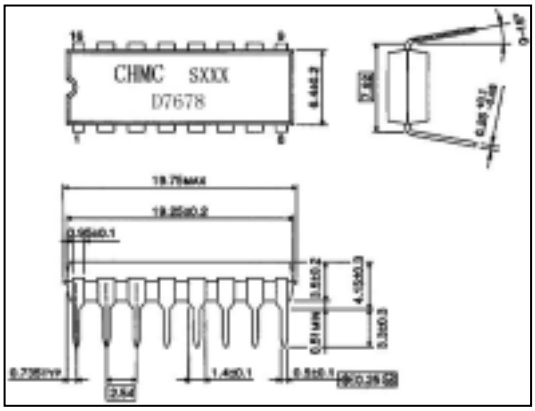
VIDEO AND SOUND IF AMPLIFIER FOR COLOR AND MONOCHROME TV RECEIVERS

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



Outline Drawing

SIF STAGE

- Three Controlled IF Amplifier Stages
- Quadrature Detector

FEATURE

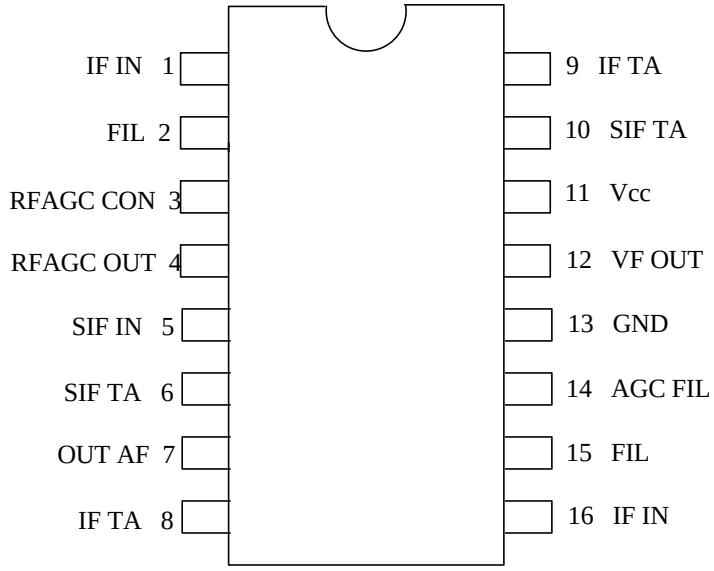
PIF STAGE

- 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.

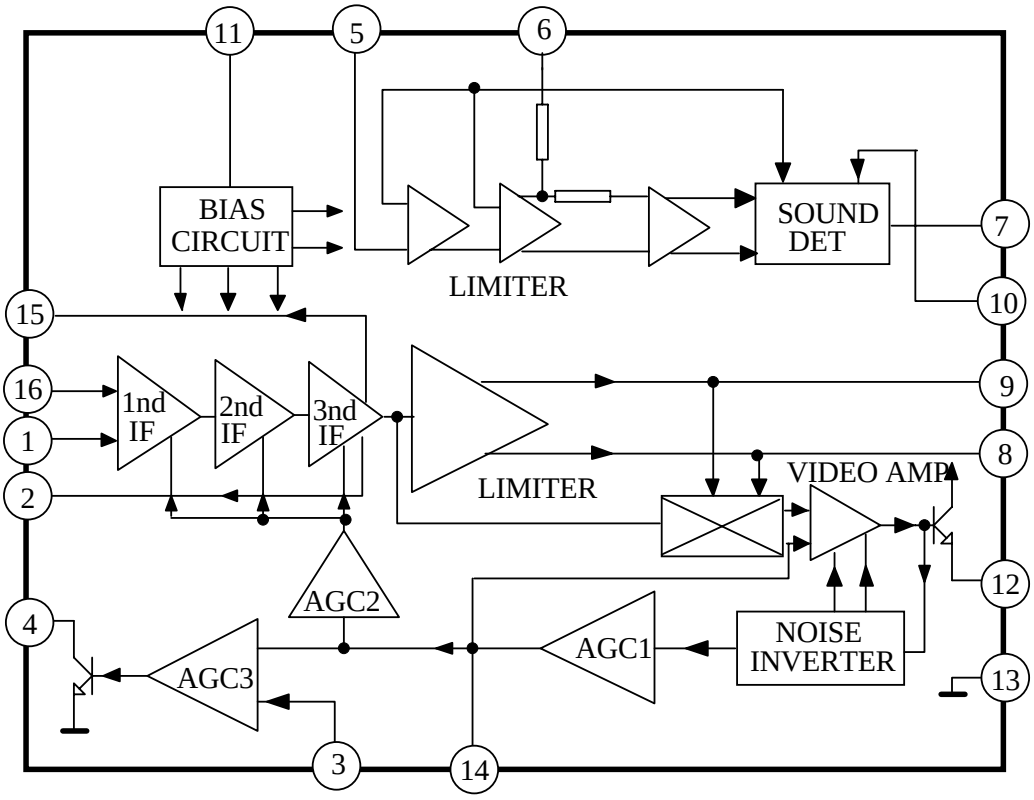
SIF STAGE

- 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)	Vcc	15	V
Open Loop Voltage (Pin 4)	V_4	15	V
Video DC Output Current (Pin 12)	I_{12}	6	mA
Power Dissipation (note)	P_D	1.4	W
Ambient Temperature	Ta	-20~65	℃
Storage Temperature	Tstg	-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	Vcc (V11)	-	-	10.8	12.0	13.2	V
Supply Current	Icc (I11)	1	S1:ON, S3:2, S5:2, S4:1	35	50	65	mA
VIDEO DC Output Voltage	V12	1	S1:OFF, S3:2, S5:2, S4:1	5.2	5.5	5.8	V
Terminal Voltage 5	V5	1	S1:ON, S3:2, S5:2, S4:1	3.5	4.4	5.3	V
Terminal Voltage 7	V7	1	S1:ON, S3:2, S5:2, S4:1	4.8	6.0	7.2	V
RF AGC Residual Output Voltage	V4 SAT	1	S1:OFF, S3:2, S5:2, S4:1	-	-	0.5	V
RF AGC Leak Current	I4 LEAK	1	S1:OFF, S3:2, S5:2, S4:1	-	-	1	μA
Video Sensitivity	Vi Pin1-16	2	(Note 1)	60	150	250	μVrms
AGC Range	ΔA (IF)	2	(Note 2)	60	64	-	dB
Sync Tip Level Voltage	V_{SYNC} (V12)	2	(Note 3)	2.3	2.5	2.7	V
Maximum IF Input Voltage	$V_{IN\ MAX}$ PIF	2	(Note 4)	100	120	-	mVrms
White Noise Threshold	V_W TH (V12)	2	(Note 5)	5.8	6.2	6.6	V
White Noise Clamp Level	V_W CL (V12)	2	(Note 5)	3.7	4.1	4.5	V
Lack Noise Threshold	V_B TH (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)

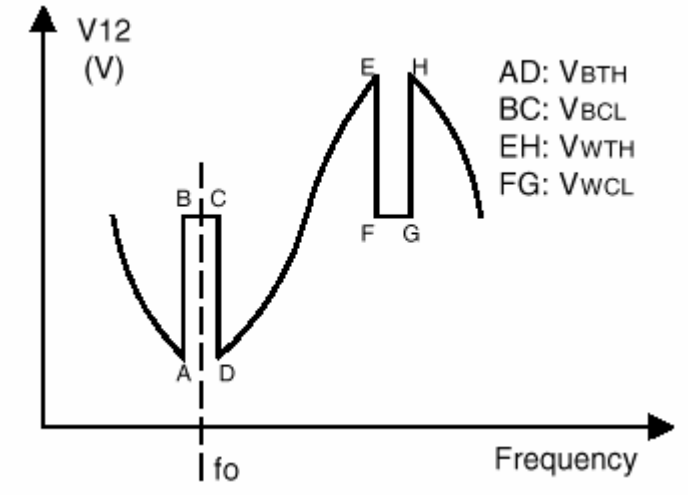
CHARACTERISTIC	SYM-BOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Black Noise Clamp Level	V_B CL (V12)	2	(Note 5)	2.9	3.3	3.7	V
Video Frequency Response	f_{BW}	3	(Note 6)	4.5	5.5	-	MHz
Suppression of carrier	CL	4	(Note 7)	40	50	-	dB
Suppression of 2nd carrier	I2nd	4	(Note 8)	40	50	-	dB
Suppression 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	$R_{IN(PIF)}$	6	(Note 11)	1.5	3.0	6.0	kΩ
	$C_{IN(PIF)}$			-	3.0	10.0	pF
Max. Available Current	I4 MAX	1	(Note 12)	7.0	-	-	mA
RF AGC Delay Point Range	V_{IN} DELAY	2	(Note 13)	5.0	7.0	9.0	V
Video Output Level	V_{OUT}	2	(Note 14)	2.25	2.5	2.75	V
SIF Output Voltage	S_{OUT}	3	(Note 15)	200	400	600	mVrms

SIF STAGE

CHARACTERISTIC	SYM-BOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Limiting Voltage	$V_{IN(LIM)}$	8	(Note 16)		200	400	μ Vrms
AM Rejection Ratio	AMR	8	(Note 17) $R_L=\infty$ $R_D=\infty$	40	45	-	dB
Recovered Output Voltage	V_{OD}	8	(Note 18) $R_L=\infty$ $R_D=\infty$	0.5	0.75	-	Vrms
Total Harmonic Distortion	THD	8	(Note 18) $R_L=\infty$ $R_D=\infty$	-	1.0	2.0	%
Max. Audio Output Voltage	V_{OM}	8	(Note 19)	4.0	-	-	Vp-p
SIF Input Impedance	$R_{IN\ (SIF)}$	7		10.0	20.0	30.0	kΩ
	$C_{IN\ (SIF)}$			-	3.0	10.0	pF
Audio Output Impedance	$R_{O(AF)}$	9	(Note 20)	10.0	15.0	20.0	kΩ

NOTE:

1. V_{AGC}(TP14 EXT. Applying Voltage)=11.5V
   PIF IN; f=58.75MHz 1kHz 30% AM modulation
   Adjust PIF Input Level Vi 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 Vi' same as NOTE 1
   A=20log Vi'/Vi (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 V01p-p
   (2) Then increase the Input Level so that detected output level will be 1.1×V01p-p and measure the Input Level
5. V_{AGC}=8V
   PIF IN; f=58.75MHz±10MHz Variable or Sweep 15mVrms Measure DC level of TP12A.



6. V_{AGC}=8V (GR≅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 100mVrems
   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}=400Hz Δf=±25kHz

    (1) Adjust SIF Input Level 100mVp-p and measure the detected output level Vos

    (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}=400Hz Δf=±25kHz AM 30%

    Input Level V_{INS}=100dBμ

18. SIF IN ; f=4.5MHz FM : f_{MOD}=400Hz Δf=±25kHz

    Input Level V_{INS}=80dBμ

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}=400Hz Δf=±25kHz

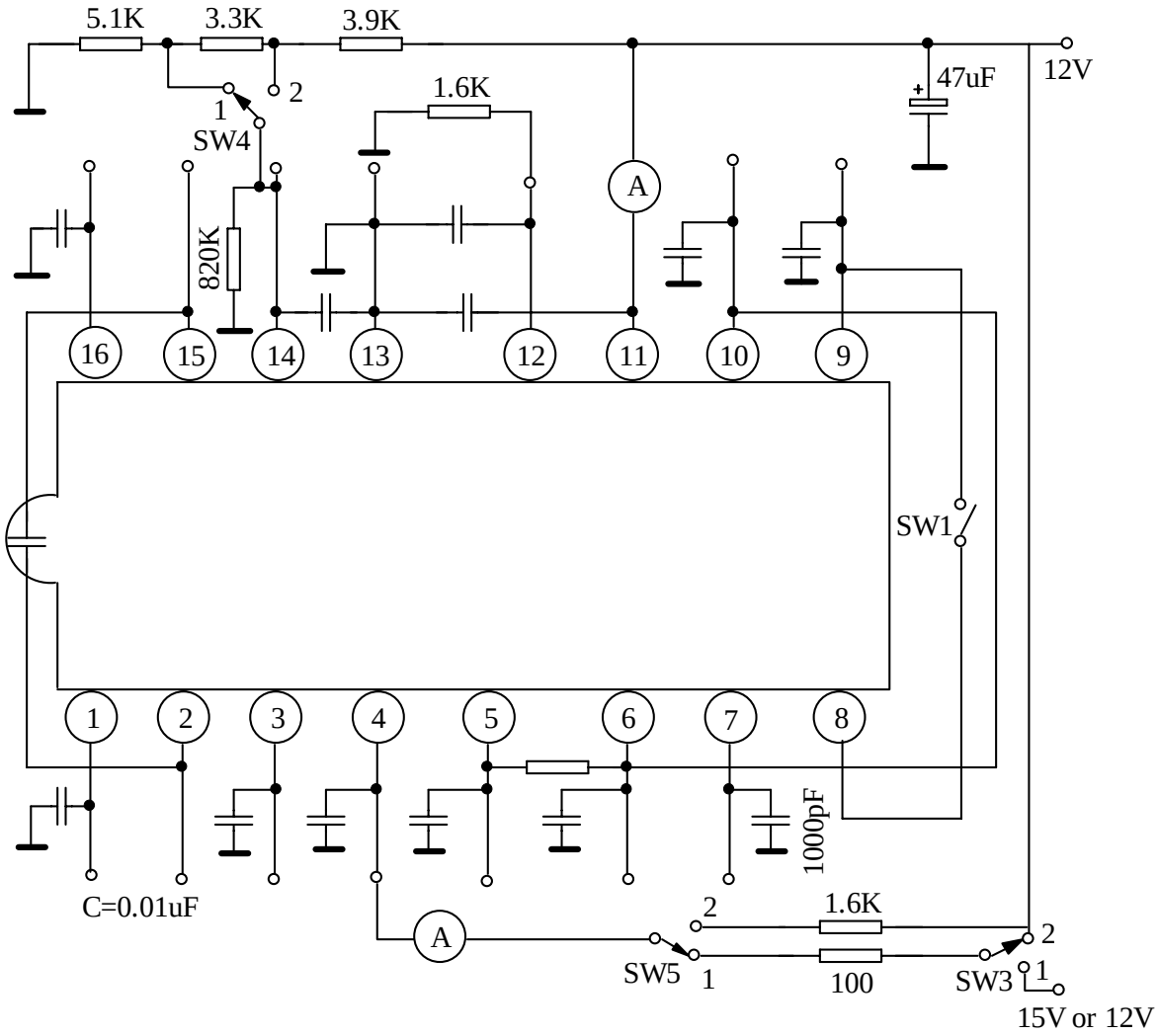
    Input Level V_{INS}=80dBμ

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

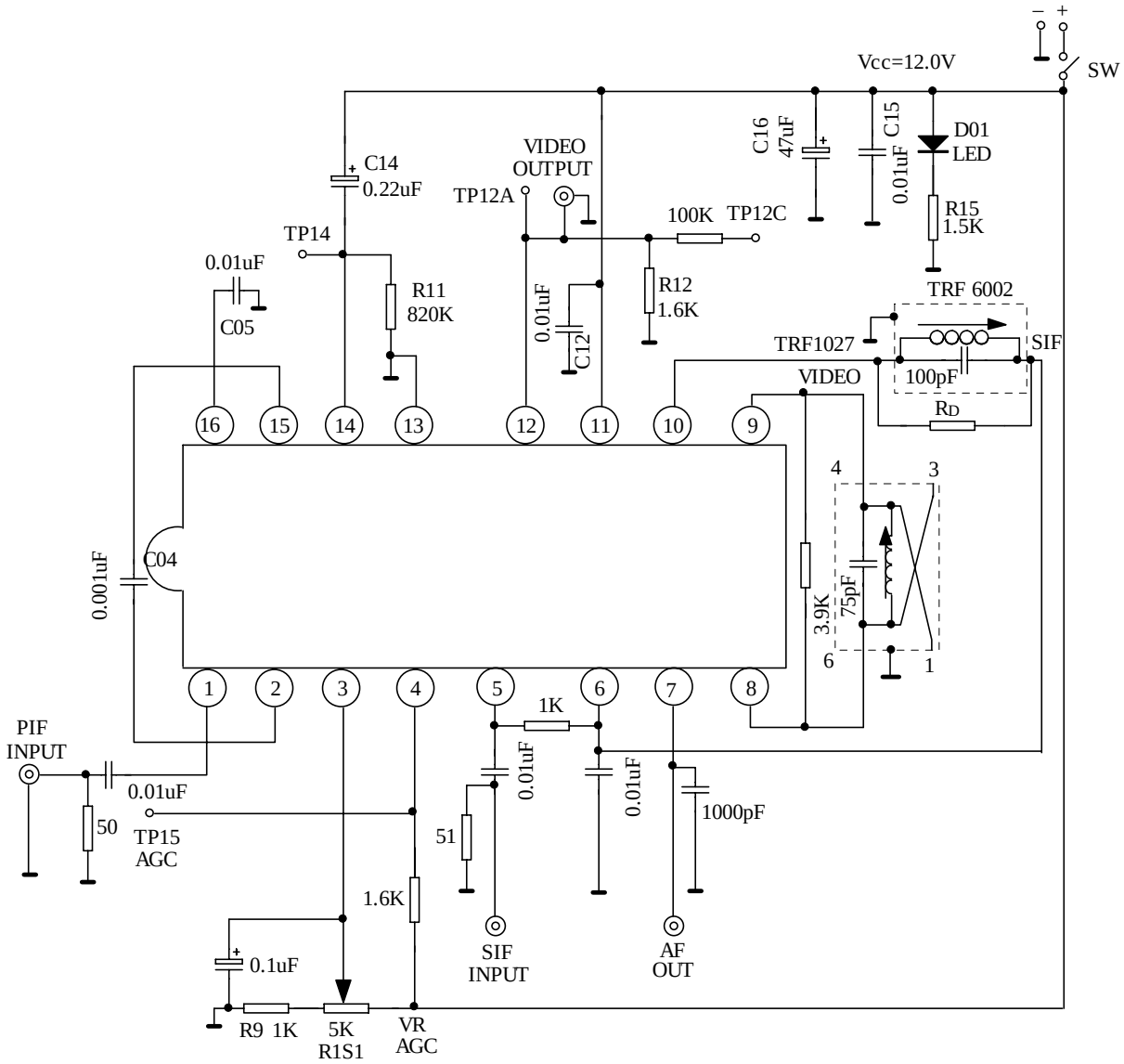
    (2) Then , adjust R_X so that the detected output voltage will be V_{OI}/2 and measure R_X.

TEST CIRCUIT

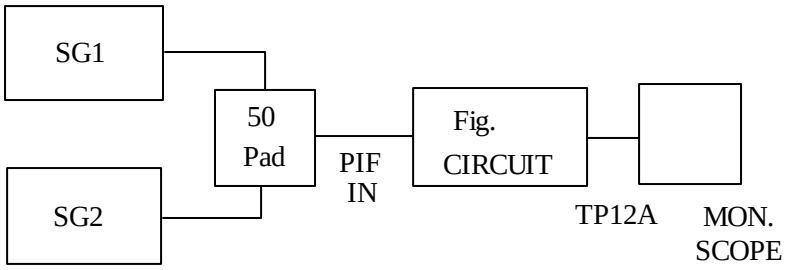
1.DC TEST CIRCUIT



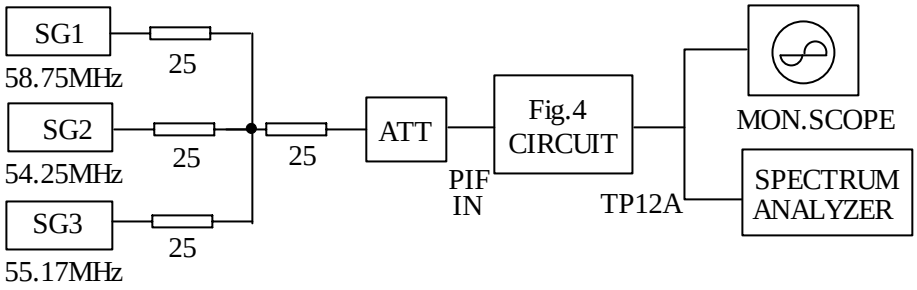
2.AC TEST CIRCUIT



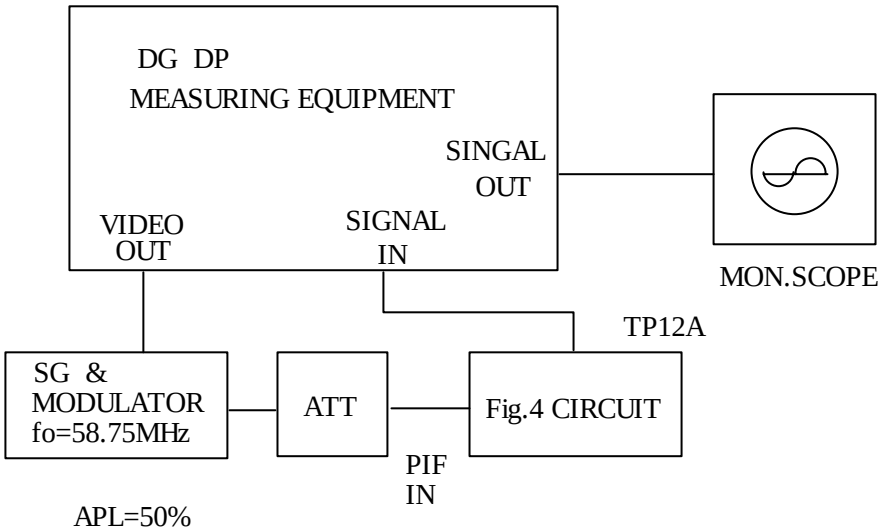
3.VIDEO FREQUENCY RESPONSE & SIF OUTPUT VOLTAGE TEST CIRCUIT



4.INTER MODULATION TEST CIRCUIT



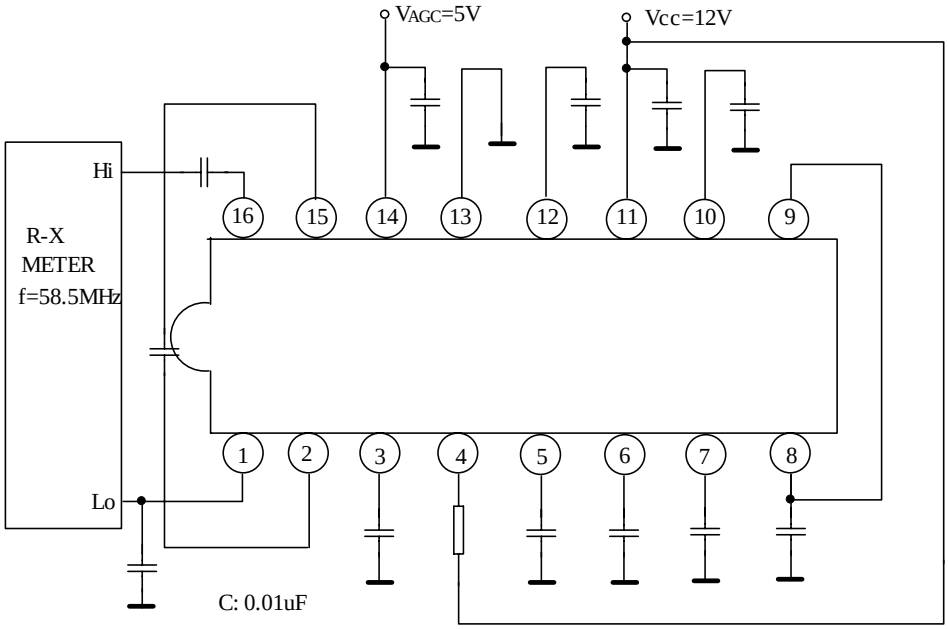
5.DC,DP TEST CIRCUIT



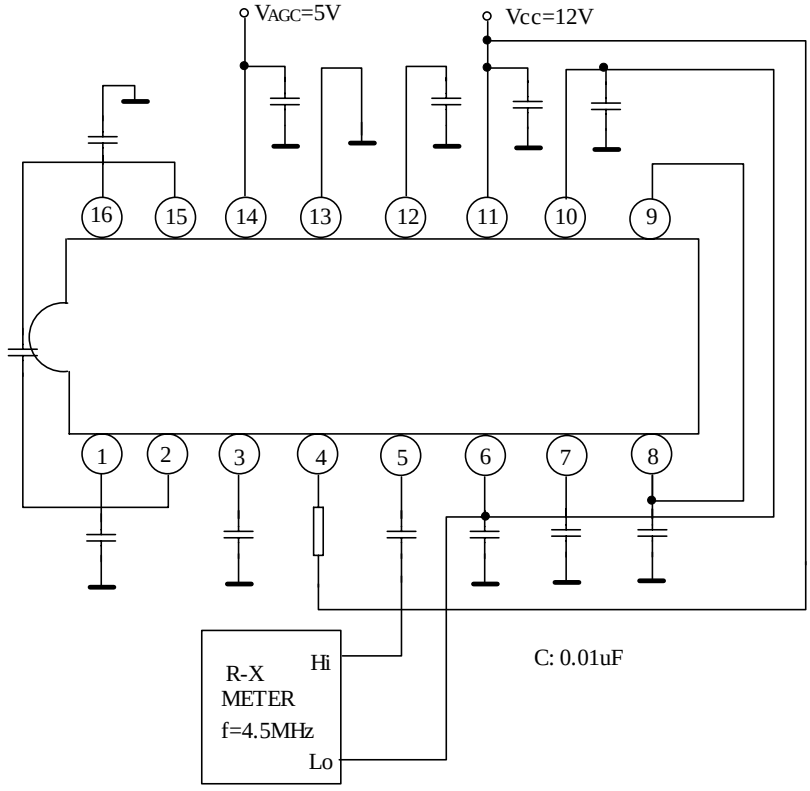
APL=50%

ATT:ADJUST SYNC TIP LEVEL to DC2.5V

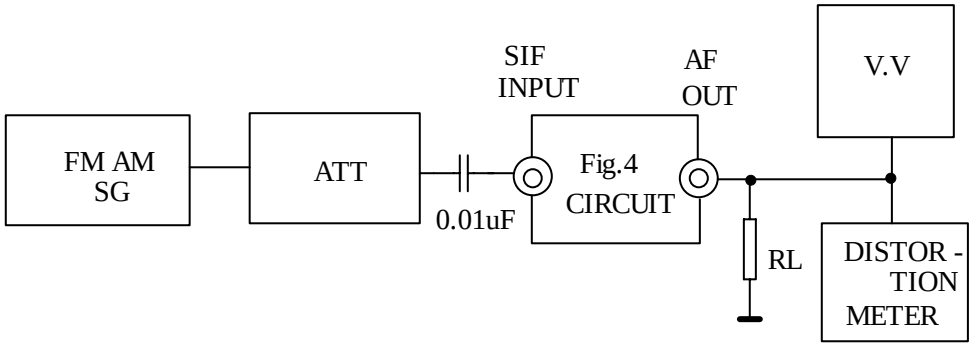
6.PIF INPUT IMPEDANCE TEST CIRCUIT



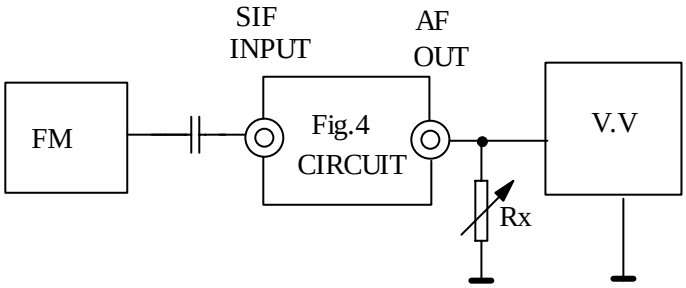
7.SIF INPUT IMPEDANCE TEST CIRCUIT



8.VIN(LIM), AMR ,VOD , THD ,VOM TEST CIRCUIT



9.AUDIO OUTPUT IMPEDANCE TEST CIRCUIT



APPLICATION CIRCUIT