

# Antenna Datasheet

## 433Mhz SMD Chip Antenna

Model:

BW433MNX1304

Description:

433Mhz SMD Chip Antenna

Features:

433MHz Frequency Range

360° Omnidirectional Radiation

Dimensions: 13mm x 4.2 mm x 1.6mm

Compliant with RoHS & REACH Regulations



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## BW433MNX1304

### Part Number Explanation

BW	Company	Bat Wireless
433	Frequency	433MHz
M	Name	SMD Chip Antenna
N	Type	Internal
X	Constant	X
1304	Package Dimensions	1304

## 1. Description

Bat Wireless BW433MNX1304 is an antenna commonly used in wireless communication. It features high integration for space-saving, with compactness and integration as its key attributes. The patch antenna is directly printed on the SMD, occupying minimal space and making it suitable for compact devices. It offers low cost: utilizing SMD technology for one-time fabrication, it requires no additional antenna components, thus being ideal for mass production. This antenna is suitable for miniaturized devices and widely applied in modules such as IoT, consumer electronics, and industrial equipment.

Classic Application Scenarios:

Consumer Electronics: Remote controls, smart home devices

IoT Devices: Smart meters, trackers

Industrial Equipment: Remote monitoring terminals, vehicle-mounted communication modules

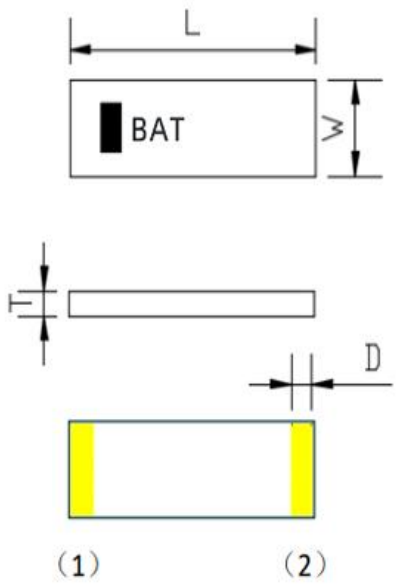
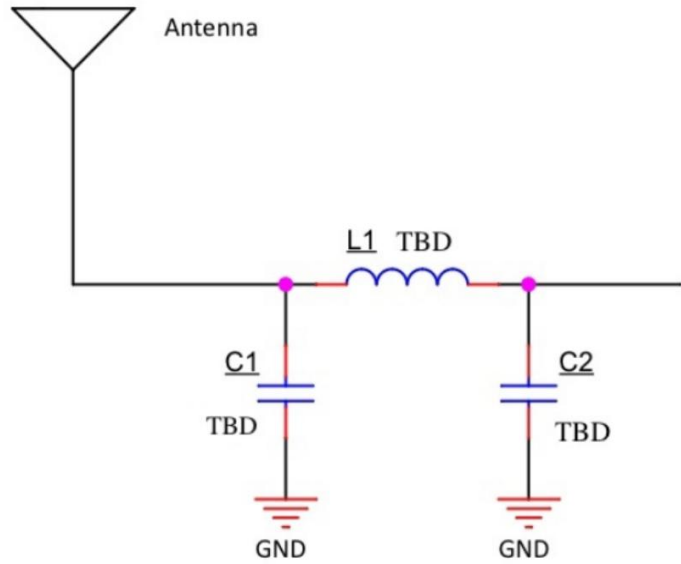
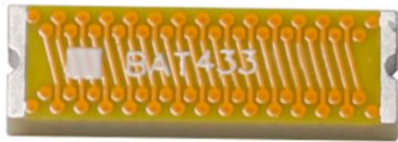
Bat Wireless provides customized services to optimize your equipment. We have a mature R&D team that can respond quickly to meet your needs. If you have any requirements, please contact our sales and FAE.



## 2. Specification

Parameters	Typ.	Unites	Notes
<b>Electrical Characteristics</b>			
Antenna Type	SMD Chip Antenna		
Frequency Range	433±5	MHz	
Input Impedence	50	Ω	
V.S.W.R	<2.5		
Gain	1	dBi	
Polarization Type	Vertical		
Power Capacity	50	W	
Lightning Protection	-		
DC Voltage	-	V	
Radiator	-		
<b>Mechanical Characteristics</b>			
Dimensions	13 x 4.2 x 1.6	mm	
Connector Type	-		
Cable Type	-		
Cable Length	-	mm	
Mount way	SMD		
Color	Orange yellow		
Meterial	PCB		
Weight	0.2	g	
<b>Environmental Characteristics</b>			
Waterproof Rating	-		
ROHS Complaint	Compliant		
Operating Temperature	-45~ +85	°C	
Storage Temperature	-45~ +85	°C	

3. Product Picture/ Drawing / Impedance Matching

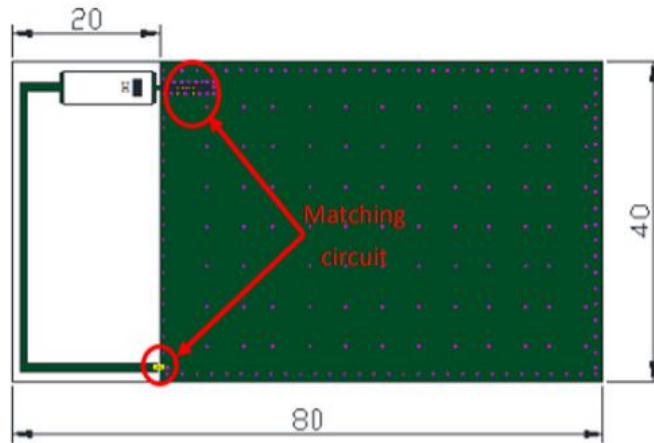


Dimension (mm)	
L	13.0±0.15
W	4.2±0.15
T	1.6±0.15
A	1.0±0.15

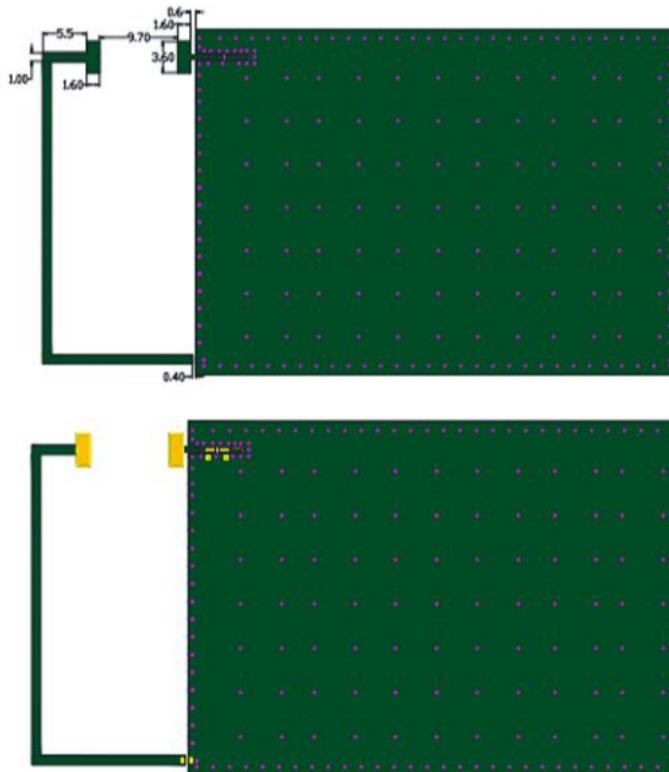
No.	Terminal Name
1	Feeding
2	grounding

## 4. Evaluation Board Reference

### PCB Dimension



### Antenna Layout Reference



Unit : mm

 : Chip Antenna  
 : Land Pattern

## 5. Test Equipment



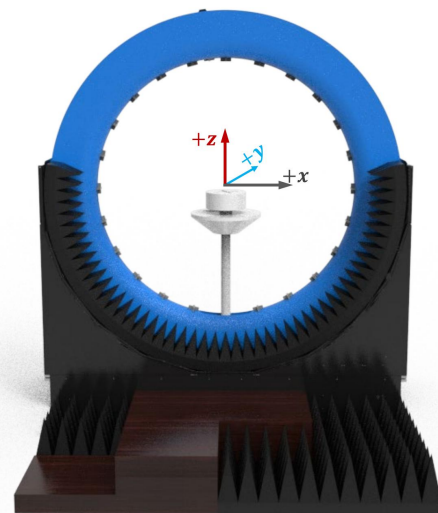
Keysight/E5071C Network Analyzer



R&amp;S/CMW500 Comprehensive Tester



R&amp;S/SMBV100B Signal Generator



### DT-3500 Datasheet

#### Specification:

Specification:	Description
Test Frequency	400MHz-8.5GHz
System Size	L*W*H=4*3.5*3.5m
Number of Probes	23 (Probe) + 1 (link)
Interval Angle	15°
Sampling Diameter	2200mm
Carring Capacity	≤40kg

#### Testing Capability

#### Description

##### Active measurement

**Capability** : TRP、TIS、EIRP、EIS,. etc  
**Mode** : 2G/3G/4G/5G、Wi-Fi b/g/n/a/ac/ax、BT、NB-IOT、Cat-M (eMTC)、GPS/BEIDOU/GLONASS、ZigBee、LoRa(Non-Signaling),.etc

##### Passive measurement

**Test category** : Gain、Efficiency、2D pattern、3D pattern、Pattern roundness、Axial Ratio、ECC,Phase center,. etc  
**Polarization** : Circular polarization, linear polarization, elliptical polarization



## RF Link diaram of multi probe spherical near-field testing system

RF Link Overview



RF Link of Passive measurement



RF Link Overview

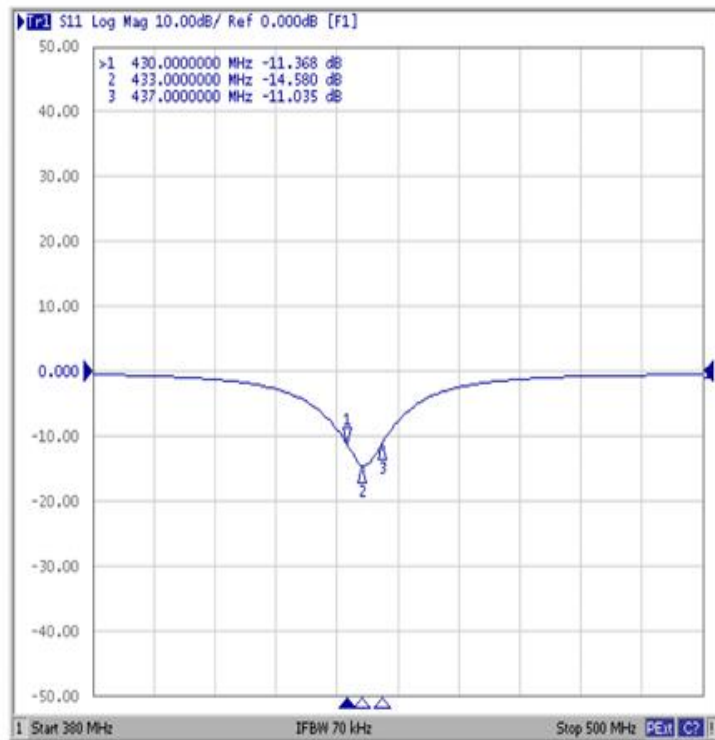


RF Link of Passive measurement

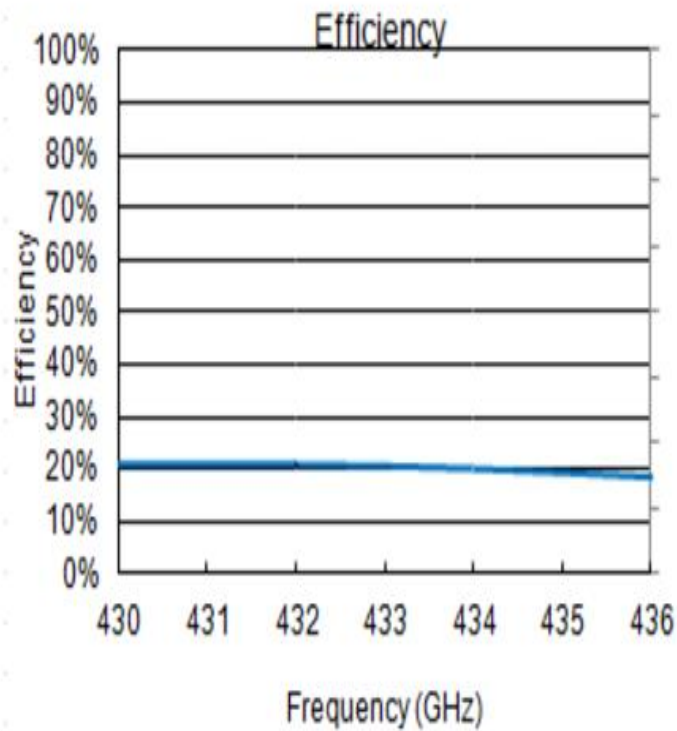


## 6. Performance Data

### 6.1 Return Loss

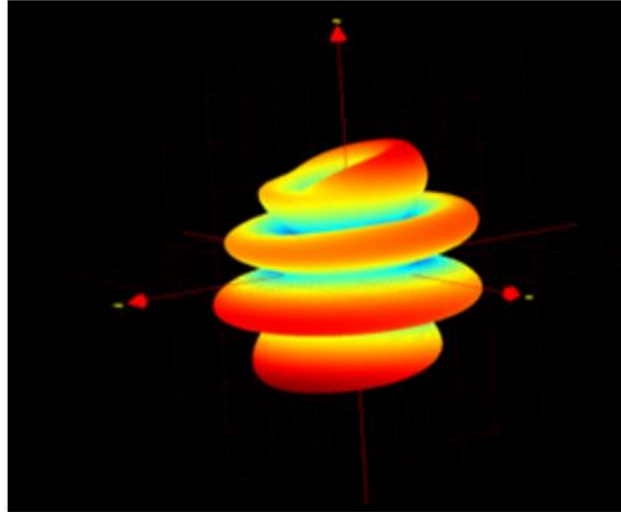


### 6.2 Efficiency



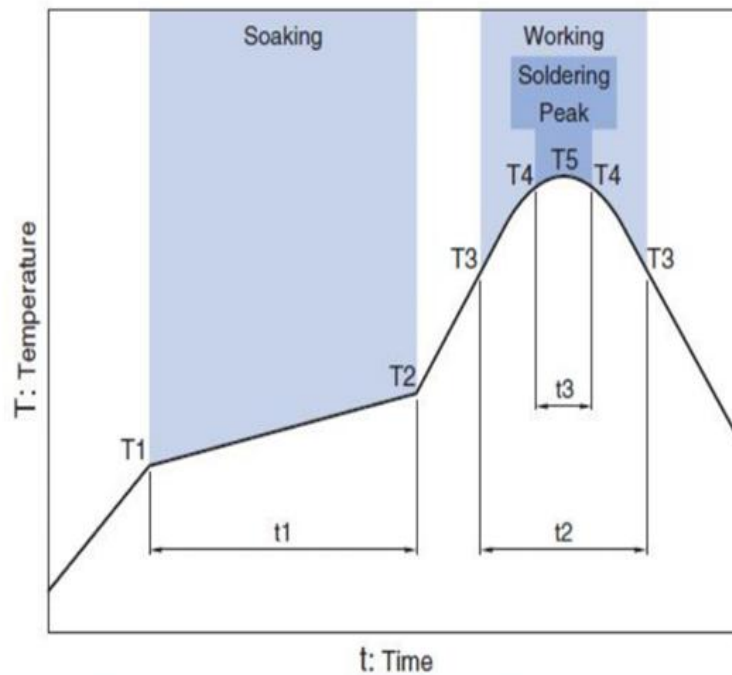
## 7. Radiation Patterns

### 7.1 3D Radiation Patterns



### 7.2 Recommended Reflow Profile

Pb free solder



Soaking			Working		Soldering		Peak
Temp.	Temp.	Time	Temp.	Time	Temp.	Time	Temp.
T1	T2	t1	T3	t2	T4	t3	T5
150°C	180°C	60 to 120sec	230°C	more than 30sec	247 to 253°C	within 10sec	260°C Max.

# 8. Packaging

**Technical Requirements:**

1. Material: PS, black anti-static, surface resistance:  $10^7 \sim 10^{11} \Omega$ .
2. Unspecified angles in the drawing shall be  $3^\circ \sim 5^\circ$ , maximum unspecified inner diameter is 0.2 mm.
3. The curvature of the carrier tape shall not exceed 1 mm per 250 mm.
4. The cumulative tolerance for 10 sprocket hole pitches shall be  $\pm 0.20$  mm.
5. All dimensions shall comply with the EA-481-E standard requirements.
6. Deformation, burrs, cracks, joints, or other defects are not allowed.
7. The dimensions of  $\blacktriangleright$  must be measured during first-article inspection.
8. Unless otherwise specified, unmarked dimensions are for reference only.
9. The product shall comply with RoHS environmental standards.
10. Modified areas must be indicated with  $\triangle$ .

QUALITY SYMBOLS	GENERAL TOLERANCES (UNLESS SPECIFIED)	DIMENSION STYLE	SCALE	DESIGN UNITS	THIRD ANGLE PROJECTION
$\blacktriangleright = 11$	MM	MM ONLY	2:1	METRIC	
X	$\pm 0.30$	DATE			
X, X	$\pm 0.20$	DATE			
X, XX	$\pm 0.10$	DATE			
$\triangle = 0$	ANGULAR $\pm 5^\circ$	DATE			

DRIFT WHERE APPLICABLE MUSH REMAIN WITHIN DIMENSIONS	SIZE	MATERIAL NO.	TOOLING NO.	DOCUMENT NO.	SHEET NO.
A4		6011004941	M-1614941-FP	E-6011004941-01	1 OF 1

PACKING INFORMATION	
Reel Type	330MM Light Blue Spill Reel
Reel Dimension	330*100*24MM
Length per Reel	24.768 Meter/Reel
Pockets per Reel	3006 Pockets
Final Pocket Count	3006 Pockets (empty pockets reserved for blending + trailing)
Protective Tape	N/A

TOOLING INFORMATION	
Mold Cavity Number	258 Shots
X-Cavity Mold	12-up tool, 96mm Mold Length

REV	CHANGE CONTENT	DRAWN	DATE
A1	First Release	MARTIN	2025/4/19



## 9. Antenna Application Precautions

1. If space permits, it is advisable not to choose antennas with too small dimensions.
2. It is best to have a large clearance area between the antenna and nearby objects; otherwise, matching adjustment will become difficult, and the radiation pattern will be severely distorted.
3. There should be no circuit layout or ground plane beneath the antenna.
4. The antenna should not be placed too close to metal objects, such as batteries and chips, and should not overlap with metal objects like batteries.
5. Note that internal cables (such as battery power cables) should preferably not be too close to the antenna.
6. A monopole antenna requires a reasonable ground plane to achieve optimal performance.
7. Performing antenna matching on the final product solution can shorten the adjustment cycle; whereas on a bare board, repeated adjustments are often needed.
8. Without matching, the same antenna placed on completely different layout boards may not work properly.
9. Do not use a metal housing or a plastic housing with metal covering around the antenna.
10. Do not use very thin antenna feeder wires; the feeder should have a certain width, not less than 0.1mm.
11. Calculate the feeder impedance based on the thickness and dielectric constant of the PCB; 50 ohms will make antenna adjustment easier.
12. Chip antennas should be assembled as far as possible from batteries, EMI shielding materials, foldable speakers, metal nails, LCD screens, etc.

## 10. Storage and Transportation Information

### Storage Conditions

To ensure the solderability of terminal electrodes:

Temperature and humidity requirements: -10~40°C, relative humidity 30~70%.

Recommended service life: Use up within 6 months from the date of delivery.

Packaging storage environment: Should be placed in an air environment free of chlorine and sulfur. Transportation Conditions Handle with care to avoid product damage caused by collision or contamination from sweat, skin oils, etc.

### Transportation Conditions

Handle with care to avoid product damage caused by collision or contamination from sweat, skin oils, etc.

Handling Recommendations: It is strongly recommended to use tweezers or a vacuum pen to pick up individual components.

Requirements for bulk handling: Friction and mechanical impact should be minimized.



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Documentation

Version :	August-21-2025-A01
Date :	2025-8-21
Remarks :	First update
Author:	Carly

Change Log
