

N-Channel Enhancement Mode Power MOSFET

Description

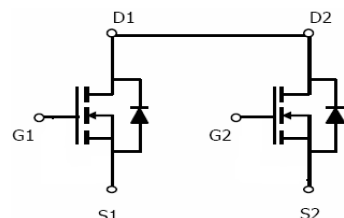
The PE8806 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a load switch or in PWM applications.

General Features

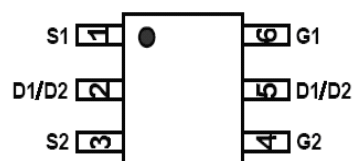
- $V_{DS}=16V, I_D=7A$
 $R_{DS(ON)} < 15m\Omega @ V_{GS}=4.5V$
 $R_{DS(ON)} < 17m\Omega @ V_{GS}=3.8V$
 $R_{DS(ON)} < 21m\Omega @ V_{GS}=2.5V$
- High Power and current handling capability
- Lead free product is acquired
- Surface Mount Package

Application

- PWM application
- Load switch



Schematic diagram



Marking and pin Assignment



SOT23-6 top view

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	16	V
Gate-Source Voltage	V_{GS}	± 10	V
Drain Current-Continuous	I_D	7	A
Drain Current-Pulsed (Note 1)	I_{DM}	28	A
Maximum Power Dissipation	P_D	1.5	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	°C

Thermal Characteristic

Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	83.3	°C/W
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Electrical Characteristics (TA=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	16		-	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	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} ,I _D =250μA	0.45	0.7	0.95	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =4.5V, I _D =6.0A	-	11	15	mΩ
		V _{GS} =3.8V, I _D =5.0A	-	12	17	mΩ
		V _{GS} =2.5V, I _D =5.5A	-	14	21	mΩ
Forward Transconductance	g _{FS}	V _{DS} =5V,I _D =7A	-	20	-	S
Dynamic Characteristics (Note4)						
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 =1.35Ω V _{GS} =5V,R _{GEN} =3Ω	-	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

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

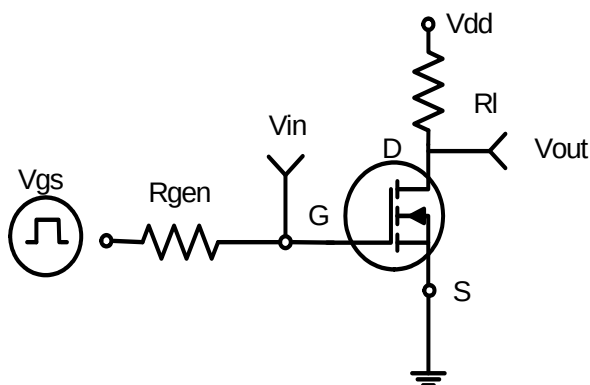


Figure 1: Switching Test Circuit

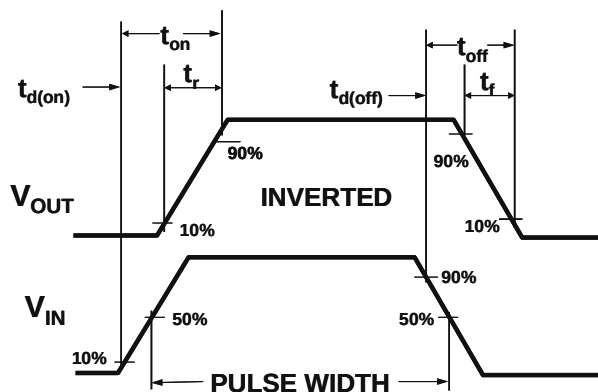


Figure 2: Switching Waveforms

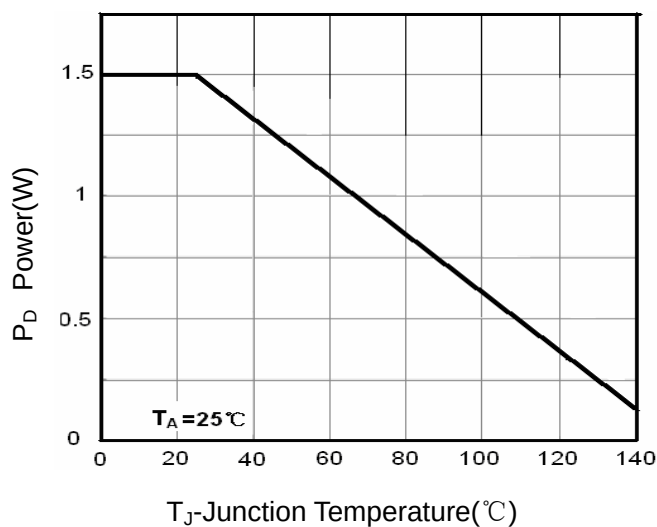


Figure 3 Power Dissipation

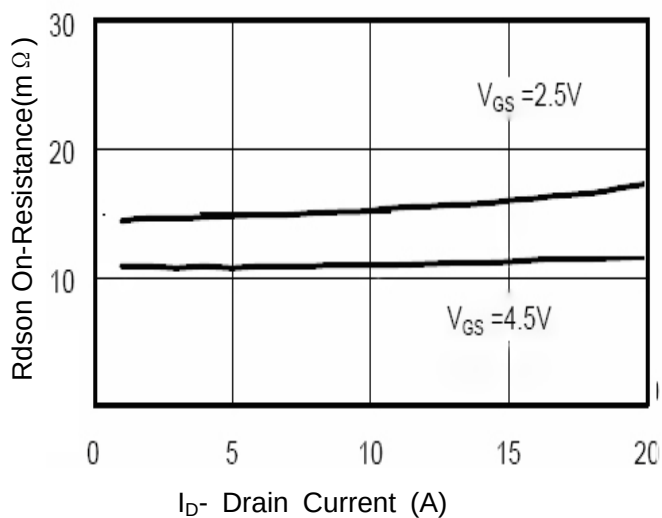


Figure 6 Drain-Source On-Resistance

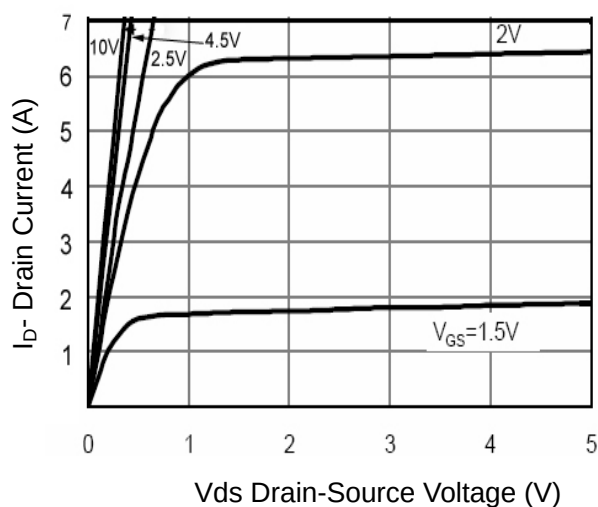


Figure 5 Output CHARACTERISTICS

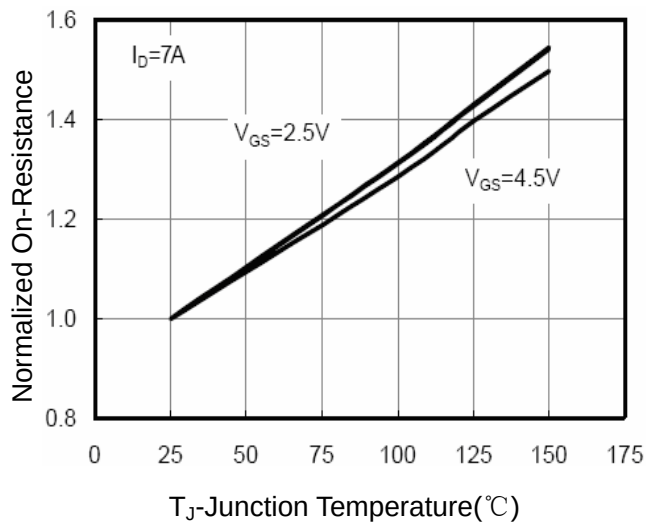
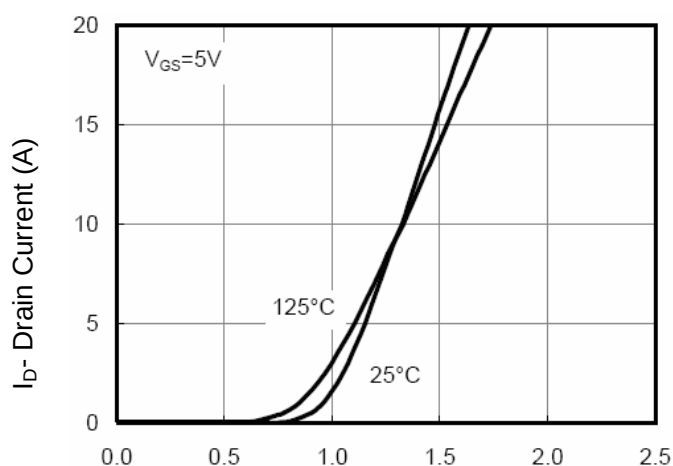
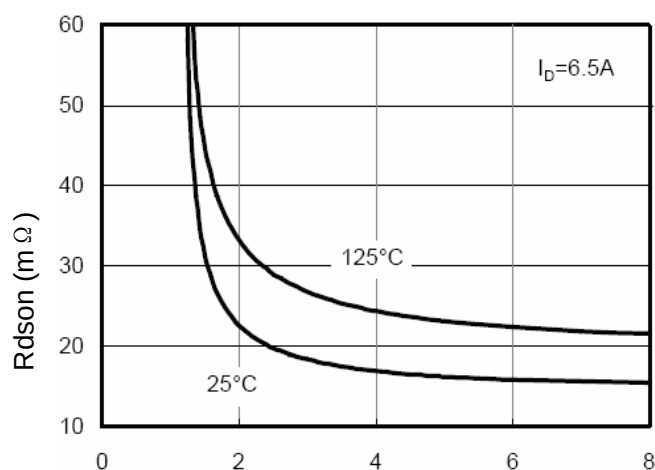


Figure 8 Drain-Source On-Resistance



Vgs Gate-Source Voltage (V)
Figure 7 Transfer Characteristics



Vgs Gate-Source Voltage (V)
Figure 9 Rdson vs Vgs

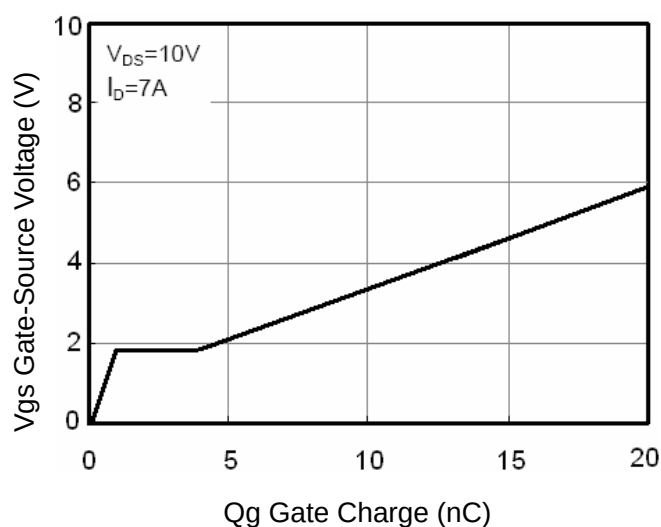
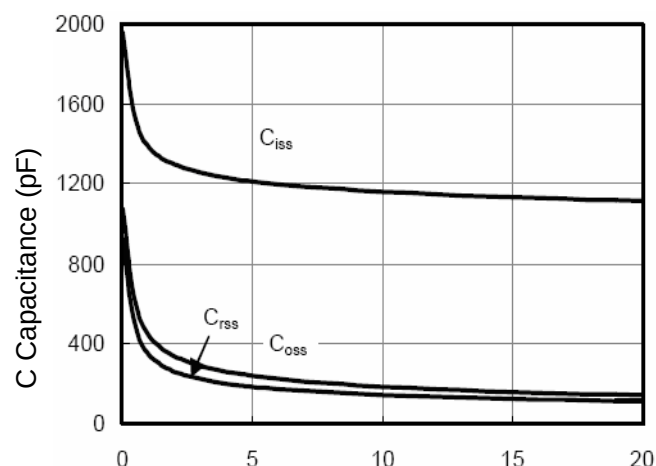
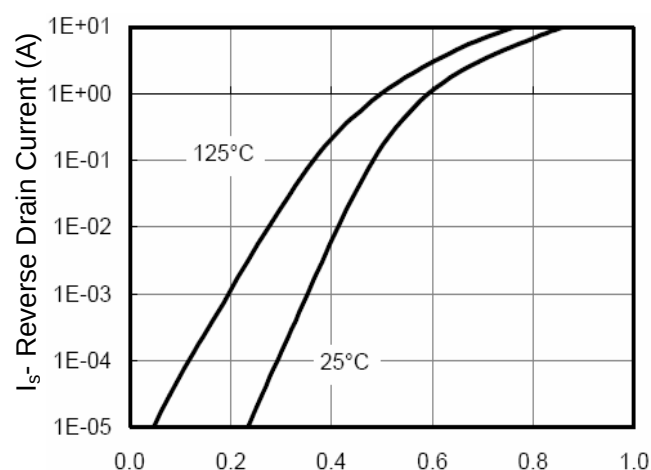


Figure 11 Gate Charge



Vds Drain-Source Voltage (V)
Figure 8 Capacitance vs Vds



Vds Drain-Source Voltage (V)
Figure 10 Capacitance vs Vds

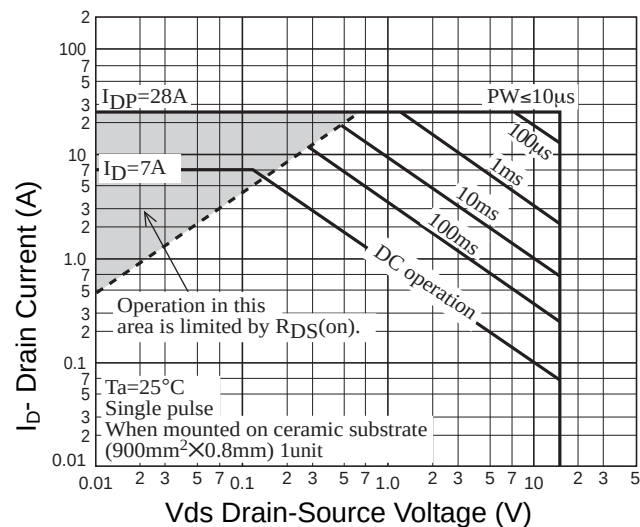


Figure 13 Safe Operation Area

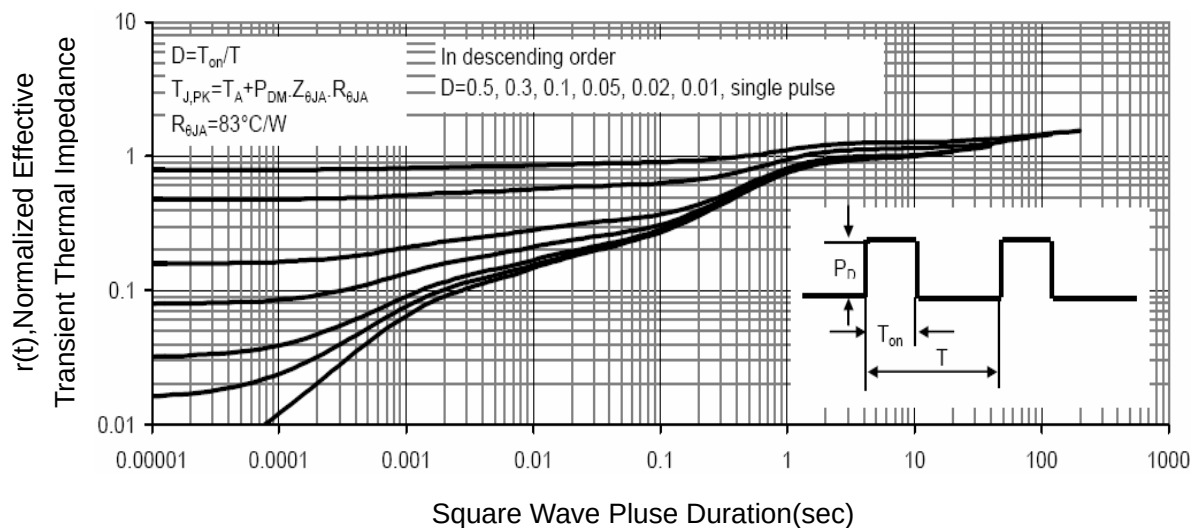


Figure 14 Normalized Maximum Transient Thermal Impedance

SOT23-6 PACKAGE INFORMATION

