

.....2

.....6

.....13

.....17

.....22

1
1) 2 6 8
5Hz 2400MHz
100mV

4 5 FM

5 7

6 8

7 9

AM FM

8 10

1

2

3

525KHz 1605KHz

525KHz 1605KHz 465KHz

10MHz 15MHz 4.5MHz 200KHz

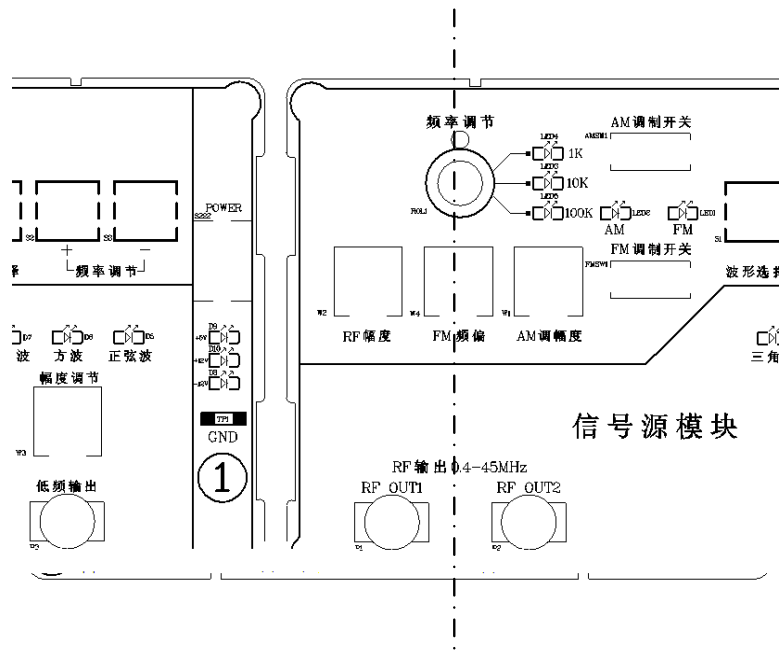
40KHz 4MHz

FM 88MHz 108MHz 10.7MHz

4

5

1



" POWER "

1KHz 10KHz 100KHz 1MHz

1KHz 10KHz 100KHz

1MHz

" "

" " " "

" RF "

" FM " " ON " " FM "

" FM " " OFF " " FM "

" AM " " ON " " AM "

" AM " " OFF " " AM "

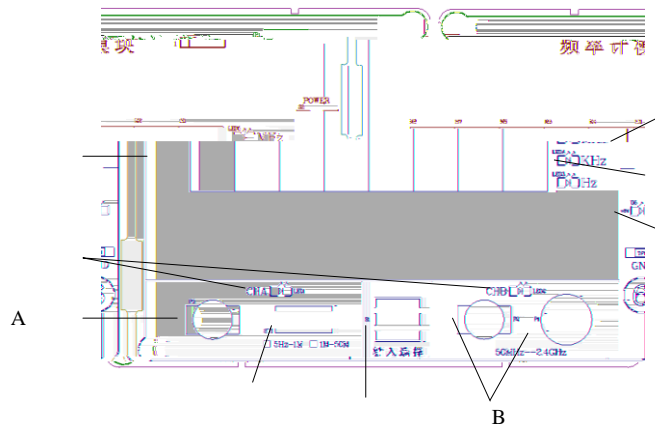
" FM " " AM "

" RF OUT1 " " RF OUT2 " 400KHz 45MHz

" RF OUT1 "

" RF OUT2 "

" 200Hz 10KHz "



8

100 " Hz"

100Hz

A B

" A

5Hz 50MHz

SW1

5Hz 1MHz

1MHz 50MHz

SW1

B

BNC

P1

1

2

3

4 ()

1

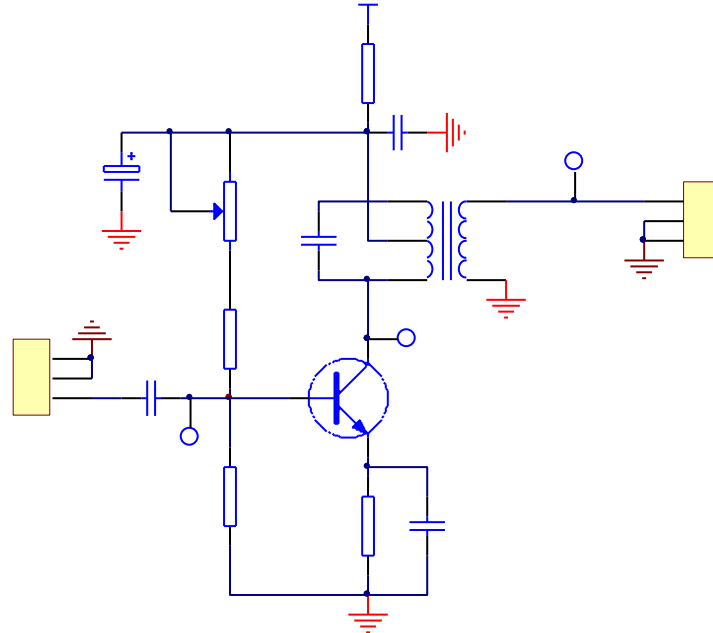
2

3

f_0

T

f_0



1-1

2

A_{v0}

A_{v0}

$$A_{v0} = -\frac{V_0}{V_i} = \frac{-P_1 P_2 y_{fe}}{g_\Sigma} = \frac{-P_1 P_2 y_{fe}}{P_1^2 g_{oe} + P_2^2 g_{ie} + G}$$

g_Σ

y_{fe}

$V_0(t)$

$V_i(t)$

180°

$180^\circ +$

$f_e V_0 V_i$

A_{v0}

1-1

V_0

V_i

A_{v0}

$$A_{v0} = V_0 / V_i$$

$$A_{v0} = 20 \lg (V_0 / V_i) \text{ dB}$$

3

A_v

$$A_{v0} = 0.707$$

BW

$$BW = 2 f_{0.7} = f_0 / Q_L$$

Q_L

A_{v0}

BW

$$A_{v0} \cdot BW = \frac{|y_{fe}|}{2\pi C_{\Sigma}}$$

y_{fe}

C_{Σ}

A_{v0}

BW

BW

f_0

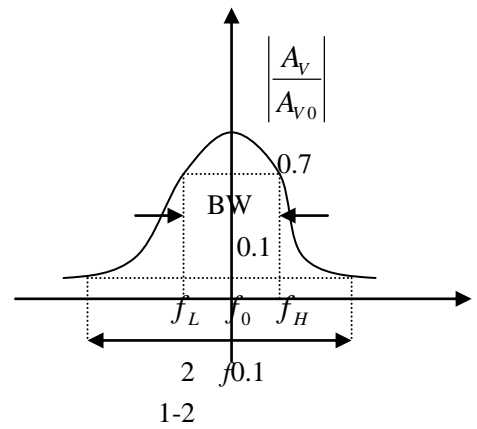
A_{v0}

1-2

$$BW = f_H - f_L = 2\Delta f_{0.7}$$

y_{fe}

C



T



1-3

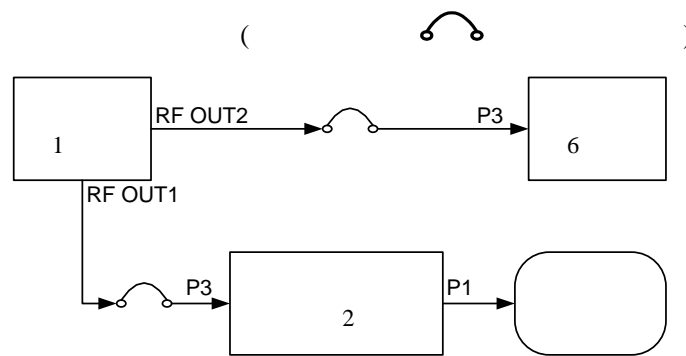
1

$$A_{v0} = -\frac{V_o}{V_i} = \frac{-p_1 p_2 y_{fe}}{2g}$$

2

$$BW = 2 f_{0.7} = \sqrt{2} f_o / Q_L$$

1



1-4

1-1

1	RF OUT1	2	P3
$V_{i(p-p)} = 200\text{mV}$ $f_s = 10.7\text{MHz}$			
1	RF OUT2	6	P3

P-P peak

2

1

TP3

200mV

10.7MHz

2

W1

TP1

TP1

3

TP3

TP1

A_V

1-2

f_i MHz	10.7MHz			
$V_{i(p-p)}$ mV TP3	100	200	300	400/500
$V_{o(p-p)}$ TP1				
A_V				

4

TP3

TP1 (

1	RF OUT1	2	P5
$V_{i(p-p)} = 150\text{mV}$ $f = 465\text{KHz}$			
1	RF OUT2	6	P3

2

1 TP6 150mV 465KHz

2 W1 T2 T3 TP7

3

TP6

TP7

A_V

1-5

f_s KHz	465KHz			
$V_{i(p-p)}$ mV TP6	100	150	200	250
$V_{o(p-p)}$ TP7				
A_V				

4

TP6

TP7

1-6

$V_{i p-p}$ mV TP6	150mV							
f_s KHz	435	445	455	465	475	485	495	505
$V_{o(p-p)}$ TP7								
A_V								

1

2

1

2 LC

3

4 LC

1

2 LC

3 LC

4

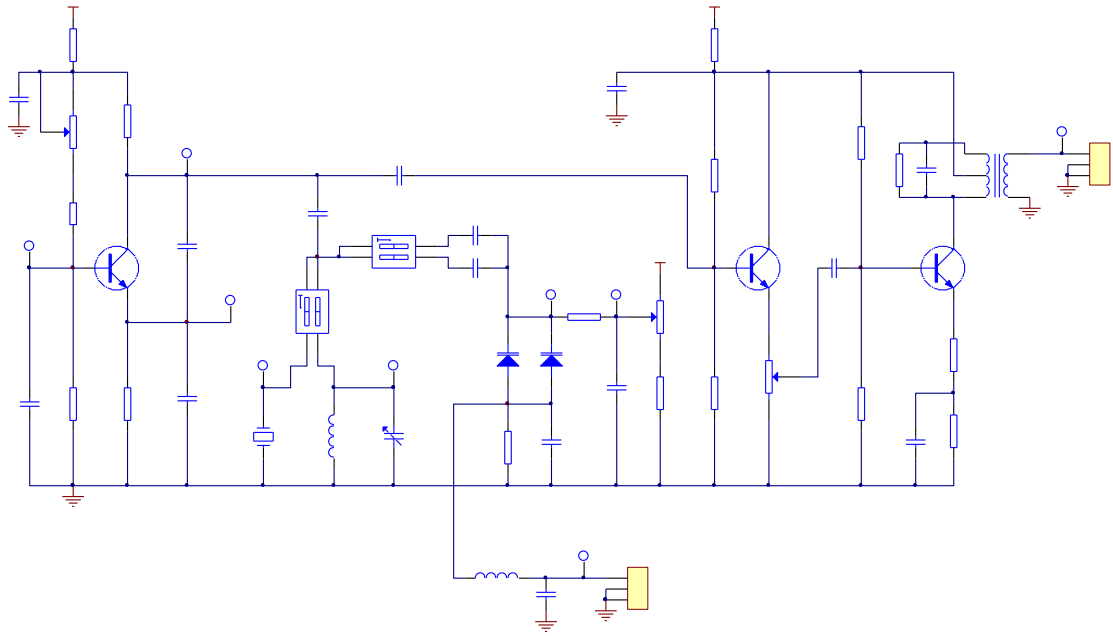
1 3 1

2 1

3 1

4 1

1 LC S1 1 2 01



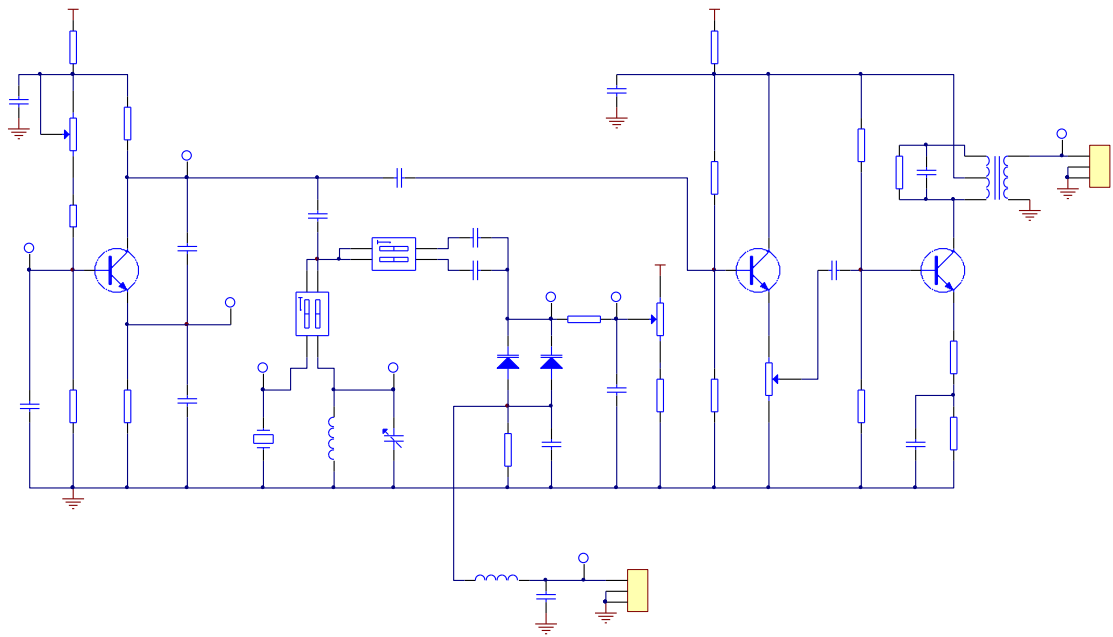
2-1 4.5MHz

3

2 S2 " 00" S1 " 10" N1 C3 C10 C11 CRY1 C4

3 LC S2 " 10" " 01" S1 " 01" D1 D2 L1
W2 D1 D2 D1 D2 C_j

4 S2 " 10" " 01" S1 " 10"



2-2 4.5MHz

1 2-1

2

1 S1 " 01" S2 " 00" LC

2 W1 N1 $I_{eo} (= \frac{V_e}{R_{I1}} \quad R_{I1}=1K \quad)$ TP2

V_e TP4 **x10** $V_{TP4 P-P}$ 2-1

2-1

	$V_{TP4 P-P}$ V	I_{eo} mA
	0	

A_v I_{CQ} g_m g_m I_{CQ}
 $I_{CQ}= 1\sim 5mA$

3

P1 CC1 TP8

2-2

2-2

f_{max}	
f_{min}	
	4.5 MHz

4

4.5 MHz

1 LC

P1

2 N1 20

3 S1 " 01" LC " 10" 2-3

2-3

		20s	40 s	60 s	80 s	100 s
LC	f_1					
	(f_2)					

5

4.5 MHz

1

LC

S1

" 01"

S2

" 10"

" 01"

P1

TP7

2

W2

3

S1

" 10"

S2

" 10"

" 01"

2

2-4

	W2	W2	W2	W2
	V_{D1}	V_{D2}		
	LC	f_1		
		f_2		

1

2

f_o

3

2-1

1

2 m

3

1

2

3

1 1

2 1

3 4 1

4 1

1

465KHz 1KHz

BG314 F1595 F1596 MC1495 MC1496

LM1595 LM1596

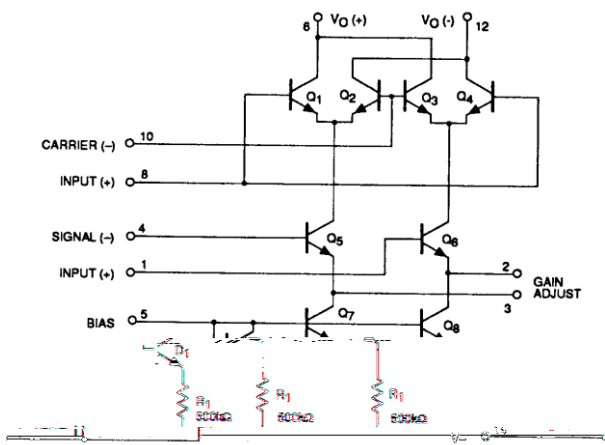
1) MC1496

MC1496 MC1496

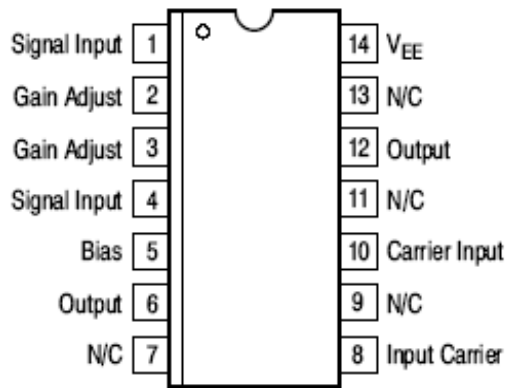
3-1 Q1 Q2 Q3 Q4

Q5 Q6 Q7

Q8 Q5 Q6



a



(b) 引脚图

3-1 MC1496

2

(1)

2V

(2)

$$I_0$$

$$I_0 \approx I_5 = \frac{V_{CC} - 0.7V}{R + 500}$$

$$I_0 \approx I_5 = \frac{V_{ee} - 0.7V}{R + 500}$$

$$I_0 \approx I_5 = \frac{V_{CC} - 0.7V}{R + 500}$$

$$I_0 \approx I_5 = \frac{V_{ee} - 0.7V}{R + 500}$$

$$I_0 \approx I_5 = \frac{V_{CC} - 0.7V}{R + 500}$$

MC1496

4mA

$$I_0 \approx I_5 = 1mA$$

R

6.8K

R15

2

MC1496

3-2

W1

1 4

12V

8V

5

R15

R1

R2

R4

R5

R6

V1

V4

8 10

V_C

C1

10

C2

8

V5 V6

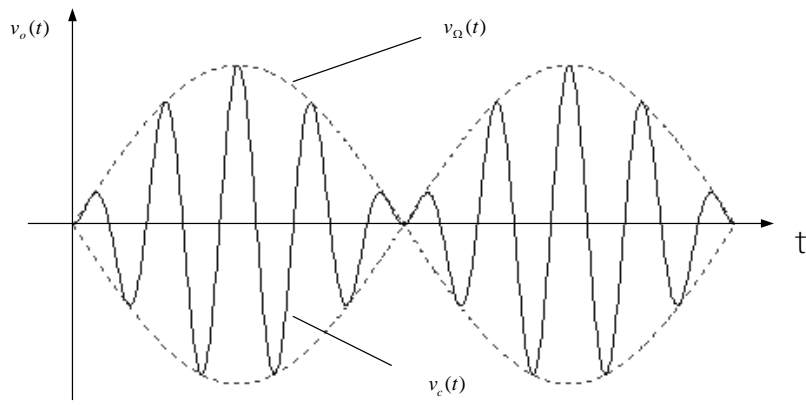
1 4

v

C5 1

2 3

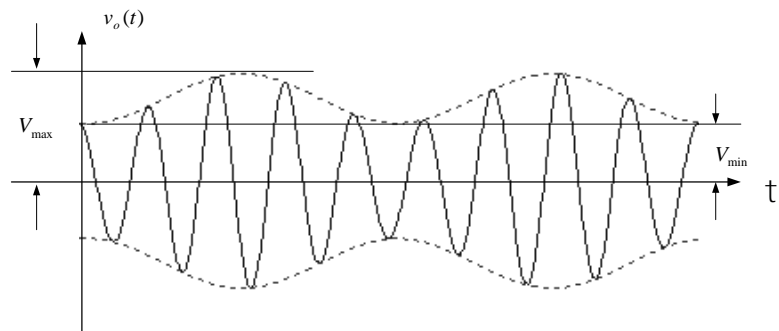
1K



3-4

1 P1 W1 v_o t TP6 V_I
 V_4 , MC1496 1 4
 2 P3 TP6 3-5

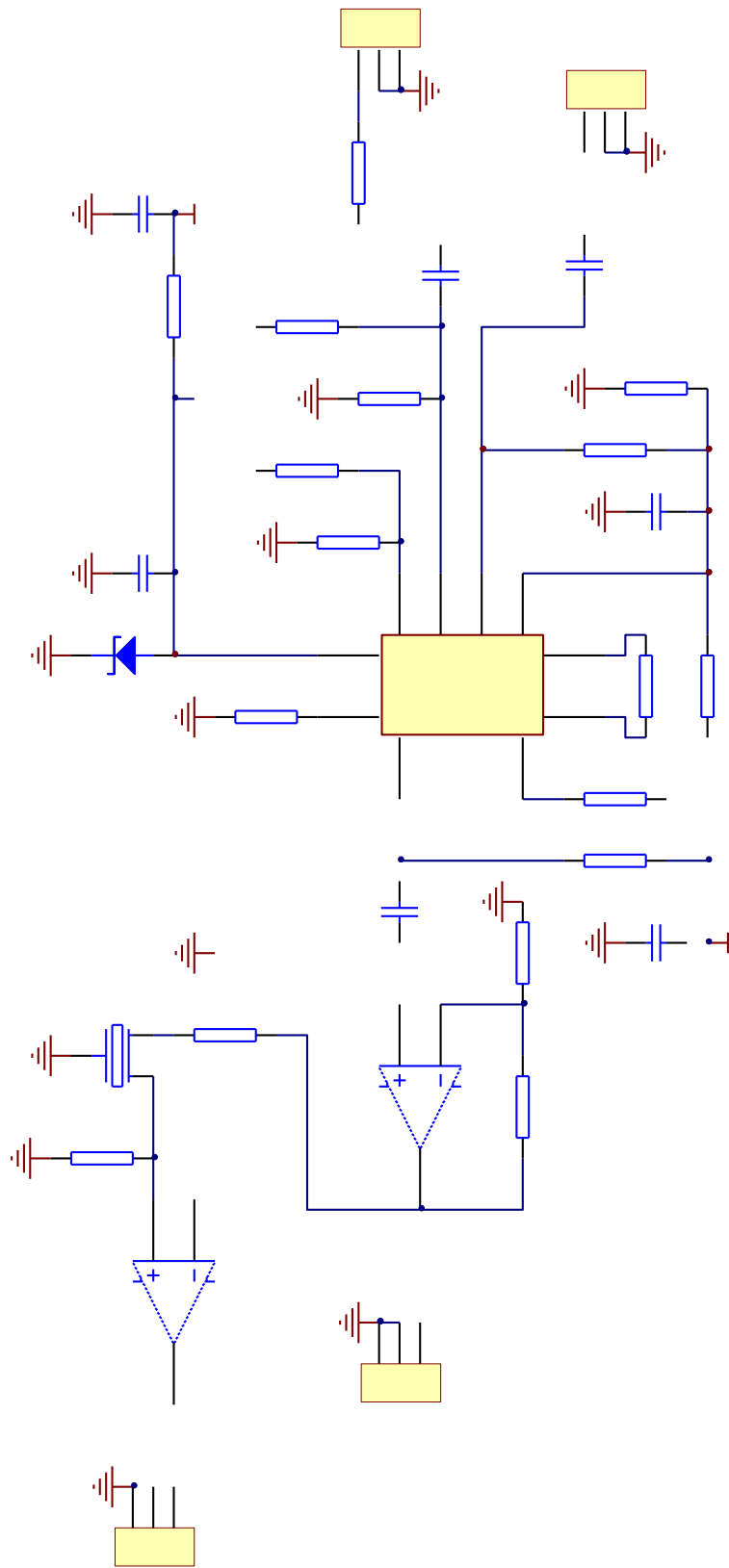
AM V_{max} V_{min} m



3-5

10KHz P5 TP7

1
 2 $m < 100$ m 100 $m > 100\%$



3-2

1

2

3

4

1

2

3

1

2

3 4

4

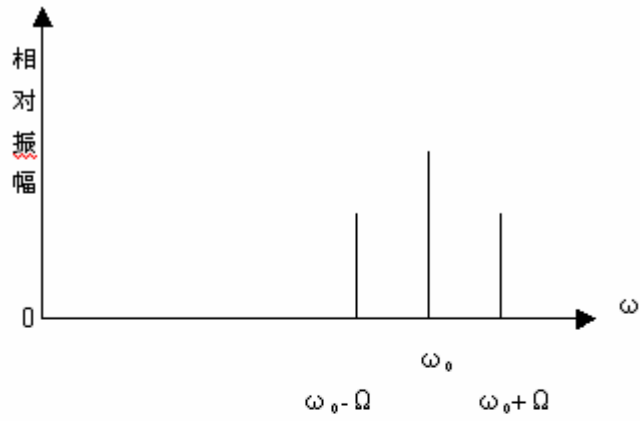
1

1

1

1

5-1



(a) 检波前



(b) 检波后

4-1

1

(0.5)

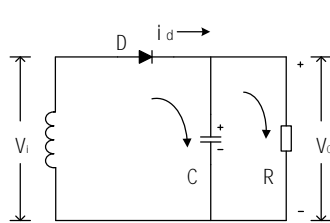
4-2 a

C

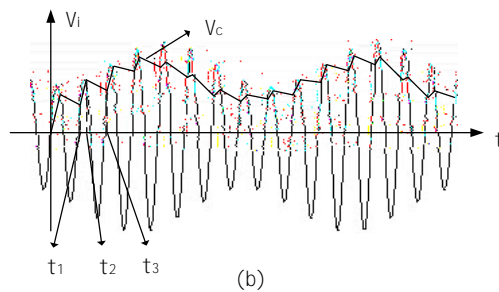
i_D

V_C

4-2 a



(a)



(b)

4-2

D

C

V_C

V_i

V_C

R

RC

4-2 b

t_1 t_2

4-2 b

t_2 t_3

R

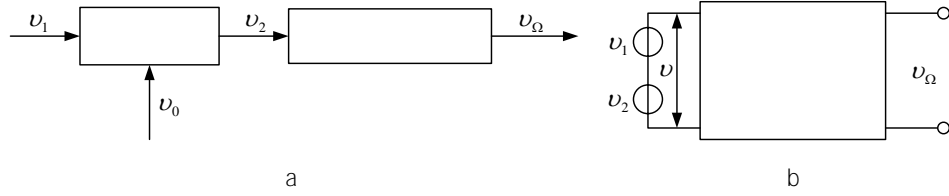
4-2 b

v_c

$R_d C$ (R_d)

)

v_c



4-4

4-4(a)

4-4(b)

1

$$v_1 = V_1 \cos \Omega t \cos \omega_1 t$$

$$v_0 = V_0 \cos(\omega_0 t + \varphi)$$

$$0 \qquad 1 \qquad 1 = 0,$$

1

$$\begin{aligned} v_2 &= V_1 V_0 (\cos \Omega t \cos \omega_1 t) \cos(\omega_2 t + \varphi) \\ &= \frac{1}{2} V_1 V_0 \cos \varphi \cos \Omega t + \frac{1}{4} V_1 V_0 \cos[(2\omega_1 + \Omega)t + \varphi] \\ &\quad + \frac{1}{4} V_1 V_0 \cos[(2\omega_1 - \Omega)t + \varphi] \end{aligned}$$

2 1

$$v_\Omega = \frac{1}{2} V_1 V_0 \cos \varphi \cos \Omega t$$

$$= 0$$

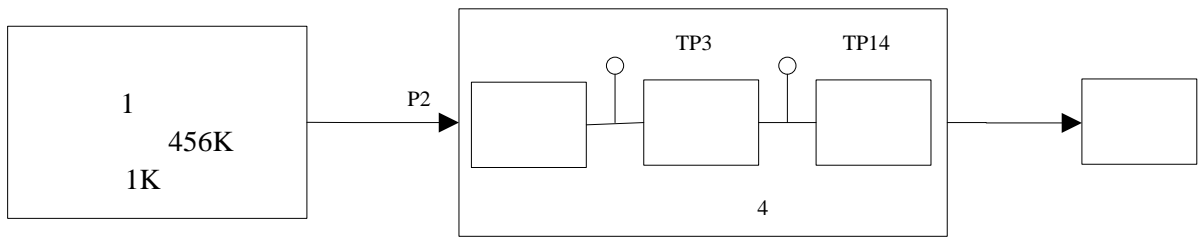
" "

W3 C13 U3A 8 10

$V_{AM}(t)$ P8 C14 1 4

12

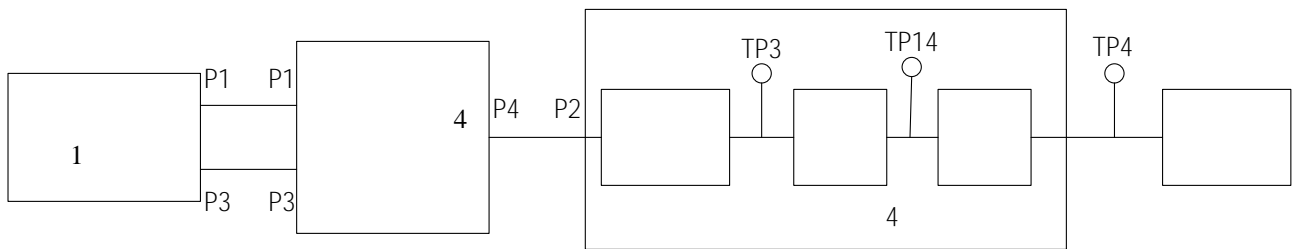
1 4-5



4-5

2

4-6



4-6

1 $m < 30\%$

2V $m < 30\%$

(

1KHz

) 4 S1 10 S2 00 TP4

2 $m = 100\%$

3 2 2 TP4

S1 " 01" 2.2K 20K TP4

4 S2 " 10" S1 " 01" TP4

1

4-7

2

30 100 >100

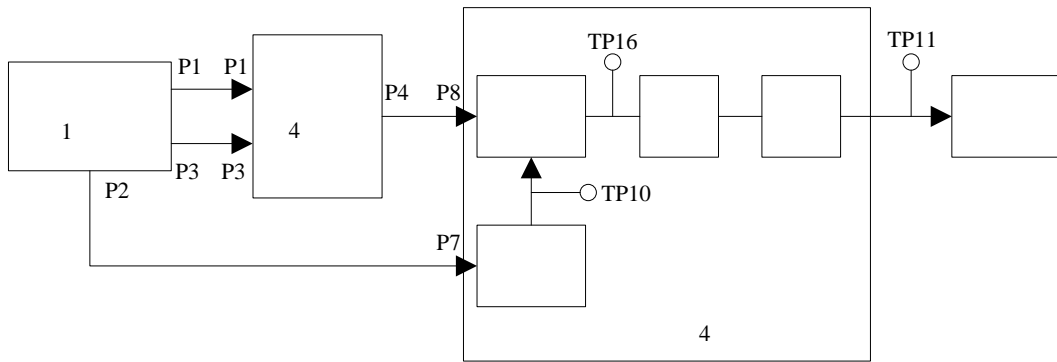
P8

P7

3

P8

P7



4-7

1

2

3

