

TOSHIBA Bipolar Linear Integrated Circuit Silicon Monolithic

# TA2132BP, TA2132BF

## AM/FM Radio IC

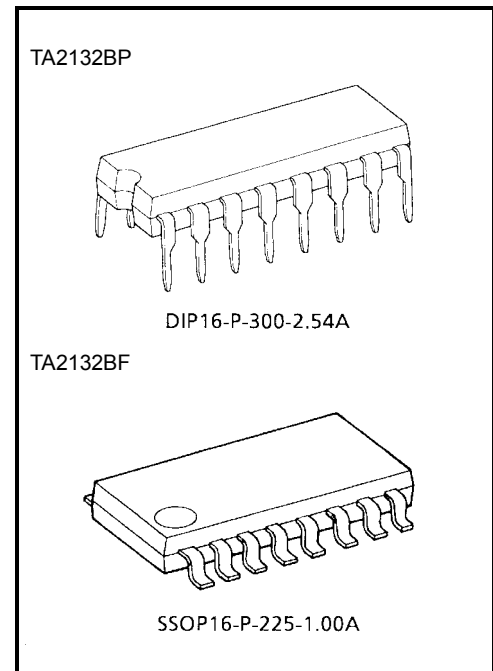
TA2132BP, TA2132BF are AM/FM Radio IC (FM F/E + AM/FM IF) which are designed for AM/FM Radios.

FM Local Oscillation Voltage is set up low relativity, for NEW FCC.

### Features

- For NEW FCC.
- AM detector coil, FM IFT, IF coupling condenser are not needed.
- For adopting ceramic discriminator, it is not necessary to adjust the FM quad detector circuit.
- Built-in varactor diode for AFC
- Low supply current: (VCC = 3 V, Ta = 25°C)  
ICCq (FM) = 7.3 mA (typ.)  
ICCq (AM) = 3.6 mA (typ.)
- Operating supply voltage range: VCC = 1.8~7 V (Ta = 25°C)

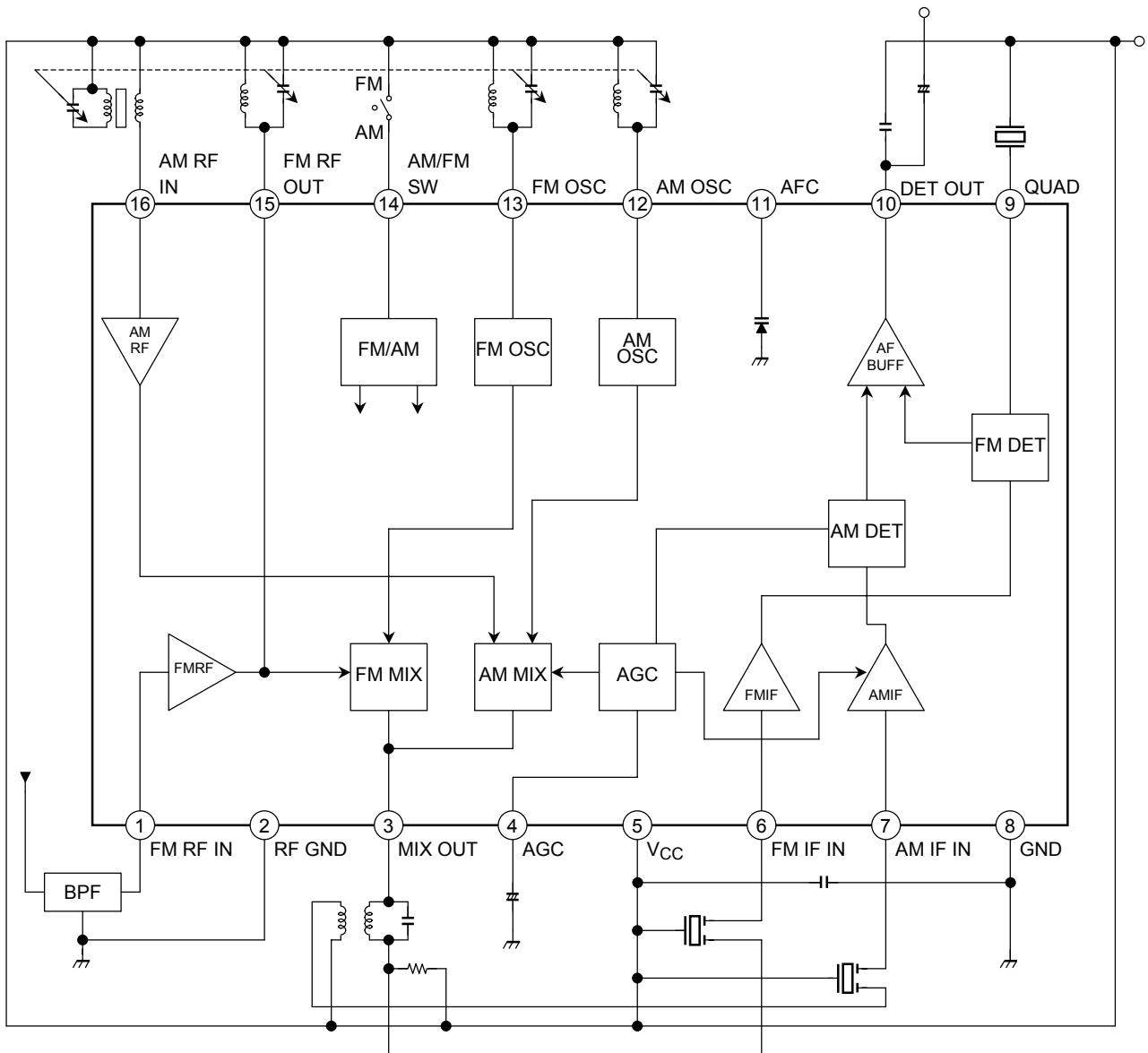
Note: The IC may be destroyed due to incorrect orientation of device's mounting.



### Weight

DIP16-P-300-2.54A : 1.00 g (typ.)  
SSOP16-P-225-1.00A : 0.14 g (typ.)

## Block Diagram



## Explanation of Terminals

(Terminal Voltage: Typical DC voltage at no signal with test circuit,  $V_{CC} = 3\text{ V}$ ,  $T_a = 25^\circ\text{C}$ )

Pin No.	Characteristics	Internal Circuit	DC Voltage (V)	
			AM	FM
1	FM RF IN		0	0.8
2	RF GND (GND for FM RF, FM OSC stage)	—	0	0
3	MIX OUT		3.0	2.9
4	AGC (FM IF level output)		0	0
5	$V_{CC}$ ( $V_{CC}$ for AM, FM IF stage)	—	3.0	3.0
6	FM IF IN		3.0	3.0

Pin No.	Characteristics	Internal Circuit	DC Voltage (V)	
			AM	FM
7	AM IF IN		2.3	2.6
8	GND (GND for AM, FM IF stage)	—	0	0
9	QUAD		2.5	2.2
10	DET OUT	<p> <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">a</span> LOW → FM, HIGH → AM  <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">b</span> LOW → AM, HIGH → FM         </p>	1.0	0.9
11	AFC		—	—

Pin No.	Characteristics	Internal Circuit	DC Voltage (V)	
			AM	FM
12	AM OSC		3.0	3.0
13	FM OSC		3.0	3.0
14	AM/FM SW <ul style="list-style-type: none"> <li>SW condition                V14 = V<sub>CC</sub> → FM                V14 = OPEN → AM</li> <li>V<sub>CC</sub> for FM RF, FM OSC stage</li> </ul>		—	3.0
15	FM RF OUT	Cf-Pin 1	3.0	3.0
16	AM RF IN		3.0	3.0

## Maximum Ratings (Ta = 25°C)

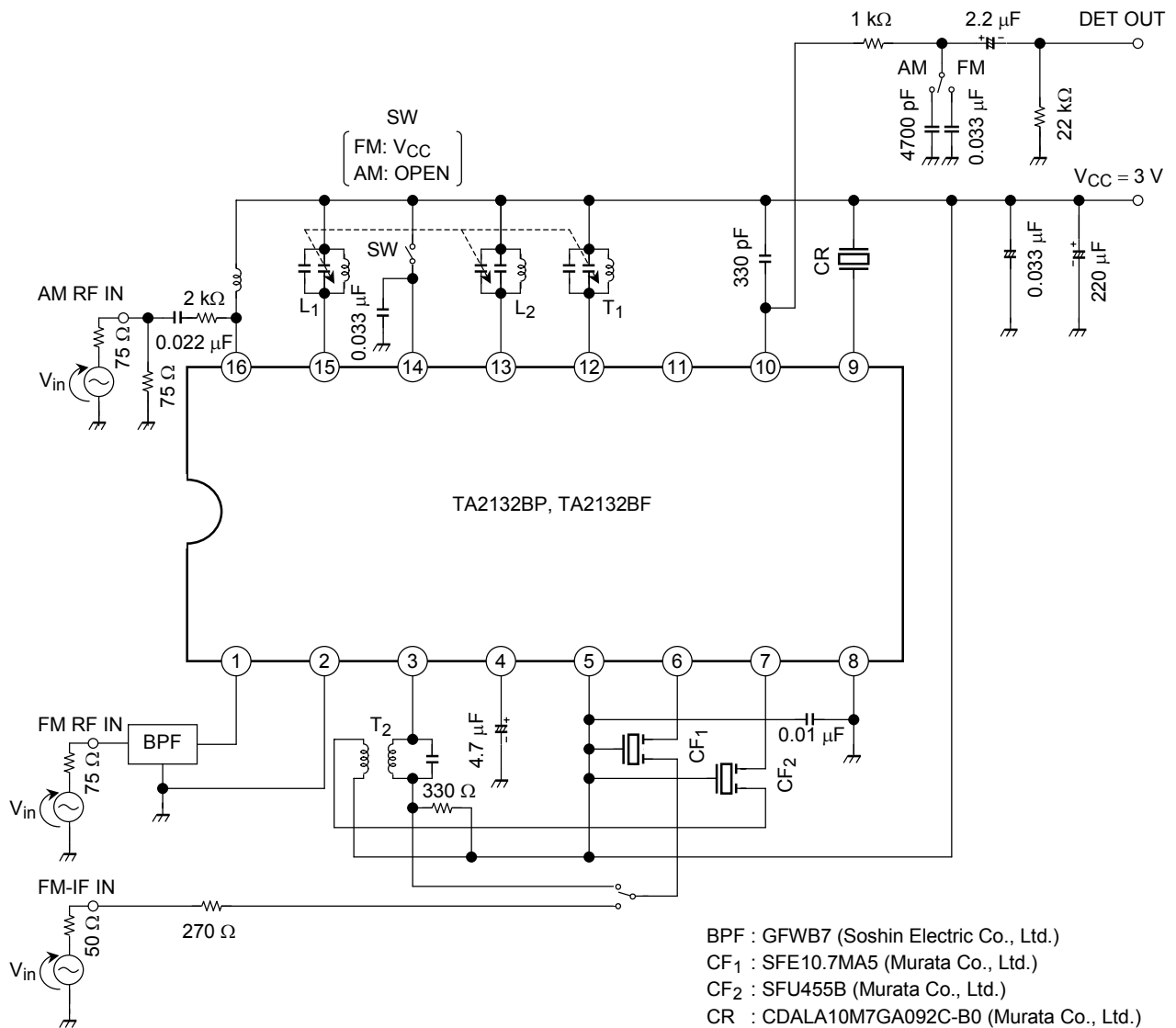
Characteristics		Symbol	Rating	Unit
Supply voltage		V <sub>CC</sub>	8	V
Power dissipation	TA2132BP	P <sub>D</sub> (Note 1)	750	mW
	TA2132BF		350	
Operating temperature		T <sub>opr</sub>	-25~75	°C
Storage temperature		T <sub>stg</sub>	-55~150	°C

Note 1: Deleted above Ta = 25°C in the proportion of 6 mW/°C for TA2132BP and of 2.8 mW/°C for TA2132BF.

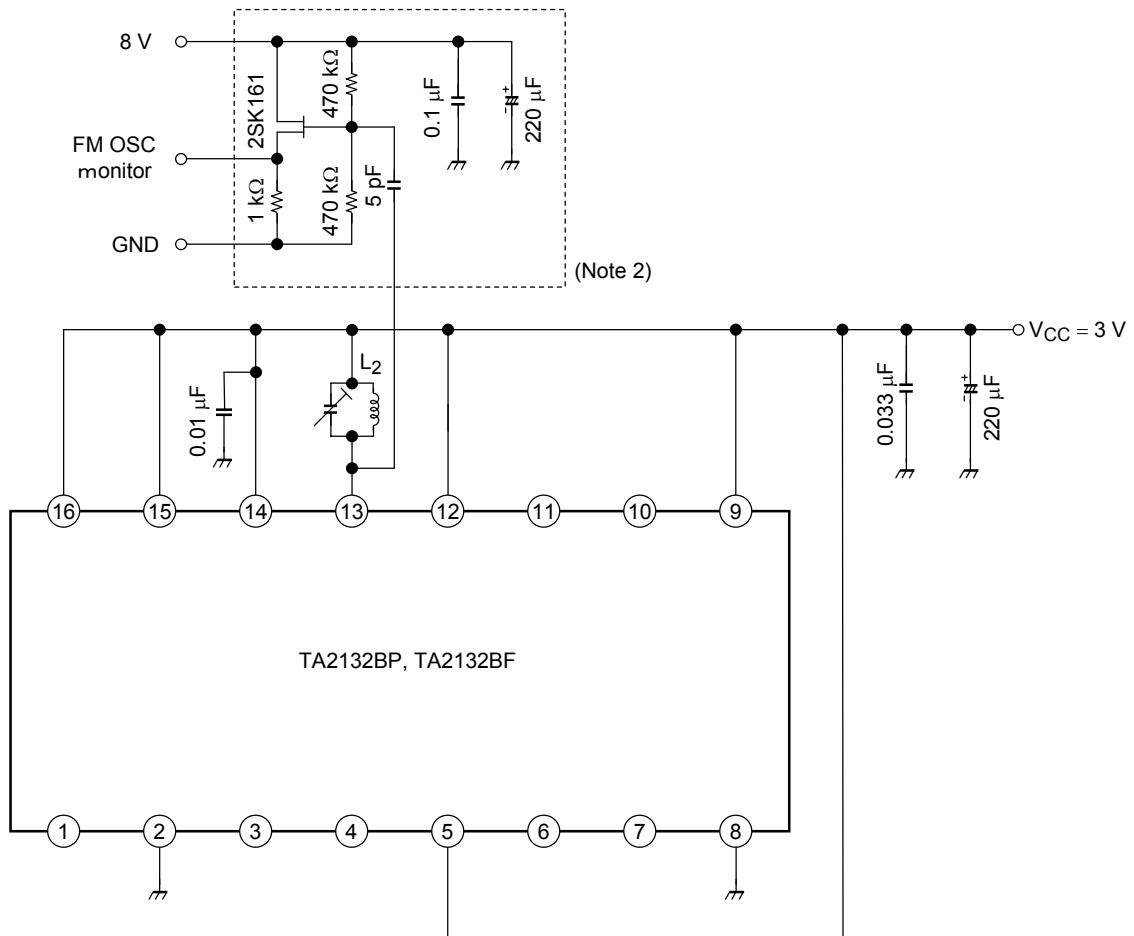
## Electrical Characteristics (Unless otherwise specified, Ta = 25°C, V<sub>CC</sub> = 3 V, **F/E** : f = 98 MHz, f<sub>m</sub> = 1 kHz **FM IF** : f = 10.7 MHz, Δf = ±75 kHz, f<sub>m</sub> = 1 kHz **AM** : f = 1 MHz, MOD = 30%, f<sub>m</sub> = 1 kHz)

Characteristics		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Supply current		I <sub>CC</sub> (FM)	1	FM mode, V <sub>in</sub> = 0	—	7.3	11.0	mA
		I <sub>CC</sub> (AM)	1	AM mode, V <sub>in</sub> = 0	—	3.6	7.0	
F/E	Input limiting voltage	V <sub>in</sub> (lim)	1	-3dB limiting point	—	10	—	dB <sub>μ</sub> V EMF
	Quiescent sensitivity	Q <sub>S</sub>	1	S/N = 40dB	—	15	—	dB <sub>μ</sub> V EMF
	Local OSC voltage	V <sub>OSC</sub>	2	f <sub>OSC</sub> = 108 MHz	—	130	—	mV <sub>rms</sub>
FM IF	Input limiting voltage	V <sub>in</sub> (lim) IF	1	-3dB limiting point	38	43	48	dB <sub>μ</sub> V EMF
	Recovered output voltage	V <sub>OD</sub>	1	V <sub>in</sub> = 80dB <sub>μ</sub> V EMF	180	240	300	mV <sub>rms</sub>
	Signal to noise ratio	S/N	1	V <sub>in</sub> = 80dB <sub>μ</sub> V EMF	—	72	—	dB
	Total harmonic distortion	THD	1	V <sub>in</sub> = 80dB <sub>μ</sub> V EMF	—	0.5	—	%
	AM rejection ratio	AMR	1	V <sub>in</sub> = 80dB <sub>μ</sub> V EMF	—	60	—	dB
AM	Voltage gain	G <sub>V</sub>	1	V <sub>in</sub> = 28dB <sub>μ</sub> V EMF	20	38	75	mV <sub>rms</sub>
	Recovered output voltage	V <sub>OD</sub>	1	V <sub>in</sub> = 60dB <sub>μ</sub> V EMF	55	80	110	mV <sub>rms</sub>
	Signal to noise ratio	S/N	1	V <sub>in</sub> = 60dB <sub>μ</sub> V EMF	—	41	—	dB
	Total harmonic distortion	THD	1	V <sub>in</sub> = 60dB <sub>μ</sub> V EMF	—	1.0	—	%

## Test Circuit 1



## Test Circuit 2

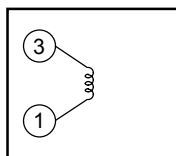


Note 2: FET buff voltage gain  $\approx$  0dB

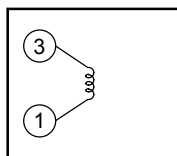
## Coil Data

Coil No.	Test Freq.	L ( $\mu$ H)	Co (pF)	Qo	Turns					Wire (mm $\phi$ )	Reference
					1-2	2-3	1-3	1-4	4-6		
L <sub>1</sub> FM RF	100 MHz	—	—	79	—	—	—	2 $\frac{1}{2}$	—	0.16UEW	Toko Co., Ltd. 666SNF-305NK
L <sub>2</sub> FM OSC	100 MHz	—	—	76	—	—	—	2	—	0.16UEW	Toko Co., Ltd. 666SNF-306NK
T <sub>1</sub> AM OSC	796 kHz	268	—	65	19	95	—	—	—	0.05UEW	Toko Co., Ltd. 5PNR-5146Y
T <sub>2</sub> AM IFT	455 kHz	—	470	60	—	—	109	—	7	0.05UEW	Toko Co., Ltd. 5PLG-5147X

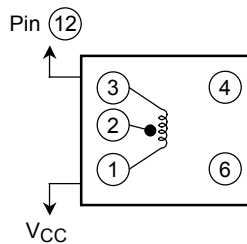
L<sub>1</sub>: FM RF



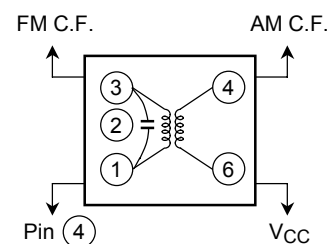
L<sub>2</sub>: FM OSC



T<sub>1</sub>: AM OSC

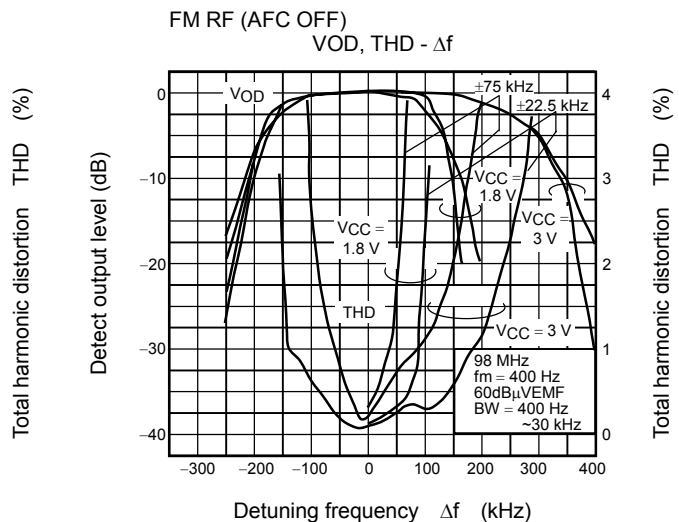
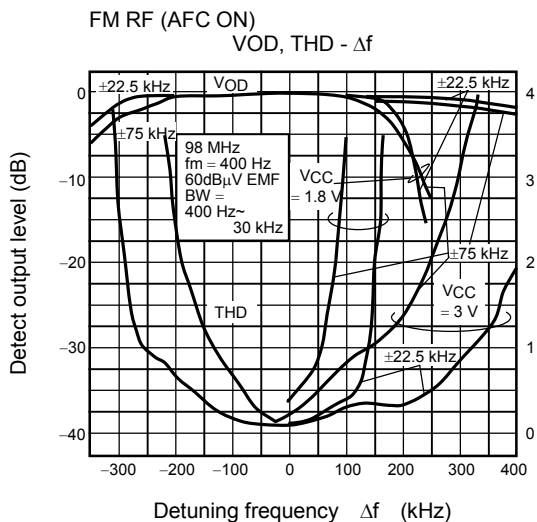
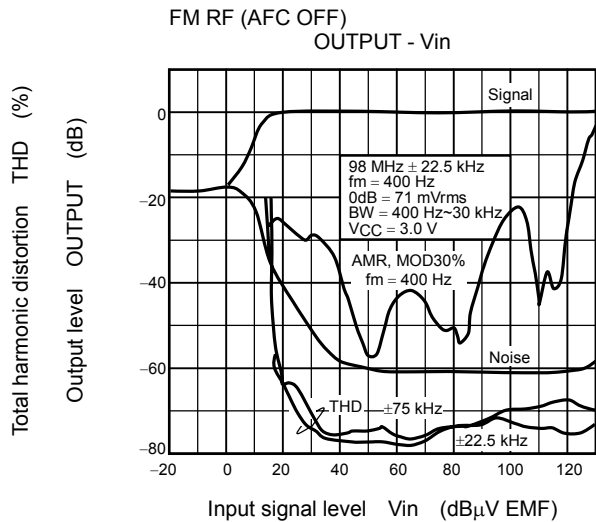
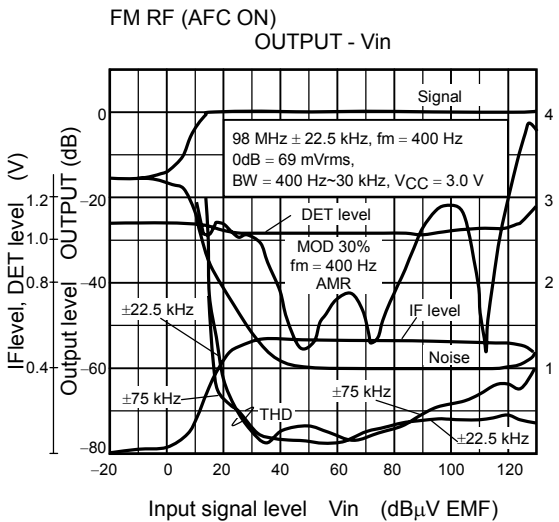
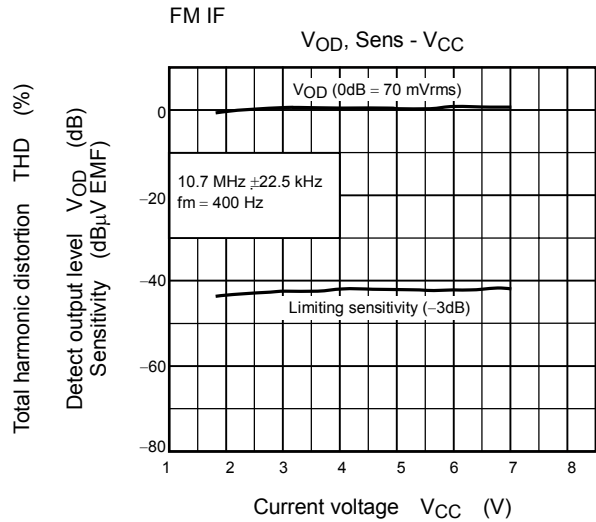
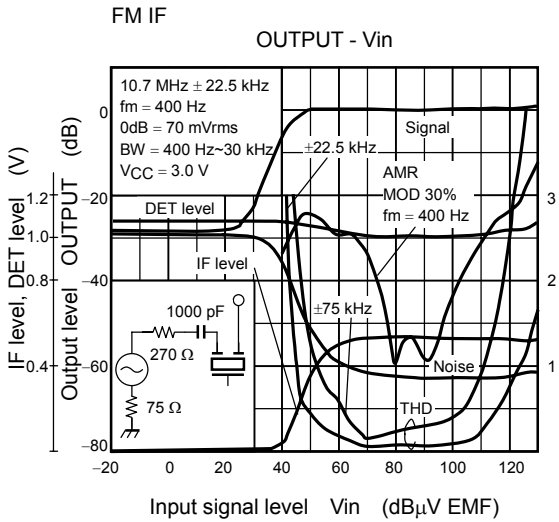


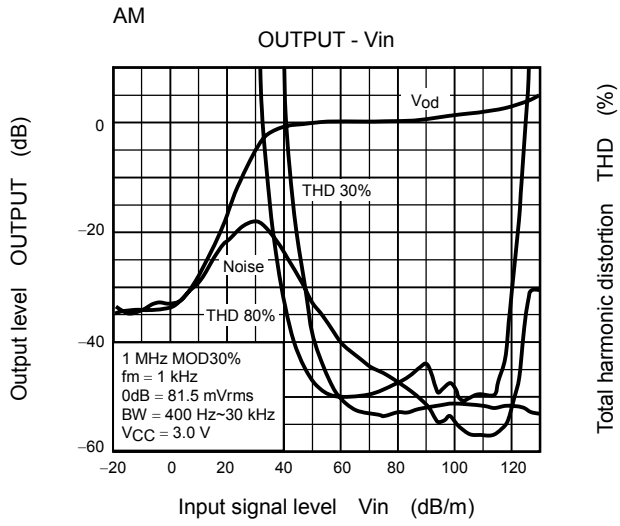
T<sub>2</sub>: AM IFT



(BOTTOM VIEW)



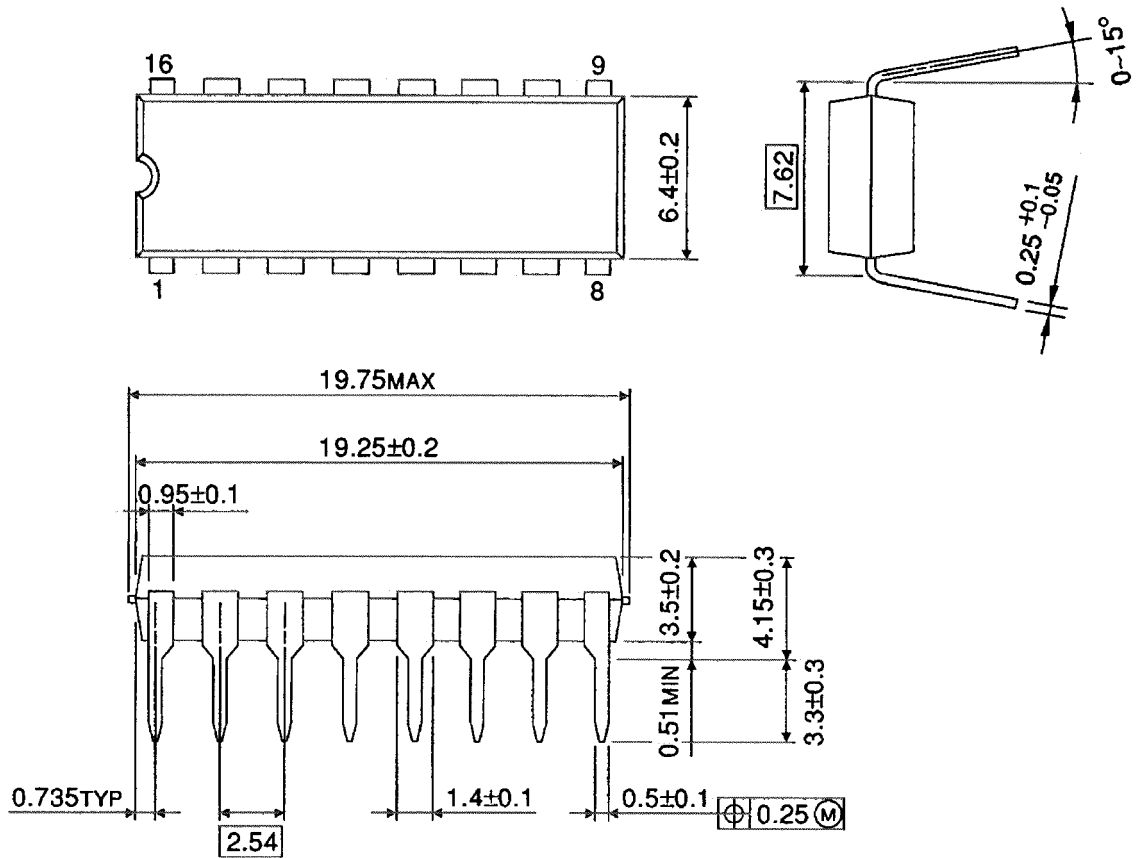




**Package Dimensions**

DIP16-P-300-2.54A

Unit : mm

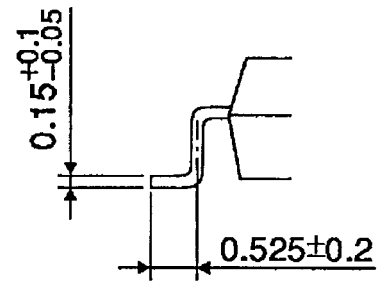
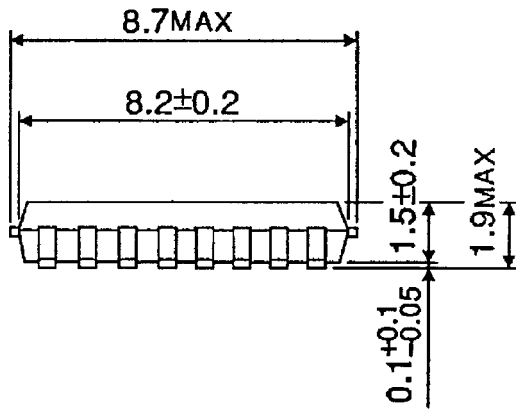
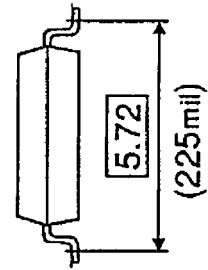
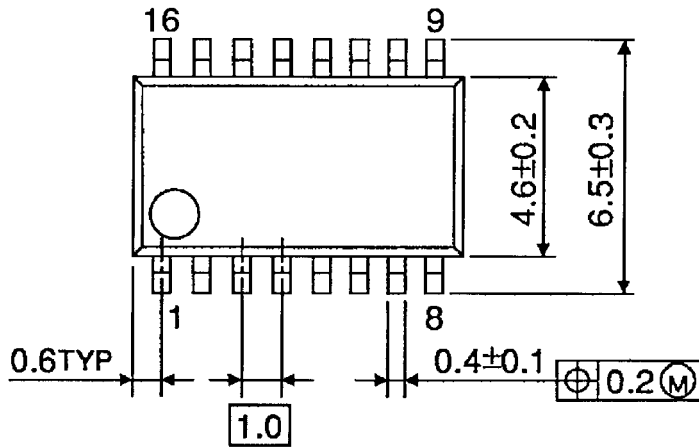


Weight: 1.00 g (typ.)

**Package Dimensions**

SSOP16-P-225-1.00A

Unit : mm



Weight: 0.14 g (typ.)

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