CARDINAL COMPONENTS

CLP PinThru Crystal

CLP
10.8 x 4.5 mm
Metal Package

Features

- Low profile pin-thru hole crystal.
- AT Cut Crystal
- 3.579545 MHz to 80 MHz

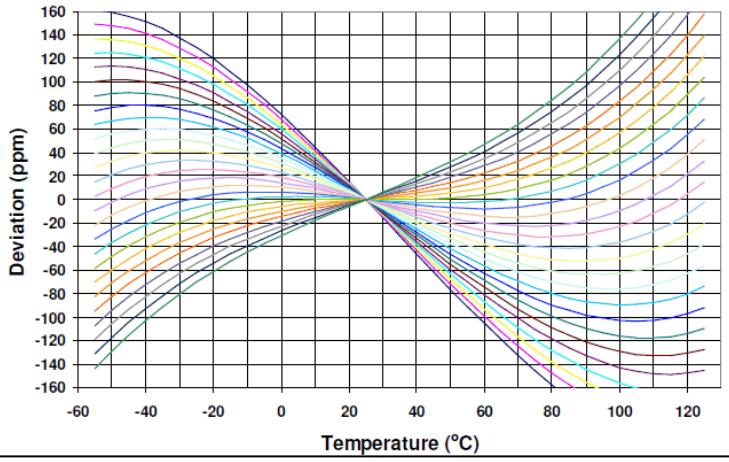
Applications

Bluetooth
WLAN
IoT
MPU
Microcontroller
Set-top Box

Electrical Characteristics

Parameter	**Min**	**Typ**	**Max**	**Unit**	**Condition** (Consult factory for other options)
Frequency Range	3.579545	-	80	MHz	
Calibration Frequency Tolerance	±10	-	±100	ppm	at +25°C ± 3°C, see part number guide below for available options
Frequency Stability	±10	-	±100	ppm	see part number guide below for available options
Operating Temperature Range	-40	-	+85	°C	see part number guide below for available options
Storage Temperature Range	-55	-	+125	°C	
Equivalent Series Resistance (ESR)	-	-	140 120 80 45 40 35 30 25 25 80 80	Ω	Freq ≤ 3.58 MHz 4 MHz ≤ Freq < 5 MHz 5 MHz ≤ Freq ≤ 7 MHz 7 MHz < Freq ≤ 9 MHz 9 MHz ≤ Freq < 13 MHz 13 MHz ≤ Freq < 16 MHz 16 MHz ≤ Freq < 20 MHz 20 MHz ≤ Freq < 30 MHz 30 MHz ≤ Freq ≤ 36MHz 30 MHz ≤ Freq ≤ 36MHz (3rd Overtone) 36 MHz ≤ Freq ≤ 80MHz (3rd Overtone)
Drive Level	-	0.1	1.0	mW	
Shunt Capacitance (C0)	-	-	7.0	pF	Pad to Pad Capacitance
Aging at 25°C ± 3°C	-	-	±5	ppm	for the first year

AT Cut Crystal Frequency versus Temperature Typical Performance:



CLP PinThru Crystal

Part Numbering (Example: CLP-A1B3C2-45-25.0D18)

Series Model	Added Features	Operating Temperature Range	Frequency Stability (ppm)	Frequency Tolerance (ppm)	ESR	Frequency	Load Capacitance Standards below, others available	Overtone
CLP		**A1**	**B3**	**C2**	**45**	**25.0**	**D18**	
	Blank = Bulk-Bag Z = Tape/Ammo X = Insulator	A0 = -10 ~ +60°C A4 = 0 ~ +70°C **A1 = -10 ~ +70°C** A5 = -20 ~ +70°C A2 = -40 ~ +85°C	B1 = ±100 B2 = ±50 **B3 = ±30** BR = ±25 B9 = ±20 B6 = ±15 B4 = ±10	C1 = ±100 **C2 = ±50** C3 = ±30 C7 = ±25 C5 = ±20 C8 = ±15 C4 = ±10	See ESR in Table		D8 = 8pF D12 = 12pF D16 = 16pF **D18 = 18pF** D20 = 20pF Series = DS	**Blank=Fund** 3=3rd OT

Available Frequency Stability versus Temperature in ppm

		B4	B6	B9	BR	B3	B2	B1
		±10	±15	±20	±25	±30	±50	±100
0 to +70°C	A4	•	•	•	•	•	•	•
-10 to +60°C	A0	•	•	•	•	•	•	•
-10 to +70°C	A1	△	•	•	•	•	•	•
-20 to +70°C	A5		•	•	•	•	•	•
-40 to +85°C	A2			•	•	•	•	•

Available Frequency Tolerance versus Load Capacitance

	B4	B6	B9	BR	B3	B2	B1
	±10	±15	±20	±25	±30	±50	±100
8pF		△	•	•	•	•	•
12pF	△	•	•	•	•	•	•
16pF	△	•	•	•	•	•	•
18pF	•	•	•	•	•	•	•
20pF	•	•	•	•	•	•	•
Series	•	•	•	•	•	•	•

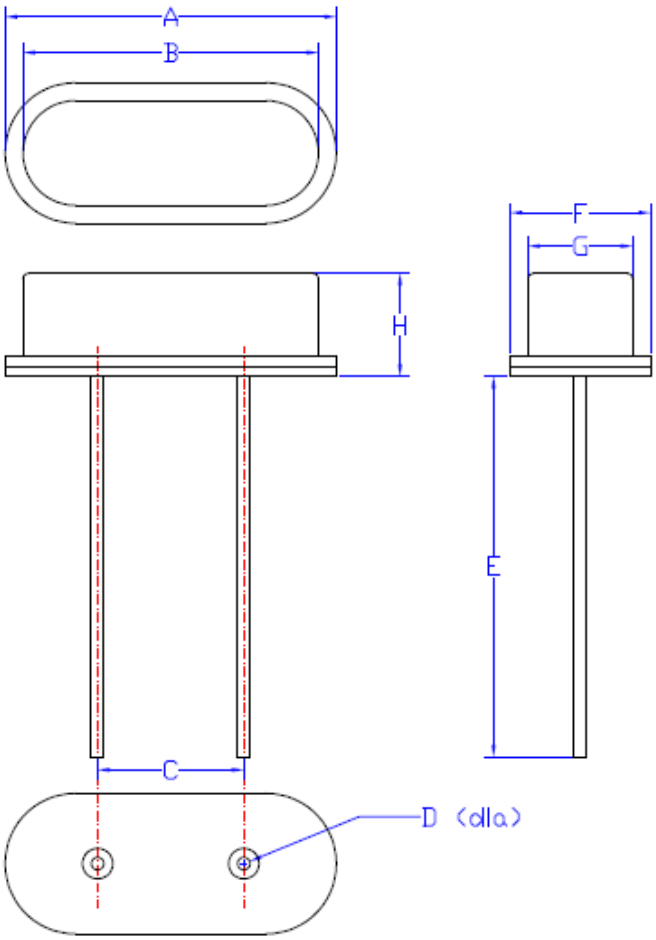
• = Available **△ = Check with Cardinal**

Note: Not all combinations may be available. Other specifications may be available. Please check with Cardinal sales.

Reliability

Parameter	Condition
Mechanical Shock	MIL-STD-883, Method 2002, Condition B
Vibration	MIL-STD-883, Method 2007, Condition A
Solderability	IPC J-STD-002
Thermal Cycle	MIL-STD-883 Method 1010, Condition B

Mechanical Dimensions



	mm
A	10.8 ± 0.2
B	9.9 ± 0.1
C	4.88 ± 0.2
D	0.43 ± 0.05
E	20 max
F	4.5 ± 0.2
G	3.5 ± 0.2
H	3.4 ± 0.1

Termination Coating: Three types are possible: matte Sn; SnCu; SnAgCu (SAC)

Cardinal Components Inc. certifies this device is in accordance with the RoHS and REACH directives.

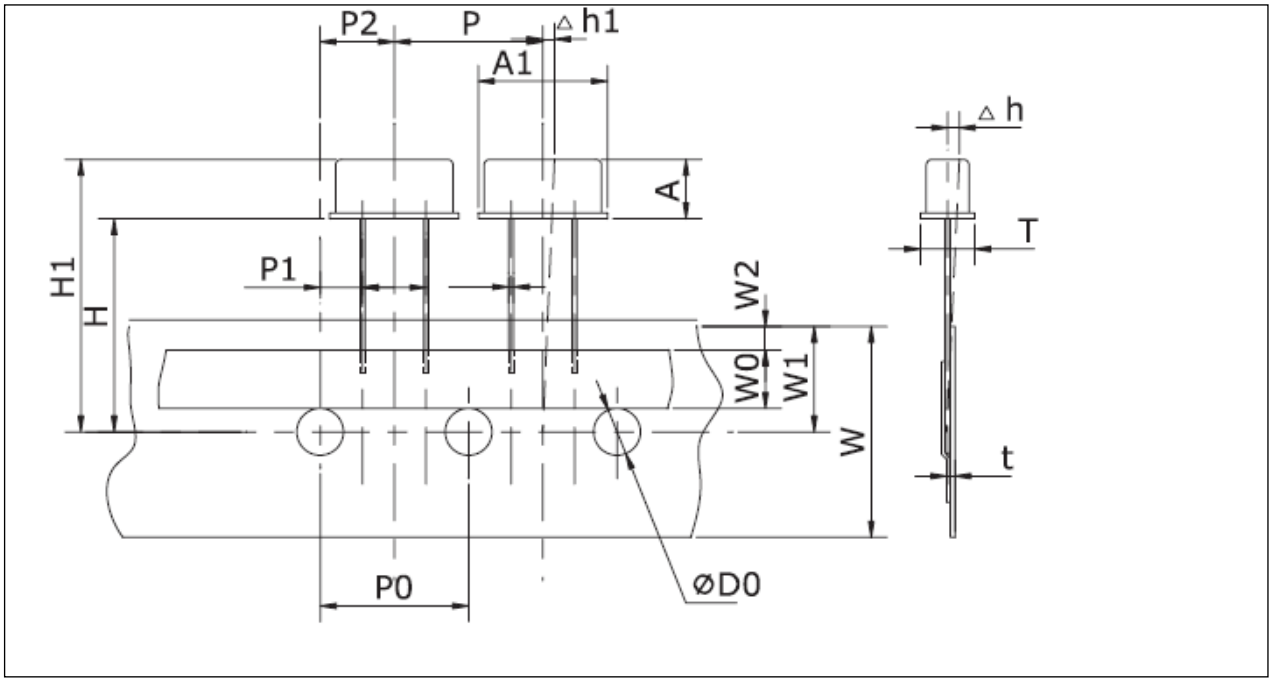
Cardinal guarantees the device does not contain the following: Cadmium, Hexavalent Chromium, Lead, Mercury, PBB's, PBDE's
Weight of the Device: 0.5 grams
Moisture Sensitivity Level: 1 As defined in J-STD-020D
Second Level Interconnect code: e1 or e2 or e3

For Optimum Jitter Performance, Cardinal recommends:

- Trace lengths to the crystal should be kept as short as possible.
- The crystal connections are sensitive to noise.

Packaging

Standard packaging is bulk, 200pcs per bag/2000pcs per box



Ammopack Tape Dimensions																
A	A1	D0	h	h1	H	H1	P	P0	P1	P2	t	T	W	W0	W1	W2
3.5	11.0	4.0 ±0.2	0±0.2	0±0.2	18.0 ±0.75	22.5 max	12.7±0.1	12.7±0.1	3.85±0.7	6.35±0.7	0.4±0.05	4.7 max	18 +1.0 -0.5	5.0±0.5	9.0 +0.75 -0.5	2.0 max

Dimensions in mm Drawing Not to scale

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Contacting Cardinal Components

Cardinal Components
19013 36th Ave. West
Lynnwood, WA 98036-5761
U.S.A.

Tel: 973-785-1333
Fax: 425.776.2760
email: sales@cardinalxtal.com
URL: www.cardinalxtal.com