

SMD Voltage Control Crystal Oscillator

High Performance Low Noise VCXO in 14 x 9 mm Surface Mount Package.

Product description

This high performance VCXO in industry standard 14 x 9 mm packages up to 500 MHz is ideal for the highest performance communications equipment. It is optimized for low close-in phase noise to address the stringent requirements of wireless RF applications and delivers ultra low RMS phase jitter required for high-capacity wireline communications.



Applications

- RRH/RRU and basestations (especially LTE)
- SONET/SDH
- DSL/ADSL
- Communications
- Ethernet
- Wi-Fi
- WiMAX/LTE

Features

- Excellent temperature stability
- Ultra Low Jitter 0.05 to 0.3 ps integrated 12 kHz to 20 MHz
- Wide frequency range
- Close-in Phase Noise optimized for Wireless RF applications
- Cost-effective SMD packages with narrow pads compatible to J-Lead packages
- Low profile 2.6 mm height available

Specifications

1.0 SPECIFICATION REFERENCES

Line	Parameter	Description
1.1	Model Description	RVX1490M VCXO
1.2	RoHS Compliant	Yes
1.3	Reference Number	
1.4	Rakon Part Number	
1.5	Package Type	Type 1 (Standard), or Type 2 (Reduced profile), or Type 3 (Low profile)

2.0 FREQUENCY CHARACTERISTICS

Line	Parameter	Test Condition	Value	Unit
2.1	Frequency		50 to 500	MHz
2.2	Operating Temperature Range		-40 to 85	°C
2.3	Frequency Stability	Including Temperature range, Supply variation, Load variation and 15 years aging at 25°C	±30 to 50	ppm
2.4	Temperature Stability	Over operating temperature range only	±10 to 20	ppm

3.0 POWER SUPPLY

Line	Parameter	Test Condition	Value	Unit
3.1	Supply Voltage (VDD)	With a tolerance of ±10% (not available with all configurations)	3.3	V
3.2	Supply Current		55 to 80	mA

4.0 CONTROL VOLTAGE (VCO)

Line	Parameter	Test Condition	Value	Unit
4.1	Absolute Pull Range (APR)		±50 min	ppm
4.2	Total Pull Range	Frequency shift from minimum to maximum control voltage	100 to 250	ppm
4.3	Control Voltage	Nominal 1.65V	0 to 3.3	V
4.4	Linearity	Control voltage 0.3 to 3V	10 max	%
4.5	Slope	Positive only		
4.6	Modulation BW		15 min	kHz
4.7	Input Impedance		10	MΩ

5.0 OUTPUT CHARACTERISTICS

Line	Parameter	Test Condition	Value	Unit
5.1	Output	LVPECL		
5.2	Output Voltage (Vol)	50Ω nominal load. (VDD - 1.6V) max.		
5.3	Output Voltage (Voh)	50Ω nominal load. (VDD - 1.03V) min.		
5.4	Duty Cycle	@ VDD-1.3V	45 to 55	%
5.5	Output Load	With VDD-2V	50	Ω
5.6	Rise Time/ Fall Time	80%/20%	0.6 max	ns
5.7	RMS Phase Jitter	Typical integrated 12kHz to 20MHz	0.05 to 0.15	ps

6.0 SSB PHASE NOISE

Line	Parameter	Test Condition	Value	Unit
6.1	SSB Phase Noise power density @ 10 Hz offset	Typical value for a 122.88 MHz VCXO @ 25 °C	-70	dBc/Hz
6.2	SSB Phase Noise power density @ 100 Hz offset	Typical value for a 122.88 MHz VCXO @ 25 °C	-100	dBc/Hz
6.3	SSB Phase Noise power density @ 1 kHz offset	Typical value for a 122.88 MHz VCXO @ 25 °C	-127	dBc/Hz
6.4	SSB Phase Noise power density @ 10 kHz offset	Typical value for a 122.88 MHz VCXO @ 25 °C	-145	dBc/Hz
6.5	SSB Phase Noise power density @ 100 kHz offset	Typical value for a 122.88 MHz VCXO @ 25 °C	-155	dBc/Hz
6.6	SSB Phase Noise power density @ 1 MHz offset	Typical value for a 122.88 MHz VCXO @ 25 °C	-157	dBc/Hz

7.0 SSB PHASE NOISE

Line	Parameter	Test Condition	Value	Unit
7.1	SSB Phase Noise power density @ 10 Hz offset	Typical value for a 491.52 MHz VCXO @ 25 °C	-60	dBc/Hz
7.2	SSB Phase Noise power density @ 100 Hz offset	Typical value for a 491.52 MHz VCXO @ 25 °C	-90	dBc/Hz
7.3	SSB Phase Noise power density @ 1 kHz offset	Typical value for a 491.52 MHz VCXO @ 25 °C	-113	dBc/Hz
7.4	SSB Phase Noise power density @ 10 kHz offset	Typical value for a 491.52 MHz VCXO @ 25 °C	-132	dBc/Hz
7.5	SSB Phase Noise power density @ 100 kHz offset	Typical value for a 491.52 MHz VCXO @ 25 °C	-145	dBc/Hz

8.0 ENVIRONMENTAL SPECIFICATION

Line	Parameter	Description
8.1	Mechanical Shock	MIL-STD-883, Method 2002
8.2	Storage Temperature Range	-55 to 125°C
8.3	Humidity	After 48 hours at 85°C±2°C 85% humidity non-condensing
8.4	Thermal Shock	MIL-STD-883, Method 1011
8.5	Vibration	MIL-STD-883, Method 2007

9.0 MANUFACTURING INFORMATION

Line	Parameter	Description
9.1	Packaging Description	Tape and reel. Standard packing quantity is 500 per reel
9.2	Reflow	Solder reflow process as per attached profile

10.0 PIN CONNECTIONS

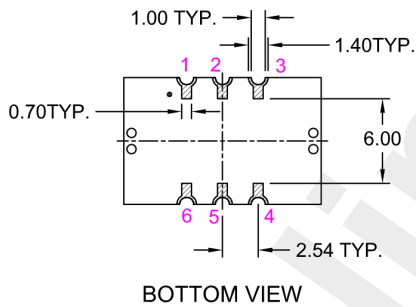
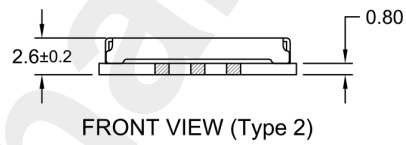
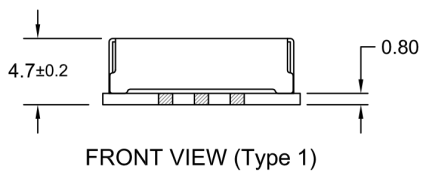
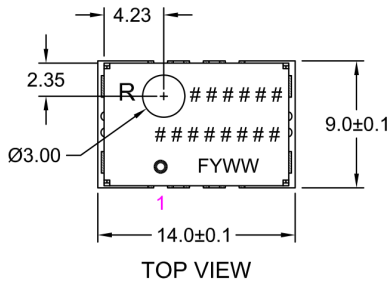
Line	Parameter	Description
10.1	Pin 1	VCO
10.2	Pin 2	E/D* or NC
10.3	Pin 3	GND
10.4	Pin 4	OUTPUT
10.5	Pin 5	COMPLIMENTARY OUTPUT
10.6	Pin 6	VDD
10.7	* Output Enabled	>70% of VDD on E/D pin, or E/D pin left open (connected to internal pull-up resistor)
10.8	* Output Disabled	<30% of VDD on E/D pin, or E/D pin to GND
10.9	* Output Enabled Low	Available upon request

11.0 PRODUCT MARKING

Line	Parameter	Description
11.1	Top Line	[R #####] Part identifier
11.2	Middle Line	[#####] Part information
11.3	Bottom Line	[o FYWW] Pin 1, Manufacturing code, Year code* and Week code**
11.4	* Year Code	A = 2010, B = 2011, C = 2012, D = 2013, ... Z = 2035
11.5	** Week Code	WW = 01 = Week of first Monday of the year

Drawing Name: XO/VCXO 1490M T6 Model Drawing

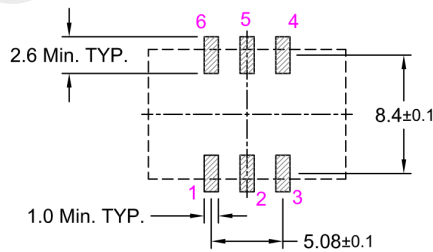
MODEL OUTLINE



NOTE :

1. MARKING INFORMATION IS DETAILED IN THE SPECIFICATION.
2. PIN CONNECTIONS ARE DETAILED IN THE SPECIFICATION

RECOMMENDED PAD LAYOUT - Top View



TITLE: XO/VCXO 1490M T6 MODEL

RELATED DRAWINGS:

FILENAME: CAT664

REVISION: C

DATE: 23-May-13

SCALE: 2 : 1

Millimetres

TOLERANCES:

XX

X.X = ±0.2

X.XX = ±0.10

X.XXX

X°

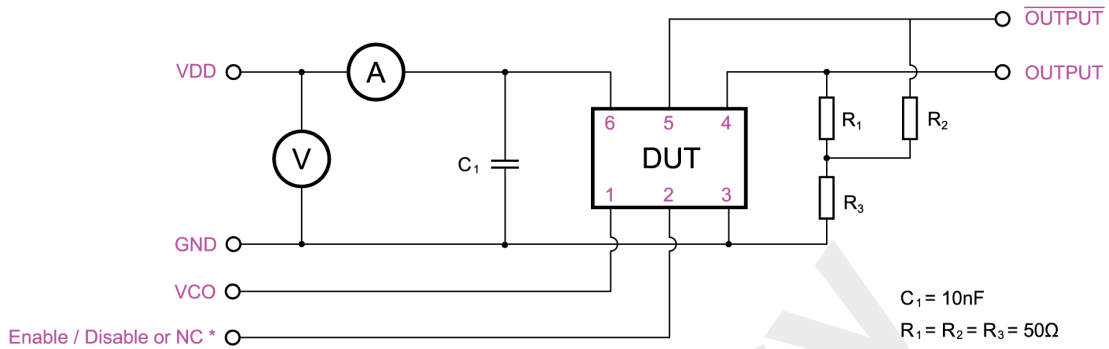
Hole

rakon

© 2013 Rakon Limited

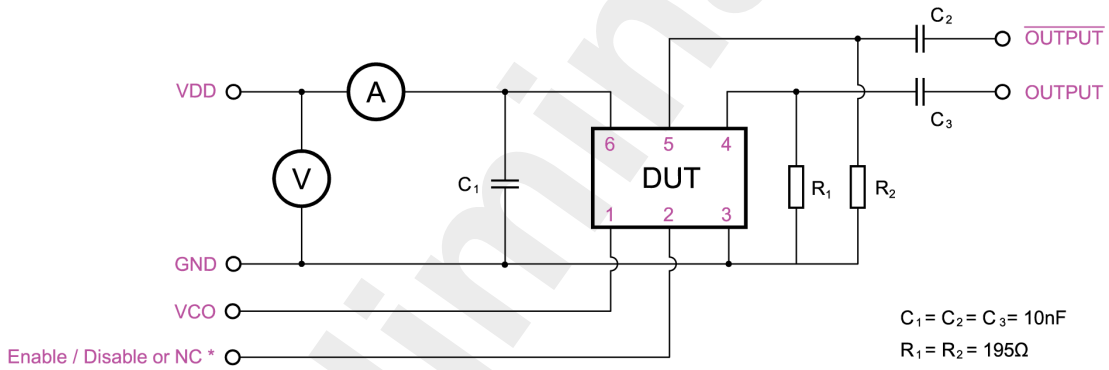
Drawing Name: Rakon 1490 Test Circuit

DC - COUPLING:



NOTE: * Customer to state.

AC - COUPLING:



NOTE: * Customer to state.

TITLE: RAKON 1490 TEST CIRCUIT

FILENAME: CAT285

RELATED DRAWINGS:

REVISION: B

DATE: 18-Sep-12

SCALE: NTS

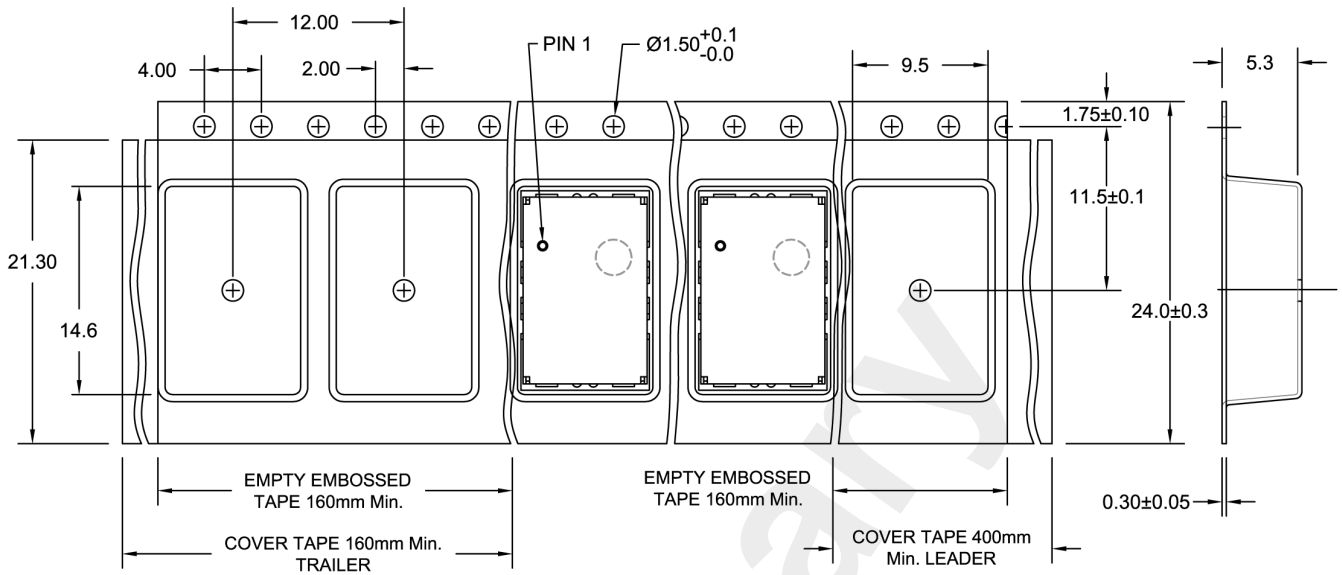
Millimetres

rakon

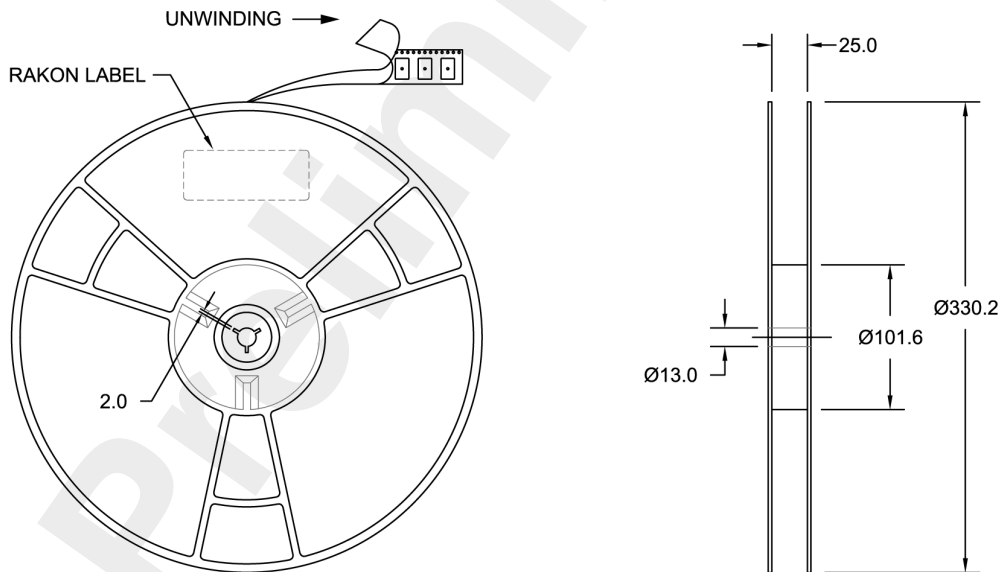
© 2009 Rakon Limited

Drawing Name: 1490M-Hi Series Tape & Reel

TAPE DETAIL (SCALE 2 : 1)



REEL DETAIL (SCALE 1 : 5)



NOTE: 1. $\varnothing 330\text{mm}$ REEL STANDARD PACKING QUANTITY is 500 OSCILLATORS PER REEL.

TITLE: 1490M-HI SERIES TAPE & REEL

FILENAME: CAT582

TOLERANCES:

RELATED DRAWINGS:

REVISION: D

XX =

X.X = ± 0.2

X.XX = ± 0.10

X.XXX = ± 0.05

X° =

Hole =

PRELIMINARY

DATE: 20-Dec-11

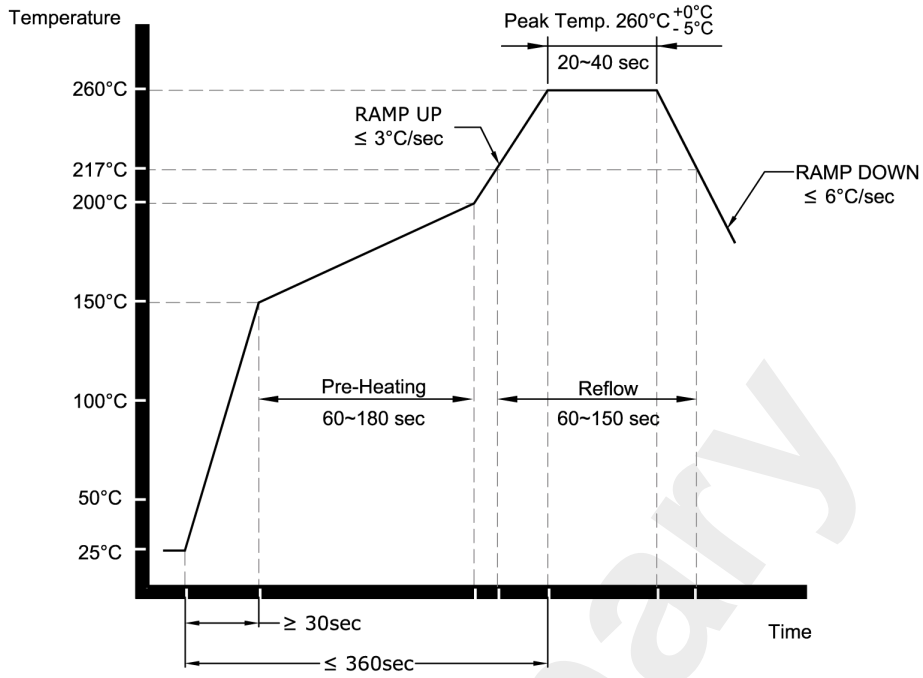
SCALE: 2 : 1

Millimetres

rakon

© 2009 Rakon Limited

Drawing Name: Pb-Free Reflow



NOTE:

The product has been tested to withstand the Reflow Profile shown. The Reflow Profile used to solder Rakon products is determined by the solder paste Manufacturer's specification. It is recommended that the Reflow Profile used does not exceed the one shown above.

TITLE: Pb-FREE REFLOW

RELATED DRAWINGS:

FILENAME: CAT541

REVISION: B

DATE: 05-Sep-11

SCALE: NTS

Millimetres

rakon

© 2009 Rakon Limited