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Digital frequency synthesizer mm wave.

(presented on the example of the frequency synthesizer 70 GHz)

Technical information:

Complication:
- Synthesizer ;
- Power Supply ;
- Remote Control ;
- Power Cord (connects the power supply and synthesizer);
- Software .

Dimensions: 600x70x120 mm;

Technical characteristics:
- Frequency band referenced +/- 0,4%;
- Output Power level 28 mW;
- Minimum frequency tuning step 1 Hz;
- Relative long-term frequency instability 1·10-10;
- Instability of the output power no more than 1%.

Device description:

Digital frequency synthesizer developed for use as a source of millimeter-wave signal in the Standard DC voltage source, as well as tools that require high-precision frequency input signal.
The synthesizer consists of two main parts: the microwave elements and electronic part. In the synthesizer uses a small range of tuning. But a very small tuning step of digital frequency synthesizer leads to the fact that, for example, at a frequency of 70 GHz can be achieved a step in 140 Hz (0,00497 Hz; 4,9*10*-3 Hz). The output of the digital frequency synthesizer is a low pass filter which removes the quantization noise, and amplifier increases the signal level.
The digital frequency synthesizer managed by a **microcontroller**. The microcontroller performs the following functions:
- Management of digital frequency synthesizer;
- Reception and transmission of information via the optical channel (IRDA);
- PLL control (5MHz into 200 MHz).

Also the synthesizer includes a remote control. It controls the frequency of the synthesizer. The remote control can work both independently and on a computer that allows user to control the frequency of synthesizer directly from the control panel or from PC via special software. The software is specially designed to manage the frequency synthesizer and offers a wide range of different functions. The remote control is connected to a PC via COM-port.
Shown a digital frequency synthesizer for 70 GHz is already a source of millimeter-wave signal in a primary standard DC voltage source of Ukraine.

The advantages of digital frequency synthesizer:

Compared with analog frequency synthesizers, the digital frequency synthesizer has the following advantages:
1. Higher noise immunity;
2. Wide range of frequency tuning;
3. Small step of frequency tuning;
4. High phase stability.

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