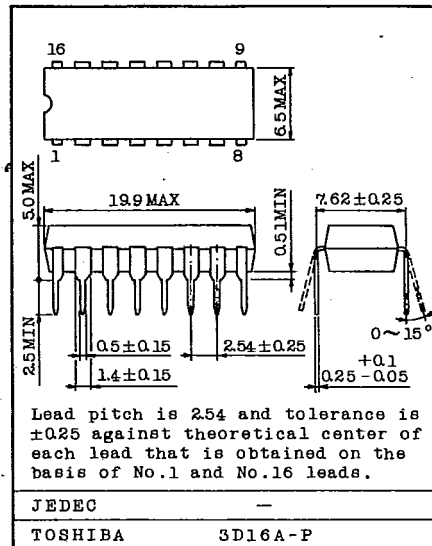


AM/FM RADIO IC WITH POWER AMPLIFIER

- 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



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.16 leads.

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	$^\circ\text{C/W}$
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

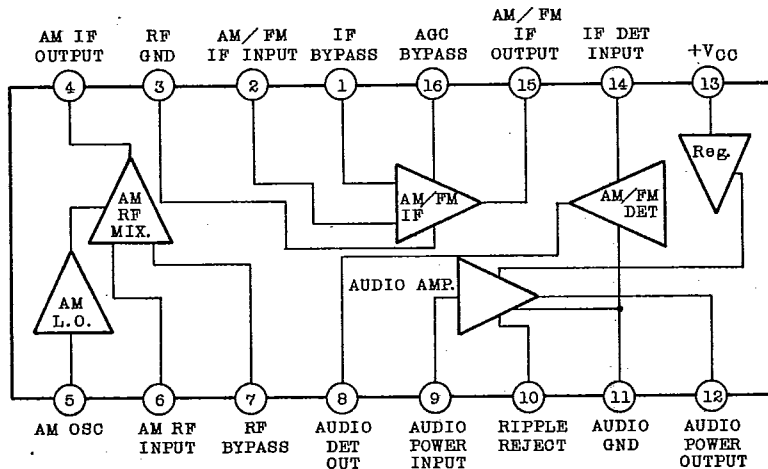
V_{CC} / R_L	4.5V	6V	7.5V	9V	Line Operated
8 Ω	○	○	○	×	×
16 Ω	○	○	○	○	×
45 Ω	○	○	○	○	○

ELECTRICAL CHARACTERISTICS

(Unless otherwise specified, $T_a=25^\circ\text{C}$, $f(\text{AM})=1\text{MHz}$, $\text{Mod}=30\%$, $f(\text{FM})=10.7\text{MHz}$
 $f_F=22.5\text{kHz}$, $f_M=1\text{kHz}$, $V_{IN}=\text{SG Open Voltage } -6\text{dB}$)

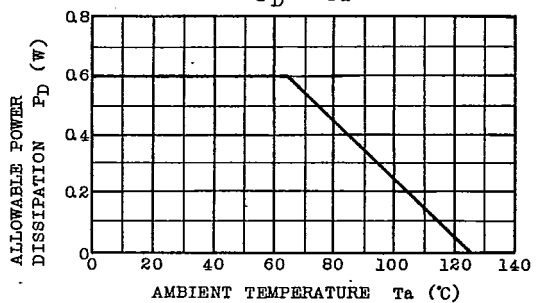
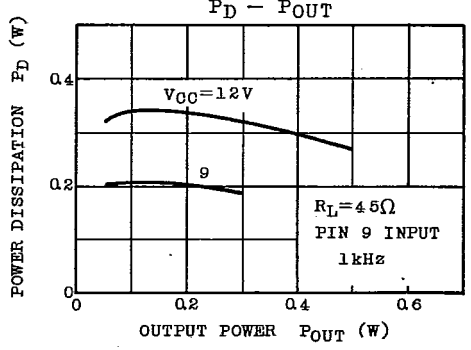
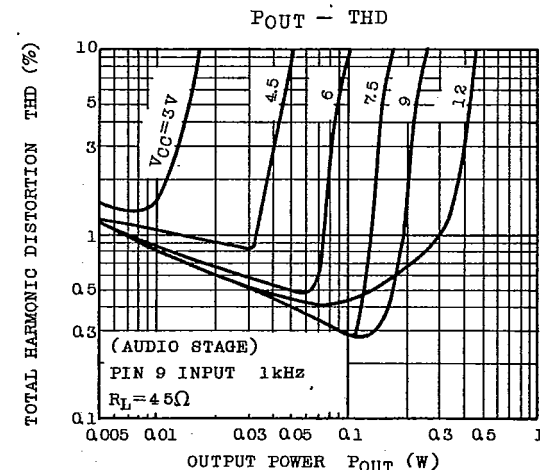
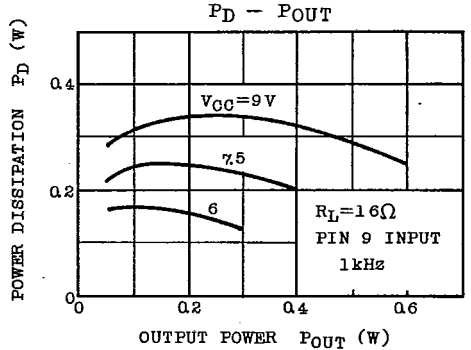
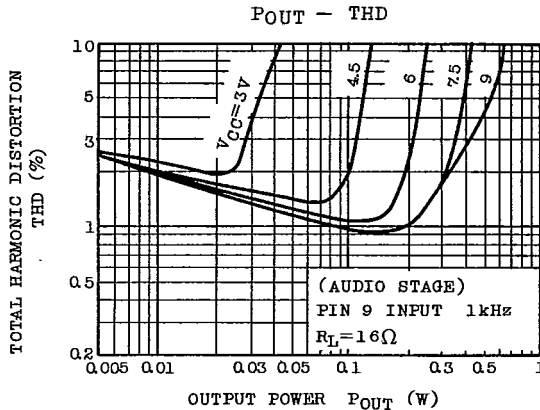
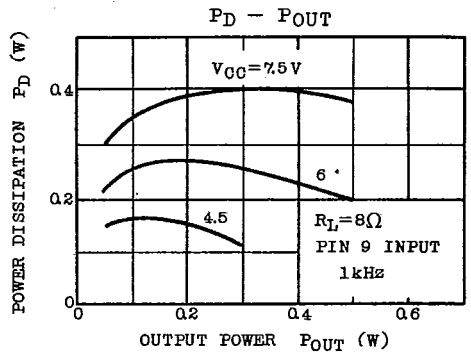
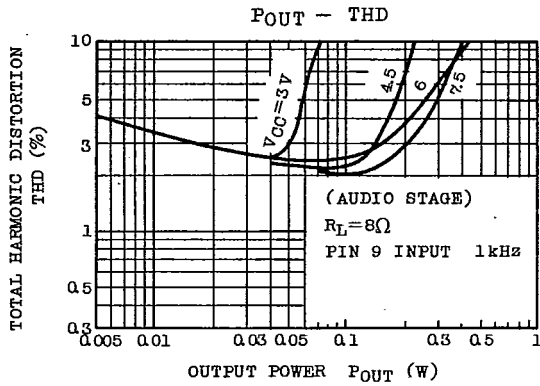
CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Quiescent Current		I _{CCQ}		SW1 → FM, V _{CC} =3V	7	12	17	mA
				SW1 → FM, V _{CC} =9V	10	17	23	
Pin 16 Terminal Voltage		V _{16(FM)}		SW1 → FM, I _{CC} =42mA, No Signal	2.0	2.4	3.1	V
Limiting Voltage		V _{IN(lim)}		SW1 → FM, V _{CC} =5.5V, -3dB V ₁₆ =2.4V, V _R =Min.	-	57	-	dB μ V
Internal Regulated Voltage		V _{CC}		SW1 → AM, I _{CC} =42mA	12.5	13.2	14.0	V
Pin 16 Terminal Voltage		V _{16(AM)}		SW1 → AM, V _{CC} =9V, No Signal	1.4	-	1.9	V
Maximum Sensitivity		V _O		SW1 → AM, V _{CC} =12V, V _{IN} =37dB SW2 → 45 Ω , V ₁₆ =1.4V	1.5	3.0	-	V
Quieting Sensitivity		S/N		SW1 → AM, V _{CC} =5.5V SW2 → 8 Ω , V _{IN} =37.5dB	15	20	-	dB
Power Stage	Output Power	P _{OUT}		SW2 → 8 Ω , V _{CC} =5.5V, f=1kHz V _R =Min. THD=10%	0.28	-	-	W
	Total Harmonic Distortion	THD		SW2 → 45 Ω , I _{CC} =42mA, f=1kHz V _R =Min. V _{OUT} =2V	-	0.5	4.0	%
	Voltage Gain	G _v		SW2 → 8 Ω , V _{CC} =5.5V, f=1kHz V _R =Min.	-	40	-	dB

BLOCK DIAGRAM



INPUT-OUTPUT IMPEDANCE ($T_a=25^\circ\text{C}$, $V_{CC}=6\text{V}$)

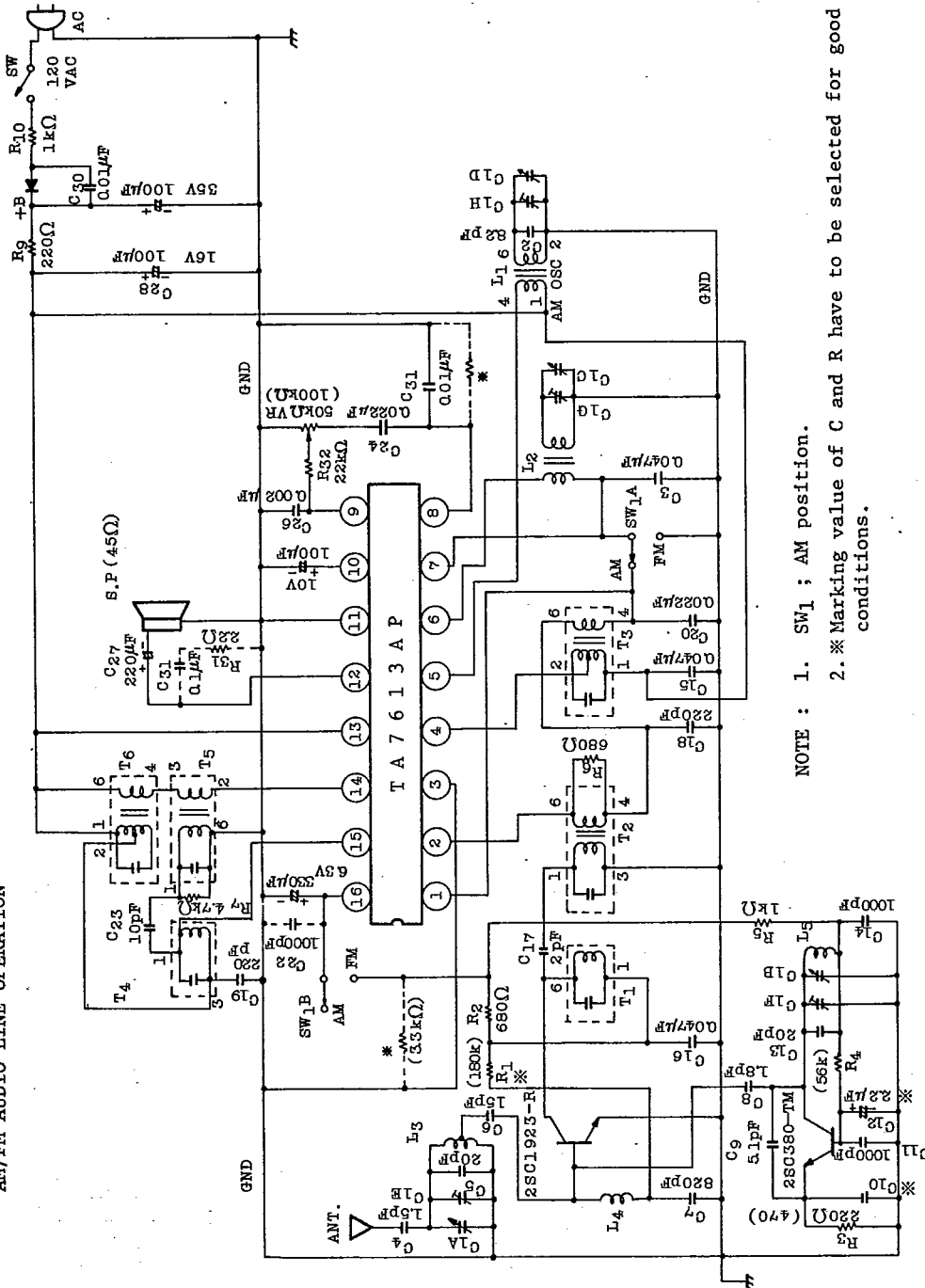
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Pin 2 Input Impedance (AM)	$R_{ip2}(AM)$	$f=455\text{kHz}$	-	200	-	$k\Omega$
	$c_{ip2}(AM)$	$f=455\text{kHz}$	-	3	-	pF
Pin 2 Input Impedance (FM)	$R_{ip2}(FM)$	$f=10.7\text{MHz}$	-	30	-	$k\Omega$
	$c_{ip2}(FM)$	$f=10.7\text{MHz}$	-	3.5	-	pF
Pin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



APPLICATION CIRCUIT

AM/FM AUDIO LINE OPERATION

1N4001



NOTE : 1. SW₁ ; AM position.

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

COIL DATA

COIL No.	f	Q ₀	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 7½T 2-3 7T	180pF	
L1	AM LOCAL OSCILLATOR	90	2-6 82½T 1-4 8½T		
L2	AM ANTENNA	200	① - ② 138T (L=560μH) ③ - ④ 9T	-	<p>CORE 10mm∅ × 55mm</p>
L3	FM ANTENNA	-	0.8mm∅ UEW 4T TAP 0.5T	-	
L4	Trap	-	0.32mm∅ UEW 10T	-	
L5	FM OSCILLATOR	-	0.8mm∅ UEW 4T	-	