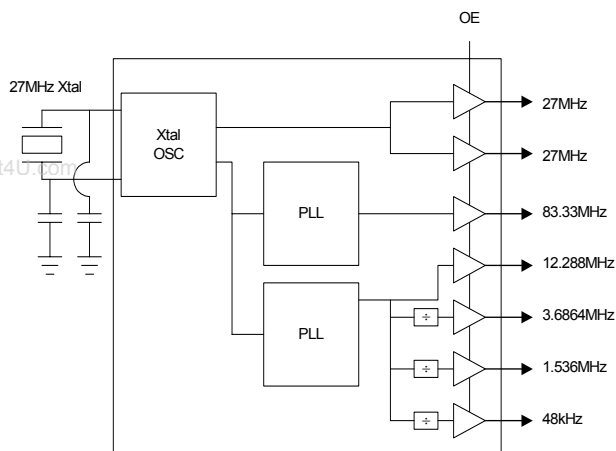


# Multimedia Clock IC

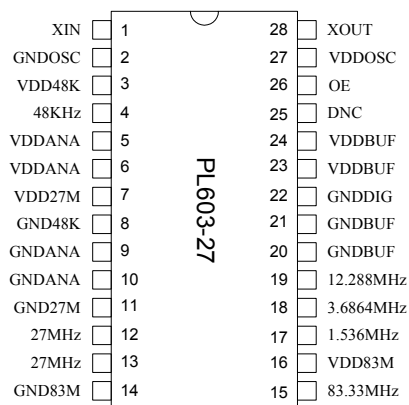
## Technical Document

## PRODUCT DESCRIPTION

PhaseLink's PL603-27 is a clock generator IC, specifically designed to accommodate the clock requirements of the set top box, HDTV, and personal video recording (PVR) receiver equipment. It offers seven different clock signals while utilizing a single low-cost 27MHz crystal input. PhaseLink's PL603-27 is designed to save board space and implementation cost while producing multiple system clock outputs.



**Figure 1: Overall PL603-27 Block Diagram**



**Figure 2: PL603-27 Pin Assignment**

## FEATURES

- High accuracy synthesis Phase Locked Loop design
- Eliminates costly quartz crystals and crystal oscillators
- Very low jitter and Phasenoise
- Single 27MHz crystal input
- Seven different output frequencies:
  - Two 27MHz output
  - One 83.33MHz output
  - One 12.288MHz output
  - One 3.3864MHz output
  - One 1.536MHz output
  - One 48KHz output
- OE (output enable) feature
- Low-power sub-micron CMOS process
- Single 3.3V +/- 10% power supply
- Available in 28-pin SSOP package

**ELECTRICAL SPECIFICATIONS**
**ABSOLUTE MAXIMUM RATINGS**

| PARAMETERS                        | SYMBOL   | MIN.         | MAX.         | UNITS |
|-----------------------------------|----------|--------------|--------------|-------|
| Supply Voltage                    | $V_{DD}$ |              | 4.6          | 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               | $T_S$    | -55          | +150         | °C    |
| Ambient Operating Temperature     | $T_A$    | -40          | +85          | °C    |
| Junction Temperature              | $T_J$    |              | 125          | °C    |
| Lead Temperature (soldering, 10s) |          |              | 260          | °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.

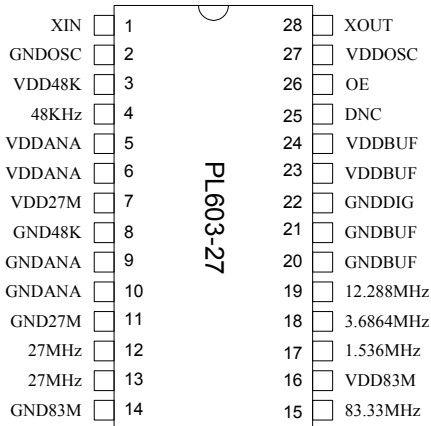
**DC SPECIFICATION**

| PARAMETERS                        | SYMBOL   | CONDITIONS              | MIN.    | TYP.  | MAX.      | UNITS |
|-----------------------------------|----------|-------------------------|---------|-------|-----------|-------|
| Operating Voltage                 | VDD      |                         | 3.13    |       | 3.47      | V     |
| Input High Voltage                | $V_{IH}$ |                         |         | VDD/2 |           | V     |
| Input Low Voltage                 | $V_{IL}$ |                         |         | VDD/2 | VDD/2 - 1 | V     |
| Input High Voltage                | $V_{IH}$ | For all Tri-level input | VDD-0.5 |       |           | V     |
| Input Low Voltage                 | $V_{IL}$ | For all Tri-level input |         |       | 0.5       | V     |
| Input High Voltage                | $V_{IH}$ | For all normal input    | 2       |       |           | V     |
| Input Low Voltage                 | $V_{IL}$ | For all normal input    |         |       | 0.8       | V     |
| Output High Voltage               | $V_{OH}$ | $I_{OH} = -25mA$        | 2.4     |       |           | V     |
| Output Low Voltage                | $V_{OL}$ | $I_{OL} = 25mA$         |         |       | 0.4       | V     |
| Output High Voltage At CMOS Level | $V_{OH}$ | $I_{OH} = -8mA$         | VDD-0.4 |       |           | V     |
| Operating Supply Current          | $I_{DD}$ | No Load                 |         | 35    |           | mA    |
| Short-circuit Current             | $I_S$    |                         |         | ±50   |           | mA    |

**AC SPECIFICATION**

| PARAMETERS                  | CONDITIONS                    | MIN. | TYP. | MAX. | UNITS |
|-----------------------------|-------------------------------|------|------|------|-------|
| Input Frequency             |                               |      | 27   |      | MHz   |
| Output Clock Rise/Fall Time | 10% ~ 90% VDD with 10 pF load |      | 1.2  | 1.6  | ns    |
| Output Clock Duty Cycle     | Measured @ 50% VDD            | 45   | 50   | 55   | %     |
| Absolute Short Term Jitter  |                               |      | 200  |      | ps    |

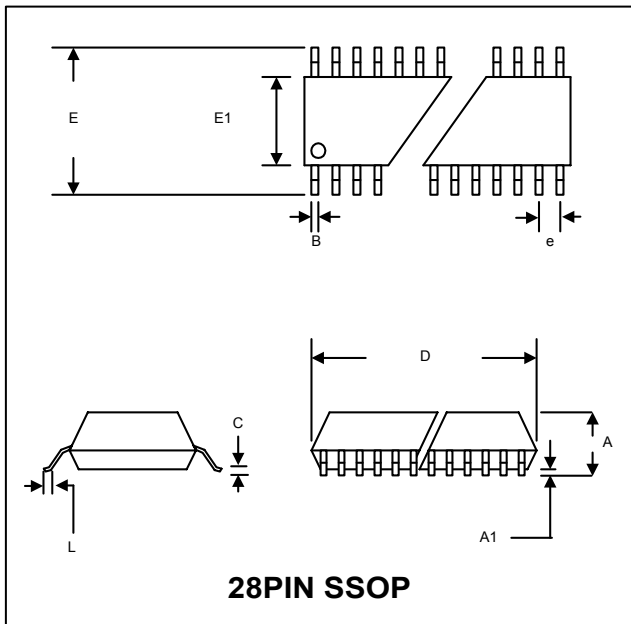
## PACKAGE PIN DESCRIPTION AND ASSIGNMENT



## PIN ASSIGNMENTS

| Name      | Pin# | Type | Description                                      |
|-----------|------|------|--------------------------------------------------|
| XIN       | 1    | I    | Input from crystal oscillator circuitry.         |
| GND       | 2    | P    | Connect to Ground.                               |
| VDD48K    | 3    | P    | Connect to 3.3V. Recommend decoupling to GND48K. |
| 48KHz     | 4    | O    | 48KHz clock output.                              |
| VDDANA    | 5    | P    | Connect to 3.3V. Recommend decoupling to GNDANA. |
| VDDANA    | 6    | P    | Connect to 3.3V. Recommend decoupling to GNDANA. |
| VDD27M    | 7    | P    | Connect to 3.3V. Recommend decoupling to GND27M. |
| GND48K    | 8    | P    | Connect to Ground.                               |
| GNDANA    | 9    | P    | Connect to Ground.                               |
| GNDANA    | 10   | P    | Connect to Ground.                               |
| GND27M    | 11   | P    | Connect to Ground.                               |
| 27MHz     | 12   | O    | 27MHz clock output.                              |
| 27MHz     | 13   | O    | 27MHz clock output.                              |
| GND83M    | 14   | P    | Connect to Ground.                               |
| 83.33MHz  | 15   | O    | 83.33MHz clock output.                           |
| VDD83M    | 16   | P    | Connect to 3.3V. Recommend decoupling to GND83M. |
| 1,536MHz  | 17   | O    | 1.536MHz clock output.                           |
| 3.6864MHz | 18   | O    | 3.6864MHz clock output.                          |
| 12.288MHz | 19   | O    | 12.288MHz clock output.                          |
| GNDBUF    | 20   | P    | Connect to Ground.                               |
| GNDBUF    | 21   | P    | Connect to Ground.                               |
| GNDOSC    | 22   | P    | Connect to Ground.                               |
| VDDBUF    | 23   | P    | Connect to 3.3V. Recommend decoupling to GNDBUF. |
| VDDBUF    | 24   | P    | Connect to 3.3V. Recommend decoupling to GNDBUF. |
| DNC       | 25   | N/A  | Do Not Connect.                                  |
| OE        | 26   | I    | Output Enable.                                   |
| VDDOSC    | 27   | P    | Connect to 3.3V. Recommend decoupling to GNDOSC. |
| XOUT      | 28   | O    | Output from crystal oscillator circuitry.        |

## PACKAGE INFORMATION



|         |                    |      |           |       |
|---------|--------------------|------|-----------|-------|
| Package | SSOP (QSOP) 209mil |      |           |       |
| Pins#   | 28                 |      |           |       |
| Unit    | mm                 |      | inches    |       |
|         | min                | max  | min       | max   |
| A       |                    | 2.0  |           | 0.079 |
| A1      | 0.05               |      | 0.002     |       |
| B       | 0.25               | 0.38 | 0.01      | 0.015 |
| C       | 0.09               | 0.25 | 0.004     | 0.010 |
| D       | 9.9                | 10.5 | 0.390     | 0.413 |
| E       | 7.40               | 8.20 | 0.291     | 0.323 |
| E1      | 5.00               | 5.60 | 0.197     | 0.220 |
| e       | 0.65BSC            |      | 0.0256BSC |       |
| L       | 0.55               | 0.95 | 0.022     | 0.038 |

## PART NUMBERING

**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

**PLL603-27 X C**

PART NUMBER

TEMPERATURE  
C=COMMERCIAL  
M=MILITARY  
I=INDUSTRIAL  
PACKAGE TYPE  
X=SSOP

## ORDERING INFORMATION

PhaseLink Corporation, reserves the right to make changes in its products or specifications, or both at any time without notice. The information furnished by PhaseLink is believed to be accurate and reliable. However, PhaseLink makes no guarantee or warranty concerning the accuracy of said information and shall not be responsible for any loss or damage of whatever nature resulting from the use of, or reliance upon this product.

## LIFE SUPPORT POLICY

PhaseLink's products are not authorized for use as critical components in life support devices or systems without the express written approval of the President of PhaseLink Corporation.

## PhaseLink Offices

### PhaseLink Corporation, USA

47745 Fremont Boulevard

Fremont, CA 94538

+ 1.510.492.0990 (phone)

+ 1.510.492.0991 (fax)

[salesinfo@phaselink.com](mailto:salesinfo@phaselink.com)

<http://www.phaselink.com>

### PhaseLink Company, Ltd., Taiwan

Asia Headquarters

5F-2, No. 94, Pao Chung Road.

Hsin Tien, Taipei, Taiwan, R.O.C.

+ 886.2.2910.0248 (phone)

+ 886.2.2910.0249 (fax)

[salesinfo@phaselink.com](mailto:salesinfo@phaselink.com)

<http://www.phaselink.com>

### PhaseLink Corporation, Japan

1-38-7-111 Matsubara Setagaya-ku

Tokyo 156-0043

+ 81-3-5355-0536 (phone)

+81-3-5355-0553 (fax)

[salesinfo@phaselink.com](mailto:salesinfo@phaselink.com)

<http://www.phaselink.com>

### PhaseLink Corporation, China

17F,Block 2,Conrad Garden,Caltian  
Rd

Futian,ShenZhen , PRC 518033

+86-755-83020204 (phone)

+86-755-83020207 (fax)

[salesinfo@phaselink.com](mailto:salesinfo@phaselink.com)

<http://www.phaselink.com>

