

MODEL VTXO600CT

Hermetically Sealed Voltage Controlled Crystal Oscillators with High Speed CMOS Output

Hermetically sealed thru-hole style VCTCXO with high speed CMOS output using standard DIP-14 pin package. Frequencies ranging from 8.2MHz to 32MHz.

Product Description

This Colpitts oscillator uses the direct two-port temperature compensation method. Operating on the fundamental mode, the circular AT-cut crystal is housed in the environmentally rugged UM-1 SLIM resistance weld package.

The product can be configured to operate on any voltage between 2.7V and 5V. No mechanical trimmer on this model.

Customized frequencies readily available make this model suitable for many timing and frequency applications where an HCMOS output is required.



Features

- Able to operate over industrial temperature ranges
- Excellent temperature stability performance
- Low temperature hysteresis
- Excellent vibration performance
- Very good phase noise performance
- Frequency control ranges from 6 to 50ppm available

1.0 SPECIFICATION REFERENCES

1.1	Model Description	VTXO610CTR 10.0 MHz
1.2	Reference Number	69002
1.3	Company	Rakon Limited
1.4	Customer Part Number	
1.5	Internal Part Number	500548 (TX3007)

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 Measured at nominal control voltage. (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 held at voltage control range midpoint. (Note 2)		1.0	+/-ppm
2.4	Temperature range	The operating temperature range over which the frequency stability is measured (Note 3)	0.0	70.0	Degrees C
2.5	Frequency perturbations	Peak to peak amplitude of frequency perturbation within operating temperature range (Note 1)		0.5	ppm
2.6	Frequency slope of perturbations	Minimum of 1 frequency reading every 2 degrees C, over the operating temperature range (Note 1)		0.5	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.		0.4	+/-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	Long term stability	Frequency drift over 10 years (Note 1)	5.0	+/-ppm
2.13	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 5V	4.75	5.25	V
3.2	Current	At Max. supply voltage		20.0	mA

4.0 CONTROL VOLTAGE

Line	Parameter	Test Condition	Min.	Max.	Units
4.1	Control voltage range	Determined by supply voltage (Note 5). The nominal control voltage value is midway between the minimum and maximum.	0.5	4.5	V
4.2	Frequency tuning	Frequency shift from Min. to Max. control voltages (Note 6)	20.0	30.0	ppm
4.3	Frequency tuning linearity	Deviation from straight line curve fit (Note 1)		10.0	%
4.4	Port input impedance		100.0		K Ohms

5.0 OSCILLATOR OUTPUT

Line	Parameter	Test Condition	Min.	Max.	Units
5.1	Output waveform	Square CMOS			
5.2	Output symmetry	At 50% Vcc	40.0	60.0	%
5.3	Rise and fall times	CMOS logic output at 10% to 90% Vcc		3.0	ns
5.4	Voltage Output Low (VOL)	10% max of Vcc	0.0	0.5	V
5.5	Voltage Output High (VOH)	90% of Vcc	4.5		V
5.6	TTL load	LS TTL gates		10.0	gates
5.7	CMOS load	HCMOS logic output		15.0	pF

6.0 SSB PHASE NOISE

Line	Parameter	Test Condition	Typical	Units
6.1	SSB Phase noise density	1Hz offset at 25°C	-70.0	dBc/Hz

6.2	SSB Phase noise density	10Hz offset at 25°C	-100.0 dBc/Hz
6.3	SSB Phase noise density	100Hz offset at 25°C	-130.0 dBc/Hz
6.4	SSB Phase noise density	1KHz offset at 25°C	-145.0 dBc/Hz
6.5	SSB Phase noise density	10KHz offset at 25°C	-150.0 dBc/Hz

7.0 ENVIRONMENTAL

7.1	Shock	Half sinewave acceleration of 100G peak amplitude for 11ms duration, 3 cycles each plane.
7.2	Humidity	After 48hours at 85 deg C +/-2% deg C 85% relative humidity non-condensing
7.3	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.
7.4	Storage temperature	-40 to 85 deg C

8.0 MARKING

8.1	Type	Engrave
8.2	Line 1	Rakon logo
8.3	Line 2	Customer part number
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

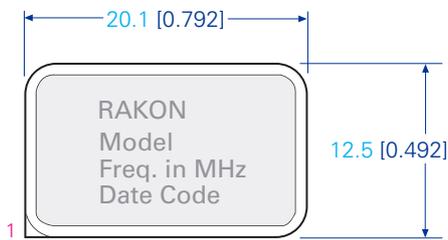
9.1	Washing	Able to withstand normal solder reflow and aqueous wash processes.
9.2	Packaging description	Anti-static trays, 50 units per tray, 10 trays per inner carton, 4 cartons per outer carton

10.0 SPECIFICATION NOTES

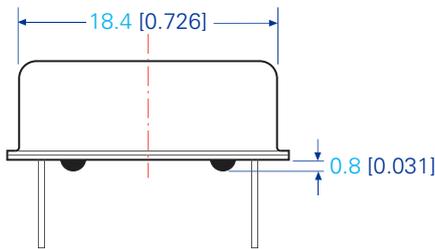
10.1	Note 1	The Max. value is the specification. A Min. value, if present, indicates the tightest specification available.
10.2	Note 2	A max. frequency stability over the temperature is required to be specified. For this model, values between to +/-1ppm and +/-10ppm are available. Standard options are +/-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 +/-1.5ppm.
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	Unit will be safe between 0 and 5V, but performance is not guaranteed outside specified range,

10.6 Note 6

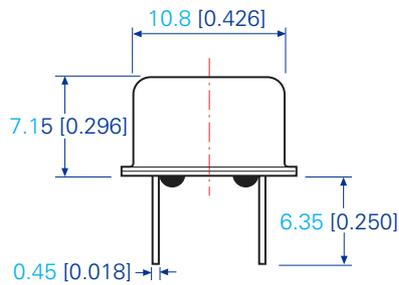
Minimum tuning range stated is equivalent to ± 10 ppm from nominal frequency at time of shipping.



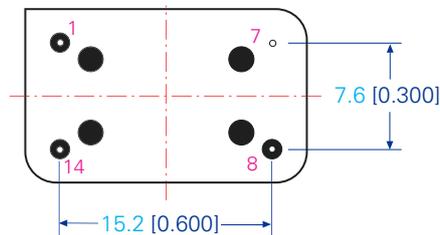
TOP VIEW



SIDE VIEW



END VIEW



BOTTOM VIEW

- PIN CONNECTIONS**
- 1 CONTROL VOLTAGE
 - 7 COMMON AND CASE
 - 8 OUTPUT
 - 14 +Vcc

TITLE: VTXO600CT MODEL

FILENAME: CAT183

REVISION: B

Tolerances:

RELATED DRAWINGS:

DATE: 23-May-07

XX = ±0.5

X.X = ±0.2

X.XX = ±0.10

X.XXX = ±0.05

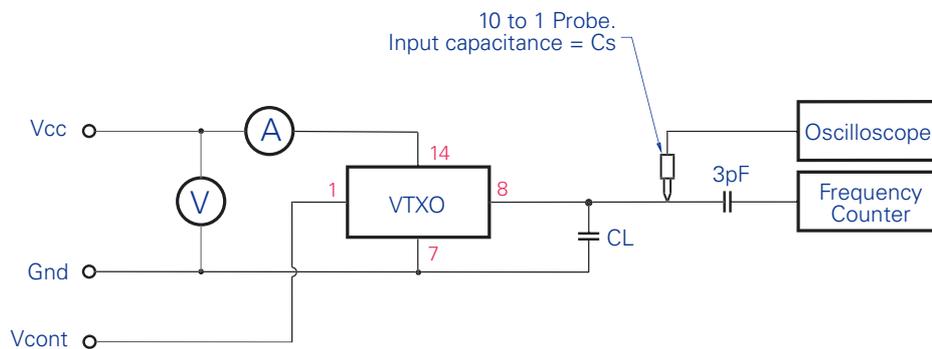
X° = ±1.0°

Hole = ±0.10

SCALE: 2 : 1

Millimetres [inch]

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CL = 15pF Total Fixture and Probe Capacitance

TITLE: VTXO CMOS TEST CIRCUIT

FILENAME: CAT138

REVISION: A

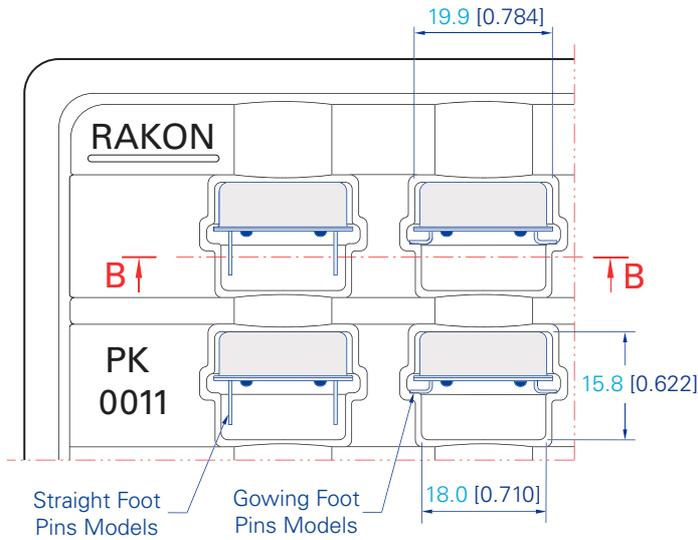
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DATE: 03-Sep-98

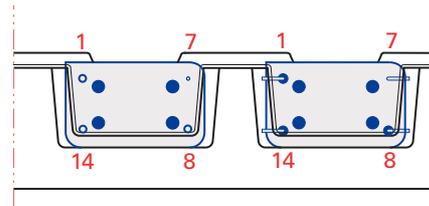
SCALE: NTS

Millimetres [inch]

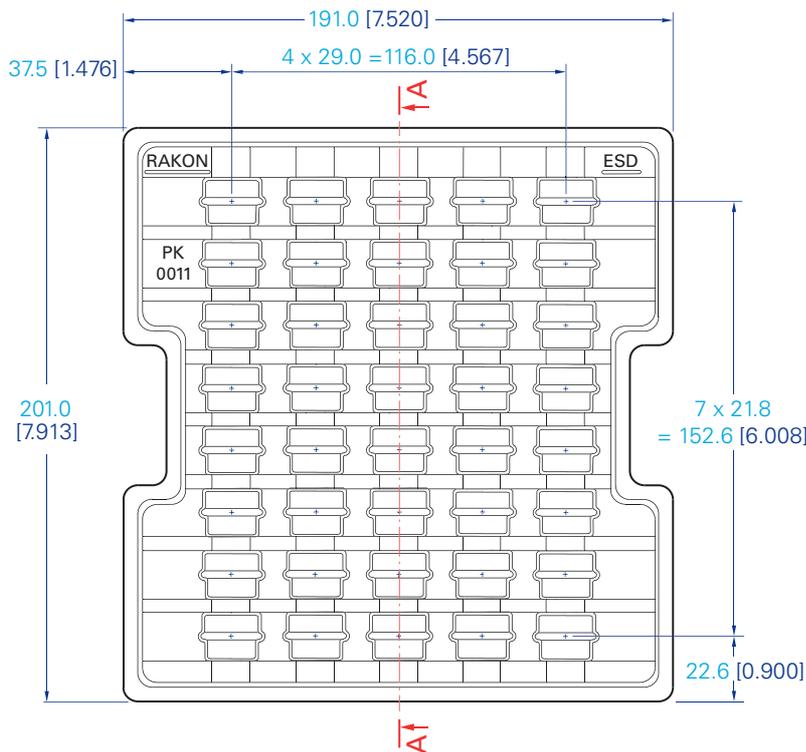
©1998 Rakon Limited



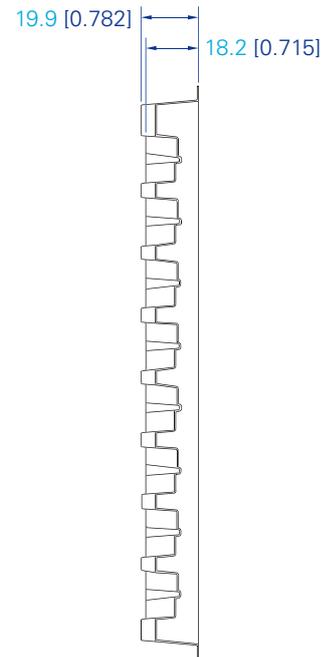
MODELS ORIENTATION (Scale 1:1)



SECTION B – B (Scale 1:1)



TRAY DETAIL (Scale 1:2)



SECTION A–A (Scale 1:2)

Note: 40 Oscillators Per Tray. 11 (10+1 top) Trays Per Small Box. 4 Small Boxes Per Large Box.

TITLE: 600/6000 SERIESTRAY

FILENAME: CAT093

REVISION: E

Tolerances:

RELATED DRAWINGS:

DATE: 11-Nov-03

XX = ±0.5

X.X = ±0.2

X.XX = ±0.10

X.XXX = ±0.05

X° = ±1.0°

Hole = ±0.10

SCALE: See Above

Millimetres [inch]

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