

27MHz Multiple Output VCXO with Audio Clock

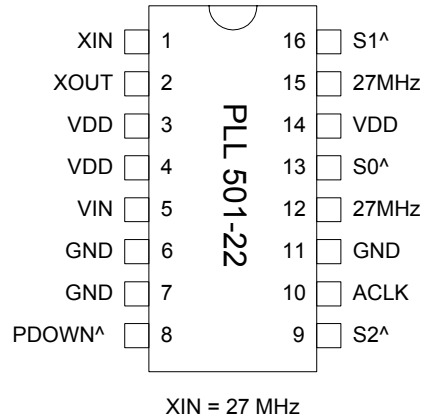
FEATURES

- 2 VCXO outputs at 27MHz (27MHz crystal input).
- Selectable Audio Clocks supporting:
 - 32kHz, 44.1kHz, 48kHz, 64kHz and 96kHz sampling rates
 - 256, 384 and 512 oversampling ratios
 - 8.192, 11.2896, 12.288, 16.9344, 16.384, 18.432, 22.5792, 24.576MHz audio frequencies
- +/- 120ppm pull range
- Power down tri-state selector.
- 3.3V Operating Voltage.
- No external load capacitor or varicap required.
- Available in 16-Pin SSOP.

DESCRIPTION

The PLL501-22 is a low cost integrated VCXO IC with power down feature, designed to work with a fundamental 27MHz crystal in order to provide most common audio clocks (8.192, 11.2896, 12.288, 16.9344, 16.384, 18.432, 22.5792, and 24.576MHz) required by sampling rates of 32kHz, 44.1kHz, 48kHz, 64kHz and 96kHz (256, 384 and 512 oversampling ratios). The audio clock follows the pulled 27MHz signal of the VCXO. The wide pull-range makes it ideal for STB and MPEG Video applications.

PACKAGE PIN CONFIGURATION

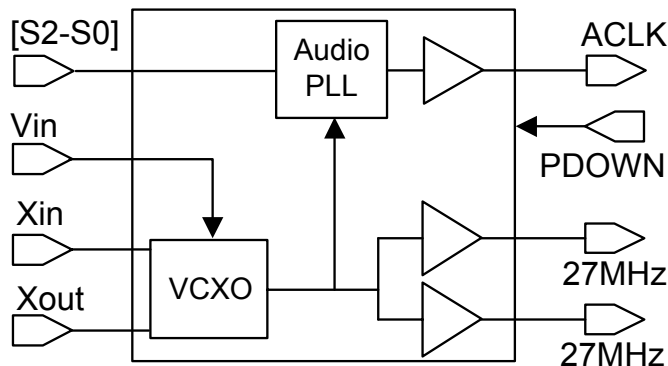


Note: ^: Internal pull-up resistor. The internal pull-up resistor results in a default high value when no pull-down resistor is connected to this pin.

AUDIO CLOCK SELECTION

S2	S1	S0	ACLK (MHz)
0	0	0	8.192
0	0	1	11.2896
0	1	0	12.288
0	1	1	16.9344
1	0	0	18.432
1	0	1	16.384
1	1	0	22.5792
1	1	1	24.576

BLOCK DIAGRAM



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PIN DESCRIPTIONS

Name	Pin #	Type	Description
XIN	1	I	Crystal input to be connected to fundamental parallel mode crystal. ($C_L=9.5pF$).
XOUT	2	I	Crystal output connector.
VDD	3	P	3.3V power supply.
VDD	4	P	3.3V power supply.
VIN	5	I	Frequency control input (0V to 3.3V).
GND	6	P	Ground.
GND	7	P	Ground.
PDOWN	8	I	Digital control input. This input powers down the entire chip and tri-states all outputs when low. 60k Ω internal pull-up.
S2	9	I	Digital control input to select audio frequency. 60k Ω internal pull-up.
ACLK	10	O	Audio clock output (see selection table on page 1).
GND	11	P	Ground.
27MHz	12	O	27MHz VCXO output.
S0	13	I	Digital control input to select audio frequency. 60k Ω internal pull-up.
VDD	14	P	3.3V power supply.
27MHz	15	O	27MHz VCXO output.
S1	16	I	Digital control input to select audio frequency. 60k Ω internal pull-up.

Notes: I – input pin; P – power supply/ground pin; O – output pin.

ELECTRICAL SPECIFICATIONS

1. Absolute Maximum Ratings

PARAMETERS	SYMBOL	MIN.	MAX.	UNITS
Supply Voltage	V_{DD}		7	V
Input Voltage, dc	V_I	$V_{SS}-0.5$	$V_{DD}+0.5$	V
Output Voltage, dc	V_O	$V_{SS}-0.5$	$V_{DD}+0.5$	V
Storage Temperature	T_S	-65	150	$^{\circ}C$
Junction Temperature	T_J		125	$^{\circ}C$
Lead Temperature (soldering, 10s)			260	$^{\circ}C$
Input Static Discharge Voltage Protection			2	kV

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.

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2. Crystal Specifications

PARAMETERS	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Crystal Resonator Frequency	F_{XIN}	Parallel Fundamental Mode		27		MHz
Crystal Loading Rating	$C_L (xtal)$	At $V_{CON} = 1.65V$		9.5		pF
Crystal Pullability	$C_0/C_1 (xtal)$	AT cut			250	-
Recommended ESR	R_E	AT cut			30	Ω

Note: Crystal Loading rating: 9.5pF is the loading the crystal sees from the VCXO chip at $V_{CON} = 1.65V$. It is assumed that the crystal will be at nominal frequency at this load. If the crystal requires more load to be at nominal frequency, the additional load must be added externally. This however may reduce the pull range.

3. Voltage Control Crystal Oscillator

PARAMETERS	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
VCXO Stabilization Time *	$T_{VCXOSTB}$	From power valid		10		ms
VCXO Tuning Range		XTAL $C_0/C_1 < 250$	240			ppm
CLK output pullability		$0V \leq V_{CON} \leq 3.3V$	± 120			ppm
Linearity				5	10	%
VCXO Tuning Characteristic				80		ppm/V
VCON input impedance			2000			k Ω
VCON modulation BW		$0V \leq V_{CON} \leq 3.3V, -3dB$	25			kHz

Note: Parameters denoted with an asterisk (*) represent nominal characterization data and are not production tested to any specific limits.

4. General Electrical Specifications

PARAMETERS	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Supply Current, Dynamic (with Loaded Outputs)	I_{DD}	15pF Load			TBD	mA
Operating Voltage	V_{DD}		2.97	3.30	3.63	V
Ambient Operating Temperature	T_A		0		70	$^{\circ}C$

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5. AC Electrical Specifications

PARAMETERS	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Input Crystal Frequency				27		MHz
Output Clock Rise Time		0.8V ~ 2.0V with 10 pF load			1.5	ns
		0.3V ~ 3.0V with 15 pF load		3.7	5	
Output Clock Fall Time		2.0V ~ 0.8V with 10 pF load			1.5	
		3.0V ~ 0.3V with 15pF load		3.7	5	
Output Clock Duty Cycle		Measured @ 1.4V	45	50	55	%
Short Circuit Current				±50		mA

6. Jitter specifications

PARAMETERS	CONDITIONS	FREQUENCY	MIN.	TYP.	MAX.	UNITS
Cycle to Cycle Jitter	$T_{cyc-cyc}$	27MHz			100	ps
Cycle to Cycle Jitter	$T_{cyc-cyc}$	Audio Clock			100	ps

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PACKAGE INFORMATION

16 PIN SSOP (inch)			
Symbol	Min.	Nom.	Max.
A	.053	.064	.069
A1	.004	.006	.010
B	.008	-	.012
C	.007	-	.010
D	.189	.193	.197
E	.150	.154	.157
H	.228	.236	.244
L	.016	.025	.050
e	.025 BASIC		

ORDERING INFORMATION

PART NUMBER

The order number for this device is a combination of the following:
Device number, Package type and Operating temperature range

PLL501-22 X C

PART NUMBER ———

TEMPERATURE
C=COMMERCIAL

PACKAGE TYPE
X=SSOP

<u>Order Number</u>	<u>Marking</u>	<u>Package Option</u>
PLL501-22 XC	PLL501-22 XC	SSOP - Tube
PLL501-22 XC-R	PLL501-22 XC	SSOP - Tape and Reel

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