



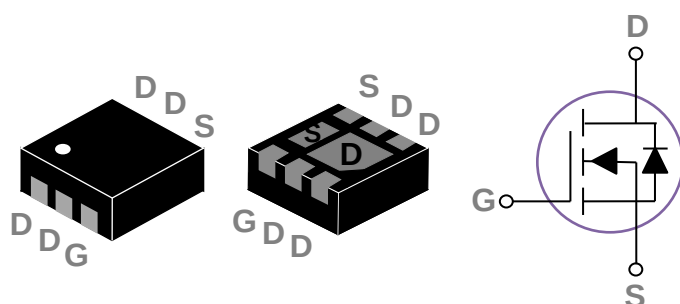
VM3005

30V N-Channel MOSFETs

General Description

These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

DFN2x2-6L 2EP Pin Configuration



BVDSS	RDS(ON)	ID
30V	19mΩ	8A

Features

- 30V, 8A, $R_{DS(ON)} = 19m\Omega$ @ $V_{GS} = 10V$
- Improved dv/dt capability
- Fast switching
- 100% EAS Guaranteed
- Green Device Available

Applications

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

Absolute Maximum Ratings $T_c=25^\circ\text{C}$ 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 ($T_A=25^\circ\text{C}$)	8	A
	Drain Current – Continuous ($T_A=70^\circ\text{C}$)	6.4	A
I_{DM}	Drain Current – Pulsed ¹	32	A
P_D	Power Dissipation ($T_A=25^\circ\text{C}$)	2	W
	Power Dissipation – Derate above 25°C	16.1	mW/ $^\circ\text{C}$
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	$^\circ\text{C/W}$



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	$V_{GS}=0V$, $I_D=250\mu A$	30	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BV_{DSS} Temperature Coefficient	Reference to 25°C , $I_D=1mA$	---	0.04	---	$V/^\circ\text{C}$
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=30V$, $V_{GS}=0V$, $T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{DS}=24V$, $V_{GS}=0V$, $T_J=125^\circ\text{C}$	---	---	10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V$, $V_{DS}=0V$	---	---	± 100	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance ³	$V_{GS}=10V$, $I_D=4A$	---	15.5	19	$m\Omega$
		$V_{GS}=4.5V$, $I_D=3A$	---	20.5	27	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	1.2	1.6	2.5	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-4	---	$mV/^\circ\text{C}$
g_{fs}	Forward Transconductance	$V_{DS}=10V$, $I_D=2A$	---	4	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge ^{2, 3}	$V_{DS}=15V$, $V_{GS}=10V$, $I_D=4A$	---	5.2	7.8	nC
Q_{gs}	Gate-Source Charge ^{2, 3}		---	0.6	0.9	
Q_{gd}	Gate-Drain Charge ^{2, 3}		---	2	3	
$T_{d(on)}$	Turn-On Delay Time ^{2, 3}	$V_{DD}=15V$, $V_{GS}=10V$, $R_G=6\Omega$ $I_D=4A$	---	2.8	4.2	ns
T_r	Rise Time ^{2, 3}		---	7.2	11	
$T_{d(off)}$	Turn-Off Delay Time ^{2, 3}		---	15.8	24	
T_f	Fall Time ^{2, 3}		---	4.6	7	
C_{iss}	Input Capacitance	$V_{DS}=15V$, $V_{GS}=0V$, $F=1MHz$	---	490	750	pF
C_{oss}	Output Capacitance		---	80	120	
C_{rss}	Reverse Transfer Capacitance		---	55	90	
R_g	Gate resistance	$V_{GS}=0V$, $V_{DS}=0V$, $f=1MHz$	---	2.2	---	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	---	---	8	A
I_{SM}	Pulsed Source Current ³		---	---	16	A
V_{SD}	Diode Forward Voltage ³	$V_{GS}=0V$, $I_S=1A$, $T_J=25^\circ\text{C}$	---	---	1	V
t_{rr}	Reverse Recovery Time	$V_R=30V$, $I_S=8A$	---	130	---	ns
Q_{rr}	Reverse Recovery Charge	$di/dt=100A/\mu s$, $T_J=25^\circ\text{C}$	---	200	---	nC

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.

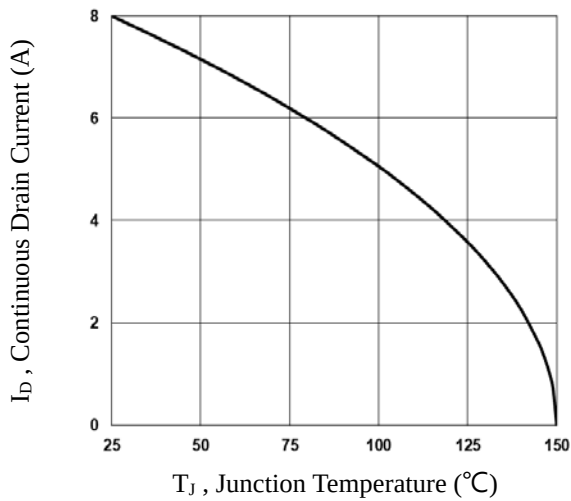


Fig.1 Continuous Drain Current vs. T_J

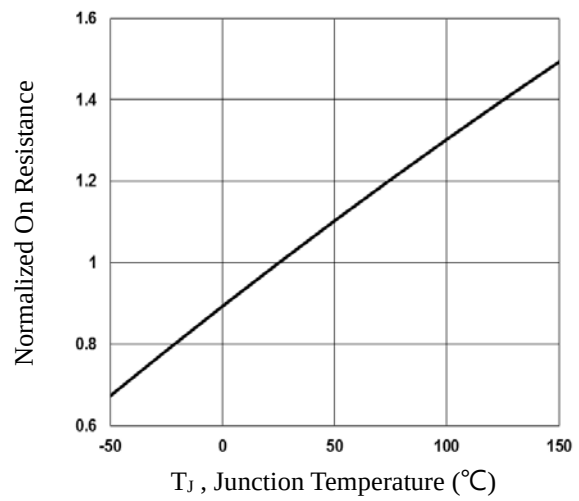


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

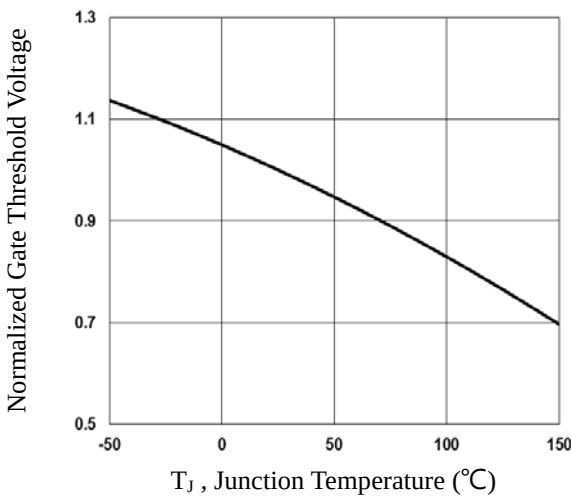


Fig.3 Normalized V_{th} vs. T_J

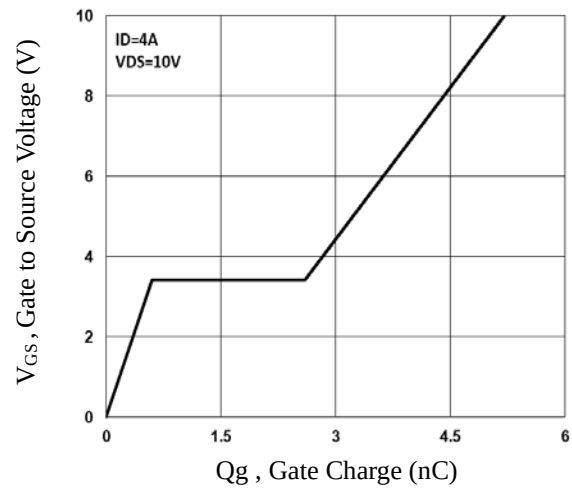


Fig.4 Gate Charge Waveform

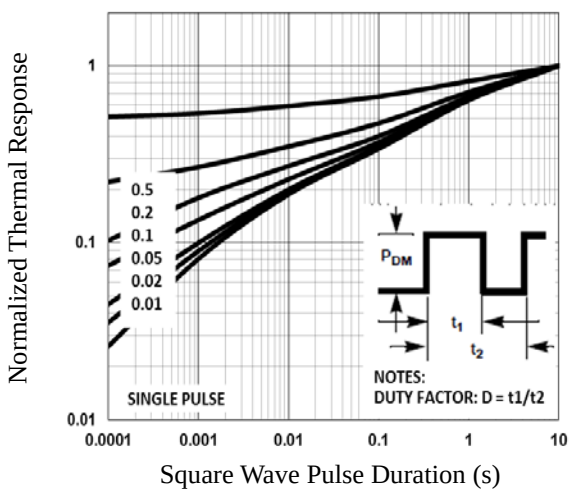


Fig.5 Normalized Transient Response

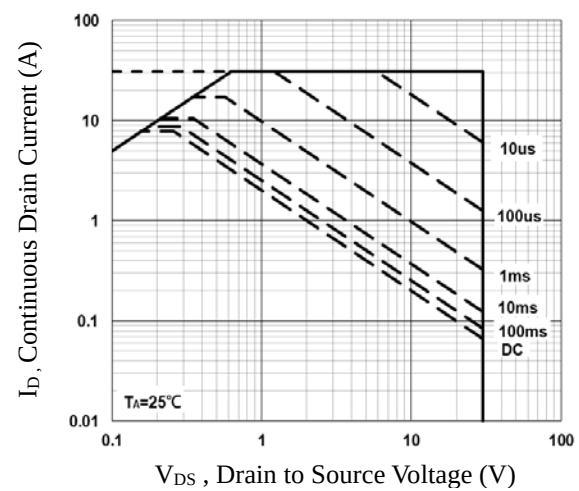


Fig.6 Maximum Safe Operation Area

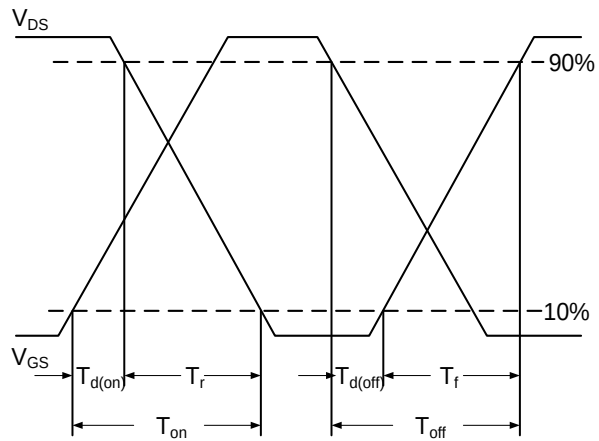


Fig.7 Switching Time Waveform

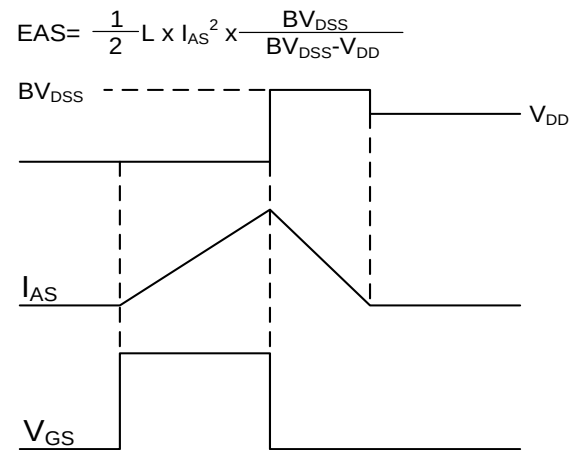
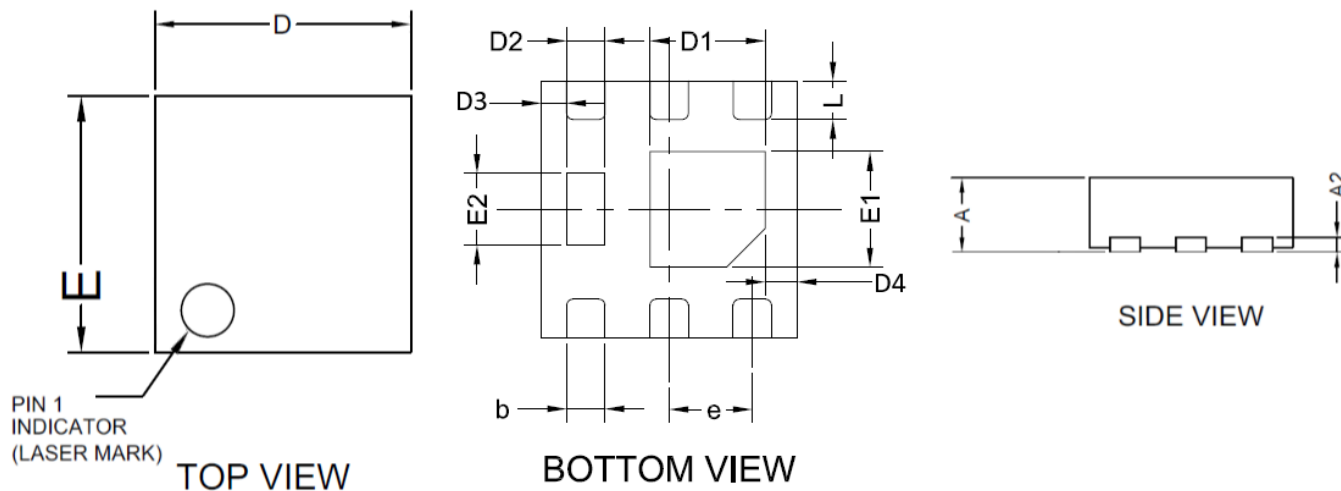


Fig.8 EAS Waveform



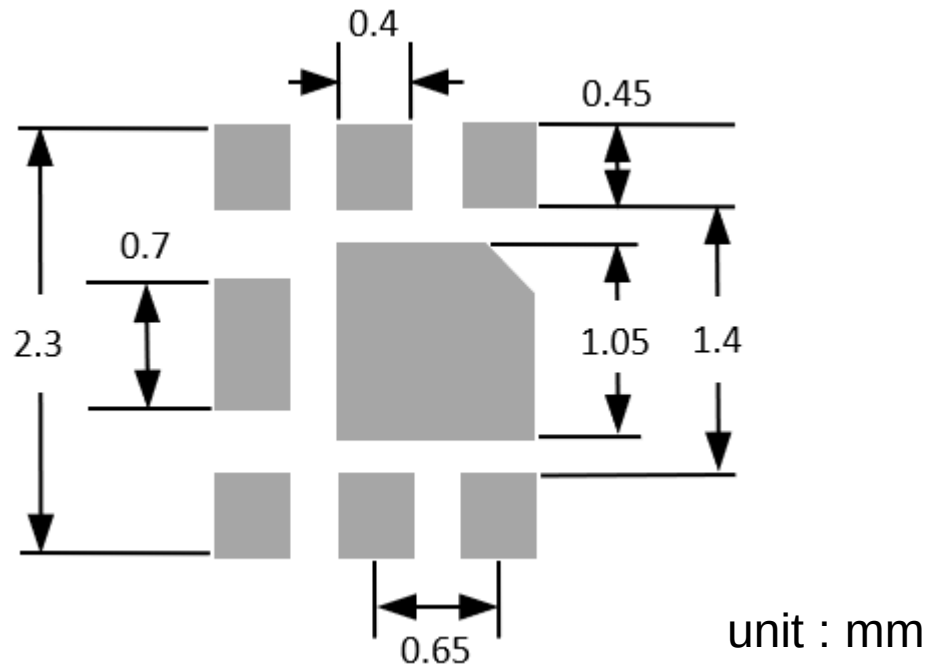
DFN2x2-6L 2EP PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	0.800	0.500	0.031	0.019
A2	0.250	0.145	0.010	0.006
b	0.350	0.250	0.014	0.010
D	2.100	1.900	0.083	0.075
D1	1.000	0.800	0.040	0.031
D2	0.350	0.250	0.014	0.010
D3	0.200BSC		0.008BSC	
D4	0.200BSC		0.008BSC	
E	2.100	1.900	0.083	0.075
E1	1.050	0.800	0.041	0.031
E2	0.66	0.46	0.026	0.018
e	0.650BSC		0.026BSC	
L	0.350	0.250	0.014	0.010



RECOMMEND FOOTPRINT Information



Contact Information

Viva Electronics Incorporated

10F-1, No. 32, Gaotie 2nd Rd., Zhubei City, Hsinchu County, Taiwan, R.O.C.

Tel: 886-3-6579508

Fax: 886-3-6579509

WWW: <http://www.viva-elec.com.tw>

Sales: sales@viva-elec.com.tw

FAE Support: fae@viva-elec.com.tw