N-Channel Enhancement Mode Power MOSFET

Description

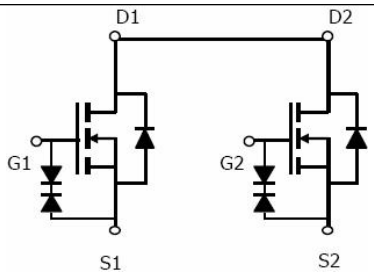
The PE8810B uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. It can be used in a wide variety of applications. It is ESD protected.

General Features

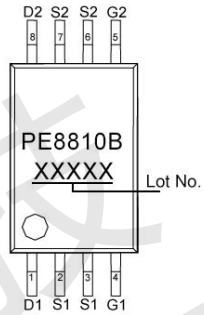
- V_{DS} = 18V, I_D = 7A
  $R_{DS(ON)}$ < 18mΩ @ V_{GS}=4.5V
  $R_{DS(ON)}$ < 19mΩ @ V_{GS}=3.8V
  $R_{DS(ON)}$ < 22mΩ @ V_{GS}=3.1V
  $R_{DS(ON)}$ < 25mΩ @ V_{GS}=2.5V
  ESD Rating: 4000V HBM
- High Power and current handing capability
- Lead free product is acquired
- Surface Mount Package

Application

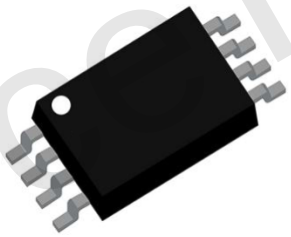
- PWM applications
- Load switch



Schematic diagram



Marking and pin assignment



TSSOP-8

Absolute Maximum Ratings (TA=25℃ unless otherwise noted)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	18	V
Gate-Source Voltage	V_{GS}	±12	V
Drain Current-Continuous	I_D	7	A
Pulsed Drain Current (Note 1)	I_{DM}	25	A
Maximum Power Dissipation	P_D	1.5	W
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃

Thermal Characteristic

Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	83	℃/W

Electrical Characteristics (TA=25℃ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=250μA	-	18	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=16V,V_{GS}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±10V,V_{DS}=0V	-	-	±10	μA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	0.45	0.7	1.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=4.5V,I_D=6A	14	15.5	18	mΩ
		V_{GS}=3.8V,I_D=5.5A	14.5	16.5	19	mΩ
		V_{GS}=3.1V,I_D=5A	15	18	22	mΩ
		V_{GS}=2.5V,I_D=5A	18	20	25	mΩ
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	-	684	-	pF
Output Capacitance	C_{oss}		-	185	-	pF
Reverse Transfer Capacitance (Note 4)	C_{rss}		-	170	-	pF
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=10V,I_D=2A,R_L=1Ω, V_{GS}=4.5V,R_G=3Ω	-	5	-	nS
Turn-on Rise Time	t_r		-	11	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	42	-	nS
Turn-Off Fall Time	t_f		-	16	-	nS
Total Gate Charge	Q_g	V_{DS}=10V,I_D=5A, V_{GS}=4.5V	-	12	-	nC
Gate-Source Charge	Q_{gs}		-	0.8	-	nC
Gate-Drain Charge	Q_{gd}		-	3	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=1A	-	-	1.2	V

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to product.

Typical Electrical and Thermal Characteristics

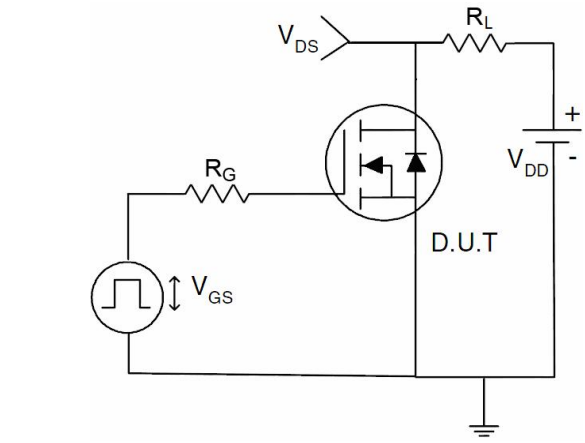


Figure 1 Switching Test Circuit

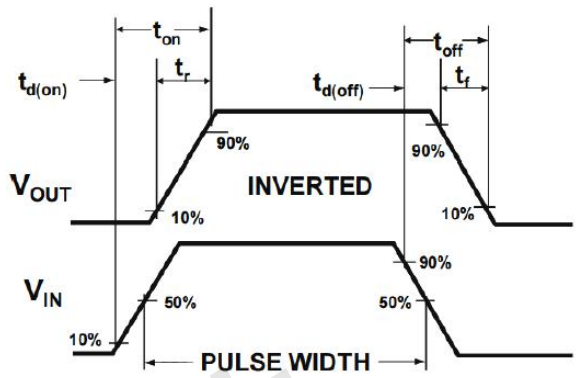


Figure 2 Switching Waveform

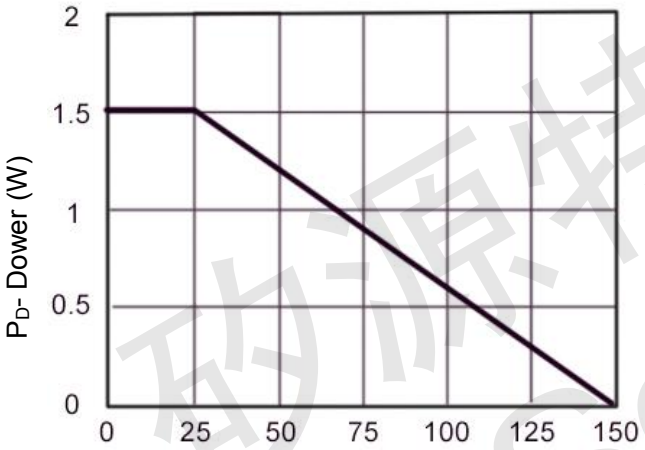


Figure 3 Power Dissipation

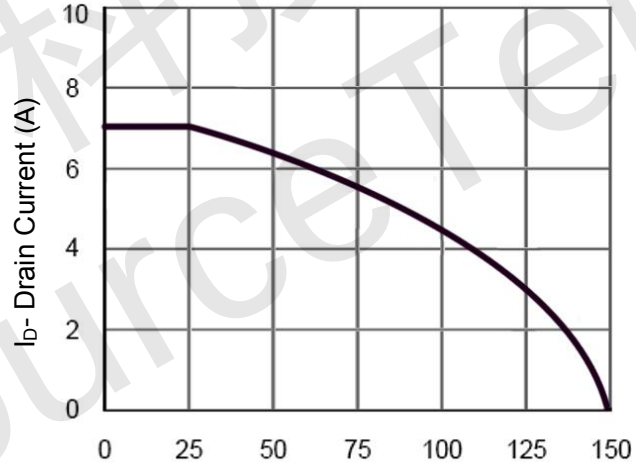


Figure 4 Drain Current

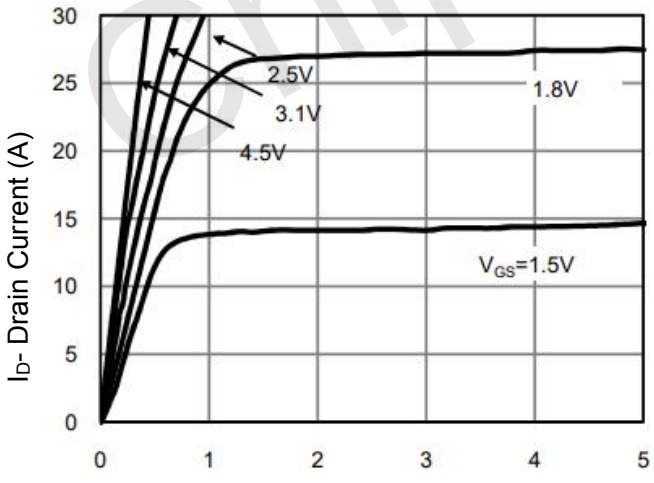


Figure 5 Output Characteristics

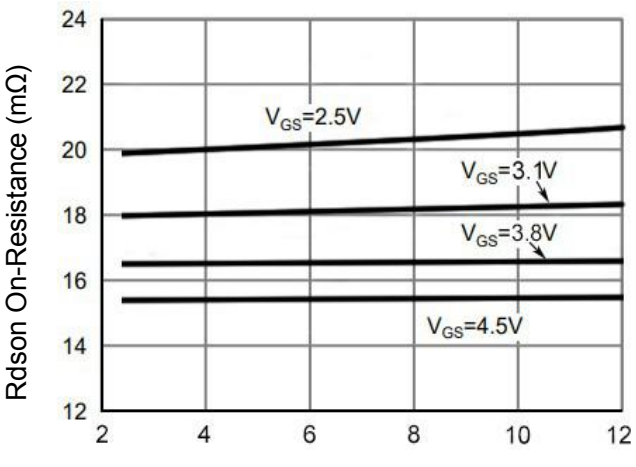


Figure 6 Rdson vs Drain Current

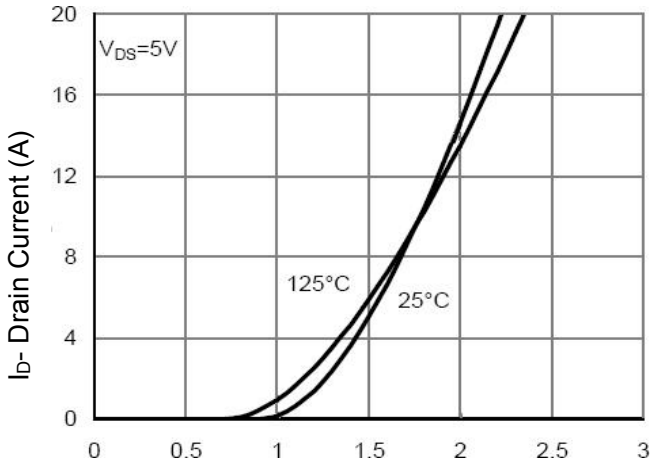


Figure 7 Transfer Characteristics

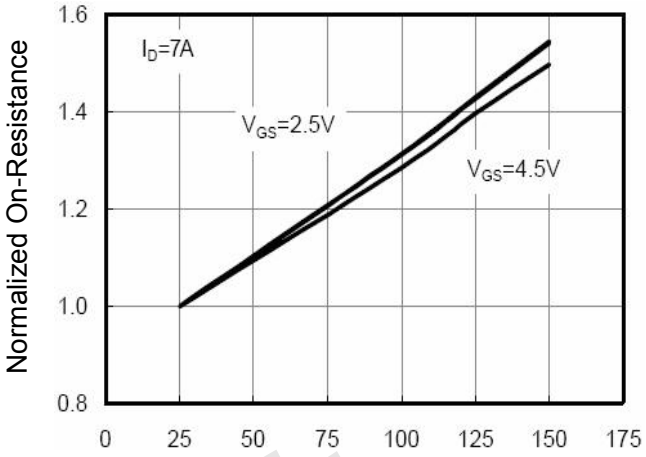


Figure 8 Rdson vs Junction Temperature

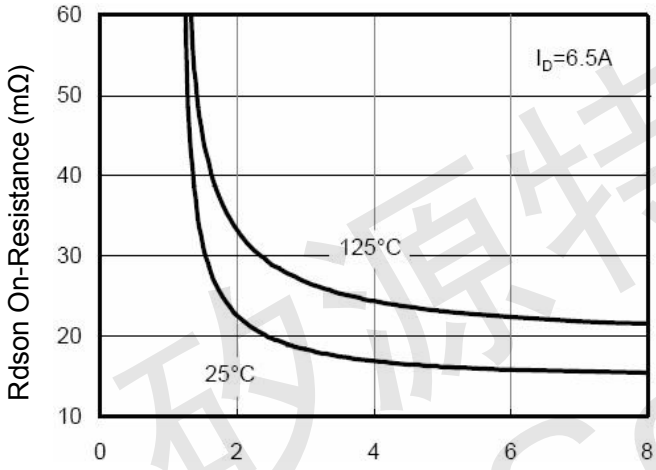


Figure 9 Rdson vs Vgs

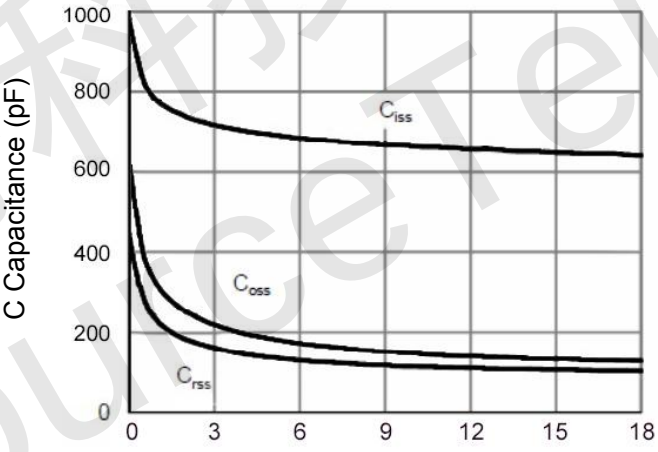


Figure 10 Capacitance vs Vds

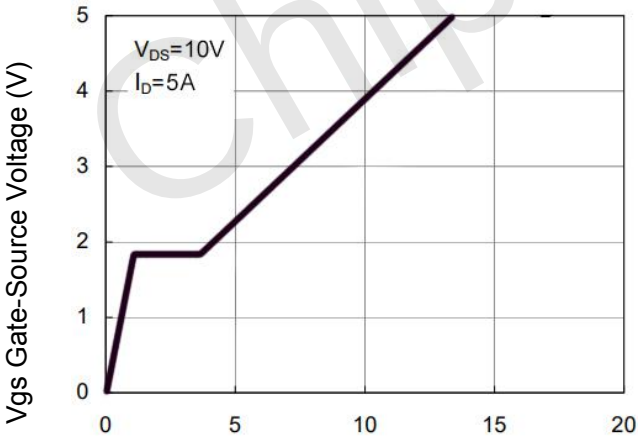


Figure 11 Gate Charge

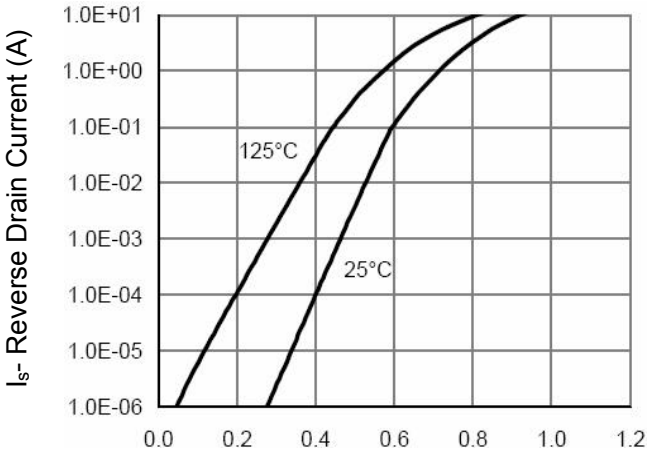


Figure 12 Source- Drain Diode Forward

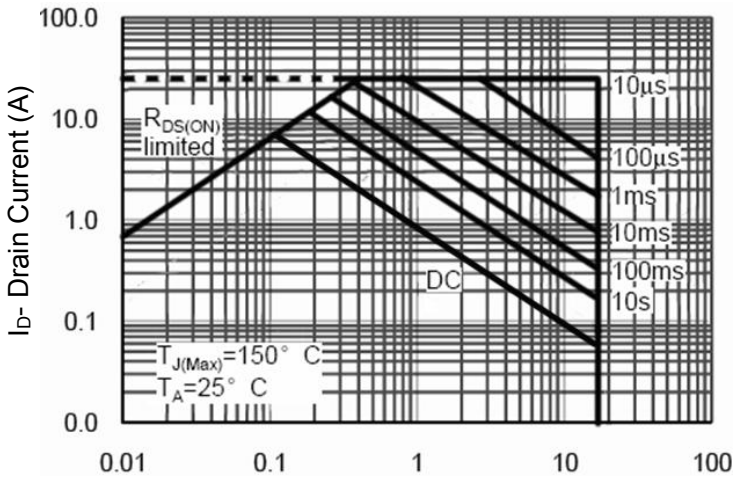


Figure 13 Safe Operation Area

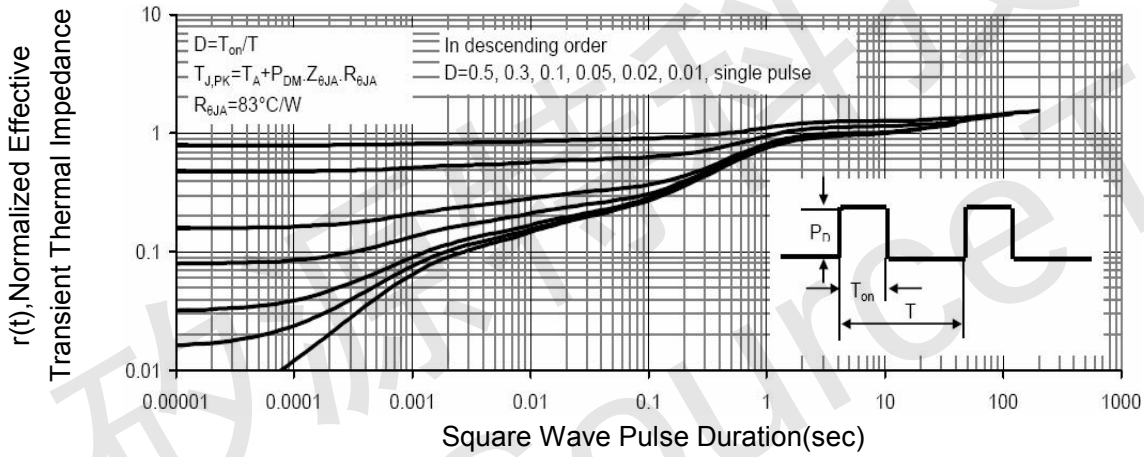
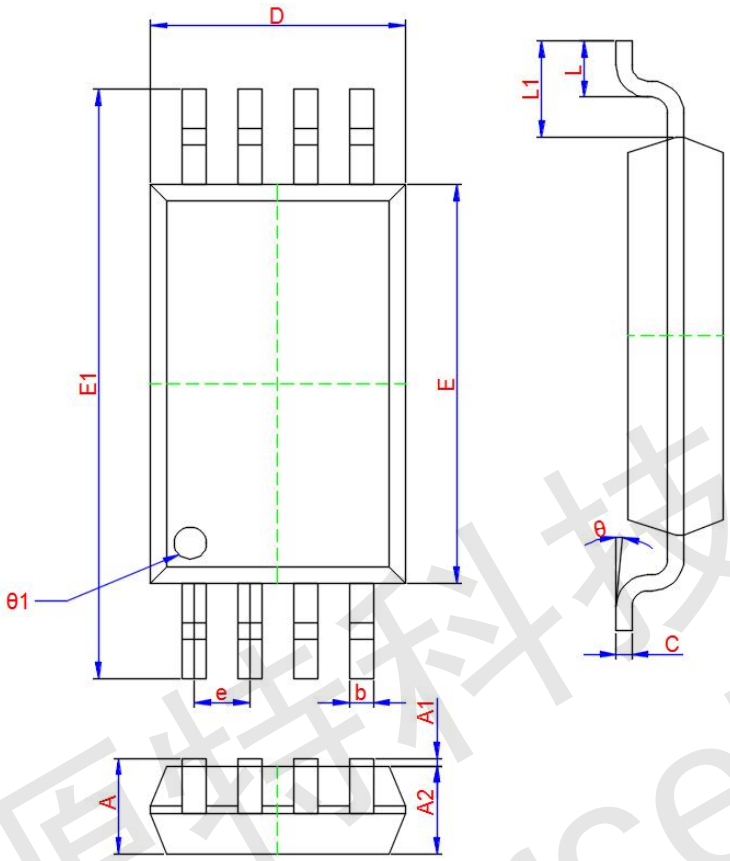


Figure 14 Normalized Maximum Transient Thermal Impedance

TSSOP-8 Package Information



Symbol	Dimensions In Millimeters		
	Min.	Typ.	Max.
A	1.000	1.150	1.200
A1	0.020	0.100	0.180
A2	0.900	1.000	1.100
b	0.170	0.220	0.270
c	0.122	0.127	0.132
L	0.400	0.600	0.800
D	2.870	2.970	3.070
E	4.300	4.400	4.500
E1	6.200	6.400	6.600
Θ1	0.500	0.600	0.700
Θ	0°	5°	10°
L1	1.00TYP		
e	0.65TYP		