

Introduction

Purpose

- To familiarize customers with Yageo's Wireless Components and their applications

Objectives

- Introduce Yageo's antennas, filters and modules product offering
- Product key features and their applications
- Explore Yageo's part number breakdowns

Content

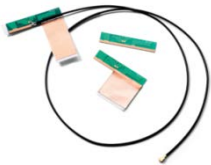
- 22 pages

Learning Time

- 10 minutes

Yageo Wireless Components Product Portfolio

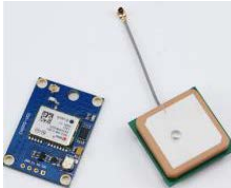
Antenna

			 1005/1608 chip	 Full Range Dimension
Metal	PCB	FPCB	Chip	Patch

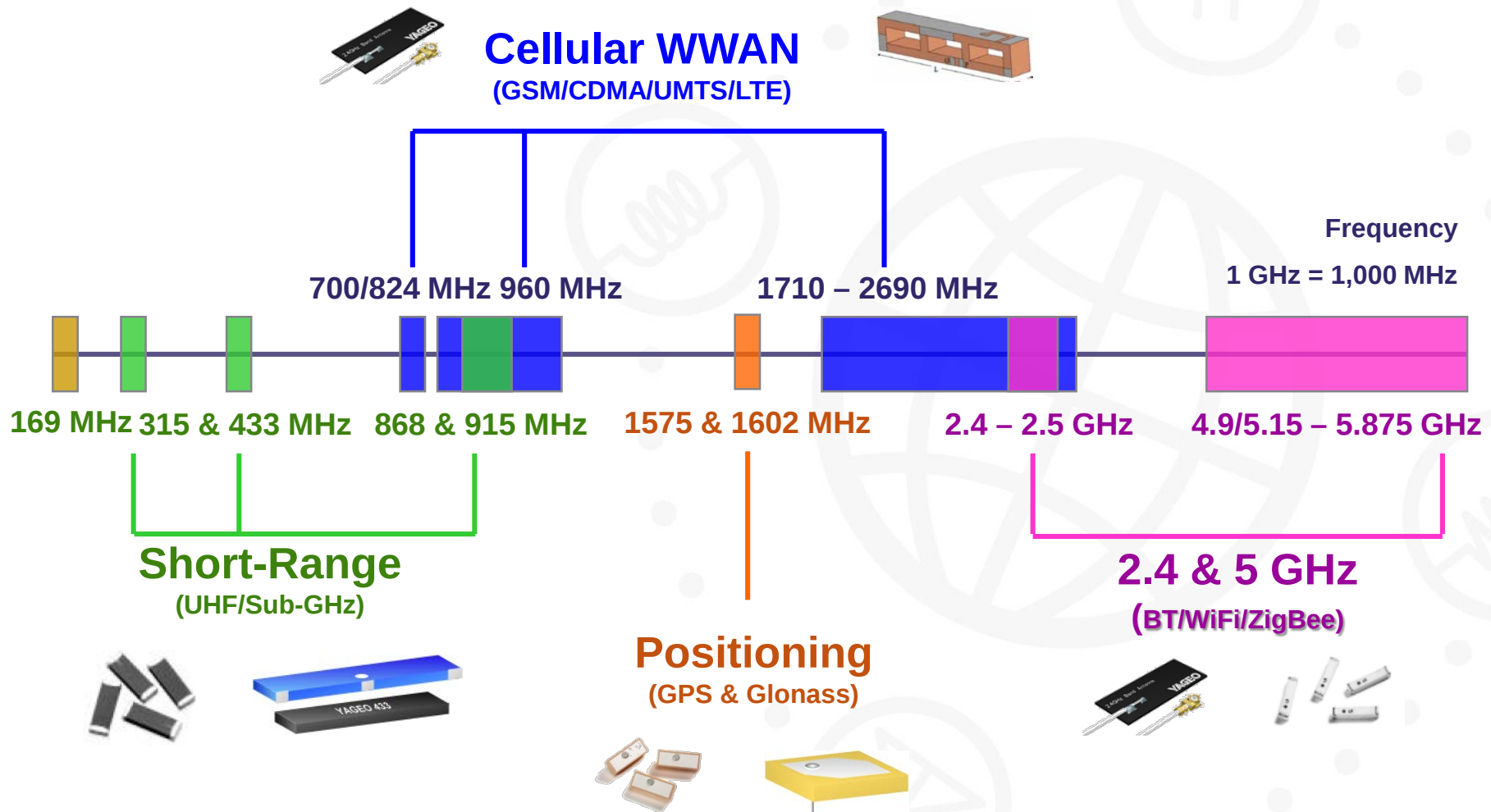
RF IPD (Integrated Passive Device, Filter/Balun/Coupler/Diplexer)

 1005 / 0605 Series				 1005 / 0605 Series
BPF, LPF	Balun	Diplexer / Triplexer	Balanced BPF	Coupler

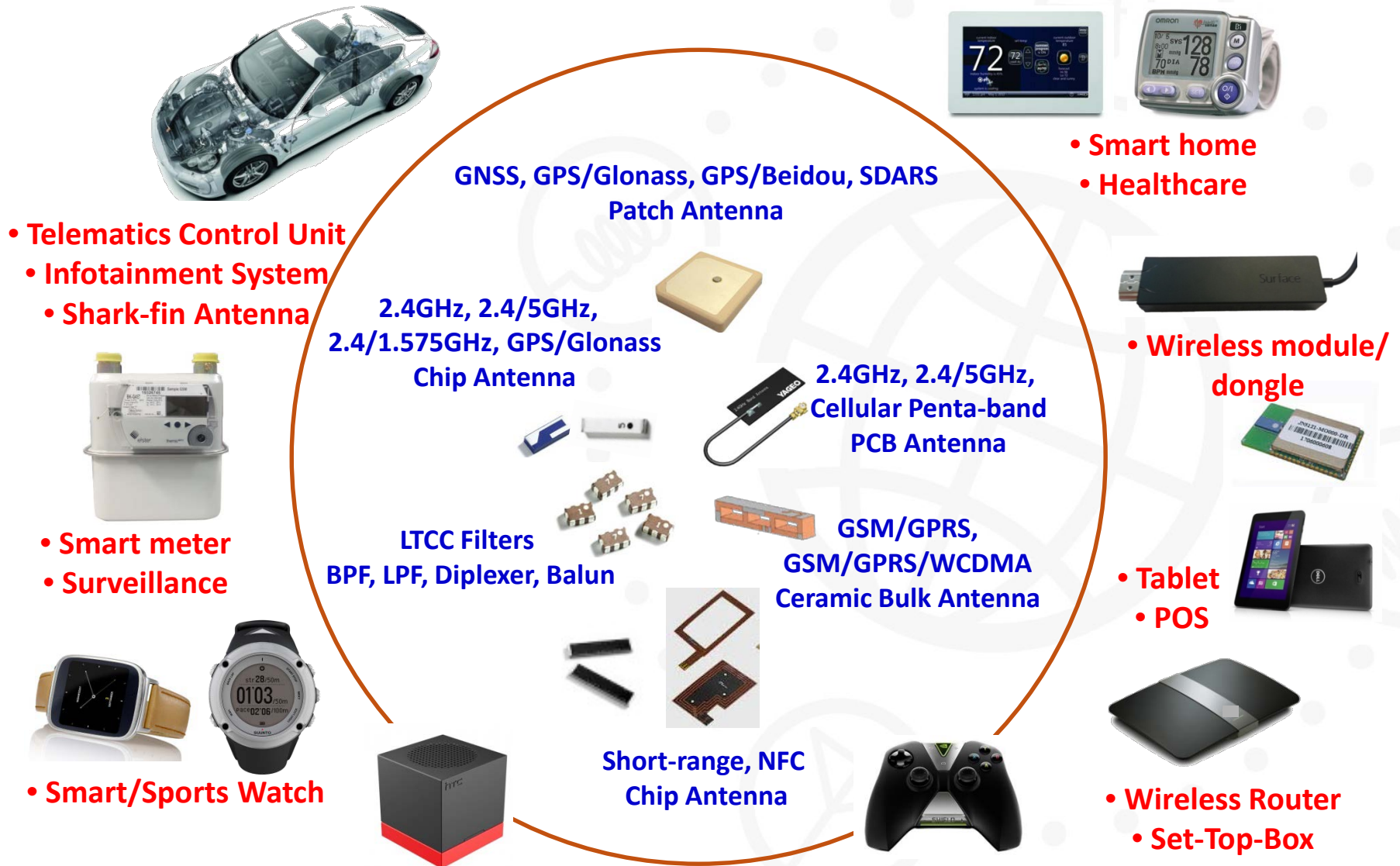
Module & Integrated Solution

	 New		 New
GPS Antenna Receiver Module	External Antenna Module	NFC Module	N-Tag Module

Broad Range Antenna Portfolio for Versatile Wireless Technologies



Successful Projects and Applications



Key Features of Yageo Wireless Components

- **Compact**

- Maximize performance with the smallest size required
- The smallest antenna with PCB & ceramic technology

- **Multi-Band & High Efficiency**

- WWAN: Quad-band (850/900/1800/1900 MHz) to Penta-band (850/900/1800/1900/2100 MHz)
- Support 4G cellular network LTE 700 MHz (Band 12,13,17), 2300/2600 MHz
- Operating in dual navigational systems GPS & Glonass: 1575 – 1602 MHz

- **High Reliability**

- Operating temperature range: -40 °C ~ 105 °C

- **Easy Assembly**

- Reliable adhesive tape, surface mount, and flexible cable/connector selection

Yageo Ceramic Antennas

- **Patch Antenna**

- Size: 10x10/12x12/15x15/18x18/25x25/35x35mm
- GPS, GPS/Glonass Dualband
- SDARS (**S**atellite **D**igital **A**udio **R**adio **S**ervice)

- **Chip Antenna**

- WWAN (GSM900/1800, 850/900/1800/1900/2100 Penta-band)
- WLAN/BT/Zigbee (2.4GHz)
- WLAN Dual-band (2.4/5GHz)
- Short-Range/Sub-GHz (169/315/433/870/915MHz)
- GPS/Glonass

- **Active Antenna** (High gain antenna, built-in amplifier and filter with cable/connector)

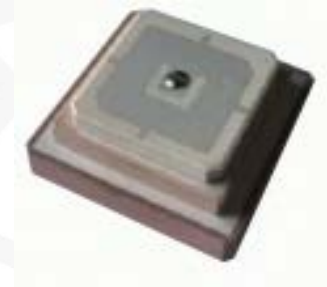
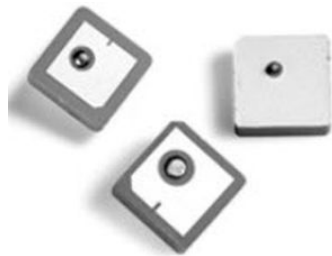
- Size: 12x12/18x18/25x25/20x6mm active GPS antenna
- Size: 22x6mm GPS/Glonass Dualband Active Antenna



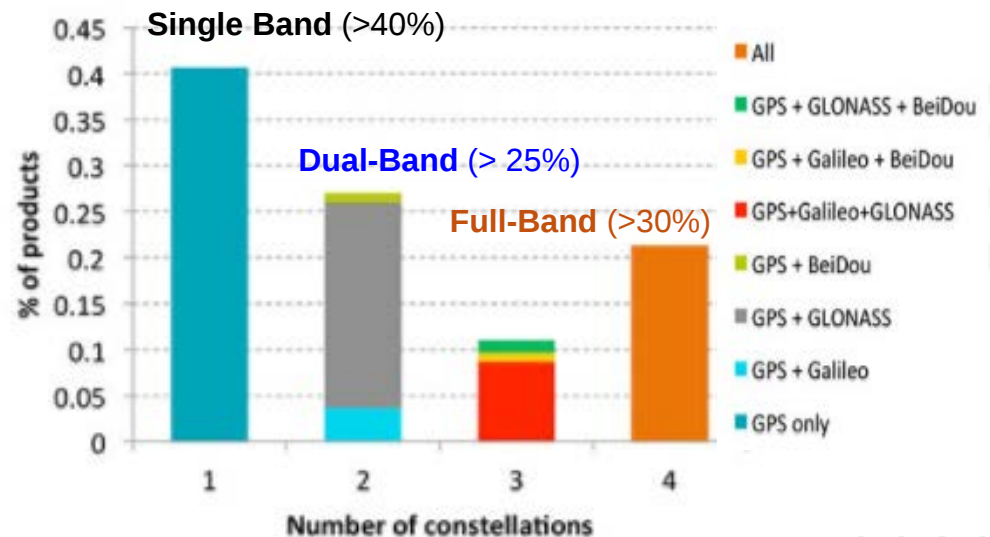
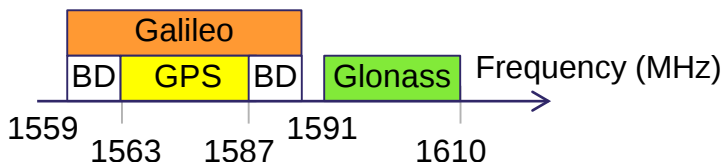
Yageo Patch Antenna

• Patch Antenna

- Size : 8x8/10x10/12x12/15x15/18x18/25x25/35x35mm (**Full Dimension Range**)
- **Positioning** : GPS, Glonass, BDs, Galileo (single-band, dual-band, or GNSS)
- **SDARS** (satellite-digital-audio-radio-service)
- **Sub-GHz** for M2M.



Positioning Satellite System :



Patch Antenna Product Range

Product	Type	Dimension (mm)													
		8x8	9x9	10x10	12x12	13x13	15x15	18x18	20x20	25x25	35x35	45x45	60x60	12x06	20x06
GPS	Pin														
	SMD														
GPS+Glonass	Pin														
	SMD														
GNSS	Pin														
	2 Pin														
	SMD														
2.4GHz	Pin														
	SMD														
SDARS (SXM)	Pin														
	SMD														
870/915MHz	Pin														
	SMD														

Full dimension range for **Positioning system** & **SDARS** & **Sub-GHz**

- **Positioning** : Vehicle, Drone, M2M
- **SDARS** : American Audio/Radio system
- **Sub-GHz** : Industrial M2M (Smart Meter)

Yageo Chip Antennas

- **Chip Antenna (Most Complete Product Range Worldwide)**

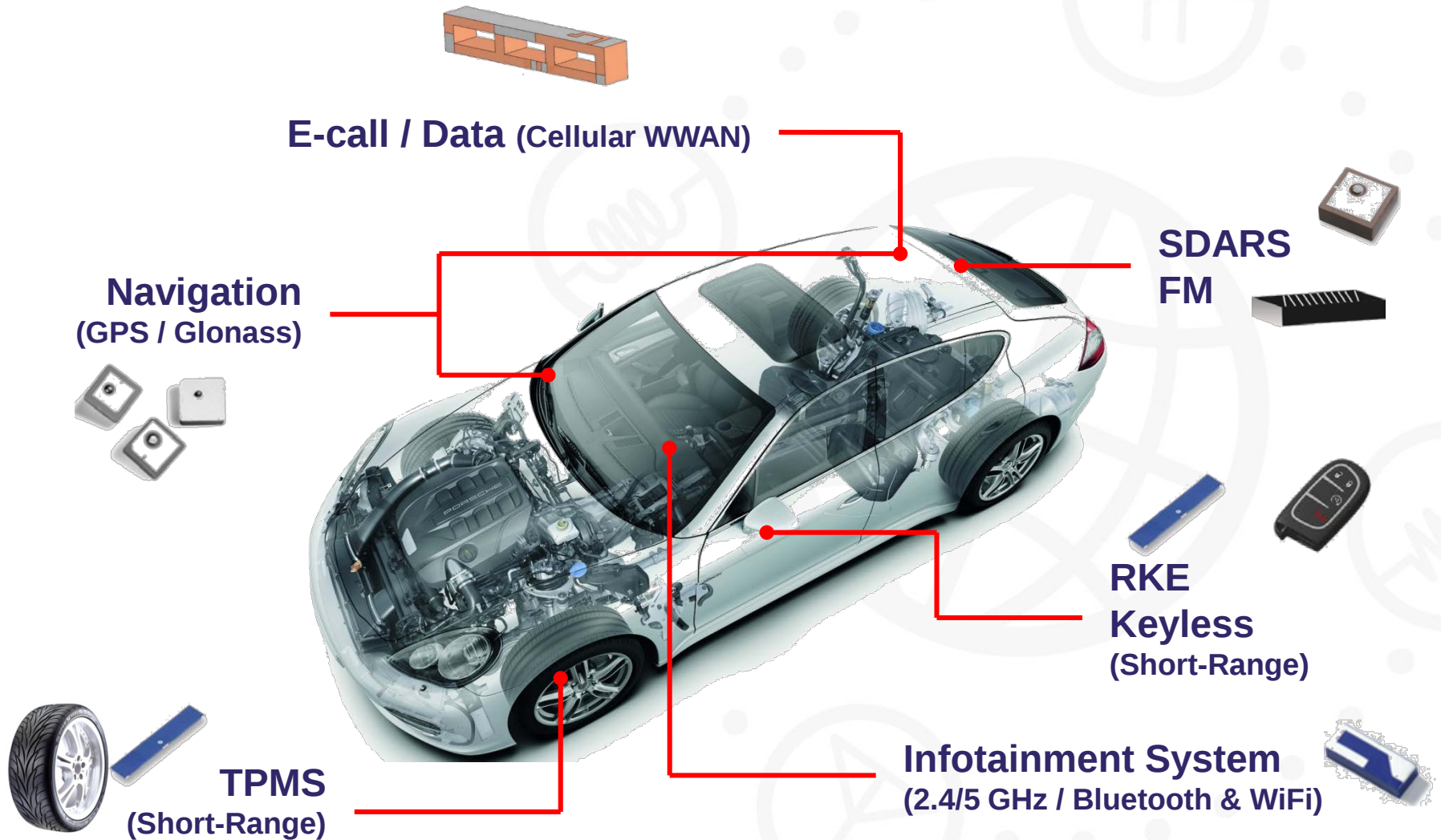
- Compact (tiny), SMD, Omni-directional
- Complete frequency range ; Various Dimension
- WWAN(GSM900/1800, 850/900/1800/1900/2100 Penta-band)
- WLAN/BT/Zigbee (2.4GHz) ; WLAN Dualband (2.4/5GHz)
- Short-Range/Sub-GHz (169/315/433/870/915MHz)
- GPS/Glonass positioning system



Frequency (Application)	Size (mm)	Part Number
2.4GHz (BT, Zigbee, ISM)	1.0x0.5	ANT1005LL14R2400A
	1.6x0.8	ANT1608LL14R2400A
	2.0x1.2	ANT2012LL00R2400A
	2.0x1.2	ANT2012LL13R2400A
	3.2x1.6	ANT3216LL00R2400A
	3.2x1.6	ANT3216LL11R2400A
	5.3x2.0	ANT5320LL24R2400A
	5.3x2.0	ANT5320LL45R2400A
	8.0x1.0	ANT8010LL04R2400A
2.4G/5GHz (WLAN, WiFi) (802.11a/b/g/n/ac)	1.6x0.8	ANT1608LL14R2455A
	3.2x1.6	ANT3216LL11R2455A
	5.3x2.0	ANT5320LL24R2455A
	10x03	ANT1003LL05R2455A
5.8GHz (DSRC)	3.2x1.6	ANT3216LL05R5000A
	5.3x2.0	ANT5320LL00R5000A

Frequency (Application)		Size (mm)	Part Number
1.55G – 1.60GHz (GPS, Glonass, BDs)		3.2x1.6	ANT3216LL15R1575A
		5.3x2.0	ANT5320LL14R1575A
		8.0x1.0	ANT8010LL05R1575A
		12x4	ANT1204LL04RGNSSA
Short-Range Device	315MHz	12x4	ANT1204LL20R0315A
		12x4	ANT1204F002R0433A
	433MHz	12x4	ANT1204LL20R0433A
		12x4	ANT1204LL08R0870A
	870MHz	12x4	ANT1204F007R0870A
		12x4	ANT1204F007R0870A
	915MHz	12x4	ANT1204LL05R0915A
		12x4	ANT1204F005R0915A
Cellular	2G-GSM	12x4	ANT1204LL00R0918A
		21x12	ANT2112LL00B0918A
	3G-UMTS	35x5x6	ANT3505B002TWPENS
		40x10x3	ANT4010F000RWPENA
	4G-LTE	40x5x6	ANT4005B000RWHEXS

Yageo Antennas for Automotive Applications



Yageo Antennas for Smart Meter

Residential Smart Meter



- ZigBee (2.4GHz)
- Sub-GHz (169/433/868MHz)



Concentrator



- Cellular (3G/GPRS/UMTS)

Control Center

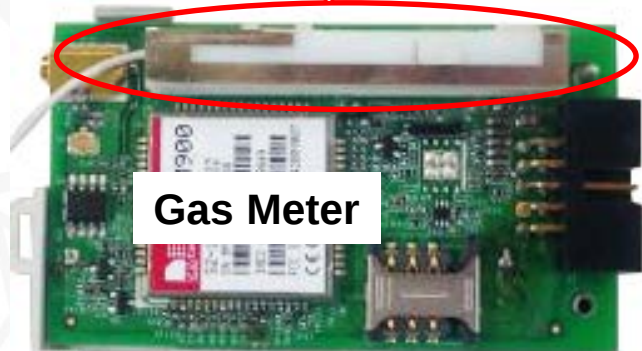
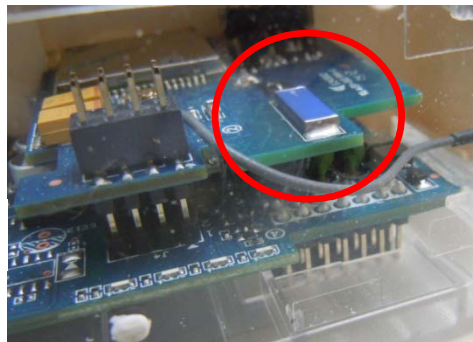


433MHz chip antenna (12x4 mm)

Quad-band GSM/GPRS antenna



Electricity Meter



Gas Meter

Yageo Antennas for Smart Home



Motion Detector



Lighting



Smoke Detector



Surveillance



Air Condition



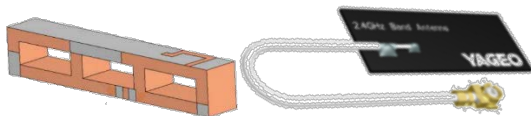
Control Panel



Door/Window Security



Cellular 2G/3G/4G Antenna



WLAN/ZigBee/Z-wave Sub-GHz Antenna



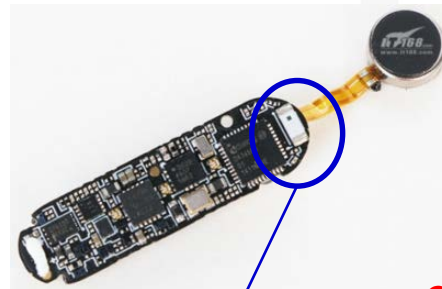
Yageo Antennas for Wearable Device

BT Earphone



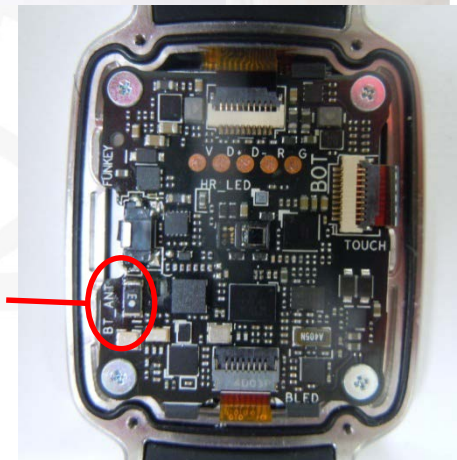
**Bluetooth (2.4GHz)
3.2x1.6mm Chip Antenna**

Mi Band



**Bluetooth (2.4GHz)
3.2x1.6mm Chip Antenna**

Smart Watch

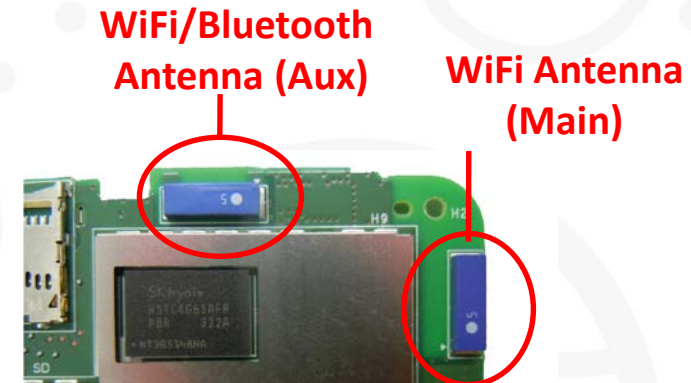


**Bluetooth
Chip Antenna
2.0x1.2mm**

Yageo Antenna for Tablet PC



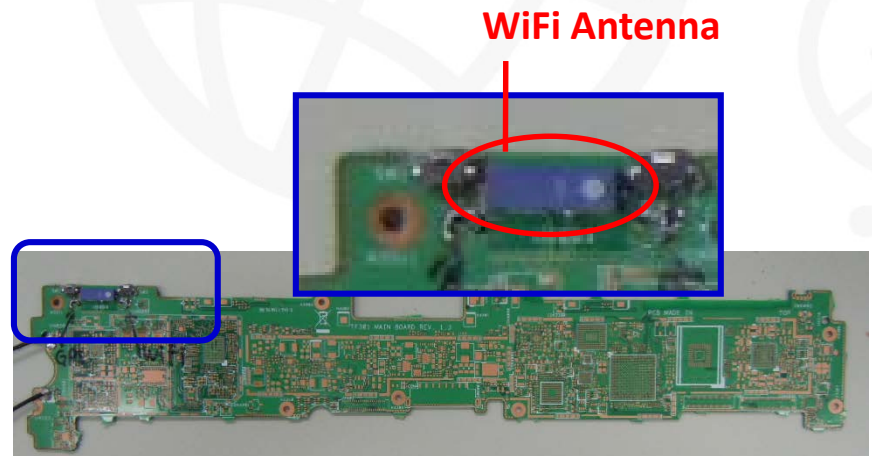
Dell Venue



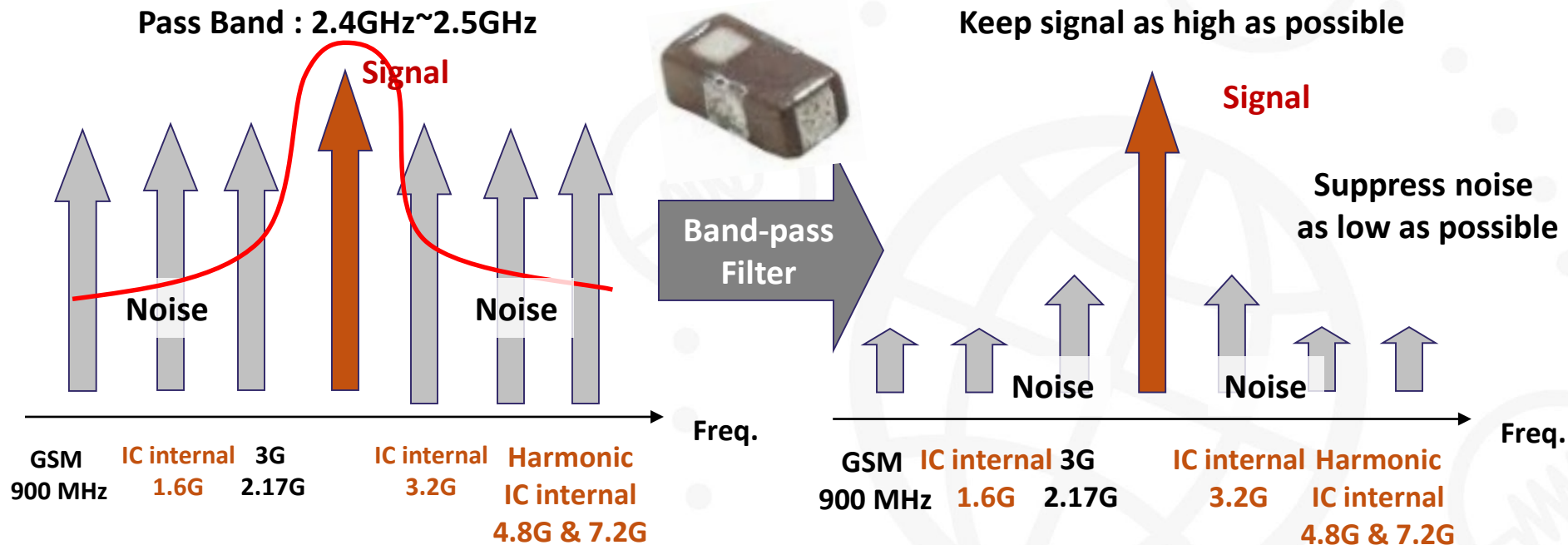
10x3 mm 2.4G/5G Wifi Antenna



Asus TF301



Filter's Characteristic / Function



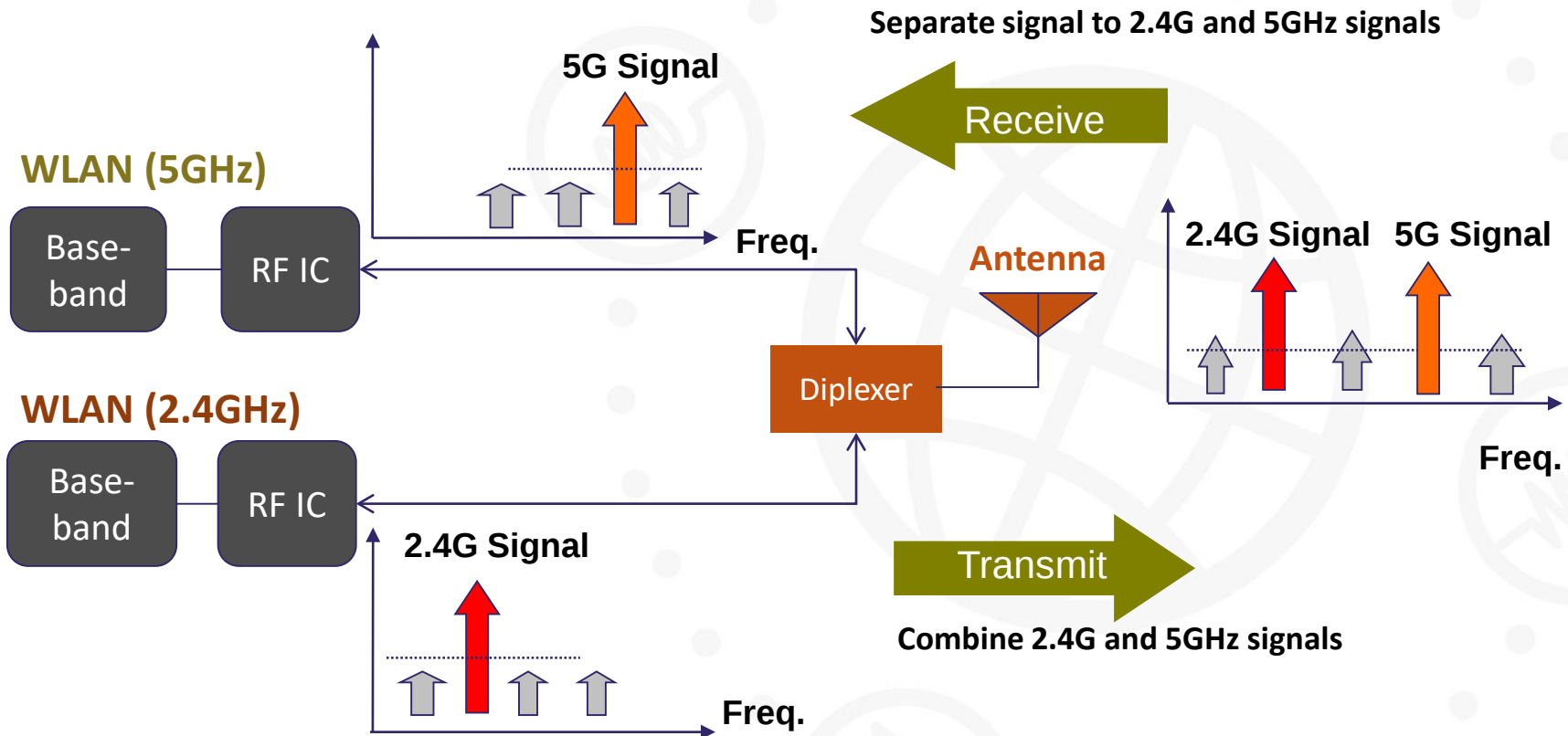
❑ Filter is to suppress noise and keep signal strong

Noise: Internal - system or IC, such as 1.6GHz, 4.8GHz or 7.2G Hz

External - GPS or 3G, such as 850MHz, 960MHz and 2.17GHz

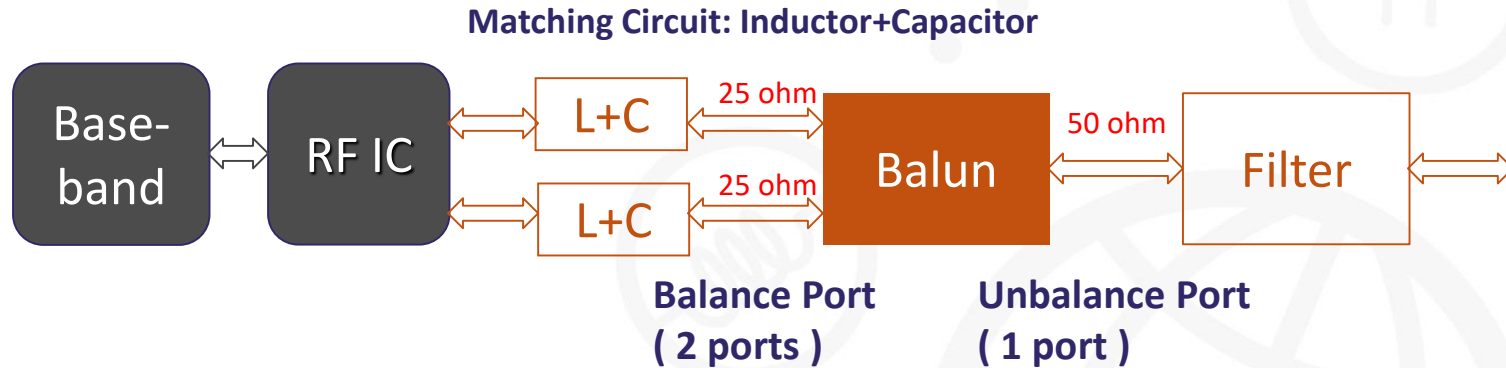
Diplexer

- ❑ **Diplexer is applied on dual-band signal with single antenna**



Balun / Combo

❑ Balun : Balance and Unbalance

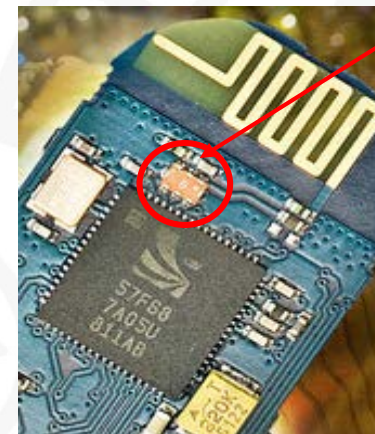


Balun 5050 : Unbalance impedance is 50 ohm , and balance impedance are 25 and 25 ohm

Balun 50100 : Unbalance impedance is 50 ohm, and balance impedance are 50 and 50 ohm

❑ Combo : Balun + Band-Pass Filter

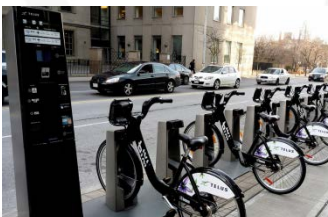
- Normal Combo : BPF + Balun 5050 or 50100
- Customized Combo : Matching circuit + Balun +BPF



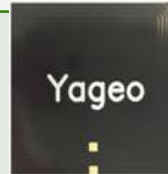
Combo

GPS Module Solutions

1. GPS Module covers range from 8x1mm compact size to 35x35mm high performance.
2. External GPS module has water proof function and case in pattern.

Module	Product Image	Features	Applications
GPS Module		Active Antenna (without receive IC) Support Frequency: GPS/GLONASS/Galileo/BDS Configuration: GPS bulk or chip antenna RLC components PCB Board <u>LNA, SAW,</u>	Military and Automotive Device 1. GPS Tracker Accessory 2. GPS Watch 3. Bicycle Sharing System   
		External Active Antenna (without receive IC) Support Frequency: GPS/GLONASS/Galileo/BDS Configuration: <u>Housing</u> GPS bulk antenna RLC components PCB Board <u>LNA, SAW</u>	External Fixed Device 1. Automotive 

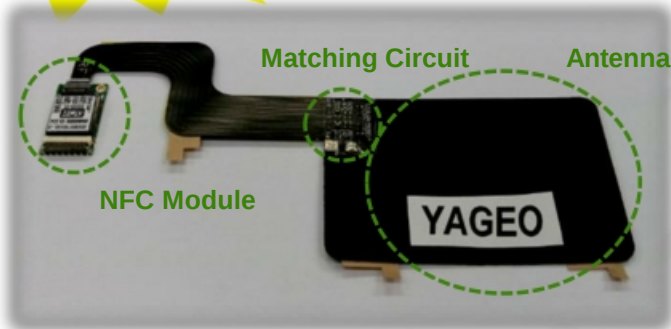
Yageo NFC Products

Item	Product Type	Support Feature	Dimension	Product
NFC Module	NFC Module	NXP Solution Chipset Support NFC Forum Tags	Microminiaturization 17 x 10 x 1.9 (mm)	
	NTag Module	ISO14443A NFC Forum Type 2 MiFare series	Easy Time to Market 30 x 20 x 2.5 (mm)	
NFC Antenna	(PCB or FPC)	PCB 0.2/0.4/0.8 mm FPC 0.1/0.15/0.2 mm Ferrite 0.065/0.09/0.13/0.15/0.2 mm	X * Y (mm) (Dimension) 60*40 50*40 40*40	
	(Coil type)	Coil OD: 0.18/0.25 mm Holder ABS/PC..etc Ferrite 0.065/0.09/0.13/0.15/0.2 mm	X * Y (mm) (Dimension) 60*40 40*40 30*30	

Total Solution of NFC Business

Microminiaturization

NFC Module



Easy Time to Market

NFC TAG



YAGEO PN	NMD1710P001BN3000
Size	17 x 10 x 1.9 mm
Chipset	NXP NPC300
Operating Frequency	13.56 MHz $\pm$ 7KHz
Support Protocol	Support ISO 14443A/B, MIFARE, NFC Type 1~4, ISO 18092
Interface	I2C
Operating Temperature	-25°C to 70°C
Antenna	PCB /FPC type
	PCB 0.2/0.4/0.8 mm FPC 0.1/0.15/0.2 mm Ferrite thickness: 0.065-0.2 mm Size: 60*40/ 50*40/ 40*40
Coil type	Coil OD: 0.18/0.25 mm Ferrite 0.065-0.2 mm Size: 60*40/ 50*40/ 40*40

YAGEO PN	NTG3020PF01BN3110
Size	30 x 20 x 2.5 $\pm$ 0.4 (mm)
Chipset	NXP NTAG 311
Support Protocol	Support ISO 14443A, MIFARE, NFC Forum Type2
Interface	I2C
Operating Temperature	-25°C to +70°C

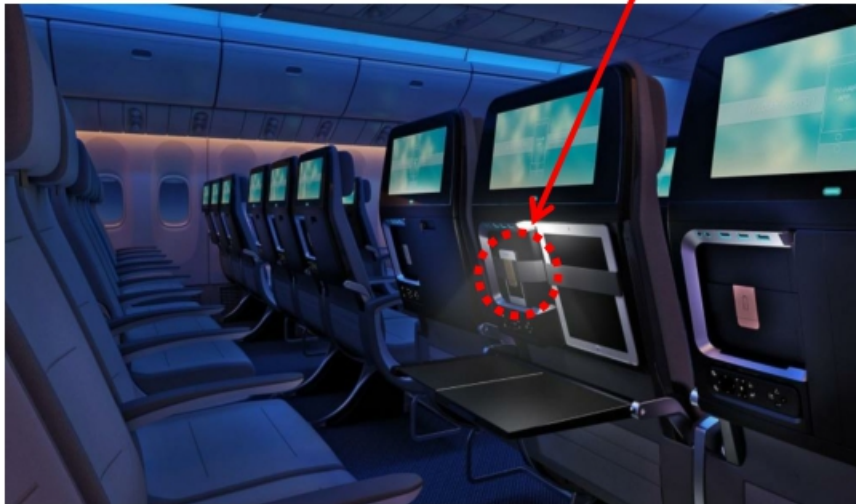
NTAG Application

Airplane Monitor : WiFi NTAG

Application



Embedded



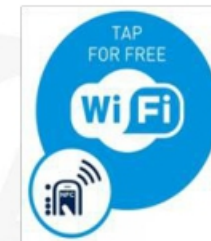
YAGEO NTAG
NTG3020PF01BN
3110
30 x 20 x 2.5 (mm)



Embedded

WiFi Printer:

WiFi NTAG Application



Yageo Wireless Part Number Coding Rule

ANT	5320	L	L04	R	2455	A
Product Type	Size/ Cable length Connector type	Ant Type/ K-value/ Connector type (B)	Serial no.	Package Type	Frequency Cellular band	Factory Control Code/ Cable type
ANT: Antenna BPF: BP Filter LPF: LP Filter BLN: Balun BLF: Combo DPX: Diplexer	Size(mm) 2012 3216 5320 2525 Connector & Cable X - XXX	Antenna type P: PCB X: FPCB S: Metal E: External L: Chip antenna, ceramic F: Chip antenna, FR4 A: Chip antenna, Alumina B: Bulk/Patch antenna I: Integrated J: Integrated(w/cable)	R: Tape & Reel T: Tray B: Bulk	2400: 2.4 - 2.5 GHz 2455: 2.4&5 GHz 1575: GPS 1602: Glonass 1516: GPS+Glonass 15BD: GPS+BeiDou 15GA: GPS+Galileo 15QZ: GPS+QZSS GSBD: GPS+Glonass+BeiDou GNSS: GPS+Glonass+BeiDou+Galileo 0169/0433/0870/0915: 169 /433/870/915MHz 0918: 900/1800 MHz WCDM: CDMA WTRI: 900/1800/1900 MHz WQUD: 850/900/1800/1900 MHz WPEN: 850/900/1800/1900/2100MHz WLTE: LTE 700+850/1700/1900/2100MHz AT&T WGPS: cellular+GPS WG24: cellular+GPS+WLAN 2.4GHz	0: none 3: 1.13 7: 1.37 8: RG-178 4: RG-174 6: RG-316 A-Z: chip /patch antenna	
Cable Length 100: 100 mm 150: 150 mm 200: 200 mm 037: 37mm						

Summary

- Yageo offers a comprehensive product portfolio, include PCB/FPCB antennas, metal antennas, ceramic patch antennas, ceramic chip antennas, and active antennas that address WWAN (3G and LTE), WLAN/BT/ISM, GNSS, and Sub-GHz/short-range technologies.
- Explain product key features and their applications.
- Explore Yageo's part number breakdowns