Raltron Electronics

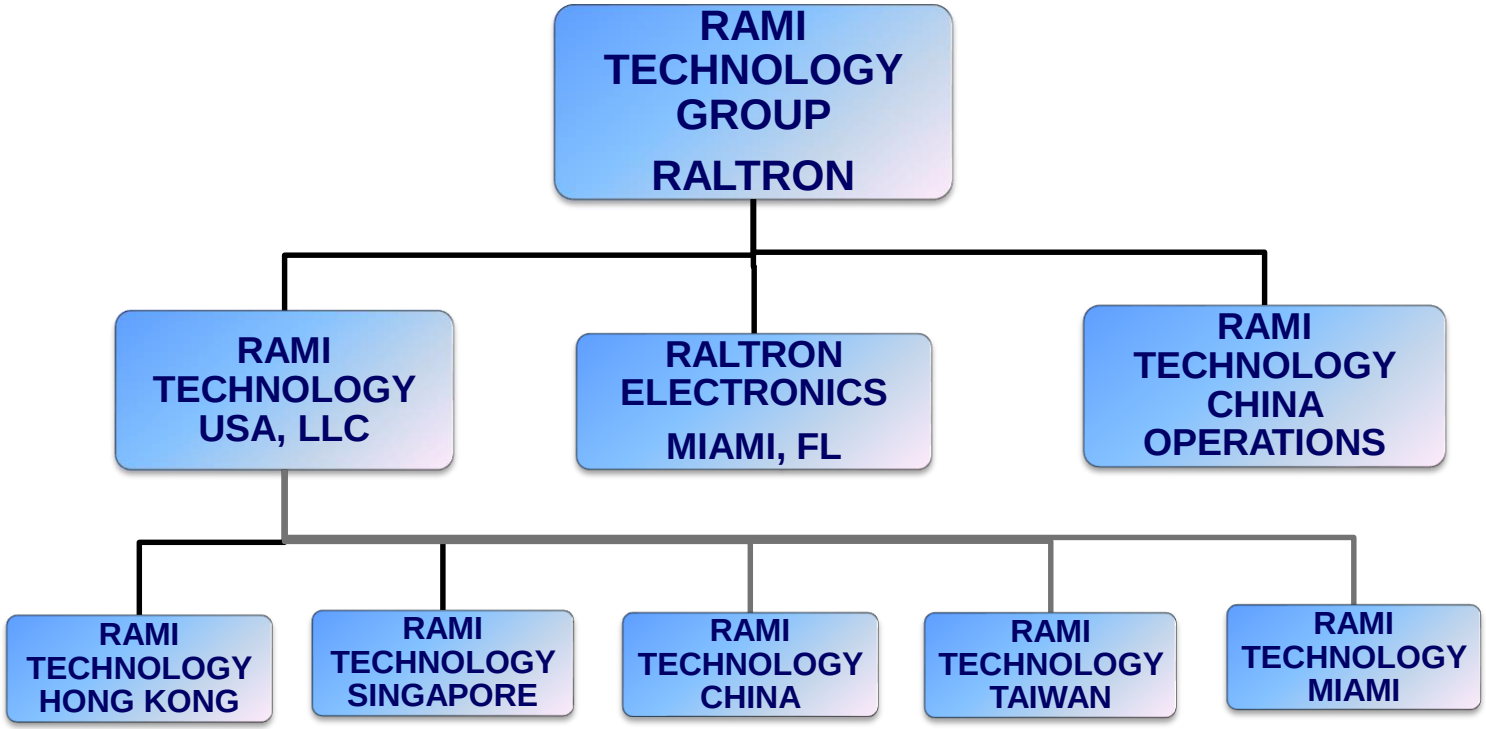
Company Profile and Product Roadmap

March 2016

Raltron Electronics

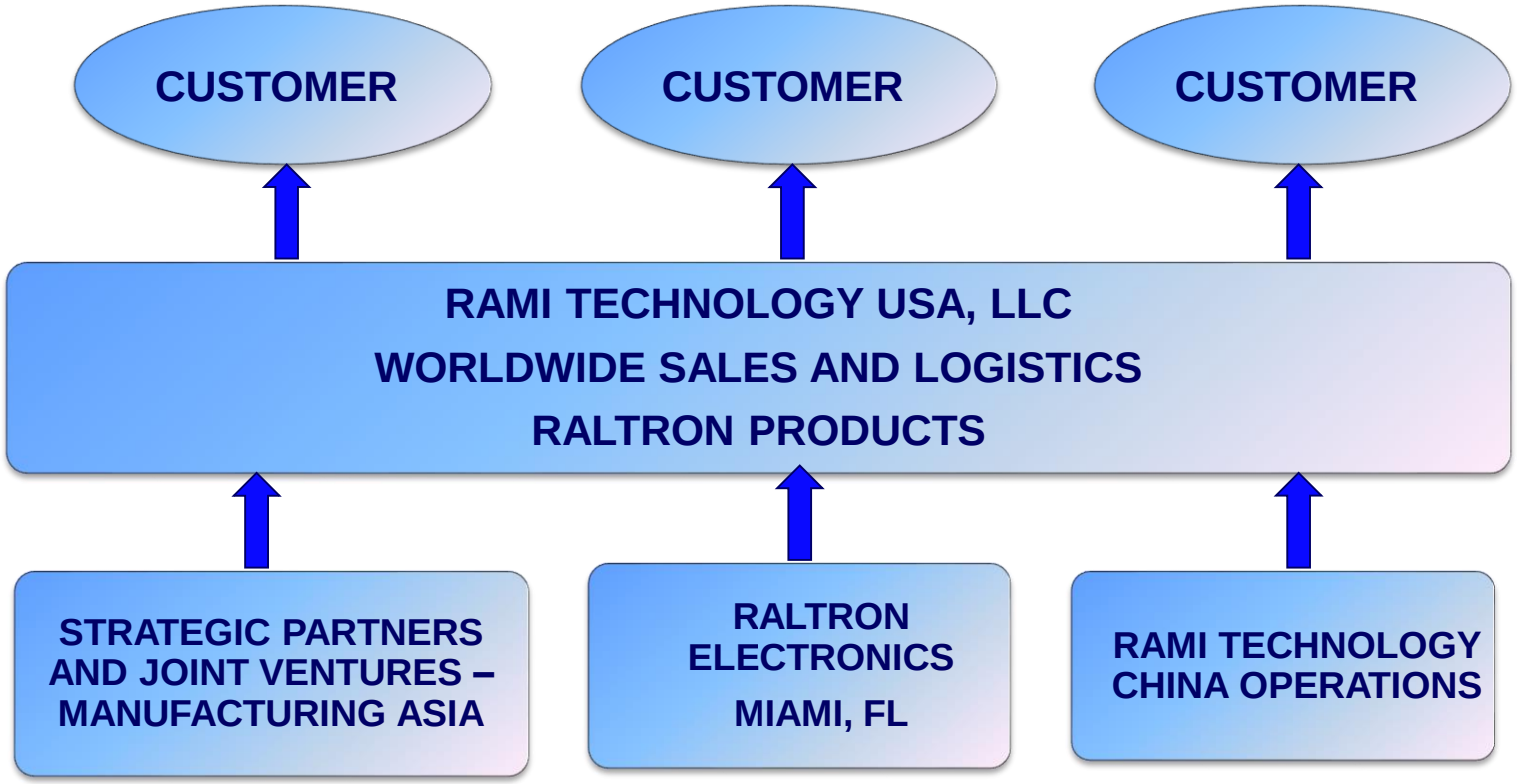
- Founded in 1983,headquartered in Miami ,Fl .
- Design, manufacture and distribute frequency management products including:
  - Precision Crystal Oscillators (VCXOs, TCXOs, OCXOs) and Crystals.
  - High Frequency VCO's and PLL.
  - Filters and ceramic resonators.
  - Synchronization and Timing modules
  - Antennas
- Privately held ISO-9001 certified company.
- Worldwide operation and distribution.
- Global network of sales offices, representatives and distributors.

Raltron Electronics – Business Review



RALTRON / RAMI TECHNOLOGY GROUP SUBSIDIARY COMPANIES

Raltron Electronics – Business Review



RALTRON / RAMI TECHNOLOGY GROUP OPERATIONS CHART

Facilities

Miami – RAMI Technology
Sales, Marketing and Administration

- Corporate Headquarters
- Sales – Americas, Europe, Middle East, and Asia
- Marketing
- Sales Engineering support
- IT Communication
- Failure Analysis Lab

Facilities

Miami – RAMI Technology
Sales, Marketing

- Independent Sales Reps in the Americas, Europe, Middle East and Asia

- Distribution: Future Electronics, Arrow-Richardson,
  Newark, RS Electronics
  Dove, WDI,
  Phoenix, MRF, Dragon

Facilities

Miami – RALTRON

Engineering and Production
Precision Oscillators and Filters

- R&D of High End Precision Oscillators
- Engineering Support for Osc. and Antenna
- Engineering support
- Automated Calibration and Test
- Quick Turn Production
- Regular Production

Facilities

Chengdu, CHINA – RAMI Technology

- TOTAL PERSONNEL: 200
- ENGINEERS: 25

- Mass manufacturing of Crystals, Oscillators and other high-end Frequency Management Products
- ISO 9001:2008 manufacturing and design
- ISO 14001:2004
- High volume manufacturing
- Automated production Line
- 2 – 10k Clean Rooms

PRODUCTION CAPACITY (MONTH)

Crystals metal can 10kk
Crystals ceramic package 12kk
Oscillators 5kk

Facilities

Taiwan – RAMI Technology

- TOTAL PERSONNEL: 297
- ENGINEERS: 22

- Mass manufacturing of Crystals, Oscillators and other high-end Frequency Management Products
- ISO 9001:2008 manufacturing and design
- ISO 14001:2004
- High volume manufacturing
- Automated production Line
- 3 – 10k Clean Rooms

PRODUCTION CAPACITY (MONTH)

Crystals metal can 24kk
Crystals ceramic package 19kk
Oscillators 5kk

Facilities

Zhejiang, China – RAMI Technology

- TOTAL PERSONNEL: 650
- ENGINEERS: 34

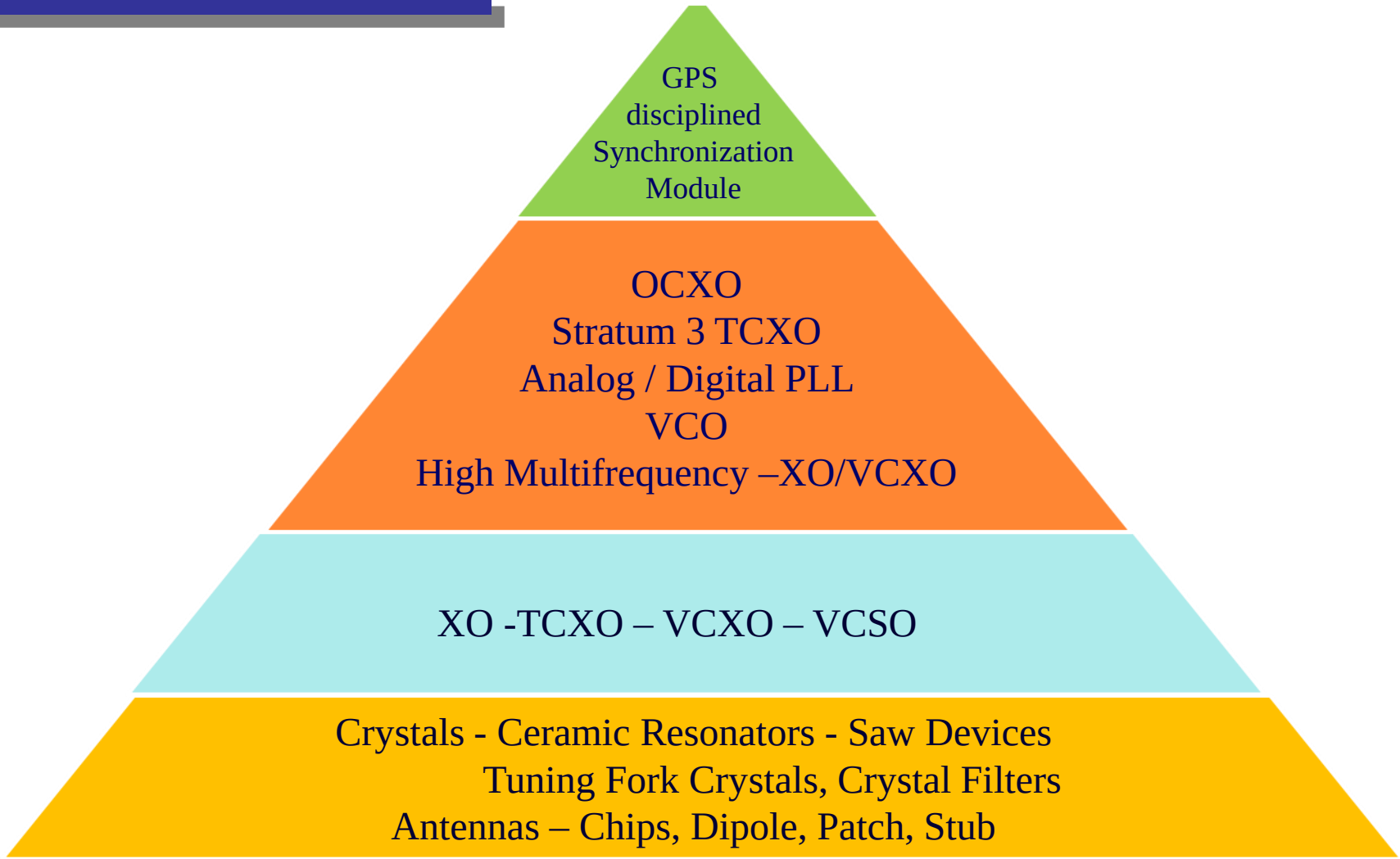
- Mass manufacturing of Antennas
- ISO 9001:2008 manufacturing and design
- ISO 14001:2004
- High volume manufacturing
- Automated production Line

PRODUCTION CAPACITY (MONTH)

ANTENNAS – 4 kk

- Bluetooth
- Chip
- Dipole
- Patch

Raltron's Complete Family of Frequency Control Products



Markets Served

TELECOM – WIRELESS & WIRELINE

- WiMAX, WLAN, Microwave Radio, Base Stations
- Gigabit Ethernet, SONET, Fibre Channel, VOIP

COMPUTERS & PERIPHERALS

- Hard drives, Thumb drives
- Servers, Storage Arrays, Printers
- Embedded computing

Markets Served (Continued)

- **INDUSTRIAL**
  - Robotics, Automation, Thermostats

- **MEDICAL**
  - Medical Equipment, instrumentation

Markets Served (Continued)

- **Utility Metering and Smart Grid**

- **Security**
  - Alarms

Markets Served (Continued)

- **CONSUMER ELECTRONICS**
  - Gaming, GPS, Bluetooth, MP3 players, Digital Cameras

- **BROADCASTING**
  - Audio, Video

Some of Our Customers

CM Relationships

Strategic

Celestica

JABIL

SANMINA

FLEXTRONICS

Benchmark electronics

Key

PEGATRON

PLEXUS
The Product Realization Company

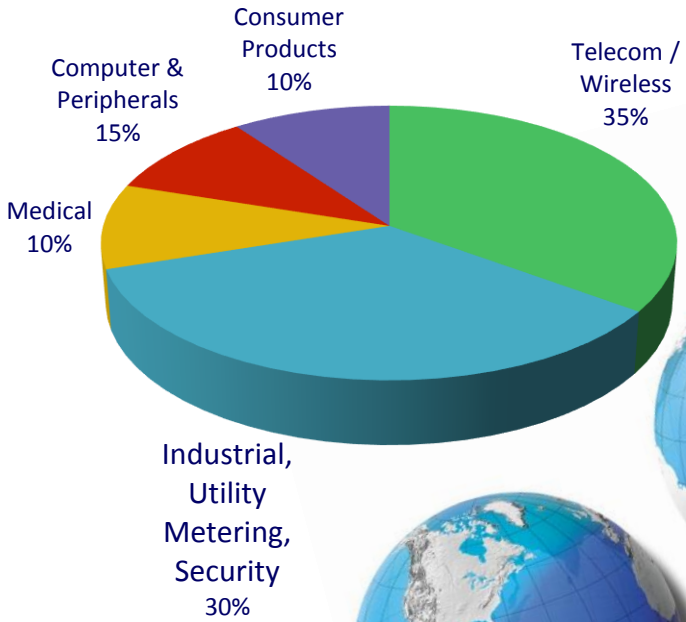
FOXCONN

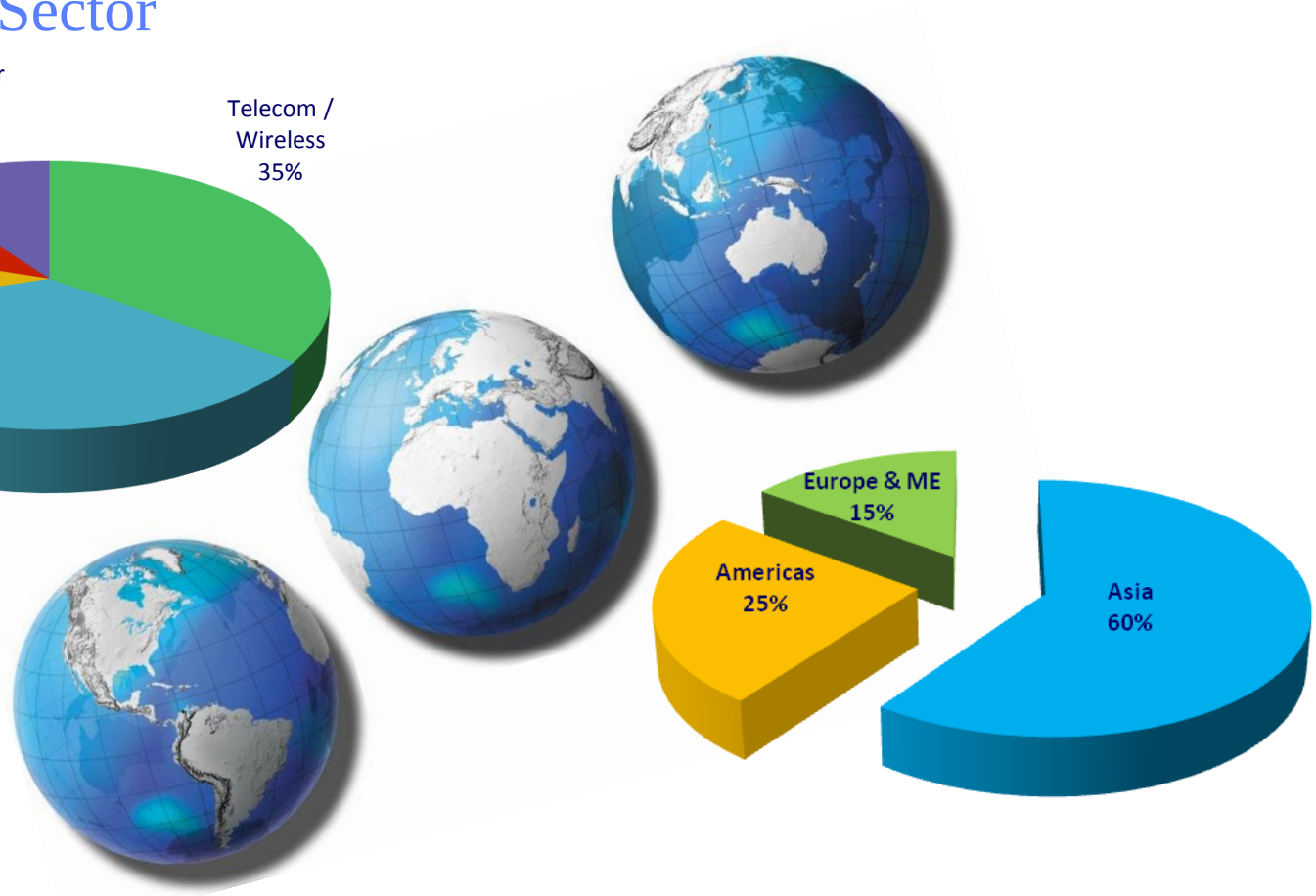
FOXLINK
Foxlink Image Technology

ASTEELFLASH
YOUR EMS PARTNER

Sales and Market Presence

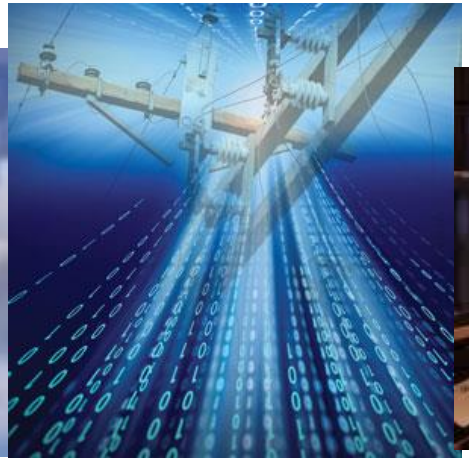
By Market Sector





Global Presence

Solutions for Wireless Applications


Raltron has solutions for most Frequency Control Needs in the Wireless Domain

Solutions for Wireless Applications

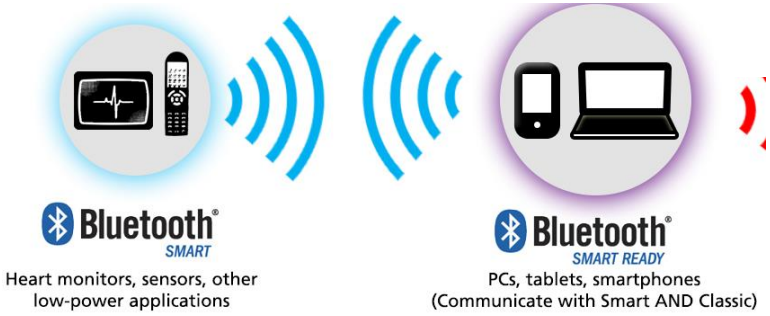
Bluetooth® Smart (previously called BTLE – Bluetooth Low Energy) is an integral part of the Bluetooth Core Specification from Bluetooth v4.0 onwards. Bluetooth Smart brings *Bluetooth* wireless connectivity to low cost, small battery operated devices that require months to years of battery lifetime.

Nordic Semiconductors – nRF8001

- **16.000 MHz crystal**
- **32.768 kHz crystal**

Texas Instruments – CC2640EM-5XD

- **24.000 MHz crystal**
- **32.768 kHz crystal**



Solutions for Wireless Applications

Bluetooth SMART

Raltron solutions –

- **2.5 x 2.0 crystals – R2520 product family (MHz)**
- **2.0 x 1.6 crystals – R2016 product family (MHz)**
- **8.0 x 3.8 tuning fork crystal – RSM200S (kHz)**
- **3.2 x 1.5 tuning fork crystal – RT3215 (kHz)**
- **Chip Antennas – RCA product family**
- **Dipole Antennas – RDP product family**
- **Stub Antennas – RST product family**

Solutions for Wireless Applications

LF (125 kHz) – **RFID Low Frequency readers are used for many applications that use close contact tags; this includes industrial manufacturing, Metal and Water friendly applications, Access Management, Asset Management, Library cards, Student cards, and Animal management applications amongst many others.**

Atmel – ATA5505

32.768 kHz crystal

Microchip – MCRF200

4.000 MHz ceramic resonator

Solutions for Wireless Applications

LF (125 kHz)

Raltron solutions –

- **HC49S/SMD crystal – AS-SMD product family**
- **8.0 x 3.8 tuning fork crystal – RSM200S (kHz)**
- **3.2 x 1.5 tuning fork crystal – RT3215 (kHz)**
- **Ceramic Resonator – POC product family**
- **Dipole Antennas – RDP product family**

Solutions for Wireless Applications

Long Range – 2-way wireless solution that complements machine to machine cellular infrastructure providing low cost and low power ultra-long range spread spectrum communication.

Semtech – SX123x

32.768 kHz crystal

Solutions for Wireless Applications

Raltron solutions –

- **2.5 x 2.0 crystals – R2520 product family (MHz)**
- **2.0 x 1.6 crystals – R2016 product family (MHz)**
- **8.0 x 3.8 tuning fork crystal – RSM200S (kHz)**
- **3.2 x 1.5 tuning fork crystal – RT3215 (kHz)**
- **Saw Filters – RSF product family**
- **Chip Antennas – RCA product family**
- **Dipole Antennas – RDP product family**
- **Stub Antennas – RST product family**

Solutions for Wireless Applications

Low Power Wi-Fi – **Low Power Wi-Fi (IEEE 802.11ah) may already be solved! Low power, low data rate ZigBee is here today in large volumes in set-top boxes and Smart Home offerings, in smart meters and lighting controls.**

Atmel – ATWINC1500

26.000 MHz crystal

32.000 MHz clock

Solutions for Wireless Applications

Low Power Wi-Fi

Raltron solutions –

- **2.5 x 2.0 crystals – R2520 product family (MHz)**
- **2.0 x 1.6 crystals – R2016 product family (MHz)**
- **3.2 x 2.5 clock – COM1 product family (MHz)**
- **5.2 x 3.2 clock – COM2 product family (MHz)**
- **Saw Filters – RSF product family (868 / 915 MHz)**
- **Chip Antennas – RCA product family**
- **Stub Antennas – RST product family**

Solutions for Wireless Applications

™NFC – Near Field Communications – Like RFID NFC works in the 13.56 MHz radiofrequency spectrum using less than 15mA of power to exchange data over distances that are usually less than 20cm. Devices that can transmit data via NFC are called "tags" and can store between 96 and 512 bytes of data.

Texas Instruments – TRF7970A

- 4.000 MHz crystal
- 256 kHz crystal

NXP – PN544

- 27.12 MHz crystal

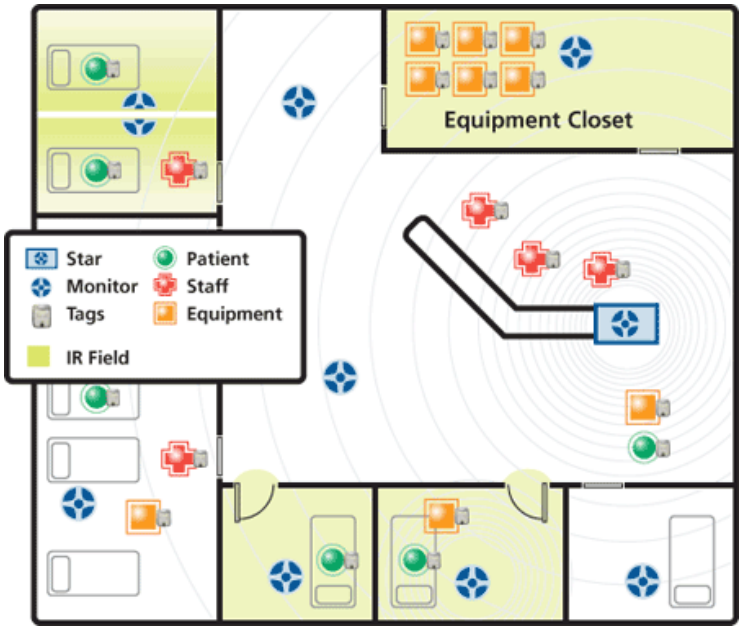
Solutions for Wireless Applications

Raltron solutions –

- **2.5 x 2.0 crystals – R2520 product family (MHz)**
- **2.0 x 1.6 crystals – R2016 product family (MHz)**
- **Chip Antennas – RCA product family**
- **Saw Filters – RSF product family (868 / 915 MHz)**

Solutions for Wireless Applications

RTLS – Real-time locating systems are used to automatically identify and track the location of objects or people in real time



Epsilon G2C547

Solutions for Wireless Applications

RTLS

Raltron solutions –

- **2.5 x 2.0 crystals – R2520 product family (MHz)**
- **2.0 x 1.6 crystals – R2016 product family (MHz)**
- **8.0 x 3.8 tuning fork crystal – RSM200S (kHz)**
- **3.2 x 1.5 tuning fork crystal – RT3215 (kHz)**
- **Chip Antennas – RCA product family**
- **Dipole Antennas – RDP product family**
- **Stub Antennas – RST product family**

Application

RuBee – a two way, active **wireless protocol** using magnetic waves designed for harsh environment, high security asset visibility applications. It uses low-frequency (HF) 131 kHz radio waves and active transceivers that communicate peer-to-peer.

Solutions for Wireless Applications

RuBee

Raltron solutions –

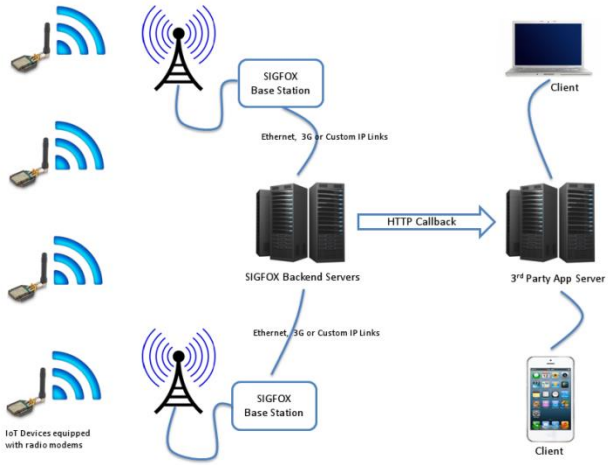
- **2.5 x 2.0 crystals – R2520 product family (MHz)**
- **2.0 x 1.6 crystals – R2016 product family (MHz)**
- **8.0 x 3.8 tuning fork crystal – RSM200S (kHz)**
- **3.2 x 1.5 tuning fork crystal – RT3215 (kHz)**
- **Chip Antennas – RCA product family**
- **Dipole Antennas – RDP product family**
- **Stub Antennas – RST product family**

Solutions for Wireless Applications

SIGFOX uses a UNB (Ultra Narrow Band) based radio technology to connect devices to its global network. An important advantage provided by the use of the narrow band technology is the flexibility it offers in terms of antenna design. On the network infrastructure end it allows the use of small and simple antennas, but more importantly, it allows devices to use inexpensive and easily customizable antennas.

Texas Instruments – CC1120

- **32.000 MHz crystal**
- **32.768 kHz crystal**
- **32.000 MHz TCXO**



Solutions for Wireless Applications

Raltron solutions –

- 2.5 x 2.0 crystals – R2520 product family (MHz)
- 2.0 x 1.6 crystals – R2016 product family (MHz)
- 8.0 x 3.8 tuning fork crystal – RSM200S (kHz)
- 3.2 x 1.5 tuning fork crystal – RT3215 (kHz)
- 3.2 x 2.5 TCXO – RTX104 product family (MHz)
- Saw Filters – RSF product family
- Chip Antennas – RCA product family
- Dipole Antennas – RDP product family
- Stub Antennas – RST product family

Technology Challenges

- HIGHER FREQUENCIES
- LOW SUPPLY VOLTAGE
- SMALLER PACKAGE
- TIGHTER STABILITY
- LOWER POWER CONSUMPTION
- RoHS COMPLIANT/Pb FREE
- LOWER COST
- SHORTER LEAD-TIMES

Technology Road Map – Crystals SMD

SIZE (mm)	FREQUENCY (MHz)
HC-49S-SMD	3 – 70
7 x 5 x 1.1	6 – 100
6 x 3.5 x 1	10 – 200
5 x 3.2 x 1	8 – 100
3.2 x 2.5 x 0.9	10 – 80
2.5 x 2.0 x 0.5	12 – 60
2.0 x 1.6 x 0.5	16 – 60
1.6 x 1.2 x 0.3	24 – 54
1.2 x 1.0 x 0.3 (2015)	36 – 54

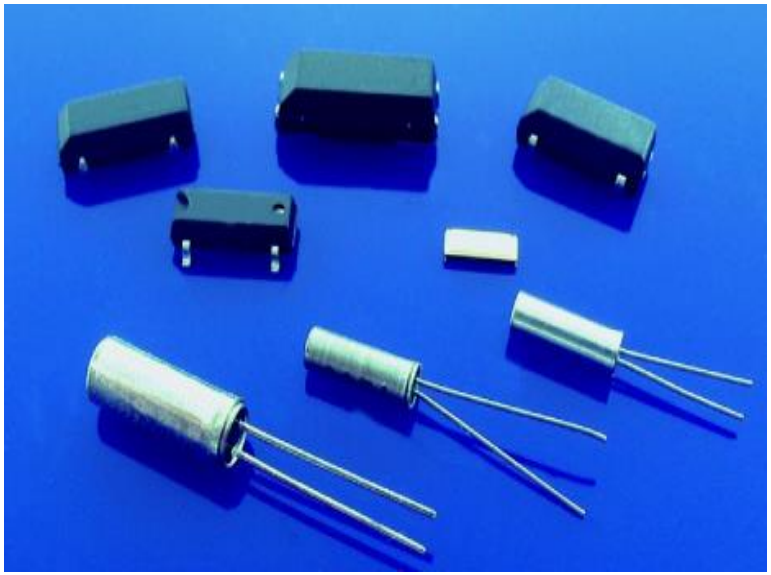
- **Smaller Packages**
  - Down to 1.2 x 1.0 x 0.3 mm
- **Improved Stability**
  - Down to +/- 5 ppm
- **Higher Frequencies**
  - ~ 300MHz Fundamental

APPLICATION

Microprocessor Clock, Computer Peripherals, Bluetooth, WLAN, Utility Metering, Security, Industrial

Technology Road Map – Tuning Fork

SIZE (mm)	FREQUENCY
2 dia x 6	32.768 kHz
3 dia x 8	“
1.5 dia x 5	“
8.0 x 3.8 x 2.5	“
6.9 x 1.4 x 1.3	“
4.1 x 1.5 x 0.9	“
3.2 x 1.5 x 0.8	“
2.0 x 1.2 x 0.6	“



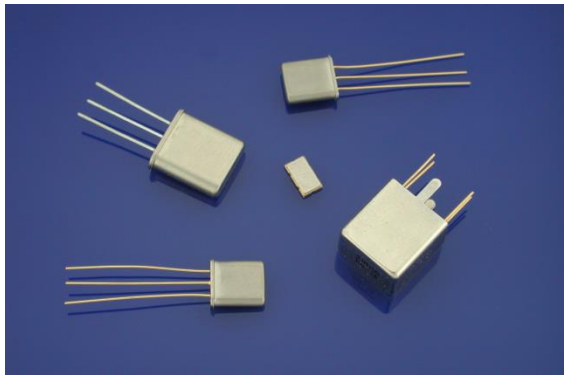
APPLICATION

Microprocessor Clock, Computer Peripherals, Bluetooth, WLAN, Utility Metering, Security, Industrial

Technology Road Map – Monolithic and Discrete Crystal Filters

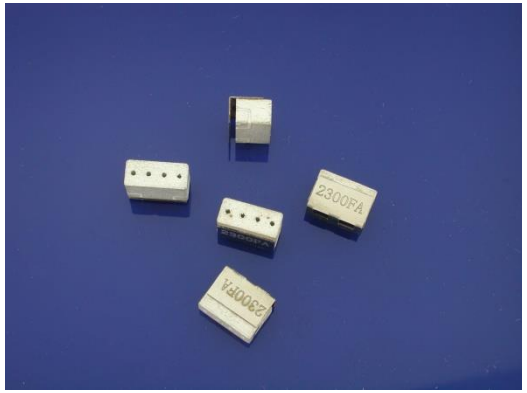
Monolithic Crystal Filters:

- **Frequency Range:**
  - **10MHz to 150MHz**
- **Metal Can and Ceramic Packages**
- **Standard and custom designs**



Discrete Multi Pole Crystal Filters:

- **Frequency Range:**
  - **10 MHz to 100MHz**
- **Low Pass, Band Pass, Notch, High Pass, Diplexers**



Ceramic Filters:

- **Frequency Range:**
  - **100 MHz to 3900 MHz**
- **Low Insertion Loss**

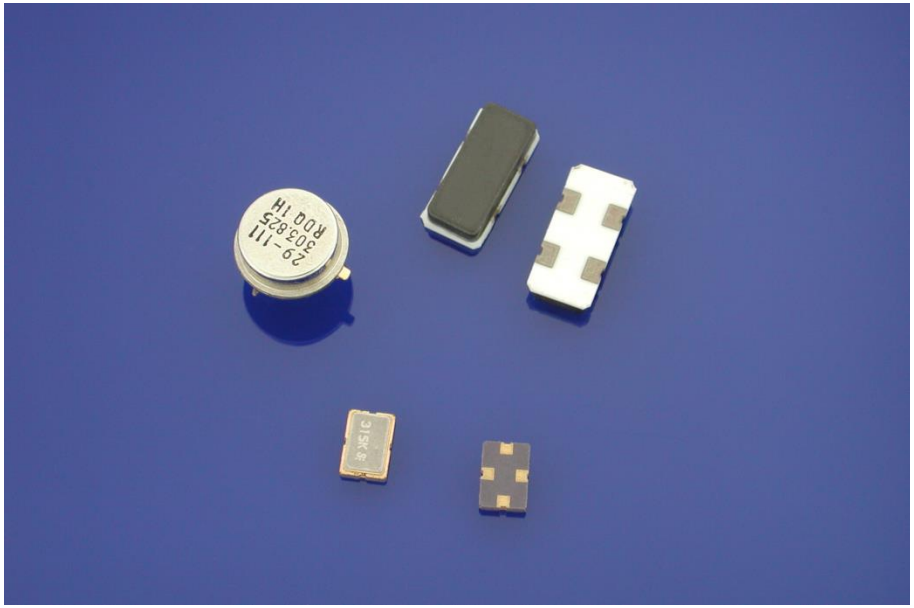
APPLICATION

Wireless Communications Infrastructure, Two Way Radios, Audio, Wireless Microphones, Precision Instrumentation, Military

Technology Road Map – SAW Resonators and Filters

SAW Resonators:

- **Frequency range:**
  - **IF: 32 MHz to 975 MHz**
  - **RF: 139 MHz to 2675 MHz**
- **Metal Can and Ceramic SMD**



SAW Filters:

- **Frequency range:**
  - **100 MHz to 3900 MHz**
- **Metal Can and Ceramic SMD**
- **Standard Products and Customized Designs**

APPLICATION

Wireless Communications Infrastructure, Wireless Microphones, Instrumentation, Utility Metering, Navigation, Security

LTCC CERAMIC FILTERS, BALUNS AND CHIP ANTENNA

	Band Pass Filter									
LTCC RF Filter	Bluetooth / Wi-Fi / Zigbee				Wi-Fi		Wi-MAX / TD-LTE			
	2.45 GHz				5 GHz		2.3 GHz	2.5 GHz	2.6 GHz	3.5 GHz
	2520 (1008)	2012 (0805)	1608 (0603)	1005 (0402)	2012 (0805)	1608 (0603)	1608 (0603)	2012 (0805)	1608 (0603)	1608 (0603)

	Low Pass Filter							IPD	CPL (Coupler)
LTCC RF Filter	Bluetooth / Wi-Fi / Zigbee			Wi-Fi	Wi-MAX / TD-LTE			Bluetooth / Wi-Fi	Bluetooth / Wi-Fi / Mobile
	2.45 GHz			5 GHz	2.5 GHz	2.6 GHz	3.5 GHz	2.45 GHz - 5 GHz	Variable Frequency
	2012 (0805)	1608 (0603)	1005 (0402)	1608 (0603)	1608 (0603)	1608 (0603)	1608 (0603)	2520	1608 / 1005

	Balanced Filter (Balun Filter)					Diplexer	
RF Filter	Bluetooth / Wi-Fi			Wi-Max		Wi-Fi	
	2.45 GHz			5 GHz	2.5 GHz	2.6 GHz	3.5 GHz
	2012 (0805)	1608 (0603)	1005 (0402)	1608 (0603)	1608 (0603)	1608 (0603)	1608 (0603)

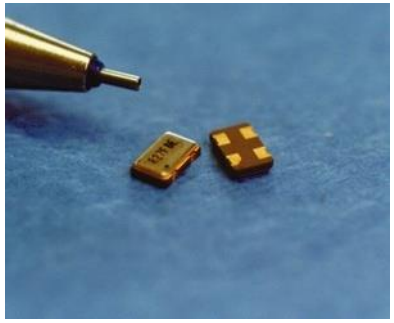
	Balun				
Balun	Bluetooth / Wi-Fi / Zigbee				Wi-Max
	2.45 GHz			5 GHz	2.5 GHz
	2012 (0805)	1608 (0603)	1005 (0402)	2012 (0805)	1608 (0603)

	Discrete					Array	
Common Mode Filter	USB 2.0 / IEEE 1394 / LVDS			HDMI / LVDS / DVI / PCI-E		USB2.0 / IEEE 1394 / LVDS	HDMI / LVDS / DVI / PCI-E
	1632 (0612)	1220 (0508)	1210 (0504)	2012 (0805)	1210 (0504)	2010 (0804)	2010 (0804)

	Chip Antenna										
Antenna	GPS		Bluetooth / Wi-Fi / Zigbee							Wi-Fi	WiMax
	1.575 GHz		2.45 GHz							2.4/5 GHz	2.6 / 3.5 GHz
	1003	3216	3216	5220	7635	8010	1204	1903	9937	6050	3216

Technology Road Map – SMD XO

SIZE (mm)	FREQUENCY
14 x 9.8 x 4.7	1 – 250 MHz
7.0 x 5.0 x 1.8	32.768 kHz, 1 – 1500 MHz
5.0 x 3.2 x 1.1	32.768 kHz, 1 – 1500 MHz
3.2 x 2.5 x 1.0	32.768 kHz, 1.8 – 300 MHz
2.5 x 2.0 x 0.8	32.768 kHz, 1 – 50 MHz
2.0 x 1.6 x 0.8	32.768 kHz, 1 – 50 MHz
1.6 x 1.2 x 0.3	4-54MHz
1.2 x 1.0 x 0.3	2016



- Internal Construction: Fundamental Mode, PLL, 3rd OT, Analog Multiplication
- Stability: up to +/10ppm (all conditions) -40°C to +85°C
- Jitter: down to 250 fs (12KHz-20MHz) RMS
- Low supply voltage: 1.8V, 2.5V, 3.3V
- Output waveform: LVPECL, LVDS, HCMOS, HCSL
- Fast turnaround option available

APPLICATION

Industrial, Ethernet, Fiber Channel, SATA, Wireless Transmission

FAST TURNAROUND – LOW JITTER CLOCK OSCILLATORS

XCO

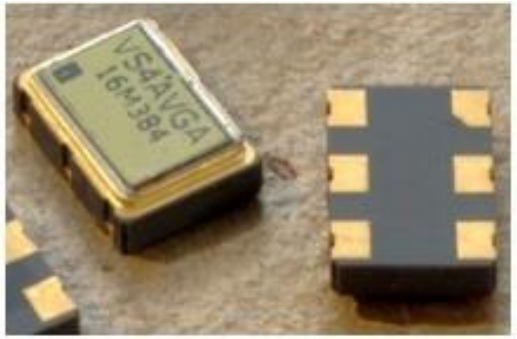
Fast turnaround, low jitter clock oscillator

FAST TURNAROUND – LOW JITTER CLOCK OSCILLATORS

SELECTOR GUIDE	LVCMOS			LVDS			LVPECL		
Package Size (mm)	7.0x5.0	5.0x3.2	3.2x2.5	7.0x5.0	5.0x3.2	3.2x2.5	7.0x5.0	5.0x3.2	3.2x2.5
Family Part Number	XCO-74	XCO-54	XCO-34	XCO-78	XCO-58	XCO-38	XCO-79	XCO-59	XCO-39
Frequency Range (MHz)	10 – 250			10 – 1200			10 - 1200		
Frequency Stability (ppm)	±20, ±25, ±50, ±100			±20, ±25, ±50, ±100			±20, ±25, ±50, ±100		
Number of Frequencies	1, 2, 4			1, 2, 4			1, 2, 4		
Supply Voltage (V)	2.5, 3.3			2.5, 3.3			2.5, 3.3		
Temperature Range (°C)	-20 ~ +70			-20 ~ +70			-20 ~ +70		
	-40 ~ +85			-40 ~ +85			-40 ~ +85		
Enable/Disable Pin	Pin 1, Pin 2, or None			Pin 1, Pin 2, or None			Pin 1, Pin 2, or None		

Technology Road Map – VCXO/VCSO

SIZE (mm)	FREQUENCY (MHz)
9.0 x 14 x 5 (SAW)	125 – 800
9.0 x 14 x 5 (Crystal)	1 – 1500
5.0 x 7.0 x 1.5 (SAW)	622.08
5.0 x 7.0 x 1.5 (Crystal)	1 – 1500
5.0 x 3.2 x 1.0 (Crystal)	1 – 1500



- Internal Construction: Fundamental Mode, PLL, 3rd OT, Analog Multiplication, SAW
- Temperature Stability: up to +/-20ppm (all conditions)
- APR (absolute pull range): up to +/-150ppm
- Low Jitter: down to 250fs (12KHz – 20MHz) RMS
- Low phase Noise: -160dBc /Hz Noise Floor
- Output waveform: LVPECL, LVDS, LVCMOS, HCSL

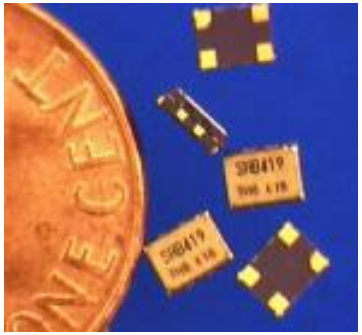
APPLICATION

SONET/SDH, Networking, SD/HD video, Test Instrument, Clock and Data recovery, Clock Generation

Technology Road Map – SMD TCXO/TCVCXO

• GENERAL PURPOSE / GPS

SIZE (mm)	FREQUENCY (MHz)	VOLTAGE (VDC)	OUTPUT WAVEFORM
5.0 x 3.2 x 1.5	10 – 52	2.5 to 5.0	Clipped Sine Wave
3.2 x 2.5 x 1.2	10 – 40	1.7 to 3.3	Clipped Sine Wave
2.5 x 2.0 x 0.8	10 – 52	1.7 to 3.3	Clipped Sine Wave
2.0 x 1.6 x 0.8	13 - 52	1.7 to 5.5	Clipped Sine Wave
1.6 x 1.2 x 0.3	13 - 52	1.7 to 3.3	Clipped Sine Wave



- Single and Double Package construction options
- Tighter Stability: ±1.5 PPM, -40°/+85°C and ± 0.5 PPM, -30°/+85°C
- Improved frequency tuning characteristic
- Superior Phase Noise Performance (-150 dBc / Hz on the floor)
- Support most popular GPS IC solutions: CSR/SIRF, Nemerix, Skytraq, Sige, MTK, etc
- Typical Frequencies: 10.0 MHz, 13.0 MHz, 19.20 MHz, 19.44 MHz, 20.0 MHz, 26.0 MHz, 30.0 MHz, 32.0 MHz, 40.0 MHz, 50.0 MHz

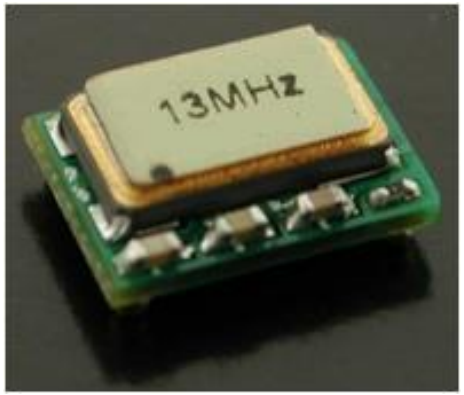
Applications:

Utility Metering, Mobile Phone, PDA, Remote Control, Telemetry

Technology Road Map – Stratum III SMD VCTCXO/TCXO

•STRATUM 3

SIZE (mm)	FREQUENCY (MHz)	VOLTAGE (VDC)	Frequency Stability -40° to +85°C	OUTPUT WAVEFORM
5.0 x 7.0 x 1.5	10 - 52	2.5 to 5.0	0.20 ppm	Clipped Sine Wave & CMOS
5.0 x 3.2 x 1.5	10 - 52	2.7 to 5.5	0.20 ppm	Clipped Sine Wave & CMOS



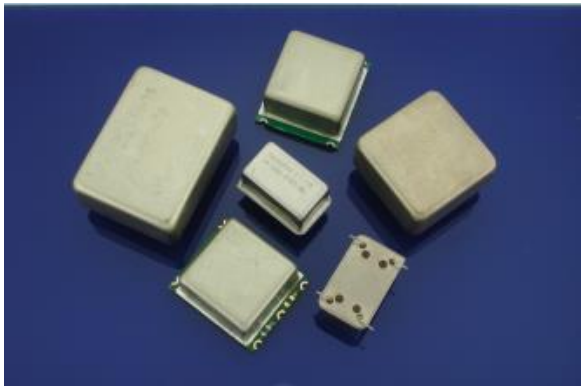
- Tighter Stability: to ± 0.5 PPM, -40°/+ 85° C
- Stratum 3 compliant: ± 0.28 PPM over - 40° C to + 85°C
  ± 4.6 PPM overall including 20 years Aging
- Low Phase Noise Performance: -135 dBc /Hz at 1 KHz and -150 dBc/Hz on the floor
- Low power substitute for AT cut OCXO s

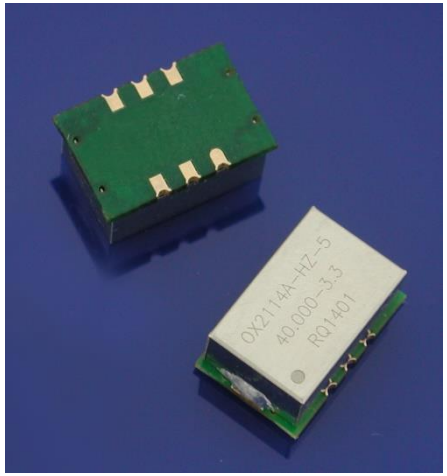
APPLICATION

Telecom Infrastructure, Network Equipment, Wireless Equipment, Test and Measurement Equipment, Picocell, Femtocell

Technology Road Map – High Stability OCXO

SIZE (Inch)	FREQUENCY (MHz)
TH DIP 14	1 – 70
SMD DIP 14 style	1 - 70
TH 2x2x1	10 – 300
TH Euro pkg.	1 – 160
1.0x0.9x0.5 SMD	1 – 160
9 x 14 SMD	10 – 40





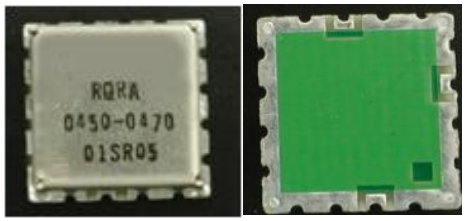
- Smallest Packages: 9 x 14 mm OCXO
- Excellent Phase Noise: -160 dBc/Hz Noise Floor
- Temperature Stability (-40°C to +85°C):
  - ± 1 ppb SC cut
  - ± 0.08 ppm AT cut
- Double oven design available

APPLICATION

Telecommunication, Base Stations, Test and Measurement Equipment, IEEE 1588

Technology Road Map – VCO and PLL

VCO SIZE (mm)	FREQUENCY
5 x 4 mm **VCO**	300 to 2.6 GHz
6 x 8 mm **VCO**	Up to 6 GHz
12.5 x 12.5 mm **VCO**	Up to 6 GHz
7.6 x 7.6 mm **VCO**	Up to 6 GHz
PLL SIZE (mm)	**Freq Input/output**
20 x 14 mm **PLL**	8KHz / 5GHz



VCO

Analog PLL

PLL

- Custom designs to meet your needs
- SMD Packages as small as 9.8 x 9.3mm
- Frequencies up to 5GHz with low Phase Noise
- Programmable Frequency Steps.
- Fast Locking with optimized Loop Band Width
- Low Cost Solution

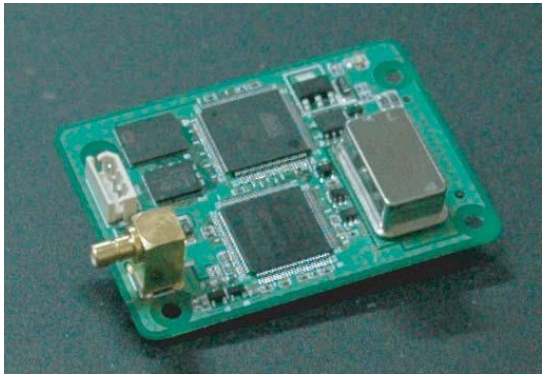
VCO

- Custom designs to meet your needs
- SMD Packages as small as 5 x 4 mm
- Frequencies up to 6GHz with
- Wide Tuning Range
- Technologies include: Micro strip, Coax, CRO, Ceramics, SAW, High Q Inductor.

APPLICATION

Commercial RF, Microwave and Wireless Markets.

Technology Road Map – GPS Disciplined Clock Synchronization Modules



- Timing Receiver
- IEEE 1588 PTP Slave
- IEEE 1588 PTP Master / Slave
- WiMax SYNC Detection Module

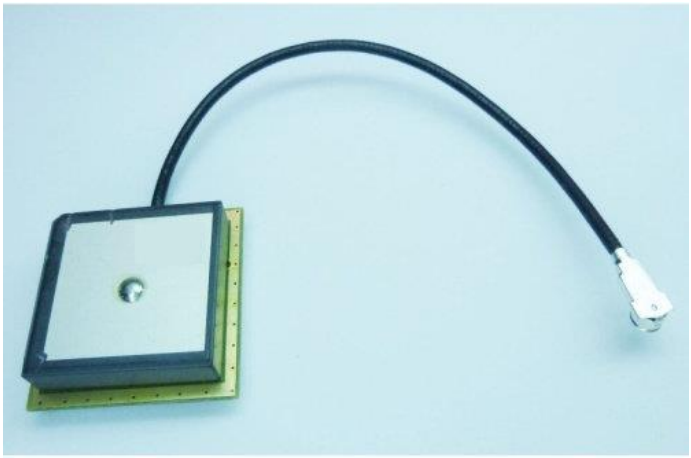
- Smaller Form Factor 48 x 36 x 18 mm, 62 x 44 15 mm, 70 x 56 x 10 mm
- Provides stable Holdover timing accuracy
- Additional 2 Reference Inputs: IEEE1588, 1pps
- Additional 1pps Output
- Standard NEMA Protocol
- High Stability OCXO

APPLICATION

WiMax / LTE, DVB-T Base Station,

Technology Road Map – Patch Antennas

Application	FREQUENCY (MHz)
RFID	915
GPS	1575
GLONASS	1602
BDS	1561



- Available Packages: 9x9 mm to 25x25 mm
- Passive or Active
- Custom Cable and Terminations per customer requirements

APPLICATION

GPS, GLONASS, BeiDou, RFID

Technology Road Map – Stub Antennas

Application	FREQUENCY (MHz)
VHF	150 ~ 230
UHF	350 ~ 400
RFID	890 ~ 960
GPRS	900/1800
Wi-Fi	2.4 ~ 2.5 GHz / 5 GHz

- Straight or Right Angle
- Inside or Outside
- Custom Cable and Terminations per customer requirements

APPLICATION

VHF, UHF, RFID, GPRS, Wi-Fi, GSM, Bluetooth, ZigBee

Technology Road Map – Dipole Antennas

Application	FREQUENCY (MHz)
VHF	150 ~ 230
UHF	350 ~ 400
RFID	890 ~ 960
GPRS	900/1800
Wi-Fi	2.4 ~ 2.5 GHz / 5 GHz

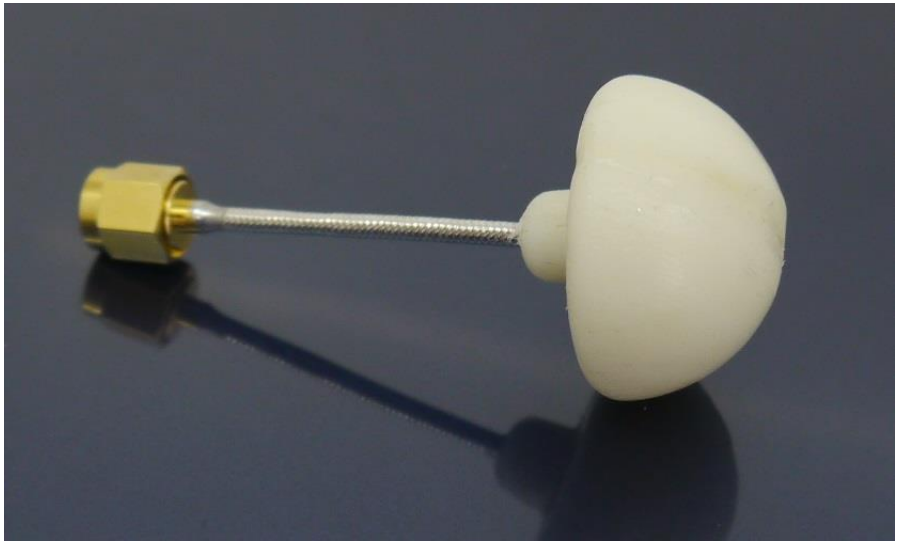
- Straight or Whip
- Inside or Outside
- Magnetic or Adhesive Mount
- Custom Cable and Terminations per customer requirements

APPLICATION

VHF, UHF, RFID, GPRS, Wi-Fi, GSM, Bluetooth, ZigBee

Technology Road Map – Dome Antennas

Application	FREQUENCY (MHz)
RFID	915
GPS	1575
GLONASS	1602
BDS	1561
Wi-Fi	2400 ~ 2500



- Custom Cable and Terminations per customer requirements

APPLICATION

GPS, GLONASS, BeiDou, RFID, Wi-Fi, GSM, Bluetooth, ZigBee

Technology Road Map – PCB Antennas

Application	FREQUENCY (MHz)
VHF	150 ~ 230
UHF	350 ~ 400
RFID	890 ~ 960
GPRS	900/1800
Wi-Fi	2.4 ~ 2.5 GHz / 5 GHz

- Available Sizes:
  - Custom Design based on Customer requirements

APPLICATION

VHF, UHF, RFID, GPRS, Wi-Fi, GSM, Bluetooth, ZigBee

BUSINESS Review

- Engineering Support
  - Circuit Design and Modification at any stage
  - Custom design and modification of standard products
  - Failure Analysis Labs in Miami and China
  - Antenna Technical Support in Miami
  - Quick turn prototypes available
  - Technical papers and application notes
  - Software for oscillator circuit design and analysis
  - Technical seminars

BUSINESS Review

- Logistic Support
  - Products are drop shipped to all world wide customers from two centralized logistic points: Hong Kong for Asia made products and Miami for US made products
  - Unique world wide computer system allowing seamless order entry and tracking
  - VMI , JIT and Kan Ban programs

BUSINESS Review

- Why Raltron?
  - Complete line of Frequency Components from simple microprocessor crystals to high precision oscillators and board level products – quintessential "one stop shopping"
  - World wide presence
  - Market compatible and cost effective logistics
  - Competent and effective technical support
  - Competitive total acquisition cost
  - Long term partnerships with customers as foundation for business growth

Contact

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