Dual Monolithic Tone Decoder

GENERAL DESCRIPTION

The XR-2567 is a dual monolithic tore decoder of the 567-type that is ideally suited for tone or frequency decoding in multiple-'tone communication systems. Each decoder of the XR-2567 can be used independently or both sections can be interconnected for dual operation. The matching and temperature tracking characteristics between decoders on this monolithic chip are superior to those available from two separate tone decoder packages.

The XR-2567 operates over a frequency range of 0.01 Hz to 500 kHz. Suoply voltages can vary from 4.5V to 12V, with internal voltage regulation provided for supplies between 7V and 12V. Each decoder consists of a phase-locked loop (PLL), a quadrature AM detector, a voltage comparator, and a logic compatible output that can sink more than 100 mA of load current.

The center frequency of each decoder is set by an external resistor and capacitor which determine the free- running frequency of each PLL. When an input tone is present within the passband of the circuit, the PLL "locks" on the input signal. The logic output, which is normally "high", then switches to a "low" state during this "lock" condition.

FEATURES

Replaces two 567-type decoders
Excellent temperature tracking between decoders
Bandwidth adjustable from 0 to 14 %
Logic compatible outputs with 100 mA sink capability
Center frequency matching (1% typ.)
Center frequency adjustable from 0.01 Hz to 500 kHz
Inherent immunity to false triggering
Frequency range adjustable over 20:1 range by external resistor.

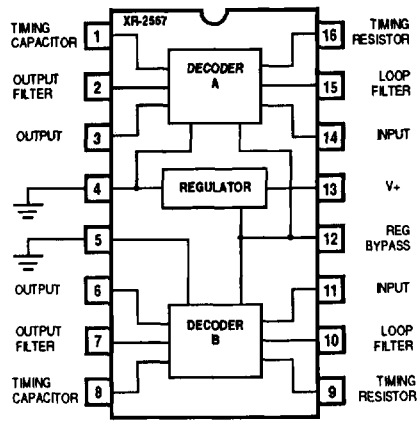
APPLICATIONS

Touch-Tone® Decoding
Sequential Tone Decoding
Dual-Tone Decoding/ Encoding
Communications Paging
Ultrasonic Remote-Control and Monitoring
Full-Duplex Carrier-Tone Transceiver
Wireless Intercom
Dual Precision Oscillator
FSK Generation and Detection

ABSOLUTE MAXIMUM RATINGS

Power Supply	
With Internal Regulator	14V
Without Regulator (Pins 12 and 13 shorted)	10V
Power Dissipation	
Ceramic Package	750 mW
Derate Above + 25°C	6 mW/°C
Storage Temperature	-65°C to +150°C
Rev-B	

FUNCTIONAL BLOCK DIAGRAM



SYSTEM DESCRIPTION

The XR-2567 dual monolithic tone decoder consists of two independent 567-type circuits and an on board voltage regulator. Each decoder has a phase detector, low pass filter, and current controlled oscillator which comprise the basic phase locked loop, plus an additional low pass filter and quadrature detector enabling detection of in-band signals. Both devices have normally high open collector outputs capable of sinking 100 mA.

The input signal is applied to Pin 14 (device A) or Pin 11 (device B), both with 20 kΩ nominal input resistance. Free running frequency is controlled by an RC network at Pins 1 and 16 (device A) or Pins 8 and 9 (device B). A capacitor on Pin 2 (A), or Pin 7 (B) serves as the output filler and eliminates out-of-band triggering. PLL fillering is accomplished with a capacitor on Pin 15 (A), or Pin 10 (B) bandwidth and skew are also dependent upon the circuitry here. Bandwidth is adjustable from 0% to 14% of the center frequency. Pin 13 is +Vcc (4.75 to 12V nominal, 14V maximum): Pin 7 is ground; and Pin 3 (A) or Pin 6 (B) is the open collector output, pulling low when an in-band signal triggers the device.

Voltage supplies below 7V necessitate bypassing the internal regulator. This is accomplished by shorting Pin 12 to Vcc, for supplies over 7V, a bypass capacitor of at least 1 µF should AC ground Pin 12.

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ELECTRICAL PERFORMANCE CHARACTERISTICS - XR-2567

TEST	SYMBOL	CONDITIONS	TEMPERATURE	LIMITS MIN	LIMITS MAX	UNIT	GROUP A SUBGROUP
Supply Current Quiescent	Icc	Vcc = +5V	TA = +25°C -55°C≤TA≤+125°C		16.0 16.0	mA mA	1 2, 3
Supply Current Quiescent	Icc	Vcc = +12V	TA = +25°C -55°C≤TA≤+125°C		40.0 40.0	mA mA	1 2, 3
Supply Current Activated	Icc	Vcc = +5V	TA = +25°C -55°C≤TA≤+125°C		26.0 26.0	mA mA	1 2, 3
Highest Center Frequency	Fc	Vcc = +12V	TA = +25°C -55°C≤TA≤+125°C	100 90		KHz KHz	9 10, 11
Highest Center Frequency	Fc	Vcc = +5V	TA = +25°C -55°C≤TA≤+125°C	100 100		KHz KHz	9 10, 11
Center Frequency Drift with Supply	Fo	4.75V≤Vcc≤6.75V	TA = +25°C -55°C≤TA≤+125°C		1.00 3.00	%/V %/V	9 10, 11
Output Saturation Voltage	VSAT	IL = 30 mA Vin = 25 mV	TA = +25°C -55°C≤TA≤+125°C		0.4 0.6	V V	1 2, 3
Output Saturation Voltage	VSAT	IL = 100 mA Vin 25 mV	TA = +25°C -55°C≤TA≤+125°C		1.0 1.0	V V	1 2, 3
Output Leakage Current	IOL	VIN = 7.5mV Vcc = +5v	TA = +25°C -55°C≤TA≤+125°C		25 35	µA µA	1 2, 3
Largest No Output Input Voltage	VIL	Vcc = +5V IL = 100mA	TA = +25°C -55°C≤TA≤+125°C	10 10		mVrms mVrms	4 5, 6
Smallest Detectable Input Voltage	VIS	Vcc = +5V IL = 100mA	TA = +25°C -55°C≤TA≤+125°C		25 50	mVrms mVrms	7 8
Largest Detection Bandwidth	LDBW	Vcc = +5V Vin = 300 mV	TA = +25°C -55°C≤TA≤+125°C	12 10	1 6 27	% %	4 5, 6
Largest Detection Bandwidth Skew	SKEW	Vcc = +5V Vin = 300 mV	TA = +25°C -55°C≤TA≤+125°C		2.00 3.00	% %	4 5, 6