Eternal Semiconductor Inc.

ET4946

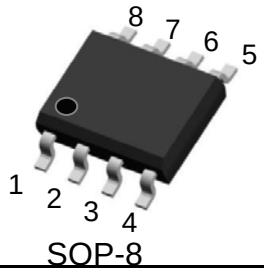
Dual N-Channel High Density Trench MOSFET (60V,6.5A)

PRODUCT SUMMARY

V_{DSS}	I_D	$R_{DS(on)}$ (mΩ)Typ.
60V	6.5A	26@ VGS = 10V, ID=6.5A
		32@ VGS = 4.5V, ID=5.8A

Features

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



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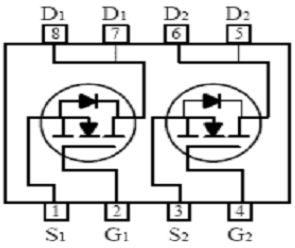
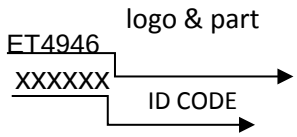


Pin 1: Source1
Pin 2: Gate 1
Pin 3: Source 2
Pin 4: Gate 2
Pin 5 / 6: Drain 2
Pin 7 / 8: Drain 1

TOP Marking



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

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Drain Current (Continuous)@TA=25°C	6.5	A
	Drain Current (Continuous)@TA=75°C	4.5	A
I_{DM}	Drain Current (Pulsed) [a]	40	A
P_D	Total Power Dissipation @T_A=25°C	2	W
	Total Power Dissipation @T_A=75°C	1.2	W
I_S	Maximum Diode Forward Current	6.5	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]	62.5	°C/W

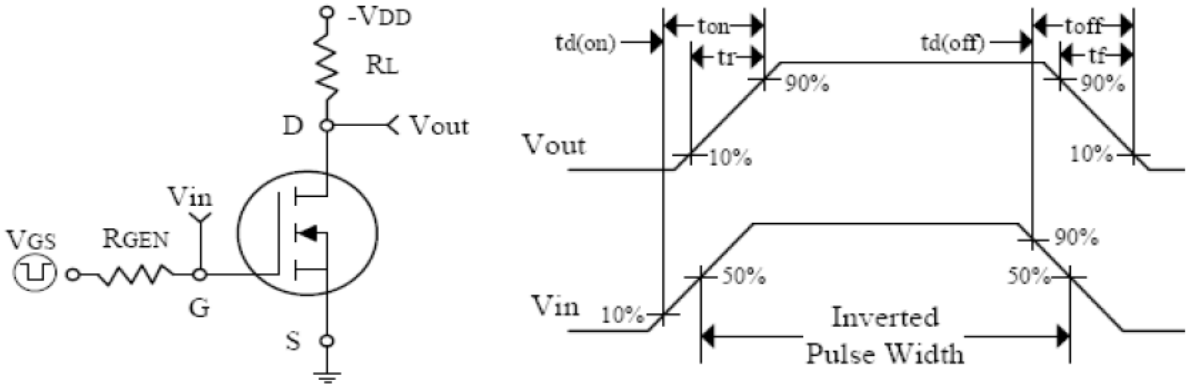
a: Repetitive Rating: Pulse width limited by the maximum junction temperature.

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	60	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=60V, 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	1.0	1.6	2.5	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=10V, I_D=6.5A	-	26	35	mΩ
		V_{GS}=4.5V, I_D=5.8A	-	32	40	
• Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=30V, V_{GS}=0V, f=1MHz	-	980	-	PF
C_{oss}	Output Capacitance		-	65	-	
C_{rss}	Reverse Transfer Capacitance		-	62	-	
• Switching Characteristics						
Q_g	Total Gate Charge	V_{DS}=30V, I_D=4A, V_{GS}=10V	-	28	-	nC
Q_{gs}	Gate-Source Charge		-	6	-	
Q_{gd}	Gate-Drain Charge		-	7.6	-	
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=30V, R_L=15Ω, I_D=4A, V_{GEN}=10V, RG=6Ω	-	8	-	nS
t_r	Turn-on Rise Time		-	22	-	
$t_{d(off)}$	Turn-off Delay Time		-	30	-	
t_f	Turn-off Fall Time		-	24	-	
• Drain-Source Diode Characteristics						
V_{SD}	Drain-Source Diode Forward	V_{GS}=0V, I_S=20A	-	-	1.2	V

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



Switching Test Circuit and Switching

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

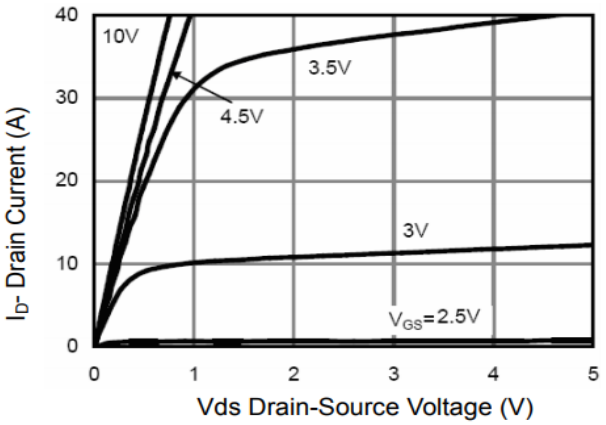


Figure 1 Output Characteristics

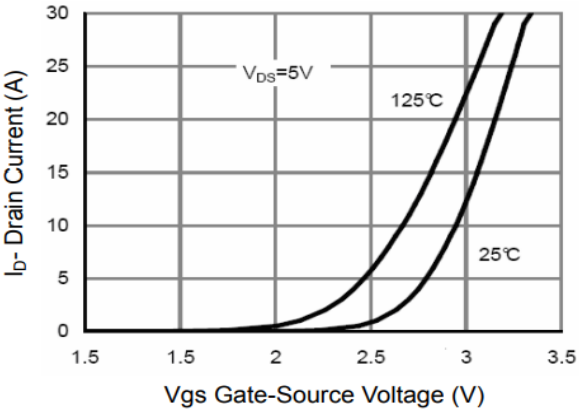


Figure 2 Transfer Characteristics

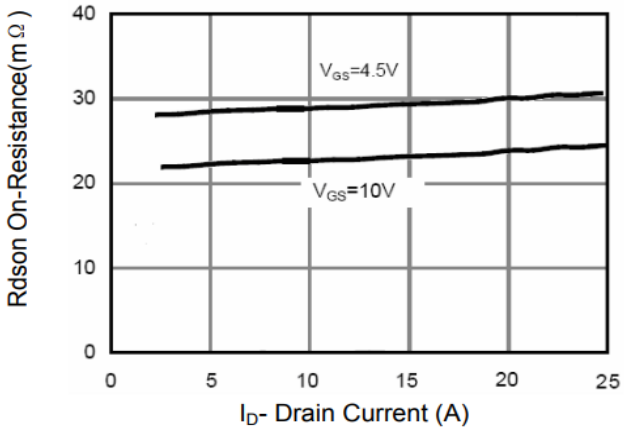


Figure 3 Rdson- Drain Current

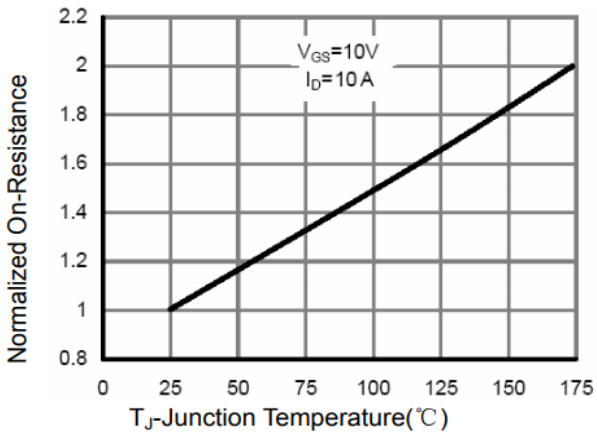


Figure 4 Rdson-Junction Temperature

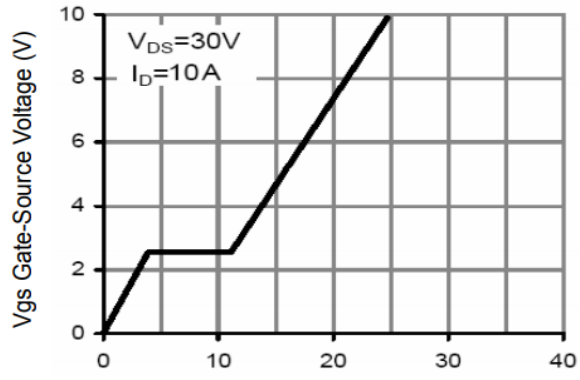


Figure 5 Gate Charge

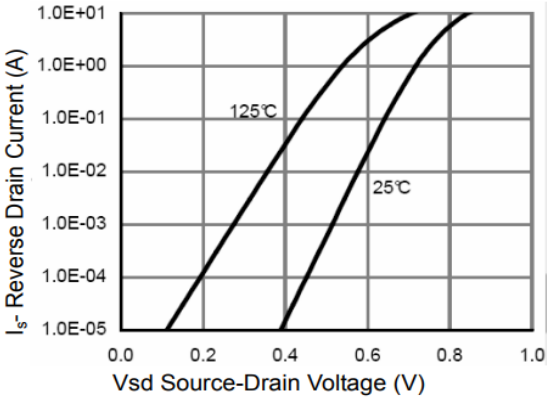


Figure 6 Source- Drain Diode Forward

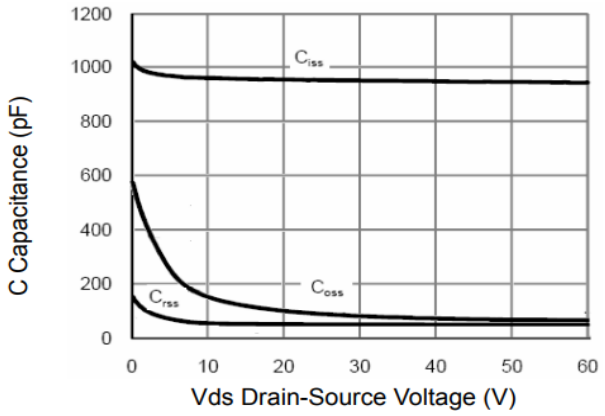


Figure 7 Capacitance vs Vds

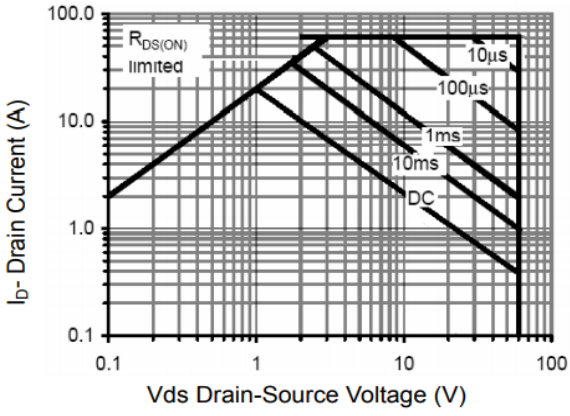


Figure 8 Safe Operation Area

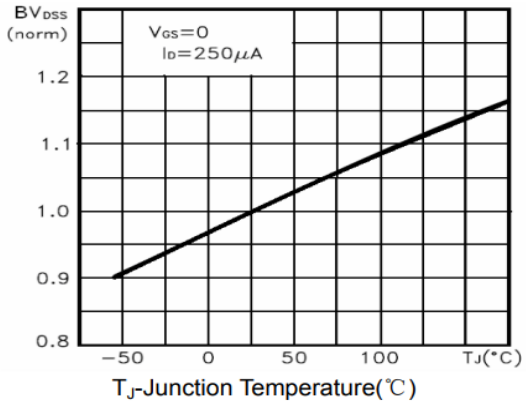


Figure 9 BV_{DSS} vs Junction Temperature

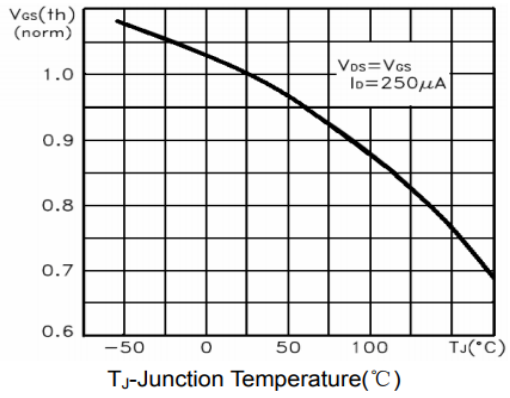


Figure 10 $V_{GS(th)}$ vs Junction Temperature

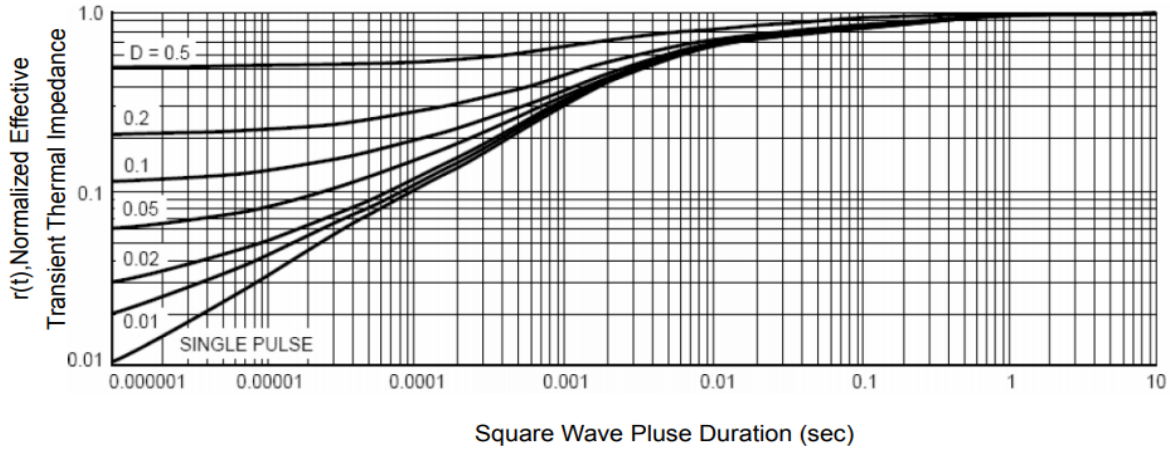
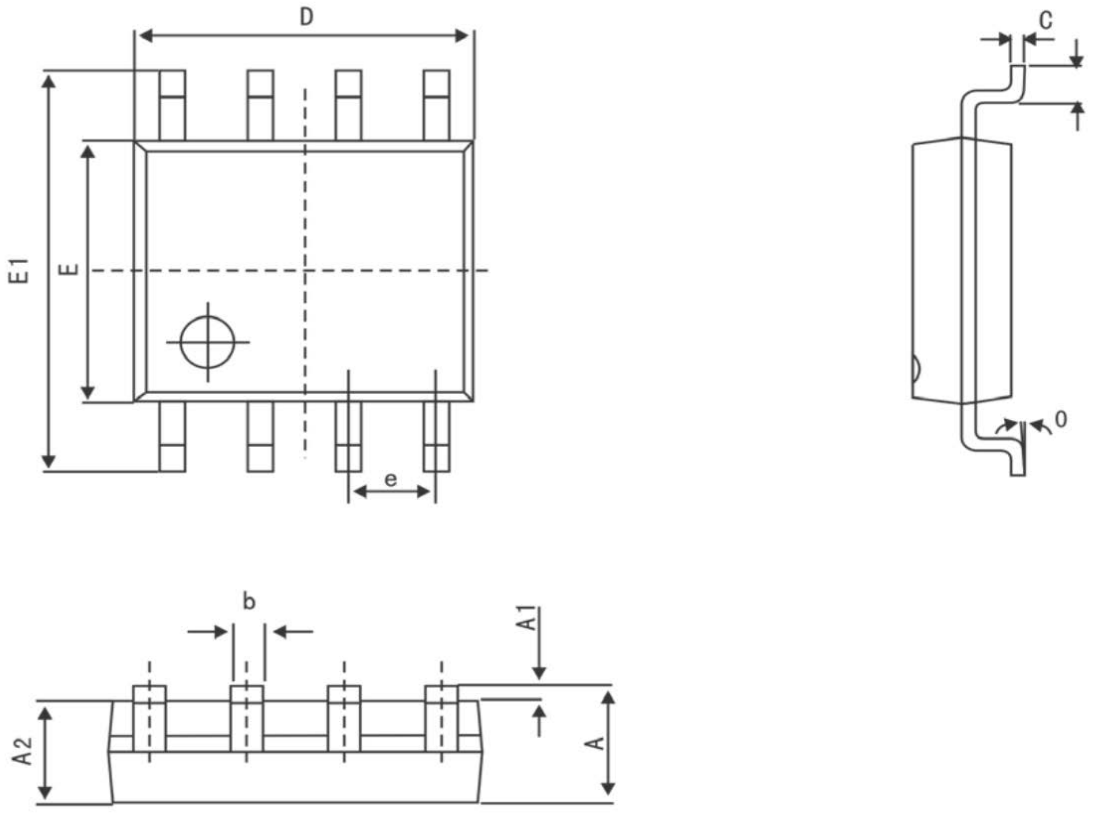


Figure 11 Normalized Maximum Transient Thermal Impedance

SOP-8L PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters (MM)		Dimensions In Inches (MIL)	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	4.700	5.100	0.185	0.201
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270（BSC)		0.050（BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°