Eternal Semiconductor Inc.

EM8810

Dual N-Channel High Density Trench MOSFET (20V, 7A)

PRODUCT SUMMARY

V_{DSS}	I_D	$R_{DS(on)}$ (mΩ) Typ.
20V	7.0A	15 @ VGS = 4.5V, ID=7A
		16@ VGS = 4.0V, ID=7A
		16.5@ VGS = 3.7V, ID=5.5A
		18 @ VGS = 2.5V, ID=5.5A

Features

• Advanced Trench Process Technology

• High Density Cell Design for Ultra Low On-Resistance

• Surface mount Package

• Lead（Pb）-free and halogen-free

Pin 1/ 8: Drain
Pin 2/ 3: Source 1
Pin 4: Gate 1
Pin 5: Gate 2
Pin 6/ 7: Source 2
PKG:TSSOP-8
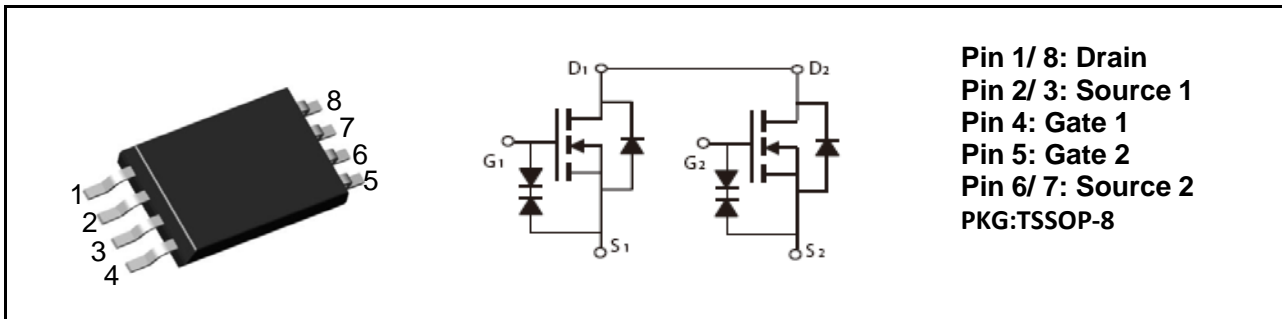
Absolute Maximum Ratings (T$_A$=25°C, unless otherwise noted)

| Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	±10	V
I_D	Drain Current (Continuous)	7	A
I_{DM}	Drain Current (Pulsed) [a]	30	A
P_D	Total Power Dissipation @T$_A$=25°C	1.5	W
I_S	Maximum Diode Forward Current	1.5	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]	83	°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	20	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=20V, V_{GS}=0V	-	-	1	µA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±10V, V_{DS}=0V	-	-	±10	µA
• **On Characteristics**						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	0.6	0.65	1.2	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=4.5V, I_D=7A	-	15	20	mΩ
		V_{GS}=3.7V, I_D=5.5A	-	16.5	25	
		V_{GS}=2.5V, I_D=5.5A	-	18	28	
• **Dynamic Characteristics**						
C_{iss}	Input Capacitance	V_{DS}=6V, V_{GS}=0V, f=1MHz	-	40	-	PF
C_{oss}	Output Capacitance		-	148	-	
C_{rss}	Reverse Transfer Capacitance		-	15	-	
• **Switching Characteristics**						
Q_g	Total Gate Charge	V_{DS}=10V, I_D=7A, V_{GS}=4.5V	-	5	-	nC
Q_{gs}	Gate-Source Charge		-	1.2	-	
Q_{gd}	Gate-Drain Charge		-	3.8	-	
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=10V, R_L=1.2Ω, I_D=1A, VGEN=10V, RG=6Ω	-	487	-	nS
t_r	Turn-on Rise Time		-	800	-	
$t_{d(off)}$	Turn-off Delay Time		-	1720	-	
t_f	Turn-off Fall Time		-	6180	-	
• **Drain-Source Diode Characteristics**						
V_{SD}	Drain-Source Diode Forward	V_{GS}=0V, I_S=1.7A	-	-	1.2	V

Note: Pulse Test: Pulse Width≤300us, Duty Cycle≤2%
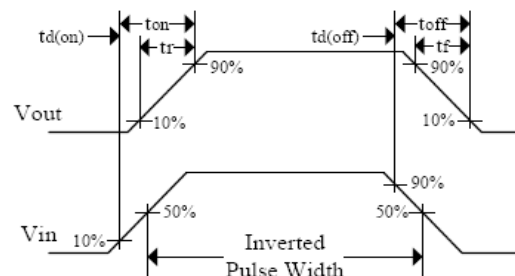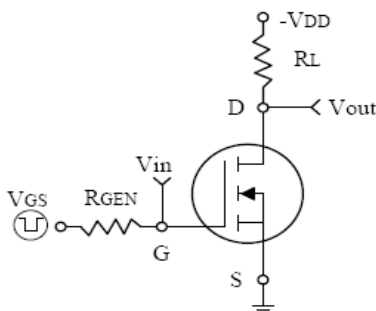
Switching Test Circuit and Switching Waveforms

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

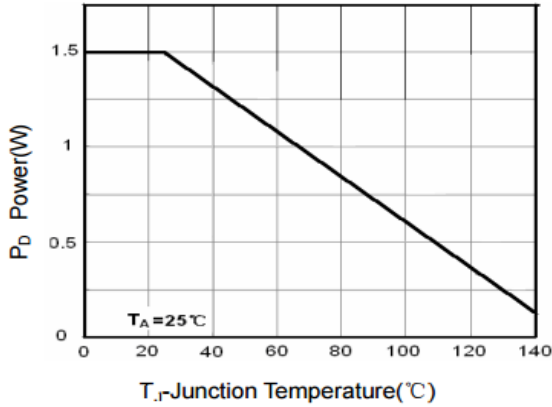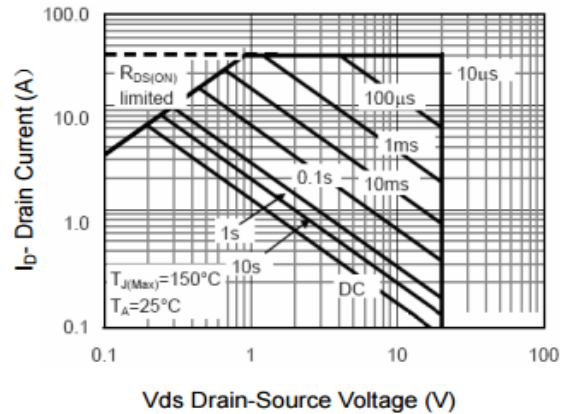**Figure 1 Power Dissipation**

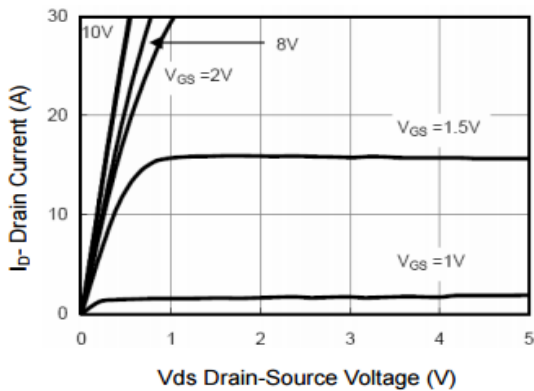**Figure 2: Safe Operation Area**

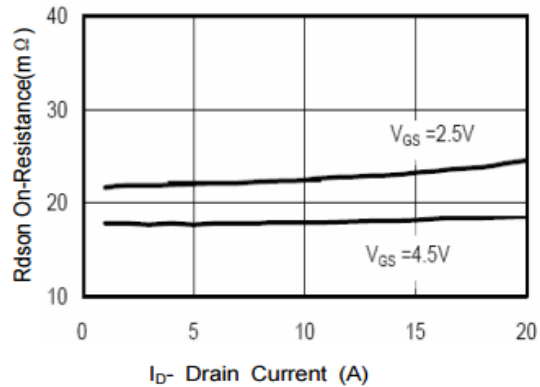**Figure 3 Output Characteristics**
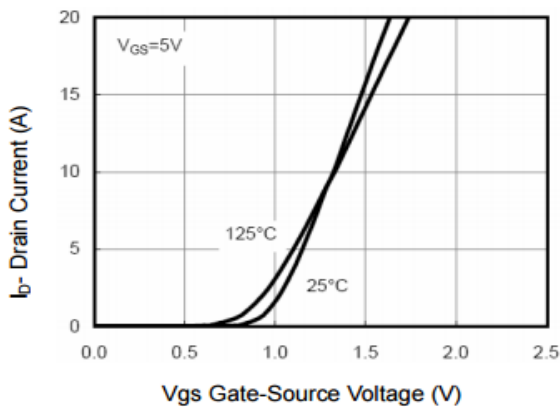

Figure 4 Drain-Source On-Resistance

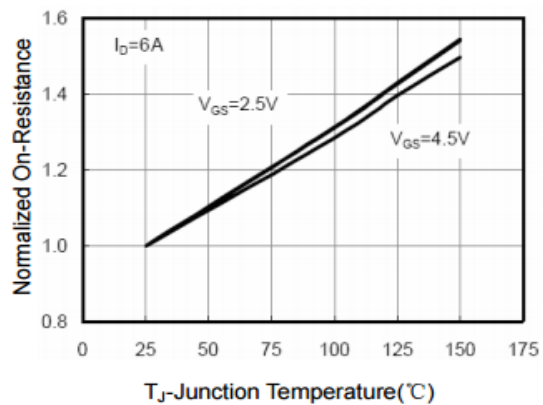**Figure 5 Transfer Characteristics**

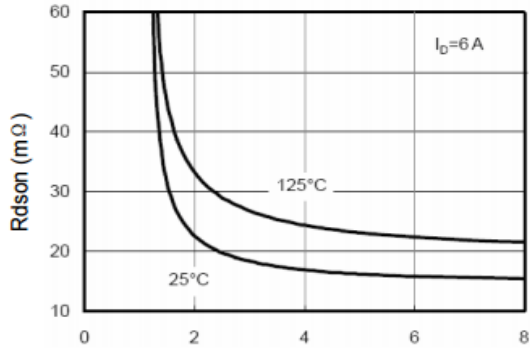**Figure 6 Drain-Source On-Resistance**
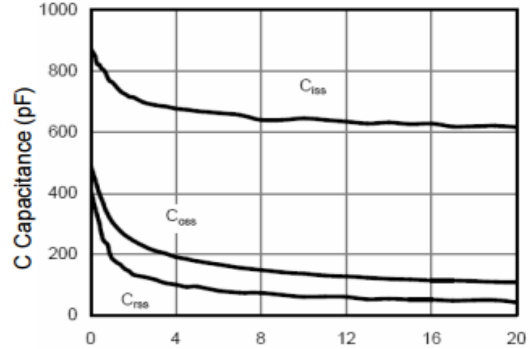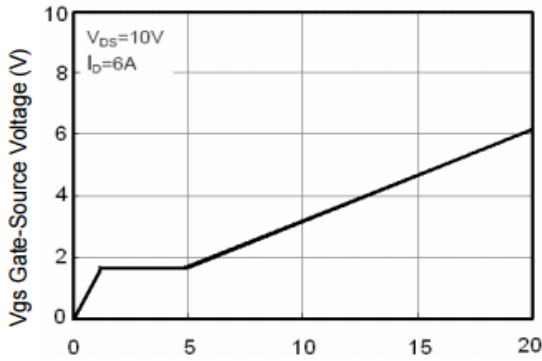
Figure 7 Rdson vs Vgs

Figure 8 Capacitance vs Vds
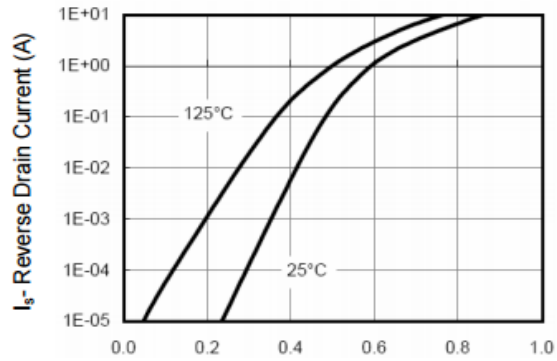
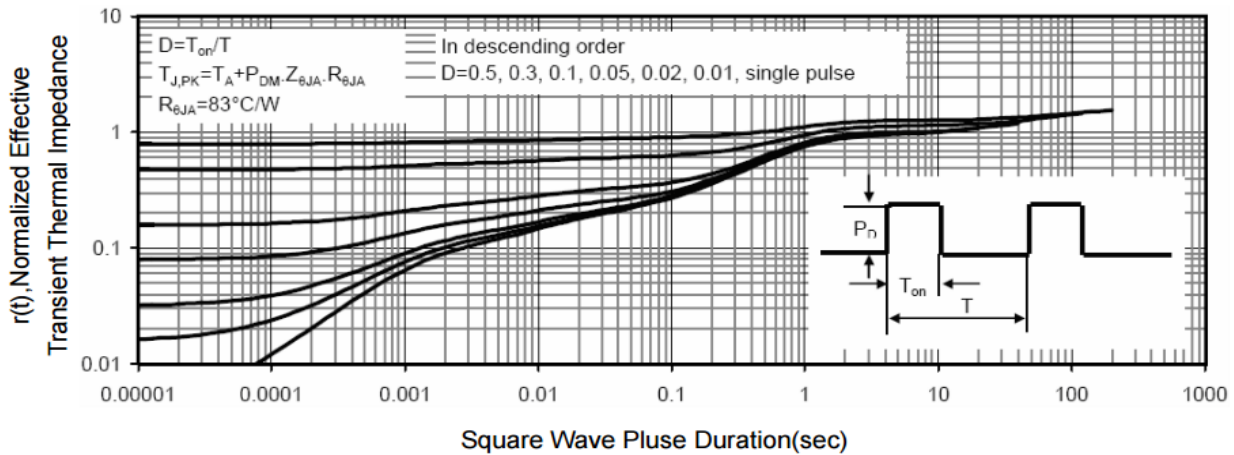**Figure 9 Gate Charge**

Figure 10 Source- Drain Diode Forward
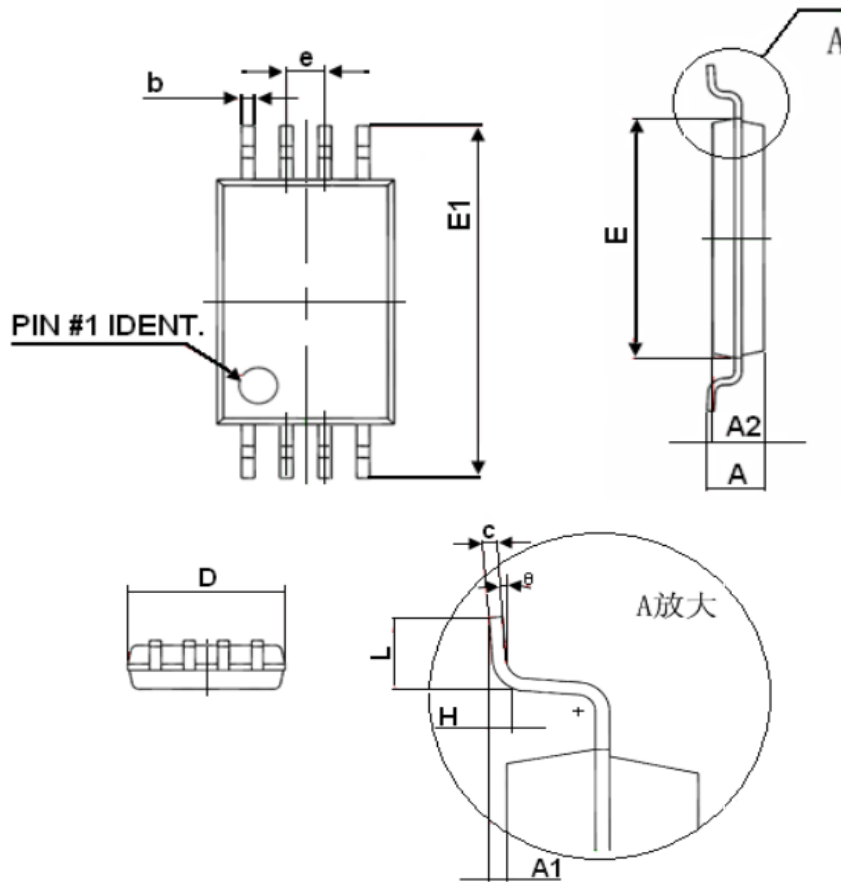
Figure 11 Normalized Maximum Transient Thermal Impedance

TSSOP8 PACKAGE OUTLINE DIMENSIONS

Symbol	Dimensions In Millimeters	
	Min	Max
D	2.900	3.100
E	4.300	4.500
b	0.190	0.300
c	0.090	0.200
E1	6.250	6.550
A		1.100
A2	0.800	1.000
A1	0.020	0.150
e	0.65(BSC)	
L	0.500	0.700
H	0.25(TYP)	
Θ	1°	7°

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