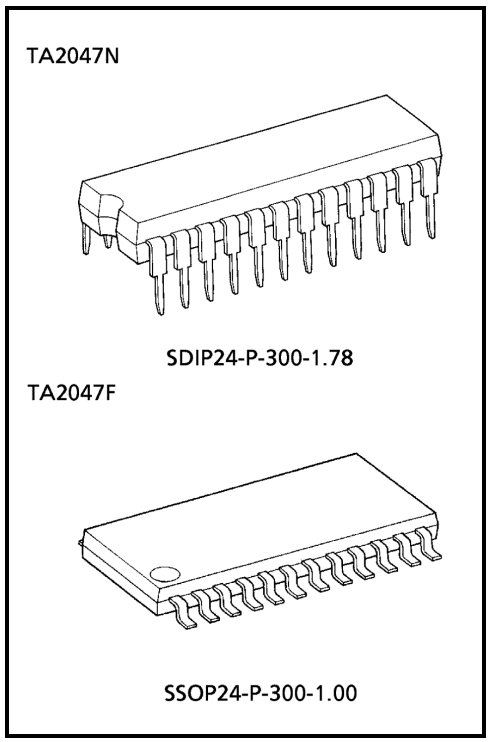
TOSHIBA Bipolar Linear Integrated Circuit Silicon Monolithic

TENTATIVE

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.

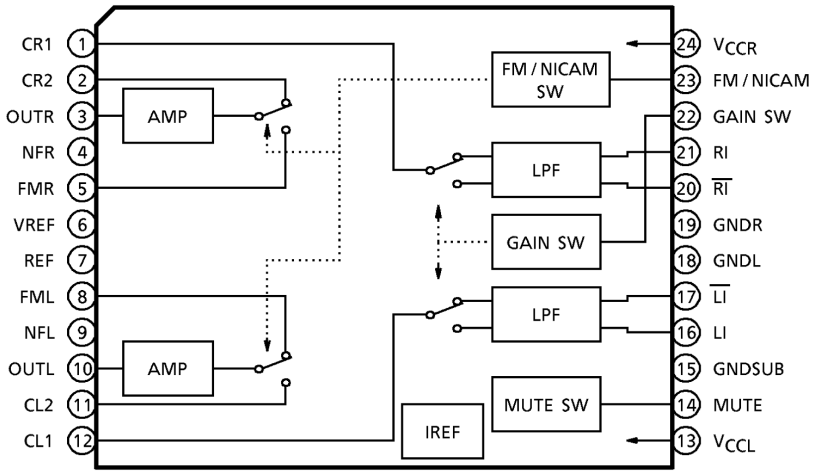


Weight
SDIP24−P−300−1.78 : 1.22g (typ.)
SSOP24−P−300−1.00 : 0.32g (typ.)

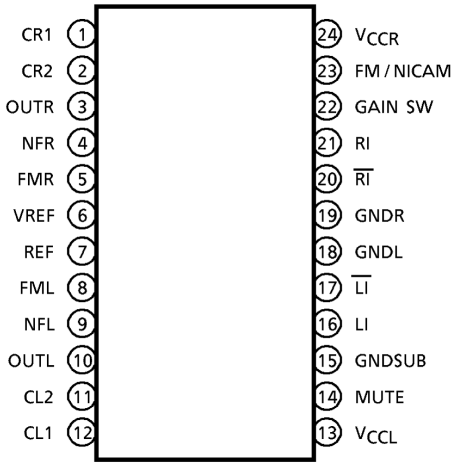
Features

- 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)

Block Diagram



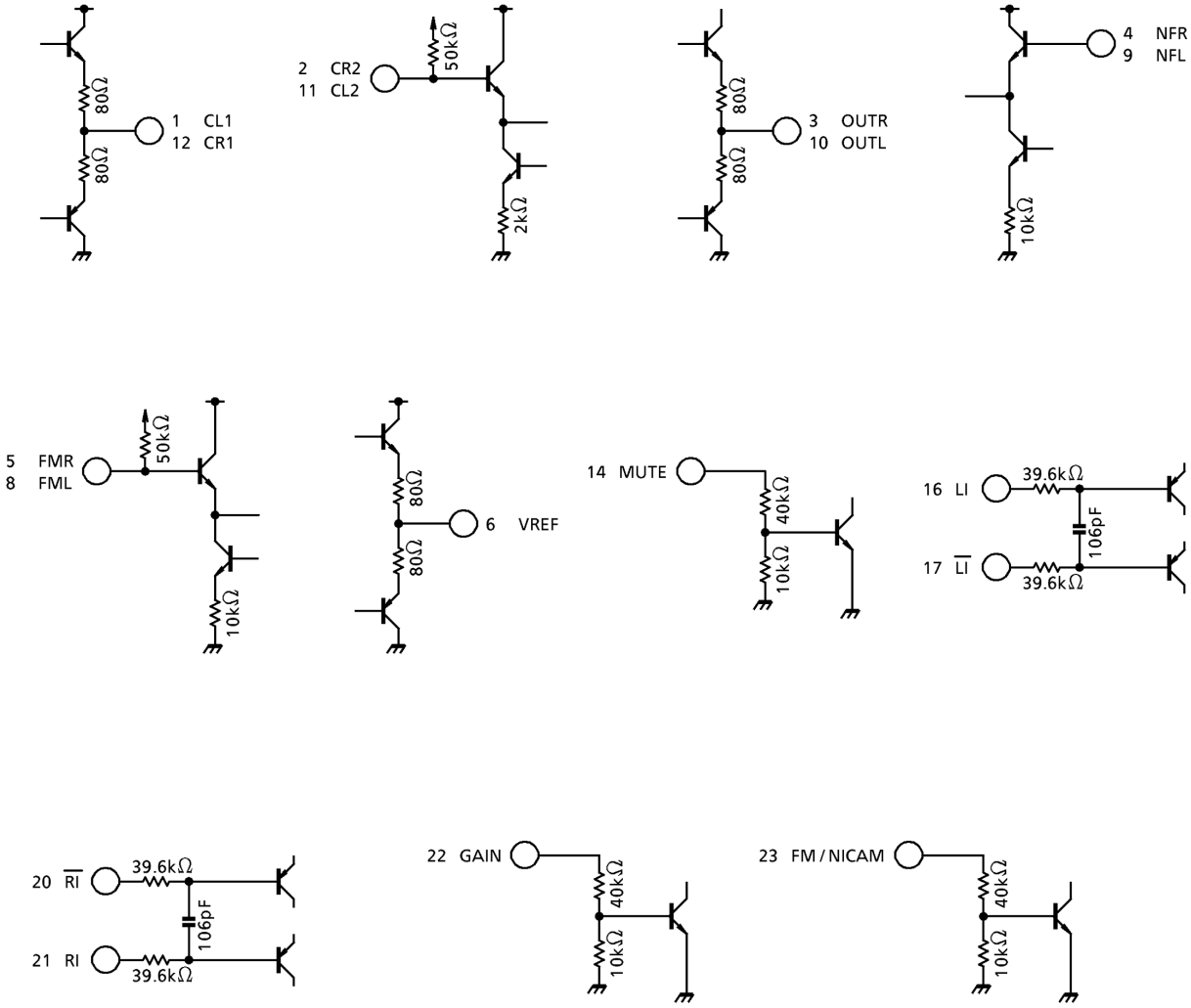
Terminal Connection



Terminal Function
Terminal List (pin24 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_{CCL}	—	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_{CCR}	—	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) SW_1~SW_8 = a, 400Hz HPF, 30kHz LPF, Ta = 25°C)

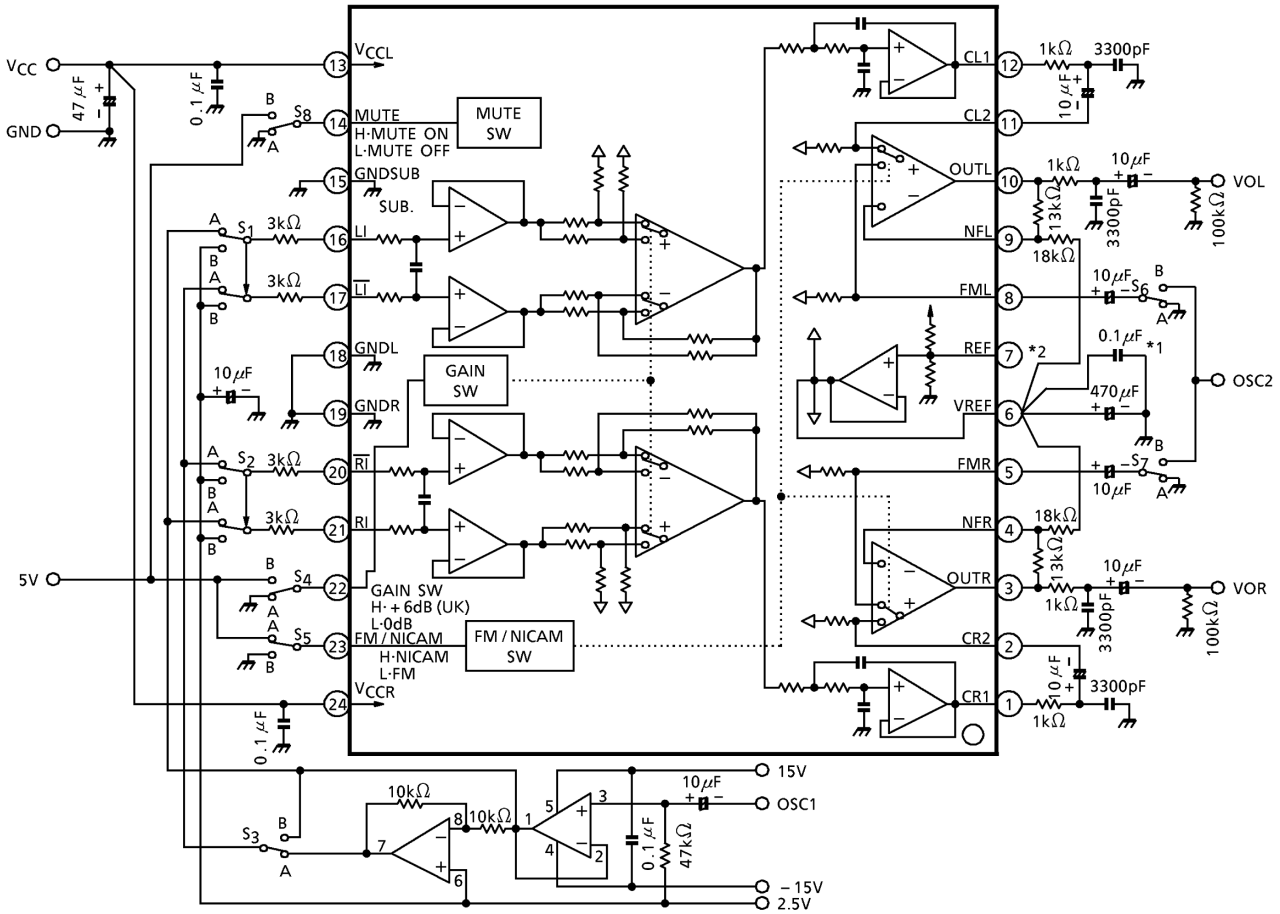
Characteristic	Symbol	Test Circuit	Test Condition	Min.	Typ.	Max.	Unit
Consumption current	I_{CCQ}	—	SW_1 = SW_2 = b	11.6	15.6	21.0	mA
Noise distortion factor	THD + N	—	—	—	−79	−74	dB
S / N	S / N	—	—	82	86	—	dB
Gain	G_V	—	OSC1 = 460mV_{rms}	2.60	4.24	—	dB
Gain (15k)	G_V (15k)	—	f = 15kHz, OSC1 = 460mV_{rms}	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) (*1)	G_V V_{th} (H)	—	—	4.0	—	—	V
Low level input voltage (2) (*1)	G_V V_{th} (L)	—	—	—	—	1.0	V
High level input voltage (3) (*2)	F / N V_{th} (H)	—	—	4.0	—	—	V
Low level input voltage (4) (*2)	F / N V_{th} (L)	—	—	—	—	1.0	V
High level input voltage (5) (*3)	Mu V_{th} (H)	—	—	4.0	—	—	V
Low level input voltage (6) (*3)	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



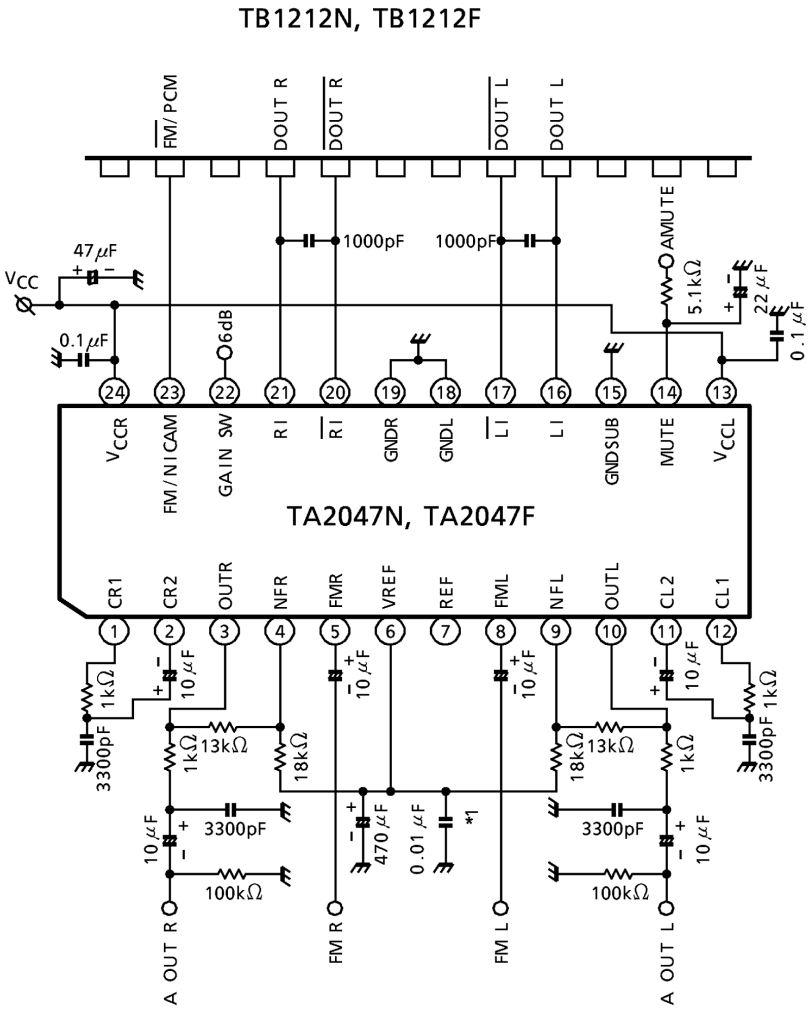
(Note 1) It is require to connect ceramic or film condenser not to receive temperature characteristics.

(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)

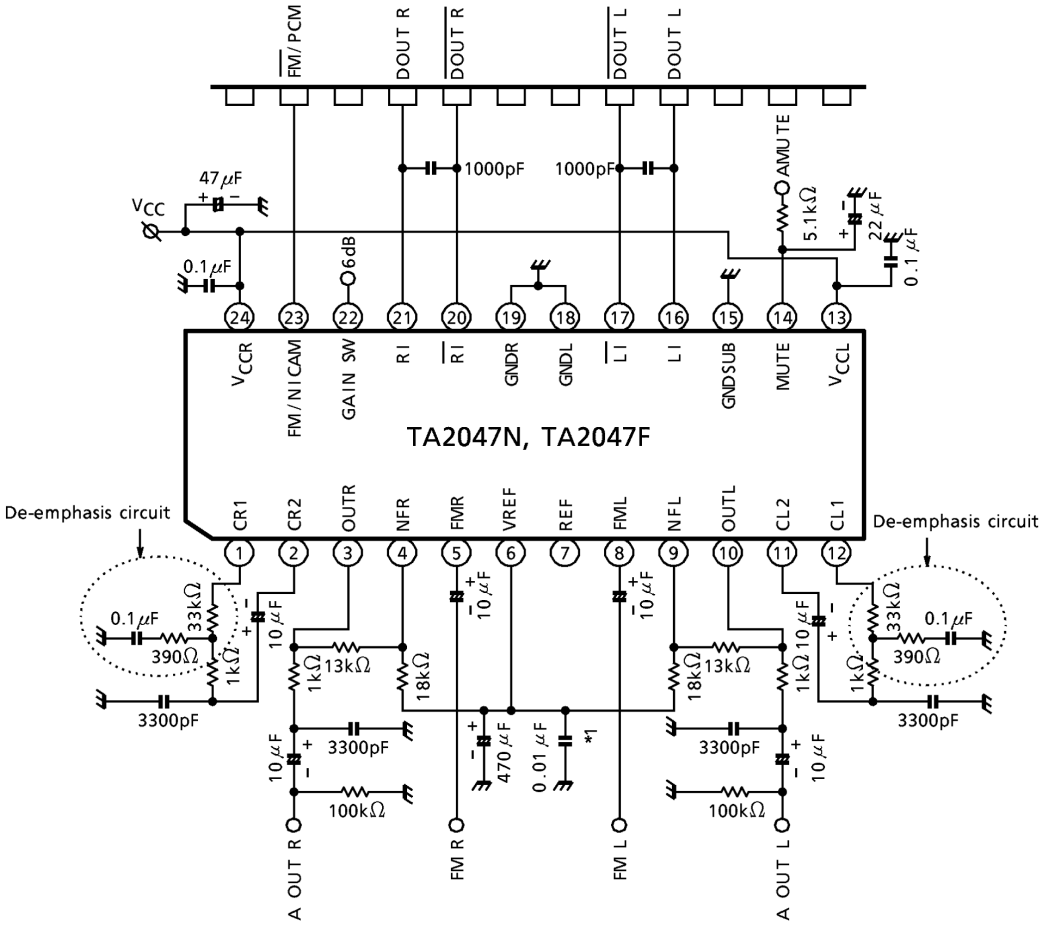
(Note 2) Pin 7 to be open. (Don't connect to GND or V_{CC})

(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)

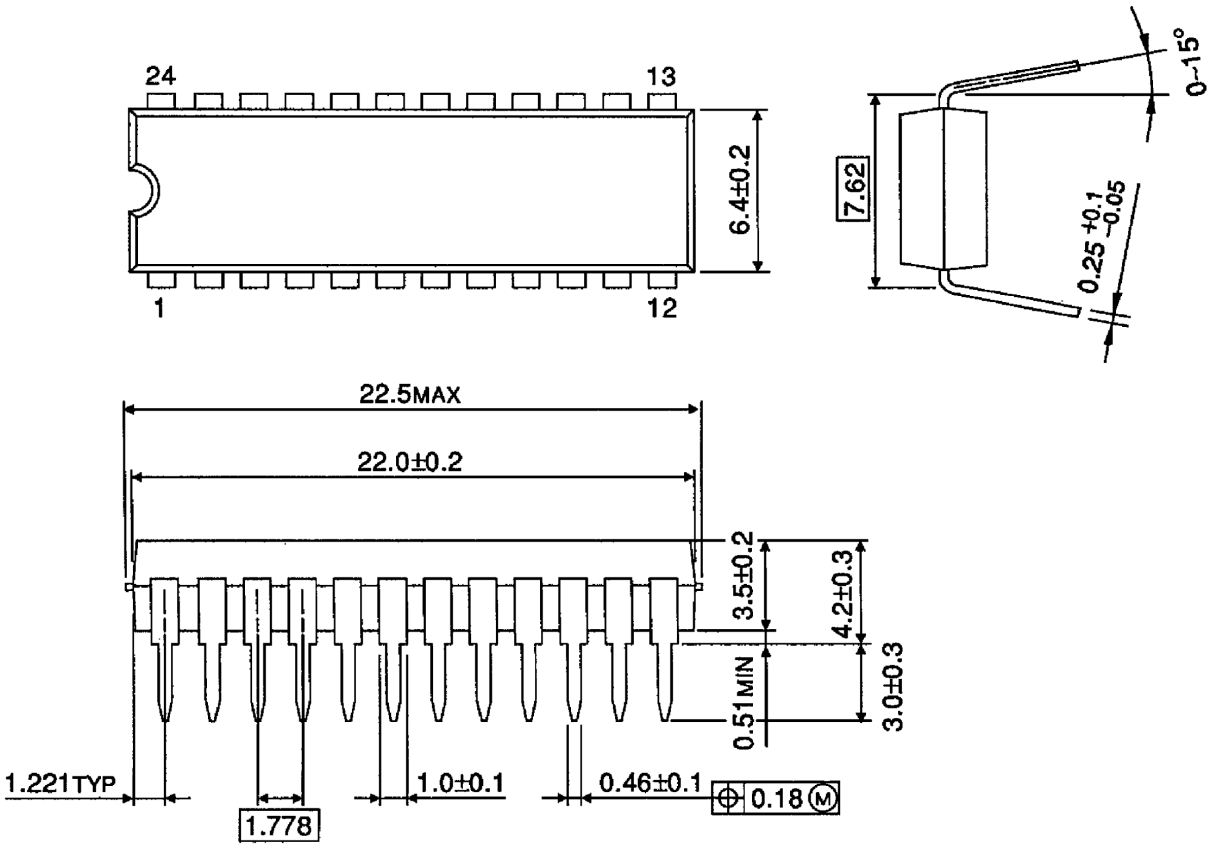
(Note 2) Pin 7 to be open. (Don't connect to GND or V_{CC})

(Note 3) It is require to other wring GND line of pin 18, 19 and 15.

(Note 4) C24 connect between pin 6 and 15.

Package Dimensions

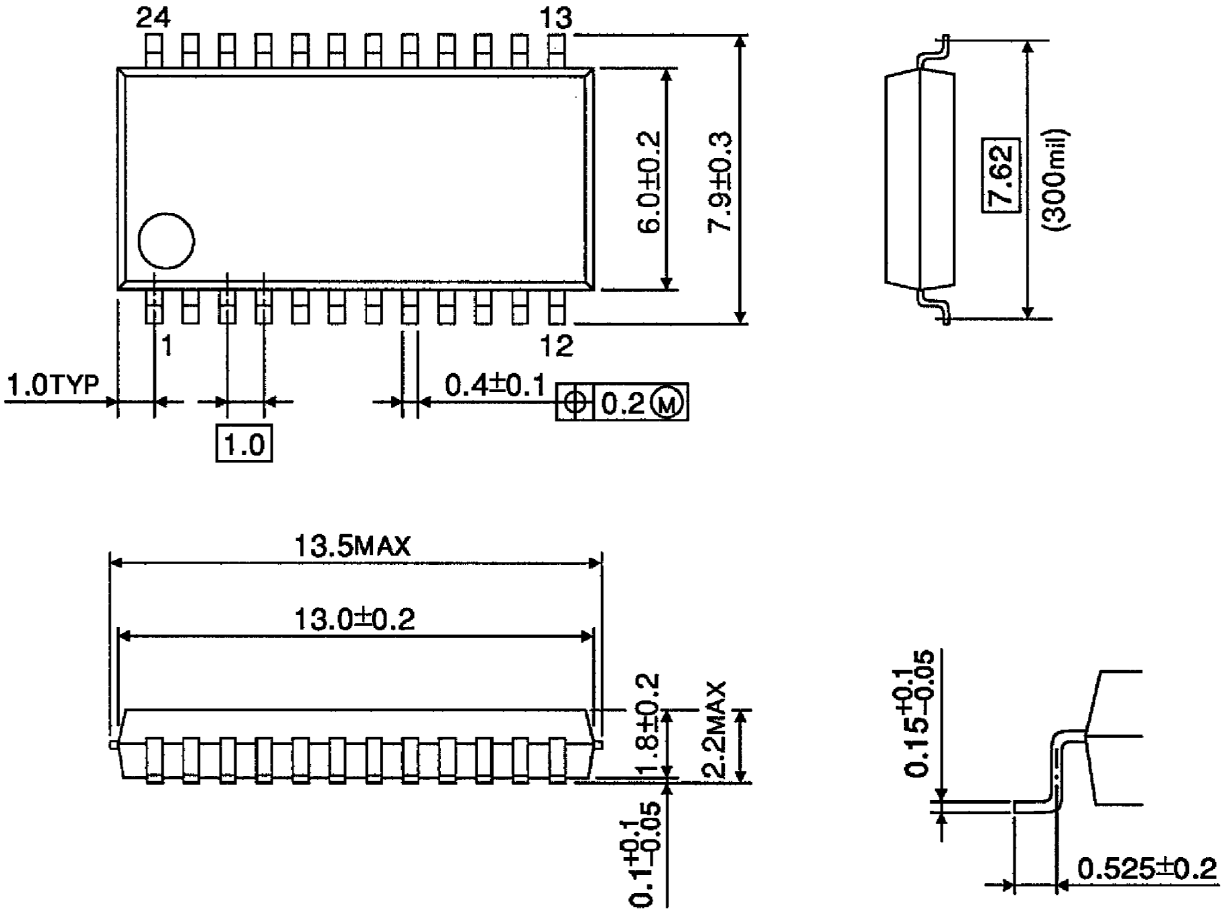
SDIP24-P-300-1.78 Unit : mm



Weight: 1.22g (typ.)

Package Dimensions

SSOP24-P-300-1.00 Unit : mm



Weight: 0.32g (typ.)

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