

**2021**

**ANTENNA  
CATALOG**



## KEY MARKET SEGMENTS



Aerospace & Defense



Communications



Consumer Electronics



Industrial



Medical



Transportation

## Why Abracon?

As a leader in passive components, Abracon offers a broad selection of timing, inductor, connectivity, RF and antenna solutions. Whether designing for transportation, communication, industrial, consumer products, medical, or aerospace and defense applications, customers need products that transform technology and enable them to move quickly, and Abracon is by their side. Our global engineering teams are focused on developing the latest technology and supporting clients with custom designs. From electric charging stations to 5G infrastructure, and everything in between, the Abracon team empowers design engineers to create innovative products that drive next-generation concepts.



Superior Product Breadth



Unmatched Channel Access



Leading Engineering and Design Capabilities



### Frequency Control & Timing Devices



**Quartz Crystals (XTAL)**  
MHz or kHz, SMD or through-hole



**Quartz Oscillators (XO)**  
MHz or 32.768kHz, SMD or through-hole



**Real Time Clock (RTC)**  
Lowest power, highly integrated & accurate



**MEMS Oscillators**  
General purpose or high performance



**Precision Quartz (XO/VCXO/TCXO/OCXO)**  
Accurate temp compensation, low jitter/noise



### Inductors & Connectivity



**Low Profile Shielded Inductors**  
Medium to high power, high temperature



**High Power Toroid**  
Inherent immunity to EMI, high temperature



**Drum Core Inductors**  
Ideal for high power applications



**Chip Inductors**  
Low profile and compact, saves space with high current carrying capability



**RJ45**  
With integrated magnetics  
PoE, 10G to 100Mbps, SMD/PIH



### RF & Antennas



**Chip Antennas**  
Improve RF range, sensitivity compared to PCB antennas



**Patch Antennas**  
Best sensitivity vs size compromise



**External Antennas**  
Best sensitivity and range performance



**Flexible Antennas**  
Low profile, multi-band, easy installation



**RF & SAW Filters**  
Small & Low profile, Low insertion loss, excellent selectivity



**RFID**  
Antennas and fully integrated tags

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## About Abracon

Abracon is an industry leader in passive components, providing frequency control & timing devices, RF & antenna products, and inductor & connectivity solutions. With service and quality at the company's core, Abracon enables innovative IoT solutions. Abracon powers the AEL Crystals, Ecliptek, Fox, ILSI, MMD, Oscilent and ProAnt brands, delivering the latest technical design support and global supply chain flexibility to solve customers' unique challenges.

## OVERVIEW

Abrakon's recent acquisition of Proant provides patented technology and custom design expertise complementing the current broad antenna offering. The additional wide range of embedded and external antennas include featured products including Niche, OnBoard, InSide, Ex-It, and the Outside antennas.

### Niche Antennas

The Niche series is PCB integrated antenna concept available through licensing. It is suitable for high volume projects and is available in various frequencies.

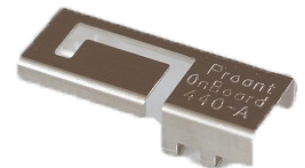
- Great efficiency
- Frequency stability
- Great suitability for potting or coating
- Freedom of placement on the PCB



### OnBoard SMD Antennas

The OnBoard SMD antenna is a surface mounted sheet metal antennas based on PIFA technology. It requires no GND cutout and is well suited for efficient mass production by pick and place / reflow soldering.

- Very high efficiency
- Frequency stability
- Isotropic radiation properties
- Mixed polarization
- Space saving features



### InSide Antennas

The InSide antennas are embedded antennas of PCB type with cable and connectors. Customization of cable length and connector type is available. These antennas are available in various frequencies.



### Ex-It Antennas

The Ex-It antennas are external stub and foldable antennas with SMA, RP-SMA and flying lead MHF (U.FL) connection and available from 169 MHz up to 6 GHz for Cellular, BLE, WiFi, sub-GHz ISM bands.



### Outside Antennas

The Outside antennas are robust wall mount antennas with through hole or wall mount option with 1 to 3 m cable and SMA connection. The Outside antennas are available for Cellular, BLE, WiFi, sub GHz ISM bands.



# 5G/4G/LTE ANTENNAS

Our high performing 5G antennas provide coverage for sub-6 GHz 5G NR and CBRS bands. Cellular antennas operate across a broad range of frequencies between 700-960 MHz, 1710-2170 MHz and 2500-2700 MHz, catering to all 4G/LTE/3G/2G applications. Abracon offers ceramic chip SMD antennas, flexible PCB antennas and external antennas with different mounts, omnidirectional radiation patterns and weather resistant capability (IP67 rated) for easy integration in wireless communication devices. High performing MIMO antennas with different mounting options are available for enhanced data rate and quality of service (QoS).

## APPLICATIONS

- IoT
- Machine to Machine
- Telecommunications
- Networking
- Telematics Control Units
- Video and Surveillance
- Medical Devices
- Consumer Electronics
- Transport and Vehicles
- Vending Machines
- Fleet Monitoring
- GSM Modems



PART NUMBER	ACR4006X	ACR3705LZ	ACAR3705-S698	ACAR4008-S698
TYPE	Chip	Chip	Chip	Chip
FREQUENCY (MHz)	600-960   1710-2690   3300-6000	698-960   1710-2170   2500-2700	700-960   1710-2170   2500-2700	700-960   1710-2170   2500-2700
GAIN (dBi)	4.42	-1.13	-3.77   -1.13	-1.55   4.1
MOUNTING	Surface Mount	Surface Mount	Surface Mount	Surface Mount
POLARIZATION	Linear	Linear	Linear	Linear
PACKAGE SIZE (mm)	40 x 6 x 5	37 x 5 x 5	37 x 5 x 5	40 x 8 x 3.2
KEY FEATURES	5G/CBRS, Compact, High Gain, Ultra wideband	AECQ200, Compact size	Compact size	High gain

New

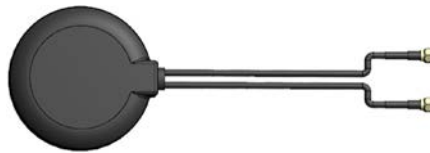
New

# 5G/4G/LTE ANTENNAS



PART NUMBER	AFAC240020-M698	AFC8513U4G	AFAC5867-S698
TYPE	Flexible PCB	Flexible PCB	Flexible PCB
FREQUENCY (MHz)	698-960   1710-2690	698-4000	698-960   1710-2690
GAIN (dBi)	3	5	2
MOUNTING	Embedded Mount	Adhesive Mount	Adhesive Mount
POLARIZATION	Linear	Linear	Linear
PACKAGE SIZE (mm)	240 x 20 x 0.2	85.0 x 13.8 x 0.2	67.4 x 58.4 x 0.2
KEY FEATURES	Low profile, 2xMIMO, Ø1.37mm, 2xIPEX	5G/CBRS, Compact, Wideband, Ø1.13 mm, IPEX	Low profile, Compact size, Ø1.13mm, IPEX

New



PART NUMBER	AFAC110020-S698	AEACBA081014-M698	AEACBK081014-M698
TYPE	Flexible PCB	Puck MIMO	Puck MIMO
FREQUENCY (MHz)	698-960   1710-2690	698-960   1710-2690	698-960   1710-2690
GAIN (dBi)	3	3	2.5
MOUNTING	Adhesive Mount	Adhesive Mount	Panel Mount
POLARIZATION	Linear	Linear	Linear
PACKAGE SIZE (mm)	110 x 20 x 0.2	Ø81.6 x 14.5	Ø81.6 x 14.5
KEY FEATURES	Low profile, Ø1.13mm, IPEX	IP67 rated, 2xMIMO, 2xRG-174, 2xSMA(M)	IP67 rated, 2xMIMO, 2xRG-174, 2xSMA(M)

# 5G/4G/LTE ANTENNAS



PART NUMBER	AECR1808X4	AEACAC198013-S5GNR	AEACAC198013-S698	AEACAD097015-S698
TYPE	Dome	Whip - Tilt	Whip-Tilt	Magnetic Mount
FREQUENCY (MHz)	600-6000	698-960   1710-2690   3300-3800	698-960   1710-2655	700-2700
GAIN (dBi)	4	3	3	5
MOUNTING	Screw	Connector Mount	Connector Mount	Magnetic Mount
POLARIZATION	Linear	Linear	Linear	Linear
PACKAGE SIZE (mm)	189 x 182 x 85	198 x Ø13.0	198 x Ø13.0	97 x Ø15
KEY FEATURES	5G/CBRS, 4 x MIMO, IP67 rated, LMR-100, SMA	High gain, SMA(M), 5G/CBRS	SMA(M)	High gain, RG-58, SMA

New



PART NUMBER	AEACAD460065-S698	AECB1102X	AEACCA115021-S698	AEACBK081014-S698
TYPE	Magnetic Mount	Blade	Blade	Puck
FREQUENCY (MHz)	698-960   1710-2700	600-6000	698-960   1710-2655	698-960   1710-2690
GAIN (dBi)	5	2	2	3
MOUNTING	Magnetic Mount	Adhesive	Adhesive Mount	Screw Mount
POLARIZATION	Linear	Linear	Linear	Linear
PACKAGE SIZE (mm)	Ø65 x 460	115.6 x 21.7 x 5.8	115.6 x 21.7 x 5.8	Ø81.3 x 14.6
KEY FEATURES	High gain, RG-58, SMA(M)	5G/CBRS, Wideband, Low Profile, LMR-100, SMA	Low profile, RG-174, SMA(M)	IP67 rated, RG-174, SMA(M)

New

# 2G/3G/GSM ANTENNAS

2G/3G/GSM cellular antennas operate across a broad range of frequencies between 824-960 MHz and 1710-2170 MHz. Abracon offers compact ceramic chip antennas, low-profile flexible PCB antennas, and external whip and puck antennas with different form factors and mounts for easy installation in a broad range of wireless data and industrial applications. These multi-band antennas support evolving LTE and 4G cellular technologies in their operating bands.

## APPLICATIONS

- IoT
- Machine to Machine
- Telecommunications
- Networking
- Telematics Control Units
- Video and Surveillance
- Medical Devices
- Consumer Electronics
- Broadband Cellular
- Transport Systems
- Fleet Monitoring
- MIMO Routers



PART NUMBER	ACAJ-109-T	ACAR3005-S824
TYPE	Chip	Chip
FREQUENCY (MHz)	824-894   880-960   1710-1880   1850-1990   920-2170	824-960   1710-2170
GAIN (dBi)	-2.4   6.4	3.12
MOUNTING	Surface Mount	Surface Mount
POLARIZATION	Linear	Linear
PACKAGE SIZE (mm)	24 x 5.5 x 4.4	30 x 5 x 5
KEY FEATURES	Compact size, Multi-band	Multi-band



# 2G/3G/GSM ANTENNAS



PART NUMBER	AFAG7020-S824	APAMS-119	APAMS-118
TYPE	Flexible PCB	Whip - Straight	Whip - Right Angle
FREQUENCY (MHz)	824-894   880-960   1710-1880   1850-1990   1710-2690	890-960   1710-1880	890-960   1710-1880
GAIN (dBi)	2.0   3.5	2.15   2.15	2   3
MOUNTING	Adhesive Mount	Connector Mount	Connector Mount
POLARIZATION	Linear	Linear	Linear
PACKAGE SIZE (mm)	70 x 20	78 x Ø12.0	108.1 x Ø10.0
KEY FEATURES	Low profile, Ø1.13mm, IPEX	Compact size, SMA	SMA



PART NUMBER	AEACCA115021-S850	APAMS-101	APAMS-102
TYPE	Blade	Blade	Blade
FREQUENCY (MHz)	824-960   1710-2170	820-960   1710-1990	820-960   1710-1880   1850-1990   1900- 2170
GAIN (dBi)	2	1   2	1   2   2.5   3
MOUNTING	Adhesive Mount	Adhesive Mount	Adhesive Mount
POLARIZATION	Linear	Linear	Linear
PACKAGE SIZE (mm)	115.6 x 21.7 x 5.8	115 x 22 x 7	138 x 21 x 6
KEY FEATURES	Low profile, RG-174, SMA	RG-174, FME-K3	RG-174, SMA-J3



# WIFI/BLUETOOTH/BLE/ZIGBEE/ISM ANTENNAS

Abracon offers a wide variety of ceramic chip antennas for WiFi/BT applications, such as compact, high gain, and dual-band antennas. Flexible PCB, external puck and low-profile whip antennas ensure quality reception and transmission for WiFi, Bluetooth, ZigBee and ISM.

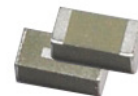
## APPLICATIONS

- IoT
- Machine to Machine
- Wearables
- Routers
- Smart Home
- UAV/Drone
- Connected Vehicles
- Smart Cities
- Portable Devices
- Set-Top Boxes
- Network Devices
- VR/AR

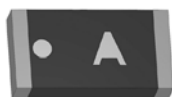


PART NUMBER	ACAG0201-2450-T	ACAG0301-2450-T	AMCA31-2R450G-S1F-T3
TYPE	Chip	Chip	Chip
FREQUENCY (MHz)	2450	2400-2500	2450
GAIN (dBi)	2.7	5.19	0.5
MOUNTING	Surface Mount	Surface Mount	Surface Mount
POLARIZATION	Linear	Linear	Linear
PACKAGE SIZE (mm)	2 x 1.25 x 0.6	3.2 x 1.6 x 1.2	3.2 x 1.6 x 1.2
KEY FEATURES	Miniature size, High gain	Compact size, High gain	Compact size

# WIFI/BLUETOOTH/BLE/ZIGBEE/ISM ANTENNAS

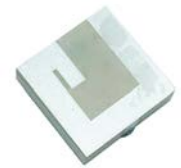
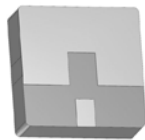


PART NUMBER	AMCA72-2R470G-S1F-T	ACAG0801-2450-T	ACAG0301-5500-T
TYPE	Chip	Chip	Chip
FREQUENCY (MHz)	2470	2450	5500
GAIN (dBi)	2.5	7.29	4.5
MOUNTING	Surface Mount	Surface Mount	Surface Mount
POLARIZATION	Linear	Linear	Linear
PACKAGE SIZE (mm)	7 x 2 x 1	8 x 1 x 1	3.2 x 1.6 x 1.2
KEY FEATURES		High gain	Compact size, High gain



PART NUMBER	ACAR0301-SW2	ACAG0301-24505500-T	APAGM2525-S2450
TYPE	Chip	Chip	Passive Patch
FREQUENCY (MHz)	2400-2500   5150-5825	2450   5500	2400-2500
GAIN (dBi)	1.0   2.5	2.23   4.05	4.5
MOUNTING	Surface Mount	Surface Mount	Through-hole Mount
POLARIZATION	Linear	Linear	RHCP
PACKAGE SIZE (mm)	3.05 x 1.6 x 0.55	3.2 x 1.6 x 1.2	25 x 25 x 4
KEY FEATURES	Low profile, Dual-band	High gain, Dual-band	High gain

# WIFI/BLUETOOTH/BLE/ZIGBEE/ISM ANTENNAS



PART NUMBER	APARN1204-S2450	APAKN1304-S2450-T	APAKN2504-S2448-T	APAKN1304-S5517-T
TYPE	Passive Patch	Passive Patch	Passive Patch	Passive Patch
FREQUENCY (MHz)	2400-2500	2412-2484	2412-2484	5150-5885
GAIN (dBi)	2	5	7	6
MOUNTING	Surface Mount	Surface Mount	Surface Mount	Surface Mount
POLARIZATION	Linear	Linear	Linear	Linear
PACKAGE SIZE (mm)	12 x 12 x 4	13 x 13 x 4	25 x 25 x 4	13 x 13 x 4
KEY FEATURES	Compact size	High gain	Very high gain	Compact size, Very high gain



PART NUMBER	APARC2505-S2450	ABAR1504-S2450	AFAG2220-SW2	AEACAC025009-S2400
TYPE	Active Patch	PCB Trace	Flexible PCB	Whip - Straight
FREQUENCY (MHz)	2450	2400-2484	2400-2500   5100-5900	2400-2483.5
GAIN (dBi)	0.5	2.28	2	2
MOUNTING	Surface Mount	Adhesive Mount	Adhesive Mount	Connector Mount
POLARIZATION	RHCP	Linear	Linear	Linear
PACKAGE SIZE (mm)	25.1 x 25.1 x 5.5	15 x 4 x 0.8	22 x 20	25.9 x Ø9.5
KEY FEATURES	Ø1.37mm, IPEX	Ultra-compact size, Low profile, Ø1.13mm, IPEX	Low profile, Dual-band, Ø1.13mm, IPEX	Ultra-compact size, SMA(M)

# WIFI/BLUETOOTH/BLE/ZIGBEE/ISM ANTENNAS



PART NUMBER	AEACAC049009-S2400	AEACQA190012-S2400	APAMSJ-137	APAMBJ-135
TYPE	Whip - Straight	Whip - Straight	Whip - Straight	Whip - Straight
FREQUENCY (MHz)	2400-2483.5	2400-2483.5	4850-5850	2400   5000
GAIN (dBi)	2	5	5	0   2
MOUNTING	Connector Mount	Knuckle Mount	Connector Mount	Connector Mount
POLARIZATION	Linear	Linear	Linear	Linear
PACKAGE SIZE (mm)	49.3 x Ø9.2	190 x Ø12.9	44 x Ø9.6	54.4 x Ø10.0
KEY FEATURES	Compact size, RG-178, IPEX	High gain, RG-178, IPEX	Compact size, High gain, SMA-J3	Dual-band, SMA-J3



PART NUMBER	APAMS-121	AEACBK050048-MW2	AEACBK050048-SW2	APAMBJ-145
TYPE	Whip - Tilt	Dome Combo	Dome	Dome
FREQUENCY (MHz)	2350-2450   5700-5900	2400-2483   4900-5825	2400-2484   4900-5825	2400   5100-5900
GAIN (dBi)	2   2	2	2	5   2
MOUNTING	Connector Mount	Screw Mount	Screw Mount	Connector Mount
POLARIZATION	Linear	Linear	Linear	Linear
PACKAGE SIZE (mm)	86 x Ø10.0	48 x Ø50	48 x Ø50	Ø77.3 x 36.5
KEY FEATURES	Dual-band, SMA-RP	IP67 rated, Dual-band MIMO, 2xRG-174, 2xSMA(M)	IP67 rated, Dual-band, RG-174, SMA	High gain, Dual-band, RG-174U, SMA(M)



# LPWA/LORA/SIGFOX/NB-IOT/ISM ANTENNAS

Abracorn offers antennas for LPWAN technologies, which combine low power consumption and wide area coverage to provide cost-effective long battery life solutions for low data rate IoT applications. The ceramic SMD chip, ceramic patch and external whip type antenna solutions support LPWA (for LoRa, SigFox applications) and ISM (for advanced industrial, scientific and medical devices) coverage, typically 915 MHz (USA), 868 MHz (Europe), 433 MHz (Asia) and 169 MHz. NB-IoT, Cat M1 and sub-GHz cellular bands antennas are also offered in chip, flexible and external types for connecting devices.

## APPLICATIONS

- IoT
- Machine to Machine
- Remote Monitoring
- Connected Lighting
- Smart Meters
- Wearables
- Network Devices
- Automation
- Asset Tracking
- Smart City
- Low Power Radio Links
- Sensor Networks
- Medical Devices
- Home Automation



PART NUMBER	ACAJ-110-T	ACAG1204-433-T	ACAG1204-868-T	ACAG1204-915-T
TYPE	Chip	Chip	Chip	Chip
FREQUENCY (MHz)	868   915	433	868	915
GAIN (dBi)	-7.4   -1.74   2.7	-1.72	2.63	3.42
MOUNTING	Surface Mount	Surface Mount	Surface Mount	Surface Mount
POLARIZATION	Linear	Linear	Linear	Linear
PACKAGE SIZE (mm)	9 x 3 x 1.2	12 x 4 x 1.6	12 x 4 x 1.6	12 x 4 x 1.6
KEY FEATURES	Compact size, LoRA/SigFox/ISM	Low profile, LoRA/SigFox/ISM	Low profile, LoRA/SigFox/ISM	Low profile, LoRA/SigFox/ISM

# LPWA/LORA/SIGFOX/NB-IOT/ISM ANTENNAS



PART NUMBER	ACR4006X	ACAR3705-SB	ACR3705LZ	ACAR3705-S698
TYPE	Chip	Chip	Chip	Chip
FREQUENCY (MHz)	600-960   1710-2690   3300-6000	698-960	698-960   1710-2170   2500-2700	700-960   1710-2170   2500-2700
GAIN (dBi)	4.42	0.61	-1.13	-3.77   -1.13
MOUNTING	Surface Mount	Surface Mount	Surface Mount	Surface Mount
POLARIZATION	Linear	Linear	Linear	Linear
PACKAGE SIZE (mm)	40 x 6 x 5	37 x 5 x 5	37 x 5 x 5	37 x 5 x 5
KEY FEATURES	5G/CBRS, Compact, High Gain, Ultra wideband	Multi-band, Sub-GHz NB-IoT/LTE Cat M1	AECQ200, Compact size	Multi-band, NB-IoT/LTE Cat M1

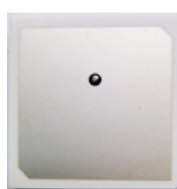
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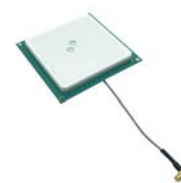
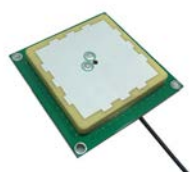
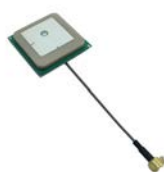


PART NUMBER	ACAR4008-S698	APAE868R2540JBDB2-T	APAE915R2540ABDB1-T	APAES923R3640C16-T
TYPE	Chip	Passive Patch	Passive Patch	Passive Patch
FREQUENCY (MHz)	700-960   1710-2170   2500-2700	868	915	923
GAIN (dBi)	-1.55   4.1	-1.37	-	1.5
MOUNTING	Surface Mount	Through-hole Mount / Adhesive Tape	Through-hole Mount / Adhesive Tape	Through-hole Mount / Adhesive Tape
POLARIZATION	Linear	RHCP	RHCP	RHCP
PACKAGE SIZE (mm)	40 x 8 x 3.2	25 x 25 x 4	25 x 25 x 4	36 x 36 x 4
KEY FEATURES	Multi-band, NB-IoT/LTE Cat M1	Compact size, LoRA/SigFox/ISM	Compact size, LoRA/SigFox/ISM	LoRA/SigFox/ISM

# LPWA/LORA/SIGFOX/NB-IOT/ISM ANTENNAS



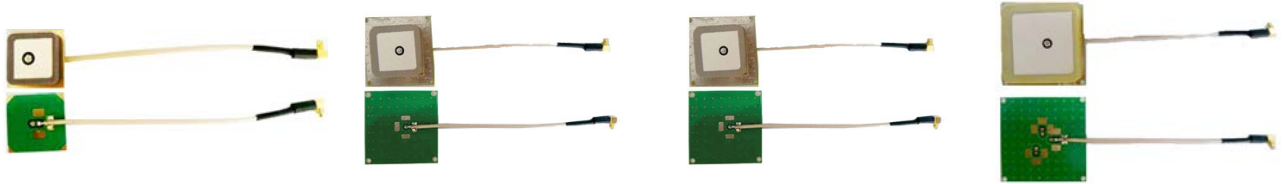
PART NUMBER	APAES923R4560C16-T	APAES915R6460C16-T	APAES915R80C16-T	APAES868R8060C16-T
TYPE	Passive Patch	Passive Patch	Passive Patch	Passive Patch
FREQUENCY (MHz)	923	915	915	868
GAIN (dBi)	2.5	3.5	5	5
MOUNTING	Through-hole Mount / Adhesive Tape	Through-hole Mount / Adhesive Tape	Through-hole Mount / Adhesive Tape	Through-hole Mount / Adhesive Tape
POLARIZATION	RHCP	RHCP	RHCP	RHCP
PACKAGE SIZE (mm)	45 x 45 x 6	62.5 x 62.5 x 6	80 x 80 x 6	80 x 80 x 6
KEY FEATURES	LPWA/LoRa/SigFox/ISM	LPWA/LoRa/SigFox/ISM	High gain, LoRa/ SigFox/ISM	High gain, LoRa/ SigFox/ISM



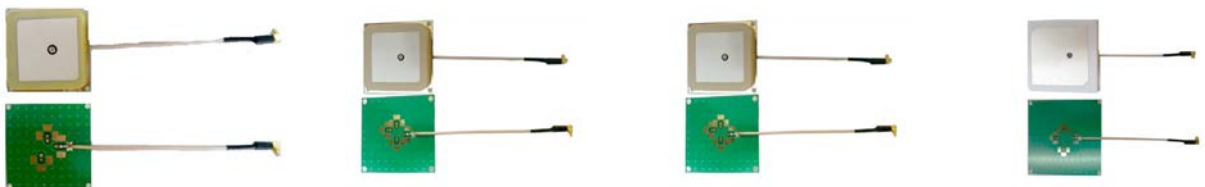
PART NUMBER	ARRKP4065-S915A	ARRKP5062-S915B	ARRKP7059-S915B	ARRCN5-868.000MHz
TYPE	Passive Patch	Passive Patch	Passive Patch	Passive Patch
FREQUENCY (MHz)	915	915	915	868-871
GAIN (dBi)	1.5	3	4	-5
MOUNTING	Through-hole Mount	Through-hole Mount	Through-hole Mount	Connector Mount
POLARIZATION	RHCP	RHCP	RHCP	RHCP
PACKAGE SIZE (mm)	40 x 40 x 6.5	50 x 50 x 6.2	70 x 70 x 5.9	20.5 x 20.5 x 7.8
KEY FEATURES	Built-in ground plane, Ø1.13mm, IPEX, LPWA/ISM	Built-in ground plane, RG-178, MMCX-JW, LPWA/ISM	High gain, Built-in ground plane, RG-178, MMCX-JW, LPWA/ISM	Built-in ground plane, Compact size, RG-178, MMCX-JW3, LPWA/ISM



# LPWA/LORA/SIGFOX/NB-IOT/ISM ANTENNAS

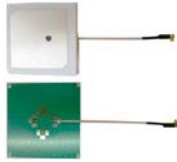


PART NUMBER	ARRCN5-915.000MHz	ARRAN5-915.000MHz	ARRAN5-868.000MHz	ARRRN5-868.000MHz
TYPE	Passive Patch	Passive Patch	Passive Patch	Passive Patch
FREQUENCY (MHz)	915-918	915-918	868-871	868-871
GAIN (dBi)	-5	0.5	0.5	1.5
MOUNTING	Connector Mount	Connector Mount	Connector Mount	Connector Mount
POLARIZATION	RHCP	RHCP	RHCP	RHCP
PACKAGE SIZE (mm)	20.5 x 20.5 x 7.8	35 x 35 x 8.2	35 x 35 x 8.2	40 x 40 x 8
KEY FEATURES	Built-in ground plane, Compact size, RG-178, MMCX-JW3, LPWA/ISM	Built-in ground plane, RG-178, MMCX-JW3, LPWA/ISM	Built-in ground plane, RG-178, MMCX-JW3, LPWA/ISM	Built-in ground plane, RG-178, MMCX-JW3, LPWA/ISM



PART NUMBER	ARRRN5-915.000MHz	ARRSN5-868.000MHz	ARRSN5-915.000MHz	ARRTN5-868.000MHz
TYPE	Passive Patch	Passive Patch	Passive Patch	Passive Patch
FREQUENCY (MHz)	915-918	868-871	915-918	868-871
GAIN (dBi)	1.5	2.5	2.5	3.5
MOUNTING	Connector Mount	Connector Mount	Connector Mount	Connector Mount
POLARIZATION	RHCP	RHCP	RHCP	RHCP
PACKAGE SIZE (mm)	40 x 40 x 8	50 x 50 x 9.4	50 x 50 x 9.4	65 x 65 x 9.2
KEY FEATURES	Built-in ground plane, RG-178, MMCX-JW3, LPWA/ISM	Built-in ground plane, RG-178, MMCX-JW3	Built-in ground plane, RG-178, MMCX-JW3, LPWA/ISM	Built-in ground plane, RG-178, MMCX-JW3, LPWA/ISM

# LPWA/LORA/SIGFOX/NB-IOT/ISM ANTENNAS



PART NUMBER	ARRTN5-915.000MHz	ARRUN5-868.000MHz	ARRUN5-915.000MHz	AFAC5867-S698
TYPE	Passive Patch	Passive Patch	Passive Patch	Flexible PCB
FREQUENCY (MHz)	915-918	868-871	915-918	698-960   1710-2690
GAIN (dBi)	3.5	5.5	5.5	2
MOUNTING	Connector Mount	Connector Mount	Connector Mount	Adhesive Mount
POLARIZATION	RHCP	RHCP	RHCP	Linear
PACKAGE SIZE (mm)	65 x 65 x 9.2	120 x 120 x 9.5	120 x 120 x 9.5	67.4 x 58.4 x 0.2
KEY FEATURES	Built-in ground plane, RG-178, MMCX-JW3, LPWA/ISM	Built-in ground plane, High gain, RG-178, MMCX-JW3, LPWA/ISM	Built-in ground plane, High gain, RG-178, MMCX-JW3, LPWA/ISM	Low profile, Compact size, Ø1.13mm, IPEX, NB-IoT/LTE Cat M1



PART NUMBER	AFC8513U4G	AFAC110020-S698	AEACAC054010-S915	AEACAC049018-S868
TYPE	Flexible PCB	Flexible PCB	Whip - Straight	Whip - Right Angle
FREQUENCY (MHz)	698-4000	698-960   1710-2690	915	868
GAIN (dBi)	5	3	2	2
MOUNTING	Adhesive Mount	Adhesive Mount	Connector Mount	Connector Mount
POLARIZATION	Linear	Linear	Linear	Linear
PACKAGE SIZE (mm)	85.0 x 13.8 x 0.2	110 x 20 x 0.2	45.9 x Ø10.0	49.9 x Ø18.6
KEY FEATURES	5G/CBRS, Compact, Wideband, Ø1.13 mm, IPEX	Low profile, Multi-band, Ø1.13mm, IPEX, NB-IoT/LTE Cat M1	Compact size, Low profile, SMA, LPWA/ISM	Compact size, Low profile, LoRa/ SigFox/ISM

New

# LPWA/LORA/SIGFOX/NB-IOT/ISM ANTENNAS



PART NUMBER	AEACAC053010Z-S433	AEACAC053010-S868	APAMSTJ-139	AEACAC198013-S5GNR
TYPE	Whip - Right Angle / Straight	Whip - Straight	Whip - Straight	Whip - Tilt
FREQUENCY (MHz)	433	868	380-500	698-960   1710-2690   3300-3800
GAIN (dBi)		2	2	3
MOUNTING	Connector Mount	Connector Mount	Connector Mount	Connector Mount
POLARIZATION		Linear	Linear	Linear
PACKAGE SIZE (mm)	53.4 x Ø10.4	53.4 x Ø10.4	54.6 x Ø13.2	198 x 13
KEY FEATURES	Ultra-compact size, SMA(M), LoRa/SigFox/ISM	Compact size, Low profile, LoRa/SigFox/ISM	Compact size, SMA(M), TETRA radio, LPWA/ISM	High gain, SMA(M), LPWA/ISM



PART NUMBER	AEACAC195013-S868	AEACAC195013-S915	AEACAC254010-S169	AEACAC198013-S698
TYPE	Whip - Tilt	Whip - Tilt	Whip - Tilt	Whip - Tilt
FREQUENCY (MHz)	868	915	161-177	698-960   1710-2655
GAIN (dBi)	3	3	2	3
MOUNTING	Connector Mount	Connector Mount	Connector Mount	Connector Mount
POLARIZATION	Linear	Linear	Linear	Linear
PACKAGE SIZE (mm)	195 x Ø12.9	195 x Ø12.9	254 x Ø10.9	198 x Ø13.0
KEY FEATURES	SMA(M), LoRa/SigFox/ISM	SMA(M), LoRa/SigFox/ISM	SMA, LoRa/SigFox/ISM	SMA(M), LoRa/SigFox/ISM/Sub-GHz - NB-IoT/LTE Cat M1

# LPWA/LORA/SIGFOX/NB-IOT/ISM ANTENNAS



PART NUMBER	AEACAQ190012-S868	AEACAQ190012-S915	AEACAD153029-S433	AEACAD097015-S698
TYPE	Whip - Straight	Whip - Straight	Magnetic Mount	Magnetic Mount
FREQUENCY (MHz)	868	915	433-960	700-2700
GAIN (dBi)	3.5	3.5	3	5
MOUNTING	Knuckle Mount	Knuckle Mount	Magnetic Mount	Magnetic Mount
POLARIZATION	Linear	Linear	Linear	Linear
PACKAGE SIZE (mm)	190 x Ø12.9	190 x Ø12.9	153.3 x Ø29.4	97 x Ø15
KEY FEATURES	High gain, Ø1.37mm, IPEX, LPWA/ISM	High gain, Ø1.37mm, IPEX, LPWA/ISM	RG-174, SMA, LoRA/SigFox/ISM/ Sub-GHz - NB-IoT/LTE Cat M1	High gain, RG-58, SMA, NB-IoT/ LTE Cat M1



PART NUMBER	AEACAD460065-S698	AECB1102X	AEACCA115021-S698	AEACBK081014-S698
TYPE	Magnetic Mount	Blade	Blade	Puck
FREQUENCY (MHz)	698-960   1710-2700	600-6000	698-960   1710-2655	698-960   1710-2690
GAIN (dBi)	5	2	2	3
MOUNTING	Magnetic Mount	Adhesive	Adhesive Mount	Screw Mount
POLARIZATION	Linear	Linear	Linear	Linear
PACKAGE SIZE (mm)	Ø65 x 460	115.6 x 21.7 x 5.8	115.6 x 21.7 x 5.8	Ø81.3 x 14.6
KEY FEATURES	High gain, RG-58, SMA, NB-IoT/ LTE Cat M1	5G/CBRS, Wideband, Low Profile, LMR-100, SMA	Low profile, RG-174, SMA, NB-IoT/LTE Cat M1	IP67 rated, RG-174, SMA(M), NB-IoT/LTE Cat M1

New



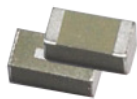
# GNSS/GPS(L1/L2/L5)/GLONASS/BEIDOU/GALILEO ANTENNAS

Abracon offers GNSS/GPS(L1/L2/L5)/GLONASS/BeiDou/Galileo antennas with multi-band capability and weather resistance to maximize the GNSS receiver's performance in rugged environments.

The solutions span across a range of choices, such as linear, circular and omnidirectional polarization. They include small ceramic SMD chip antennas, directional patch antennas and high accuracy stacked patch antennas that allow flexibility of antenna orientation for receiving satellite signal. The options include active antennas with integrated high gain LNA guarantee positioning accuracy and reliability for GNSS signals.

## APPLICATIONS

- IoT
- Industrial Drones
- Security Surveillance
- Machine to Machine
- Surveying
- Mapping
- Navigation
- Fleet Management
- Smart Agriculture
- Rail Systems
- Marine GPS
- Transportation
- Commercial Vehicles
- Geofencing
- Logistics



PART NUMBER	ACAG0301-1575-T	ACAR0301-SG3	APAKN0904-S1575-T	APAE1575R1240ABDD1-T
TYPE	Chip	Chip	Passive Patch	Passive Patch
FREQUENCY (MHz)	1575	1561-1610	1575.42	1575.42
GAIN (dBi)	4.18	1.69   -1.81   1.43	0.5	0.6
MOUNTING	Surface Mount	Surface Mount	Surface Mount	Through-hole Mount / Adhesive Tape
POLARIZATION	Linear	Linear	RHCP	RHCP
PACKAGE SIZE (mm)	3.2 x 1.6 x 0.6	3.05 x 1.6 x 0.55	9 x 9 x 4	12 x 12 x 4
KEY FEATURES	GPS, High gain	GNSS, Multi-band, Low profile	GPS, Ultra-compact size	GPS, Compact size

# GNSS/GPS(L1/L2/L5)/GLONASS/BEIDOU/GALILEO ANTENNAS

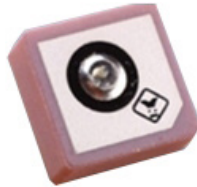


PART NUMBER	APAE1575R1340ABDD6-T	APAE1575R1540AZDB2F-T	APAE1575R1820ABDC1-T	APAE1575R1840AADB7-T
TYPE	Passive Patch	Passive Patch	Passive Patch	Passive Patch
FREQUENCY (MHz)	1575.42	1575.42	1575.42	1575.42
GAIN (dBi)	-	1.2	3.3	-
MOUNTING	Through-hole Mount / Adhesive Tape	Through-hole Mount / Adhesive Tape	Through-hole Mount / Adhesive Tape	Through-hole Mount / Adhesive Tape
POLARIZATION	RHCP	RHCP	RHCP	RHCP
PACKAGE SIZE (mm)	13 x 13 x 4	15 x 15 x 4	18 x 18 x 2	18 x 18 x 4
KEY FEATURES	GPS, Compact size	GPS	GPS, Low profile	GPS

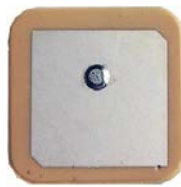


PART NUMBER	APAE1575R1840BADB1F-T	APAE1575R2040ABDD2-T	APAE1575R2520ABDD7-T	APAE1575R2540AADBE-T
TYPE	Passive Patch	Passive Patch	Passive Patch	Passive Patch
FREQUENCY (MHz)	1575.42	1575.42	1575.42	1575.42
GAIN (dBi)	3.3	-	4.3	4.5
MOUNTING	Through-hole Mount / Adhesive Tape	Through-hole Mount / Adhesive Tape	Through-hole Mount / Adhesive Tape	Through-hole Mount / Adhesive Tape
POLARIZATION	RHCP	RHCP	RHCP	RHCP
PACKAGE SIZE (mm)	18 x 18 x 4	20 x 20 x 4	25 x 25 x 2	25 x 25 x 4
KEY FEATURES	GPS	GPS	GPS, Low profile, High gain	GPS, High gain

# GNSS/GPS(L1/L2/L5)/GLONASS/BEIDOU/GALILEO ANTENNAS



PART NUMBER	APAE1575R2540BBDB1-T	APAEA1575R0940K14-T	APAES1575R1040J34-T	APAE1590R1340AKDB2-T
TYPE	Passive Patch	Passive Patch	Passive Patch	Passive Patch
FREQUENCY (MHz)	1575.42	1606	1606	1575   1598-1606
GAIN (dBi)	4.5	-1	-2	-2
MOUNTING	Through-hole Mount / Adhesive Tape	Through-hole Mount / Adhesive Tape	Through-hole Mount / Adhesive Tape	Through-hole Mount / Adhesive Tape
POLARIZATION	RHCP	RHCP	RHCP	RHCP
PACKAGE SIZE (mm)	25 x 25 x 4	9 x 9 x 4	10 x 10 x 4	13 x 13 x 4
KEY FEATURES	GPS, High gain	GPS/GLONASS, Ultra-compact size	GPS/GLONASS, Compact size	GPS/GLONASS, Compact size



PART NUMBER	APAE1590R1350AKDB5-T	APAE1590R2540AKDB1-T	APAKN1304-C2G-T	APARM1504-SG3
TYPE	Passive Patch	Passive Patch	Passive Patch	Passive Patch
FREQUENCY (MHz)	1575   1598-1606	1575   1592-1608	1575.42   1602	1561   1575   1602
GAIN (dBi)	-2	-	2.6   2.4	-3   -4.5   0.8
MOUNTING	Through-hole Mount / Adhesive Tape	Through-hole Mount / Adhesive Tape	Surface Mount	Through-hole Mount
POLARIZATION	RHCP	RHCP	RHCP	RHCP
PACKAGE SIZE (mm)	13 x 13 x 5	25 x 25 x 4	13 x 13 x 4	15 x 15 x 4
KEY FEATURES	GPS/GLONASS, Compact size	GPS/GLONASS	GPS/GLONASS, Compact size	GNSS, Multi-band, Low profile

# GNSS/GPS(L1/L2/L5)/GLONASS/BEIDOU/GALILEO ANTENNAS



PART NUMBER	APRA1804G3Z	APARM1804-SG3	APAKN1804-C2G-T	APRA2504G3Z
TYPE	Passive Patch	Passive Patch	Passive Patch	Passive Patch
FREQUENCY (MHz)	1561-1602	1561   1575.42   1602	1575.42   1602	1561   1575   1602
GAIN (dBi)	3.5   2.6   4.7	3   2   4	2.8   2.9	3.4   2.4   4.2
MOUNTING	Through-hole Mount	Through-hole Mount	Surface Mount	Through-hole Mount
POLARIZATION	RHCP	RHCP	RHCP	RHCP
PACKAGE SIZE (mm)	18 x 18 x 4	18 x 18 x 4	18 x 18 x 4	25.1 x 25.1 x 4
KEY FEATURES	AECQ200, GNSS, Multi-band, Compact size	GNSS, Multi-band, Compact size	GPS/GLONASS, Compact size	AECQ200, GNSS, Multi-band, High gain

New

New



PART NUMBER	APARM2504-SG3	APAKN2504-C2G-T	APARM3503-SG3	APAGM3606-SG3
TYPE	Passive Patch	Passive Patch	Passive Patch	Passive Patch
FREQUENCY (MHz)	1561   1575   1602	1575.42   1602	1561   1575.42   1602	1562   1575   1602
GAIN (dBi)	2.5   1.5   3.5	3.6	4.0   3.0   4.5	4
MOUNTING	Through-hole Mount	Surface Mount	Through-hole Mount	Through-hole Mount
POLARIZATION	RHCP	RHCP	RHCP	RHCP
PACKAGE SIZE (mm)	25.1 x 25.1 x 4	25 x 25 x 4	35 x 35 x 3	36 x 36 x 6
KEY FEATURES	GNSS, Multi-band, High gain	GPS/GLONASS, High gain	GNSS, Multi-band, High gain	GNSS, Multi-band, High gain, High efficiency



# GNSS/GPS(L1/L2/L5)/GLONASS/BEIDOU/GALILEO ANTENNAS



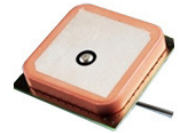
PART NUMBER	APAKM3513-SGL2	APRE2508GCZ	APAKM2507S-SGL5	APARM2508S-SG3L5
TYPE	Passive Patch	Passive Stacked Patch	Passive Patch	Passive Patch
FREQUENCY (MHz)	1227   1575	1176   1561   1575   1577   1602	1575.42   1176.45	1176   1561   1575   1577   1602
GAIN (dBi)	1.2   3.1	1.3   3.1   1.6   1.6   4.3	4   -3	0.5   2.4   0.6   0.6   3.4
MOUNTING	Through-hole Mount	Through-hole Mount	Through-hole Mount	Through-hole Mount
POLARIZATION	Circular	RHCP	RHCP	RHCP
PACKAGE SIZE (mm)	35.6 x 35.6 x 13.5	25.1 x 25.1 x 8	25 x 25 x 7.5	25.1 x 25.1 x 8
KEY FEATURES	GPS(L1+L2)	AECQ200, GNSS, GPS (L1/L5)	GPS(L1+L5), High gain	GPS(L1+L5)/GLONASS, Compact size

New

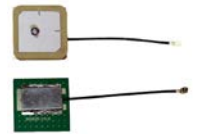
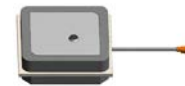


PART NUMBER	APARM2508S-SGL2L5	APAM0968JL03V2.0	APAM1068JL01V2.0	APAM1268JL02V2.0
TYPE	Passive Patch	Active Patch	Active Patch	Active Patch
FREQUENCY (MHz)	1176   1227   1575	1575.42	1575.42	1575.42
GAIN (dBi)	-0.5   -0.3   3.8	-3	-2	0
MOUNTING	Through-hole Mount	Connector Mount	Connector Mount	Connector Mount
POLARIZATION	RHCP	RHCP	RHCP	RHCP
PACKAGE SIZE (mm)	25 x 25 x 8	9 x 9 x 6.8	10 x 10 x 6.8	12 x 12 x 6.8
KEY FEATURES	GPS(L1+L2+L5)/GLONASS, Compact size	GPS, Ultra-compact size, LNA gain : 18 dB, Ø0.80mm, IPEX	GPS, Compact size, LNA gain : 18 dB, Ø0.80mm, IPEX	GPS, LNA gain : 18 dB, Ø0.80mm, IPEX

# GNSS/GPS(L1/L2/L5)/GLONASS/BEIDOU/GALILEO ANTENNAS



PART NUMBER	APAM1368YB13V3.0	APAM1568YE15V2.0	APAM1866YA18	APAM2764YK0175
TYPE	Active Patch	Active Patch	Active Patch	Active Patch
FREQUENCY (MHz)	1575.42	1575.42	1575.42	1575.42
GAIN (dBi)	0	1.5	2.5	2.5
MOUNTING	Connector Mount	Connector Mount	Connector Mount	Connector Mount
POLARIZATION	RHCP	RHCP	RHCP	RHCP
PACKAGE SIZE (mm)	13 x 13 x 6.8	15 x 15 x 6.8	18 x 18 x 7	27 x 27 x 7
KEY FEATURES	GPS, LNA gain : 19 dB, Ø0.81mm, IPEX	GPS, LNA gain : 18 dB, Ø0.80mm, IPEX	GPS, LNA gain: 27 dB, Ø1.13mm, IPEX	GPS, LNA gain: 28 dB, Ø1.13mm, IPEX



PART NUMBER	APARC1807A-SG3	APAMPGJ-141	APAGM2704A-C2G	APAKC2506A-SG3
TYPE	Active Patch	Active Patch	Active Patch	Active Patch
FREQUENCY (MHz)	1561-1602	1575.42   1592-1610	1575.42-1601.02	1555-1615
GAIN (dBi)	-6.5   -6.5   -6.0	3	4.5	-1.5   -1   -2.5
MOUNTING	Surface Mount	Connector Mount	Surface Mount	Surface Mount
POLARIZATION	RHCP	RHCP	RHCP	RHCP
PACKAGE SIZE (mm)	18 x 18 x 7.6	25 x 25 x 8.6	27 x 27 x 4	25 x 25 x 6.9
KEY FEATURES	GNSS, Multi-band, High gain LNA, Ø1.13mm, IPEX	GPS/GLONASS, High gain, LNA gain: 24 dB, Ø1.13mm, IPEX	GPS/GLONASS, LNA gain: 28 dB, Ø1.13mm, IPEX	GNSS, Multi-band, High gain LNA : 32 dB, Ø1.13mm, IPEX II

# GNSS/GPS(L1/L2/L5)/GLONASS/BEIDOU/GALILEO ANTENNAS



PART NUMBER	APARC2504A-SG3	APAKC3508A-SG3	APARC2511X-SGL2L5	APARC2511X-SG3L5
TYPE	Active Patch	Active Patch	Active Patch	Active Patch
FREQUENCY (MHz)	1561   1575.42   1602	1555-1615	1176.45   1227.6   1575.42	1176   1561   1575.42   1602
GAIN (dBi)	-1   -2.5   -1.5	3.0   2.8   2.5   3.0		
MOUNTING	Adhesive Mount	Surface Mount	Surface Mount	Surface Mount
POLARIZATION	RHCP	RHCP	RHCP	RHCP
PACKAGE SIZE (mm)	25 x 25 x 7.4	35 x 35 x 8.7	25 x 25 x 12.4	25 x 25 x 13
KEY FEATURES	GNSS, Multi-band, LNA gain: 18 dB, Ø1.13mm, IPEX	GNSS, Multi-band, High gain LNA : 32 dB, Ø1.13mm, IPEX II	GPS(L1+L2+L5), Compact size, High gain LNA, Ø1.13mm, IPEX(F)	GPS(L1+L5)/GLONASS, Compact size, High gain LNA, Ø1.13mm, IPEX(F)



PART NUMBER	AFAG3030-SG3	AFAG4330-SG3	AECC0502GB	APAMP-114
TYPE	Flexible PCB	Flexible PCB	Whip	Module
FREQUENCY (MHz)	1550-1620	1550-1620	1207-1278   1561-1610	1575.42
GAIN (dBi)		2	2	1
MOUNTING	Adhesive Tape	Adhesive Mount	Connector Mount	Adhesive Mount
POLARIZATION	Vertical	Linear	RHCP	RHCP
PACKAGE SIZE (mm)	30 x 30 x 0.2	40 x 10	55.6 x Ø27.5	26 x 23 x 12
KEY FEATURES	GNSS, Low Profile, Ultra-compact size, Ø1.13mm, IPEX	Low profile, High gain, Ø1.13mm, IPEX	Ultra Low Profile, IP67, Active GNSS, GPS L1/L2, GLONASS, BeiDou, Galileo, SMA	GPS, LNA gain: 26 dB, RG-174, SMA-J3

New

# GNSS/GPS(L1/L2/L5)/GLONASS/BEIDOU/GALILEO ANTENNAS



PART NUMBER	APAMP-113	APAMP-127	APAMP-111	APAMP-125
TYPE	Module	Module	Module	Module
FREQUENCY (MHz)	1575.42	1576.44	1575.42	1576.44
GAIN (dBi)	5	5	5	5
MOUNTING	Adhesive Mount	Magnetic Mount	Adhesive Mount	Magnetic Mount
POLARIZATION	RHCP	RHCP	RHCP	RHCP
PACKAGE SIZE (mm)	38 x 34 x 12	38 x 34 x 12	38.3 x 35 x 12	38.3 x 35 x 12
KEY FEATURES	GPS, High gain, LNA gain: 28 dB, RG-174, FAKRA-C	GPS, High gain, LNA gain: 28 dB, RG-174, FAKRA-C	GPS, High gain, LNA gain: 28 dB, SMA-J3	GPS, High gain, LNA gain: 27 dB, RG-174, SMA-J3



PART NUMBER	APAMP-115	APAMP-128	APAMPJ-133	APAMP-116
TYPE	Module	Module	Module	Module
FREQUENCY (MHz)	1575.42	1576.44	1575.42	1575.42
GAIN (dBi)	3.5	3.5	4	5
MOUNTING	Adhesive Mount	Magnetic Mount	Adhesive Mount	Adhesive Mount
POLARIZATION	RHCP	RHCP	RHCP	RHCP
PACKAGE SIZE (mm)	40 x 35 x 15.1	40 x 35 x 13.1	41 x 34 x 14.5	44 x 37 x 14.5
KEY FEATURES	GPS, LNA gain: 28 dB, RG-174, SMA-J3	GPS, High gain, LNA gain: 28 dB, RG-174, SMA-J3	GPS, High gain, LNA gain: 15 dB, RG-174U, MMCX(M)	GPS, High gain, LNA gain: 27 dB, RG-174, SMA-JW3

# GNSS/GPS(L1/L2/L5)/GLONASS/BEIDOU/GALILEO ANTENNAS



PART NUMBER	APAMP-129	APAMP-112	APAMP-107	APAMP-122
TYPE	Module	Module	Module	Module
FREQUENCY (MHz)	1576.44	1575.42	1575.42	1576.44
GAIN (dBi)	5	5	5	5
MOUNTING	Magnetic Mount	Adhesive Mount	Adhesive Mount	Magnetic Mount
POLARIZATION	RHCP	RHCP	RHCP	RHCP
PACKAGE SIZE (mm)	44 x 37 x 14.5	46 x 38 x 15	48.6 x 39.2 x 15.2	48.6 x 39.2 x 15.2
KEY FEATURES	GPS, LNA gain: 27 dB, RG-174, SMA-JW3	GPS, High gain, LNA gain: 27 dB, RG-174, SMA-J3	GPS, High gain, LNA gain: 27 dB, SMA-J3	GPS, High gain, LNA gain: 27 dB, SMA-J3



PART NUMBER	APAMP-124	APAMP-126	APAMP-109	APAMP-123
TYPE	Module	Module	Module	Module
FREQUENCY (MHz)	1576.44	1576.44	1575.42	1576.44
GAIN (dBi)	5	5	5	5
MOUNTING	Magnetic Mount	Magnetic Mount	Adhesive Mount	Magnetic Mount
POLARIZATION	RHCP	RHCP	RHCP	RHCP
PACKAGE SIZE (mm)	49.2 x 40 x 15.2	49.2 x 40 x 15.2	50.6 x 50.6 x 15.1	50.6 x 50.6 x 15.1
KEY FEATURES	GPS, High gain, LNA gain: 29 dB, RG-174, SMA-JW3	GPS, High gain, LNA gain: 27 dB, RG-174, SMA-J3	GPS, High gain, LNA gain: 26 dB, RG-174, SMA-J3	GPS, High gain, LNA gain: 26 dB, RG-174, SMA-J3

# GNSS/GPS(L1/L2/L5)/GLONASS/BEIDOU/GALILEO ANTENNAS



PART NUMBER	APAMP-108	APAMPG-117	APAMPG-130
TYPE	Module	Module	Module
FREQUENCY (MHz)	1575.42	1575.42   1594-1610	1576.44   1594-1610
GAIN (dBi)	5	5	5
MOUNTING	Adhesive Mount	Adhesive Mount	Magnetic Mount
POLARIZATION	RHCP	RHCP	RHCP
PACKAGE SIZE (mm)	54.5 x 44.5 x 14.8	44 x 14.5	44 x 14.5
KEY FEATURES	GPS, High gain, LNA gain: 27 dB, SMA-J3	High gain, LNA gain: 30 dB, GPS/GLONASS, SMA-J3	GPS/GLONASS, High gain, LNA gain: 30 dB, SMA-J3



PART NUMBER	AEACBA045015-SG2	AEACBD045015-SG2	AEARBA048014-SG3
TYPE	Module	Module	Module
FREQUENCY (MHz)	1575-1602	1575-1602	1559-1610
GAIN (dBi)	5	5	5.78   4.27   5.65
MOUNTING	Adhesive Mount	Magnetic Mount	Adhesive Mount
POLARIZATION	RHCP	RHCP	RHCP
PACKAGE SIZE (mm)	45.2 x 35.8 x 15.2	45.2 x 35.8 x 15.2	48.5 x 47 x 14
KEY FEATURES	GPS/GLONASS, Multi-band, IP67 rated, RG-174, SMA	GPS/GLONASS, High gain, RG-174, SMA	GNSS, Multi-band, High gain, LNA gain: 28 dB, Ø2.7mm, SMA(M)



PART NUMBER	AEARBD048014-SG3	AEACBA050018-SG3	AEACBD050018-SG3
TYPE	Module	Module	Module
FREQUENCY (MHz)	1559-1610	1561-1602	1561-1602
GAIN (dBi)	5.78   4.27   5.65	5	5
MOUNTING	Magnetic Mount	Adhesive Mount	Magnetic Mount
POLARIZATION	RHCP	RHCP	RHCP
PACKAGE SIZE (mm)	48.5 x 47 x 14	50 x 50 x 18	50 x 50 x 18
KEY FEATURES	GPS/GLONASS, High gain, Ø2.7mm, SMA(M)	GNSS, Multi-band, High gain, LNA gain: 34 dB, RG-174, SMA(M)	GNSS, Multi-band, IP67 rated, RG-174, SMA



PART NUMBER	AEACBA050018-SG4L2L5	AEAGMK148060-S1575	AEACMK0660746-SG4
TYPE	Puck	Dome	Dome
FREQUENCY (MHz)	1561-1602   1176-1227	1164-1300   1559-1615	1561-1602
GAIN (dBi)	3	4.5	5
MOUNTING	Adhesive / Magnetic Mount	Screw Mount	Screw Mount
POLARIZATION	RHCP	RHCP	RHCP
PACKAGE SIZE (mm)	50 x 50 x 18	Ø148 x 60	Ø66.5 x x 76
KEY FEATURES	GPS(L1+L2+L5)/GLONASS, Multi-band, IP67 rated, RG-174, SMA	GNSS, Multi-band, High gain, IP66 rated, TNC-K	GNSS, Multi-band, Ultra-High gain, IP67 rated, TNC



# RFID READER ANTENNAS

Abrakon offers patch antennas for ultra-high frequency (UHF) RFID applications in 868 MHz (Europe) or 915 MHz (USA). These patch antennas come in assorted sizes, featuring circular polarization and high-gain performance with directional patterns. Our high performing reader antennas feature easy installation and come tuned to the ground plane, allowing the RFID reader systems to meet the read range specified with each tag.

## APPLICATIONS

- Logistics
- Industrial Automation
- Manufacturing
- Inventory Management
- Smart Cards
- Field Mobility
- Pharmaceutical
- Asset Management
- Transportation



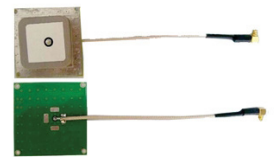
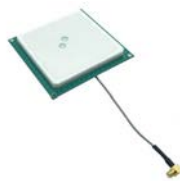
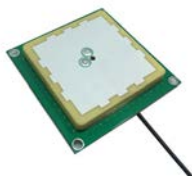
PART NUMBER	APAE868R2540JBDB2-T	APAE915R2540ABDB1-T	APAES923R3640C16-T	APAES923R4560C16-T
TYPE	Passive Patch	Passive Patch	Passive Patch	Passive Patch
FREQUENCY (MHz)	868	915	923	923
GAIN (dBi)	-1.37	-	1.5	2.5
MOUNTING	Through-hole Mount / Adhesive Tape	Through-hole Mount / Adhesive Tape	Through-hole Mount / Adhesive Tape	Through-hole Mount / Adhesive Tape
POLARIZATION	RHCP	RHCP	RHCP	RHCP
PACKAGE SIZE (mm)	25 x 25 x 4	25 x 25 x 4	36 x 36 x 4	45 x 45 x 6
KEY FEATURES	Compact size	Compact size		



# RFID READER ANTENNAS



PART NUMBER	APAES915R6460C16-T	APAES868R8060C16-T	APAES915R80C16-T	ARRKP4065-S915A
TYPE	Passive Patch	Passive Patch	Passive Patch	Passive Patch
FREQUENCY (MHz)	915	868	915	915
GAIN (dBi)	3.5	5	5	1.5
MOUNTING	Through-hole Mount / Adhesive Tape	Through-hole Mount / Adhesive Tape	Through-hole Mount / Adhesive Tape	Through-hole Mount
POLARIZATION	RHCP	RHCP	RHCP	RHCP
PACKAGE SIZE (mm)	62.5 x 62.5 x 6	80 x 80 x 6	80 x 80 x 6	40 x 40 x 6.5
KEY FEATURES		High gain	High gain	Built-in ground plane, Ø1.13mm, IPEX



PART NUMBER	ARRKP5062-S915B	ARRKP7059-S915B	ARRCN5-915.000MHz	ARRAN5-915.000MHz
TYPE	Passive Patch	Passive Patch	Passive Patch	Passive Patch
FREQUENCY (MHz)	915	915	915-918	915-918
GAIN (dBi)	3	4	-5	0.5
MOUNTING	Through-hole Mount	Through-hole Mount	Connector Mount	Connector Mount
POLARIZATION	RHCP	RHCP	RHCP	RHCP
PACKAGE SIZE (mm)	50 x 50 x 6.2	70 x 70 x 5.9	20.5 x 20.5 x 7.8	35 x 35 x 8.2
KEY FEATURES	Built-in ground plane, RG-178, MMCX-JW	High gain, Built-in ground plane, RG-178, MMCX-JW	Built-in ground plane, Compact size, RG-178, MMCX-JW3, LPWA/ISM	Built-in ground plane, RG-178, MMCX-JW3

# RFID READER ANTENNAS



PART NUMBER	ARRRN5-868.000MHz	ARRRN5-915.000MHz	ARRSN5-868.000MHz	ARRSN5-915.000MHz
TYPE	Passive Patch	Passive Patch	Passive Patch	Passive Patch
FREQUENCY (MHz)	868-871	915-918	868-871	915-918
GAIN (dBi)	1.5	1.5	2.5	2.5
MOUNTING	Connector Mount	Connector Mount	Connector Mount	Connector Mount
POLARIZATION	RHCP	RHCP	RHCP	RHCP
PACKAGE SIZE (mm)	40 x 40 x 8	40 x 40 x 8	50 x 50 x 9.4	50 x 50 x 9.4
KEY FEATURES	Built-in ground plane, RG-178, MMCX-JW3	Built-in ground plane, RG-178, MMCX-JW3	Built-in ground plane, RG-178, MMCX-JW3	Built-in ground plane, RG-178, MMCX-JW3



PART NUMBER	ARRTN5-868.000MHz	ARRTN5-915.000MHz	ARRUN5-868.000MHz	ARRUN5-915.000MHz
TYPE	Passive Patch	Passive Patch	Passive Patch	Passive Patch
FREQUENCY (MHz)	868-871	915-918	868-871	915-918
GAIN (dBi)	3.5	3.5	5.5	5.5
MOUNTING	Connector Mount	Connector Mount	Connector Mount	Connector Mount
POLARIZATION	RHCP	RHCP	RHCP	RHCP
PACKAGE SIZE (mm)	65 x 65 x 9.2	65 x 65 x 9.2	120 x 120 x 9.5	120 x 120 x 9.5
KEY FEATURES	Built-in ground plane, RG-178, MMCX-JW3	Built-in ground plane, RG-178, MMCX-JW3	High gain, Built-in ground plane, RG-178, MMCX-JW3	High gain, Built-in ground plane, RG-178, MMCX-JW3



# SATELLITE COMMUNICATIONS ANTENNAS

Abracon offers patch and external antennas for satellite communications compatible with Iridium or Satellite Digital Audio Radio Services (SDARS). Our antennas feature high gain, low profile and right-hand circular polarization to maximize sensitivity in compact applications. Abracon also offers optimization for customer-specific devices, making them compatible with the most popular satellite radio services and Iridium communication systems.

## APPLICATIONS

- Fleet Tracking
- Asset Tracking
- Personal Tracking
- Handheld Devices
- Satellite Telephony
- Utility Monitoring
- Automotive
- Satellite Radios



PART NUMBER	APAE1621R2540ABDD1-T	APAE2338L2540DDDB1-T	AEARBD040038-S1621	AEACBD045015-S2332
TYPE	Passive Patch	Passive Patch	Module	Module
FREQUENCY (MHz)	1621-1624	2338	1616-1626.5	2320-2345
GAIN (dBi)	4	5	0.46	3
MOUNTING	Through-hole Mount / Adhesive Tape	Through-hole Mount / Adhesive Tape	Magnetic Mount	Magnetic Mount
POLARIZATION	RHCP	LHCP	RHCP	Circular
PACKAGE SIZE (mm)	25 x 25 x 4	25 x 25 x 4	40.5 x 38 x 12.3	45.2 x 35.8 x 15.1
KEY FEATURES	Low profile, High gain, Iridium	Low profile, High gain, SDARS	RG-174, SMA, Iridium	IP67 rated, High gain LNA, SDARS

# COMBINATION ANTENNAS

Abrakon offers combo antenna solutions in diverse types, from compact SMD chip to heavy duty external antennas with 2-in-1, 3-in-1, 5-in-1 and 6-in-1 protocol support. Our antennas feature IP67 rating for weather resistance to rugged environments.

These high efficiency antennas integrate 4G/LTE/3G/2G/GSM, GNSS/GPS(L1/L5)/GLONASS/BeiDou/Galileo, dual-band WiFi and AM/FM bands for next-generation devices, offering long range connectivity and easy integration for IoT and machine-to-machine (M2M) applications. High data rates, throughputs and quality of service (QoS) can be achieved with our MIMO offerings for cellular and WiFi bands.



PART NUMBER	ACAG0301-15752450-T	ACAR3005-C2WB	APRA2504F00Z	APARM2504-C2GR	APAKM4012-C2G3D
TYPE	Chip	Chip	Passive Patch	Passive Patch	Passive Patch
FREQUENCY (MHz)	1575   2450	824-960   2400-2500	1575   1610-1625	1575   1610-1625	1561-1602   2320-2345
GAIN (dBi)	1.21   3.18	2.61	3.5   4.5	2   3	2.7   4
MOUNTING	Surface Mount	Surface Mount	Through-hole Mount	Through-hole Mount	Through-hole Mount
POLARIZATION	Linear	Linear	RHCP	RHCP	RHCP   LHCP
PACKAGE SIZE (mm)	3.2 x 1.6 x 1.2	30 x 5 x 5	25.1 x 25.1 x 4	25.1 x 25.1 x 4	40 x 40 x 12.2
KEY FEATURES	WiFi + GPS, Compact size	WiFi+ LPWA/NB-IoT/Sub-GHz Cellular	AECQ200, GPS + Iridium	GPS + Iridium	GNSS + SDARS, High gain

New

# COMBINATION ANTENNAS



PART NUMBER	AFAC120050-U6G	APAMPSLJ-140	APAMSTJ-138	AEACBK046014-C2WG
TYPE	Flexible PCB	Blade	Blade	Puck
FREQUENCY (MHz)	698-6000	1559-1606   699-960   1710-2690	380-500   824-894   868   900   1800   1900   2100   2400	1575.42   2400-2483.5   4800-5825
GAIN (dBi)	5	5	2.2	0   2
MOUNTING	Adhesive Mount	Connector Mount	Glass Mount	Connector Mount
POLARIZATION	Linear	Linear	Linear	RHCP   Linear
PACKAGE SIZE (mm)	120 x 50 x 0.2	196 x 38 x 13.8	126.5 x 22 x 6.7	Ø46.6 x 14.5
KEY FEATURES	UWB + 4G/LTE + Dual-band WiFi + GNSS, High gain, Ø1.37mm, IPEX	4G/LTE + WiFi + GNSS, SMA(M)	2G/3G/GSM + WiFi + TETRA, RG-174, SMA(M)	GNSS + Dual WiFi, IP67 Rated, LNA gain : 20dB, RG-178, SMA



PART NUMBER	AEACBA081016-C2LG	AEACBD081016-C2LG	APAMPS-105	APAMPS-106
TYPE	Puck	Puck	Puck	Puck
FREQUENCY (MHz)	1575.42   698-960   1710-2690	1575.42   698-960   1710-2690	1575.42   806-960   1710-1880	1575.42   806-960   1710-1880
GAIN (dBi)	2.0   2.5	2.0   2.38	5   -1   1	5   -1   1
MOUNTING	Adhesive Mount	Magnetic Mount	Adhesive Mount	Screw Mount / Adhesive Tape
POLARIZATION	RHCP   Linear	RHCP   Linear	RHCP   Linear	RHCP   Linear
PACKAGE SIZE (mm)	Ø81.6 x 16.2	Ø81.6 x 16.2	Ø76.8 x 15.5	Ø75 x 14.1
KEY FEATURES	4G/LTE + GPS, IP67 Rated, High gain LNA, 2xRG174, 2xSMA(M)	4G/LTE + GPS, IP67 Rated, High gain LNA, 2xRG-174, 2xSMA(M)	2G/3G/GSM + GPS, High gain LNA, RF Cable, SMA-J3 + FME-J3	2G/3G/GSM + GPS, High gain LNA, RF Cable, SMA-J3

# COMBINATION ANTENNAS



PART NUMBER	APAMSJ-147	AEACBK050048-C2LG	AEACBA059015-C3GSW
TYPE	Puck	Dome	Module
FREQUENCY (MHz)	850-900   824-960   1700-2100   1575.42   1592-1610	1575.42   698-960   1710-2690	1575.42   824-960   1710-2170   2400-2483.5
GAIN (dBi)	1.5   0.5	2	2   3
MOUNTING	Adhesive Mount	Screw Mount	Adhesive Mount
POLARIZATION	Linear   Linear   Linear   RHCP   RHCP	RHCP   Linear	RHCP   Linear
PACKAGE SIZE (mm)	Ø77.0 x 12	Ø50 x 48	52 x 59 x 15
KEY FEATURES	2G/3G/GSM + GNSS, IP67 Rated, High gain LNA, 2xRG174U, 2xSMA(M)	4G/LTE + GPS, IP66 Rated, High gain LNA, 2xRG174, 2xSMA(M)	2G/3G/GSM + WiFi + CPS, High gain LNA, 3xRG-174, 3xSMA(M)



PART NUMBER	AEACBD059015-C3GSW	AECW0801C03	AECW0801C09
TYPE	Module	Puck	Puck
FREQUENCY (MHz)	1575.42   824-960   1710-2170	698-960   1710-2690   2400-2483.5   4900-5825   1561-1602	698-960   1710-2690   2400-2483.5   4900-5825   1561-1602
GAIN (dBi)	2   2	2   2   2	2.5   3   2
MOUNTING	Magnetic Mount	Screw Mount	Screw Mount
POLARIZATION	Linear	Linear   Linear   RHCP	Linear   Linear   RHCP
PACKAGE SIZE (mm)	52 x 59 x 15	Ø81.3 x 16.3	Ø81.3 x 16.3
KEY FEATURES	2G/3G/GSM + WiFi + CPS, High gain LNA, 3xRG-174, 3xSMA(M)	3-in-1, 4G LTE, WiFi, GNSS with LNA gain 28 dB, IP67, 1xLMR100, 2xRG174, SMA	4-in-1, 2x4GLTE MIMO, WiFi, GNSS, LNA gain 28 dB, IP67, 1xLMR100, 3xRG174, SMA

New

New

# COMBINATION ANTENNAS



PART NUMBER	APAMPSBJ-144	APAMPSLJ-142	AEACBK110053-MLWG
TYPE	Dome	Module	Dome MIMO
FREQUENCY (MHz)	791-960   1710-2960   850   900   1800   1900   2100   2400   1572-1610	1572-1610   380-500   824-894   880-960   1710-1880   1850-1990   1920-2170   2400-2497	1575.42-1610   698-960   1710-2690   2400-2483.5   4900-5825
GAIN (dBi)	2	2.2   2   2	3.0   2.0
MOUNTING	Body Mount	Body Mount	Screw Mount
POLARIZATION	Linear   RHCP	RHCP	RHCP   Linear   Linear
PACKAGE SIZE (mm)	Ø77.3 x 66.5	92 x 52 x 157	Ø110 x 53
KEY FEATURES	4G/LTE + WiFi + GNSS, IP67 Rated, LNA Gain: 23 dB, 2xRG174U, 2xSMA(M)	2G/3G/GSM + WiFi + GNSS + TETRA, 2xRG174 + 1xRG58, 1xFME(F) + 2xSMA(M)	2x4G/LTE MIMO + 2xWiFi MIMO + GNSS, IP67 Rated, 5xRG-174, 5xSMA(M)



PART NUMBER	AECR1808A12	AECR1808A20	AEACBK189085-MLWFL5
TYPE	Dome	Dome	Dome
FREQUENCY (MHz)	600-6000   2400-2483.5   4900-5925   1561-1606	600-6000   2400-2483.5   4900-5925   1561-1606	76-108   520-1629   698-960   1710-2690   2900-3800   1575   1176   2400-2483   4900-5925
GAIN (dBi)	4   4   3	4   4   3	1   8   4   4
MOUNTING	Connector Mount	Screw Mount	Screw Mount
POLARIZATION	Linear   Linear   RHCP	Linear   Linear   RHCP	RHCP
PACKAGE SIZE (mm)	189 x 182 x 85	189 x 182 x 85	189 x 182 x 85
KEY FEATURES	5-in-1, 2x5G MIMO, 2xWiFi MIMO, active GNSS, LNA, IP67, 4xLMR100, 1xRG174, SMA	7-in-1, 4x5G MIMO, 2xWiFi MIMO, active GNSS, LNA, IP67 rated, 7xLMR100, 7xSMA	2x4G/LTE MIMO + GPS(L1,L5) + Dual WiFi + AM/FM, High gain, 5xRG-174, 4 SMA(M)+1 DIN

New

New

# ANTENNA WHITE PAPER

## ANTENNA IMPEDANCE MATCHING

### Why is impedance matching required?

An antenna's performance is affected by the environment such as its proximity to other components or to the enclosure. The antenna must be impedance matched and tuned to the right center frequency when assembled for the end-user environment so that it operates in the desired frequency band with maximum efficiency. Optimal efficiency results in maximum range, minimum power consumption, reduced heating and reliable data throughput.

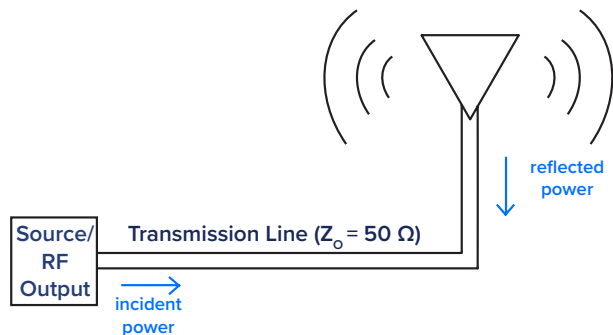
### What is impedance matching?

Impedance matching is the process of designing the antenna's input impedance or matching it to the corresponding RF circuitry's output impedance, which is  $50 \Omega$  in most cases. If the impedance of the line feeding the antenna and the antenna impedance do not match, then the source experiences complex impedance, which would be a function of the line length. Matching on the final board is crucial because antenna impedance can be altered depending on the electrical properties, size and proximity of the adjacent objects mounted on the end product, any enclosures, etc.

Impedance matching is achieved by designing a matching network, which is a circuit between the feed line and the antenna. A Smith chart is an excellent graphical aid for visualizing the impedance at the input of the antenna. A Smith chart can be used to determine matching network's lumped element values. By adjusting the reactance values in the matching network, impedance can be brought to the center of the chart, which corresponds to a pure resistance of  $50 \Omega$ .

### What is so important about impedance matching?

Despite being a complicated procedure requiring testing and validation, antenna optimization is essential in all RF designs. Without proper matching and tuning, the antenna becomes a choke point of performance due to reduced range, increased power consumption and poor transmission quality. Recent advancements in Internet of Things and smart applications demand highly efficient and reliable antenna systems.



Abracon offers an Antenna Optimization Service for customers wanting to maximize the performance of the antenna in their application. For more information about the optimization service, please see page 38 or contact the Abracon sales team for further information.

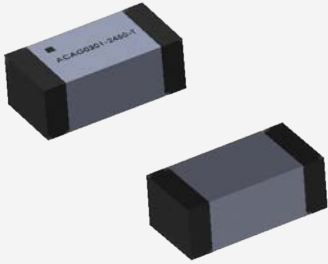
To read the full white paper, visit [abracon.com](http://abracon.com)



# ANTENNA OPTIMIZATION SERVICE

## OVERVIEW

### OBTAIN OPTIMAL POWER, GAIN AND RANGE



Abrakon offers in-system tuning services for patch and chip antennas. By characterizing the antenna performance in the end system or product, this service takes the guess work out of RF verification while offering corrective measures that re-tune the system for center frequency and impedance mismatch. This provides maximum system efficiency delivering many benefits including, extended RF range, improved sensitivity and can reduce the required power consumption for a given level of transmit range.

### Orderable Part Number: ABAOS-5WK

#### Patch Antennas

This service is offered for the APAE and APA series of passive patch antennas covering a variety of RF bands from 800MHz to 6000MHz including applications such as RFID, GPS/GNSS, WiFi, ISM radios, and Iridium. In most cases, tuning is required after the patch antenna is mounted in the end-application, especially if the antenna operating bandwidth is narrow. Passive patch antennas should be tuned to the ground plane to which they are mounted. This compensates for the frequency shifts occurring due to the particular device environment in which the antenna is placed. There are several methods to tune the patch antenna such as moving the feed point, changing the shape of the top silver electrode, and removing the corners or sides of the top silver plate.

#### Chip Antennas

This service also applies to the ACAG, ACAJ, ACAR and AMCA series of chip antennas. For chip antennas, the efficiency of the antenna depends mainly on the size and shape of the ground plane to which it is mounted as well the impedance matching of the antenna to the feed line. The antenna has to be tuned to center resonant frequency by matching the impedance to the antenna using inductors and capacitors. Higher efficiency guarantees more radiated power and increased operating range for the antennas.



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