

FH8810T6

N- Channel Enhancement Mode Power MOSFET

Description

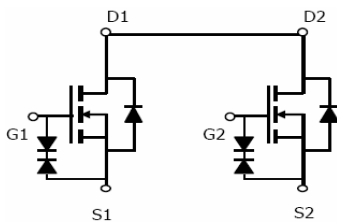
The FH8810T6 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 1.8V. This device is suitable for use as a load switch or in PWM applications .It is ESD protested.

Application

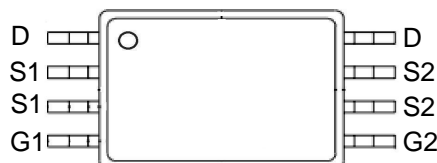
- Uni-directional load switch
- Bi-directional load switch

General Features

- $V_{DS} = 20V, I_D = 8A$
- $R_{DS(ON)} < 18 m\Omega (MAX) @ V_{GS} = 4.5V$
- $R_{DS(ON)} < 23 m\Omega (MAX) @ V_{GS} = 2.5V$
- ESD Rating : 2000V HBM
- High power and current handling capability
- Lead free product is acquired
- Surface mount package



Schematic diagram



Marking and pin Assignment



TSSOP-8 top view

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
Drain Current-Pulsed ^(Note 1)	I_{DM}	30	A
Maximum Power Dissipation	P_D	1.5	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	$^\circ C$

Thermal Characteristic

Thermal Resistance, Junction-to-Ambient ^(Note 2)	$R_{\theta JA}$	83	$^\circ C/W$
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Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
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	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.4	0.7	1.0	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=4.5V, I_D=4A$		15	18	m Ω
		$V_{GS}=2.5V, I_D=3A$	-	19	23	m Ω
		$V_{GS}=1.8V, I_D=3A$	-	23	29	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_D=8A$	-	35	-	S
Dynamic Characteristics ^(Note 4)						
Input Capacitance	C_{iss}	$V_{DS}=10V, V_{GS}=0V,$ $F=1.0\text{MHz}$		1180		PF
Output Capacitance	C_{oss}		-	230	-	PF
Reverse Transfer Capacitance	C_{rss}			200		PF
Switching Characteristics ^(Note 4)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=10V, R_L=1.2\Omega$ $V_{GS}=8V, R_{GEN}=3\Omega$	-	2.5		nS
Turn-on Rise Time	t_r		-	7.2		nS
Turn-Off Delay Time	$t_{d(off)}$		-	49		nS
Turn Off Fall Time	t_f		-	10.8		nS
Total Gate Charge	Q_g	$V_{DS}=10V, I_D=8A,$ $V_{GS}=4.5V$	-	17.9		nC
Gate-Source Charge	Q_{gs}		-	1.5	-	nC
Gate-Drain Charge	Q_{gd}		-	4.7	-	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		-	-	3	A

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production

Typical Electrical and Thermal Characteristics

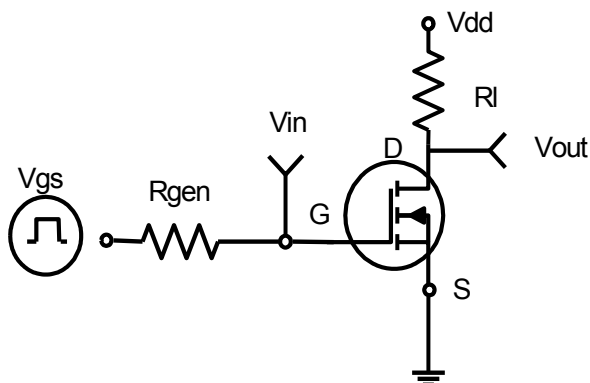


Figure 1: Switching Test Circuit

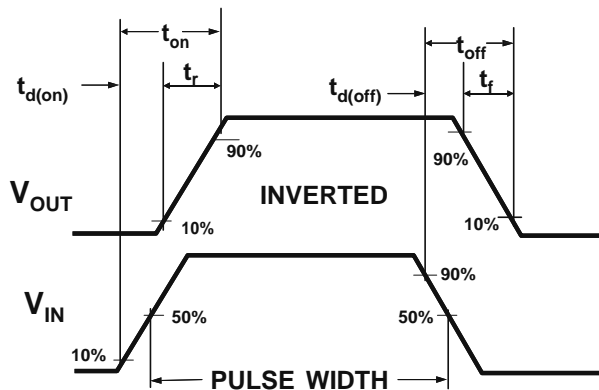


Figure 2: Switching Waveforms

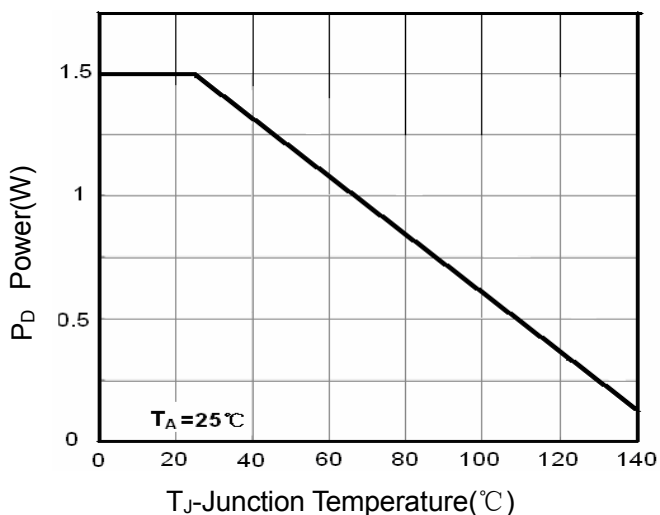


Figure 3 Power Dissipation

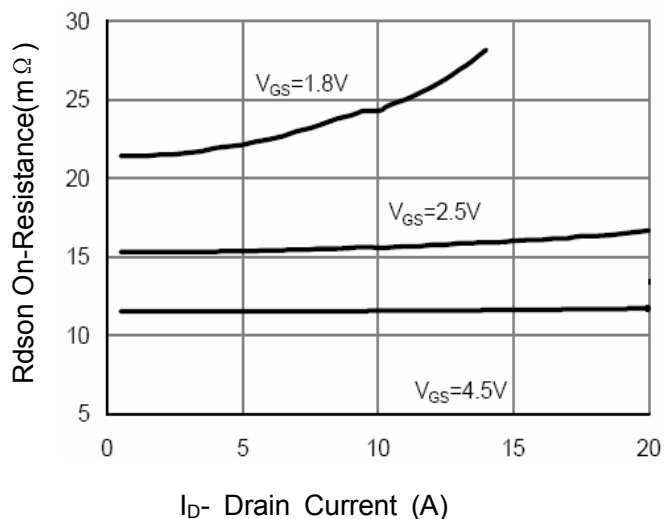


Figure 6 Drain-Source On-Resistance

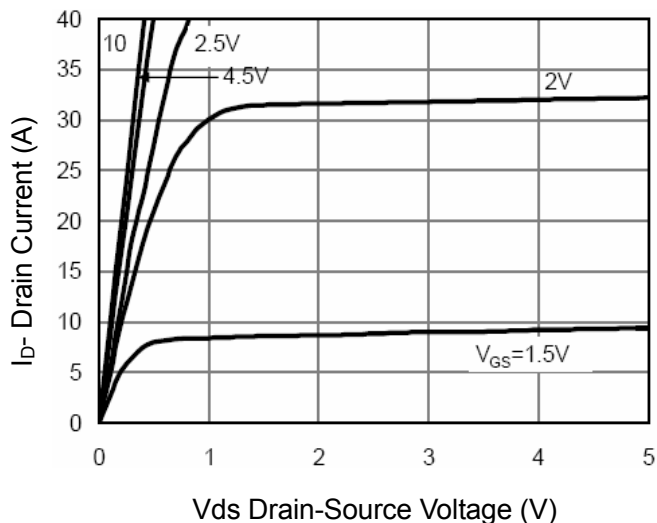


Figure 5 Output Characteristics

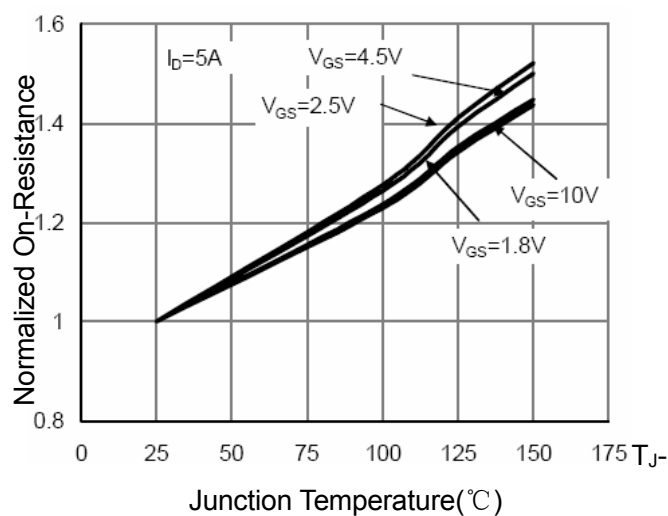


Figure 8 Drain-Source On-Resistance

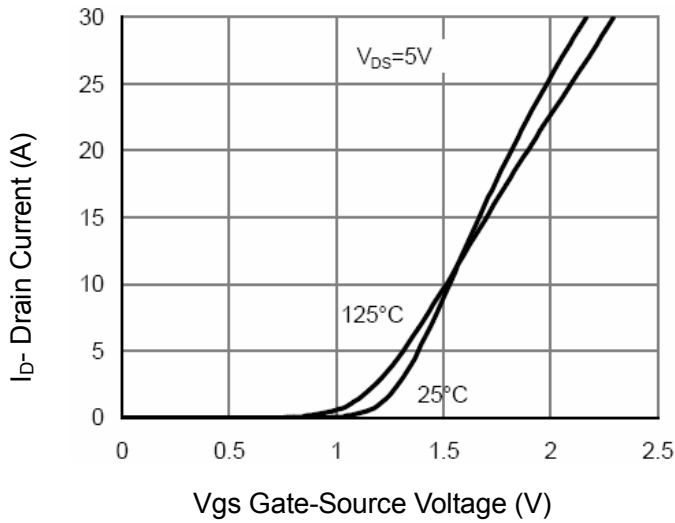


Figure 7 Transfer Characteristics

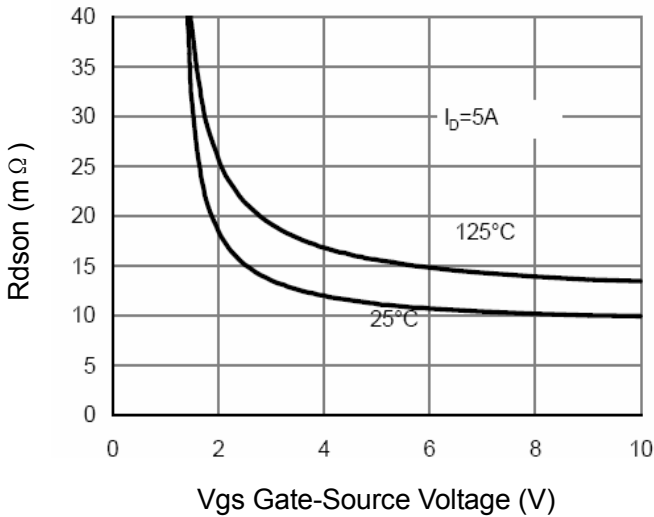


Figure 9 $R_{DS(on)}$ vs V_{GS}

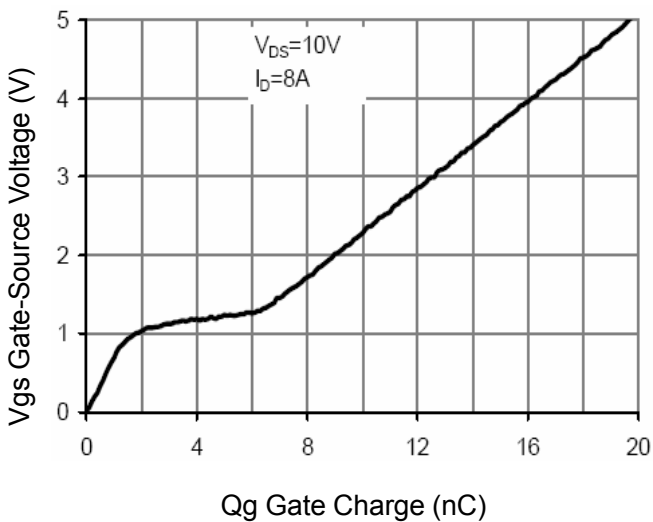


Figure 11 Gate Charge

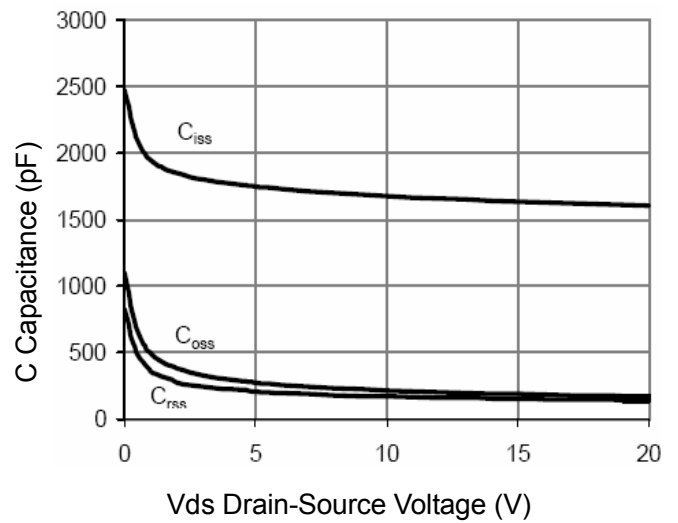


Figure 8 Capacitance vs V_{DS}

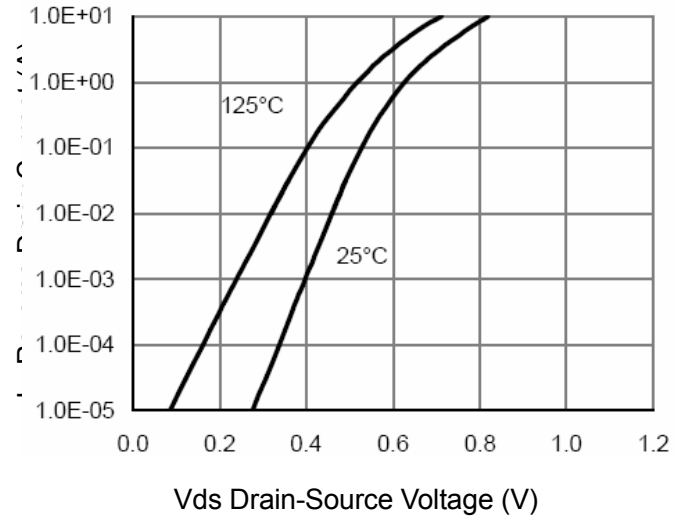


Figure 10 Capacitance vs V_{DS}

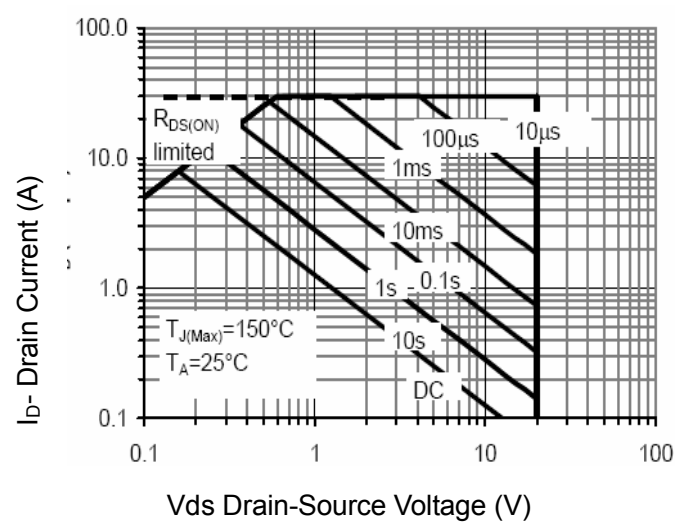


Figure 13 Safe Operation Area

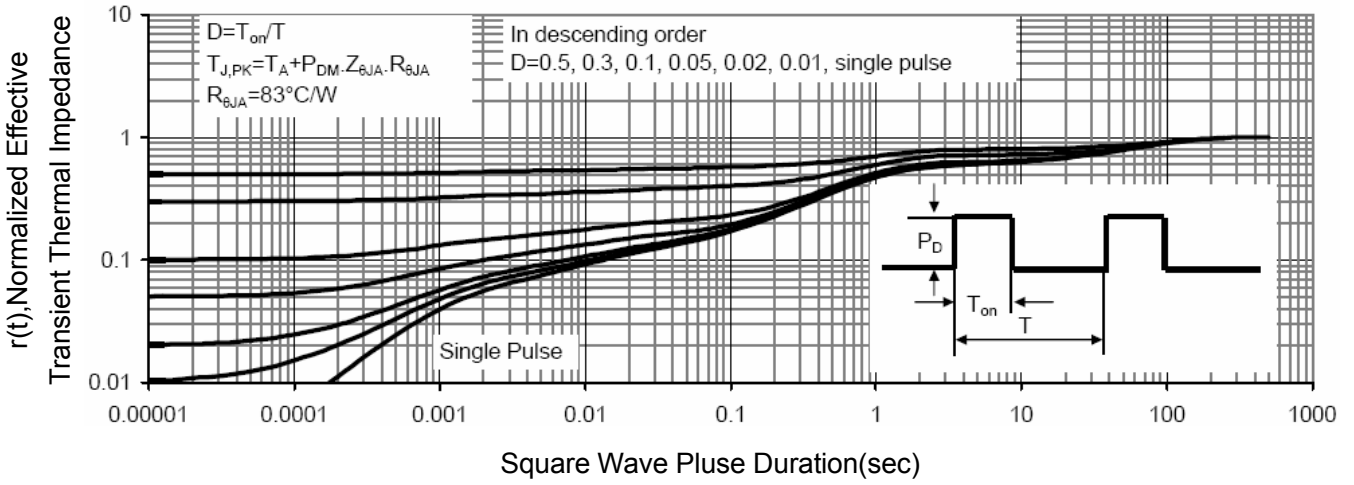
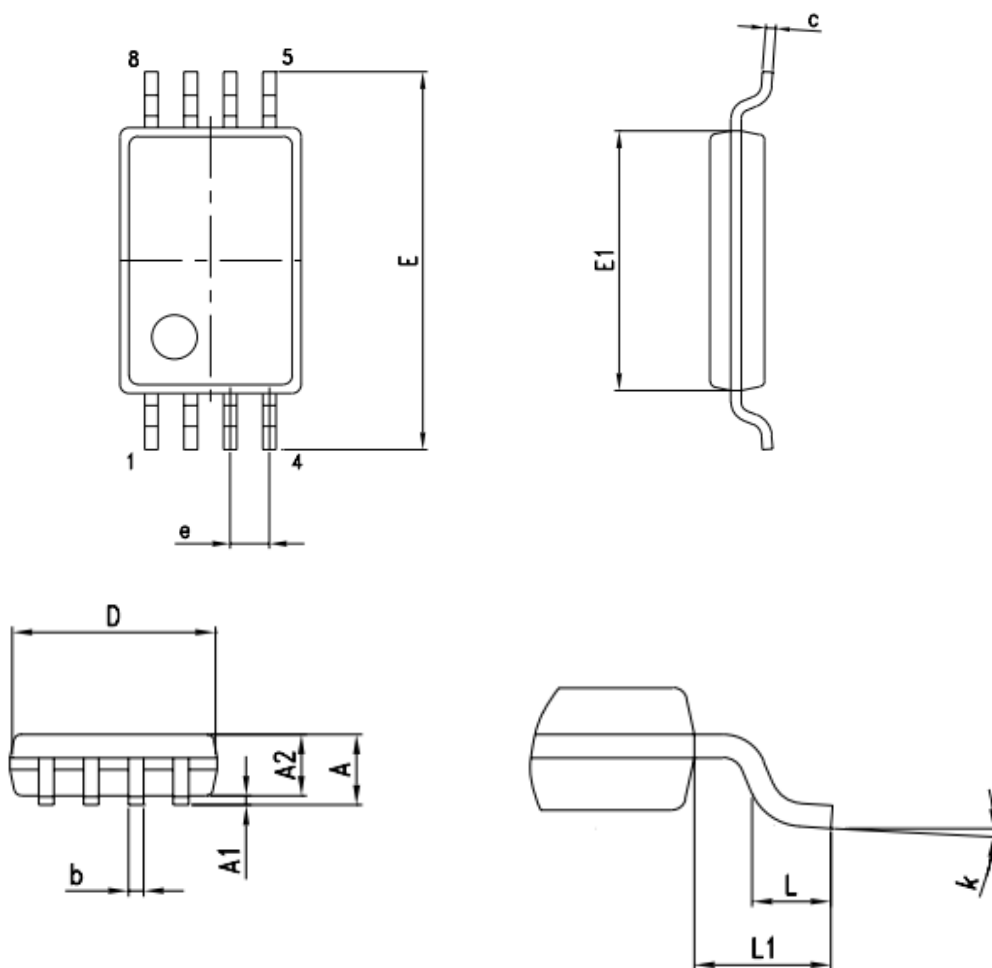


Figure 14 Normalized Maximum Transient Thermal Impedance

Package Outline Dimensions : TSSOP-8



DIM.	mm.			inch.		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	1.05		1.20	0.041		0.047
A1	0.05		0.15	0.002		0.006
A2	0.80		1.05	0.032		0.041
b	0.19		0.30	0.008		0.012
c	0.090		0.20	0.003		0.007
D	2.90		3.10	0.114		0.122
E	6.20		6.60	0.240		0.260
E1	4.30		4.50	0.170		0.177
e		0.65			0.025	
L	0.45		0.75	0.018		0.030
L1		1.00			0.039	
k	0°		8°	0.192		0.208