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# Digital video transmission system "VDD-1"

The video transmission system is a one-way data transmission system with a maximum data transfer rate of up to 10 Mbps. It is built based on a COFDM modulator and demodulator, a frequency converter for the range of 1.35 - 1.8 GHz, and an amplifier. The operating frequency can be changed at the command of the operator through the control system and telemetry.

## 1. Full video transmission kit:

- VDD-S3-01 transmitter with COFDM modulator and amplifier - 1 pc
- COFDM demodulator – 1 pc
- VDD-M3-01 frequency converter with a low-noise amplifier - 1 pc
- Antenna VD-AS-1 (on UAV) – 1 pc
- Antenna VD-AM-1 (on the ground control station) – 1 pc
- RG223 cable, 1.5 m with connectors SMA(m) - N(m) – 1 pc

## 2. Specifications:

***Technical general characteristics***

| | |
|---|---|
| 2.1. Operating frequency range, MHz | 1350 – 1800 |
| 2.2. Frequency setting step, kHz | 1 |
| 2.3. Modulation type | COFDM |
| - quantity of subcarrier | 2K |
| - working bandwidth, MHz, | 1…8 |
| - FEC | 1/2, 2/3, 3/4, 5/6, 7/8 |
| - protective interval GI | 1/32, 1/16, 1/8, 1/4 |
| - subcarrier modulation type | QPSK, 16QAM, 64QAM |
| 2.4. Data transfer speed, Mbit/s | 0,5…31,67 |

2.5. Video signal formats:

- HDMI

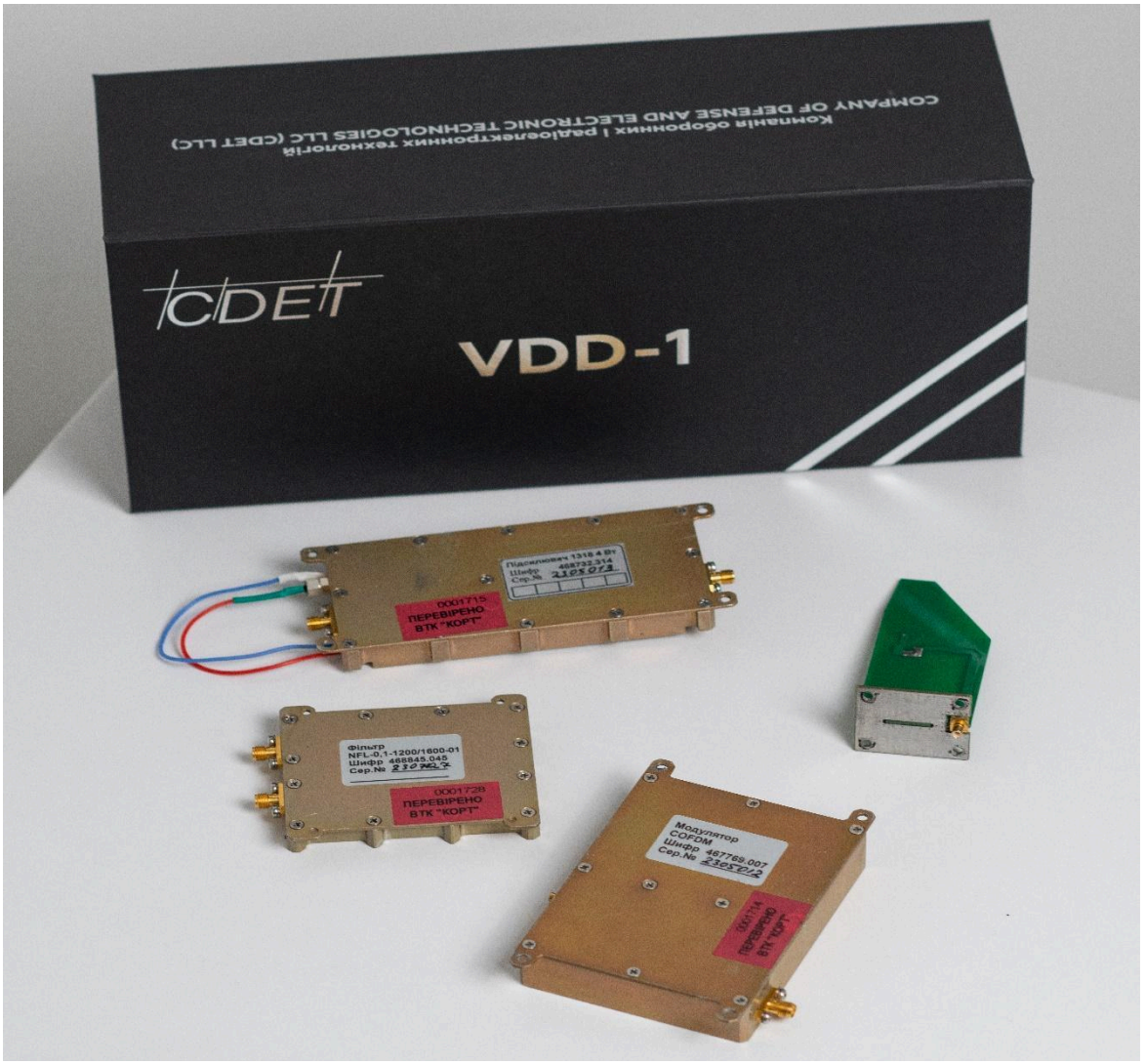
1080@60P, 1080@50P, 1080@30P, 1080@25P, 1080@24P, 1080@60I, 1080@ 50I, 1080@30I, 720@60P, 720@50P, 720@30P, ……

- CVBS

720*480 60I(NTSC), 720*576 50I(PAL)

2.6. Coding formats

| | |
|---|---|
| - video | H.264 |
| - audio | AAC, 16bit, stereo, 32Kbps |
| 2.7. Encryption | AES256 |
| 2.8. Maximum video signal delay, ms | 250 |



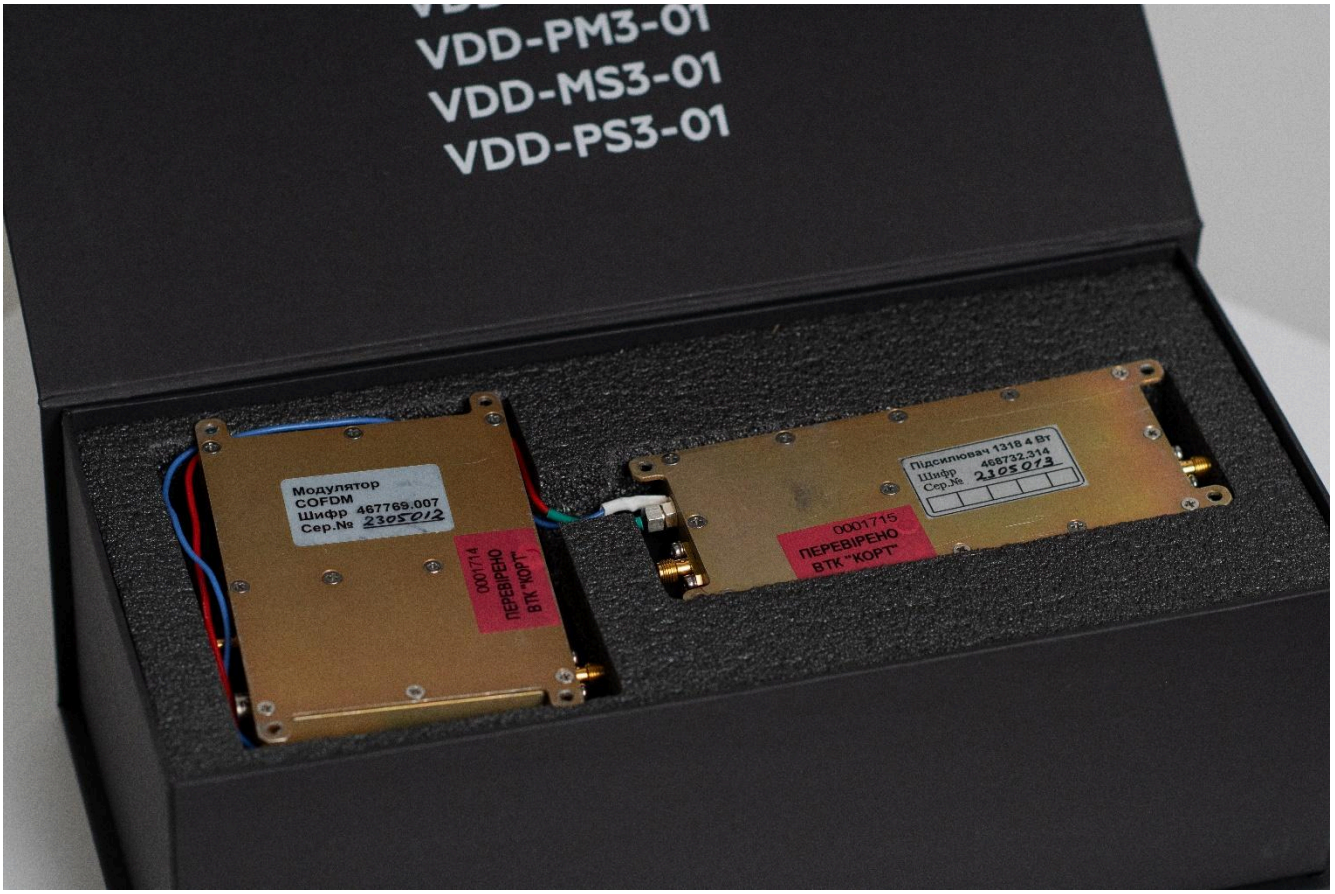
***Technical characteristics of the transmitter (on-board equipment)***

- Output power, W, not less than 2
- Supply voltage, 10-22(3S-5S)
- Power consumption, W, no more than 12
- Input connector SMA(f)
- Type of power supply connector Hirose: HR10-7R-6P
- Analog video signal connector type SMB
- Type of digital video signal connector HDMI
- Type of control signal connector Hirose: HR10-7R-6P
- Type of input interface of control signals UART (LVTTL)
- UART connection speed, bit/s 57600

Overall dimensions, mm, (WxDxH)
- modulator 100x100x18
- amplifier 130x60x16

Weight, g, no more than 250

The range of working temperatures, ºC, within -20...+ 40



***Technical characteristics of the receiver (ground equipment)***

| | |
|---|---|
| • The minimum sensitivity of the receiver, dBm, no more than (by BW=8MHz, QPSK, CR=2/3, GI=1/16) | - 98 |
| • Supply voltage, V | 10-22(3S-5S) |
| • Power consumption, W, no more than | 7 |
| • Input connector | SMA(f) |
| • Type of power supply connector | SF1213/P4 WEIPU |
| • Type of control signal connector | Hirose: HR10-7R-6P |
| • Analog video/audio connector type | RCA |
| • Type of digital video connector | HDMI |
| • Video streaming connector type | RJ45 |
| • Type of input interface of control signals | UART (LVTTL) |
| • UART connection speed, bit/s | 57600 |
| • Video streaming interface type | Ethernet |
| • Overall dimensions, mm, (WxDxH) | |
| • - demodulator | 140x130x20 |
| • - frequency converter | 100x100x14 |
| • Weight, kg, no more than | 1 |
| • The range of working temperatures, ºC, within | -20...+ 40 |

## 3. Technical characteristics of antennas.

***Antenna VDD-AS-01 (on-board)***

| | |
|---|---|
| ● Operating frequency range, MHz | 1350 - 1800 |
| ● Polarization | vertical |
| ● • The amplification factor AF is relatively isotropic emitter, dBi, no less | 2 |
| ● Orientation | omnidirectional |
| ● Maximum input power, kW | 0,2 |
| ● Input standing wave coefficient in the operating frequency range, no more than | 2 |
| ● Input resistance, Ohm | 50 |
| ● Input connectors | SMA(m) |
| ● Dimensions of the antenna, mm, (WxDxH) | 20x50x130 |
| ● Mass, g, no more than | 30 |

***Antenna VDD-AM-01 (ground)***

| | |
|---|---|
| 2.1 Operating frequency range, MHz | 1350 - 1800 |
| 2.2 Polarization | elliptical |
| 2.3 The amplification factor AF is relatively isotropic emitter, dBi, no less | 5 |
| 2.4 Orientation | omnidirectional |
| 2.5 Maximum input power for each input, kW | 0,2 |
| 2.6 • Input standing wave coefficient in the operating frequency range, no more than | 2 |
| 2.7 Input resistance, Ohm | 50 |
| 2.8 Input connectors | N(f) |
| 2.9 Dimensions of the antenna, mm, (WxDxH) | 280x280x60 |
| 2.10 Mass, g, no more than | 0,8 |

## The price and completeness of the video line VDD-1

***Ground equipment:***

- COFDM demodulator – 1 pc
- VDD-M3-01 frequency converter with a low-noise amplifier - 1 pc
- VD-AM-01 antenna – 1 pc
- Cable RG223, 1.5 m with connectors SMA(m) - SMA(m) - 1 pc

***On-board equipment:***

- VDD-S3-01 transmitter with COFDM modulator and amplifier - 1 pc
- VD-AS-01 antenna – 1 pc

**TOTAL: 12000.00 €**

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***To order:***
***+38 096 109 8953***
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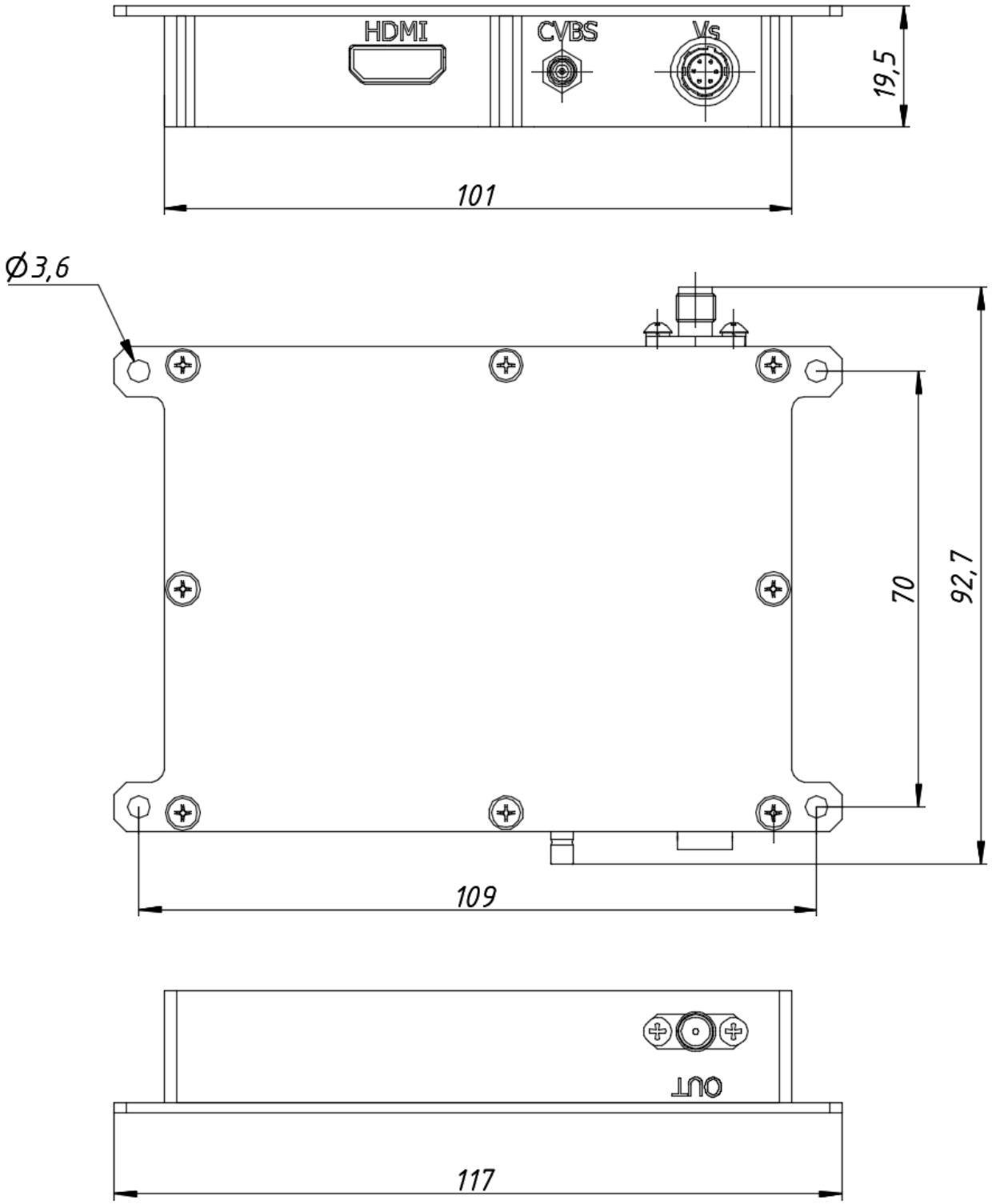
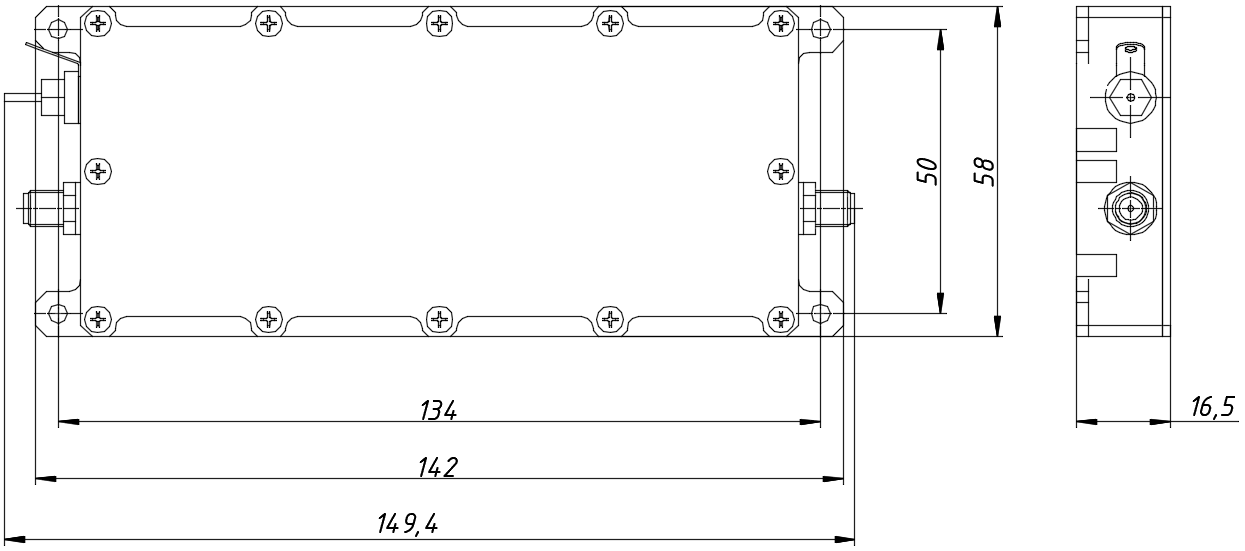
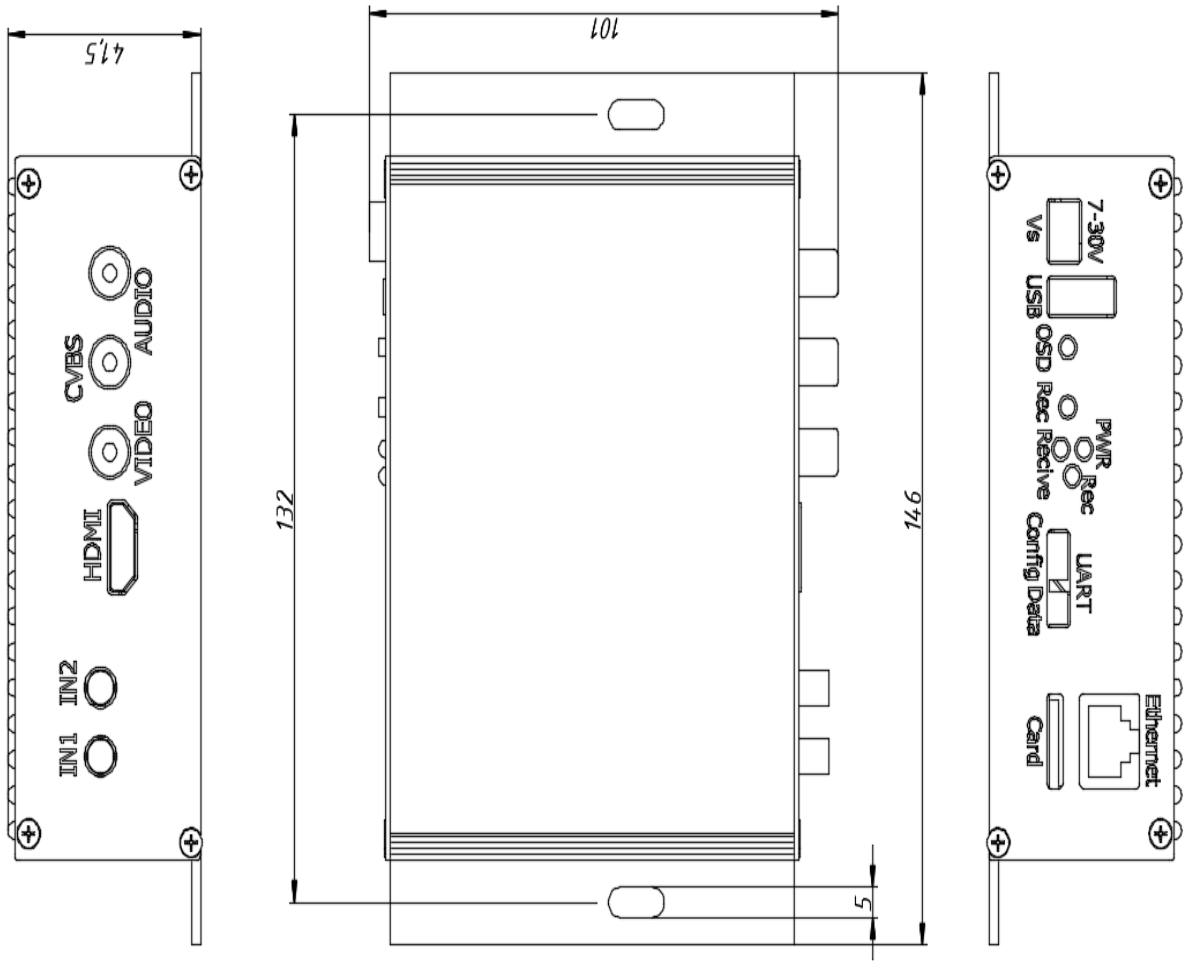
**Overall dimensions of modulator COFDM**
**VDD-MS3-01**



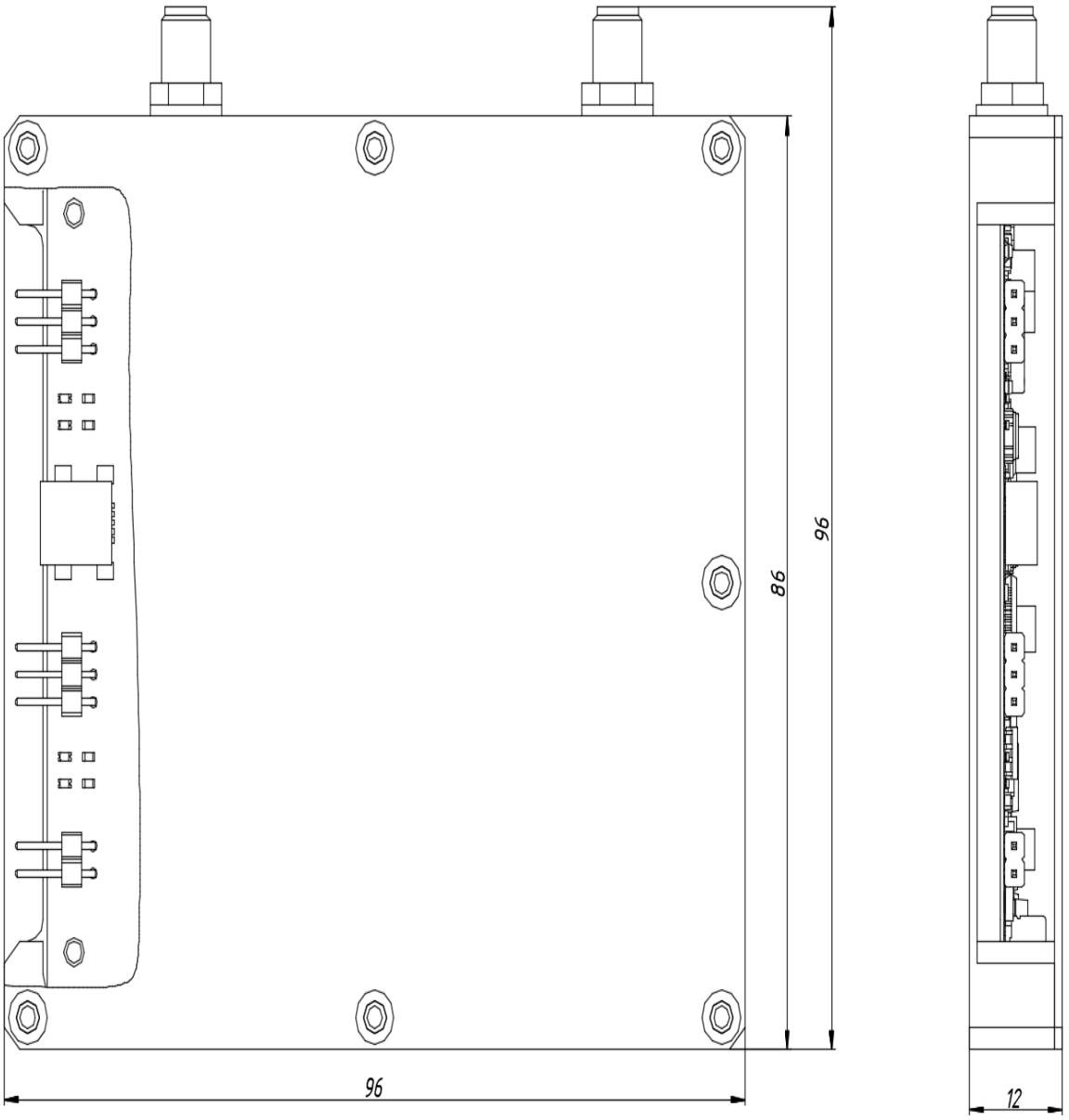
## Overall dimensions of power amplifier.



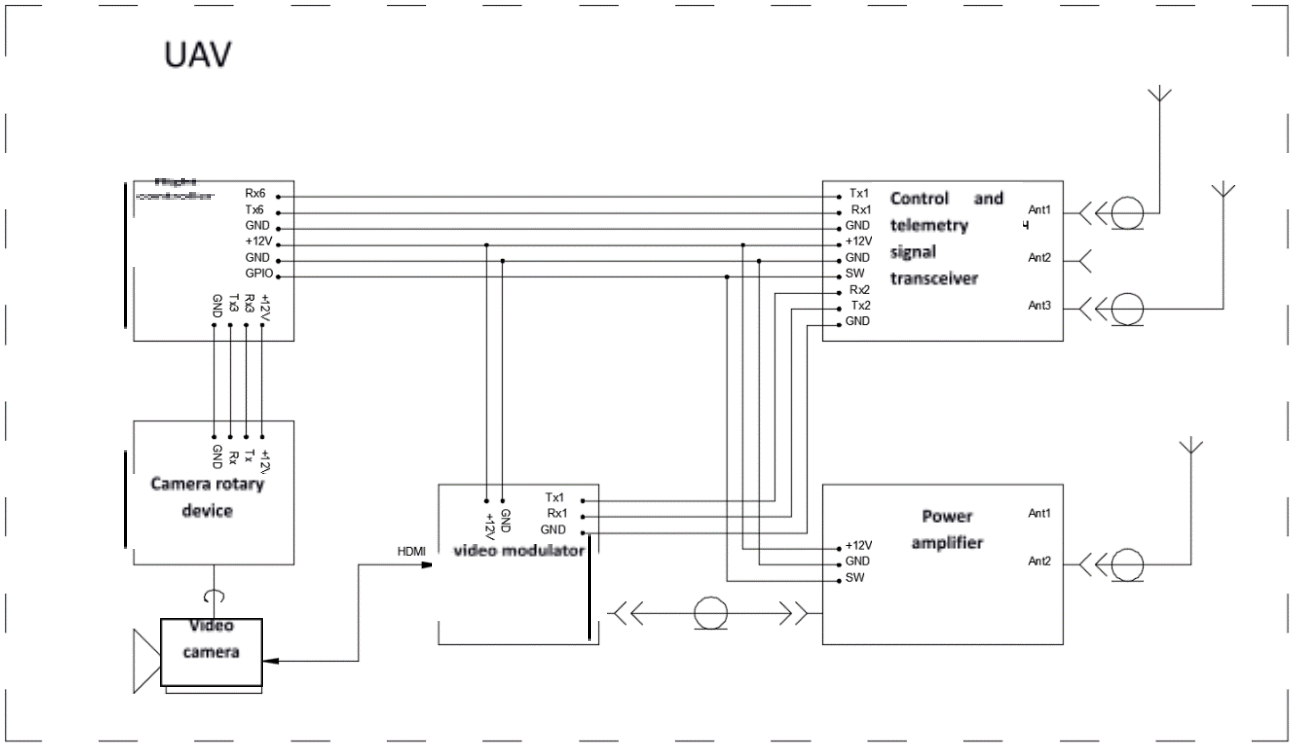

## Overall dimensions of demodulator COFDM VDD-DM3-01

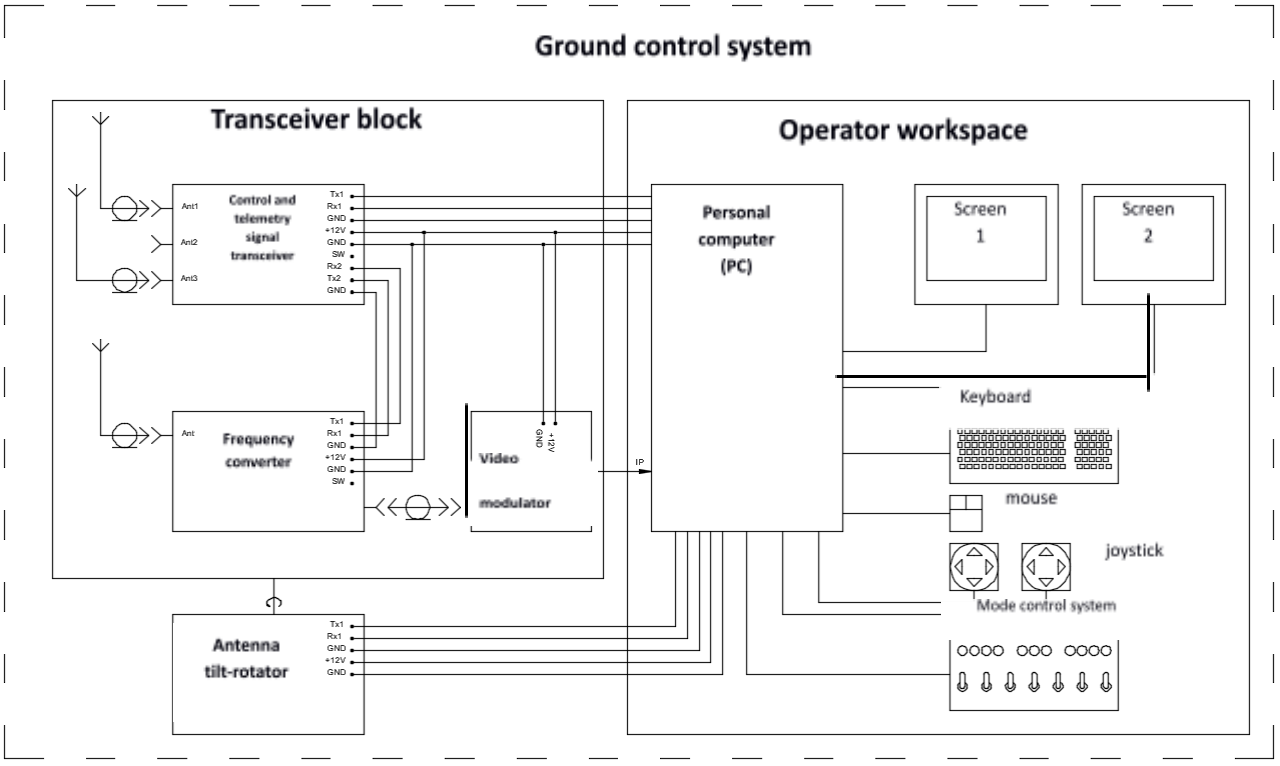
## Overall dimensions of frequency converter.

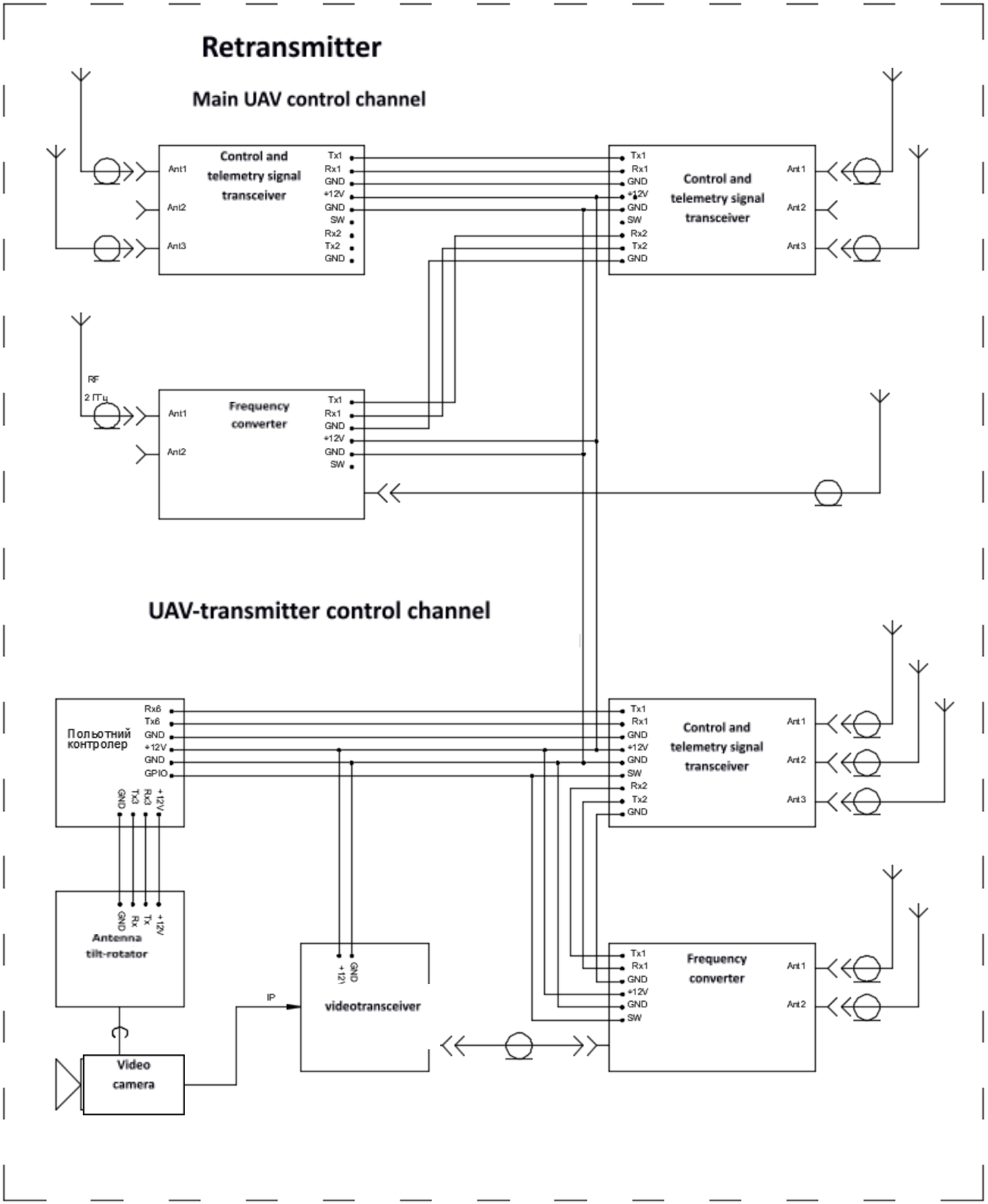



### Options for building a UAV control system based on a set of TLM-2 and VDD-1 radio lines

There are two options for building a UAV control system based on a radio line kit
1 option – direct control of the UAV.
2 option – controlling the UAV when using the UAV repeater

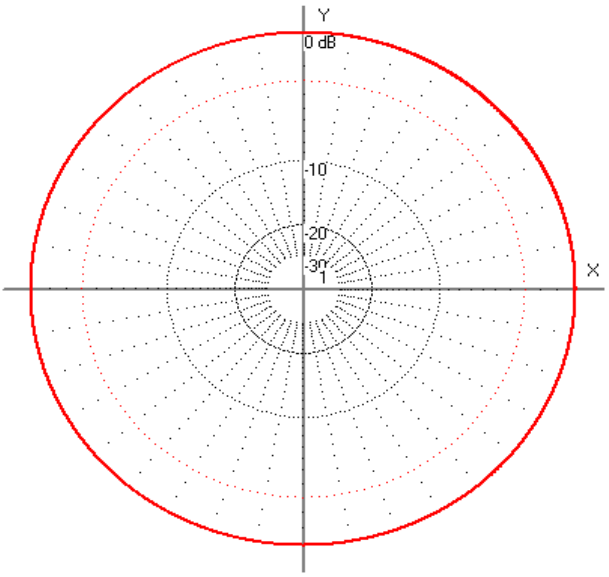

UAV
Rx6
Tx6
GND
+12V
GND
GPIO
GND
Tx3
Rx3
+12V
Control and telemetry signal transceiver
Tx1
Rx1
GND
+12V
GND
SW
Rx2
Tx2
GND
Ant1
Ant2
Ant3
GND
Tx
Rx
+12V
Camera rotary device
HDMI
video modulator
Tx1
Rx1
GND
+12V
GND
Power amplifier
+12V
GND
SW
Ant1
Ant2
Video camera


Ground control system
Transceiver block
Operator workspace
Control and telemetry signal transceiver
Ant1
Ant2
Ant3
Tx1
Rx1
GND
+12V
GND
SW
Rx2
Tx2
GND
Personal computer (PC)
Screen 1
Screen 2
Keyboard
mouse
joystick
Mode control system
Frequency converter
Ant
Video modulator
IP
Antenna tilt-rotator

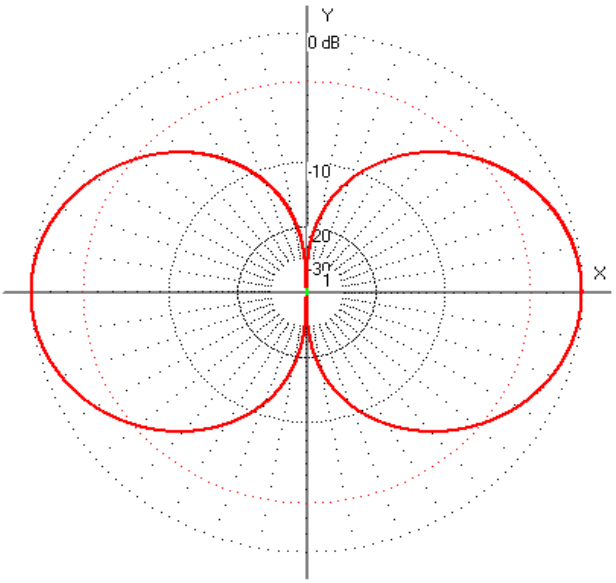

Retransmitter
Main UAV control channel
Control and telemetry signal transceiver
Ant1
Ant2
Ant3
Tx1
Rx1
GND
+12V
GND
SW
Rx2
Tx2
GND
Control and telemetry signal transceiver
Ant1
Ant2
Ant3
RF 2 ГГц
Frequency converter
Ant1
Ant2
Tx1
Rx1
GND
+12V
GND
SW
UAV-transmitter control channel
Польотний контролер
Rx6
Tx6
GND
+12V
GND
GPIO
GND
Tx3
Rx3
+12V
Control and telemetry signal transceiver
Antenna tilt-rotator
GND
Rx
Tx
+12V
videotransceiver
+12V
GND
IP
Video camera
Frequency converter

## Directivity diagrams VDD-AS-01

*Directivity diagram in the horizontal plane*

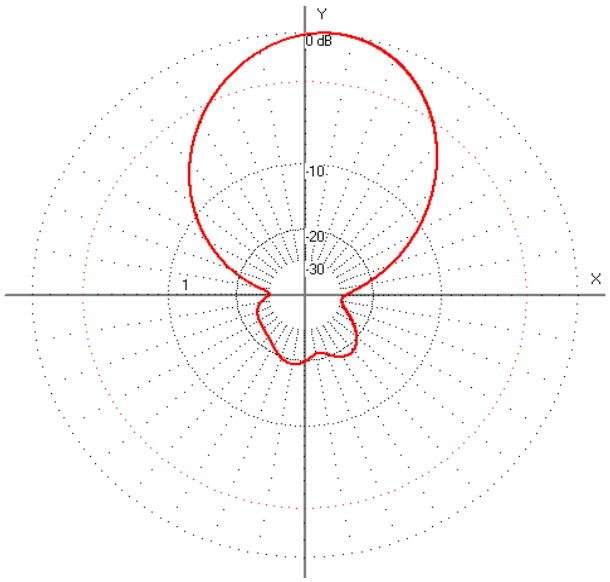



*Directivity diagram in the vertical plane*




## Directivity diagrams VDD-AM-01

*Directivity diagram in the horizontal plane*




*Directivity diagram in the vertical plane*