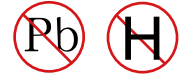




YEA SHIN TECHNOLOGY CO., LTD

YSE2210KBB

Dual N-Channel Enhancement MOSFET

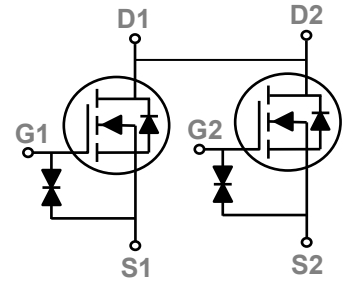
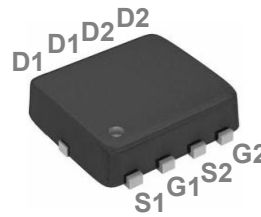


VDS= 20V, ID= 8.6A

Features

- 20V, 8.6A, $R_{DS(ON)} = 14m\Omega @ V_{GS} = 4.5V$
- Improved dv/dt capability
- ESD Protection Diode Embedded
- Green Device Available

PPAK3x3 Dual NEP Pin Configuration



Applications

- POL Applications
- SMPS 2nd SR
- Li-Battery Protection

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	± 10	V
I_D	Drain Current – Continuous ($T_A=25^\circ C$)	8.6	A
	Drain Current – Continuous ($T_A=70^\circ C$)	6.8	A
I_{DM}	Drain Current – Pulsed ¹	34.4	A
P_D	Power Dissipation ($T_c=25^\circ C$)	1.67	W
	Power Dissipation – Derate above $25^\circ C$	0.014	W/ $^\circ C$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	75	$^\circ C/W$

DEVICE CHARACTERISTICS

YSE2210KBB

Electrical Characteristics ($T_J=25^\circ\text{C}$, 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
$\Delta BV_{DSS}/\Delta T_J$	BV_{DSS} Temperature Coefficient	Reference to 25°C , $I_D=1\text{mA}$	---	0.02	---	$V/^\circ\text{C}$
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=20V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{DS}=16V, V_{GS}=0V, T_J=125^\circ\text{C}$	---	---	10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 10V, V_{DS}=0V$	---	---	± 10	μA

On Characteristics

$R_{DS(ON)}$	Static Drain-source On-Resistance	$V_{GS}=4.5V, I_D=5A$	---	11	14	$m\Omega$
		$V_{GS}=4.2V, I_D=5A$	---	11.2	14.2	$m\Omega$
		$V_{GS}=3.7V, I_D=4A$	---	11.5	14.5	$m\Omega$
		$V_{GS}=3.0V, I_D=4A$	---	12	15.2	$m\Omega$
		$V_{GS}=2.5V, I_D=3A$	---	12.5	16	$m\Omega$
		$V_{GS}=1.8V, I_D=2A$	---	15.5	20	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	0.3	0.6	1.0	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	2	---	$mV/^\circ\text{C}$
gfs	Forward Transconductance	$V_{DS}=10V, I_D=5A$	---	13	---	S

Dynamic and Switching Characteristics

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

Drain-Source Diode Characteristics and Maximum Ratings

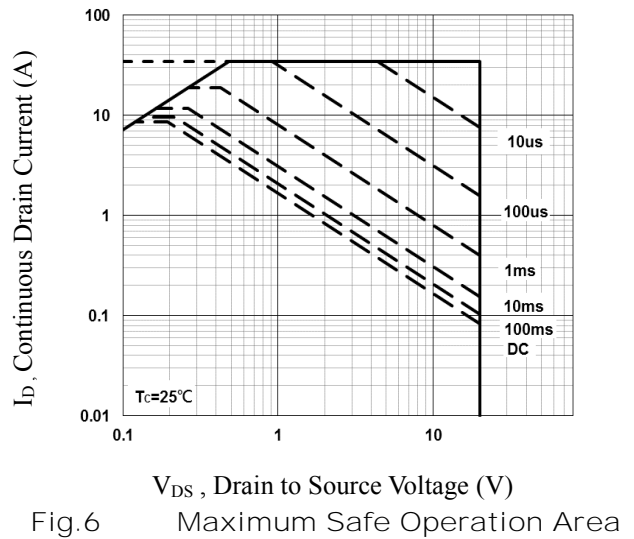
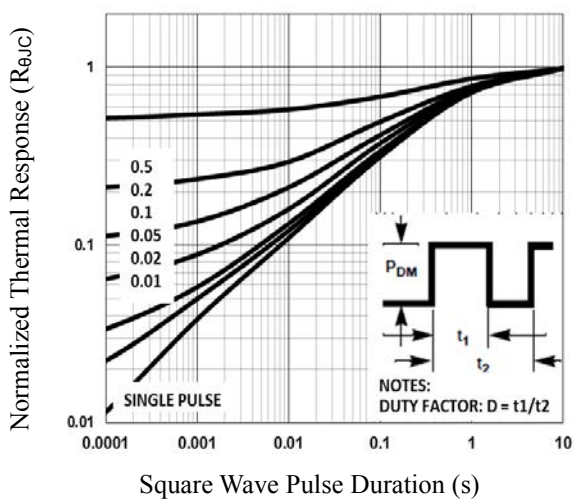
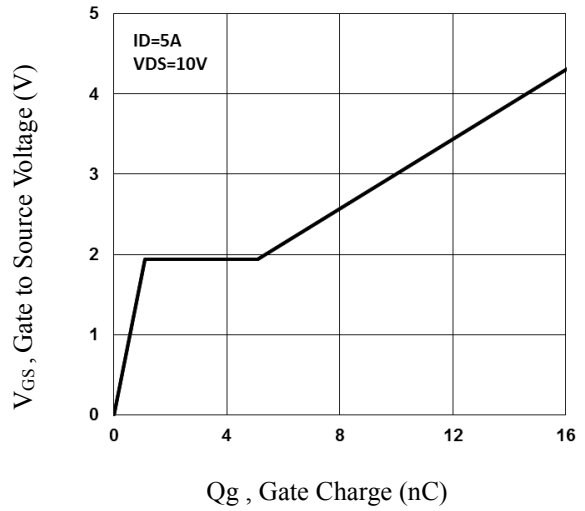
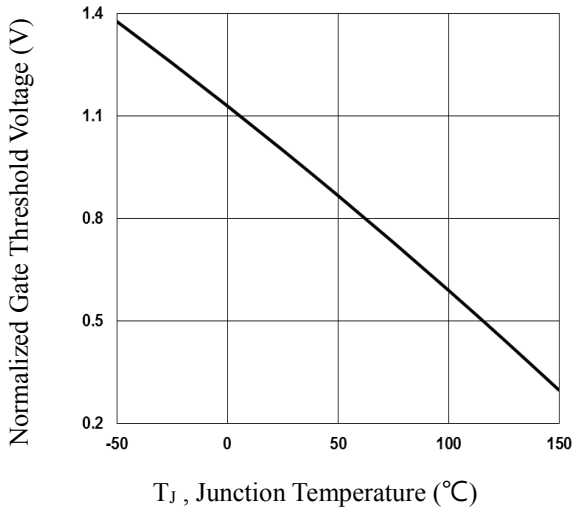
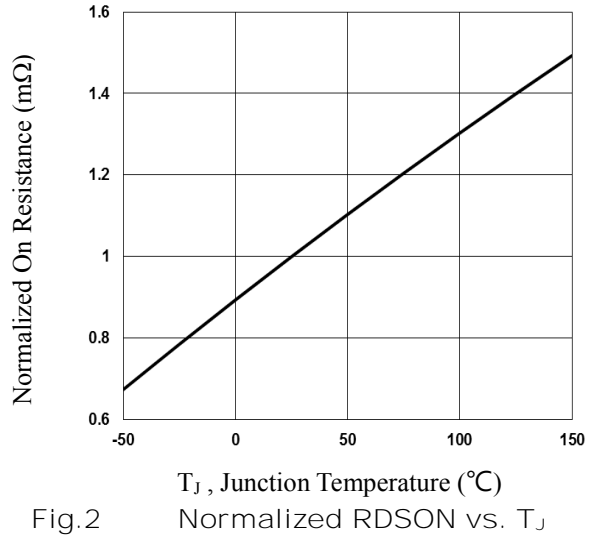
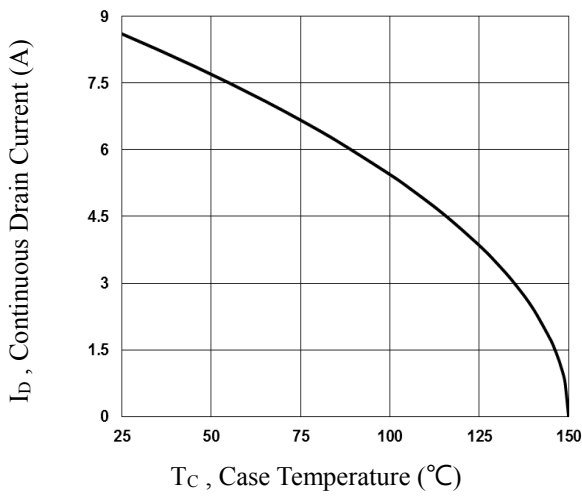
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V, \text{Force Current}$	---	---	8.6	A
I_{SM}	Pulsed Source Current		---	---	17.2	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_S=1A, T_J=25^\circ\text{C}$	---	---	1	V

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

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DEVICE CHARACTERISTICS

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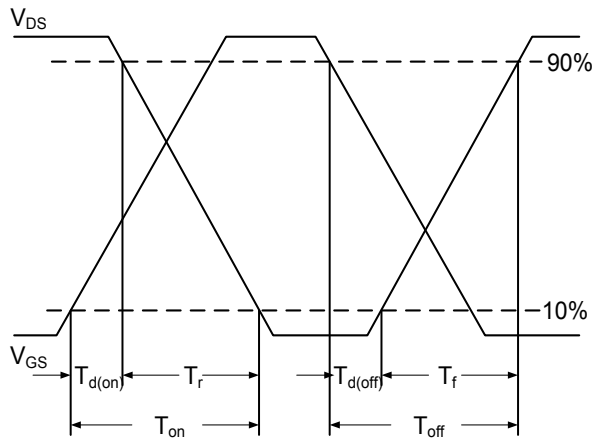


Fig.7 Switching Time Waveform

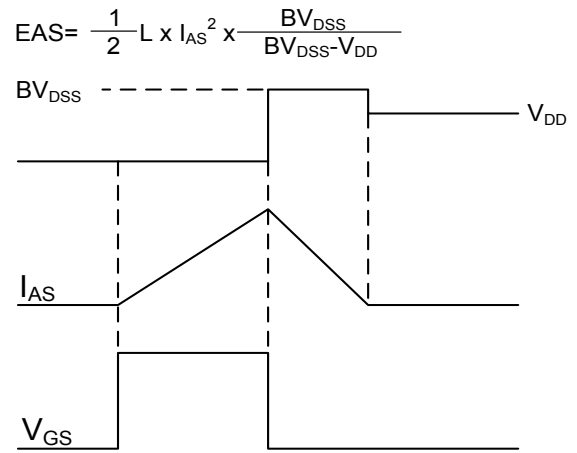
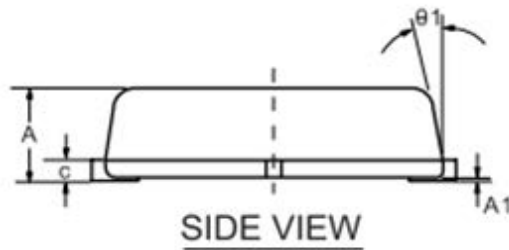
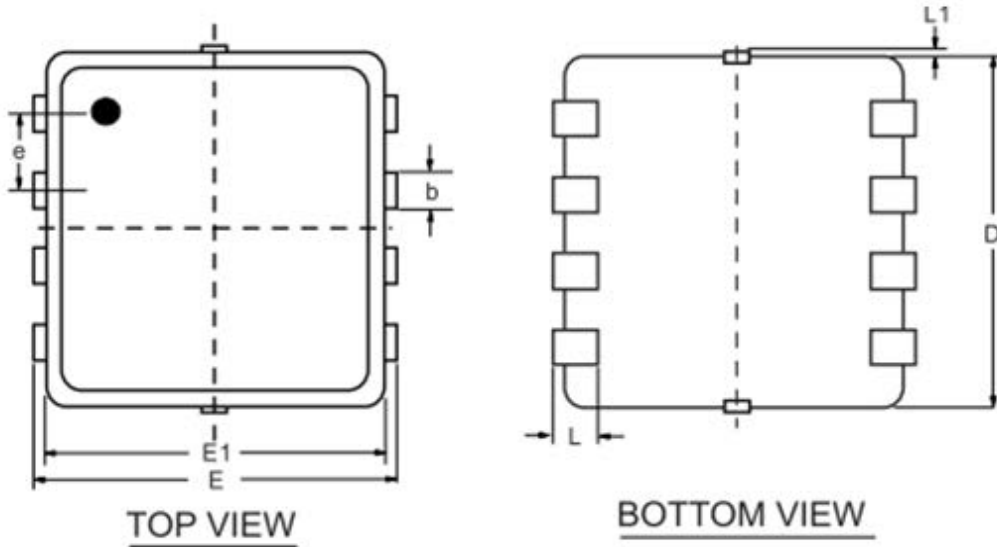


Fig.8 EAS Waveform

PACKAGE OUTLINE & DIMENSIONS

YSE2210KBB

PPAK3x3 Dual NEP PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		
	Min	Typ	Max
A	0.700	0.800	0.900
A1	0.000	---	0.050
b	0.250	0.300	0.350
c	0.080	0.152	0.250
D	2.800	2.900	3.000
E	2.700	2.800	2.900
E1	2.200	2.300	2.400
e	0.65BSC		
L	0.200	0.375	0.450
L1	0.00	---	0.10
θ1	0°	10°	12°