CY26121

PacketClock™ Spread Spectrum Clock Generator

Features

- Integrated phase-locked loop (PLL)
- Low jitter, high-accuracy outputs
- 3.3V operation
- 25-MHz input frequency
- 66.66-MHz or 33.33-MHz selectable output frequency (orig, -3,-11,-31)
- 33.33-MHz or 25-MHz selectable output frequency (-2,-21)

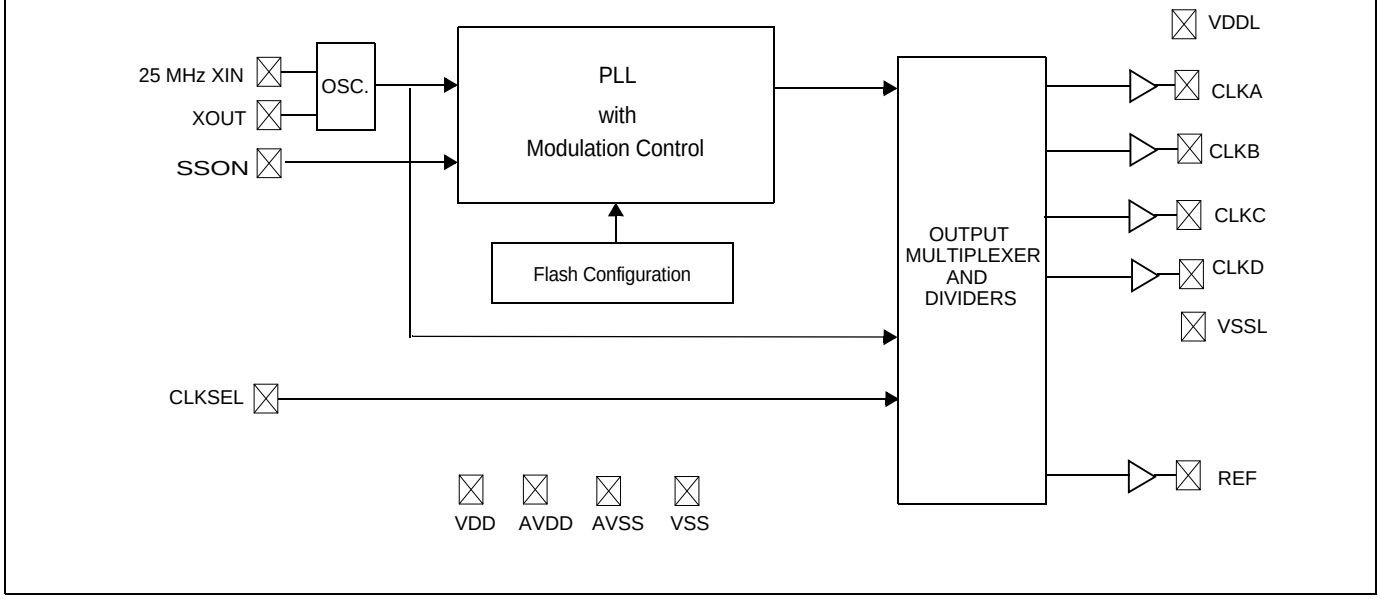
Benefits

- High-performance PLL tailored for Spread Spectrum application
- Meets critical timing requirements in complex system designs
- Enables application compatibility
- Works with commonly available crystal or driven reference
- Downspread Spread Spectrum with 30-kHz nominal modulation frequency

Table 1. Frequency Table for CLKA-D

Part Number	CLKSEL=0	CLKSEL=1	Spread%	Parallel Crystal Load
CY26121	66.66 MHz	33.33	–2.8%	6 pF
CY26121-2	33.33 MHz	25.00	–2.8%	6 pF
CY26121-3	66.66 MHz	33.33	–1.4%	6 pF
CY26121-11	66.66 MHz	33.33	–2.8%	15 pF
CY26121-21	33.33 MHz	25.00	–2.8%	15 pF
CY26121-31	66.66 MHz	33.33	–1.4%	15 pF

Logic Block Diagram



Pin Configuration

Figure 1. CY26121, 16-pin TSSOP

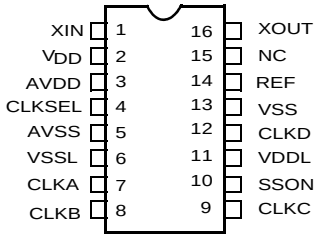


Table 2. Pin Definitions

Name	Pin Number	Description
XIN	1	Reference input Or Crystal Input
VDD	2	3.3V Voltage Supply
AVDD	3	3.3V Analog Voltage
CLKSEL	4 (orig., -11,-3,-31)	0 = 66.66MHz out, 1 = 33.33 MHz Out. Weak pull up.
CLKSEL	4 (-2, -21)	0 = 33.33MHz out, 1 = 25 MHz Out. Weak pull up.
AVSS	5	Analog Ground
VSSL	6	CLK Ground
CLK(A:D)	7,8,9,12	Clock Outputs at V_{DDL} level
SSON	10	Spread Spectrum Enable pin 0 = SS off; 1 = SS on. Weak pull up.
VDDL	11	3.3V Clock Voltage Supply
VSS	13	Ground
REF	14	Reference Output at V_{DD} Level
NC	15	No Connect
XOUT[1]	16	Crystal Output

Maximum Ratings

Exceeding maximum ratings may impair the useful life of the device. These user guidelines are not tested.

Supply Voltage (V_{DD}, AV_{DD}, V_{DDL}) ..... –0.5 to +7.0V

DC Input Voltage ..... –0.5V to V_{DD} + 0.5

Storage Temperature (Non-condensing) ..... –55°C to +125°C

Junction Temperature ..... –40°C to +125°C

Data Retention at Tj = 125°C ..... > 10 years

Package Power Dissipation ..... 350 mW

Static Discharge Voltage ..... ≥ 2000V (per MIL-STD-883, Method 3015)

Recommended Operating Conditions

Parameter	Description	Min	Typ.	Max	Unit
$V_{DD,}$ AV_{DD}	Supply voltage	3.135	3.30	3.465	V
V_{DDL}	Supply voltage for CLK (A-D)	3.135	3.30	3.465	V
T_A	Ambient temperature (commercial temp. grade)	0		70	° C
T_A	Ambient Temperature (industrial temp grade)	-40		85	° C
C_{LOAD}	Max. output load capacitance			15	pF
F_{ref}	Reference frequency		25		MHz

Crystal Specification[2]

Parameter	Name	Min	Typ	Max	Unit
CR_{load}	Crystal load capacitance (original, -2, -3)		6		pF
CR_{load}	Crystal load capacitance (-11,-21,-31)		15		pF
ESR	Equivalent series resistance			50	Ω

DC Electrical Specifications

Parameter	Description	Condition	Min	Typ.	Max	Unit
I_{OH}	Output High Current	$V_{OH} = V_{DD} – 0.5$, V_{DD}/V_{DDL}=3.3V	12	24		mA
I_{OL}	Output Low Current	V_{OL} = 0.5, V_{DD}/V_{DDL} = 3.3V	12	24		mA
I_{IH}	Input High Current	$V_{IH} = V_{DD}$		5	10	µA
I_{IL}	Input Low Current	V_{IL} = 0V			50	µA
V_{IH}	Input High Voltage	CMOS levels	0.7			V_{DD}
V_{IL}	Input Low Voltage	CMOS levels			0.3	V_{DD}
C_{IN}[3]	Input Capacitance	Input pins excluding XIN			7	pF
R_{UP}[3]	Pull up resistor on input pins	V_{DD} = 3.14 to 3.47V, measured at V_{IN} = 0V	80	100	150	kΩ
I_{DD}	Supply Current	$AV_{DD}/V_{DD}/V_{DDL}$ Current.		42	60	mA

Notes
1. Float XOUT if XIN is externally driven.
2. A fundamental parallel resonant crystal must be used

AC Electrical Specifications [3]

Parameter	Description	Condition	Min	Typ.	Max	Unit
DC	Output Duty Cycle	Duty Cycle is defined in Figure 2, 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 3.	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 3.	0.8	1.4		V/ns
tj	RMS Clock Cycle-to-Cycle Jitter	RMS cycle-to-cycle jitter with Spread on. Measured at $V_{DD}/2$.		15	40	ps

Voltage and Timing Definitions

Figure 2. Duty Cycle Definition

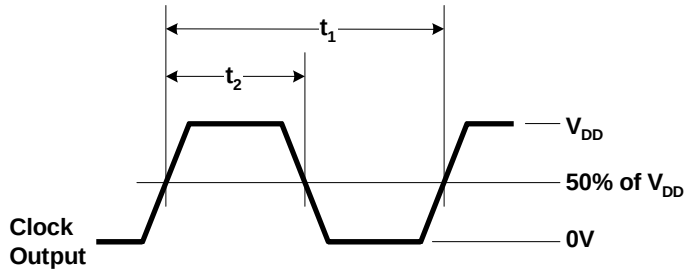
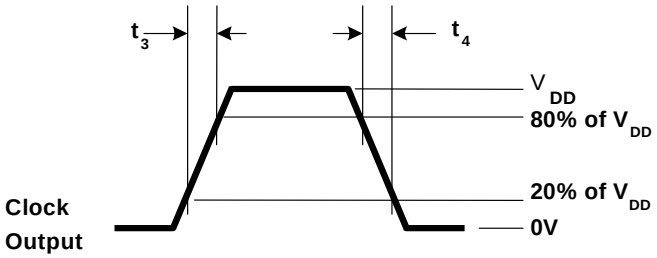


Figure 3. ER = (0.6 x V_{DD}) /t3, EF = (0.6 x V_{DD}) /t4



Note
3. Guaranteed by Characterization, not 100% tested.

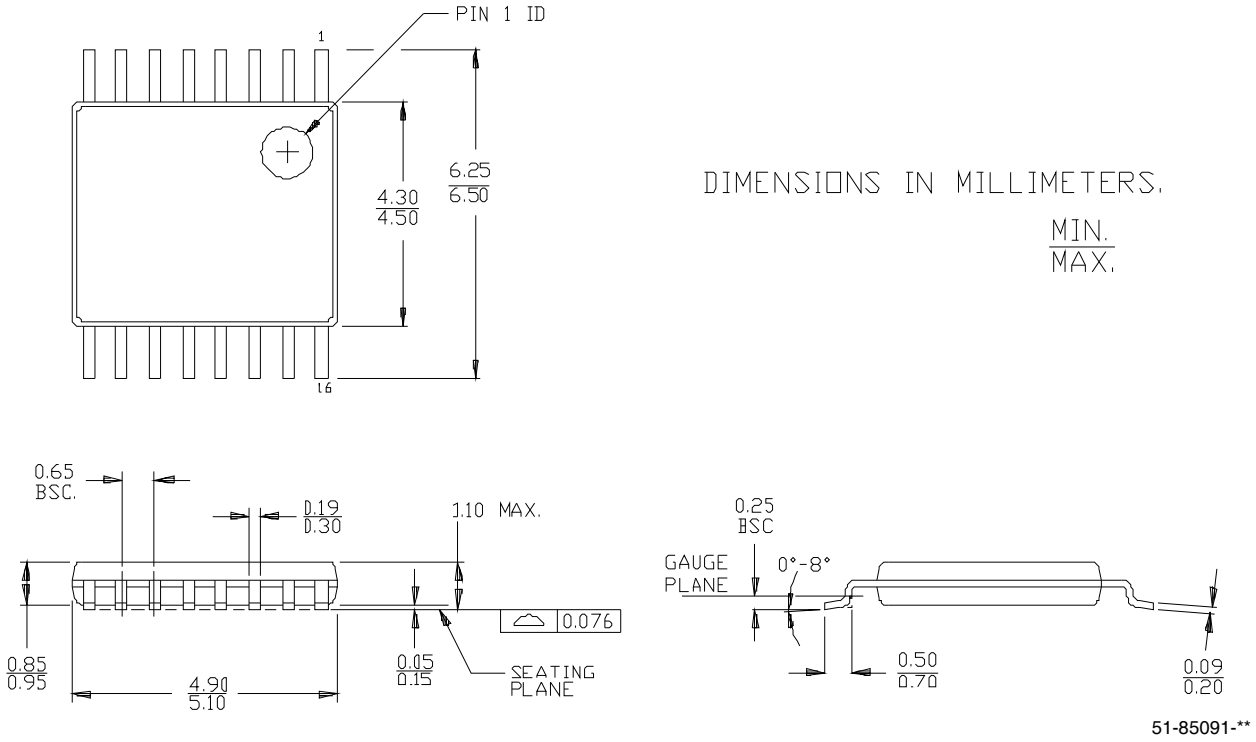
Ordering Information

Ordering Code	Package Type	Operating Range
CY26121ZC[4]	16-pin TSSOP	Commercial, 0°C to 70°C
CY26121ZCT[4]	16-pin TSSOP – Tape and Reel	Commercial, 0°C to 70°C
CY26121ZI[4]	16-pin TSSOP	Industrial, –40°C to 85°C
CY26121ZIT[4]	16-pin TSSOP – Tape and Reel	Industrial, –40°C to 85°C
CY26121ZC-2[4]	16-pin TSSOP	Commercial, 0°C to 70°C
CY26121ZC-2T[4]	16-pin TSSOP – Tape and Reel	Commercial, 0°C to 70°C
CY26121ZI-2[4]	16-pin TSSOP	Industrial, –40°C to 85°C
CY26121ZI-2T[4]	16-pin TSSOP – Tape and Reel	Industrial, –40°C to 85°C
CY26121ZC-3[4]	16-pin TSSOP	Commercial, 0°C to 70°C
CY26121ZC-3T[4]	16-pin TSSOP – Tape and Reel	Commercial, 0°C to 70°C
CY26121ZI-3[4]	16-pin TSSOP	Industrial, –40°C to 85°C
CY26121ZI-3T[4]	16-pin TSSOP – Tape and Reel	Industrial, –40°C to 85°C
CY26121ZC-11[4]	16-pin TSSOP	Commercial, 0°C to 70°C
CY26121ZC-11T[4]	16-pin TSSOP – Tape and Reel	Commercial, 0°C to 70°C
CY26121ZC-21[4]	16-pin TSSOP	Commercial, 0°C to 70°C
CY26121ZC-21T[4]	16-pin TSSOP – Tape and Reel	Commercial, 0°C to 70°C
CY26121ZI-21[4]	16-pin TSSOP	Industrial, –40°C to 85°C
CY26121ZI-21T[4]	16-pin TSSOP – Tape and Reel	Industrial, –40°C to 85°C
CY26121ZC-31[4]	16-pin TSSOP	Commercial, 0°C to 70°C
CY26121ZC-31T[4]	16-pin TSSOP – Tape and Reel	Commercial, 0°C to 70°C
CY26121KZC-21	16-pin TSSOP	Commercial, 0°C to 70°C
CY26121KZC-21T	16-pin TSSOP – Tape and Reel	Commercial, 0°C to 70°C
CY26121KZI-21	16-pin TSSOP	Industrial, –40°C to 85°C
CY26121KZI-21T	16-pin TSSOP – Tape and Reel	Industrial, –40°C to 85°C
Pb-Free		
CY26121ZXC-21[4]	16-pin TSSOP	Commercial, 0°C to 70°C
CY26121ZXC-21T[4]	16-pin TSSOP – Tape and Reel	Commercial, 0°C to 70°C
CY26121ZXI-21[4]	16-pin TSSOP	Industrial, –40°C to 85°C
CY26121ZXI-21T[4]	16-pin TSSOP – Tape and Reel	Industrial, –40°C to 85°C
CY26121KZXC-21	16-pin TSSOP	Commercial, 0°C to 70°C
CY26121KZXC-21T	16-pin TSSOP – Tape and Reel	Commercial, 0°C to 70°C
CY26121KZXI-21	16-pin TSSOP	Industrial, –40°C to 85°C
CY26121KZXI-21T	16-pin TSSOP – Tape and Reel	Industrial, –40°C to 85°C

Note
4. Not recommended for new designs.

Package Drawing and Dimensions

Figure 4. 16-lead Thin Shrunk Small Outline Package (4.40 MM Body) Z16



Parameter	Inches			Millimeters		
	Min	Nom.	Max	Min	Nom.	Max.
A	–	–	0.047	–	–	1.20
A_1	0.002	–	0.006	0.05	–	0.15
A2	0.031	0.039	0.041	0.80	1.00	1.05
B	0.007	–	0.012	0.19	–	0.30
C	0.004	–	0.008	0.09	–	0.20
D	0.193	0.197	0.201	4.90	5.00	5.10
E	0.169	0.173	0.177	4.30	4.40	4.50
e	0.026 BSC			0.65 BSC		
H	0.244	0.252	0.260	6.20	6.40	6.60
L	0.018	0.024	0.030	0.45	0.60	0.75
a	0°	–	8°	0°	–	8°

Document History Page

Document Title: CY26121 PacketClock™ Spread Spectrum Clock Generator Document Number: 38-07350				
REV.	**ECN NO.**	**Issue Date**	**Orig. of Change**	**Description of Change**
**	121669	02/11/03	CKN	New Data Sheet
*A	2440886	See ECN	KVM/AESA	Updated template. Added Note “Not recommended for new designs.” Added part numbers CY26121ZXC-21, CY26121ZXC-21T, CY26121ZXI-21, and CY26121ZXI-21T in ordering information table. Added part numbers CY26121KZC-21, CY26121KZC-21T, CY26121KZI-21, and CY26121KZI-21T. Added part numbers CY26121KZXC-21, CY26121KZXC-21T, CY26121KZXI-21, and CY26121KZXI-21T. Removed part numbers CY26121ZI-11, CY26121ZI-11T, CY26121ZI-31 and CY26121ZI-31T

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