# Annex E

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**Test report annex authorized:**

Meheza Walla
Lab Manager
Radio Communications & EMC

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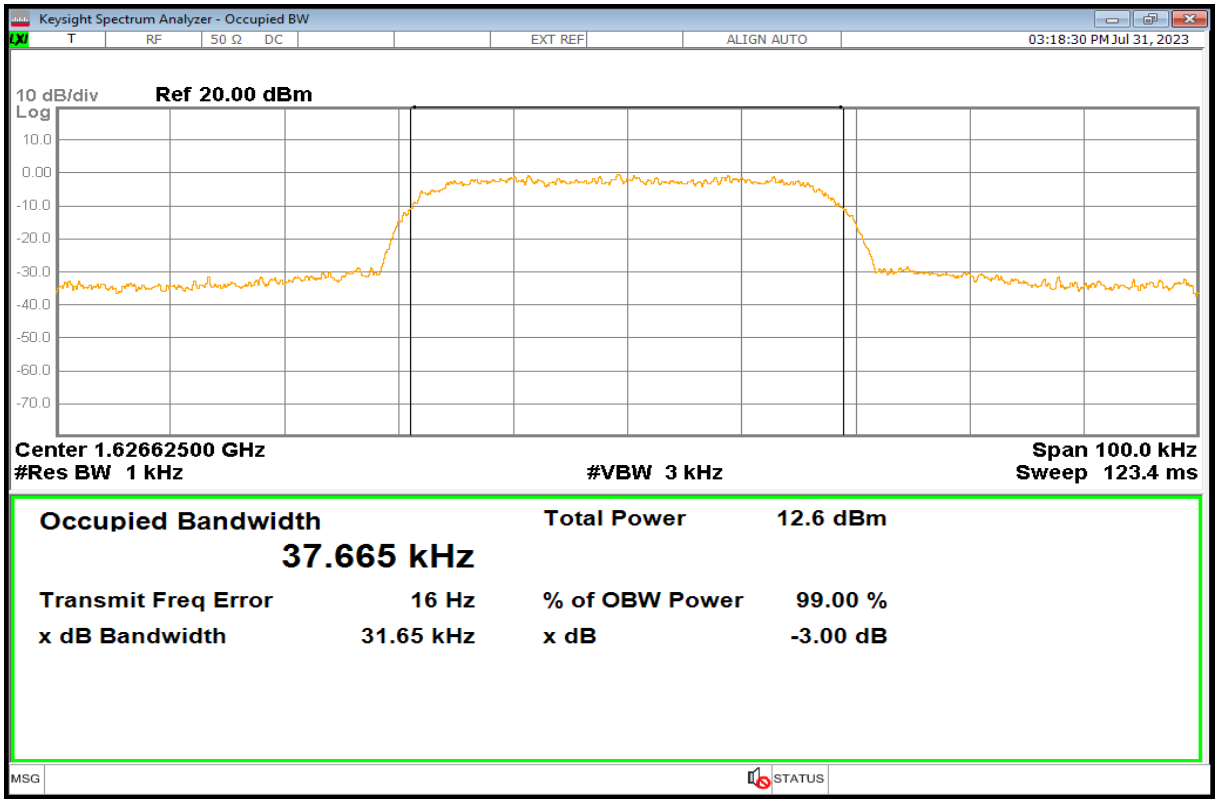
## 2. Measurement results for CLASS 15, FCC Part 87

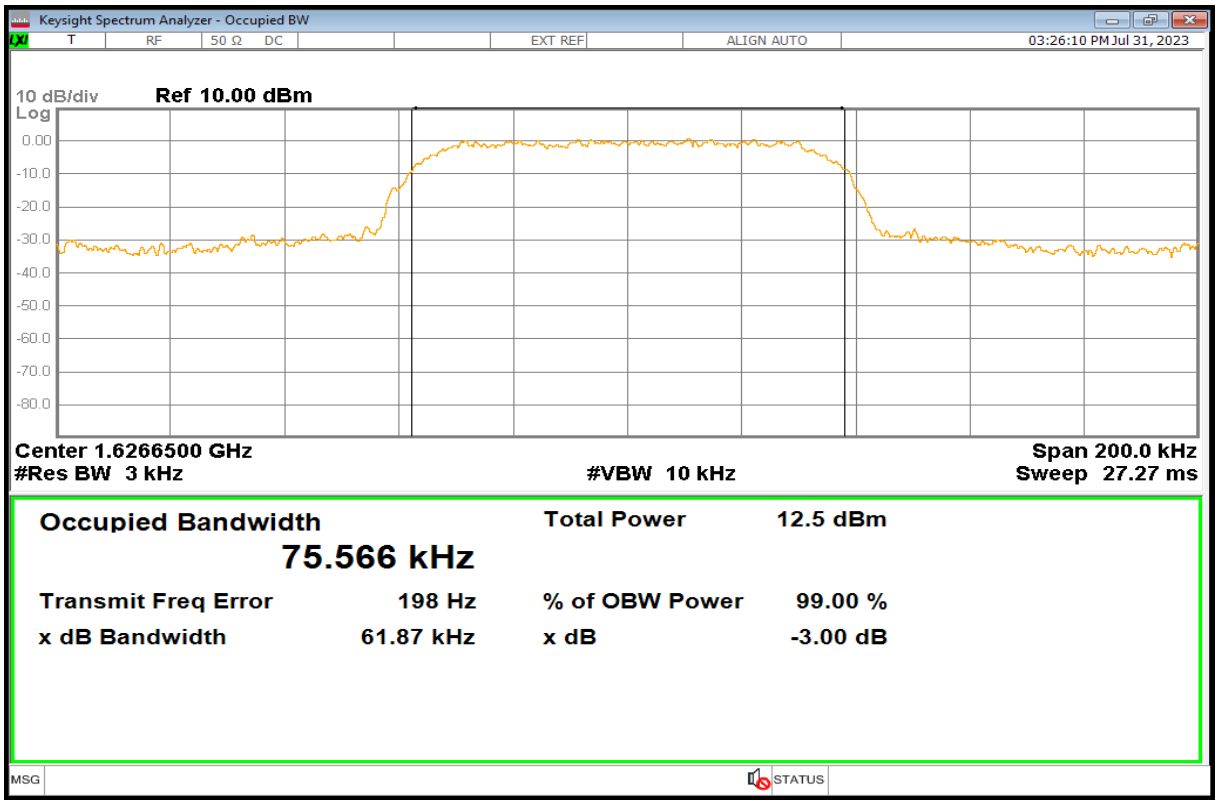
This chapter consists of 102 pages including this page.

Plot No. 1



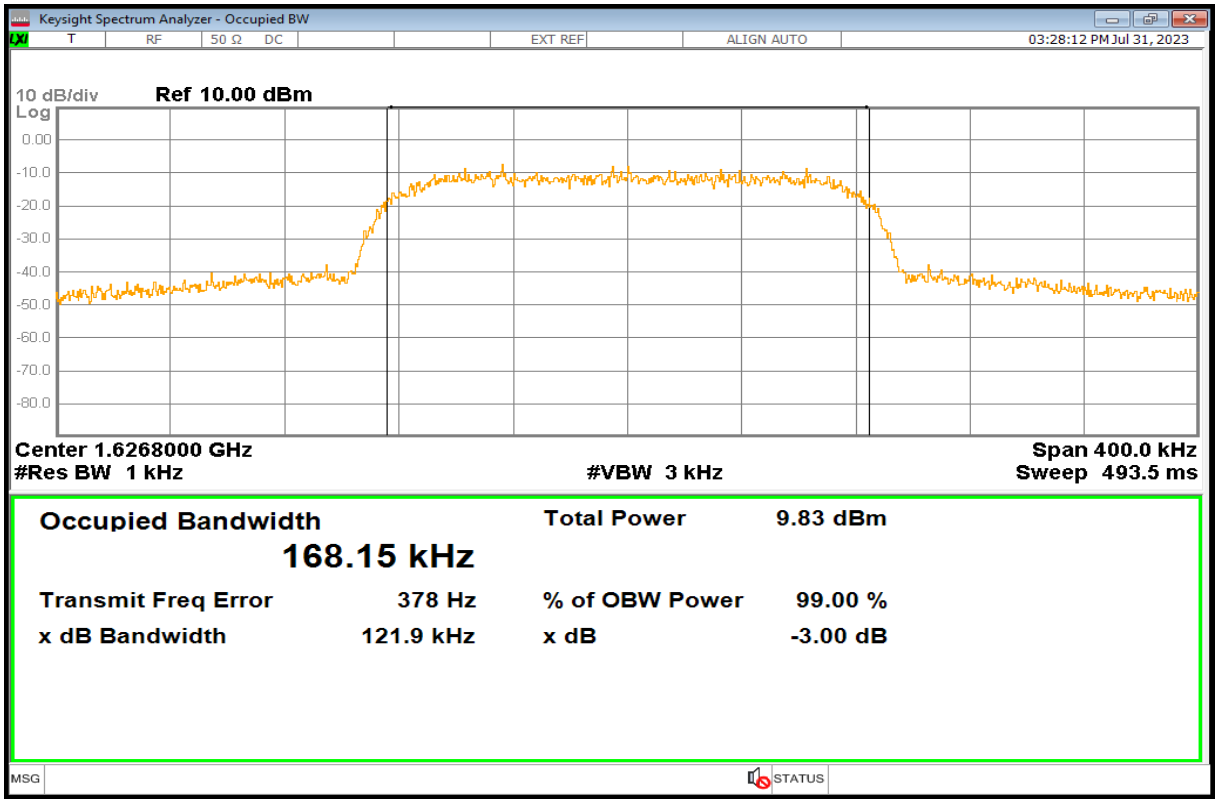

B3dB, Sub-Band 1, Low Channel, R5T1XD

Plot No. 2



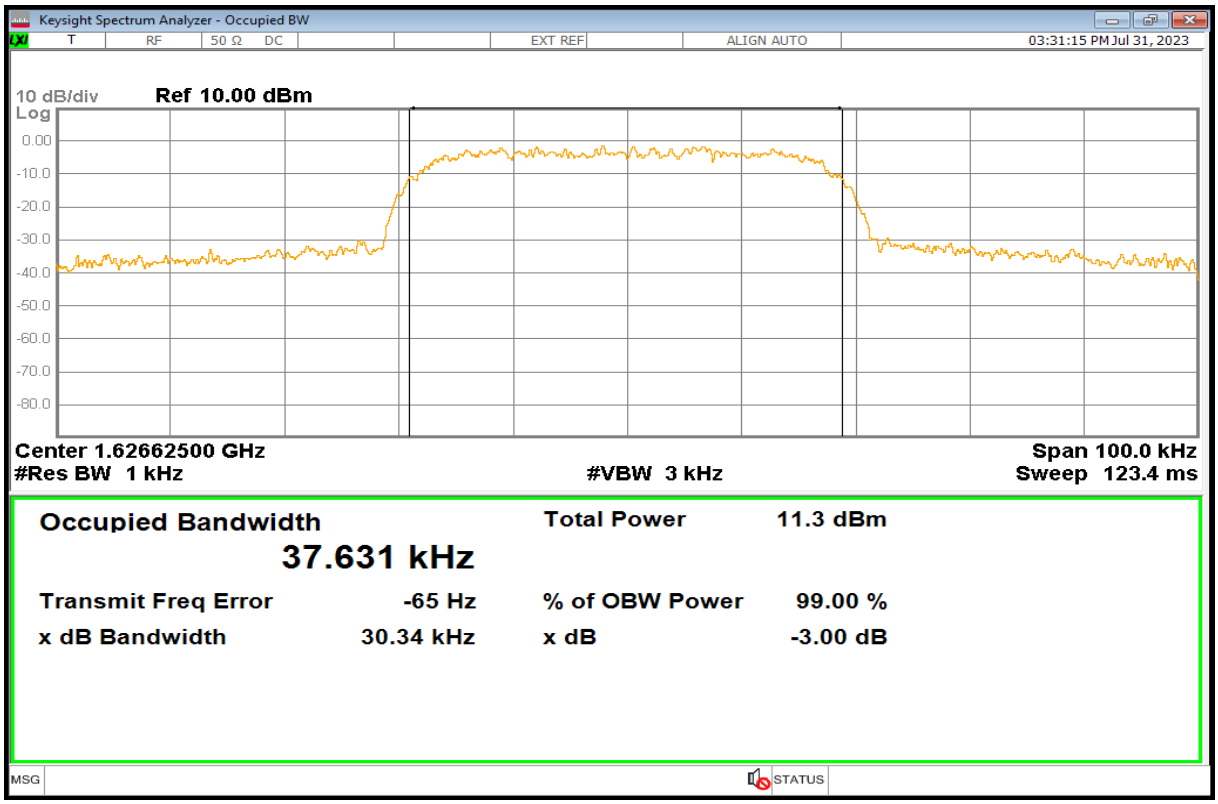

B3dB, Sub-Band 1, Low Channel, R5T2XD

Plot No. 3



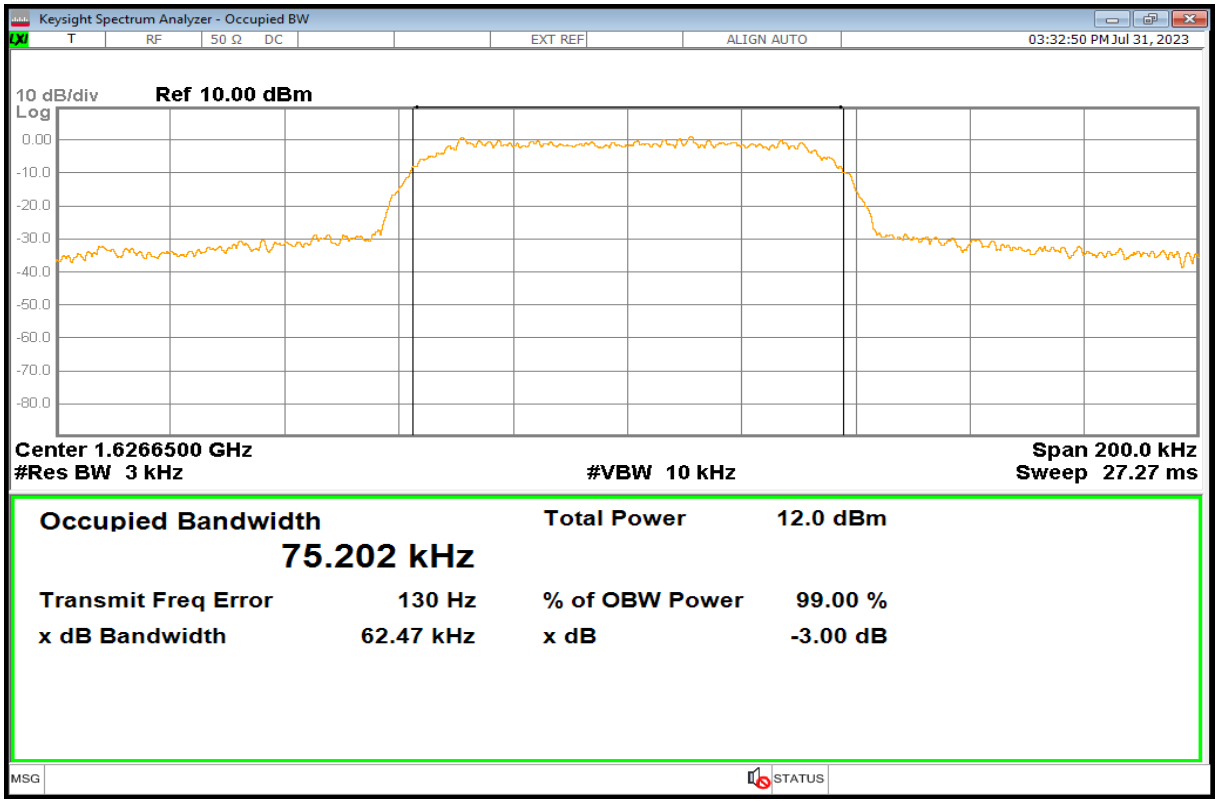

B3dB, Sub-Band 1, Low Channel, R5T4.5XD

Plot No. 4



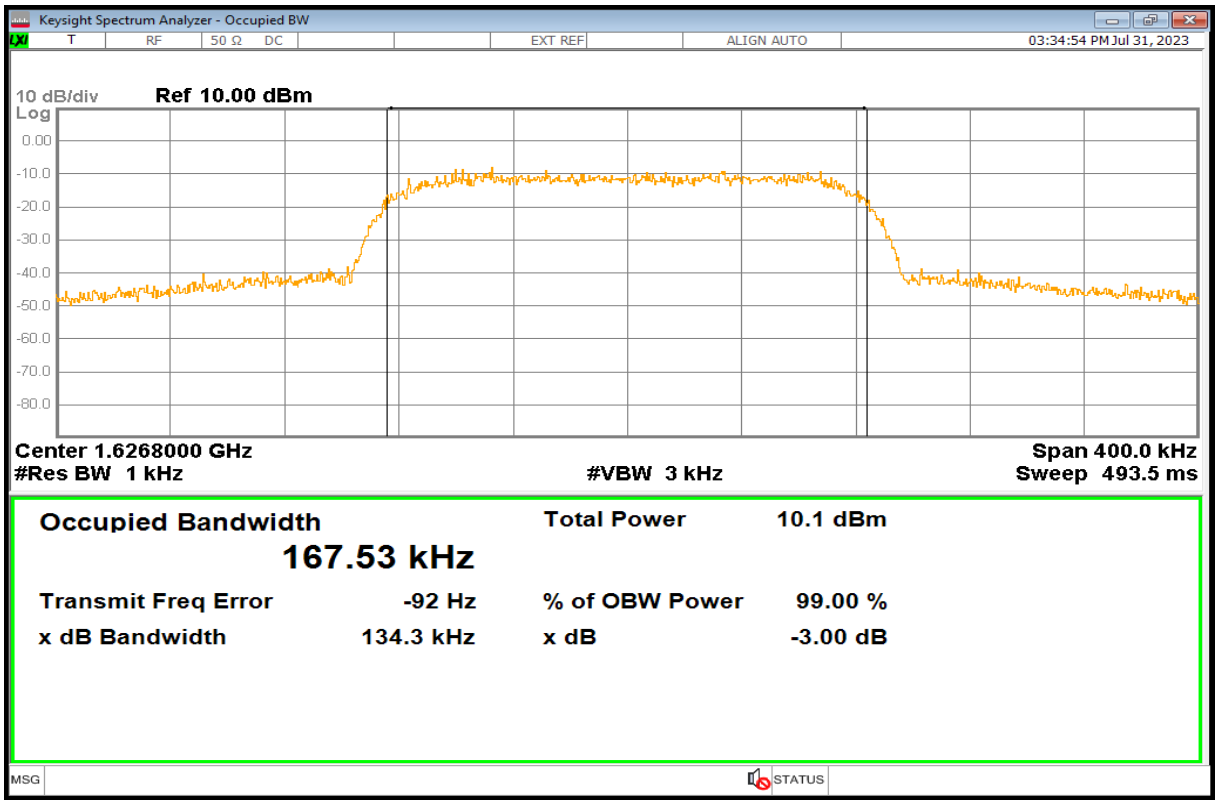

B3dB, Sub-Band 1, Low Channel, R20T1XD

Plot No. 5



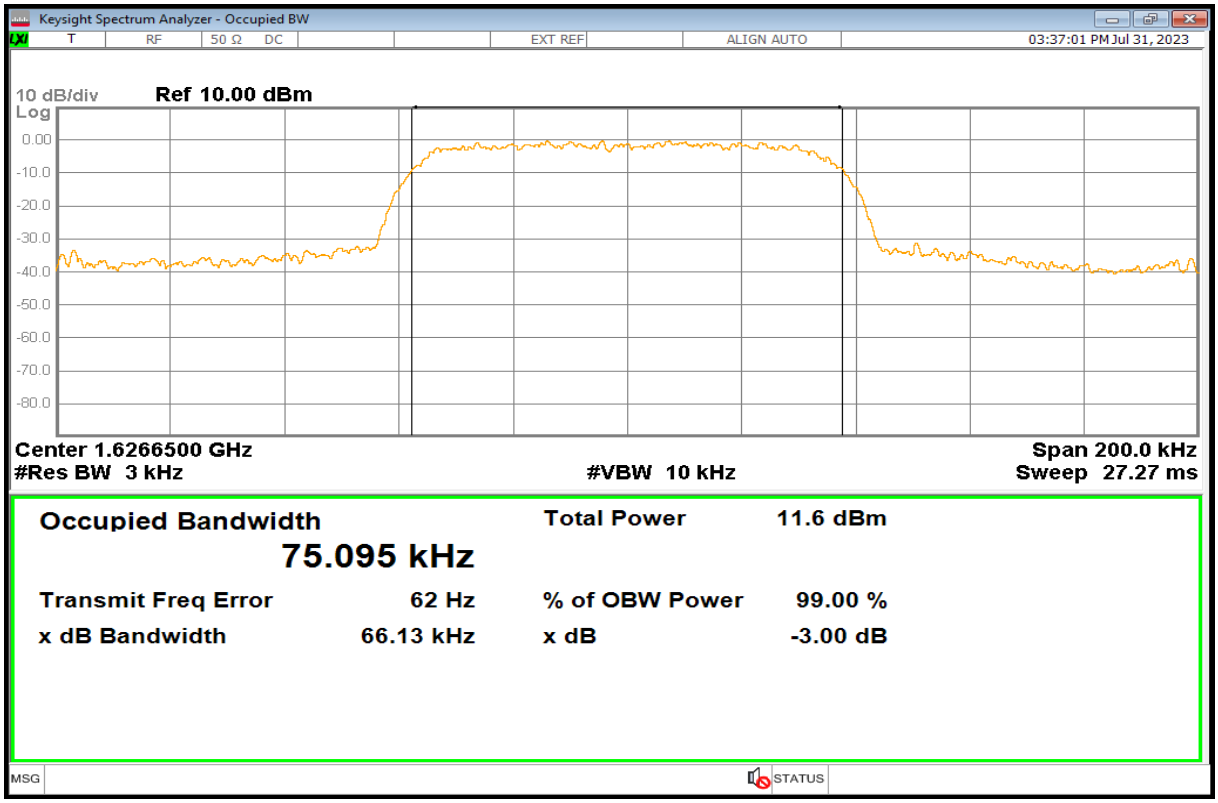

B3dB, Sub-Band 1, Low Channel, R20T2XD

Plot No. 6



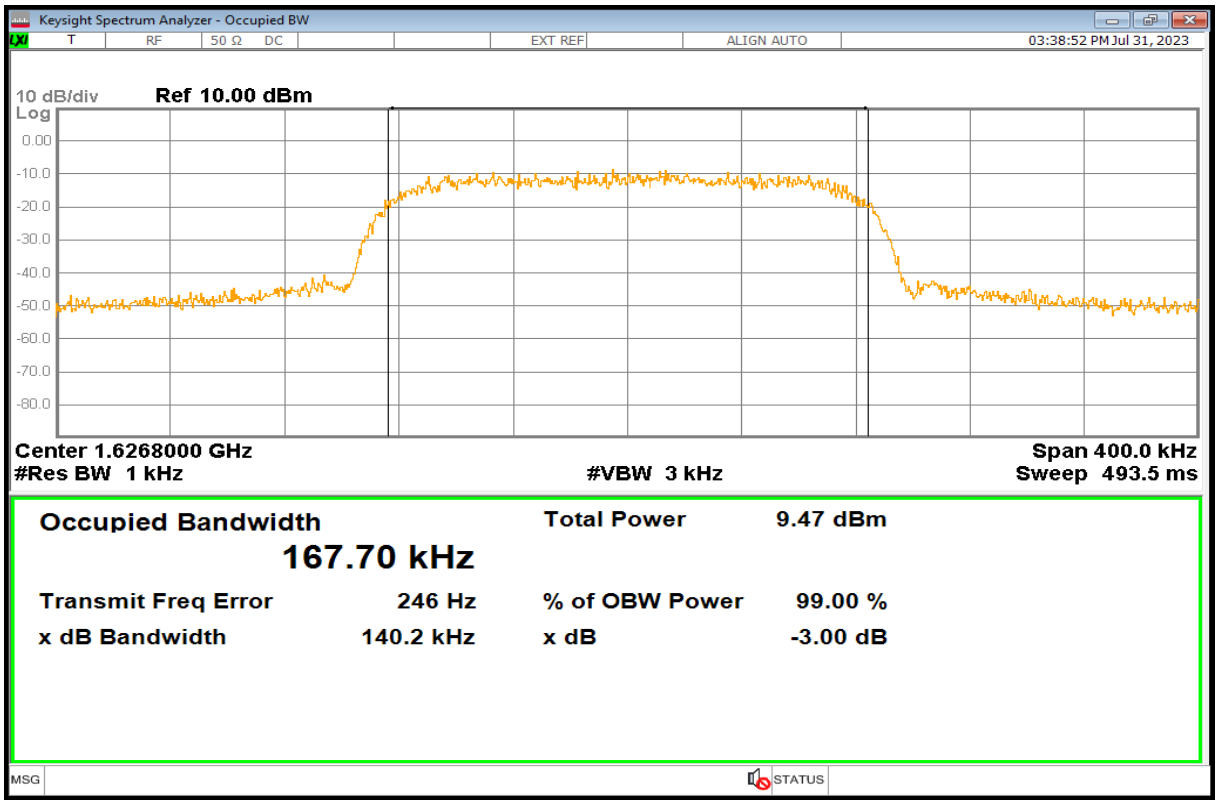

B3dB, Sub-Band 1, Low Channel, R20T4.5XD

Plot No. 7



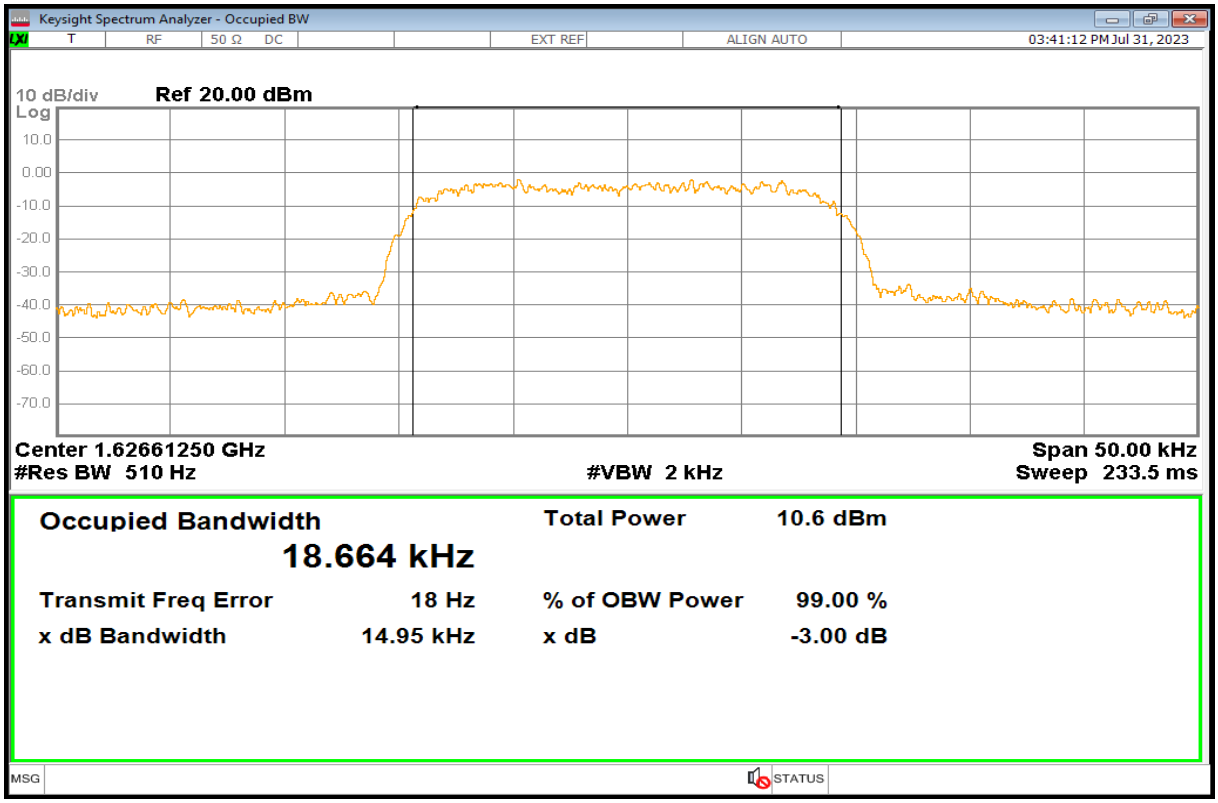

B3dB, Sub-Band 1, Low Channel, R5T2QD

Plot No. 8



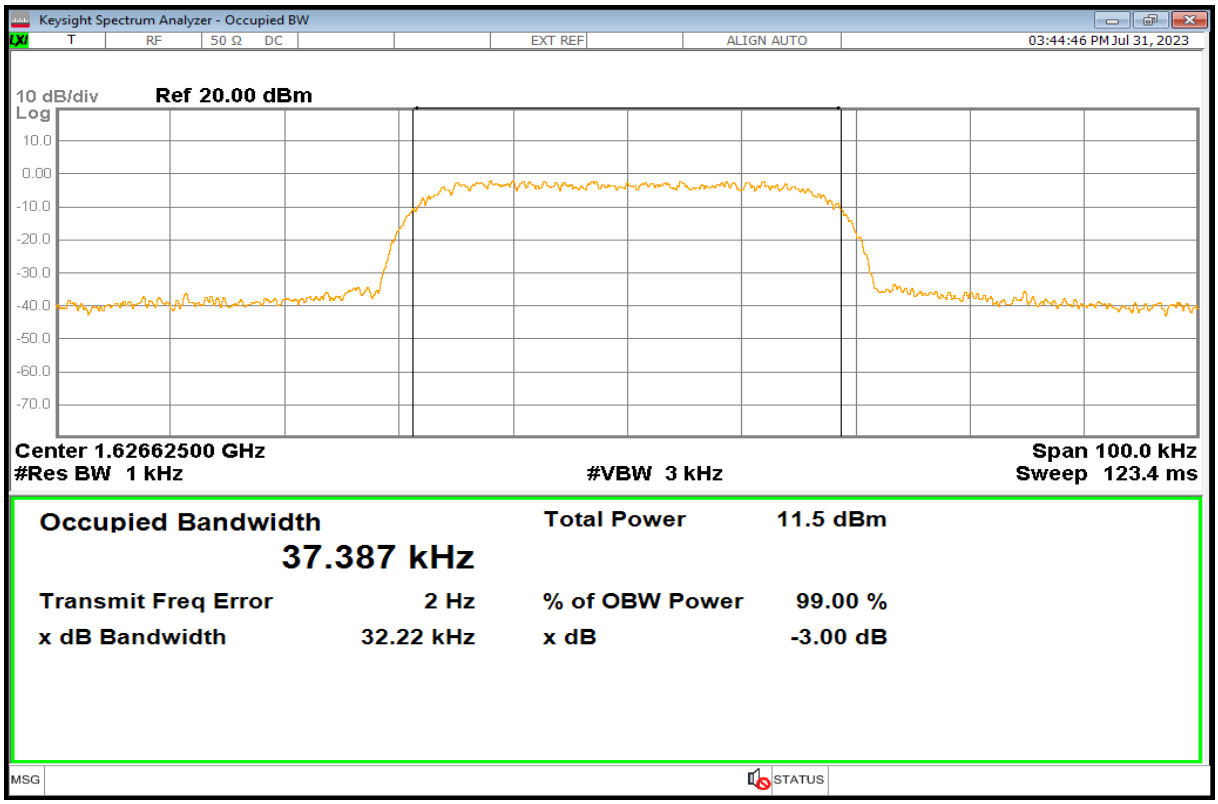

B3dB, Sub-Band 1, Low Channel, R5T4.5QD

Plot No. 9



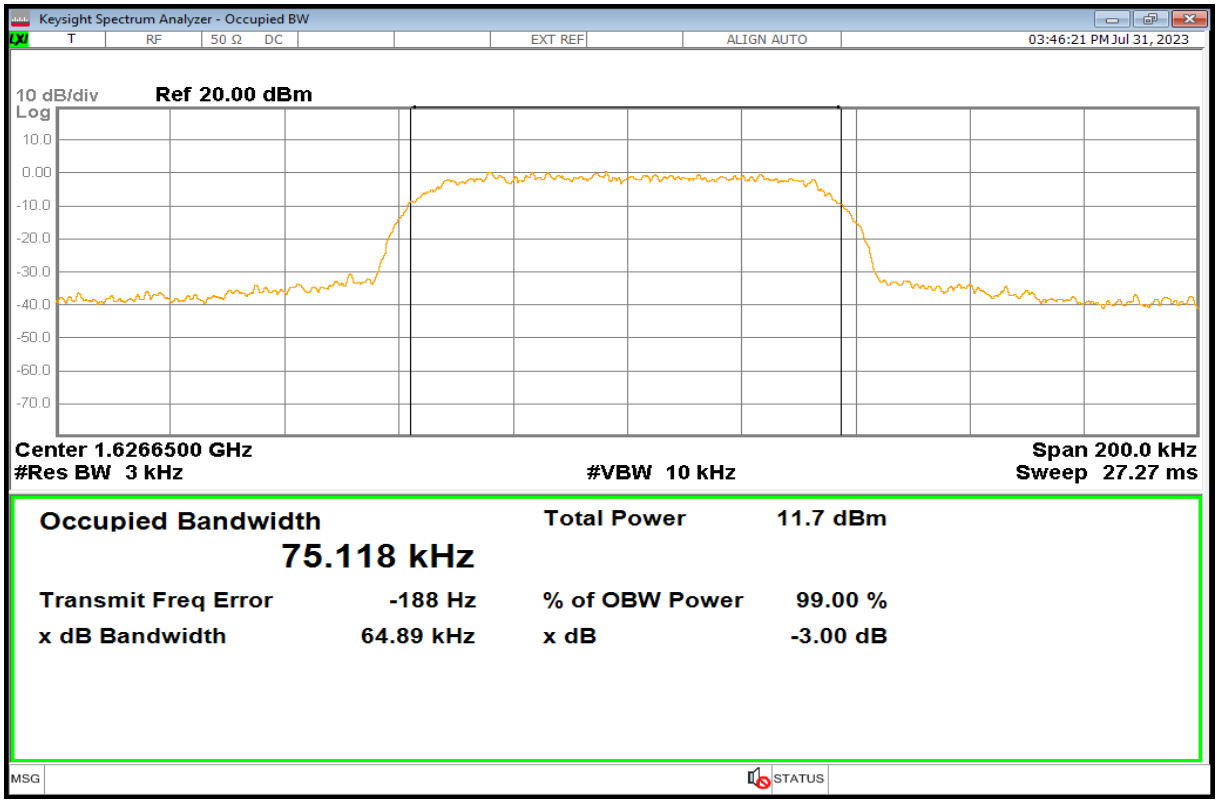

B3dB, Sub-Band 1, Low Channel, R20T0.5QD

Plot No. 10



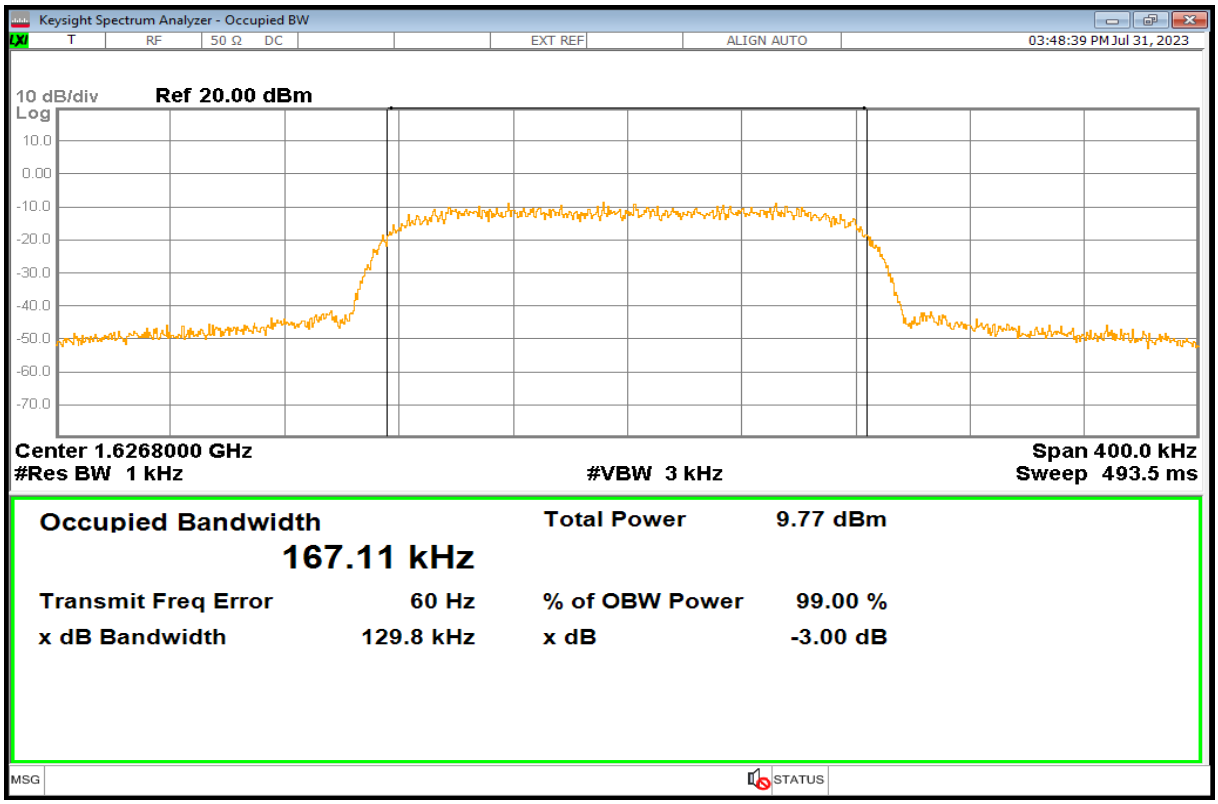

B3dB, Sub-Band 1, Low Channel, R20T1QD

Plot No. 11



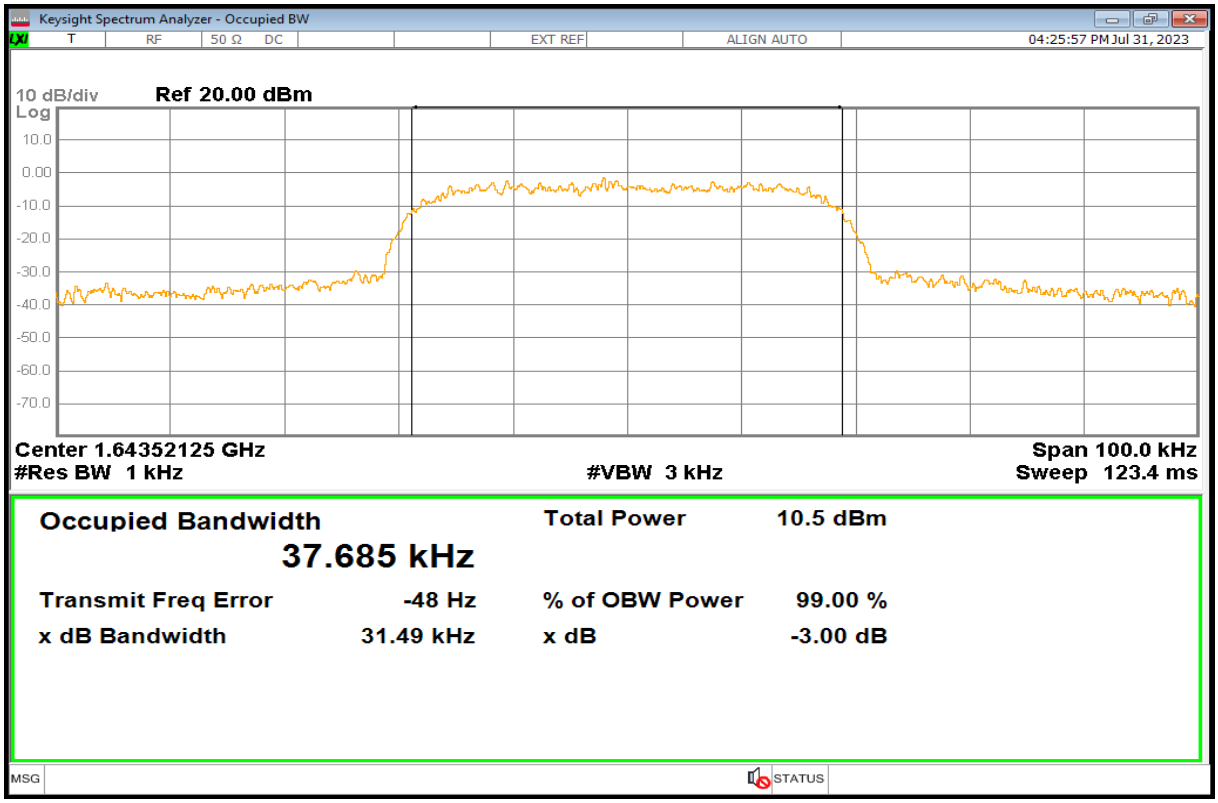

B3dB, Sub-Band 1, Low Channel, R20T2QD

Plot No. 12



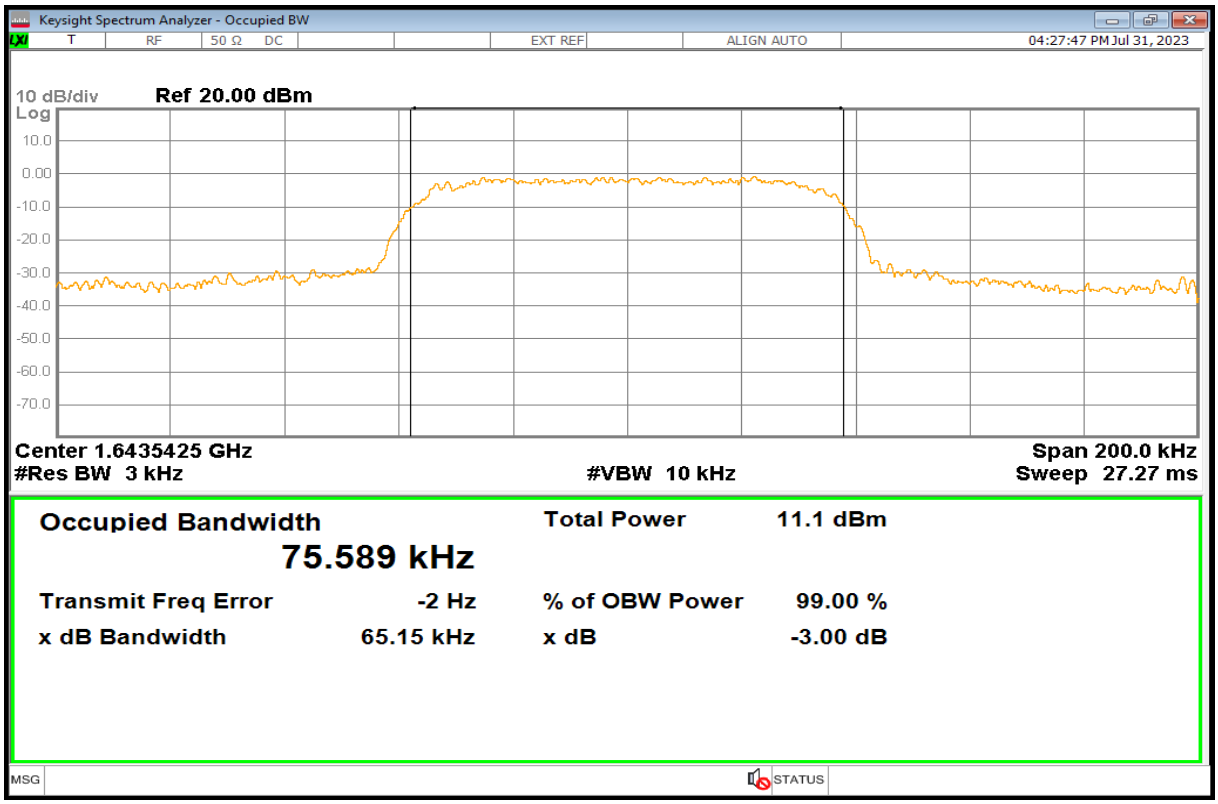

B3dB, Sub-Band 1, Low Channel, R20T4.5QD

Plot No. 13



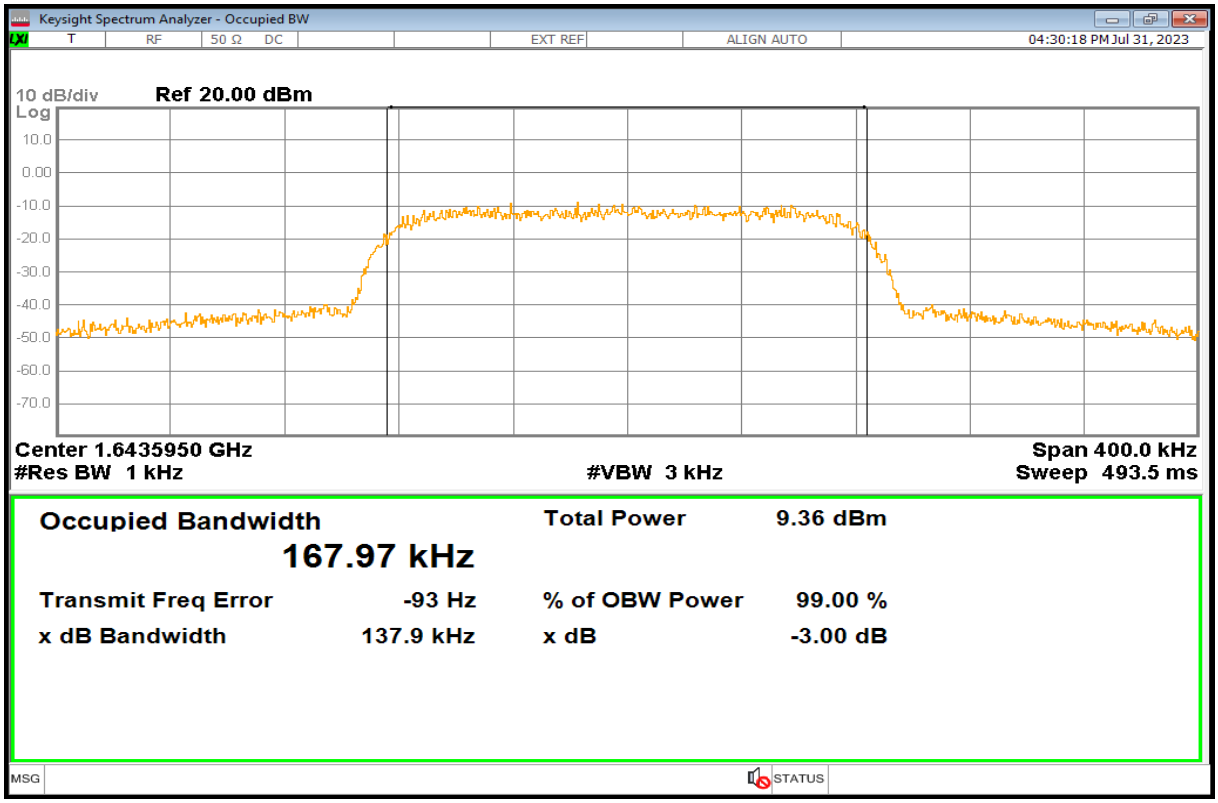

B3dB, Sub-Band 1, Middle Channel, R5T1XD

Plot No. 14



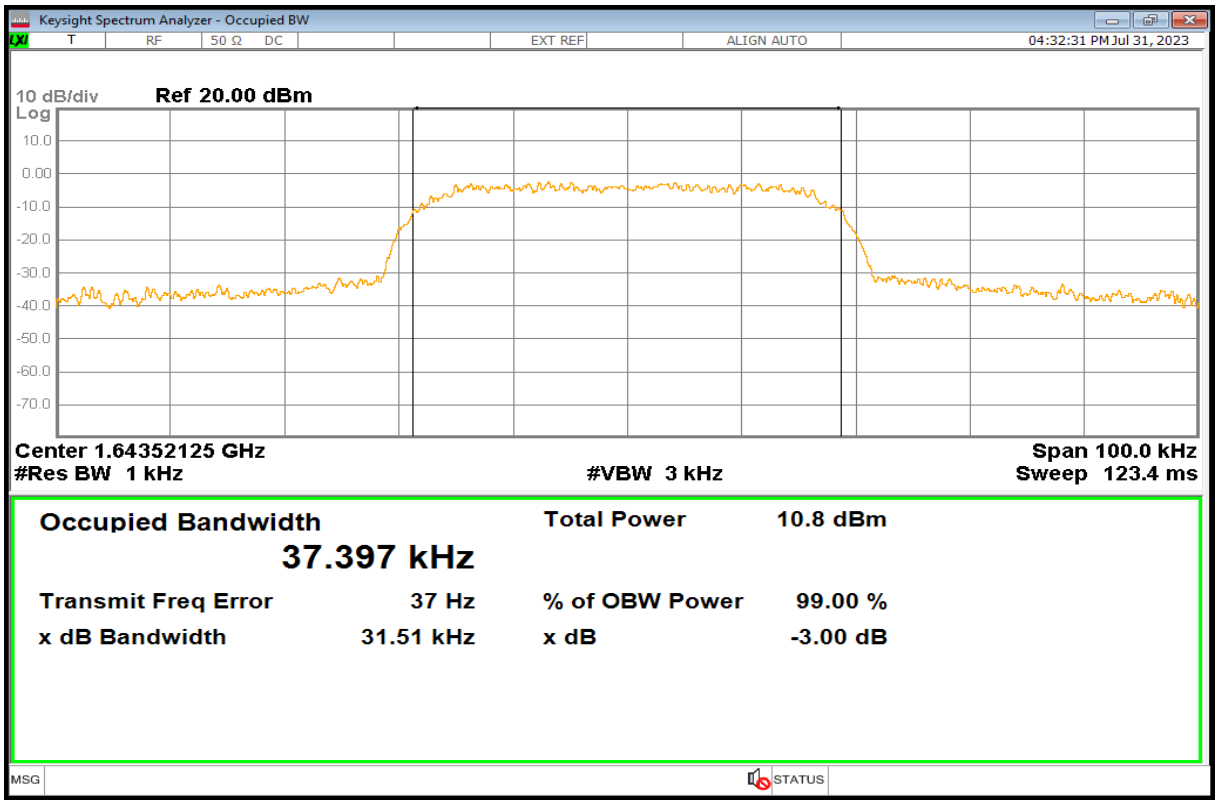

B3dB, Sub-Band 1, Middle Channel, R5T2XD

Plot No. 15



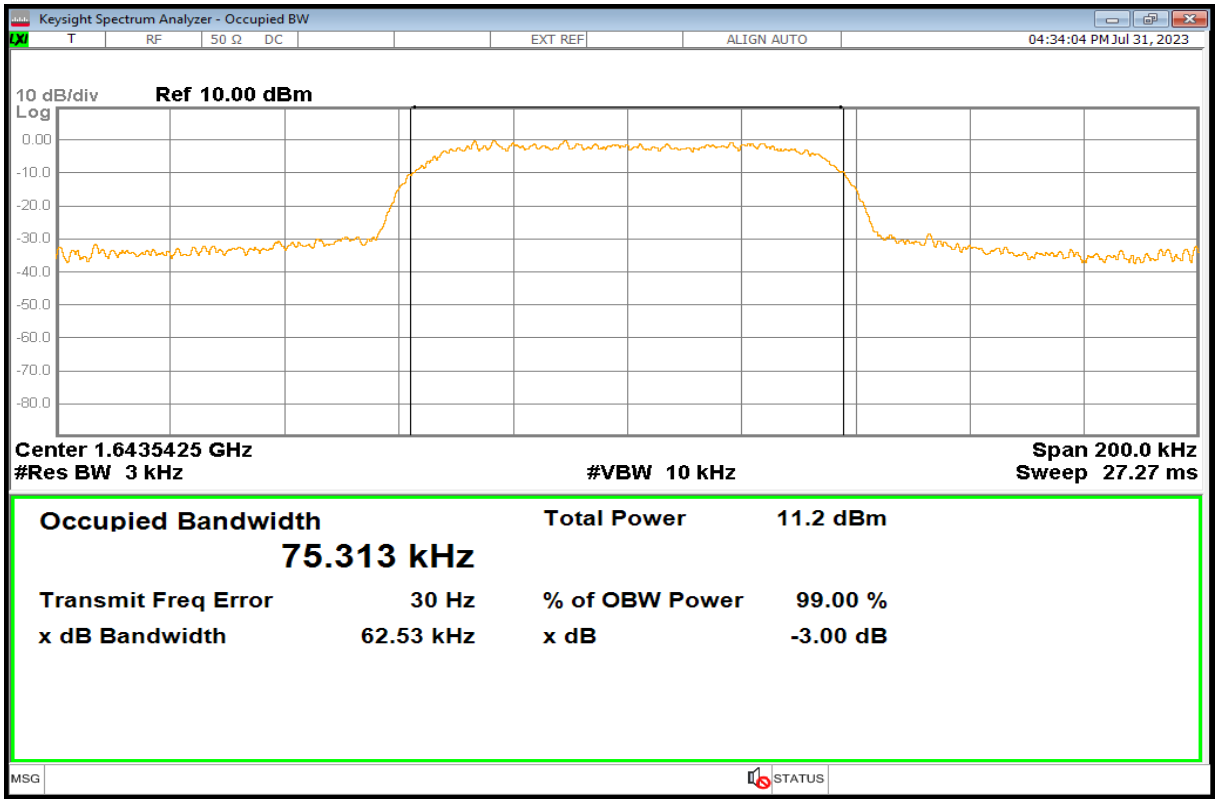

B3dB, Sub-Band 1, Middle Channel, R5T4.5XD

Plot No. 16



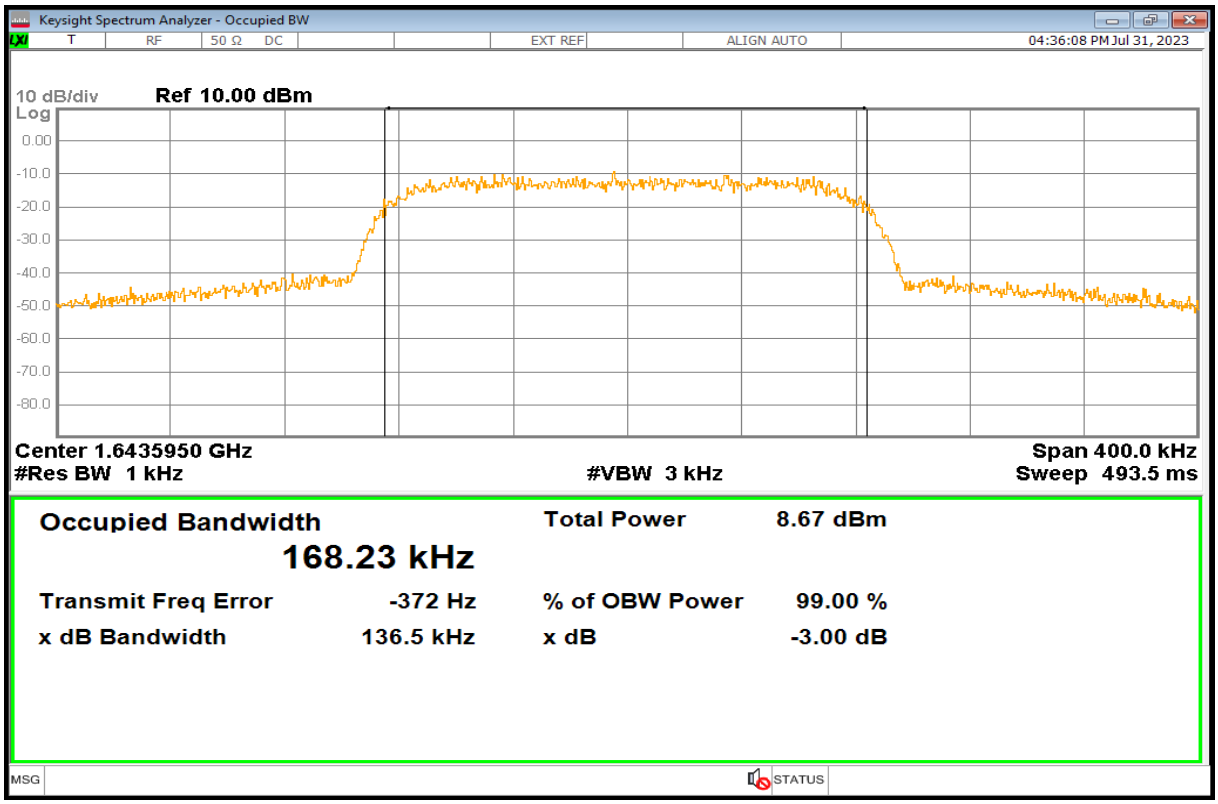

B3dB, Sub-Band 1, Middle Channel, R20T1XD

Plot No. 17



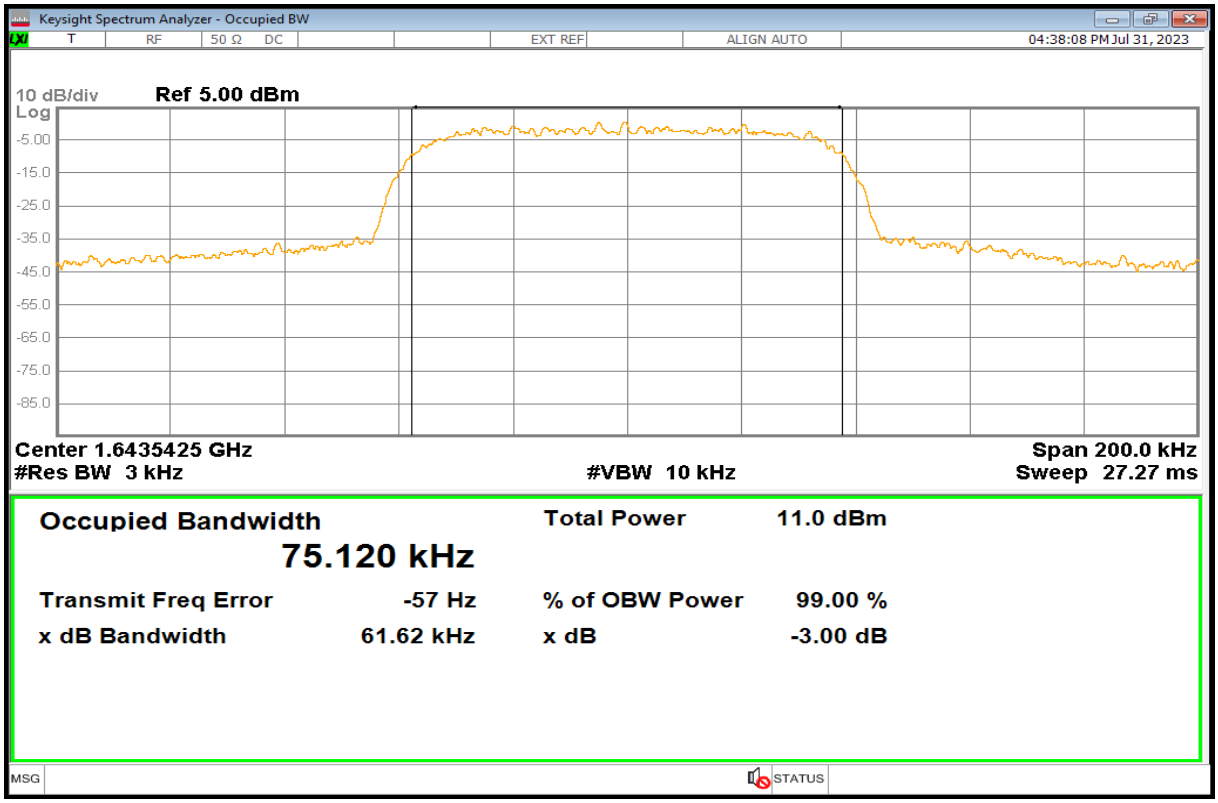

B3dB, Sub-Band 1, Middle Channel, R20T2XD

Plot No. 18



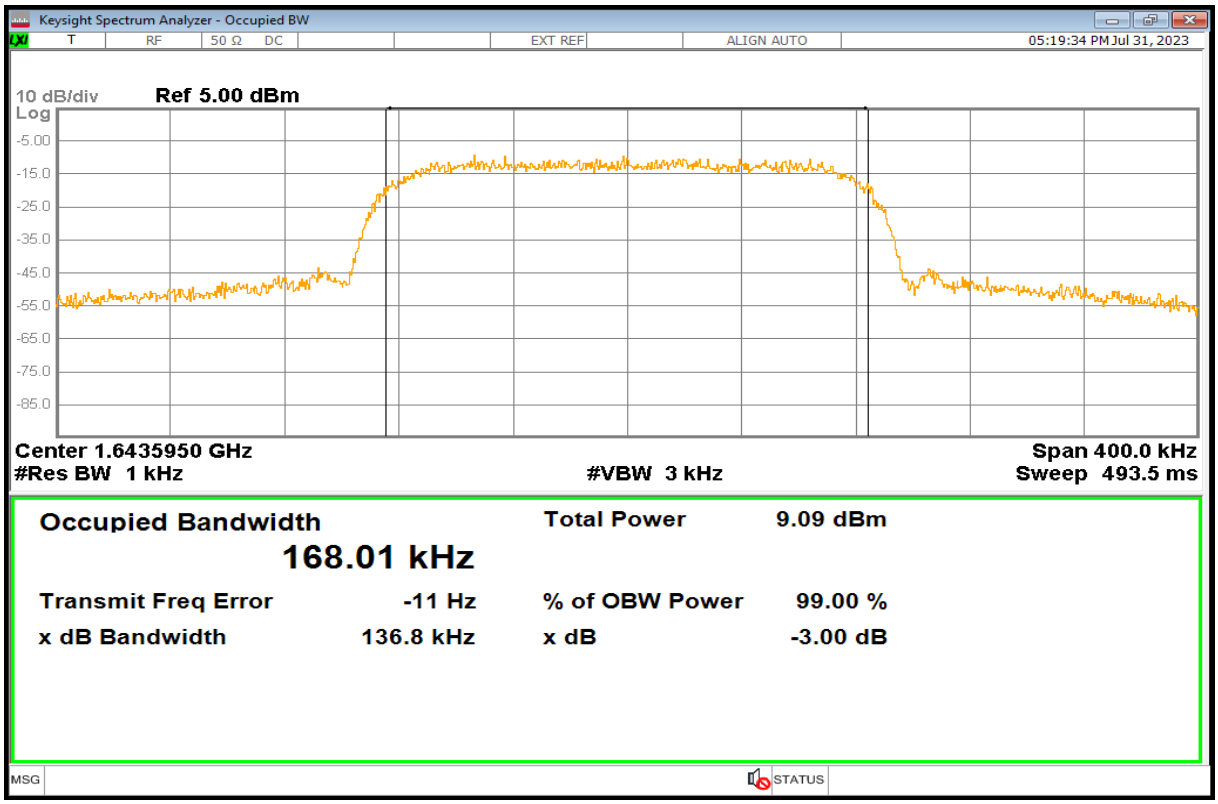

B3dB, Sub-Band 1, Middle Channel, R20T4.5XD

Plot No. 19



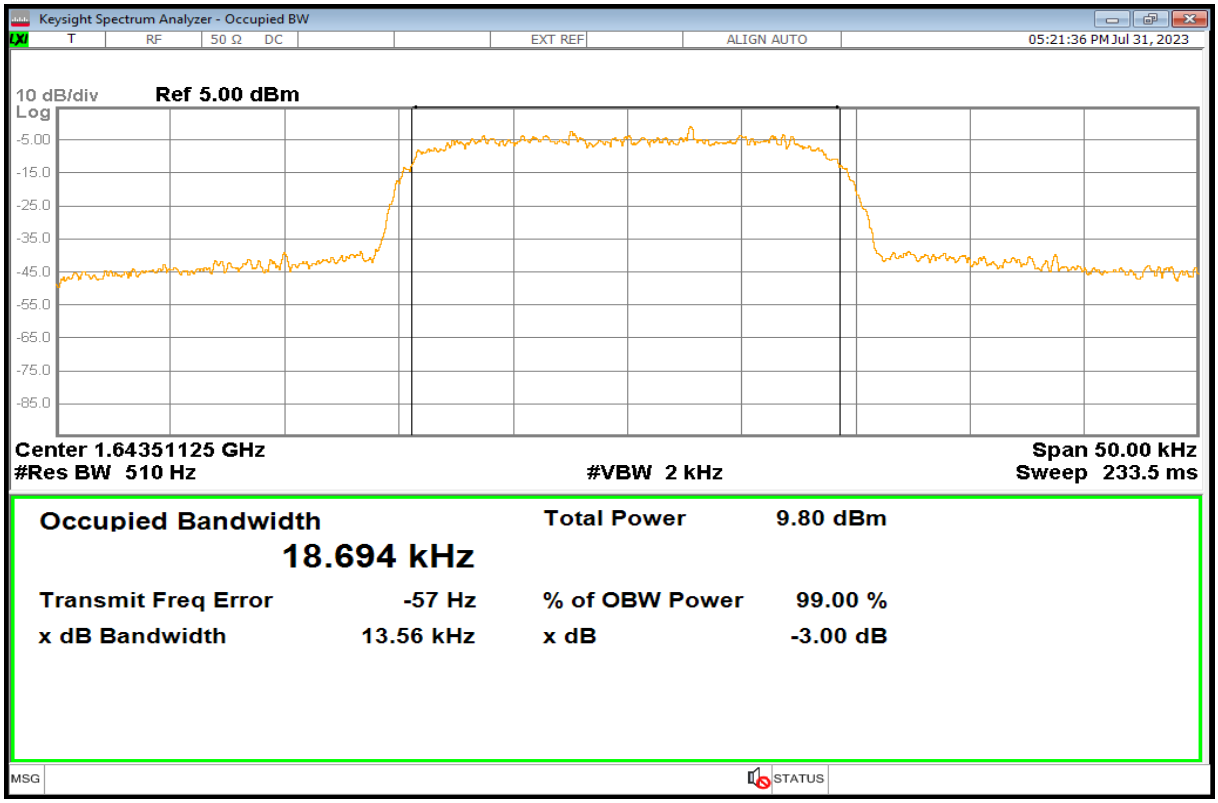

B3dB, Sub-Band 1, Middle Channel, R5T2QD

Plot No. 20



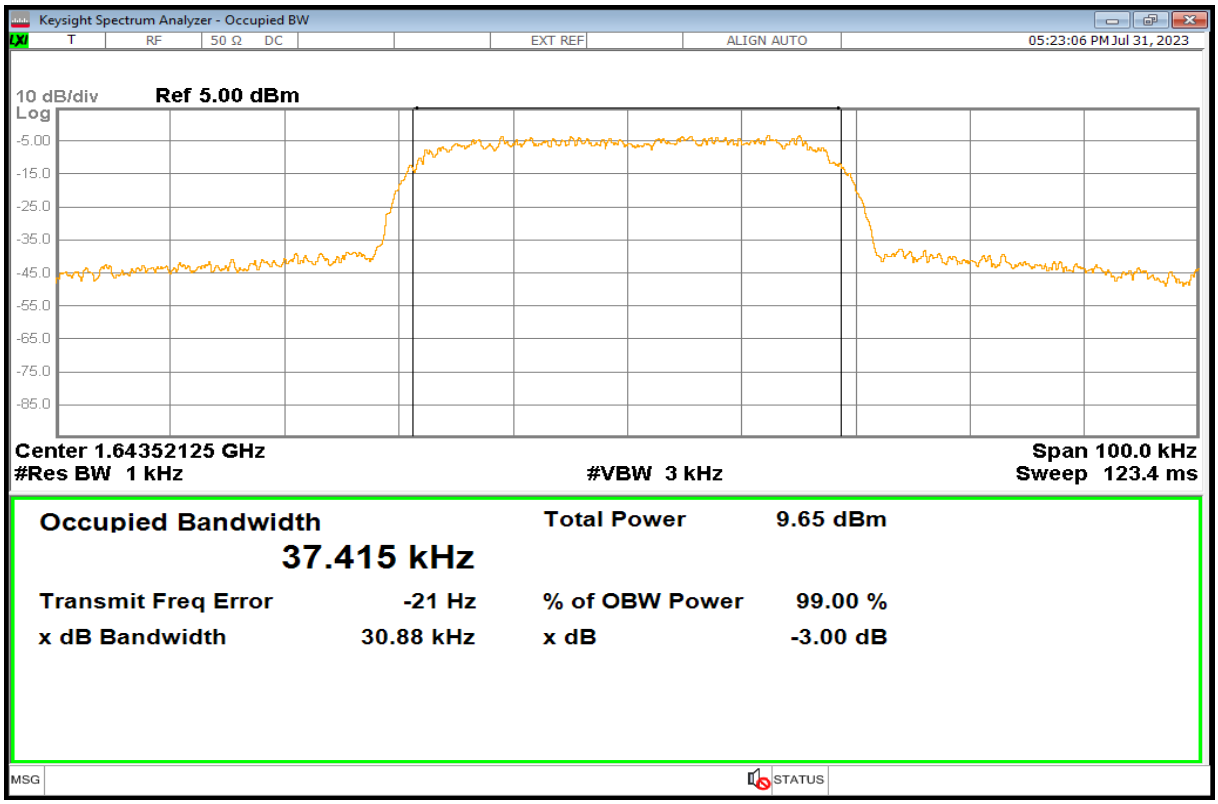

B3dB, Sub-Band 1, Middle Channel, R5T4.5QD

Plot No. 21



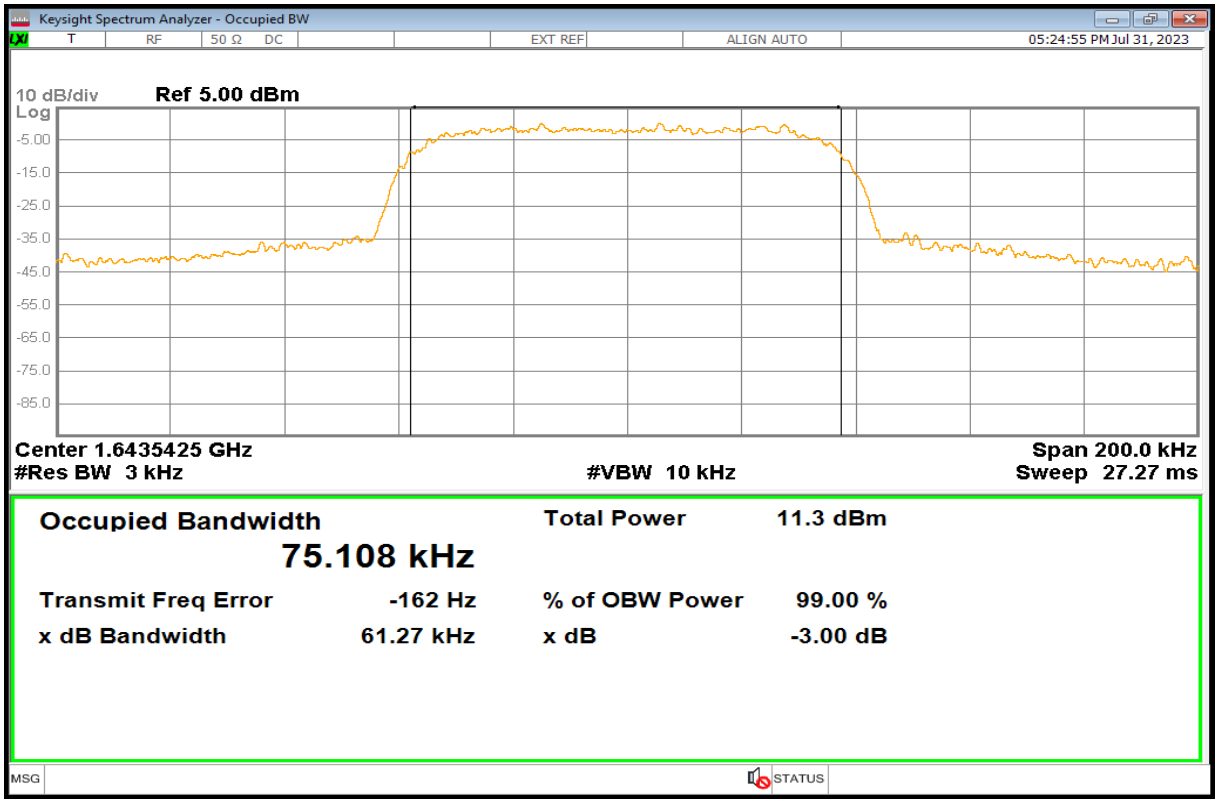

B3dB, Sub-Band 1, Middle Channel, R20T0.5QD

Plot No. 22



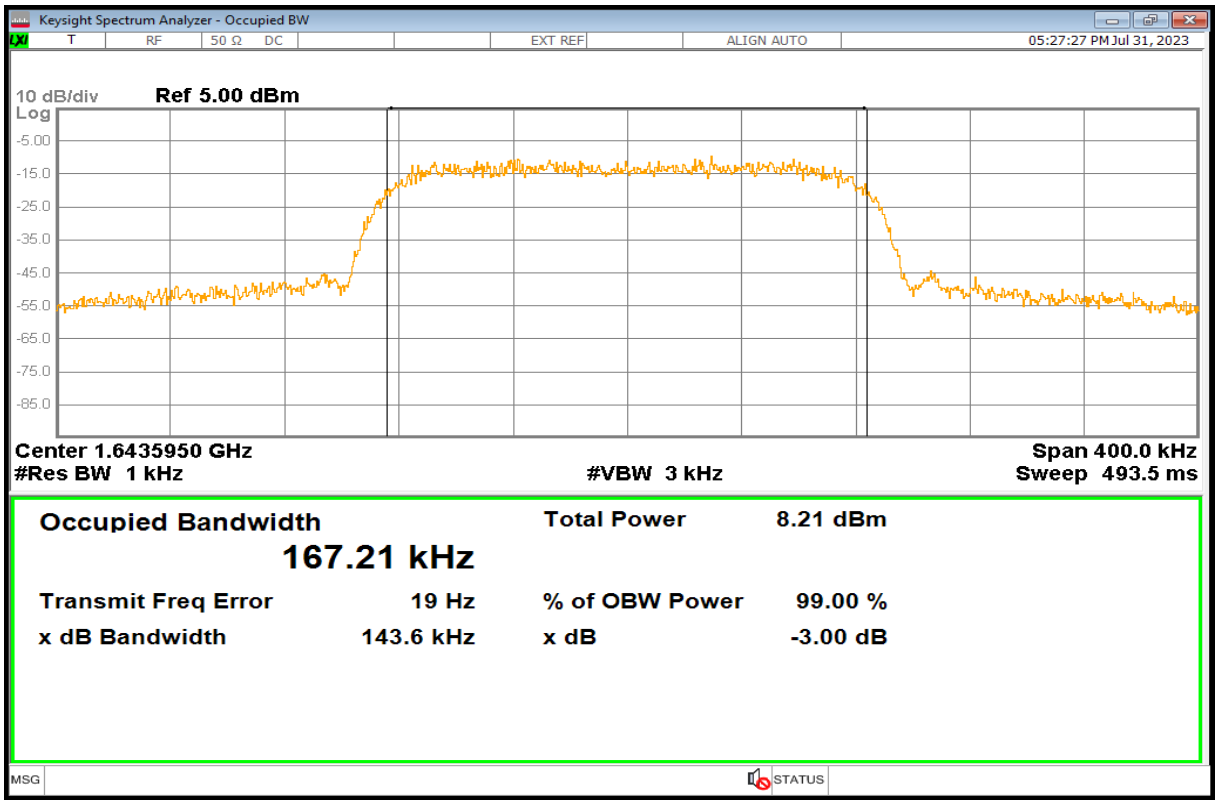

B3dB, Sub-Band 1, Middle Channel, R20T1QD

Plot No. 23



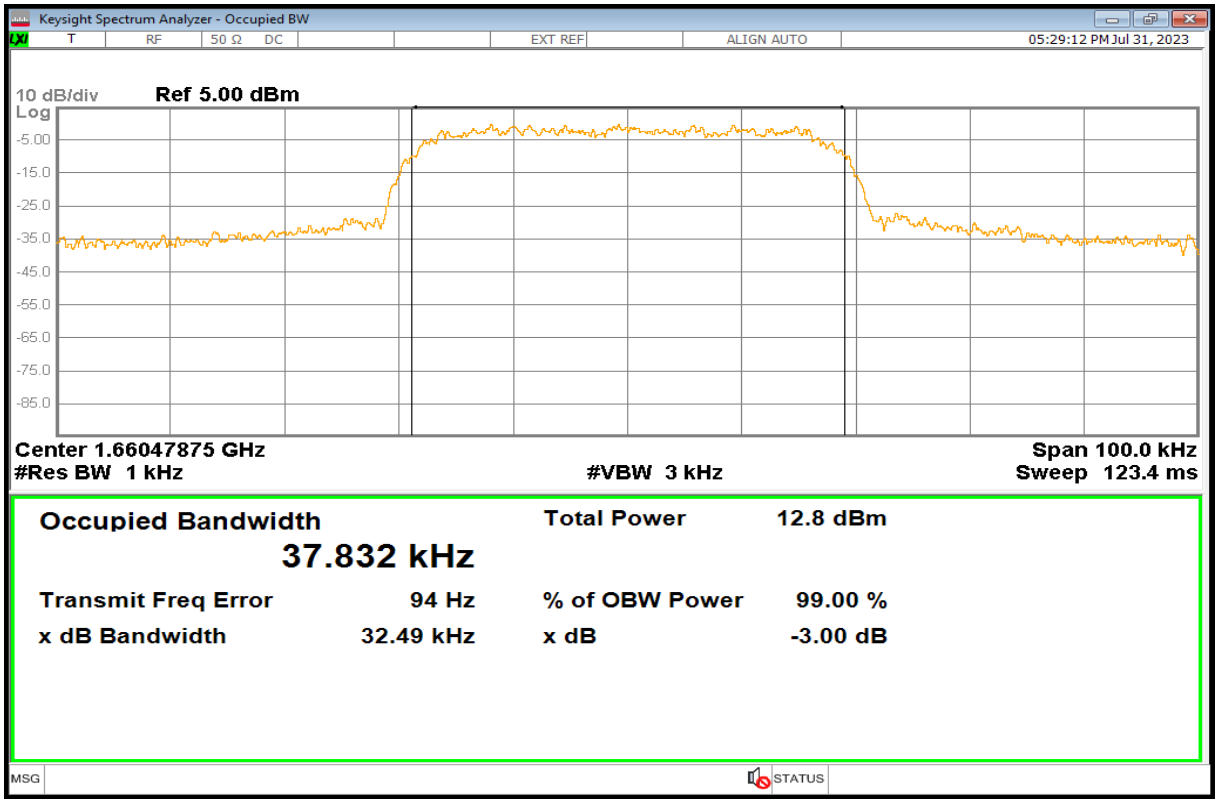

B3dB, Sub-Band 1, Middle Channel, R20T2QD

Plot No. 24



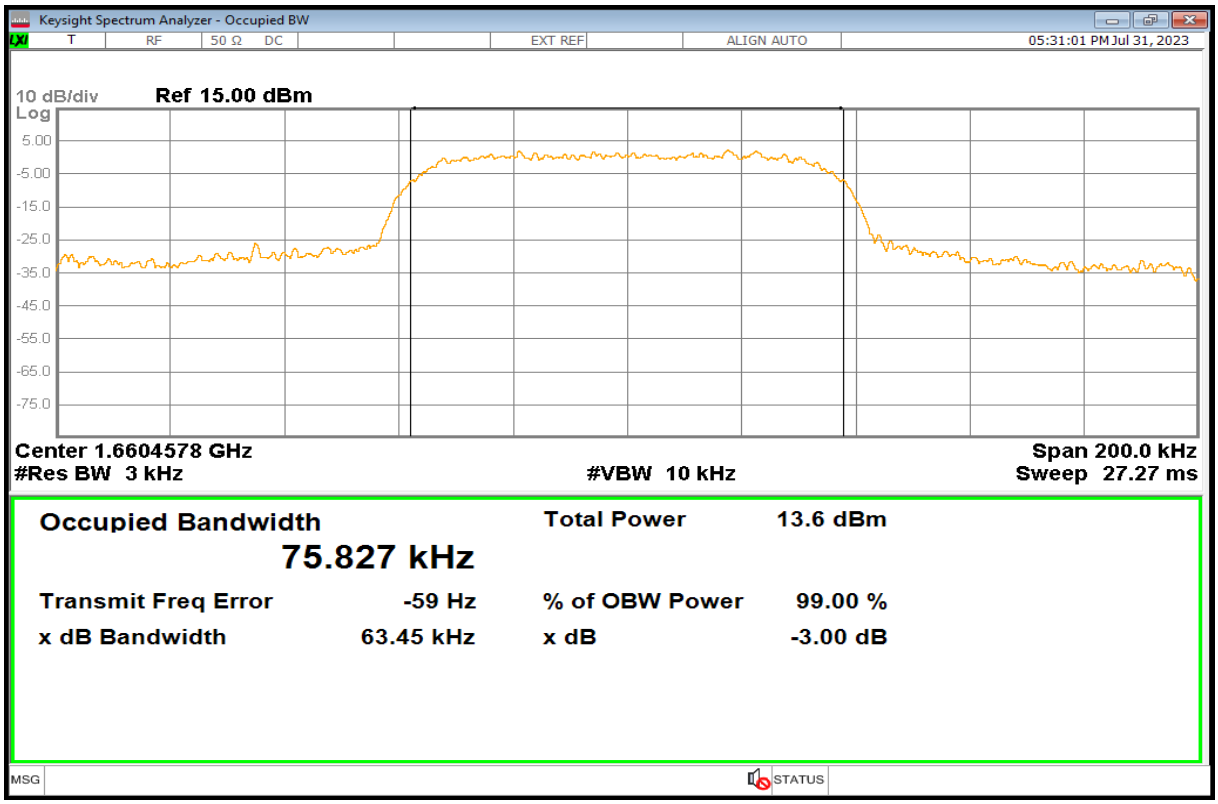

B3dB, Sub-Band 1, Middle Channel, R20T4.5QD

Plot No. 25



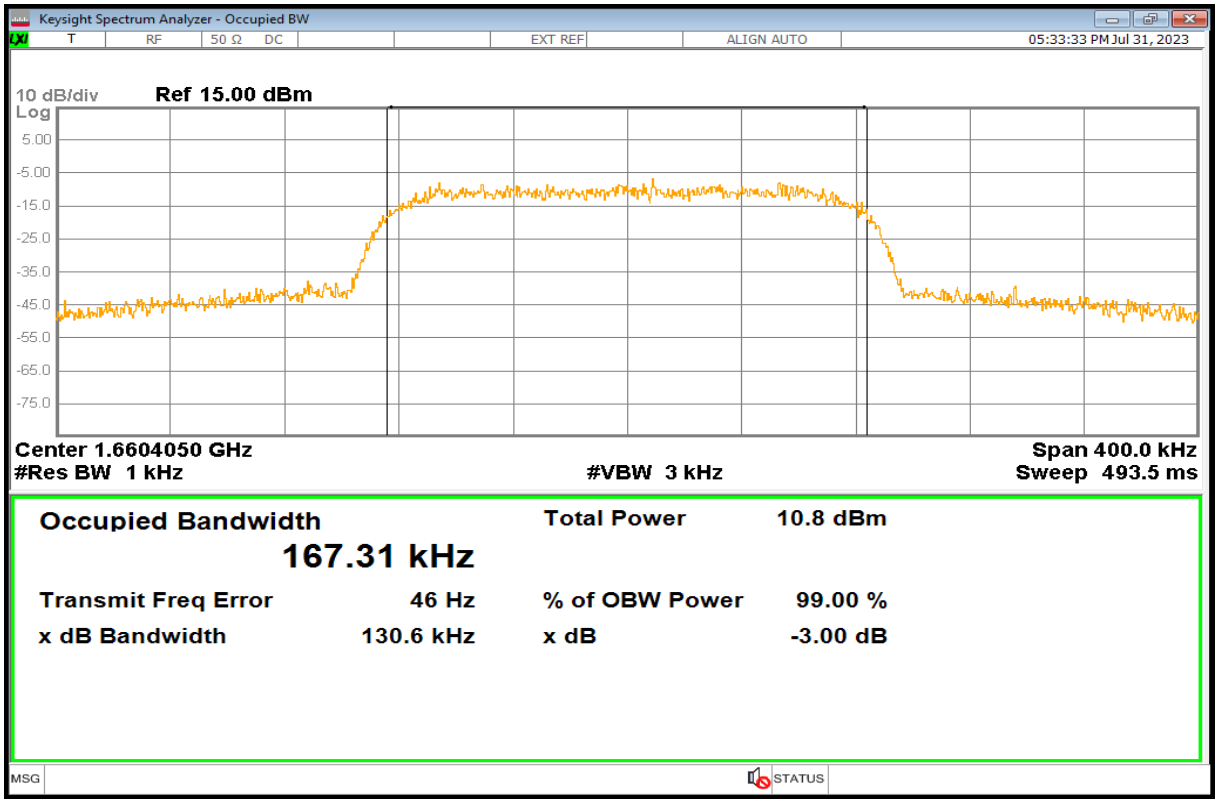

B3dB, Sub-Band 1, High Channel, R5T1XD

Plot No. 26



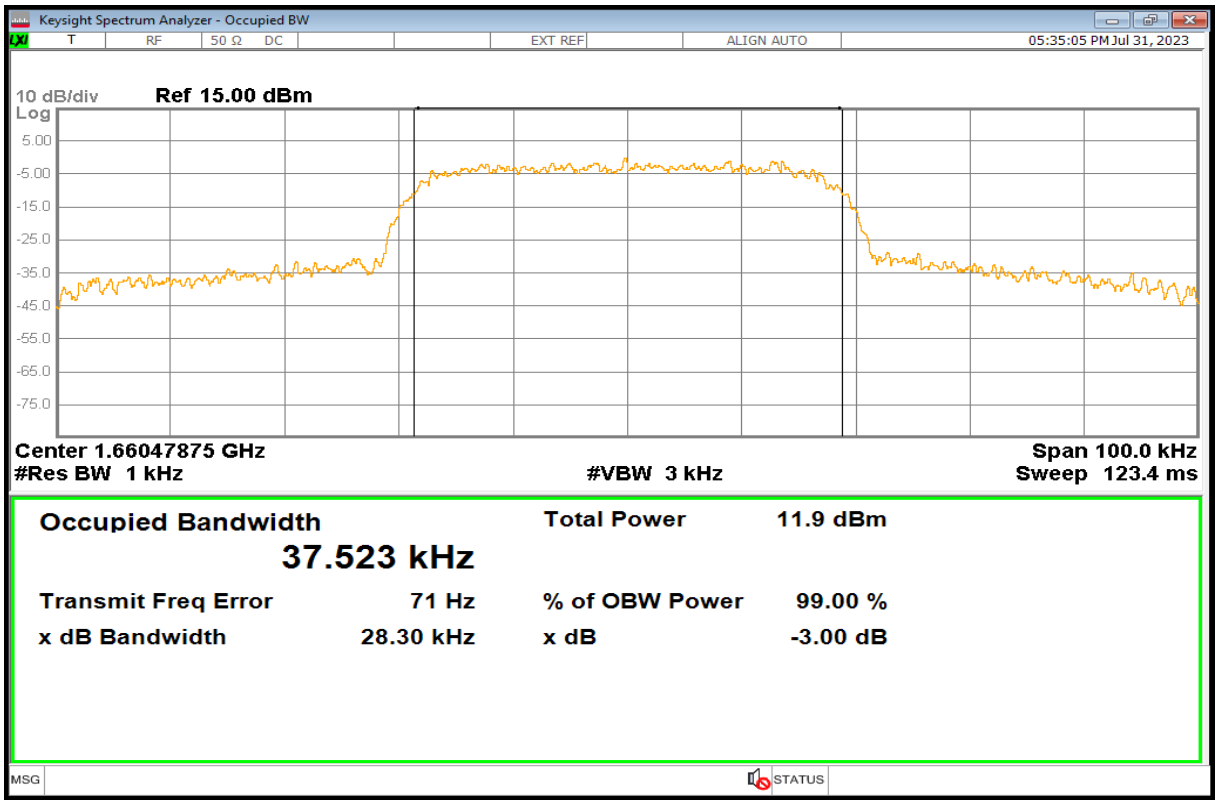

B3dB, Sub-Band 1, High Channel, R5T2XD

Plot No. 27



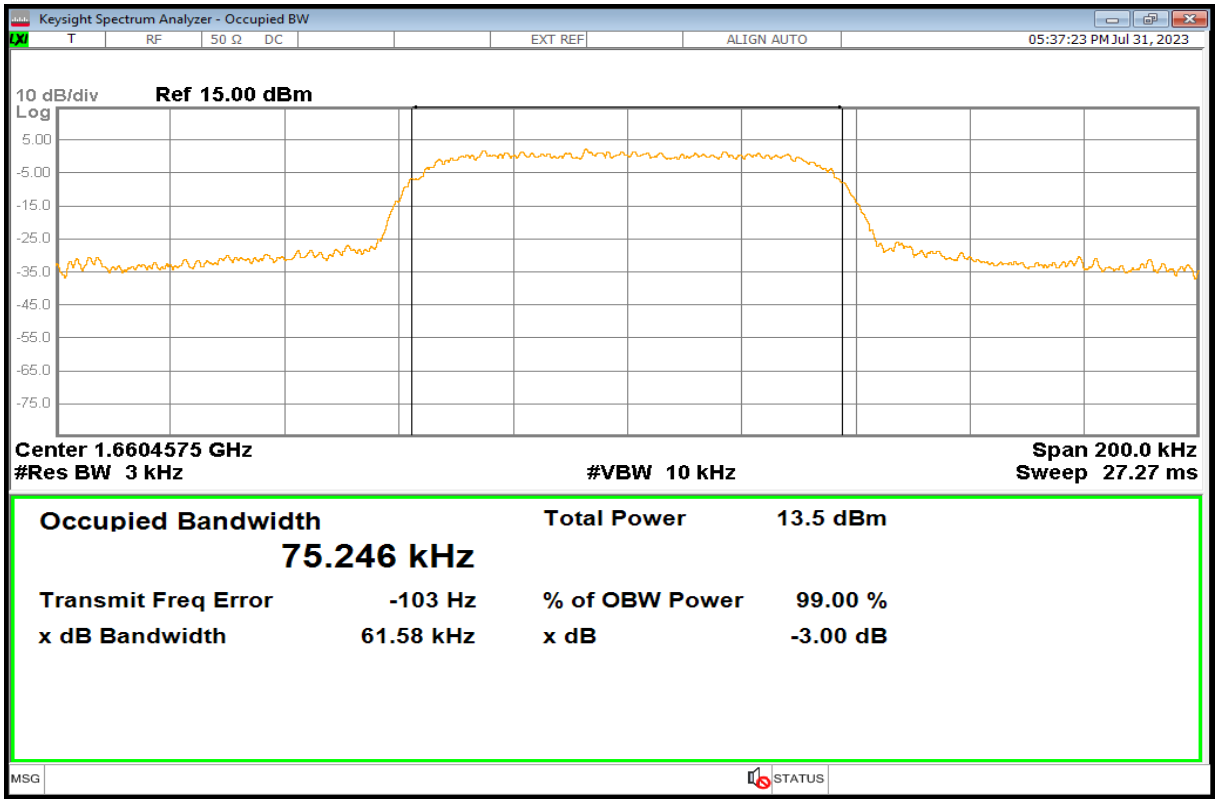

B3dB, Sub-Band 1, High Channel, R5T4.5XD

Plot No. 28



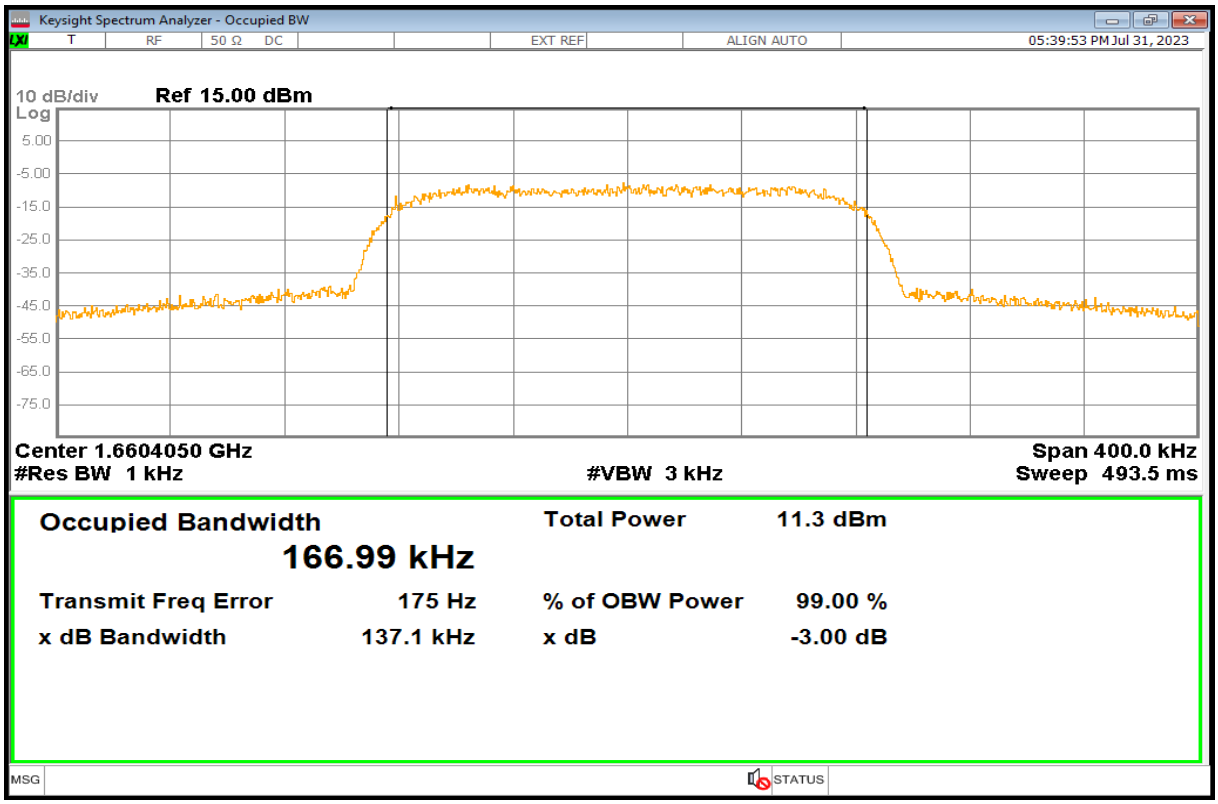

B3dB, Sub-Band 1, High Channel, R20T1XD

Plot No. 29



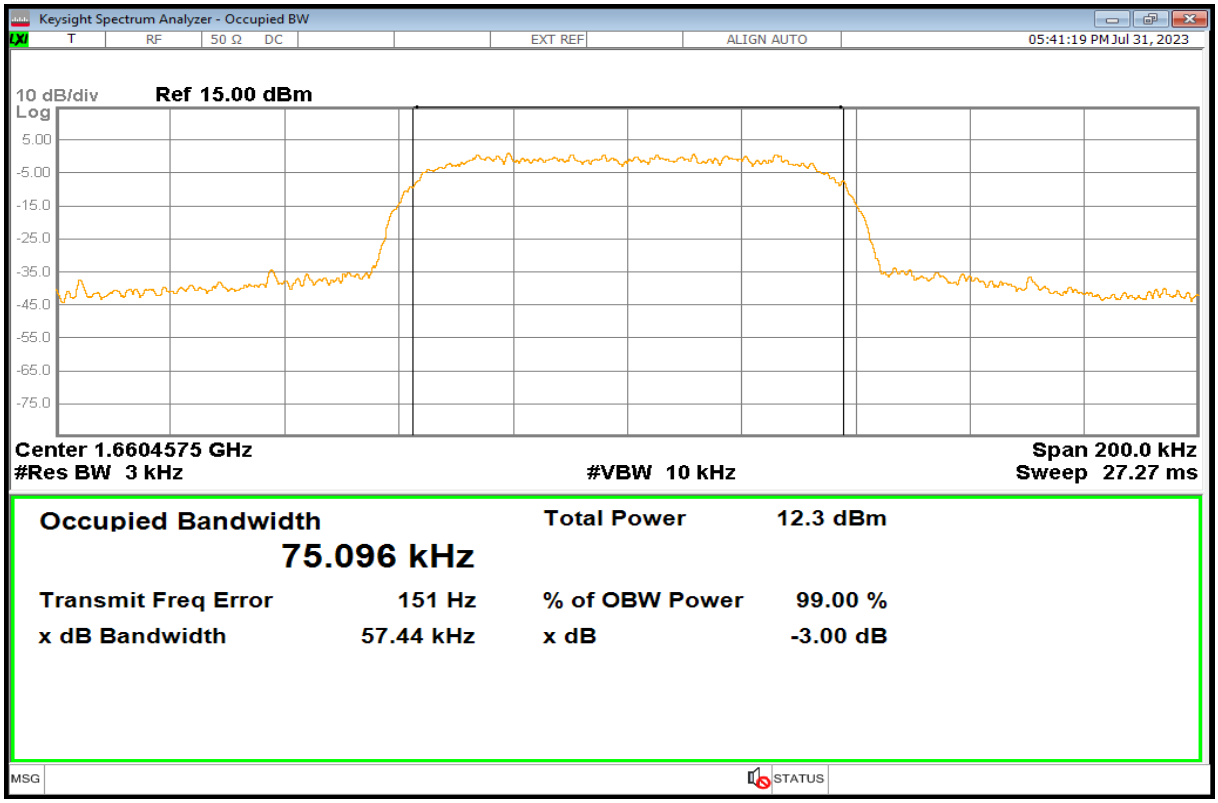

B3dB, Sub-Band 1, High Channel, R20T2XD

Plot No. 30



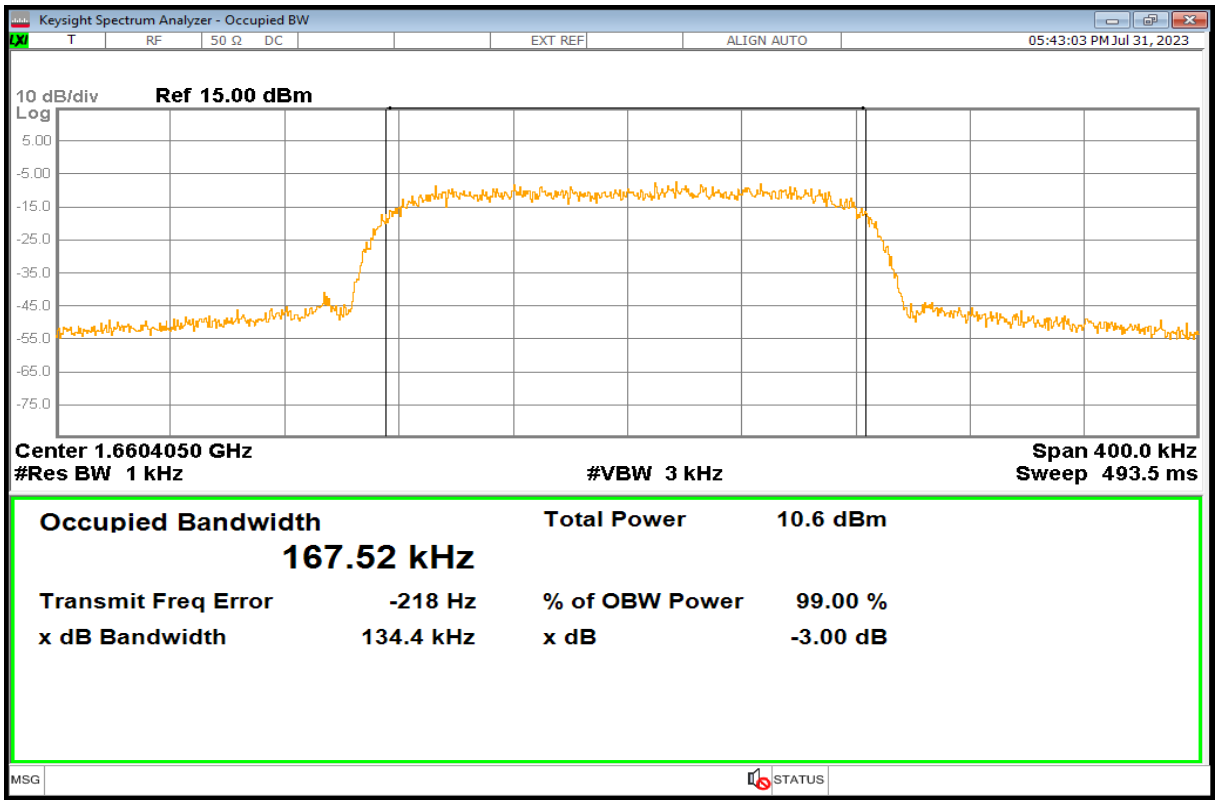

B3dB, Sub-Band 1, High Channel, R20T4.5XD

Plot No. 31



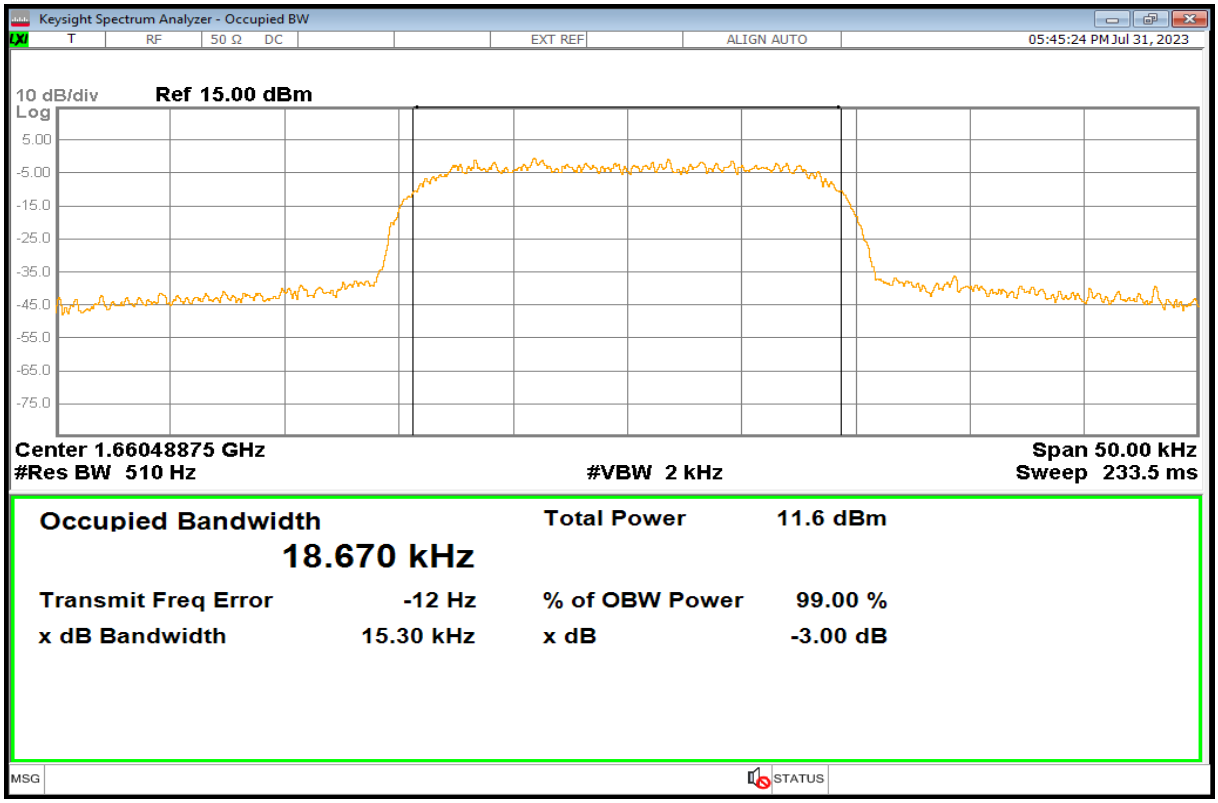

B3dB, Sub-Band 1, High Channel, R5T2QD

Plot No. 32



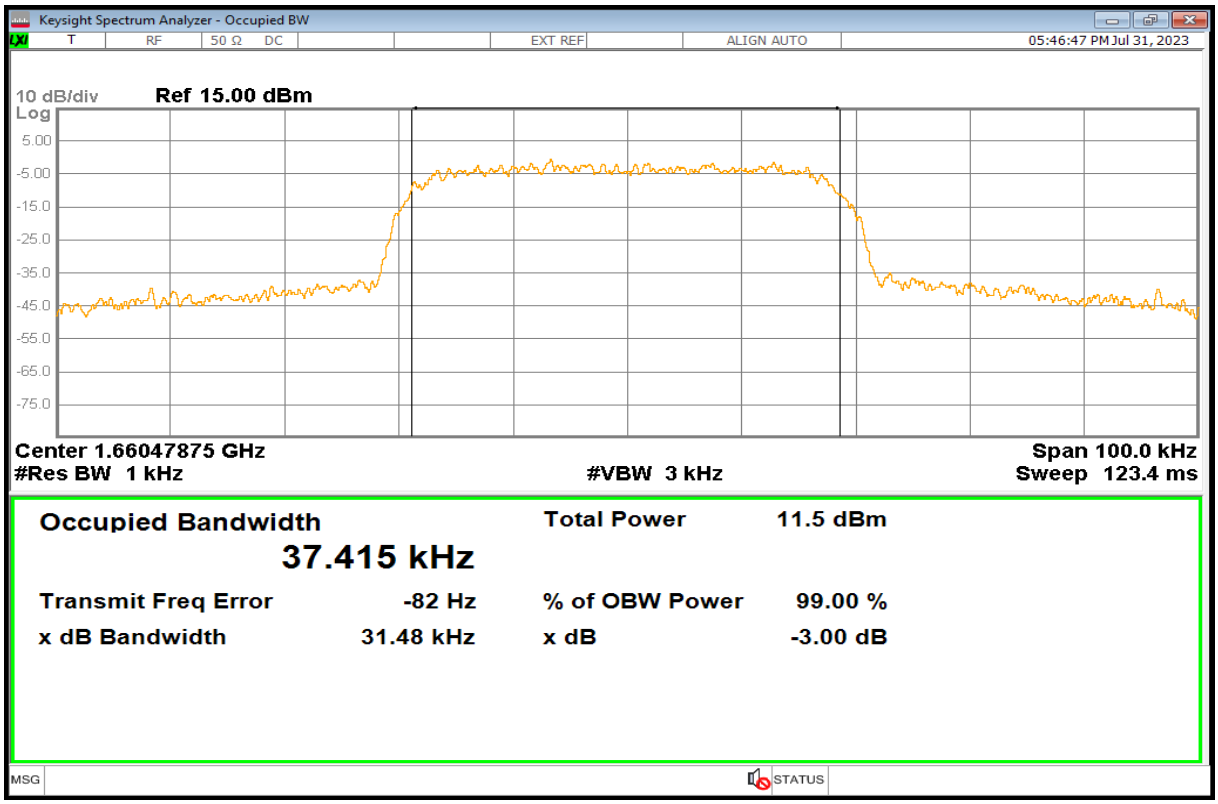

B3dB, Sub-Band 1, High Channel, R5T4.5QD

Plot No. 33



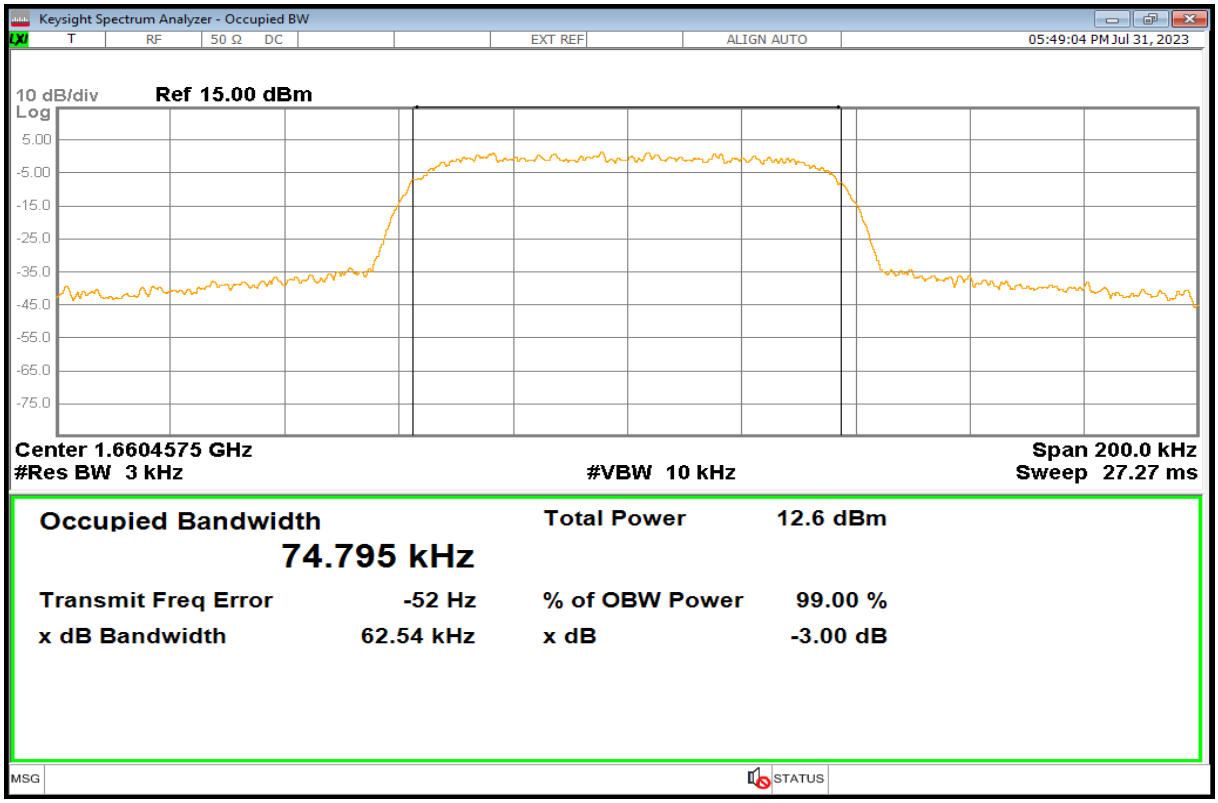

B3dB, Sub-Band 1, High Channel, R20T0.5QD

Plot No. 34



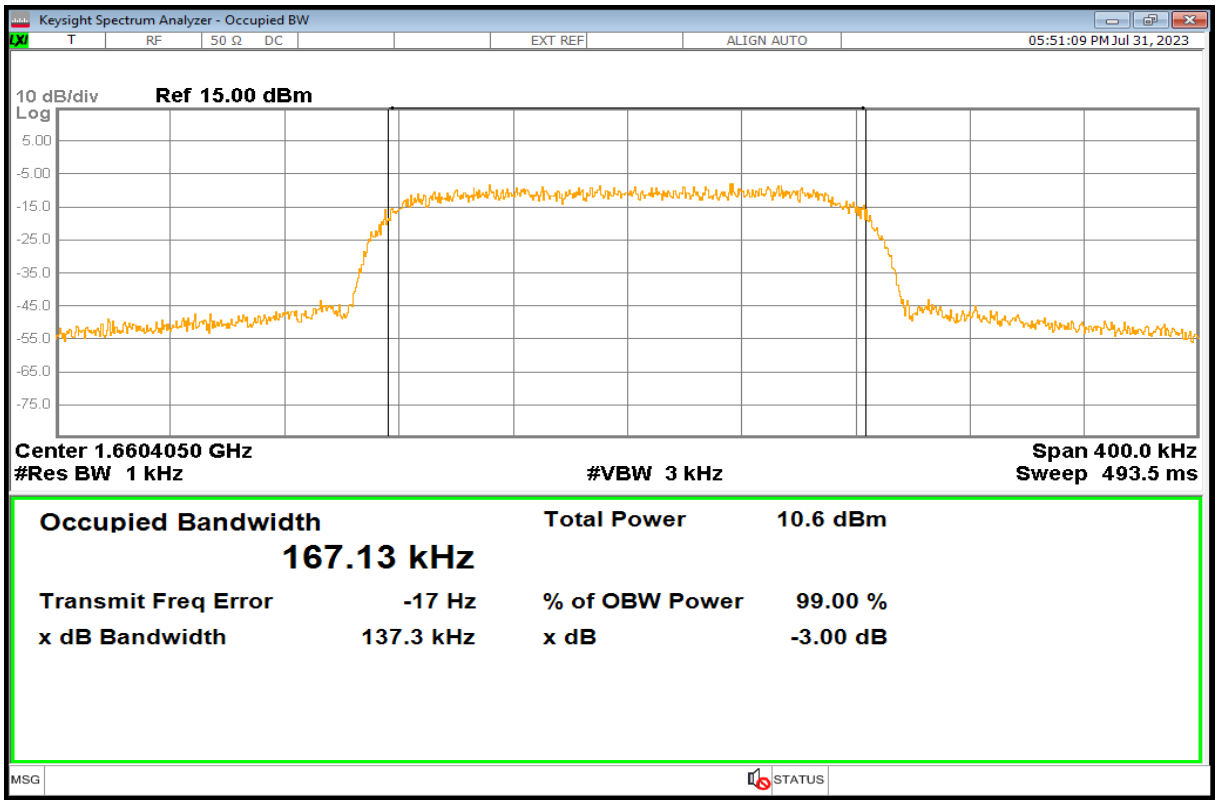

B3dB, Sub-Band 1, High Channel, R20T1QD

Plot No. 35



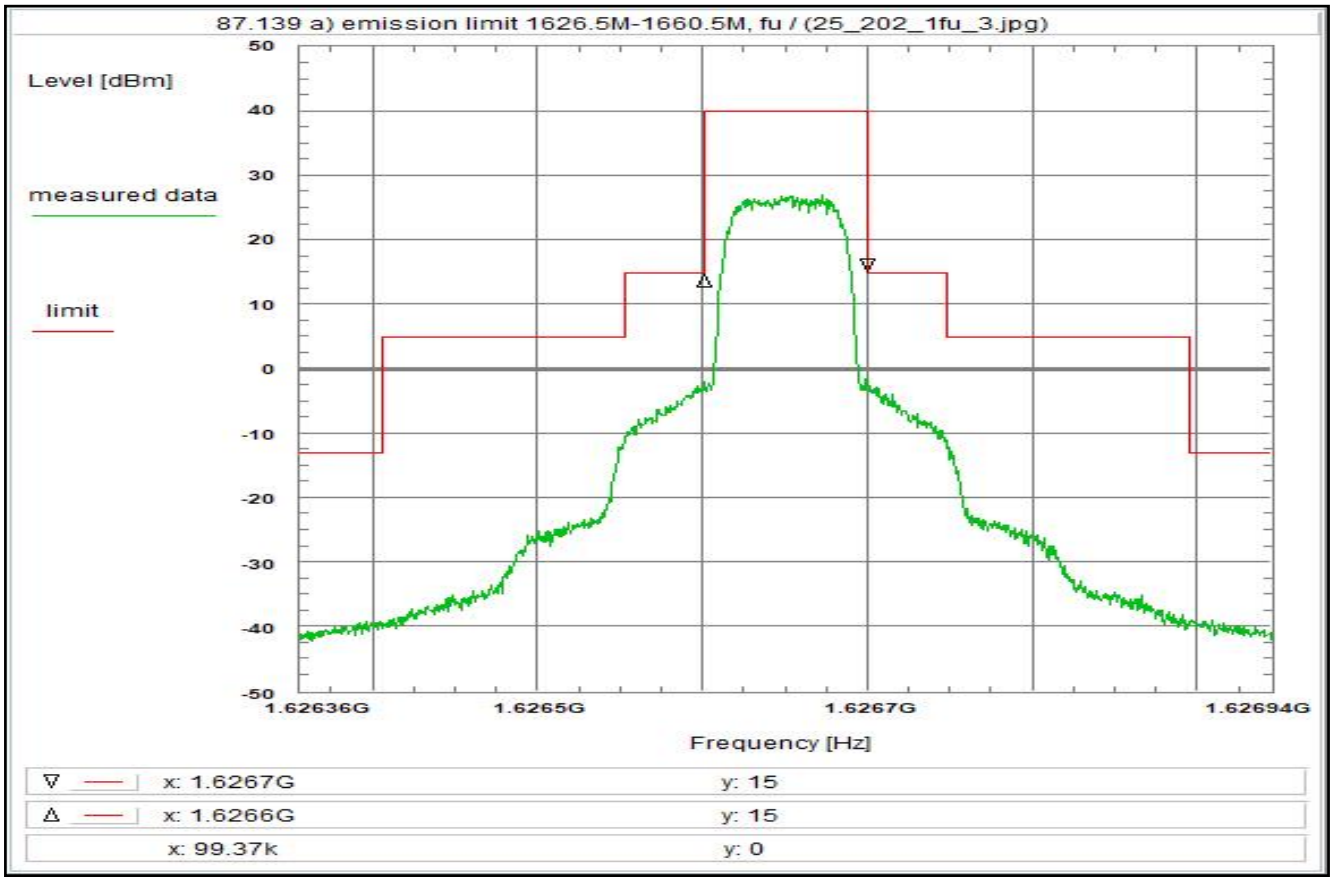

B3dB, Sub-Band 1, High Channel, R20T2QD

Plot No. 36




B3dB, Sub-Band 1, High Channel, R20T4.5QD

Plot No. 37




Subclause: 87.139 a)Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Limit:
Limit according to 87.139 a):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with the above schedule.

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fl, R5T2XD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

**Test result:** **Test passed**

Environment condition:

| | |
|---|---|
| Date & Time: | Wed 16/Aug/2023 16:09:22 |
| Location: | CTC advanced GmbH, Laboratory RC-SYS |
| Temperature: | 22 °C |
| Humidity: | 55 % |
| Voltage: | 230 Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 1.626356 | GHz |
| Stop frequency: | 1.626944 | GHz |
| Center frequency: | 1.62665 | GHz |
| Frequency span: | 588 | kHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 10 | kHz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Clear Write | |
| Detector-Mode: | AVG | |

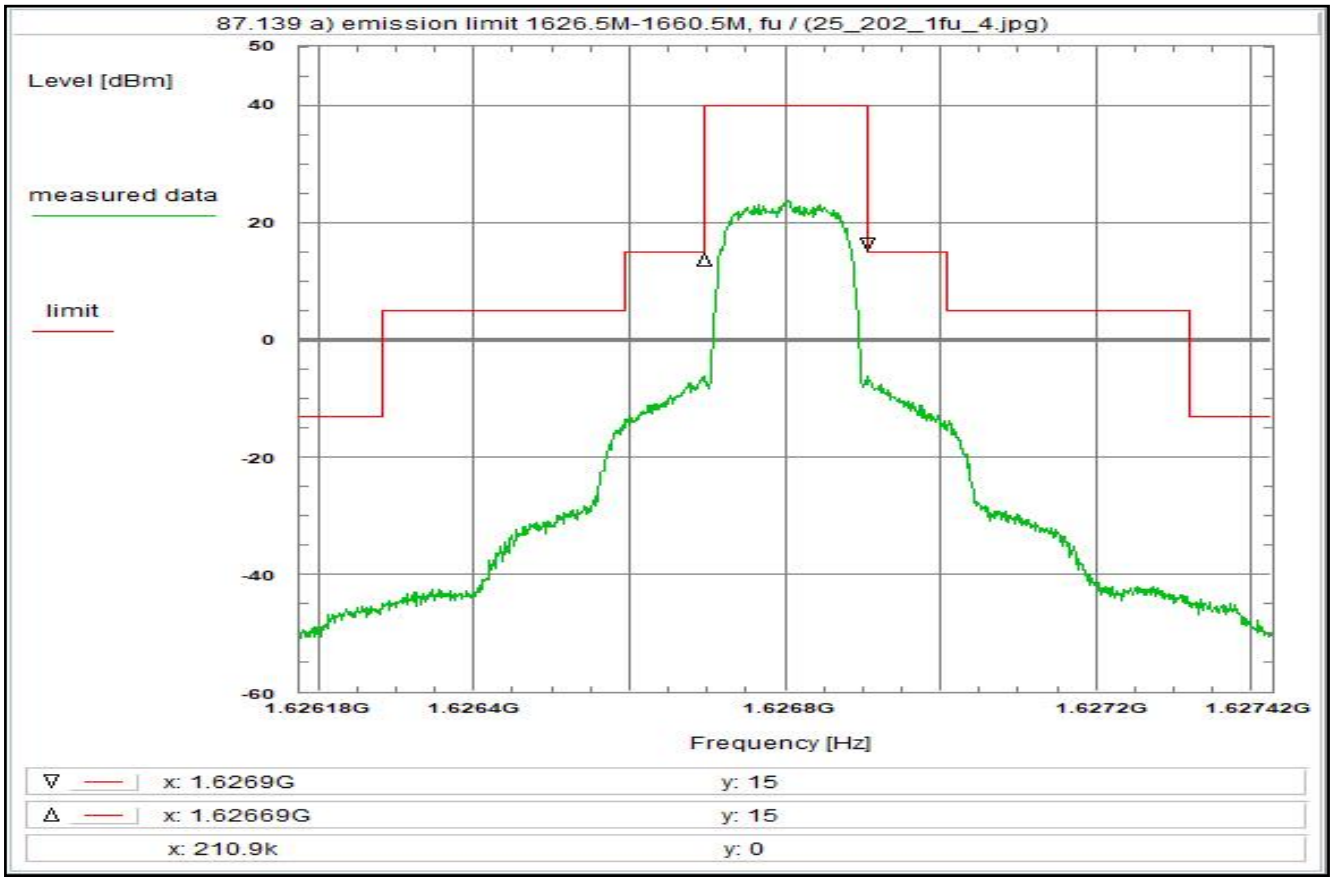
Correction:

| | | | |
|---|---|---|---|
| Directional coupler | + | 0.0 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U330) | + | 31.9 | dB |
| TOTAL CORRECTION: | + | 35.4 | dB |

Remarks:
Carrier-on state / Carrier at the lower edge of the band (fu)

Reference of limit = 40 dBm
Spectrum mask referenced to necessary bandwidth

Plot No. 38




Subclause: 87.139 a)Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Limit:
Limit according to 87.139 a):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with the above schedule.

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fl, R5T4.5XD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: R001

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Wed 16/Aug/2023 16:13:14 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 1.626176 | GHz |
| Stop frequency: | 1.627424 | GHz |
| Center frequency: | 1.6268 | GHz |
| Frequency span: | 1.248 | MHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 10 | kHz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Clear Write | |
| Detector-Mode: | AVG | |

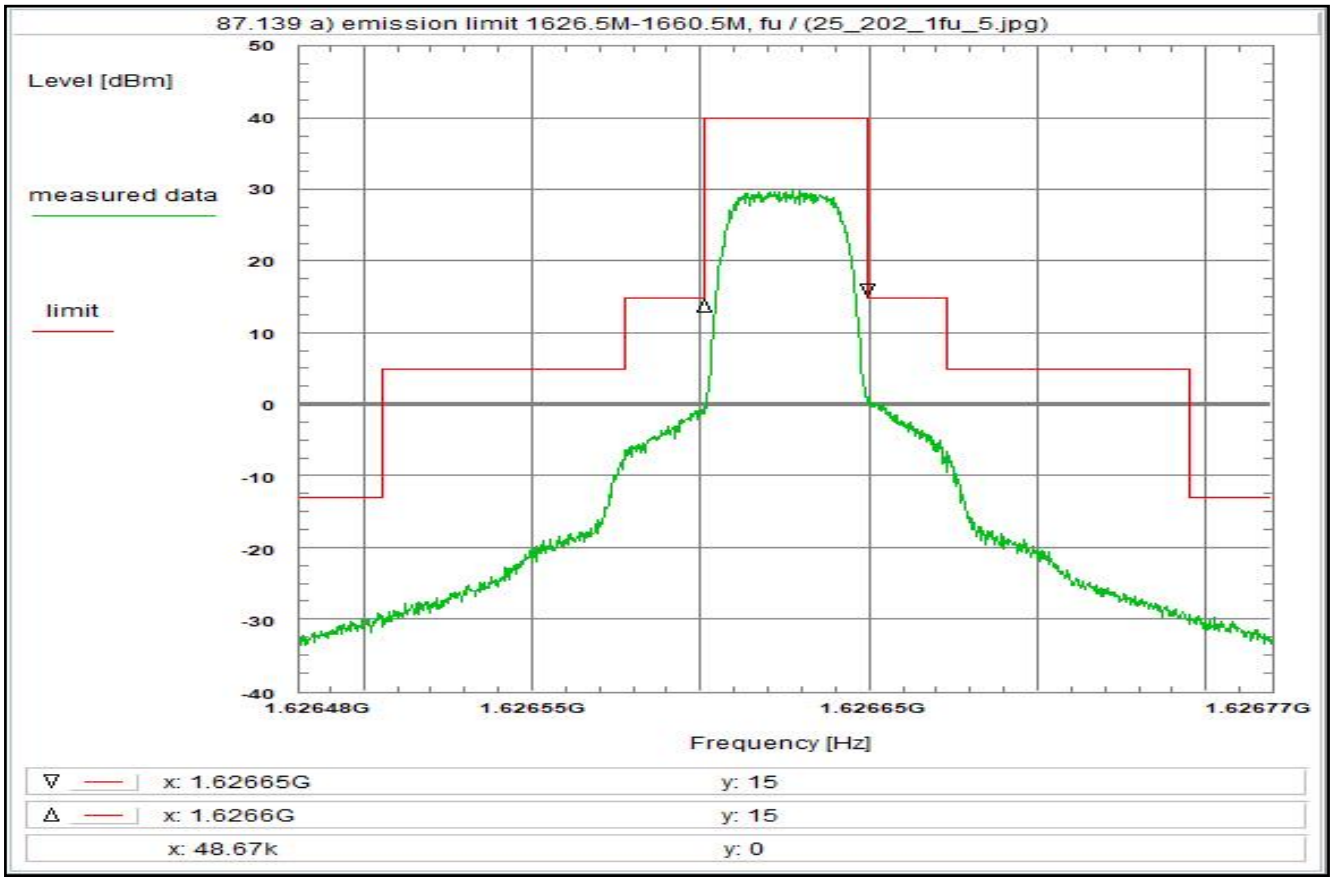
Correction:

| | | | |
|---|---|---|---|
| Directional coupler | + | 0.0 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U330) | + | 31.9 | dB |
| TOTAL CORRECTION: | + | 35.4 | dB |

Remarks:
Carrier-on state / Carrier at the lower edge of the band (fu)

Reference of limit = 40 dBm
Spectrum mask referenced to necessary bandwidth

Plot No. 39




Subclause: 87.139 a)Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Limit:
Limit according to 87.139 a):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with the above schedule.

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fl, R20T1XD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Wed 16/Aug/2023 16:18:06 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 1.626481 | GHz |
| Stop frequency: | 1.626769 | GHz |
| Center frequency: | 1.626625 | GHz |
| Frequency span: | 288 | kHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 10 | kHz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Clear Write | |
| Detector-Mode: | AVG | |

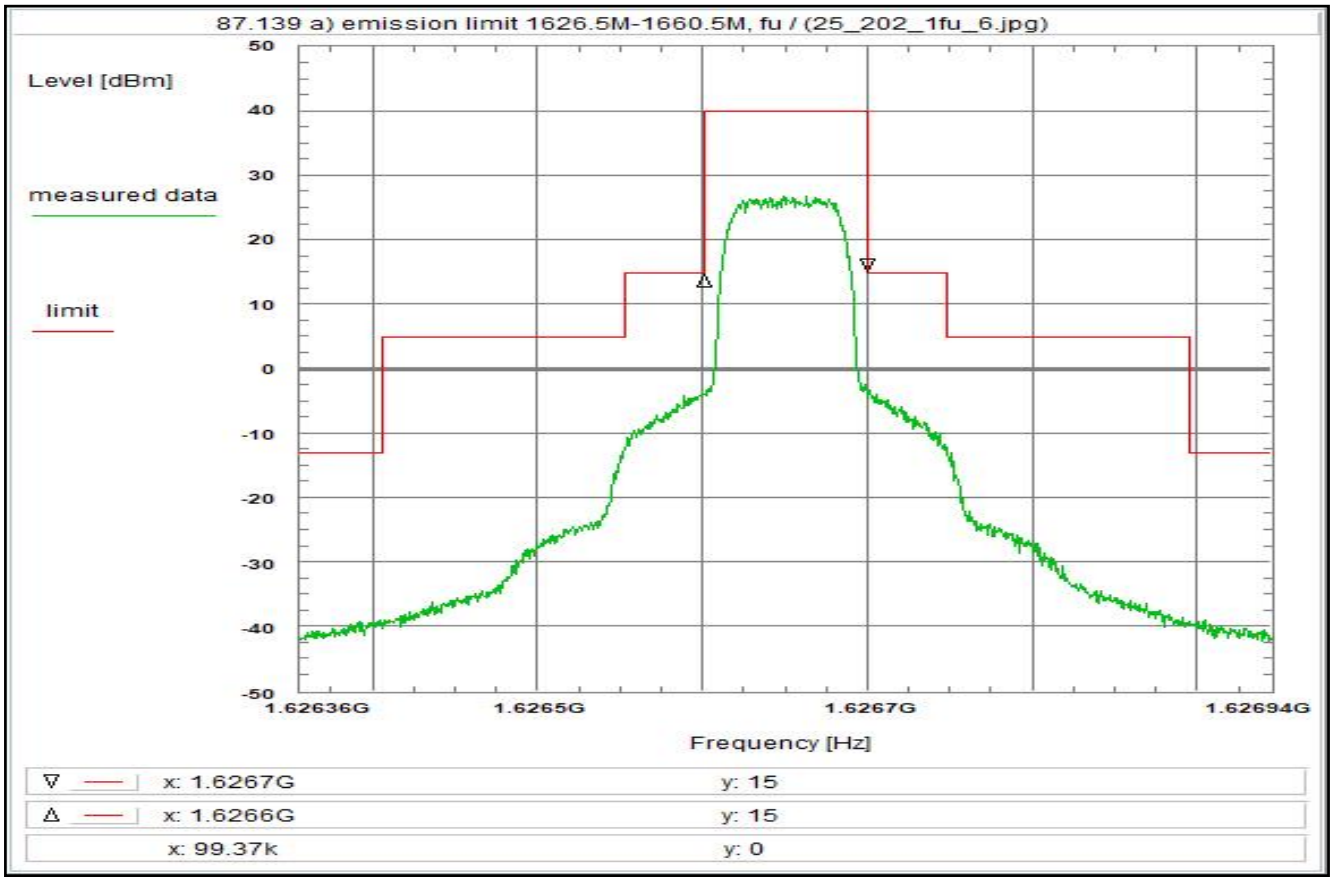
Correction:

| | | | |
|---|---|---|---|
| Directional coupler | + | 0.0 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U330) | + | 31.9 | dB |
| TOTAL CORRECTION: | + | 35.4 | dB |

Remarks:
Carrier-on state / Carrier at the lower edge of the band (fu)

Reference of limit = 40 dBm
Spectrum mask referenced to necessary bandwidth

Plot No. 40




Subclause: 87.139 a)Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Limit:
Limit according to 87.139 a):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with the above schedule.

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fl, R20T2XD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

**Test result:** **Test passed**

Environment condition:

| | |
|---|---|
| Date & Time: | Wed 16/Aug/2023 16:49:20 |
| Location: | CTC advanced GmbH, Laboratory RC-SYS |
| Temperature: | 22 °C |
| Humidity: | 55 % |
| Voltage: | 230 Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 1.626356 | GHz |
| Stop frequency: | 1.626944 | GHz |
| Center frequency: | 1.62665 | GHz |
| Frequency span: | 588 | kHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 10 | kHz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Max-Hold | |
| Detector-Mode: | AVG | |

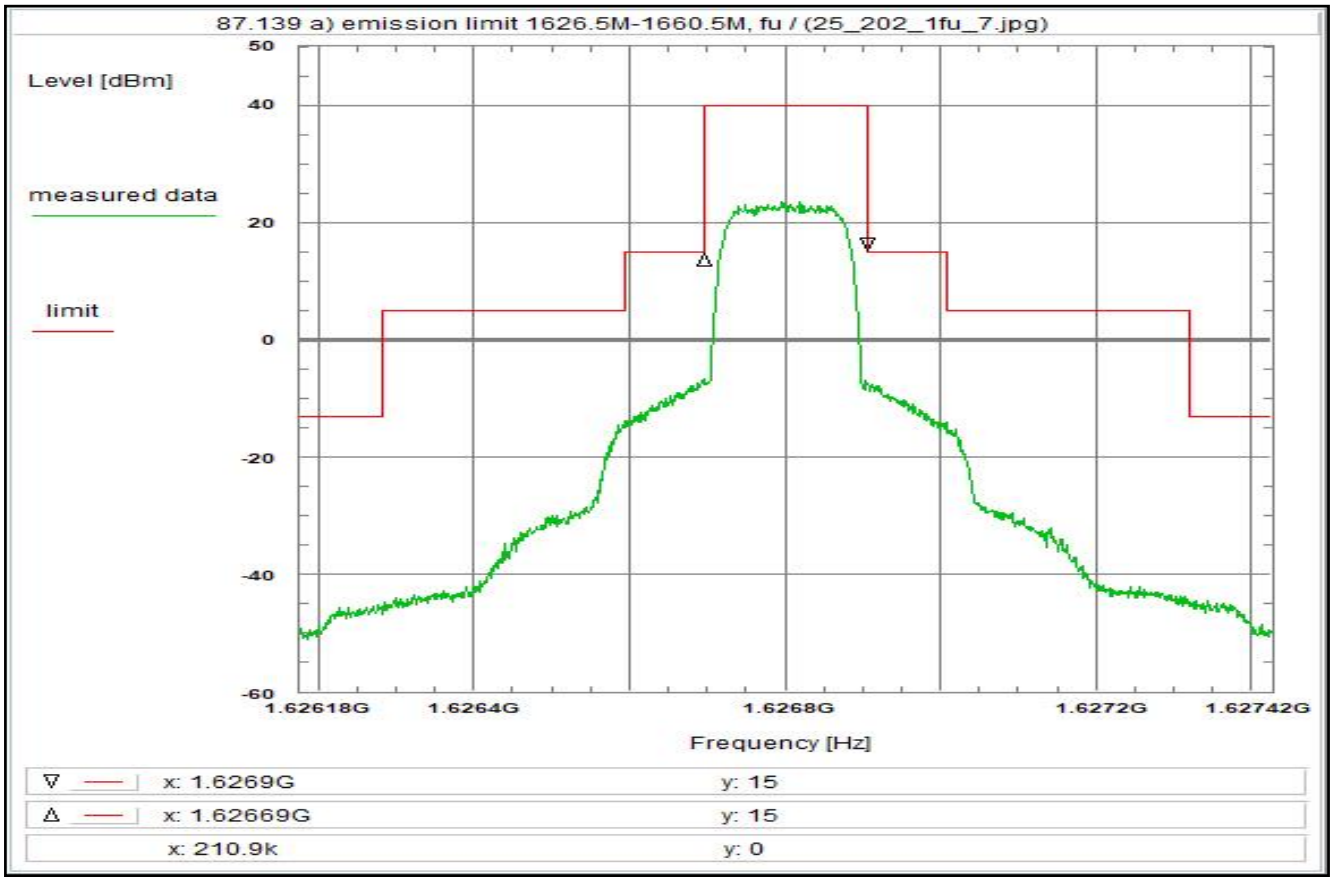
Correction:

| | | | |
|---|---|---|---|
| Directional coupler | + | 0.0 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U330) | + | 31.9 | dB |
| TOTAL CORRECTION: | + | 35.4 | dB |

Remarks:
Carrier-on state / Carrier at the lower edge of the band (fu)

Reference of limit = 40 dBm
Spectrum mask referenced to necessary bandwidth

Plot No. 41




Subclause: 87.139 a)Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Limit:
Limit according to 87.139 a):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with the above schedule.

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fl, R20T4.5XD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Wed 16/Aug/2023 16:55:45 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 1.626176 | GHz |
| Stop frequency: | 1.627424 | GHz |
| Center frequency: | 1.6268 | GHz |
| Frequency span: | 1.248 | MHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 10 | kHz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Clear Write | |
| Detector-Mode: | AVG | |

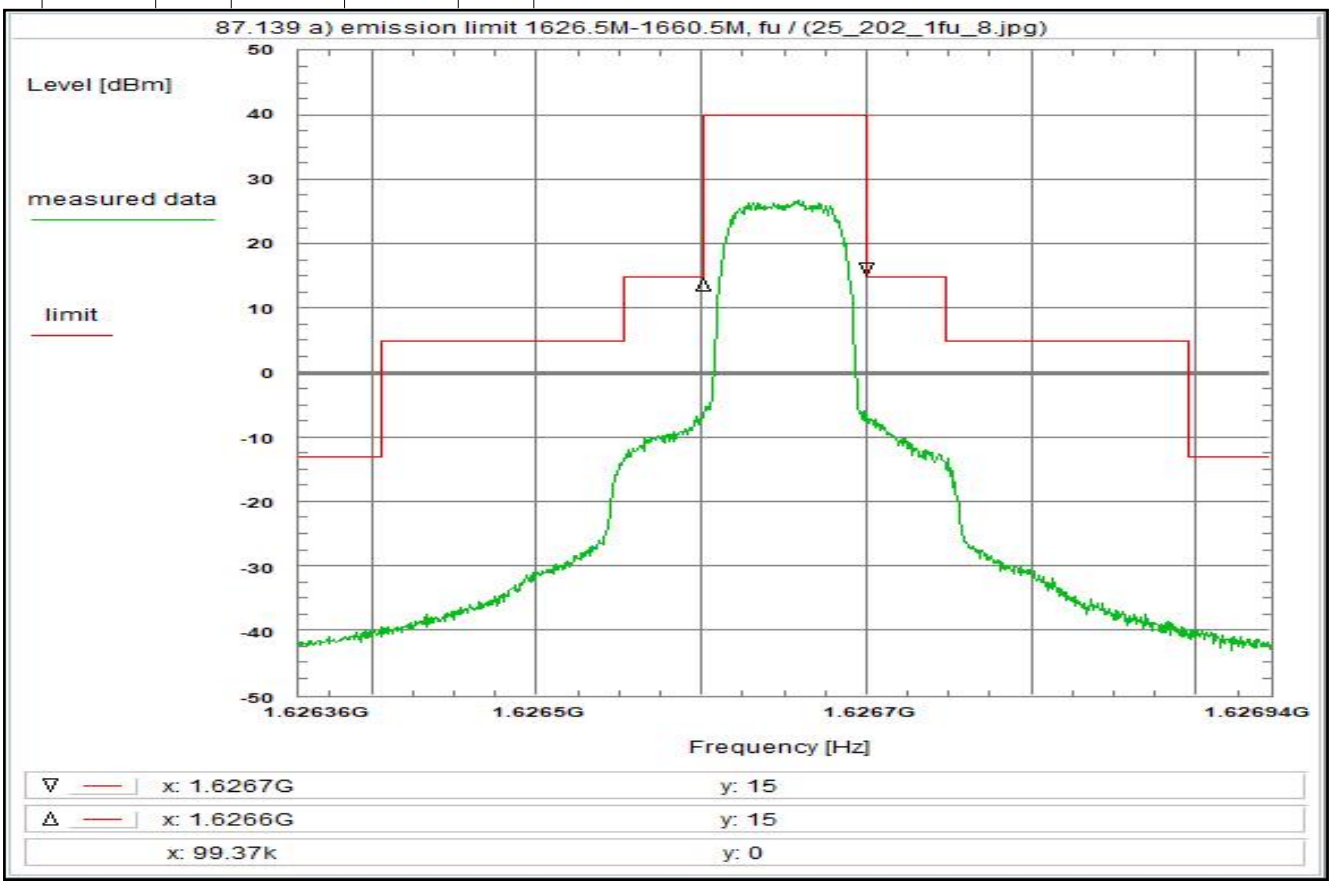
Correction:

| | | | |
|---|---|---|---|
| Directional coupler | + | 0.0 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U330) | + | 31.9 | dB |
| TOTAL CORRECTION: | + | 35.4 | dB |

Remarks:
Carrier-on state / Carrier at the lower edge of the band (fu)

Reference of limit = 40 dBm
Spectrum mask referenced to necessary bandwidth

Plot No. 42




Subclause: 87.139 a)Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Limit:
Limit according to 87.139 a):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with the above schedule.

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fl, R5T2QD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

**Test result:** **Test passed**

Environment condition:

| | |
|---|---|
| Date & Time: | Wed 16/Aug/2023 17:05:28 |
| Location: | CTC advanced GmbH, Laboratory RC-SYS |
| Temperature: | 22 °C |
| Humidity: | 55 % |
| Voltage: | 230 Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 1.626356 | GHz |
| Stop frequency: | 1.626944 | GHz |
| Center frequency: | 1.62665 | GHz |
| Frequency span: | 588 | kHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 10 | kHz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Max-Hold | |
| Detector-Mode: | AVG | |

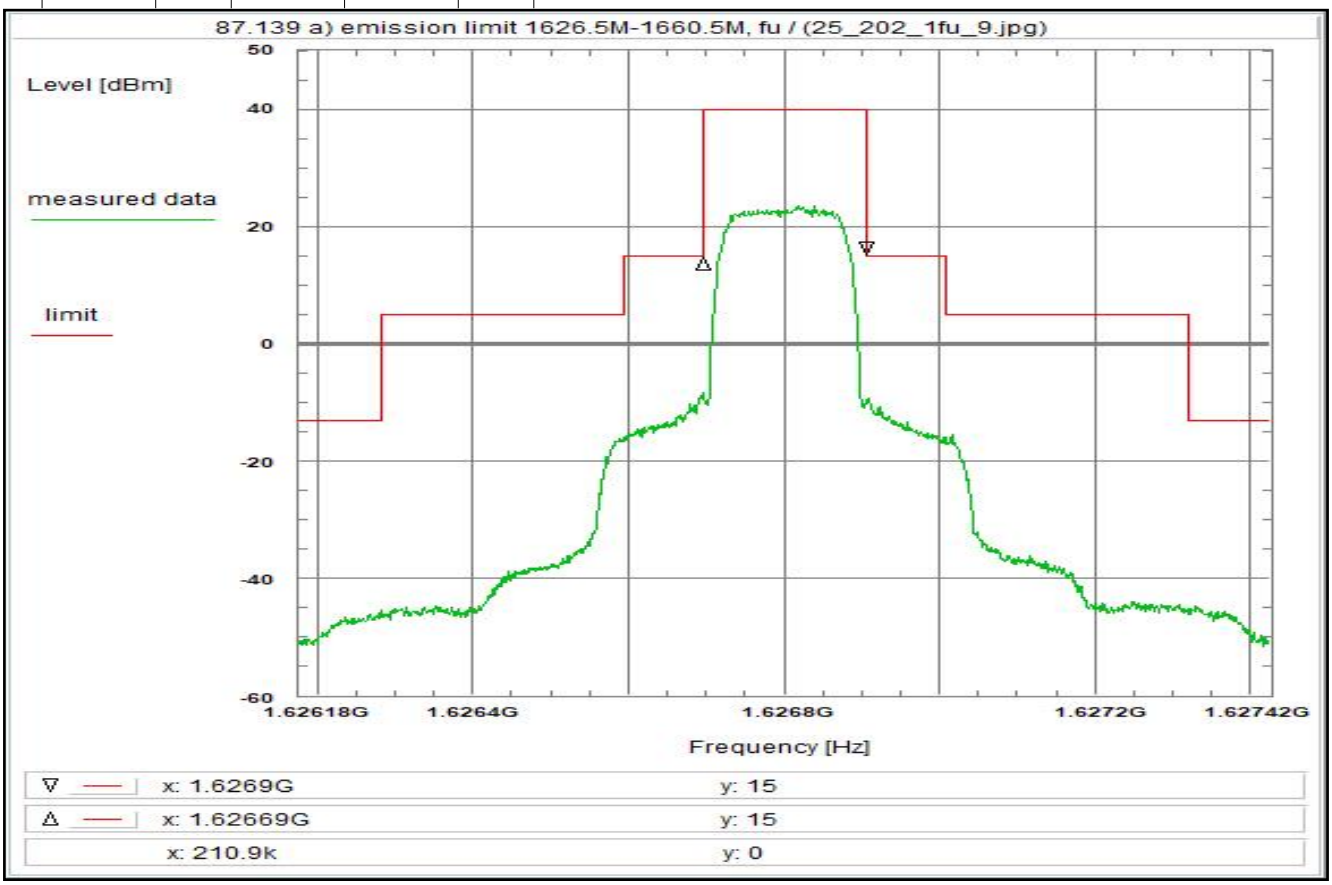
Correction:

| | | | |
|---|---|---|---|
| Directional coupler | + | 0.0 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U330) | + | 31.9 | dB |
| TOTAL CORRECTION: | + | 35.4 | dB |

Remarks:
Carrier-on state / Carrier at the lower edge of the band (fu)

Reference of limit = 40 dBm
Spectrum mask referenced to necessary bandwidth

Plot No. 43




Subclause: 87.139 a)Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Limit:
Limit according to 87.139 a):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with the above schedule.

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fl, R5T4.5QD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Wed 16/Aug/2023 18:01:04 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 1.626176 | GHz |
| Stop frequency: | 1.627424 | GHz |
| Center frequency: | 1.6268 | GHz |
| Frequency span: | 1.248 | MHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 10 | kHz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Max-Hold | |
| Detector-Mode: | AVG | |

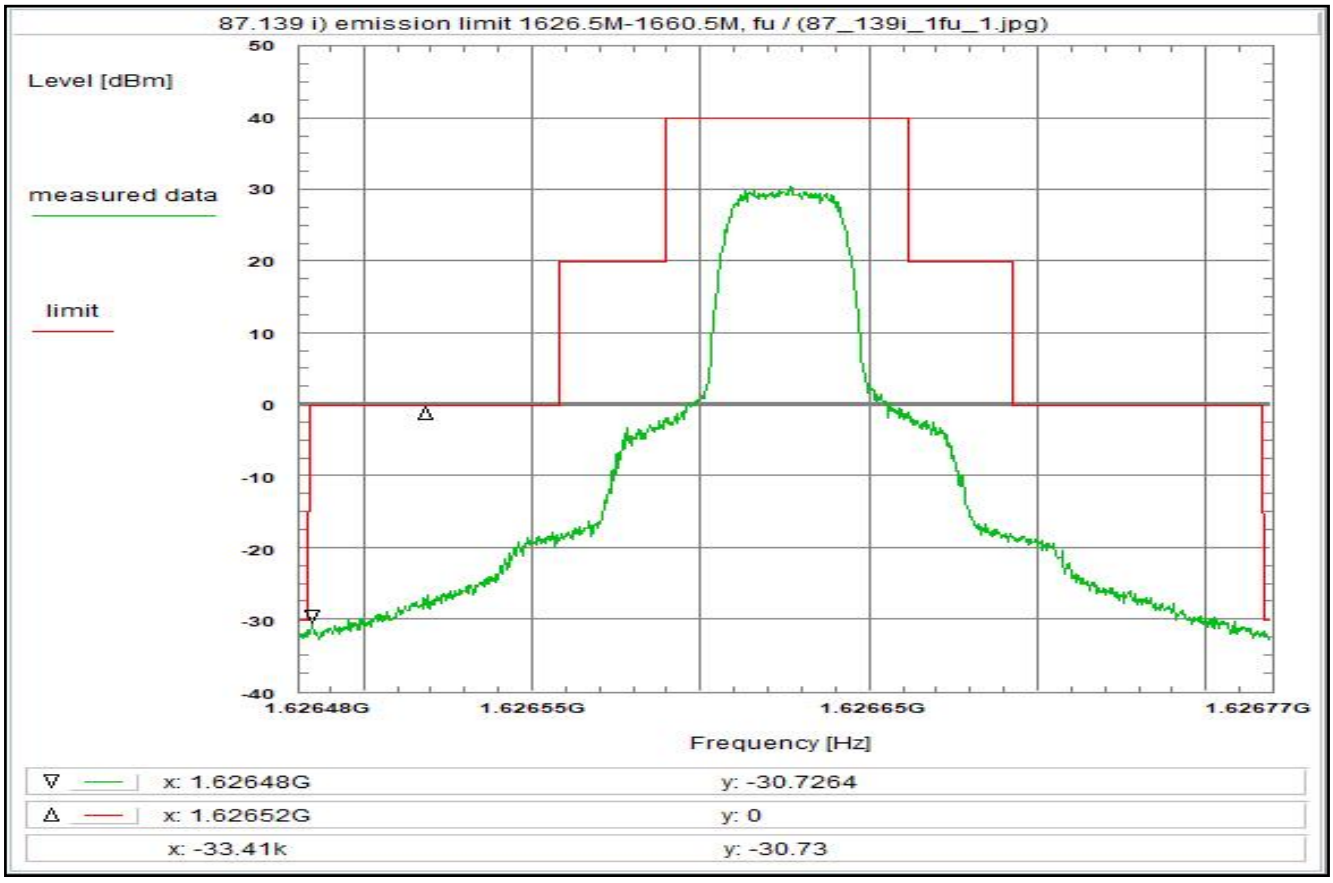
Correction:

| | | | |
|---|---|---|---|
| Directional coupler | + | 0.0 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U330) | + | 31.9 | dB |
| TOTAL CORRECTION: | + | 35.4 | dB |

Remarks:
Carrier-on state / Carrier at the lower edge of the band (fu)

Reference of limit = 40 dBm
Spectrum mask referenced to necessary bandwidth

Plot No. 44




Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Limit:
Limit according to 87.139(i)(1)
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with 87.139(i)(1).

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fl, R5T1XD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: R001

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Wed 16/Aug/2023 16:05:08 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

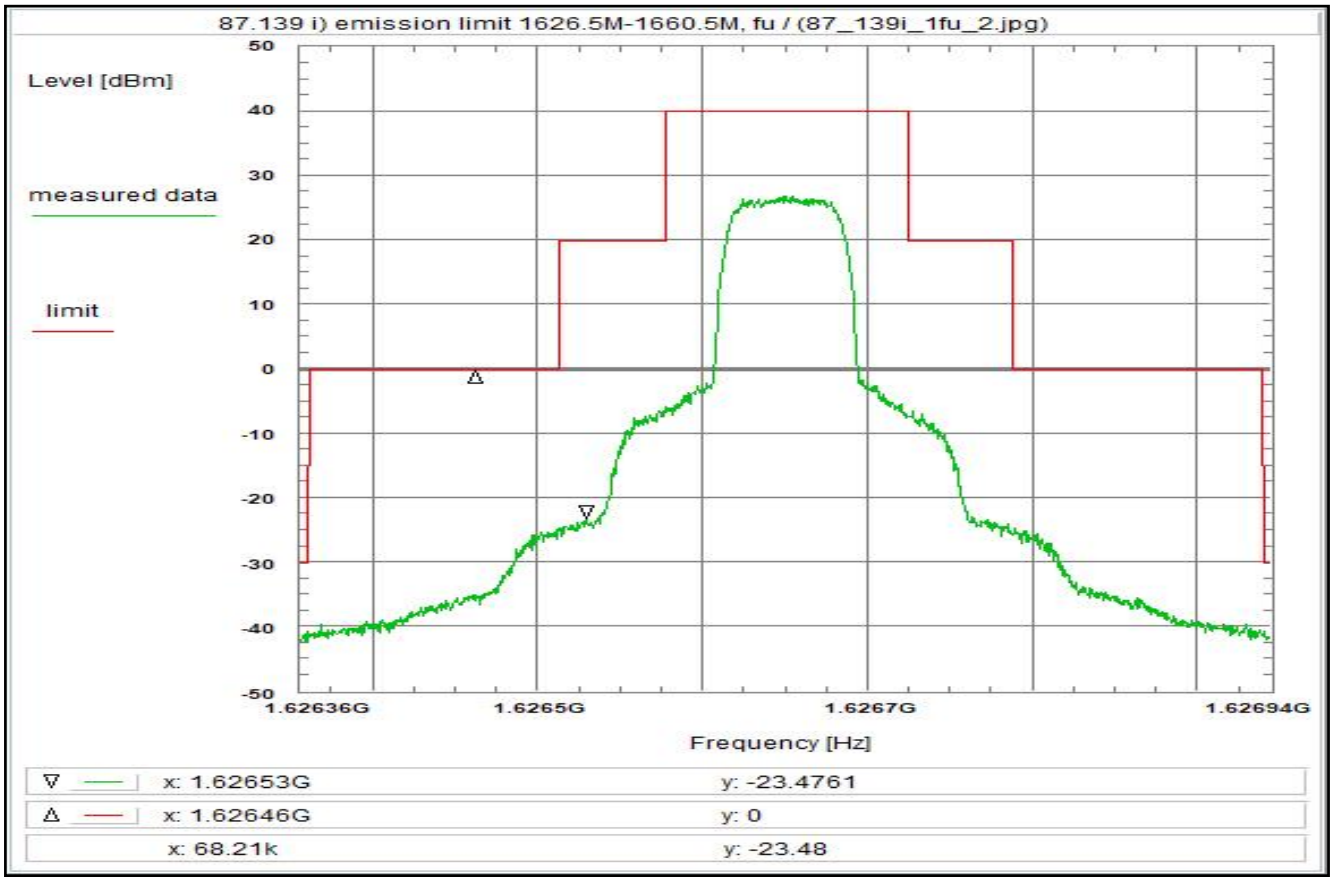
| | | |
|---|---|---|
| Start frequency: | 1.626481 | GHz |
| Stop frequency: | 1.626769 | GHz |
| Center frequency: | 1.626625 | GHz |
| Frequency span: | 288 | kHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 300 | Hz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Average | |
| Detector-Mode: | AVG | |

Correction:

| | | | |
|---|---|---|---|
| Directional coupler | + | 0.0 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U330) | + | 31.9 | dB |
| TOTAL CORRECTION: | + | 35.4 | dB |

Remarks:
Carrier-on state / Carrier at the lower edge of the band (fu)
For EIRP calculation:
´worst-case´ = maximum antenna gain

Plot No. 45




Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Limit:
Limit according to 87.139(i)(1)
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with 87.139(i)(1).

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fl, R5T2XD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: R001

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Wed 16/Aug/2023 16:07:41 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

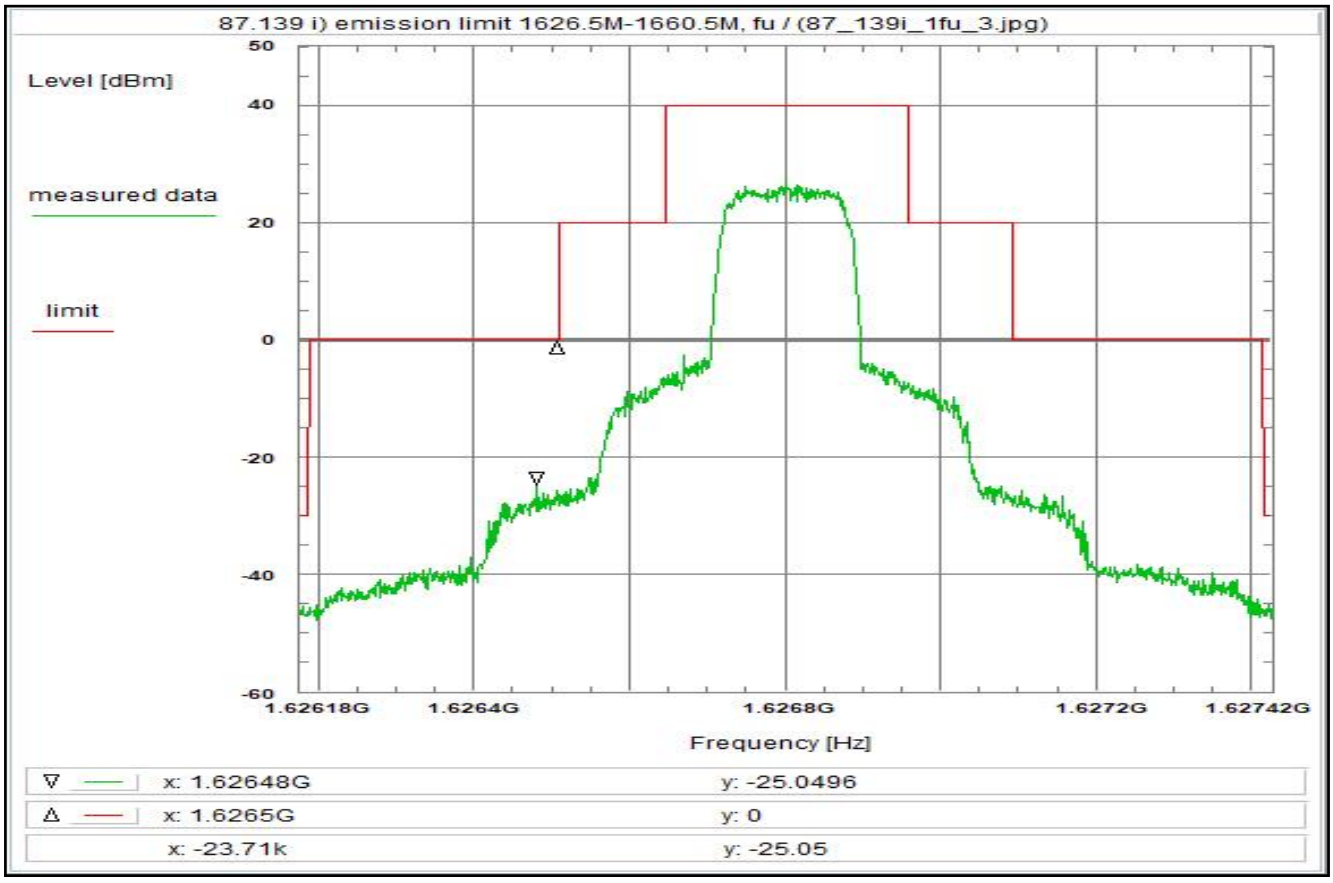
| | | |
|---|---|---|
| Start frequency: | 1.626356 | GHz |
| Stop frequency: | 1.626944 | GHz |
| Center frequency: | 1.62665 | GHz |
| Frequency span: | 588 | kHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 300 | Hz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Average | |
| Detector-Mode: | AVG | |

Correction:

| | | | |
|---|---|---|---|
| Directional coupler | + | 0.0 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U330) | + | 31.9 | dB |
| TOTAL CORRECTION: | + | 35.4 | dB |

Remarks:
Carrier-on state / Carrier at the lower edge of the band (fu)
For EIRP calculation:
´worst-case´ = maximum antenna gain

Plot No. 46




Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Limit:
Limit according to 87.139(i)(1)
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with 87.139(i)(1).

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fl, R5T4.5XD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Wed 16/Aug/2023 16:34:53 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

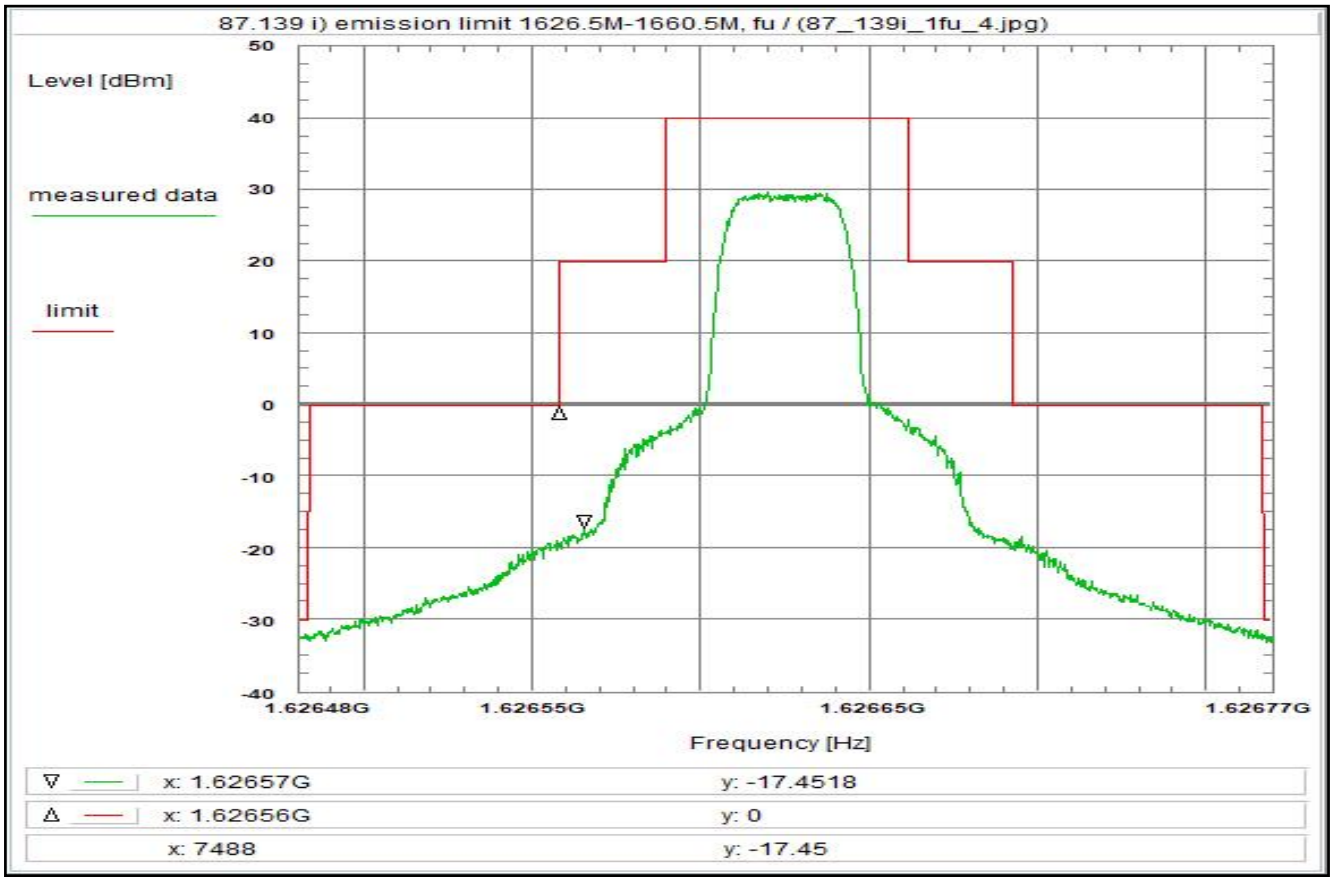
| | | |
|---|---|---|
| Start frequency: | 1.626176 | GHz |
| Stop frequency: | 1.627424 | GHz |
| Center frequency: | 1.6268 | GHz |
| Frequency span: | 1.248 | MHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 300 | Hz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Max-Hold | |
| Detector-Mode: | AVG | |

Correction:

| | | | |
|---|---|---|---|
| Directional coupler | + | 0.0 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U330) | + | 31.9 | dB |
| TOTAL CORRECTION: | + | 35.4 | dB |

Remarks:
Carrier-on state / Carrier at the lower edge of the band (fu)
For EIRP calculation:
´worst-case´ = maximum antenna gain

Plot No. 47




Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Limit:
Limit according to 87.139(i)(1)
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with 87.139(i)(1).

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fl, R20T1XD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Wed 16/Aug/2023 16:37:36 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

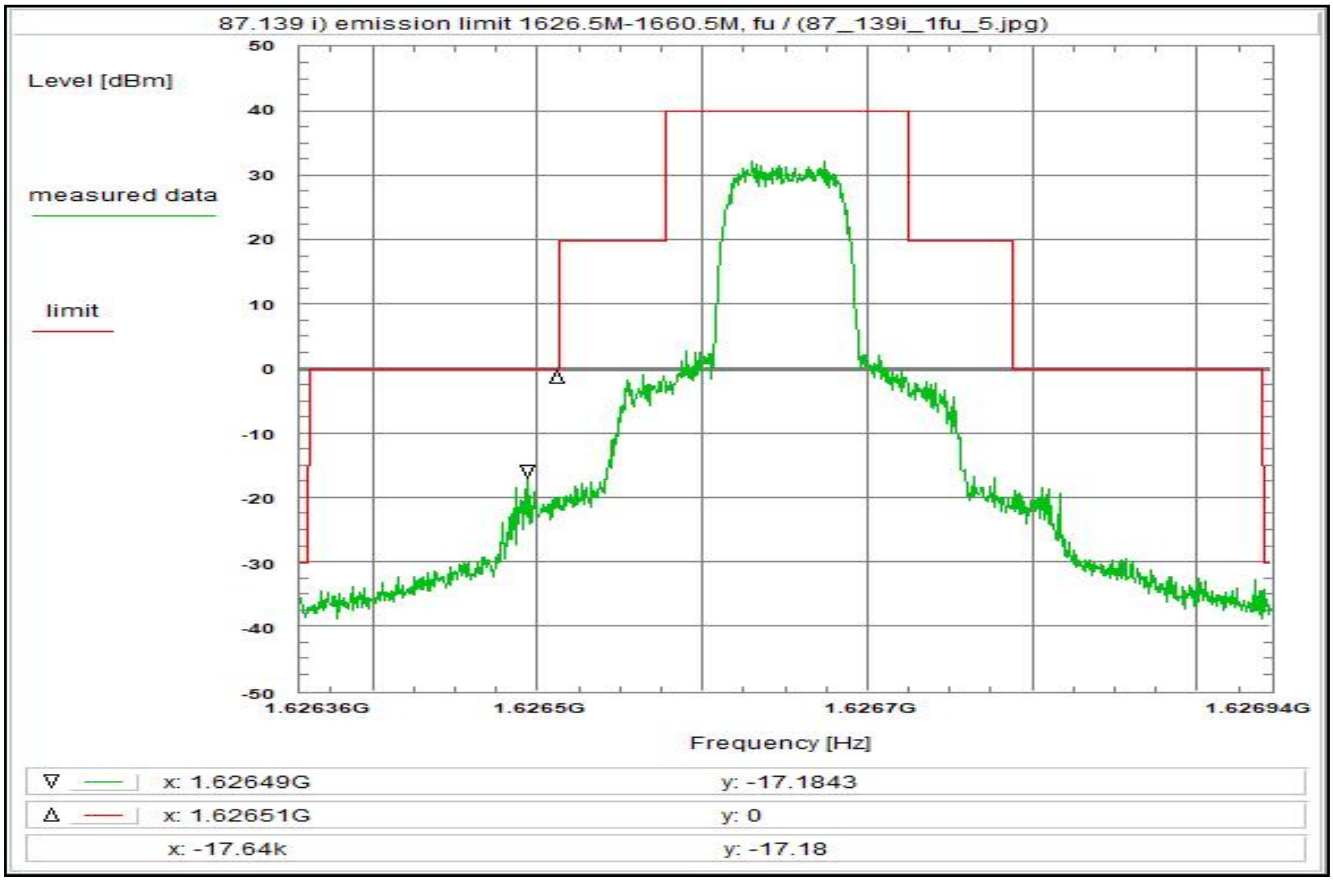
| | | |
|---|---|---|
| Start frequency: | 1.626481 | GHz |
| Stop frequency: | 1.626769 | GHz |
| Center frequency: | 1.626625 | GHz |
| Frequency span: | 288 | kHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 300 | Hz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Average | |
| Detector-Mode: | AVG | |

Correction:

| | | | |
|---|---|---|---|
| Directional coupler | + | 0.0 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U330) | + | 31.9 | dB |
| TOTAL CORRECTION: | + | 35.4 | dB |

Remarks:
Carrier-on state / Carrier at the lower edge of the band (fu)
For EIRP calculation:
´worst-case´ = maximum antenna gain

Plot No. 48




Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Limit:
Limit according to 87.139(i)(1)
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with 87.139(i)(1).

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fl, R20T2XD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: R001

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Wed 16/Aug/2023 16:50:26 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 1.626356 | GHz |
| Stop frequency: | 1.626944 | GHz |
| Center frequency: | 1.62665 | GHz |
| Frequency span: | 588 | kHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 300 | Hz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Max-Hold | |
| Detector-Mode: | AVG | |

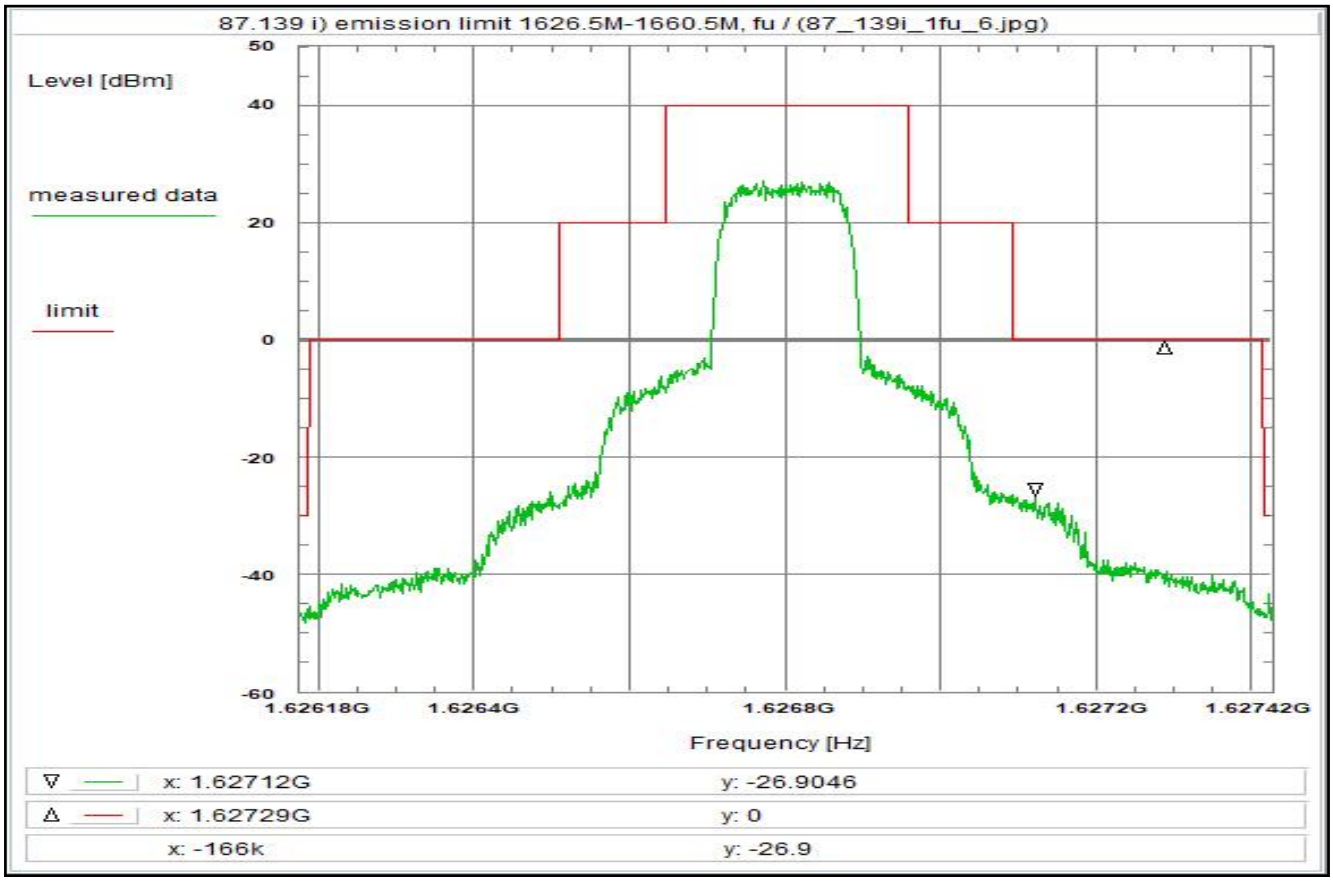
Correction:

| | | | |
|---|---|---|---|
| Directional coupler | + | 0.0 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U330) | + | 31.9 | dB |
| TOTAL CORRECTION: | + | 35.4 | dB |

Remarks:
Carrier-on state / Carrier at the lower edge of the band (fu)
For EIRP calculation:
´worst-case´ = maximum antenna gain

Reference of limit = 40 dBm
Spectrum mask referenced to necessary bandwidth

Plot No. 49




Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Limit:
Limit according to 87.139(i)(1)
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with 87.139(i)(1).

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fl, R20T4.5XD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Wed 16/Aug/2023 16:57:23 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

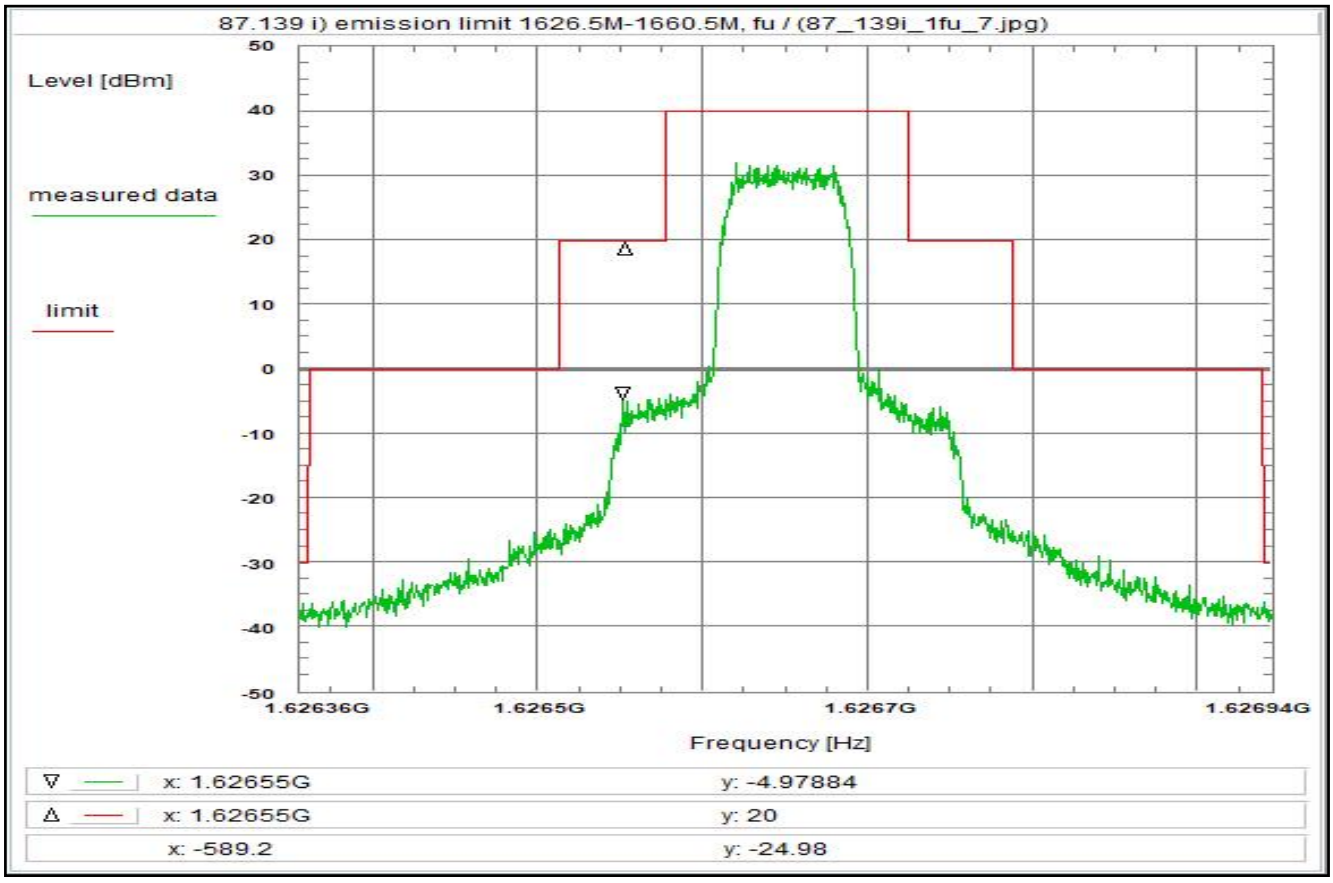
| | | |
|---|---|---|
| Start frequency: | 1.626176 | GHz |
| Stop frequency: | 1.627424 | GHz |
| Center frequency: | 1.6268 | GHz |
| Frequency span: | 1.248 | MHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 300 | Hz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Max-Hold | |
| Detector-Mode: | AVG | |

Correction:

| | | | |
|---|---|---|---|
| Directional coupler | + | 0.0 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U330) | + | 31.9 | dB |
| TOTAL CORRECTION: | + | 35.4 | dB |

Remarks:
Carrier-on state / Carrier at the lower edge of the band (fu)
For EIRP calculation:
´worst-case´ = maximum antenna gain

Plot No. 50




Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Limit:
Limit according to 87.139(i)(1)
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with 87.139(i)(1).

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fl, R5T2QD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Wed 16/Aug/2023 17:57:11 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 1.626356 | GHz |
| Stop frequency: | 1.626944 | GHz |
| Center frequency: | 1.62665 | GHz |
| Frequency span: | 588 | kHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 300 | Hz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Max-Hold | |
| Detector-Mode: | AVG | |

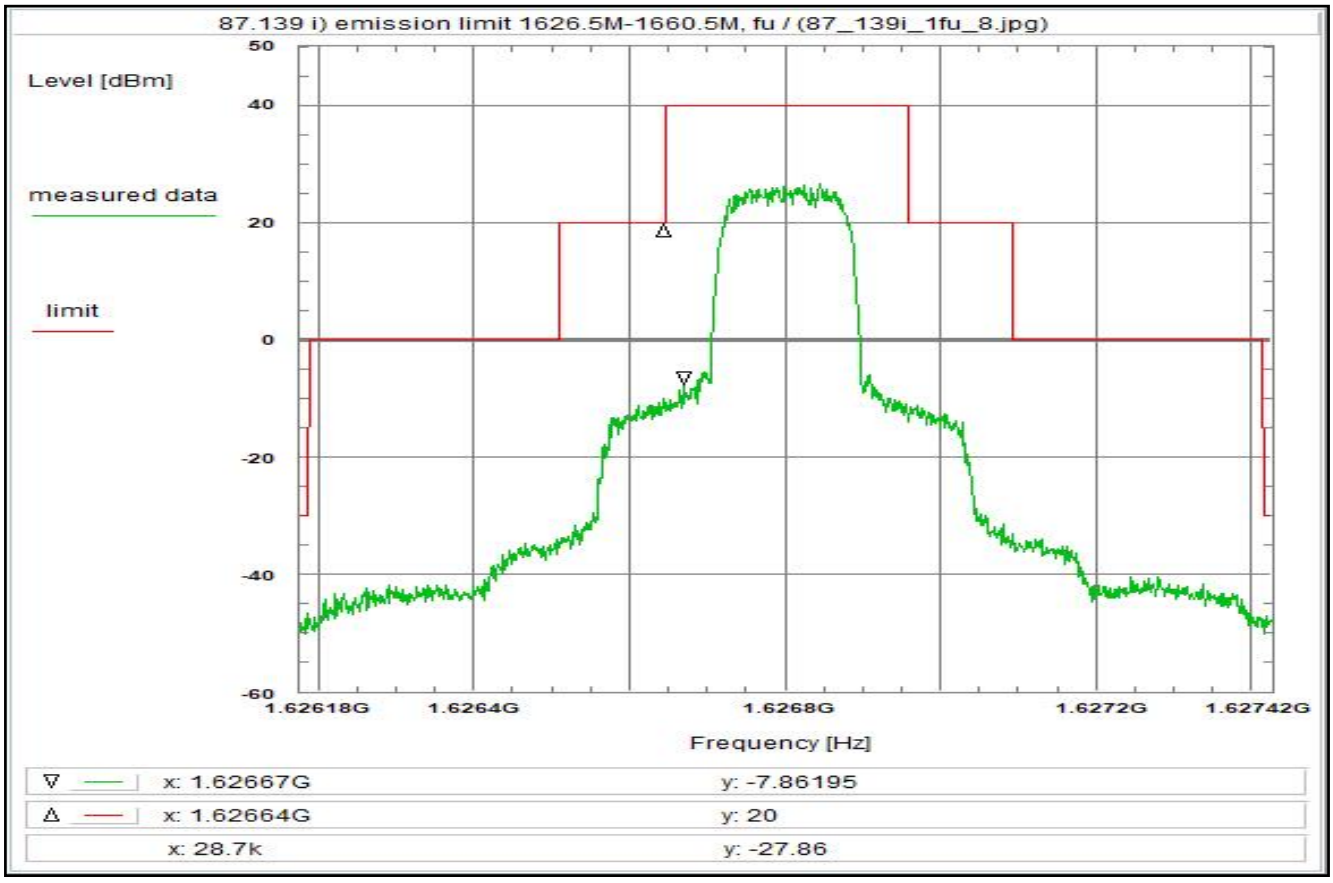
Correction:

| | | | |
|---|---|---|---|
| Directional coupler | + | 0.0 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U330) | + | 31.9 | dB |
| TOTAL CORRECTION: | + | 35.4 | dB |

Remarks:
Carrier-on state / Carrier at the lower edge of the band (fu)
For EIRP calculation:
´worst-case´ = maximum antenna gain

Reference of limit = 40 dBm
Spectrum mask referenced to necessary bandwidth

Plot No. 51




Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Limit:
Limit according to 87.139(i)(1)
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with 87.139(i)(1).

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fl, R5T4.5QD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: R001

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Wed 16/Aug/2023 18:02:11 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 1.626176 | GHz |
| Stop frequency: | 1.627424 | GHz |
| Center frequency: | 1.6268 | GHz |
| Frequency span: | 1.248 | MHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 300 | Hz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Max-Hold | |
| Detector-Mode: | AVG | |

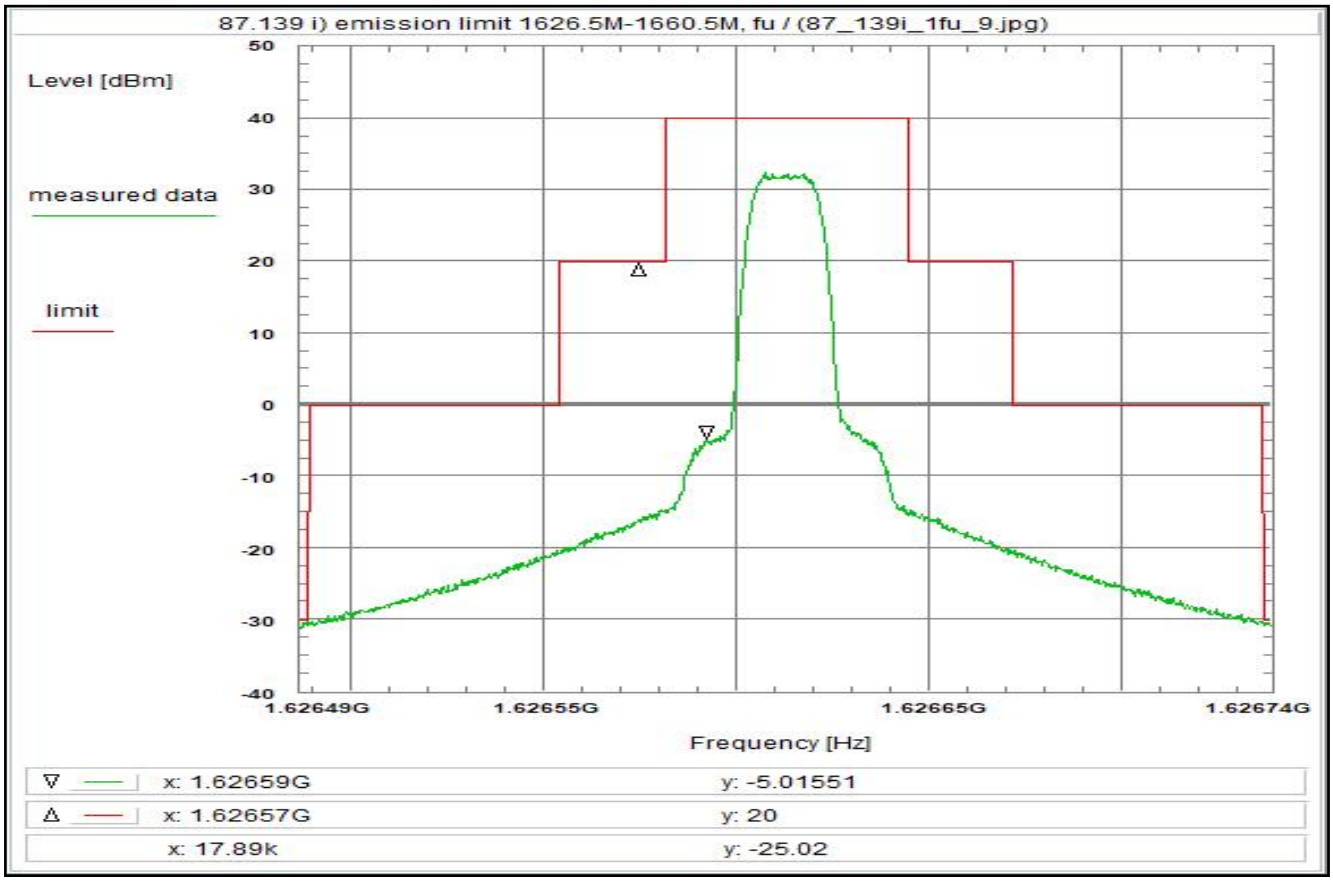
Correction:

| | | | |
|---|---|---|---|
| Directional coupler | + | 0.0 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U330) | + | 31.9 | dB |
| TOTAL CORRECTION: | + | 35.4 | dB |

Remarks:
Carrier-on state / Carrier at the lower edge of the band (fu)
For EIRP calculation:
´worst-case´ = maximum antenna gain

Reference of limit = 40 dBm
Spectrum mask referenced to necessary bandwidth

Plot No. 52




Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Limit:
Limit according to 87.139(i)(1)
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with 87.139(i)(1).

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fl, R20T0.5QD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: R001

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Wed 16/Aug/2023 18:14:42 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 1.6264865 | GHz |
| Stop frequency: | 1.6267385 | GHz |
| Center frequency: | 1.6266125 | GHz |
| Frequency span: | 252 | kHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 300 | Hz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Average | |
| Detector-Mode: | AVG | |

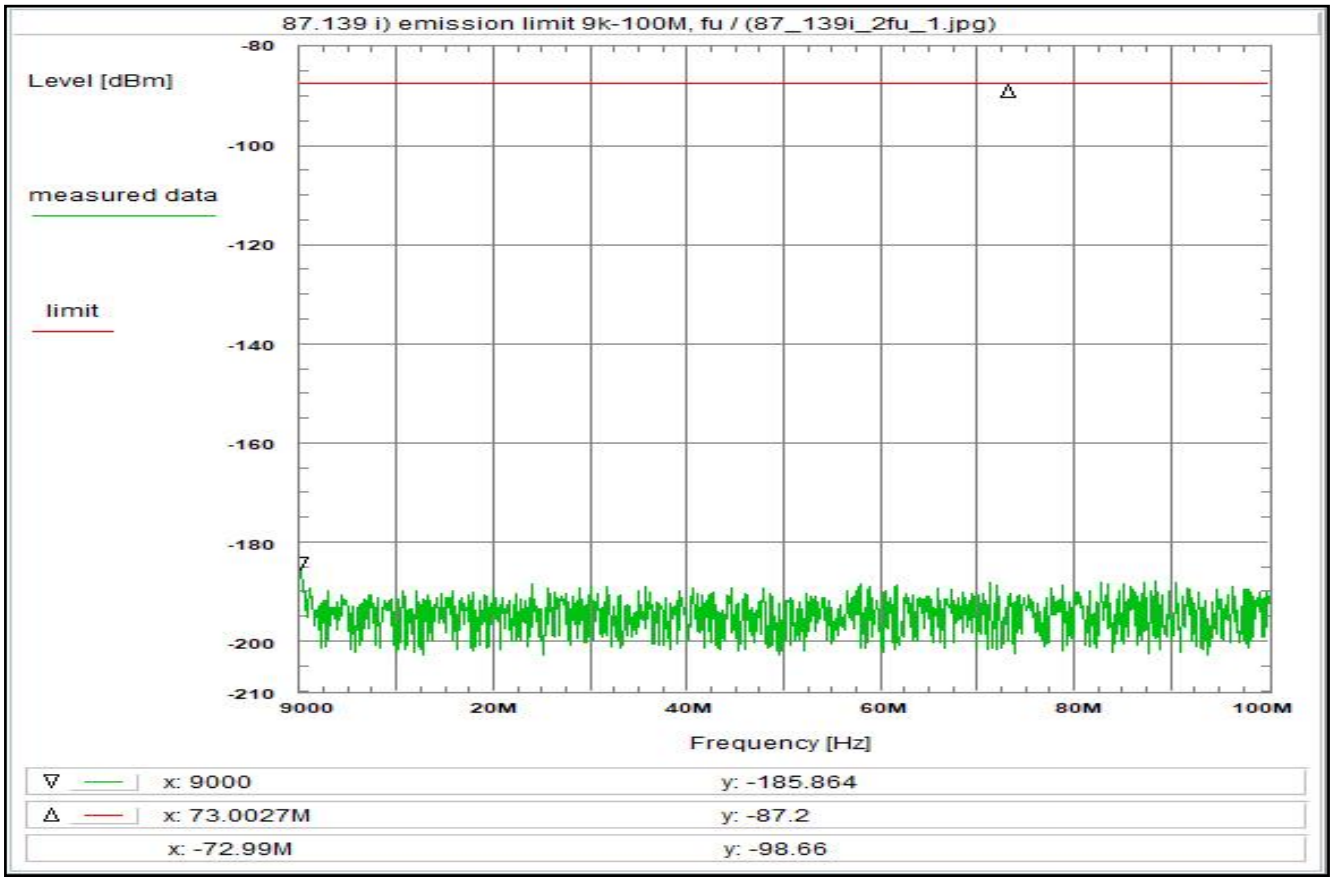
Correction:

| | | | |
|---|---|---|---|
| Directional coupler | + | 0.0 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U330) | + | 31.9 | dB |
| TOTAL CORRECTION: | + | 35.4 | dB |

Remarks:
Carrier-on state / Carrier at the lower edge of the band (fu)
For EIRP calculation:
´worst-case´ = maximum antenna gain

Reference of limit = 40 dBm
Spectrum mask referenced to necessary bandwidth

Plot No. 53




Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Limit:
Limit according to 87.139(i)(1)
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with 87.139(i)(1).

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fl, max hold, valid for all modulations

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330, W_RE, W_REJF

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Wed 23/Aug/2023 19:06:45 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 9 | kHz |
| Stop frequency: | 100 | MHz |
| Center frequency: | 50.0045 | MHz |
| Frequency span: | 99.991 | MHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 10 | kHz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Max-Hold | |
| Detector-Mode: | AVG | |

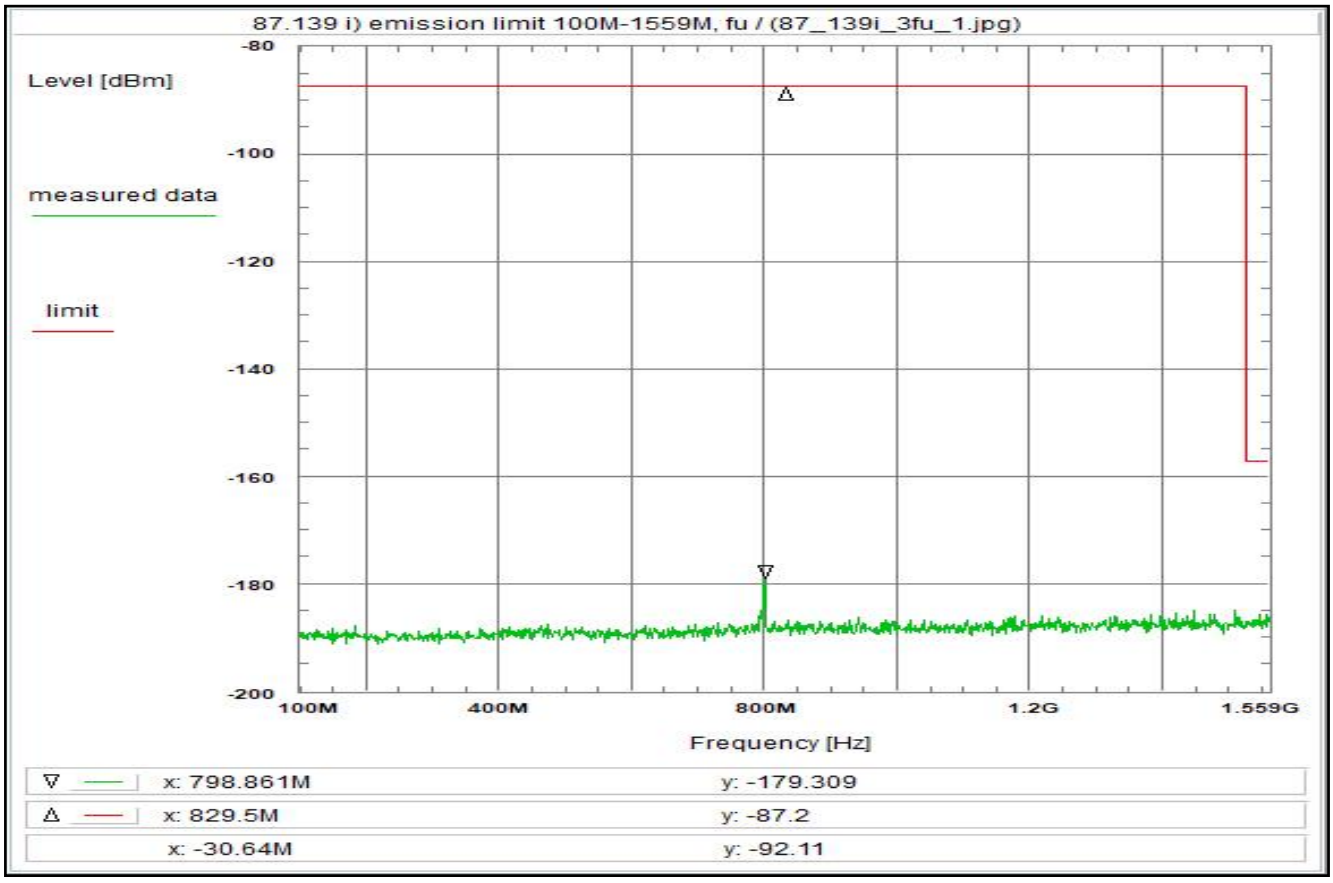
Correction:

| | | | |
|---|---|---|---|
| (W_RE) | - | 120.0 | dB |
| Coaxial cable (C220) | + | 0.2 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U330) | + | 31.3 | dB |
| TOTAL CORRECTION: | - | -85.9 | dB |

Remarks:
Carrier-on state / Carrier at the lower edge of the band (fu)
For EIRP calculation:
´worst-case´ = maximum antenna gain

Since the measurement was updated with the maximum antenna gain, which is 5.23 dBic, the corrected value of the marker is -182 dBm

Plot No. 54




Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Limit:
Limit according to 87.139(i)(1)
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with 87.139(i)(1).

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fl, max hold, valid for all modulations

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Wed 23/Aug/2023 09:27:27 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 100 | MHz |
| Stop frequency: | 1.559 | GHz |
| Center frequency: | 829.5 | MHz |
| Frequency span: | 1.459 | GHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 10 | kHz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Max-Hold | |
| Detector-Mode: | AVG | |

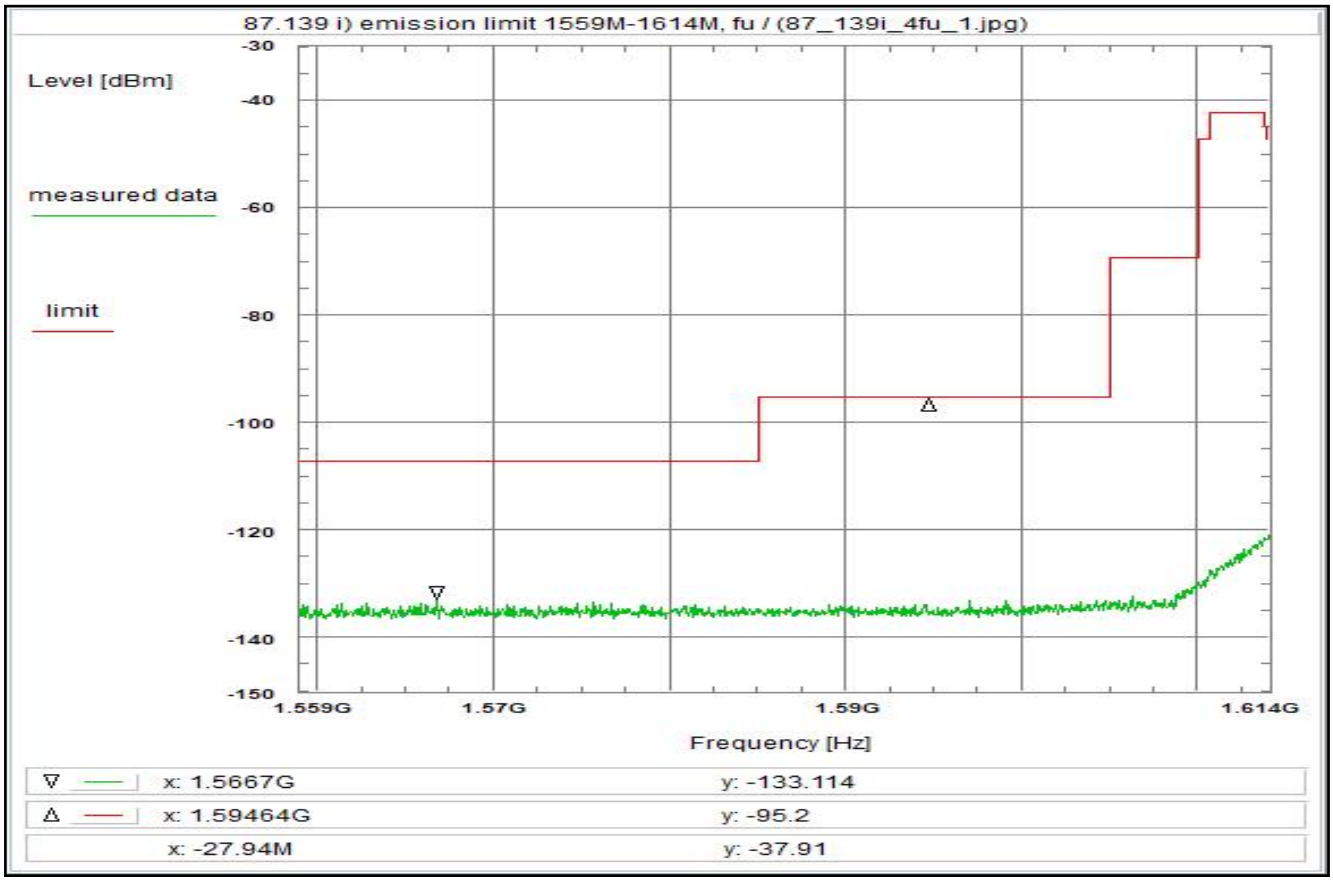
Correction:

| | | | |
|---|---|---|---|
| (W_RE) | - | 115.7 | dB |
| Coaxial cable | + | 0.6 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U330) | + | 31.7 | dB |
| TOTAL CORRECTION: | - | -80.8 | dB |

Remarks:
Carrier-on state / Carrier at the lower edge of the band (fu)
For EIRP calculation:
´worst-case´ = maximum antenna gain

Since the measurement was updated with the maximum antenna gain, which is 5.23 dBic, the corrected value of the marker is-175 dBm

Plot No. 55




Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Limit:
Limit according to 87.139(i)(1)
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with 87.139(i)(1).

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fl, max hold, valid for all modulations

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U331, W_RE

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Wed 23/Aug/2023 11:23:47 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 1.559 | GHz |
| Stop frequency: | 1.614 | GHz |
| Center frequency: | 1.5865 | GHz |
| Frequency span: | 55 | MHz |
| Resolution-BW: | 1 | MHz |
| Video-BW: | 3 | MHz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Max-Hold | |
| Detector-Mode: | AVG | |

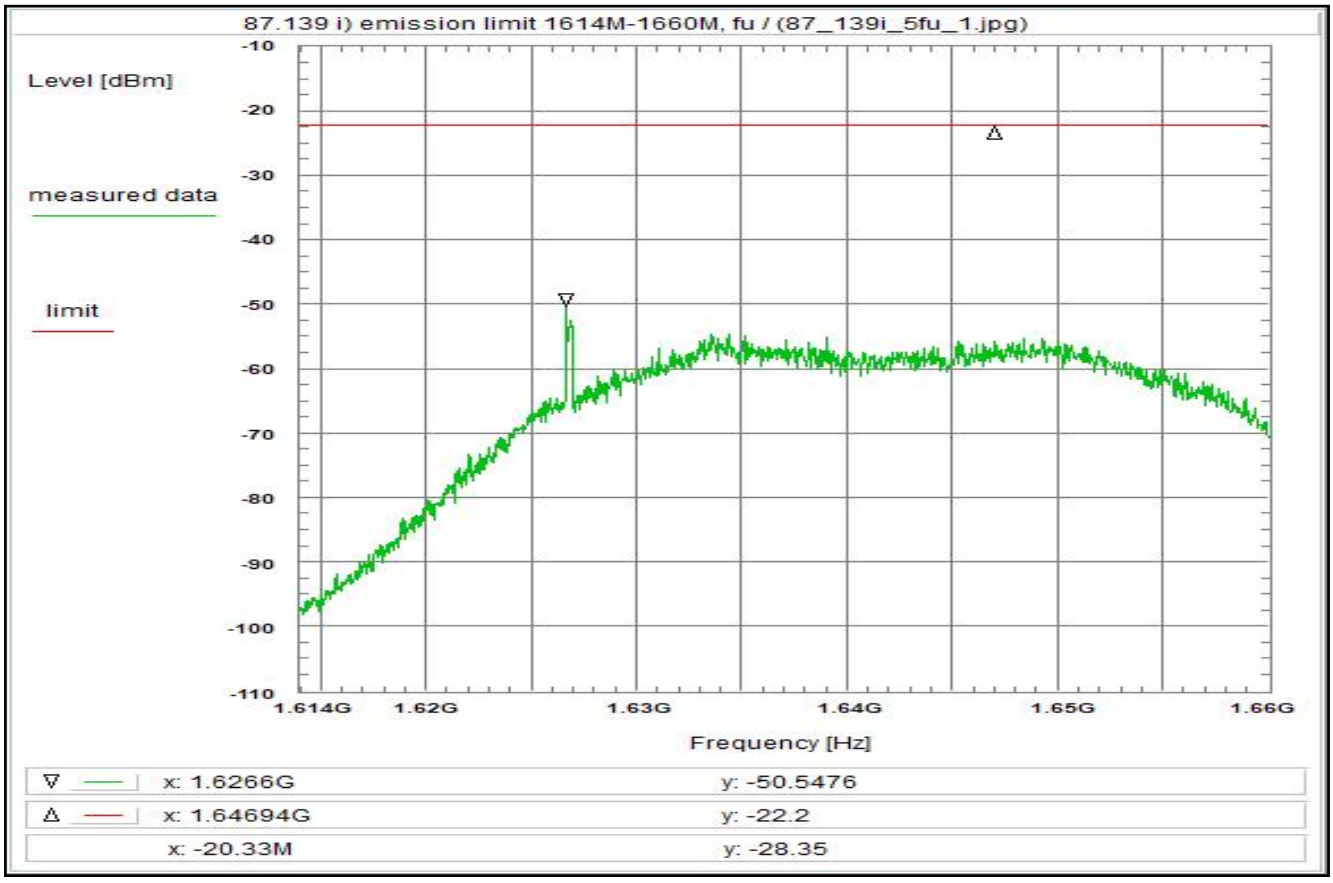
Correction:

| | | | |
|---|---|---|---|
| (W_RE) | - | 104.1 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor | + | 0.0 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U331) | + | 32.6 | dB |
| TOTAL CORRECTION: | - | -69.2 | dB |

Remarks:
Carrier-on state / Carrier at the lower edge of the band (fu)
For EIRP calculation:
´worst-case´ = maximum antenna gain

Since the measurement was updated with the maximum antenna gain, which is 5.23 dBic, the corrected value of the marker is -129 dBm

Plot No. 56




Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Limit:
Limit according to 87.139(i)(1)
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with 87.139(i)(1).

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fl, max hold, valid for all modulations

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U331

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Wed 23/Aug/2023 14:30:49 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 1.614 | GHz |
| Stop frequency: | 1.66 | GHz |
| Center frequency: | 1.637 | GHz |
| Frequency span: | 46 | MHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 10 | kHz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Max-Hold | |
| Detector-Mode: | AVG | |

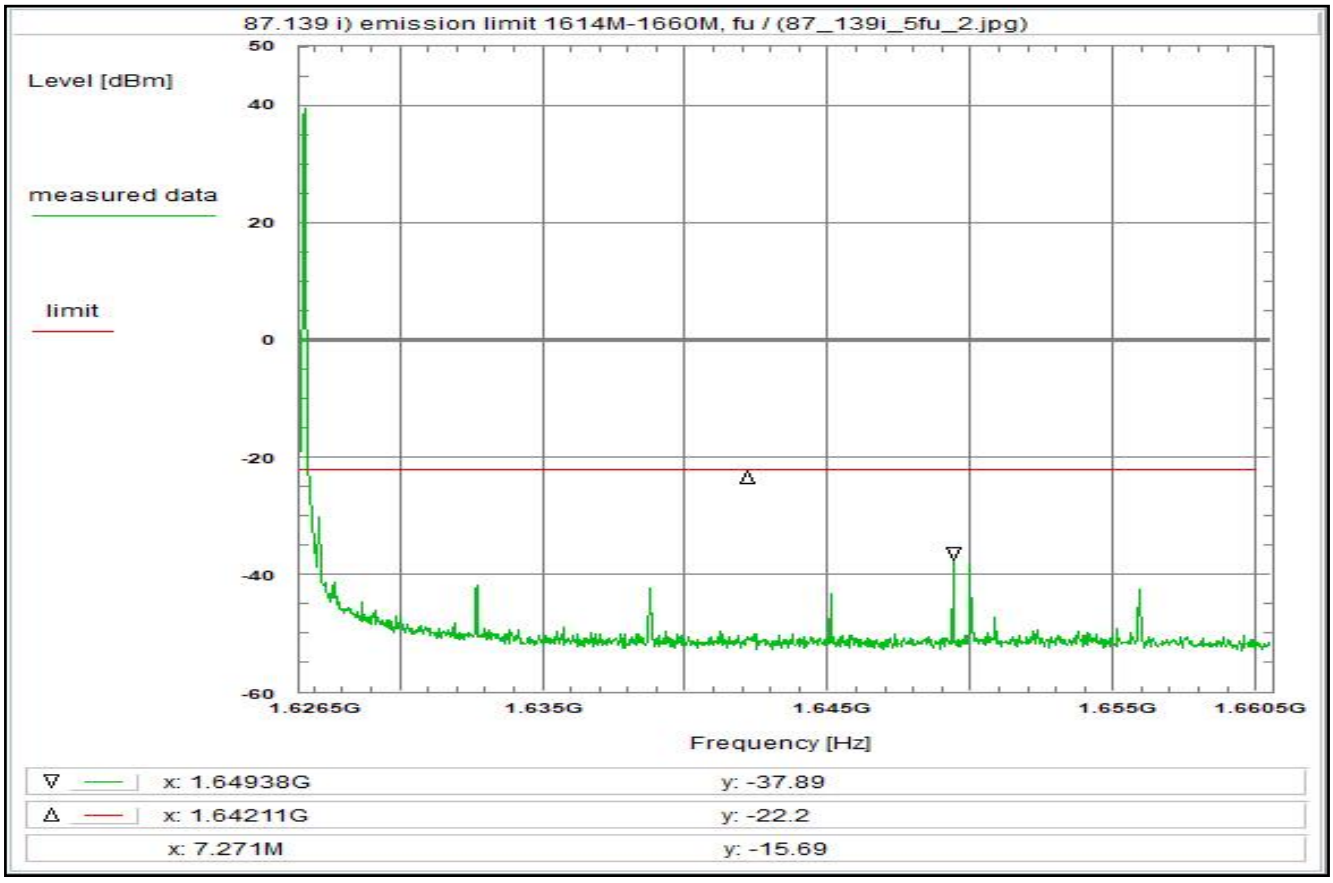
Correction:

| | | | |
|---|---|---|---|
| (W_RE) | - | 47.8 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U331) | + | 74.2 | dB |
| TOTAL CORRECTION: | + | 29.9 | dB |

Remarks:
Carrier-on state / Carrier at the lower edge of the band (fu)
For EIRP calculation:
´worst-case´ = maximum antenna gain

Since the measurement was updated with the maximum antenna gain, which is 5.23 dBic, the corrected value of the marker is -46.7 dBm

Plot No. 57




Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Limit:
Limit according to 87.139(i)(1)
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with 87.139(i)(1).

Test results:

| No. | Frequency | Level | Acceptance | Exceeding | Limit | Exceeding |
|---|---|---|---|---|---|---|
| # | Hz | dBm | dBm | dB | dBm | dB |
| 1 | 1.6600G | -27.4 | -32.2 | 4.8 | -22.2 | -5.2 |

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fl, max hold, valid for all modulations

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

Test result: Test passed

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Fri 25/Aug/2023 19:08:23 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 1.6265 | GHz |
| Stop frequency: | 1.6605 | GHz |
| Center frequency: | 1.6435 | GHz |
| Frequency span: | 34 | MHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 30 | kHz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Max-Hold | |
| Detector-Mode: | Pos Peak | |

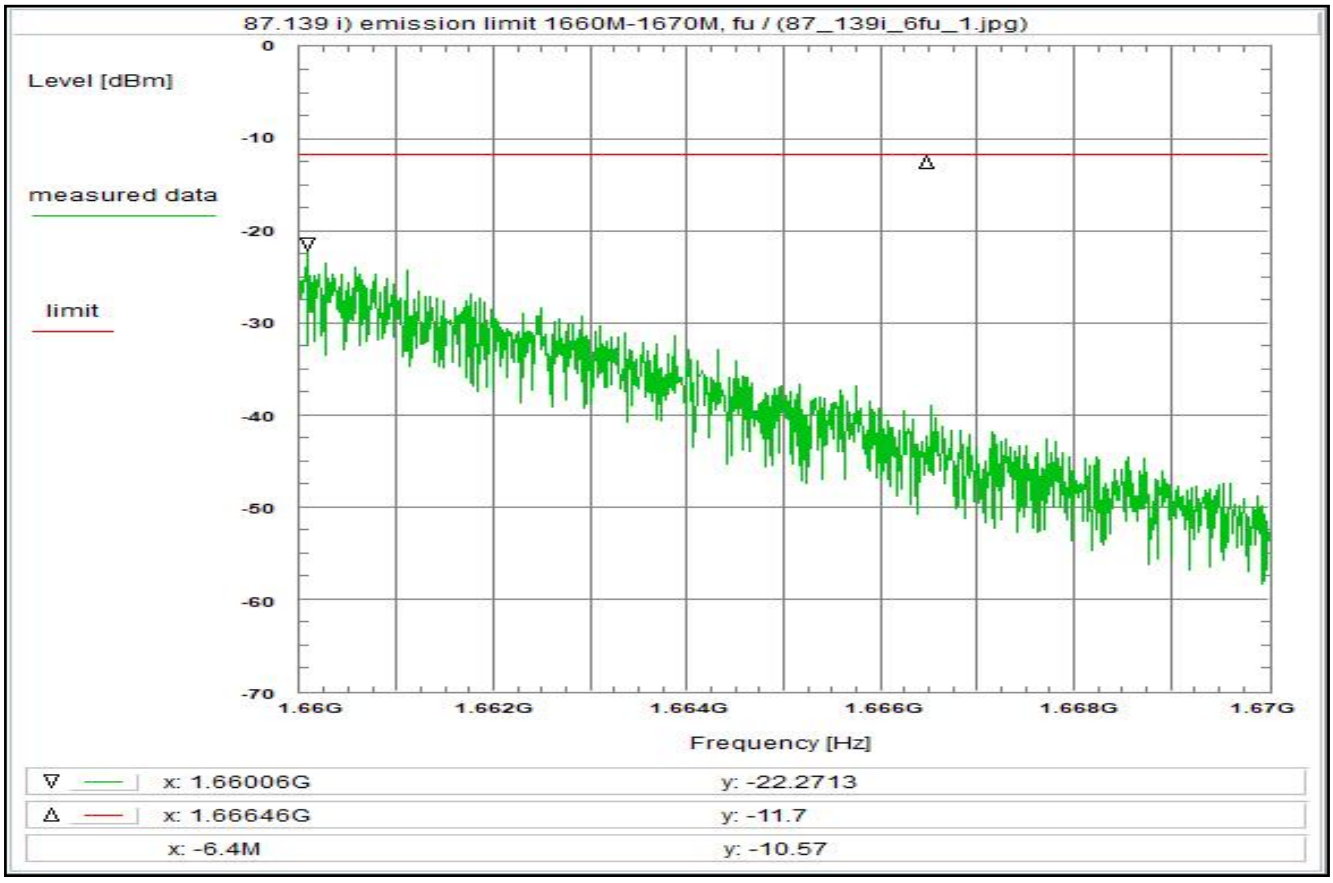
Correction:

| | | | |
|---|---|---|---|
| Directional coupler | + | 0.0 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| Freefield attenuation (U330) | + | 31.9 | dB |
| TOTAL CORRECTION: | + | 35.4 | dB |

Remarks:
Carrier-on state / Carrier at the lower edge of the band (fu)
For EIRP calculation:
´worst-case´ = maximum antenna gain

Since the measurement was updated with the maximum antenna gain, which is 5.23 dBic, the corrected value of the marker is -34.1 dBm

Plot No. 58




Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Limit:
Limit according to 87.139(i)(1)
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with 87.139(i)(1).

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fl, max hold, valid for all modulations

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U331

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Wed 23/Aug/2023 15:09:52 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 1.66 | GHz |
| Stop frequency: | 1.67 | GHz |
| Center frequency: | 1.665 | GHz |
| Frequency span: | 10 | MHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 300 | Hz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Max-Hold | |
| Detector-Mode: | AVG | |

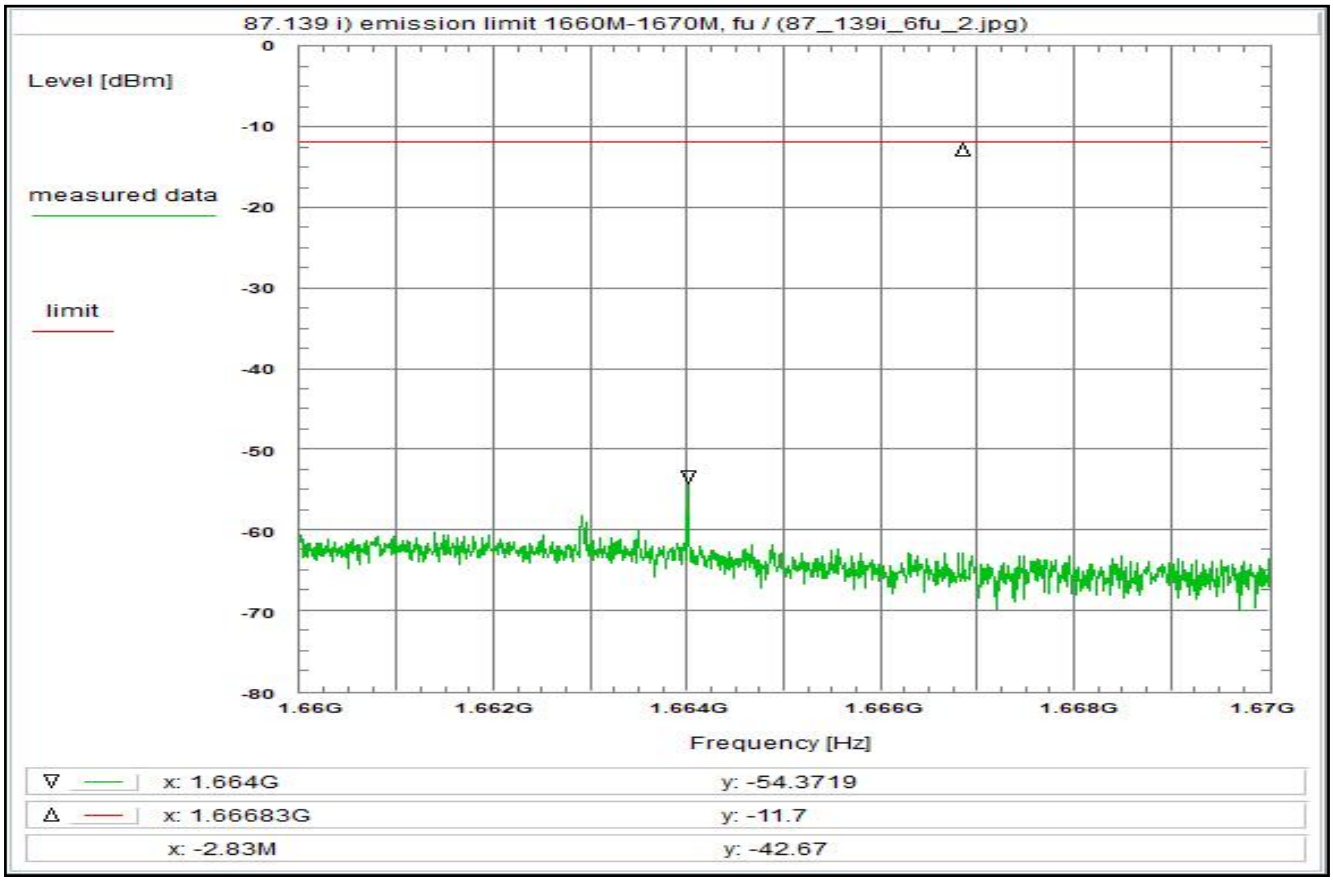
Correction:

| | | | |
|---|---|---|---|
| (W_RE) | - | 4.5 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 20k) | + | 8.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U331) | + | 72.8 | dB |
| TOTAL CORRECTION: | + | 78.8 | dB |

Remarks:
Carrier-on state / Carrier at the lower edge of the band (fu)
For EIRP calculation:
´worst-case´ = maximum antenna gain

Since the measurement was updated with the maximum antenna gain, which is 5.23 dBic, the corrected value of the marker is -18.4 dBm

Plot No. 59




Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Limit:
Limit according to 87.139(i)(1)
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with 87.139(i)(1).

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fl, max hold, valid for all modulations

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Wed 23/Aug/2023 18:22:34 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 1.66 | GHz |
| Stop frequency: | 1.67 | GHz |
| Center frequency: | 1.665 | GHz |
| Frequency span: | 10 | MHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 300 | Hz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Max-Hold | |
| Detector-Mode: | AVG | |

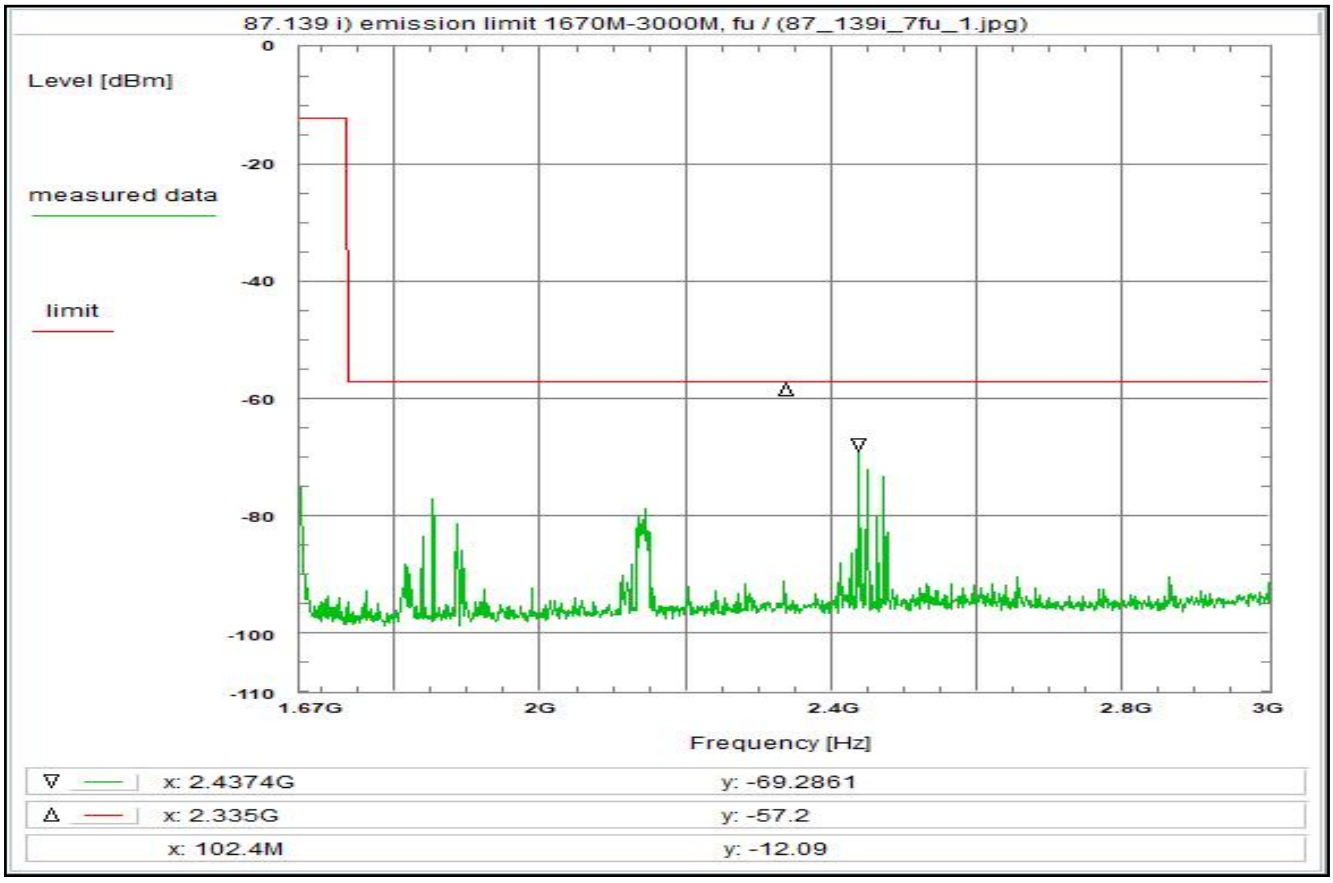
Correction:

| | | | |
|---|---|---|---|
| (W_RE) | - | 4.5 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 20k) | + | 8.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U330) | + | 31.9 | dB |
| TOTAL CORRECTION: | + | 37.9 | dB |

Remarks:
Carrier-on state / Carrier at the lower edge of the band (fu)
For EIRP calculation:
´worst-case´ = maximum antenna gain

Since the measurement was updated with the maximum antenna gain, which is 5.23 dBic, the corrected value of the marker is -50.5 dBm

Plot No. 60




Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Limit:
Limit according to 87.139(i)(1)
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with 87.139(i)(1).

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fl, max hold, valid for all modulations

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U331

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Tue 22/Aug/2023 15:02:23 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 1.67 | GHz |
| Stop frequency: | 3 | GHz |
| Center frequency: | 2.335 | GHz |
| Frequency span: | 1.33 | GHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 10 | kHz |
| Input attenuation: | 0 | dB |
| Trace-Mode: | Max-Hold | |
| Detector-Mode: | AVG | |

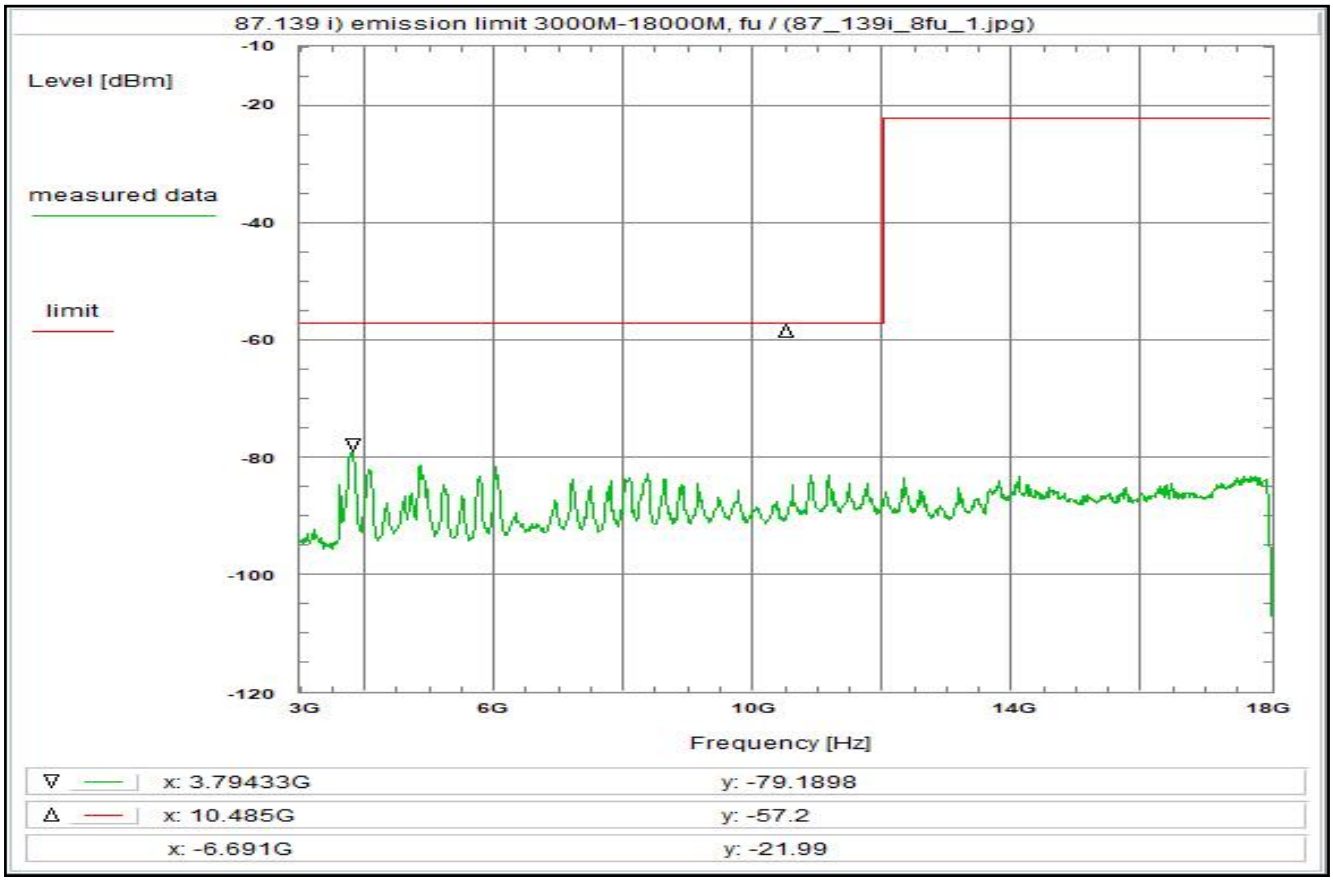
Correction:

| | | | |
|---|---|---|---|
| Directional coupler | + | 0.0 | dB |
| Coaxial cable (C220) | + | 1.1 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U331) | + | 32.5 | dB |
| TOTAL CORRECTION: | + | 36.2 | dB |

Remarks:
Carrier-on state / Carrier at the lower edge of the band (fu)
For EIRP calculation:
´worst-case´ = maximum antenna gain

Since the measurement was updated with the maximum antenna gain, which is 5.23 dBic, the corrected value of the marker is -65.5 dBm

Plot No. 61




Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier at the lower edge of the band (fu)

Limit:
Limit according to 87.139(i)(1)
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with 87.139(i)(1).

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fl, max hold, valid for all modulations

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U332

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Tue 22/Aug/2023 15:42:48 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 3 | GHz |
| Stop frequency: | 18 | GHz |
| Center frequency: | 10.5 | GHz |
| Frequency span: | 15 | GHz |
| Resolution-BW: | 10 | kHz |
| Video-BW: | 30 | kHz |
| Input attenuation: | 0 | dB |
| Trace-Mode: | Max-Hold | |
| Detector-Mode: | AVG | |

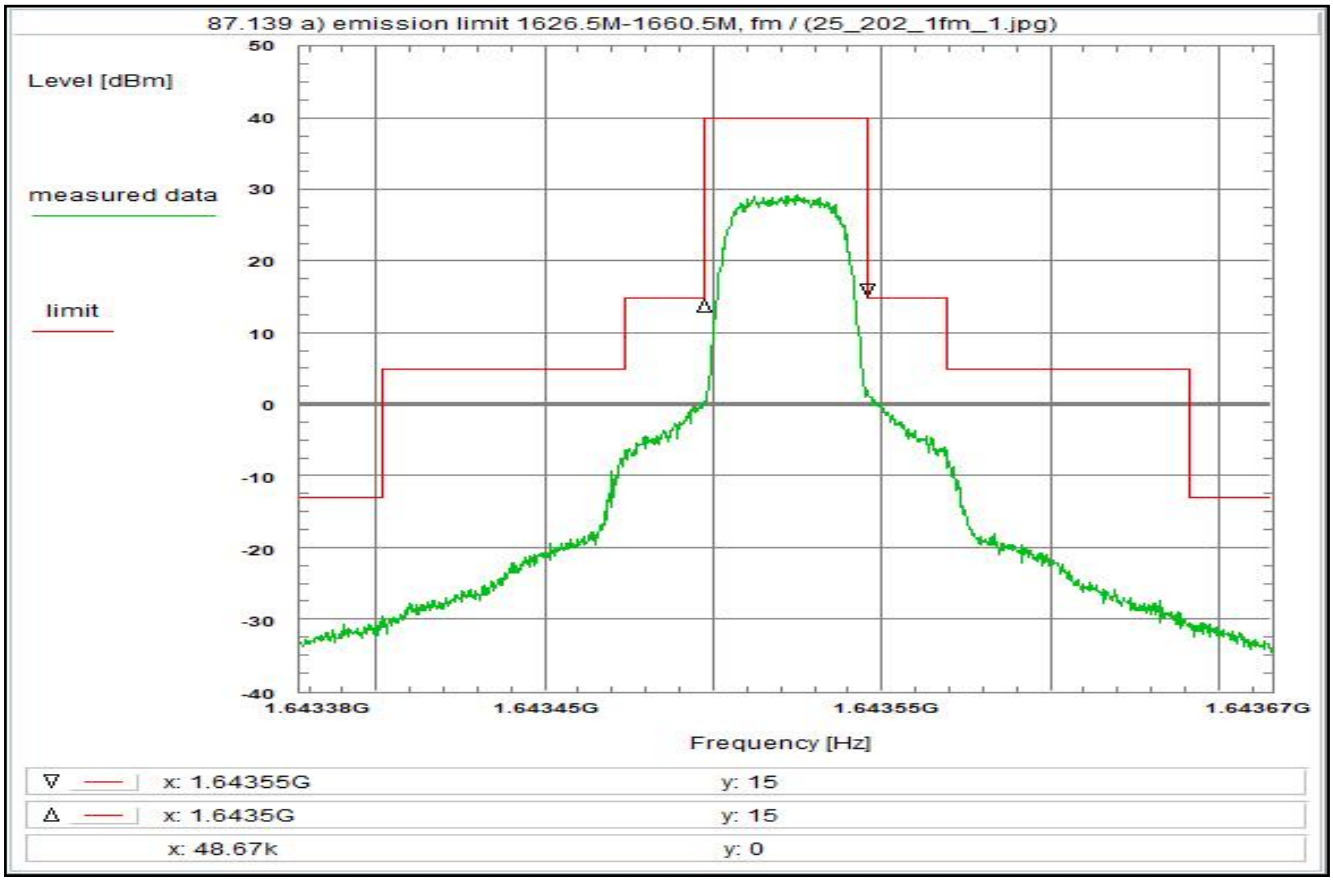
Correction:

| | | | |
|---|---|---|---|
| Directional coupler | + | 0.0 | dB |
| Coaxial cable (C220) | + | 2.3 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (10k -> 4k) | - | 4.0 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U332) | + | 34.0 | dB |
| TOTAL CORRECTION: | + | 33.7 | dB |

Remarks:
Carrier-on state / Carrier at the lower edge of the band (fu)
For EIRP calculation:
´worst-case´ = maximum antenna gain

Since the measurement was updated with the maximum antenna gain, which is 5.23 dBic, the corrected value of the marker is -75.4 dBm

Plot No. 62




Subclause: 87.139 a)Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier in the middle of the band (fm)

Limit:
Limit according to 87.139 a):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with the above schedule.

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fm, R5T1XD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Fri 18/Aug/2023 14:53:30 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 1.64337725 | GHz |
| Stop frequency: | 1.64366525 | GHz |
| Center frequency: | 1.64352125 | GHz |
| Frequency span: | 288 | kHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 10 | kHz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Max-Hold | |
| Detector-Mode: | AVG | |

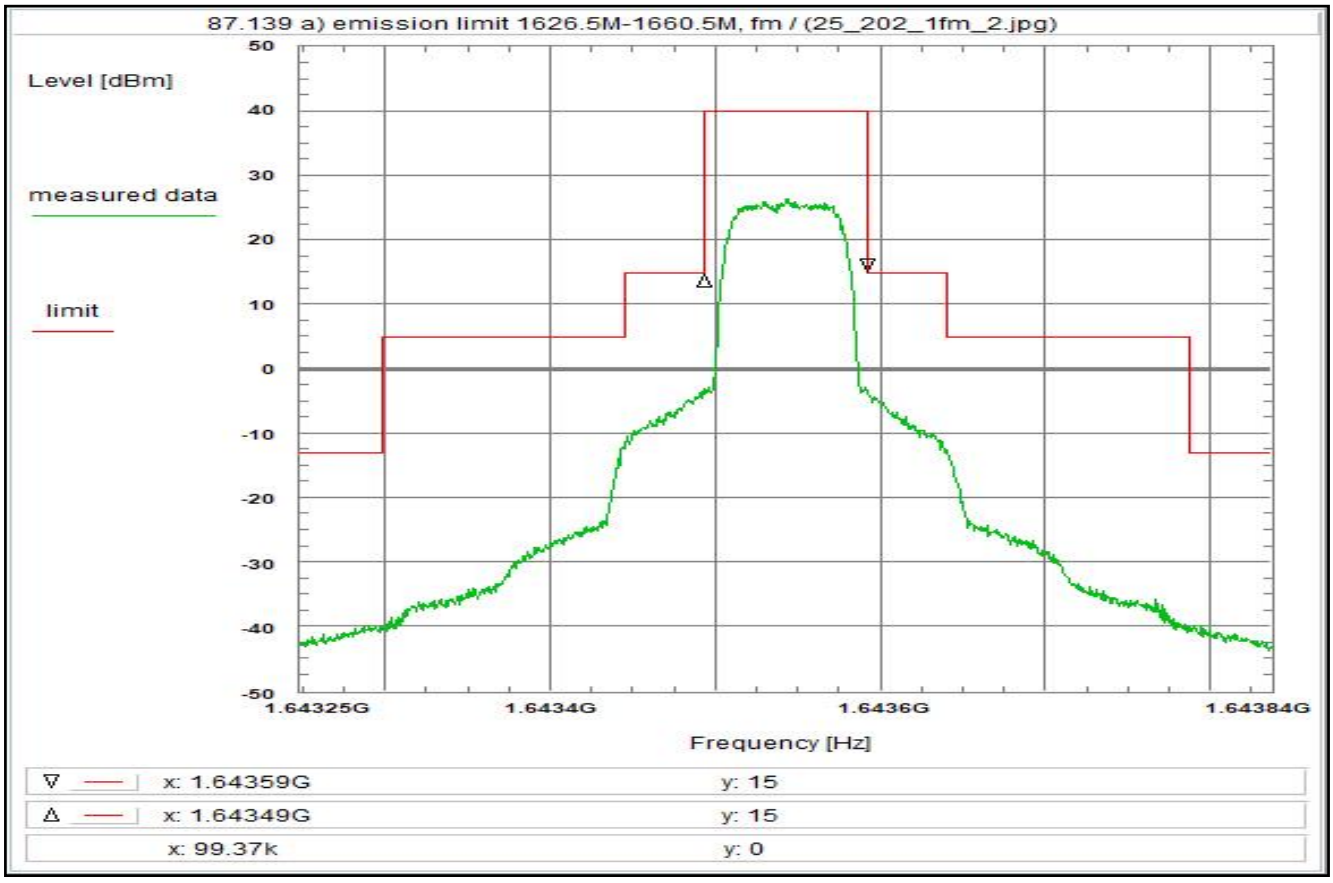
Correction:

| | | | |
|---|---|---|---|
| Directional coupler | + | 0.0 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U330) | + | 31.9 | dB |
| TOTAL CORRECTION: | + | 35.4 | dB |

Remarks:
Carrier-on state / Carrier in the middle of the band (fm)

Reference of limit = 40 dBm
Spectrum mask referenced to necessary bandwidth

Plot No. 63




Subclause: 87.139 a)Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier in the middle of the band (fm)

Limit:
Limit according to 87.139 a):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with the above schedule.

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fm, R5T2XD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: R001

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Fri 18/Aug/2023 14:57:39 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 1.64324825 | GHz |
| Stop frequency: | 1.64383625 | GHz |
| Center frequency: | 1.64354225 | GHz |
| Frequency span: | 588 | kHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 10 | kHz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Max-Hold | |
| Detector-Mode: | AVG | |

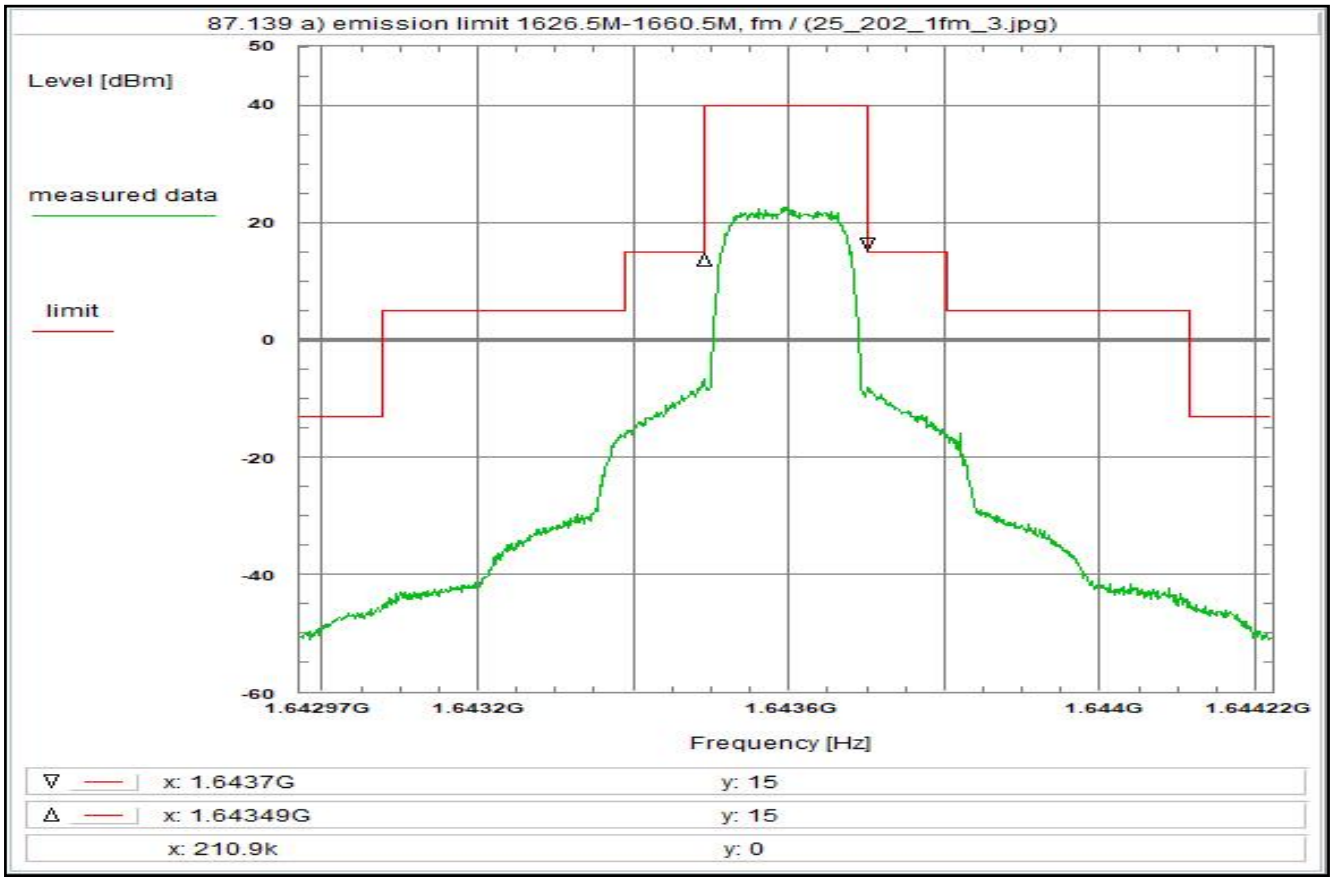
Correction:

| | | | |
|---|---|---|---|
| Directional coupler | + | 0.0 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U330) | + | 31.9 | dB |
| TOTAL CORRECTION: | + | 35.4 | dB |

Remarks:
Carrier-on state / Carrier in the middle of the band (fm)

Reference of limit = 40 dBm
Spectrum mask referenced to necessary bandwidth

Plot No. 64




Subclause: 87.139 a)Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier in the middle of the band (fm)

Limit:
Limit according to 87.139 a):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with the above schedule.

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fm, R5T4.5XD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Fri 18/Aug/2023 15:01:08 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 1.642971 | GHz |
| Stop frequency: | 1.644219 | GHz |
| Center frequency: | 1.643595 | GHz |
| Frequency span: | 1.248 | MHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 10 | kHz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Max-Hold | |
| Detector-Mode: | AVG | |

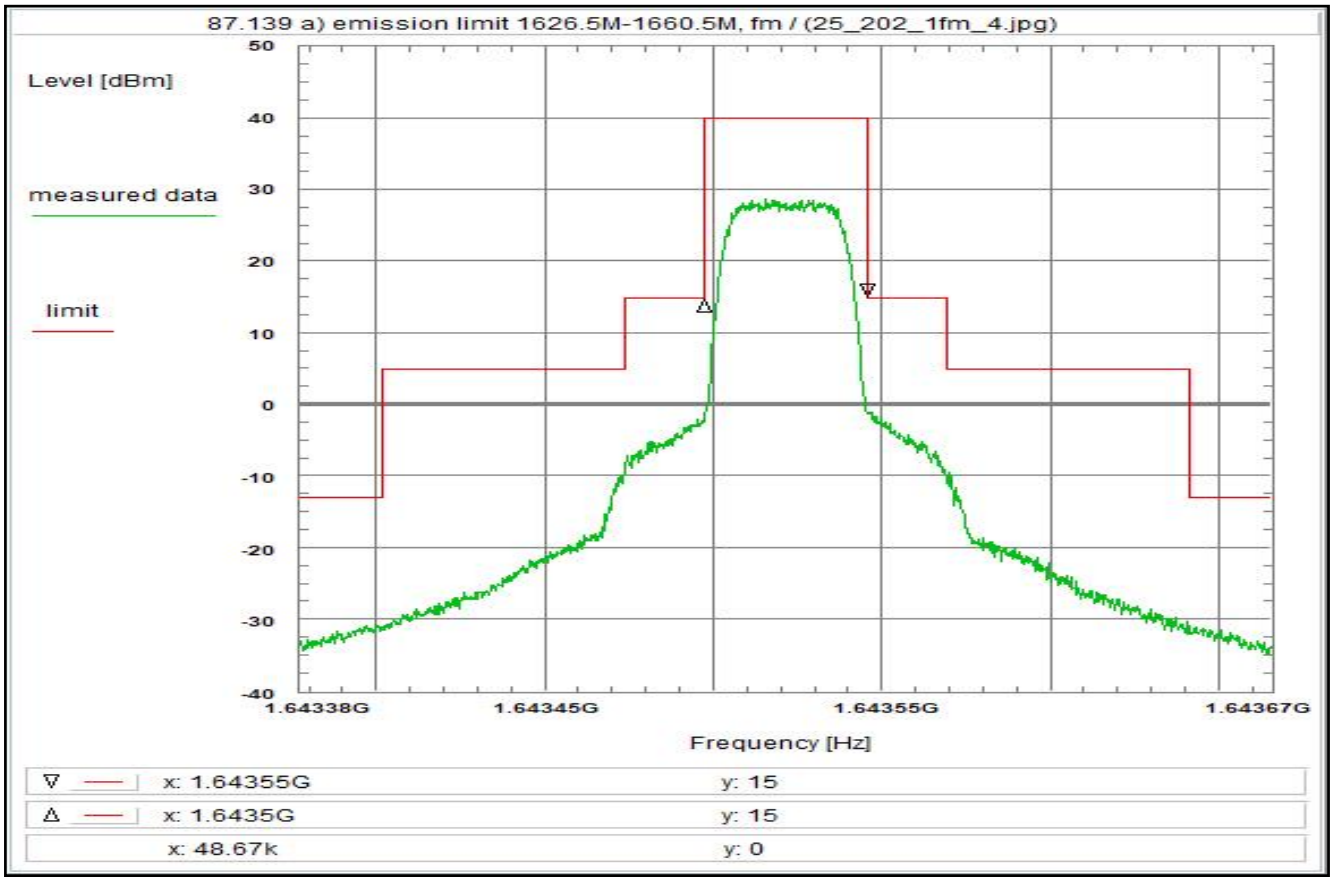
Correction:

| | | | |
|---|---|---|---|
| Directional coupler | + | 0.0 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U330) | + | 31.9 | dB |
| TOTAL CORRECTION: | + | 35.4 | dB |

Remarks:
Carrier-on state / Carrier in the middle of the band (fm)

Reference of limit = 40 dBm
Spectrum mask referenced to necessary bandwidth

Plot No. 65




Subclause: 87.139 a)Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier in the middle of the band (fm)

Limit:
Limit according to 87.139 a):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with the above schedule.

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fm, R20T1XD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Fri 18/Aug/2023 15:04:28 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 1.64337725 | GHz |
| Stop frequency: | 1.64366525 | GHz |
| Center frequency: | 1.64352125 | GHz |
| Frequency span: | 288 | kHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 10 | kHz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Max-Hold | |
| Detector-Mode: | AVG | |

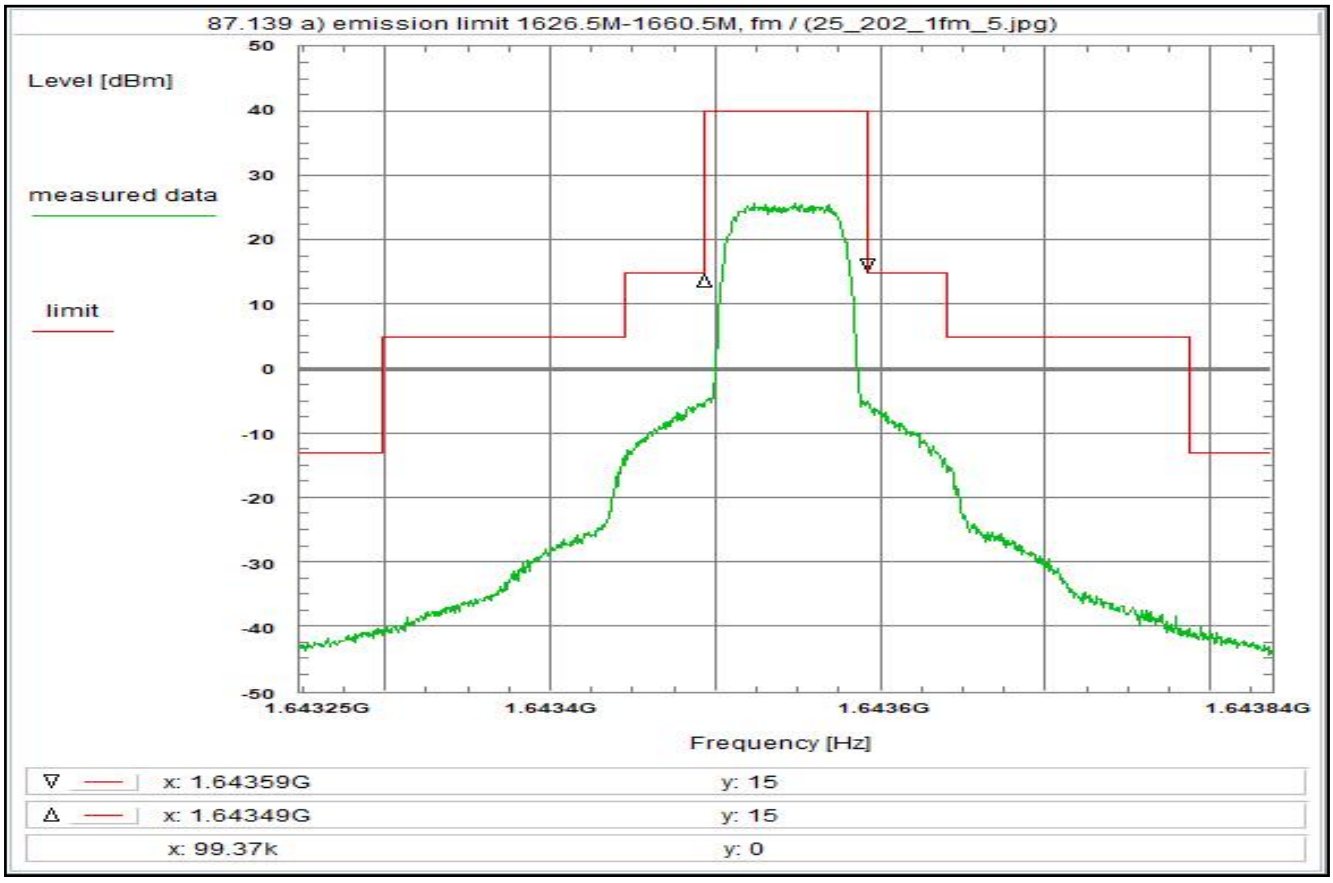
Correction:

| | | | |
|---|---|---|---|
| Directional coupler | + | 0.0 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U330) | + | 31.9 | dB |
| TOTAL CORRECTION: | + | 35.4 | dB |

Remarks:
Carrier-on state / Carrier in the middle of the band (fm)

Reference of limit = 40 dBm
Spectrum mask referenced to necessary bandwidth

Plot No. 66




Subclause: 87.139 a)Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier in the middle of the band (fm)

Limit:
Limit according to 87.139 a):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with the above schedule.

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fm, R20T1XD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Fri 18/Aug/2023 15:07:20 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 1.64324825 | GHz |
| Stop frequency: | 1.64383625 | GHz |
| Center frequency: | 1.64354225 | GHz |
| Frequency span: | 588 | kHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 10 | kHz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Max-Hold | |
| Detector-Mode: | AVG | |

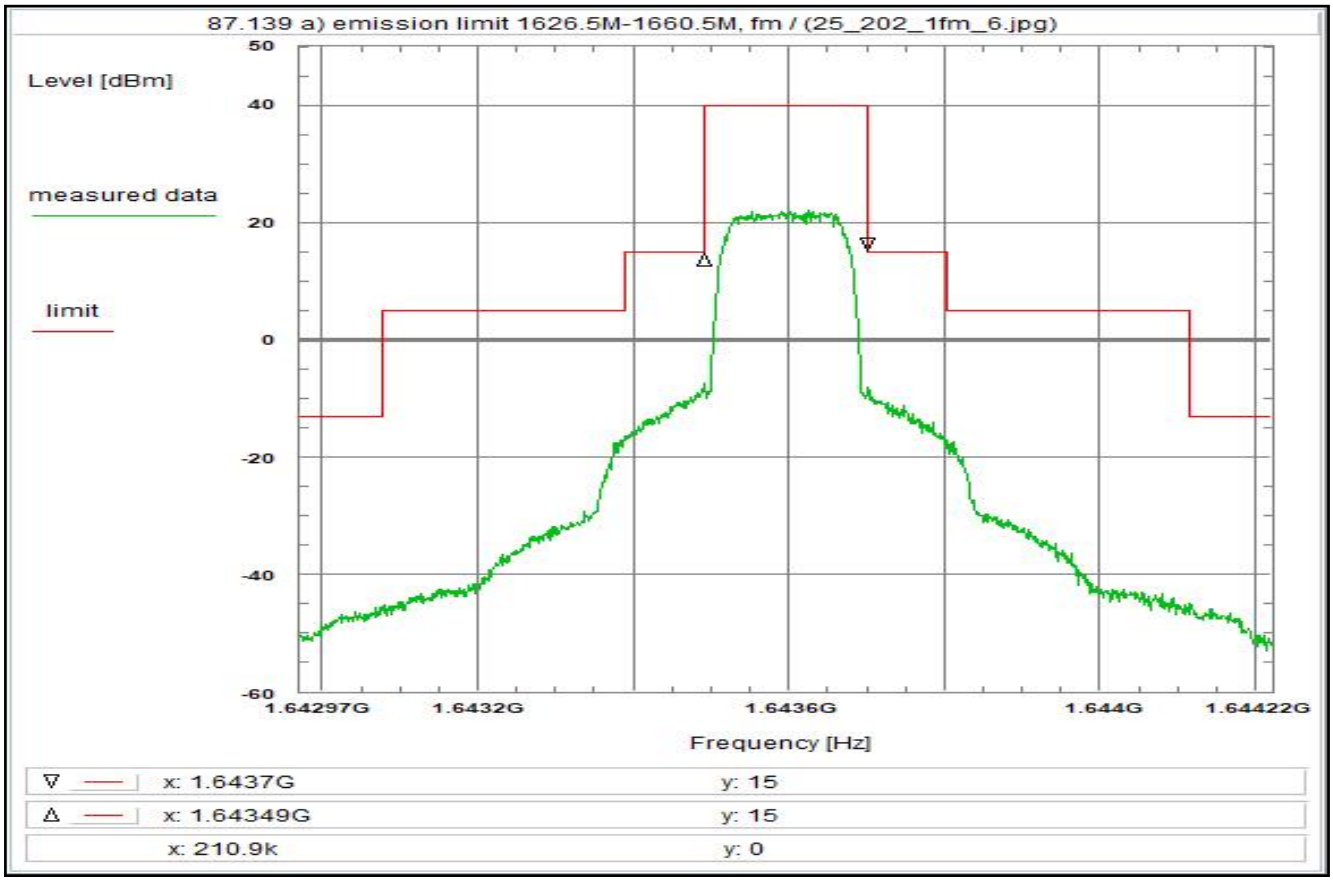
Correction:

| | | | |
|---|---|---|---|
| Directional coupler | + | 0.0 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U330) | + | 31.9 | dB |
| TOTAL CORRECTION: | + | 35.4 | dB |

Remarks:
Carrier-on state / Carrier in the middle of the band (fm)

Reference of limit = 40 dBm
Spectrum mask referenced to necessary bandwidth

Plot No. 67




Subclause: 87.139 a)Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier in the middle of the band (fm)

Limit:
Limit according to 87.139 a):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with the above schedule.

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fm, R20T4.5XD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Fri 18/Aug/2023 15:10:17 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 1.642971 | GHz |
| Stop frequency: | 1.644219 | GHz |
| Center frequency: | 1.643595 | GHz |
| Frequency span: | 1.248 | MHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 10 | kHz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Max-Hold | |
| Detector-Mode: | AVG | |

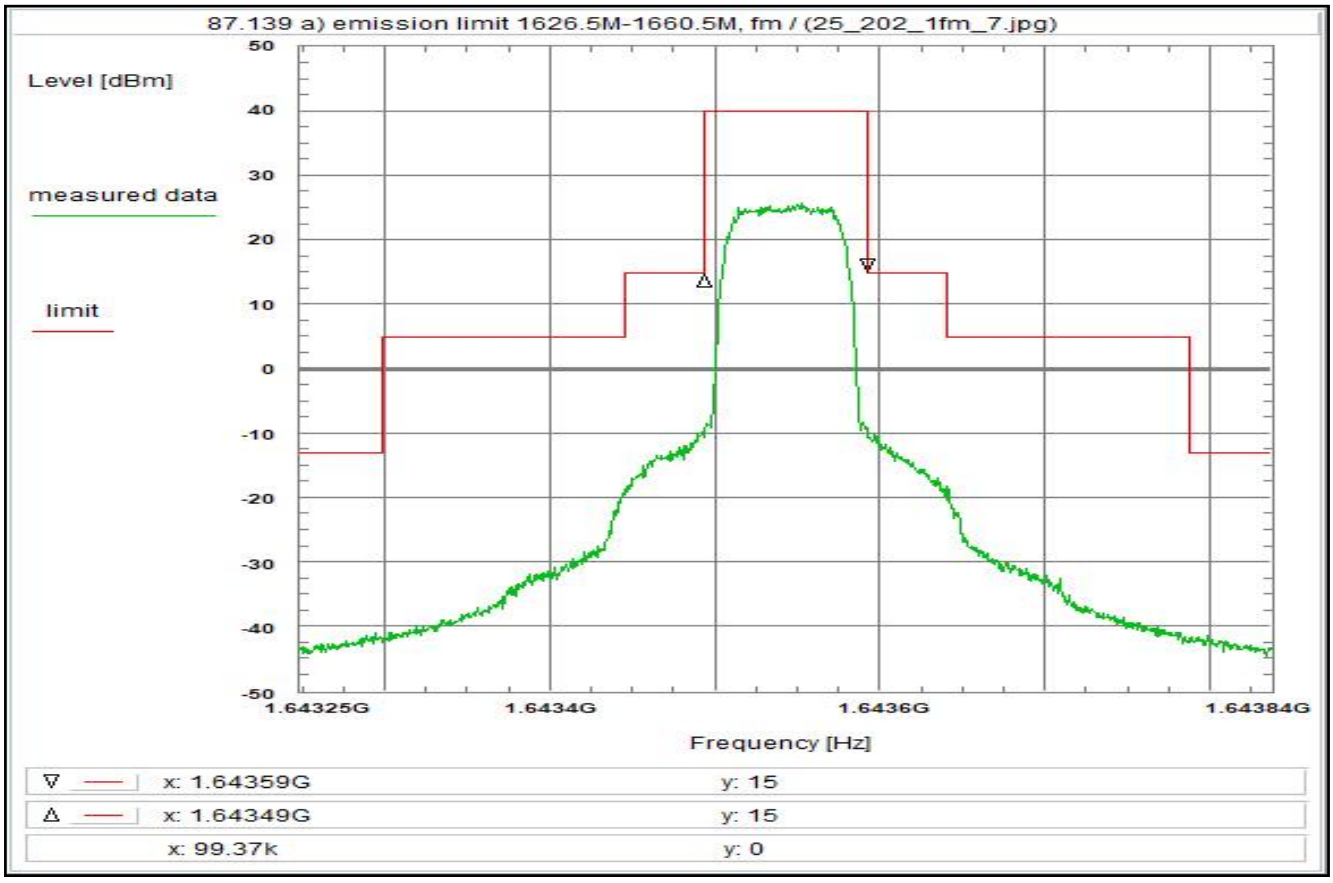
Correction:

| | | | |
|---|---|---|---|
| Directional coupler | + | 0.0 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U330) | + | 31.9 | dB |
| TOTAL CORRECTION: | + | 35.4 | dB |

Remarks:
Carrier-on state / Carrier in the middle of the band (fm)

Reference of limit = 40 dBm
Spectrum mask referenced to necessary bandwidth

Plot No. 68




Subclause: 87.139 a)Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier in the middle of the band (fm)

Limit:
Limit according to 87.139 a):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with the above schedule.

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fm, R5T2QD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Fri 18/Aug/2023 15:13:51 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 1.6432485 | GHz |
| Stop frequency: | 1.6438365 | GHz |
| Center frequency: | 1.6435425 | GHz |
| Frequency span: | 588 | kHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 10 | kHz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Max-Hold | |
| Detector-Mode: | AVG | |

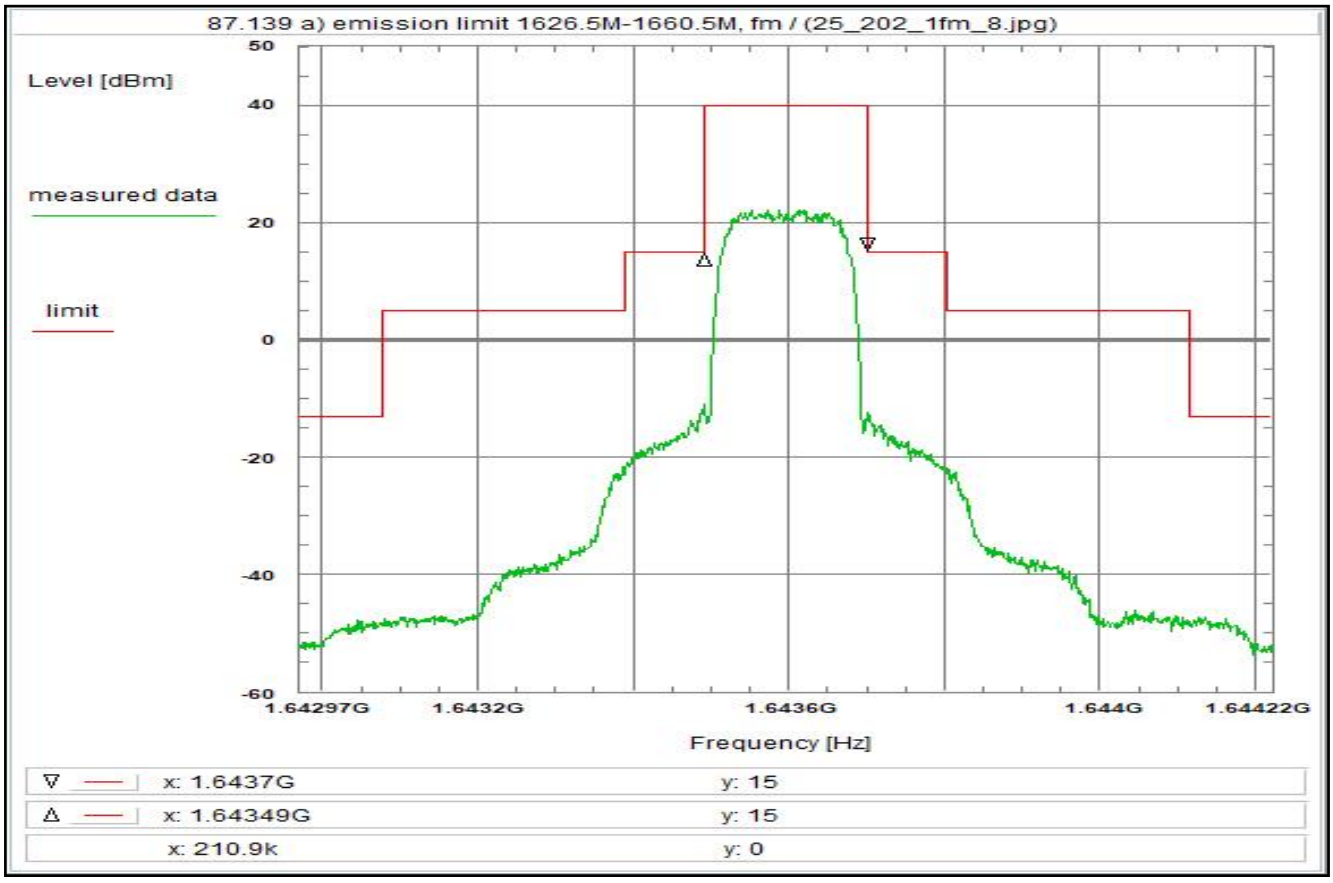
Correction:

| | | | |
|---|---|---|---|
| Directional coupler | + | 0.0 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U330) | + | 31.9 | dB |
| TOTAL CORRECTION: | + | 35.4 | dB |

Remarks:
Carrier-on state / Carrier in the middle of the band (fm)

Reference of limit = 40 dBm
Spectrum mask referenced to necessary bandwidth

Plot No. 69




Subclause: 87.139 a)Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier in the middle of the band (fm)

Limit:
Limit according to 87.139 a):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with the above schedule.

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fm, R5T4.5QD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Fri 18/Aug/2023 15:17:48 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 1.642971 | GHz |
| Stop frequency: | 1.644219 | GHz |
| Center frequency: | 1.643595 | GHz |
| Frequency span: | 1.248 | MHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 10 | kHz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Max-Hold | |
| Detector-Mode: | AVG | |

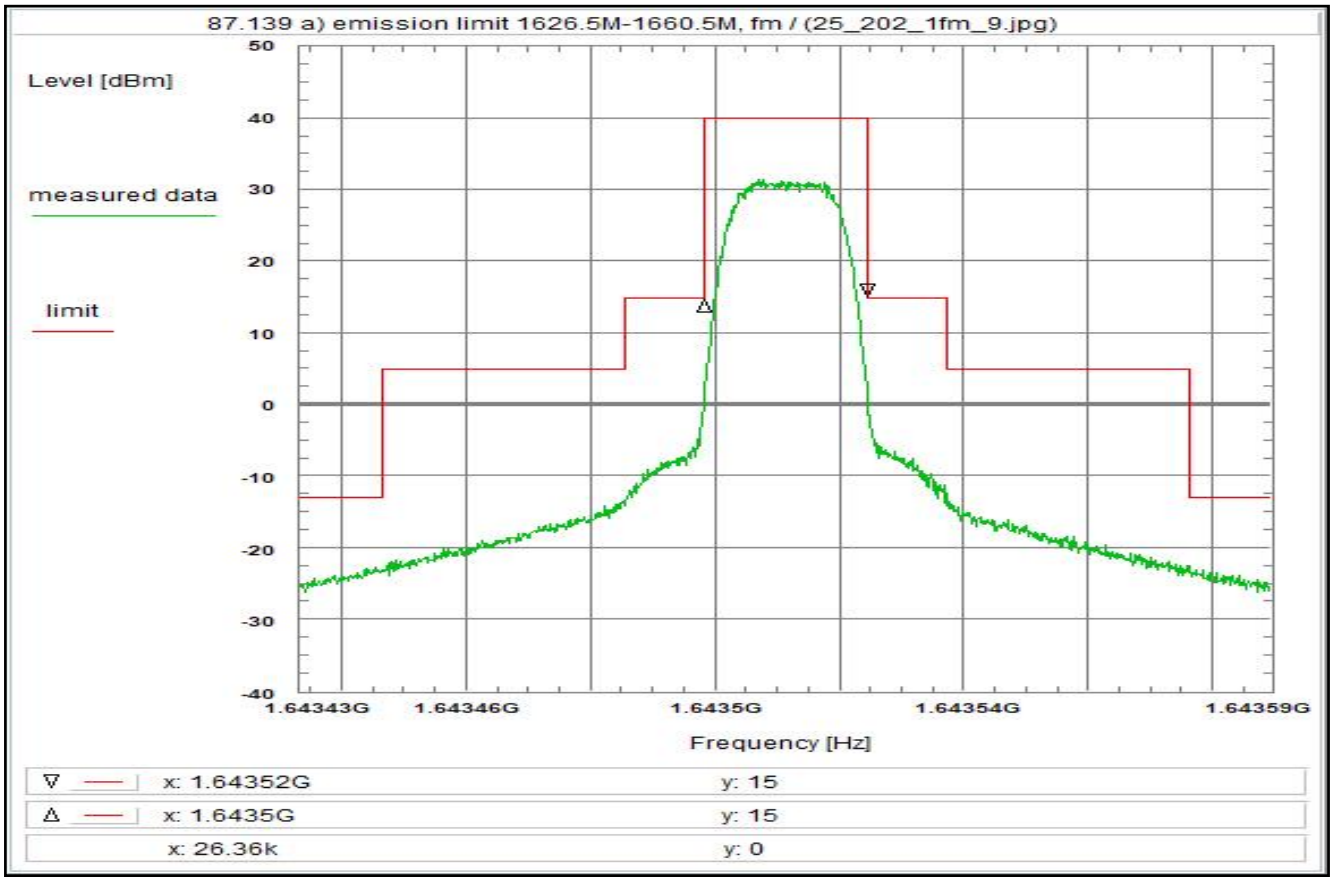
Correction:

| | | | |
|---|---|---|---|
| Directional coupler | + | 0.0 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U330) | + | 31.9 | dB |
| TOTAL CORRECTION: | + | 35.4 | dB |

Remarks:
Carrier-on state / Carrier in the middle of the band (fm)

Reference of limit = 40 dBm
Spectrum mask referenced to necessary bandwidth

Plot No. 70




Subclause: 87.139 a)Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier in the middle of the band (fm)

Limit:
Limit according to 87.139 a):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with the above schedule.

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fm, R20T0.5QD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Fri 18/Aug/2023 15:20:37 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 1.64343325 | GHz |
| Stop frequency: | 1.64358925 | GHz |
| Center frequency: | 1.64351125 | GHz |
| Frequency span: | 156 | kHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 10 | kHz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Max-Hold | |
| Detector-Mode: | AVG | |

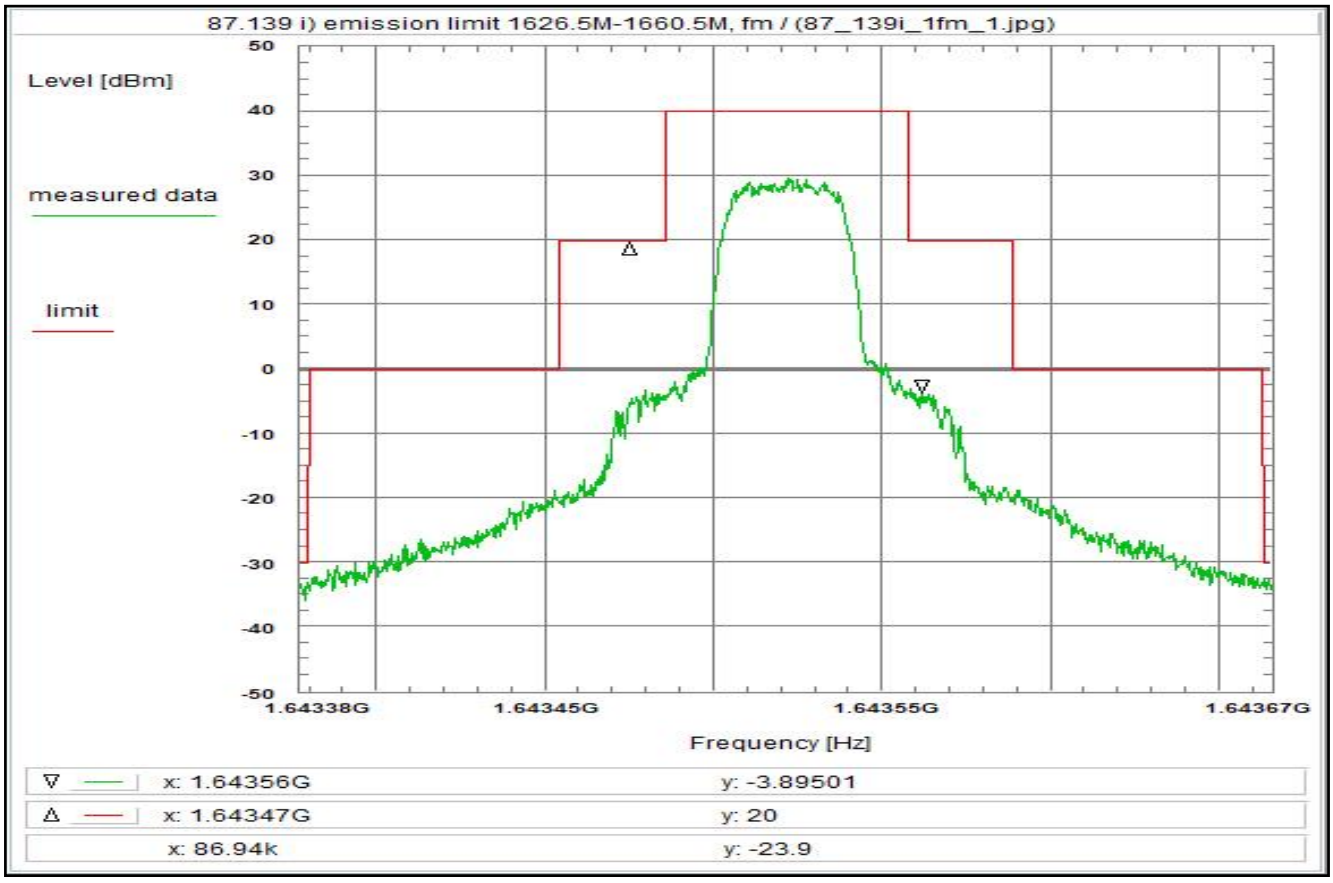
Correction:

| | | | |
|---|---|---|---|
| Directional coupler | + | 0.0 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U330) | + | 31.9 | dB |
| TOTAL CORRECTION: | + | 35.4 | dB |

Remarks:
Carrier-on state / Carrier in the middle of the band (fm)

Reference of limit = 40 dBm
Spectrum mask referenced to necessary bandwidth

Plot No. 71




Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier in the middle of the band (fm)

Limit:
Limit according to 87.139(i)(1)
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with 87.139(i)(1).

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fm, R5T1XD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Fri 18/Aug/2023 14:54:36 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 1.64337725 | GHz |
| Stop frequency: | 1.64366525 | GHz |
| Center frequency: | 1.64352125 | GHz |
| Frequency span: | 288 | kHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 300 | Hz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Average | |
| Detector-Mode: | AVG | |

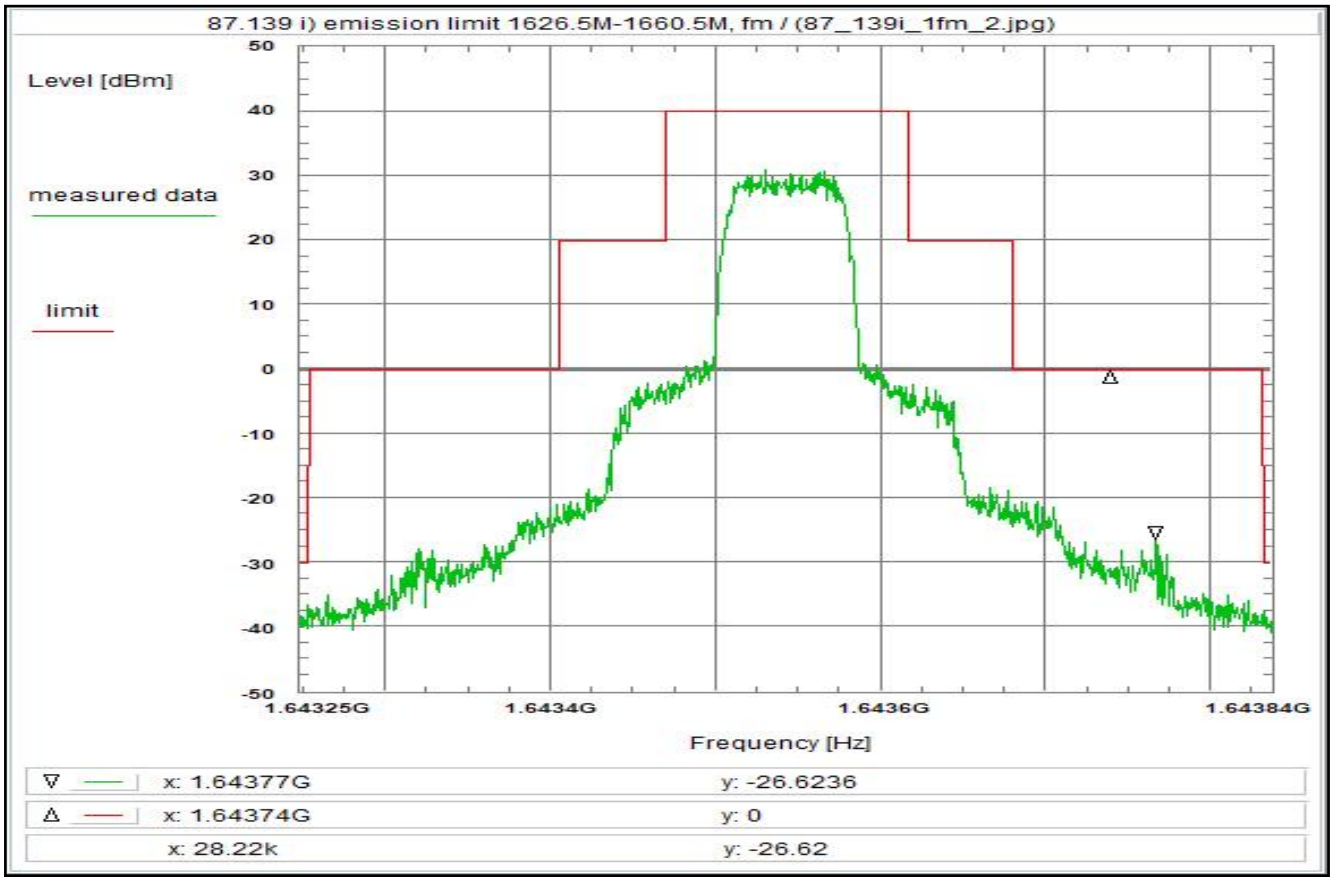
Correction:

| | | | |
|---|---|---|---|
| Directional coupler | + | 0.0 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U330) | + | 31.9 | dB |
| TOTAL CORRECTION: | + | 35.4 | dB |

Remarks:
Carrier-on state / Carrier in the middle of the band (fm)
For EIRP calculation:
´worst-case´ = maximum antenna gain

Reference of limit = 40 dBm
Spectrum mask referenced to necessary bandwidth

Plot No. 72




Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier in the middle of the band (fm)

Limit:
Limit according to 87.139(i)(1)
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with 87.139(i)(1).

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fm, R5T2XD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Fri 18/Aug/2023 14:58:39 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 1.64324825 | GHz |
| Stop frequency: | 1.64383625 | GHz |
| Center frequency: | 1.64354225 | GHz |
| Frequency span: | 588 | kHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 300 | Hz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Max-Hold | |
| Detector-Mode: | AVG | |

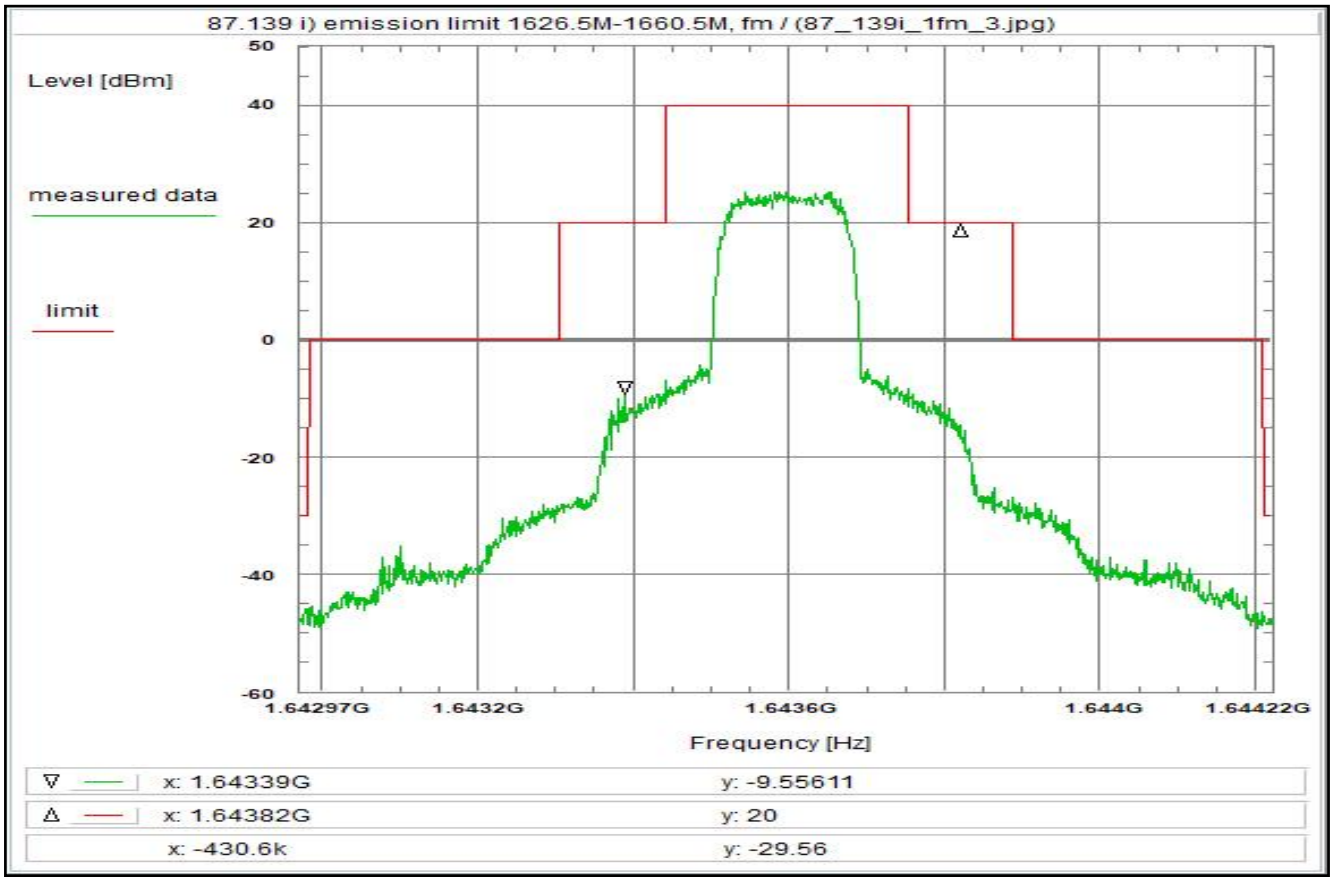
Correction:

| | | | |
|---|---|---|---|
| Directional coupler | + | 0.0 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U330) | + | 31.9 | dB |
| TOTAL CORRECTION: | + | 35.4 | dB |

Remarks:
Carrier-on state / Carrier in the middle of the band (fm)
For EIRP calculation:
´worst-case´ = maximum antenna gain

Reference of limit = 40 dBm
Spectrum mask referenced to necessary bandwidth

Plot No. 73




Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier in the middle of the band (fm)

Limit:
Limit according to 87.139(i)(1)
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with 87.139(i)(1).

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fm, R5T4.5XD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Fri 18/Aug/2023 15:02:24 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 1.642971 | GHz |
| Stop frequency: | 1.644219 | GHz |
| Center frequency: | 1.643595 | GHz |
| Frequency span: | 1.248 | MHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 300 | Hz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Max-Hold | |
| Detector-Mode: | AVG | |

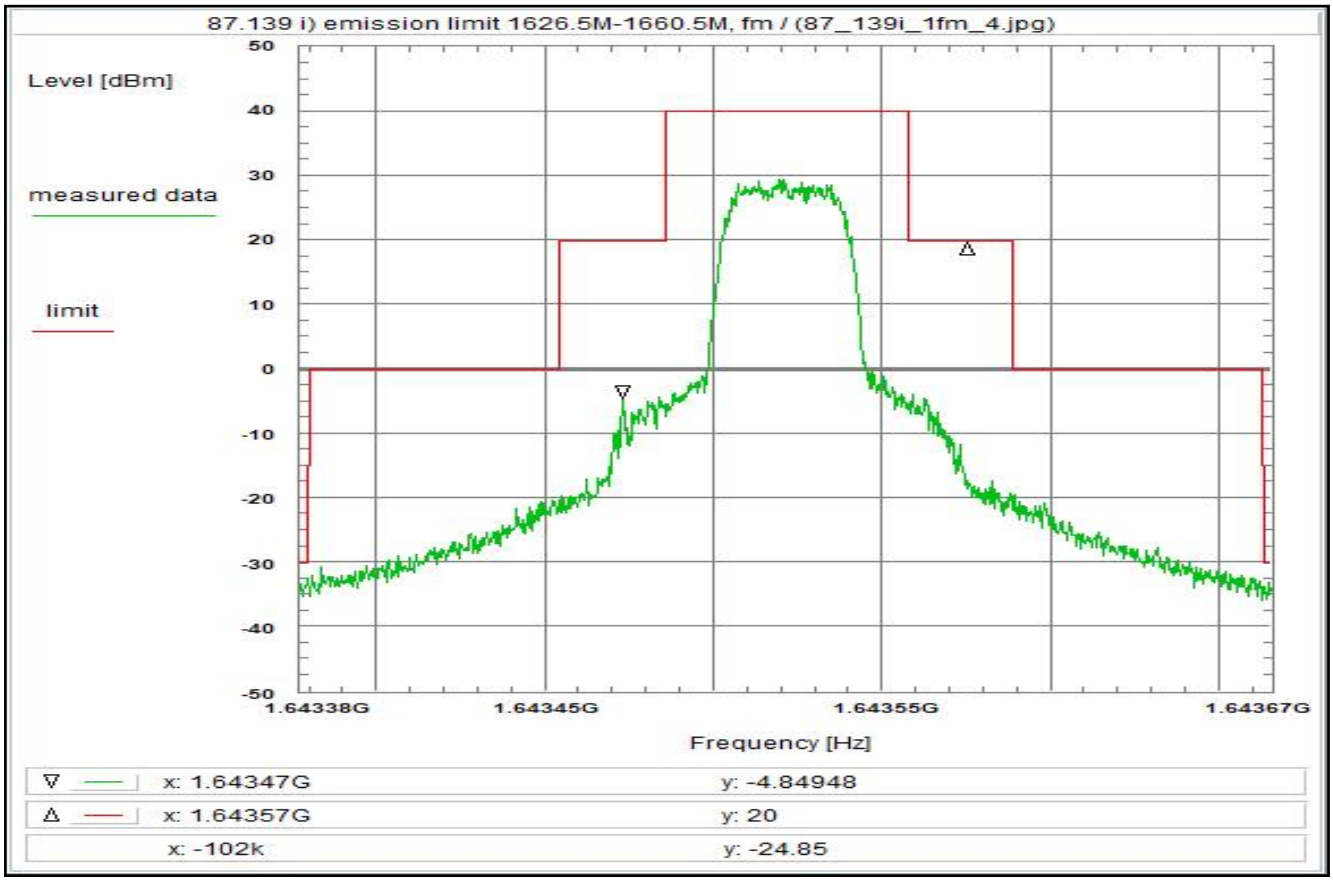
Correction:

| | | | |
|---|---|---|---|
| Directional coupler | + | 0.0 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U330) | + | 31.9 | dB |
| TOTAL CORRECTION: | + | 35.4 | dB |

Remarks:
Carrier-on state / Carrier in the middle of the band (fm)
For EIRP calculation:
´worst-case´ = maximum antenna gain

Reference of limit = 40 dBm
Spectrum mask referenced to necessary bandwidth

Plot No. 74




Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier in the middle of the band (fm)

Limit:
Limit according to 87.139(i)(1)
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with 87.139(i)(1).

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fm, R20T1XD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Fri 18/Aug/2023 15:05:17 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 1.64337725 | GHz |
| Stop frequency: | 1.64366525 | GHz |
| Center frequency: | 1.64352125 | GHz |
| Frequency span: | 288 | kHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 300 | Hz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Average | |
| Detector-Mode: | AVG | |

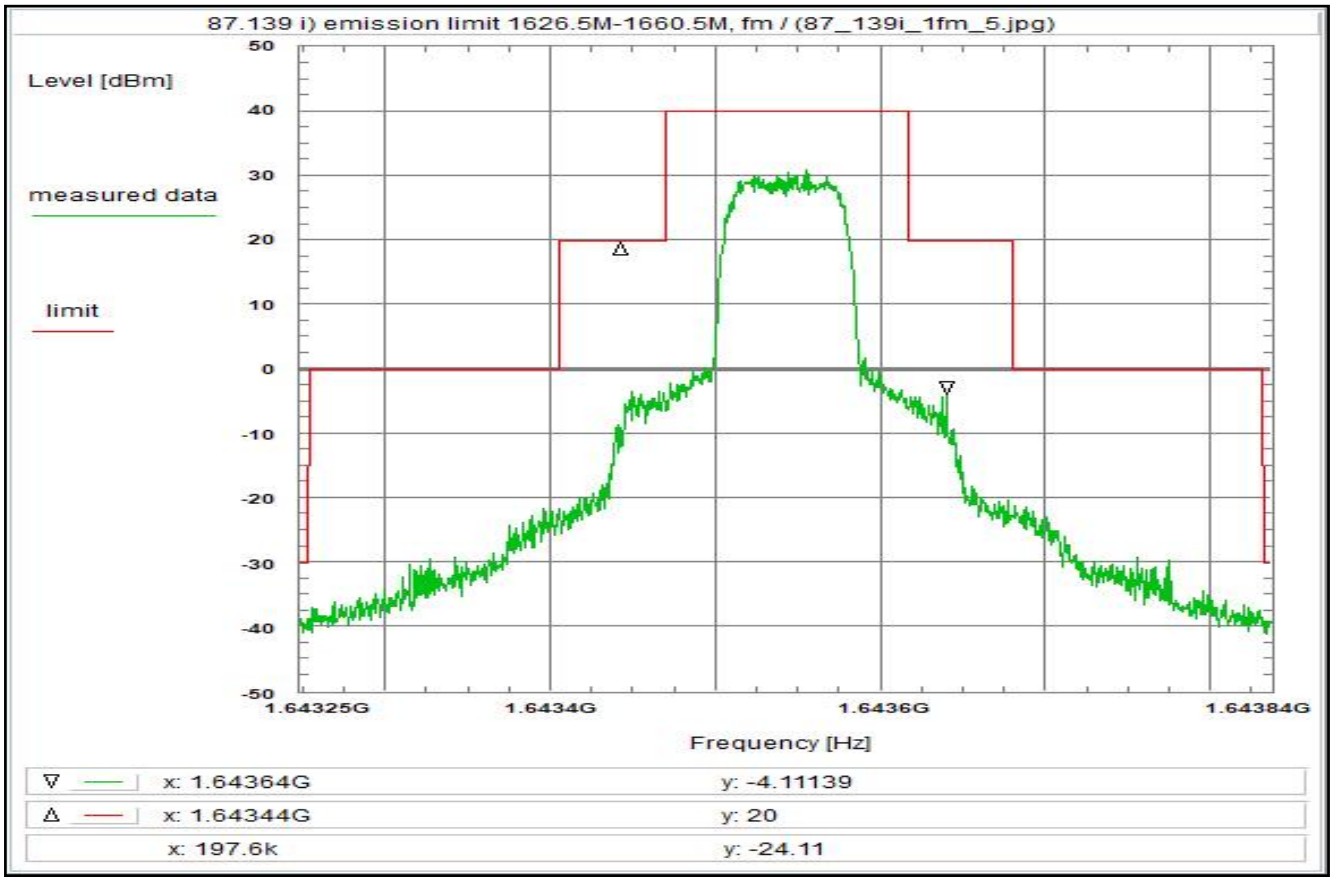
Correction:

| | | | |
|---|---|---|---|
| Directional coupler | + | 0.0 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U330) | + | 31.9 | dB |
| TOTAL CORRECTION: | + | 35.4 | dB |

Remarks:
Carrier-on state / Carrier in the middle of the band (fm)
For EIRP calculation:
´worst-case´ = maximum antenna gain

Reference of limit = 40 dBm
Spectrum mask referenced to necessary bandwidth

Plot No. 75




Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier in the middle of the band (fm)

Limit:
Limit according to 87.139(i)(1)
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with 87.139(i)(1).

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fm, R20T1XD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Fri 18/Aug/2023 15:08:08 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 1.64324825 | GHz |
| Stop frequency: | 1.64383625 | GHz |
| Center frequency: | 1.64354225 | GHz |
| Frequency span: | 588 | kHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 300 | Hz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Max-Hold | |
| Detector-Mode: | AVG | |

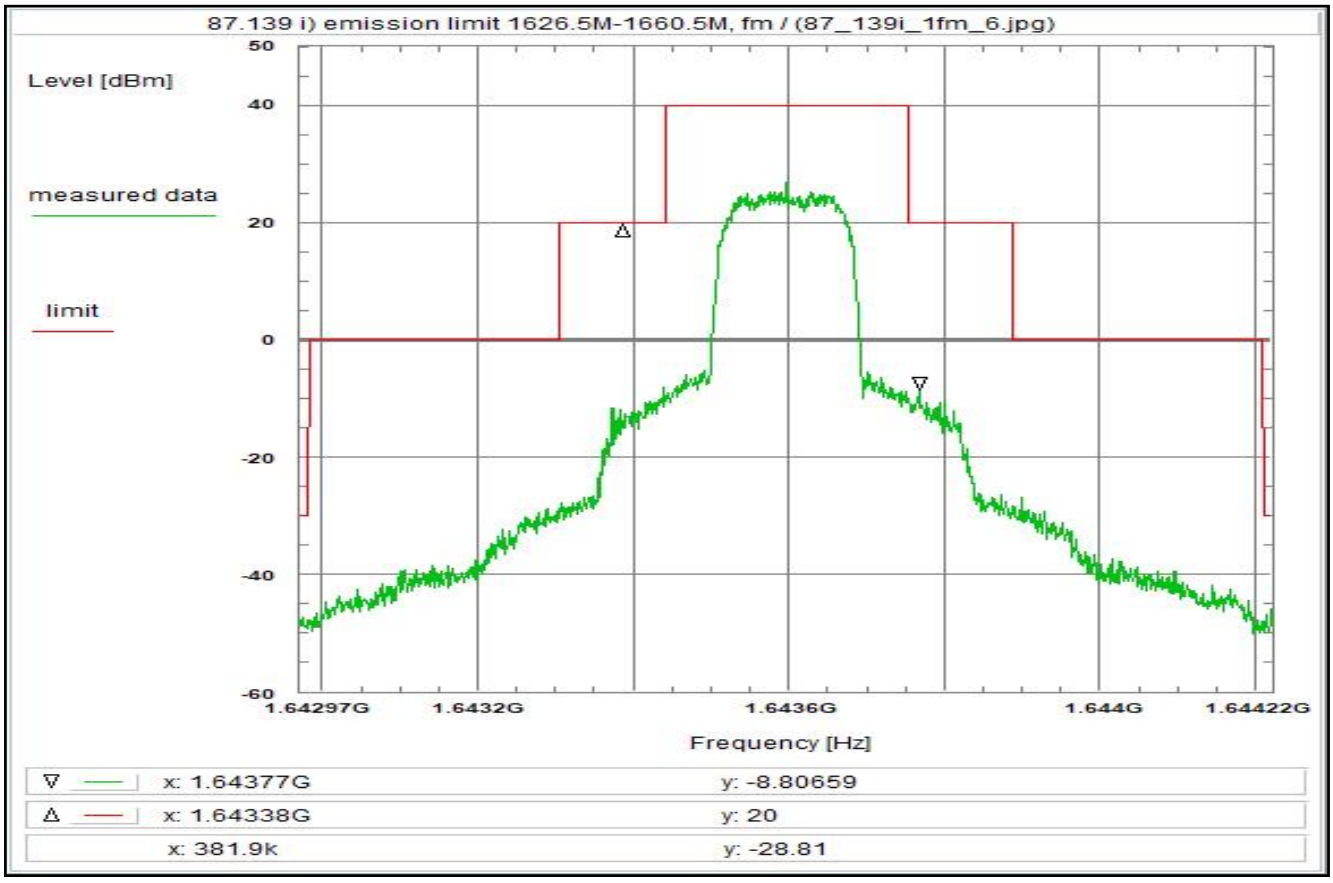
Correction:

| | | | |
|---|---|---|---|
| Directional coupler | + | 0.0 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U330) | + | 31.9 | dB |
| TOTAL CORRECTION: | + | 35.4 | dB |

Remarks:
Carrier-on state / Carrier in the middle of the band (fm)
For EIRP calculation:
´worst-case´ = maximum antenna gain

Reference of limit = 40 dBm
Spectrum mask referenced to necessary bandwidth

Plot No. 76




Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier in the middle of the band (fm)

Limit:
Limit according to 87.139(i)(1)
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with 87.139(i)(1).

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fm, R20T4.5XD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: R001

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Fri 18/Aug/2023 15:11:01 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 1.642971 | GHz |
| Stop frequency: | 1.644219 | GHz |
| Center frequency: | 1.643595 | GHz |
| Frequency span: | 1.248 | MHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 300 | Hz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Max-Hold | |
| Detector-Mode: | AVG | |

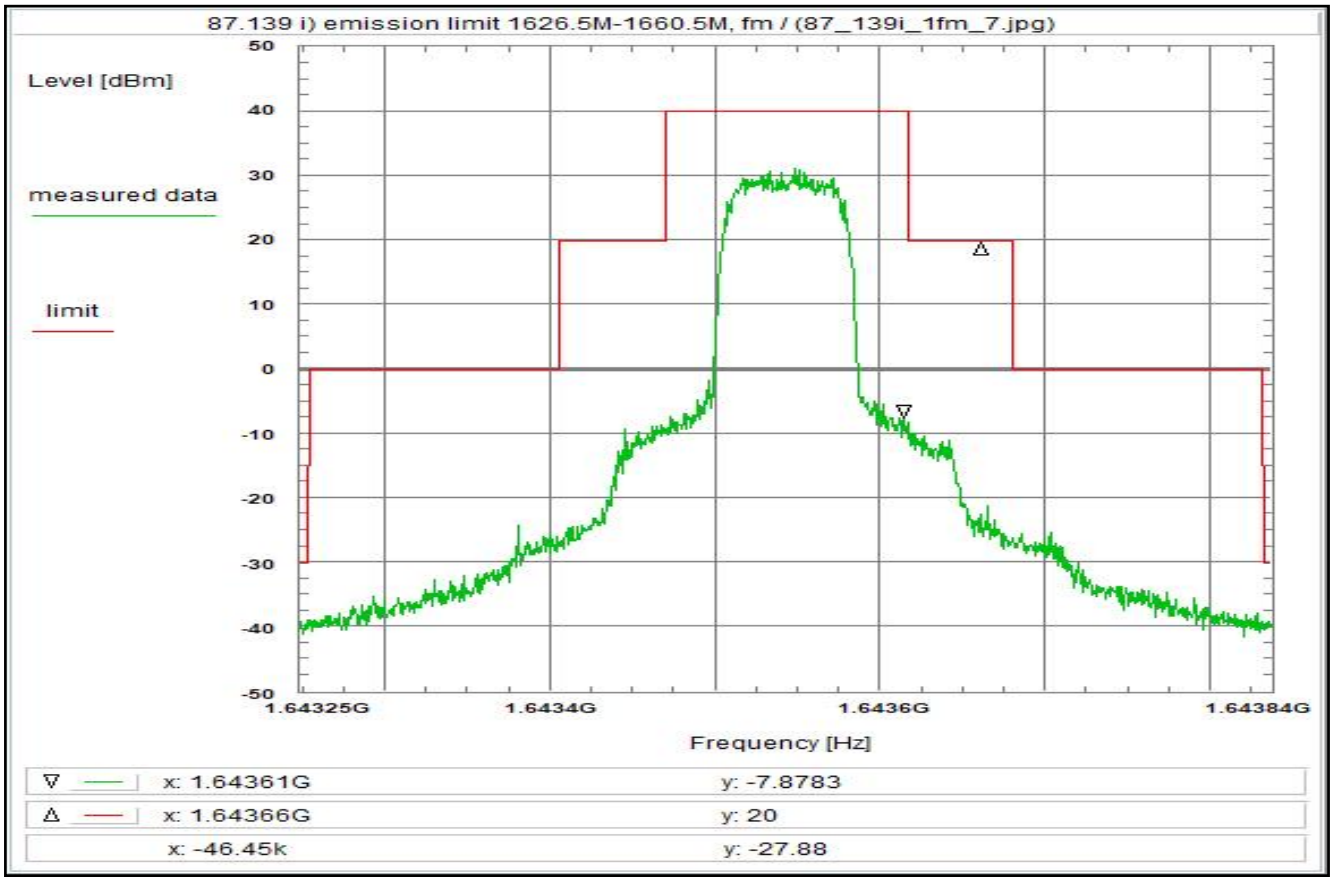
Correction:

| | | | |
|---|---|---|---|
| Directional coupler | + | 0.0 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U330) | + | 31.9 | dB |
| TOTAL CORRECTION: | + | 35.4 | dB |

Remarks:
Carrier-on state / Carrier in the middle of the band (fm)
For EIRP calculation:
´worst-case´ = maximum antenna gain

Reference of limit = 40 dBm
Spectrum mask referenced to necessary bandwidth

Plot No. 77




Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier in the middle of the band (fm)

Limit:
Limit according to 87.139(i)(1)
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with 87.139(i)(1).

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fm, R5T2QD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Fri 18/Aug/2023 15:14:50 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 1.6432485 | GHz |
| Stop frequency: | 1.6438365 | GHz |
| Center frequency: | 1.6435425 | GHz |
| Frequency span: | 588 | kHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 300 | Hz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Max-Hold | |
| Detector-Mode: | AVG | |

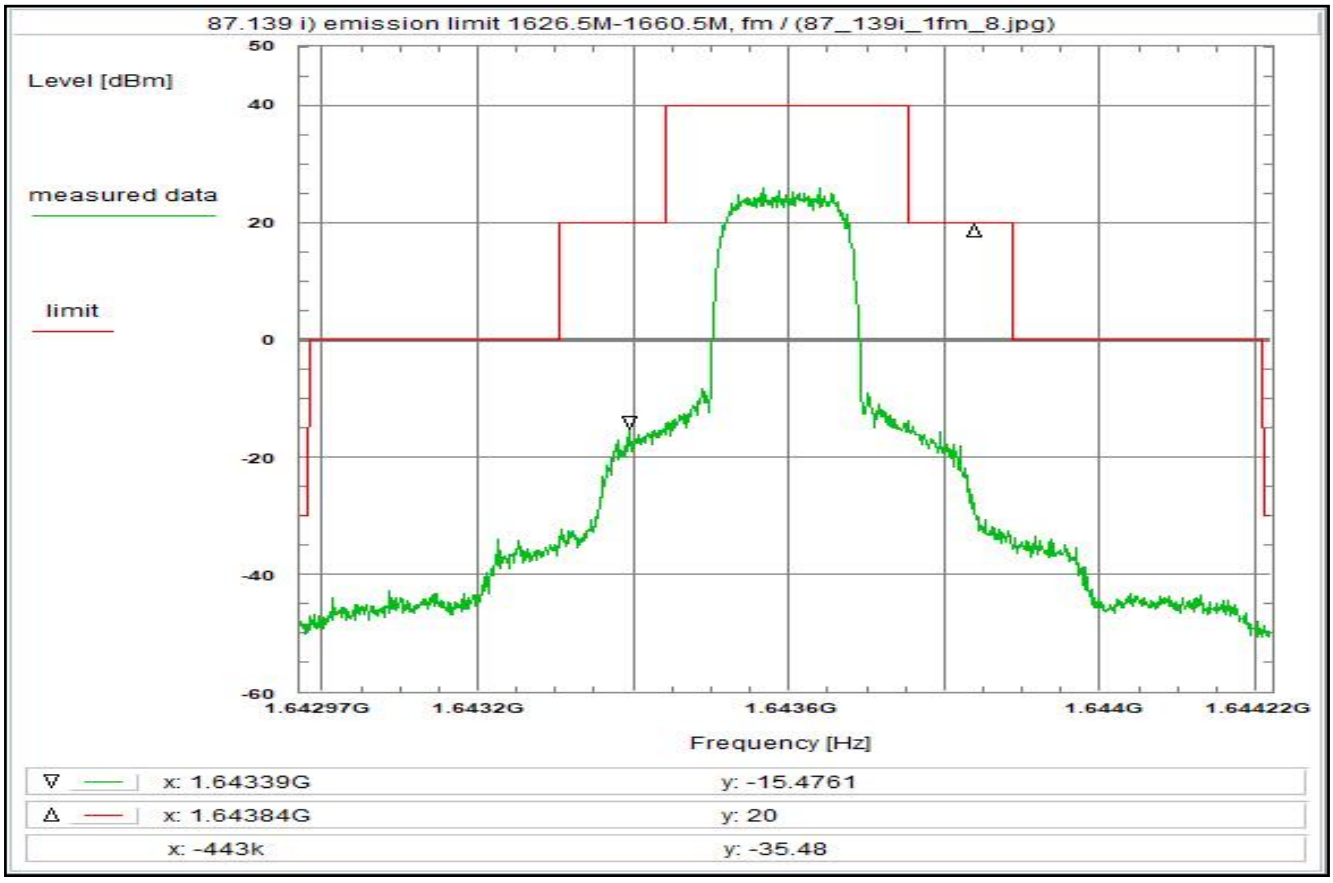
Correction:

| | | | |
|---|---|---|---|
| Directional coupler | + | 0.0 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U330) | + | 31.9 | dB |
| TOTAL CORRECTION: | + | 35.4 | dB |

Remarks:
Carrier-on state / Carrier in the middle of the band (fm)
For EIRP calculation:
´worst-case´ = maximum antenna gain

Reference of limit = 40 dBm
Spectrum mask referenced to necessary bandwidth

Plot No. 78




Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier in the middle of the band (fm)

Limit:
Limit according to 87.139(i)(1)
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with 87.139(i)(1).

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fm, R5T4.5QD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Fri 18/Aug/2023 15:18:48 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 1.642971 | GHz |
| Stop frequency: | 1.644219 | GHz |
| Center frequency: | 1.643595 | GHz |
| Frequency span: | 1.248 | MHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 300 | Hz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Max-Hold | |
| Detector-Mode: | AVG | |

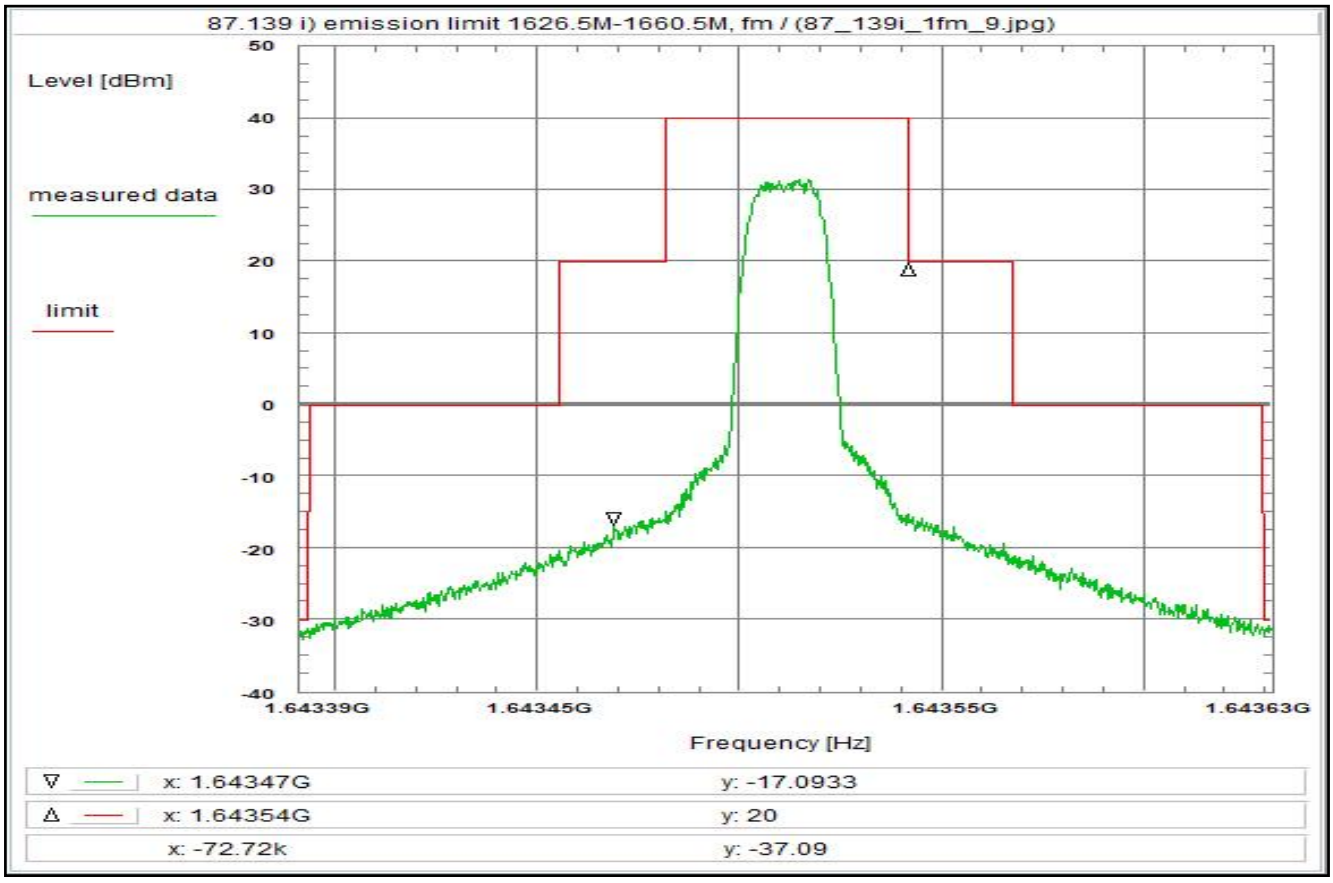
Correction:

| | | | |
|---|---|---|---|
| Directional coupler | + | 0.0 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U330) | + | 31.9 | dB |
| TOTAL CORRECTION: | + | 35.4 | dB |

Remarks:
Carrier-on state / Carrier in the middle of the band (fm)
For EIRP calculation:
´worst-case´ = maximum antenna gain

Reference of limit = 40 dBm
Spectrum mask referenced to necessary bandwidth

Plot No. 79




Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier in the middle of the band (fm)

Limit:
Limit according to 87.139(i)(1)
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with 87.139(i)(1).

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fm, R20T0.5QD

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Fri 18/Aug/2023 15:23:08 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 1.64339125 | GHz |
| Stop frequency: | 1.64363125 | GHz |
| Center frequency: | 1.64351125 | GHz |
| Frequency span: | 240 | kHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 300 | Hz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Average | |
| Detector-Mode: | AVG | |

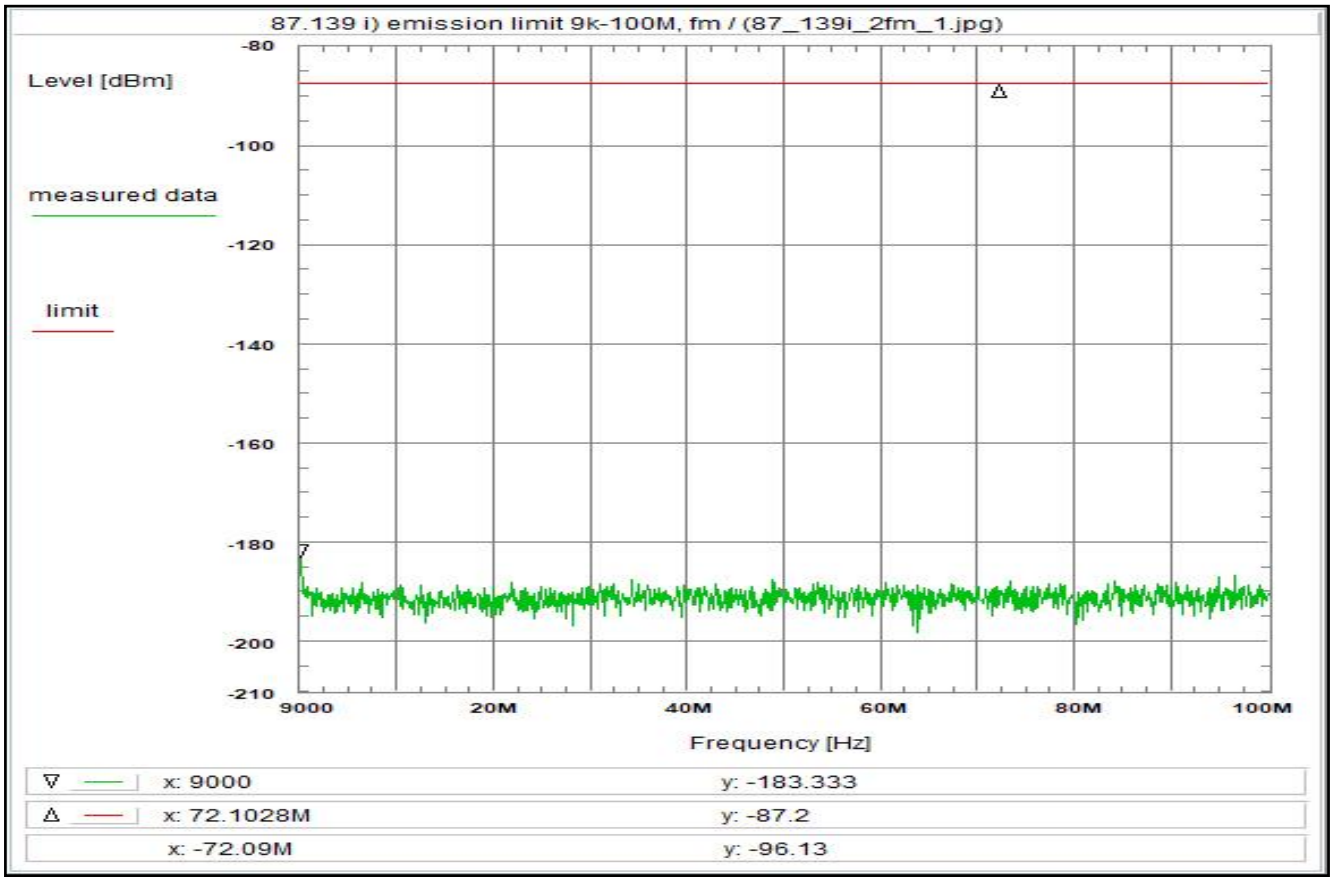
Correction:

| | | | |
|---|---|---|---|
| Directional coupler | + | 0.0 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U330) | + | 31.9 | dB |
| TOTAL CORRECTION: | + | 35.4 | dB |

Remarks:
Carrier-on state / Carrier in the middle of the band (fm)
For EIRP calculation:
´worst-case´ = maximum antenna gain

Reference of limit = 40 dBm
Spectrum mask referenced to necessary bandwidth

Plot No. 80




Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier in the middle of the band (fm)

Limit:
Limit according to 87.139(i)(1)
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with 87.139(i)(1).

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fm, max hold, valid for all modulations

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U330

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Wed 23/Aug/2023 19:08:51 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 9 | kHz |
| Stop frequency: | 100 | MHz |
| Center frequency: | 50.0045 | MHz |
| Frequency span: | 99.991 | MHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 10 | kHz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Max-Hold | |
| Detector-Mode: | AVG | |

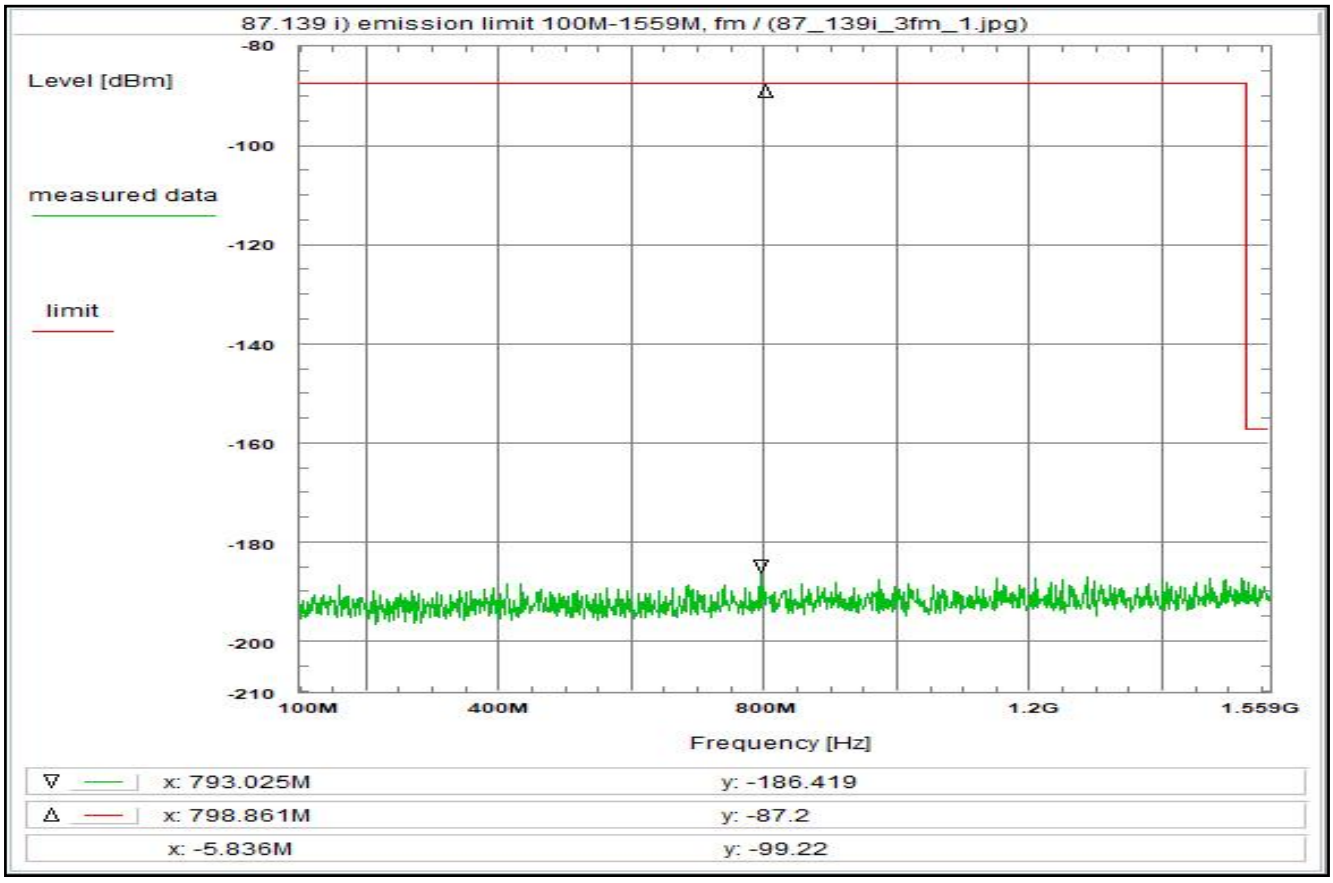
Correction:

| | | | |
|---|---|---|---|
| (W_RE) | - | 120.0 | dB |
| Coaxial cable (C220) | + | 0.2 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U330) | + | 31.3 | dB |
| TOTAL CORRECTION: | - | -85.9 | dB |

Remarks:
Carrier-on state / Carrier in the middle of the band (fm)
For EIRP calculation:
´worst-case´ = maximum antenna gain

Since the measurement was updated with the maximum antenna gain, which is 5.23 dBic, the corrected value of the marker is -179.5 dBm

Plot No. 81




Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier in the middle of the band (fm)

Limit:
Limit according to 87.139(i)(1)
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with 87.139(i)(1).

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fm, max hold, valid for all modulations

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: R001, U330

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Wed 23/Aug/2023 09:34:02 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 100 | MHz |
| Stop frequency: | 1.559 | GHz |
| Center frequency: | 829.5 | MHz |
| Frequency span: | 1.459 | GHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 10 | kHz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Max-Hold | |
| Detector-Mode: | AVG | |

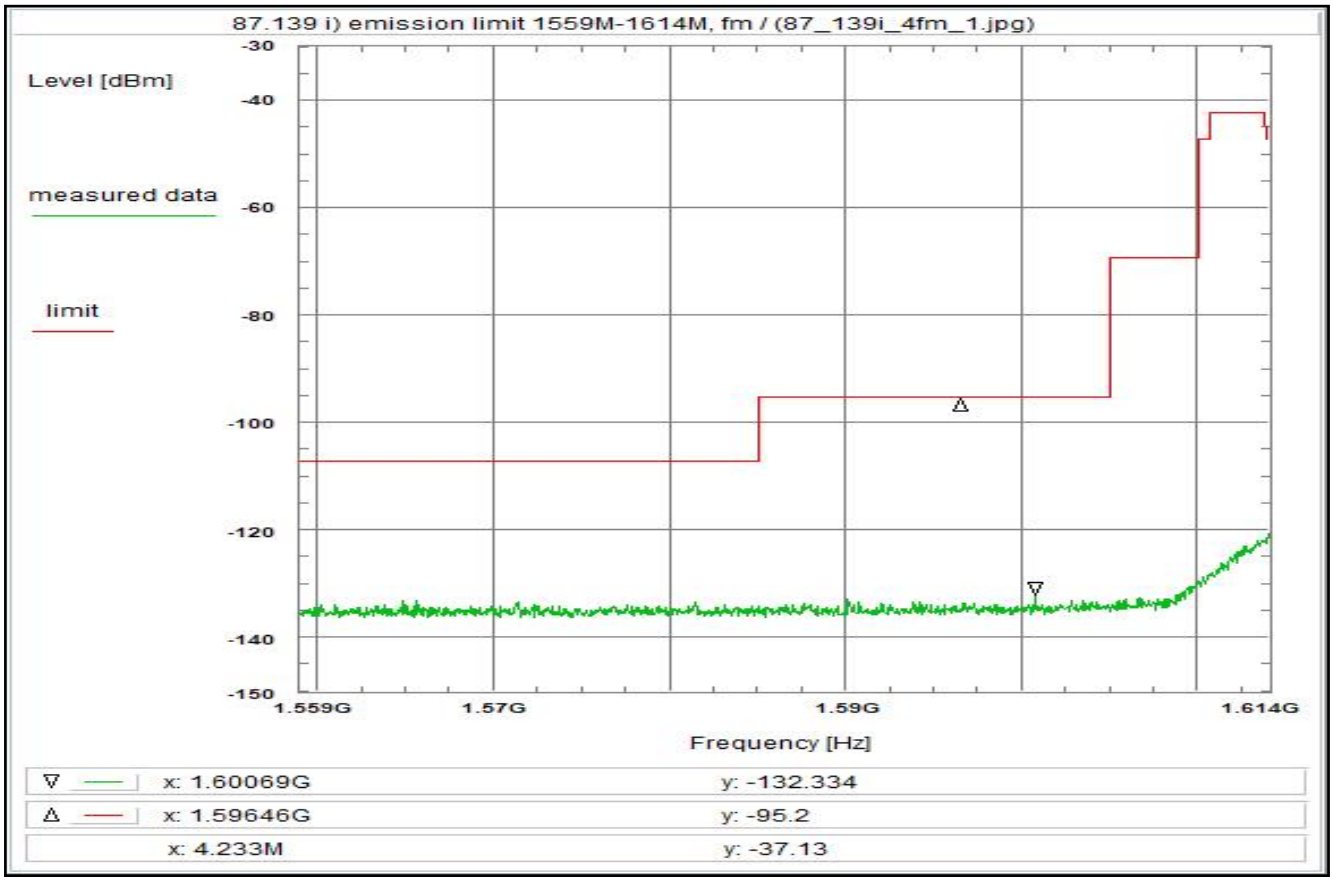
Correction:

| | | | |
|---|---|---|---|
| (W_RE) | - | 115.7 | dB |
| Coaxial cable | + | 0.6 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U330) | + | 31.7 | dB |
| TOTAL CORRECTION: | - | -80.8 | dB |

Remarks:
Carrier-on state / Carrier in the middle of the band (fm)
For EIRP calculation:
´worst-case´ = maximum antenna gain

Since the measurement was updated with the maximum antenna gain, which is 5.23 dBic, the corrected value of the marker is -182.6 dBm

Plot No. 82




Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier in the middle of the band (fm)

Limit:
Limit according to 87.139(i)(1)
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with 87.139(i)(1).

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fm, max hold, valid for all modulations

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U331

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Wed 23/Aug/2023 11:28:33 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 1.559 | GHz |
| Stop frequency: | 1.614 | GHz |
| Center frequency: | 1.5865 | GHz |
| Frequency span: | 55 | MHz |
| Resolution-BW: | 1 | MHz |
| Video-BW: | 3 | MHz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Max-Hold | |
| Detector-Mode: | AVG | |

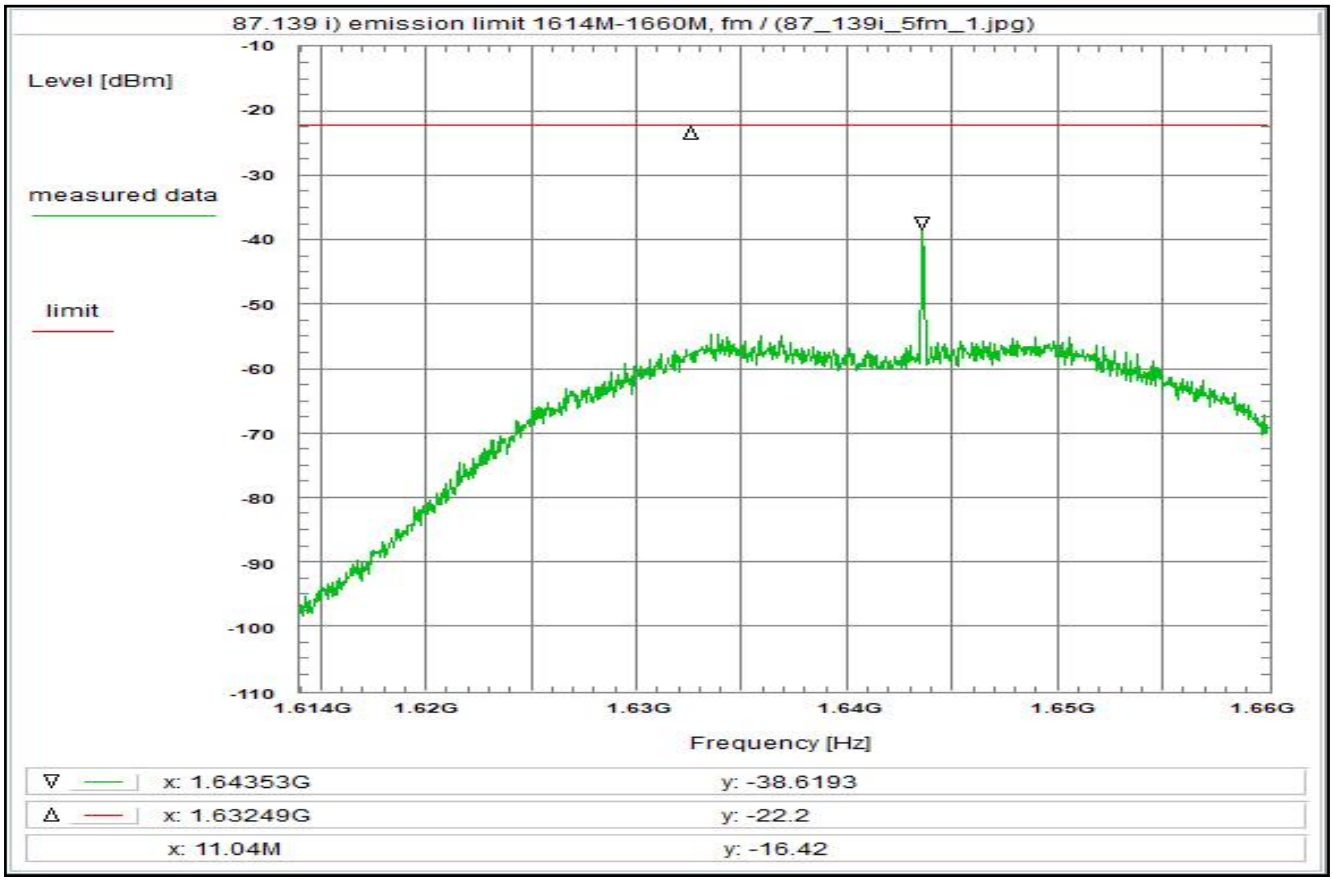
Correction:

| | | | |
|---|---|---|---|
| (W_RE) | - | 104.1 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor | + | 0.0 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U331) | + | 32.6 | dB |
| TOTAL CORRECTION: | - | -69.2 | dB |

Remarks:
Carrier-on state / Carrier in the middle of the band (fm)
For EIRP calculation:
´worst-case´ = maximum antenna gain

Since the measurement was updated with the maximum antenna gain, which is 5.23 dBic, the corrected value of the marker is -128.5 dBm

Plot No. 83




Subclause: 87.139 i) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-carrier in the middle of the band (fm)

Limit:
Limit according to 87.139(i)(1)
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with 87.139(i)(1).

Test results:
see plot (an explicit table was not generated)

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fm, max hold, valid for all modulations

Test setup:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.1-7.2: C220, R001, U331

Remark:

**Test result:** **Test passed**

Environment condition:

| | | |
|---|---|---|
| Date & Time: | Wed 23/Aug/2023 14:35:53 | |
| Location: | CTC advanced GmbH, Laboratory RC-SYS | |
| Temperature: | 22 | °C |
| Humidity: | 55 | % |
| Voltage: | 230 | Vac |

Setup of measurement equipment:

| | | |
|---|---|---|
| Start frequency: | 1.614 | GHz |
| Stop frequency: | 1.66 | GHz |
| Center frequency: | 1.637 | GHz |
| Frequency span: | 46 | MHz |
| Resolution-BW: | 3 | kHz |
| Video-BW: | 10 | kHz |
| Input attenuation: | 20 | dB |
| Trace-Mode: | Max-Hold | |
| Detector-Mode: | AVG | |

Correction:

| | | | |
|---|---|---|---|
| (W_RE) | - | 47.8 | dB |
| Coaxial cable (C220) | + | 0.9 | dB |
| DUT-Antenna (on-axis) | + | 1.4 | dBi |
| Test antenna | + | 0.0 | dB |
| BW correction factor (3k -> 4k) | + | 1.2 | dB |
| Atten. between HPA and feedhorn | - | 0.0 | dB |
| (U331) | + | 74.2 | dB |
| TOTAL CORRECTION: | + | 29.9 | dB |

Remarks:
Carrier-on state / Carrier in the middle of the band (fm)
For EIRP calculation:
´worst-case´ = maximum antenna gain

Since the measurement was updated with the maximum antenna gain, which is 5.23 dBic, the corrected value of the marker is -34.8 dBm