

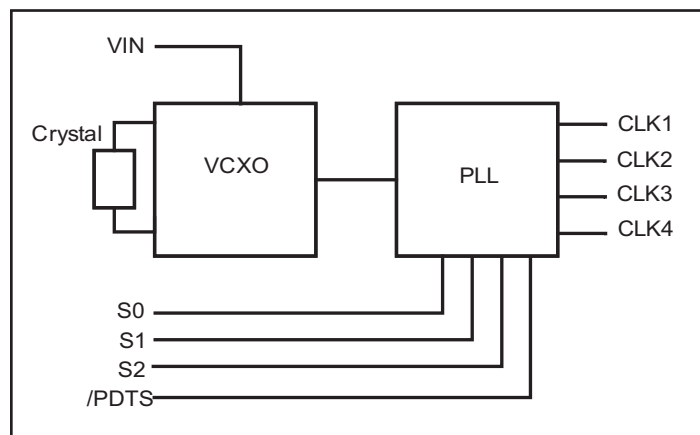
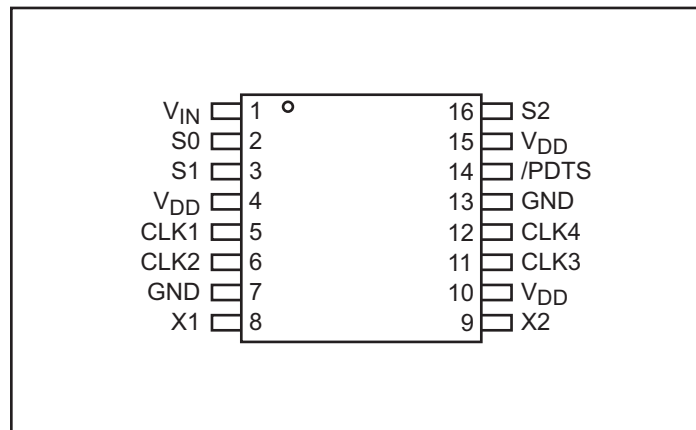
**3.3V VCXO with Triple PLL Panel Clock Synthesizer**
**Features**

- Four video frequency outputs
- VCXO
  - Push/pull range:  $\pm 120\text{ppm}$  (+240ppm)
  - Rail-to-rail input tuning range: 0 to  $+V_{DD}$
  - Interfaces directly to a crystal
  - $\pm 10\%$  linearity
- Precision on-chip PLL with ultra-low jitter
  - Cycle-to-cycle jitter: 300ps (typical)
  - Bandwidth optimized for low jitter
- Power-down control
- Outputs
  - Duty cycle 45/55
- Power supply  $+3.3\text{V} \pm 5\%$
- Commercial temp range  $0^\circ\text{C}$  to  $+70^\circ\text{C}$
- Packaging (Pb-Free & Green): 16-pin TSSOP (L16)

**Description**

The PI6CX300 is a low jitter, high-performance VCXO (Voltage Controlled Crystal Oscillator) with Triple Integrated PLL based clock synthesizer optimized for precision set-top box audio/video applications. The PI6CX300 features an on-chip VCXO capable of pulling a crystal  $\pm 120\text{ppm}$ . The VCXO is used as a reference for the integrated PLL. The on-board PLL is programmed through GPIO pins. The multiplication ratios are optimized to support most video panel applications.

The PI6CX300 operates from a  $3.3\text{V} \pm 5\%$  supply and is guaranteed over the full commercial temperature range of  $0^\circ\text{C}$  to  $+70^\circ\text{C}$ . All support documentation can be found on Pericom's web site at: [www.pericom.com](http://www.pericom.com). Pericom can customize these devices for many different frequencies.

**Block Diagram**

**Pin Configuration**


### Pin Description

Pin Number	Pin Name	Pin Description
8, 9	X1, X2	Crystal inputs
1	V <sub>IN</sub>	VCXO voltage input.
7, 13	GND	Ground
4, 10, 15	V <sub>DD</sub>	3.3V ±5% Positive power supply. Bypass with 0.1µF  0.01µF capacitors and place as close to each V <sub>DD</sub> pins as possible. Power pins are not connected internally.
5, 6, 11, 12	CLK1, CLK2 CLK3, CLK4	PLL clock outputs with weak pull-downs
14	/PDTS	Power-down. /PDTS is active LOW with weak pull-up. When /PDTS is active, all outputs are LOW, and all outputs will stop glitch free at their respective HIGH-to-LOW transition after /PDTS is asserted.
2, 3, 16	S0, S1 S2	Input frequency select pins with weak pull-ups

### Panel Display Frequencies

#### Frequency Select Table<sup>(1)</sup>

S2	S1	S0	CLK1 (MHz)	CLK2 (MHz)	CLK3 (MHz)	CLK4 (MHz)
0	0	0	54	74.25	no use	no use
0	0	1	54	82	no use	no use
0	1	0	54	66	no use	no use
0	1	1	no use	no use	no use	no use
1	0	0	54	74.25	62	no use
1	0	1	54	82	69	no use
1	1	0	54	66	55	no use
1	1	1	no use	no use	no use	no use

**Note:**

1. Outputs designated with "no use" are held to a logic LOW.

### Maximum Ratings<sup>(1)</sup>

#### Supply Voltage

V <sub>DD</sub> .....	-0.5V to +4.6V
Input/Output Voltage.....	-0.5V to +V <sub>DD</sub> +0.5V
Lead Temperature (soldering, 10 sec.).....	+260°C
Storage Temperature (T <sub>S</sub> ).....	-40°C to +85°C
Junction Temperature.....	+150°C

### Operating Ratings

#### Supply Voltage

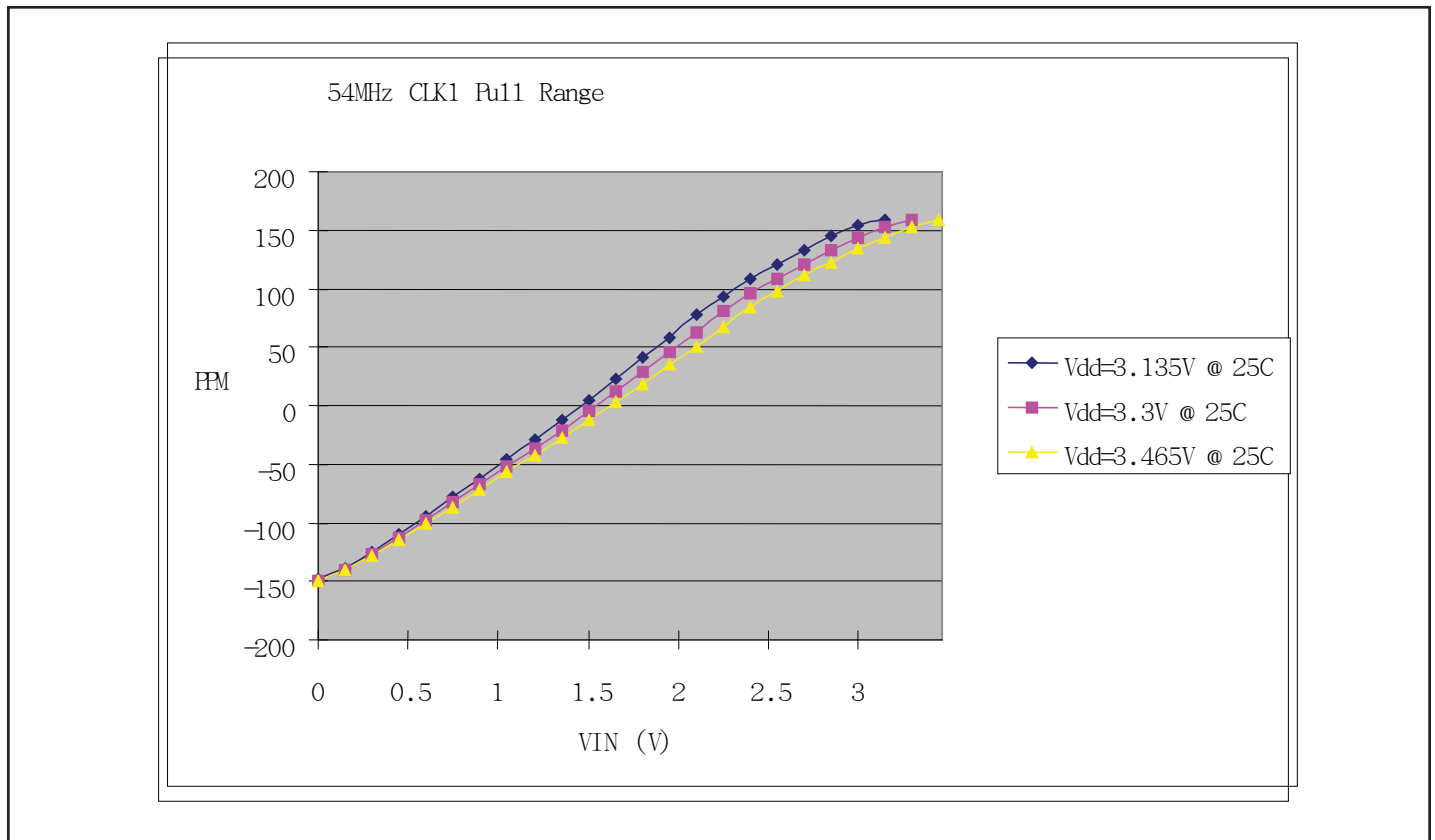
V <sub>DD</sub> .....	+3.135V to +3.465V
Ambient Temperature (T <sub>A</sub> ).....	0°C to +70°C
Package Thermal Resistance <sup>(2)</sup>	
• MLF TM (θ <sub>JA</sub> )	
Still-Air.....	90°C/W
• MLFTM (Ψ <sub>JB</sub> )	
Junction-to-Board.....	24°C

#### Notes:

- Stresses greater than those listed under MAXIMUM RATINGS may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.
- θ<sub>JA</sub> and Ψ<sub>JB</sub> values are determined for a 4-layer board in still-air, unless otherwise stated.

### VCXO Operating Characteristics

V<sub>DD</sub>=3.3V, f<sub>IN</sub>=27 MHz, C<sub>L</sub>=15pF, T<sub>A</sub> = 25°C



### DC Electrical Characteristics

$V_{DD}=3.3V \pm 5\%$ ,  $f_{IN}=27MHz$ ,  $V_{IN}=1.65V$ ,  $C_L=15pF$ ,  $T_A = 0^\circ C$  to  $+70^\circ C$ , unless otherwise stated.

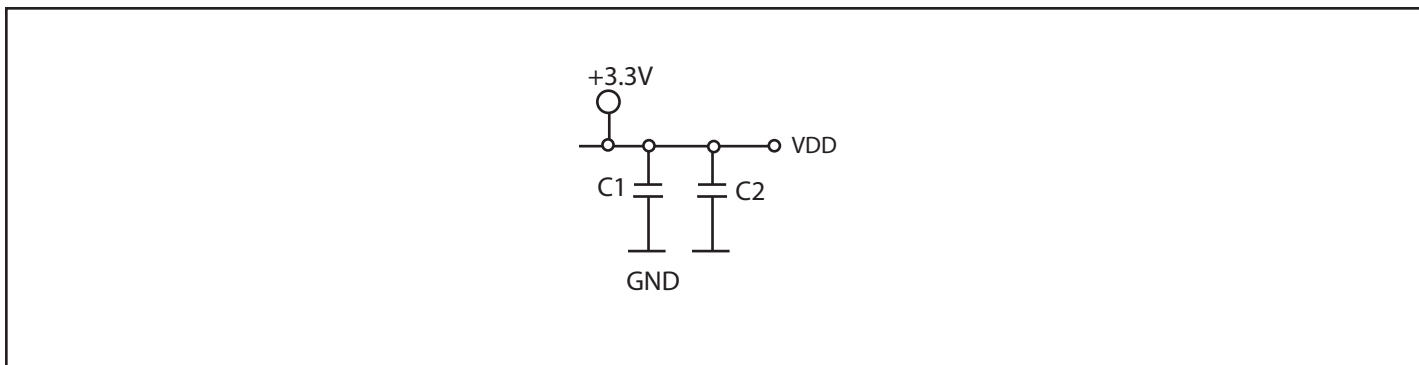
Symbol	Parameter	Condition	Min	Typ	Max	Units
$V_{DD}$	Power Supply		3.135	3.3	3.465	V
$V_{OH}$	Output HIGH voltage	$I_{OH} = -12mA$	2.4			V
$V_{OL}$	Output LOW voltage	$I_{OH} = +12mA$			0.5	V
$V_{IH}$	Input HIGH voltage		2			V
$V_{IL}$	Input LOW voltage				0.8	V
$I_{DD}$	Supply current	Max. $V_{DD}$ , $C_L = 15pF$		48		mA
$I_{DDPD}$	Power Down Current	No Load		0.1		mA
$R_S$	Negative resistance	$V_{IN} = 0V$		-150		$\Omega$
$C_L$	Output load				15	pF

### AC Electrical Characteristics

$V_{DD}=3.3V \pm 5\%$ ,  $f_{IN}=27MHz$ ,  $V_{IN}=1.65V$ ,  $C_L = 15pF$ ,  $T_A = 0^\circ C$  to  $+70^\circ C$ , unless otherwise stated.

Symbol	Parameter	Condition	Min	Typ	Max	Units
$F_{RANGE}$	Crystal Frequency Range		24	27	30	MHz
$\Delta f$	VCXO Pull Range	$V_{IN} = 0$ to $+3.3V$		$\pm 120$		PPM
LIN	VCXO Linearity	$V_{IN} = 0.1 V_{DD}$ to $0.9 V_{DD}$		$\pm 10$		%
$T_{START-UP}$	VCXO Startup Time	$V_{DD} = 0.9 V_{DD}$ Trigger		1.5	10	ms
$J_{cycle-to-cycle}$	Cycle-to-cycle Jitter			300	350	ps
$T_R/T_F$	Rise/Fall Time	$V_{OUT} = 0.2V_{DD}$ to $0.8V_{DD}$		1.3	2.0	ns
$BW_{VCXO}$	VCXO Bandwidth		10	20	50	kHz
$T_{DUTY-CYCLE}$	Duty Cycle	$V_{OUT} = 0.5V_{DD}$	45		55	%
$T_{OE}$	/PDTS HIGH to output locked to $\pm 1\%$			250		$\mu S$
$T_{OD}$	/PDTS LOW to output tri-state			70		nS

### Power Supply Filtering



### Bill of Material

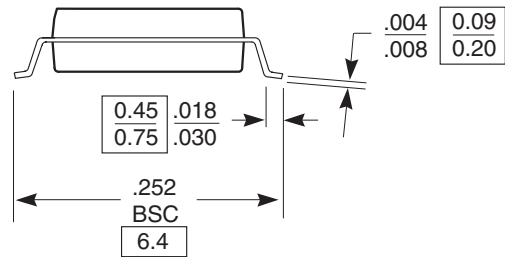
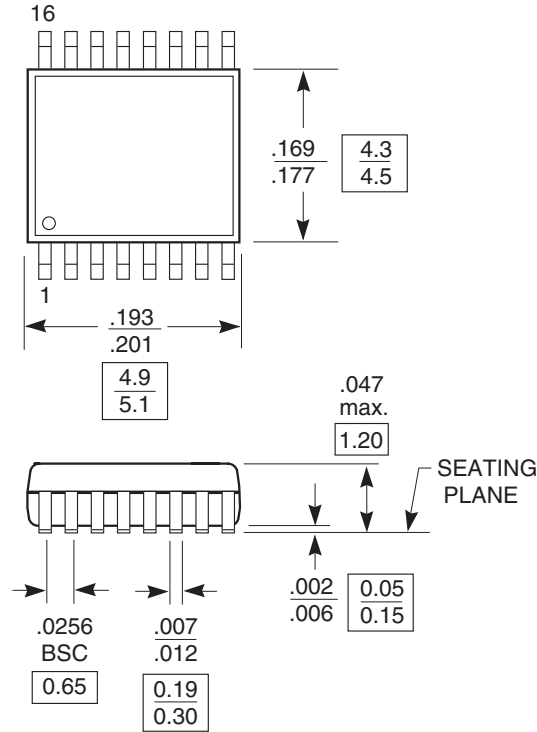
Component	BOM
C1	0.01uF Capacitor
C2	0.1uF Capacitor

### Recommended Crystal Specifications – SRX7398-E

Description	Crystal
Mode of Oscillation and Cut	Fundamental AT
Frequency (as specified)	27 MHz
Frequency Tolerance	±20ppm
Temperature plus Aging Stability	±30ppm
C0 /C1	230
Load Capacitance (C <sub>LXTAL</sub> )	12pF
Equivalent Series Resistance (ESR)	30Ω (max.)

DOCUMENT CONTROL NO.  
PD - 1310

REVISION: E  
DATE: 03/09/05



**Note:**

1. Package Outline Exclusive of Mold Flash and Metal Burr
2. Controlling dimensions in millimeters
3. Ref: JEDEC MO-153F/AB



Pericom Semiconductor Corporation  
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1-800-435-2335 • www.pericom.com

DESCRIPTION: 16-Pin, 173-Mil Wide, TSSOP

PACKAGE CODE: L

**Ordering Information**(1,2,3)

Ordering Code	Package Code	Package Description
PI6CX300LE	L	Pb-free & Green, 16-pin TSSOP

**Notes:**

1. Thermal characteristics can be found on the company web site at [www.pericom.com/packaging/](http://www.pericom.com/packaging/)
2. E = Pb-free and Green
3. Adding an X suffix = Tape/Reel