



# AMOTECH ANTENNA

Antenna Solution for Mobile, Automotive, M2M and IoT



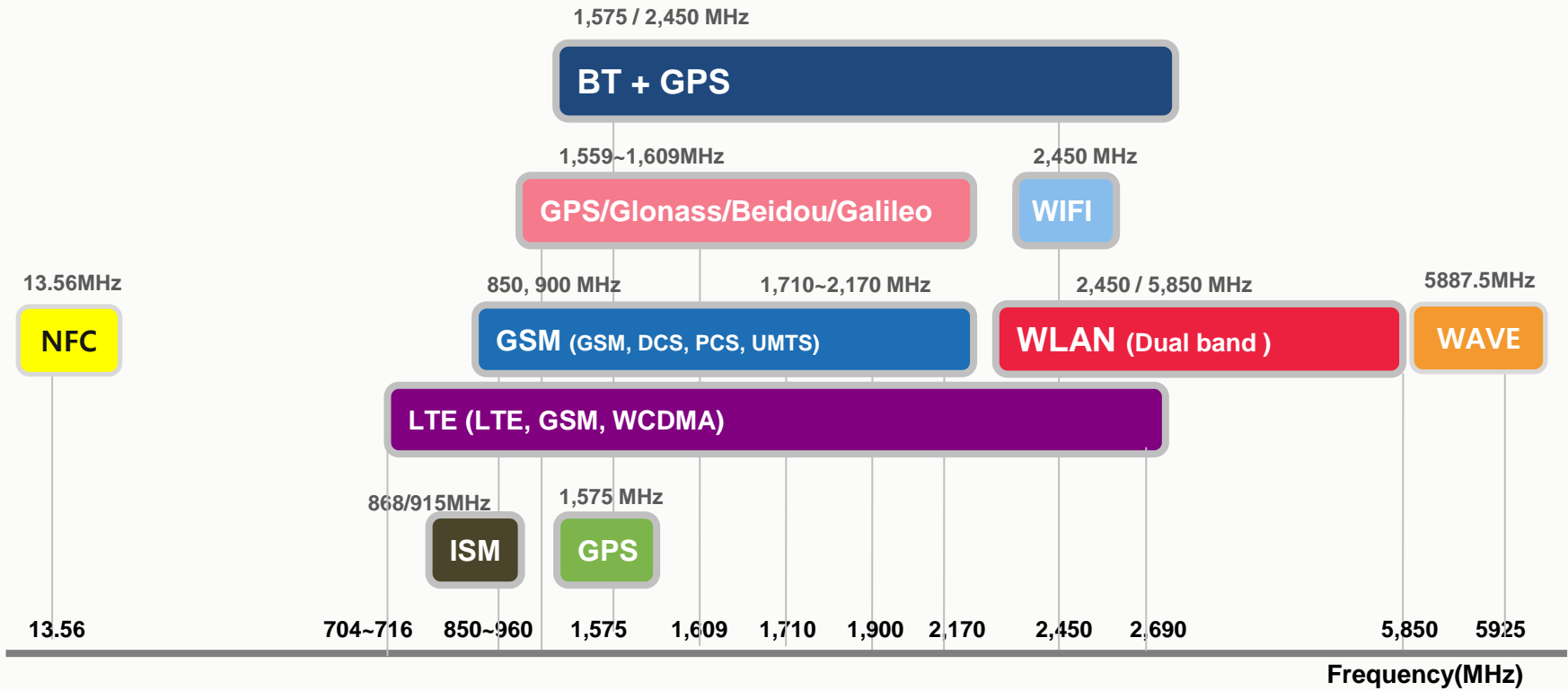
A M O T E C H

## ABOUT AMO GROUP

Challenging the world with **advanced material and technology**

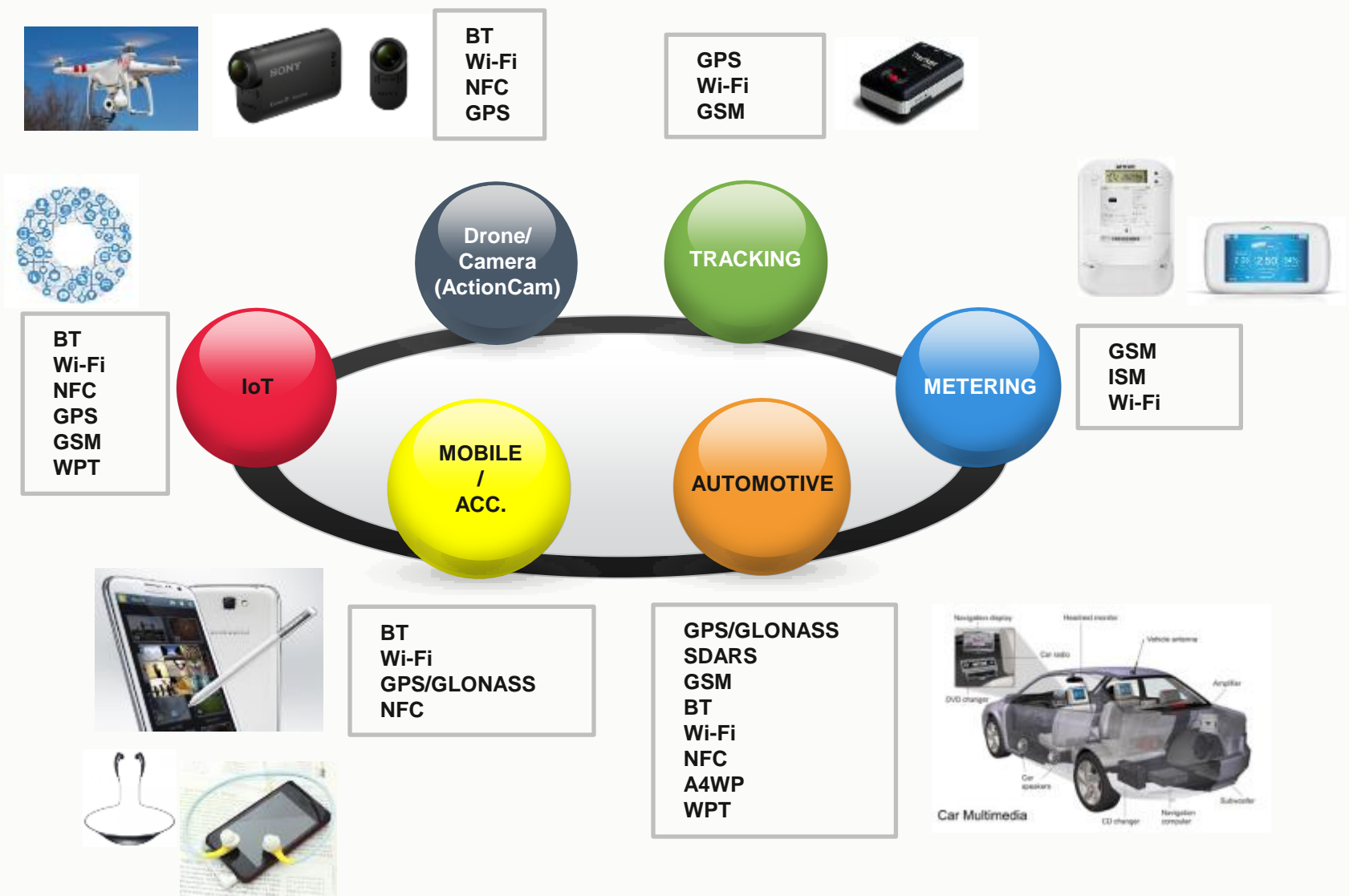
Based on the new advanced material,  
Amotech has provided the competitive products  
in the IT, energy, environment industries since 1994.

# Amotech Antenna Line-up




	Chip	FPCB	Metal stamping	PCB + cable	Patch		Chip	FPCB	Patch
B/T WIFI						GNSS			

# Applications




# GNSS Antenna

## 1. GPS / SDARS : Passive Patch

Type	Part number	Size (mm)	Frequency (MHz)	Gain@Zenith (dBic)	Axial Ratio (dB)	Polarization	G/P Size (mm)
<b>Pin type</b> 	<b>A9-4T</b>	9x9x4	GPS L1	-4.5	Typ. 4.0	RHCP	30x30
	<b>D12-2T</b>	12x12x2		-4.5	3.0	RHCP	12x12
	<b>D12-4T</b>	12x12x4		-2.0	3.0	RHCP	12x12
	<b>YDRA-A15-1575</b>	15x15x4		0.9	Typ.2.0	RHCP	30x30
	<b>YDRA-A18-1575</b>	18x18x4		3.4	Typ.2.0	RHCP	50x50
	<b>A20-4565753-STD60</b>	20x20x4		4.8	Typ.2.0	RHCP	60x60
	<b>YDRA-A25-1575</b>	25x25x4		5.8	Typ.2.0	RHCP	70x70
	<b>B35-3452753-STD35</b>	35x35x3		2.4	Typ.2.0	RHCP	35x35
<b>SMD type</b>	<b>B9</b>	9x9x4	GPS L1	-4.5	Typ. 4.0	RHCP	30x30
	<b>E12-4T</b>	12x12x4		-3.3	3.0	RHCP	About 14x17
	<b>B18-4T</b>	18x18x4		4.0	Typ.2.0	RHCP	70x70
	<b>G25-4T</b>	25x25x4		5.8	Typ.2.0	RHCP	70x70
<b>Pin type</b>	<b>S25,SB25,SG25,SH25-STD70</b>	25x25x4	SDARS (SXM)	5.0	2.0	LHCP	70x70
	<b>SB34-STD70</b>	34x34x3.2		5.0	2.0	LHCP	70x70

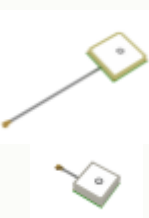

# GNSS Antenna

## 2. GPS/Glonass/Beidou/Galileo: Passive Patch

Type	Part number	Size (mm)	Frequency (MHz)	Gain@Zenith (dBic)	Axial Ratio (dB)	Polarization	G/P Size (mm)
Pin type 	A13-4T	13x13x4	GPSL1/Glonass	1.0	Typ. 20	RHEP	70x70
	A15-4T	15x15x4	GPSL1/Glonass	2.0	Typ. 15	RHEP	70x70
	A18-4T	18x18x4	GPSL1/Glonass	2.8	Typ. 12.0	RHEP	70x70
	A18-4T	18x18x4	GPSL1/Beidou	3.0	Typ. 10.0	RHEP	70x70
	A25-4102920-AMT02	25x25x4	GPSL1/Glonass	3.7	Typ. 8	RHCP	70x70
	A25-4T	25x25x4	GPSL1/Beidou	4.5	Typ. 6	RHCP	70x70
	A25-6B02920-AMT15	25x25x4	GPSL1/Glonass	4.0	Typ. 8	RHCP	70x70
	A25-6T	25x25x6	GPSL1/Beidou	5.0	Typ. 4	RHCP	70x70
	N25-4102820-GNS5	25x25x4	GPS/Glonass/ Galileo/Beidou	2.0	2.0	RHCP	70x70
	N25-6B02920-GNS6	25x25x6		3.0	2.0	RHCP	70x70
SMD type	E12-4T	12x12x4T	GPSL1/Glonass	-6.5	Typ. 10	RHEP	About 14x17
	B18-4T(Glonass)	18x18x4	GPSL1/Glonass	2.7	Typ. 2.0	RHEP	70x70
	B18-4T(Beidou)	18x18x4	GPSL1/Beidou	8.0	Typ. 2.0	RHEP	70x70

# GNSS Antenna

## 3. GPS/Glonass/Beidou: Active(Embedded/External)

Type	Part Number	Size (mm)	Frequency (MHz)	LNA Gain (dB)	NF (dB)	Current (mA)	Cable(mm)/connector
<b>Embedded Active Ant.</b> 	AGA090904-S0-A1	10x10-6.8T	GPS	Typ. 19	Typ. 1.2	Typ. 4.0 @ 3V	$\Phi=0.81$ , L=30 / U.FL Equivalence
	AGA250602-S0-A1	39x5.7-3T	GPS	Typ. 19	Typ. 1.2	Typ. 4.0 @ 3V	$\Phi=1.13$ , L=62 / U.FL Equivalence
	AGA121202-S0-A3	12x12-4.8T	GPS	Typ. 19	Typ. 1.2	Typ. 4.0 @ 3V	$\Phi=1.13$ , L=100 / U.FL Equivalence
	AGA121204-S0-A11	12x12-6.8T	GPS/Glonass	Typ. 19	Typ. 1.2	Typ. 4.0 @ 3V	$\Phi=1.13$ , L=100 / U.FL Equivalence
	AGA151502-S0-A1	15x15-4.8T	GPS	Typ. 19	Typ. 1.2	Typ. 4.0 @ 3V	$\Phi=1.13$ , L=100 / U.FL Equivalence
	AGA151504-S0-A8	15x15-6.8T	GPS/Glonass	Typ. 19	Typ. 1.2	Typ. 4.0 @ 3V	$\Phi=1.13$ , L=100 / U.FL Equivalence
	AGA181802-S0-A3	18x18-4.8T	GPS	Typ. 19	Typ. 1.2	Typ. 4.0 @ 3V	$\Phi=1.13$ , L=100 / U.FL Equivalence
	AGA181804-S0-A8	18x18-6.8T	GPS/Glonass	Typ. 19	Typ. 1.2	Typ. 4.0 @ 3V	$\Phi=1.13$ , L=100 / U.FL Equivalence
	AGA252502-S0-A6	25x25-6.5T	GPS/Glonass	Typ. 30	Typ. 1.5	Typ. 11 @ 3V	$\Phi=1.13$ , L=100 / U.FL Equivalence
	AGA252504-S0-A7	25x25-8.5T	GPS/Glonass	Typ. 30	Typ. 1.5	Typ. 11 @ 3V	$\Phi=1.13$ , L=100 / U.FL Equivalence
<b>External Ant.</b> 	AGA363913-S0-A1	36x39-13T	GPS/Glonass/Beidou	Typ. 30	Typ. 1.5	Typ. 14 @ 5V	RG174 $\Phi$ 2.8, L=3,000/ SMA
	AGA363914-S0-A5 (New, Pre-LNA)	36x39-14T	GPS/Glonass/Beidou	Typ. 30	Typ. 1.5	Typ. 14 @ 5V	RG174 $\Phi$ 2.8, L=3,000/ SMA
	AGA393914-S0-A2 (New, IP66)	39x39-14T	GPS/Glonass/Beidou	Typ. 30	Typ. 1.5	Typ. 14 @ 5V	RG174 $\Phi$ 2.8, L=3,000/ SMA

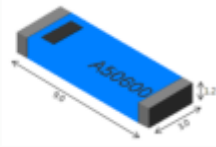
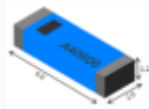
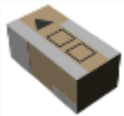
## 4. GPS Chip Antenna

Type	Part number	Size (mm)	Frequency (MHz)	VSWR	Gain	
					Average	Peak
PIFA type	AMAN1003030ST01	10x3.0x3.0	GPS	3.0:1	-0.3	3.7
	AMAN1003015ST01	10x3.0x1.5	GPS	3.0:1	-1.1	1.0
	AMAN1003015ST02		Glonass	3.0:1	-1.1	2.3
	AMAN1003015ST03		GPS+Glonass	3.0:1	-0.7~-0.1	2.8, 2.2

# BT/Wifi Antenna

Zigbee / Bluetooth / Wi-Fi 2.4GHz

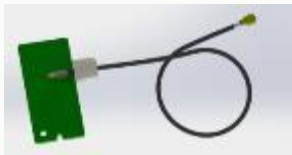
Standard design



Chip antenna

Patch

Customized design



PCB / FPCB & Cable assembly antenna

Metal stamped antenna

Wi-Fi 5GHz

Standard design



Chip antenna

Standard design



Chip antenna

Customized design



PCB / FPCB & Cable assembly

Standard design







Patch

Wi-Fi 2.4GHz / 5GHz Dual band



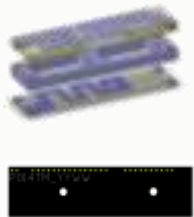


# BT/Wifi Antenna

## Standard Design

Type	Part Number	Size (mm)	Frequency (MHz)	VSWR	Gain (dBi)	
					Average	Peak
 Chip (Helical)	ALA321C3	3.2x1.6x1.2	2400~2485	3.0:1	-1.6	2.3
	ALA621C4	6.0x2.0x1.2		2.5:1	-1.0	3.5
	ALA621C5	6.0x2.0x1.0		2.5:1	-1.0	3.5
	ALA931C5	9.0x3.0x1.2		2.5:1	-0.5	3.5
	ALA131C3	11.0x3.0x1.2		2.5:1	-0.5	4.0
 Chip (Mono-Pole)	AMAN402012MS01	4.0x2.0x1.2	2400~2485	3.0:1	-1.6	2.6
	AMAN802012MS02	8.0x2.0x1.2		2.5:1	-0.5	3.5
	AMAN1003015ST04	10.0x3.0x1.5	5150~5850	2.0:1	-1.4	-
	AMAN1004015ST05	10.0x3.0x1.5		2.0:1	-1.6	-
 Chip (PIFA)	AMAN201510ST01	2.0x1.5x1.0	2400~2485	3.0:1	-1.0	3.0
	AMAN301512ST01	3.0x1.5x1.2		3.0:1	-1.0	3.0
	AMAN402012ST01	4.0x2.0x1.2		3.0:1	-1.0	3.0
	AMAN1003030ST02 Dual Band	10.0x3.0x3.0	2400~2485 5150~5850	2.5:1	-2.0	-
	AMAN1003030ST03	10.0x3.0x3.0	2400~2485	3.0:1	-1.0	3.0
	AMAN1003015ST06 Dual Band	10.0x3.0x1.5	2400~2485 5150~5850	2.5:1	-1.2	-
 Patch (On ground)	F12(SMD)	12x12x4	2400~2485	3.0:1	-1.4	3.8
	SM25-4552250-STD70 (New) Dual Band	25x25x5	2400~2485 5150~5850 5850~5925	3.0:1	Max.-1.4, -2.7 at edge Max.-4.2, -1.4 at edge Max.-1.2, -2.0 at edge	5.4 6.5 6.8

# GSM & ISM Band Antenna

Type	Part Number	Size (mm)	Frequency	VSWR	Gain (dBi)		EVB Size (mm)
					Average	Peak	
PCB/FPCB & Cable Assembly Antenna 	AMMAP007(FPCB)	40.0x15.0x0.55		3:1	-1.0	3.0	-
	AMMAP008(PR4)	40.0x15.0x0.14		3:1	-3.0	4.0	-
	AMMAP009	40.0x15.0x0.14		3:1	Min. -4.5	-	-
Customizing 	Press / FPCB Type With Carrier	User Option	GSM850 GSM900 DCS1800 PCS1900	-	-	-	-
Main Chip Antenna (SMD) 	AMMAP003(F)	24.0x5.5x4.4	WCDMA	3.5:1	Min. -3.7	4	114x45
	AMMAP005(R)	24.0x5.5x4.4	UMTS	3.5:1	Min. -3.7	4	114x45
	AMMAQ002	22.0x5.5x4.4		3.5:1	Min. -3.3	3	114x45
	AMMAP014(New)	35.0x9.0x3.2		2.7:1	Min. -3.3	3	110x50
	AMMAL001(New)	35.0x9.0x 3.2	US LTE	2.7:1	Min. -2.6	3	120x50
	AMMAL002(New)	35.0x9.0x 3.2	EU LTE (791~2690MHz)	3.0:1	Min. -3.4	3	120x50
Helical type - MAC Mono-pole – 868/915MHz	AMAN903012ST05	9.0x3.0x1.2	868MHz	2:1	-7	-3.4	-
		9.0x3.0x1.2	915MHz	2:1	-4	-1.3	-

# NFC Antenna & Module



## Antenna

- EMV 2.0.1 Type A & B
- ISIS Standard

Rear Case



Battery Pack



Battery Pack



Back Cover



## Tag Module

**01 Home Theater**

- Power control
- Sync

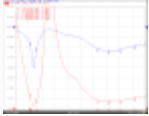

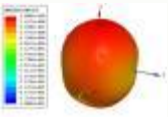


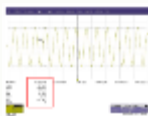






**02 BT Headphone**

- BT pairing

## Features

- Over 100 models (phone application) have achieved NFC certification.
- Global GSM: EMV Level 1 & 2, ISO
- USA : ISIS Level 1 & 2
- China: ISO, NFC Forum
- Priority vendor to chipset makers : NXP, Broadcom, SL

# Amotech Test Environment

	Item	Result	Equipment
Passive Test	Center Frequency & Return-loss (VSWR)		Network Analyzer 
	2D/3D Anechoic Chamber		8x4x4(2D) / 6x3x3(3D) / 2.8x1.6x1.8(3D) 
Active Test	GPS Signal Generator		Spirent STR4500
	NFC EMVCo		3 sets of EMVCo full test bench  
	BT Tester		TC3000C (Tescom) 
	WIFI Tester		MT9960C R&S PTW70 (Anritsu) 
	Cellular TRP/TIS		E5515C 8960 (Agilent), MT8820C(LTE)  

# Thank You



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