



**nWave™ CP5 and CP7
Programmable Clock Oscillator**

FEATURES

- Standard 5x3.2mm or 7x5mm Surface Mount Footprint
- LVCMOS Output
- PLL Technology
- Frequency Range 2 – 200 MHz
- Frequency Stability, ± 50 ppm
- +2.5Vdc or +3.3Vdc Operation
- Operating Temperature to -40°C to $+85^{\circ}\text{C}$
- Output Enable (Stand-By)
- Tape & Reel Packaging
- RoHS/Green Compliant

DESCRIPTION

The CP5 and CP7 is a ceramic packaged Programmable Clock oscillator for quick turn delivery. Wide range of frequencies allows engineers to develop new designs and bring them to market faster and more efficiently.

ORDERING INFORMATION

EXAMPLE PART NUMBER: CP7032M7680LABK

CP 7 0 3 2 M 7 6 8 0 L A B K

MODEL NUMBER

CP = Programmable Clock

PACKAGE TYPE

5 = 5x3.2mm, LLC
7 = 7x5mm, LLC

FREQUENCY IN MHz

M – indicates MHz and decimal point.
Frequency is recorded with minimum 4 significant digits to the right of the “M”

PACKAGING OPTIONS

T0 = Tape & Reel 1,000 pcs.
T3 = Tape & Reel 250 pcs.
SP = Slide Pack (tube)
BK = Bulk

STABILITY/TEMPERATURE RANGE

A = ± 50 ppm, -20°C to $+70^{\circ}\text{C}$
B = ± 50 ppm, -40°C to $+85^{\circ}\text{C}$

SUPPLY VOLTAGE

L = +3.3V
N = +2.5V

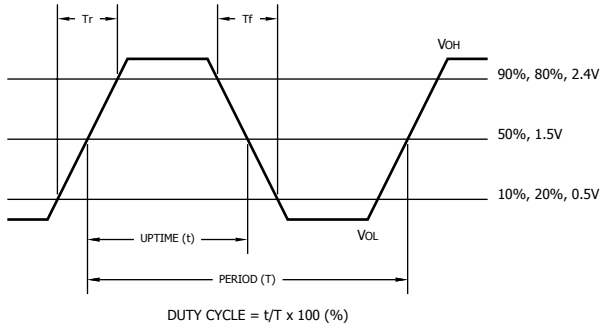
ELECTRICAL CHARACTERISTICS

	PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
ABSOLUTE MAXIMUMS	Maximum Supply Voltage	V_{CC}	-	-0.5	-	4.6	V
	Storage Temperature	T_{STG}	-	-55	-	125	°C
	Frequency Range	f_0	-	2	-	200	MHz
	Frequency Stability (See Note 1 and Ordering Information)	$\Delta f/f_0$	-	-	-	50	± ppm
	Operating Temperature Commercial	T_A	-	-20	25	70	°C
	Industrial			-40		85	
Data Retention	-	@ 85°C	10	-	-	Years	
ELECTRICAL AND WAVEFORM PARAMETERS	Supply Voltage (See Note 2)	V_{CC}	± 10 %	2.25 2.97	2.5 3.3	2.75 3.63	V
	Supply Current	I_{CC}	@ $C_L = 15$ pF	-	-	40	mA
	Output Load	C_L	-	-	-	15	pF
	Output Voltage Levels						
	Logic '1' Level	V_{OH}	CMOS Load $I_{OH} = -4$ mA	0.1 V_{CC}	-	-	V
	Logic '0' Level	V_{OL}	CMOS Load $I_{OL} = +4$ mA	-	-	0.9 V_{CC}	
	Output Duty Cycle	SYM	@ 50% Level	45	-	55	%
	Rise and Fall Time	T_{R} , T_{F}	@ 20% - 80% Levels	-	2.5	4	ns
	Start Up Time	T_S	Application of V_{CC}	-	-	10	ms
	Enable Function						
	Enable Input Voltage	V_{IH}	Pin 1 Logic '1', Output Enabled	0.7 V_{CC}	-	-	V
	Disable Input Voltage	V_{IL}	Pin 1 Logic '0', Output Disabled	-	-	0.2 V_{CC}	
	Standby Current	I_{ST}	Pin 1 Logic '0', Output Disabled	-	-	10	uA
Enable Start Up Time	T_{PLZ}	Pin 1 Logic '1', Output Enabled	-	-	10	ms	
Jitter (peak - peak)	J_{p-p}	10k hits & 0.1 uF bypass capacitor	-	100	250	ps	
Phase Jitter	t_{jms}	Bandwidth 12kHz - 20MHz	-	2.5	-	ps RMS	

Notes:

- Inclusive of initial tolerance at time of shipment, changes in supply voltage, load, temperature and first year aging at an average operating temperature of +40 °C.
- Power supply start-up time should be greater than 150 us (0% V_{CC} to 90% V_{CC}).

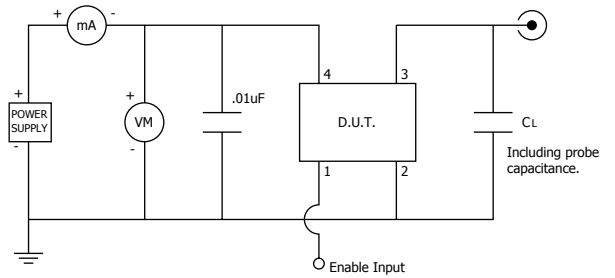
CMOS/TTL OUTPUT WAVEFORM



ENABLE TRUTH TABLE

PIN 1	PIN 3
Logic '1'	Output
Open	Output
Logic '0'	High Imp.

TEST CIRCUIT, CMOS LOAD

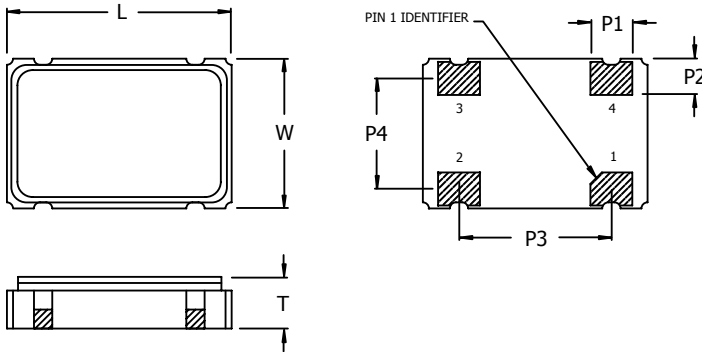


D.U.T. PIN ASSIGNMENTS

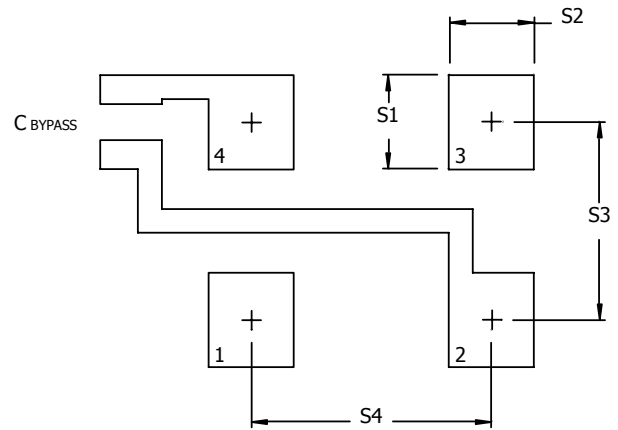
PIN	SYMBOL	DESCRIPTION
1	EOH	Enable Input (Standby)
2	GND	Circuit & Package Ground
3	Output	RF Output
4	V _{CC}	Supply Voltage

MECHANICAL SPECIFICATIONS

PACKAGE DRAWING



SUGGESTED SOLDER PAD GEOMETRY



DIMENSION TABLE

PACKAGE	L	W	T	P1	P2	P3	P4	S1	S2	S3	S4
CP5	5.0 ± 0.2	3.2 ± 0.2	1.2 Max	1.2	1.0	2.54	2.2	1.2	1.4	2.2	2.54
	0.197 ± 0.008	0.126 ± 0.008	0.047 Max	0.047	0.039	0.100	0.087	0.047	0.055	0.087	0.100
CP7	7.0 ± 0.2	5.0 ± 0.2	1.6 Max	1.4	1.2	5.08	3.7	2.0	1.8	4.2	5.08
	0.276 ± 0.008	0.197 ± 0.008	0.063 Max	0.055	0.047	0.200	0.146	0.079	0.071	0.165	0.200

Key: $\frac{\quad}{\quad}$
mm
Inch

ENVIRONMENTAL SPECIFICATIONS

Temperature Cycle:	400 cycles from -55°C to +125°C, 10 minute dwell at each temperature, 1 minute transfer time between temperatures.
Mechanical Shock:	1,500g's, 0.5mS duration, ½ sinewave, 3 shocks each direction along 3 mutually perpendicular planes (18 total shocks).
Sinusoidal Vibration:	0.06 inches double amplitude, 10 to 55 Hz and 20g's, 55 to 2,000 Hz, 3 cycles each in 3 mutually perpendicular planes (9 times total).
Gross Leak:	No leak shall appear while immersed in an FC40 or equivalent liquid at +125°C for 20 seconds.
Fine Leak:	Mass spectrometer leak rates less than 2x10-8 ATM cc/sec air equivalent.
Resistance to Solder Heat:	Product must survive 3 reflows of +260°C peak, 10 seconds maximum.
High Temperature Operating Bias:	2,000 hours at +125°C, maximum bias, disregarding frequency shift.
Frequency Aging:	1,000 hours at +85°C, full bias, less than ±5 ppm shift.
Moisture Sensitivity Level:	Level 1 per JEDEC J-STD-020.

QUALITY AND RELIABILITY

Quality systems meet or exceed the requirements of ISO 9000:2000 standards.