

## Specifications

### 1.0 SPECIFICATION REFERENCES

Line	Parameter	Description
1.1	Model description	RTX5032A 12.800 MHz
1.2	RoHS compliant	Yes
1.3	Filter	Enabled
1.4	Reference number	RTX5032A-56
1.5	Rakon part number	509237
1.6	Current Version	1.01

### 2.0 FREQUENCY CHARACTERISTICS

Line	Parameter	Test Condition	Value	Unit
2.1	Frequency	Nominal frequency	12.800	MHz
2.2	Frequency calibration	Offset from nominal frequency measured at 25°C ± 2°C	±1 max	ppm
2.3	Reflow shift	Two consecutive reflows as per attached profile after 1 hour recovery at 25°C	±1 max	ppm
2.4	Frequency stability over temperature	Referenced to the midpoint between minimum and maximum frequency value over the specified temperature range (Note 1, 2)	±0.28 max	ppm
2.5	Temperature range	The operating temperature range over which the frequency stability is measured	-40 to 85	°C
2.6	Frequency slope	Minimum of 1 frequency reading every 2°C, over the operating temperature range (Note 1, 2)	0.1 max	ppm/°C
2.7	Static temperature hysteresis	Frequency change after reciprocal temperature ramped over the operating range. Frequency measured before and after at 25°C	0.4 max	ppm
2.8	Supply voltage stability	Supply voltage varied ±5% at 25°C	±0.1 max	ppm
2.9	Load sensitivity	±10% load change (Note 3)	±0.2 max	ppm
2.10	Long term stability	Frequency drift over 1 year at 25°C	±1 max	ppm
2.11	Overall stability	For all causes including: calibration, temperature, supply voltage, load, reflow soldering and 20 years aging	±4.6 max	ppm
2.12	Holdover stability	24 hours drift at constant temperature (Telcordia GR-1244-CORE)	±40 max	ppb

### 3.0 POWER SUPPLY

Line	Parameter	Test Condition	Value	Unit
3.1	Supply voltage	Nominal supply voltage 3.3V	3.14 to 3.46	V
3.2	Current	At maximum supply voltage (Note 3)	2.5 max	mA

### 4.0 OSCILLATOR OUTPUT - CMOS OPTION

Line	Parameter	Test Condition	Value	Unit
4.1	Output waveform	HCMOS		
4.2	Output voltage level low	Measured with a capacitive load of 10pF	10 max	%Vcc
4.3	Output voltage level high	Measured with a capacitive load of 10pF	90 min	%Vcc
4.4	Rise and fall times	Measured with a capacitive load of 10pF	5 max	ns
4.5	Duty cycle	Measured at 50% Vcc trigger level	45 to 55	%
4.6	Output load		10 max	pF
4.7	Settling time (frequency)	Time taken for frequency to reach specified calibration tolerance	50 max	ms

## 5.0 SSB PHASE NOISE

Line	Parameter	Test Condition	Value	Unit
5.1	SSB phase noise power density at 1Hz offset	Typical value for a 12.8MHz Oscillator with 10nF external filter capacitor at 25°C. CMOS output	-70	dBc/Hz
5.2	SSB phase noise power density at 10Hz offset	Typical value for a 12.8MHz Oscillator with 10nF external filter capacitor at 25°C. CMOS output	-100	dBc/Hz
5.3	SSB phase noise power density at 100Hz offset	Typical value for a 12.8MHz Oscillator with 10nF external filter capacitor at 25°C. CMOS output	-125	dBc/Hz
5.4	SSB phase noise power density at 1kHz offset	Typical value for a 12.8MHz Oscillator with 10nF external filter capacitor at 25°C. CMOS output	-147	dBc/Hz
5.5	SSB phase noise power density at 10kHz offset	Typical value for a 12.8MHz Oscillator with 10nF external filter capacitor at 25°C. CMOS output	-152	dBc/Hz
5.6	SSB phase noise power density at 100kHz offset	Typical value for a 12.8MHz Oscillator with 10nF external filter capacitor at 25°C. CMOS output	-155	dBc/Hz
5.7	SSB phase noise power density at 1MHz offset	Typical value for a 12.8MHz Oscillator with 10nF external filter capacitor at 25°C. CMOS output	-155	dBc/Hz

## 6.0 ENVIRONMENTAL

Line	Parameter	Description
6.1	Shock	Half sine wave acceleration of 100G peak amplitude for 6ms duration, 3 cycles each plane. IEC 60068-2-27.
6.2	Humidity	After 48 hours at 85°C ± 2°C 85% relative humidity non-condensing (Note 7).
6.3	Thermal shock	Exposed at -40°C for 30 minutes then to 85°C for 30 minutes constantly for a period of 5 days (Note 7).
6.4	Vibration	10G RMS from 30Hz to 1500Hz random in each of the 3 axis for 4 hours, total 12 hours (Note 7).
6.5	Storage temperature	-40 to 85°C.

## 7.0 MARKING

Line	Parameter	Description
7.1	Type	Engraved.
7.2	Line 1	R and product code.
7.3	Line 2	Pin 1 and date code.

## 8.0 MANUFACTURING INFORMATION

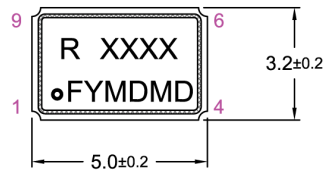
Line	Parameter	Description
8.1	Reflow	Solder reflow processes as per attached profile.
8.2	Packaging description	Tape and reel. Standard packing quantity is 2000 units per reel

## 9.0 SPECIFICATION NOTES

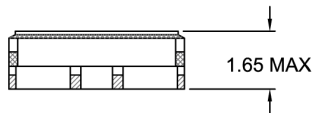
Line	Parameter	Description
9.1	Note 1	Temperature varied at maximum of 1°C per minute. Control voltage held at midpoint.
9.2	Note 2	Parts should be shielded from drafts causing unexpected thermal gradients. Temperature changes due to ambient air currents on the oscillator can lead to short term frequency drift.
9.3	Note 3	Specified for load stated in oscillator output section.
9.4	Note 4	VCO of 4.5V only applicable when Vcc of 5.0V is applied.
9.5	Note 5	For AC coupling, an external capacitor (greater or equal 1nF) is required.
9.6	Note 6	Specification assumes that no phase noise filtering. If low phase noise is required, frequency settling time will be extended. Full details are available from your Rakon sales office.
9.7	Note 7	The environmental condition will cause less than 1ppm shift in frequency measured at 25°C.

# Drawing Name: RTX5032A Model Drawing

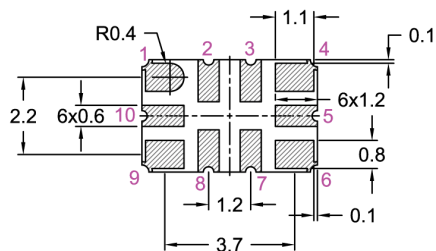
## MODEL DRAWING



FRONT VIEW

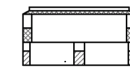
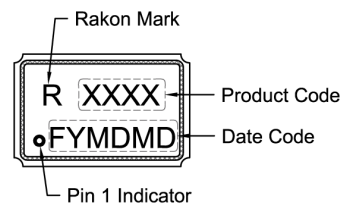


SIDE VIEW



BOTTOM VIEW

## MARKING EXAMPLE

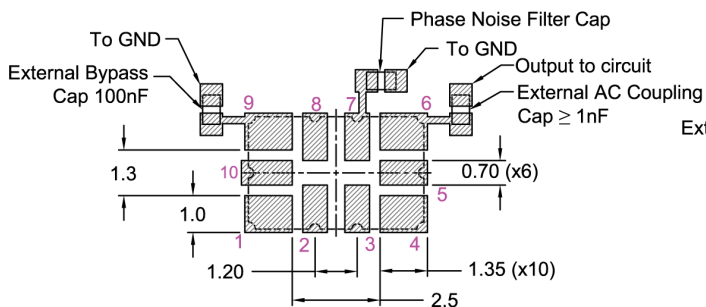


END VIEW

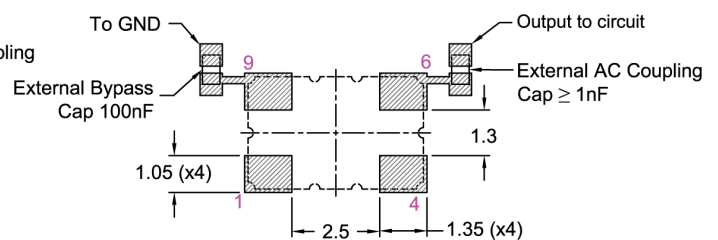
## PIN CONNECTIONS

Without VC		With VC	
Filter Enabled	Filter Disabled	Filter Enabled	Filter Disabled
1 NC	1 NC	1 VCO	1 VCO
2 NC	4 GND	2 NC	4 GND
3 NC	6 RF OUT	3 NC	6 RF OUT
4 GND	9 VCC	4 GND	9 VCC
5 NC		5 NC	
6 RF OUT		6 RF OUT	
7 VC FILTER		7 VC FILTER	
8 NC		8 NC	
9 VCC		9 VCC	
10 NC		10 NC	

## RECOMMENDED PAD LAYOUT - FILTER ENABLED



## RECOMMENDED PAD LAYOUT - FILTER DISABLED



TITLE: RTX5032A MODEL

RELATED DRAWINGS:

FILENAME: CAT569

REVISION: B

DATE: 22-Aug-11

SCALE: 5 : 1

Millimetres

TOLERANCES:

XX =

X.X =  $\pm 0.2$

X.XX =  $\pm 0.13$

X.XXX =

X° =

Hole =

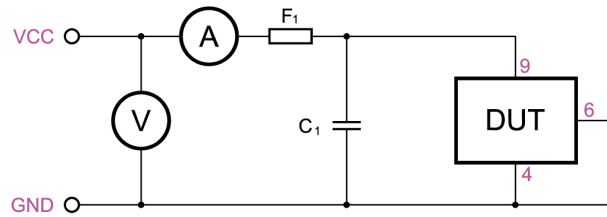
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## Drawing Name: RTX5032 Series Test Circuit

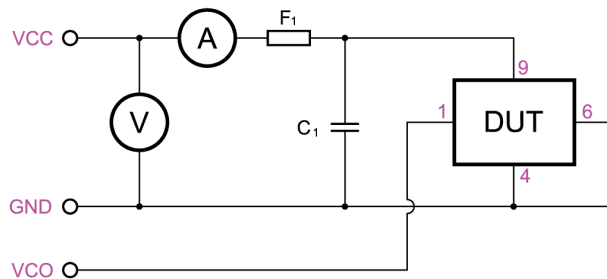
### NO VOLTAGE CONTROL INPUT:

C1: 100nF.  
F1: A ferrite bead or a resistor between  
22Ω ~ 47Ω recommended.



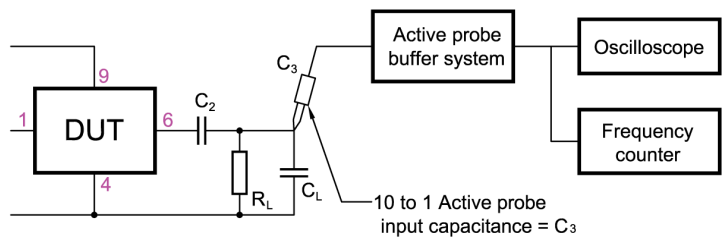
### VOLTAGE CONTROL INPUT:

C1: 100nF.  
F1: A ferrite bead or a resistor between  
22Ω ~ 47Ω recommended.



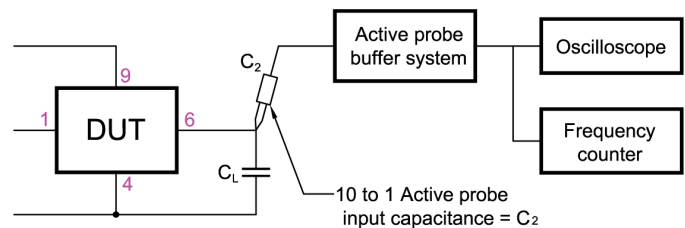
### CLIPPED SINEWAVE OUTPUT:

C2: ≥1nF  
RL: 10k  
CT: CL + C3 (C3 - Oscilloscope probe capacitance)  
CT as stated in OSCILLATOR OUTPUT section



### CMOS OUTPUT:

CT: CL + C2 (C2 - Oscilloscope probe capacitance)  
CT as stated in OSCILLATOR OUTPUT section



TITLE: RTX5032 SERIES TEST CIRCUIT

RELATED DRAWINGS:

FILENAME: CAT571

REVISION: A

DATE: 02-Dec-10

SCALE: NTS

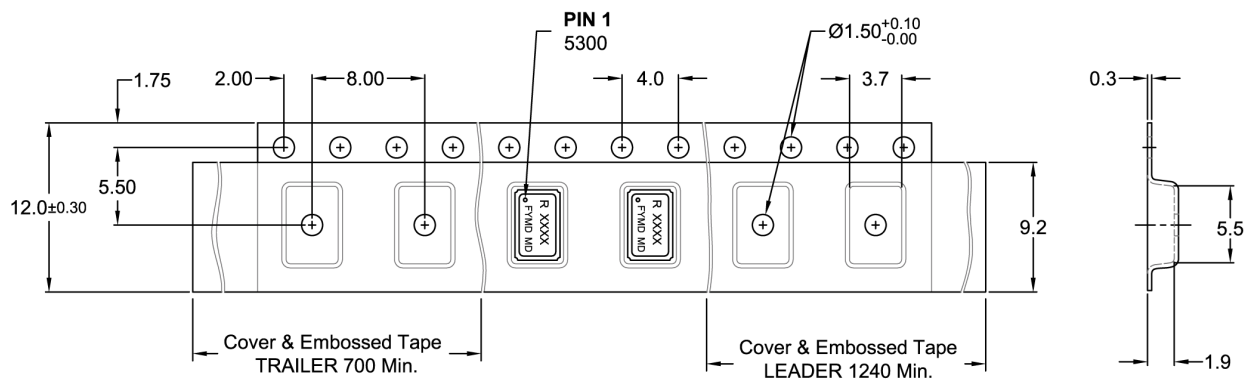
Millimetres

**rakon**

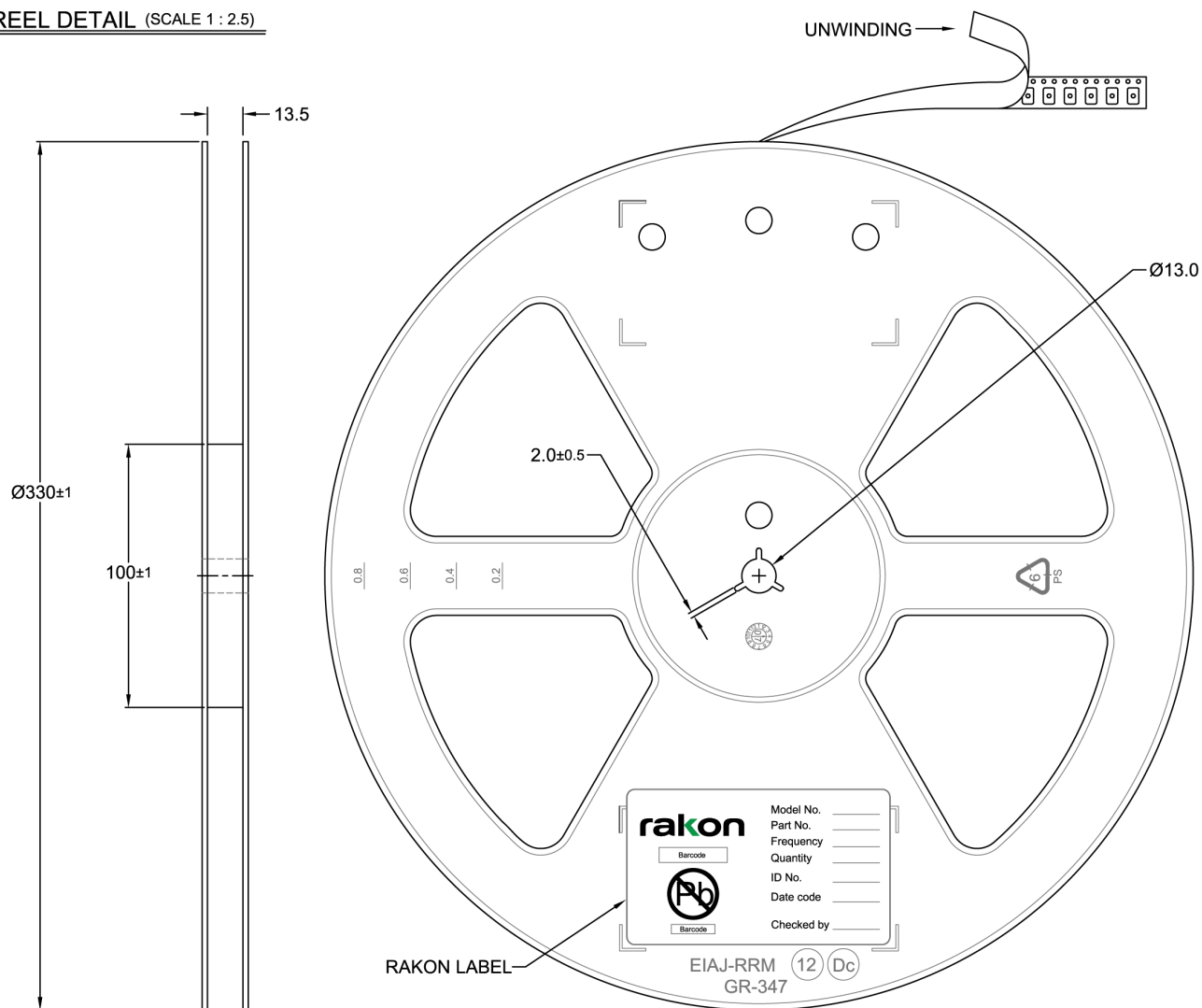
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**Drawing Name: I(V)T5300 Series Tape & Reel**

TAPE DETAIL (SCALE 2 : 1)



### REEL DETAIL (SCALE 1 : 2.5)



TITLE: 5032 SERIES TAPE REEL

RELATED DRAWINGS:

FILENAME: CAT449

REVISION: F

DATE: 22-Aug-11

SCALE: 2 : 1

Millimetres

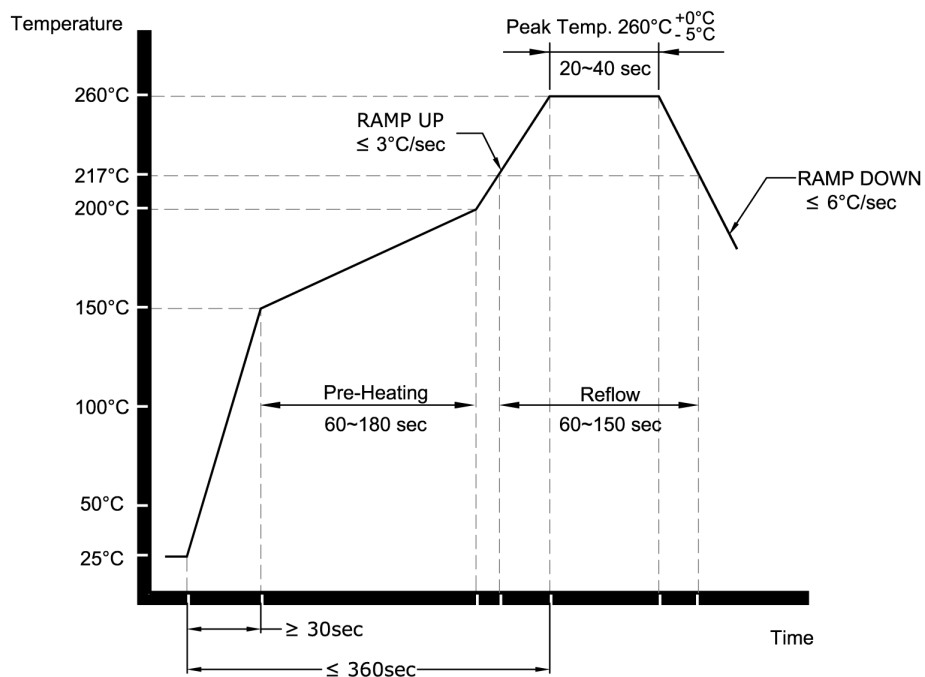
TOLERANCES:

XX	=
X.X	= $\pm 0.1$
X.XX	= $\pm 0.05$
X.XXX	=
X°	=
Hole	=

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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

FILENAME: CAT541

RELATED DRAWINGS:

REVISION: B

DATE: 05-Sep-11

SCALE: NTS

Millimetres

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# Specification History

Current Version : 1.01

Version	User	Change	Note	Date
1.0	System	Specification Created		2011-10-21 10:51
1.01	andrew.daken	<ul style="list-style-type: none"><li>• Changed max value in line 2.6 from '0.05' to '0.1'</li><li>• Changed max value in line 4.5 from '60' to '55'</li><li>• Changed min value in line 4.5 from '40' to '45'</li><li>• Changed max value in line 5.1 from '-67' to '-70'</li><li>• Changed max value in line 5.2 from '-97' to '-100'</li><li>• Changed max value in line 5.3 from '-120' to '-125'</li><li>• Changed max value in line 5.4 from '-141' to '-147'</li><li>• Changed max value in line 5.5 from '-155' to '-152'</li></ul>	Update frequency slope and duty cycle to match the RTX7050A version. Updated phase noise values	2012-07-19 11:56