CARDINAL COMPONENTS

CPFB Series
SMD Watch Crystal

CPFB
8.7 x 3.7 x 2.4 mm

Features

- Package is ideal for automated surface mount assembly and reflow practices.
- Low profile
- Industry Standard Footprint
- 32.768 kHz

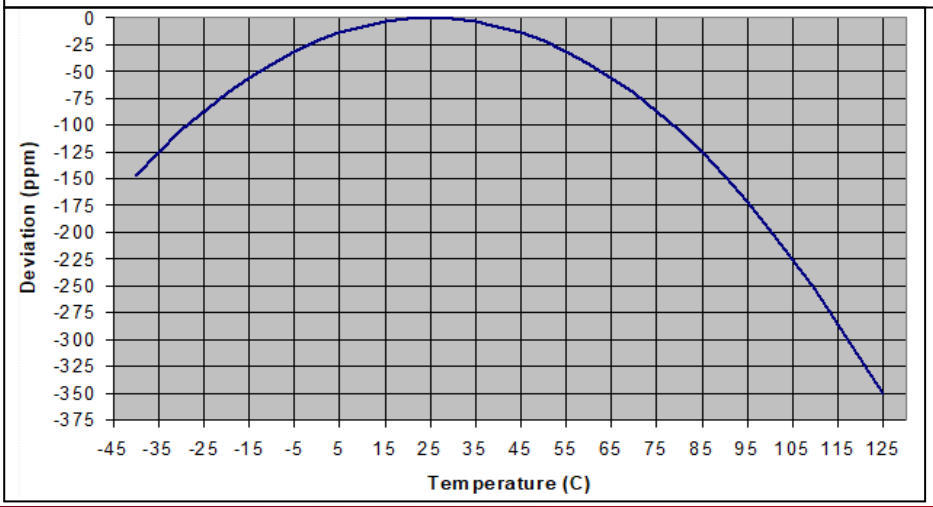
Applications

RTC

Electrical Characteristics

Parameter	Min	Typ	Max	Unit	Condition
Frequency Range	-	32.768	-	kHz	
Calibration Frequency Tolerance	-	-	±20	ppm	Standard at 25°C ± 3°C.
Frequency Stability	-0.027	-0.035	-0.043	ppm/Δ°C^2	
Turnover Temperature	20	25	30	°C	
Operating Temperature Range	-40	-	+85	°C	
Storage Temperature Range	-55	-	+125	°C	
Equivalent Series Resistance (ESR)	-	-	50	kΩ	At 25°C
Drive Level	-	-	1	µW	
Shunt Capacitance (C0)	-	1.35	-	pF	Pad 1 to Pad 4 Capacitance
Insulation Resistance	500	-	-	MΩ	@100VDC
Aging at 25°C ± 3°C	-	-	±3	ppm	for the first year at +25°C ± 3°C

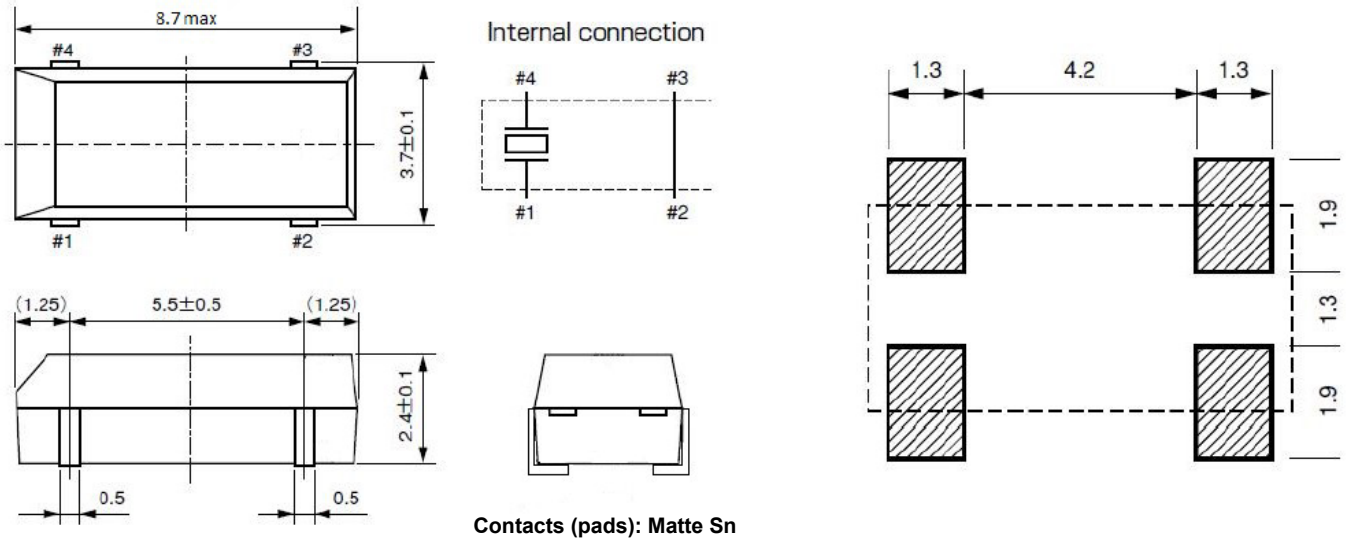
Frequency versus Temperature - Typical Performance



Part Numbering (Example: CPFBZ-A2C5-32.768KD12.5

Series Model	Packaging		Operating Temperature	Calibration Tolerance		Frequency	Load Capacitance (pF)
CPFB	**Z**	**-**	**A2**	**C5**	**-**	**32.768K**	**D12.5**
	Blank = Bulk **Z = Tape/Reel**		**A2 = -40 to +85°C**	**C5 = ±20 ppm**			D6 = 6.0 pF **D12.5 = 12.5 pF**

Mechanical Dimensions (mm)



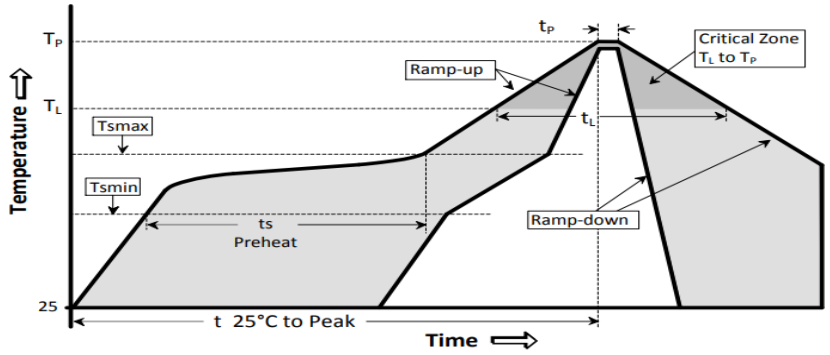
Contacts (pads): Matte Sn

Cardinal Components Inc. certifies this device is in accordance with the RoHS and REACH directives.
The device is RoHS Compliant via Exemption 7a.

Cardinal guarantees the device does not contain the following: Cadmium, Hexavalent Chromium, Mercury, PBB's, PBDE's
Weight of the Device: 0.127 grams
Moisture Sensitivity Level: 1 As defined in J-STD-020D
Second Level Interconnect code: e3

Reflow Cycle

Maximum Reflow Conditions in accordance with IPC/JEDEC J-STD-020C "Pb-free"

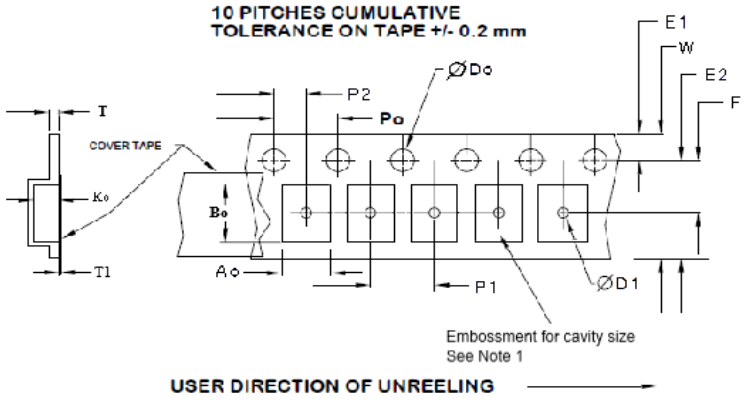


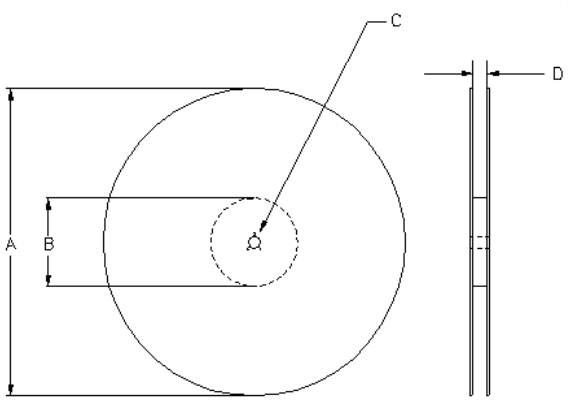
Temperature Profile	Symbol	Condition	Unit
Average ramp-up rate	(Ts_{max} to T_P)	3°C / second max	°C / s
Ramp down Rate	T_{cool}	6°C / second max	°C / s
Time 25°C to Peak Temperature	$T_{to\text{-}peak}$	8 minutes max	min
Preheat			
Temperature min	Ts_{min}	150	°C
Temperature max	Ts_{max}	200	°C
Time Ts_{min} to Ts_{max}	ts	60 – 180	sec
Soldering above liquidus			
Temperature liquidus	T_L	217	°C
Time above liquidus	t_L	60 – 150	sec
Peak temperature			
Peak Temperature	Tp	260	°C
Time within 5°C of peak temperature	tp	20 – 40	sec

The part may be reflowed 2 times without degradation (typical for lead free processing).

Tape and Reel

Tape and Reel available for quantities of 250 to 3000 per reel, cut tape for < 1000. 16mm tape, 8mm pitch.





Tape Dimensions Table 1							
Tape Size	E2 typ	F	P1	W max	Ao	Bo	Ko
16mm	14.25	7.5 ±0.05	8.0 ±0.1	16.3	Note 1	Note 1	Note 1

Dimensions in mm Drawing Not to scale

Note 1: Embossed cavity to conform to EIA– 481-B

Tape Dimensions Table 2							
Tape Size	Do	D1	E1	Po	P2	T max	T1 max
16mm	1.5 +0.1 -0.0	1.0	1.75 ±0.1	4.0 ±0.1	2.0 ±0.05	0.3	0.1

Reel Dimensions (may vary) Table 3						
	A		B		C	D
Reel Qty	Inches	mm	Inches	mm	mm	mm
3000	13.0	330	4	100	13.0 +0.5 -0.2	17.5

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