

Frequency Components and Antennas
for
Utility Metering Applications



RALTRON

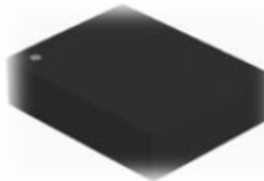
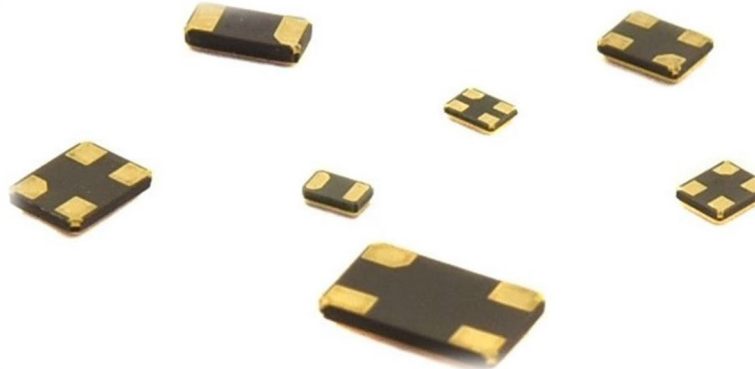
Introduction



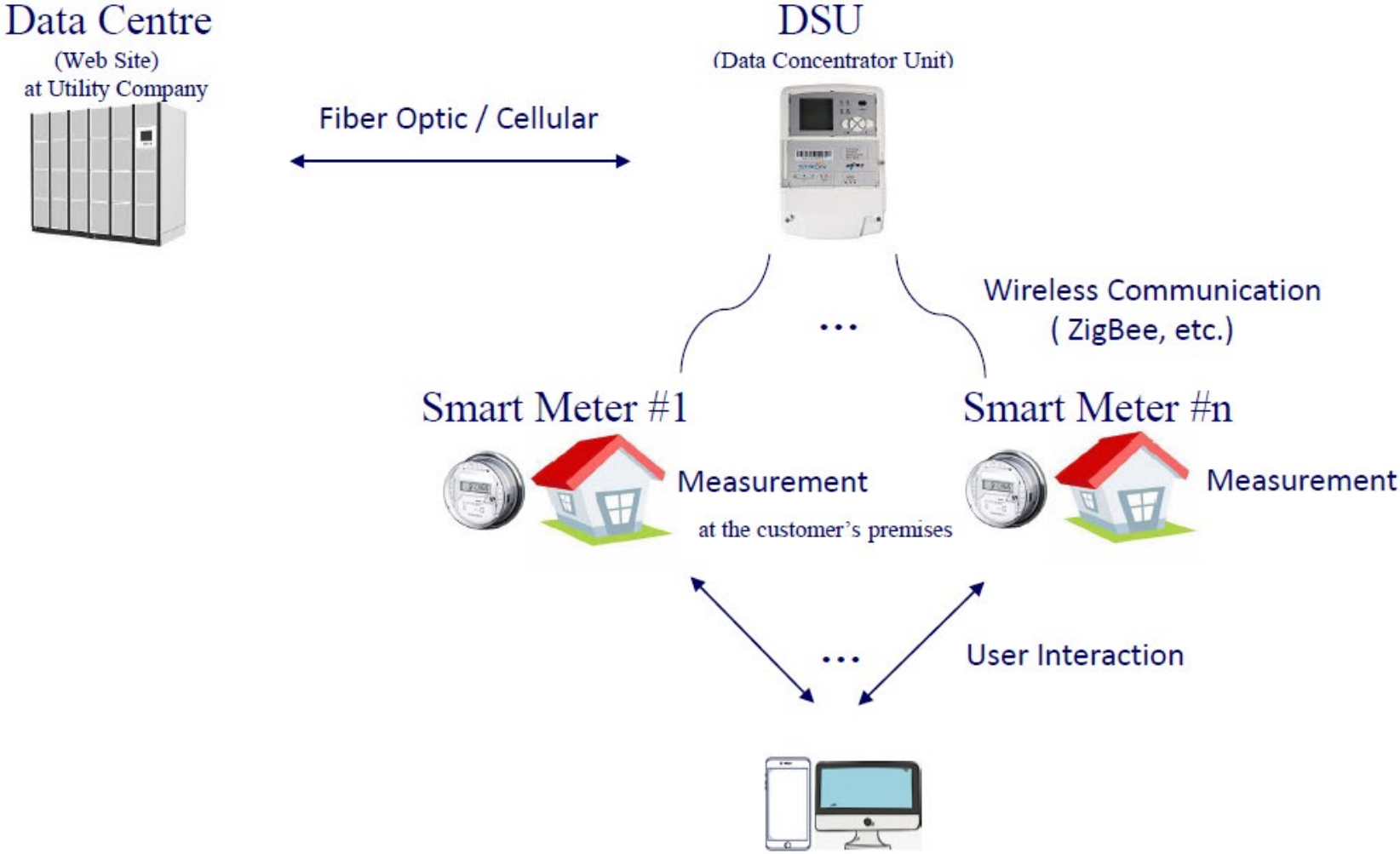
Raltron offers the most comprehensive line of frequency management components for Utility Metering Applications, from simple tuning fork crystals to high stability, temperature compensated crystal oscillators and antennas. These products are designed to satisfy the ultra-low power, small footprint, and 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-157-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

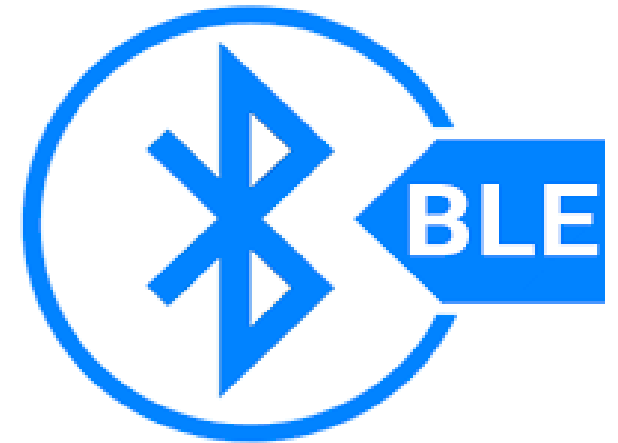
Nordic Semiconductor - nRF52810 - 64 MHz Crystal Oscillator, 32 MHz Crystal
32.768 kHz Crystal Oscillator, 32.768 kHz Crystal
1 MHz/16 MHz/32 MHz Peripheral Clock
- 2.4 GHz Antenna

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-157-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

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

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

[See All Crystal Products](#)



Raltron Solutions - MHz Crystals

Raltron Crystals Solutions

Part #	Size(mm)	Product Series	Datasheet	Image	Contact Us / Buy Now
R1612-27.120-8-F-3030-EXT-TR	1.60 x 1.25 x 0.32	R1612 View products in stock			Buy Now
R2016-48.000-8-F-1030-EXT-TR	2.00 x 1.60 x 0.50	R2016 View products in stock			Buy Now
R2520-27.120-8-F-3030-EXT-TR	2.50 x 2.00 x 0.65	R2520 View products in stock			Buy Now
RH100-38.400-10-F-1010-TR	3.20 x 2.50 x 0.70	RH100 View products in stock			Buy Now

Typical Frequencies:

16 MHz, 26 MHz, 32 MHz, 37.4 MHz, 38.4 MHz, 40 MHz, 48 MHz, 59.97 MHz, 64 MHz

[See All Crystal Products](#)



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
RT3215-32.768-7-TR	3.2 x 1.5
RSE-32.768-12.5-H14-TR	6.9 x 1.4

Typical example of IC for Utility Metering Applications using a 32.768 kHz crystal as frequency reference:

Texas Instruments - MSP430F676x1A

Using 32.768 kHz crystal

CL: 6, 9 or 12 pF

ESR: 30 kΩ max

[See All Crystal Products](#)



Stock at our Distributors

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			Buy Now

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







Frequency Tolerances: ±20 ppm and ±10 ppm











Raltron Solutions - TCXOs and VCTCXOs

Raltron General Purpose TCXOs Solutions



Part #	Size(mm)	Product Series	Datasheet	Image	Contact Us
RTX-1612BD32-S-52.000-TR	1.6 x 1.2	RTX-1612 View products in stock			Buy Now
RTX-2016AD333-S-26.000-TR	2.0 x 1.6	RTV-2016 View products in stock			Buy Now
RTX-2520AF32-S-48.000-TR	2.5 x 2.0	RTX-2520 View products in stock			Buy Now



Raltron Stratum III TCXOs Solutions

Product Series	Size(mm)	Frequency (MHz)	Datasheet	Image	Contact Us
TV-35	5.0 x 3.2	10 ~ 52			Contact Us
TX-35	5.0 x 3.2	10 ~ 52			Contact Us
TV-57 View products in stock	7.0 x 5.0	10 ~ 52			Buy Now
TX-57 View products in stock	7.0 x 5.0	10 ~ 52			Buy Now

[See All TCXOs Products](#)

Raltron Solutions - RTC Modules

Raltron RTC Modules Solutions

Product Series	Size(mm)	Frequency (kHz)	Image	Contact Us / Buy Now
RTT21065	3.2 x 2.5	32.768		Contact Us
RTT21933	3.2 x 2.5	32.768		Contact Us

Main Features:

- Low current consumption: 0.9uA (Typ.)
- High stability: 5023ppm max @ +25°C
- Build-in XO: 32.768kHz
- Communication interface: I2C bus
- Power Supply Voltage: 1.6V ~ 5.5V
- Backup battery charge control function for rechargeable lithium batteries.
- Timekeeper voltage: 1.2V~5.5V
- Operation Temperature Range: -40°C ~ +85°C
- Leap years autocorrection
- Timer output function with adjustable period
- Package: 3.2mm h 2.5mm h 1.0mm
- Digital offset function

[See All Real Time Clock Oscillators Products](#)



Raltron Solutions – Antennas

Raltron Stub Antennas Solutions

Part #	Frequency(MHz)
RST-W2-P-105-RPSMA-H	2400~2483
RST-W2A1-20022-17M-TE-001	2400 ~ 2500
RST-W7-30-A-G	2400 ~ 2500



Raltron Chip Antennas:
sub-1 GHz and Zigbee



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

Raltron Chip Antennas Solutions

Part #	Frequency(MHz)
RCA-MA11-1204-G-002	868
RCA-3216-A1-TR	2450

Raltron Stub Antenna: Length 5 to 17 cm, straight, right angle or swivel

Frequency: ZigBee (2.45 GHz)

Wi-Fi (2.4/5 GHz)

WiMax (2.6/3.5 GHz)



Raltron Flexible PCB Antennas for
Zigbee and sub-1 GHz frequencies:



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

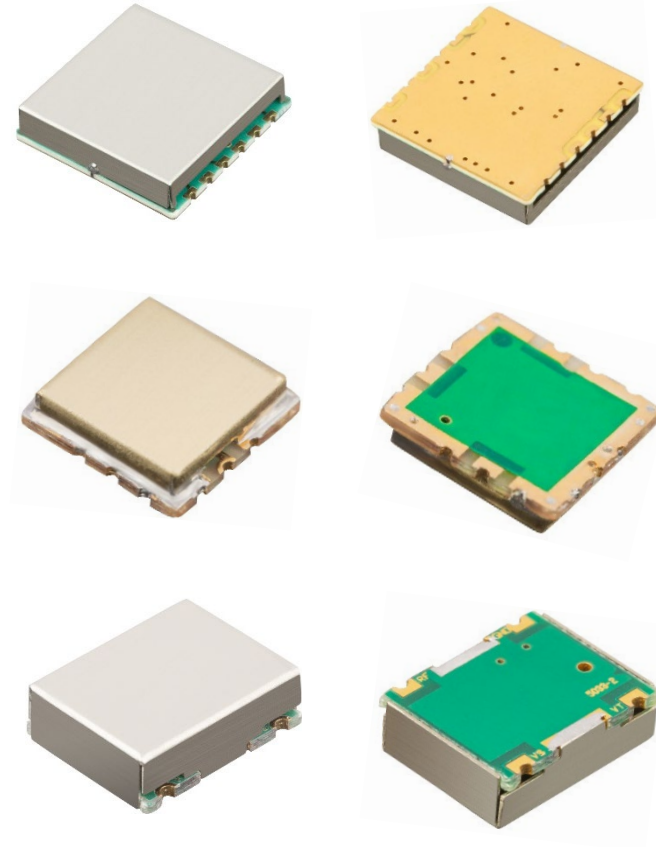
Excellent Return Loss

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

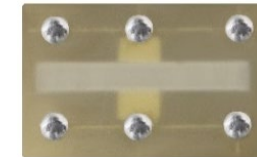
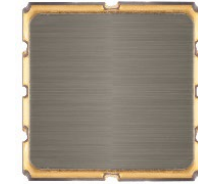
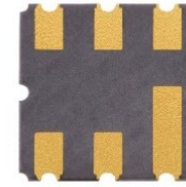
Raltron SAW Filter IC Solution

Part #	Size(mm)
RSF-916.500-5200-1411-TR-NS3	1.40 x 1.10 x 0.60
RSF-868.300-7000-3030-TR	3.00 x 3.00 x 1.28
RSF-915.000-926000-2016-TR	2.00 x 1.60 x 0.73

Raltron SAW filters designed for center frequencies between 315 MHz and 2.45 GHz with wideband and narrowband characteristics.

Main Features:

- Center frequency range between 315 MHz and 2.45 GHz
- Wideband filter with a center frequency of 315.00 MHz, 433.92 MHz, 460.00 MHz, 868.30 MHz, 869.00 MHz, 915.00 MHz, 942.50 MHz and 2.45 GHz
- Narrowband filters with a center frequency of 433.92 MHz and 868.30 MHz
- Low insertion loss between 1.4 dB and 3.3 dB



[See All SAW Filters Products](#)

Contact



<http://www.raltron.com>

Raltron Electronics

10400 N.W. 33rd Street
Miami, FL 33172, U.S.A.

Phone: 305 593 6033

Fax: 305 594 3973