

AN7224

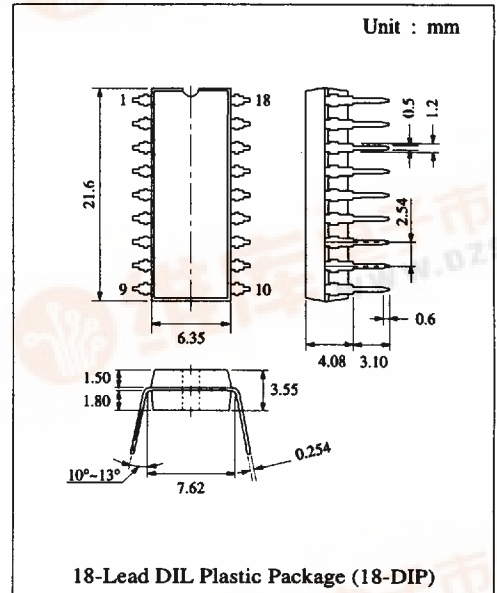
AM Tuner, FM-AM IF Amplifier Circuit for Radio Cassette Recorders

■ Description

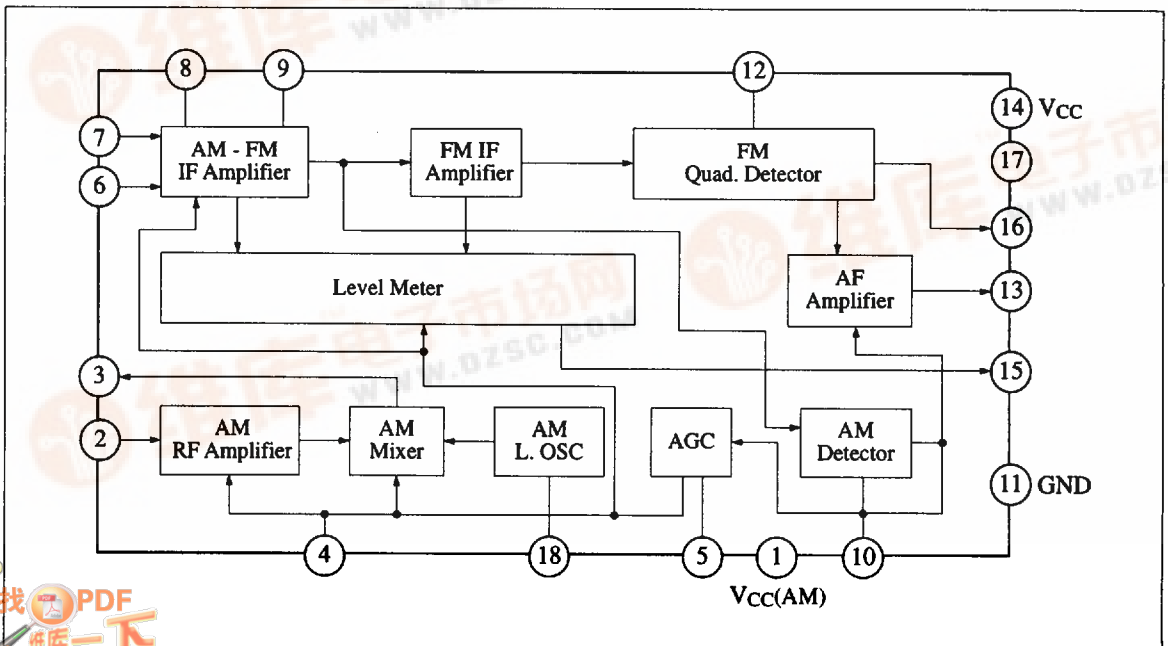
The AN7224 is a monolithic integrated circuit designed for high performance, multi-function FM-AM IF system.

■ 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 ~ 9.6V

■ Electrical Characteristics (V_{CC}=5V, Ta=25°C)

| Item | | Symbol | Condition | min. | typ. | max. | Unit |
|--------|--------------------------|-----------------------|--------------------------|------|------|------|------|
| F M | Detector Output | V _{O(FM)} | V _{in} = 100dBμ | 55 | 71 | 87 | mV |
| | Limiting Sensitivity | V _{in(lim)} | V _O = -3dB | 38 | 41 | 44.5 | dBμ |
| | Meter Output Voltage (1) | V _{O(15-11)} | V _{in} = 50dBμ | 230 | 550 | 880 | mV |
| | Meter Output Voltage (2) | V _{O(15-11)} | V _{in} = 100dBμ | 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} = 60dBμ | 57 | 73 | 88 | mV |
| | Sensitivity | S _(AM) | V _O = 10mV | 3 | 8.5 | 14.5 | dBμ |

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

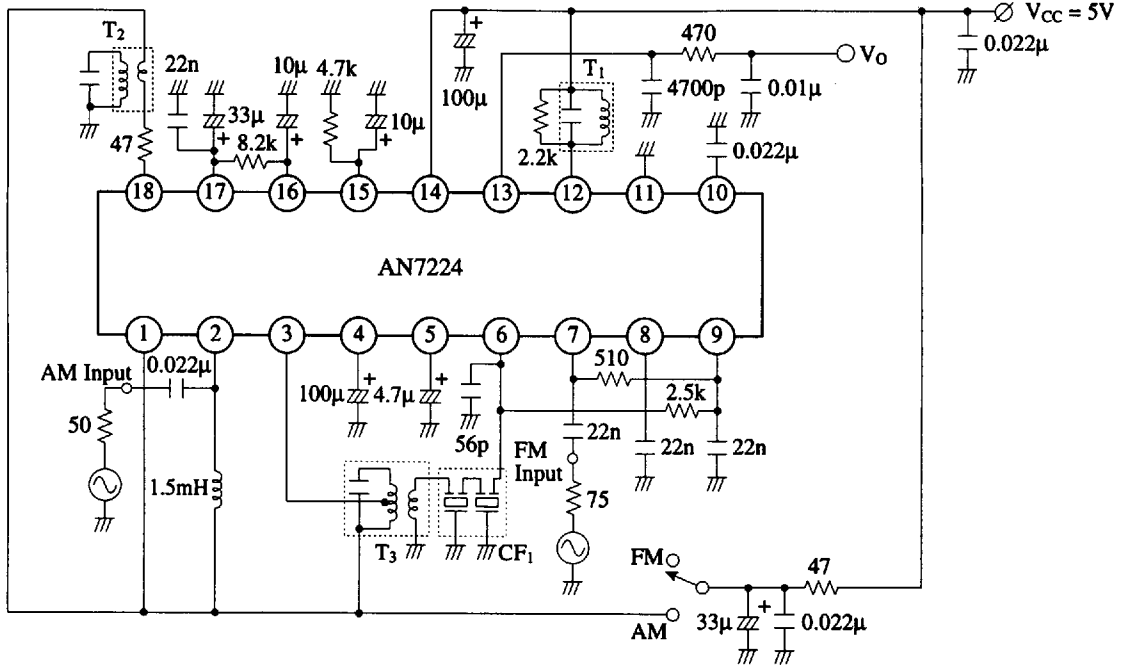
AM : f = 1MHz, f_m = 400Hz, Mod = 30%

■ Pin

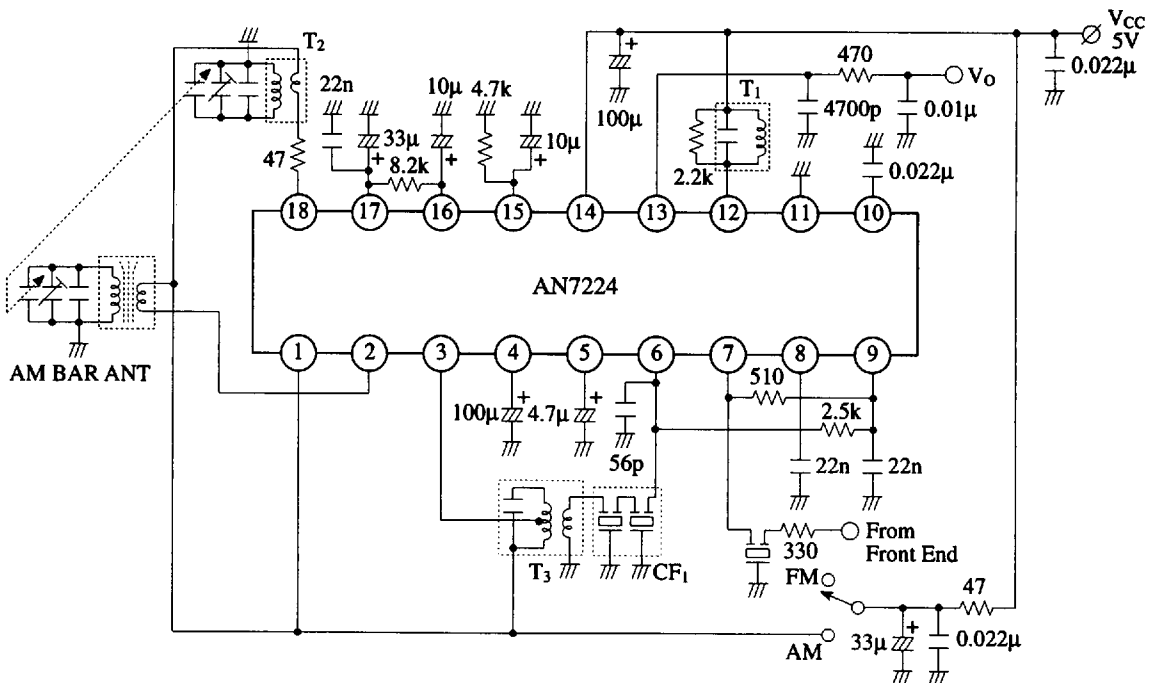
| Pin No. | Pin Name | Pin No. | Pin Name |
|---------|-----------------------|---------|--------------------|
| 1 | V _{CC} (AM) | 10 | AM Detector Output |
| 2 | AM RF Amplifier Input | 11 | GND |
| 3 | AM Mixer Output | 12 | FM Detector Coil |
| 4 | AGC Output (2) | 13 | AF Output |
| 5 | AGC Output (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 |

AN7224

Test Circuit



Application Circuit



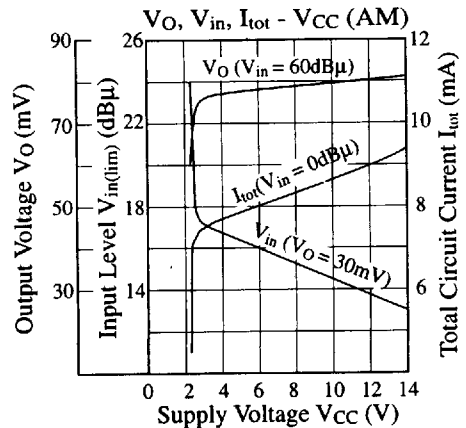
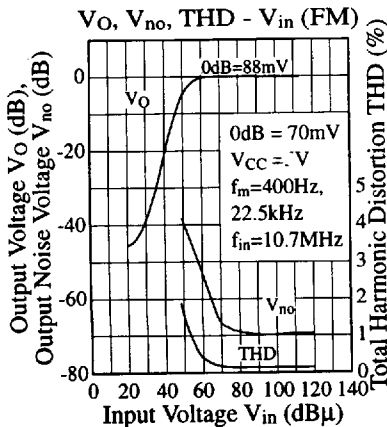
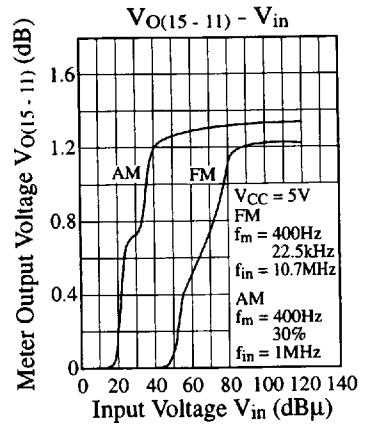
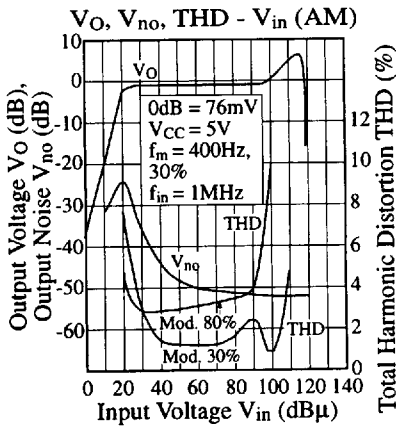
■ Coil Specifications

| 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

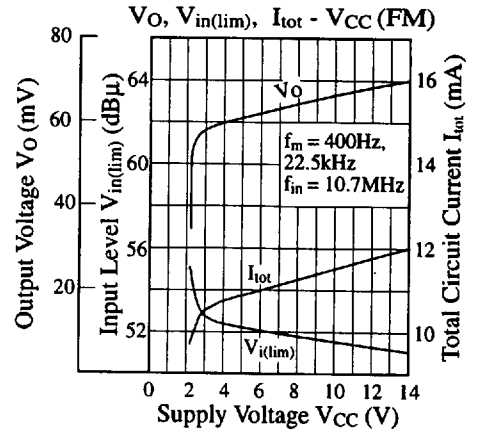
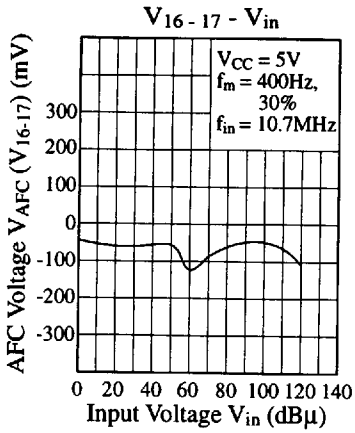
| Symbol | Use | Type No. | Maker | Center Freq. | Band Width | Loss |
|-----------------|-------|-----------|-------|--------------|-------------|-------|
| CF ₁ | AM IF | CFM2-455B | Toko | 455kHz | 7kHz (-6dB) | 2.6dB |

■ Characteristics Curve



AN7224

■ Characteristics Curve (Continue)



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

