

# FCC Part 47 §15.247 2400-2483.5 MHz 2015

## DUT Information

### Frequencies

|                       |                       |                       |
|-----------------------|-----------------------|-----------------------|
| 2402 MHz (2402 MHz)   | WLAN CH 3 (2422 MHz)  | WLAN CH 6 (2437 MHz)  |
| WLAN CH 9 (2452 MHz)  | 2440 MHz (2440 MHz)   | 2480 MHz (2480 MHz)   |
| WLAN CH 2 (2417 MHz)  | WLAN CH 4 (2427 MHz)  | WLAN CH 5 (2432 MHz)  |
| WLAN CH 7 (2442 MHz)  | WLAN CH 8 (2447 MHz)  | WLAN CH 10 (2457 MHz) |
| WLAN CH 11 (2462 MHz) | WLAN CH 12 (2467 MHz) | WLAN CH 13 (2472 MHz) |
| WLAN CH 1 (2412 MHz)  | BT CH 3 (2405 MHz)    |                       |

### Bandwidths

|                 |               |                 |
|-----------------|---------------|-----------------|
| 1 MHz (1 MHz)   | 2 MHz (2 MHz) | 20 MHz (20 MHz) |
| 40 MHz (40 MHz) | 3 MHz (3 MHz) |                 |

### Power

|                     |                     |                   |
|---------------------|---------------------|-------------------|
| 20.000 dBm (20 dBm) | 10.000 dBm (10 dBm) | 0.000 dBm (0 dBm) |
|---------------------|---------------------|-------------------|

### Beamforming Gain

| Powerstep name (value) | Beamforming gain table names |
|------------------------|------------------------------|
| 20.000 dBm (20 dBm)    | ---                          |
| 10.000 dBm (10 dBm)    | ---                          |
| 0.000 dBm (0 dBm)      | ---                          |

### Gain Tables

| Powerstep name (value) | Gain table names |
|------------------------|------------------|
| 20.000 dBm (20 dBm)    | Port 1: ---;     |
| 10.000 dBm (10 dBm)    | Port 1: ---;     |
| 0.000 dBm (0 dBm)      | Port 1: ---;     |

### DUT Settings

|                            |       |
|----------------------------|-------|
| No. of transmission chains | 1     |
| Equipment Type             | Other |
| Digital Modulation         | Yes   |
| Frequency Hopping          | No    |

## Hardware Setup: WMS Measurements\TS8997

|                    |                                                                                                                                             |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Spectrum Analyzer: | SA FSV 40 (SA FSV 40) @ VISA (ADR<br>TCPIP::192.168.48.111::INST0::INSTR), SN 1321.3008K39/101229,<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 (1) (SMB100A) @ VISA (ADR<br>TCPIP::192.168.48.30::INST0::INSTR), SN 178361, FW 3.20.390.24<br>/ Drv:Rev 2.21.0, 07/2016, CVI 2015 |
| OSP:               | OSP-B157W (CMA) (OSP-B157W) @ VISA (ADR<br>TCPIP::192.168.48.157::INST0::INSTR), SN 1527.1144.03 / 101057,<br>FW 1.27.0.0                   |

## Summary

| Test                            | Frequency (MHz) | Nominal Power (dBm) | Nominal Bandwidth (MHz) | Result |
|---------------------------------|-----------------|---------------------|-------------------------|--------|
| Minimum Emission Bandwidth 6 dB | 2422.000        | 20.0                | 40.000000               | PASS   |
| Emission Bandwidth 20 dB        | 2422.000        | 20.0                | 40.000000               | PASS   |
| RF output power                 | 2422.000        | 20.0                | 40.000000               | PASS   |
| Peak Power Spectral Density     | 2422.000        | 20.0                | 40.000000               | PASS   |
| Band Edge low                   | 2422.000        | 20.0                | 40.000000               | PASS   |
| Tx Spurious Emission            | 2422.000        | 20.0                | 40.000000               | PASS   |
| Emission Bandwidth 20 dB        | 2437.000        | 20.0                | 40.000000               | PASS   |
| Minimum Emission Bandwidth 6 dB | 2437.000        | 20.0                | 40.000000               | PASS   |
| RF output power                 | 2437.000        | 20.0                | 40.000000               | PASS   |
| Peak Power Spectral Density     | 2437.000        | 20.0                | 40.000000               | PASS   |
| Tx Spurious Emission            | 2437.000        | 20.0                | 40.000000               | PASS   |
| Emission Bandwidth 20 dB        | 2452.000        | 20.0                | 40.000000               | PASS   |
| Minimum Emission Bandwidth 6 dB | 2452.000        | 20.0                | 40.000000               | PASS   |
| RF output power                 | 2452.000        | 20.0                | 40.000000               | PASS   |
| Peak Power Spectral Density     | 2452.000        | 20.0                | 40.000000               | PASS   |
| Band Edge high                  | 2452.000        | 20.0                | 40.000000               | PASS   |
| Tx Spurious Emission            | 2452.000        | 20.0                | 40.000000               | PASS   |

## Minimum Emission Bandwidth 6 dB (2422 MHz; 20.000 dBm; 40 MHz)

Customized settings.

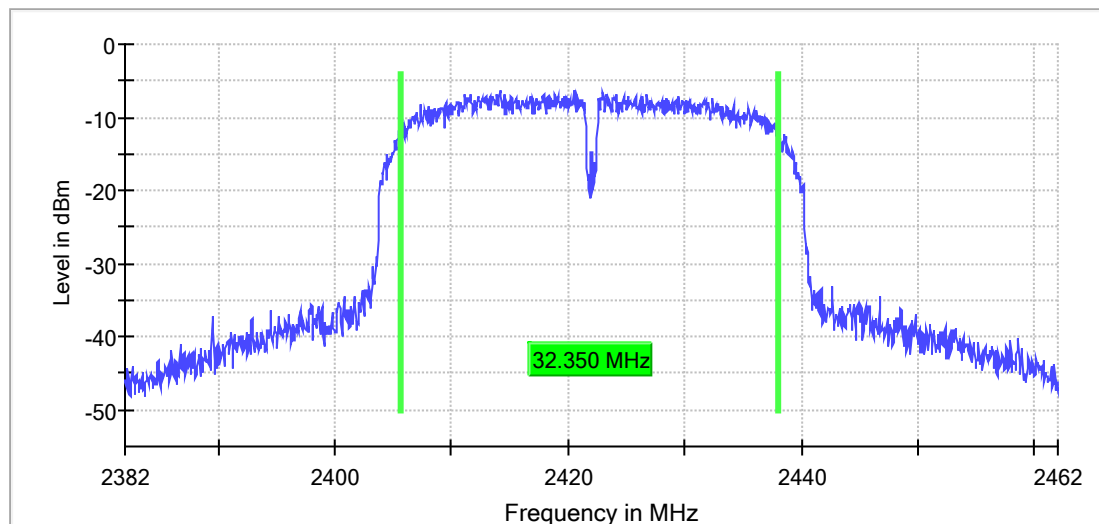
### 6 dB Bandwidth

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---------------------|-----------------|-----------------|-----------------|----------------------|-----------------------|
| 2422.000000         | 32.350000       | 0.500000        | ---             | 2405.675000          | 2438.025000           |

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

| DUT Frequency (MHz) | Max Level (dBm) | Result |
|---------------------|-----------------|--------|
| 2422.000000         | -6.2            | PASS   |

6 dB Bandwidth



### Measurement

| Setting               | Instrument Value | Target Value  |
|-----------------------|------------------|---------------|
| Start Frequency       | 2.38200 GHz      | 2.38200 GHz   |
| Stop Frequency        | 2.46200 GHz      | 2.46200 GHz   |
| Span                  | 80.000 MHz       | 80.000 MHz    |
| RBW                   | 100.000 kHz      | ~ 100.000 kHz |
| VBW                   | 300.000 kHz      | ~ 300.000 kHz |
| SweepPoints           | 1600             | ~ 1600        |
| Sweptime              | 1.600 ms         | AUTO          |
| Reference Level       | 10.000 dBm       | 10.000 dBm    |
| Attenuation           | 30.000 dB        | AUTO          |
| Detector              | Peak             | Peak          |
| SweepCount            | 100              | 100           |
| 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                   | 1 / max. 1       | max. 1        |
| Stable                | 0 / 1            | 1             |
| Max Stable Difference | 0.00 dB          | 0.50 dB       |

## Emission Bandwidth 20 dB (2422 MHz; 20.000 dBm; 40 MHz)

Customized settings.

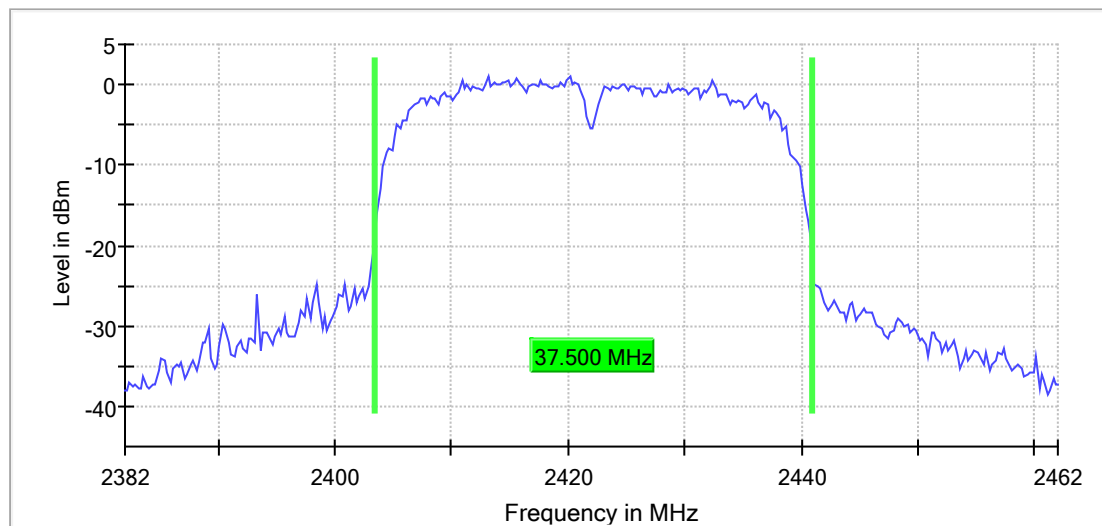
### 20 dB Bandwidth

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---------------------|-----------------|-----------------|-----------------|----------------------|-----------------------|
| 2422.000000         | 37.500000       | ---             | ---             | 2403.375000          | 2440.875000           |

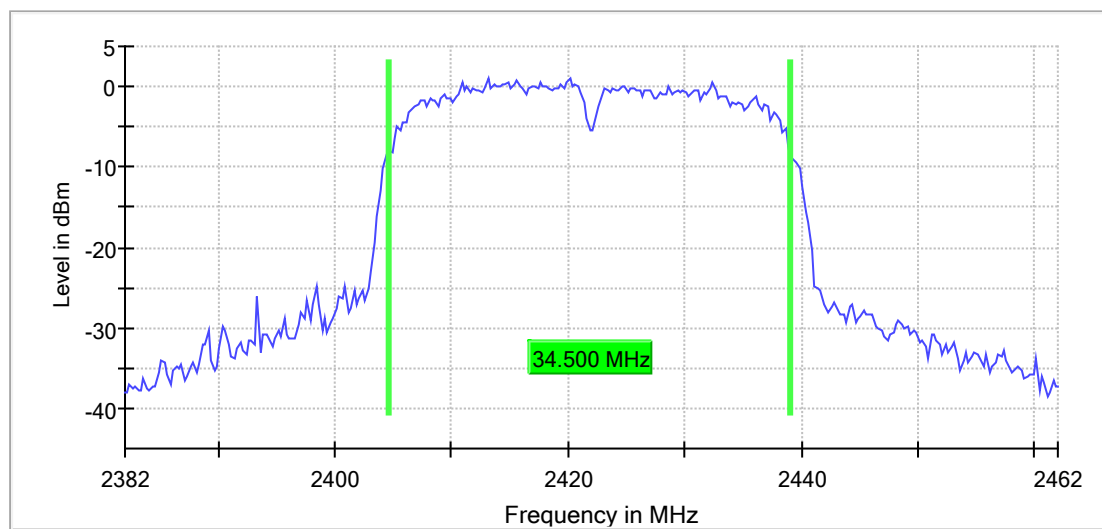
(continuation of the "20 dB Bandwidth" table from column 6 ...)

| DUT Frequency (MHz) | Max Level (dBm) | Result |
|---------------------|-----------------|--------|
| 2422.000000         | 0.9             | PASS   |

20 dB Bandwidth



99 % Bandwidth



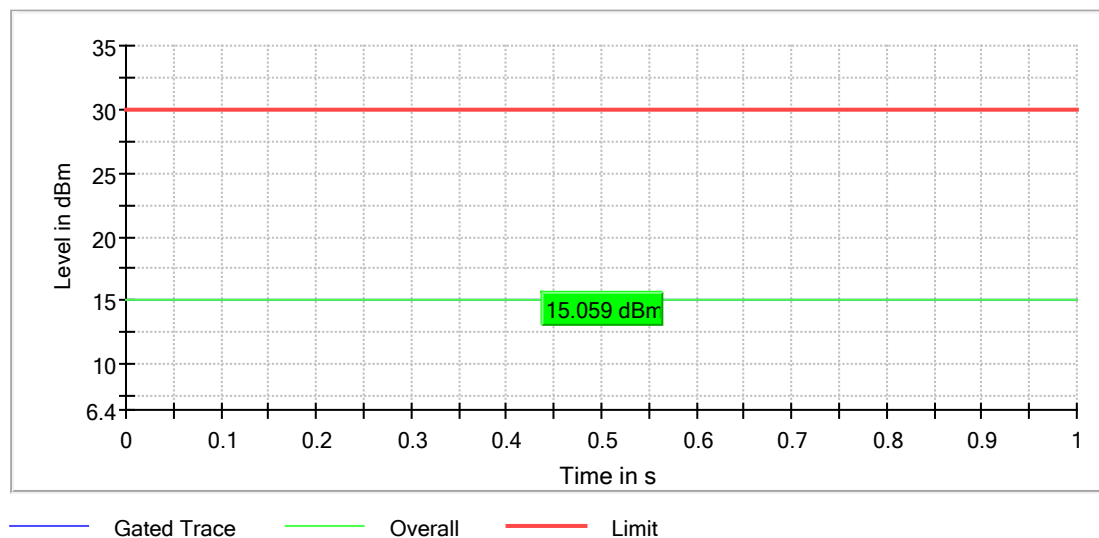
## Measurement

| Setting               | Instrument Value | Target Value   |
|-----------------------|------------------|----------------|
| Start Frequency       | 2.38200 GHz      | 2.38200 GHz    |
| Stop Frequency        | 2.46200 GHz      | 2.46200 GHz    |
| Span                  | 80.000 MHz       | 80.000 MHz     |
| RBW                   | 500.000 kHz      | >= 500.000 kHz |
| VBW                   | 2.000 MHz        | >= 1.500 MHz   |
| SweepPoints           | 320              | ~ 320          |
| SweepTime             | 1.000 ms         | AUTO           |
| Reference Level       | 10.000 dBm       | 10.000 dBm     |
| Attenuation           | 30.000 dB        | AUTO           |
| Detector              | Peak             | Peak           |
| SweepCount            | 100              | 100            |
| 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                   | 1 / max. 1       | max. 1         |
| Stable                | 0 / 1            | 1              |
| Max Stable Difference | 0.00 dB          | 0.50 dB        |

**RF output power (2422 MHz; 20.000 dBm; 40 MHz)****Result**

| DUT Frequency (MHz) | Gated RMS (dBm) | Limit Max (dBm) | Gated EIRP (dBm) | DutyCycle (%) | Result |
|---------------------|-----------------|-----------------|------------------|---------------|--------|
| 2422.000000         | 15.1            | 30.0            | 15.1             | 100.000       | 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 |

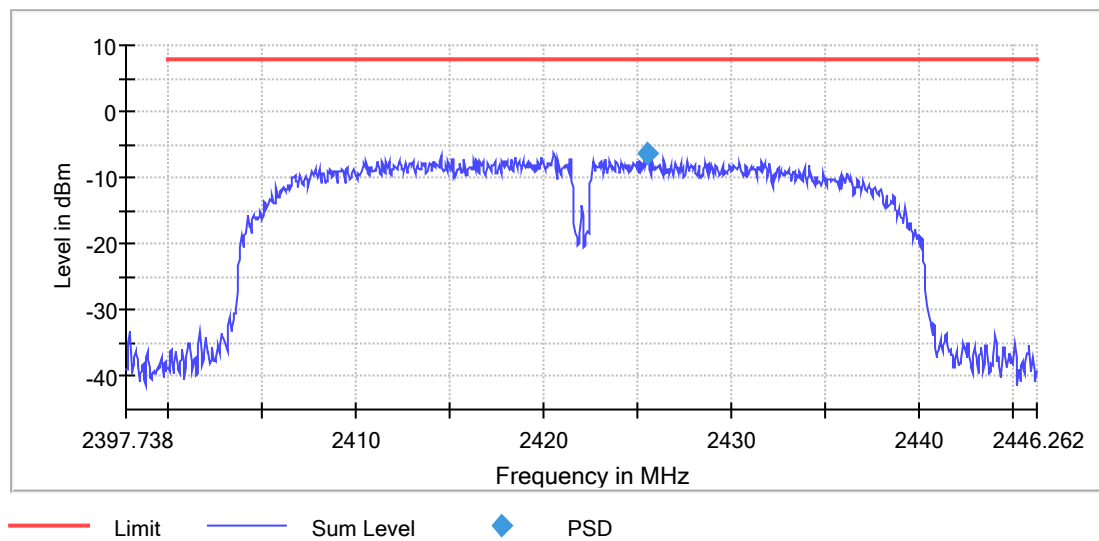
## Peak Power Spectral Density (2422 MHz; 20.000 dBm; 40 MHz)

Customized settings.

### Result

| DUT Frequency (MHz) | Frequency (MHz) | PSD (dBm) | Limit Max (dBm) | Result |
|---------------------|-----------------|-----------|-----------------|--------|
| 2422.000000         | 2425.526817     | -6.311    | 8.0             | PASS   |

Peak Power Spectral Density



### Measurement

| Setting               | Instrument Value | Target Value   |
|-----------------------|------------------|----------------|
| Start Frequency       | 2.39774 GHz      | 2.39774 GHz    |
| Stop Frequency        | 2.44626 GHz      | 2.44626 GHz    |
| Span                  | 48.525 MHz       | 48.525 MHz     |
| RBW                   | 100.000 kHz      | <= 100.000 kHz |
| VBW                   | 300.000 kHz      | >= 300.000 kHz |
| SweepPoints           | 970              | ~ 970          |
| SweepTime             | 1.050 ms         | AUTO           |
| Reference Level       | 10.000 dBm       | 10.000 dBm     |
| Attenuation           | 30.000 dB        | AUTO           |
| Detector              | Peak             | Peak           |
| SweepCount            | 100              | 100            |
| Filter                | 3 dB             | 3 dB           |
| Trace Mode            | Max Hold         | Max Hold       |
| SweepType             | Sweep            | Sweep          |
| 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 (2422 MHz; 20.000 dBm; 40 MHz)**

Customized settings.

**Result**

| DUT Frequency (MHz) | Result |
|---------------------|--------|
| 2422.000000         | PASS   |

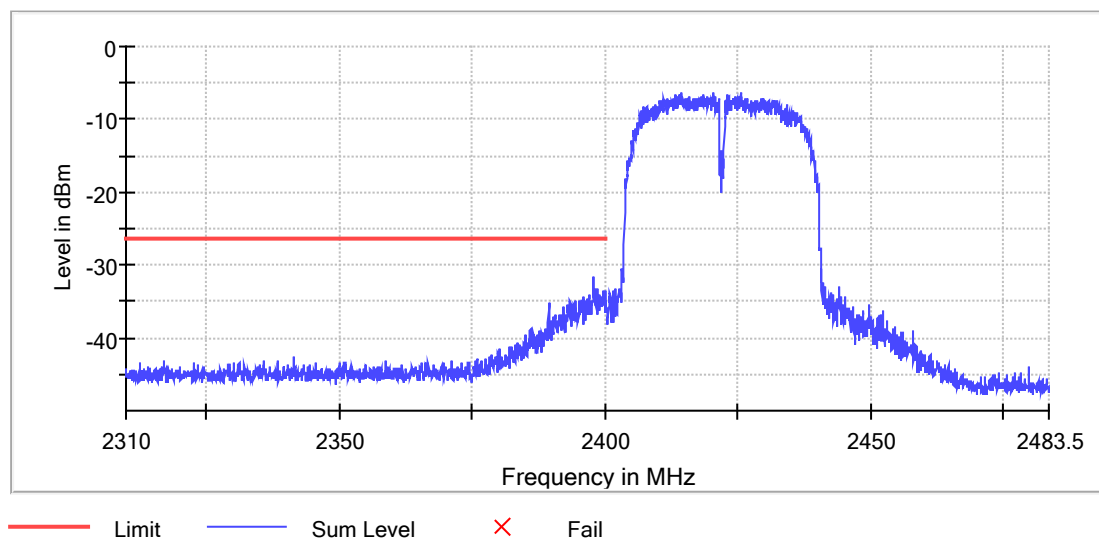
**Inband Peak**

| Frequency (MHz) | Level (dBm) |
|-----------------|-------------|
| 2420.525000     | -6.2        |

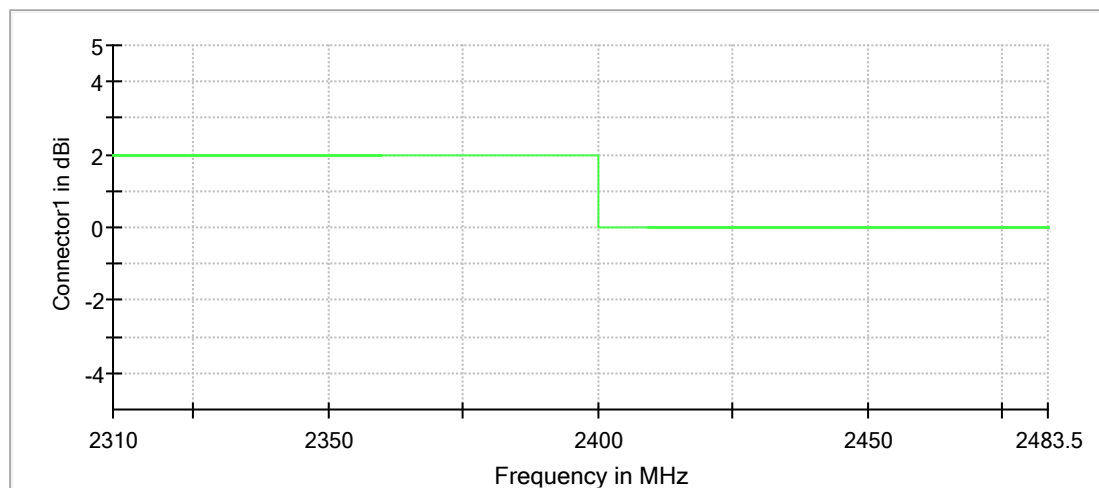
**Measurements**

| Frequency (MHz) | Level (dBm) | Margin (dB) | Limit (dBm) | Result |
|-----------------|-------------|-------------|-------------|--------|
| 2397.875000     | -31.5       | 5.2         | -26.3       | PASS   |
| 2397.925000     | -31.7       | 5.3         | -26.3       | PASS   |
| 2397.825000     | -32.0       | 5.7         | -26.3       | PASS   |
| 2397.975000     | -33.1       | 6.8         | -26.3       | PASS   |
| 2398.275000     | -33.2       | 6.9         | -26.3       | PASS   |
| 2398.325000     | -33.3       | 7.0         | -26.3       | PASS   |
| 2398.625000     | -33.4       | 7.0         | -26.3       | PASS   |
| 2398.575000     | -33.4       | 7.1         | -26.3       | PASS   |
| 2399.825000     | -33.5       | 7.2         | -26.3       | PASS   |
| 2398.225000     | -34.0       | 7.7         | -26.3       | PASS   |
| 2397.775000     | -34.1       | 7.8         | -26.3       | PASS   |
| 2398.875000     | -34.1       | 7.8         | -26.3       | PASS   |
| 2398.175000     | -34.1       | 7.8         | -26.3       | PASS   |
| 2399.875000     | -34.1       | 7.8         | -26.3       | PASS   |
| 2397.025000     | -34.2       | 7.8         | -26.3       | PASS   |

Band Edge

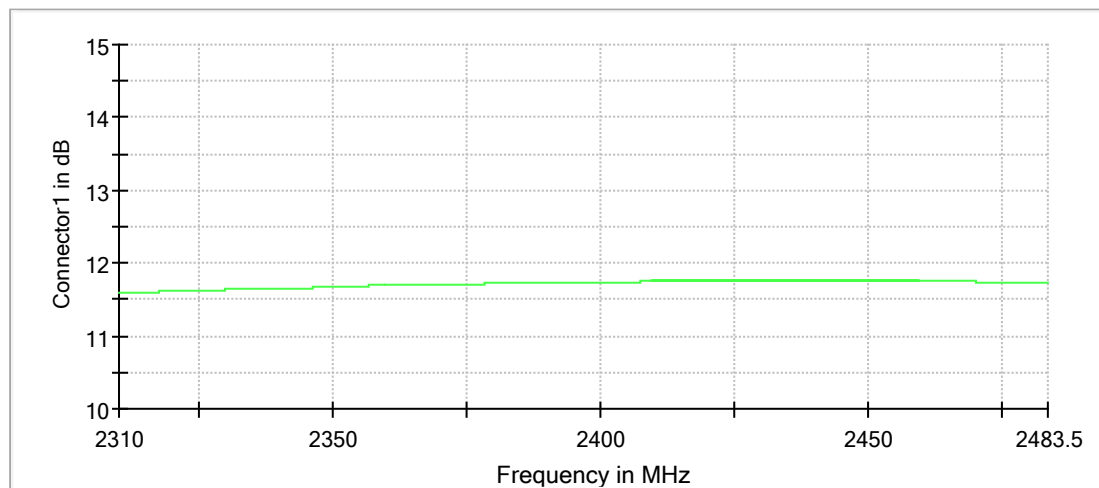


Gain



Connector1

Attenuation



Connector1

## 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         |
| SweepTime             | 1.800 ms         | 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             | Sweep            | AUTO           |
| Preamp                | off              | off            |
| Stablemode            | Trace            | Trace          |
| Stablevalue           | 0.50 dB          | 0.50 dB        |
| Run                   | 34 / 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 |
| SweepPoints           | 1670             | ~ 1670         |
| SweepTime             | 1.670 ms         | 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             | Sweep            | AUTO           |
| Preamplifier          | 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 | 0.43 dB          | 0.50 dB        |

**Tx Spurious Emission (2422 MHz; 20.000 dBm; 40 MHz)**

Customized settings.

**Result**

| DUT Frequency (MHz) | Result |
|---------------------|--------|
| 2422.000000         | PASS   |

**Final measurements**

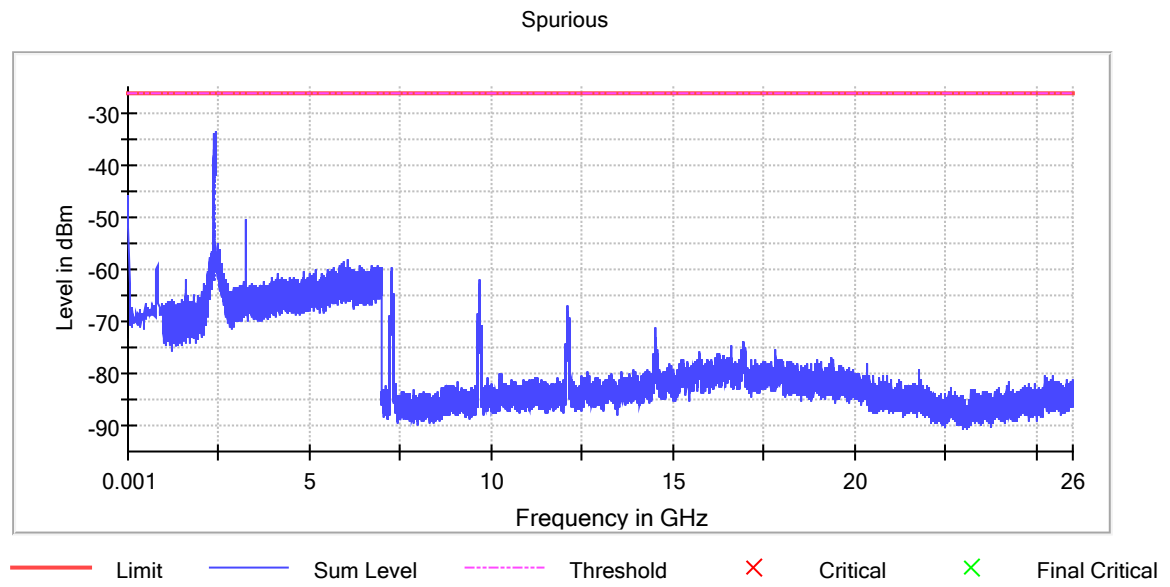
| Frequency (MHz) | Level Pre Measurement (dBm) | level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|-----------------------------|-------------|-------------|-------------|--------|
| ---             | ---                         | ---         | ---         | ---         | ---   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

**Pre Measurements**

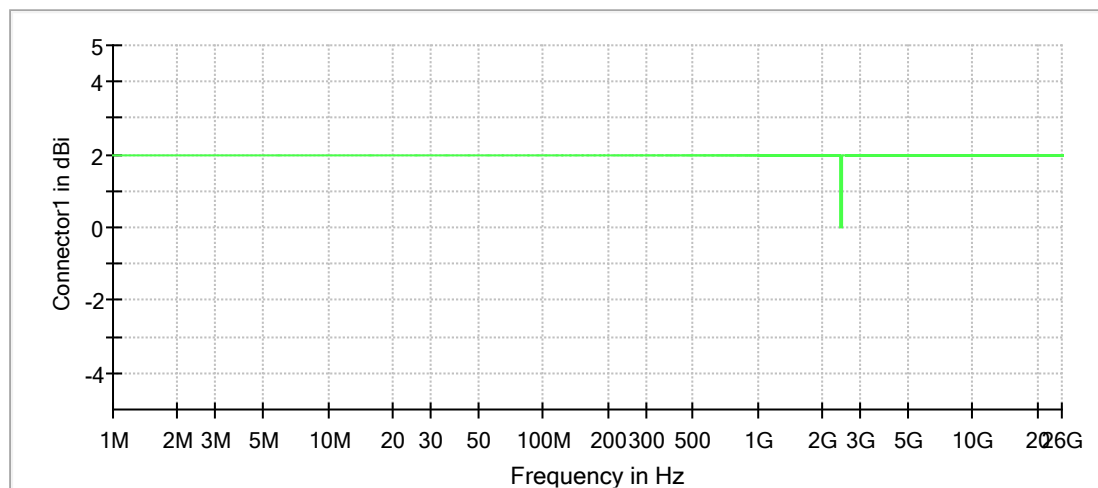
| Frequency (MHz) | Level (dBm) | Margin (dB) | Limit (dBm) |
|-----------------|-------------|-------------|-------------|
| 2398.275000     | -33.3       | 7.0         | -26.3       |
| 2398.225000     | -33.9       | 7.6         | -26.3       |
| 2389.525000     | -33.9       | 7.6         | -26.3       |
| 2398.325000     | -34.0       | 7.7         | -26.3       |
| 2389.575000     | -34.3       | 8.0         | -26.3       |
| 2396.925000     | -34.5       | 8.2         | -26.3       |
| 2396.825000     | -34.6       | 8.2         | -26.3       |
| 2398.875000     | -34.6       | 8.3         | -26.3       |
| 2398.925000     | -34.8       | 8.5         | -26.3       |
| 2396.975000     | -34.9       | 8.5         | -26.3       |
| 2396.875000     | -35.0       | 8.7         | -26.3       |
| 2398.625000     | -35.0       | 8.7         | -26.3       |
| 2398.525000     | -35.1       | 8.8         | -26.3       |
| 2395.775000     | -35.2       | 8.9         | -26.3       |
| 2396.775000     | -35.3       | 9.0         | -26.3       |

**Measurement Settings**

| Start Frequency (MHz) | Stop Frequency (MHz) | Pre Measurement | Final Measurement |
|-----------------------|----------------------|-----------------|-------------------|
| 1.000000              | 1000.000000          | 1               | ---               |
| 1000.000000           | 2400.000000          | 2               | ---               |
| 2483.500000           | 7000.000000          | 2               | ---               |
| 7000.000000           | 18000.000000         | 2               | ---               |
| 18000.000000          | 26000.000000         | 2               | ---               |

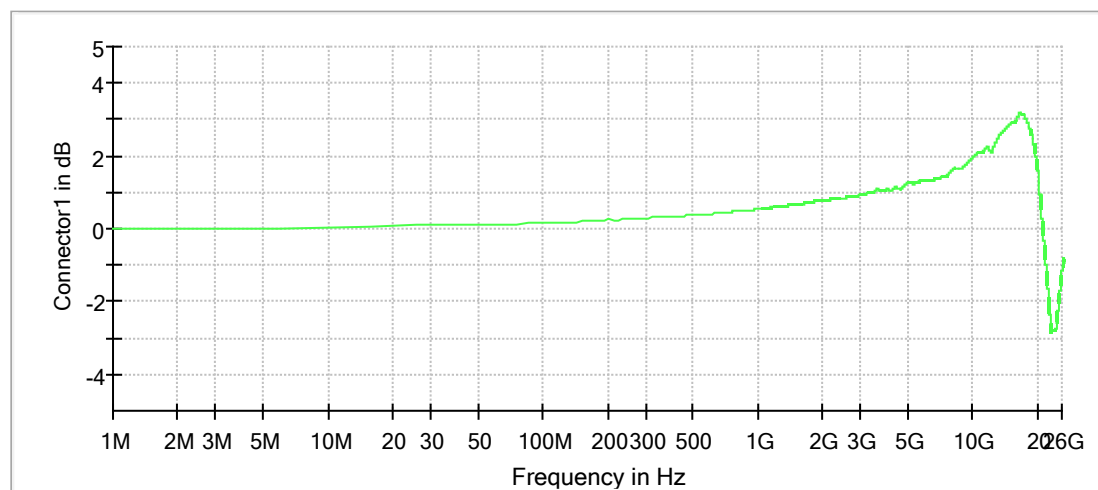


Gain



Connector1

Attenuation



Connector1

## Pre Measurement 1

| Setting               | Instrument Value | Target Value       |
|-----------------------|------------------|--------------------|
| RBW                   | 100.000 kHz      | $\leq 100.000$ kHz |
| VBW                   | 300.000 kHz      | $\geq 300.000$ kHz |
| SweepPoints           | 101              | ~ 101              |
| Sweptime              | 9.990 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                   | 1 / max. 1       | max. 1             |
| Stable                | 0 / 1            | 1                  |
| Max Stable Difference | 0.00 dB          | 0.50 dB            |

**Pre Measurement 2**

| Setting               | Instrument Value | Target Value   |
|-----------------------|------------------|----------------|
| RBW                   | 100.000 kHz      | <= 100.000 kHz |
| VBW                   | 300.000 kHz      | >= 300.000 kHz |
| SweepPoints           | 28000            | ~ 28000        |
| SweepTime             | 28.000 ms        | AUTO           |
| Reference Level       | -10.000 dBm      | -30.000 dBm    |
| Attenuation           | 20.000 dB        | AUTO           |
| Detector              | MaxPeak          | MaxPeak        |
| SweepCount            | 30               | 30             |
| Filter                | 3 dB             | 3 dB           |
| Trace Mode            | Max Hold         | Max Hold       |
| SweepType             | Sweep            | AUTO           |
| Preamp                | off              | off            |
| Stablemode            | Trace            | Trace          |
| Stablevalue           | 1.00 dB          | 1.00 dB        |
| Run                   | 1 / max. 1       | max. 1         |
| Stable                | 0 / 3            | 3              |
| Max Stable Difference | 0.00 dB          | 1.00 dB        |

## Emission Bandwidth 20 dB (2437 MHz; 20.000 dBm; 40 MHz)

Customized settings.

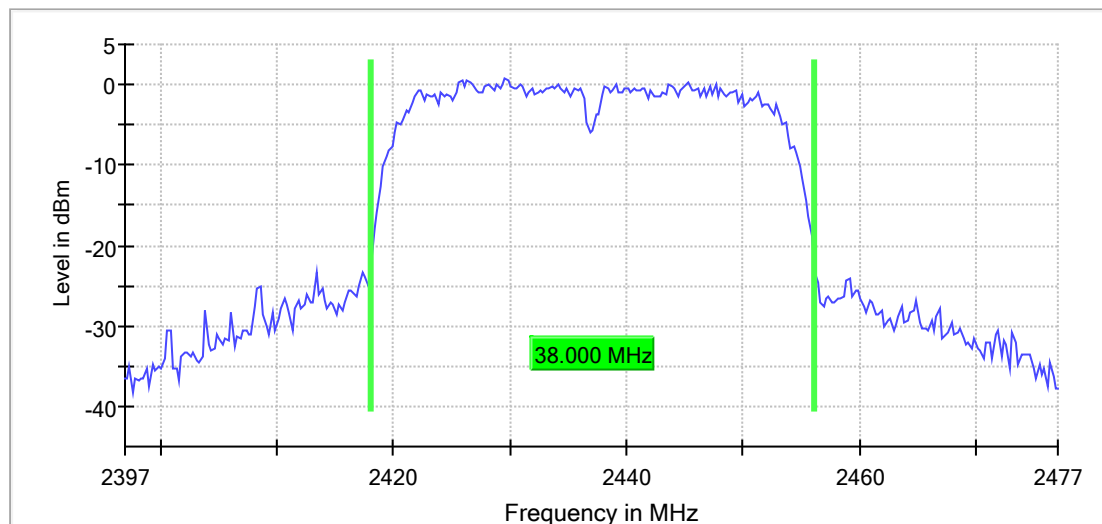
### 20 dB Bandwidth

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---------------------|-----------------|-----------------|-----------------|----------------------|-----------------------|
| 2437.000000         | 38.000000       | ---             | ---             | 2418.125000          | 2456.125000           |

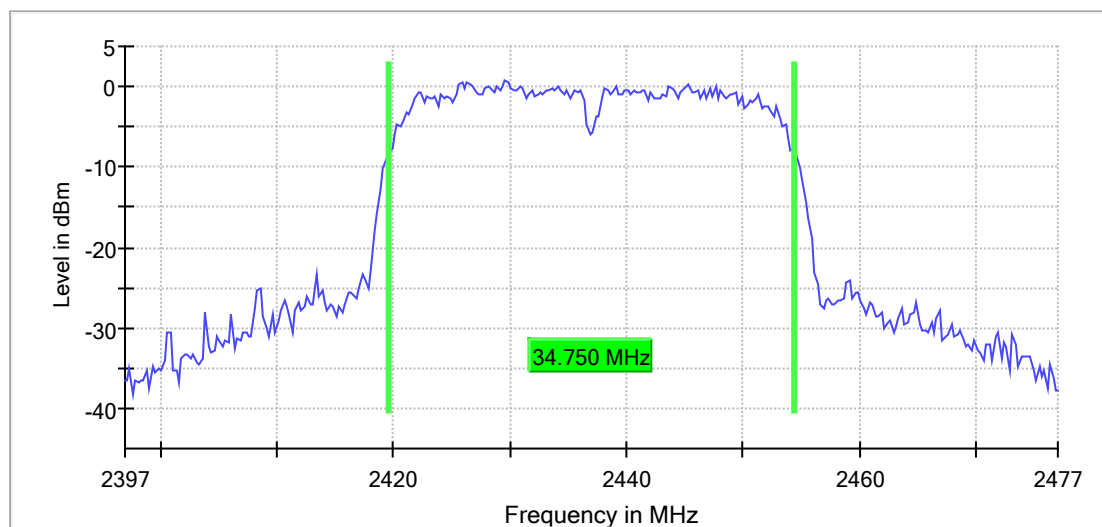
(continuation of the "20 dB Bandwidth" table from column 6 ...)

| DUT Frequency (MHz) | Max Level (dBm) | Result |
|---------------------|-----------------|--------|
| 2437.000000         | 0.9             | PASS   |

20 dB Bandwidth



99 % Bandwidth



## Measurement

| Setting               | Instrument Value | Target Value   |
|-----------------------|------------------|----------------|
| Start Frequency       | 2.39700 GHz      | 2.39700 GHz    |
| Stop Frequency        | 2.47700 GHz      | 2.47700 GHz    |
| Span                  | 80.000 MHz       | 80.000 MHz     |
| RBW                   | 500.000 kHz      | >= 500.000 kHz |
| VBW                   | 2.000 MHz        | >= 1.500 MHz   |
| SweepPoints           | 320              | ~ 320          |
| SweepTime             | 1.000 ms         | AUTO           |
| Reference Level       | 10.000 dBm       | 10.000 dBm     |
| Attenuation           | 30.000 dB        | AUTO           |
| Detector              | Peak             | Peak           |
| SweepCount            | 100              | 100            |
| 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                   | 1 / max. 1       | max. 1         |
| Stable                | 0 / 1            | 1              |
| Max Stable Difference | 0.00 dB          | 0.50 dB        |

## Minimum Emission Bandwidth 6 dB (2437 MHz; 20.000 dBm; 40 MHz)

Customized settings.

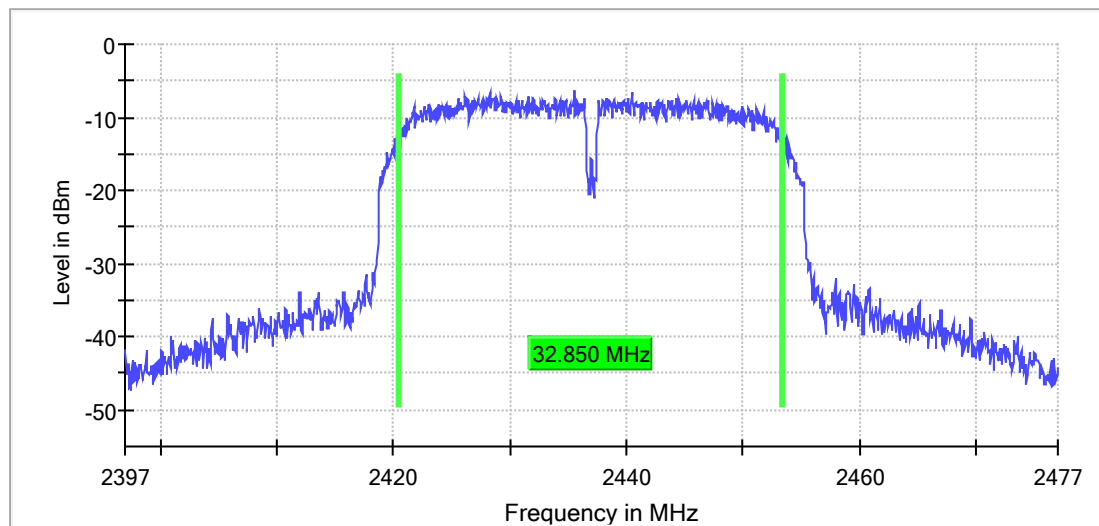
### 6 dB Bandwidth

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---------------------|-----------------|-----------------|-----------------|----------------------|-----------------------|
| 2437.000000         | 32.850000       | 0.500000        | ---             | 2420.475000          | 2453.325000           |

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

| DUT Frequency (MHz) | Max Level (dBm) | Result |
|---------------------|-----------------|--------|
| 2437.000000         | -6.4            | PASS   |

6 dB Bandwidth



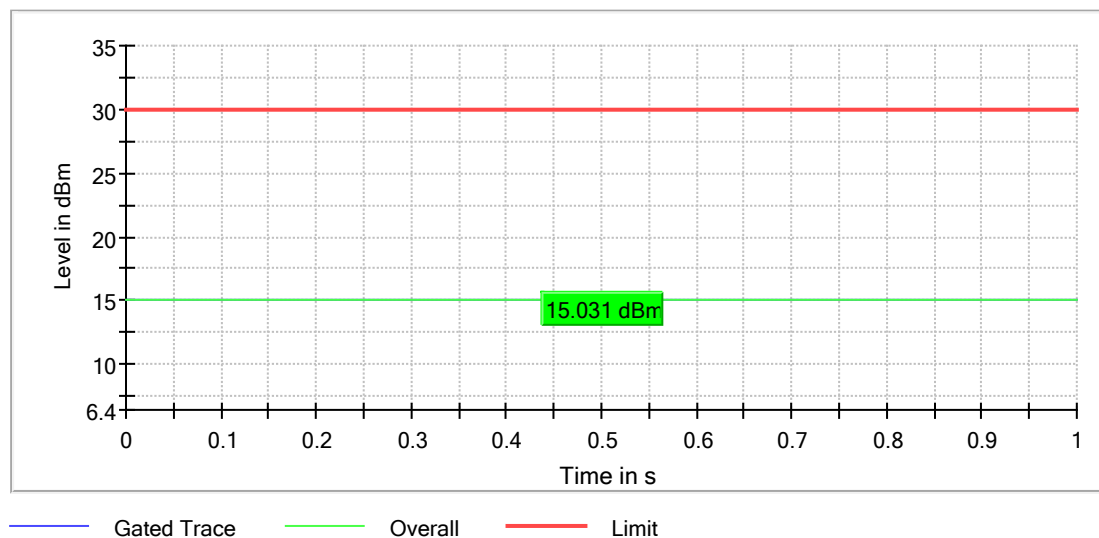
### Measurement

| Setting               | Instrument Value | Target Value  |
|-----------------------|------------------|---------------|
| Start Frequency       | 2.39700 GHz      | 2.39700 GHz   |
| Stop Frequency        | 2.47700 GHz      | 2.47700 GHz   |
| Span                  | 80.000 MHz       | 80.000 MHz    |
| RBW                   | 100.000 kHz      | ~ 100.000 kHz |
| VBW                   | 300.000 kHz      | ~ 300.000 kHz |
| SweepPoints           | 1600             | ~ 1600        |
| Sweptime              | 1.600 ms         | AUTO          |
| Reference Level       | 10.000 dBm       | 10.000 dBm    |
| Attenuation           | 30.000 dB        | AUTO          |
| Detector              | Peak             | Peak          |
| SweepCount            | 100              | 100           |
| 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                   | 1 / max. 1       | max. 1        |
| Stable                | 0 / 1            | 1             |
| Max Stable Difference | 0.00 dB          | 0.50 dB       |

**RF output power (2437 MHz; 20.000 dBm; 40 MHz)****Result**

| DUT Frequency (MHz) | Gated RMS (dBm) | Limit Max (dBm) | Gated EIRP (dBm) | DutyCycle (%) | Result |
|---------------------|-----------------|-----------------|------------------|---------------|--------|
| 2437.000000         | 15.0            | 30.0            | 15.0             | 100.000       | 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 |

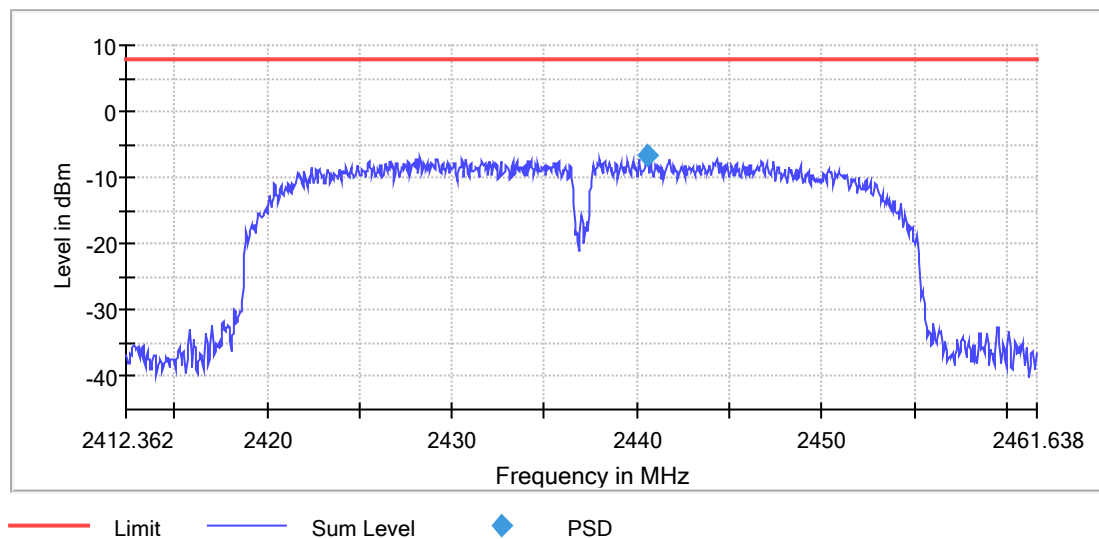
## Peak Power Spectral Density (2437 MHz; 20.000 dBm; 40 MHz)

Customized settings.

### Result

| DUT Frequency (MHz) | Frequency (MHz) | PSD (dBm) | Limit Max (dBm) | Result |
|---------------------|-----------------|-----------|-----------------|--------|
| 2437.000000         | 2440.523212     | -6.568    | 8.0             | PASS   |

Peak Power Spectral Density



### Measurement

| Setting               | Instrument Value | Target Value   |
|-----------------------|------------------|----------------|
| Start Frequency       | 2.41236 GHz      | 2.41236 GHz    |
| Stop Frequency        | 2.46164 GHz      | 2.46164 GHz    |
| Span                  | 49.275 MHz       | 49.275 MHz     |
| RBW                   | 100.000 kHz      | <= 100.000 kHz |
| VBW                   | 300.000 kHz      | >= 300.000 kHz |
| SweepPoints           | 986              | ~ 986          |
| SweepTime             | 1.060 ms         | AUTO           |
| Reference Level       | 10.000 dBm       | 10.000 dBm     |
| Attenuation           | 30.000 dB        | AUTO           |
| Detector              | Peak             | Peak           |
| SweepCount            | 100              | 100            |
| Filter                | 3 dB             | 3 dB           |
| Trace Mode            | Max Hold         | Max Hold       |
| SweepType             | Sweep            | Sweep          |
| 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 (2437 MHz; 20.000 dBm; 40 MHz)**

Customized settings.

**Result**

| DUT Frequency (MHz) | Result |
|---------------------|--------|
| 2437.000000         | PASS   |

**Final measurements**

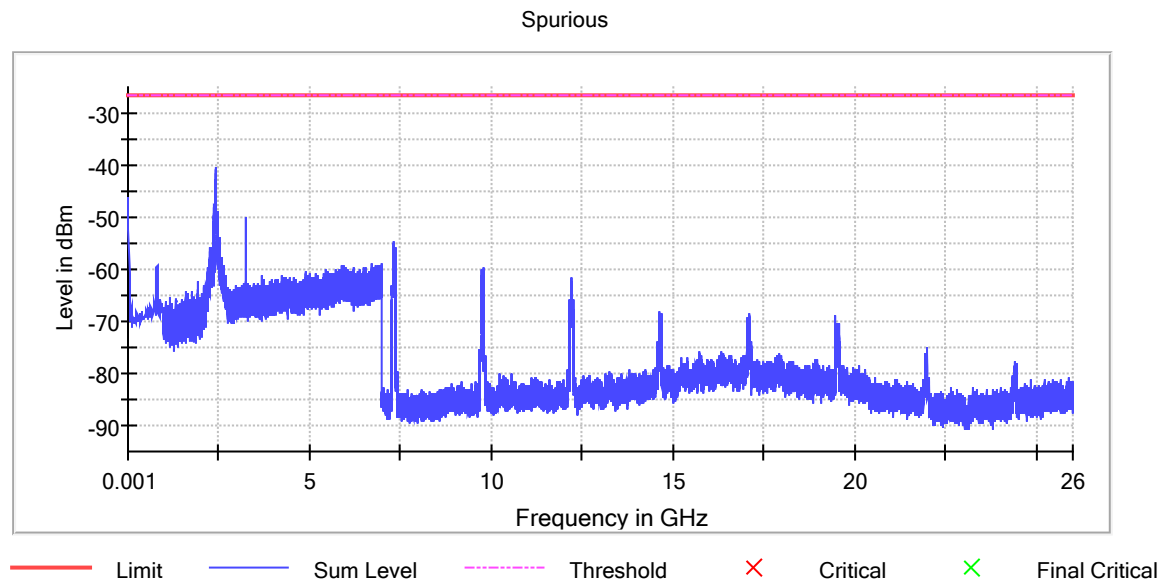
| Frequency (MHz) | Level Pre Measurement (dBm) | level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|-----------------------------|-------------|-------------|-------------|--------|
| ---             | ---                         | ---         | ---         | ---         | ---   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

**Pre Measurements**

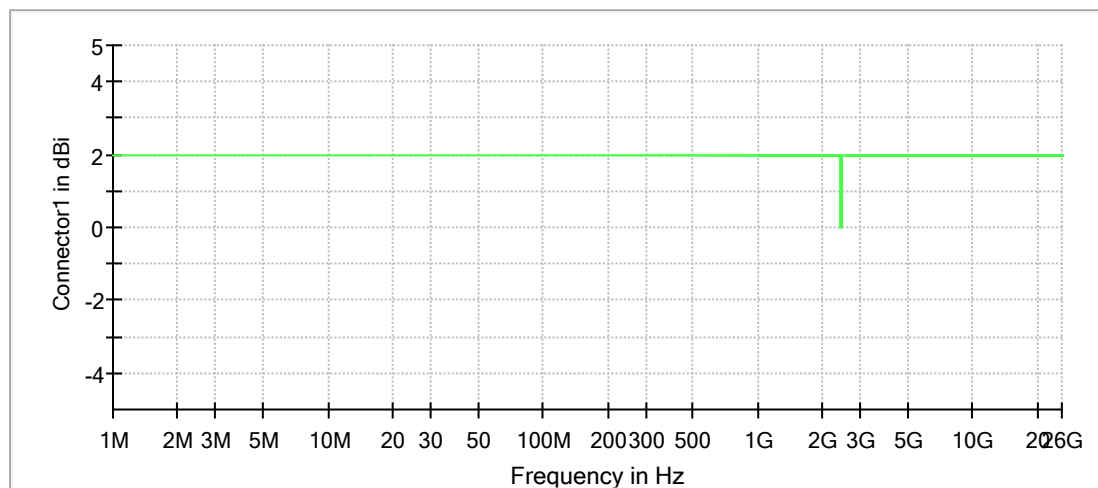
| Frequency (MHz) | Level (dBm) | Margin (dB) | Limit (dBm) |
|-----------------|-------------|-------------|-------------|
| 2398.625000     | -40.4       | 13.9        | -26.6       |
| 2398.275000     | -40.7       | 14.1        | -26.6       |
| 2398.375000     | -40.7       | 14.2        | -26.6       |
| 2398.325000     | -40.9       | 14.3        | -26.6       |
| 2398.575000     | -40.9       | 14.4        | -26.6       |
| 2399.875000     | -40.9       | 14.4        | -26.6       |
| 2399.825000     | -41.1       | 14.5        | -26.6       |
| 2399.925000     | -41.4       | 14.9        | -26.6       |
| 2398.525000     | -41.5       | 15.0        | -26.6       |
| 2398.675000     | -41.6       | 15.0        | -26.6       |
| 2399.075000     | -41.7       | 15.1        | -26.6       |
| 2399.125000     | -42.0       | 15.4        | -26.6       |
| 2398.225000     | -42.2       | 15.6        | -26.6       |
| 2398.425000     | -42.4       | 15.8        | -26.6       |
| 2399.225000     | -42.5       | 15.9        | -26.6       |

**Measurement Settings**

| Start Frequency (MHz) | Stop Frequency (MHz) | Pre Measurement | Final Measurement |
|-----------------------|----------------------|-----------------|-------------------|
| 1.000000              | 1000.000000          | 1               | ---               |
| 1000.000000           | 2400.000000          | 2               | ---               |
| 2483.500000           | 7000.000000          | 2               | ---               |
| 7000.000000           | 18000.000000         | 2               | ---               |
| 18000.000000          | 26000.000000         | 2               | ---               |

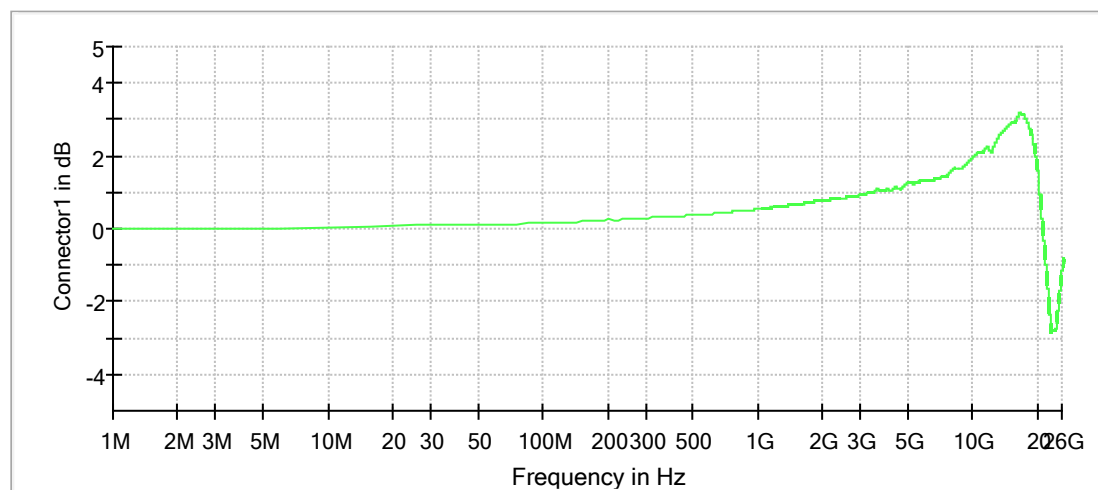


Gain



Connector1

Attenuation



Connector1

## Pre Measurement 1

| Setting               | Instrument Value | Target Value       |
|-----------------------|------------------|--------------------|
| RBW                   | 100.000 kHz      | $\leq 100.000$ kHz |
| VBW                   | 300.000 kHz      | $\geq 300.000$ kHz |
| SweepPoints           | 101              | ~ 101              |
| Sweptime              | 9.990 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           | 1.00 dB          | 1.00 dB            |
| Run                   | 1 / max. 1       | max. 1             |
| Stable                | 0 / 1            | 1                  |
| Max Stable Difference | 0.00 dB          | 1.00 dB            |

**Pre Measurement 2**

| Setting               | Instrument Value | Target Value   |
|-----------------------|------------------|----------------|
| RBW                   | 100.000 kHz      | <= 100.000 kHz |
| VBW                   | 300.000 kHz      | >= 300.000 kHz |
| SweepPoints           | 28000            | ~ 28000        |
| SweepTime             | 28.000 ms        | AUTO           |
| Reference Level       | -10.000 dBm      | -30.000 dBm    |
| Attenuation           | 20.000 dB        | AUTO           |
| Detector              | MaxPeak          | MaxPeak        |
| SweepCount            | 30               | 30             |
| Filter                | 3 dB             | 3 dB           |
| Trace Mode            | Max Hold         | Max Hold       |
| SweepType             | Sweep            | AUTO           |
| Preamp                | off              | off            |
| Stablemode            | Trace            | Trace          |
| Stablevalue           | 1.00 dB          | 1.00 dB        |
| Run                   | 1 / max. 1       | max. 1         |
| Stable                | 0 / 3            | 3              |
| Max Stable Difference | 0.00 dB          | 1.00 dB        |

## Emission Bandwidth 20 dB (2452 MHz; 20.000 dBm; 40 MHz)

Customized settings.

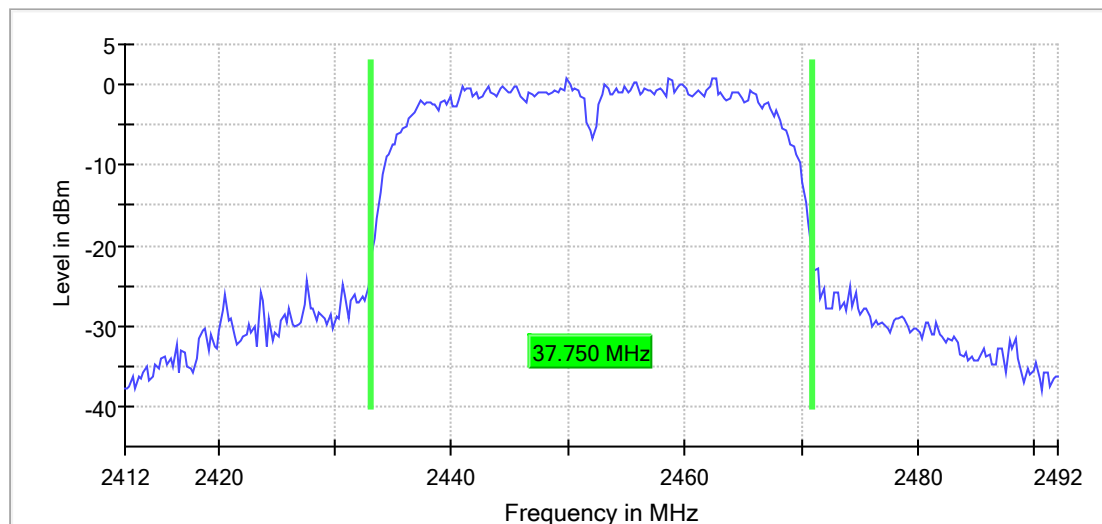
### 20 dB Bandwidth

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---------------------|-----------------|-----------------|-----------------|----------------------|-----------------------|
| 2452.000000         | 37.750000       | ---             | ---             | 2433.125000          | 2470.875000           |

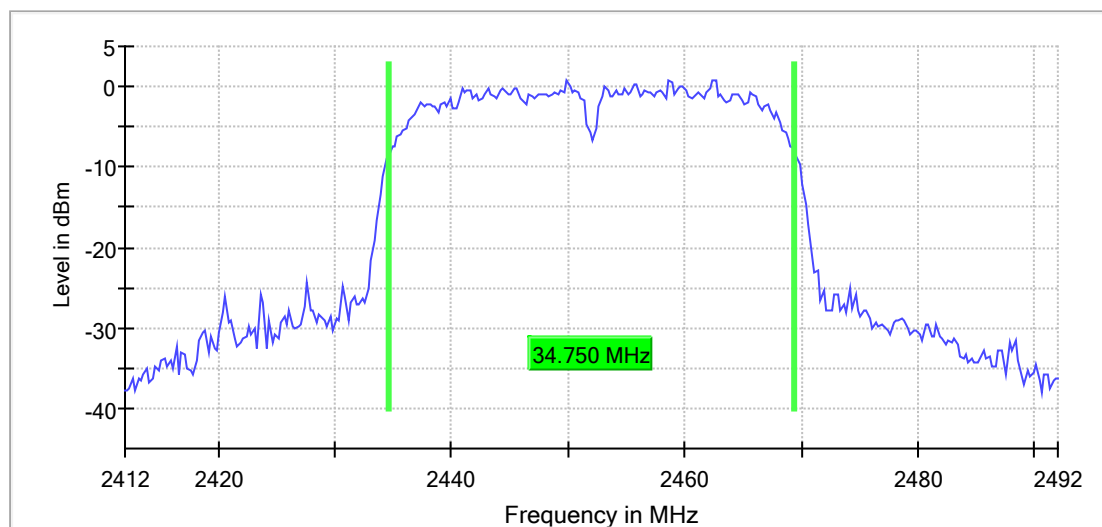
(continuation of the "20 dB Bandwidth" table from column 6 ...)

| DUT Frequency (MHz) | Max Level (dBm) | Result |
|---------------------|-----------------|--------|
| 2452.000000         | 0.8             | PASS   |

20 dB Bandwidth



99 % Bandwidth



## Measurement

| Setting               | Instrument Value | Target Value   |
|-----------------------|------------------|----------------|
| Start Frequency       | 2.41200 GHz      | 2.41200 GHz    |
| Stop Frequency        | 2.49200 GHz      | 2.49200 GHz    |
| Span                  | 80.000 MHz       | 80.000 MHz     |
| RBW                   | 500.000 kHz      | >= 500.000 kHz |
| VBW                   | 2.000 MHz        | >= 1.500 MHz   |
| SweepPoints           | 320              | ~ 320          |
| SweepTime             | 1.000 ms         | AUTO           |
| Reference Level       | 10.000 dBm       | 10.000 dBm     |
| Attenuation           | 30.000 dB        | AUTO           |
| Detector              | Peak             | Peak           |
| SweepCount            | 100              | 100            |
| 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                   | 1 / max. 1       | max. 1         |
| Stable                | 0 / 1            | 1              |
| Max Stable Difference | 0.00 dB          | 0.50 dB        |

## Minimum Emission Bandwidth 6 dB (2452 MHz; 20.000 dBm; 40 MHz)

Customized settings.

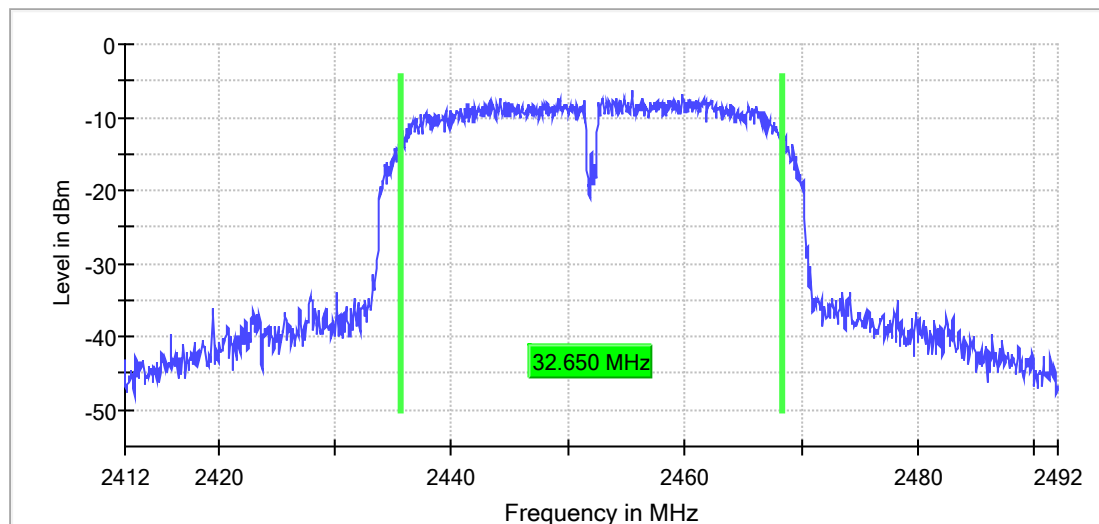
### 6 dB Bandwidth

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---------------------|-----------------|-----------------|-----------------|----------------------|-----------------------|
| 2452.000000         | 32.650000       | 0.500000        | ---             | 2435.675000          | 2468.325000           |

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

| DUT Frequency (MHz) | Max Level (dBm) | Result |
|---------------------|-----------------|--------|
| 2452.000000         | -6.4            | PASS   |

6 dB Bandwidth



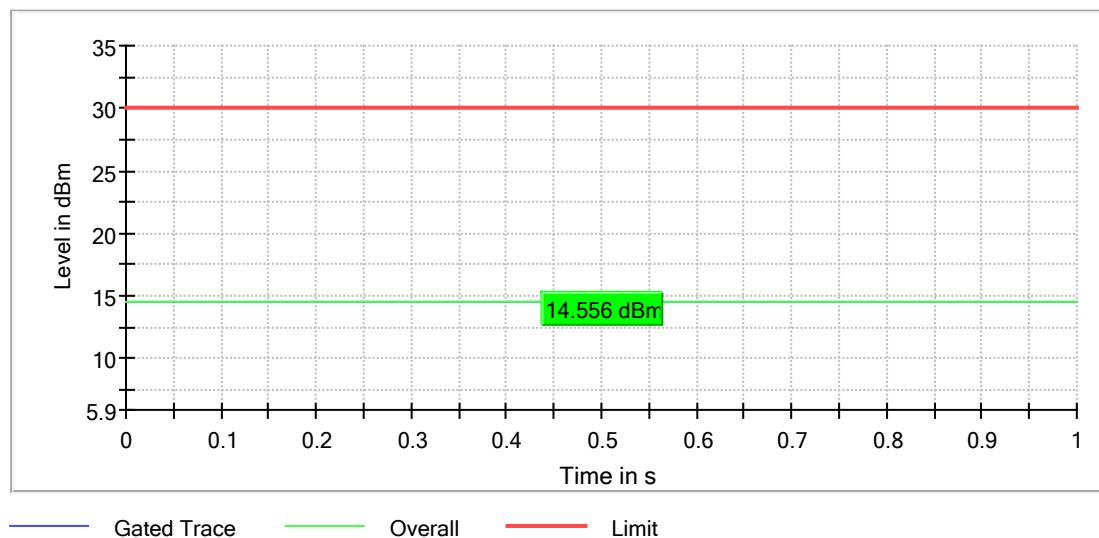
### Measurement

| Setting               | Instrument Value | Target Value  |
|-----------------------|------------------|---------------|
| Start Frequency       | 2.41200 GHz      | 2.41200 GHz   |
| Stop Frequency        | 2.49200 GHz      | 2.49200 GHz   |
| Span                  | 80.000 MHz       | 80.000 MHz    |
| RBW                   | 100.000 kHz      | ~ 100.000 kHz |
| VBW                   | 300.000 kHz      | ~ 300.000 kHz |
| SweepPoints           | 1600             | ~ 1600        |
| Sweptime              | 1.600 ms         | AUTO          |
| Reference Level       | 10.000 dBm       | 10.000 dBm    |
| Attenuation           | 30.000 dB        | AUTO          |
| Detector              | Peak             | Peak          |
| SweepCount            | 100              | 100           |
| 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                   | 1 / max. 1       | max. 1        |
| Stable                | 0 / 1            | 1             |
| Max Stable Difference | 0.00 dB          | 0.50 dB       |

**RF output power (2452 MHz; 20.000 dBm; 40 MHz)****Result**

| DUT Frequency (MHz) | Gated RMS (dBm) | Limit Max (dBm) | Gated EIRP (dBm) | DutyCycle (%) | Result |
|---------------------|-----------------|-----------------|------------------|---------------|--------|
| 2452.000000         | 14.6            | 30.0            | 14.6             | 100.000       | 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 |

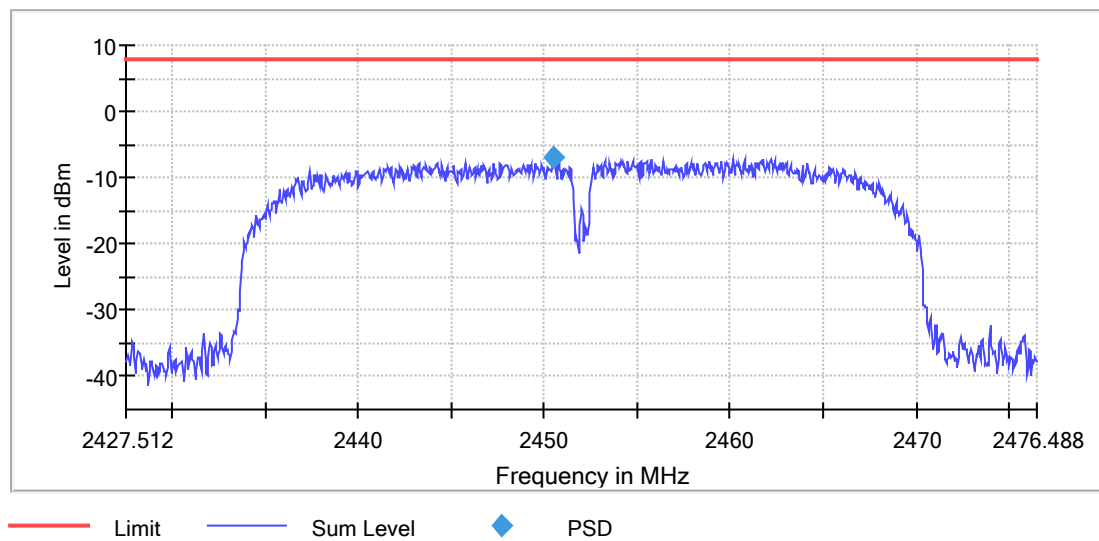
## Peak Power Spectral Density (2452 MHz; 20.000 dBm; 40 MHz)

Customized settings.

### Result

| DUT Frequency (MHz) | Frequency (MHz) | PSD (dBm) | Limit Max (dBm) | Result |
|---------------------|-----------------|-----------|-----------------|--------|
| 2452.000000         | 2450.525753     | -6.821    | 8.0             | PASS   |

Peak Power Spectral Density



### Measurement

| Setting               | Instrument Value | Target Value   |
|-----------------------|------------------|----------------|
| Start Frequency       | 2.42751 GHz      | 2.42751 GHz    |
| Stop Frequency        | 2.47649 GHz      | 2.47649 GHz    |
| Span                  | 48.975 MHz       | 48.975 MHz     |
| RBW                   | 100.000 kHz      | <= 100.000 kHz |
| VBW                   | 300.000 kHz      | >= 300.000 kHz |
| SweepPoints           | 980              | ~ 980          |
| SweepTime             | 1.050 ms         | AUTO           |
| Reference Level       | 10.000 dBm       | 10.000 dBm     |
| Attenuation           | 30.000 dB        | AUTO           |
| Detector              | Peak             | Peak           |
| SweepCount            | 100              | 100            |
| Filter                | 3 dB             | 3 dB           |
| Trace Mode            | Max Hold         | Max Hold       |
| SweepType             | Sweep            | Sweep          |
| 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 (2452 MHz; 20.000 dBm; 40 MHz)**

Customized settings.

**Result**

| DUT Frequency (MHz) | Result |
|---------------------|--------|
| 2452.000000         | PASS   |

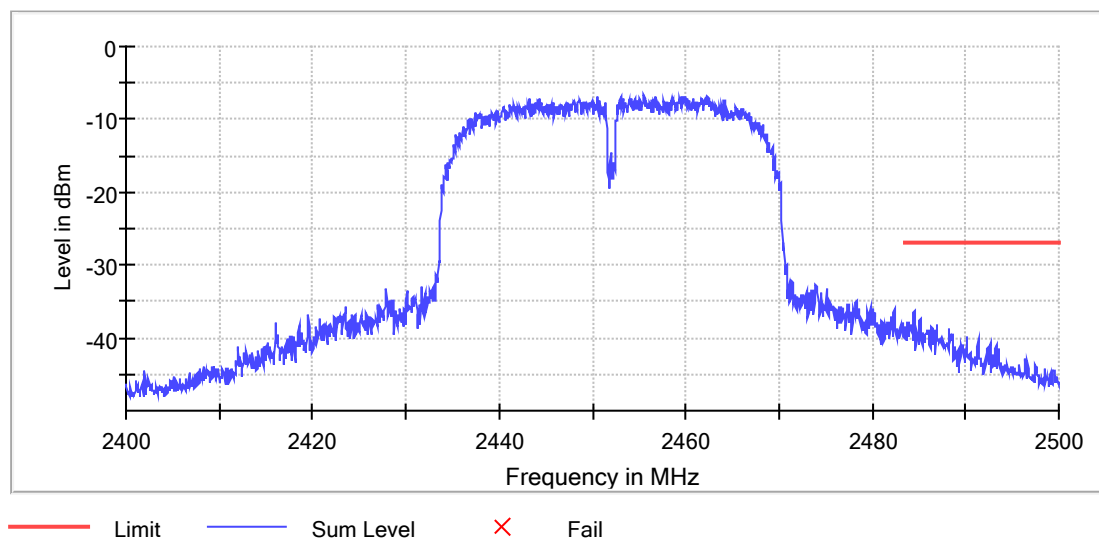
**Inband Peak**

| Frequency (MHz) | Level (dBm) |
|-----------------|-------------|
| 2455.525000     | -6.6        |

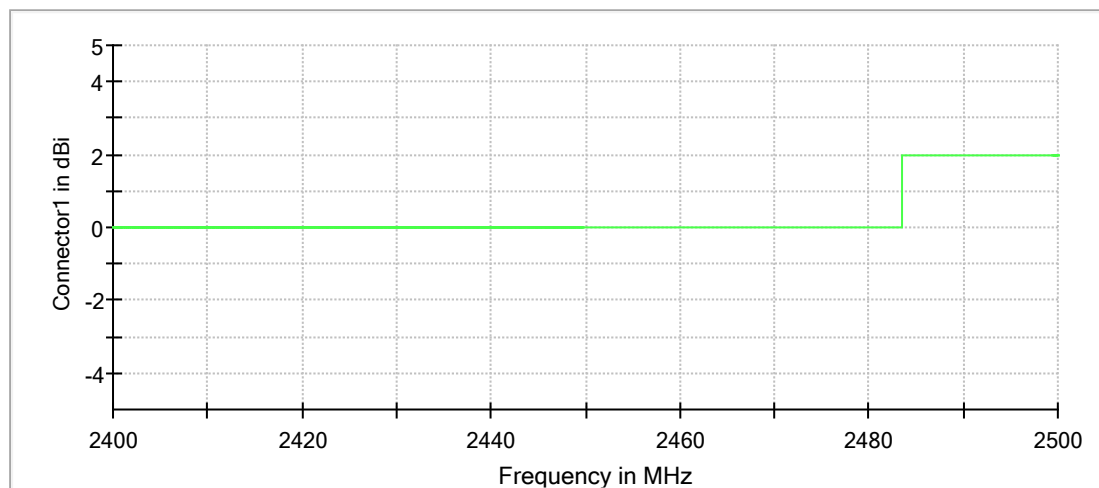
**Measurements**

| Frequency (MHz) | Level (dBm) | Margin (dB) | Limit (dBm) | Result |
|-----------------|-------------|-------------|-------------|--------|
| 2484.525000     | -36.3       | 9.4         | -26.8       | PASS   |
| 2484.475000     | -36.5       | 9.7         | -26.8       | PASS   |
| 2485.125000     | -37.4       | 10.5        | -26.8       | PASS   |
| 2485.075000     | -37.5       | 10.7        | -26.8       | PASS   |
| 2484.575000     | -37.8       | 10.9        | -26.8       | PASS   |
| 2483.875000     | -37.9       | 11.1        | -26.8       | PASS   |
| 2483.825000     | -38.0       | 11.2        | -26.8       | PASS   |
| 2484.125000     | -38.1       | 11.3        | -26.8       | PASS   |
| 2486.925000     | -38.3       | 11.5        | -26.8       | PASS   |
| 2485.175000     | -38.3       | 11.5        | -26.8       | PASS   |
| 2483.525000     | -38.5       | 11.6        | -26.8       | PASS   |
| 2483.925000     | -38.5       | 11.7        | -26.8       | PASS   |
| 2486.375000     | -38.6       | 11.8        | -26.8       | PASS   |
| 2484.075000     | -38.6       | 11.8        | -26.8       | PASS   |
| 2486.425000     | -38.6       | 11.8        | -26.8       | PASS   |

Band Edge

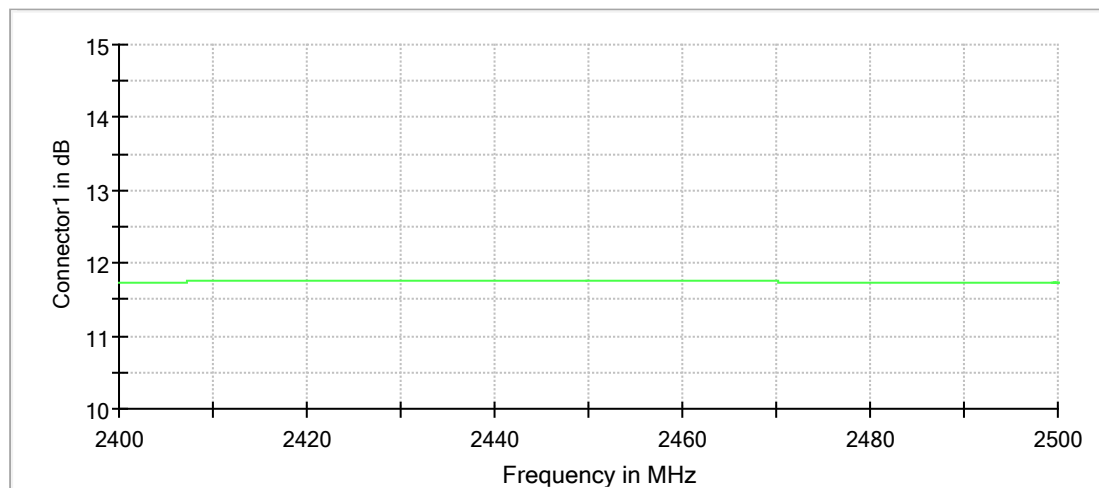


Gain



Connector1

Attenuation



Connector1

## 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         |
| SweepTime             | 1.670 ms         | 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             | Sweep            | AUTO           |
| Preamp                | off              | off            |
| Stablemode            | Trace            | Trace          |
| Stablevalue           | 0.50 dB          | 0.50 dB        |
| Run                   | 17 / max. 150    | max. 150       |
| Stable                | 3 / 3            | 3              |
| Max Stable Difference | 0.25 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 |
| SweepPoints           | 330              | ~ 330          |
| SweepTime             | 37.969 $\mu$ s   | 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           |
| Preamplifier          | off              | off            |
| Stablemode            | Trace            | Trace          |
| Stablevalue           | 0.50 dB          | 0.50 dB        |
| Run                   | 4 / max. 150     | max. 150       |
| Stable                | 3 / 3            | 3              |
| Max Stable Difference | 0.00 dB          | 0.50 dB        |

**Tx Spurious Emission (2452 MHz; 20.000 dBm; 40 MHz)**

Customized settings.

**Result**

| DUT Frequency (MHz) | Result |
|---------------------|--------|
| 2452.000000         | PASS   |

**Final measurements**

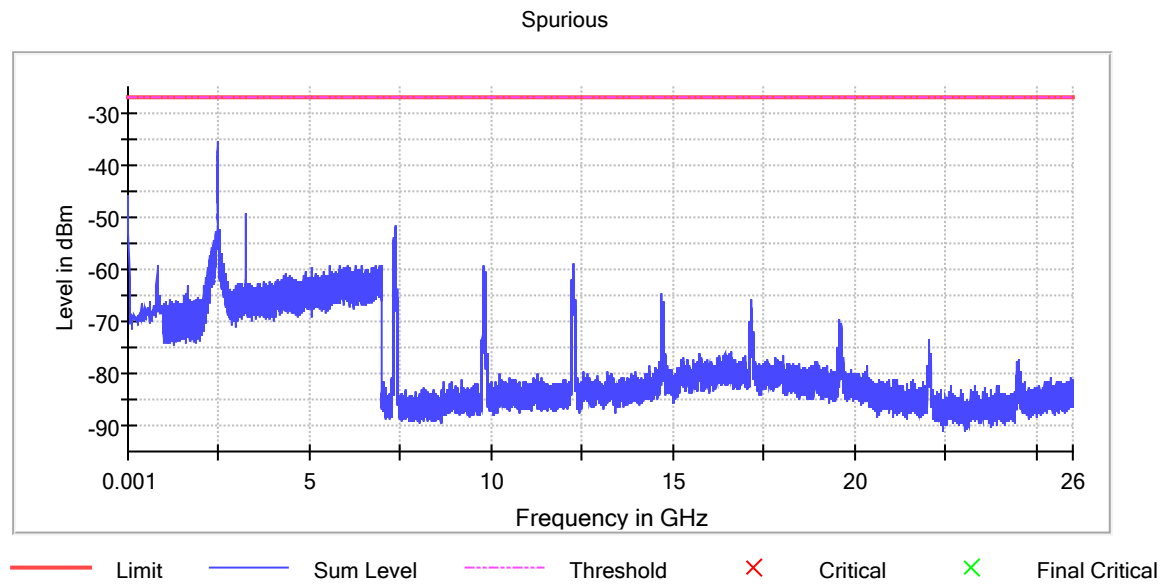
| Frequency (MHz) | Level Pre Measurement (dBm) | level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|-----------------------------|-------------|-------------|-------------|--------|
| ---             | ---                         | ---         | ---         | ---         | ---   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

**Pre Measurements**

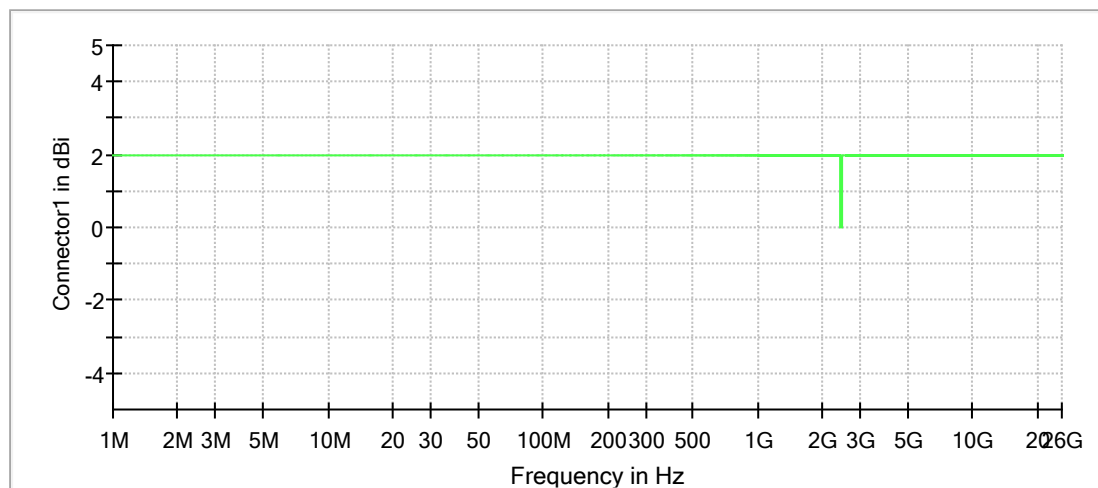
| Frequency (MHz) | Level (dBm) | Margin (dB) | Limit (dBm) |
|-----------------|-------------|-------------|-------------|
| 2483.852841     | -35.5       | 8.7         | -26.8       |
| 2483.570568     | -36.4       | 9.6         | -26.8       |
| 2483.993977     | -36.7       | 9.9         | -26.8       |
| 2485.969884     | -36.9       | 10.1        | -26.8       |
| 2488.510336     | -37.2       | 10.3        | -26.8       |
| 2484.417385     | -37.3       | 10.5        | -26.8       |
| 2485.828748     | -37.5       | 10.6        | -26.8       |
| 2488.651472     | -37.7       | 10.9        | -26.8       |
| 2483.711704     | -37.8       | 11.0        | -26.8       |
| 2486.393292     | -38.1       | 11.3        | -26.8       |
| 2486.675565     | -38.3       | 11.5        | -26.8       |
| 2484.558522     | -38.3       | 11.5        | -26.8       |
| 2483.500000     | -38.4       | 11.6        | -26.8       |
| 2484.135113     | -39.1       | 12.3        | -26.8       |
| 2486.534429     | -39.1       | 12.3        | -26.8       |

**Measurement Settings**

| Start Frequency (MHz) | Stop Frequency (MHz) | Pre Measurement | Final Measurement |
|-----------------------|----------------------|-----------------|-------------------|
| 1.000000              | 1000.000000          | 1               | ---               |
| 1000.000000           | 2400.000000          | 2               | ---               |
| 2483.500000           | 7000.000000          | 2               | ---               |
| 7000.000000           | 18000.000000         | 2               | ---               |
| 18000.000000          | 26000.000000         | 2               | ---               |

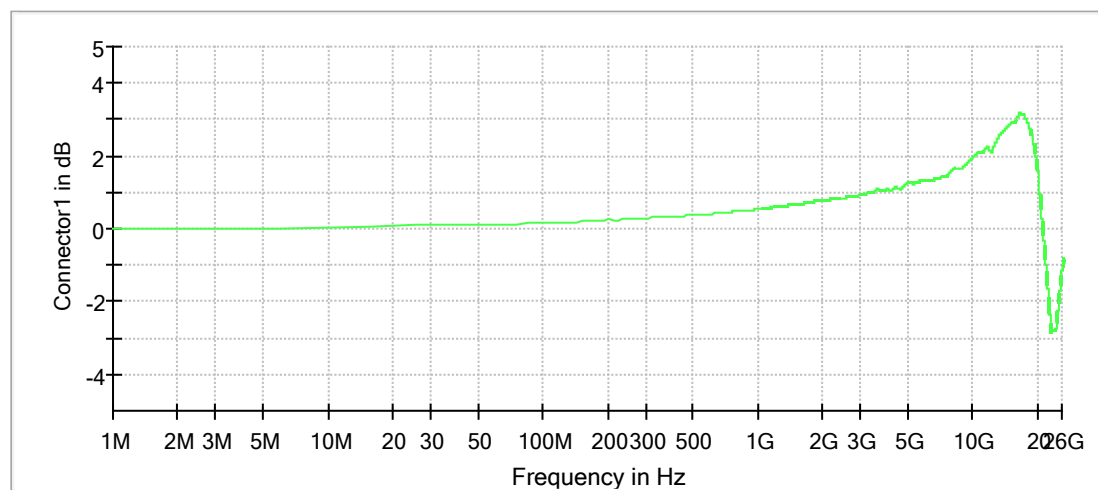


Gain



Connector1

Attenuation



Connector1

## Pre Measurement 1

| Setting               | Instrument Value | Target Value       |
|-----------------------|------------------|--------------------|
| RBW                   | 100.000 kHz      | $\leq 100.000$ kHz |
| VBW                   | 300.000 kHz      | $\geq 300.000$ kHz |
| SweepPoints           | 101              | ~ 101              |
| Sweptime              | 9.990 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                   | 1 / max. 1       | max. 1             |
| Stable                | 0 / 1            | 1                  |
| Max Stable Difference | 0.00 dB          | 0.50 dB            |

**Pre Measurement 2**

| Setting               | Instrument Value | Target Value   |
|-----------------------|------------------|----------------|
| RBW                   | 100.000 kHz      | <= 100.000 kHz |
| VBW                   | 300.000 kHz      | >= 300.000 kHz |
| SweepPoints           | 28000            | ~ 28000        |
| SweepTime             | 28.000 ms        | AUTO           |
| Reference Level       | -10.000 dBm      | -30.000 dBm    |
| Attenuation           | 20.000 dB        | AUTO           |
| Detector              | MaxPeak          | MaxPeak        |
| SweepCount            | 30               | 30             |
| Filter                | 3 dB             | 3 dB           |
| Trace Mode            | Max Hold         | Max Hold       |
| SweepType             | Sweep            | AUTO           |
| Preamp                | off              | off            |
| Stablemode            | Trace            | Trace          |
| Stablevalue           | 1.00 dB          | 1.00 dB        |
| Run                   | 1 / max. 1       | max. 1         |
| Stable                | 0 / 3            | 3              |
| Max Stable Difference | 0.00 dB          | 1.00 dB        |