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.

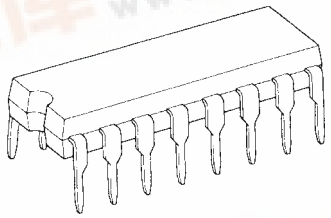
FM Local Oscillation Voltage is set up low relativity, for NEW FCC.

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 V, Ta = 25°C)
  I_{CCq} (FM) = 7.3 mA (typ.)
  I_{CCq} (AM) = 3.6 mA (typ.)
- Operating supply voltage range: V_{CC} = 1.8~7 V (Ta = 25°C)

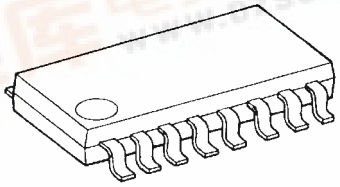
Note: The IC may be destroyed due to incorrect orientation of device's mounting.

TA2132BP



DIP16-P-300-2.54A

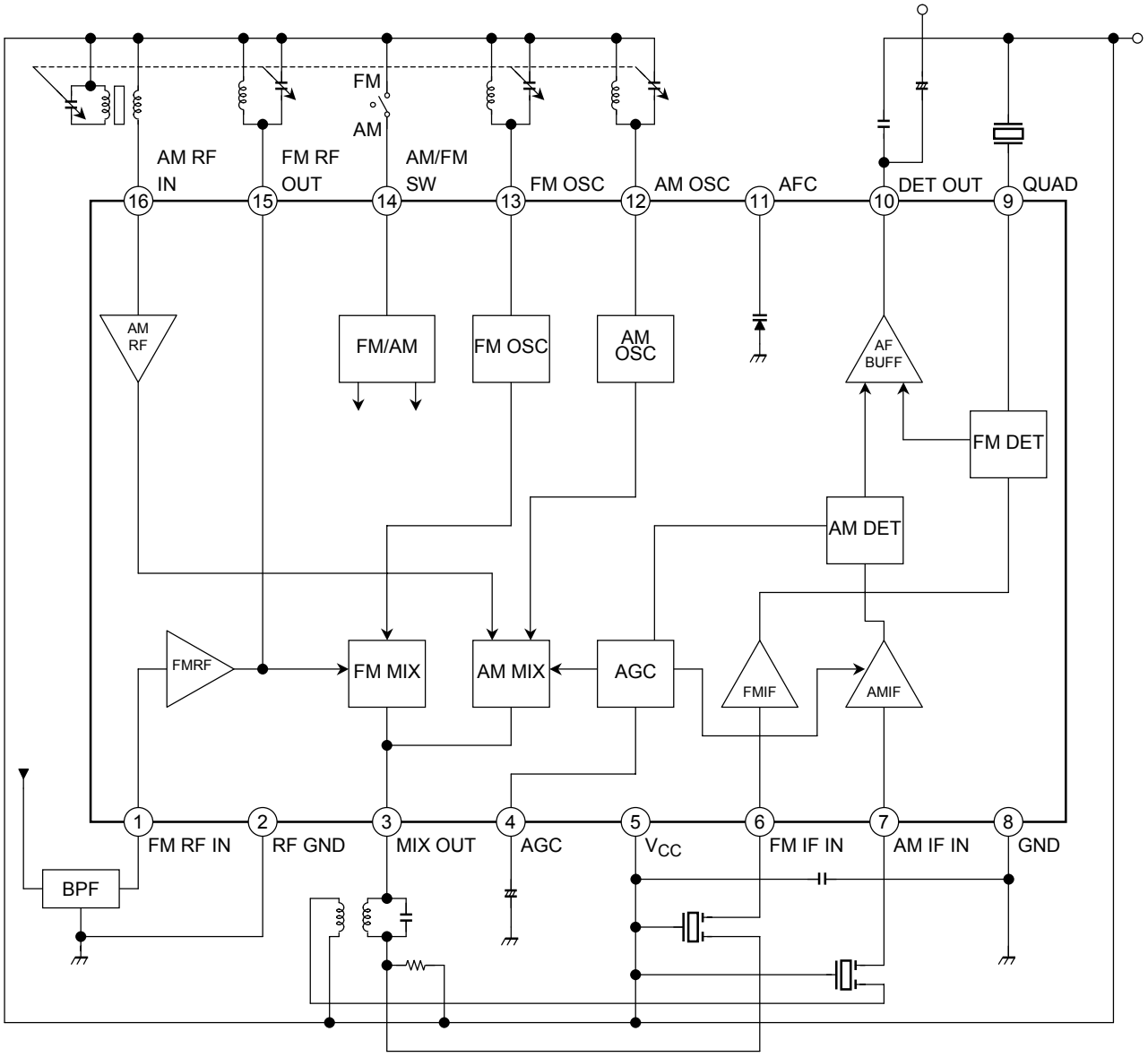
TA2132BF



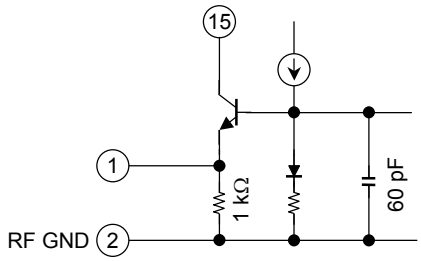
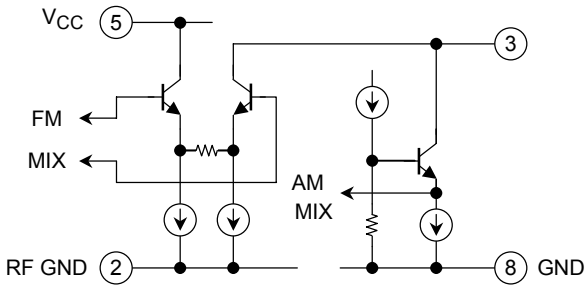
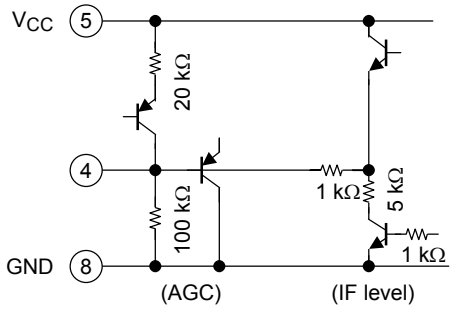
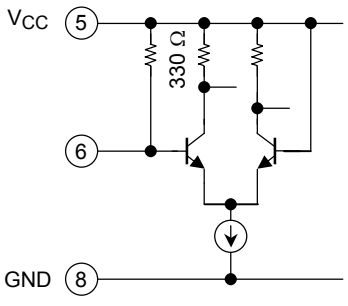
SSOP16-P-225-1.00A

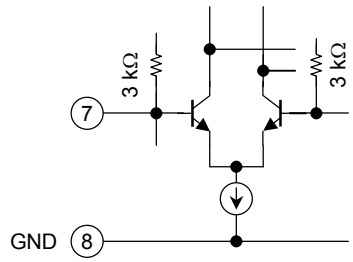
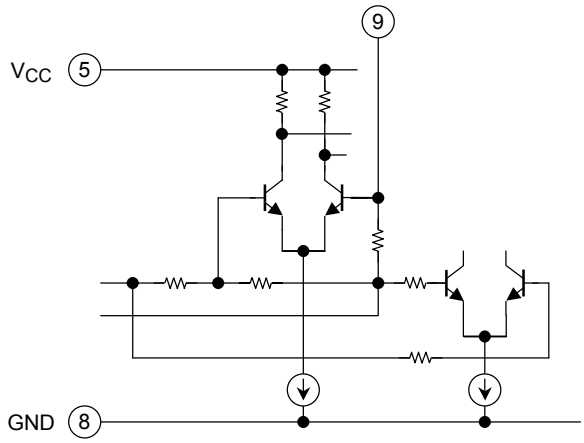
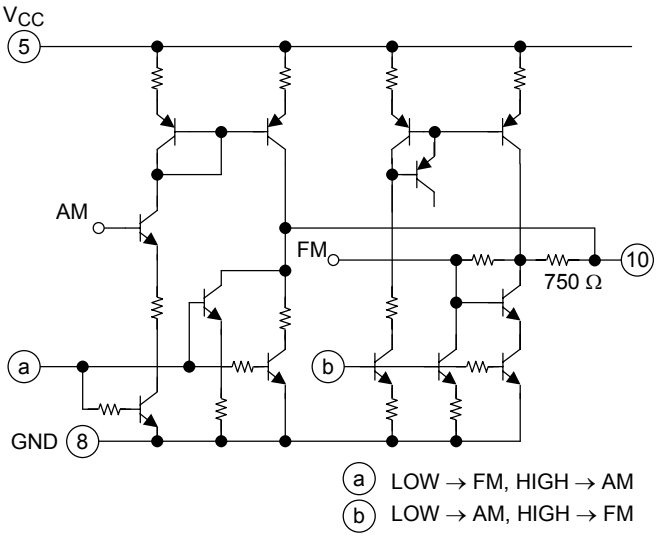
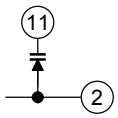
Weight
DIP16-P-300-2.54A : 1.00 g (typ.)
SSOP16-P-225-1.00A : 0.14 g (typ.)

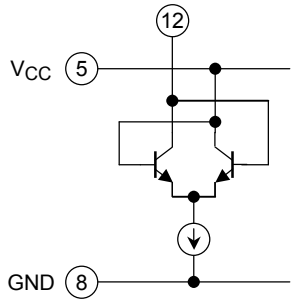
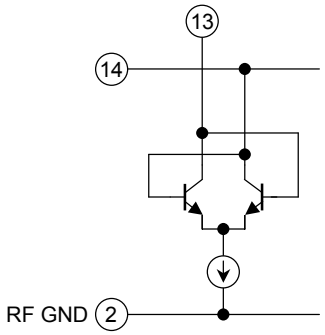
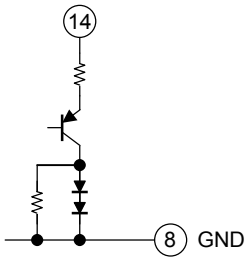
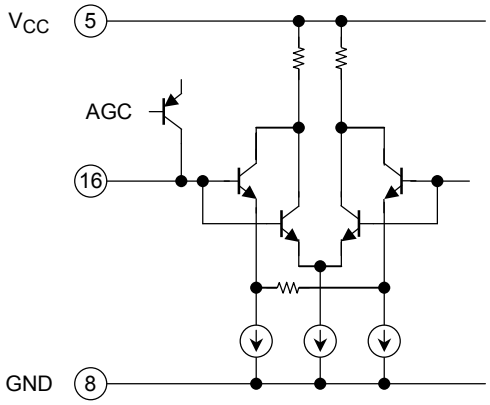
Block Diagram



Explanation of Terminals
(Terminal Voltage: Typical DC voltage at no signal with test circuit, V_{CC} = 3 V, Ta = 25°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		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 • 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)

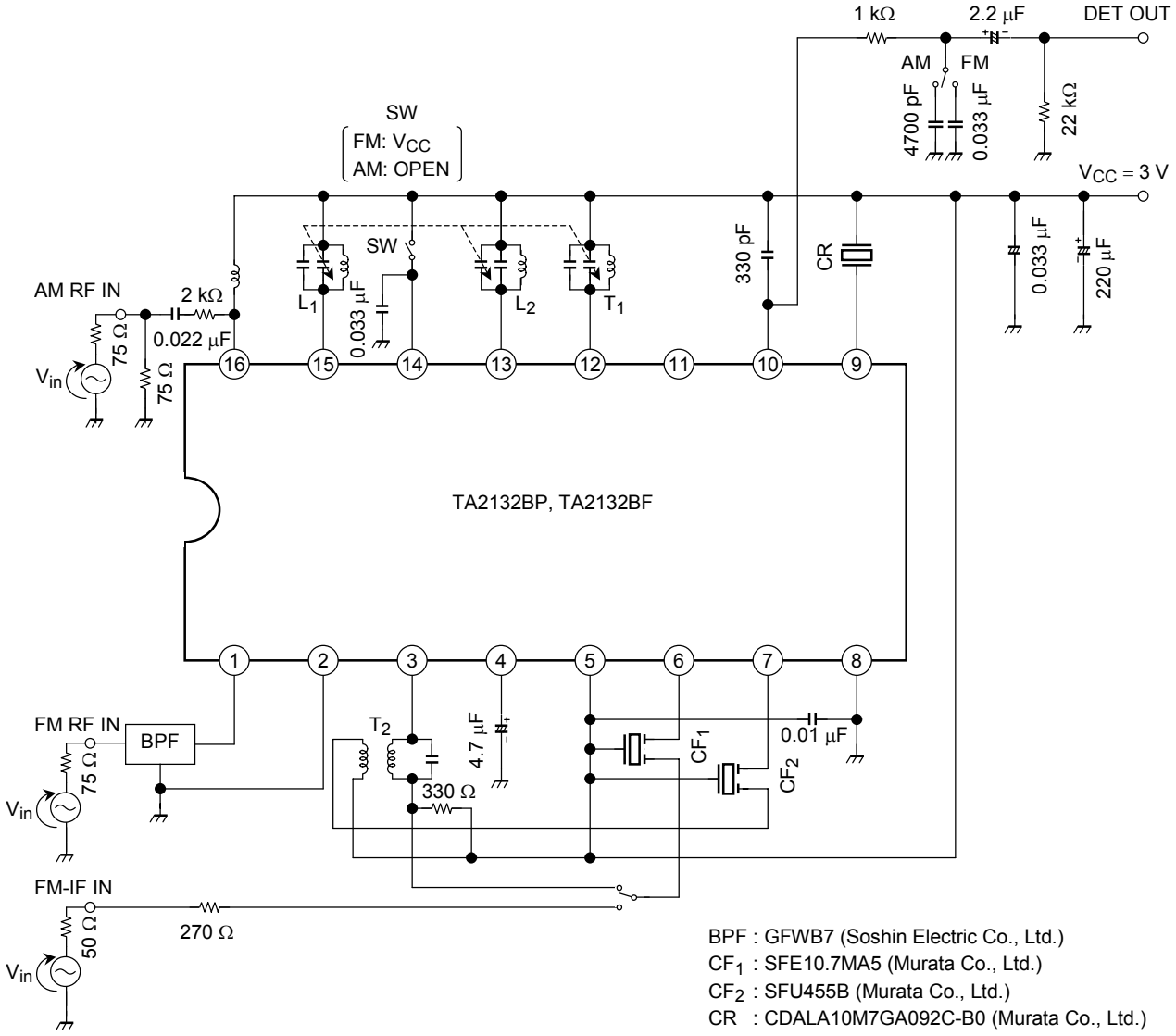
Characteristics		Symbol	Rating	Unit
Supply voltage		V_{CC}	8	V
Power dissipation	TA2132BP	P_D (Note 1)	750	mW
	TA2132BF		350	
Operating temperature		T_{opr}	−25~75	°C
Storage temperature		T_{stg}	−55~150	°C

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)

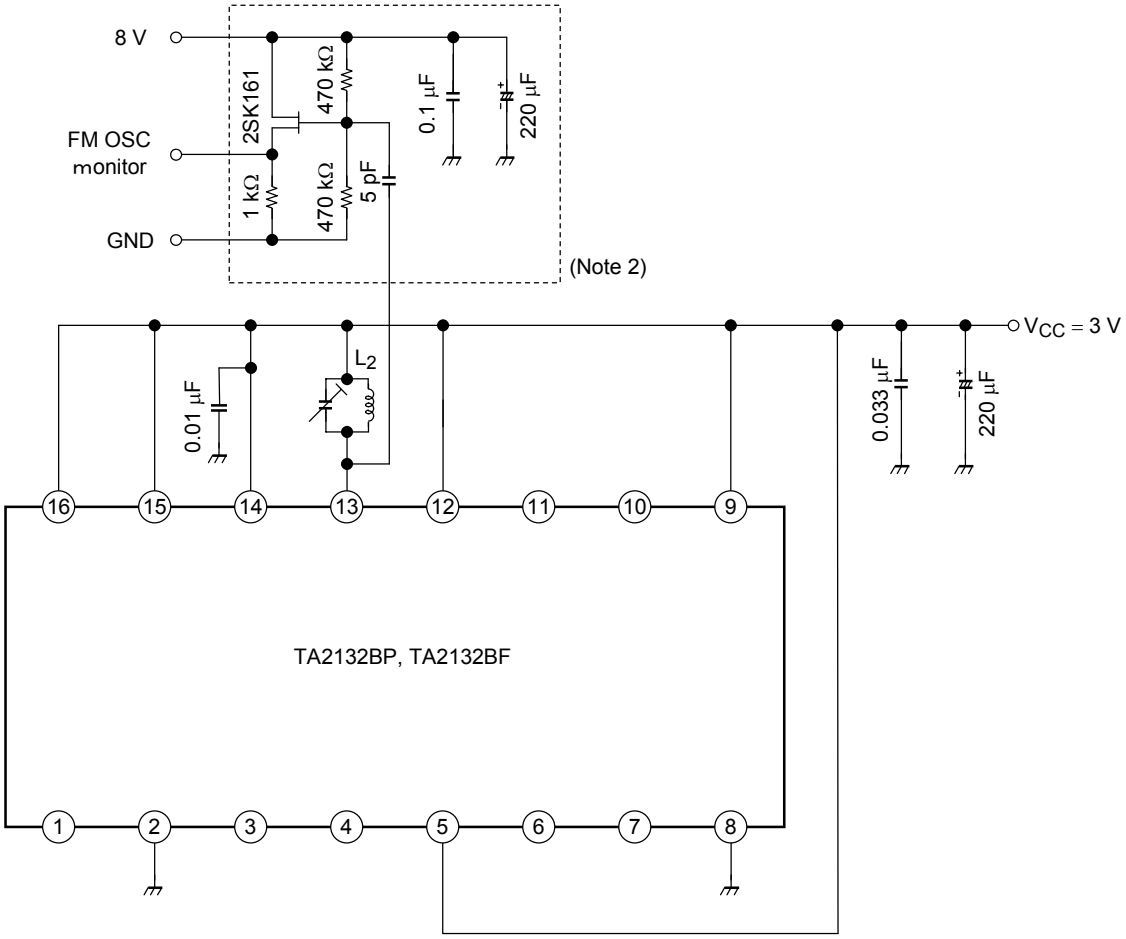
Characteristics		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Supply current		$I_{CC\ (FM)}$	1	FM mode, V_{in} = 0	—	7.3	11.0	mA
		$I_{CC\ (AM)}$	1	AM mode, V_{in} = 0	—	3.6	7.0	
F/E	Input limiting voltage	$V_{in\ (lim)}$	1	−3dB limiting point	—	10	—	dBμV EMF
	Quiescent sensitivity	Q_S	1	S/N = 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	mVrms
	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	mVrms
	Recovered output voltage	V_{OD}	1	V_{in} = 60dBμV EMF	55	80	110	mVrms
	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



BPF : GFWB7 (Soshin Electric Co., Ltd.)
CF_1 : SFE10.7MA5 (Murata Co., Ltd.)
CF_2 : SFU455B (Murata Co., Ltd.)
CR : CDALA10M7GA092C-B0 (Murata Co., Ltd.)

Test Circuit 2

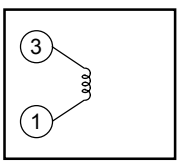


Note 2: FET buff voltage gain ≃ 0dB

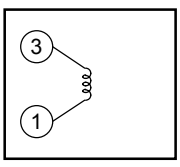
Coil Data

Coil No.	Test Freq.	L (μH)	Co (pF)	Qo	Turns					Wire (mmϕ)	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

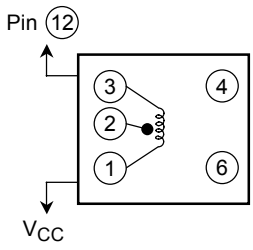
L_1: FM RF



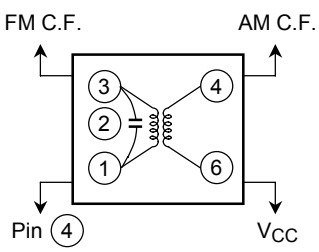
L_2: FM OSC



T_1: AM OSC



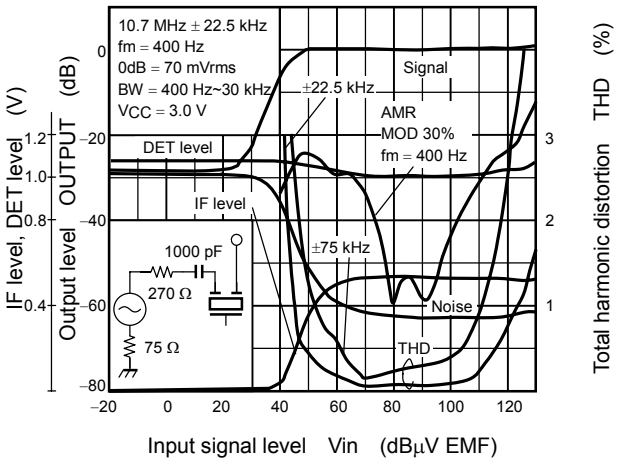
T_2: AM IFT



(BOTTOM VIEW)

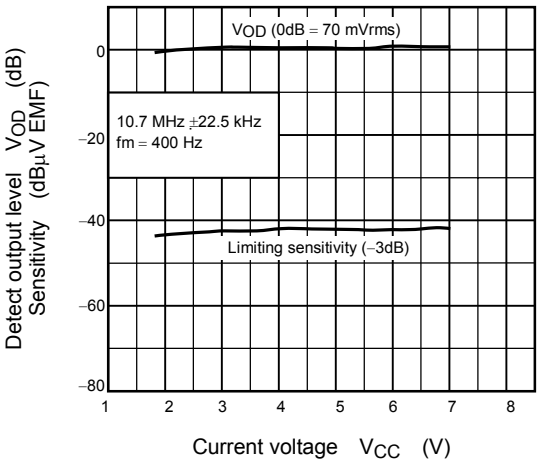
FM IF

OUTPUT - Vin



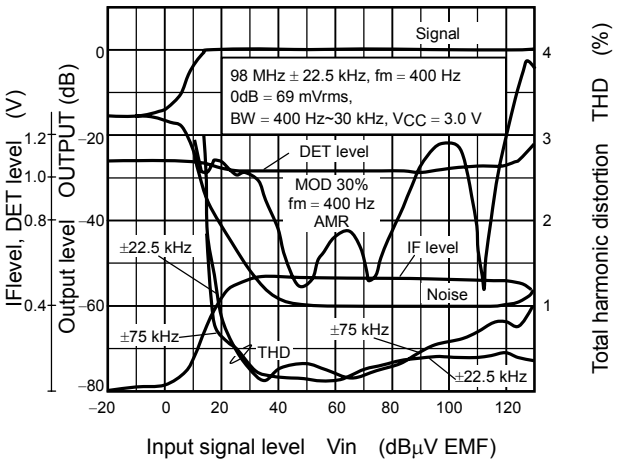
FM IF

V_{OD}, Sens - V_{CC}



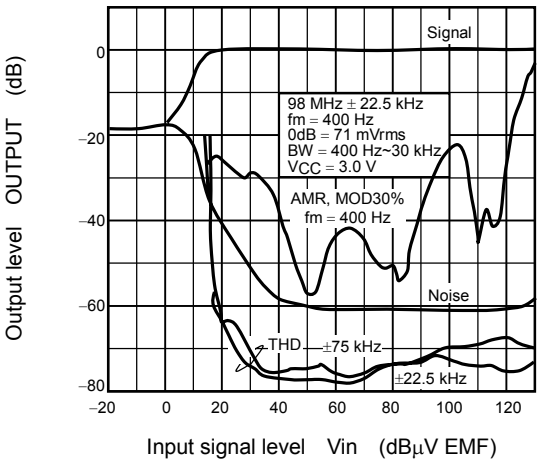
FM RF (AFC ON)

OUTPUT - Vin



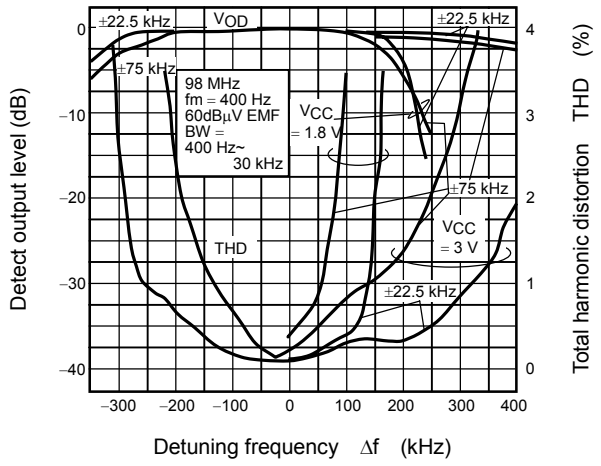
FM RF (AFC OFF)

OUTPUT - Vin



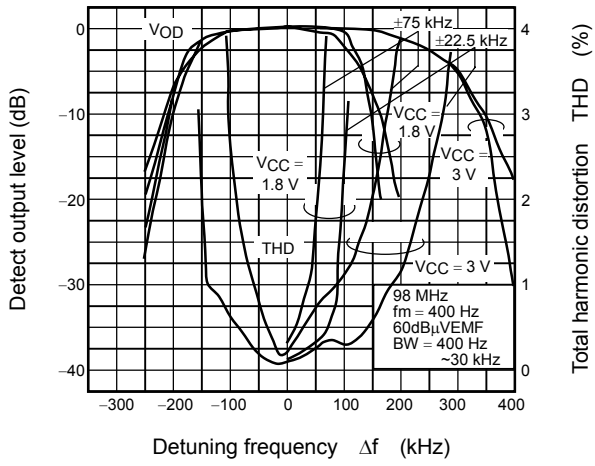
FM RF (AFC ON)

VOD, THD - Δf



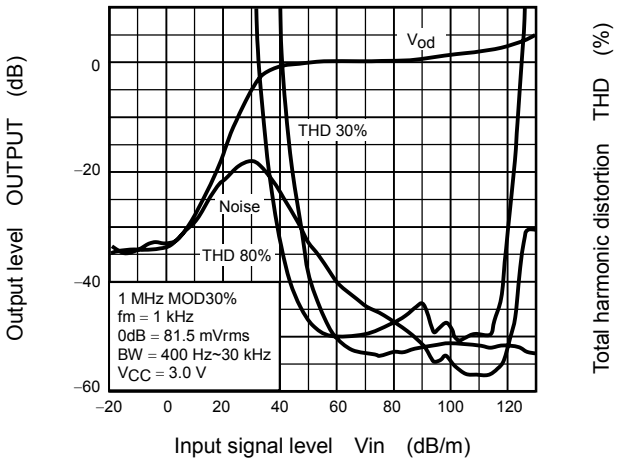
FM RF (AFC OFF)

VOD, THD - Δf



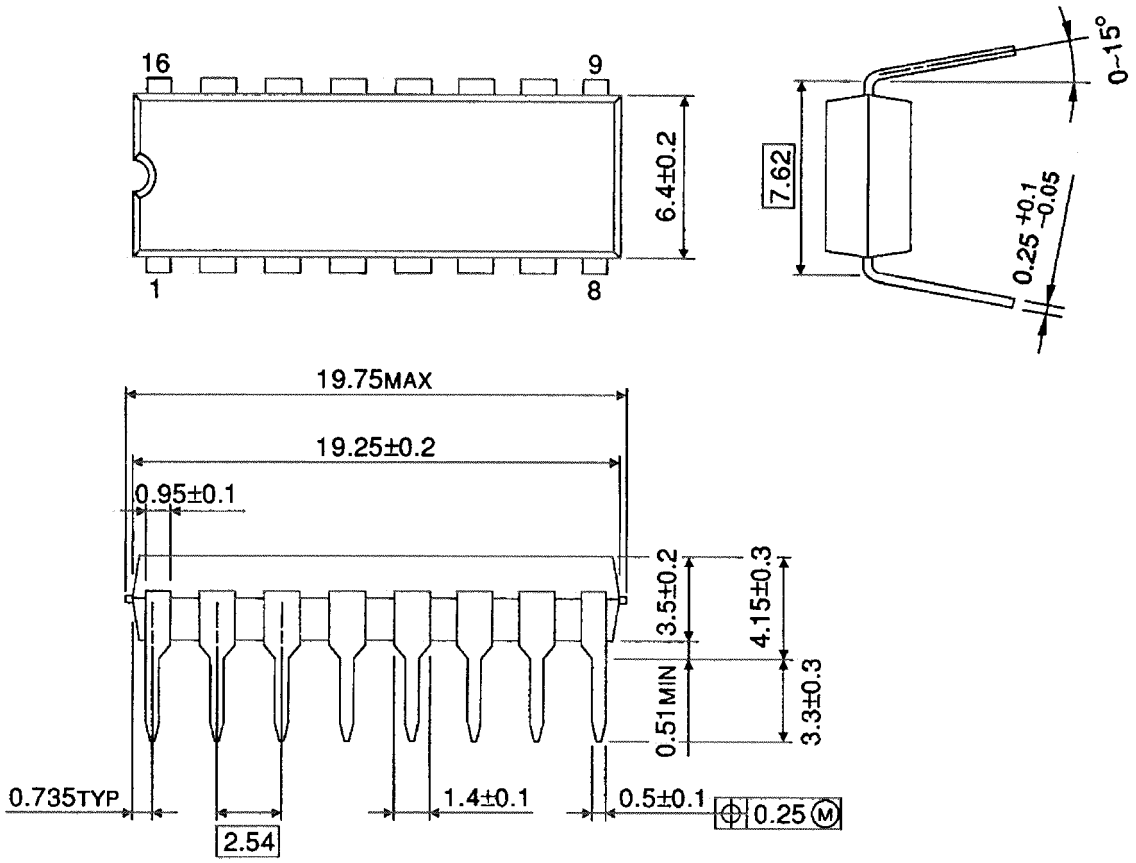
AM

OUTPUT - Vin



Package Dimensions

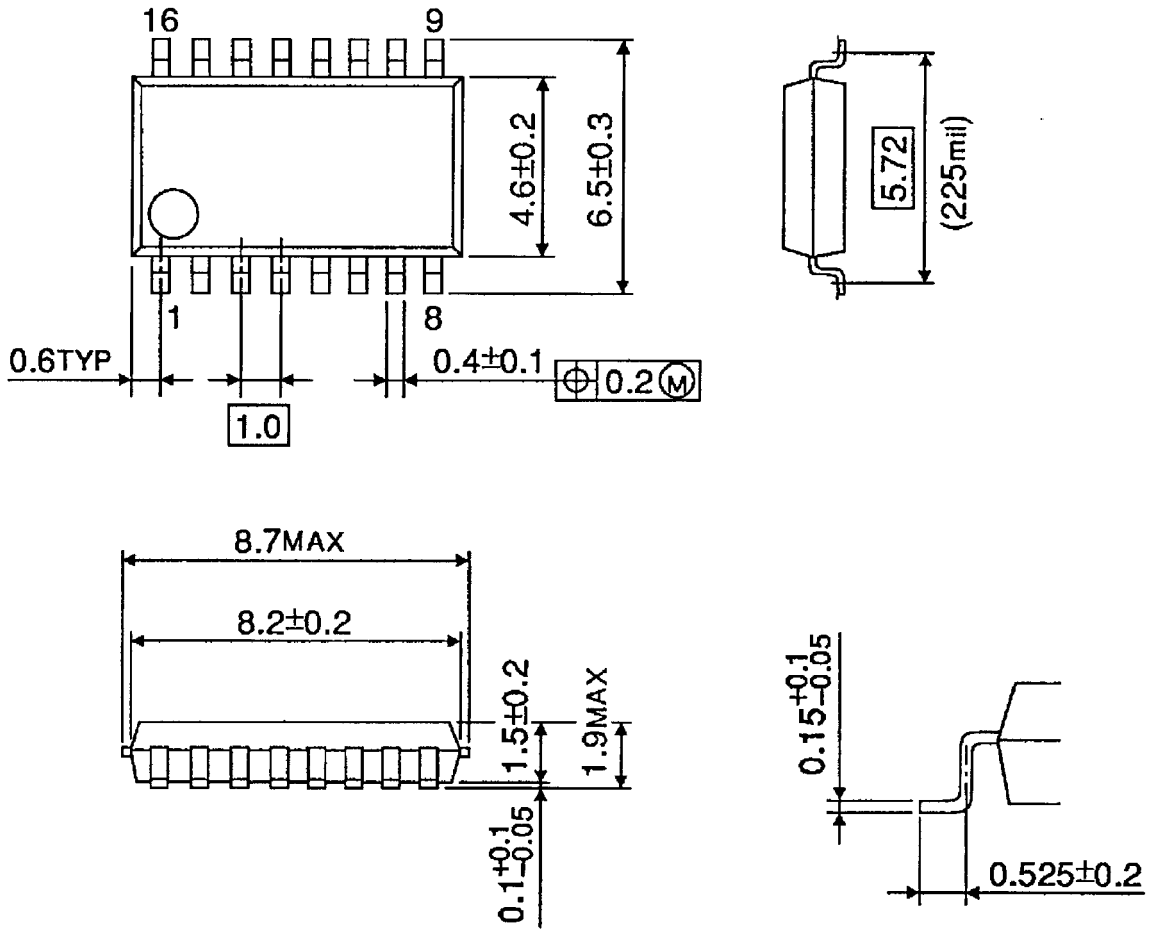
DIP16-P-300-2.54A Unit : mm



Weight: 1.00 g (typ.)

Package Dimensions

SSOP16-P-225-1.00A Unit : mm



Weight: 0.14 g (typ.)

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000707EBA

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