

DESCRIPTION

The MX2810 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a load switch or in PWM applications. It is ESD protected.

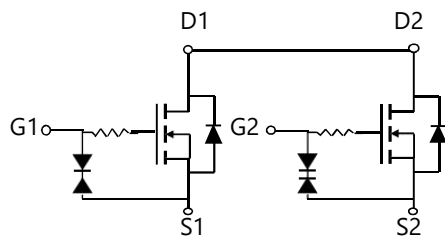
GENERAL FEATURES

- $V_{DS}=20V$, $I_D=8A$
 $R_{DS(ON)}(Typ.)=18m\Omega @ V_{GS}=2.5V$
 $R_{DS(ON)}(Typ.)=15m\Omega @ V_{GS}=3.8V$
 $R_{DS(ON)}(Typ.)=13.5m\Omega @ V_{GS}=4.5V$
 ESD Rating: 2000V HBM
- High power and current handling capability
- Lead free product is acquired
- Surface mount package

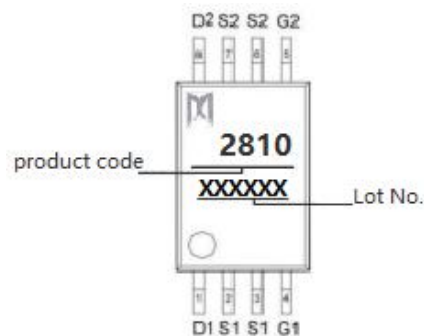
APPLICATION

- PWM applications
- Load switch

PINOUT



Schematic diagram



Marking and Pin Assignment

ORDERING INFORMATION

Part Number	Marking	Storage Temperature	Package	Devices Per Reel
MX2810	2810	-55°C to 150°C	TSSOP-8	3000

ABSOLUTE MAXIMUM RATINGS ($T_A=25^\circ C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 10	V
Drain Current-Continuous	I_D	8	A
Pulsed Drain Current ^(Note1)	I_{DM}	34	A
Maximum Power Dissipation	P_D	1.5	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	°C

THERMAL RESISTANCE

Thermal Resistance, Junction-to-Ambient ^(Note2)	$R_{\theta JA}$	83.3	°C/W
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Note 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

Note 2. Surface Mounted on FR4 Board, $t \leq 10$ sec.



ELECTRICAL CHARACTERISTICS ($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
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Off Characteristics

Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	20	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=20V, V_{GS}=0V$	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 10V, V_{DS}=0V$	-	-	± 10	μA

On Characteristics (Note 3)

Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.45	0.7	0.95	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=2.5V, I_D=5.5A$	16	18	21	$m\Omega$
		$V_{GS}=3.8V, I_D=6A$	13	15	18	$m\Omega$
		$V_{GS}=4.5V, I_D=7A$	12	13.5	17	$m\Omega$
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_D=7A$	-	20	-	S

Dynamic Characteristics (Note 4)

Input Capacitance	C_{iss}	$V_{DS}=10V, V_{GS}=0V, F=1.0MHz$	-	1150	-	pF
Output Capacitance	C_{oss}		-	185	-	pF
Reverse Transfer Capacitance	C_{rss}		-	145	-	pF

Switching Characteristics (Note 4)

Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=10V, R_L=1.35\Omega, V_{GS}=5V, R_{GEN}=3\Omega$	-	6	-	nS
Turn-on Rise Time	t_r		-	13	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	52	-	nS
Turn-Off Fall Time	t_f		-	16	-	nS
Total Gate Charge	Q_g	$V_{DS}=10V, I_D=7A, V_{GS}=4.5V$	-	15	-	nC
Gate-Source Charge	Q_{gs}		-	0.8	-	nC
Gate-Drain Charge	Q_{gd}		-	3.2	-	nC

Drain-Source Diode Characteristics

Diode Forward Voltage (Note 3)	V_{SD}	$V_{GS}=0V, I_S=1A$	-	-	1.2	V
Diode Forward Current (Note 2)	I_S		-	-	7	A

Note 2. Surface Mounted on FR4 Board, $t \leq 10$ sec.

Note 3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.

Note 4. Guaranteed by design, not subject to product.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 1. Switching Test Circuit

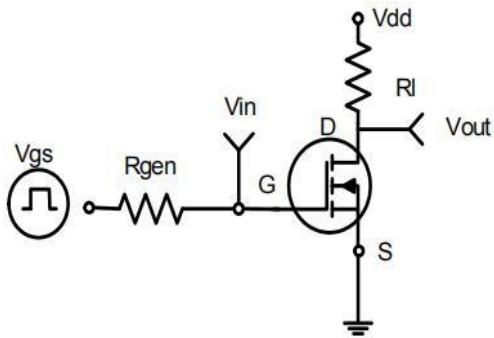


Figure 2. Switching Waveform

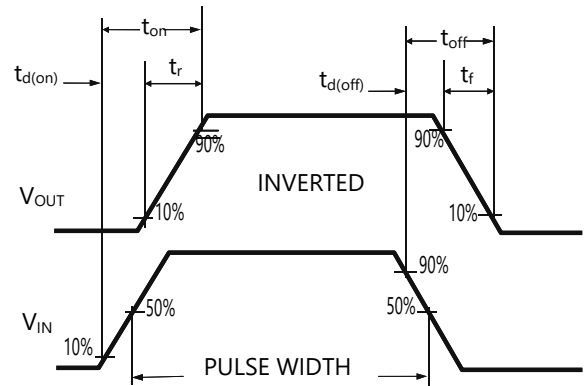


Figure 3. Power Dissipation

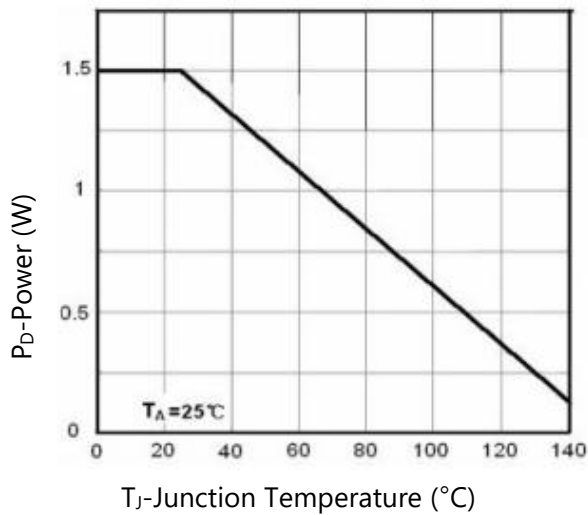


Figure 4. On-Resistance

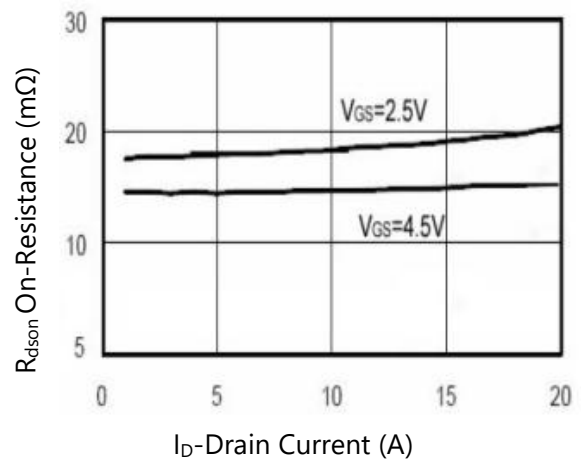


Figure 5. Output Characteristics

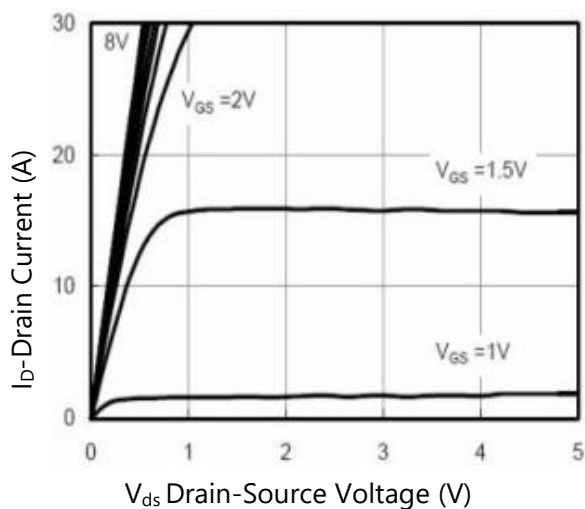
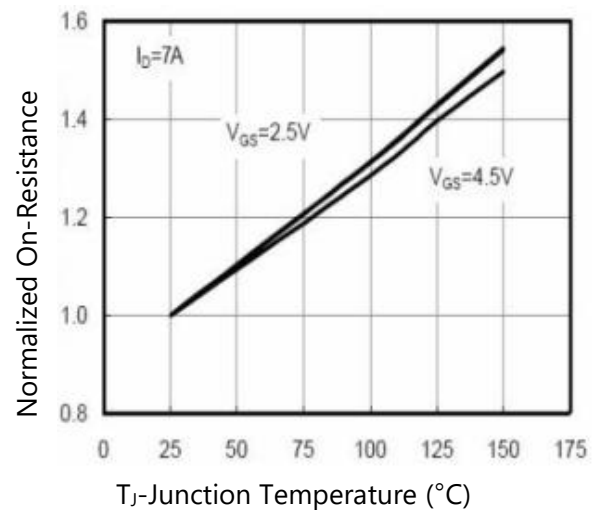


Figure 6. Normalized On-Resistance





TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 7. Transfer Characteristics

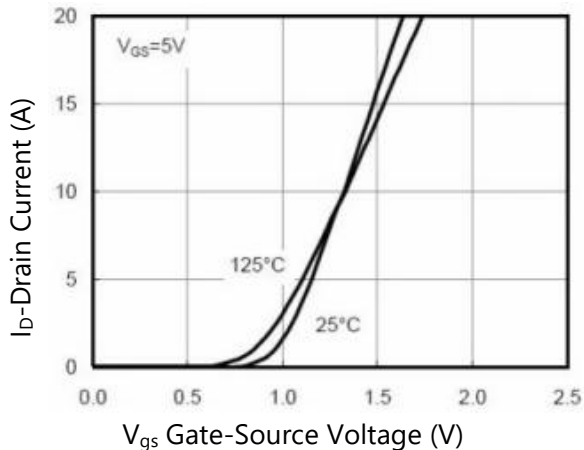


Figure 8. Capacitance vs Vds

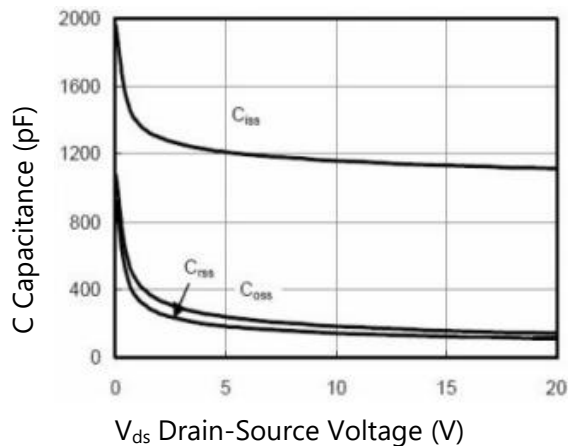


Figure 9. Rds(on) vs Vgs

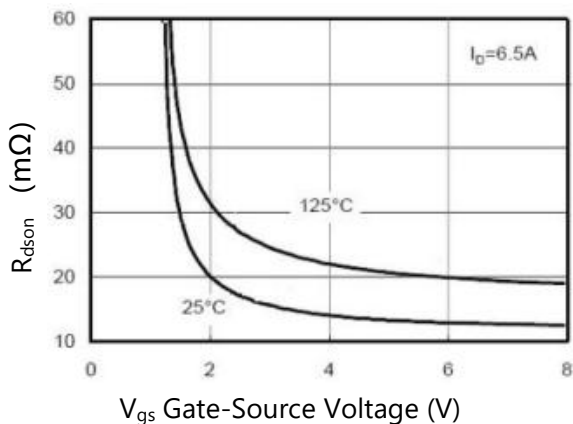


Figure 10. Capacitance vs Vds

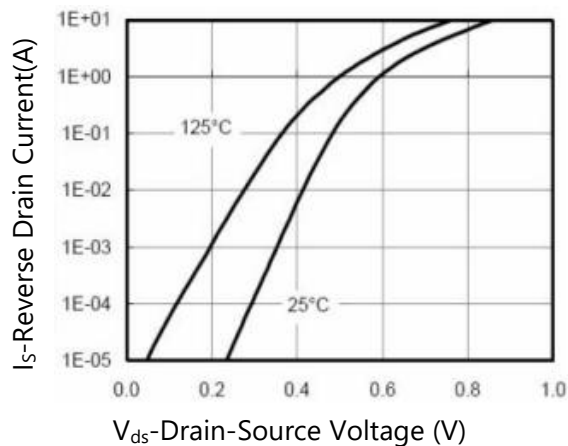


Figure 11. Gate Charge

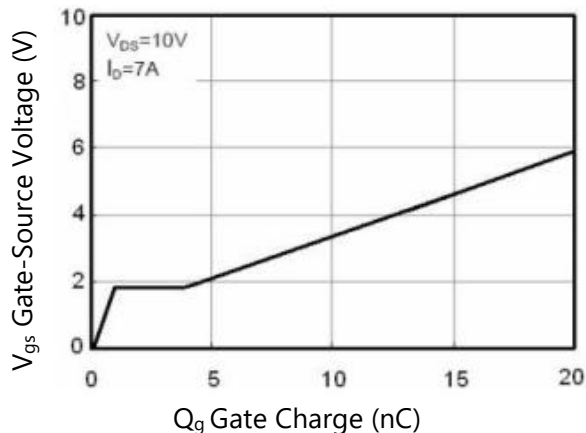
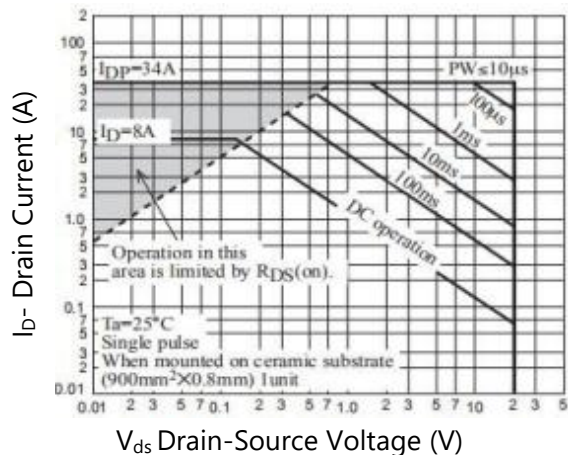


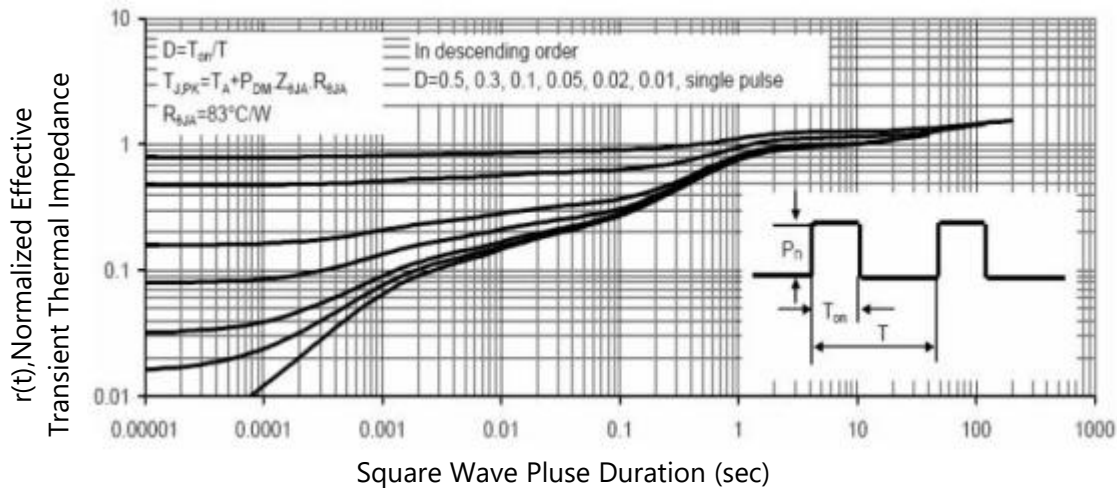
Figure 12. Safe Operation Area

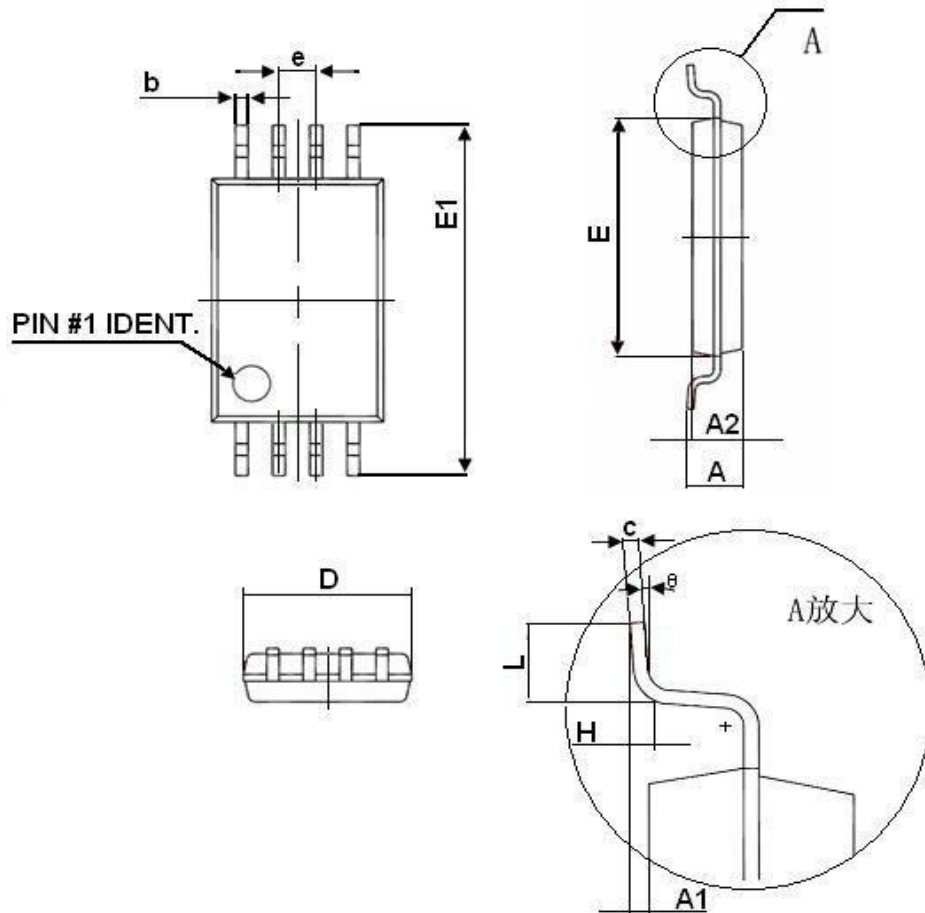




TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 13. Normalized Maximum Transient Thermal Impedance



PACKAGE INFORMATION
TSSOP-8


SYMBOLS	DIMENSIONS IN MILLIMETERS	
	MIN	MAX
D	2.90	3.10
E	4.30	4.50
b	0.19	0.30
c	0.09	0.20
E1	6.25	6.55
A	-	1.10
A2	0.80	1.00
A1	0.02	0.15
e	0.65(BSC)	
L	0.50	0.70
H	0.25(TYP)	
θ	1°	7°