

TENTATIVE TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

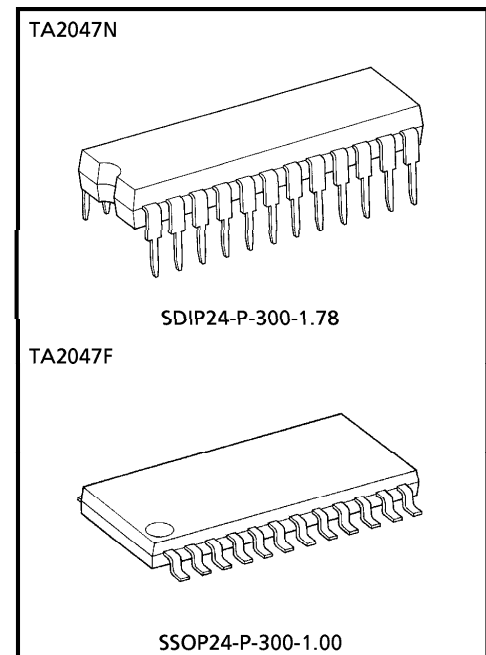
TA2047N, TA2047F

FILTER IC FOR NICAM

The TA2047N, TA2047F is an analog filter IC for NICAM. Using the TA2047N, TA2047F in combination the TB1212N, TB1212F (Single Chip NICAM System), it is possible to construct a NICAM decoder system with less external parts.

FEATURES

- Built-in CR for LPFs and output (differential) amplifiers for the left and right channel.
- Built-in audio SW and possible to FM signal input dynamic range up. ($V_{CC} = 9V$)
- It is possible to apply an analog de-emphasis circuit.
- $2V_{rms}$ output. ($V_{CC} = 9V$)
- 6dB up SW. (9V operation)
- Built-in analog mute circuit.
- 9V power supply operation. (5V, 12V possible)



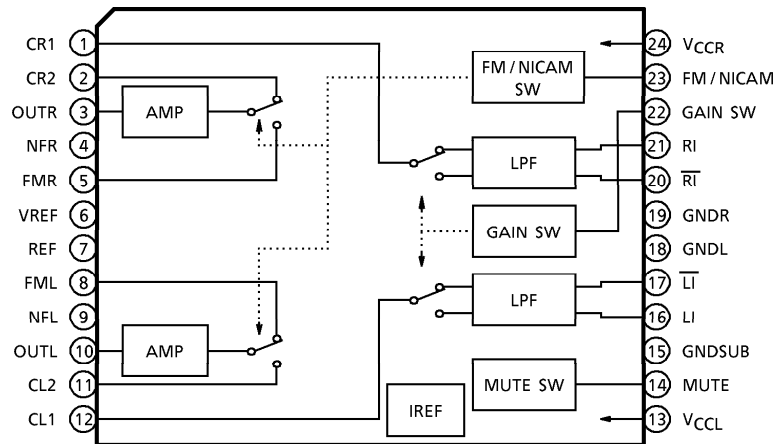
Weight

SDIP24-P-300-1.78 : 1.22g (Typ.)
SSOP24-P-300-1.00 : 0.32g (Typ.)

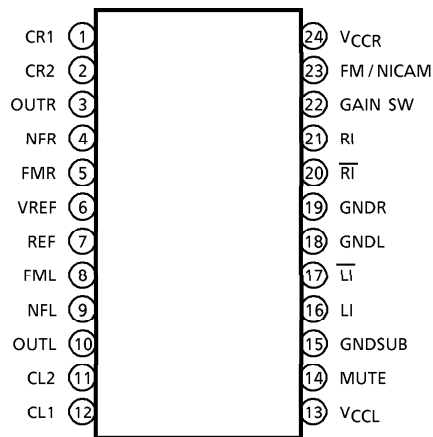
980910EBA1

- TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.
- The products described in this document are subject to the foreign exchange and foreign trade laws.
- 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.
- The information contained herein is subject to change without notice.

BLOCK DIAGRAM



TERMINAL CONNECTION

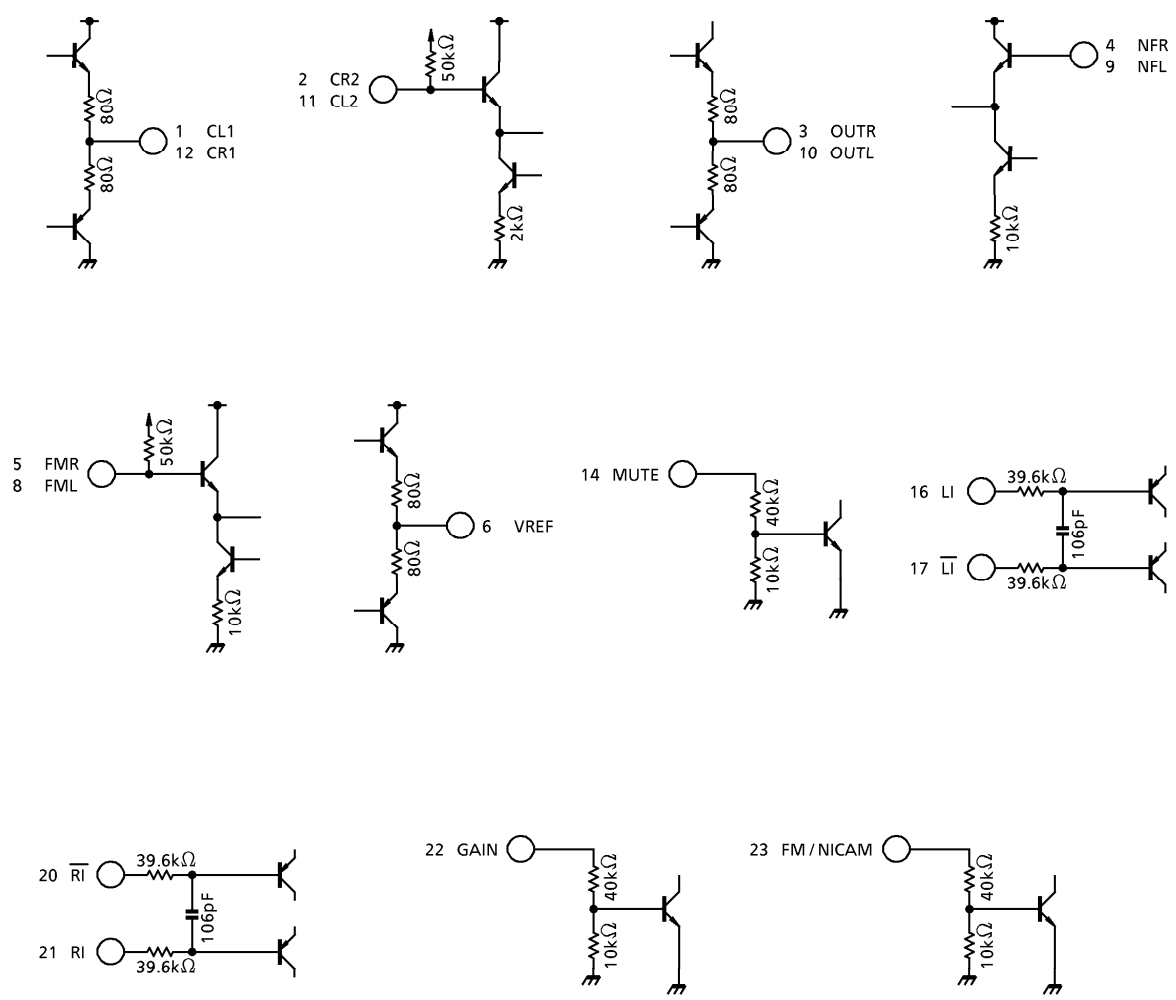


TERMINAL FUNCTION

Terminal list (Pin 24 FP, SDIP24)

PIN No.	PIN NAME	I/O	FUNCTION
1	CR1	O	R channel LPF input terminal.
2	CR2	I	R channel FM/NICAM select Amp. forward input terminal. (NICAM)
3	OUTR	O	R channel FM/NICAM select Amp. output terminal.
4	NFR	I	R channel FM/NICAM select Amp. reverse input terminal.
5	FMR	I	R channel FM/NICAM select Amp. forward input terminal. (FM)
6	VREF	O	1/2 V _{CC} reference voltage output terminal.
7	REF	—	(to be open)
8	FML	I	L channel FM/NICAM select Amp. forward input terminal. (FM)
9	NFL	I	L channel FM/NICAM select Amp. reverse input terminal.
10	OUTL	O	L channel FM/NICAM select Amp. output terminal.
11	CL2	I	L channel FM/NICAM select Amp. forward input terminal (NICAM)
12	CL1	O	L channel LPF input terminal.
13	V _{CC} L	—	L channel power supply.
14	MUTE	I	MUTE control signal input terminal. (L : MUTE OFF, H : MUTE ON)
15	GNDSUB	—	GND
16	LI	I	L channel forward input terminal.
17	\overline{LI}	I	L channel reverse input terminal.
18	GNDL	—	L channel GND.
19	GNDR	—	R channel GND.
20	\overline{RI}	I	R channel reverse input terminal.
21	RI	I	R channel forward input terminal.
22	GAIN SW	I	Gain control. (L : +0dB, H : +6dB)
23	FM/NICAM	I	FM/NICAM select terminal. (L : FM, H : NICAM)
24	V _{CC} R	—	R channel power supply.

TERMINAL INTERFACE CIRCUIT



MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V _{CC}	12.6	V
Storage Temperature	T _{stg}	-55~150	°C
Power Dissipation	P _D	1300 (*1)	mW
		400 (*2)	

(*1) When using the device at above Ta = 25°C, decrease the power dissipation by 3.6mW for each increase of 1°C. [TA2047N (24Pin SDIP Package)]

(*2) When using the device at above Ta = 25°C, decrease the power dissipation by 10.4mW for each increase of 1°C. [TA2047F (24Pin SSOP Package)]

RECOMMENDABLE OPERATING CONDITION

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V _{CC}	—	4.5	—	12.6	V
Operating Temperature	T _{opr}	—	-25	—	65	°C

ELECTRICAL CHARACTERISTICS (tentative)

(Unless otherwise specified, V_{CC} = 9V, 1/2V_{DD} = 2.5V, OSC1 = OSC2 = 1.17V_{rms} (1kHz))
 SW₁~SW₈ = a, 400Hz HPF, 30kHz LPF, Ta = 25°C

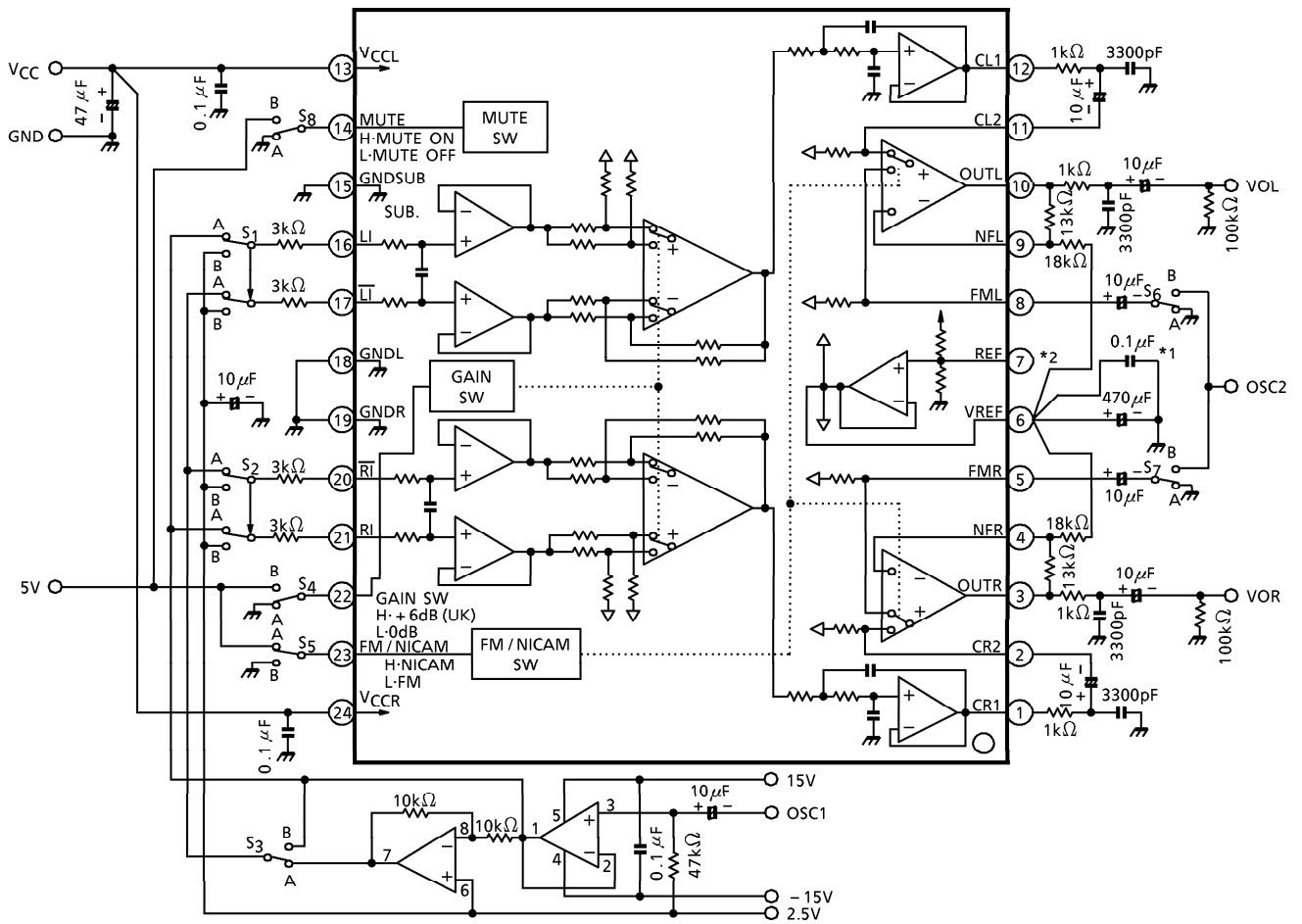
CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Consumption Current	I _{CCQ}	—	SW ₁ = SW ₂ = b	11.6	15.6	21.0	mA
Noise Distortion Factor	THD + N	—	—	—	-79	-74	dB
S/N	S/N	—	—	82	86	—	dB
Gain	G _V	—	OSC1 = 460mV _{rms}	2.60	4.24	—	dB
Gain (15k)	G _V (15k)	—	f = 15kHz, OSC1 = 460mV _{rms}	1.25	3.45	—	dB
Gain (70k)	G _V (70k)	—	f = 70kHz, OSC1 = 460mV _{rms}	—	-31.0	-12.7	dB
Gain (UK)	G _V (UK)	—	SW ₄ = b, OSC1 = 230mV _{rms}	8.6	10.28	—	dB
Cross Talk	CT	—	SW ₂ = b (L-ch→R-ch), SW ₁ = b (R-ch→L-ch)	—	-85.0	-80.8	dB
High Level Input Voltage (1)	G _V V _{th} (H)	—	—	4.0	—	—	V
Low Level Input Voltage (2)	G _V V _{th} (L)	—	—	—	—	1.0	V
High Level Input Voltage (3)	F/N V _{th} (H)	—	—	4.0	—	—	V
Low Level Input Voltage (4)	F/N V _{th} (L)	—	—	—	—	1.0	V
High Level Input Voltage (5)	Mu V _{th} (H)	—	—	4.0	—	—	V
Low Level Input Voltage (6)	Mu V _{th} (L)	—	—	—	—	1.0	V

(*1) For GAIN SW (pin 22)

(*2) For FM / NICAM (pin 23)

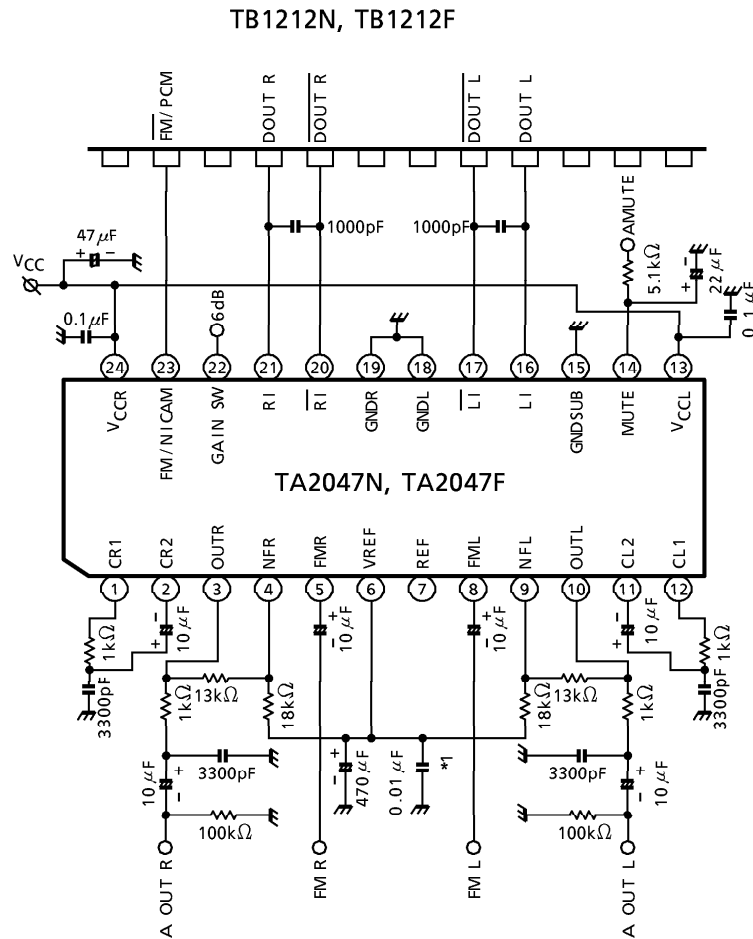
(*3) For MUTE (pin 14)

TEST CIRCUIT



- (Note 1) It is require to connect ceramic or film condenser not to receive temperature characteristics.
- (Note 2) Pin 7 to be open. (Don't connect to GND or V_{CC}).
- (Note 3) It is require to other wring GND line of pin 18, 19 and 15.
- (Note 4) C24 connect between pin 6 and 15.

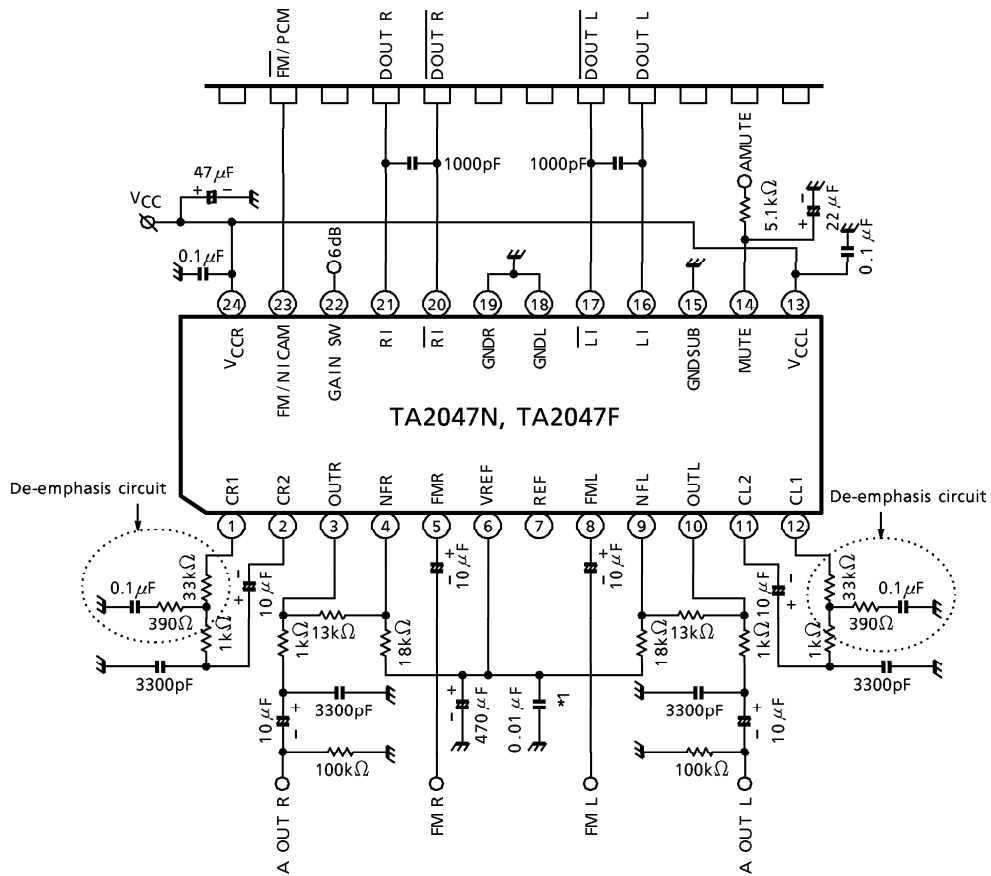
APPLICATION CIRCUIT 1
(Digital De-emphasis $V_{CC} = 9V$)



- (Note 1) It is require to connect ceramic or film condenser not to receive temperature characteristics. (*1)
- (Note 2) Pin 7 to be open. (Don't connect to GND or V_{CC})
- (Note 3) It is require to other wring GND line of pin 18, 19 and 15.
- (Note 4) C24 connect between pin 6 and 15.

APPLICATION CIRCUIT 2
(Analog De-emphasis $V_{CC} = 9V$)

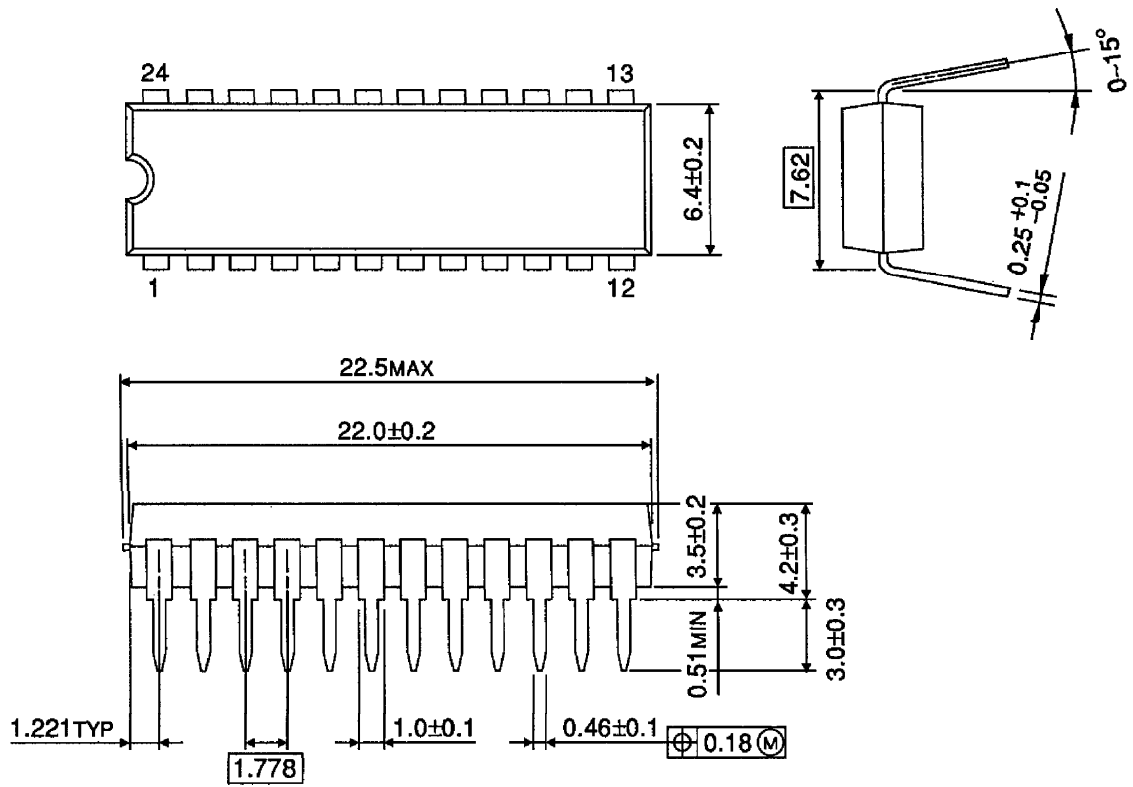
TB1212N, TB1212F



- (Note 1) It is require to connect ceramic or film condenser not to receive temperature characteristics. (*1)
- (Note 2) Pin 7 to be open. (Don't connect to GND or V_{CC})
- (Note 3) It is require to other wiring GND line of pin 18, 19 and 15.
- (Note 4) C24 connect between pin 6 and 15.

OUTLINE DRAWING
SDIP24-P-300-1.78

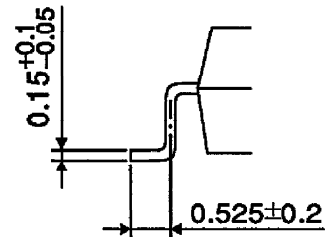
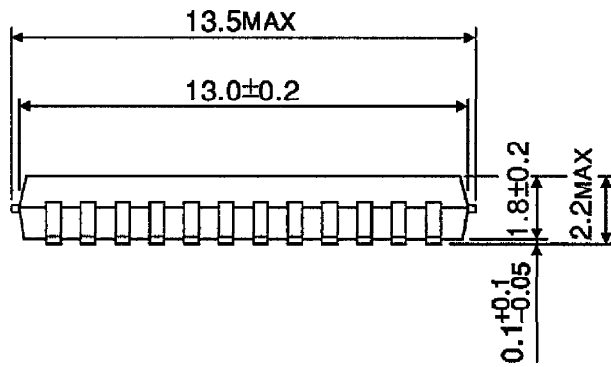
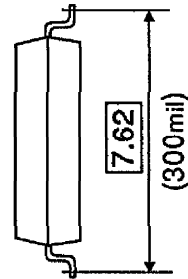
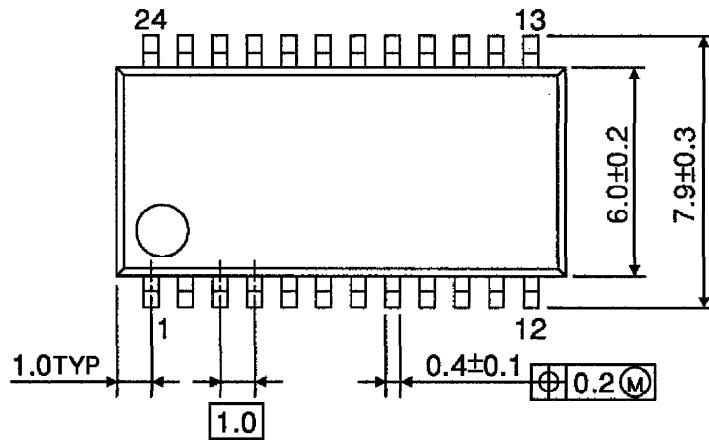
Unit : mm



Weight : 1.22g (Typ.)

OUTLINE DRAWING
SSOP24-P-300-1.00

Unit : mm



Weight : 0.32g (Typ.)