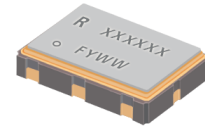


SMD Selectable Frequency Voltage Controlled Crystal Oscillator

High Performance VCXO in a 7 x 5 mm Surface Mount package with selectable output frequency



Product description

The RCV7050P selectable VCXO combines low RMS phase jitter and low power with the ability to select the output frequency from up to four factory-configured frequencies by controlling two Frequency Select (FS) pins (e.g. 122.88 or 153.6 MHz). This enables reductions in part count and built-in upgrade paths to increase design flexibility and reduce costs.

Applications

- Base stations
- Consumer
- Communications
- DSL/ADSL
- Ethernet
- Wi-Fi
- WiMAX/W-LAN

Features

- Selectable output frequencies (Up to 4)
- Low power differential outputs
- <1ps integrated RMS phase jitter (12 kHz to 20 MHz)
- Wide frequency range
- CMOS, LVPECL, LVDS, or HCSL output options
- Fast sample turnaround

Specifications

1.0 SPECIFICATION REFERENCES

Line	Parameter	Description
1.1	Model Description	RCV7050P VCXO
1.2	Reference Number	
1.3	Rakon Part Number	

2.0 FREQUENCY CHARACTERISTICS

Line	Parameter	Test Condition	Value	Unit
2.1	Frequency 1	FS1 = 0, FS2 = 0. See pin connections for details	8 to 1500	MHz
2.2	Frequency 2	FS1 = 1, FS2 = 0. See pin connections for details	8 to 1500	MHz
2.3	Frequency 3	FS1 = 0, FS2 = 1. See pin connections for details	8 to 1500	MHz
2.4	Frequency 4	FS1 = 1, FS2 = 1. See pin connections for details	8 to 1500	MHz
2.5	Output Switching Time		0.1 max	ms
2.6	Operating Temperature Range		-40 to 85	°C
2.7	Frequency Stability	Including Temperature range, Supply variation, Load variation and 10 years aging at 25°C	±25 to 50	ppm
2.8	Temperature Stability	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 $\pm 10\%$	3.3	V
3.2	Supply Voltage (VDD)	With a tolerance of $\pm 5\%$	2.5	V
3.3	Supply Current	For LVCMOS	30 max	mA
3.4	Supply Current	For LVPECL	65 max	mA
3.5	Supply Current	For LVDS	40 max	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	50 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	Control voltage 0.3 to 3V	10 min	kHz
4.7	Input Impedance		1 min	M Ω

5.0 OUTPUT CHARACTERISTICS - LVCMOS (UP TO 200 MHz)

Line	Parameter	Test Condition	Value	Unit
5.1	Output Voltage (Vol)	15pF load	10 max	%VDD
5.2	Output Voltage (Voh)	15pF load	90 min	%VDD
5.3	Duty Cycle	@ 50% VDD	48 to 52	%
5.4	Rise Time / Fall Time	90%/10%	3 max	ns
5.5	RMS Phase Jitter	Integrated 12kHz to 20MHz	0.4 to 1	ps

6.0 OUTPUT CHARACTERISTICS - LVPECL ONLY

Line	Parameter	Test Condition	Value	Unit
6.1	Output Voltage (Vol)	50 Ω nominal load. (VDD - 1.6V) max.		
6.2	Output Voltage (Voh)	50 Ω nominal load. (VDD - 1.03V) min.		
6.3	Duty Cycle	@ VDD-1.3V (45 to 55% over 600MHz)	48 to 52	%
6.4	Rise Time / Fall Time	80%/20%	0.6 max	ns
6.5	RMS Phase Jitter	Integrated 12kHz to 20MHz	0.4 to 1	ps

7.0 OUTPUT CHARACTERISTICS - LVDS ONLY

Line	Parameter	Test Condition	Value	Unit
7.1	Differential Output: Voltage Swing (Vod)		350	mV
7.2	Duty Cycle	Measured at 1.25V (45 to 55% over 150MHz)	48 to 52	%
7.3	Rise Time / Fall Time	RL = 100 Ω / CL = 10 pF	0.6 max	ns
7.6	RMS Phase Jitter	Integrated 12kHz to 20MHz	0.4 to 1	ps

8.0 SSB PHASE NOISE

Line	Parameter	Test Condition	Value	Unit
8.1	SSB Phase Noise Power Density @ 10 Hz Offset	Typical value for a 77.76 MHz VCXO @ 25 °C	-68	dBc/Hz
8.2	SSB Phase Noise Power Density @ 100 Hz Offset	Typical value for a 77.76 MHz VCXO @ 25 °C	-95	dBc/Hz
8.3	SSB Phase Noise Power Density @ 1 kHz Offset	Typical value for a 77.76 MHz VCXO @ 25 °C	-120	dBc/Hz
8.4	SSB Phase Noise Power Density @ 10 kHz Offset	Typical value for a 77.76 MHz VCXO @ 25 °C	-125	dBc/Hz
8.5	SSB Phase Noise Power Density @ 100 kHz Offset	Typical value for a 77.76 MHz VCXO @ 25 °C	-128	dBc/Hz

9.0 SSB PHASE NOISE

Line	Parameter	Test Condition	Value	Unit
9.1	SSB Phase Noise Power Density @ 10 Hz Offset	Typical value for a 155.52 MHz VCXO @ 25°C	-62	dBc/Hz
9.2	SSB Phase Noise Power Density @ 100 Hz Offset	Typical value for a 155.52 MHz VCXO @ 25°C	-90	dBc/Hz
9.3	SSB Phase Noise Power Density @ 1 kHz Offset	Typical value for a 155.52 MHz VCXO @ 25°C	-112	dBc/Hz
9.4	SSB Phase Noise Power Density @ 10 kHz Offset	Typical value for a 155.52 MHz VCXO @ 25°C	-118	dBc/Hz
9.5	SSB Phase Noise Power Density @ 100 kHz Offset	Typical value for a 155.52 MHz VCXO @ 25°C	-120	dBc/Hz

10.0 SSB PHASE NOISE

Line	Parameter	Test Condition	Value	Unit
10.1	SSB Phase Noise Power Density @ 10 Hz Offset	Typical value for a 622.08 MHz VCXO @ 25°C	-48	dBc/Hz
10.2	SSB Phase Noise Power Density @ 100 Hz Offset	Typical value for a 622.08 MHz VCXO @ 25°C	-78	dBc/Hz
10.3	SSB Phase Noise Power Density @ 1 kHz Offset	Typical value for a 622.08 MHz VCXO @ 25°C	-101	dBc/Hz
10.4	SSB Phase Noise Power Density @ 10 kHz Offset	Typical value for a 622.08 MHz VCXO @ 25°C	-107	dBc/Hz
10.5	SSB Phase Noise Power Density @ 100 kHz Offset	Typical value for a 622.08 MHz VCXO @ 25°C	-108	dBc/Hz

11.0 PIN CONNECTIONS

Line	Parameter	Description
11.1	Pin 1	VCO
11.2	Pin 2	FS1*, or E/D** or NC
11.3	Pin 3	GND
11.4	Pin 4	OUTPUT
11.5	Pin 5	COMPLIMENTARY OUTPUT (LVPECL/LVDS only), or E/D**, or NC
11.6	Pin 6	VDD
11.7	Pin 7 (Package Q)	FS1* or NC
11.8	Pin 8 (Package Q)	FS2* or NC
11.9	* FS1, FS2	0 =<30% of VDD or GND, 1 = >70% VDD
11.10	** Output Enabled	>70% of VDD on E/D pin, or E/D pin left open (Internal pull-up resistor)
11.11	** Output Disabled	<30% of VDD on E/D pin, or E/D pin to GND

12.0 PACKAGE DETAILS

Line	Parameter	Description
12.1	Package	Package B (6 pin) or Package Q (8 pin)
12.2	Top line	[R #####] Part identifier
12.3	Bottom line	[o FYWW] Pin 1, Manufacturing code, Year code* and Week code**
12.4	* Year code	A = 2010, B = 2011, C = 2012, D = 2013, ... Z = 2035
12.5	** Week Code	WW = 01 = Week of first Monday of the year

13.0 ENVIRONMENTAL SPECIFICATION

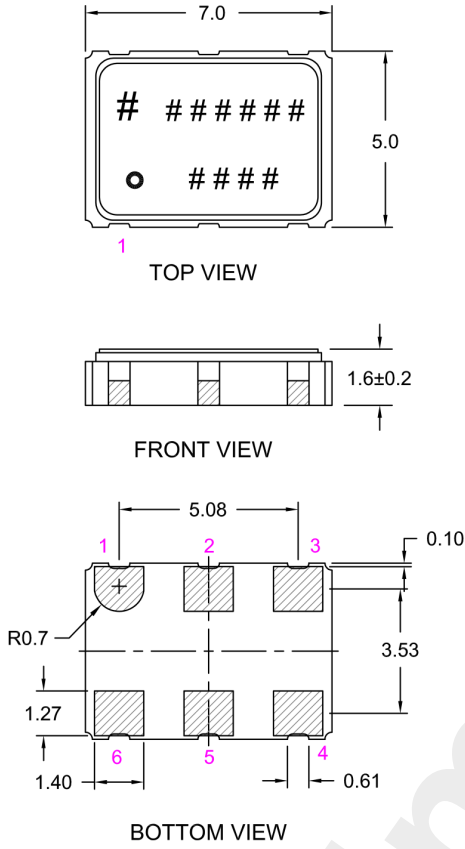
Line	Parameter	Description
13.1	Mechanical Shock	MIL-STD-883, Method 2002
13.2	Storage Temperature Range	-55 to 125 °C
13.3	Humidity	After 48 hours at 85 °C±2 °C 85 % relative humidity non-condensing
13.4	Thermal Shock	MIL-STD-883, Method 1011
13.5	Vibration	MIL-STD-883, Method 2007
13.6	Gross and Fine Leak	MIL-STD-883, Method 1014
13.7	RoHS Compliant	Yes

14.0 MANUFACTURING INFORMATION

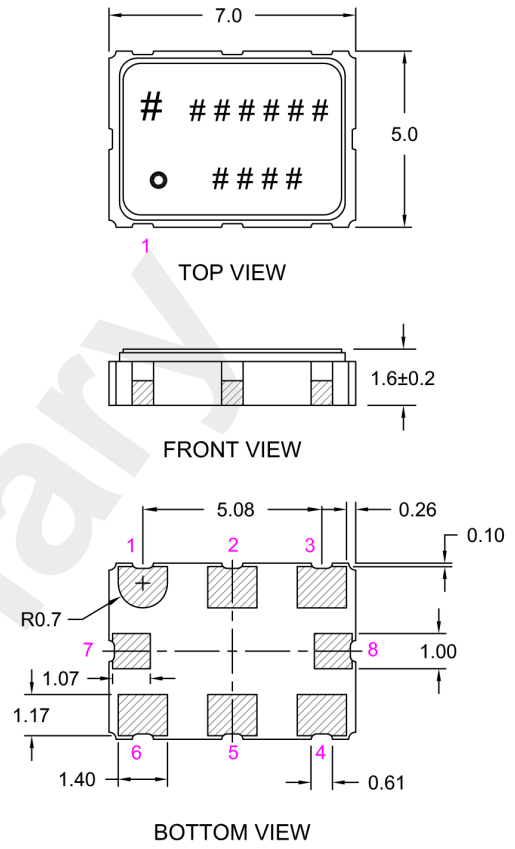
Line	Parameter	Description
14.1	Packaging Description	Tape and Reel. Standard packing quantity is 2000 per reel
14.2	Reflow	Solder reflow process as per attached profile

Drawing Name: XO/VCXO 7050 Selectable Frequency

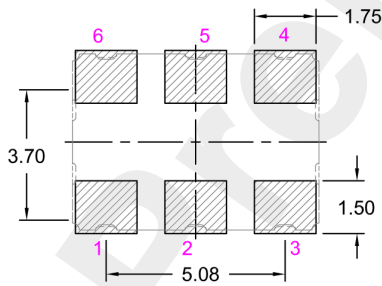
PACKAGE B



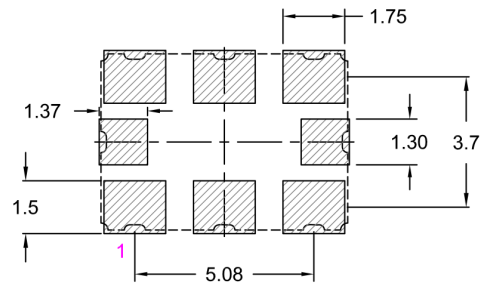
PACKAGE Q



RECOMMENDED PAD LAYOUT - TOP VIEW (6 Pin)



RECOMMENDED PAD LAYOUT - TOP VIEW (8 Pin)



NOTE:

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

TITLE: XO/VCXO 7050 Selectable Frequency Model

RELATED DRAWINGS:

FILENAME: CAT641

REVISION: C

DATE: 12-Apr-13

SCALE: 5 : 1

Millimetres

TOLERANCES:

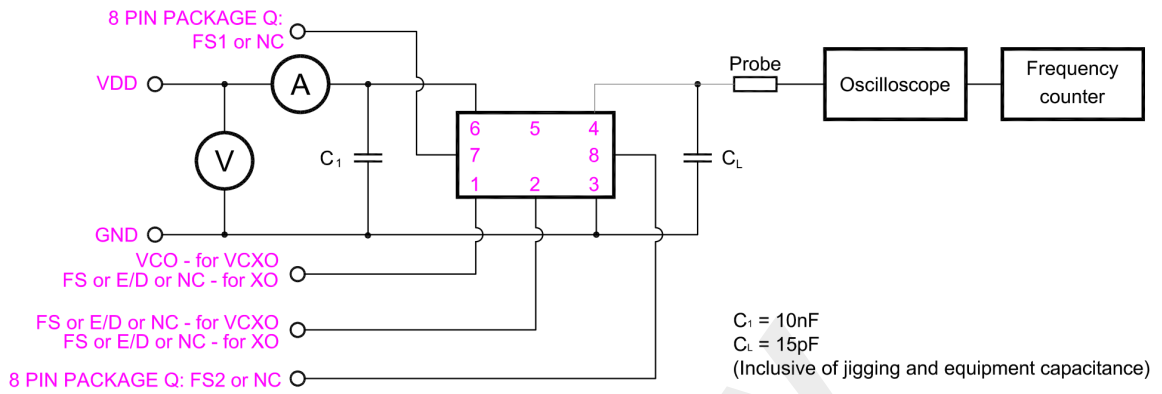
XX =
 X.X = ±0.15
 X.XX = ±0.10
 X.XXX =
 X° =
 Hole =

rakon

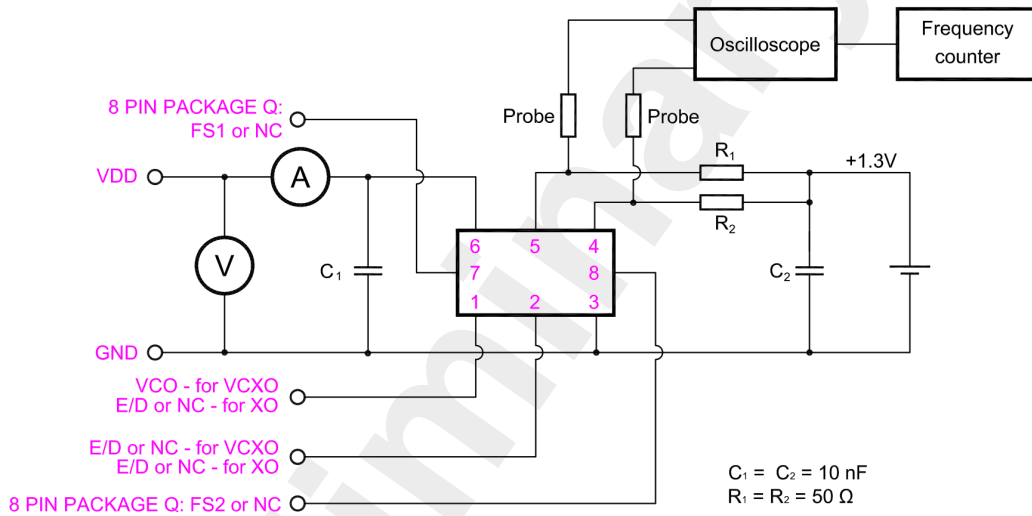
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Drawing Name: XO/VCXO 7050 Selectable Frequency Test Circuit

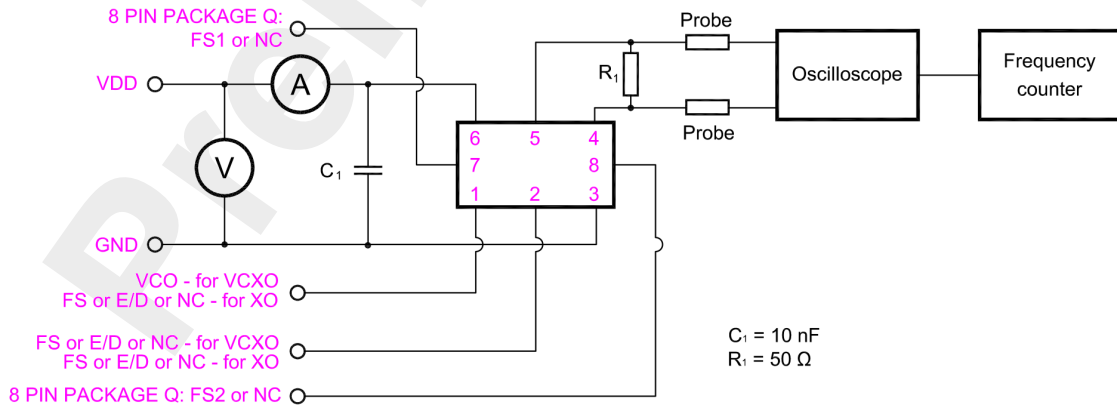
LVCMOS:



LVPECL:



LVDS:



TITLE: XO/VCXO 7050 Selectable Frequency Test Circuit

FILENAME: CAT643

RELATED DRAWINGS:

REVISION: B

DATE: 12-Apr-13

SCALE: NTS

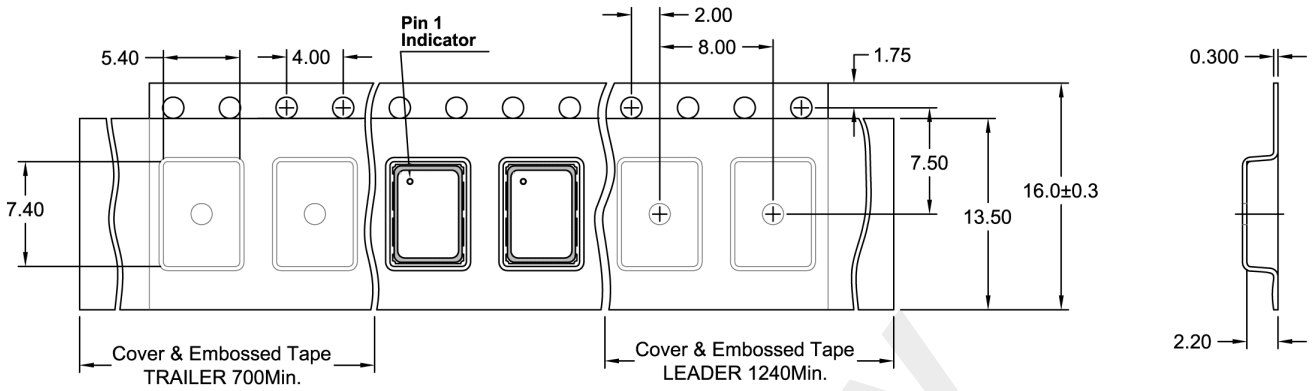
Millimetres

rakon

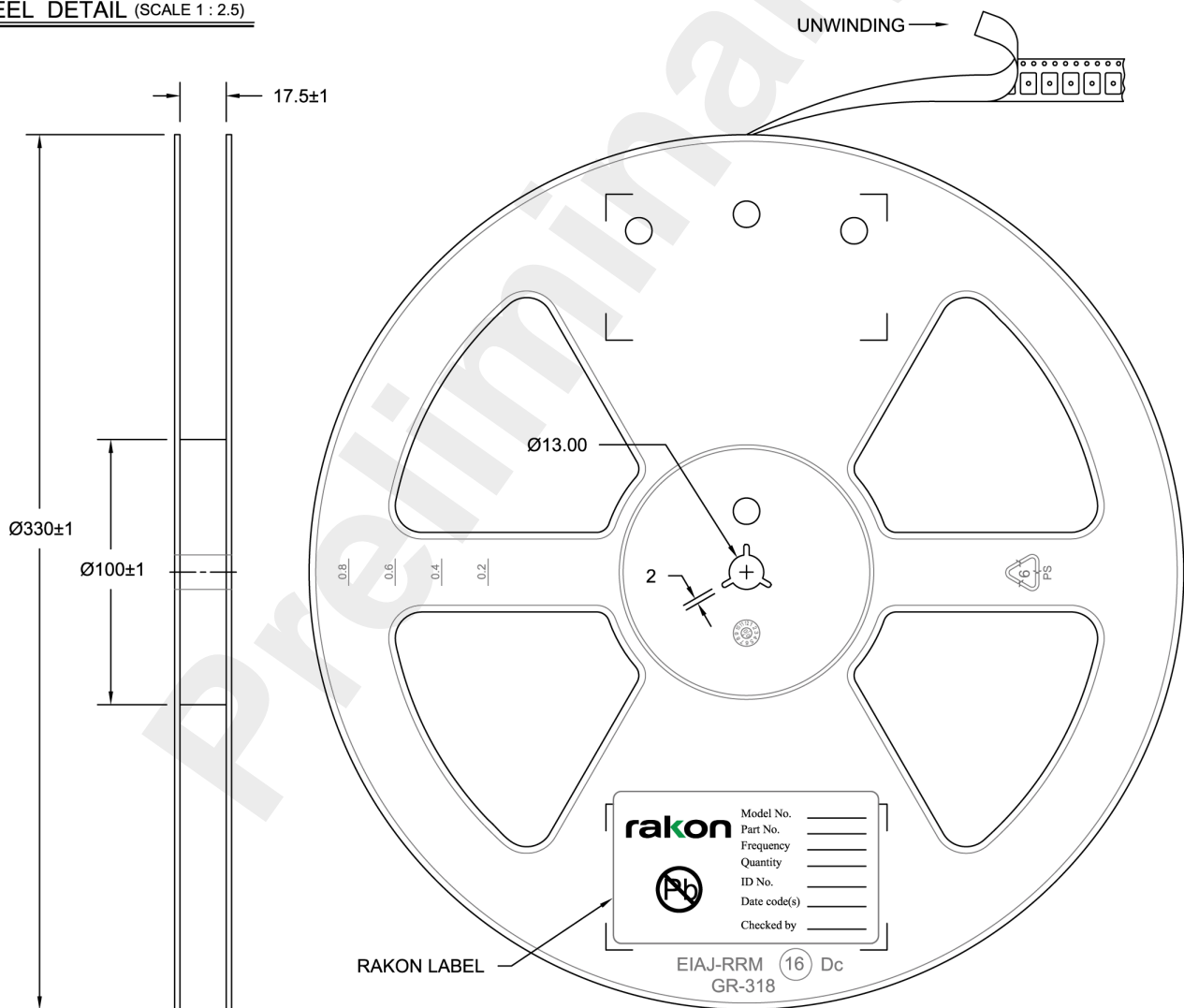
© 2013 Rakon Limited

Drawing Name: XO/VCXO 7050 Series Tape & Reel

TAPE DETAIL (SCALE 2 : 1)



REEL DETAIL (SCALE 1 : 2.5)



TITLE: XO/VCXO 7050 SERIES TAPE & REEL

RELATED DRAWINGS:

FILENAME: CAT032

REVISION: D

DATE: 05-Sep-11

SCALE: 2 : 1

Millimetres

TOLERANCES:

XX = ±0.5

X.X = ±0.2

X.XX = ±0.10

X.XXX = ±0.05

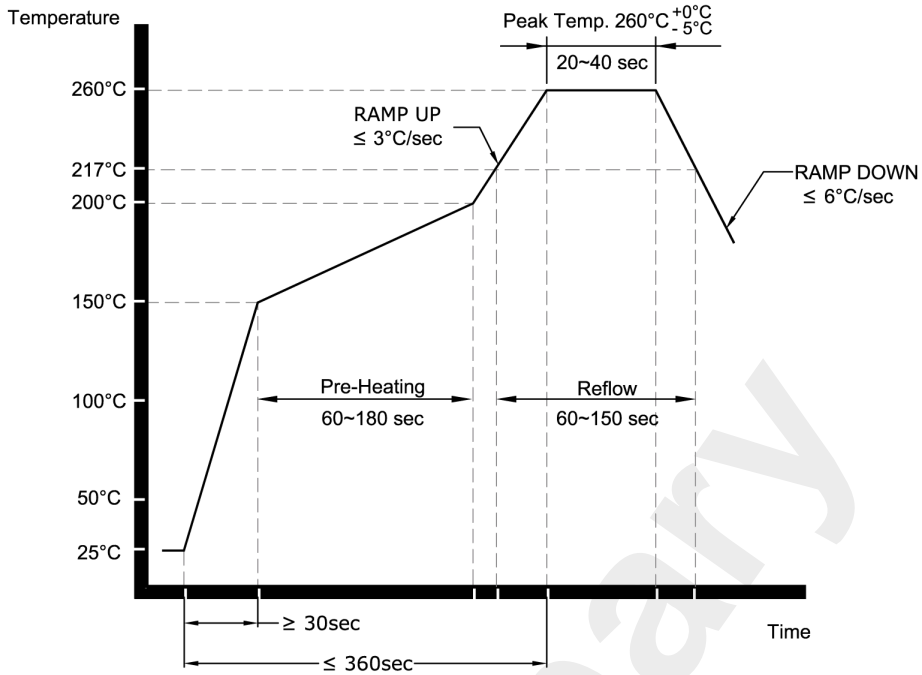
X° =

Hole =

rakon

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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

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