

**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.

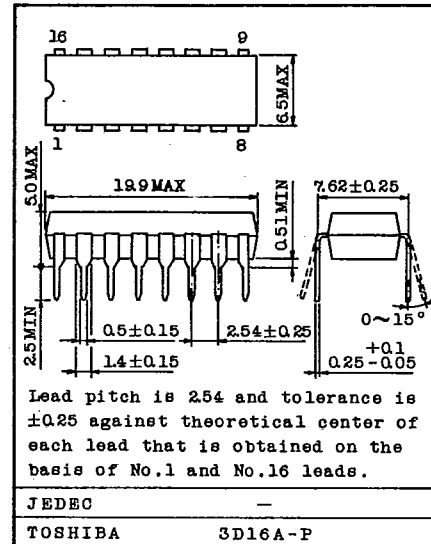
- . Small Installed Area and Few External Parts
- . Excellent Tweed
- . Low Overload Distortion
- . Low Supply Current AM :  $I_{CC}=3\text{mA}$  (Typ.)  
FM :  $I_{CC}=8\text{mA}$  (Typ.)
- . Tuning Indicator LED Driving Capability  
 $I_{LAMP}=10\text{mA}$  (Max.)
- . FM/AM Mode Switch Built-in
- . 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 ( $T_a=25^\circ\text{C}$ )

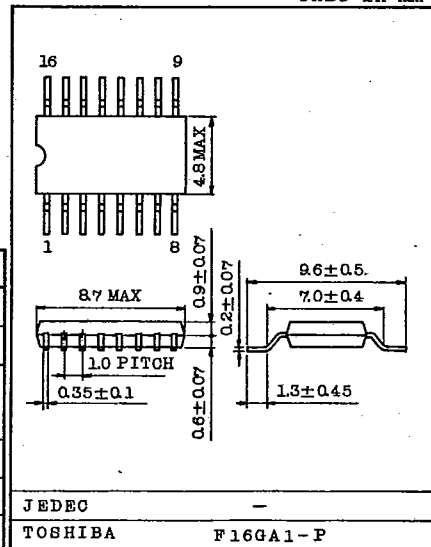
CHARACTERISTIC		SYMBOL	RATING	UNIT
Supply Voltage		$V_{CC}$	6	V
Lamp Current		$I_{LAMP}$	10	mA
Power Dissipation (Note)	TA7687AP	$P_D$	750	mW
	TA8687AF		350	
Operating Temperature		$T_{opr}$	$-25 \sim 75$	$^\circ\text{C}$
Storage Temperature		$T_{stg}$	$-55 \sim 150$	$^\circ\text{C}$
Lamp Voltage		$V_{LAMP}$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



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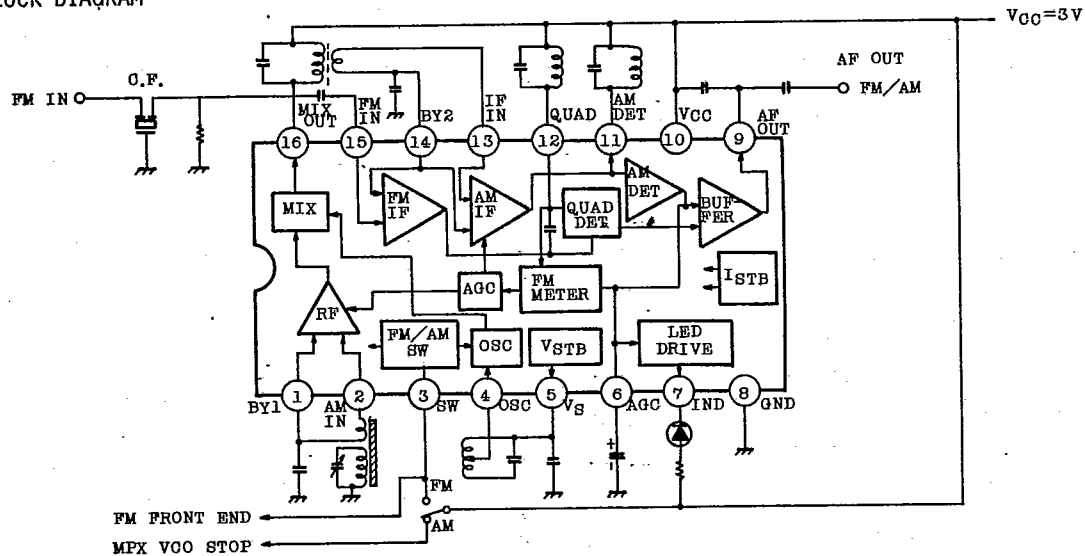
02E 17506 D

# 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

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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%,  $f_m=1\text{kHz}$ )

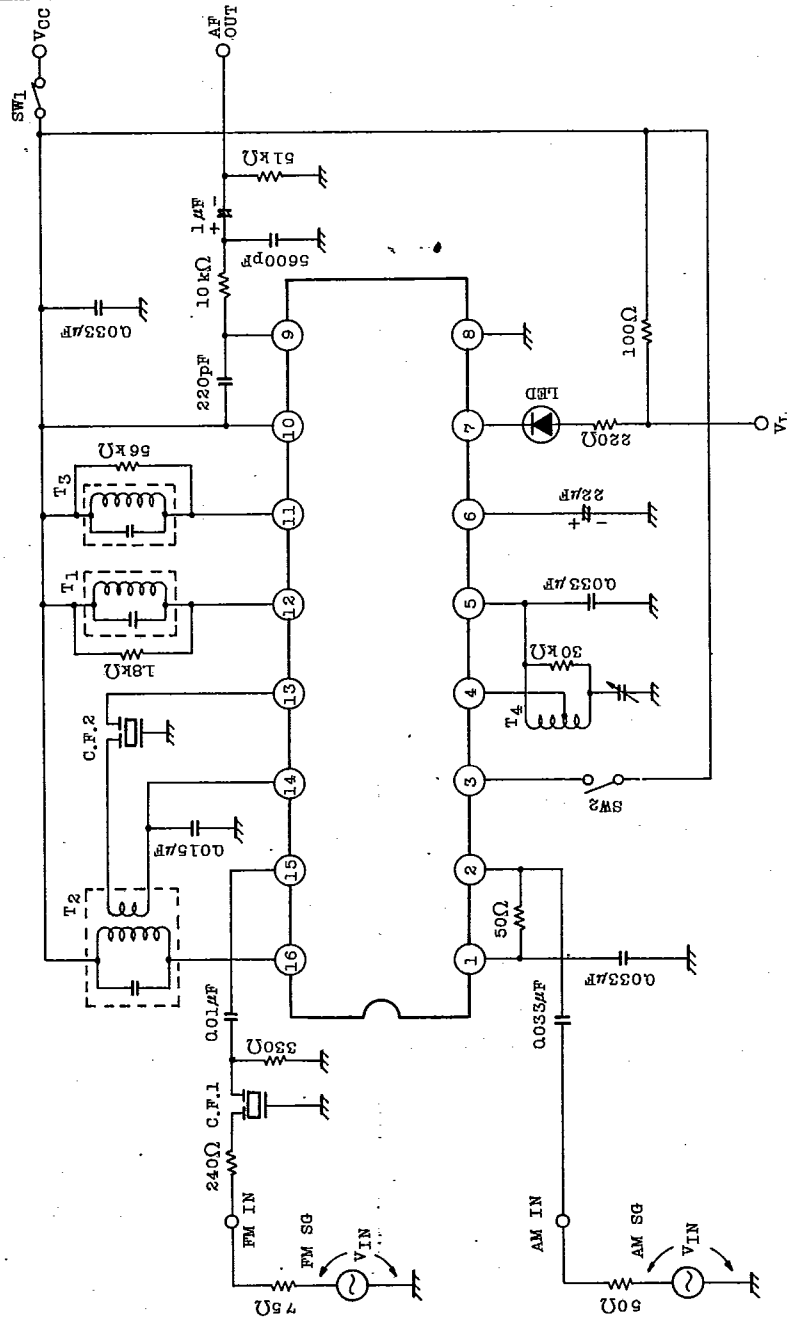
CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Current		$I_{CC}(1)$	1	FM $V_{IN}=0$	-	8	13	mA
		$I_{CC}(2)$		AM $V_{IN}=0$	-	3	7	
F M	Input Limiting Voltage	$V_{IN}(lim)$	1	-3dB Limiting	-	50	57	dB $\mu$ V
	Recovered Output Voltage	$V_{OD}$	1	$V_{IN}=86\text{dB}\mu\text{V}$	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 $\mu$ 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 $\mu$ V
	Local OSC Stop Voltage	$V_{stop}$	1	-	-	1.2	-	V
Output Resistance		$R_{o9}(FM)$		$f=1\text{kHz}$	-	0.7	-	k $\Omega$
		$R_{o9}(AM)$			-	8.3	-	

TOSHIBA

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TEST CIRCUIT



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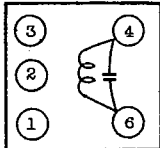
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**TA7687AP**  
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COIL DATA (TEST CIRCUIT)

T1 FM DETECTOR COIL

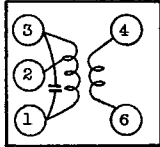


(BOTTOM VIEW)

C <sub>0</sub> (pF)	f (MHz)	Q <sub>0</sub>	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)

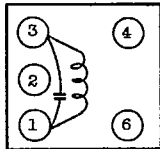


(BOTTOM VIEW)

C <sub>0</sub> (pF)	f (kHz)	Q <sub>0</sub>	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)

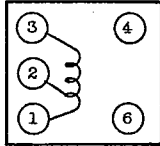


(BOTTOM VIEW)

C <sub>0</sub> (pF)	f (kHz)	Q <sub>0</sub>	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



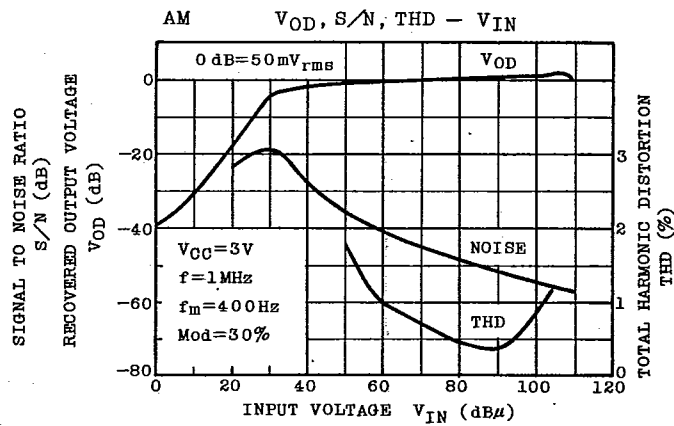
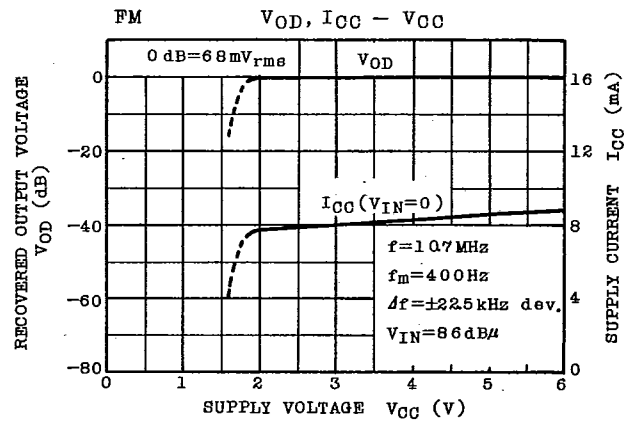
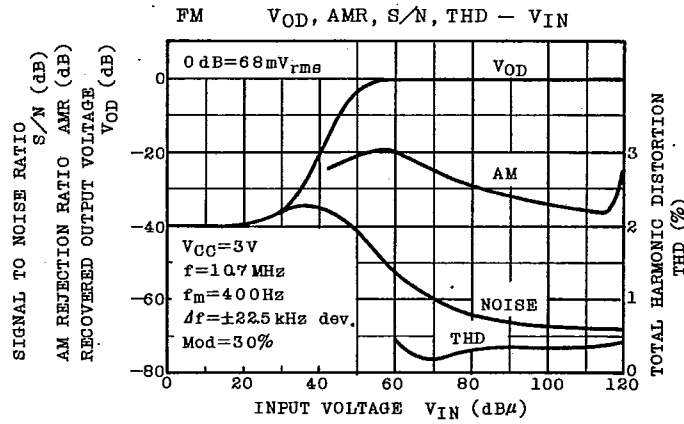
(BOTTOM VIEW)

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

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

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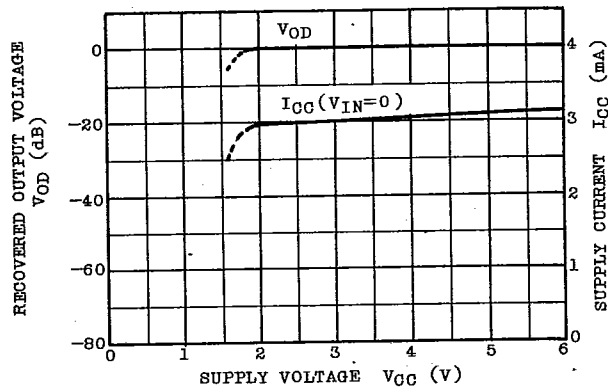


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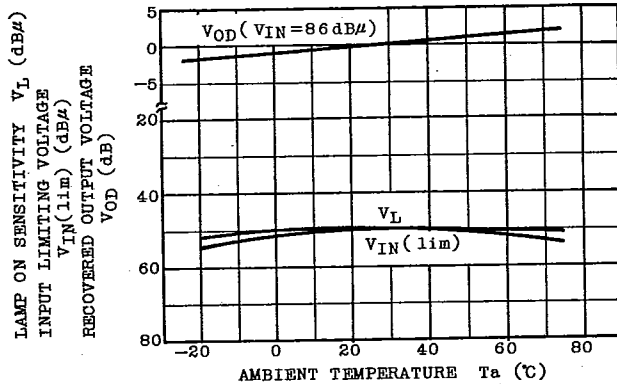
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AM  $V_{OD}, I_{CC} - V_{CC}$



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



AM  $V_{OD}, V_L - T_a$

