

Annex D



This test report annex is electronically signed and valid without handwriting signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

Test report annex authorized:

Thomas Vogler
Lab Manager
Radio Communications & EMC

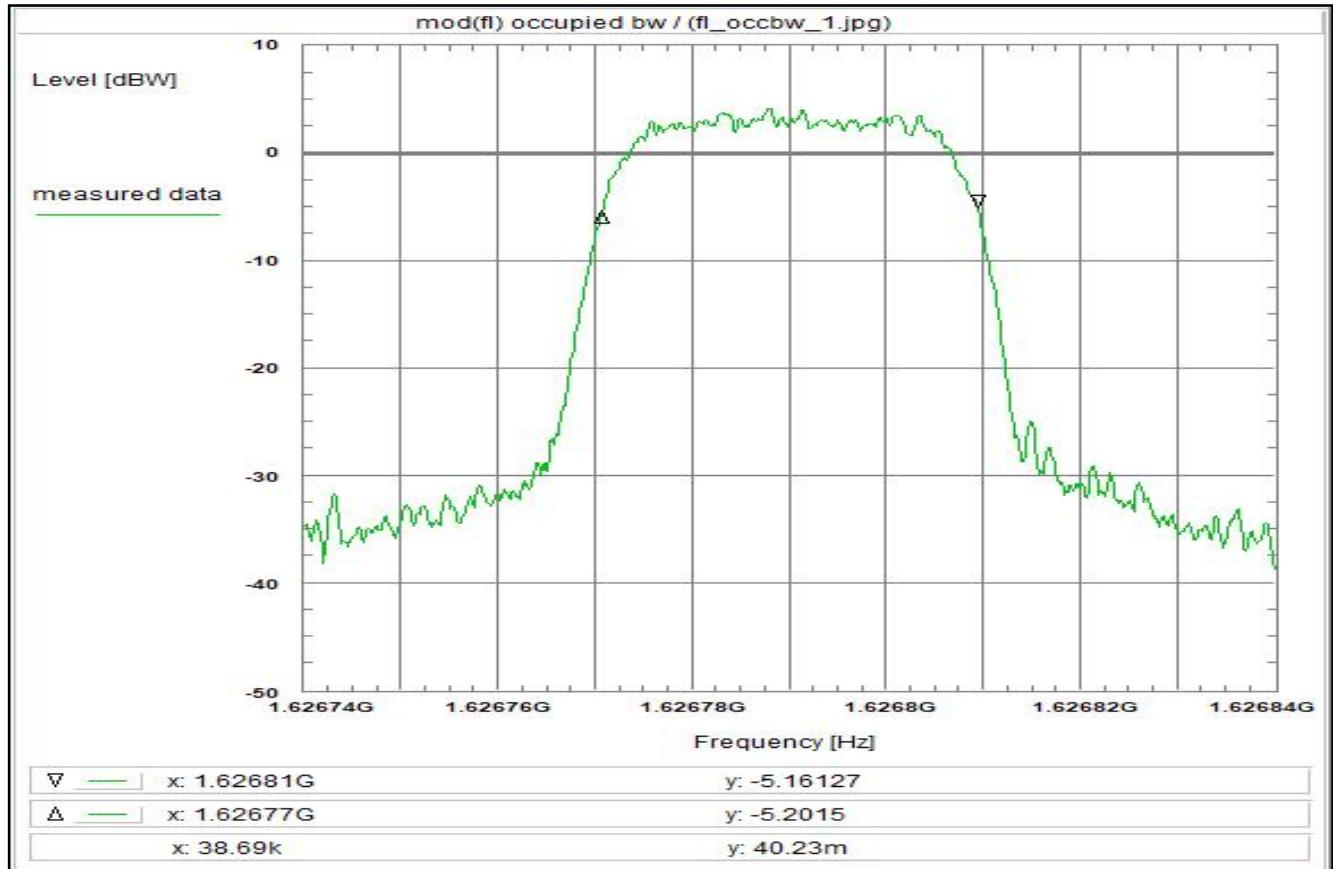
1 Table of contents

| | | |
|---|--------------------------------------|----|
| 1 | Table of contents..... | 2 |
| 2 | Measurement results (conducted)..... | 3 |
| 3 | Radiated spurious emissions | 68 |
| 4 | Document history | 72 |

2 Measurement results (conducted)

This chapter consists of 65 pages including this page.

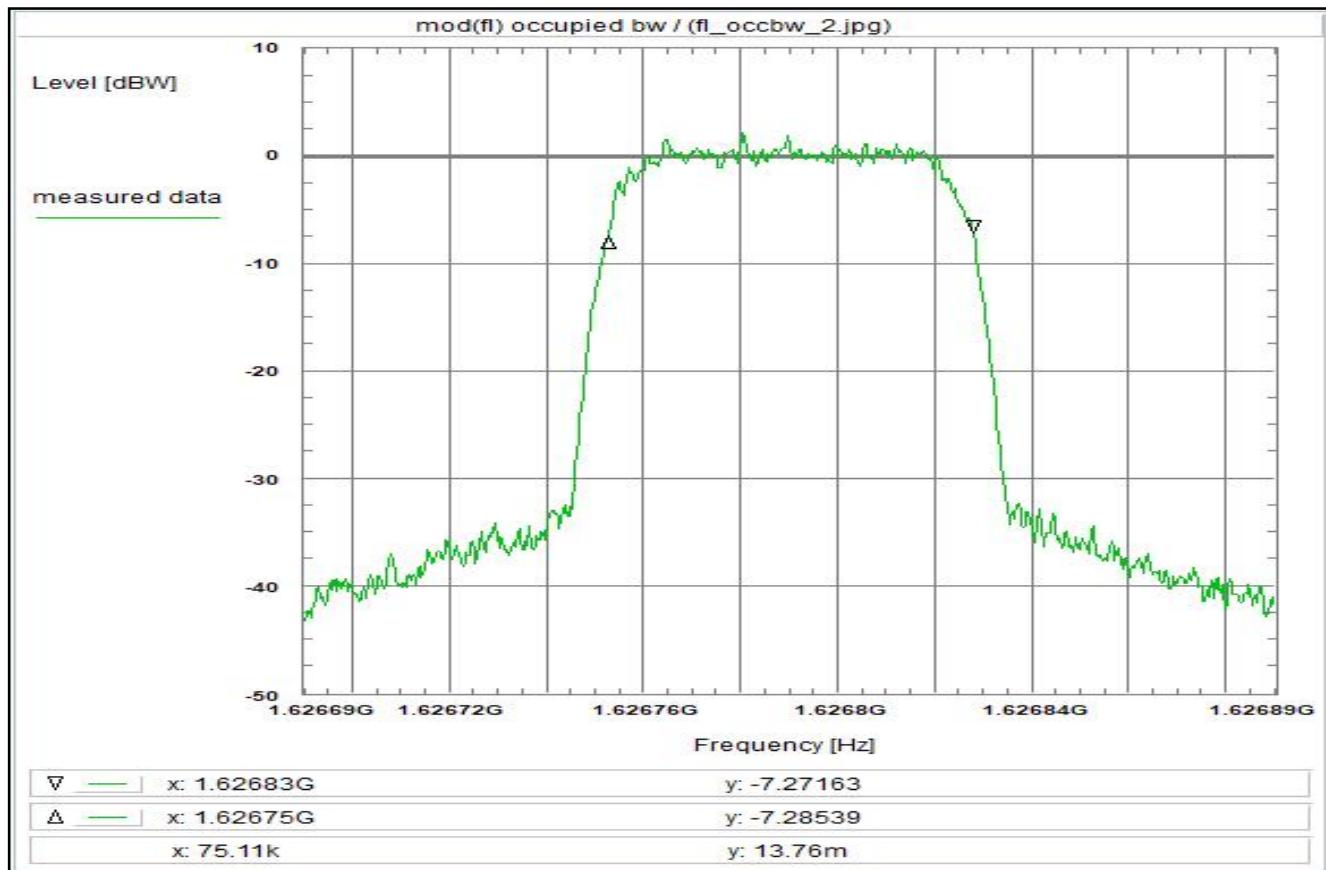
Plot No. 1



| | | |
|------------------------------------|--|---|
| <u>Subclause:</u> | -/- | Function test |
| | | Modulated rf-carrier at the lower edge of the band (f1) |
| | | Determination of the 'occupied bandwidth' |
| <u>Limit:</u> | | No limits defined |
| <u>Test results:</u> | | see plot (an explicit table was not generated) |
| <u>Operating condition of DUT:</u> | | operating condition 1, see test report chapter 5.2 signal type: R5T1X-1B/R20T1X-1B |
| <u>Test setup:</u> | | see test report chapter 7.2: setup 1.1hgj |
| <u>Test equipment:</u> | | see test report chapter 7.2: C220, R001, U316 |
| <u>Remark:</u> | | determination of the occupied bandwidth |
| Test result: | Determination of the occupied bandwidth | |

| | |
|---|--------------------------------------|
| <u>Environment condition:</u> | |
| Date & Time: | Fri 09/Oct/2020 14:58:36 |
| Location: | CTC advanced GmbH, Laboratory RC-SYS |
| Temperature: | 22 °C |
| Humidity: | 55 % |
| Voltage: | 24 Vdc |
| <u>Setup of measurement equipment:</u> | |
| Start frequency: | 1.62674 GHz |
| Stop frequency: | 1.62684 GHz |
| Center frequency: | 1.62679 GHz |
| Frequency span: | 100 kHz |
| Resolution-BW: | 3 kHz |
| Video-BW: | 10 kHz |
| Input attenuation: | 20 dB |
| Trace-Mode: | Max-Hold |
| Detector-Mode: | Sample |
| <u>Correction:</u> | |
| Directional coupler | + 0.0 dB |
| Coaxial cable (C220) | + 0.9 dB |
| DUT-Antenna (on-axis) | + 0.0 dB |
| Test antenna | + 0.0 dB |
| BW correction factor | + 0.0 dB |
| Atten. between HPA and feedhorn | + 0.0 dB |
| Attenuator 10 dB+20dB (U316) | + 29.3 dB |
| Power Splitter | + 3.0 dB |
| TOTAL CORRECTION: | + 33.2 dB |
| <u>Remarks:</u> | |
| Determination of the 'occupied bandwidth' at f1: | |
| The measured value is about 38.7 kHz (delta marker) | |
| Measurement with 3 kHz resolution filter and noise averaging. | |

Plot No. 2



Subclause: -/- Function test
Modulated rf-carrier at the lower edge of the band (f_l)
Determination of the 'occupied bandwidth'

Limit:
No limits defined

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

Operating condition of DUT:
operating condition 1, see test report chapter 5.2
signal type: R5T2X-1B/R20T2X-1B

Test setup:
see test report chapter 7.2: setup 1.1hgj

Test equipment:
see test report chapter 7.2: C220, R001, U316

Remark:
determination of the occupied bandwidth

Test result: Determination of the occupied bandwidth

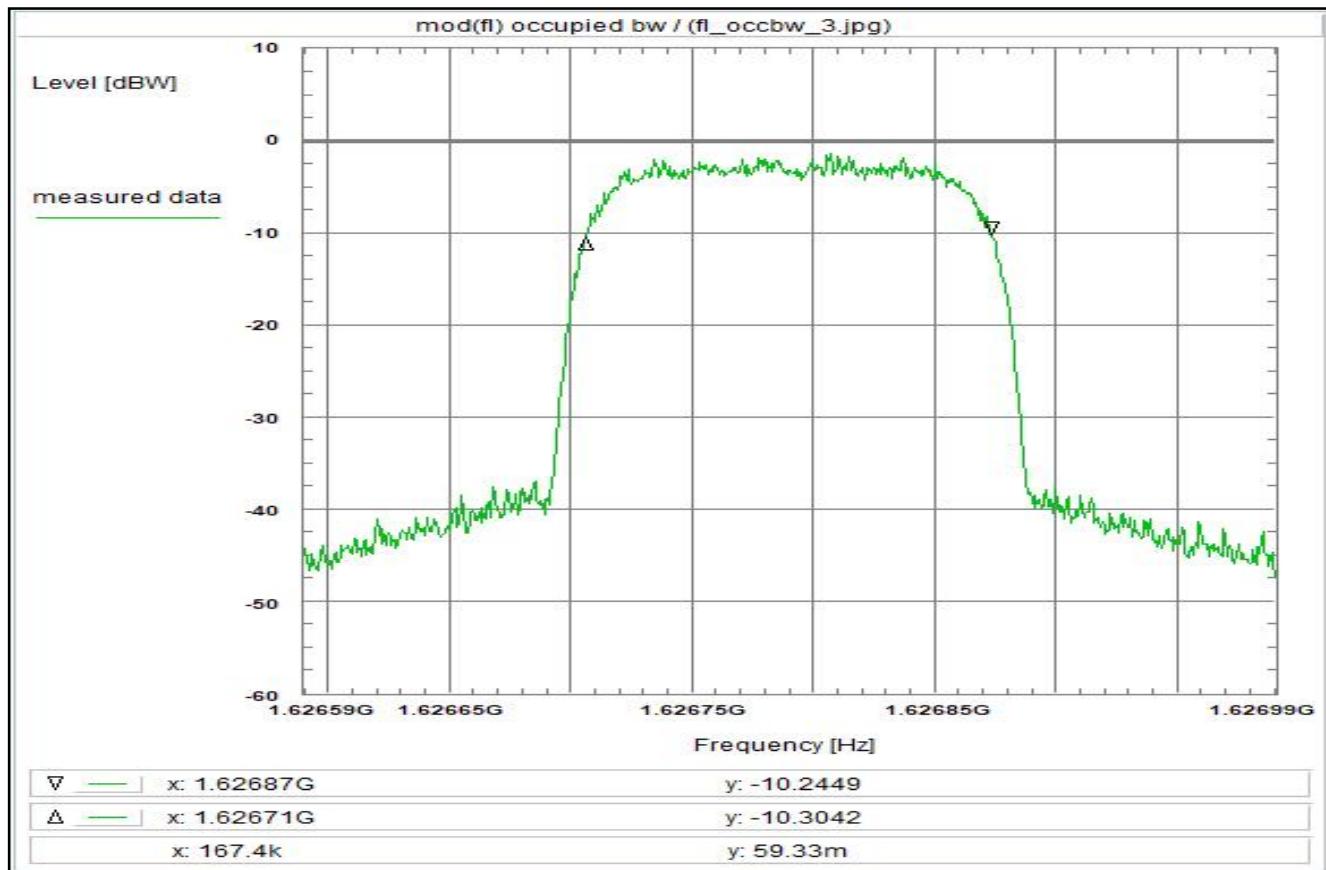
Environment condition:
Date & Time: Fri 09/Oct/2020 15:01:20
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 24 Vdc

Setup of measurement equipment:
Start frequency: 1.62669 GHz
Stop frequency: 1.62689 GHz
Center frequency: 1.62679 GHz
Frequency span: 200 kHz
Resolution-BW: 3 kHz
Video-BW: 10 kHz
Input attenuation: 20 dB
Trace-Mode: Max-Hold
Detector-Mode: Sample

Correction:
Directional coupler + 0.0 dB
Coaxial cable (C220) + 0.9 dB
DUT-Antenna (on-axis) + 0.0 dB
Test antenna + 0.0 dB
BW correction factor + 0.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuator 10 dB+20dB (U316) + 29.3 dB
Power Splitter + 3.0 dB
TOTAL CORRECTION: + 33.2 dB

Remarks:
Determination of the 'occupied bandwidth' at f_l :
The measured value is about 75 kHz (delta marker)
Measurement with 3 kHz resolution filter and noise averaging.

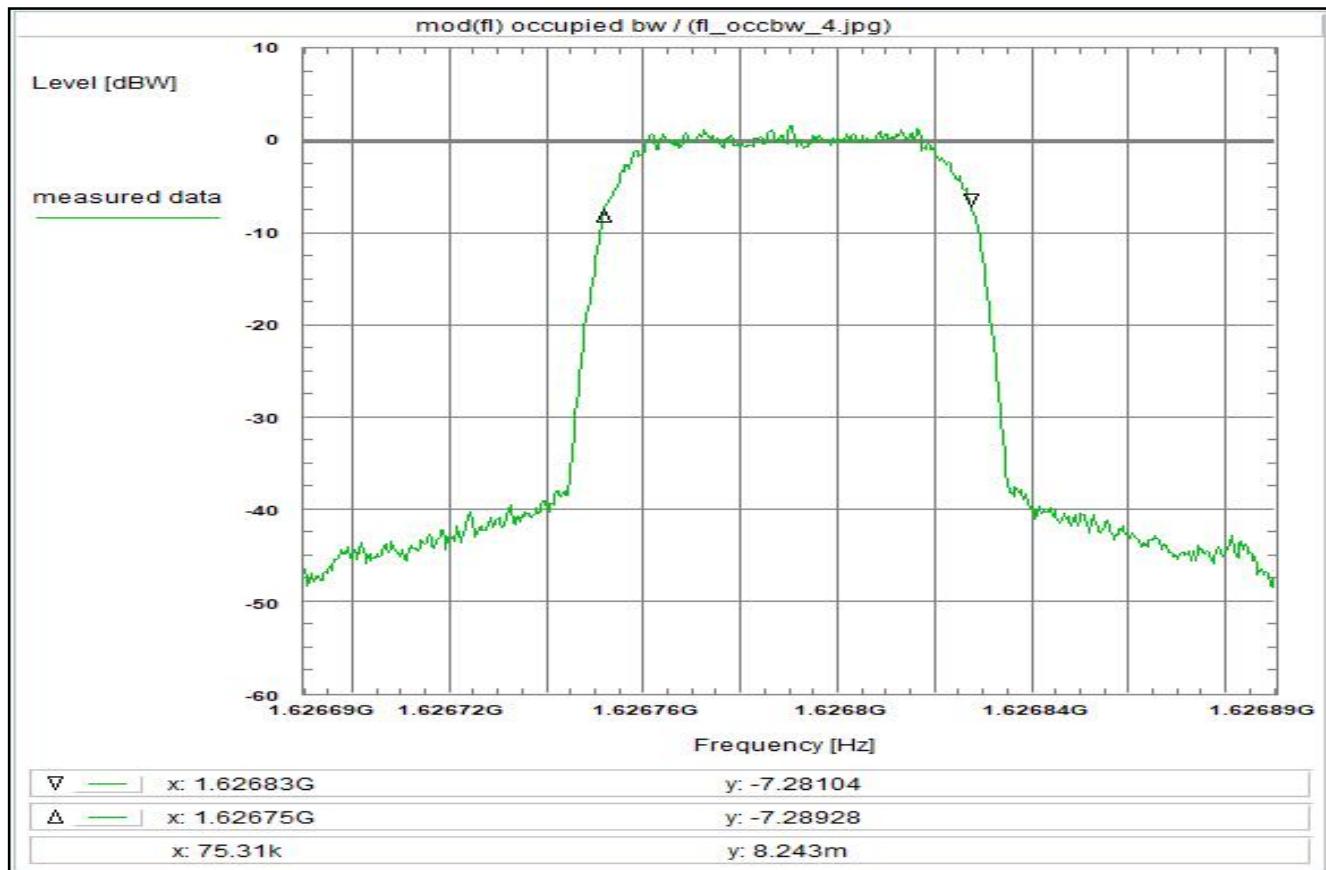
Plot No. 3



| | | |
|------------------------------------|--|---|
| <u>Subclause:</u> | -/- | Function test |
| | | Modulated rf-carrier at the lower edge of the band (f _l) |
| | | Determination of the 'occupied bandwidth' |
| <u>Limit:</u> | | No limits defined |
| <u>Test results:</u> | | see plot (an explicit table was not generated) |
| <u>Operating condition of DUT:</u> | | operating condition 1, see test report chapter 5.2 signal type: R5T4.5X-1B/R20T4.5X-2B |
| <u>Test setup:</u> | | see test report chapter 7.2: setup 1.1hgj |
| <u>Test equipment:</u> | | see test report chapter 7.2: C220, R001, U316 |
| <u>Remark:</u> | | determination of the occupied bandwidth |
| Test result: | Determination of the occupied bandwidth | |

| | |
|--|--------------------------------------|
| <u>Environment condition:</u> | |
| Date & Time: | Fri 09/Oct/2020 15:05:45 |
| Location: | CTC advanced GmbH, Laboratory RC-SYS |
| Temperature: | 22 °C |
| Humidity: | 55 % |
| Voltage: | 24 Vdc |
| <u>Setup of measurement equipment:</u> | |
| Start frequency: | 1.62659 GHz |
| Stop frequency: | 1.62699 GHz |
| Center frequency: | 1.62679 GHz |
| Frequency span: | 400 kHz |
| Resolution-BW: | 3 kHz |
| Video-BW: | 10 kHz |
| Input attenuation: | 20 dB |
| Trace-Mode: | Max-Hold |
| Detector-Mode: | Sample |
| <u>Correction:</u> | |
| Directional coupler | + 0.0 dB |
| Coaxial cable (C220) | + 0.9 dB |
| DUT-Antenna (on-axis) | + 0.0 dB |
| Test antenna | + 0.0 dB |
| BW correction factor | + 0.0 dB |
| Atten. between HPA and feedhorn | + 0.0 dB |
| Attenuator 10 dB+20dB (U316) | + 29.3 dB |
| Power Splitter | + 3.0 dB |
| TOTAL CORRECTION: | + 33.2 dB |
| <u>Remarks:</u> | |
| <u>Determination of the 'occupied bandwidth' at f_l:</u> | |
| The measured value is about 167 kHz (delta marker) | |
| Measurement with 3 kHz resolution filter and noise averaging. | |

Plot No. 4



Subclause: -/- Function test
Modulated rf-carrier at the lower edge of the band (f_l)
Determination of the 'occupied bandwidth'

Limit:
No limits defined

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

Operating condition of DUT:
operating condition 1, see test report chapter 5.2
signal type: R5T2Q-1B/R20T2Q-1B

Test setup:
see test report chapter 7.2: setup 1.1hgj

Test equipment:
see test report chapter 7.2: C220, R001, U316

Remark:
determination of the occupied bandwidth

Test result: Determination of the occupied bandwidth

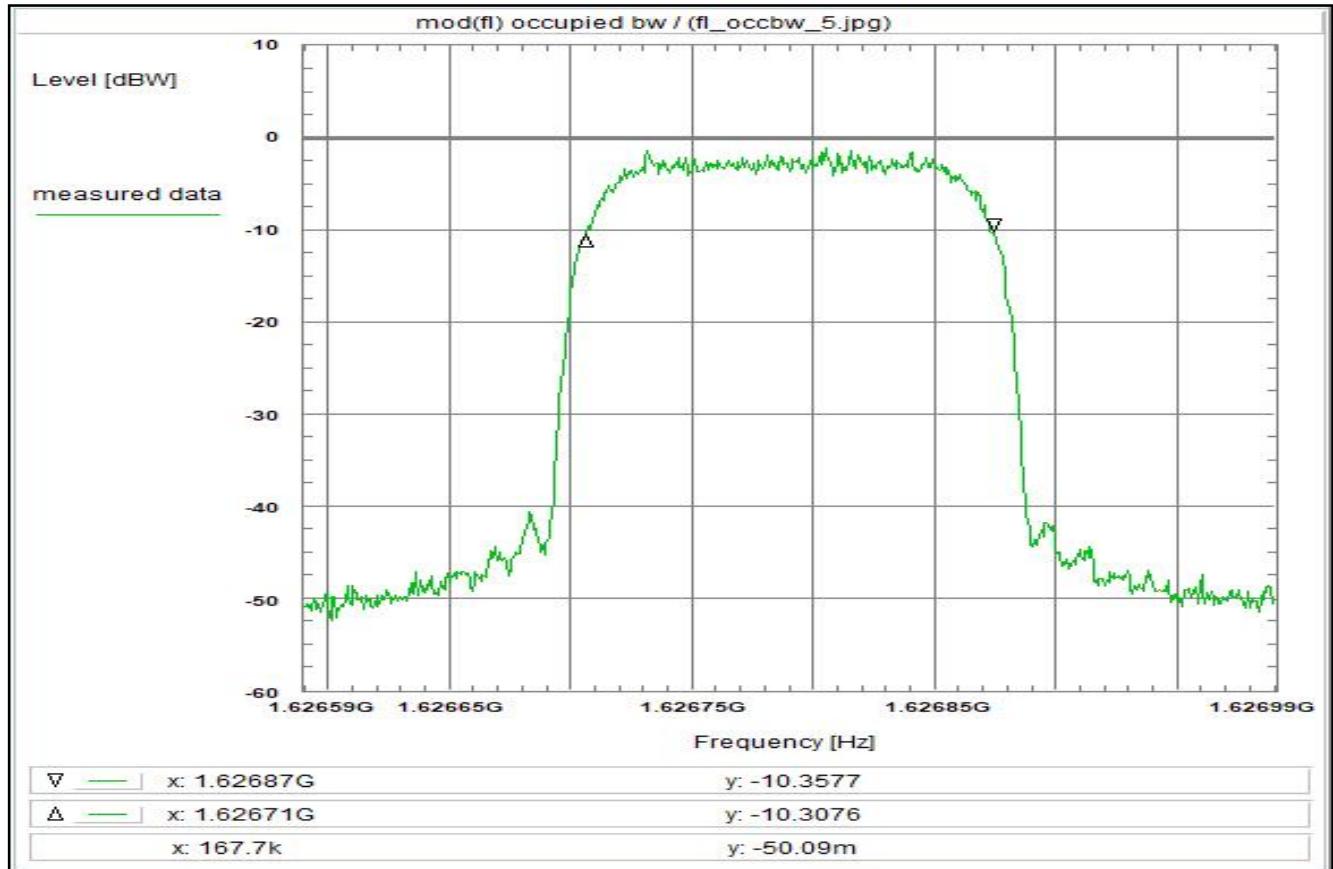
Environment condition:
Date & Time: Fri 09/Oct/2020 15:10:59
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 24 Vdc

Setup of measurement equipment:
Start frequency: 1.62669 GHz
Stop frequency: 1.62689 GHz
Center frequency: 1.62679 GHz
Frequency span: 200 kHz
Resolution-BW: 3 kHz
Video-BW: 10 kHz
Input attenuation: 20 dB
Trace-Mode: Max-Hold
Detector-Mode: Sample

Correction:
Directional coupler + 0.0 dB
Coaxial cable (C220) + 0.9 dB
DUT-Antenna (on-axis) + 0.0 dB
Test antenna + 0.0 dB
BW correction factor + 0.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuator 10 dB+20dB (U316) + 29.3 dB
Power Splitter + 3.0 dB
TOTAL CORRECTION: + 33.2 dB

Remarks:
Determination of the 'occupied bandwidth' at f_l:
The measured value is about 75 kHz (delta marker)
Measurement with 3 kHz resolution filter and noise averaging.

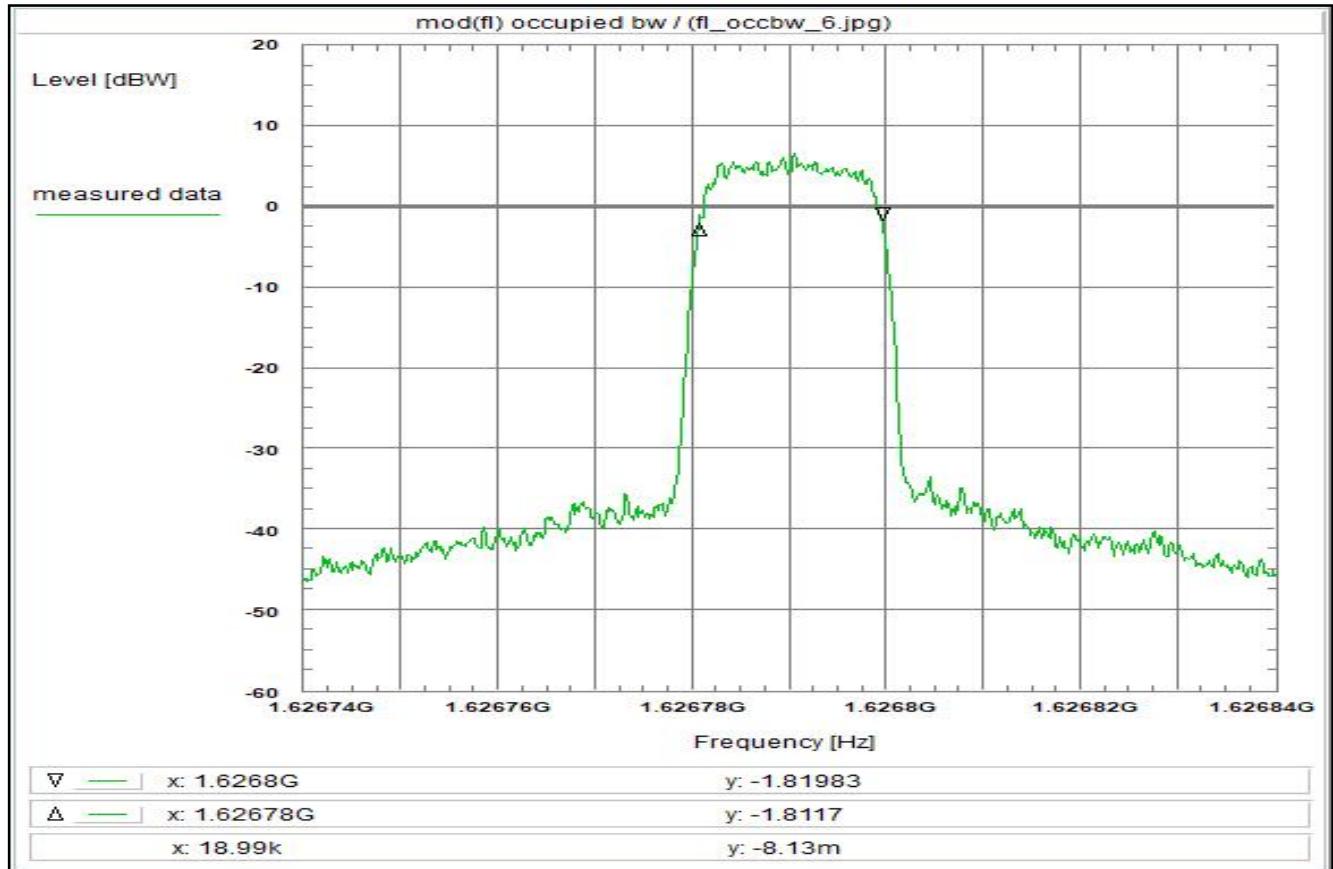
Plot No. 5



| | | |
|------------------------------------|--|---|
| <u>Subclause:</u> | -/- | Function test Modulated rf-carrier at the lower edge of the band (f1) Determination of the 'occupied bandwidth' |
| <u>Limit:</u> | | No limits defined |
| <u>Test results:</u> | | see plot (an explicit table was not generated) |
| <u>Operating condition of DUT:</u> | | operating condition 1, see test report chapter 5.2 signal type: R5T4.5Q-1B/R20T4.5Q-2B |
| <u>Test setup:</u> | | see test report chapter 7.2: setup 1.hgj |
| <u>Test equipment:</u> | | see test report chapter 7.2: C220, R001, U316 |
| <u>Remark:</u> | | determination of the occupied bandwidth |
| Test result: | Determination of the occupied bandwidth | |

| | |
|---|--------------------------------------|
| <u>Environment condition:</u> | |
| Date & Time: | Fri 09/Oct/2020 15:16:20 |
| Location: | CTC advanced GmbH, Laboratory RC-SYS |
| Temperature: | 22 °C |
| Humidity: | 55 % |
| Voltage: | 24 Vdc |
| <u>Setup of measurement equipment:</u> | |
| Start frequency: | 1.62659 GHz |
| Stop frequency: | 1.62699 GHz |
| Center frequency: | 1.62679 GHz |
| Frequency span: | 400 kHz |
| Resolution-BW: | 3 kHz |
| Video-BW: | 10 kHz |
| Input attenuation: | 20 dB |
| Trace-Mode: | Max-Hold |
| Detector-Mode: | Sample |
| <u>Correction:</u> | |
| Directional coupler | + 0.0 dB |
| Coaxial cable (C220) | + 0.9 dB |
| DUT-Antenna (on-axis) | + 0.0 dB |
| Test antenna | + 0.0 dB |
| BW correction factor | + 0.0 dB |
| Atten. between HPA and feedhorn | + 0.0 dB |
| Attenuator 10 dB+20dB (U316) | + 29.3 dB |
| Power Splitter | + 3.0 dB |
| TOTAL CORRECTION: | + 33.2 dB |
| <u>Remarks:</u> | |
| Determination of the 'occupied bandwidth' at f1: | |
| The measured value is about 168 kHz (delta marker) | |
| Measurement with 3 kHz resolution filter and noise averaging. | |

Plot No. 6



Subclause: -/- Function test
Modulated rf-carrier at the lower edge of the band (f1)
Determination of the 'occupied bandwidth'

Limit:
No limits defined

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

Operating condition of DUT:
operating condition 1, see test report chapter 5.2
signal type: R20T0.5Q-1B

Test setup:
see test report chapter 7.2: setup 1.1hgj

Test equipment:
see test report chapter 7.2: C220, R001, U316

Remark:
determination of the occupied bandwidth

Test result: Determination of the occupied bandwidth

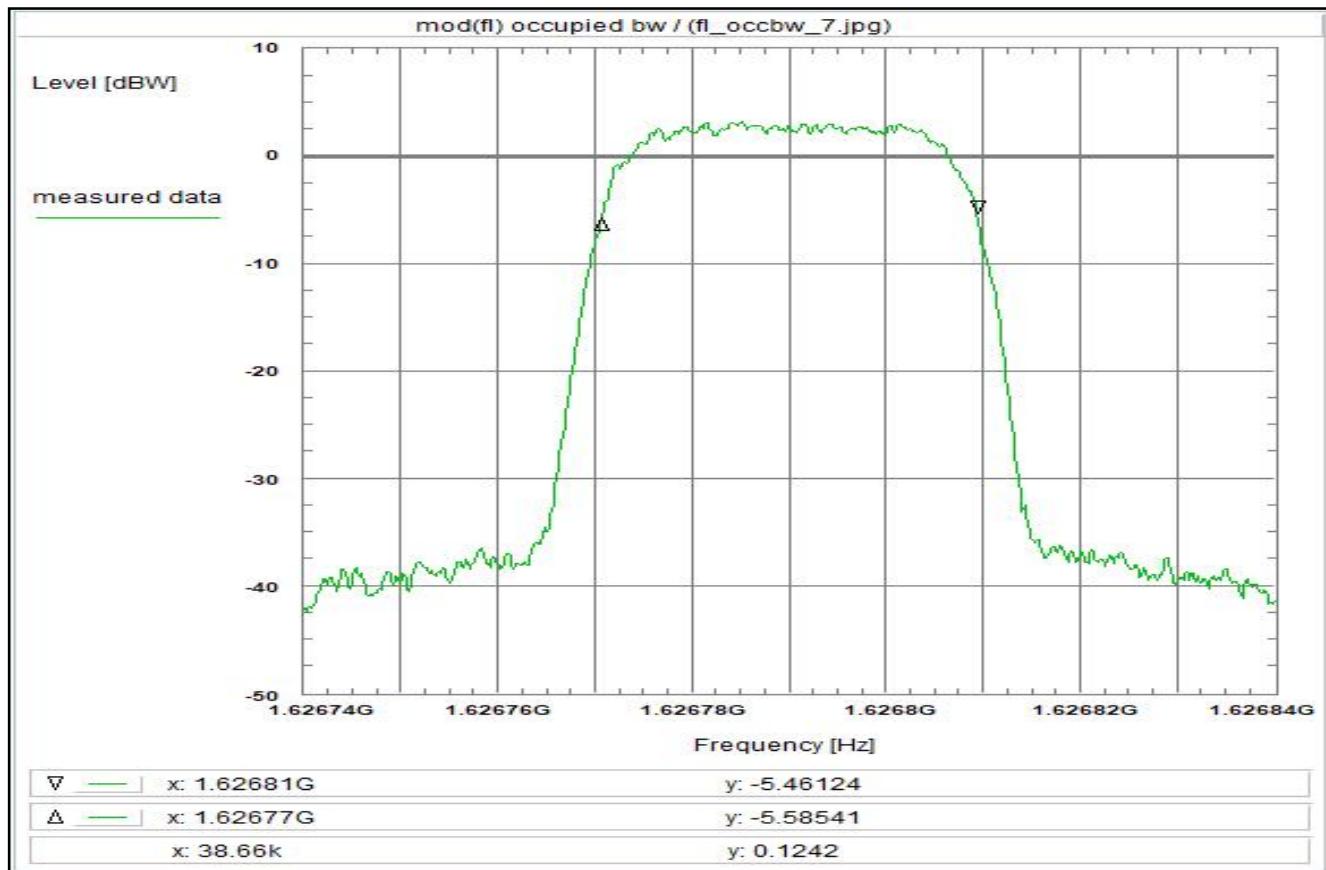
Environment condition:
Date & Time: Fri 09/Oct/2020 15:20:32
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 24 Vdc

Setup of measurement equipment:
Start frequency: 1.62674 GHz
Stop frequency: 1.62684 GHz
Center frequency: 1.62679 GHz
Frequency span: 100 kHz
Resolution-BW: 1 kHz
Video-BW: 3 kHz
Input attenuation: 20 dB
Trace-Mode: Max-Hold
Detector-Mode: Sample

Correction:
Directional coupler + 0.0 dB
Coaxial cable (C220) + 0.9 dB
DUT-Antenna (on-axis) + 0.0 dB
Test antenna + 0.0 dB
BW correction factor (1k > 3k) + 4.8 dB
Atten. between HPA and feedhorn + 0.0 dB
Attenuator 10 dB+20dB (U316) + 29.3 dB
Power Splitter + 3.0 dB
TOTAL CORRECTION: + 38.0 dB

Remarks:
Determination of the 'occupied bandwidth' at f1:
The measured value is about 19 kHz (delta marker)
Measurement with 3 kHz resolution filter and noise averaging.

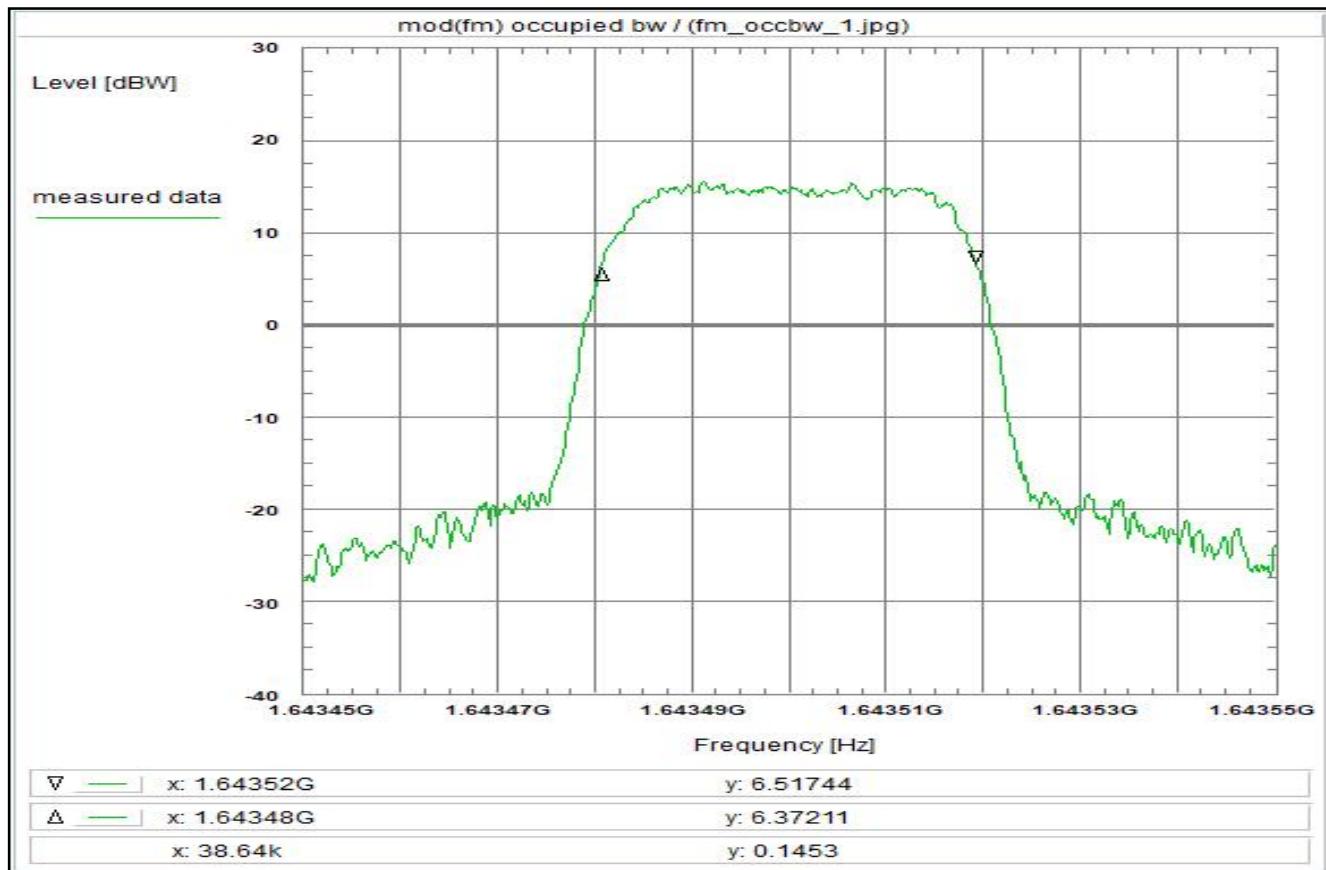
Plot No. 7



| | | |
|---|-----|---|
| <u>Subclause:</u> | -/- | Function test |
| | | Modulated rf-carrier at the lower edge of the band (f1) |
| | | Determination of the 'occupied bandwidth' |
| <u>Limit:</u> | | |
| No limits defined | | |
| <u>Test results:</u> | | |
| see plot (an explicit table was not generated) | | |
| <u>Operating condition of DUT:</u> | | |
| operating condition 1, see test report chapter 5.2 | | |
| signal type: R20T1Q-1B | | |
| <u>Test setup:</u> | | |
| see test report chapter 7.2: setup 1.1hgj | | |
| <u>Test equipment:</u> | | |
| see test report chapter 7.2: C220, R001, U316 | | |
| <u>Remark:</u> | | |
| determination of the occupied bandwidth | | |
| Test result: Determination of the occupied bandwidth | | |

| | |
|---|--------------------------------------|
| <u>Environment condition:</u> | |
| Date & Time: | Fri 09/Oct/2020 15:24:49 |
| Location: | CTC advanced GmbH, Laboratory RC-SYS |
| Temperature: | 22 °C |
| Humidity: | 55 % |
| Voltage: | 24 Vdc |
| <u>Setup of measurement equipment:</u> | |
| Start frequency: | 1.62674 GHz |
| Stop frequency: | 1.62684 GHz |
| Center frequency: | 1.62679 GHz |
| Frequency span: | 100 kHz |
| Resolution-BW: | 3 kHz |
| Video-BW: | 10 kHz |
| Input attenuation: | 20 dB |
| Trace-Mode: | Max-Hold |
| Detector-Mode: | Sample |
| <u>Correction:</u> | |
| Directional coupler | + 0.0 dB |
| Coaxial cable (C220) | + 0.9 dB |
| DUT-Antenna (on-axis) | + 0.0 dB |
| Test antenna | + 0.0 dB |
| BW correction factor | + 0.0 dB |
| Atten. between HPA and feedhorn | + 0.0 dB |
| Attenuator 10 dB+20dB (U316) | + 29.3 dB |
| Power Splitter | + 3.0 dB |
| TOTAL CORRECTION: | + 33.2 dB |
| <u>Remarks:</u> | |
| Determination of the 'occupied bandwidth' at f1: | |
| The measured value is about 38.6 kHz (delta marker) | |
| Measurement with 3 kHz resolution filter and noise averaging. | |

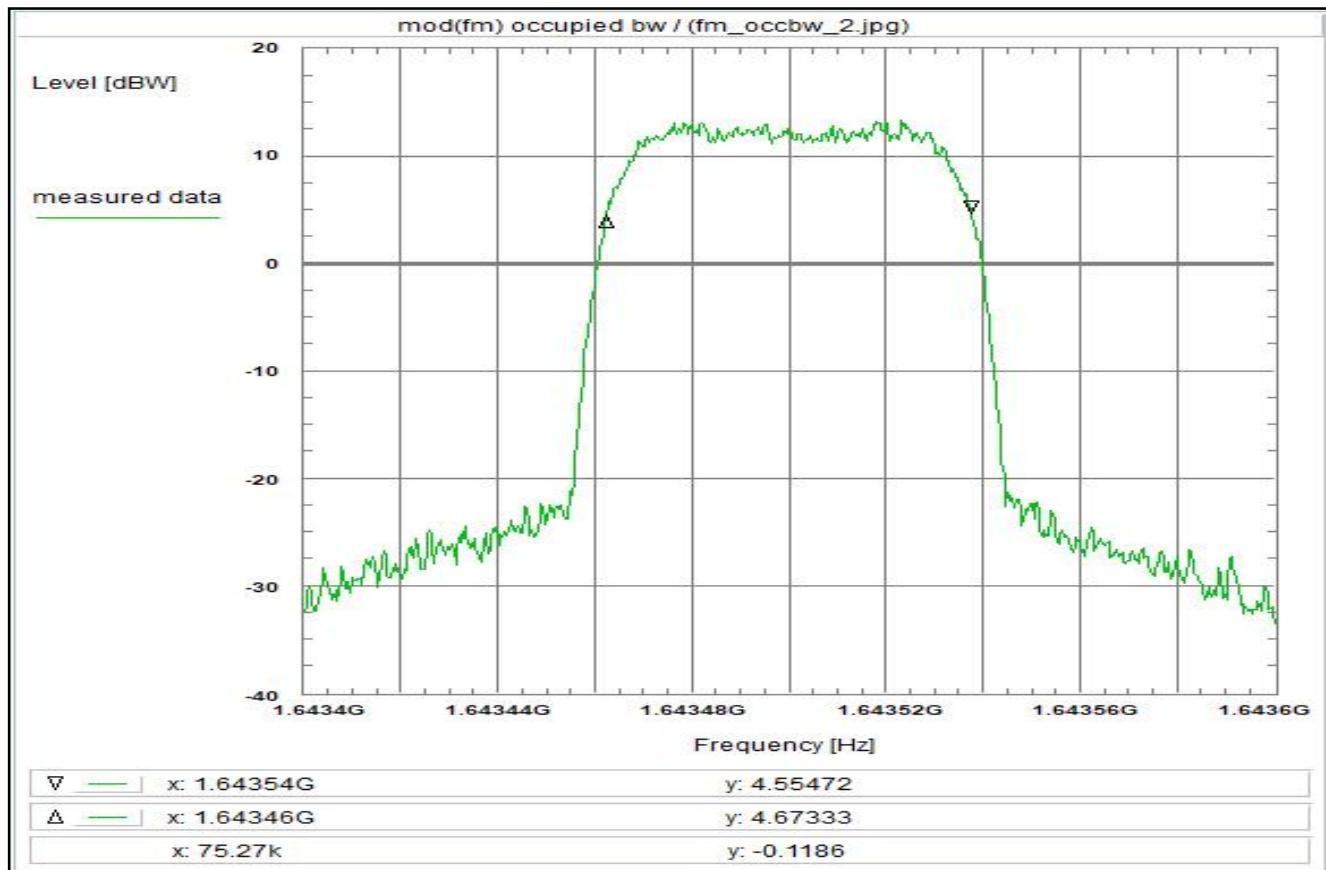
Plot No. 8



| | | |
|---|-----|---|
| <u>Subclause:</u> | -/- | Function test |
| | | Modulated rf-carrier in the middle of the band (fm) |
| | | Determination of the 'occupied bandwidth' |
| <u>Limit:</u> | | |
| No limits defined | | |
| <u>Test results:</u> | | |
| see plot (an explicit table was not generated) | | |
| <u>Operating condition of DUT:</u> | | |
| operating condition 1, see test report chapter 5.2 | | |
| signal type R5T1X-1B/R20T1X-1B | | |
| <u>Test setup:</u> | | |
| see test report chapter 7.2: setup 1.1hgj | | |
| <u>Test equipment:</u> | | |
| see test report chapter 7.2: C220, R001, U316 | | |
| <u>Remark:</u> | | |
| determination of the occupied bandwidth | | |
| Test result: Determination of the occupied bandwidth | | |

| | |
|---|--------------------------------------|
| <u>Environment condition:</u> | |
| Date & Time: | Fri 09/Oct/2020 14:21:27 |
| Location: | CTC advanced GmbH, Laboratory RC-SYS |
| Temperature: | 22 °C |
| Humidity: | 55 % |
| Voltage: | 24 Vdc |
| <u>Setup of measurement equipment:</u> | |
| Start frequency: | 1.64345 GHz |
| Stop frequency: | 1.64355 GHz |
| Center frequency: | 1.6435 GHz |
| Frequency span: | 100 kHz |
| Resolution-BW: | 3 kHz |
| Video-BW: | 10 kHz |
| Input attenuation: | 20 dB |
| Trace-Mode: | Max-Hold |
| Detector-Mode: | Sample |
| <u>Correction:</u> | |
| Directional coupler | + 0.0 dB |
| Coaxial cable (C220) | + 0.9 dB |
| DUT-Antenna | + 11.3 dBi |
| Test antenna | + 0.0 dB |
| BW correction factor | + 0.0 dB |
| Atten. between HPA and feedhorn | - 0.0 dB |
| Attenuator 10 dB+20dB (U316) | + 29.3 dB |
| Power Splitter | + 3.0 dB |
| TOTAL CORRECTION: | + 44.5 dB |
| <u>Remarks:</u> | |
| Determination of the 'occupied bandwidth' at fm: | |
| The measured value is about 38.6 kHz (delta marker) | |
| Measurement with 3 kHz resolution filter and noise averaging. | |

Plot No. 9



Subclause: -/- Function test
Modulated rf-carrier in the middle of the band (fm)
Determination of the 'occupied bandwidth'

Limit:
No limits defined

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

Operating condition of DUT:
operating condition 1, see test report chapter 5.2
signal type: R5T2X-1B/R20T2X-1B

Test setup:
see test report chapter 7.2: setup 1.1hgj

Test equipment:
see test report chapter 7.2: C220, R001, U316

Remark:
determination of the occupied bandwidth

Test result: Determination of the occupied bandwidth

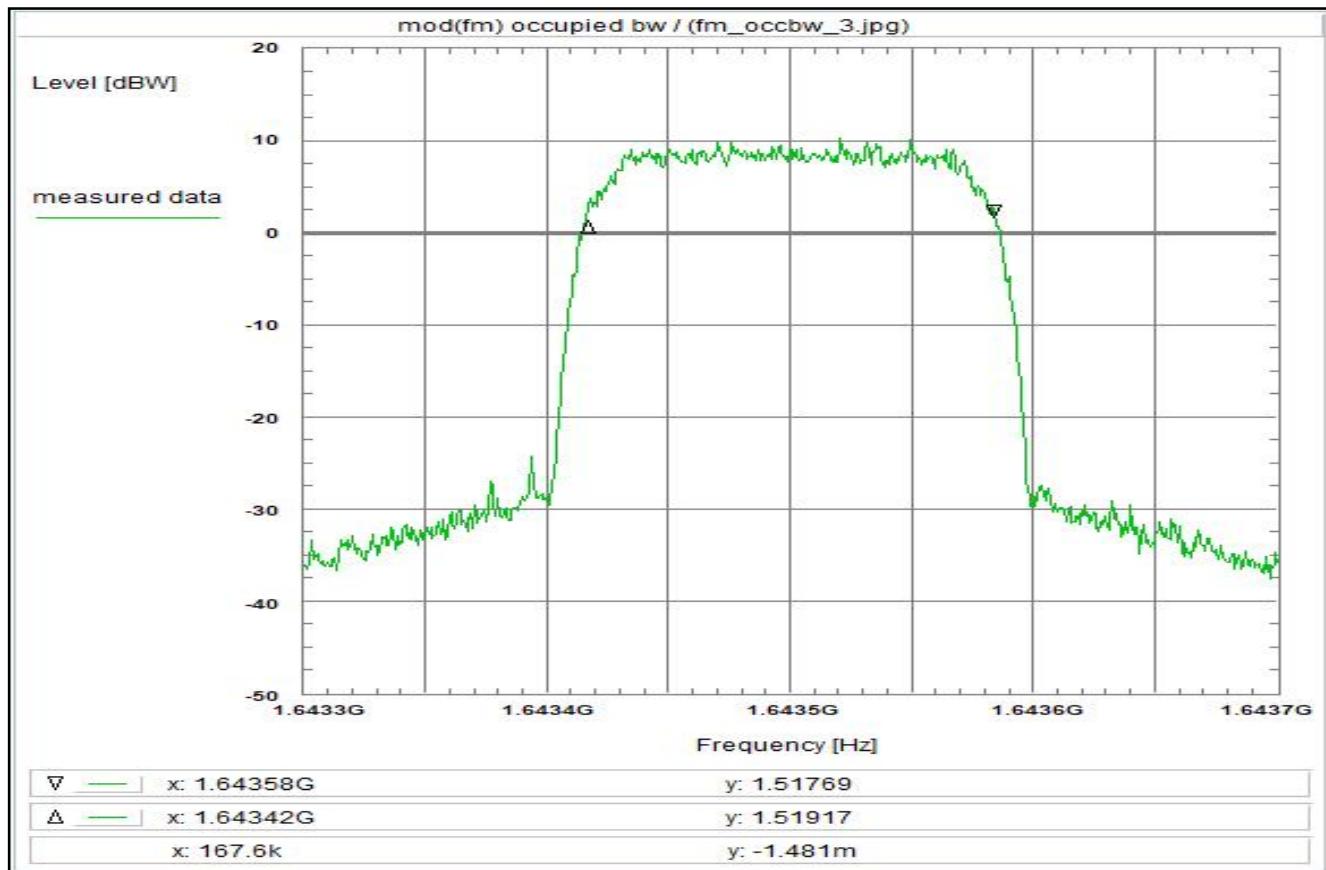
Environment condition:
Date & Time: Fri 09/Oct/2020 14:27:38
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 24 Vdc

Setup of measurement equipment:
Start frequency: 1.6434 GHz
Stop frequency: 1.6436 GHz
Center frequency: 1.6435 GHz
Frequency span: 200 kHz
Resolution-BW: 3 kHz
Video-BW: 10 kHz
Input attenuation: 20 dB
Trace-Mode: Max-Hold
Detector-Mode: Sample

Correction:
Directional coupler + 0.0 dB
Coaxial cable (C220) + 0.9 dB
DUT-Antenna + 11.3 dBi
Test antenna + 0.0 dB
BW correction factor + 0.0 dB
Atten. between HPA and feedhorn - 0.0 dB
Attenuator 10 dB+20dB (U316) + 29.3 dB
Power Splitter + 3.0 dB
TOTAL CORRECTION: + 44.5 dB

Remarks:
Determination of the 'occupied bandwidth' at fm:
The measured value is about 75 kHz (delta marker)
Measurement with 3 kHz resolution filter and noise averaging.

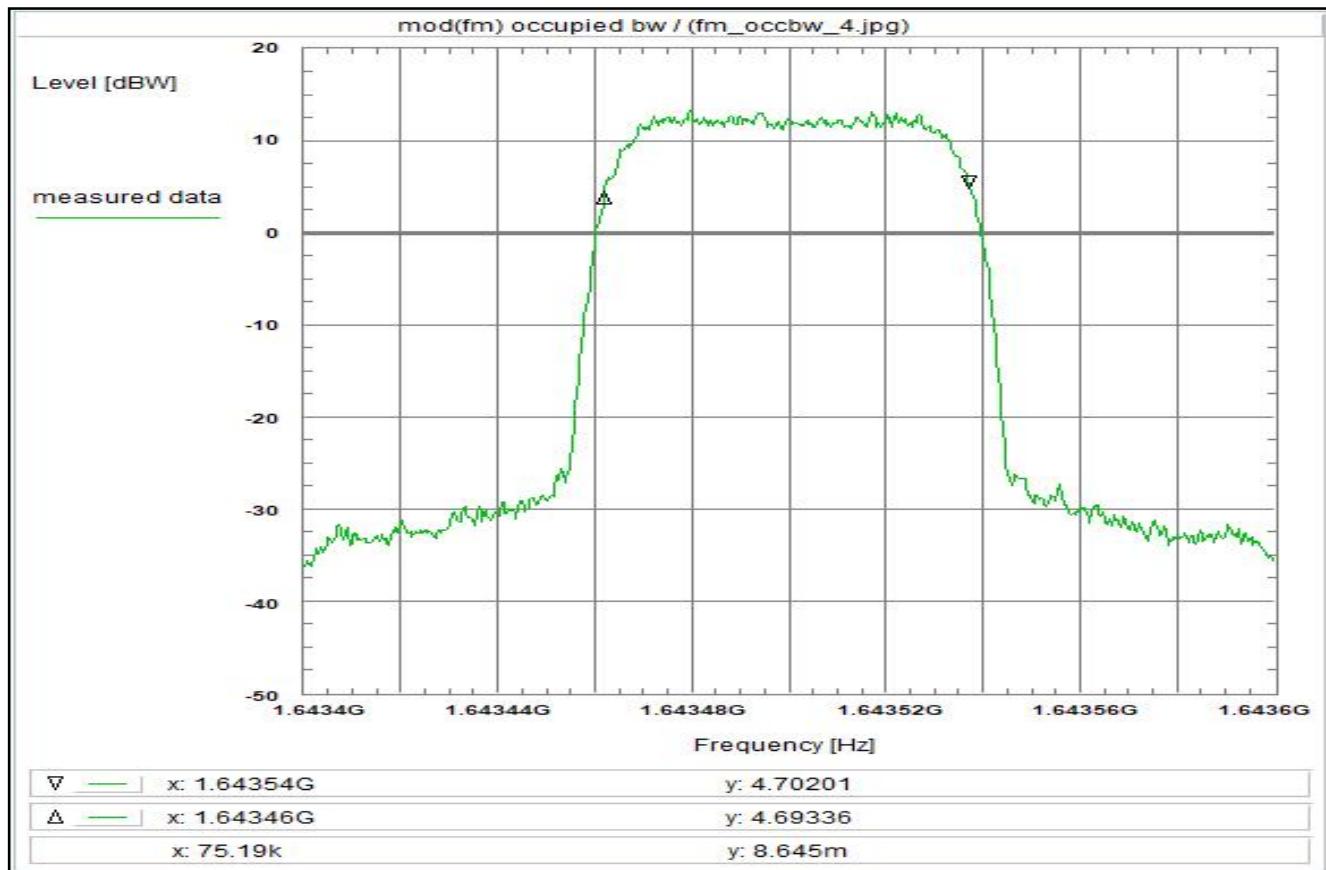
Plot No. 10



| | | |
|------------------------------------|--|---|
| <u>Subclause:</u> | -/- | Function test Modulated rf-carrier in the middle of the band (fm) Determination of the 'occupied bandwidth' |
| <u>Limit:</u> | | No limits defined |
| <u>Test results:</u> | | see plot (an explicit table was not generated) |
| <u>Operating condition of DUT:</u> | | operating condition 1, see test report chapter 5.2 signal type: R5T4.5X-1B/R20T4.5X-2B |
| <u>Test setup:</u> | | see test report chapter 7.2: setup 1.1hgj |
| <u>Test equipment:</u> | | see test report chapter 7.2: C220, R001, U316 |
| <u>Remark:</u> | | determination of the occupied bandwidth |
| <u>Test result:</u> | Determination of the occupied bandwidth | |

| | |
|---|--------------------------------------|
| <u>Environment condition:</u> | |
| Date & Time: | Fri 09/Oct/2020 14:32:22 |
| Location: | CTC advanced GmbH, Laboratory RC-SYS |
| Temperature: | 22 °C |
| Humidity: | 55 % |
| Voltage: | 24 Vdc |
| <u>Setup of measurement equipment:</u> | |
| Start frequency: | 1.6433 GHz |
| Stop frequency: | 1.6437 GHz |
| Center frequency: | 1.6435 GHz |
| Frequency span: | 400 kHz |
| Resolution-BW: | 3 kHz |
| Video-BW: | 10 kHz |
| Input attenuation: | 20 dB |
| Trace-Mode: | Max-Hold |
| Detector-Mode: | Sample |
| <u>Correction:</u> | |
| Directional coupler | + 0.0 dB |
| Coaxial cable (C220) | + 0.9 dB |
| DUT-Antenna | + 11.3 dBi |
| Test antenna | + 0.0 dB |
| BW correction factor | + 0.0 dB |
| Atten. between HPA and feedhorn | - 0.0 dB |
| Attenuator 10 dB+20dB (U316) | + 29.3 dB |
| Power Splitter | + 3.0 dB |
| TOTAL CORRECTION: | + 44.5 dB |
| <u>Remarks:</u> | |
| <u>Determination of the 'occupied bandwidth' at fm:</u> | |
| The measured value is about 168 kHz (delta marker) | |
| Measurement with 3 kHz resolution filter and noise averaging. | |

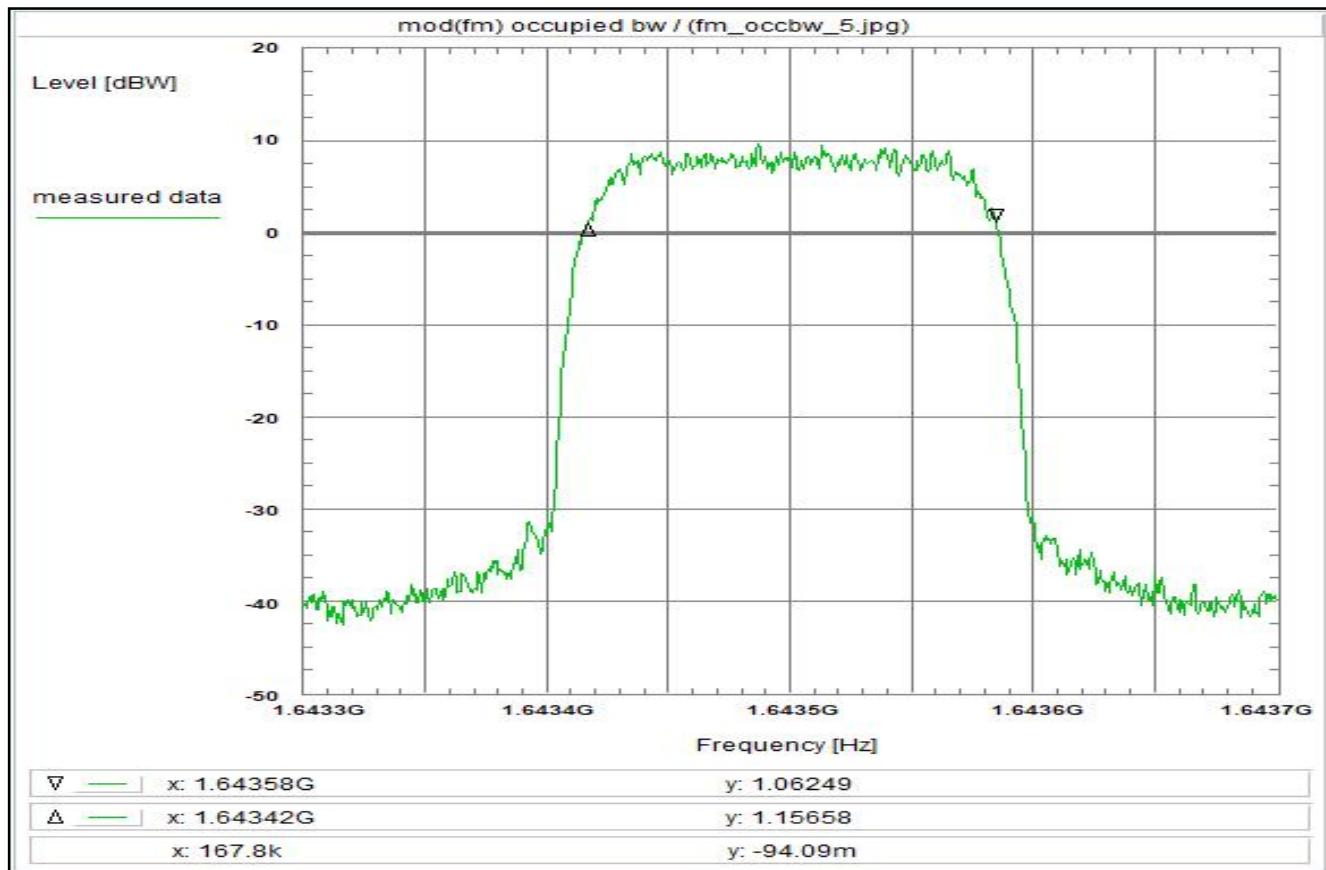
Plot No. 11



| | | |
|-----------------------------|--|---|
| Subclause: | -/- | Function test Modulated rf-carrier in the middle of the band (fm) Determination of the 'occupied bandwidth' |
| Limit: | | No limits defined |
| Test results: | | see plot (an explicit table was not generated) |
| Operating condition of DUT: | | operating condition 1, see test report chapter 5.2 signal type: R5T2Q-1B/R20T2Q-1B |
| Test setup: | | see test report chapter 7.2: setup 1.1hgj |
| Test equipment: | | see test report chapter 7.2: C220, R001, U316 |
| Remark: | | determination of the occupied bandwidth |
| Test result: | Determination of the occupied bandwidth | |

| | |
|---|--------------------------------------|
| Environment condition: | |
| Date & Time: | Fri 09/Oct/2020 14:45:12 |
| Location: | CTC advanced GmbH, Laboratory RC-SYS |
| Temperature: | 22 °C |
| Humidity: | 55 % |
| Voltage: | 24 Vdc |
| Setup of measurement equipment: | |
| Start frequency: | 1.6434 GHz |
| Stop frequency: | 1.6436 GHz |
| Center frequency: | 1.6435 GHz |
| Frequency span: | 200 kHz |
| Resolution-BW: | 3 kHz |
| Video-BW: | 10 kHz |
| Input attenuation: | 20 dB |
| Trace-Mode: | Max-Hold |
| Detector-Mode: | Sample |
| Correction: | |
| Directional coupler | + 0.0 dB |
| Coaxial cable (C220) | + 0.9 dB |
| DUT-Antenna | + 11.3 dBi |
| Test antenna | + 0.0 dB |
| BW correction factor | + 0.0 dB |
| Atten. between HPA and feedhorn | - 0.0 dB |
| Attenuator 10 dB+20dB (U316) | + 29.3 dB |
| Power Splitter | + 3.0 dB |
| TOTAL CORRECTION: | + 44.5 dB |
| Remarks: | |
| Determination of the 'occupied bandwidth' at fm: | |
| The measured value is about 75 kHz (delta marker) | |
| Measurement with 3 kHz resolution filter and noise averaging. | |

Plot No. 12



Subclause: -/- Function test
Modulated rf-carrier in the middle of the band (fm)
Determination of the 'occupied bandwidth'

Limit:
No limits defined

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

Operating condition of DUT:
operating condition 1, see test report chapter 5.2
signal type: R5T4.5Q-1B/R20T4.5Q-1B

Test setup:
see test report chapter 7.2: setup 1.1hgj

Test equipment:
see test report chapter 7.2: C220, R001, U316

Remark:
determination of the occupied bandwidth

Test result: Determination of the occupied bandwidth

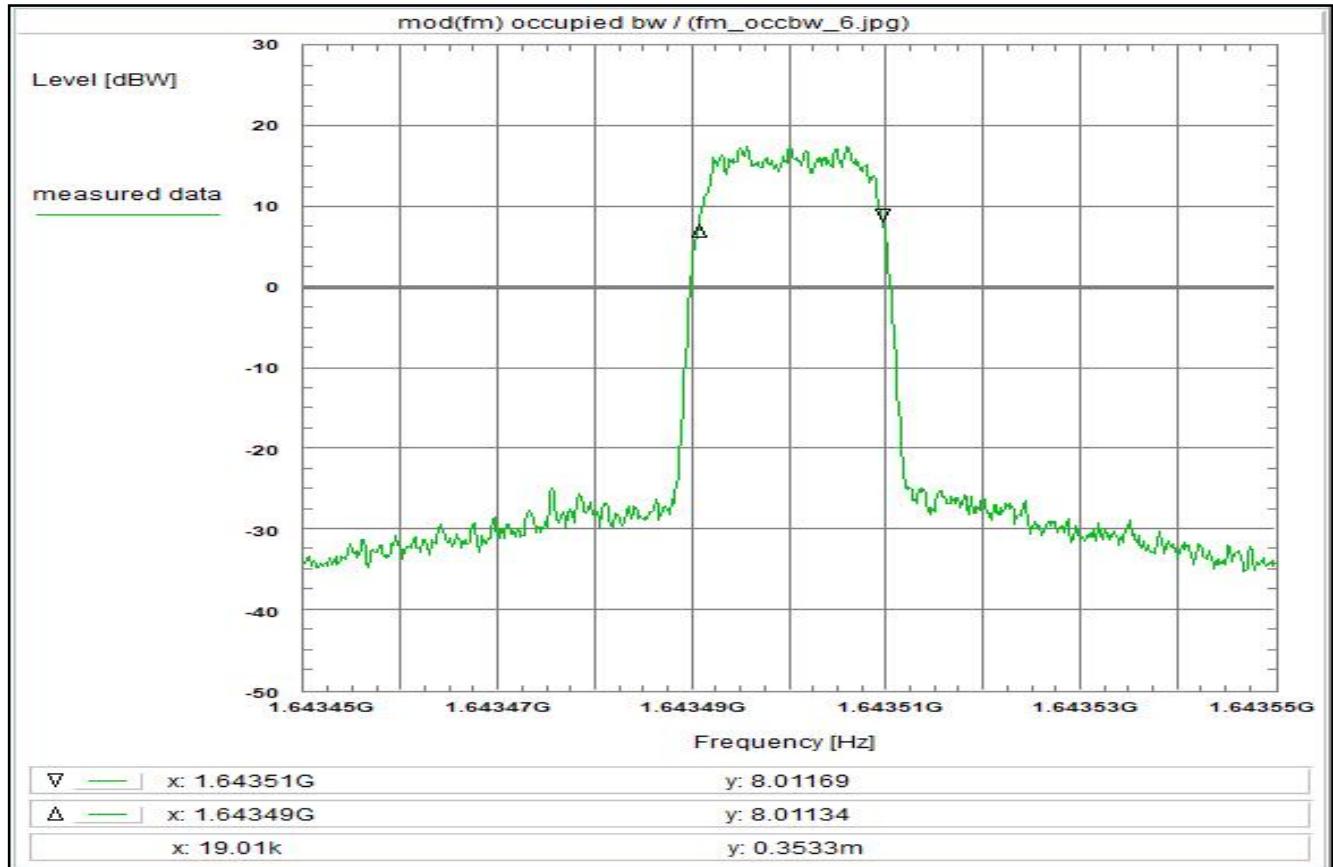
Environment condition:
Date & Time: Fri 09/Oct/2020 14:47:24
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 24 Vdc

Setup of measurement equipment:
Start frequency: 1.6433 GHz
Stop frequency: 1.6437 GHz
Center frequency: 1.6435 GHz
Frequency span: 400 kHz
Resolution-BW: 3 kHz
Video-BW: 10 kHz
Input attenuation: 20 dB
Trace-Mode: Max-Hold
Detector-Mode: Sample

Correction:
Directional coupler + 0.0 dB
Coaxial cable (C220) + 0.9 dB
DUT-Antenna + 11.3 dBi
Test antenna + 0.0 dB
BW correction factor + 0.0 dB
Atten. between HPA and feedhorn - 0.0 dB
Attenuator 10 dB+20dB (U316) + 29.3 dB
Power Splitter + 3.0 dB
TOTAL CORRECTION: + 44.5 dB

Remarks:
Determination of the 'occupied bandwidth' at fm:
The measured value is about 168 kHz (delta marker)
Measurement with 3 kHz resolution filter and noise averaging.

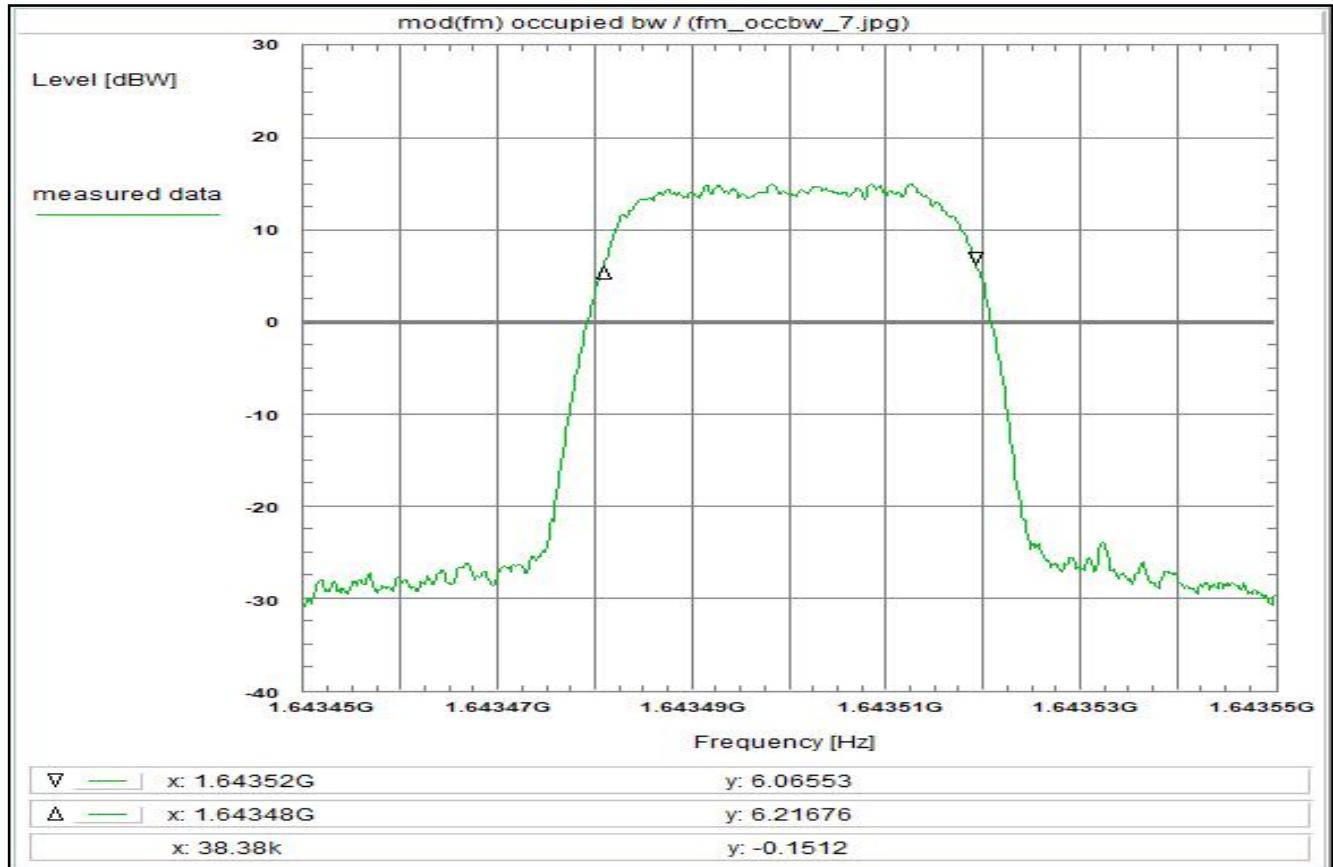
Plot No. 13



| | | |
|---|-----|---|
| <u>Subclause:</u> | -/- | Function test |
| | | Modulated rf-carrier in the middle of the band (fm) |
| | | Determination of the 'occupied bandwidth' |
| <u>Limit:</u> | | |
| No limits defined | | |
| <u>Test results:</u> | | |
| see plot (an explicit table was not generated) | | |
| <u>Operating condition of DUT:</u> | | |
| operating condition 1, see test report chapter 5.2 | | |
| signal type: R20T0.5Q-1B | | |
| <u>Test setup:</u> | | |
| see test report chapter 7.2: setup 1.1hgj | | |
| <u>Test equipment:</u> | | |
| see test report chapter 7.2: C220, R001, U316 | | |
| <u>Remark:</u> | | |
| determination of the occupied bandwidth | | |
| Test result: Determination of the occupied bandwidth | | |

| | |
|---|--------------------------------------|
| <u>Environment condition:</u> | |
| Date & Time: | Fri 09/Oct/2020 14:48:54 |
| Location: | CTC advanced GmbH, Laboratory RC-SYS |
| Temperature: | 22 °C |
| Humidity: | 55 % |
| Voltage: | 24 Vdc |
| <u>Setup of measurement equipment:</u> | |
| Start frequency: | 1.64345 GHz |
| Stop frequency: | 1.64355 GHz |
| Center frequency: | 1.6435 GHz |
| Frequency span: | 100 kHz |
| Resolution-BW: | 1 kHz |
| Video-BW: | 3 kHz |
| Input attenuation: | 20 dB |
| Trace-Mode: | Max-Hold |
| Detector-Mode: | Sample |
| <u>Correction:</u> | |
| Directional coupler | + 0.0 dB |
| Coaxial cable (C220) | + 0.9 dB |
| DUT-Antenna | + 11.3 dBi |
| Test antenna | + 0.0 dB |
| BW correction factor (1k > 3k) | + 4.8 dB |
| Atten. between HPA and feedhorn | - 0.0 dB |
| Attenuator 10 dB+20dB (U316) | + 29.3 dB |
| Power Splitter | + 3.0 dB |
| TOTAL CORRECTION: | + 49.3 dB |
| <u>Remarks:</u> | |
| Determination of the 'occupied bandwidth' at fm: | |
| The measured value is about 19 kHz (delta marker) | |
| Measurement with 3 kHz resolution filter and noise averaging. | |

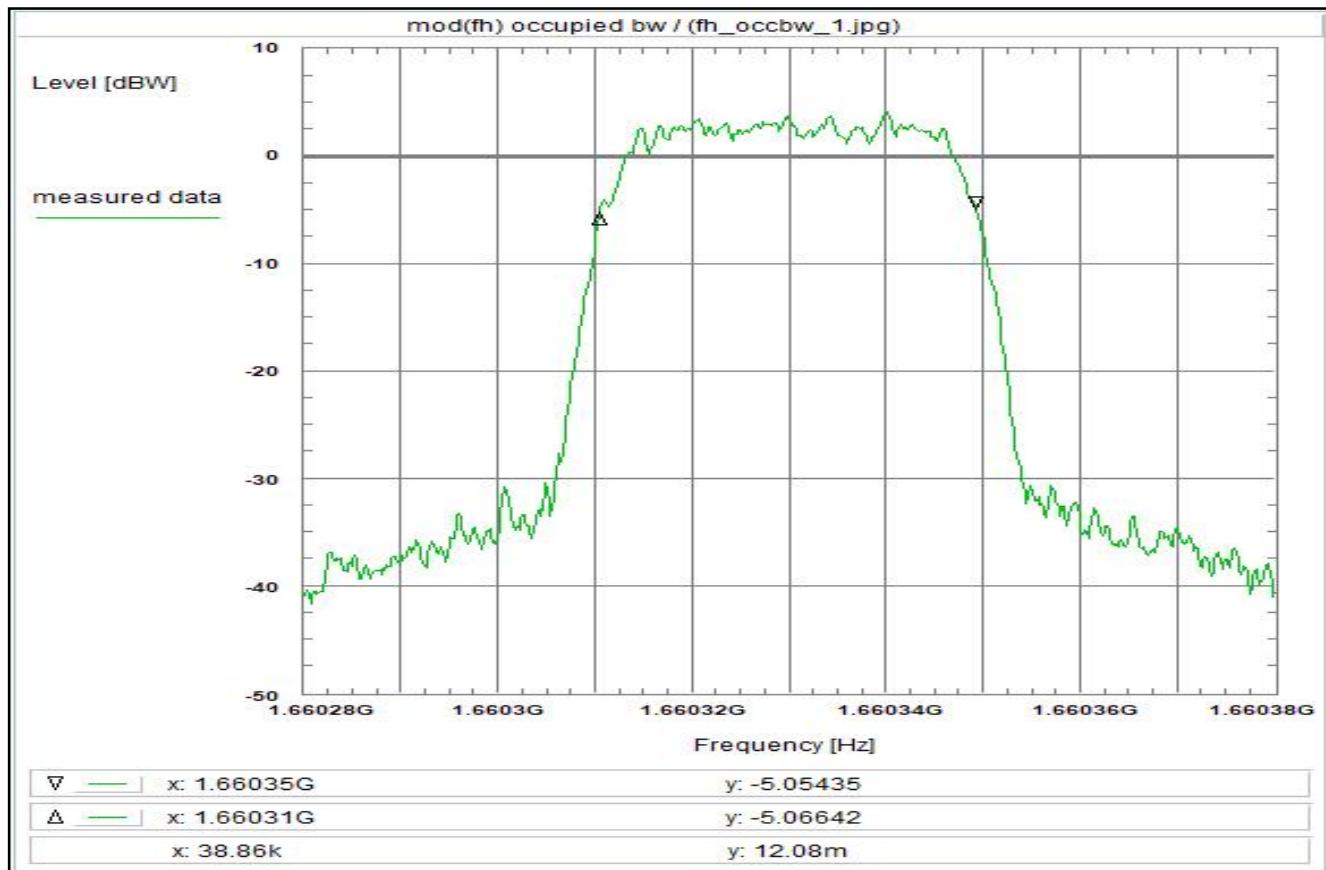
Plot No. 14



| | | |
|---|-----|---|
| <u>Subclause:</u> | -/- | Function test |
| | | Modulated rf-carrier in the middle of the band (fm) |
| | | Determination of the 'occupied bandwidth' |
| <u>Limit:</u> | | |
| No limits defined | | |
| <u>Test results:</u> | | |
| see plot (an explicit table was not generated) | | |
| <u>Operating condition of DUT:</u> | | |
| operating condition 1, see test report chapter 5.2 | | |
| signal type: R20T1Q-1B | | |
| <u>Test setup:</u> | | |
| see test report chapter 7.2: setup 1.1hgj | | |
| <u>Test equipment:</u> | | |
| see test report chapter 7.2: C220, R001, U316 | | |
| <u>Remark:</u> | | |
| determination of the occupied bandwidth | | |
| Test result: Determination of the occupied bandwidth | | |

| | |
|---|--------------------------------------|
| <u>Environment condition:</u> | |
| Date & Time: | Fri 09/Oct/2020 14:53:35 |
| Location: | CTC advanced GmbH, Laboratory RC-SYS |
| Temperature: | 22 °C |
| Humidity: | 55 % |
| Voltage: | 24 Vdc |
| <u>Setup of measurement equipment:</u> | |
| Start frequency: | 1.64345 GHz |
| Stop frequency: | 1.64355 GHz |
| Center frequency: | 1.6435 GHz |
| Frequency span: | 100 kHz |
| Resolution-BW: | 3 kHz |
| Video-BW: | 10 kHz |
| Input attenuation: | 20 dB |
| Trace-Mode: | Max-Hold |
| Detector-Mode: | Sample |
| <u>Correction:</u> | |
| Directional coupler | + 0.0 dB |
| Coaxial cable (C220) | + 0.9 dB |
| DUT-Antenna | + 11.3 dBi |
| Test antenna | + 0.0 dB |
| BW correction factor | + 0.0 dB |
| Atten. between HPA and feedhorn | - 0.0 dB |
| Attenuator 10 dB+20dB (U316) | + 29.3 dB |
| Power Splitter | + 3.0 dB |
| TOTAL CORRECTION: | + 44.5 dB |
| <u>Remarks:</u> | |
| Determination of the 'occupied bandwidth' at fm: | |
| The measured value is about 38.4 kHz (delta marker) | |
| Measurement with 3 kHz resolution filter and noise averaging. | |

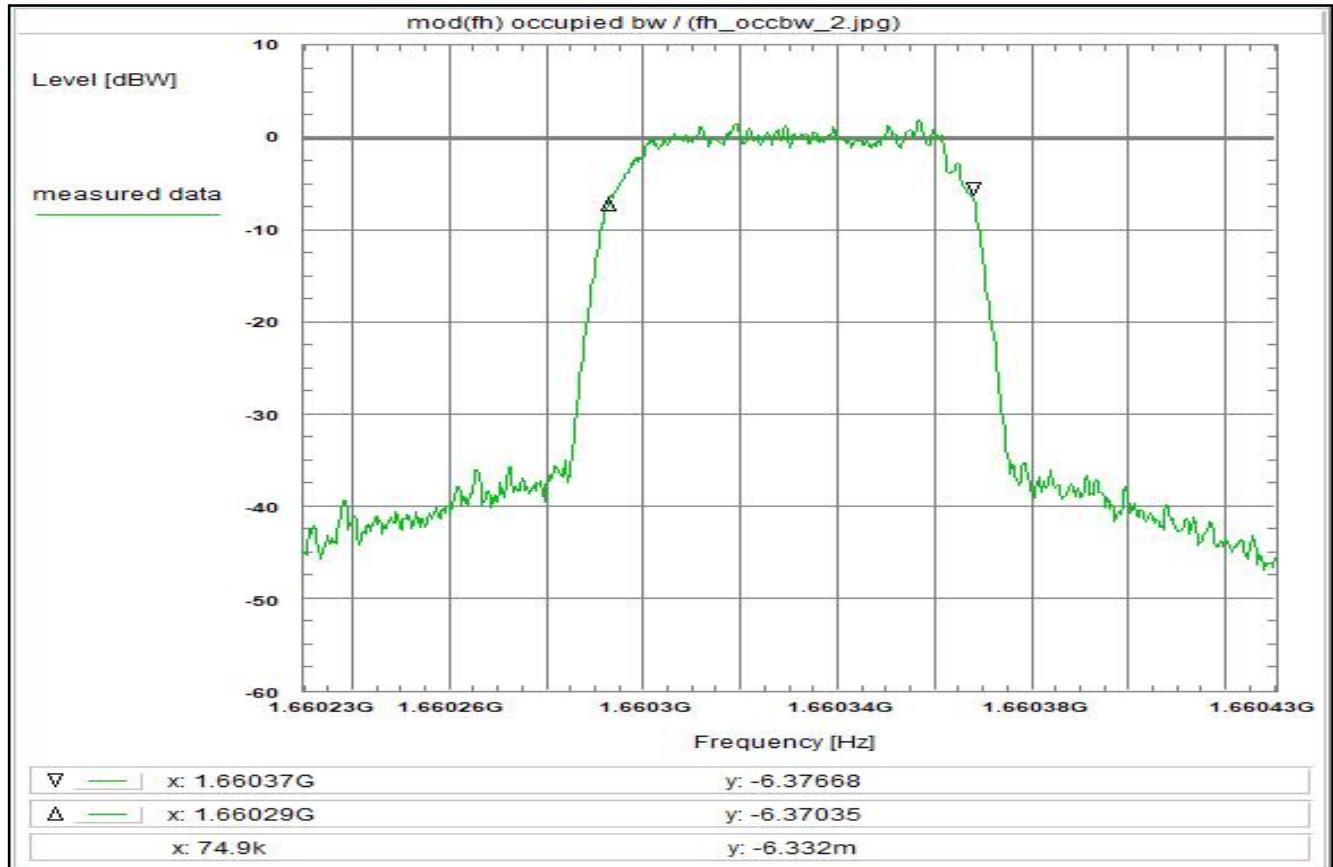
Plot No. 15



| | | |
|------------------------------------|--|---|
| <u>Subclause:</u> | -/- | Function test Modulated rf-carrier at the upper edge of the band (fh) Determination of the 'occupied bandwidth' |
| <u>Limit:</u> | | No limits defined |
| <u>Test results:</u> | | see plot (an explicit table was not generated) |
| <u>Operating condition of DUT:</u> | | operating condition 1, see test report chapter 5.2 signal type: R5T1X-1B/R20T1X-1B |
| <u>Test setup:</u> | | see test report chapter 7.2: setup 1.1hgj |
| <u>Test equipment:</u> | | see test report chapter 7.2: C220, R001, U316 |
| <u>Remark:</u> | | determination of the occupied bandwidth |
| <u>Test result:</u> | Determination of the occupied bandwidth | |

| | |
|---|--------------------------------------|
| <u>Environment condition:</u> | |
| Date & Time: | Fri 09/Oct/2020 15:29:19 |
| Location: | CTC advanced GmbH, Laboratory RC-SYS |
| Temperature: | 22 °C |
| Humidity: | 55 % |
| Voltage: | 24 Vdc |
| <u>Setup of measurement equipment:</u> | |
| Start frequency: | 1.66028 GHz |
| Stop frequency: | 1.66038 GHz |
| Center frequency: | 1.66033 GHz |
| Frequency span: | 100 kHz |
| Resolution-BW: | 3 kHz |
| Video-BW: | 10 kHz |
| Input attenuation: | 20 dB |
| Trace-Mode: | Max-Hold |
| Detector-Mode: | Sample |
| <u>Correction:</u> | |
| Directional coupler | + 0.0 dB |
| Coaxial cable (C220) | + 0.9 dB |
| DUT-Antenna (on-axis) | + 0.0 dB |
| Test antenna | + 0.0 dB |
| BW correction factor | + 0.0 dB |
| Atten. between HPA and feedhorn | + 0.0 dB |
| Attenuator 10 dB+20dB (U316) | + 29.3 dB |
| Power Splitter | + 3.0 dB |
| TOTAL CORRECTION: | + 33.2 dB |
| <u>Remarks:</u> | |
| <u>Determination of the 'occupied bandwidth' at fh:</u> | |
| The measured value is about 38.8 kHz (delta marker) | |
| Measurement with 3 kHz resolution filter and noise averaging. | |

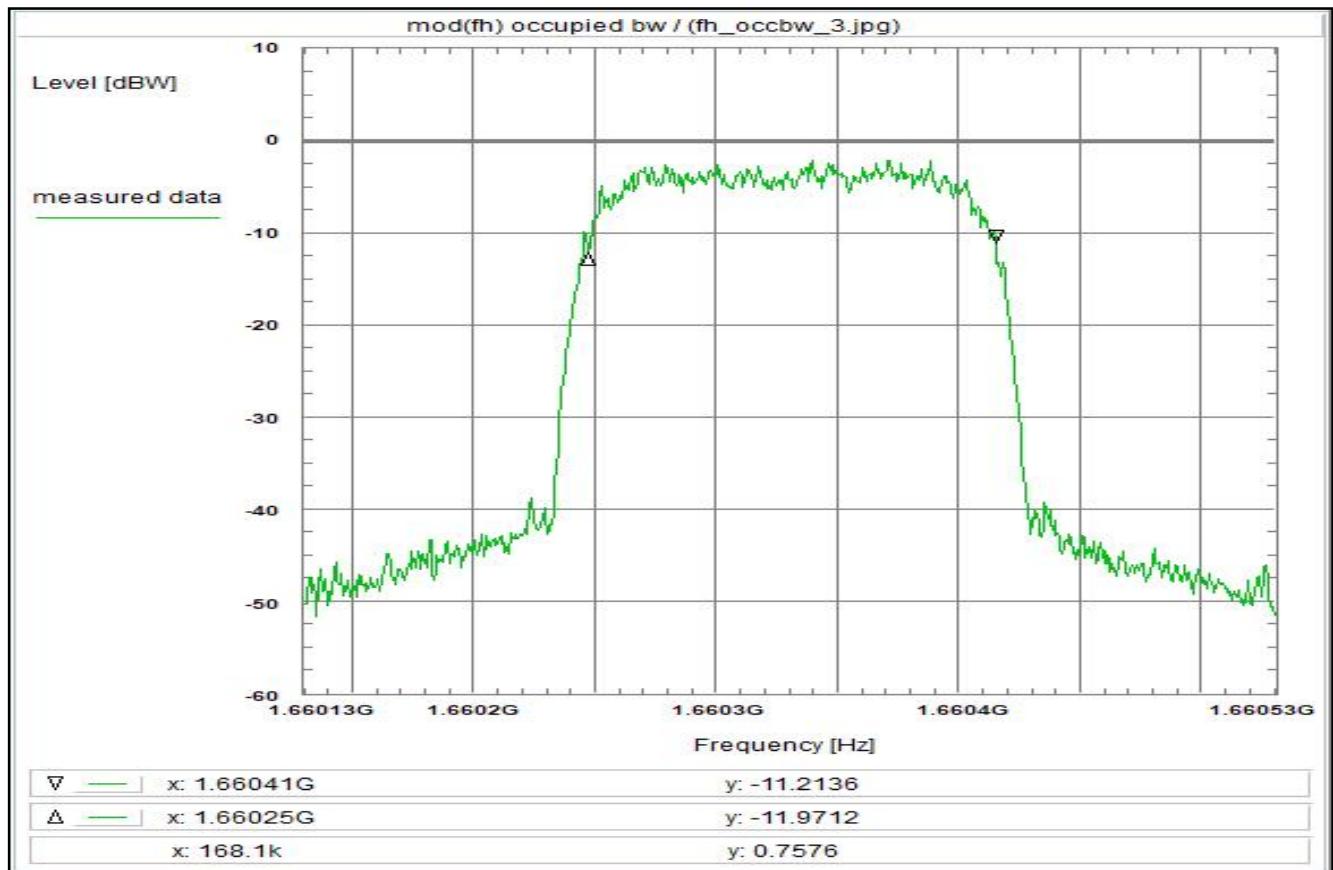
Plot No. 16



| | | |
|------------------------------------|--|---|
| <u>Subclause:</u> | -/- | Function test Modulated rf-carrier at the upper edge of the band (fh) Determination of the 'occupied bandwidth' |
| <u>Limit:</u> | | No limits defined |
| <u>Test results:</u> | | see plot (an explicit table was not generated) |
| <u>Operating condition of DUT:</u> | | operating condition 1, see test report chapter 5.2 signal type: R5T2X-1B/R20T2X-1B |
| <u>Test setup:</u> | | see test report chapter 7.2: setup 1.1hgj |
| <u>Test equipment:</u> | | see test report chapter 7.2: C220, R001, U316 |
| <u>Remark:</u> | | determination of the occupied bandwidth |
| <u>Test result:</u> | Determination of the occupied bandwidth | |

| | |
|---|--------------------------------------|
| <u>Environment condition:</u> | |
| Date & Time: | Fri 09/Oct/2020 15:31:16 |
| Location: | CTC advanced GmbH, Laboratory RC-SYS |
| Temperature: | 22 °C |
| Humidity: | 55 % |
| Voltage: | 24 Vdc |
| <u>Setup of measurement equipment:</u> | |
| Start frequency: | 1.66023 GHz |
| Stop frequency: | 1.66043 GHz |
| Center frequency: | 1.66033 GHz |
| Frequency span: | 200 kHz |
| Resolution-BW: | 3 kHz |
| Video-BW: | 10 kHz |
| Input attenuation: | 20 dB |
| Trace-Mode: | Max-Hold |
| Detector-Mode: | Sample |
| <u>Correction:</u> | |
| Directional coupler | + 0.0 dB |
| Coaxial cable (C220) | + 0.9 dB |
| DUT-Antenna (on-axis) | + 0.0 dB |
| Test antenna | + 0.0 dB |
| BW correction factor | + 0.0 dB |
| Atten. between HPA and feedhorn | + 0.0 dB |
| Attenuator 10 dB+20dB (U316) | + 29.3 dB |
| Power Splitter | + 3.0 dB |
| TOTAL CORRECTION: | + 33.2 dB |
| <u>Remarks:</u> | |
| <u>Determination of the 'occupied bandwidth' at fh:</u> | |
| The measured value is about 75 kHz (delta marker) | |
| Measurement with 3 kHz resolution filter and noise averaging. | |

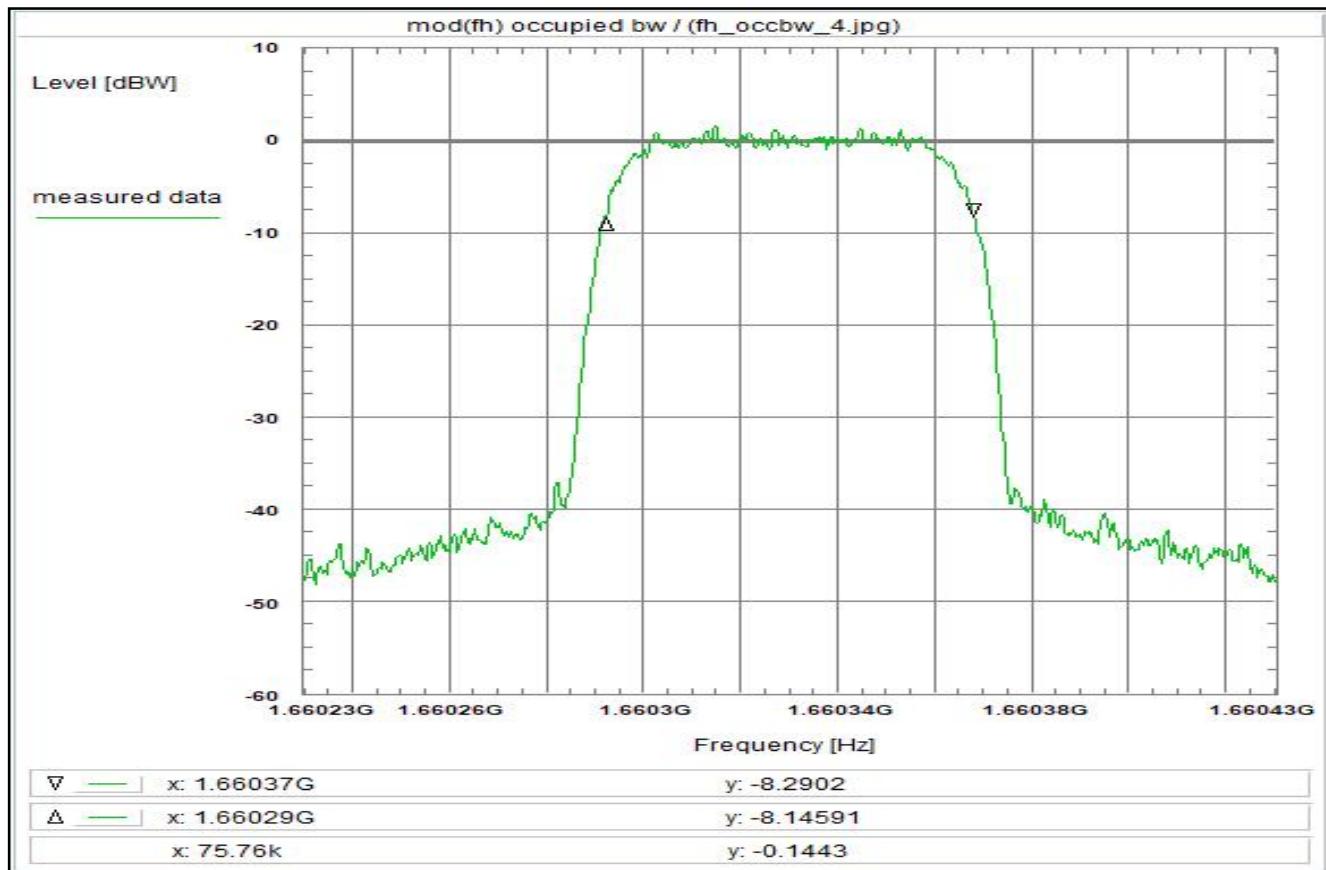
Plot No. 17



| | | |
|------------------------------------|--|---|
| <u>Subclause:</u> | -/- | Function test Modulated rf-carrier at the upper edge of the band (fh) Determination of the 'occupied bandwidth' |
| <u>Limit:</u> | | No limits defined |
| <u>Test results:</u> | | see plot (an explicit table was not generated) |
| <u>Operating condition of DUT:</u> | | operating condition 1, see test report chapter 5.2 signal type: R5T4.5X-1B/R20T4.5X-2B |
| <u>Test setup:</u> | | see test report chapter 7.2: setup 1.1hgj |
| <u>Test equipment:</u> | | see test report chapter 7.2: C220, R001, U316 |
| <u>Remark:</u> | | determination of the occupied bandwidth |
| <u>Test result:</u> | Determination of the occupied bandwidth | |

| | |
|---|--------------------------------------|
| <u>Environment condition:</u> | |
| Date & Time: | Fri 09/Oct/2020 15:35:14 |
| Location: | CTC advanced GmbH, Laboratory RC-SYS |
| Temperature: | 22 °C |
| Humidity: | 55 % |
| Voltage: | 24 Vdc |
| <u>Setup of measurement equipment:</u> | |
| Start frequency: | 1.66013 GHz |
| Stop frequency: | 1.66053 GHz |
| Center frequency: | 1.66033 GHz |
| Frequency span: | 400 kHz |
| Resolution-BW: | 3 kHz |
| Video-BW: | 10 kHz |
| Input attenuation: | 20 dB |
| Trace-Mode: | Max-Hold |
| Detector-Mode: | Sample |
| <u>Correction:</u> | |
| Directional coupler | + 0.0 dB |
| Coaxial cable (C220) | + 0.9 dB |
| DUT-Antenna (on-axis) | + 0.0 dB |
| Test antenna | + 0.0 dB |
| BW correction factor | + 0.0 dB |
| Atten. between HPA and feedhorn | + 0.0 dB |
| Attenuator 10 dB+20dB (U316) | + 29.3 dB |
| Power Splitter | + 3.0 dB |
| TOTAL CORRECTION: | + 33.2 dB |
| <u>Remarks:</u> | |
| <u>Determination of the 'occupied bandwidth' at fh:</u> | |
| The measured value is about 168 kHz (delta marker) | |
| Measurement with 3 kHz resolution filter and noise averaging. | |

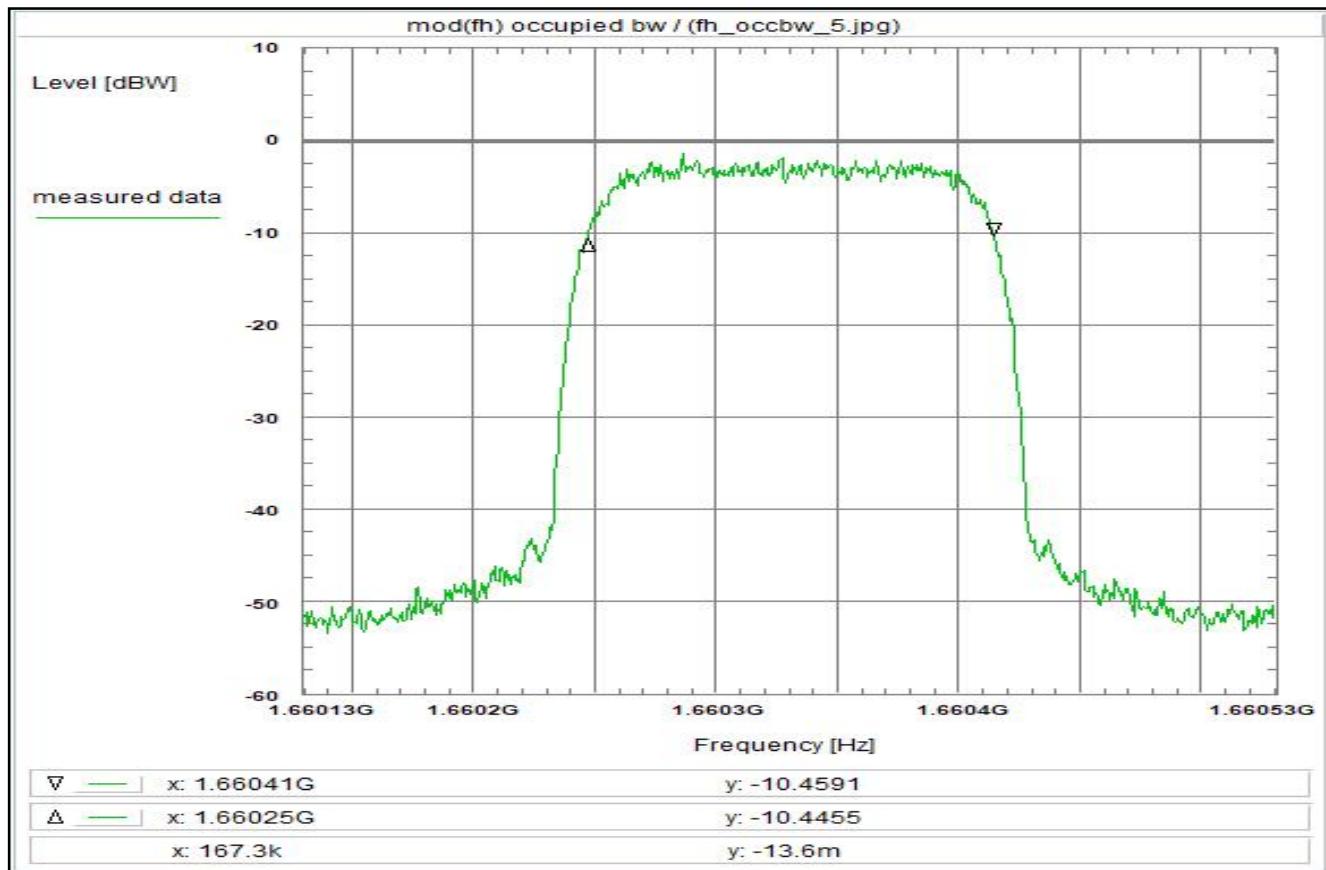
Plot No. 18



| | | |
|---|-----|---|
| <u>Subclause:</u> | -/- | Function test Modulated rf-carrier at the upper edge of the band (fh) Determination of the 'occupied bandwidth' |
| <u>Limit:</u> | | No limits defined |
| <u>Test results:</u> | | see plot (an explicit table was not generated) |
| <u>Operating condition of DUT:</u> | | operating condition 1, see test report chapter 5.2 signal type: R5T2Q-1B/R20T2Q-1B |
| <u>Test setup:</u> | | see test report chapter 7.2: setup 1.1hgj |
| <u>Test equipment:</u> | | see test report chapter 7.2: C220, R001, U316 |
| <u>Remark:</u> | | determination of the occupied bandwidth |
| Test result: Determination of the occupied bandwidth | | |

| | |
|---|--------------------------------------|
| <u>Environment condition:</u> | |
| Date & Time: | Fri 09/Oct/2020 15:38:30 |
| Location: | CTC advanced GmbH, Laboratory RC-SYS |
| Temperature: | 22 °C |
| Humidity: | 55 % |
| Voltage: | 24 Vdc |
| <u>Setup of measurement equipment:</u> | |
| Start frequency: | 1.66023 GHz |
| Stop frequency: | 1.66043 GHz |
| Center frequency: | 1.66033 GHz |
| Frequency span: | 200 kHz |
| Resolution-BW: | 3 kHz |
| Video-BW: | 10 kHz |
| Input attenuation: | 20 dB |
| Trace-Mode: | Max-Hold |
| Detector-Mode: | Sample |
| <u>Correction:</u> | |
| Directional coupler | + 0.0 dB |
| Coaxial cable (C220) | + 0.9 dB |
| DUT-Antenna (on-axis) | + 0.0 dB |
| Test antenna | + 0.0 dB |
| BW correction factor | + 0.0 dB |
| Atten. between HPA and feedhorn | + 0.0 dB |
| Attenuator 10 dB+20dB (U316) | + 29.3 dB |
| Power Splitter | + 3.0 dB |
| TOTAL CORRECTION: | + 33.2 dB |
| <u>Remarks:</u> | |
| Determination of the 'occupied bandwidth' at fh: | |
| The measured value is about 75 kHz (delta marker) | |
| Measurement with 3 kHz resolution filter and noise averaging. | |

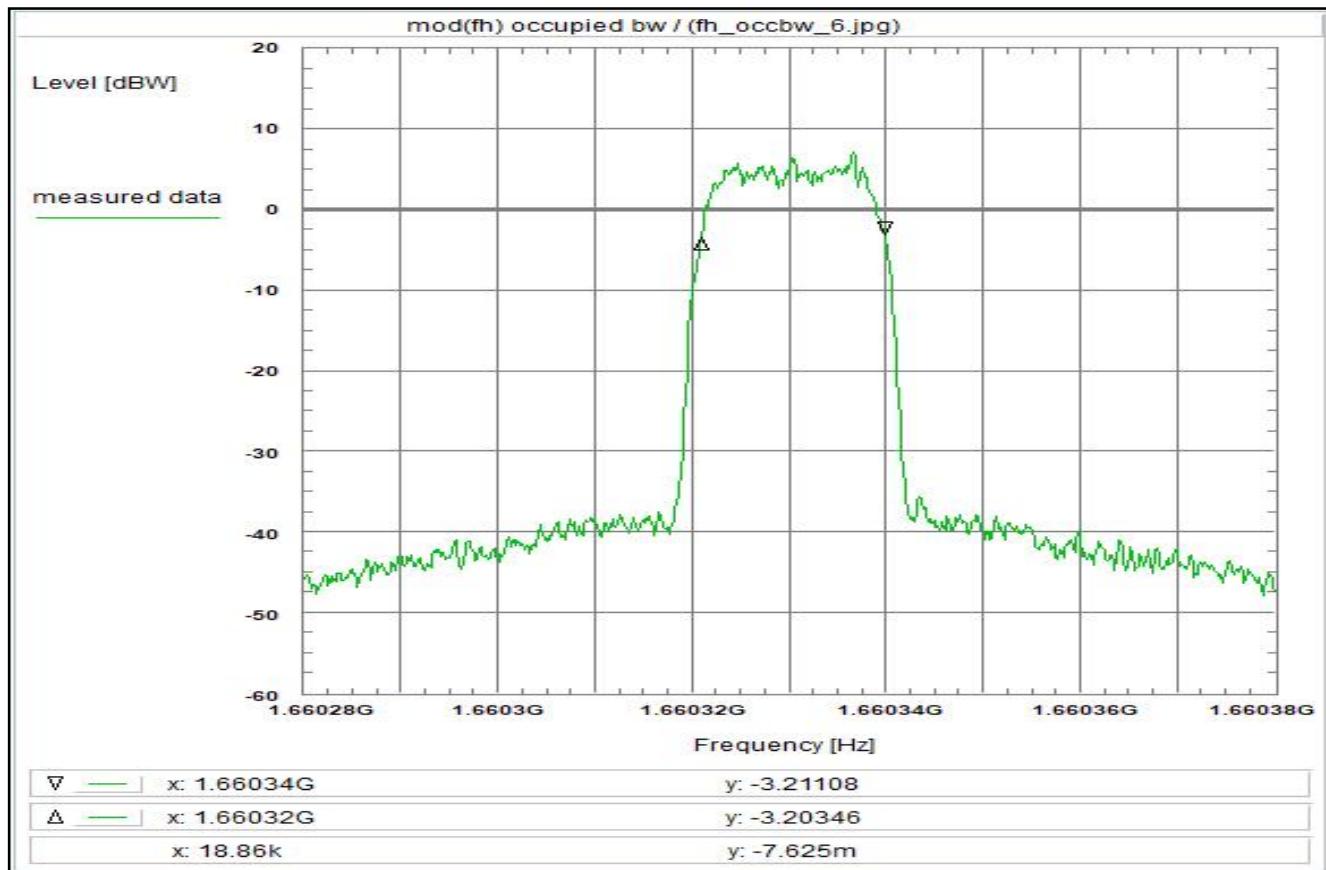
Plot No. 19



| | | |
|------------------------------------|--|---|
| <u>Subclause:</u> | -/- | Function test |
| | | Modulated rf-carrier at the upper edge of the band (fh) |
| | | Determination of the 'occupied bandwidth' |
| <u>Limit:</u> | | No limits defined |
| <u>Test results:</u> | | see plot (an explicit table was not generated) |
| <u>Operating condition of DUT:</u> | | operating condition 1, see test report chapter 5.2 signal type: R5T4.5Q-1B/R20T4.5Q-1B |
| <u>Test setup:</u> | | see test report chapter 7.2: setup 1.1hgj |
| <u>Test equipment:</u> | | see test report chapter 7.2: C220, R001, U316 |
| <u>Remark:</u> | | determination of the occupied bandwidth |
| Test result: | Determination of the occupied bandwidth | |

| | |
|---|--------------------------------------|
| <u>Environment condition:</u> | |
| Date & Time: | Fri 09/Oct/2020 15:40:40 |
| Location: | CTC advanced GmbH, Laboratory RC-SYS |
| Temperature: | 22 °C |
| Humidity: | 55 % |
| Voltage: | 24 Vdc |
| <u>Setup of measurement equipment:</u> | |
| Start frequency: | 1.66013 GHz |
| Stop frequency: | 1.66053 GHz |
| Center frequency: | 1.66033 GHz |
| Frequency span: | 400 kHz |
| Resolution-BW: | 3 kHz |
| Video-BW: | 10 kHz |
| Input attenuation: | 20 dB |
| Trace-Mode: | Max-Hold |
| Detector-Mode: | Sample |
| <u>Correction:</u> | |
| Directional coupler | + 0.0 dB |
| Coaxial cable (C220) | + 0.9 dB |
| DUT-Antenna (on-axis) | + 0.0 dB |
| Test antenna | + 0.0 dB |
| BW correction factor | + 0.0 dB |
| Atten. between HPA and feedhorn | + 0.0 dB |
| Attenuator 10 dB+20dB (U316) | + 29.3 dB |
| Power Splitter | + 3.0 dB |
| TOTAL CORRECTION: | + 33.2 dB |
| <u>Remarks:</u> | |
| Determination of the 'occupied bandwidth' at fh: | |
| The measured value is about 167 kHz (delta marker) | |
| Measurement with 3 kHz resolution filter and noise averaging. | |

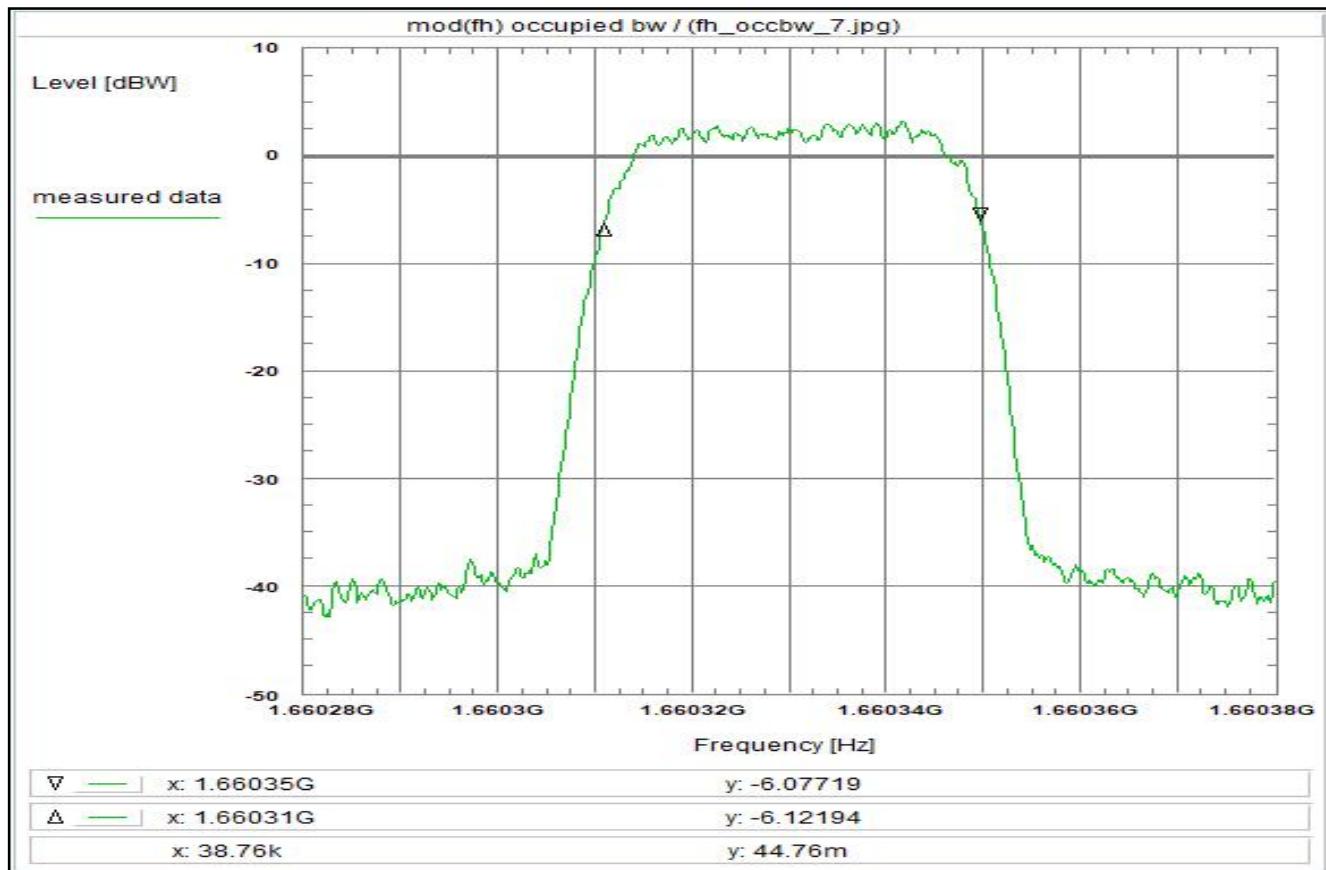
Plot No. 20



| | | |
|------------------------------------|--|---|
| <u>Subclause:</u> | -/- | Function test Modulated rf-carrier at the upper edge of the band (fh) Determination of the 'occupied bandwidth' |
| <u>Limit:</u> | | No limits defined |
| <u>Test results:</u> | | see plot (an explicit table was not generated) |
| <u>Operating condition of DUT:</u> | | operating condition 1, see test report chapter 5.2 signal type: R20T0.5Q-1B |
| <u>Test setup:</u> | | see test report chapter 7.2: setup 1.1hgj |
| <u>Test equipment:</u> | | see test report chapter 7.2: C220, R001, U316 |
| <u>Remark:</u> | | determination of the occupied bandwidth |
| Test result: | Determination of the occupied bandwidth | |

| | |
|---|--------------------------------------|
| <u>Environment condition:</u> | |
| Date & Time: | Fri 09/Oct/2020 15:43:46 |
| Location: | CTC advanced GmbH, Laboratory RC-SYS |
| Temperature: | 22 °C |
| Humidity: | 55 % |
| Voltage: | 24 Vdc |
| <u>Setup of measurement equipment:</u> | |
| Start frequency: | 1.66028 GHz |
| Stop frequency: | 1.66038 GHz |
| Center frequency: | 1.66033 GHz |
| Frequency span: | 100 kHz |
| Resolution-BW: | 1 kHz |
| Video-BW: | 3 kHz |
| Input attenuation: | 20 dB |
| Trace-Mode: | Max-Hold |
| Detector-Mode: | Sample |
| <u>Correction:</u> | |
| Directional coupler | + 0.0 dB |
| Coaxial cable (C220) | + 0.9 dB |
| DUT-Antenna (on-axis) | + 0.0 dB |
| Test antenna | + 0.0 dB |
| BW correction factor (1k > 3k) | + 4.8 dB |
| Atten. between HPA and feedhorn | + 0.0 dB |
| Attenuator 10 dB+20dB (U316) | + 29.3 dB |
| Power Splitter | + 3.0 dB |
| TOTAL CORRECTION: | + 38.0 dB |
| <u>Remarks:</u> | |
| Determination of the 'occupied bandwidth' at fh: | |
| The measured value is about 18.9 kHz (delta marker) | |
| Measurement with 3 kHz resolution filter and noise averaging. | |

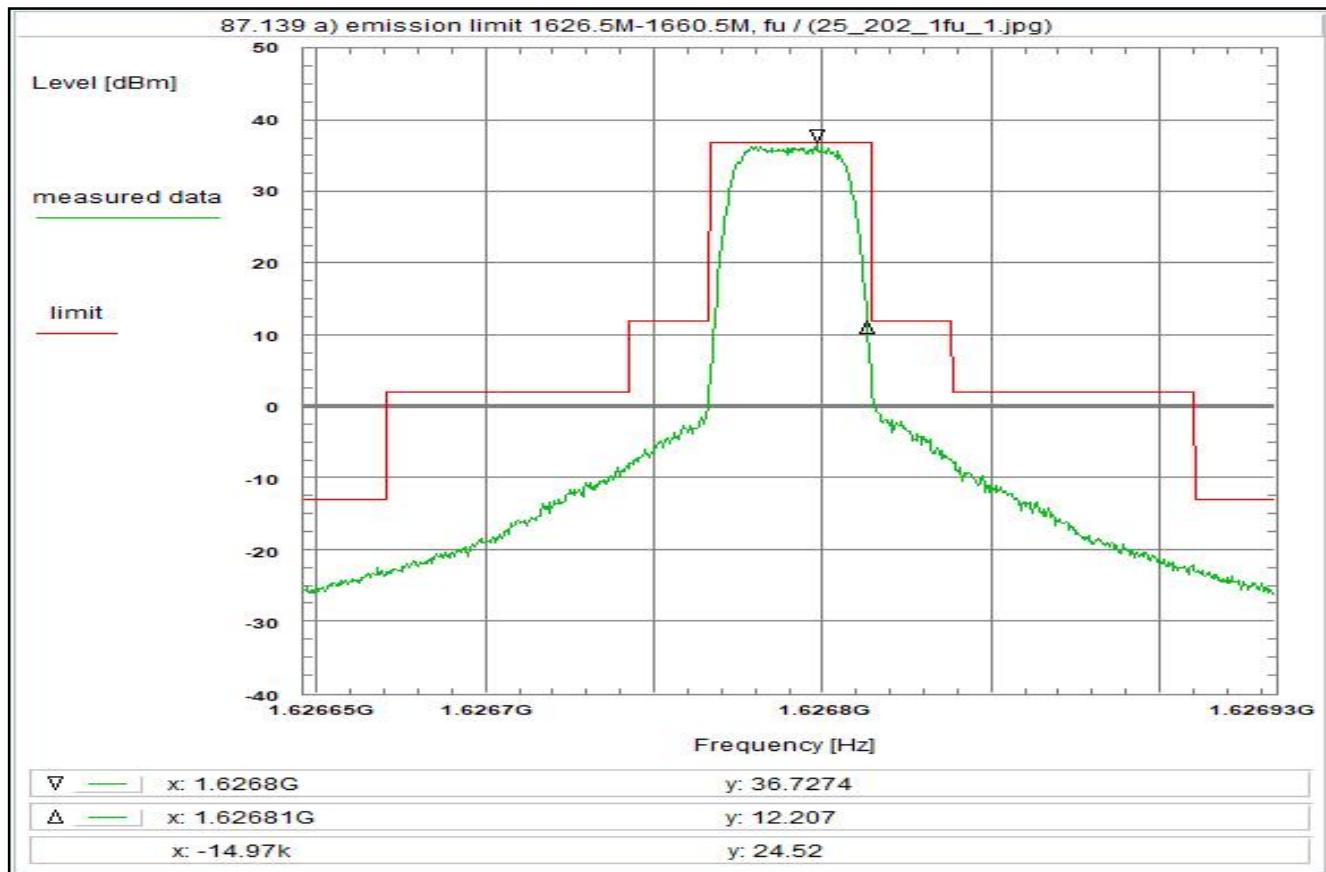
Plot No. 21



| | | |
|------------------------------------|--|---|
| <u>Subclause:</u> | -/- | Function test Modulated rf-carrier at the upper edge of the band (fh) Determination of the 'occupied bandwidth' |
| <u>Limit:</u> | | No limits defined |
| <u>Test results:</u> | | see plot (an explicit table was not generated) |
| <u>Operating condition of DUT:</u> | | operating condition 1, see test report chapter 5.2 signal type: R20T1Q-1B |
| <u>Test setup:</u> | | see test report chapter 7.2: setup 1.1hgj |
| <u>Test equipment:</u> | | see test report chapter 7.2: C220, R001, U316 |
| <u>Remark:</u> | | determination of the occupied bandwidth |
| <u>Test result:</u> | Determination of the occupied bandwidth | |

| | |
|---|--------------------------------------|
| <u>Environment condition:</u> | |
| Date & Time: | Fri 09/Oct/2020 15:46:07 |
| Location: | CTC advanced GmbH, Laboratory RC-SYS |
| Temperature: | 22 °C |
| Humidity: | 55 % |
| Voltage: | 24 Vdc |
| <u>Setup of measurement equipment:</u> | |
| Start frequency: | 1.66028 GHz |
| Stop frequency: | 1.66038 GHz |
| Center frequency: | 1.66033 GHz |
| Frequency span: | 100 kHz |
| Resolution-BW: | 3 kHz |
| Video-BW: | 10 kHz |
| Input attenuation: | 20 dB |
| Trace-Mode: | Max-Hold |
| Detector-Mode: | Sample |
| <u>Correction:</u> | |
| Directional coupler | + 0.0 dB |
| Coaxial cable (C220) | + 0.9 dB |
| DUT-Antenna (on-axis) | + 0.0 dB |
| Test antenna | + 0.0 dB |
| BW correction factor | + 0.0 dB |
| Atten. between HPA and feedhorn | + 0.0 dB |
| Attenuator 10 dB+20dB (U316) | + 29.3 dB |
| Power Splitter | + 3.0 dB |
| TOTAL CORRECTION: | + 33.2 dB |
| <u>Remarks:</u> | |
| <u>Determination of the 'occupied bandwidth' at fh:</u> | |
| The measured value is about 38.6 kHz (delta marker) | |
| Measurement with 3 kHz resolution filter and noise averaging. | |

Plot No. 22



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
 Emission limitations
 Modulated f-carrier at the upper edge of the band (fu)

Limit:
 Limit according to 25.202 f):
 50-100% of assigned bw: -25dBc/4kHz
 100-250% of assigned bw: -35dBc/4kHz
 > 250% of assigned bw: $-43 + 10\log(P_{max})$ 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 5.2
 signal type: R5T1X-1B/R20T1X-1B

Test setup:
 see test report chapter 7.2: setup 1.1hgj

Test equipment:
 see test report chapter 7.2: C220, R001, U316

Remark:

Test result: Test passed

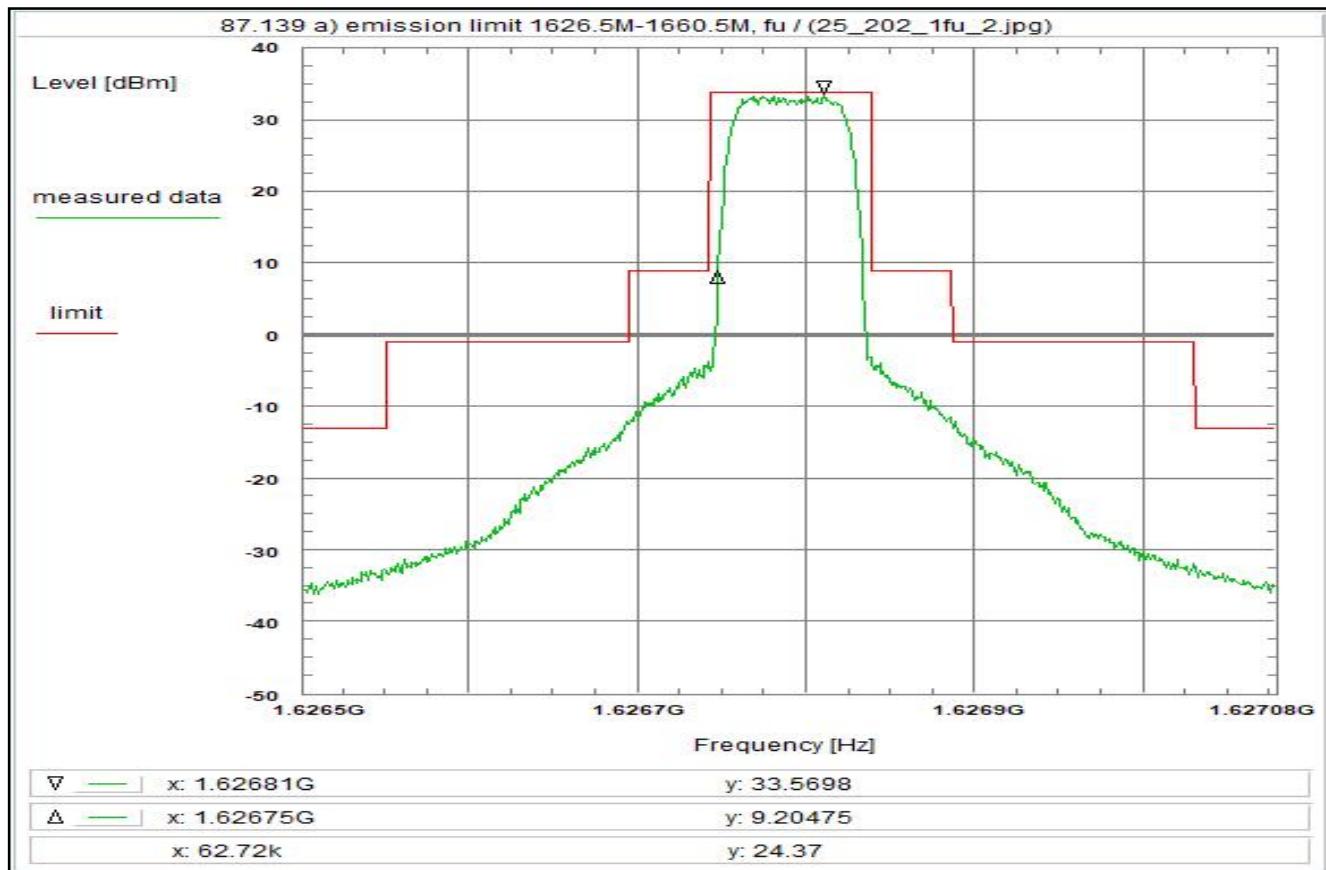
Environment condition:
 Date & Time: Tue 13/Oct/2020 13:25:46
 Location: CTC advanced GmbH, Laboratory RC-SYS
 Temperature: 22 °C
 Humidity: 55 %
 Voltage: 24 Vdc

Setup of measurement equipment:
 Start frequency: 1.626646 GHz
 Stop frequency: 1.626934 GHz
 Center frequency: 1.62679 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 + 11.3 dBi
 Test antenna + 0.0 dB
 BW correction factor (3k > 4k) + 1.2 dB
 Atten. between HPA and feedhorn - 0.0 dB
 Attenuation 10 + 20 dB (U316) + 29.3 dB
 Combined RF + 3.0 dB
 TOTAL CORRECTION: + 45.7 dB

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

Plot No. 23



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
 Modulated f-carrier at the upper edge of the band (fu)

Limit:
Limit according to 25.202 f):
 50-100% of assigned bw: -25dBc/4kHz
 100-250% of assigned bw: -35dBc/4kHz
 > 250% of assigned bw: $-43 + 10\log(P_{max})$ 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 5.2
 signal type: R5T2X-1B/R20T2X-1B

Test setup:
 see test report chapter 7.2: setup 1.1hgj

Test equipment:
 see test report chapter 7.2: C220, R001, U316

Remark:

Test result: Test passed

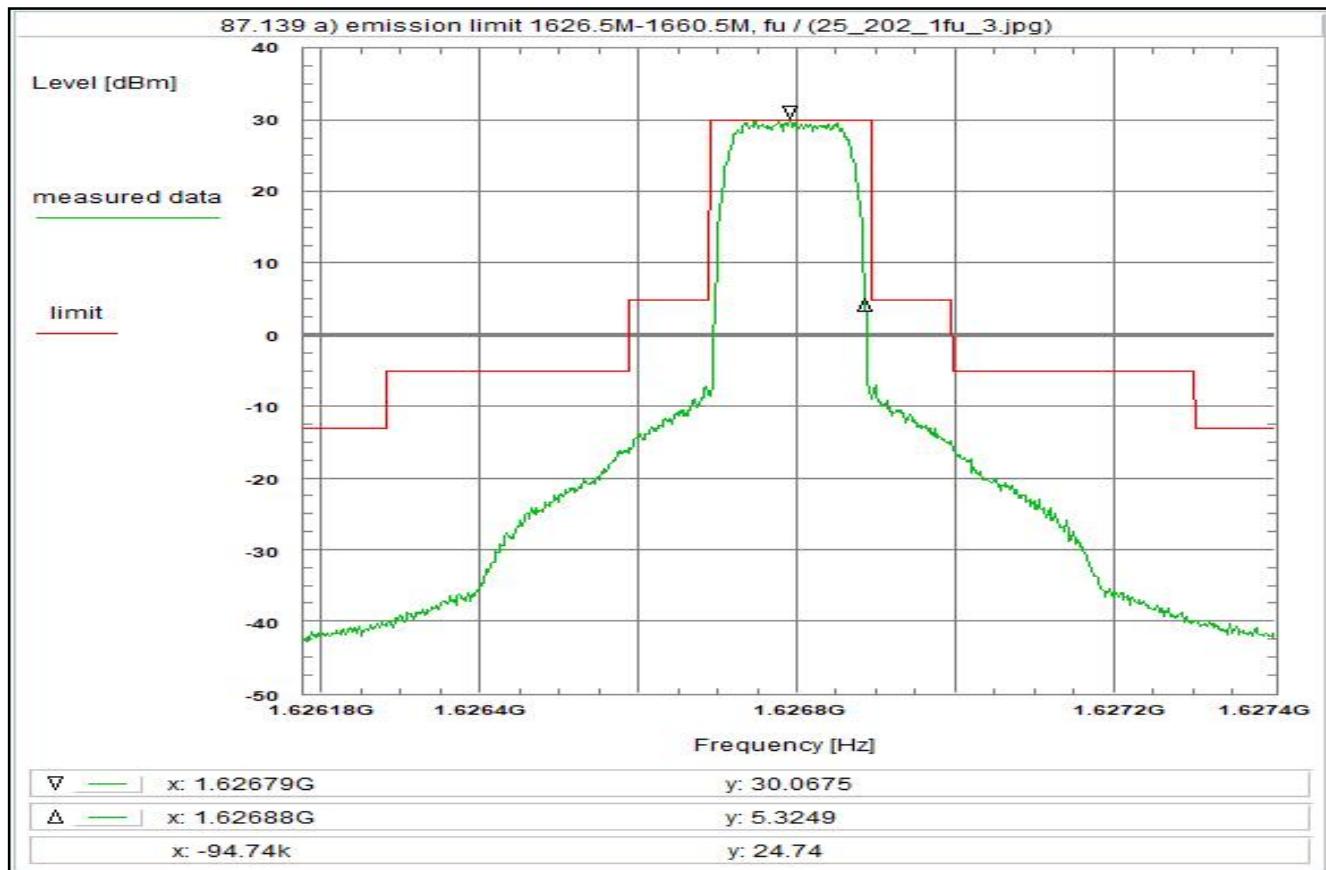
Environment condition:
 Date & Time: Tue 13/Oct/2020 13:29:30
 Location: CTC advanced GmbH, Laboratory RC-SYS
 Temperature: 22 °C
 Humidity: 55 %
 Voltage: 24 Vdc

Setup of measurement equipment:
 Start frequency: 1.626502 GHz
 Stop frequency: 1.627078 GHz
 Center frequency: 1.62679 GHz
 Frequency span: 576 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 + 11.3 dBi
 Test antenna + 0.0 dB
 BW correction factor (3k > 4k) + 1.2 dB
 Atten. between HPA and feedhorn - 0.0 dB
 Attenuation 10 + 20 dB (U316) + 29.3 dB
 Combined RF + 3.0 dB
 TOTAL CORRECTION: + 45.7 dB

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

Plot No. 24



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
 Emission limitations
 Modulated f-carrier at the upper edge of the band (fu)

Limit:
 Limit according to 25.202 f):
 50-100% of assigned bw: -25dBc/4kHz
 100-250% of assigned bw: -35dBc/4kHz
 > 250% of assigned bw: $-43 + 10\log(P_{max})\text{dBc}/4\text{kHz} = -43 \text{ dBW}$
 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 5.2
 signal type: R5T4.5X-1B/R20T4.5X-2B

Test setup:
 see test report chapter 7.2: setup 1.1hgj

Test equipment:
 see test report chapter 7.2: C220, R001, U316

Remark:

Test result: Test passed

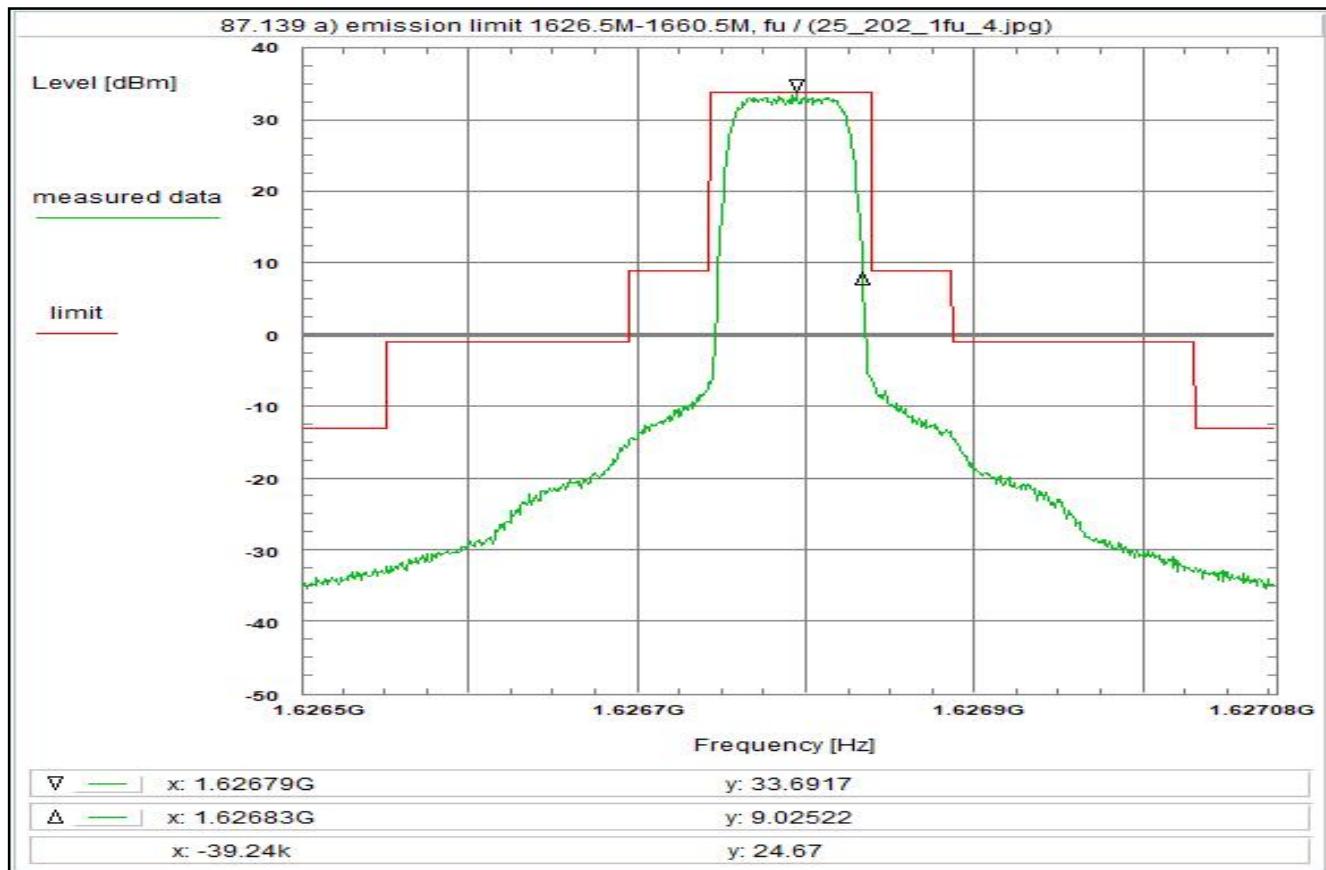
Environment condition:
 Date & Time: Tue 13/Oct/2020 13:32:04
 Location: CTC advanced GmbH, Laboratory RC-SYS
 Temperature: 22 °C
 Humidity: 55 %
 Voltage: 24 Vdc

Setup of measurement equipment:
 Start frequency: 1.626178 GHz
 Stop frequency: 1.627402 GHz
 Center frequency: 1.62679 GHz
 Frequency span: 1.224 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 + 11.3 dBi
 Test antenna + 0.0 dB
 BW correction factor (3k > 4k) + 1.2 dB
 Atten. between HPA and feedhorn - 0.0 dB
 Attenuation 10 + 20 dB (U316) + 29.3 dB
 Combined RF + 3.0 dB
 TOTAL CORRECTION: + 45.7 dB

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

Plot No. 25



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
 Modulated f-carrier at the upper edge of the band (fu)

Limit:
Limit according to 25.202 f):
 50-100% of assigned bw: -25dBc/4kHz
 100-250% of assigned bw: -35dBc/4kHz
 > 250% of assigned bw: $-43 + 10\log(P_{max})$ 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 5.2
 signal type: R5T2Q-1B/R20T2Q-1B

Test setup:
 see test report chapter 7.2: setup 1.1hgj

Test equipment:
 see test report chapter 7.2: C220, R001, U316

Remark:

Test result: Test passed

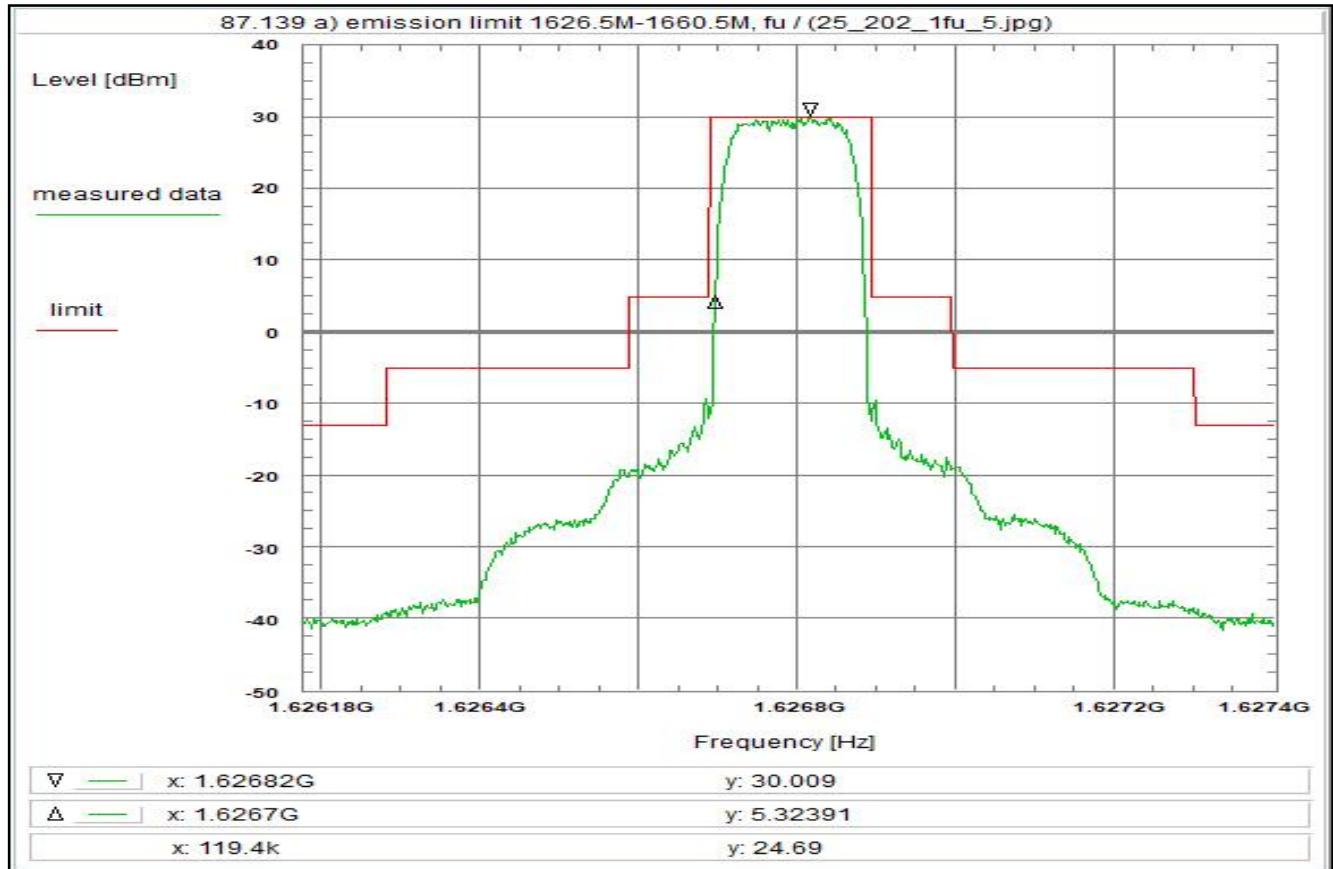
Environment condition:
 Date & Time: Tue 13/Oct/2020 13:34:31
 Location: CTC advanced GmbH, Laboratory RC-SYS
 Temperature: 22 °C
 Humidity: 55 %
 Voltage: 24 Vdc

Setup of measurement equipment:
 Start frequency: 1.626502 GHz
 Stop frequency: 1.627078 GHz
 Center frequency: 1.62679 GHz
 Frequency span: 576 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 + 11.3 dBi
 Test antenna + 0.0 dB
 BW correction factor (3k > 4k) + 1.2 dB
 Atten. between HPA and feedhorn - 0.0 dB
 Attenuation 10 + 20 dB (U316) + 29.3 dB
 Combined RF + 3.0 dB
 TOTAL CORRECTION: + 45.7 dB

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

Plot No. 26



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
 Emission limitations
 Modulated f-carrier at the upper edge of the band (fu)

Limit:
 Limit according to 25.202 f):
 50-100% of assigned bw: -25dBc/4kHz
 100-250% of assigned bw: -35dBc/4kHz
 > 250% of assigned bw: $-43 + 10\log(P_{max})$ 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 5.2
 signal type: R5T4.5Q-1B/R20T4.5Q-1B

Test setup:
 see test report chapter 7.2: setup 1.1hgj

Test equipment:
 see test report chapter 7.2: C220, R001, U316

Remark:

Test result: Test passed

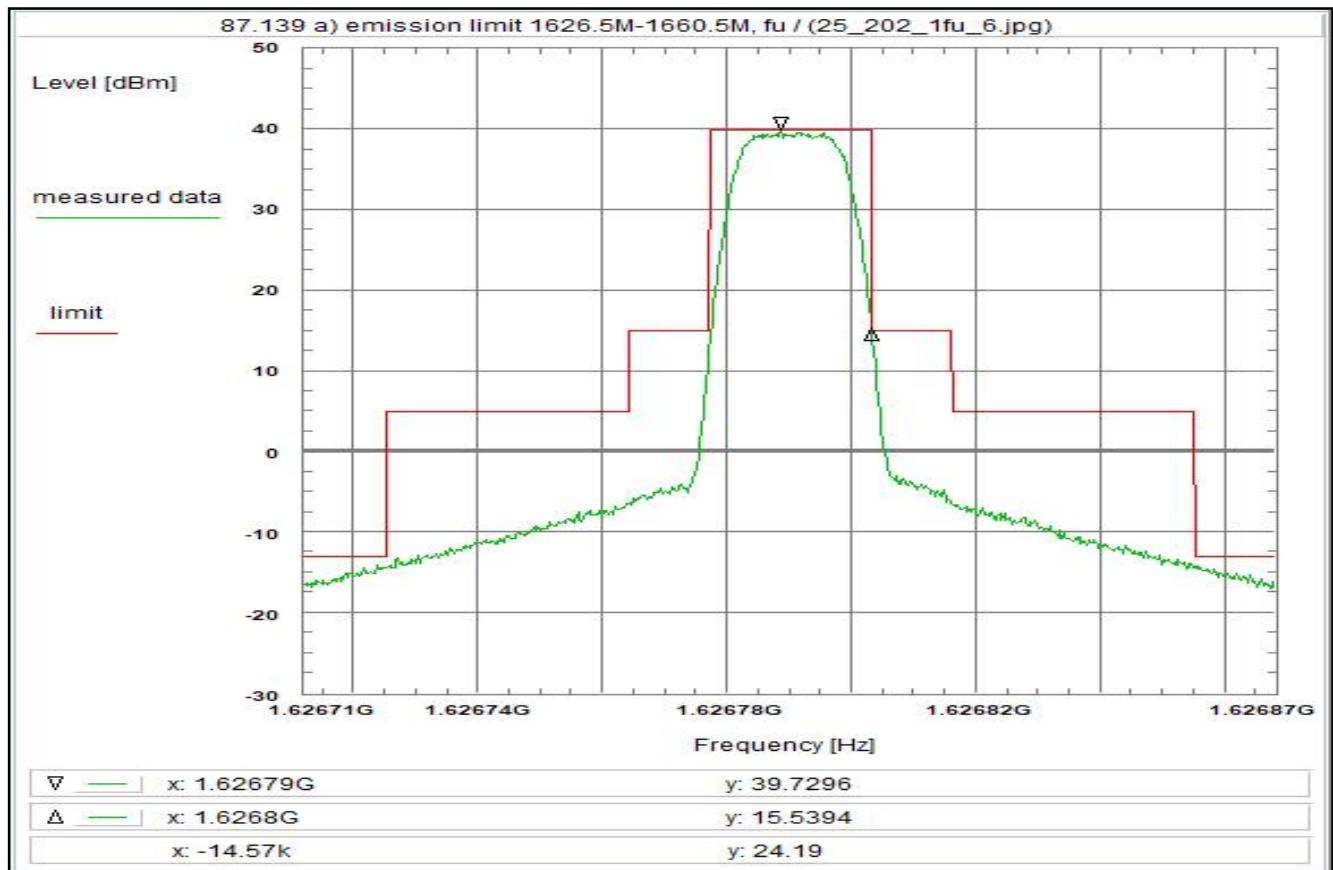
Environment condition:
 Date & Time: Tue 13/Oct/2020 13:38:30
 Location: CTC advanced GmbH, Laboratory RC-SYS
 Temperature: 22 °C
 Humidity: 55 %
 Voltage: 24 Vdc

Setup of measurement equipment:
 Start frequency: 1.626178 GHz
 Stop frequency: 1.627402 GHz
 Center frequency: 1.62679 GHz
 Frequency span: 1.224 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 + 11.3 dBi
 Test antenna + 0.0 dB
 BW correction factor (3k > 4k) + 1.2 dB
 Atten. between HPA and feedhorn - 0.0 dB
 Attenuation 10 + 20 dB (U316) + 29.3 dB
 Combined RF + 3.0 dB
 TOTAL CORRECTION: + 45.7 dB

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

Plot No. 27



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
 Emission limitations
 Modulated f-carrier at the upper edge of the band (fu)

Limit:
 Limit according to 25.202 f):
 50-100% of assigned bw: -25dBc/4kHz
 100-250% of assigned bw: -35dBc/4kHz
 > 250% of assigned bw: $-43 + 10\log(P_{max})\text{dBc}/4\text{kHz} = -43 \text{ dBW}$
 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 5.2
 signal type: R20T0.5Q-1B

Test setup:
 see test report chapter 7.2: setup 1.1hgj

Test equipment:
 see test report chapter 7.2: C220, R001, U316

Remark:

Test result: Test passed

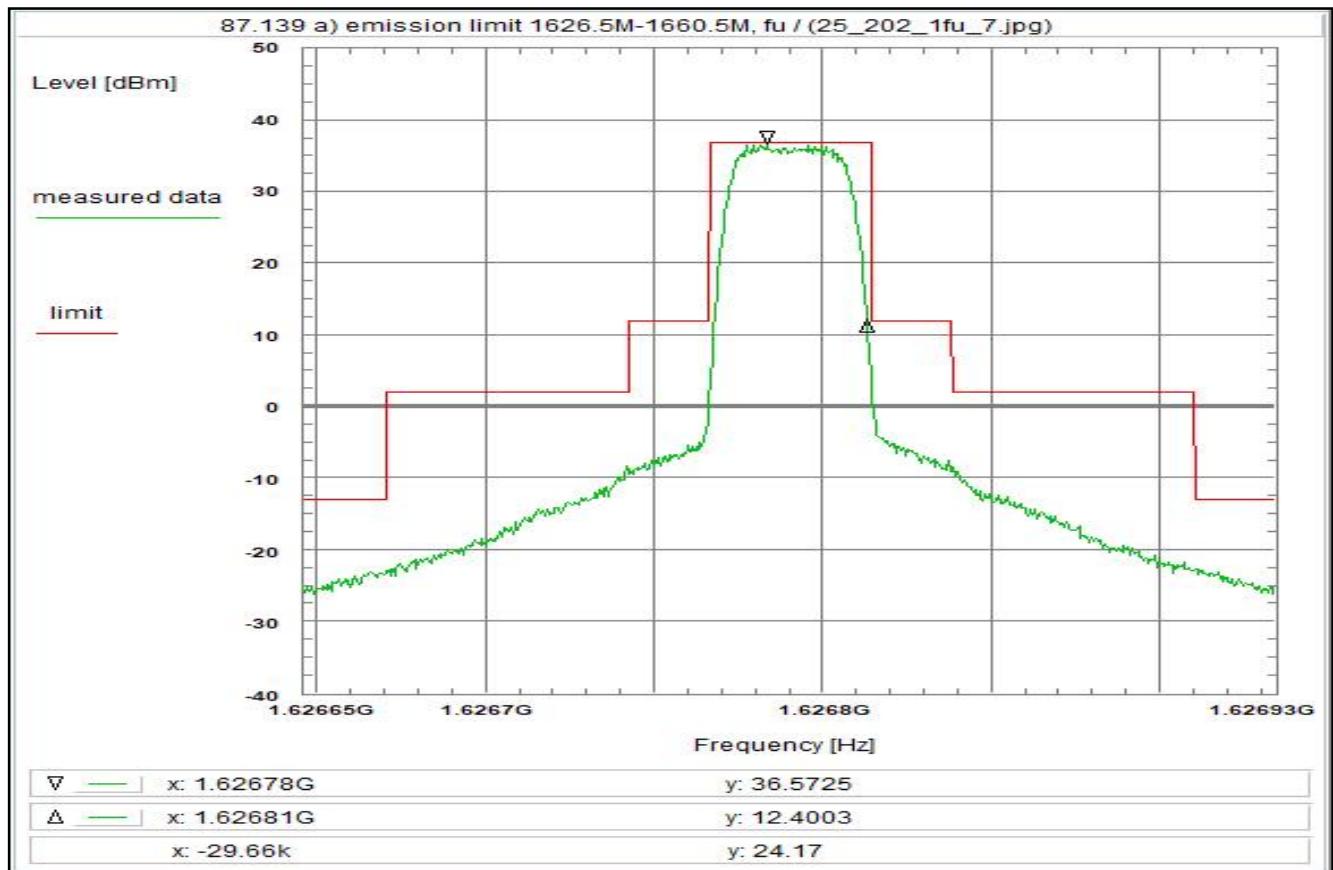
Environment condition:
 Date & Time: Tue 13/Oct/2020 13:44:54
 Location: CTC advanced GmbH, Laboratory RC-SYS
 Temperature: 22 °C
 Humidity: 55 %
 Voltage: 24 Vdc

Setup of measurement equipment:
 Start frequency: 1.626712 GHz
 Stop frequency: 1.626868 GHz
 Center frequency: 1.62679 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 + 11.3 dBi
 Test antenna + 0.0 dB
 BW correction factor (3k > 4k) + 1.2 dB
 Atten. between HPA and feedhorn - 0.0 dB
 Attenuation 10 + 20 dB (U316) + 29.3 dB
 Combined RF + 3.0 dB
 TOTAL CORRECTION: + 45.7 dB

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

Plot No. 28



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
 Emission limitations
 Modulated f-carrier at the upper edge of the band (fu)

Limit:
 Limit according to 25.202 f):
 50-100% of assigned bw: -25dBc/4kHz
 100-250% of assigned bw: -35dBc/4kHz
 > 250% of assigned bw: $-43 + 10\log(P_{max})\text{dBc}/4\text{kHz} = -43 \text{ dBW}$
 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 5.2
 signal type: R20T1Q-1B

Test setup:
 see test report chapter 7.2: setup 1.1hgj

Test equipment:
 see test report chapter 7.2: C220, R001, U316

Remark:

Test result: Test passed

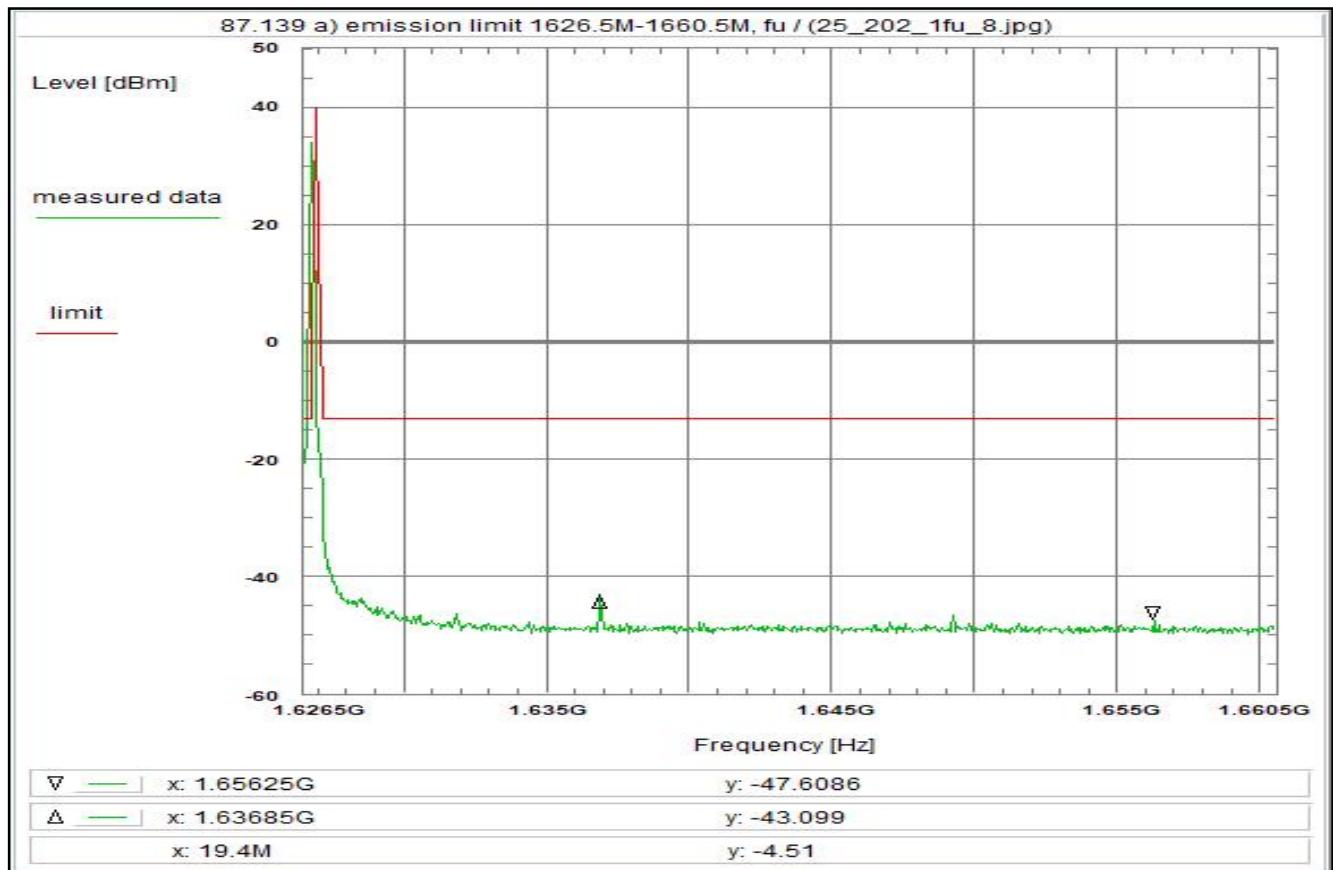
Environment condition:
 Date & Time: Tue 13/Oct/2020 13:47:22
 Location: CTC advanced GmbH, Laboratory RC-SYS
 Temperature: 22 °C
 Humidity: 55 %
 Voltage: 24 Vdc

Setup of measurement equipment:
 Start frequency: 1.626646 GHz
 Stop frequency: 1.626934 GHz
 Center frequency: 1.62679 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 + 11.3 dBi
 Test antenna + 0.0 dB
 BW correction factor (3k > 4k) + 1.2 dB
 Atten. between HPA and feedhorn - 0.0 dB
 Attenuation 10 + 20 dB (U316) + 29.3 dB
 Combined RF + 3.0 dB
 TOTAL CORRECTION: + 45.7 dB

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

Plot No. 29



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
 Modulated f-carrier at the upper edge of the band (fu)

Limit:
Limit according to 25.202 f):
 50-100% of assigned bw: -25dBc/4kHz
 100-250% of assigned bw: -35dBc/4kHz
 > 250% of assigned bw: $-43 + 10\log(P_{max})\text{dBc}/4\text{kHz} = -43 \text{ dBW}$
 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 5.2
 signal type: max. hold of all

Test setup:
 see test report chapter 7.2: setup 1.1hgj

Test equipment:
 see test report chapter 7.2: R001

Remark:

Test result: Test passed

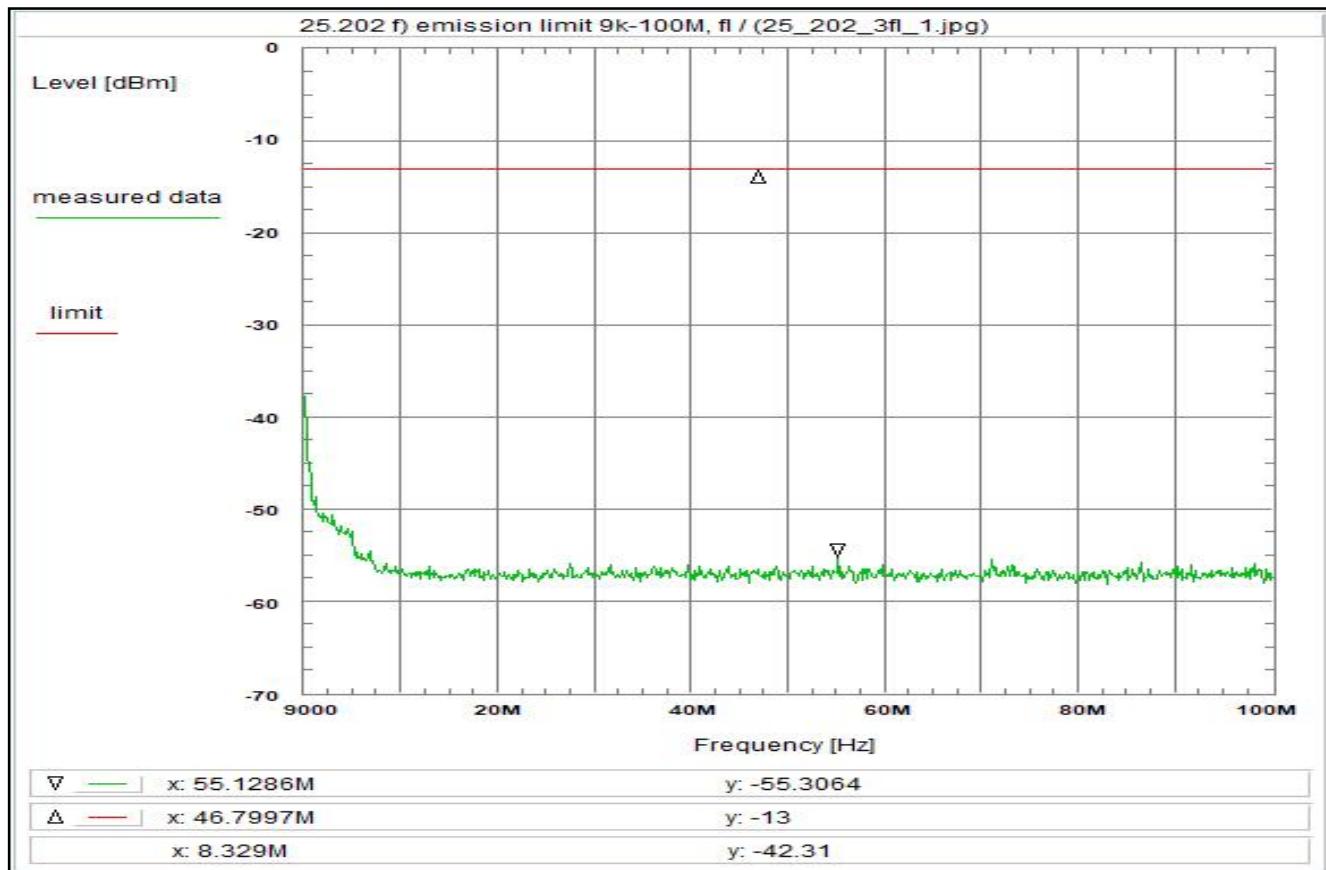
Environment condition:
 Date & Time: Tue 13/Oct/2020 14:28:52
 Location: CTC advanced GmbH, Laboratory RC-SYS
 Temperature: 22 °C
 Humidity: 55 %
 Voltage: 24 Vdc

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: 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 + 11.3 dBi
 Test antenna + 0.0 dB
 BW correction factor (3k > 4k) + 1.2 dB
 Atten. between HPA and feedhorn - 0.0 dB
 Attenuation 10 + 20 dB (U316) + 29.3 dB
 Combined RF + 3.0 dB
 TOTAL CORRECTION: + 45.7 dB

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

Plot No. 30



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
 Emission limitations
 Modulated f-carrier at the lower edge of the band (fl)

Limit:
 Limit according to 25.202 f):
 50-100% of assigned bw: -25dBc/4kHz
 100-250% of assigned bw: -35dBc/4kHz
 > 250% of assigned bw: $-43 + 10\log(P_{max})\text{dBc}/4\text{kHz} = -43 \text{ dBW}$
 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 5.2
 signal type: max. hold of all

Test setup:
 see test report chapter 7.2: setup 1.1hgj

Test equipment:
 see test report chapter 7.2: C220, R001, U317

Remark:

Test result: Test passed

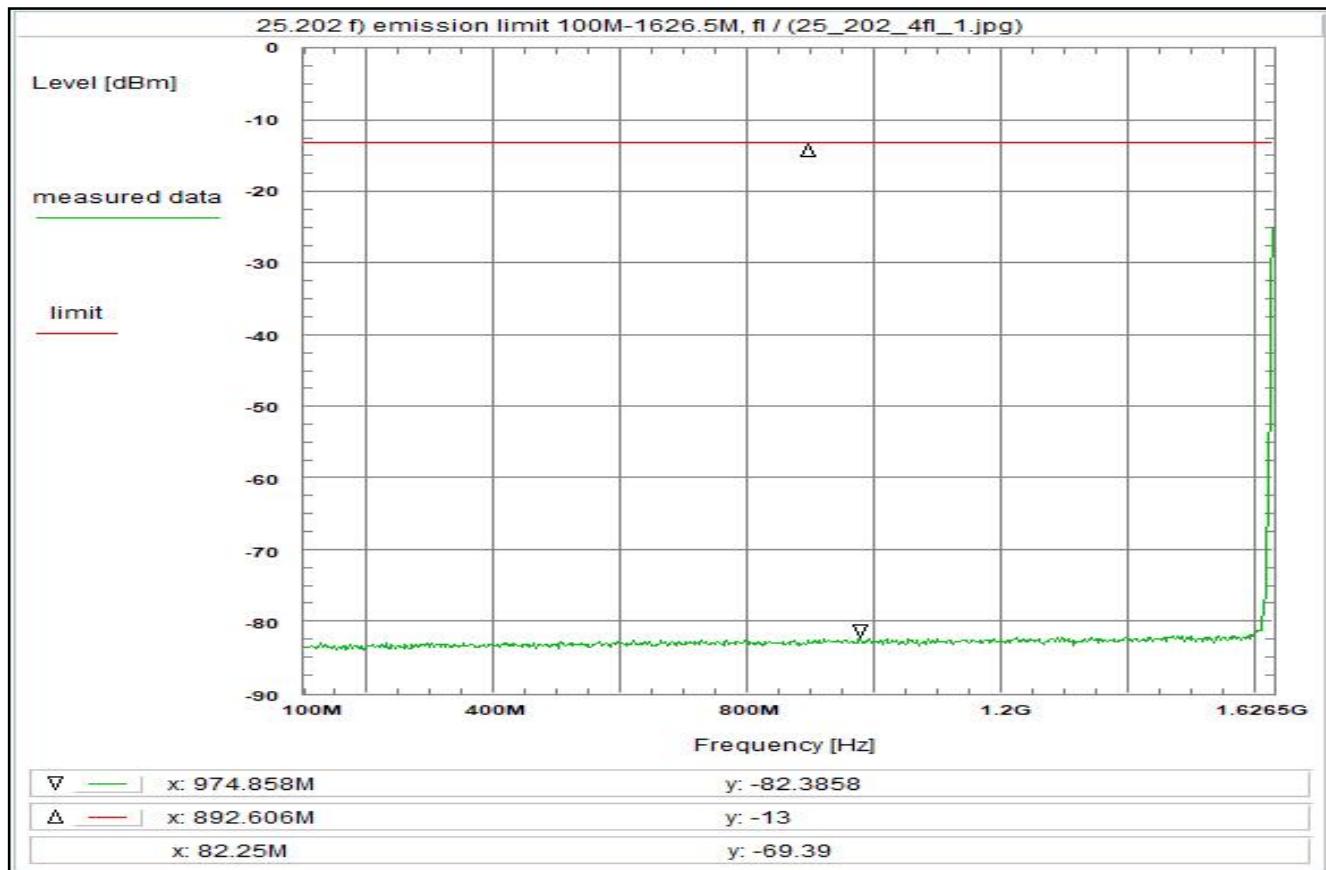
Environment condition:
 Date & Time: Tue 13/Oct/2020 16:51:13
 Location: CTC advanced GmbH, Laboratory RC-SYS
 Temperature: 22 °C
 Humidity: 55 %
 Voltage: 24 Vdc

Setup of measurement equipment:
 Start frequency: 9 kHz
 Stop frequency: 100 MHz
 Center frequency: 50.0045 MHz
 Frequency span: 99.991 MHz
 Resolution-BW: 1 kHz
 Video-BW: 3 kHz
 Input attenuation: 40 dB
 Trace-Mode: Max-Hold
 Detector-Mode: RMS

Correction:
 Directional coupler + 0.0 dB
 Coaxial cable (C220) + 0.2 dB
 DUT-Antenna + 11.3 dBi
 Test antenna + 0.0 dB
 BW correction factor (1k > 4k) + 6.0 dB
 (U317) + 9.6 dB
 TOTAL CORRECTION: + 27.1 dB

Remarks:
 Carrier-on state / Carrier at the lower edge of the band (fl)
 rather left the plot shows the zero response of the spectrum analyzer

Plot No. 31



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
 Emission limitations
 Modulated f-carrier at the lower edge of the band (fl)

Limit:
 Limit according to 25.202 f):
 50-100% of assigned bw: -25dBc/4kHz
 100-250% of assigned bw: -35dBc/4kHz
 > 250% of assigned bw: $-43 + 10\log(P_{max})\text{dBc}/4\text{kHz} = -43 \text{ dBW}$
 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 5.2
 signal type: max. hold of all

Test setup:
 see test report chapter 7.2: setup 1.hgj

Test equipment:
 see test report chapter 7.2: C220, R001, U317

Remark:

Test result: Test passed

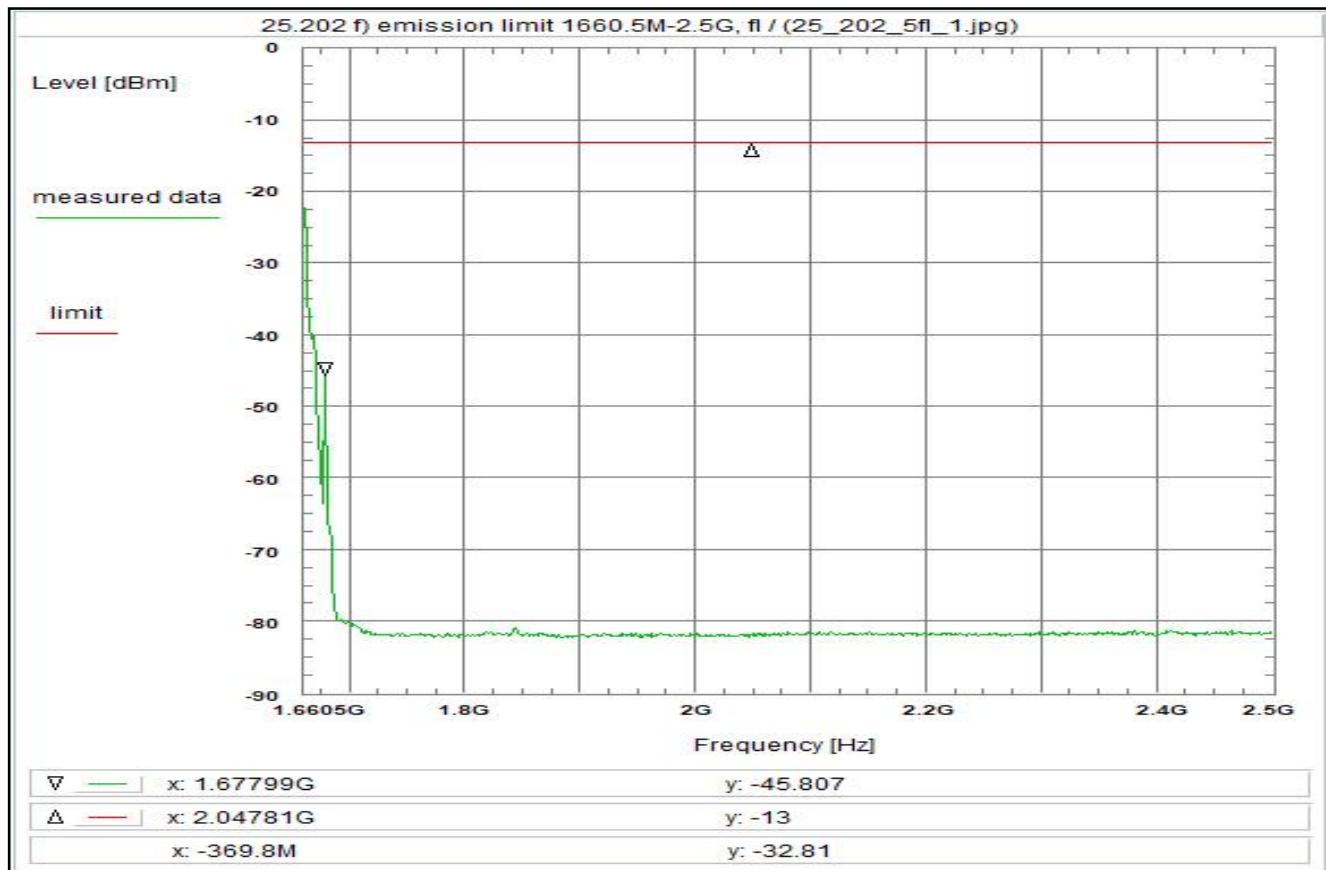
Environment condition:
 Date & Time: Tue 13/Oct/2020 17:27:56
 Location: CTC advanced GmbH, Laboratory RC-SYS
 Temperature: 22 °C
 Humidity: 55 %
 Voltage: 24 Vdc

Setup of measurement equipment:
 Start frequency: 100 MHz
 Stop frequency: 1.6265 GHz
 Center frequency: 863.25 MHz
 Frequency span: 1.5265 GHz
 Resolution-BW: 10 kHz
 Video-BW: 30 kHz
 Input attenuation: 0 dB
 Trace-Mode: Max-Hold
 Detector-Mode: RMS

Correction:
 Directional coupler + 0.0 dB
 Coaxial cable (C220) + 0.6 dB
 DUT-Antenna (on-axis) + 11.3 dBi
 Test antenna + 0.0 dB
 BW correction factor (10k -> 4k) - 4.0 dB
 Atten. between HPA and feedhorn - 0.0 dB
 (U317) + 10.2 dB
 TOTAL CORRECTION: + 18.1 dB

Remarks:
 Carrier-on state / Carrier at the lower edge of the band (fl)
 rather right the plot shows the correction curve of the band notch filter

Plot No. 32



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
 Modulated f-carrier at the lower edge of the band (f1)

Limit:
Limit according to 25.202 f1:
 50-100% of assigned bw: -25dBc/4kHz
 100-250% of assigned bw: -35dBc/4kHz
 > 250% of assigned bw: $-43 + 10\log(P_{max})\text{dBc}/4\text{kHz} = -43 \text{ dBW}$
 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 5.2
 signal type: max. hold of all

Test setup:
 see test report chapter 7.2: setup 1.1hgj

Test equipment:
 see test report chapter 7.2: C220, R001, U317

Remark:

Test result: Test passed

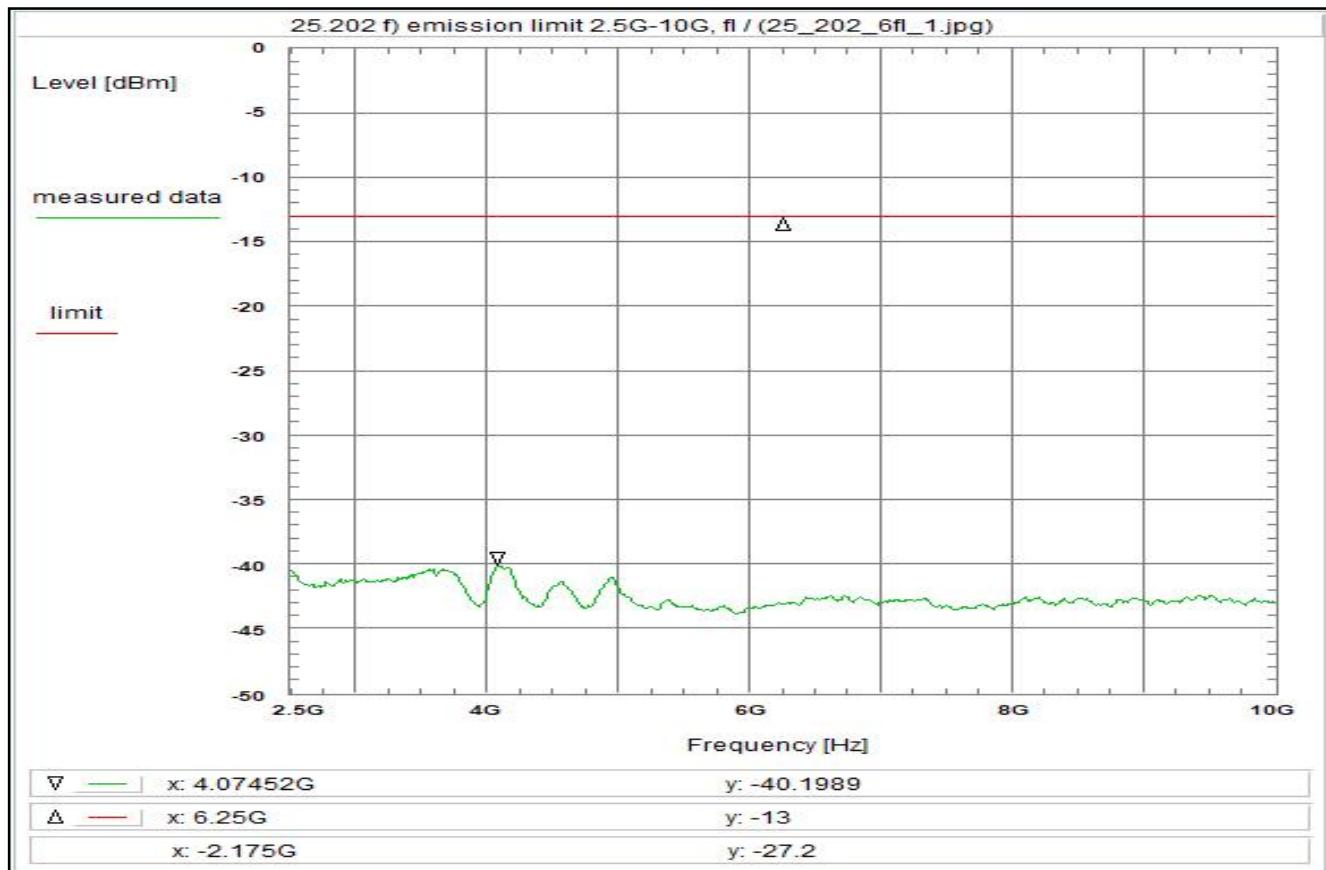
Environment condition:
 Date & Time: Tue 13/Oct/2020 17:26:20
 Location: CTC advanced GmbH, Laboratory RC-SYS
 Temperature: 22 °C
 Humidity: 55 %
 Voltage: 24 Vdc

Setup of measurement equipment:
 Start frequency: 1.6605 GHz
 Stop frequency: 2.5 GHz
 Center frequency: 2.08025 GHz
 Frequency span: 839.5 MHz
 Resolution-BW: 10 kHz
 Video-BW: 30 kHz
 Input attenuation: 0 dB
 Trace-Mode: Max-Hold
 Detector-Mode: RMS

Correction:
 Directional coupler + 0.0 dB
 Coaxial cable (C220) + 1.0 dB
 DUT-Antenna (on-axis) + 11.3 dBi
 Test antenna + 0.0 dB
 BW correction factor (10k → 4k) - 4.0 dB
 Atten. between HPA and feedhorn - 0.0 dB
 (U317) + 10.9 dB
 TOTAL CORRECTION: + 19.2 dB

Remarks:
 Carrier-on state / Carrier at the lower edge of the band (f1)
 rather left the plot shows the correction curve of the band notch filter

Plot No. 33



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
 Emission limitations
 Modulated f-carrier at the lower edge of the band (fl)

Limit:
 Limit according to 25.202 f):
 50-100% of assigned bw: -25dBc/4kHz
 100-250% of assigned bw: -35dBc/4kHz
 > 250% of assigned bw: $-43 + 10\log(P_{max})\text{dBc}/4\text{kHz} = -43 \text{ dBW}$
 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 5.2
 signal type: max. hold of all

Test setup:
 see test report chapter 7.2: setup 1.hgj

Test equipment:
 see test report chapter 7.2: C220, R001, U319

Remark:

Test result: Test passed

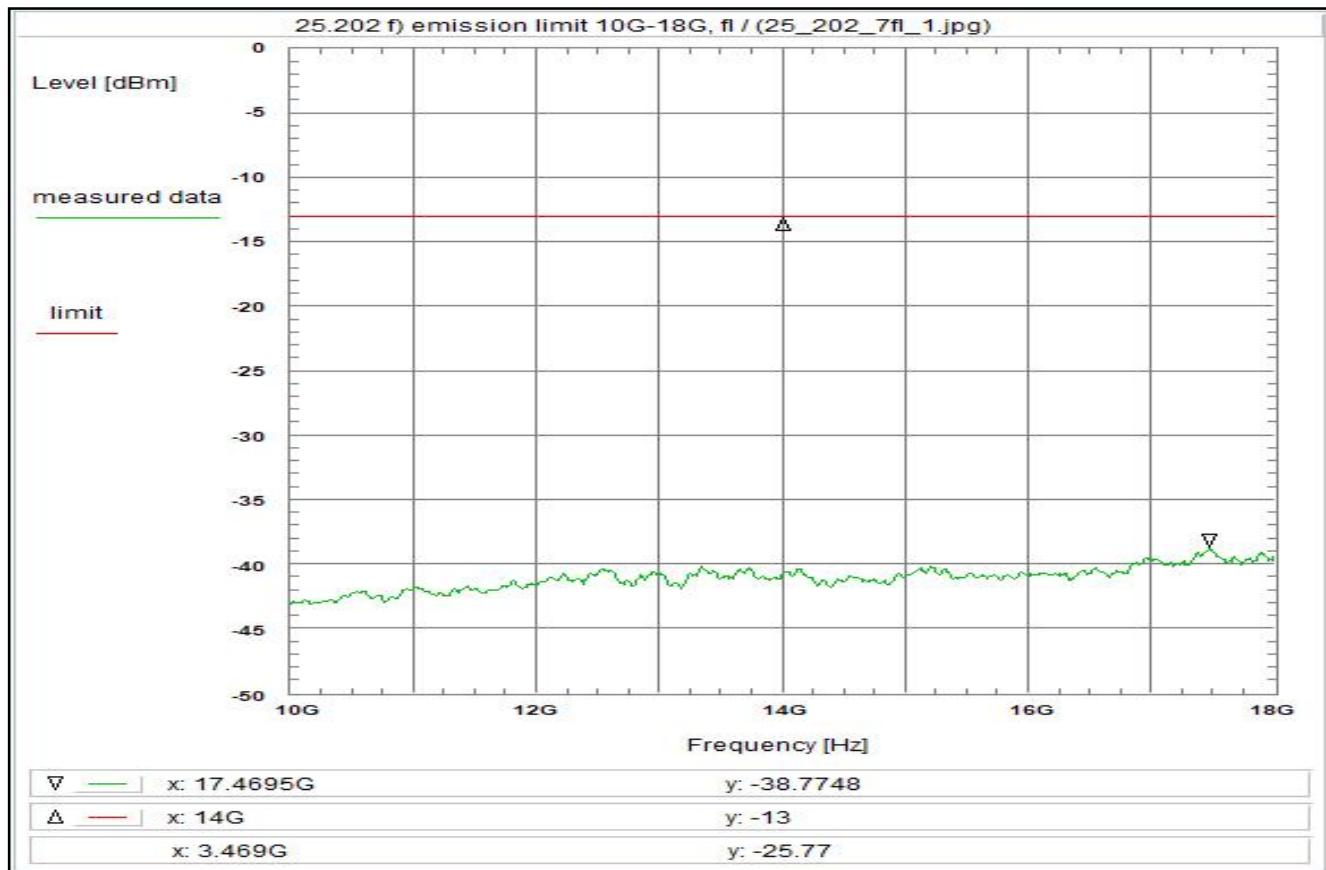
Environment condition:
 Date & Time: Tue 13/Oct/2020 16:15:34
 Location: CTC advanced GmbH, Laboratory RC-SYS
 Temperature: 22 °C
 Humidity: 55 %
 Voltage: 24 Vdc

Setup of measurement equipment:
 Start frequency: 2.5 GHz
 Stop frequency: 10 GHz
 Center frequency: 6.25 GHz
 Frequency span: 7.5 GHz
 Resolution-BW: 100 kHz
 Video-BW: 300 kHz
 Input attenuation: 40 dB
 Trace-Mode: Max-Hold
 Detector-Mode: RMS

Correction:
 Directional coupler + 0.0 dB
 Coaxial cable (C220) + 1.7 dB
 DUT-Antenna + 11.3 dBi
 Test antenna + 0.0 dB
 BW correction factor (100k > 4k) - 14.0 dB
 High Pass Filter + 20 dB att. (U319) + 20.4 dB
 TOTAL CORRECTION: + 19.4 dB

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

Plot No. 34



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
 Emission limitations
 Modulated f-carrier at the lower edge of the band (fl)

Limit:
 Limit according to 25.202 f):
 50-100% of assigned bw: -25dBc/4kHz
 100-250% of assigned bw: -35dBc/4kHz
 > 250% of assigned bw: $-43 + 10\log(P_{max})\text{dBc}/4\text{kHz} = -43 \text{ dBW}$
 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 5.2
 signal type: max. hold of all

Test setup:
 see test report chapter 7.2: setup 1.hgj

Test equipment:
 see test report chapter 7.2: C220, R001, U319

Remark:

Test result: Test passed

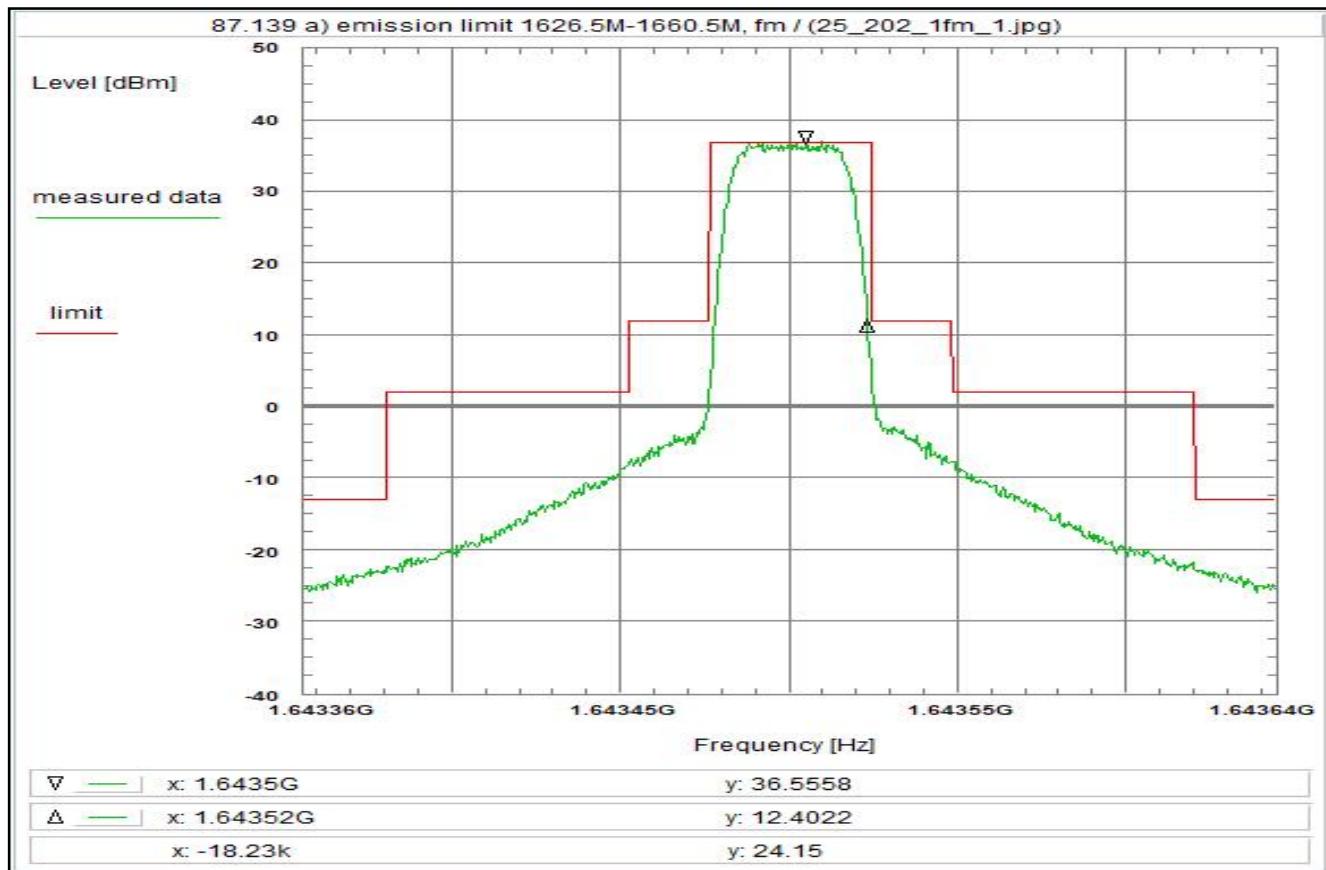
Environment condition:
 Date & Time: Tue 13/Oct/2020 16:16:52
 Location: CTC advanced GmbH, Laboratory RC-SYS
 Temperature: 22 °C
 Humidity: 55 %
 Voltage: 24 Vdc

Setup of measurement equipment:
 Start frequency: 10 GHz
 Stop frequency: 18 GHz
 Center frequency: 14 GHz
 Frequency span: 8 GHz
 Resolution-BW: 100 kHz
 Video-BW: 300 kHz
 Input attenuation: 40 dB
 Trace-Mode: Max-Hold
 Detector-Mode: RMS

Correction:
 Directional coupler + 0.0 dB
 Coaxial cable (C220) + 2.7 dB
 DUT-Antenna + 11.3 dBi
 Test antenna + 0.0 dB
 BW correction factor (100k > 4k) - 14.0 dB
 (U319) + 21.3 dB
 TOTAL CORRECTION: + 21.3 dB

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

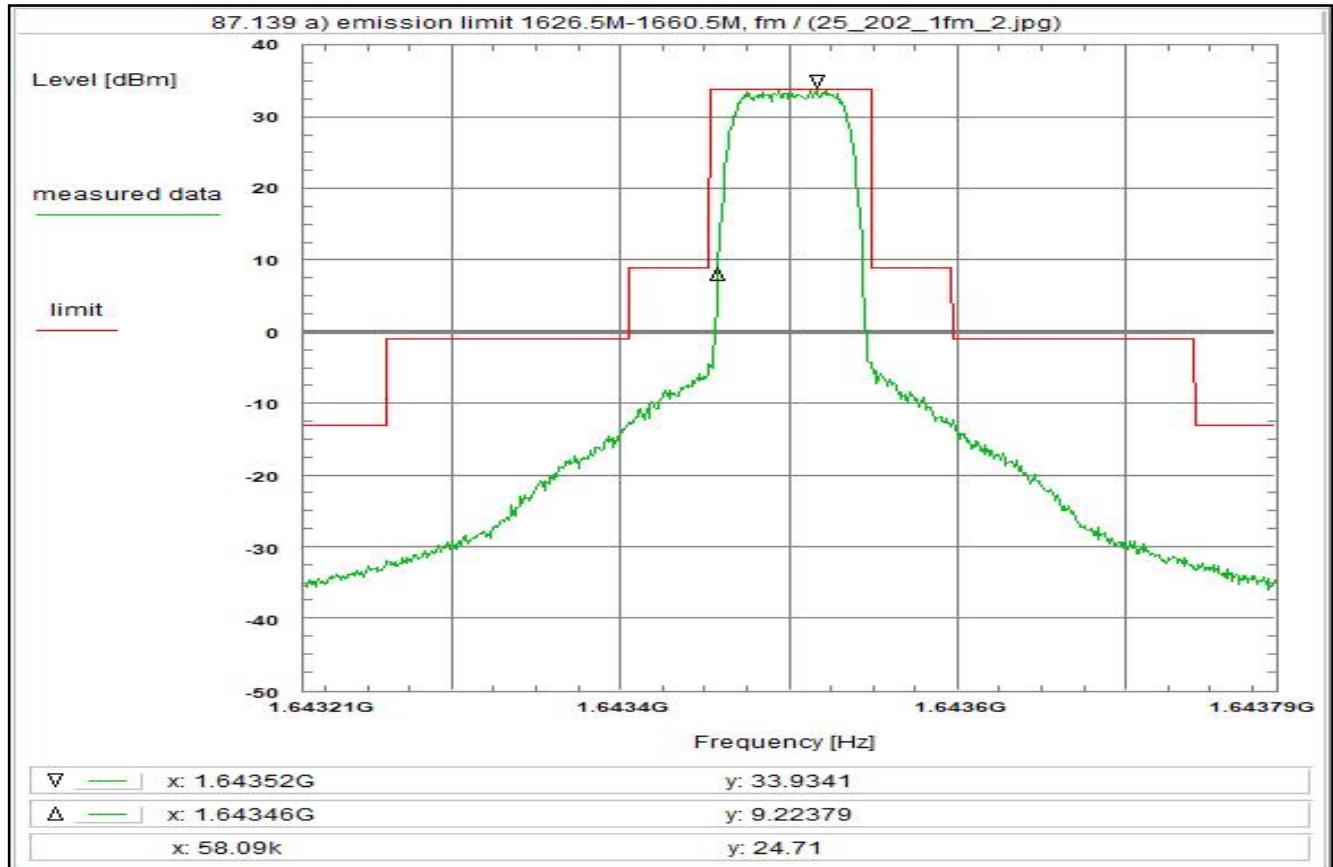
Plot No. 35



| |
|---|
| <u>Subclause:</u> 25.202 f) Frequencies, frequency tolerance and emission limitations |
| Emission limitations |
| Modulated f-carrier at the upper edge of the band (fm) |
| <u>Limit:</u> |
| Limit according to 25.202 f): |
| 50-100% of assigned bw: -25dBc/4kHz |
| 100-250% of assigned bw: -35dBc/4kHz |
| > 250% of assigned bw: $-43 + 10\log(P_{max})\text{dBc}/4\text{kHz} = -43 \text{ dBW}$ |
| The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule. |
| <u>Test results:</u> see plot (an explicit table was not generated) |
| <u>Operating condition of DUT:</u> operating condition 1, see test report chapter 5.2 signal type: R5T1X-1B/R20T1X-1B |
| <u>Test setup:</u> see test report chapter 7.2: setup 1.1hgj |
| <u>Test equipment:</u> see test report chapter 7.2: C220, R001, U316 |
| Remark: |
| Test result: Test passed |

| |
|--|
| <u>Environment condition:</u> |
| Date & Time: Tue 13/Oct/2020 12:33:33 |
| Location: CTC advanced GmbH, Laboratory RC-SYS |
| Temperature: 22 °C |
| Humidity: 55 % |
| Voltage: 24 Vdc |
| <u>Setup of measurement equipment:</u> |
| Start frequency: 1.643356 GHz |
| Stop frequency: 1.643644 GHz |
| Center frequency: 1.6435 GHz |
| Frequency span: 288 kHz |
| Resolution-BW: 3 kHz |
| Video-BW: 10 kHz |
| Input attenuation: 20 dB |
| Trace-Mode: Clear Write |
| Detector-Mode: AVG |
| <u>Correction:</u> |
| Directional coupler + 0.0 dB |
| Coaxial cable (C220) + 0.9 dB |
| DUT-Antenna + 11.3 dBi |
| Test antenna + 0.0 dB |
| BW correction factor (3k > 4k) + 1.2 dB |
| Atten. between HPA and feedhorn - 0.0 dB |
| Attenuation 10 + 20 dB (U316) + 29.3 dB |
| Combined RF + 3.0 dB |
| TOTAL CORRECTION: + 45.7 dB |
| <u>Remarks:</u> Carrier-on state / Carrier in the middle of the band (fm) |

Plot No. 36



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
 Emission limitations
 Modulated f-carrier at the upper edge of the band (fh)

Limit:
 Limit according to 25.202 f):
 50-100% of assigned bw: -25dBc/4kHz
 100-250% of assigned bw: -35dBc/4kHz
 > 250% of assigned bw: $-43 + 10\log(P_{max})$ 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 5.2
 signal type: R5T2X-1B/R20T2X-1B

Test setup:
 see test report chapter 7.2: setup 1.1hgj

Test equipment:
 see test report chapter 7.2: R001

Remark:

Test result: Test passed

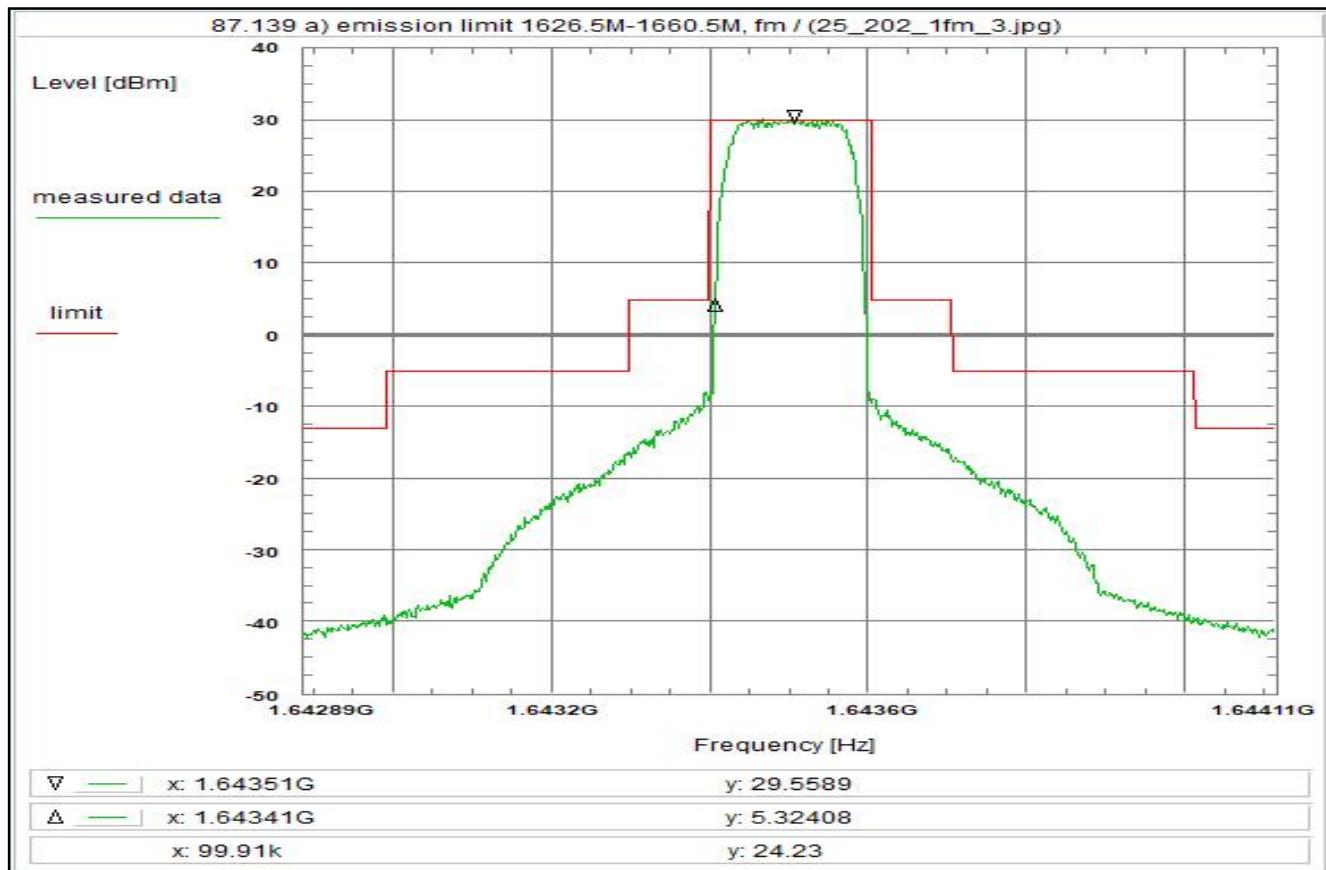
Environment condition:
 Date & Time: Tue 13/Oct/2020 13:01:05
 Location: CTC advanced GmbH, Laboratory RC-SYS
 Temperature: 22 °C
 Humidity: 55 %
 Voltage: 24 Vdc

Setup of measurement equipment:
 Start frequency: 1.643212 GHz
 Stop frequency: 1.643788 GHz
 Center frequency: 1.6435 GHz
 Frequency span: 576 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 + 11.3 dBi
 Test antenna + 0.0 dB
 BW correction factor (3k > 4k) + 1.2 dB
 Atten. between HPA and feedhorn - 0.0 dB
 Attenuation 10 + 20 dB (U316) + 29.3 dB
 Combined RF + 3.0 dB
 TOTAL CORRECTION: + 45.7 dB

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

Plot No. 37



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
 Emission limitations
 Modulated f-carrier at the upper edge of the band (fm)

Limit:
 Limit according to 25.202 f):
 50-100% of assigned bw: -25dBc/4kHz
 100-250% of assigned bw: -35dBc/4kHz
 > 250% of assigned bw: $-43 + 10\log(P_{max})\text{dBc}/4\text{kHz} = -43 \text{ dBW}$
 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 5.2
 signal type: R5T4.5X-1B/R20T4.5X-2B

Test setup:
 see test report chapter 7.2: setup 1.1hgj

Test equipment:
 see test report chapter 7.2: R001

Remark:

Test result: Test passed

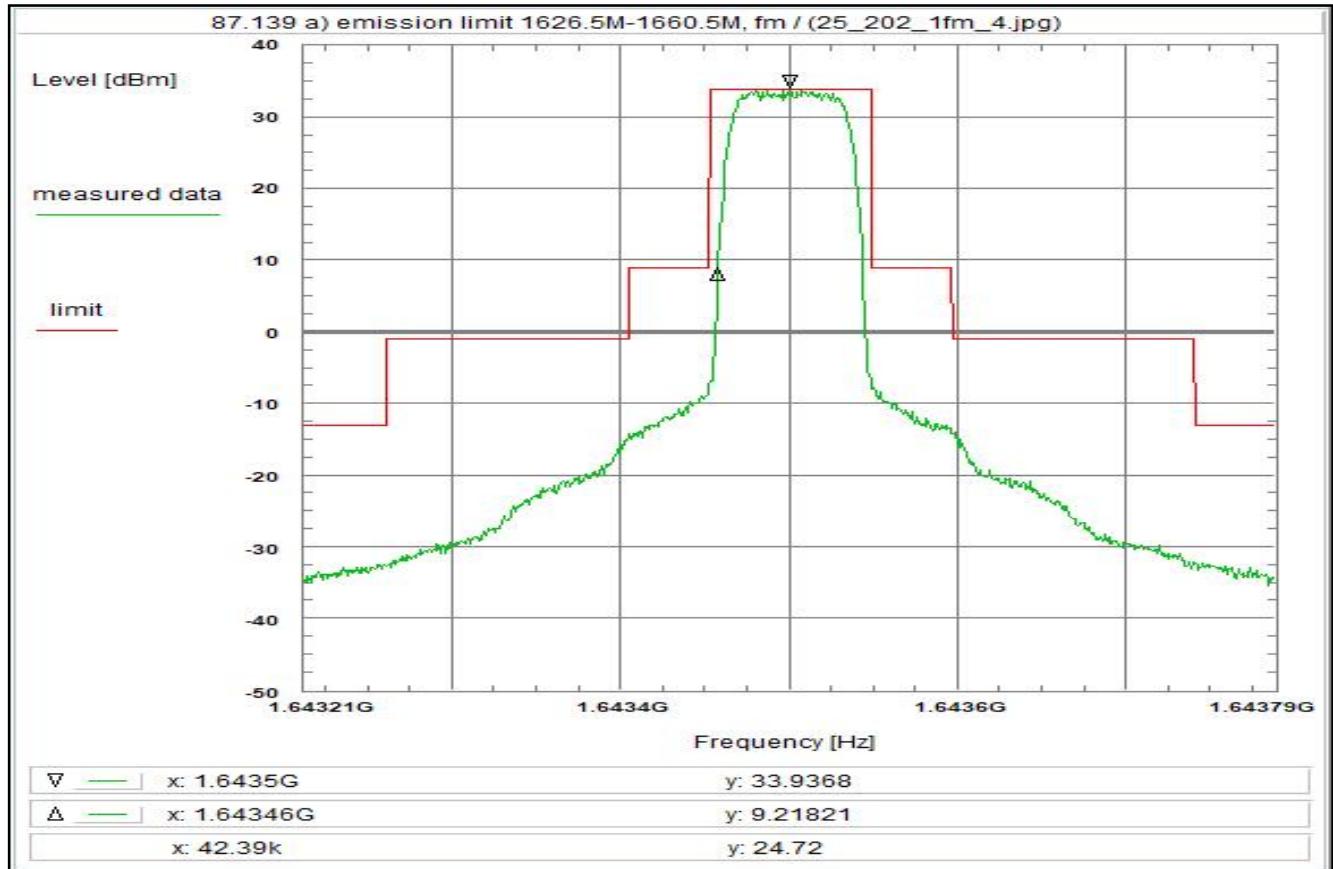
Environment condition:
 Date & Time: Tue 13/Oct/2020 13:03:55
 Location: CTC advanced GmbH, Laboratory RC-SYS
 Temperature: 22 °C
 Humidity: 55 %
 Voltage: 24 Vdc

Setup of measurement equipment:
 Start frequency: 1.642888 GHz
 Stop frequency: 1.644112 GHz
 Center frequency: 1.6435 GHz
 Frequency span: 1.224 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 + 11.3 dBi
 Test antenna + 0.0 dB
 BW correction factor (3k > 4k) + 1.2 dB
 Atten. between HPA and feedhorn - 0.0 dB
 Attenuation 10 + 20 dB (U316) + 29.3 dB
 Combined RF + 3.0 dB
 TOTAL CORRECTION: + 45.7 dB

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

Plot No. 38



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated f-carrier at the upper edge of the band (fm)

Limit:
Limit according to 25.202 f):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: $-43 + 10\log(P_{max})\text{dBc}/4\text{kHz} = -43 \text{ dBW}$
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 5.2
signal type: R5T2Q-1B/R20T2Q-1B

Test setup:
see test report chapter 7.2: setup 1.1hgj

Test equipment:
see test report chapter 7.2: R001

Remark:

Test result: Test passed

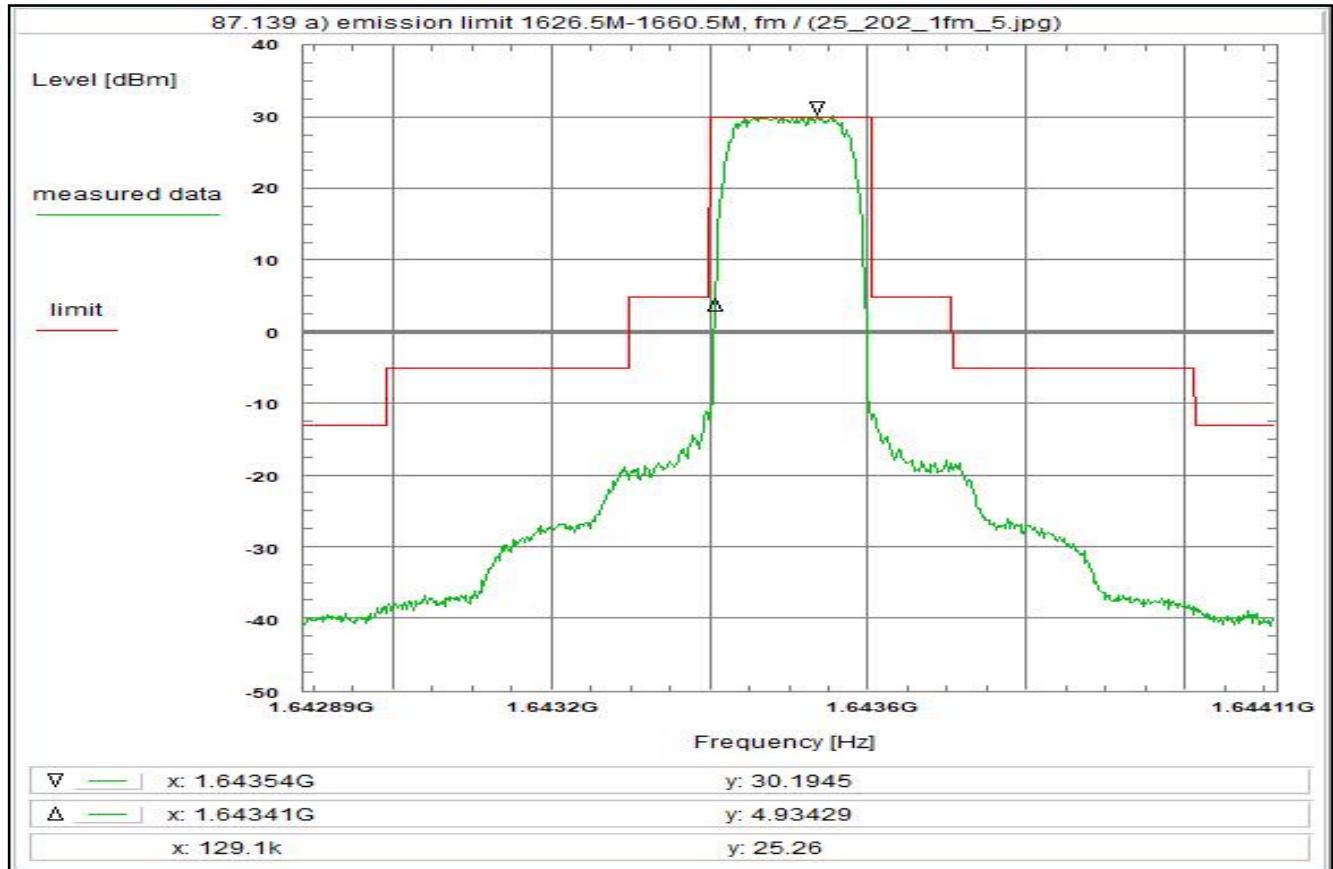
Environment condition:
Date & Time: Tue 13/Oct/2020 13:09:44
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 24 Vdc

Setup of measurement equipment:
Start frequency: 1.643212 GHz
Stop frequency: 1.643788 GHz
Center frequency: 1.6435 GHz
Frequency span: 576 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 + 11.3 dBi
Test antenna + 0.0 dB
BW correction factor (3k > 4k) + 1.2 dB
Atten. between HPA and feedhorn - 0.0 dB
Attenuation 10 + 20 dB (U316) + 29.3 dB
Combined RF + 3.0 dB
TOTAL CORRECTION: + 45.7 dB

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

Plot No. 39



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
 Emission limitations
 Modulated rf-carrier at the upper edge of the band (fm)

Limit:
 Limit according to 25.202 f):
 50-100% of assigned bw: -25dBc/4kHz
 100-250% of assigned bw: -35dBc/4kHz
 > 250% of assigned bw: $-43 + 10\log(P_{max})\text{dBc}/4\text{kHz} = -43 \text{ dBW}$
 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 5.2
 signal type: R5T4.5Q-1B/R20T4.5X-1B

Test setup:
 see test report chapter 7.2: setup 1.1hgj

Test equipment:
 see test report chapter 7.2: R001

Remark:

Test result: Test passed

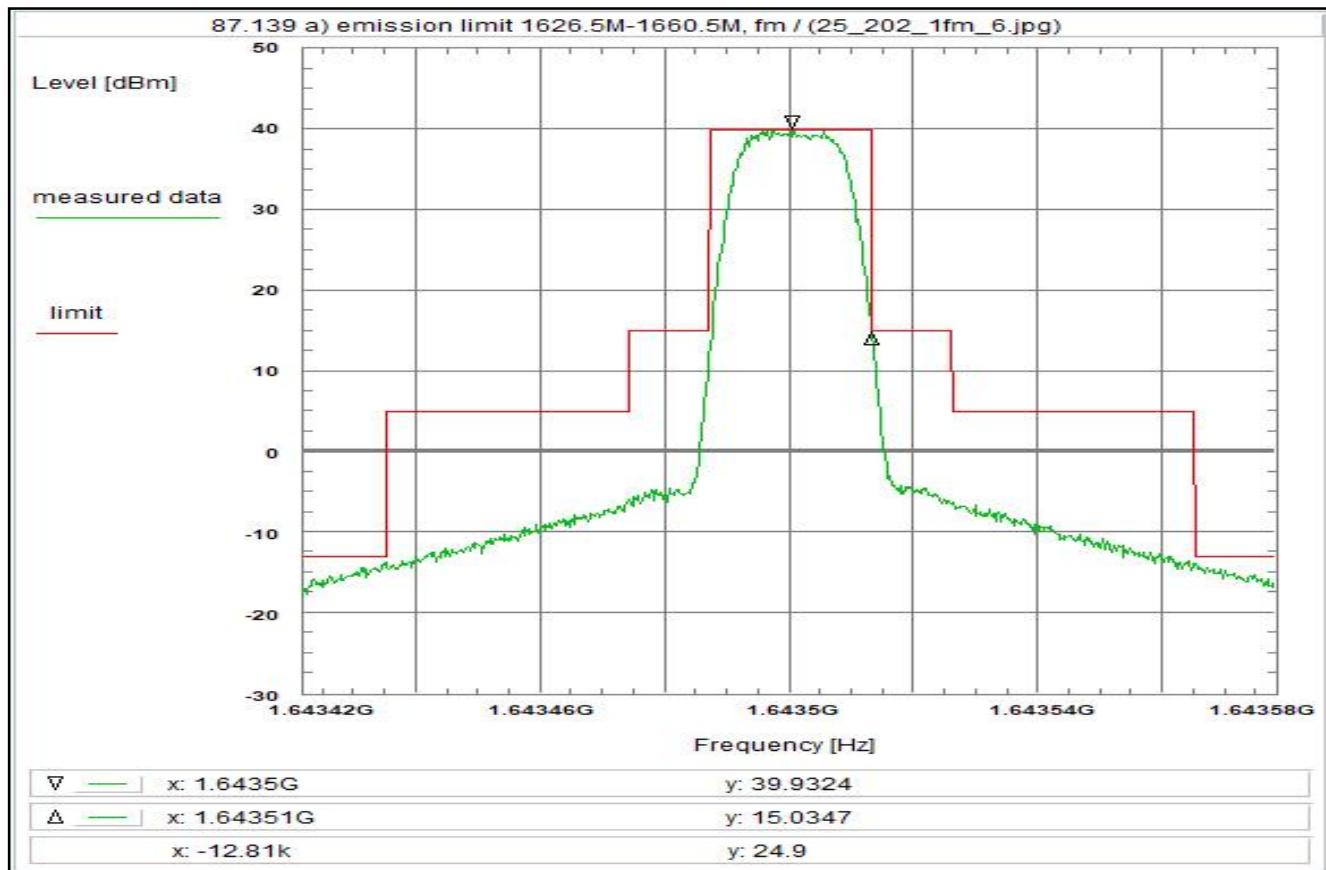
Environment condition:
 Date & Time: Tue 13/Oct/2020 13:12:20
 Location: CTC advanced GmbH, Laboratory RC-SYS
 Temperature: 22 °C
 Humidity: 55 %
 Voltage: 24 Vdc

Setup of measurement equipment:
 Start frequency: 1.642888 GHz
 Stop frequency: 1.644112 GHz
 Center frequency: 1.6435 GHz
 Frequency span: 1.224 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 + 11.3 dBi
 Test antenna + 0.0 dB
 BW correction factor (3k > 4k) + 1.2 dB
 Atten. between HPA and feedhorn - 0.0 dB
 Attenuation 10 + 20 dB (U316) + 29.3 dB
 Combined RF + 3.0 dB
 TOTAL CORRECTION: + 45.7 dB

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

Plot No. 40



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
 Emission limitations
 Modulated f-carrier at the upper edge of the band (fm)

Limit:
 Limit according to 25.202 f):
 50-100% of assigned bw: -25dBc/4kHz
 100-250% of assigned bw: -35dBc/4kHz
 > 250% of assigned bw: $-43 + 10\log(P_{max})$ 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 5.2
 signal type: R20T05Q

Test setup:
 see test report chapter 7.2: setup 1.1hgj

Test equipment:
 see test report chapter 7.2: C220, R001, U316

Remark:

Test result: Test passed

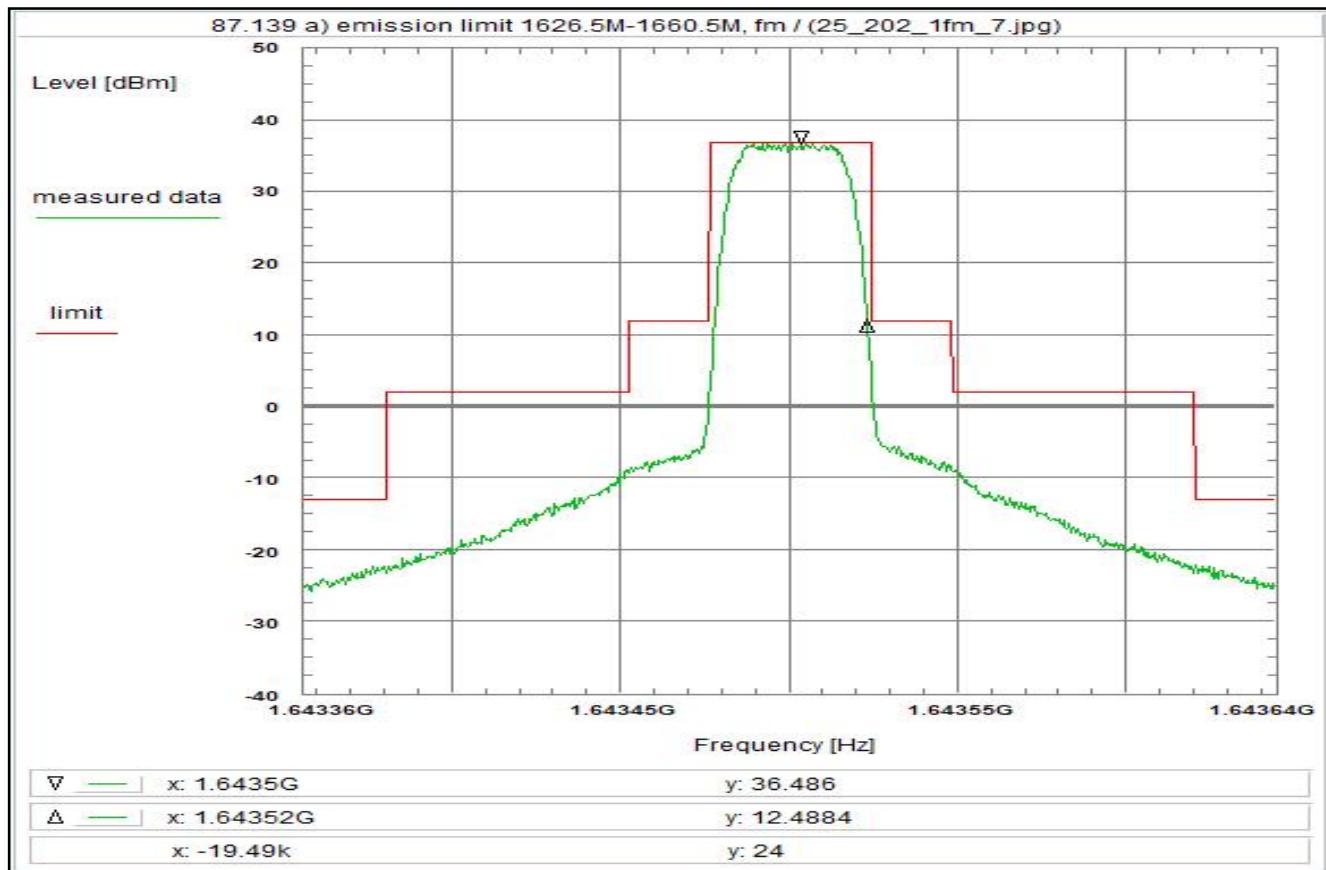
Environment condition:
 Date & Time: Tue 13/Oct/2020 13:17:33
 Location: CTC advanced GmbH, Laboratory RC-SYS
 Temperature: 22 °C
 Humidity: 55 %
 Voltage: 24 Vdc

Setup of measurement equipment:
 Start frequency: 1.643422 GHz
 Stop frequency: 1.643578 GHz
 Center frequency: 1.6435 GHz
 Frequency span: 156 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 + 11.3 dBi
 Test antenna + 0.0 dB
 BW correction factor (3k > 4k) + 1.2 dB
 Atten. between HPA and feedhorn - 0.0 dB
 Attenuation 10 + 20 dB (U316) + 29.3 dB
 Combined RF + 3.0 dB
 TOTAL CORRECTION: + 45.7 dB

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

Plot No. 41



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
 Modulated f-carrier at the upper edge of the band (fm)

Limit:
Limit according to 25.202 f):
 50-100% of assigned bw: -25dBc/4kHz
 100-250% of assigned bw: -35dBc/4kHz
 > 250% of assigned bw: $-43 + 10\log(P_{max})$ 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 5.2
 signal type: R20T1Q-1B

Test setup:
 see test report chapter 7.2: setup 1.1hgj

Test equipment:
 see test report chapter 7.2: C220, R001, U316

Remark:

Test result: Test passed

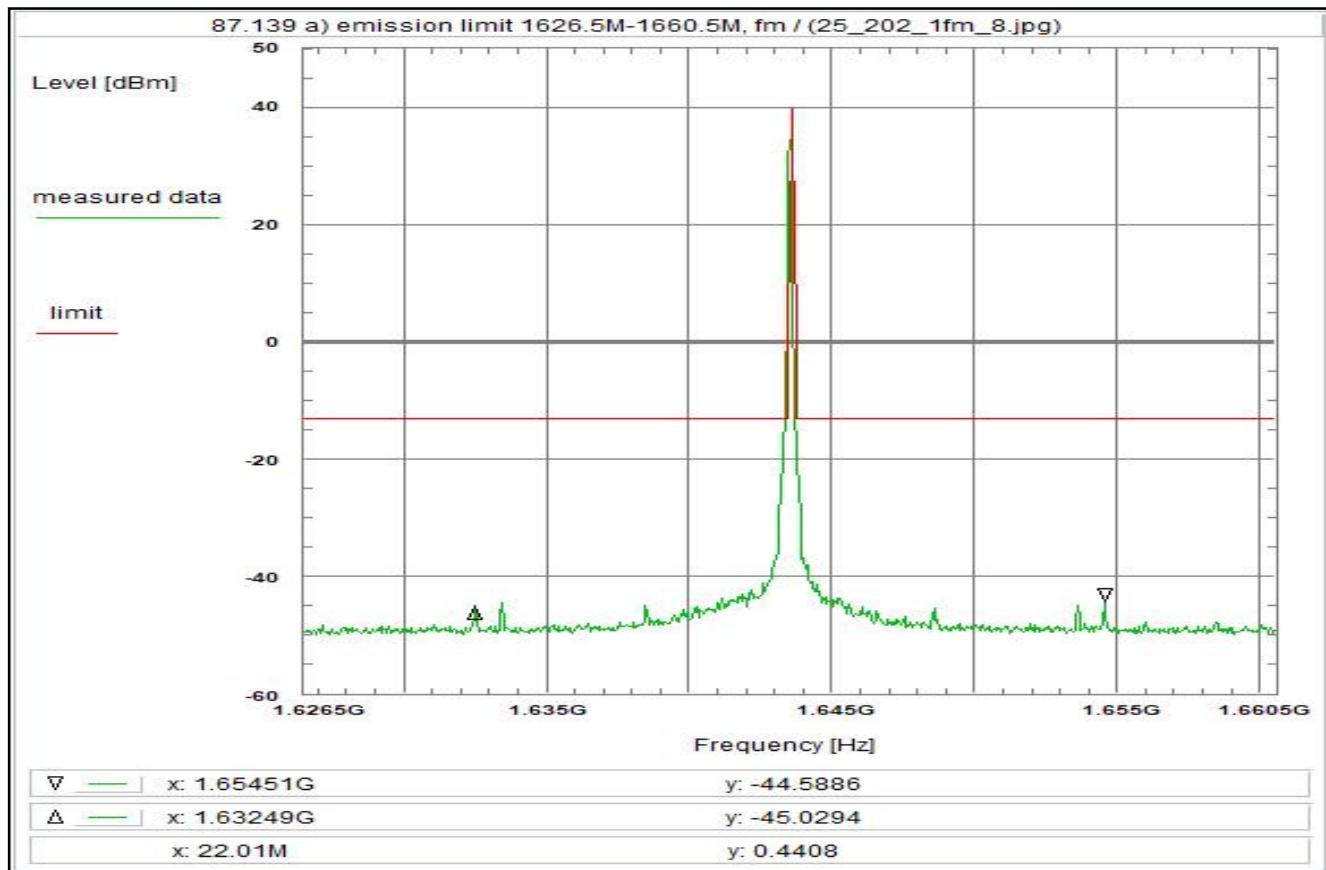
Environment condition:
 Date & Time: Tue 13/Oct/2020 13:21:26
 Location: CTC advanced GmbH, Laboratory RC-SYS
 Temperature: 22 °C
 Humidity: 55 %
 Voltage: 24 Vdc

Setup of measurement equipment:
 Start frequency: 1.643356 GHz
 Stop frequency: 1.643644 GHz
 Center frequency: 1.6435 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 + 11.3 dBi
 Test antenna + 0.0 dB
 BW correction factor (3k > 4k) + 1.2 dB
 Atten. between HPA and feedhorn - 0.0 dB
 Attenuation 10 + 20 dB (U316) + 29.3 dB
 Combined RF + 3.0 dB
 TOTAL CORRECTION: + 45.7 dB

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

Plot No. 42



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
 Emission limitations
 Modulated f-carrier at the upper edge of the band (fm)

Limit:
 Limit according to 25.202 f):
 50-100% of assigned bw: -25dBc/4kHz
 100-250% of assigned bw: -35dBc/4kHz
 > 250% of assigned bw: $-43 + 10\log(P_{max})\text{dBc}/4\text{kHz} = -43 \text{ dBW}$
 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 5.2
 signal type: max. hold of all

Test setup:
 see test report chapter 7.2: setup 1.1hgj

Test equipment:
 see test report chapter 7.2: C220, R001, U316

Remark:

Test result: Test passed

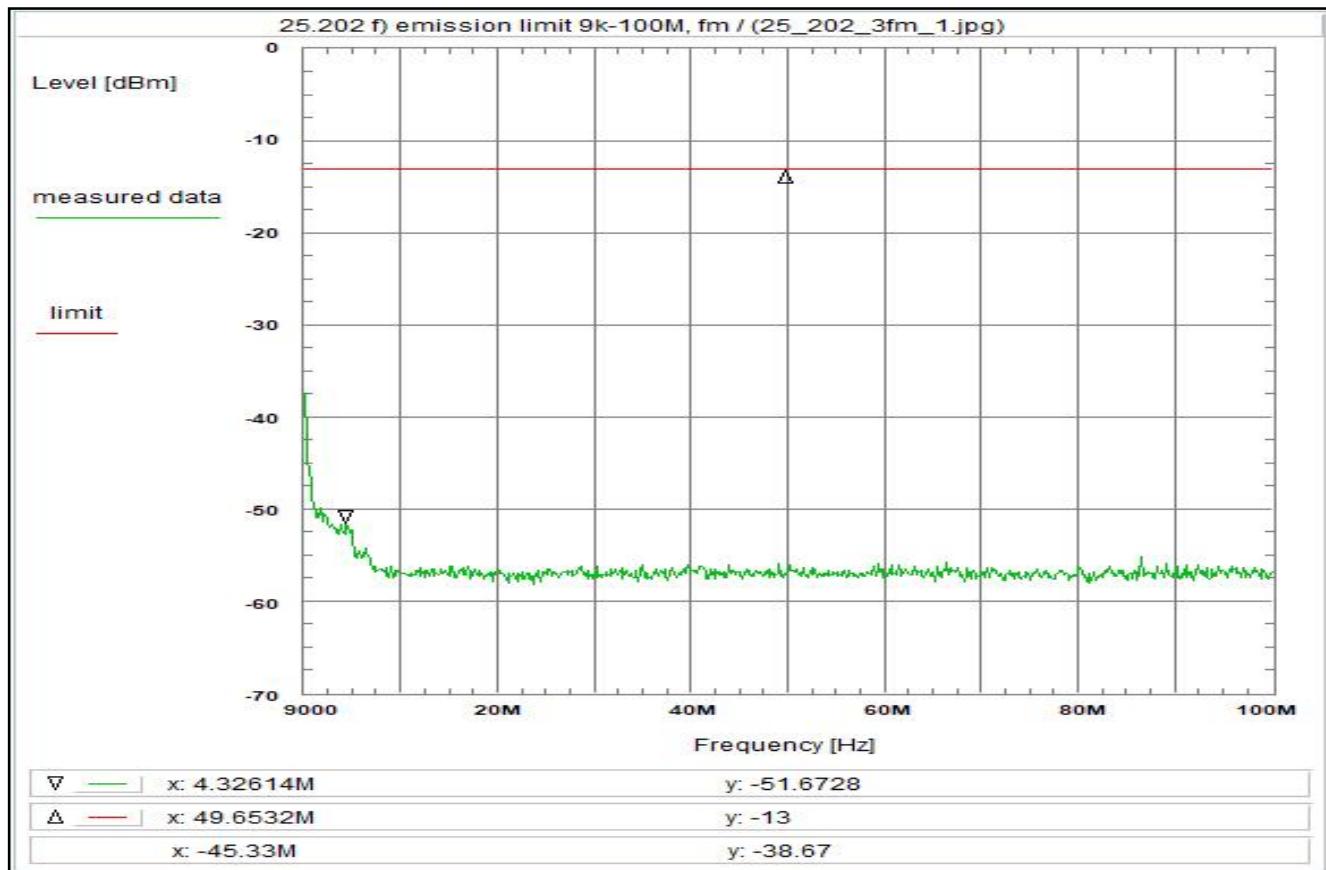
Environment condition:
 Date & Time: Tue 13/Oct/2020 14:34:59
 Location: CTC advanced GmbH, Laboratory RC-SYS
 Temperature: 22 °C
 Humidity: 55 %
 Voltage: 24 Vdc

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: 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 + 11.3 dBi
 Test antenna + 0.0 dB
 BW correction factor (3k > 4k) + 1.2 dB
 Atten. between HPA and feedhorn - 0.0 dB
 Attenuation 10 + 20 dB (U316) + 29.3 dB
 Combined RF + 3.0 dB
 TOTAL CORRECTION: + 45.7 dB

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

Plot No. 43



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
 Modulated f-carrier in the middle of the band (fm)

Limit:
Limit according to 25.202 f):
 50-100% of assigned bw: -25dBc/4kHz
 100-250% of assigned bw: -35dBc/4kHz
 > 250% of assigned bw: $-43 + 10\log(P_{max})\text{dBc}/4\text{kHz} = -43 \text{ dBW}$
 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 5.2
 signal type: max. hold of all

Test setup:
 see test report chapter 7.2: setup 1.1hgj

Test equipment:
 see test report chapter 7.2: C220, R001, U317

Remark:

Test result: Test passed

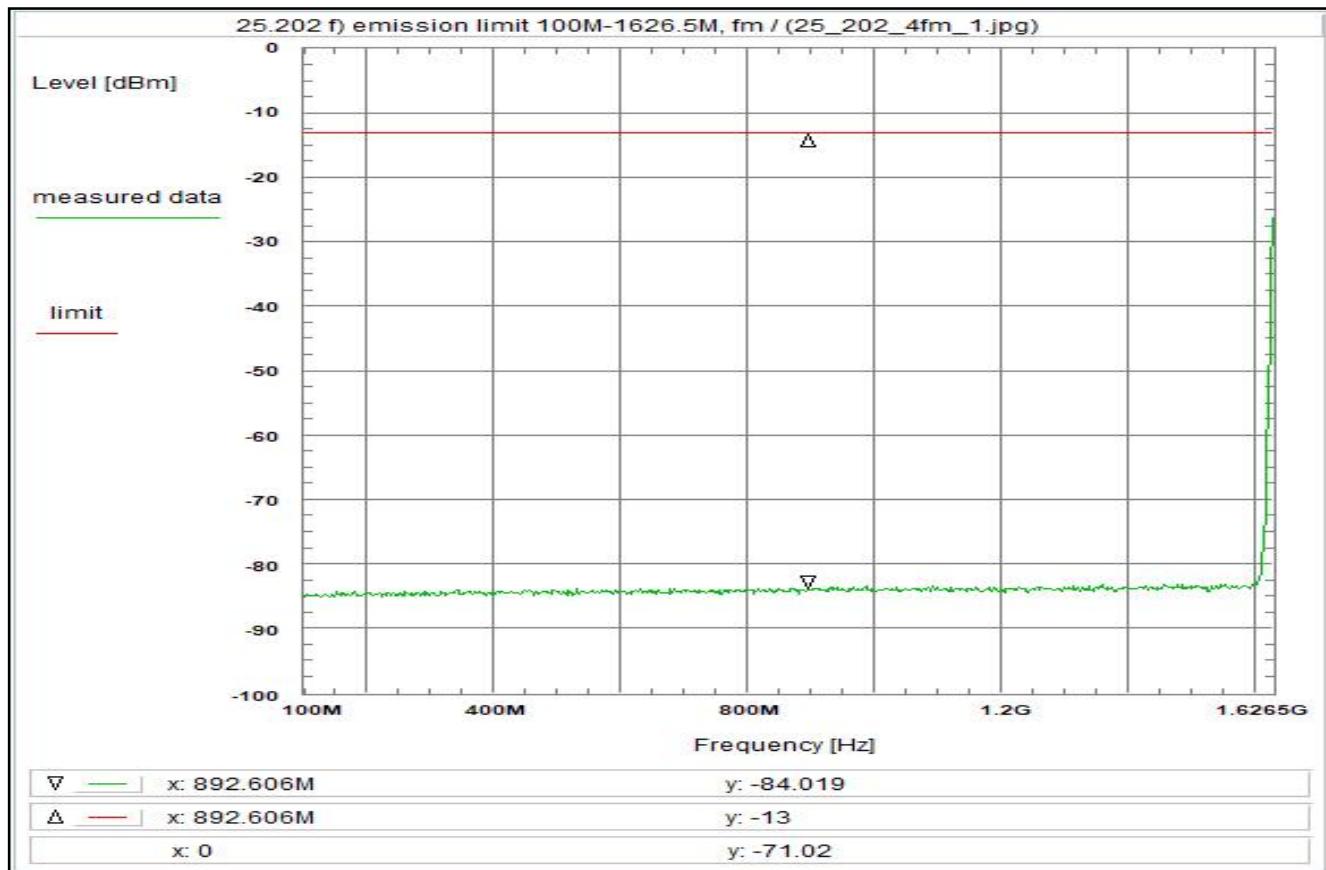
Environment condition:
 Date & Time: Tue 13/Oct/2020 16:42:26
 Location: CTC advanced GmbH, Laboratory RC-SYS
 Temperature: 22 °C
 Humidity: 55 %
 Voltage: 24 Vdc

Setup of measurement equipment:
 Start frequency: 9 kHz
 Stop frequency: 100 MHz
 Center frequency: 50.0045 MHz
 Frequency span: 99.991 MHz
 Resolution-BW: 1 kHz
 Video-BW: 3 kHz
 Input attenuation: 40 dB
 Trace-Mode: Max-Hold
 Detector-Mode: RMS

Correction:
 Directional coupler + 0.0 dB
 Coaxial cable (C220) + 0.2 dB
 DUT-Antenna + 11.3 dBi
 Test antenna + 0.0 dB
 BW correction factor (1k > 4k) + 6.0 dB
 (U317) + 9.6 dB
 TOTAL CORRECTION: + 27.1 dB

Remarks:
 Carrier-on state / Carrier in the middle of the band (fm)
 rather left the plot shows the zero response of the analyzer

Plot No. 44



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated f-carrier in the middle of the band (fm)

Limit:
Limit according to 25.202 f):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: $-43 + 10\log(P_{max})dBc/4kHz = -43 dBW$
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 5.2
signal type: max. hold of all

Test setup:
see test report chapter 7.2: setup 1.1hgj

Test equipment:
see test report chapter 7.2: C220, R001, U317

Remark:

Test result: Test passed

Environment condition:
Date & Time: Tue 13/Oct/2020 17:31:00
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 24 Vdc

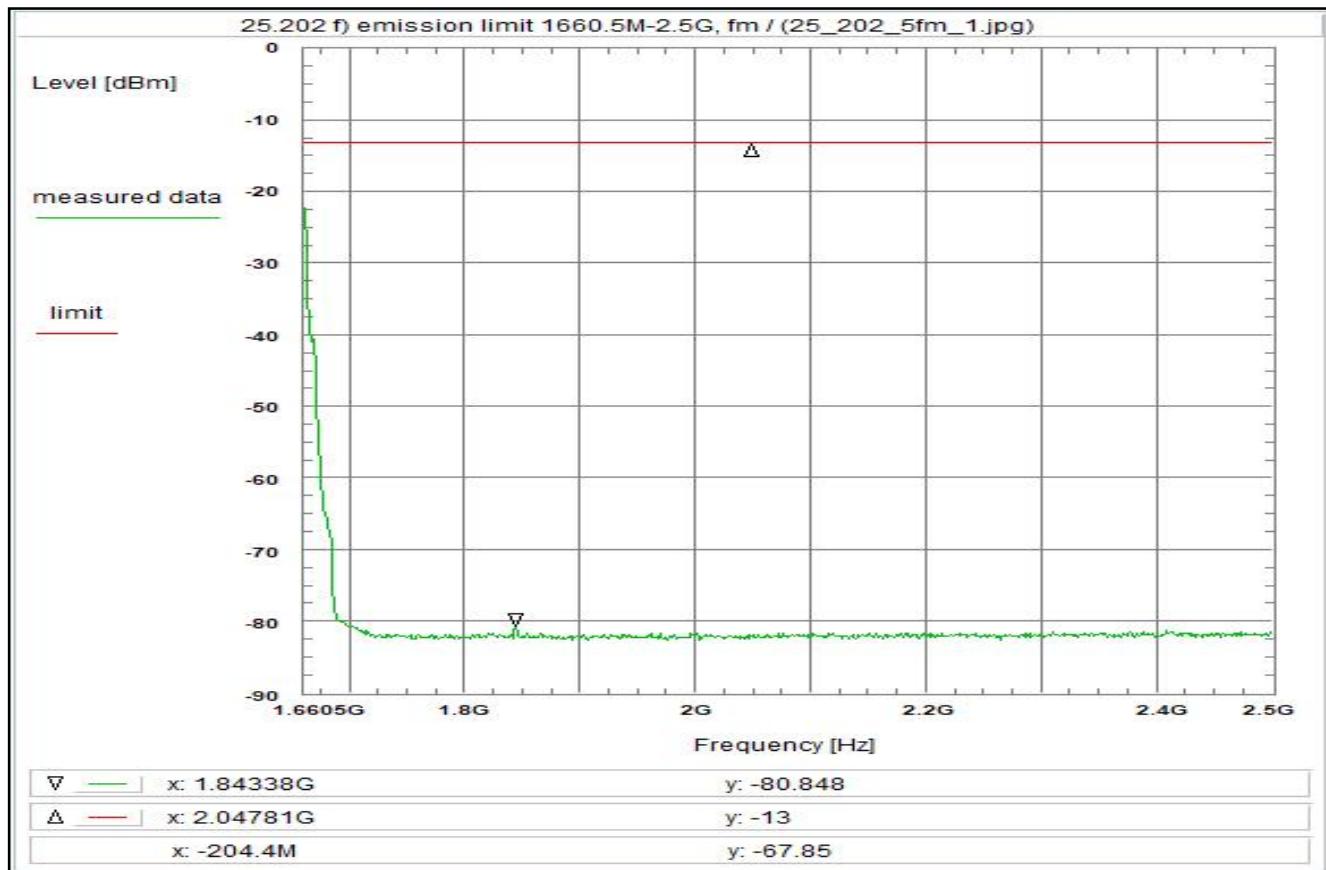
Setup of measurement equipment:
Start frequency: 100 MHz
Stop frequency: 1.6265 GHz
Center frequency: 863.25 MHz
Frequency span: 1.5265 GHz
Resolution-BW: 10 kHz
Video-BW: 30 kHz
Input attenuation: 0 dB
Trace-Mode: Max-Hold
Detector-Mode: AVG

Correction:
Directional coupler + 0.0 dB
Coaxial cable (C220) + 0.6 dB
DUT-Antenna (on-axis) + 11.3 dBi
Test antenna + 0.0 dB
BW correction factor (10k -> 4k) - 4.0 dB
Atten. between HPA and feedhorn (U317) + 10.2 dB
TOTAL CORRECTION: + 18.1 dB

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

rather right the plot shows the correction curve of the band notch filter

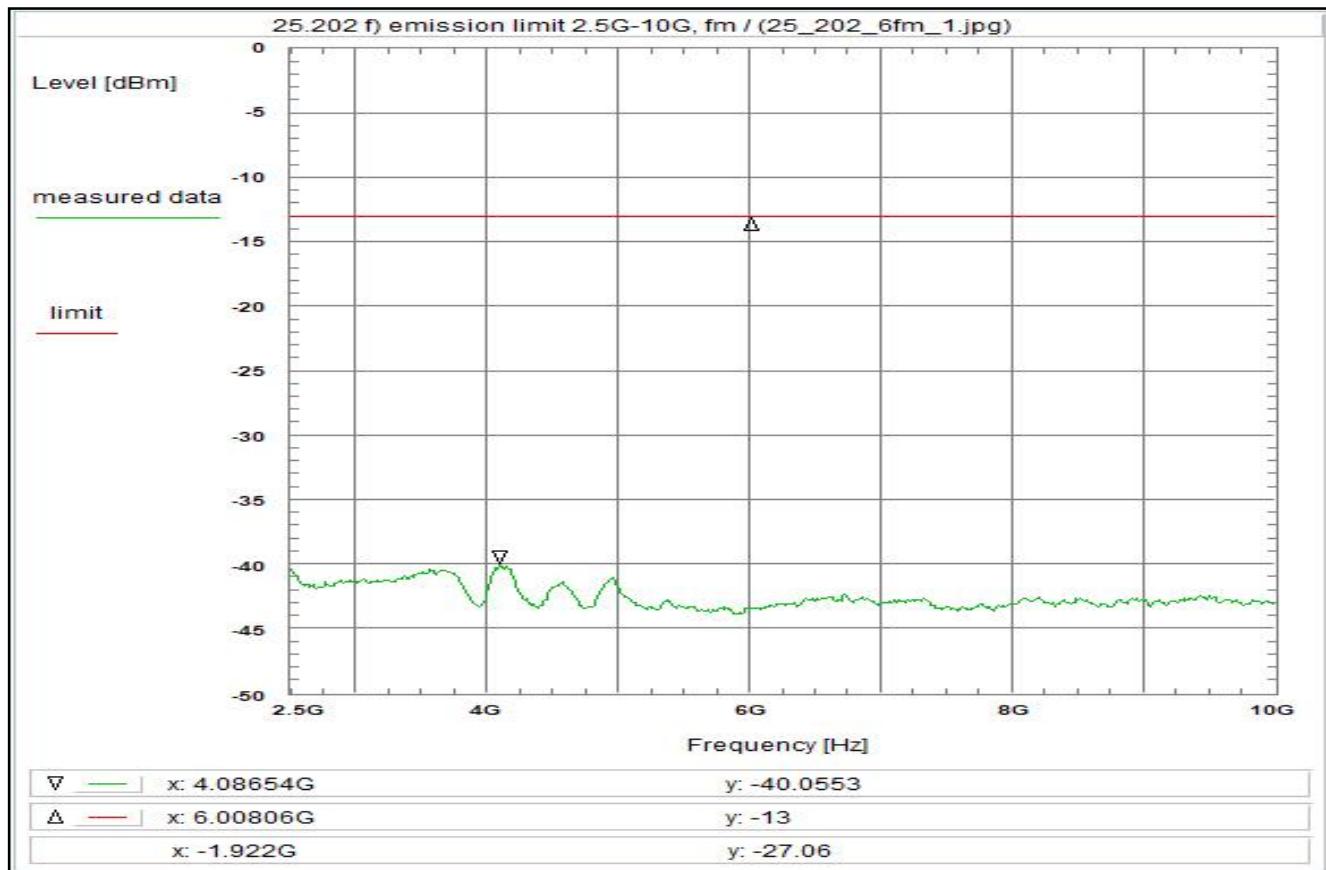
Plot No. 45



| | |
|--|---|
| <u>Subclause:</u> | 25.202 f) Frequencies, frequency tolerance and emission limitations |
| | Emission limitations |
| | Modulated rf-carrier in the middle of the band (fm) |
| <u>Limit:</u> | |
| <u>Limit according to 25.202 f):</u> | |
| 50-100% of assigned bw: | -25dBc/4kHz |
| 100-250% of assigned bw: | -35dBc/4kHz |
| > 250% of assigned bw: | $-43 + 10\log(P_{max})\text{dBc}/4\text{kHz} = -43 \text{ dBW}$ |
| The mean power of emissions shall be attenuated | |
| below the mean output power of the transmitter | |
| in accordance with the above schedule. | |
| <u>Test results:</u> | |
| see plot (an explicit table was not generated) | |
| <u>Operating condition of DUT:</u> | |
| operating condition 1, see test report chapter 5.2 | |
| signal type: max. hold of all | |
| <u>Test setup:</u> | |
| see test report chapter 7.2: setup 1.1hgj | |
| <u>Test equipment:</u> | |
| see test report chapter 7.2: C220, R001, U317 | |
| Remark: | |
| Test result: | Test passed |

| | |
|--|--------------------------------------|
| <u>Environment condition:</u> | |
| Date & Time: | Tue 13/Oct/2020 17:24:47 |
| Location: | CTC advanced GmbH, Laboratory RC-SYS |
| Temperature: | 22 °C |
| Humidity: | 55 % |
| Voltage: | 24 Vdc |
| <u>Setup of measurement equipment:</u> | |
| Start frequency: | 1.6605 GHz |
| Stop frequency: | 2.5 GHz |
| Center frequency: | 2.08025 GHz |
| Frequency span: | 839.5 MHz |
| Resolution-BW: | 10 kHz |
| Video-BW: | 30 kHz |
| Input attenuation: | 0 dB |
| Trace-Mode: | Max-Hold |
| Detector-Mode: | RMS |
| <u>Correction:</u> | |
| Directional coupler | + 0.0 dB |
| Coaxial cable (C220) | + 1.0 dB |
| DUT-Antenna (on-axis) | + 11.3 dBi |
| Test antenna | + 0.0 dB |
| BW correction factor (10k -> 4k) | - 4.0 dB |
| Atten. between HPA and feedhorn (U317) | - 0.0 dB |
| TOTAL CORRECTION: | + 10.9 dB |
| | + 19.2 dB |
| <u>Remarks:</u> | |
| Carrier-on state / Carrier in the middle of the band (fm) | |
| rather left the plot shows the correction curve of the band notch filter | |

Plot No. 46



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated f-carrier in the middle of the band (fm)

Limit:
Limit according to 25.202 f):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: $-43 + 10\log(P_{max})\text{dBc}/4\text{kHz} = -43 \text{ dBW}$
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 5.2
signal type: max. hold of all

Test setup:
see test report chapter 7.2: setup 1.1hgj

Test equipment:
see test report chapter 7.2: C220, R001, U319

Remark:

Test result: Test passed

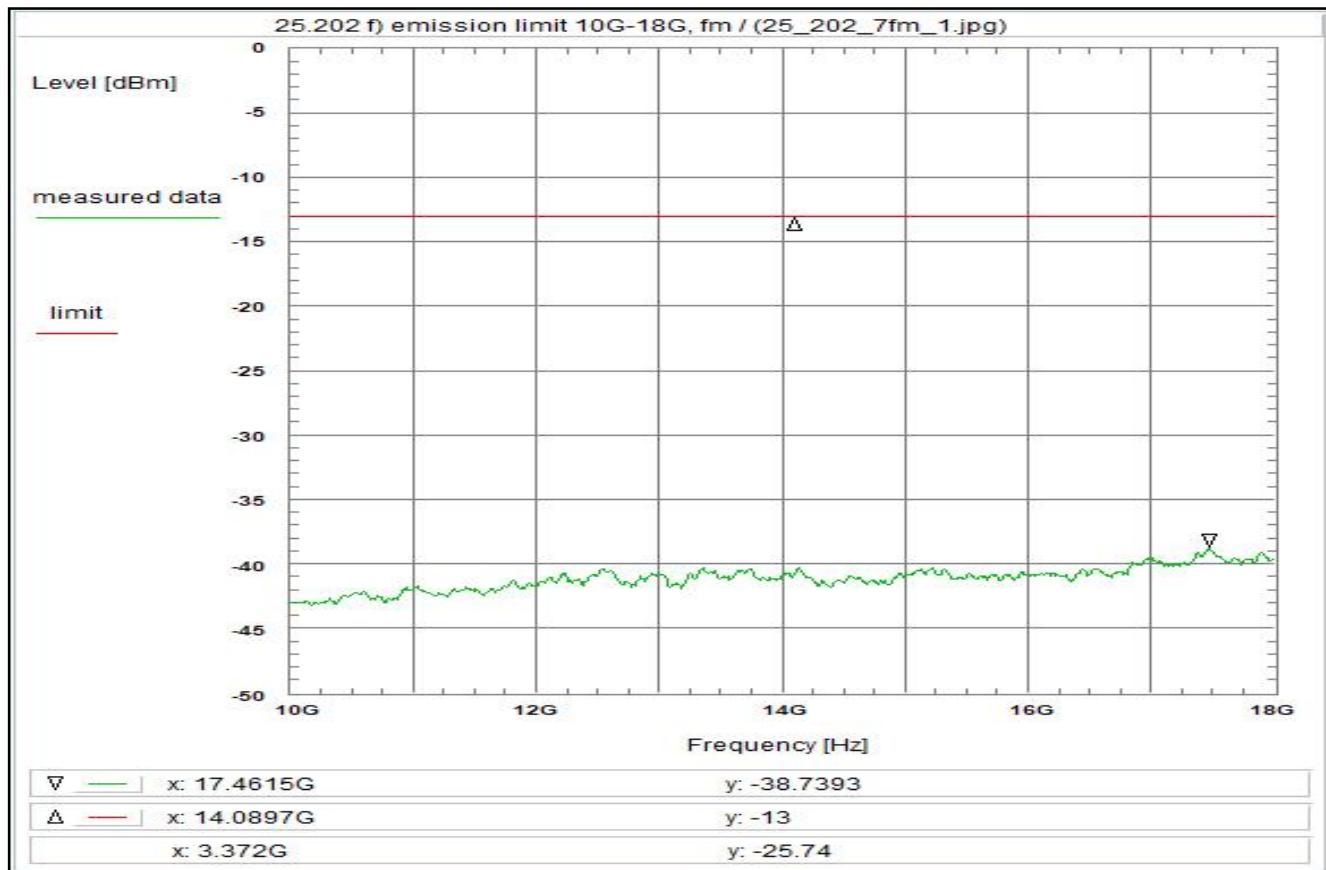
Environment condition:
Date & Time: Tue 13/Oct/2020 16:19:36
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 24 Vdc

Setup of measurement equipment:
Start frequency: 2.5 GHz
Stop frequency: 10 GHz
Center frequency: 6.25 GHz
Frequency span: 7.5 GHz
Resolution-BW: 100 kHz
Video-BW: 300 kHz
Input attenuation: 40 dB
Trace-Mode: Max-Hold
Detector-Mode: RMS

Correction:
Directional coupler + 0.0 dB
Coaxial cable (C220) + 1.7 dB
DUT-Antenna + 11.3 dBi
Test antenna + 0.0 dB
BW correction factor (100k > 4k) - 14.0 dB
(U319) + 20.4 dB
TOTAL CORRECTION: + 19.4 dB

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

Plot No. 47



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
 Modulated f-carrier in the middle of the band (fm)

Limit:
Limit according to 25.202 f):
 50-100% of assigned bw: -25dBc/4kHz
 100-250% of assigned bw: -35dBc/4kHz
 > 250% of assigned bw: $-43 + 10\log(P_{max})\text{dBc}/4\text{kHz} = -43 \text{ dBW}$
 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 5.2
 signal type: max. hold of all

Test setup:
 see test report chapter 7.2: setup 1.hgj

Test equipment:
 see test report chapter 7.2: C220, R001, U319

Remark:

Test result: Test passed

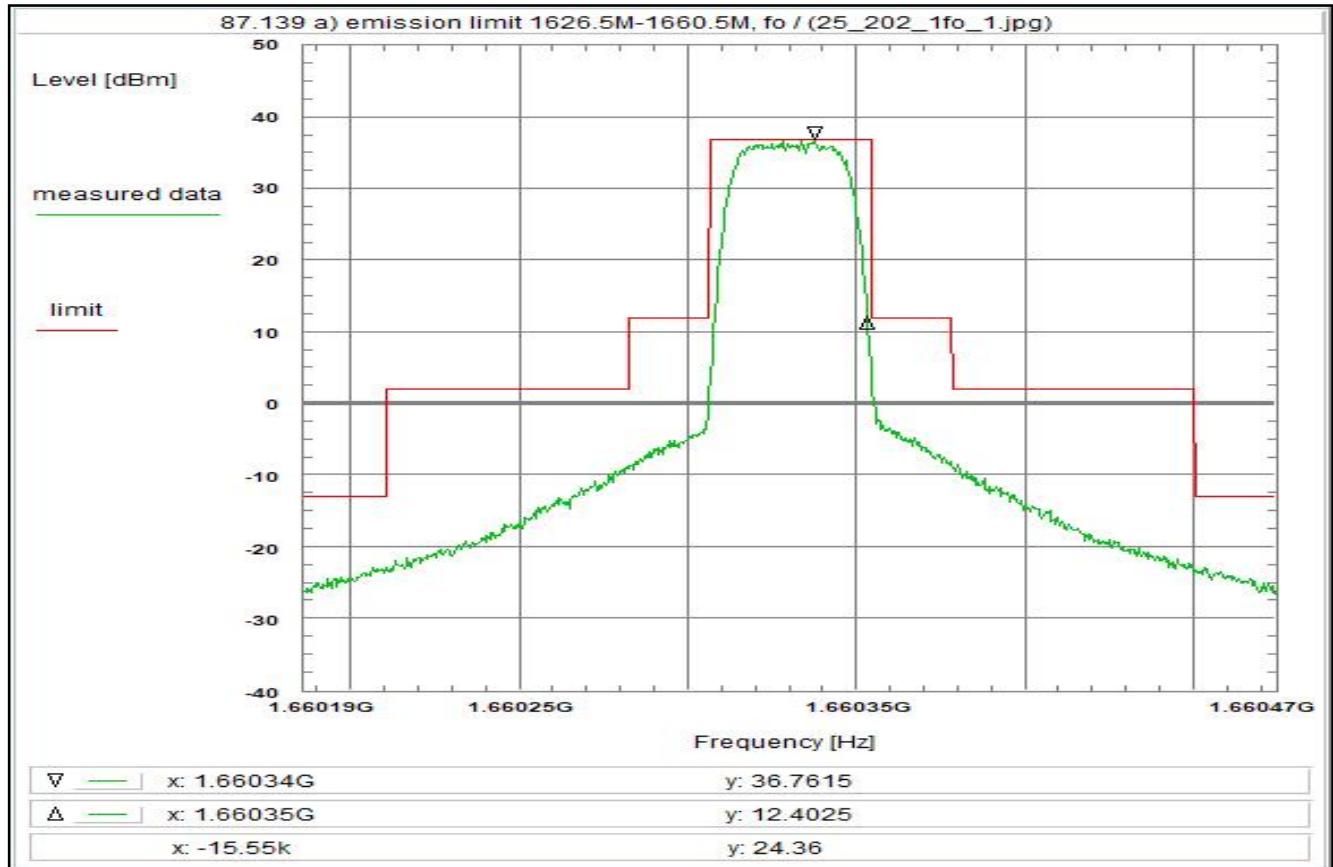
Environment condition:
 Date & Time: Tue 13/Oct/2020 16:18:28
 Location: CTC advanced GmbH, Laboratory RC-SYS
 Temperature: 22 °C
 Humidity: 55 %
 Voltage: 24 Vdc

Setup of measurement equipment:
 Start frequency: 10 GHz
 Stop frequency: 18 GHz
 Center frequency: 14 GHz
 Frequency span: 8 GHz
 Resolution-BW: 100 kHz
 Video-BW: 300 kHz
 Input attenuation: 40 dB
 Trace-Mode: Max-Hold
 Detector-Mode: RMS

Correction:
 Directional coupler + 0.0 dB
 Coaxial cable (C220) + 2.7 dB
 DUT-Antenna + 11.3 dBi
 Test antenna + 0.0 dB
 BW correction factor (100k -> 4k) - 14.0 dB
 (U319) + 21.3 dB
 TOTAL CORRECTION: + 21.3 dB

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

Plot No. 48



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
 Emission limitations
 Modulated f-carrier at the upper edge of the band (f_h)

Limit:
 Limit according to 25.202 f):
 50-100% of assigned bw: -25dBc/4kHz
 100-250% of assigned bw: -35dBc/4kHz
 > 250% of assigned bw: -43+10log(P_{max})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 5.2
 signal type: R5T1X-1B/R5T1Q-1B

Test setup:
 see test report chapter 7.2: setup 1.1hgj

Test equipment:
 see test report chapter 7.2: C220, R001, U316

Remark:

Test result: Test passed

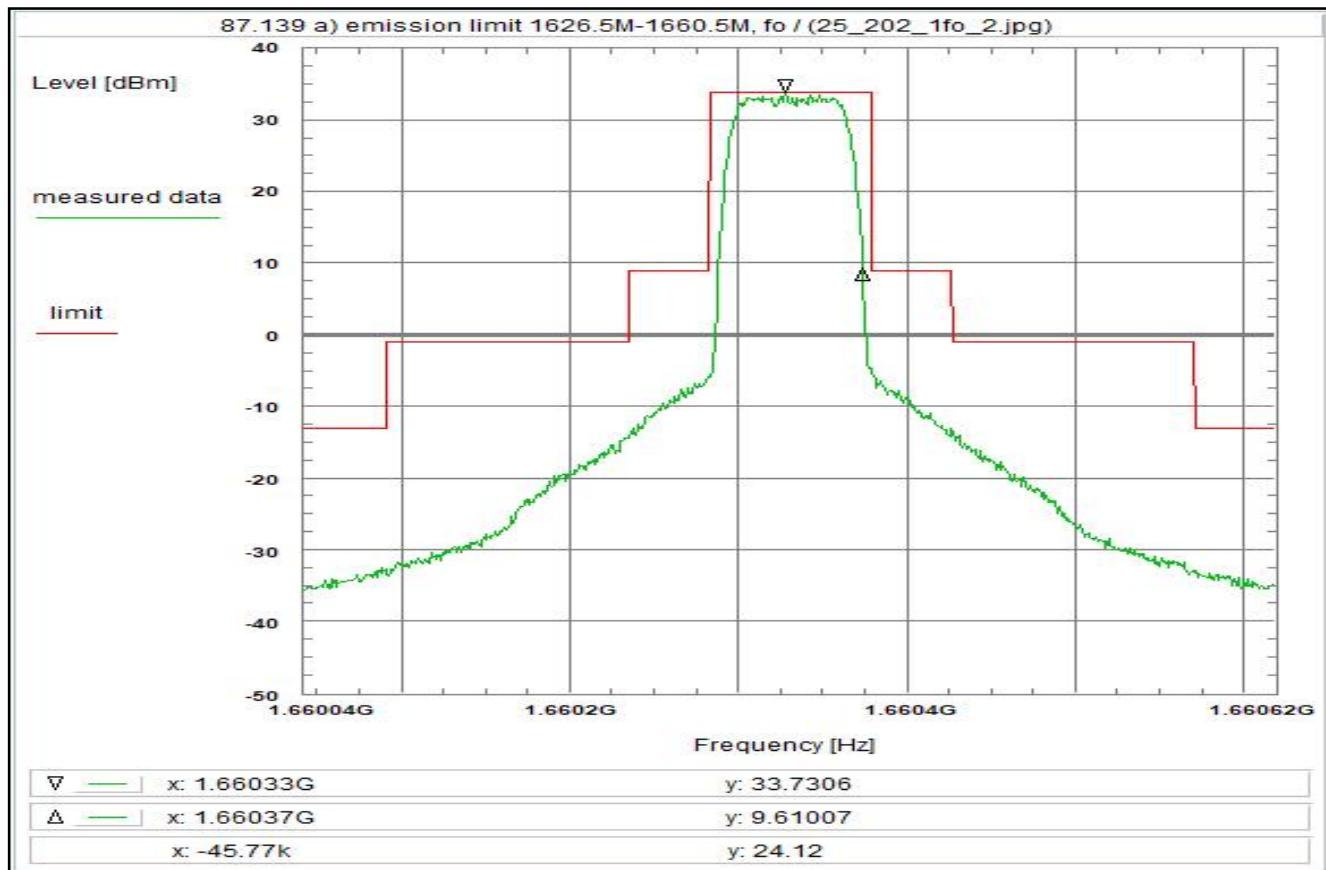
Environment condition:
 Date & Time: Tue 13/Oct/2020 13:50:48
 Location: CTC advanced GmbH, Laboratory RC-SYS
 Temperature: 22 °C
 Humidity: 55 %
 Voltage: 24 Vdc

Setup of measurement equipment:
 Start frequency: 1.660186 GHz
 Stop frequency: 1.660474 GHz
 Center frequency: 1.66033 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 + 11.3 dBi
 Test antenna + 0.0 dB
 BW correction factor (3k > 4k) + 1.2 dB
 Atten. between HPA and feedhorn - 0.0 dB
 Attenuation 10 + 20 dB (U316) + 29.3 dB
 Combined RF + 3.0 dB
 TOTAL CORRECTION: + 45.7 dB

Remarks:
 Carrier-on state / Carrier at the upper edge of the band (f_o)

Plot No. 49



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
 Emission limitations
 Modulated f-carrier at the upper edge of the band (f_h)

Limit:
 Limit according to 25.202 f):
 50-100% of assigned bw: -25dBc/4kHz
 100-250% of assigned bw: -35dBc/4kHz
 > 250% of assigned bw: -43+10log(P_{max})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 5.2
 signal type: R5T2X-1B/R5T2Q-1B

Test setup:
 see test report chapter 7.2: setup 1.1hgj

Test equipment:
 see test report chapter 7.2: C220, R001, U316

Remark:

Test result: Test passed

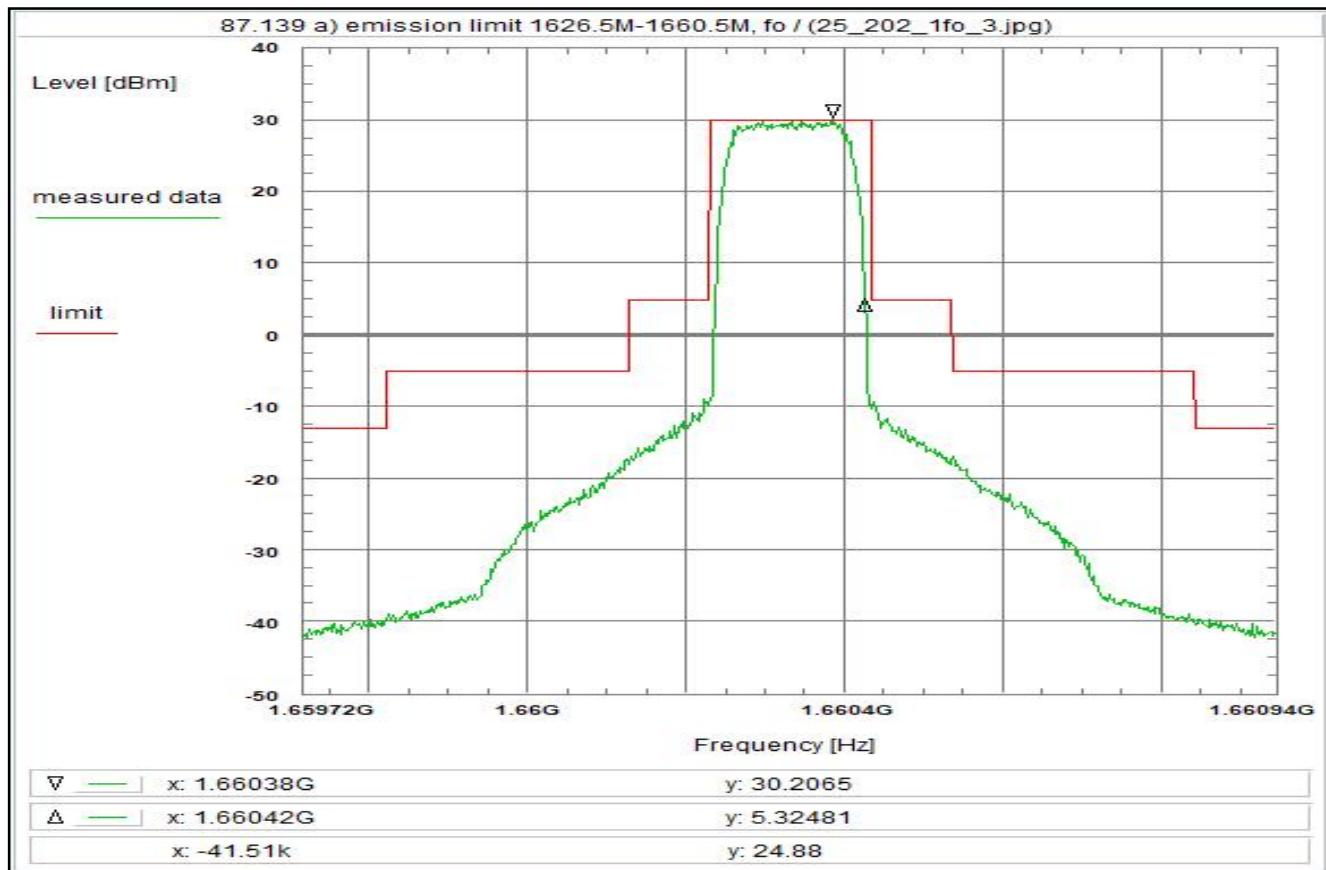
Environment condition:
 Date & Time: Tue 13/Oct/2020 13:52:54
 Location: CTC advanced GmbH, Laboratory RC-SYS
 Temperature: 22 °C
 Humidity: 55 %
 Voltage: 24 Vdc

Setup of measurement equipment:
 Start frequency: 1.660042 GHz
 Stop frequency: 1.660618 GHz
 Center frequency: 1.66033 GHz
 Frequency span: 576 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 + 11.3 dBi
 Test antenna + 0.0 dB
 BW correction factor (3k > 4k) + 1.2 dB
 Atten. between HPA and feedhorn - 0.0 dB
 Attenuation 10 + 20 dB (U316) + 29.3 dB
 Combined RF + 3.0 dB
 TOTAL CORRECTION: + 45.7 dB

Remarks:
 Carrier-on state / Carrier at the upper edge of the band (f_o)

Plot No. 50



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
 Modulated f-carrier at the upper edge of the band (f_h)

Limit:Limit according to 25.202 f):

50-100% of assigned bw: -25dBc/4kHz
 100-250% of assigned bw: -35dBc/4kHz
 > 250% of assigned bw: $-43 + 10\log(P_{max})\text{dBc}/4\text{kHz} = -43 \text{ dBW}$
 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 5.2
 signal type: R5T4.5X-1B/R5T4.5Q-2BTest setup:

see test report chapter 7.2: setup 1.hgj

Test equipment:

see test report chapter 7.2: C220, R001, U316

Remark:

Test result: Test passedEnvironment condition:

Date & Time: Tue 13/Oct/2020 13:57:04
 Location: CTC advanced GmbH, Laboratory RC-SYS
 Temperature: 22 °C
 Humidity: 55 %
 Voltage: 24 Vdc

Setup of measurement equipment:

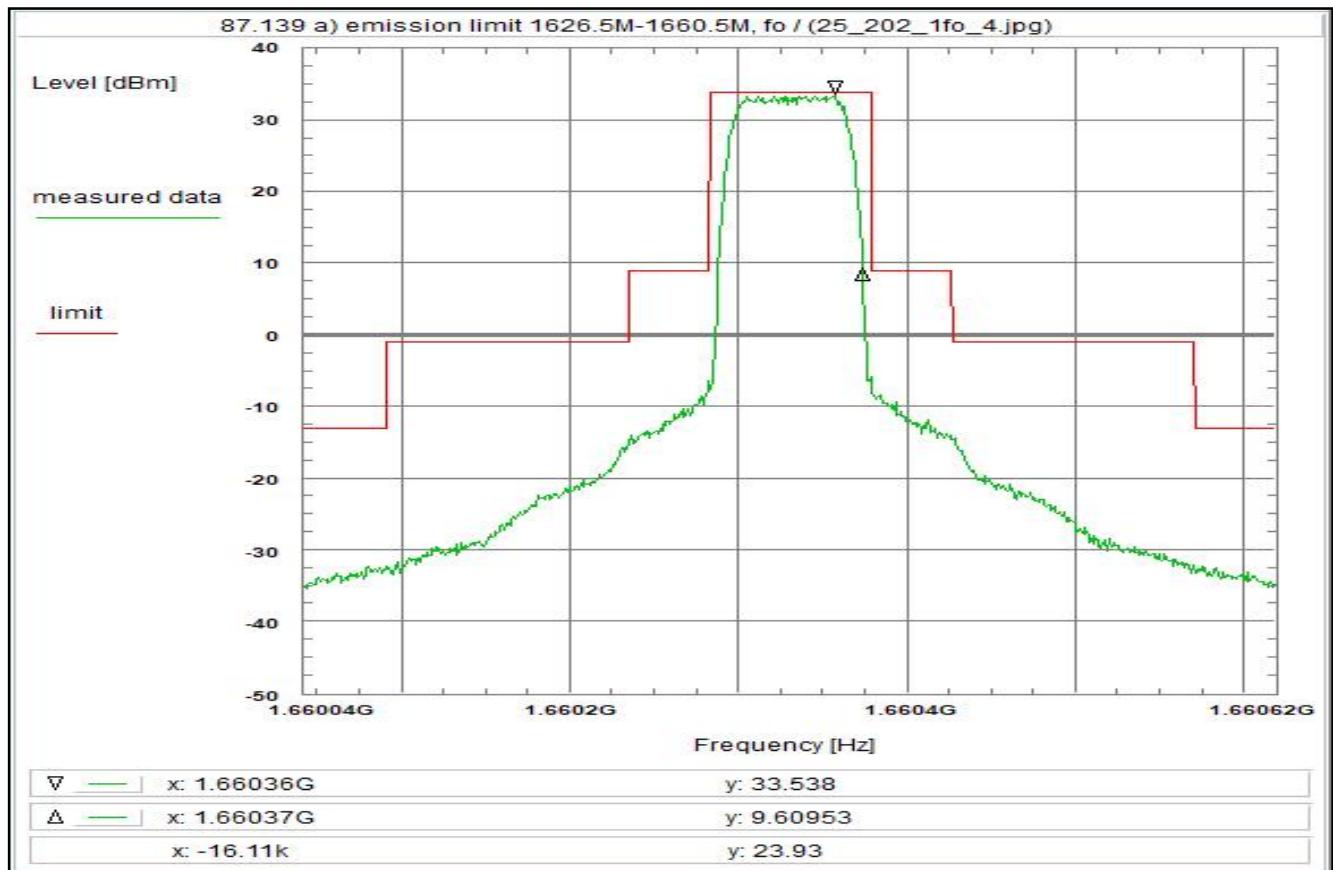
Start frequency: 1.659718 GHz
 Stop frequency: 1.660942 GHz
 Center frequency: 1.66033 GHz
 Frequency span: 1.224 MHz
 Resolution-BW: 3 kHz
 Video-BW: 10 kHz
 Input attenuation: 20 dB
 Trace-Mode: Clear Write
 Detector-Mode: AVG

Correction:

| | |
|---------------------------------|------------|
| Directional coupler | + 0.0 dB |
| Coaxial cable (C220) | + 0.9 dB |
| DUT-Antenna | + 11.3 dBi |
| Test antenna | + 0.0 dB |
| BW correction factor (3k > 4k) | + 1.2 dB |
| Atten. between HPA and feedhorn | - 0.0 dB |
| Attenuation 10 + 20 dB (U316) | + 29.3 dB |
| Combined RF | + 3.0 dB |
| TOTAL CORRECTION: | + 45.7 dB |

Remarks:Carrier-on state / Carrier at the upper edge of the band (f_o)

Plot No. 51



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
 Modulated f-carrier at the upper edge of the band (f_h)

Limit:
Limit according to 25.202 f):
 50-100% of assigned bw: -25dBc/4kHz
 100-250% of assigned bw: -35dBc/4kHz
 > 250% of assigned bw: -43+10log(P_{max})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 5.2
 signal type: R5T2Q-1B/R20T2Q-1B

Test setup:
 see test report chapter 7.2: setup 1.1hgj

Test equipment:
 see test report chapter 7.2: C220, R001, U316

Remark:

Test result: Test passed

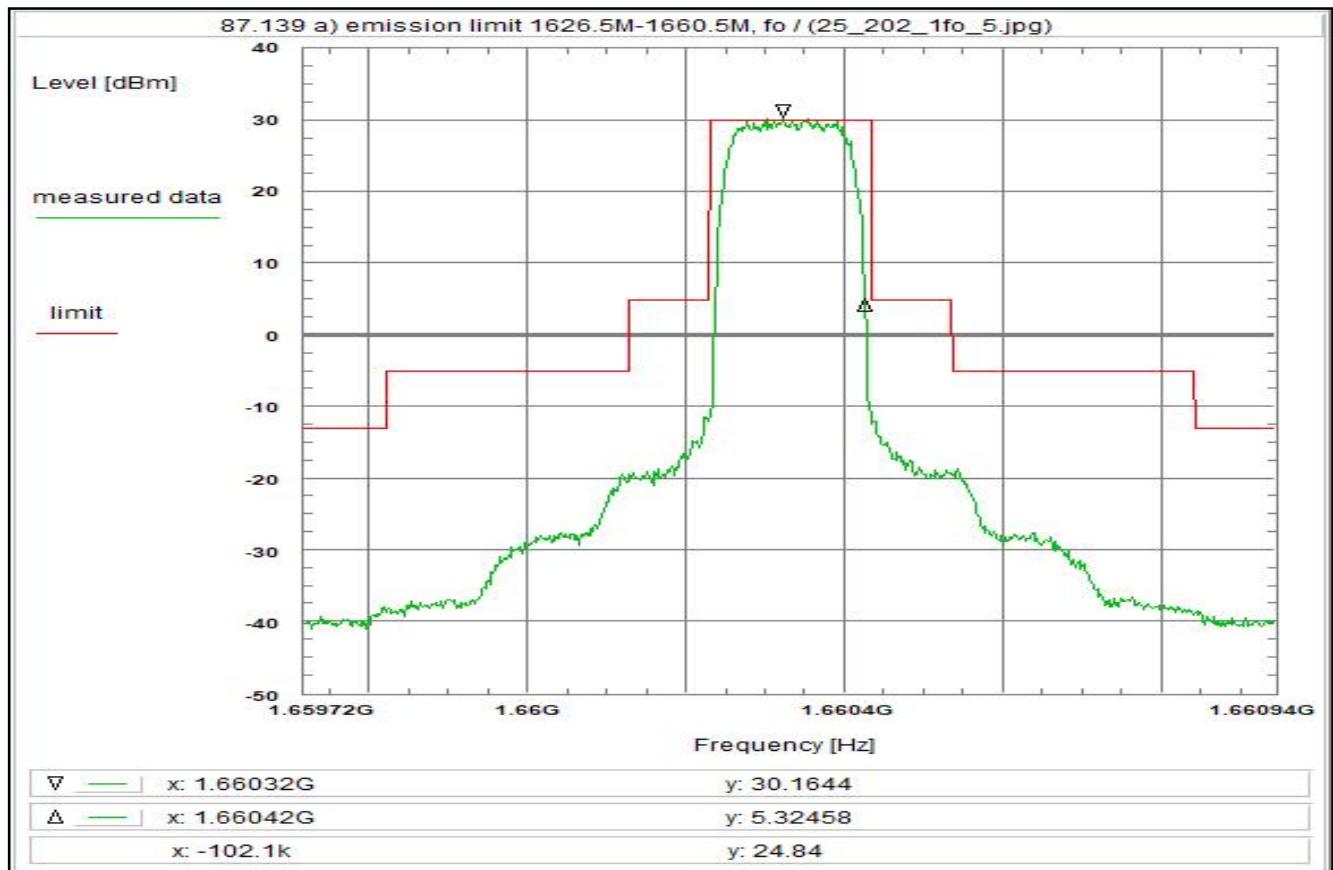
Environment condition:
 Date & Time: Tue 13/Oct/2020 14:00:55
 Location: CTC advanced GmbH, Laboratory RC-SYS
 Temperature: 22 °C
 Humidity: 55 %
 Voltage: 24 Vdc

Setup of measurement equipment:
 Start frequency: 1.660042 GHz
 Stop frequency: 1.660618 GHz
 Center frequency: 1.66033 GHz
 Frequency span: 576 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 + 11.3 dBi
 Test antenna + 0.0 dB
 BW correction factor (3k > 4k) + 1.2 dB
 Atten. between HPA and feedhorn - 0.0 dB
 Attenuation 10 + 20 dB (U316) + 29.3 dB
 Combined RF + 3.0 dB
 TOTAL CORRECTION: + 45.7 dB

Remarks:
 Carrier-on state / Carrier at the upper edge of the band (f_o)

Plot No. 52



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
 Emission limitations
 Modulated f-carrier at the upper edge of the band (f_h)

Limit:
 Limit according to 25.202 f):
 50-100% of assigned bw: -25dBc/4kHz
 100-250% of assigned bw: -35dBc/4kHz
 > 250% of assigned bw: -43+10log(P_{max})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 5.2
 signal type: R5T4.5Q-1B/R20T4.5Q-1B

Test setup:
 see test report chapter 7.2: setup 1.hgj

Test equipment:
 see test report chapter 7.2: C220, R001, U316

Remark:

Test result: Test passed

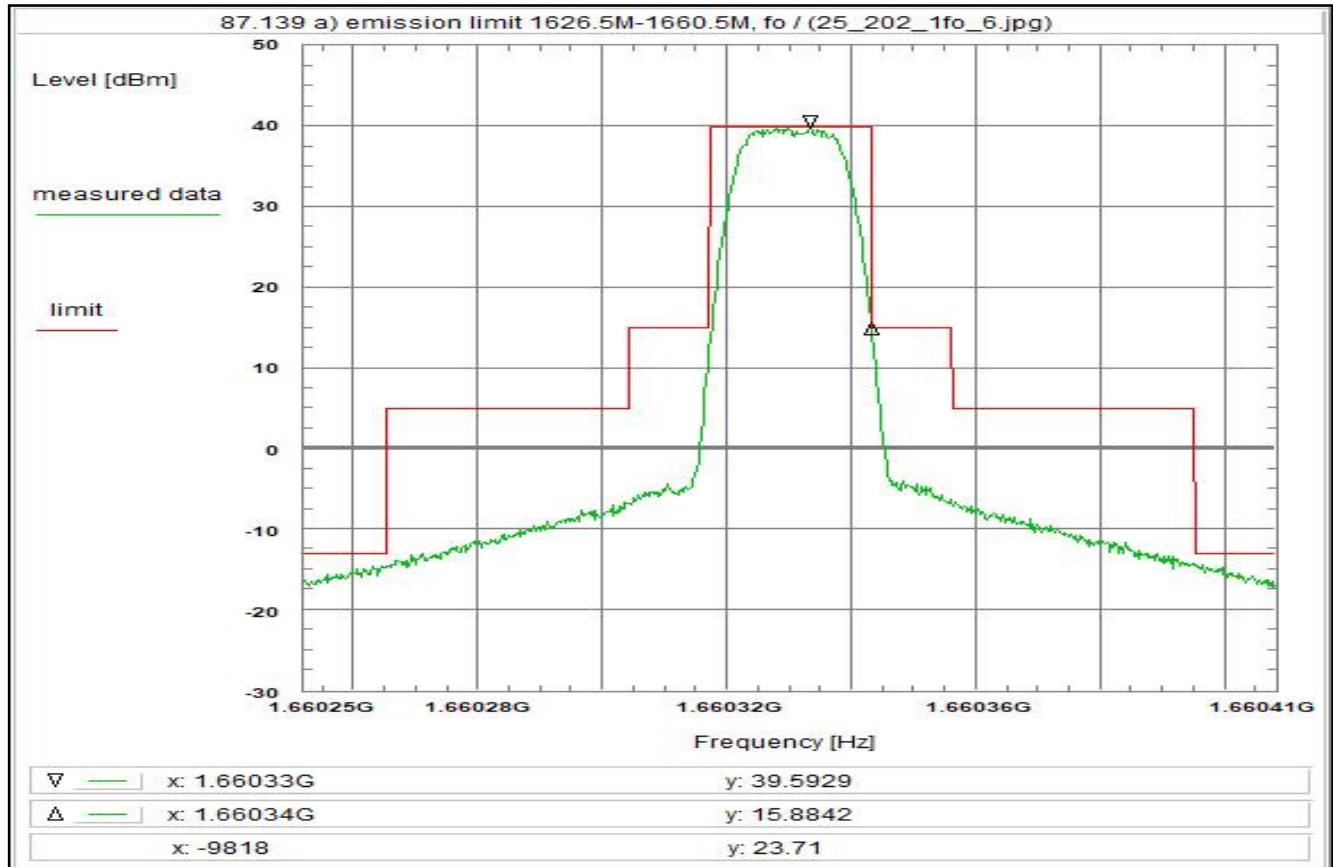
Environment condition:
 Date & Time: Tue 13/Oct/2020 14:05:19
 Location: CTC advanced GmbH, Laboratory RC-SYS
 Temperature: 22 °C
 Humidity: 55 %
 Voltage: 24 Vdc

Setup of measurement equipment:
 Start frequency: 1.659718 GHz
 Stop frequency: 1.660942 GHz
 Center frequency: 1.66033 GHz
 Frequency span: 1.224 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 + 11.3 dBi
 Test antenna + 0.0 dB
 BW correction factor (3k > 4k) + 1.2 dB
 Atten. between HPA and feedhorn - 0.0 dB
 Attenuation 10 + 20 dB (U316) + 29.3 dB
 Combined RF + 3.0 dB
 TOTAL CORRECTION: + 45.7 dB

Remarks:
 Carrier-on state / Carrier at the upper edge of the band (f_o)

Plot No. 53



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
 Modulated f-carrier at the upper edge of the band (f_h)

Limit:
Limit according to 25.202 f):
 50-100% of assigned bw: -25dBc/4kHz
 100-250% of assigned bw: -35dBc/4kHz
 > 250% of assigned bw: -43+10log(P_{max})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 5.2
 signal type: R20T0.5Q-1B

Test setup:
 see test report chapter 7.2: setup 1.1hgj

Test equipment:
 see test report chapter 7.2: C220, R001, U316

Remark:

Test result: Test passed

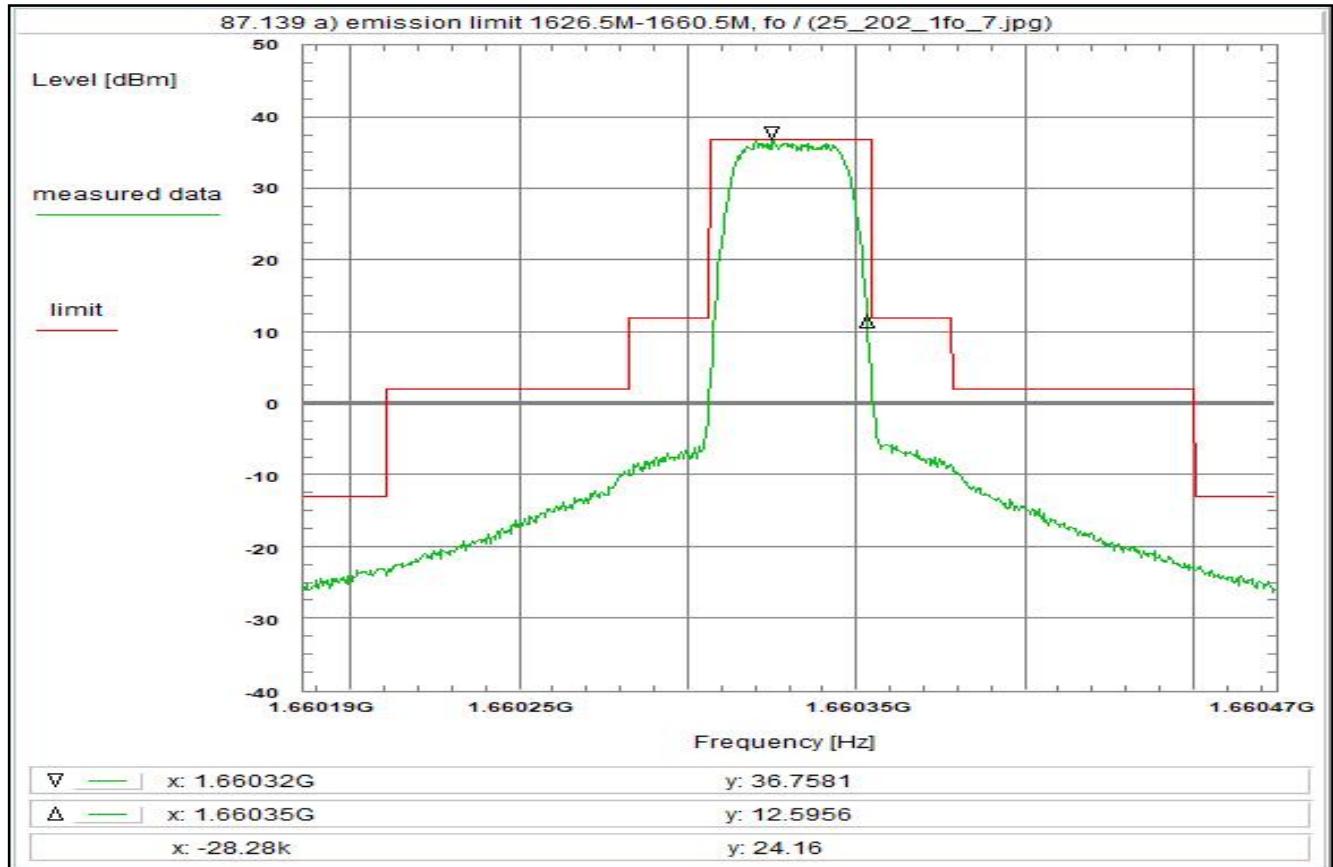
Environment condition:
 Date & Time: Tue 13/Oct/2020 14:08:43
 Location: CTC advanced GmbH, Laboratory RC-SYS
 Temperature: 22 °C
 Humidity: 55 %
 Voltage: 24 Vdc

Setup of measurement equipment:
 Start frequency: 1.660252 GHz
 Stop frequency: 1.660408 GHz
 Center frequency: 1.66033 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 + 11.3 dBi
 Test antenna + 0.0 dB
 BW correction factor (3k > 4k) + 1.2 dB
 Atten. between HPA and feedhorn - 0.0 dB
 Attenuation 10 + 20 dB (U316) + 29.3 dB
 Combined RF + 3.0 dB
 TOTAL CORRECTION: + 45.7 dB

Remarks:
 Carrier-on state / Carrier at the upper edge of the band (f_o)

Plot No. 54



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
 Emission limitations
 Modulated f-carrier at the upper edge of the band (f_h)

Limit:
 Limit according to 25.202 f):
 50-100% of assigned bw: -25dBc/4kHz
 100-250% of assigned bw: -35dBc/4kHz
 > 250% of assigned bw: -43+10log(P_{max})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 5.2
 signal type: R20T1Q-1B

Test setup:
 see test report chapter 7.2: setup 1.1hgj

Test equipment:
 see test report chapter 7.2: C220, R001, U316

Remark:

Test result: Test passed

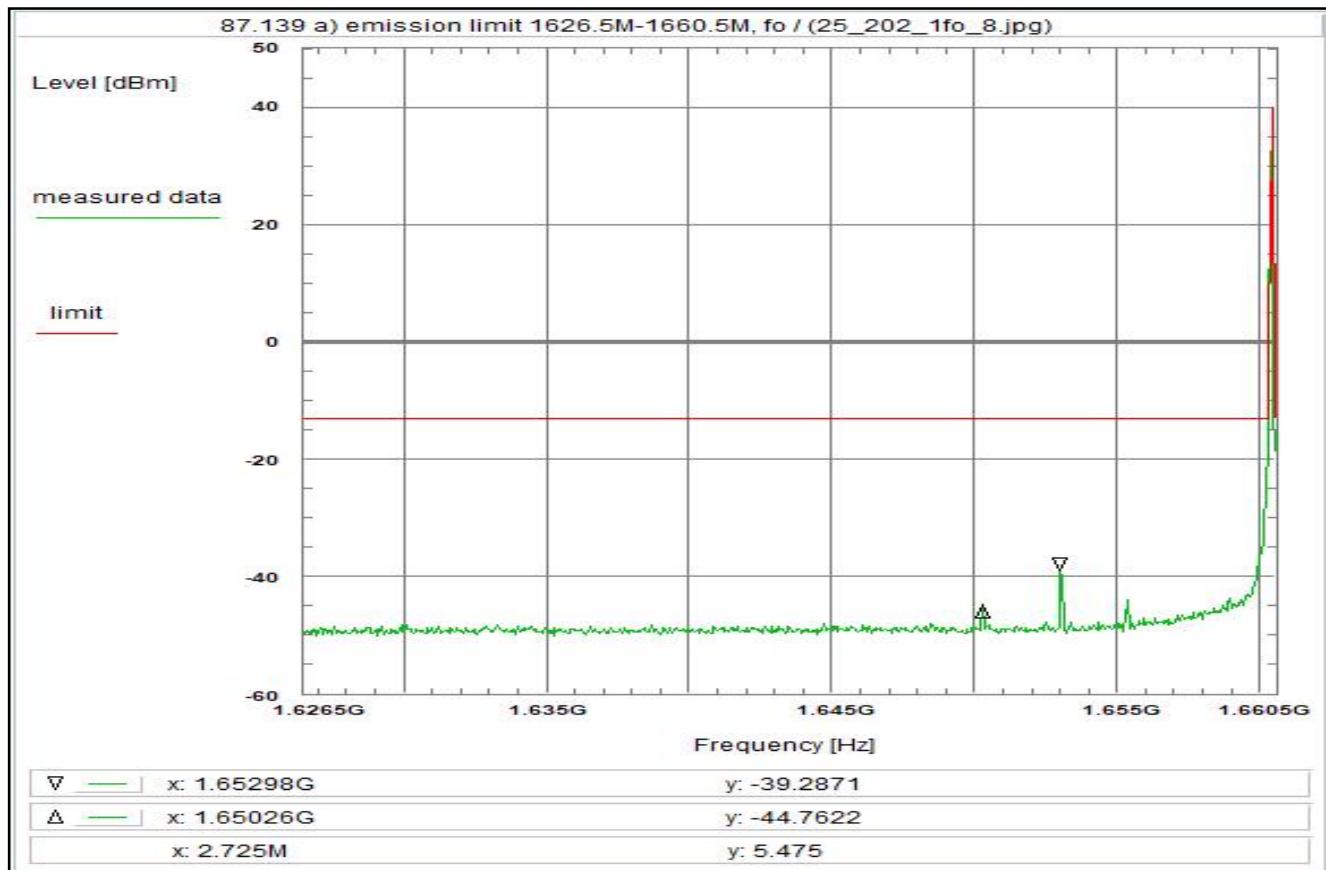
Environment condition:
 Date & Time: Tue 13/Oct/2020 14:10:40
 Location: CTC advanced GmbH, Laboratory RC-SYS
 Temperature: 22 °C
 Humidity: 55 %
 Voltage: 24 Vdc

Setup of measurement equipment:
 Start frequency: 1.660186 GHz
 Stop frequency: 1.660474 GHz
 Center frequency: 1.66033 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 + 11.3 dBi
 Test antenna + 0.0 dB
 BW correction factor (3k > 4k) + 1.2 dB
 Atten. between HPA and feedhorn - 0.0 dB
 Attenuation 10 + 20 dB (U316) + 29.3 dB
 Combined RF + 3.0 dB
 TOTAL CORRECTION: + 45.7 dB

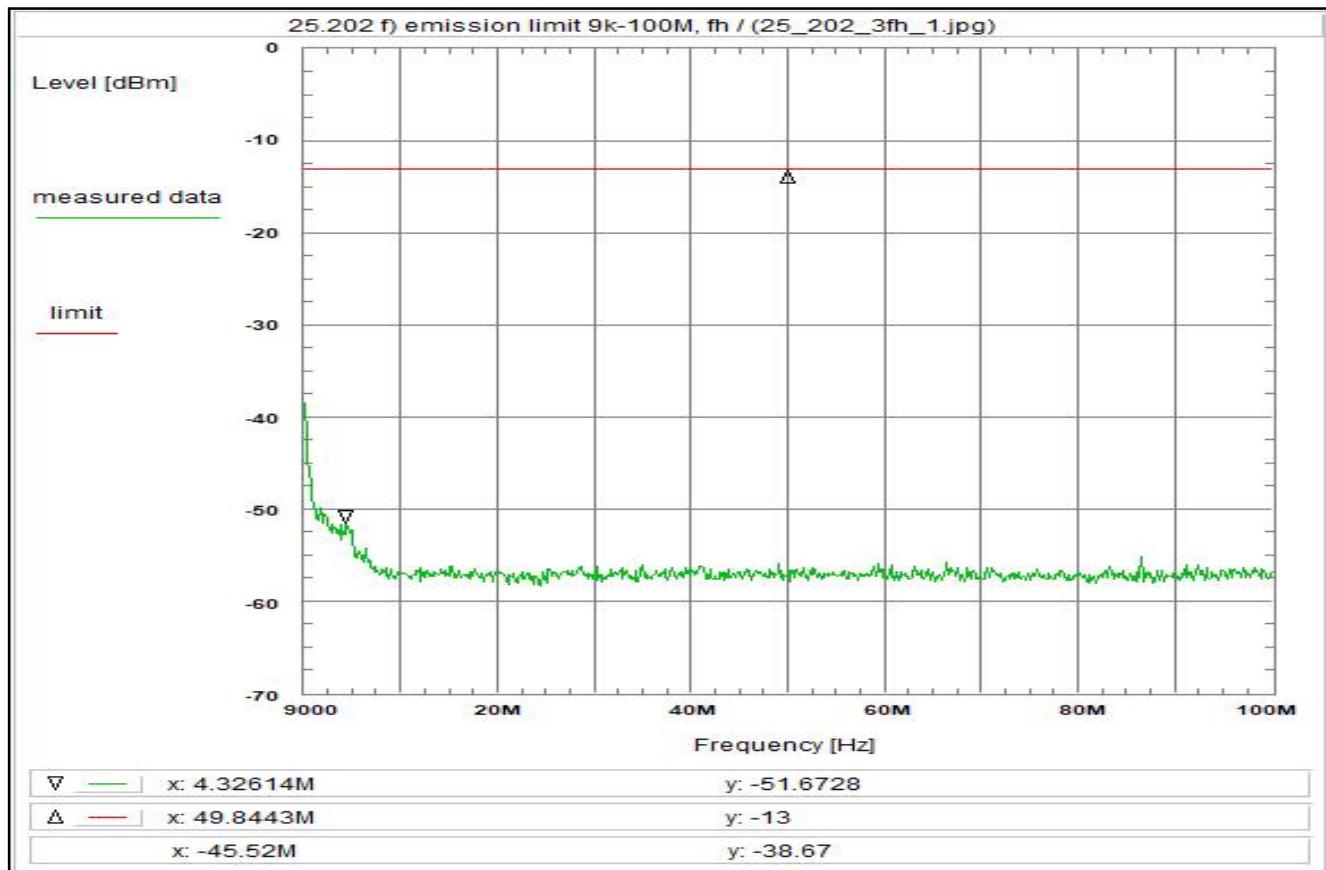
Remarks:
 Carrier-on state / Carrier at the upper edge of the band (f_o)

Plot No. 55



| | | | | | | | | | | | | | | | | | | | |
|---|---|---------------------|----------|----------------------|----------|-------------|------------|--------------|----------|--------------------------------|----------|---------------------------------|----------|-------------------------------|-----------|-------------|----------|-------------------|-----------|
| <p><u>Subclause:</u> 25.202 f) Frequencies, frequency tolerance and emission limitations</p> <p>Emission limitations</p> <p>Modulated f-carrier at the upper edge of the band (f_h)</p> <p><u>Limit:</u></p> <p>Limit according to 25.202 f):</p> <p>50-100% of assigned bw: -25dBc/4kHz</p> <p>100-250% of assigned bw: -35dBc/4kHz</p> <p>> 250% of assigned bw: -43+10log(P_{max})dBc/4kHz = -43 dBW</p> <p>The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule.</p> <p><u>Test results:</u> see plot (an explicit table was not generated)</p> <p><u>Operating condition of DUT:</u> operating condition 1, see test report chapter 5.2 signal type: max. hold of all</p> <p><u>Test setup:</u> see test report chapter 7.2: setup 1.1hgj</p> <p><u>Test equipment:</u> see test report chapter 7.2: C220, R001, U316</p> <p>Remark:</p> <p>Test result: Test passed</p> | <p><u>Environment condition:</u></p> <p>Date & Time: Tue 13/Oct/2020 14:22:01</p> <p>Location: CTC advanced GmbH, Laboratory RC-SYS</p> <p>Temperature: 22 °C</p> <p>Humidity: 55 %</p> <p>Voltage: 24 Vdc</p> <p><u>Setup of measurement equipment:</u></p> <p>Start frequency: 1.6265 GHz</p> <p>Stop frequency: 1.6605 GHz</p> <p>Center frequency: 1.6435 GHz</p> <p>Frequency span: 34 MHz</p> <p>Resolution-BW: 3 kHz</p> <p>Video-BW: 10 kHz</p> <p>Input attenuation: 20 dB</p> <p>Trace-Mode: Max-Hold</p> <p>Detector-Mode: AVG</p> <p><u>Correction:</u></p> <table> <tbody> <tr> <td>Directional coupler</td> <td>+ 0.0 dB</td> </tr> <tr> <td>Coaxial cable (C220)</td> <td>+ 0.9 dB</td> </tr> <tr> <td>DUT-Antenna</td> <td>+ 11.3 dBi</td> </tr> <tr> <td>Test antenna</td> <td>+ 0.0 dB</td> </tr> <tr> <td>BW correction factor (3k > 4k)</td> <td>+ 1.2 dB</td> </tr> <tr> <td>Atten. between HPA and feedhorn</td> <td>- 0.0 dB</td> </tr> <tr> <td>Attenuation 10 + 20 dB (U316)</td> <td>+ 29.3 dB</td> </tr> <tr> <td>Combined RF</td> <td>+ 3.0 dB</td> </tr> <tr> <td>TOTAL CORRECTION:</td> <td>+ 45.7 dB</td> </tr> </tbody> </table> <p><u>Remarks:</u> Carrier-on state / Carrier at the upper edge of the band (f_h)</p> | Directional coupler | + 0.0 dB | Coaxial cable (C220) | + 0.9 dB | DUT-Antenna | + 11.3 dBi | Test antenna | + 0.0 dB | BW correction factor (3k > 4k) | + 1.2 dB | Atten. between HPA and feedhorn | - 0.0 dB | Attenuation 10 + 20 dB (U316) | + 29.3 dB | Combined RF | + 3.0 dB | TOTAL CORRECTION: | + 45.7 dB |
| Directional coupler | + 0.0 dB | | | | | | | | | | | | | | | | | | |
| Coaxial cable (C220) | + 0.9 dB | | | | | | | | | | | | | | | | | | |
| DUT-Antenna | + 11.3 dBi | | | | | | | | | | | | | | | | | | |
| Test antenna | + 0.0 dB | | | | | | | | | | | | | | | | | | |
| BW correction factor (3k > 4k) | + 1.2 dB | | | | | | | | | | | | | | | | | | |
| Atten. between HPA and feedhorn | - 0.0 dB | | | | | | | | | | | | | | | | | | |
| Attenuation 10 + 20 dB (U316) | + 29.3 dB | | | | | | | | | | | | | | | | | | |
| Combined RF | + 3.0 dB | | | | | | | | | | | | | | | | | | |
| TOTAL CORRECTION: | + 45.7 dB | | | | | | | | | | | | | | | | | | |

Plot No. 56



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
 Modulated f-carrier at the upper edge of the band (fh)

Limit:
Limit according to 25.202 f):
 50-100% of assigned bw: -25dBc/4kHz
 100-250% of assigned bw: -35dBc/4kHz
 > 250% of assigned bw: $-43 + 10\log(P_{max})\text{dBc}/4\text{kHz} = -43 \text{ dBW}$
 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 5.2
 signal type: max. hold of all

Test setup:
 see test report chapter 7.2: setup 1.1hgj

Test equipment:
 see test report chapter 7.2: C220, R001, U317

Remark:

Test result: Test passed

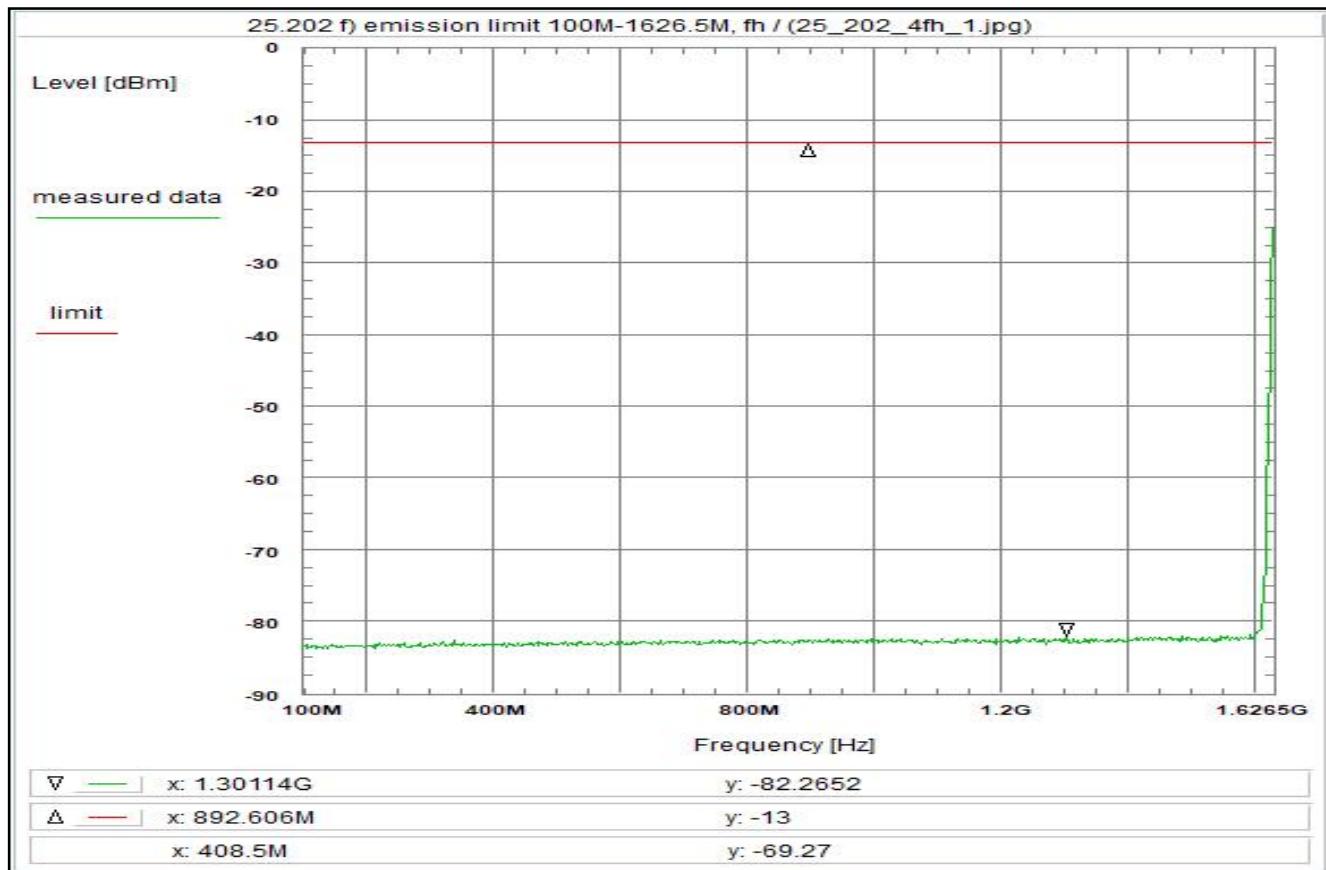
Environment condition:
 Date & Time: Tue 13/Oct/2020 16:41:09
 Location: CTC advanced GmbH, Laboratory RC-SYS
 Temperature: 22 °C
 Humidity: 55 %
 Voltage: 24 Vdc

Setup of measurement equipment:
 Start frequency: 9 kHz
 Stop frequency: 100 MHz
 Center frequency: 50.0045 MHz
 Frequency span: 99.991 MHz
 Resolution-BW: 1 kHz
 Video-BW: 3 kHz
 Input attenuation: 40 dB
 Trace-Mode: Max-Hold
 Detector-Mode: RMS

Correction:
 Directional coupler + 0.0 dB
 Coaxial cable (C220) + 0.2 dB
 DUT-Antenna + 11.3 dBi
 Test antenna + 0.0 dB
 BW correction factor (1k > 4k) + 6.0 dB
 (U317) + 9.6 dB
 TOTAL CORRECTION: + 27.1 dB

Remarks:
 Carrier-on state / Carrier at the upper edge of the band (fh)
 rather left the plot shows the zero response of the analyzer

Plot No. 57



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
 Emission limitations
 Modulated f-carrier at the upper edge of the band (fh)

Limit:
 Limit according to 25.202 f):
 50-100% of assigned bw: -25dBc/4kHz
 100-250% of assigned bw: -35dBc/4kHz
 > 250% of assigned bw: $-43 + 10\log(P_{max})\text{dBc}/4\text{kHz} = -43 \text{ dBW}$
 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 5.2
 signal type: max. hold of all

Test setup:
 see test report chapter 7.2: setup 1.1hgj

Test equipment:
 see test report chapter 7.2: C220, R001, U317

Remark:

Test result: Test passed

Environment condition:
 Date & Time: Tue 13/Oct/2020 17:32:15
 Location: CTC advanced GmbH, Laboratory RC-SYS
 Temperature: 22 °C
 Humidity: 55 %
 Voltage: 24 Vdc

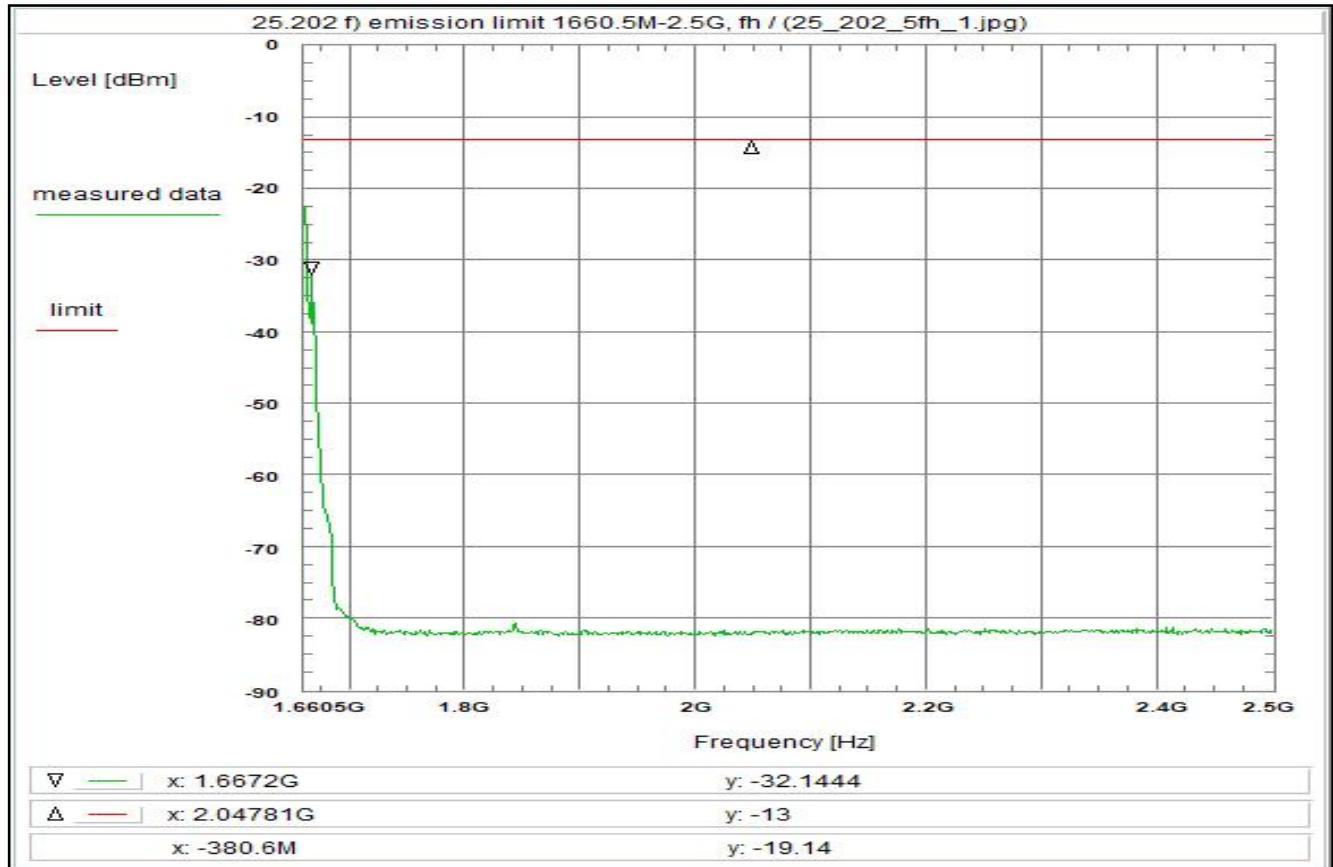
Setup of measurement equipment:
 Start frequency: 100 MHz
 Stop frequency: 1.6265 GHz
 Center frequency: 863.25 MHz
 Frequency span: 1.5265 GHz
 Resolution-BW: 10 kHz
 Video-BW: 30 kHz
 Input attenuation: 0 dB
 Trace-Mode: Max-Hold
 Detector-Mode: RMS

Correction:
 Directional coupler + 0.0 dB
 Coaxial cable (C220) + 0.6 dB
 DUT-Antenna (on-axis) + 11.3 dBi
 Test antenna + 0.0 dB
 BW correction factor (10k -> 4k) - 4.0 dB
 Atten. between HPA and feedhorn (U317) - 0.0 dB
 TOTAL CORRECTION: + 10.2 dB
 + 18.1 dB

Remarks:
 Carrier-on state / Carrier at the upper edge of the band (fh)

rather right the plot shows the correction curve of the band notch filter

Plot No. 58



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
 Modulated f-carrier at the upper edge of the band (fh)

Limit:
Limit according to 25.202 f):
 50-100% of assigned bw: -25dBc/4kHz
 100-250% of assigned bw: -35dBc/4kHz
 > 250% of assigned bw: $-43 + 10\log(P_{max})$ 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 5.2
 signal type: max. hold of all

Test setup:
 see test report chapter 7.2: setup 1.1hgj

Test equipment:
 see test report chapter 7.2: C220, R001, U317

Remark:

Test result: Test passed

Environment condition:
 Date & Time: Tue 13/Oct/2020 17:33:54
 Location: CTC advanced GmbH, Laboratory RC-SYS
 Temperature: 22 °C
 Humidity: 55 %
 Voltage: 24 Vdc

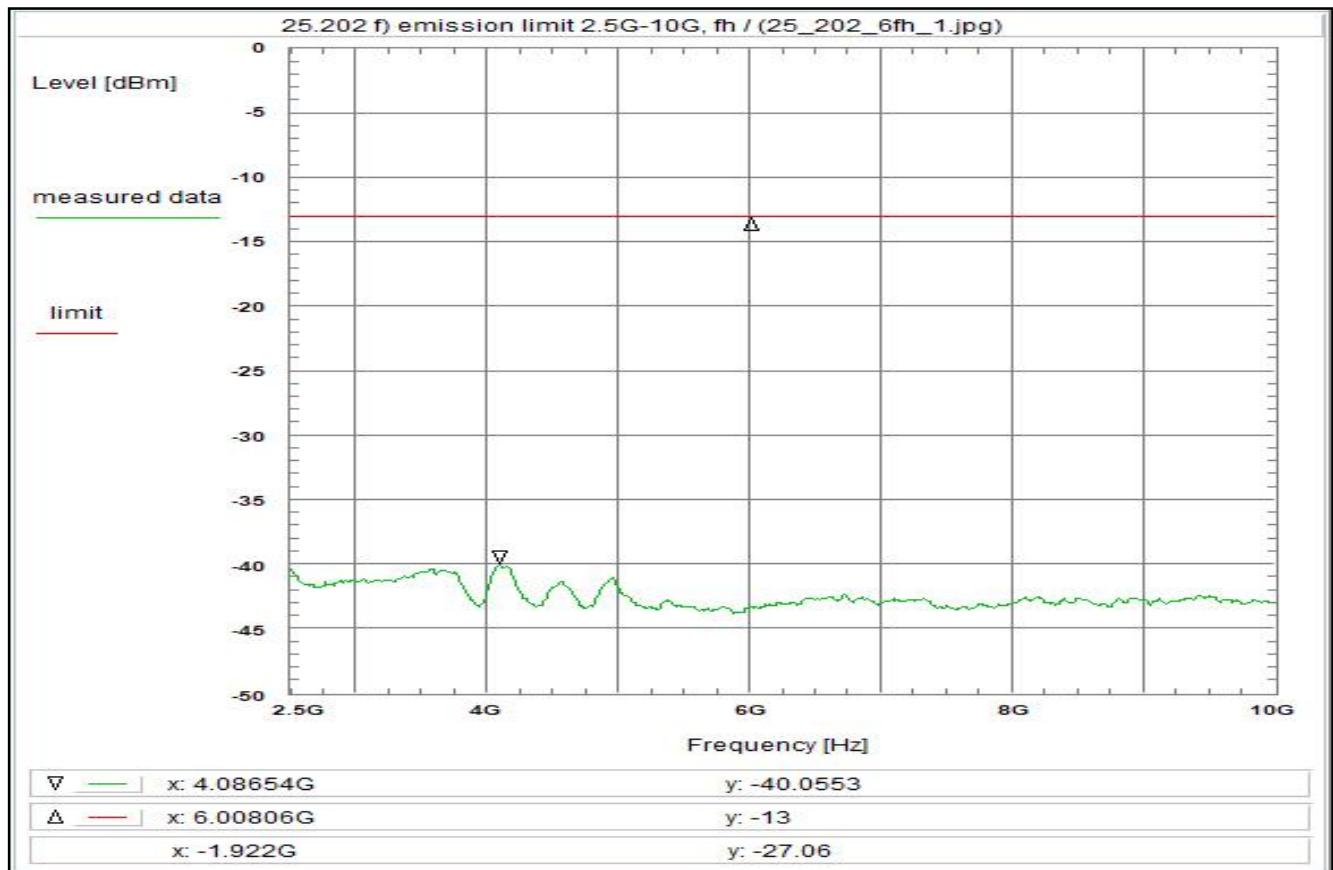
Setup of measurement equipment:
 Start frequency: 1.6605 GHz
 Stop frequency: 2.5 GHz
 Center frequency: 2.08025 GHz
 Frequency span: 839.5 MHz
 Resolution-BW: 10 kHz
 Video-BW: 30 kHz
 Input attenuation: 0 dB
 Trace-Mode: Max-Hold
 Detector-Mode: RMS

Correction:
 Directional coupler + 0.0 dB
 Coaxial cable (C220) + 1.0 dB
 DUT-Antenna (on-axis) + 11.3 dBi
 Test antenna + 0.0 dB
 BW correction factor (10k -> 4k) - 4.0 dB
 Atten. between HPA and feedhorn (U317) - 0.0 dB
 TOTAL CORRECTION: + 10.9 dB
 + 19.2 dB

Remarks:
 Carrier-on state / Carrier at the upper edge of the band (fh)

rather left the plot shows the correction curve of the band notch filter

Plot No. 59



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
 Modulated f-carrier at the upper edge of the band (fh)

Limit:
Limit according to 25.202 f):
 50-100% of assigned bw: -25dBc/4kHz
 100-250% of assigned bw: -35dBc/4kHz
 > 250% of assigned bw: $-43 + 10\log(P_{max})\text{dBc}/4\text{kHz} = -43 \text{ dBW}$
 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 5.2
 signal type: max. hold of all

Test setup:
 see test report chapter 7.2: setup 1.1hgj

Test equipment:
 see test report chapter 7.2: C220, R001, U319

Remark:

Test result: Test passed

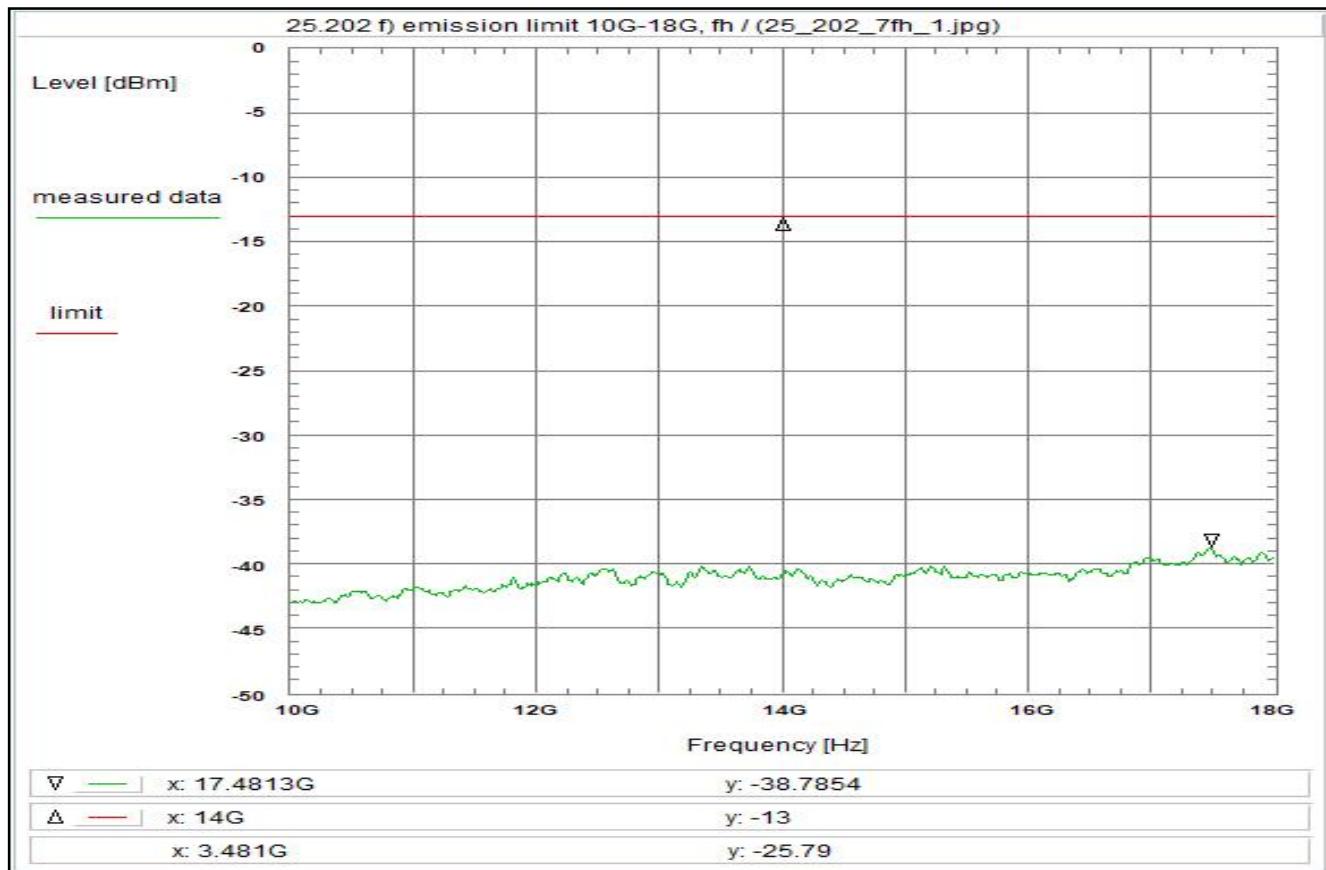
Environment condition:
 Date & Time: Tue 13/Oct/2020 16:21:16
 Location: CTC advanced GmbH, Laboratory RC-SYS
 Temperature: 22 °C
 Humidity: 55 %
 Voltage: 24 Vdc

Setup of measurement equipment:
 Start frequency: 2.5 GHz
 Stop frequency: 10 GHz
 Center frequency: 6.25 GHz
 Frequency span: 7.5 GHz
 Resolution-BW: 100 kHz
 Video-BW: 300 kHz
 Input attenuation: 40 dB
 Trace-Mode: Max-Hold
 Detector-Mode: RMS

Correction:
 Directional coupler + 0.0 dB
 Coaxial cable (C220) + 1.7 dB
 DUT-Antenna + 11.3 dBi
 Test antenna + 0.0 dB
 BW correction factor (100k > 4k) - 14.0 dB
 (U319) + 20.4 dB
 TOTAL CORRECTION: + 19.4 dB

Remarks:
 Carrier-on state / Carrier at the upper edge of the band (fh)

Plot No. 60



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
 Emission limitations
 Modulated f-carrier at the upper edge of the band (fh)

Limit:

Limit according to 25.202 f):
 50-100% of assigned bw: -25dBc/4kHz
 100-250% of assigned bw: -35dBc/4kHz
 > 250% of assigned bw: $-43 + 10\log(P_{max})\text{dBc}/4\text{kHz} = -43 \text{ dBW}$
 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 5.2
 signal type: max. hold of all

Test setup:
 see test report chapter 7.2: setup 1.1hgj

Test equipment:
 see test report chapter 7.2: C220, R001, U319

Remark:

Test result: Test passed

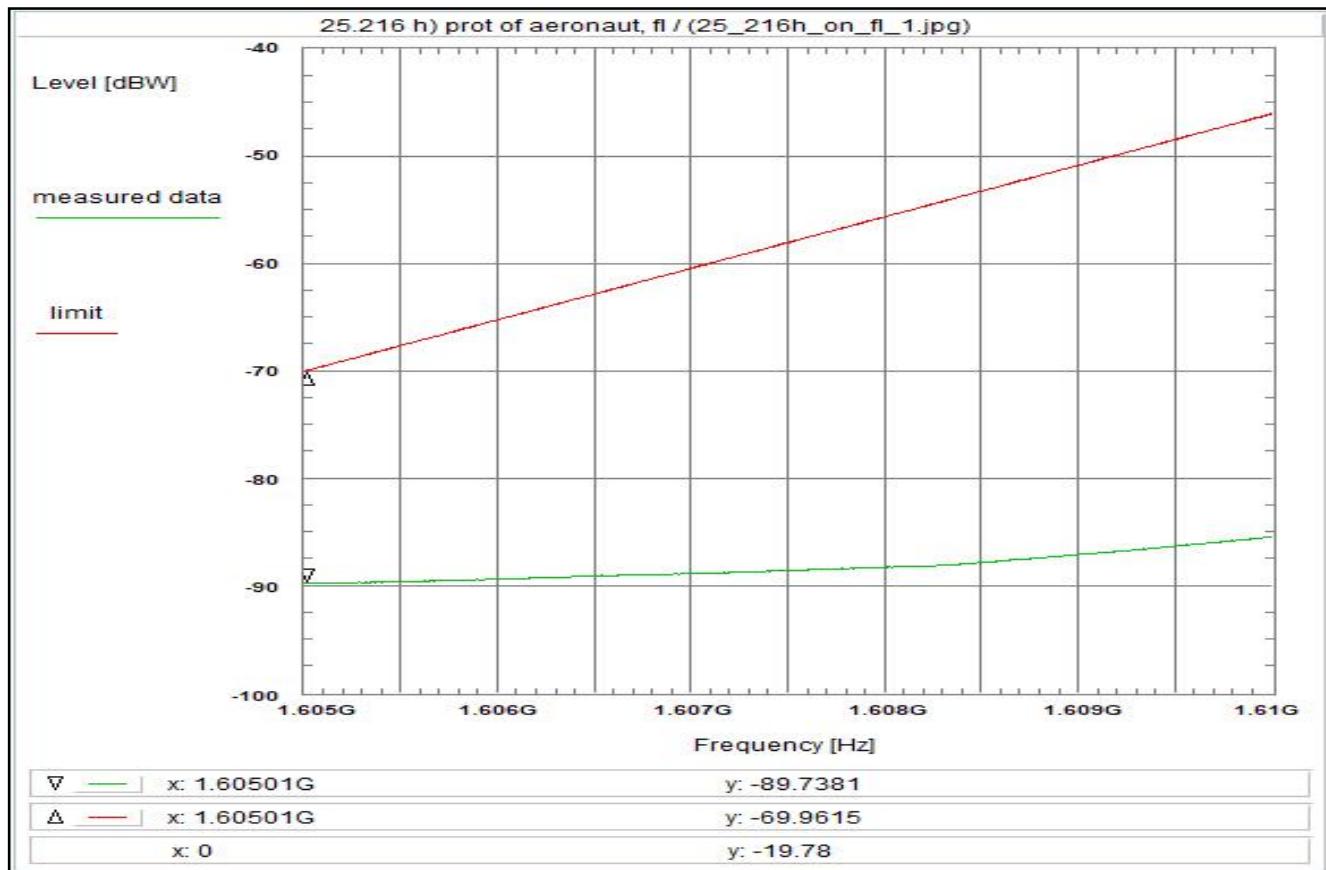
Environment condition:
 Date & Time: Tue 13/Oct/2020 16:22:51
 Location: CTC advanced GmbH, Laboratory RC-SYS
 Temperature: 22 °C
 Humidity: 55 %
 Voltage: 24 Vdc

Setup of measurement equipment:
 Start frequency: 10 GHz
 Stop frequency: 18 GHz
 Center frequency: 14 GHz
 Frequency span: 8 GHz
 Resolution-BW: 100 kHz
 Video-BW: 300 kHz
 Input attenuation: 40 dB
 Trace-Mode: Max-Hold
 Detector-Mode: RMS

Correction:
 Directional coupler + 0.0 dB
 Coaxial cable (C220) + 2.7 dB
 DUT-Antenna + 11.3 dBi
 Test antenna + 0.0 dB
 BW correction factor (100k > 4k) - 14.0 dB
 (U319) + 21.3 dB
 TOTAL CORRECTION: + 21.3 dB

Remarks:
 Carrier-on state / Carrier at the upper edge of the band (fh)

Plot No. 61



Subclause: 25.216 h) Protection of aeronautical radionavigation-satellite service
Carrier-on state, modulated carrier at the lower edge of the band (fl)
Conducted measurement at the antenna-connector

Limit:
Limit according to 25.216 h):
1605.0 - 1610MHz: -70 to -46dBW/1MHz (linear interpolated)
The EIRP, averaged over any two-millisecond active transmission interval from the MESS in the carrier-on state shall not exceed the limits above.

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

Operating condition of DUT:
operating condition 1, see test report chapter 5.2
signal type: max. hold of all

Test setup:
see test report chapter 7.2: setup 1.1hgj

Test equipment:
see test report chapter 7.2: C220, R001, U317

Remark:

Test result: Test passed

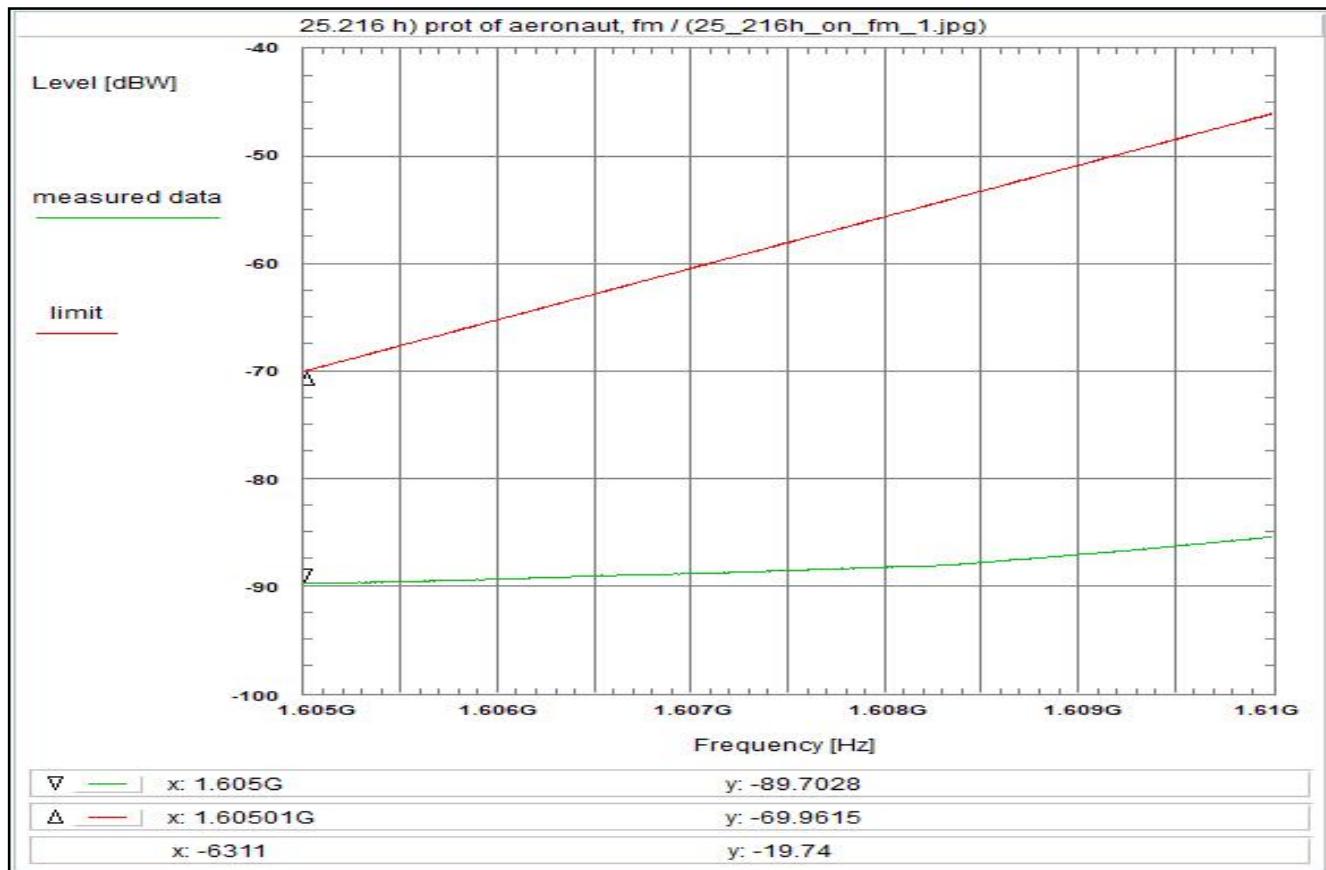
Environment condition:
Date & Time: Tue 13/Oct/2020 17:14:56
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 24 Vdc

Setup of measurement equipment:
Start frequency: 1.605 GHz
Stop frequency: 1.61 GHz
Center frequency: 1.6075 GHz
Frequency span: 5 MHz
Resolution-BW: 1 MHz
Video-BW: 3 MHz
Input attenuation: 0 dB
Trace-Mode: Max-Hold
Detector-Mode: RMS

Correction:
Directional coupler + 0.0 dB
Coaxial cable (C220) + 0.9 dB
DUT-Antenna (on-axis) + 11.3 dBi
Test antenna + 0.0 dB
BW correction factor + 0.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Band Notch Filter + 10 dB Att. (U317) + 10.5 dB
TOTAL CORRECTION: + 22.7 dB

Remarks:
Carrier-on state / Carrier at the lower edge of the band (fl)
Measurement with 1 MHz resolution/video filter and RMS detector.
For EIRP calculation:
'worst-case' = maximum antenna gain

Plot No. 62



Subclause: 25.216 h) Protection of aeronautical radionavigation-satellite service
 Carrier-on state, modulated carrier in the middle of the band (fm)
 Conducted measurement at the antenna-connector

Limit:
 Limit according to 25.216 h):
 1605.0 - 1610MHz: -70 to -46dBW/1MHz (linear interpolated)
 The EIRP, averaged over any two-millisecond active transmission interval from the MESS in the carrier-on state shall not exceed the limits above.

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

Operating condition of DUT:
 operating condition 1, see test report chapter 5.2
 signal type: max. hold of all

Test setup:
 see test report chapter 7.2: setup 1.1hgj

Test equipment:
 see test report chapter 7.2: C220, R001, U317

Remark:

Test result: Test passed

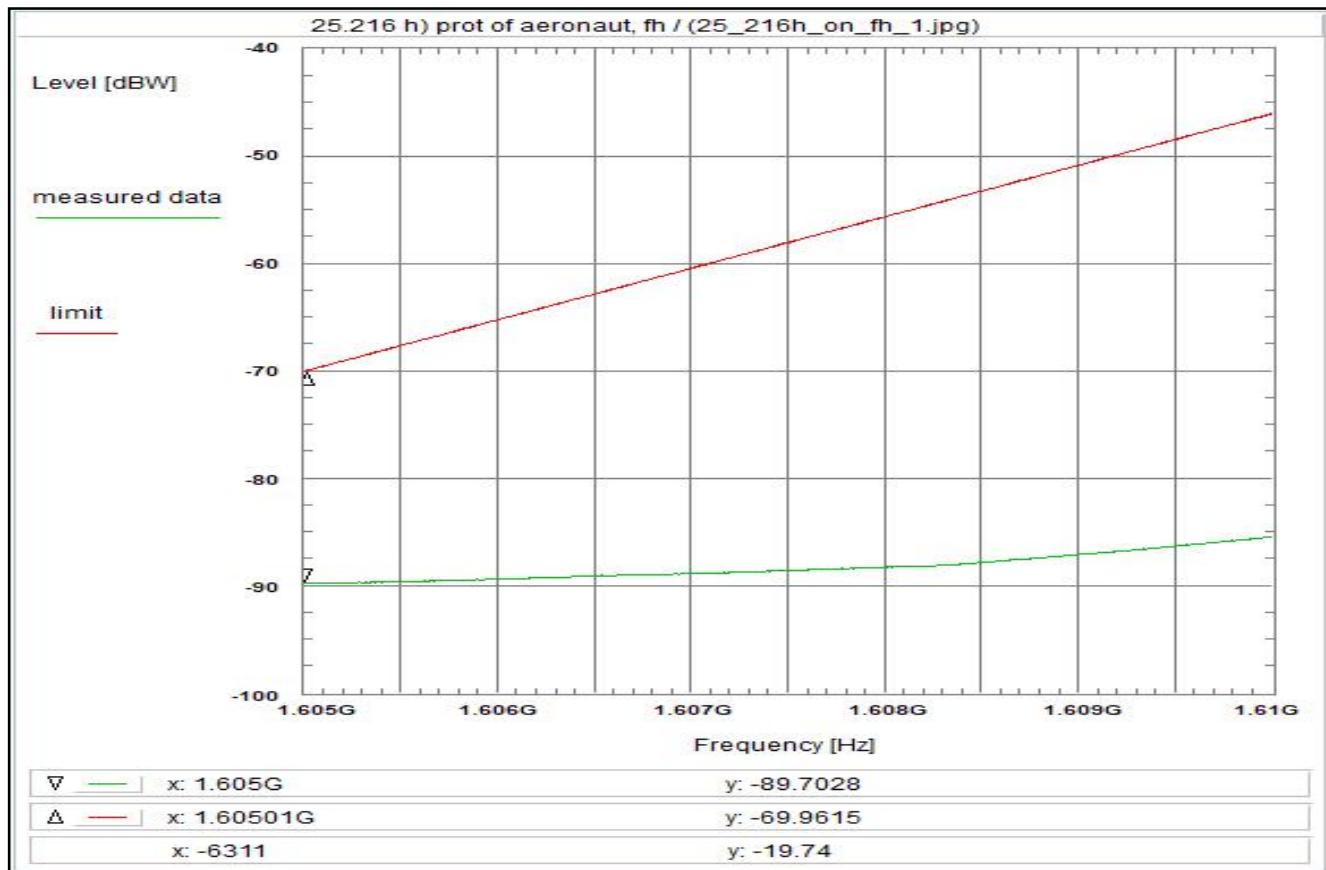
Environment condition:
 Date & Time: Tue 13/Oct/2020 17:15:43
 Location: CTC advanced GmbH, Laboratory RC-SYS
 Temperature: 22 °C
 Humidity: 55 %
 Voltage: 24 Vdc

Setup of measurement equipment:
 Start frequency: 1.605 GHz
 Stop frequency: 1.61 GHz
 Center frequency: 1.6075 GHz
 Frequency span: 5 MHz
 Resolution-BW: 1 MHz
 Video-BW: 3 MHz
 Input attenuation: 0 dB
 Trace-Mode: Max-Hold
 Detector-Mode: RMS

Correction:
 Directional coupler + 0.0 dB
 Coaxial cable (C220) + 0.9 dB
 DUT-Antenna (on-axis) + 11.3 dBi
 Test antenna + 0.0 dB
 BW correction factor + 0.0 dB
 Atten. between HPA and feedhorn + 0.0 dB
 Band Notch Filter + 10 dB Att. (U317) + 10.5 dB
 TOTAL CORRECTION: + 22.7 dB

Remarks:
 Carrier-on state / Carrier in the middle of the band (fm)
 Measurement with 1 MHz resolution/video filter and RMS detector.
For EIRP calculation:
 'worst-case' = maximum antenna gain

Plot No. 63



Subclause: 25.216 h) Protection of aeronautical radionavigation-satellite service
Carrier-on state, modulated carrier at the upper edge of the band (fh)
Conducted measurement at the antenna-connector

Limit:
Limit according to 25.216 h:
1605.0 - 1610MHz: -70 to -46dBW/1MHz (linear interpolated)
The EIRP, averaged over any two-millisecond active transmission interval from the MESS in the carrier-on state shall not exceed the limits above.

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

Operating condition of DUT:
operating condition 1, see test report chapter 5.2
signal type: max. hold of all

Test setup:
see test report chapter 7.2: setup 1.1hgj

Test equipment:
see test report chapter 7.2: C220, R001, U317

Remark:

Test result: Test passed

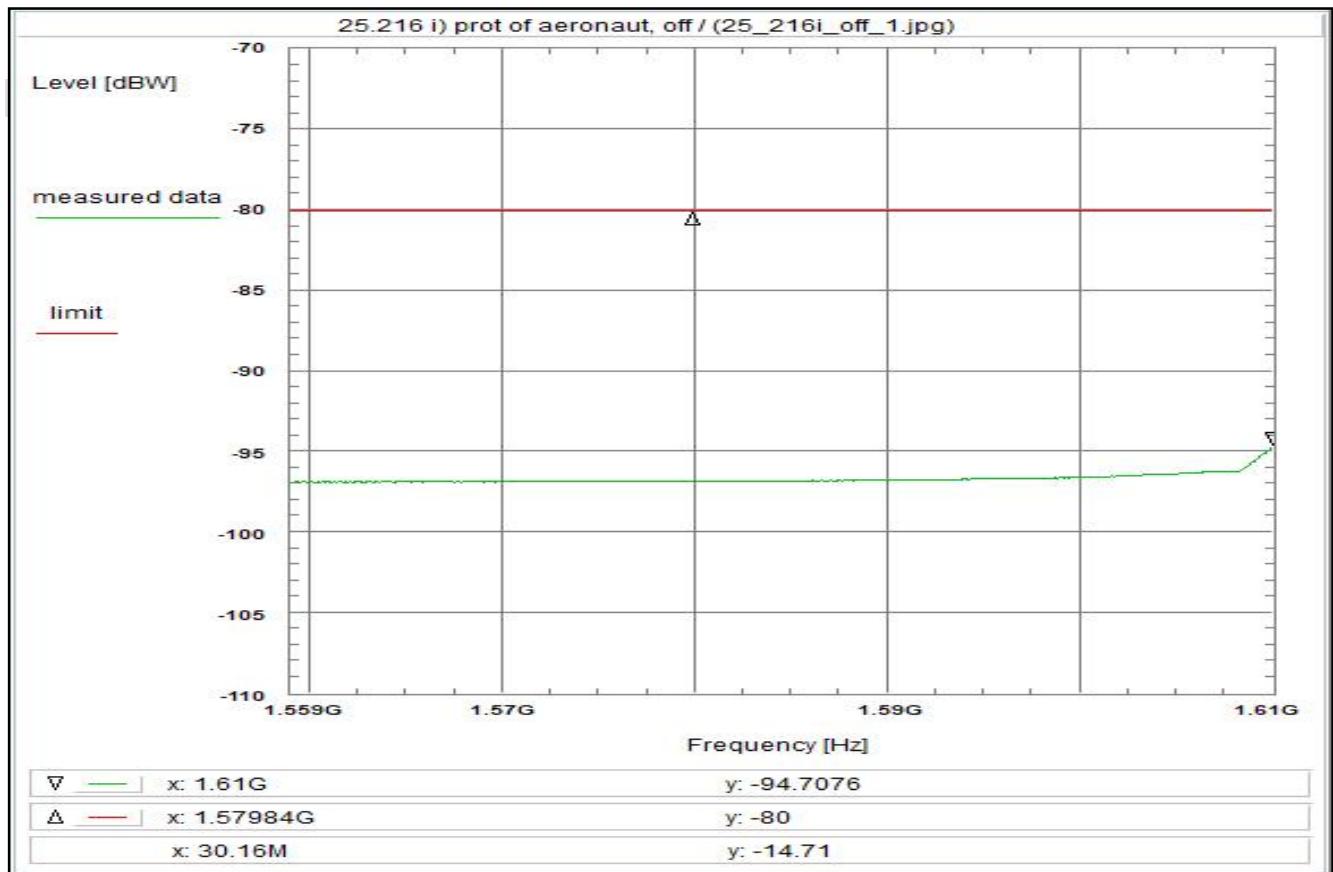
Environment condition:
Date & Time: Tue 13/Oct/2020 17:16:38
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 24 Vdc

Setup of measurement equipment:
Start frequency: 1.605 GHz
Stop frequency: 1.61 GHz
Center frequency: 1.6075 GHz
Frequency span: 5 MHz
Resolution-BW: 1 MHz
Video-BW: 3 MHz
Input attenuation: 0 dB
Trace-Mode: Max-Hold
Detector-Mode: RMS

Correction:
Directional coupler + 0.0 dB
Coaxial cable (C220) + 0.9 dB
DUT-Antenna (on-axis) + 11.3 dBi
Test antenna + 0.0 dB
BW correction factor + 0.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Band Notch Filter + 10 dB Att. (U317) + 10.5 dB
TOTAL CORRECTION: + 22.7 dB

Remarks:
Carrier-on state / Carrier at the upper edge of the band (fh)
Measurement with 1 MHz resolution/video filter and RMS detector.
For EIRP calculation:
'worst-case' = maximum antenna gain

Plot No. 64



Subclause: 25.216 i) Protection of aeronautical radionavigation-satellite service
Carrier-off state, conducted measurement at the antenna-connector

Limit:
Limit according to 25.216 i): -80dBW/1MHz
The EIRP, averaged over any two-millisecond active transmission interval from the MESs in the carrier-off state shall not exceed the limit above.

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

Operating condition of DUT:
operating condition 2, see test report chapter 5.2

Test setup:
see test report chapter 7.2: setup 1.1hgj

Test equipment:
see test report chapter 7.2: C220, R001, U317

Remark:

Test result: Test passed

Environment condition:
Date & Time: Tue 13/Oct/2020 17:17:30
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 24 Vdc

Setup of measurement equipment:
Start frequency: 1.559 GHz
Stop frequency: 1.61 GHz
Center frequency: 1.5845 GHz
Frequency span: 51 MHz
Resolution-BW: 1 MHz
Video-BW: 3 MHz
Input attenuation: 0 dB
Trace-Mode: Max-Hold
Detector-Mode: RMS

Correction:
Directional coupler + 0.0 dB
Coaxial cable (C220) + 0.9 dB
DUT-Antenna (on-axis) + 11.3 dBi
Test antenna + 0.0 dB
BW correction factor + 0.0 dB
Atten. between HPA and feedhorn (U317) + 10.3 dB
TOTAL CORRECTION: + 22.5 dB

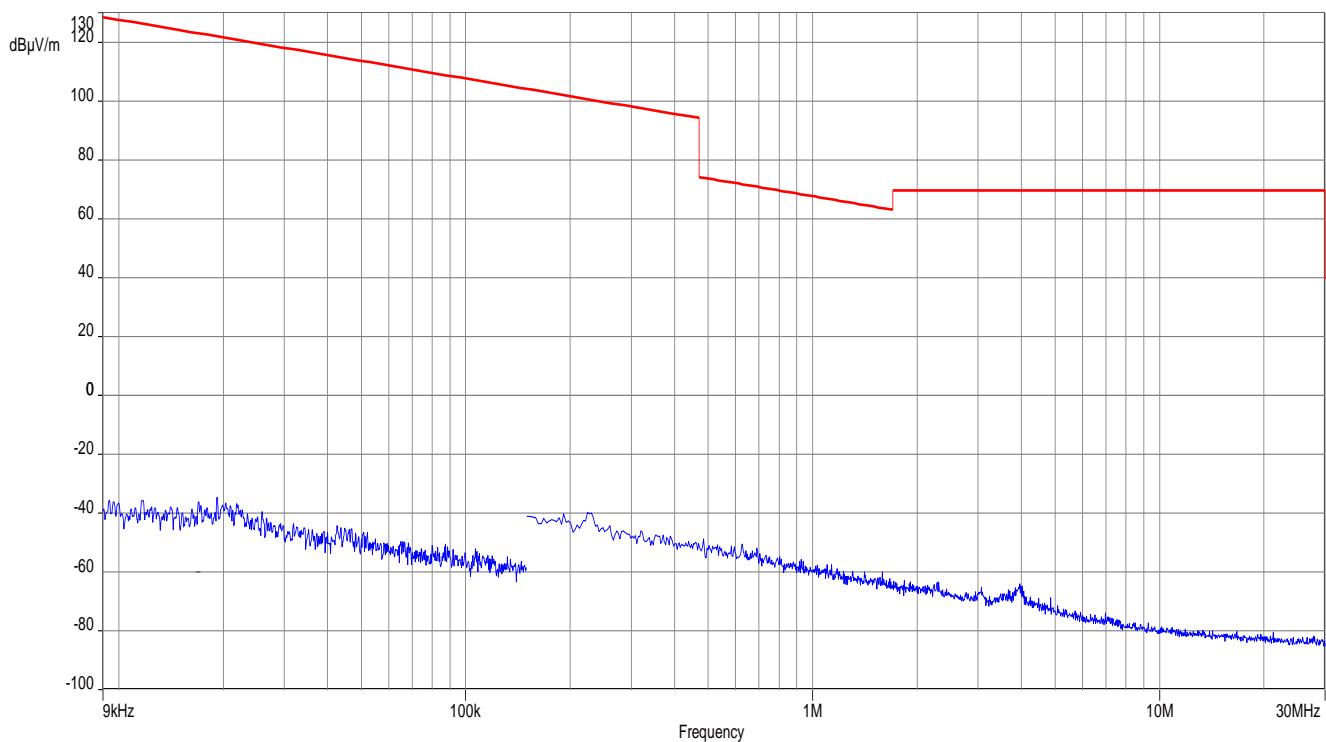
Remarks:
Carrier-off state.
Measurement with 1 MHz resolution filter and RMS detector.
For EIRP calculation:
'worst-case' = maximum antenna gain

3 Radiated spurious emissions

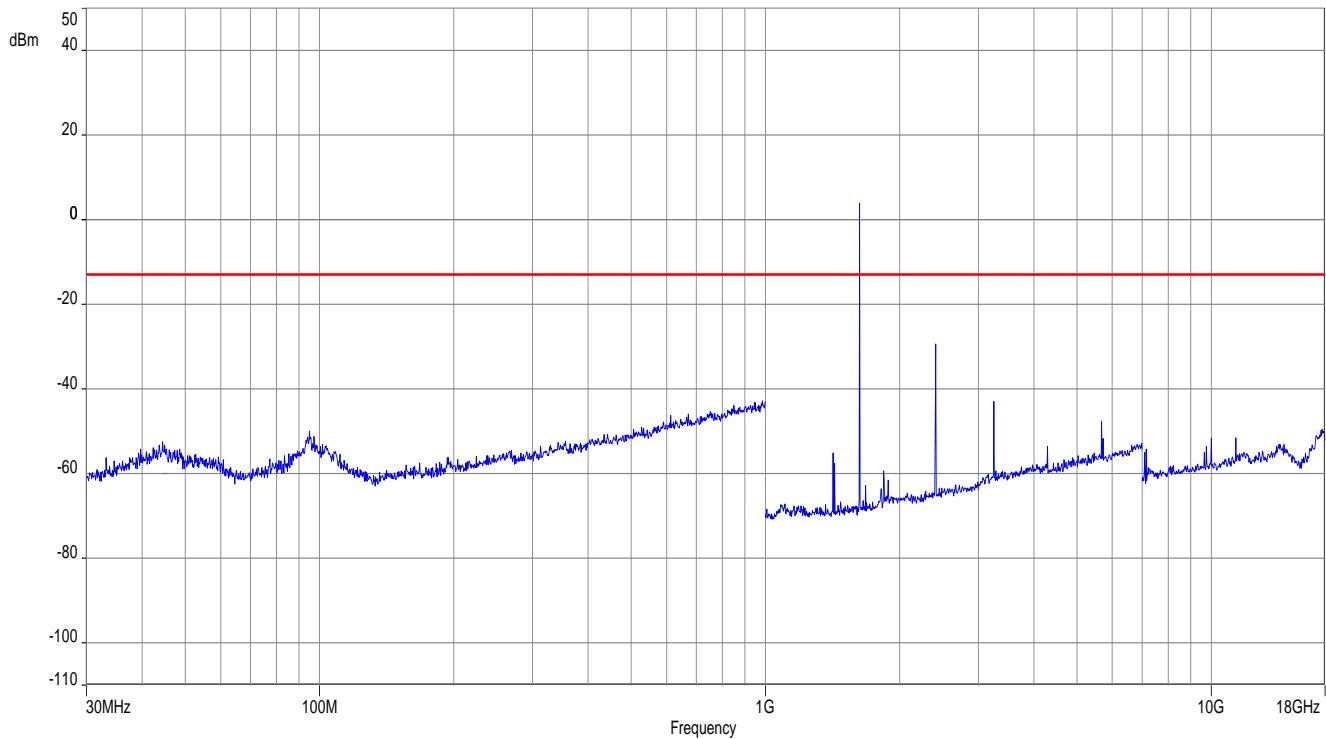
This part consists of 3 pages including this page.

Note: The plots show the intended signals for BGAN at 1.6 GHz and WLAN at 2.4 GHz.

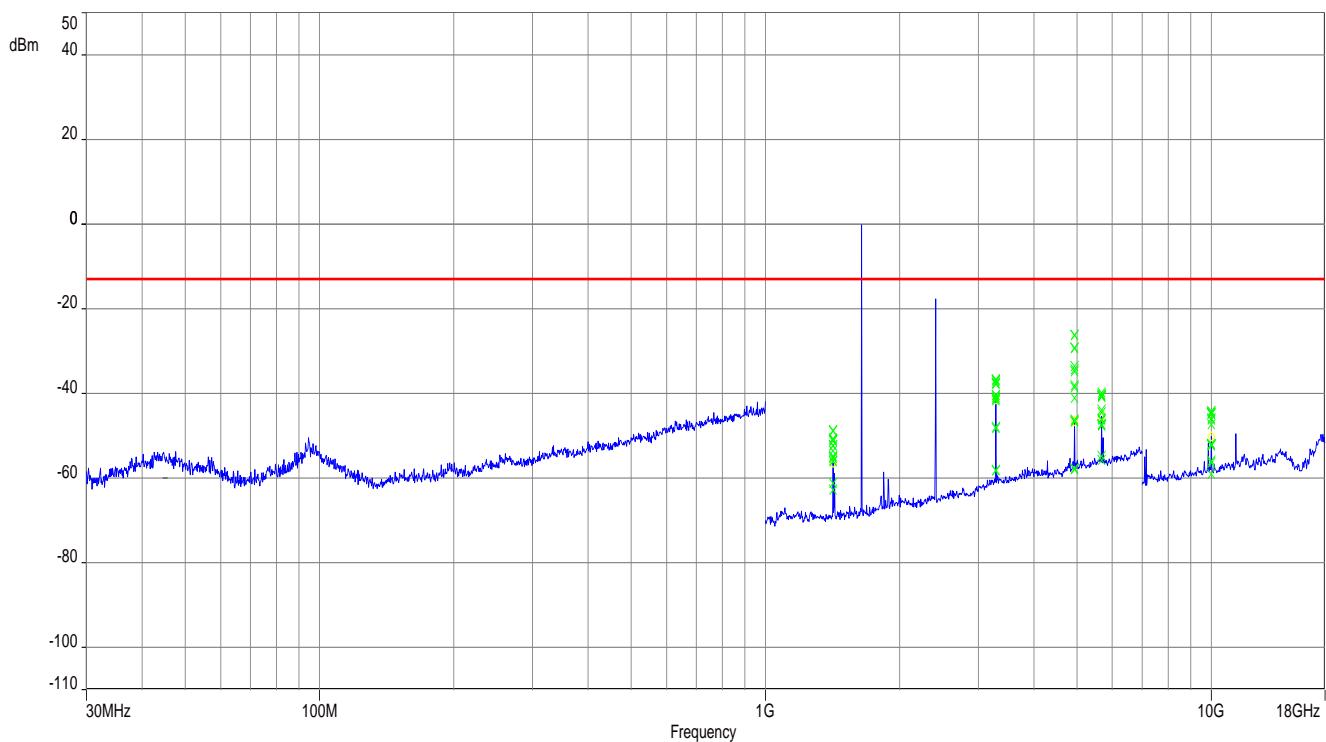
Plot No. 1: magnetic field 9 kHz to 30 MHz



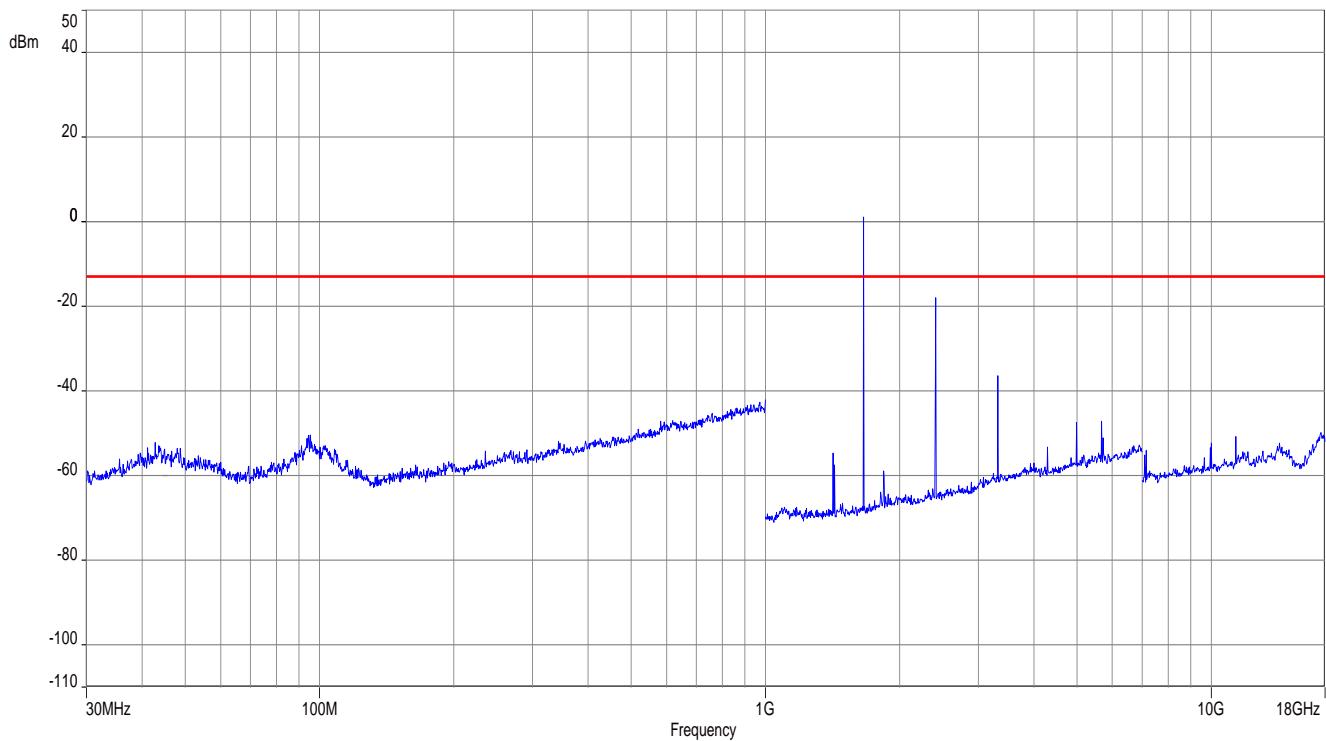
Plot No. 2: BGAN Tx on, bottom frequency, 30 MHz – 18 GHz



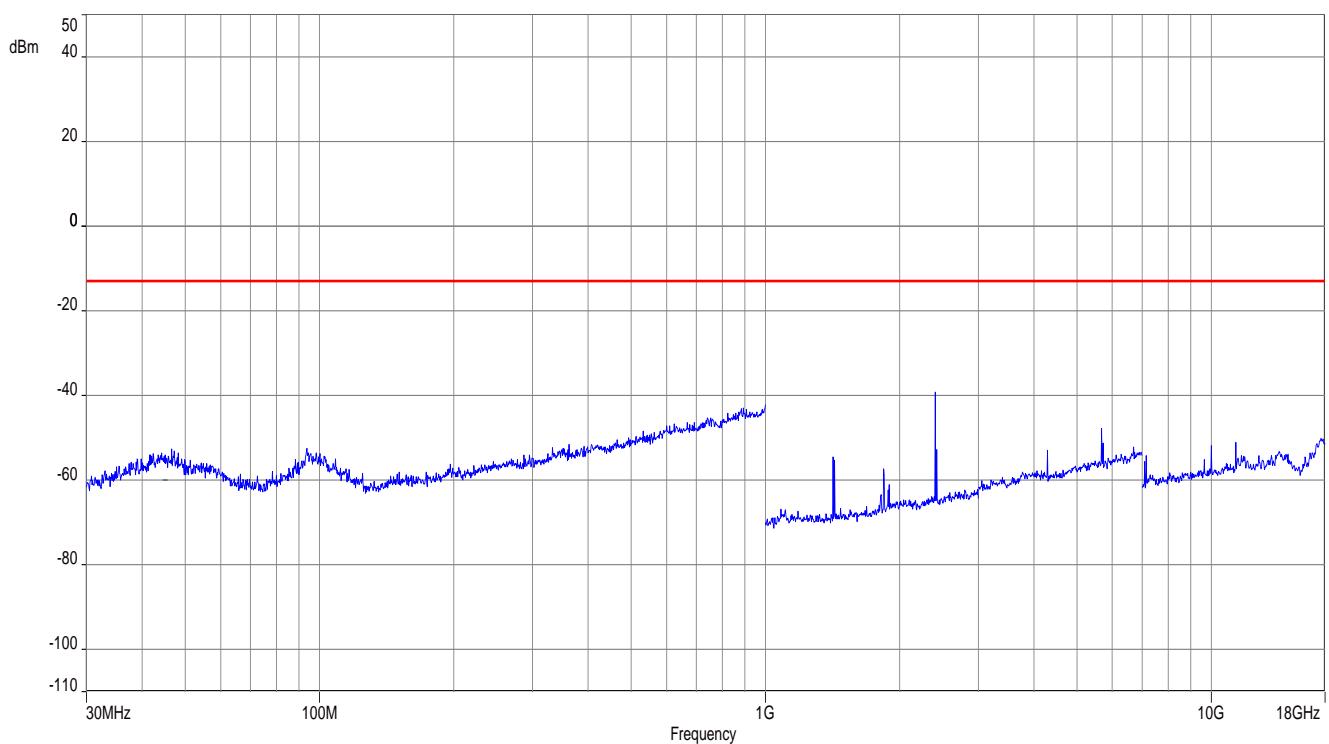
Plot No. 3: BGAN Tx on, center frequency, 30 MHz – 18 GHz



Plot No. 4: BGAN Tx on, top frequency, 30 MHz – 18 GHz



Plot No. 5: BGAN Tx off, 30 MHz – 18 GHz



4 Document history

| Version | Applied changes | Date of release |
|---------|--------------------------|-----------------|
| | Initial release - DRAFT | 2020-10-16 |
| | Initial release – DRAFT2 | 2020-10-29 |
| | Final release | 2020-11-12 |