Eternal Semiconductor Inc.

ET6312

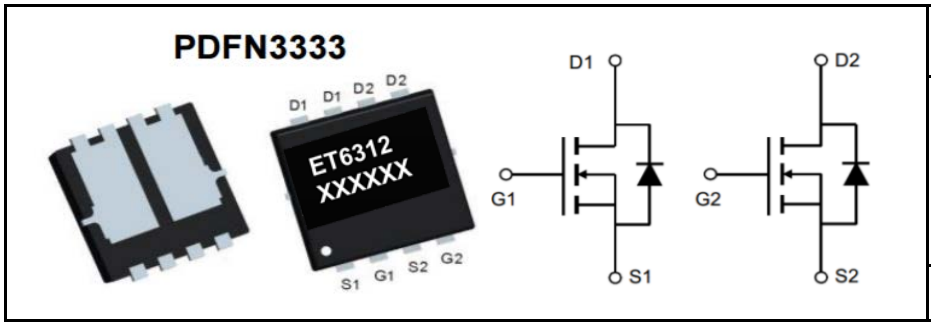
Dual N-Channel High Density Trench MOSFET (30V, 24A)

PRODUCT SUMMARY

V_{DSS}	I_D	$R_{DS(on)}$ (mΩ) Typ.
30V	24	15 @ VGS = 10V, ID=10A
		24 @ VGS = 4.5V, ID=8A

Features

- Super high density cell design for extremely low RDS(ON)
- Exceptional on-resistance and maximum DC current capability
- Lead（Pb）-free and halogen-free



TOP Marking
ET6312 XXXXXX
XXXXXX:D/C

Absolute Maximum Ratings (T_A=25°C, unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Drain Current (Continuous)@TA=25°C	24	A
	Drain Current (Continuous)@TA=75°C	16	A
I_{DM}	Drain Current (Pulsed) [a]	96	A
P_D	Total Power Dissipation @T_A=25°C	14	W
	Total Power Dissipation @T_A=75°C	7	W
EAS	Avalanche energy，single pulsed	15	Mj
I_S	Maximum Diode Forward Current	24	A
T_j, T_{stg}	Operating Junction and Storage Temperature Range	-55 to +150	°C
R_{QJA}	Thermal Resistance Junction to Ambient (PCB mounted)[b]	45	°C/W

a: Repetitive Rating: Pulse width limited by the maximum junction temperature.

b: 1-in^2 2oz Cu PCB board

Electrical Characteristics (T_A=25°C, unless otherwise noted)

Symbol	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
• Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=30V, V_{GS}=0V	-	-	1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
• On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	1.3	1.9	2.4	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=10V, I_D=10A	-	15	19	mΩ
		V_{GS}=4.5V, I_D=8A	-	24	30	
• Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=15V, V_{GS}=0V, f=1MHz	-	480	560	PF
C_{oss}	Output Capacitance		-	78	130	
C_{rss}	Reverse Transfer Capacitance		-	60	120	
• Switching Characteristics						
Q_g	Total Gate Charge	V_{DS}=15V, I_D=6.9A, V_{GS}=10V	-	11	-	nC
Q_{gs}	Gate-Source Charge		-	3	-	
Q_{gd}	Gate-Drain Charge		-	4.5	-	
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=15V, R_L=15Ω, I_D=1A, V_{GEN}=10V, RG=6Ω	-	7	-	nS
t_r	Turn-on Rise Time		-	10	-	
$t_{d(off)}$	Turn-off Delay Time		-	22	-	
t_f	Turn-off Fall Time		-	7	-	
• Drain-Source Diode Characteristics						
V_{SD}	Drain-Source Diode Forward	V_{GS}=0V, I_S=2.0A	-	-	1.2	V

Note: Pulse Test: Pulse Width≤300us, Duty Cycle≤2%

Typical Characteristics Curves (Ta=25°C, unless otherwise note)

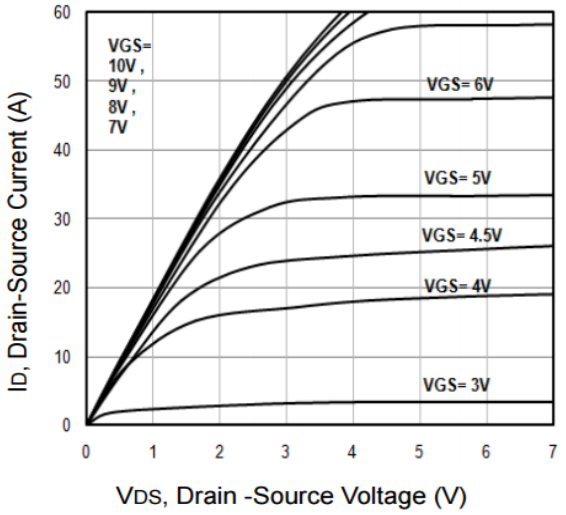


Fig1. Typical Output Characteristics

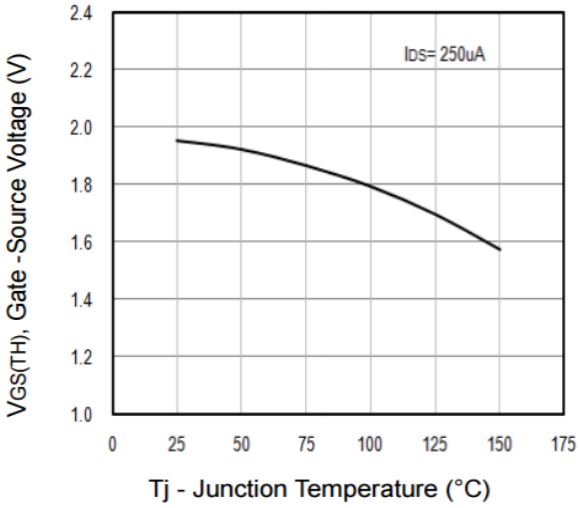


Fig2. Threshold Voltage Vs. Temperature

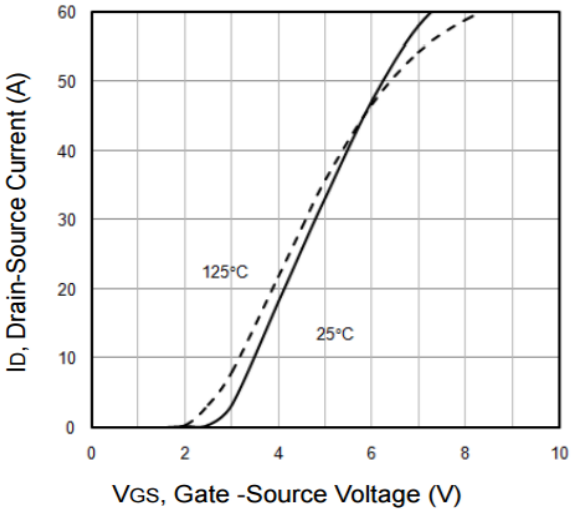


Fig3. Typical Transfer Characteristics

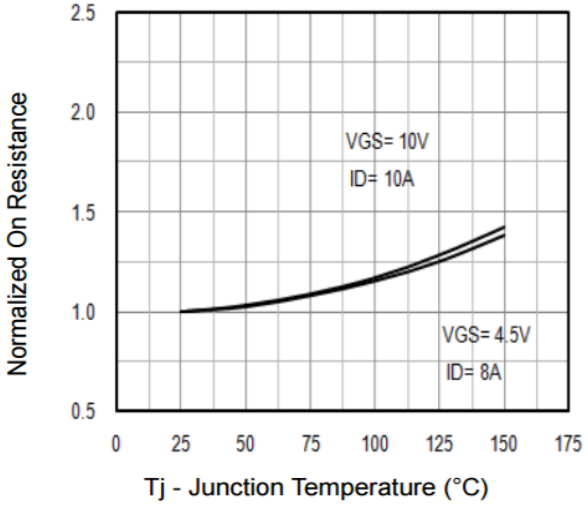


Fig4. Normalized On-Resistance Vs. Temperature

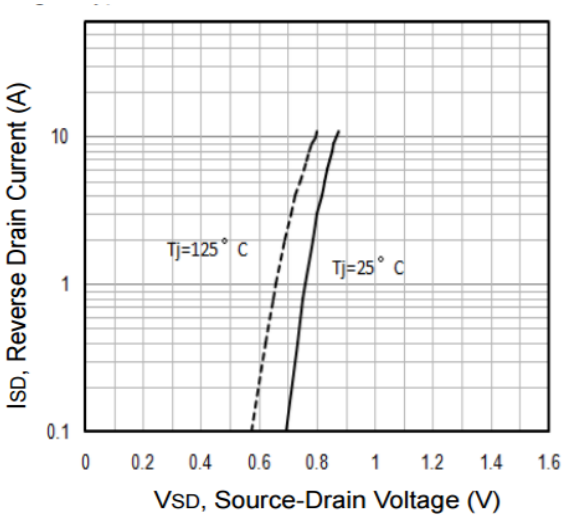


Fig5. Typical Source-Drain Diode Forward Voltage

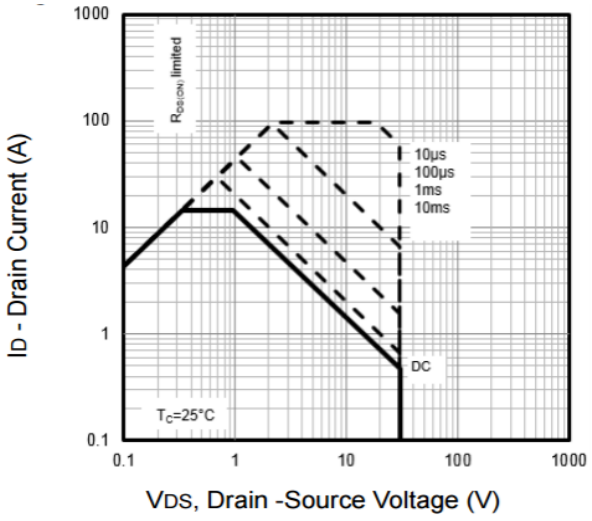


Fig6. Maximum Safe Operating Area

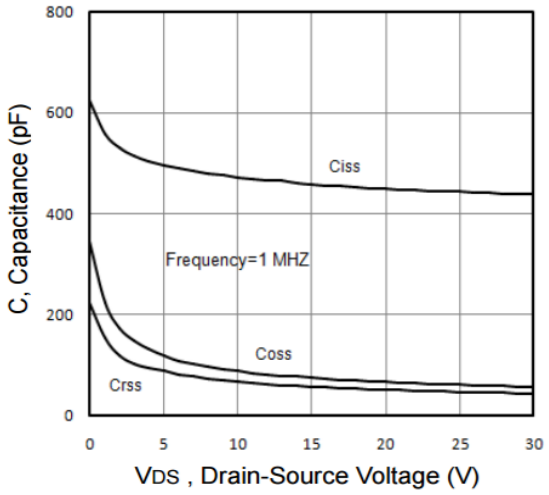


Fig7. Typical Capacitance Vs.Drain-Source Voltage

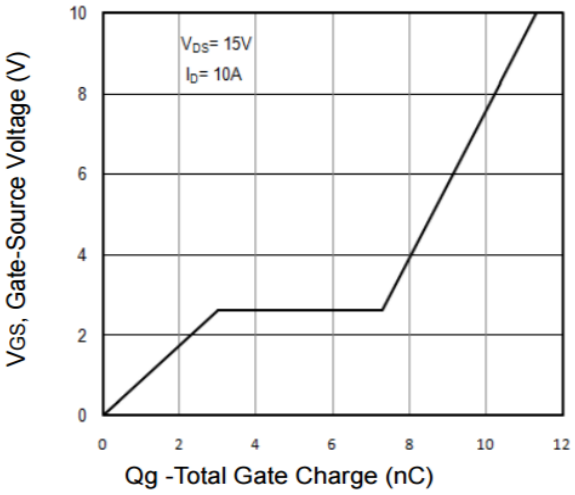


Fig8. Typical Gate Charge Vs.Gate-Source Voltage

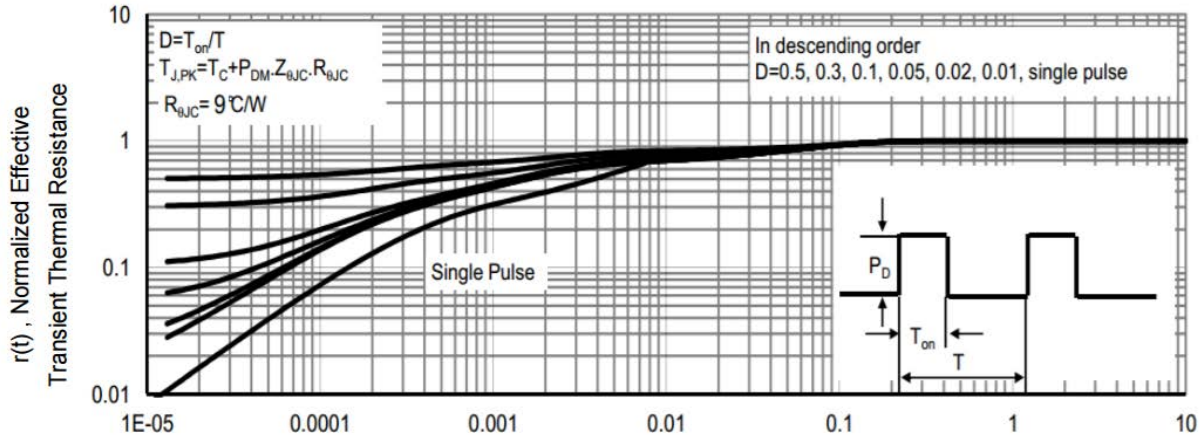


Fig9. T1 ,Transient Thermal Response Curve

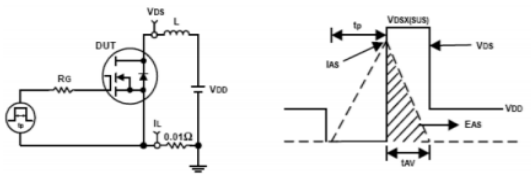


Fig10. Unclamped Inductive Test Circuit and waveforms

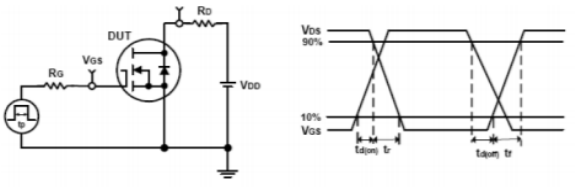
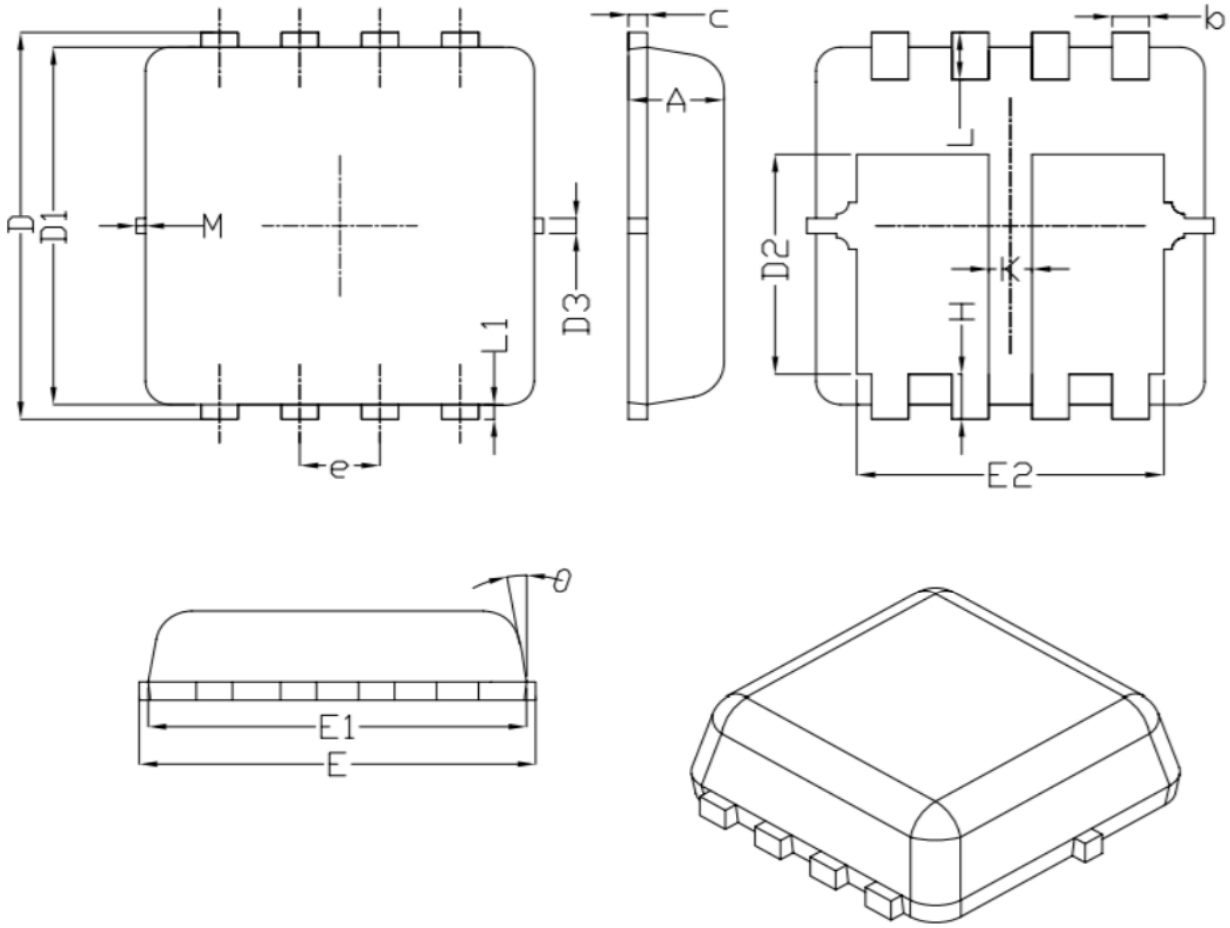


Fig11. Switching Time Test Circuit and waveforms

Dual PDFN3333 Package Outline Data



Symbol	Dimensions （unit： mm)		
	Min	TYP	Max
A	0.70	0.75	0.8
b	0.25	0.30	0.35
c	0.10	0.15	0.25
D	3.25	3.35	3.45
D1	3.00	3.10	3.2
D2	1.78	1.88	1.98
D3	-	0.13	-
E	3.20	3.30	3.4
E1	3.00	3.15	3.2
E2	2.39	2.49	2.59
e	0.65BSC		
H	0.30	0.39	0.5
L	0.30	0.40	0.5
L1	-	0.13	-
K	0.30	-	-
θ	-	10^{O}	12^{O}
M	*	*	0.15