YEA SHIN TECHNOLOGY CO., LTD

YS3810HCB

Dual N-Channel Enhancement MOSFET

VDS= 30V, ID= 19.5A

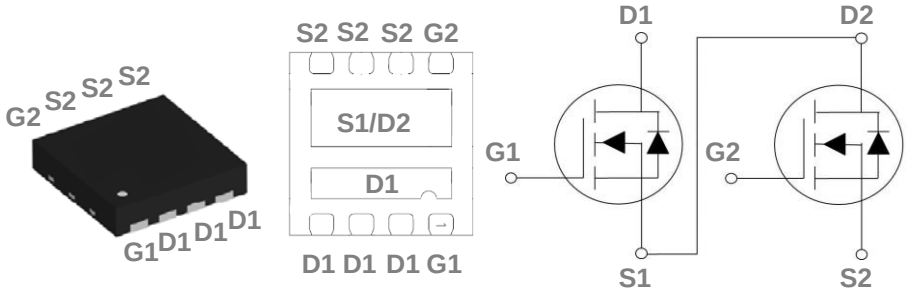
Features

- *Improved dv/dt capability*
- *Fast switching*
- *100% EAS Guaranteed*
- *Halogen free*

Applications

- *MB / VGA / Vcore*
- *POL Buck Applications*
- *SMPS 2nd SR*

DFN3x3 Asymmetric Dual Pin Configuration



Absolute Maximum Rating T_C=25℃ **unless otherwise noted**

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Drain Current – Continuous (T_C=25℃)	19.5	A
	Drain Current – Continuous (T_C=100℃)	12.3	A
	Drain Current – Continuous (T_A=25℃)	10.8	A
	Drain Current – Continuous (T_A=100℃)	6.8	A
I_{DM}	Drain Current – Pulsed[1]	78	A
EAS	Single Pulse Avalanche Energy[2]	13	mJ
IAS	Single Pulse Avalanche Current[2]	16	A
P_D	Power Dissipation (T_A=25℃)	27	W
	Power Dissipation – Derate above 25℃	0.01	W/℃
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	62	℃/W
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	4.6	℃/W

DEVICE CHARACTERISTICS

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Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	30	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BV_{DSS} Temperature Coefficient	Reference to 25℃, I_D=1mA	---	0.04	---	V/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=30V, V_{GS}=0V, T_J=25℃	---	---	1	uA
		V_{DS}=24V, V_{GS}=0V, T_J=125℃	---	---	10	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0V	---	---	±100	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-source On-Resistance[3]	V_{GS}=10V, I_D=10A	---	8.5	10.5	mΩ
		V_{GS}=4.5V, I_D=5A	---	11	14	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS}, I_D=250uA	1.2	1.6	2.5	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-4	---	mV/℃
gfs	Forward Transconductance	V_{DS}=5V, I_D=5A	---	12	---	S

Dynamic and Switching Characteristics

Q_g	Total Gate Charge[3,4]	V_{DS}=15V, V_{GS}=10V, I_D=5A	---	15.6	31	nC
Q_{gs}	Gate-Source Charge[3,4]		---	2.3	5	
Q_{gd}	Gate-Drain Charge[3,4]		---	3	6	
$T_{d(on)}$	Turn-On Delay Time[3,4]	V_{DD}=15V, V_{GS}=10V, R_G=6 Ω, I_D=1A	---	3.8	7	ns
T_r	Rise Time[3,4]		---	10	19	
$T_{d(off)}$	Turn-On Delay Time[3,4]		---	22	42	
T_f	Fall Time[3,4]		---	6.6	13	
C_{iss}	Input Capacitance	V_{DS}=25V, V_{GS}=0V, f=1MHz	---	620	900	pF
C_{oss}	Output Capacitance		---	85	125	
C_{rss}	Reverse Transfer Capacitance		---	60	90	
R_g	Gate Resistance	V_{GS}=0V, V_{DS}=0V, f=1MHz	---	2.8	5.6	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, Force Current	---	---	19.5	A
I_{SM}	Pulsed Source Current[3]		---	---	39	A
V_{SD}	Diode Forward Voltage[3]	V_{GS}=0V, I_S=1A, T_J=25℃	---	---	1	V

Note :
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V,V_{GS}=10V,L=0.1mH,Q1:I_{AS}=16A,Q2:I_{AS}=42A,R_G=25Ω,Starting T_J=25℃.
3. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
4. Essentially independent of operating temperature.

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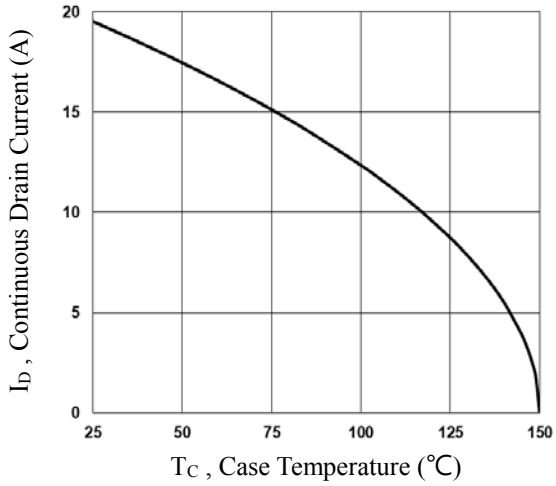

Fig.1 Continuous Drain Current vs. T_C

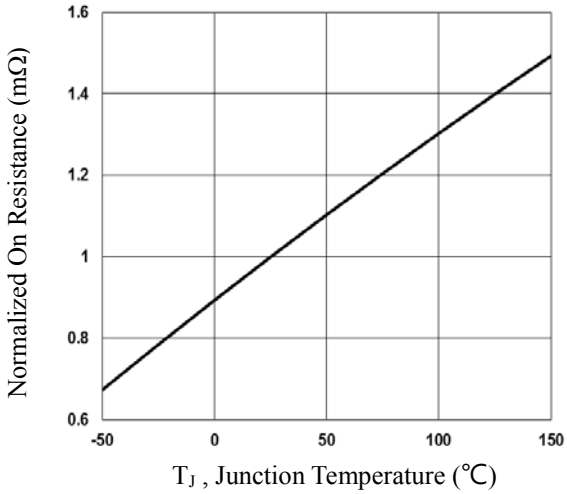

Fig.2 Normalized RDSON vs. T_J

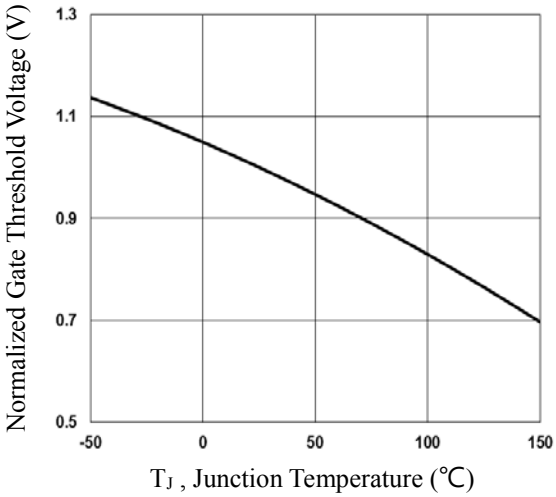

Fig.3 Normalized V_{th} vs. T_J

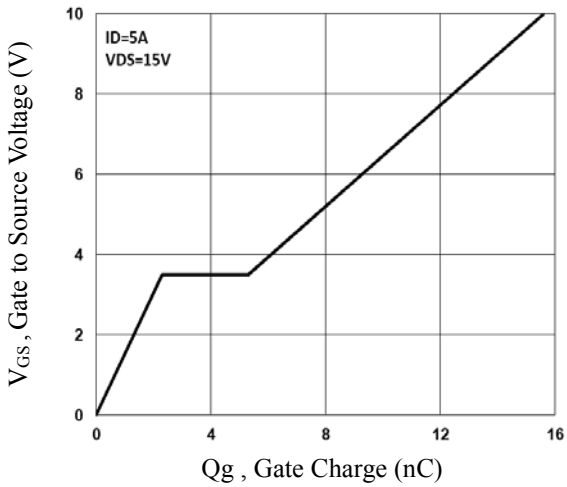

Fig.4 Gate Charge Waveform

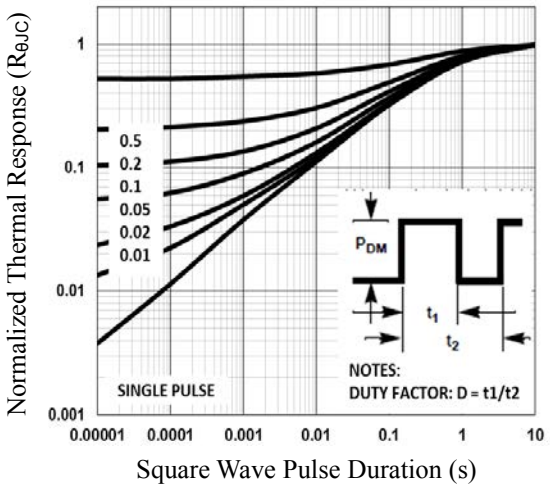

Fig.5 Normalized Transient Impedance

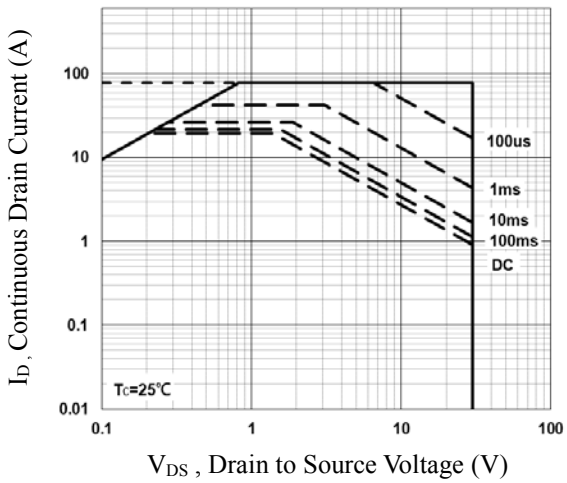

Fig.6 Maximum Safe Operation Area

DEVICE CHARACTERISTICS

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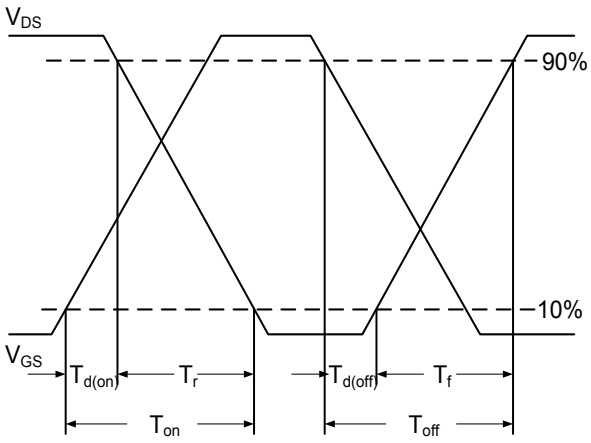


Fig.7 Switching Time Waveform

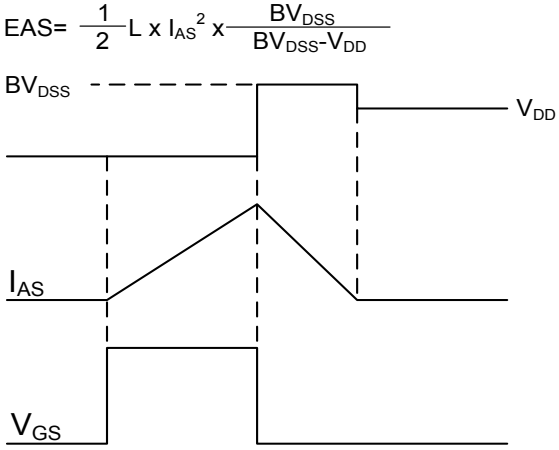
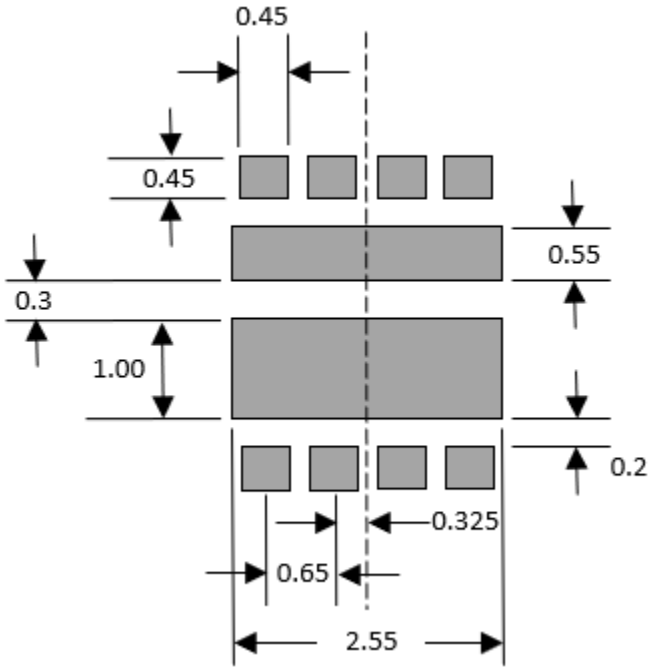


Fig.8 EAS Waveform

RECOMMEND FOOTPRINT Information



PACKAGE OUTLINE & DIMENSIONS

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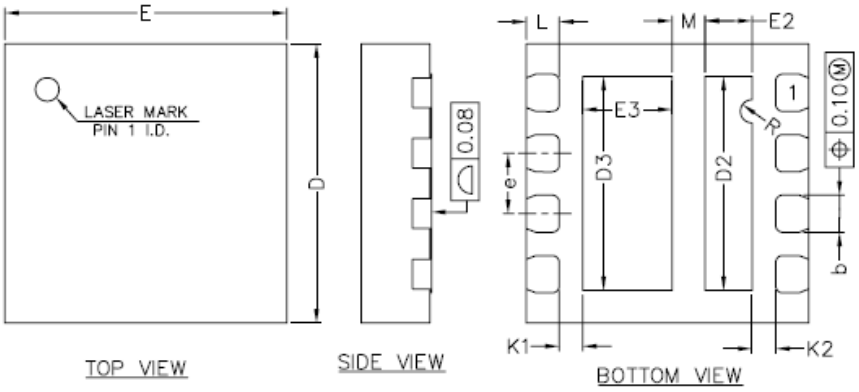
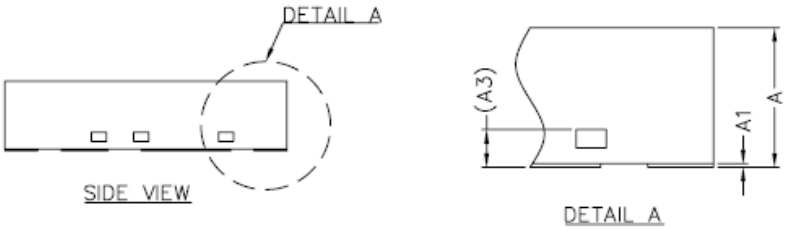
DFN3x3 Asymmetric Dual Package Information





Symbol	Dimensions In Millimeters		
	Min	Typ	Max
A	0.70	0.75	0.80
A1	0.00	0.02	0.05
A3	0.20REF		
b	0.35	0.40	0.45
D	2.90	3.00	3.10
E	2.90	3.00	3.10
D2	2.20	2.30	2.40
E2	0.40	0.50	0.60
D3	2.20	2.30	2.40
E3	0.85	0.95	1.05
e	0.55	0.65	0.75
K1	0.15	0.25	0.35
K2	0.15	0.25	0.35
L	0.30	0.35	0.40
M	0.25	0.35	0.45
R	0.125REF		