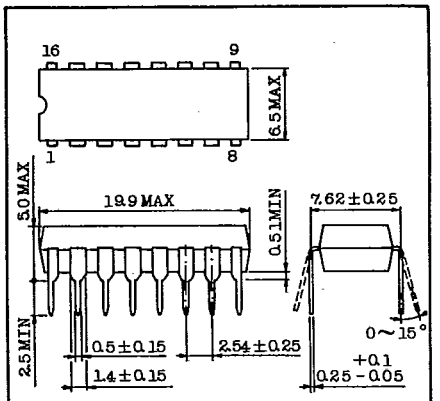
CAR RADIO AM TUNER
ONE CHIP AM SYSTEM

- Stable Operation at High Input Signal .
- Wide Operating Supply Voltage Range:
  V_{CC}=7～15V, Recommend V_{CC}=9V
- Small Noise at Detune.
- AM RF, AM MIX. and AM OSC Amplifiers.
- AM IF, Detector and AGC Circuits.

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.

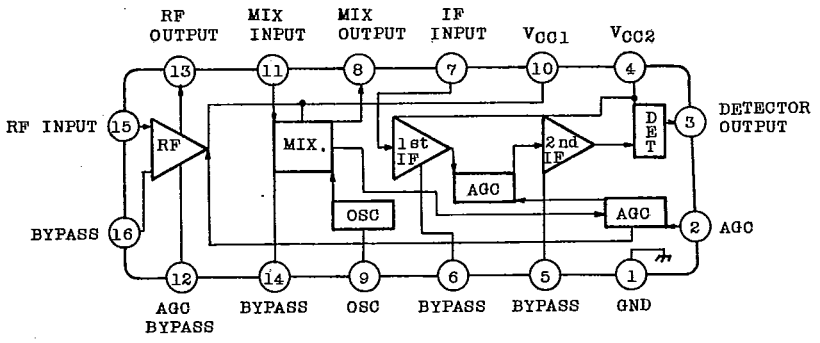
JEDEC	—
TOSHIBA	3D16A-P

MAXIMUM RATINGS (Ta=25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	16	V
Power Dissipation (Note)	P_D	750	mW
Operating Temperature	T_{opr}	-30～75	°C
Storage Temperature	T_{stg}	-55～150	°C

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

BLOCK AND TERMINAL DIAGRAMS



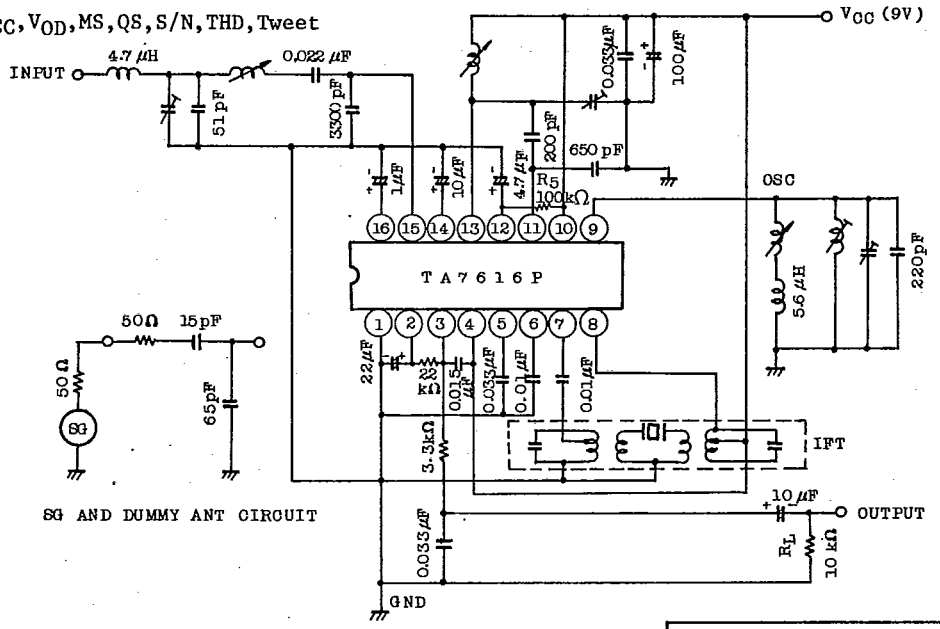
ELECTRICAL CHARACTERISTICS

(Unless otherwise specified, V_{CC}=9V, f_S=1MHz, f_M=400Hz, Mod=30%, IF=455kHz, Ta=25°C)

CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Supply Current		I_{CC}	1	-		9	13	20	mA
Recovered Output Voltage		V_{OD}	1	V_{IN}=74dBμV		55	84	110	mV_{rms}
Maximum Sensitivity		MS	1	V_{OD}=20mV_{rms}		-	9	-	dBμV
Quieting Sensitivity		QS	1	S/N=20dB		-	24	30	dBμV
Signal to Noise Ratio		S/N	1	V_{IN}=74dBμV		46	52.5	-	dB
Total Harmonic Distortion		THD(1)	1	V_{IN}=74dBμV		-	0.3	3	%
		THD(2)	1	V_{IN}=74dBμV Mod=80%		-	0.6	-	
		THD(3)	1	V_{IN}=120dBμV		-	0.5	-	
Tweet		Tweet	1	V_{IN}=74dBμV Max. Point	2IF	-	-35	-	dB
					3IF	-	-40	-	
Pin 15 Input Impedance	Parallel Input Resistance	$R_{ip}15$	2	f=1000kHz		-	6.6	-	kΩ
	Parallel Input Capacitance	$C_{ip}15$				-	3	-	pF
Pin 13 Output Impedance	Parallel Output Resistance	$R_{op}13$	3	f=1000kHz		-	100	-	kΩ
	Parallel Output Capacitance	$C_{op}13$				-	1.4	-	pF
Pin 11 Input Impedance	Parallel Input Resistance	$R_{ip}11$	4	f=1000kHz		-	2.2	-	kΩ
	Parallel Input Capacitance	$C_{ip}11$				-	7.5	-	pF
Pin 8 Output Impedance	Parallel Output Resistance	$R_{op}8$	5	f=455kHz		-	100	-	kΩ
	Parallel Output Capacitance	$C_{op}8$				-	3.5	-	pF
Pin 7 Input Impedance	Parallel Input Resistance	$R_{ip}7$	6	f=455kHz		-	3.5	-	kΩ
	Parallel Input Capacitance	$C_{ip}7$				-	8	-	pF

TEST CIRCUIT

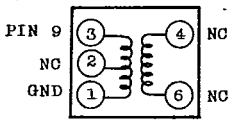
1. I_{CC}, V_{OD}, MS, QS, S/N, THD, Tweet



SG AND DUMMY ANT CIRCUIT

COIL DATA

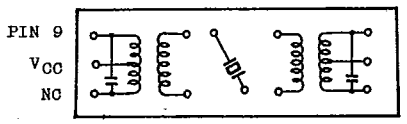
1. OSC COIL " L"



L = 220 μH STANDARD		
Q ≧ 80 at 796 kHz		
①~②	①~③	④~⑥
10 T	98 T	39 T

DENKEN Co., 4691 OR EQUIVALENT

2. IFT

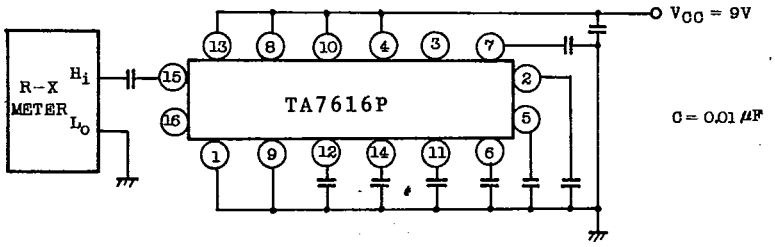


BOTTOM VIEW

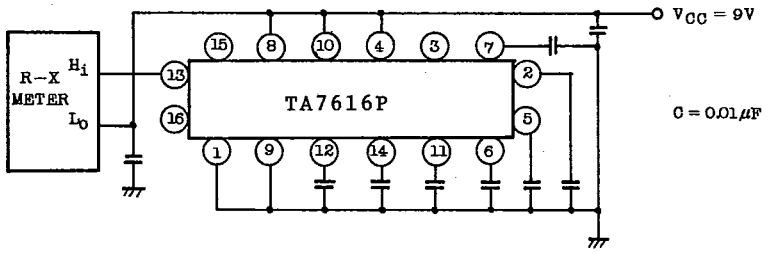
TOKO Co.,
CFT-455A OR EQUIVALENT IFT
CENTER FREQUENCY 455 ± 3.5 KHz

3. AM TUNNER COIL
MITSUMI Co., CMM ZT-02 OR EQUIVALENT TUNNER COIL.
TUNING FREQUENCY RANGE 520 ~ 1660 ± 40 KHz

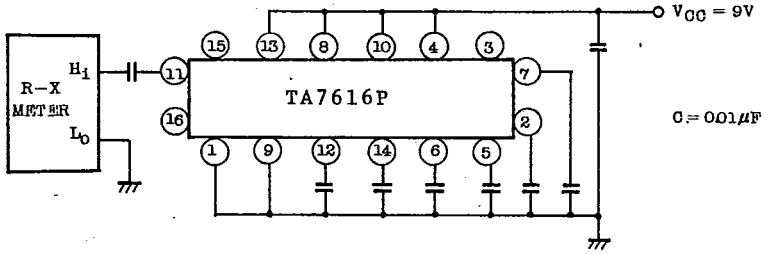
2. R_{ip15}, C_{ip15}



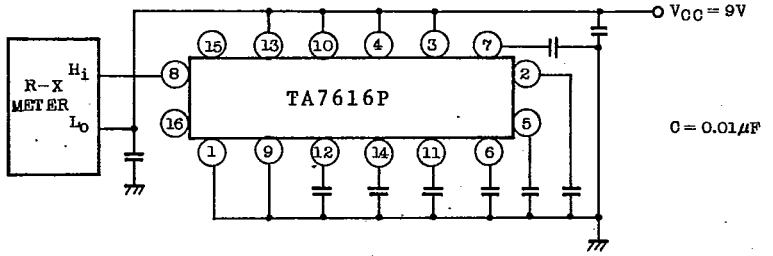
3. R_{op13}, C_{op13}



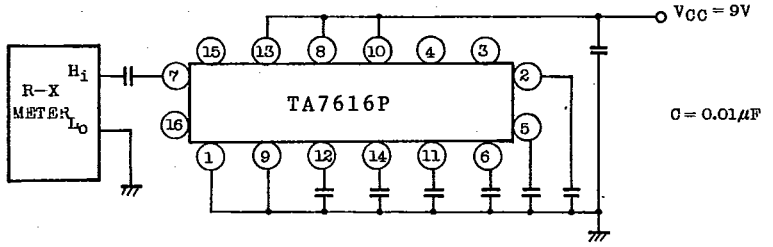
4. R_{ip11}, C_{ip11}



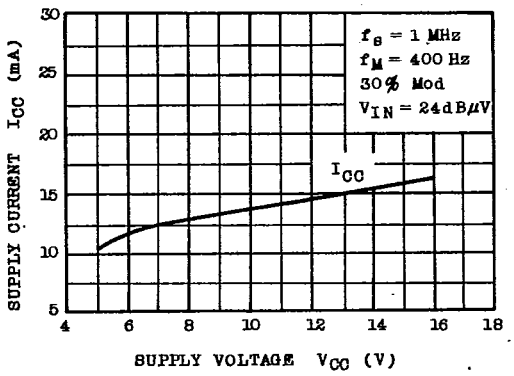
5. R_{op8}, C_{op8}



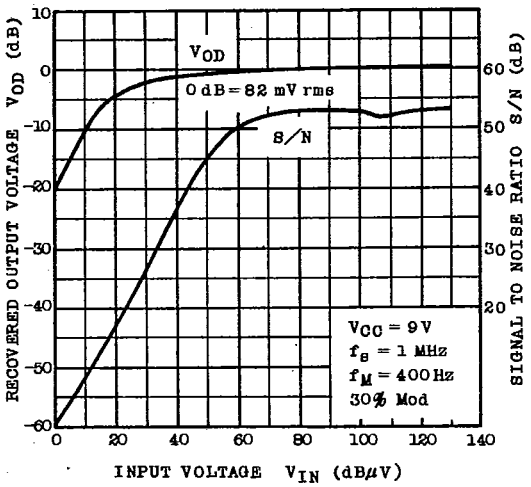
6. R_{ip7}, C_{ip7}



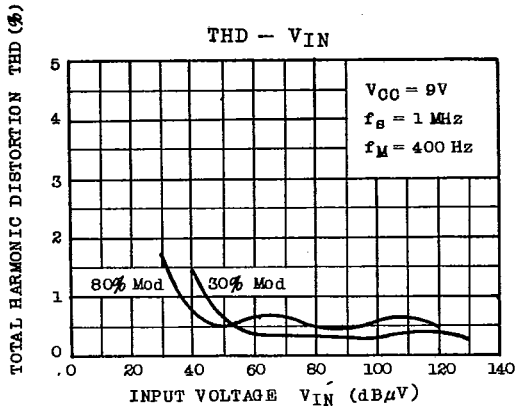
I_{CC} – V_{CC}



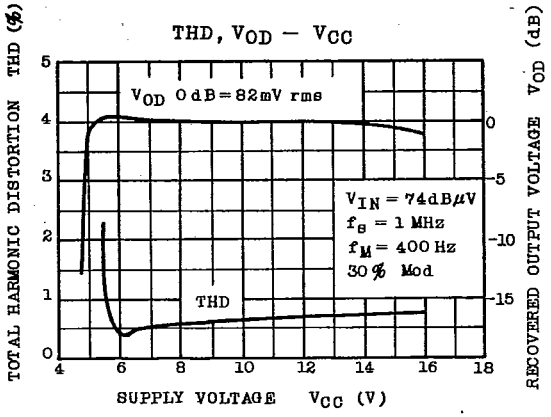
V_{OD}, S/N – V_{IN}



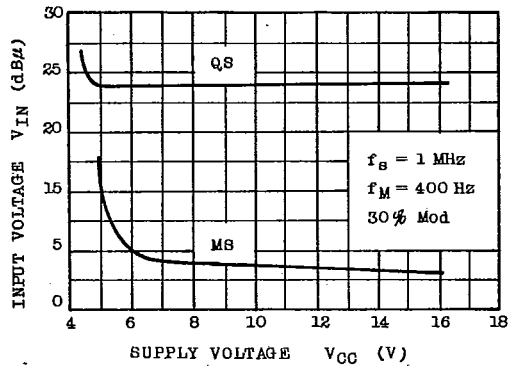
THD – V_{IN}



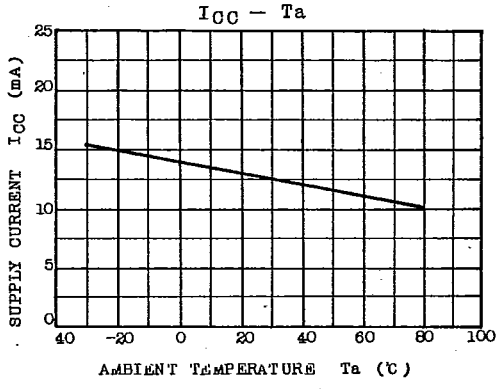
THD, V_{OD} – V_{CC}



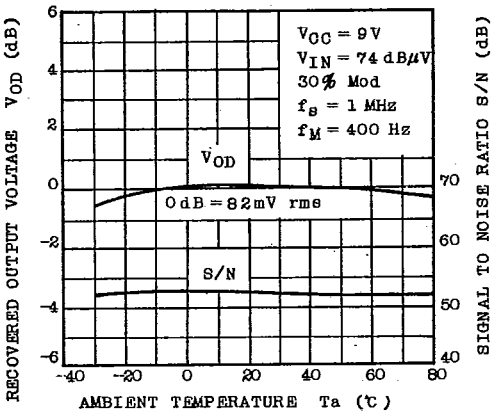
QS, MS – V_{CC}



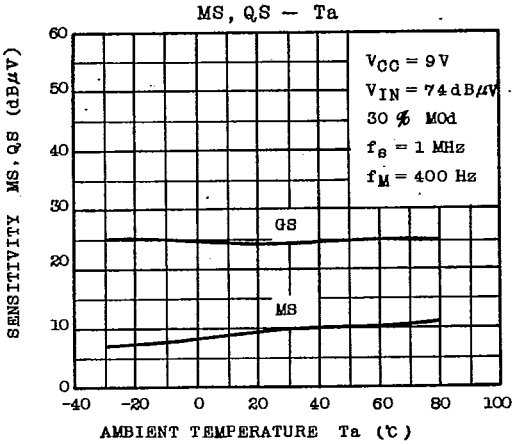
I_{CC} – Ta



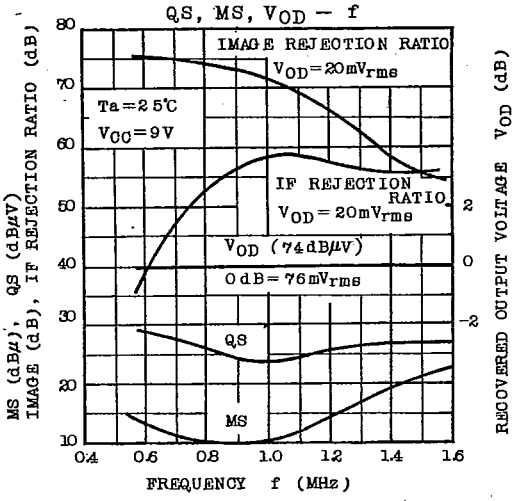
V_{OD}, S/N — Ta



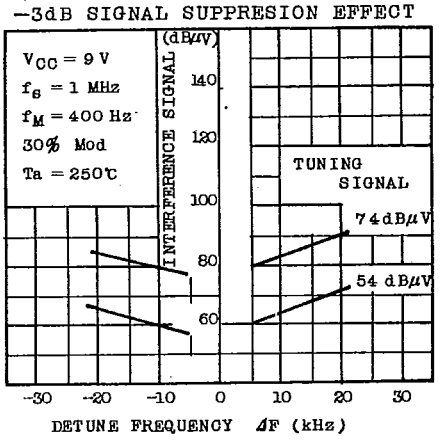
MS, QS — Ta



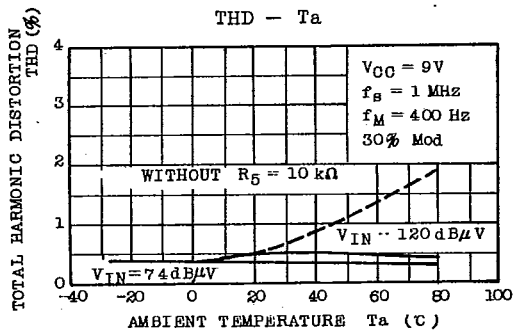
IF REJECTION RATIO,
IMAGE REJECTION RATIO
QS, MS, V_{OD} — f



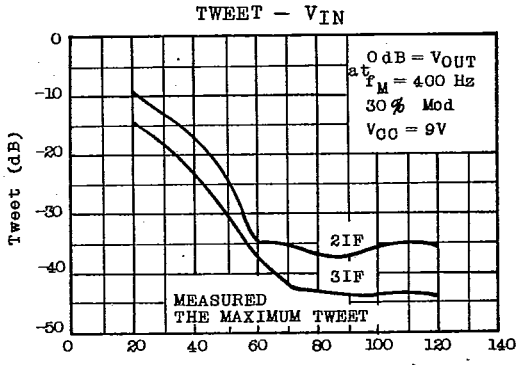
2 SIGNAL CHARACTERISTIC
−3dB SIGNAL SUPPRESION EFFECT



THD — Ta

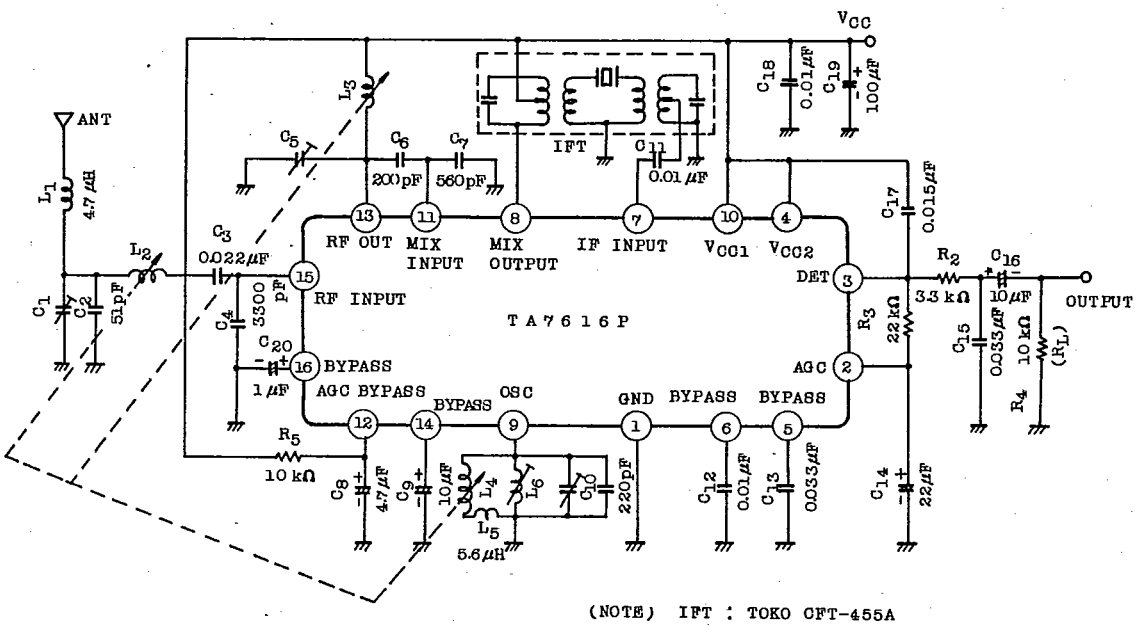


TWEET — V_{IN}



The tweet is defined as follow
0dB=V_{OD} at Mod=30%, f_m=400Hz

APPLICATION CIRCUIT



(NOTE) IFT : TOKO CFT-455A

NOTE :

1. To avoid the instability (especially tweet problem), capacitor C_{17} must be placed near by 3 pin and 4 pin.
2. Inductor L_1 is the noise radiation suppressor from antenna.
3. Capacitor C_6 and C_7 must be selected so that the injection level of the mixer stage will be optimum value.
4. AGC by-passing capacitor C_{14} and C_8 determine AGC response speed.

   So, large value will cause slow response and too small value will cause poor distortion characteristics at low frequency.
5. Resistor R_5 assures low distortion characteristics (THD = 1%) at all operation temperature range.