METHOD OF THE CALIBRATION OF THE FSK RADIO CHANNELS OF THE MEASURING SYSTEM FOR THE TACTICAL TRAINING

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Military trainings propose the exploitation a big number of the radio channels of the wireless networks, located on the not large area of the polygon. It's necessary to provide the correct operating the radio channels in the networks with the huge number of the connected devices. This task is achieved due to the realization the calibration of the radio channels [1].

The purpose of the paper is to analyze modern methods of the calibration of the radio channels and to propose an improved method for the calibration of the radio channels of the measuring systems, intended for the tactical training of the military servicemen.

The radio channel with the radio module RFM66W-868, produced by HOPERF, was researched. It's reference frequency is equal 867,850 MHz, the bandwidth is equal 60 kHz. The quartz resonator makes the main contribution to the instability of the reference frequency [2]. Taking into account the given in the technical instruction of the radio module value of the deviation of the reference frequency $\pm 20\,\text{ppm}$, the deviation in absolute values was calculated (it's value is equal 17,357 kHz).

The researches of the deviation of the reference frequency were carried out on the 20 devices with the radio module RFM66W-868. The different temperature ranges and bandwidth were considered. The minimum and maximum deviation of the reference frequency at the temperature range (-10…+40)°C with bandwidth 30 kHz is presented on the fig. 1.

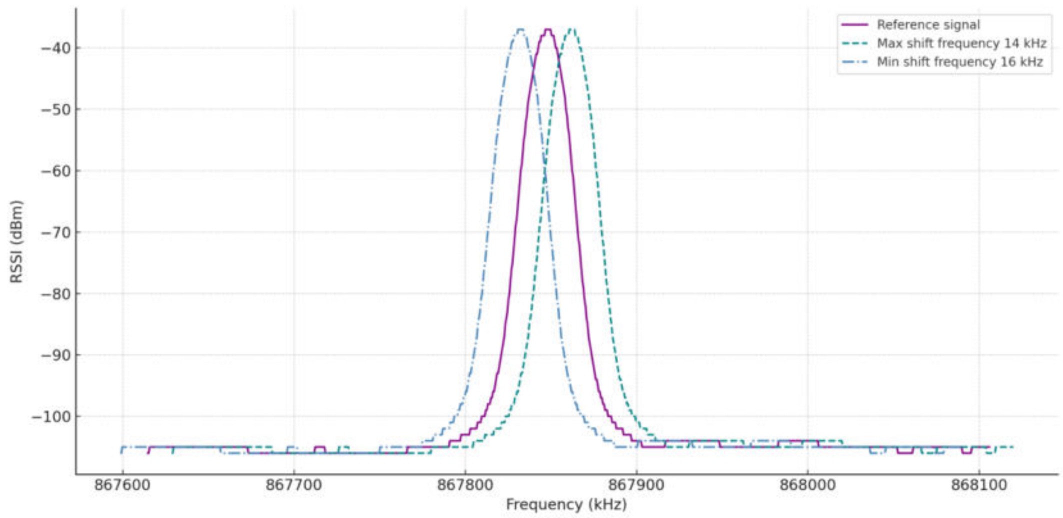

Fig. 1 Minimum and maximum deviation of the reference frequency

References:

1. DSTU EN ISO/IEC 17025:2019 National Standard of Ukraine. General requirements for the competence of testing and calibration laboratories.

2. Zhang, L., & Lee, Y. «Signal Calibration in IoT Networks». Journal of Wireless Communications, 2022. 14 p.