



YEA SHIN TECHNOLOGY CO., LTD

YSE2310ZBB

# N-Channel Enhancement MOSFET

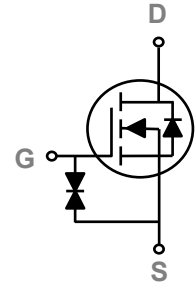
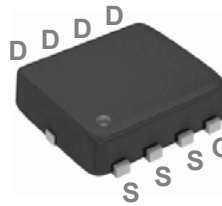


VDS= 20V, ID= 30A

## Features

- 20V,30A,  $R_{DS(ON)} = 10m\Omega$  @VGS = 10V
- Improved dv/dt capability
- ESD Protection Diode Embedded
- Green Device Available

## PPAK3x3 Pin Configuration



## Applications

- MB / VGA / Vcore
- POL Buck Applications
- SMPS 2<sup>nd</sup> SR
- Li-Battery Protection

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

Symbol	Parameter	Rating	Units
V <sub>DS</sub>	Drain-Source Voltage	20	V
V <sub>GS</sub>	Gate-Source Voltage	±10	V
I <sub>D</sub>	Drain Current – Continuous ( $T_c=25^\circ\text{C}$ ) (Chip Limitation)	30	A
	Drain Current – Continuous ( $T_c=100^\circ\text{C}$ ) (Chip Limitation)	19	A
I <sub>DM</sub>	Drain Current – Pulsed <sup>1</sup> (Chip Limitation)	120	A
P <sub>D</sub>	Power Dissipation ( $T_c=25^\circ\text{C}$ )	26	W
	Power Dissipation – Derate above 25 $^\circ\text{C}$	0.21	W/ $^\circ\text{C}$
T <sub>STG</sub>	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T <sub>J</sub>	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

### Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
R <sub>θJA</sub>	Thermal Resistance Junction to ambient	---	62	$^\circ\text{C}/\text{W}$
R <sub>θJC</sub>	Thermal Resistance Junction to Case	---	4.8	$^\circ\text{C}/\text{W}$

# DEVICE CHARACTERISTICS

## YSE2310ZBB

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	$V_{GS}=0V, I_D=250\mu A$	20	---	---	V
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=20V, V_{GS}=0V, T_J=25^\circ C$	---	---	1	$\mu A$
		$V_{DS}=16V, V_{GS}=0V, T_J=125^\circ C$	---	---	10	$\mu A$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 10V, V_{DS}=0V$	---	---	$\pm 10$	$\mu A$

### On Characteristics

$R_{DS(ON)}$	Static Drain-source On-Resistance <sup>2</sup>	$V_{GS}=4.5V, I_D=5A$	---	8	10	$m\Omega$
		$V_{GS}=2.5V, I_D=3A$	---	9.5	12	$m\Omega$
		$V_{GS}=1.8V, I_D=2A$	---	12	17	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	0.3	0.6	1	V
$g_{fs}$	Forward Transconductance	$V_{DS}=10V, I_D=5A$	---	12	---	S

### Dynamic and Switching Characteristics

$Q_g$	Total Gate Charge <sup>2,3</sup>	$V_{DS}=10V, V_{GS}=4.5V, I_D=5A$	---	16.9	26	nC
$Q_{gs}$	Gate-Source Charge <sup>2,3</sup>		---	1.1	3	
$Q_{gd}$	Gate-Drain Charge <sup>2,3</sup>		---	4	7	
$T_{d(on)}$	Turn-On Delay Time <sup>2,3</sup>	$V_{DD}=10V, V_{GS}=4.5V, R_G=25\Omega, I_D=1A$	---	6.8	13	ns
$T_r$	Rise Time <sup>2,3</sup>		---	20	38	
$T_{d(off)}$	Turn-Off Delay Time <sup>2,3</sup>		---	41.8	79	
$T_f$	Fall Time <sup>2,3</sup>		---	13.2	25	
$C_{iss}$	Input Capacitance	$V_{DS}=10V, V_{GS}=0V, f=1MHz$	---	1020	1480	pF
$C_{oss}$	Output Capacitance		---	160	240	
$C_{rss}$	Reverse Transfer Capacitance		---	110	100	
$R_g$	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, f=1MHz$	---	2	4	$\Omega$

### Drain-Source Diode Characteristics and Maximum Ratings

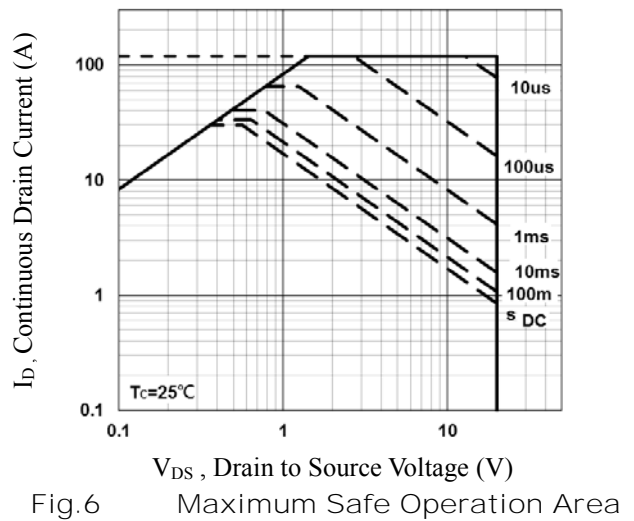
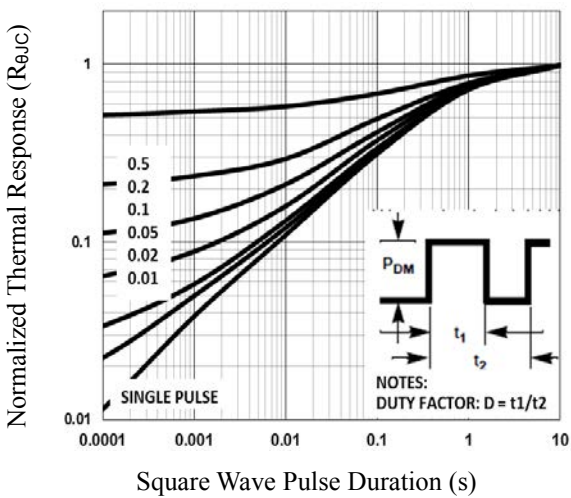
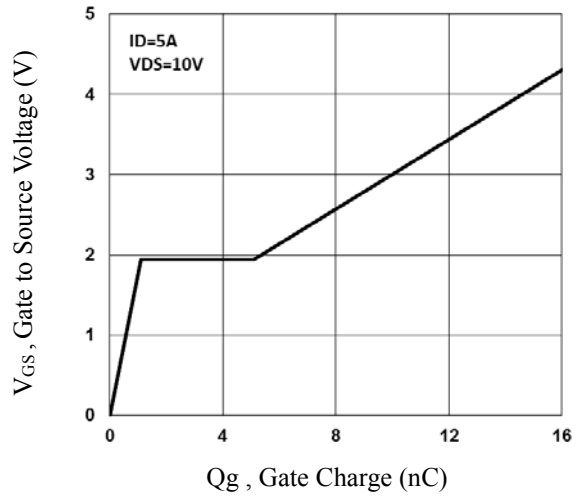
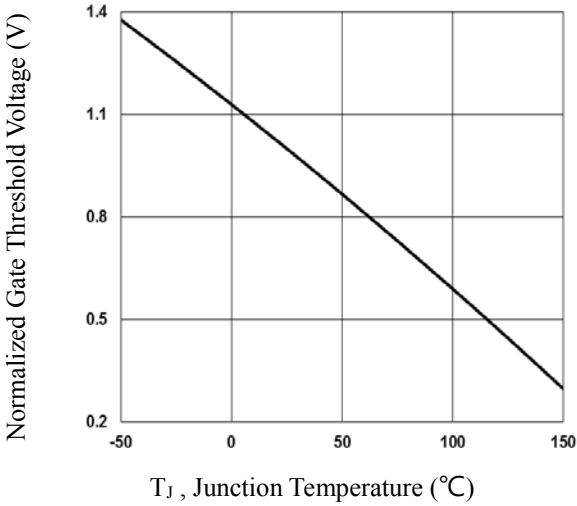
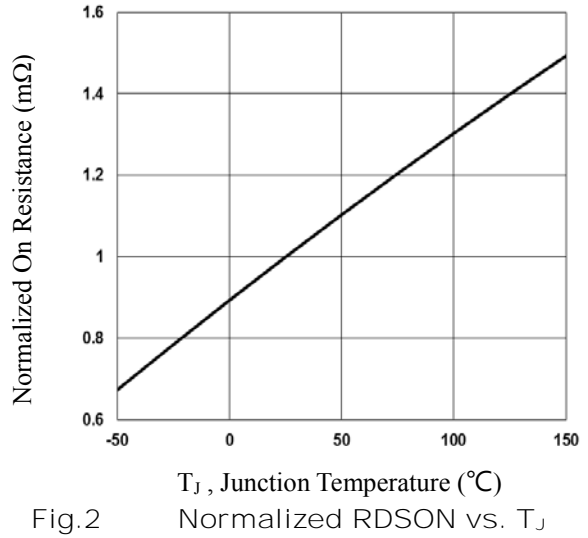
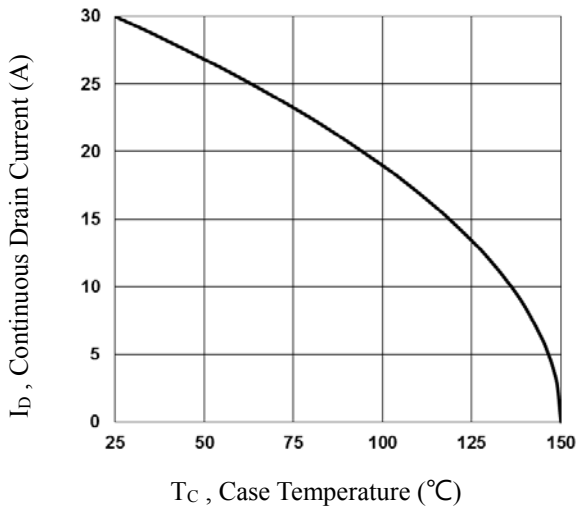
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_S$	Continuous Source Current	$V_G=V_D=0V, \text{Force Current}$	---	---	30	A
$I_{SM}$	Pulsed Source Current <sup>2</sup>		---	---	60	A
$V_{SD}$	Diode Forward Voltage <sup>2</sup>	$V_{GS}=0V, I_S=1A, T_J=25^\circ C$	---	---	1	V

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

## YSE2310ZBB



# DEVICE CHARACTERISTICS

## YSE2310ZBB

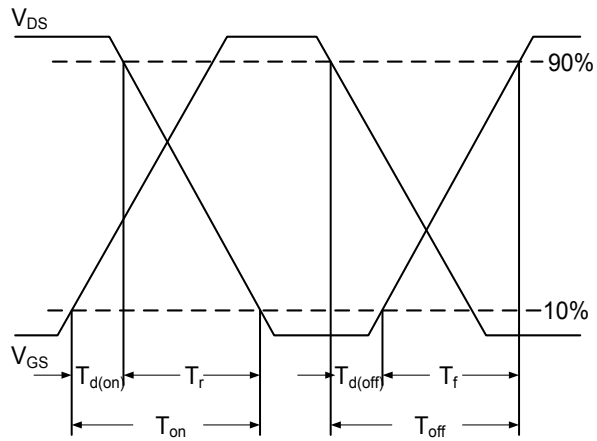


Fig.7 Switching Time Waveform

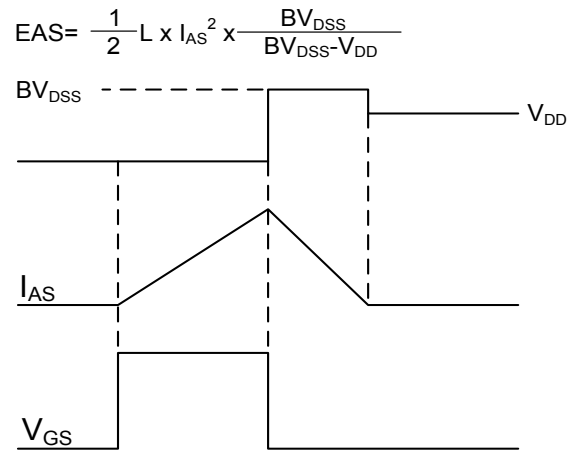
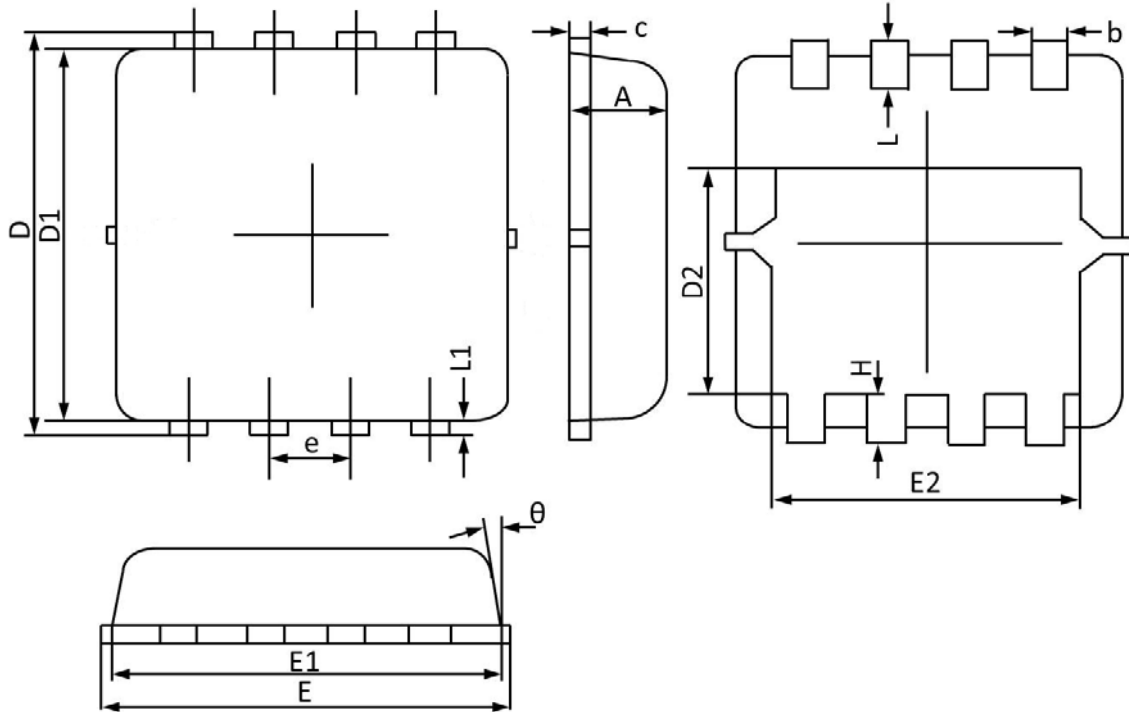


Fig.8 EAS Waveform

# PACKAGE OUTLINE & DIMENSIONS

YSE2310ZBB

## 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	0.200	0.700	0.003	0.008
$\theta$	0°	12°	0°	12°