Raltron Products for Smart City Applications
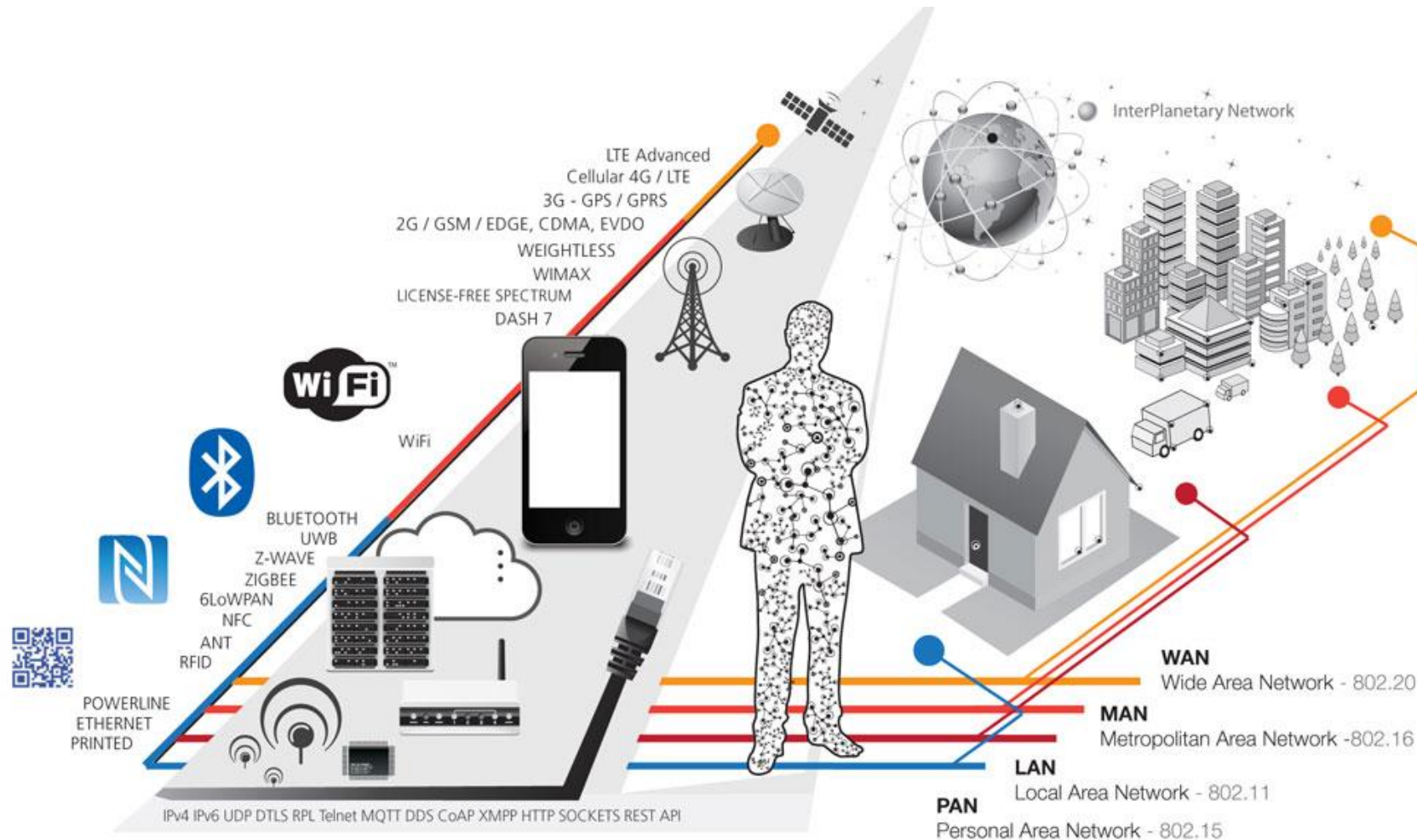
Introduction

Raltron offers the most comprehensive line of frequency management components for Smart City 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.

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What is Smart City?

❑ A Smart City is a city that utilizes advanced technologies and data-driven solutions to enhance the quality of life for its citizens and improve the efficiency of urban services. To achieve this goal, a Smart City aims to create an intelligent and sustainable ecosystem by integrating various components such as transportation, energy, healthcare, and communication.

❑ To collect and analyze data in real-time, a Smart City uses sensors, data analytics, and Internet of Things (IoT) devices. This data helps city administrators make informed decisions and optimize resource allocation. By leveraging technology, a Smart City can improve mobility, reduce carbon emissions, increase safety, and foster economic growth.

❑ Smart Cities offer a promising solution to address urban challenges and create a better future for citizens, especially with the growing global population and rapid urbanization.

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The Future Of Smart Cities

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Global Solutions for Frequency Management

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 Smart City 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 Smart City 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

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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 Smart City 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
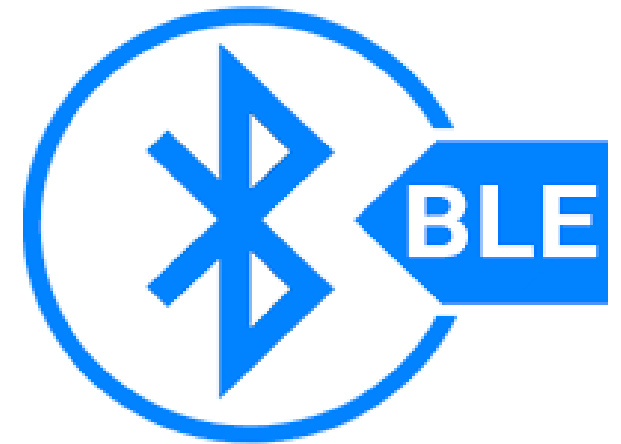- 2.4 GHz Chip Antenna

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

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Solutions for Near-field Communication Protocol

NFC operates at 13.56 MHz on ISO/IEC 18000-3 air interface. The technology is a simple extension of the ISO/IEC14443 proximity-card standard(contactless card, RFID).

Some Typical Crystal or TCXO frequencies for Near-field communication Smart City Applications ICs:

NXP Semiconductors - PN7160_PN7161 - 27.12 MHz Crystal, 40 MHz Oscillator
PN7150 - 27.12 MHz Crystal, 40 MHz Oscillator

STMicroelectronics - ST25R3916 - 27.12 MHz Crystal, 27 kHz RC Oscillator, 32.768 kHz Crystal
ST25RU3993 - 20 MHz TCXO
ST95HF - 27.12 MHz Crystal

See All Crystal Products

See Antenna Products for NFC

Applicable Raltron Products

Texas Instruments - CC330x

40 MHz Crystal 5pf 10/10ppm 60 ohm
R2016-40.000-6-F-1010-EXT-TR-NS1
R2520-40.000-6-F-1010-EXT-TR-NS1

32.768 kHz Crystal Oscillator
RT3215-32.768-12.5-TR

2.4 GHz Antenna
RST-W2-P-105-RPSMA-H
RCA-5220-A0-TR

CC330x Wi-Fi and BLE Companion IC

Interfaces
SDIO / SPI
UART
Coexistence
Antenna Diversity

Wi-Fi & BLE Core
DMA
Crypto
ELP
Wi-Fi MAC / Modem
BLE MAC / Modem
2.4 GHz Wi-Fi / BLE RF

nReset

System
Power
Clock
User OTP
Packet RAM
Execution / Data RAM

2.4 GHz ANT

— — — CC3301 only

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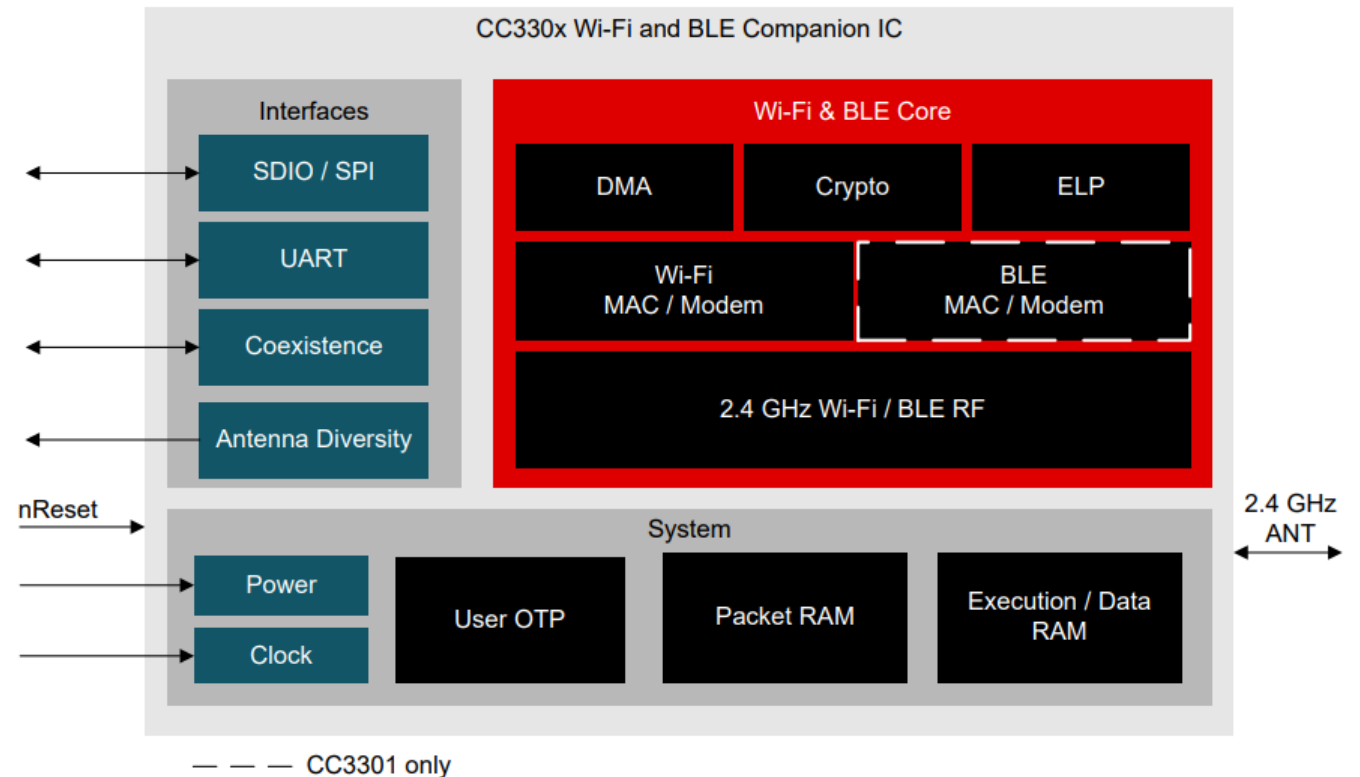
Applicable Raltron Products

Renesas - R9A06G150

24 MHz Clock Oscillators

CO2016-24.000-3.3-25-TR-NS1

CO2520-24.000-3.3-50-EXT-T-TR

32.768 kHz Crystal Oscillator

RT1610-32.768-12.5-TR
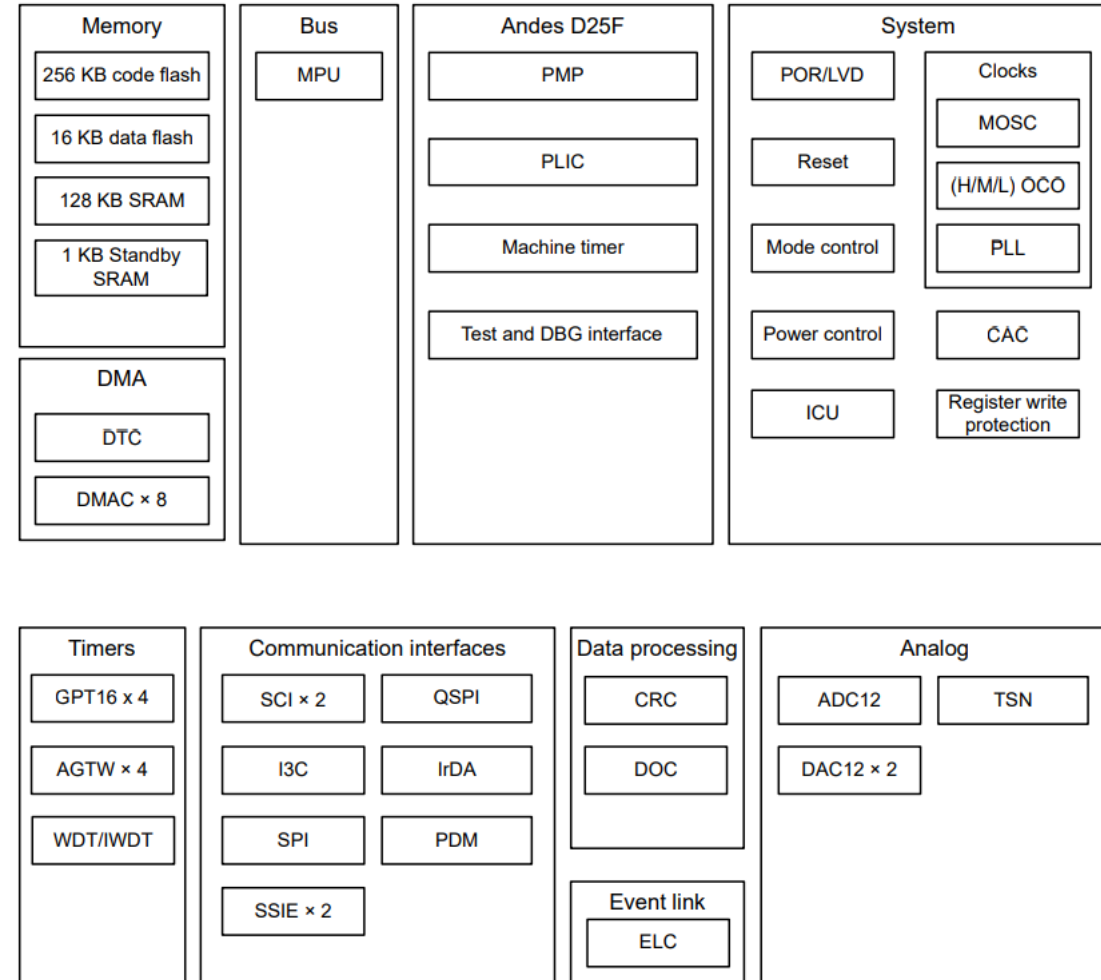
Raltron Solutions - MHz Crystals

Available Crystal Packages

Part #	Size(mm)
R2016-32.000-12-F-1010-EXT-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
R2520-16.000-10-1020-EXT-TR	2.50 x 2.00 x 0.65
RH100-24.000-9-1010-TR	3.20 x 2.50 x 0.70

See All Crystal Products

Typical Frequencies:
16 MHz, 20 MHz, 24 MHz, 26 MHz, 32 MHz, 26 MHz, 37.4 MHz, 38.4 MHz, 39 MHz, 40 MHz, 48 MHz, 59.97 MHz , 64 MHz

Stock at our Distributors

Product Series	Datasheet	Image	Contact Us / Buy Now
R1612 View products in stock	PDF		Buy Now
R2016 View products in stock	PDF		Buy Now
R2520 View products in stock	PDF		Buy Now
RH100 View products in stock	PDF		Buy Now

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Raltron Solutions – Oscillators

Raltron MHz Oscillators Solutions

Part #	Frequency(MHz)
CO2016-24.000-3.3-25-TR-NS1	24
CO2520-24.000-3.3-50-EXT-T-TR	24

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

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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

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

Frequency Tolerances: ±20 ppm and ±10 ppm

Stock at our Distributors

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

See All Crystal Products

Raltron Solutions – Antennas

Raltron Antennas Solutions

Part #	Datasheet	Image	Frequency(MHz)	Contact Us / Buy Now
RCA-3216-A1-TR	PDF		2450±50	Contact Us
RCA-5220-A0-TR	PDF		2450±50	Buy Now
RCA-E-3216-A2-TR	PDF		2400~2483.5	Contact Us
RCA-E-3216-E1-TR	PDF		1575	Contact Us
RCA-W2-P-3216-A29-G	PDF		2545	Contact Us
RCA-W2A1-3216-Z-040	PDF		2400~2500	Buy Now

See Antenna Products for Wi-Fi
See Antenna Products for Bluetooth
See Antenna Products for NFC

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Raltron Products – LTCC Filters, Baluns and Diplexers

Raltron LTCC Filters, Baluns and Diplexers Solutions

Part #	Datasheet	Size(mm)	Contact Us / Buy Now
RCF-5500.000-700000-1005-W-001	PDF	1.00 x 0.50 x 0.40	Contact Us
RBL-2430.000-1005-EV-001	PDF	1.00 x 0.50 x 0.40	Contact Us
RCDI-24-49-1608-W-TR	PDF	1.60 x 0.80 x 0.60	Contact Us
RCDI-W2A1-W5A17-1608-W-TR	PDF	1.60 x 0.80 x 0.60	Contact Us

See All LTCC Filters, Baluns and Diplexers Products

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Global Solutions for Frequency Management

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Raltron Solutions - RF Connectors

Raltron RF connectors with low insertion loss and excellent voltage standing wave ratio support the high-level performance demanded by Smart City Applications.

Product #	Datasheet	Image	Connector Family	Description
RCN-3F-3108-K-001	PDF		BNC	BNC Straight Jack PCB Receptacle
RCN-4F-28012-K-001	PDF		MCX	MCX Straight Jack PCB Receptacle
RCN-5F-33106-K-001	PDF		MMCX	MMCX Straight Jack PCB Receptacle
RCN-17M-12816-K-001	PDF		N	Type N Right Angle Plug
RCN-1M-21419-K-001	PDF		SMA	SMA Straight Plug (Quick Fit) for Semi Rigid Cable
RCN-9F-16801-K-001	PDF		TNC	TNC Straight Jack Bulkhead Crimp

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Raltron Solutions - RF Cable Assemblies

Raltron cable assemblies range from simple jumpers to power and high-speed data cables.

Product #	Datasheet	Image	Cable Assemblies	Description
RCB-16-F-95-11-SD	PDF		SMA to IPEX	RP SMA Jack S/T For RF1.13 Cable
RCB-21-174-150-DO-001	PDF		MCX to MCX	MCX Plug to MCX R/A Plug For RG174 Cable
RCB-14-H-100-12-SD	PDF		MCX to SMA	SMA Jack to MCX Plug For RF1.37 Cable
RCB-15-A-100-12-SD	PDF		MMCX to SMA	SMA to MMCX For RG174 Cable
RCB-13-J-600-13-SD	PDF		TNC to SMA	TNC Jack S/T For RG316 Cable

CABLE ASSEMBLIES SHORT FORM CATALOG

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