

TOSHIBA Bipolar Linear Integrated Circuit Silicon Monolithic

TA2132BP, TA2132BF

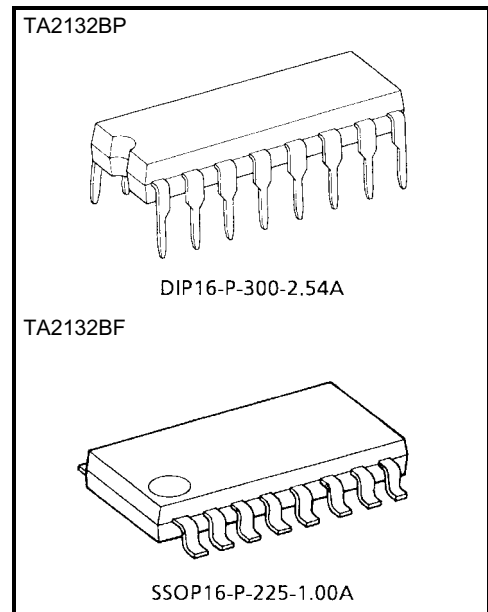
AM/FM Radio IC

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: ($V_{CC} = 3\text{ V}$, $T_a = 25^\circ\text{C}$)
 $I_{CCq}(\text{FM}) = 7.3\text{ mA (typ.)}$
 $I_{CCq}(\text{AM}) = 3.6\text{ mA (typ.)}$
- Operating supply voltage range: $V_{CC} = 1.8\sim 7\text{ V}$ ($T_a = 25^\circ\text{C}$)



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

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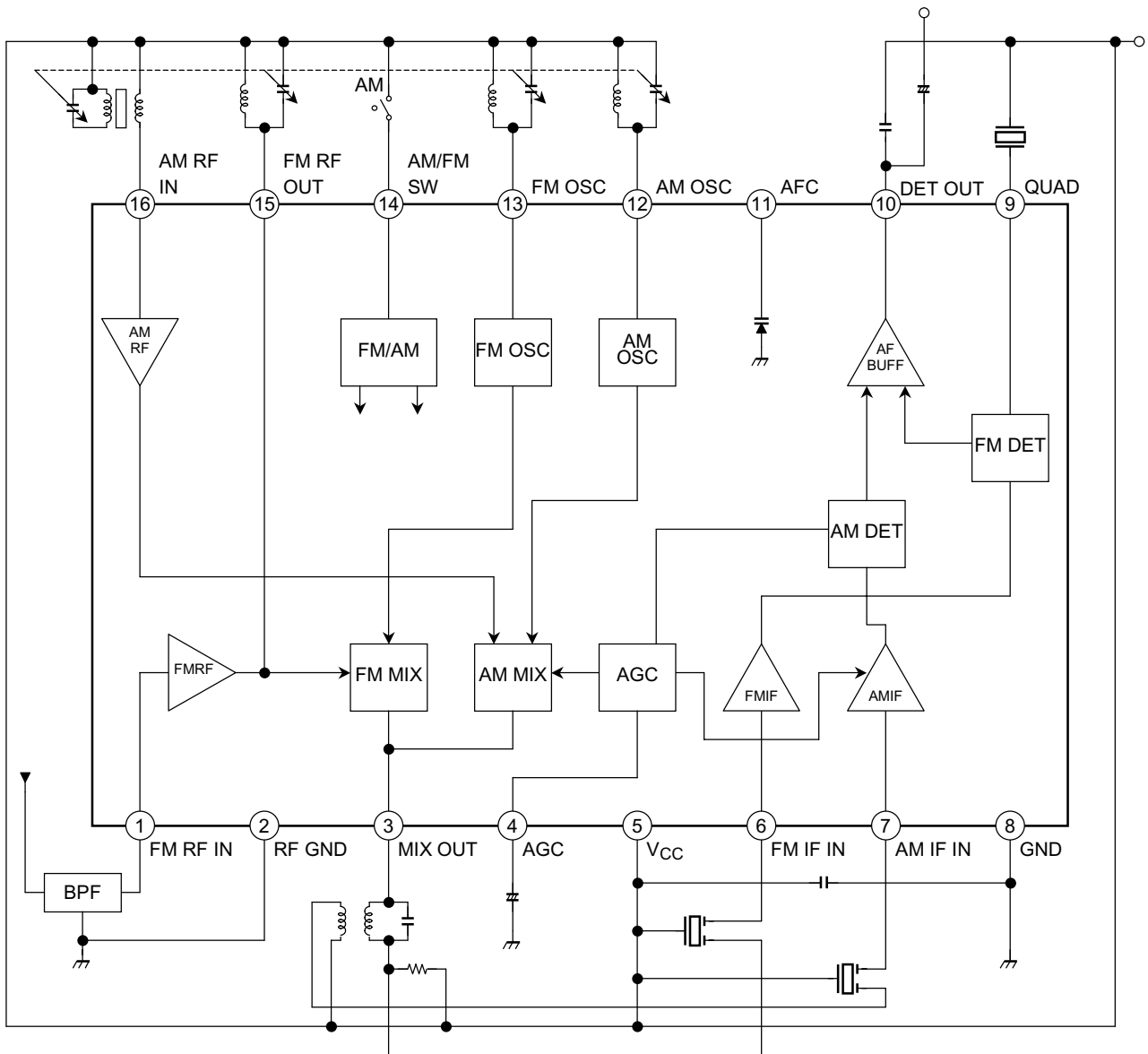
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Block Diagram



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>(a) LOW → FM, HIGH → AM (b) 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	<p>AM/FM SW</p> <ul style="list-style-type: none"> SW condition V14 = V_{CC} → FM V14 = OPEN → AM V_{CC} for FM RF, FM OSC stage 		—	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)

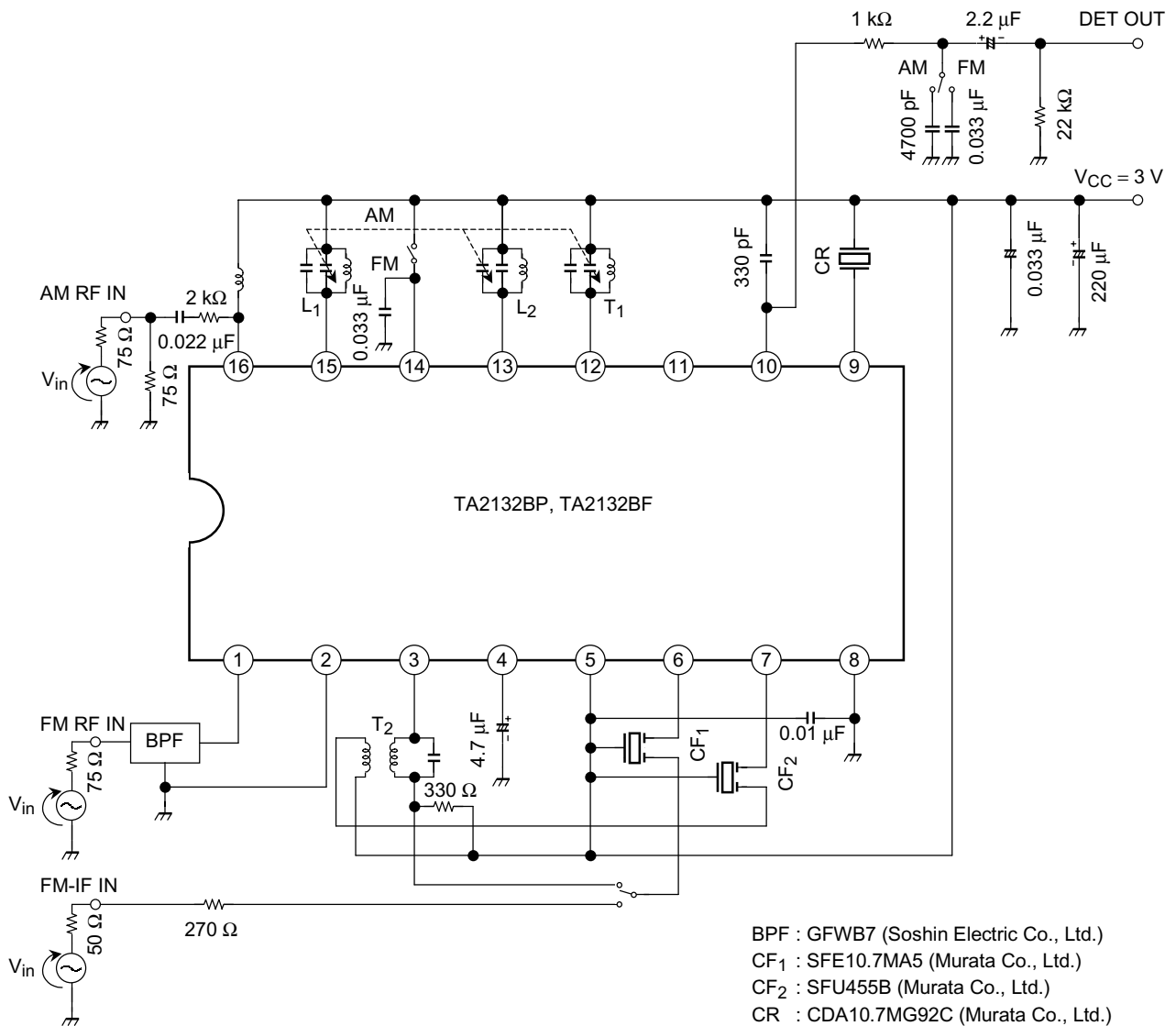
Characteristics		Symbol	Rating	Unit
Supply voltage		V _{CC}	8	V
Power dissipation	TA2132BP	P _D (Note 1)	750	mA
	TA2132BF		350	mW
Operating temperature		T _{opr}	-25~75	°C
Storage temperature		T _{stg}	-55~150	°C

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

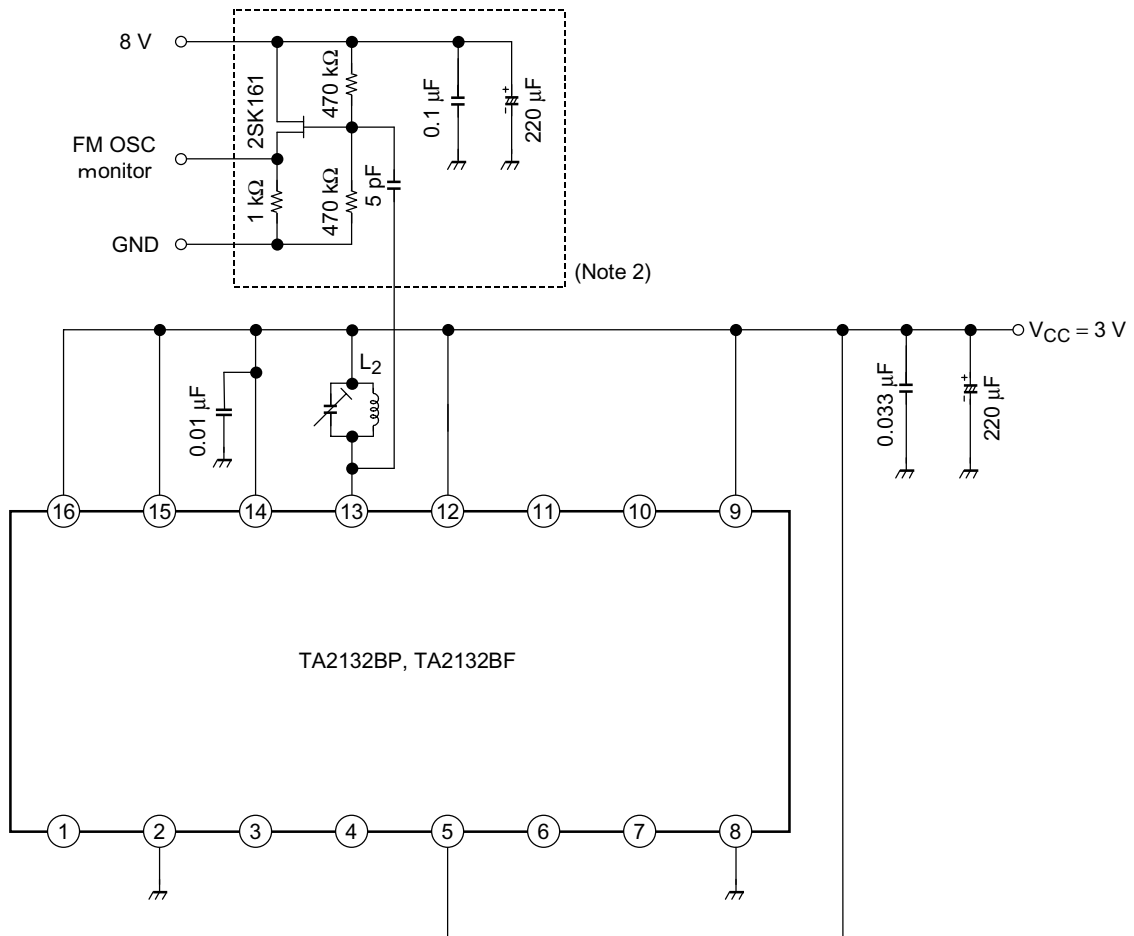
Electrical Characteristics (Unless otherwise specified, Ta = 25°C, V_{CC} = 3 V, F/E : f = 98 MHz, f_m = 1 kHz FM IF : f = 10.7 MHz, Δf = ±75 kHz, f_m = 1 kHz AM : f = 1 MHz, MOD = 30%, f_m = 1 kHz)

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

Test Circuit 1



Test Circuit 2

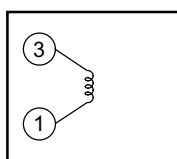


Note 2: FET buff voltage gain \approx 0dB

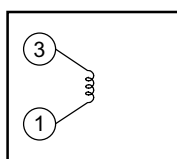
Coil Data

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

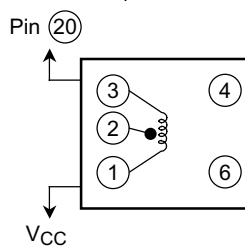
L₁: FM RF



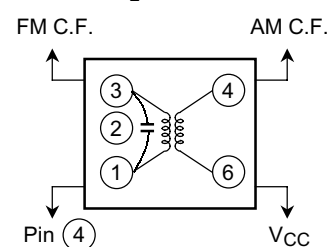
L₂: FM OSC



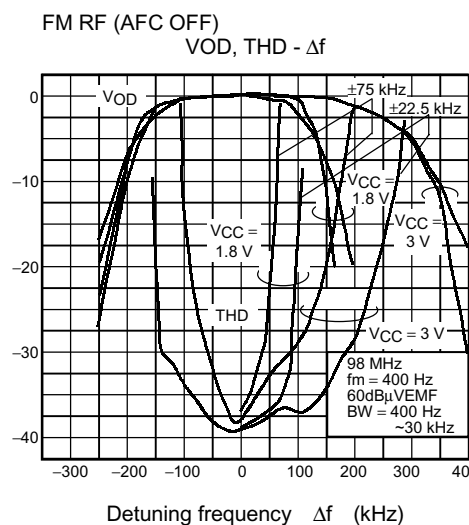
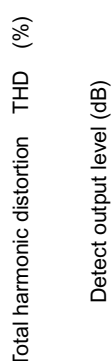
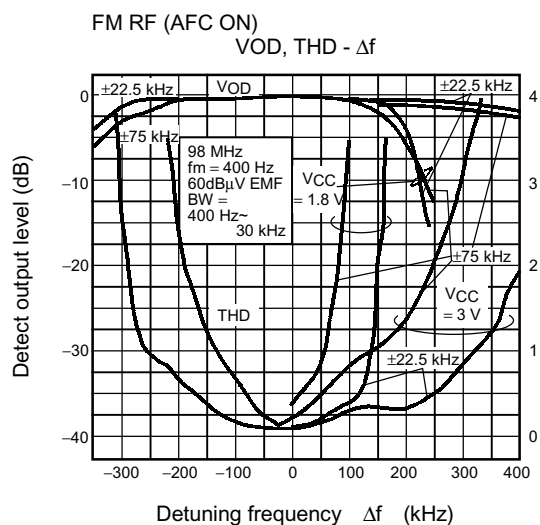
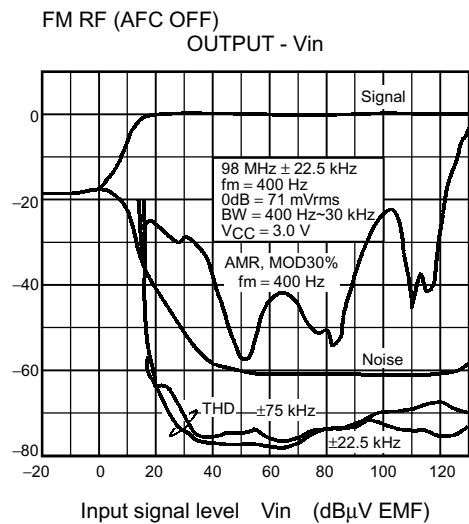
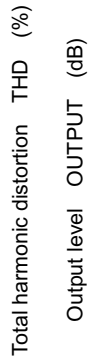
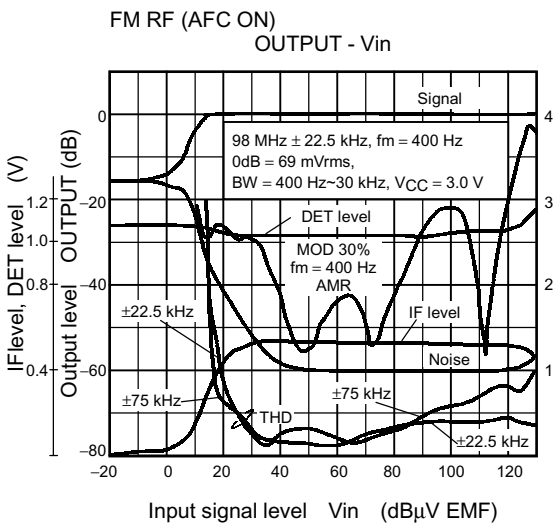
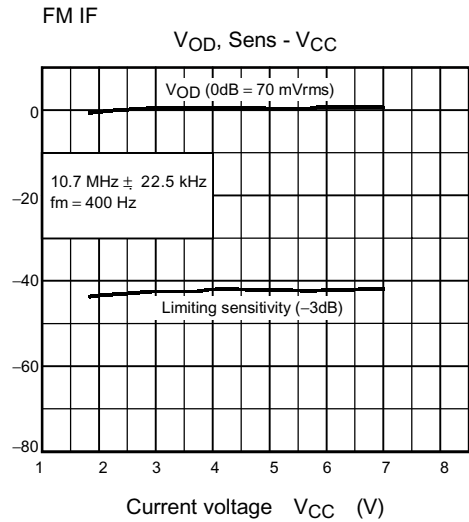
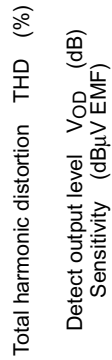
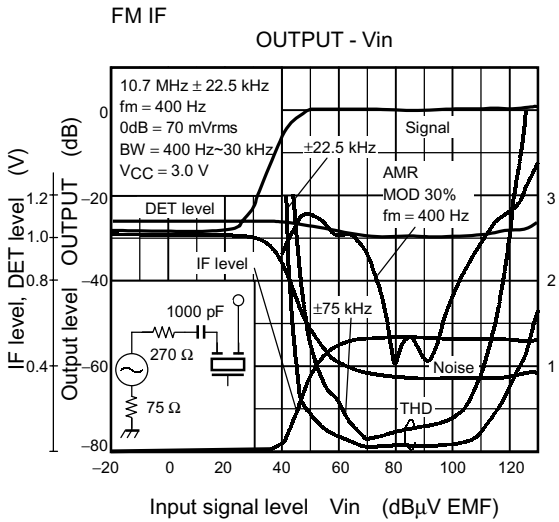
T₁: AM OSC

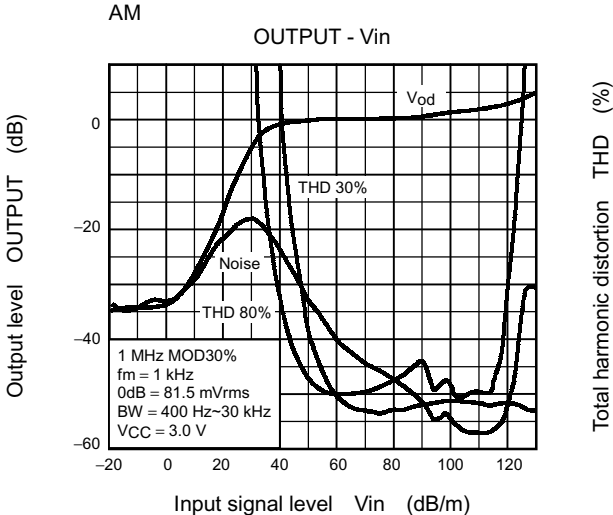


T₂: AM IFT



(BOTTOM VIEW)

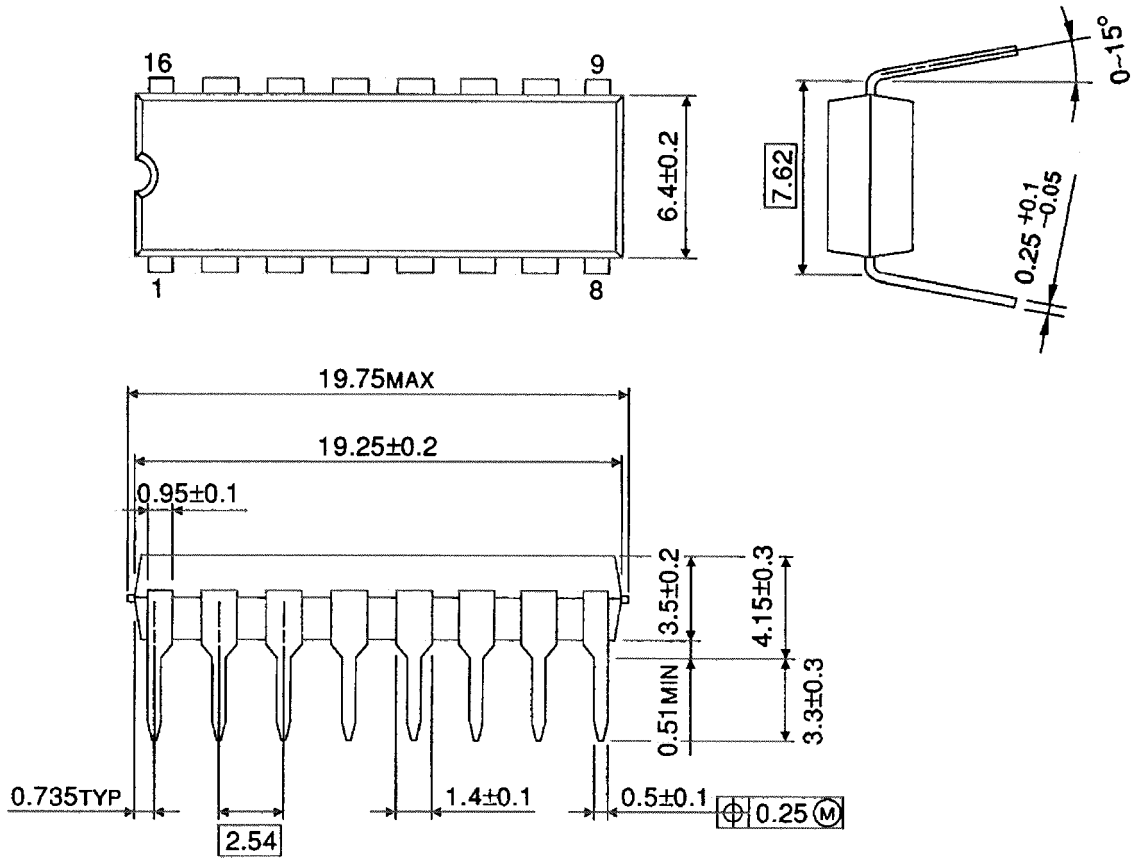




Package Dimensions

DIP16-P-300-2.54A

Unit : mm

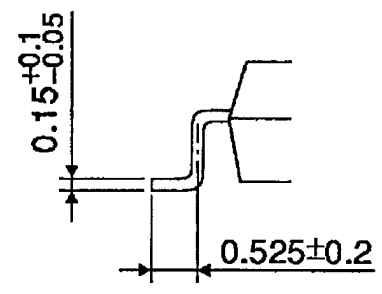
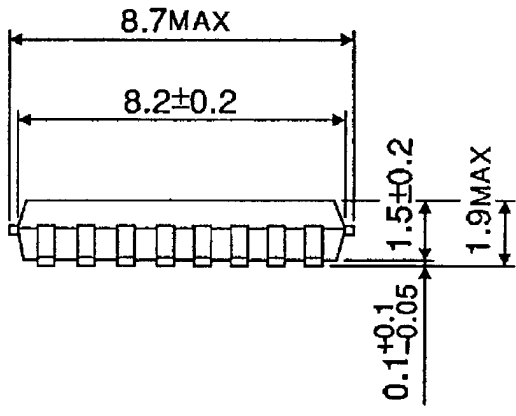
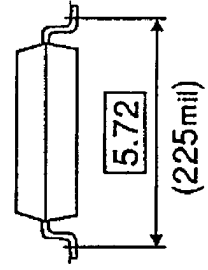
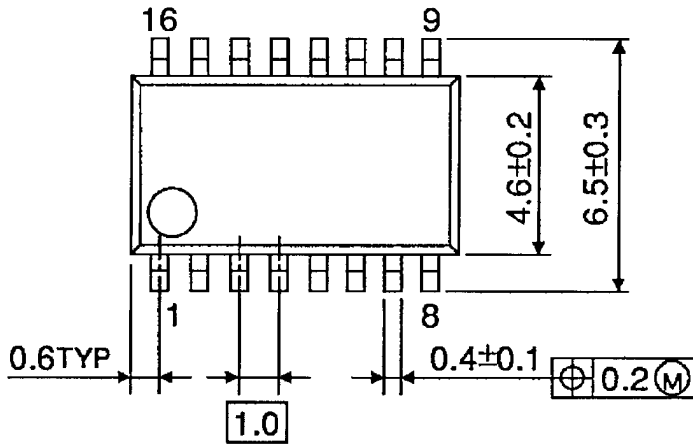


Weight: 1.00 g (typ.)

Package Dimensions

SSOP16-P-225-1.00A

Unit : mm



Weight: 0.14 g (typ.)