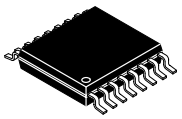
# PCS1P2858A

*Product Preview*

# Multi-Output Clock Generator

ON Semiconductor®

http://onsemi.com



TSSOP−16
T SUFFIX
CASE 948AN

### Description

The PCS1P2858A is a versatile multi output clock generator. The PCS1P2858A uses the latest PLL technology. The six Clock outputs are generated using an inexpensive 27 MHz Crystal. The accuracy of the 27 MHz Input Clock should be within ±50 ppm. The outputs consist of 24.576 MHz, 24 MHz, 10 MHz, and 28.322 MHz clocks together with two 27 MHz reference clocks. The OE tri−states all the clocks when disabled. The device operates from a Supply Voltage of 3.3 V ± 5% V. The device is available in a 16−pin TSSOP JEDEC package.

### Application

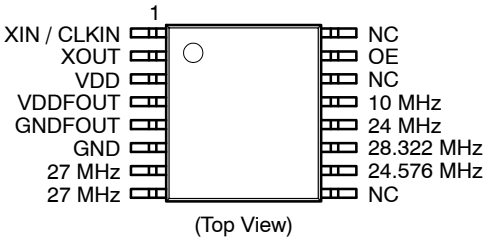
PCS1P2858A is targeted for use in HDTV digital video.

### Features

- Generates Multiple Clock Outputs from an Inexpensive 27 MHz Crystal
- Multiple Clock Outputs:
  - 27 MHz Reference Clock
  - 27 MHz Reference Clock
  - 10 MHz
  - 24 MHz
  - 28.322 MHz
  - 24.576 MHz
- Supply Voltage: 3.3 V ± 5% V
- 16−pin TSSOP Package
- Commercial Temperature Range
- Low−power CMOS Process
- These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS Compliant

This document contains information on a product under development. ON Semiconductor reserves the right to change or discontinue this product without notice.

### PIN CONFIGURATION




(Top View)

### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 6 of this data sheet.

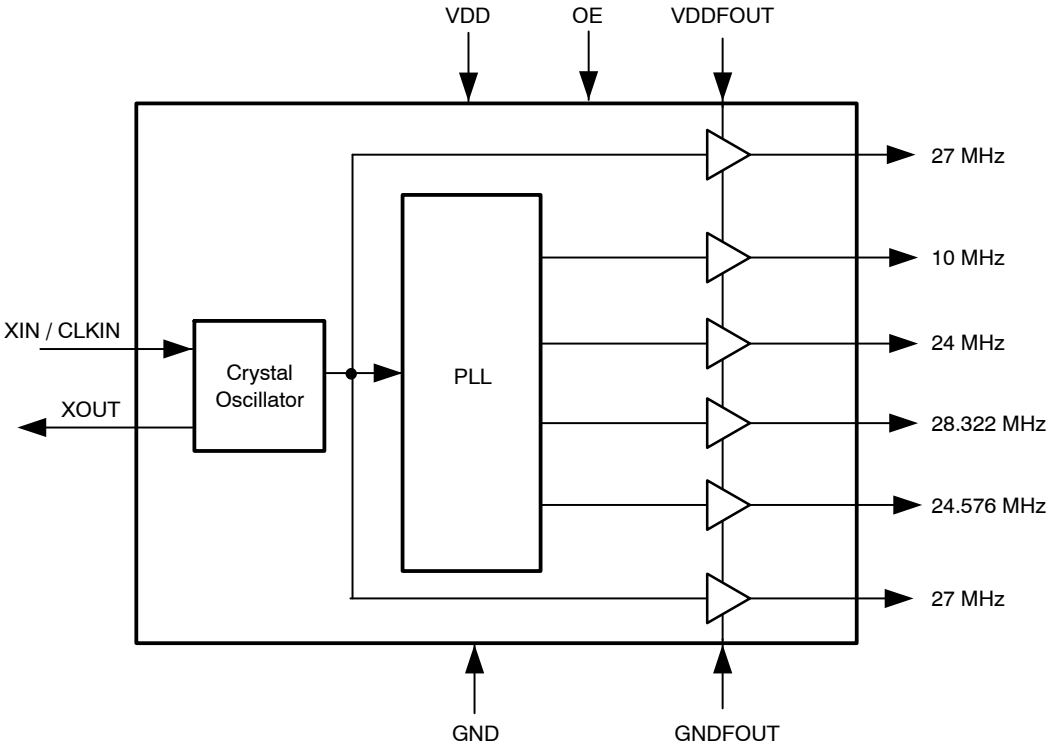



**Figure 1. Block Diagram**

**Table 1. PIN DESCRIPTION**

| Pin # | Pin Name | Pin Type | Pin Description |
|---|---|---|---|
| 1 | XIN / CLKIN | Input | Crystal connection or External reference Clock input. |
| 2 | XOUT | Output | Connection to crystal. If using an external reference clock, this pin must be left unconnected. |
| 3 | VDD | Power | Connect to +3.3 V. |
| 4 | VDDFOUT | Power | Connect to +3.3 V. |
| 5 | GNDFOUT | Power | Connect to ground. |
| 6 | GND | Power | Connect to ground. |
| 7 | 27 MHz | Output | 27 MHz Reference Clock output. |
| 8 | 27 MHz | Output | 27 MHz Reference Clock output. |
| 9 | NC | – | No connection. |
| 10 | 24.576 MHz | Output | 24.576 MHz Output Clock. |
| 11 | 28.322 MHz | Output | 28.322 MHz Output Clock. |
| 12 | 24 MHz | Output | 24 MHz Output Clock. |
| 13 | 10 MHz | Output | 10 MHz Output Clock. |
| 14 | NC | – | No connection. |
| 15 | OE | Input | Output Enable bit. When this pin is made HIGH, the output clocks are enabled. Tri−states all the clocks when disabled. Has an Internal pull−up resistor. |
| 16 | NC | – | No connection. |

**Table 2. ABSOLUTE MAXIMUM RATINGS**

| Symbol | Parameter | Rating | Unit |
|---|---|---|---|
| VDD | Power Supply Voltage relative to Ground | −0.5 to +4.6 | V |
| $V_{IN}$ | Input Voltage relative to Ground (Input Pins) | −0.5 to VDD+0.3 | |
| $T_{STG}$ | Storage temperature | −65 to +150 | °C |
| $T_s$ | Max. Soldering Temperature (10 sec) | 260 | °C |
| $T_J$ | Junction Temperature | 125 | °C |
| $T_{DV}$ | Static Discharge Voltage (As per JEDEC STD22− A114−B) | 2 | KV |

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

**Table 3. OPERATING CONDITIONS**

| Parameter | Description | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| VDD / VDDFOUT | Operating Voltage | 3.135 | 3.3 | 3.465 | V |
| $T_A$ | Operating Temperature (Ambient Temperature) | 0 | | +70 | °C |
| $C_L$ | Load Capacitance | | | 15 | pF |
| $C_{IN}$ | Input Capacitance | | 5 | | pF |

**Table 4. DC ELECTRICAL CHARACTERISTICS**

| Symbol | Parameter | Conditions | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| VDD | Operating Voltage | | 3.135 | 3.3 | 3.465 | V |
| $V_{IH}$ | Input High Voltage | | 2 | | VDD+0.3 | V |
| $V_{IL}$ | Input Low Voltage | | GND−0.3 | | 0.8 | V |
| $V_{OH}$ | Output High Voltage | $I_{OH}$ = −12 mA | 2.4 | | | V |
| $V_{OL}$ | Output Low Voltage | $I_{OL}$ = 12 mA | | | 0.4 | V |
| $I_{OS}$ | Short Circuit Current | Clock outputs | | ±70 | | mA |
| $I_{CC}$ | Static Current | CLKIN Pin pulled low | | | 10 | mA |
| $I_{DD}$ | Dynamic Current | No Load, All Clocks on | | | 30 | mA |
| $Z_{OUT}$ | Nominal output impedance | | | 30 | | Ω |

**Table 5. AC ELECTRICAL CHARACTERISTICS**

| Symbol | Parameter | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| CLKIN | Input Clock frequency | | | 27 | | MHz |
| CLK OUT | Output Clock frequency | | | 27 | | MHz |
| | | | | 10 | | |
| | | | | 24 | | |
| | | | | 24.576 | | |
| | | | | 28.322 | | |
| $t_{LH}$ (Note 1) | Output rise time (Measured from 0.8 V to 2.0 V) | | 0.8 | 1.4 | 2.0 | nS |
| $t_{HL}$ (Note 1) | Output fall time (Measured from 2.0 V to 0.8 V) | | 0.8 | 1.4 | 2.0 | nS |
| $t_{JC}$ | Period Jitter | | | ±300 | | pS |
| | Synthesis Error (Output Frequency) | 28.322 MHz | | 5.68 | | ppm |
| | | Other outputs | | 0 | | |
| $t_D$ (Note 1) | Output duty cycle | | 45 | 50 | 55 | % |
| $t_{ON}$ | Power up Time (first locked cycle after power−up) | | | 3 | 5 | mS |

1. $t_{LH}$ and $t_{HL}$ are measured into a capacitive load of 15 pF.

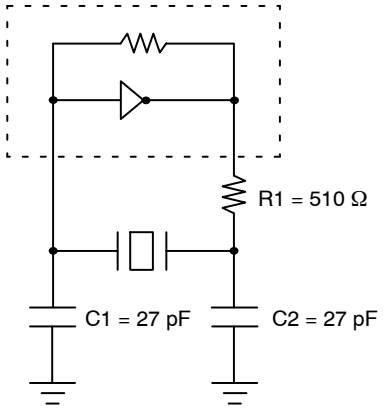


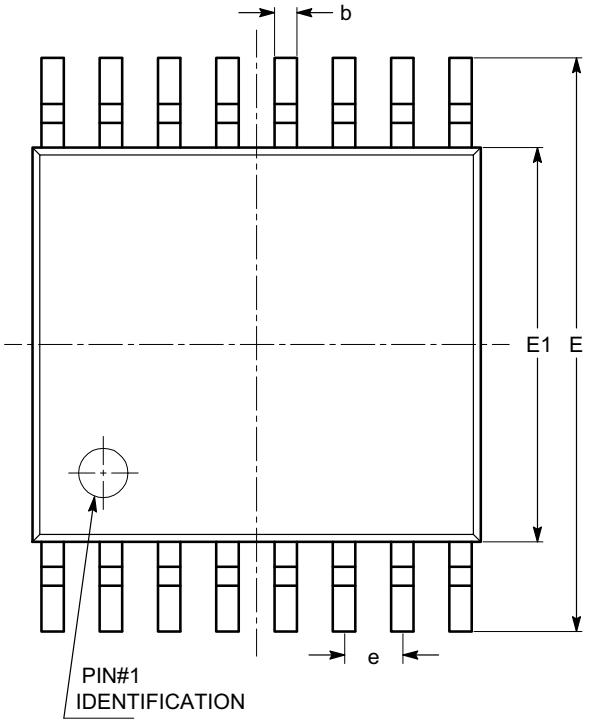

**Figure 2. Typical Crystal Oscillator Circuit**

**Table 6. TYPICAL CRYSTAL SPECIFICATIONS**

| Fundamental AT Cut Parallel Resonant Crystal | |
|---|---|
| Nominal frequency | 27 MHz |
| Frequency tolerance | ±50 ppm or better at 25°C |
| Operating temperature range | −25°C to +85°C |
| Storage temperature | −40°C to +85°C |
| Load capacitance | 18 pF |
| Shunt capacitance | 7 pF maximum |
| ESR | 25 Ω |

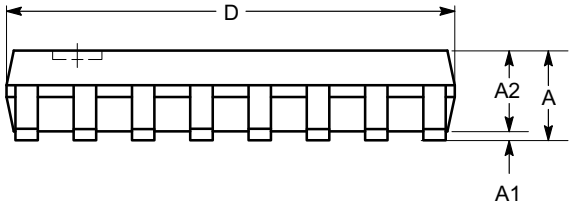
## PACKAGE DIMENSIONS

**TSSOP16, 4.4x5**
CASE 948AN−01
ISSUE O

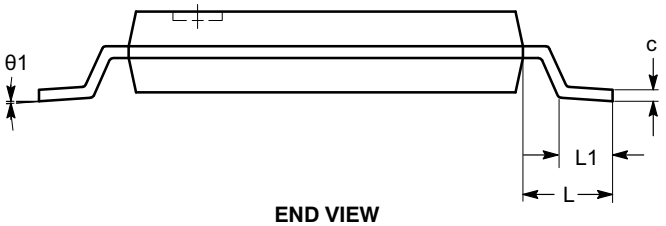



**TOP VIEW**

| SYMBOL | MIN | NOM | MAX |
|---|---|---|---|
| A | | | 1.10 |
| A1 | 0.05 | | 0.15 |
| A2 | 0.85 | | 0.95 |
| b | 0.19 | | 0.30 |
| c | 0.13 | | 0.20 |
| D | 4.90 | | 5.10 |
| E | 6.30 | | 6.50 |
| E1 | 4.30 | | 4.50 |
| e | 0.65 BSC | | |
| L | 1.00 REF | | |
| L1 | 0.45 | | 0.75 |
| θ | 0º | | 8º |




**SIDE VIEW**




**END VIEW**

**Notes:**
(1) All dimensions are in millimeters. Angles in degrees.
(2) Complies with JEDEC MO-153.

**Table 7. ORDERING INFORMATION**

| Part Number | Marking | Package Type | Temperature |
|---|---|---|---|
| PCS1P2858AG−16TR | 3P2858AG | 16−Pin TSSOP, TAPE & REEL, Green | Commercial |
| PCS1P2858AG−16TT | 3P2858AG | 16−Pin TSSOP, TUBE, Green | Commercial |



## PUBLICATION ORDERING INFORMATION

**LITERATURE FULFILLMENT**:
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