INTEGRATED CIRCUIT

TECHNICAL DATA

TA7176AP

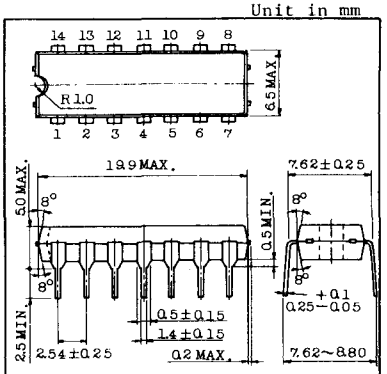
TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT

SILICON MONOLITHIC

TELEVISION SOUND SYSTEM

- Electronic Attenuator Replaces Conventional Volume Control.
- High Sensitivity : $V_{IN(lim)}$=200μV (Typ.)
- Internal Zener Diode Regulated Supply
- Excellent AM Rejection : AMR=50dB (Typ.)
- Low Distortion
- Audio Drive Capability 6mAp-p
- Audio Output Voltage 7V_{p-p}

Unit in mm



Lead pitch is 2.54 and tolerance is ±0.25 against theoretical center of each lead that is obtained on the basis of No.1 and No.14 leads.

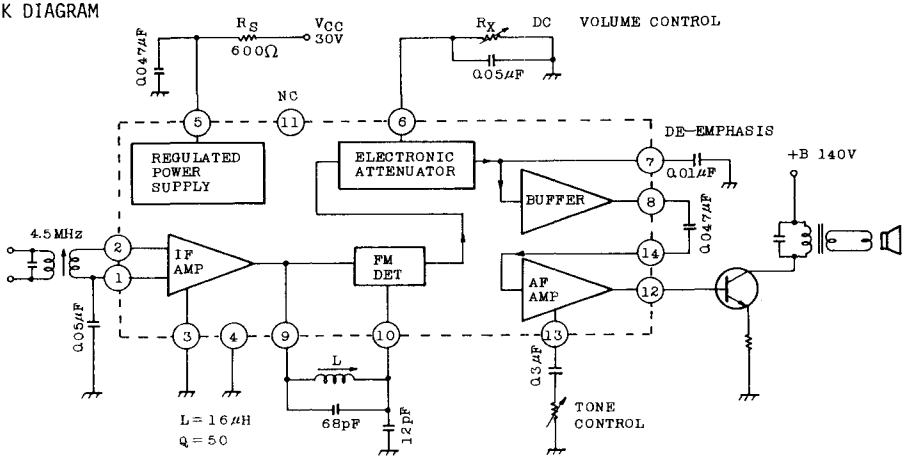
JEDEC	—
TOSHIBA	5−21D

MAXIMUM RATINGS (Ta=25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Input Voltage	V_{IN}	±3	V
Supply Current	I_{CC}	30	mA
Power Dissipation (Note)	P_D	625	mW
Operating Temperature	T_{opr}	-20 ~ 75	°C
Storage Temperature	T_{stg}	-55 ~ 150	°C

(Note) Derated above Ta=25°C in the proportion of 5.0mW/°C

BLOCK DIAGRAM

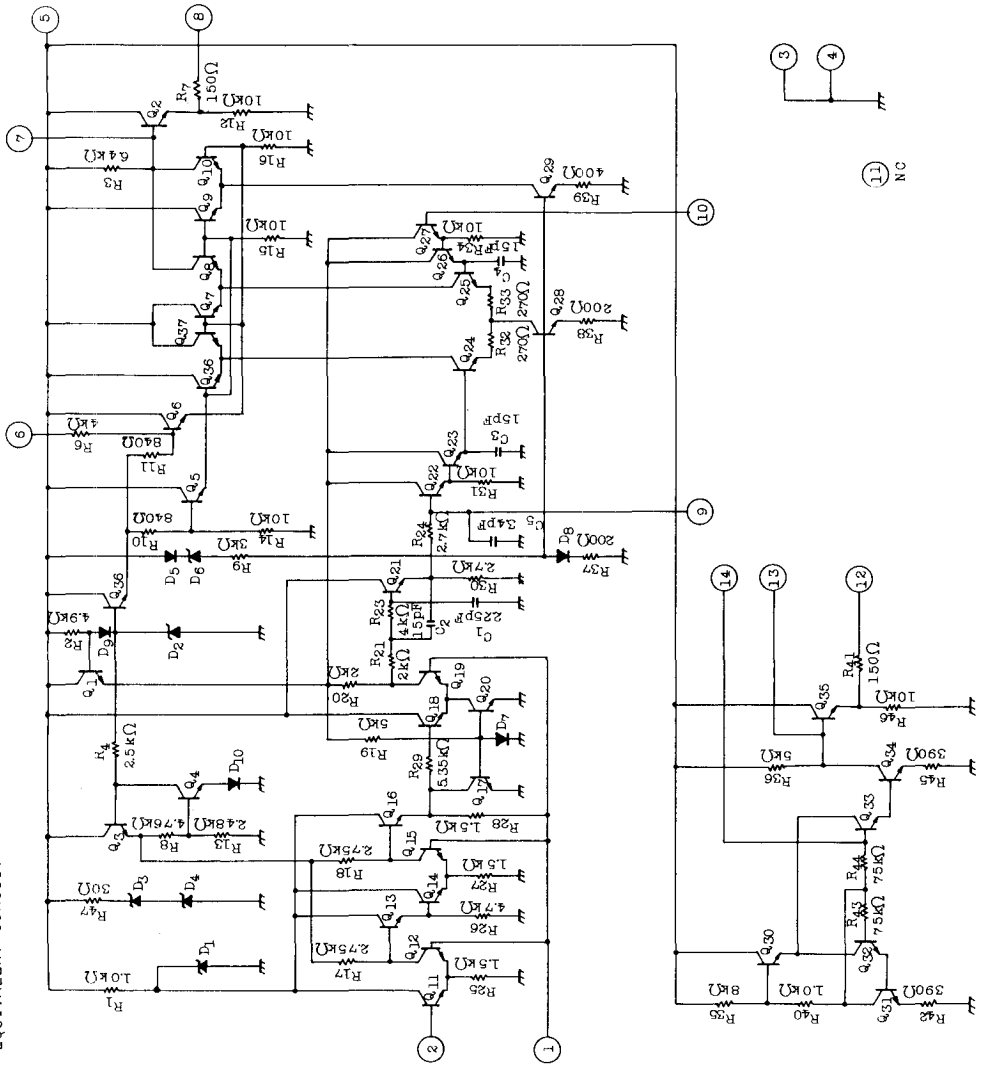


ELECTRICAL CHARACTERISTICS

(Unless otherwise specified V_{CC}=30V, R_S=600Ω, Ta=25°C)

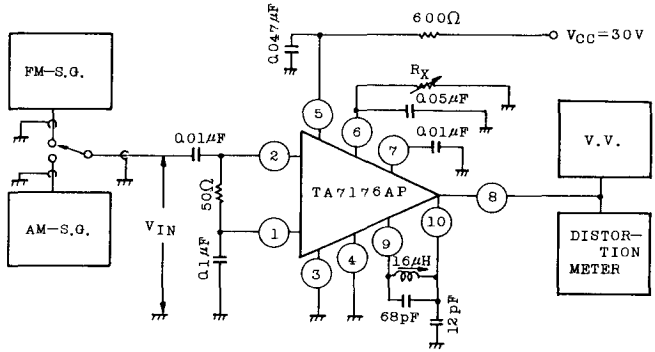
CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Zener Voltage		V_Z	-	-	10.3	11.2	12.2	V
Supply Current		I_{CC}	-	V_S=9V	10	16	24	mA
Power Dissipation		P_D	-	-	330	345	360	mW
Input Limiting Voltage		$V_{IN(lim)}$	1	f=4.5MHz, f_M=400Hz $\Delta f=\pm 25$kHz, -3dB Limiting	-	200	400	μV
AM Rejection		AMR		f=4.5MHz, V_{IN}=90dBμ FM: $\Delta f=\pm 25$kHz AM: 30% Modulation	40	50	-	dB
Recovered Output Voltage		V_{OD}		f=4.5MHz, V_I=0.1V	0.5	0.75	-	V_{rms}
Total Harmonic Distortion		THD(1)		$\Delta f=\pm 25$kHz, f_M=400Hz	-	0.9	2.0	%
Input Impedance	Parallel Input Resistance	r_{ip}	3	Measured Between Terminal No.1 & 2 f=4.5MHz	-	17	-	kΩ
	Parallel Input Capacitance	c_{ip}			-	4	-	pF
Output Impedance	Parallel Output Resistance	r_{op}	-	Measured Between Terminal No.9 & GND f=4.5MHz	-	3.25	-	kΩ
	Parallel Output Capacitance	c_{op}			-	7.5	-	pF
Output Impedance (PIN 7)		Z_o	-	f=400Hz	-	7.5	-	kΩ
Output Impedance (PIN 8)		Z_o	-	f=400Hz	-	300	-	Ω
Max. Attenuation		ATT(Max)	1	$R_X=\infty$	60	80	-	dB
AF Voltage Gain		G_V(AF)	2	V_{IN}=0.1V_{rms}, f=400Hz	17.5	20	-	dB
Total Harmonic Distortion		THD(2)		V_{OUT}=2V_{rms}, f=400Hz	-	1.5	-	%
Max. Audio Output Voltage		V_{OM}		THD=5%, f=400Hz	2	2.5	-	V_{rms}
Input Impedance		Z_i(AF)	-	f=400Hz	-	70	-	kΩ
Output Impedance		Z_o(AF)			-	270	-	Ω

EQUIVALENT CIRCUIT

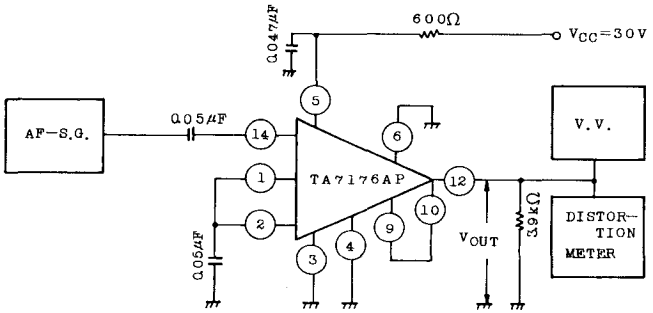


TEST CIRCUIT

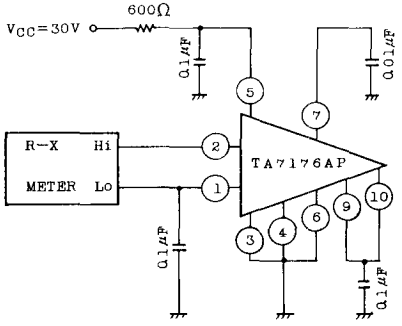
1. $V_{IN(lim)}$, V_{OD}, AMR, THD(1), ATT



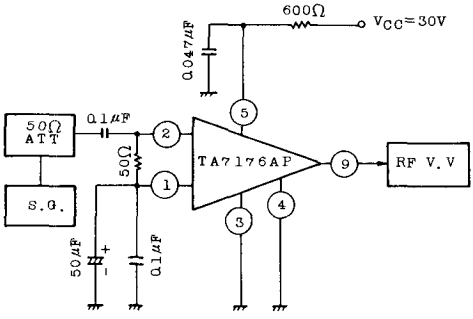
2. $G_{V(AF)}$, THD(2), V_{OM}



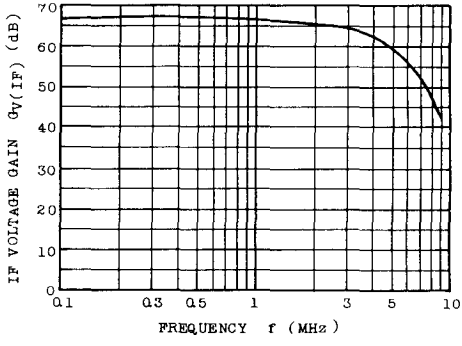
3. r_{ip}, c_{ip}



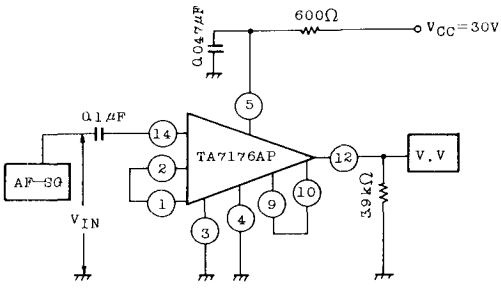
FREQUENCY RESPONSE (CHARACTERISTIC) OF IF AMPLIFIER SECTION

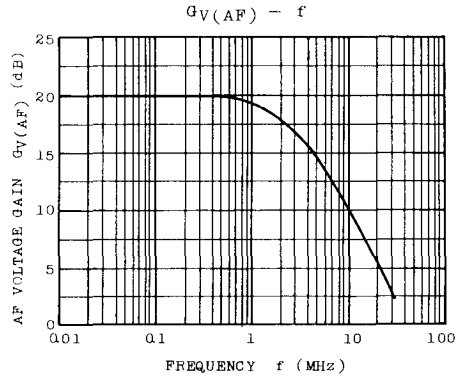


$G_{V(IF)}$ – f



FREQUENCY RESPONCE (CHARACTERISTIC) OF AF AMPLIFIER SECTION





GAIN REDUCTION – EXTERNAL RESISTANCE CHARACTERISTICS