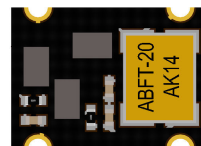


Frequency Translator / Jitter Attenuator

ABFT



RoHS
Compliant



5.00 x 7.00 x 2.0mm

Moisture Sensitivity Level (MSL)–This product is not Moisture Sensitive MSL = N/A: Not Applicable

FEATURES:

- 5x7x2 mm SMT, RoHS Compliant reflow-able package
- Frequency translation to either 20MHz or 40MHz carrier @ +3.3V Supply Voltage
- Industrial operating temperature range (-40°C to +85°C)
- LVC MOS Output
- Internal absolute pull range > ±100 ppm allowing for long term drift correction
- Superior Phase Noise and rms jitter @ 20MHz or 40MHz output, compared to IC based solutions utilizing traditional PLL technique
- Stand-alone solution, does not require auxiliary circuitry such as loop filter and/or Quartz Crystal with loop capacitors

APPLICATIONS:

- Frequency translation, clock smoothing and jitter attenuation of the input 10MHz reference
- Datacom - DSLAM, DSLAR, Access Nodes
- Cable modem head end
- Base Station - GSM, CDMA
- Telecom - SONET/SDH/ATM

GENERAL DESCRIPTION

The ABFT series is an Ultra Low Jitter VCXO based frequency translator; ideally suited to improve Jitter characteristics of the input signal. This device is designed to provide input clock smoothing - while providing Phase and Frequency Locked higher frequency translated output.

Typical application will take a 10MHz reference frequency and phase & frequency lock it to either a 20MHz or a 40MHz Low Jitter VCXO. The implemented technology significantly attenuates the jitter content of the 10MHz reference signal; while keeping the higher frequency RF Output - Frequency and Phase Coherent with the input 10MHz reference signal.

STANDARD SPECIFICATIONS:

| Parameters | Minimum | Typical | Maximum | Units | Notes |
|---|----------|------------------------------|-----------|--------|---|
| Resonant Frequency | | 20.000 <i>Or</i> 40.00 | | MHz | See options |
| Operating Temperature | -40 | | +85 | °C | |
| Storage Temperature | -40 | | +85 | °C | |
| Supply Voltage (Vdd) | 3.135 | 3.3 | 3.465 | V | 3.3V±5% |
| Input Signal Characteristics | | | | | Input signal must be with-in ±20.00 ppm from 10.00MHz carrier for the ABFT device to achieve lock |
| Frequency | 9.999800 | 10.000000 | 10.000200 | MHz | |
| Signal level | 0.300 | | 3.3 | Vp-p | |
| Lock Time | | < 20 | 50 | ms | |
| Frequency Stability Over Temperature (Note # 1) | -25.00 | | +25.00 | ppb | Referenced to the stable input reference of 10.00MHz (such as a Stratum-III TCXO or an OCXO) |
| Internal Frequency Pull Range | ±100.00 | | | ppm | This is the internal pull range of the ABFT device providing sufficient correction range to account for internal aging, stand-alone temperature variation, etc. |
| Supply Current (I _{DD}) | | < 14.0 | 20.00 | mA | Under Lock |
| RF output Characteristics | | | | | |
| Output Load: | | | 15 10 | pF kΩ | |
| Rise Time (Tr) | | 853 | 1200 | ps | @ no load |
| Fall Time (Tf) | | 526 | 1200 | ps | @ no load |
| Symmetry | | 48/52 | 55 | % | |
| Output Voltage (V _{OH}) | 0.9*Vdd | | | V | @1/2Vdd |
| Output Voltage (V _{OL}) | | | 0.1*Vdd | V | |
| Stand alone Aging (Note # 2) | -5.0 | | +5.0 | ppm | @+25°C First year |
| | -12.0 | | +12.0 | | @+25°C After 10 years |

(Note # 1):The frequency stability over temperature of the ABFT device is greatly dependant on the short term perturbations of the input reference signal.

(Note # 2):The Aging characteristics of the Quartz used inside the ABFT solution are such that, the stand-alone aging will not exceed ±12.00 ppm over a 10-year product life; referenced to the initial measured frequency post reflow in end application

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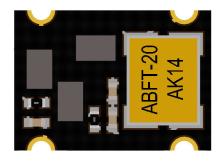
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Frequency Translator / Jitter Attenuator

ABFT



RoHS
Compliant

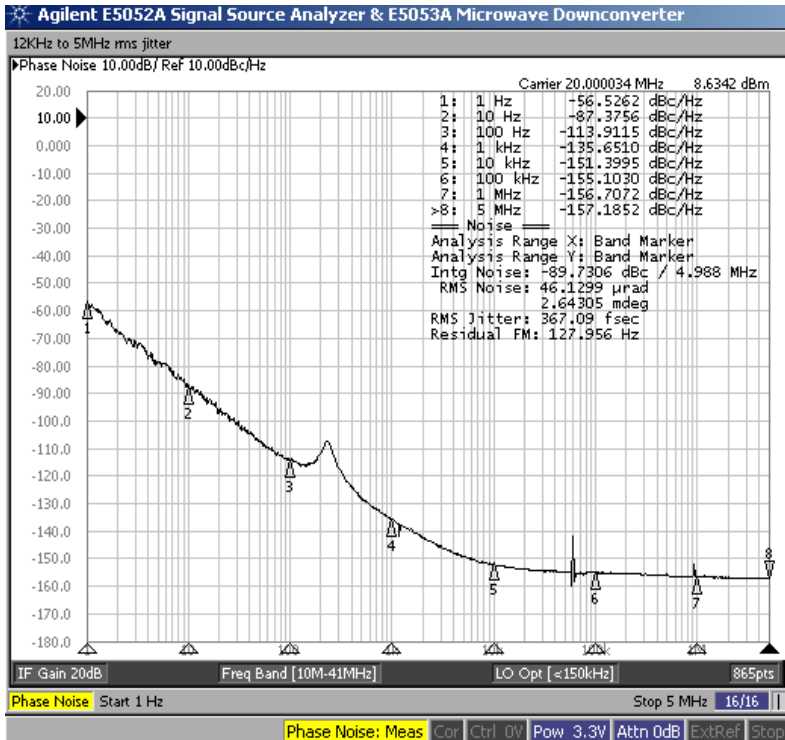


5.00 x 7.00 x 2.0mm

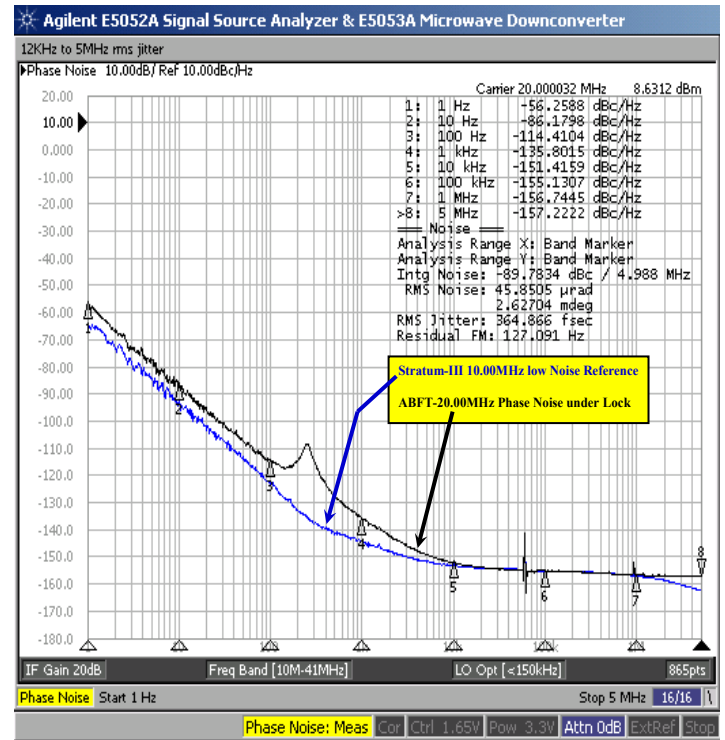
| Parameters | Minimum | Typical | Maximum | Units | Notes |
|-------------------------------------|---------|---------|---------|--------|--|
| Phase Noise @ 20MHz carrier | | | | | Close to the carrier phase noise is dependent on the cleanliness of the input reference. However, at 1kHz offset and beyond, ABFT phase noise is practically independent of the input reference noise |
| 1Hz offset from the carrier | | -56 | | dBc/Hz | |
| 10Hz offset from the carrier | | -87 | | | |
| 100Hz offset from the carrier | | -113 | | | |
| 1,000Hz offset from the carrier | | -135 | -130 | | |
| 10,000Hz offset from the carrier | | -151 | -145 | | |
| 100,000Hz offset from the carrier | | -155 | -150 | | |
| 1,000,000Hz offset from the carrier | | -156 | -150 | | |
| 5,000,000Hz offset from the carrier | | -157 | -155 | | |

PHASE NOISE

Phase Noise under lock (ABFT-20.00MHz with input connected to a low noise, stable 10.00MHz Stratum-III reference signal)



Detail Comparative Phase Noise Plot (Stratum-III 10.0MHz as Reference)



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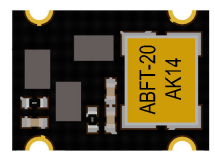
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Frequency Translator / Jitter Attenuator

ABFT



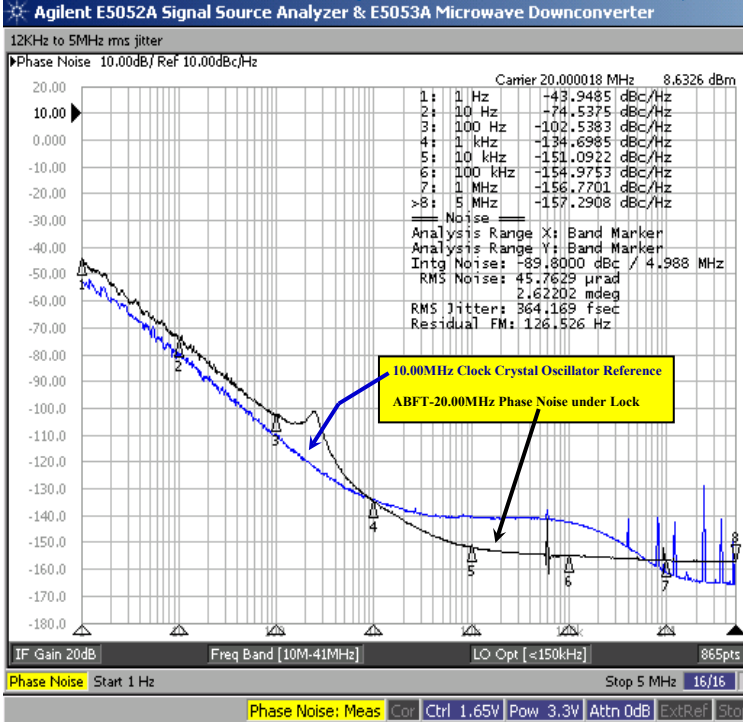
**RoHS
Compliant**



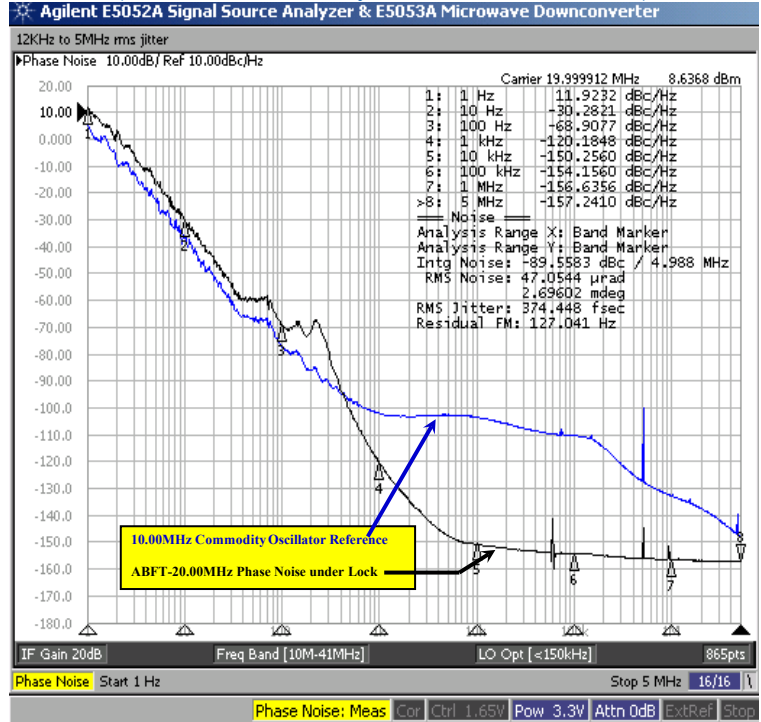
5.00 x 7.00 x 2.0mm

PHASE NOISE

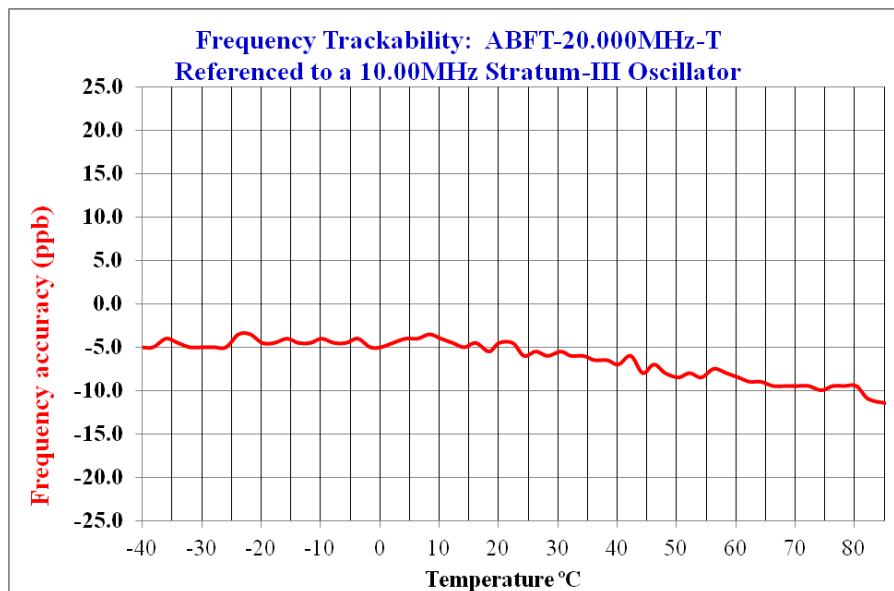
**Detail Comparative Phase Noise Plot
(10.0MHz Clock Crystal Oscillator as Reference)**



**Detail Comparative Phase Noise Plot
(10.0MHz Commodity Oscillator as Reference)**



FREQUENCY TRACKING OVER TEMPERATURE



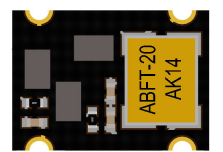
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Frequency Translator / Jitter Attenuator

ABFT



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PART IDENTIFICATION

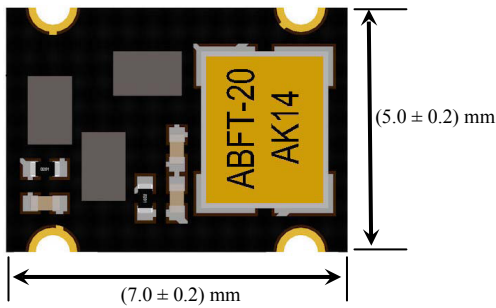
ABFT - MHz -

| Frequency in MHz |
|--------------------------------|
| 20.000 MHz Or 40.000 MHz |

| | | |
|-----------|---|-----------------|
| T | = | 1,000 unit Reel |
| T2 | = | (250) unit Reel |

FREQUENCY TRACKING OVER TEMPERATURE

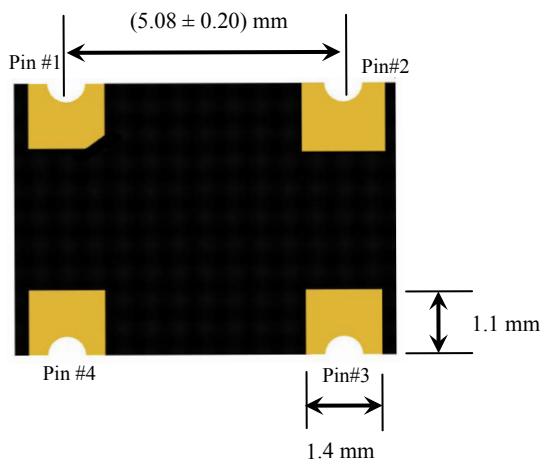
Top View



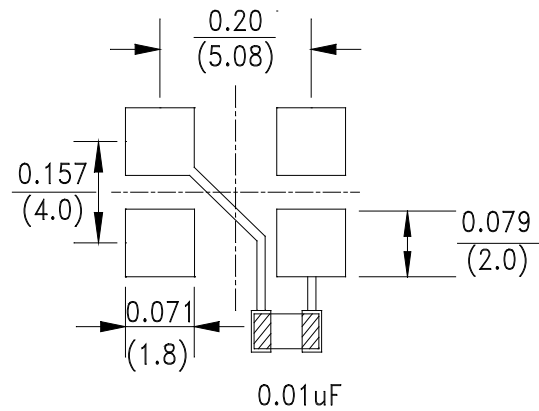
Side View



Bottom View



Recommended land pattern



Dimension : Inches
(mm)

| PIN # | Name |
|-------|-------------------------|
| 1 | 10.0MHz Reference Input |
| 2 | GND |
| 3 | Locked - Output |
| 4 | Vdd |

Note: Abracon recommends a 0.01uF bypass capacitor between pin#2 and pin#4

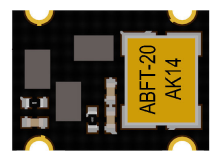
ALL Dimensions are in (mm)

Frequency Translator / Jitter Attenuator

ABFT

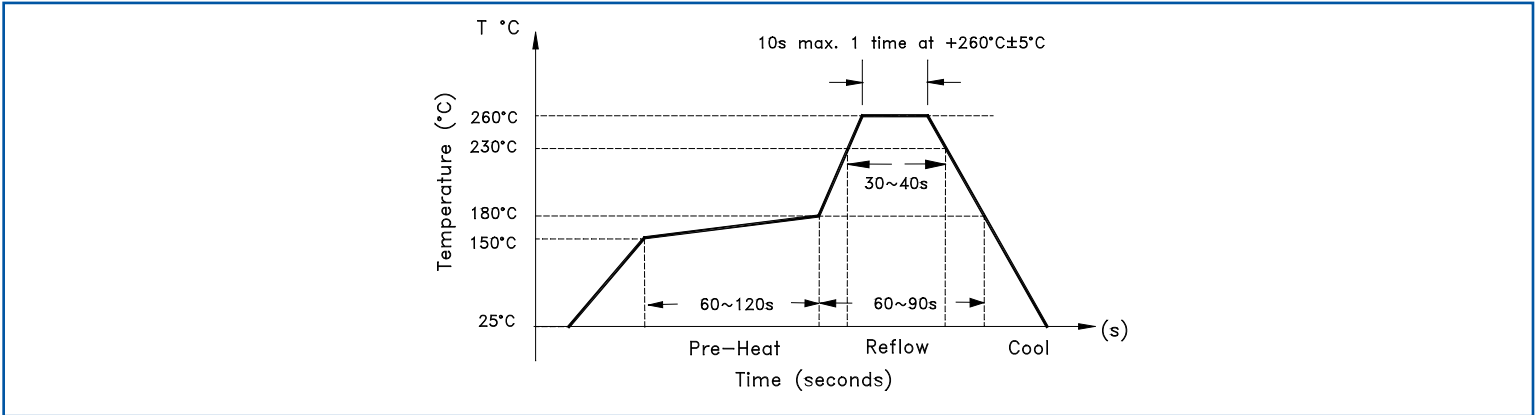


RoHS
Compliant



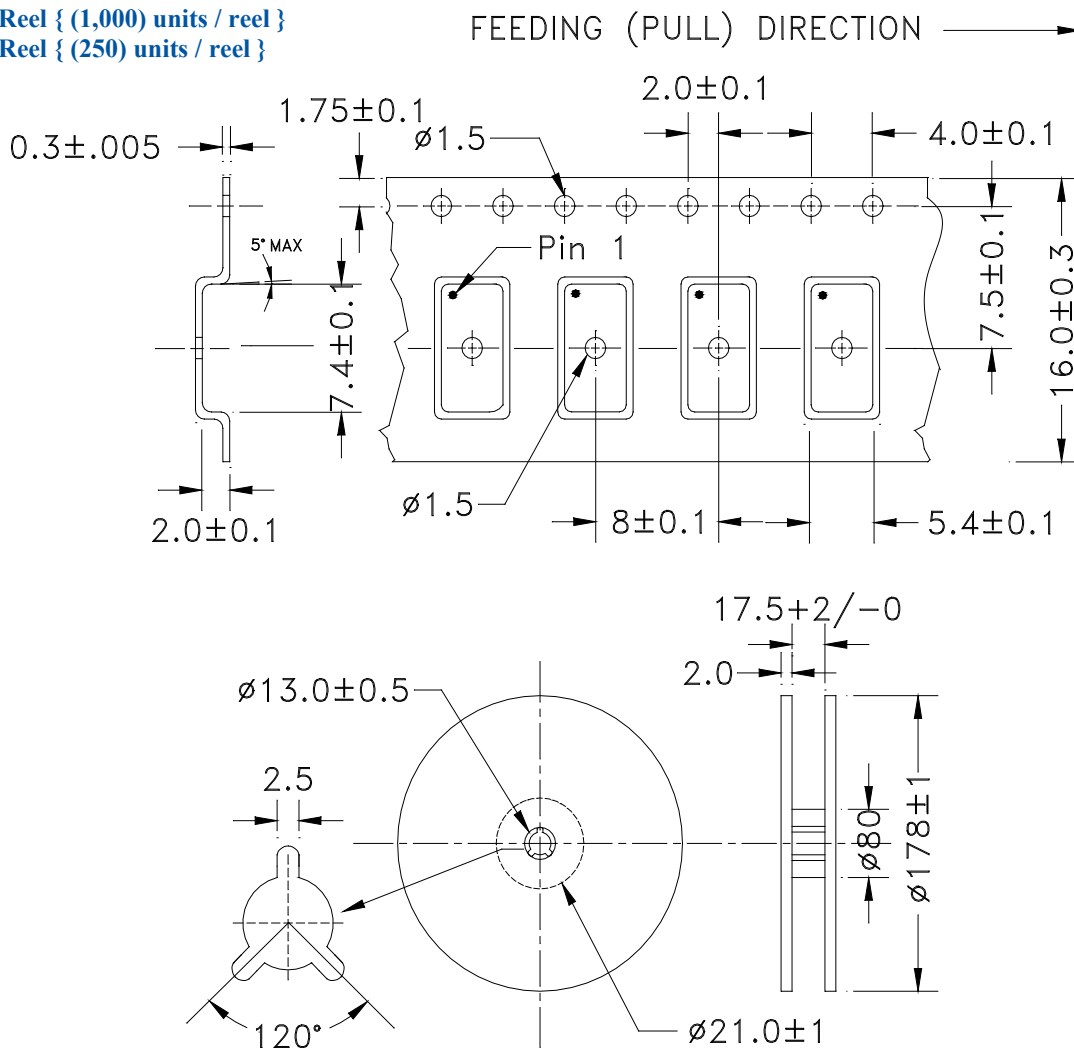
5.00 x 7.00 x 2.0mm

REFLOW PROFILE



REFLOW PROFILE

T = Tape & Reel { (1,000) units / reel }
T2 = Tape & Reel { (250) units / reel }



Dimensions: mm

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