

MODEL IT7500B

SMD Temperature Compensated Crystal Oscillators

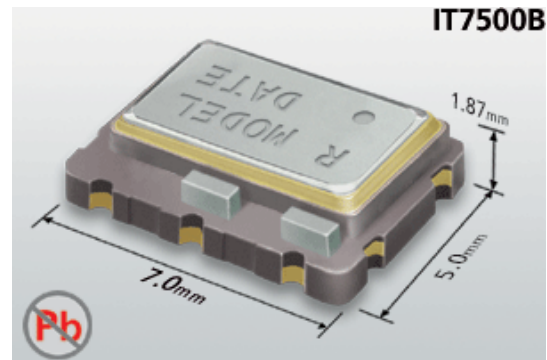
Miniature 7x5mm, low cost SMD TCXO using an analogue IC for compensation. Frequencies ranging from 10MHz to 26MHz.

Product Description

The IT7500B employs an analogue IC for the oscillator and temperature compensation. The RSX-3 crystal is surface mounted on top of the ceramic IC carrier. The segregation of the crystal from the oscillator further improves the reliability of the product.

Applications include

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



Features

- Temperature stability as low as ± 0.5 ppm, over wide temperature ranges.
- 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.

1.0 SPECIFICATION REFERENCES

1.1	Model Description	IT7520BE 16.367 MHz (Pb Free)
1.2	Reference Number	41848
1.3	Company	Rakon Ltd
1.4	Internal Part Number	TX4251
1.5	Customer Part Number	4887622J04
1.6	Automotive	Yes

2.0 FREQUENCY CHARACTERISTICS

Line	Parameter	Test Condition	Min.	Max.	Units
2.1	Nominal Frequency	Nominal Frequency referenced to 25 deg. C.		16.367	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 (Note 2)	2.0		\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 the operating temperature range. Minimum of 1 frequency reading every 2 degree C (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)	0.5		ppm/deg C

reduced

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. (Note 1)	0.1	+/-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)	4.0	+/-ppm
2.13	G Sensitivity	Gamma vector of all three axes from 30Hz to 1500Hz, typical values (Note 1)	2.0	ppb/G
2.14	Micro-Frequency jumps	See Note 5	5.0	ppb
2.15	RMS Noise	See Note 5	0.5	ppb
2.16	Harmonics		-5.0	dBc

3.0 POWER SUPPLY

Line	Parameter	Test Condition	Min.	Max.	Units
3.1	Supply voltage	Has internal power regulation. Unit can operate on any supply voltage between min. and max.	2.7	3.6	V
3.2	Current	At Max. supply voltage		2.0	mA

4.0 OSCILLATOR OUTPUT

Line	Parameter	Test Condition	Min.	Max.	Units
4.1	Output waveform	Clipped sinewave			
4.2	Output voltage level	At min. supply voltage (set at HIGH)	900.0	1500.0	mVpp
4.3	Output load resistance	Operating range		1.5	K Ohm
4.4	Output load capacitance	Operating range		10.0	pF

5.0 SSB PHASE NOISE

5.1	Typical SSB phase noise density	1Hz offset	-50.0		dBc/Hz
5.2	Typical SSB phase noise density	10Hz offset	-80.0		dBc/Hz
5.3	Typical SSB phase noise density	100Hz offset	-110.0		dBc/Hz
5.4	Typical SSB phase noise density	1KHz offset	-130.0		dBc/Hz
5.5	Typical SSB phase noise density	10KHz offset	-140.0		dBc/Hz

5.6 Typical SSB phase noise density 100KHz offset -145.0 dBc/Hz

6.0 ENVIRONMENTAL

Line	Parameter	Test Condition	Min.	Max.	Units
6.1	Shock	Half sinewave acceleration of 3000G peak amplitude for 0.3ms duration, 3 cycles each plane.			
6.2	Random Vibration	10G RMS 30Hz to 1500Hz duration of 6 Hours.			
6.3	Humidity	After 1000 hours at 85 deg C +/-2% deg C 85% relative humidity non-condensing			
6.4	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.			
6.5	Storage temperature	-40 to 105 deg C			

7.0 MARKING

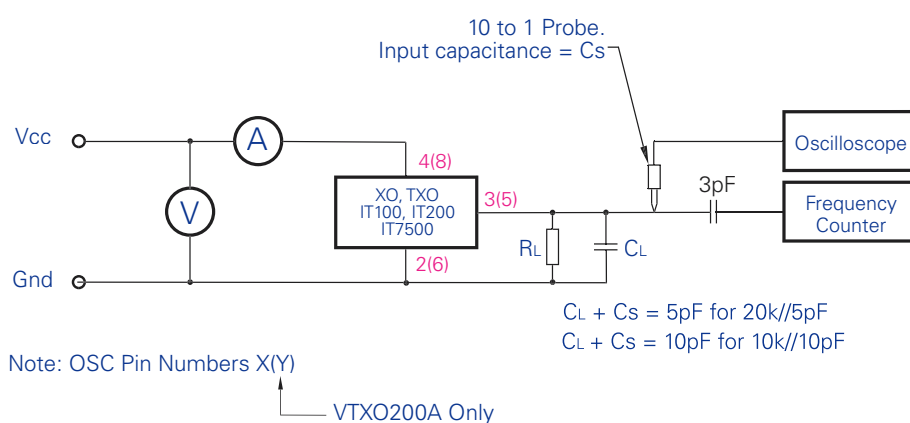
7.1	Type	Engrave
7.2	Line 1	Rakon Logo and the last four characters of the Internal Part Number
7.3	Line 2	Pin 1 mark and Date Code

8.0 MANUFACTURING INFORMATION

8.1	Washing and reflow	Able to withstand aqueous washing process and normal solder reflow processes.
8.2	Reflow temperature	Soldering temperature for 10 seconds max. 230 degrees C
8.3	Packaging description	Tape and reel (2000pcs max std.)

9.0 SPECIFICATION NOTES

9.1	Note 1	The Max. value is the specification. A Min. value, if present, indicates the tightest specification available.
9.2	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.
9.3	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 +/-
9.4	Note 4	The unit will operate on any voltage between Min. and Max. values.
9.5	Note 5	Micro-Frequency jumps and phase noise when measured as the frequency difference between any two adjacent 100 millisecond frequency measurement periods conducted over a sample period of >500 seconds



TITLE: TXO & IT CLIPPED SINEWAVE TEST CIRCUIT

FILENAME: CAT007

REVISION: E

RELATED DRAWINGS:

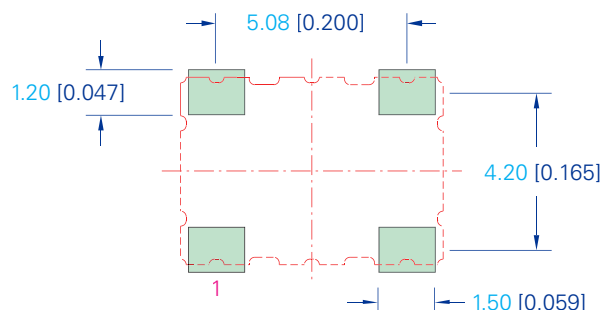
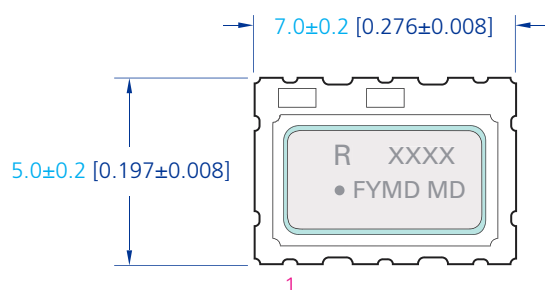
DATE: 29-Mar-05

SCALE: NTS

Millimetres [inch]

RAKON
 PRECISION QUARTZ PRODUCTS

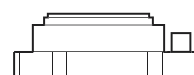
©2005 Rakon Limited



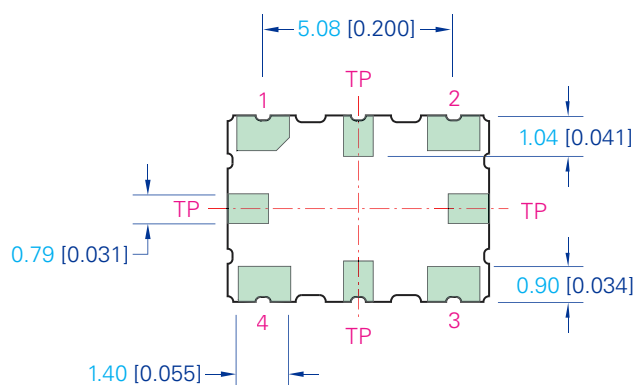
TOP VIEW
RECOMMENDED PAD LAYOUT



SIDE VIEW



END VIEW



BOTTOM VIEW

PIN CONNECTIONS	
1	GROUND RECOMMENDED
2	COMMON & CASE
3	OUTPUT
4	+ Vcc

TITLE: IT7500B MODEL

FILENAME: CAT307

REVISION: B

Tolerances:

RELATED DRAWINGS:

DATE: 14-Jul-05

XX ± 0.5

X.X ± 0.2

X.XX ± 0.10

X.XXX ± 0.05

X° $\pm 1.0^\circ$

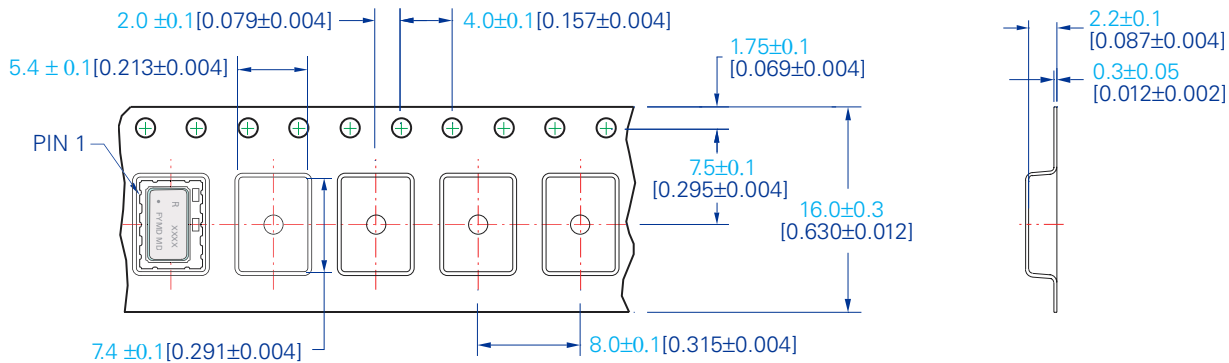
Hole ± 0.10

SCALE: 5 : 1

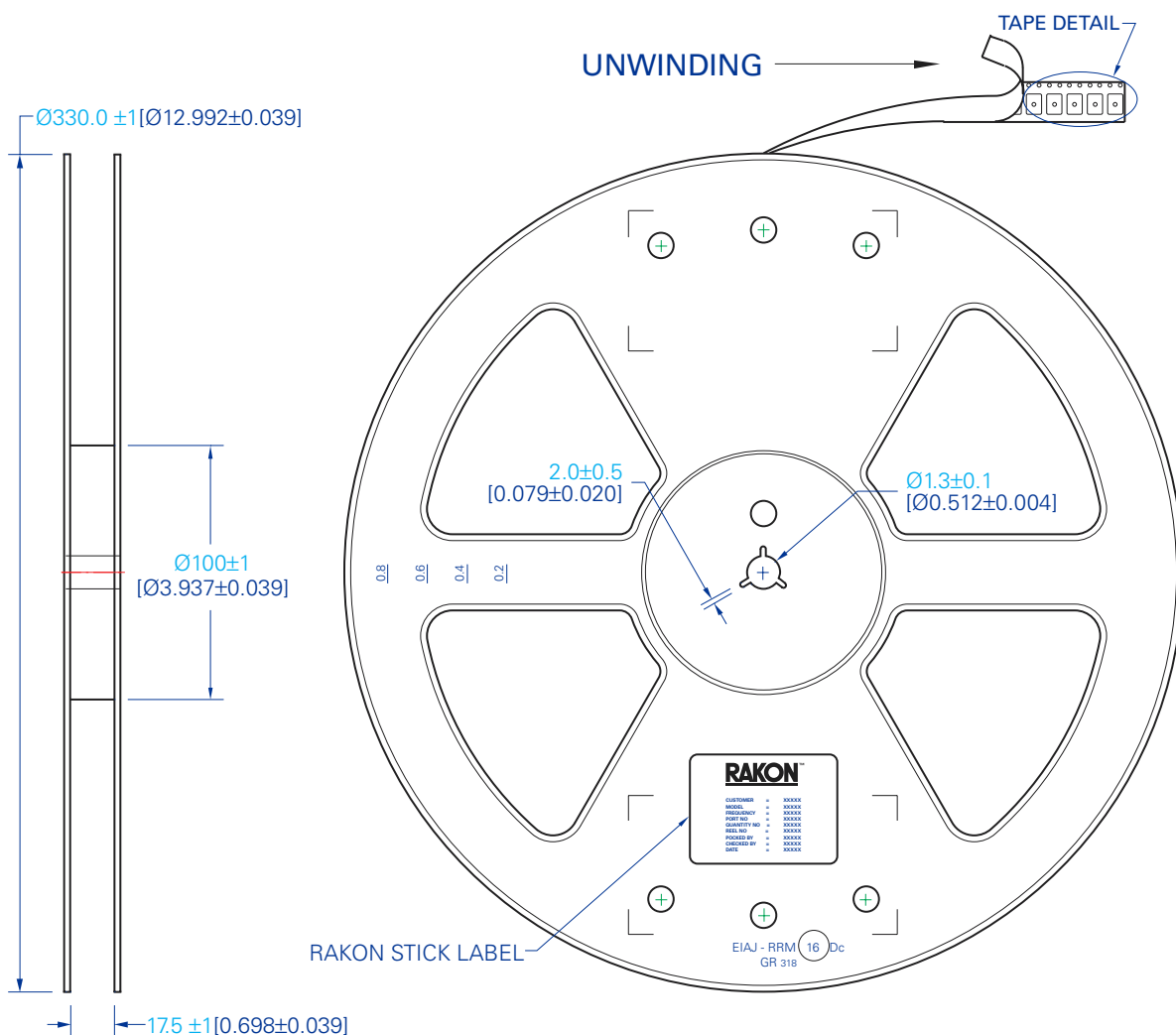
Millimetres [inch]

RAKON
PRECISION QUARTZ CRYSTALS

©2005 Rakon Limited



TAPE DETAIL (SCALE 2 : 1)



REEL DETAIL (SCALE 1 : 5)

NOTE: Ø330mm REEL'S STANDARD PACKING QUANTITY IS 2000 OSCILLATORS PER REEL.

TITLE: I(V)T7500 SERIES TAPE & REEL

FILENAME: CAT156

REVISION: B

Tolerances:

RELATED DRAWINGS:

DATE: 17-Jul-02

XX = ±0.5

X.X = ±0.2

X.XX = ±0.10

X.XXX = ±0.05

X° = ±1.0°

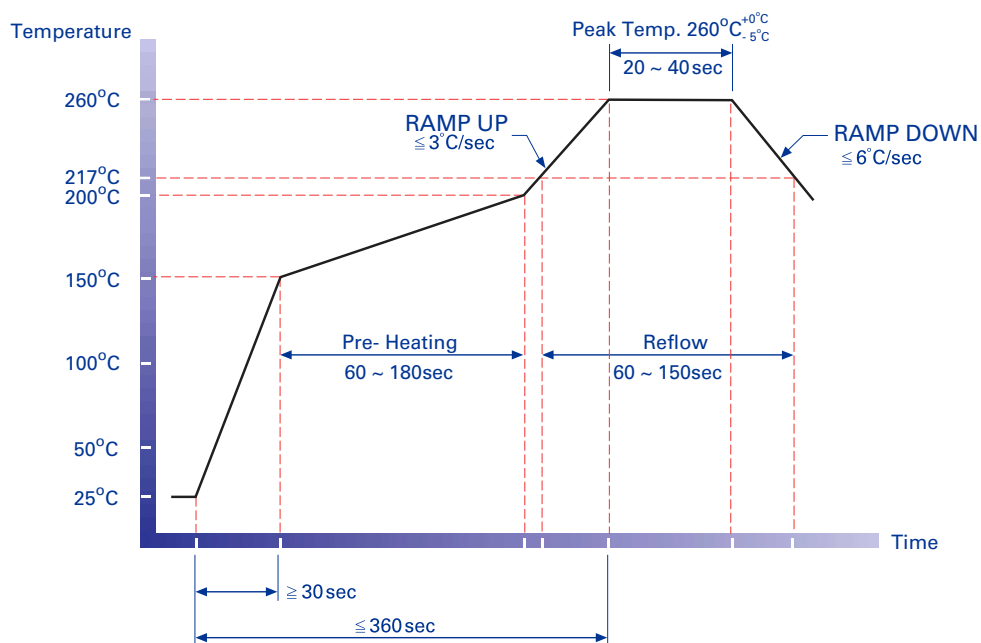
Hole = ±0.10

SCALE: See Above

Millimetres [inch]

RAKON
PRECISION QUARTZ CRYSTALS

©2002 Rakon Limited



NOTE:

The product has been tested to withstand the Reflow Profile shown. The Reflow Profile used to solder Rakon TCXO is determined by the solder paste manufacturer's specification. It is recommended that the Reflow Profile used does not exceed the one shown in this picture.

TITLE: 7500 SERIES Pb-FREE REFLOW

FILENAME: CAT317

REVISION: A

RELATED DRAWINGS:

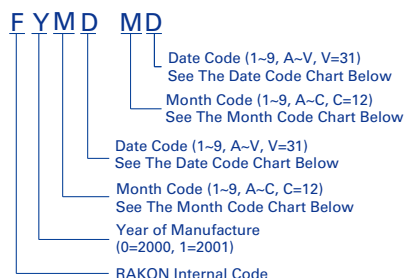
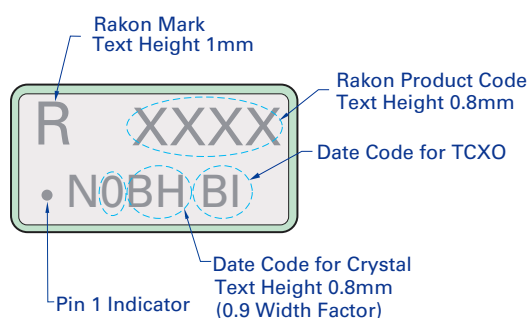
DATE: 03-Mar-05

SCALE: NTS

Millimetres [inch]

RAKON
PRECISION QUARTZ PRODUCTS

©2005 Rakon Limited



M - Month code

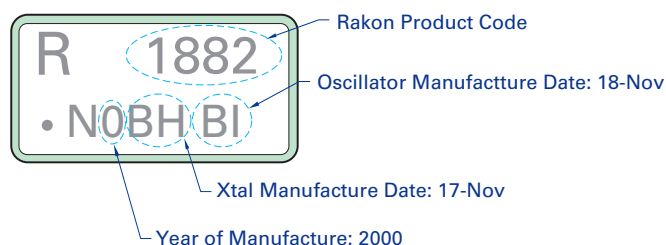
Month	Code
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	A
11	B
12	C

D - Date code

Date	Code	Date	Code	Date	Code
1	1	13	D	25	P
2	2	14	E	26	Q
3	3	15	F	27	R
4	4	16	G	28	S
5	5	17	H	29	T
6	6	18	I	30	U
7	7	19	J	31	V
8	8	20	K		
9	9	21	L		
10	A	22	M		
11	B	23	N		
12	C	24	O		

Note: 1 MUST BE DIFFERENT TO I.

For Example:



TITLE: I(V)T7500 SERIES LID MARKING

FILENAME: CAT188

REVISION: B

RELATED DRAWINGS:

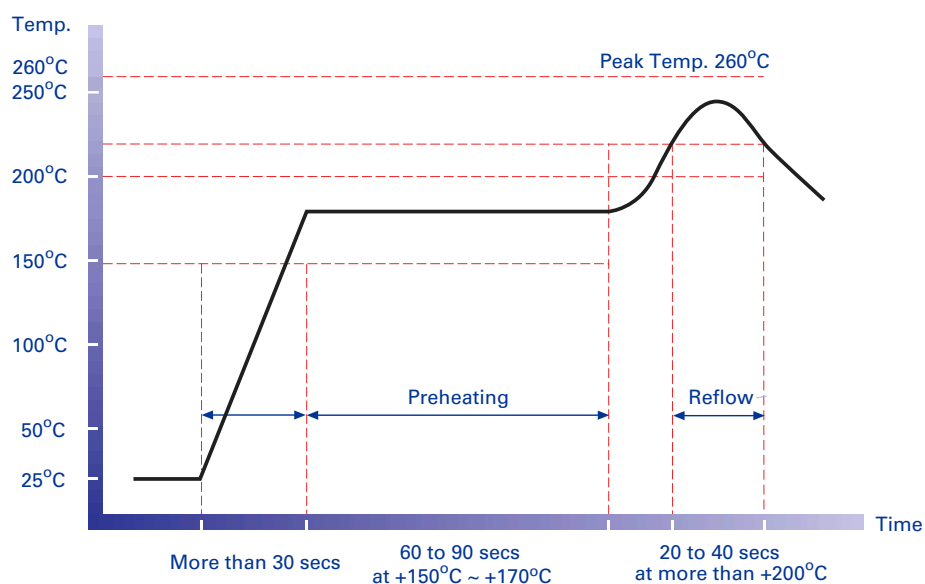
DATE: 11-Sep-02

SCALE: NTS

Millimetres [inch]

RAKON
PRECISION QUARTZ CRYSTALS

©2002 Rakon Limited



TITLE: 100 & 7500 SERIES REFLOW

FILENAME: CAT014

REVISION: G

RELATED DRAWINGS:

DATE: 30-Sep-04

SCALE: NTS

Millimetres [inch]

RAKON
PRECISION QUARTZ PRODUCTS

©2004 Rakon Limited