

DATASHEET · REV 1.1

Handheld 2.4 GHz Yagi-Uda Antenna

with Flipper Zero mount

16-element Yagi-Uda · 651 mm aluminium-alloy boom · SMA male, 18 cm 90° pigtail · PETG grip

1 Features

- 2400–2500 MHz ISM band
- Gain 10.3 dBi at 2400 MHz, 10.3–10.9 dBi across the band⁽¹⁾
- Front-to-back ratio 10.2–12.7 dB⁽¹⁾
- H-plane beamwidth 30–33°⁽¹⁾
- VSWR 1.172 at 2.400 GHz, 1.213 at 2.483 GHz
- 50 Ω, linear polarisation (H or V by orientation)
- Counterbalanced handheld assembly, 238 g
 - Flipper Zero acts as counterweight
 - Modular mount interface; grip usable without mount
- M5 threaded inserts, fully serviceable

2 Applications

- Directional range extension for Flipper Zero add-on boards (ESP32, nRF24) with an SMA female port
- Range testing and link-margin checks on 2.4 GHz ISM equipment
- Direction finding by signal-strength sweep
- RF experimentation and education

3 Description

This is a 16-element Yagi-Uda (a reflector, the driven element and 14 directors) on a 651 mm aluminium-alloy boom. It comes as a handheld assembly with a 3D-printed PETG grip and a snap-in Flipper Zero mount.

It's passive, so it doesn't add power. It takes what your board already transmits and points it one way instead of everywhere, and it listens better in that direction too. The 18 cm pigtail ends in a 90° SMA male connector that plugs into your add-on board, not into the Flipper itself. The Flipper sits in the mount (without its silicone case) and works as a counterweight, so the whole thing is comfortable in one hand.



FIGURE 3-1 The assembly as shipped

Key parameters

PARAMETER	VALUE	UNIT
Frequency range	2400–2500	MHz
Gain, 2400 MHz ⁽¹⁾	10.3	dBi
Gain, 2400–2500 MHz ⁽¹⁾	10.3–10.9	dBi
Front-to-back ratio ⁽¹⁾	10.2–12.7	dB
VSWR, 2.400 / 2.483 GHz	1.172 / 1.213	
Impedance	50	Ω
Boom length	651	mm
Mass, without Flipper	238	g

⁽¹⁾ Measured by the manufacturer on 9 July 2025, one sample. They haven't confirmed yet whether this is realised gain or directivity. More in Section 7.

4 Specifications

4.1 Electrical characteristics

PARAMETER	CONDITIONS	VALUE	UNIT	NOTE
Frequency range	ISM band	2400–2500	MHz	
Gain	2400 MHz	10.30	dBi	(1) (2)
	2450 MHz	10.61	dBi	(1) (2)
	2480 MHz	10.86	dBi	(1) (2)
	2500 MHz	10.88	dBi	(1) (2)
Front-to-back ratio	2400 MHz	12.55	dB	(1) (3)
	2450 MHz	10.16	dB	(1) (3)
	2480 MHz	12.47	dB	(1) (3)
	2500 MHz	12.69	dB	(1) (3)
Half-power beamwidth	H-plane, 2400–2500 MHz	30–33	°	(1)
VSWR	2.400 GHz, instrument marker	1.172		(4)
	2.483 GHz, instrument marker	1.213		(4)
Impedance	Nominal	50	Ω	
Polarisation	Set by orientation of the elements	Linear		

- (1) Measured by the manufacturer, YC Antenna, on 9 July 2025. One sample, no uncertainty given.
- (2) The manufacturer calls this "peak measured gain". We've asked whether that means realised gain or directivity and are still waiting. If it's directivity, the gain you actually get is lower.
- (3) Main-lobe power compared with power straight behind the antenna (180°), from the manufacturer's XZ-plane cut.
- (4) Marker readings from the supplier's VNA screenshot. They named it an Agilent 5071-series; we haven't confirmed the exact model.

4.2 Mechanical characteristics

PARAMETER	CONDITIONS	VALUE	UNIT
Boom length	Aluminium alloy	651	mm
Elements	Reflector + driven element + directors	1 + 1 + 14	
Feed	Pigtail, 90° SMA male	180	mm
Grip and mount	3D-printed	PETG	
Fasteners	Threaded inserts	M5	
Mass	Complete assembly, without Flipper Zero	238	g

5 Typical characteristics

From the manufacturer's 9 July 2025 measurement, one sample. The squares are the four frequencies that were measured. The lines just connect them; there's no data in between.

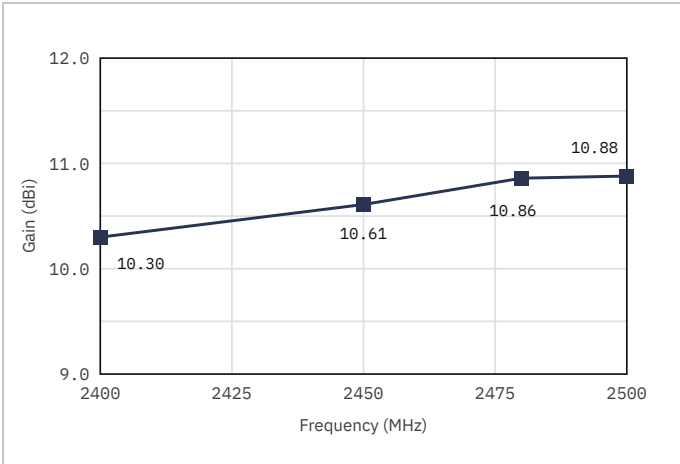


FIGURE 5-1 Gain vs frequency

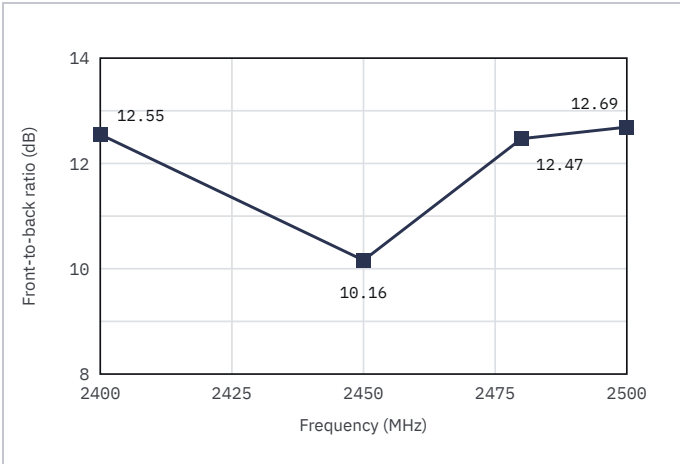


FIGURE 5-2 Front-to-back ratio vs frequency

6 Handling and integration

6.1 What's in the box

ITEM	DESCRIPTION	QTY
01	Yagi assembly with 18 cm 90° SMA male pigtail	1
02	PETG grip, 2 parts, M5 threaded inserts	1
03	Snap-in Flipper Zero mount	1
04	M5 fastener	2
05	Washer	1
06	4 mm hex key	1

The Flipper and the add-on board aren't included.

6.2 Aiming

Turn the antenna so the elements line up with the polarisation of whatever you're aiming at, then sweep slowly and watch for the signal strength to peak. The beam is about 30–33° wide, so take your time aiming.

6.3 Compatibility

You need an add-on board with an SMA female port, like most ESP32 and nRF24 boards. The Flipper goes in without its silicone case. Not sure your board fits? Email support@rm-exp.com before you order and we'll check.

7 Where the numbers come from

The antenna was measured by its manufacturer, YC Antenna. We didn't measure it ourselves. Their measurement from 9 July 2025 gives 10.3 dBi at 2400 MHz, 10.6 dBi at 2450 MHz, 10.9 dBi at 2480 MHz and 10.9 dBi at 2500 MHz. We publish the lowest value, 10.3 dBi.

What we don't know yet

The manufacturer calls these values "peak measured gain". We asked whether that means realised gain or directivity and haven't had an answer yet. If it's directivity, real-world gain is lower. They also didn't give a measurement uncertainty, and only one sample was tested. When they answer, this datasheet gets updated.

On 22 September the manufacturer sent a second test sheet with higher figures. It doesn't say when or how the antenna was measured, so we are not using it until they confirm.

7.1 Measurement record

ITEM	RECORD
Measured by	YC Antenna, the manufacturer. We didn't measure it ourselves.
Measurement date	2025-07-09
Sample count	1, the manufacturer's first sample
Instrument	VNA, Agilent 5071-series, as named by the supplier
Gain definition	"Peak measured gain", per the manufacturer. Realised gain or directivity: still asking.
Uncertainty	Not given. Cable loss and connector repeatability weren't characterised.
Second test sheet	Received 2026-09-22. Not used: no date, method or sample count given.

8 Intended use

Built for lawful RF experimentation, range testing, direction finding and getting more link margin out of permitted 2.4 GHz systems. The antenna itself is passive; your board decides the transmit power and duty cycle, and following local RF rules and network permissions is up to you. RM-EXP isn't affiliated with or endorsed by Flipper Devices.

9 Revision history

REV	DATE	CHANGES
1.1	2026-09-25	Gain corrected to the manufacturer's 9 July 2025 measurement: 10.3–10.9 dBi, 10.3 dBi at 2400 MHz. The earlier figure wasn't backed by the data. Sample count corrected to one. The earlier count was wrong. Instrument restated as the supplier named it (Agilent 5071-series). Front-to-back ratio replaced with the manufacturer's XZ-plane values. Efficiency figure removed until it can be confirmed. Boom length 651 mm; pigtail 18 cm. Contact changed to support@rm-exp.com. Added the measurement record and where the numbers come from (Section 7). Noted a second, unverified test sheet from the manufacturer (22 September 2026); not used.
1.0R	2026-02-25	First release. Replaced by 1.1.