Advance Information

Multiple Output Clock Synthesizer

MPC9108

MULTIPLE OUTPUT CLOCK SYNTHESIZER

The MPC9108 is a multiple CMOS output clock synthesizer targeted for disk drive applications. The device interfaces to a 20MHz crystal as its frequency source. From this source the device provides a buffered copy of the 20MHz clock as well as synthesized 40MHz and 50MHz output clocks.

- Fully Integrated PLL
- Fully Integrated Crystal Oscillator
- Low cost, low jitter design
- Low cost 8–lead SOIC packaging

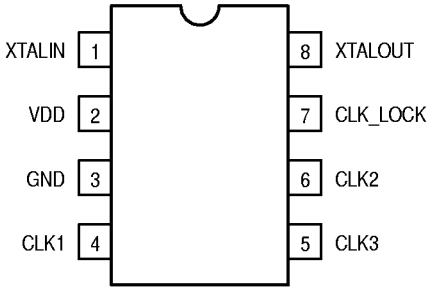
In addition to the output clock frequencies, the MPC9108 also offers a lock indicator output. When the internal PLL achieves phase and frequency lock the CLK_LOCK signal will go HIGH. The pin will remain HIGH unless the PLL loses lock due to input clock or power supply disturbances.

The XTALIN pin (pin 1) can be over–driven with a standard 5V CMOS signal. When an externally generated reference is used the XTALOUT pin should be left open.

The MPC9108 operates from a 5.0V supply across the commercial temperature range of 0°C to 70°C. The 8–lead SOIC package is used to optimize board space efficiency as well as minimizing cost.

D SUFFIX
8–LEAD PLASTIC SOIC PACKAGE
CASE 751–06

Pinout: 8–Lead SOIC
(Top View)

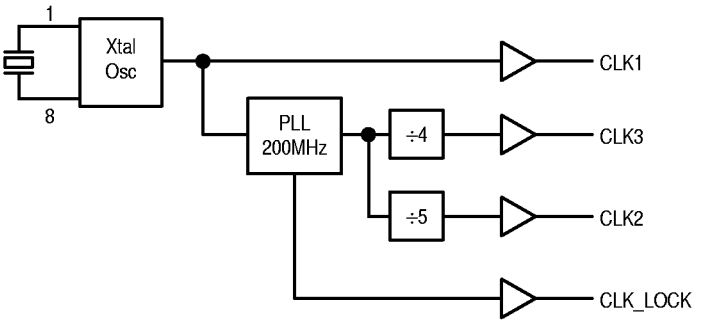


Pin Descriptions

Pin Name	Pin Number	I/O	Function
XTALIN	1	I	20MHz Crystal Connection, External Reference Point
VDD	2	–	+5V Power Supply
GND	3	–	Ground
CLK1	4	O	20MHz Output, Buffer Xtal Output
CLK3	5	O	50MHz Output, PLL Controlled
CLK2	6	O	40MHz Output, PLL Controlled
CLK_LOCK	7	O	HIGH When PLL is Locked
XTALOUT	8	O	Crystal Oscillator Connection

This document contains information on a new product. Specifications and information herein are subject to change without notice.

BLOCK DIAGRAM



MAXIMUM RATINGS*

Symbol	Parameter	Value	Unit
V_{CC}	DC Supply Voltage (Referenced to GND)	–0.5 to +7.0	V
V_{IN}	Input Voltage	–0.5 to +7.0	V
T_A	Operating Temperature Range (In Free-Air)	0 to +70	°C
T_A	Ambient Temperature Range (Under Bias)	–55 to +125	°C
T_{STG}	Storage Temperature Range	–65 to +150	°C

* Maximum Ratings are those values beyond which damage to the device may occur. Functional operation should be restricted to the Recommended Operating Conditions.

DC CHARACTERISTICS ($0°C < T_A < 70°C$; $V_{DD} = 5V \pm 10\%$; Unless Otherwise Stated)

Symbol	Characteristic	Min	Typ	Max	Unit	Condition
V_{IL}	Input Low Voltage			0.8	V	V_{DD} = 5V
V_{IH}	Input High Voltage	2.0			V	V_{DD} = 5V
I_{IL}	Input Low Current			–5	µA	V_{IN} = 0.5V
I_{IH}	Input High Current			5	µA	$V_{IN} = V_{DD}$
V_{OL}	Output Low Voltage CLKn			0.4	V	I_{OL} = 4mA
V_{OL}	Output Low Voltage CLK_LOCK			0.4	V	I_{OL} = 10mA
V_{OH}	Output High Voltage	$0.8V_{DD}$			V	I_{OH} = –30mA
I_{DD}	Supply Current		50	65	mA	No Load; Note 1.
F_D	Output Frequency Change Over Supply & Temp		0.002	0.01	%	With Respect to Typ Freq
I_{SC}	Short Circuit Current	25	40		mA	Each Output Clock
C_I	Input Capacitance			10	pF	Except X1, X2
C_L	Xtal Load Capacitance		20		pF	Pins X1, X2

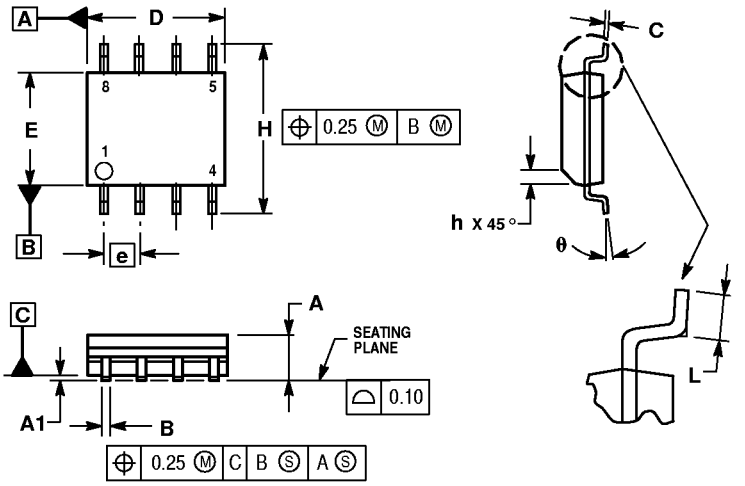
1. All clocks operating at highest frequencies.

AC CHARACTERISTICS (0°C < T_A < 70°C; V_{DD} = 5V ±10%; Unless Otherwise Stated)

Symbol	Characteristic		Min	Typ	Max	Unit	Condition
t_{ICr}	Input Clock Rise Time				20	ns	
t_{ICf}	Input Clock Fall Time				20	ns	
t_r	Output Rise Time	0.8 to 2.0V		1.0	2.0	ns	30pf Load
t_r	Rise Time	20% to 80% V_{DD}		2.0	4.0	ns	30pf Load
t_f	Output Fall Time	2.0 to 0.8V		1.0	2.0	ns	30pf Load
t_f	Fall Time	20% to 80% V_{DD}		2.0	4.0	ns	30pf Load
d_t	Duty Cycle	Pins 4, 6, 5	45/55	48/52	55/45	%	30pf Load
f_i	Input Frequency			20		MHz	
t_{per}	Output Period	Pins 4, 6, 5	–1		1	ns	
t_{lock}	Output Lock Time		0.02	3.0	4.0	ms	

OUTLINE DIMENSIONS

D SUFFIX
PLASTIC SOIC PACKAGE
CASE 751–06
ISSUE T



NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. DIMENSIONS ARE IN MILLIMETER.
3. DIMENSION D AND E DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 PER SIDE.
5. DIMENSION B DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 TOTAL IN EXCESS OF THE B DIMENSION AT MAXIMUM MATERIAL CONDITION.

	MILLIMETERS	
DIM	MIN	MAX
A	1.35	1.75
A1	0.10	0.25
B	0.35	0.49
C	0.19	0.25
D	4.80	5.00
E	3.80	4.00
e	1.27 BSC	
H	5.80	6.20
h	0.25	0.50
L	0.40	1.25
θ	0°	7°

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