

TA8164P

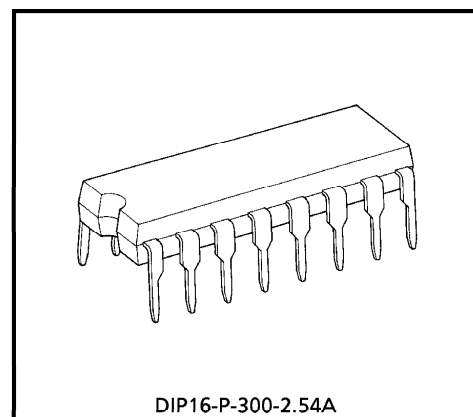
3V MONAURAL RADIO IC

The TA8164P is AM/FM Tuner (FM F/E + AM/FM IF) IC, which is designed for AM/FM monaural radio.

Combining with the TA7368P (Mono PW IC), a suitable monaural AM/FM radio system is able to be constituted.

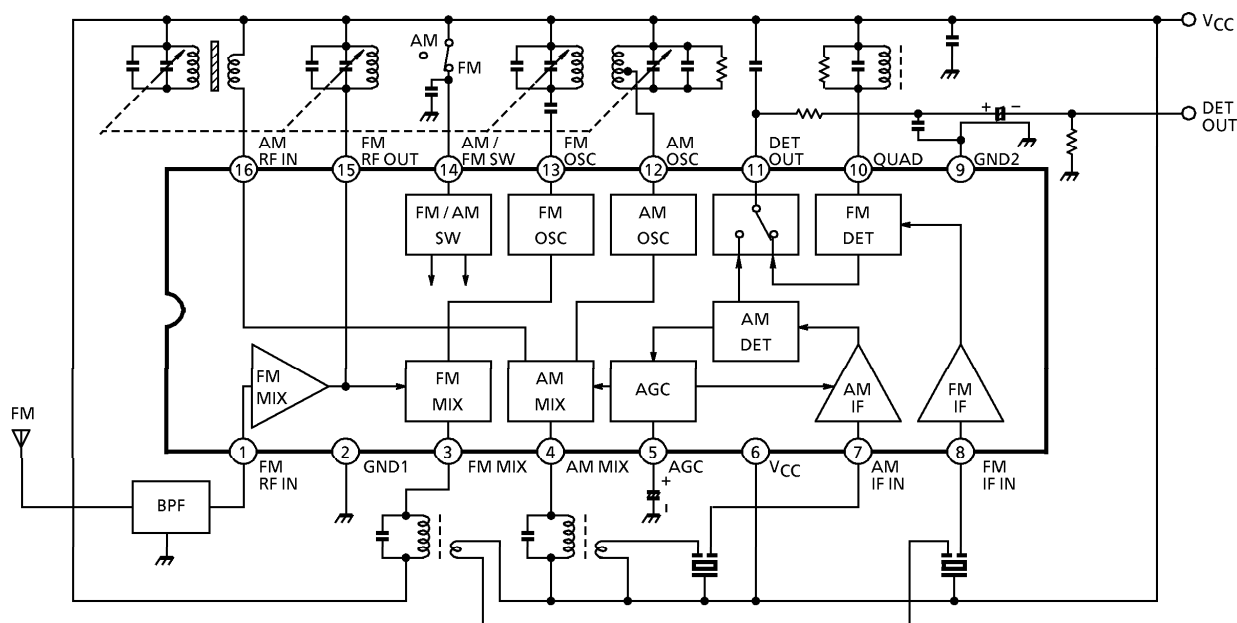
FEATURES

- Common output for AM/FM
- Switch over between AM/FM mode is possible with one-wake switch.
- Operating supply voltage range
: $V_{CC}(\text{opr}) = 1.8 \sim 7V$ ($T_a = 25^\circ C$)



Weight : 1.00g (Typ.)

BLOCK DIAGRAM

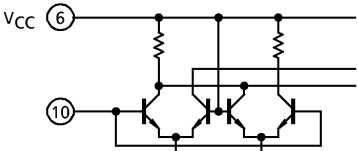
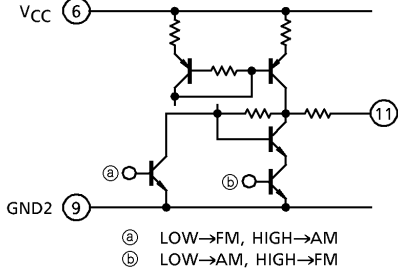
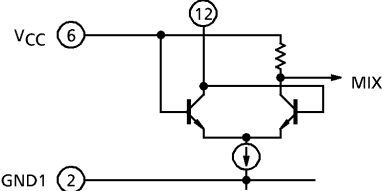
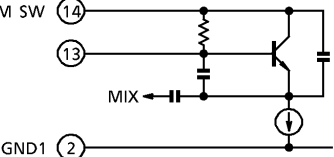
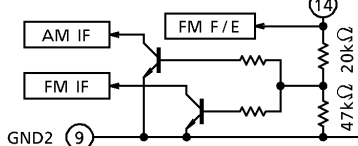
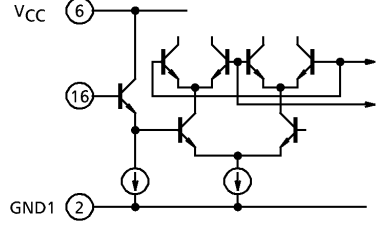


961001EBA2

- 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 foreign exchange and foreign trade control 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.

EXPLANATION OF TERMINAL

PIN No.	SYMBOL	INTERNAL CIRCUIT	DC VOLTAGE (V) (AT NO SIGNAL)	
			AM	FM
1	FM-RF IN		0	0.7
2	GND1 (GND for AM RF, OSC, MIX, FM RF, OSC, MIX)	—	0	0
3	FM MIX		3.0	3.0
4	AM MIX		3.0	3.0
5	AGC (AM AGC)		0	0
6	V _{CC}	—	3.0	3.0
7	AM IF IN		3.0	3.0
8	FM IF IN		3.0	3.0

PIN No.	SYMBOL	INTERNAL CIRCUIT	DC VOLTAGE (V) (AT NO SIGNAL)	
			AM	FM
9	GND2 (GND for AM IF and FM IF)	—	0	0
10	QUAD (FM QUAD, Detector)		3.0	3.0
11	DET OUT		1.4	1.4
12	AM OSC		3.0	3.0
13	FM OSC		3.0	3.0
14	AM/FM SW PIN⑭ VCC →FM PIN⑭ OPEN →AM		—	3.0
15	FM RF OUT	cf. pin①	3.0	3.0
16	AM RF IN		3.0	3.0

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V _{CC}	8	V
Power Dissipation	P _D (Note)	750	mW
Operating Temperature	T _{opr}	- 25~75	°C
Storage Temperature	T _{stg}	- 55~150	°C

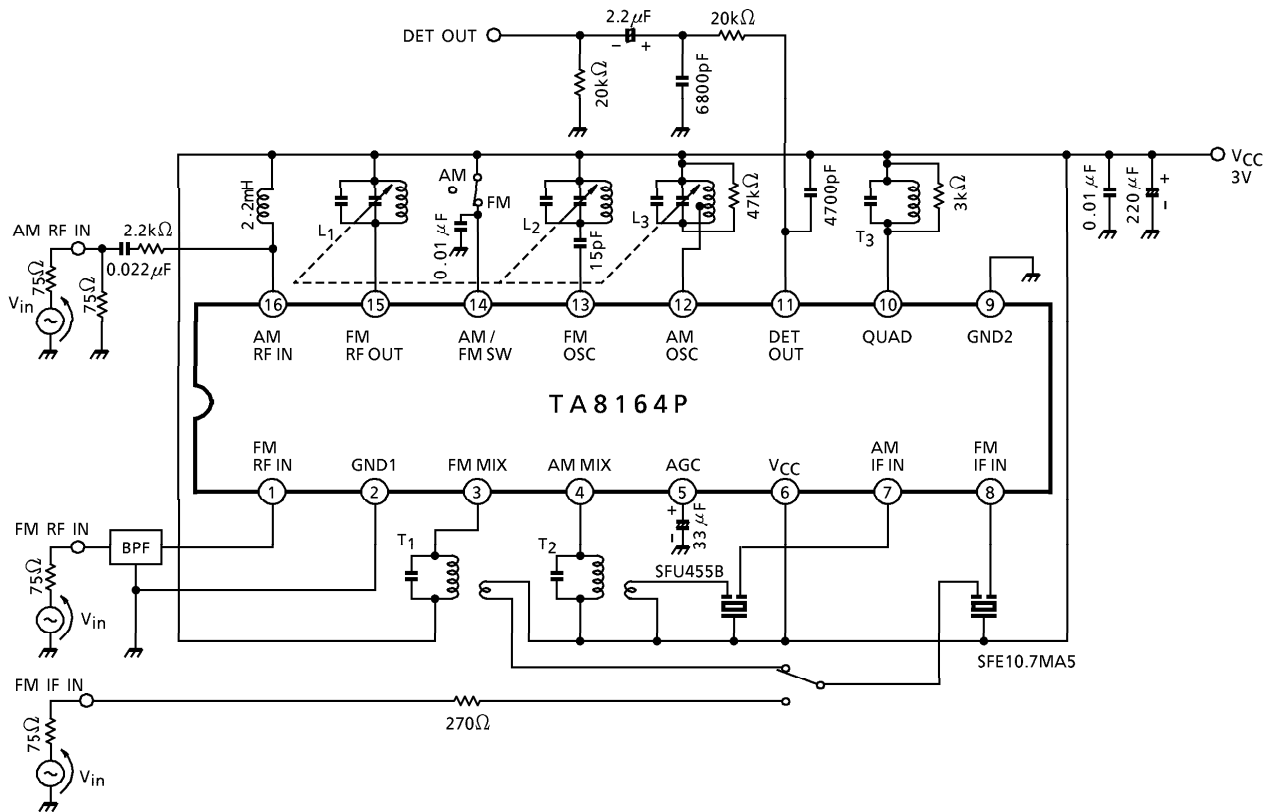
(Note) Derated above Ta = 25°C in the proportion of 6mW/°C.

ELECTRICAL CHARACTERISTICS

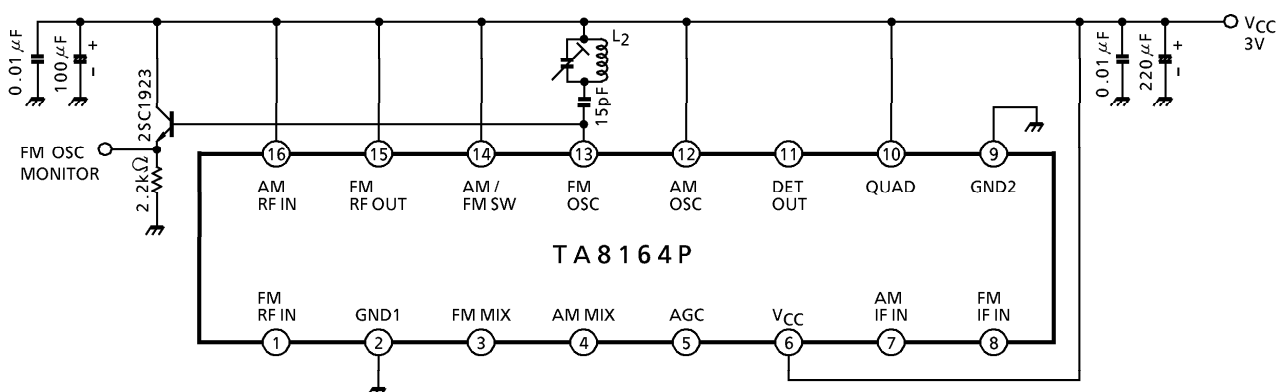
Unless otherwise specified, Ta = 25°C, V_{CC} = 3V, F/E : f = 98MHz, f_m = 1kHz
 FM IF : f = 10.7MHz, Δf = ± 22.5kHz, f_m = 1kHz
 AM : f = 1MHz, MOD = 30%, f_m = 1kHz

CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Current		I _{CC} (FM)	1	FM Mode V _{in} = 0	—	10.5	15.5	mA
		I _{CC} (AM)	1	AM Mode V _{in} = 0	—	4.5	7.0	
FM F/E	Input Limiting Voltage	V _{in} (lim)	1	- 3dB limiting point	—	12	—	dB μ V EMF
	Quiescent Sensitivity	Q _S	1	S / N = 30dB	—	12	—	dB μ V EMF
	Local OSC Voltage	V _{OSC}	2	f _{OSC} = 108MHz	150	205	280	mV _{rms}
	Local OSC Stop Supply Voltage	V _{stop} (FM)	2	V _{in} = 0	—	1.2	—	V
FM IF	Input Limiting Voltage	V _{in} (lim) IF	1	- 3dB limiting point	44	50	56	dB μ V EMF
	Recovered Output Voltage	V _{OD}	1	V _{in} = 80dB μ V EMF	20	35	55	mV _{rms}
	Signal To Noise Ratio	S / N	1	V _{in} = 80dB μ V EMF	—	62	—	dB
	Total Harmonic Distortion	THD	1	V _{in} = 80dB μ V EMF	—	0.4	—	%
	AM Rejection Ratio	AMR	1	V _{in} = 80dB μ V EMF	—	33	—	dB
AM	Gain	G _V	1	V _{in} = 30dB μ V EMF	15	30	45	mV _{rms}
	Recovered Output Voltage	V _{OD}	1	V _{in} = 60dB μ V EMF	20	35	55	mV _{rms}
	Signal To Noise Ratio	S / N	1	V _{in} = 60dB μ V EMF	—	43	—	dB
	Total Harmonic Distortion	THD	1	V _{in} = 60dB μ V EMF	—	1.0	—	%
	Local OSC Stop Supply Voltage	V _{stop} (AM)	1	V _{in} = 0	—	1.6	—	V

TEST CIRCUIT 1



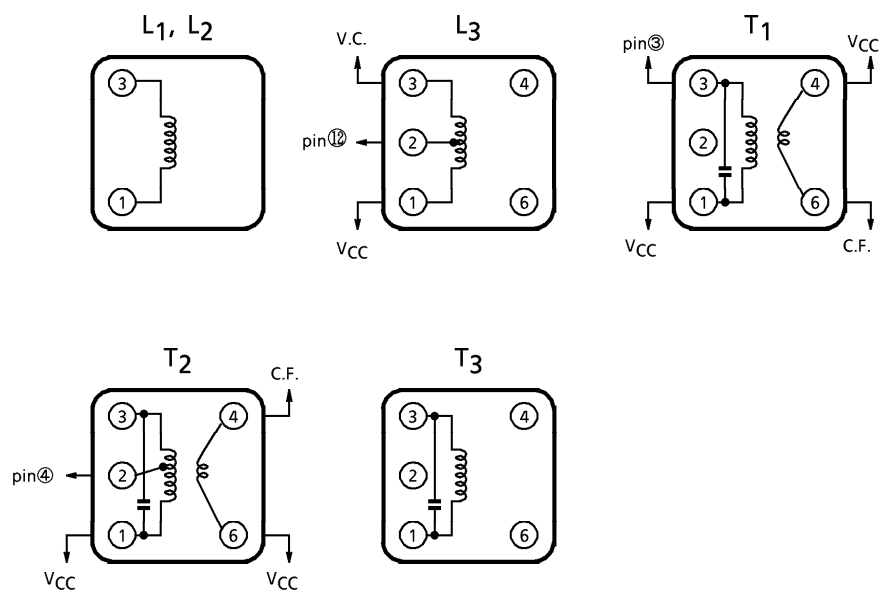
TEST CIRCUIT 2

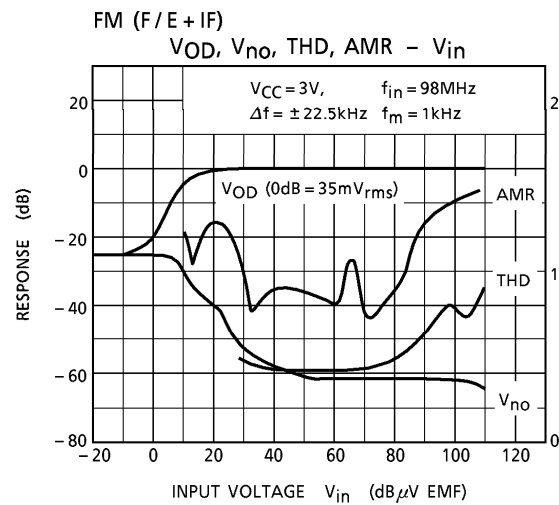


COIL DATA

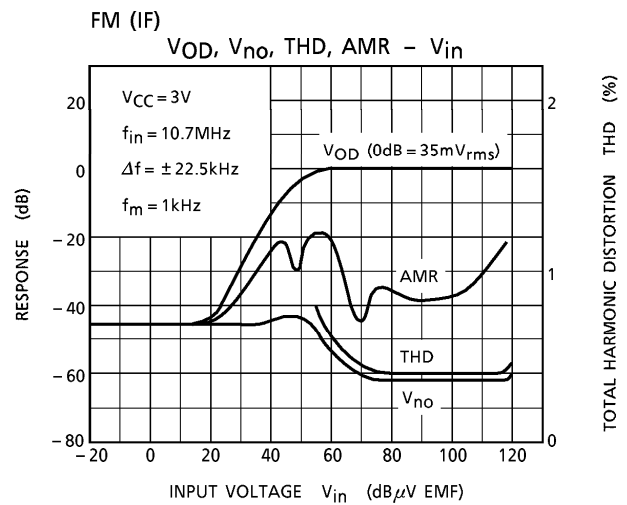
COIL No.	f (Hz)	L (μ H)	C _o (pF)	Q _o	TURNS					WIRE (mm ϕ)	REF.
					1-2	2-3	1-3	1-4	4-6		
L ₁ FM RF	100M	—	—	100	—	—	—	$2\frac{1}{4}$	—	0.5UEW	⑤ 0258-000-021
L ₂ FM OSC	100M	—	—	100	—	—	$1\frac{3}{4}$	—	—	0.5UEW	⑤ 0258-000-020
L ₃ AM OSC	796k	268	—	125	14	86	—	—	—	0.06UEW	⑤ 2157-2239-213A
T ₁ FM MIX	10.7M	—	75	100	—	—	13	—	2	0.1UEW	⑤ 2153-414-041A
T ₂ AM MIX	455k	—	330	100	65	45	110	—	6	0.08UEW	⑤ 4140-1289-311
T ₃ FM DET	10.7M	—	100	95	—	—	12	—	—	0.12UEW	⑤ 2153-4095-189

⑤ : SUMIDA ELECTRIC Co., Ltd.

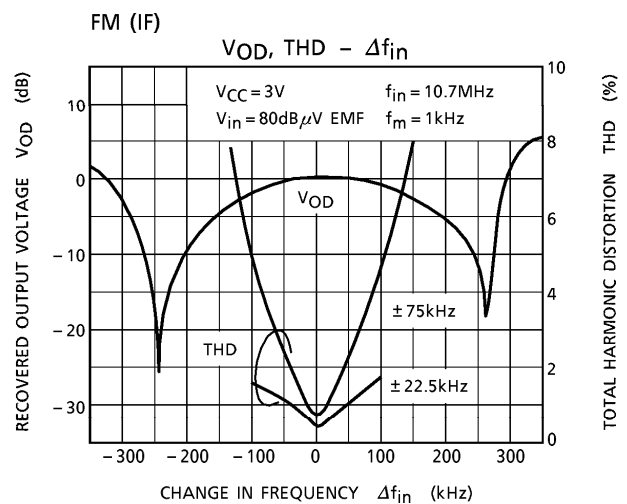
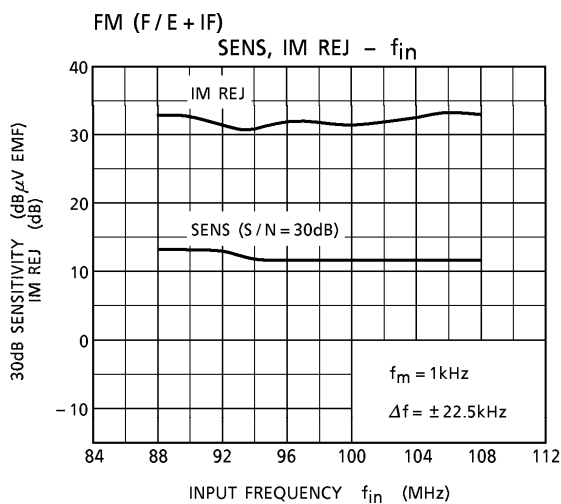




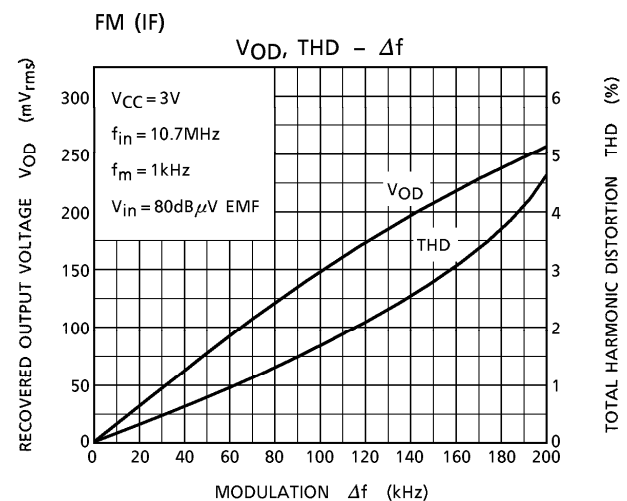
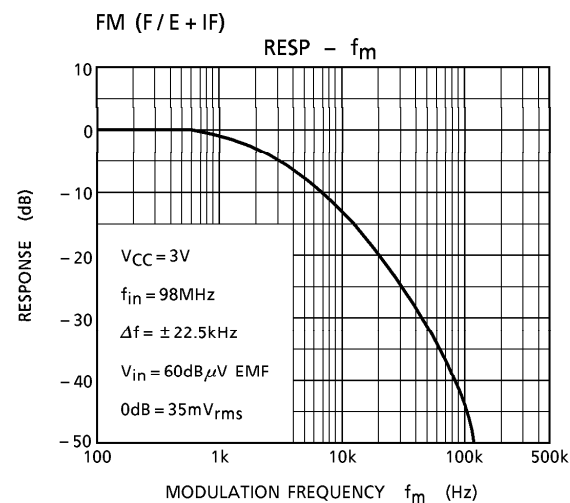
TOTAL HARMONIC DISTORTION THD (%)



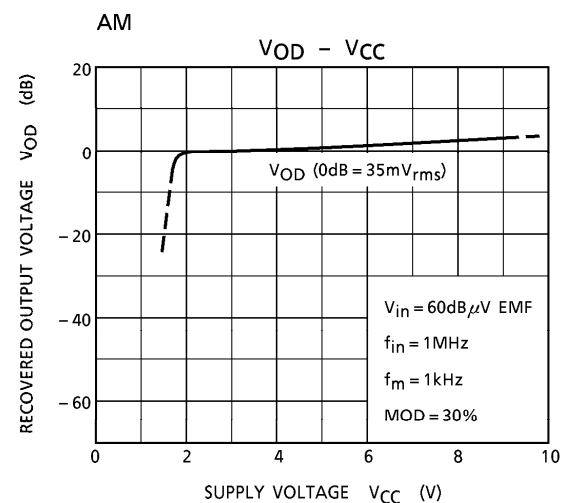
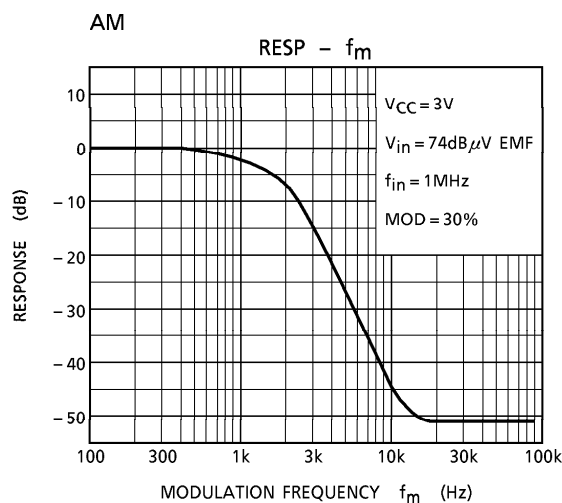
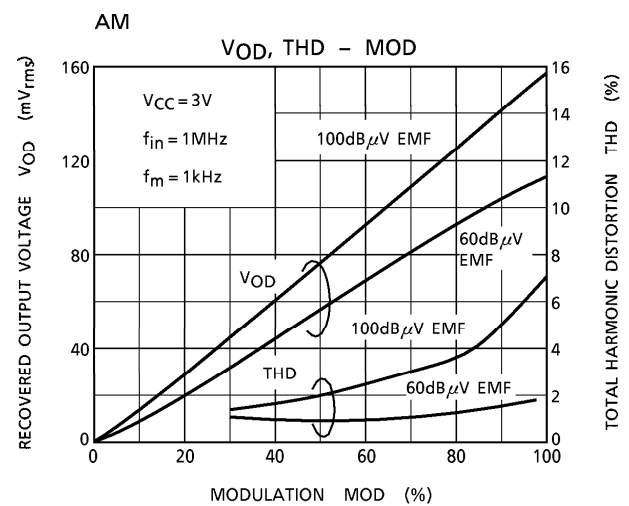
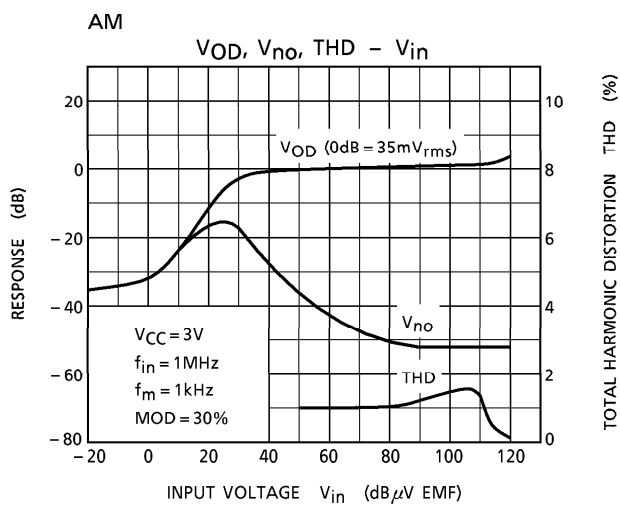
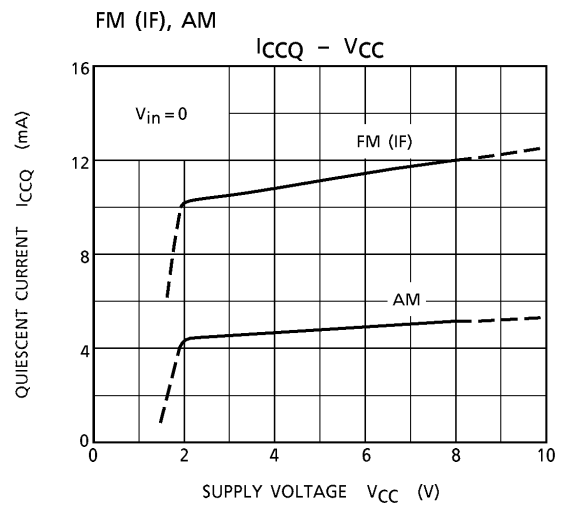
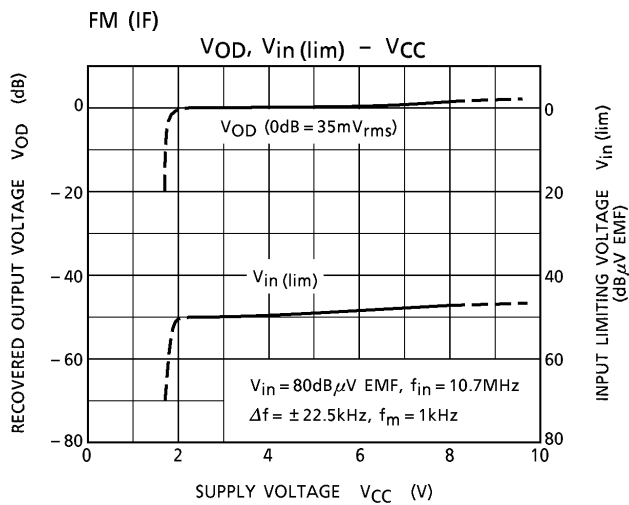
TOTAL HARMONIC DISTORTION THD (%)



TOTAL HARMONIC DISTORTION THD (%)

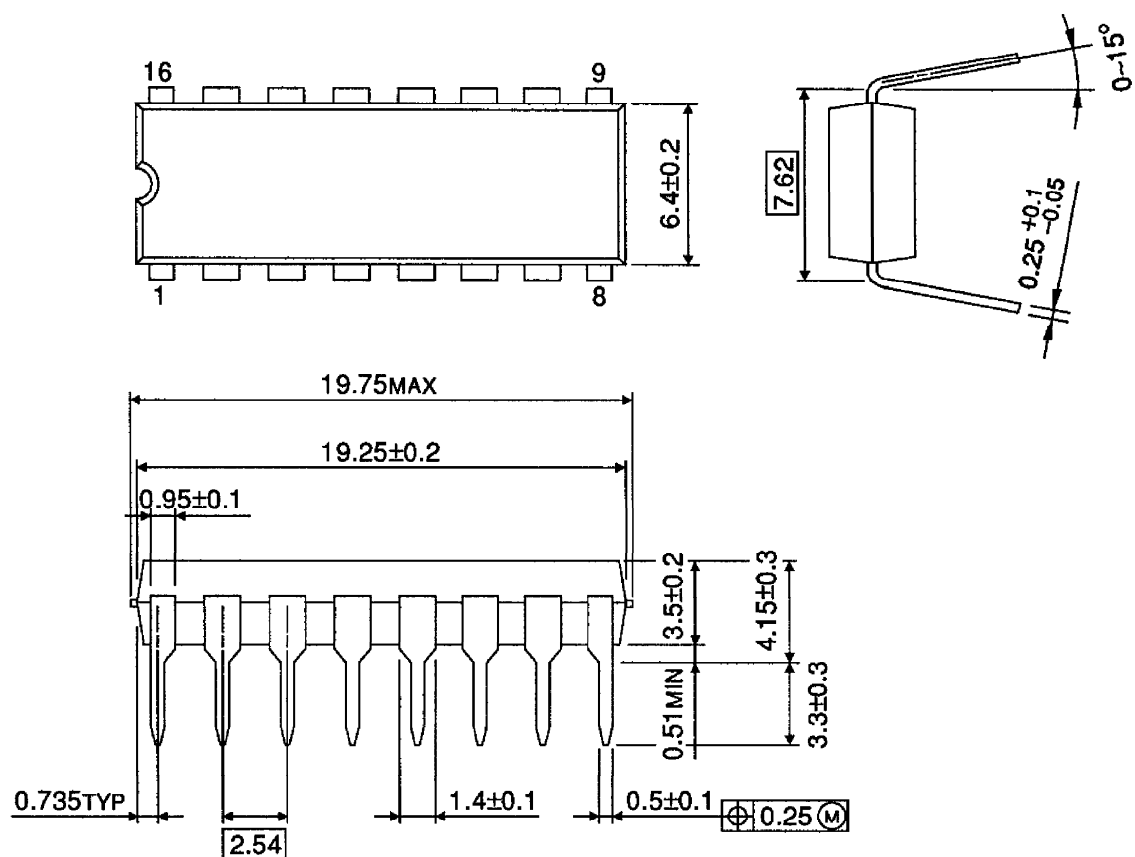


TOTAL HARMONIC DISTORTION THD (%)



OUTLINE DRAWING DIP16-P-300-2.54A

Unit : mm



Weight : 1.0g (Typ.)