

MODEL VTXO200B

SMD Voltage Controlled Temperature Compensated Crystal Oscillators

Small low profile SMD VCTCXO with standard four-terminal interface and clipped sinewave output. Frequencies ranging from 10MHz to 26MHz available.

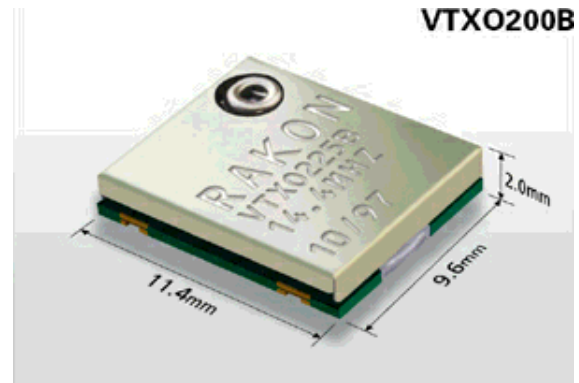
Product Description

This Colpitts oscillator uses the direct two-port temperature compensation method. Operating on the fundamental mode, the low-profile AT-cut crystal is housed in a seam-sealed ceramic package.

The product can be configured to operate on any voltage between 2.7V and 5V. A mechanical trimmer is available for adjusting the frequency.

Applications include

TDMA/APMS/CDMA cellular and satellite phones, PCMCIA CDPD cards, two-way pagers and many other wireless possibilities.



Features

- Excellent phase noise performance, very little aging and low temperature hysteresis
- Clipped sinewave frequency output (10MHz to 26MHz)
- Standard temperature stability choices are +/-1ppm, +/-1.5ppm and +/-2.5ppm, over wide temperature range
- This product has a manual trimmer as standard, but can be supplied with no trimmer to allow for an aqueous wash process
- Power supply alternatives are 2.7V to 5V, and the unit consumes only 1.2mA typically
- Frequency control ranges from 6 to 40ppm available

1.0 SPECIFICATION REFERENCES

1.1	Reference Number	774
1.2	Model Description	VTXO225BR 10.0 MHz
1.3	Company	BAE Systems

2.0 FREQUENCY CHARACTERISTICS

Line	Parameter	Test Condition	Min.	Max.	Units
2.1	Nominal Frequency	Nominal Frequency referenced to 25 deg. C.		10.0	MHz
2.2	Frequency calibration	Frequency at 23 deg. C +/-2 deg. C (see Note 1)	1.0		+/-ppm
2.3	Frequency stability over temperature	Referenced to frequency reading at 25 deg. C. Temperature varied at max. of 2 deg. C per minute. Control voltage varied between min. and max. (Note 2)	2.5		+/-ppm
2.4	Temperature range	The operating temperature range over which the frequency stability is measured (Note 3)	-20.0	70.0	Degrees C
2.5	Frequency perturbations	Peak to peak amplitude of frequency perturbation within operating temperature range (Note 1)	1.0		ppm
2.6	Frequency slope of perturbations	Minimum of 1 frequency reading every 2 degrees C, over the operating temperature range (Note 1)	1.0		ppm/deg C
2.7	Static temperature	Frequency change after reciprocal temperature ramped	0.6		+/-ppm

	hysteresis	over the operating range. Frequency measured before and after at 25 deg C		
2.8	Supply voltage stability	Supply voltage varied +/-5% at 25 deg C. Frequencies above 25MHz are not able to be specified below the max. value given. (Note 1)	0.3	+/-ppm
2.9	Load sensitivity	+/-10% load change	0.2	+/-ppm
2.10	Root Allan Variance	1 second Tau. (Note 1)	1.0	ppb
2.11	Long term stability	Frequency drift over 1 year (Note 1)	1.0	+/-ppm
2.12	G Sensitivity	Gamma vector of all three axes from 30Hz to 1500Hz (Note 1)	2.0	ppb/G
2.13	Trimmer adjustment	Manual adjustment using trimmer tool	3.0	+/-ppm

3.0 POWER SUPPLY

Line	Parameter	Test Condition	Min.	Max.	Units
3.1	Supply voltage	Supply voltage range based on nominal 3V	2.85	3.15	V
3.2	Current	At Max. supply voltage		2.0	mA

4.0 CONTROL VOLTAGE

Line	Parameter	Test Condition	Min.	Max.	Units
4.1	Control voltage range	Determined by supply voltage (Note 5)	0.5	2.5	V
4.2	Frequency tuning	Frequency shift from Min. to Max. control voltages (Note 6)	6.0		ppm
4.3	Frequency tuning linearity	Deviation from straight line curve fit (Note 1)		20.0	%
4.4	Port input impedance		100.0		K Ohms

5.0 OSCILLATOR OUTPUT

Line	Parameter	Test Condition	Min.	Max.	Units
5.1	Output waveform	Clipped sinewave.			
5.2	Output voltage level	At min. supply voltage	0.8		V
5.3	Output load resistance	Operating range	18.0	22.0	K Ohms
5.4	Output load capacitance	Operating range	4.5	5.5	pF

6.0 SSB PHASE NOISE

Line	Parameter	Test Condition	Min.	Max.	Units
<i>Quiescent measurement at room temperature. Phase noise dependent on oscillator frequency.</i>					
6.1	SSB Phase noise density	1Hz offset		-60.0	dBc/Hz
6.2	SSB Phase noise density	10Hz offset		-90.0	dBc/Hz
6.3	SSB Phase noise density	10Hz offset		-90.0	dBc/Hz
6.4	SSB Phase noise density	100Hz offset		-120.0	dBc/Hz
6.5	SSB Phase noise density	1KHz offset		-140.0	dBc/Hz

6.6	SSB Phase noise density	10KHz offset	-145.0 dBc/Hz
6.7	SSB Phase noise density	100KHz offset	-150.0 dBc/Hz

7.0 ENVIRONMENTAL

The oscillator shall meet electrical characteristics and suffer no physical damage after being subject to the following conditions:

7.1	Shock	Half sinewave acceleration of 100G peak amplitude for 11ms duration, 3 cycles each plane.
7.2	Random Vibration	10G's RMS 30Hz to 1500Hz duration of 6 hours
7.3	Humidity	After 48hours at 85 deg C +/-2% deg C 85% relative humidity non-condensing
7.4	Thermal shock test	Exposed at -40 deg C for 30 minutes then to 85 deg C for 30 minutes constantly for a period of 5 days.
7.5	Storage Temperature	-40 to 85 deg C.

8.0 MARKING

8.1	Type	Engrave
8.2	Line 1	Rakon logo
8.3	Line 2	Model descriptive
8.4	Line 3	Frequency in MHz (to 3 decimal places or greater depending on the no. of significant digits after the decimal point)
8.5	Line 4	Date Code MM/YY

9.0 MANUFACTURING INFORMATION

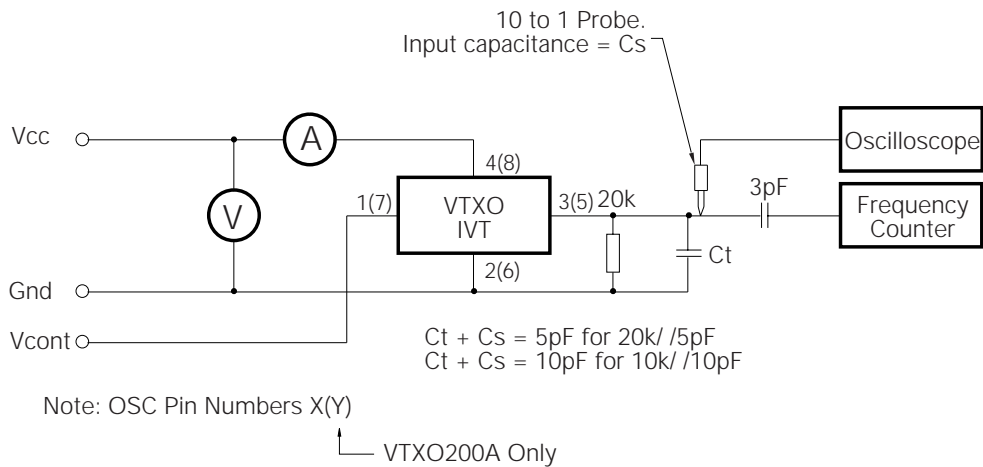
9.1	Reflow and washing	Able to withstand normal solder reflow processes but not aqueous washing due to presence of trimmer with open dielectric exposure.
9.2	Packaging description	Tape and reel

10.0 SPECIFICATION NOTES

10.1	Note 1	The Max. value is the specification. A Min. value, if present, indicates the tightest specification available.
10.2	Note 2	A max. frequency stability over the temperature is required to be specified. For this model series, values between to +/-1ppm and +/-10ppm are available. Standard options are +/-1ppm, +/-1.5ppm, +/-2ppm and +/-2.5ppm.
10.3	Note 3	The operating temperature range needs to be specified. The extremes for this model are -40 and +85 deg C. If either or both ends of the operating temperature range are at these extremes, then the frequency stability options are limited to greater than +/-2ppm.
10.4	Note 4	Standard power supply options are 2.7V, 3V, 3.3V, 4V or 5V, but any value between Min. & Max. is available.
10.5	Note 5	This range is normally 0.5V to Supply voltage less 0.5V i.e. for a supply voltage of 3V, the range is 0.5V to 2.5V.

10.6 Note 6

The Min value is the specification. A Max value, if present, indicates the widest tuning range available for this model (subject to other parameters).



TITLE: VT XO & IVT CLIPPED SINEWAVE TEST CIRCUIT FILENAME: CAT003

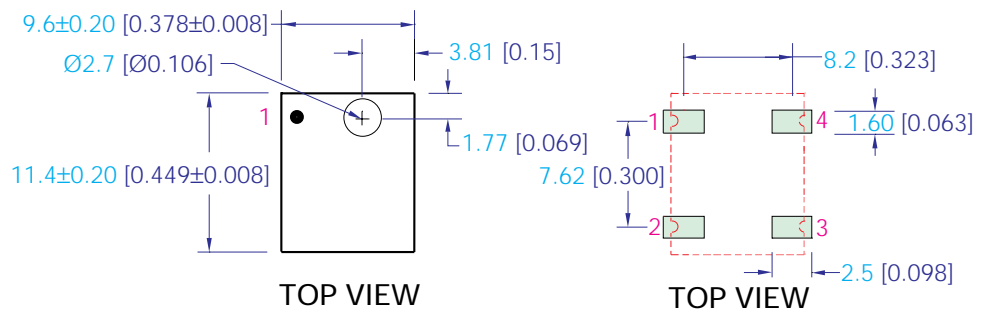
REVISION: B

RELATED DRAWINGS: VT XO100 VT XO200A
IVT100 VT XO200B
IVT200B VT XO200U

DATE: 28 AUG 98

SCALE: NTS

Millimetres [inch]



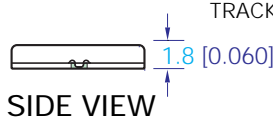
TOP VIEW

TOP VIEW

RECOMMENDED PAD LAYOUT
TRACKS NOT RECOMMENDED UNDER OSCILLATOR



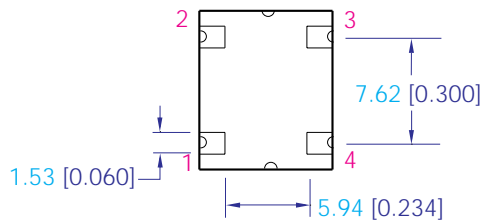
END VIEW



SIDE VIEW



END VIEW



BOTTOM VIEW

PIN CONNECTIONS

- 1 CONTROL VOLTAGE
- 2 COMMON AND CASE
- 3 OUTPUT
- 4 +Vcc

TITLE: VTXO200B MODEL

FILENAME: CAT005

REVISION: C

Tolerances:

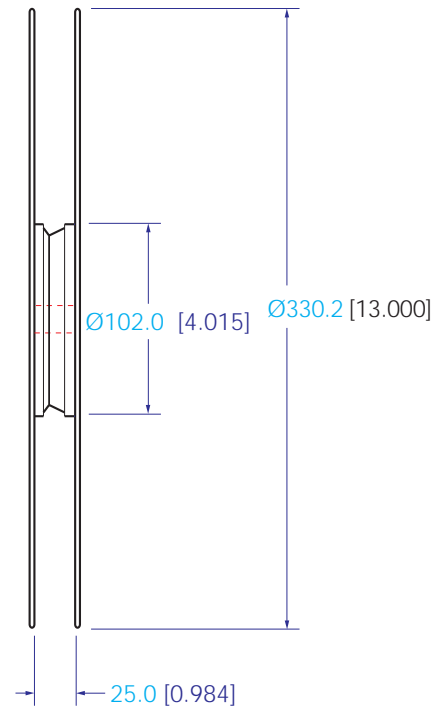
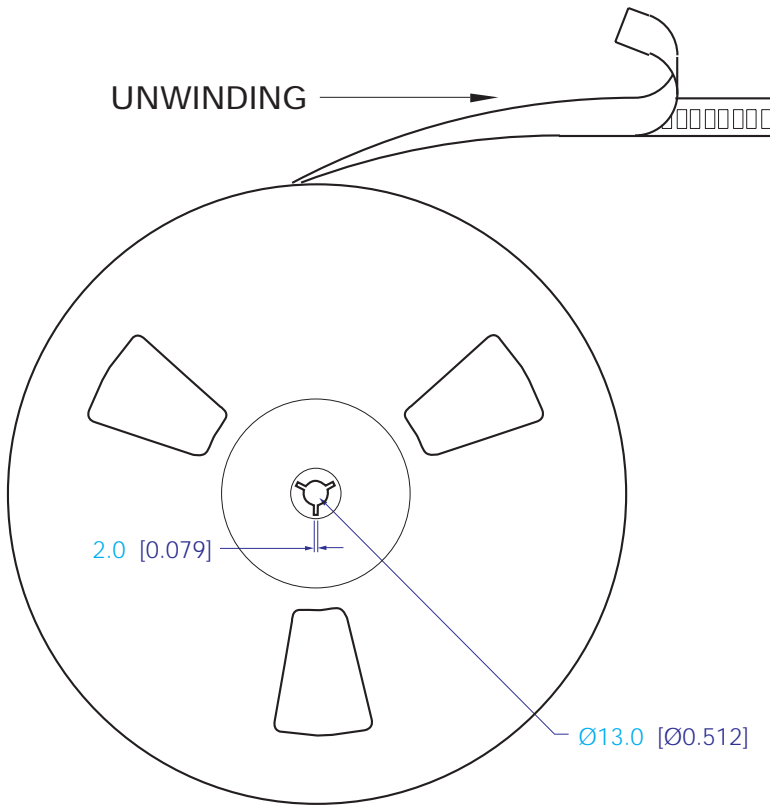
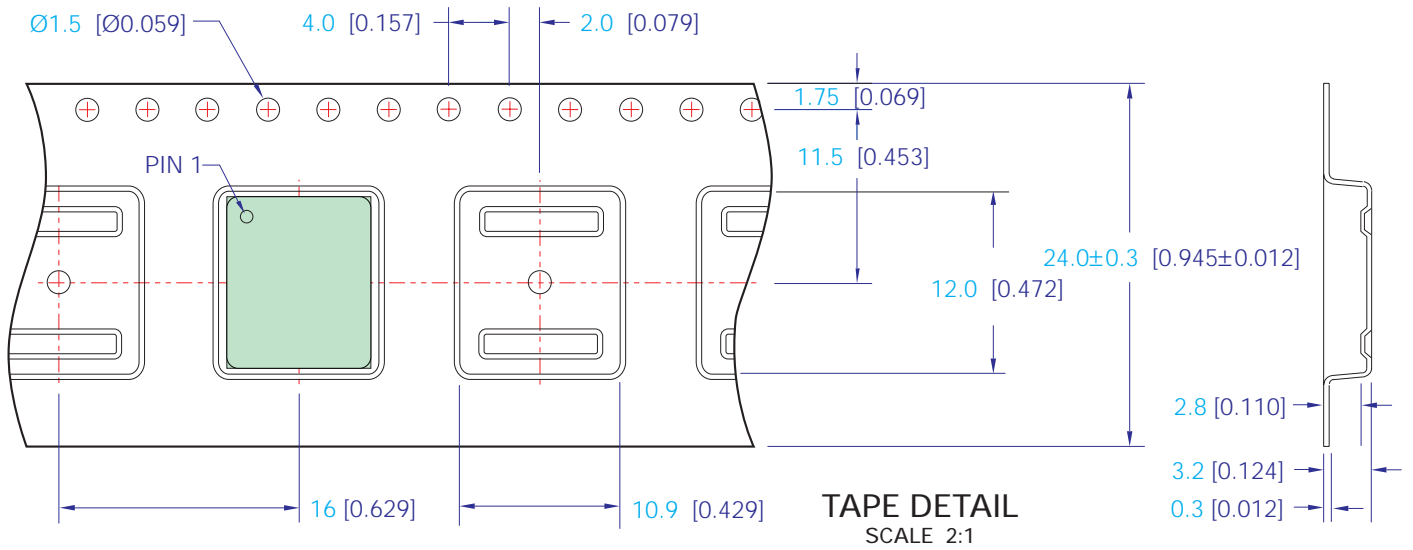
RELATED DRAWINGS: VTXO & IT CLIPPED
SINEWAVE TEST CIRCUIT (CAT003)
200A&B TAPE & REEL (CAT011)
200 SERIES REFLOW (CAT015)

DATE: 13 APRIL 99

SCALE: 2:1

Millimetres [inch]

XX = ±0.5
X.X = ±0.10
X.XX = ±0.05
X.XXX = ±0.05
X° = ±1.0°
Hole = ±0.10



TITLE: 200A&B TAPE & REEL

FILENAME: CAT011

REVISION: A

RELATED DRAWINGS: TXO200A
TXO200B
IT200B

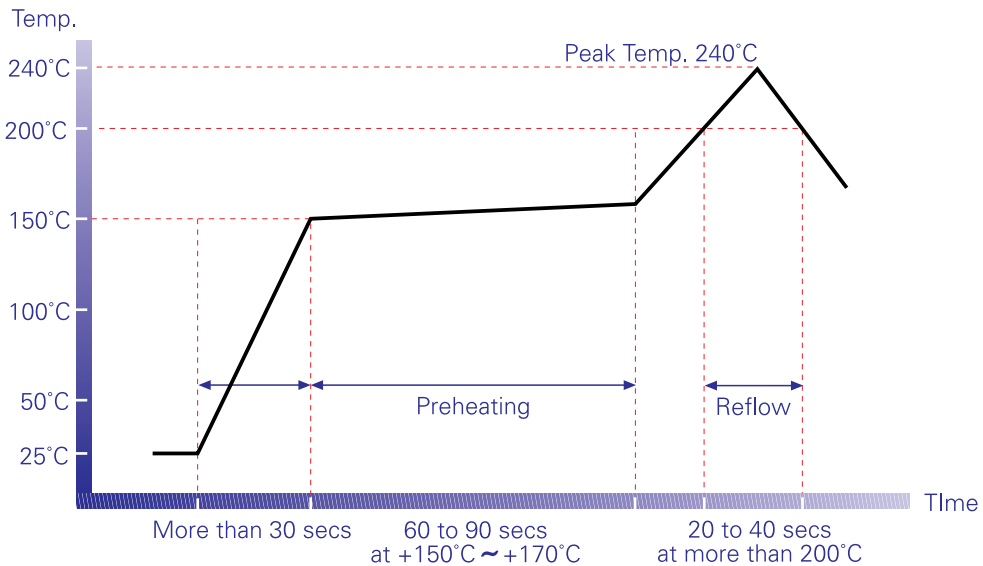
VTXO200A
VTXO200B
IVT200B

DATE: 5 OCT 98

SCALE: 2:1 1:4

Millimetres [inch]

200 Series A,B & U TXO/VTXO



TITLE: 200 SERIES REFLOW

FILENAME: CAT015

REVISION: B

RELATED DRAWINGS: TXO200A (CAT008) VTXO200A (CAT004) IT200B (CAT082)
TXO200B (CAT009) VTXO200B (CAT005) IVT200B (CAT083)
TXO200U (CAT010) VTXO200U (CAT006)

DATE: 16 SEPT 98

SCALE: NTS

Millimetres [inch]