CYPRESS

CY26121

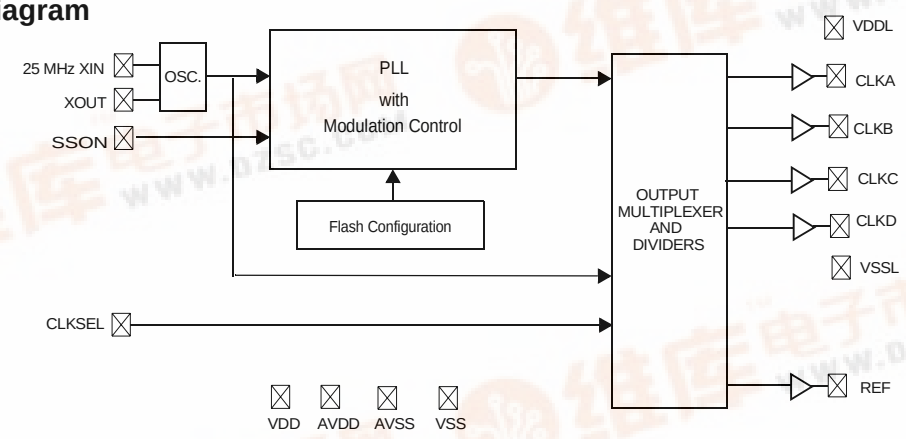
PacketClock™ Spread Spectrum Clock Generator

Features	Benefits
• Integrated phase-locked loop (PLL)	High-performance PLL tailored for Spread Spectrum application
• Low jitter, high-accuracy outputs	Meets critical timing requirements in complex system designs
• 3.3V operation	Enables application compatibility
• 25-MHz input frequency	Works with commonly available crystal or driven reference
• 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)	Downspread Spread Spectrum with 30-kHz nominal modulation frequency

Frequency Table for CLKA-D

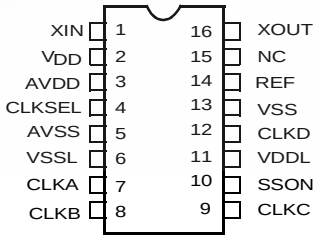
Part Number	CLKSEL=0	CLKSEL=1	Spread%	Parallel Crystal Load
CY26121	66.66 MHz	33.33	–2.8%	6 pF
CY26121-2	33.33 MHz	25.00	–2.8%	6 pF
CY26121-3	66.66 MHz	33.33	–1.4%	6 pF
CY26121-11	66.66 MHz	33.33	–2.8%	15 pF
CY26121-21	33.33 MHz	25.00	–2.8%	15 pF
CY26121-31	66.66 MHz	33.33	–1.4%	15 pF

Logic Block Diagram



Pin Configuration

CY26121
16-pin TSSOP



Pin Description

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**

Absolute Maximum Conditions

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 @ Tj = 125°C.....> 10 years

Package Power Dissipation..... 350 mW

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

(Above which the useful life may be impaired. For user guidelines, not tested.)

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

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

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

AC Electrical Specifications[3]

Parameter	Description	Condition	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
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

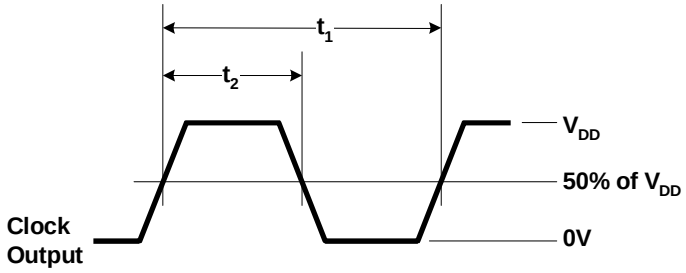


Figure 1. Duty Cycle Definition

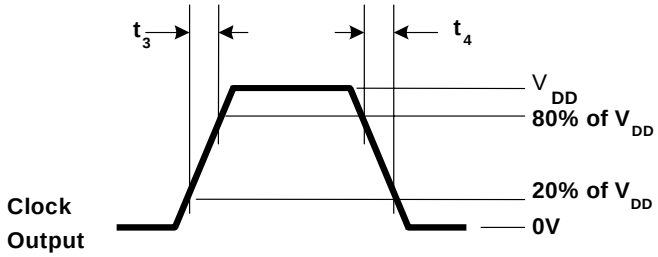


Figure 2. ER = (0.6 x V_{DD}) /t3, EF = (0.6 x V_{DD}) /t4

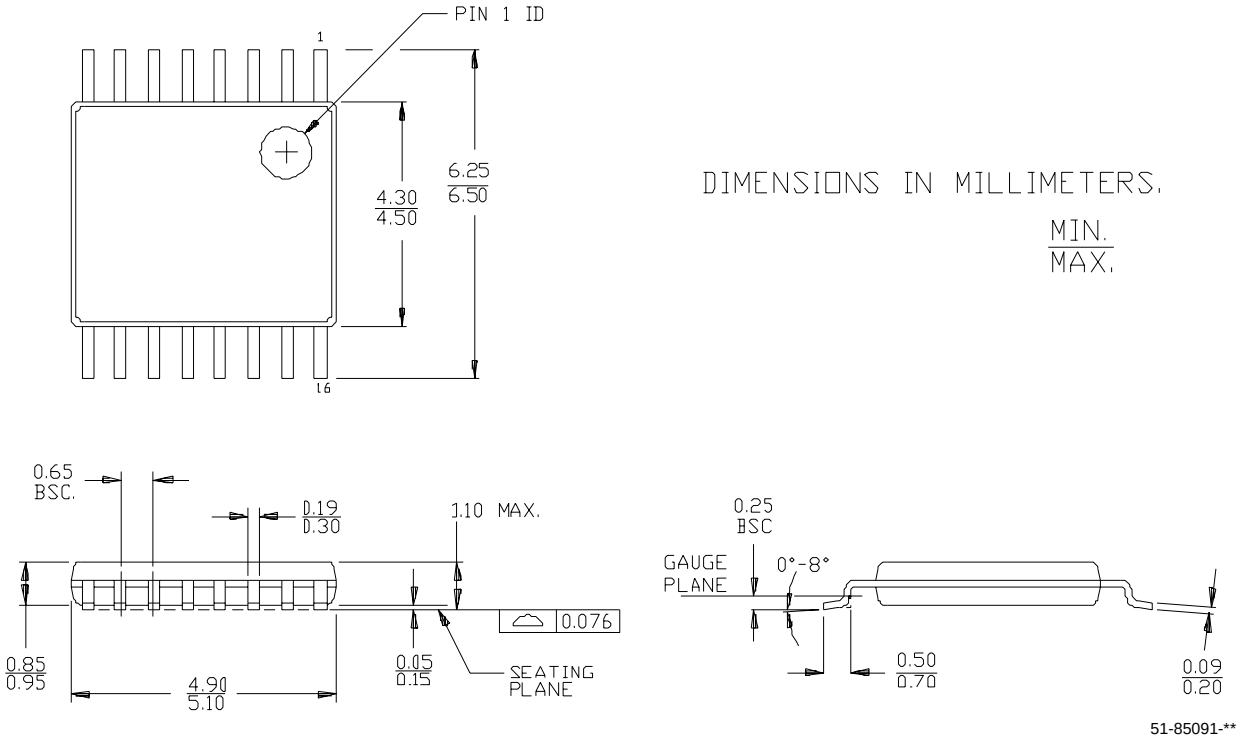
Notes:
3. Guaranteed by Characterization, not 100% tested.

Ordering Information

Ordering Code	Package Type	Operating Range
CY26121ZC	16-pin TSSOP	Commercial, 0°C to 70°C
CY26121ZCT	16-pin TSSOP – Tape and Reel	Commercial, 0°C to 70°C
CY26121ZI	16-pin TSSOP	Industrial, –40°C to 85°C
CY26121ZIT	16-pin TSSOP – Tape and Reel	Industrial, –40°C to 85°C
CY26121ZC-2	16-pin TSSOP	Commercial, 0°C to 70°C
CY26121ZC-2T	16-pin TSSOP – Tape and Reel	Commercial, 0°C to 70°C
CY26121ZI-2	16-pin TSSOP	Industrial, –40°C to 85°C
CY26121ZI-2T	16-pin TSSOP – Tape and Reel	Industrial, –40°C to 85°C
CY26121ZC-3	16-pin TSSOP	Commercial, 0°C to 70°C
CY26121ZC-3T	16-pin TSSOP – Tape and Reel	Commercial, 0°C to 70°C
CY26121ZI-3	16-pin TSSOP	Industrial, –40°C to 85°C
CY26121ZI-3T	16-pin TSSOP – Tape and Reel	Industrial, –40°C to 85°C
CY26121ZC-11	16-pin TSSOP	Commercial, 0°C to 70°C
CY26121ZC-11T	16-pin TSSOP – Tape and Reel	Commercial, 0°C to 70°C
CY26121ZI-11	16-pin TSSOP	Industrial, –40°C to 85°C
CY26121ZI-11T	16-pin TSSOP – Tape and Reel	Industrial, –40°C to 85°C
CY26121ZC-21	16-pin TSSOP	Commercial, 0°C to 70°C
CY26121ZC-21T	16-pin TSSOP – Tape and Reel	Commercial, 0°C to 70°C
CY26121ZI-21	16-pin TSSOP	Industrial, –40°C to 85°C
CY26121ZI-21T	16-pin TSSOP – Tape and Reel	Industrial, –40°C to 85°C
CY26121ZC-31	16-pin TSSOP	Commercial, 0°C to 70°C
CY26121ZC-31T	16-pin TSSOP – Tape and Reel	Commercial, 0°C to 70°C
CY26121ZI-31	16-pin TSSOP	Industrial, –40°C to 85°C
CY26121ZI-31T	16-pin TSSOP – Tape and Reel	Industrial, –40°C to 85°C

Package Drawing and Dimensions

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

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REV.	**ECN NO.**	**Issue Date**	**Orig. of Change**	**Description of Change**
**	121669	02/11/03	CKN	New Data Sheet