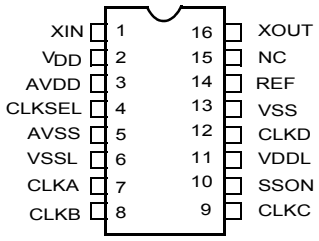
Pin Configuration

Figure 1. 16-pin TSSOP pinout



Pin Definitions

Pin Name	Pin Number	Description
XIN	1	Reference input Or crystal input
VDD	2	3.3 V voltage supply
AVDD	3	3.3 V analog voltage
CLKSEL	4 (-21)	0 = 33.33 MHz 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	3.3 V clock voltage supply
VSS	13	Ground
REF	14	Reference output at V_{DD} level
NC	15	No connect
XOUT[1]	16	Crystal output

Notes
1. Float XOUT if XIN is externally driven.

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 +7.0 V

DC input voltage ..... –0.5 V to V_{DD} + 0.5 V

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

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 (industrial temp grade)	–40	–	85	°C
C_{LOAD}	Max. output load capacitance	–	–	15	pF
F_{ref}	Reference frequency	–	25	–	MHz

Crystal Specification

Parameter [2]	Description	Min	Typ	Max	Unit
CR_{load}	Crystal load capacitance (-21)	–	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, V_{DD}/V_{DDL} = 3.3 V	12	24	–	mA
I_{OL}	Output low current	V_{OL} = 0.5 V, V_{DD}/V_{DDL} = 3.3 V	12	24	–	mA
I_{IH}	Input high current	$V_{IH} = V_{DD}$	–	5	10	µA
I_{IL}	Input low current	V_{IL} = 0 V	–	–	50	µA
V_{IH}	Input high voltage	CMOS levels	0.7 × V_{DD}	–	–	V
V_{IL}	Input low voltage	CMOS levels	–	–	0.3 × V_{DD}	V
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 3.47 V, measured at V_{IN} = 0 V	80	100	150	kΩ
I_{DD}	Supply current	$AV_{DD}/V_{DD}/V_{DDL}$ Current.	–	42	60	mA

Thermal Resistance

Parameter [3]	Description	Test Conditions	16-pin TSSOP	Unit
θ_{JA}	Thermal resistance (junction to ambient)	Test conditions follow standard test methods and procedures for measuring thermal impedance, in accordance with EIA/JESD51.	90	°C/W
θ_{JC}	Thermal resistance (junction to case)		14	°C/W

Notes
2. A fundamental parallel resonant crystal must be used.
3. Guaranteed by Characterization, not 100% tested.
3. These parameters are guaranteed by design and are not tested.

AC Electrical Specifications

Parameter [4]	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

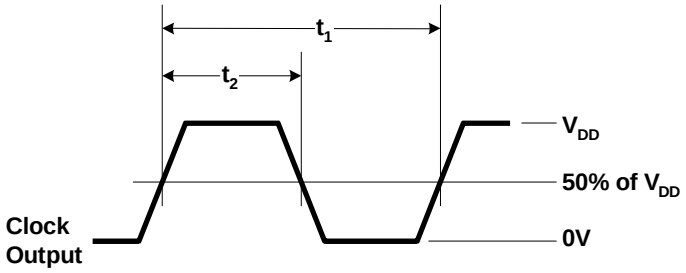
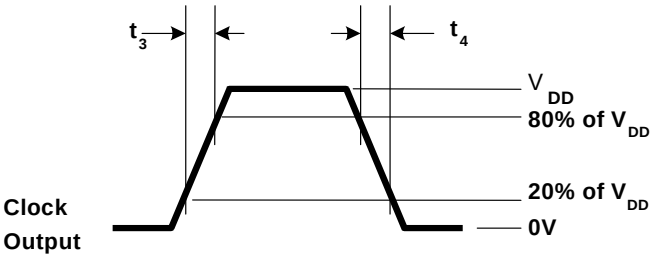


Figure 3. ER = (0.6 × V_{DD}) /t_3, EF = (0.6 × V_{DD}) /t_4

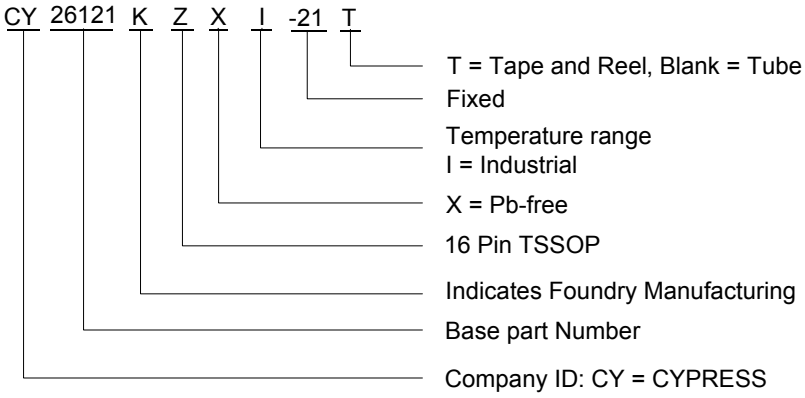


Notes
4. Guaranteed by Characterization, not 100% tested.

Ordering Information

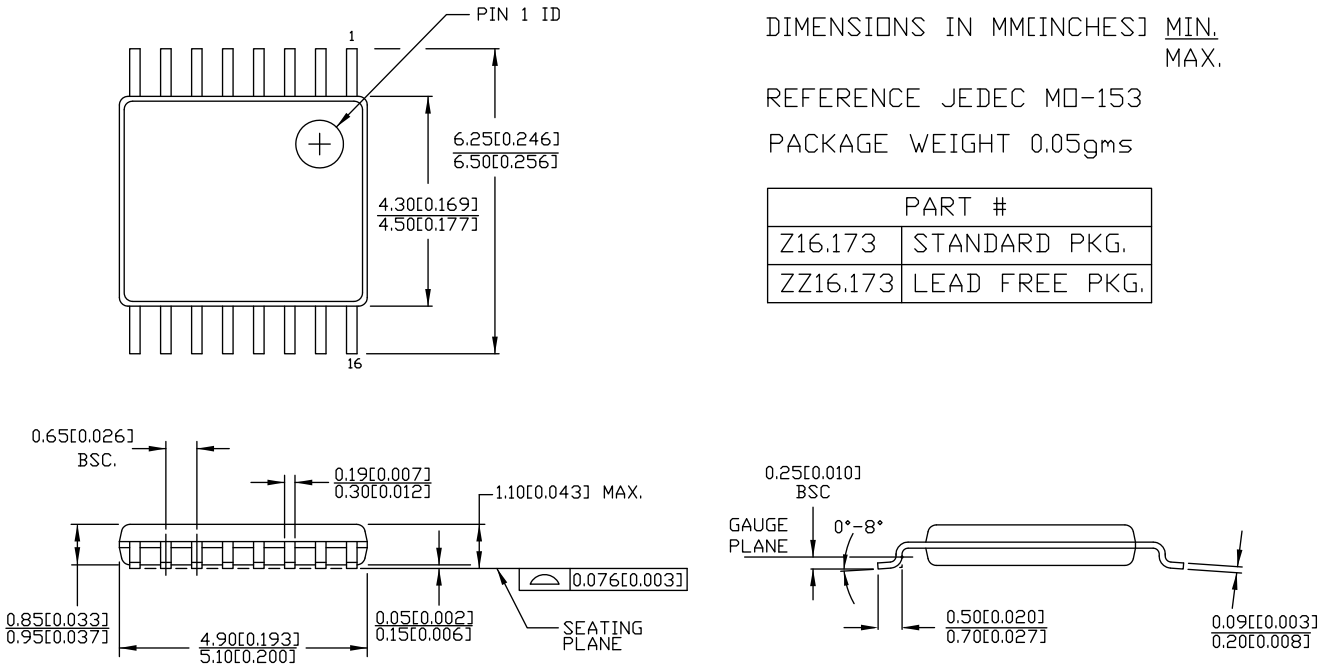
Ordering Code	Package Type	Operating Range
CY26121KZXI-21	16-pin TSSOP	Industrial, –40 °C to 85 °C
CY26121KZXI-21T	16-pin TSSOP – Tape and Reel	Industrial, –40 °C to 85 °C

Ordering Code Definitions



Package Drawing and Dimensions

Figure 4. 16-pin TSSOP (4.40 mm Body) Z16.173/ZZ16.173 Package Outline, 51-85091



51-85091 *E

Acronyms

Table 1. Acronyms Used in this Document

Acronym	Description
ESR	Equivalent Series Resistance
PLL	Phase-Locked Loop
TSSOP	Thin-Shrunk Small Outline Package

Document Conventions

Units of Measure

Table 2. Units of Measure

Symbol	Unit of Measure
°C	degree Celsius
kΩ	kilohm
MHz	megahertz
µA	microampere
mA	milliampere
mW	milliwatt
ns	nanosecond
Ω	ohm
%	percent
pF	picofarad
ps	picosecond
V	volt

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 Ordering Information: Added part numbers CY26121ZXC-21, CY26121ZXC-21T, CY26121ZXI-21, and CY26121ZXI-21T. 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. Added Note “Not recommended for new designs.” and referred in some MPNs. Updated to new template.
*B	2899683	03/26/10	KVM	Removed reference to -2, -3, -11, -31 parts in all instances across the document. Updated Ordering Information: Removed inactive parts. Removed Note “Not recommended for new designs.” and its references. Updated Package Drawing and Dimensions.
*C	3383431	09/26/2011	PURU	Updated Logic Block Diagram. Added Ordering Code Definitions under Ordering Information. Updated Package Drawing and Dimensions. Added Acronyms and Units of Measure.
*D	4556342	10/30/2014	TAVA	Updated Package Drawing and Dimensions: spec 51-85091 – Changed revision from *C to *E. Updated to new template. Completing Sunset Review.
*E	5279177	05/20/2016	PSR	Added Thermal Resistance. Updated to new template.

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