

AN7224

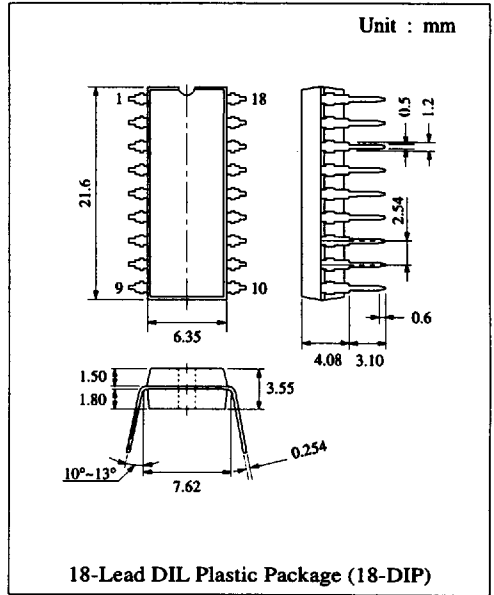
AM Tuner, FM-AM IF Amplifier Circuit for Radio Cassette Recorders

■ Description

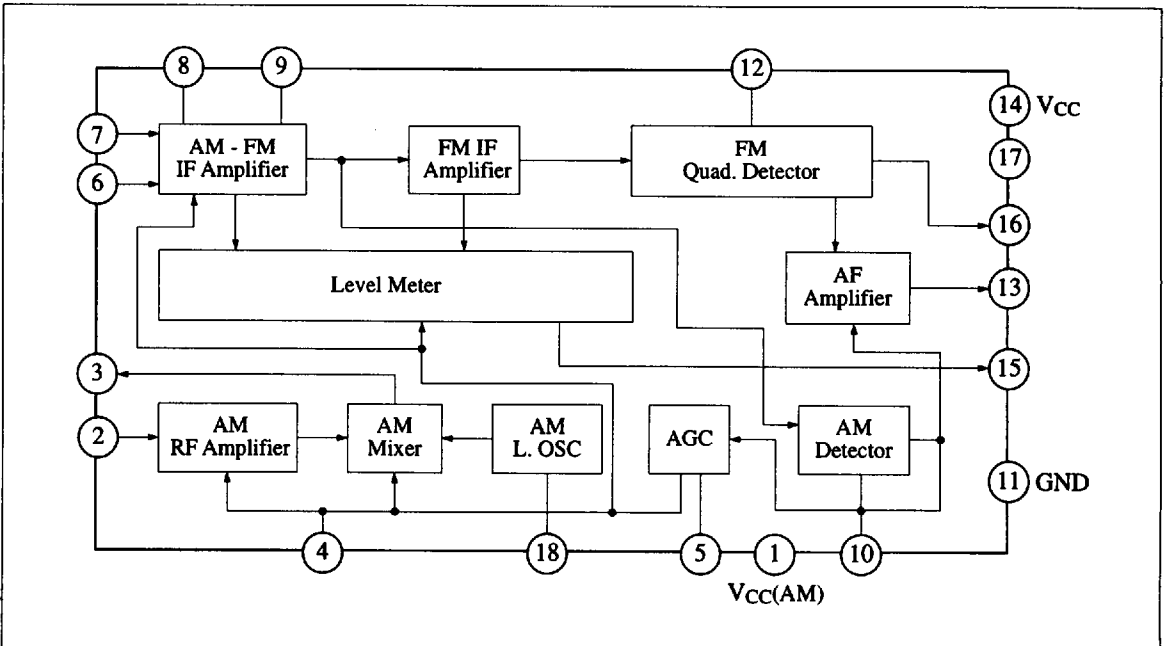
The AN7224 is a monolithic integrated circuit designed for high performance, multi-function FM-AM IF system.

■ Features

- Wide operation voltage ($V_{CC} = 2.8V \sim 9.6V$)
- Incorporating both FM and AM detectors
- Incorporating a level indicator output (FM / AM common)
- AM : High sensitivity, including RF amplifier
- Low power consumption
- AFC control
- Few external parts



■ Block Diagram



■ Absolute Maximum Ratings (Ta=25°C)

| Item | Symbol | Rating | Unit |
|-------------------------------|----------|------------|------|
| Supply Voltage | V_{CC} | 9.6 | V |
| Supply Current | I_{CC} | 20 | mA |
| Power Dissipation | P_D | 192 | mW |
| Operating Ambient Temperature | Topr | -20 ~ +75 | °C |
| Storage Temperature | Tstg | -55 ~ +150 | °C |

Operating Supply Voltage Range: $V_{CC} = 2.8V \sim 9.6V$

■ Electrical Characteristics (VCC=5V, Ta=25°C)

| Item | | Symbol | Condition | min. | typ. | max. | Unit |
|--------|--------------------------|----------------|---------------------|------|------|------|----------|
| F M | Detector Output | $V_{O(FM)}$ | $V_{in} = 100dB\mu$ | 55 | 71 | 87 | mV |
| | Limiting Sensitivity | $V_{in(lim)}$ | $V_O = -3dB$ | 38 | 41 | 44.5 | dB μ |
| | Meter Output Voltage (1) | $V_{O(15-11)}$ | $V_{in} = 50dB\mu$ | 230 | 550 | 880 | mV |
| | Meter Output Voltage (2) | $V_{O(15-11)}$ | $V_{in} = 100dB\mu$ | 1080 | 1220 | 1360 | mV |
| | Offset Voltage | $V_{(16-17)}$ | $V_{in} = 0dB$ | -250 | 0 | 250 | mV |
| A M | Detector Output Voltage | $V_{O(AM)}$ | $V_{in} = 60dB\mu$ | 57 | 73 | 88 | mV |
| | Sensitivity | $S_{(AM)}$ | $V_O = 10mV$ | 3 | 8.5 | 14.5 | dB μ |

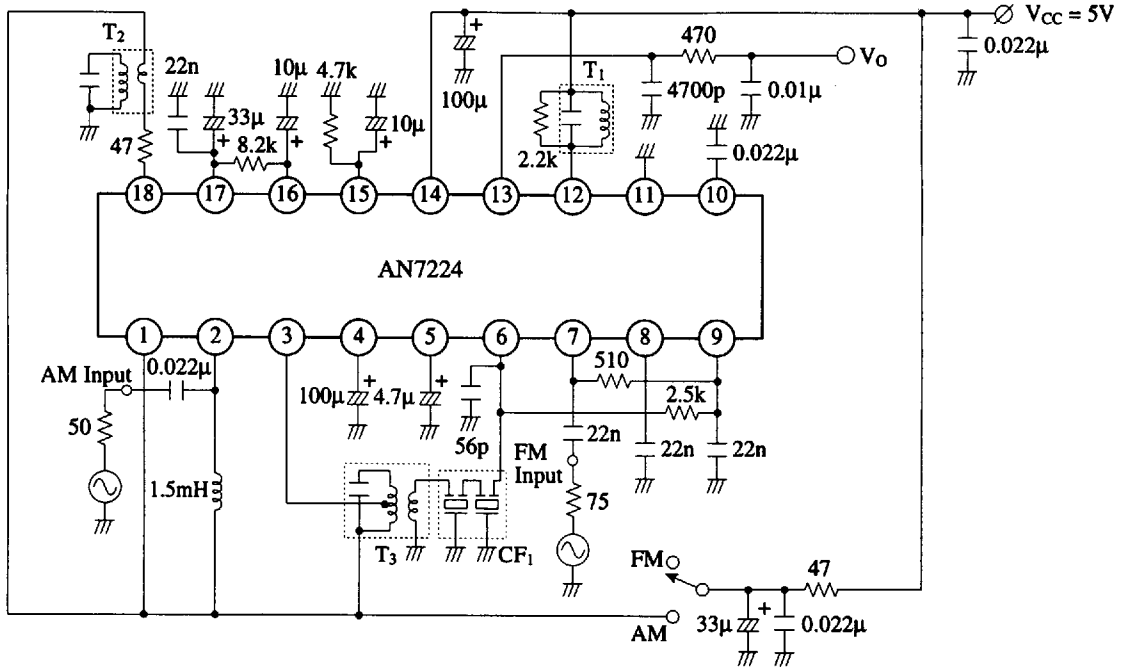
Note) FM : $f = 10.7MHz$, $f_{dev} = 22.5kHz$, $f_m = 400Hz$

AM : $f = 1MHz$, $f_m = 400Hz$, Mod = 30%

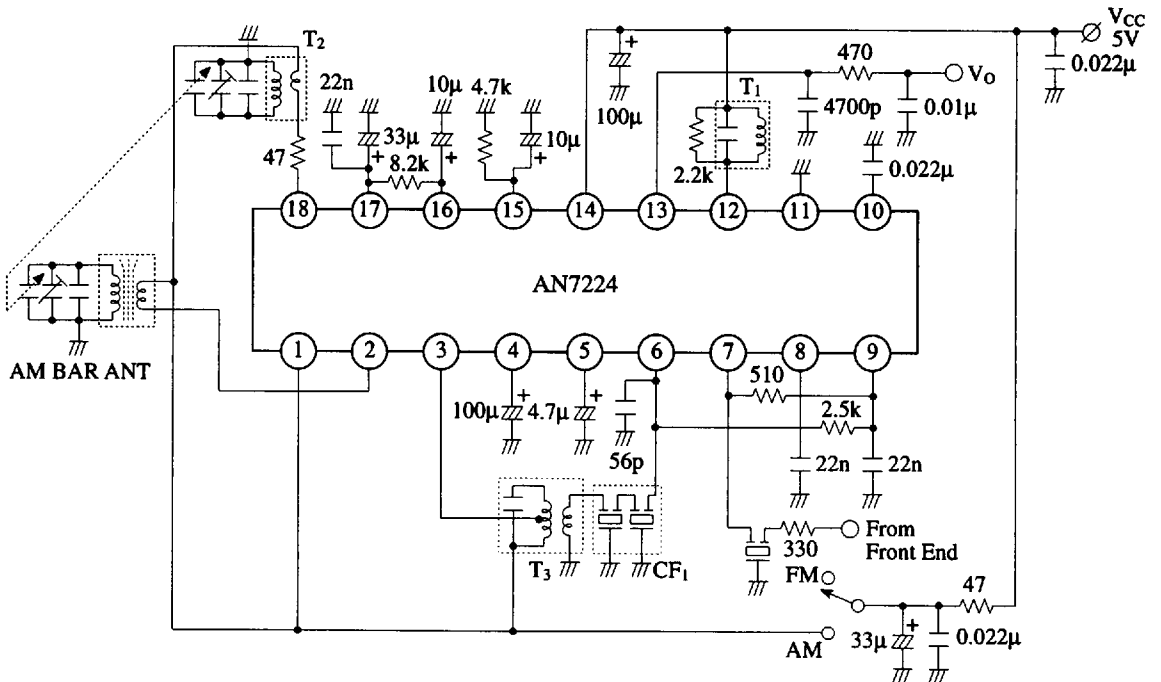
■ Pin

| Pin No. | Pin Name | Pin No. | Pin Name |
|---------|-----------------------|---------|--------------------|
| 1 | V_{CC} (AM) | 10 | AM Detector Output |
| 2 | AM RF Amplifier Input | 11 | GND |
| 3 | AM Mixer Output | 12 | FM Detector Coil |
| 4 | AGC Output (2) | 13 | AF Output |
| 5 | AGC Output (1) | 14 | V_{CC} |
| 6 | AM IF Amplifier Input | 15 | Level Meter Output |
| 7 | FM IF Amp. Input | 16 | AFC Output |
| 8 | IF By-pass | 17 | Reference Voltage |
| 9 | IF By-pass | 18 | Local Oscillator |

Test Circuit



■ Application Circuit



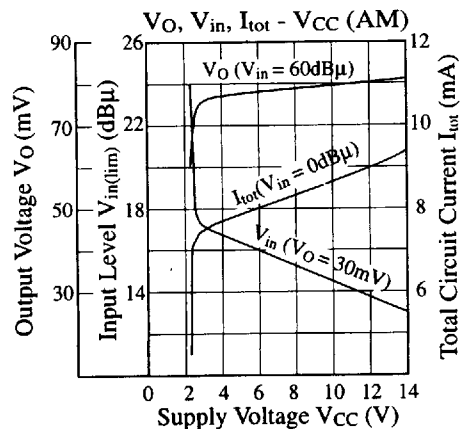
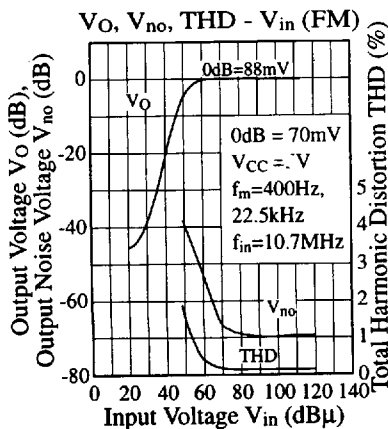
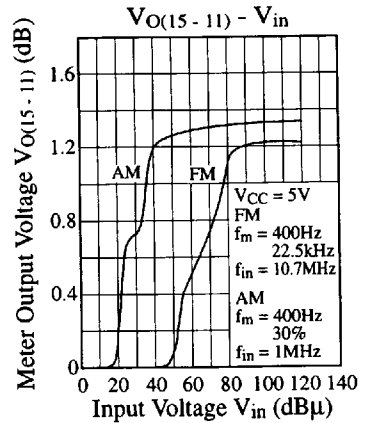
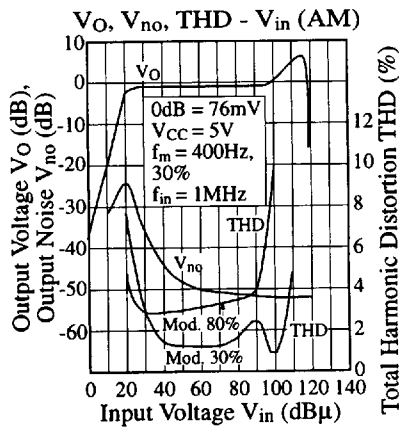
■ Coil Specifications

| Symbol | Use, Freq. | Type No. | Maker | Connection Diagram | Number of Turns | Tuning Cap. | Unloaded Q |
|----------------|---------------------------|------------|------------|--------------------|-------------------------------------|-------------|------------|
| T ₁ | FM Quad Coil 10.7MHz | EIF-7S752A | Matsushita | | ①...② 8T ②...③ 5T ④...⑥ 3T | 100pF | 90±20% |
| T ₂ | AM MW Osc. Coil | ELL-7S754 | Matsushita | | ①...② 4T ②...③ 125T ④...⑥ 7T | - | 95±20% |
| T ₃ | AM Mixer Output 455kHz | EIA-7S802A | Matsushita | | ③...② 35T ⑥...④ 10T ②...① 19T | 1500pF | 60±30% |

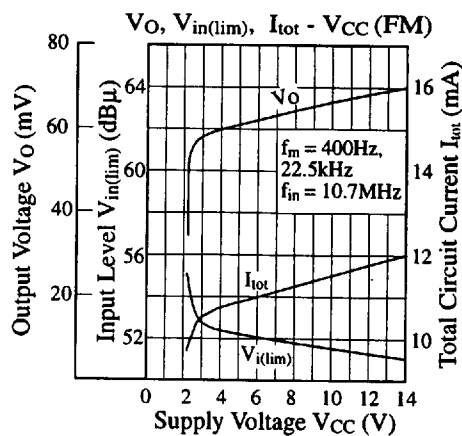
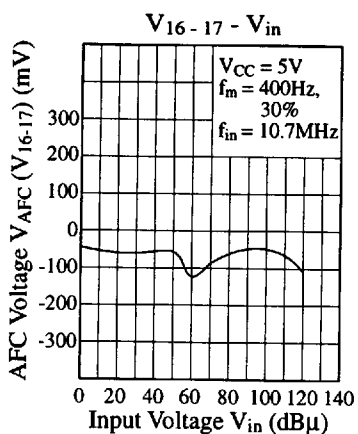
■ Ceramic Filter Specification

| Symbol | Use | Type No. | Maker | Center Freq. | Band Width | Loss |
|-----------------|-------|-----------|-------|--------------|-------------|-------|
| CF ₁ | AM IF | CFM2-455B | Toko | 455kHz | 7kHz (-6dB) | 2.6dB |

■ Characteristics Curve



■ Characteristics Curve (Continue)



■ Printed Circuit Board Layout (Scale: 1:1)

