

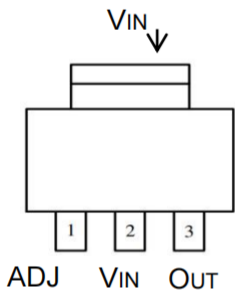
Features

- Output Adjustable between 1.2V and 37V
- Output current up to 1.5A
- Internal Thermal Overload Protection
- internal thermal Overload protection
- Output transistor safe area compensation

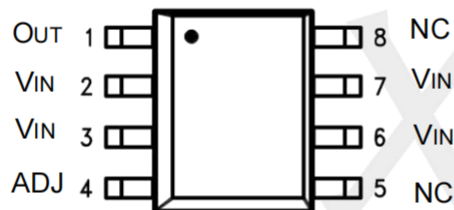
Applications

- HVAC Systems
- SMPS Post Regulation
- Test and Measurement Equipment
- Industrial Power Supplies

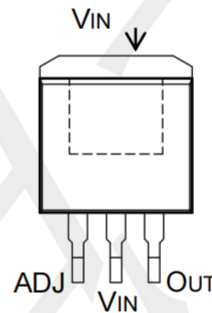
PIN CONFIGURATION



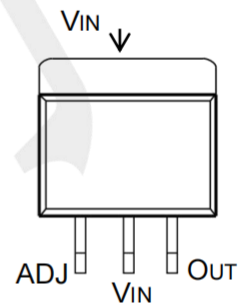
**SOT-223-3
(TOP VIEW)**



**SOP8
(TOP VIEW)**



**TO-263-3
(TOP VIEW)**



**TO-252-3
(TOP VIEW)**

Pin Number				Pin Name	Pin Function
LM317Y3	LM317W3	LM317K3	LM317S8		
SOT-223-3	TO-263-3	TO-252-3	SOP8		
1	1	1	4	ADJ	Adjust pin
2	2	2	2,3,6,7	VOUT	Output of the Regulator
3	3	3	1	VIN	Input of Supply Voltage
--	--	--	5,8	NC	No connection

Absolute Maximum Ratings

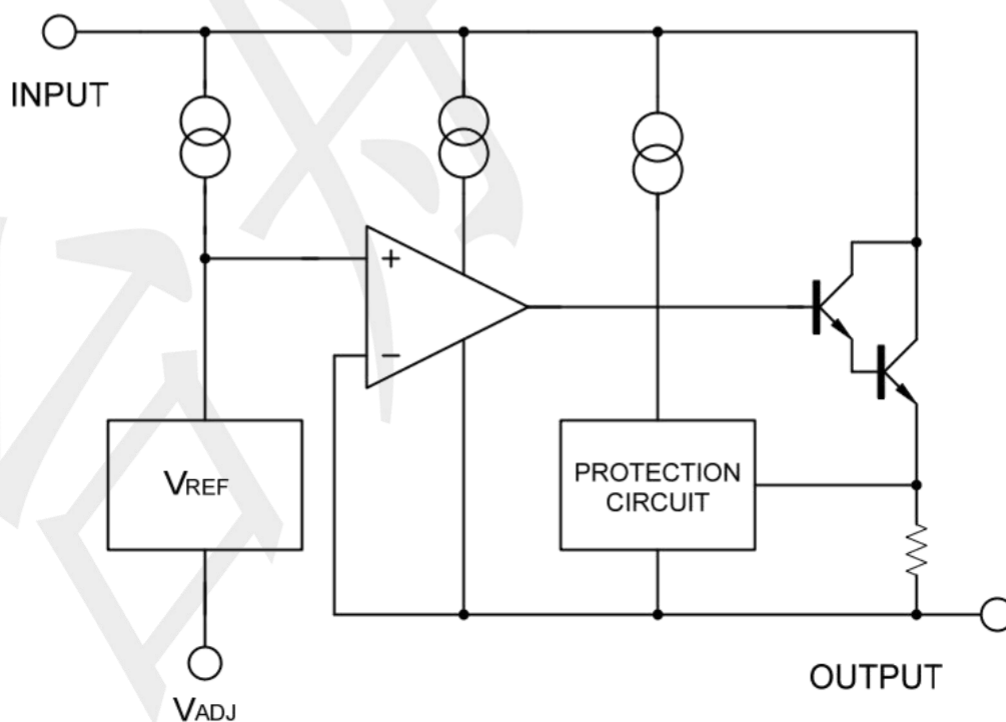
over operating free-air temperature range (unless otherwise noted)

SYMBOL	PARAMETER	RATINGS	UNIT
$V_i - V_o$	Input-Output Voltage Differential	40	V
P_D	Power Dissipation	Internally Limited	W
T_J	Operating Junction Temperature Range	+125	°C
T_{stg}	Storage temperature range	-65~ +150	°C
T_{OPR}	Operating Temperature	-40 ~ +85	°C

THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-223-3	θ_{JA}	140	°C/W
	SOP8		111.3	°C/W
	TO-263-3		62.5	°C/W
	TO-252-3		103	°C/W
Junction to Case	SOT-223-3	θ_{JC}	23.5	°C/W
	SOP8		56.1	°C/W
	TO-263-3		5.5	°C/W
	TO-252-3		12.2	°C/W

BLOCK DIAGRAM



Electrical Characteristics (TA=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST Conditions	MIN	TYP	MAX	UNIT	
Line Regulation (Note 1)	$\Delta V_{OUT} / V_{OUT}$	TA = +25°C, 3.0V ≤ VI-VO ≤ 40V	--	0.01	0.04	%/V	
Load Regulation (Note 1)	ΔV_{OUT}	TA = +25°C, 10mA ≤ IO ≤ 1.5A	VO ≤ 5.0V	--	5	25	mV
			VO ≥ 5.0V	--	0.1	0.5	%
Adjustment Pin Current	I _{ADJ}		--	50	100	μA	
Adjustment Pin Current Change	ΔI _{ADJ}	3.0V ≤ VI-VO ≤ 40V, 10mA ≤ IL ≤ 1.5A, PD ≤ P _{MAX} , TA = +25°C	--	2.0	5.0	μA	
Reference Voltage	V _{REF}	TA = +25°C, 3.0V ≤ VI-VO ≤ 40V	1.215	1.250	1.285	V	
		10mA ≤ IO ≤ 1.5A, PD ≤ P _{MAX} , T _J = T _{LOW} to T _{HIGH}	1.20	1.25	1.30	V	
Temperature Stability	T _S	T _{LOW} ≤ T _J ≤ T _{HIGH}	--	0.7	--	%V _O	
Minimum Load Current to Maintain Regulation	I _{LMIN}	VI-VO ≤ 10V	--	1.5	6.0	mA	
		VI-VO ≤ 40V	--	2.5	10	mA	
Maximum Output Current	I _{MAX}	VI-VO ≤ 15V, PD ≤ P _{MAX}	1.5	2.2	--	A	
		VI-VO ≤ 40V, PD ≤ P _{MAX} , T _J = +25°C	0.3	0.4	--	A	
RMS Noise	N	% of V _O , TA = +25°C, 10Hz ≤ f ≤ 10kHz	--	0.003	--	%V _O	
Ripple Rejection	RR	V _O = -10V, f = 120Hz (Note 2)	Without C _{ADJ}	--	65	--	dB
			C _{ADJ} = 10μF	66	80	--	dB
Long-Term Stability	S	T _J = T _{HIGH} (Note 4), TA = +25°C for Endpoint Measurements		0.3	1.0	%/1.0k Hrs.	
Thermal Regulation		TA = +25°C (Note 3), 10ms Pulse		0.003	0.4	%VO/W	

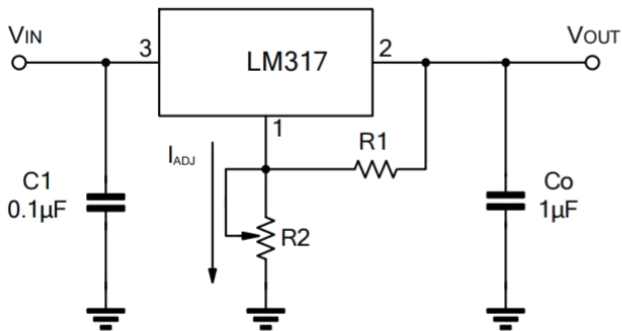
Notes: 1. Load and line regulation are specified at constant junction temperature. Change in V_O because of heating effects is covered under the Thermal Regulation specification. Pulse testing with a low duty cycle is used.

2. C_{ADJ}, when used, is connected between the adjustment pin and ground.

3. Power dissipation within an IC voltage regulator produces a temperature gradient on the die, affecting individual IC components on the die. These effects can be minimized by proper integrated circuit design and layout techniques. Thermal Regulation is the effect of these temperature gradients on the output voltage and is expressed in percentage of output change per watt of power change in a specified time.

4. Since Long Term Stability cannot be measured on each device before shipment, this specification is an engineering estimate of average stability from lot to lot.

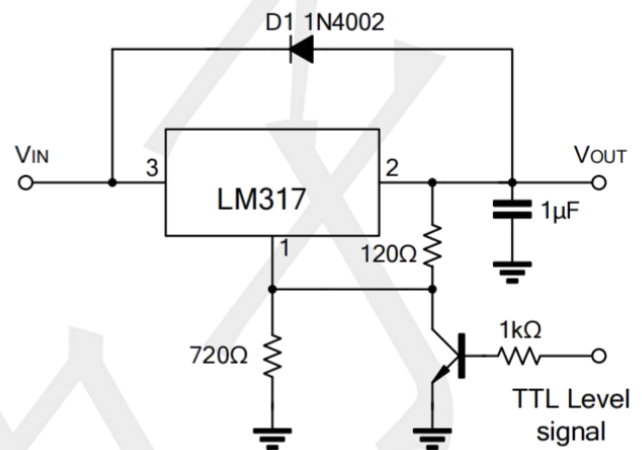
Typical Application Circuit



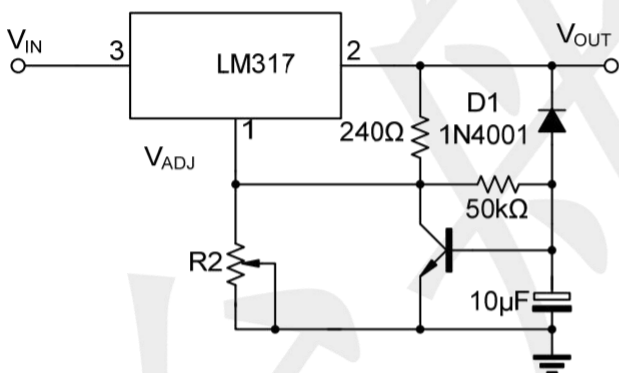
$$V_{OUT} = 1.25V \times (1 + R2/R1) + I_{ADJ} \times R2$$

C1 is required when regulator is located an appreciated distance from power supply. Co is needed to improve transient response.

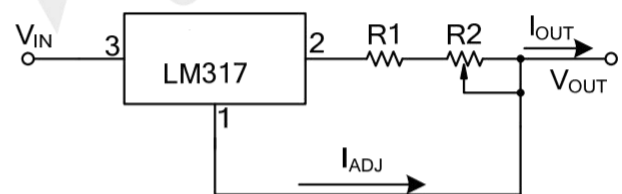
Programmable voltage regulator



Regulator with On-off control



Soft Start Application



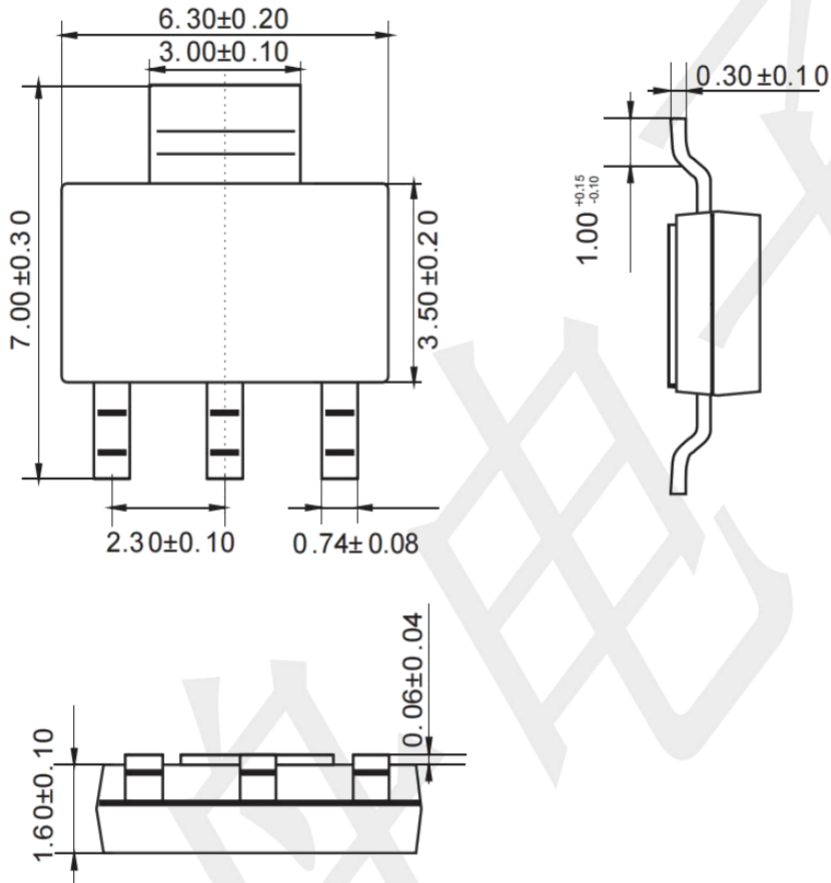
$$I_{O(MAX)} = \left(\frac{V_{REF}}{R1} \right) + I_{ADJ} = \frac{1.25V}{R1}$$

$$I_{O(MIN)} = \left(\frac{V_{REF}}{R1+R2} \right) + I_{ADJ} = \frac{1.25V}{R1+R2}$$

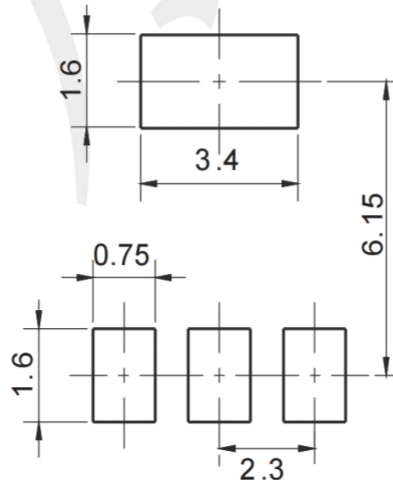
Constant Current Application

Package Outline Dimensions (unit: mm)

SOT-223-3

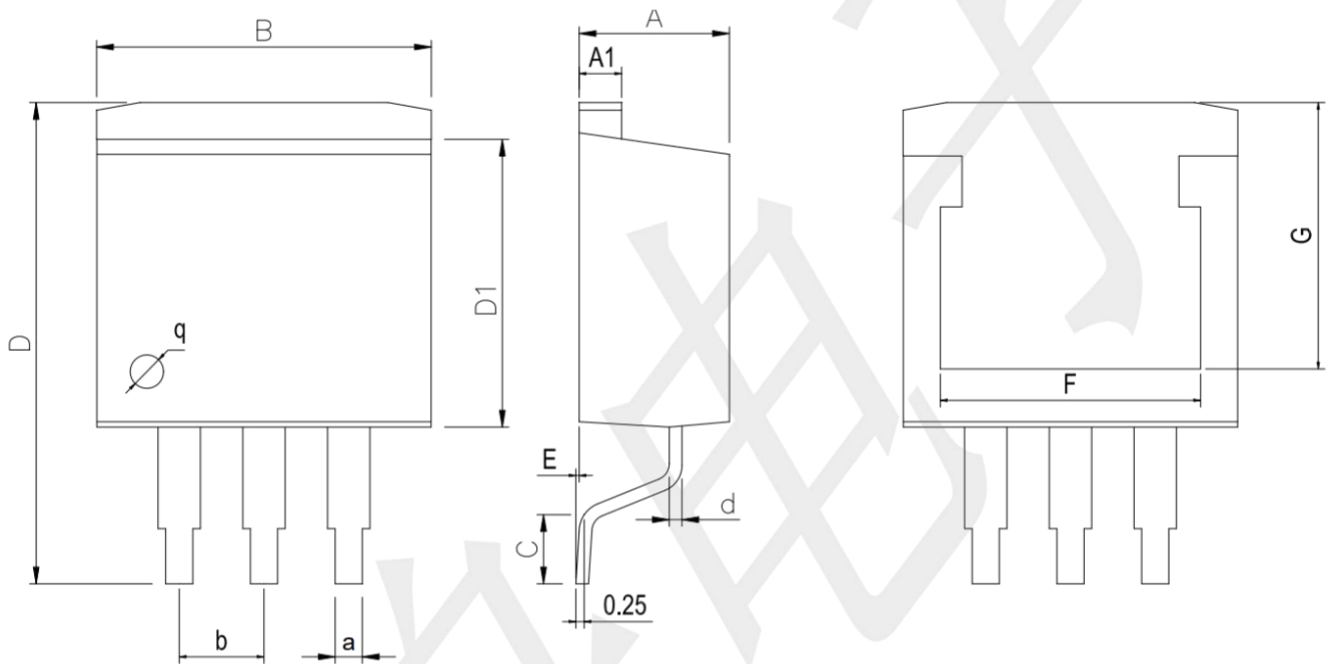


Mounting Pad Layout (unit: mm)



Package Outline Dimensions (unit: mm)

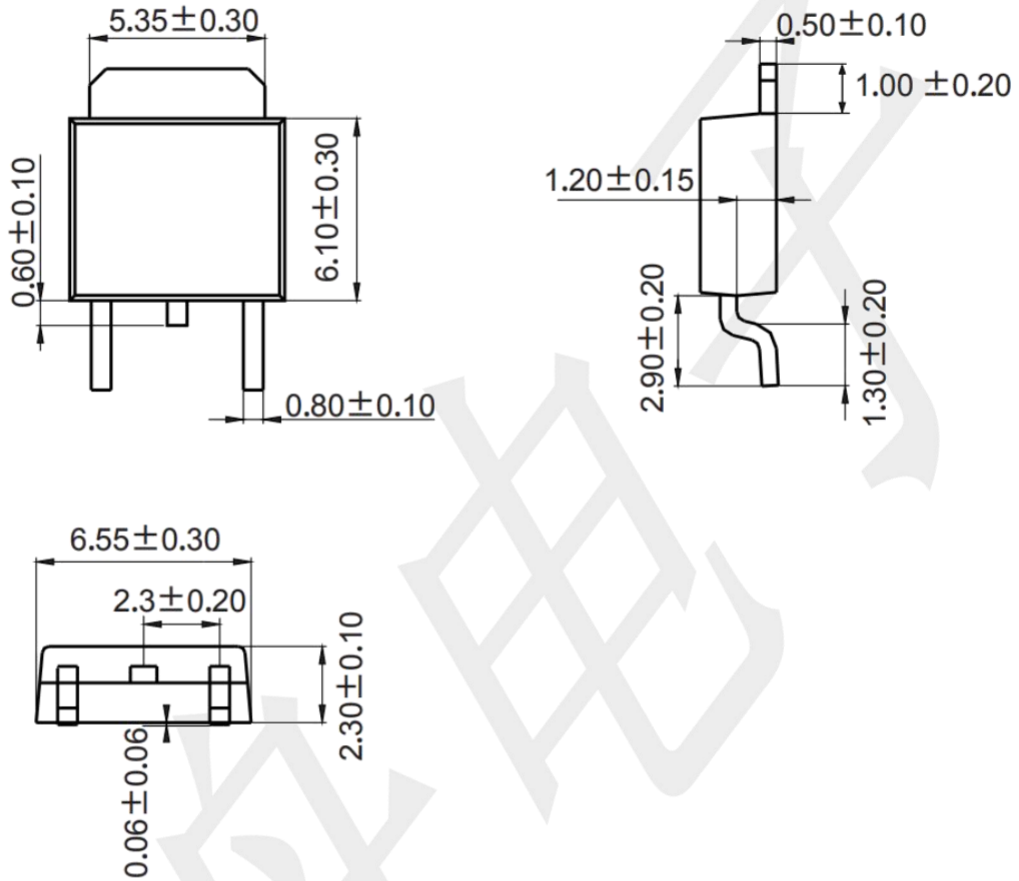
T0-263-3



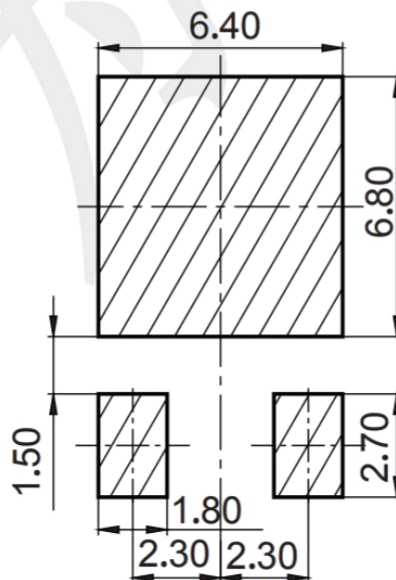
Dimensions In Millimeters(TO-263-3)											
Symbol:	A	A1	B	C	D	D1	E	F	G	a	b
Min:	4.45	1.22	10	1.89	13.7	8.38	0	8.332	7.70	0.71	2.54BSC
Max:	4.62	1.32	10.4	2.19	14.6	8.89	0.305	8.552	8.10	0.97	

Package Outline Dimensions (unit: mm)

T0-252-3

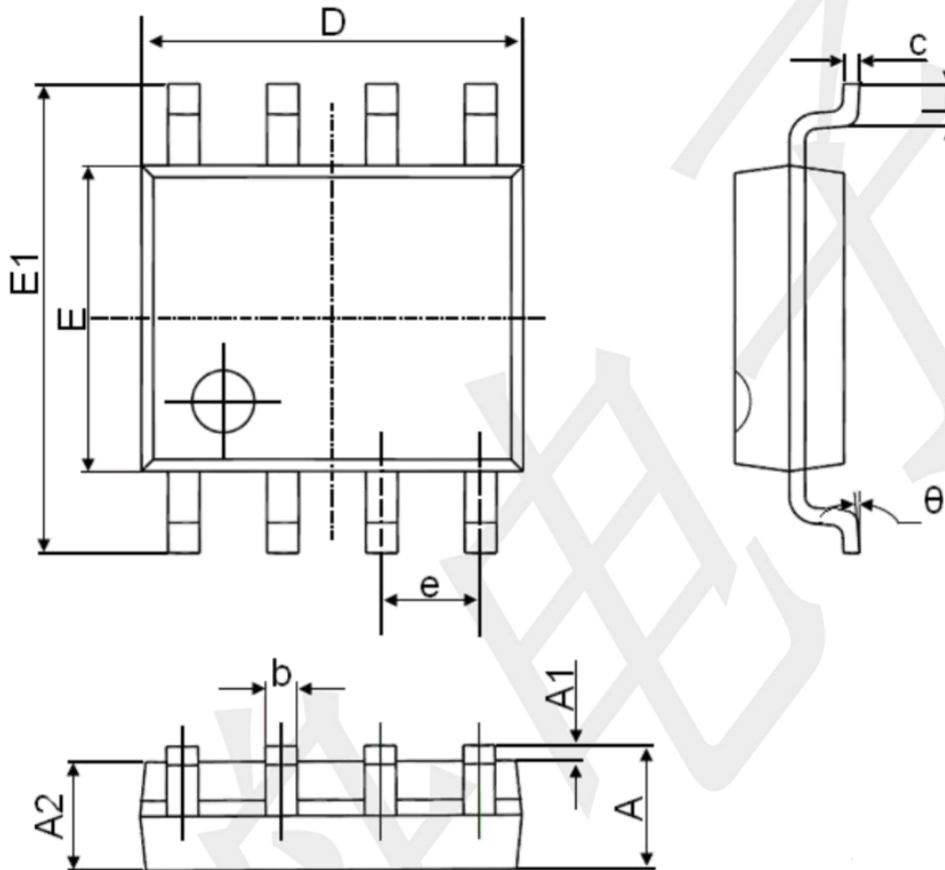


Mounting Pad Layout (unit: mm)



Package Outline Dimensions (unit: mm)

SOP8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°