

DUAL OUTPUT STRATUM-III SMD TCXO & VCTCXO



9.0 x 14.0 x 3.0mm

Pb RoHS/RoHS II Compliant

ESD SENSITIVE

MSL = 3

ABDFTCXO/ABDFVCTCXO SERIES

FEATURES

- Phase and frequency coherent dual output
- F0 and F0÷2 with integrated precision fanout buffers
- Meets ±280ppb Stratum-III stability requirements
- Excellent ±1ppm aging with ±4.6ppm guaranteed lifetime accuracy
- 5 to 52MHz standard and custom frequencies available
- TCXO or VCTCXO functionality available
- ±5ppm minimum pull with 0.5% typ linearity (VCTCXO only)
- LVC MOS outputs
- 10pin package
- -40°C to 85°C operation

APPLICATIONS

- Communications and Networking
- Synchronization
- PLL with Holdover
- Geolocation, RTLS, GPS
- Synchronous Ethernet
- IEEE1588
- Instrumentation, test and measurement
- Femtocells, picocells (BTS)
- Oil and gas exploration

TYPICAL OPERATING CIRCUIT

DIGITAL FPGA BASED PLL WITH PRECISION STRATUM-III HOLDOVER



OPTIONS AND PART IDENTIFICATION

ABDFTCXO OR ABDFVCTCXO - [] MHz - [] - [] - []

OUTPUT 1 (F₀) IN MHZ
Please specify the frequency
Output 1 (F0) in MHz e.g.
16.384MHz

*F0 > 40MHz, available in Q4-2017

OPERATING TEMP. RANGE
E: -20°C to +70°C
L: -40°C to +85°C

FREQ. STABILITY
1: ±100ppb*
2: ±280ppb

*Available Q4-2017

PACKAGING
Blank: Bulk**
T5: 500 pcs/reel
T2: 250 pcs/reel
CT: Cut Tape***

**Bulk devices are not in MSL-3 compliant packaging

***Cut Tape devices available in 25pc, 50pc, & 100pc quantities (MSL-3 compliant)



5101 Hidden Creek Ln Spicewood TX 78669
Phone: 512-371-6159 | Fax: 512-351-8858
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REVISED: 05.19.2017

ABRACON IS
ISO9001-2008
CERTIFIED

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STANDARD SPECIFICATIONS

| PARAMETERS | RATING |
|--------------------------------|-----------------|
| Storage Temperature Range (Ts) | -55°C to +125°C |
| Supply Voltage (Vdd) | -0.5V to 6V |
| Control Voltage (Vc) | 0V to 3V |
| ESD, HBM/CDM/MM | 4kV/2kV/200V |

| PARAMETERS | MINIMUM | TYPICAL | MAXIMUM | UNITS | NOTES |
|--|--|--|---|-------|--|
| Frequency Range | 5.000 | | 52.000 | MHz | |
| Standard Frequencies [Output 1(F ₀)/Output 2 (F ₀ /2)] | 10.000/5.000 16.384/8.192 20.000/10.000 26.000/13.000 38.400/19.200 50.000/25.000 | 12.800/6.400 19.200/9.600 24.576/12.288 30.000/15.000 38.880/19.440 52.000/26.000 | 16.000/8.000 19.440/9.720 25.000/12.500 30.720/15.360 40.000/20.000 | MHz | Custom frequencies available upon request. Please contact Abracon. *Note 1 |
| Supply Voltage (Vdd) | +3.135 | +3.3 | +3.465 | V | |
| Supply Current (Icc) (into 15pF load) | | | 20 | mA | Carrier dependent |
| Initial Frequency Tolerance @ +25°C | -0.50 | | +0.50 | ppm | As received, Relative to carrier |
| Operating Temperature | -20 | | +70 | °C | Option "E" |
| | -40 | | +85 | | Option "L" |
| Frequency Stability vs. Operating Temperature (ref. to +25°C) | -100 | | +100 | ppb | Option "1" *Note 2 |
| | -280 | | +280 | ppb | Option "2" |
| Frequency Stability vs. Vdd Change | -100 | | +100 | ppb | Vdd ±5% |
| Frequency Stability vs. Load Change | -200 | | +200 | ppb | Load ±5% |
| Aging (1 st year @ +25°C) | -1.0 | | +1.0 | ppm | |
| Aging (10 years @ +25°C) | -3.0 | | +3.0 | ppm | |
| All-inclusive frequency stability over 10 years product life (Stratum-III Compliant) | -4.60 | | +4.60 | ppm | |
| LVC MOS Output (Square wave) | | | | | |
| V _{OH} | 2.4 | | | V | Load = 15pF |
| V _{OL} | | | 0.4 | V | Load = 15pF |
| Load | | | 15 | pF | |
| Duty Cycle | 45 | | 55 | % | @ (V _{OH} - V _{OL})/2 |
| Rise/Fall Time | | | 6 | ns | Load = 15pF |
| Control Port (Applicable for VCTCXO only) | | | | | |
| Center Control Voltage (Vc) | | +1.50 | | V | |
| Control Voltage Range (Vc) | +0.50 | | +2.50 | V | |
| Frequency Pull | ±5.00 | | < ±13.00 | ppm | Vc = 1.5V±1.0V |
| Tuning Slope | | Positive | | | |
| Linearity Error | | < 0.5 | 10 | % | |

*Note 1: F₀ > 40MHz, available in Q4-2017 | *Note 2: Available Q4-2017

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STANDARD SPECIFICATIONS (CONT.)

| PARAMETERS | MINIMUM | TYPICAL | MAXIMUM | UNITS | NOTES |
|---|---------|---------|---------|--------|----------------|
| RMS Jitter (12kHz ~ 20MHz BW) @ 25°C | | | | | |
| 16.384 MHz Carrier | | 650 | 1,300 | fs | |
| 20.000 MHz Carrier | | 525 | 1,300 | fs | |
| 10.000 MHz Carrier | | 650 | 1,300 | fs | |
| 26.000 MHz Carrier | | 450 | 1,300 | fs | |
| 13.000 MHz Carrier | | 775 | 1,300 | fs | |
| 40.000 MHz Carrier | | 325 | 1,300 | fs | |
| 20.000 MHz Carrier | | 450 | 1,300 | fs | |
| Phase Noise | | | | | |
| F ₀ @ 20.000 MHz | | -85 | | dBc/Hz | Offset @10Hz |
| | | -100 | | | Offset @100Hz |
| | | -135 | | | Offset @1kHz |
| | | -145 | | | Offset @10kHz |
| | | -150 | | | Offset @100kHz |
| | | -155 | | | Offset @ 5MHz |
| F ₀ /2 @ 10.000 MHz | | -90 | | dBc/Hz | Offset @10Hz |
| | | -100 | | | Offset @100Hz |
| | | -135 | | | Offset @1kHz |
| | | -145 | | | Offset @10kHz |
| | | -150 | | | Offset @100kHz |
| | | -155 | | | Offset @ 5MHz |
| F ₀ @ 26.000 MHz | | -85 | | dBc/Hz | Offset @10Hz |
| | | -100 | | | Offset @100Hz |
| | | -135 | | | Offset @1kHz |
| | | -145 | | | Offset @10kHz |
| | | -150 | | | Offset @100kHz |
| | | -150 | | | Offset @ 5MHz |
| F ₀ /2 @ 13.000 MHz | | -75 | | dBc/Hz | Offset @10Hz |
| | | -100 | | | Offset @100Hz |
| | | -135 | | | Offset @1kHz |
| | | -150 | | | Offset @10kHz |
| | | -150 | | | Offset @100kHz |
| | | -155 | | | Offset @ 5MHz |
| F ₀ @ 40.000 MHz | | -80 | | dBc/Hz | Offset @10Hz |
| | | -100 | | | Offset @100Hz |
| | | -125 | | | Offset @1kHz |
| | | -140 | | | Offset @10kHz |
| | | -150 | | | Offset @100kHz |
| | | -150 | | | Offset @ 5MHz |
| F ₀ /2 @ 20.000 MHz | | -80 | | dBc/Hz | Offset @10Hz |
| | | -100 | | | Offset @100Hz |
| | | -135 | | | Offset @1kHz |
| | | -140 | | | Offset @10kHz |
| | | -145 | | | Offset @100kHz |
| | | -155 | | | Offset @ 5MHz |

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TYPICAL PHASE NOISE & JITTER CHARACTERISTICS

16.384MHz
[Output 1 (F0)]



20.000MHz / 10.000MHz
[Output 1 (F0) / Output 2 (F0/2)]

20.000MHz



10.000MHz



REVISED: 05.19.2017



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TYPICAL PHASE NOISE & JITTER CHARACTERISTICS

26.000MHz / 13.000MHz
 [Output 1 (F0) / Output 2 (F0/2)]



40.000MHz / 20.000MHz
 [Output 1 (F0) / Output 2 (F0/2)]



| Frequency | 16.384MHz | 20MHz | 10MHz | 26MHz | 13MHz | 40MHz | 20MHz |
|--|-----------|--------|--------|--------|--------|--------|--------|
| Typical rms Phase Jitter (12kHz to 20MHz BW) | 640 fs | 498 fs | 643 fs | 429 fs | 752 fs | 311 fs | 432 fs |

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FREQUENCY STABILITY VS. TEMPERATURE

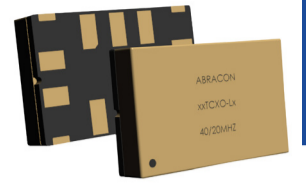
FREQUENCY PULL VS. CONTROL VOLTAGE (VCTCXO MODE)



AGING PROFILE (ACCELERATED AGING @ +85°C)



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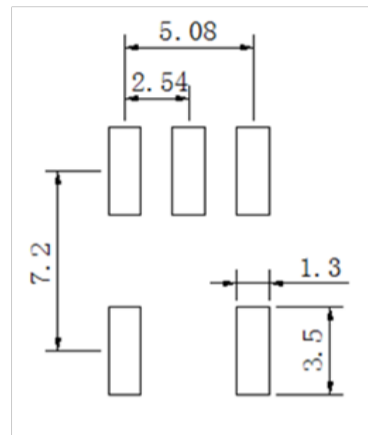
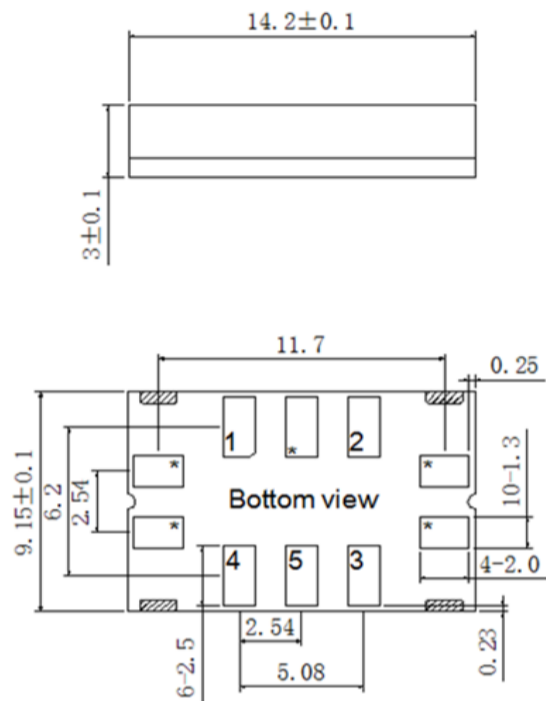
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TYPICAL PHASE NOISE & JITTER CHARACTERISTICS

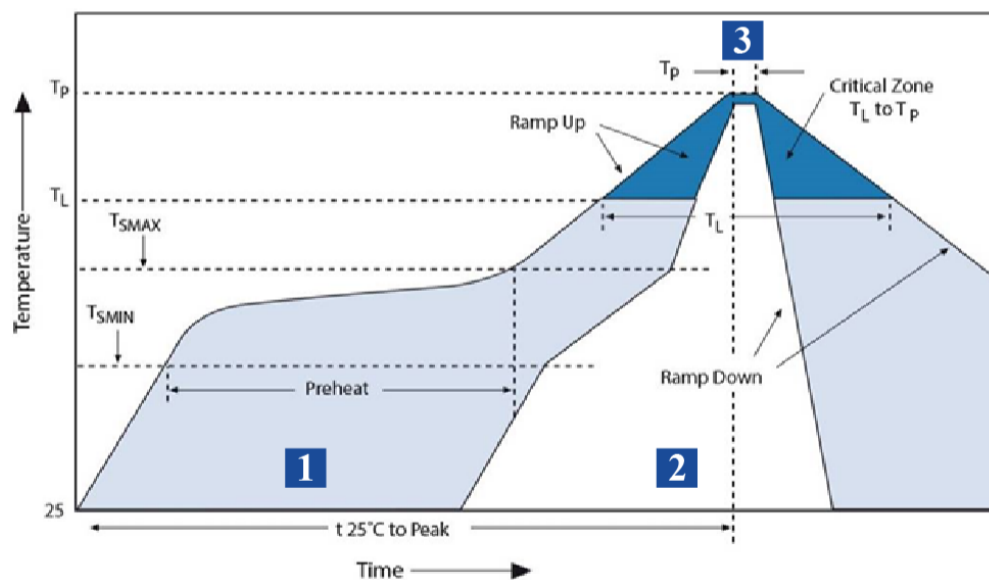
RECOMMENDED LAND PATTERN



| Pin | Function |
|-----|----------------------------------|
| 1 | NC (for TCXO) Vc (for VCTCXO) |
| 2 | GND |
| 3 | Output #1 (F0) |
| 4 | Vdd |
| 5 | Output #2 (F0/2) |
| * | For factory test only |

Dimensions: mm

REFLOW PROFILE



| Zone | Description | Temperature | Time |
|------|-------------|---|---------------|
| 1 | Preheat | $T_{SMIN} \sim T_{SMAX}$ 150°C ~ 200°C | 60 ~ 120 sec. |
| 2 | Reflow | T_L 220°C | 60 ~ 150 sec. |
| 3 | Peak Heat | T_P 260°C | 25 sec. MAX |

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PACKAGING

T5: 500 pcs/reel

T2: 250 pcs/reel

MSL - 3 compliant packaging applies to MOQ=25 units (cut tape) & T5 and T2 options

MSL - 3 compliant packaging DOES NOT apply to bulk quantities



| W | A0 | B0 | K0 | P | |
|-----------|----------|-----------|----------|----------|----------|
| 24.0±0.3 | 9.6±0.10 | 14.5±0.10 | 3.9±0.10 | 16.0±0.1 | |
| F | E | D | P0 | P2 | T |
| 13.25±0.1 | 1.75±0.1 | 1.5±0.1 | 4.0±0.1 | 2.0±0.1 | 0.3±0.05 |



| W | A | N | T | E | F | D |
|----------|---------|---------|---------|---------|-----------|---------------|
| 24.5±0.4 | 330±0.5 | 100±0.3 | 1.8±0.2 | 2.1±0.3 | 10.75±0.3 | 13.5+0.5/-0.2 |

Dimensions: mm

Mouser Electronics

Authorized Distributor

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ABRACON:

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Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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- Подбор аналогов;
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- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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Факс: 8 (812) 320-02-42

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