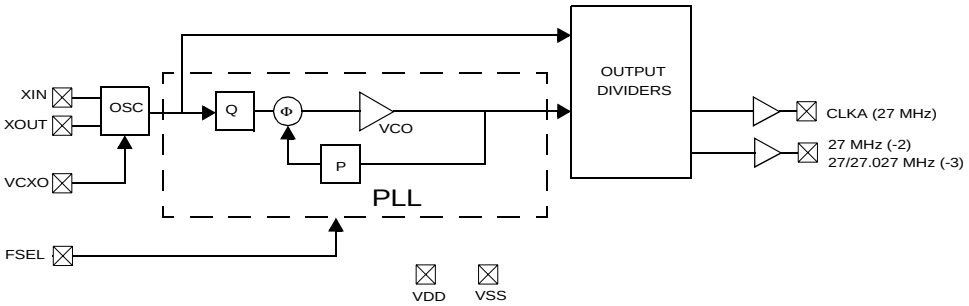
MediaClock™ MPEG Clock Generator with VCXO

Features	Benefits
• **Integrated phase-locked loop (PLL)**	Highest-performance PLL tailored for multimedia applications
• **Low jitter, high-accuracy outputs**	Meets critical timing requirements in complex system designs
• **VCXO with analog adjust**	Large ±150-ppm range, better linearity
• **3.3V operation**	Enables application compatibility

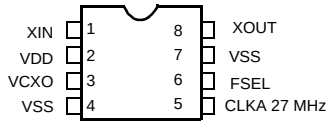
Part Number	Outputs	Input Frequency Range	Output Frequencies
CY24212-1	1	13.5 MHz/27 MHz (selectable)	27 MHz
CY24212-2	2	13.5 MHz/27 MHz (selectable)	Two copies of 27 MHz
CY24212-3	2	27 MHz	27 MHz/27.027 MHz (-1 ppm)
CY24212-5	2	27 MHz	27 MHz/27.027 MHz (0 ppm)

Logic Block Diagram

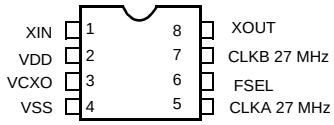


Pin Configurations

CY24212-1
8-pin SOIC



CY24212-2
8-pin SOIC



CY24212-3,-5
8-pin SOIC

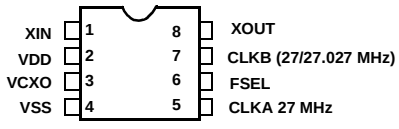


Table 1. CY24212 (-1, -2) Frequency Select Option

FSEL	Reference	CLKA/CLKB
0	13.5 MHz	27 MHz
1	27 MHz	27 MHz

Table 2. CY24212 (-3, -5) Frequency Select Option

FSEL	Reference	CLKA	CLKB
0	27 MHz	27 MHz	27 MHz
1	27 MHz	27 MHz	27.027 MHz

Pin Description

Name	Pin Number	Description
XIN	1	**Reference Input**.
VDD	2	**Voltage Supply**.
VCXO	3	**Input Analog Control for VCXO**.
VSS	4	**Ground**.
CLKA	5	**27-MHz Clock Output**.
FSEL (-1,-2)	6	**Input Frequency Select, Weak Internal Pull-up**. FSEL = 0, XIN = 13.5 MHz FSEL = 1, XIN = 27 MHz
FSEL (-3,-5)	6	**Output Frequency Select, Weak Internal Pull-up**. FSEL = 0, CLKA = 27 MHz, CLKB = 27 MHz FSEL = 1, CLKA = 27 MHz, CLKB = 27.027 MHz
VSS (-1)	7	**Ground**.
CLKB (-2)	7	**27 MHz**.
CLKB (-3,-5)	7	**27 MHz/27.027 MHz**.
XOUT[1]	8	**Reference Output**.

Pullable Crystal Specifications

Parameter	Name	Min	Typ	Max	Unit
CR_{load}	Crystal Load Capacitance		14		pF
C0/C1				240	
ESR	Equivalent Series Resistance		35	50	Ω
T_o	Operating Temperature	0		70	°C
Crystal Accuracy	Crystal Accuracy			± 20	ppm
TT_s	Stability over Temperature and Aging			± 50	ppm

Absolute Maximum Conditions

Parameter	Description	Min	Max	Unit
V_{DD}	Supply Voltage	–0.5	7.0	V
T_S	Storage Temperature[2]	–65	125	°C
T_J	Junction Temperature		125	°C
	Digital Inputs	V_{SS} – 0.3	V_{DD} + 0.3	V
	Electrostatic Discharge	2		kV

Recommended Operating Conditions

Parameter	Description	Min	Typ	Max	Unit
V_{DD}	Operating Voltage	3.135	3.3	3.465	V
T_A	Ambient Temperature	0		70	°C
C_{LOAD}	Max. Load Capacitance			15	pF
f_{REF}	Reference Frequency	13.5		27	MHz

Notes:
1. Float XOUT if XIN is externally driven.
2. Rated for ten years.

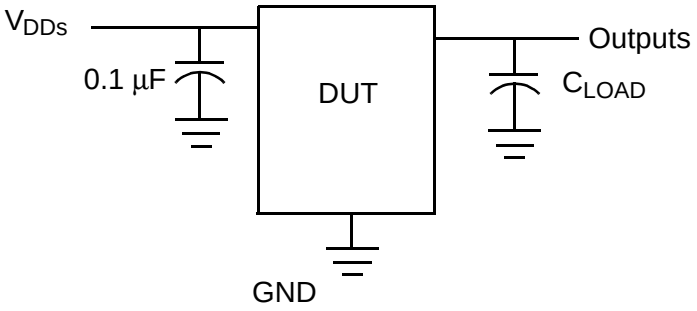
DC Electrical Specifications

Parameter	Name	Description	Min	Typ	Max	Unit
I_{OH}	Output High Current	$V_{OH} = V_{DD} – 0.5$, $V_{DD} = 3.3V$ (source)	12	24		mA
I_{OL}	Output Low Current	$V_{OL} = 0.5$, $V_{DD} = 3.3V$ (sink)	12	24		mA
C_{IN}	Input Capacitance				7	pF
I_{IH}	Input High Current	$V_{IH} = V_{DD}$	–	5	10	µA
I_{IL}	Input Low Current	$V_{IL} = 0V$	–	–	50	µA
$f_{\Delta XO}$	VCXO Pullability Range		±150			ppm
V_{VCXO}	VCXO Input Range		0		V_{DD}	V
I_{DD}	Supply Current	Sum of Core and Output Current			35	mA
V_{IH}	Input High Voltage	CMOS levels, 70% of V_{DD}	0.7			V_{DD}
V_{IL}	Input Low Voltage	CMOS levels, 30% of V_{DD}			0.3	V_{DD}
R_{UP}	Pull-up resistor on inputs	$V_{DD} = 3.14$ to 3.47V, measured $V_{IN} = 0V$		100	150	kΩ

AC Electrical Specifications ($V_{DD} = 3.3V$)

Parameter[3]	Name	Description	Min	Typ	Max	Unit
DC	Output Duty Cycle	Duty Cycle is defined in *Figure 1*, 50% of V_{DD}	45	50	55	%
ER	Rising Edge Rate	Output Clock Edge Rate, Measured from 20% to 80% of V_{DD}, C_{LOAD} = 15 pF. See *Figure 2*.	0.8	1.4		V/ns
EF	Falling Edge Rate	Output Clock Edge Rate, Measured from 80% to 20% of V_{DD}, C_{LOAD} = 15 pF. See *Figure 2*.	0.8	1.4		V/ns
t_9	Clock Jitter	Peak-to-peak period jitter		300		ps
t_{10}	PLL Lock Time				3	ms

Test and Measurement Set-up



Note:
3. Not 100% tested.

Voltage and Timing Definitions

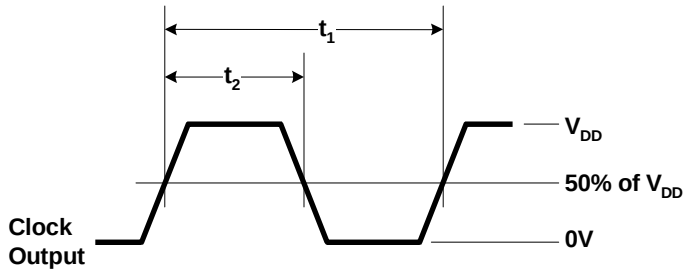


Figure 1. Duty Cycle Definition

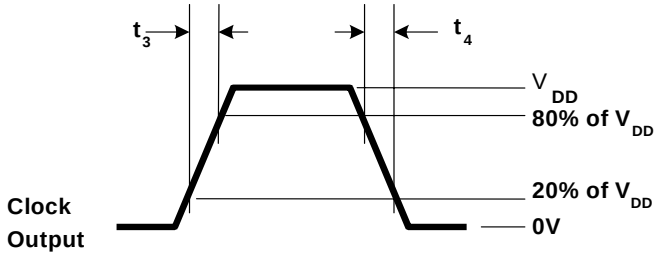


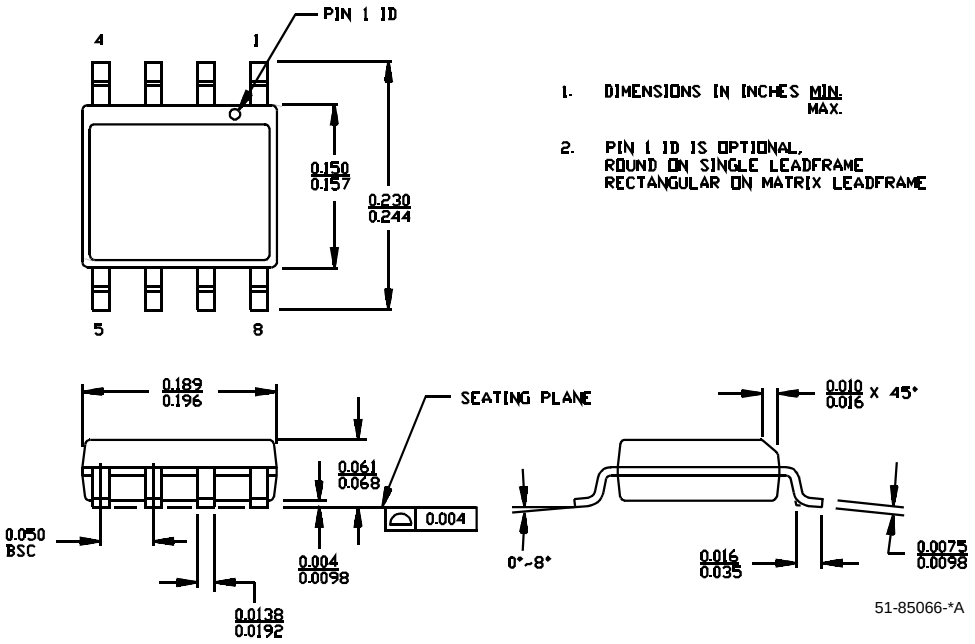
Figure 2. ER = (0.6 x V_{DD}) /t3, EF = (0.6 x V_{DD}) /t4

Ordering Information

Ordering Code	Package Name	Package Type	Operating Range	Operating Voltage
CY24212SC-1	S8	8-Pin SOIC	Commercial	3.3V
CY24212SC-1T	S8	8-Pin SOIC -Tape and Reel	Commercial	3.3V
CY24212SC-2	S8	8-Pin SOIC	Commercial	3.3V
CY24212SC-2T	S8	8-Pin SOIC -Tape and Reel	Commercial	3.3V
CY24212SC-3	S8	8-Pin SOIC	Commercial	3.3V
CY24212SC-3T	S8	8-Pin SOIC -Tape and Reel	Commercial	3.3V
CY24212SC-5	S8	8-Pin SOIC	Commercial	3.3V
CY24212SC-5T	S8	8-Pin SOIC -Tape and Reel	Commercial	3.3V

Package Drawing and Dimensions

8-Lead (150-Mil) SOIC S8



Document History Page

Document Title: CY24212 MediaClock™ MPEG Clock Generator with VCXO Document Number: 38-07402				
REV.	**ECN NO.**	**Issue Date**	**Orig. of Change**	**Description of Change**
**	117089	09/09/02	CKN	New Data Sheet
*A	120888	12/06/02	CKN	Added -3
*B	123064	02/19/03	CKN	Added -5