

# AN7213

## FM Front-end Circuit for Radio

### Description

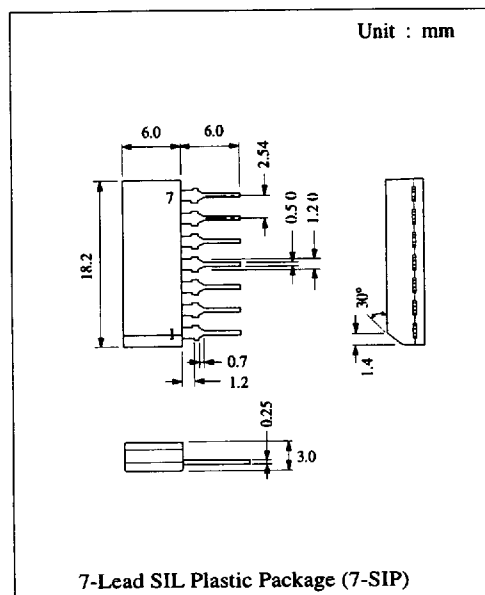
The AN7213 is a monolithic integrated circuit designed for FM front-end of the portable radio.

### Features

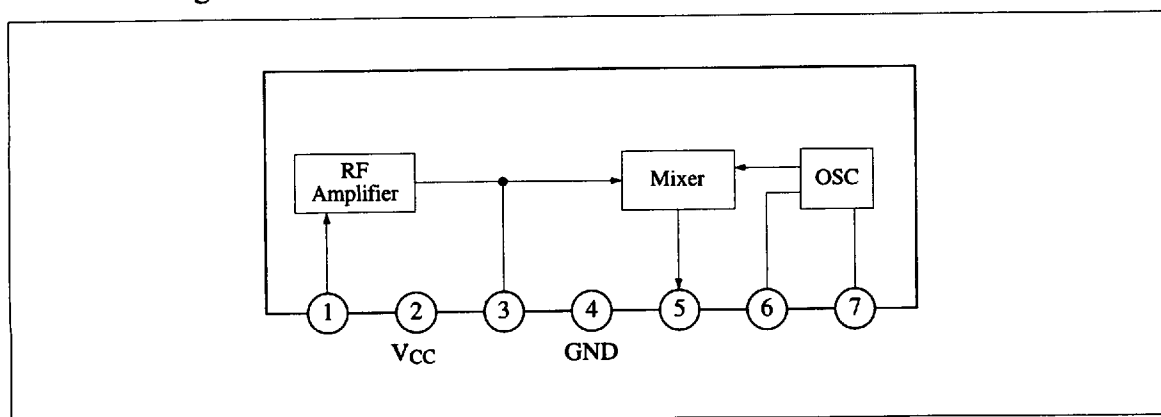
- Built-in RF amplifier, frequency converter, local oscillator
- Wide operating voltage range: 2V~ 7V
- Low current consumption: 2mA ( $V_{CC} = 4V$ )

### Pin

| Pin No. | Pin Name             |
|---------|----------------------|
| 1       | RF Input             |
| 2       | $V_{CC}$             |
| 3       | RF Output            |
| 4       | GND                  |
| 5       | Mixer Output         |
| 6       | Oscillator Collector |
| 7       | Oscillator Emitter   |



### Block Diagram



## ■ Absolute Maximum Ratings (Ta=25°C)

| Item                          | Symbol    | Rating     | Unit |
|-------------------------------|-----------|------------|------|
| Supply Voltage                | $V_{CC}$  | 7          | V    |
| Terminal Voltage              | $V_{3-4}$ | 14         | V    |
|                               | $V_{5-4}$ | 14         | V    |
|                               | $V_{6-4}$ | 14         | V    |
| Power Dissipation             | $P_D$     | 30         | mW   |
| Operating Ambient Temperature | $T_{opr}$ | -20 ~ +75  | °C   |
| Storage Temperature           | $T_{stg}$ | -55 ~ +125 | °C   |

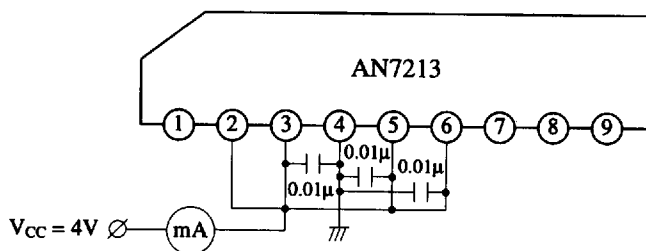
Operating Supply Voltage Range:  $V_{CC} = 2.0V \sim 7.0V$

## ■ Electrical Characteristics (Ta=25°C)

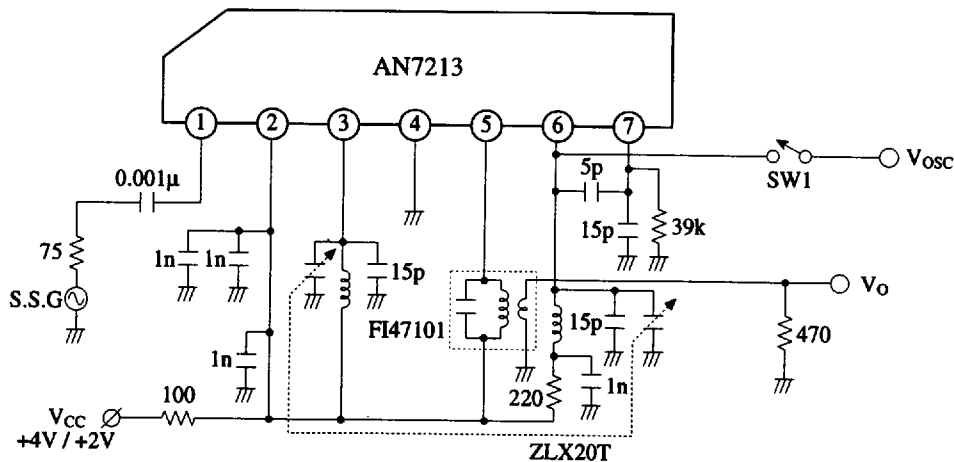
| Item                      | Symbol    | Test Circuit | Condition                                    | min. | typ. | max. | Unit |
|---------------------------|-----------|--------------|----------------------------------------------|------|------|------|------|
| Quiescent Current         | $I_{CQ}$  | 1            | $V_{CC} = 4V$ , without signal               | 1.4  |      | 2.55 | mA   |
| Output Voltage            | $V_O$     | 2            | $V_{CC} = 4V$ , $V_{in} = 70dB\mu$ , 106MHz* | 30.5 |      | 68.5 | mV   |
| Local Oscillation Voltage | $V_{osc}$ | 2            | $V_{CC} = 2V$                                | 130  |      |      | mV   |

\* Max. output voltage value is obtained by changing input signal frequency  $\pm\Delta f$  at 106MHz

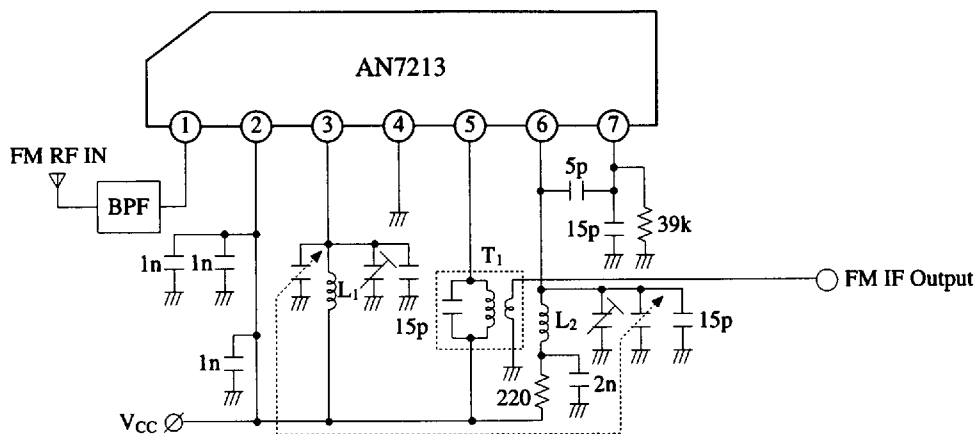
Test Circuit 1 ( $I_{tot}$ )



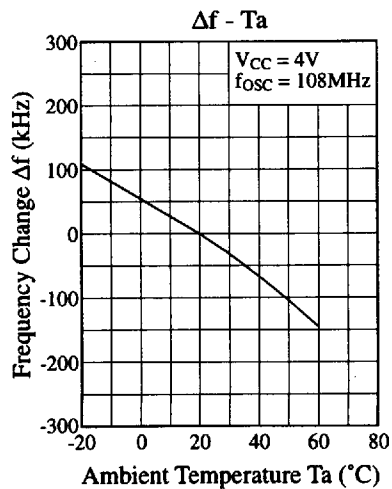
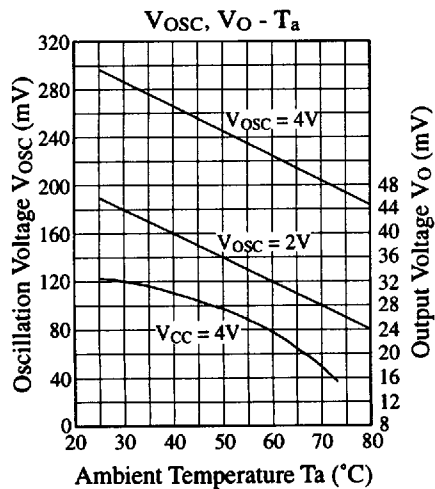
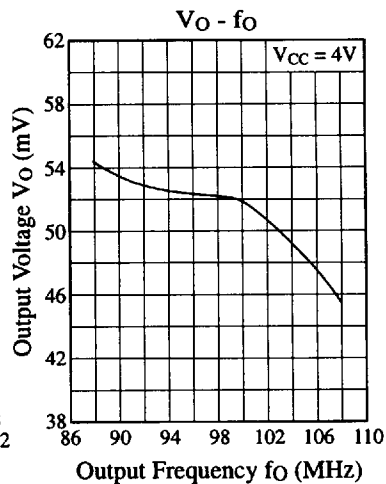
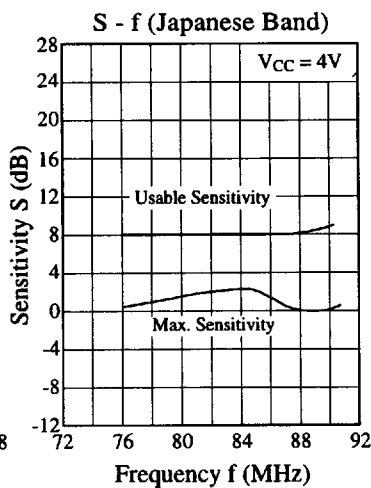
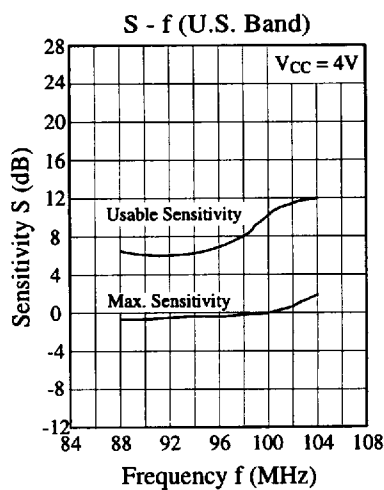
Test Circuit 2 ( $V_O$ ,  $V_{OSC}$ )



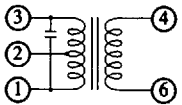
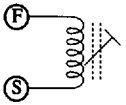
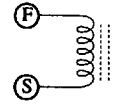
## ■ Application Circuit



## ■ Characteristics Curve



■ Coil Specifications

| Symbol         | Use, Freq.              | Type No.   | Maker      | Connection Diagram                                                                | Number of Turns                  | Tuning Cap. | Unloaded Q          |
|----------------|-------------------------|------------|------------|-----------------------------------------------------------------------------------|----------------------------------|-------------|---------------------|
| T <sub>1</sub> | FM Quad Coil<br>10.7MHz | EIF-7S752A | Matsushita |  | ①...② 8T<br>②...③ 5T<br>④...⑥ 2T | 100pF       | 90                  |
| L <sub>1</sub> | RF Coil<br>76 ~ 108MHz  | ELQ-5N53   | Matsushita |  | ⑤...⑥ 2.5T                       | 0.0986μH    | 110<br>(at 25.2MHz) |
| L <sub>2</sub> | OSC Coil                | ELQ-5N111  | Matsushita |  | ⑤...⑥ 1.75T                      | 0.0495μH    | 150<br>(at 25.2MHz) |

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

