

# Frequency Components and Antennas for Utility Metering Applications



**RAFLTRON**

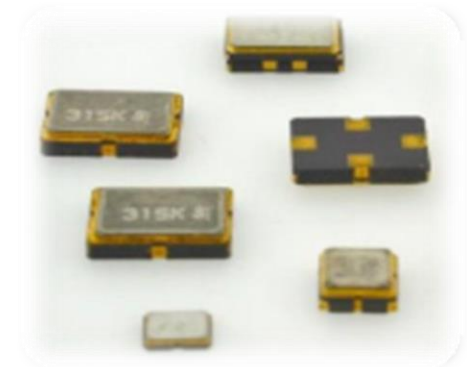
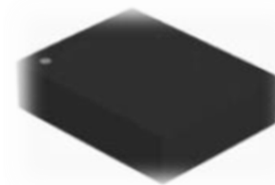
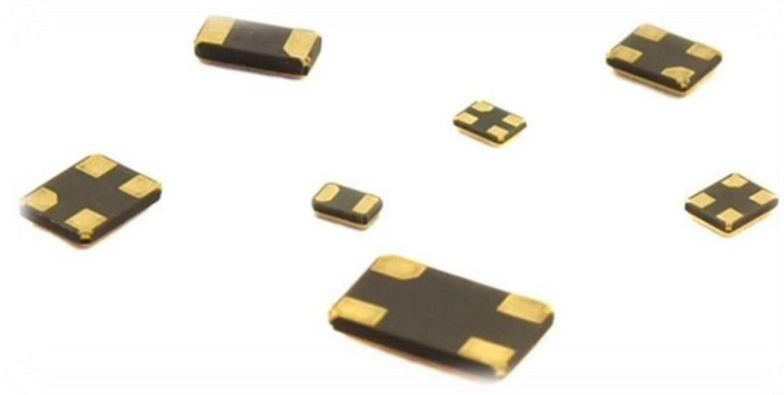
# Introduction



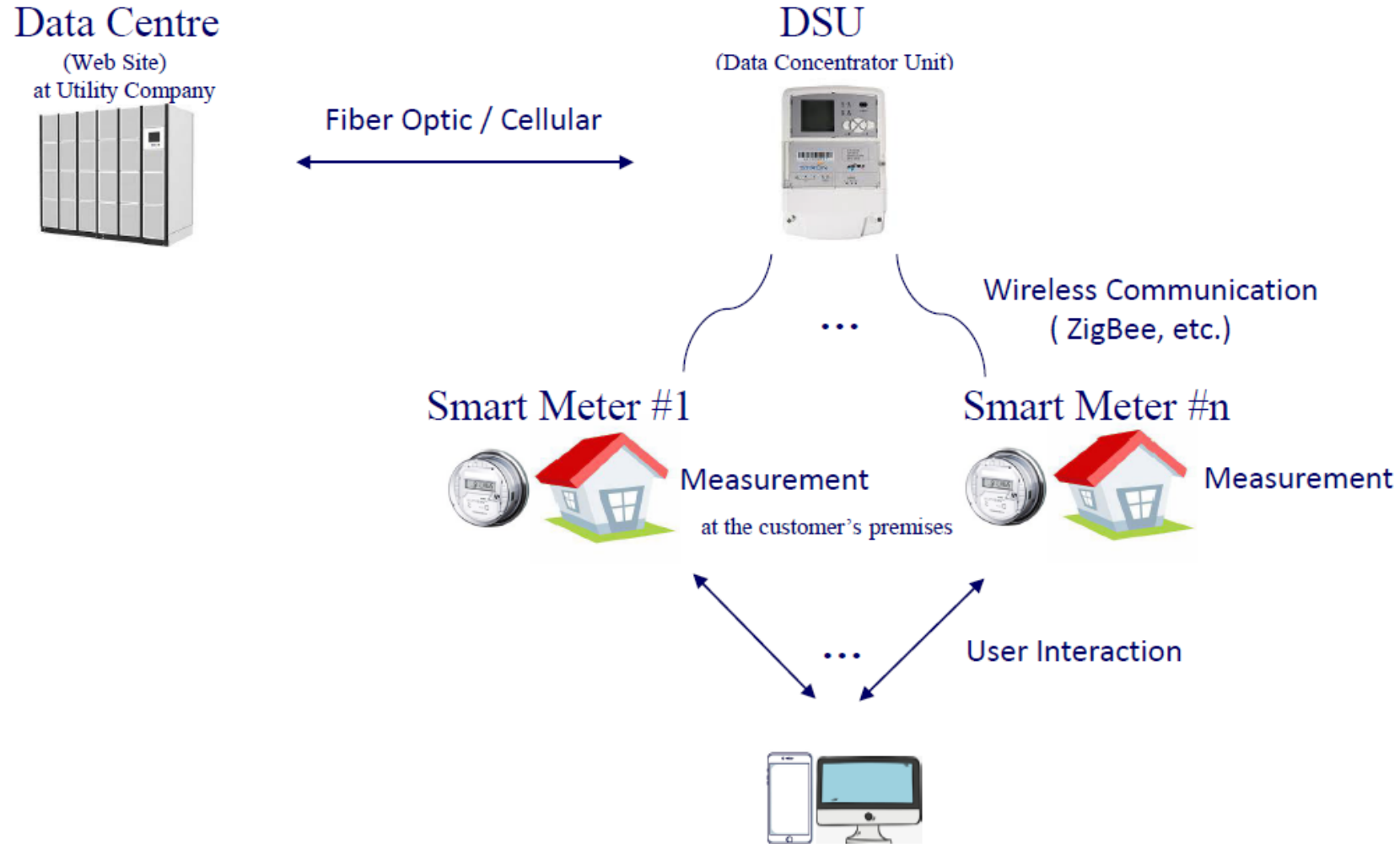
**Raltron** offers the most comprehensive line of frequency management components for Utility Metering Applications, from simple tuning fork crystals to high stability, temperature compensated crystal oscillators and antennas. These products are designed to satisfy the ultra-low power, small footprint, and low-cost requirements of this growing market.

# Raltron Frequency Products and Antennas for Utility Metering Systems

**Raltron** offers a wide range of frequency components and antenna solutions for utility metering applications. These include crystals, TCXOs, OCXOs, VCOs, SAW filters, LTCC filters, Real Time Clocks, antennas and RF connectors and cable assemblies.



# Smart Metering System Architecture



# Solutions for Wi-Fi Protocol

The Wi-Fi/IEEE 802.11 has three frequency bands, 2.4/5/6 GHz.

Some Typical Crystal or TCXO frequencies for **Wi-Fi** Utility Metering Applications ICs:

Infineon - CYW43012 - 37.4 MHz, 32.768 kHz  
CY8C62xA - 16 to 35 MHz , 32.768 kHz

Silicon Labs - WF200 - 38.4 MHz, 32.768 kHz  
RS9116 - 40 MHz, 32.768 kHz

Microchip - ATWINC3400A-MU - 26 MHz, 32.768 kHz

## Raltron Stub Antennas Solutions

[RST-2400-P-190-IPEX-H](#)

[RST-MB-P-153-SMA-G](#)



The Wi-Fi 6/IEEE 802.11ax has two frequency bands, 2.4/5 GHz.

The Crystals for lower frequencies of Wi-Fi 6 such as 38.4 and 48 MHz, and for higher are 76.8 and 96 MHz

Some Typical Crystals or TCXO frequencies for **Wi-Fi 6** Utility Metering Applications ICs:

SparkLan - WNFB-266AXI(BT) - 37.4 MHz, 32.768 kHz  
AP6281 - 59.97 MHz, 32.768 kHz

[See All Crystal Products](#)

[See Antenna Products for Wi-Fi](#)



# Solutions for Bluetooth & BLE Protocol

Bluetooth Low Energy uses the same 2.4 GHz radio frequencies as classic Bluetooth  
Some Typical Crystal or TCXO frequencies for **Bluetooth & BLE** Utility Metering Applications ICs:

Infineon - PSoC 6 MCU: CY8C63x6, CY8C63x7 - 16 MHz/32 MHz Crystal Oscillator  
16 to 35 MHz, 32.768 kHz On-chip Crystal Oscillators  
- 2.4 GHz Chip Antenna

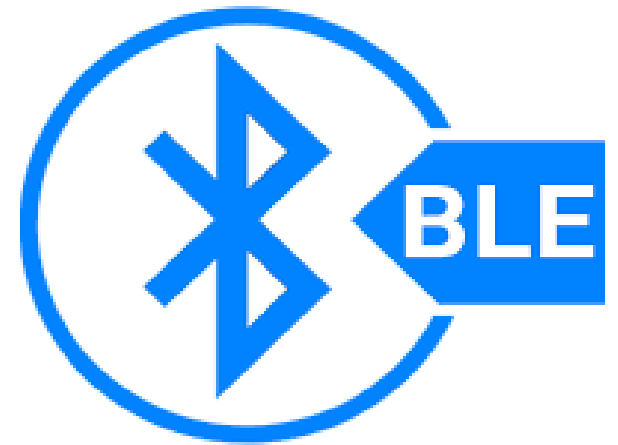
Nordic Semiconductor - nRF52810 - 64 MHz Crystal Oscillator, 32 MHz Crystal  
32.768 kHz Crystal Oscillator, 32.768 kHz Crystal  
1 MHz/16 MHz/32 MHz Peripheral Clock  
- 2.4 GHz Antenna

Texas Instruments - CC2640R2F - 32.8 kHz/48 MHz RC Oscillator, 24 MHz Crystal Oscillator  
32.768 kHz Crystal Oscillator  
- 2.4 GHz Antenna

NXP Semiconductors - MKW39/38/37 - 26 MHz/32 MHz Crystal, 32.768 kHz Crystal Oscillator  
- 2.4 GHz Antenna

Dialog Semiconductor - DA1469x - 32 MHz Crystal, 32.768 kHz Crystal Oscillator  
- 2.4 GHz Antenna

STMicroelectronics - BlueNRG-LPS - 32 MHz Crystal, 32.768 kHz Crystal  
- 2.4 GHz Antenna



[See All Crystal Products](#)

[See Antenna Products for Bluetooth](#)

# Solutions for ZigBee Protocol

The ZigBee/IEEE 802.15.4 has three frequency bands, allowing operation in all regions of the world: 2.4 GHz for worldwide applications, 868 MHz for Europe and 915 MHz for the American.

Some Typical Crystal or TCXO frequencies for **ZigBee** Utility Metering Applications ICs :

Texas Instruments - CC2652RSIP - 48 MHz Crystal  
48 MHz Crystal Oscillator  
32.768 kHz Crystal Oscillator  
- 2.4 GHz Inverted F Antenna

Nordic Semiconductor - nRF52832 - 64 MHz Crystal Oscillator  
32 MHz Crystal, 32.768 kHz Crystal Oscillator  
- 2.4 GHz Chip Antenna

NXP Semiconductors - JN5189 - 32 MHz Crystal Oscillator  
32.768 kHz Crystal Oscillator  
- 2.4 GHz Antenna

## Raltron Stub Antennas Solutions

[RST-2400-P-190-IPEX-H](#)

[RST-MB-P-153-SMA-G](#)



[See All Crystal Products](#)

[See Antenna Products for ZigBee](#)

# Solutions for Thread Protocol

Thread uses IEEE 802.15. 4 radio technology on the 2.4 GHz spectrum, which can be deployed worldwide.

Some Typical Crystal or TCXO frequencies for **Thread** Utility Metering Applications ICs :

Texas Instruments - CC2651R3SIPA - 48 MHz Crystal Oscillator  
32.768 kHz Crystal Oscillator  
- 2.4 GHz Antenna

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Nordic Semiconductor - nRF52840 - 64 MHz Crystal Oscillator  
32 MHz Crystal  
32.768 kHz Crystal Oscillator  
- 2.4 GHz Antenna

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Silicon Labs - EFR32MG24 - 39 MHz Crystal Oscillator  
32.768 kHz Crystal Oscillator  
- 2.4 GHz Antenna



[See All Crystal Products](#)



# Raltron Solutions - MHz Crystals

## Available Crystal Packages









Part #	Size(mm)
<a href="#">R2016-32.000-12-F-1010-EXT-TR</a>	1.60 x 1.25 x 0.32
<a href="#">R2016-48.000-8-F-1030-EXT-TR</a>	2.00 x 1.60 x 0.50
<a href="#">R2520-16.000-10-1020-EXT-TR</a>	2.50 x 2.00 x 0.65
<a href="#">RH100-24.000-9-1010-TR</a>	3.20 x 2.50 x 0.70

[See All Crystal Products](#)

### Typical Frequencies:

16 MHz, 26 MHz, 32 MHz, 37.4 MHz, 38.4 MHz, 48 MHz,  
59.97 MHz , 64 MHz

## Stock at our Distributors

Product Series	Datasheet	Image	Contact Us / Buy Now
<b>R1612</b> <a href="#">View products in stock</a>	 PDF		<a href="#">Buy Now</a>
<b>R2016</b> <a href="#">View products in stock</a>	 PDF		<a href="#">Buy Now</a>
<b>R2520</b> <a href="#">View products in stock</a>	 PDF		<a href="#">Buy Now</a>
<b>RH100</b> <a href="#">View products in stock</a>	 PDF		<a href="#">Buy Now</a>



# Raltron Solutions - Tuning Fork 32.768 kHz

## Available Tuning Fork Crystal Packages













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

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

Frequency Tolerances:  $\pm 20$  ppm and  $\pm 10$  ppm



## Stock at our Distributors

Product Series	Datasheet	Image	Contact Us / Buy Now
<b>RT1210</b> <a href="#">View products in stock</a>			<a href="#">Buy Now</a>
<b>RT1610</b> <a href="#">View products in stock</a>			<a href="#">Buy Now</a>
<b>RT2012</b> <a href="#">View products in stock</a>			<a href="#">Buy Now</a>
<b>RT3215</b> <a href="#">View products in stock</a>			<a href="#">Buy Now</a>
<b>RSE H14</b>			<a href="#">Buy Now</a>
<b>RSM200S</b> <a href="#">View products in stock</a>			<a href="#">Buy Now</a>

[See All Crystal Products](#)

# Raltron Solutions - TCXOs and VCTCXOs



## Raltron TCXOs IC Solutions

Part #	Size(mm)
<a href="#">RTX-1612BD32-S-52.000-TR</a>	1.6 x 1.2
<a href="#">RTX-2016AD333-S-26.000-TR</a>	2.0 x 1.6
<a href="#">RTX-2520AD31-S-26.000-TR</a>	2.5 x 2.0
<a href="#">RTX-2520AF32-S-48.000-TR</a>	2.5 x 2.0

[See All TCXOs Products](#)

- Tighter Stability:  $\pm 0.5$  ppm ~  $\pm 2.5$  ppm, -40 ~ +85°C
- Improved Frequency Tuning Characteristic
- Superior Phase Noise Performance (-130 dBc/Hz on the floor)
- Range Supply Voltage: 1.8 V ~ 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
<b>RTX-1612</b> <a href="#">View products in stock</a>			<a href="#">Buy Now</a>
<b>RTX /RTV-2016</b> <a href="#">View products in stock</a>			<a href="#">Buy Now</a>
<b>RTX /RTV-2520</b> <a href="#">View products in stock</a>			<a href="#">Buy Now</a>



# Raltron Solutions – Antennas

## Raltron Antennas Solutions

Part #	Datasheet	Image	Frequency(MHz)	Contact Us / Buy Now
<a href="#">RCA-3216-A1-TR</a>	 PDF		2450±50	Contact Us
<a href="#">RCA-5220-A0-TR</a>	 PDF		2450±50	Buy Now
<a href="#">RCA-E-3216-A2-TR</a>	 PDF		2400~2483.5	Contact Us
<a href="#">RCA-W2-P-3216-A29-G</a>	 PDF		2545	Contact Us
<a href="#">RCA-W2A1-3216-Z-040</a>	 PDF		2400~2500	Buy Now

[See Antenna Products for Wi-Fi](#)

[See Antenna Products for Bluetooth](#)

[See Antenna Products for ZigBee](#)



# 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

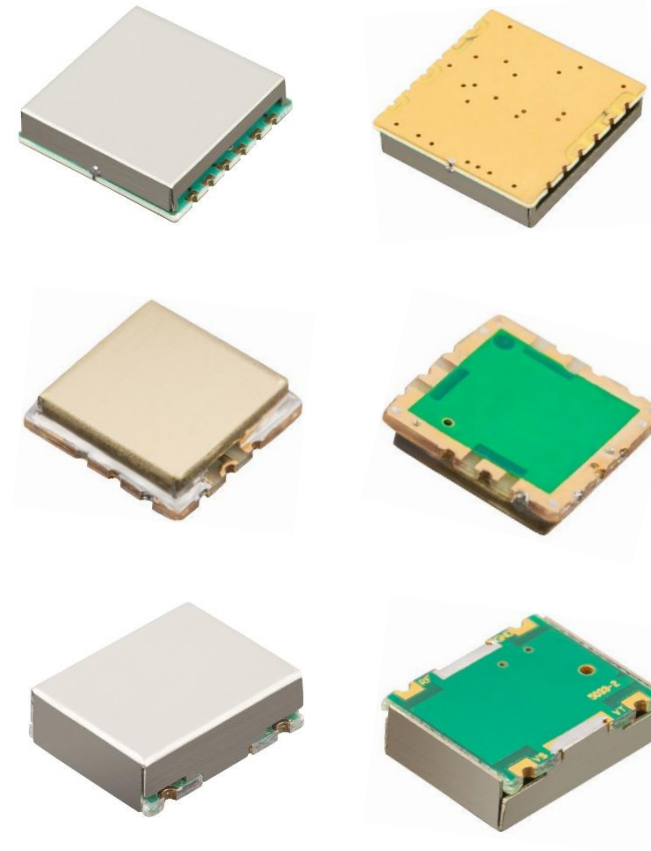
Excellent Return Loss

Supply Voltage: +2.2 to +12.0 VDC

Ultra Wide Tuning Ranges




Packages: 5 x 4 to 20 x 20 mm footprint

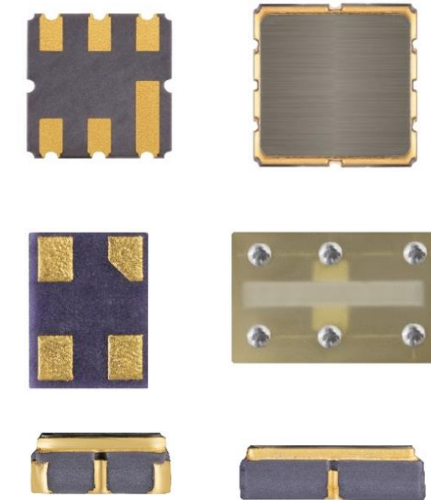
[See All VCOs Products](#)



# Raltron Solutions – SAW Filters

## Raltron SAW Filter IC Solutions

Part #	Datasheet	Size(mm)	Contact Us / Buy Now
<a href="#">RSF-1176.450-20460-1109-TR</a>	 PDF	1.1 x 0.9 x 0.55	<a href="#">Buy Now</a>
<a href="#">RSF-1582.400-46800-1109-TR</a>	 PDF	1.1 x 0.9 x 0.55	<a href="#">Buy Now</a>
<a href="#">RSF-915.000-926000-2016-TR</a>	 PDF	2.0 x 1.6 x 0.73	<a href="#">Contact Us</a>



[See All SAW Filters Products](#)



# Contact



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