

# TA7678

# LINEAR INTEGRATED CIRCUIT

## VIDEO AND SOUND IF AMPLIFIER FOR MONOCHROME TV RECEIVERS

### DESCRIPTION

The Contek TA7678 is a monolithic integrated circuit designed for the VIF and SIF stage in B/W television receivers. The UTC TA7678 is used for forward AGC Type.

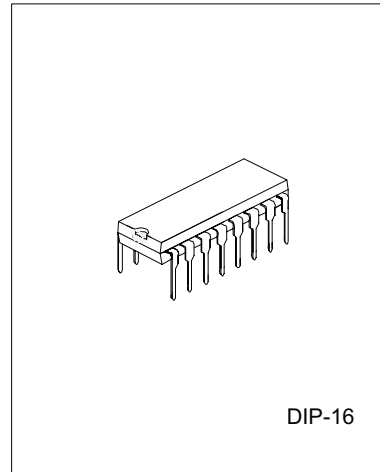
### FEATURE

#### VIF STAGE

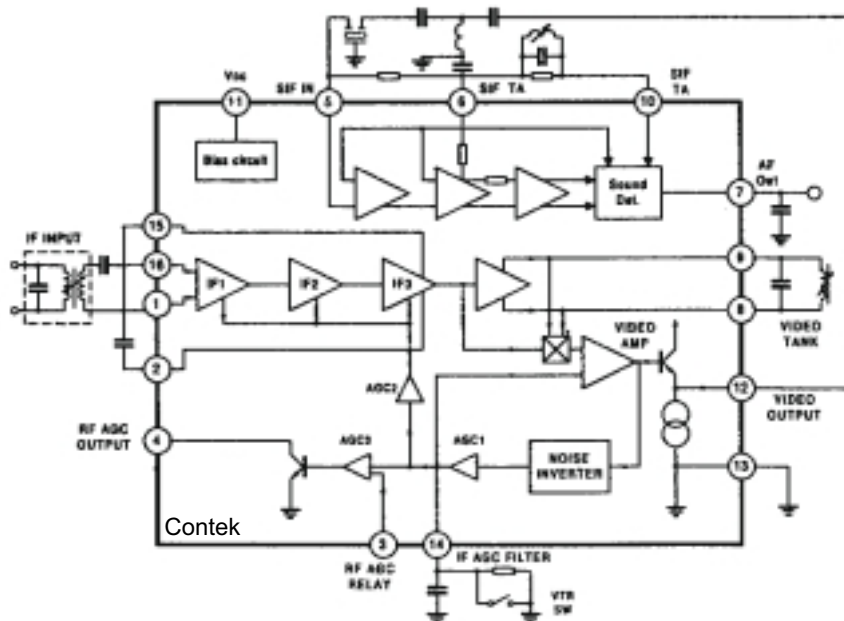
- \*High gain wide band IF amplifier 50dB at 45MHz
- \*Gain reduction with excellent stability: 55dB at 45MHz
- \*Excellent DG/DP and S/N characteristics

#### SIF STAGE

- \*Excellent limiter characteristics
- \*Excellent AM Rejection
- \*Large undistorted audio output voltage with quadrature detector



### BLOCK DIAGRAM



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## ABSOLUTE MAXIMUM RATINGS(Ta=25 C)

PARAMETER	SYMBOL	VALUE	UNIT
Supply Voltage	Vcc	15	V
Open Loop Voltage	V4	15	V
Video DC output current (note)	V12	6	V
Operating Temperature	Topr	-20 to +65	C
Storage Temperature	Tstg	-55 to 155	C
Power dissipation	PD	1.4	W

## ELECTRICAL CHARACTERISTICS(Ta=25 C,Vcc=12V,fp=45.75MHz,unless otherwise specified)

PARAMETER	TEST CIRCUIT	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Recommended Supply Voltage		Vcc		10.8	12	13.2	V
Quiescent circuit current	1	Iccq	S1:ON,S3:2,S5:2,S4:1	35	50	65	mA
Video DC output	1	V12	S1:OFF,S3:2,S5:2,S4:1	5.2	5.5	5.8	V
Terminal 5 voltage	1	V5	S1:ON,S3:2,S5:2,S4:1	3.5	4.4	5.3	V
Terminal 7 voltage	1	V5	S1:ON,S3:2,S5:2,S4:1	4.6	6.0	7.2	V
RF AGC Residual Output Voltage	1	V4(sat)	S1:OFF,S3:2,S5:2,S4:1			0.5	V
RF AGC Leak Current	1	I4(leak)	S1:OFF,S3:1,S5:2,S4:1			1	μA
Video sensitivity	2	SVI	Note 1	60	150	250	μVrms
AGC Range	2	V <sub>AGC(IF)</sub>	Note 2	60	64		dB
Sync Tip Level Voltage (pin12)	2	V <sub>sync</sub> (pin12)	Note 3	2.3	2.5	2.7	V
Maximum IF Input Voltage	2	V <sub>I(MAX)</sub>	Note 4	100	120		mVrms
White Noise Threshold (pin12)	2	V <sub>WTH</sub> (pin12)	Note 5	5.8	6.2	6.6	V
White Noise Clamp Level (pin12)	2	V <sub>WCL</sub> (pin12)	Note 5	3.7	4.1	4.5	V
Black Noise Threshold (pin12)	2	V <sub>BTH</sub> (pin12)	Note 5	1.4	1.6	1.8	V
Black Noise Clamp Level (pin12)	2	V <sub>BCL</sub> (pin12)	Note 5	2.9	3.3	3.7	V
Video Frequency Response	3	Gv(IF)	Note 6	4.5	5.5		MHz
Suppression of carrier	4	CL	Note 7	40	50		dB
Suppression of 2 <sup>nd</sup> Carrier	4	I2nd	Note 8	40	50		dB
920kHz Beat level	4	I920	Note 9	33	38		dB
Differential Gain	5	DG	Note 10		7	10	dB
Differential Phase	5	DP	Note 10		3.5	5	C
VIF Input Impedance	6	RIN	Note 11	1.5	3.0	6.0	k
		CIN			3.0	10.0	pF
Maximum Available Current	1	I4(MAX)	Note 12	7			mA
RF AGC delay Point Range	2	Vin(delay)	Note 13	5.0	7.0	9.0	V
Video output level	2	Vo0	Note 14	2.25	2.5	2.75	V



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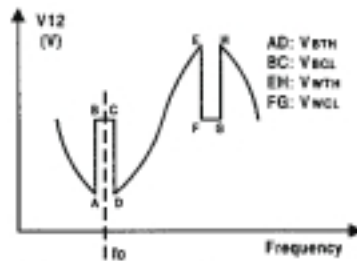
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SIF STAGE ( $T_a=25^\circ\text{C}$ ,  $V_{CC}=12\text{V}$ ,  $f_o=45.75\text{MHz}$ , unless otherwise specified)

PARAMETER	TEST CIRCUIT	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
SIF Output Voltage	3	VSO	Note 15	200	400	600	mVrms
Input limiting voltage	8	$V_i(\text{lim})$	Note 16	200	400		$\mu\text{Vrms}$
AM Rejection Ratio	8	AMR	Note 17	40	45		dB
Recovered Output Voltage	8	VOD	Note 18	0.5	0.75		Vrms
Total Harmonic distortion	8	THD	Note 18		1.0	2.0	%
Maximum Audi Output Voltage	8	VOM	Note 19	4.0			Vp-p
SIF Input Impedance	7	RIN(SIF)		10	20	30	$\text{k}\Omega$
		CIN(SIF)			3	10	pF
Audio Output Impedance	9	RO(AF)	Note 20	10	15	20	$\text{k}\Omega$

**Note:**

- $V_{AGC}=11.5\text{V}$ , VIF Input : 45.5MHz, 1kHz, 30 AM Modulation. Adjust VIF input  $V_i$  level so that the detected output of Pin 12 with high impedance probe will be 0.8Vp-p and measure the input Level.
- $V_{AGC}=4\text{V}$ . Measure VIF input level  $v_i$  is same as note 1  $\Delta A=20\log(V_i/V_i)(\text{dB})$
- VIF input :  $f=45.75\text{MHz}$  CW 15mVrms. Measure the DC level of Pin12.
- VIF Input :  $f=45.75\text{MHz}$  APL 100%. 87.5% AM Modulation. Pin 14 Open
  - Adjust VIF input level 50mVp-p and measure the detected output level  $V_o(\text{p-p})$
  - Then increase the input level so that the detected output level will be  $1.1 * V_o(\text{p-p})$  and measure the input level.
- $V_{AGC}=8\text{V}$ . VIF input :  $f=45.75\text{MHz} \pm 10\text{MHz}$  variable or sweep 15mVrms measure DC level of Pin12.



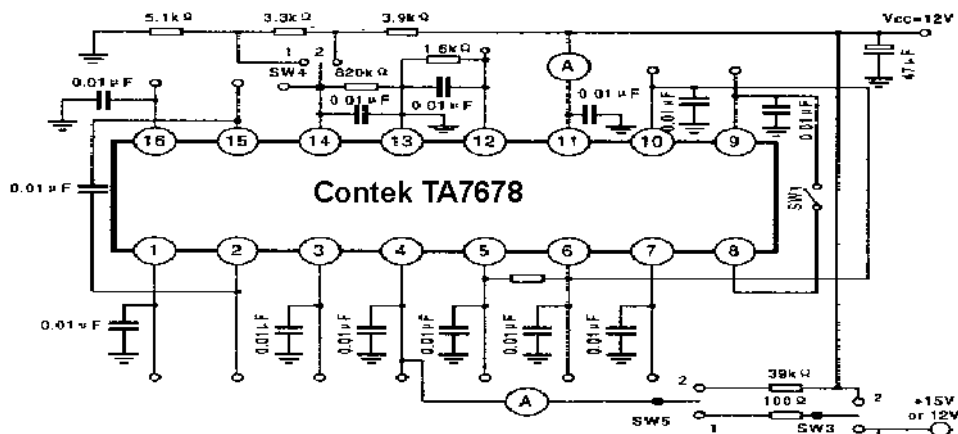
- $V_{AGC}=8\text{V}$ . SG1:45.75MHz CW. SG2:45.65~27MHz variable.
  - Setting output of SG1 so that the DC level of Pin12 will be
  - Setting output of SG1(45.65MHz) so that the AC level of Pin12 will be 0.5Vp-p.
  - Decreasing frequency of SG2 until the AC level of Pin 12 will be 0.35vp-p(-3dB of 0.5Vp-p) then read  $F_{SG2}=F$ ,  $f_{BW}=45.75-F$  MHZ
- SG1:45.75MHz, 1kHz 80% AM Modulation 100mVrms. SG2, SG3:OFF. Setting  $V_{AGC}$  so that the output AC level of Pin12 will be 2.7Vp-p. Measure CL of Pin12 after setting to 0% AM of SG1.
- Measure 2<sup>nd</sup> of Pin12 same as note 9.

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9.  $V_{AGC}=8V$ . SG1 :45.75MHz(P:picture) 100mVrms, SG2:41.25MHz(S: Sound) 32mVrms(-10dB of SG1),SG3:42.17MHz(C:Chroma) 32mVrms(-10dB of SG1)
  - 9.1. Setting  $V_{AGC}$  so that the output Pin12 will be 3.0V DC.
  - 9.2. Measure the level difference between the C-level and 920kHz.
10.  $V_{AGC}=8V$ . VIF Input : f=45.75MHz video signal (RAMP) 87.5% AM 100mVp-p. Setting ATT so that the SYNC TIP level of Pin12 will be 2.5VDC measure DP and DG.
11.  $V_{AGC}=5V$ . f=45.75MHz. Measure RIN and CIN.
12. S1=ON, S3=2,S5=1,S4=2
13. Pin 14 open. VIF Input : 45.75MHz CW 20mVrms.
  - 13.1. Adjust the voltag of Pin 3 so that the voltage of Pin4 will be 6.0V DC.
  - 13.2. Measure the Pin 3.
14. Pin 14 open. VIF Input: 45.75MHz 100% APL 87.5% AM Modulation signal amplitude 50mVp-p measure the detected output voltage (white peak to SYNC TIP)
15. PIN14: Op en. SG1 :45.75MHz CW 100mvrms. SG2 :41.25MHz CW 25mVrms. Measre SIF(4.5MHz) output voltage at Pin12.
16. SIF input: f=4.5MHz FM fMOD=400Hzm  $\Delta f=+-25kHz$ 
  - 16.1. Adjust SIF input level 100mVp-p and measure the detected output level Vos.
  - 16.2. Then decrease the iinput level so that the detected output level will be 3dB down of Vos and measure the input level.
17. SIF input: f=4.5MHz, FM fMOD=400Hz  $\Delta f=+-25kHz$ . AM 30%,input level Vins=80dB $\mu$ .
18. SIF input: f=4.5MHz, fM fMOD=400Hz  $\Delta f=+-25kHz$ . Input level Vins=80dB $\mu$
19. SIF input: f=4.4~4.6MHz variable or sweep measure the outjput DC voltage change.
20. SIF input : f=4.5MHz, FM FMOD=400Hz  $\Delta f=+-25kHz$ , input level Vins=80dB $\mu$ .
  - 20.1. Measure the detected output voltagae vOA with Rx= .
  - 20.2. Then, adjust Rx so that the d etected output voltage will be VOA/2 and measure Rx.

## 1. DC TEST CIRCUIT



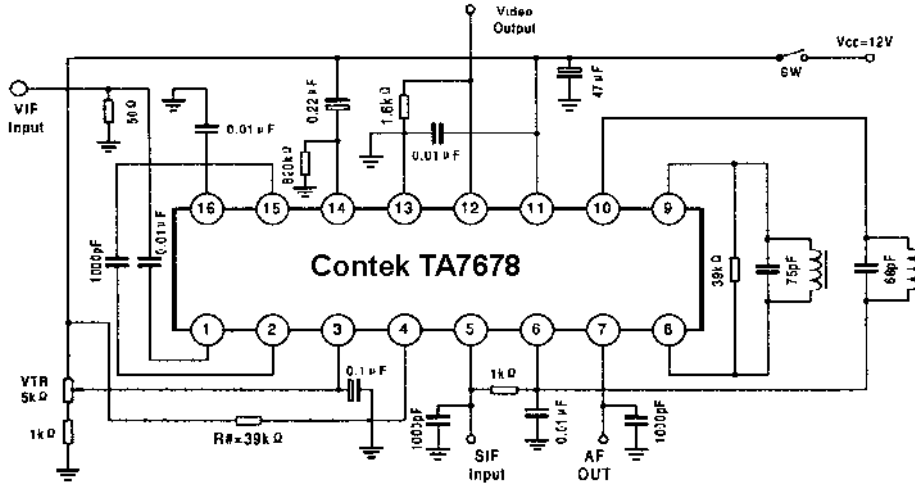
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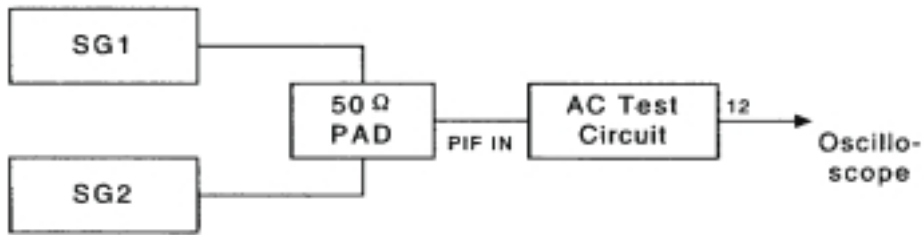
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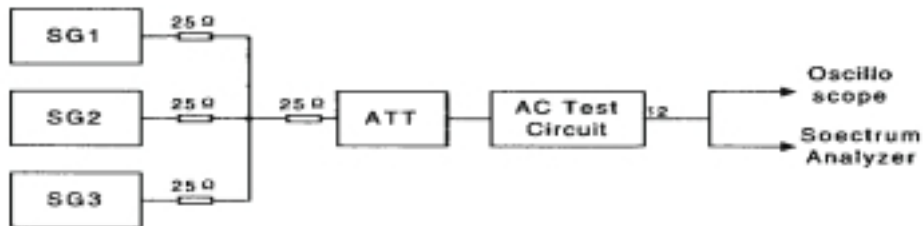
## 2. AC TESTS CIRCUIT



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



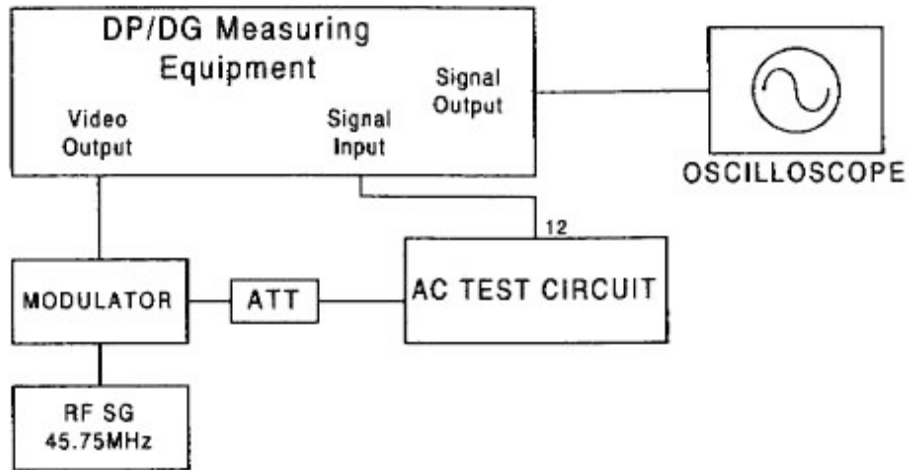
## 4. INTER MODULATION TEST CIRCUIT



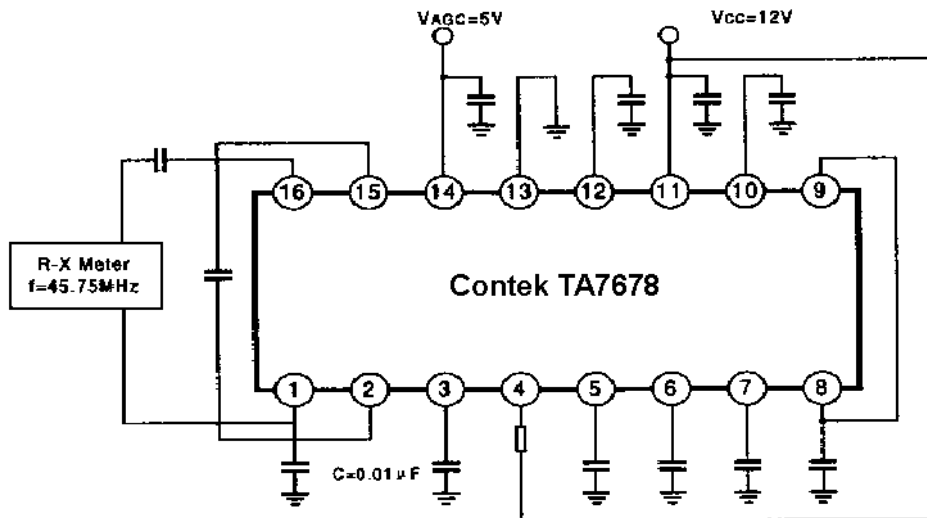
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## 5. DG,DP TEST CIRCUIT



## 5. INPUT IMPEDANCE TEST CIRCUIT



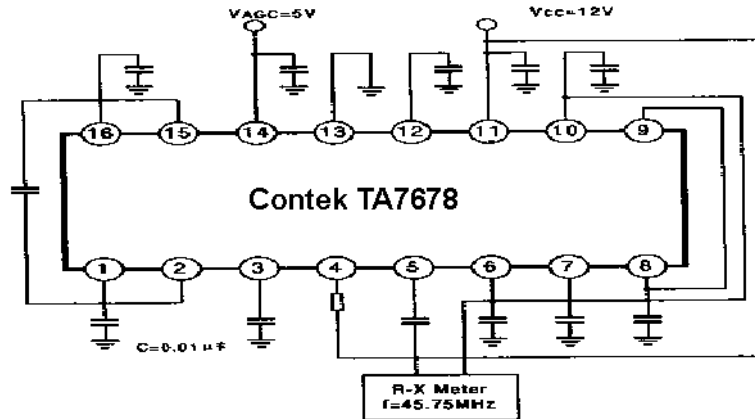
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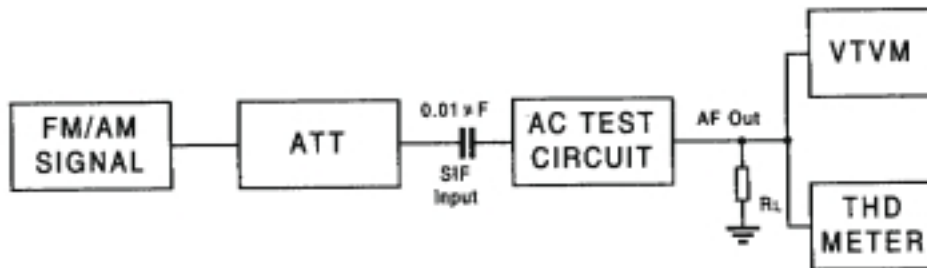
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## 7. SIF INPUT IMPEDANCE TEST CIRCUIT



## 8. V<sub>IN(LIM)</sub>, AMR, V<sub>OD</sub>, THD, V<sub>OM</sub> TEST CIRCUIT



## 9. AUDIO OUTPUT IMPEDANCE TEST CIRCUIT

