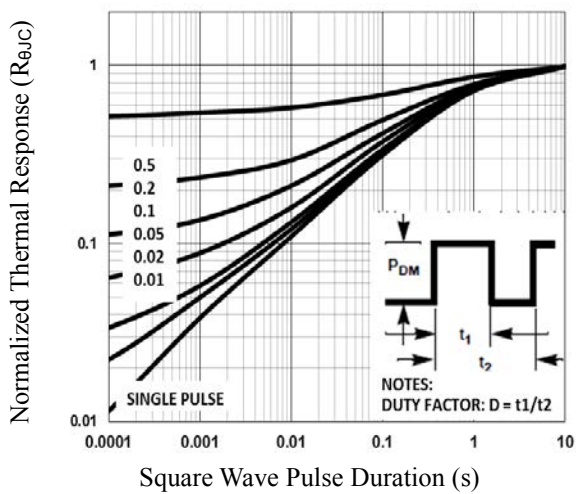
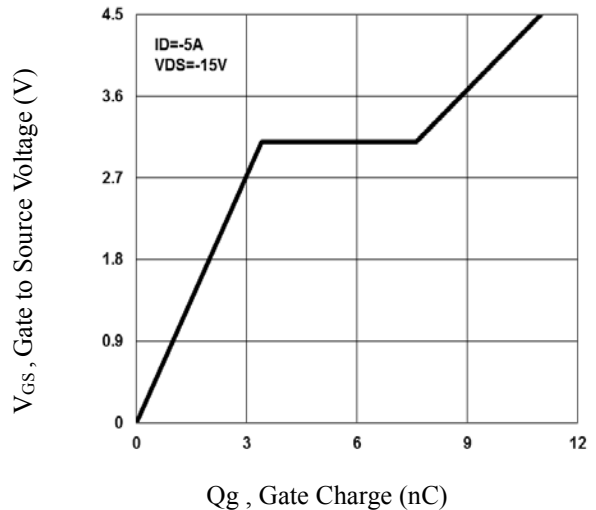
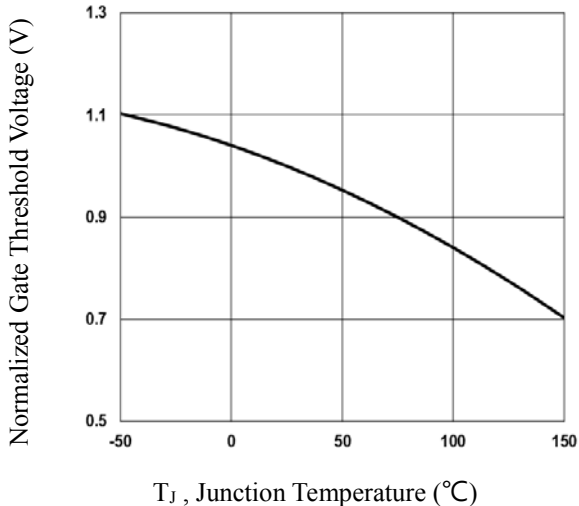
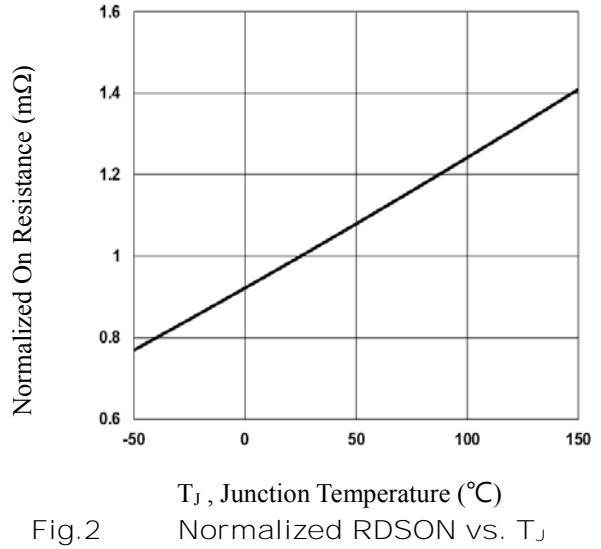
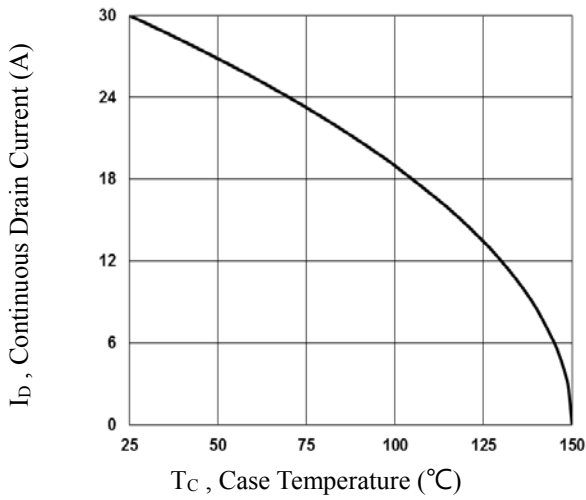
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_S$	Continuous Source Current	$V_G=V_D=0V$ , Force Current	---	---	-30	A
$I_{SM}$	Pulsed Source Current		---	---	-60	A
$V_{SD}$	Diode Forward Voltage	$V_{GS}=0V, I_S=-1A, T_J=25^\circ\text{C}$	---	---	-1	V

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

## YS3907ZBB



# DEVICE CHARACTERISTICS

## YS3907ZBB

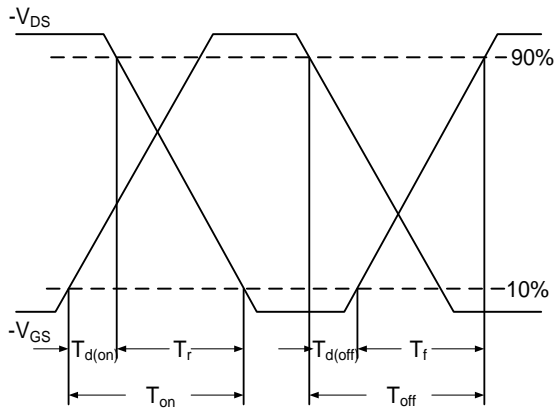


Fig.7 Switching Time Waveform

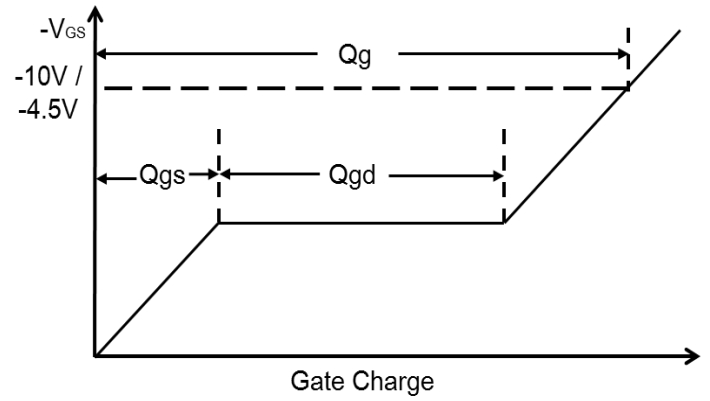
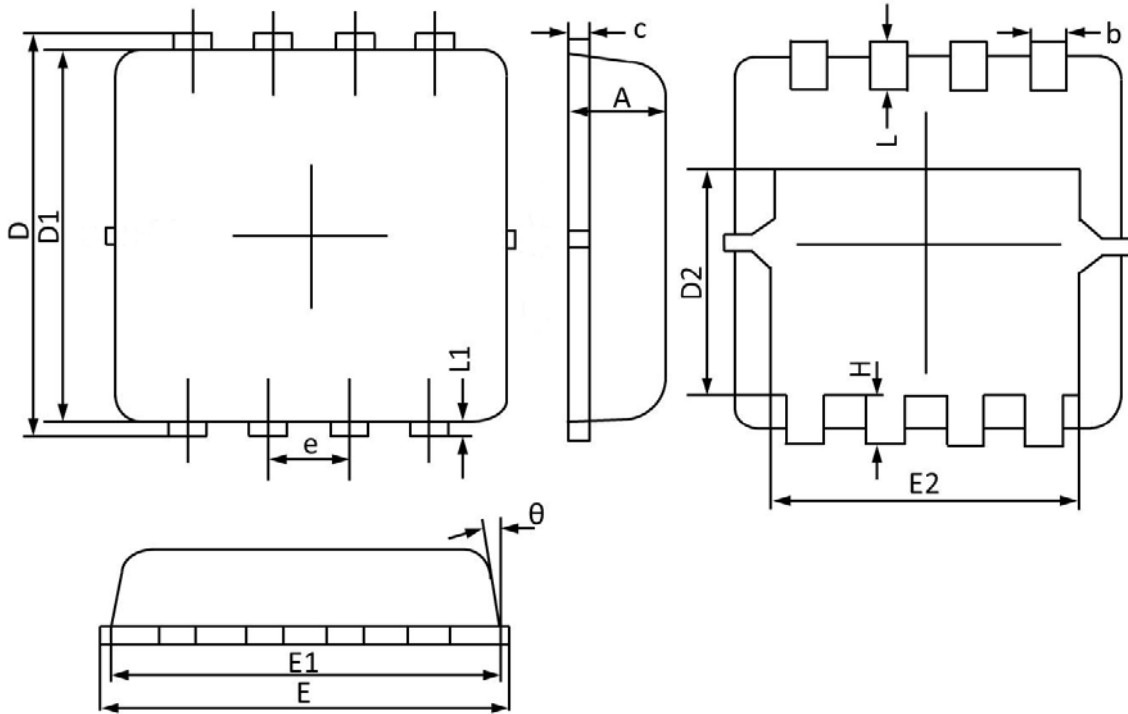


Fig.8 Gate Charge Waveform

# PACKAGE OUTLINE & DIMENSIONS

YS3907ZBB

## PPAK3x3 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.700	0.900	0.028	0.035
b	0.240	0.350	0.009	0.014
c	0.100	0.250	0.004	0.010
D	3.050	3.450	0.120	0.136
D1	2.900	3.200	0.114	0.126
D2	1.350	1.850	0.053	0.073
E	3.000	3.400	0.118	0.134
E1	2.900	3.250	0.114	0.128
E2	2.350	2.600	0.093	0.102
e	0.650 BSC		0.026 BSC	
H	0.300	0.500	0.012	0.020
L	0.300	0.500	0.012	0.020
L1	0.070	0.200	0.003	0.008
$\theta$	0°	12°	0°	12°