

TA8611AN

Unit: mm

VIDEO AND SOUND IF FOR TV SET

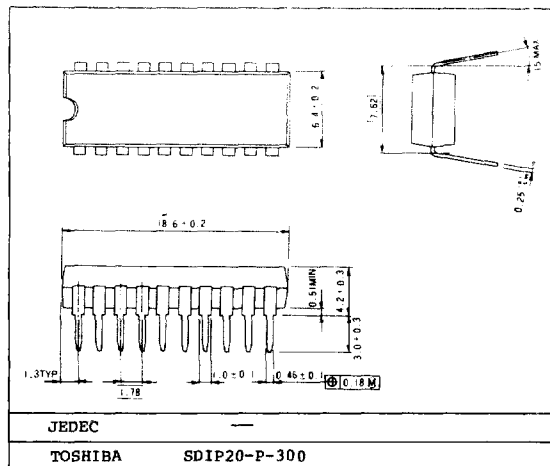
FUNCTION

PIF

- 3-stage IF amplifier
- Video detector
- Black/white noise inverting circuits
- Single AFT output
- Fast response AGC (peak) with dual time constants
- Reverse RF AGC

SIF

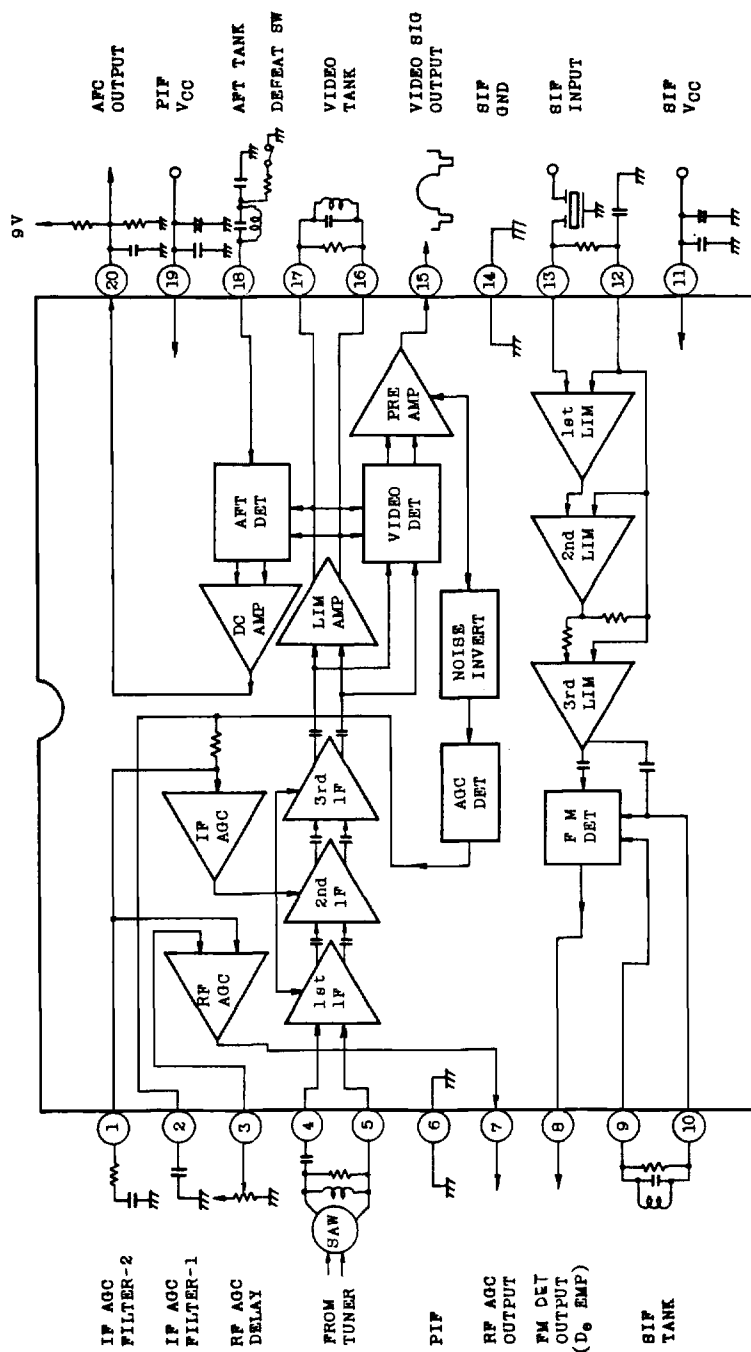
- Quadrature detector

MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

ITEM	SYMBOL	RATING	UNIT
Power Supply Voltage	V_{CC} MAX	12	V
Power Dissipation	P_D	1.4	W
Input Signal Voltage	e_{in} MAX	5	Vp-p
Operating Temperature	T_{opr}	-20 to 75	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to 150	$^\circ\text{C}$

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BLOCK DIAGRAM



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ELECTRICAL CHARACTERISTICS

DC CHARACTERISTICS (Ta = 25°C, V_{CC} = 9V)

ITEM		SYMBOL	TEST CIRCUIT	TEST CONDITIONS	MINI- MUM	TYPI- CAL	MAXI- MUM	UNIT
Recommended Supply Voltage		V _{CC}	—		8.1	9	9.9	V
Supply Current		I _{CC}	1		32	47	63	mA
Terminal Voltage	3	V ₃	1	SW ₄ : a	—	6	—	V
	4	V ₄	1		3.6	4.0	4.4	V
	5	V ₅	1		3.6	4.0	4.4	V
	7	V ₇₍₁₎	1	SW ₁ : c, SW ₄ : b	8.8	—	—	V
		V ₇₍₂₎	1	SW ₁ : c, SW ₄ : c	—	—	0.1	V
	8	V ₈	—		3.7	4.2	4.7	V
	9	V ₉	1		5.3	5.8	6.3	V
	12	V ₁₂	1		1.7	2.3	2.8	V
	13	V ₁₃	1		1.7	2.3	2.8	V
	15	V ₁₅	1		4.0	4.5	5.0	V
	16	V ₁₆	1		5.6	6.2	6.8	V
	17	V ₁₇	1		5.6	6.2	6.8	V
	18	V ₁₈	1		3.6	4.0	4.4	V
	20	V ₂₀	1		3.3	4.5	5.7	V

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AC CHARACTERISTICS (Ta = 25°C, VCC = 9V)

ITEM	SYMBOL	TEST CIRCUIT	TEST CONDITIONS	MINI-MUM	TYPI-CAL	MAXI-MUM	UNIT
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PIF

Video Sensitivity	v_{in} MIN	2		50	100	200	μV_{rms}
Maximum IF Input Voltage	v_{in} MAX	2		100	120	—	mV _{rms}
IF AGC Range	ΔA	2		60	64	—	dB
Differential Gain	DG	3		—	—	10	%
Differential Phase	DP	3		—	—	5	deg
VIDEO DC Output Voltage		2		4.0	4.5	5.0	V
Sync Tip Level Voltage	V _{SYNC}	2		1.5	2.0	2.5	V
VIDEO Output Level	V _{OUT}	2		1.7	2.0	2.3	V
White Noise Threshold	V _{WTH}	2		—	5.2	—	V
White Noise Clamp Level	V _{WCL}	2		—	3.5	—	V
Black Noise Threshold	V _{BTH}	2		—	1.5	—	V
Black Noise Clamp Level	V _{BCL}	2		—	3.0	—	V
Suppression of Carrier	CL	2		40	—	—	dB
Suppression of 2nd Carrier	I _{2nd}	2		40	—	—	dB
AFT Sensitivity	$\Delta F/\Delta V_{20}$	2		—	15	26	kHz/V
AFT Output Voltage	MIN. V_L	2		—	1.0	1.5	V
	MAX. V_U			7.5	8.0	—	
Suppression of Sound Carrier/Color Subcarrier	I ₉₂₀	4		30	38	—	dB

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ITEM	SYMBOL	TEST CIRCUIT	TEST CONDITIONS	MINI- MUM	TYPI- CAL	MAXI- MUM	UNIT
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SIF

Recovered Output Voltage	V_{OD}	5		250	360	—	mV _{rms}
Input Limiting Voltage	V_{INLIM}	5		—	200	400	μV_{rms}
AM Rejection Ratio	AMR	5		40	—	—	dB
Detector Band Width 1	$\pm \Delta f_G$	5	Output: -3 dB of V_{OD}	60	80	—	kHz
Detector Band Width 2	$\pm \Delta f_D$	5	Total Harmonic Distortion = 1.5%	50	70	—	kHz

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TEST CONDITION

NOTE 1) PIF IN; $f = 58.75$ MHz, $f_m = 1$ kHz, 30% AM Modulation

Adjust PIF input level so that the detected output of P15, measured with a high-impedance probe, becomes 0.6 V_{p-p}; then measure the input level.

NOTE 2) Measure PIF input level v_1 , v_2 the same as NOTE 1).

V1: Apply 9V to P1

V2: Apply 3V to P2

$$\Delta A = 20 \log (v_1/v_2) \text{ [dB]}$$

NOTE 3) Gain Reduction = 40 dB

PIF IN; CW $f = 58.75$ MHz APL 50%, 87.5% AM Modulation.

(1) Adjust ATT so that the sync tip level of P15 becomes 2.0V DC.

(2) Measure DP and DG.

NOTE 4) PIF IN; No Signal

Measure output level of P15.

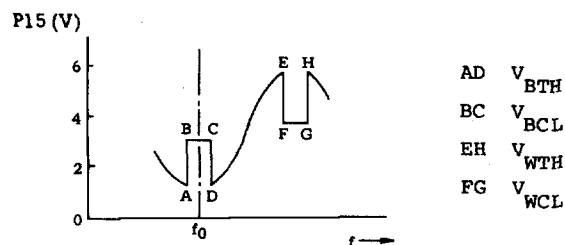
NOTE 5) PIF IN; $f = 58.75$ MHz CW 15 mV_{rms}

Measure DC level of P15.

NOTE 6) PIF IN; $f = 58.75$ MHz 100% APL 15 mV_{rms}

Measure detected output voltage.

NOTE 7) PIF IN; $f = 58.75$ MHz ± 10 MHz variable or sweep 15 mV_{rms}; measure DC level of P15.



NOTE 8) PIF IN; 58.75 MHz, 1 kHz 87.5% AM Modulation 15 mV_{rms}.

(1) Adjust VAGC so that output AC level of P15 becomes 2.0 V_{p-p}.

(2) Measure CL of P15 after setting 0% AM of SG.

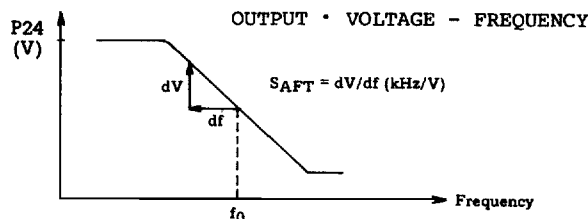
NOTE 9) Measure I 2nd carrier of P15 the same as NOTE 8).

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NOTE 10) PIF IN; SG = variable, 15 mV_{rms} CW

(1) P24 DC voltage will be 4.5V.

(2) Apply SG signal to P4 and measure P24 voltage change as shown below.



NOTE 11) SG1; 58.75 MHz (P; Picture) 15 mV_{rms}.

SG2; 54.25 MHz (S; Sound) -6 dB of SG1

SG3; 55.17 MHz (C; Chroma) -6 dB of SG1

(1) Adjust VAGC so that the output tip level of P15 becomes 2.0V DC.

(2) Measure the level difference [dB] between C-level and 920 kHz level.

NOTE 12) SIF IN; fm = 400 Hz 25 kHz dev. 100 dB_μ FM Modulation

Measure the output level at P8.

NOTE 13) SIF IN; fm = 400 Hz 25 kHz dev. 100 dB_μ FM Modulation

Decrease the input level so that the detected output level will drop to 3 dB less than P8; then measure the input level.

NOTE 14) SIF IN; f = 4.5 MHz, 100 dB

(1) FM: $\Delta f = 25$ kHz, fm = 400 Hz

(2) AM: 30%, fm = 400 Hz

NOTE 15) SIF IN; f = 4.5 MHz 7.5 kHz dev. 100 dB_μ

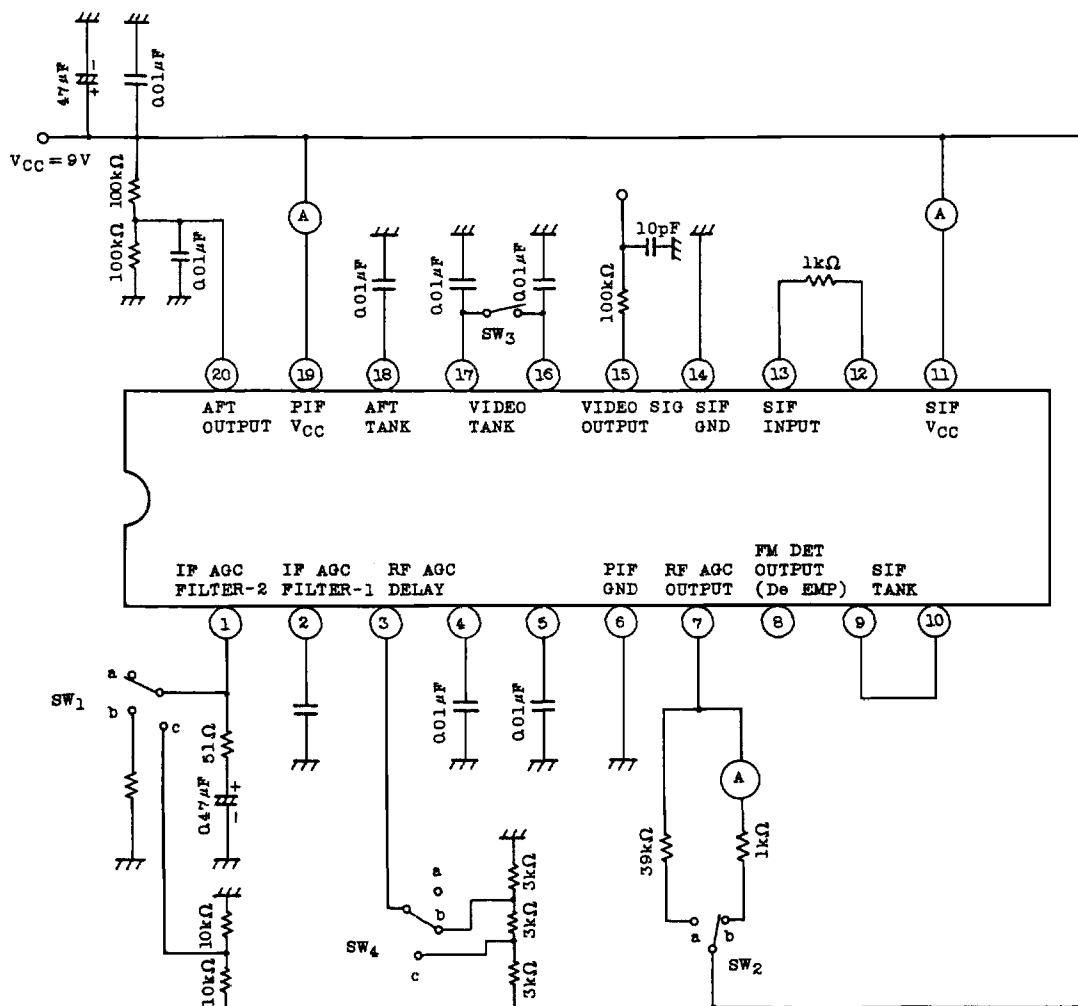
Vary the frequency so that the detected output level will drop to 3 dB less than the peak; then measure the carrier frequency.

NOTE 16) Adjust SIF IN so that the detected output level of Harmonic Distortion becomes 1.5%; then measure the carrier frequency the same as NOTE 15).

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TEST CIRCUIT

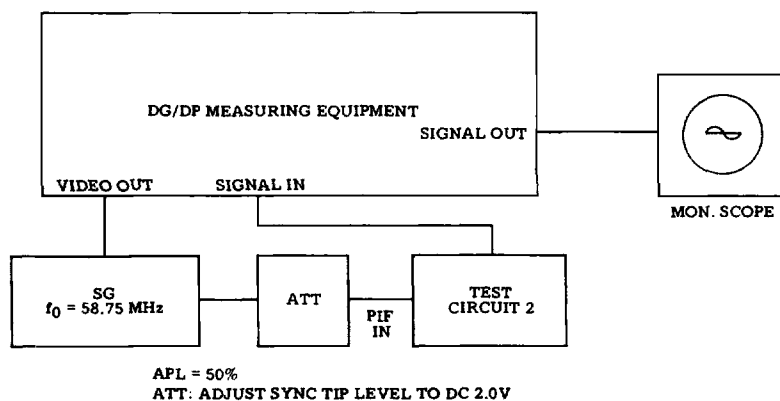
1. DC CHARACTERISTICS



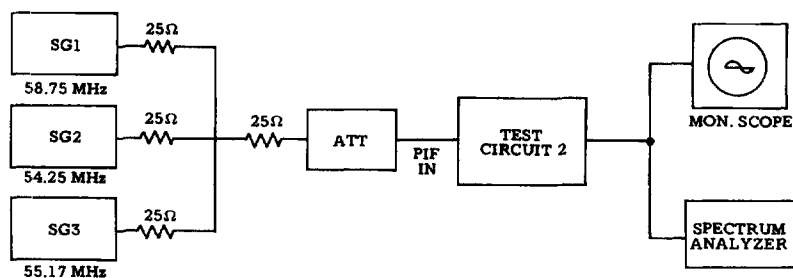
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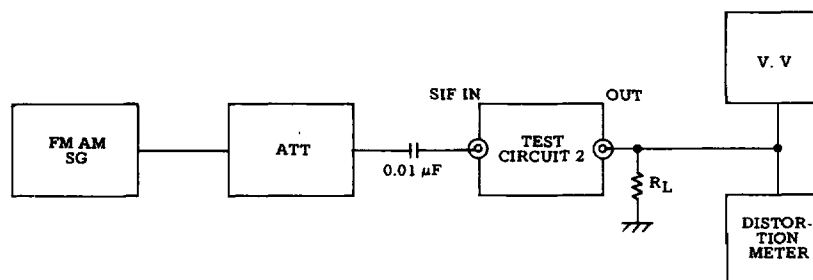
3. DG. DP



4. INTERMODULATION



5. $V_{IN(LIM)}$, AMR, V_{OD} , Δf_G , Δf_D



The schematic diagram illustrates a radio receiver circuit powered by a 9V and 12V supply. The circuit is divided into several functional sections:

- IF AGC Section (Pins 1-3):** Includes IF AGC FILTER-2 (Pin 1), IF AGC FILTER-1 (Pin 2), and RF AGC DELAY (Pin 3). Components include a 390Ω resistor, a 0.47μF capacitor, a 0.036μF capacitor, and a 0.001μF capacitor.
- PIF IN Section (Pins 4-5):** Includes PIF IN (Pin 4) and PIF GND (Pin 5). Components include a 1.5kΩ resistor and a 0.01μF capacitor.
- RF AGC OUTPUT Section (Pins 6-7):** Includes RF AGC OUTPUT (Pin 6) and FM DET OUTPUT (Pin 7). Components include a 220Ω resistor and an 820pF capacitor.
- FM DET OUTPUT Section (Pins 8-9):** Includes FM DET OUTPUT (Pin 8) and SIF TANK (Pin 9). Components include a 1.5kΩ resistor, a 0.01μF capacitor, and a 0.051μF capacitor.
- SIF TANK Section (Pin 10):** Includes SIF TANK (Pin 10). Components include a 5.6kΩ resistor and a TRF6002 integrated circuit.
- PIF GND Section (Pin 6):** Includes PIF GND (Pin 6).
- RF AGC OUTPUT Section (Pin 7):** Includes RF AGC OUTPUT (Pin 7).
- FM DET OUTPUT Section (Pin 8):** Includes FM DET OUTPUT (Pin 8).
- SIF TANK Section (Pin 9):** Includes SIF TANK (Pin 9).
- SIF VCC Section (Pin 11):** Includes SIF VCC (Pin 11). Components include a 4.7μF capacitor and a 330μF capacitor.
- SIF INPUT Section (Pin 12):** Includes SIF INPUT (Pin 12). Components include a 1kΩ resistor, a 0.01μF capacitor, and a 24μF capacitor.
- SIF GND Section (Pin 13):** Includes SIF GND (Pin 13). Components include a 4.5MΩ resistor, a 47pF capacitor, and a 1kΩ resistor.
- VIDEO OUTPUT Section (Pin 14):** Includes VIDEO OUTPUT (Pin 14). Components include a 3.6kΩ resistor and a 15μF capacitor.
- VIDEO TANK Section (Pin 16):** Includes VIDEO TANK (Pin 16). Components include a 5.6kΩ resistor and a TRF1027 integrated circuit.
- AFT TANK Section (Pin 18):** Includes AFT TANK (Pin 18). Components include a 10pF capacitor and a TRF1028 integrated circuit.
- PIF VCC Section (Pin 19):** Includes PIF VCC (Pin 19). Components include a 0.01μF capacitor and a 47μF capacitor.
- AFT OUTPUT Section (Pin 20):** Includes AFT OUTPUT (Pin 20). Components include a 100kΩ resistor and a 1000pF capacitor.

The circuit also includes a 12V power supply section with a 0.01μF capacitor, a 5.6kΩ resistor, a 25C388 integrated circuit, a 360Ω resistor, a 91Ω resistor, a 430Ω resistor, and a 10μF capacitor.