



Test Report Serial Number:

**45461626 R1.0**

Test Report Date:

**4 December 2020**

Project Number:

**1510**

## **Appendix I - Conducted Tx Spurious Emissions Measurement Plots**

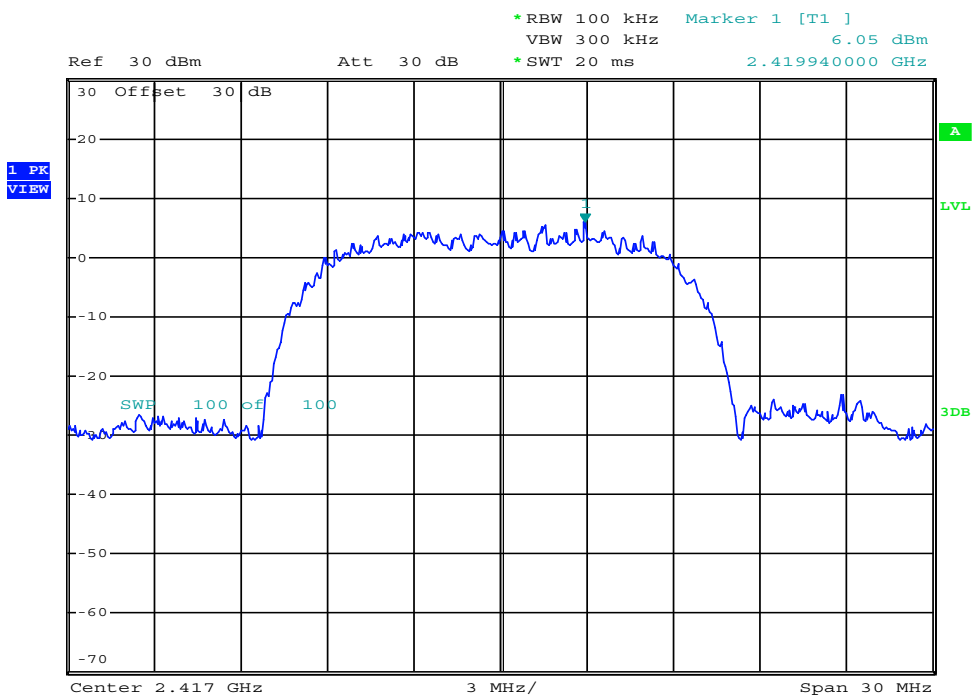
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**Conducted Spurious Emissions - Reference Measurement**

| Frequency<br>(MHz) | Modulation | Bit<br>Rate<br>(Mbps) | Measured<br>PSD<br>[P <sub>Meas</sub> ]<br>(dBm) | Required<br>Attenuation<br>[A <sub>R</sub> ]<br>(dB) | Limit<br>Line<br>[A <sub>L</sub> ]<br>(dBm) |
|--------------------|------------|-----------------------|--------------------------------------------------|------------------------------------------------------|---------------------------------------------|
| 2417.00            | DSSS       | 5.5                   | 6.05                                             | 30                                                   | -23.950                                     |
| 2417.00            | OFDM       | 12                    | 0.98                                             | 30                                                   | -29.020                                     |
| 2417.00            | MCS7       | -                     | -1.02                                            | 30                                                   | -31.020                                     |

## Power Spectral Density



Date: 2.DEC.2020 13:29:33

Channel Frequency:

**2417.00 MHz**

DUT Modulation:

**DSSS**

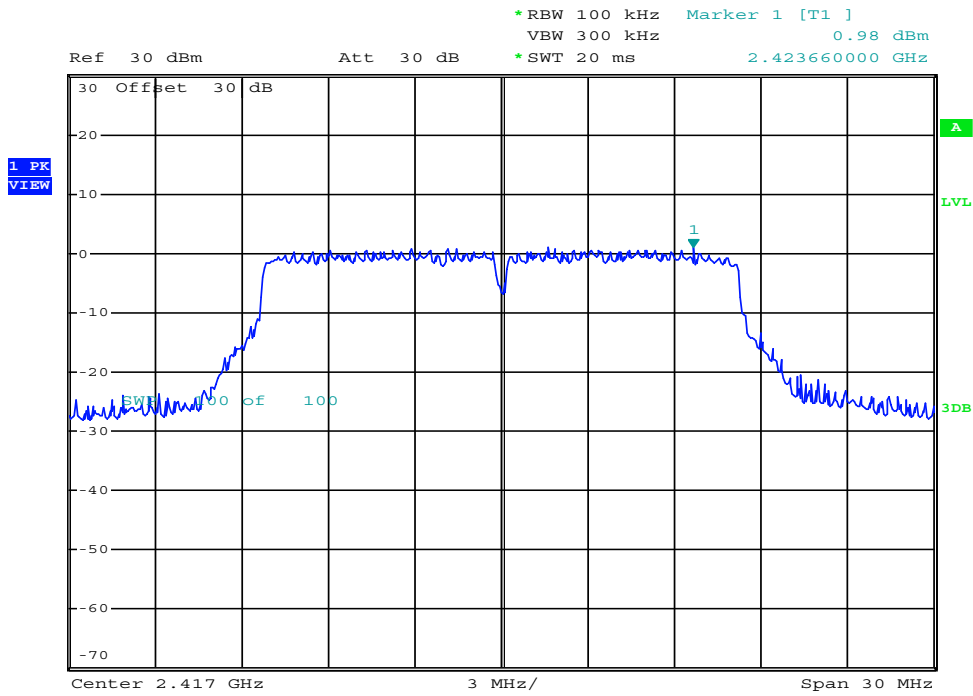
Data Rate:

**5.5 Mbps**

Measured PSD:

**6.05 dBm**

## Power Spectral Density



Date: 2.DEC.2020 13:31:48

Channel Frequency:

**2417.00 MHz**

DUT Modulation:

**OFDM**

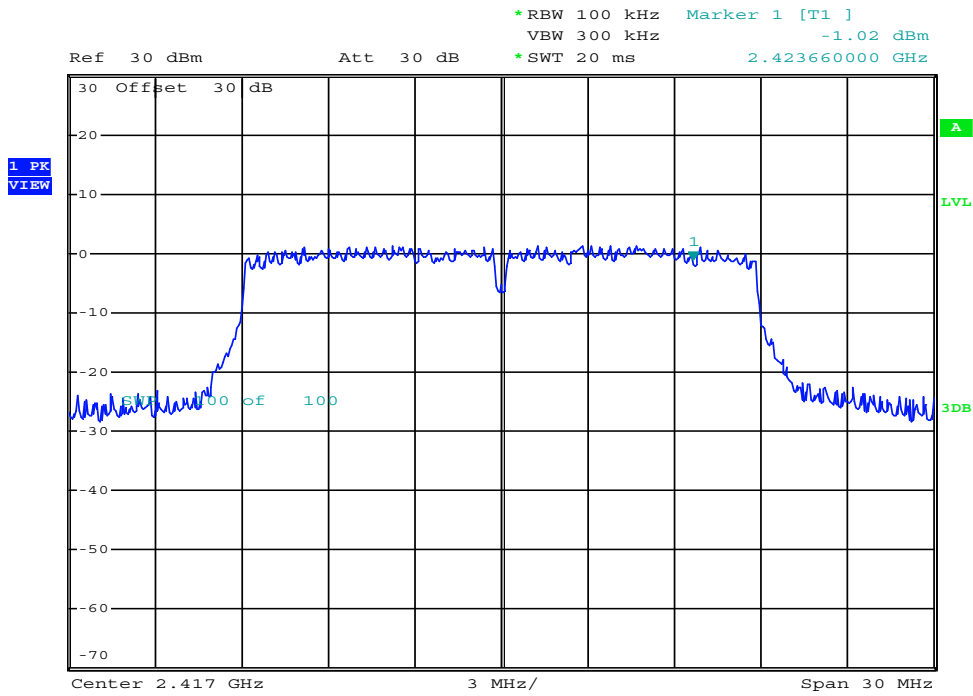
Data Rate:

**12 Mbps**

Measured PSD:

**0.98 dBm**

## Power Spectral Density



Date: 2.DEC.2020 13:33:11

Channel Frequency:

**2417.00 MHz**

DUT Modulation:

**MCS7**

Data Rate:

- Mbps

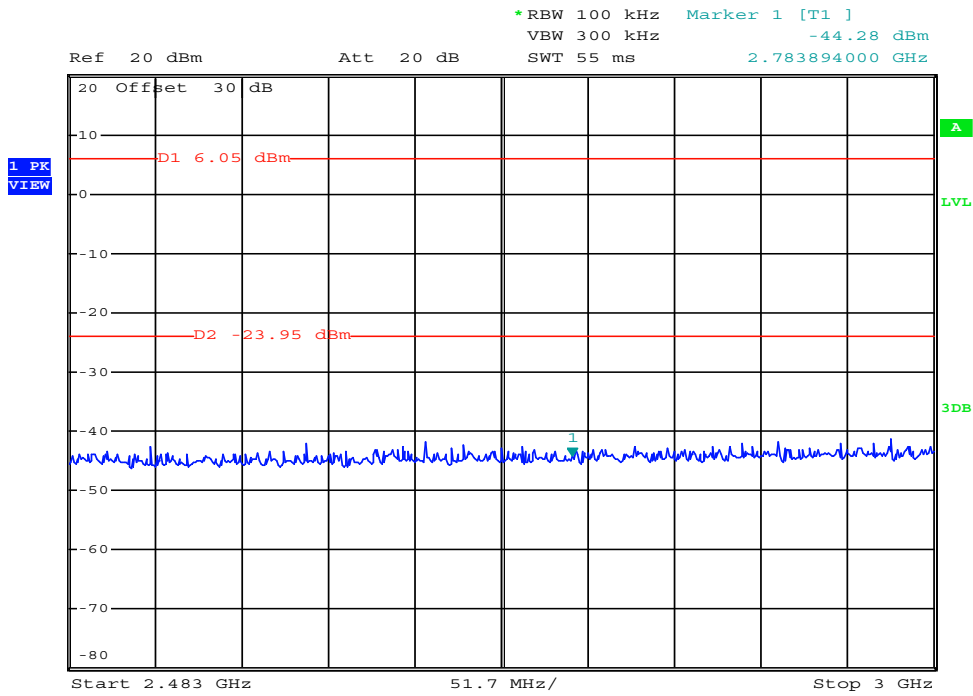
Measured PSD:

**-1.02 dBm**

| Emission Level Measurement      |                           |            |                                                           |                                                 |                        |
|---------------------------------|---------------------------|------------|-----------------------------------------------------------|-------------------------------------------------|------------------------|
| Frequency<br><br>Range<br>(GHz) | Bit<br><br>Rate<br>(mbps) | Modulation | Measured<br><br>Emission<br>[E <sub>Meas</sub> ]<br>(dBm) | Limit<br><br>Line<br>[A <sub>L</sub> ]<br>(dBm) | Margin<br><br><br>(dB) |
| to 3GHz                         | 5.5                       | DSSS       | -44.28                                                    | -23.95                                          | 20.33                  |
| 3-13.6                          |                           |            | -32.68                                                    |                                                 | 8.73                   |
| 13.6-18                         |                           |            | -32.07                                                    |                                                 | 8.12                   |
| 18-25                           |                           |            | -32.48                                                    |                                                 | 8.53                   |
| Results:                        |                           |            |                                                           | Complies                                        |                        |

Margin = A<sub>L</sub> - E<sub>MEAS</sub>

## Conducted Spurious Emissions



Date: 2.DEC.2020 13:53:44

Channel Frequency:

**2417.00 MHz**

DUT Modulation:

**DSSS**

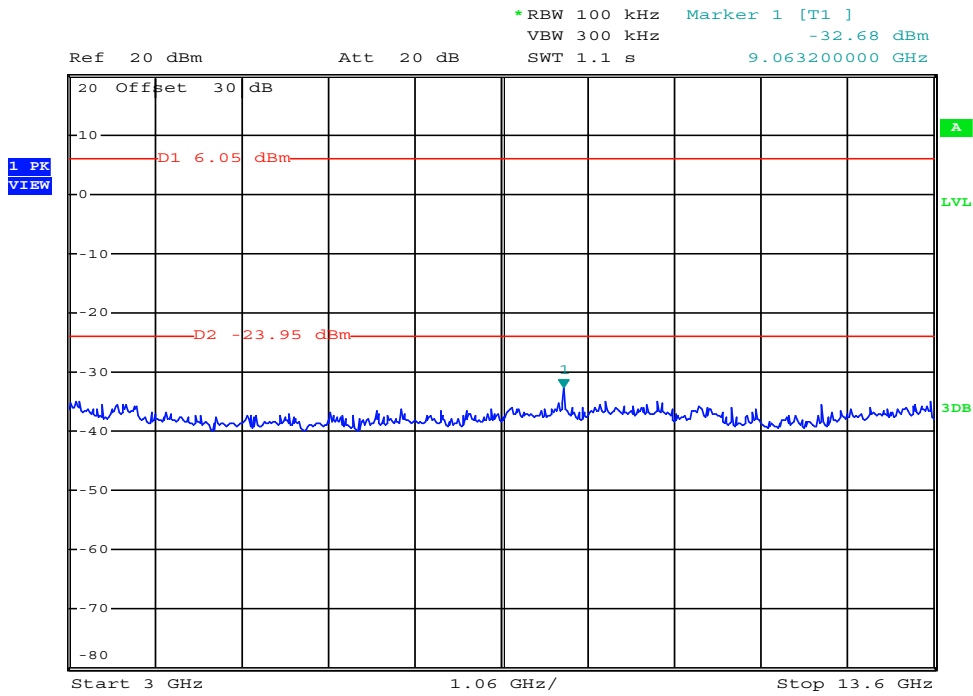
Data Rate:

**5.5 Mbps**

Measured Emission:

**-44.28 dBm**

## Conducted Spurious Emissions



Date: 2.DEC.2020 13:54:17

Channel Frequency:

**2417.00 MHz**

DUT Modulation:

**DSSS**

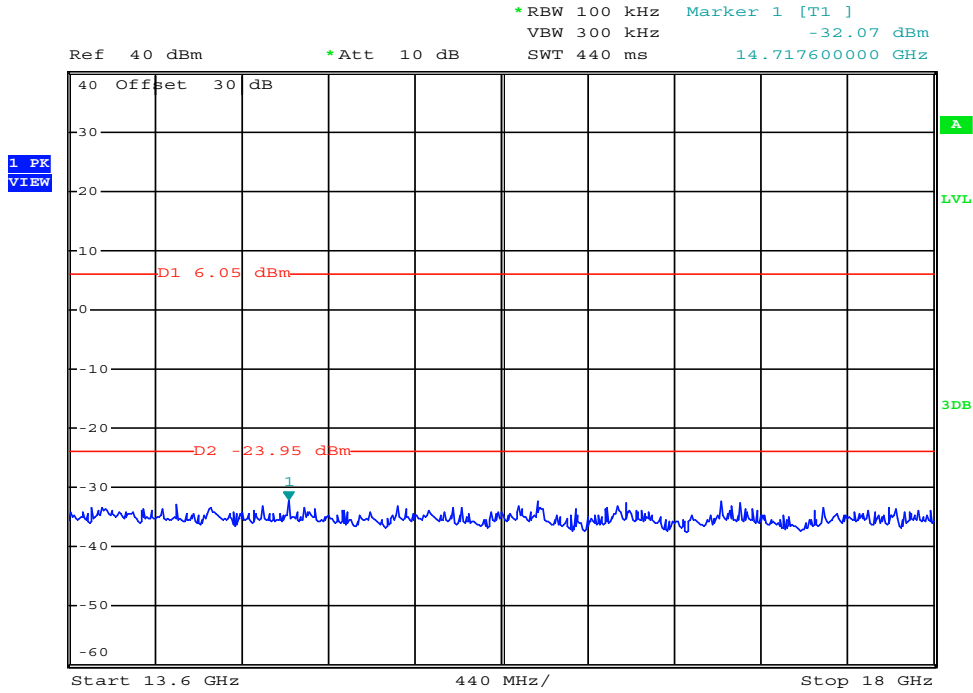
Data Rate:

**5.5 Mbps**

Measured Emission:

**-32.68 dBm**

## Conducted Spurious Emissions



Date: 2.DEC.2020 13:57:24

Channel Frequency:

**2417.00 MHz**

DUT Modulation:

**DSSS**

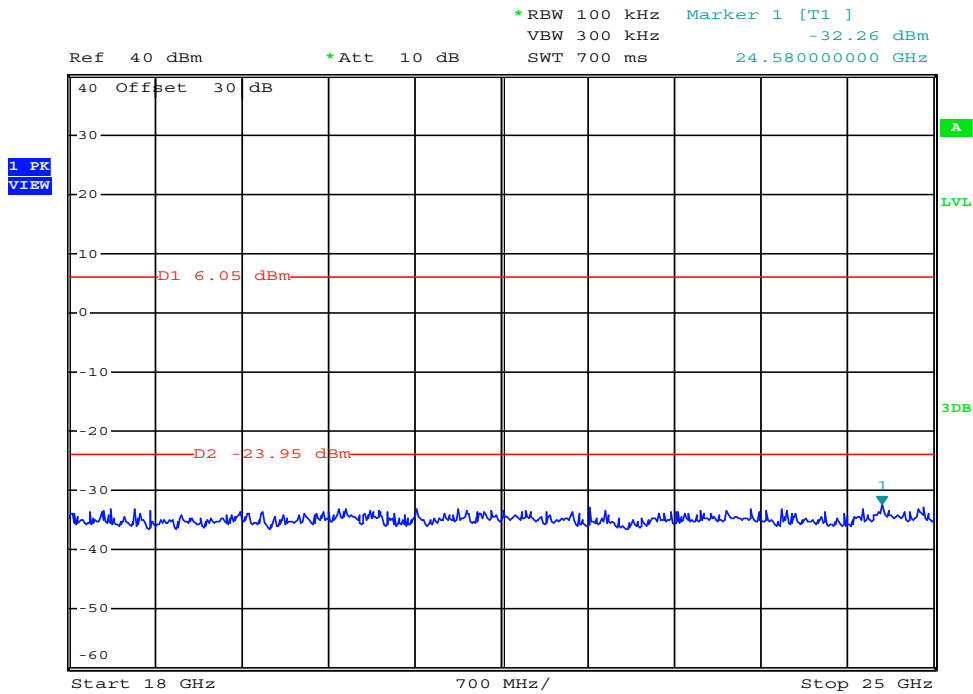
Data Rate:

**5.5 Mbps**

Measured Emission:

**-32.07 dBm**

## Conducted Spurious Emissions



Date: 2.DEC.2020 13:57:45

Channel Frequency:

**2417.00 MHz**

DUT Modulation:

**DSSS**

Data Rate:

**5.5 Mbps**

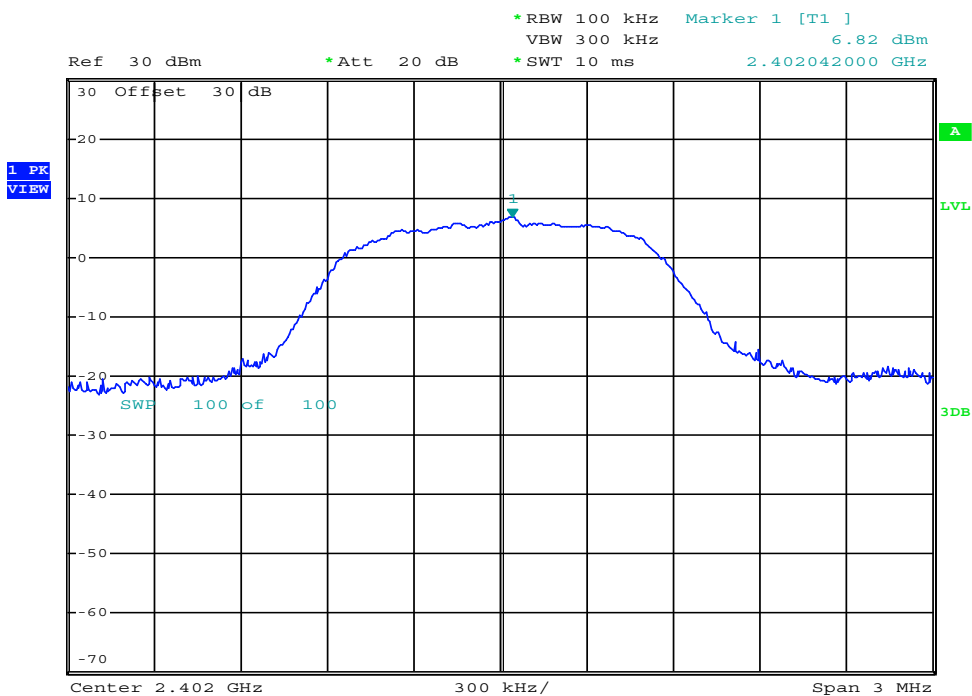
Measured Emission:

**-32.84 dBm**

| Conducted Spurious Emissions - Reference Measurement |            |                       |                                                  |                                                      |                                             |
|------------------------------------------------------|------------|-----------------------|--------------------------------------------------|------------------------------------------------------|---------------------------------------------|
| Frequency<br>(MHz)                                   | Modulation | Bit<br>Rate<br>(Mbps) | Measured<br>PSD<br>[P <sub>Meas</sub> ]<br>(dBm) | Required<br>Attenuation<br>[A <sub>R</sub> ]<br>(dB) | Limit<br>Line<br>[A <sub>L</sub> ]<br>(dBm) |
| 2402.00                                              | Pi/4-DQPSK | 2                     | 6.82                                             | 30                                                   | -23.18                                      |
| 2442.00                                              |            |                       | 6.62                                             | 30                                                   | -23.38                                      |
| 2480.00                                              |            |                       | 5.73                                             | 30                                                   | -24.27                                      |

Limit Line = Measured PSD - Required Attenuation

## Power Spectral Density



Date: 2.DEC.2020 16:01:01

Channel Frequency:

**2402.00 MHz**

DUT Modulation:

**Pi/4-DQPSK**

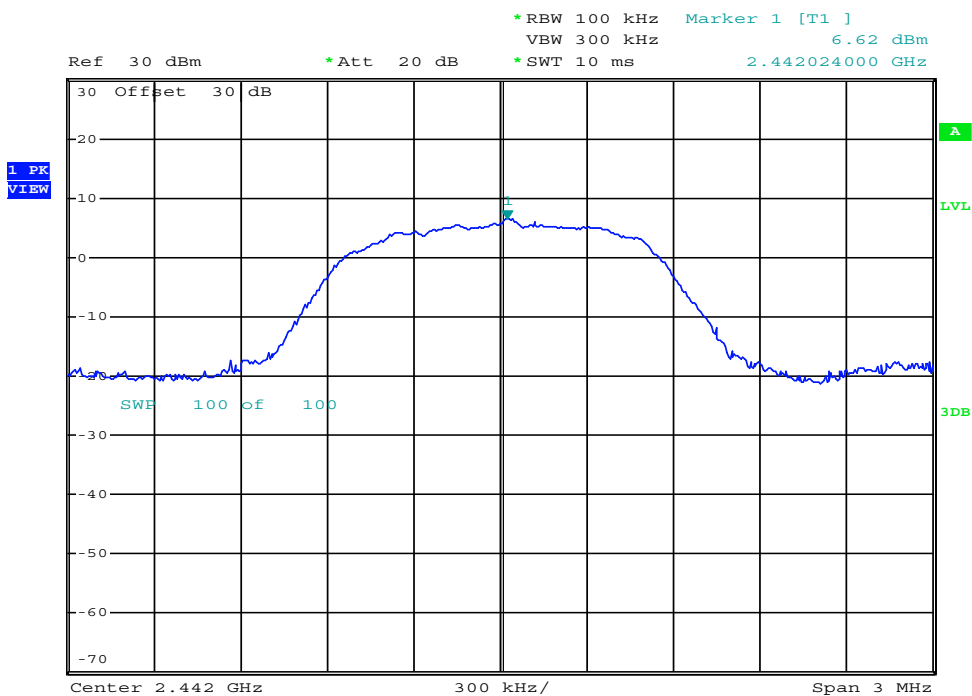
Data Rate:

**2 Mbps**

Measured PSD:

**6.82 dBm**

# Power Spectral Density



Date: 2.DEC.2020 16:02:45

Channel Frequency:

**2442.00 MHz**

DUT Modulation:

**Pi/4-DQPSK**

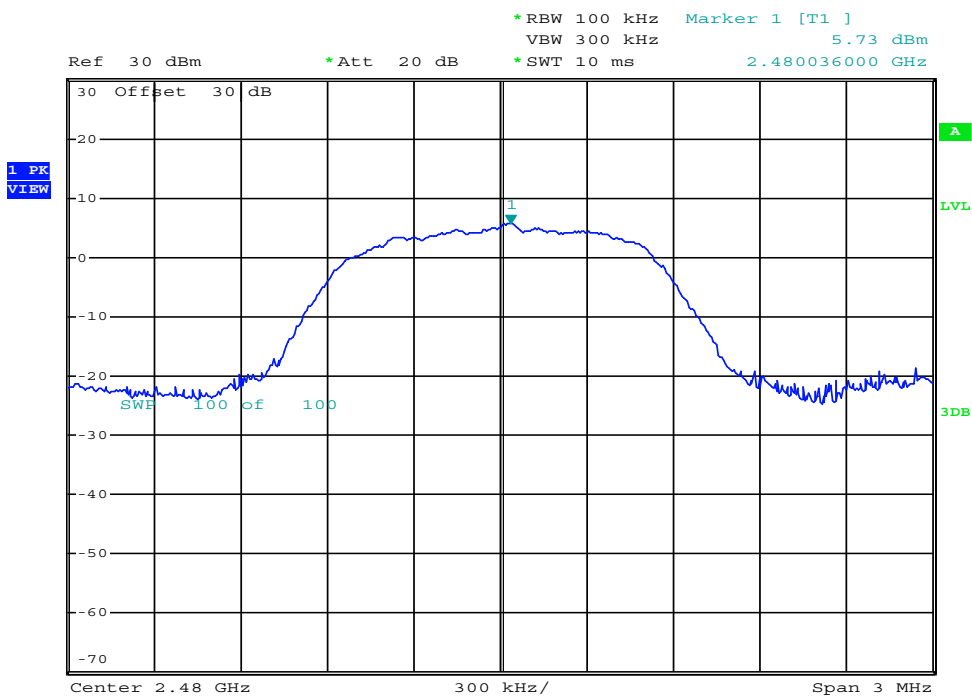
Data Rate:

**2 Mbps**

Measured PSD:

**6.62 dBm**

## Power Spectral Density



Date: 2.DEC.2020 16:01:46

Channel Frequency:

**2408.00 MHz**

DUT Modulation:

**Pi/4-DQPSK**

Data Rate:

**2 Mbps**

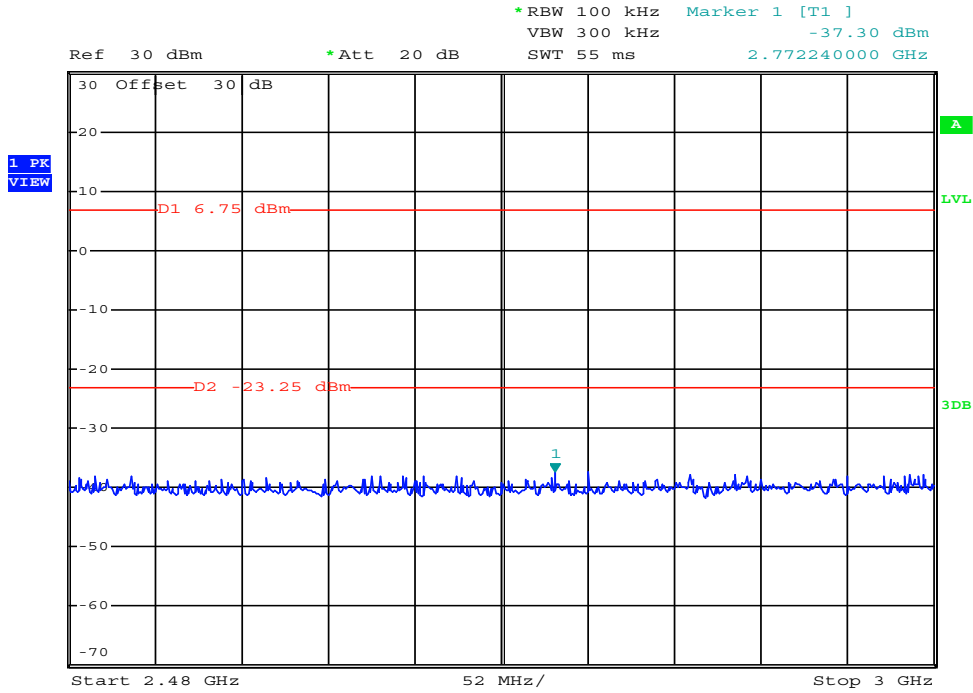
Measured PSD:

**5.73 dBm**

| Emission Level Measurement      |                           |            |                                                           |                                                 |                        |
|---------------------------------|---------------------------|------------|-----------------------------------------------------------|-------------------------------------------------|------------------------|
| Frequency<br><br>Range<br>(GHz) | Bit<br><br>Rate<br>(mbps) | Modulation | Measured<br><br>Emission<br>[E <sub>Meas</sub> ]<br>(dBm) | Limit<br><br>Line<br>[A <sub>L</sub> ]<br>(dBm) | Margin<br><br><br>(dB) |
| to 3GHz                         | 2                         | Pi/4-DQPSK | -37.30                                                    | -23.18                                          | 14.12                  |
| 3-10                            |                           |            | -33.38                                                    |                                                 | 10.20                  |
| 10-13.6                         |                           |            | -33.95                                                    |                                                 | 10.77                  |
| 13.6-25                         |                           |            | -32.12                                                    |                                                 | 8.94                   |
| Results:                        |                           |            |                                                           | Complies                                        |                        |

Margin = A<sub>L</sub> - E<sub>MEAS</sub>

## Conducted Spurious Emissions



Date: 2.DEC.2020 16:28:49

Channel Frequency:

**2417.00 MHz**

DUT Modulation:

**Pi/4-DQPSK**

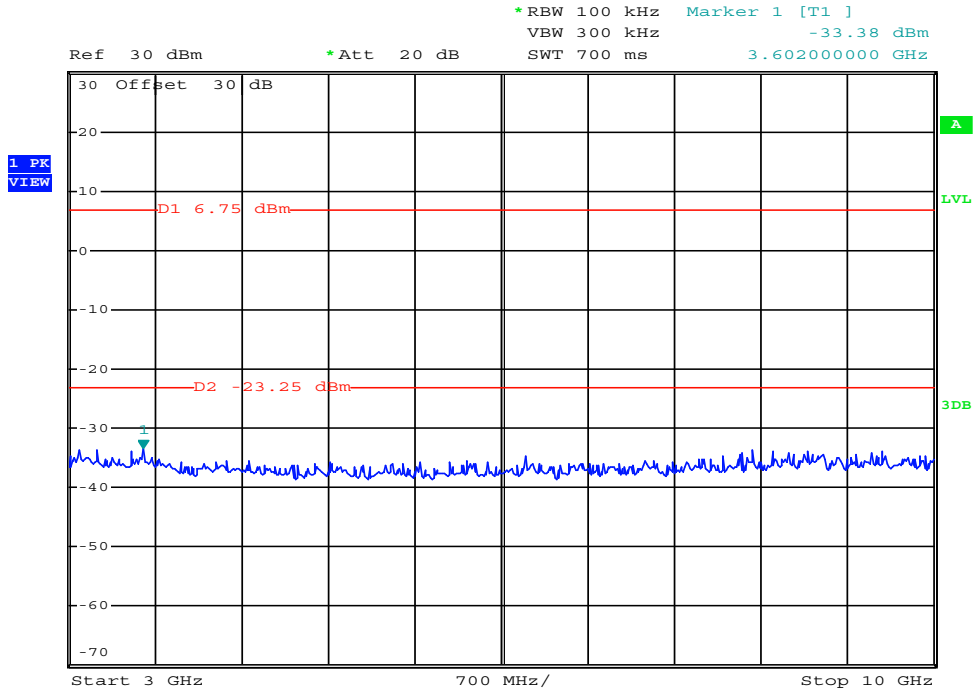
Data Rate:

**2 Mbps**

Measured Emission:

**-37.30 dBm**

## Conducted Spurious Emissions



Date: 2.DEC.2020 16:29:09

Channel Frequency:

**2417.00 MHz**

DUT Modulation:

**Pi/4-DQPSK**

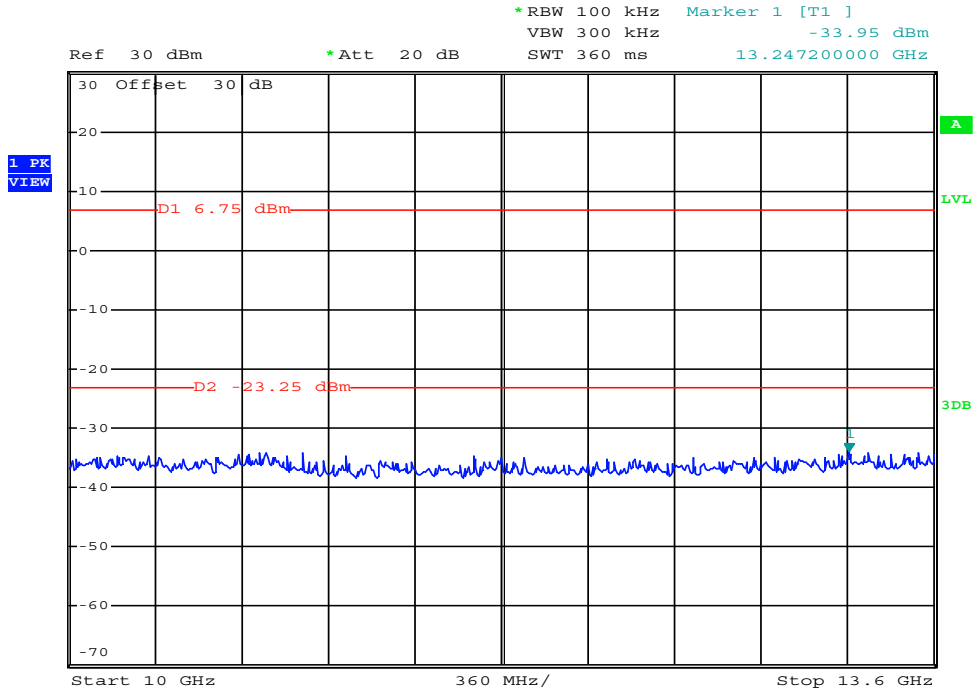
Data Rate:

**2 Mbps**

Measured Emission:

**-33.38 dBm**

## Conducted Spurious Emissions



Date: 2.DEC.2020 16:29:29

Channel Frequency:

**2417.00 MHz**

DUT Modulation:

**Pi/4-DQPSK**

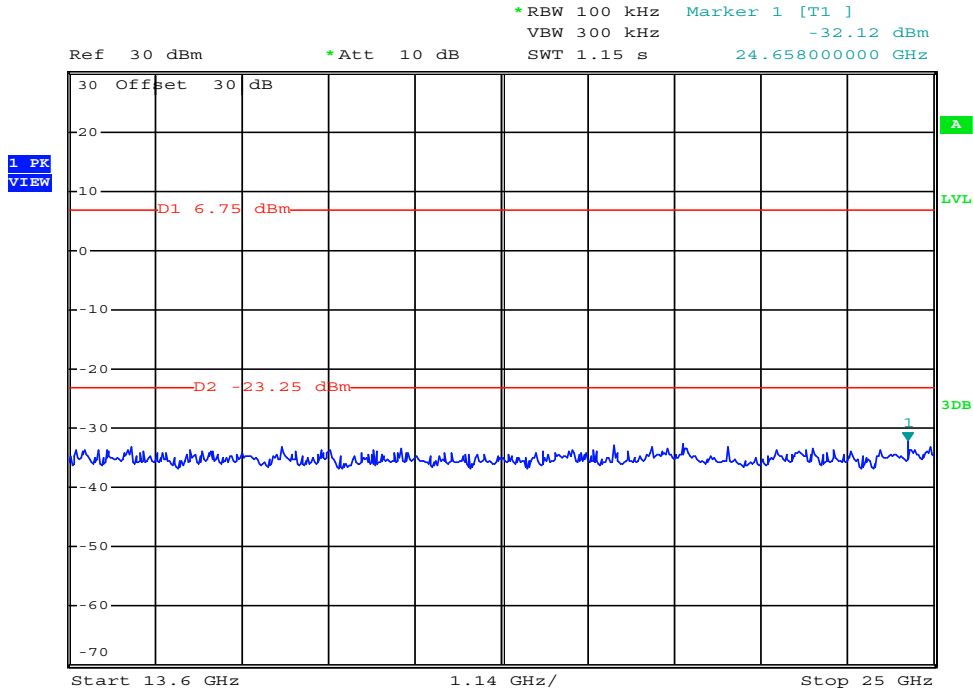
Data Rate:

**2 Mbps**

Measured Emission:

**-33.95 dBm**

## Conducted Spurious Emissions



Date: 2.DEC.2020 16:30:33

Channel Frequency:

**2417.00 MHz**

DUT Modulation:

**Pi/4-DQPSK**

Data Rate:

**2 Mbps**

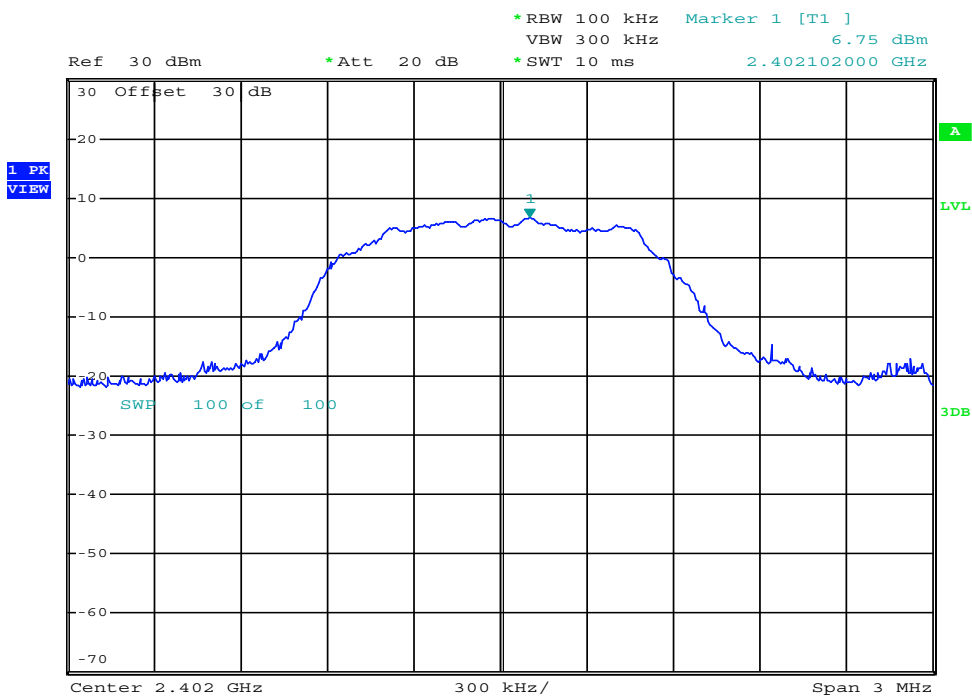
Measured Emission:

**-32.12 dBm**

| Conducted Spurious Emissions - Reference Measurement |            |                       |                                                  |                                                      |                                             |
|------------------------------------------------------|------------|-----------------------|--------------------------------------------------|------------------------------------------------------|---------------------------------------------|
| Frequency<br>(MHz)                                   | Modulation | Bit<br>Rate<br>(Mbps) | Measured<br>PSD<br>[P <sub>Meas</sub> ]<br>(dBm) | Required<br>Attenuation<br>[A <sub>R</sub> ]<br>(dB) | Limit<br>Line<br>[A <sub>L</sub> ]<br>(dBm) |
| 2402.00                                              | 8-DPSK     | 3                     | 6.75                                             | 30                                                   | -23.25                                      |
| 2442.00                                              |            |                       | 6.50                                             | 30                                                   | -23.50                                      |
| 2480.00                                              |            |                       | 5.94                                             | 30                                                   | -24.06                                      |

Limit Line = Measured PSD - Required Attenuation

## Power Spectral Density



Date: 2.DEC.2020 15:59:25

Channel Frequency:

**2402.00 MHz**

DUT Modulation:

**8-DPSK**

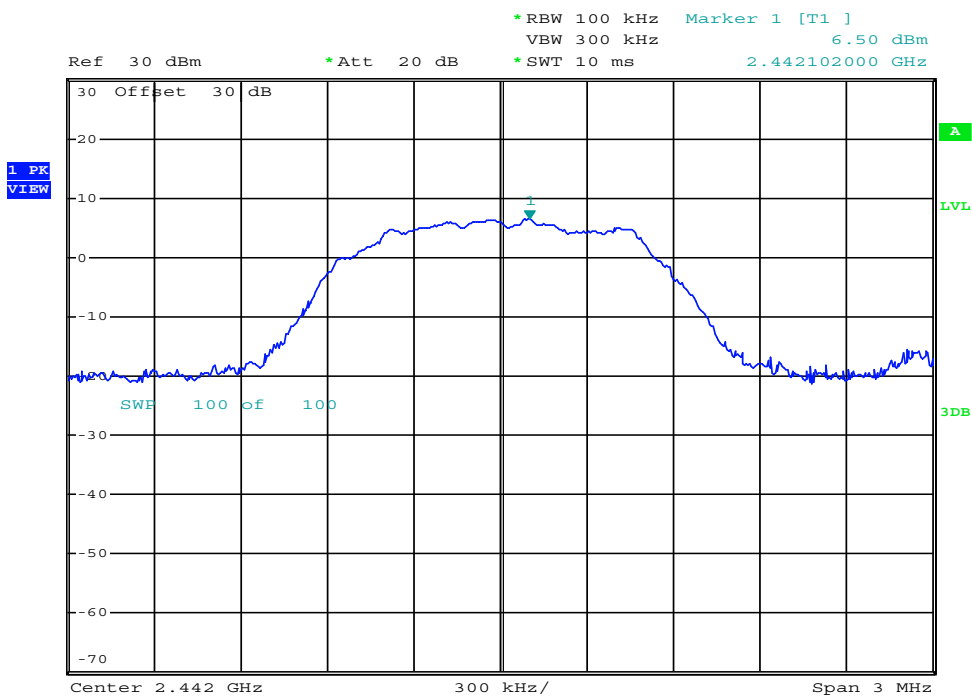
Data Rate:

**3 Mbps**

Measured PSD:

**6.75 dBm**

## Power Spectral Density



Date: 2.DEC.2020 15:58:32

Channel Frequency:

**2442.00 MHz**

DUT Modulation:

**8-DPSK**

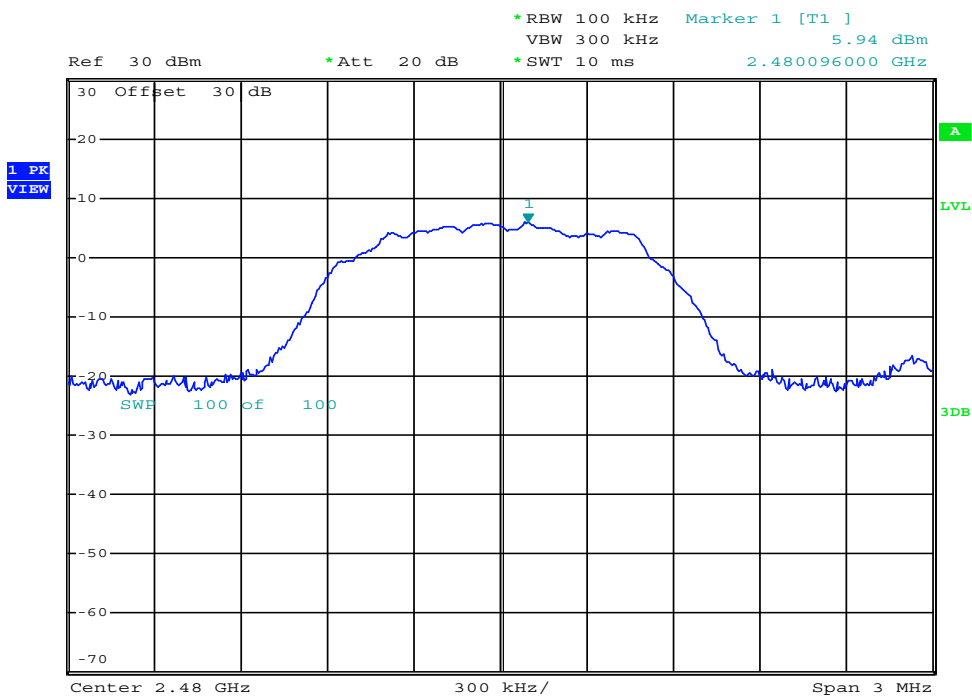
Data Rate:

**3 Mbps**

Measured PSD:

**6.50 dBm**

## Power Spectral Density



Date: 2.DEC.2020 15:58:00

Channel Frequency:

**2480.00 MHz**

DUT Modulation:

**8-DPSK**

Data Rate:

**3 Mbps**

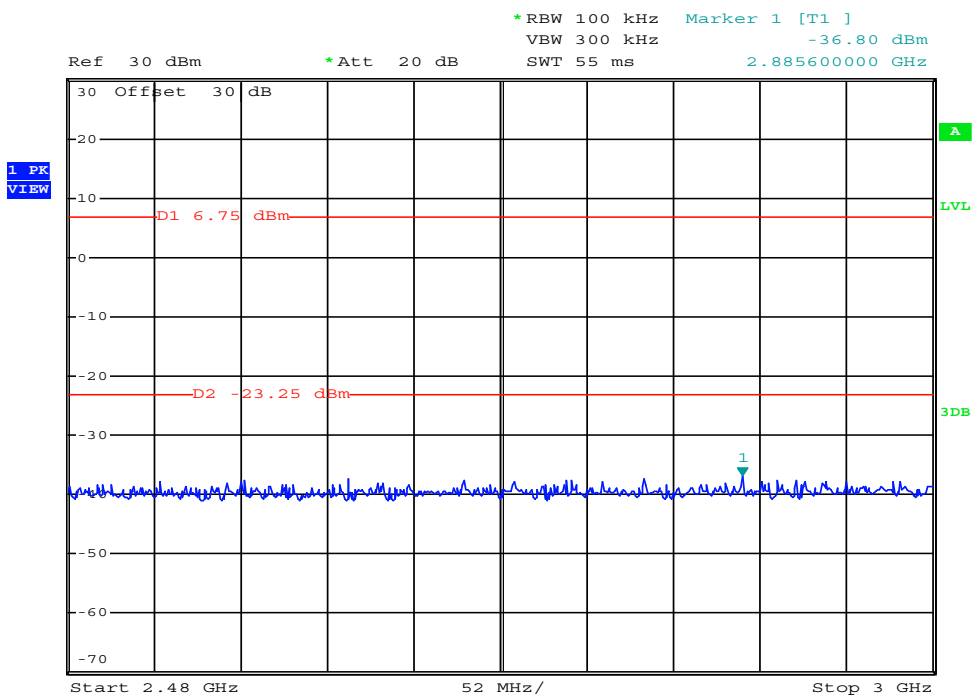
Measured PSD:

**5.94 dBm**

| Emission Level Measurement      |                           |            |                                                           |                                                 |                        |
|---------------------------------|---------------------------|------------|-----------------------------------------------------------|-------------------------------------------------|------------------------|
| Frequency<br><br>Range<br>(GHz) | Bit<br><br>Rate<br>(mbps) | Modulation | Measured<br><br>Emission<br>[E <sub>Meas</sub> ]<br>(dBm) | Limit<br><br>Line<br>[A <sub>L</sub> ]<br>(dBm) | Margin<br><br><br>(dB) |
| to 3GHz                         | 3                         | 8-DPSK     | -36.80                                                    | -23.25                                          | 13.55                  |
| 3-10                            |                           |            | -33.43                                                    |                                                 | 10.18                  |
| 10-13.6                         |                           |            | -33.62                                                    |                                                 | 10.37                  |
| 13.6-25                         |                           |            | -37.03                                                    |                                                 | 13.78                  |
| Results:                        |                           |            |                                                           | Complies                                        |                        |

Margin = A<sub>L</sub> - E<sub>MEAS</sub>

## Conducted Spurious Emissions



Date: 2.DEC.2020 16:24:55

Channel Frequency:

**2417.00 MHz**

DUT Modulation:

**8-DPSK**

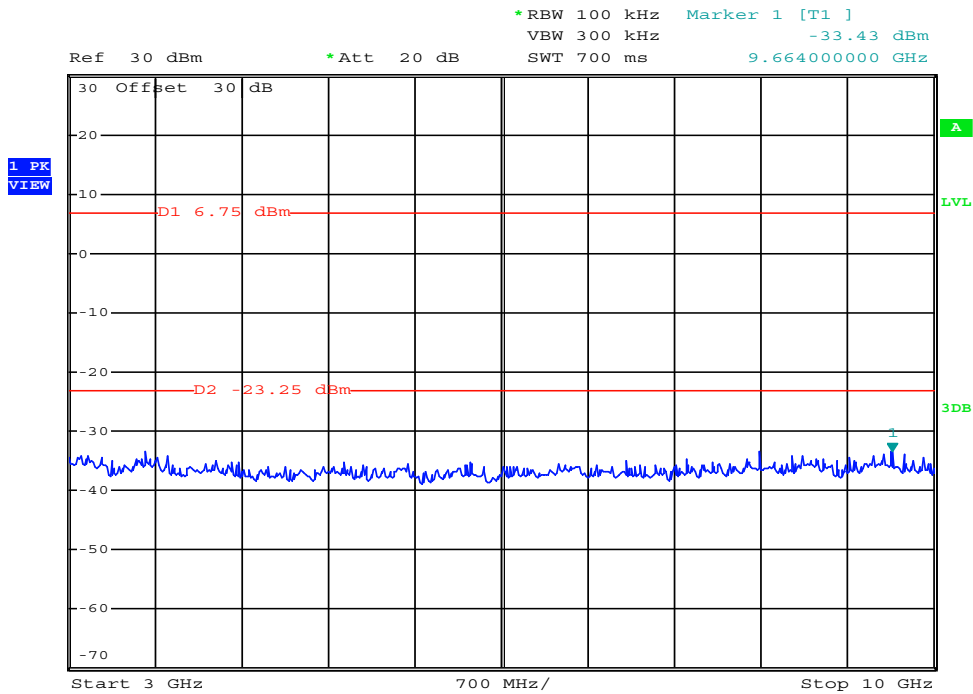
Data Rate:

**3 Mbps**

Measured Emission:

**-36.80 dBm**

## Conducted Spurious Emissions



Date: 2.DEC.2020 16:25:30

Channel Frequency:

**2417.00 MHz**

DUT Modulation:

**8-DPSK**

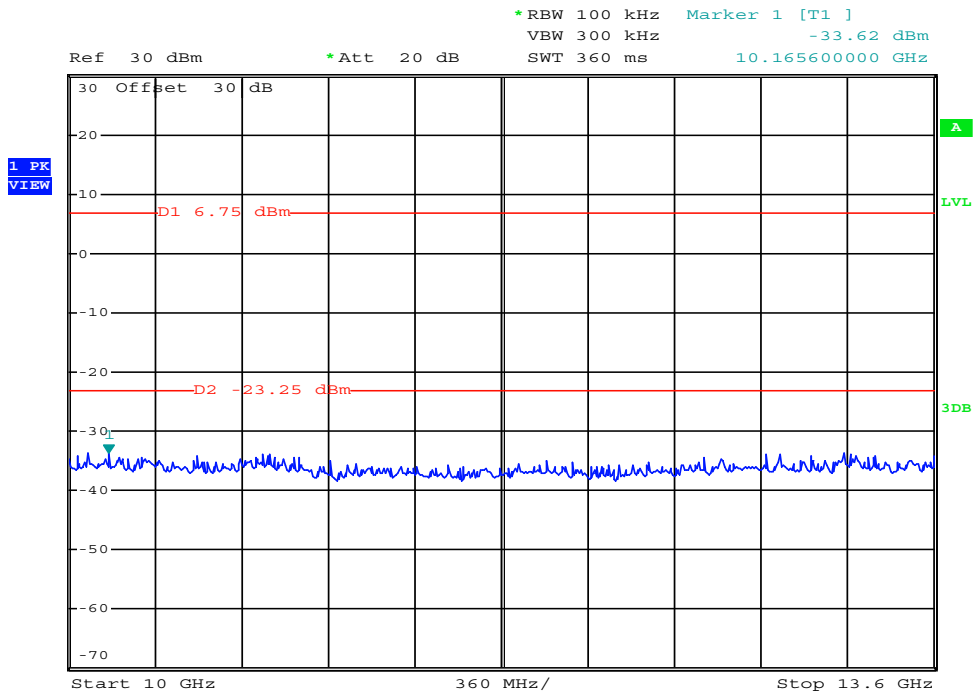
Data Rate:

**3 Mbps**

Measured Emission:

**-33.43 dBm**

## Conducted Spurious Emissions



Date: 2.DEC.2020 16:26:01

Channel Frequency:

**2417.00 MHz**

DUT Modulation:

**8-DPSK**

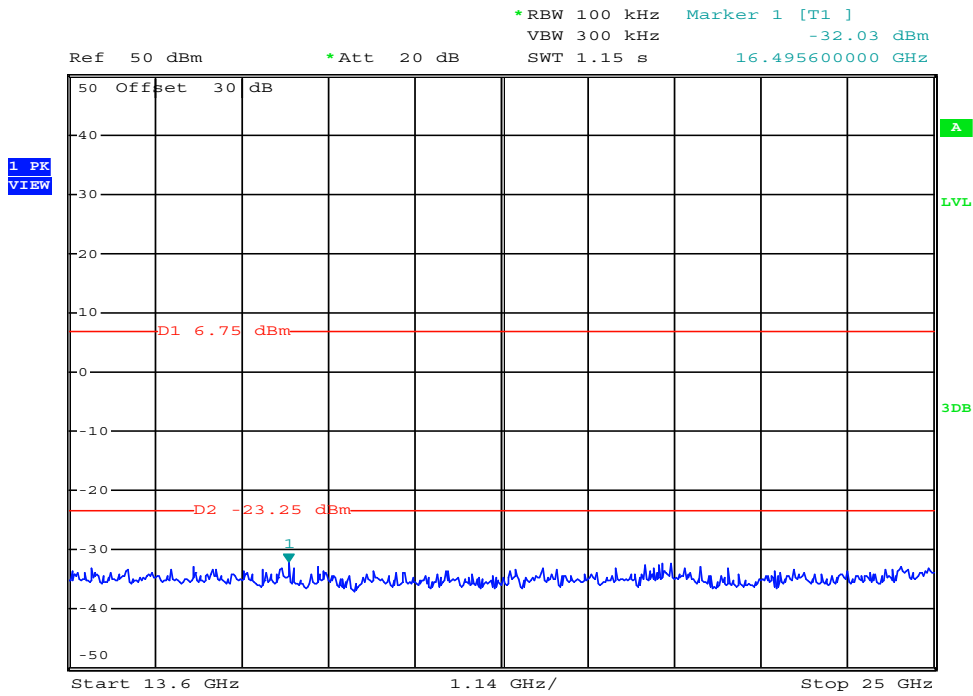
Data Rate:

**3 Mbps**

Measured Emission:

**-33.62 dBm**

## Conducted Spurious Emissions



Date: 2.DEC.2020 16:27:11

Channel Frequency:

**2417.00 MHz**

DUT Modulation:

**8-DPSK**

Data Rate:

**3 Mbps**

Measured Emission:

**-32.03 dBm**