

# KA22900

# AM/FM TUNER + MPX

## INTRODUCTION

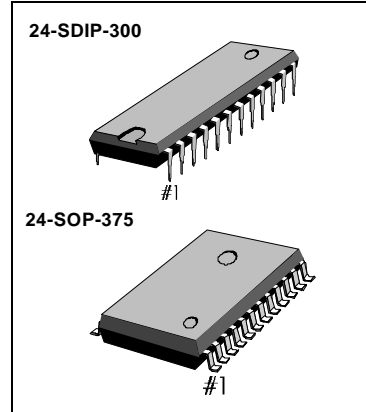
The KA22900 is a monolithic intergrated circuit which consists of a 3V one chip tuner and FM multiplex for AM/FM radios and head-phone radios.

## FUNCTIONS

- \* FM Stage : RF/IF/AF amp, Quadrature Detector, MIX, OSC, Tuning Indicator.
- \* AM Stage : RF/IF/AF amp, Detector, MIX, OSC, AGC, Tuning Indicator.
- \* MPX Stage : PLL amp, Decoder, Flip Flop, VCO Stop, Phase Detector, Stereo Indicator.

## FEATURES

- 3V one chip tuner with built - in FM Multiplex
- No AM detect coil, IF coupling capacitor, FM IF by-pass capacitor needed.
- Built-in tuning indicator function.
- 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 |
|----------|-------------|-----------------------|
| KA22900  | 24-SDIP-300 | -20°C ~ +75°C         |
| KA22900D | 24-SOP-375  |                       |

## BLOCK DIAGRAM

# KA22900

# AM/FM TUNER + MPX

## 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)

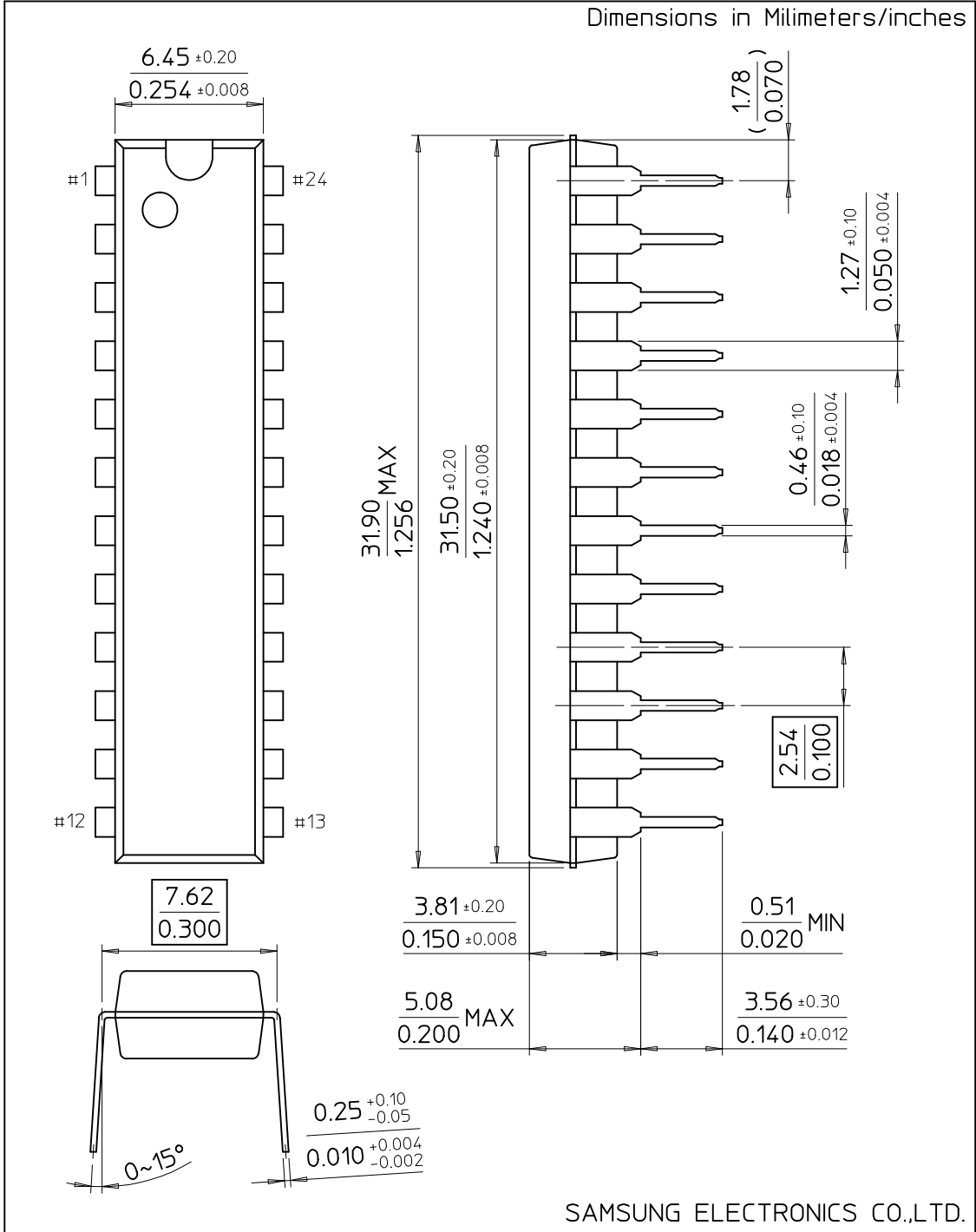
FM F/E : f = 98MHz, fm = 1KHzΔf = 22.5KHz AM : f = 1KHz, 30% Mod

FM IF : f = 10, 7MHz, fm = 1KHzΔf = 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   | 8.4 | 13.2 | 20.0 | mA   | 1            |
|                           |                           | I <sub>CCQ2</sub>    | AM, V <sub>I</sub> = 0   | 4.4 | 8.4  | 13.4 | mA   | 1            |
| F/E                       | -3dB Limiting Sensitivity | V <sub>I(LIM)1</sub> | V <sub>O</sub> = -3dB    |     | 10   |      | dBμ  | 1            |
|                           | Oscillation Voltage       | V <sub>OSC</sub>     | f <sub>OSC</sub> = 98MHz | 40  | 70   | 110  | mV   | 2            |
| FM<br>IF                  | -3dB Limiting Sensitivity | V <sub>I(LIM)2</sub> | V <sub>O</sub> = -3dB    | 40  | 46   | 53   | 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    | dBμ  | 1            |
|                           | AM Rejection Ratio        | AMR                  | V <sub>I</sub> = 80dBμ   | 22  | 32   |      | dB   | 1            |
|                           | Tuning Indication Voltage | V <sub>LI</sub>      | I <sub>LED</sub> = 1mA   | 45  | 51   | 56   | dBμ  | 1            |
| AM<br>IF                  | Voltage Gain              | G <sub>V1</sub>      | V <sub>I</sub> = 26dBμ   | 40  | 70   | 110  | mV   | 1            |
|                           | Detector Output Voltage   | V <sub>O(DET)2</sub> | V <sub>I</sub> = 60dBμ   | 55  | 80   | 110  | mV   | 1            |
|                           | Signal to Noise Ratio     | S/N <sub>2</sub>     | V <sub>I</sub> = 60dBμ   | 32  | 42   |      | 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   | 20  | 25   | 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               | ±1  | ±3   | ±5   | %    | 1            |
|                           | Signal to Noise Ratio     | S/N <sub>3</sub>     | Mono                     | 60  | 70   |      | dB   | 1            |

# 24-DIP-300

Dimensions in Millimeters/inches



SAMSUNG ELECTRONICS CO.,LTD.

# 24-SOP-375

