

# FCC Part 47 §15.247 2400-2483.5 MHz 2015

## DUT Information

### Frequencies

|                     |                     |                     |
|---------------------|---------------------|---------------------|
| BT CH 0 (2402 MHz)  | BT CH 1 (2403 MHz)  | BT CH 2 (2404 MHz)  |
| BT CH 3 (2405 MHz)  | BT CH 4 (2406 MHz)  | BT CH 5 (2407 MHz)  |
| BT CH 6 (2408 MHz)  | BT CH 7 (2409 MHz)  | BT CH 8 (2410 MHz)  |
| BT CH 9 (2411 MHz)  | BT CH 10 (2412 MHz) | BT CH 11 (2413 MHz) |
| BT CH 12 (2414 MHz) | BT CH 13 (2415 MHz) | BT CH 14 (2416 MHz) |
| BT CH 15 (2417 MHz) | BT CH 16 (2418 MHz) | BT CH 17 (2419 MHz) |
| BT CH 18 (2420 MHz) | BT CH 19 (2421 MHz) | BT CH 20 (2422 MHz) |
| BT CH 21 (2423 MHz) | BT CH 22 (2424 MHz) | BT CH 23 (2425 MHz) |
| BT CH 24 (2426 MHz) | BT CH 25 (2427 MHz) | BT CH 26 (2428 MHz) |
| BT CH 27 (2429 MHz) | BT CH 28 (2430 MHz) | BT CH 29 (2431 MHz) |
| BT CH 30 (2432 MHz) | BT CH 31 (2433 MHz) | BT CH 32 (2434 MHz) |
| BT CH 33 (2435 MHz) | BT CH 34 (2436 MHz) | BT CH 35 (2437 MHz) |
| BT CH 36 (2438 MHz) | BT CH 37 (2439 MHz) | BT CH 38 (2440 MHz) |
| BT CH 39 (2441 MHz) | BT CH 40 (2442 MHz) | BT CH 41 (2443 MHz) |
| BT CH 42 (2444 MHz) | BT CH 43 (2445 MHz) | BT CH 44 (2446 MHz) |
| BT CH 45 (2447 MHz) | BT CH 46 (2448 MHz) | BT CH 47 (2449 MHz) |
| BT CH 48 (2450 MHz) | BT CH 49 (2451 MHz) | BT CH 50 (2452 MHz) |
| BT CH 51 (2453 MHz) | BT CH 52 (2454 MHz) | BT CH 53 (2455 MHz) |
| BT CH 54 (2456 MHz) | BT CH 55 (2457 MHz) | BT CH 56 (2458 MHz) |
| BT CH 57 (2459 MHz) | BT CH 58 (2460 MHz) | BT CH 59 (2461 MHz) |
| BT CH 60 (2462 MHz) | BT CH 61 (2463 MHz) | BT CH 62 (2464 MHz) |
| BT CH 63 (2465 MHz) | BT CH 64 (2466 MHz) | BT CH 65 (2467 MHz) |
| BT CH 66 (2468 MHz) | BT CH 67 (2469 MHz) | BT CH 68 (2470 MHz) |
| BT CH 69 (2471 MHz) | BT CH 70 (2472 MHz) | BT CH 71 (2473 MHz) |
| BT CH 72 (2474 MHz) | BT CH 73 (2475 MHz) | BT CH 74 (2476 MHz) |
| BT CH 75 (2477 MHz) | BT CH 76 (2478 MHz) | BT CH 77 (2479 MHz) |
| BT CH 78 (2480 MHz) |                     |                     |

### Bandwidths

|               |               |               |
|---------------|---------------|---------------|
| 1 MHz (1 MHz) | 2 MHz (2 MHz) | 3 MHz (3 MHz) |
|---------------|---------------|---------------|

### Power

20.000 dBm (20 dBm)

### Beamforming Gain

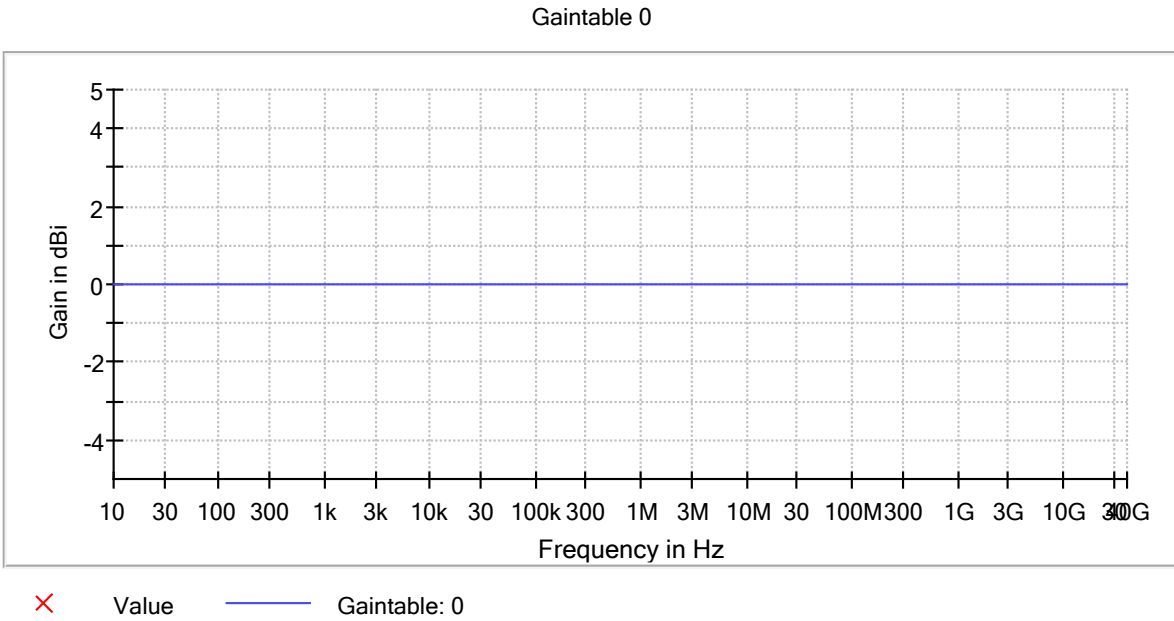
|                        |                              |
|------------------------|------------------------------|
| Powerstep name (value) | Beamforming gain table names |
| 20.000 dBm (20 dBm)    | 0;                           |

### Gain Tables

|                        |                  |
|------------------------|------------------|
| Powerstep name (value) | Gain table names |
| 20.000 dBm (20 dBm)    | Port 1: ---;     |

### DUT Settings

|                              |       |
|------------------------------|-------|
| No. of transmission chains   | 1     |
| Equipment Type               | Other |
| Digital Modulation           | No    |
| Frequency Hopping            | Yes   |
| Carrier Frequency Separation | 1 MHz |
| Dwell Time                   | 5 ms  |



**Hardware Setup: WMS Measurements\TS8997**

|                    |                                                                                                                             |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------|
| Spectrum Analyzer: | SA FSV 40 (SA FSV 40) @ VISA (ADR<br>TCPIP::192.168.48.111::INST0::INSTR), SN 1307.9002K40/101076,<br>FW 3.40               |
| Vector Generator:  | VG SMBV100B (VG SMBV100B) @ VISA (ADR<br>TCPIP::192.168.48.29::INST0::INSTR), SN 101685, FW 4.70.006.33                     |
| Generator:         | SMB100Aa (SMB100A) @ VISA (ADR<br>TCPIP::192.168.48.28::INST0::INSTR), SN 177894, FW / Drv:Rev<br>2.21.0, 07/2016, CVI 2015 |
| OSP:               | OSP-B157W (OSP-B157W) @ VISA (ADR<br>TCPIP::192.168.48.157::INST0::INSTR), SN 1527.1144. /, FW<br>1.27.0.0                  |

## Summary

| Test                      | Frequency (MHz)    | Nominal Power (dBm) | Nominal Bandwidth (MHz) | Result |
|---------------------------|--------------------|---------------------|-------------------------|--------|
| Band Edge low             | --- (hopping)      | 20.0                | 3.000000                | PASS   |
| Band Edge high            | --- (hopping)      | 20.0                | 3.000000                | PASS   |
| Time of Channel Occupancy | 2442.000 (hopping) | 20.0                | 3.000000                | PASS   |
| RF output power           | 2406.000 (single)  | 20.0                | 3.000000                | PASS   |
| Emission Bandwidth 20 dB  | 2406.000 (single)  | 20.0                | 3.000000                | PASS   |
| Band Edge low             | 2406.000 (single)  | 20.0                | 3.000000                | PASS   |
| Tx Spurious Emission      | 2406.000 (single)  | 20.0                | 3.000000                | PASS   |
| RF output power           | 2442.000 (single)  | 20.0                | 3.000000                | PASS   |
| Emission Bandwidth 20 dB  | 2442.000 (single)  | 20.0                | 3.000000                | PASS   |
| Tx Spurious Emission      | 2442.000 (single)  | 20.0                | 3.000000                | PASS   |
| RF output power           | 2475.000 (single)  | 20.0                | 3.000000                | PASS   |
| Emission Bandwidth 20 dB  | 2475.000 (single)  | 20.0                | 3.000000                | PASS   |
| Band Edge high            | 2475.000 (single)  | 20.0                | 3.000000                | PASS   |
| Tx Spurious Emission      | 2475.000 (single)  | 20.0                | 3.000000                | PASS   |

## Band Edge low (frequency independent; 20.000 dBm; 3 MHz)

Test according to FCC title 47 part 15 §15.247(d), KDB 558074 D01 DTS Meas Guidance v03r05 and ANSI C63.10-2013

### Result

| DUT Frequency (MHz) | Result |
|---------------------|--------|
| hopping             | PASS   |

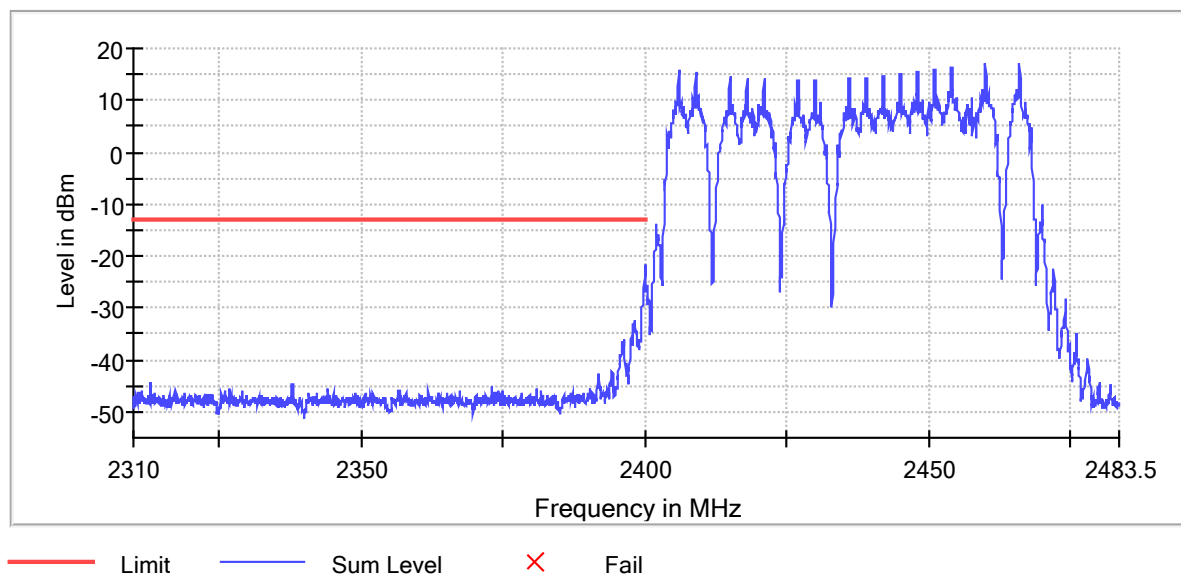
### Inband Peak

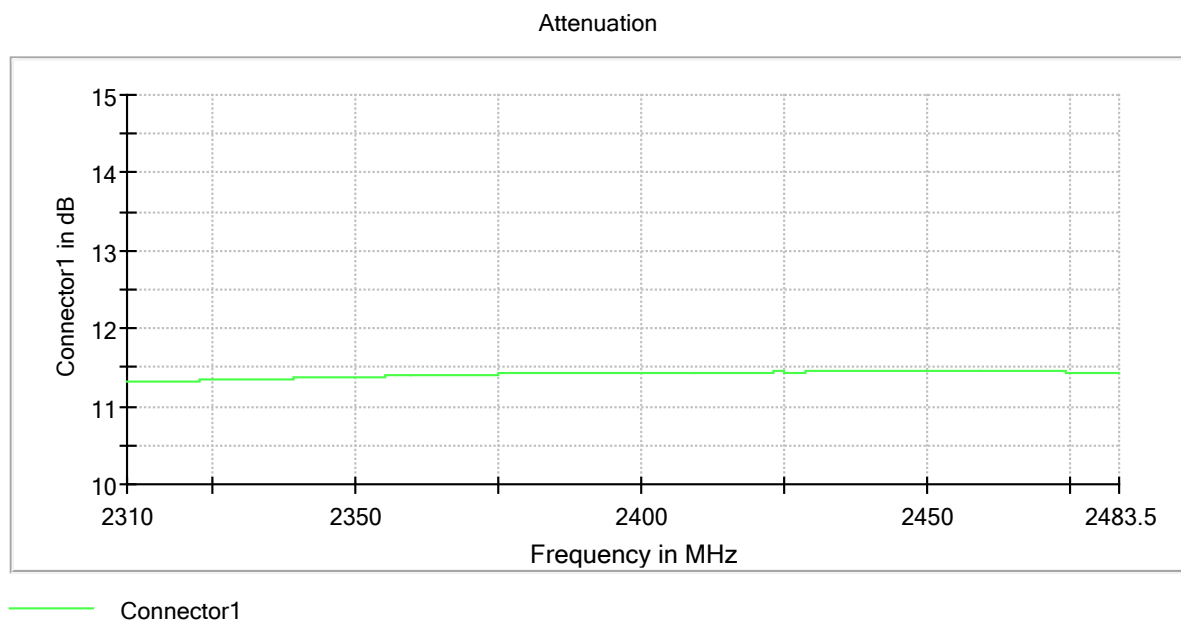
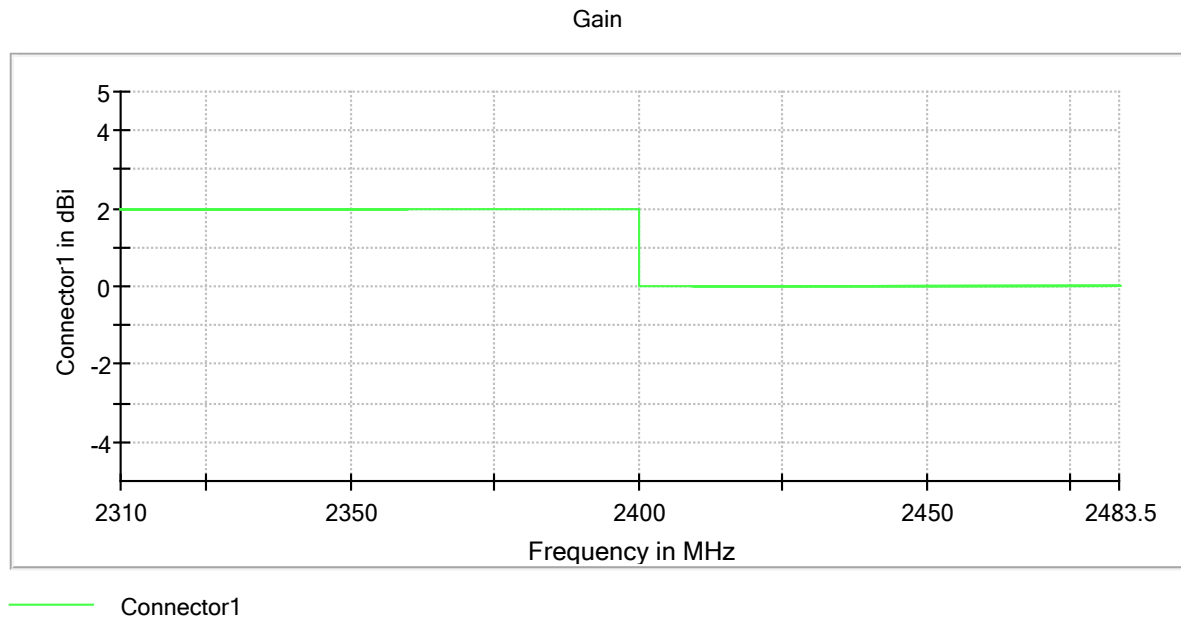
| Frequency (MHz) | Level (dBm) |
|-----------------|-------------|
| 2465.975000     | 17.0        |

### Measurements

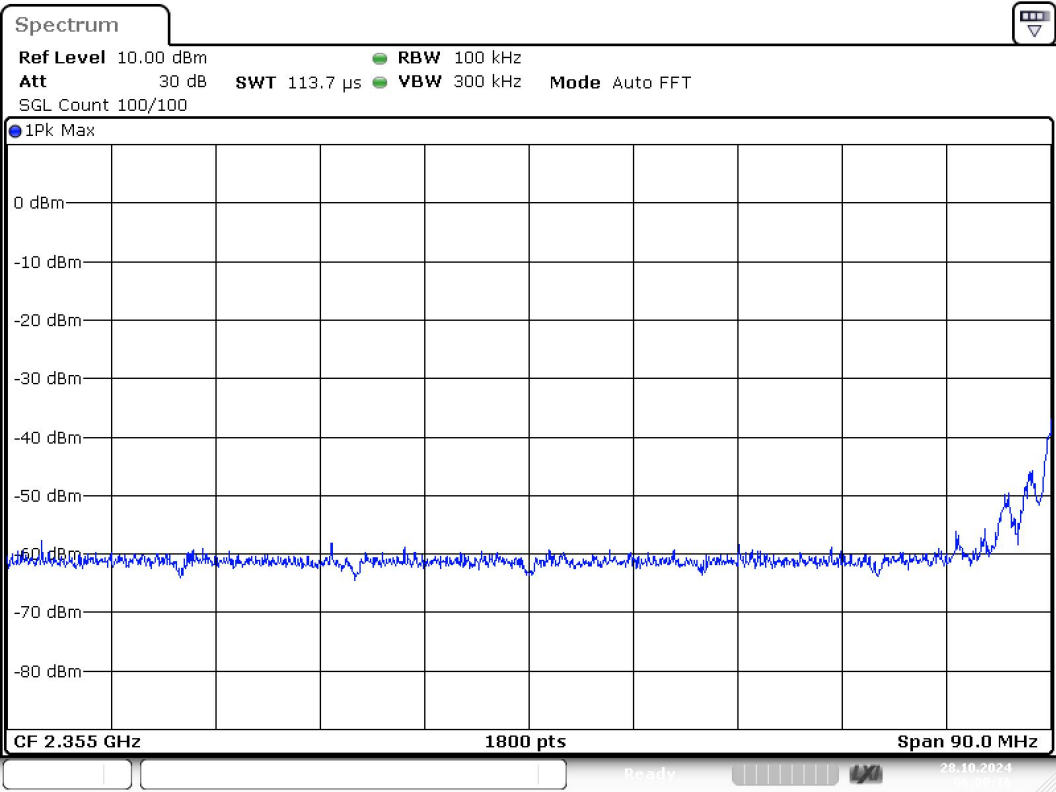
| Frequency (MHz) | Level (dBm) | Margin (dB) | Limit (dBm) | Result |
|-----------------|-------------|-------------|-------------|--------|
| 2399.975000     | -23.6       | 10.6        | -13.0       | PASS   |
| 2399.825000     | -26.0       | 13.0        | -13.0       | PASS   |
| 2399.875000     | -26.1       | 13.0        | -13.0       | PASS   |
| 2399.925000     | -26.2       | 13.2        | -13.0       | PASS   |
| 2399.775000     | -26.4       | 13.4        | -13.0       | PASS   |
| 2399.725000     | -27.0       | 13.9        | -13.0       | PASS   |
| 2399.675000     | -27.0       | 14.0        | -13.0       | PASS   |
| 2399.625000     | -28.2       | 15.2        | -13.0       | PASS   |
| 2399.575000     | -29.5       | 16.5        | -13.0       | PASS   |
| 2399.525000     | -30.0       | 17.0        | -13.0       | PASS   |
| 2399.475000     | -30.6       | 17.6        | -13.0       | PASS   |
| 2399.425000     | -30.6       | 17.6        | -13.0       | PASS   |
| 2399.375000     | -31.6       | 18.5        | -13.0       | PASS   |
| 2398.375000     | -32.2       | 19.2        | -13.0       | PASS   |
| 2398.325000     | -32.4       | 19.4        | -13.0       | PASS   |

Band Edge



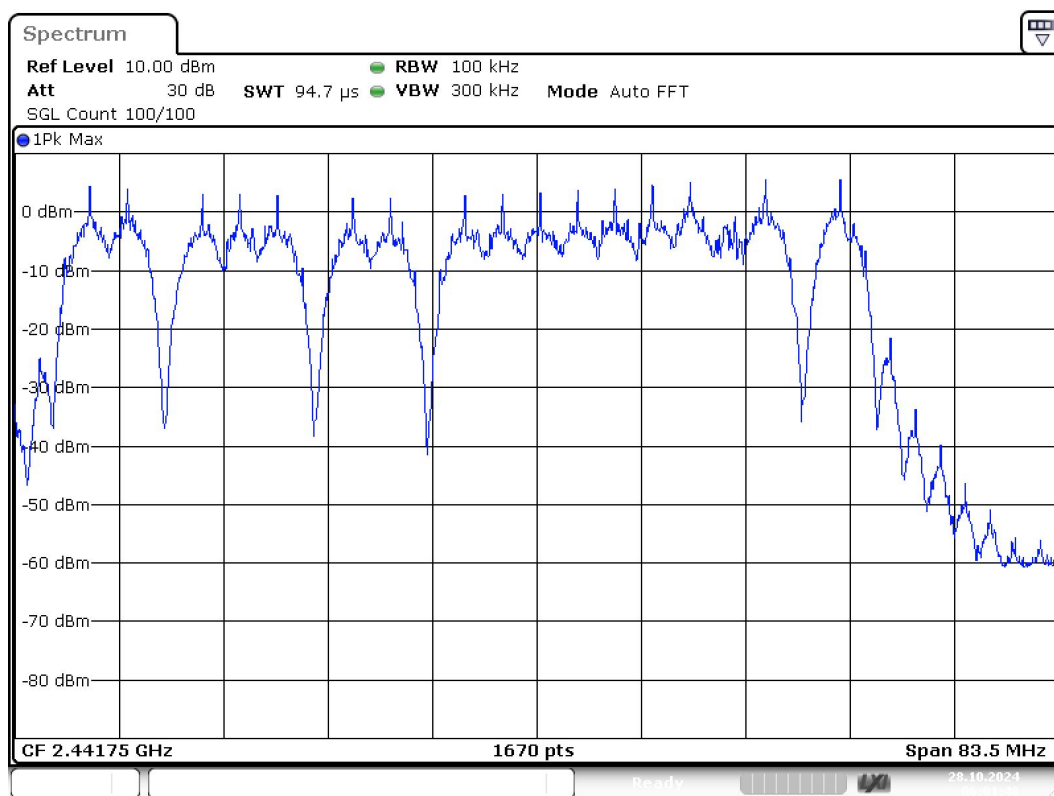


Band Edge Connector 1\_0



Date: 28.OCT.2024 06:00:16

Band Edge Connector 1\_1



Date: 28.OCT.2024 06:01:49

## Measurement 1

| Setting               | Instrument Value | Target Value   |
|-----------------------|------------------|----------------|
| Start Frequency       | 2.31000 GHz      | 2.31000 GHz    |
| Stop Frequency        | 2.40000 GHz      | 2.40000 GHz    |
| Span                  | 90.000 MHz       | 90.000 MHz     |
| RBW                   | 100.000 kHz      | <= 100.000 kHz |
| VBW                   | 300.000 kHz      | >= 300.000 kHz |
| SweepPoints           | 1800             | ~ 1800         |
| Sweptime              | 113.672 µs       | AUTO           |
| Reference Level       | 10.000 dBm       | 10.000 dBm     |
| Attenuation           | 30.000 dB        | AUTO           |
| Detector              | MaxPeak          | MaxPeak        |
| SweepCount            | 100              | 100            |
| Filter                | 3 dB             | 3 dB           |
| Trace Mode            | Max Hold         | Max Hold       |
| SweepType             | FFT              | AUTO           |
| Preamp                | off              | off            |
| Stablemode            | Trace            | Trace          |
| Stablevalue           | 0.50 dB          | 0.50 dB        |
| Run                   | 14 / max. 150    | max. 150       |
| Stable                | 3 / 3            | 3              |
| Max Stable Difference | 0.00 dB          | 0.50 dB        |

## Measurement 2

| Setting         | Instrument Value | Target Value   |
|-----------------|------------------|----------------|
| Start Frequency | 2.40000 GHz      | 2.40000 GHz    |
| Stop Frequency  | 2.48350 GHz      | 2.48350 GHz    |
| Span            | 83.500 MHz       | 83.500 MHz     |
| RBW             | 100.000 kHz      | <= 100.000 kHz |
| VBW             | 300.000 kHz      | >= 300.000 kHz |

|                              |                      |                   |
|------------------------------|----------------------|-------------------|
| <b>SweepPoints</b>           | <b>1670</b>          | <b>~ 1670</b>     |
| <b>SweepTime</b>             | <b>94.727 µs</b>     | <b>AUTO</b>       |
| <b>Reference Level</b>       | <b>10.000 dBm</b>    | <b>10.000 dBm</b> |
| <b>Attenuation</b>           | <b>30.000 dB</b>     | <b>AUTO</b>       |
| <b>Detector</b>              | <b>MaxPeak</b>       | <b>MaxPeak</b>    |
| <b>SweepCount</b>            | <b>100</b>           | <b>100</b>        |
| <b>Filter</b>                | <b>3 dB</b>          | <b>3 dB</b>       |
| <b>Trace Mode</b>            | <b>Max Hold</b>      | <b>Max Hold</b>   |
| <b>SweepType</b>             | <b>FFT</b>           | <b>AUTO</b>       |
| <b>Preamplifier</b>          | <b>off</b>           | <b>off</b>        |
| <b>Stablemode</b>            | <b>Trace</b>         | <b>Trace</b>      |
| <b>Stablevalue</b>           | <b>0.50 dB</b>       | <b>0.50 dB</b>    |
| <b>Run</b>                   | <b>78 / max. 150</b> | <b>max. 150</b>   |
| <b>Stable</b>                | <b>3 / 3</b>         | <b>3</b>          |
| <b>Max Stable Difference</b> | <b>0.00 dB</b>       | <b>0.50 dB</b>    |

## Band Edge high (frequency independent; 20.000 dBm; 3 MHz)

Test according to FCC title 47 part 15 §15.247(d), KDB 558074 D01 DTS Meas Guidance v03r05 and ANSI C63.10-2013

### Result

| DUT Frequency (MHz) | Result |
|---------------------|--------|
| hopping             | PASS   |

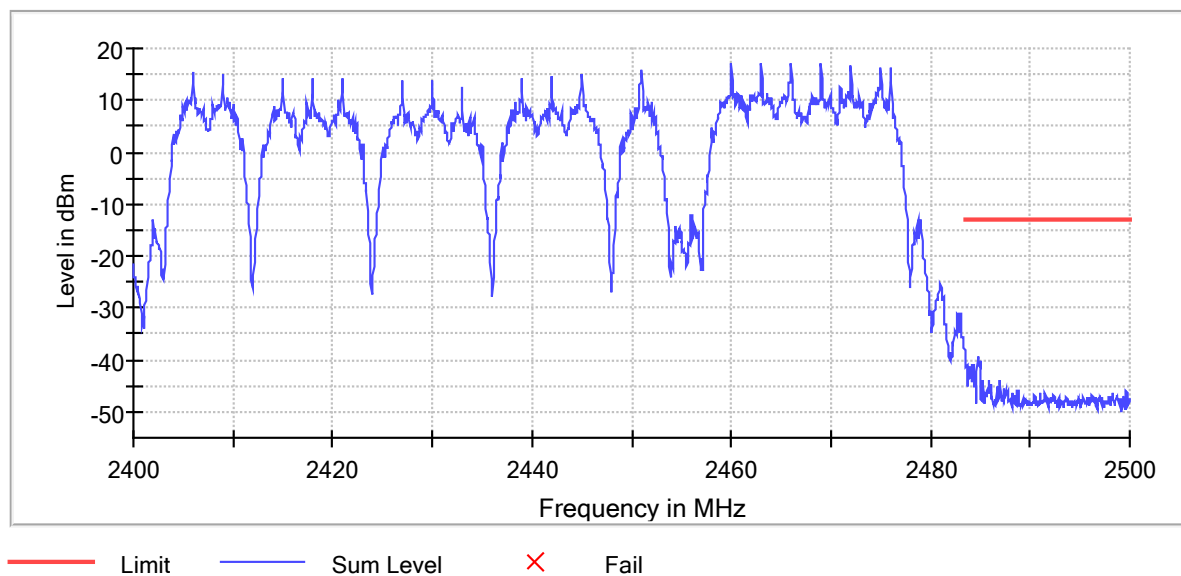
### Inband Peak

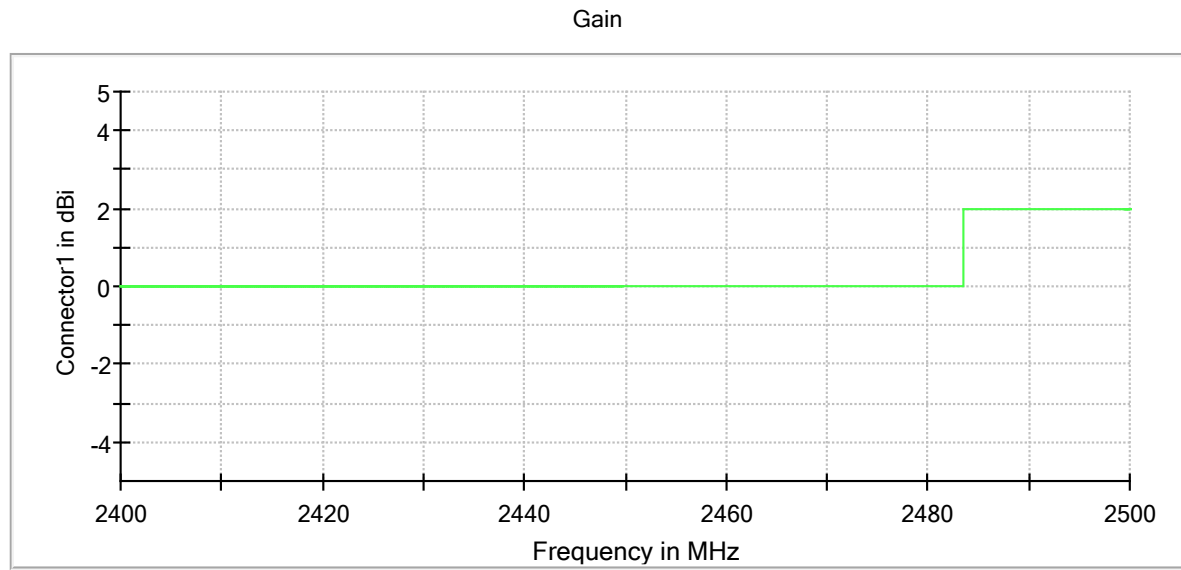
| Frequency (MHz) | Level (dBm) |
|-----------------|-------------|
| 2462.975000     | 17.1        |

### Measurements

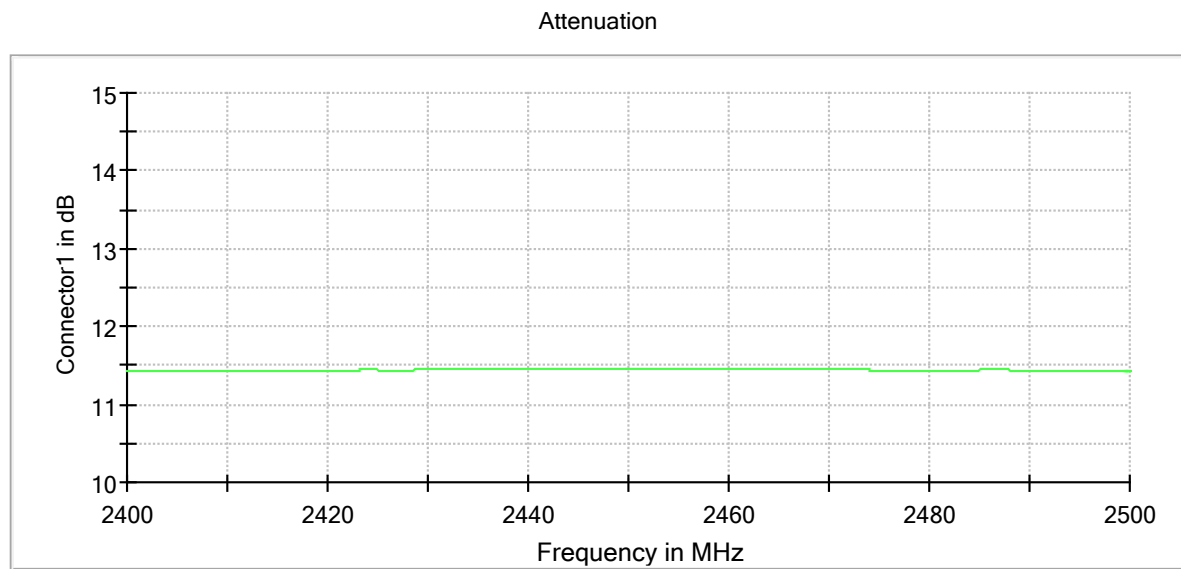
| Frequency (MHz) | Level (dBm) | Margin (dB) | Limit (dBm) | Result |
|-----------------|-------------|-------------|-------------|--------|
| 2484.775000     | -39.3       | 26.4        | -12.9       | PASS   |
| 2484.825000     | -39.5       | 26.6        | -12.9       | PASS   |
| 2484.725000     | -39.8       | 26.9        | -12.9       | PASS   |
| 2484.975000     | -40.3       | 27.4        | -12.9       | PASS   |
| 2483.525000     | -40.4       | 27.5        | -12.9       | PASS   |
| 2483.625000     | -41.0       | 28.1        | -12.9       | PASS   |
| 2484.225000     | -41.0       | 28.1        | -12.9       | PASS   |
| 2485.025000     | -41.1       | 28.2        | -12.9       | PASS   |
| 2484.275000     | -41.1       | 28.2        | -12.9       | PASS   |
| 2484.875000     | -41.2       | 28.3        | -12.9       | PASS   |
| 2483.875000     | -41.3       | 28.4        | -12.9       | PASS   |
| 2483.675000     | -41.4       | 28.5        | -12.9       | PASS   |
| 2483.825000     | -41.4       | 28.5        | -12.9       | PASS   |
| 2484.925000     | -41.4       | 28.5        | -12.9       | PASS   |
| 2483.575000     | -41.5       | 28.6        | -12.9       | PASS   |

Band Edge



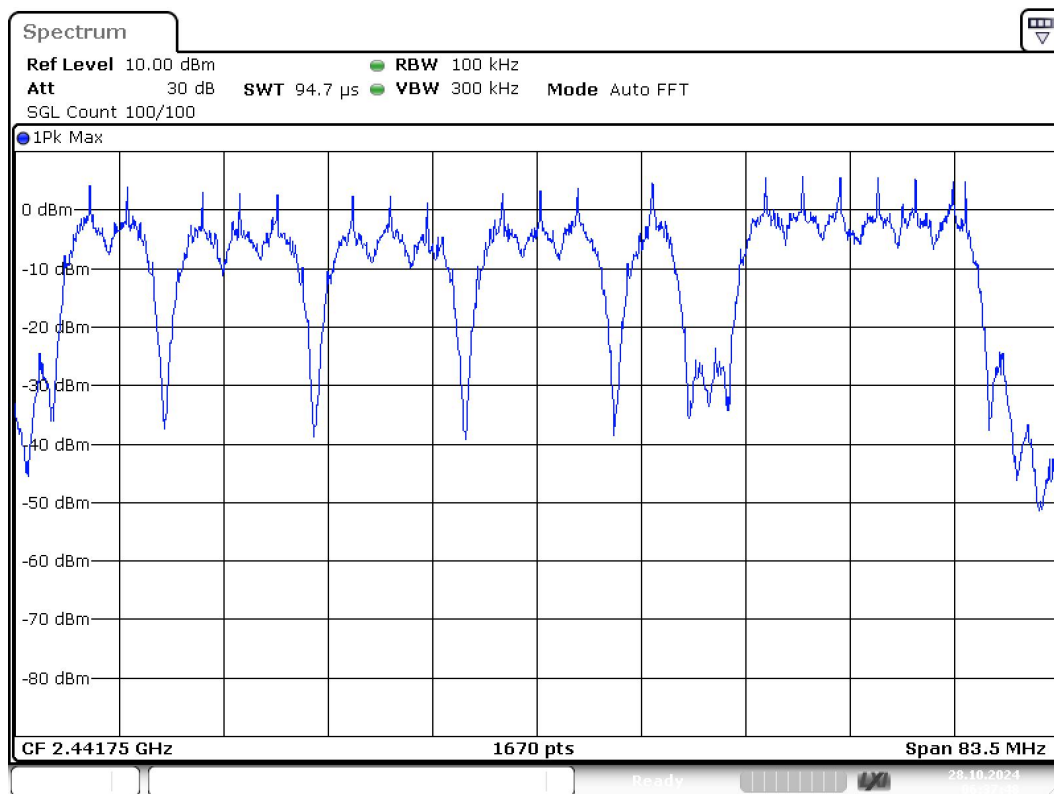


Connector1



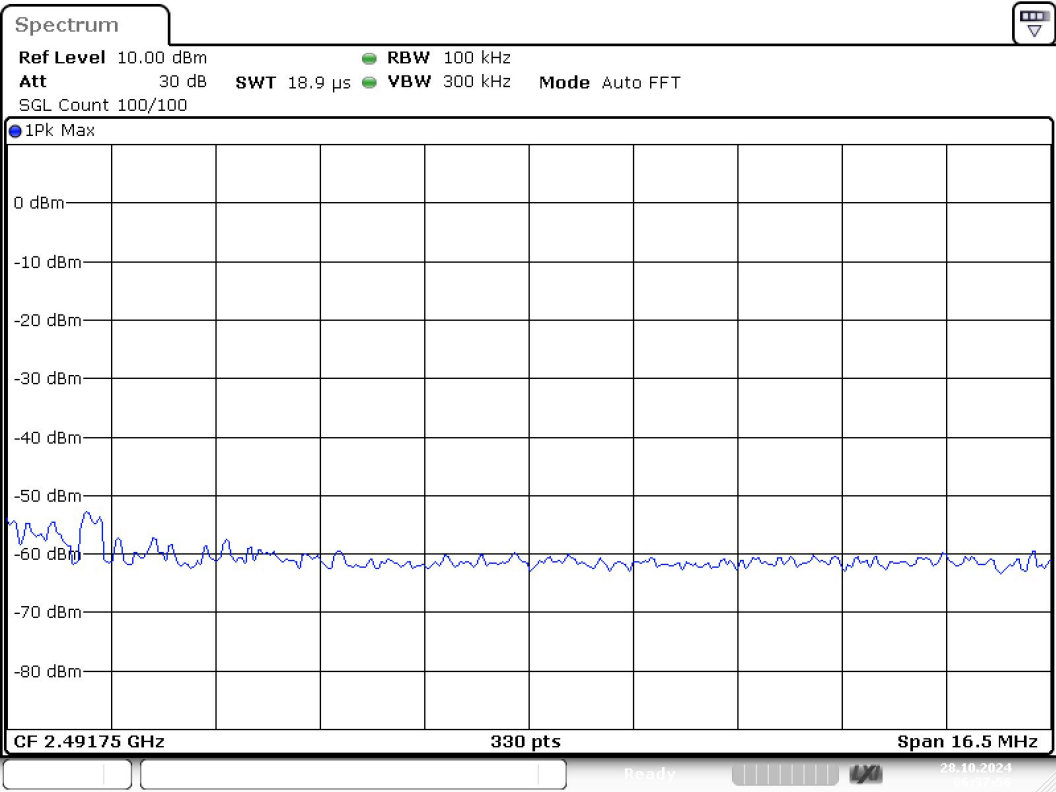
Connector1

Band Edge Connector 1\_0



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Band Edge Connector 1\_1



Date: 28.OCT.2024 06:37:56

Measurement 1

| Setting               | Instrument Value | Target Value   |
|-----------------------|------------------|----------------|
| Start Frequency       | 2.40000 GHz      | 2.40000 GHz    |
| Stop Frequency        | 2.48350 GHz      | 2.48350 GHz    |
| Span                  | 83.500 MHz       | 83.500 MHz     |
| RBW                   | 100.000 kHz      | <= 100.000 kHz |
| VBW                   | 300.000 kHz      | >= 300.000 kHz |
| SweepPoints           | 1670             | ~ 1670         |
| Sweptime              | 94.727 µs        | AUTO           |
| Reference Level       | 10.000 dBm       | 10.000 dBm     |
| Attenuation           | 30.000 dB        | AUTO           |
| Detector              | MaxPeak          | MaxPeak        |
| SweepCount            | 100              | 100            |
| Filter                | 3 dB             | 3 dB           |
| Trace Mode            | Max Hold         | Max Hold       |
| SweepType             | FFT              | AUTO           |
| Preamp                | off              | off            |
| Stablemode            | Trace            | Trace          |
| Stablevalue           | 0.50 dB          | 0.50 dB        |
| Run                   | 89 / max. 150    | max. 150       |
| Stable                | 3 / 3            | 3              |
| Max Stable Difference | 0.05 dB          | 0.50 dB        |

Measurement 2

| Setting         | Instrument Value | Target Value   |
|-----------------|------------------|----------------|
| Start Frequency | 2.48350 GHz      | 2.48350 GHz    |
| Stop Frequency  | 2.50000 GHz      | 2.50000 GHz    |
| Span            | 16.500 MHz       | 16.500 MHz     |
| RBW             | 100.000 kHz      | <= 100.000 kHz |
| VBW             | 300.000 kHz      | >= 300.000 kHz |

|                              |                     |                   |
|------------------------------|---------------------|-------------------|
| <b>SweepPoints</b>           | <b>330</b>          | <b>~ 330</b>      |
| <b>SweepTime</b>             | <b>18.945 µs</b>    | <b>AUTO</b>       |
| <b>Reference Level</b>       | <b>10.000 dBm</b>   | <b>10.000 dBm</b> |
| <b>Attenuation</b>           | <b>30.000 dB</b>    | <b>AUTO</b>       |
| <b>Detector</b>              | <b>MaxPeak</b>      | <b>MaxPeak</b>    |
| <b>SweepCount</b>            | <b>100</b>          | <b>100</b>        |
| <b>Filter</b>                | <b>3 dB</b>         | <b>3 dB</b>       |
| <b>Trace Mode</b>            | <b>Max Hold</b>     | <b>Max Hold</b>   |
| <b>SweepType</b>             | <b>FFT</b>          | <b>AUTO</b>       |
| <b>Preamp</b>                | <b>off</b>          | <b>off</b>        |
| <b>Stablemode</b>            | <b>Trace</b>        | <b>Trace</b>      |
| <b>Stablevalue</b>           | <b>0.50 dB</b>      | <b>0.50 dB</b>    |
| <b>Run</b>                   | <b>4 / max. 150</b> | <b>max. 150</b>   |
| <b>Stable</b>                | <b>3 / 3</b>        | <b>3</b>          |
| <b>Max Stable Difference</b> | <b>0.00 dB</b>      | <b>0.50 dB</b>    |

## Time of Channel Occupancy (2442 MHz; 20.000 dBm; 3 MHz)

Customized settings.

Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v03r05 and ANSI C63.10-2013

### Result

| DUT Frequency (MHz) | Result | Number of Hops | Average time of occupancy (ms) | Threshold (dBm) |
|---------------------|--------|----------------|--------------------------------|-----------------|
| 2442.000000         | PASS   | 39             | 130.441                        | 0.0             |

### Periode

| Min (ms) | Max (ms) | Mean (ms) |
|----------|----------|-----------|
| 39.796   | 300.223  | 161.574   |

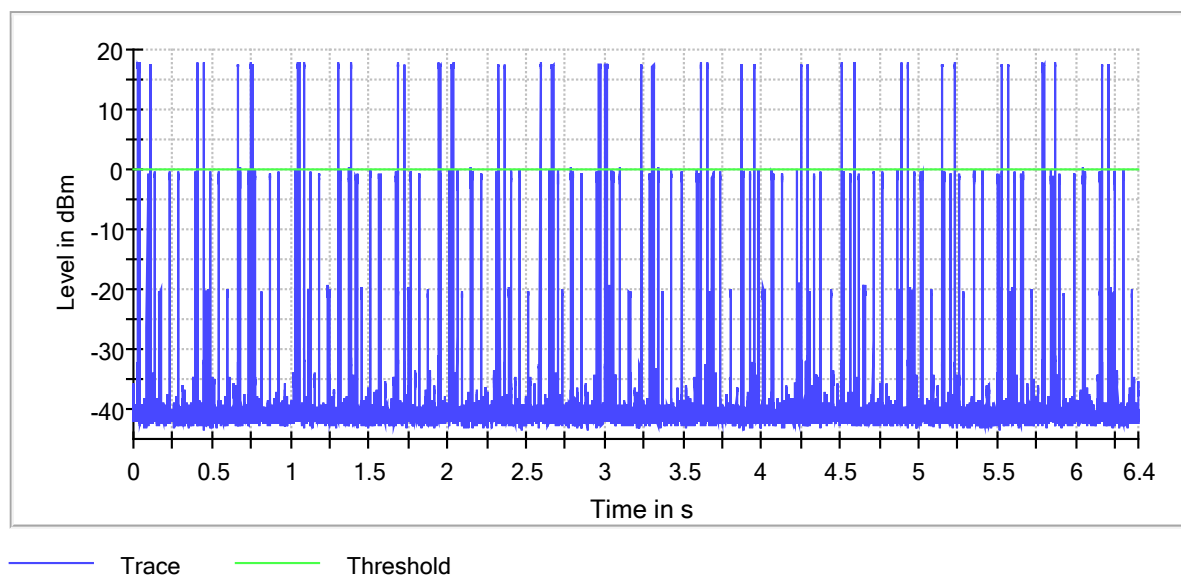
### Transmit Time per Hop

| Min (ms) | Max (ms) | Limit Max for Max (ms) | Limit Min for Max (ms) | Mean (ms) |
|----------|----------|------------------------|------------------------|-----------|
| 1.710    | 6.874    | 400.000                | 0.000                  | 3.301     |

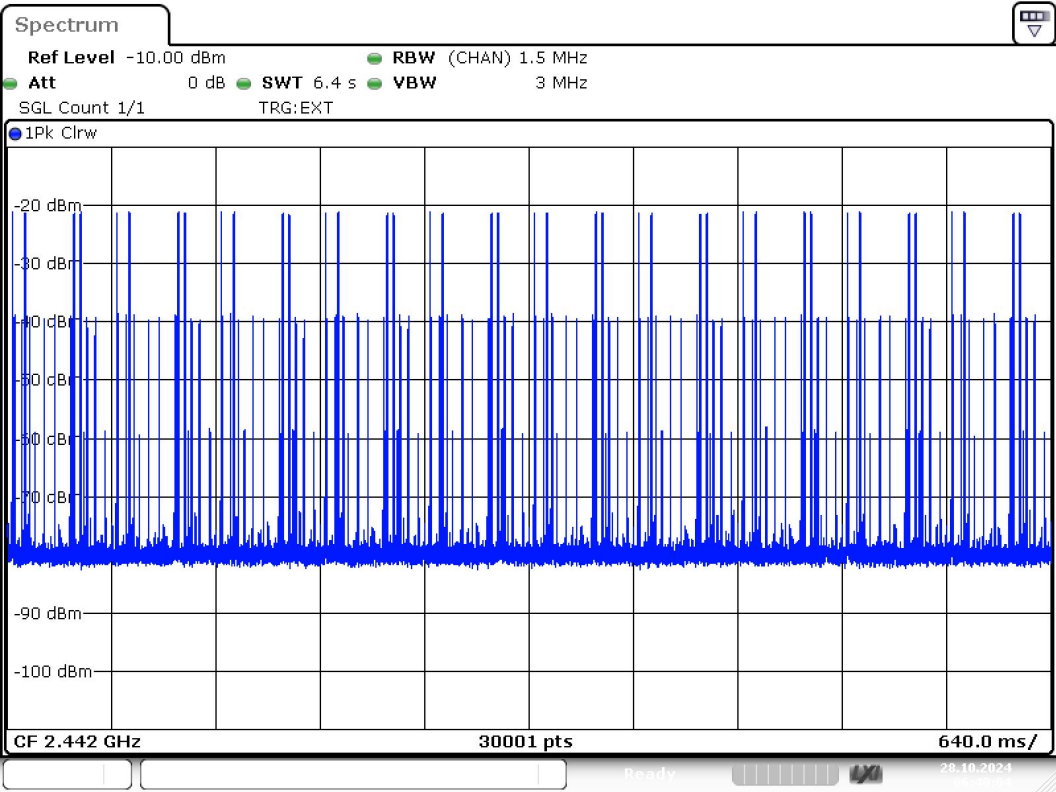
### DwellTime

| Min (ms) | Max (ms) | Mean (ms) |
|----------|----------|-----------|
| 1.806    | 7.423    | 3.534     |

Time of Channel Occupancy



Time of Channel Occupancy



Date: 28.OCT.2024 06:40:04

Measurement

| Setting          | Instrument Value | Target Value |
|------------------|------------------|--------------|
| Center Frequency | 2.44200 GHz      | 2.44200 GHz  |
| Span             | ZeroSpan         | ZeroSpan     |
| RBW              | 1.500 MHz        | ~ 1.500 MHz  |
| VBW              | 3.000 MHz        | ~ 3.000 MHz  |
| SweepPoints      | 30001            | ~ 30001      |
| SweepTime        | 6.400 s          | 6.400 s      |
| Reference Level  | -10.000 dBm      | -10.000 dBm  |
| Attenuation      | 0.000 dB         | 0.000 dB     |
| Detector         | MaxPeak          | MaxPeak      |
| SweepCount       | 1                | 1            |
| Filter           | Channel          | Channel      |
| Trace Mode       | Clear Write      | Clear Write  |
| SweepType        | Sweep            | AUTO         |
| Preamp           | off              | off          |
| Trigger          | External         | External     |
| Trigger Offset   | 0.000 s          | 0.000 s      |

OSP

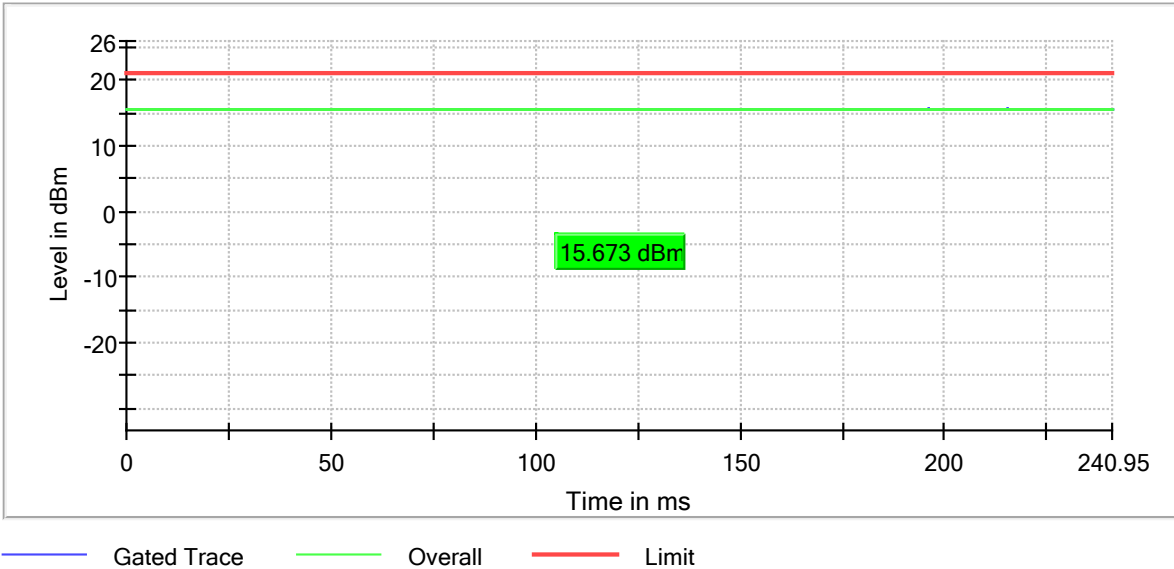
| Setting          | Instrument Value | Target Value |
|------------------|------------------|--------------|
| Measurement Time | 6.400 s          | 6.400 s      |
| Tracepoints      | 6400000          | 6400000      |
| Time resolution  | 1.000 µs         | 1.000 µs     |
| Detector         | RMS              | RMS          |

RF output power (2406 MHz; 20.000 dBm; 3 MHz; Test Mode)

Result

| DUT Frequency (MHz) | Gated RMS (dBm) | Limit Max (dBm) | Gated EIRP (dBm) | DutyCycle (%) | Result |
|---------------------|-----------------|-----------------|------------------|---------------|--------|
| 2406.000000         | 15.7            | 21.0            | 15.7             | 24.236        | PASS   |

Gated Trace



OSP PowerMeter settings

| Setting          | Instrument Value | Target Value  |
|------------------|------------------|---------------|
| Measurement Time | 1.000 s          | 1.000 s       |
| Points           | 1000000          | 1000000       |
| Time resolution  | 1.000 $\mu$ s    | 1.000 $\mu$ s |

## Emission Bandwidth 20 dB (2406 MHz; 20.000 dBm; 3 MHz; Test Mode)

Customized settings.

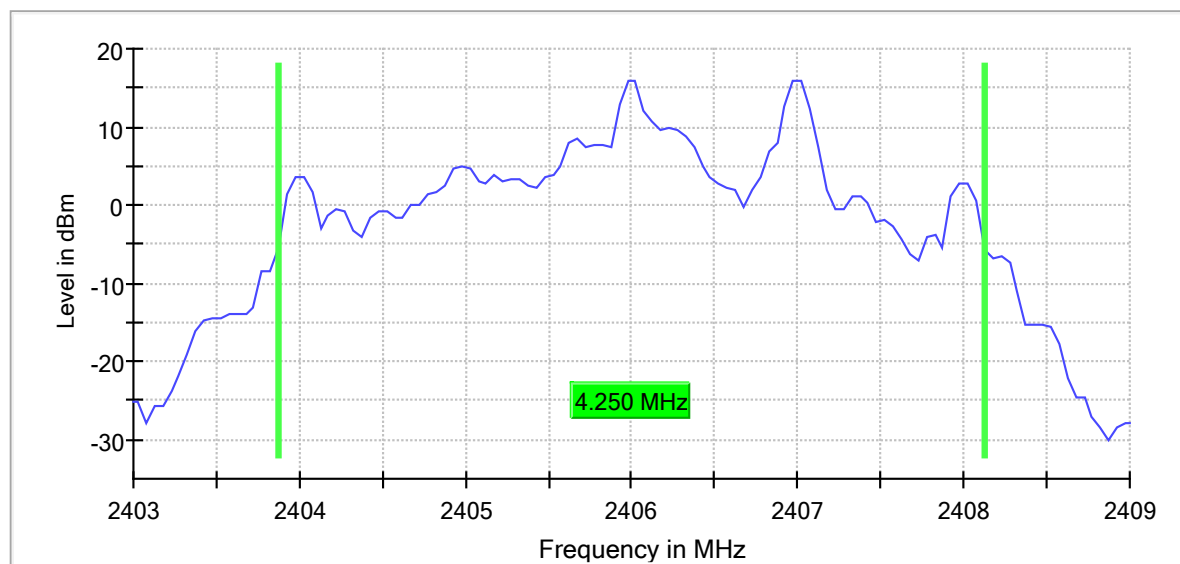
### 20 dB Bandwidth

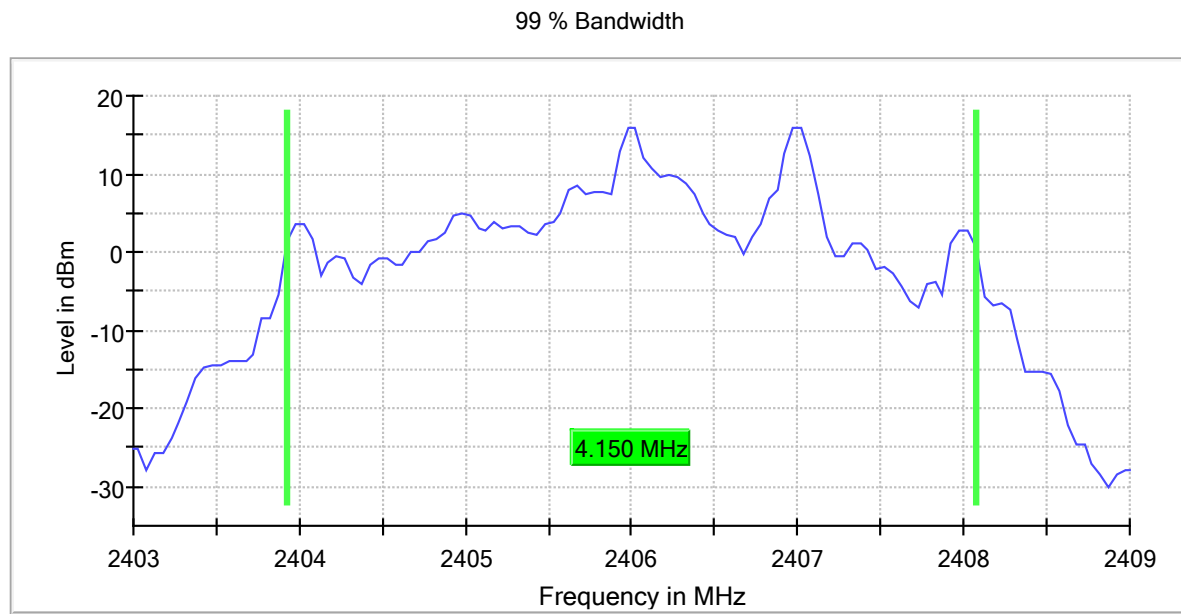
| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---------------------|-----------------|-----------------|-----------------|----------------------|-----------------------|
| 2406.000000         | 4.250000        | ---             | ---             | 2403.875000          | 2408.125000           |

(continuation of the "20 dB Bandwidth" table from column 6 ...)

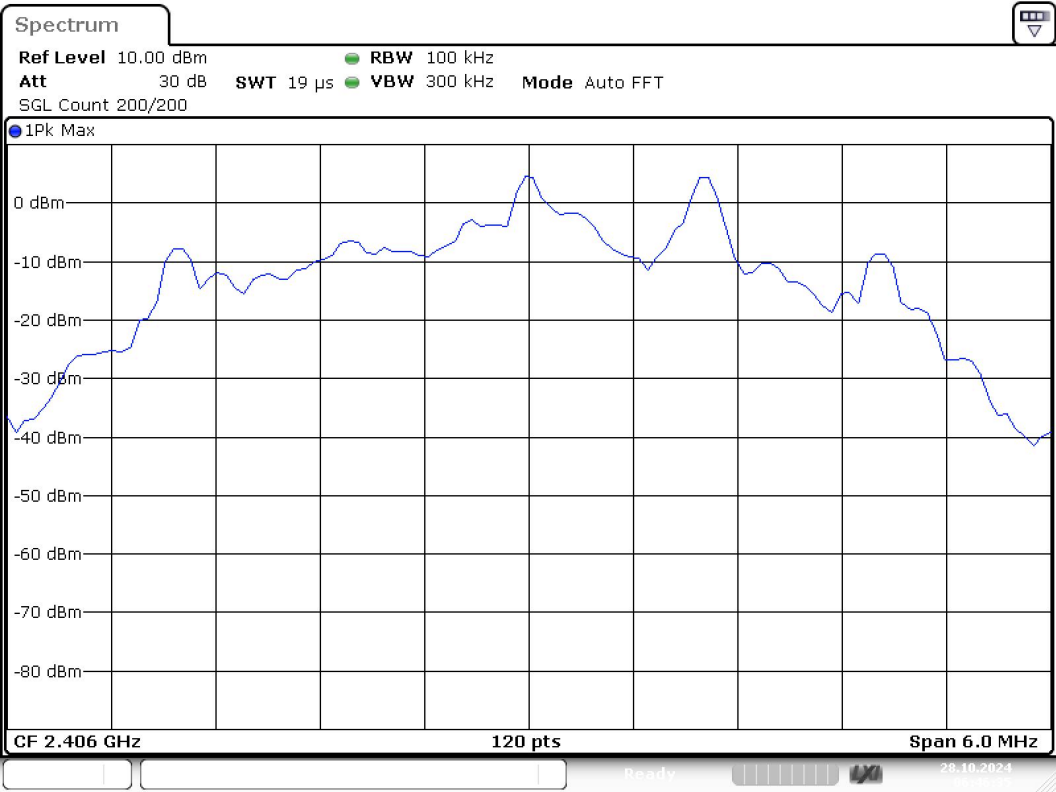
| DUT Frequency (MHz) | Max Level (dBm) | Result |
|---------------------|-----------------|--------|
| 2406.000000         | 15.9            | PASS   |

20 dB Bandwidth





Bandwidth



Date: 28.OCT.2024 06:46:35

Measurement

| Setting               | Instrument Value | Target Value   |
|-----------------------|------------------|----------------|
| Start Frequency       | 2.40300 GHz      | 2.40300 GHz    |
| Stop Frequency        | 2.40900 GHz      | 2.40900 GHz    |
| Span                  | 6.000 MHz        | 6.000 MHz      |
| RBW                   | 100.000 kHz      | >= 100.000 kHz |
| VBW                   | 300.000 kHz      | >= 300.000 kHz |
| SweepPoints           | 120              | ~ 120          |
| SweepTime             | 18.984 µs        | AUTO           |
| Reference Level       | 10.000 dBm       | 10.000 dBm     |
| Attenuation           | 30.000 dB        | AUTO           |
| Detector              | MaxPeak          | MaxPeak        |
| SweepCount            | 200              | 200            |
| Filter                | 3 dB             | 3 dB           |
| Trace Mode            | Max Hold         | Max Hold       |
| SweepType             | FFT              | AUTO           |
| Preamp                | off              | off            |
| Stablemode            | Trace            | Trace          |
| Stablevalue           | 0.50 dB          | 0.50 dB        |
| Run                   | 1 / max. 1       | max. 1         |
| Stable                | 0 / 1            | 1              |
| Max Stable Difference | 0.00 dB          | 0.50 dB        |

**Band Edge low (2406 MHz; 20.000 dBm; 3 MHz; Test Mode)****Result**

| DUT Frequency (MHz) | Result |
|---------------------|--------|
| 2406.000000         | PASS   |

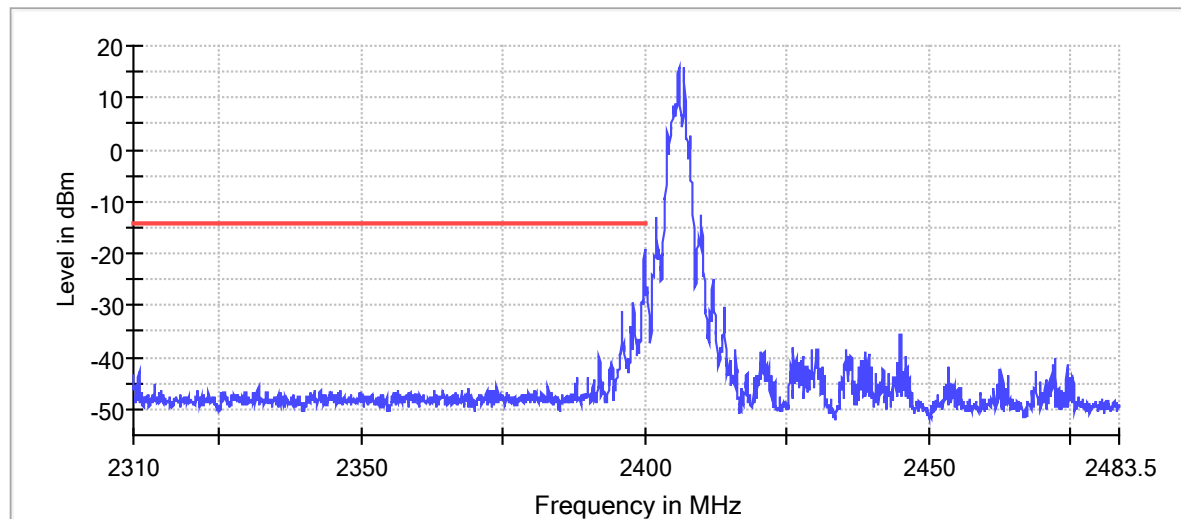
**Inband Peak**

| Frequency (MHz) | Level (dBm) |
|-----------------|-------------|
| 2405.975000     | 16.0        |

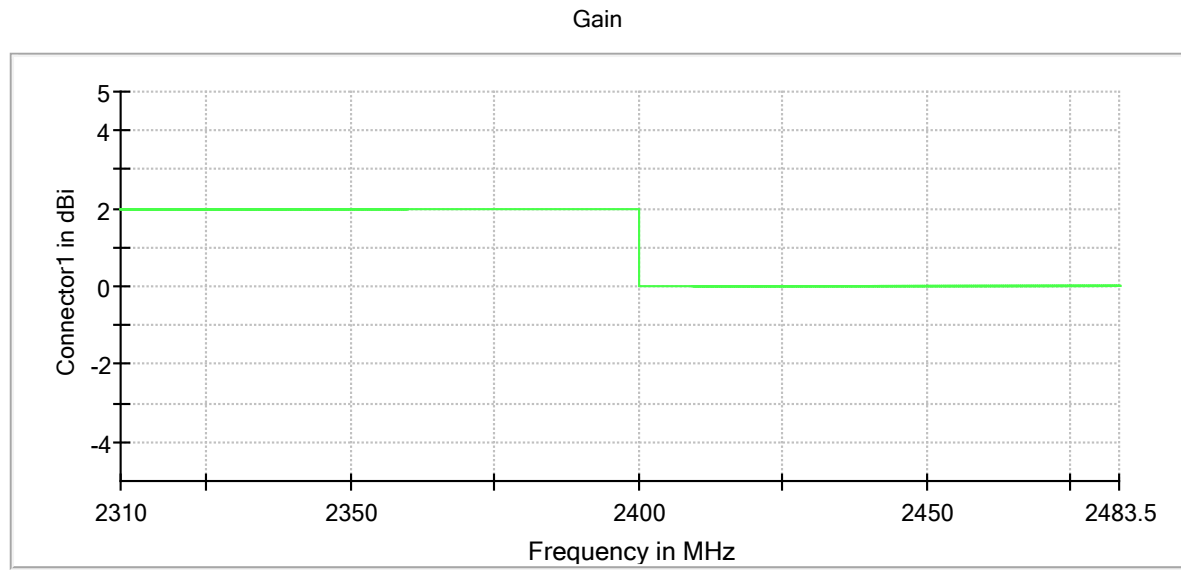
**Measurements**

| Frequency (MHz) | Level (dBm) | Margin (dB) | Limit (dBm) | Result |
|-----------------|-------------|-------------|-------------|--------|
| 2399.975000     | -19.3       | 5.2         | -14.0       | PASS   |
| 2399.925000     | -21.3       | 7.2         | -14.0       | PASS   |
| 2399.875000     | -24.1       | 10.0        | -14.0       | PASS   |
| 2399.825000     | -26.4       | 12.3        | -14.0       | PASS   |
| 2399.775000     | -28.8       | 14.7        | -14.0       | PASS   |
| 2399.725000     | -29.0       | 15.0        | -14.0       | PASS   |
| 2399.575000     | -29.1       | 15.0        | -14.0       | PASS   |
| 2397.975000     | -29.4       | 15.3        | -14.0       | PASS   |
| 2399.625000     | -29.4       | 15.4        | -14.0       | PASS   |
| 2398.025000     | -29.5       | 15.4        | -14.0       | PASS   |
| 2399.525000     | -29.7       | 15.6        | -14.0       | PASS   |
| 2399.675000     | -29.7       | 15.7        | -14.0       | PASS   |
| 2397.925000     | -30.5       | 16.5        | -14.0       | PASS   |
| 2395.975000     | -31.0       | 16.9        | -14.0       | PASS   |
| 2396.025000     | -31.0       | 16.9        | -14.0       | PASS   |

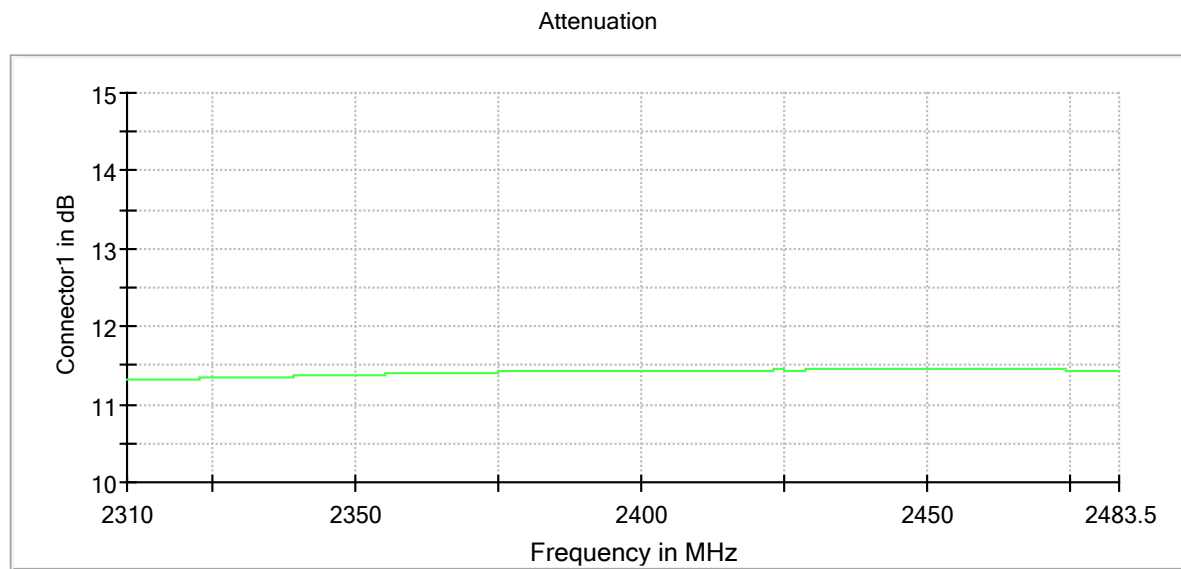
Band Edge



— Limit — Sum Level × Fail

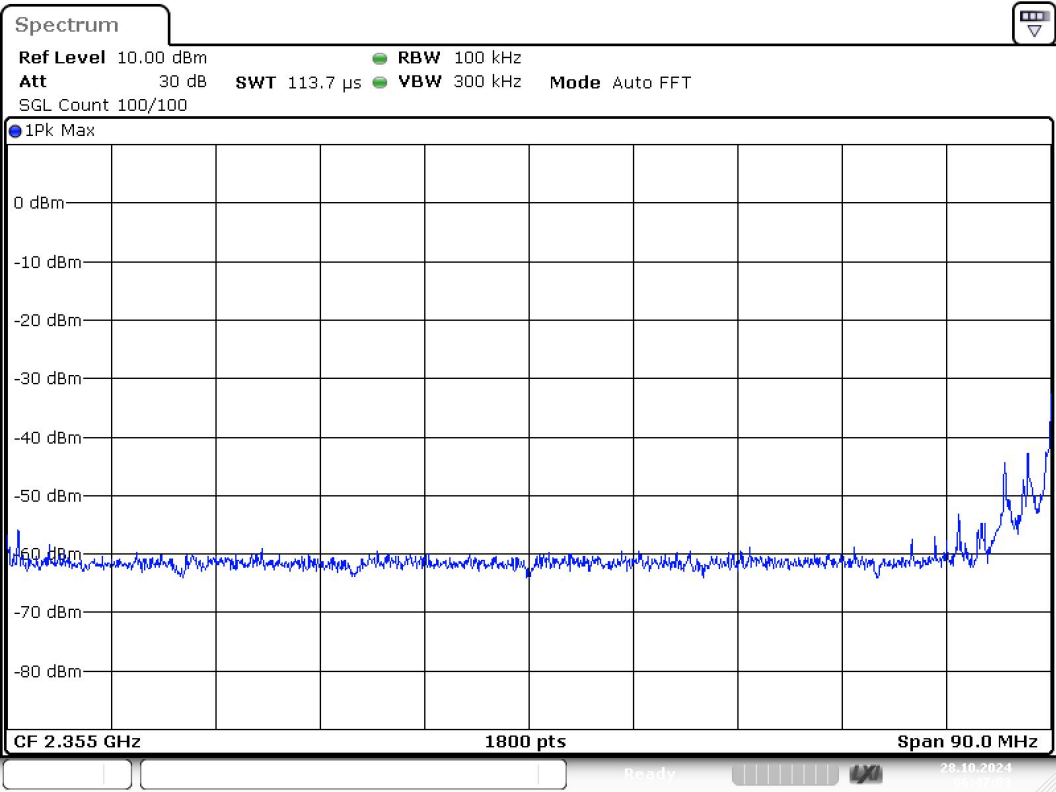


Connector1



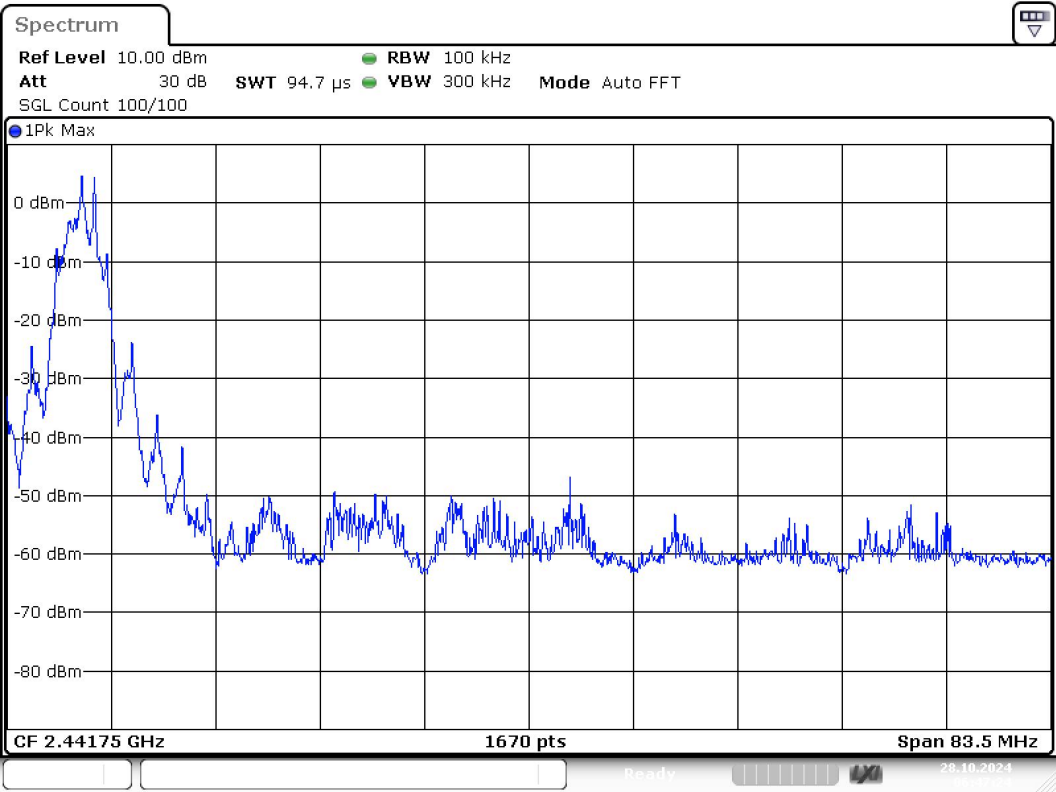
Connector1

Band Edge Connector 1\_0



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Band Edge Connector 1\_1



Date: 28.OCT.2024 06:47:24

Measurement 1

| Setting               | Instrument Value | Target Value   |
|-----------------------|------------------|----------------|
| Start Frequency       | 2.31000 GHz      | 2.31000 GHz    |
| Stop Frequency        | 2.40000 GHz      | 2.40000 GHz    |
| Span                  | 90.000 MHz       | 90.000 MHz     |
| RBW                   | 100.000 kHz      | <= 100.000 kHz |
| VBW                   | 300.000 kHz      | >= 300.000 kHz |
| SweepPoints           | 1800             | ~ 1800         |
| Sweptime              | 113.672 µs       | AUTO           |
| Reference Level       | 10.000 dBm       | 10.000 dBm     |
| Attenuation           | 30.000 dB        | AUTO           |
| Detector              | MaxPeak          | MaxPeak        |
| SweepCount            | 100              | 100            |
| Filter                | 3 dB             | 3 dB           |
| Trace Mode            | Max Hold         | Max Hold       |
| SweepType             | FFT              | AUTO           |
| Preamp                | off              | off            |
| Stablemode            | Trace            | Trace          |
| Stablevalue           | 0.50 dB          | 0.50 dB        |
| Run                   | 9 / max. 150     | max. 150       |
| Stable                | 3 / 3            | 3              |
| Max Stable Difference | 0.00 dB          | 0.50 dB        |

Measurement 2

| Setting         | Instrument Value | Target Value   |
|-----------------|------------------|----------------|
| Start Frequency | 2.40000 GHz      | 2.40000 GHz    |
| Stop Frequency  | 2.48350 GHz      | 2.48350 GHz    |
| Span            | 83.500 MHz       | 83.500 MHz     |
| RBW             | 100.000 kHz      | <= 100.000 kHz |
| VBW             | 300.000 kHz      | >= 300.000 kHz |

|                              |                      |                   |
|------------------------------|----------------------|-------------------|
| <b>SweepPoints</b>           | <b>1670</b>          | <b>~ 1670</b>     |
| <b>SweepTime</b>             | <b>94.727 µs</b>     | <b>AUTO</b>       |
| <b>Reference Level</b>       | <b>10.000 dBm</b>    | <b>10.000 dBm</b> |
| <b>Attenuation</b>           | <b>30.000 dB</b>     | <b>AUTO</b>       |
| <b>Detector</b>              | <b>MaxPeak</b>       | <b>MaxPeak</b>    |
| <b>SweepCount</b>            | <b>100</b>           | <b>100</b>        |
| <b>Filter</b>                | <b>3 dB</b>          | <b>3 dB</b>       |
| <b>Trace Mode</b>            | <b>Max Hold</b>      | <b>Max Hold</b>   |
| <b>SweepType</b>             | <b>FFT</b>           | <b>AUTO</b>       |
| <b>Preamplifier</b>          | <b>off</b>           | <b>off</b>        |
| <b>Stablemode</b>            | <b>Trace</b>         | <b>Trace</b>      |
| <b>Stablevalue</b>           | <b>0.50 dB</b>       | <b>0.50 dB</b>    |
| <b>Run</b>                   | <b>13 / max. 150</b> | <b>max. 150</b>   |
| <b>Stable</b>                | <b>3 / 3</b>         | <b>3</b>          |
| <b>Max Stable Difference</b> | <b>0.00 dB</b>       | <b>0.50 dB</b>    |

**Tx Spurious Emission (2406 MHz; 20.000 dBm; 3 MHz; Test Mode)****Result**

| DUT Frequency (MHz) | Result |
|---------------------|--------|
| 2406.000000         | PASS   |

**Final measurements**

| Frequency (MHz) | Level Pre Measurement (dBm) | level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|-----------------------------|-------------|-------------|-------------|--------|
| ---             | ---                         | ---         | ---         | ---         | ---    |

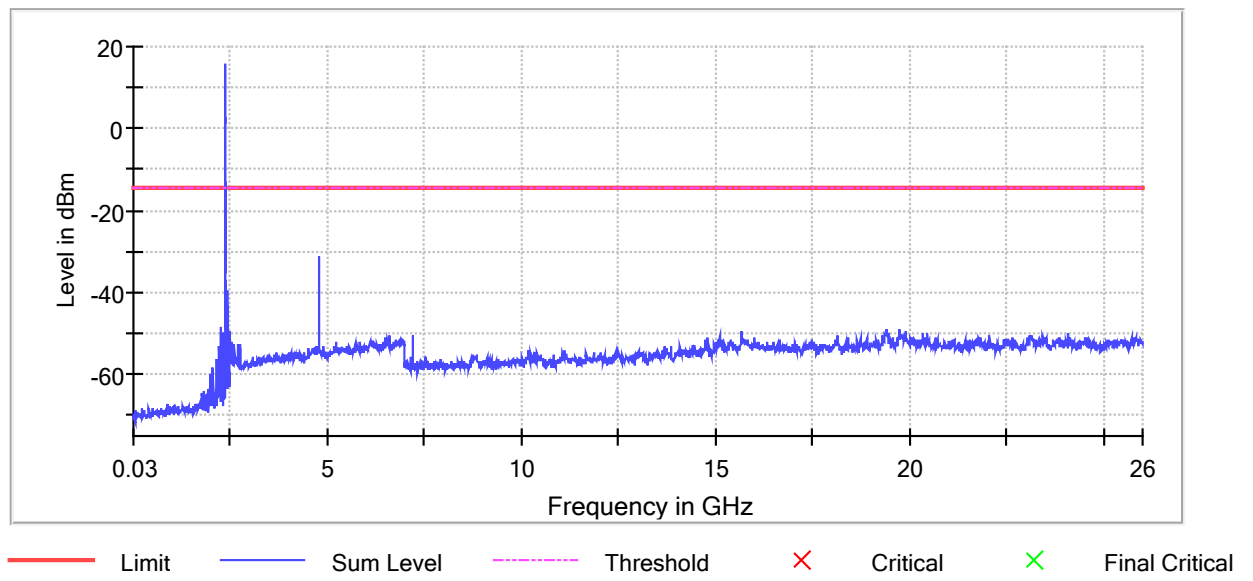
**Pre Measurements**

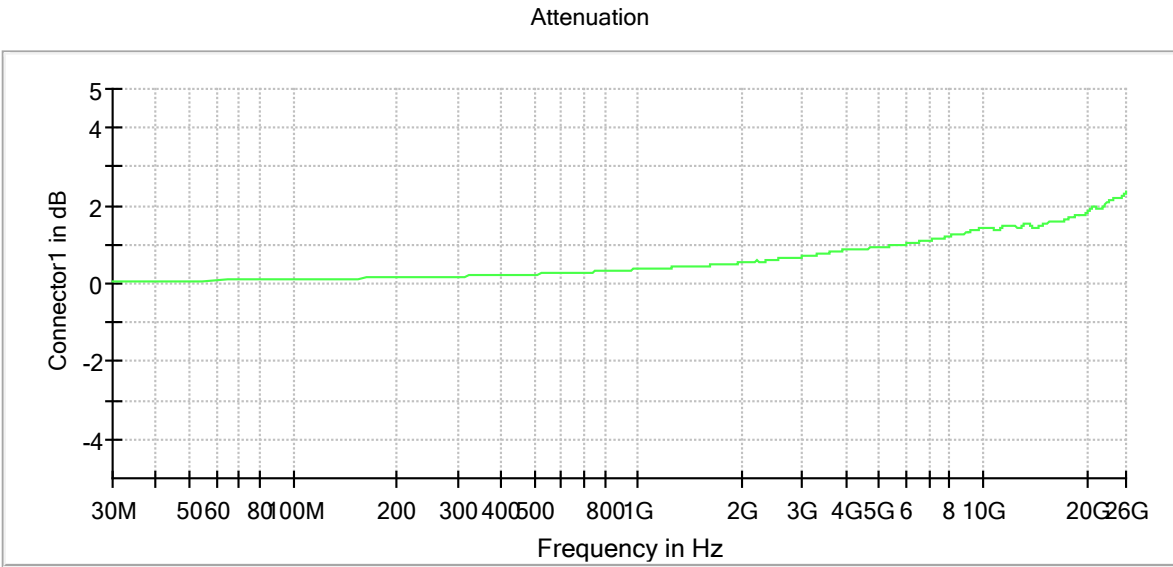
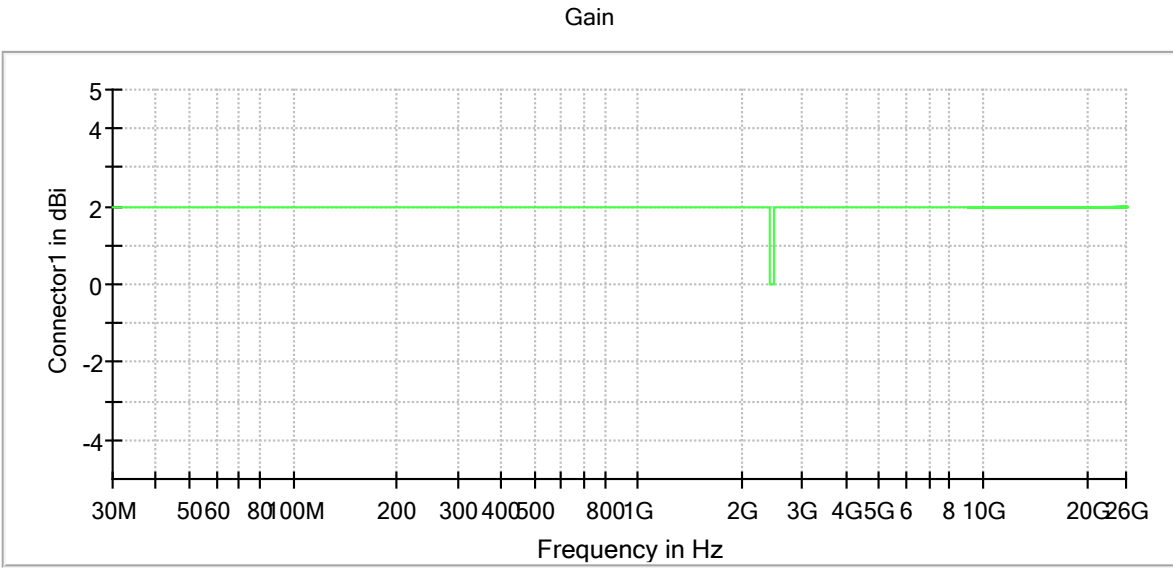
| Frequency (MHz) | Level (dBm) | Margin (dB) | Limit (dBm) |
|-----------------|-------------|-------------|-------------|
| 2395.021008     | -24.2       | 9.9         | -14.2       |
| 4817.160327     | -31.0       | 16.8        | -14.2       |
| 4807.166065     | -32.1       | 17.9        | -14.2       |
| 2275.525210     | -48.3       | 34.1        | -14.2       |
| 19748.588717    | -48.9       | 34.7        | -14.2       |
| 19408.783787    | -49.0       | 34.7        | -14.2       |
| 19418.778049    | -49.2       | 35.0        | -14.2       |
| 19428.772312    | -49.3       | 35.1        | -14.2       |
| 19888.508394    | -49.3       | 35.1        | -14.2       |
| 2518.479919     | -49.4       | 35.2        | -14.2       |
| 19438.766575    | -49.4       | 35.2        | -14.2       |
| 15660.935295    | -49.6       | 35.4        | -14.2       |
| 24096.092966    | -49.7       | 35.5        | -14.2       |
| 19378.800999    | -49.8       | 35.6        | -14.2       |
| 19398.789524    | -49.8       | 35.6        | -14.2       |

**Measurement Settings**

| Start Frequency (MHz) | Stop Frequency (MHz) | Pre Measurement | Final Measurement |
|-----------------------|----------------------|-----------------|-------------------|
| 30.000000             | 2400.000000          | 1               | 1                 |
| 2400.000000           | 2483.500000          | 1               | 1                 |
| 2483.500000           | 26000.000000         | 1               | 1                 |

Spurious





Pre Measurement 1

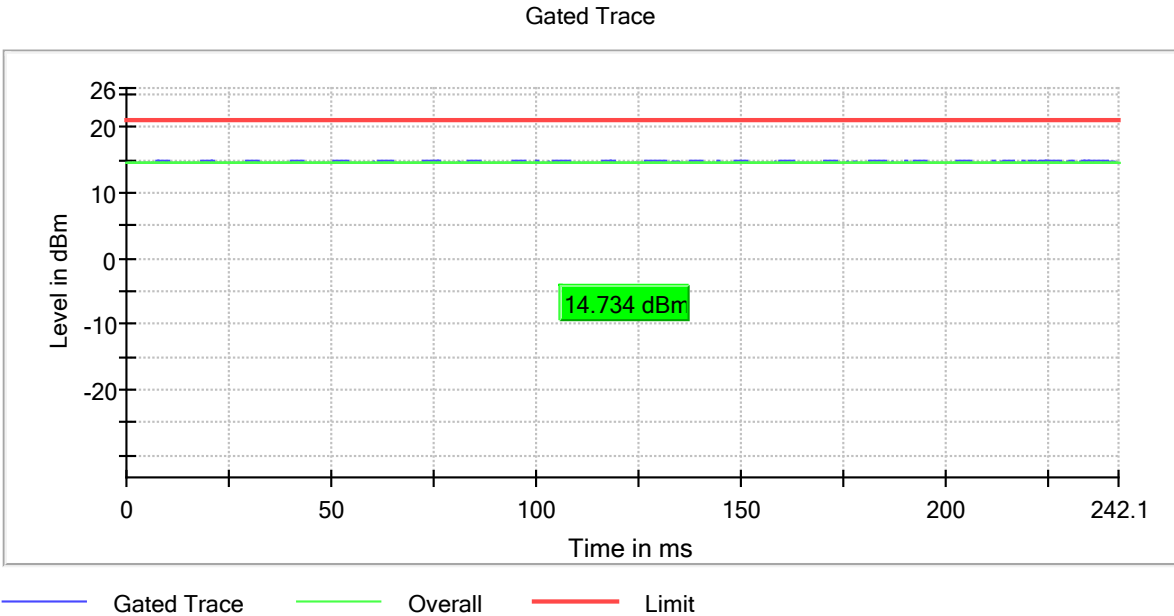
| Setting               | Instrument Value | Target Value   |
|-----------------------|------------------|----------------|
| RBW                   | 100.000 kHz      | <= 100.000 kHz |
| VBW                   | 300.000 kHz      | >= 300.000 kHz |
| SweepPoints           | 238              | ~ 238          |
| SweepTime             | 23.700 ms        | AUTO           |
| Reference Level       | -10.000 dBm      | -30.000 dBm    |
| Attenuation           | 20.000 dB        | AUTO           |
| Detector              | MaxPeak          | MaxPeak        |
| SweepCount            | 3                | 3              |
| Filter                | 3 dB             | 3 dB           |
| Trace Mode            | Max Hold         | Max Hold       |
| Sweeptype             | Sweep            | AUTO           |
| Preamp                | off              | off            |
| Stablemode            | Trace            | Trace          |
| Stablevalue           | 0.50 dB          | 0.50 dB        |
| Run                   | 10 / max. 40     | max. 40        |
| Stable                | 3 / 3            | 3              |
| Max Stable Difference | 0.00 dB          | 0.50 dB        |



RF output power (2442 MHz; 20.000 dBm; 3 MHz; Test Mode)

Result

| DUT Frequency (MHz) | Gated RMS (dBm) | Limit Max (dBm) | Gated EIRP (dBm) | DutyCycle (%) | Result |
|---------------------|-----------------|-----------------|------------------|---------------|--------|
| 2442.000000         | 14.7            | 21.0            | 14.7             | 24.343        | PASS   |



OSP PowerMeter settings

| Setting          | Instrument Value | Target Value  |
|------------------|------------------|---------------|
| Measurement Time | 1.000 s          | 1.000 s       |
| Points           | 1000000          | 1000000       |
| Time resolution  | 1.000 $\mu$ s    | 1.000 $\mu$ s |

## Emission Bandwidth 20 dB (2442 MHz; 20.000 dBm; 3 MHz; Test Mode)

Customized settings.

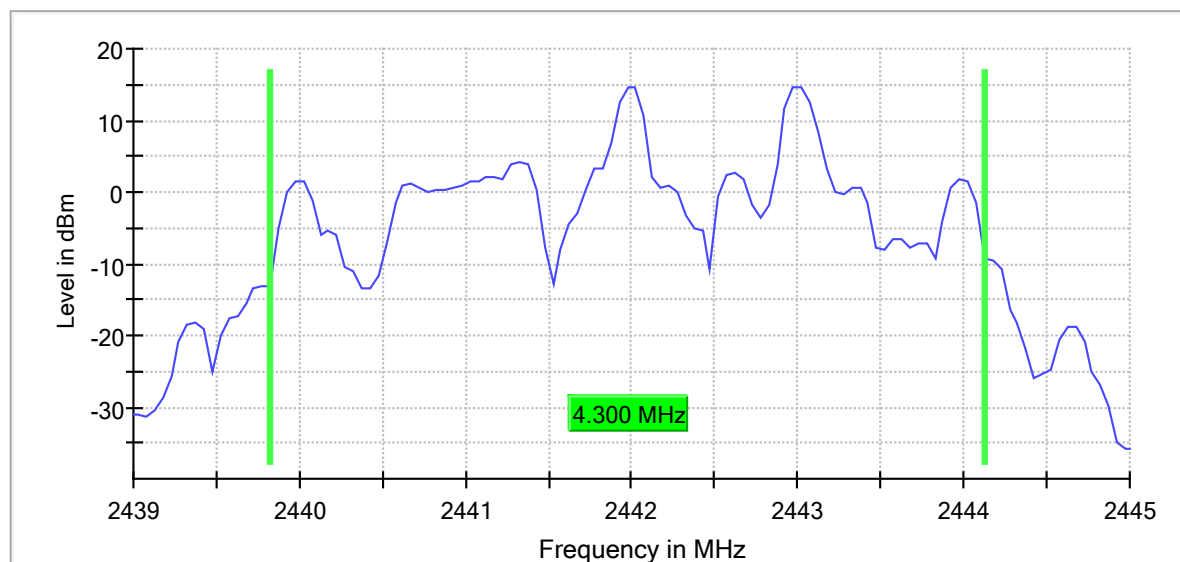
### 20 dB Bandwidth

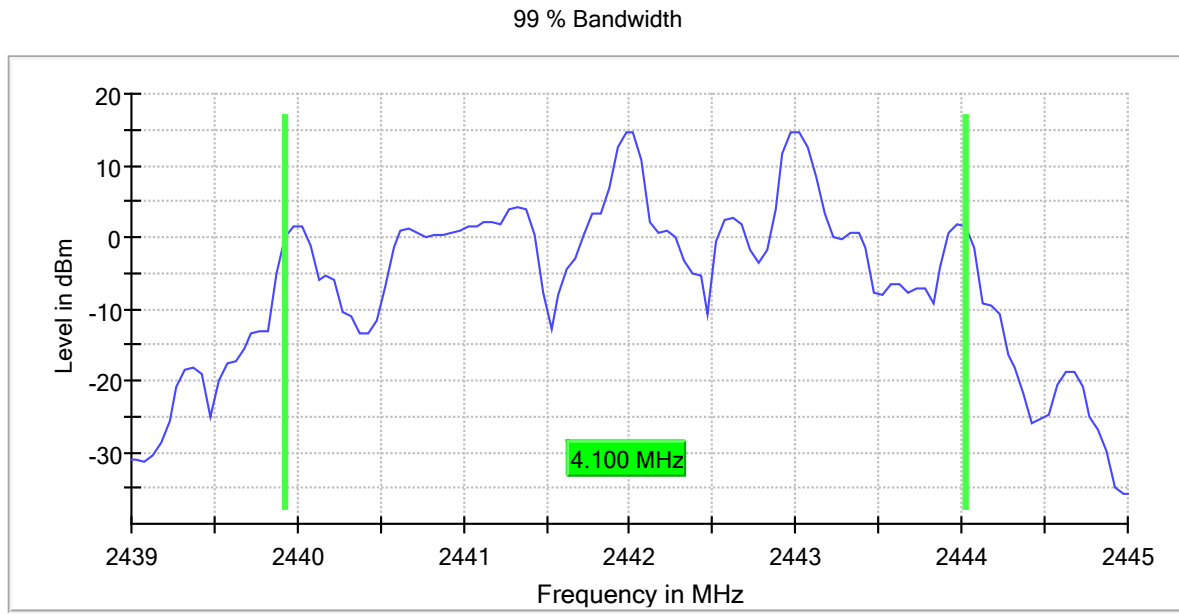
| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---------------------|-----------------|-----------------|-----------------|----------------------|-----------------------|
| 2442.000000         | 4.300000        | ---             | ---             | 2439.825000          | 2444.125000           |

(continuation of the "20 dB Bandwidth" table from column 6 ...)

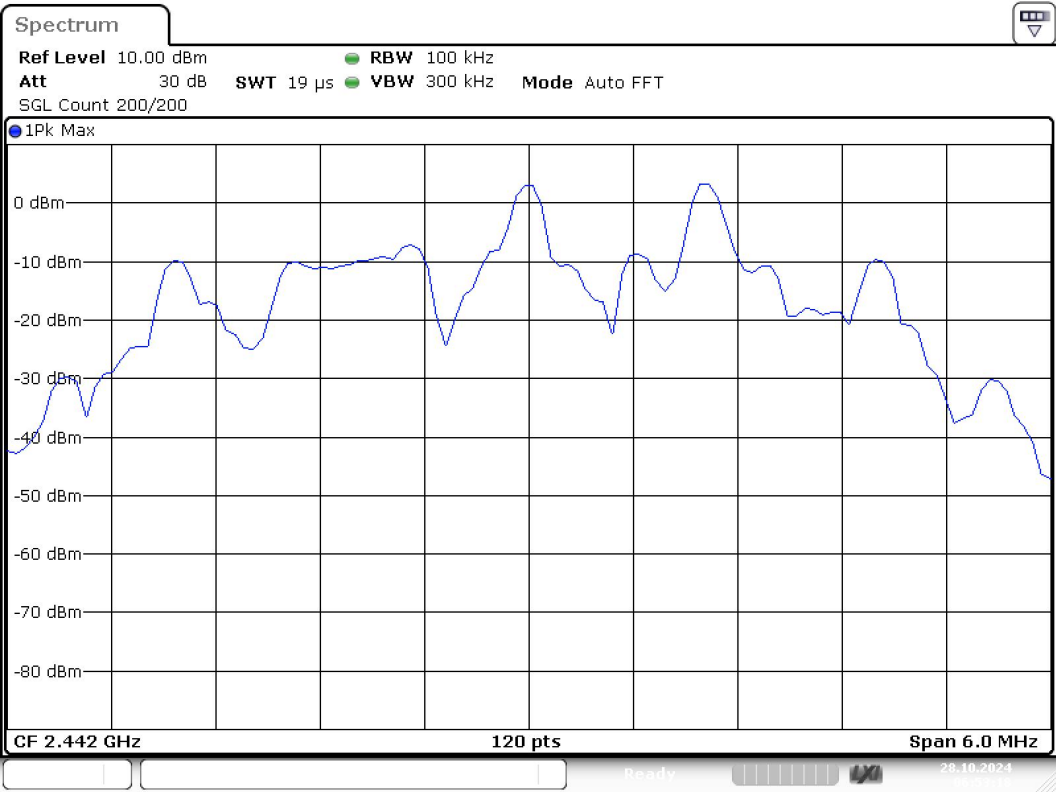
| DUT Frequency (MHz) | Max Level (dBm) | Result |
|---------------------|-----------------|--------|
| 2442.000000         | 14.7            | PASS   |

20 dB Bandwidth





Bandwidth



Date: 28.OCT.2024 06:53:18

Measurement

| Setting               | Instrument Value | Target Value   |
|-----------------------|------------------|----------------|
| Start Frequency       | 2.43900 GHz      | 2.43900 GHz    |
| Stop Frequency        | 2.44500 GHz      | 2.44500 GHz    |
| Span                  | 6.000 MHz        | 6.000 MHz      |
| RBW                   | 100.000 kHz      | >= 100.000 kHz |
| VBW                   | 300.000 kHz      | >= 300.000 kHz |
| SweepPoints           | 120              | ~ 120          |
| SweepTime             | 18.984 µs        | AUTO           |
| Reference Level       | 10.000 dBm       | 10.000 dBm     |
| Attenuation           | 30.000 dB        | AUTO           |
| Detector              | MaxPeak          | MaxPeak        |
| SweepCount            | 200              | 200            |
| Filter                | 3 dB             | 3 dB           |
| Trace Mode            | Max Hold         | Max Hold       |
| SweepType             | FFT              | AUTO           |
| Preamp                | off              | off            |
| Stablemode            | Trace            | Trace          |
| Stablevalue           | 0.50 dB          | 0.50 dB        |
| Run                   | 1 / max. 1       | max. 1         |
| Stable                | 0 / 1            | 1              |
| Max Stable Difference | 0.00 dB          | 0.50 dB        |

**Tx Spurious Emission (2442 MHz; 20.000 dBm; 3 MHz; Test Mode)****Result**

| DUT Frequency (MHz) | Result |
|---------------------|--------|
| 2442.000000         | PASS   |

**Final measurements**

| Frequency (MHz) | Level Pre Measurement (dBm) | level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|-----------------------------|-------------|-------------|-------------|--------|
| ---             | ---                         | ---         | ---         | ---         | ---    |

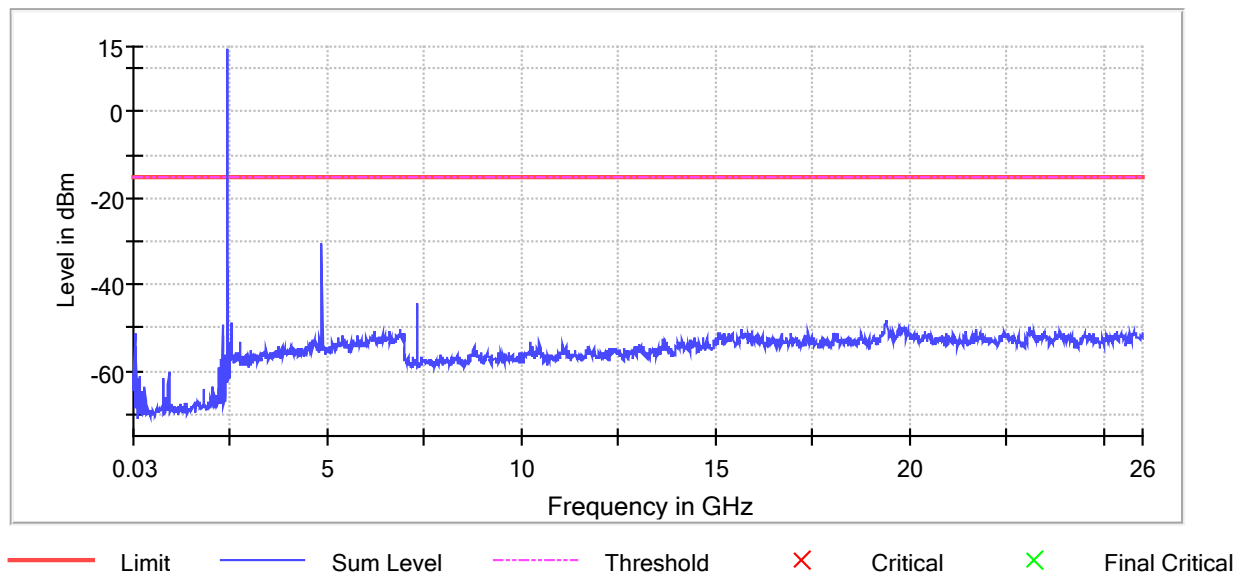
**Pre Measurements**

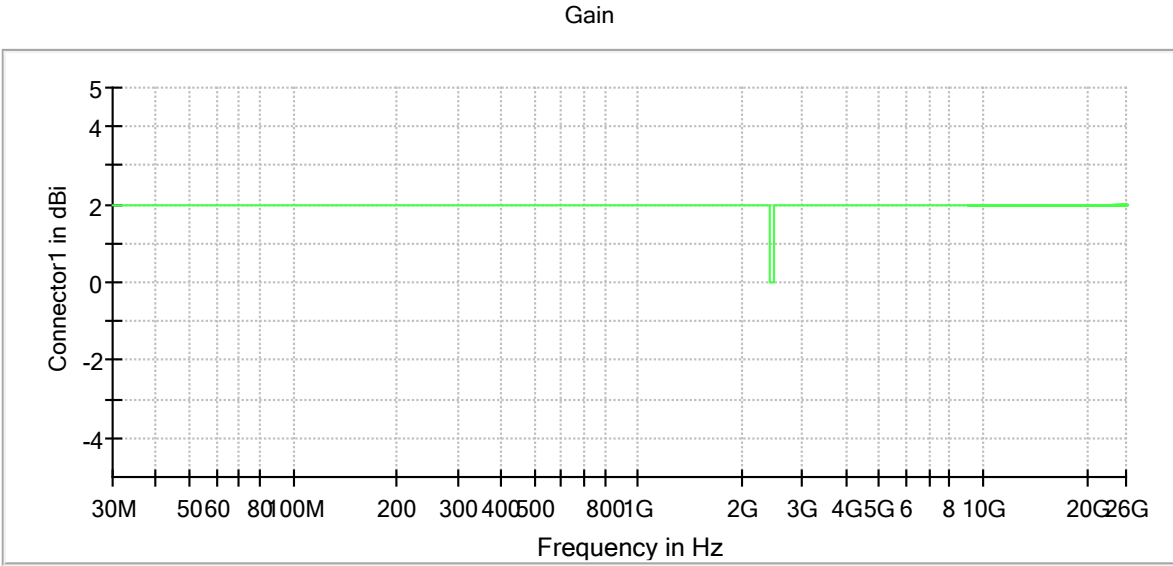
| Frequency (MHz) | Level (dBm) | Margin (dB) | Limit (dBm) |
|-----------------|-------------|-------------|-------------|
| 4887.120166     | -30.4       | 15.1        | -15.3       |
| 4877.125903     | -36.3       | 20.9        | -15.3       |
| 7325.720251     | -44.2       | 28.9        | -15.3       |
| 19428.772312    | -48.1       | 32.7        | -15.3       |
| 19398.789524    | -48.4       | 33.1        | -15.3       |
| 19408.783787    | -48.6       | 33.2        | -15.3       |
| 19418.778049    | -48.7       | 33.4        | -15.3       |
| 2568.451232     | -48.9       | 33.5        | -15.3       |
| 19388.795261    | -49.0       | 33.7        | -15.3       |
| 19438.766575    | -49.4       | 34.1        | -15.3       |
| 2315.357143     | -49.4       | 34.1        | -15.3       |
| 19378.800999    | -49.5       | 34.2        | -15.3       |
| 19728.600191    | -49.6       | 34.3        | -15.3       |
| 19718.605929    | -49.7       | 34.4        | -15.3       |
| 19758.582979    | -49.8       | 34.4        | -15.3       |

**Measurement Settings**

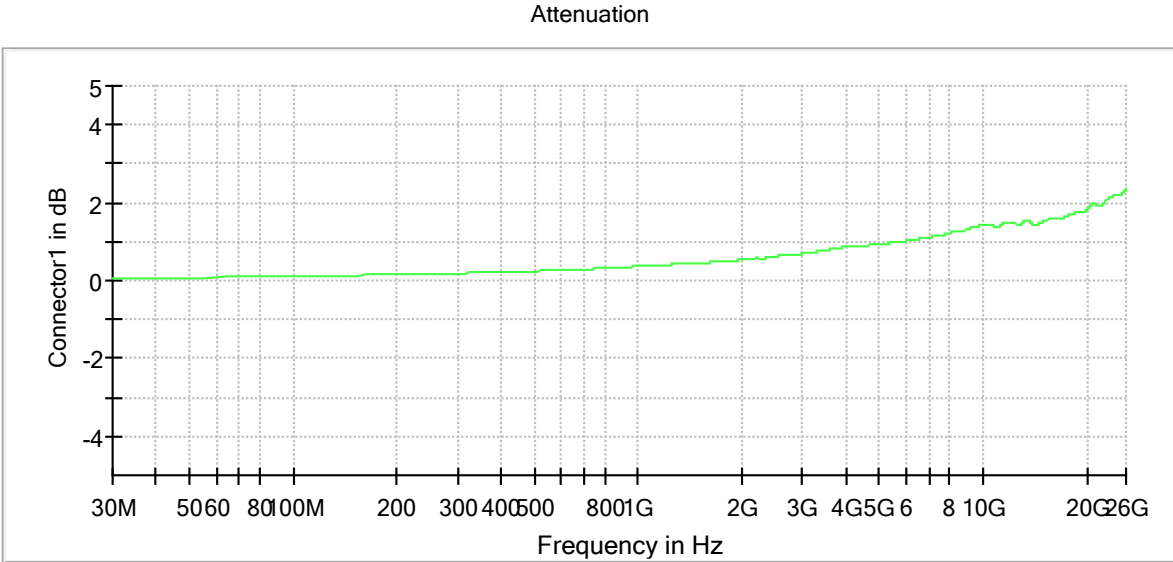
| Start Frequency (MHz) | Stop Frequency (MHz) | Pre Measurement | Final Measurement |
|-----------------------|----------------------|-----------------|-------------------|
| 30.000000             | 2400.000000          | 1               | 1                 |
| 2400.000000           | 2483.500000          | 1               | 1                 |
| 2483.500000           | 26000.000000         | 1               | 1                 |

Spurious





Connector1



Connector1

Pre Measurement 1

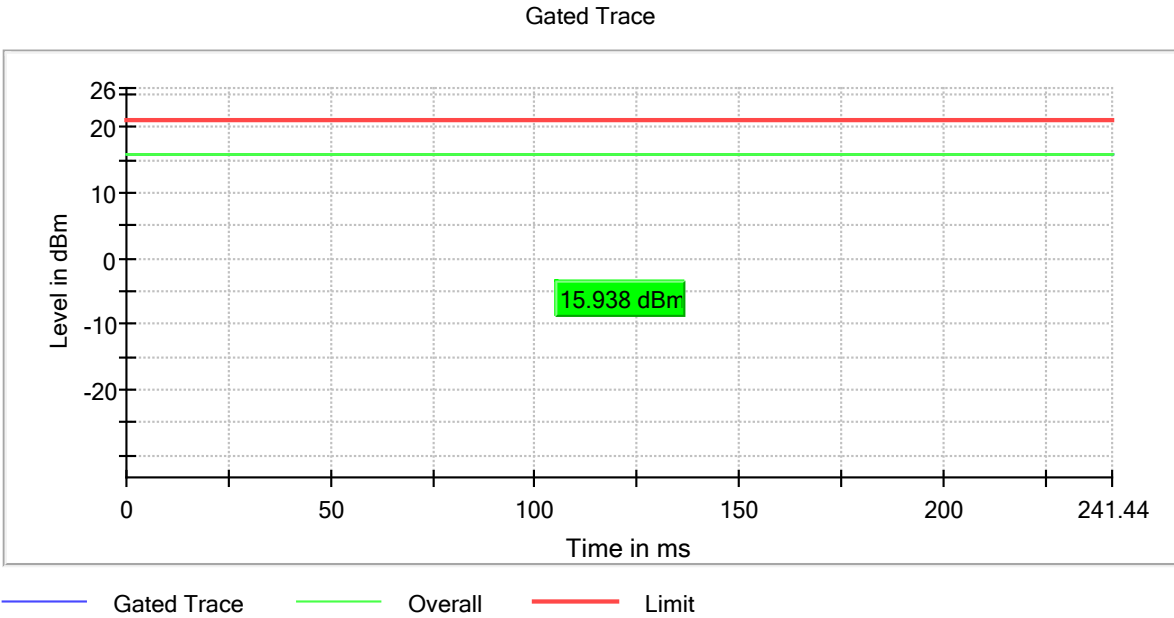
| Setting               | Instrument Value | Target Value   |
|-----------------------|------------------|----------------|
| RBW                   | 100.000 kHz      | <= 100.000 kHz |
| VBW                   | 300.000 kHz      | >= 300.000 kHz |
| SweepPoints           | 238              | ~ 238          |
| SweepTime             | 23.700 ms        | AUTO           |
| Reference Level       | -10.000 dBm      | -30.000 dBm    |
| Attenuation           | 20.000 dB        | AUTO           |
| Detector              | MaxPeak          | MaxPeak        |
| SweepCount            | 3                | 3              |
| Filter                | 3 dB             | 3 dB           |
| Trace Mode            | Max Hold         | Max Hold       |
| Sweeptype             | Sweep            | AUTO           |
| Preamp                | off              | off            |
| Stablemode            | Trace            | Trace          |
| Stablevalue           | 0.50 dB          | 0.50 dB        |
| Run                   | 12 / max. 40     | max. 40        |
| Stable                | 3 / 3            | 3              |
| Max Stable Difference | 0.00 dB          | 0.50 dB        |



RF output power (2475 MHz; 20.000 dBm; 3 MHz; Test Mode)

Result

| DUT Frequency (MHz) | Gated RMS (dBm) | Limit Max (dBm) | Gated EIRP (dBm) | DutyCycle (%) | Result |
|---------------------|-----------------|-----------------|------------------|---------------|--------|
| 2475.000000         | 15.9            | 21.0            | 15.9             | 24.280        | PASS   |



OSP PowerMeter settings

| Setting          | Instrument Value | Target Value  |
|------------------|------------------|---------------|
| Measurement Time | 1.000 s          | 1.000 s       |
| Points           | 1000000          | 1000000       |
| Time resolution  | 1.000 $\mu$ s    | 1.000 $\mu$ s |

## Emission Bandwidth 20 dB (2475 MHz; 20.000 dBm; 3 MHz; Test Mode)

Customized settings.

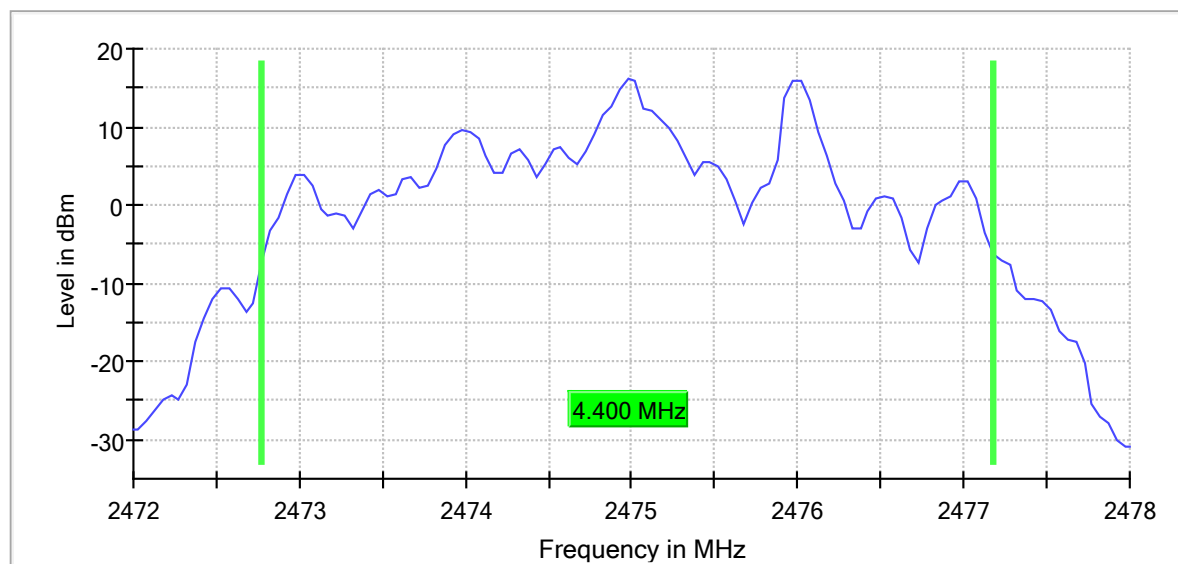
### 20 dB Bandwidth

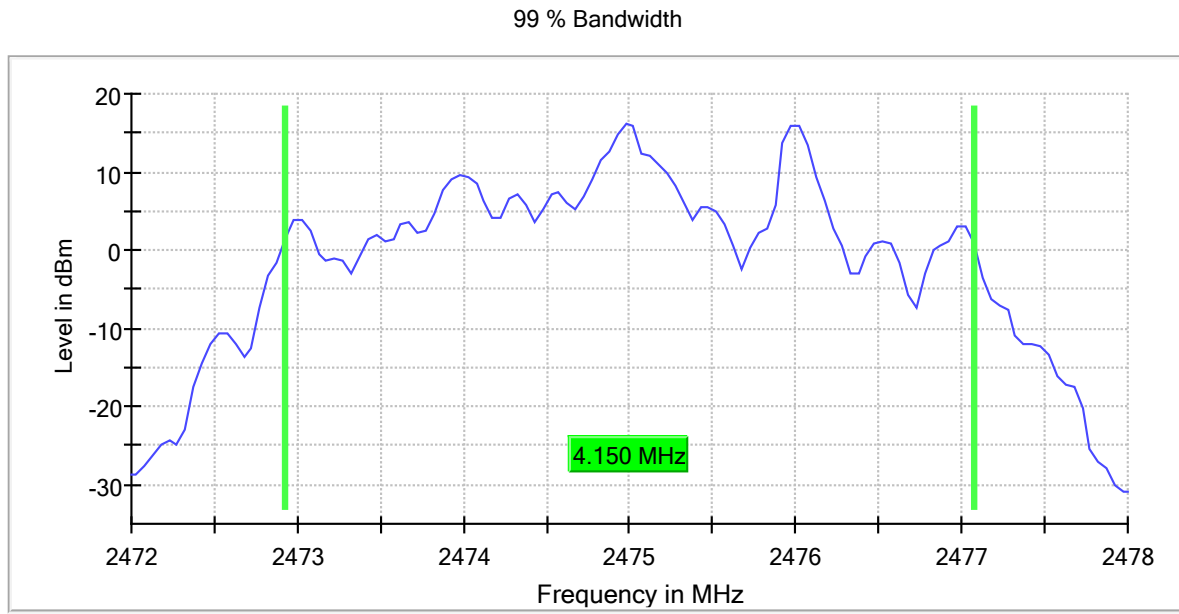
| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---------------------|-----------------|-----------------|-----------------|----------------------|-----------------------|
| 2475.000000         | 4.400000        | ---             | ---             | 2472.775000          | 2477.175000           |

(continuation of the "20 dB Bandwidth" table from column 6 ...)

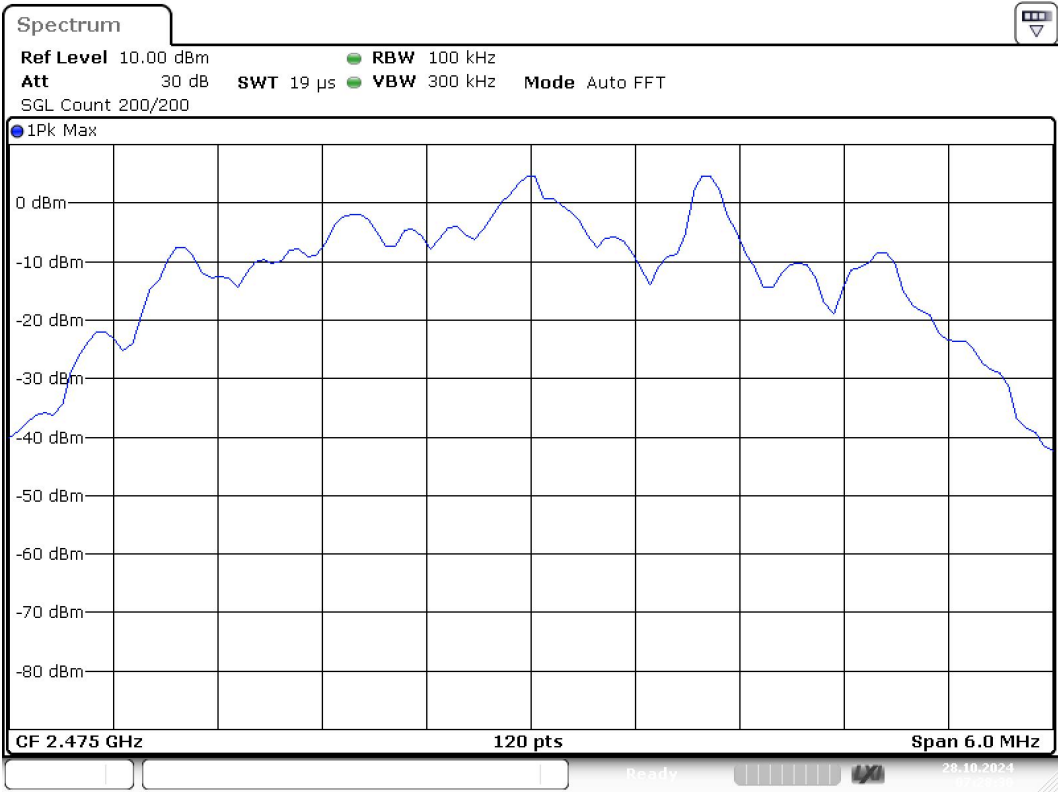
| DUT Frequency (MHz) | Max Level (dBm) | Result |
|---------------------|-----------------|--------|
| 2475.000000         | 16.1            | PASS   |

20 dB Bandwidth





Bandwidth



Date: 28.OCT.2024 07:28:30

**Measurement**

| Setting               | Instrument Value | Target Value   |
|-----------------------|------------------|----------------|
| Start Frequency       | 2.47200 GHz      | 2.47200 GHz    |
| Stop Frequency        | 2.47800 GHz      | 2.47800 GHz    |
| Span                  | 6.000 MHz        | 6.000 MHz      |
| RBW                   | 100.000 kHz      | >= 100.000 kHz |
| VBW                   | 300.000 kHz      | >= 300.000 kHz |
| SweepPoints           | 120              | ~ 120          |
| SweepTime             | 18.984 µs        | AUTO           |
| Reference Level       | 10.000 dBm       | 10.000 dBm     |
| Attenuation           | 30.000 dB        | AUTO           |
| Detector              | MaxPeak          | MaxPeak        |
| SweepCount            | 200              | 200            |
| Filter                | 3 dB             | 3 dB           |
| Trace Mode            | Max Hold         | Max Hold       |
| SweepType             | FFT              | AUTO           |
| Preamp                | off              | off            |
| Stablemode            | Trace            | Trace          |
| Stablevalue           | 0.50 dB          | 0.50 dB        |
| Run                   | 1 / max. 1       | max. 1         |
| Stable                | 0 / 1            | 1              |
| Max Stable Difference | 0.00 dB          | 0.50 dB        |

**Band Edge high (2475 MHz; 20.000 dBm; 3 MHz; Test Mode)****Result**

| DUT Frequency (MHz) | Result |
|---------------------|--------|
| 2475.000000         | PASS   |

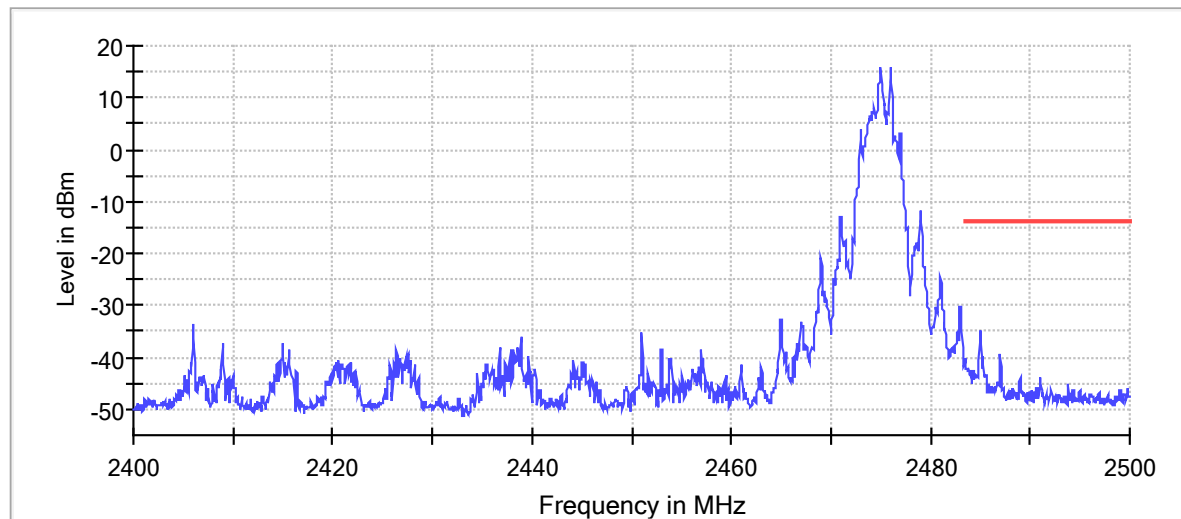
**Inband Peak**

| Frequency (MHz) | Level (dBm) |
|-----------------|-------------|
| 2474.975000     | 16.1        |

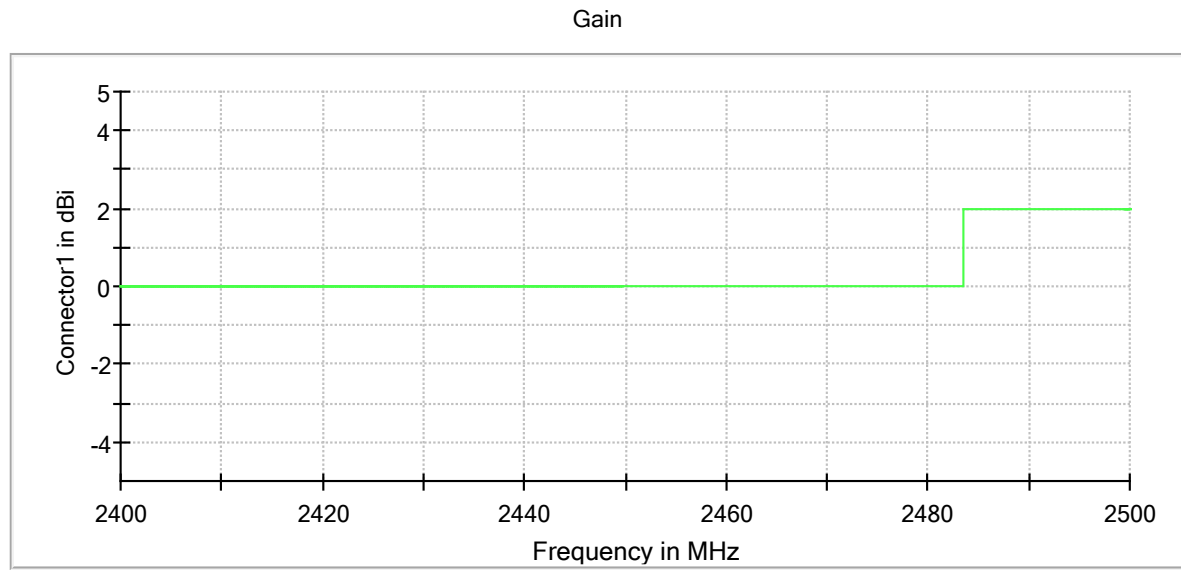
**Measurements**

| Frequency (MHz) | Level (dBm) | Margin (dB) | Limit (dBm) | Result |
|-----------------|-------------|-------------|-------------|--------|
| 2484.975000     | -34.9       | 21.0        | -13.9       | PASS   |
| 2485.025000     | -34.9       | 21.0        | -13.9       | PASS   |
| 2484.925000     | -36.6       | 22.7        | -13.9       | PASS   |
| 2485.075000     | -36.6       | 22.7        | -13.9       | PASS   |
| 2486.975000     | -39.5       | 25.6        | -13.9       | PASS   |
| 2487.025000     | -39.7       | 25.7        | -13.9       | PASS   |
| 2485.275000     | -39.7       | 25.8        | -13.9       | PASS   |
| 2485.225000     | -40.0       | 26.0        | -13.9       | PASS   |
| 2484.875000     | -40.7       | 26.8        | -13.9       | PASS   |
| 2486.925000     | -40.8       | 26.9        | -13.9       | PASS   |
| 2485.325000     | -40.8       | 26.9        | -13.9       | PASS   |
| 2484.825000     | -40.9       | 26.9        | -13.9       | PASS   |
| 2485.125000     | -41.1       | 27.2        | -13.9       | PASS   |
| 2483.525000     | -41.4       | 27.5        | -13.9       | PASS   |
| 2487.075000     | -41.7       | 27.8        | -13.9       | PASS   |

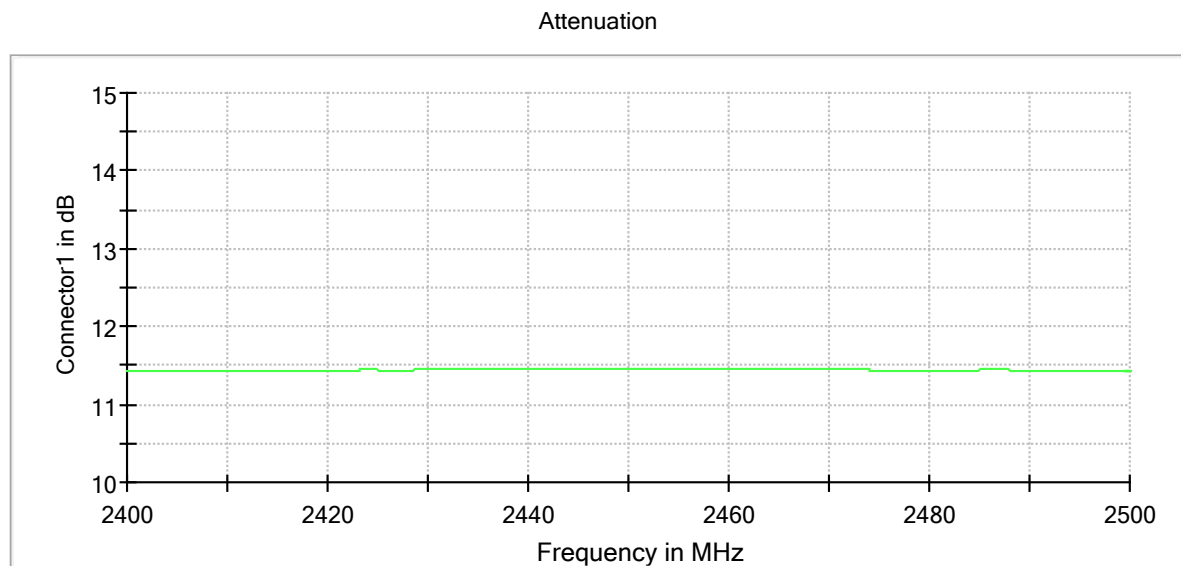
Band Edge



— Limit — Sum Level × Fail



Connector1



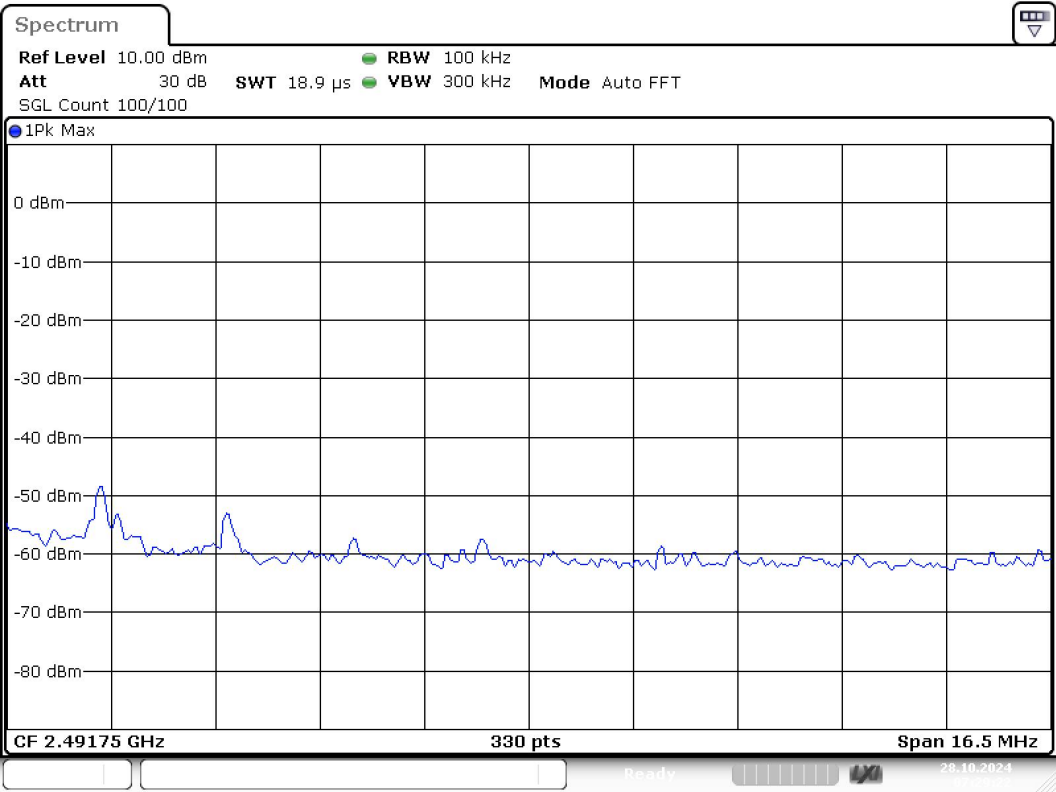
Connector1

Band Edge Connector 1\_0



Date: 28.OCT.2024 07:29:15

Band Edge Connector 1\_1



|                              |                                 |                   |
|------------------------------|---------------------------------|-------------------|
| <b>SweepPoints</b>           | <b>330</b>                      | <b>~ 330</b>      |
| <b>SweepTime</b>             | <b>18.945 <math>\mu</math>s</b> | <b>AUTO</b>       |
| <b>Reference Level</b>       | <b>10.000 dBm</b>               | <b>10.000 dBm</b> |
| <b>Attenuation</b>           | <b>30.000 dB</b>                | <b>AUTO</b>       |
| <b>Detector</b>              | <b>MaxPeak</b>                  | <b>MaxPeak</b>    |
| <b>SweepCount</b>            | <b>100</b>                      | <b>100</b>        |
| <b>Filter</b>                | <b>3 dB</b>                     | <b>3 dB</b>       |
| <b>Trace Mode</b>            | <b>Max Hold</b>                 | <b>Max Hold</b>   |
| <b>SweepType</b>             | <b>FFT</b>                      | <b>AUTO</b>       |
| <b>Preamp</b>                | <b>off</b>                      | <b>off</b>        |
| <b>Stablemode</b>            | <b>Trace</b>                    | <b>Trace</b>      |
| <b>Stablevalue</b>           | <b>0.50 dB</b>                  | <b>0.50 dB</b>    |
| <b>Run</b>                   | <b>6 / max. 150</b>             | <b>max. 150</b>   |
| <b>Stable</b>                | <b>3 / 3</b>                    | <b>3</b>          |
| <b>Max Stable Difference</b> | <b>0.00 dB</b>                  | <b>0.50 dB</b>    |

**Tx Spurious Emission (2475 MHz; 20.000 dBm; 3 MHz; Test Mode)****Result**

| DUT Frequency (MHz) | Result |
|---------------------|--------|
| 2475.000000         | PASS   |

**Final measurements**

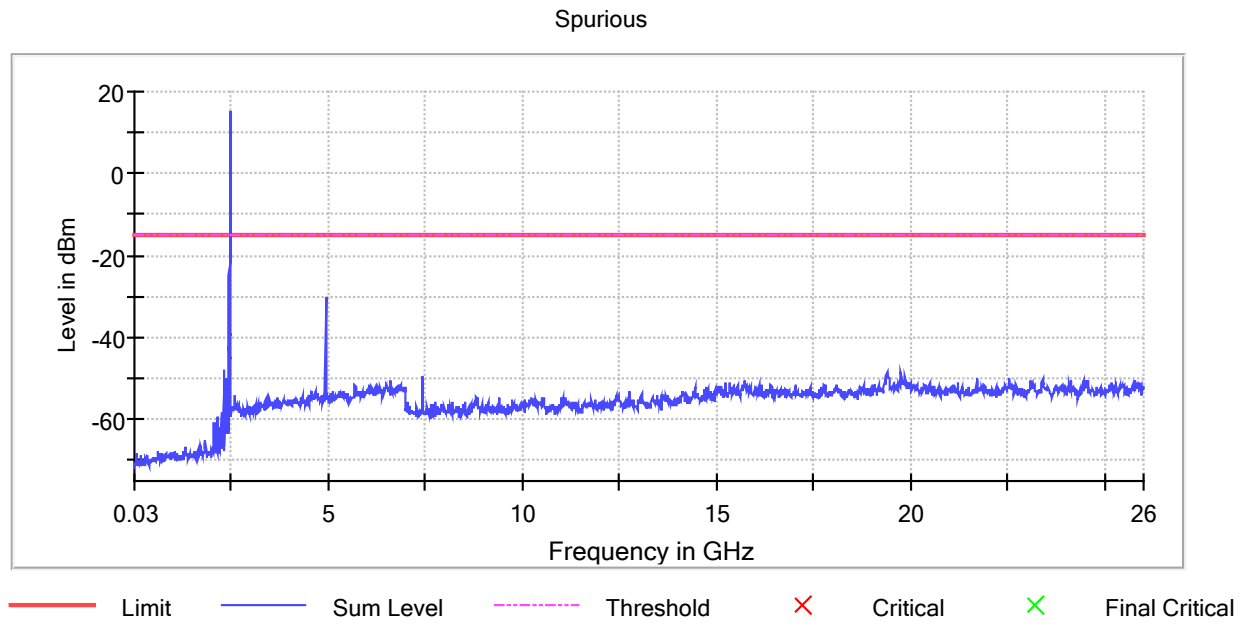
| Frequency (MHz) | Level Pre Measurement (dBm) | level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|-----------------------------|-------------|-------------|-------------|--------|
| ---             | ---                         | ---         | ---         | ---         | ---    |

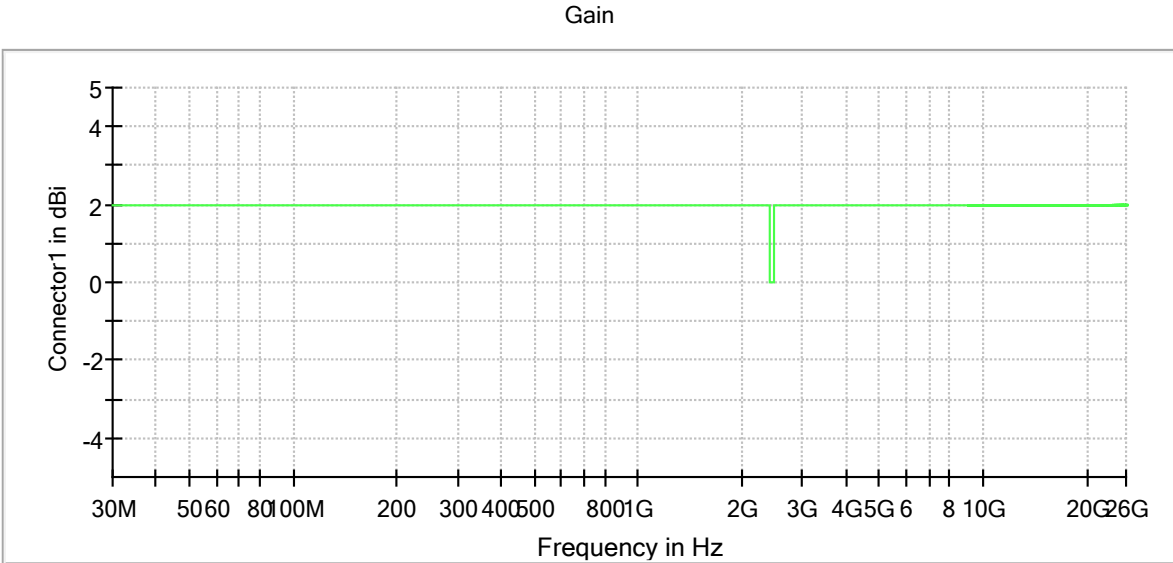
**Pre Measurements**

| Frequency (MHz) | Level (dBm) | Margin (dB) | Limit (dBm) |
|-----------------|-------------|-------------|-------------|
| 4947.085742     | -30.1       | 15.2        | -14.9       |
| 4957.080004     | -37.1       | 22.2        | -14.9       |
| 2488.497131     | -44.6       | 29.7        | -14.9       |
| 2345.231092     | -48.1       | 33.2        | -14.9       |
| 19758.582979    | -48.2       | 33.4        | -14.9       |
| 19388.795261    | -48.5       | 33.6        | -14.9       |
| 19428.772312    | -48.7       | 33.8        | -14.9       |
| 19408.783787    | -49.1       | 34.2        | -14.9       |
| 19378.800999    | -49.2       | 34.3        | -14.9       |
| 7425.662877     | -49.2       | 34.4        | -14.9       |
| 19868.519868    | -49.5       | 34.6        | -14.9       |
| 19398.789524    | -49.5       | 34.6        | -14.9       |
| 19438.766575    | -49.7       | 34.8        | -14.9       |
| 2375.105042     | -49.7       | 34.8        | -14.9       |
| 19418.778049    | -49.8       | 34.9        | -14.9       |

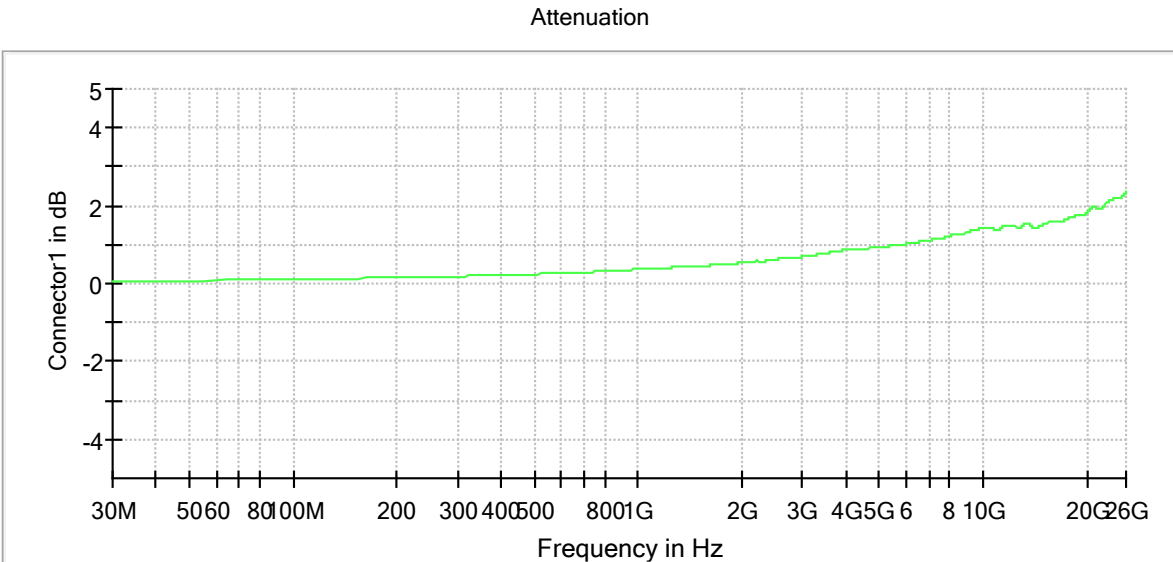
**Measurement Settings**

| Start Frequency (MHz) | Stop Frequency (MHz) | Pre Measurement | Final Measurement |
|-----------------------|----------------------|-----------------|-------------------|
| 30.000000             | 2400.000000          | 1               | 1                 |
| 2400.000000           | 2483.500000          | 1               | 1                 |
| 2483.500000           | 26000.000000         | 1               | 1                 |





Connector1



Connector1

Pre Measurement 1

| Setting               | Instrument Value | Target Value   |
|-----------------------|------------------|----------------|
| RBW                   | 100.000 kHz      | <= 100.000 kHz |
| VBW                   | 300.000 kHz      | >= 300.000 kHz |
| SweepPoints           | 238              | ~ 238          |
| SweepTime             | 23.700 ms        | AUTO           |
| Reference Level       | -10.000 dBm      | -30.000 dBm    |
| Attenuation           | 20.000 dB        | AUTO           |
| Detector              | MaxPeak          | MaxPeak        |
| SweepCount            | 3                | 3              |
| Filter                | 3 dB             | 3 dB           |
| Trace Mode            | Max Hold         | Max Hold       |
| Sweeptype             | Sweep            | AUTO           |
| Preamp                | off              | off            |
| Stablemode            | Trace            | Trace          |
| Stablevalue           | 0.50 dB          | 0.50 dB        |
| Run                   | 7 / max. 40      | max. 40        |
| Stable                | 3 / 3            | 3              |
| Max Stable Difference | 0.00 dB          | 0.50 dB        |

