

# KA22901

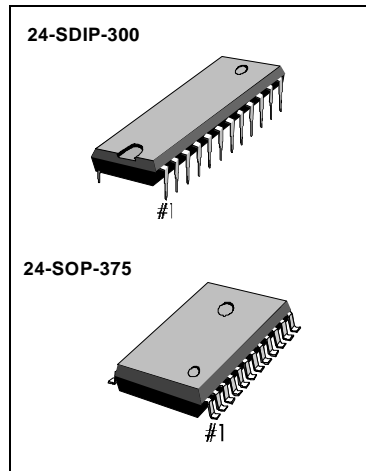
# AM/FM TUNER + MPX

## INTRODUCTION

The KA22901 is a monolithic integrated circuit which consists of one chip tuner and no adjustment FM multiplex for AM/FM radios and headphone radios.

## FEATURES

- One chip tuner with built - in FM Multiplex
- No adjustment for FM detector and VCO.
- No AM detect coil, IF coupling capacitor, FM IF bypass capacitor needed.
- Built-in AM/FM selection switch.
- Minimum number of external parts required.
- Wide operating voltage range :  $V_{CC} = 1.8V \sim 7V$
- Low distortion (FM IF : 0.4%, AM IF : 1%, 0.2% (Typ) ).



## ORDERING INFORMATION

Device	Package	Operating Temperature
KA22901	24-SDIP-300	-20 °C ~ +75°C
KA22901D	24-SOP-375	

## BLOCK DIAGRAM

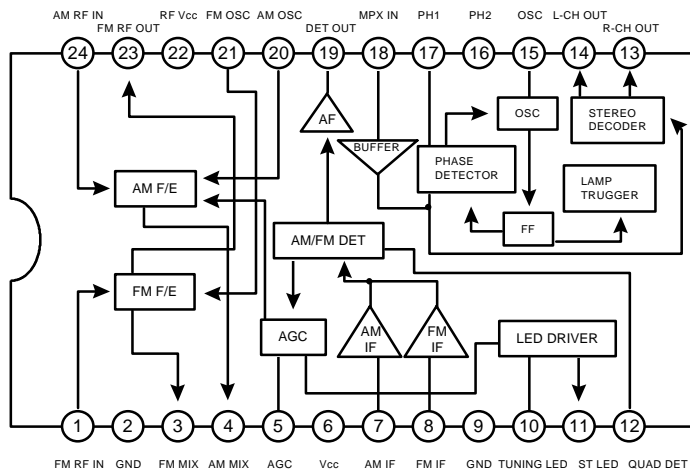


Fig. 1

**ABSOLUTE MAXIMUM RATINGS** (Ta = 25°C)

Characteristic	Symbol	Value	Unit
Supply Voltage	V <sub>CC</sub>	8	V
Power Dissipation	P <sub>D</sub>	1200	mW
Operating Temperature	T <sub>OPR</sub>	-20 ~ +75	°C
Storage Temperature	T <sub>STG</sub>	-55 ~ +150	°C
LED Driver Voltage	V <sub>DR</sub>	10	V
LED Driver Current	I <sub>DR</sub>	10	mA

**ELECTRICAL CHARACTERISTICS**(Ta = 25°C, V<sub>CC</sub> = 3V, unless otherwise specified)

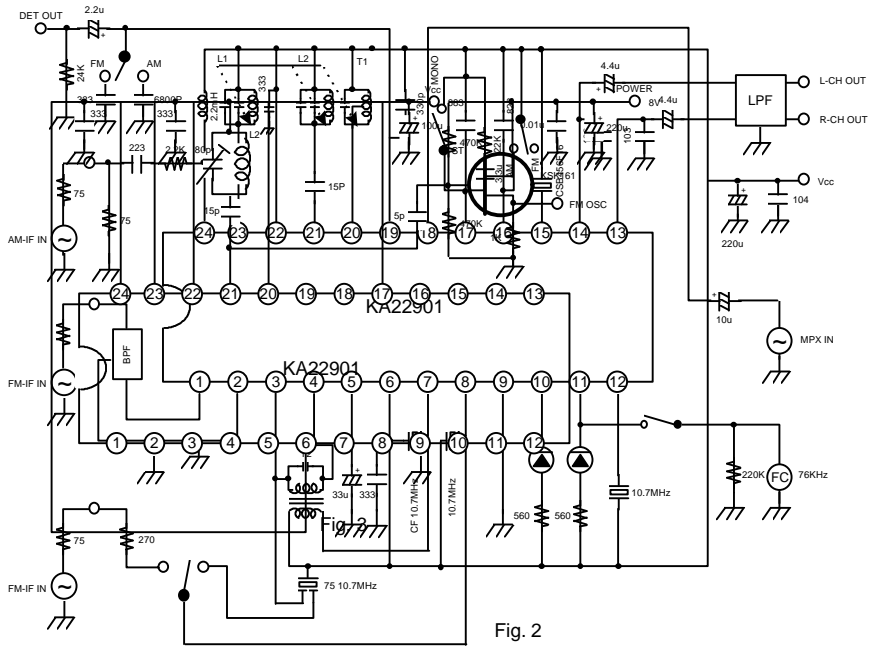
FM F/E : f = 98MHz, fm = 1KHz, Δf = 22.5KHz AM : f = 1KHz, 30% Mod

FM IF : f = 10, 7MHz, fm = 1KHz, Δf = 22.5KHz MPX : f = 1KHz, L + R = 90%, P = 10%, V = 150mV

Characteristics		Symbol	Test Condition	Min	Typ	Max	Unit	Test Circuit
Quiescent Circuit Current		I <sub>CCQ1</sub>	FM, V <sub>i</sub> = 0	10	14	18	mA	1
		I <sub>CCQ2</sub>	AM, V <sub>i</sub> = 0	3.5	6.0	9	mA	1
F/E	-3dB Limiting Sensitivity	V <sub>i(LIM)1</sub>	V <sub>o</sub> = -3dB	10	14	18	dBμ	1
	Oscillation Voltage	V <sub>OSC</sub>	f <sub>OSC</sub> = 72.3MHz	70	105	140	mV	2
FM IF	-3dB Limiting Sensitivity	V <sub>i(LIM)2</sub>	V <sub>o</sub> = -3dB	39	44	49	dBμ	1
	Detector Output Voltage	V <sub>O(DET)1</sub>	V <sub>i</sub> = 80dBμ	55	80	110	mV	1
	Signal to Noise Ratio	S/N <sub>1</sub>	V <sub>i</sub> = 80dBμ	60	70		dB	1
	Total Harmonic Distortion	THD <sub>1</sub>	V <sub>i</sub> = 80dBμ		0.4	1	%	1
	AM Rejection Ratio	AMR	V <sub>i</sub> = 80dBμ	40	50		dB	1
	Tuning Indication Voltage	V <sub>LI</sub>	I <sub>LED</sub> = 1mA	39	44	49	dBμ	1
AM IF	Voltage Gain	G <sub>V1</sub>	V <sub>i</sub> = 23dBμ	20	40	80	mV	1
	Detector Output Voltage	V <sub>O(DET)2</sub>	V <sub>i</sub> = 60dBμ	50	60	100	mV	1
	Signal to Noise Ratio	S/N <sub>2</sub>	V <sub>i</sub> = 60dBμ	34	44		dB	1
	Total Harmonic Distortion	THD <sub>2</sub>	V <sub>i</sub> = 60dBμ		1	2	%	1
	Tuning Indication Voltage	V <sub>L2</sub>	I <sub>LED</sub> = 1mA	19	24	30	dBμ	1
MPX	Maximum Input Voltage	V <sub>i(MAX)</sub>	Stereo, THD = 3%	250	350		mV	1
	Channel Separation	CS <sub>1</sub>	Stereo, f = 100Hz	35	42		dB	1
		CS <sub>2</sub>	Stereo, f = 1KHz	35	42		dB	1
		CS <sub>3</sub>	Stereo, f = 10KHz	35	42		dB	1
	Total Harmonic Distortion	THD <sub>3</sub>	Mono		0.2	1	%	1
		THD <sub>4</sub>	Stereo		0.2	1	%	1
	Voltage Gain	G <sub>V2</sub>	Mono	-5	-3	-1	dB	1
	Channel Balance	CB	Mono	-2	0	2	dB	1
	Lamp on Level	V <sub>L(ON)</sub>	Pilot only		8	16	mV	1
		V <sub>L(OFF)</sub>	Pilot only	2	6		mV	1
	Lamp Hysteresis	HY			2		mV	1
Capture Range	CR	Pilot only		±3		%	1	
Signal to Noise Ratio	S/N <sub>3</sub>	Mono	60	70		dB	1	

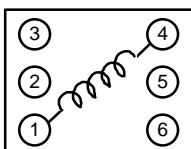
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# AM/FM TUNER + MPX



COIL SPECIFICATION

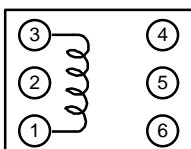
L1 FM RF



f (MHz)	Qo	TURNS		
		1-4		
100	100	2 1/2		

0.5mmφ 0

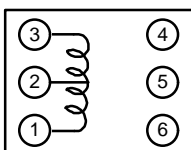
L2 FM OSC



f (MHz)	Qo	TURNS		
		1-3		
100	100	2 3/4		

0.5mmφ 0

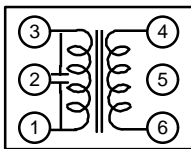
T1 AM OSC



f (MHz)	Qo	TURNS			L (uH)
		1-3	2-3		
796	115	13	73	288	

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0.08mmφ 0

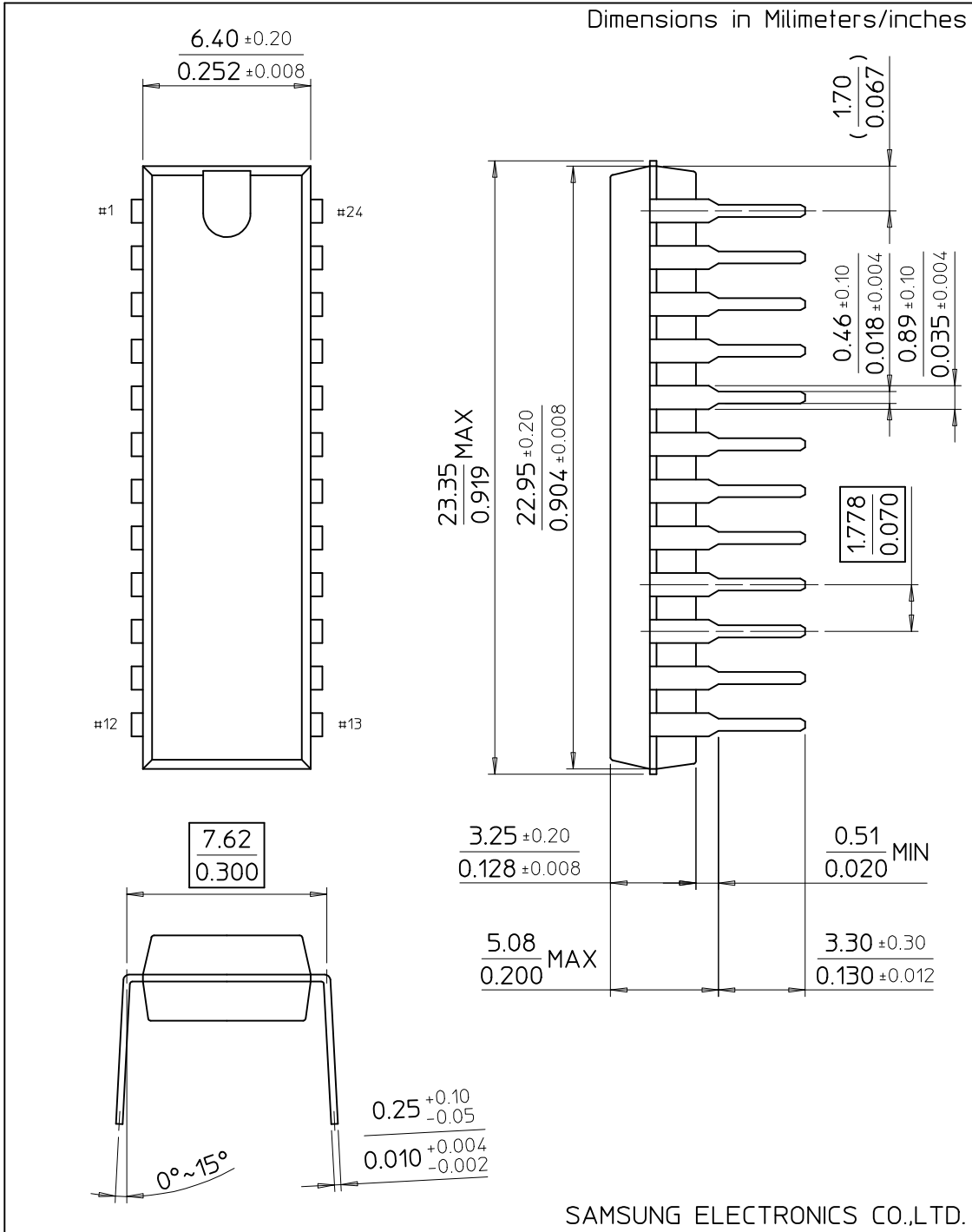
T2 AM IFT (MIX OUT)



Co (pF)	f (MHz)	Qo	TURNS		
1-3			1-3	4-6	
180	455	120	180	15	

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0.08mmφ 0

# 24-SDIP-300



# 24-SOP-375

