

**FM IF/AM TUNER SYSTEM**

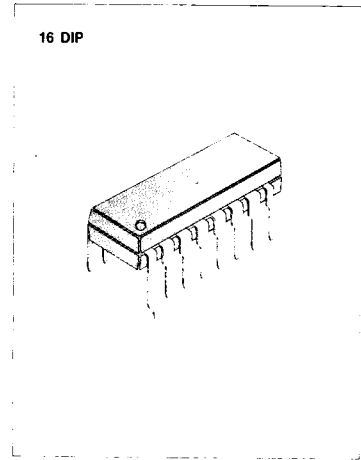
The KA22471 is a monolithic integrated circuit developed for the radio cassette tape recorder.

**FUNCTIONS**

- AM SECTION: Converter, IF amplifier, Detector, Tuning indicator.
- FM SECTION: IF amplifier, Quadrature detector, Tuning indicator.

**FEATURES**

- Low quiescent circuit current.  
 AM: 7mA (Typ) FM: 10mA (Typ)
- A minimum number of external parts required.
- Built-in AM/FM function switch.
- Tuning indicator: direct LED driving capability:  $I_{LAMP} = 10mA$  (MAX)
- One terminal AM/FM detector output.
- Advanced performance at high input signal.
- Operating supply voltage range:  $V_{CC} = 3V \sim 8V$ .



**ORDERING INFORMATION**

| Device  | Package | Operating Temperature |
|---------|---------|-----------------------|
| KA22471 | 16 DIP  | -20°C ~ +70°C         |

**BLOCK DIAGRAM**

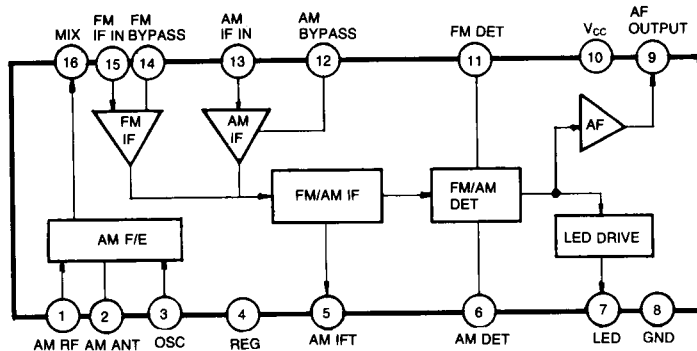


Fig. 1

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

| Characteristic        | Symbol    | Value      | Unit             |
|-----------------------|-----------|------------|------------------|
| Supply Voltage        | $V_{CC}$  | 8          | V                |
| Power Dissipation     | $P_D$     | 600        | mW               |
| Operating Temperature | $T_{OPR}$ | -20 ~ +70  | $^\circ\text{C}$ |
| Storage Temperature   | $T_{STG}$ | -40 ~ +125 | $^\circ\text{C}$ |

## ELECTRICAL CHARACTERISTICS

( $T_a = 25^\circ\text{C}$ ,  $V_{CC} = 5\text{V}$ , unless otherwise specified)

**FM Section** ( $f = 10.7\text{MHz}$ ,  $f_m = 400\text{Hz}$ ,  $\Delta f = \pm 22.5\text{KHz}$ )

| Characteristic            | Symbol       | Test Conditions  | Min  | Typ  | Max  | Unit           |
|---------------------------|--------------|--|------|------|------|----------------|
| Quiescent Circuit Current | $I_{CCO}$    | $V_i = 0$  |      | 10   | 15   | mA             |
| -3dB Limiting Sensitivity | $V_{i(LIM)}$ | $V_o (V_i = 80\text{dB}\mu) - 3\text{dB down}$             |      | 40   | 46   | $\text{dB}\mu$ |
| Detector Output Voltage   | $V_{O(DET)}$ | $V_i = 66\text{dB}\mu$ , $R_{DUMP} = 4.7\text{K}\Omega$    | 57   | 85   | 114  | mV             |
| Total Harmonic Distortion | THD          | $V_i = 80\text{dB}\mu$                                     |      | 0.05 |      | %              |
| AM Rejection Ratio        | AMR          | $V_i = 80\text{dB}\mu$ , AM: $f_m = 1\text{KHz}$ , 30% Mod |      | 38   |      | dB             |
| Signal to Noise Ratio     | S/N          | $V_i = 80\text{dB}\mu$                                     |      | 65   |      | dB             |
| Signal Meter Output       | $V_M$        | $V_i = 100\text{dB}\mu$                                    | 1.55 | 1.7  | 1.85 | V              |
| Tuning Indication Voltage | $V_L$        | $I_{LAMP} = 1\text{mA}$                                    |      | 46   | 52   | $\text{dB}\mu$ |

**AM Section** ( $f = 1\text{MHz}$ , 30% Mod,  $f_m = 400\text{Hz}$ )

| Characteristic            | Symbol       | Test Conditions         | Min  | Typ | Max  | Unit           |
|---------------------------|--------------|-------------------------|------|-----|------|----------------|
| Quiescent Circuit Current | $I_{CCO}$    | $V_i = 0$               |      | 7   | 10   | mA             |
| Voltage Gain              | $G_V$        | $V_i = 26\text{dB}\mu$  | 20   | 30  | 60   | $\text{mV}_i$  |
| Detector Output Voltage   | $V_{O(DET)}$ | $V_i = 60\text{dB}\mu$  | 65   | 95  | 125  | mV             |
| Total Harmonic Distortion | THD          | $V_i = 60\text{dB}\mu$  |      | 1.0 |      | %              |
| Signal to Noise Ratio     | S/N          | $V_i = 60\text{dB}\mu$  |      | 47  |      | dB             |
| Signal Meter Output       | $V_M$        | $V_i = 100\text{dB}\mu$ | 1.55 | 1.7 | 1.85 | V              |
| Tuning Indication Voltage | $V_L$        | $I_{LAMP} = 1\text{mA}$ |      | 32  |      | $\text{dB}\mu$ |
| Oscillator Stop Voltage   | $V_{STOP}$   | $R_{DUMP} = \infty$     |      | 1.5 |      | V              |

TEST CIRCUIT

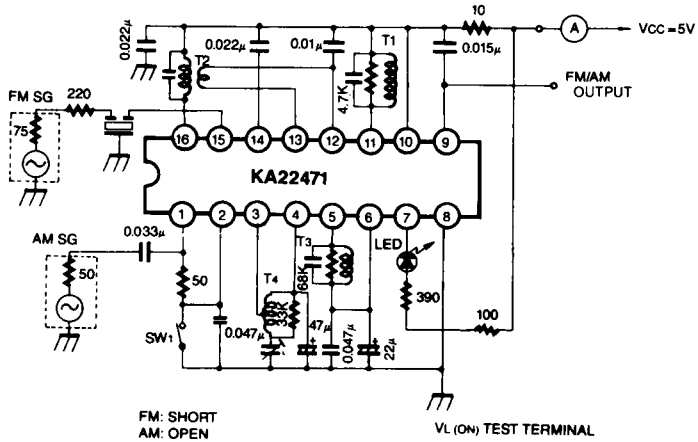
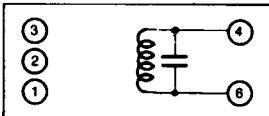


Fig. 2

COIL SPECIFICATIONS

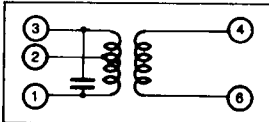
T1 FM IF (DET)



| C <sub>0</sub> (pF) | f (MHz) | Q <sub>0</sub> | URNS |
|---------------------|---------|----------------|------|
| 4-6                 | 10.7    | 4-6            | 4-6  |
| 47                  |         | 150            | 14   |

Seoul Jupa  
0.12mmφ UEW

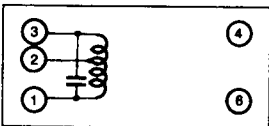
T2 AM IFT (MIX OUT)



| C <sub>0</sub> (PF) | f (KHz) | Q <sub>0</sub> | URNS |     |     |
|---------------------|---------|----------------|------|-----|-----|
| 1-3                 | 455     | 1-3            | 1-2  | 2-3 | 4-6 |
| 180                 |         | 110            | 90   | 62  | 8   |

Seoul Jupa  
0.07mmφ UEW

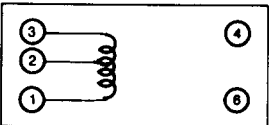
T3 AM IFT (DET)



| C <sub>0</sub> (pF) | f (KHz) | Q <sub>0</sub> | URNS |
|---------------------|---------|----------------|------|
| 1-3                 | 455     | 1-3            | 1-3  |
| 180                 |         | 110            | 152  |

Seoul Jupa  
0.07mmφ UEW

T4 (MW OSC)



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

Seoul Jupa  
0.06mmφ UEW

APPLICATION CIRCUIT

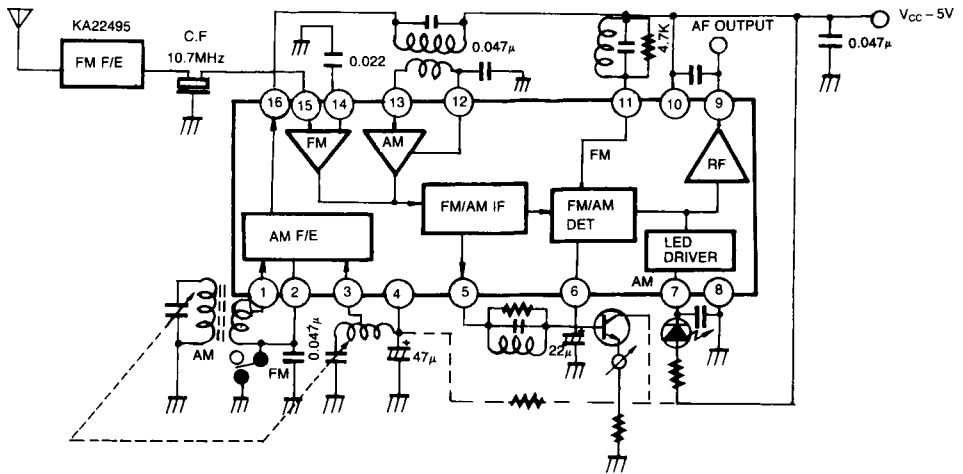


Fig. 3