

FSK Modulator/Demodulator

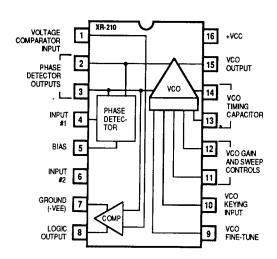
GENERAL DESCRIPTION

The XR-210 is a highly versatile monolithic phase-locked loop system, especially designed for data communications. It is particularly well suited for FSK modulation/demodulation (MODEM) applications, frequency synthesis, tracking filters, and tone decoding. The XR-210 operates over a power supply range of 5V to 26V, and over a frequency band of 0.5 Hz to 20 MHz. The circuit can accommodate analog signals between $300\mu V$ and 3V, and can interface with conventional DTL, TTL, and ECL logic families.

FEATURES

Wide Frequency Range 0.5 Hz to 20 MHz Wide Supply Voltage Range 5V to 26V Digital Programming Capability RS-232C Compatible Demodulator Output DTL, TTL and ECL Logic Compatibility Wide Dynamic Range 300μV to 3V ON-OFF Keying & Sweep Capability Wide Tracking Range ±1% to ±50% Good Temperature Stability 200 ppm/°C High-Current Logic Output 50 mA Independent "Mark" and "Space" Frequency Adjustment VCO Duty Cycle Control

FUNCTIONAL BLOCK DIAGRAM



APPLICATIONS

Data Synchronization
Signal Conditioning
FSK Generation
Tone Decoding
Frequency Synthesis
FSK Demodulation
Tracking Filter
FM Detection
FM and Sweep Generation
Wideband Discrimination

ABSOLUTE MAXIMUM RATINGS

Power Supply 26 Volts
Power Dissipation 750 mW
Derate Above +25°C 6.0 mW/°C
Storage Temperature -65°C to + 150°C
Rev-C

SYSTEM DESCRIPTION

The XR-210 is made up of a stable wide-range voltage- controlled oscillator (VCO), exclusive OR gate type phase detector, and an analog voltage comparator. The VCO, which produces a square wave as an output, is either used in conjunction with the phase detector to form a phase-locked loop (PLL) for FSK demodulation and tone detection or as a generator in FSK modulation schemes. The phase detector when used in the PLL configuration produces a differential output voltage with a 6 K Ω output impedance, which when capacitively loaded forms a single pole loop filter. The voltage comparator is used to sense the phase detector output and produces the output in the FSK demodulation connection.

XR-210

| ELECTRICAL | PERFORMANCE | CHARACTERISTICS - XR-210 |
|-------------------|-------------|--------------------------|
| | | |

| LECTRICAL PERFORMANCE CHARACTERISTICS - X1-210 | | | LIMITS | | | GROUP A | |
|--|------------------------|---------------------------|------------------------------|------|-------|---------|----------|
| TEST | SYMBOL | CONDITIONS | TEMPERATURE | MIN | MAX | UNIT | SUBGROUP |
| | | | T .050C | 5.0 | 16.0 | mA | 1 |
| Supply Current | Icc | V _{CC} = ±6V | T _A = +25°C | 5.0 | 20.0 | mA | 2,3 |
| | | | -55°C≤T _A ≤+125°C | 5.0 | 20.0 | IIIA : | 2,0 |
| Supply Current I _{CC} | V _{CC} = ±13V | T _A = +25°C | | 26.0 | mΑ | 1 | |
| | ,00 | 100 | -55°C≤T _A ≤+125°C | | 26.0 | mA | 2,3 |
| VCO Power | PSR | ±6V≤V _{CC} ≤±12V | T _A =+25°C | | 0.5 | %/V | 9 |
| Supply Stability | | | -55°C≤T _A ≤+125°C | | 1.0 | %/V | 10,11 |
| VCO Sweep | FSW | | T _A = +25°C | 5:1 | | | 9 |
| | 1011 | | -55°C≤T _A ≤+125°C | 3:1 | | | 10,11 |
| Range | | | 00 01 M | | | | |
| VCO Duty | DC | | T _A = +25°C | | ±3 | % | 9 |
| Cycle Asymmetry | | | -55°C≤T _A ≤+125°C | | ±10 | % | 10,11 |
| O yulo | | | ,, | | | | |
| Phase Detector | | Measured Across Pin 1 | T _A = +25°C | | ±150 | m∨ | 1 |
| Output | | | ' | | 1450 | mV | 2.3 |
| Offset Voltage | | and Pin 3,VIN =0 | -55°C≤T _A ≤+125°C | | ±150 | mv | 2,3 |
| Logic Output | 10н | V _{CC} = ±12V | T _A = +25°C | 1 | 10.0 | μА | 1 |
| Leakage Current | , OH | V _{CC} = ±6V | -55°C≤T _A ≤+125°C | ! | 100.0 | μА | 2,3 |
| Leakage Current | İ | 100 - 201 | 00 02 A | ŀ | | , | |
| Logic Output | VOL | 1 _L = 10 mA | T _A = +25°·C | | 0.4 | V | 1 |
| Low Voltage |) IOL | _ | -55°C≤T _A ≤+125°C | | 0.7 | V | 2,3 |
| Lon Tonage | | | | | | | |
| Logic Output | ISINK | V _o ≤1V | T _A =+25°C | 30 | | mA | 1 |
| Sink Current | 0,147 | | -55°C≤T _A ≤+125°C | 25 | | mA | 2,3 |