

MODEL IVT200B

SMD Voltage Controlled Temperature Compensated Crystal Oscillators

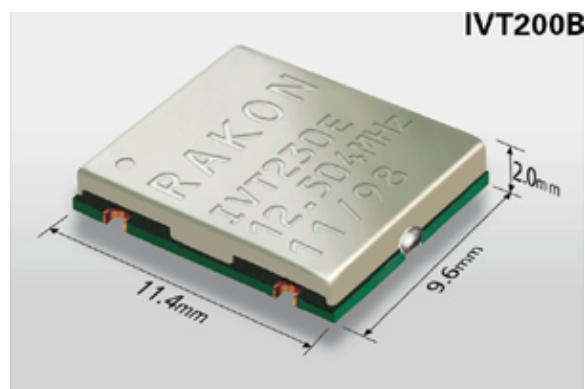
Small, low cost SMD VCTCXO using an analogue IC for compensation. Frequencies ranging from 10MHz to 26MHz.

Product Description

The IVT200B employs an analogue IC for the oscillator and temperature compensation giving excellent temperature stability performance for low cost.

Applications include

GSM/TDMA/APMS cellular phones, PCMCIA CDPD cards and many other wireless applications.



Features

- Standard temperature stability choices are ± 1 ppm, ± 1.5 ppm and ± 2.5 ppm, over wide temperature ranges.
- Unit weight is only 0.1720 grams.
- Clipped sinewave frequency output from 10MHz to 26MHz.
- Frequency slope and perturbation specifications can be customized to the application requirement.
- Internal power regulation. Unit can operate on any supply voltage between 2.7 and 5.5 Volts.
- The unit consumes only 1.2mA typically.
- Frequency control ranges from 6 to 50ppm available

1.0 SPECIFICATION REFERENCES

1.1	Model Description	IVT215BE 12.8 MHz
1.2	Reference Number	3424
1.3	Company	Trimble Navigation

2.0 FREQUENCY CHARACTERISTICS

Line	Parameter	Test Condition	Min.	Max.	Units
2.1	Nominal Frequency	Nominal Frequency referenced to 25 deg. C.		12.8	MHz
2.2	Frequency calibration	Frequency at 23 deg. C ± 2 deg. C. sixty minutes after reflow		2.0	$\pm$ -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 held at voltage control range midpoint. (Note 2)		1.5	$\pm$ -ppm
2.4	Temperature range	The operating temperature range over which the frequency stability is measured (Note 3)	-40.0	85.0	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 hysteresis	Frequency change after reciprocal temperature ramped over the operating range. Frequency measured before and after at 25 deg C.	0.6	+/-ppm
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)	1.0	ppb/G

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		1.5	mA

4.0 CONTROL VOLTAGE

Line	Parameter	Test Condition	Min.	Max.	Units
4.1	Control voltage range	The nominal control voltage value is midway between the minimum and maximum.	0.5	2.5	V
4.2	Frequency tuning	Frequency shift from Min. to Max. control voltages (Note 6)	18.0	30.0	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	9.0	11.0	K Ohms

5.4	Output load capacitance	Operating range	9.0	11.0	pF
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6.0 SSB PHASE NOISE

Quiescent measurement at room temperature. Phase noise dependent on oscillator frequency. The dBc/Hz are typical values.

6.1	SSB Phase noise density	1Hz offset typical	-55.0	dBc/Hz
6.2	SSB Phase noise density	10Hz offset typical	-85.0	dBc/Hz
6.3	SSB Phase noise density	100Hz offset typical	-110.0	dBc/Hz
6.4	SSB Phase noise density	1KHz offset typical	-125.0	dBc/Hz
6.5	SSB Phase noise density	10KHz offset typical	-140.0	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 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

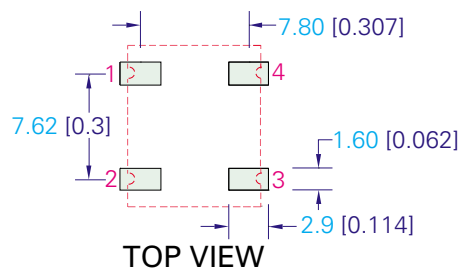
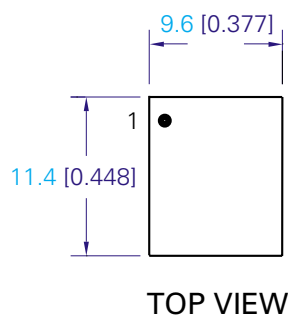
8.1	Type	Engrave
8.2	Line 1	Rakon logo
8.3	Line 2	Model descriptive
8.4	Line 3	Frequency in MHz (to 3 decimal places or greater depending on the no. of significant digits after the decimal point)
8.5	Line 4	Date code WWYY

9.0 **MANUFACTURING INFORMATION**

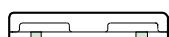
- | | |
|----------------------------------|---|
| 9.1 Reflow and washing | Able to withstand aqueous washing process and normal solder reflow processes. |
| 9.2 Packaging description | Tape and reel (1000pcs max std.) |

10.0 **SPECIFICATION NOTES**

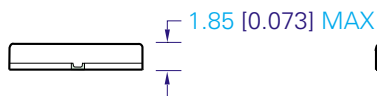
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|--------------------|--|
| 10.1 Note 1 | The Max. value is the specification. A Min. value, if present, indicates the tightest specification available. |
| 10.2 Note 2 | A max. frequency stability over the temperature is required to be specified. For this model series, values between to ± 1 ppm and ± 10 ppm are available. Standard options are ± 1 ppm, ± 1.5 ppm, ± 2 ppm and ± 2.5 ppm. |
| 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 ± 1.5 ppm. |
| 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 | The Min value is the specification. A Max value, if present, indicates the widest tuning range available for this model (subject to other parameters). |



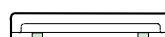
RECOMMENDED PAD LAYOUT
TRACKS NOT RECOMMENDED UNDER OSCILLATOR



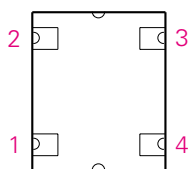
END VIEW



SIDE VIEW



END VIEW



BOTTOM VIEW

PIN CONNECTIONS	
1	CONTROL VOLTAGE
2	COMMON & CASE
3	OUTPUT
4	+ Vcc

TITLE: IVT200B MODEL

FILENAME: CAT083

REVISION: B

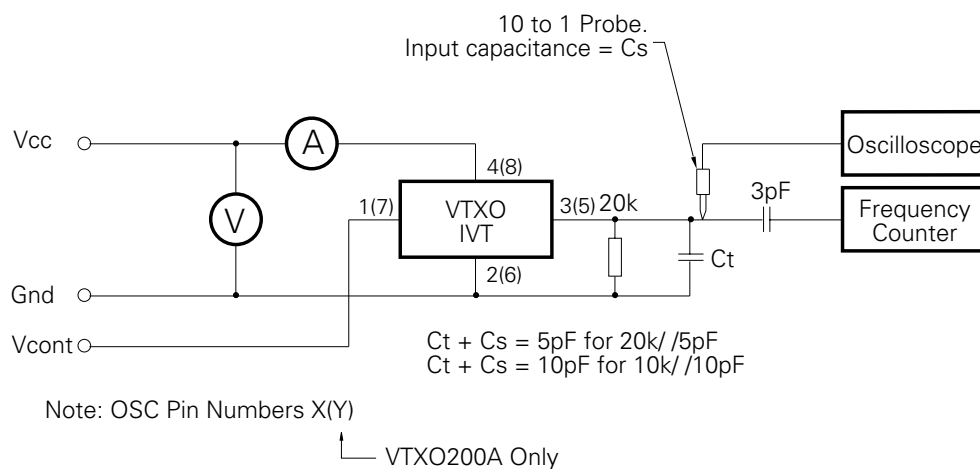
RELATED DRAWINGS: VTXO & IVT CLIPPED
SINEWAVE TEST CIRCUIT (CAT003)
200A&B TAPE & REEL (CAT011)
200SERIES REFLOW (CAT015)

DATE: 1 OCT 98

SCALE: 2:1

Millimetres [inch]

Tolerances:	
XX	= ±0.5
X.X	= ±0.10
X.XX	= ±0.05
X.XXX	= ±0.05
X ⁰	= ±1.0°
Hole	= ±0.10



TITLE: VTXO & IVT CLIPPED SINEWAVE TEST CIRCUIT FILENAME: CAT003

REVISION: B

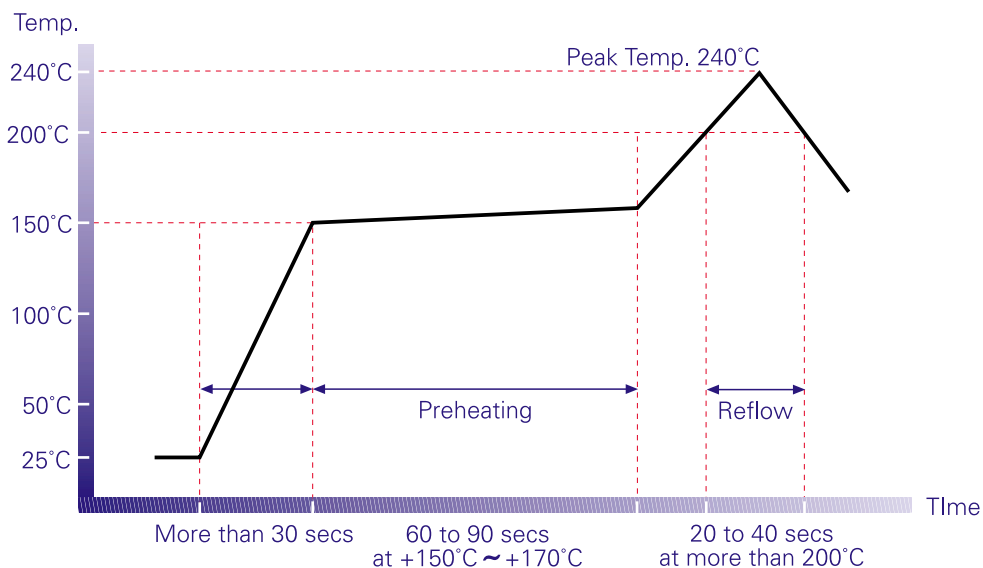
RELATED DRAWINGS: VTXO100 VTXO200A
 IVT100 VTXO200B
 IVT200B VTXO200U

DATE: 28 AUG 98

SCALE: NTS

Millimetres [inch]

200 Series A,B & U TXO/VTXO



TITLE: 200 SERIES REFLOW

FILENAME: CAT015

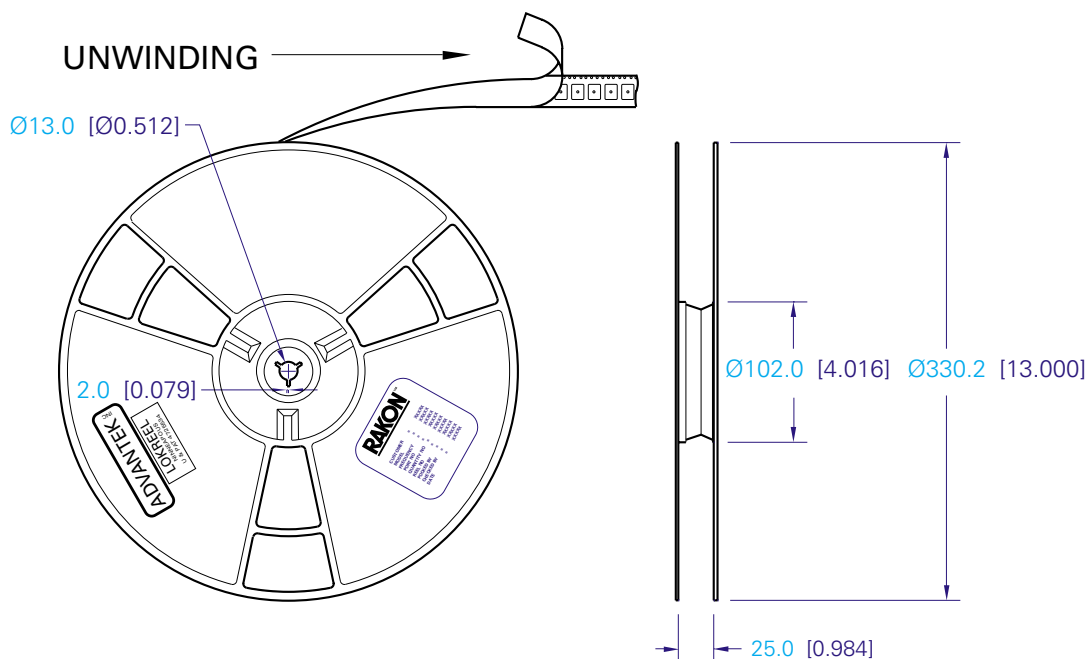
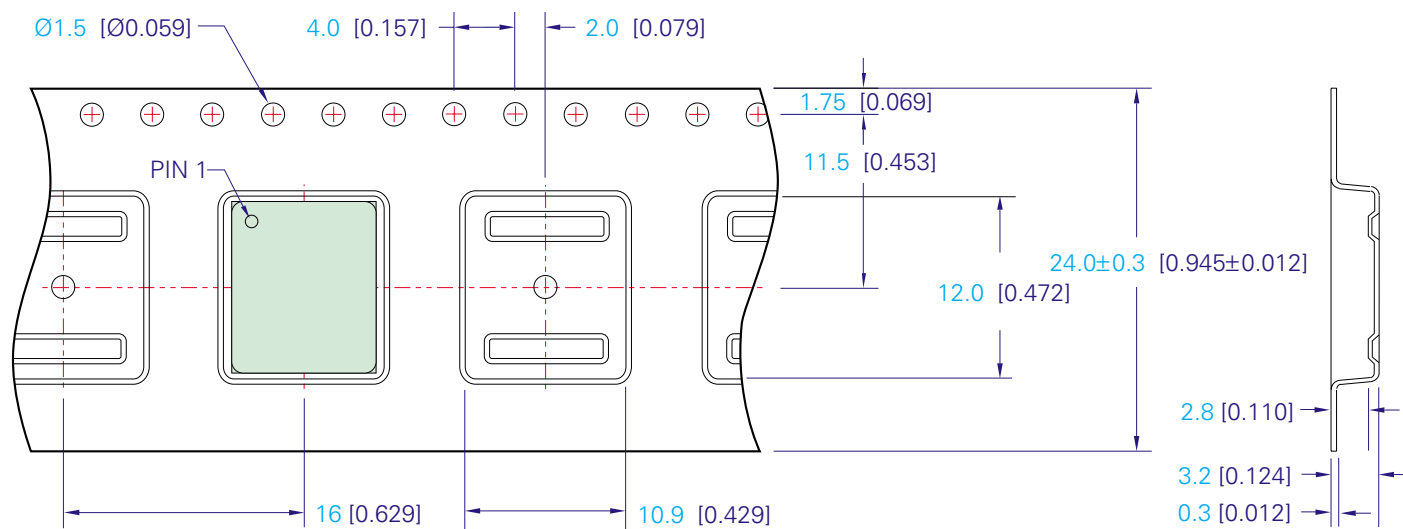
REVISION: B

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]



REEL DETAIL
SCALE 1:5

TITLE: 200A&B TAPE & REEL

FILENAME: CAT011

REVISION: C

RELATED DRAWINGS: TXO200A / AT
TXO200B / BT
IT200B

VTXO200A / AT
VTXO200B / BT
IVT200B

DATE: 2 NOV 00

SCALE: 2:1

Millimetres [inch]

RAKON
PRECISION QUARTZ CRYSTALS

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