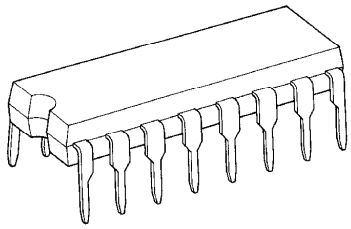
TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

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.



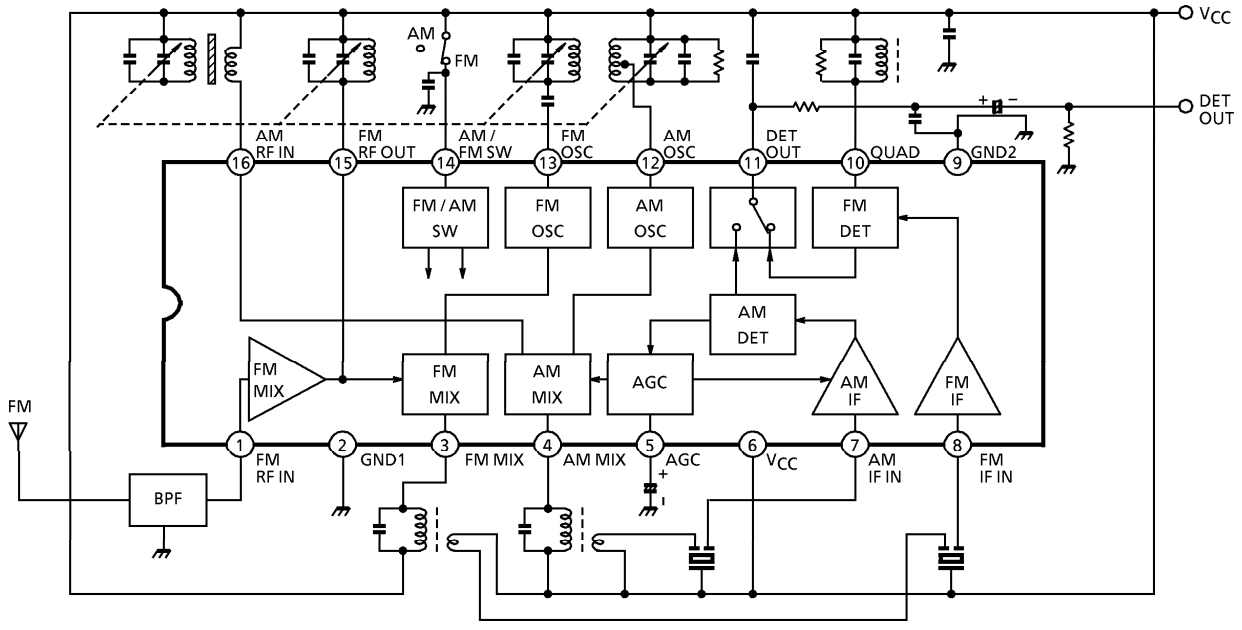
DIP16-P-300-2.54A

Weight : 1.00g (Typ.)

FEATURES

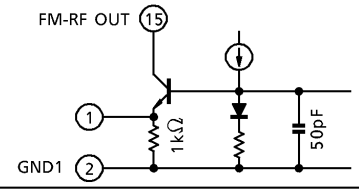
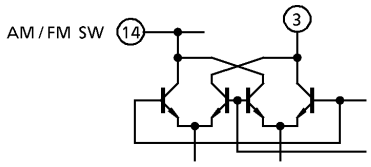
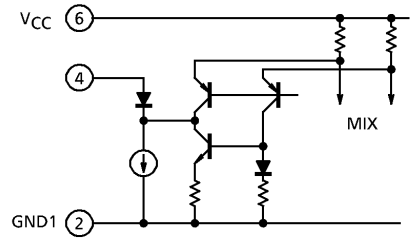
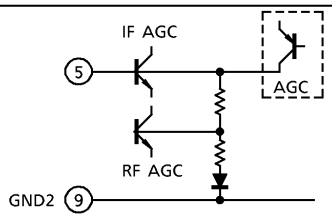
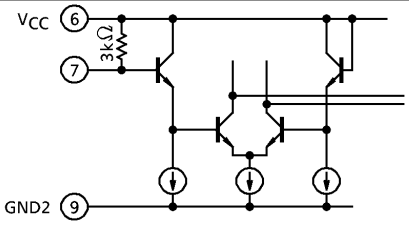
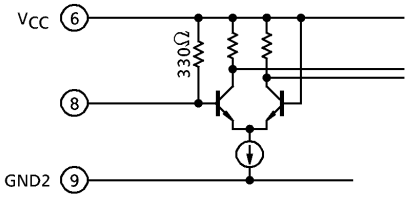
- Common output for AM / FM
- Switch over between AM / FM mode is possible with one-wake switch.
- Operating supply voltage range
  : $V_{CC\ (opr)}$ = 1.8~7V (Ta = 25°C)

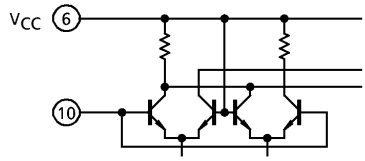
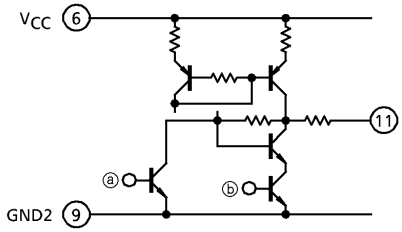
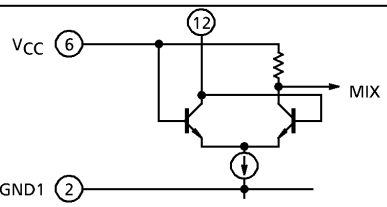
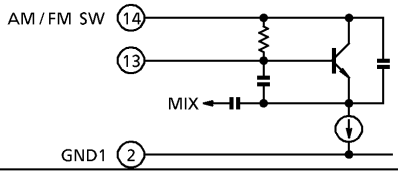
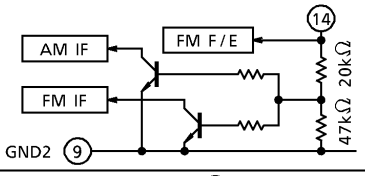
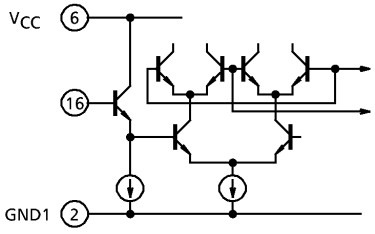
BLOCK DIAGRAM



961001EBA2

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	 ⓐ LOW→FM, HIGH→AM ⓑ LOW→AM, HIGH→FM	1.4	1.4
12	AM OSC		3.0	3.0
13	FM OSC		3.0	3.0
14	AM / FM SW PIN⑭ V_{CC} →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

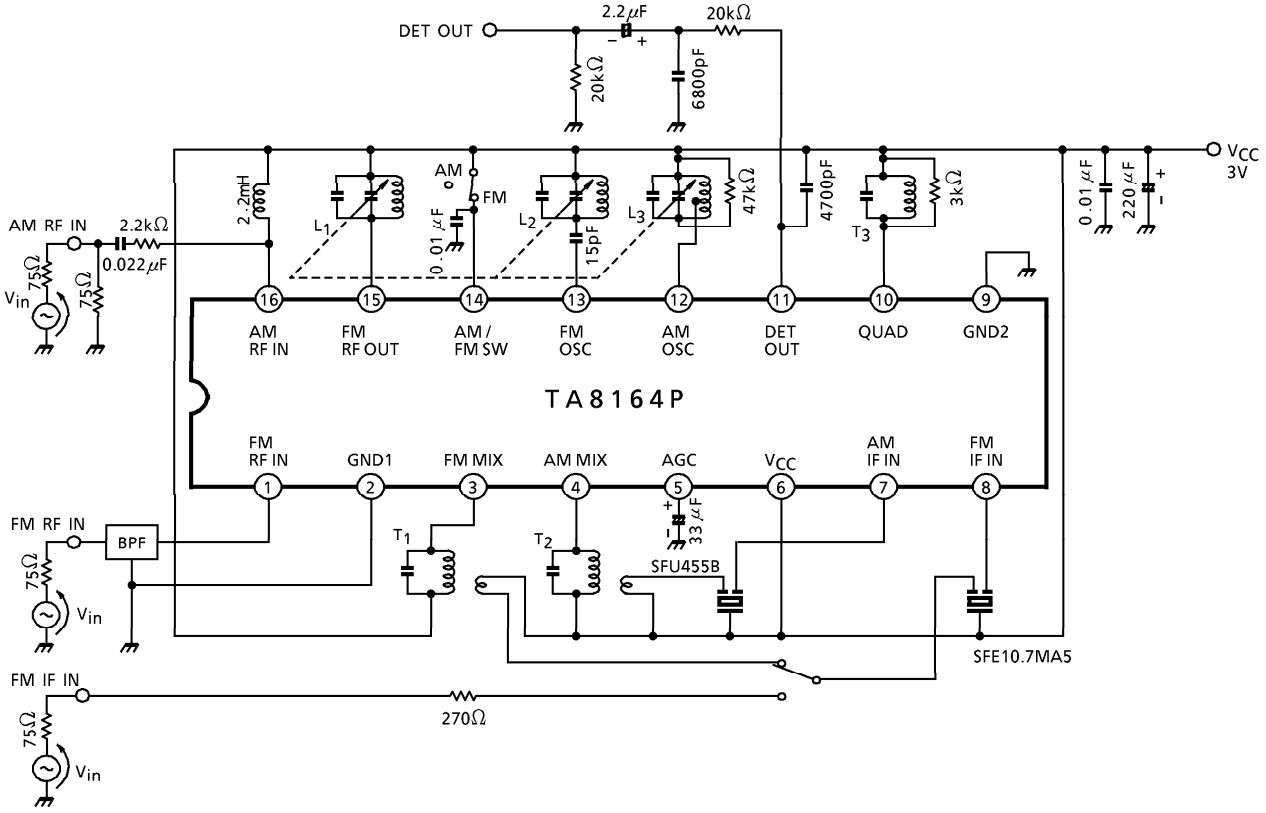
(Note) Derated above Ta = 25°C in the proportion of 6mW / °C.

ELECTRICAL CHARACTERISTICS

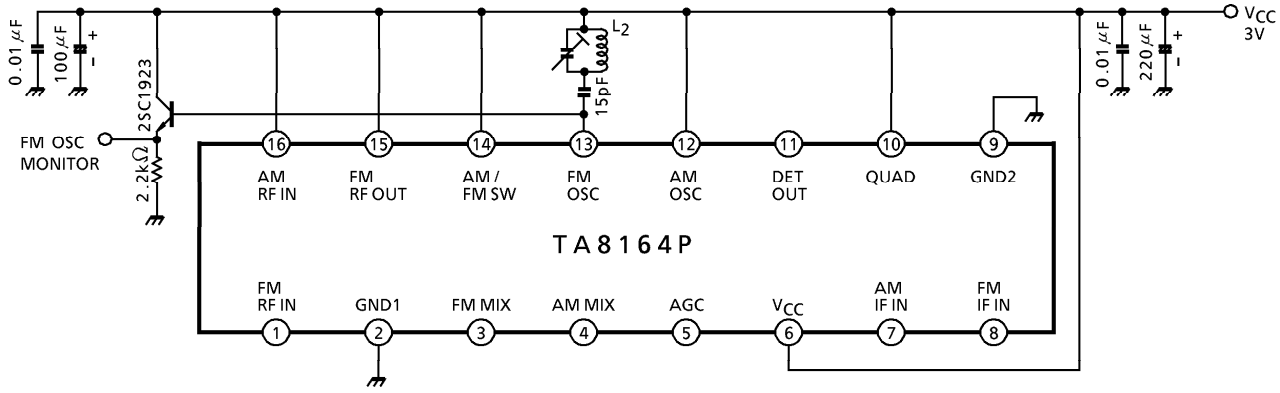
Unless otherwise specified, Ta = 25°C, V_{CC} = 3V, F / E : f = 98MHz, f_m = 1kHz
FM IF : f = 10.7MHz, Δf = ±22.5kHz, f_m = 1kHz
AM : f = 1MHz, MOD = 30%, f_m = 1kHz

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	—	dBμV EMF
	Quiescent Sensitivity	Q_S	1	S / N = 30dB	—	12	—	dBμV 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	dBμV EMF
	Recovered Output Voltage	V_{OD}	1	V_{in} = 80dBμV EMF	20	35	55	mV_{rms}
	Signal To Noise Ratio	S / N	1	V_{in} = 80dBμV EMF	—	62	—	dB
	Total Harmonic Distortion	THD	1	V_{in} = 80dBμV EMF	—	0.4	—	%
	AM Rejection Ratio	AMR	1	V_{in} = 80dBμV EMF	—	33	—	dB
AM	Gain	G_V	1	V_{in} = 30dBμV EMF	15	30	45	mV_{rms}
	Recovered Output Voltage	V_{OD}	1	V_{in} = 60dBμV EMF	20	35	55	mV_{rms}
	Signal To Noise Ratio	S / N	1	V_{in} = 60dBμV EMF	—	43	—	dB
	Total Harmonic Distortion	THD	1	V_{in} = 60dBμV EMF	—	1.0	—	%
	Local OSC Stop Supply Voltage	V_{stop} (AM)	1	V_{in} = 0	—	1.6	—	V

TEST CIRCUIT 1



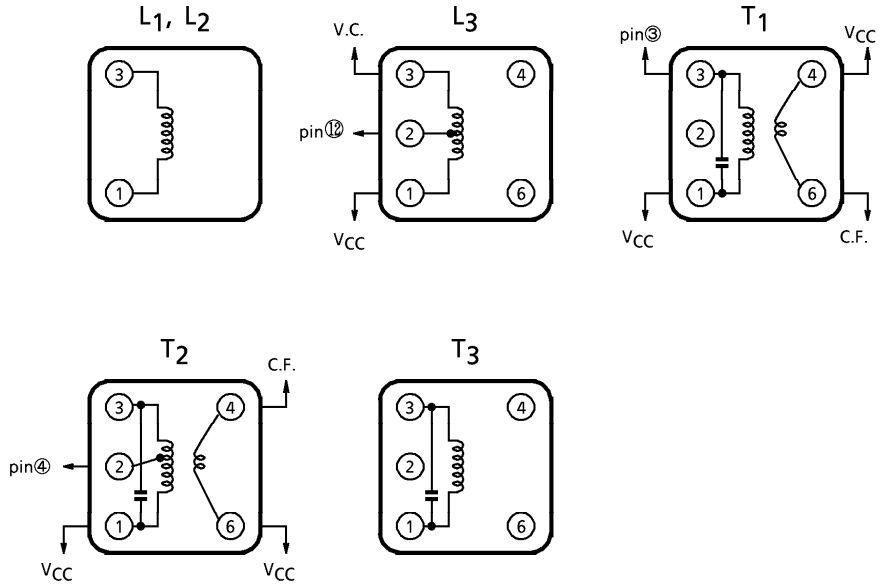
TEST CIRCUIT 2



COIL DATA

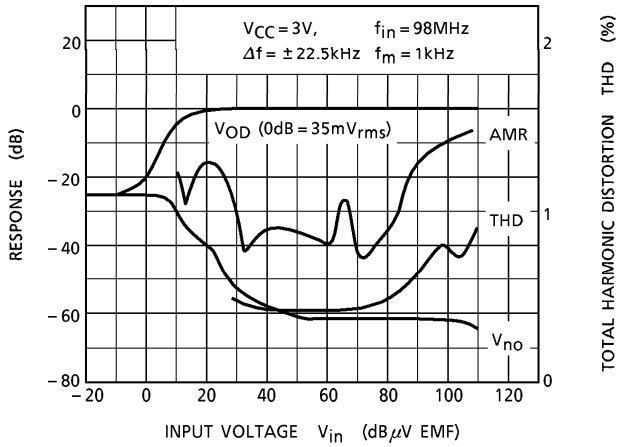
COIL No.	f (Hz)	L (μH)	C_O (pF)	Q_O	TURNS					WIRE (mmϕ)	REF.
					1-2	2-3	1-3	1-4	4-6		
L_1 FM RF	100M	—	—	100	—	—	—	$2\frac{1}{4}$	—	0.5UEW	Ⓢ 0258-000-021
L_2 FM OSC	100M	—	—	100	—	—	$1\frac{3}{4}$	—	—	0.5UEW	Ⓢ 0258-000-020
L_3 AM OSC	796k	268	—	125	14	86	—	—	—	0.06UEW	Ⓢ 2157-2239-213A
T_1 FM MIX	10.7M	—	75	100	—	—	13	—	2	0.1UEW	Ⓢ 2153-414-041A
T_2 AM MIX	455k	—	330	100	65	45	110	—	6	0.08UEW	Ⓢ 4140-1289-311
T_3 FM DET	10.7M	—	100	95	—	—	12	—	—	0.12UEW	Ⓢ 2153-4095-189

Ⓢ : SUMIDA ELECTRIC Co., Ltd.



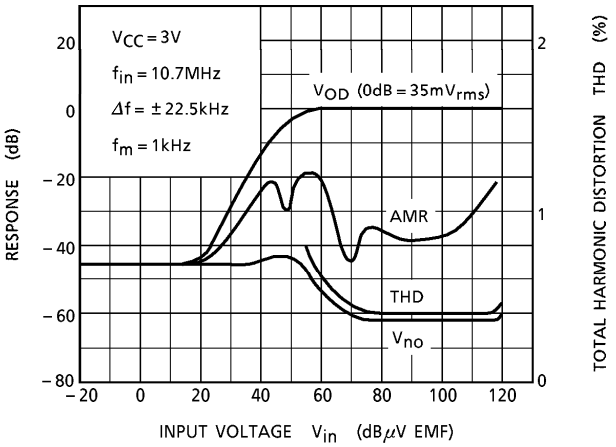
FM (F / E + IF)

V_{OD}, V_{no}, THD, AMR – V_{in}



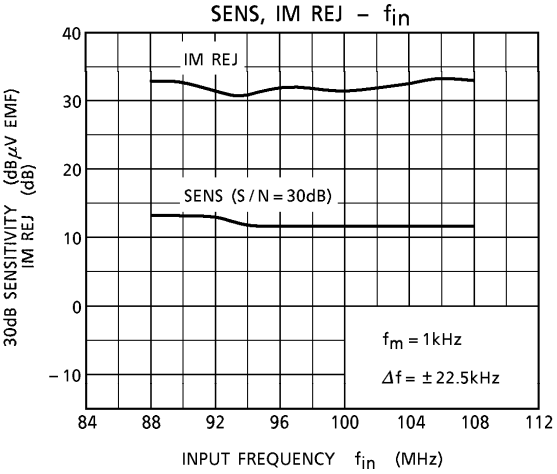
FM (IF)

V_{OD}, V_{no}, THD, AMR – V_{in}



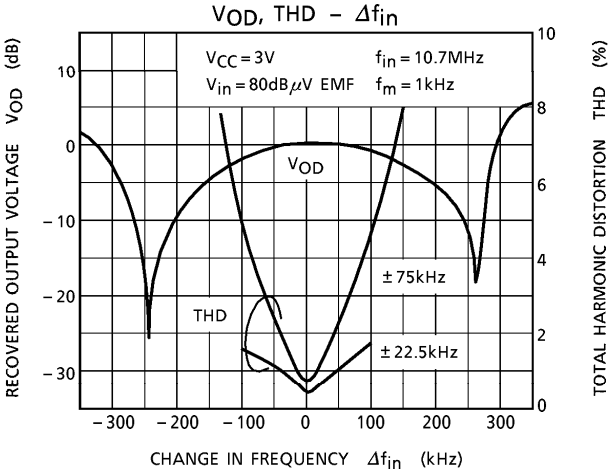
FM (F / E + IF)

SENS, IM REJ – f_{in}



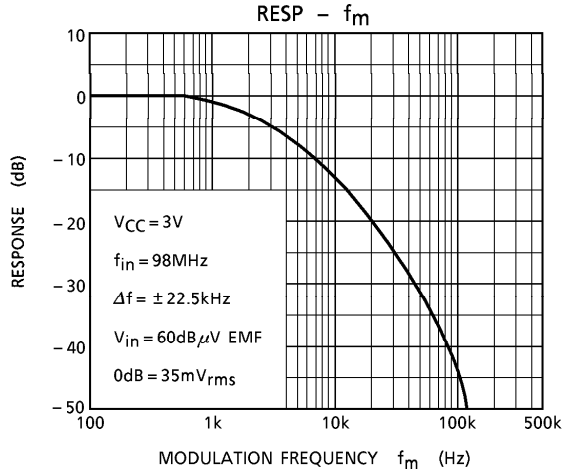
FM (IF)

V_{OD}, THD – Δf_{in}



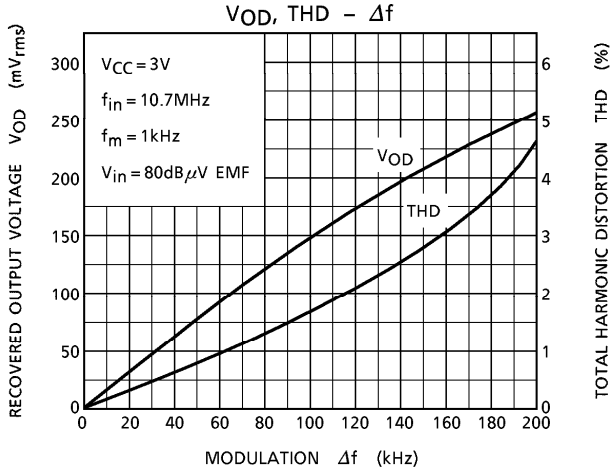
FM (F / E + IF)

RESP – f_m



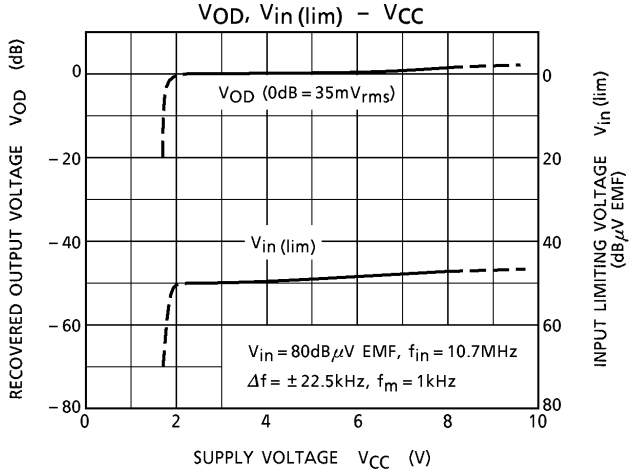
FM (IF)

V_{OD}, THD – Δf



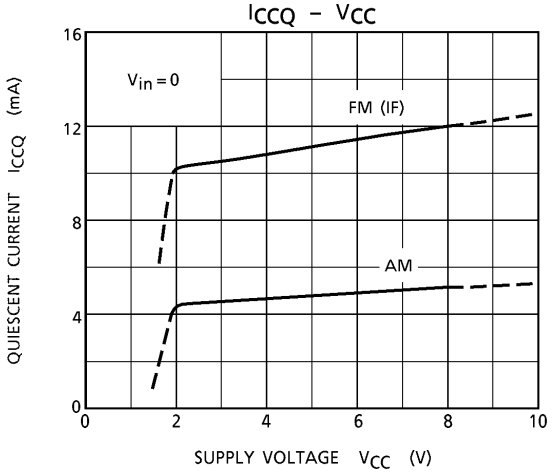
FM (IF)

V_{OD}, $V_{in\,(lim)}$ – V_{CC}



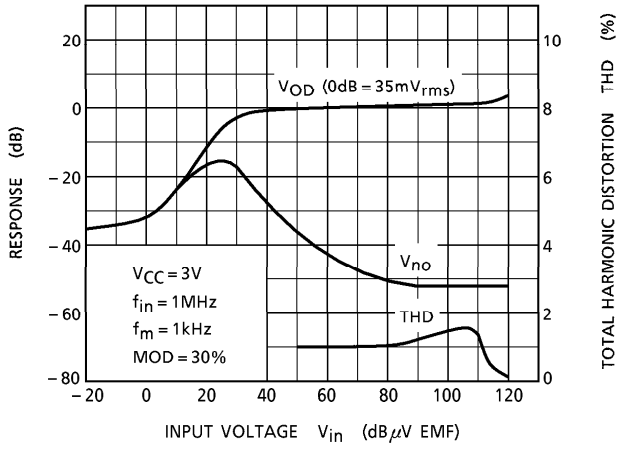
FM (IF), AM

I_{CCQ} – V_{CC}



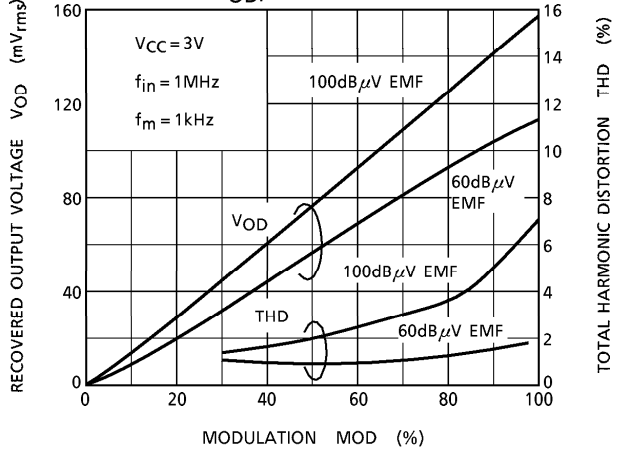
AM

V_{OD}, V_{no}, THD – V_{in}



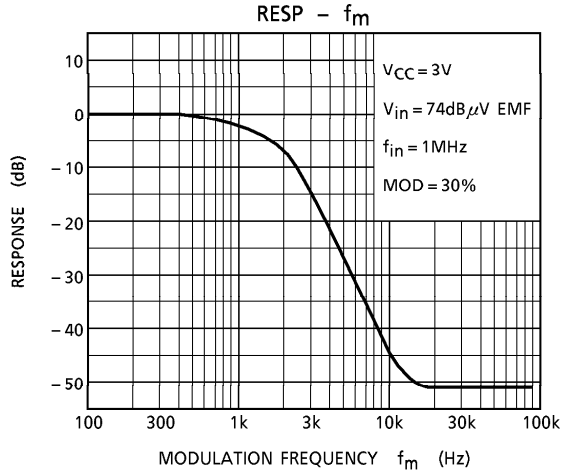
AM

V_{OD}, THD – MOD



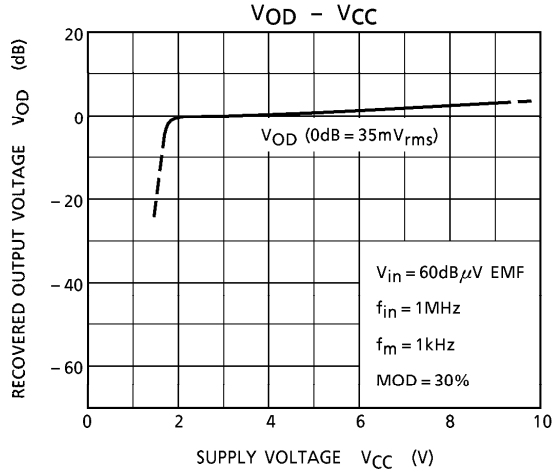
AM

RESP – f_m



AM

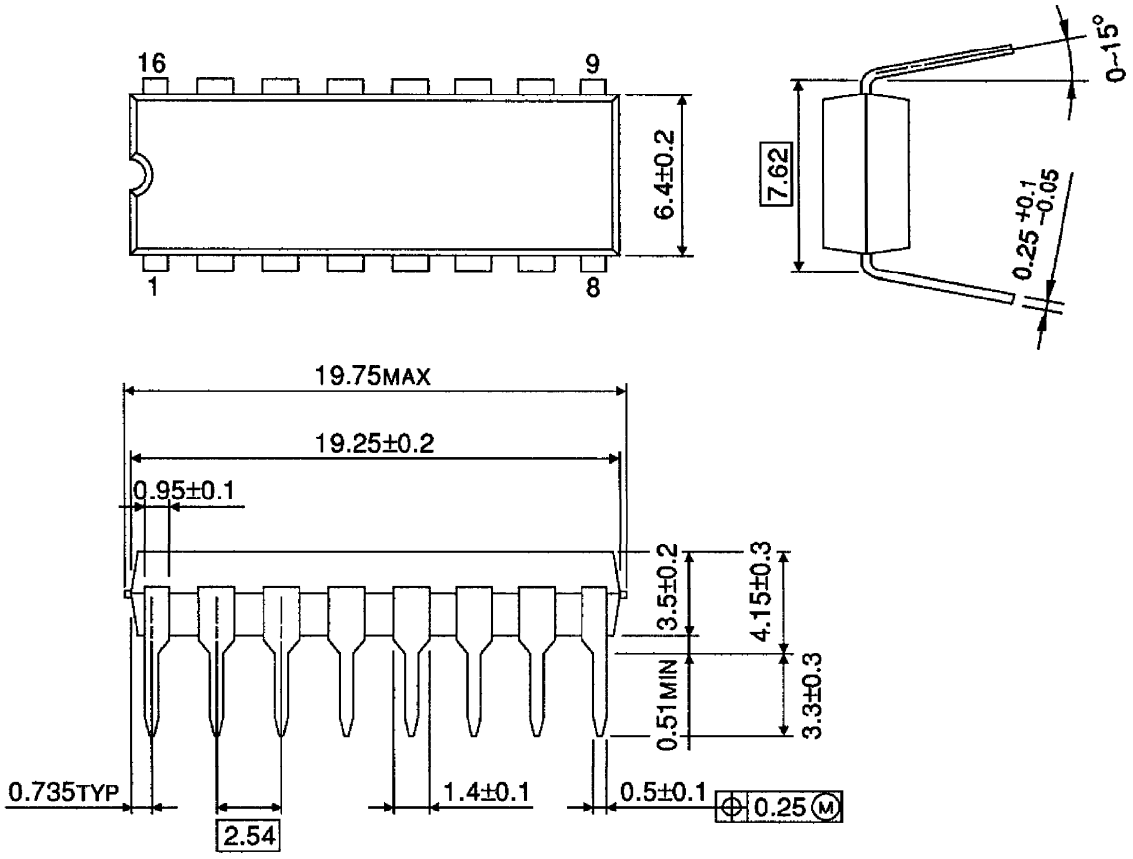
V_{OD} – V_{CC}



OUTLINE DRAWING

DIP16-P-300-2.54A

Unit : mm



Weight : 1.0g (Typ.)