



YEA SHIN TECHNOLOGY CO., LTD

YSE2210VBB

Dual N-Channel Enhancement MOSFET

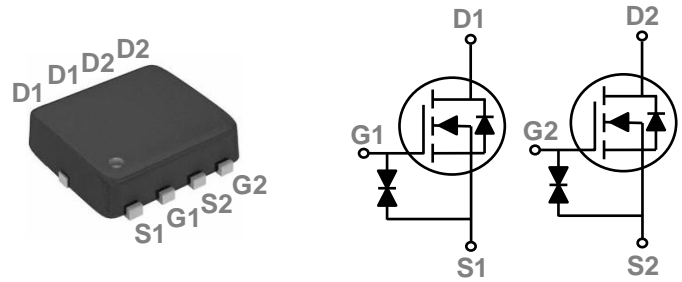


VDS= 20V, ID= 12A

Features

- 20V,30A, RDS(ON) =12mΩ @VGS = 10V
- Improved dv/dt capability
- ESD Protection Diode Embedded
- Green Device Available

PPAK3x3 Dual Pin Configuration



Applications

- MB / VGA / Vcore
- POL Applications
- SMPS 2nd SR
- Li-Battery Protection

Absolute Maximum Rating Tc=25°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 _c =25°C)	30	A
	Drain Current – Continuous (T _c =100°C)	19	A
I _{DM}	Drain Current – Pulsed ¹	120	A
P _D	Power Dissipation (T _c =25°C)	26	W
	Power Dissipation – Derate above 25°C	0.21	W/°C
T _{STG}	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
R _{θJA}	Thermal Resistance Junction to ambient	---	62	°C/W
R _{θJC}	Thermal Resistance Junction to Case	---	4.8	°C/W

DEVICE CHARACTERISTICS

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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
		$V_{DS}=16V, V_{GS}=0V, T_J=85^\circ\text{C}$	---	---	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	$V_{GS}=4.5V, I_D=10A$	---	10	12	$\text{m}\Omega$
		$V_{GS}=4.2V, I_D=10A$	---	10.1	12.2	$\text{m}\Omega$
		$V_{GS}=3.7V, I_D=9A$	---	10.3	12.5	$\text{m}\Omega$
		$V_{GS}=3.0V, I_D=9A$	---	10.7	13.2	$\text{m}\Omega$
		$V_{GS}=2.5V, I_D=8A$	---	11.4	14.5	$\text{m}\Omega$
		$V_{GS}=1.8V, I_D=8A$	---	15	20	$\text{m}\Omega$
$V_{GS(th)}$	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	---	$\text{mV}/^\circ\text{C}$
gfs	Forward Transconductance	$V_{DS}=10V, I_D=5A$	---	12	---	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

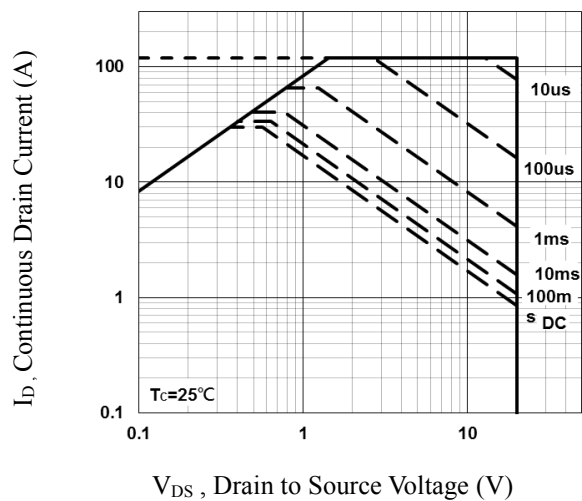
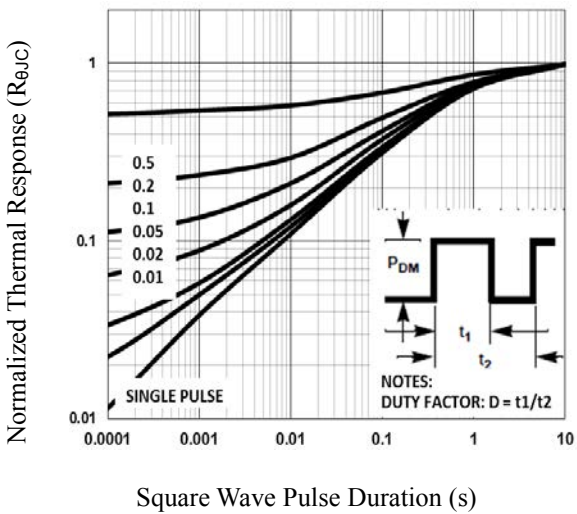
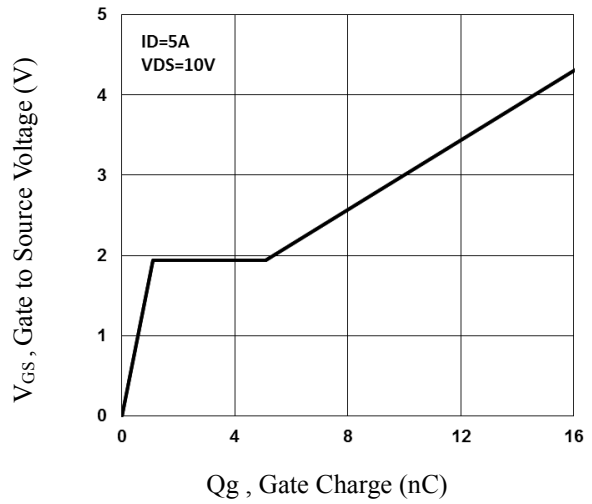
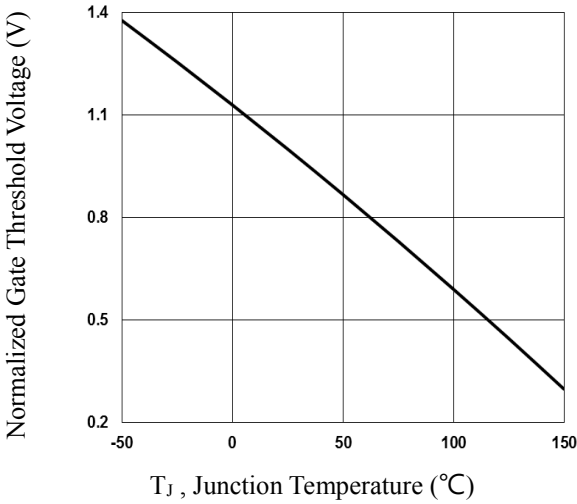
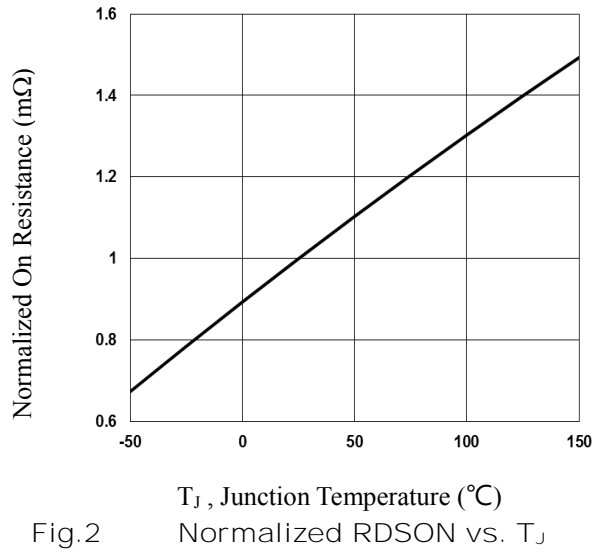
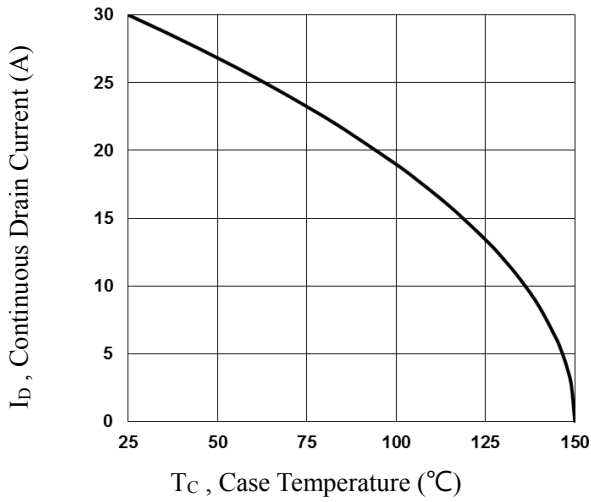
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V, \text{Force Current}$	---	---	30	A
I_{SM}	Pulsed Source Current		---	---	60	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_S=1A, T_J=25^\circ\text{C}$	---	---	1	V

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.

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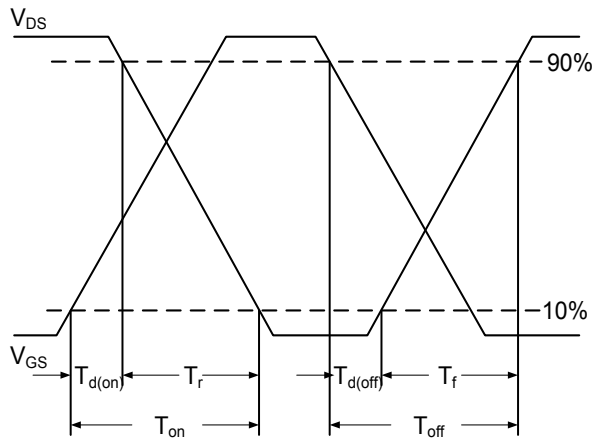


Fig.7 Switching Time Waveform

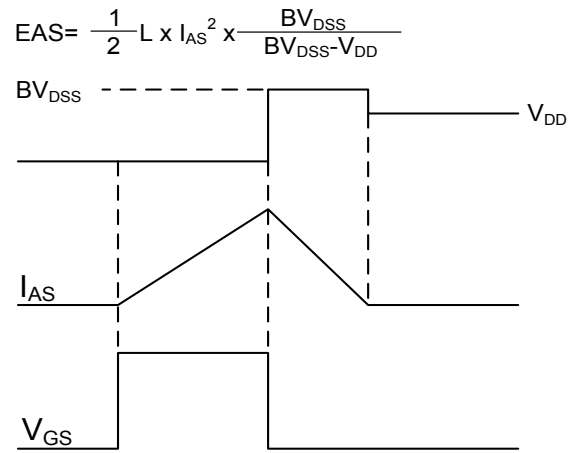
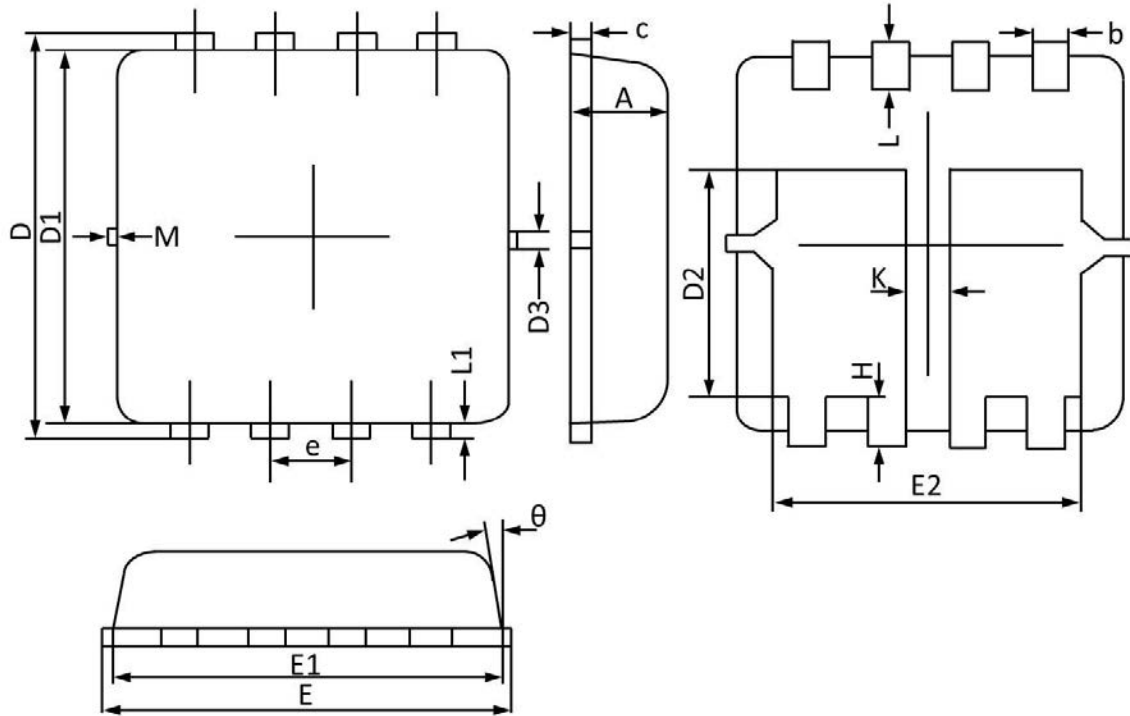


Fig.8 EAS Waveform

PACKAGE OUTLINE & DIMENSIONS

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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	