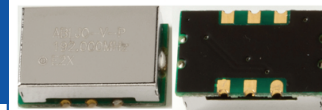


# LOW JITTER CRYSTAL OSCILLATOR

**ABLJO**

RoHS/RoHS II Compliant and Pb free



14.3 X 8.7 X 5.5 mm

## FEATURES:

- High "Q", 3rd Overtone Crystal Technology
- Ultra Low Jitter performance 0.10 ps Max. (12kHz to 20MHz)
- Standard LVCMOS RF Output
- Wide Operating Temperature (-40°C to +85°C) standard
- $\pm 40$  ppm Max. All inclusive Stability (including Aging) over 10-years
- (17) Standard Frequencies between 80MHz & 200MHz
- 9x14mm RoHS Compliant SMT package

## APPLICATIONS:

- Avionics
- COTS - Military communications
- Low Phase Noise Signal Sources
- High Definition TV
- Test & Measurement
- Ultra Low Jitter RF Communication Circuitry

## STANDARD SPECIFICATIONS

| Parameters                                            | Minimum                                                                                                                                                                   | Typical | Maximum             | Units         | Notes                 |
|-------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------------------|---------------|-----------------------|
| <b>RF Output Frequency Range</b>                      | 80.00                                                                                                                                                                     |         | 200.00              | MHz           |                       |
| Standard Available Frequencies                        | 80.00MHz, 81.920MHz, 92.160MHz, 96MHz, 98.304MHz, 100MHz, 106.250MHz, 120MHz, 122.880MHz, 125MHz, 150MHz, 155.520MHz, 156.250MHz, 160MHz, 184.32MHz, 187.5MHz, and 200MHz |         |                     |               |                       |
| Supply Voltage                                        | 3.135                                                                                                                                                                     | 3.300   | 3.465               | Volts         |                       |
| <b>Current Drain</b>                                  |                                                                                                                                                                           |         |                     |               |                       |
| 80MHz ~ 99.999MHz                                     |                                                                                                                                                                           |         | 25.00               | mA            |                       |
| 100MHz ~ 149.999MHz                                   |                                                                                                                                                                           |         | 30.00               | mA            |                       |
| 150MHz ~ 200MHz                                       |                                                                                                                                                                           |         | 40.00               | mA            |                       |
| <b>Waveform</b>                                       | LVCMOS                                                                                                                                                                    |         |                     |               |                       |
| V <sub>OH</sub>                                       | 0.1*V <sub>dd</sub>                                                                                                                                                       |         |                     | Volts         |                       |
| V <sub>OL</sub>                                       |                                                                                                                                                                           |         | 0.1*V <sub>dd</sub> | $\Omega$      |                       |
| Symmetry                                              | 45                                                                                                                                                                        | 50      | 55                  | %             |                       |
| Rise & Fall Times                                     |                                                                                                                                                                           |         | 3.0                 | ns            |                       |
| <b>Operating Temperature Range</b>                    | -40                                                                                                                                                                       |         | +85                 | °C            |                       |
| <b>Frequency Stability</b>                            |                                                                                                                                                                           |         |                     |               |                       |
| Over (-40° C to +85°C)                                |                                                                                                                                                                           |         | $\pm 25.00$         | ppm           |                       |
| ALL effects, including Aging                          |                                                                                                                                                                           |         | $\pm 40.00$         | ppm           |                       |
| Storage Temperature Range                             | -40                                                                                                                                                                       |         | +85                 | °C            |                       |
| Aging                                                 |                                                                                                                                                                           |         |                     |               |                       |
| First Year                                            |                                                                                                                                                                           |         | $\pm 2.00$          | ppm           |                       |
| 5-Years                                               |                                                                                                                                                                           |         | $\pm 5.00$          | ppm           |                       |
| 10-Years                                              |                                                                                                                                                                           |         | $\pm 7.00$          | ppm           |                       |
| <b>Phase Noise (100MHz Carrier)</b>                   |                                                                                                                                                                           |         |                     |               | V <sub>dd</sub> =3.3V |
| @ 10 Hz offset                                        |                                                                                                                                                                           | -70     |                     | dBc/Hz        |                       |
| @ 100 Hz offset                                       |                                                                                                                                                                           | -105    |                     | dBc/Hz        |                       |
| @ 1,000 Hz offset                                     |                                                                                                                                                                           | -135    |                     | dBc/Hz        |                       |
| @ 10,000 Hz offset                                    |                                                                                                                                                                           | -144    | -140                | dBc/Hz        |                       |
| @ 25,000 Hz offset                                    |                                                                                                                                                                           | -150    | -145                | dBc/Hz        |                       |
| @ 100,000 Hz offset                                   |                                                                                                                                                                           | -155    | -150                | dBc/Hz        |                       |
| <b>Integrated RMS Phase Jitter (12kHz ~ 20MHz BW)</b> |                                                                                                                                                                           | 75      | 100                 | Femto Seconds | 0.10 ps Max.          |



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## STANDARD SPECIFICATIONS - continued

| Parameters                      | Minimum | Typical  | Maximum | Units | Notes |
|---------------------------------|---------|----------|---------|-------|-------|
| Electrical Frequency Adjustment |         |          |         |       |       |
| Control Voltage Range (Vc)      | 0.0     |          | 3.30    | Volts |       |
| Frequency Pull Range            | ±45.00  |          |         | ppm   |       |
| Frequency Pull Slope            |         | Positive |         |       |       |
| Control Voltage Port Impedance  | 10      |          |         | kΩ    |       |
| Center Control Voltage          | 1.45    | 1.65     | 1.85    | Volts |       |
| Control Port Linearity          |         |          | ±10     | %     |       |

## TYPICAL PHASE NOISE PERFORMANCE @ 156.25MHZ CARRIER



## OPTIONS AND PART IDENTIFICATION:

ABLJO -   - Frequency (MHz) -    

### Frequency Pull Option

|       |                      |
|-------|----------------------|
| Blank | XO (Fixed Frequency) |
| V     | VCXO (±45 ppm min.)  |

### Tape & Reel Options

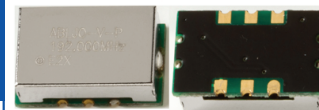
|       |                         |
|-------|-------------------------|
| Blank | < 250 units on cut tape |
| T     | 1,000 units per reel    |
| T2    | 250 units per reel      |



# LOW JITTER CRYSTAL OSCILLATOR

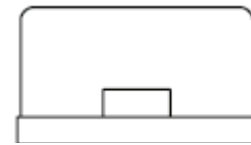
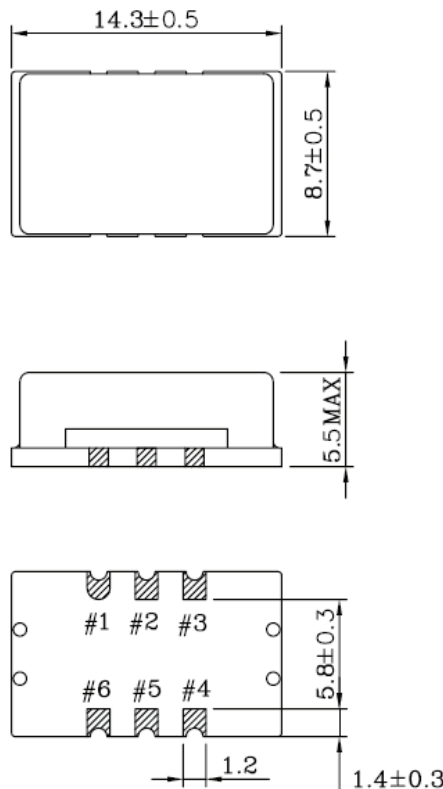
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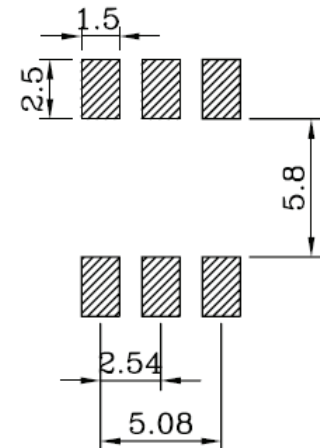
14.3 X 8.7 X 5.5 mm

## OUTLINE DIMENSIONS:



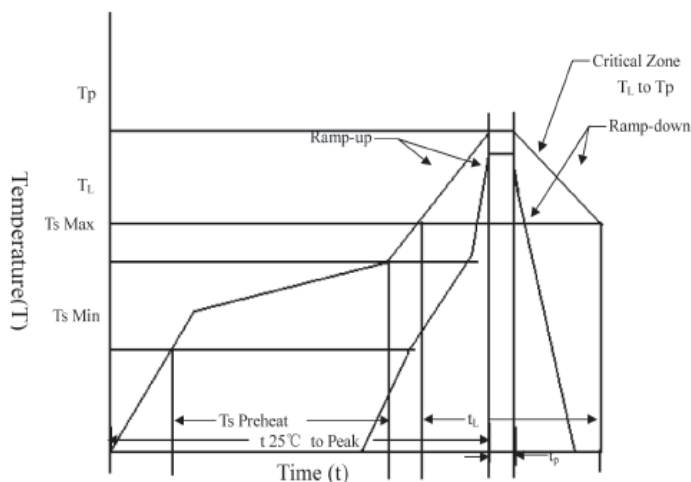
| Pin | Function        |      |
|-----|-----------------|------|
|     | VCXO            | XO   |
| 1   | V <sub>c</sub>  | N.C. |
| 2   | N.C.            |      |
| 3   | GND             |      |
| 4   | Output          |      |
| 5   | N.C.            |      |
| 6   | V <sub>dd</sub> |      |

## Recommended Soldering Pattern



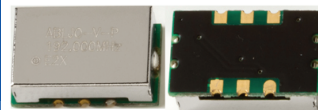
Dimensions: inches (mm)

## REFLOW PROFILE:



|                                                        |                           |
|--------------------------------------------------------|---------------------------|
| T <sub>s</sub> max to T <sub>L</sub> (Ramp-up Rate)    | 3°C/second max.           |
| Preheat                                                |                           |
| Temperature Min. (T <sub>s</sub> Min.)                 | 150°C                     |
| Temperature Typical (T <sub>s</sub> Typ.)              | 175°C                     |
| Temperature Max. (T <sub>s</sub> Max.)                 | 200°C                     |
| Time (t <sub>s</sub> )                                 | 60 ~ 180 seconds          |
| Ramp-up rate (T <sub>L</sub> to T <sub>p</sub> )       | 3°C/second max.           |
| Time Maintained Above:                                 |                           |
| --Temperature (T <sub>L</sub> )/Time (T <sub>L</sub> ) | 217°C/60 ~ 150 seconds    |
| Peak Temperature (T <sub>p</sub> )                     | 250°C max. for 10 seconds |
| Target Peak Temperature (T <sub>p</sub> Target)        | 250°C +0/-5°C             |
| Time within 5°C of actual peak (t <sub>p</sub> )       | 20 ~ 40 seconds           |
| Ramp-down Rate                                         | 6°C/second max.           |
| Tune 25°C to Peak Temperature (t)                      | 8 minutes max.            |

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## TAPE & REEL:

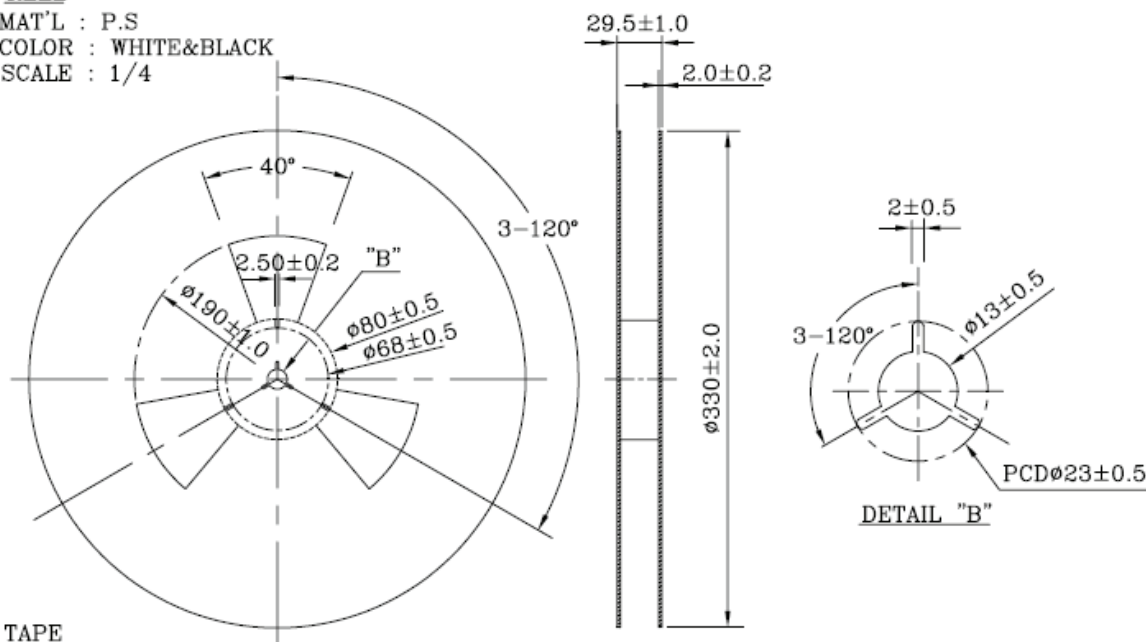
**Packaging: (1,000) units per reel standard, (250) units per reel available (option # T2)**

### REEL

MAT'L : P.S

COLOR : WHITE&BLACK

SCALE : 1/4



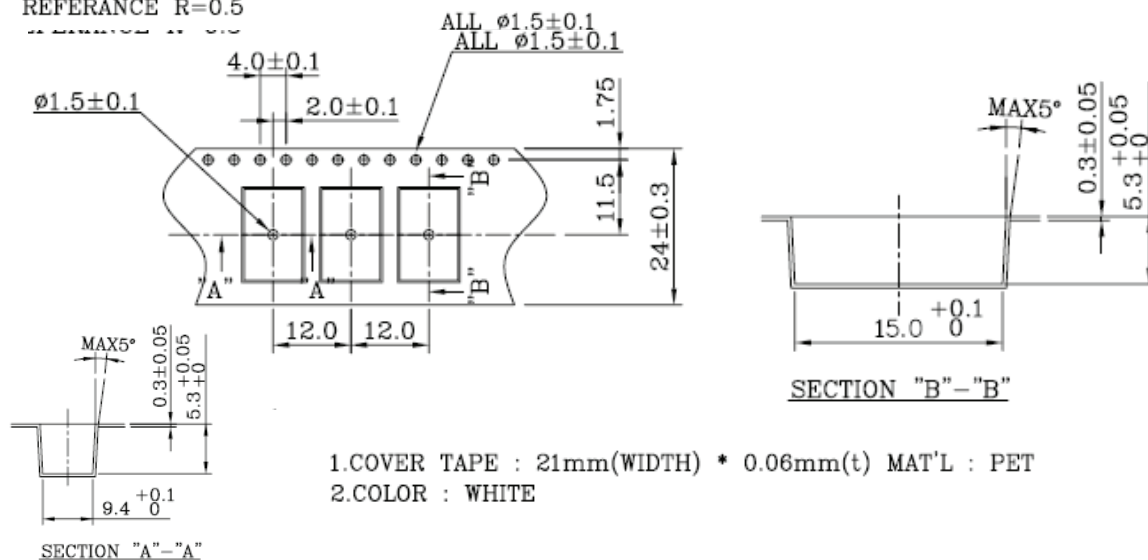
### TAPE

MAT'L : P.S

COLOR : WHITE&BLACK

REFERENCE R=0.5

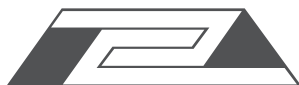
REFERENCE R=0.5



- 1.COVER TAPE : 21mm(WIDTH) \* 0.06mm(t) MAT'L : PET
- 2.COLOR : WHITE

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