

## 120V N-Channel Enhancement Mode MOSFET

### 1. Product Information

#### 1.1 Features

- ◇ Advanced SGT cell design
- ◇ MSL1
- ◇ Low Thermal Resistance
- ◇  $T_j \text{ max } 175^\circ\text{C}$

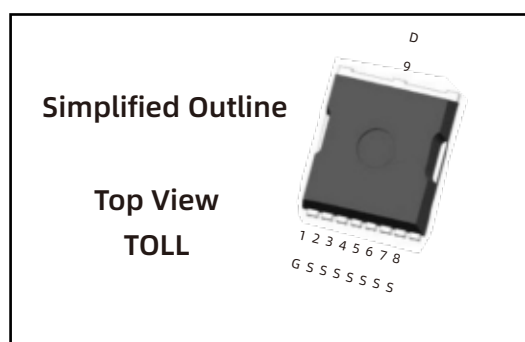
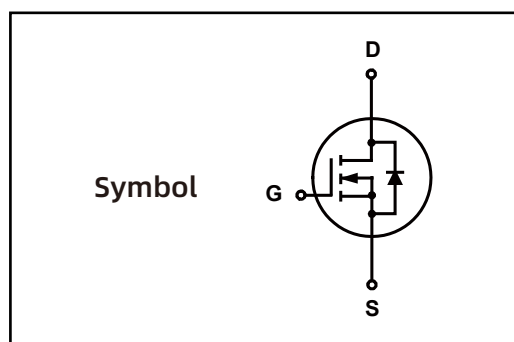
#### 1.2 Applications

- ◇ Motor drivers
- ◇ DC - DC Converter

#### 1.3 Quick reference

- ◇  $BV \cong 120 \text{ V}$
- ◇  $P_{\text{tot}} \cong 375 \text{ W}$
- ◇  $I_D \cong 250 \text{ A}$
- ◇  $R_{\text{DS(ON)}} \cong 5.5\text{m}\Omega @ V_{\text{GS}} = 10 \text{ V}$
- ◇  $R_{\text{DS(ON)}} \cong 7.5\text{m}\Omega @ V_{\text{GS}} = 6\text{V}$

### 2. Pin Description



### 3. Marking Information

Product Name	Marking
LN050N120T	LN050N120T AYWWZZ XXXXXX

## 4.Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
$V_{DS}$	Drain-Source Voltage	$T_C = 25\text{ }^\circ\text{C}$	120	-	V
$V_{GS}$	Gate-Source Voltage	$T_C = 25\text{ }^\circ\text{C}$	-	$\pm 20$	V
$I_D^*$	Drain Current ( DC )	$T_C = 25\text{ }^\circ\text{C}, V_{GS} = 10\text{ V}$	-	250	A
		$T_C = 100\text{ }^\circ\text{C}, V_{GS} = 10\text{ V}$	-	177	A
$I_{DM}^{*,**}$	Drain Current ( Pulsed )	$T_C = 25\text{ }^\circ\text{C}, V_{GS} = 10\text{ V}$	-	396	A
$P_{tot}^*$	Drain power dissipation	$T_C = 25\text{ }^\circ\text{C}$	-	375	W
$T_{stg}$	Storage Temperature		-55	150	$^\circ\text{C}$
$T_J$	Junction Temperature		-	150	$^\circ\text{C}$
$I_S$	Continuous-Source Current	$T_C = 25\text{ }^\circ\text{C}$	-	250	A
$E_{AS}^*$	Single Pulsed Avalanche Energy	$V_{DD} = 50\text{ V}, L = 1.0\text{mH}$	-	922	mJ
$R_{\theta JA}^*$	Thermal Resistance- Junction to Ambient		-	40	$^\circ\text{C/W}$
$R_{\theta JC}^*$	Thermal Resistance- Junction to Case		-	0.45	

Notes :

\* Surface Mounted on 1 in<sup>2</sup> pad area,  $t \leq 10\text{ sec}$

\*\* Pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$

\*\*\* Thermal resistance, junction - case, bottom with thermal pad

## 5.Ordering Code

Product Name	Package	Reel Size	Tape width	Quantity	Note
LN050N120T	TOLL-8			2000	

Note: COMTECH defines " Green " as lead-free ( RoHS compliant ) and halogen free ( Br or Cl does not exceed 900 ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500 ppm by weight; Follow IEC 61249-2-21 and IPC / JEDEC J-STD-020C )

## 6. Electrical Characteristics (TA=25 ° Unless Otherwise Noted )

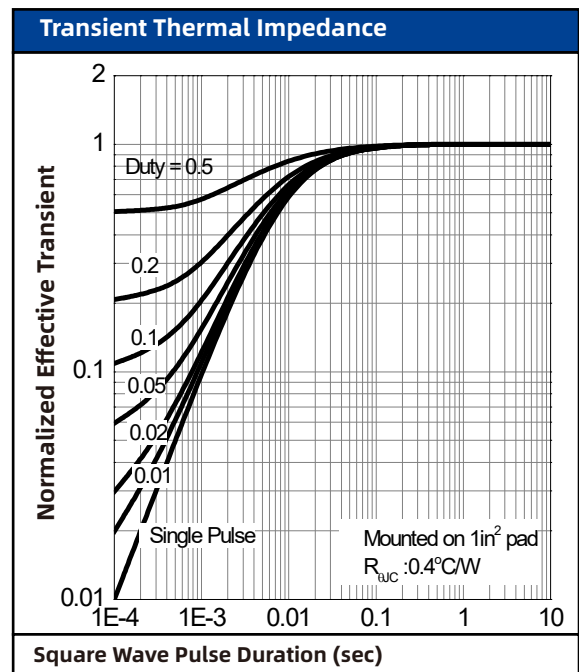
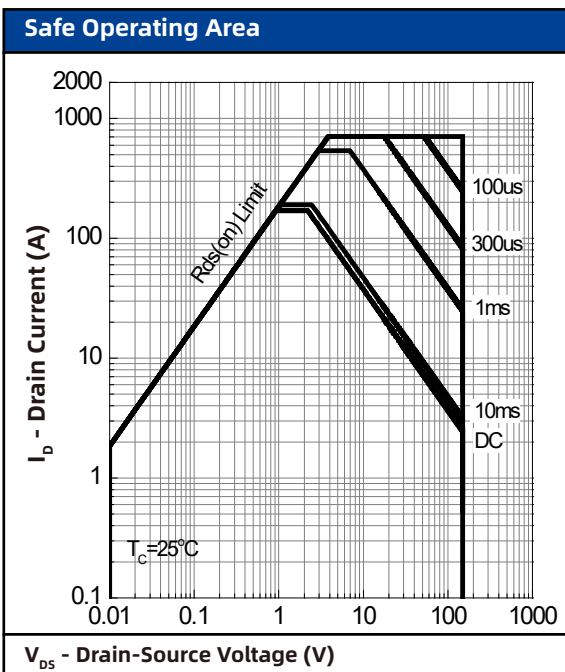
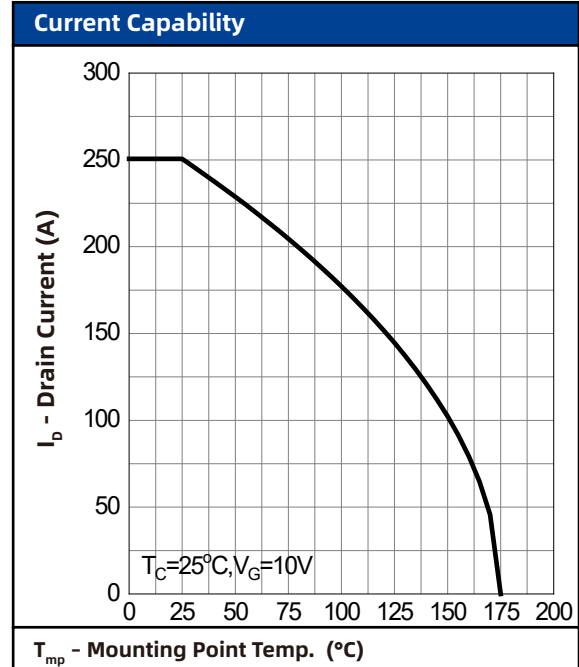
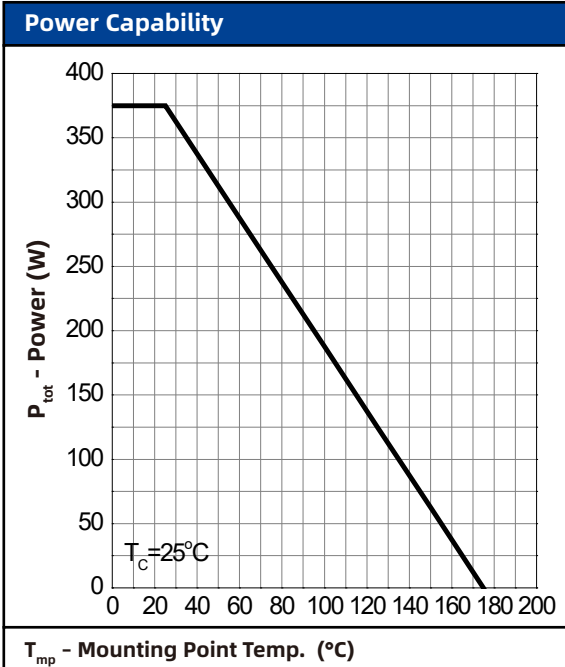
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_{DS} = 250\ \mu\text{A}$	120	-	-	V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_{DS} = 250\ \mu\text{A}$	2	-	4	V
$I_{DSS}$	Drain Leakage Current	$V_{DS} = 96\text{ V}, V_{GS} = 0\text{ V}$	-	-	1	$\mu\text{A}$
$I_{GSS}$	Gate Leakage Current	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{ V}$	-	-	$\pm 100$	nA
$R_{DS(on)}^a$	On-State Resistance	$V_{GS} = 10\text{ V}, I_{DS} = 20\text{ A}$	-	5.0	5.5	m $\Omega$
		$V_{GS} = 6\text{ V}, I_{DS} = 10\text{ A}$	-	6.5	7.5	
<b>Diode Characteristics</b>						
$V_{SD}^a$	Diode Forward Voltage	$I_{SD} = 20\text{ A}, V_{GS} = 0\text{ V}$	-	-	1.3	V
$t_{rr}$	Reverse Recovery Time	$I_{DS} = 20\text{ A}$	-	92	-	nS
$Q_{rr}$	Reverse Recovery Charge	$dI_{SD}/dt = 100\text{ A}/\mu\text{s}$	-	337	-	nC
<b>Dynamic Characteristics<sup>b</sup></b>						
$C_{ISS}$	Input Capacitance	$V_{GS} = 0\text{ V}, V_{DS} = 60\text{ V}$ Frequency = 1 MHz	-	4779	-	pF
$C_{OSS}$	Output Capacitance		-	570	-	
$C_{rSS}$	Reverse Transfer Capacitance		-	34	-	
$t_d(on)$	Turn-on Delay Time	$V_{DS} = 60\text{ V}, V_{GEN} = 10\text{ V},$ $R_G = 3.9\ \Omega, R_L = 3\ \Omega,$ $I_{DS} = 20\text{ A}$	-	16	-	nS
$t_r$	Turn-on Rise Time		-	27	-	
$t_d(off)$	Turn-off Delay Time		-	51	-	
$t_f$	Turn-off Fall Time		-	27	-	
<b>Gate Charge Characteristics<sup>b</sup></b>						
$Q_g$	Total Gate Charge	$V_{DS} = 60\text{ V}, V_{GS} = 10\text{ V},$ $I_{DS} = 20\text{ A}$	-	80	-	nC
$Q_{gs}$	Gate-Source Charge		-	24	-	
$Q_{gd}$	Gate-Drain Charge		-	18	-	

Notes :

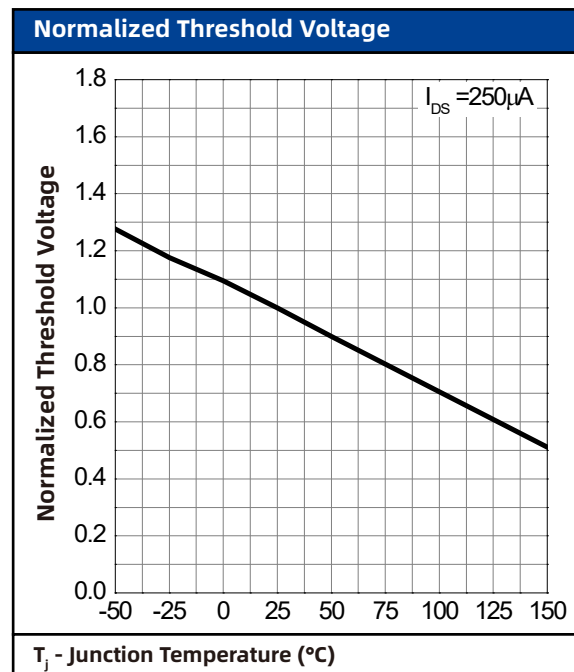
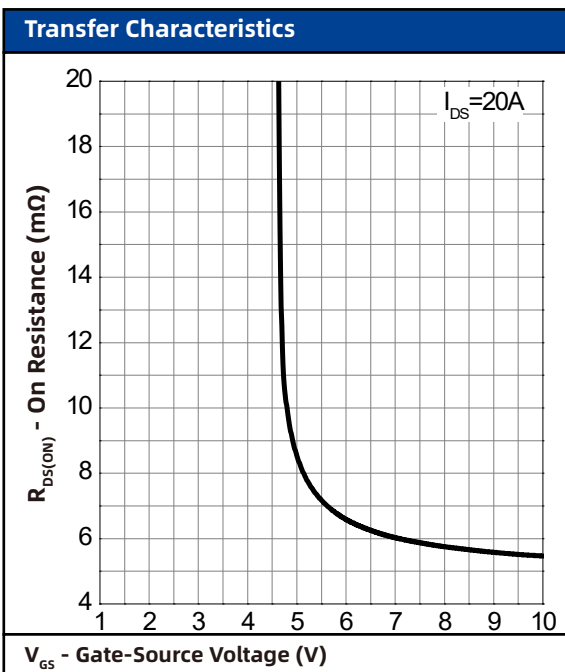
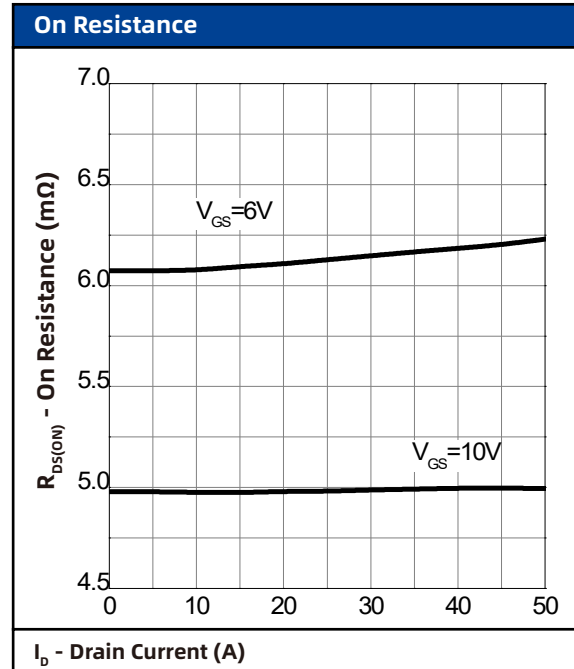
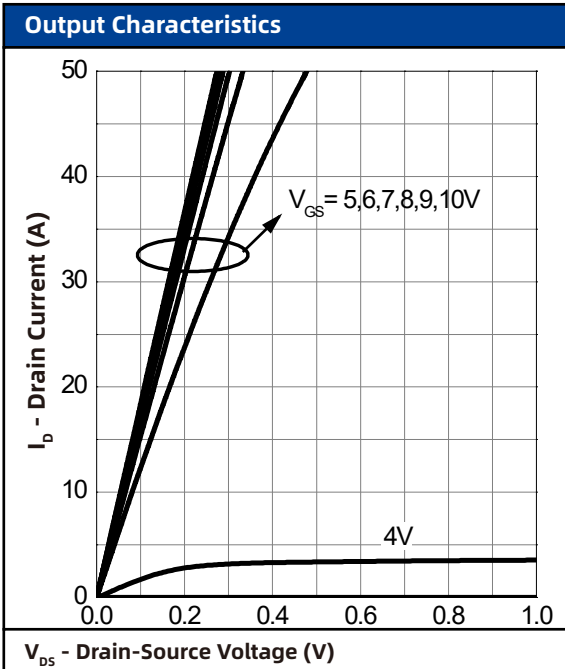
a : Pulse test ; pulse width  $\leq 300\ \mu\text{s}$ , duty cycle  $\leq 2\%$

b : Guaranteed by design, not subject to production testing

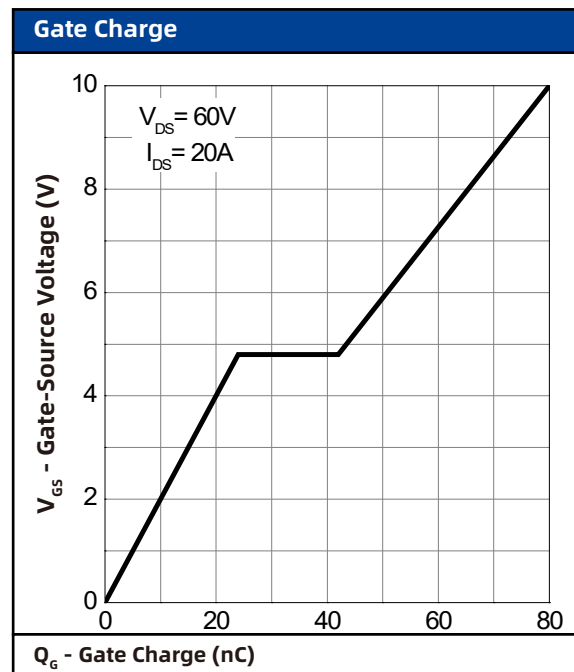
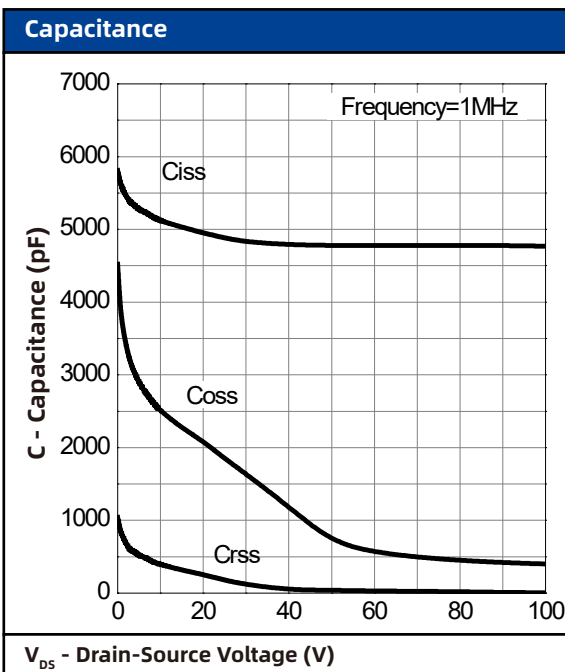
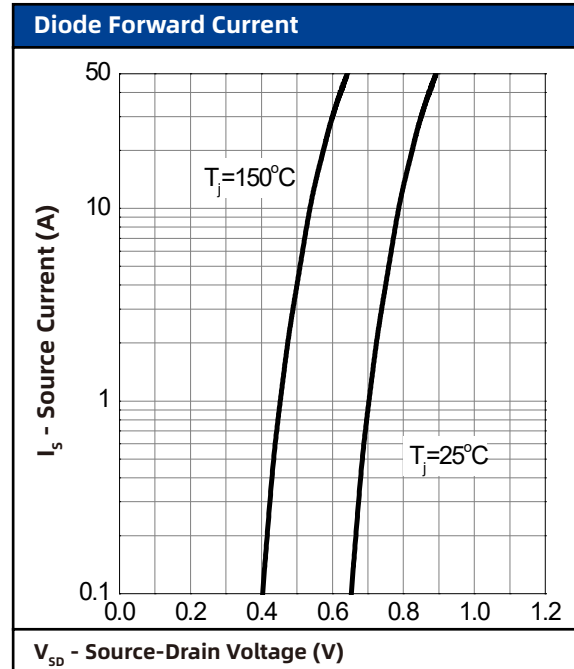
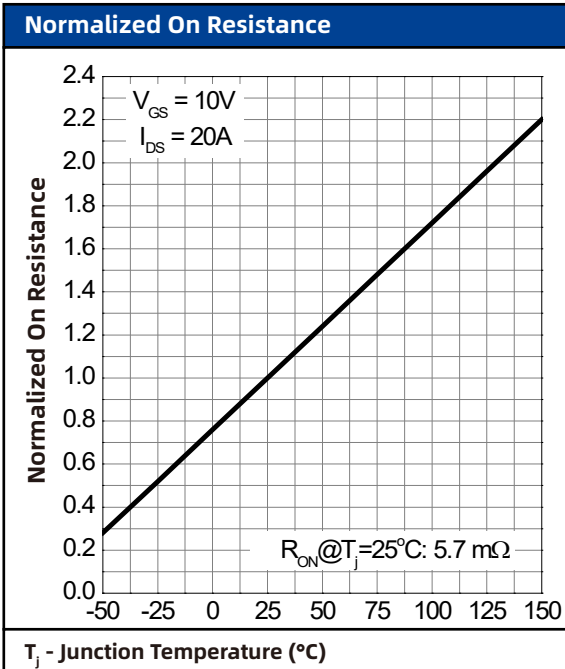
## 7. Typical Characteristics



## 7. Typical Characteristics (cont.)

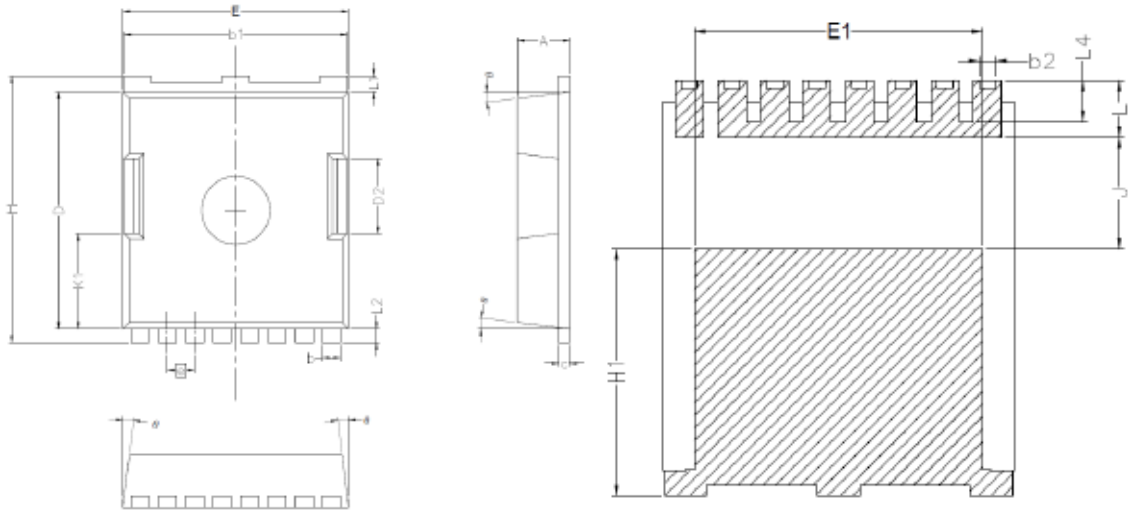


## 7. Typical Characteristics (cont.)



## 8. Package Dimensions

### TOLL-8 Package



Symbol	Dimensions In Millimeters	
	MIN.	MAX.
A	2.20	2.40
b	0.70	0.90
b1	9.70	9.90
b2	0.42	0.50
c	0.40	0.60
D	10.28	10.58
D2	3.10	3.50
E	9.70	10.10
E1	7.90	8.30
e	1.20BSC	
H	11.48	11.88
H1	6.75	7.15
N	8	
J	3.00	3.30
K1	3.98	4.38
L	1.40	1.80
L1	0.60	0.80
L2	0.50	0.70
L4	1.00	1.30
θ	4°	10°