INTEGRATED CIRCUIT **TOSHIBA** TECHNICAL DATA

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT TA8712N, TA8796N SILICON MONOLITHIC

PIF QIF SYSTEM FOR TV

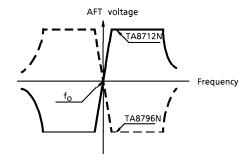
FEATURES

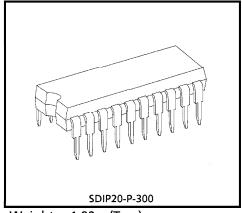
PIF section

- 3-stage variable gain PIF amplifier
- High-speed response AGC with dual time constants
- Single end AFT output with defeat function
- Delayed RF AGC output (Reverse AGC)
- Black/White noise inverter
- The AFT polarity of TA8712N different from TA8796N

OIF section

- Intercarrier demodulation section by the same configuration as PIF section.
- Independent average AGC circuit



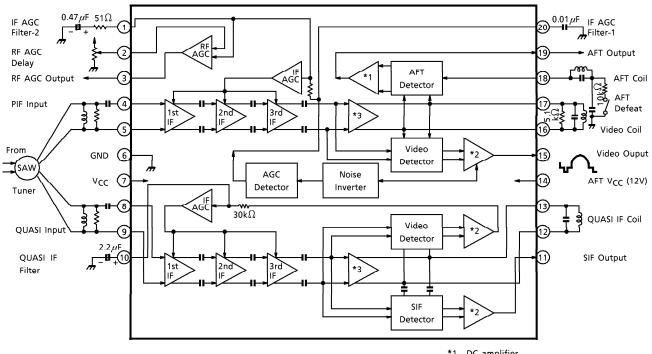


Weight: 1.02g (Typ.)

The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others. These TOSHIBA products are intended for use in general commercial applications (office equipment, communication equipment, measuring equipment, domestic appliances, etc.), please make sure that you consult with us before you use these TOSHIBA products in equipment which requires extraordinarily high quality and/or reliability, and in equipment which may involve the threatening or critical application, including by not limited to such uses as atomic energy control, airplane or spaceship instrumentation, traffic signals, medical instrumentation, combustion control, all types of safety devices, etc. TOSHIBA cannot accept and hereby discalaims liability for any damage which may occur in case the TOSHIBA products are used in such equipment or applications without prior consultation with TOSHIBA.

TECHNICAL DATA

BLOCK DIAGRAM



- *1 DC amplifier
- *2 Preamplifier
- *3 Limiter

TERMINAL FUNCTION

PIN No.	I PIN NAME I FUNCTION I INTERFACE CIRCUIT						
1 20	AGC Filter	This filter is a dual time constant system to speed up AGC. By connecting the primary filter terminal of pin 20 to GND, a picture muting is executed.	1 IF Amp. AGC Detector				
2	AGC Delay	This terminal adjusts the delay point of RF AGC by varying the reference voltage of comparator.	V _{CC} Cys 6 AGC RF Output				

TA8712N – 2
1995 – 11 – 13
TOSHIBA CORPORATION

INTEGRATED CIRCUIT

TOSHIBA

TECHNICAL DATA

TA8712N, TA8796N

PIN No.	PIN NAME	FUNCTION	INTERFACE CIRCUIT
3	RF AGC Output	Since this is an open collector output, the gain is determined by an external resistor.	VCC AGC Delay
4 5	PIF Input	This is an input terminal of PIF signal using an emitter follower. The input impedance is typical 2.5k Ω , 4pF.	25 kû de û bê û b
8 9	QIF Input	This is a quasi input terminal and connects a sound output of dual SAW filter. When not using QUASI, connect this pin to GND by capacitor.	8kΩ 4kΩ 4kΩ 4kΩ 4kΩ
10	AGC Filter	This connects QIF AGC filter. Since AGC is executed by a video signal, there is no worry about the IF amplifier saturation by the video signal even if the P/S ratio is greater like CATV.	VCC $\frac{C}{y_1}$ $\frac{C}{y_2}$
11	QUASI Output	Because SIF is detected by a video carrier of 90° phase shifted, the video signal will affect less and buzz will largely be improved.	VCC COOL

TA8712N – 3
1995 – 11 – 13
TOSHIBA CORPORATION

TECHNICAL DATA

PIN No.	PIN NAME	FUNCTION	INTERFACE CIRCUIT
12 13	QUASI Coil	In order to influence less on video signal buzz, the multiple detection is executed by a 90° phase shifter of video carrier. Connect the tuning coil circuit of carrier whose phase was 90° shifted to pins 12 and 13.	(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)
15	Video Output	This is a Video output terminal. By connecting the primary filter terminal of pin 20 to GND, a picture muting is executed.	(15) (1000) (100
16 17	Video Coil	This connects a coil for video detection.	VCC
18	AFT Coil	Supply a control signal by single end. This method is that the phase difference is treated as current and voltage is converted by an external resistor. Therefore, this can be connected to AFT using only one pin. By connecting a resistor of $5.1k\Omega$ to GND, an AFT defeat can be executed.	V _{CC} 3.3kΩ 3.3kΩ
19	AFT Output	By connecting an AFT coil pin to GND, a muting is executed.	19 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

TA8712N – 4
<u> 1995 – 11 – 13</u>
TOSHIBA CORPORATION

TECHNICAL DATA

TA8712N, TA8796N

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	Vcc	15	V
Power Dissipation	P _D (Note)	1.4	W
Operating Temperature	T _{opr}	- 20∼65	°C
Storage Temperature	T _{stg}	- 55∼150	°C

(Note) When using the device at above $Ta = 25^{\circ}C$, decrease the power dissipation by 11.2mW for each increase of 1°C.

RECOMMENDED SUPPLY VOLTAGE

	PIN No.	PIN NAME	MIN.	TYP.	MAX.	UNIT
Г	7	V _{CC}	8.1	9.0	9.9	V

ELECTRICAL CHARACTERISTICS

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

			•	·				
CHARACT	ERISTIC	SYMBOL	TEST CIR- CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Current		ICC	1	_	45	60	75	mA
Terminal Voltage	Pin 4	V ₄		_	3.5	4.0	4.5	
	Pin 5	V ₅	1		3.5	4.0	4.5	
	Pin 8	V ₈			3.5	4.0	4.5	
	Pin 9	V9			3.5	4.0	4.5] v
	Pin 11	V ₁₁			3.0	3.5	4.0	
	Pin 15	V ₁₅			4.1	4.4	4.7	1
	Pin 19	V ₁₉			5.0	6.5	8.0	

TA8712N – 5	
1995 – 11 – 13	

TECHNICAL DATA

TA8712N, TA8796N

AC CHARACTERISTICS (Unless otherwise specified, $V_{CC} = 9V$, $Ta = 25^{\circ}C$) PIF section (when using the specified video coil)

in section (which using the specimen video con,								
CHARACTERISTIC		SYMBOL	TEST CIR- CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Sensitivity		V _{IN}	2	(Note 1)	28	34	42	$dB\muV$
Sync. Tip Level Voltag	je	VSYNC	2	(Note 2)	1.5	2.0	2.5	V
AFT Sensitivity		Δf/ΔV	2	(Note 3)	_	22	30	kHz/V
AGC Range		ΔA	2	(Note 4)	60	_	_	dB
AFT Output Valtage	Max.	٧u	2	(Note 5)	7.5	8.0	_	V
AFT Output Voltage	Min.	VL]	(Note 3)	_	1.0	1.5	
Black Noise Threshold Level		V _{BTH}			_	1.5	_	
Black Noise Clamp Le	vel	V _{BCL}	2	(Note 6)	_	3.0	_	V
White Noise Threshol	d Level	V _{WTH}				5.2		
White Noise Clamp Lo	evel	VWCL			_	3.5	_	
Carrier Wave Suppression Ratio		V _{CL}	4	(Note 7)	40	50	_	dB
Secondary Harmonics Suppression Ratio		V _{2nd}	4	(Note 8)	35	50	_	dB
Differential Gain		DG	- 5	(Note 0)	_	4	7	%
Differential Phase		DP]	(Note 9)	_	3.0	5.0	۰
Innut Impodance		R _{IN}	_	_	1.0	2.5	4.0	kΩ
Input Impedance		CIN	 	_	_	3	6	pF
Intermodulation		IM	4	(Note 10)	31	58		dB

QUASI section (when using the specified quasi coil)

CHARACTERISTIC	SYMBOL	TEST CIR- CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Sensitivity	v_{IN}	2	(Note 11)	30	36	42	$dB\muV$
Gain Reduction Characteristic	GR	2	(Note 12)	60	64	_	dB
4.5MHz Output Level	V_{QD}	3	(Note 13)	400	500	_	mV _{p-p}
Input Impedance	R _{IN}	_	<u> </u>	1.0	2.5	4.0	kΩ
input impedance	CIN	_	_	_	3	6	pF
Carrier Suppression Ratio	CL			40	50	_	
Secondary Harmonic Suppression Ratio	l _{2nd}	4	Same as PIF (Note 6)	40	50	_	dB

TA8712N – 6	
1995 – 11 – 13	

TEST CONDITIONS

(Note 1) Input Sensitivity

Input : Supply the P4, f = 58.75 MHz, $f_m = 15.75 kHz$, 30% AM signal, Internal AGC. Measure the input level when the output amplitude of P15A becomes $0.6 V_{p-p}$.

(Note 2) Synchronization Tip Level

Input : Supply the P4, f = 58.75MHz, 84dB μ V, and CW. Measure DC voltage of P15.

(Note 3) AFT Sensitivity

Input : Read the variation of P19 when increase/decreasing the frequency by supplying P4, $f = 58.75 MHz \ 84 dB \mu V$, and CW.

(Note 4) AGC Range

Input : Supply the P4, f = 58.75MHz, $f_m = 15.75kHz$, 30% AM signal.

When an external AGC voltage is 8.5V and 3.0V, each input level whose output voltage will be $0.6V_{p-p}$ is treated as V_1 and V_2 .

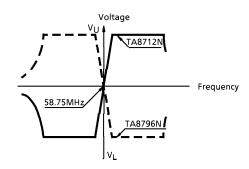
Then, calculate the following equation.

$$\Delta A = 20 \ell \text{og} \frac{V_1}{V_2}$$

(Note 5) AFT Output Voltage

Input : Measure DC voltage of P19 by varying the P4, f = 58.75 MHz, $f_m = 15.75 kHz$, 30% AM signal and internal AGC.

(Diagram below)



TA8712N – 7	
1995 – 11 – 13	

INTEGRATED CIRCUIT

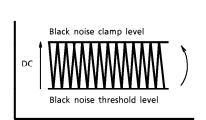
TOSHIBA

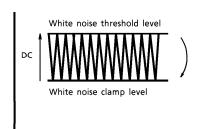
TECHNICAL DATA

TA8712N, TA8796N

(Note 6) Noise Threshold / Clamp Level

Sweep the input frequency up to external AGC 8.5V, frequency 57~63MHz and observe the output level by monitor scope.





Waveforms by monitor scope

(Note 7) Carrier Suppression Ratio

Input : Supply the P4, f = 58.75MHz, $f_m = 15.75kHz$, 30% AM signal.

Adjust so that the output can be $2V_{\mbox{\scriptsize D-D}}$ by external AGC.

Calculate the following equation by setting the modulation to 0 and measuring the output carrier level.

$$V_{CL} = 20 log \frac{2.0}{V_{CR} (V_{p-p})}$$

(Note 8) Secondary Harmonic Suppression Ratio

Calculate the secondary harmonics using the same method as note 7.

(Note 9) Differential Gain, Differential Phase

Adjust the AGC voltage so that the sync. tip level will be 2V by supplying the f = 58.75MHz, APL 50%, and 87.5% AM signal. Measure by DG or DP meter.

(Note 10) Intermodulation

 $SG_1: 58.75 MHz$ (P) $84 dB \mu V$, CW. $SG_2: 54.25 MHz$ (S) $78 dB \mu V$, CW. $SG_3: 55.17 MHz$ (C) $78 dB \mu V$, CW.

Input in combination with the above three signal and adjust the AGC voltage so that the min. D.C. voltage of output will be the same as the sync. tip level. Measure the difference between the chroma signal and 920kHz signal by spectrum analyzer.

TA8712N – 8	
1995 – 11 – 13	

TECHNICAL DATA

(Note 11) Input Sensitivity

Pin 8 input

 $SG_1: 58.75 MHz$ (P) $100 dB \mu V$, CW. $SG_2: 54.25 MHz$ (S) $90 dB \mu V$, CW.

Input in combination with the above two signals. Measure the input level so that the detection output will be half by lowering the input level gradually.

(Note 12) Gain Reduction Characteristics

Measure the input level so that the output can be $0.2V_{p-p}$ under the following external AGC supply.

Pin 10 = 8.5V Input level V_1

Pin 10 = 3.0V Input level V_2

From the above measurement value,

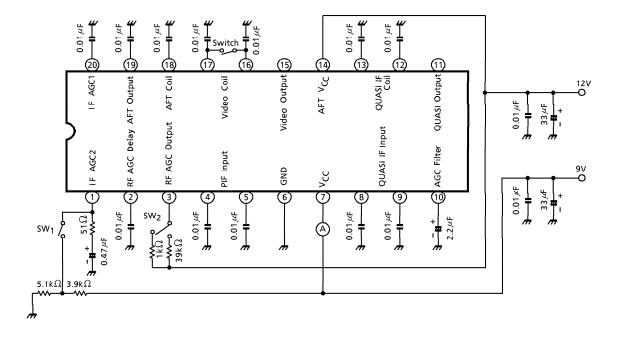
 $GR = 20log (V_1/V_2) dB$

(Note 13) 4.5MHz Output Level

Measure the output level using the same input level of note 11.

TEST CIRCUIT 1

DC characteristic



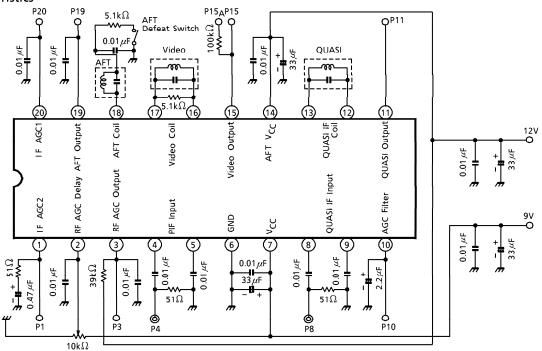
TA8712N – 9	
1995 – 11 – 13	

TECHNICAL DATA

TA8712N, TA8796N

TEST CIRCUIT 2

AC characteristics

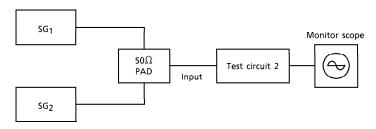


TA8712N - 10	
1995 – 11 – 13	

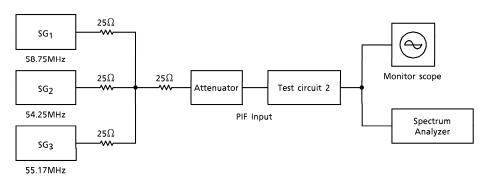
TOSHIBA

TECHNICAL DATA

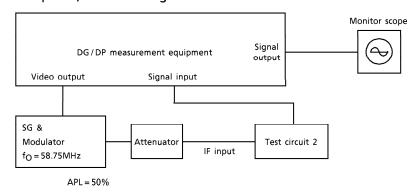
TEST CIRCUIT 3 QIF detection output VOD



TEST CIRCUIT 4 Carrier, Secondary harmonic suppression ratio, Intermodulation



TEST CIRCUIT 5 Differential phase, differential gain

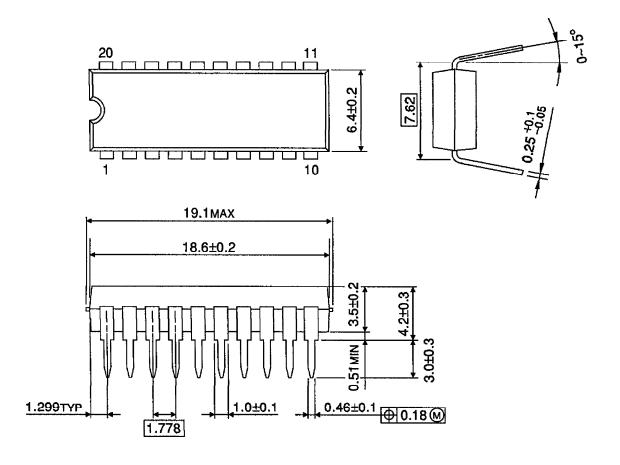


TA8712N, TA8796N

TECHNICAL DATA

OUTLINE DRAWING SDIP20-P-300

Unit: mm



Weight: 1.02g (Typ.)

TA8712N – 12*
1995 – 11 – 13