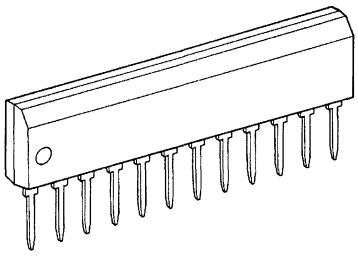
TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA8721ASN

DUAL SIF SYSTEM FOR TV

FEATURES

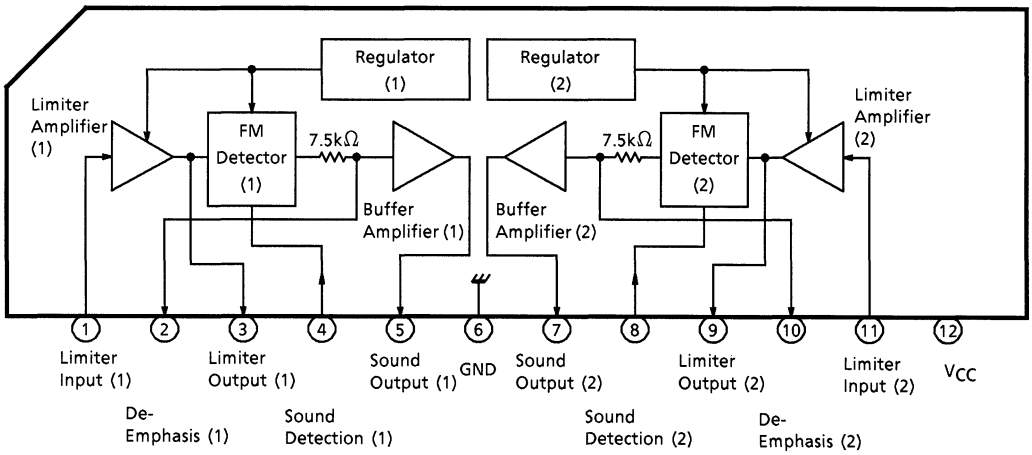
- Two channel SIF circuit (The 2ch demodulation circuit can be configured in combination with the TA8712N or TA8796N.)
- Three stage limiter amplifier
- Quadrature type detection circuit
- No-adjustment type FM detector circuit by ceramic discriminator



SSIP12-P-1.78

Weight : 0.71g (Typ.)

BLOCK DIAGRAM



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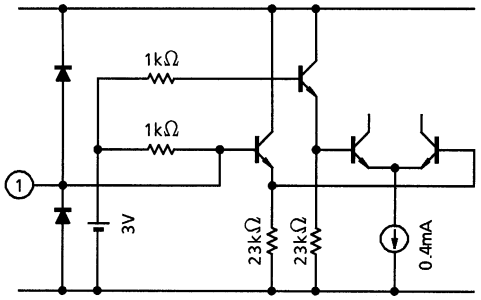
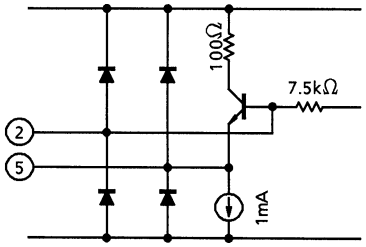
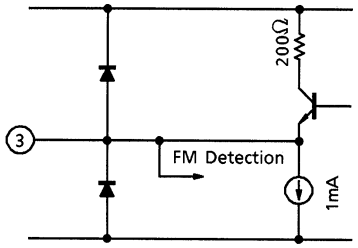
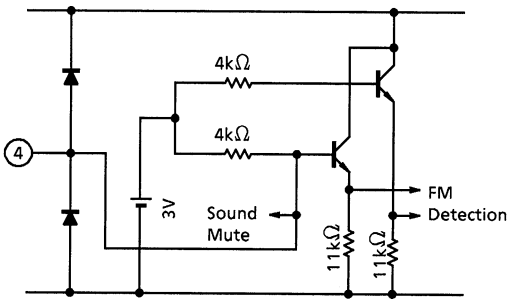
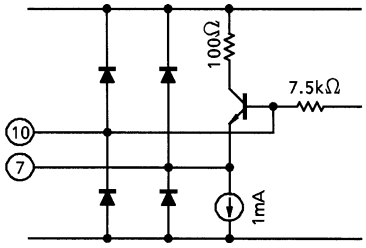
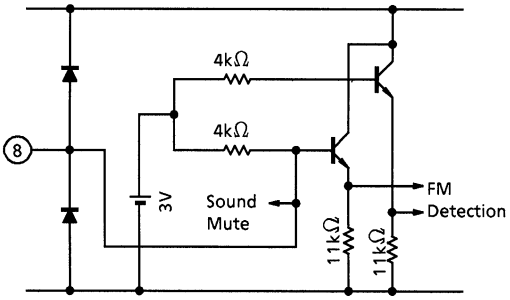
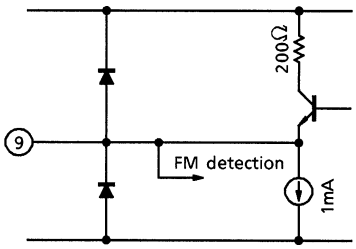
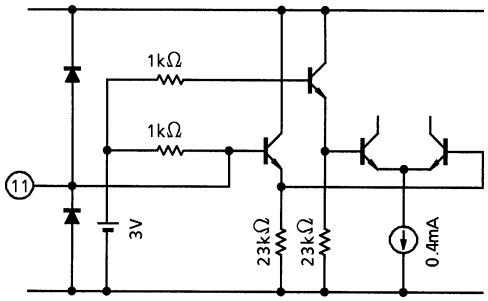
TERMINAL FUNCTION

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_{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, Ta=25°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=100dBμV	350	500	700	mV_{rms}
	V_{OD2}		f_o=4.724MHz, V_i=100dBμV	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	dBμV
	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, fm=400Hz	60	—	—	
Limiter Input Resistance (Note 8)	Ri1, Ri2	2	—	0.75	1.0	1.25	kΩ

TEST CONDITION

Note 1: Audio Frequency Output Level
Limiter input
V_{OD1} : f_o=4.5MHz, 100dBμV, f_m=400Hz, 100% (25kHz / dev) FM modulation
V_{OD2} : f_o=4.724MHz, 100dBμV, 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_o=4.5MHz, 100dBμV, f_m=400Hz, 30% AM modulation

AMR2 : f_o=4.724MHz, 100dBμV, f_m=400Hz, 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.

$$AMR = 20\ell og\frac{AMout}{V_{OD}}$$

Note 5: Audio Frequency Bandwidth

Limiter input

AF_{BW1} : f_o variable (center 4.5MHz), 100dBμV, f_m=400Hz, 100% (25kHz / dev) FM modulation

AF_{BW2} : f_o variable (center 4.724MHz), 100dBμV, f_m=400Hz, 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_o frequency high and low.

Note 6: S / N Ratio

Limiter input

S / N (1) : f_o=4.5MHz, 100dBμV CW

S / N (2) : f_o=4.724MHz, 100dBμV 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.

$$S/N = 20\ell og\frac{V_{OD}}{S/N\ out}$$

Note 7: Cross Talk between sound outputs

Limiter input

CR1: ┌ SIF1 f_o=4.5MHz, 100dBμV, f_m=400Hz
└ SIF2 f_o=4.724MHz, 100dBμV, CW

CR2: ┌ SIF1 f_o=4.5MHz, 100dBμV, CW
└ SIF2 f_o=4.724MHz, 100dBμV, f_m=400Hz

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

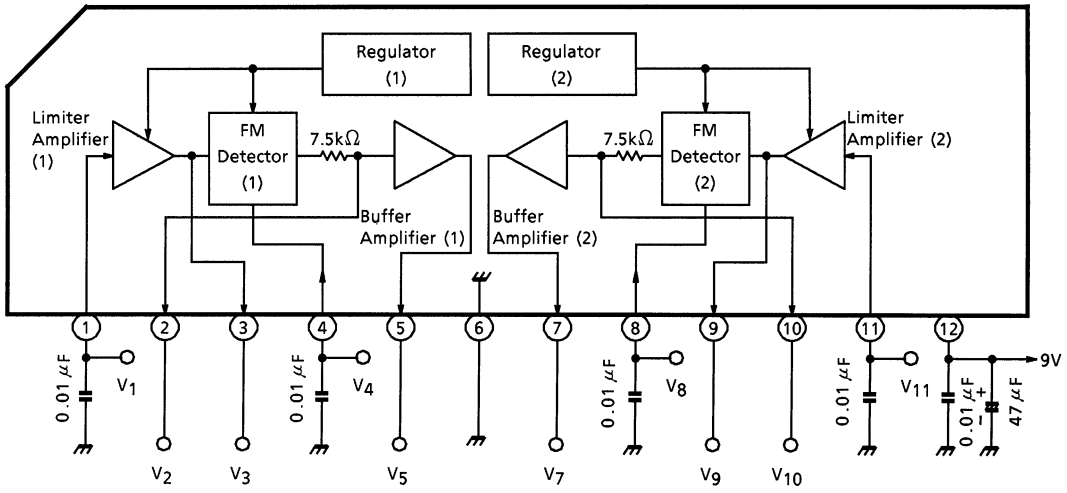
$$CR1(2) = 20\ell og\frac{SIF\ 1(2)}{SIF\ 2(1)}$$

Note 8: Limiter input resitance

Measure the resistance of limiter input terminal by impedance analyzer.

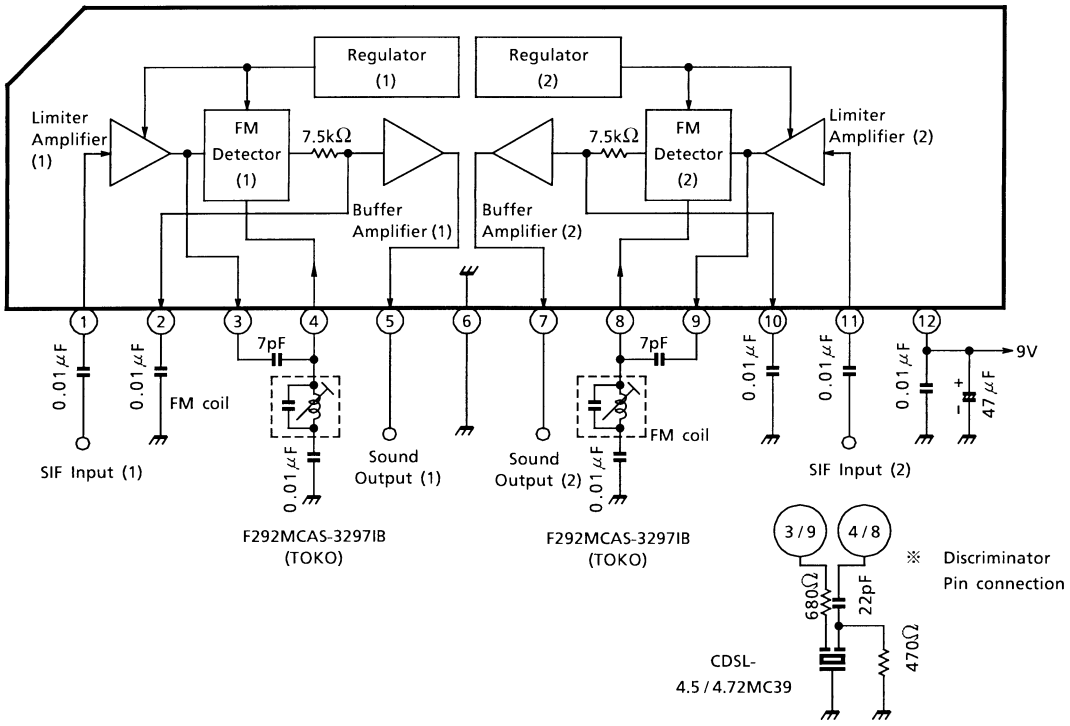
TEST CIRCUIT 1

DC characteristics



TEST CIRCUIT 2

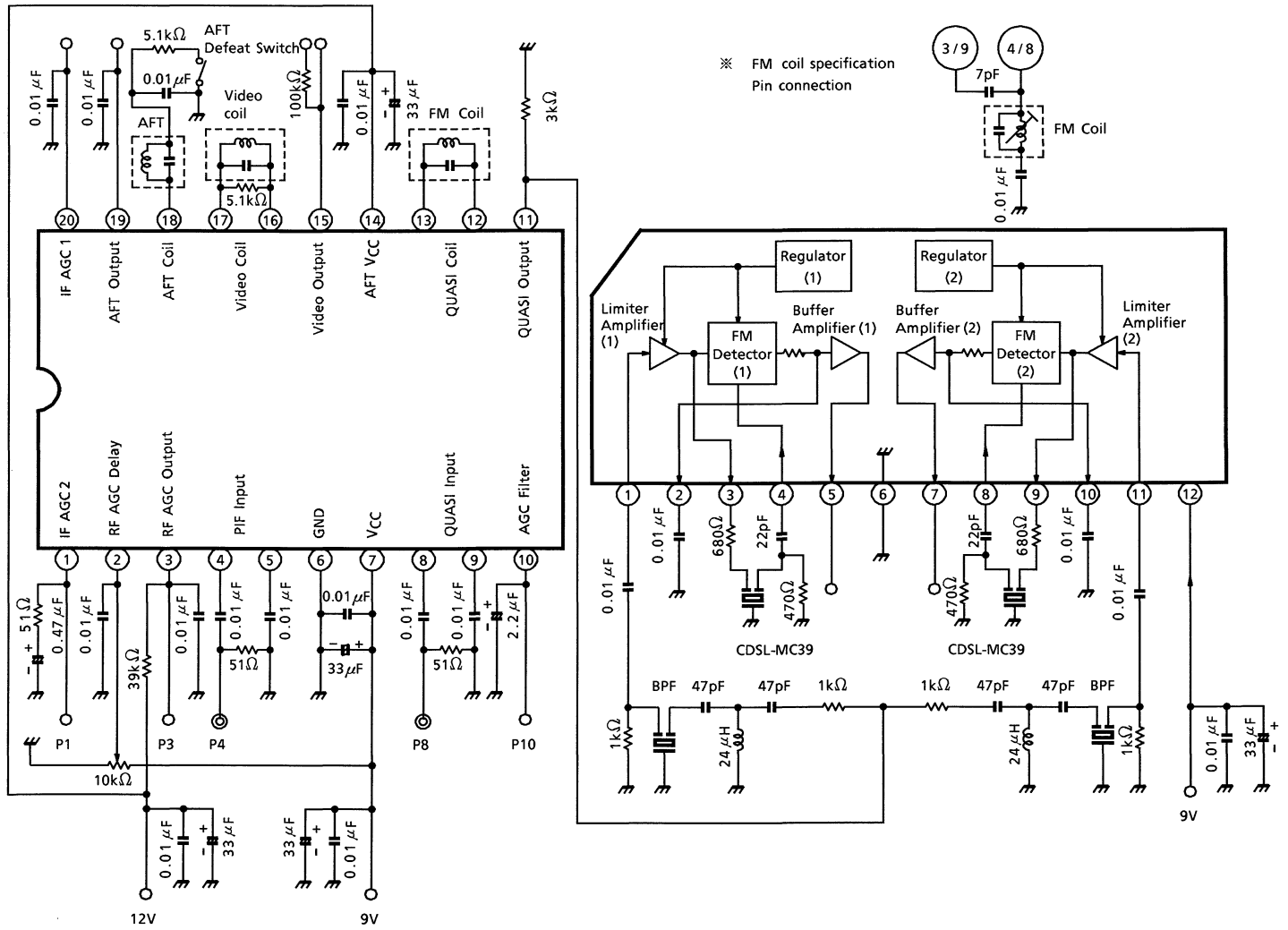
AC characteristics



APPLICATION CIRCUIT

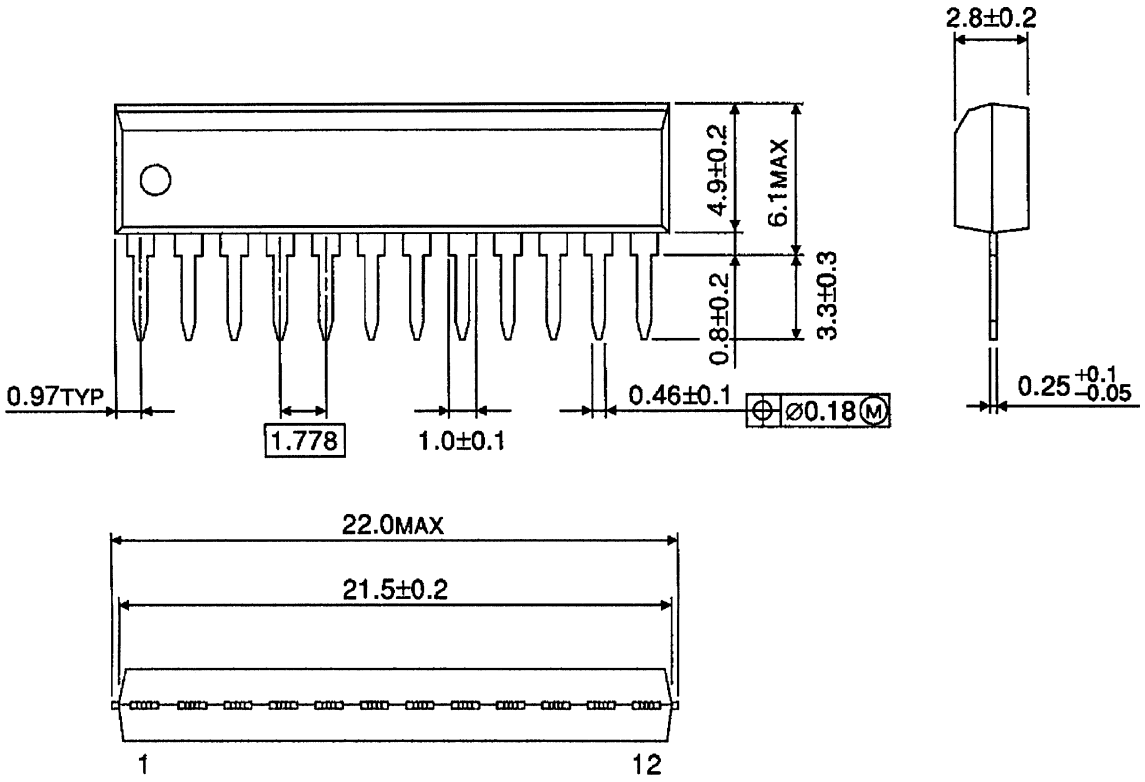
TA8712N /TA8796N

TA8721ASN



PACKAGE DIMENSIONS

SSIP12-P-1.78 Unit: mm



Weight : 0.71g (Typ.)