

9097247 TOSHIBA, ELECTRONIC

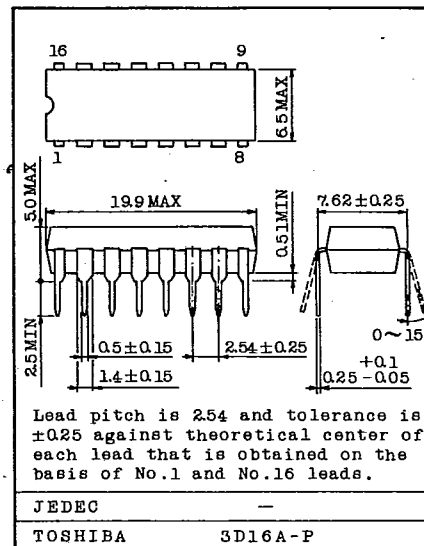
02E 17425 D

T-77-05-05

TA7613AP**AM/FM RADIO IC WITH POWER AMPLIFIER**

- TA7613AP is Suitable for Use in AM/FM Portable Radios or Main-fed AM/FM Clock Radios.
- It Incorporates : AM RF Amp, AM Local Oscillator, AM Mixer, AM/FM IF Amp, AM/FM Detector, AM AGC Circuit, FM AFC Circuit and B Class-Audio Power Amplifier.
- Using the TA7613AP, Plus the Discrete Input Stage (for FM : RF Amp and Converter), It is Possible to Construct a Complete AM/FM Radios Receivers.
- It Features Wide Operating Voltage Range : from 3 Volts to Approximately 13 Volts, Depending on the Internal Regulator Tolerance.
- As the Internal Shunt Voltage Regulator Circuit is Connected to the Supply Voltage Terminal, it Permits a Constant Current Mode (Approximately 42mA) of Operation which is Desirable for Line-Operated Equipments.
- AM to FM Switching is Accomplished by Switching Only DC Circuitly.

Unit in mm

**MAXIMUM RATINGS ($T_a=25^\circ\text{C}$)**

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	11	V
Supply Current	I_{CC}	44	mA
Power Dissipation (Note) ($T_a \leq 65^\circ\text{C}$)	P_D	600	mW
Thermal Resistance	R_{J-A}	100	$^\circ\text{C}/\text{W}$
Operating Temperature	T_{opr}	-18 ~ 65	$^\circ\text{C}$
Storage Temperature	T_{stg}	-40 ~ 125	$^\circ\text{C}$

Note : Derated above $T_a=25^\circ\text{C}$ in the proportion of 10mW/ $^\circ\text{C}$. **V_{CC} vs R_L**

V_{CC} \ R_L	4.5V	6V	7.5V	9V	Line Operated
8 Ω	○	○	○	×	×
16 Ω	○	○	○	○	×
45 Ω	○	○	○	○	○

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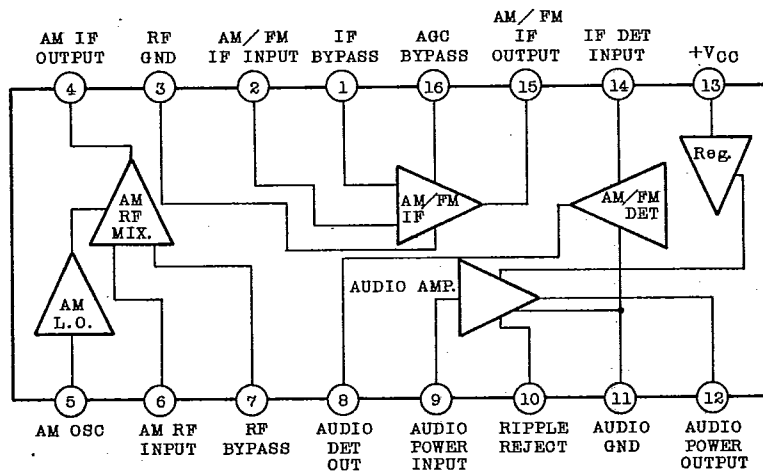
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ELECTRICAL CHARACTERISTICS

(Unless otherwise specified, Ta=25°C, f(AM)=1MHz, Mod=30%, f(FM)=10.7MHz
 ΔF=22.5kHz, fM=1kHz, VIN=SG Open Voltage -6dB)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Quiescent Current	ICCQ		SW1 → FM, VCC=3V	7	12	17	mA
			SW1 → FM, VCC=9V	10	17	23	
Pin 16 Terminal Voltage	V16(FM)		SW1 → FM, ICC=42mA, No Signal	2.0	2.4	3.1	V
Limiting Voltage	VIN(1im)		SW1 → FM, VCC=5.5V, -3dB V16=2.4V, VR=Min.	-	57	-	dBμV
Internal Regulated Voltage	VCC		SW1 → AM, ICC=42mA	12.5	13.2	14.0	V
Pin 16 Terminal Voltage	V16(AM)		SW1 → AM, VCC=9V, No Signal	1.4	-	1.9	V
Maximum Sensitivity	VO		SW1 → AM, VCC=12V, VIN=37dB SW2 → 45Ω, V16=1.4V	1.5	3.0	-	V
Quieting Sensitivity	S/N		SW1 → AM, VCC=5.5V SW2 → 8Ω, VIN=37.5dB	15	20	-	dB
Power Stage	Output Power	POUT	SW2 → 8Ω, VCC=5.5V, f=1kHz VR=Min. THD=10%	0.28	-	-	W
	Total Harmonic Distortion	THD	SW2 → 45Ω, ICC=42mA, f=1kHz VR=Min. VOUT=2V	-	0.5	4.0	%
	Voltage Gain	Gv	SW2 → 8Ω, VCC=5.5V, f=1kHz VR=Min.	-	40	-	dB

BLOCK DIAGRAM



AUDIO LINEAR IC

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INPUT-OUTPUT IMPEDANCE (Ta=25°C, V_{CC}=6V)

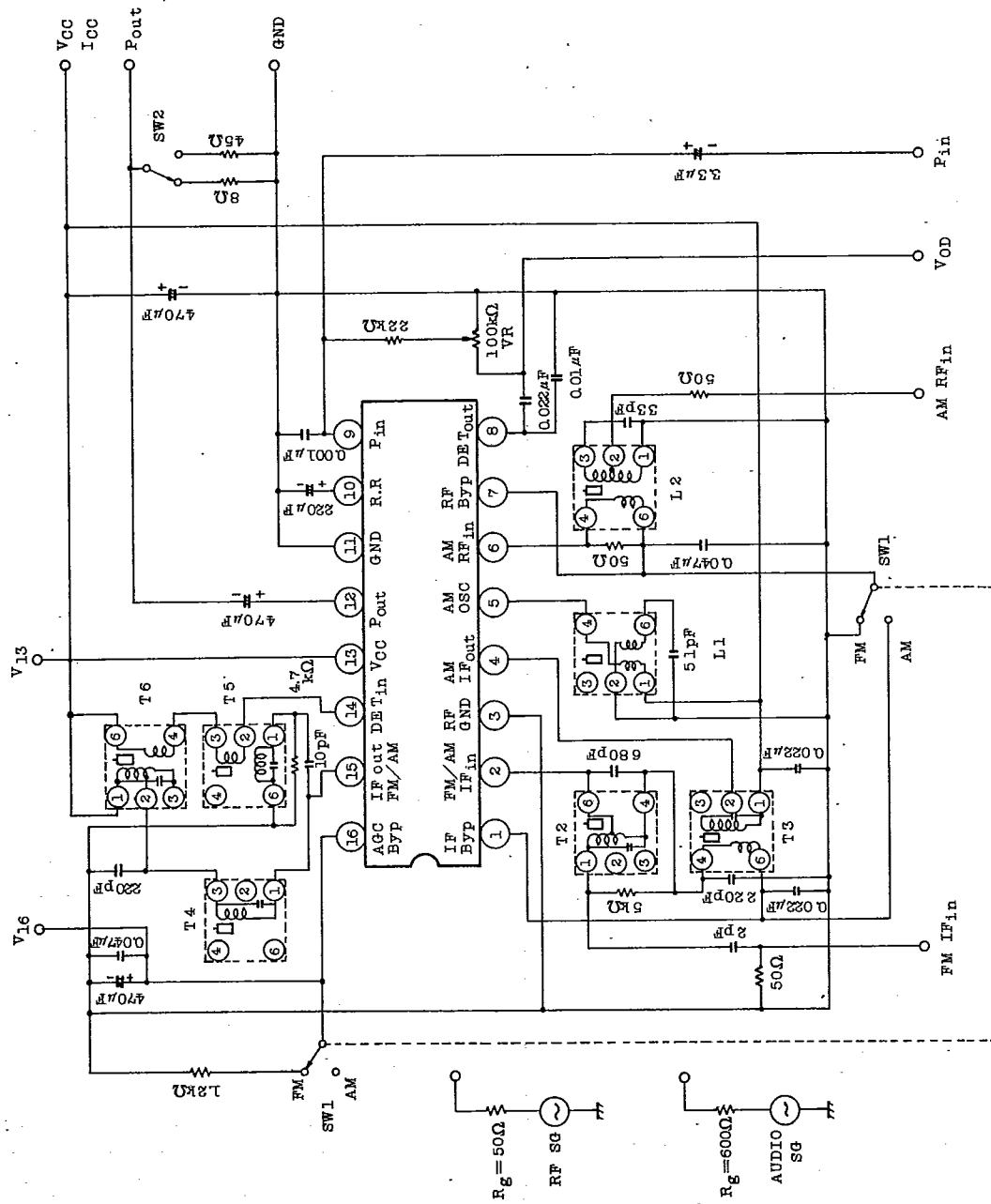
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Pin 2 Input Impedance (AM)	R _{ip2} (AM)	f=455kHz	-	200	-	kΩ
	c _{ip2} (AM)	f=455kHz	-	3	-	pF
Pin 2 Input Impedance (FM)	R _{ip2} (FM)	f=10.7MHz	-	30	-	kΩ
	c _{ip2} (FM)	f=10.7MHz	-	3.5	-	pF
Pin 4 Output Impedance	R _{op4}	f=455kHz	-	300	-	kΩ
	c _{op4}	f=455kHz	-	6	-	pF
Pin 6 Input Impedance	R _{ip6}	f=1MHz	-	50	-	kΩ
	c _{ip6}	f=1MHz	-	5	-	pF
Pin 14 Input Impedance (AM)	R _{ip14} (AM)	f=455kHz	-	300	-	kΩ
	c _{ip14} (AM)	f=455kHz	-	3.5	-	pF
Pin 14 Input Impedance (FM)	R _{ip14} (FM)	f=10.7MHz	-	300	-	kΩ
	c _{ip14} (FM)	f=10.7MHz	-	4	-	pF
Pin 15 Output Impedance (AM)	R _{op15} (AM)	f=455kHz	-	300	-	kΩ
	c _{op15} (AM)	f=455kHz	-	5.5	-	pF
Pin 15 Output Impedance (FM)	R _{op15} (FM)	f=10.7MHz	-	300	-	kΩ
	c _{op15} (FM)	f=10.7MHz	-	6	-	pF

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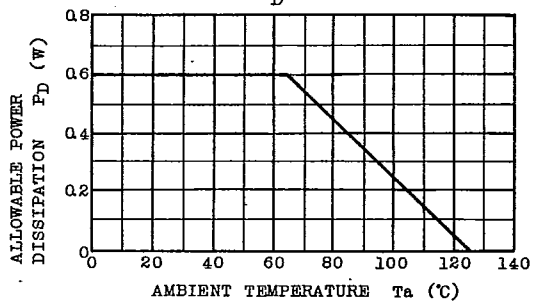
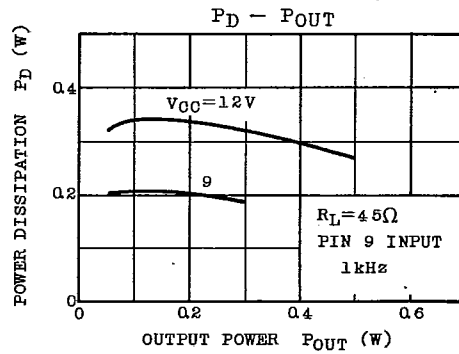
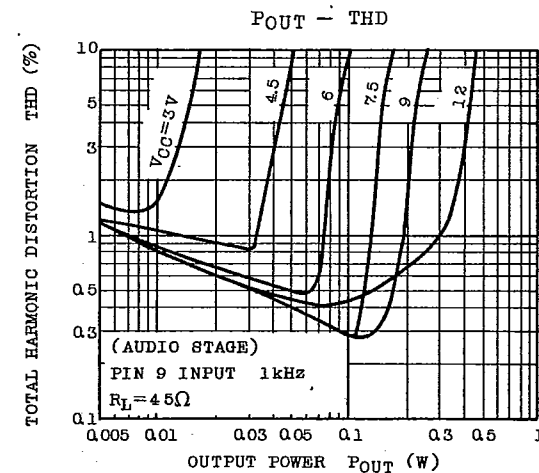
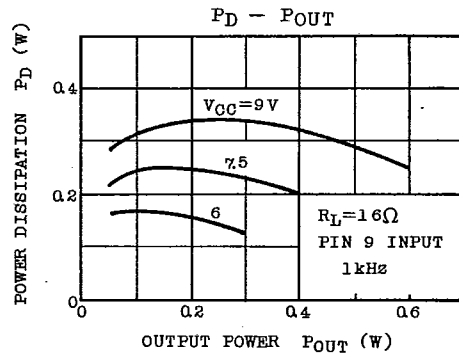
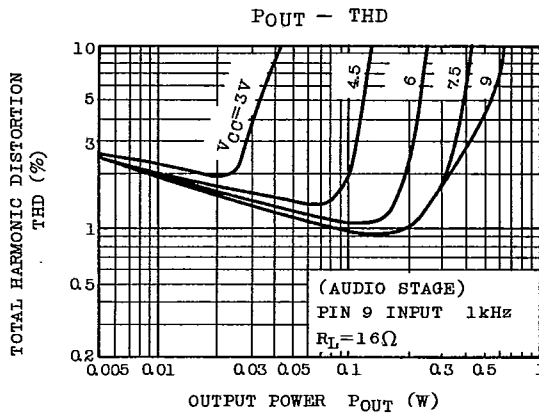
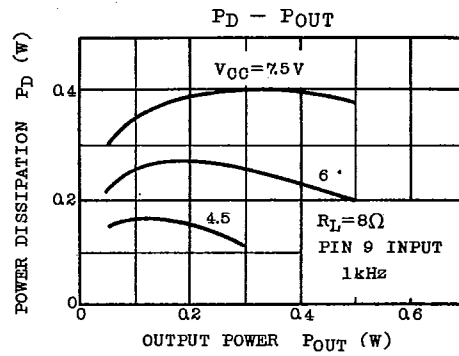
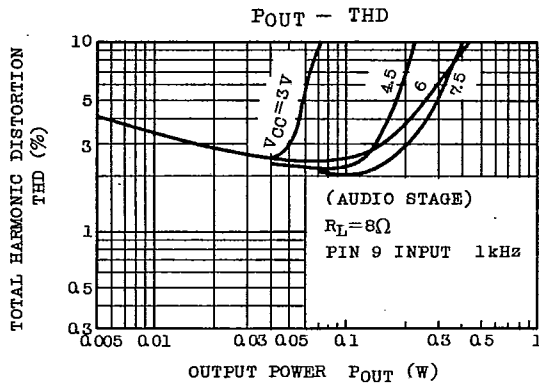
TEST CIRCUIT



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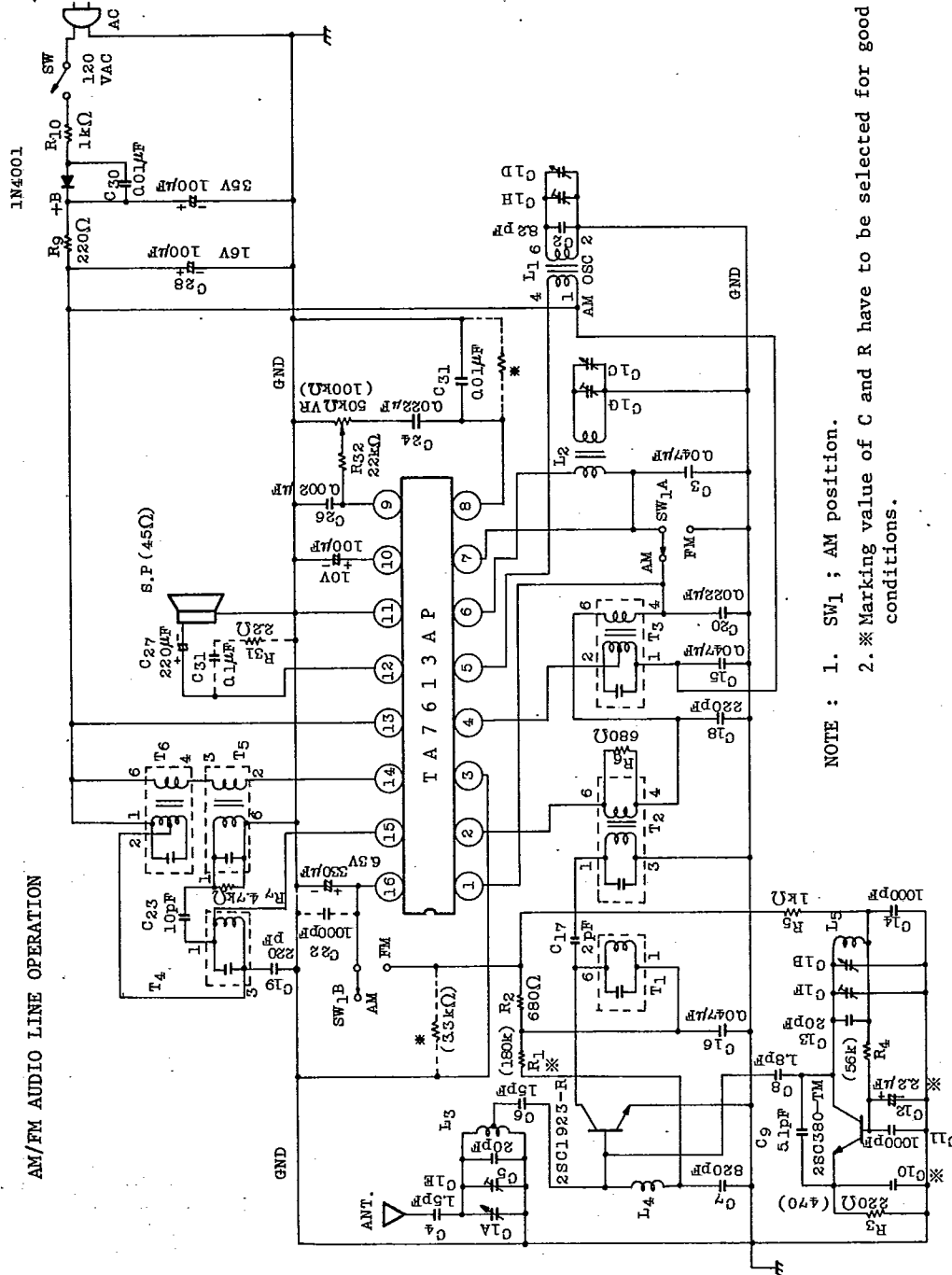


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APPLICATION CIRCUIT

AM/FM AUDIO LINE OPERATION



NOTE : 1. SW₁ ; AM position.

2. * Marking value of C and R have to be selected for good conditions.

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COIL DATA

COIL No.	f	Q0	TURNS	C ₀	
T1	10.7MHz	120	6-1 8T	150pF	
T2	10.7MHz	95	3-1 5T 4-6 2T	400pF	
T3 (T6)	455kHz	130	1-2 45T 2-3 110T 4-6 55T	150pF	
T4	10.7MHz	80	3-1 6T	300pF	
T5	10.7MHz	70	6-1 7 1/2 T 2-3 7T	180pF	
L1	AM LOCAL OSCILLATOR	90	2-6 82 1/2 T 1-4 8 1/2 T		
L2	AM ANTENNA	200	① - ② 138T (L=560μH) ③ - ④ 9T	-	
L3	FM ANTENNA	-	0.8mmφ UEW 4T TAP 0.5T	-	
L4	Trap	-	0.32mmφ UEW 10T	-	
L5	FM OSCILLATOR	-	0.8mmφ UEW 4T	-	

1983-2-5

TOSHIBA CORPORATION

EJB-TA7613AP-7

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