

# 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 | 2412.000        | 20.0                | 20.000000               | PASS   |
| Emission Bandwidth 20 dB        | 2412.000        | 20.0                | 20.000000               | PASS   |
| RF output power                 | 2412.000        | 20.0                | 20.000000               | PASS   |
| Peak Power Spectral Density     | 2412.000        | 20.0                | 20.000000               | PASS   |
| Band Edge low                   | 2412.000        | 20.0                | 20.000000               | PASS   |
| Tx Spurious Emission            | 2412.000        | 20.0                | 20.000000               | PASS   |
| Emission Bandwidth 20 dB        | 2437.000        | 20.0                | 20.000000               | PASS   |
| Minimum Emission Bandwidth 6 dB | 2437.000        | 20.0                | 20.000000               | PASS   |
| RF output power                 | 2437.000        | 20.0                | 20.000000               | PASS   |
| Peak Power Spectral Density     | 2437.000        | 20.0                | 20.000000               | PASS   |
| Tx Spurious Emission            | 2437.000        | 20.0                | 20.000000               | PASS   |
| Emission Bandwidth 20 dB        | 2462.000        | 20.0                | 20.000000               | PASS   |
| Minimum Emission Bandwidth 6 dB | 2462.000        | 20.0                | 20.000000               | PASS   |
| RF output power                 | 2462.000        | 20.0                | 20.000000               | PASS   |
| Peak Power Spectral Density     | 2462.000        | 20.0                | 20.000000               | PASS   |
| Band Edge high                  | 2462.000        | 20.0                | 20.000000               | PASS   |
| Tx Spurious Emission            | 2462.000        | 20.0                | 20.000000               | PASS   |

## Minimum Emission Bandwidth 6 dB (2412 MHz; 20.000 dBm; 20 MHz)

Customized settings.

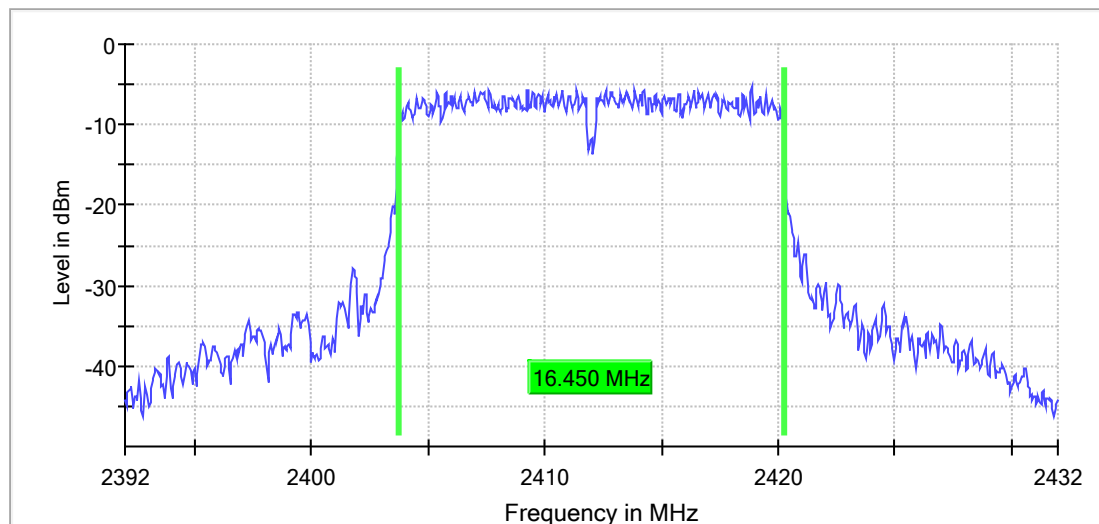
### 6 dB Bandwidth

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---------------------|-----------------|-----------------|-----------------|----------------------|-----------------------|
| 2412.000000         | 16.450000       | 0.500000        | ---             | 2403.775000          | 2420.225000           |

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

| DUT Frequency (MHz) | Max Level (dBm) | Result |
|---------------------|-----------------|--------|
| 2412.000000         | -5.2            | PASS   |

6 dB Bandwidth



### Measurement

| Setting               | Instrument Value | Target Value  |
|-----------------------|------------------|---------------|
| Start Frequency       | 2.39200 GHz      | 2.39200 GHz   |
| Stop Frequency        | 2.43200 GHz      | 2.43200 GHz   |
| Span                  | 40.000 MHz       | 40.000 MHz    |
| RBW                   | 100.000 kHz      | ~ 100.000 kHz |
| VBW                   | 300.000 kHz      | ~ 300.000 kHz |
| SweepPoints           | 800              | ~ 800         |
| Sweptime              | 94.922 $\mu$ s   | 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             | 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       |

## Emission Bandwidth 20 dB (2412 MHz; 20.000 dBm; 20 MHz)

Customized settings.

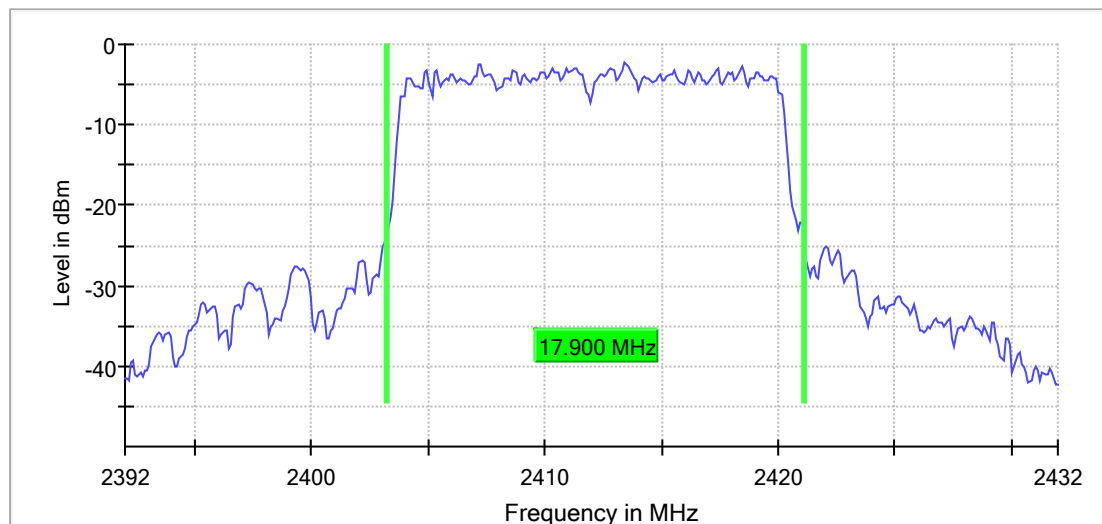
### 20 dB Bandwidth

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---------------------|-----------------|-----------------|-----------------|----------------------|-----------------------|
| 2412.000000         | 17.900000       | ---             | ---             | 2403.250000          | 2421.150000           |

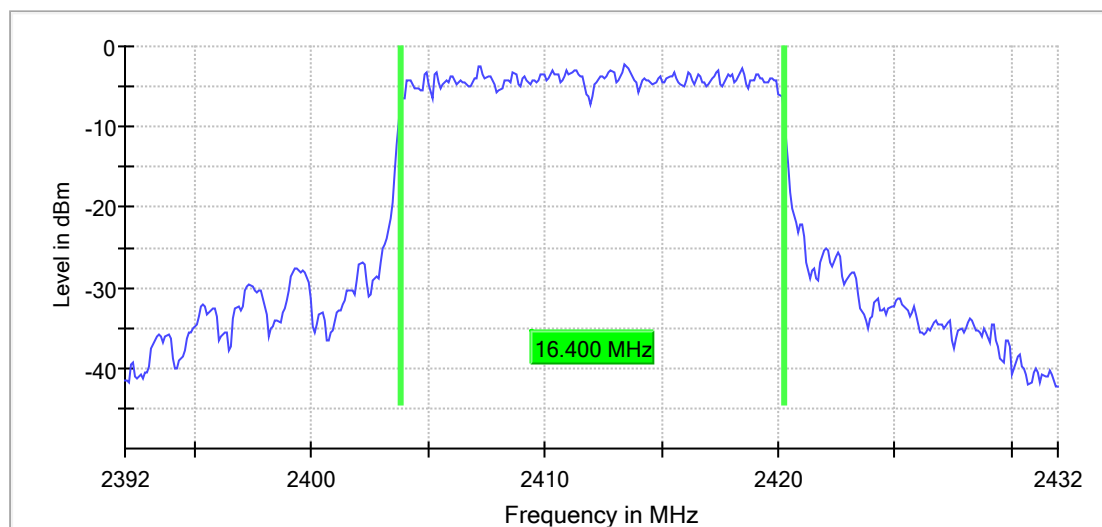
(continuation of the "20 dB Bandwidth" table from column 6 ...)

| DUT Frequency (MHz) | Max Level (dBm) | Result |
|---------------------|-----------------|--------|
| 2412.000000         | -2.3            | PASS   |

20 dB Bandwidth



99 % Bandwidth



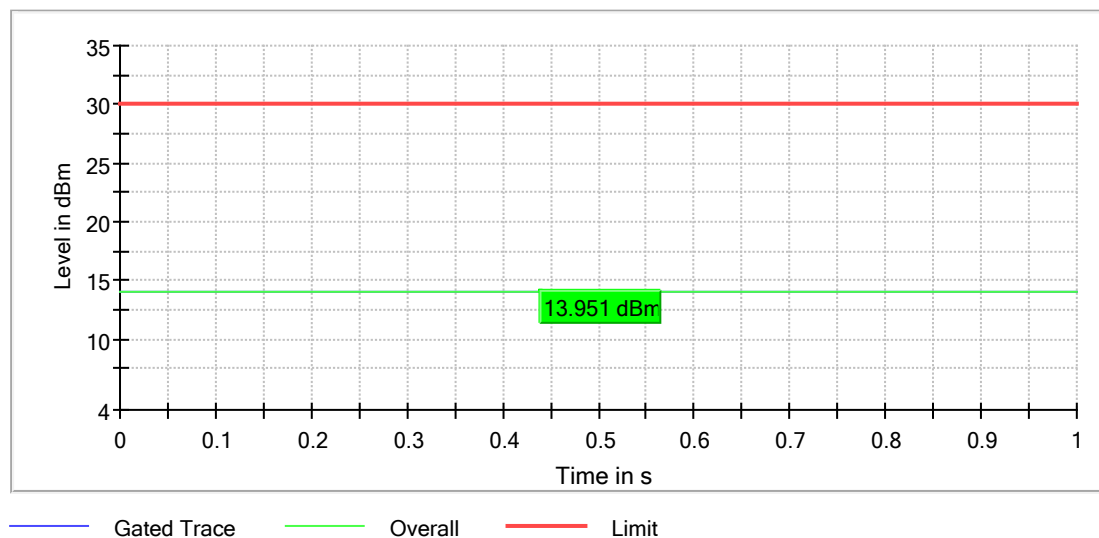
## Measurement

| Setting               | Instrument Value | Target Value   |
|-----------------------|------------------|----------------|
| Start Frequency       | 2.39200 GHz      | 2.39200 GHz    |
| Stop Frequency        | 2.43200 GHz      | 2.43200 GHz    |
| Span                  | 40.000 MHz       | 40.000 MHz     |
| RBW                   | 200.000 kHz      | >= 200.000 kHz |
| VBW                   | 1.000 MHz        | >= 600.000 kHz |
| SweepPoints           | 400              | ~ 400          |
| SweepTime             | 47.266 $\mu$ s   | 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             | 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        |

**RF output power (2412 MHz; 20.000 dBm; 20 MHz)****Result**

| DUT Frequency (MHz) | Gated RMS (dBm) | Limit Max (dBm) | Gated EIRP (dBm) | DutyCycle (%) | Result |
|---------------------|-----------------|-----------------|------------------|---------------|--------|
| 2412.000000         | 14.0            | 30.0            | 14.0             | 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 |

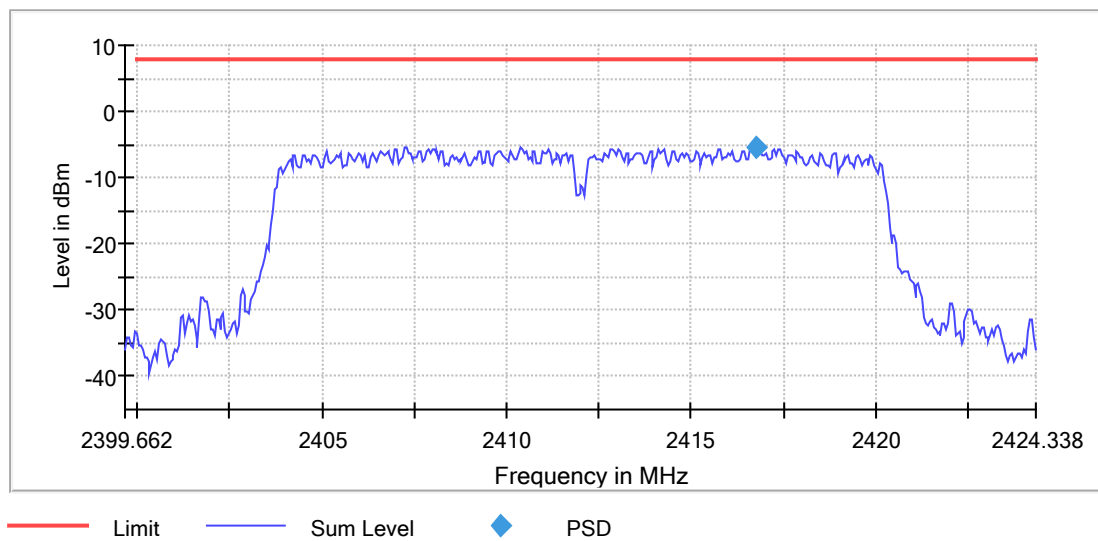
## Peak Power Spectral Density (2412 MHz; 20.000 dBm; 20 MHz)

Customized settings.

### Result

| DUT Frequency (MHz) | Frequency (MHz) | PSD (dBm) | Limit Max (dBm) | Result |
|---------------------|-----------------|-----------|-----------------|--------|
| 2412.000000         | 2416.770167     | -5.303    | 8.0             | PASS   |

Peak Power Spectral Density



### Measurement

| Setting               | Instrument Value | Target Value   |
|-----------------------|------------------|----------------|
| Start Frequency       | 2.39966 GHz      | 2.39966 GHz    |
| Stop Frequency        | 2.42434 GHz      | 2.42434 GHz    |
| Span                  | 24.675 MHz       | 24.675 MHz     |
| RBW                   | 100.000 kHz      | <= 100.000 kHz |
| VBW                   | 300.000 kHz      | >= 300.000 kHz |
| SweepPoints           | 494              | ~ 494          |
| SweepTime             | 1.040 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 (2412 MHz; 20.000 dBm; 20 MHz)**

Customized settings.

**Result**

| DUT Frequency (MHz) | Result |
|---------------------|--------|
| 2412.000000         | PASS   |

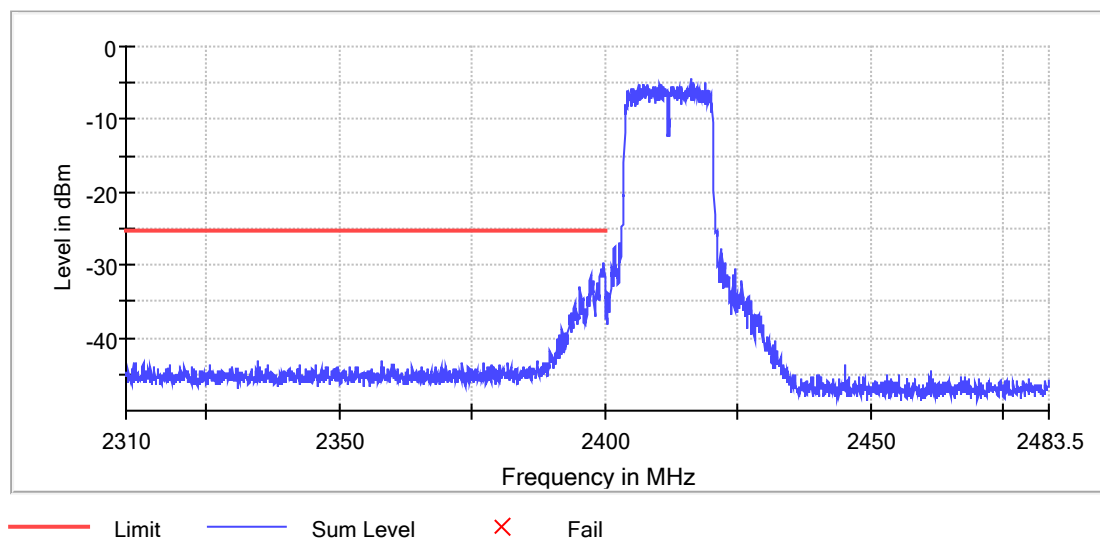
**Inband Peak**

| Frequency (MHz) | Level (dBm) |
|-----------------|-------------|
| 2416.175000     | -4.3        |

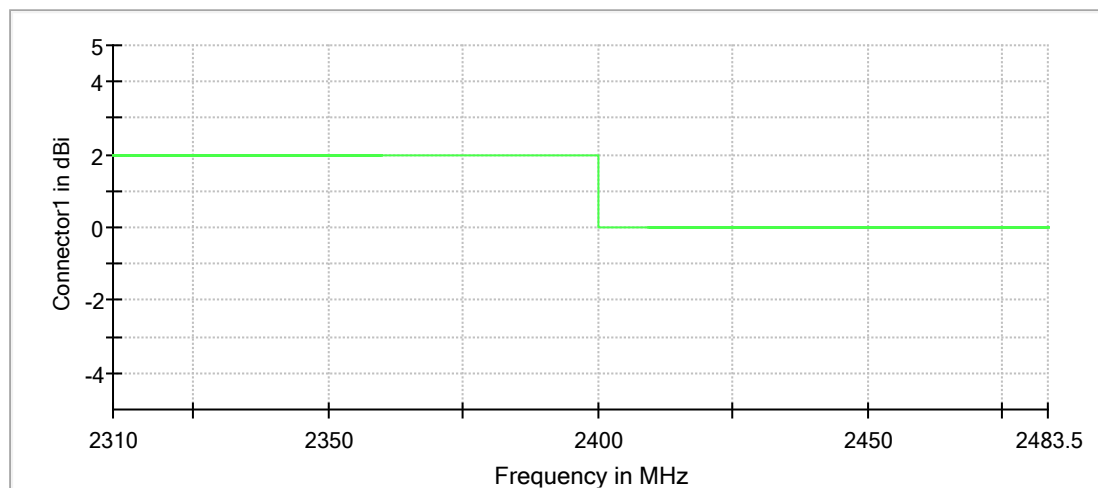
**Measurements**

| Frequency (MHz) | Level (dBm) | Margin (dB) | Limit (dBm) | Result |
|-----------------|-------------|-------------|-------------|--------|
| 2399.875000     | -29.8       | 4.5         | -25.3       | PASS   |
| 2399.825000     | -29.9       | 4.6         | -25.3       | PASS   |
| 2399.925000     | -30.3       | 5.0         | -25.3       | PASS   |
| 2399.375000     | -30.5       | 5.2         | -25.3       | PASS   |
| 2399.325000     | -30.5       | 5.2         | -25.3       | PASS   |
| 2399.775000     | -30.6       | 5.3         | -25.3       | PASS   |
| 2399.425000     | -30.6       | 5.3         | -25.3       | PASS   |
| 2399.475000     | -30.6       | 5.3         | -25.3       | PASS   |
| 2399.275000     | -30.7       | 5.4         | -25.3       | PASS   |
| 2399.225000     | -30.7       | 5.4         | -25.3       | PASS   |
| 2399.725000     | -31.2       | 5.9         | -25.3       | PASS   |
| 2397.325000     | -31.3       | 6.0         | -25.3       | PASS   |
| 2399.625000     | -31.4       | 6.1         | -25.3       | PASS   |
| 2399.675000     | -31.4       | 6.1         | -25.3       | PASS   |
| 2397.375000     | -31.5       | 6.1         | -25.3       | PASS   |

Band Edge

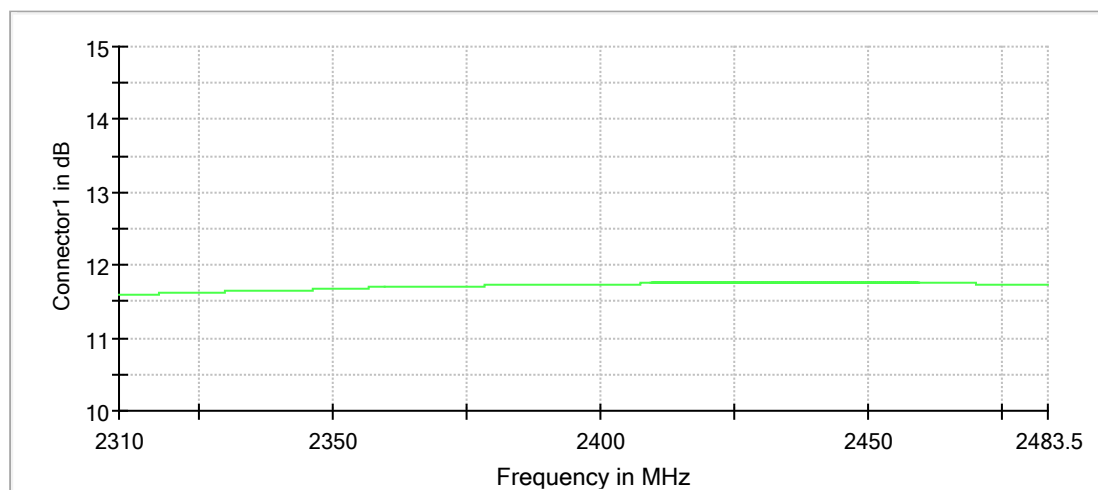


Gain



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                   | 21 / max. 150    | max. 150       |
| Stable                | 3 / 3            | 3              |
| Max Stable Difference | 0.41 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                   | 10 / max. 150    | max. 150       |
| Stable                | 3 / 3            | 3              |
| Max Stable Difference | 0.27 dB          | 0.50 dB        |

**Tx Spurious Emission (2412 MHz; 20.000 dBm; 20 MHz)**

Customized settings.

**Result**

| DUT Frequency (MHz) | Result |
|---------------------|--------|
| 2412.000000         | PASS   |

**Final measurements**

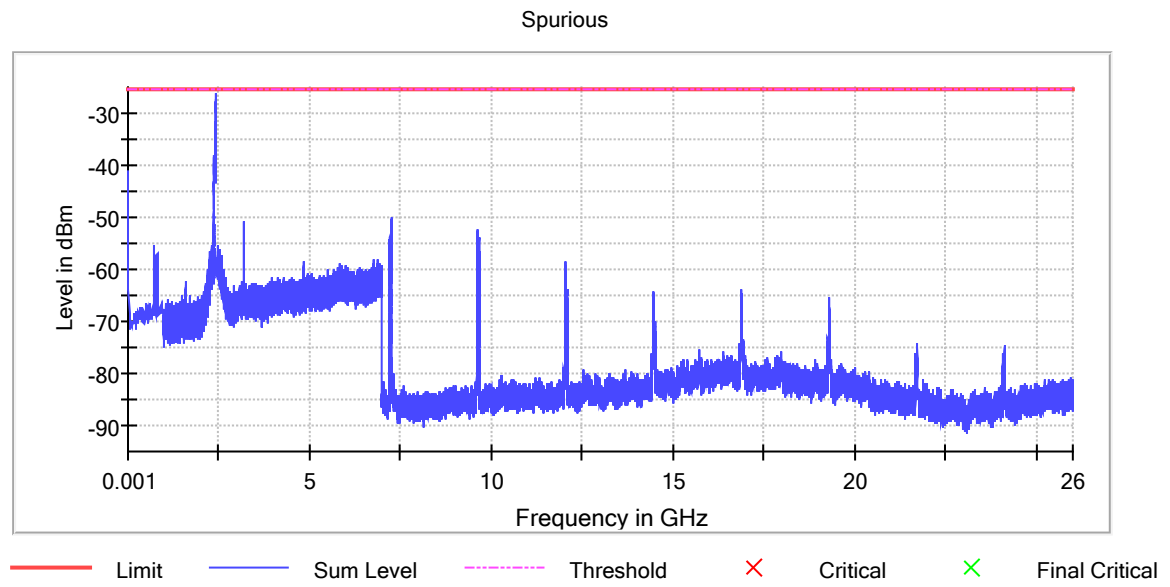
| Frequency (MHz) | Level Pre Measurement (dBm) | level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|-----------------------------|-------------|-------------|-------------|--------|
| ---             | ---                         | ---         | ---         | ---         | ---   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

**Pre Measurements**

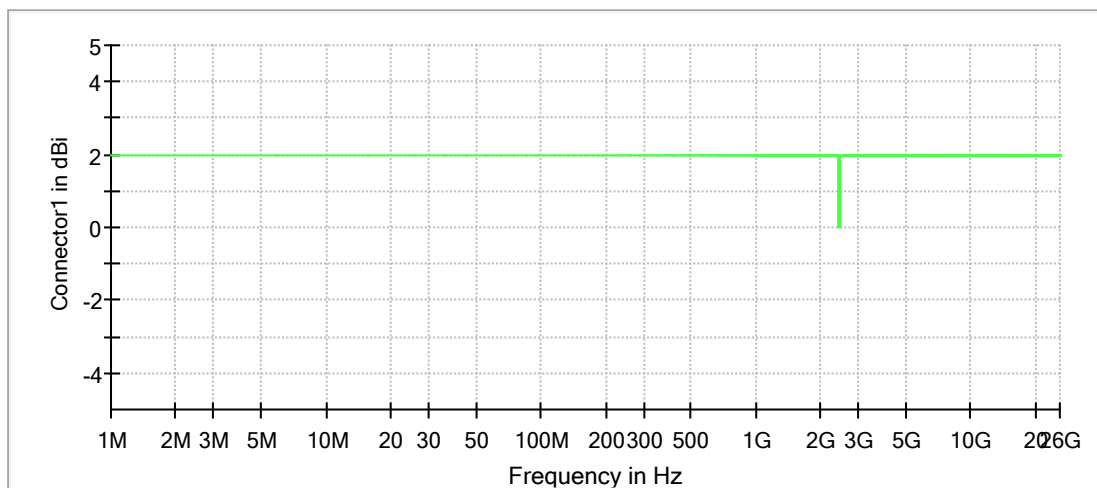
| Frequency (MHz) | Level (dBm) | Margin (dB) | Limit (dBm) |
|-----------------|-------------|-------------|-------------|
| 2399.475000     | -26.3       | 1.0         | -25.3       |
| 2399.525000     | -26.8       | 1.5         | -25.3       |
| 2399.425000     | -26.8       | 1.5         | -25.3       |
| 2397.775000     | -27.4       | 2.1         | -25.3       |
| 2397.725000     | -27.4       | 2.1         | -25.3       |
| 2397.325000     | -27.5       | 2.2         | -25.3       |
| 2397.275000     | -27.5       | 2.2         | -25.3       |
| 2398.525000     | -27.5       | 2.2         | -25.3       |
| 2397.825000     | -27.6       | 2.3         | -25.3       |
| 2399.775000     | -27.6       | 2.3         | -25.3       |
| 2397.225000     | -27.8       | 2.5         | -25.3       |
| 2397.175000     | -28.1       | 2.8         | -25.3       |
| 2399.825000     | -28.1       | 2.8         | -25.3       |
| 2398.475000     | -28.3       | 3.0         | -25.3       |
| 2399.375000     | -28.5       | 3.2         | -25.3       |

**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               | ---               |

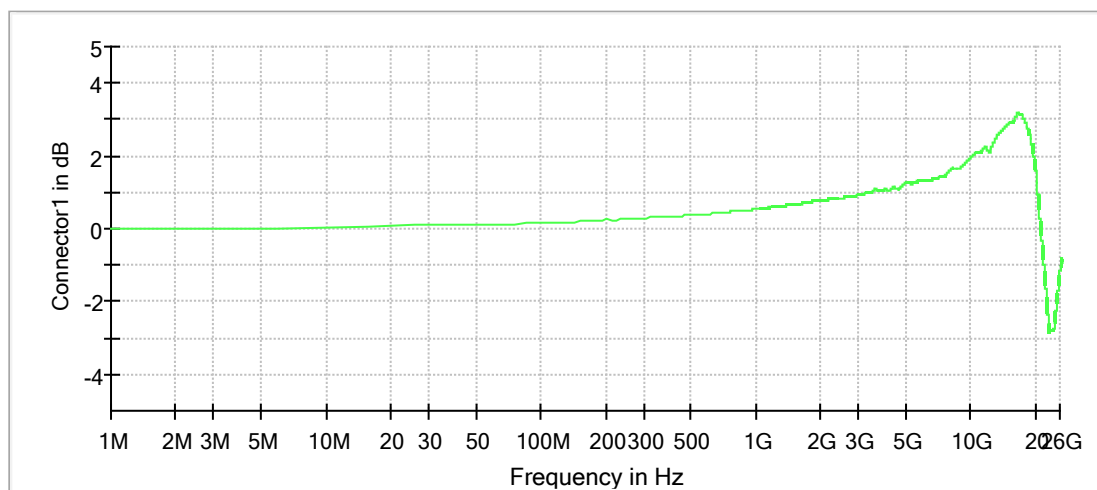


Gain



Connector1

Attenuation



Connector1

## Pre Measurement 1

| Setting               | Instrument Value | Target Value   |
|-----------------------|------------------|----------------|
| RBW                   | 100.000 kHz      | <= 100.000 kHz |
| VBW                   | 300.000 kHz      | >= 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; 20 MHz)**

Customized settings.

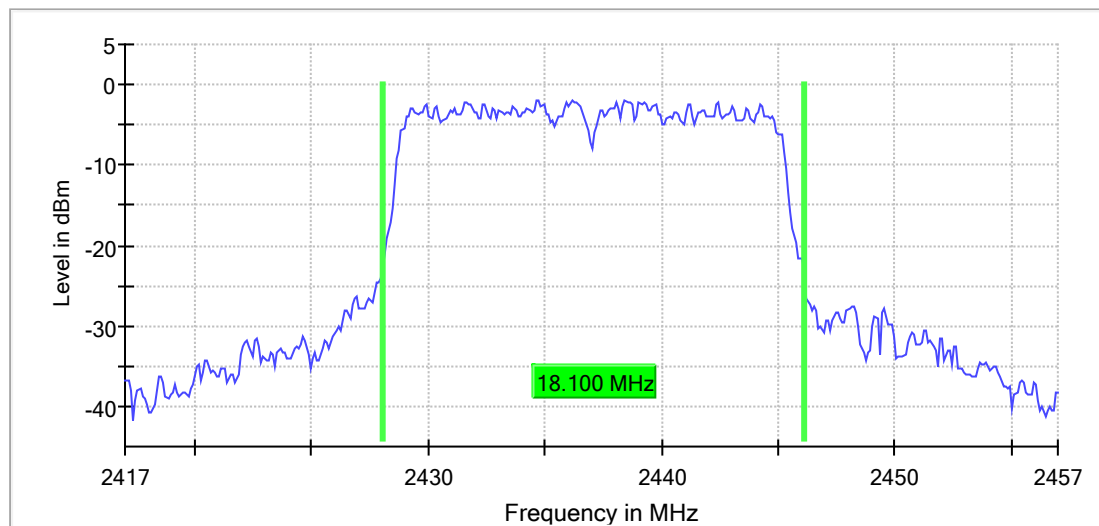
**20 dB Bandwidth**

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---------------------|-----------------|-----------------|-----------------|----------------------|-----------------------|
| 2437.000000         | 18.100000       | ---             | ---             | 2428.050000          | 2446.150000           |

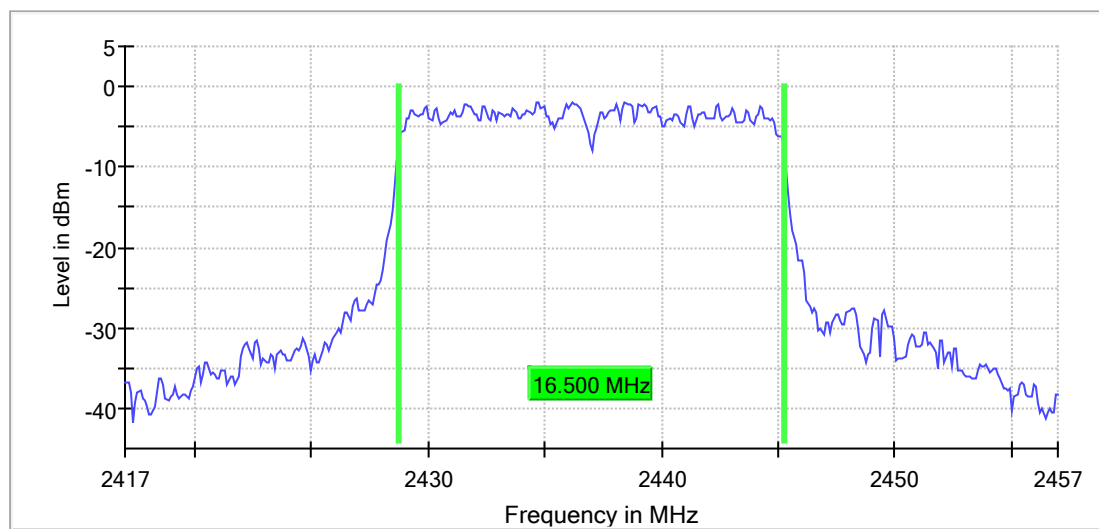
(continuation of the "20 dB Bandwidth" table from column 6 ...)

| DUT Frequency (MHz) | Max Level (dBm) | Result |
|---------------------|-----------------|--------|
| 2437.000000         | -1.9            | PASS   |

20 dB Bandwidth



99 % Bandwidth

**Measurement**

| Setting               | Instrument Value | Target Value   |
|-----------------------|------------------|----------------|
| Start Frequency       | 2.41700 GHz      | 2.41700 GHz    |
| Stop Frequency        | 2.45700 GHz      | 2.45700 GHz    |
| Span                  | 40.000 MHz       | 40.000 MHz     |
| RBW                   | 200.000 kHz      | >= 200.000 kHz |
| VBW                   | 1.000 MHz        | >= 600.000 kHz |
| SweepPoints           | 400              | ~ 400          |
| SweepTime             | 47.266 $\mu$ s   | 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             | 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        |

## Minimum Emission Bandwidth 6 dB (2437 MHz; 20.000 dBm; 20 MHz)

Customized settings.

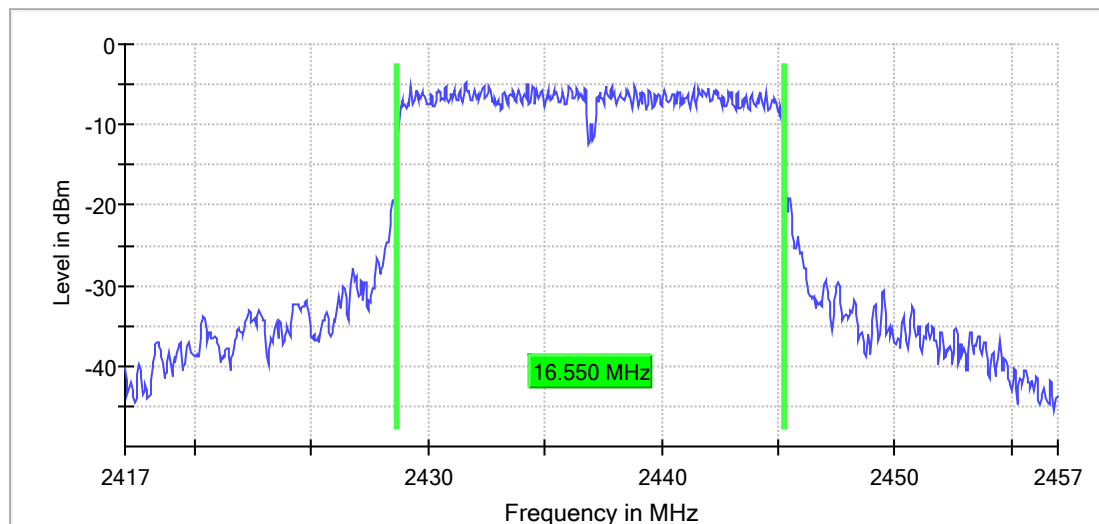
### 6 dB Bandwidth

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---------------------|-----------------|-----------------|-----------------|----------------------|-----------------------|
| 2437.000000         | 16.550000       | 0.500000        | ---             | 2428.675000          | 2445.225000           |

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

| DUT Frequency (MHz) | Max Level (dBm) | Result |
|---------------------|-----------------|--------|
| 2437.000000         | -4.8            | PASS   |

6 dB Bandwidth



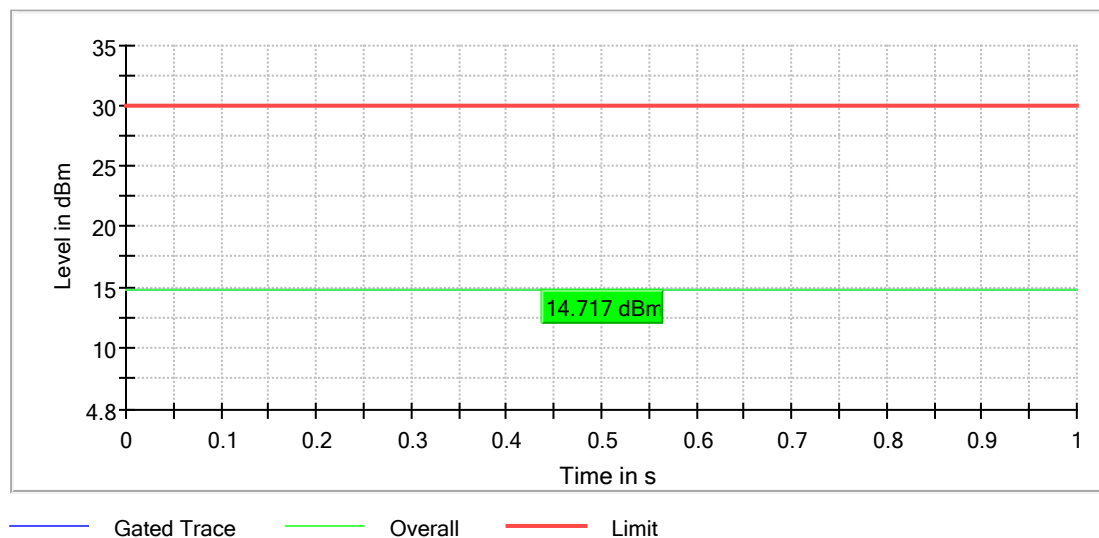
### Measurement

| Setting               | Instrument Value | Target Value  |
|-----------------------|------------------|---------------|
| Start Frequency       | 2.41700 GHz      | 2.41700 GHz   |
| Stop Frequency        | 2.45700 GHz      | 2.45700 GHz   |
| Span                  | 40.000 MHz       | 40.000 MHz    |
| RBW                   | 100.000 kHz      | ~ 100.000 kHz |
| VBW                   | 300.000 kHz      | ~ 300.000 kHz |
| SweepPoints           | 800              | ~ 800         |
| Sweptime              | 94.922 $\mu$ s   | 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             | 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       |

**RF output power (2437 MHz; 20.000 dBm; 20 MHz)****Result**

| DUT Frequency (MHz) | Gated RMS (dBm) | Limit Max (dBm) | Gated EIRP (dBm) | DutyCycle (%) | Result |
|---------------------|-----------------|-----------------|------------------|---------------|--------|
| 2437.000000         | 14.7            | 30.0            | 14.7             | 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 |

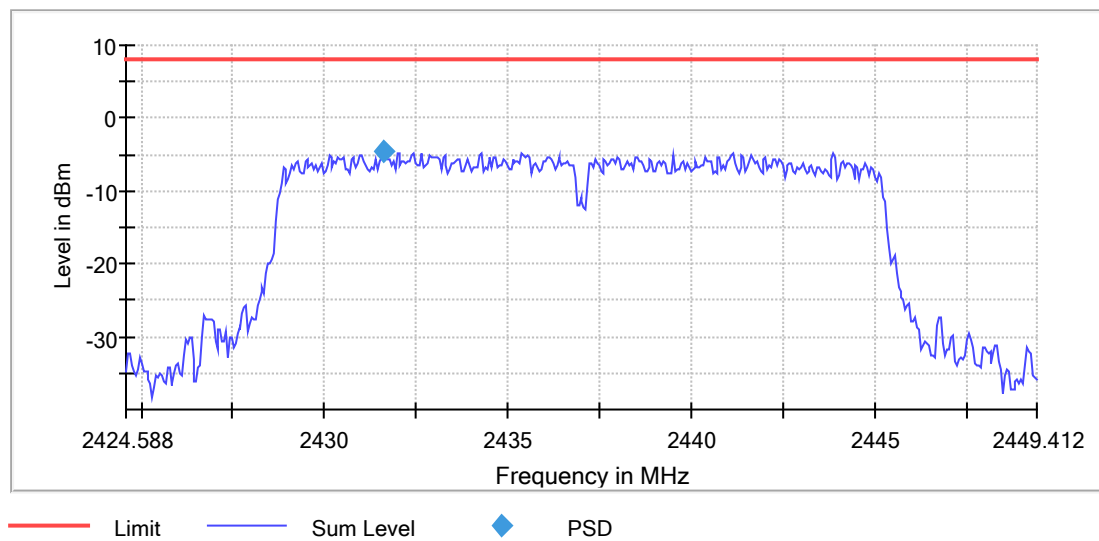
## Peak Power Spectral Density (2437 MHz; 20.000 dBm; 20 MHz)

Customized settings.

### Result

| DUT Frequency (MHz) | Frequency (MHz) | PSD (dBm) | Limit Max (dBm) | Result |
|---------------------|-----------------|-----------|-----------------|--------|
| 2437.000000         | 2431.619582     | -4.674    | 8.0             | PASS   |

Peak Power Spectral Density



### Measurement

| Setting               | Instrument Value | Target Value   |
|-----------------------|------------------|----------------|
| Start Frequency       | 2.42459 GHz      | 2.42459 GHz    |
| Stop Frequency        | 2.44941 GHz      | 2.44941 GHz    |
| Span                  | 24.825 MHz       | 24.825 MHz     |
| RBW                   | 100.000 kHz      | <= 100.000 kHz |
| VBW                   | 300.000 kHz      | >= 300.000 kHz |
| SweepPoints           | 496              | ~ 496          |
| SweepTime             | 1.040 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; 20 MHz)**

Customized settings.

**Result**

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

**Final measurements**

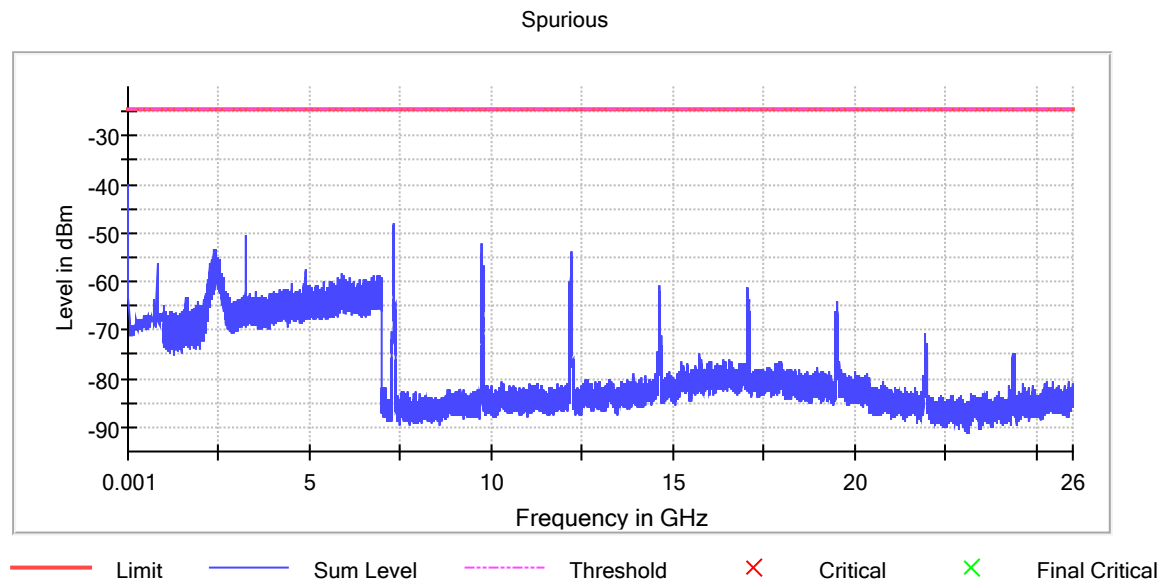
| Frequency (MHz) | Level Pre Measurement (dBm) | level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|-----------------------------|-------------|-------------|-------------|--------|
| ---             | ---                         | ---         | ---         | ---         | ---   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

**Pre Measurements**

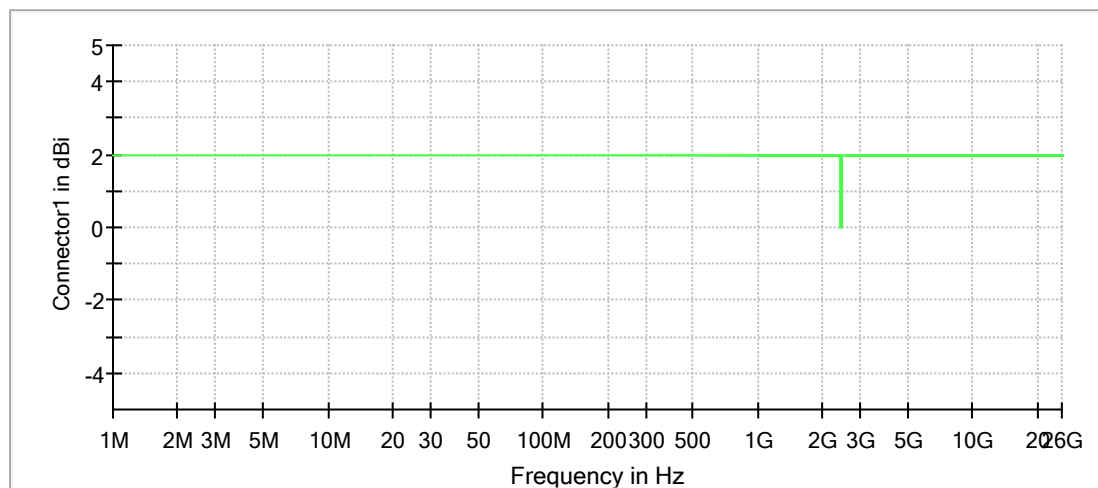
| Frequency (MHz) | Level (dBm) | Margin (dB) | Limit (dBm) |
|-----------------|-------------|-------------|-------------|
| 5.945545        | -40.0       | 15.3        | -24.7       |
| 1.000000        | -40.0       | 15.3        | -24.7       |
| 15.836634       | -46.3       | 21.6        | -24.7       |
| 7310.568420     | -47.9       | 23.2        | -24.7       |
| 7308.505984     | -48.4       | 23.8        | -24.7       |
| 7312.630855     | -48.6       | 24.0        | -24.7       |
| 7306.443549     | -49.0       | 24.3        | -24.7       |
| 7314.349552     | -49.2       | 24.5        | -24.7       |
| 7304.724852     | -49.3       | 24.7        | -24.7       |
| 7309.880941     | -49.5       | 24.9        | -24.7       |
| 7307.131027     | -49.7       | 25.1        | -24.7       |
| 7315.724509     | -49.9       | 25.2        | -24.7       |
| 7314.005812     | -49.9       | 25.2        | -24.7       |
| 7308.162245     | -49.9       | 25.3        | -24.7       |
| 7307.818506     | -50.0       | 25.3        | -24.7       |

**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               | ---               |

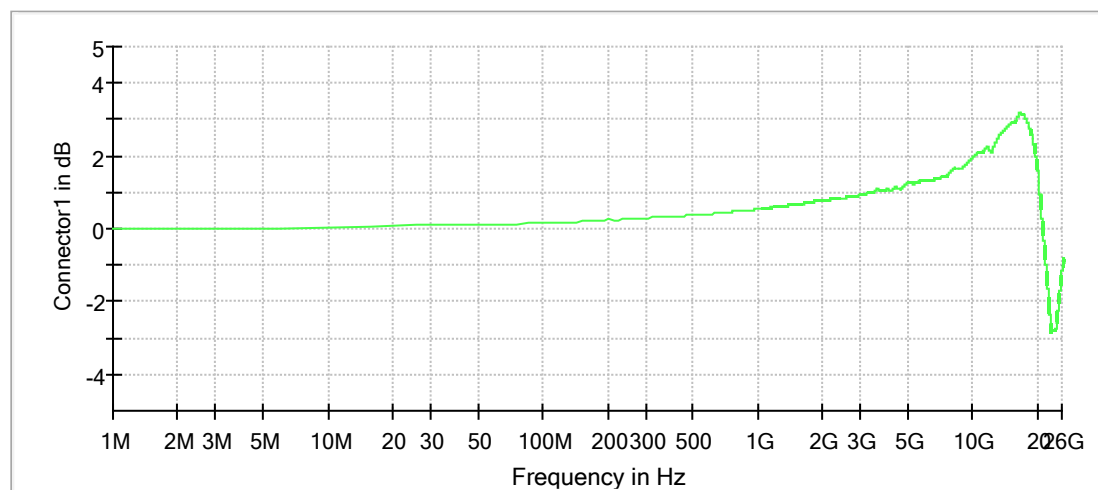


Gain



Connector1

Attenuation



Connector1

## Pre Measurement 1

| Setting               | Instrument Value | Target Value   |
|-----------------------|------------------|----------------|
| RBW                   | 100.000 kHz      | <= 100.000 kHz |
| VBW                   | 300.000 kHz      | >= 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 (2462 MHz; 20.000 dBm; 20 MHz)

Customized settings.

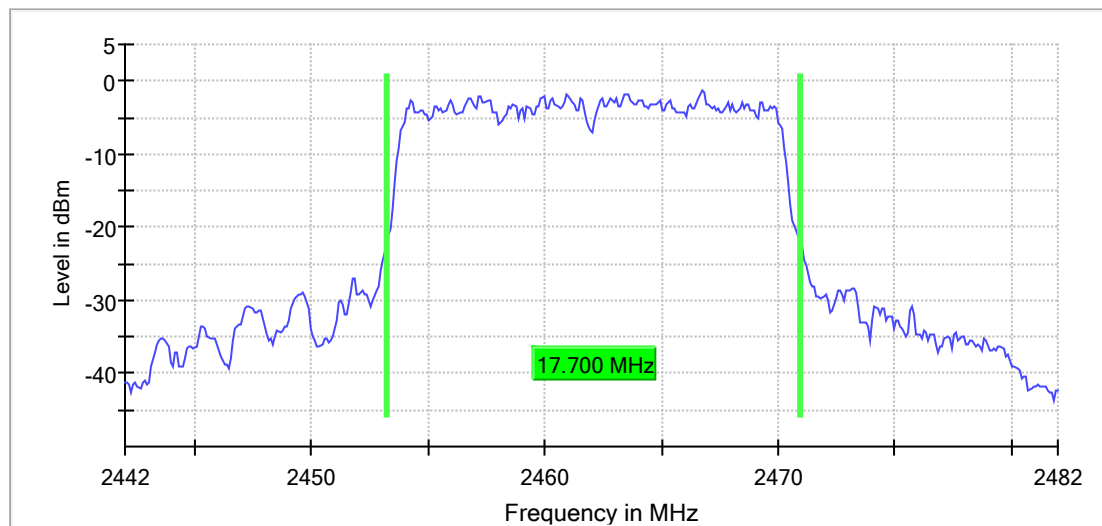
### 20 dB Bandwidth

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---------------------|-----------------|-----------------|-----------------|----------------------|-----------------------|
| 2462.000000         | 17.700000       | ---             | ---             | 2453.250000          | 2470.950000           |

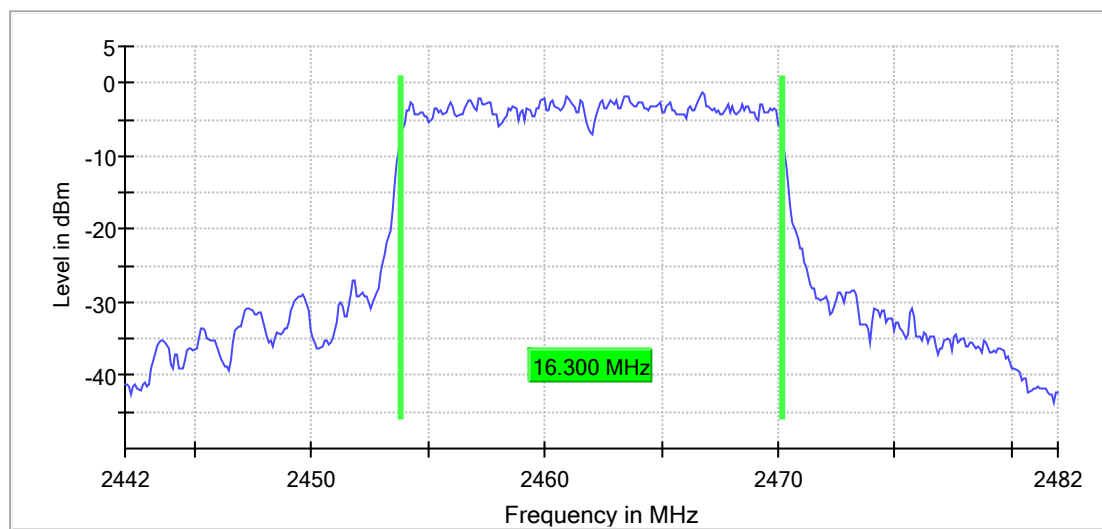
(continuation of the "20 dB Bandwidth" table from column 6 ...)

| DUT Frequency (MHz) | Max Level (dBm) | Result |
|---------------------|-----------------|--------|
| 2462.000000         | -1.3            | PASS   |

20 dB Bandwidth



99 % Bandwidth



## Measurement

| Setting               | Instrument Value | Target Value   |
|-----------------------|------------------|----------------|
| Start Frequency       | 2.44200 GHz      | 2.44200 GHz    |
| Stop Frequency        | 2.48200 GHz      | 2.48200 GHz    |
| Span                  | 40.000 MHz       | 40.000 MHz     |
| RBW                   | 200.000 kHz      | >= 200.000 kHz |
| VBW                   | 1.000 MHz        | >= 600.000 kHz |
| SweepPoints           | 400              | ~ 400          |
| SweepTime             | 47.266 $\mu$ s   | 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             | 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        |

## Minimum Emission Bandwidth 6 dB (2462 MHz; 20.000 dBm; 20 MHz)

Customized settings.

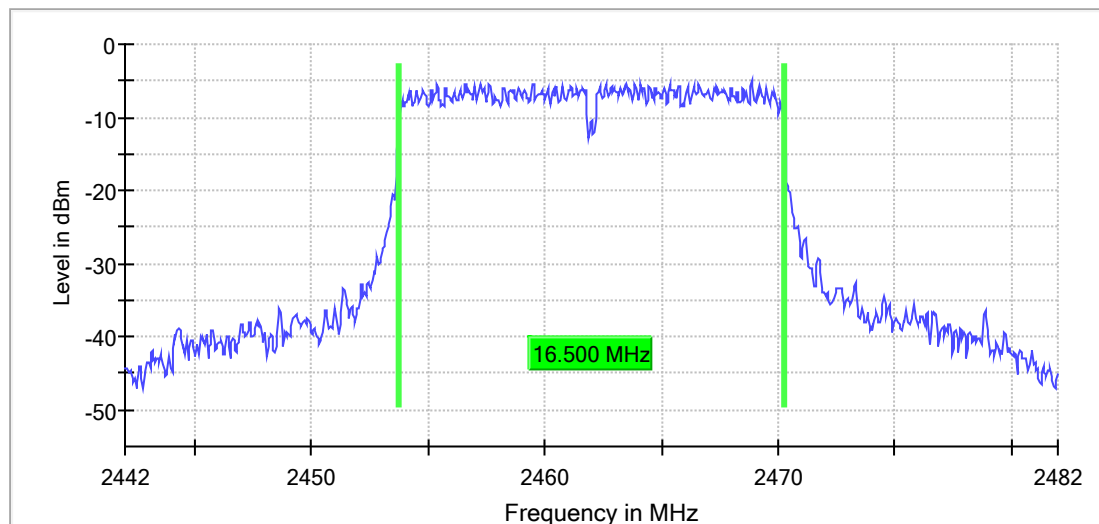
### 6 dB Bandwidth

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---------------------|-----------------|-----------------|-----------------|----------------------|-----------------------|
| 2462.000000         | 16.500000       | 0.500000        | ---             | 2453.725000          | 2470.225000           |

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

| DUT Frequency (MHz) | Max Level (dBm) | Result |
|---------------------|-----------------|--------|
| 2462.000000         | -5.0            | PASS   |

6 dB Bandwidth



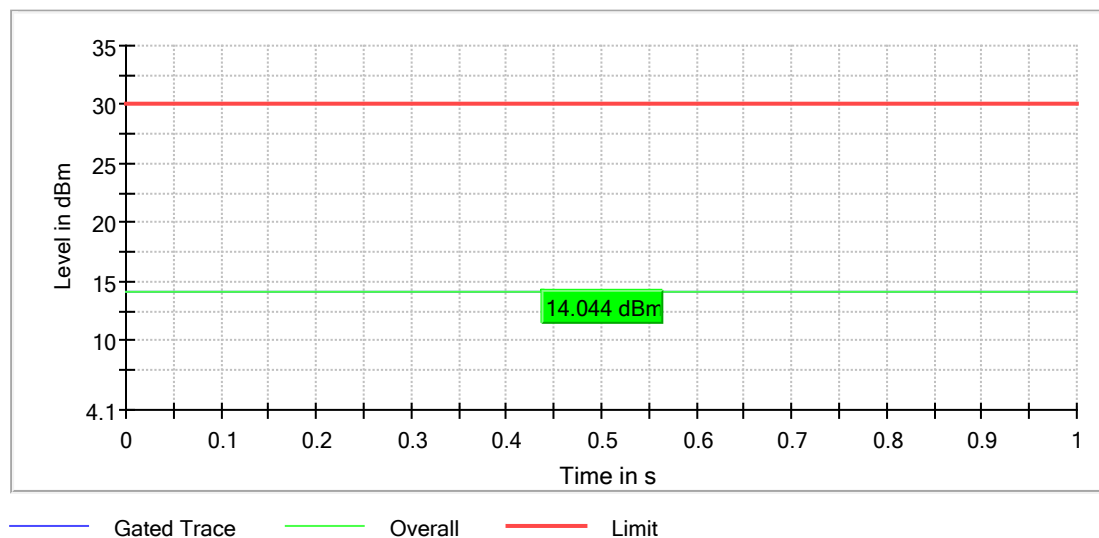
### Measurement

| Setting               | Instrument Value | Target Value  |
|-----------------------|------------------|---------------|
| Start Frequency       | 2.44200 GHz      | 2.44200 GHz   |
| Stop Frequency        | 2.48200 GHz      | 2.48200 GHz   |
| Span                  | 40.000 MHz       | 40.000 MHz    |
| RBW                   | 100.000 kHz      | ~ 100.000 kHz |
| VBW                   | 300.000 kHz      | ~ 300.000 kHz |
| SweepPoints           | 800              | ~ 800         |
| Sweptime              | 94.922 $\mu$ s   | 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             | 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       |

**RF output power (2462 MHz; 20.000 dBm; 20 MHz)****Result**

| DUT Frequency (MHz) | Gated RMS (dBm) | Limit Max (dBm) | Gated EIRP (dBm) | DutyCycle (%) | Result |
|---------------------|-----------------|-----------------|------------------|---------------|--------|
| 2462.000000         | 14.0            | 30.0            | 14.0             | 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 |

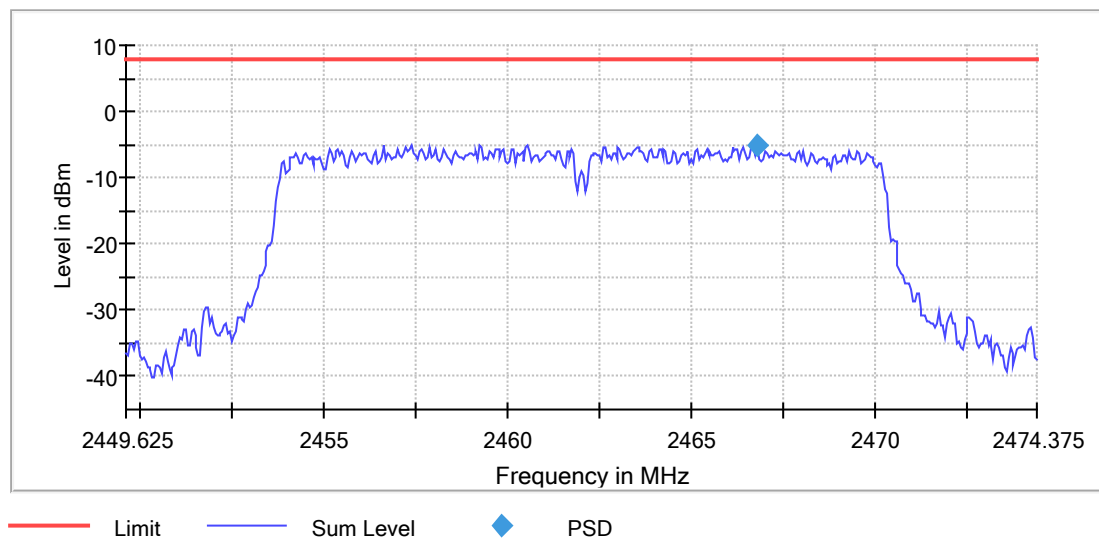
## Peak Power Spectral Density (2462 MHz; 20.000 dBm; 20 MHz)

Customized settings.

### Result

| DUT Frequency (MHz) | Frequency (MHz) | PSD (dBm) | Limit Max (dBm) | Result |
|---------------------|-----------------|-----------|-----------------|--------|
| 2462.000000         | 2466.750000     | -5.019    | 8.0             | PASS   |

Peak Power Spectral Density



### Measurement

| Setting               | Instrument Value | Target Value   |
|-----------------------|------------------|----------------|
| Start Frequency       | 2.44963 GHz      | 2.44963 GHz    |
| Stop Frequency        | 2.47438 GHz      | 2.47438 GHz    |
| Span                  | 24.750 MHz       | 24.750 MHz     |
| RBW                   | 100.000 kHz      | <= 100.000 kHz |
| VBW                   | 300.000 kHz      | >= 300.000 kHz |
| SweepPoints           | 495              | ~ 495          |
| SweepTime             | 1.040 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 (2462 MHz; 20.000 dBm; 20 MHz)**

Customized settings.

**Result**

| DUT Frequency (MHz) | Result |
|---------------------|--------|
| 2462.000000         | PASS   |

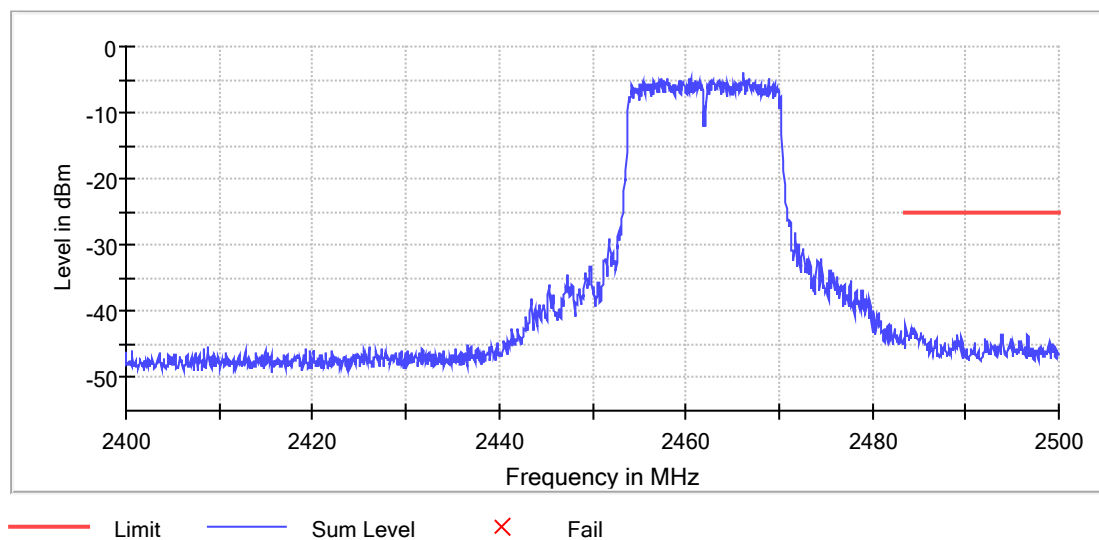
**Inband Peak**

| Frequency (MHz) | Level (dBm) |
|-----------------|-------------|
| 2466.175000     | -4.0        |

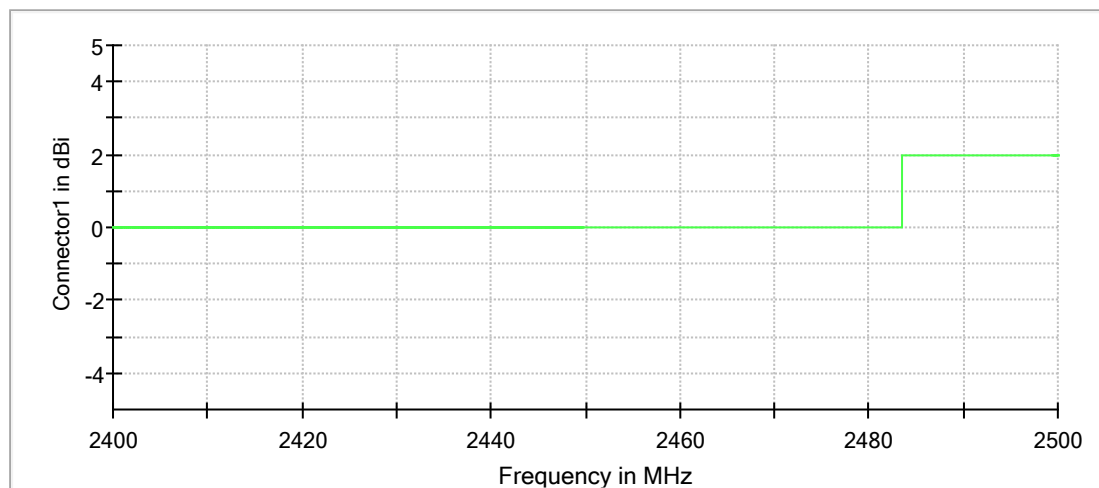
**Measurements**

| Frequency (MHz) | Level (dBm) | Margin (dB) | Limit (dBm) | Result |
|-----------------|-------------|-------------|-------------|--------|
| 2483.525000     | -41.9       | 16.9        | -25.0       | PASS   |
| 2483.575000     | -42.0       | 16.9        | -25.0       | PASS   |
| 2484.275000     | -42.5       | 17.5        | -25.0       | PASS   |
| 2484.225000     | -42.5       | 17.5        | -25.0       | PASS   |
| 2484.475000     | -42.8       | 17.8        | -25.0       | PASS   |
| 2484.075000     | -42.8       | 17.8        | -25.0       | PASS   |
| 2484.125000     | -42.9       | 17.9        | -25.0       | PASS   |
| 2484.425000     | -43.0       | 18.0        | -25.0       | PASS   |
| 2484.675000     | -43.0       | 18.0        | -25.0       | PASS   |
| 2485.275000     | -43.1       | 18.1        | -25.0       | PASS   |
| 2483.775000     | -43.1       | 18.1        | -25.0       | PASS   |
| 2483.625000     | -43.3       | 18.3        | -25.0       | PASS   |
| 2485.175000     | -43.4       | 18.4        | -25.0       | PASS   |
| 2485.225000     | -43.4       | 18.4        | -25.0       | PASS   |
| 2485.125000     | -43.4       | 18.4        | -25.0       | PASS   |

Band Edge

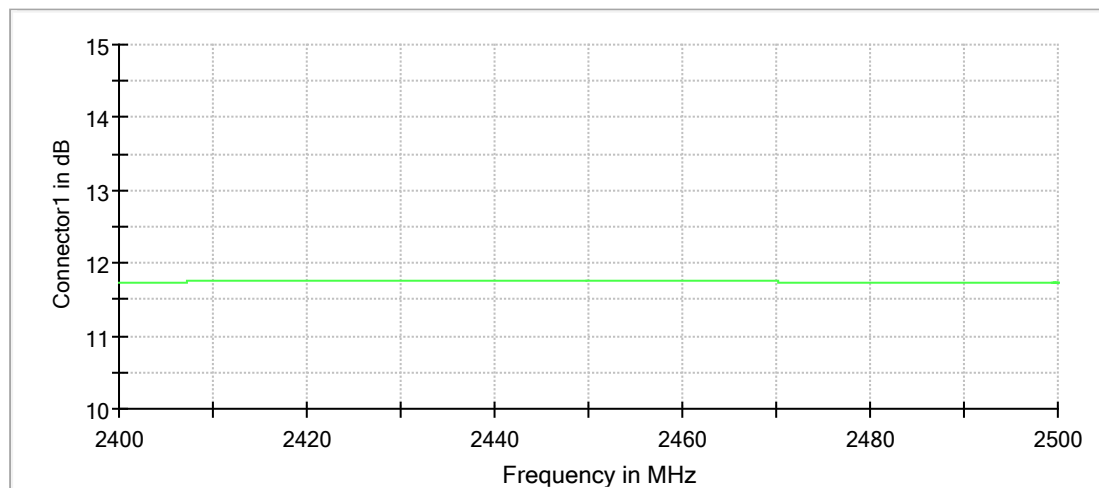


Gain



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                   | 9 / max. 150     | max. 150       |
| Stable                | 3 / 3            | 3              |
| Max Stable Difference | 0.40 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           |
| Preamp                | 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 (2462 MHz; 20.000 dBm; 20 MHz)**

Customized settings.

**Result**

| DUT Frequency (MHz) | Result |
|---------------------|--------|
| 2462.000000         | PASS   |

**Final measurements**

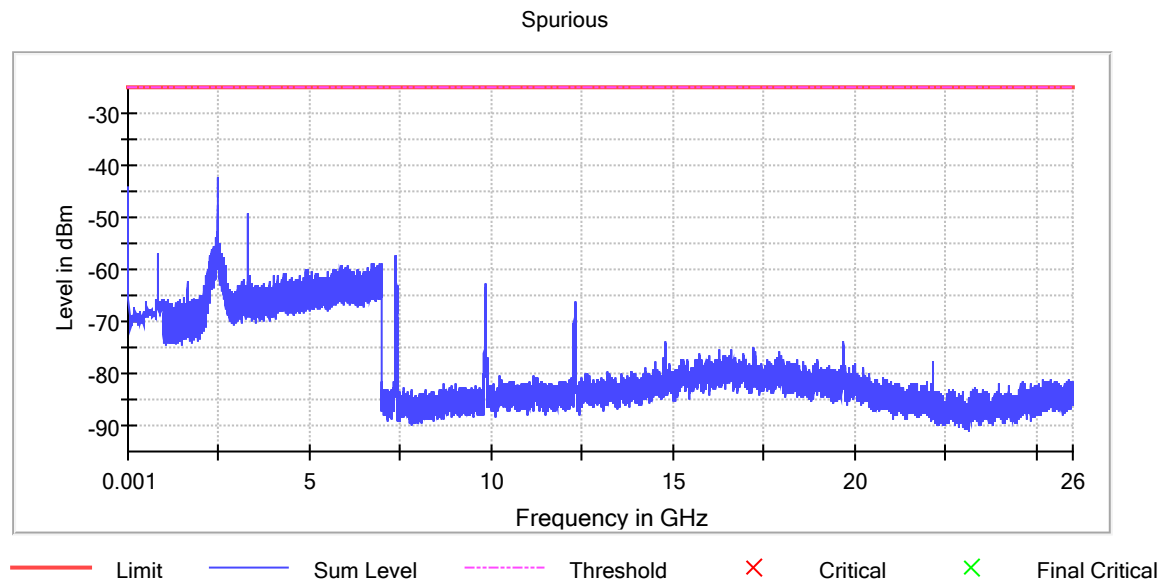
| Frequency (MHz) | Level Pre Measurement (dBm) | level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|-----------------------------|-------------|-------------|-------------|--------|
| ---             | ---                         | ---         | ---         | ---         | ---   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

**Pre Measurements**

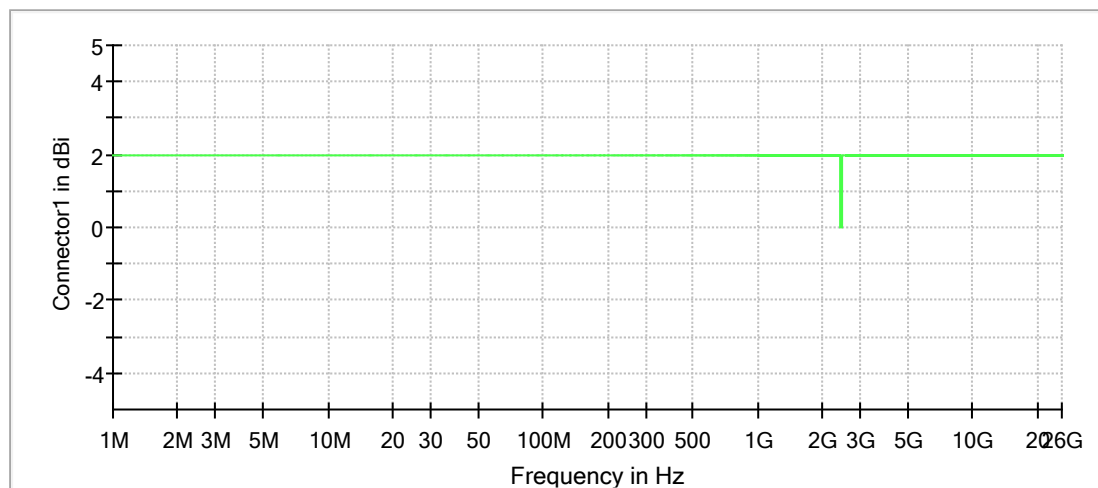
| Frequency (MHz) | Level (dBm) | Margin (dB) | Limit (dBm) |
|-----------------|-------------|-------------|-------------|
| 2483.570568     | -42.1       | 17.1        | -25.0       |
| 2483.711704     | -43.3       | 18.3        | -25.0       |
| 2483.500000     | -44.1       | 19.1        | -25.0       |
| 5.945545        | -44.2       | 19.2        | -25.0       |
| 2484.135113     | -44.2       | 19.2        | -25.0       |
| 1.000000        | -44.2       | 19.2        | -25.0       |
| 2483.852841     | -44.4       | 19.3        | -25.0       |
| 2483.993977     | -44.6       | 19.6        | -25.0       |
| 2484.276249     | -45.2       | 20.2        | -25.0       |
| 2484.558522     | -45.4       | 20.3        | -25.0       |
| 2484.699658     | -45.4       | 20.4        | -25.0       |
| 2484.840794     | -45.4       | 20.4        | -25.0       |
| 2484.417385     | -46.1       | 21.1        | -25.0       |
| 2485.405339     | -47.7       | 22.7        | -25.0       |
| 2485.123066     | -48.3       | 23.3        | -25.0       |

**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               | ---               |

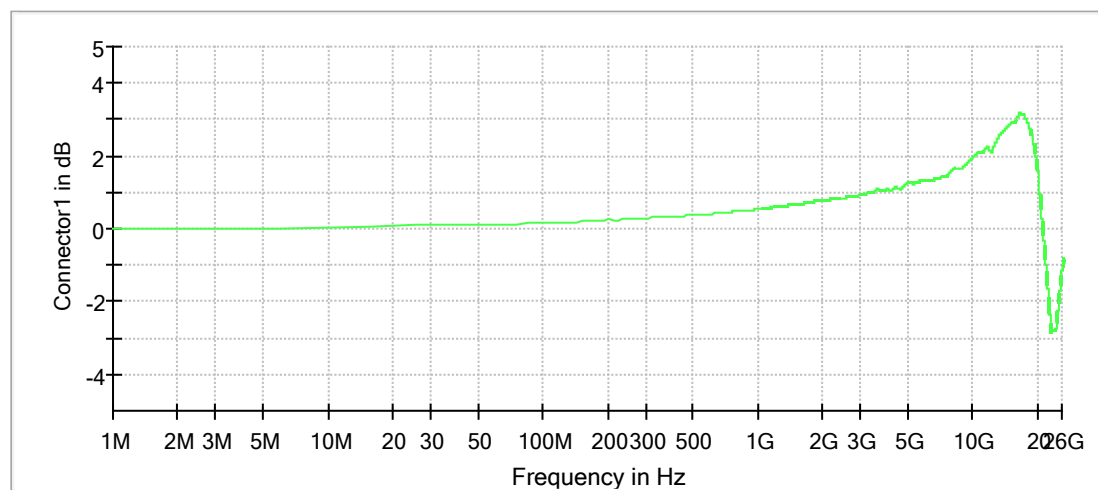


Gain



Connector1

Attenuation



Connector1

## Pre Measurement 1

| Setting               | Instrument Value | Target Value   |
|-----------------------|------------------|----------------|
| RBW                   | 100.000 kHz      | <= 100.000 kHz |
| VBW                   | 300.000 kHz      | >= 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        |