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5 74LS00 2

74LS20 1

74LS86 1

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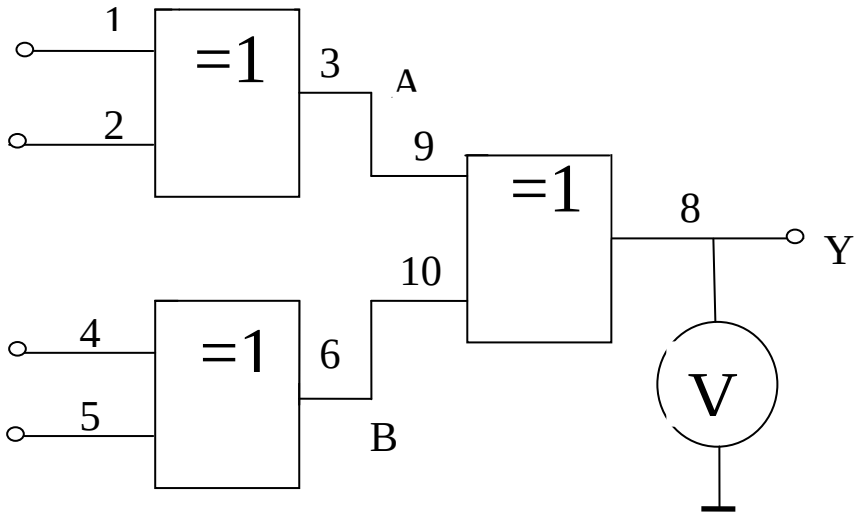
1 74LS20 3.1.1

2 3.1.1 3.1.1



3.1.2

2 3.1.2 , 3.1.2

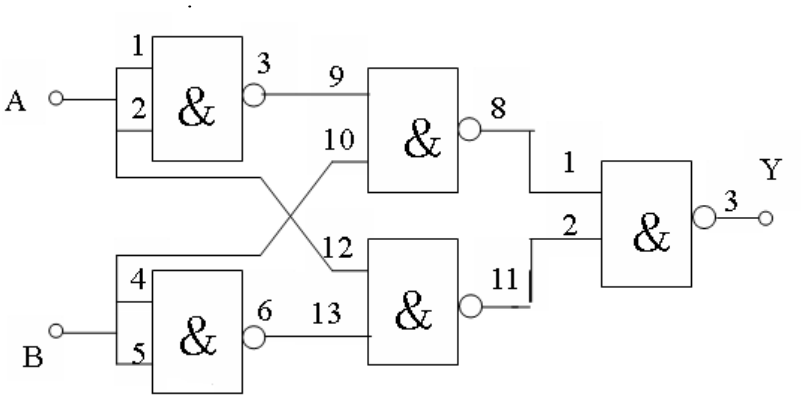
3.1.2

1	2	4	5	Y	V
H	H	H	H		
L	H	H	H		
L	L	H	H		
L	L	L	H		
L	L	L	L		

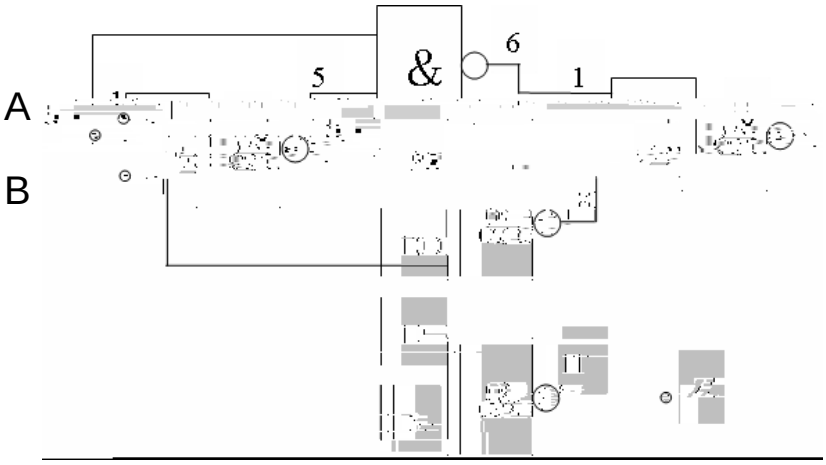
3

1 74LS00 3.1. 3 3.1. 4 3.1.3 3.1. 4

2



3.1.3



3.1. 4

3.1.3

A	B	Y
L	L	
L	H	
H	L	
H	H	

Y

3.1.4

A	B	Y	Z
L	L		
L	H		

H	L		
H	H		

4

1

74LS00 $F = \overline{\overline{A+B}} = \overline{\overline{A} \bullet \overline{B}}$ 3.1.5

3.1.5

A	B	F
L	L	
L	H	
H	L	
H	H	

2

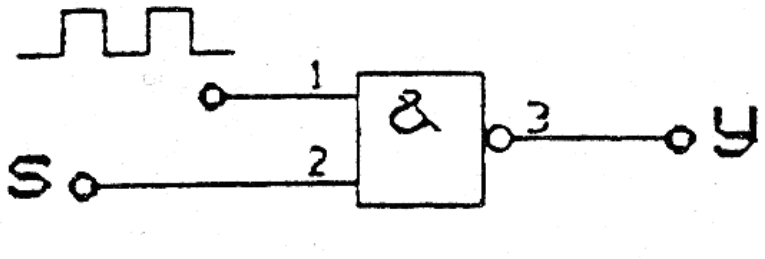
74LS00 3.1. 6

3.1. 6

A	B	F
L	L	
L	H	
H	L	
H	H	

5

74LS00 3.1.5 S S



3.1.5

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3 74LS00 3

74LS86 1

74LS54 1

3

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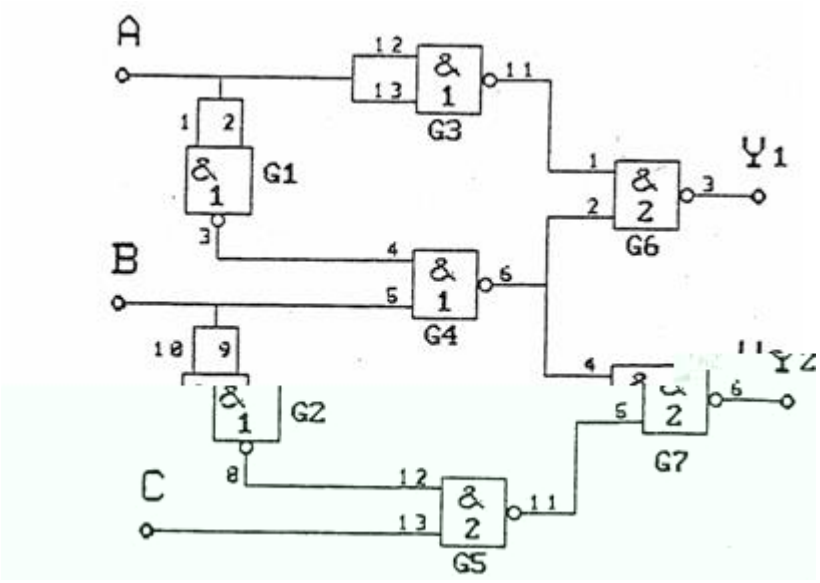


3.1.6 2 74LS00

1) 2 74LS00 3.1.6

2 *A B C* Y_1 Y_2

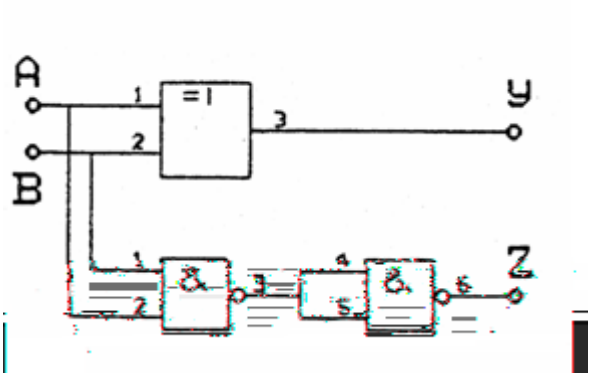
3 3.1. 7 Y_1 Y_2

4

3.1. 7

A		*C*	Y_1	Y_2
0	0	0		
0	0	1		
0	1	0		
0	1	1		
1	0	0		
1	0	1		
1	1	0		
1	1	1		

2 74LS86 74LS00



3.1.7

3.1.7

1 *A* *B* *Y* *Z*

2 3.1.8

3.1.8

A	*Y*

1 0 1	
1 1 0	
1 1 1	

5

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1 74LSl39

2 74LSl53

2

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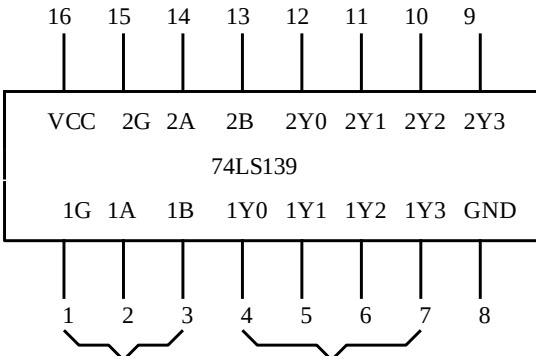


3.1.8 74LSl39

3.1.10

G	B	A	Y_0	Y_1	Y_2	Y_3
H	X	X				
L	L	L				
L	L	H				
L	H	L				
L	H	H				

2

2 4 3 8

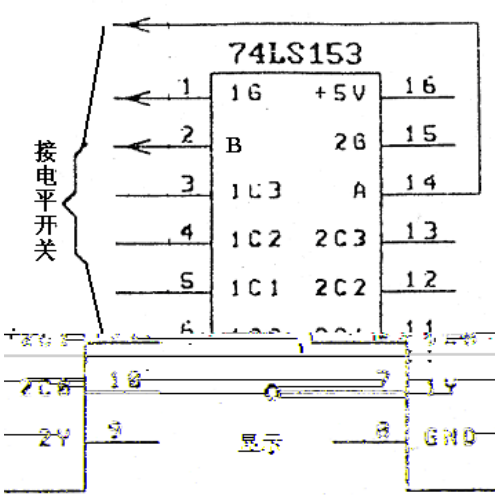
1)

2)

3) 3 8

3

1 4 1 74LSl53 3.1.9 3.1.11



3.1.9 4 1 74LSl53

3.1.11

B	A	C_0	C_1	C_2	C_3	G	Y
X	X	X	X	X	X	H	
L	L	L	X	X	X	L	
L	L	H	X	X	X	L	
L	H	X	L	X	X	L	
L	H	X	H	X	X	L	
H	L	X	X	L	X	L	
H	L	X	X	H	X	L	
H	H	X	X	X	L	L	
H	H	X	X	X	H	L	

2) 4 1 74LSl53 Y=AB+AC

Y=AB+AC 3.1.12

3.1.12

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1 2 3

2

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1 JK

Ä

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4

1 RS

RS 3.1.10

3.1.10 RS

1 3.1. 13 $\overline{S_d}$ $\overline{R_d}$ Q $\overline{Q}$

3.1.13

3.1.13

$\overline{S_d}$	$\overline{R_d}$	Q	$\overline{Q}$	
L	L			
L	H			
H	L			
H	H			

2 $\overline{S_d}$ $\overline{R_d}$

3 $\overline{S_d}$ $\overline{R_d}$

4 $\overline{R_d}$ $\overline{S_d}$

2 3 4 Q $\overline{Q}$ RS Q

$\overline{Q}$ $\overline{S_d}$ $\overline{R_d}$

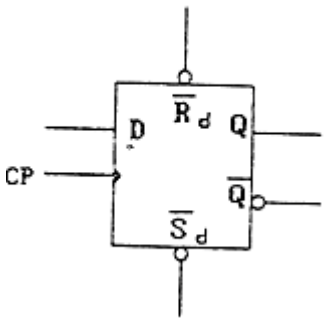
5 $\overline{S_d}$ $\overline{R_d}$ Q $\overline{Q}$ $\overline{S_d}$ $\overline{R_d}$

Q $\overline{Q}$ 3-5 Q $\overline{Q}$

2 **D**

D 74LS74 3.1.11 $\overline{S_d}$ 1 $\overline{R_d}$

0 *CP*



3.1.11 74LS74

1 $\overline{S_d}$ $\overline{R_d}$ Q $\overline{Q}$

2 $\overline{S_d}$ =$\overline{R_d}$ =1 *D* *CP* *CP* 0 1

Q

3 $\overline{S_d}$ =$\overline{R_d}$ =1 *CP*≥0 *CP*≥1 *D* *Q*

3.1.1 4

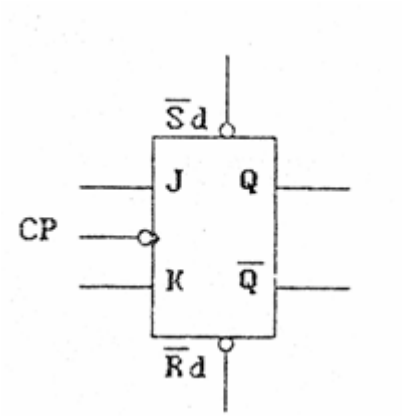
3.1.1 4

$\overline{S_d}$ $\overline{R_d}$	*CP*	*D*	Q^n	Q^{n+1}
0 1			0	

4) $\overline{S_d}=\overline{R_d}=1$ *D* $\overline{Q}$ *CP* *Q* *CP*

3 **JK**

JK 74LS112 3.1.12 $\overline{S_d}$ 1 $\overline{R_d}$ 0 *CP*



3.1.12 74LS112

1 3.1. 15

3.1.15

$\overline{S_d}$ $\overline{R_d}$	*CP J K* Q^n	Q^{n+1}
0 1		
1 0		
1 1	0 0	
1 1	1 0	
1 1	0 1	
1 1	1 1	

2 $\overline{S_d}=\overline{R_d}=1$ *J=K*=1 *CP* *Q* *CP*

D *D* $\overline{Q}$ *CP* *Q*

4

1 D JK T ,

2 *CP* *CP* *Q*

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4 74LS00 1

74LS10 1

74LS175 D 1

74LS73 JK 2

3

1

2 D JK

3

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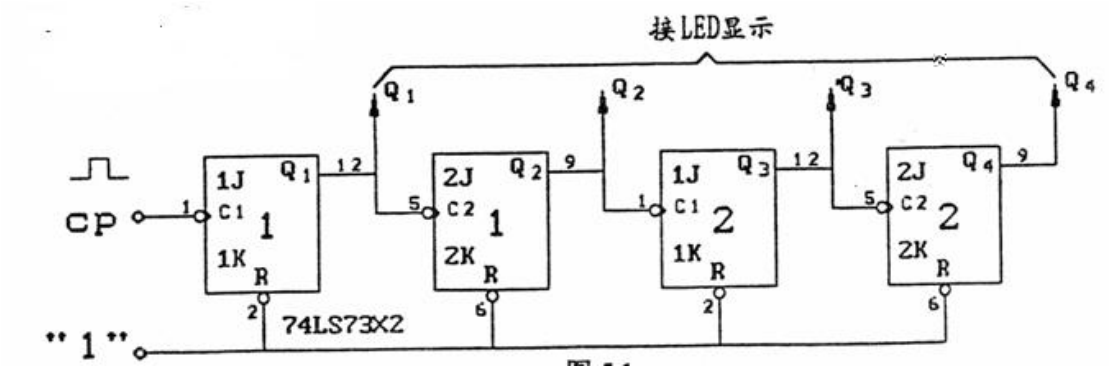
3.1.13

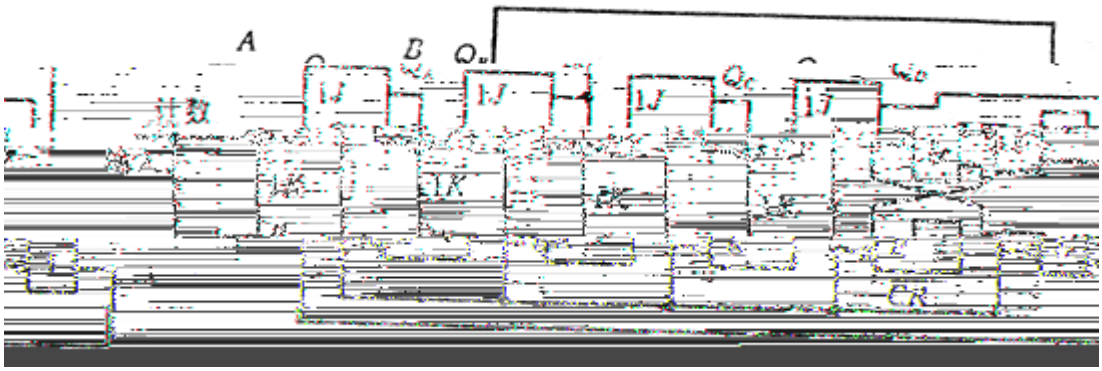
1 *CP* Q_1 *Q* 3.1.16



3.1.13

3.1.16

CP	Q_1	Q_2	Q_3	Q_4	CP	Q_1	Q_2	Q_3	Q_4
0					9				
1					10				
2					11				
3					12				
4					13				
5					14				
6					15				
7					16				

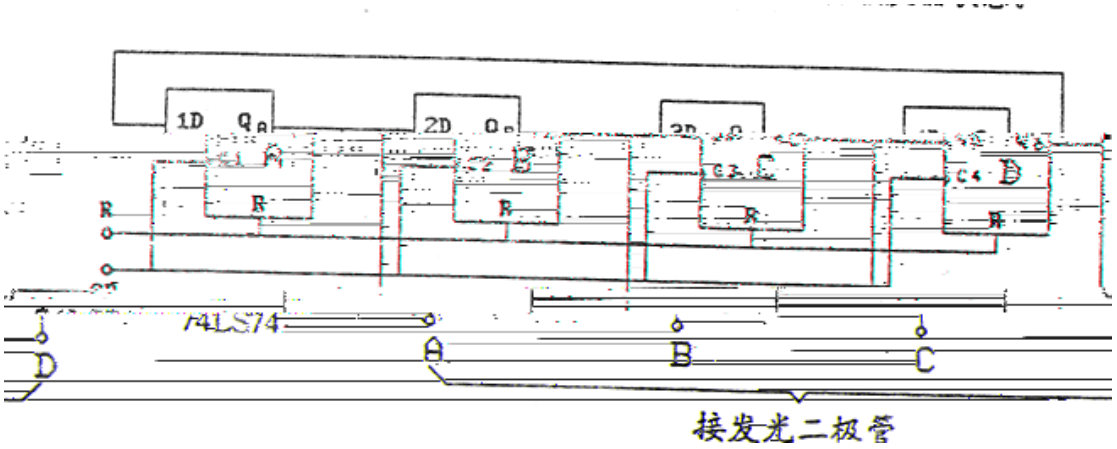


3.1.14

2

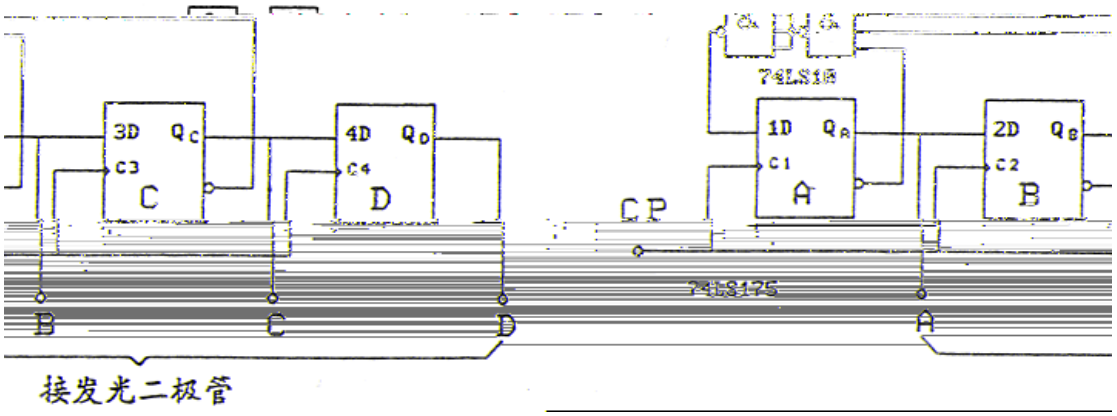
1 3.1.15 *ABCD* 1000,

0 1 *CP*



3.1.15 1

2 3.1.16



3.1.16 2

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2

3

2

1 74LS160 12

1

2

2 74LS161 12

3 74LS160 M 1 M 0

3

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1

2 74LS161 74LS160 CP 1Hz

Q_0Q_1 Q_2Q_3

3 Multisim Max+plus

5

1

2 74LS161 74LS160 12

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2

3

4 Multisim Max+plus

5

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1 555

2 555

2

1

2

3

4 555

3

1 555

2

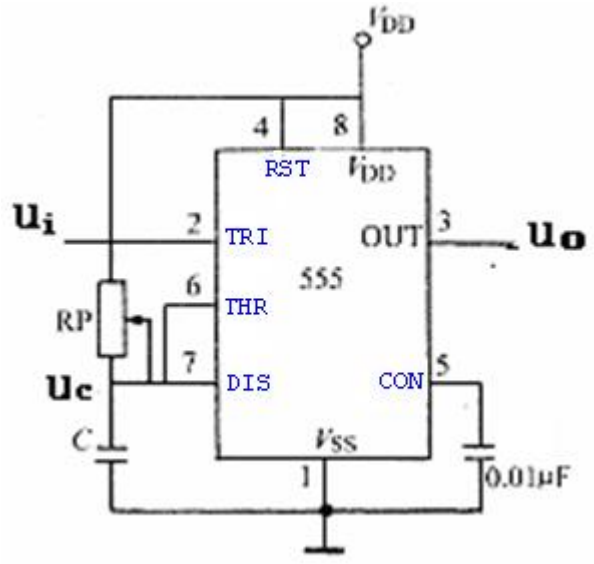
3 555

4 T_w T f_o D

4

1 555

3.1.17 R_P=10K C=0.047uF


V_{DD}
4
8
RST
V_{DD}
U_i
2
TRI
OUT
3
U_o
555
6
THR
RP
7
DIS
CON
5
U_c
C
V_{SS}
1
0.01μF

3.1.17

1

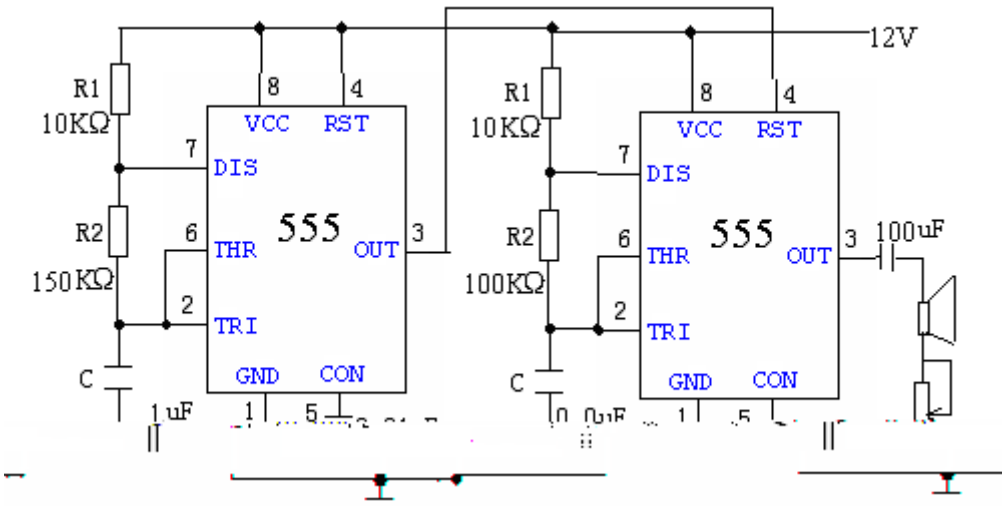
1 u_o u_c u_o u_c

2 R_1 C R_1 C T_w

T f_o D

(3)

3.1.19



3.1.19

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3 555 4 5 555

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1 555

2

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1 555

2

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1 555

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4 : 74LSl60 2

74LS247 2

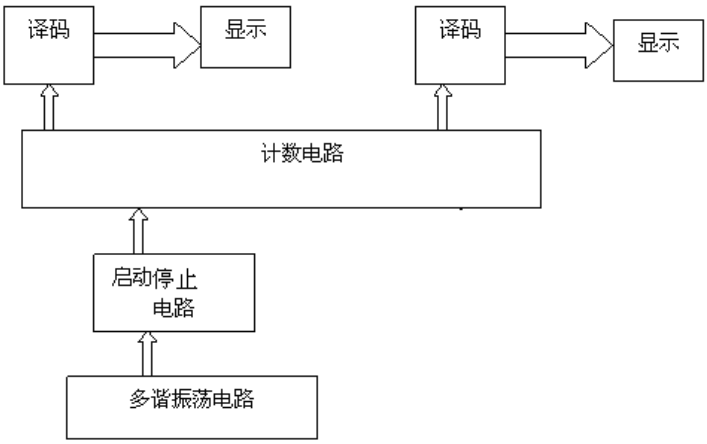
74LS00 l

74LS08 l

555 l

5.

3.1.20



3.1.20

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S +5V

S

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74LS160 74LS161 74lS290

74LS160 74LS160

74LS160 .

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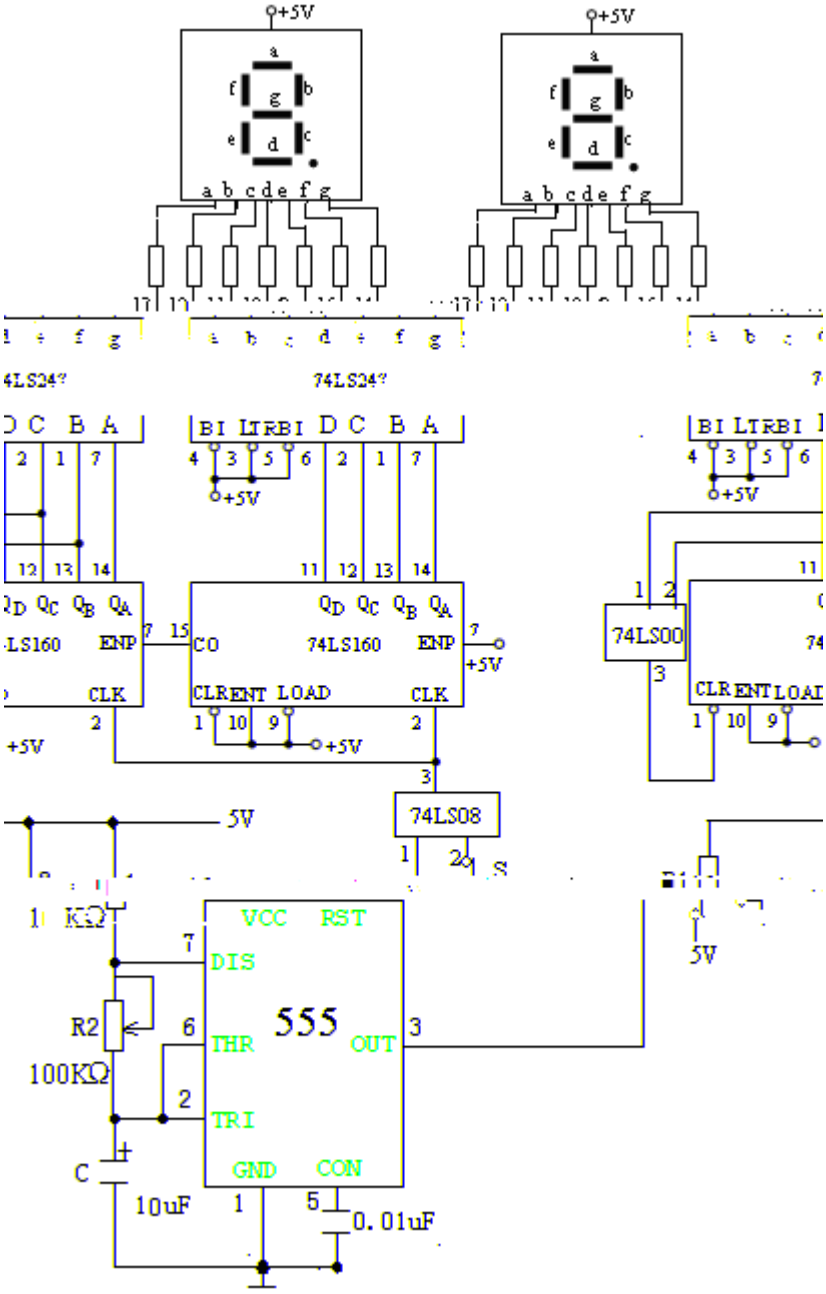
74LS248 74LS247

, 74LS247 ,74LS247

3.1.21



3.1.21

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EDA 3.1.21

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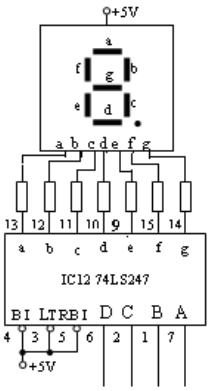
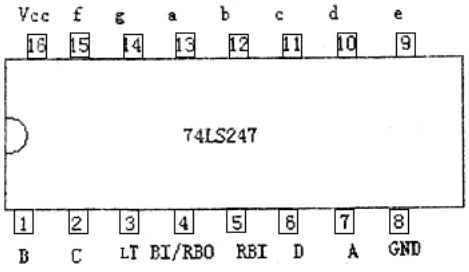
3.1.22 , 74LS247 DCBA 0101 1001 0011

3.1.17 74LS247 3.1.23 ,74LS247 3.1.18

3.1.24





3.1.22 3.1.23 74LS247 3.1.24

3.1.17

D	C	B	A	
0	0	0	0	
0	0	0	1	
0	0	1	1	
0	1	0	1	
0	1	1	1	
1	0	0	1	

3.1.18 74LS247

LT	RBI	BI/RBO	D	C	B	A	a	b	c	d	e	f	g	
0	×	1	×	×	×	×	0	0	0	0	0	0	0	8
×	×	0	×	×	×	×	1	1	1	1	1	1	1	
1	0	0	0	0	0	0	1	1	1	1	1	1	1	0
1	1	1	0	0	0	0	0	0	0	0	0	0	1	0
		.									.			.
		.									.			.
1	1	1	1	0	0	1	0	0	0	0	1	0	0	9

3

74LS160 3.1.25 2

3.1.19

CP	Q_D	Q_C	Q_B	Q_A	
	0	0	0	0	0
1					
2					
3					
4					

4 **N**

74LS160 74LS00 6 2

3.1.26

3.1.20

CP	Q_D	Q_C	Q_B	Q_A	
	0	0	0	0	0
1	0	0	0	1	1
2	0	0	1	0	2
3					
4					
5					
6					

5 555 3.1.27

1HZ R2 3

A. B C

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4 Multisim Max+plus

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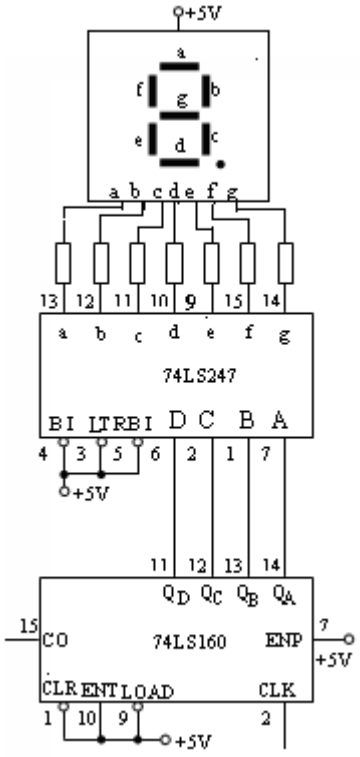
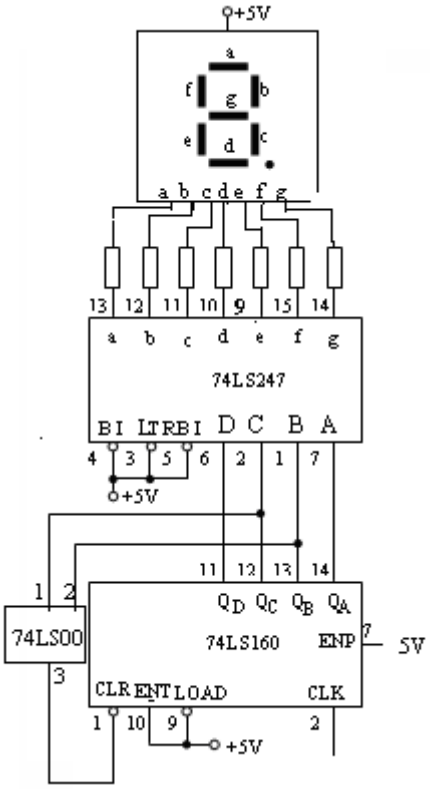


3.1.25



3.1.26

3.1.27