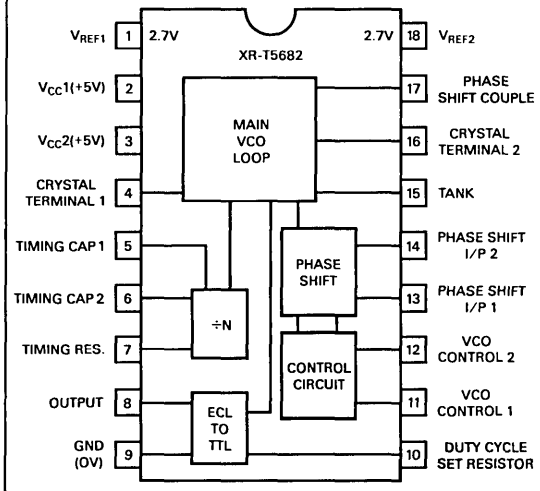
Voltage Controlled Crystal Oscillator

GENERAL DESCRIPTION

The XR-T5682 is a bipolar monolithic voltage controlled crystal oscillator IC designed for general purpose crystal phase locked loop (PLL) and particularly in data rate conversion, jitter reduction, and down multiplexing applications in PCM systems operating at 1.536, 1.544 and 2.048 M/bits/s data rates. It is packaged in 18 pin CERDIP and can operate from 4.75 to 5.25 volts.

FUNCTIONAL BLOCK DIAGRAM



FEATURES

Single +5V Circuit
Built-in Programmable Analog Divider
TTL Compatible Clock Signal Output
Adjustable Duty Cycle of the Output Clock Squarewave
Uses Phase Lead/Lag Capacitor and Inductor Instead of a Varactor Diode to Control Frequency

ORDERING INFORMATION

Part Number	Package	Operating Temperature
XR-T5682	Ceramic	0°C to 70°C

ABSOLUTE MAXIMUM RATINGS

Supply Voltage	+10V
Storage Temperature	-65°C to 150°C
Operating Temperature	0°C to 70°C
Lead Soldering (10 Seconds)	300°C

SYSTEM DESCRIPTION

The XR-T5682 uses phase lead and lag components rather than a varactor diode to control the frequency of oscillations. A filter crystal, at least twice the desired frequency, is used in series oscillation mode. The generated signal is fed back through a phase shift control circuit to sustain and change the frequency of oscillations. An analog divide by N circuit which consists of an astable mutlivibrator is provided to obtain the desired clock rate. The frequency of oscillations of the astable multivibrator can be changed externally by means of a resistor and a capacitor to obtain the required number of divisions. An ECL to TTL convertor circuit is designed to provide a TTL compatible clock signal, the duty cycle of which is adjustable with an external resistor tied either to V_{CO} or Ground.

ELECTRICAL CHARACTERISTICS

Test Conditions: T_A = 25°C at a supply voltage of V_{CC} = 4.75 V to 5.25 V_{DC}, unless otherwise specified.

SYMBOL	PARAMETERS	MIN.	TYP.	MAX.	UNIT	CONDITIONS
V_{CC}	Supply Voltage	4.75	5.0	5.25	V	
I_{CC}	Supply Current	20	35	45	mA	
V_{REF}	Referene Voltage	2.5	2.7	2.9	V	Pin 13
V_{REF}	Reference Voltage	2.5	2.7	2.9	V	Pin 14
V_{REF}	Reference Voltage	2.5	2.7	2.9	V	Pin 1 and 18
V_{OH}	Output High Voltage	4			V	Pin 8
V_{OL}	Output Low Voltage			0.8	V	
I_{TANK}	Tank Circuit Current	1.4	1.73	2.3	mA	Pin 15
I_{TIMING}			1	3	mA	Pin 7
G_C	VCO Convertion Gain	350	650	1000	Hz/V	
	Clock Duty Cycle	25	50	75	%	Adjustable

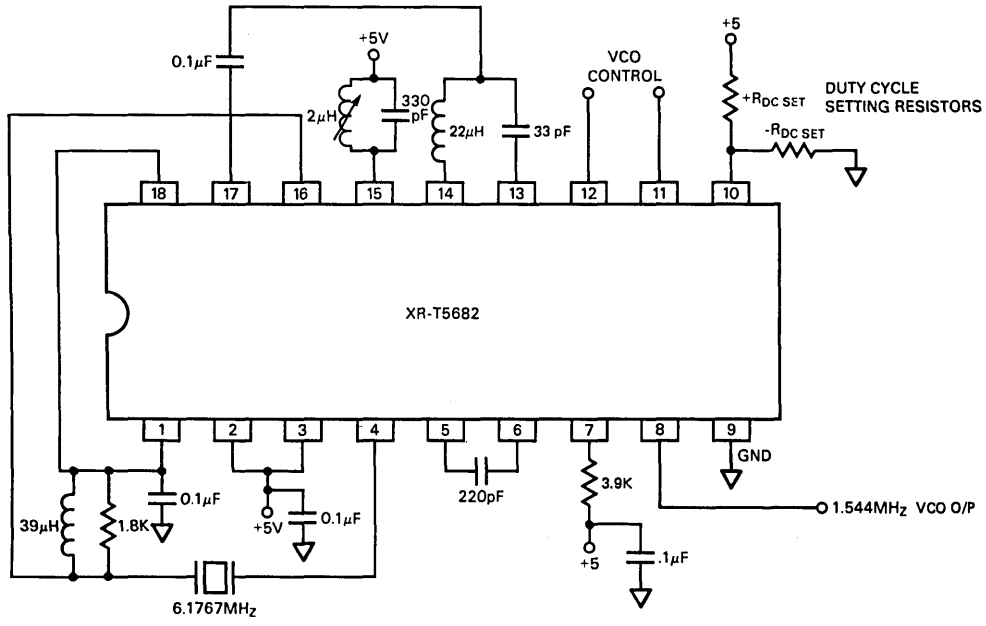


Figure 1. Typical 1.544 M/bits/s Application Circuit

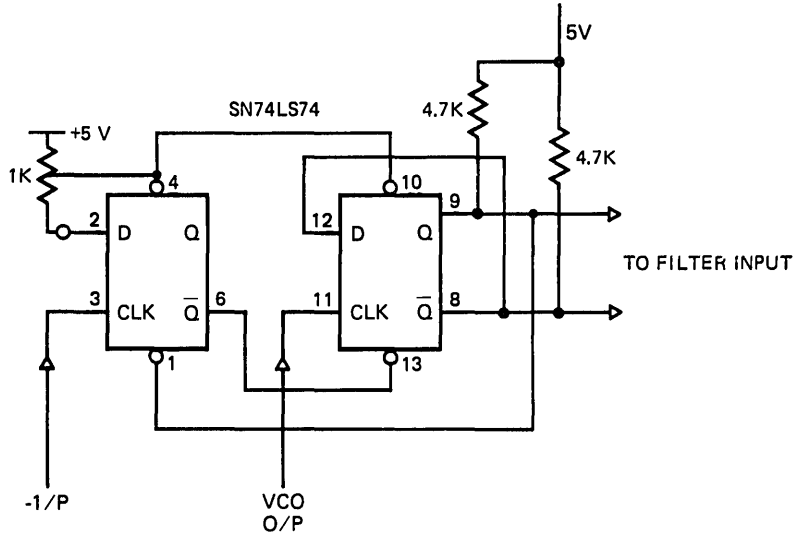


Figure 2. Recommended Phase Detector

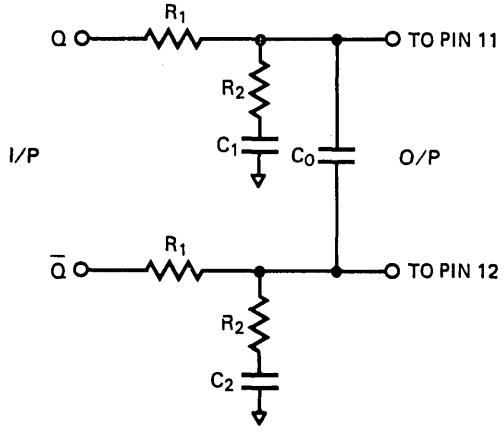


Figure 3. Phase Lag Filter