Monolithic Function Generator

GENERAL DESCRIPTION

The XR-2206 is a monolithic function generator integrated circuit capable of producing high quality sine, square, triangle, ramp, and pulse waveforms of high- stability and accuracy The output waveforms can be both amplitude and frequency modulated by an external voltage. Frequency of operation can be selected externally over a range of 0.01 Hz to more than 1 MHz.

The circuit is ideally suited for communications, instrumentation, and function generator applications requiring sinusoidal tone, AM, FM, or FSK generation. It has a typical drift specification of 20 ppm/°C. The oscillator frequency can be linearly swept over a 2000:1 frequency range, with an external control voltage, having a very small affect on distortion.

FEATURES

Low-Sine Wave Distortion	0.5%, Typical
Excellent Temperature Stability	20 ppm/°C, Typical
Wide Sweep Range	2000:1, Typical
Low-Supply Sensitivity	0.01%V, Typical
Linear Amplitude Modulation	
TTL Compatible FSK Controls	
Wide Supply Range	10V to 26V
Adjustable Duty Cycle	1% to 99%

APPLICATIONS

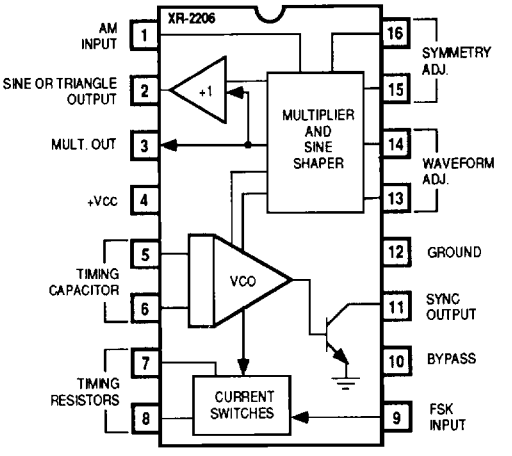
Waveform Generation
Sweep Generation
AM/FM Generation
V/F Conversion
FSK Generation
Phase-Locked Loops (VCO)

ABSOLUTE MAXIMUM RATINGS

Power Supply	26V
Power Dissipation	750 mW
Derate Above 25°C	5 mW/°C
Total Timing Current	6 mA
Storage Temperature	-65°C to + 150°C

Rev-A

FUNCTIONAL BLOCK DIAGRAM



SYSTEM DESCRIPTION

The XR-2206 is comprised of four functional blocks; a voltage-controlled oscillator (VCO), an analog multiplier and sine-shaper; a unity gain buffer amplifier; and a set of current switches.

The VCO actually produces an output frequency proportional to an input current, which is produced by a resistor from the timing terminals to ground. The current switches route one of the timing pins current to the VCO controlled by an FSK input pin, to produce an output frequency. With two timing pins, two discrete output frequencies can be independently produced for FSK Generation Applications.

ELECTRICAL PERFORMANCE CHARACTERISTICS - XR-2206

TEST	SYMBOL	CONDITIONS	TEMPERATURE	LIMITS MIN	LIMITS MAX	UNIT	GROUP A SUBGROUP
Supply Current	Icc1	Vcc = 12V	TA = +25°C		17.0	mA	1
			-55°C≤TA≤+125°C		17.0	mA	2, 3
Supply Current	Icc2	Vcc = 26V	TA = +25°C		25.0	mA	1
			-55°C≤TA≤+125°C		25.0	mA	2, 3
Squarewave Leakage Current	IL	V11 =26V	TA = +25°C		20	µA	1
			-55°C≤TA≤+125°C		20	µA	2, 3
Squarewave Saturation Voltage	VSAT	IL=2mA	TA = +25°C		0.4	V	1
			-55°C≤TA≤+125°C		0.6	V	2, 3
Reference Bypass Voltage	VREF	AT Pin 10	TA = +25°C	2.9	3.3	V	1
			-55°C≤TA≤+125°C	2.5	3.5	V	2, 3
FSK Input Threshold	VINKEY	Vcc = 12V	TA = +25°C	0.8	2.4	V	1
			-55°C≤TA≤+125°C	0.8	2.4	V	2, 3
Max. Frequency	FMAX	RT = 1Kohm	TA = +25°C	500		KHz	9
		CT = 1000PF	-55°C≤TA≤+125°C	500		KHz	10, 11
Frequency Accuracy	Fo	Vcc = 12V	TA = +25°C	.96	1.04	KHz	9
		CT = 0.01µF	-55°C≤TA≤+125°C	.96	1.04	KHz	10, 11
		RT = 100Kohm					
Frequency Accuracy	Fo	Vcc = 12V	TA = +25°C	9.0	11.0	KHz	9
		CT = 0.01µF	-55°C≤TA≤+125°C	9.0	11.0	KHz	10, 11
		RT = 1OKohm					
Frequency Accuracy Low Voltage		Vcc = 10V	TA = +25°C	4.0	6.0	KHz	9
		RT = 20Kohm	-55°C≤TA≤+125°C	4.0	6.0	KHz	10, 11
		CT =.01µF					
		VINKEY = 2.4V					
Frequency Accuracy Low Voltage		Vcc = 10V	TA = +25°C	4.0	6.0	KHz	9
		CT =.01µF	-55°C≤TA≤+125°C				10, 11
		VINKEY = 0.8V					
Frequency Accuracy High Voltage		Vcc = 26V	TA = +25°C	4.0	6.0	KHz	9
		RT = 20Kohm	-55°C≤TA≤+125°C	4.0	6.0	KHz	10, 11
		CT =.01µF					
		VINKEY = 2.4V					
Frequency Accuracy High Voltage		Vcc = 26V	TA = +25°C	4.0	6.0	KHz	9
		RT = 20Kohm	-55°C≤TA≤+125°C	4.0	6.0	KHz	10, 11
		CT =.01µF					
		VINKEY = 0.8V					
Supply Sensitivity	PSRR	Vcc = 10 to 20V	TA = +25°C		0.1	%/V	9
		RT = 20Kohm	-55°C≤TA≤+125°C		0.1	%/V	10, 11
		CT = 0. 01 µF					
		VINKEY =2.4V					

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Supply Sensitivity	PSRR	Vcc 10 to 20V RT = 20Kohm CT = 0.01µF VINKEY = 0.8V	TA = +25°C -55°C≤TA≤+125°C		0.1 0.1	%/V %/V	9 10, 11
Low Timing Resistor	FMAX	RT = 1 KΩ CT = 100pF	TA = +25°C -55°C≤TA≤+125°C	500 500		KHz KHz	9 10, 11
High Timing Resistor	FMIN	RT = 2MΩ CT = 1000pF	TA = +25°C -55°C≤TA≤+125°C	400 400	600 600	Hz Hz	9 10, 11
Sweep Range		FMAX/FMIN	TA = +25°C -55°C≤TA≤+125°C	1000 1000			9 10, 11
Sine Wave Amplitude		RT = 100KΩ CT =.01µF	TA = +25°C -55°C≤TA≤+125°C	40 20	80 120 Kohm	mV/ Kohm mV/	4 5, 6
AM Sine Wave Amplitude		RT= 100KΩ VAM = 3V CT =.01µF	TA = +25°C -55°C≤TA≤+125°C	30 10	60 100 Kohm	mV/ Kohm mV/	4 5, 6
AM Sine Wave Amplitude		AT = 100KΩ VAM = 9V CT =.01µF	TA = +25°C -55°C≤TA≤+125°C	30 10	60 100 Kohm	mV/ Kohm mV/	4 5, 6
AM Sine Wave Amplitude Symmetry			TA = +25°C -55°C≤TA≤+125°C		10 10	mV mV	4 5, 6
Symmetry Adjust Resistor	R15	Pin 15	TA = +25°C -55°C≤TA≤+125°C	1.7 1.5	2.6 3.0	Kohm Kohm	4 5, 6
Symmetry Adjust Resistor	R16	Pin 16	TA = +25°C -55°C≤TA≤+125°C	1.7 1.5	2.6 3.0	Kohm Kohm	4 5, 6
Symmetry Adjust Balance		R16-R15	TA = +25°C -55°C≤TA≤+125°C	-0.1 -0.2	0.1 0.2	Kohm Kohm	4 5, 6