

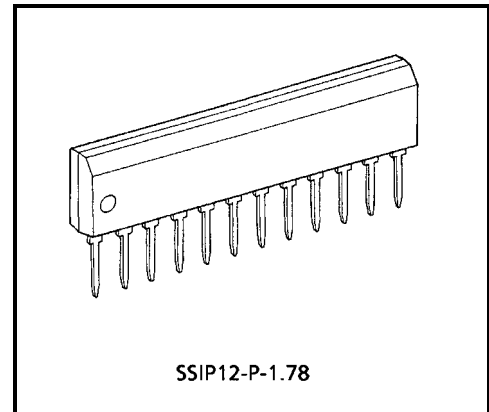
TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

# TA8721ASN

DUAL SIF SYSTEM FOR TV

## FEATURES

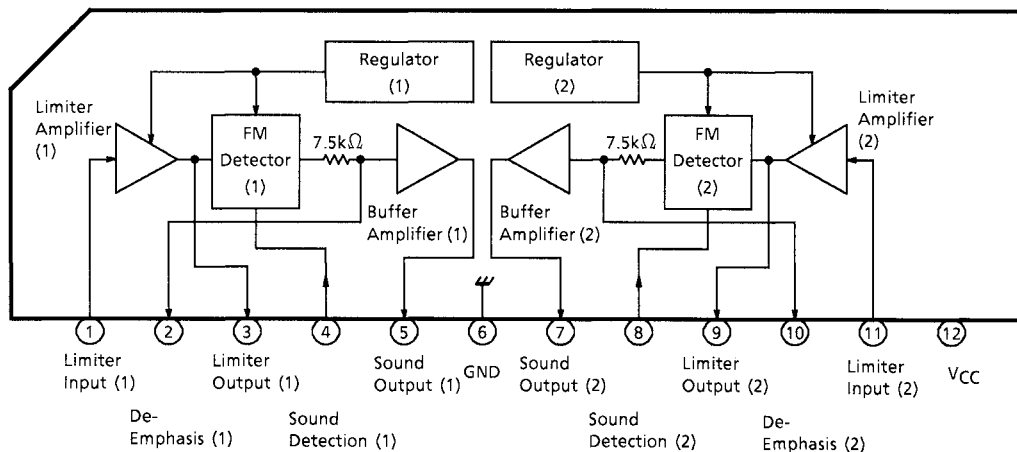
- Two channel SIF circuit (The 2ch demodulation circuit can be configured in combination with the TA8712N or TA8796N.)
- Three stage limiter amplifier
- Quadrature type detection circuit
- No-adjustment type FM detector circuit by ceramic discriminator



SSIP12-P-1.78

Weight : 0.71g (Typ.)

## BLOCK DIAGRAM



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## TERMINAL FUNCTION

PIN No.	PIN NAME	FUNCTION	INTERFACE CIRCUIT
1	Limiter Input (1)	A sound carrier is input from SAW filter.	
2 5	De-Emphasis (1) Sound Output (1)	The De-Emphasis time constant is defined by external capacitor. This is an FM detector circuit output terminal.	
3 4	Limiter Output (1) SoundDetection(1)	This is a connection terminal of sound detection coil. This will be of no-adjustment type by using ceramic discriminator. A sound muting will be performed by connecting pin 4 to GND.	 
6	SIF GND	Connect a bypass capacitor between this pin and SIF V <sub>CC</sub> of pin 12.	—

PIN No.	PIN NAME	FUNCTION	INTERFACE CIRCUIT
7 10	Sound Output (2) De-Emphasis (2)	This is an FM detector circuit output terminal. The De-Emphasis time constant is defined by external capacitor.	
8 9	Sound Detection (2) Limiter Output (2)	This is a connection terminal of sound detection coil. This will be of no-adjustment type by means of ceramic discriminator. A sound muting will be performed by connecting pin 8 to GND.	
11	Limiter Input (2)	A sound carrier is input from the SAW filter.	
12	SIF V <sub>CC</sub>	Connect a bypass capacitor between this pin and SIF GND of pin 6.	—

## MAXIMUM RATINGS (Ta=25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V <sub>CC</sub>	15	V
Power Dissipation	P <sub>D</sub> (Note)	890	mW
Operating Temperature	T <sub>opr</sub>	-20~75	°C
Storage Temperature	T <sub>stg</sub>	-55~150	°C

Note: When using the device at above Ta=25°C, decrease the power dissipation by 7.14mW for each increase of 1°C.

## RECOMMENDED SUPPLY VOLTAGE

PIN No.	PIN NAME	MIN.	TYP.	MAX.	UNIT
12	V <sub>CC</sub>	8.1	9.0	9.9	V

## ELECTRICAL CHARACTERISTICS

### DC CHARACTERISTICS (Unless otherwise specified V<sub>CC</sub>=9V, Ta=25°C)

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Voltage	I <sub>CC</sub>	1	—	13	18	23	mA
Terminal Voltage	V <sub>1</sub>	1	—	2.7	3.0	3.3	V
	V <sub>2</sub>		—	4.1	5.1	6.1	
	V <sub>3</sub>		—	2.7	3.7	4.7	
	V <sub>4</sub>		—	2.3	2.9	3.6	
	V <sub>5</sub>		—	3.5	4.5	5.5	
	V <sub>7</sub>		—	3.5	4.5	5.5	
	V <sub>8</sub>		—	2.3	2.9	3.6	
	V <sub>9</sub>		—	2.7	3.7	4.7	
	V <sub>10</sub>		—	4.1	5.1	6.1	
	V <sub>11</sub>		—	2.7	3.0	3.3	

## AC CHARACTERISTICS

(When using the specified coil unless otherwise specified,  $V_{CC}=9V$ ,  $T_a=25^\circ C$ )

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Audio Frequency Output Level (Note 1)	$V_{OD1}$	2	$f_o=4.5MHz$ , $V_i=100dB\mu V$	350	500	700	$mV_{rms}$
	$V_{OD2}$		$f_o=4.724MHz$ , $V_i=100dB\mu V$	350	500	700	
Audio Frequency Distortion Rate (Note 2)	THD1	2	$f_o=4.5MHz$	—	0.2	1.0	%
	THD2		$f_o=4.724MHz$	—	0.2	1.0	
Limiting Sensitivity (Note 3)	$V_{LIM1}$	2	When output $V_{OD1}$ is $-3dB$ .	—	—	50	$dB\mu V$
	$V_{LIM2}$		When output $V_{OD2}$ is $-3dB$ .	—	—	50	
AMR (Note 4)	AMR1	2	$f_o=4.5MHz$ , $AM=30\%$	40	50	—	dB
	AMR2		$f_o=4.724MHz$ , $AM=30\%$	40	50	—	
Audio Frequency Bandwidth (Note 5)	$AF_{BW1}$	2	$-3dB$ bandwidth	$\pm 70$	—	—	kHz
	$AF_{BW2}$		$-3dB$ bandwidth	$\pm 70$	—	—	
S / N Ratio (Note 6)	S / N1	2	$f_o=4.5MHz$ , CW against FM 25kHz / dev	60	—	—	dB
	S / N2		$f_o=4.724MHz$ , CW against FM 25kHz / dev	60	—	—	
Crosstalk Between Sound Outputs (Note 7)	CR1	2	SIF1 $f_o=4.5MHz$ , $f_m=400Hz$ SIF2 $f_o=4.724MHz$ , CW	60	—	—	dB
	CR2		SIF1 $f_o=4.5MHz$ , CW SIF2 $f_o=4.724MHz$ , $f_m=400Hz$	60	—	—	
Limiter Input Resistance (Note 8)	$R_{i1}$ , $R_{i2}$	2	—	0.75	1.0	1.25	k $\Omega$

## TEST CONDITION

Note 1: Audio Frequency Output Level

Limiter input

$V_{OD1}$  :  $f_o=4.5MHz$ ,  $100dB\mu V$ ,  $f_m=400Hz$ , 100% (25kHz / dev) FM modulation

$V_{OD2}$  :  $f_o=4.724MHz$ ,  $100dB\mu V$ ,  $f_m=400Hz$ , 100% (25kHz / dev) FM modulation

After the above input, measure the output level of sound output.

Note 2: Audio Frequency Distortion Rate

Measure the distortion rate of sound output by distortion meter under the condition of Note 1.

Note 3: Limiting Sensitivity

Limiter input

$V_{LIM1}$  :  $f_o=4.5MHz$ , variable level,  $f_m=400Hz$ , 100% (25kHz / dev) FM modulation

$V_{LIM2}$  :  $f_o=4.724MHz$ , variable level,  $f_m=400Hz$ , 100% (25kHz / dev) FM modulation

After the above input, measure the output level of sound output. Measure the input level of Note 1 output level at  $-3dB$ .

Note 4: AMR  
 Limiter input  
 AMR1 :  $f_0=4.5\text{MHz}$ ,  $100\text{dB}\mu\text{V}$ ,  $f_m=400\text{Hz}$ , 30% AM modulation  
 AMR2 :  $f_0=4.724\text{MHz}$ ,  $100\text{dB}\mu\text{V}$ ,  $f_m=400\text{Hz}$ , 30% AM modulation  
 After the above input, measure the output level of sound output. (AMout)  
 Calculate the ratio of the output level of Note 1.

$$\text{AMR} = 20\log \frac{\text{AMout}}{\text{VOD}}$$

Note 5: Audio Frequency Bandwidth  
 Limiter input  
 AFBW1 :  $f_0$  variable (center  $4.5\text{MHz}$ ),  $100\text{dB}\mu\text{V}$ ,  $f_m=400\text{Hz}$ , 100% (25kHz / dev) FM modulation  
 AFBW2 :  $f_0$  variable (center  $4.724\text{MHz}$ ),  $100\text{dB}\mu\text{V}$ ,  $f_m=400\text{Hz}$ ,  
 100% (25kHz / dev) FM modulation  
 After the above input, measure the output level of sound output. Calculate the frequency width when the output level of Note 1 becomes -3dB by changing the  $f_0$  frequency high and low.

Note 6: S / N Ratio  
 Limiter input  
 S / N (1) :  $f_0=4.5\text{MHz}$ ,  $100\text{dB}\mu\text{V}$  CW  
 S / N (2) :  $f_0=4.724\text{MHz}$ ,  $100\text{dB}\mu\text{V}$  CW  
 After the above input, measure the output level of sound output (S / N out). Calculate the ratio of the output level of Note 1.

$$\text{S / N} = 20\log \frac{\text{VOD}}{\text{S / N out}}$$

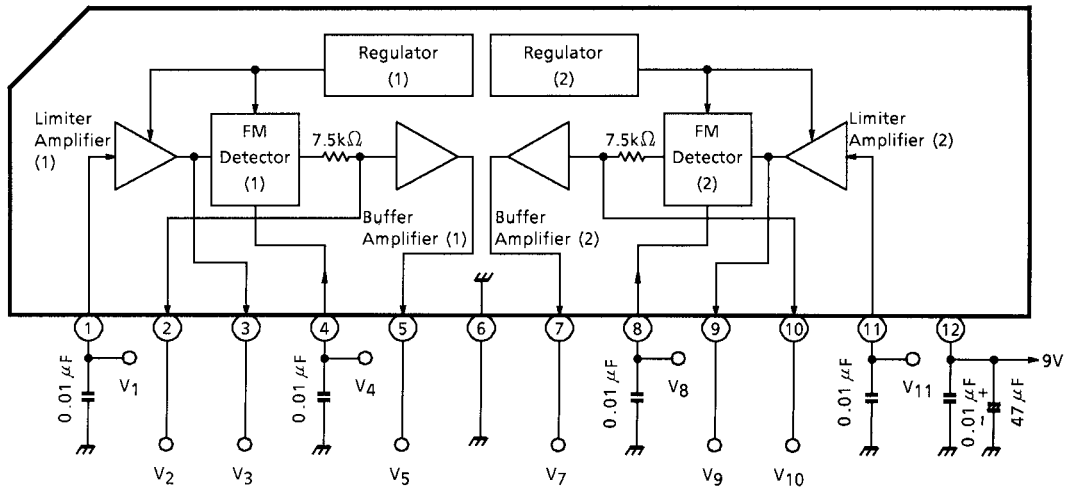
Note 7: Cross Talk between sound outputs  
 Limiter input  
 CR1:  $\left[ \begin{array}{l} \text{SIF1 } f_0=4.5\text{MHz}, 100\text{dB}\mu\text{V}, f_m=400\text{Hz} \\ \text{SIF2 } f_0=4.724\text{MHz}, 100\text{dB}\mu\text{V}, \text{CW} \end{array} \right.$   
 CR2:  $\left[ \begin{array}{l} \text{SIF1 } f_0=4.5\text{MHz}, 100\text{dB}\mu\text{V}, \text{CW} \\ \text{SIF2 } f_0=4.724\text{MHz}, 100\text{dB}\mu\text{V}, f_m=400\text{Hz} \end{array} \right.$   
 After the above input, measure the output leakage level of sound output.

$$\text{CR1 (2)} = 20\log \frac{\text{SIF 1 (2)}}{\text{SIF 2 (1)}}$$

Note 8: Limiter input resistance  
 Measure the resistance of limiter input terminal by impedance analyzer.

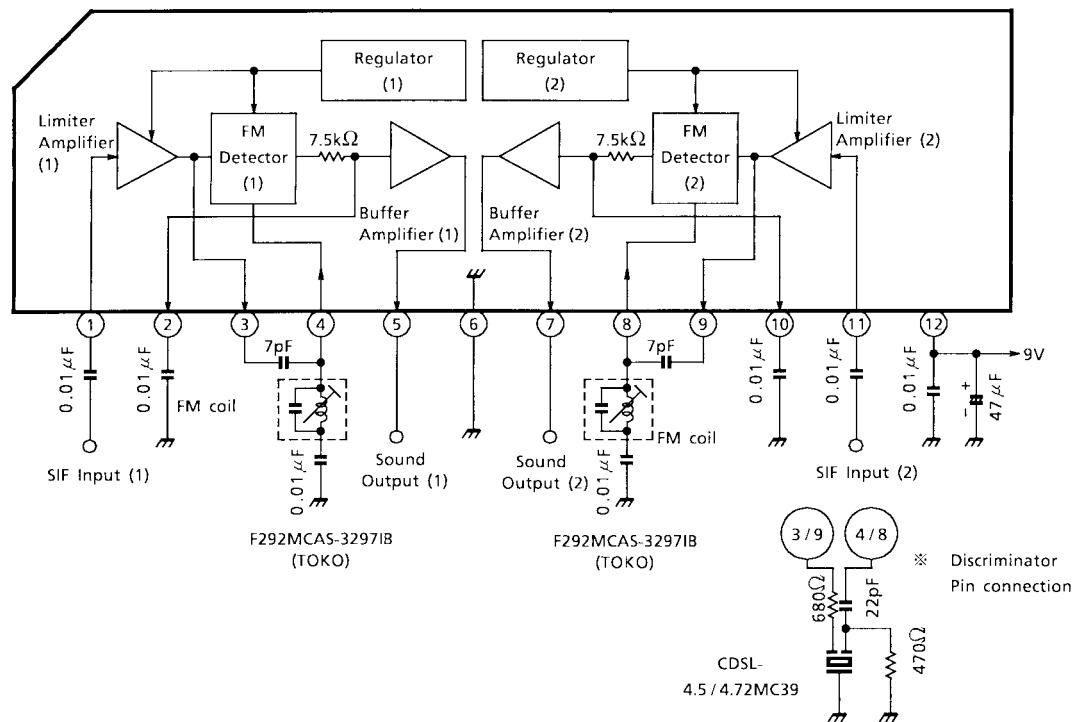
## TEST CIRCUIT 1

DC characteristics



## TEST CIRCUIT 2

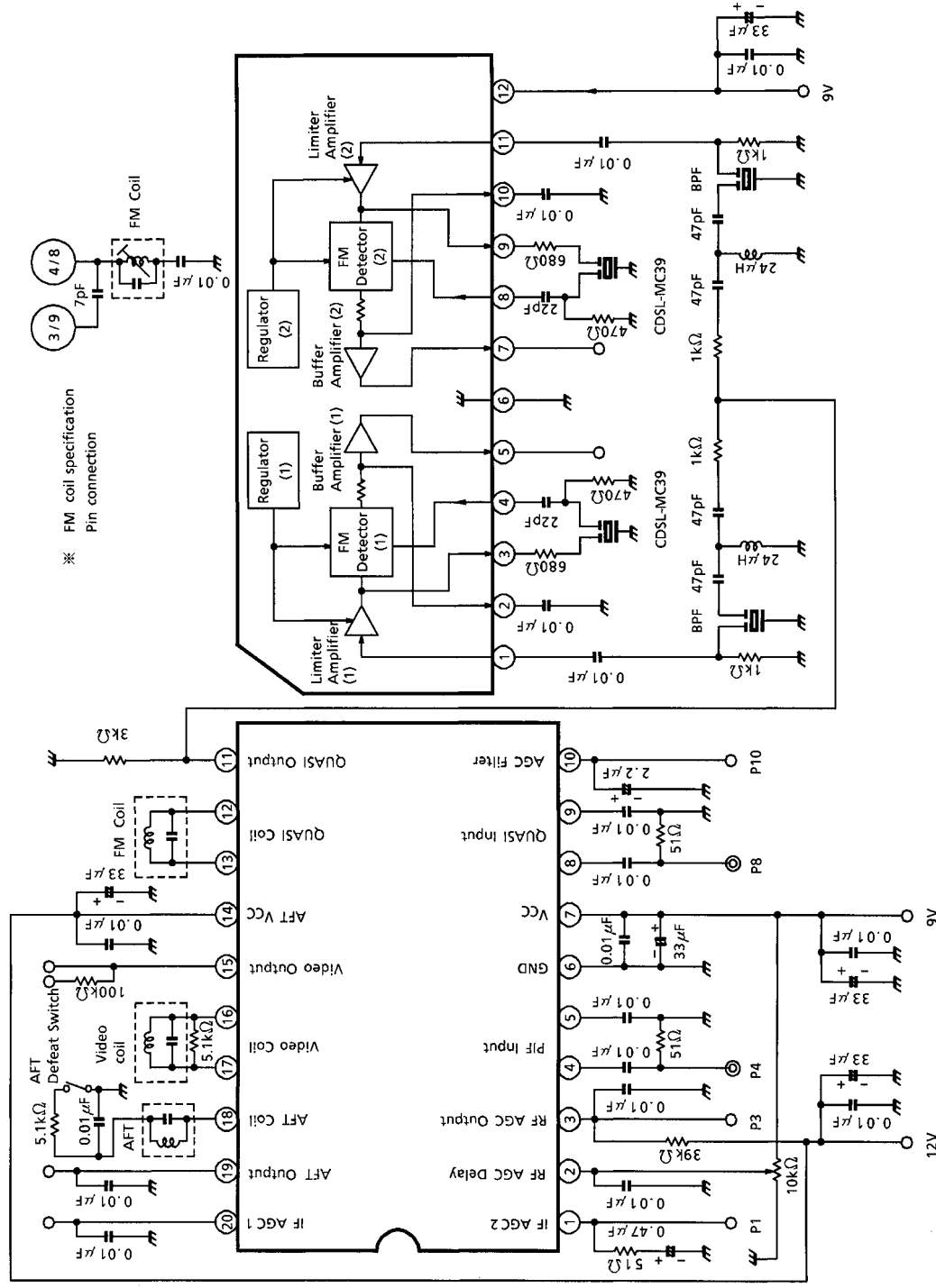
AC characteristics



**APPLICATION CIRCUIT**

TA8712N / TA8796N

TA8721ASN

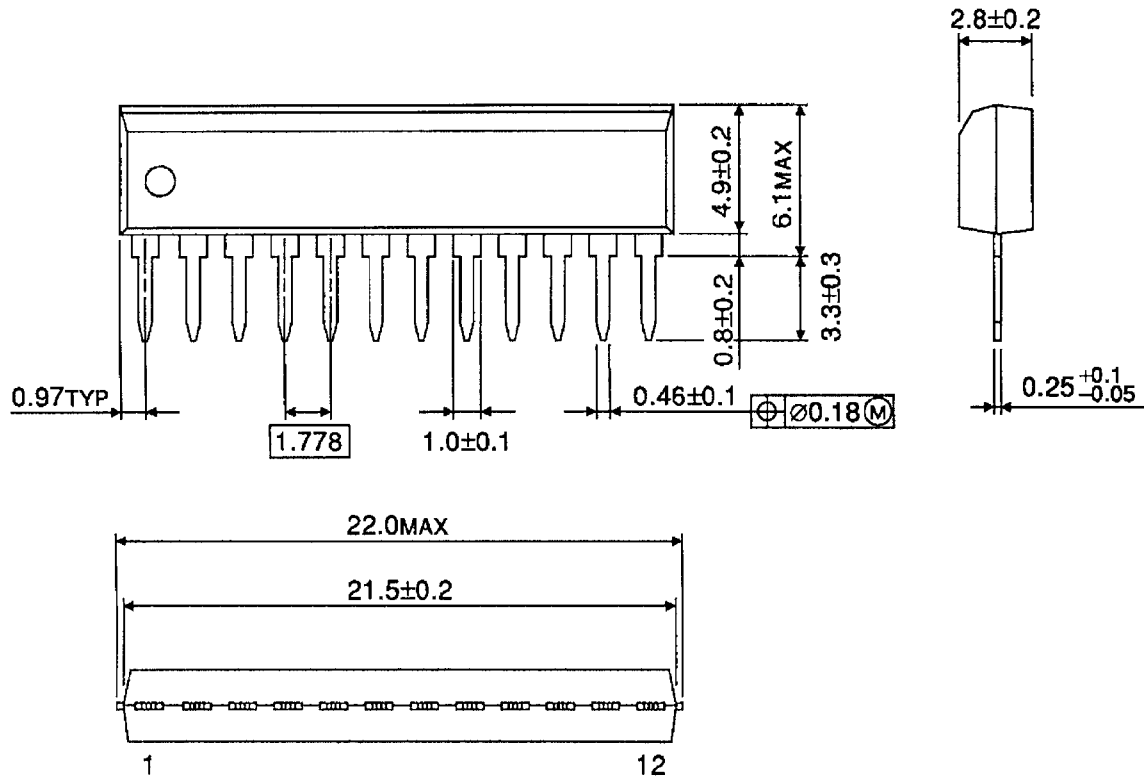




## PACKAGE DIMENSIONS

SSIP12-P-1.78

Unit: mm



Weight : 0.71g (Typ.)