

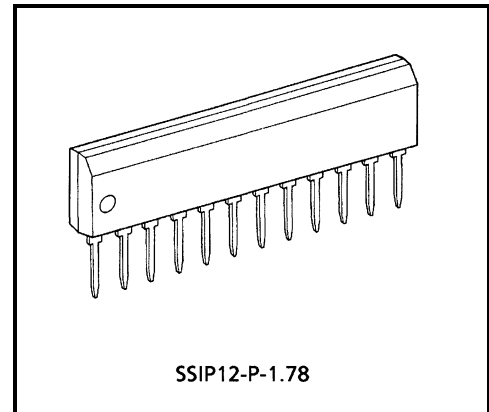
TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA8721ASN

DUAL SIF SYSTEM FOR TV

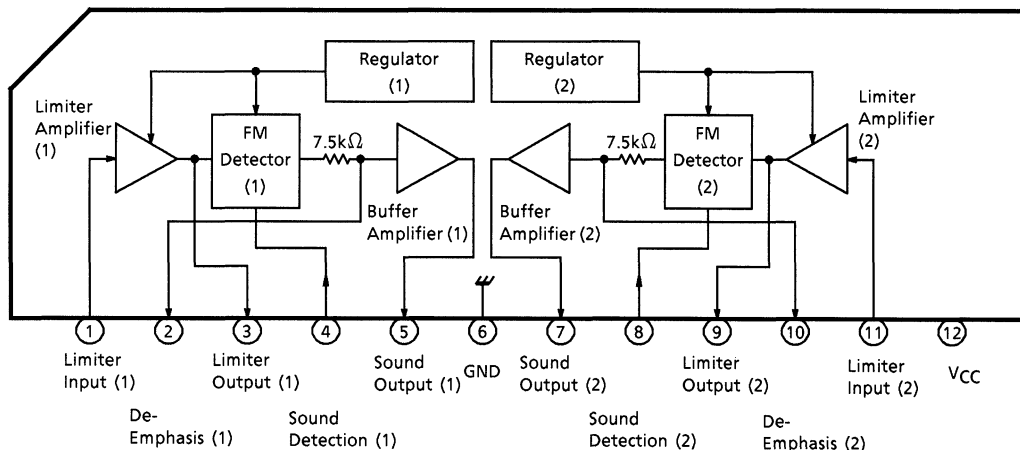
FEATURES

- 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



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 _{CC} 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 _{CC}	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 _{CC}	15	V
Power Dissipation	P _D (Note)	890	mW
Operating Temperature	T _{opr}	-20~75	°C
Storage Temperature	T _{stg}	-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 _{CC}	8.1	9.0	9.9	V

ELECTRICAL CHARACTERISTICS

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

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Voltage	I _{CC}	1	—	13	18	23	mA
Terminal Voltage	V ₁	1	—	2.7	3.0	3.3	V
	V ₂		—	4.1	5.1	6.1	
	V ₃		—	2.7	3.7	4.7	
	V ₄		—	2.3	2.9	3.6	
	V ₅		—	3.5	4.5	5.5	
	V ₇		—	3.5	4.5	5.5	
	V ₈		—	2.3	2.9	3.6	
	V ₉		—	2.7	3.7	4.7	
	V ₁₀		—	4.1	5.1	6.1	
	V ₁₁		—	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	± 70	—	—	kHz
	AF_{BW2}		$-3dB$ bandwidth	± 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 Ω

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 4.5MHz), $100\text{dB}\mu\text{V}$, $f_m=400\text{Hz}$, 100% (25kHz / dev) FM modulation
 AFBW2 : f_0 variable (center 4.724MHz), $100\text{dB}\mu\text{V}$, $f_m=400\text{Hz}$,
 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.

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

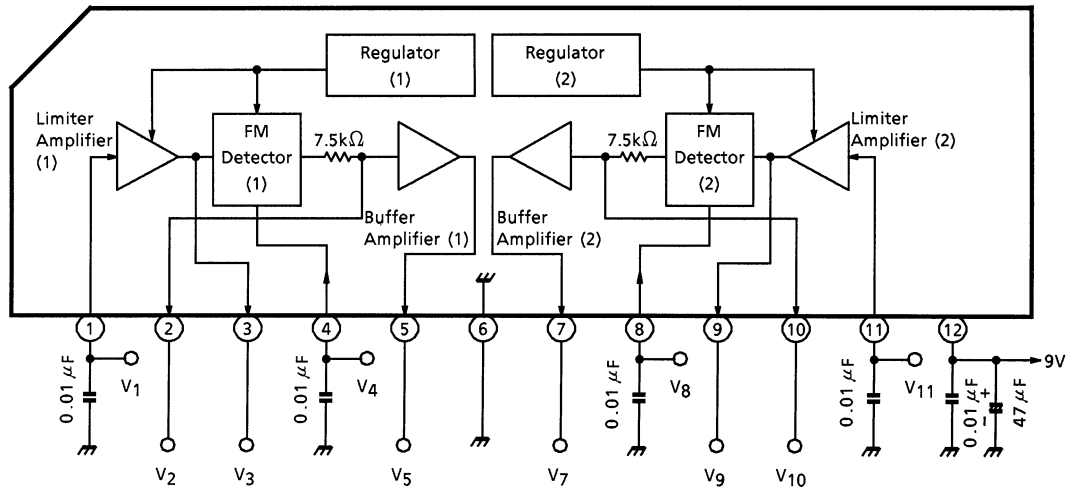
Note 7: Cross Talk between sound outputs
 Limiter input
 CR1: $\left[\begin{array}{l} \text{SIF1 } f_0=4.5\text{MHz}, 100\text{dB}\mu\text{V}, f_m=400\text{Hz} \\ \text{SIF2 } f_0=4.724\text{MHz}, 100\text{dB}\mu\text{V}, \text{CW} \end{array} \right.$
 CR2: $\left[\begin{array}{l} \text{SIF1 } f_0=4.5\text{MHz},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

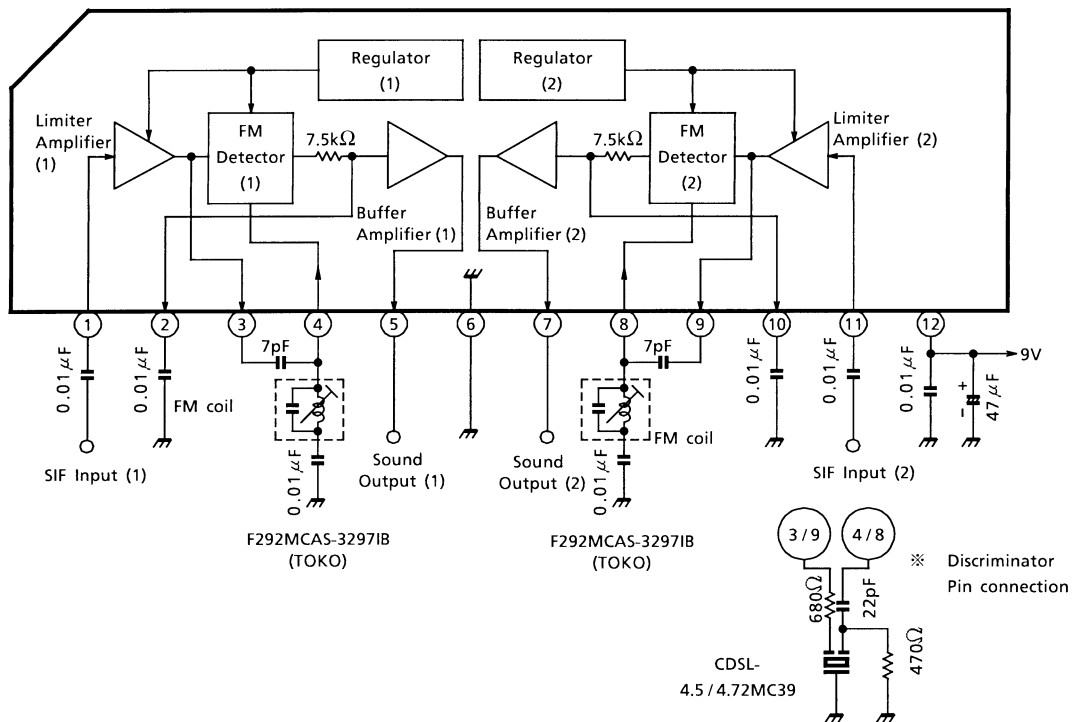
TEST CIRCUIT 1

DC characteristics



TEST CIRCUIT 2

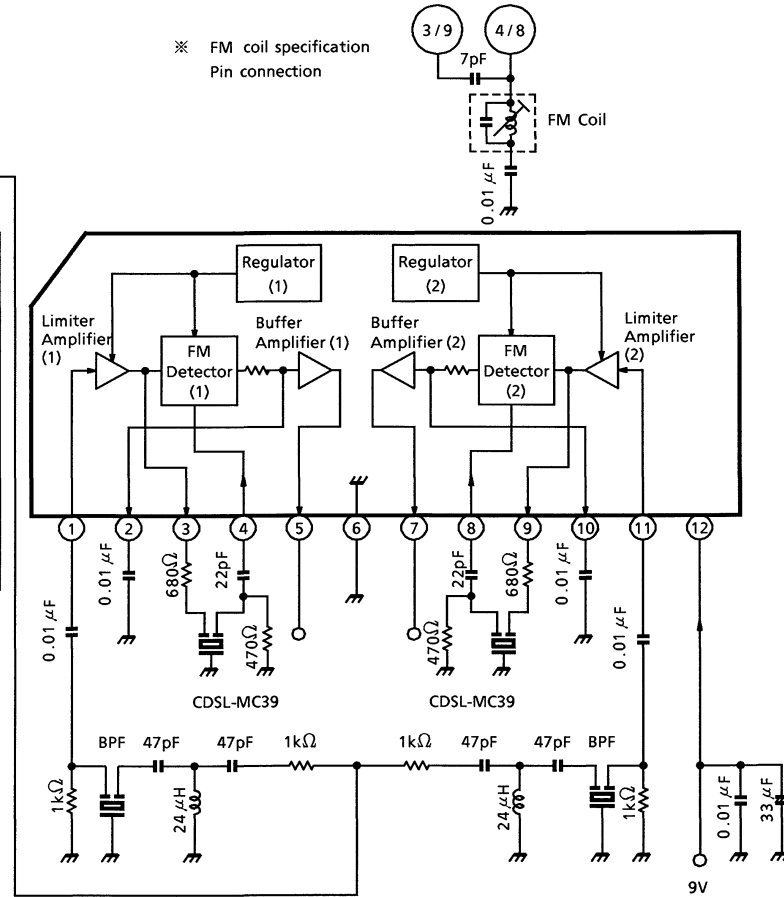
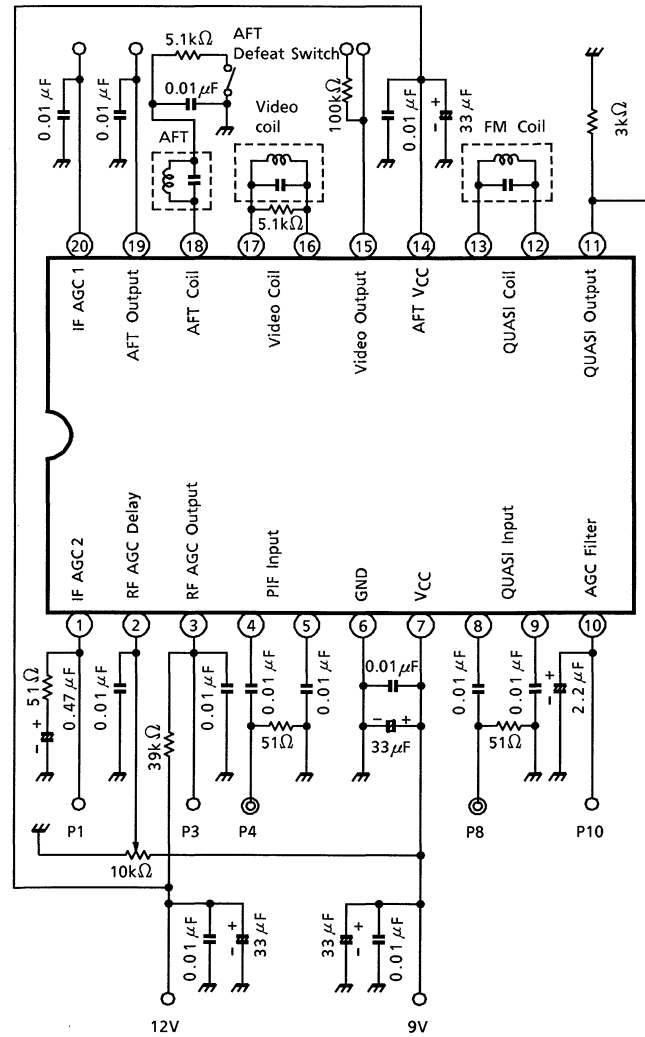
AC characteristics



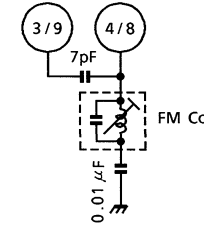
APPLICATION CIRCUIT

TA8712N /TA8796N

TA8721ASN



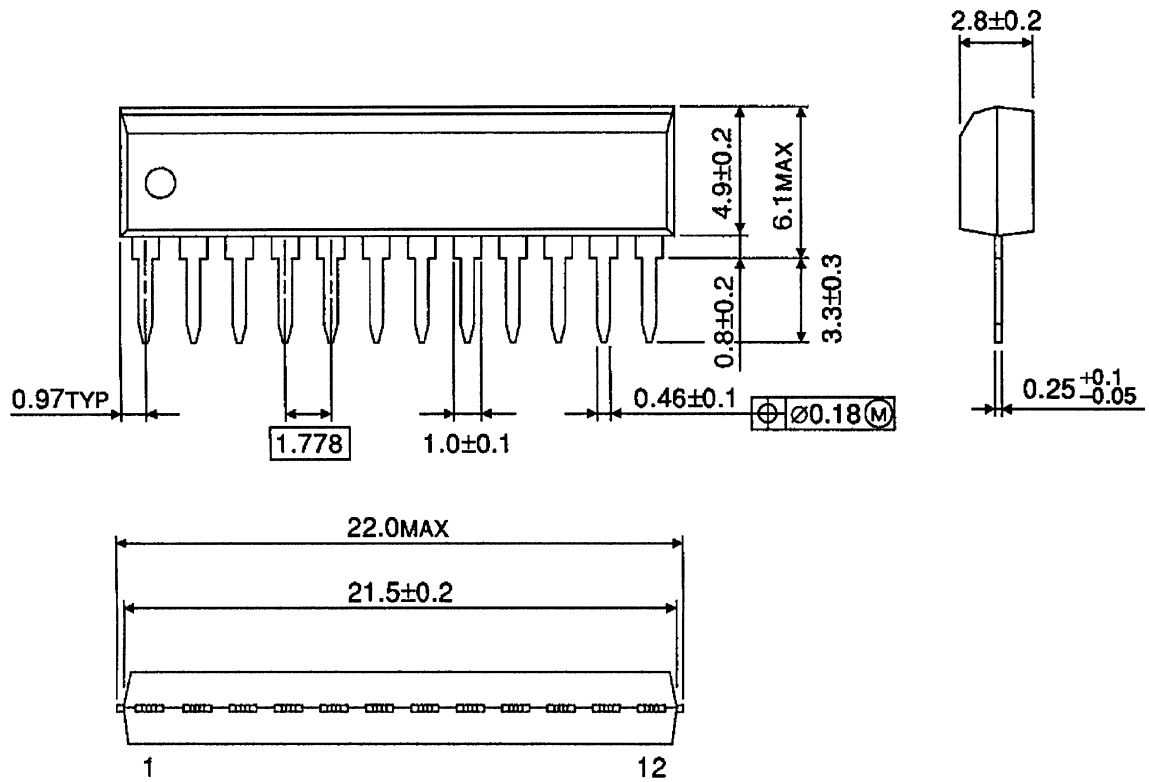
※ FM coil specification
Pin connection



PACKAGE DIMENSIONS

SSIP12-P-1.78

Unit: mm



Weight : 0.71g (Typ.)