



427 West 12800 South  
Draper, UT 84020

## Test Report Attachment

|                                  |                   |
|----------------------------------|-------------------|
| <b>FCC ID</b>                    | SWX-UDB           |
| <b>ISED ID</b>                   | 6545A-UDB         |
| <b>Equipment Under Test</b>      | UDB               |
| <b>Test Report Serial Number</b> | TR9363_01         |
| <b>Date of Test</b>              | 16 July 2024      |
| <b>Report Issue Date</b>         | 12 September 2024 |

## Test Personnel

|                             |               |
|-----------------------------|---------------|
| <b>Testing performed by</b> | Evan Hartzell |
|-----------------------------|---------------|

## Test Location

Testing was performed at the Unified Compliance Laboratory located at 427 West 12800 South, Draper, UT 84020. Unified Compliance Laboratory is accredited by National Voluntary Laboratory Accreditation Program (NVLAP); NVLAP Code 600241-0 which is effective until 30 June 2025. This site has also been registered with Innovations, Science and Economic Development (ISED) department as was accepted under Appendix B, Phase 1 procedures of the APEC Tel MRA for Canadian recognition. ISED No.: 25346, effective until 30 June 2025. Unified Compliance Laboratory has been assigned Conformity Assessment Number US0223 by ISED and MRA US5037.



# 1 WiFi Band – Internal Antenna

## 1.1 Summary

| Test                            | Frequency (MHz) | Nominal Power (dBm) | Nominal Bandwidth (MHz) | Result |
|---------------------------------|-----------------|---------------------|-------------------------|--------|
| RF output power                 | 2412.000        | 24.0                | 20.000000               | PASS   |
| Minimum Emission Bandwidth 6 dB | 2412.000        | 24.0                | 20.000000               | PASS   |
| Power Spectral Density          | 2412.000        | 24.0                | 20.000000               | PASS   |
| Occupied Channel Bandwidth 99%  | 2412.000        | 24.0                | 20.000000               | PASS   |
| Tx Spurious Emission            | 2412.000        | 24.0                | 20.000000               | PASS   |
| Minimum Emission Bandwidth 6 dB | 2437.000        | 24.0                | 20.000000               | PASS   |
| Power Spectral Density          | 2437.000        | 24.0                | 20.000000               | PASS   |
| Occupied Channel Bandwidth 99%  | 2437.000        | 24.0                | 20.000000               | PASS   |
| Tx Spurious Emission            | 2437.000        | 24.0                | 20.000000               | PASS   |
| Minimum Emission Bandwidth 6 dB | 2462.000        | 24.0                | 20.000000               | PASS   |
| Power Spectral Density          | 2462.000        | 24.0                | 20.000000               | PASS   |
| Occupied Channel Bandwidth 99%  | 2462.000        | 24.0                | 20.000000               | PASS   |
| Tx Spurious Emission            | 2462.000        | 24.0                | 20.000000               | PASS   |
| Minimum Emission Bandwidth 6 dB | 2422.000        | 24.0                | 40.000000               | PASS   |
| Power Spectral Density          | 2422.000        | 24.0                | 40.000000               | PASS   |
| Occupied Channel Bandwidth 99%  | 2422.000        | 24.0                | 40.000000               | PASS   |
| Tx Spurious Emission            | 2422.000        | 24.0                | 40.000000               | PASS   |
| Minimum Emission Bandwidth 6 dB | 2437.000        | 24.0                | 40.000000               | PASS   |
| Power Spectral Density          | 2437.000        | 24.0                | 40.000000               | PASS   |
| Occupied Channel Bandwidth 99%  | 2437.000        | 24.0                | 40.000000               | PASS   |
| Tx Spurious Emission            | 2437.000        | 24.0                | 40.000000               | PASS   |
| Minimum Emission Bandwidth 6 dB | 2452.000        | 24.0                | 40.000000               | PASS   |
| Power Spectral Density          | 2452.000        | 24.0                | 40.000000               | PASS   |
| Occupied Channel Bandwidth 99%  | 2452.000        | 24.0                | 40.000000               | PASS   |
| Tx Spurious Emission            | 2452.000        | 24.0                | 40.000000               | PASS   |

## RF output power (2412 MHz; 24.000 dBm; 20 MHz)

### Result

| DUT Frequency (MHz) | Gated RMS (dBm) | Limit Max (dBm) | Gated EIRP (dBm) | DutyCycle (%) | Result |
|---------------------|-----------------|-----------------|------------------|---------------|--------|
| 2412.000000         | 16.8            | 30.0            | 16.8             | 95.736        | PASS   |

### OSP PowerMeter settings

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

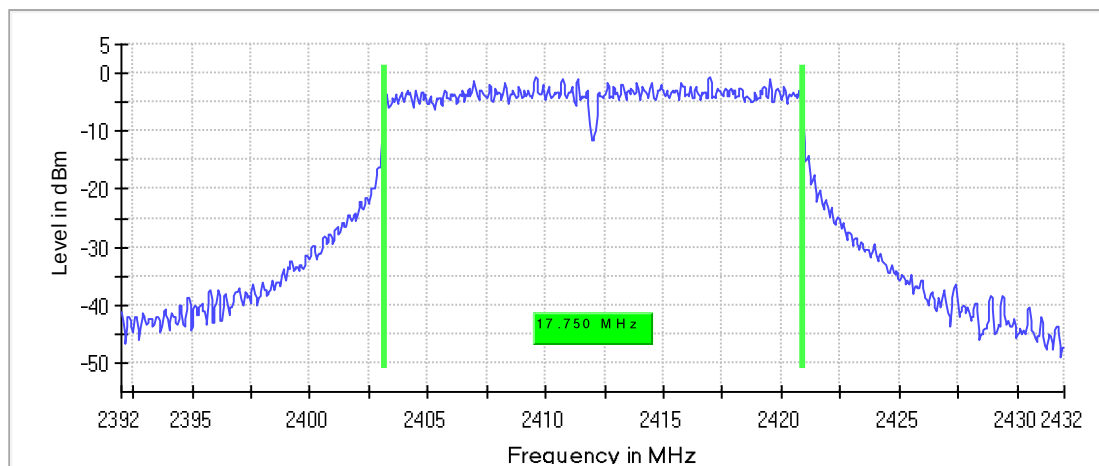
## Minimum Emission Bandwidth 6 dB (2412 MHz; 24.000 dBm; 20 MHz)

### 6 dB Bandwidth

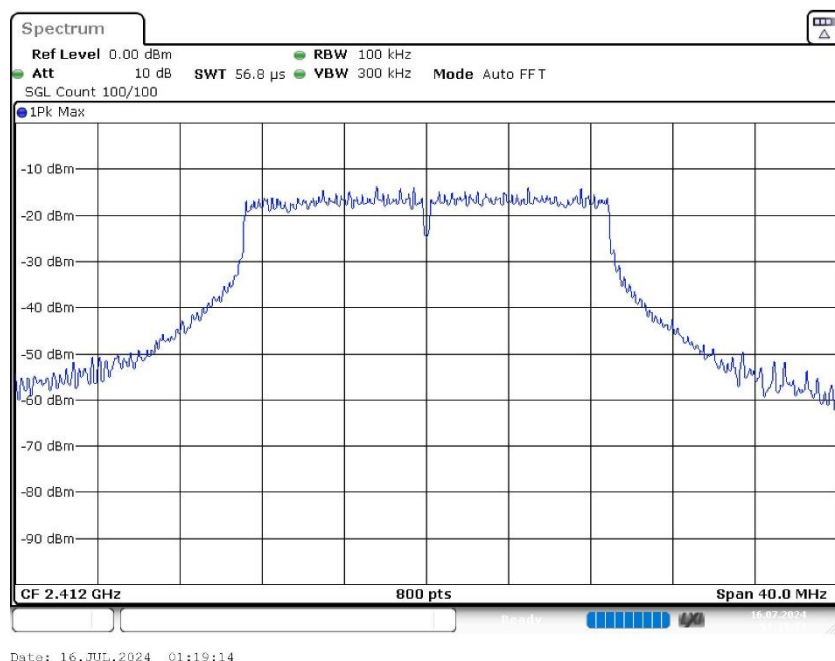
| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---------------------|-----------------|-----------------|-----------------|----------------------|-----------------------|
| 2412.000000         | 17.750000       | 0.500000        | ---             | 2403.175000          | 2420.925000           |

| DUT Frequency (MHz) | Max Level (dBm) | Result |
|---------------------|-----------------|--------|
| 2412.000000         | -0.5            | PASS   |

6 dB Bandwidth



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         |
| SweepTime       | 56.836 μs        | AUTO          |
| Reference Level | 0.000 dBm        | AUTO          |
| Attenuation     | 10.000 dB        | 0.000 dB      |
| Detector        | MaxPeak          | MaxPeak       |
| SweepCount      | 100              | 100           |
| Filter          | 3 dB             | 3 dB          |
| Trace Mode      | Max Hold         | Max Hold      |
| SweepType       | FFT              | AUTO          |
| Preamp          | off              | off           |

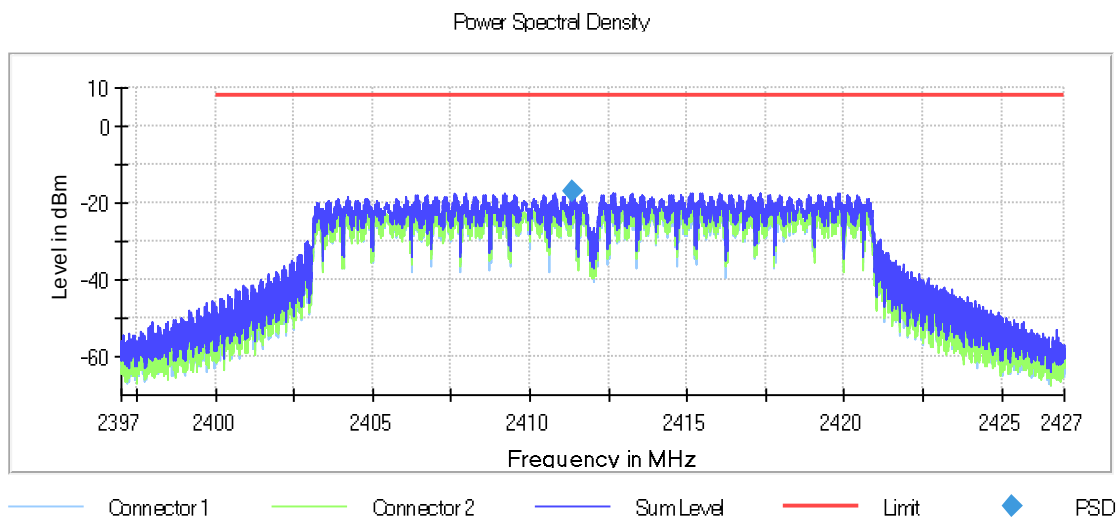
## Power Spectral Density (2412 MHz; 24.000 dBm; 20 MHz)

## Result

| DUT Frequency (MHz) | Frequency (MHz) | PSD (dBm) | Limit Max (dBm) | Result |
|---------------------|-----------------|-----------|-----------------|--------|
| 2412.000000         | 2411.379750     | -17.227   | 8.0             | PASS   |

## Ports

| Port | State |
|------|-------|
| 1    | used  |
| 2    | used  |



## Measurement

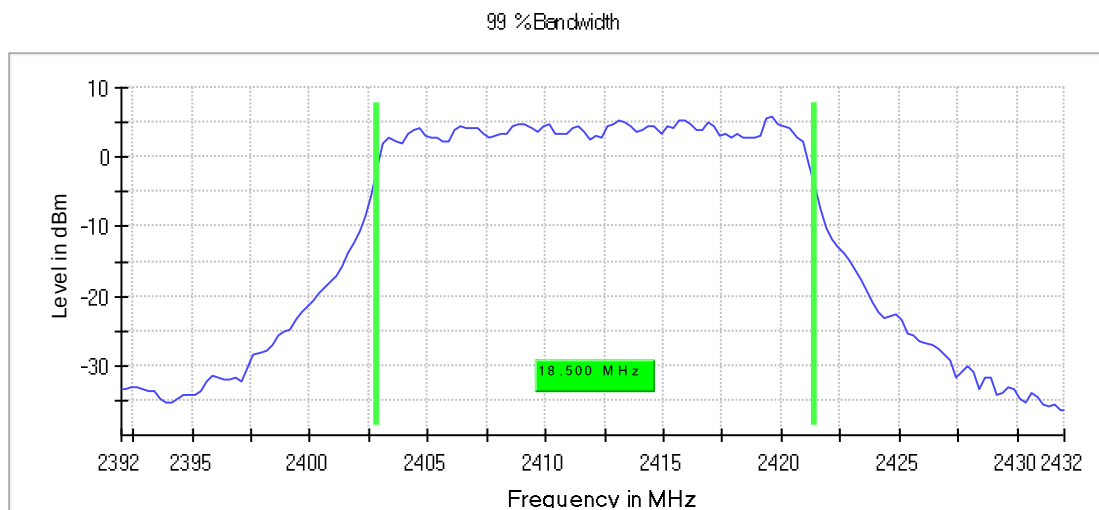
| Setting         | Instrument Value | Target Value  |
|-----------------|------------------|---------------|
| Start Frequency | 2.39700 GHz      | 2.39700 GHz   |
| Stop Frequency  | 2.42700 GHz      | 2.42700 GHz   |
| Span            | 30.000 MHz       | 30.000 MHz    |
| RBW             | 3.000 kHz        | <= 3.000 kHz  |
| VBW             | 10.000 kHz       | >= 9.000 kHz  |
| SweepPoints     | 20000            | ~ 20000       |
| Sweeptime       | 4.424 ms         | AUTO          |
| Reference Level | 10.000 dBm       | 10.000 dBm    |
| Attenuation     | 30.000 dB        | AUTO          |
| Detector        | RMS              | RMS           |
| SweepCount      | 100              | 100           |
| Filter          | 3 dB             | 3 dB          |
| Trace Mode      | Average Power    | Average Power |
| SweepType       | FFT              | AUTO          |
| Preamp          | off              | off           |

**Occupied Channel Bandwidth 99% (2412 MHz; 24.000 dBm; 20 MHz)**

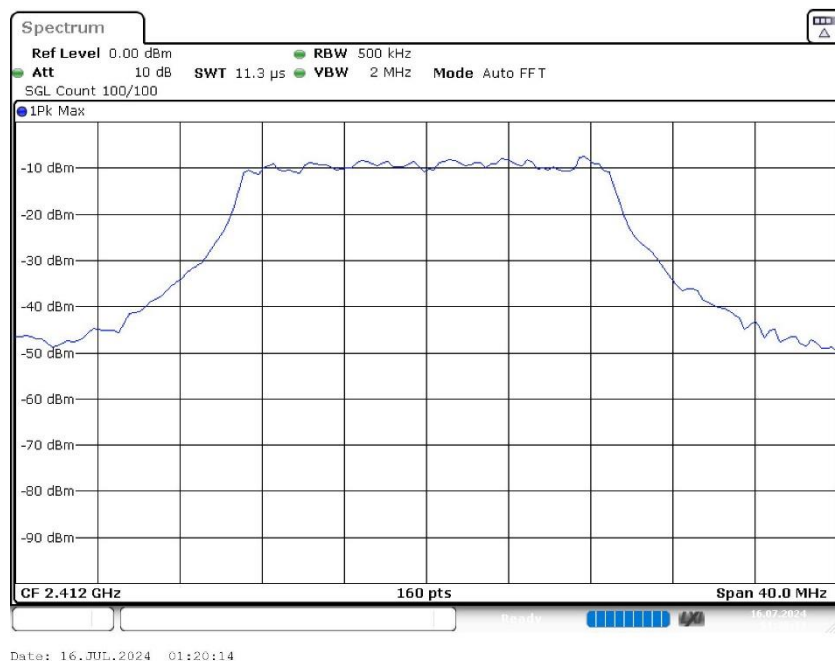
## 99 % Bandwidth

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---------------------|-----------------|-----------------|-----------------|----------------------|-----------------------|
| 2412.000000         | 18.500000       | ---             | ---             | 2402.875000          | 2421.375000           |

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



## 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             | 500.000 kHz      | $\geq$ 500.000 kHz |
| VBW             | 2.000 MHz        | $\geq$ 1.500 MHz   |
| SweepPoints     | 160              | $\sim$ 160         |
| Sweptime        | 11.344 $\mu$ s   | AUTO               |
| Reference Level | 0.000 dBm        | AUTO               |

|             |           |          |
|-------------|-----------|----------|
| Attenuation | 10.000 dB | 0.000 dB |
| Detector    | MaxPeak   | MaxPeak  |
| SweepCount  | 100       | 100      |
| Filter      | 3 dB      | 3 dB     |
| Trace Mode  | Max Hold  | Max Hold |
| SweepType   | FFT       | AUTO     |
| Preamp      | off       | off      |

## Tx Spurious Emission (2412 MHz; 24.000 dBm; 20 MHz)

### Result

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

### Final measurements

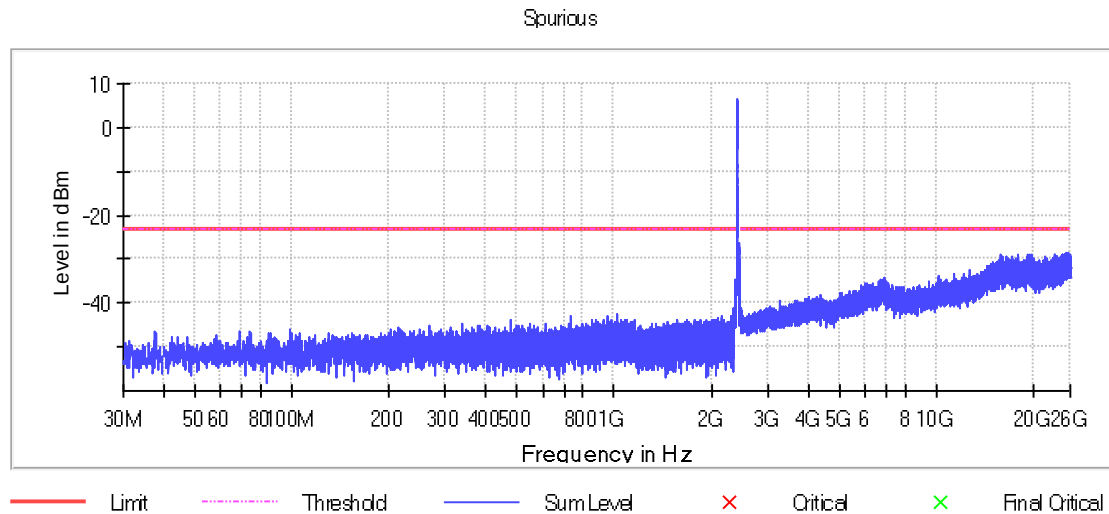
| Frequency (MHz) | Level Pre Measurement (dBm) | level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|-----------------------------|-------------|-------------|-------------|--------|
| ---             | ---                         | ---         | ---         | ---         | ---   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

### Pre Measurements

| Frequency (MHz) | Level (dBm) | Margin (dB) | Limit (dBm) |
|-----------------|-------------|-------------|-------------|
| 2399.375000     | -27.0       | 3.6         | -23.4       |
| 2399.875000     | -27.3       | 3.8         | -23.4       |
| 2399.325000     | -27.3       | 3.8         | -23.4       |
| 2399.425000     | -27.3       | 3.9         | -23.4       |
| 2399.925000     | -27.4       | 4.0         | -23.4       |
| 2399.825000     | -27.6       | 4.2         | -23.4       |
| 2399.725000     | -27.7       | 4.3         | -23.4       |
| 2399.125000     | -27.7       | 4.3         | -23.4       |
| 2399.175000     | -27.9       | 4.4         | -23.4       |
| 2399.225000     | -27.9       | 4.5         | -23.4       |
| 2399.475000     | -28.0       | 4.5         | -23.4       |
| 2399.275000     | -28.1       | 4.7         | -23.4       |
| 2399.525000     | -28.2       | 4.7         | -23.4       |
| 2399.675000     | -28.2       | 4.8         | -23.4       |
| 2399.775000     | -28.3       | 4.8         | -23.4       |

### Measurement Settings

| Start Frequency (MHz) | Stop Frequency (MHz) | Pre Measurement | Final Measurement |
|-----------------------|----------------------|-----------------|-------------------|
| 30.000000             | 2350.000000          | 1               | 1                 |
| 2350.000000           | 2483.500000          | 2               | 1                 |
| 2483.500000           | 26000.000000         | 1               | 1                 |



## 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     | 32001            | ~ 46400            |
| SweepTime       | 32.100 ms        | AUTO               |
| Reference Level | 20.000 dBm       | 20.000 dBm         |
| Attenuation     | 40.000 dB        | 40.000 dB          |
| Detector        | MaxPeak          | MaxPeak            |
| SweepCount      | 3                | 3                  |
| Filter          | 3 dB             | 3 dB               |
| Trace Mode      | Max Hold         | Max Hold           |
| SweepType       | Sweep            | AUTO               |
| Preamp          | off              | off                |

## Pre Measurement 2

| Setting         | Instrument Value | Target Value       |
|-----------------|------------------|--------------------|
| RBW             | 100.000 kHz      | $\leq 100.000$ kHz |
| VBW             | 300.000 kHz      | $\geq 300.000$ kHz |
| SweepPoints     | 2670             | ~ 2670             |
| SweepTime       | 151.563 $\mu$ s  | AUTO               |
| Reference Level | 20.000 dBm       | 20.000 dBm         |
| Attenuation     | 40.000 dB        | 40.000 dB          |
| Detector        | MaxPeak          | MaxPeak            |
| SweepCount      | 300              | 300                |
| Filter          | 3 dB             | 3 dB               |
| Trace Mode      | Max Hold         | Max Hold           |
| SweepType       | FFT              | AUTO               |
| Preamp          | off              | off                |

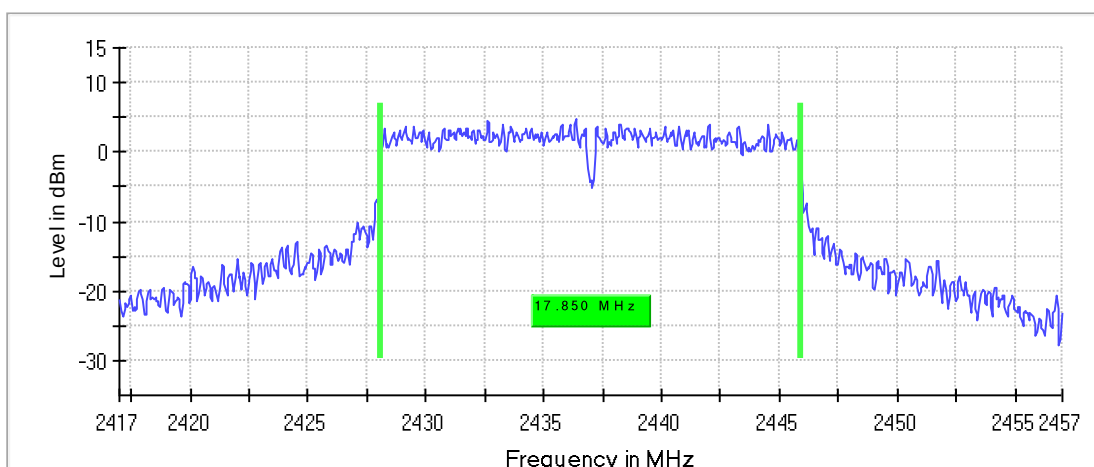
## Minimum Emission Bandwidth 6 dB (2437 MHz; 24.000 dBm; 20 MHz)

### 6 dB Bandwidth

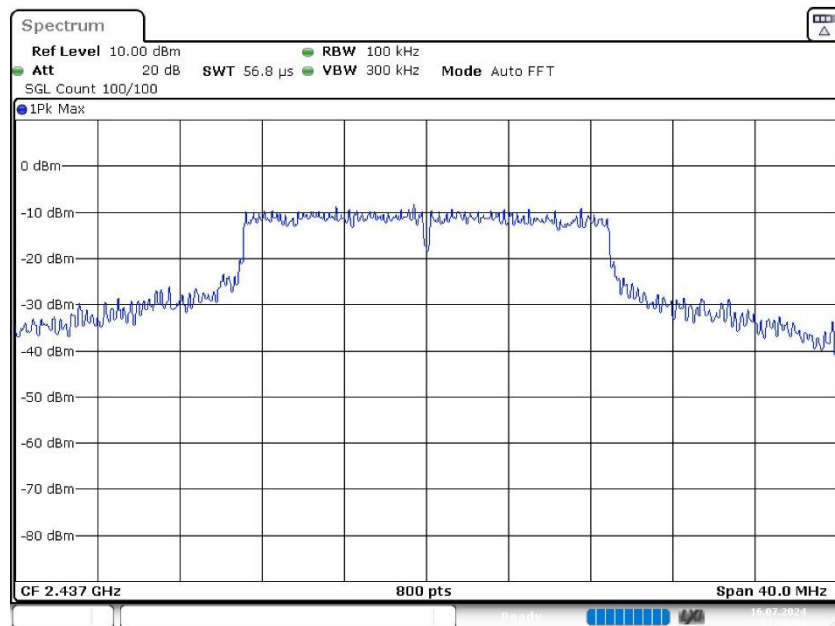
| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---------------------|-----------------|-----------------|-----------------|----------------------|-----------------------|
| 2437.000000         | 17.850000       | 0.500000        | ---             | 2428.075000          | 2445.925000           |

| DUT Frequency (MHz) | Max Level (dBm) | Result |
|---------------------|-----------------|--------|
| 2437.000000         | 4.9             | PASS   |

6 dB Bandwidth



Bandwidth



Date: 16.JUL.2024 01:44:03

## 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         |
| SweepTime       | 56.836 $\mu$ s   | AUTO          |
| Reference Level | 10.000 dBm       | AUTO          |
| Attenuation     | 20.000 dB        | 0.000 dB      |
| Detector        | MaxPeak          | MaxPeak       |
| SweepCount      | 100              | 100           |
| Filter          | 3 dB             | 3 dB          |
| Trace Mode      | Max Hold         | Max Hold      |
| SweepType       | FFT              | AUTO          |
| Preamp          | off              | off           |

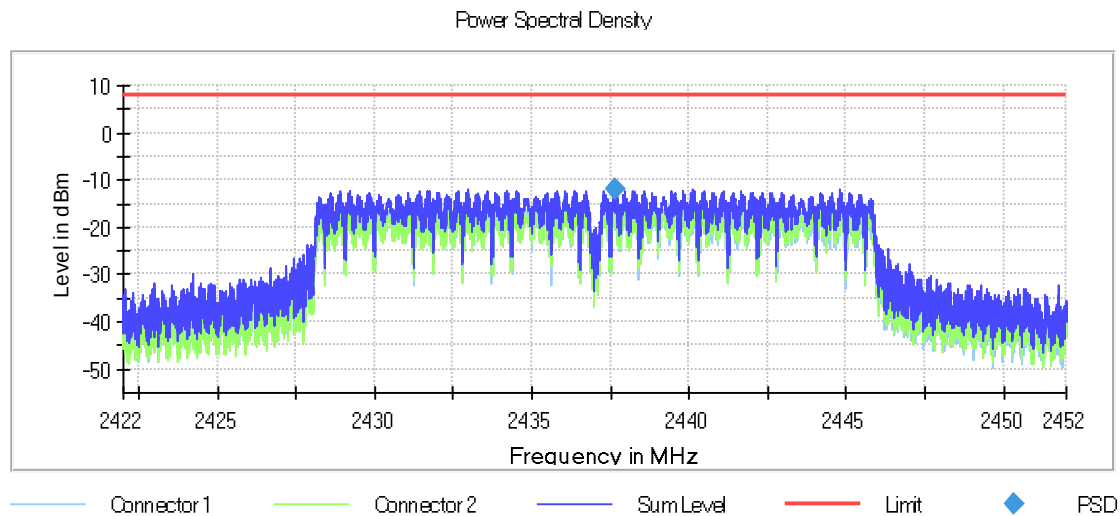
## Power Spectral Density (2437 MHz; 24.000 dBm; 20 MHz)

## Result

| DUT Frequency (MHz) | Frequency (MHz) | PSD (dBm) | Limit Max (dBm) | Result |
|---------------------|-----------------|-----------|-----------------|--------|
| 2437.000000         | 2437.629250     | -11.883   | 8.0             | PASS   |

## Ports

| Port | State |
|------|-------|
| 1    | used  |
| 2    | used  |

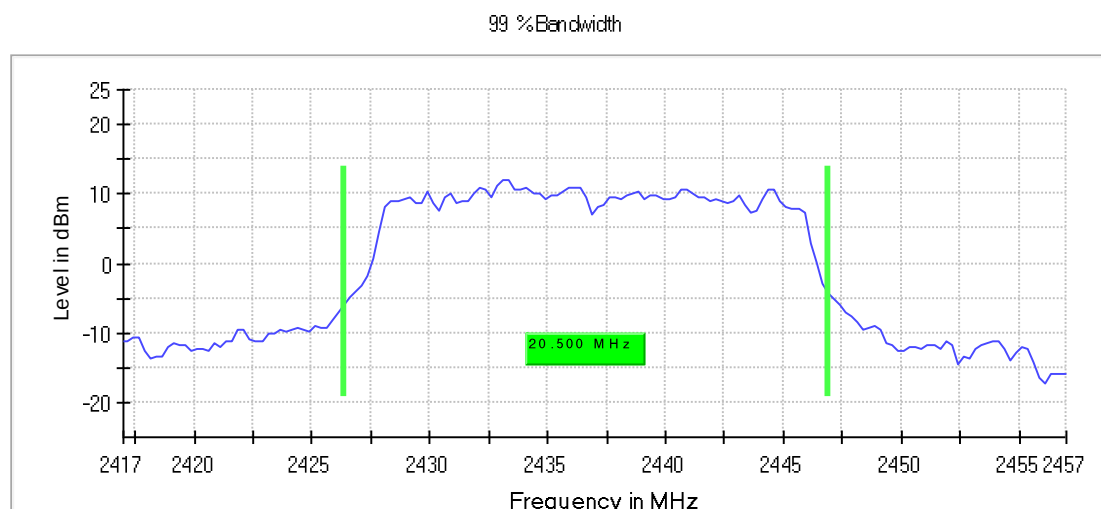


**Occupied Channel Bandwidth 99% (2437 MHz; 24.000 dBm; 20 MHz)**

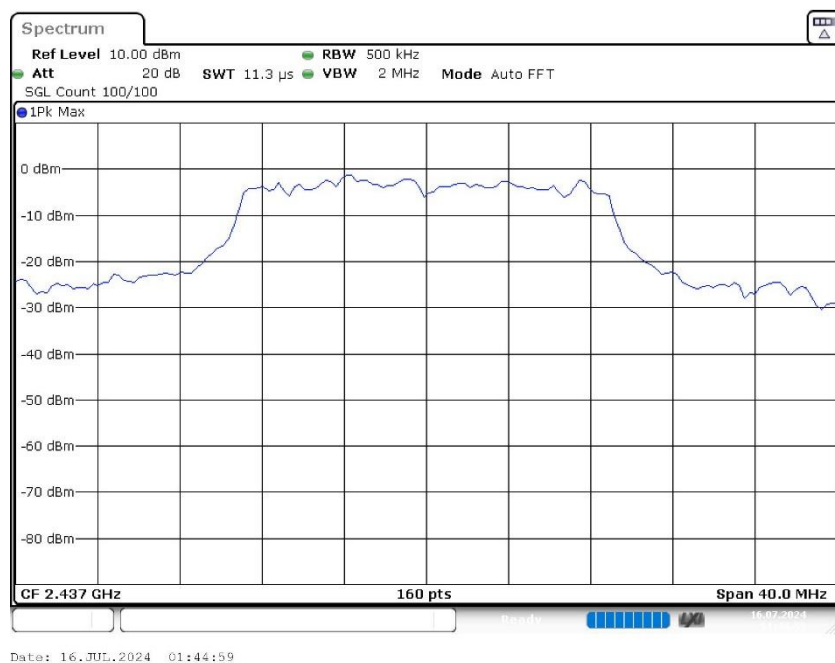
### 99 % Bandwidth

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---------------------|-----------------|-----------------|-----------------|----------------------|-----------------------|
| 2437.000000         | 20.500000       | ---             | ---             | 2426.375000          | 2446.875000           |

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



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             | 500.000 kHz      | >= 500.000 kHz |
| VBW             | 2.000 MHz        | >= 1.500 MHz   |
| SweepPoints     | 160              | ~ 160          |
| SweepTime       | 11.344 $\mu$ s   | AUTO           |
| Reference Level | 10.000 dBm       | AUTO           |
| Attenuation     | 20.000 dB        | 0.000 dB       |
| Detector        | MaxPeak          | MaxPeak        |
| SweepCount      | 100              | 100            |
| Filter          | 3 dB             | 3 dB           |
| Trace Mode      | Max Hold         | Max Hold       |
| SweepType       | FFT              | AUTO           |
| Preamp          | off              | off            |

## Tx Spurious Emission (2437 MHz; 24.000 dBm; 20 MHz)

## Result

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

## Final measurements

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

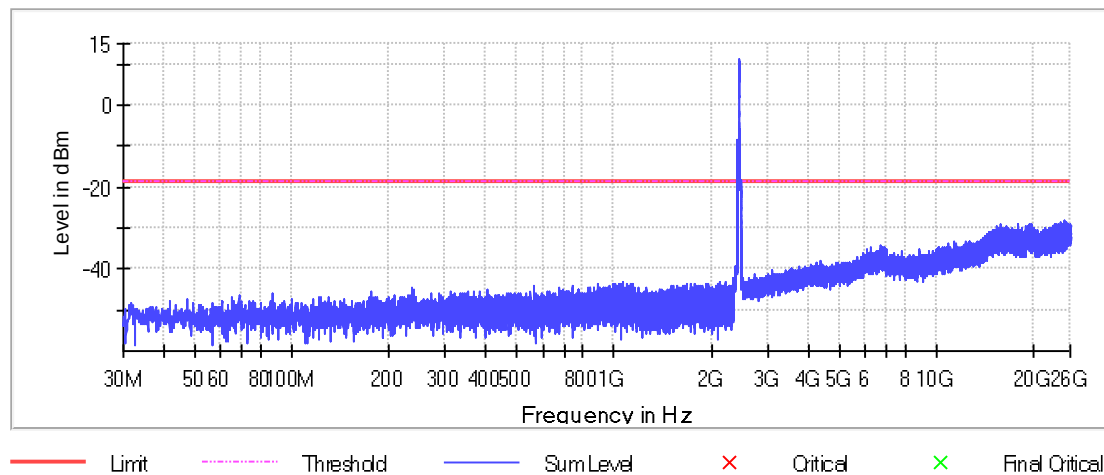
## Pre Measurements

| Frequency (MHz) | Level (dBm) | Margin (dB) | Limit (dBm) |
|-----------------|-------------|-------------|-------------|
| 25081.782858    | -28.1       | 9.2         | -18.9       |
| 25103.094020    | -28.4       | 9.5         | -18.9       |
| 24135.273312    | -28.5       | 9.6         | -18.9       |
| 24928.930385    | -28.7       | 9.8         | -18.9       |
| 25169.232110    | -28.7       | 9.8         | -18.9       |
| 24776.812779    | -28.8       | 9.9         | -18.9       |
| 25141.307139    | -28.9       | 9.9         | -18.9       |
| 24371.165831    | -28.9       | 10.0        | -18.9       |
| 23401.875387    | -28.9       | 10.0        | -18.9       |
| 23384.973431    | -28.9       | 10.0        | -18.9       |
| 17815.411432    | -28.9       | 10.0        | -18.9       |
| 25073.699314    | -28.9       | 10.0        | -18.9       |
| 24134.538444    | -29.0       | 10.0        | -18.9       |
| 25947.456962    | -29.0       | 10.1        | -18.9       |
| 19451.961712    | -29.0       | 10.1        | -18.9       |

## Measurement Settings

| Start Frequency (MHz) | Stop Frequency (MHz) | Pre Measurement | Final Measurement |
|-----------------------|----------------------|-----------------|-------------------|
| 30.000000             | 2350.000000          | 1               | 1                 |
| 2350.000000           | 2483.500000          | 2               | 1                 |
| 2483.500000           | 26000.000000         | 1               | 1                 |

Spurious

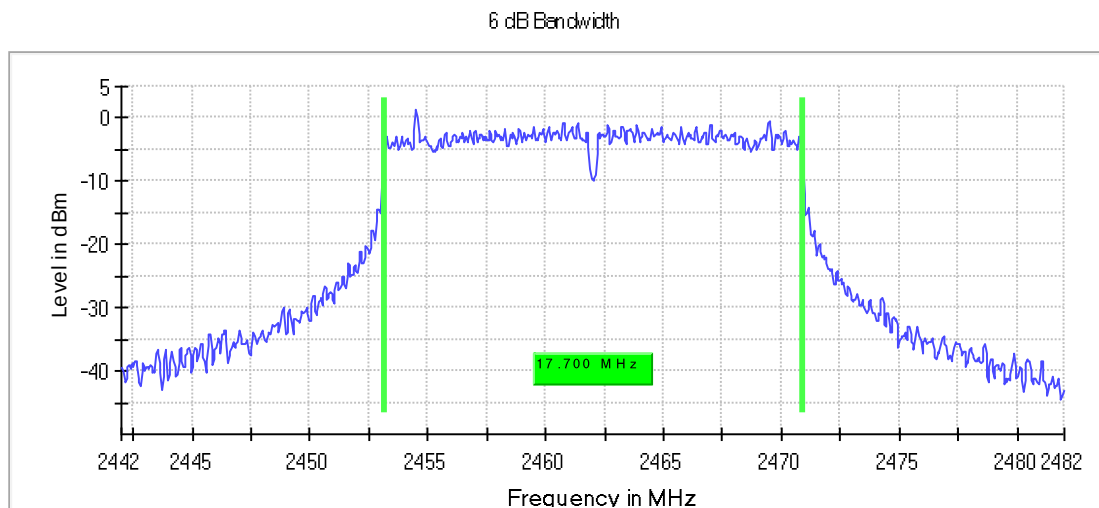


## Minimum Emission Bandwidth 6 dB (2462 MHz; 24.000 dBm; 20 MHz)

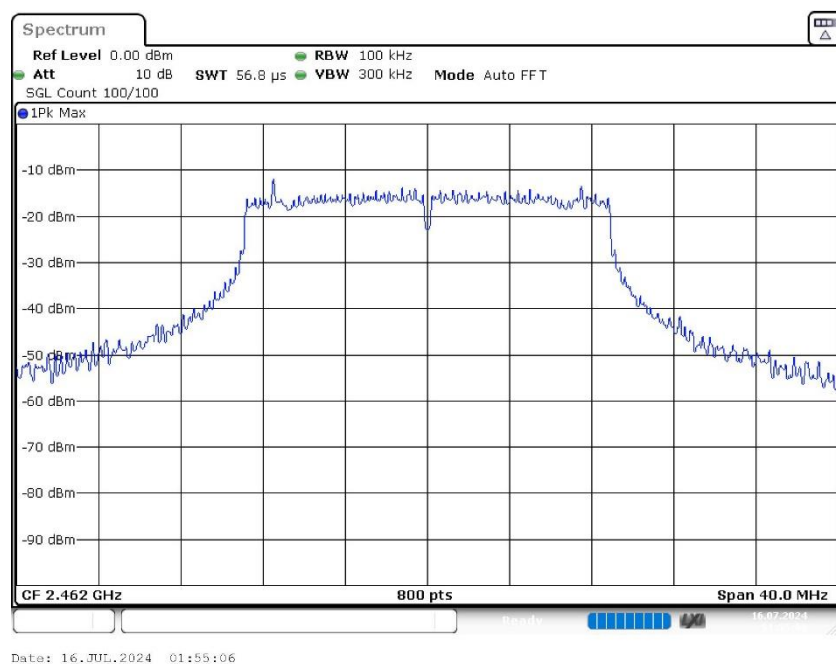
### 6 dB Bandwidth

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---------------------|-----------------|-----------------|-----------------|----------------------|-----------------------|
| 2462.000000         | 17.700000       | 0.500000        | ---             | 2453.175000          | 2470.875000           |

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



## 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         |
| SweepTime       | 56.836 $\mu$ s | AUTO          |
| Reference Level | 0.000 dBm      | AUTO          |
| Attenuation     | 10.000 dB      | 0.000 dB      |
| Detector        | MaxPeak        | MaxPeak       |
| SweepCount      | 100            | 100           |
| Filter          | 3 dB           | 3 dB          |
| Trace Mode      | Max Hold       | Max Hold      |
| Sweeptype       | FFT            | AUTO          |
| Preamp          | off            | off           |

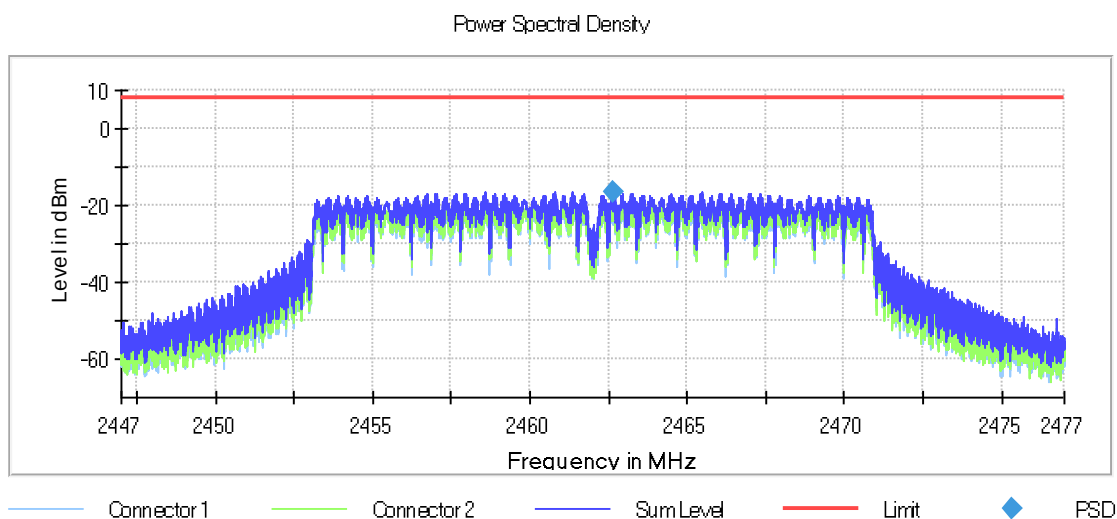
## Power Spectral Density (2462 MHz; 24.000 dBm; 20 MHz)

### Result

| DUT Frequency (MHz) | Frequency (MHz) | PSD (dBm) | Limit Max (dBm) | Result |
|---------------------|-----------------|-----------|-----------------|--------|
| 2462.000000         | 2462.654750     | -16.535   | 8.0             | PASS   |

### Ports

| Port | State |
|------|-------|
| 1    | used  |
| 2    | used  |

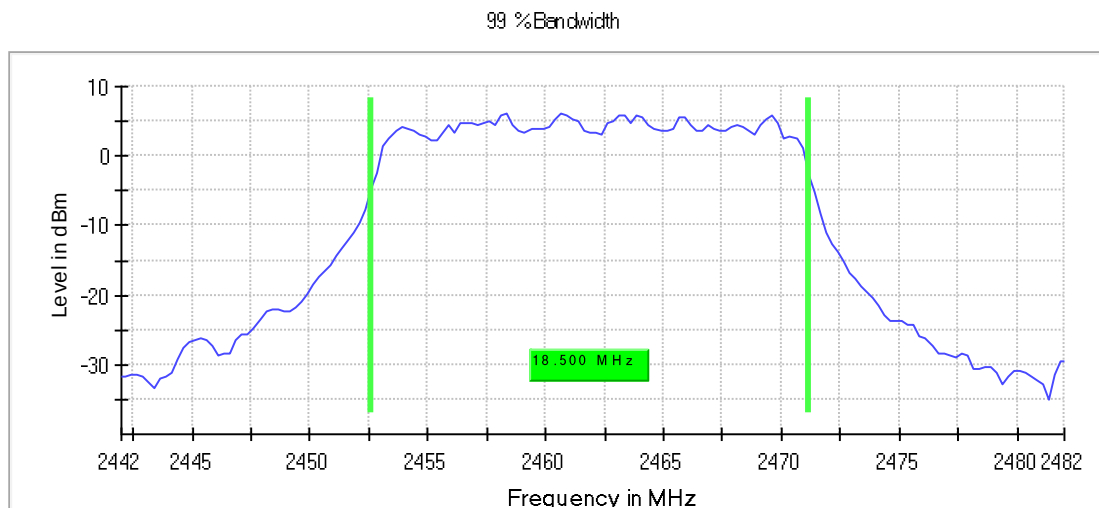


## Occupied Channel Bandwidth 99% (2462 MHz; 24.000 dBm; 20 MHz)

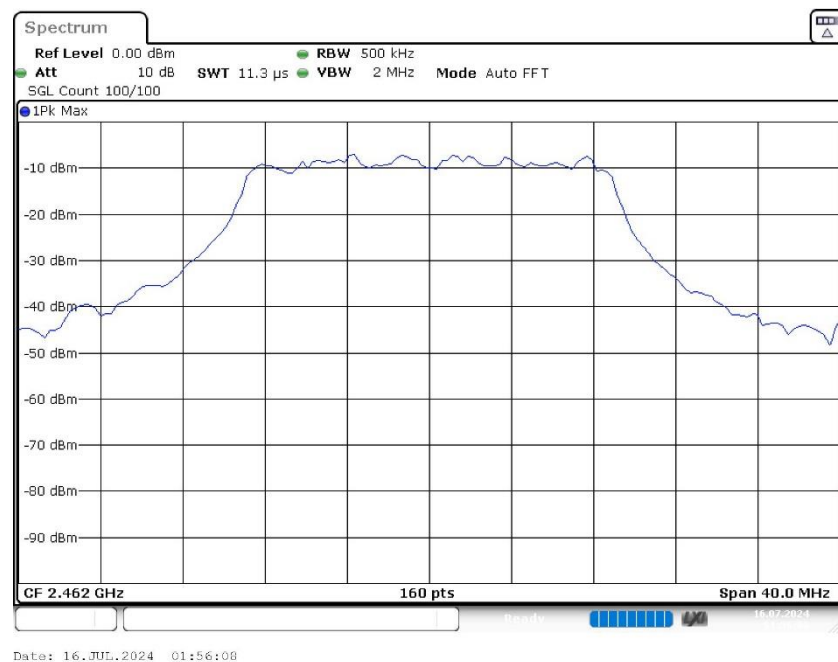
### 99 % Bandwidth

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---------------------|-----------------|-----------------|-----------------|----------------------|-----------------------|
| 2462.000000         | 18.500000       | ---             | ---             | 2452.625000          | 2471.125000           |

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



## 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             | 500.000 kHz | >= 500.000 kHz |
| VBW             | 2.000 MHz   | >= 1.500 MHz   |
| SweepPoints     | 160         | ~ 160          |
| SweepTime       | 11.344 µs   | AUTO           |
| Reference Level | 0.000 dBm   | AUTO           |
| Attenuation     | 10.000 dB   | 0.000 dB       |
| Detector        | MaxPeak     | MaxPeak        |
| SweepCount      | 100         | 100            |
| Filter          | 3 dB        | 3 dB           |
| Trace Mode      | Max Hold    | Max Hold       |
| SweepType       | FFT         | AUTO           |
| Preamp          | off         | off            |

## Tx Spurious Emission (2462 MHz; 24.000 dBm; 20 MHz)

### Result

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

### Final measurements

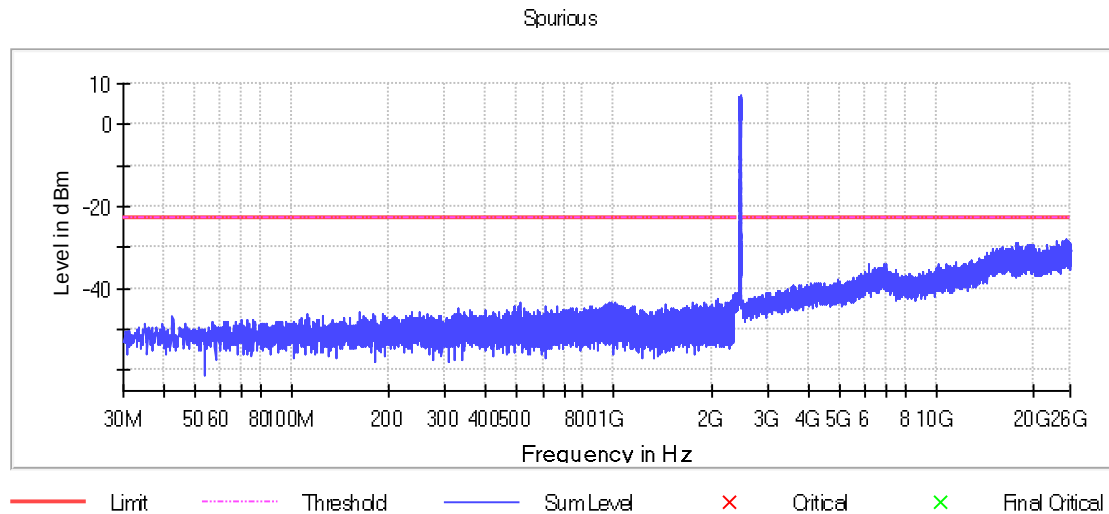
| Frequency (MHz) | Level Pre Measurement (dBm) | level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|-----------------------------|-------------|-------------|-------------|--------|
| ---             | ---                         | ---         | ---         | ---         | ---   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

### Pre Measurements

| Frequency (MHz) | Level (dBm) | Margin (dB) | Limit (dBm) |
|-----------------|-------------|-------------|-------------|
| 25117.056506    | -28.1       | 5.2         | -22.9       |
| 25175.845919    | -28.4       | 5.5         | -22.9       |
| 25541.075146    | -28.5       | 5.6         | -22.9       |
| 25105.298623    | -28.5       | 5.6         | -22.9       |
| 24698.916807    | -28.6       | 5.6         | -22.9       |
| 25770.353856    | -28.6       | 5.7         | -22.9       |
| 23762.695408    | -28.6       | 5.7         | -22.9       |
| 25783.581474    | -28.8       | 5.9         | -22.9       |
| 17786.751594    | -29.0       | 6.0         | -22.9       |
| 25635.873074    | -29.0       | 6.0         | -22.9       |
| 25061.941432    | -29.0       | 6.1         | -22.9       |
| 17766.175299    | -29.0       | 6.1         | -22.9       |
| 25465.383777    | -29.1       | 6.2         | -22.9       |
| 24794.449603    | -29.1       | 6.2         | -22.9       |
| 25345.600348    | -29.1       | 6.2         | -22.9       |

### Measurement Settings

| Start Frequency (MHz) | Stop Frequency (MHz) | Pre Measurement | Final Measurement |
|-----------------------|----------------------|-----------------|-------------------|
| 30.000000             | 2350.000000          | 1               | 1                 |
| 2350.000000           | 2483.500000          | 2               | 1                 |
| 2483.500000           | 26000.000000         | 1               | 1                 |

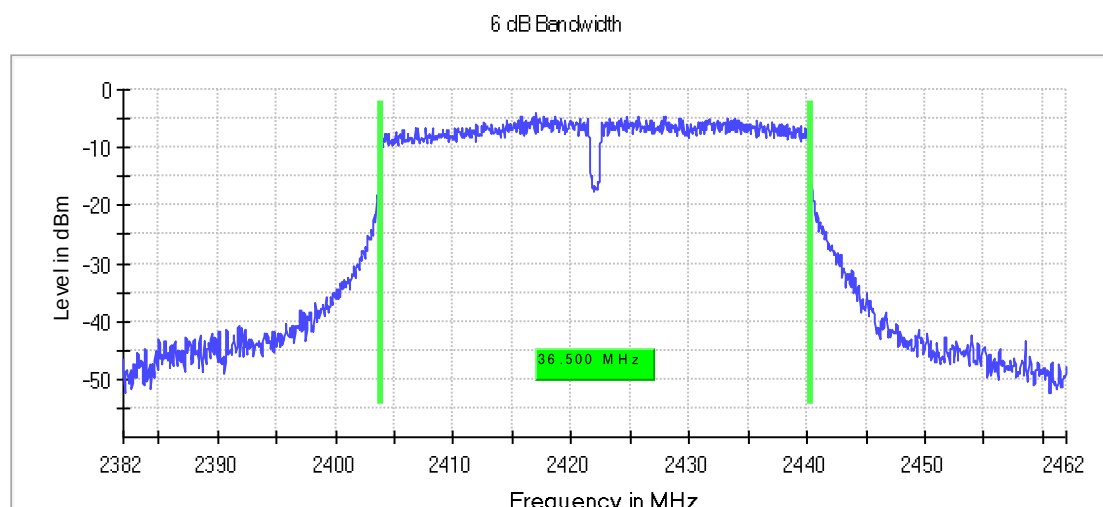


## Minimum Emission Bandwidth 6 dB (2422 MHz; 24.000 dBm; 40 MHz)

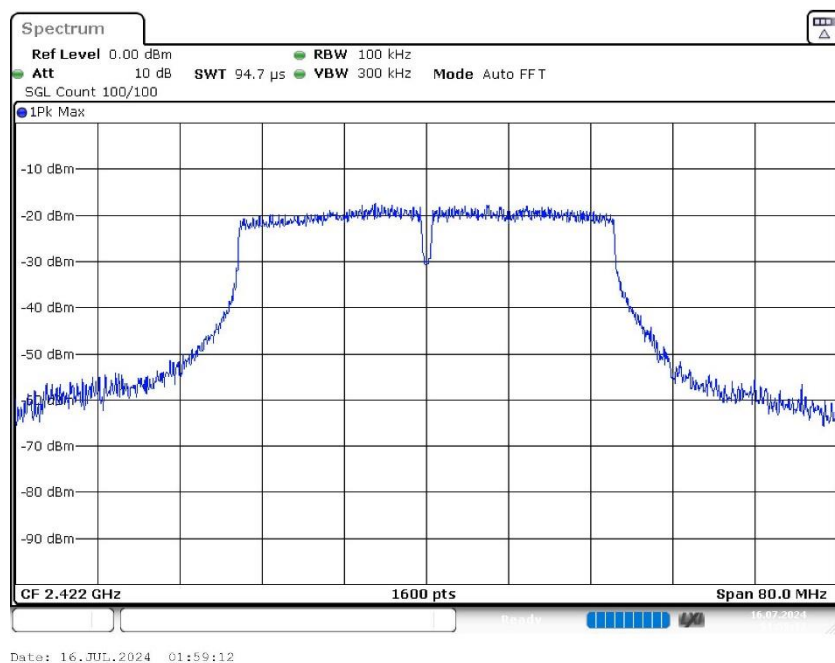
### 6 dB Bandwidth

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---------------------|-----------------|-----------------|-----------------|----------------------|-----------------------|
| 2422.000000         | 36.500000       | 0.500000        | ---             | 2403.775000          | 2440.275000           |

| DUT Frequency (MHz) | Max Level (dBm) | Result |
|---------------------|-----------------|--------|
| 2422.000000         | -4.1            | PASS   |



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        | 94.727 $\mu$ s   | AUTO          |
| Reference Level | 0.000 dBm        | AUTO          |
| Attenuation     | 10.000 dB        | 0.000 dB      |
| Detector        | MaxPeak          | MaxPeak       |
| SweepCount      | 100              | 100           |
| Filter          | 3 dB             | 3 dB          |
| Trace Mode      | Max Hold         | Max Hold      |
| Sweeptype       | FFT              | AUTO          |
| Preamp          | off              | off           |

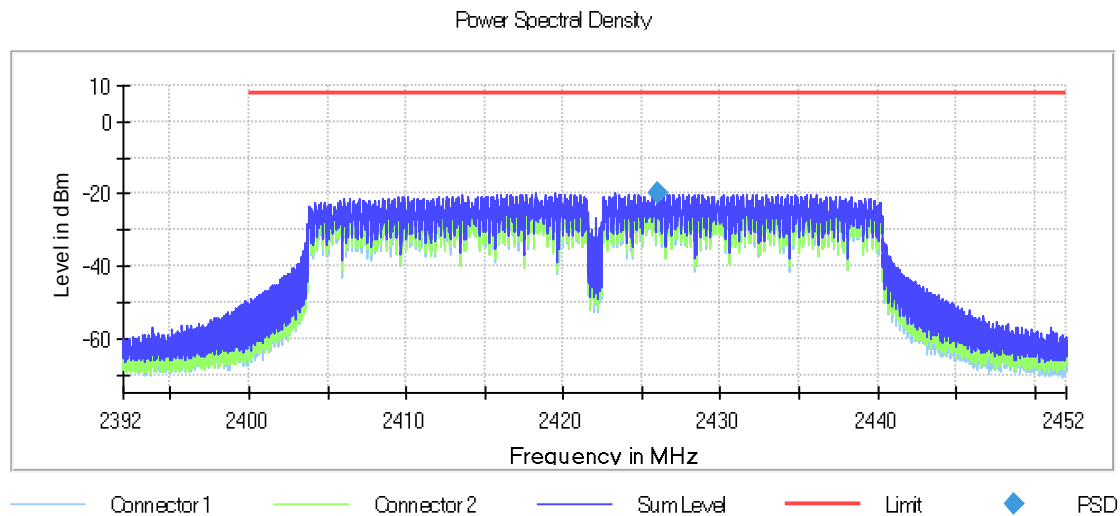
## Power Spectral Density (2422 MHz; 24.000 dBm; 40 MHz)

## Result

| DUT Frequency (MHz) | Frequency (MHz) | PSD (dBm) | Limit Max (dBm) | Result |
|---------------------|-----------------|-----------|-----------------|--------|
| 2422.000000         | 2426.051748     | -19.886   | 8.0             | PASS   |

## Ports

| Port | State |
|------|-------|
| 1    | used  |
| 2    | used  |

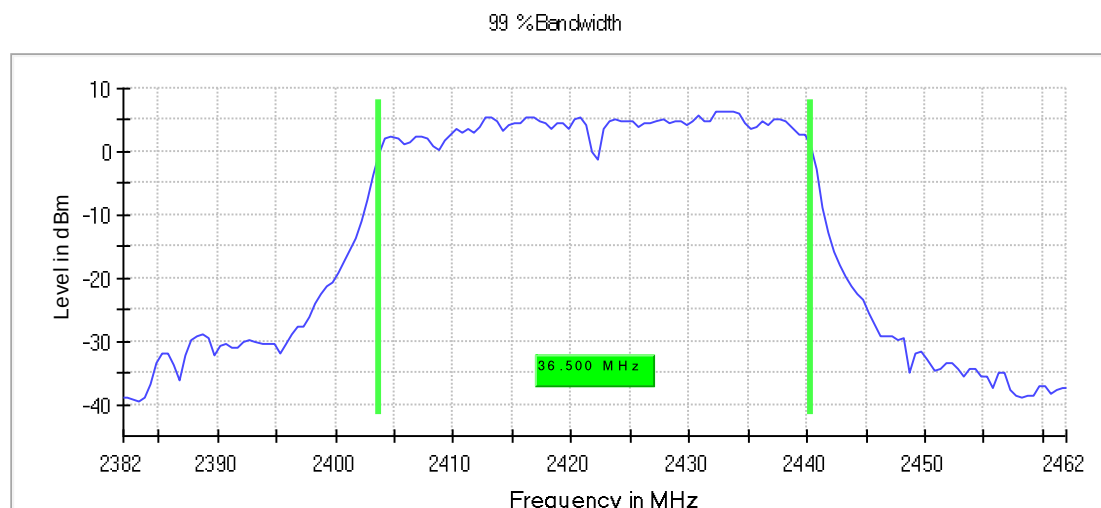


**Occupied Channel Bandwidth 99% (2422 MHz; 24.000 dBm; 40 MHz)**

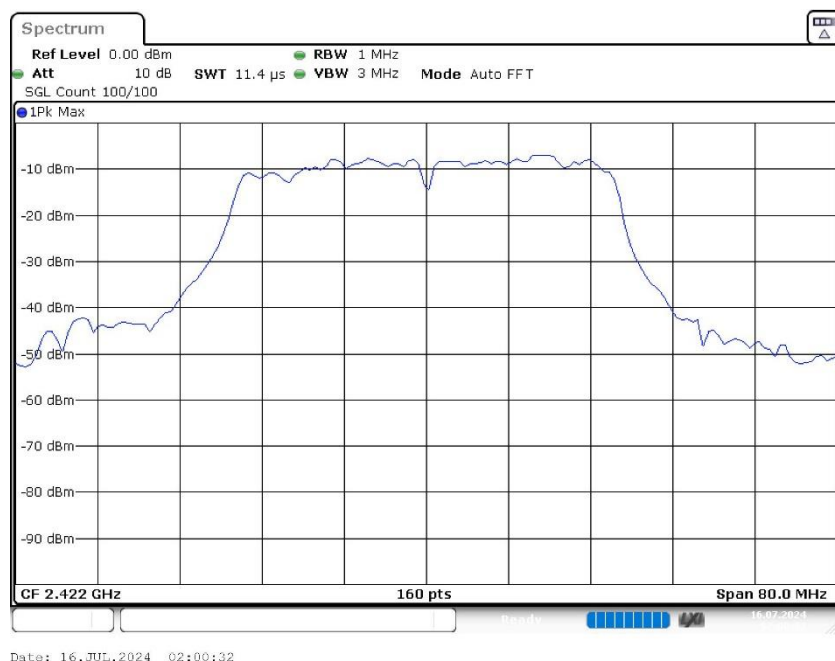
### 99 % Bandwidth

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---------------------|-----------------|-----------------|-----------------|----------------------|-----------------------|
| 2422.000000         | 36.500000       | ---             | ---             | 2403.750000          | 2440.250000           |

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



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             | 1.000 MHz        | $\geq 1.000$ MHz |
| VBW             | 3.000 MHz        | $\geq 3.000$ MHz |
| SweepPoints     | 160              | $\sim 160$       |
| SweepTime       | 11.438 $\mu$ s   | AUTO             |
| Reference Level | 0.000 dBm        | AUTO             |
| Attenuation     | 10.000 dB        | 0.000 dB         |
| Detector        | MaxPeak          | MaxPeak          |
| SweepCount      | 100              | 100              |
| Filter          | 3 dB             | 3 dB             |
| Trace Mode      | Max Hold         | Max Hold         |
| SweepType       | FFT              | AUTO             |
| Preamp          | off              | off              |

## Tx Spurious Emission (2422 MHz; 24.000 dBm; 40 MHz)

## Result

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

## Final measurements

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

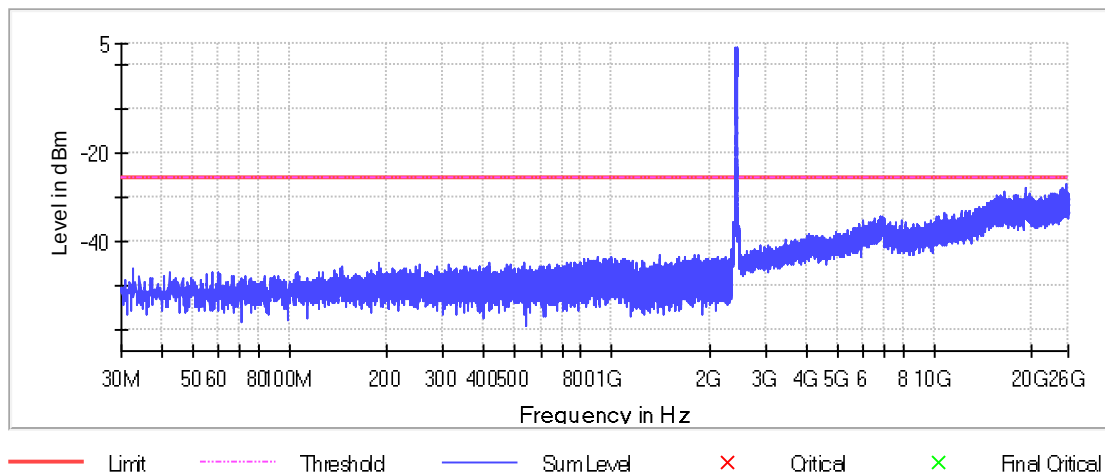
## Pre Measurements

| Frequency (MHz) | Level (dBm) | Margin (dB) | Limit (dBm) |
|-----------------|-------------|-------------|-------------|
| 25618.236250    | -27.0       | 1.2         | -25.8       |
| 25017.849372    | -27.7       | 1.9         | -25.8       |
| 19097.020632    | -27.8       | 2.0         | -25.8       |
| 25038.425666    | -28.2       | 2.4         | -25.8       |
| 24757.706220    | -28.4       | 2.6         | -25.8       |
| 25153.799889    | -28.4       | 2.6         | -25.8       |
| 25018.584240    | -28.6       | 2.8         | -25.8       |
| 25144.246609    | -28.7       | 2.9         | -25.8       |
| 16361.108333    | -28.7       | 2.9         | -25.8       |
| 25613.827044    | -28.8       | 3.0         | -25.8       |
| 25095.745344    | -28.8       | 3.0         | -25.8       |
| 25061.206564    | -28.9       | 3.1         | -25.8       |
| 24729.781249    | -28.9       | 3.1         | -25.8       |
| 24853.239016    | -28.9       | 3.1         | -25.8       |
| 25480.081130    | -28.9       | 3.1         | -25.8       |

## Measurement Settings

| Start Frequency (MHz) | Stop Frequency (MHz) | Pre Measurement | Final Measurement |
|-----------------------|----------------------|-----------------|-------------------|
| 30.000000             | 2350.000000          | 1               | 1                 |
| 2350.000000           | 2483.500000          | 2               | 1                 |
| 2483.500000           | 26000.000000         | 1               | 1                 |

Spurious



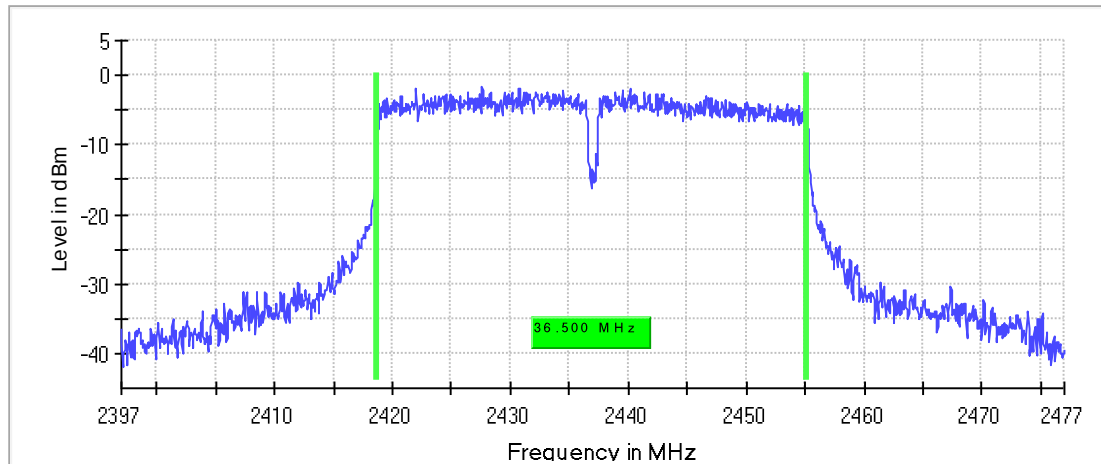
## Minimum Emission Bandwidth 6 dB (2437 MHz; 24.000 dBm; 40 MHz)

### 6 dB Bandwidth

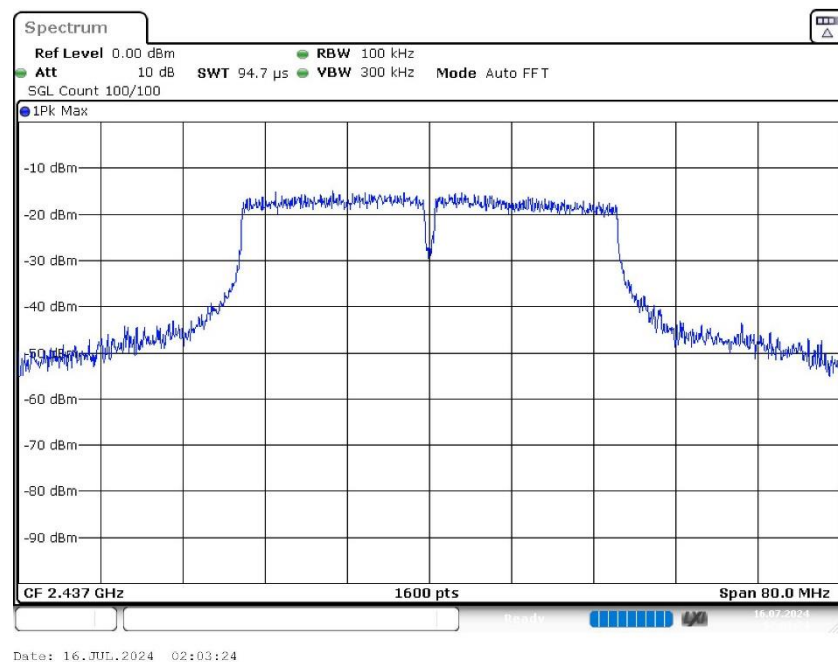
| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---------------------|-----------------|-----------------|-----------------|----------------------|-----------------------|
| 2437.000000         | 36.500000       | 0.500000        | ---             | 2418.725000          | 2455.225000           |

| DUT Frequency (MHz) | Max Level (dBm) | Result |
|---------------------|-----------------|--------|
| 2437.000000         | -1.7            | PASS   |

6 dB Bandwidth



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        |
| SweepTime       | 94.727 $\mu$ s | AUTO          |
| Reference Level | 0.000 dBm      | AUTO          |
| Attenuation     | 10.000 dB      | 0.000 dB      |
| Detector        | MaxPeak        | MaxPeak       |
| SweepCount      | 100            | 100           |
| Filter          | 3 dB           | 3 dB          |
| Trace Mode      | Max Hold       | Max Hold      |
| Sweeptype       | FFT            | AUTO          |
| Preamp          | off            | off           |

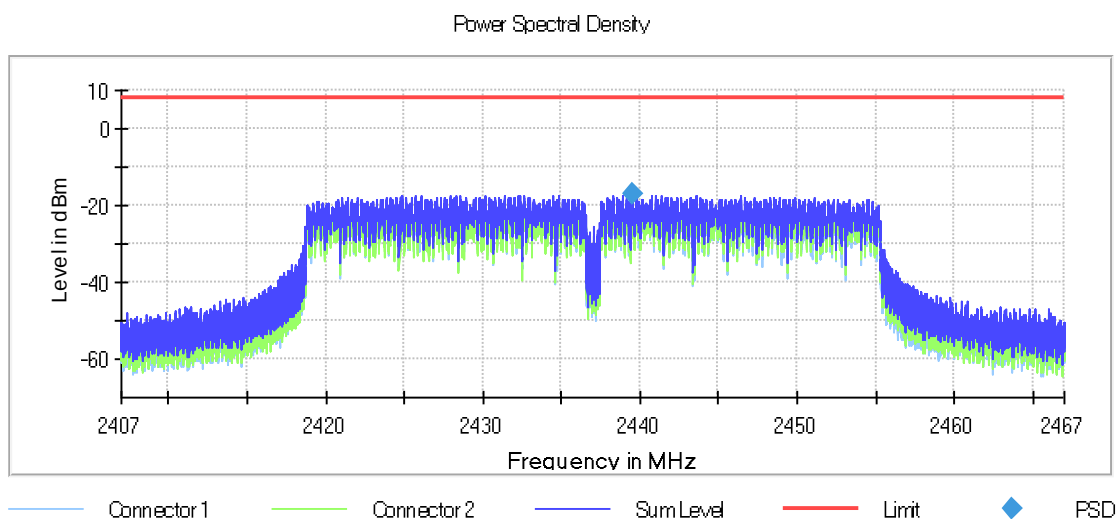
## Power Spectral Density (2437 MHz; 24.000 dBm; 40 MHz)

### Result

| DUT Frequency (MHz) | Frequency (MHz) | PSD (dBm) | Limit Max (dBm) | Result |
|---------------------|-----------------|-----------|-----------------|--------|
| 2437.000000         | 2439.529296     | -17.191   | 8.0             | PASS   |

### Ports

| Port | State |
|------|-------|
| 1    | used  |
| 2    | used  |

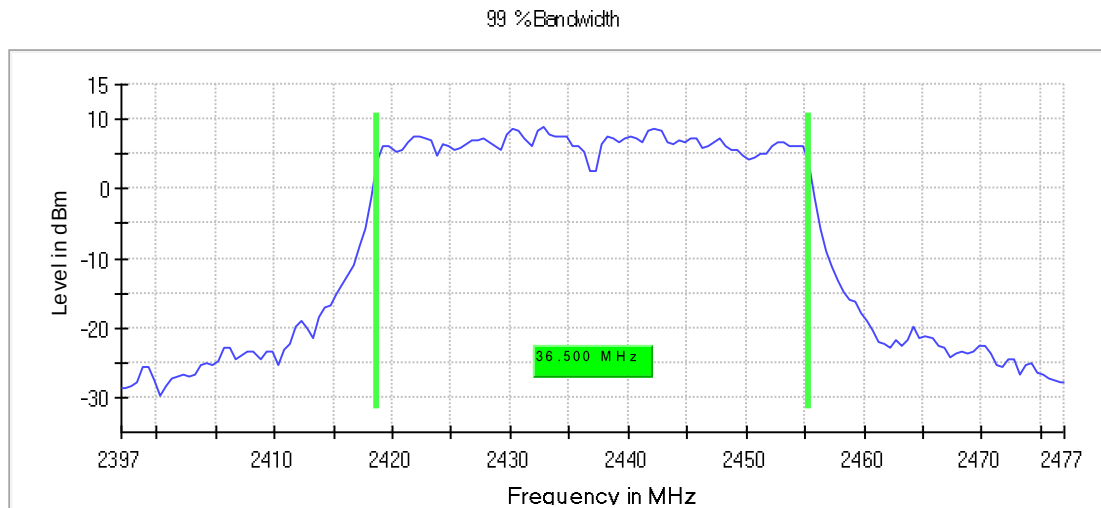


## Occupied Channel Bandwidth 99% (2437 MHz; 24.000 dBm; 40 MHz)

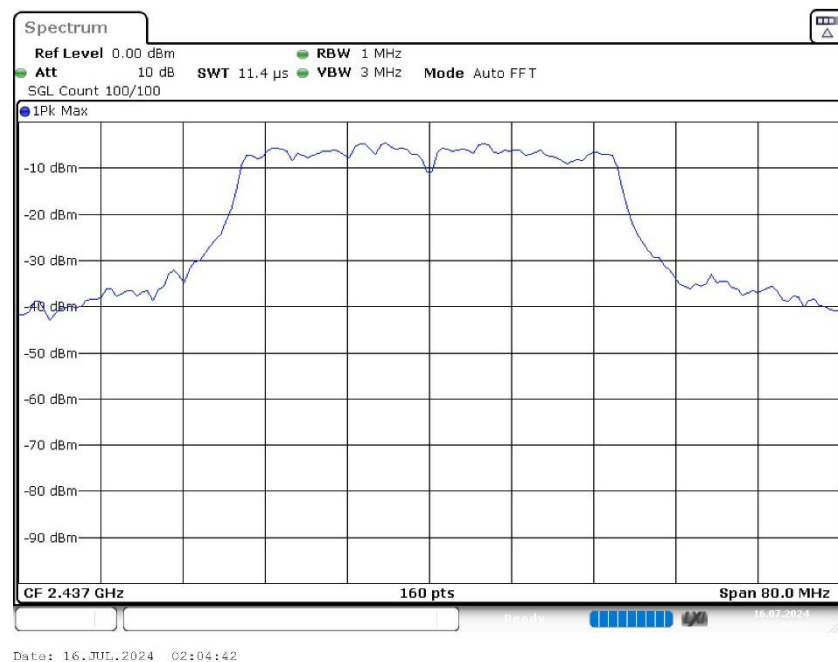
### 99 % Bandwidth

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---------------------|-----------------|-----------------|-----------------|----------------------|-----------------------|
| 2437.000000         | 36.500000       | ---             | ---             | 2418.750000          | 2455.250000           |

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



## 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             | 1.000 MHz      | >= 1.000 MHz |
| VBW             | 3.000 MHz      | >= 3.000 MHz |
| SweepPoints     | 160            | ~ 160        |
| SweepTime       | 11.438 $\mu$ s | AUTO         |
| Reference Level | 0.000 dBm      | AUTO         |
| Attenuation     | 10.000 dB      | 0.000 dB     |
| Detector        | MaxPeak        | MaxPeak      |
| SweepCount      | 100            | 100          |
| Filter          | 3 dB           | 3 dB         |
| Trace Mode      | Max Hold       | Max Hold     |
| SweepType       | FFT            | AUTO         |
| Preamp          | off            | off          |

## Tx Spurious Emission (2437 MHz; 24.000 dBm; 40 MHz)

### Result

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

### Final measurements

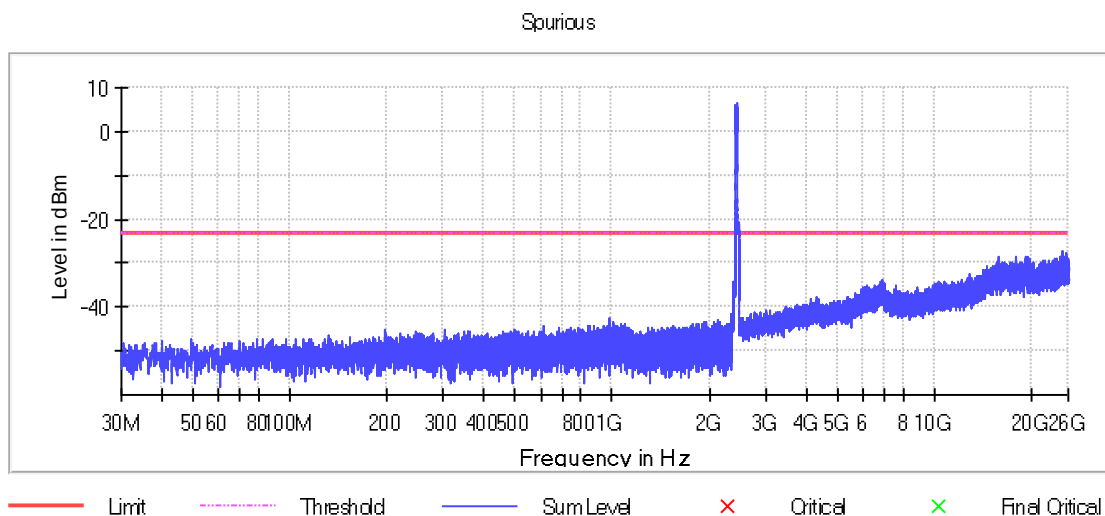
| Frequency (MHz) | Level Pre Measurement (dBm) | level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|-----------------------------|-------------|-------------|-------------|--------|
| ---             | ---                         | ---         | ---         | ---         | ---   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

### Pre Measurements

| Frequency (MHz) | Level (dBm) | Margin (dB) | Limit (dBm) |
|-----------------|-------------|-------------|-------------|
| 25061.941432    | -27.3       | 3.9         | -23.4       |
| 25584.432338    | -27.7       | 4.3         | -23.4       |
| 24971.552709    | -28.2       | 4.8         | -23.4       |
| 25674.821060    | -28.3       | 4.9         | -23.4       |
| 24708.470087    | -28.3       | 4.9         | -23.4       |
| 19454.166315    | -28.3       | 5.0         | -23.4       |
| 25136.163065    | -28.4       | 5.0         | -23.4       |
| 17773.523976    | -28.4       | 5.0         | -23.4       |
| 17808.797624    | -28.4       | 5.1         | -23.4       |
| 19095.550897    | -28.6       | 5.2         | -23.4       |
| 24767.259500    | -28.6       | 5.3         | -23.4       |
| 25075.903917    | -28.6       | 5.3         | -23.4       |
| 15827.594411    | -28.7       | 5.3         | -23.4       |
| 25501.392292    | -28.8       | 5.4         | -23.4       |
| 25014.175034    | -28.8       | 5.5         | -23.4       |

### Measurement Settings

| Start Frequency (MHz) | Stop Frequency (MHz) | Pre Measurement | Final Measurement |
|-----------------------|----------------------|-----------------|-------------------|
| 30.000000             | 2350.000000          | 1               | 1                 |
| 2350.000000           | 2483.500000          | 2               | 1                 |
| 2483.500000           | 26000.000000         | 1               | 1                 |

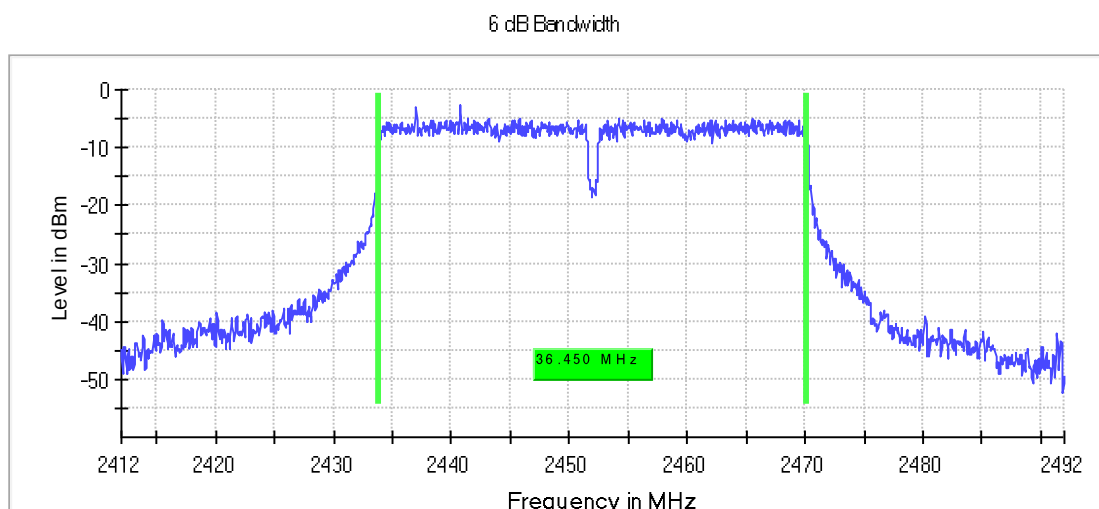


## Minimum Emission Bandwidth 6 dB (2452 MHz; 24.000 dBm; 40 MHz)

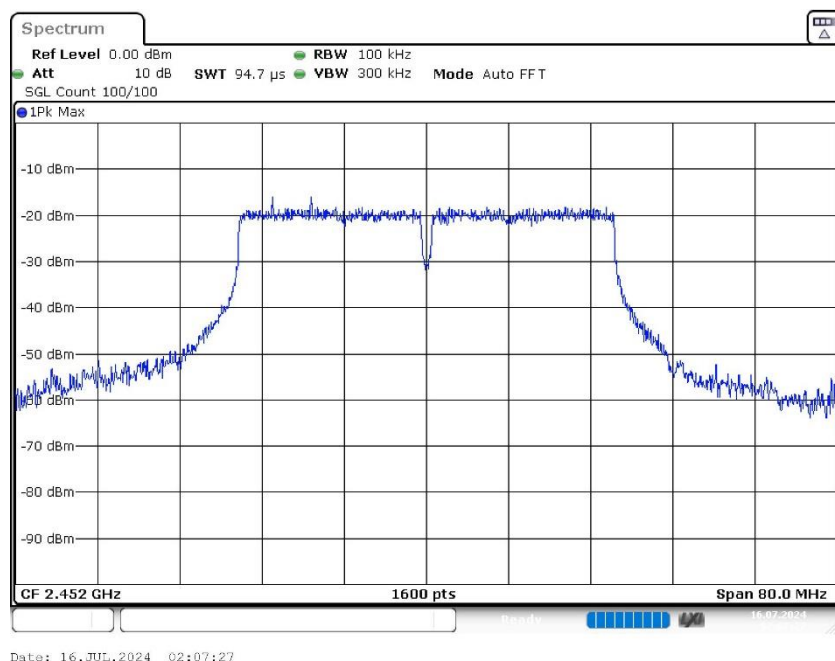
### 6 dB Bandwidth

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---------------------|-----------------|-----------------|-----------------|----------------------|-----------------------|
| 2452.000000         | 36.450000       | 0.500000        | ---             | 2433.775000          | 2470.225000           |

| DUT Frequency (MHz) | Max Level (dBm) | Result |
|---------------------|-----------------|--------|
| 2452.000000         | -2.7            | PASS   |



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        |
| SweepTime       | 94.727 $\mu$ s   | AUTO          |
| Reference Level | 0.000 dBm        | AUTO          |
| Attenuation     | 10.000 dB        | 0.000 dB      |
| Detector        | MaxPeak          | MaxPeak       |
| SweepCount      | 100              | 100           |
| Filter          | 3 dB             | 3 dB          |
| Trace Mode      | Max Hold         | Max Hold      |
| SweepType       | FFT              | AUTO          |
| Preamp          | off              | off           |

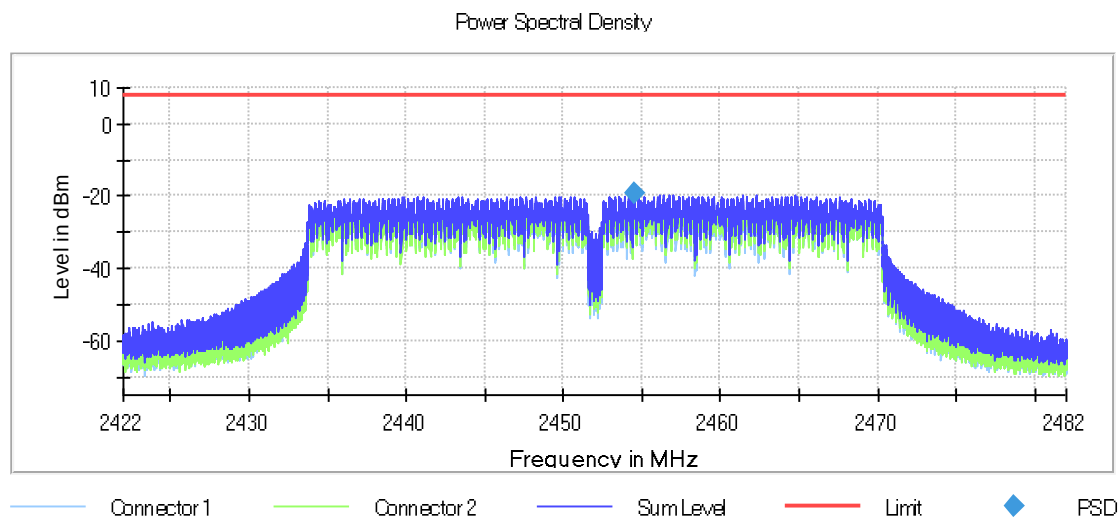
## Power Spectral Density (2452 MHz; 24.000 dBm; 40 MHz)

## Result

| DUT Frequency (MHz) | Frequency (MHz) | PSD (dBm) | Limit Max (dBm) | Result |
|---------------------|-----------------|-----------|-----------------|--------|
| 2452.000000         | 2454.529296     | -19.354   | 8.0             | PASS   |

## Ports

| Port | State |
|------|-------|
| 1    | used  |
| 2    | used  |

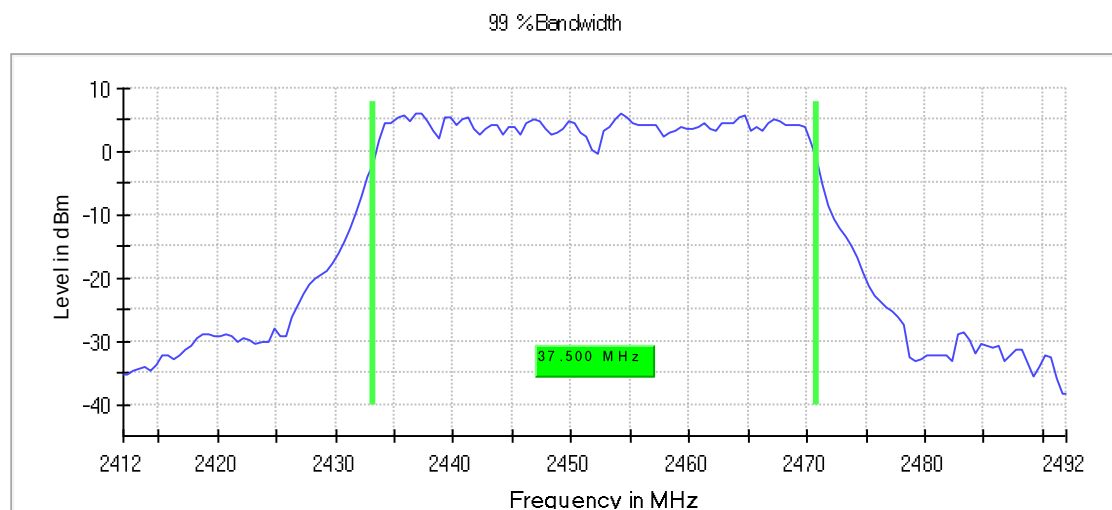


**Occupied Channel Bandwidth 99% (2452 MHz; 24.000 dBm; 40 MHz)**

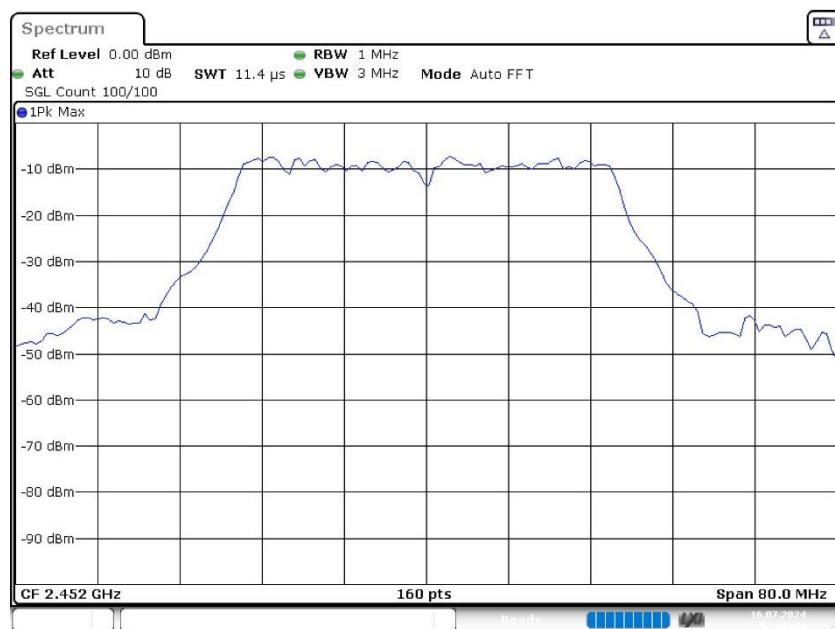
### 99 % Bandwidth

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---------------------|-----------------|-----------------|-----------------|----------------------|-----------------------|
| 2452.000000         | 37.500000       | ---             | ---             | 2433.250000          | 2470.750000           |

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



Bandwidth



Date: 16.JUL.2024 02:08:44

## 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             | 1.000 MHz        | >= 1.000 MHz |
| VBW             | 3.000 MHz        | >= 3.000 MHz |
| SweepPoints     | 160              | ~ 160        |
| SweepTime       | 11.438 $\mu$ s   | AUTO         |
| Reference Level | 0.000 dBm        | AUTO         |
| Attenuation     | 10.000 dB        | 0.000 dB     |
| Detector        | MaxPeak          | MaxPeak      |
| SweepCount      | 100              | 100          |
| Filter          | 3 dB             | 3 dB         |
| Trace Mode      | Max Hold         | Max Hold     |
| SweepType       | FFT              | AUTO         |
| Preamp          | off              | off          |

## Tx Spurious Emission (2452 MHz; 24.000 dBm; 40 MHz)

## Result

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

## Final measurements

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

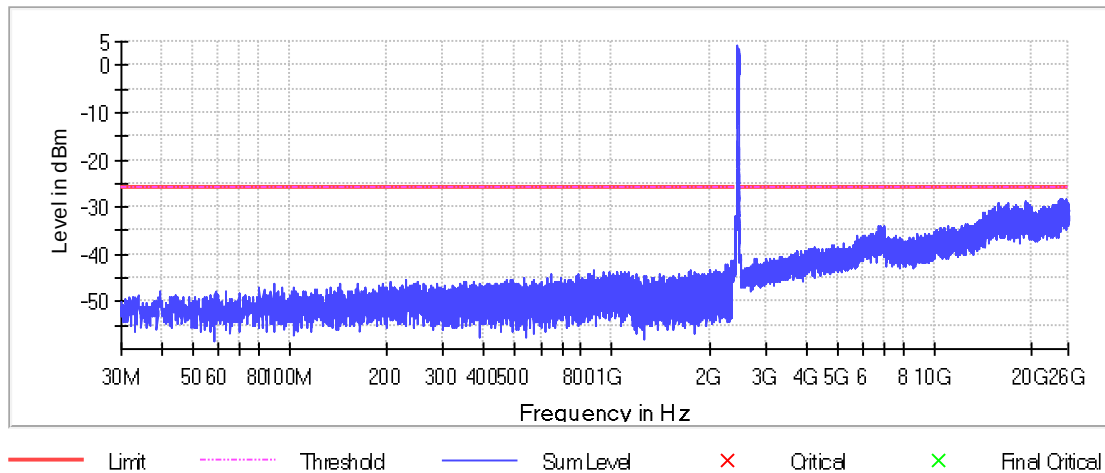
## Pre Measurements

| Frequency (MHz) | Level (dBm) | Margin (dB) | Limit (dBm) |
|-----------------|-------------|-------------|-------------|
| 24740.804264    | -28.1       | 2.2         | -25.9       |
| 24724.637175    | -28.2       | 2.2         | -25.9       |
| 24773.873309    | -28.2       | 2.2         | -25.9       |
| 25563.121176    | -28.3       | 2.4         | -25.9       |
| 24737.129926    | -28.4       | 2.4         | -25.9       |
| 25579.288264    | -28.7       | 2.7         | -25.9       |
| 25162.618301    | -28.7       | 2.7         | -25.9       |
| 24413.053287    | -28.7       | 2.8         | -25.9       |
| 25075.903917    | -28.8       | 2.8         | -25.9       |
| 24703.326013    | -28.8       | 2.8         | -25.9       |
| 19213.864590    | -28.8       | 2.8         | -25.9       |
| 25129.549256    | -28.9       | 2.9         | -25.9       |
| 24738.599661    | -28.9       | 2.9         | -25.9       |
| 24725.372043    | -28.9       | 3.0         | -25.9       |
| 25166.292639    | -28.9       | 3.0         | -25.9       |

## Measurement Settings

| Start Frequency (MHz) | Stop Frequency (MHz) | Pre Measurement | Final Measurement |
|-----------------------|----------------------|-----------------|-------------------|
| 30.000000             | 2350.000000          | 1               | 1                 |
| 2350.000000           | 2483.500000          | 2               | 1                 |
| 2483.500000           | 26000.000000         | 1               | 1                 |

Spurious



**-- End of Report --**