

Cellular · Sub 1GHz LPWAN & ISM · WiFi/WLAN · 2.4 GHz ISM · GNSS ·
UHF/VHF · Other Antennas · Antenna Mounts



About Joymax Electronics

Joymax Electronics founded in 1994 manufactures wireless components including antennas, RF connectors and cables assemblies for Internet of Things (IoT) application. Antennas for wireless IoT can be a design challenge. The Joymax team relentlessly focuses on ensuring customer successful product launches by guiding customers through selection and adoption of the best antenna for each individual design. Joymax Electronics lives in EnJOY MAX Wireless®. With easy to use products and a focus on customer service, Joymax strives to make every customer engineer success in making wireless design.

For Internet of Things and LPWA applications, Joymax Electronics has antenna, connector and cable offerings that support LTE-M (Cat-M1), NB-IoT, LoRaWAN™, as well as, LTE offerings. These include external antennas for permanent or connector attachment, and embedded ceramic and chip antenna offerings. The Joymax antenna portfolio covers single-band solutions for targeted applications, multi-band and wideband antennas to cover wireless mobile network operator and cellular carrier operation, and specialty IoT frequency bands plus GPS/GNSS or 2.4 GHz protocols like WiFi, Bluetooth®, ZigBee® and Thread®.

Support and Service

In addition to antenna products, Joymax offers design support and services:

- Complimentary design reviews
- Complimentary antenna-matching circuit design
- Full-custom and semi-custom antenna and cable assembly design and documentation

Brand Promise

If you choose to incorporate our components in your design, we relentlessly focus on ensuring your successful product launches.

How to Purchase

Joymax sells directly and through a global network of distributors, catalog houses and representatives. See the full list of distributors at the end of this catalog or visit:

<https://www.joymax.com.tw/en/>

Contact Information

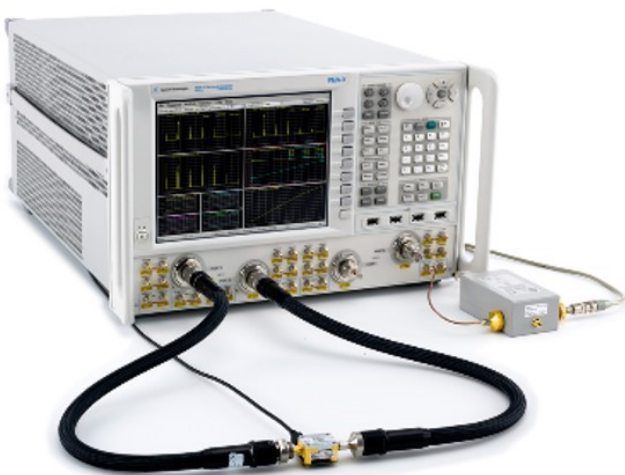
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Headquarters and Factory

Joymax Electronics Co., Ltd. 5, Dong-Yuan 2nd Road, Zhong-Li Dist., Tao-Yuan City 32063 Taiwan (R.O.C.)



Catalog Organization

Antenna product listings are grouped by application, mounting location and mounting type as defined below. Within each grouping, antennas are listed by part number and series, summary applications and characteristics, and termination type for ease of product selection. An asterisk (*) may be used in a part number to denote multiple antenna termination options or cable length options.

Application

Cellular

Joymax cellular antennas support cellular and cellular IoT/cellular LPWA applications including:

- 5G, 4G, 3G, 2G
- LTE, UMTS, GSM
- LTE-M (Cat-M1)
- NB-IoT
- CBRS

Sub-1 GHz LPWA & ISM

Joymax sub-1 GHz antennas for LPWA and ISM applications offer single-band options in multiple styles, mounting, and terminations at 433 MHz, 490 MHz, 868 MHz and 915 MHz in support of applications including:

- LoRaWAN®
- Sigfox®
- Weightless-P
- WiFi HaLow

WiFi/WLAN

Joymax dual-band 2.4 GHz, 5 GHz and 6 GHz antenna solutions target wireless LAN (WiFi/WLAN) applications including:

- WiFi 6E/ WiFi 7
- WiFi 6
- WiFi 5
- WiFi 4
- U-NII 1-4, 5-8
- 802.11b/g/n/ac/ax

2.4 GHz ISM

Joymax 2.4 GHz single-band antennas provide a broad range of styles, mounting, termination and levels of performance to accommodate ISM applications including:

- Bluetooth®
- ZigBee®
- Thread®
- IEEE 802.11b/g
- IEEE 802.15.4

GNSS

Joymax offers global navigation satellite system (GNSS) antennas for systems including:

- GPS
- Galileo
- GLONASS
- Beidou/COMPASS

Other

- NFC, UWB,
- VHF/UHF
- 403 MHz
- 418 MHz

Mounting Location

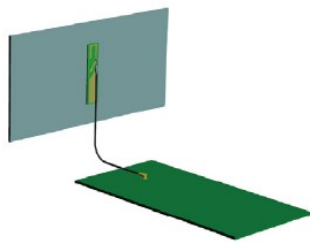
Internal/Embedded	Antenna mounts inside an enclosure
External	Antenna mounts on the outside of an enclosure
Remote	Antenna mounts away from an enclosure with cabled connection to the enclosure

Mounting Type

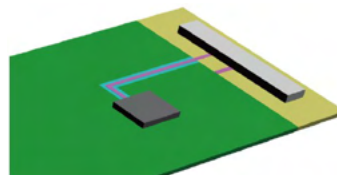
Connector	Connector (e.g. SMA) directly attaches antenna to mounting location
Adhesive	Antenna mounts to mounting location using adhesive
Surface Mount	Antenna mounts directly to printed circuit board with surface mount solder connection
Panel Mount	Antenna mounts to enclosure panel/surface and signal connects to radio via cable
Bracket	Antenna mounts to mounting location via bracket
Magnetic	Antenna mounts to mounting location via magnetic base
Through Hole	Antenna mounts to printed circuit board with a through hole solder connection



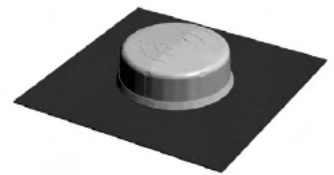
Connector Mount



Adhesive Mount



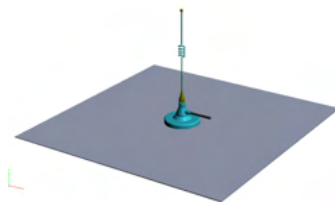
Surface Mount



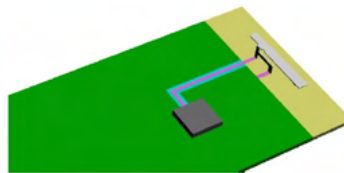
Panel Mount



Bracket Mount



Magnetic Mount



Through Hole Mount

TABLE OF CONTENT

Cellular Antennas

Internal	6
External	7
Remote	14

Sub-1 GHz LPWA & ISM Antennas

Internal	17
External	17
Remote	25

WiFi/WLAN Antennas

Internal	28
External	29
Remote	39

2.4 GHz ISM Antennas

Internal	40
External	41

GNSS Antennas

Remote	45
External	46

Combo (MIMO, All-In-One) Antennas

External	47
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Other Antennas

Internal	49
External	50
Remote	51

Cellular Antennas

Joymax antennas offer a various range of types, mounting and connections, supporting cellular and cellular IoT applications including:

- 5G, 4G, 3G, 2G
- LTE, UMTS, GSM
- LTE-M (Cat-M1)
- NB-IoT
- CBRS

Data is provided by frequency band in MHz. LTE/5G NR band names may be cross-referenced to frequencies using the band table on pages [52](#) and [53](#).

Internal

Surface Mount

YBD-CH01





New



Overview	Electrical Data				Mechanical Data	
5G Cellular Multi-band Monopole PCB Chip	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	Mounting Type	Surface Mount
Applications 5G NR FR1, 4G LTE, UMTS, GSM, LTE-M (Cat-M1), NB-IoT, CBRS	617-960	3.5	2.1	51	Termination	Solder Pad
	1710-2690	2.5	4.0	62	Dimensions	43x8x3.2 mm
	3300-4200	2.5	3.3	54	Op. Temp.	-40°C to +85°C
	4400-5000	2.3	3.6	57	Ground Plane	140x50 mm
	5150-5850	2.4	3.0	50		
	5925-7125	2.0	2.9	42		
Polarization				Linear		
Wavelength				$\frac{1}{4}\lambda$		
Electrical Type				Monopole		
Radiation Pattern				Omni directional		
Impedance (Ohms)				50		

External

Connector Mount

<u>ZWX-180ASA3B</u>	Overview	Electrical Data	Mechanical Data																																						
	Outdoor 5G Cellular Multiband Tilt/Swivel Dipole Whip	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>617-960</td> <td>2.5</td> <td>1.5</td> <td>38</td> </tr> <tr> <td>1710-2690</td> <td>3.2</td> <td>2.8</td> <td>44</td> </tr> <tr> <td>3300-4200</td> <td>2.0</td> <td>2.8</td> <td>47</td> </tr> <tr> <td>4400-5000</td> <td>1.7</td> <td>2.4</td> <td>43</td> </tr> <tr> <td>5150-5850</td> <td>2.6</td> <td>2.6</td> <td>48</td> </tr> <tr> <td>5925-7125</td> <td>2.8</td> <td>3.1</td> <td>43</td> </tr> </tbody> </table>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	617-960	2.5	1.5	38	1710-2690	3.2	2.8	44	3300-4200	2.0	2.8	47	4400-5000	1.7	2.4	43	5150-5850	2.6	2.6	48	5925-7125	2.8	3.1	43	<table border="1"> <thead> <tr> <th>Mounting Type</th> <th>Connector</th> </tr> </thead> <tbody> <tr> <td>Termination*</td> <td>SMA Plug RP-SMA Plug</td> </tr> <tr> <td>Dimensions</td> <td>203xø13 mm</td> </tr> <tr> <td>Op. Temp.</td> <td>-30°C to +70°C</td> </tr> <tr> <td>IP Rating</td> <td>IP67</td> </tr> </tbody> </table>	Mounting Type	Connector	Termination*	SMA Plug RP-SMA Plug	Dimensions	203xø13 mm	Op. Temp.	-30°C to +70°C	IP Rating	IP67
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Applications LTE-M (Cat-M1), NB-IoT, GSM, LPWA	<table border="1"> <thead> <tr> <th>Polarization</th> <th>Wavelength</th> <th>Electrical Type</th> <th>Radiation Pattern</th> <th>Impedance (Ohms)</th> </tr> </thead> <tbody> <tr> <td>Linear</td> <td>$\frac{1}{4}\lambda$</td> <td>Monopole</td> <td>Omni directional</td> <td>50</td> </tr> </tbody> </table>	Polarization	Wavelength	Electrical Type	Radiation Pattern	Impedance (Ohms)	Linear	$\frac{1}{4}\lambda$	Monopole	Omni directional	50																														
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Cellular

External

Connector Mount

ZGX-1023NF3W



Overview	Electrical Data				Mechanical Data	
Outdoor 5G Cellular Multiband Fiberglass Dipole Baton/Stick	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	Mounting Type	Connector Mount
Applications 5G NR FR1, 4G LTE, UMTS, GSM, LTE-M (Cat-M1), NB-IoT, CBRS	617-960	2.2	2.4	47	Termination*	N-Type Jack
	1710-2690	2.7	2.7	49		N-Type Plug
	3300-4200	2.3	3.3	52	Dimensions	145xø25 mm
	4400-5000	2.8	4.3	43	Op. Temp.	-40°C to +85°C
	5150-5850	2.4	4.8	57	IP Rating	IP67
	5925-7125	2.5	3.8	52		
	Polarization		Linear			
	Wavelength		½-λ			
	Electrical Type		Dipole			
	Radiation Pattern		Omni directional			
	Impedance (Ohms)		50			

ZGX-1123NX3W

New



Overview	Electrical Data				Mechanical Data	
Outdoor 5G Cellular Multiband Fiberglass Dipole Baton/Stick	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	Mounting Type	Connector Mount
Applications 5G NR FR1, 4G LTE, UMTS, GSM, LTE-M (Cat-M1), NB-IoT, CBRS	617-960	2.1	2.7	55	Termination	N-Type Plug
	1710-2690	2.5	3.4	65	Dimensions	152xø24 mm
	3300-4200	2.3	2.2	68	Op. Temp.	-40°C to +85°C
	4400-5000	3.0	3.6	56	IP Rating	IP67
	5150-5850	2.4	4.0	58		
	5925-7125	2.0	4.5	55		
	Polarization		Linear			
	Wavelength		½-λ			
	Electrical Type		Dipole			
	Radiation Pattern		Omni directional			
	Impedance (Ohms)		50			

ZHX-150XNX3B



Overview	Electrical Data				Mechanical Data	
5G Cellular Multi-band Straight Dipole Blade	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	Mounting Type	Connector Mount
Applications 5G NR FR1, 4G LTE, UMTS, GSM, LTE-M (Cat-M1), NB-IoT, CBRS	617-960	2.9	1.3	44	Termination*	N-Type Plug
	1710-2690	2.8	0.8	36		N-Type Jack
	3300-4200	3.0	2.3	56	Dimensions	180xø21 mm
	4400-5000	3.0	1.8	61	Op. Temp.	-40°C to +85°C
	5150-5925	3.0	3.2	68	IP Rating	IP67
	5925-7125	3.5	2.8	59		
	Polarization		Linear			
	Wavelength		½-λ			
	Electrical Type		Dipole			
	Radiation Pattern		Omni directional			
	Impedance (Ohms)		50			

ZHX-713ASA3B

New



Overview	Electrical Data				Mechanical Data	
5G Cellular Multi-band Straight Dipole Blade	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	Mounting Type	Connector Mount
Applications 5G NR FR1, 4G LTE, UMTS, GSM, LTE-M (Cat-M1), NB-IoT, CBRS	617-960	2.0	1.8	45	Termination*	SMA Plug
	1710-2690	3.0	2.5	56		RP-SMA Plug
	3300-4200	2.5	3.0	66	Dimensions	174x27x13 mm
	4400-5000	2.5	2.5	55	Op. Temp.	-30°C to +70°C
	5150-5850	2.0	2.5	63	IP Rating	IP67
	5925-7125	2.5	3.6	61		
	Polarization		Linear			
	Wavelength		½-λ			
	Electrical Type		Dipole			
	Radiation Pattern		Omni directional			
	Impedance (Ohms)		50			

External

Connector Mount

Part Number	Overview	Electrical Data	Mechanical Data																												
ZWX-715BSA5B 	450MHz + 5G Cellular Multiband Tilt/Swivel Dipole Blade Applications 5G NR FR1, 4G LTE, UMTS, GSM, LTE-M (Cat-M1), NB-IoT, CBRS	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>450</td> <td>1.9</td> <td>0.9</td> <td>41</td> </tr> <tr> <td>617-960</td> <td>2.0</td> <td>1.9</td> <td>40</td> </tr> <tr> <td>1710-2690</td> <td>2.5</td> <td>4.3</td> <td>57</td> </tr> <tr> <td>3300-4200</td> <td>1.4</td> <td>3.1</td> <td>63</td> </tr> <tr> <td>4400-5000</td> <td>2.0</td> <td>2.2</td> <td>49</td> </tr> <tr> <td>5150-5925</td> <td>1.9</td> <td>4.4</td> <td>64</td> </tr> </tbody> </table> Polarization: Linear Wavelength: $\frac{1}{2}\lambda$ Electrical Type: Dipole Radiation Pattern: Omni directional Impedance (Ohms): 50	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	450	1.9	0.9	41	617-960	2.0	1.9	40	1710-2690	2.5	4.3	57	3300-4200	1.4	3.1	63	4400-5000	2.0	2.2	49	5150-5925	1.9	4.4	64	Mounting Type: Connector Mount Termination*: SMA Plug, RP-SMA Plug Dimensions: 183x28x13mm Op. Temp.: -30°C to +70°C
Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)																												
450	1.9	0.9	41																												
617-960	2.0	1.9	40																												
1710-2690	2.5	4.3	57																												
3300-4200	1.4	3.1	63																												
4400-5000	2.0	2.2	49																												
5150-5925	1.9	4.4	64																												
UWX-715BSAXB 	410MHz 450MHz Tilt/Swivel Dipole Blade Applications LTE Band 31, Band 72, Band 73, Band 87, Band 88, LTE- M, NB-IoT	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>410-430</td> <td>2.3</td> <td>1.6</td> <td>44</td> </tr> <tr> <td>450-470</td> <td>2.0</td> <td>1.8</td> <td>43</td> </tr> </tbody> </table> Polarization: Linear Wavelength: $\frac{1}{2}\lambda$ Electrical Type: Dipole Radiation Pattern: Omni directional Impedance (Ohms): 50	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	410-430	2.3	1.6	44	450-470	2.0	1.8	43	Mounting Type: Connector Mount Termination*: SMA Plug, RP-SMA Plug Dimensions: 183x28x13mm Op. Temp.: -30°C to +70°C																
Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)																												
410-430	2.3	1.6	44																												
450-470	2.0	1.8	43																												
ZWX-713ASA3B New 	5G Cellular Multi- band Tilt/Swivel Dipole Blade Applications 5G NR FR1, 4G LTE, UMTS, GSM, LTE-M (Cat-M1), NB-IoT, CBRS	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>617-960</td> <td>2.0</td> <td>1.8</td> <td>45</td> </tr> <tr> <td>1710-2690</td> <td>3.0</td> <td>2.5</td> <td>56</td> </tr> <tr> <td>3300-4200</td> <td>2.5</td> <td>3.0</td> <td>66</td> </tr> <tr> <td>4400-5000</td> <td>2.5</td> <td>2.5</td> <td>55</td> </tr> <tr> <td>5150-5850</td> <td>2.0</td> <td>2.5</td> <td>63</td> </tr> <tr> <td>5925-7125</td> <td>2.5</td> <td>3.6</td> <td>61</td> </tr> </tbody> </table> Polarization: Linear Wavelength: $\frac{1}{2}\lambda$ Electrical Type: Dipole Radiation Pattern: Omni directional Impedance (Ohms): 50	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	617-960	2.0	1.8	45	1710-2690	3.0	2.5	56	3300-4200	2.5	3.0	66	4400-5000	2.5	2.5	55	5150-5850	2.0	2.5	63	5925-7125	2.5	3.6	61	Mounting Type: Connector Mount Termination*: SMA Plug, RP-SMA Plug Dimensions: 188x27x13 mm Op. Temp.: -30°C to +70°C IP Rating: IP67
Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)																												
617-960	2.0	1.8	45																												
1710-2690	3.0	2.5	56																												
3300-4200	2.5	3.0	66																												
4400-5000	2.5	2.5	55																												
5150-5850	2.0	2.5	63																												
5925-7125	2.5	3.6	61																												
ZWX-720XSA3B 	5G Cellular Multi- band Tilt/Swivel Dipole Blade Applications 5G NR FR1, 4G LTE, UMTS, GSM, LTE-M (Cat-M1), NB-IoT, CBRS	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>698-960</td> <td>2.7</td> <td>1.0</td> <td>56</td> </tr> <tr> <td>1710-2690</td> <td>2.3</td> <td>2.6</td> <td>64</td> </tr> <tr> <td>3300-4200</td> <td>2.8</td> <td>2.4</td> <td>62</td> </tr> <tr> <td>4400-5000</td> <td>2.3</td> <td>2.6</td> <td>61</td> </tr> <tr> <td>5150-5850</td> <td>3.0</td> <td>2.7</td> <td>61</td> </tr> <tr> <td>5925-7125</td> <td>3.5</td> <td>2.5</td> <td>66</td> </tr> </tbody> </table> Polarization: Linear Wavelength: $\frac{1}{2}\lambda$ Electrical Type: Dipole Radiation Pattern: Omni directional Impedance (Ohms): 50	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	698-960	2.7	1.0	56	1710-2690	2.3	2.6	64	3300-4200	2.8	2.4	62	4400-5000	2.3	2.6	61	5150-5850	3.0	2.7	61	5925-7125	3.5	2.5	66	Mounting Type: Connector Mount Termination*: SMA Plug, RP-SMA Plug Dimensions: 222x28x14 mm Op. Temp.: -20°C to +70°C
Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)																												
698-960	2.7	1.0	56																												
1710-2690	2.3	2.6	64																												
3300-4200	2.8	2.4	62																												
4400-5000	2.3	2.6	61																												
5150-5850	3.0	2.7	61																												
5925-7125	3.5	2.5	66																												

Cellular

External

Connector Mount

ZWX-711BSA3B



Overview

5G Cellular Multi-band Tilt/Swivel Dipole Blade

Applications

5G NR FR1, 4G LTE, UMTS, GSM, LTE-M (Cat-M1), NB-IoT, CBRS

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)
617-960	2.5	2.7	54
1710-2690	2.1	3.8	67
3300-4200	1.6	3.0	62
4400-5000	1.8	3.2	52
5150-5850	1.9	2.8	50
5925-7125	2.0	3.5	46
Polarization	Linear		
Wavelength	$\frac{1}{2}\lambda$		
Electrical Type	Dipole		
Radiation Pattern	Omni directional		
Impedance (Ohms)	50		

Mechanical Data

Mounting Type	Connector Mount
Termination*	SMA Plug RP-SMA Plug
Dimensions	136x24x11 mm
Op. Temp.	-30°C to +70°C

ZWX-721XSA2B



Overview

5G Cellular Multi-band Tilt/Swivel Dipole Blade

Applications

5G NR FR1, 4G LTE, UMTS, GSM, LTE-M (Cat-M1), NB-IoT, CBRS

Electrical Data





Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)
617-960	2.0	2.1	51
1710-2690	2.9	4.4	65
3300-4200	2.7	2.8	68
4400-5000	2.0	3.7	54
5150-5850	2.6	4.8	52
Polarization	Linear		
Wavelength	$\frac{1}{2}\lambda$		
Electrical Type	Dipole		
Radiation Pattern	Omni directional		
Impedance (Ohms)	50		

Mechanical Data

Mounting Type	Connector Mount
Termination*	SMA Plug RP-SMA Plug
Dimensions	150x22x11 mm
Op. Temp.	-20°C to +70°C

External

Connector Mount

<u>ZWX-6231SA4B</u>	Overview	Electrical Data	Mechanical Data																												
	450MHz + 5G Cellular Multiband Tilt/Swivel Dipole Blade	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>450</td> <td>1.6</td> <td>1.2</td> <td>45</td> </tr> <tr> <td>617-960</td> <td>2.6</td> <td>2.0</td> <td>51</td> </tr> <tr> <td>1710-2690</td> <td>2.5</td> <td>3.5</td> <td>63</td> </tr> <tr> <td>3300-5000</td> <td>2.0</td> <td>4.0</td> <td>60</td> </tr> <tr> <td>5150-5850</td> <td>1.8</td> <td>4.7</td> <td>65</td> </tr> <tr> <td>5925-7125</td> <td>1.8</td> <td>3.8</td> <td>60</td> </tr> </tbody> </table>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	450	1.6	1.2	45	617-960	2.6	2.0	51	1710-2690	2.5	3.5	63	3300-5000	2.0	4.0	60	5150-5850	1.8	4.7	65	5925-7125	1.8	3.8	60	Mounting Type Connector Mount Termination* SMA Plug RP-SMA Plug Dimensions 205x25x13mm Op. Temp. -30°C to +70°C
	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)																											
450	1.6	1.2	45																												
617-960	2.6	2.0	51																												
1710-2690	2.5	3.5	63																												
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	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)																											
410-430	2.3	1.6	42																												
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	5G Cellular Multi- band Tilt/Swivel Dipole Blade	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>617-960</td> <td>3.2</td> <td>1.6</td> <td>41</td> </tr> <tr> <td>1710-2690</td> <td>2.1</td> <td>4.8</td> <td>70</td> </tr> <tr> <td>3300-4200</td> <td>1.8</td> <td>2.0</td> <td>62</td> </tr> <tr> <td>4400-5000</td> <td>1.7</td> <td>3.4</td> <td>63</td> </tr> <tr> <td>5150-5850</td> <td>1.9</td> <td>3.8</td> <td>59</td> </tr> <tr> <td>5925-7125</td> <td>2.4</td> <td>3.5</td> <td>58</td> </tr> </tbody> </table>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	617-960	3.2	1.6	41	1710-2690	2.1	4.8	70	3300-4200	1.8	2.0	62	4400-5000	1.7	3.4	63	5150-5850	1.9	3.8	59	5925-7125	2.4	3.5	58	Mounting Type Connector Mount Termination* SMA Plug RP-SMA Plug Dimensions 160x22x13 mm Op. Temp. -30°C to +70°C
	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)																											
617-960	3.2	1.6	41																												
1710-2690	2.1	4.8	70																												
3300-4200	1.8	2.0	62																												
4400-5000	1.7	3.4	63																												
5150-5850	1.9	3.8	59																												
5925-7125	2.4	3.5	58																												
Applications 5G NR FR1, 4G LTE, UMTS, GSM, LTE-M (Cat-M1), NB-IoT, CBRS	Polarization Linear Wavelength $\frac{1}{2}\lambda$ Electrical Type Dipole Radiation Pattern Omni directional Impedance (Ohms) 50																														
	450MHz + 5G Cellular Multiband Tilt/Swivel Dipole Blade	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>450</td> <td>2.0</td> <td>1.8</td> <td>52</td> </tr> <tr> <td>617-960</td> <td>3.0</td> <td>2.0</td> <td>76</td> </tr> <tr> <td>1710-2690</td> <td>2.5</td> <td>3.0</td> <td>70</td> </tr> <tr> <td>3300-4200</td> <td>2.5</td> <td>3.5</td> <td>65</td> </tr> <tr> <td>4400-5000</td> <td>2.0</td> <td>3.5</td> <td>66</td> </tr> <tr> <td>5150-7125</td> <td>2.5</td> <td>3.6</td> <td>65</td> </tr> </tbody> </table>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	450	2.0	1.8	52	617-960	3.0	2.0	76	1710-2690	2.5	3.0	70	3300-4200	2.5	3.5	65	4400-5000	2.0	3.5	66	5150-7125	2.5	3.6	65	Mounting Type Connector Mount Termination* SMA Plug RP-SMA Plug Dimensions 237x39x13 mm Op. Temp. -30°C to +70°C
	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)																											
450	2.0	1.8	52																												
617-960	3.0	2.0	76																												
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3300-4200	2.5	3.5	65																												
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Applications 5G NR FR1, 4G LTE, UMTS, GSM, LTE-M (Cat-M1), NB-IoT, CBRS	Polarization Linear Wavelength $\frac{1}{2}\lambda$ Electrical Type Dipole Radiation Pattern Omni directional Impedance (Ohms) 50																														

Cellular

External

Panel Mount

ZHX-3802NF3B



Overview

5G Cellular Multi-band Dipole Dome/Saltshaker

Applications

5G NR FR1, 4G LTE, UMTS, GSM, LTE-M (Cat-M1), NB-IoT

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)
617-960	3.6	4.1	78
1710-2690	2.8	7.1	76
3300-4200	2.3	6.8	70
4400-5000	2.5	6.2	76
5150-5850	2.0	10.0	80
5925-7125	2.8	8.9	75
Polarization	Linear		
Wavelength	$\frac{1}{2}\lambda$		
Electrical Type	Dipole		
Radiation Pattern	Omni directional		
Impedance (Ohms)	50		

Mechanical Data

Mounting Type	Panel Mount
Termination	N-Type Jack
Dimensions	77.7x \varnothing 38 mm
Op. Temp.	-40°C to +85°C
IP Rating	IP67

YHX-3602NF3B



Overview

5G Cellular Multi-band Dipole Dome/Saltshaker

Applications

5G NR FR1, 4G LTE, UMTS, GSM, LTE-M (Cat-M1), NB-IoT

Electrical Data




Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)
698-960	3.3	2.5	60
1710-2690	2.5	3.5	67
3300-3800	2.5	4.2	72
Polarization	Linear		
Wavelength	$\frac{1}{2}\lambda$		
Electrical Type	Dipole		
Radiation Pattern	Omni directional		
Impedance (Ohms)	50		

Mechanical Data

Mounting Type	Panel Mount
Termination	N-Type Jack
Dimensions	71x \varnothing 40.2 mm
Op. Temp.	-30°C to +70°C
IP Rating	IP65

External

Panel Mount

<u>ZHF-3802SA3B-*</u>	Overview	Electrical Data	Mechanical Data																																												
	5G Cellular Multi-band Dipole Dome /Saltshaker Flying Lead	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>617-960</td> <td>2.8</td> <td>2.8</td> <td>64</td> </tr> <tr> <td>1710-2690</td> <td>2.2</td> <td>3.0</td> <td>68</td> </tr> <tr> <td>3300-4200</td> <td>2.3</td> <td>3.6</td> <td>70</td> </tr> <tr> <td>4400-5000</td> <td>2.6</td> <td>3.7</td> <td>59</td> </tr> <tr> <td>5150-5850</td> <td>2.0</td> <td>4.6</td> <td>71</td> </tr> <tr> <td>5925-7125</td> <td>2.1</td> <td>3.5</td> <td>51</td> </tr> </tbody> </table>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	617-960	2.8	2.8	64	1710-2690	2.2	3.0	68	3300-4200	2.3	3.6	70	4400-5000	2.6	3.7	59	5150-5850	2.0	4.6	71	5925-7125	2.1	3.5	51	<table border="1"> <thead> <tr> <th>Mounting Type</th> <th>Panel Mount</th> </tr> </thead> <tbody> <tr> <td>Termination</td> <td>SMA Plug</td> </tr> <tr> <td>Dimensions</td> <td>77.7xø38 mm</td> </tr> <tr> <td>Op. Temp.</td> <td>-40°C to +85°C</td> </tr> <tr> <td>Cable Type</td> <td>RG174</td> </tr> <tr> <td>Cable Length*</td> <td>1000 mm</td> </tr> <tr> <td></td> <td>2000 mm</td> </tr> <tr> <td>IP Rating</td> <td>IP65</td> </tr> </tbody> </table>	Mounting Type	Panel Mount	Termination	SMA Plug	Dimensions	77.7xø38 mm	Op. Temp.	-40°C to +85°C	Cable Type	RG174	Cable Length*	1000 mm		2000 mm	IP Rating	IP65
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Applications 5G NR FR1, 4G LTE, UMTS, GSM, LTE-M (Cat-M1), NB-IoT	<table border="1"> <thead> <tr> <th>Polarization</th> <th>Linear</th> </tr> </thead> <tbody> <tr> <td>Wavelength</td> <td>$\frac{1}{2}\lambda$</td> </tr> <tr> <td>Electrical Type</td> <td>Dipole</td> </tr> <tr> <td>Radiation Pattern</td> <td>Omni directional</td> </tr> <tr> <td>Impedance (Ohms)</td> <td>50</td> </tr> </tbody> </table>	Polarization	Linear	Wavelength	$\frac{1}{2}\lambda$	Electrical Type	Dipole	Radiation Pattern	Omni directional	Impedance (Ohms)	50																																				
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<u>YHF-3602SA3B-*</u>	Overview	Electrical Data	Mechanical Data																																												
	4G LTE Cellular Multiband Dipole Dome/Saltshaker Flying Lead	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>698-960</td> <td>3.2</td> <td>2.0</td> <td>64</td> </tr> <tr> <td>1710-2690</td> <td>3.3</td> <td>3.1</td> <td>67</td> </tr> <tr> <td>3300-3800</td> <td>2.9</td> <td>4.6</td> <td>71</td> </tr> </tbody> </table>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	698-960	3.2	2.0	64	1710-2690	3.3	3.1	67	3300-3800	2.9	4.6	71	<table border="1"> <thead> <tr> <th>Mounting Type</th> <th>Panel Mount</th> </tr> </thead> <tbody> <tr> <td>Termination</td> <td>SMA Plug</td> </tr> <tr> <td>Dimensions</td> <td>71xø40.2 mm</td> </tr> <tr> <td>Op. Temp.</td> <td>-30°C to +70°C</td> </tr> <tr> <td>Cable Type</td> <td>RG174</td> </tr> <tr> <td>Cable Length*</td> <td>1000 mm</td> </tr> <tr> <td></td> <td>2000 mm</td> </tr> </tbody> </table>	Mounting Type	Panel Mount	Termination	SMA Plug	Dimensions	71xø40.2 mm	Op. Temp.	-30°C to +70°C	Cable Type	RG174	Cable Length*	1000 mm		2000 mm														
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Impedance (Ohms)	50																																														
<u>ZHF-106SA3B-*</u>	Overview	Electrical Data	Mechanical Data																																												
	5G Cellular Multi-band Dipole Puck Flying Lead	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>617-960</td> <td>3.6</td> <td>2.2</td> <td>29</td> </tr> <tr> <td>1710-2690</td> <td>5.0</td> <td>3.4</td> <td>33</td> </tr> <tr> <td>3300-4200</td> <td>3.5</td> <td>3.6</td> <td>36</td> </tr> <tr> <td>4400-5000</td> <td>3.0</td> <td>3.7</td> <td>35</td> </tr> <tr> <td>5150-5850</td> <td>3.2</td> <td>3.1</td> <td>28</td> </tr> <tr> <td>5925-7125</td> <td>5.0</td> <td>2.2</td> <td>26</td> </tr> </tbody> </table>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	617-960	3.6	2.2	29	1710-2690	5.0	3.4	33	3300-4200	3.5	3.6	36	4400-5000	3.0	3.7	35	5150-5850	3.2	3.1	28	5925-7125	5.0	2.2	26	<table border="1"> <thead> <tr> <th>Mounting Type</th> <th>Panel Mount</th> </tr> </thead> <tbody> <tr> <td>Termination</td> <td>SMA Plug</td> </tr> <tr> <td>Dimensions</td> <td>26xø99 mm</td> </tr> <tr> <td>Op. Temp.</td> <td>-30°C to +70°C</td> </tr> <tr> <td>Cable Type</td> <td>RG174</td> </tr> <tr> <td>Cable Length*</td> <td>1000 mm</td> </tr> <tr> <td></td> <td>2000 mm</td> </tr> <tr> <td>IP Rating</td> <td>IP65</td> </tr> </tbody> </table>	Mounting Type	Panel Mount	Termination	SMA Plug	Dimensions	26xø99 mm	Op. Temp.	-30°C to +70°C	Cable Type	RG174	Cable Length*	1000 mm		2000 mm	IP Rating	IP65
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Impedance (Ohms)	50																																														

New

Cellular

Remote / Rugged

Panel Mount

YHF-HA02SA1W-*



Overview

4G LTE Cellular
Multiband Rugged
Dipole Dome Flying Lead

Applications

4G LTE, UMTS,
GSM, LTE-M (Cat-M1), NB-IoT

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)
698-960	3.5	2.6	65
1710-2690	2.8	3.1	72

Polarization	Linear
Wavelength	$\frac{1}{2}\lambda$
Electrical Type	Dipole
Radiation Pattern	Omni directional
Impedance (Ohms)	50

Mechanical Data

Mounting Type	Panel Mount
Termination	SMA Plug
Dimensions	35x \varnothing 169 mm
Op. Temp.	-40°C to +85 °C
Cable Type	RG58
Cable Length*	1000mm 2000mm
IP Rating	IP67

YHF-HA03TC1G-*

New



Overview

4G LTE Cellular
Multiband Rugged
Dipole Dome Flying Lead

Applications

4G LTE, UMTS,
GSM, LTE-M (Cat-M1), NB-IoT

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)
698-960	2.8	2.5	57
1710-2690	3.0	3.0	63


Polarization	Linear
Wavelength	$\frac{1}{2}\lambda$
Electrical Type	Dipole
Radiation Pattern	Omni directional
Impedance (Ohms)	50


Mechanical Data


Mounting Type	Panel Mount
Termination	TNC Plug
Dimensions	62x \varnothing 101 mm
Op. Temp.	-40°C to +85°C
Cable Type	RG58
Cable Length*	1000mm 2000mm
IP Rating	IP67

Remote

Adhesive Mount

<u>ZBF-603XSA3B-*</u>	Overview	Electrical Data				Mechanical Data	
	5G Cellular Multi-band Straight Dipole Adhesive Bar/Blade, Flying Lead Applications 5G NR FR1, 4G LTE, UMTS, GSM, LTE-M (Cat-M1), NB-IoT, CBRS	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	Mounting Type	Adhesive Mount
		617-960	1.9	3.2	46	Termination	SMA Plug
		1710-2690	1.6	2.5	39	Dimensions	110x20x6 mm
		3300-4200	1.6	0.3	28	Op. Temp.	-40°C to +85°C
		4400-5000	1.6	-1.5	17	Cable Type	RG174
		5150-5925	1.6	0.5	19	Cable Length*	1000 mm
		5925-7125	1.8	0.2	13		2000 mm
		Polarization		Linear			
		Wavelength		$\frac{1}{2}\lambda$			
		Electrical Type		Dipole			
		Radiation Pattern		Omni directional			
		Impedance (Ohms)		50			



<u>CAF-601XSAXB-*</u>	Overview	Electrical Data				Mechanical Data	
	Cellular Multiband Straight Dipole Adhesive Bar/Blade, Flying Lead Applications LTE-M (Cat-M1), NB-IoT, UMTS, GSM, LPWA	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	Mounting Type	Adhesive Mount
		824-960	2.0	2.0	53	Termination	SMA Plug
		1710-2170	2.0	2.5	61	Dimensions	146x20x13 mm
						Op. Temp.	-30°C to +70°C
						Cable Type	RG174
						Cable Length*	1000 mm
							2000 mm
		Polarization		Linear			
		Wavelength		$\frac{1}{2}\lambda$			
		Electrical Type		Dipole			
		Radiation Pattern		Omni directional			
		Impedance (Ohms)		50			

<u>CAF-350XSA1B-*</u>	Overview	Electrical Data				Mechanical Data	
	Cellular Multiband Dipole Adhesive Puck, Flying Lead Applications LTE-M (Cat-M1), NB-IoT, UMTS, GSM, LPWA	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	Mounting Type	Adhesive Mount
		880-960	2.7	1.6	34	Termination	SMA Plug
		1710-1880	2.6	1.0	28	Dimensions	9.8x50 mm
						Op. Temp.	-30°C to +70°C
						Cable Type	RG174
						Cable Length*	1000 mm
							2000 mm
		Polarization		Linear			
		Wavelength		$\frac{1}{2}\lambda$			
		Electrical Type		Dipole			
		Radiation Pattern		Omni directional			
		Impedance (Ohms)		50			

Cellular

Remote

Magnetic Mount

<u>YAF-129XSA1B-*</u>	Overview	Electrical Data	Mechanical Data																								
	4G Cellular Multi-band Straight Monopole Magnetic Mount Whip, Flying Lead	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>698-960</td> <td>2.5</td> <td>2.0</td> <td>55</td> </tr> <tr> <td>1710-2690</td> <td>2.0</td> <td>3.0</td> <td>63</td> </tr> </tbody> </table>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	698-960	2.5	2.0	55	1710-2690	2.0	3.0	63	<table border="1"> <thead> <tr> <th>Mounting Type</th> <td>Magnetic Mount</td> </tr> <tr> <th>Termination</th> <td>SMA Plug</td> </tr> <tr> <th>Dimensions</th> <td>91xø31 mm</td> </tr> <tr> <th>Op. Temp.</th> <td>-30°C to +70°C</td> </tr> <tr> <th>Cable Type</th> <td>RG174</td> </tr> <tr> <th>Cable Length*</th> <td>1000 mm 2000 mm</td> </tr> </thead> </table>	Mounting Type	Magnetic Mount	Termination	SMA Plug	Dimensions	91xø31 mm	Op. Temp.	-30°C to +70°C	Cable Type	RG174	Cable Length*	1000 mm 2000 mm
	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)																							
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<u>CAF-126XSAXB-*</u>	Overview	Electrical Data	Mechanical Data																								
	Cellular Multiband Straight Monopole Magnetic Mount Whip, Flying Lead	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>824-896</td> <td>2.5</td> <td>2.0</td> <td>56</td> </tr> <tr> <td>1710-2170</td> <td>2.0</td> <td>3.0</td> <td>65</td> </tr> </tbody> </table>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	824-896	2.5	2.0	56	1710-2170	2.0	3.0	65	<table border="1"> <thead> <tr> <th>Mounting Type</th> <td>Magnetic Mount</td> </tr> <tr> <th>Termination</th> <td>SMA Plug</td> </tr> <tr> <th>Dimensions</th> <td>120xø27 mm</td> </tr> <tr> <th>Op. Temp.</th> <td>-30°C to +70°C</td> </tr> <tr> <th>Cable Type</th> <td>RG174</td> </tr> <tr> <th>Cable Length*</th> <td>1000 mm 2000 mm</td> </tr> </thead> </table>	Mounting Type	Magnetic Mount	Termination	SMA Plug	Dimensions	120xø27 mm	Op. Temp.	-30°C to +70°C	Cable Type	RG174	Cable Length*	1000 mm 2000 mm
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Impedance (Ohms)	50																										

Sub-1 GHz LPWA and ISM Antennas

Joymax sub-1 GHz antennas for LPWA and ISM applications offer single-band options in multiple styles, mounting, and terminations at 433MHz, 490MHz, 868MHz and 915MHz in support of applications including:

- LoRaWAN®
- Sigfox®
- Weightless-P®
- WiFi HaLow

External

Connector Mount

GWX-180ASA2B		Electrical Data				Mechanical Data	
	Overview	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	Mounting Type	Connector Mount
	915MHz LPWA Outdoor Tilt/Swivel Dipole Whip	915	1.6	2.8	74	Termination*	SMA Plug RP-SMA Plug
	Applications					Dimensions	203xø13 mm
	LoRaWAN, Sigfox, Weightless-P, WiFi HaLow					Op. Temp.	-30°C to +70°C
						IP Rating	IP67
		Polarization		Linear			
		Wavelength		½-λ			
		Electrical Type		Dipole			
		Radiation Pattern		Omni directional			
		Impedance (Ohms)		50			
GWX-180ASA1B		Electrical Data				Mechanical Data	
	Overview	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	Mounting Type	Connector Mount
	868MHz LPWA Outdoor Tilt/Swivel Dipole Whip	868	1.5	2.0	73	Termination*	SMA Plug RP-SMA Plug
	Applications					Dimensions	203xø13 mm
	LoRaWAN, Sigfox, Weightless-P, WiFi HaLow					Op. Temp.	-30°C to +70°C
						IP Rating	IP67
		Polarization		Linear			
		Wavelength		½-λ			
		Electrical Type		Dipole			
		Radiation Pattern		Omni directional			
		Impedance (Ohms)		50			
GWX-100BSA3B		Electrical Data				Mechanical Data	
	Overview	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	Mounting Type	Connector Mount
	868MHz 915MHz LPWA Tilt/Swivel Monopole Whip	868	2.5	1.5	54	Termination*	SMA Plug RP-SMA Plug
		915	2.2	1.9	57	Dimensions	124xø13 mm
	Applications					Op. Temp.	-30°C to +70°C
	LoRaWAN, Sigfox, Weightless-P, WiFi HaLow						
		Polarization		Linear			
		Wavelength		¼-λ			
		Electrical Type		Monopole			
		Radiation Pattern		Omni directional			
		Impedance (Ohms)		50			

Sub-1 GHz LPWA and ISM

External

Connector Mount

<u>GWX-241BSA3B</u>	Overview	Electrical Data	Mechanical Data												
	868 MHz 915MHz LPWA Tilt/Swivel Monopole Whip	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>868</td> <td>1.6</td> <td>2.3</td> <td>78</td> </tr> <tr> <td>915</td> <td>1.7</td> <td>2.3</td> <td>78</td> </tr> </tbody> </table>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	868	1.6	2.3	78	915	1.7	2.3	78	Mounting Type Connector Mount Termination* SMA Plug RP-SMA Plug
	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)											
	868	1.6	2.3	78											
	915	1.7	2.3	78											
Applications LoRaWAN, Sigfox, Weightless-P, WiFi HaLow		Dimensions 108xø10 mm Op. Temp. -30°C to +70°C													
	Polarization Linear Wavelength ¼-λ Electrical Type Monopole Radiation Pattern Omni directional Impedance (Ohms) 50														
<u>GMX-221ASA3B</u>	Overview	Electrical Data	Mechanical Data												
	868MHz 915MHz LPWA Right Angle Monopole Whip	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>868</td> <td>2.4</td> <td>1.1</td> <td>55</td> </tr> <tr> <td>915</td> <td>2.0</td> <td>1.8</td> <td>66</td> </tr> </tbody> </table>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	868	2.4	1.1	55	915	2.0	1.8	66	Mounting Type Connector Mount Termination* SMA Plug RP-SMA Plug
	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)											
	868	2.4	1.1	55											
	915	2.0	1.8	66											
Applications LoRaWAN, Sigfox, Weightless-P, WiFi HaLow		Dimensions 47xø8 mm Op. Temp. -30°C to +70 °C													
	Polarization Linear Wavelength ¼-λ Electrical Type Monopole Radiation Pattern Omni directional Impedance (Ohms) 50														
<u>GHX-328XSA3B</u>	Overview	Electrical Data	Mechanical Data												
	868MHz 915MHz LPWA Straight Monopole Whip	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>868</td> <td>1.6</td> <td>2.7</td> <td>78</td> </tr> <tr> <td>915</td> <td>1.7</td> <td>2.7</td> <td>79</td> </tr> </tbody> </table>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	868	1.6	2.7	78	915	1.7	2.7	79	Mounting Type Connector Mount Termination* SMA Plug RP-SMA Plug
	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)											
	868	1.6	2.7	78											
	915	1.7	2.7	79											
Applications LoRaWAN, Sigfox, Weightless-P, WiFi HaLow		Dimensions 46xø13 mm Op. Temp. -30°C to +70°C													
	Polarization Linear Wavelength ¼-λ Electrical Type Monopole Radiation Pattern Omni directional Impedance (Ohms) 50														

Sub-1 GHz LPWA and ISM

External





Connector Mount

<u>UHX-362XSAXB</u>	Overview	Electrical Data	Mechanical Data																								
	433MHz Straight Monopole Whip	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>433</td> <td>2.5</td> <td>1.3</td> <td>49</td> </tr> </tbody> </table>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	433	2.5	1.3	49	<table border="1"> <thead> <tr> <th>Mounting Type</th> <th>Connector</th> </tr> </thead> <tbody> <tr> <td>Termination</td> <td>SMA Plug</td> </tr> <tr> <td>Dimensions</td> <td>157xø13.5 mm</td> </tr> <tr> <td>Op. Temp.</td> <td>-30°C to +70°C</td> </tr> </tbody> </table>	Mounting Type	Connector	Termination	SMA Plug	Dimensions	157xø13.5 mm	Op. Temp.	-30°C to +70°C								
	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)																							
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Mounting Type	Connector																										
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Dimensions	157xø13.5 mm																										
Op. Temp.	-30°C to +70°C																										
Applications LoRaWAN, Weightless-P, Remote Control	Polarization: Linear Wavelength: $\frac{1}{4}\lambda$ Electrical Type: Monopole Radiation Pattern: Omni directional Impedance (Ohms): 50																										
<u>UWX-6231SAXB</u>	Overview	Electrical Data	Mechanical Data																								
	433MHz Tilt/Swivel Dipole Blade	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>433</td> <td>2.5</td> <td>1.2</td> <td>60</td> </tr> </tbody> </table>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	433	2.5	1.2	60	<table border="1"> <thead> <tr> <th>Mounting Type</th> <th>Connector</th> </tr> </thead> <tbody> <tr> <td>Termination</td> <td>SMA Plug</td> </tr> <tr> <td>Dimensions</td> <td>205x25x13 mm</td> </tr> <tr> <td>Op. Temp.</td> <td>-30°C to +70 °C</td> </tr> </tbody> </table>	Mounting Type	Connector	Termination	SMA Plug	Dimensions	205x25x13 mm	Op. Temp.	-30°C to +70 °C								
	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)																							
	433	2.5	1.2	60																							
Mounting Type	Connector																										
Termination	SMA Plug																										
Dimensions	205x25x13 mm																										
Op. Temp.	-30°C to +70 °C																										
Applications LoRaWAN, Weightless-P, Remote Control	Polarization: Linear Wavelength: $\frac{1}{2}\lambda$ Electrical Type: Dipole Radiation Pattern: Omni directional Impedance (Ohms): 50																										
<u>UWX-6221SA1B</u>	Overview	Electrical Data	Mechanical Data																								
	433MHz 868MH 915MHz LPWA Tilt/Swivel Dipole Blade	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>433</td> <td>2.5</td> <td>1.5</td> <td>60</td> </tr> <tr> <td>868</td> <td>2.0</td> <td>1.8</td> <td>61</td> </tr> <tr> <td>915</td> <td>2.0</td> <td>2.0</td> <td>65</td> </tr> </tbody> </table>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	433	2.5	1.5	60	868	2.0	1.8	61	915	2.0	2.0	65	<table border="1"> <thead> <tr> <th>Mounting Type</th> <th>Connector</th> </tr> </thead> <tbody> <tr> <td>Termination</td> <td>SMA Plug</td> </tr> <tr> <td>Dimensions</td> <td>237x39x13 mm</td> </tr> <tr> <td>Op. Temp.</td> <td>-30°C to +70°C</td> </tr> </tbody> </table>	Mounting Type	Connector	Termination	SMA Plug	Dimensions	237x39x13 mm	Op. Temp.	-30°C to +70°C
	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)																							
	433	2.5	1.5	60																							
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Op. Temp.	-30°C to +70°C																										
Applications LoRaWAN, Sigfox, Weightless-P, WiFi HaLow, Remote Control	Polarization: Linear Wavelength: $\frac{1}{2}\lambda$ Electrical Type: Dipole Radiation Pattern: Omni directional Impedance (Ohms): 50																										

Sub-1 GHz LPWA and ISM

External

Connector Mount




	Overview	Electrical Data	Mechanical Data												
	GHX-150XNX3B 868MHz 915MHz LPWA Straight Dipole Blade Applications LoRaWAN, Sigfox, Weightless-P, WiFi HaLow	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>868</td> <td>2.5</td> <td>1.6</td> <td>56</td> </tr> <tr> <td>915</td> <td>2.0</td> <td>1.9</td> <td>61</td> </tr> </tbody> </table>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	868	2.5	1.6	56	915	2.0	1.9	61	Mounting Type Connector Mount Termination* N-Type Plug N-Type Jack Dimensions 180xø21 mm Op. Temp. -40°C to +85°C IP Rating IP67
		Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)										
868	2.5	1.6	56												
915	2.0	1.9	61												
Polarization Linear Wavelength $\frac{1}{2}\lambda$ Electrical Type Dipole Radiation Pattern Omni directional Impedance (Ohms) 50															
	GHX-463XSA3B 868MHz 915MHz LPWA Straight Monopole Whip Applications LoRaWAN, Sigfox, Weightless-P, WiFi HaLow	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>868</td> <td>1.3</td> <td>1.0</td> <td>60</td> </tr> <tr> <td>915</td> <td>1.7</td> <td>2.4</td> <td>72</td> </tr> </tbody> </table>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	868	1.3	1.0	60	915	1.7	2.4	72	Mounting Type Connector Mount Termination SMA Plug Dimensions 176xø10 mm Op. Temp. -30°C to +70°C
		Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)										
868	1.3	1.0	60												
915	1.7	2.4	72												
Polarization Linear Wavelength $\frac{1}{4}\lambda$ Electrical Type Monopole Radiation Pattern Omni directional Impedance (Ohms) 50															
	GGX-1023NF3W 868MHz 915MHz LPWA Outdoor Fiberglass Dipole Baton/Stick Applications LoRaWAN, Sigfox, Weightless-P, WiFi HaLow	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>868</td> <td>2.5</td> <td>2.1</td> <td>50</td> </tr> <tr> <td>915</td> <td>2.5</td> <td>2.5</td> <td>56</td> </tr> </tbody> </table>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	868	2.5	2.1	50	915	2.5	2.5	56	Mounting Type Connector Mount Termination* N-Type Jack N-Type Plug Dimensions 145xø25 mm Op. Temp. -40°C to +85°C IP Rating IP67
		Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)										
868	2.5	2.1	50												
915	2.5	2.5	56												
Polarization Linear Wavelength $\frac{1}{2}\lambda$ Electrical Type Dipole Radiation Pattern Omni directional Impedance (Ohms) 50															
	GGX-1123NX3W 868MHz 915MHz LPWA Outdoor Fiberglass Dipole Baton/Stick Applications LoRaWAN, Sigfox, Weightless-P, WiFi HaLow	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>868</td> <td>1.6</td> <td>2.0</td> <td>51</td> </tr> <tr> <td>915</td> <td>1.9</td> <td>2.3</td> <td>53</td> </tr> </tbody> </table>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	868	1.6	2.0	51	915	1.9	2.3	53	Mounting Type Connector Mount Termination N-Type Plug Dimensions 152xø24 mm Op. Temp. -40°C to +85°C IP Rating IP67
		Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)										
868	1.6	2.0	51												
915	1.9	2.3	53												
Polarization Linear Wavelength $\frac{1}{2}\lambda$ Electrical Type Dipole Radiation Pattern Omni directional Impedance (Ohms) 50															

New

Sub-1 GHz LPWA and ISM

External

Connector Mount

<u>GHX-1017NX2W</u>	Overview	Electrical Data	Mechanical Data																		
	915MHz LPWA Outdoor Fiber- glass Dipole Baton/Stick	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>915</td> <td>1.3</td> <td>4.5</td> <td>76</td> </tr> </tbody> </table>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	915	1.3	4.5	76	<table border="1"> <thead> <tr> <th>Mounting Type</th> <th>Connector Mount</th> </tr> </thead> <tbody> <tr> <td>Termination</td> <td>N-Type Plug</td> </tr> <tr> <td>Dimensions</td> <td>528xø20 mm</td> </tr> <tr> <td>Op. Temp.</td> <td>-40°C to +85 °C</td> </tr> <tr> <td>IP Rating</td> <td>IP67</td> </tr> </tbody> </table>	Mounting Type	Connector Mount	Termination	N-Type Plug	Dimensions	528xø20 mm	Op. Temp.	-40°C to +85 °C	IP Rating	IP67
	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)																	
915	1.3	4.5	76																		
Mounting Type	Connector Mount																				
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Dimensions	528xø20 mm																				
Op. Temp.	-40°C to +85 °C																				
IP Rating	IP67																				
<p>Applications LoRaWAN, Sigfox, Weightless-P, WiFi HaLow</p> <table border="1"> <tbody> <tr> <td>Polarization</td> <td>Linear</td> </tr> <tr> <td>Wavelength</td> <td>½-λ</td> </tr> <tr> <td>Electrical Type</td> <td>Dipole</td> </tr> <tr> <td>Radiation Pattern</td> <td>Omni directional</td> </tr> <tr> <td>Impedance (Ohms)</td> <td>50</td> </tr> </tbody> </table>	Polarization	Linear	Wavelength	½-λ	Electrical Type	Dipole	Radiation Pattern	Omni directional	Impedance (Ohms)	50											
Polarization	Linear																				
Wavelength	½-λ																				
Electrical Type	Dipole																				
Radiation Pattern	Omni directional																				
Impedance (Ohms)	50																				
<u>GGX-102XNF2W</u>	Overview	Electrical Data	Mechanical Data																		
	915MHz LPWA Outdoor Fiber- glass Dipole Baton/Stick	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>915</td> <td>1.5</td> <td>5.0</td> <td>82</td> </tr> </tbody> </table>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	915	1.5	5.0	82	<table border="1"> <thead> <tr> <th>Mounting Type</th> <th>Connector Mount</th> </tr> </thead> <tbody> <tr> <td>Termination</td> <td>N-Type Jack</td> </tr> <tr> <td>Dimensions</td> <td>421xø22 mm</td> </tr> <tr> <td>Op. Temp.</td> <td>-40°C to +85°C</td> </tr> <tr> <td>IP Rating</td> <td>IP65</td> </tr> </tbody> </table>	Mounting Type	Connector Mount	Termination	N-Type Jack	Dimensions	421xø22 mm	Op. Temp.	-40°C to +85°C	IP Rating	IP65
	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)																	
915	1.5	5.0	82																		
Mounting Type	Connector Mount																				
Termination	N-Type Jack																				
Dimensions	421xø22 mm																				
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IP Rating	IP65																				
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Polarization	Linear																				
Wavelength	½-λ																				
Electrical Type	Dipole																				
Radiation Pattern	Omni directional																				
Impedance (Ohms)	50																				
<u>GGX-103XNF2W</u>	Overview	Electrical Data	Mechanical Data																		
	915MHz LPWA Outdoor Fiber- glass Dipole Baton/Stick	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>915</td> <td>1.5</td> <td>7.0</td> <td>83</td> </tr> </tbody> </table>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	915	1.5	7.0	83	<table border="1"> <thead> <tr> <th>Mounting Type</th> <th>Connector Mount</th> </tr> </thead> <tbody> <tr> <td>Termination</td> <td>N-Type Jack</td> </tr> <tr> <td>Dimensions</td> <td>621xø22 mm</td> </tr> <tr> <td>Op. Temp.</td> <td>-40°C to +85°C</td> </tr> <tr> <td>IP Rating</td> <td>IP65</td> </tr> </tbody> </table>	Mounting Type	Connector Mount	Termination	N-Type Jack	Dimensions	621xø22 mm	Op. Temp.	-40°C to +85°C	IP Rating	IP65
	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)																	
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IP Rating	IP65																				
<p>Applications LoRaWAN, Sigfox, Weightless-P, WiFi HaLow</p> <table border="1"> <tbody> <tr> <td>Polarization</td> <td>Linear</td> </tr> <tr> <td>Wavelength</td> <td>½-λ</td> </tr> <tr> <td>Electrical Type</td> <td>Dipole</td> </tr> <tr> <td>Radiation Pattern</td> <td>Omni directional</td> </tr> <tr> <td>Impedance (Ohms)</td> <td>50</td> </tr> </tbody> </table>	Polarization	Linear	Wavelength	½-λ	Electrical Type	Dipole	Radiation Pattern	Omni directional	Impedance (Ohms)	50											
Polarization	Linear																				
Wavelength	½-λ																				
Electrical Type	Dipole																				
Radiation Pattern	Omni directional																				
Impedance (Ohms)	50																				

Sub-1 GHz LPWA and ISM

External

Panel Mount

GHX-3802NF3B



Overview

868MHz 915MHz
LPWA Dipole
Dome/Saltshaker

Applications

LoRaWAN, Sigfox,
Weightless-P, WiFi
HaLow

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)
868	3.0	2.3	61
915	3.0	2.5	63

Polarization	Linear
Wavelength	$\frac{1}{2}\lambda$
Electrical Type	Dipole
Radiation Pattern	Omni directional
Impedance (Ohms)	50

Mechanical Data

Mounting Type	Panel Mount
Termination	N-Type Jack
Dimensions	77.7x \varnothing 38 mm
Op. Temp.	-40°C to +85°C
IP Rating	IP67

GHX-3602NF3B



Overview

868MHz 915MHz
LPWA Dipole
Dome/Saltshaker

Applications

LoRaWAN, Sigfox,
Weightless-P, WiFi
HaLow

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)
868	3.0	1.9	58
915	3.0	2.2	60

Polarization	Linear
Wavelength	$\frac{1}{2}\lambda$
Electrical Type	Dipole
Radiation Pattern	Omni directional
Impedance (Ohms)	50

Mechanical Data

Mounting Type	Panel Mount
Termination	N-Type Jack
Dimensions	71x \varnothing 40.2 mm
Op. Temp.	-30°C to +70 °C
IP Rating	IP65

Sub-1 GHz LPWA and ISM

External

Panel Mount

GHF-3802SA3B-*



Overview

868MHz 915MHz
LPWA Dipole
Dome/Saltshaker,
Flying Lead

Applications

LoRaWAN, Sigfox,
Weightless-P, WiFi
HaLow

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)
868	3.0	2.3	61
915	3.0	2.5	63

Polarization	Linear
Wavelength	$\frac{1}{2}\lambda$
Electrical Type	Dipole
Radiation Pattern	Omni directional
Impedance (Ohms)	50

Mechanical Data

Mounting Type	Panel Mount
Termination	SMA Plug
Dimensions	78x \varnothing 40 mm
Op. Temp.	-40°C to +85°C
Cable Type	RG174
Cable Length*	1000 mm 2000 mm
IP Rating	IP65

GHF-3602SA3B-*



Overview

868MHz 915MHz
LPWA Dipole
Dome/Saltshaker,
Flying Lead

Applications

LoRaWAN, Sigfox,
Weightless-P, WiFi
HaLow

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)
868	3.0	1.9	58
915	3.0	2.2	60

Polarization	Linear
Wavelength	$\frac{1}{2}\lambda$
Electrical Type	Dipole
Radiation Pattern	Omni directional
Impedance (Ohms)	50



Mechanical Data

Mounting Type	Panel Mount
Termination	SMA Plug
Dimensions	71x \varnothing 40.2 mm
Op. Temp.	-30°C to +70 °C
Cable Type	RG174
Cable Length*	1000 mm 2000 mm

Sub-1 GHz LPWA and ISM

Remote





Magnetic Mount

<u>GAF-129XSA3B-*</u>	Overview	Electrical Data	Mechanical Data																								
	868MHz 915MHz LPWA Straight Monopole Mag- netic Mount Whip, Flying Lead	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>868</td> <td>2.5</td> <td>1.8</td> <td>55</td> </tr> <tr> <td>915</td> <td>2.2</td> <td>2.0</td> <td>58</td> </tr> </tbody> </table>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	868	2.5	1.8	55	915	2.2	2.0	58	<table border="1"> <thead> <tr> <th>Mounting Type</th> <td>Magnetic Mount</td> </tr> <tr> <th>Termination</th> <td>SMA Plug</td> </tr> <tr> <th>Dimensions</th> <td>91xø31 mm</td> </tr> <tr> <th>Op. Temp.</th> <td>-30°C to +70 °C</td> </tr> <tr> <th>Cable Type</th> <td>RG174</td> </tr> <tr> <th>Cable Length*</th> <td>1000 mm 2000 mm</td> </tr> </thead> </table>	Mounting Type	Magnetic Mount	Termination	SMA Plug	Dimensions	91xø31 mm	Op. Temp.	-30°C to +70 °C	Cable Type	RG174	Cable Length*	1000 mm 2000 mm
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Radiation Pattern	Omni directional																										
Impedance (Ohms)	50																										
<u>GAF-126XSA3B-*</u>	Overview	Electrical Data	Mechanical Data																								
	868MHz 915MHz LPWA Straight Monopole Mag- netic Mount Whip, Flying Lead	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>868</td> <td>2.4</td> <td>1.9</td> <td>57</td> </tr> <tr> <td>915</td> <td>2.0</td> <td>2.2</td> <td>59</td> </tr> </tbody> </table>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	868	2.4	1.9	57	915	2.0	2.2	59	<table border="1"> <thead> <tr> <th>Mounting Type</th> <td>Magnetic Mount</td> </tr> <tr> <th>Termination</th> <td>SMA Plug</td> </tr> <tr> <th>Dimensions</th> <td>120xø27 mm</td> </tr> <tr> <th>Op. Temp.</th> <td>-30°C to +70 °C</td> </tr> <tr> <th>Cable Type</th> <td>RG174</td> </tr> <tr> <th>Cable Length*</th> <td>1000 mm 2000 mm</td> </tr> </thead> </table>	Mounting Type	Magnetic Mount	Termination	SMA Plug	Dimensions	120xø27 mm	Op. Temp.	-30°C to +70 °C	Cable Type	RG174	Cable Length*	1000 mm 2000 mm
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Wavelength	¼-λ																										
Electrical Type	Monopole																										
Radiation Pattern	Omni directional																										
Impedance (Ohms)	50																										

Sub-1 GHz LPWA and ISM

Remote

Bracket Mount

<u>GPX-026XNF2W</u>	Overview	Electrical Data	Mechanical Data																		
	915MHz Outdoor Directional Patch Flat Panel	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>915</td> <td>1.1</td> <td>8.1</td> <td>79</td> </tr> </tbody> </table>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	915	1.1	8.1	79	<table border="1"> <thead> <tr> <th>Mounting Type</th> <th>Bracket Mount</th> </tr> </thead> <tbody> <tr> <td>Termination</td> <td>N-Type Jack</td> </tr> <tr> <td>Dimensions</td> <td>260x260x44 mm</td> </tr> <tr> <td>Op. Temp.</td> <td>-40°C to +85°C</td> </tr> <tr> <td>IP Rating</td> <td>IP65</td> </tr> </tbody> </table>	Mounting Type	Bracket Mount	Termination	N-Type Jack	Dimensions	260x260x44 mm	Op. Temp.	-40°C to +85°C	IP Rating	IP65
	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)																	
915	1.1	8.1	79																		
Mounting Type	Bracket Mount																				
Termination	N-Type Jack																				
Dimensions	260x260x44 mm																				
Op. Temp.	-40°C to +85°C																				
IP Rating	IP65																				
Applications RFID, LoRaWAN, Sigfox, Weightless-P, WiFi HaLow	Polarization: RHCP Wavelength: $\frac{1}{2}\lambda$ Electrical Type: Radiating Patch Radiation Pattern: Directional Impedance (Ohms): 50																				
<u>GPX-036XNF2W</u>	Overview	Electrical Data	Mechanical Data																		
	915MHz Outdoor Directional Patch Flat Panel	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>915</td> <td>1.2</td> <td>8.9</td> <td>83</td> </tr> </tbody> </table>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	915	1.2	8.9	83	<table border="1"> <thead> <tr> <th>Mounting Type</th> <th>Bracket Mount</th> </tr> </thead> <tbody> <tr> <td>Termination</td> <td>N-Type Jack</td> </tr> <tr> <td>Dimensions</td> <td>360x220x42 mm</td> </tr> <tr> <td>Op. Temp.</td> <td>-40°C to +85°C</td> </tr> <tr> <td>IP Rating</td> <td>IP65</td> </tr> </tbody> </table>	Mounting Type	Bracket Mount	Termination	N-Type Jack	Dimensions	360x220x42 mm	Op. Temp.	-40°C to +85°C	IP Rating	IP65
	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)																	
915	1.2	8.9	83																		
Mounting Type	Bracket Mount																				
Termination	N-Type Jack																				
Dimensions	360x220x42 mm																				
Op. Temp.	-40°C to +85°C																				
IP Rating	IP65																				
Applications RFID, LoRaWAN, Sigfox, Weightless-P, WiFi HaLow	Polarization: RHCP Wavelength: $\frac{1}{2}\lambda$ Electrical Type: Radiating Patch Radiation Pattern: Directional Impedance (Ohms): 50																				
<u>GPX-052XNF2W</u>	Overview	Electrical Data	Mechanical Data																		
	915MHz Outdoor Directional Patch Flat Panel	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>915</td> <td>1.2</td> <td>9.5</td> <td>84</td> </tr> </tbody> </table>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	915	1.2	9.5	84	<table border="1"> <thead> <tr> <th>Mounting Type</th> <th>Bracket Mount</th> </tr> </thead> <tbody> <tr> <td>Termination</td> <td>N-Type Jack</td> </tr> <tr> <td>Dimensions</td> <td>520x300x52 mm</td> </tr> <tr> <td>Op. Temp.</td> <td>-30°C to +70°C</td> </tr> <tr> <td>IP Rating</td> <td>IP65</td> </tr> </tbody> </table>	Mounting Type	Bracket Mount	Termination	N-Type Jack	Dimensions	520x300x52 mm	Op. Temp.	-30°C to +70°C	IP Rating	IP65
	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)																	
915	1.2	9.5	84																		
Mounting Type	Bracket Mount																				
Termination	N-Type Jack																				
Dimensions	520x300x52 mm																				
Op. Temp.	-30°C to +70°C																				
IP Rating	IP65																				
Applications RFID, LoRaWAN, Sigfox, Weightless-P, WiFi HaLow	Polarization: RHCP Wavelength: $\frac{1}{2}\lambda$ Electrical Type: Radiating Patch Radiation Pattern: Directional Impedance (Ohms): 50																				
<u>GPX-052ANF2W</u>	Overview	Electrical Data	Mechanical Data																		
	915MHz Outdoor Directional Patch Flat Panel	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>915</td> <td>1.2</td> <td>9.5</td> <td>84</td> </tr> </tbody> </table>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	915	1.2	9.5	84	<table border="1"> <thead> <tr> <th>Mounting Type</th> <th>Bracket Mount</th> </tr> </thead> <tbody> <tr> <td>Termination</td> <td>N-Type Jack</td> </tr> <tr> <td>Dimensions</td> <td>521x301x48 mm</td> </tr> <tr> <td>Op. Temp.</td> <td>-40°C to +85°C</td> </tr> <tr> <td>IP Rating</td> <td>IP65</td> </tr> </tbody> </table>	Mounting Type	Bracket Mount	Termination	N-Type Jack	Dimensions	521x301x48 mm	Op. Temp.	-40°C to +85°C	IP Rating	IP65
	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)																	
915	1.2	9.5	84																		
Mounting Type	Bracket Mount																				
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Op. Temp.	-40°C to +85°C																				
IP Rating	IP65																				
Applications RFID LoRaWAN, Sigfox, Weightless-P, WiFi HaLow	Polarization: RHCP Wavelength: $\frac{1}{2}\lambda$ Electrical Type: Radiating Patch Radiation Pattern: Directional Impedance (Ohms): 50																				

WiFi / WLAN

Joymax multi-band 2.4 GHz, 5 GHz and 6 GHz antenna solutions target wireless LAN (WiFi/WLAN) applications including:

- WiFi 7 (Tri-band: 2.4 GHz + 5GHz + 6GHz)
- WiFi 6E (Tri-band: 2.4 GHz + 5GHz + 6GHz)
- WiFi 6 (Dual-band: 2.4 GHz + 5GHz)
- WiFi 5 (5GHz)
- WiFi 4 (2.4GHz)
- U-NII 1-8
- 802.11b/g/n/ac/ax

Internal

Adhesive Mount

TBF-H035MP3B-*

New



Overview

WLAN/WiFi Trib-and FPC Adhesive Dipole Flexible Patch Orthogonal Cable

Applications

WiFi 7, WiFi 6E, WiFi 6, WiFi 5, WiFi 4, U-NII, 802.11, 802.15.4

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)
2400-2500	2.2	2.4	60
5150-5850	2.1	4.4	71
5925-7125	2.7	7.1	62

Polarization	Linear
Wavelength	$\frac{1}{2}\lambda$
Electrical Type	Dipole
Radiation Pattern	Omni directional
Impedance (Ohms)	50

Mechanical Data

Mounting Type	Adhesive Mount
Termination*	U.FL-type Plug /MHF1 Plug /MHF4 Plug
Dimensions	35x20x0.1 mm
Op. Temp.	-40°C to +85°C
Cable Type	\varnothing 1.13mm
Cable Length*	60 mm 120 mm 180 mm

TBF-V035MP3B-*

New



Overview

WLAN/WiFi Trib-and FPC Adhesive Dipole Flexible Patch Coax Cable

Applications

WiFi 7, WiFi 6E, WiFi 6, WiFi 5, WiFi 4, U-NII, 802.11, 802.15.4

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)
2400-2500	2.2	2.4	60
5150-5850	2.1	4.4	71
5925-7125	2.7	7.1	62

Polarization	Linear
Wavelength	$\frac{1}{2}\lambda$
Electrical Type	Dipole
Radiation Pattern	Omni directional
Impedance (Ohms)	50

Mechanical Data

Mounting Type	Adhesive Mount
Termination*	U.FL-type Plug /MHF1 Plug /MHF4 Plug
Dimensions	35x20x0.1 mm
Op. Temp.	-40°C to +85°C
Cable Type	\varnothing 1.13mm
Cable Length*	60 mm 120 mm 180 mm

TBF-H030MP3B-*

New



Overview

WLAN/WiFi Trib-and FPC Adhesive Dipole Flexible Patch Orthogonal Cable

Applications

WiFi 7, WiFi 6E, WiFi 6, WiFi 5, WiFi 4, U-NII, 802.11, 802.15.4

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)
2400-2500	2.0	2.3	63
5150-5850	1.5	4.6	70
5925-7125	1.5	6.3	64

Polarization	Linear
Wavelength	$\frac{1}{2}\lambda$
Electrical Type	Dipole
Radiation Pattern	Omni directional
Impedance (Ohms)	50

Mechanical Data

Mounting Type	Adhesive Mount
Termination*	U.FL-type Plug /MHF1 Plug /MHF4 Plug
Dimensions	30x15x0.1 mm
Op. Temp.	-40°C to +85°C
Cable Type	\varnothing 1.13mm
Cable Length*	60 mm 120 mm 180 mm

External

Connector Mount

Model	Overview	Electrical Data	Mechanical Data																
<p>TWX-100ARS3B</p> 	<p>Outdoor WLAN/ WiFi Triband Tilt/ Swivel Dipole Whip</p> <p>Applications WiFi 7, WiFi 6E, WiFi 6, WiFi 5, WiFi 4, U-NII, 802.11, 802.15.4</p>	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>2400-2500</td> <td>1.6</td> <td>2.6</td> <td>71</td> </tr> <tr> <td>5150-5850</td> <td>1.5</td> <td>4.3</td> <td>57</td> </tr> <tr> <td>5925-7125</td> <td>3.0</td> <td>4.6</td> <td>58</td> </tr> </tbody> </table> <p>Polarization: Linear Wavelength: $\frac{1}{2}\lambda$ Electrical Type: Dipole Radiation Pattern: Omni directional Impedance (Ohms): 50</p>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	2400-2500	1.6	2.6	71	5150-5850	1.5	4.3	57	5925-7125	3.0	4.6	58	<p>Mounting Type: Connector Mount Termination: RP-SMA Plug Dimensions: 124xϕ13 mm Op. Temp.: -30°C to +70°C IP Rating: IP67</p>
Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)																
2400-2500	1.6	2.6	71																
5150-5850	1.5	4.3	57																
5925-7125	3.0	4.6	58																
<p>TWX-180ARS3B</p> 	<p>Outdoor WLAN/ WiFi Triband Tilt/ Swivel Dipole Whip</p> <p>Applications WiFi 7, WiFi 6E, WiFi 6, WiFi 5, WiFi 4, U-NII, 802.11, 802.15.4</p>	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>2400-2500</td> <td>1.9</td> <td>3.7</td> <td>53</td> </tr> <tr> <td>5150-5850</td> <td>1.6</td> <td>5.5</td> <td>69</td> </tr> <tr> <td>5925-7125</td> <td>2.0</td> <td>4.9</td> <td>66</td> </tr> </tbody> </table> <p>Polarization: Linear Wavelength: $\frac{1}{2}\lambda$ Electrical Type: Dipole Radiation Pattern: Omni directional Impedance (Ohms): 50</p>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	2400-2500	1.9	3.7	53	5150-5850	1.6	5.5	69	5925-7125	2.0	4.9	66	<p>Mounting Type: Connector Mount Termination: RP-SMA Plug Dimensions: 203xϕ13 mm Op. Temp.: -30°C to +70°C IP Rating: IP67</p>
Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)																
2400-2500	1.9	3.7	53																
5150-5850	1.6	5.5	69																
5925-7125	2.0	4.9	66																
<p>TWX-100BRS3B</p> 	<p>WLAN/WiFi Trib- and Tilt/Swivel Dipole Whip</p> <p>Applications WiFi 7, WiFi 6E, WiFi 6, WiFi 5, WiFi 4, U-NII, 802.11, 802.15.4</p>	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>2400-2500</td> <td>1.6</td> <td>2.6</td> <td>71</td> </tr> <tr> <td>5150-5850</td> <td>1.5</td> <td>4.3</td> <td>57</td> </tr> <tr> <td>5925-7125</td> <td>3.0</td> <td>4.4</td> <td>58</td> </tr> </tbody> </table> <p>Polarization: Linear Wavelength: $\frac{1}{2}\lambda$ Electrical Type: Dipole Radiation Pattern: Omni directional Impedance (Ohms): 50</p>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	2400-2500	1.6	2.6	71	5150-5850	1.5	4.3	57	5925-7125	3.0	4.4	58	<p>Mounting Type: Connector Mount Termination: RP-SMA Plug Dimensions: 124xϕ13 mm Op. Temp.: -30°C to +70°C</p>
Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)																
2400-2500	1.6	2.6	71																
5150-5850	1.5	4.3	57																
5925-7125	3.0	4.4	58																
<p>TWX-180BRS3B</p> 	<p>WLAN/WiFi Trib- and Tilt/Swivel Dipole Whip</p> <p>Applications WiFi 7, WiFi 6E, WiFi 6, WiFi 5, WiFi 4, U-NII, 802.11, 802.15.4</p>	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>2400-2500</td> <td>1.9</td> <td>3.7</td> <td>53</td> </tr> <tr> <td>5150-5850</td> <td>1.6</td> <td>5.5</td> <td>69</td> </tr> <tr> <td>5925-7125</td> <td>2.0</td> <td>4.9</td> <td>66</td> </tr> </tbody> </table> <p>Polarization: Linear Wavelength: $\frac{1}{2}\lambda$ Electrical Type: Dipole Radiation Pattern: Omni directional Impedance (Ohms): 50</p>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	2400-2500	1.9	3.7	53	5150-5850	1.6	5.5	69	5925-7125	2.0	4.9	66	<p>Mounting Type: Connector Mount Termination: RP-SMA Plug Dimensions: 203xϕ13 mm Op. Temp.: -30°C to +70°C</p>
Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)																
2400-2500	1.9	3.7	53																
5150-5850	1.6	5.5	69																
5925-7125	2.0	4.9	66																

WiFi / WLAN

External

Connector Mount

TMX-221ARS3B

New



Overview

WLAN/WiFi Trib- and Right-Angle Monopole Whip

Applications

WiFi 7, WiFi 6E, WiFi 6, WiFi 5, WiFi 4, U-NII, 802.11, 802.15.4

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)
2400-2500	1.5	1.1	49
5150-5850	2.5	3.0	62
5925-7125	3.0	3.5	61

Polarization	Linear
Wavelength	$\frac{1}{4}\lambda$
Electrical Type	Monopole
Radiation Pattern	Omni directional
Impedance (Ohms)	50

Mechanical Data

Mounting Type	Connector Mount
Termination	RP-SMA Plug
Dimensions	47xø8 mm
Op. Temp.	-30°C to +70°C

TWX-144XRS3B



Overview

WLAN/WiFi Trib- and Tilt/Swivel Dipole Whip

Applications

WiFi 7, WiFi 6E, WiFi 6, WiFi 5, WiFi 4, U-NII, 802.11, 802.15.4

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)
2400-2500	1.3	2.5	70
5150-5850	1.6	4.2	56
5925-7125	2.1	4.4	57

Polarization	Linear
Wavelength	$\frac{1}{2}\lambda$
Electrical Type	Dipole
Radiation Pattern	Omni directional
Impedance (Ohms)	50

Mechanical Data

Mounting Type	Connector Mount
Termination	RP-SMA Plug
Dimensions	138xø13 mm
Op. Temp.	-30°C to +70°C

TWX-1511RS1B



Overview

WLAN/WiFi Trib- and Tilt/Swivel Dipole Whip

Applications

WiFi 6, WiFi 5, WiFi 4, U-NII, 802.11, 802.15.4

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)
2400-2500	1.8	3.6	55
5150-5850	2.0	5.0	70

Polarization	Linear
Wavelength	$\frac{1}{2}\lambda$
Electrical Type	Dipole
Radiation Pattern	Omni directional
Impedance (Ohms)	50

Mechanical Data

Mounting Type	Connector Mount
Termination	RP-SMA Plug
Dimensions	196xø13 mm
Op. Temp.	-30°C to +70°C

THX-150XNX2B

New



Overview

WLAN/WiFi dual-band Straight Dipole Blade

Applications

WiFi 6, WiFi 5, WiFi 4, U-NII, 802.11, 802.15.4

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)
2400-2500	2.0	4.0	70
5150-5850	2.0	5.5	77


Polarization	Linear
Wavelength	$\frac{1}{2}\lambda$
Electrical Type	Dipole
Radiation Pattern	Omni directional
Impedance (Ohms)	50


Mechanical Data

Mounting Type	Connector Mount
Termination	RP-SMA Plug
Dimensions	180xø21 mm
Op. Temp.	-40°C to +85°C
IP Rating	IP67

External

Panel Mount

<u>TWF-144XMP3B-*</u>	Overview	Electrical Data				Mechanical Data	
	WLAN/WiFi Trib-band Tilt/Swivel Dipole Whip Flying Lead	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	Mounting Type	Panel Mount
		2400-2500	1.8	2.0	52	Termination	MHF1 Plug
		5150-5850	2.0	3.8	70	Dimensions	131xø13 mm
		5925-7125	2.5	3.8	72	Op. Temp.	-30°C to +70 °C
Applications	WiFi 7, WiFi 6E, WiFi 6, WiFi 5, WiFi 4, U-NII, 802.11, 802.15.4			Polarization	Linear	Cable Type	ø1.37mm
				Wavelength	½-λ	Cable Length*	150mm
				Electrical Type	Dipole		
				Radiation Pattern	Omni directional		
				Impedance (Ohms)	50		

<u>TWF-1511MP1B-*</u>	Overview	Electrical Data				Mechanical Data	
	WLAN/WiFi Dual-band Tilt/Swivel Dipole Whip Flying Lead	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	Mounting Type	Panel Mount
		2400-2500	1.8	3.6	55	Termination	MHF1 Plug
		5150-5850	2.0	5.0	70	Dimensions	191xø13 mm
						Op. Temp.	-30°C to +70 °C
Applications	WiFi 6, WiFi 5, WiFi 4, U-NII, 802.11, 802.15.4			Polarization	Linear	Cable Type	ø1.37mm
				Wavelength	½-λ	Cable Length*	150mm
				Electrical Type	Dipole		
				Radiation Pattern	Omni directional		
				Impedance (Ohms)	50		

WiFi / WLAN

External

Connector Mount

TWX-282BRS3B



Overview

WLAN/WiFi Tri-band Tilt/Swivel Dipole Whip

Applications

WiFi 7, WiFi 6E, WiFi 6, WiFi 5, WiFi 4, U-NII, 802.11, 802.15.4

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)
2400-2500	1.4	2.0	67
5150-5850	1.5	3.0	73
5925-7125	2.7	3.3	70

Polarization	Linear
Wavelength	$\frac{1}{2}\lambda$
Electrical Type	Dipole
Radiation Pattern	Omni directional
Impedance (Ohms)	50

Mechanical Data

Mounting Type	Connector Mount
Termination	RP-SMA Plug
Dimensions	86x \varnothing 10 mm
Op. Temp.	-30°C to +70°C

TWX-241BRS3B



Overview

WLAN/WiFi Tri-band Tilt/Swivel Dipole Whip

Applications

WiFi 7, WiFi 6E, WiFi 6, WiFi 5, WiFi 4, U-NII, 802.11, 802.15.4

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)
2400-2500	1.3	2.1	65
5150-5850	1.4	3.1	69
5925-7125	2.1	3.3	72

Polarization	Linear
Wavelength	$\frac{1}{2}\lambda$
Electrical Type	Dipole
Radiation Pattern	Omni directional
Impedance (Ohms)	50

Mechanical Data

Mounting Type	Connector Mount
Termination	RP-SMA Plug
Dimensions	108x \varnothing 10 mm
Op. Temp.	-30°C to +70°C

External

Panel Mount

TWF-282BMP3B-*



Overview

WLAN/WiFi Tri-band Tilt/Swivel Dipole Whip, Flying Lead

Applications

WiFi 7, WiFi 6E, WiFi 6, WiFi 5, WiFi 4, U-NII, 802.11, 802.15.4

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)
2400-2500	1.4	2.0	67
5150-5850	1.5	3.0	73
5925-7125	2.7	3.3	70

Polarization	Linear
Wavelength	$\frac{1}{2}\lambda$
Electrical Type	Dipole
Radiation Pattern	Omni directional
Impedance (Ohms)	50

Mechanical Data

Mounting Type	Panel Mount
Termination	MHF1 Plug
Dimensions	82x \varnothing 10 mm
Op. Temp.	-30°C to +70°C
Cable Type	\varnothing 1.37mm
Cable Length*	150mm

TWF-241BMP3B-*



Overview

WLAN/WiFi Tri-band Tilt/Swivel Dipole Whip, Flying Lead

Applications

WiFi 7, WiFi 6E, WiFi 6, WiFi 5, WiFi 4, U-NII, 802.11, 802.15.4

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)
2400-2500	1.3	2.1	65
5150-5850	1.4	3.1	69
5925-7125	2.1	3.3	72

Polarization	Linear
Wavelength	$\frac{1}{2}\lambda$
Electrical Type	Dipole
Radiation Pattern	Omni directional
Impedance (Ohms)	50

Mechanical Data

Mounting Type	Panel Mount
Termination	MHF1 Plug
Dimensions	105x \varnothing 10 mm
Op. Temp.	-30°C to +70°C
Cable Type	\varnothing 1.37mm
Cable Length*	150mm

WiFi / WLAN

External

Connector Mount

TGX-1023NF3W



Overview

Outdoor WLAN/
WiFi tri-band Fi-
berglass Dipole
Baton/Stick

Applications

WiFi 7, WiFi 6E,
WiFi 6, WiFi 5,
WiFi 4, U-NII,
802.11, 802.15.4

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)
2400-2500	2.0	3.0	66
5150-5850	2.0	4.2	69
5925-7125	2.0	3.2	70

Polarization	Linear
Wavelength	$\frac{1}{2}\lambda$
Electrical Type	Dipole
Radiation Pattern	Omni directional
Impedance (Ohms)	50

Mechanical Data

Mounting Type	Connector Mount
Termination*	N-Type Jack N-Type Plug
Dimensions	145 \times 25 mm
Op. Temp.	-40°C to +85 °C
IP Rating	IP67

TGX-1123NX3W

New



Overview

Outdoor WLAN/
WiFi Tri-band
Fiberglass Dipole
Baton/Stick

Applications

WiFi 7, WiFi 6E,
WiFi 6, WiFi 5,
WiFi 4, U-NII,
802.11, 802.15.4

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)
2400-2500	2.0	2.8	63
5150-5850	2.0	3.2	65
5925-7125	2.0	3.1	70

Polarization	Linear
Wavelength	$\frac{1}{2}\lambda$
Electrical Type	Dipole
Radiation Pattern	Omni directional
Impedance (Ohms)	50

Mechanical Data

Mounting Type	Connector Mount
Termination	N-Type Plug
Dimensions	152 \times 24 mm
Op. Temp.	-40°C to +85 °C
IP Rating	IP67

TGX-102XNF1W



Overview

Outdoor WLAN/
WiFi Dual-band
Fiberglass Dipole
Baton/Stick

Applications

WiFi 6, WiFi 5,
WiFi 4, U-NII,
802.11, 802.15.4

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)
2400-2500	2.3	6.5	69
5150-5850	2.8	5.2	73

Polarization	Linear
Wavelength	$\frac{1}{2}\lambda$
Electrical Type	Dipole
Radiation Pattern	Omni directional
Impedance (Ohms)	50

Mechanical Data

Mounting Type	Connector Mount
Termination	N-Type Jack
Dimensions	421 \times 22 mm
Op. Temp.	-30°C to +70 °C
IP Rating	IP65

TGX-103XNF1W



Overview

Outdoor WLAN/
WiFi Dual-band
Fiberglass Dipole
Baton/Stick

Applications

WiFi 6, WiFi 5,
WiFi 4, U-NII,
802.11, 802.15.4

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)
2400-2500	2.5	7.0	68
5150-5850	3.0	9.0	75

Polarization	Linear
Wavelength	$\frac{1}{2}\lambda$
Electrical Type	Dipole
Radiation Pattern	Omni directional
Impedance (Ohms)	50

Mechanical Data

Mounting Type	Connector Mount
Termination	N-Type Jack
Dimensions	621 \times 22 mm
Op. Temp.	-30°C to +70 °C
IP Rating	IP65

External

Connector Mount

<u>TWX-711BRS3B</u>	Overview	Electrical Data	Mechanical Data																								
	WLAN/WiFi Triband Tilt/Swivel Dipole Blade	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>2400-2500</td> <td>2.0</td> <td>3.0</td> <td>56</td> </tr> <tr> <td>5150-5850</td> <td>2.0</td> <td>4.0</td> <td>77</td> </tr> <tr> <td>5925-7125</td> <td>2.8</td> <td>4.0</td> <td>73</td> </tr> </tbody> </table>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	2400-2500	2.0	3.0	56	5150-5850	2.0	4.0	77	5925-7125	2.8	4.0	73	<table border="1"> <thead> <tr> <th>Mounting Type</th> <th>Connector</th> </tr> </thead> <tbody> <tr> <td>Termination</td> <td>RP-SMA Plug</td> </tr> <tr> <td>Dimensions</td> <td>136x24x11 mm</td> </tr> <tr> <td>Op. Temp.</td> <td>-30°C to +70°C</td> </tr> </tbody> </table>	Mounting Type	Connector	Termination	RP-SMA Plug	Dimensions	136x24x11 mm	Op. Temp.	-30°C to +70°C
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Mounting Type	Connector																										
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	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)																							
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	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)																							
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		Dipole	Omni directional																								

WiFi / WLAN

External

Panel Mount

TWF-6141MP1B-*



Overview

WLAN/WiFi Dual-band Tilt/Swivel Dipole Blade, Flying Lead

Applications

WiFi 6, WiFi 5, WiFi 4, U-NII, 802.11, 802.15.4

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)
2400-2500	2.0	3.0	66
5150-5850	2.0	4.2	69

Polarization	Linear
Wavelength	$\frac{1}{2}\lambda$
Electrical Type	Dipole
Radiation Pattern	Omni directional
Impedance (Ohms)	50

Mechanical Data

Mounting Type	Panel Mount
Termination	MHF1 Plug
Dimensions	153x25x13 mm
Op. Temp.	-30°C to +70 °C
Cable Type	∅1.37mm
Cable Length*	150mm

External

Panel Mount

THX-3802NF1B



Overview

WLAN/WiFi Dual-band Dipole Dome/Saltshaker

Applications

WiFi 6, WiFi 5, WiFi 4, U-NII, 802.11, 802.15.4

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)
2400-2500	2.2	2.4	48
5150-5850	2.8	2.6	63

Polarization	Linear
Wavelength	$\frac{1}{2}\lambda$
Electrical Type	Dipole
Radiation Pattern	Omni directional
Impedance (Ohms)	50

Mechanical Data

Mounting Type	Panel Mount
Termination	N-Type Jack
Dimensions	77.7x \varnothing 38 mm
Op. Temp.	-40°C to +85 °C
IP Rating	IP67

THX-3602NF1B



Overview

WLAN/WiFi Tri-band Dipole Dome/Saltshaker

Applications

WiFi 7, WiFi 6E, WiFi 6, WiFi 5, WiFi 4, U-NII, 802.11, 802.15.4

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)
2400-2500	2.0	2.0	45
5150-5850	2.0	2.0	60
5925-7125	3.0	2.0	63

Polarization	Linear
Wavelength	$\frac{1}{2}\lambda$
Electrical Type	Dipole
Radiation Pattern	Omni directional
Impedance (Ohms)	50

Mechanical Data

Mounting Type	Panel Mount
Termination	N-Type Jack
Dimensions	71x \varnothing 40.2 mm
Op. Temp.	-30°C to +70 °C
IP Rating	IP65

WiFi / WLAN

External

Panel Mount

THF-3802RS1B-*



Overview

WLAN/WiFi Dual-band Dipole
Dome/Saltshaker,
Flying Lead

Applications

WiFi 6, WiFi 5,
WiFi 4, U-NII,
802.11, 802.15.4

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)
2400-2500	2.2	2.4	48
5150-5850	2.8	2.6	63

Polarization	Linear
Wavelength	$\frac{1}{2}\lambda$
Electrical Type	Dipole
Radiation Pattern	Omni directional
Impedance (Ohms)	50

Mechanical Data

Mounting Type	Panel Mount
Termination	RP-SMA Plug
Dimensions	77.7x \varnothing 38 mm
Op. Temp.	-40°C to +85 °C
Cable Type	RG174
Cable Length*	1000 mm 2000 mm
IP Rating	IP67

THF-3602RS3B-*



Overview

WLAN/WiFi Tri-band Dipole
Dome/Saltshaker,
Flying Lead

Applications

WiFi 7, WiFi 6E,
WiFi 6, WiFi 5,
WiFi 4, U-NII,
802.11, 802.15.4

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)
2400-2500	2.0	2.0	45
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Polarization	Linear
Wavelength	$\frac{1}{2}\lambda$
Electrical Type	Dipole
Radiation Pattern	Omni directional
Impedance (Ohms)	50

Mechanical Data

Mounting Type	Panel Mount
Termination	RP-SMA Plug
Dimensions	71x \varnothing 40.2 mm
Op. Temp.	-30°C to +70 °C
Cable Type	RG174
Cable Length*	1000 mm 2000 mm
IP Rating	IP65

2.4 GHz ISM

External

Connector Mount

<u>IWX-180ARSXB</u>	Overview	Electrical Data	Mechanical Data																		
	2.4 GHz Tilt/Swivel Dipole Whip	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>2400-2500</td> <td>1.9</td> <td>4.5</td> <td>77</td> </tr> </tbody> </table>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	2400-2500	1.9	4.5	77	<table border="1"> <thead> <tr> <th>Mounting Type</th> <th>Connector</th> </tr> </thead> <tbody> <tr> <td>Termination</td> <td>RP-SMA Plug</td> </tr> <tr> <td>Dimensions</td> <td>203xø13 mm</td> </tr> <tr> <td>Op. Temp.</td> <td>-30°C to +70 °C</td> </tr> <tr> <td>IP Rating</td> <td>IP67</td> </tr> </tbody> </table>	Mounting Type	Connector	Termination	RP-SMA Plug	Dimensions	203xø13 mm	Op. Temp.	-30°C to +70 °C	IP Rating	IP67
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IP Rating	IP67																				
Applications Bluetooth, Zigbee, Thread, 802.11b/g, 802.15.4	Polarization Wavelength Electrical Type Radiation Pattern Impedance (Ohms)	Linear $\frac{1}{2}\lambda$ Dipole Omni directional 50																			
<u>IWX-100ARSXB</u>	Overview	Electrical Data	Mechanical Data																		
	Outdoor 2.4 GHz Tilt/Swivel Dipole Whip	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>2400-2500</td> <td>1.8</td> <td>2.1</td> <td>77</td> </tr> </tbody> </table>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	2400-2500	1.8	2.1	77	<table border="1"> <thead> <tr> <th>Mounting Type</th> <th>Connector</th> </tr> </thead> <tbody> <tr> <td>Termination</td> <td>RP-SMA Plug</td> </tr> <tr> <td>Dimensions</td> <td>124xø13 mm</td> </tr> <tr> <td>Op. Temp.</td> <td>-30°C to +70°C</td> </tr> <tr> <td>IP Rating</td> <td>IP67</td> </tr> </tbody> </table>	Mounting Type	Connector	Termination	RP-SMA Plug	Dimensions	124xø13 mm	Op. Temp.	-30°C to +70°C	IP Rating	IP67
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Applications Bluetooth, Zigbee, Thread, 802.11b/g, 802.15.4	Polarization Wavelength Electrical Type Radiation Pattern Impedance (Ohms)	Linear $\frac{1}{2}\lambda$ Dipole Omni directional 50																			
<u>IWX-180BRSXB</u>	Overview	Electrical Data	Mechanical Data																		
	2.4 GHz Tilt/Swivel Dipole Whip	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>2400-2500</td> <td>1.9</td> <td>4.5</td> <td>77</td> </tr> </tbody> </table>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	2400-2500	1.9	4.5	77	<table border="1"> <thead> <tr> <th>Mounting Type</th> <th>Connector</th> </tr> </thead> <tbody> <tr> <td>Termination</td> <td>RP-SMA Plug</td> </tr> <tr> <td>Dimensions</td> <td>203xø13 mm</td> </tr> <tr> <td>Op. Temp.</td> <td>-30°C to +70 °C</td> </tr> </tbody> </table>	Mounting Type	Connector	Termination	RP-SMA Plug	Dimensions	203xø13 mm	Op. Temp.	-30°C to +70 °C		
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<u>IWX-100BRSXB</u>	Overview	Electrical Data	Mechanical Data																		
	Outdoor 2.4 GHz Tilt/Swivel Dipole Whip	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>2400-2500</td> <td>1.8</td> <td>2.1</td> <td>77</td> </tr> </tbody> </table>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	2400-2500	1.8	2.1	77	<table border="1"> <thead> <tr> <th>Mounting Type</th> <th>Connector</th> </tr> </thead> <tbody> <tr> <td>Termination</td> <td>RP-SMA Plug</td> </tr> <tr> <td>Dimensions</td> <td>124xø13 mm</td> </tr> <tr> <td>Op. Temp.</td> <td>-30°C to +70°C</td> </tr> </tbody> </table>	Mounting Type	Connector	Termination	RP-SMA Plug	Dimensions	124xø13 mm	Op. Temp.	-30°C to +70°C		
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Applications Bluetooth, Zigbee, Thread, 802.11b/g, 802.15.4	Polarization Wavelength Electrical Type Radiation Pattern Impedance (Ohms)	Linear $\frac{1}{2}\lambda$ Dipole Omni directional 50																			

2.4 GHz ISM

External

Connector Mount

IWX-241BRSXB



Overview

2.4 GHz Tilt/Swivel
Dipole Whip

Applications

Bluetooth, Zigbee,
Thread, 802.11b/
g, 802.15.4

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)
2400-2500	1.5	2.5	67

Polarization	Linear
Wavelength	$\frac{1}{2}\lambda$
Electrical Type	Dipole
Radiation Pattern	Omni directional
Impedance (Ohms)	50

Mechanical Data

Mounting Type	Connector Mount
Termination	RP-SMA Plug
Dimensions	108x \varnothing 10 mm
Op. Temp.	-30°C to +70°C

IWX-282BRSXB



Overview

2.4 GHz Tilt/Swivel
Dipole Whip

Applications

Bluetooth, Zigbee,
Thread, 802.11b/
g, 802.15.4

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)
2400-2500	1.6	2.4	72

Polarization	Linear
Wavelength	$\frac{1}{2}\lambda$
Electrical Type	Dipole
Radiation Pattern	Omni directional
Impedance (Ohms)	50

Mechanical Data

Mounting Type	Connector Mount
Termination	RP-SMA Plug
Dimensions	86x \varnothing 10 mm
Op. Temp.	-30°C to +70°C

IWX-1511RSXB



Overview

2.4 GHz Tilt/Swivel
Dipole Whip

Applications

Bluetooth, Zigbee,
Thread, 802.11b/
g, 802.15.4

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)
2400-2500	2.0	5.0	72

Polarization	Linear
Wavelength	$\frac{1}{2}\lambda$
Electrical Type	Dipole
Radiation Pattern	Omni directional
Impedance (Ohms)	50

Mechanical Data

Mounting Type	Connector Mount
Termination	RP-SMA Plug
Dimensions	196x \varnothing 13 mm
Op. Temp.	-30°C to +70°C

2.4 GHz ISM

External

Panel Mount

<u>IWF-241BMPXB-*</u>	Overview	Electrical Data				Mechanical Data	
	2.4 GHz Tilt/Swivel Dipole Whip, Flying Lead	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	Mounting Type	Panel Mount
		2400-2500	1.5	2.5	67	Termination	MHF1 Plug
						Dimensions	105xø10 mm
	Applications Bluetooth, Zigbee, Thread, 802.11b/g, 802.15.4					Op. Temp.	-30°C to +70 °C
						Cable Type	ø1.37mm
						Cable Length*	150mm
		Polarization		Linear			
		Wavelength		½-λ			
		Electrical Type		Dipole			
		Radiation Pattern		Omni directional			
		Impedance (Ohms)		50			
<u>IWF-282BMPXB-*</u>	Overview	Electrical Data				Mechanical Data	
	2.4 GHz Tilt/Swivel Dipole Whip, Flying Lead	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	Mounting Type	Panel Mount
		2400-2500	1.6	2.4	72	Termination	MHF1 Plug
						Dimensions	82xø10 mm
	Applications Bluetooth, Zigbee, Thread, 802.11b/g, 802.15.4					Op. Temp.	-30°C to +70°C
						Cable Type	ø1.37mm
						Cable Length*	150mm
		Polarization		Linear			
		Wavelength		½-λ			
		Electrical Type		Dipole			
		Radiation Pattern		Omni directional			
		Impedance (Ohms)		50			
<u>IHF-2120MPXB-*</u>	Overview	Electrical Data				Mechanical Data	
	2.4 GHz Straight Monopole Dome, Flying Lead	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	Mounting Type	Panel Mount
		2400-2500	1.2	2.7	63	Termination	MHF1 Plug
						Dimensions	14xø9 mm
	Applications Bluetooth, Zigbee, Thread, 802.11b/g, 802.15.4					Op. Temp.	-30°C to +70 °C
						Cable Type	ø1.13mm
						Cable Length*	100 mm 150 mm
		Polarization		Linear			
		Wavelength		¼-λ			
		Electrical Type		Monopole			
		Radiation Pattern		Omni directional			
		Impedance (Ohms)		50			

2.4 GHz ISM

External

Connector Mount

IGX-1023NFXW



Overview

Outdoor 2.4 GHz
Fiberglass Dipole
Baton/Stick

Applications

Bluetooth, Zigbee,
Thread, 802.11b/
g, 802.15.4

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)
2400-2500	2.0	3.5	75
Polarization		Linear	
Wavelength		$\frac{1}{2}\lambda$	
Electrical Type		Dipole	
Radiation Pattern		Omni directional	
Impedance (Ohms)		50	

Mechanical Data

Mounting Type	Connector Mount
Termination*	N-Type Jack N-Type Plug
Dimensions	145x \varnothing 25 mm
Op. Temp.	-40°C to +85°C
IP Rating	IP67

IGX-1123NXXW

New



Overview

Outdoor 2.4 GHz
Fiberglass Dipole
Baton/Stick

Applications

Bluetooth, Zigbee,
Thread, 802.11b/
g, 802.15.4

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)
2400-2500	2.0	3.5	76
Polarization		Linear	
Wavelength		$\frac{1}{2}\lambda$	
Electrical Type		Dipole	
Radiation Pattern		Omni directional	
Impedance (Ohms)		50	

Mechanical Data

Mounting Type	Connector Mount
Termination	N-Type Plug
Dimensions	152x \varnothing 24 mm
Op. Temp.	-40°C to +85°C
IP Rating	IP67

GNSS Antennas

Joymax offers internal and external Global Navigation Satellite System (GNSS) antennas for systems including:

- GPS (L1 band central frequency at: 1575.42MHz)
- Galileo (E1 band central frequency at: 1575.42MHz)
- Glonass (G1 band central frequency at: 1602MHz)
- BeiDou/ COMPASS (B1 band central frequency: 1561MHz)

Remote

Magnetic Mount

PPF-GP07SAXB-*



Overview

L1, E1, G1 Patch Puck with integrated 2-stage LNA, Flying Lead

Applications

GNSS, Navigation, Location, Timing, GZSS

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Noise Figure (dB)
1561	1.8	29.6	0.9
1575.42	2.0	29.3	0.9
1602	1.7	29.2	0.9

Polarization	RHCP
Wavelength	$\frac{1}{2}\lambda$
Electrical Type	Radiating Patch + LNA
Radiation Pattern	Directional
Impedance (Ohms)	50

Mechanical Data

Mounting Type	Magnetic Mount
Termination	SMA Plug
Dimensions	49x38x17 mm
Op. Temp.	-30°C to +70 °C
Cable Type	RG-174
Cable Length*	3000 mm
IP Rating	IP65

PWX-711BSAXB

New



Overview

L1, E1, G1, B1 Tilt/Swivel Dipole Blade

Applications

GNSS, Navigation, Location, Timing, GZSS

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)
1561	1.3	1.1	67
1575.42	1.2	1.5	71
1602	1.2	1.6	68

Polarization	Linear
Wavelength	$\frac{1}{2}\lambda$
Electrical Type	Dipole
Radiation Pattern	Omni directional
Impedance (Ohms)	50

Mechanical Data

Mounting Type	Connector Mount
Termination	SMA Plug
Dimensions	136x24x11 mm
Op. Temp.	-40°C to +85 °C

External

Panel Mount

PPX-6030NFXB



Overview

L1, E1, G1 Patch Dome with integrated 2-stage LNA

Applications

GNSS, Navigation, Location, Timing, GZSS

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Noise Figure (dB)
1561	1.2	28.2	1.2
1575.42	2.0	28.8	1.2
1602	1.9	26.8	1.3

Polarization	RHCP
Wavelength	$\frac{1}{2}\lambda$
Electrical Type	Radiating Patch
Radiation Pattern	Directional
Impedance (Ohms)	50

Mechanical Data

Mounting Type	Panel Mount
Termination	N-Type Jack
Dimensions	30xø60 mm
Op. Temp.	-30°C to +70 °C
IP Rating	IP65

PPF-6030SAXB-*



Overview

L1, E1, G1 Patch Dome with integrated 2-stage LNA, Flying Lead

Applications

GNSS, Navigation, Location, Timing, GZSS

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Noise Figure (dB)
1561	1.2	28.2	1.2
1575.42	2.0	28.8	1.2
1602	1.9	26.8	1.3

Polarization	RHCP
Wavelength	$\frac{1}{2}\lambda$
Electrical Type	Radiating Patch
Radiation Pattern	Directional
Impedance (Ohms)	50

Mechanical Data

Mounting Type	Panel Mount
Termination	SMA Plug
Dimensions	30xø60 mm
Op. Temp.	-30°C to +70 °C
Cable Type	RG-174
Cable Length*	3000 mm
IP Rating	IP65


Combo (MIMO) Antennas


Joymax offers external Multi Input and Multi Output (MIMO) combo all-in-1 antennas for fleet management, public transportation, industrial and other applications combining:

- LTE / Cellular 5G, 4G, 3G, 2G
- WiFi
- GNSS
- 2.4 GHz
- UHF / VHF
- ISM / LPWA

External

Panel Mount

<u>PPF-168A5SNB-*</u>	Overview	Electrical Data				Mechanical Data	
	Outdoor MIMO 5x5 Dome 5G/LTE x2, WiFi x2, GNSS x1	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	Mounting Type	Panel Mount
	Applications Fleet Management, Public Transportation, Industrial	617-960	2.5	3.8	66	Termination	SMA Plug
		1710-2690	2.0	4.0	69	Dimensions	85xø142 mm
		3300-4200	2.0	4.7	62	Op. Temp.	-40°C to +85 °C
		4400-5000	2.2	4.6	68	Cable Type	RG174/RG58
		5150-5925	2.1	5.5	73	Cable Length*	2000 mm
	1575.42	2.3	30.0		Cable Length*	3000 mm	
	Polarization	Linear/RHCP			IP Rating	IP67	
	Wavelength	¼-λ					
	Electrical Type	Monopole					
Radiation Pattern	Omni directional						
Impedance (Ohms)	50						

<u>PPF-165A5SNB</u>	Overview	Electrical Data				Mechanical Data	
	Outdoor MIMO 5x5 Dome 5G/LTE x2, WiFi x2, GNSS x1	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	Mounting Type	Panel Mount
	Applications Fleet Management, Public Transportation, Industrial	617-960	2.3	4.0	65	Termination	SMA Plug
		1710-2690	2.2	4.2	72	Dimensions	50xø150 mm
		3300-4200	2.5	4.8	65	Op. Temp.	-40°C to +85°C
		4400-5000	2.0	4.6	67	Cable Type	RG174/RG58
		5150-5925	2.1	5.3	70	Cable Length*	2000 mm
	1575.42	2.3	30.0		Cable Length*	3000 mm	
	Polarization	Linear/RHCP			IP Rating	IP67	
	Wavelength	¼-λ					
	Electrical Type	Monopole					
Radiation Pattern	Omni directional						
Impedance (Ohms)	50						

Combo / MIMO

External

Panel Mount

PPF-1003SAXW-*



Overview

MIMO 5x5 Dome
4G/LTE x2, WiFi x2,
GNSS x1

Applications

Fleet Management, Public
Transportation,
Industrial

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)
698-960	2.8	3.5	42
1710-2690	2.5	4.0	68
2400-2500	2.8	3.4	64
5150-5850	2.5	5.7	61
1575.42	2.0	30.0	

Polarization	Linear
Wavelength	$\frac{1}{2}\lambda$
Electrical Type	Dipole
Radiation Pattern	Omni directional
Impedance (Ohms)	50

Mechanical Data

Mounting Type	Panel Mount
Termination	SMA Plug
Dimensions	75x \varnothing 107 mm
Op. Temp.	-30°C to +70 °C
Cable Type	RG174/RG58
Cable Length*	2000 mm 3000 mm
IP Rating	IP65

TDF-1204RS1W-*



Overview

MIMO 4x4 Dome
WiFi x 4 Ceiling
Mount DAS

Applications

WiFi 6, WiFi 5,
WiFi 4, U-NII,
802.11, 802.15.4

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)
2400-2500	2.5	2.5	65
5150-5850	2.5	4.3	72

Polarization	Linear
Wavelength	$\frac{1}{4}\lambda$
Electrical Type	Monopole
Radiation Pattern	Directional
Impedance (Ohms)	50

Mechanical Data

Mounting Type	Panel Mount
Termination	SMA Plug
Dimensions	45x \varnothing 130 mm
Op. Temp.	-30°C to +70 °C
Cable Type	RG174
Cable Length*	2000 mm 3000 mm

Other Antennas

Joymax offers a number of internal and external antennas for uses including Land Mobile Radio (VHF/UHF), Medical applications, unlicensed applications and remote control applications including:

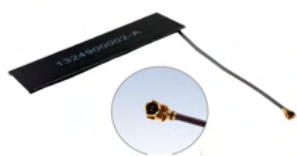
- 13.56MHz (NFC)
- 169MHz
- 315MHz
- 430MHz
- 1.4GHz
- 3~10GHz (UWB)

Internal

Adhesive Mount

LBF-A045MPXB-*

New



Overview

13.56 MHz Loop
Rigid PCB with
Ferrite Backing

Applications

NFC, RFID, Access
control, POS terminal

Electrical Data

Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)
13.56	2.0		

Polarization	Linear
Wavelength	Magnetic Field
Electrical Type	Loop
Radiation Pattern	Directional
Impedance (Ohms)	50




Mechanical Data

Mounting Type	Adhesive Mount
Termination*	U.FL-Type Plug /MHF1 Plug /MHF4 Plug
Dimensions	45x14x1 mm
Op. Temp.	-40°C to +85 °C
Cable Type	∅1.13 mm
Cable Length*	60 mm 120 mm 180 mm

Other




External

Connector Mount

	Overview	Electrical Data	Mechanical Data																										
 <p>UHX-465XSAXB</p>	<p>UHF 430 MHz Straight Monopole Whip</p> <p>Applications LMR for Public Safety</p>	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>430</td> <td>2.0</td> <td>2.0</td> <td>50</td> </tr> </tbody> </table> <table border="1"> <tbody> <tr> <td>Polarization</td> <td>Linear</td> </tr> <tr> <td>Wavelength</td> <td>$\frac{1}{4}\lambda$</td> </tr> <tr> <td>Electrical Type</td> <td>Monopole</td> </tr> <tr> <td>Radiation Pattern</td> <td>Omni directional</td> </tr> <tr> <td>Impedance (Ohms)</td> <td>50</td> </tr> </tbody> </table>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	430	2.0	2.0	50	Polarization	Linear	Wavelength	$\frac{1}{4}\lambda$	Electrical Type	Monopole	Radiation Pattern	Omni directional	Impedance (Ohms)	50	<table border="1"> <tbody> <tr> <td>Mounting Type</td> <td>Connector Mount</td> </tr> <tr> <td>Termination</td> <td>SMA Plug</td> </tr> <tr> <td>Dimensions</td> <td>193x\varnothing14 mm</td> </tr> <tr> <td>Op. Temp.</td> <td>-30°C to +70 °C</td> </tr> </tbody> </table>	Mounting Type	Connector Mount	Termination	SMA Plug	Dimensions	193x \varnothing 14 mm	Op. Temp.	-30°C to +70 °C
	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)																									
430	2.0	2.0	50																										
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Op. Temp.	-30°C to +70 °C																												
 <p>UHX-462CSAXB</p>	<p>UHF 400-420MHz Straight Monopole Whip</p> <p>Applications LMR for Public Safety</p>	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>400-420</td> <td>2.0</td> <td>2.0</td> <td>60</td> </tr> </tbody> </table> <table border="1"> <tbody> <tr> <td>Polarization</td> <td>Linear</td> </tr> <tr> <td>Wavelength</td> <td>$\frac{1}{4}\lambda$</td> </tr> <tr> <td>Electrical Type</td> <td>Monopole</td> </tr> <tr> <td>Radiation Pattern</td> <td>Omni directional</td> </tr> <tr> <td>Impedance (Ohms)</td> <td>50</td> </tr> </tbody> </table>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	400-420	2.0	2.0	60	Polarization	Linear	Wavelength	$\frac{1}{4}\lambda$	Electrical Type	Monopole	Radiation Pattern	Omni directional	Impedance (Ohms)	50	<table border="1"> <tbody> <tr> <td>Mounting Type</td> <td>Connector Mount</td> </tr> <tr> <td>Termination</td> <td>SMA Plug</td> </tr> <tr> <td>Dimensions</td> <td>170x\varnothing14.8 mm</td> </tr> <tr> <td>Op. Temp.</td> <td>-30°C to +70 °C</td> </tr> </tbody> </table>	Mounting Type	Connector Mount	Termination	SMA Plug	Dimensions	170x \varnothing 14.8 mm	Op. Temp.	-30°C to +70 °C
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 <p>UHX-SH01SAXB</p>	<p>UHF 470-654MHz Straight Monopole Whip</p> <p>Applications LMR for Public Safety</p>	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>470-654</td> <td>2.5</td> <td>2.5</td> <td>50</td> </tr> </tbody> </table> <table border="1"> <tbody> <tr> <td>Polarization</td> <td>Linear</td> </tr> <tr> <td>Wavelength</td> <td>$\frac{1}{4}\lambda$</td> </tr> <tr> <td>Electrical Type</td> <td>Monopole</td> </tr> <tr> <td>Radiation Pattern</td> <td>Omni directional</td> </tr> <tr> <td>Impedance (Ohms)</td> <td>50</td> </tr> </tbody> </table>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	470-654	2.5	2.5	50	Polarization	Linear	Wavelength	$\frac{1}{4}\lambda$	Electrical Type	Monopole	Radiation Pattern	Omni directional	Impedance (Ohms)	50	<table border="1"> <tbody> <tr> <td>Mounting Type</td> <td>Connector Mount</td> </tr> <tr> <td>Termination</td> <td>SMA Plug</td> </tr> <tr> <td>Dimensions</td> <td>133x\varnothing10 mm</td> </tr> <tr> <td>Op. Temp.</td> <td>-30°C to +70 °C</td> </tr> </tbody> </table>	Mounting Type	Connector Mount	Termination	SMA Plug	Dimensions	133x \varnothing 10 mm	Op. Temp.	-30°C to +70 °C
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Mounting Type	Connector Mount																												
Termination	SMA Plug																												
Dimensions	133x \varnothing 10 mm																												
Op. Temp.	-30°C to +70 °C																												

Remote

Magnetic Mount

<u>UAF-121XSAXB-*</u>	Overview	Electrical Data	Mechanical Data																				
	UHF 430 MHz Straight Monopole Magnetic Mount Whip, Flying Lead	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>430</td> <td>2.0</td> <td>2.0</td> <td>60</td> </tr> </tbody> </table>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	430	2.0	2.0	60	<table border="1"> <thead> <tr> <th>Mounting Type</th> <th>Magnetic Mount</th> </tr> </thead> <tbody> <tr> <td>Termination</td> <td>SMA Plug</td> </tr> <tr> <td>Dimensions</td> <td>178xø27 mm</td> </tr> <tr> <td>Op. Temp.</td> <td>-30°C to +70°C</td> </tr> <tr> <td>Cable Type</td> <td>RG174</td> </tr> <tr> <td>Cable Length*</td> <td>1000 mm 2000 mm</td> </tr> </tbody> </table>	Mounting Type	Magnetic Mount	Termination	SMA Plug	Dimensions	178xø27 mm	Op. Temp.	-30°C to +70°C	Cable Type	RG174	Cable Length*	1000 mm 2000 mm
	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)																			
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Applications LMR for Public Safety	<table border="1"> <tbody> <tr> <td>Polarization</td> <td>Linear</td> </tr> <tr> <td>Wavelength</td> <td>¼-λ</td> </tr> <tr> <td>Electrical Type</td> <td>Monopole</td> </tr> <tr> <td>Radiation Pattern</td> <td>Omni directional</td> </tr> <tr> <td>Impedance (Ohms)</td> <td>50</td> </tr> </tbody> </table>	Polarization	Linear	Wavelength	¼-λ	Electrical Type	Monopole	Radiation Pattern	Omni directional	Impedance (Ohms)	50												
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Wavelength	¼-λ																						
Electrical Type	Monopole																						
Radiation Pattern	Omni directional																						
Impedance (Ohms)	50																						
<u>UAF-128XSAXB-*</u>	Overview	Electrical Data	Mechanical Data																				
	UHF 470-490MHz Straight Monopole Magnetic Mount Whip, Flying Lead	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>VSWR (Max)</th> <th>Peak Gain (dBi)</th> <th>Efficiency (%)</th> </tr> </thead> <tbody> <tr> <td>470-490</td> <td>2.5</td> <td>2.0</td> <td>60</td> </tr> </tbody> </table>	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)	470-490	2.5	2.0	60	<table border="1"> <thead> <tr> <th>Mounting Type</th> <th>Magnetic Mount</th> </tr> </thead> <tbody> <tr> <td>Termination</td> <td>SMA Plug</td> </tr> <tr> <td>Dimensions</td> <td>120xø27 mm</td> </tr> <tr> <td>Op. Temp.</td> <td>-30°C to +70 °C</td> </tr> <tr> <td>Cable Type</td> <td>RG174</td> </tr> <tr> <td>Cable Length*</td> <td>1000 mm 2000 mm</td> </tr> </tbody> </table>	Mounting Type	Magnetic Mount	Termination	SMA Plug	Dimensions	120xø27 mm	Op. Temp.	-30°C to +70 °C	Cable Type	RG174	Cable Length*	1000 mm 2000 mm
	Frequency (MHz)	VSWR (Max)	Peak Gain (dBi)	Efficiency (%)																			
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Cellular LTE / 5G NR Frequency Band Guide

Band #	Uplink Band (MHz)	Downlink Band (MHz)	Overall Band (MHz)	Total Bandwidth	LTE-M	LTE NB-IoT	5G NB-IoT
(n)1	1920 — 1980	2110 — 2170	1920 — 2170	250	X	X	X
(n)2	1850 — 1910	1930 — 1990	1850 — 1990	140	X	X	X
(n)3	1710 — 1785	1805 — 1880	1710 — 1880	170	X	X	X
4	1710 — 1755	2110 — 2155	1710 — 2155	445	X	X	
(n)5	824 — 849	869 — 894	824 — 894	70	X	X	X
(n)7	2500 — 2570	2620 — 2690	2500 — 2690	190	X	X	X
(n)8	880 — 915	925 — 960	880 — 960	80	X	X	X
9	1749.9 — 1784.9	1844.9 — 1879.9	1749.9 — 1879.9	130			
10	1710 — 1770	2110 — 2170	1710 — 2170	460			
11	1427.9 — 1447.9	1475.9 — 1495.9	1427.9 — 1495.9	68	X	X	
(n)12	699 — 716	729 — 746	699 — 746	47	X	X	X
(n)13	777 — 787	746 — 756	746 — 787	41	X	X	
(n)14	788 — 798	758 — 768	758 — 798	40	X	X	X
17	704 — 716	734 — 746	704 — 746	42		X	
(n)18	815 — 830	860 — 875	815 — 875	60	X	X	X
19	830 — 845	875 — 890	830 — 890	60	X	X	
(n)20	832 — 862	791 — 821	791 — 862	71	X	X	X
21	1447.9 — 1462.9	1495.9 — 1510.9	1447.9 — 1510.9	63	X	X	
22	3410 — 3490	3510 — 3590	3410 — 3590	180			
23	2000 — 2020	2180 — 2200	2000 — 2200	200			
(n)24	1626.5 — 1660.5	1525 — 1559	1525 — 1660.5	135.5			
(n)25	1850 — 1915	1930 — 1995	1850 — 1995	145	X	X	X
(n)26	814 — 849	859 — 894	814 — 894	80	X	X	
27	807 — 824	852 — 869	807 — 869	62	X		
(n)28	703 — 748	758 — 803	703 — 803	100	X	X	X
(n)29	N/A	717 — 728	717 — 728	11			
(n)30	2305 — 2315	2350 — 2360	2305 — 2360	55			
31	452.5 — 457.5	462.5 — 467.5	452.5 — 467.5	15	X	X	
32	N/A	1452 — 1496	1452 — 1496	44			
33	1900 — 1920	1900 — 1920	1900 — 1920	20			
(n)34	2010 — 2025	2010 — 2025	2010 — 2025	15			
35	1850 — 1910	1850 — 1910	1850 — 1910	60			
36	1930 — 1990	1930 — 1990	1930 — 1990	60			
37	1910 — 1930	1910 — 1930	1910 — 1930	20			
(n)38	2570 — 2620	2570 — 2620	2570 — 2620	50			
(n)39	1880 — 1920	1880 — 1920	1880 — 1920	40			
(n)40	2300 — 2400	2300 — 2400	2300 — 2400	100			
(n)41	2496 — 2690	2496 — 2690	2496 — 2690	194		X	X
42	3400 — 3600	3400 — 3600	3400 — 3600	200		X	
43	3600 — 3800	3600 — 3800	3600 — 3800	200		X	
44	703 — 803	703 — 803	703 — 803	100			
45	1447 — 1467	1447 — 1467	1447 — 1467	20			
(n)46	5150 — 5925	5150 — 5925	5150 — 5925	775			
47	5855 — 5925	5855 — 5925	5855 — 5925	70			
(n)48	3550 — 3700	3550 — 3700	3550 — 3700	150			

LTE: 3GPP TS 36.101 V18.3.0 (2023-09), 5G NR: 3GPP TS 38.104 V18.2.0 (2023-06)



Cellular LTE / 5G NR Frequency Band Guide

Band #	Uplink Band (MHz)	Downlink Band (MHz)	Overall Band (MHz)	Total Bandwidth	LTE-M	LTE NB-IoT	5G NB-IoT
49	3550 — 3700	3550 — 3700	3550 — 3700	150			
(n)50	1432 — 1517	1432 — 1517	1432 — 1517	85			
(n)51	1427 — 1432	1427 — 1432	1427 — 1432	5			
52	3300 — 3400	3300 — 3400	3300 — 3400	100			
(n)53	2483.5 — 2495	2483.5 — 2495	2483.5 — 2495	11.5			
(n)54	1670 — 1675	1670 — 1675	1670 — 1675	5			
(n)65	1920 — 2010	2110 — 2200	1920 — 2200	280		X	X
(n)66	1710 — 1780	2110 — 2200	1710 — 2200	490	X	X	X
(n)67	N/A	738 — 758	738 — 758	20			
68	698 — 728	753 — 783	698 — 783	85			
69	N/A	2570 — 2620	2570 — 2620	50			
(n)70	1695 — 1710	1995 — 2020	1695 — 2020	325		X	
(n)71	663 — 698	617 — 652	617 — 698	81	X	X	X
72	451 — 456	461 — 466	451 — 466	15	X	X	
73	450 — 455	460 — 465	450 — 465	15	X	X	X
(n)74	1427 — 1470	1475 — 1518	1427 — 1518	91	X	X	
(n)75	N/A	1432 — 1517	1432 — 1517	85			
(n)76	N/A	1427 — 1432	1427 — 1432	5			
n77	3300 — 4200	3300 — 4200	3300 — 4200	900			
n78	3300 — 3800	3300 — 3800	3300 — 3800	500			
n79	4400 — 5000	4400 — 5000	4400 — 5000	600			
n80	1710 — 1785	N/A	1710 — 1785	75			
n81	880 — 915	N/A	880 — 915	35			
n82	832 — 862	N/A	832 — 862	30			
n83	703 — 748	N/A	703 — 748	45			
n84	1920 — 1980	N/A	1920 — 1980	60			
(n)85	698 — 716	728 — 746	698 — 746	48	X	X	
n86	1710 — 1780	N/A	1710 — 1780	70			
87	410 — 415	420 — 425	410 — 425	15	X	X	
88	412 — 417	422 — 427	412 — 427	15	X	X	
n89	824 — 849	N/A	824 — 849	25			
n90	2496 — 2690	2496 — 2690	2496 — 2690	194			X
n91	832 — 862	1427 — 1432	832 — 1432	600			
n92	832 — 862	1432 — 1517	832 — 1517	685			
n93	880 — 915	1427 — 1432	880 — 1432	552			
n94	880 — 915	1432 — 1517	880 — 1517	637			
n95	2010 — 2025	N/A	2010 — 2025	15			
n96	5925 — 7125	5925 — 7125	5925 — 7125	1200			
n96	5925 — 7125	5925 — 7125	5925 — 7125	1200			
n97	2300 — 2400	N/A	2300 — 2400	100			
n98	1880 — 1920	N/A	1880 — 1920	40			
n99	1626.5 — 1660.5	N/A	1626.5 — 1660.5	34			
n100	874.4 — 880	919.4 — 925	874.4 — 925	50.6			
n101	1900 — 1910	1900 — 1910	1900 — 1910	10			
n102	5925 — 6425	5925 — 6425	5925 — 6425	500			

LTE: 3GPP TS 36.101 V18.3.0 (2023-09), 5G NR: 3GPP TS 38.104 V18.2.0 (2023-06)

Cellular LTE / 5G NR Frequency Band Guide

Band #	Uplink Band (MHz)	Downlink Band (MHz)	Overall Band (MHz)	Total Bandwidth	LTE-M	LTE NB-IoT	5G NB-IoT
103	787 — 788	757 — 758	757 — 788	31		X	
n104	6425 — 7125	6425 — 7125	6425 — 7125	700			
n105	663 — 703	612 — 652	612 — 703	91			
106	896 — 901	935 — 940	896 — 940	44		X	

LTE-only Bands

5G NR-only Bands

Both LTE and 5G NR Bands

LTE: 3GPP TS 36.101 V18.3.0 (2023-09), 5G NR: 3GPP TS 38.104 V18.2.0 (2023-06)



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