



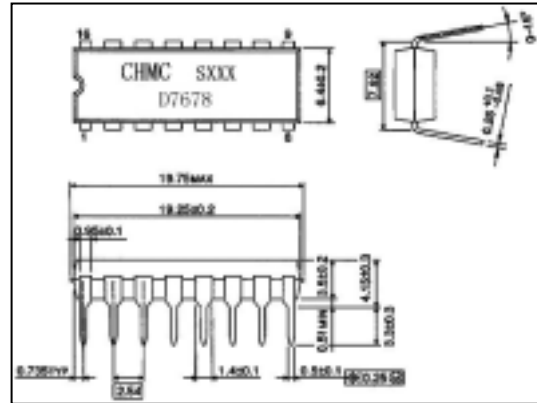
## VIDEO AND SOUND IF AMPLIFIER FOR COLOR AND MONOCHROME TV RECEIVERS

### CHMC D7678

#### FUNCTION

##### PIF STAGE

- Three Controlled IF Amplifier stages
- Video Demodulator Controlled by Picture Carrier
- Black Noise and White Noise Inverter
- Peak AGC
- DC Amplifier for RF AGC Output



##### SIF STAGE

- Three Controlled IF Amplifier Stages
- Quadrature Detector

Outline Drawing

#### FEATURE

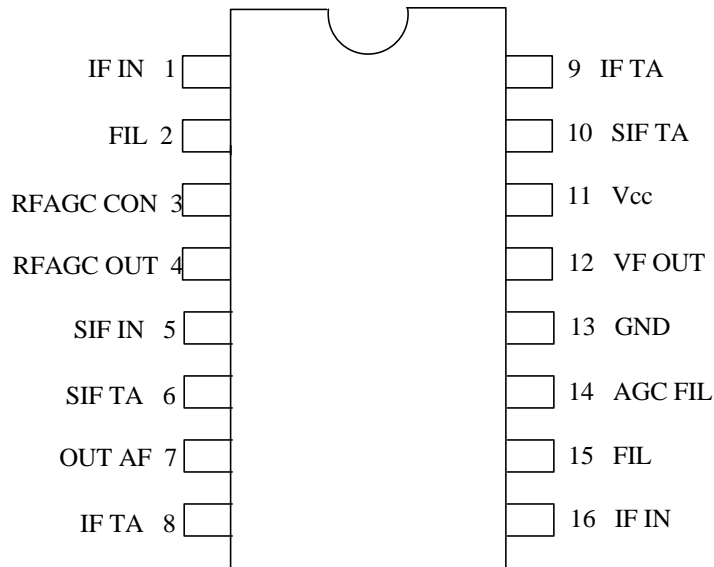
##### PIF STAGE

- High Gain, Wide Band IF Amplifier : 50dB(Typ.) at 58MHz
- Gain Reduction with Excellent Stability : 55dB(Typ.) at 58MHz
- Excellent DG/DP Characteristics : DG 7%(Typ.), DP 3.5deg.(Typ.)
- Excellent S/N Characteristics Due to Delayed 3 Stage AGC Action.
- Fast AGC Action Due to Noise Inverter and Peak AGC.
- Switch Off the Video part with VTR Switch.
- Dual Differential AFT Output.

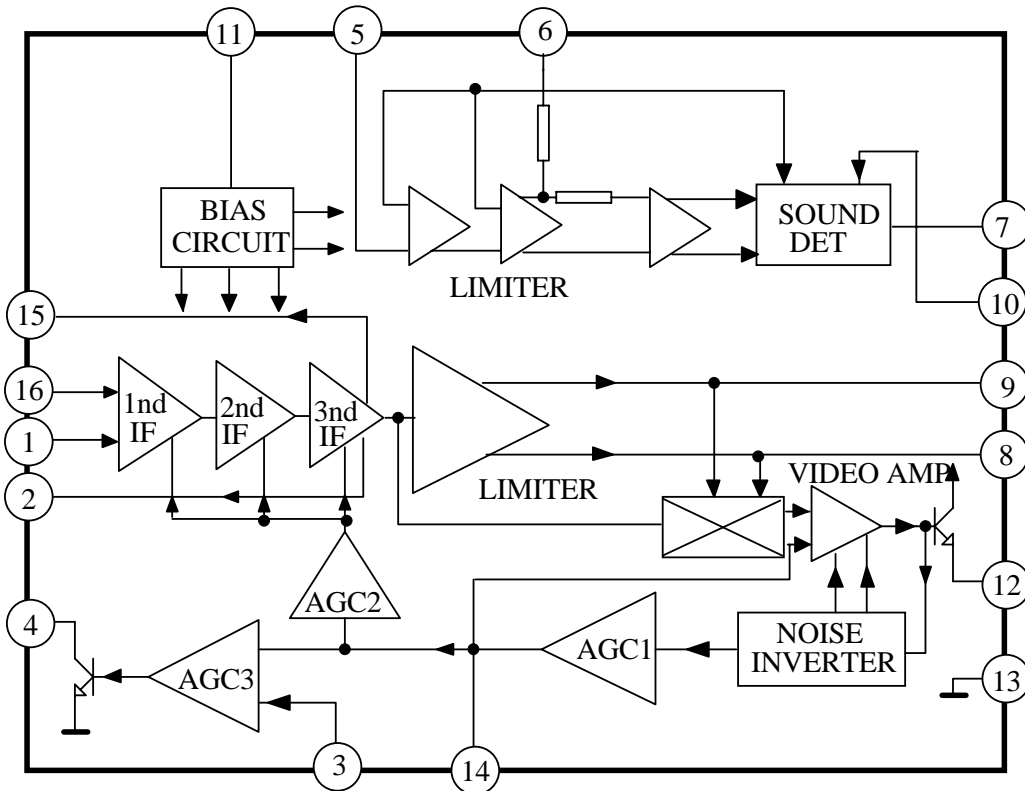
##### SIF STAGE

- Excellent Limiter Characteristics.
- Excellent AM Rejection.
- Large Undistorted Audio Output Voltage with Quadrature Detector.

## PIN CONNECTION



## BLOCK DIAGRAM



## MAXIMUM RATINGS (Ta=25 )

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage (Pin 11)	V <sub>cc</sub>	15	V
Open Loop Voltage (Pin 4)	V <sub>4</sub>	15	V
Video DC Output Current (Pin 12)	I <sub>12</sub>	6	mA
Power Dissipation (note)	P <sub>D</sub>	1.4	W
Ambient Temperature	T <sub>a</sub>	-20~65	
Storage Temperature	T <sub>stg</sub>	-55~150	

## ELECTRICAL CHARACTERISTICS

### PIF STAGE (Ta=25 , Vcc=12V,fp=58.75MHz,fs=54.25MHz)

CHARACTERISTIC	SYM-BOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Recommended Supply Voltage	V <sub>cc</sub> (V11)	-	-	10.8	12.0	13.2	V
Supply Current	I <sub>cc</sub> (I11)	1	S1:ON, S3:2, S5:2, S4:1	35	50	65	mA
VIDEO DC Output Voltage	V <sub>12</sub>	1	S1:OFF, S3:2, S5:2, S4:1	5.2	5.5	5.8	V
Terminal Voltage 5	V <sub>5</sub>	1	S1:ON, S3:2, S5:2, S4:1	3.5	4.4	5.3	V
Terminal Voltage 7	V <sub>7</sub>	1	S1:ON, S3:2, S5:2, S4:1	4.8	6.0	7.2	V
RF AGC Residual Output Voltage	V <sub>4</sub> SAT	1	S1:OFF, S3:2, S5:2, S4:1	-	-	0.5	V
RF AGC Leak Current	I <sub>4</sub> LEAK	1	S1:OFF, S3:2, S5:2, S4:1	-	-	1	μ A
Video Sensitivity	V <sub>i</sub> Pin1-16	2	(Note 1)	60	150	250	μ Vrms
AGC Range	A (IF)	2	(Note 2)	60	64	-	dB
Sync Tip Level Voltage	V <sub>SYNC</sub> (V12)	2	(Note 3)	2.3	2.5	2.7	V
Maximum IF Input Voltage	V <sub>IN MAX</sub> PIF	2	(Note 4)	100	120	-	mVrms
White Noise Threshold	V <sub>w TH</sub> (V12)	2	(Note 5)	5.8	6.2	6.6	V
White Noise Clamp Level	V <sub>w CL</sub> (V12)	2	(Note 5)	3.7	4.1	4.5	V
Lack Noise Threshold	V <sub>B TH</sub> (V12)	2	(Note5)	1.4	1.6	1.8	V

**ELECTRICAL CHARACTERISTICS**

CONTINUE

**PIF STAGE (Ta=25 , Vcc=12V,fp=58.75MHz,fs=54.25MHz)**

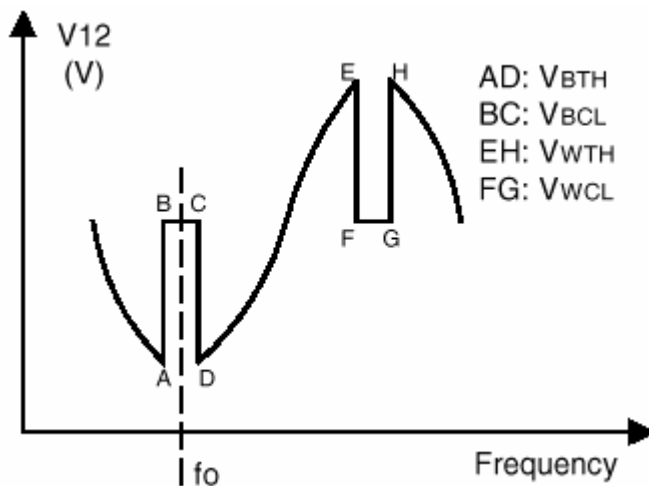
CHARACTERISTIC	SYM-BOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Black Noise Clamp Level	V <sub>B CL</sub> (V12)	2	(Note 5)	2.9	3.3	3.7	V
Video Frequency Response	f <sub>BW</sub>	3	(Note 6)	4.5	5.5	-	MHz
Suppression of carrier	CL	4	(Note 7)	40	50	-	dB
Suppression of 2 <sup>nd</sup> carrier	I2nd	4	(Note 8)	40	50	-	dB
Suppression of Sound Carrier/Color Sub-carrier	I920	4	(Note 9)	33	38	-	dB
Differential Phase	DP	5	(Note 10)	-	3.5	5	deg
Differential Gain	DG	5	(Note 10)	-	7	10	%
PIF Input Impedance	R <sub>IN(PIF)</sub>	6	(Note 11)	1.5	3.0	6.0	k
	C <sub>IN(PIF)</sub>			-	3.0	10.0	pF
Max. Available Current	I <sub>4 MAX</sub>	1	(Note 12)				mA
				7.0	-	-	
RF AGC Delay Point Range	V <sub>IN DELAY</sub>	2	(Note 13)	5.0	7.0	9.0	V
Video Output Level	V <sub>OUT</sub>	2	(Note 14)	2.25	2.5	2.75	V
SIF Output Voltage	S <sub>OUT</sub>	3	(Note 15)	200	400	600	mVrms

**SIF STAGE**

CHARACTERISTIC	SYM-BOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Limiting Voltage	V <sub>IN(LIM)</sub>	8	(Note 16)		200	400	μ Vrms
AM Rejection Ratio	AMR	8	(Note 17) R <sub>L</sub> = R <sub>D</sub> =	40	45	-	dB
Recovered Output Voltage	V <sub>OD</sub>	8	(Note 18) R <sub>L</sub> = R <sub>D</sub> =	0.5	0.75	-	Vrms
Total Harmonic Distortion	THD	8	(Note 18) R <sub>L</sub> = R <sub>D</sub> =	-	1.0	2.0	%
Max. Audio Output Voltage	V <sub>OM</sub>	8	(Note 19)	4.0	-	-	V <sub>p-p</sub>
SIF Input Impedance	R <sub>IN (SIF)</sub>	7		10.0	20.0	30.0	k
	C <sub>IN (SIF)</sub>			-	3.0	10.0	pF
Audio Output Impedance	R <sub>O(AF)</sub>	9	(Note 20)	10.0	15.0	20.0	k

**NOTE:**

1.  $V_{AGC}(TP14 \text{ EXT. Applying Voltage})=11.5V$   
 PIF IN;  $f=58.75MHz$  1kHz 30% AM modulation  
 Adjust PIF Input Level  $V_i$  so that the detected output of TP12C with high impedance probe will be 0.8Vp-p and measure the Input Level.
2.  $V_{AGC}=4V$   
 Measure PIF Input Level  $V_i'$  same as NOTE 1  
 $A=20\log V_i'/V_i$  (dB)
3. PIF IN;  $f=58.75MHz$  CW 15mVrms  
 Measure DC Level of TP12A
4. PIF IN;  $f=58.75MHz$  APL 100%, 87.5% AM modulation.  
 TP14: open  
 (1) Adjust PIF Input Level 50mVp-p and measure the detected output level  $V_{01p-p}$   
 (2) Then increase the Input Level so that detected output level will be  $1.1 \times V_{01p-p}$  and measure the Input Level
5.  $V_{AGC}=8V$   
 PIF IN;  $f=58.75MHz \pm 10MHz$  Variable or Sweep 15mVrms Measure DC level of TP12A.



6.  $V_{AGC}=8V$  ( $GR \cong 30dB$ )  
SG1 ; 58.75MHz CW  
SG2 ; 58.65~40MHz Variable  
(1) Setting output of SG1 so that DC level of TP12A will be 4.0V  
(2) Setting output of SG2(58.65MHz) so that AC level of TP12A will be 0.5Vp-p  
(3) Decreasing Frequency of SG2 until AC level of TP12A will be 0.35Vp-p (-3dB of 0.5Vp-p) then read  $f_{SG2}=F$   $f_{BW}=58.75-F$  MHz
7. SG1 ; 58.75MHz, 1kHz 80% AM modulation 100mVrms  
SG2, SG3 ; OFF  
Setting  $V_{AGC}$  so that output AC level of TP12A will be 2.7Vp-p  
Measure CL of TP12A after setting to 0% AM of SG1
8. Measure I2nd of TP12A same as NOTE 9
9.  $V_{AGC}=8V$   
SG1 ; 58.75MHz (P ; Picture) 100mVrms  
SG2 ; 54.25MHz (S ; Sound ) 32mVrms (-10dB of SG1)  
SG3 ; 55.17MHz (c ; chroma) 32mVrms (-10dB of SG1)  
(1) Setting  $V_{AGC}$  so that the output tip level (lower) of TP12A will be 3.0V DC  
(2) Measure the level difference (dB) between c-level and 920kHz level
10.  $V_{AGC}=8V$   
PIF IN ;  $f=58.75MHz$  Video Signal (ramp) 87.5% AM 100mVp-p  
Setting ATT so that the sync tip level of TP12A will be 2.5V DC  
Measure DP and DG
11.  $V_{AGC}=5V$ ,  $f=58.75MHz$   
Measure  $R_{JN}$  ,  $C_{IN}$
12. S1: ON, S3: 2, S5: 1, S4: 1
13. TP14: Open  
PIF IN ; 58.75MHz CW 20mVrms  
(1) Adjust the voltage of terminal 3 so that the voltage of terminal 4 will be 6.0V DC  
(2) Measure the terminal voltage 3

14. TP14: Open

PIF IN ; 58.75MHz 100% APL 87.5% AM modulation Signal Amplitude 50Vp-p  
Measure detected output voltage (White peak to sync Tip)

15. TP14: Open

SG1 ; 58.75MHz CW 100mVrms

SG2 ; 54.25MHz CW 25mVrms

Measure SIF (4.5MHz) output voltage at TP12A

16. SIF IN ; f=4.5MHz FM  $f_{MOD}=400\text{Hz}$   $\Delta f=\pm 25\text{kHz}$

(1) Adjust SIF Input Level 100mVp-p and measure the detected output level  $V_{OS}$

(2) Then decrease the Input Level so that the detected output level will be 3dB down of  $V_{OD}$  and measure the Input Level

17. SIF IN ; f=4.5MHz FM :  $f_{MOD}=400\text{Hz}$   $\Delta f=\pm 25\text{kHz}$  AM 30%

Input Level  $V_{INS}=100\text{dB}\mu$

18. SIF IN ; f=4.5MHz FM :  $f_{MOD}=400\text{Hz}$   $\Delta f=\pm 25\text{kHz}$

Input Level  $V_{INS}=80\text{dB}\mu$

19. SIF IN ; f=4.4~4.6MHz Variable or Sweep

Measure the output DC voltage change

20. SIF IN; f=4.5MHz FM :  $f_{MOD}=400\text{Hz}$   $\Delta f=\pm 25\text{kHz}$

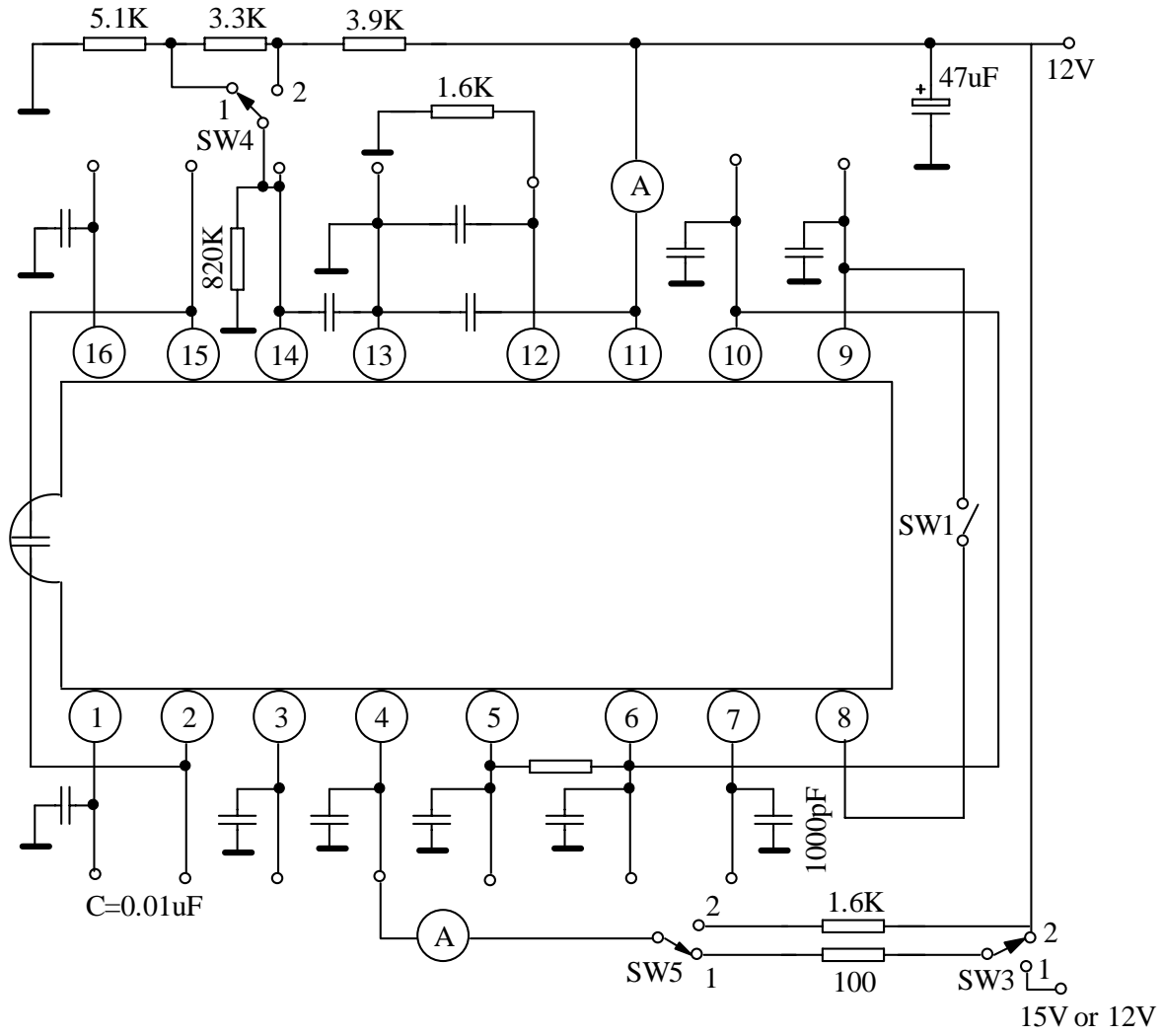
Input Level  $V_{INS}=80\text{dB}\mu$

(1) Measure the detected output voltage  $V_{OI}$  with  $R_X=$

(2) Then , adjust  $R_X$  so that the detected output voltage will be  $V_{OI}/2$  and measure  $R_X$ .

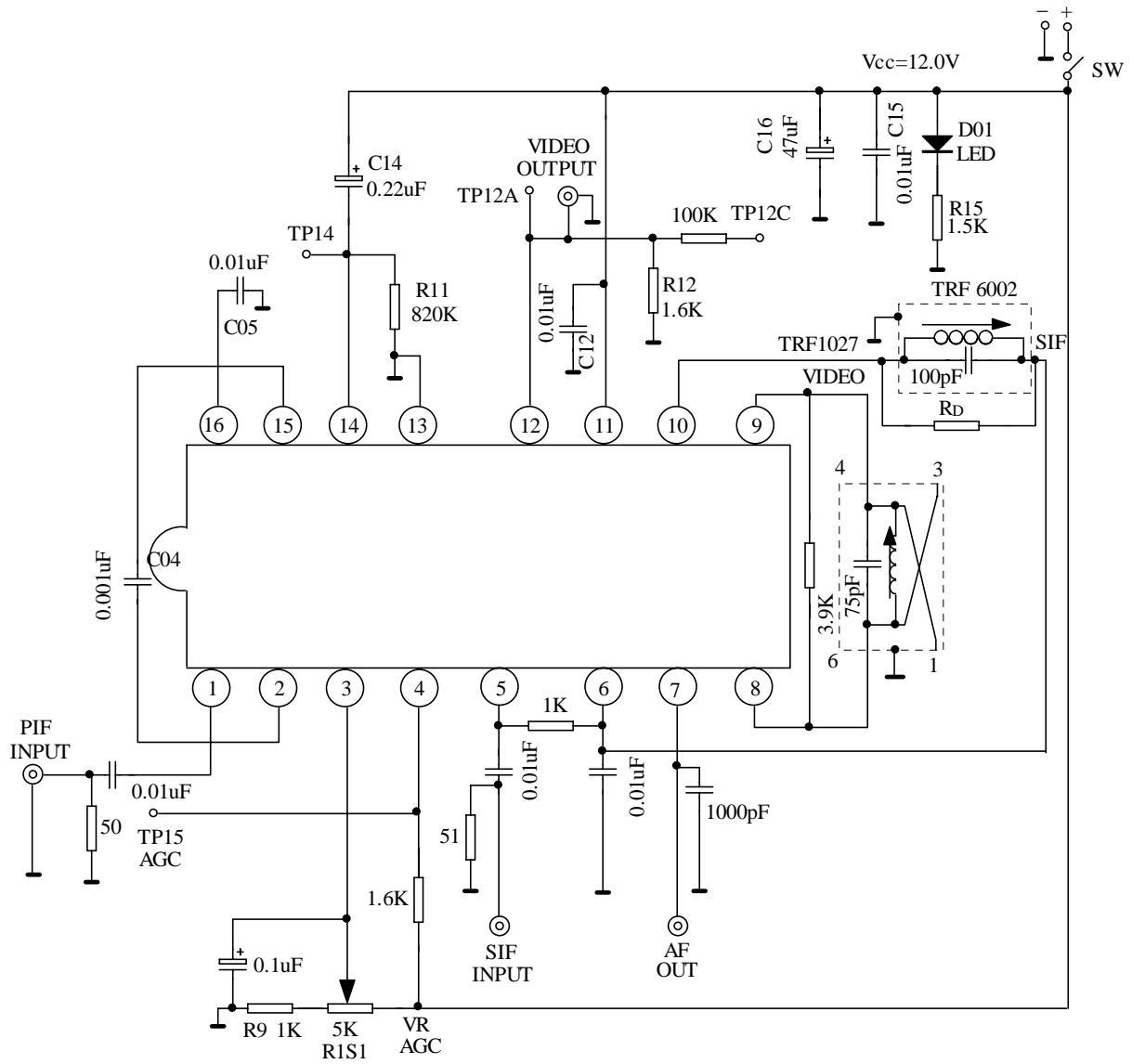
TEST CIRCUIT

1.DC TEST CIRCUIT

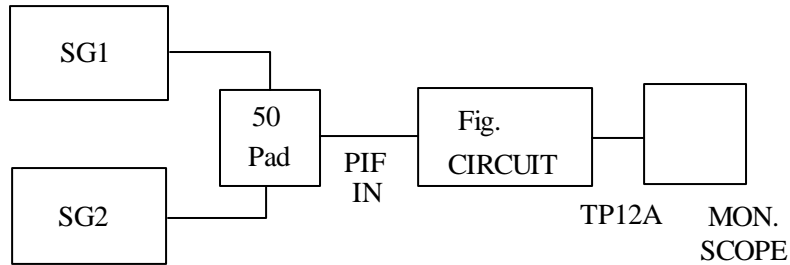




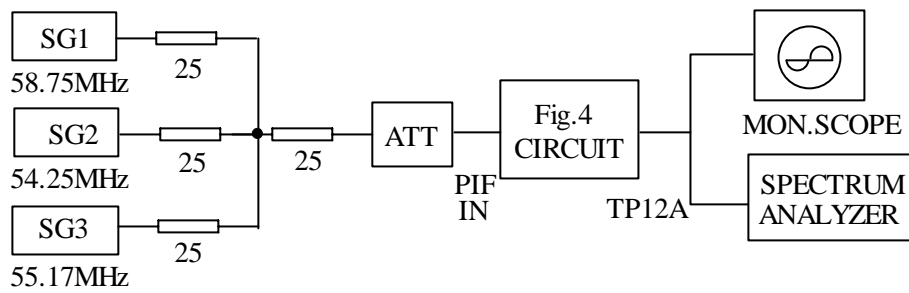
2.AC TEST CIRCUIT



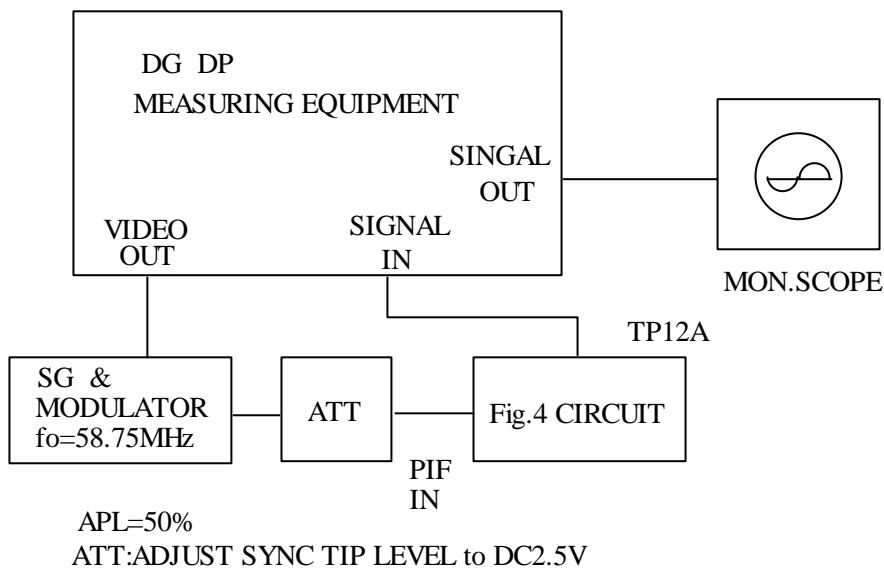
**3.VIDEO FREQUENCY RESPONSE & SIF OUTPUT VOLTAGE TEST CIRCUIT**



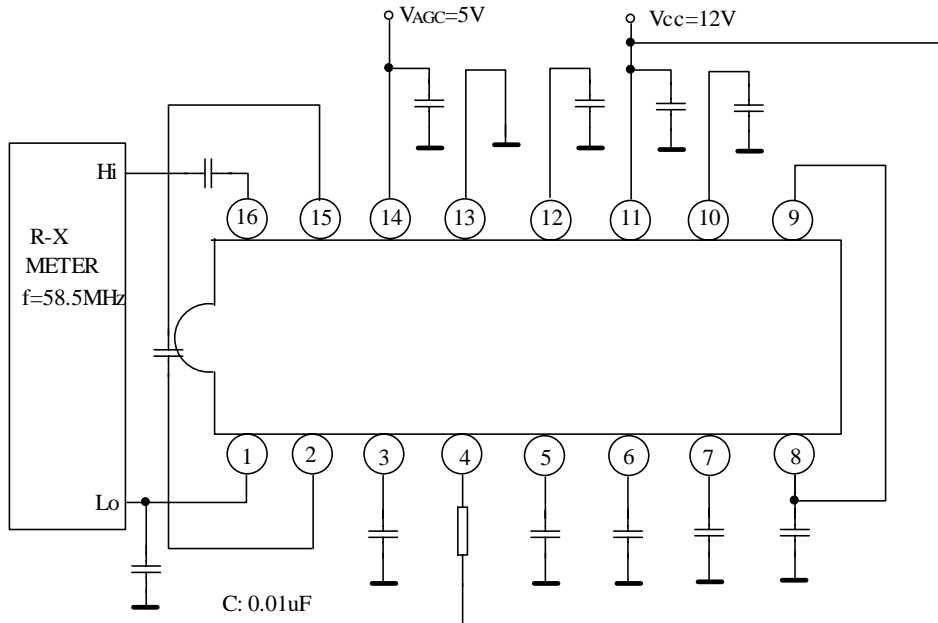
**4.INTER MODULATION TEST CIRCUIT**



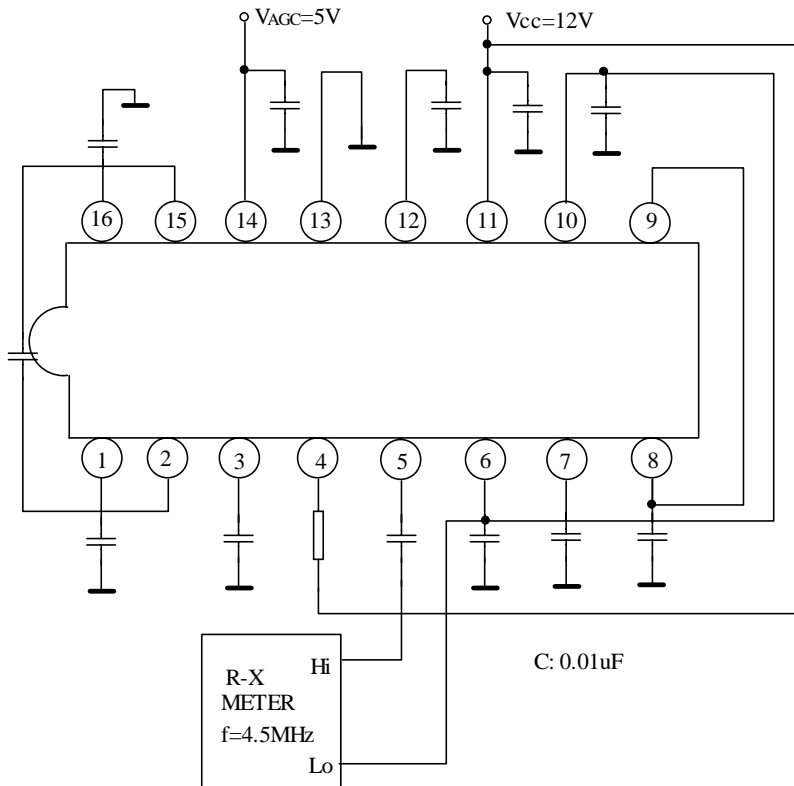
**5.DC,DP TEST CIRCUIT**



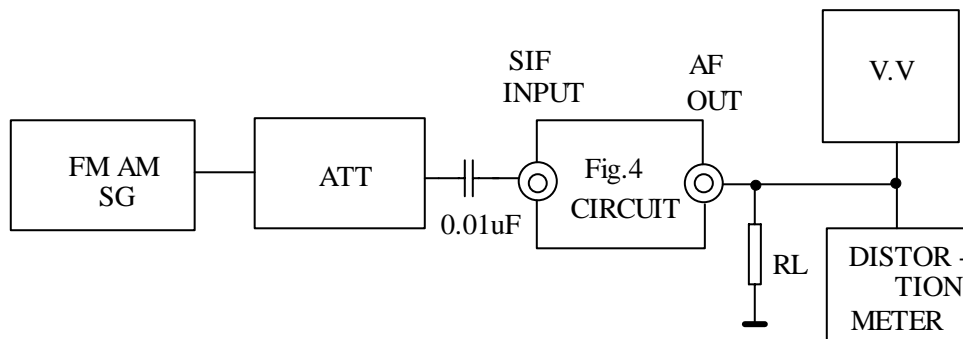
6. PIF INPUT IMPEDANCE TEST CIRCUIT



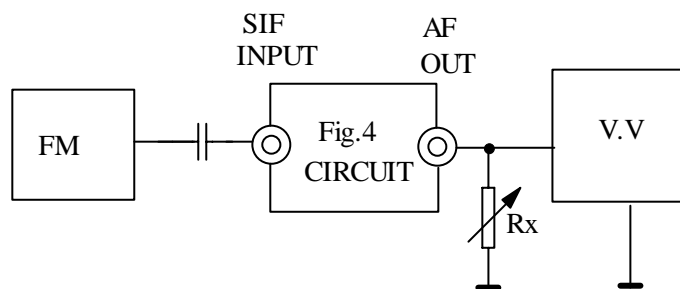
7. SIF INPUT IMPEDANCE TEST CIRCUIT



8.  $V_{IN(LIM)}$ , AMR,  $V_{OD}$ , THD,  $V_{OM}$  TEST CIRCUIT



9. AUDIO OUTPUT IMPEDANCE TEST CIRCUIT



## APPLICATION CIRCUIT

