

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 μ 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	300 μ V to 3V
ON-OFF Keying & Sweep Capability	
Wide Tracking Range	$\pm 1\%$ to $\pm 50\%$
Good Temperature Stability	200 ppm/ $^{\circ}$ C
High-Current Logic Output	50 mA
Independent "Mark" and "Space"	
Frequency Adjustment	
VCO Duty Cycle Control	

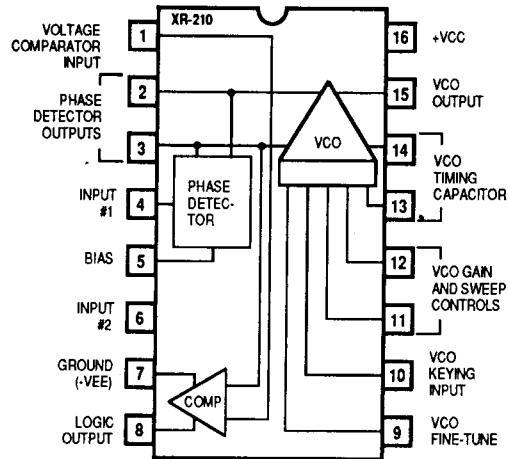
APPLICATIONS

- 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 $^{\circ}$ C	6.0 mW/ $^{\circ}$ C
Storage Temperature	- 65 $^{\circ}$ C to + 150 $^{\circ}$ C
Rev-C	

FUNCTIONAL BLOCK DIAGRAM



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

TEST	SYMBOL	CONDITIONS	TEMPERATURE	LIMITS		UNIT	GROUP A SUBGROUP
				MIN	MAX		
Supply Current	I_{CC}	$V_{CC} = \pm 6V$	$T_A = +25^\circ C$	5.0	16.0	mA	1
			$-55^\circ C \leq T_A \leq +125^\circ C$	5.0	20.0	mA	2,3
Supply Current	I_{CC}	$V_{CC} = \pm 13V$	$T_A = +25^\circ C$		26.0	mA	1
			$-55^\circ C \leq T_A \leq +125^\circ C$		26.0	mA	2,3
VCO Power	PSR	$\pm 6V \leq V_{CC} \leq \pm 12V$	$T_A = +25^\circ C$		0.5	%/V	9
Supply Stability			$-55^\circ C \leq T_A \leq +125^\circ C$		1.0	%/V	10,11
VCO Sweep Range	FSW		$T_A = +25^\circ C$	5:1			9
			$-55^\circ C \leq T_A \leq +125^\circ C$	3:1			10,11
VCO Duty Cycle Asymmetry	DC		$T_A = +25^\circ C$		± 3	%	9
			$-55^\circ C \leq T_A \leq +125^\circ C$		± 10	%	10,11
Phase Detector Output Offset Voltage		Measured Across Pin 1	$T_A = +25^\circ C$		± 150	mV	1
		and Pin 3, $V_{IN} = 0$	$-55^\circ C \leq T_A \leq +125^\circ C$		± 150	mV	2,3
Logic Output Leakage Current	I_{OH}	$V_{CC} = \pm 12V$	$T_A = +25^\circ C$		10.0	μA	1
		$V_{CC} = \pm 6V$	$-55^\circ C \leq T_A \leq +125^\circ C$		100.0	μA	2,3
Logic Output Low Voltage	V_{OL}	$I_L = 10 \text{ mA}$	$T_A = +25^\circ C$		0.4	V	1
			$-55^\circ C \leq T_A \leq +125^\circ C$		0.7	V	2,3
Logic Output Sink Current	I_{SINK}	$V_O \leq 1V$	$T_A = +25^\circ C$	30		mA	1
			$-55^\circ C \leq T_A \leq +125^\circ C$	25		mA	2,3