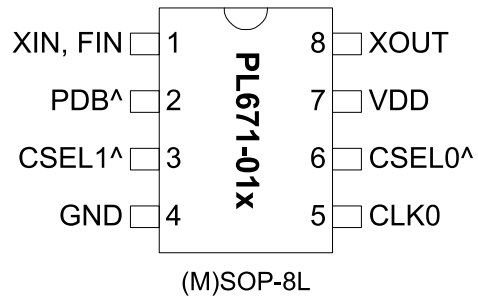


FEATURES

- Accepts Crystal or Reference Clock input
 - Crystal: 10MHz - 40MHz
 - Reference Clock: 10MHz - 150MHz
- Output Frequency up to 150MHz
- Center and Down Spread Spectrum Modulation
- Four selectable configurations
- Max 100ps Cycle to Cycle jitter
- Single 2.5V ~ 3.3V, ± 10% power supply
- Operating temperature range from -40°C to 85°C
- Available in MSOP-8L and SOP-8L GREEN/RoHS compliant packaging
- Custom configurations available, see PL671-01 datasheet

PIN CONFIGURATION



Note: ^ Denotes 60KΩ Pull-up resistor

DESCRIPTION

The PL671-01A, B, C and D are a series of EMI reduction clocks from PhaseLink's PicoEMI product family. This series includes four configurations that provide various spread spectrum modulation amplitudes for the most common EMI reduction requirements. Each configuration provides for a non-spread selection plus three spread levels to choose from.

PL671-01A/B (Modulation Rate = Fin/512)

INPUT*	CSEL0	CSEL1	Multiplier*	PL671-01A Center Spread %*	PL671-01B Down Spread %*
Crystal: 10-40MHz Reference: 10-40MHz	1	1	1X	±0.50%	-1.00%
	1	0		±1.00%	-2.00%
	0	1		±1.50%	-3.00%
	0	0		Spread Spectrum Off	Spread Spectrum Off

PL671-01C/D (Modulation Rate = Fin/1024)

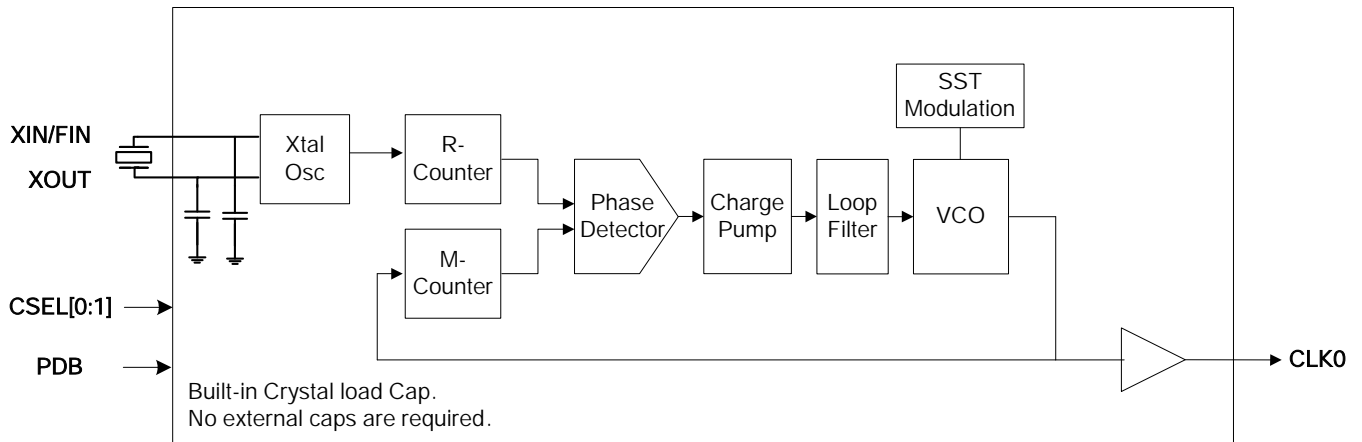
INPUT*	CSEL0	CSEL1	Multiplier*	PL671-01C Center Spread %*	PL671-01D Down Spread %*
Reference: 30-150MHz	1	1	1X	±0.25%	-0.50%
	1	0		±0.50%	-1.00%
	0	1		±1.00%	-2.00%
	0	0		Spread Spectrum Off	Spread Spectrum Off

* For other input/output frequency range, modulation magnitude, modulation rate, output drive, and other features, please see PL671-01 datasheet or contact Phaselink (info@phaselink.com) for more information.

PACKAGE PIN ASSIGNMENT

Name	SOP-8L	Type	Description
XIN, FIN	1	I	Crystal or Reference input pin
PDB	2	I	Power Down input. 60kΩ pull up resistor
CSEL[1:0]	3,6	I	Selector pins used to toggle between four configurations. These pins have 60K ohm internal pull up resistor. See Part Number Configurations table below
GND	4	P	GND connection
CLK0	5	O	Spread Spectrum Clock Output
VDD	7	P	VDD connection (2.25~3.63V)
XOUT	8	O	Crystal output pin. Do Not Connect when using FIN.

BLOCK DIAGRAM



LAYOUT RECOMMENDATIONS

The following guidelines are to assist you with a performance optimized PCB design:

Signal Integrity and Termination Considerations

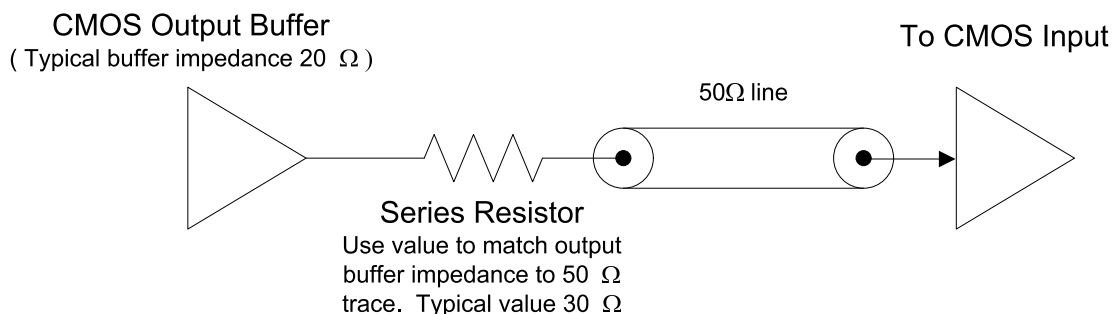
- Keep traces as short as possible.
- Trace = Inductor. With a capacitive load this equals ringing!
- Long trace = Transmission Line. Without proper termination this will cause reflections (looks like ringing).
- Design long traces (>1 inch) as "striplines" or "microstrips" with defined impedance.
- Match trace at one side to avoid reflections bouncing back and forth.

Decoupling and Power Supply Considerations

- Place decoupling capacitors as close as possible to the VDD pin(s) to limit noise from the power supply
- Multiple VDD pins should be decoupled separately for best performance.
- Addition of a ferrite bead in series with VDD can help prevent noise from other board sources
- Value of decoupling capacitor is frequency dependant. Typical values to use are 0.1µF for designs using frequencies < 50MHz and 0.01µF for designs using frequencies > 50MHz.

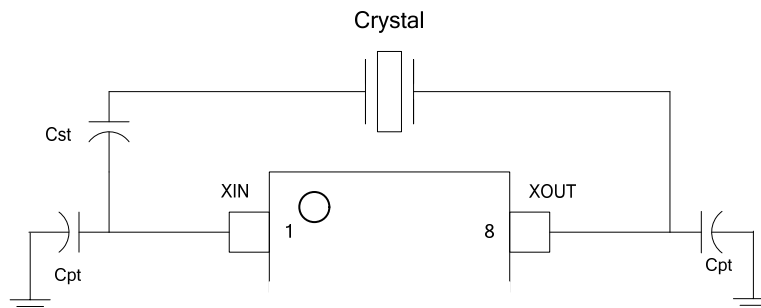
Typical CMOS termination

Place Series Resistor as close as possible to CMOS output



Crystal Tuning Circuit

Series and parallel capacitors used to fine tune the crystal load to the circuit load.



CST - Series Capacitor, used to lower circuit load to match crystal load. Raises frequency offset. This can be eliminated by using a crystal with a Cload of equal or greater value than the oscillator.

CPT - Parallel Capacitors, Used to raise the circuit load to match the crystal load. Lowers frequency offset.

ELECTRICAL SPECIFICATIONS

ABSOLUTE MAXIMUM RATINGS

PARAMETERS	SYMBOL	MIN.	MAX.	UNITS
Supply Voltage Range	V_{DD}	-0.5	4.6	V
Input Voltage Range	V_I	-0.5	$V_{DD}+0.5$	V
Output Voltage Range	V_O	-0.5	$V_{DD}+0.5$	V
Soldering Temperature (Green package)			260	°C
Data Retention @ 85°C		10		Year
Storage Temperature	T_S	-65	150	°C
Ambient Operating Temperature*		-40	85	°C

Exposure of the device under conditions beyond the limits specified by Maximum Ratings for extended periods may cause permanent damage to the device and affect product reliability. These conditions represent a stress rating only, and functional operations of the device at these or any other conditions above the operational limits noted in this specification is not implied. *Operating temperature is guaranteed by design. Parts are tested to commercial grade only.

AC SPECIFICATIONS

PARAMETERS	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Crystal Input Frequency(XIN)	Fundamental Crystal	10		40	MHz
Input (FIN) Frequency		10		150	MHz
Input (FIN) Signal Amplitude	Internally AC coupled (High Frequency)	0.9		V_{DD}	Vpp
Input (FIN) Signal Amplitude	Internally AC coupled (Low Frequency) $3.3V \leq 50MHz, 2.5V \leq 40MHz$	0.1		V_{DD}	Vpp
Output Frequency		1		150	MHz
Settling Time	At power-up (after V_{DD} increases over 2.25V)			2	ms
Output Enable Time	PDB Function; $T_a=25^\circ C, 15pF$ Load			2	ms
Output Rise Time	15pF Load, 10/90% V_{DD}		2.0	3.0	ns
Output Fall Time	15pF Load, 90/10% V_{DD}		2.0	3.0	ns
Duty Cycle	At $V_{DD} / 2$	45	50	55	%
Cycle to Cycle Jitter	$T_{CYC-CYC}$ Over output frequency range @ 3.3V			100	ps

DC SPECIFICATIONS

PARAMETERS	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Supply Current, Dynamic, with Loaded Outputs	I _{DD}	At 27MHz, 3.3V, load=15pF, (PDB=1)			15	mA
		PDB=0			10	μA
Operating Voltage	V _{DD}		2.25		3.63	V
Output Low Voltage	V _{OL}	I _{OL} = +4mA (Std. Drive)			0.4	V
Output High Voltage	V _{OH}	I _{OH} = -4mA (Std. Drive)	V _{DD} - 0.4			V
Output Current	I _{OSD}	V _{OL} = 0.4V, V _{OH} = 2.4V	8			mA

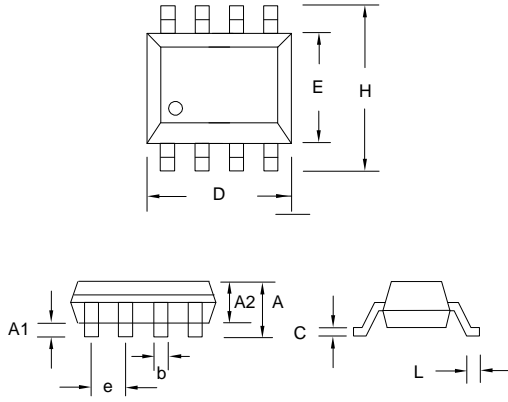
CRYSTAL SPECIFICATIONS

PARAMETERS		SYMBOL	MIN.	TYP.	MAX.	UNITS
Fundamental Crystal Resonator Frequency		F _{XIN}	10		40	MHz
Crystal Loading Rating		C _{L (xtal)}		15		pF
Maximum Sustainable Drive Level					100	μW
Operating Drive Level				30		μW
Metal Can Crystal	Shunt Capacitance	C ₀			5.5	pF
	ESR Max	ESR			50	Ω
Small SMD Crystal	Shunt Capacitance	C ₀			2.5	pF
	ESR Max	ESR			80	Ω

PACKAGE DRAWINGS (GREEN PACKAGE COMPLIANT)

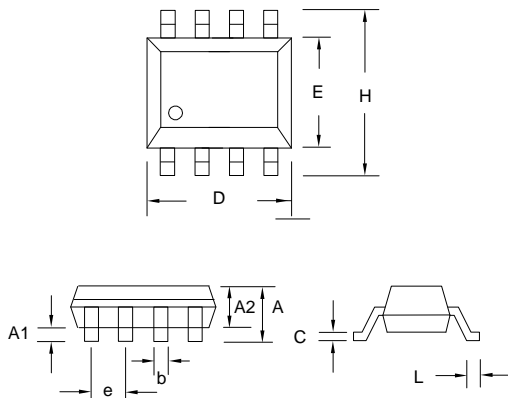
MSOP-8L

Symbol	Dimension in MM	
	Min.	Max.
A	---	1.10
A1	0.05	0.15
A2	0.81	0.91
B	0.25	0.40
C	0.13	0.23
D	2.90	3.10
E	2.90	3.10
H	4.90 BSC	
L	0.445	0.648
e	0.65 BSC	



SOP-8L

Symbol	Dimension in MM	
	Min.	Max.
A	1.35	1.75
A1	0.10	0.25
A2	1.25	1.50
B	0.33	0.53
C	0.19	0.27
D	4.80	5.00
E	3.80	4.00
H	5.80	6.20
L	0.40	0.89
e	1.27 BSC	

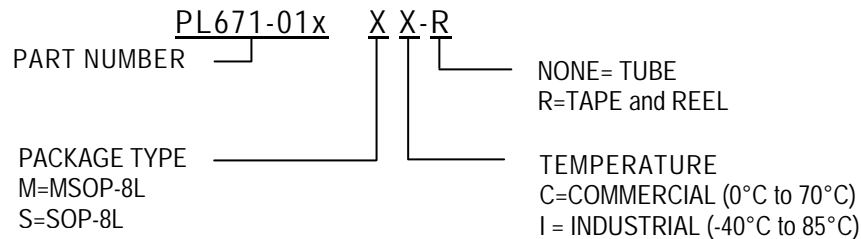


ORDERING INFORMATION (GREEN PACKAGE COMPLIANT)

For part ordering, please contact our Sales Department:
47745 Fremont Blvd., Fremont, CA 94538, USA
Tel: (510) 492-0990 Fax: (510) 492-0991

PART NUMBER

The order number for this device is a combination of the following:
Part Number, Package Type and Operating Temperature Range



Part/Order Number	Marking	Package Option
PL671-01AMC	P67101A	8-Pin MSOP (Tube)
PL671-01AMC-R	P67101A	8-Pin MSOP (Tape and Reel)
PL671-01ASC	P67101A	8-Pin SOP (Tube)
PL671-01ASC-R	P67101A	8-Pin SOP (Tape and Reel)
PL671-01BMC	P67101B	8-Pin MSOP (Tube)
PL671-01BMC-R	P67101B	8-Pin MSOP (Tape and Reel)
PL671-01BSC	P67101B	8-Pin SOP (Tube)
PL671-01BSC-R	P67101B	8-Pin SOP (Tape and Reel)
PL671-01CMC	P67101C	8-Pin MSOP (Tube)
PL671-01CMC-R	P67101C	8-Pin MSOP (Tape and Reel)
PL671-01CSC	P67101C	8-Pin SOP (Tube)
PL671-01CSC-R	P67101C	8-Pin SOP (Tape and Reel)
PL671-01DMC	P67101D	8-Pin MSOP (Tube)
PL671-01DMC-R	P67101D	8-Pin MSOP (Tape and Reel)
PL671-01DSC	P67101D	8-Pin SOP (Tube)
PL671-01DSC-R	P67101D	8-Pin SOP (Tape and Reel)

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Solder reflow profile available at www.phaselink.com/QA/solderingGreen.pdf