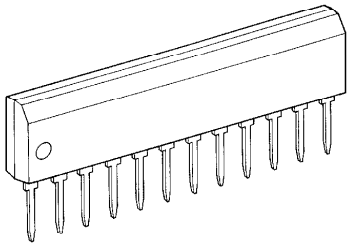
TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA8721ASN

DUAL SIF SYSTEM FOR TV

FEATURES

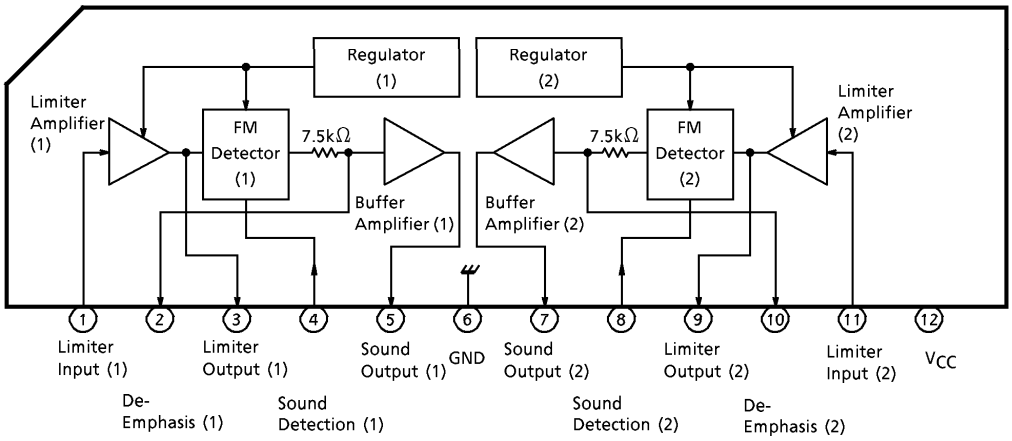
- Two channel SIF circuit (The 2ch demodulation circuit can be configured in combination with the TA8712N or TA8796N.)
- Three stage limiter amplifier
- Quadrature type detection circuit
- No-adjustment type FM detector circuit by ceramic discriminator



SSIP12-P-1.78

Weight : 0.71g (Typ.)

BLOCK DIAGRAM



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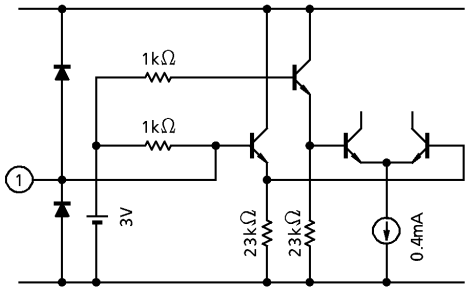
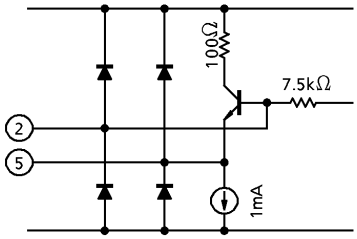
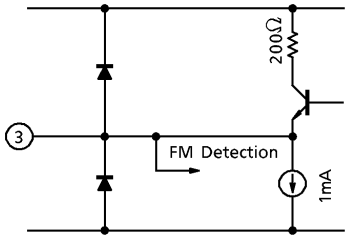
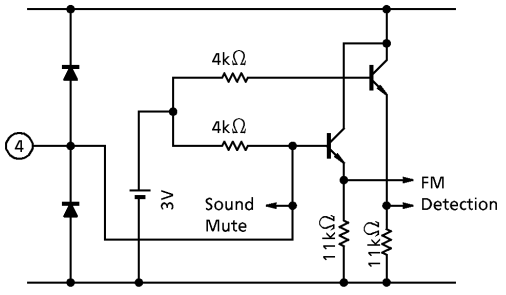
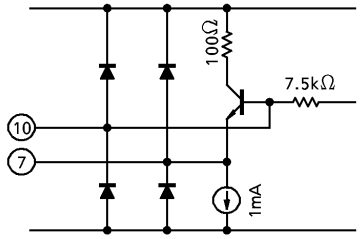
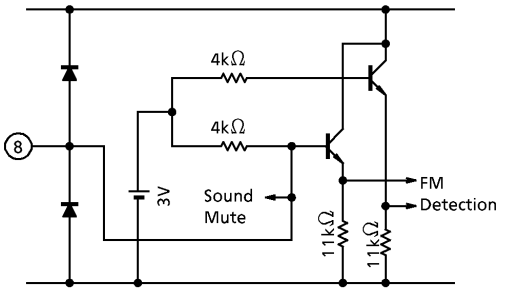
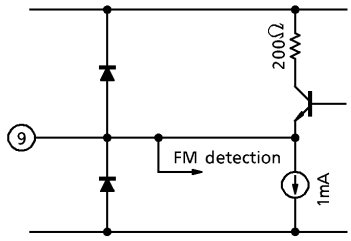
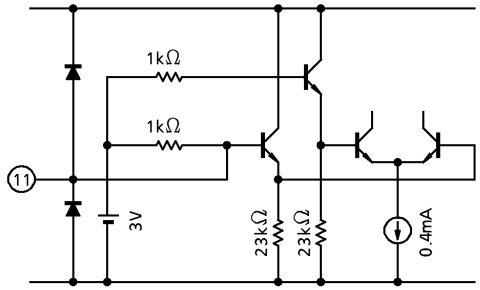
TERMINAL FUNCTION

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) Sound Detection (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	fo = 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 fo 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

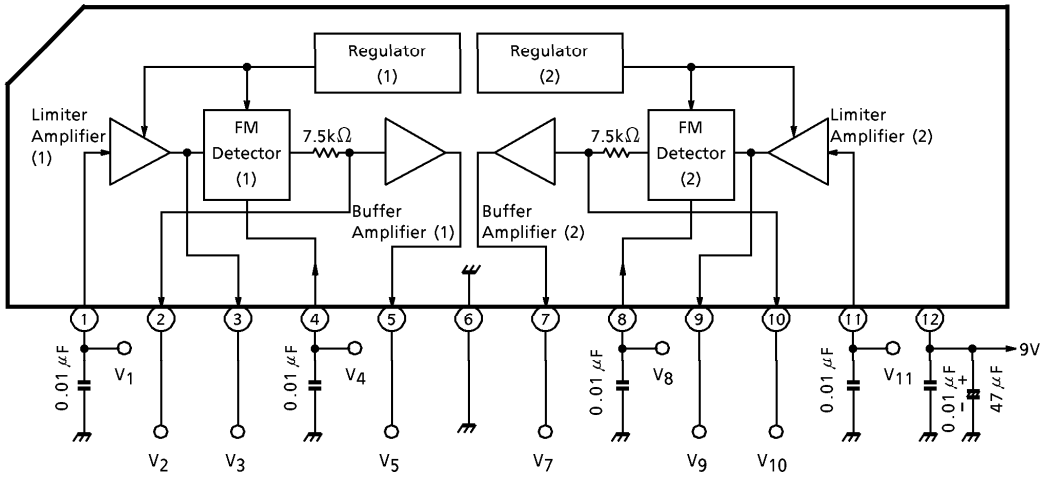
After the above input, measure the output leakage level of sound output.

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

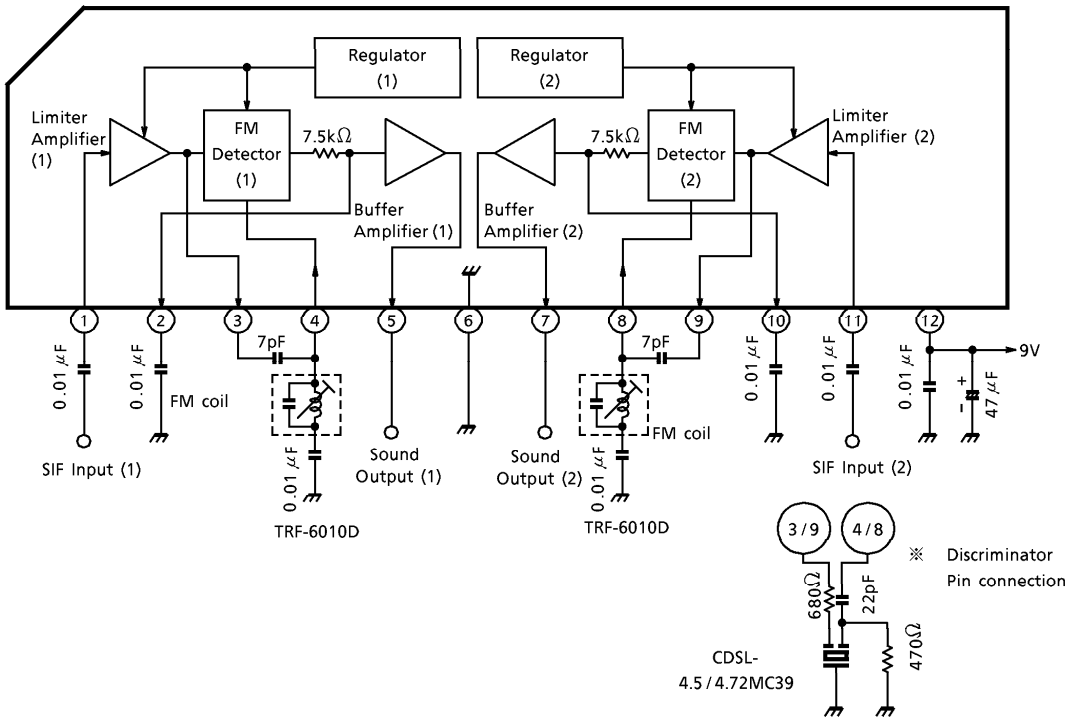
(Note 8) Limiter input resitance

Measure the resistance of limiter input terminal by impedance analyzer.

TEST CIRCUIT 1
DC characteristics



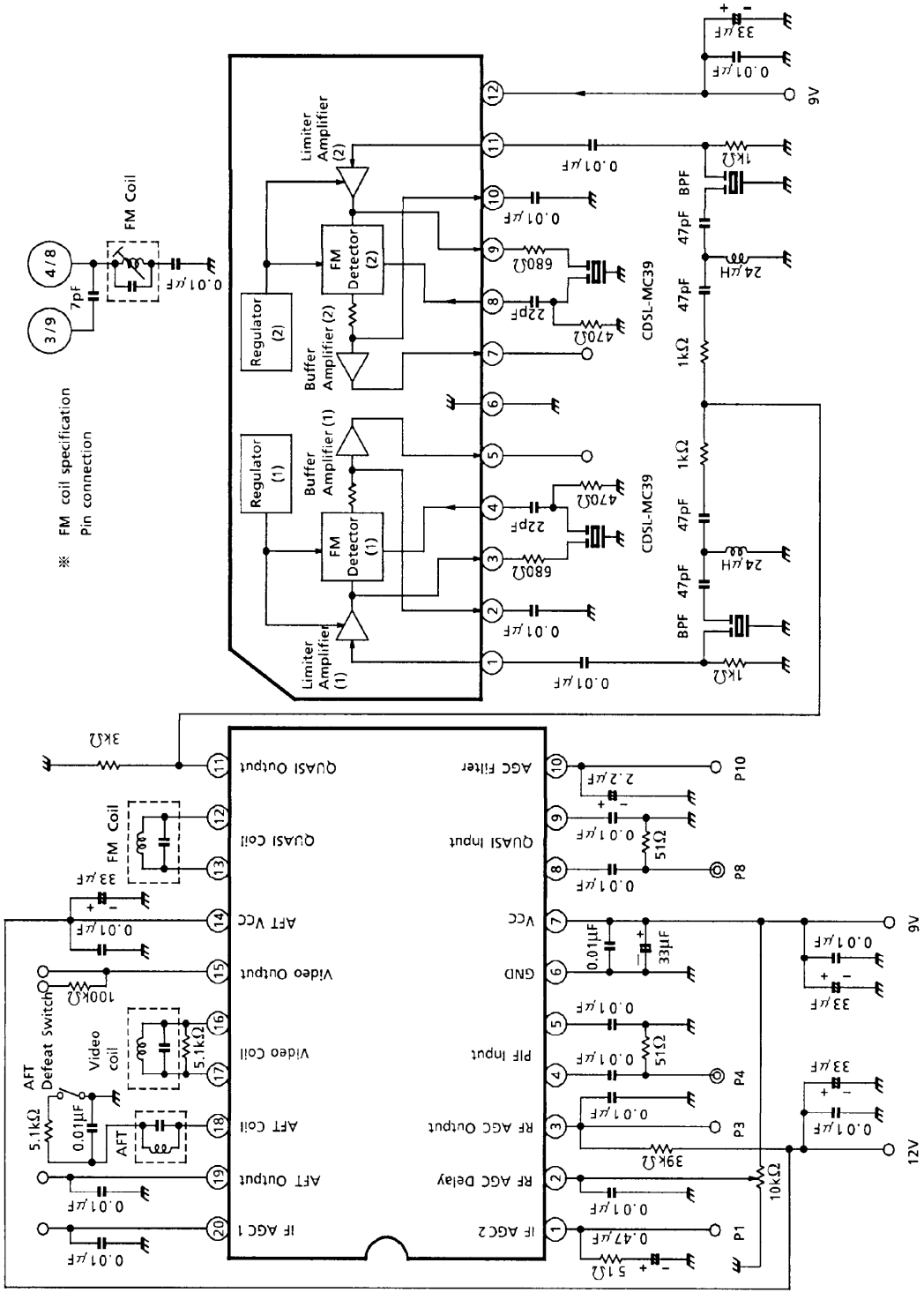
TEST CIRCUIT 2
AC characteristics



APPLICATION CIRCUIT

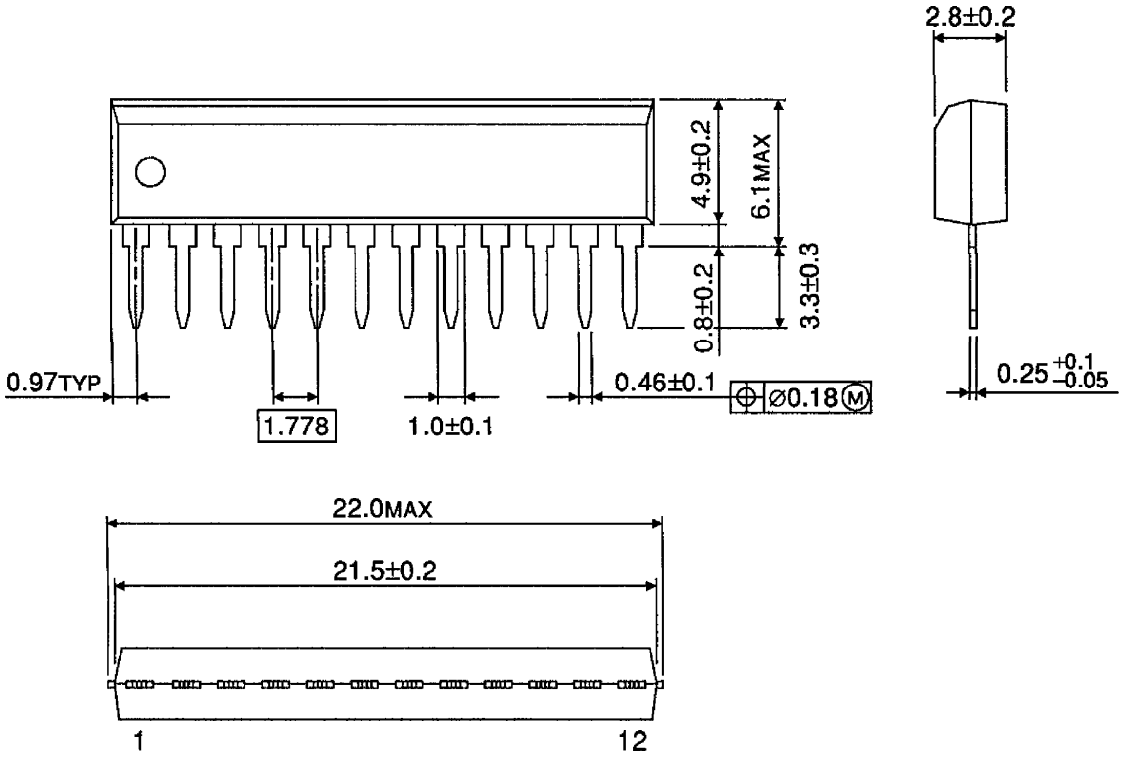
TA8712N/TA8796N

TA8721ASN



OUTLINE DRAWING
SSIP12-P-1.78

Unit : mm



Weight : 0.71g (Typ.)