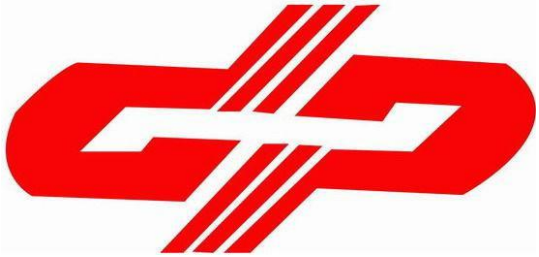


产品规格书

DP4080（TO-252）

Datasheet of DP4080（TO-252）

深圳市德普微电子有限公司

Shenzhen Developer Microelectronics Co.,Ltd.

地址：深圳市南山区高新南四道创维半导体设计大厦西座707-710单元

Address:Unit 7-10,7/F.,west block, Skyworth Semiconductor design Building,
The 4th on High-tech Zone, Nanshan District, Shenzhen

Features

- Uses CRM(CQ) advanced Trench MOS technology
- Extremely low on-resistance RDS(on)
- Excellent QgxRDS(on) product(FOM)
- Qualified according to JEDEC criteria

Applications

- Motor control and drive
- Battery management
- UPS (Uninterrupible Power Supplies)

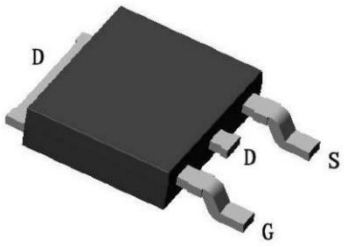
Product Summary

Vds	40V
I_D	80A
$R_{DS(ON)}$ typ(at V_{GS} = 10V)	6mΩ
$R_{DS(ON)}$ typ(at V_{GS} = 4.5V)	8mΩ

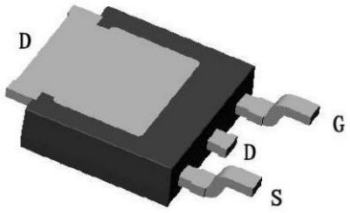
100% DVDS Tested
100% Avalanche Tested

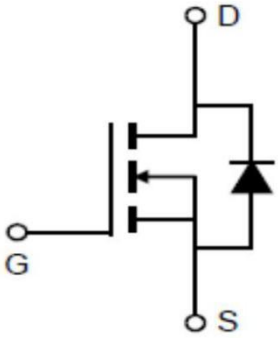
TO-252

Top View



Bottom View





Absolute Maximum Ratings TA=25°C unless otherwise noted

Parameter	Symbol	P-Channel	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	80	A
Drain Current-Continuous(T=100℃)	ID (100℃)	61	A
Pulsed drain current (TC = 25°C, tp limited by Tjmax)	ID pulse	320	A
Avalanche energy, single pulse (L=0.3mH, Rg=25Ω)	EAS	145	mJ
Power dissipation (TC = 25°C)	Ptot	81	W
Operating junction and storage temperature	Tj , T stg	-55 To 150	°C

Thermal Resistance

Parameter	Symbol	Max	Unit
Thermal resistance, junction – case.	R_{thJC}	12	℃/W
Thermal resistance, junction –ambient(min. footprint)	RthJA	70	

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	40	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=40V V_{GS}=0V	-	0.01	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	±5	±100	nA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	1	1.5	2.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=1A	-	6	8	mΩ
		V_{GS}=4.5V, I_D=1A	-	8	10.5	
Forward Transconductance	g_{FS}	V_{DS}=5V,ID=40A	-	90	-	S
Dynamic Characteristics [b]						
Input Capacitance	C_{lss}	VGS=0V, VDS=15V, f=1MHz	-	2165	-	pF
Output Capacitance	C_{oss}		-	278	-	
Reverse Transfer Capacitance	C_{rss}		-	210	-	
Switching Characteristics [b]						
Turn-on Delay Time	$t_{d(on)}$	VGS=10V, VDD=15V, RG_ext=2.7Ω, ID=40A,	-	7.6	-	nS
Turn-on Rise Time	t_r		-	80	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	46	-	nS
Turn-Off Fall Time	t_f		-	91	-	nS
Total Gate Charge	Q_g	VGS=10V, VDS=15V, ID=40A, f=1MHz	-	48	-	nC
Gate-Source Charge	Q_{gs}		-	9	-	nC
Gate-Drain Charge	Q_{gd}		-	11	-	nC
Gate resistance	R_G	V_{GS}=0V, V_{DS}=0V,f=1MHz		2.4		Ω

Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	Typ.	Max.		
Body Diode Forward Voltage	V_{SD}	-	0.8	1.3	V	V_{GS}=0V,I_{SD}=40A
Body Diode Reverse Recovery Time	t_{rr}	-	13		nS	I_F=40A, dI/dt=100A/μs
Body Diode Reverse Recovery Charge	Q_{rr}	-	5		nC	

Typical Performance Characteristics

Figure 1. Typ. Output Characteristics

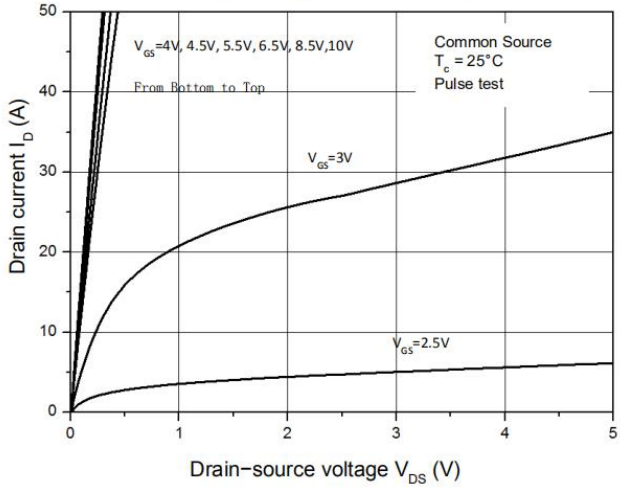


Figure 2. Transfer Characteristics

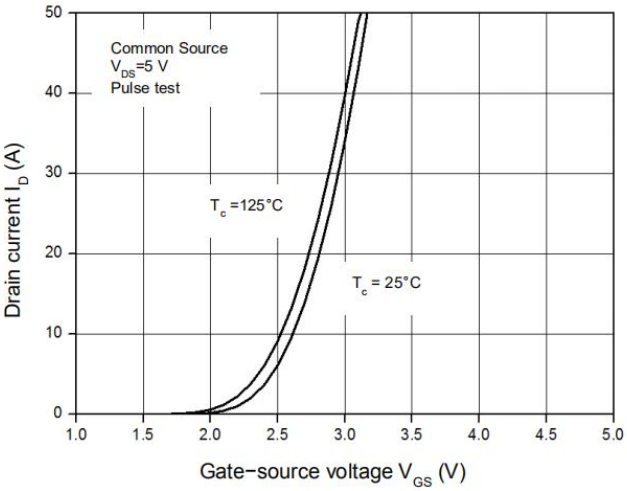


Figure 3. Capacitance Characteristics

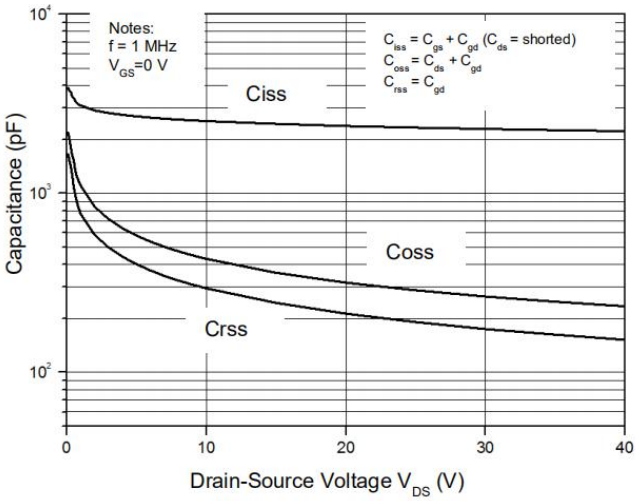


Figure 4. Gate Charge Waveform

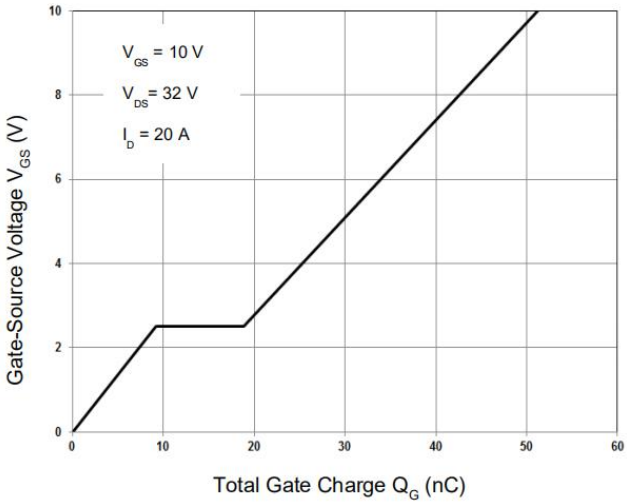


Figure 5. Body-Diode Characteristics

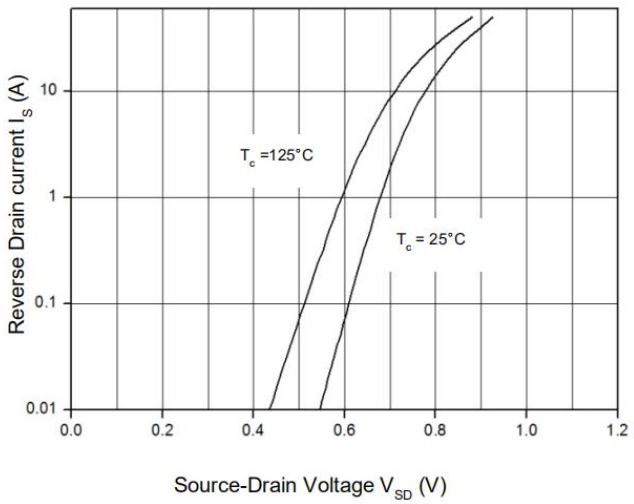


Figure 6. Rdson-Drain Current

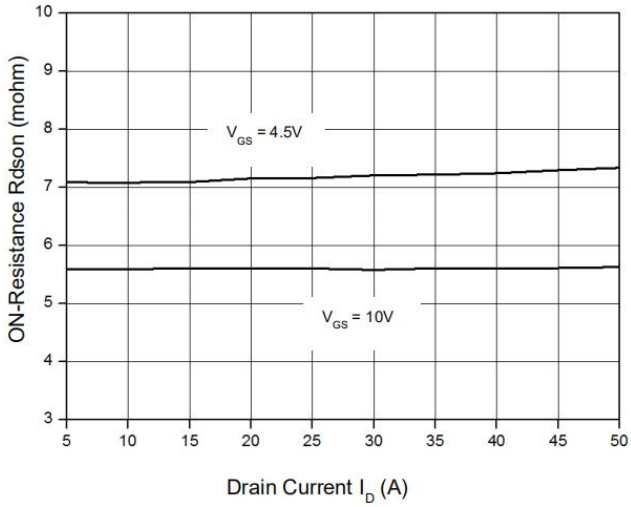


Figure 7. Rdson-Junction Temperature(℃)

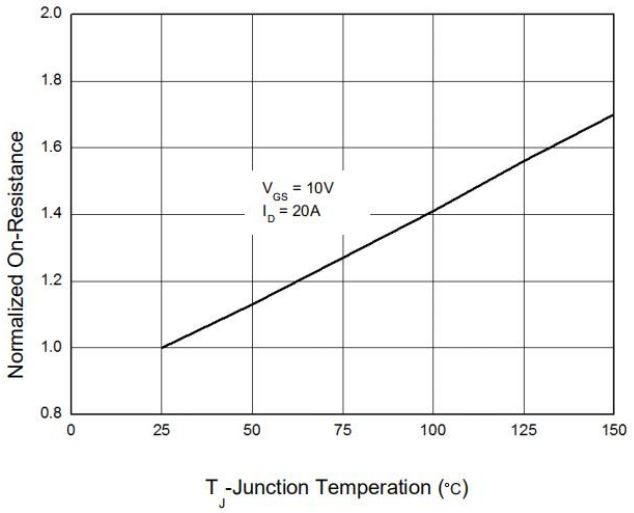


Figure 8. Maximum Safe Operating Area

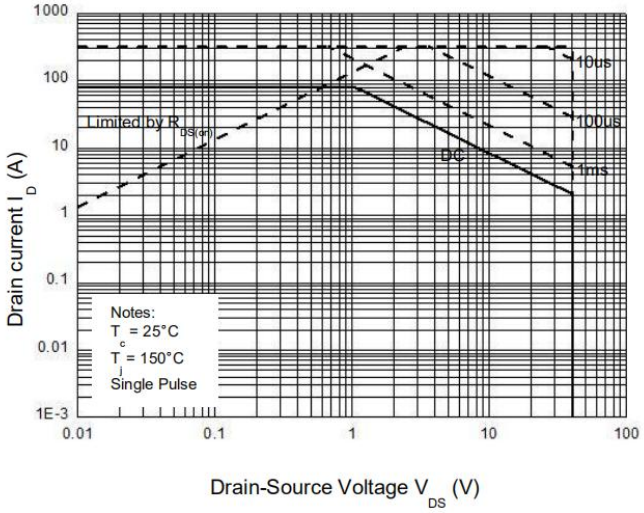
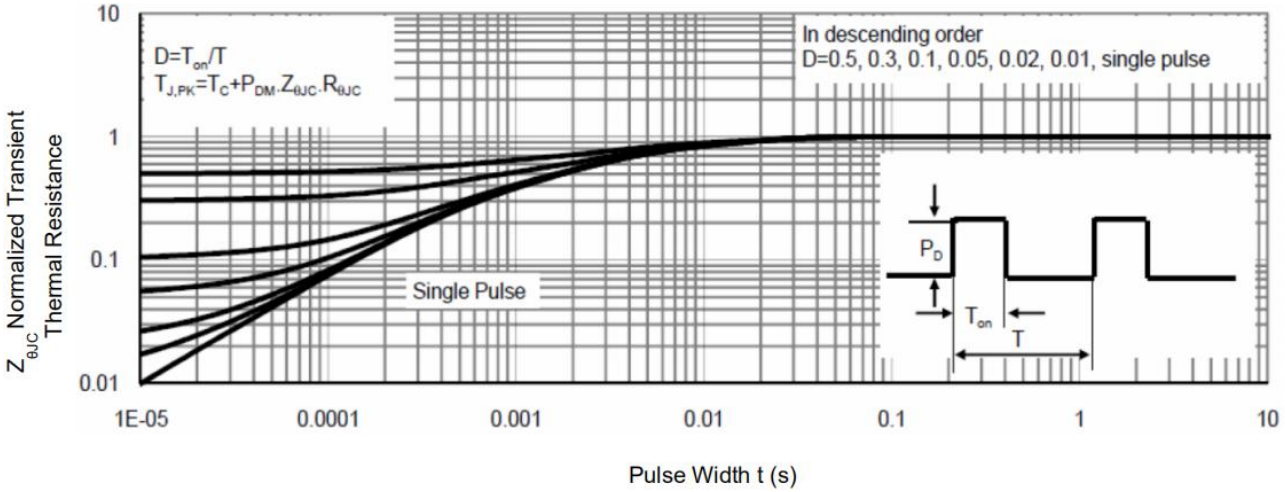


Figure 9. Normalized Maximum Transient Thermal Impedance (RthJC)



Test Circuit & Waveform

Figure 8. Gate Charge Test Circuit & Waveform

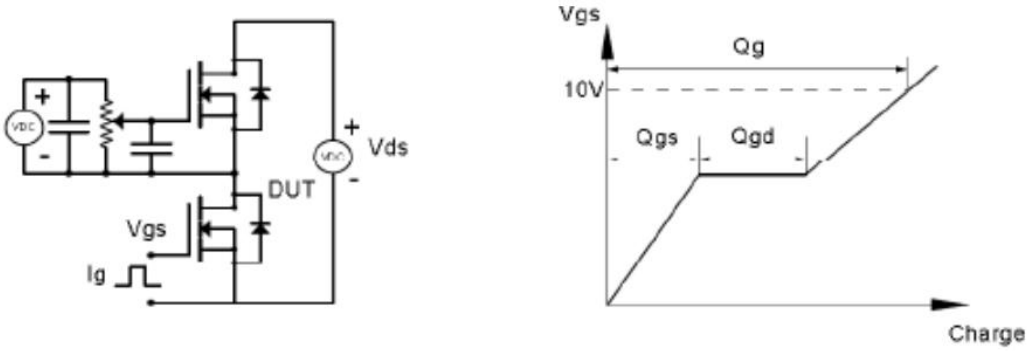


Figure 9. Resistive Switching Test Circuit & Waveforms

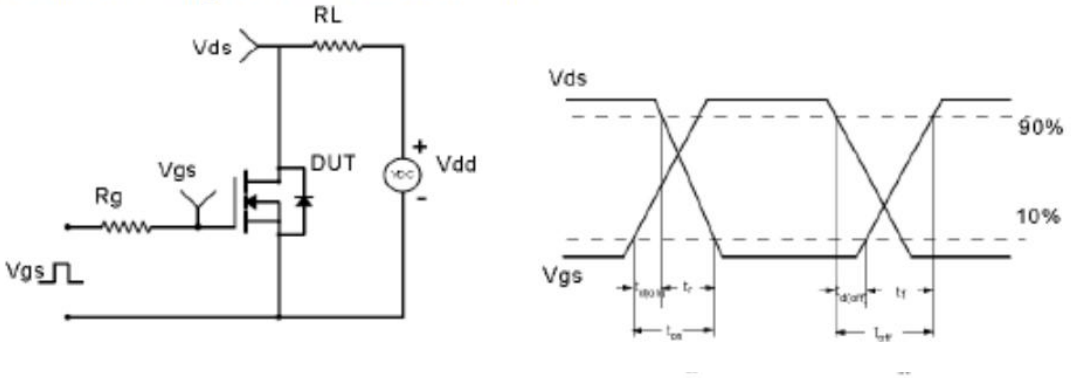


Figure 10. Unclamped Inductive Switching (UIS) Test Circuit & Waveform

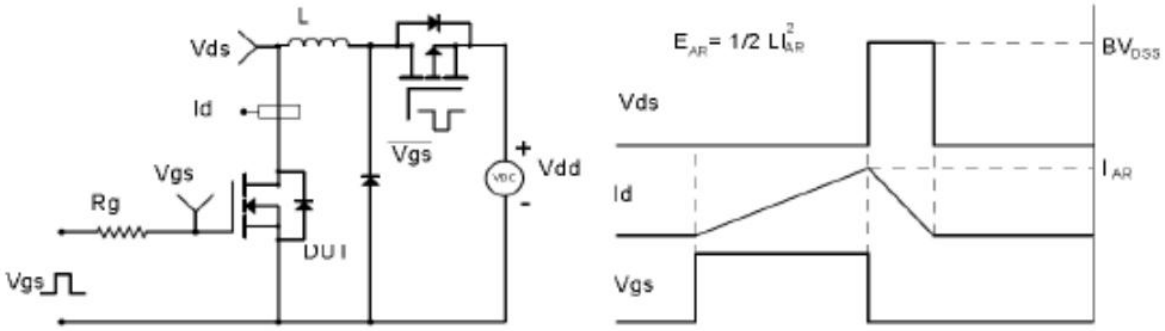
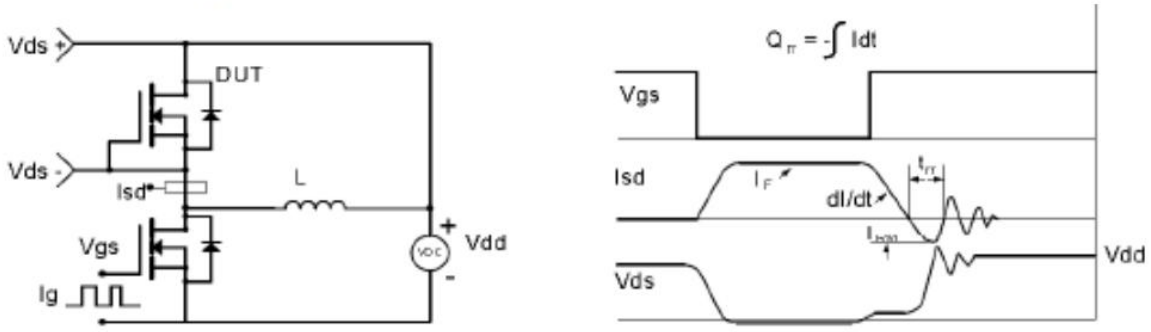
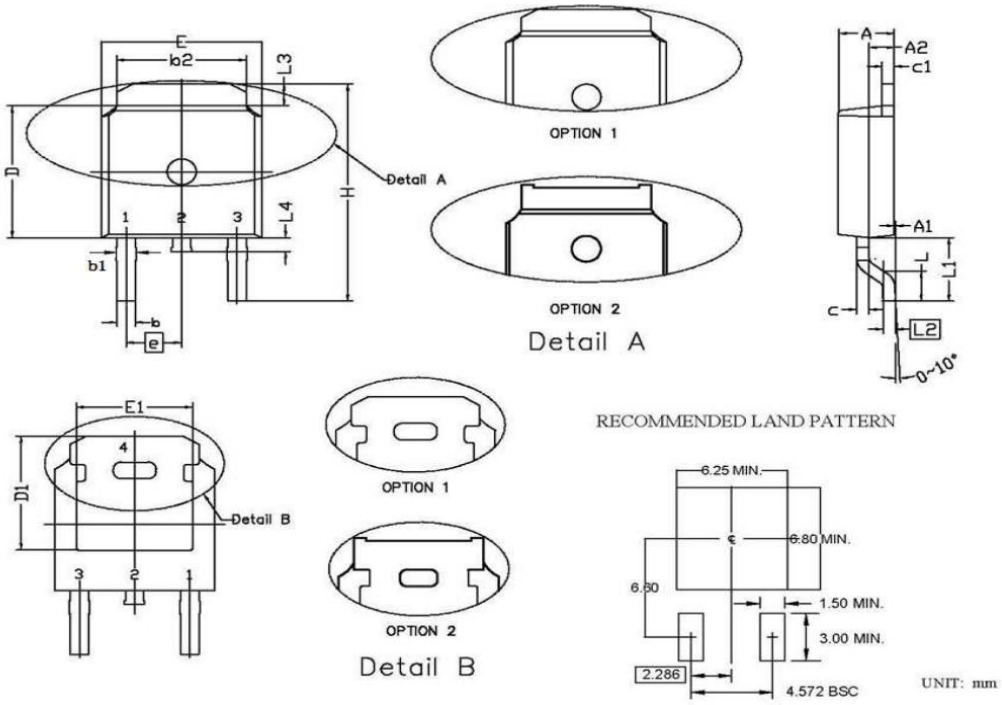


Figure 11. Diode Recovery Circuit & Waveform



Package Outline: TO-252-3L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.15	2.45	0.085	0.096
A1	0.00	0.15	0.000	0.006
A2	0.76	1.36	0.030	0.054
b	0.60	0.91	0.024	0.036
b1	0.65	1.15	0.026	0.045
b2	5.00	5.64	0.197	0.222
c	0.45	0.61	0.018	0.024
c1	0.36	0.66	0.014	0.026
D	5.80	6.30	0.228	0.248
D1	5.00	6.00	0.197	0.236
e	2.29 BSC.		0.090 BSC.	
E	6.30	6.90	0.248	0.272
E1	4.55	5.30	0.179	0.209
H	9.40	10.48	0.370	0.413
L	1.18	1.70	0.046	0.067
L1	2.92 REF		0.115 REF	
L2	0.36	0.66	0.014	0.026
L3	0.72	1.35	0.028	0.053
L4	0.60	1.20	0.024	0.047