

General Description

The HSBA0715 is the highest performance SGT N-ch MOSFETs with extreme high cell density, which provide excellent $R_{DS(ON)}$ and gate charge for most of the synchronous buck converter applications.

The HSBA0715 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

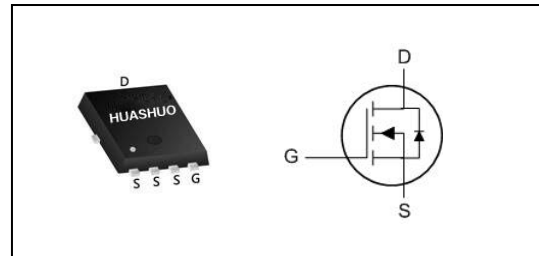
Features

- Super Low Gate Charge
- Green Device Available
- Excellent C_{dv}/dt effect decline
- Advanced high cell density SGT MOS technology

Product Summary

V_{DS}	150	V
$R_{DS(ON),max}$	8.8	m Ω
I_D	90	A

PRPAK5*6 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	150	V
V_{GS}	Gate-Source Voltage	± 25	V
$I_D@T_C=25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	90	A
$I_D@T_C=100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	63	A
I_{DM}	Pulsed Drain Current ²	360	A
EAS	Single Pulse Avalanche Energy ³	760	mJ
I_{AS}	Avalanche Current	110	A
$P_D@T_C=25^\circ C$	Total Power Dissipation ³	187	W
T_{STG}	Storage Temperature Range	-55 to 175	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 175	$^\circ C$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient ¹	---	62.5	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	0.8	$^\circ C/W$



Electrical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=250\mu A$	150	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=10V$, $I_D=30A$	---	7.95	8.8	$m\Omega$
	Static Drain-Source On-Resistance ²	$V_{GS}=6V$, $I_D=20A$	---	9.42	11.5	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	2	3	4	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=120V$, $V_{GS}=0V$, $T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{DS}=120V$, $V_{GS}=0V$, $T_J=85^\circ\text{C}$	---	---	30	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 25V$, $V_{DS}=0V$	---	---	± 100	nA
Q_g	Total Gate Charge	$V_{DS}=75V$, $V_{GS}=4.5V$, $I_D=10A$	---	68	---	nC
Q_{gs}	Gate-Source Charge		---	23	---	
Q_{gd}	Gate-Drain Charge		---	12	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=75V$, $V_{GS}=10V$, $I_D=30A$. $R_G=3.9\Omega$, $R_L=2.5\Omega$	---	16	---	ns
T_r	Rise Time		---	29	---	
$T_{d(off)}$	Turn-Off Delay Time		---	44	---	
T_f	Fall Time		---	22	---	
C_{iss}	Input Capacitance	$V_{DS}=75V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	4590	---	pF
C_{oss}	Output Capacitance		---	319	---	
C_{rss}	Reverse Transfer Capacitance		---	36	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V$, $I_S=30A$, $T_J=25^\circ\text{C}$	---	---	1.3	V
t_{rr}	Reverse Recovery Time	$I_F=30A$, $dI/dt=100A/\mu s$, $T_J=25^\circ\text{C}$	---	92	---	nS
Q_{rr}	Reverse Recovery Charge		---	340	---	nC

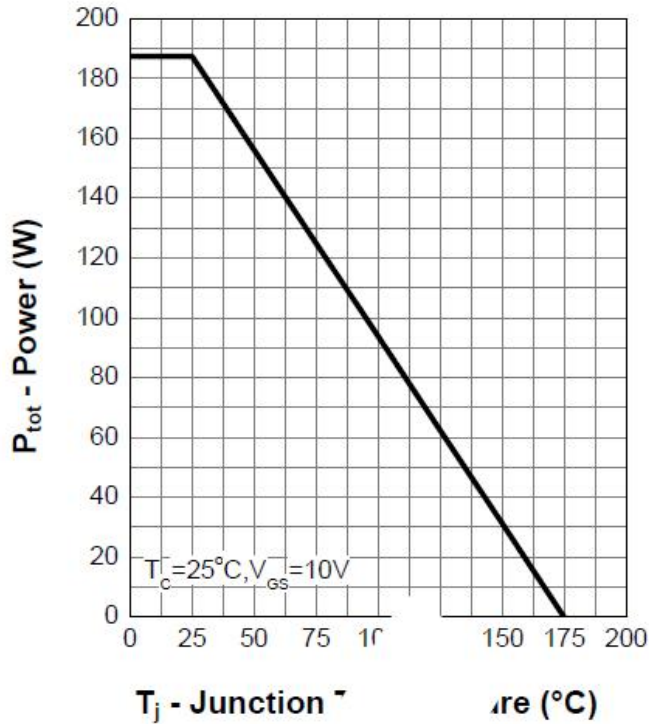
Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
- 2.The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3.The power dissipation is limited by 150°C junction temperature
- 4.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

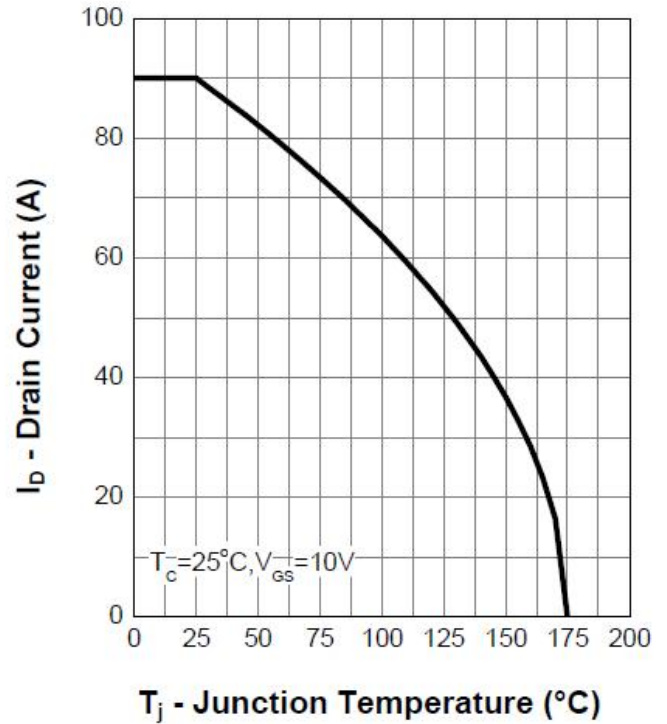


Typical Characteristics

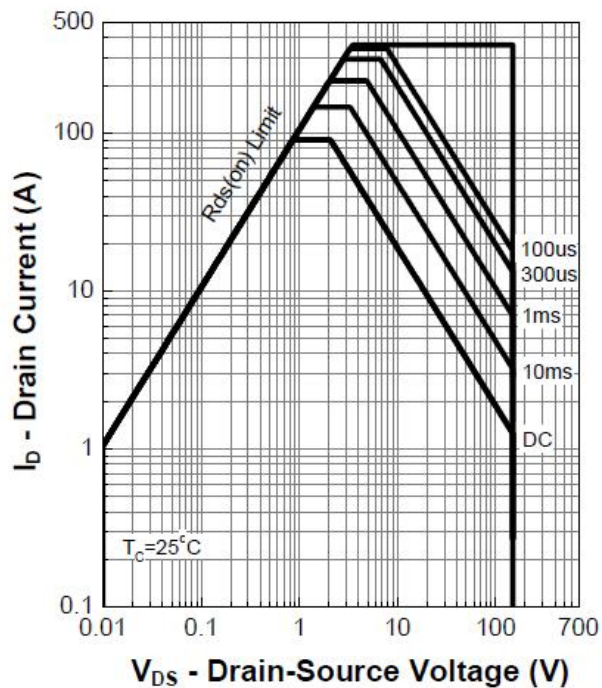
Power Capability



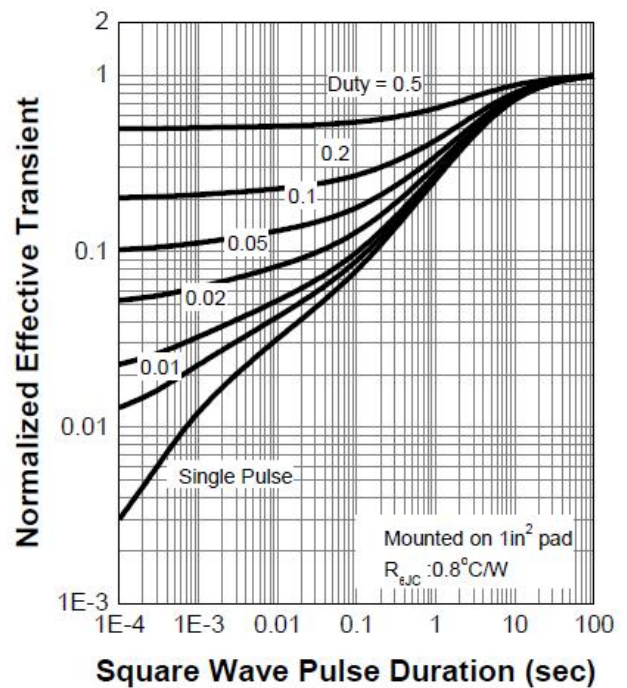
Current Capability



Safe Operation Area

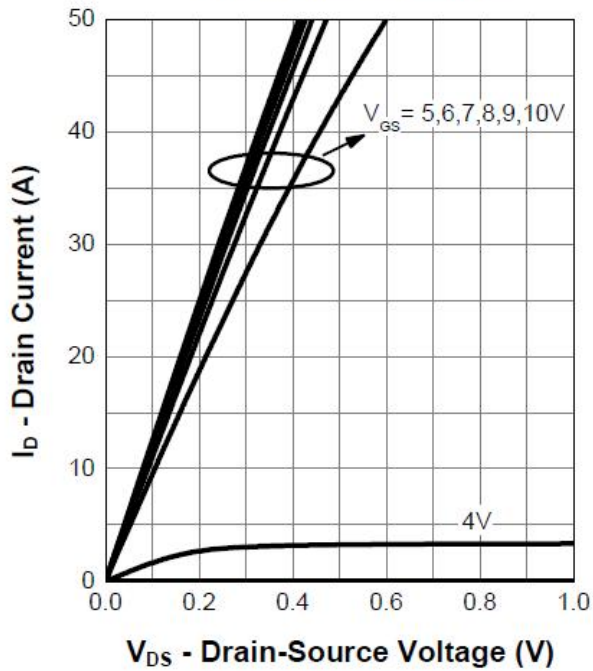


Transient Thermal Impedance

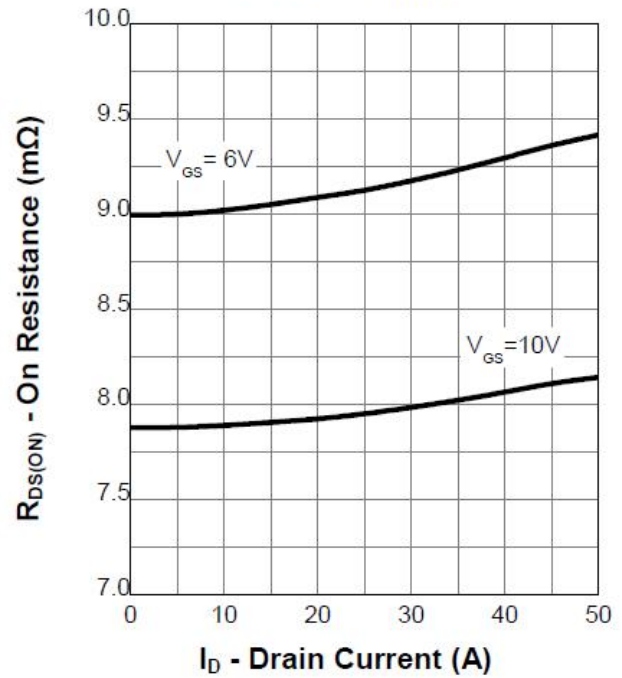




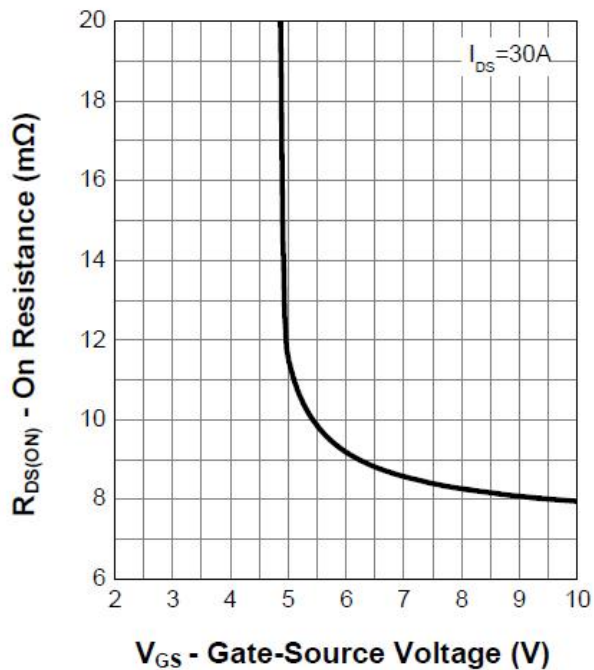
Output Characteristics



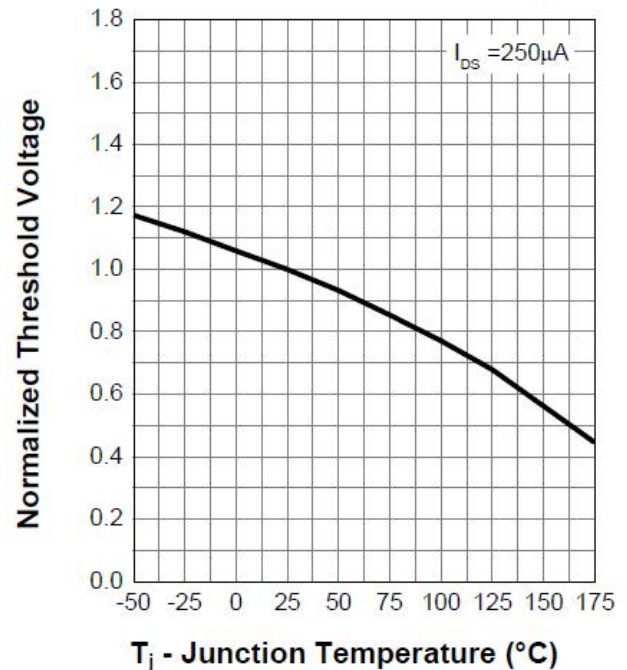
On Resistance



Transfer Characteristics

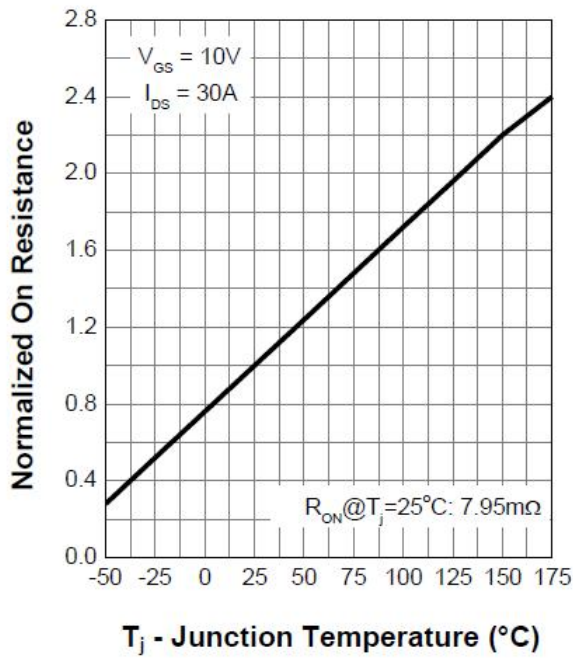


Normalized Threshold Voltage

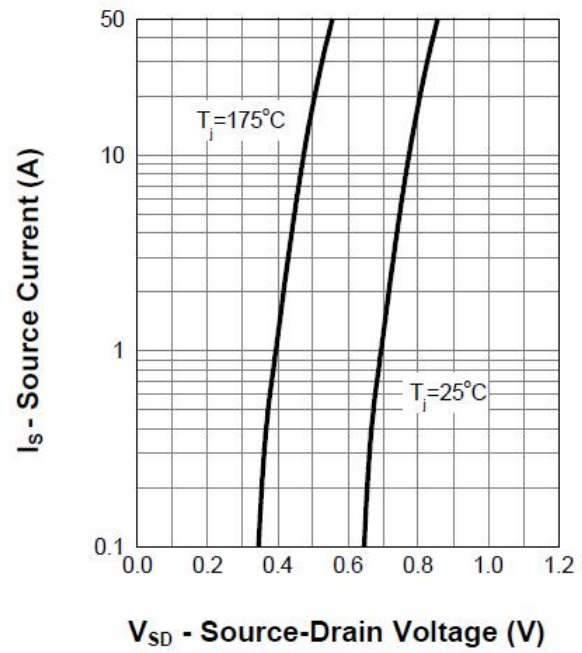




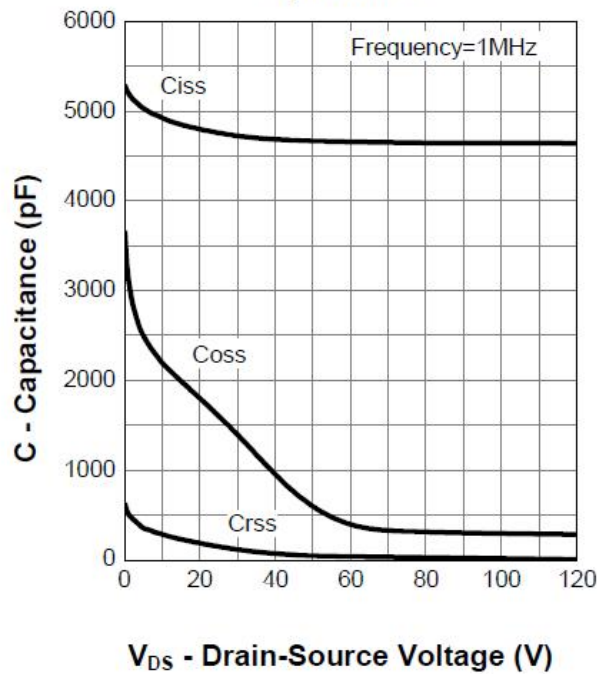
Normalized On Resistance



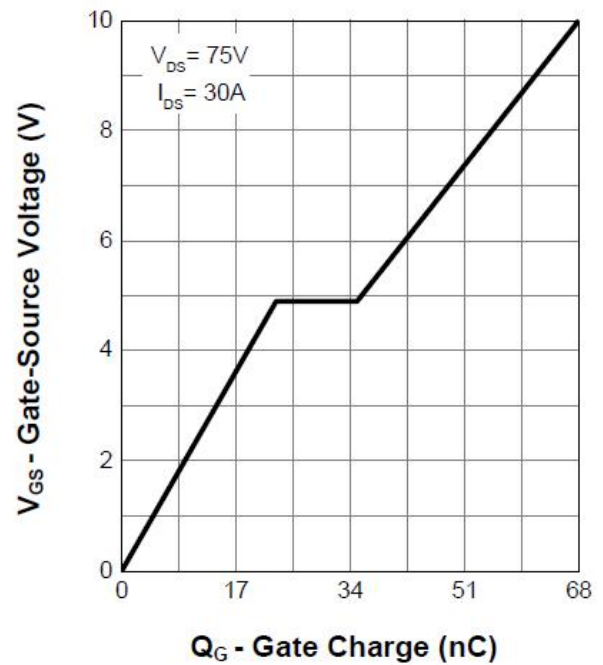
Diode Forward Current



Capacitance



Gate Charge

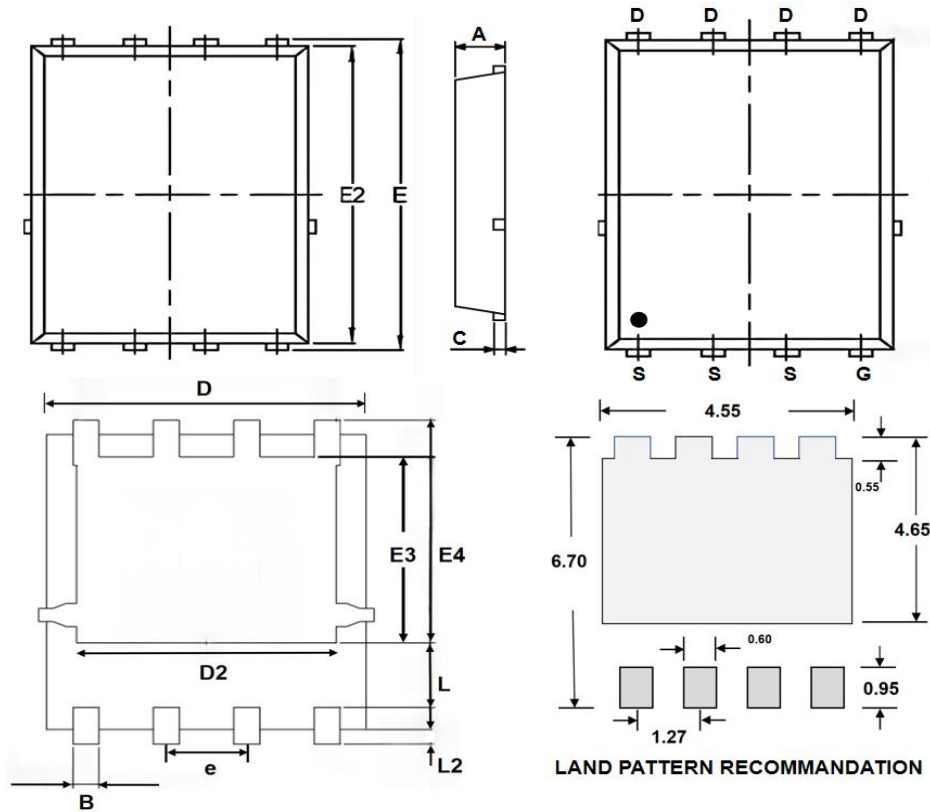




Ordering Information

Part Number	Package code	Packaging
HSBA0715	PRPAK5*6	5000/Tape&Reel

PRPAK5*6 Package Outline



SYMBOLS	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.80	--	1.20	0.031	--	0.047
B	0.25	--	0.51	0.012	--	0.020
C	0.15	--	0.35	0.006	--	0.014
D	4.80	--	5.45	0.189	--	0.209
D2	3.61	--	4.35	0.142	--	0.171
E	5.90	--	6.35	0.232	--	0.250
E2	5.42	--	6.06	0.213	--	0.232
E3	3.23	--	3.90	0.127	--	0.154
E4	3.69	--	4.55	0.145	--	0.179
L	0.61	--	1.80	0.024	--	0.071
L2	0.05	--	0.36	0.002	--	0.014
e	--	1.27	--	--	0.050	--