

### FEATURES

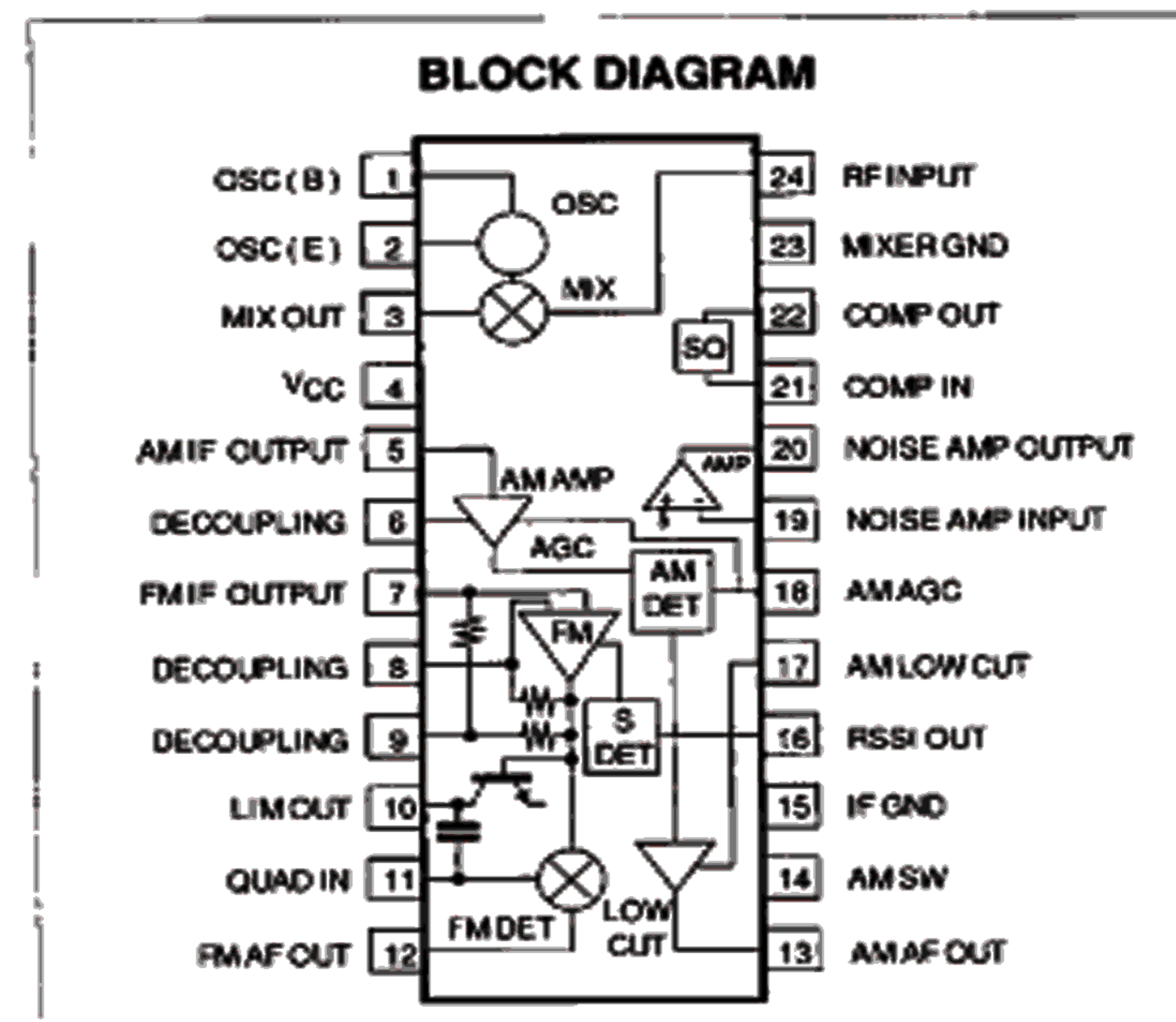
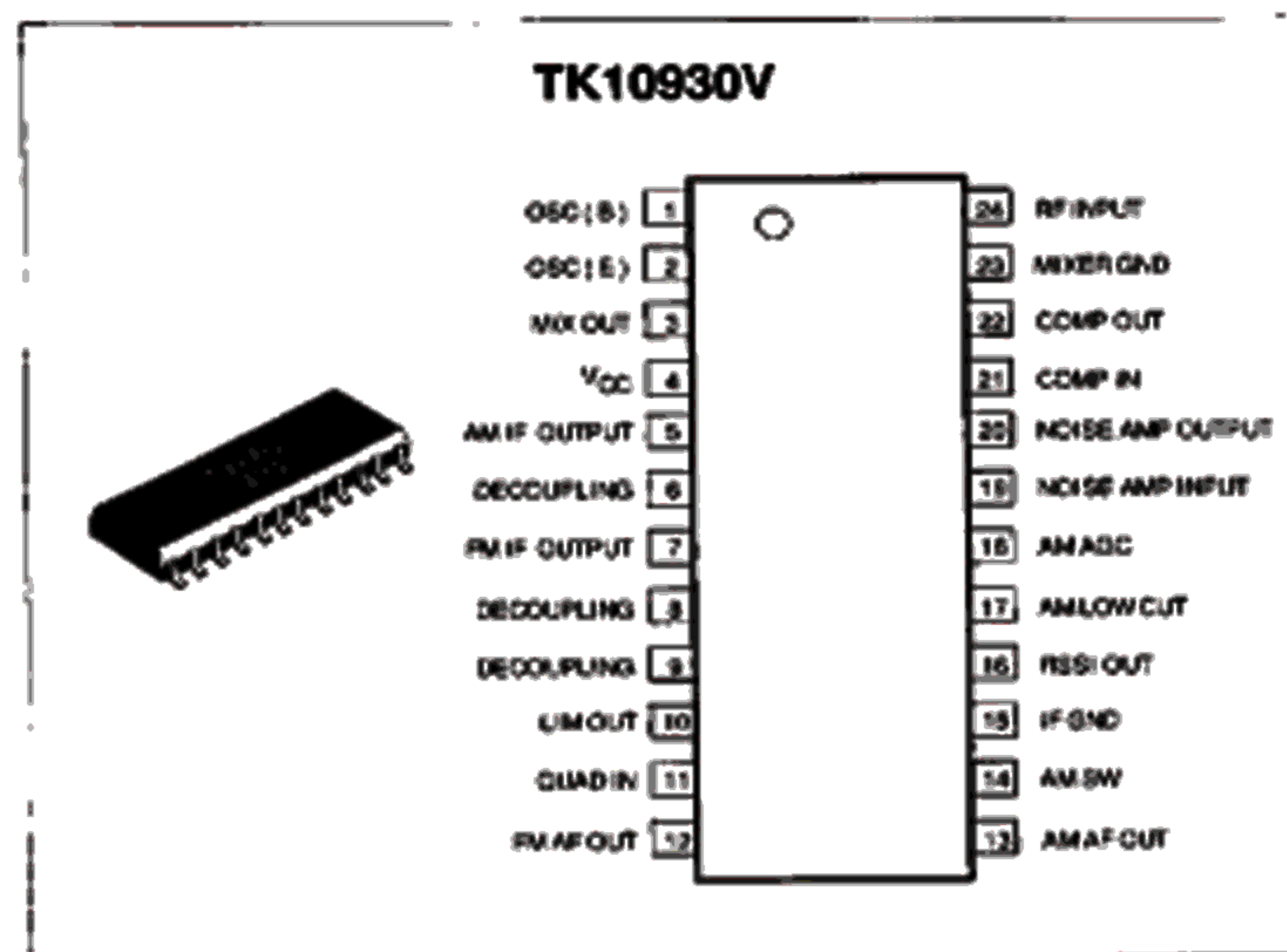
- AM/FM Simultaneous Detection
- Low Voltage Operation
- Low Operation Current AM & FM (6.8 mA TYP)  
FM Only (3.9 mA TYP)
- Small Surface Mount Package

### APPLICATIONS

- Portable Instrumentation
- Communications Receivers
- Amateur Radio Transceivers
- Scanners

### DESCRIPTION

The TK10930 is a AM/FM Detector IF IC specially suited where simultaneous AM and FM signal detection is required. This makes the device suited for portable scanners, aircraft receivers, amateur radio, and is specially designed for portable operation due to low voltage and current requirements. The TK10930 is available in a VSOP-24 surface mount package.



| ORDERING INFORMATION |                    |   |
|----------------------|--------------------|---|
| <b>TK10930</b>       |                    |   |
| □ □ □ □              | □ □ □ □            | □ □ □ □   |
|                      | Tape/Reel Code     |   |
|                      | Temp. Range        |   |
|                      | Package Code       |   |
| <b>PACKAGE CODE</b>  | <b>TEMP. RANGE</b> | <b>TAPE/REEL CODE</b>   |
| V: Surface Mount     | C: -30 to +75 °C   | BX: Bulk/Bag<br>TX: Paper Tape<br>TR: Tape Right<br>TL: Tape Left<br>MG: Magazine |

# TK10930

## ABSOLUTE MAXIMUM RATINGS

Input Voltage  $V_{CCMAX}$  ..... 10 V  
 Operating Voltage Range ..... 2.5 to 8.5 V  
 Power Dissipation (Note 1) ..... 400 mW  
 Junction Temperature ..... 150 °C

Storage Temperature Range ..... -55 to +150 °C  
 Operating Temperature Range ..... -30 to +75 °C  
 Lead Soldering Temp. (10 sec.) ..... 300 °C

## ELECTRICAL CHARACTERISTICS

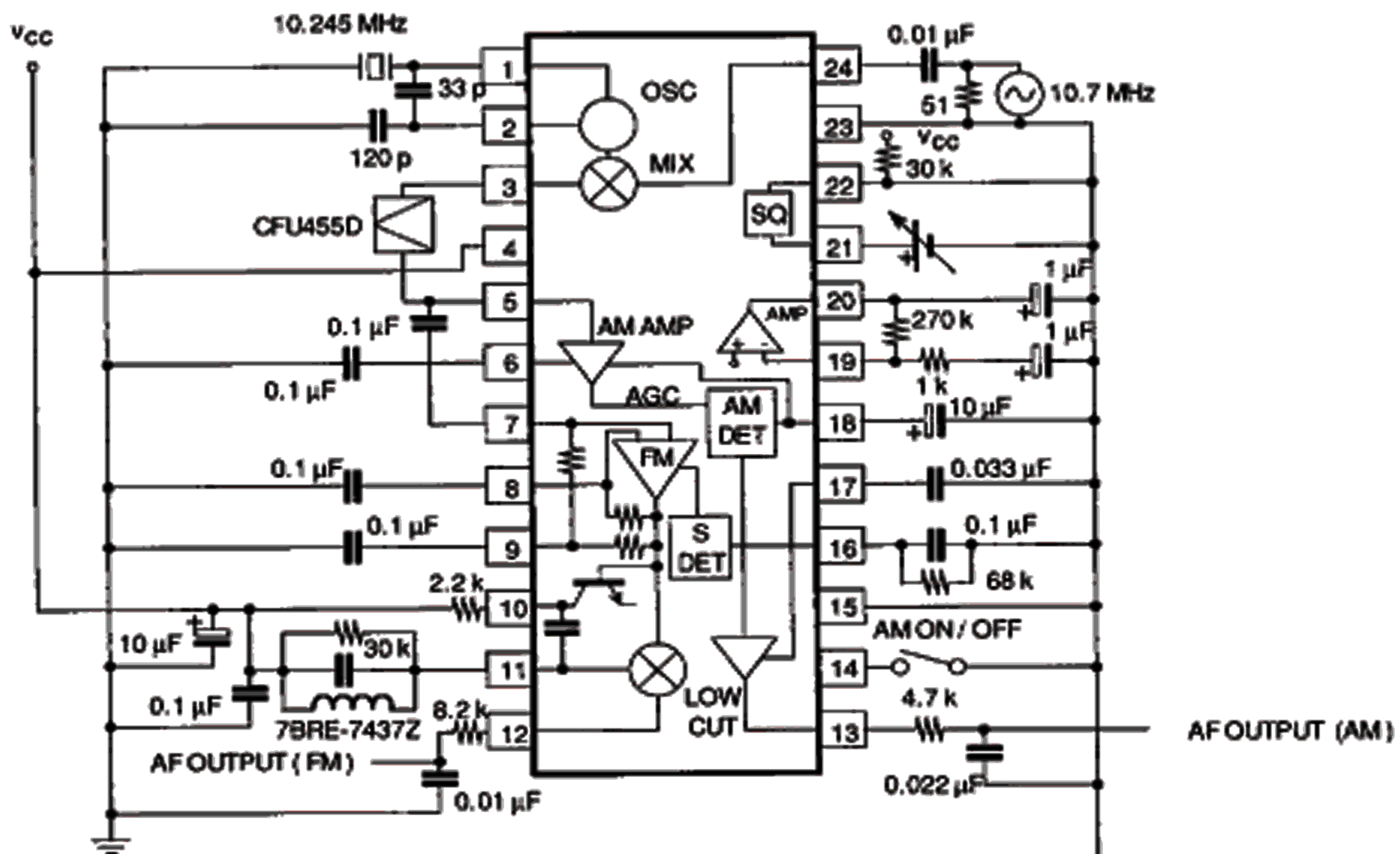
Test conditions:  $V_{CC} = 3.0$  V,  $T_A = 25$  °C, unless otherwise specified.

| SYMBOL            | PARAMETER                   | TEST CONDITIONS                              | MIN  | TYP  | MAX | UNITS      |
|-------------------|-----------------------------|--|------|------|-----|------------|
| $I_{CC1}$         | Supply Current 1            | No input                                     |      | 6.8  | 8.9 | mA         |
| $I_{CC2}$         | Supply Current 2            | No input                                     |      | 3.9  | 5.3 | mA         |
| $M_C$             | Mixer Conversion Gain       |  |      | 20   |     | dB         |
| $M_Z$             | Mixer Input Resistance      | Measurement                                  |      | 3.6  |     | k $\Omega$ |
| <b>FM Section</b> |                             |  |      |      |     |            |
| Limit 1           | Limiting Sensitivity        | -3 dB Point                                  |      | 2.0  | 8.0 | $\mu$ V    |
| $V_{OUT1}$        | Demodulation Output Voltage | $V_{IN} = 10$ mV, $\pm 3$ kHz DEV            | 85   | 150  | 230 | mV(rms)    |
| THD 1             | Total Harmonic Distortion   | $V_{IN} = 10$ mV, $\pm 3$ kHz DEV            |      | 1.0  | 2.0 | %          |
| $Z_{OUT}$         | Output Impedance            | $V_{IN} = 10$ mV                             |      | 800  |     | $\Omega$   |
| THD               | Total Harmonic Distortion   | $V_{IN} = 10$ mV                             |      | 1.0  | 2.0 | %          |
| $F_G$             | Filter Amplifier Gain       | $F_{IN} = 30$ kHz,<br>$V_O = 100$ mV         | 30   | 38   |     | dB         |
| $S_H$             | Scan Control High Level     | 2.5 V Squelch Input                          | 2.3  |      |     | V          |
| $S_L$             | Scan Control Low Level      | 0 V Squelch Input                            |      |      | 0.3 | V          |
| HYS               | Squelch Hysteresis          |  |      | 30   |     | mV         |
| $S_0$             | Output Voltage              | $V_{IN} = 0.00$ mV,<br>$R_S = 68$ k $\Omega$ |      | 0.05 | 0.5 | V          |
| $S_1$             | Output Voltage 1            | $V_{IN} = 0.01$ mV,<br>$R_S = 68$ k $\Omega$ | 0.05 | 0.5  | 0.9 | V          |
| $S_2$             | Output Voltage 2            | $V_{IN} = 0.1$ mV,<br>$R_S = 68$ k $\Omega$  | 0.7  | 1.2  | 1.7 | V          |
| $S_3$             | Output Voltage 3            | $V_{IN} = 1$ mV,<br>$R_S = 68$ k $\Omega$    | 1.2  | 1.8  | 2.5 | V          |

Note 1: Power dissipation must be derated at the rate of 3.3 mW/°C at  $T_A = 25$  °C and above.

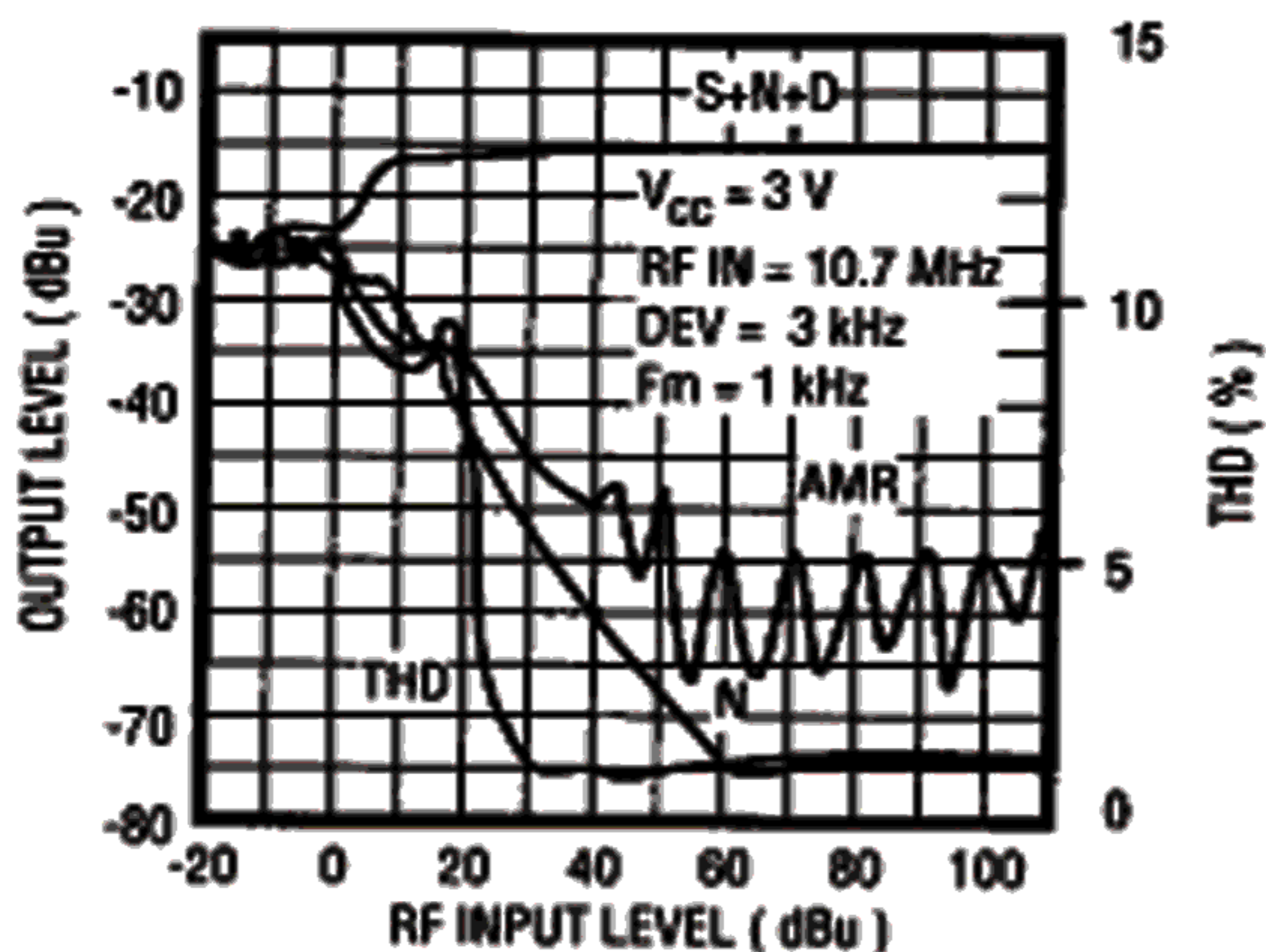
**ELECTRICAL CHARACTERISTICS (CONT.)**Test conditions:  $V_{CC} = 3.0\text{ V}$ ,  $T_A = 25\text{ }^\circ\text{C}$ , unless otherwise specified.

| SYMBOL            | PARAMETER                   | TEST CONDITIONS   | MIN  | TYP | MAX | UNITS    |
|-------------------|-----------------------------|---|------|-----|-----|----------|
| $S_4$             | Output Voltage 4            | $V_{IN} = 10\text{ mV}$ ,<br>$R_S = 68\text{ k}\Omega$  | 1.6  | 2.3 | 2.9 | V        |
| $S_5$             | Output Voltage 5            | $V_{IN} = 100\text{ mV}$ ,<br>$R_S = 68\text{ k}\Omega$ | 1.8  | 2.4 | 2.9 | V        |
| <b>AM Section</b> |                             |   |      |     |     |          |
| US                | Sensitivity                 | 20 mV(rms)  | 20   | 15  |     | dB $\mu$ |
| $V_{OUT2}$        | Demodulation Output Voltage | 1 kHz 30%, $V_{IN} = 1\text{ mV}$                       | 60   | 120 | 160 | mV(rms)  |
| THD 2             | Total Harmonic Distortion 1 | 1 kHz 30%, $V_{IN} = 1\text{ mV}$                       |      | 1.0 | 2.0 | %        |
| THD 3             | Total Harmonic Distortion 2 | 1 kHz 80%, $V_{IN} = 1\text{ mV}$                       |      | 2.0 | 4.0 | %        |
| S/N               | S/N                         | 1 kHz 30%, $V_{IN} = 1\text{ mV}$                       | 40   | 48  |     | dB       |
| $V_{OUT}$         | AM On DC Level (Pin 14)     |   | -0.3 |     | 0.3 | V        |

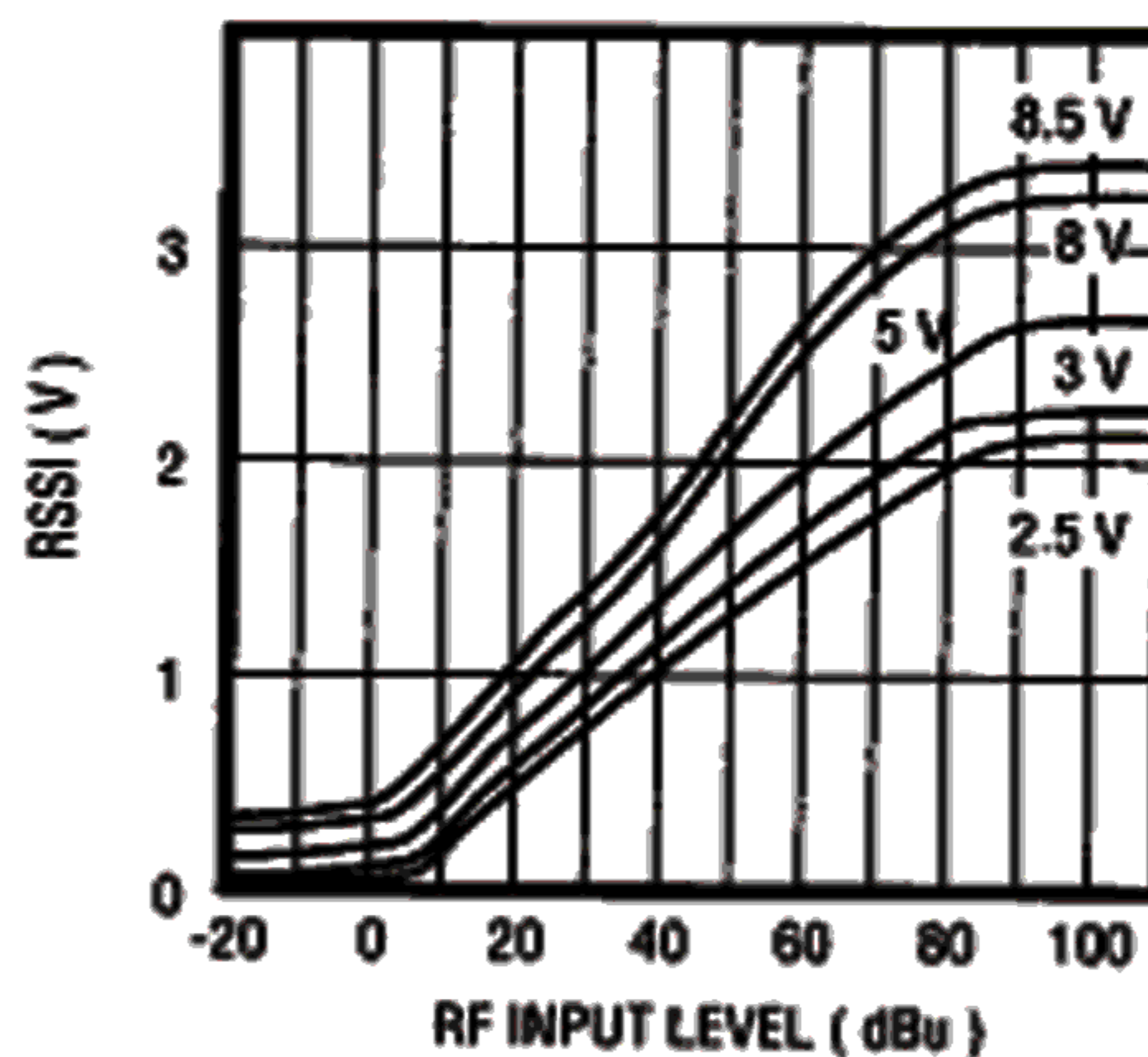
**TEST CIRCUIT**

TYPICAL PERFORMANCE CHARACTERISTICS

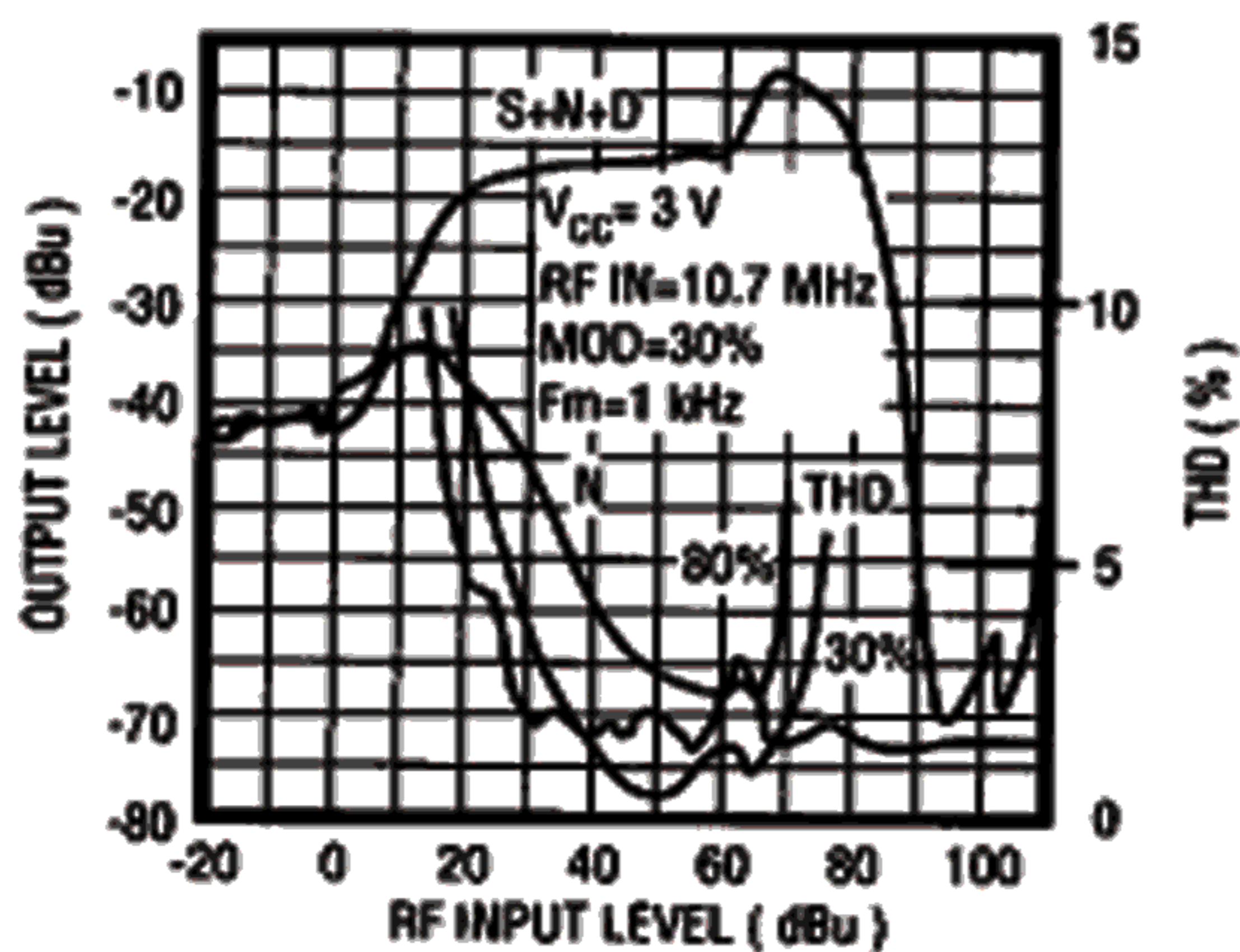
GENERAL CHARACTERISTICS (FM)



RSSI CHARACTERISTICS



GENERAL CHARACTERISTICS (AM)



VAGC CHARACTERISTICS

