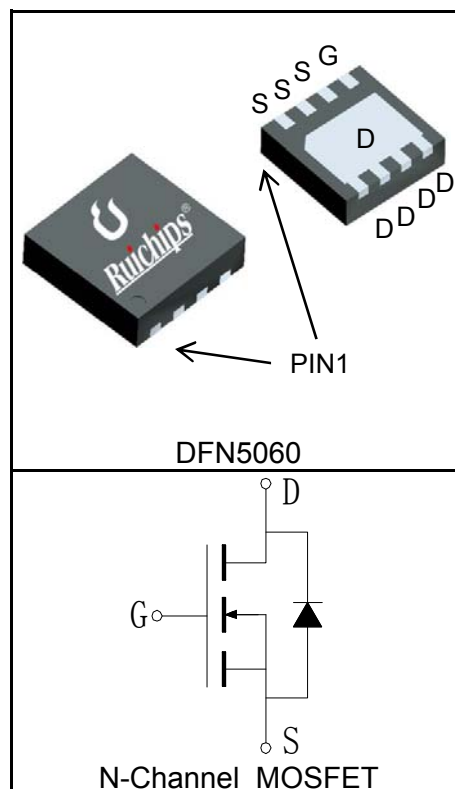


Features

- 85V/120A,
- $R_{DS(ON)} = 4m\Omega(Typ.)@V_{GS}=10V$
- $R_{DS(ON)} = 5.5m\Omega(Typ.)@V_{GS}=4.5V$
- Ultra Low On-Resistance
- Fast Switching Speed
- 100% Avalanche Tested
- Uses Ruichips advanced SGT™ technology
- Lead Free and Green Devices (RoHS Compliant)



Pin Description



Applications

- Synchronous Rectification for Flyback Converters
- PD Adaptors
- Charger for Mobile

Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T _C =25°C Unless Otherwise Noted)				
V _{DSS}	Drain-Source Voltage		85	V
V _{GSS}	Gate-Source Voltage		±20	
T _J	Maximum Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-55 to 150	°C
I _S	Diode Continuous Forward Current	T _C =25°C	120	A
Mounted on Large Heat Sink				
I _{DP} ^①	300µs Pulse Drain Current Tested	T _C =25°C	480	A
I _D ^②	Continuous Drain Current@T _C (V _{GS} =10V)	T _C =25°C	120	A
		T _C =100°C	76	
	Continuous Drain Current@T _A (V _{GS} =10V) ^③	T _A =25°C	15	
		T _A =70°C	12	
P _D	Maximum Power Dissipation@T _C	T _C =25°C	184	W
		T _C =100°C	74	
	Maximum Power Dissipation@T _A ^③	T _A =25°C	2.3	
		T _A =70°C	1.5	

Symbol	Parameter	Rating	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	0.68	°C/W
$R_{\theta JA}^{(3)}$	Thermal Resistance-Junction to Ambient	54	°C/W
Drain-Source Avalanche Ratings			
$E_{AS}^{(4)}$	Avalanche Energy, Single Pulsed	225	mJ

Electrical Characteristics ($T_C=25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Condition	RUH85120M-C			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	85			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =85V, V _{GS} =0V			1	μA
		T _J =125°C			30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	1		3	V
I _{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V			±100	nA
R _{DS(ON)} ^⑤	Drain-Source On-state Resistance	V _{GS} =4.5V, I _{DS} =40A		5.5	6.5	mΩ
		V _{GS} =10V, I _{DS} =50A		4	5	mΩ
		T _J =125°C		7.8	10	mΩ
Diode Characteristics						
V _{SD} ^⑤	Diode Forward Voltage	I _{SD} =50A, V _{GS} =0V		0.8	1.2	V
g _{FS}	Forward Transconductance	V _{DS} =5V, I _D =20A		50	80	S
t _{rr}	Reverse Recovery Time	I _{SD} =50A, dI _{SD} /dt=100A/μs		37	80	ns
Q _{rr}	Reverse Recovery Charge			36	190	nC
Dynamic Characteristics ^⑥						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz		1.1	1.6	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =40V, Frequency=1.0MHz		2380	3000	pF
C _{oss}	Output Capacitance			870	1300	
C _{rss}	Reverse Transfer Capacitance			13	25	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =40V, I _{DS} =50A, V _{GEN} =10V, R _G =1.2Ω		12.5	20	ns
t _r	Turn-on Rise Time			26	40	
t _{d(OFF)}	Turn-off Delay Time			13	20	
t _f	Turn-off Fall Time			12.5	20	
Gate Charge Characteristics ^⑥						
Q _g	Total Gate Charge	V _{DS} =68V, V _{GS} =10V, I _{DS} =50A		37	55	nC
Q _{gs}	Gate-Source Charge			11	20	
Q _{gd}	Gate-Drain Charge			8	16	

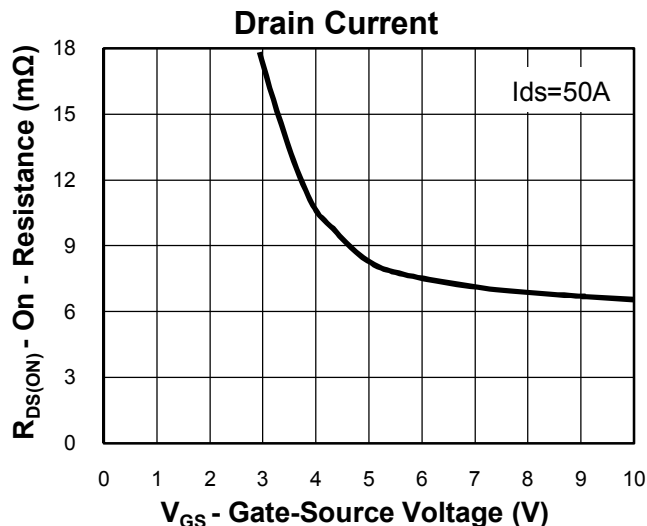
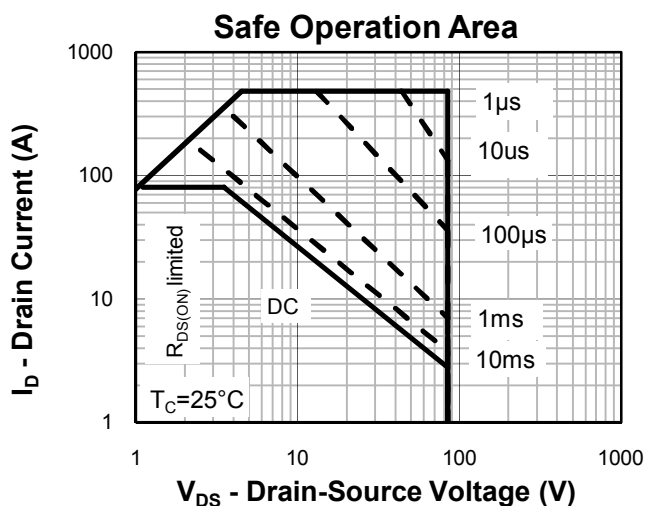
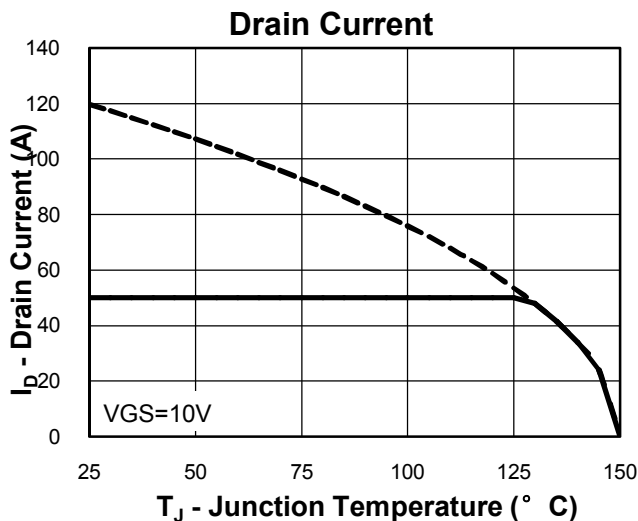
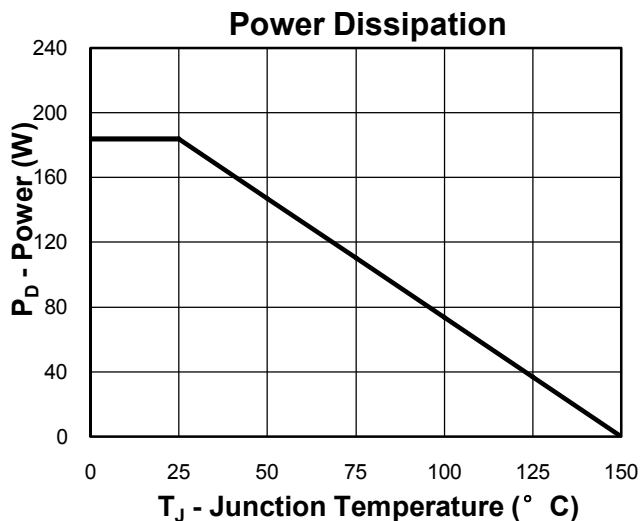
Notes:

- ①Pulse width limited by safe operating area.
- ②Calculated continuous current based on maximum allowable junction temperature. The package limitation current is 50A.
- ③When mounted on 1 inch square copper board, $t \leq 10\text{sec}$.
- ④This value is based on starting $T_J = 25^\circ\text{C}$, $L = 0.5\text{mH}$, $R_G = 25\Omega$, $I_{AS}=30\text{A}$, $V_{DD}=60\text{V}$; 100% FT tested at $L=0.5\text{mH}$, $I_{AS}=21\text{A}$.
- ⑤Pulse test;Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
- ⑥Guaranteed by design, not subject to production testing.

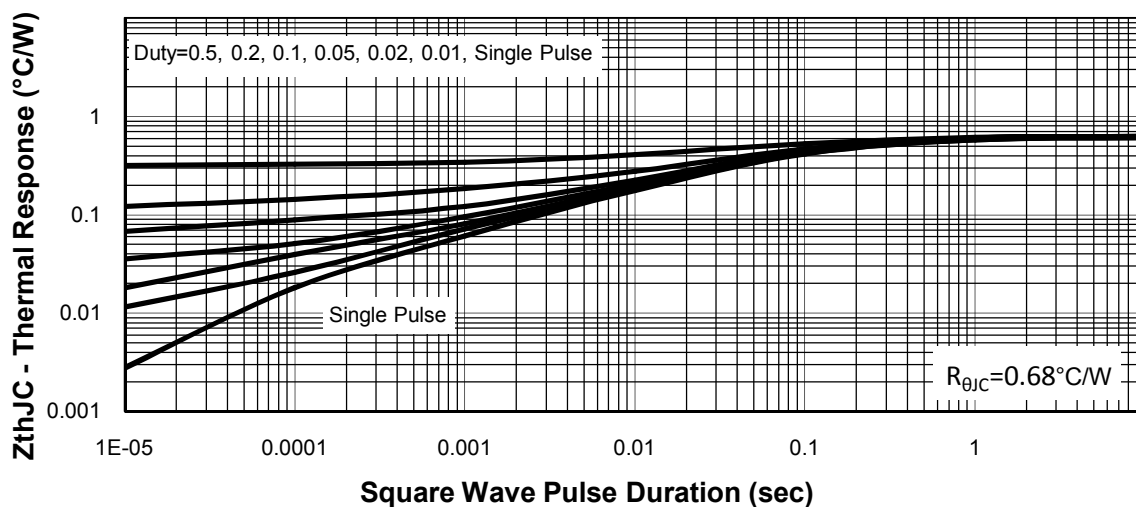
Ordering and Marking Information

Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
RUH85120M-C	RUH85120M	DFN5060	Tape&Reel	5000	13"	12mm

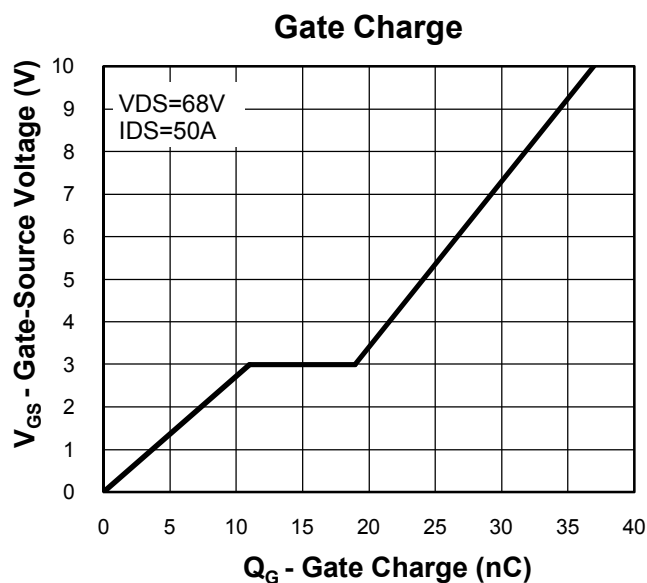
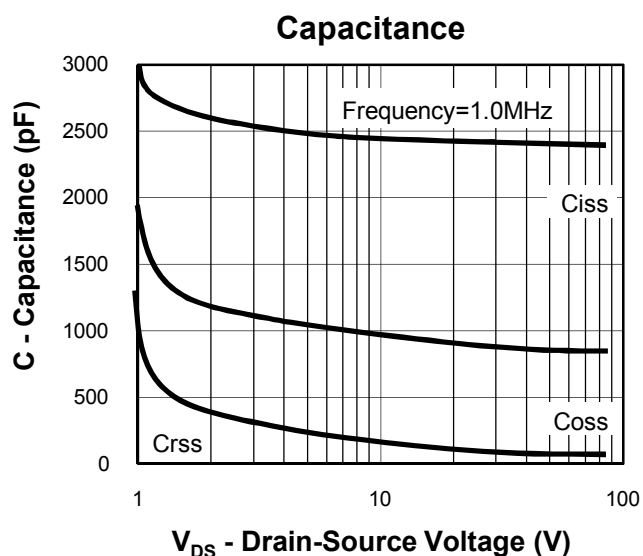
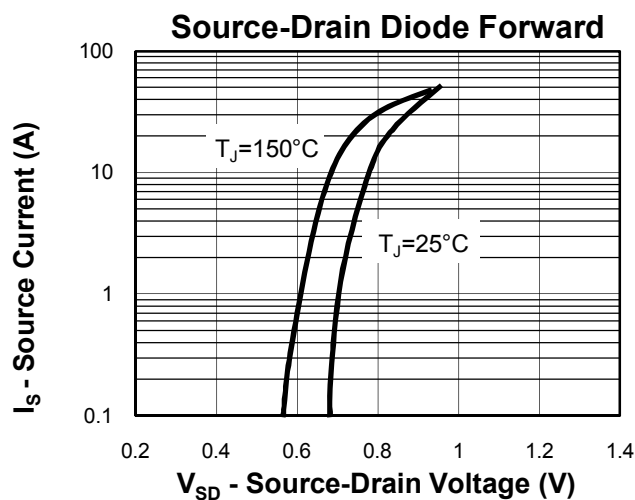
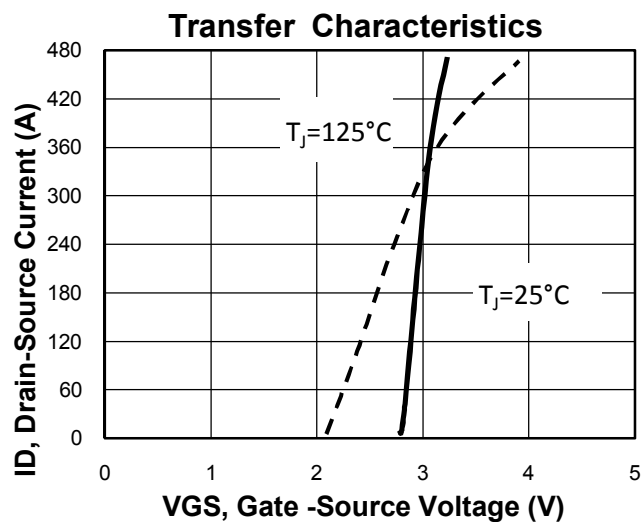
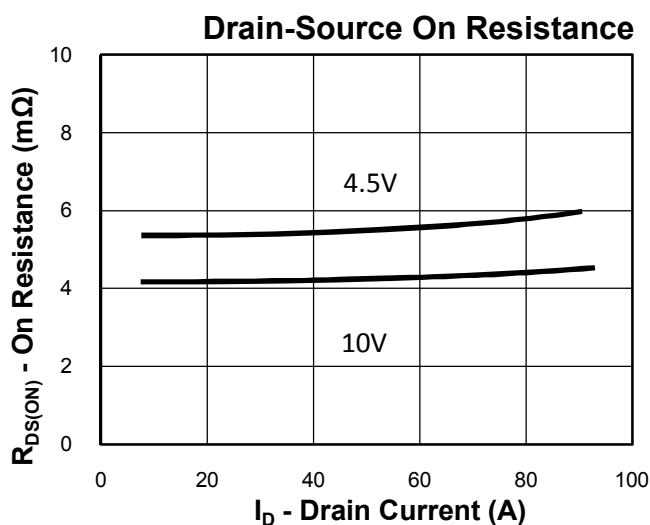
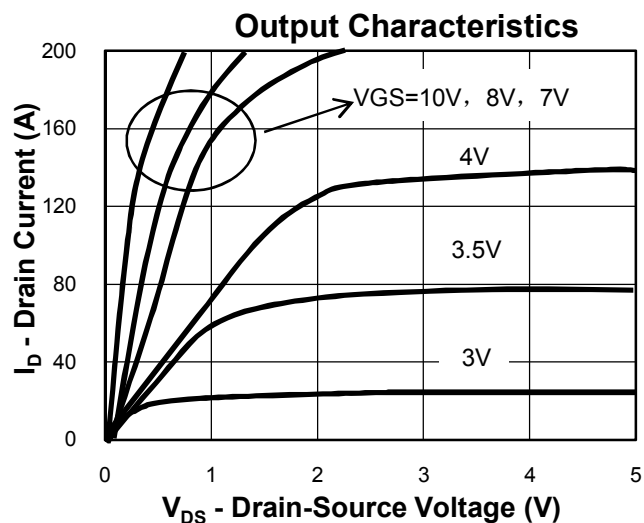
Typical Characteristics



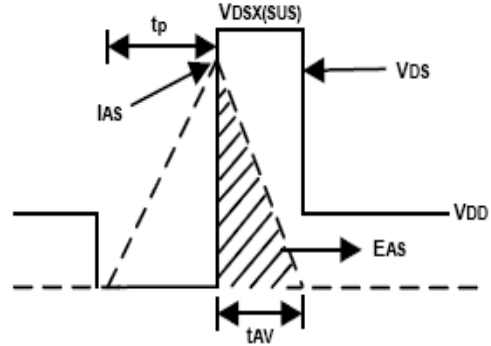
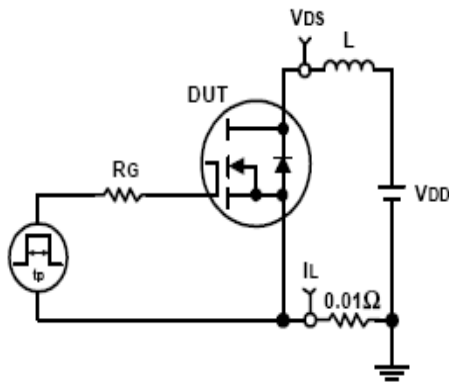
Thermal Transient Impedance



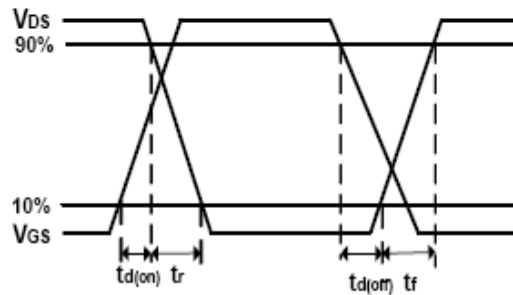
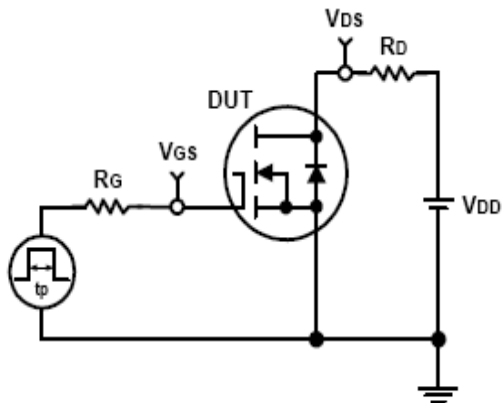
Typical Characteristics



Avalanche Test Circuit and Waveforms

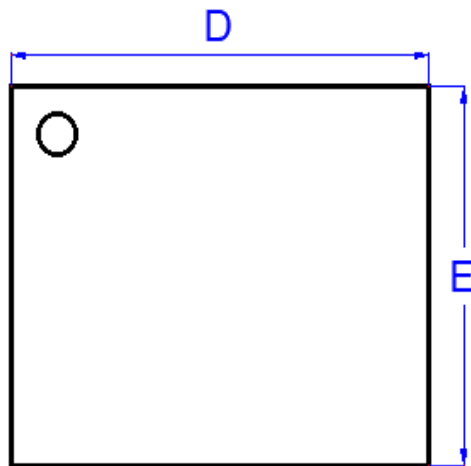


Switching Time Test Circuit and Waveforms

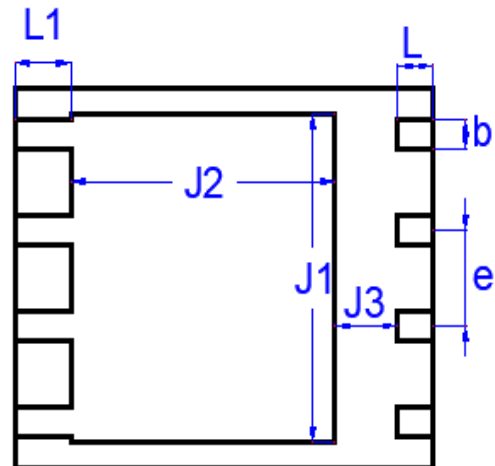


Package Information

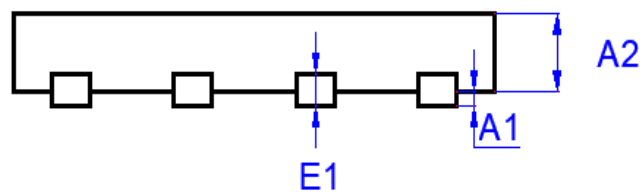
DFN5060



TOP View



Bottom View



Side View

NOTE:

1: ALL UNITS ARE IN MILLIMETER.

2: EJECTOR PIN MARK POSITION MAY VARY FROM DIFFERENT MOLD.

3: ALL DIMENSIONS REFER TO JEDEC.DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS.

SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A1	—	—	0.15	—	—	0.006
A2	0.70	0.75	0.80	0.028	0.030	0.031
E1	0.185	0.235	0.285	0.007	0.009	0.011
b	0.350	0.400	0.450	0.014	0.016	0.018
e	1.220	1.270	1.320	0.048	0.050	0.052
D	5.900	6.000	6.100	0.232	0.236	0.240
E	4.900	5.000	5.100	0.193	0.197	0.201
J1	4.300	4.360	4.420	0.169	0.172	0.174
J2	3.700	3.800	3.900	0.146	0.150	0.154
J3	0.800	0.900	0.950	0.031	0.035	0.037
L	0.450	0.515	0.565	0.018	0.020	0.022
L1	0.750	0.800	0.850	0.030	0.031	0.033