

FEATURES

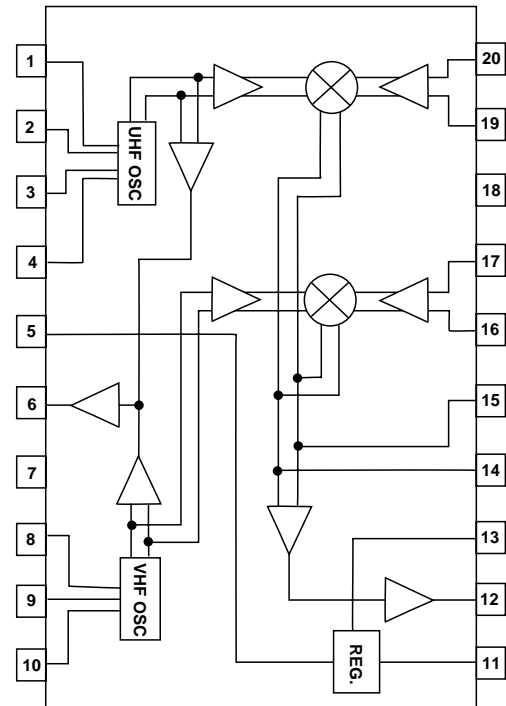
- UHF AND VHF DOWNCONVERTERS ON A SINGLE IC
- HIGH CONVERSION GAIN: 31 dB (UPC2744GS)
23 dB (UPC2743GS)
- LOW DISTORTION: UPC2743GS
- TYPICAL SATURATED OUTPUT POWER: +13 dBm
- 9 V SINGLE SUPPLY
- SMALL PACKAGE: 20 PIN SOP
Suitable for Surface Mount
- TAPE AND REEL PACKAGING OPTION AVAILABLE

DESCRIPTION

The UPC2743GS and UPC2744GS are Silicon Monolithic Integrated Circuits designed using the NESAT II MMIC process. These products consist of UHF and VHF double balanced mixers and local oscillators, an IF amplifier, an oscillator output buffer amplifier and a UHF/VHF switching circuit. These devices are ideal for TV and VCR tuners.

NEC's stringent quality assurance and test procedures ensure the highest reliability and performance.

INTERNAL BLOCK DIAGRAM



ELECTRICAL CHARACTERISTICS (T_A = 25°C, V_{CC} = 9 V, f_{IF} = 45 MHz)

| PART NUMBER PACKAGE OUTLINE | | | UPC2743GS G20 | | | | | | UPC2744GS G20 | | | | | |
|--------------------------------|--|-------|-----------------------------|------|------|-----------------------------|------|------|-----------------------------|------|------|-----------------------------|------|------|
| | | | VHF ¹ CIRCUIT | | | UHF ² CIRCUIT | | | VHF ¹ CIRCUIT | | | UHF ² CIRCUIT | | |
| SYMBOLS | PARAMETERS AND CONDITIONS | UNITS | MIN | TYP | MAX | MIN | TYP | MAX | MIN | TYP | MAX | MIN | TYP | MAX |
| I _{CC} | Circuit Current (no signal) | mA | 37 | 47 | 57 | 39 | 49 | 59 | 37 | 47 | 57 | 39 | 49 | 59 |
| CG ³ | Conversion Gain (P _{RF} = -30 dBm) | | | | | | | | | | | | | |
| | f _{RF} = 55 MHz | dB | 16.5 | 20 | 23.5 | | | | 21.5 | 25 | 28.5 | | | |
| | f _{RF} = 200 MHz | dB | 16.5 | 20 | 23.5 | | | | 21.5 | 25 | 28.5 | | | |
| | f _{RF} = 470 MHz | dB | 16.5 | 20 | 23.5 | 19.5 | 23 | 26.5 | 21.5 | 25 | 28.5 | 27.5 | 31 | 34.5 |
| | f _{RF} = 890 MHz | dB | | | | 19.5 | 23 | 26.5 | | | | 27.5 | 31 | 34.5 |
| CG ⁴ | Conversion Gain (P _{RF} = -30 dBm) | | | | | | | | | | | | | |
| | f _{RF} = 55 MHz | dB | | 22 | | | | | | 27.5 | | | | |
| | f _{RF} = 360 MHz | dB | | 22.5 | | | | | | 28 | | | | |
| | f _{RF} = 400 MHz | dB | | | | | 27 | | | | | | 35.5 | |
| | f _{RF} = 800 MHz | dB | | | | | 26.5 | | | | | | 35 | |
| P _{SAT} ³ | Saturated Output Power (P _{RF} = 0 dBm) | | | | | | | | | | | | | |
| | f _{RF} = 55 MHz | dBm | 10 | 13 | | | | | 10 | 13 | | | | |
| | f _{RF} = 200 MHz | dBm | 10 | 13 | | | | | 10 | 13 | | | | |
| | f _{RF} = 470 MHz | dBm | 10 | 13 | | | | | 10 | 13 | | | | |
| | f _{RF} = 890 MHz | dBm | | | | 10 | 13 | | | | | 10 | 13 | |

Notes:

1. Mode Select (Pin 5) = open.
2. Mode Select (Pin 5) = 9 V.
3. Measured with external LO, P_{LO} = -5 dBm.
4. Measured with internal LO

ELECTRICAL CHARACTERISTICS (TA = 25°C, VCC = 9 V, fIF = 45 MHz)

| PART NUMBER PACKAGE OUTLINE | | | UPC2743GS G20 | | | | | | UPC2744GS G20 | | | | | |
|--------------------------------|----------------------------------|----------------------------|-----------------------------|------|-----|-----------------------------|------|-----|-----------------------------|------|-----|-----------------------------|------|-----|
| | | | VHF ¹ CIRCUIT | | | UHF ² CIRCUIT | | | VHF ¹ CIRCUIT | | | UHF ² CIRCUIT | | |
| SYMBOLS | PARAMETERS AND CONDITIONS | UNITS | MIN | TYP | MAX | MIN | TYP | MAX | MIN | TYP | MAX | MIN | TYP | MAX |
| P _{osc} ⁴ | Power at OSC Output (Pin 6) | | -20 | | 0 | -20 | | 0 | -20 | | 0 | -20 | | 0 |
| | f _{LO} = 100 to 900 MHz | dBm | | | | | | | | | | | | |
| | f _{LO} = 100 MHz | dBm | | -4 | | | -4 | | | -4 | | | -4 | |
| | f _{LO} = 405 MHz | dBm | | -5 | | | -5 | | | -5 | | | -5 | |
| | f _{LO} = 445 MHz | dBm | | -9 | | | -9 | | | -9 | | | -9 | |
| | f _{LO} = 845 MHz | dBm | | -13 | | | -13 | | | -13 | | | -13 | |
| NF ³ | Noise Figure | f _{RF} = 55 MHz | dB | 13 | 16 | | | | | 11 | 14 | | | |
| | | f _{RF} = 200 MHz | dB | 13 | 16 | | | | | 11 | 14 | | | |
| | | f _{RF} = 470 MHz | dB | 13 | 16 | | 12 | 15 | | 11 | 14 | | 10 | 13 |
| | | f _{RF} = 890 MHz | dB | | | | 12 | 15 | | | | | 10 | 13 |
| NF ⁴ | Noise Figure | f _{RF} = 55 MHz | dB | 12.3 | | | | | | 9.2 | | | | |
| | | f _{RF} = 360 MHz | dB | 13.4 | | | | | | 9.4 | | | | |
| | | f _{RF} = 400 MHz | dB | | | | 11.0 | | | | | | 8.3 | |
| | | f _{RF} = 800 MHz | dB | | | | 12.7 | | | | | | 10.0 | |
| CM ⁵ | 1% Cross Modulation | f _{des} = 55 MHz | dBμ | | 97 | | | | | 92 | | | | |
| | | f _{des} = 360 MHz | dBμ | | 94 | | | | | 90 | | | | |
| | | f _{des} = 400 MHz | dBμ | | | | | 92 | | | | | 82 | |
| | | f _{des} = 800 MHz | dBμ | | | | | 90 | | | | | 80 | |
| S/I ⁶ | Six Channel Beat | dBc | | 57.5 | | | | | | 53.5 | | | | |

Notes:

1. Mode Select (Pin 5) = open.
2. Mode Select (Pin 5) = 9 V.
3. Measured with external LO, P_{LO} = -5 dBm.
4. Measured with internal LO.
5. f_{UNDESIRE}D = f_{DESIRE}D + 12 MHz, P_{IN} = -30 dBm, AM 100 KHz, 30% modulation, S/I ratio = 46 dBc, open output terminal.
6. f_p = 83.25 MHz, f_s = 87.75, P_{IN} = -30 dBm each, f_{LO} = 129 MHz.

ABSOLUTE MAXIMUM RATINGS¹ (TA = 25°C)

| SYMBOLS | PARAMETERS | UNITS | RATINGS |
|------------------|--------------------------------------|-------|-------------|
| V _{CC} | Supply Voltage | V | 11.0 |
| P _T | Total Power Dissipation ² | mW | 750 |
| T _{OP} | Operating Temperature | °C | -20 to +75 |
| T _{STG} | Storage Temperature | °C | -55 to +150 |

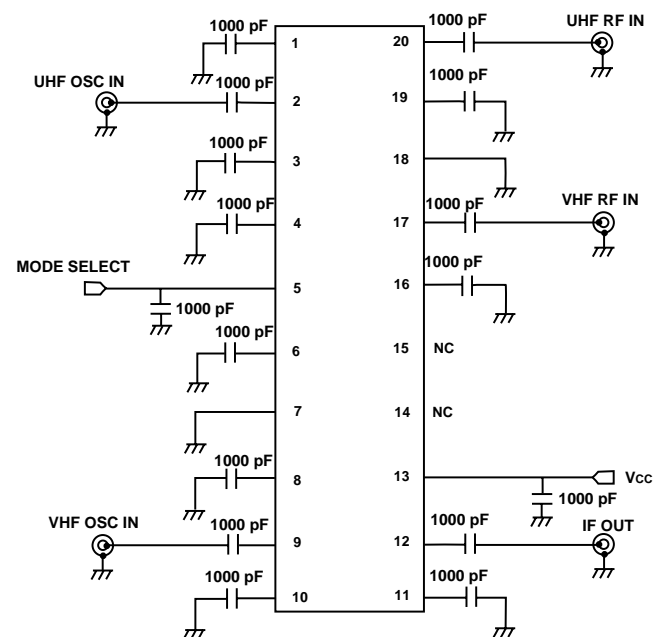
Notes:

1. Operation in excess of any one of these parameters may result in permanent damage.
2. Mounted on a 50 x 50 x 1.6 mm epoxy glass PWB (TA = +75°C).

RECOMMENDED OPERATING CONDITIONS

| SYMBOLS | PARAMETERS | UNITS | MIN | TYP | MAX |
|-----------------|----------------|-------|-----|-----|------|
| V _{CC} | Supply Voltage | V | 8.0 | 9.0 | 10.0 |

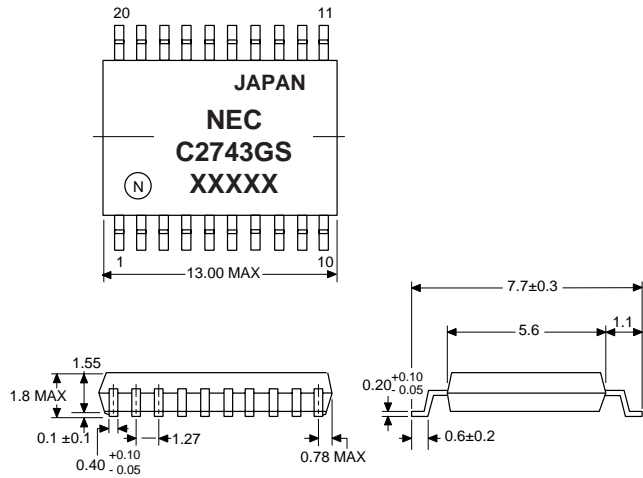
TEST CIRCUIT - EXTERNAL OSCILLATOR



| MODE | V _{CC} | MODE SELECT |
|------|-----------------|-------------|
| VHF | 9V | Open |
| UHF | 9V | 9V |

OUTLINE DIMENSIONS¹ (Units in mm)

PACKAGE OUTLINE² G20

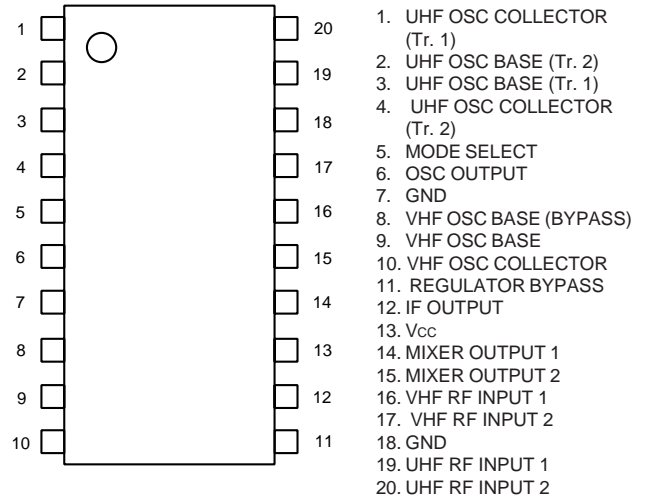


Notes:

1. All dimensions are typical unless otherwise specified.
2. Package will be marked 2743 or 2744 as shown. "XXXXX" is date/lot code.

LEAD CONNECTIONS

(Top View)



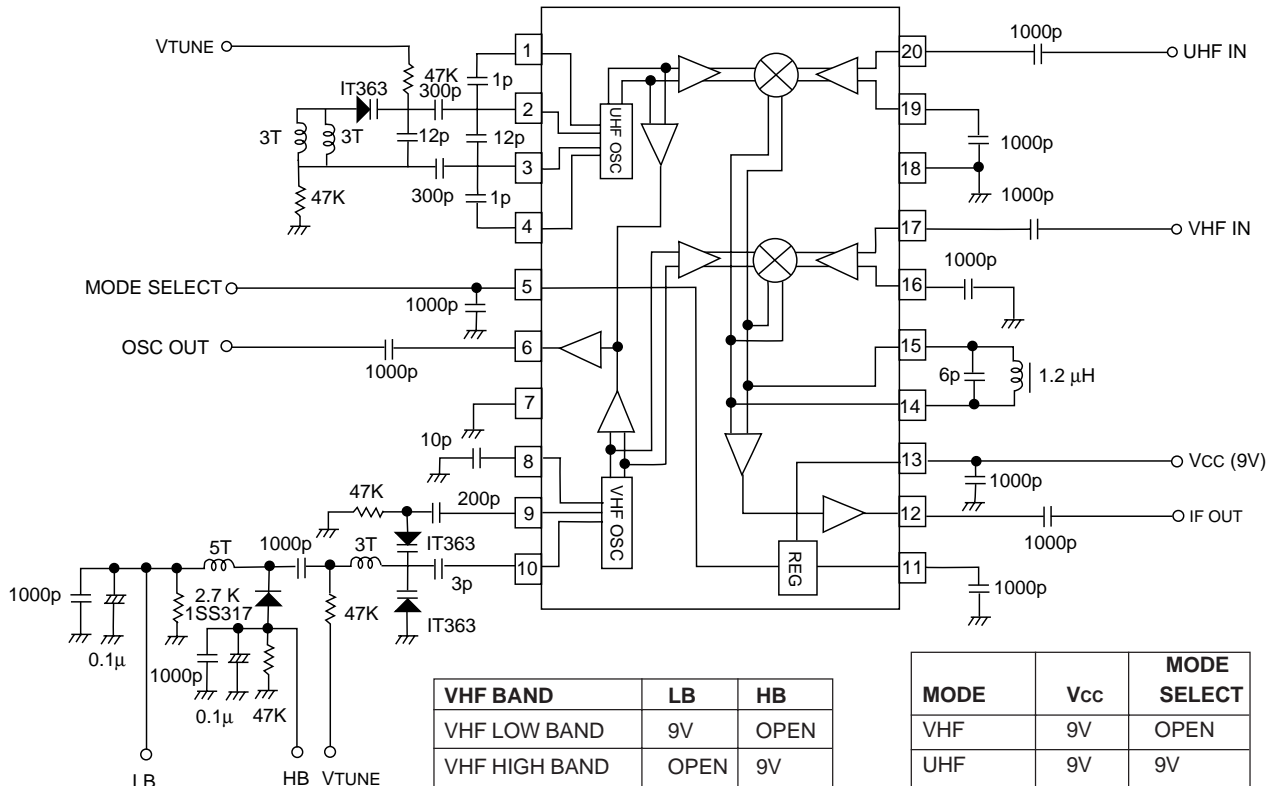
ORDERING INFORMATION

| PART NUMBER | QTY |
|--------------|---------------|
| UPC2743GS-E1 | 2500 per Reel |
| UPC2744GS-E1 | 2500 per Reel |

Note:

Embossed Tape, 24 mm wide,
Pins 1-10 are in tape pull-out direction.

TEST CIRCUIT - INTERNAL OSCILLATOR



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