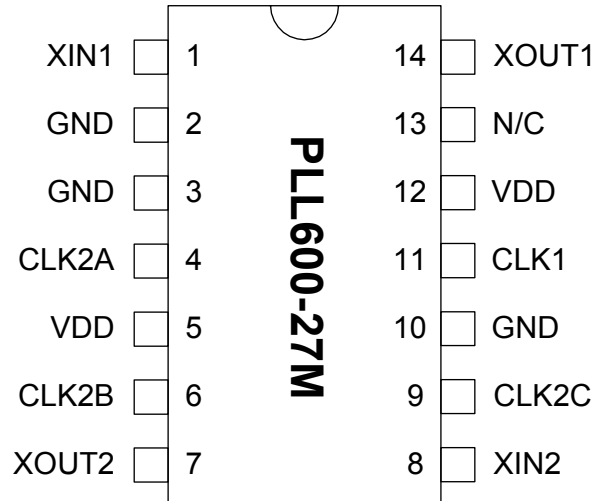


Dual XO with 4 CMOS Outputs 10MHz to 52MHz

FEATURES

- Generates 4 CMOS outputs from 2 crystal inputs
 - XIN1- Accepts a 10 to 52MHz crystal input and generates 1 CMOS output at the same frequency.
 - XIN2- Accepts a 10 to 52MHz crystal input and generates 3 CMOS outputs at the same frequency.
- Low phase noise (-130 dBc @ 10kHz offset).
- Low jitter (RMS): 2.5ps period jitter.
- 12mA drive capability at TTL output.
- 1.62V to 3.63V DC operation.
- Available in 14 pin 150mil SOIC.

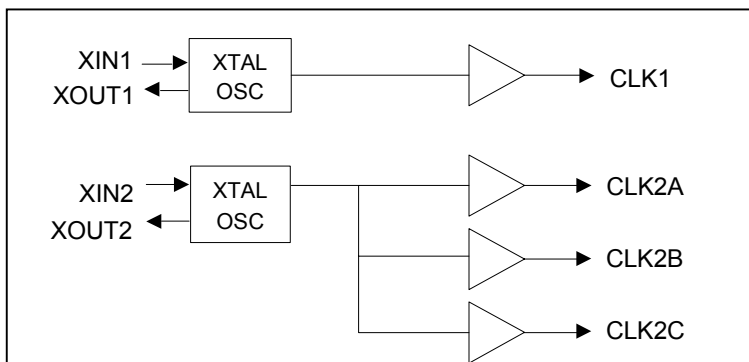
PIN ASSIGNMENT



DESCRIPTION

The PLL600-27M is part of PhaseLink 's low cost family of XO IC's, designed to replace multiple XO solutions saving the cost and board space of clock distribution buffers. In addition, this product family provides among the lowest current on the market for the 10MHz to 52MHz range. They accept input crystals from 10MHz to 52MHz (fundamental resonant mode) and provide low phase noise (<-130dBc at 10kHz offset at 30MHz), and very low jitter (2.5 ps RMS period jitter) outputs.

BLOCK DIAGRAM



Dual XO with 4 CMOS Outputs 10MHz to 52MHz
PIN DESCRIPTION

| Name | Pin # | Type | Description |
|-----------|--------|------|--|
| XIN1 | 1 | I | Crystal input. |
| GND | 2,3,10 | P | Ground. |
| CLK2[A:C] | 4,6,9 | O | Buffered output from XIN2 crystal input. |
| VDD | 5,12 | P | Power supply. |
| XOUT2 | 7 | O | Crystal output for XIN2 crystal. |
| XIN2 | 8 | I | Crystal input. |
| CLK1 | 11 | O | Buffered output from XIN1 crystal input. |
| N/C | 13 | - | No connection. |
| XOUT1 | 14 | O | Crystal output for XIN1 crystal. |

ELECTRICAL SPECIFICATIONS
1. Absolute Maximum Ratings

| PARAMETERS | SYMBOL | MIN. | MAX. | UNITS |
|-----------------------------------|----------|------|--------------|-------|
| Supply Voltage | V_{DD} | | 4.6 | V |
| Input Voltage, dc | V_I | -0.5 | $V_{DD}+0.5$ | V |
| Output Voltage, dc | V_O | -0.5 | $V_{DD}+0.5$ | V |
| Storage Temperature | T_S | -65 | 150 | °C |
| Ambient Operating Temperature* | T_A | -40 | 85 | °C |
| Junction Temperature | T_J | | 125 | °C |
| Lead Temperature (soldering, 10s) | | | 260 | °C |
| ESD Protection, Human Body Model | | | 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.

* **Note:** Operating Temperature is guaranteed by design for all parts (COMMERCIAL and INDUSTRIAL), but tested for COMMERCIAL grade only.

2. AC Electrical Specifications

| PARAMETERS | CONDITIONS | MIN. | TYP. | MAX. | UNITS |
|---|---------------------------------|------|------|------|-------|
| Input Crystal Frequency (XIN1 and XIN2) | | 10 | | 52 | MHz |
| Settling time | At power-up (Vdd reaches 1.62V) | | | 10 | ms |
| Output Clock Rise/Fall Time | 0.8V ~ 2.0V with 10 pF load | | 1.15 | | ns |
| | 0.3V ~ 3.0V with 15 pF load | | 2.4 | | |
| VDD sensitivity | Frequency vs. VDD +/- 10% | 0.8 | | 0.8 | ppm |
| Output Clock Duty Cycle | Measured @ 1.4V | 45 | 50 | 55 | % |
| Short Circuit Current | | | ±50 | | mA |

Dual XO with 4 CMOS Outputs 10MHz to 52MHz
3. Jitter and Phase Noise Specifications

| PARAMETERS | CONDITIONS | MIN. | TYP. | MAX. | UNITS |
|---|--|------|------|------|--------|
| RMS Period Jitter (1 sigma – 1000 samples) | With capacitive decoupling between VDD and GND. | | 2.1 | 2.5 | ps |
| Phase Noise relative to carrier | 30MHz @100Hz offset | | -80 | | dBc/Hz |
| Phase Noise relative to carrier | 30MHz @1kHz offset | | -110 | | dBc/Hz |
| Phase Noise relative to carrier | 30MHz @10kHz offset | | -130 | | dBc/Hz |
| Phase Noise relative to carrier | 30MHz @100kHz offset | | -138 | | dBc/Hz |
| Phase Noise relative to carrier | 30MHz @1MHz offset | | -145 | | dBc/Hz |

4. DC Specifications

| PARAMETERS | SYMBOL | CONDITIONS | MIN. | TYP. | MAX. | UNITS |
|---|------------------|---------------------------------------|-----------------------|------|------|-------|
| Supply Current, Dynamic, with Loaded Outputs @ 3.3V | I _{DD} | XIN1 and XIN2 at 27MHz, Cload=10pF | | 6.0 | | mA |
| Supply Current in tri-state | I _{DD} | Output disabled | | | 520 | μA |
| Operating Voltage | V _{DD} | | 1.62 | | 3.63 | V |
| Output High Voltage | V _{OH} | I _{OH} = -12mA (3.3V) | 2.4 | | | V |
| Output Low Voltage | V _{OL} | I _{OL} = 12mA (3.3V) | | | 0.4 | V |
| Output High Voltage at CMOS level | V _{OHC} | I _{OH} = -4mA (3.3V) | V _{DD} - 0.4 | | | V |
| Output drive current | | At TTL level (3.3V) | 10 | | | mA |

5. Crystal Specification

| PARAMETERS | SYMBOL | MIN. | TYP. | MAX. | UNITS |
|----------------------------------|-----------------------|------|------|------|-------|
| Crystal Resonator Frequency | F _{XIN1} | 10 | | 52 | MHz |
| | F _{XIN2} | | | | |
| Crystal Loading Rating | C _{L (xtal)} | | 8.5 | | pF |
| Maximum Sustainable Drive Level | | | | 200 | μW |
| Operating Drive Level | | | 50 | | μW |
| C0 (for frequencies below 30MHz) | | | | 5 | pF |
| C0 (for frequencies above 30MHz) | | | | 4 | pF |
| ESR | R _s | | | 30 | Ω |

Note: A detailed crystal specification document is also available for this part

Dual XO with 4 CMOS Outputs 10MHz to 52MHz

PACKAGE INFORMATION

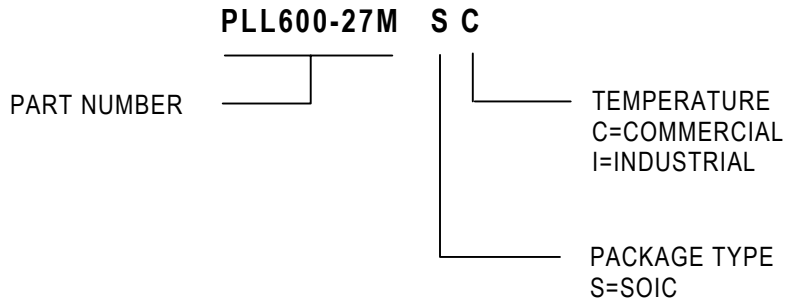
| 14 PIN Narrow SOIC (mm) | | |
|---------------------------|----------|-------|
| SOIC | | |
| Symbol | Min. | Max. |
| A | 1.35 | 1.75 |
| A1 | 0.10 | 0.25 |
| B | 0.33 | 0.51 |
| C | 0.19 | 0.25 |
| D | 9.80 | 10.00 |
| E | 3.80 | 4.00 |
| H | 5.80 | 6.20 |
| L | 0.40 | 1.27 |
| e | 1.27 BSC | |

ORDERING INFORMATION

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:
Device number, Package type and Operating temperature range



| <u>Order Number</u> | <u>Marking</u> | <u>Package Option</u> |
|---------------------|----------------|-----------------------|
| PLL600-27M SC | P600-27M SC | SOIC - Tube |
| PLL600-27M SC-R | P600-27M SC | SOIC - Tape and Reel |

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