LABORATORY MEASUREMENTS

RADIATED EMISSIONS

PRODUCT DESCRIPTION: **CONCORD TRANSMITTER**
MODEL NUMBER: **B4Z-703-XMTR**
FUNDAMENTAL **319.5MHz**
POLARIZATION: **HORIZONTAL & VERTICAL**

The highest fundimental emission along with, the three highest spurious and restricted band emissions are listed below as per ANSI C63.4 paragraph 10.1.8.2.

Emissions from .009MHz to the tenth harmonic were measured as per FCC Rules Part 15, Subpart C, paragraph 15.33 (a).

75.9 F
55.9 H

FREQUENCY MHz	ANALYZER READING dBuV	20*LOG DUTY CYCLE -dB	ANTENNA FACTOR dB	FIELD STRENGTH dBM	FIELD STRENGTH uV/m	FCC LIMIT uV/M
319.5	75.5	20	17.4	72.9	4415.7	6229.5
639	30	20	22.4	32.4	41.7	623
958.5	21.75	20	27.5	29.3	29	623
1278	17.85	20	29.3	27.2	22.8	623
R 2236.6	17	20	41.1	38.1	80.4	500
R 1597.5	25.9	20	31.2	37.1	71.6	500
R 2875.6	2.4	20	36.5	18.9	8.8	500

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Emission limits were derived from the table in Paragraph 15.231 (e). 67.9

FREQUENCY MHz	ANALYZER READING dBuV	20*LOG DUTY CYCLE -dB	ANTENNA FACTOR dB	FIELD STRENGTH dBM	FIELD STRENGTH uV/m	FCC LIMIT uV/M
319.5	69.3	20	17.4	66.7	2162.7	2480
1278	17.5	20	29.3	26.8	21.9	248
639	20.75	20	22.4	23.2	14.4	248
958.5	14.25	20	27.5	21.8	12.2	248
1597.5	25.75	20	31.2	37	70.4	500
2236.6	4.2	20	41.1	25.3	18.4	500
2875.6	1.9	20	38.4	18.4	8.3	500

AMBIENT LEVEL IN FORBIDDEN BANDS

Noise floor of spectrum analyzer with antenna factors and duty cycle correction converted to uV/M at approximately one meter.

15.205(a) All forbidden band information is listed below.

FREQUENCY MHz	NOISE FLOOR READING dBuV	20 LOG DUTY CYCLE dB	LOSS FACTOR dB	FIELD STRENGTH uV/M	FCC LIMIT uV/M
.09-.11	N.A.	N.A.	N.A.	N.A.	*
.49-.51	N.A.	N.A.	N.A.	N.A.	*
2.1735-2.1905	N.A.	N.A.	N.A.	N.A.	300
8.362-8.366	N.A.	N.A.	N.A.	N.A.	300
13.36-13.41	N.A.	N.A.	N.A.	N.A.	300
25.5-25.67	N.A.	N.A.	N.A.	N.A.	300
37.5-38.25	N.A.	N.A.	N.A.	N.A.	300
73-75.4	N.A.	N.A.	N.A.	N.A.	300
108-121.94	N.A.	N.A.	N.A.	N.A.	450
123-138	N.A.	N.A.	N.A.	N.A.	450
149.9-150.05	N.A.	N.A.	N.A.	N.A.	450
156.7-156.9	N.A.	N.A.	N.A.	N.A.	450
162.0125-167.17	N.A.	N.A.	N.A.	N.A.	450
167.72-173.2	N.A.	N.A.	N.A.	N.A.	450
240-285	17.45	-20	22	9.4	600
322-335.4	19.35	-20	23.8	14.4	600
399.9-410	19.35	-20	22.1	11.8	600
608-614	0.4	-20	24.6	1.8	600
960-999	0.4	-20	33.4	4.9	600
999-1240	-0.75	-20	26	1.8	1500
1300-1427	-0.75	-20	28	2.3	1500
1435-1626.5	-0.75	-20	28	2.3	1500
1660-1710	-0.75	-20	28	2.3	1500
1717.8-1722.2	-0.75	-20	28	2.3	1500
2200-2300	-1.25	-20	32	3.4	1500
2310-2390	-1.25	-20	32	3.4	1500
2483.5-2500	-1.25	-20	32	3.4	1500
2655-2900	-1.25	-20	34	4.3	1500
3260-3267	NA	NA	NA	NA	1500
3332-3339	NA	NA	NA	NA	1500
3345.8-3358	NA	NA	NA	NA	1500
3600-4400	NA	NA	NA	NA	1500

* Calculated based on 2400/F (kHz) x 300. (See Rule 15.209.)

All measurements were taken with an HP 8566B Spectrum Analyzer. The bandwidth was 100kHz for measurements below 100MHz. The bandwidth was 1MHz for measurements above 1000MHz. The video filter was off.

T U V P R O D U C T S E R V I C E

RADIATED EMISSIONS

Large Test Site
3 Meter Antenna Distance
Equipment Under Test:
ITI
CONCORD HYBRID SECURITY PANEL
Notes: WITH ON BOARD TRANSMITTER.

Report W8264 Run 4
Date 06/09/98 Page 1
Engineer _____
Tech: RMJ _____
Requester _____

Frequency MHz	Level dBuV	Factor dB	Cable dB	Final dBuV/m	Az deg	Polar\ Height	Delta	Delta
ALL READINGS MAXIMIZED.								
319.44	71.65	15.8	1.6	89	--	H	--	
638.94	30	20.1	2.3	52.3	--	V	--	
319.44	75.5	15.8	1.6	92.9	--	V	--	
958.45	21.75	24.6	2.9	49.2	--	V	--	
1278.0	17.85	25.9	3.4	47.1	--	H	--	
1597.5	25.9	27.3	3.9	57	--	V	--	
1917.0	12.55	28.9	4.9	46.4	--	V	--	
2236.6	17	29.9	12	58.9	--	V	--	
2556.1	7	30.7	7.5	45.2	--	V	--	
2875.6	2.4	31.1	5.4	39	--	V	--	
3195.0	.2	31.9	5.4	37.5	--	V	--	
LOW LEVEL MODE TRANSMITTER.								
NOISE FLOOR READING.								
3195.0	.6	31.9	5.4	37.9	--	V	--	
2875.6	1.9	31.1	5.4	38.5	--	V	--	
2556.1	3.55	30.7	7.5	41.7	--	V	--	
2236.5	4.2	29.9	12	46.1	--	V	--	
NOISE FLOOR READING.								
1999.9	-1.25	29.3	6.1	34.1	--	V	--	
1917.0	2.75	28.9	4.9	36.6	--	V	--	
1597.5	25.75	27.3	3.9	56.9	--	V	--	

T U V P R O D U C T S E R V I C E

RADIATED EMISSIONS

Large Test Site
3 Meter Antenna Distance
Equipment Under Test:
ITI
CONCORD HYBRID SECURITY PANEL
Notes: WITH ON BOARD TRANSMITTER.

Report W8264 Run 4
Date 06/09/98 Page 2
Engineer _____
Tech: RMJ _____
Requester _____

Frequency MHz	Level dBuV	Factor dB	Cable dB	Final dBuV/m	Az deg	Polar\ Height	Delta	Delta
1278.0	17.5	25.9	3.4	46.8	--	V	--	
NOISE FLOOR READING.								
1000	-.75	25.4	3	27.6	--	V	--	
958.55	14.25	24.6	2.9	41.7	--	V	--	
639.03	20.75	20.1	2.3	43.1	--	V	--	
NOISE FLOOR READING.								
500	.4	18.8	2	21.2	--	V	--	
319.43	69.3	15.9	1.6	86.7	--	V	--	
319.43	66.55	15.8	1.6	83.9	--	H	--	
NOISE FLOOR READING.								
300	19.25	15	1.5	35.8	--	V	--	
500	19	18.8	2	39.8	--	V	--	
200.1	17.45	12.4	1.3	31.1	--	V	--	

END OF SCAN.

PRELIMINARY INFORMATION

ICS501

MICROCLOCK LOCO™ PLL Clock Multiplier

Description

The ICS501 LOCO™ is the most cost effective way to generate a high quality, high frequency clock output from a lower frequency crystal or clock input. The name LOCO stands for LOw Cost Oscillator, as it is designed to replace crystal oscillators in most electronic systems. Using Phase-Locked-Loop (PLL) techniques, the device uses a standard fundamental mode, inexpensive crystal to produce output clocks up to 160 MHz.

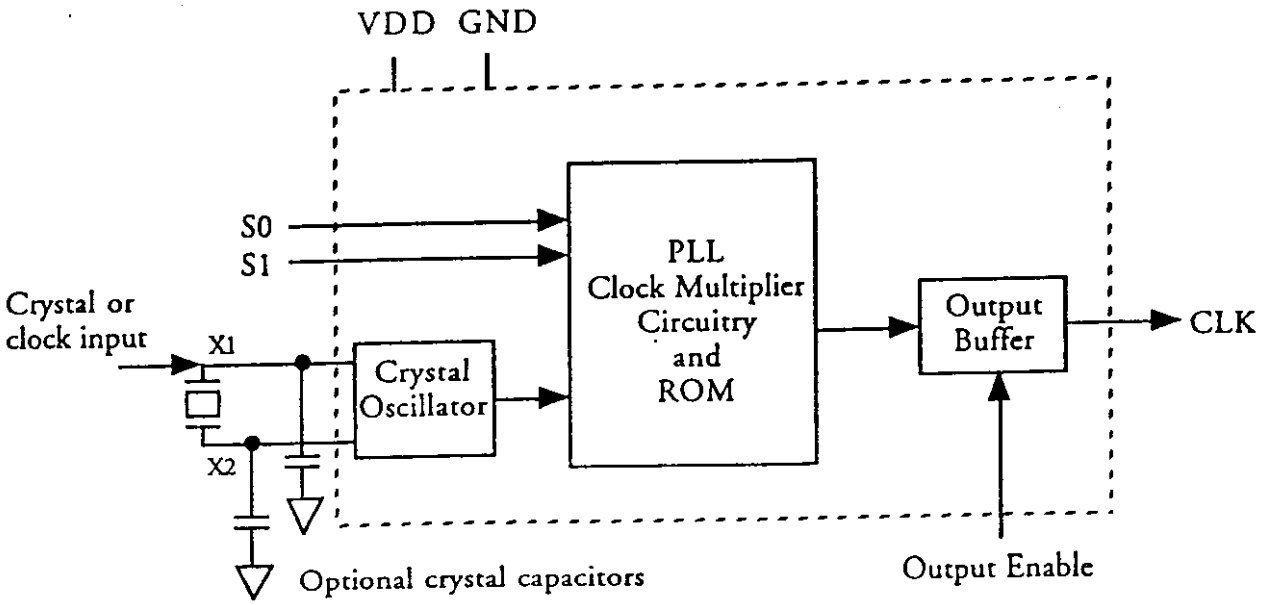
Stored in the chip's ROM is the ability to generate 9 different multiplication factors, allowing one chip to output many common frequencies (see page 2).

The device also has an Output Enable pin that tri-states the clock output when the OE pin is taken low.

Features

- Packaged as 8 pin SOIC or die
- ICS' lowest cost PLL clock
- Zero ppm multiplication error
- Input crystal frequency of 5 - 27 MHz
- Input clock frequency of 2 - 50 MHz
- Output clock frequencies up to 160 MHz
- Extremely low jitter - 25 ps one sigma
- Compatible with all popular CPUs
- Duty cycle of 45/55 up to 160 MHz
- Mask option for 9 selectable frequencies
- Operating voltages of 3.0 to 5.5V
- Tri-state output for board level testing
- 25mA drive capability at TTL levels
- Ideal for oscillator replacement
- Advanced, low power CMOS process

Block Diagram

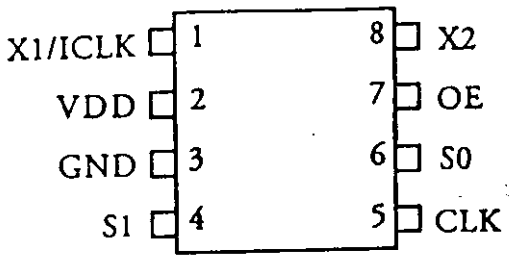


PRELIMINARY INFORMATION

MICROCLOCK

ICS501
LOCO™ PLL Clock Multiplier

Pin Assignment



Clock Output Table

S1	S0	CLK
0	0	4X input
0	M	5.3125X input
0	1	5X input
M	0	6.25X input
M	M	2X input
M	1	3.125X input
1	0	6X input
1	M	3X input
1	1	8X input

0 = connect directly to ground.
1 = connect directly to VDD.
M = leave unconnected (floating).

Common Output Frequencies Examples (MHz)

Output	20	24	30	32	33.33	37.5	40	48	50	60	62.5
Input	10	12	10	16	16.66	12	10	12	16.66	10	20
Selection (S1, S0)	M, M	M, M	1, M	M, M	M, M	M, 1	0, 0	0, 0	1, M	1, 0	M, 1
Output	64	66.66	72	75	80	83.33	90	100	106.25	120	125
Input	16	16.66	12	12	10	16.66	15	20	20	15	20
Selection (S1, S0)	0, 0	0, 0	1, 0	M, 0	1, 1	0, 1	1, 0	0, 1	0, M	1, 1	M, 0

Note that all of the above outputs are achieved by using a common, inexpensive 10MHz to 20MHz crystal. Consult MicroClock/ICS on how to achieve other output frequencies.

Pin Descriptions

Number	Name	Type	Description
1	X1/ICLK	I	Crystal connection or clock input.
2	VDD	P	Connect to +3.3V or +5V.
3	GND	P	Connect to ground.
4	S1	TI	Select 1 for output clock. Connect to GND or VDD or float.
5	CLK	O	Clock output per Table above.
6	S0	TI	Select 0 for output clock. Connect to GND or VDD or float.
7	OE	I	Output Enable. Tri-states CLK output when low. Internal pull-up.
8	X2	O	Crystal connection. Leave unconnected for clock input.

Key: I = Input, TI = Tri-Level Input, O = output, P = power supply connection

* **NOTE:** Schematics give pertinent information on oscillators, frequency blocks and microprocessors.