

Product Specification

XBLW TLC555

General Purpose CMOS Timer

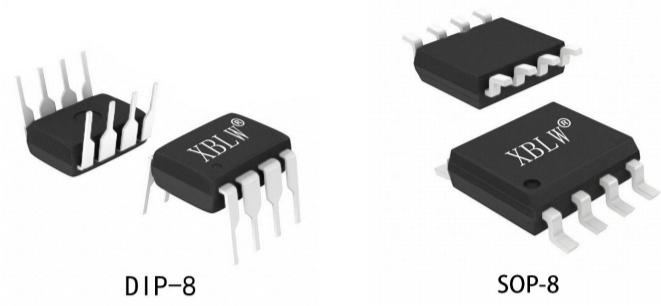
WEB | www.xinboleic.com



Descriptions

TLC555 is a general-purpose timer in the CMOS version. TLC555 can provide precise time delay and frequency generation, with very low power loss and power supply current spikes. When the chip is used as a trigger delay, the time delay is precisely controlled by a single external resistor and capacitor. In stable mode, the oscillation frequency and duty cycle are accurately set by two external resistors and one capacitor.

It adopts DIP-8 and SOP-8 packaging.



Feature

- Low supply current: 80uA (typical)
- 500KHz Stable frequency
- Lowest Operating Voltage 4.5V
- Output fully compatible with CMOS, TTL, and MOS under 5V
- Low supply current spike during output conversion
- Very low trigger, threshold and reset currents: 20pA (Typical)
- Operate in non-stable and mono-stable modes with adjustable duty cycle

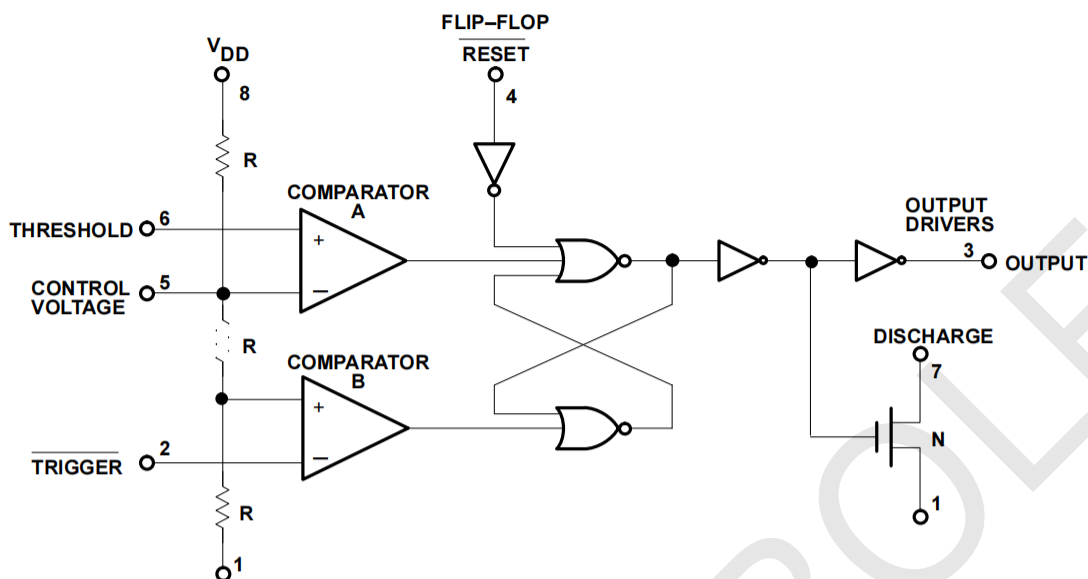
Applications

- Active Filter
- Pulse generation
- Sequential timing
- Time delay generation
- Pulse width modulation

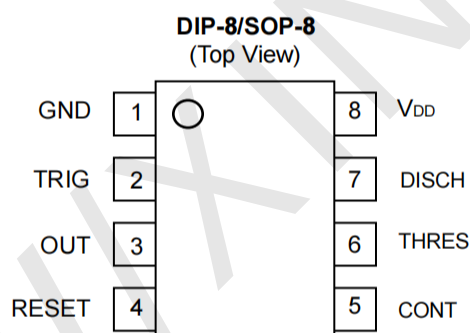
Ordering Information

Product Model	Package Type	Marking	Packing	Packing Qty
XBLW TLC555DTR	SOP-8	TLC555	Tape	2500Pcs/Reel
XBLW TLC555N	DIP-8	TLC555N	Tube	2000Pcs/Box

Block Diagram



Pins Configurations



Pin Functions

Pin		Type	Description
NO.	Name.		
5	CONT	Input	Controls comparator thresholds. Outputs $2/3 V_{DD}$ and allows bypass capacitor connection.
7	DISCH	Output	Open collector output to discharge timing capacitor.
1	GND	—	Ground.
3	OUT	Output	High current timer output signal.
4	RESET	Input	Active low reset input forces output and discharge low.
6	THRES	Input	End of timing input. $THRES > CONT$ sets output low and discharge low.
2	TRIG	Input	Start of timing input. $TRIG < 1/2 CONT$ sets output high and discharge open.
8	V_{DD}	—	Power-supply voltage.

Truth Table

RESET	Vtrigger	Vthreshold	OUTPUT	DISCHARGE SWITCH
LOW	--	--	LOW	ON
HIGH	$<1/3V_{DD}$	--	HIGH	OFF
HIGH	$>1/3V_{DD}$	$>2/3V_{DD}$	LOW	ON
HIGH	$>1/3V_{DD}$	$<2/3V_{DD}$	Sustain	

Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
V_{DD}	Supply Voltage	18	V
V_{TRIG}	Trigger Input Voltage	$-0.3 \sim (V_{DD}+0.3)$	V
V_{CV}	Control Voltage	$-0.3 \sim (V_{DD}+0.3)$	V
V_{TH}	Threshold Input Voltage	$-0.3 \sim (V_{DD}+0.3)$	V
V_{RST}	Reset Input Voltage	$-0.3 \sim (V_{DD}+0.3)$	V
I_{OUT}	Output Current	100	mA
T_W	Welding temperature (10s)	260	°C
T_j	Junction Temperature	150	°C
T_{stg}	Storage Temperature Range	-50~ 150	°C

Recommended Operating Conditions($T_a=25^{\circ}\text{C}$)

Symbol	Parameter	Value	Unit
V_{DD}	Supply Voltage	4.5 ~ 15	V
V_{th} , V_{trig} , V_{CTRL} , V_{reset}	Maximum Input Voltage	$-0.3 \sim V_{DD}+0.3$	V
T_{oper}	Operating Temperature	-20~85	°C

Electrical Characteristics (Note 1,2)

Ta=25°C, All switches are on, RESET connect to V_{DD}.

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Supply Current	I _{CC}	V _{DD} =5V TRI=RESET=THRE=0		40	60	uA
		V _{DD} = 10V TRI=RESET=THRE=0		60	100	
		V _{DD} = 15V TRI=RESET=THRE=0		80	150	
Control Voltage	V _{CON}	V _{DD} =5V	3.13	3.33	3.50	V
		V _{DD} = 10V	6.33	6.66	6.99	
		V _{DD} = 15V	9.5	10	10.5	
Discharge Saturation Voltage	V _{DIS}	V _{DD} =5V, I _{dis} = 10mA		100	400	mV
Output Voltage (Low)	V _{OL}	V _{DD} =5V , I _o =3.2mA		0.1	0.4	V
		V _{DD} = 15V , I _o =3.2mA				
Output Voltage (High)	V _{OH}	V _{DD} =5V , I _o =-2mA	4.0	4.5		V
		V _{DD} = 15V , I _o =-2mA	14.5	14.75		
Trigger Voltage	V _{TRIG}	V _{DD} =5V	1.55	1.66	1.75	V
		V _{DD} = 10V	3.15	3.33	3.50	V
		V _{DD} = 15V	4.75	5.00	5.25	V
Trigger Current	I _{TRIG}	V _{DD} =5V			50	nA
Reset Voltage	V _{RST}	V _{DD} =5V	0.4	0.7	1.2	V
Reset Current	I _{RST}	V _{DD} =5V			50	nA
Threshold Current	I _{THRESH}	V _{DD} =5V			50	nA
Discharge Current	I _{DIS}	V _{DD} = 12V			0.1	uA
Rise Time	t _R	V _{DD} = 5V , R _L = 10MΩ ,C _L = 10pF	35	40	75	ns
Fall Time	t _F	V _{DD} = 5V , R _L = 10MΩ ,C _L = 10pF	35	40	75	ns
Maximum Frequency	F _{MAX}			500		Khz

Note 1: All voltages are measured relative to the ground pin unless otherwise specified.

Note 2: The absolute maximum rating refers to the possibility of chip damage beyond the working limit. The operating rating indicates that the equipment is operable but does not guarantee special performance limits. Test conditions for electrical characteristics This ensures specific performance indicators under the DC and AC gas specifications. This assumes that the chip is within the operating rating range. Specifications do not guarantee unconstrained parameters, however typical values are a good indication of chip performance.

Application Information

In this mode of operation, the timer is used as a trigger (Figure 1). The external capacitor is initially discharged through the internal circuit.

When a negative trigger pulse of less than $1/3V_S$ is added to the trigger terminal, the trigger sets the capacitor to release the short-circuit current and drives the output as High level.

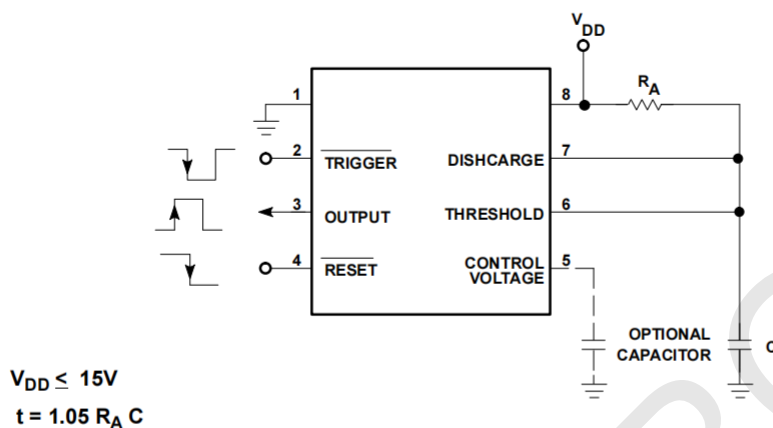


Figure 1: Monostable

Stable Operation

The circuit is connected in Figure 2 (the triggered and the threshold terminals are connected together), which will trigger itself and release the operation as a multi-vibrator. The external capacitor is charged by $R_A + R_B$ and discharged by R_B . Thus the duty cycle can be set precisely by the ratio of these two resistors.

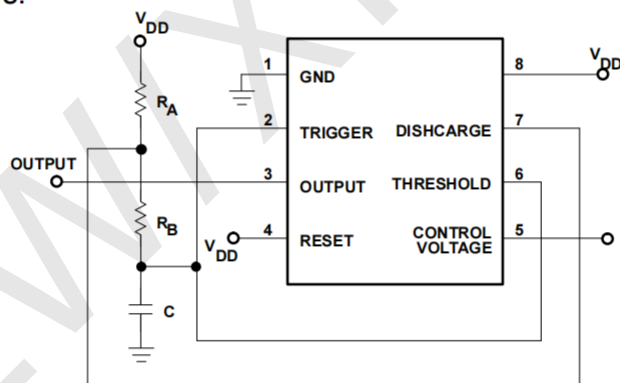
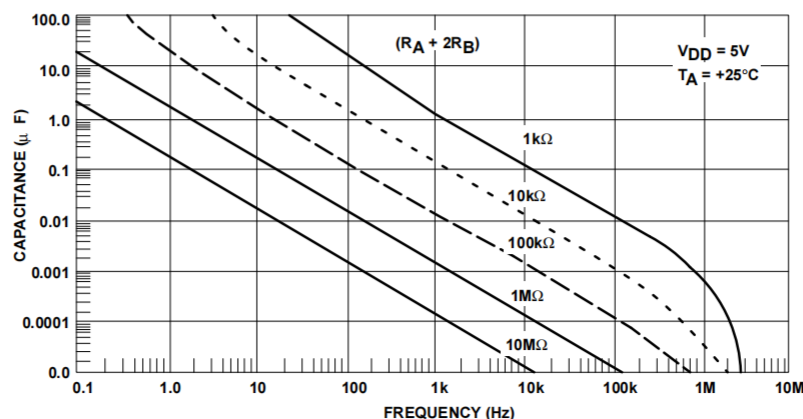


Figure 2: Stable (Variable Duty Cycle Oscillator)

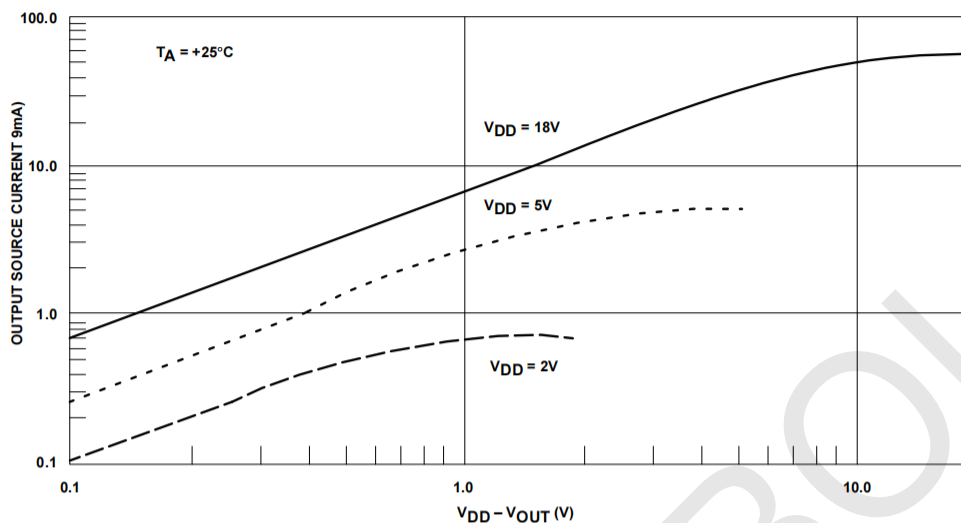
Typical Performance

1、Ra、Rb、C and Frequency

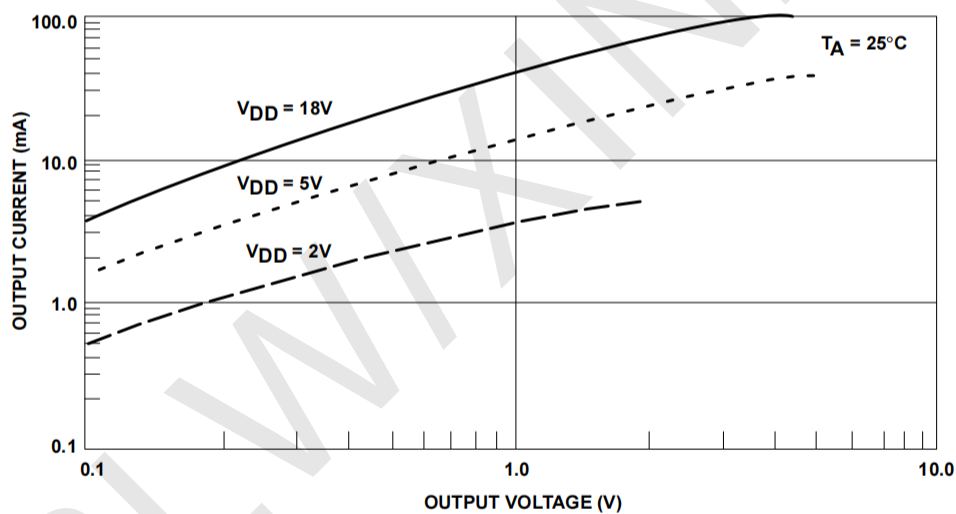


Typical Performance

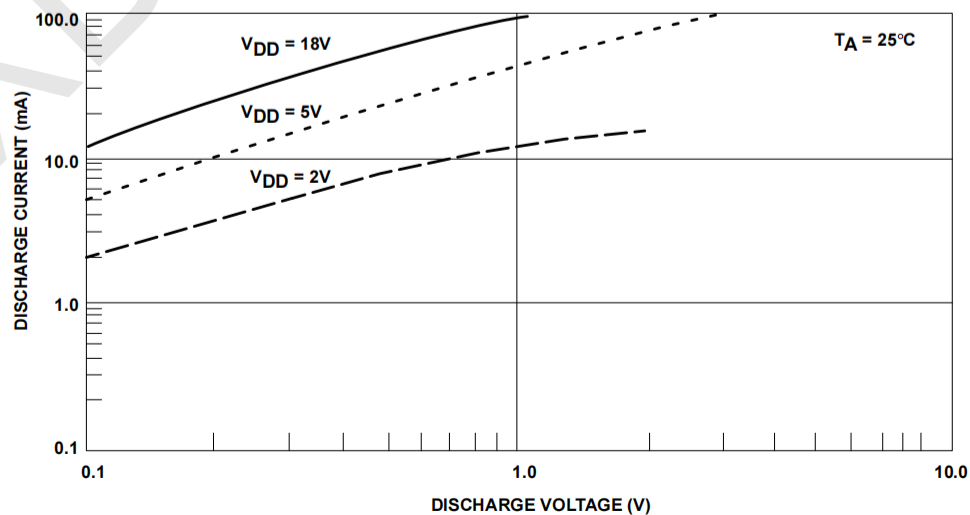
2、High Output Voltage Drop And Output Source Current



3、Low Output Voltage And Output Absorption Current



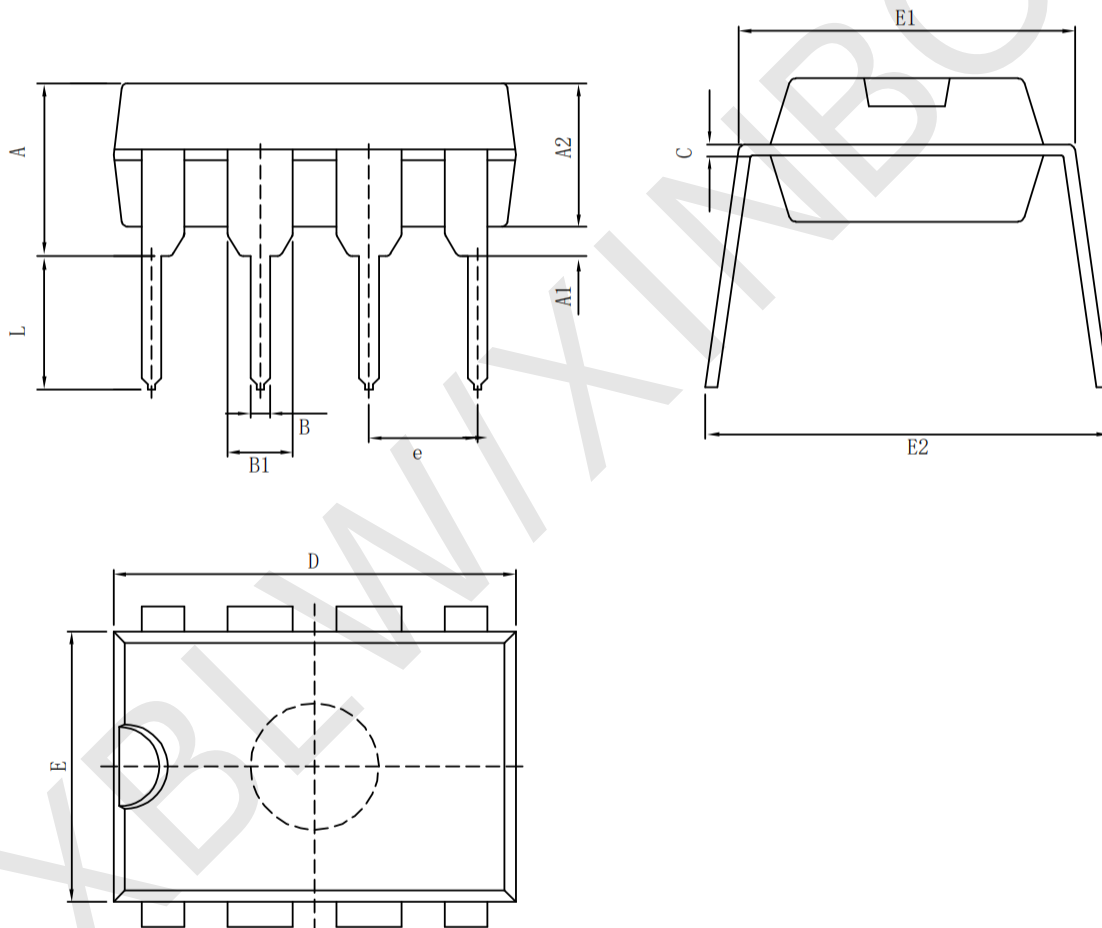
4、Discharge Low Output Voltage And Discharge Absorption Current



Package Information

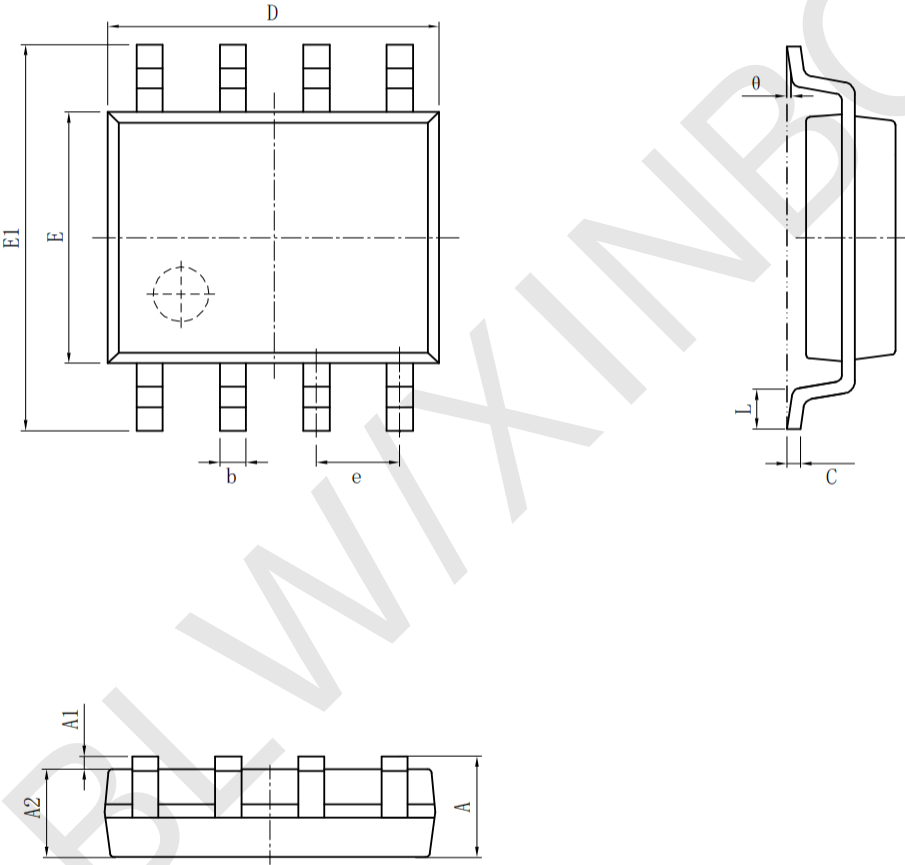
• DIP-8

Symbol	Size	Dimensions In Millimeters		Symbol	Size	Dimensions In Inches	
		Min (mm)	Max (mm)			Min (in)	Max (in)
A		3.710	4.310	A		0.146	0.170
A1		0.510		A1		0.020	
A2		3.200	3.600	A2		0.126	0.142
B		0.380	0.570	B		0.015	0.022
B1		1.524 (BSC)		B1		0.060 (BSC)	
C		0.204	0.360	C		0.008	0.014
D		9.000	9.400	D		0.354	0.370
E		6.200	6.600	E		0.244	0.260
E1		7.320	7.920	E1		0.288	0.312
e		2.540 (BSC)		e		0.100 (BSC)	
L		3.000	3.600	L		0.118	0.142
E2		8.400	9.000	E2		0.331	0.354



• SOP-8

Size Symbol	Dimensions In Millimeters		Size Symbol	Dimensions In Inches	
	Min (mm)	Max (mm)		Min (in)	Max (in)
A	1.350	1.750	A	0.053	0.069
A1	0.100	0.250	A1	0.004	0.010
A2	1.350	1.550	A2	0.053	0.061
b	0.330	0.510	b	0.013	0.020
c	0.170	0.250	c	0.006	0.010
D	4.700	5.100	D	0.185	0.200
E	3.800	4.000	E	0.150	0.157
E1	5.800	6.200	E1	0.228	0.224
e	1.270 (BSC)		e	0.050 (BSC)	
L	0.400	1.270	L	0.016	0.050
θ	0°	8°	θ	0°	8°



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