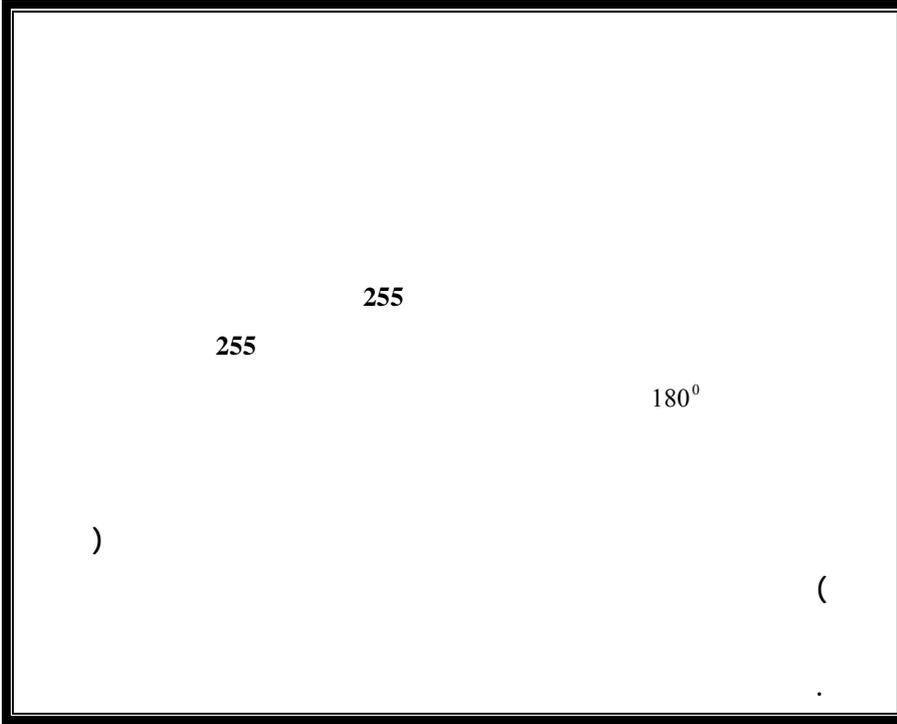


2

1

3



. - . - . 1  
. - . - . 2  
. - . - . 3

---

15

256

)

( )

(

-

-

:

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-

-

: -I

Analogue

)

(

( )

( )



: : -II  
 : - 1 -II  
 : -1  
 : -2  
 [1]  
 (... )

.[1] ( )  
 : -3

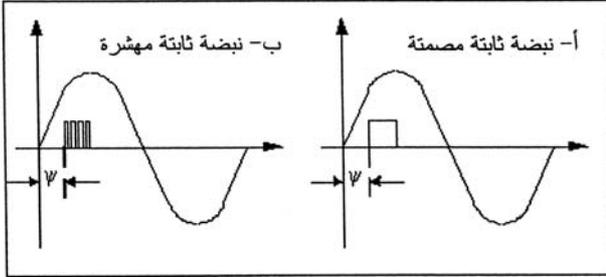
[4]

(1 ÷ 5)

- 2 - II

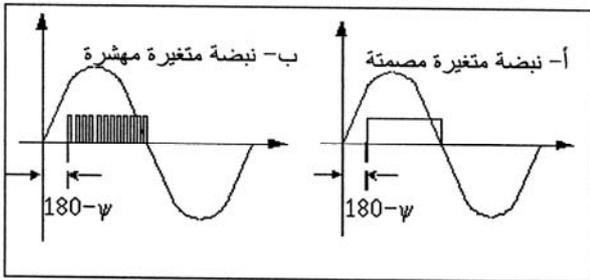
60  
( )

(1)



(1)

$\psi$   
(180- $\psi$ )  
(2) ( )



(2)

$\psi$

: : :

$$\frac{T}{q}$$

$Th_1$

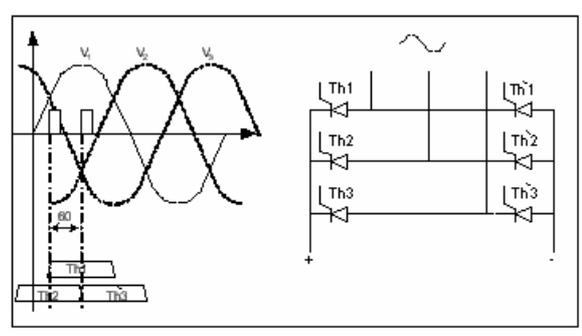
$Th'_3$

$Th'_2$

$60^\circ$

$Th'_2$

.(3)



(3)

$Th_1$

$Th_1$

$Th3'$

$60^\circ$

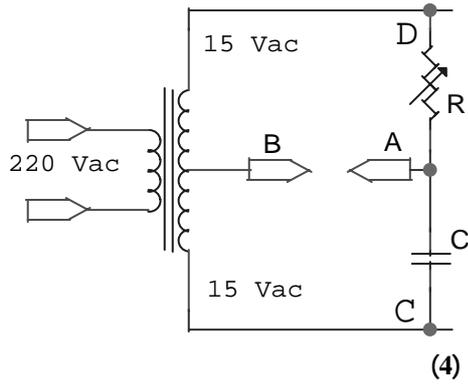
**-III**

**-1 -III**

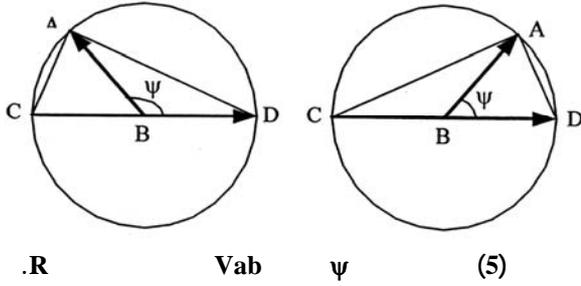
:

:

.(4)



R A  
 180 0 B A  
 $\psi$  (5)



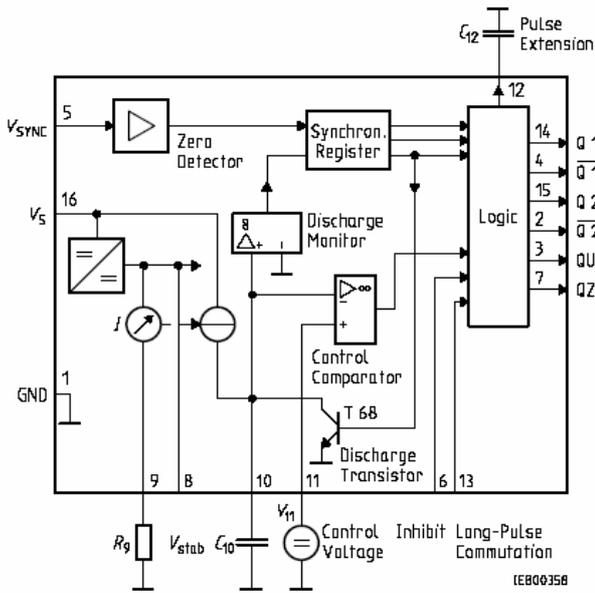
:  
 :

-2 -III

: [3] TCA785

(6)

: TCA785



**TCA-785 (6)**

V5

V10

10V

(6)

C10

R9

V11

.180°

10V

: (7)

)

:

-

(

) Q<sub>2</sub>

(

V14 ( )  $Q_1$  V15  
. (180 -  $\psi$ ) 12

)  $\bar{Q}_2$  ( ) :

13 )  $\bar{Q}_1$  V2 ( V4 (

.  $\psi$  . (180 -  $\psi$ )

:

$\psi$  QU -

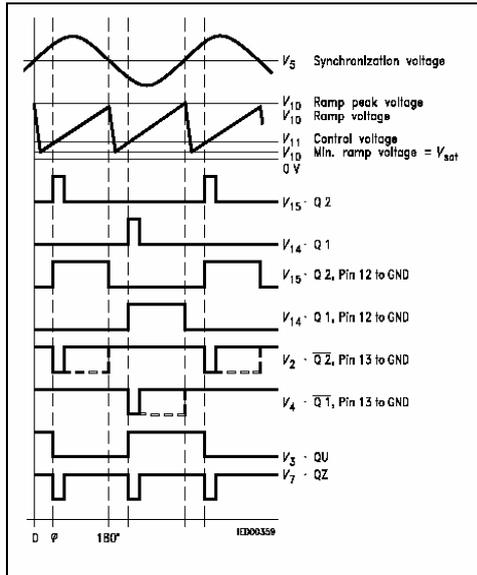
.V3

$\bar{Q}_1$   $\bar{Q}_2$  QZ -

6

.V7

.



TCA-785

(7)

: [5]

- 3 - III

: UAA145

Pin16

Pin9

(10V

) Pin7

C

R

(8)

Pin14

:

-

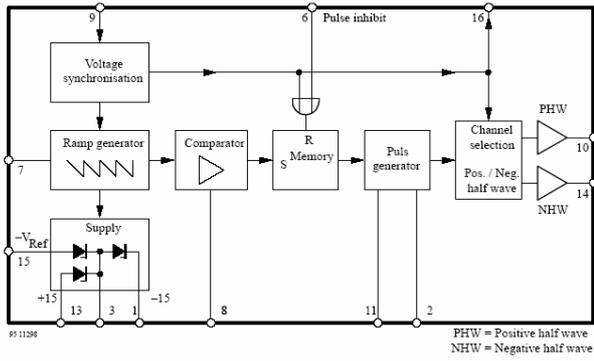
Pin10

Ct

.2,11

Rt

Pin 16 -

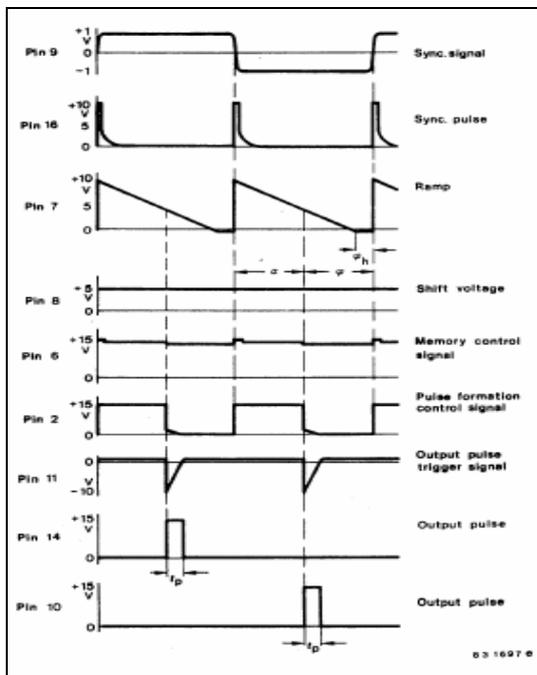


UAA- 145

(8)

Pin6

(9)



UAA- 145

(9)

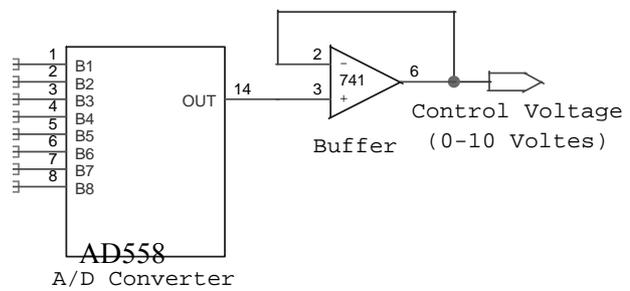
: : -IV  
 : -1-IV

(0-10)

) (Digital to Analoge Converter)  
 (

Buffer

.(10)



(10)

: -2-IV

:(11)

(50Hz)

( ) 255  
25600 10 m.s

.51.2 KHz

B

255 0

180 0

255

A

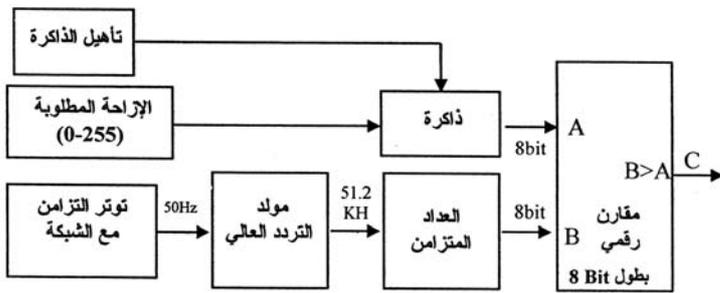
B

(11)

C

25.6KHz

NAND



(11)

High Frequency Generator : -V  
 : -1

51.2 KHz

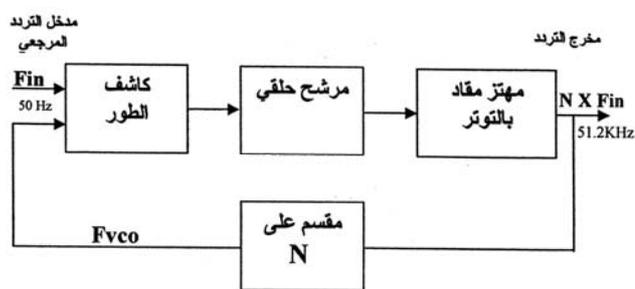
Phase Locked Loop (PLL)

.(50Hz) Fin (12)

) Fin  
 (Fin ≠ Fvco) Fvco (N

Fin

Fin



PLL - (12)

LM565

PLL

.(13)

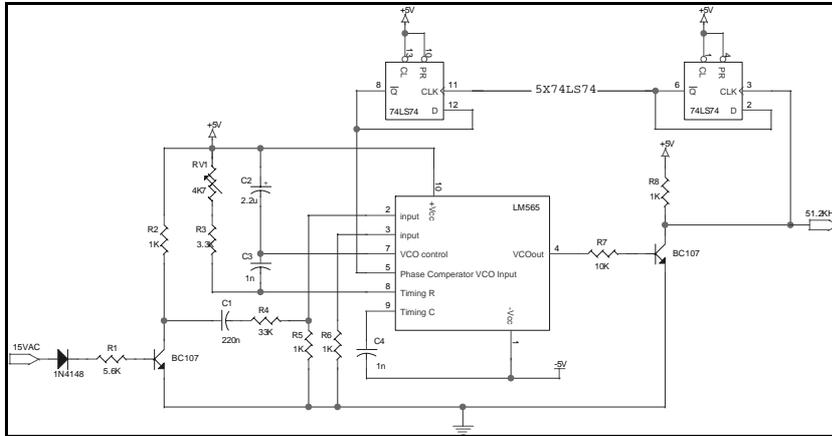
15Vac

51.2KHz

Fin

50Hz

51.2KHz



51.2 KHz

(13)

:Synchronised Counter

:

-2

74LS161

51.2KHz

(C<sub>0</sub> → C<sub>7</sub>)

255

.(14)

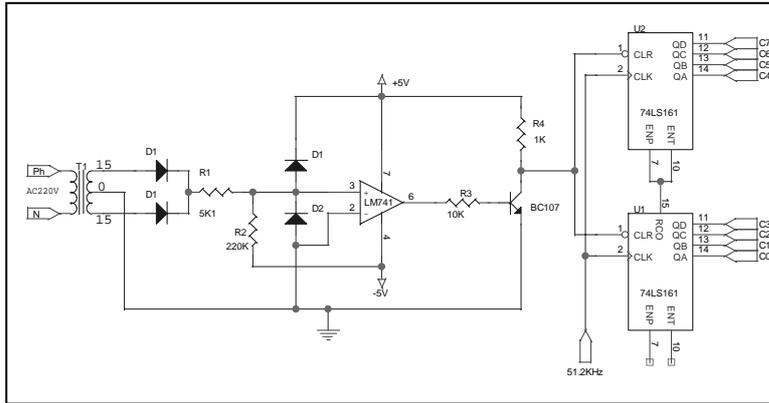
T.T.L.

LM741

(50Hz)

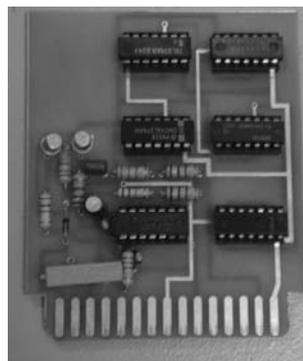
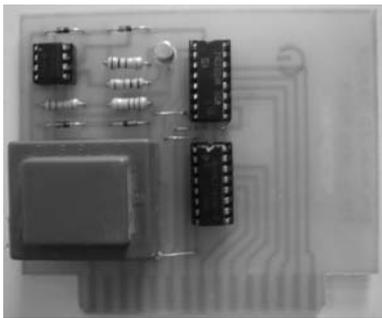
.BC107

. 220/2.x15 V



(14)

(15)



(15)

**Comparator And Output Pulses:**

: -3

( )

180° 0° 255 0

E1,E2

74LS75

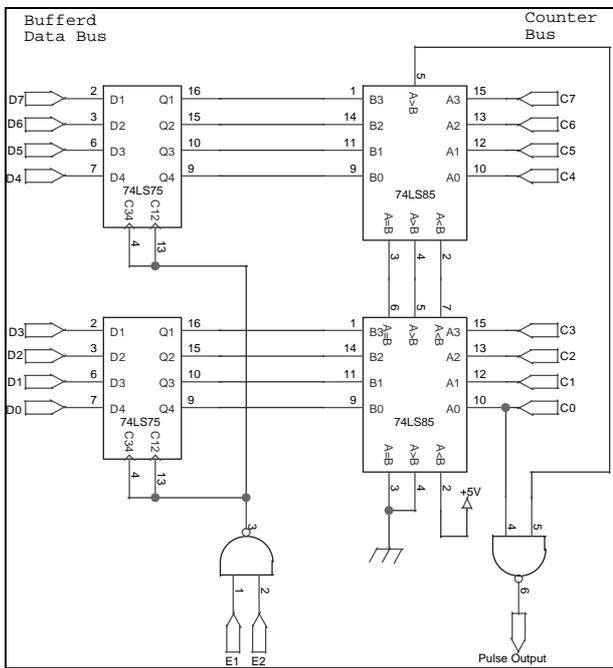
(A0-A3)

(B0- B3)

≤

C0

(NAND)



(15)

: : -4

: (15)

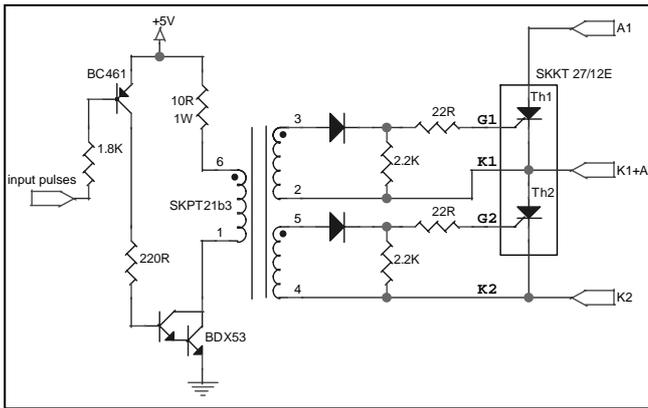
:

(17) [4] (SKKT27/12E)

(15)

(SKPT21b3)

. [4]

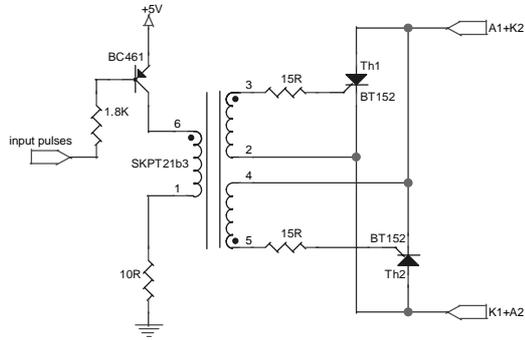


(17)

E1-E2

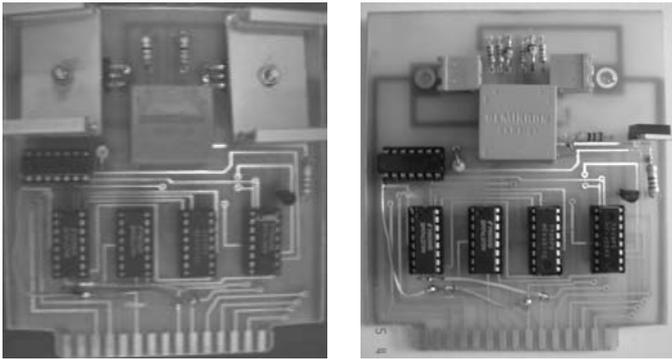
.( )

( ) (BT152) :  
(18) Phase Regulator ( )  
(SKPT21b3)



(18)

(19)



(19)

**:Addressing System**

:

**-5**

256

(20)

16

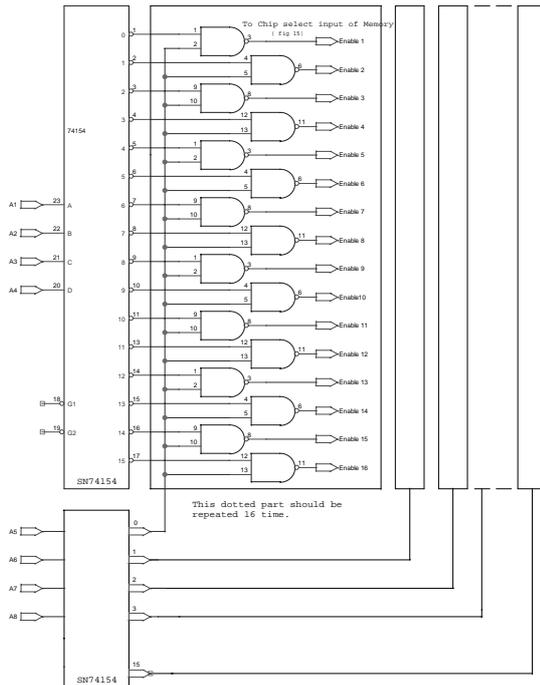
(15)

(NAND)

E1

E2

.16 x 16=256 ( )



**256**

**( (20)**

**(15)**

**NAND**

( )

(21)

DATA

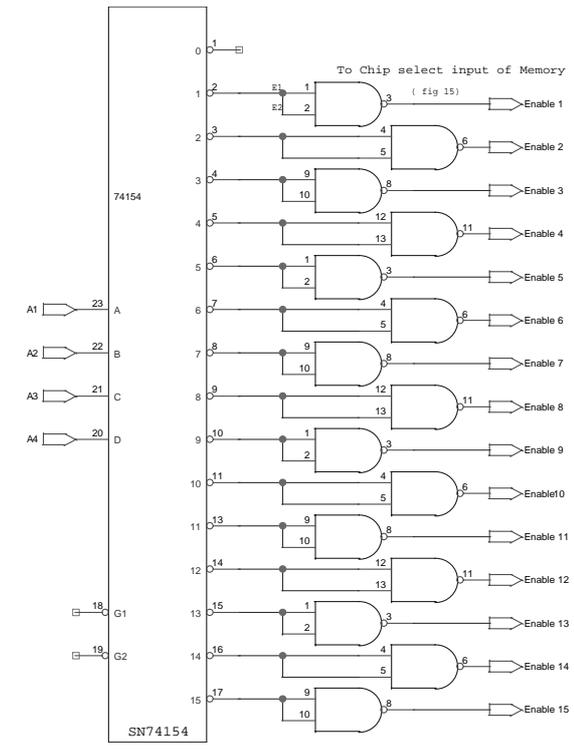
(1-15)

(0-255)

NAND E1,E2

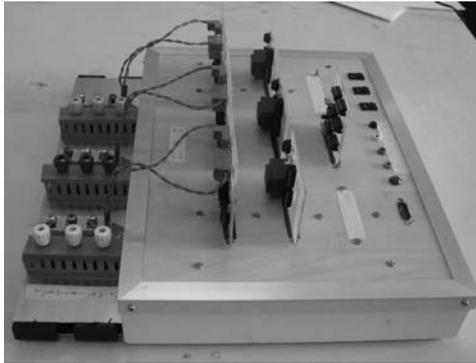
15

16

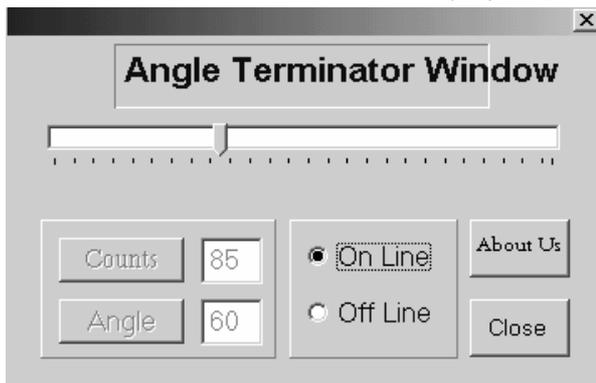


(15) **16** **(21)**  
**NAND**  
**(22)**

(23) C++Builder  
(LPT) C++  
:  
.255 -1  
. 180 -2  
.(On line) -3  
.(Off line) -4



(22)



(23)

(24)

15

( )



15

(24)

(25)

C++Builder

:

:

-1

15

( Manual- Single)

.a

(Manual-Group) .b

15

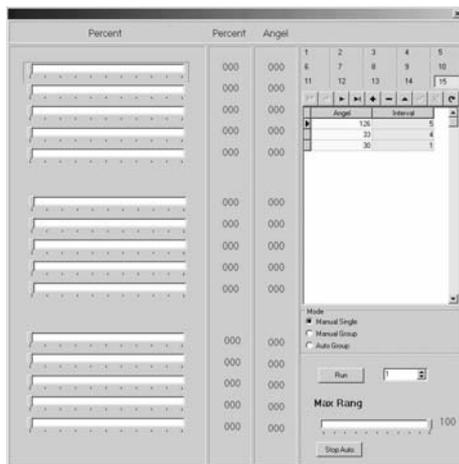
) (Auto-Group) .c

(  
-2

) -3

(15 1 ) : (In files  
(255 0 )

Out File -4



15

(25)

(26-27-28-29)

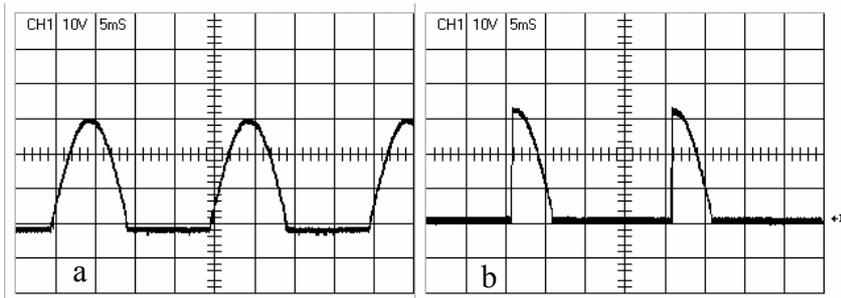
.x10

OX8040

(26-a)

(26-b)

90



(26)

90

-b

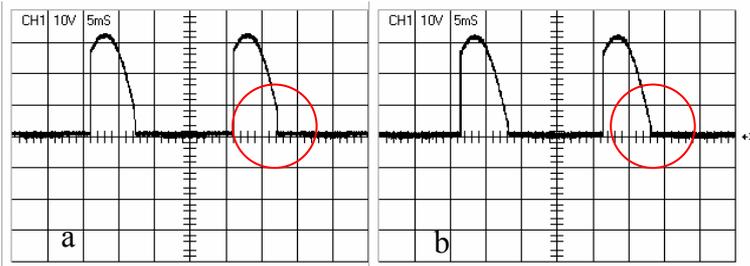
-a

(27-a)

60

(27-b)

.Holding Current



(27)

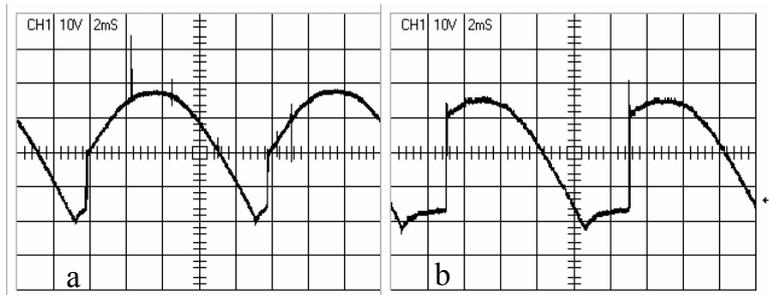
60 -b

60 -a

(28-a)

(28-b) 30

60



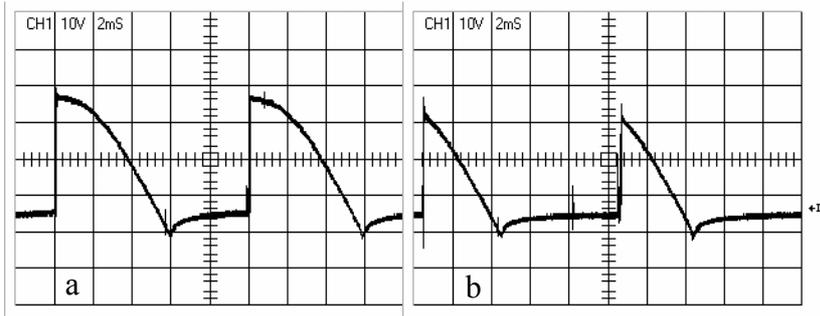
(28)

60 -b

30 -a

(29-a-b)

120 90



(29)

120      -b      90      -a

(30-a-b)

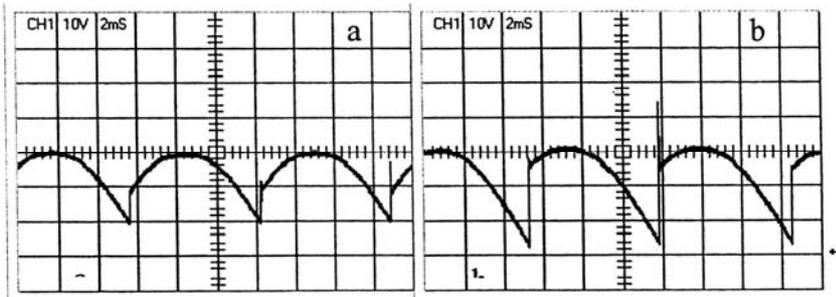
)

(

a      .Three Phase Mid Point Bridge

b      30

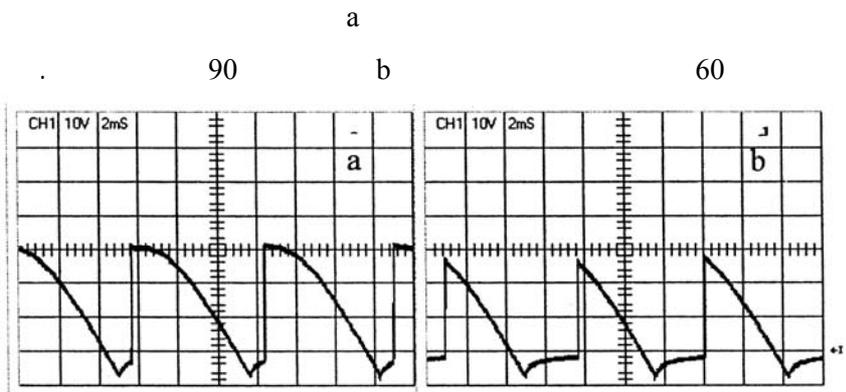
45



(30)

45      -b      30      -a

(31-a-b)



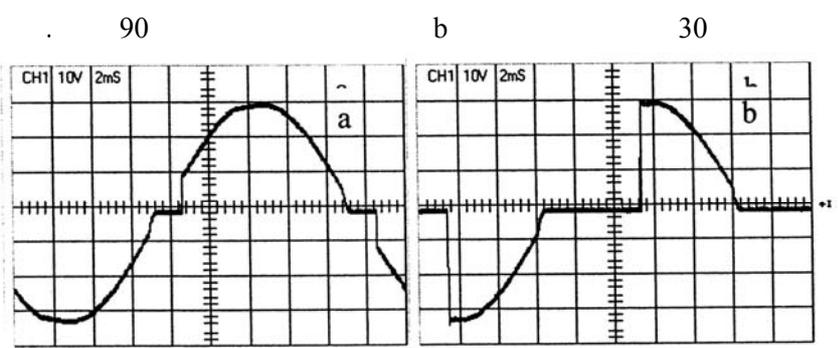
(31)

90                      -b                      60                      -a

(32,33)

a

PhaseRgulator

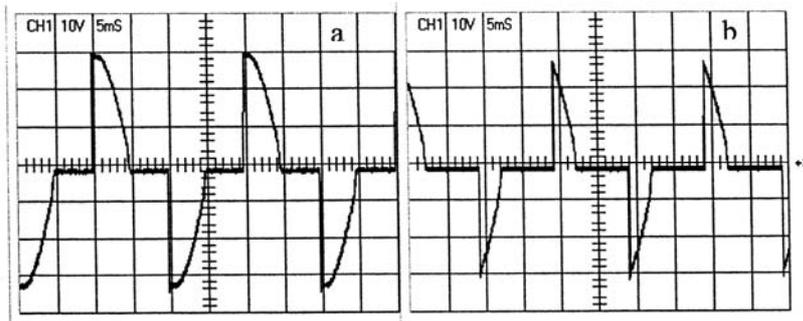


(32)

90                      -b                      30                      -a

33-b

120



(33)

120      -b      90      -a

HM507

(34,35,36)

.50Hz

15

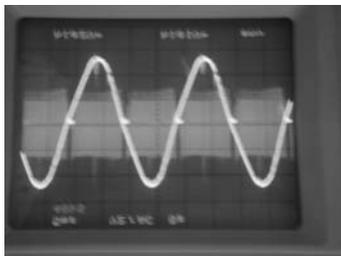
34

90

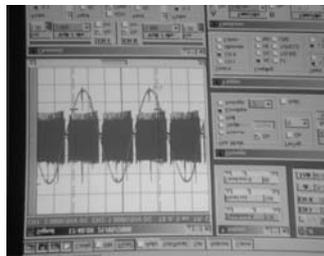
34

145

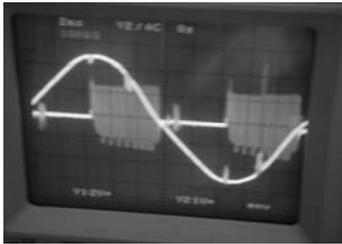
34



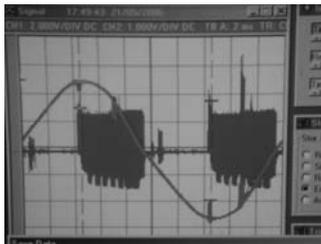
15



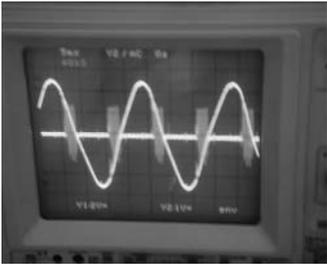
(34)



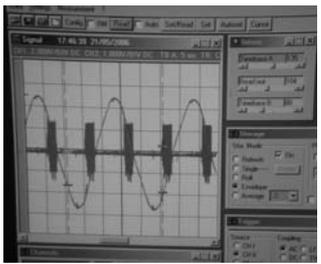
90



(35)

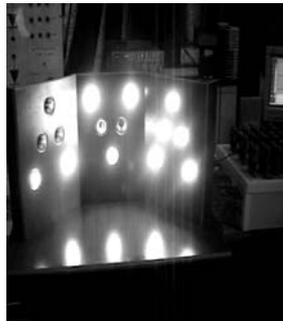


145



(36)

(37)



(37)

(38)



(38)

(39)

(13)

Frequency multiplier

.N ( R,S,T )  
255 8Bit

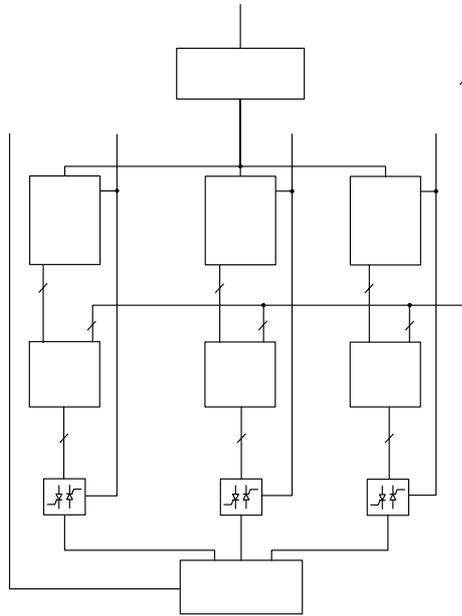
8 Bit Data Bus

Trigger

.(15,17)

). .

( 180 )  
 .( )



N (39) R S T  
 (40)

Line frequency

Frequency multiplier

Sync counter ( )

Sync counter

Sync counter

8

8

8

8

8

8

Trig

Trig

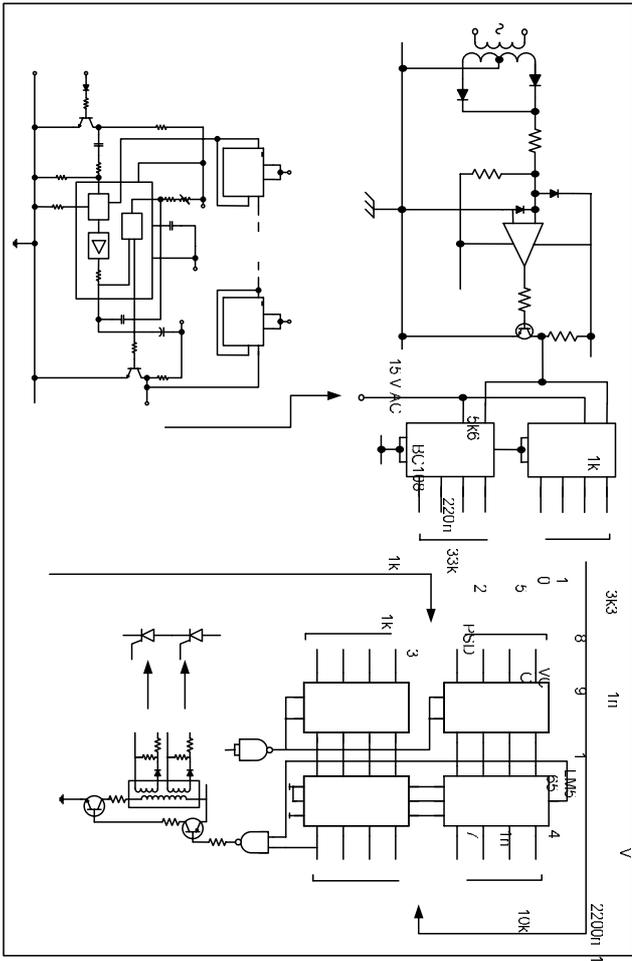
Trig

2

2

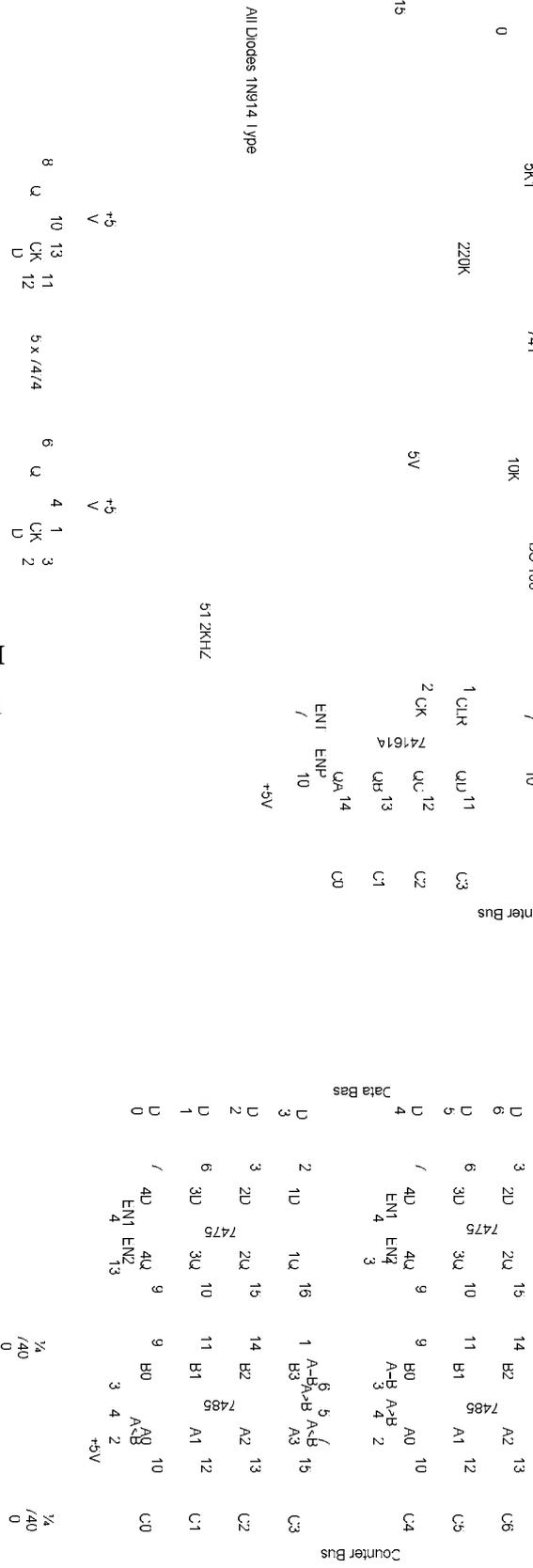
2

Load



(40)  
 BC 108  
 51.2  
 KHZ

VI - 1



---

THD

-2

-3

256

-4

Analogue

)

.(

:

- VII

-

.Microcontroller

)

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(

## References

- 1- Mohan,N. &Undeland,T., “ Power Electronics- Converters , Application,and Design - ” , John Willey&Sons INC. , New York, 2ed, edition 1995.
- 2- Norris,B.,”Electronic Power Control and digital Techniques “, Texas Ins.Ltd. , 1996.
- 3- Technical documents of “ Simens “ company .
- 4- Technical documents of “ Semikron “ company .
- 5- Technical documents of “ Temic semiconductor “ company.
- 6- Technical documents of “National semiconductor company.

.2006-6-15