



YEA SHIN TECHNOLOGY CO., LTD

YS2209VBB

Dual P-Channel Enhancement MOSFET



VDS= -20V, ID= -7.5A

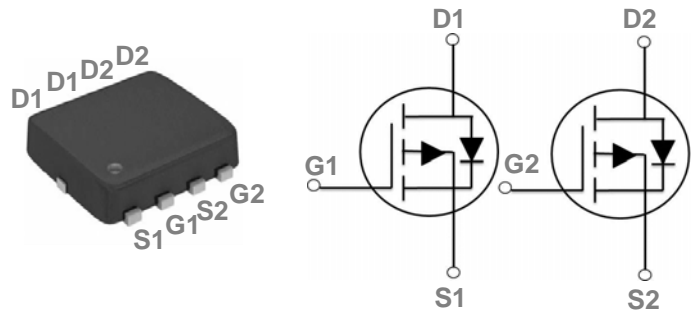
Features

- -20V,-7.5A, $R_{DS(ON)} = 33m\Omega @ V_{GS} = -4.5V$
- Improved dv/dt capability
- Fast switching
- Green Device Available

Applications

- MB / VGA / Vcore
- POL Applications
- Networking

PPAK3x3 Dual Pin Configuration



Absolute Maximum Rating $T_c=25^\circ\text{C}$ 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 ($T_c=25^\circ\text{C}$)	-7.5	A
	Drain Current – Continuous ($T_c=100^\circ\text{C}$)	-4.5	A
I_{DM}	Drain Current – Pulsed ¹	-30	A
P_D	Power Dissipation ($T_c=25^\circ\text{C}$)	25	W
	Power Dissipation – Derate above 25°C	0.2	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	---	5	$^\circ\text{C}/\text{W}$

DEVICE CHARACTERISTICS

YS2209VBB

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 , $I_D=-1mA$	---	-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	$V_{GS}=\pm 10V, V_{DS}=0V$	---	---	± 100	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-source On-Resistance ²	$V_{GS}=-4.5V, I_D=-4A$	---	28	33	$m\Omega$
		$V_{GS}=-2.5V, I_D=-3A$	---	37	45	$m\Omega$
		$V_{GS}=-1.8V, I_D=-2A$	---	49	65	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=-250\mu A$	-0.3	-0.6	-1	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	2	---	$mV/^\circ\text{C}$
g_{fs}	Forward Transconductance	$V_{DS}=-10V, I_D=-3A$	---	8.5	---	S

Dynamic and Switching Characteristics

Q_g	Total Gate Charge ^{2,3}	$V_{DS}=-10V, V_{GS}=-4.5V, I_D=-4A$	---	16.1	25	nC
Q_{gs}	Gate-Source Charge ^{2,3}		---	1.8	3.6	
Q_{gd}	Gate-Drain Charge ^{2,3}		---	3.8	7	
$T_{d(on)}$	Turn-On Delay Time ^{2,3}	$V_{DD}=-10V, V_{GS}=-4.5V, R_G=25\Omega, I_D=-1A$	---	8.2	16	ns
T_r	Rise Time ^{2,3}		---	30	57	
$T_{d(off)}$	Turn-Off Delay Time ^{2,3}		---	71	135	
T_f	Fall Time ^{2,3}		---	20	38	
C_{iss}	Input Capacitance	$V_{DS}=-15V, V_{GS}=0V, f=1MHz$	---	1440	2100	pF
C_{oss}	Output Capacitance		---	155	230	
C_{rss}	Reverse Transfer Capacitance		---	115	170	

Drain-Source Diode Characteristics and Maximum Ratings

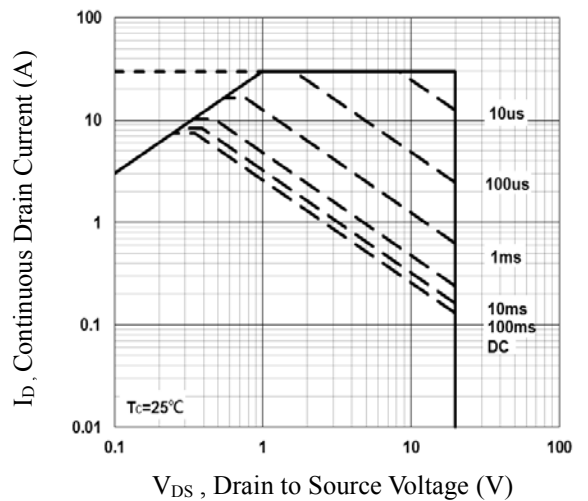
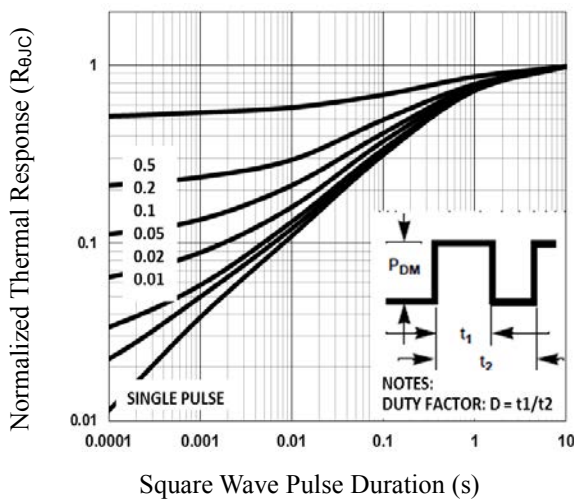
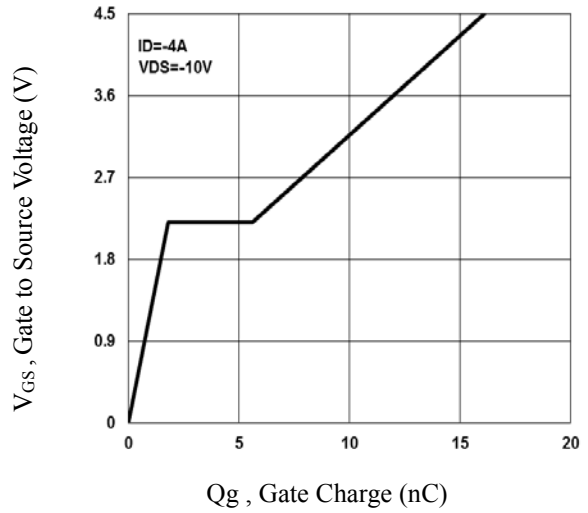
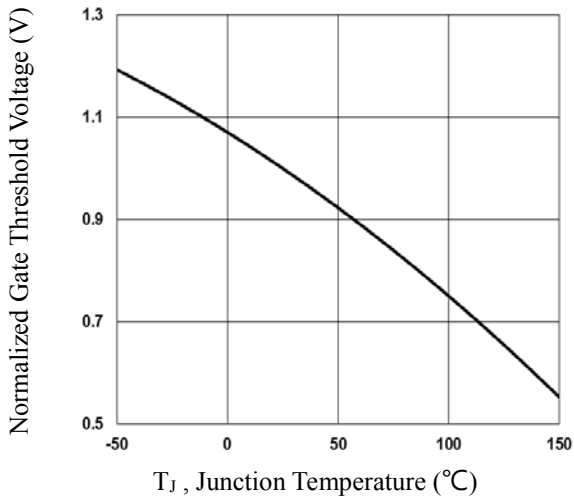
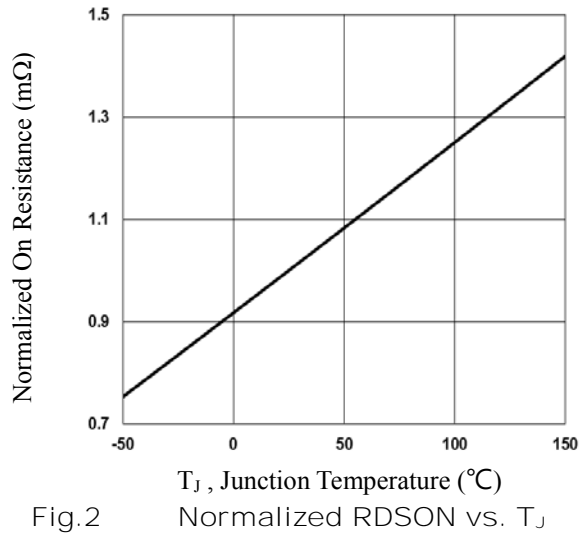
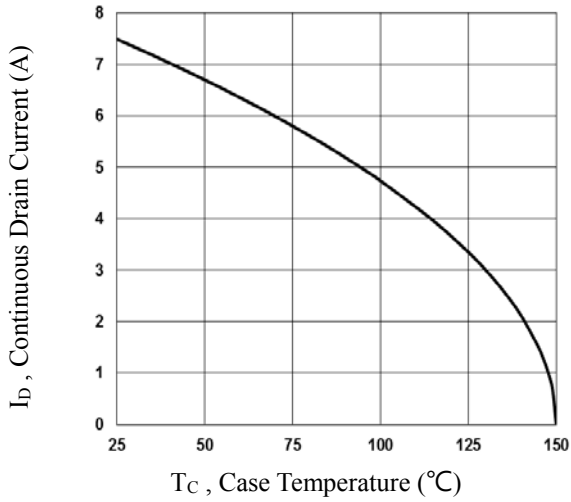
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V, \text{Force Current}$	---	---	-7.5	A
I_{SM}	Pulsed Source Current ²		---	---	-15	A
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V, I_S=-1A, T_J=25^\circ\text{C}$	---	---	-1	V

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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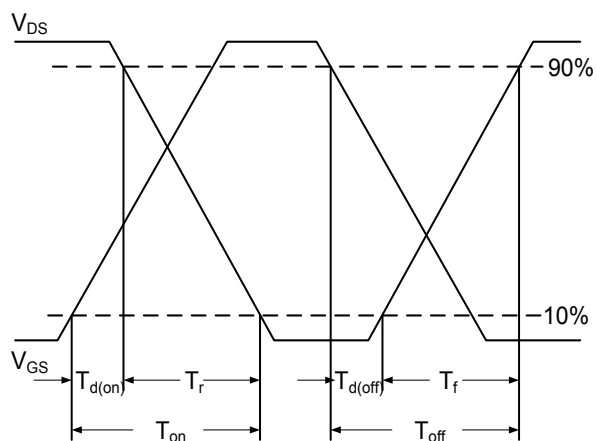
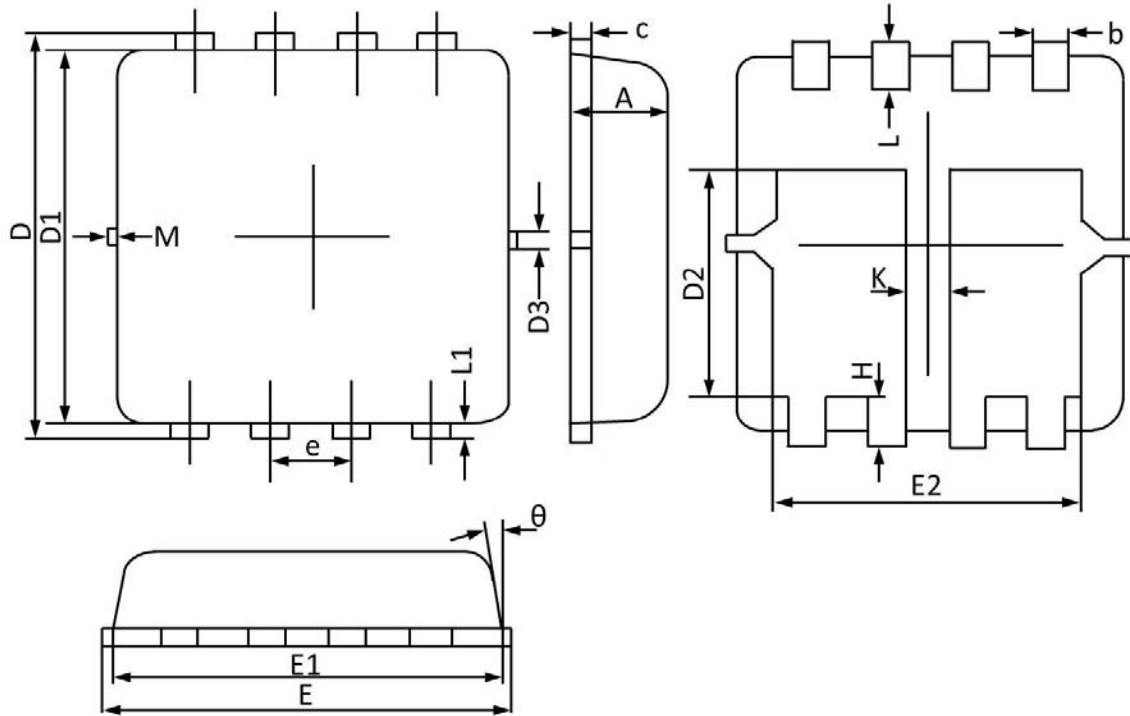


Fig.7 Switching Time Waveform

PACKAGE OUTLINE & DIMENSIONS

YS2209VBB

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	