

Ultra Low Phase Noise XO / VCXO

ABLNO



ESD Sensitive



RoHS Compliant



14.3 x 8.7 x 5.5mm

FEATURES:

- High "Q", 3rd Overtone Crystal Technology
- Ultra Low Phase Noise -162 dBc/Hz Typ. @ 10kHz offset, 100MHz carrier
- Standard LVCMOS RF Output
- Wide Operating Temperature (-40°C to +85°C) standard
- ±28 ppm Max. All inclusive Stability (including Aging) over 10-years
- Available Frequency range from 24.576MHz to 200.00MHz

APPLICATIONS:

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

STANDARD SPECIFICATIONS

| Parameters | | Minimum | Typical | Maximum | Units | Notes |
|--|---------------------|---|---------|---------|----------------------|---|
| RF Output Frequency Range | | 24.576 | | 200.00 | MHz | |
| Standard Available Frequencies | | 24.576MHz, 80.00MHz, 81.92MHz, 92.16MHz, 96.00MHz, 98.304MHz, 100MHz, 104.00MHz, 106.25MHz, 120.00MHz, 122.88MHz, 125.00MHz, 150.00MHz, 155.52MHz, 156.250MHz, 200MHz | | | | Custom frequencies available upon request |
| Supply Voltage (Vdd) | | 3.135 | 3.300 | 3.465 | Volts | |
| Current Drain | 50MHz ~ 99.999MHz | | | 25.00 | mA | |
| | 100MHz ~ 149.999MHz | | | 35.00 | | |
| | ≥ 150.00MHz | | | 40.00 | | |
| Waveform | | LVCMOS | | | | |
| Output Load | | | | 15 | pF | |
| V _{OH} | | 0.9*Vdd | | | Volts | |
| V _{OL} | | | | 0.1*Vdd | Ω | |
| Symmetry | | 45 | 50 | 55 | % | |
| Rise & Fall Times | | | | 3.0 | ns | |
| Operating Temperature Range | | -40 | | +85 | °C | |
| Frequency Stability | | | | | | |
| Over (-40° C to +85°C) | | | ±12.00 | ±18.00 | ppm | Relative to measured frequency @ 25°C |
| ALL effects, including Aging | | | | ±28.00 | ppm | |
| Storage Temperature Range | | -40 | | +90 | °C | |
| Aging | First Year | | | ±2.00 | ppm | |
| | 5-Years | | | ±5.00 | ppm | |
| | 10-Years | | | ±7.00 | ppm | |
| Phase Noise (24.576MHz Carrier) | | | | | | Vdd=3.3V |
| @ 10 | Hz offset | | -90 | -82 | dBc/Hz | <i>Note #1 & #2</i> |
| @ 100 | Hz offset | | -120 | -115 | dBc/Hz | |
| @ 1,000 | Hz offset | | -145 | -140 | dBc/Hz | |
| @ 10,000 | Hz offset | | -165 | -160 | dBc/Hz | |
| @ 100,000 | Hz offset | | -166 | -165 | dBc/Hz | |
| @ 1,000,000 | Hz offset | | -166 | -165 | dBc/Hz | |
| RMS Jitter (12kHz ~ 20MHz BW) | | | < 100 | 125 | Femto Seconds | 0.125 ps Max. |

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| Parameters | Minimum | Typical | Maximum | Units | Notes |
|--|---------|----------|---------|----------------------|---------------------------|
| Phase Noise (100MHz Carrier) | | | | | Vdd=3.3V |
| @ 10 Hz offset | | -88 | -82 | dBc/Hz | <i>Note #1 & #2</i> |
| @ 100 Hz offset | | -118 | -115 | dBc/Hz | |
| @ 1,000 Hz offset | | -141 | -138 | dBc/Hz | |
| @ 10,000 Hz offset | | -160 | -155 | dBc/Hz | |
| @ 100,000 Hz offset | | -161 | -160 | dBc/Hz | |
| @ 1,000,000 Hz offset | | -165 | -160 | dBc/Hz | |
| RMS Jitter (12kHz ~ 20MHz BW) | | < 50 | 100 | Femto Seconds | 0.10 ps Max. |
| Phase Noise (156.25MHz Carrier) | | | | | Vdd=3.3V |
| @ 10 Hz offset | | -75 | -70 | dBc/Hz | <i>Note #1 & #2</i> |
| @ 100 Hz offset | | -110 | -105 | dBc/Hz | |
| @ 1,000 Hz offset | | -140 | -135 | dBc/Hz | |
| @ 10,000 Hz offset | | -155 | -150 | dBc/Hz | |
| @ 100,000 Hz offset | | -161 | -160 | dBc/Hz | |
| @ 1,000,000 Hz offset | | -165 | -160 | dBc/Hz | |
| RMS Jitter (12kHz ~ 20MHz BW) | | < 50 | 100 | Femto Seconds | 0.10 ps Max. |
| Phase Noise (200MHz Carrier) | | | | | Vdd=3.3V |
| @ 10 Hz offset | | -75 | -70 | dBc/Hz | <i>Note #1 & #2</i> |
| @ 100 Hz offset | | -105 | -100 | dBc/Hz | |
| @ 1,000 Hz offset | | -135 | -130 | dBc/Hz | |
| @ 10,000 Hz offset | | -150 | -145 | dBc/Hz | |
| @ 100,000 Hz offset | | -155 | -150 | dBc/Hz | |
| RMS Jitter (12kHz ~ 20MHz BW) | | < 20 | 30 | Femto Seconds | 0.03 ps Max |
| Electrical Frequency Adjustment | | | | | |
| Control Voltage Range (Vc) | 0.0 | 1.65 | 3.30 | Volts | |
| Frequency Pull Range | ±28.00 | | ±55.00 | ppm | Referenced to the carrier |
| Frequency Pull Slope | | Positive | | | |
| Control Voltage Port Impedance | 10 | | | kΩ | |
| Control Port Linearity | | | ±10 | % | |

Note #1: Maximum Phase Noise is verified on 100% of the parts at 25°C ± 3°C.

Note #2: The above specified Phase Noise & Jitter is with the oscillator device configured as a VCXO. In XO configuration, the Phase Noise will be slightly better at each offset between 10Hz and 10 kHz, by approximately -3dB to -5dB.

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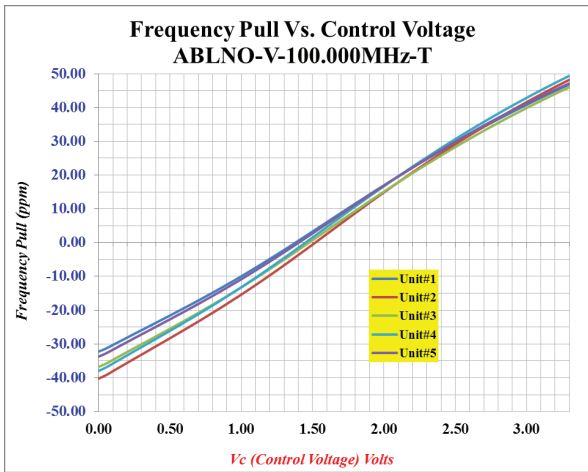
14.3 x 8.7 x 5.5mm

TYPICAL PHASE NOISE PERFORMANCE @ 50.00 MHz CARRIER

TYPICAL PHASE NOISE PERFORMANCE @ 100.00 MHz CARRIER



FREQUENCY PULL VERSUS CONTROL VOLTAGE (REFERENCED TO 100.000MHz)



CURRENT DRAIN VERSUS CONTROL VOLTAGE @ VDD = +3.3V



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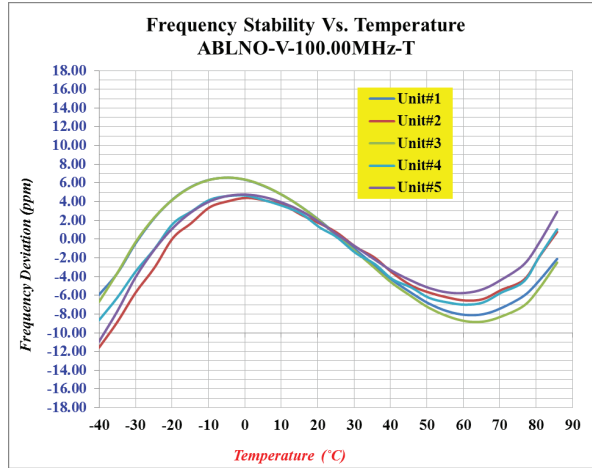


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FREQUENCY STABILITY VS. TEMPERATURE @ VDD = +3.3V (REFERENCED TO MEASURED FREQUENCY @ 25°C)



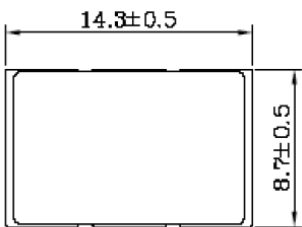
PART IDENTIFICATION:

ABLNO - Frequency (MHz) -

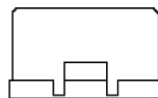
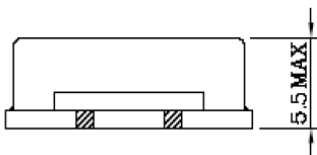
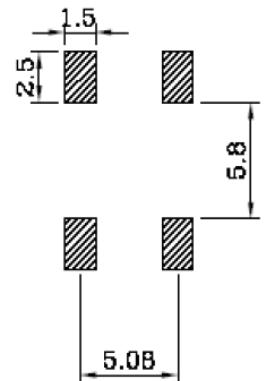
| Fixed Clock Vs. VCXO Option | |
|-----------------------------|--------------------------------|
| Blank | Fixed Clock Oscillator |
| V | VCXO (± 28 ppm min. Pull) |

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

OUTLINE DIMENSIONS:



Recommended Land Pattern



| Pin # | Functionality |
|-------|--|
| 1 | Voltage Control (Vc) for VCXO No Connect (N/C) for XO |
| 2 | Ground |
| 3 | RF Output |
| 4 | Vdd |

Dimensions: mm

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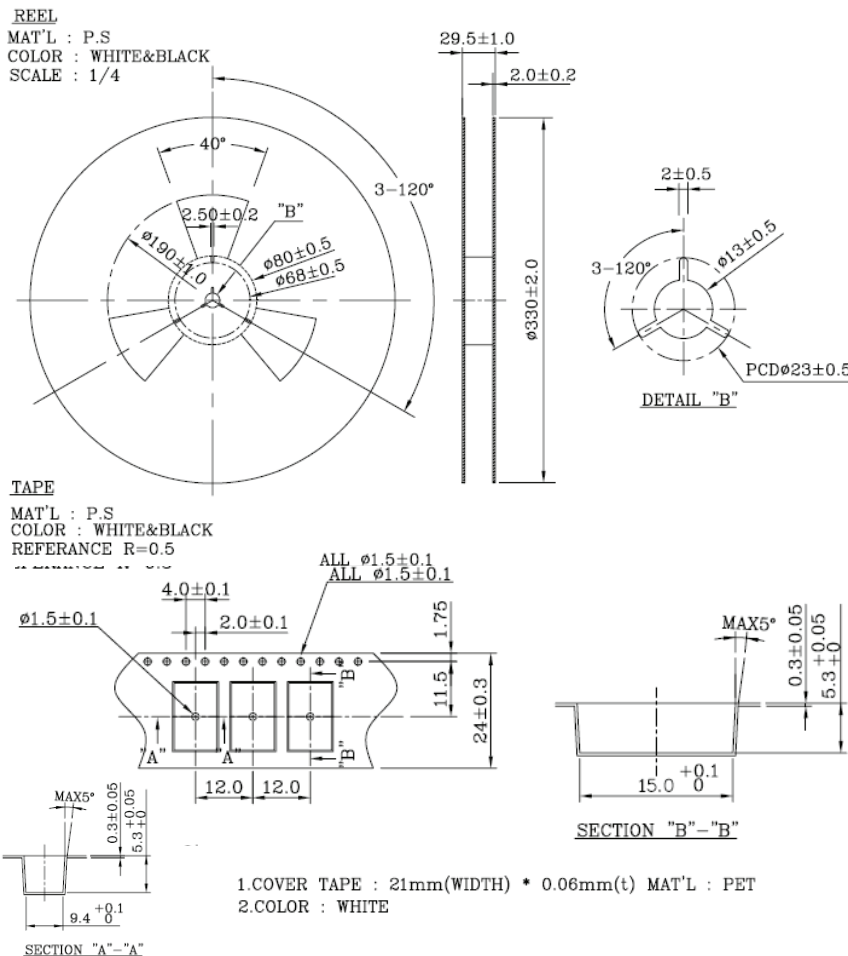
14.3 x 8.7 x 5.5mm

REFLOW PROFILE:



TAPE & REEL:

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



Dimensions: mm

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