

TA7687AP
TA7687AF

TENTATIVE

FM/AM IF SYSTEM (3V USE)

The TA7687AP/AF are FM/AM IF system ICs designed for portable radio applications.

It is especially suitable for small-sized low-voltage sets because of flat package and low current.

- . Small Installed Area and Few External Parts
- . Excellent Tweak
- . Low Overload Distortion
- . Low Supply Current AM : $I_{CC}=3\text{mA}$ (Typ.)
FM : $I_{CC}=8\text{mA}$ (Typ.)
- . Tuning Indicator LED Driving Capability

$I_{LAMP}=10\text{mA}$ (Max.)

- . FM/AM Mode Switch Built-in
- . Common Output for AM/FM
- . Operating Supply Voltage Range : $V_{CC(opr)}=1.8 \sim 6\text{V}$
- . Recommended Supply Voltage : $V_{CC}=3\text{V}$
- . The Item is Different Each Outlines

TA7687AP: Dual in Line Package..Outline 3D16A-P

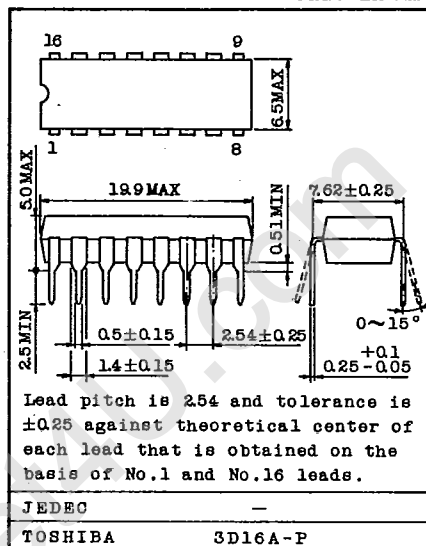
TA7687AF: Flat Package.....Outline F16GA1-P

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

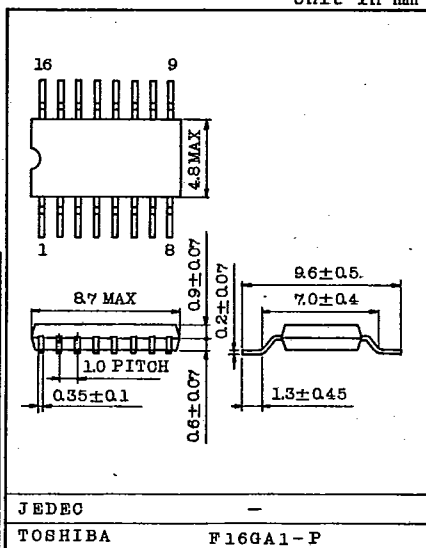
CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	6	V
Lamp Current	I_{LAMP}	10	mA
Power Dissipation (Note)	TA7687AP	750	mW
	TA8687AF	350	
Operating Temperature	T_{opr}	$-25 \sim 75$	$^\circ\text{C}$
Storage Temperature	T_{stg}	$-55 \sim 150$	$^\circ\text{C}$
Lamp Voltage	V_{LAMP}	8	V

Note : Derated above $T_a=25^\circ\text{C}$ in the proportion of $6\text{mW}/^\circ\text{C}$ for TA7687AP and of $2.8\text{mW}/^\circ\text{C}$ for TA7687AF.

Unit in mm



Unit in mm



9097247 TOSHIBA, ELECTRONIC

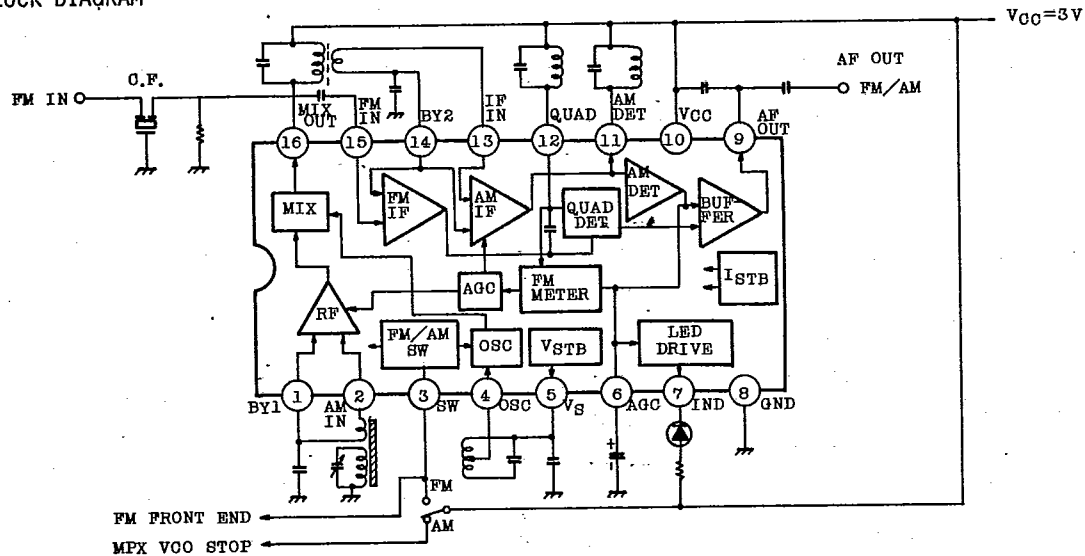
02E 17506 D

TA7687AP

TA7687AF

T-77-05-07

BLOCK DIAGRAM



ELECTRICAL CHARACTERISTICS

1. DC CHARACTERISTICS ($V_{CC}=3V$, $T_a=25^{\circ}C$, Terminal Voltage at No Signal)

ITEM	SYMBOL	TYPICAL VALUE		UNIT
		AM	FM	
Terminal 1 AM RF BYPASS	V1	0.96	0	V
2 AM RF INPUT	V2	0.96	0	V
3 FM/AM SWITCH	V3	0	3.0	V
4 AM OSC	V4	1.4	1.4	V
5 REGULATOR	V5	1.4	1.4	V
6 AGC	V6	0	0	V
7 LED	V7	-	-	V
8 GND	V8	0	0	V
9 DET. OUTPUT	V9	1.1	1.1	V
10 VCC	V10	3.0	3.0	V
11 AM IF OUTPUT	V11	3.0	3.0	V
12 FM DET. COIL	V12	3.0	3.0	V
13 AM IF INPUT	V13	2.8	2.8	V
14 FM IF BYPASS	V14	2.8	2.8	V
15 FM IF INPUT	V15	3.0	2.8	V
16 AM MIX OUTPUT	V16	3.0	3.0	V

AUDIO LINEAR IC

9097247 TOSHIBA. ELECTRONIC

02E 17507 D

TA7687AP
TA7687AF

T-77-05-07

2. AC CHARACTERISTICS ($T_a=25^{\circ}\text{C}$, $V_{CC}=3\text{V}$, FM : $f=10.7\text{MHz}$, $4f=\pm 22.5\text{kHz}$, $f_m=1\text{kHz}$)
 AM : $f=1\text{MHz}$, Mod=30%, $f_m=1\text{kHz}$)

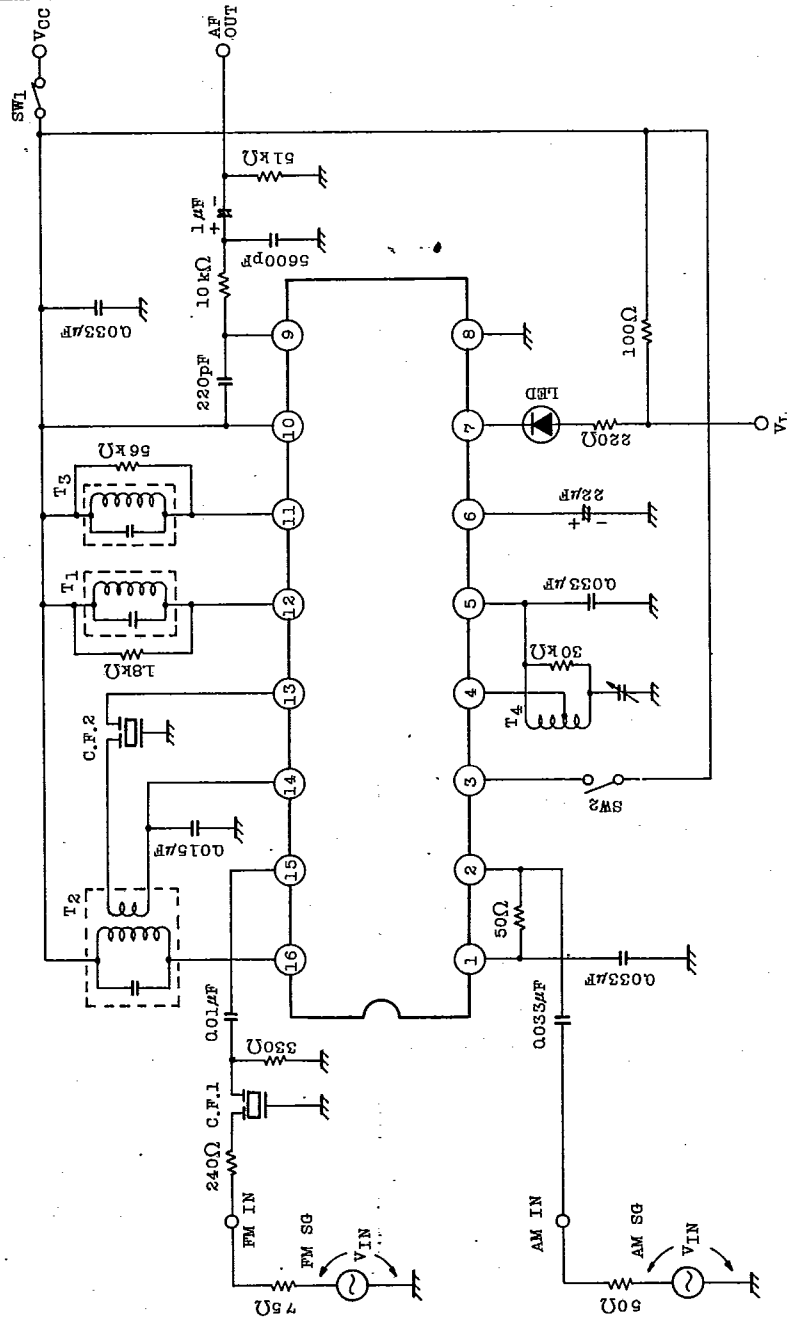
CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Current		$I_{CC}(1)$	1	FM $V_{IN}=0$	-	8	13	mA
		$I_{CC}(2)$		AM $V_{IN}=0$	-	3	7	
F M	Input Limiting Voltage	$V_{IN}(lim)$	1	-3dB Limiting	-	50	57	dB μ V
	Recovered Output Voltage	V_{OD}	1	$V_{IN}=86\text{dB}\mu\text{V}$	50	68	85	mVrms
	Signal to Noise Ratio	S/N	1	$V_{IN}=86\text{dB}\mu\text{V}$	-	65	-	dB
	Total Harmonic Distortion	THD	1	$V_{IN}=86\text{dB}\mu\text{V}$	-	0.1	-	%
	AM Rejection Ratio	AMR	1	$V_{IN}=86\text{dB}\mu\text{V}$	-	45	-	dB
	Lamp ON Sensitivity	V_L	1	$I_L=1\text{mA}$	-	50	58	dB μ V
A M	Gain	G_v	1	$V_{IN}=26\text{dB}\mu\text{V}$	15	30	50	mVrms
	Recovered Output Voltage	V_{OD}	1	$V_{IN}=60\text{dB}\mu\text{V}$	35	50	70	mVrms
	Signal to Noise Ratio	S/N	1	$V_{IN}=60\text{dB}\mu\text{V}$	-	45	-	dB
	Total Harmonic Distortion	THD	1	$V_{IN}=60\text{dB}\mu\text{V}$	-	1.0	-	%
	Lamp ON Sensitivity	V_L	1	$I_L=1\text{mA}$	-	26	-	dB μ V
	Local OSC Stop Voltage	V_{stop}	1	-	-	1.2	-	V
Output Resistance		$R_{o9}(FM)$		$f=1\text{kHz}$	-	0.7	-	k Ω
		$R_{o9}(AM)$			-	8.3	-	

TOSHIBA

TA7687AP
TA7687AF

T-77-05-07

TEST CIRCUIT



AUDIO LINEAR IC

9097247 TOSHIBA. ELECTRONIC

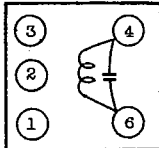
02E 17509 D

TA7687AP
TA7687AF

T-77-05-07

COIL DATA (TEST CIRCUIT)

T1 FM DETECTOR COIL

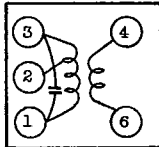


(BOTTOM VIEW)

C ₀ (pF)	f (MHz)	Q ₀	TURNS
4-6		4-6	4-6
100	10.7	150	14

SUMIDA ELECTRIC CO., LTD.
: 0133-182 or SIMILAR
WIRE : 0.12mmφ UEW

T2 AM IFT (MIX OUT)

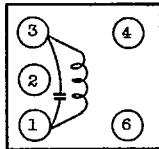


(BOTTOM VIEW)

C ₀ (pF)	f (kHz)	Q ₀	TURNS		
			1-2	2-3	4-6
1-3		1-3	90	52	8
180	455	110			

SUMIDA ELECTRIC CO., LTD.
: 48T-423 or SIMILAR
WIRE: 0.07mmφ UEW

T3 AM IFT (DET)

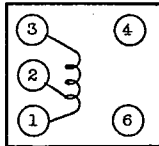


(BOTTOM VIEW)

C ₀ (pF)	f (kHz)	Q ₀	TURNS
1-3		1-3	1-3
180	455	110	152

SUMIDA ELECTRIC CO., LTD.
: 44M-935C or SIMILAR
WIRE: 0.07mmφ UEW

T4 MW OSC



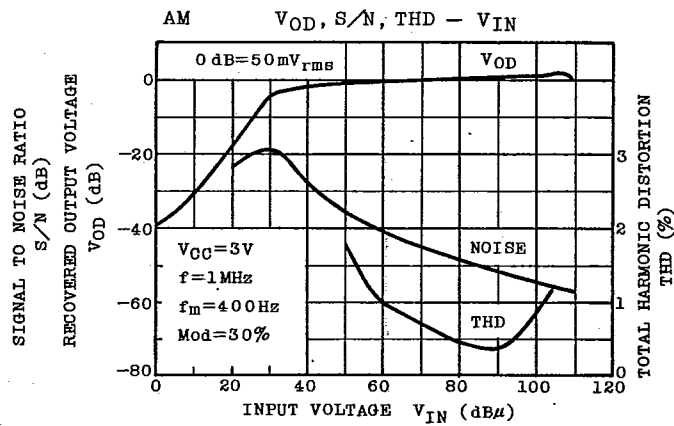
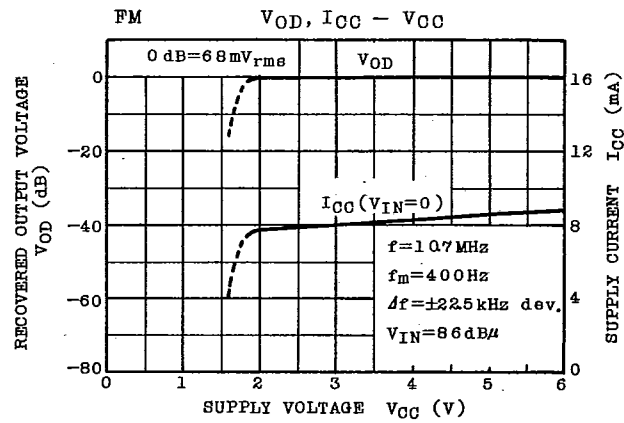
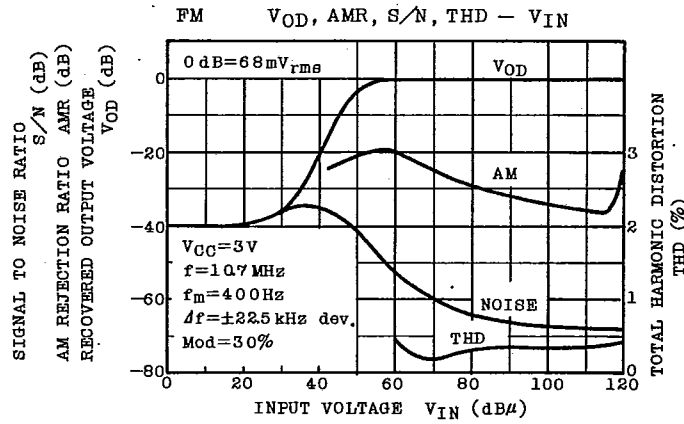
(BOTTOM VIEW)

f (kHz)	L(μH)	Q ₀	TURNS	
	1-3		1-2	2-3
796	288	120	13	75

SUMIDA ELECTRIC CO., LTD.
: 0137-262 or SIMILAR
WIRE : 0.08mmφ UEW

TA7687AP TA7687AF

T-77-05-07

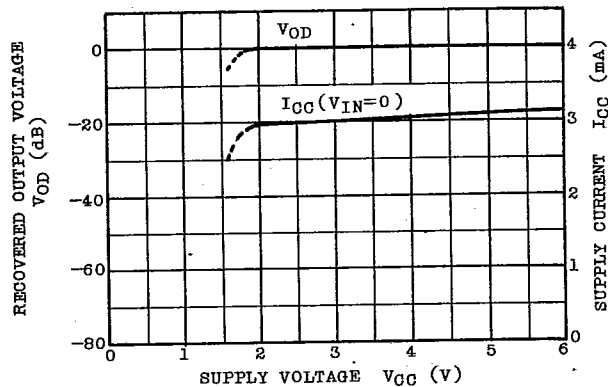


AUDIO LINEAR IC

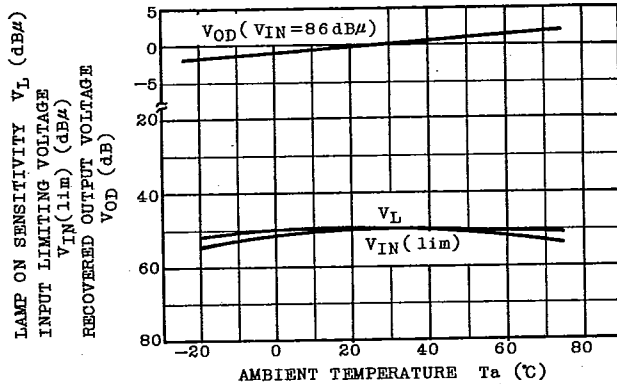
TA7687AP
TA7687AF

T-77-05-07

AM $V_{OD}, I_{CC} - V_{CC}$



FM $V_{OD}, V_{IN}(lim), V_L - T_a$



AM $V_{OD}, V_L - T_a$

