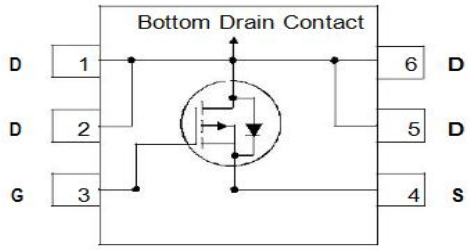
P-Channel Enhancement Mode Power MOSFET

Description

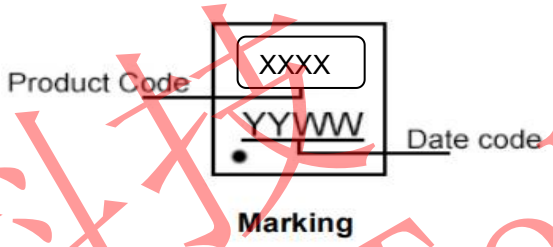
The MXND805 uses advanced trench technology to provideexcellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as aload switching applications and a wide variety of other applications.



Pin Assignment

General Features

- V_{DS} =-12V，I_D =-8.5A
  @V_{GS}=-4.5V $R_{DS(ON)}$(Typ.)=14mΩ
  @V_{GS}=-2.5V $R_{DS(ON)}$(Typ.)=19mΩ
  @V_{GS}=-1.8V $R_{DS(ON)}$(Typ.)=29mΩ

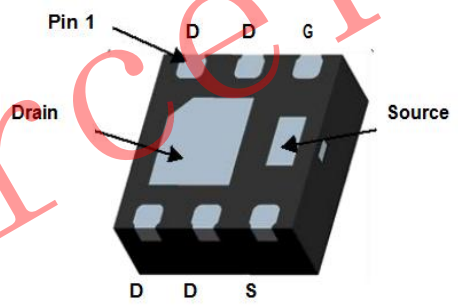


Marking

- Asvanced trench MOSFET process technology
- Ultra low on-resistance with low gate charge
- New Thermally Enhanced DFN2X2-6L Package

Application

- PWM applications
- Load switch
- battery charge in cellular handset



DFN2x2-6L Pin definition and Top / Bottom View

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-12	V
Gate-Source Voltage	V_{GS}	±12	V
Drain Current-Continuous	I_D	-8.5	A
Drain Current-Pulsed (Note 1)	I_{DM}	-32	A
Maximum Power Dissipation	P_D	2.8	W
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃

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	-12	-15	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-12V,V_{GS}=0V	-	-	-1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±12V,V_{DS}=0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250μA	-0.4	-0.65	-1.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-6A	-	14	18	mΩ
		V_{GS}=-2.5V, I_D=-5A	-	19	25	
		V_{GS}=-1.8V, I_D=-2.5A	-	29	45	
Forward Transconductance	g_{FS}	V_{DS}=-5V, I_D=-8A	-	33	-	S
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		-	-	-3.5	A
Dynamic Characteristics (Note4)						
Input Capacitance	C_{lss}	V_{DS}=-6V,V_{GS}=0V, F=1.0MHz	-	1370	-	PF
Output Capacitance	C_{oss}		-	350	-	PF
Reverse Transfer Capacitance	C_{rss}		-	258	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=-6V, R_L=0.75Ω V_{GS}=-4.5V, R_{GEN}=3Ω	-	11	-	nS
Turn-on Rise Time	t_r		-	25	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	70	-	nS
Turn-Off Fall Time	t_f		-	42	-	nS
Total Gate Charge	Q_g	V_{DS}=-6V,I_D=-8A,V_{GS}=-4.5V	-	13	-	nC
Gate-Source Charge	Q_{gs}		-	2	-	nC
Gate-Drain Charge	Q_{gd}		-	3	-	nC

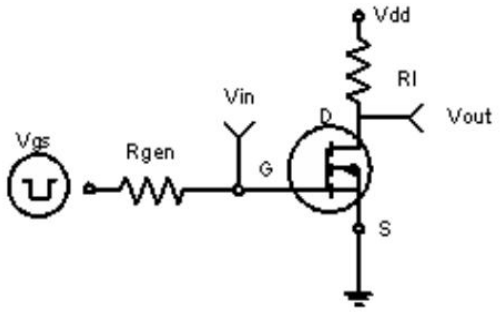
Notes:

a. surface mounted on FR4 board,t≤10sec
b. pulse test: pulse width≤300μs,duty≤2%
c. guaranteed by design, not subject to production testing

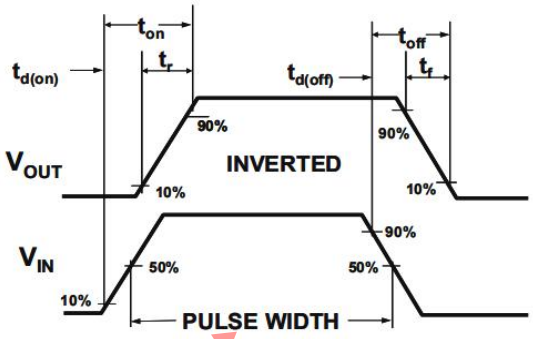
Thermal Characteristics

Thermal Resistance junction-to ambient	Rth JA	45	℃/W

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS



Switching Test Circuit



Switching Waveforms

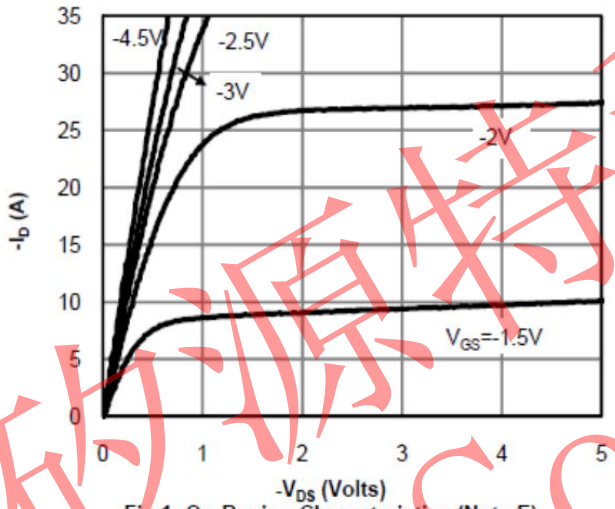


Fig 1: On-Region Characteristics (Note E)

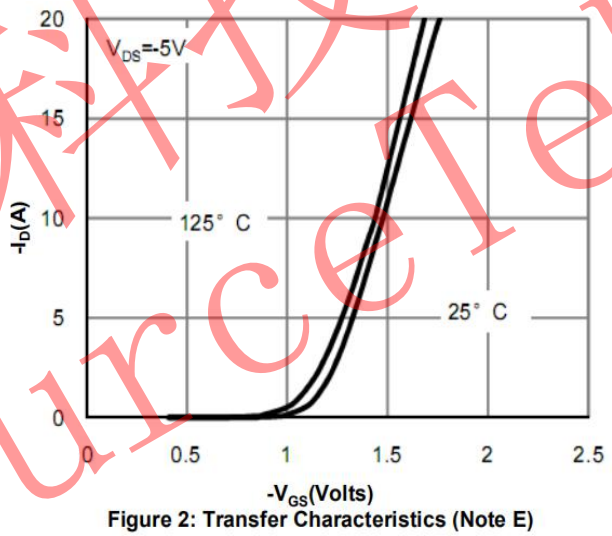


Figure 2: Transfer Characteristics (Note E)

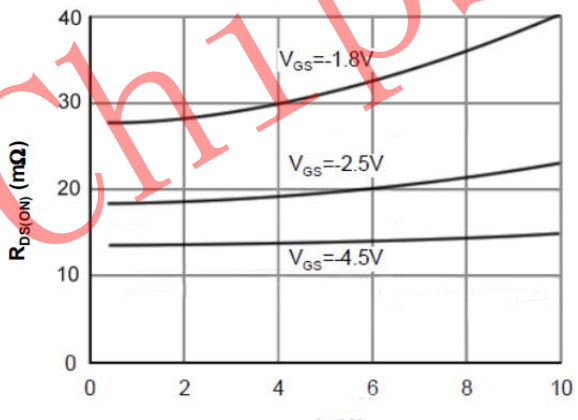


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

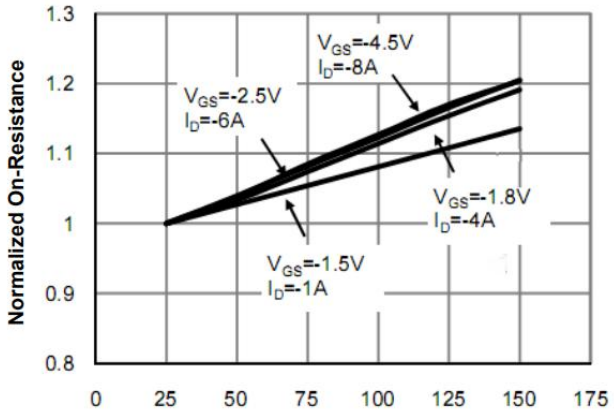


Figure 4: On-Resistance vs. Junction Temperature (Note E)

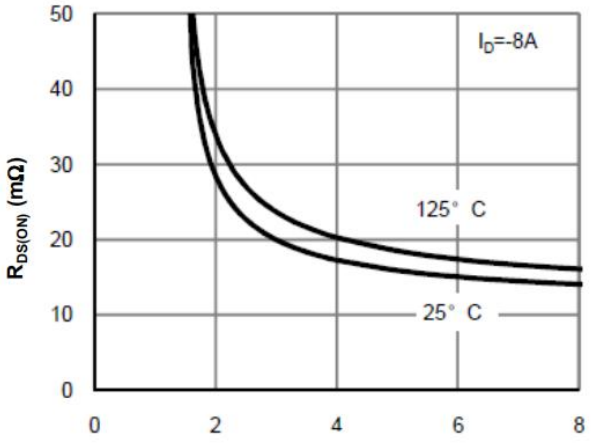


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

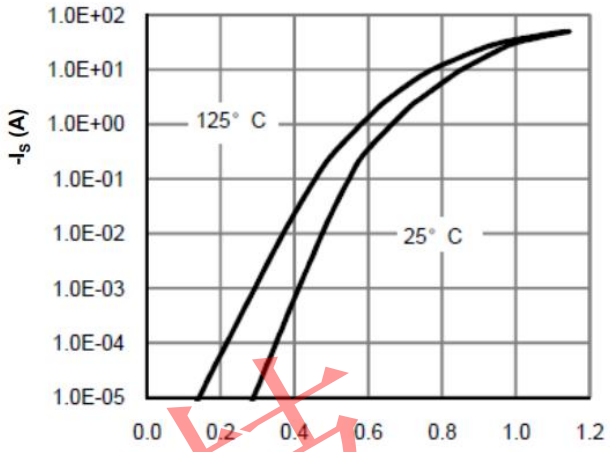


Figure 6: Body-Diode Characteristics (Note E)

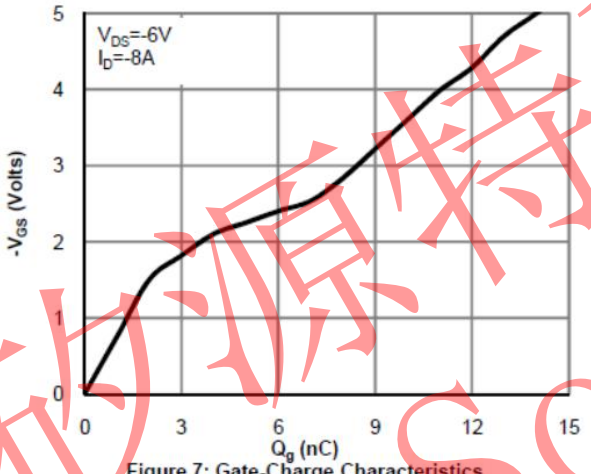


Figure 7: Gate-Charge Characteristics

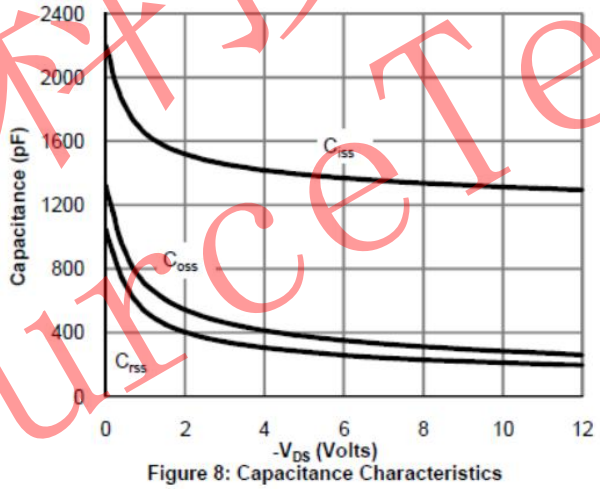


Figure 8: Capacitance Characteristics

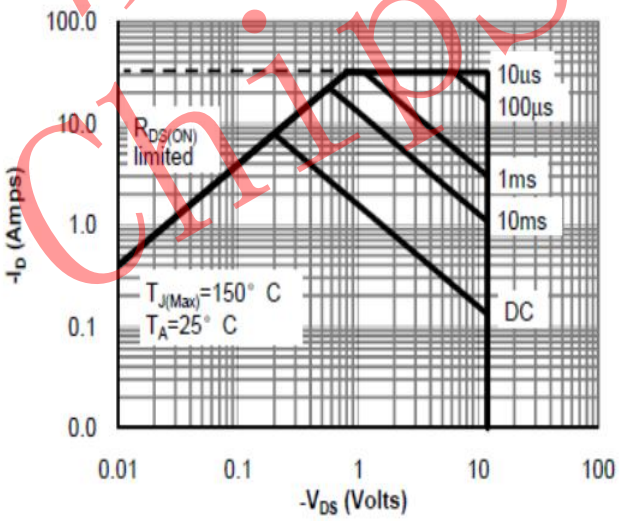


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

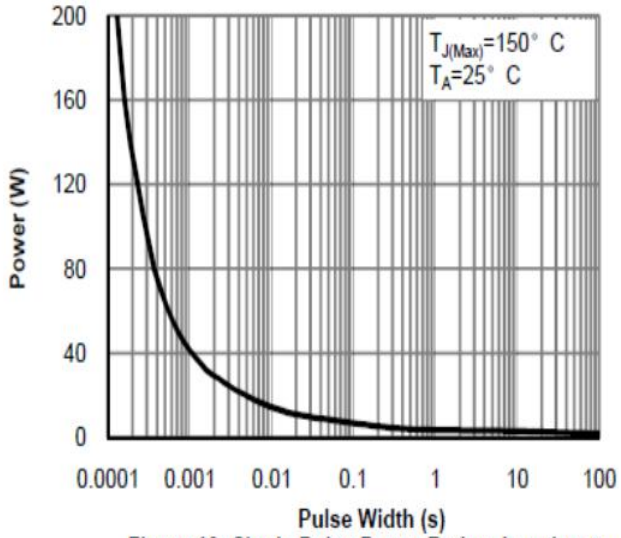


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note H)

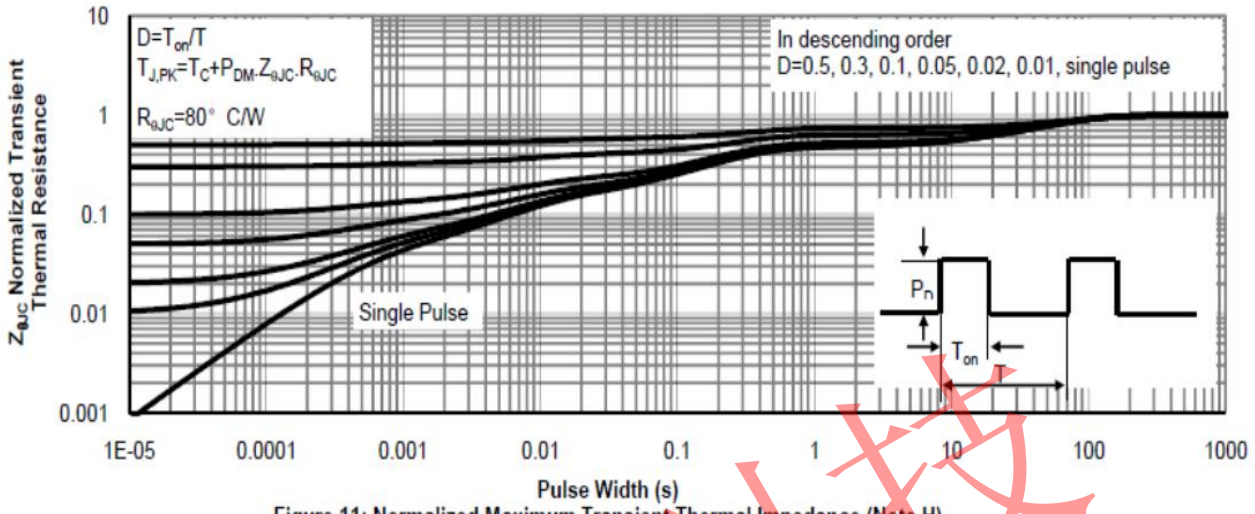
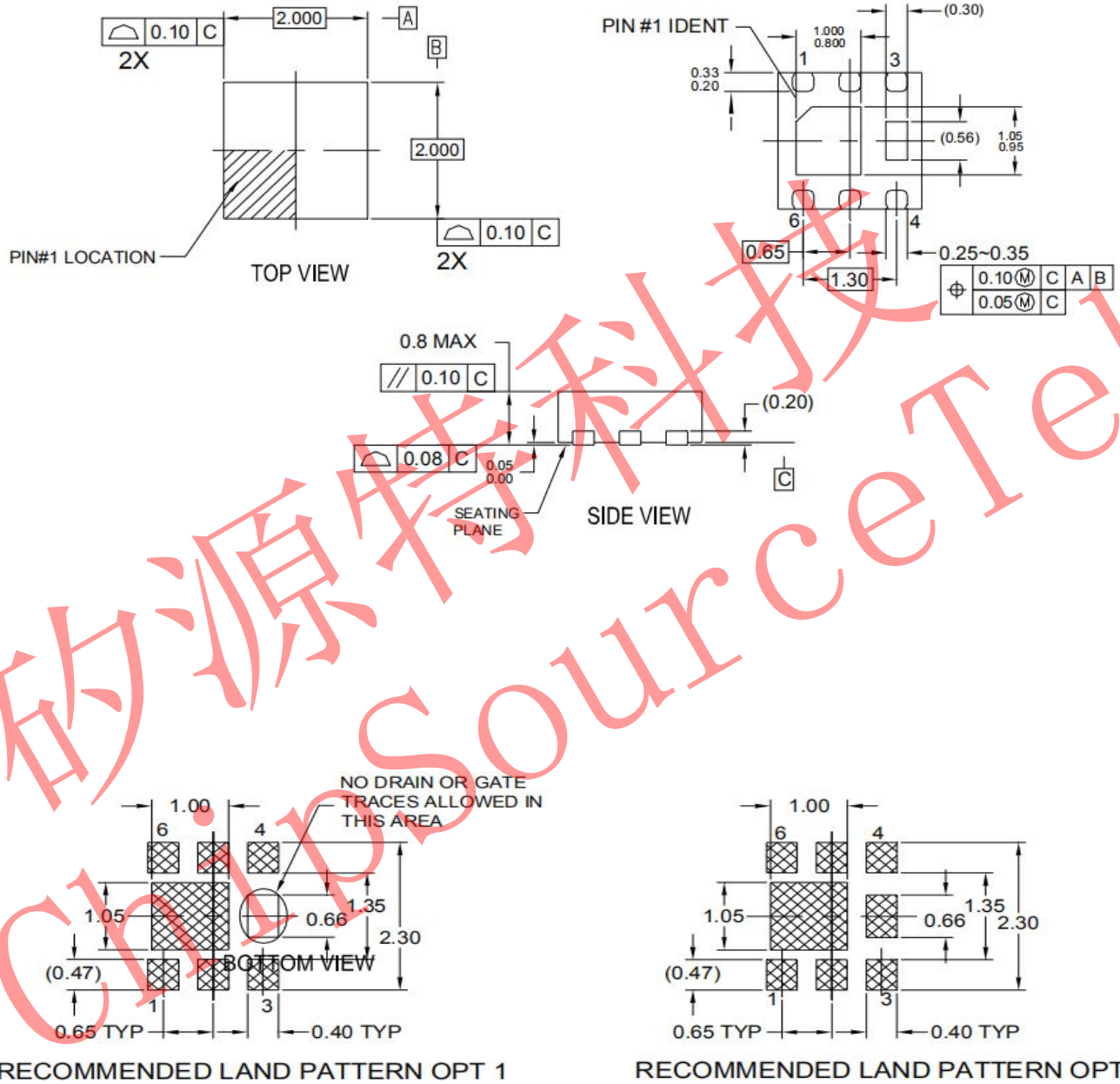


Figure 11: Normalized Maximum Transient Thermal Impedance (Note H)

DFN2x2-6L PACKAGE OUTLINE DIMENSIONS



RECOMMENDED LAND PATTERN OPT 1

RECOMMENDED LAND PATTERN OPT 2

NOTES

1. All dimensions are in millimeters.
2. Tolerance ±0.10mm (4 mil) unless otherwise specified
3. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 5 mils.
4. Dimension L is measured in gauge plane.
5. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.