

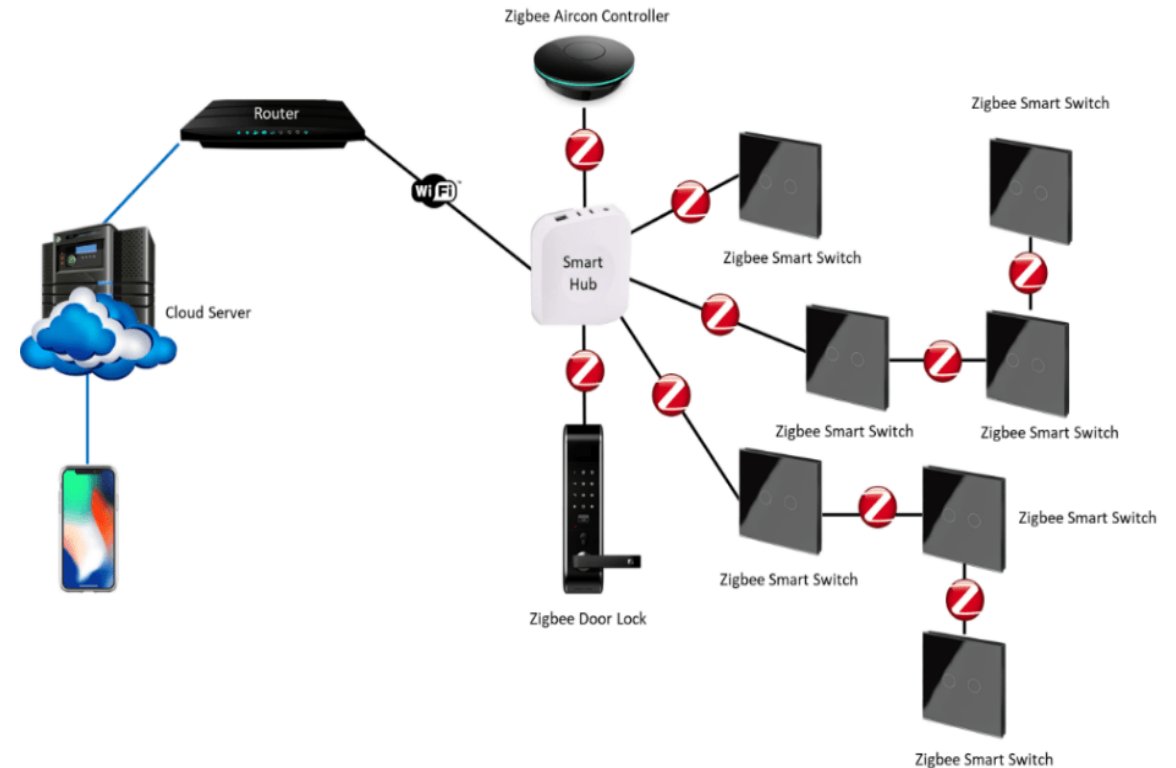
**Raltron Frequency
Components
for
ZigBee Applications**



What is ZigBee ?

- ZigBee is a wireless technology using the 2.4 GHz ISM frequency band
- Technological Standard Created for control and sensor networks
- Based on the IEEE 802.15.4 standard created by the ZigBee Alliance
- Philips, Intel, Amazon, Comcast, Honeywell, etc. are all members of the alliance
- Designed for low power consumption allowing extremely long battery life
- ZigBee enables completely networked homes where all devices can communicate and be controlled by a single unit
- Zigbee provides network security and application support services

Zigbee Mesh Topology



Source: <https://koble.sg/4-reasons-why-a-zigbee-home-automation-system-is-better-than-a-wi-fi-smart-home-system/>

ZigBee & IEEE 802.15.4

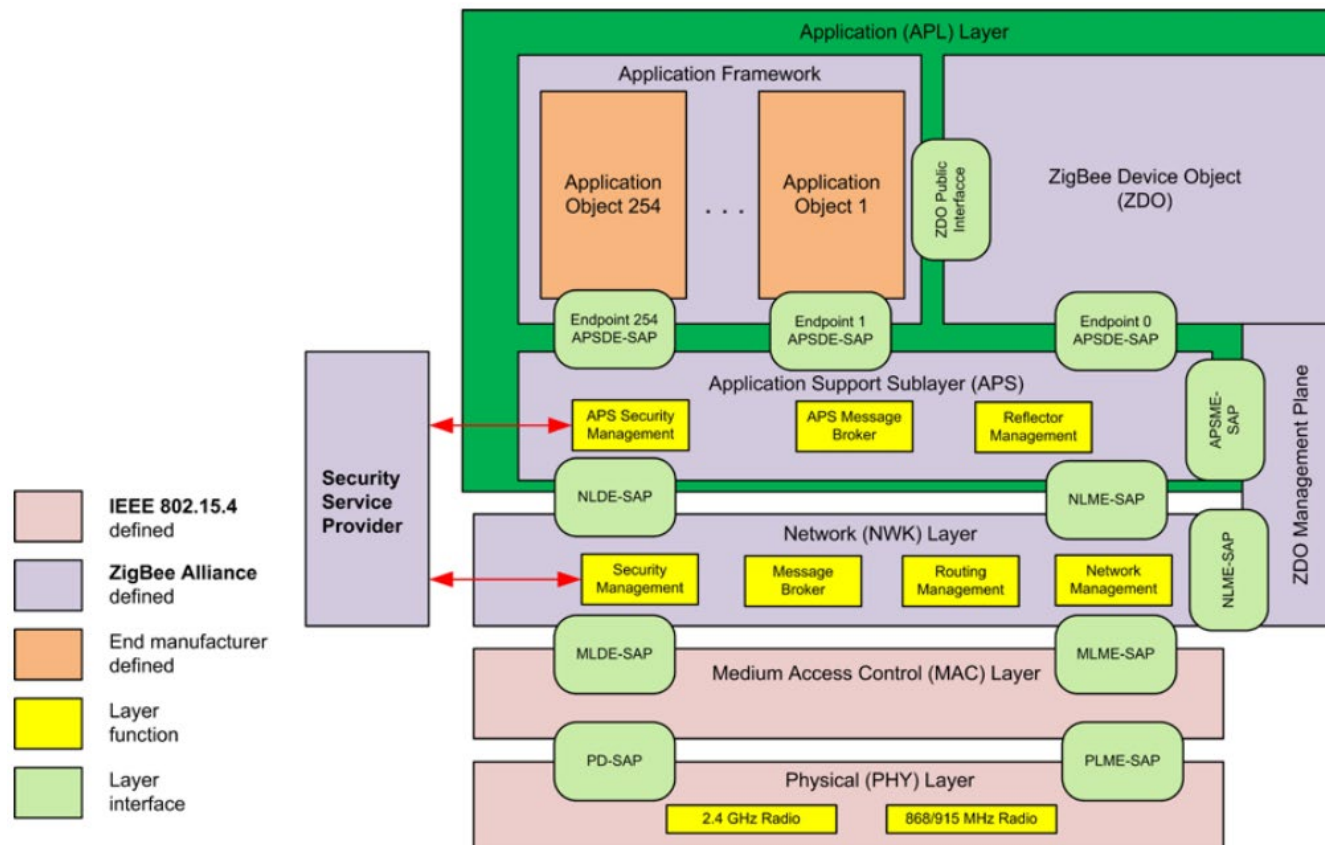
Since the formation in 2021 of the more unified smart home standard, Matter, the Zigbee Alliance has been rebranded to the Connectivity Standards Alliance (CSA)



- “the software”
- Network, Security & Application layers
- Brand management

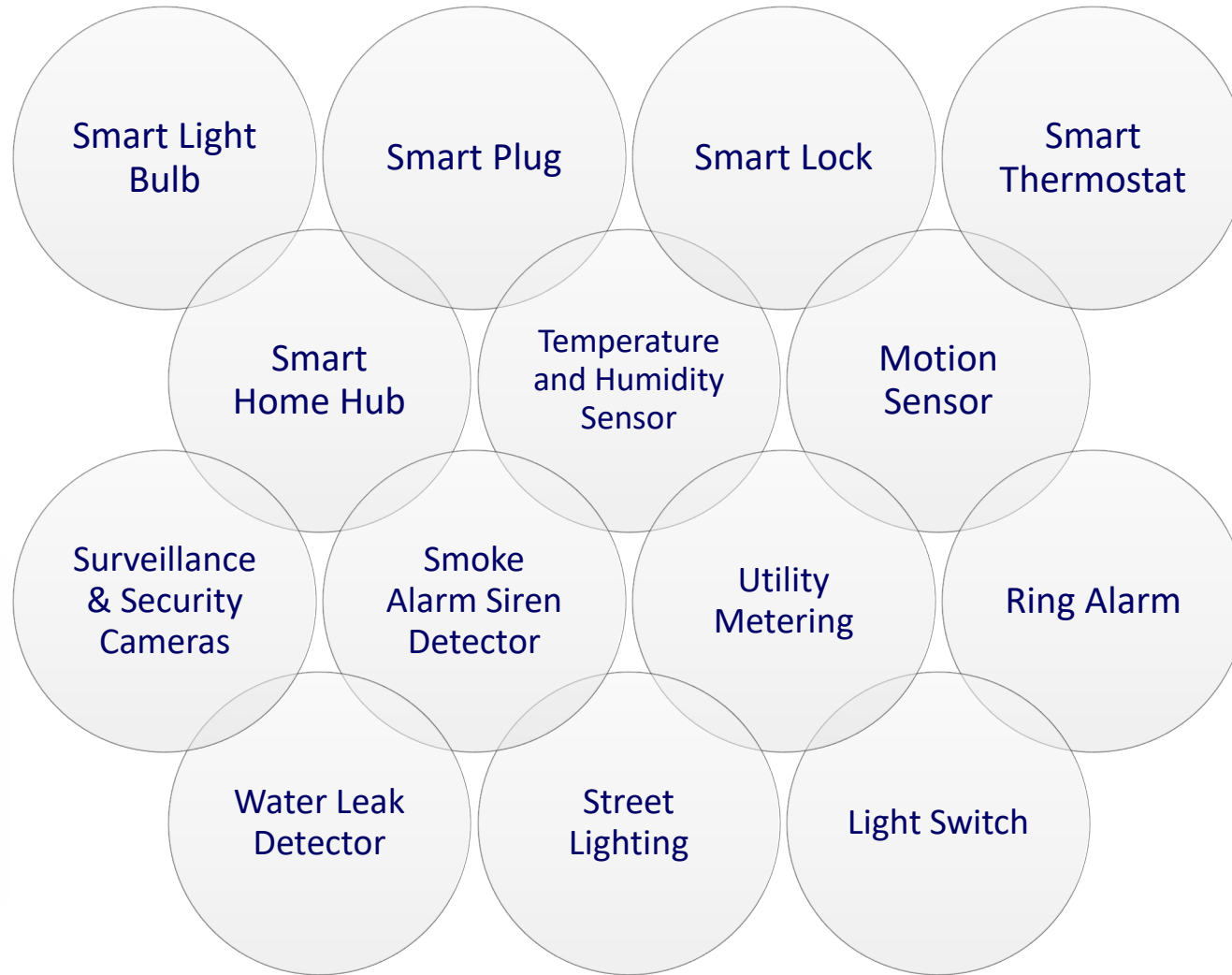
IEEE 802.15.4

- “the hardware”
- Physical & Media Access Control layers



Source: <https://zigbeealliance.org/wp-content/uploads/2019/12/docs-05-3474-21-0csg-zigbee-specification.pdf>

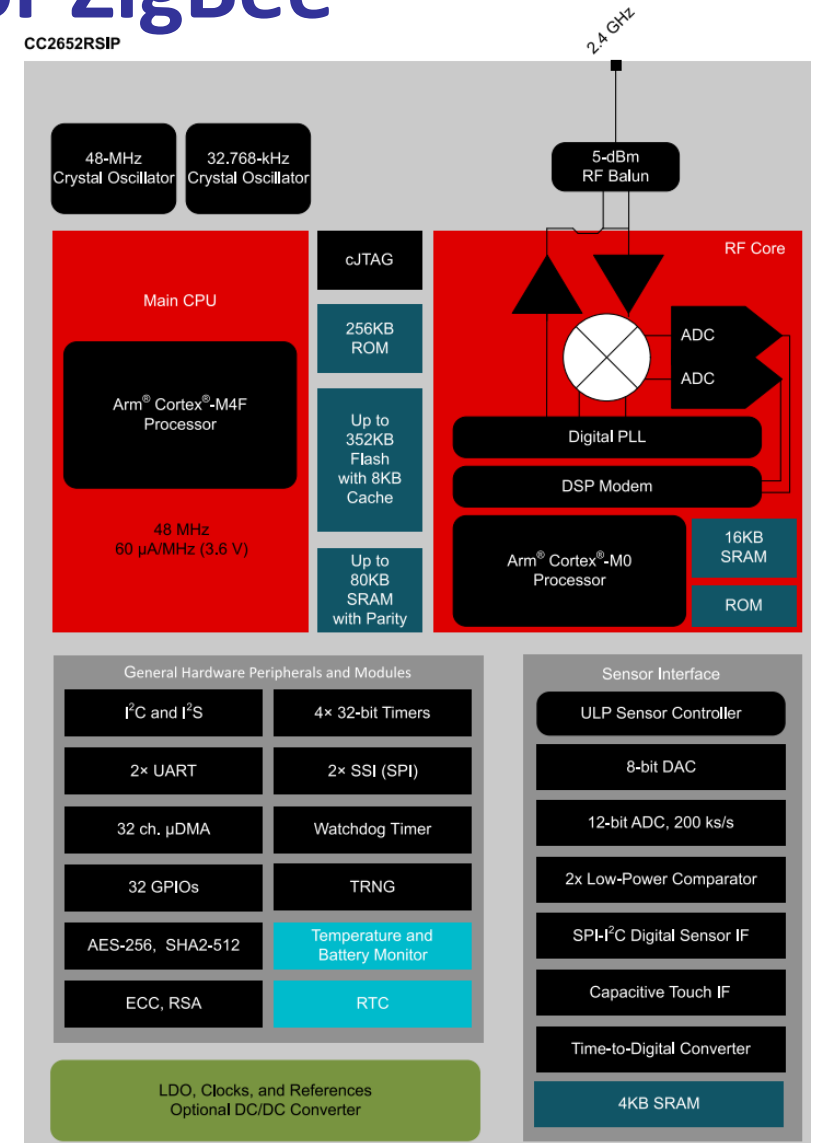
Zigbee Protocol Based Applications



Typical IC Solutions for ZigBee

Texas Instruments - CC2652RSIP

- 48 MHz Oscillator
[CO2520-48.000-3.3-50-X-T-TR](#)
- 32.768 kHz Crystal Oscillator
[CO2016-0.032768-3.3-25-X-T-TR](#)
- 2.4 GHz Antenna
[RCA-W2-P-3216-A36-G](#)

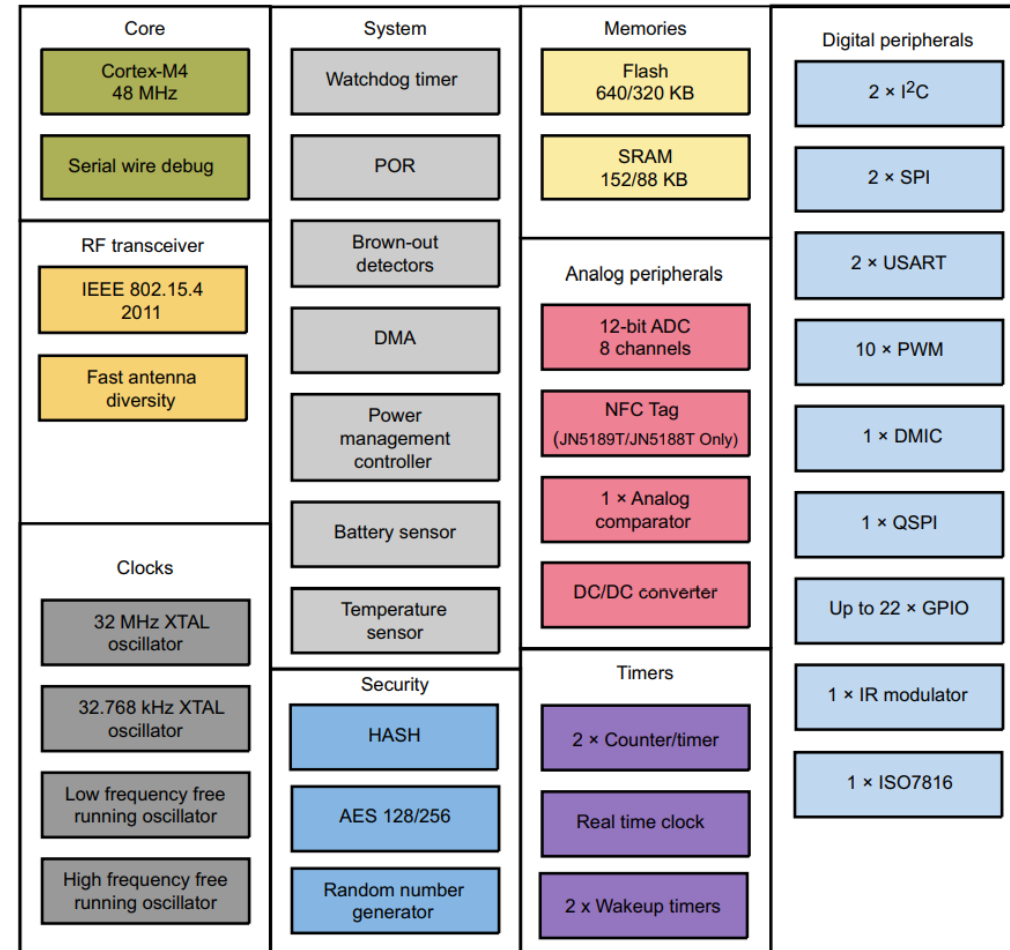


TI CC2652RSIP Hardware Overview

Typical IC Solutions for ZigBee

NXP Semiconductors - JN5189

- 32 MHz Crystal
[R1210-32.000-8-F-1030-EXT-TR](#)
- 32.768 kHz Crystal Oscillator
[CO2016-0.032768-3.3-25-X-T-TR](#)
- 2.4 GHz Antenna
[RCA-W2-P-3216-A36-G](#)
- NFC Antenna
[RNF-VA1-862155-W-001](#)
- VCO
[VCO Selector Guide](#)

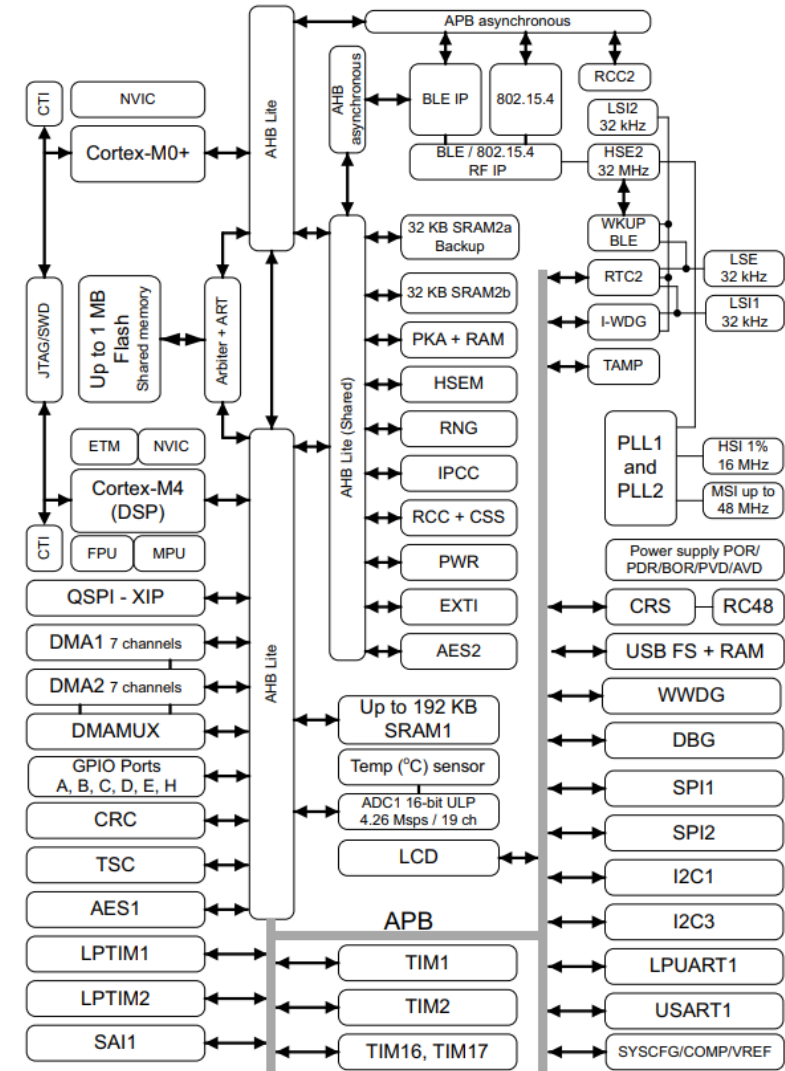


NXP Semiconductors JN5189 block diagram

Typical IC Solutions for ZigBee

STMicroelectronics - STM32WB55xx

- 32 MHz Crystal, 6 pF min, 8 pF max
[R1612-32.000-6-F-1020-TR](#)
- 16 MHz Oscillator
[CO2520-16.000-3.3-50-X-TR](#)
- 48 MHz Oscillator
[CO2520-48.000-3.3-50-X-T-TR](#)
- 32.768 kHz Crystal Oscillator
[CO2016-0.032768-3.3-25-X-T-TR](#)
- BP Filter
[RCF-2450.000-100000-1411-W-TR-001](#)
- 2.4 GHz band Antenna
[RCA-3216-A1-TR](#)



Raltron Solutions - MHz Crystals

Available Crystal Packages









Part #	Size(mm)
R1612-32.000-6-F-1020-TR	1.60 x 1.25 x 0.32
R2016-48.000-8-F-1030-EXT-TR	2.00 x 1.60 x 0.50
R2520-32.000-8-F-1030-EXT-TR	2.50 x 2.00 x 0.65
RH100-48.000-8-F-1015-EXT-TR	3.20 x 2.50 x 0.70

[See All Crystal Products](#)

Typical Frequencies:

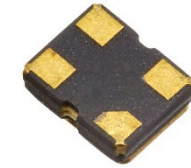
16 MHz, 32 MHz, 48 MHz

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Product Series	Datasheet	Image	Contact Us / Buy Now
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R2016 View products in stock	 PDF		Buy Now
R2520 View products in stock	 PDF		Buy Now
RH100 View products in stock	 PDF		Buy Now



Raltron Solutions – Oscillators



Raltron MHz Oscillators Solutions

Part #	Frequency(MHz)
CO2520-48.000-3.3-50-X-T-TR	48
CO2520-16.000-3.3-50-X-TR	16

Raltron kHz Oscillators Solutions

Part #	Frequency(kHz)
CO2016-0.032768-3.3-25-X-T-TR	32.768
CO2520-0.032768-3.3-50-X-TR	32.768

[See Antenna Products for Oscillators](#)

Raltron Solutions - Tuning Fork 32.768 kHz

Available Tuning Fork Crystal Packages

Part #	SIZE(mm)
RT1210-32.768-9-TR	1.2 x 1.0
RT1610-32.768-12.5-TR	1.6 x 1.0
RT2012-32.768-7-20-EXT-TR	2.0 x 1.2
RT3215-32.768-12.5-TR	3.2 x 1.5
RSE-32.768-12.5-H14-TR	6.9 x 1.4
RSM200S-32.768-12.5-TR	8.0 x 3.8

[See All Crystal Products](#)

Load capacitance values: 6 pF, 7 pF, 9 pF and 12.5 pF

Frequency Tolerances: ± 20 ppm and ± 10 ppm



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Product Series	Datasheet	Image	Contact Us / Buy Now
RT1210 View products in stock			Buy Now
RT1610 View products in stock			Buy Now
RT2012 View products in stock			Buy Now
RT3215 View products in stock			Buy Now
RSE H14 View products in stock			Buy Now
RSM200S View products in stock			Buy Now

Typical example of IC for ZigBee using a 32.768 kHz crystal as frequency reference:

Texas Instruments - CC1352P7

Using 32.768 kHz crystal

CL: 6, 7 or 12 pF

ESR: 90 k Ω max

Raltron Solutions - TCXOs and VCTCXOs


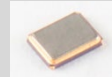

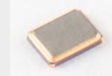
Raltron TCXOs IC Solutions

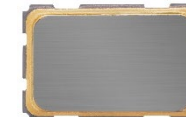
Part #	Size(mm)
RTX-2016AF3F-S-32.000-TR	2.0 x 1.6
RTX-2520AF32-S-48.000-TR	2.5 x 2.0
RTX-2520AF32-S-48.000-TR	2.5 x 2.0

[See All TCXOs Products](#)

- Tighter Stability: ± 0.5 ppm \sim ± 2.5 ppm, -40 \sim +85°C
- Improved Frequency Tuning Characteristic
- Superior Phase Noise Performance (-130 dBc/Hz on the floor)
- Range Supply Voltage: 1.8 V \sim 3.3 V
- Typical Frequencies: 10.0 MHz, 16.0 MHz, 19.2 MHz, 20.0 MHz, 26.0 MHz, 32.0 MHz, 38.4MHz, 48.0 MHz, 50.0 MHz, 52.0 MHz

Stock at our Distributors

Product Series	Datasheet	Image	Contact Us / Buy Now
RTX /RTV-2016 View products in stock			Buy Now
RTX /RTV-2520 View products in stock			Buy Now



Raltron Solutions – Antennas

Raltron Stub Antennas Solutions

Part #	Frequency(MHz)
RST-W2-P-195-RPSMA-G	2400 ~ 2500
RST-W2A1-20022-17M-TE-001	2400 ~ 2500
RST-W7-30-A-G	2400 ~ 2500

[See Antenna Products for Zigbee](#)



Raltron Chip Antennas Solutions

Part #	Frequency(MHz)
RCA-W2-P-3216-A36-G	2450
RCA-3216-A1-TR	2450

Raltron NFC Antennas Solutions

Part #	Frequency(MHz)
RNF-VA1-862155-W-001	13.560



Raltron Solutions – VCOs

Raltron VCOs Solutions

VCO Size (mm)	Frequency(GHz)
5 x 4	300 to 2.6
8 x 6	Up to 12
7.6 x 7.6	Up to 12
12.5 x 12.5	Up to 12

Raltron VCOs:

Frequency Range: up to 12.00 GHz

Low Phase Noise and Fast Settling Time

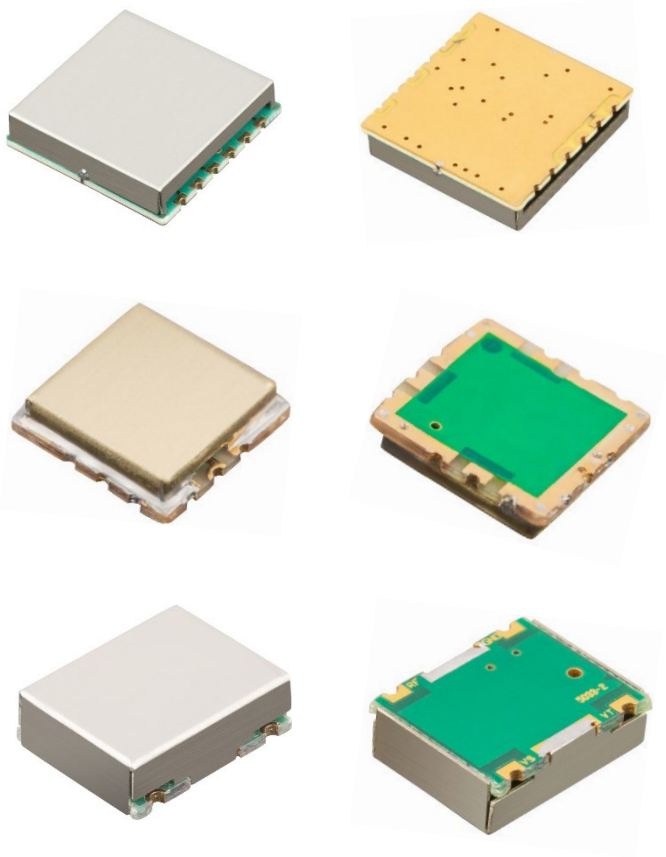
Excellent Return Loss

Supply Voltage: +2.2 to +12.0 VDC

Ultra Wide Tuning Ranges

Packages: 5 x 4 to 20 x 20 mm footprint

[See All VCOs Products](#)



Contact



<http://www.raltron.com>

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