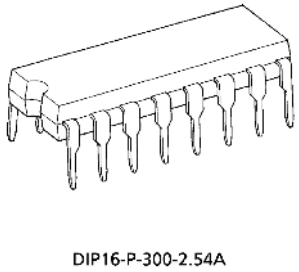
TOSHIBA Bipolar Linear Integrated Circuit Silicon Monolithic

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.



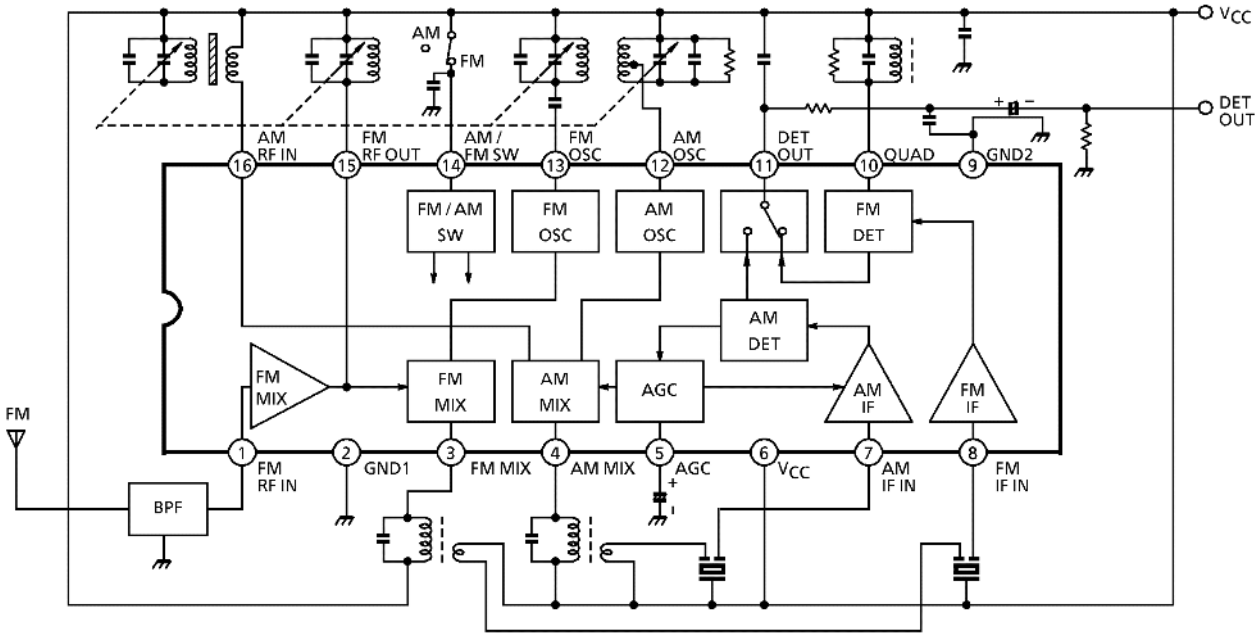
DIP16-P-300-2.54A

Weight: 1.00g (typ.)

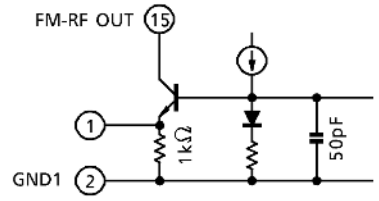
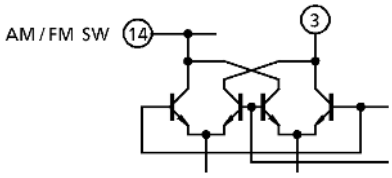
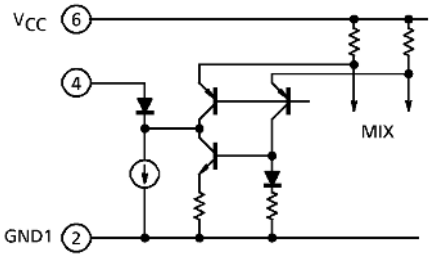
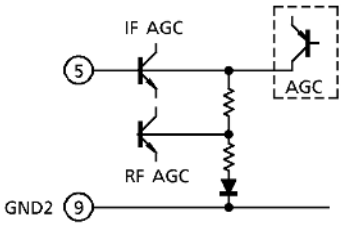
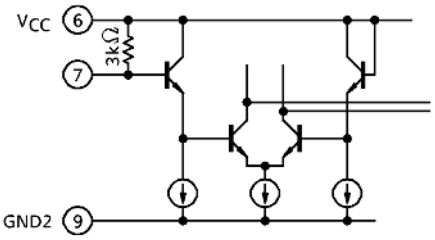
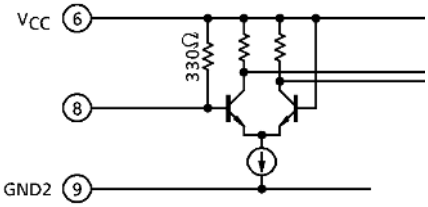
Features

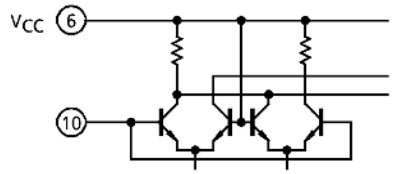
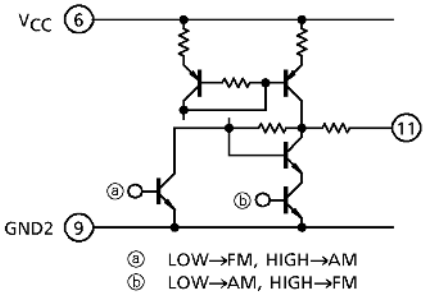
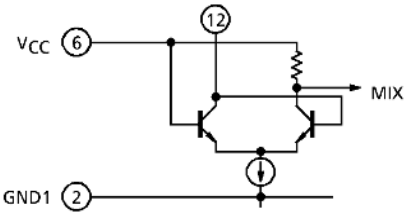
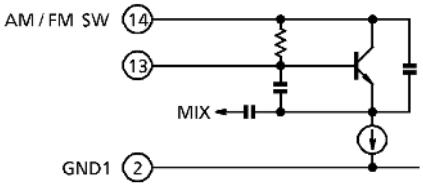
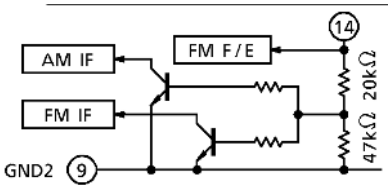
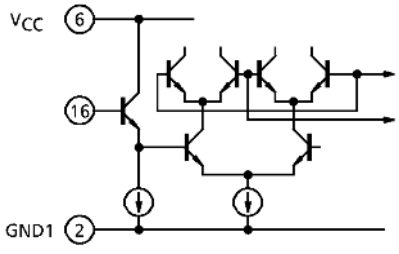
- Common output for AM / FM
- Switch over between AM / FM mode is possible with one−wake switch.
- Operating supply voltage range
  : $V_{CC\ (opr)}$ = 1.8~7V (Ta = 25°C)

Block Diagram



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 Pin (14) V_{CC} →FM Pin (14) open →AM		—	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)

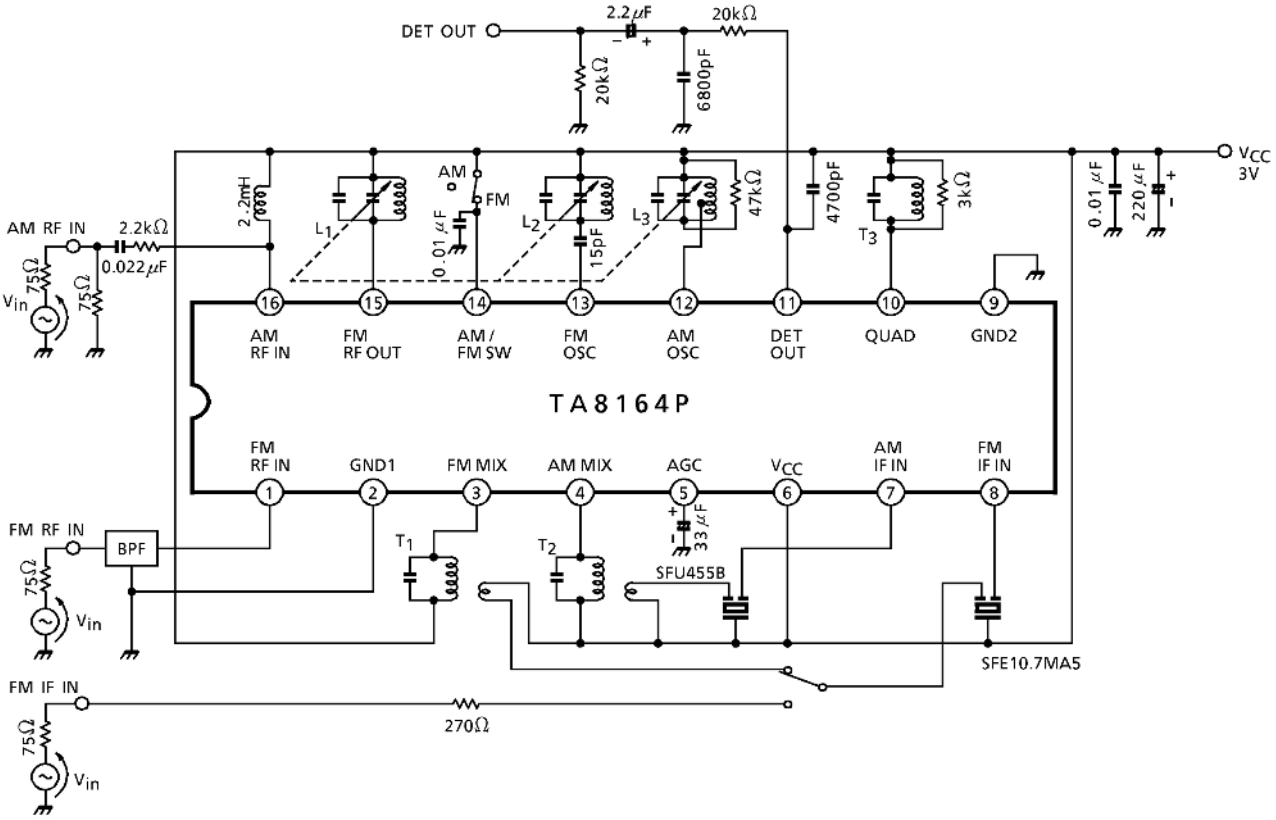
Characteristic	Symbol	Rating	Unit
Supply voltage	V_{CC}	8	V
Power dissipation	P_D (Note)	750	mW
Operating temperature	Topr	−25~75	°C
Storage temperature	Tstg	−55~150	°C

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

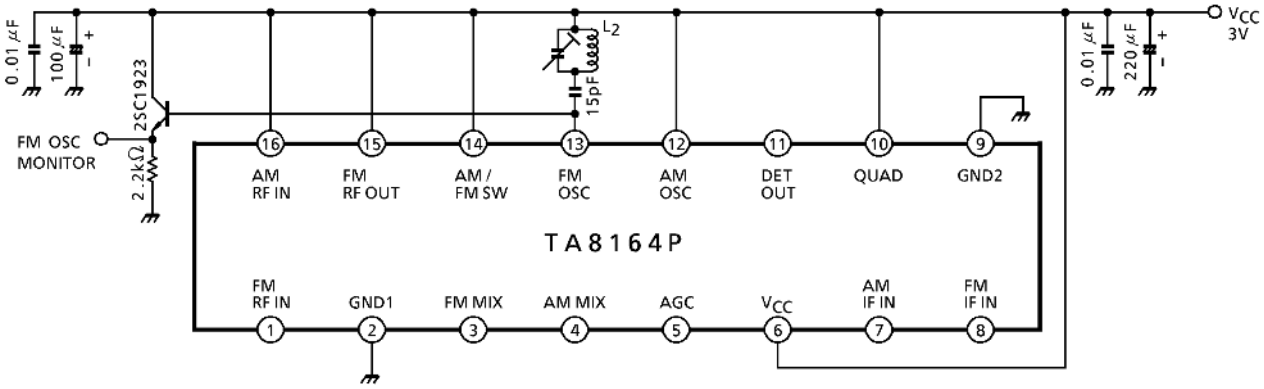
Electrical Characteristics
Unless Otherwise Specified, Ta = 25°C, V_{CC} = 3V, F / E: f = 98MHz, f_m = 1kHz
FM IF: f = 10.7MHz, Δf = ±22.5kHz, f_m = 1kHz
AM: f = 1MHz, MOD = 30%, f_m = 1kHz

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



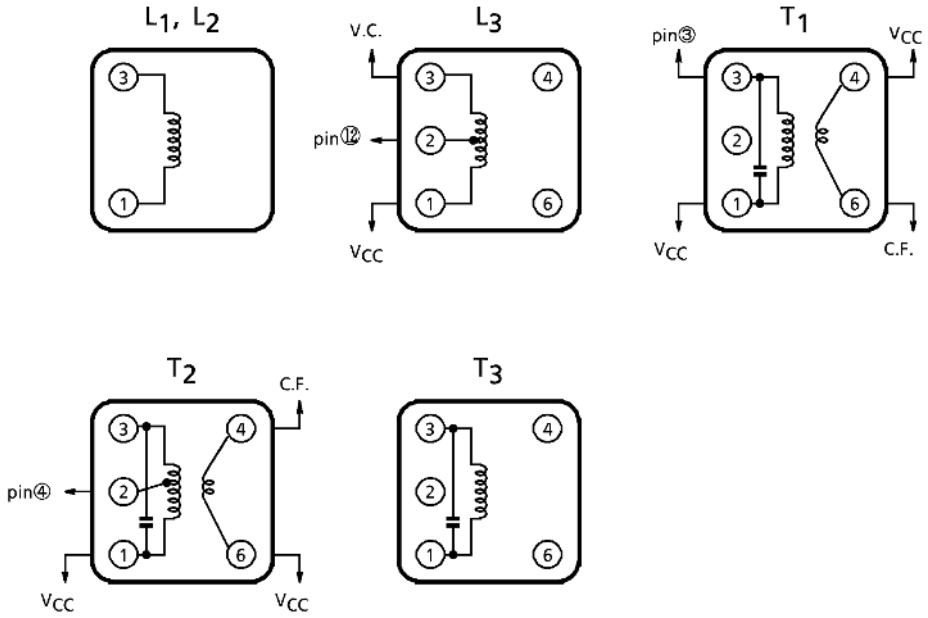
Test Circuit 2



Coil Data

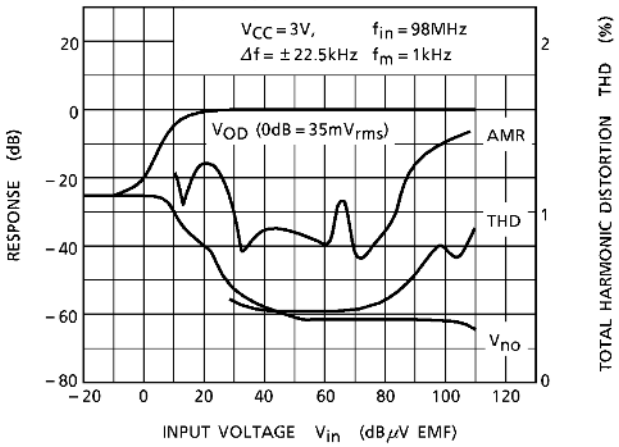
Coil No.	f (Hz)	L (μH)	C_o (pF)	Q_o	Turns					Wire (mmϕ)	Ref.
					1–2	2–3	1–3	1–4	4–6		
L_1 FM RF	100M	—	—	100	—	—	—	$2\frac{1}{4}$	—	0.5UEW	(S) 0258–000–021
L_2 FM OSC	100M	—	—	100	—	—	$1\frac{3}{4}$	—	—	0.5UEW	(S) 0258–000–020
L_3 AM OSC	796k	268	—	125	14	86	—	—	—	0.06UEW	(S) 2157–2239–213A
T_1 FM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

(S): Sumida electric co., ltd.



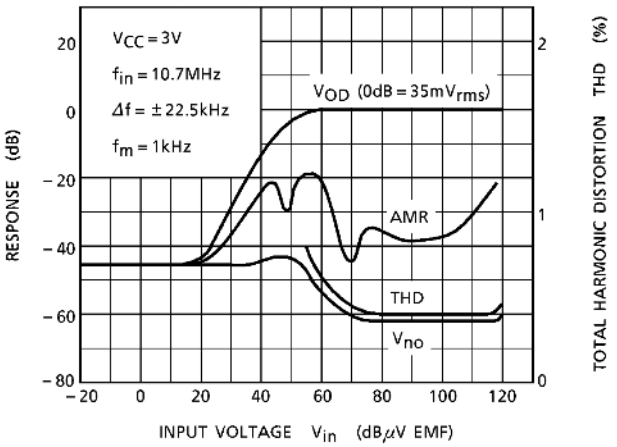
FM (F / E + IF)

V_{OD}, V_{no}, THD, AMR – V_{in}



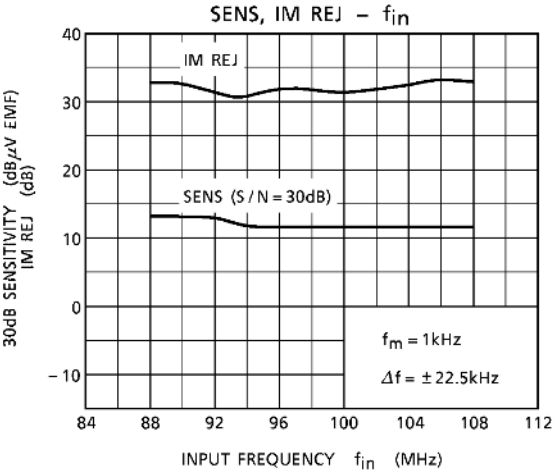
FM (IF)

V_{OD}, V_{no}, THD, AMR – V_{in}



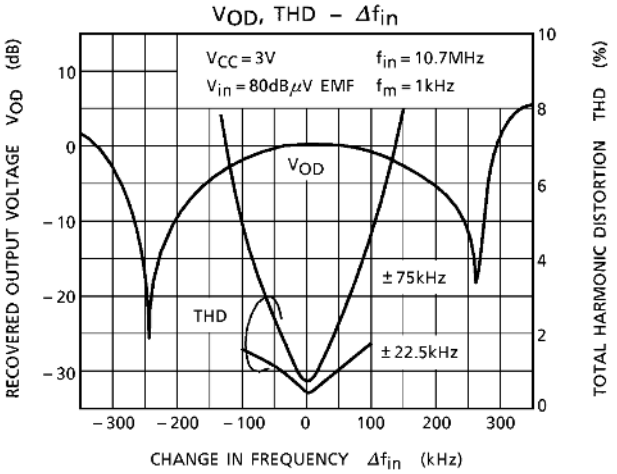
FM (F / E + IF)

SENS, IM REJ – f_{in}



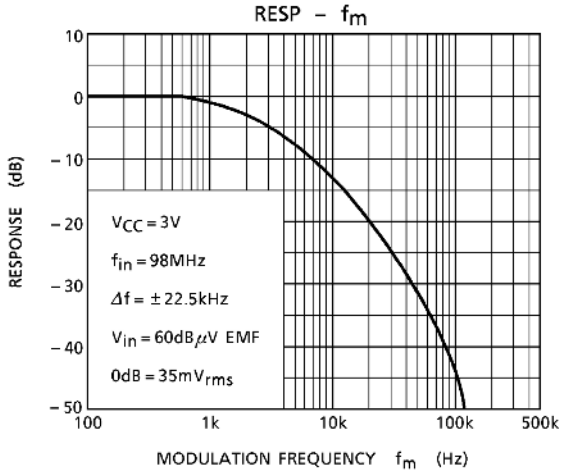
FM (IF)

V_{OD}, THD – Δf_{in}



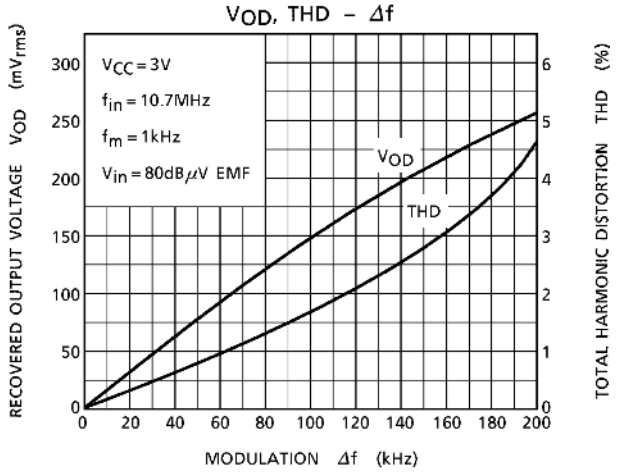
FM (F / E + IF)

RESP – f_m



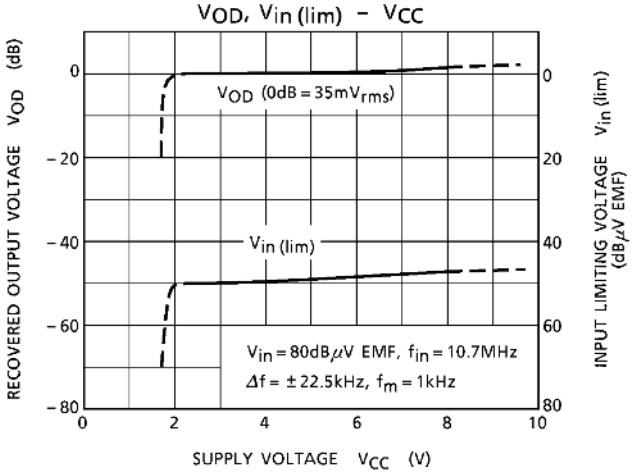
FM (IF)

V_{OD}, THD – Δf



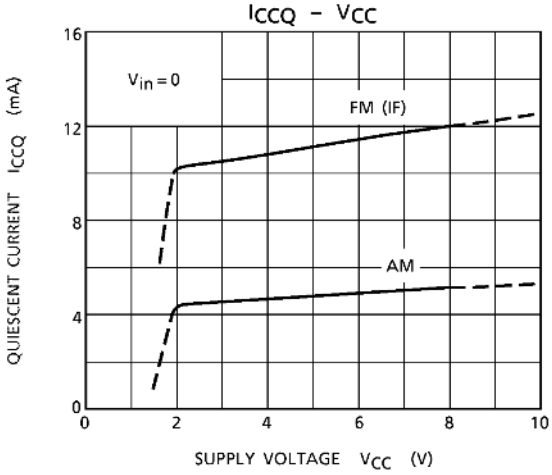
FM (IF)

V_{OD}, $V_{in\,(lim)}$ – V_{CC}



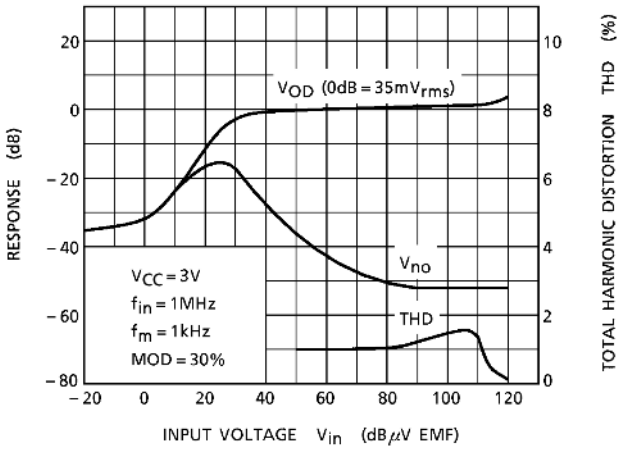
FM (IF), AM

I_{CCQ} – V_{CC}



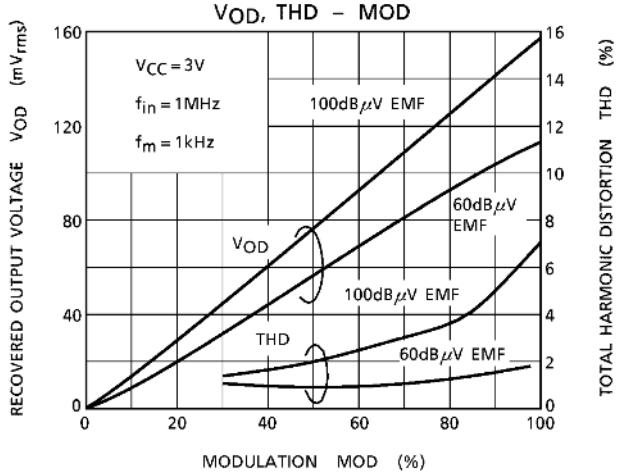
AM

V_{OD}, V_{no}, THD – V_{in}



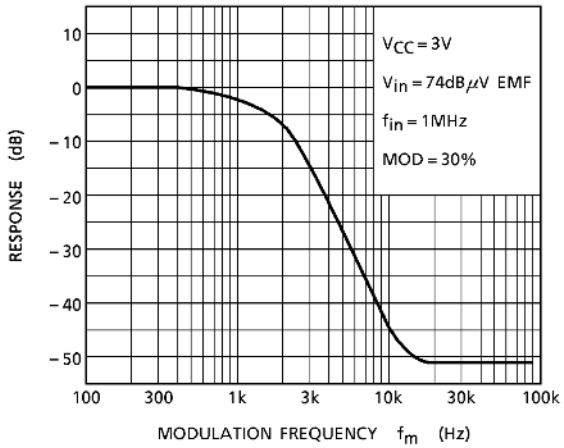
AM

V_{OD}, THD – MOD



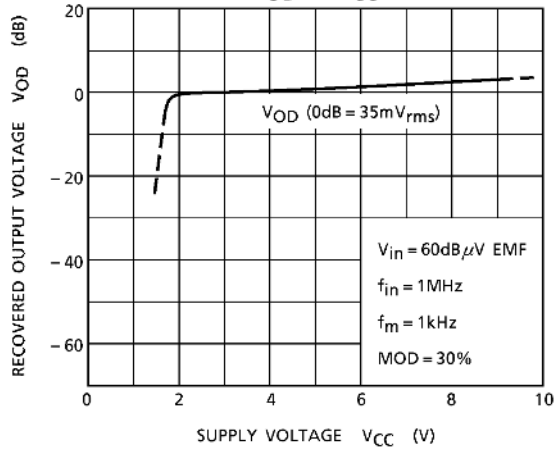
AM

RESP – f_m



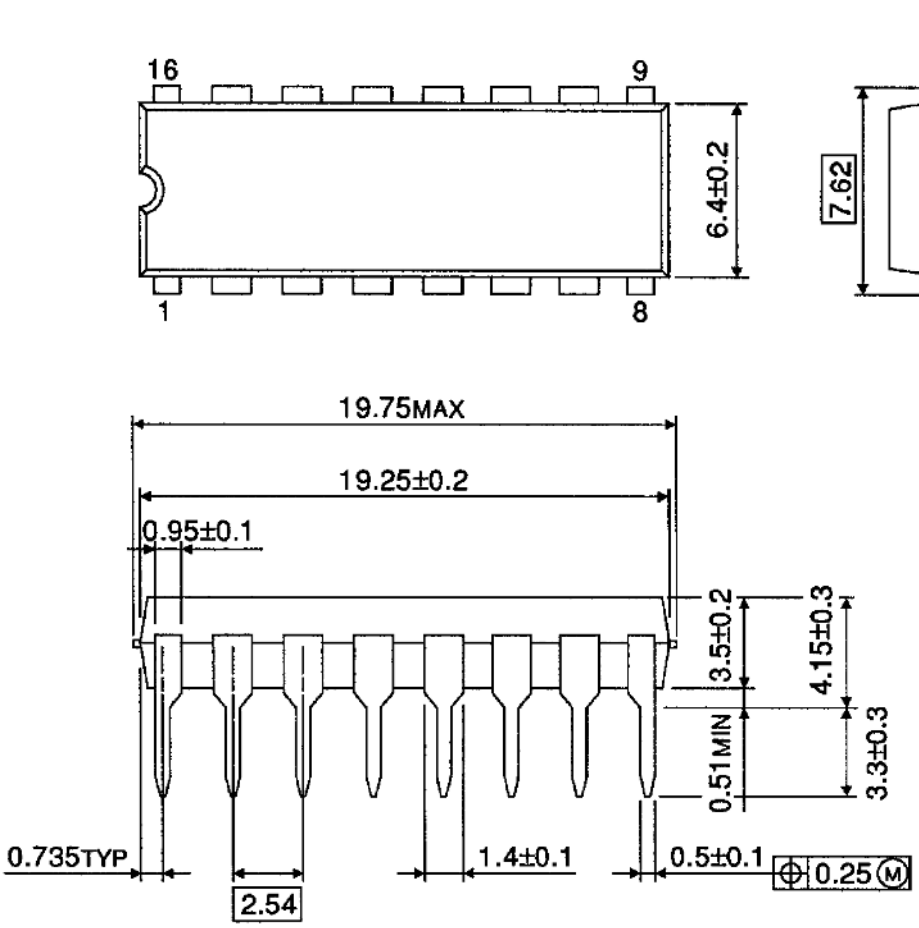
AM

V_{OD} – V_{CC}



Package Dimensions

DIP16-P-300-2.54A Unit : mm



Weight: 1.0g (typ.)

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000707EBA

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