

Annex D



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Test report annex authorized:

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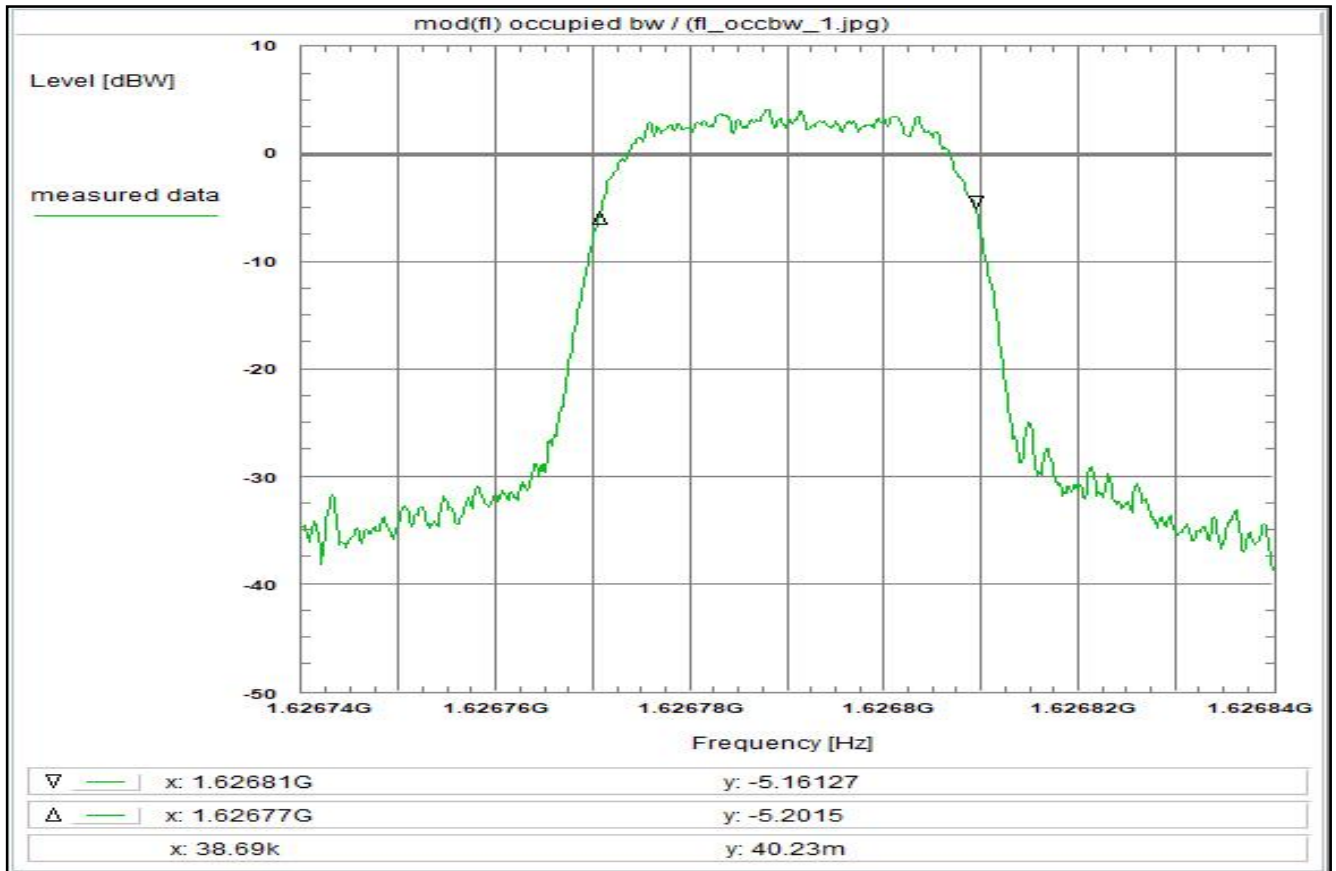
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2 Measurement results (conducted)

This chapter consists of 65 pages including this page.

Plot No. 1



Subclause: -/- Function test
Modulated rf-carrier at the lower edge of the band (fl)
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: 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:
determination of the occupied bandwidth

Test result: Determination of the occupied bandwidth

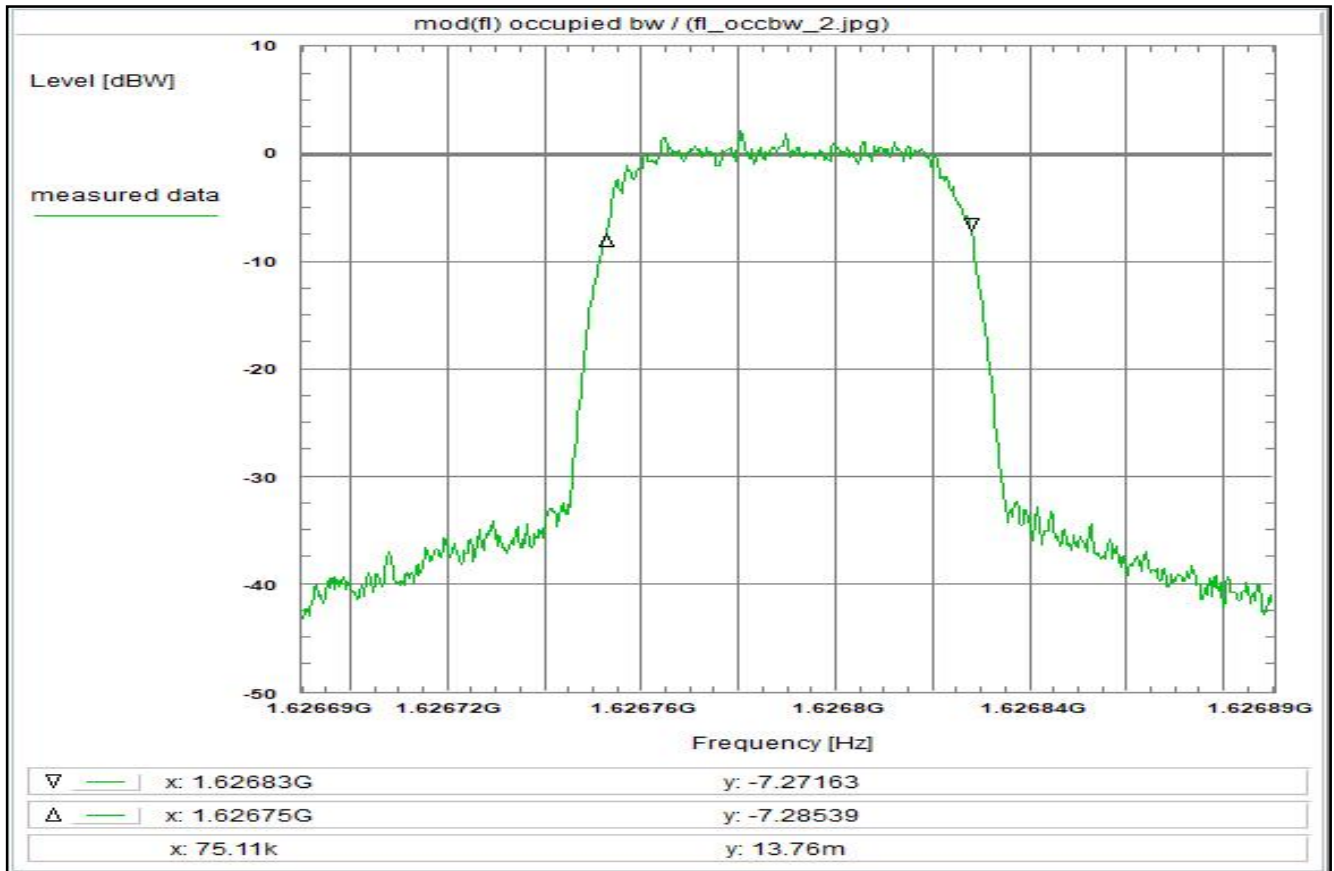
Environment condition:
Date & Time: Fri 09/Oct/2020 14:58:36
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 24 Vdc

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: 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 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: + 33.2 dB

Remarks:
Determination of the 'occupied bandwidth' at fl:
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 (fl)
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

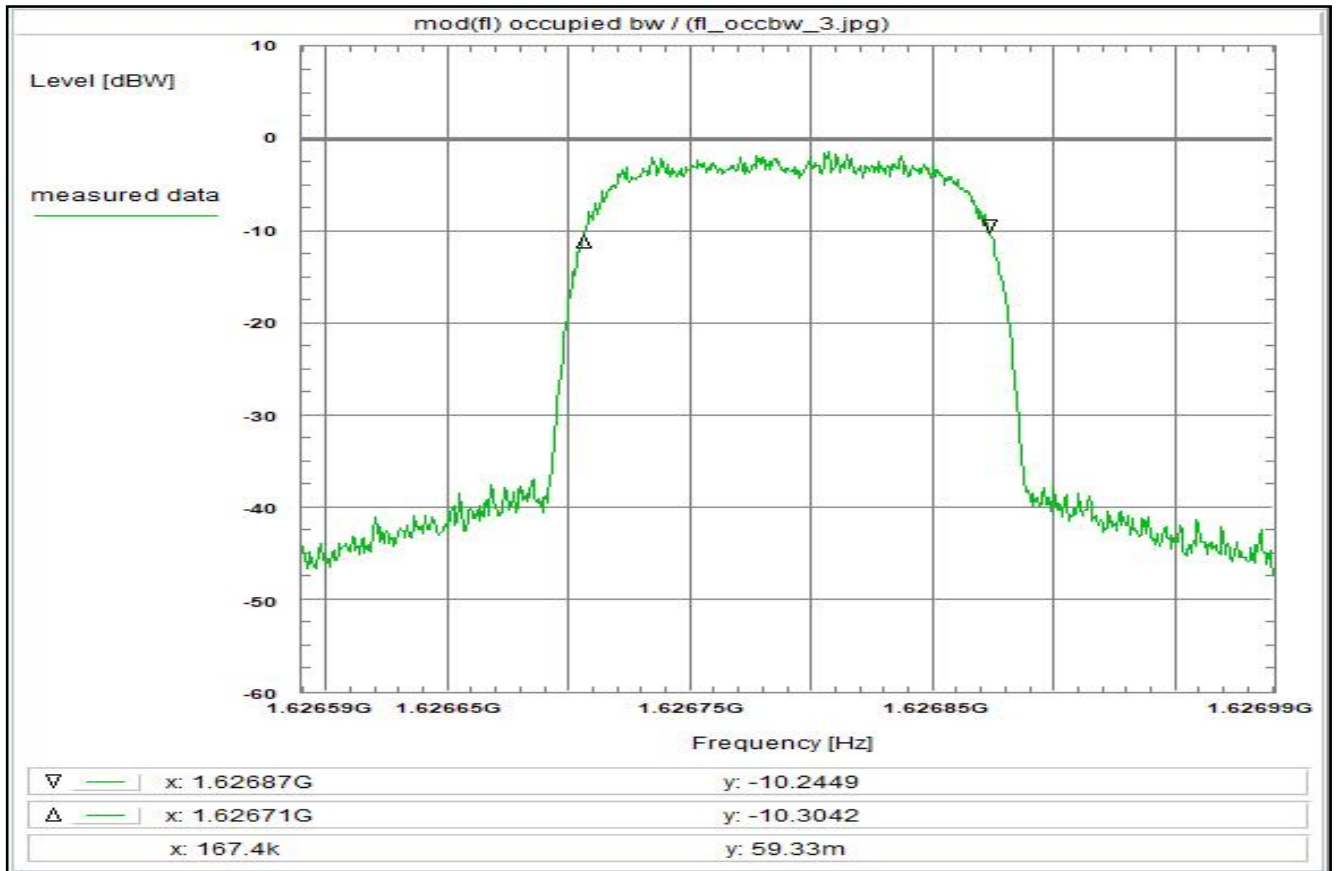
Environment condition:
Date & Time: Fri 09/Oct/2020 15:01:20
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 24 Vdc

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 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: + 33.2 dB

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

Plot No. 3



Subclause: -/- Function test
Modulated rf-carrier at the lower edge of the band (fl)
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: R5T4.5X-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:
determination of the occupied bandwidth

Test result: Determination of the occupied bandwidth

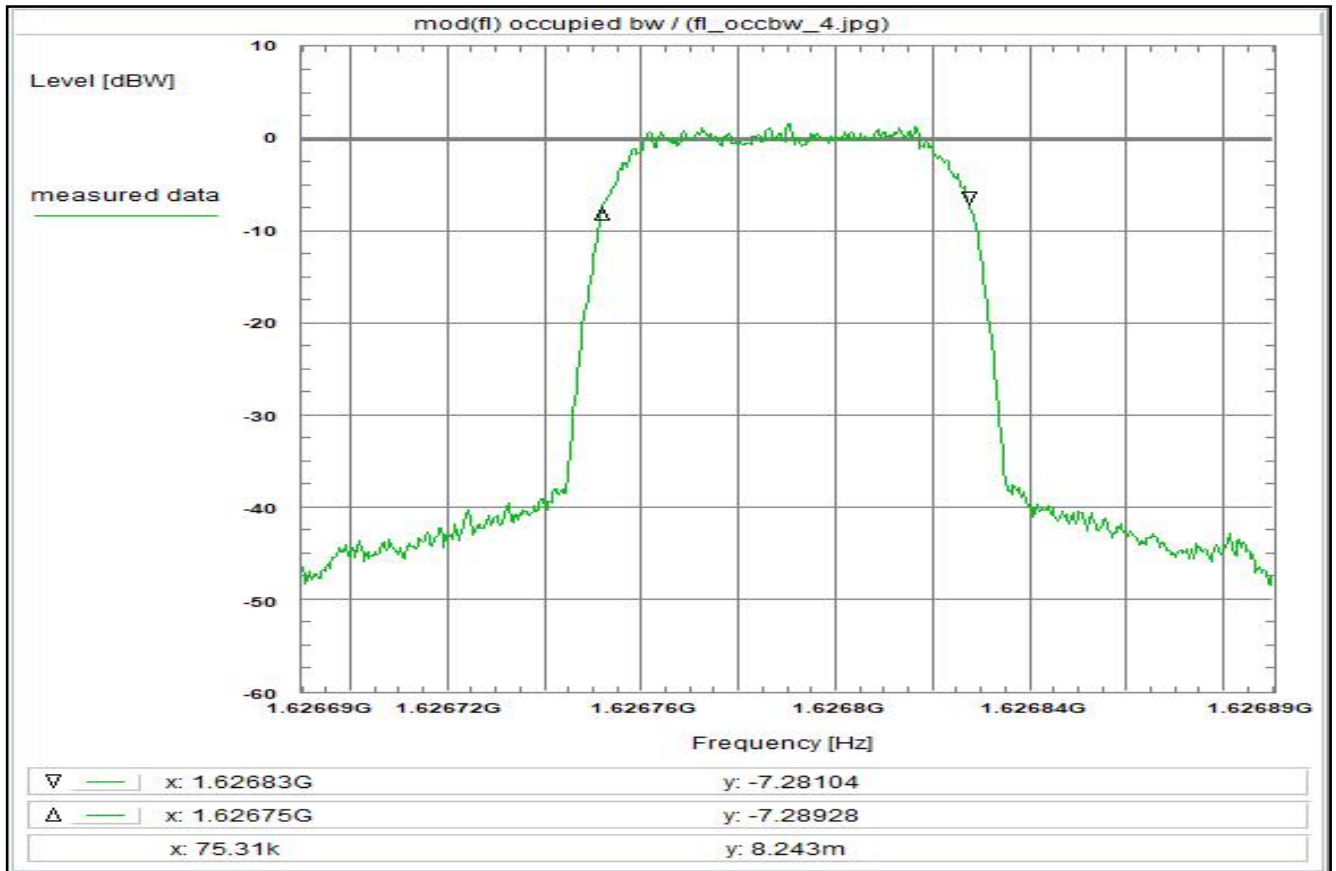
Environment condition:
Date & Time: Fri 09/Oct/2020 15:05:45
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 24 Vdc

Setup of measurement equipment:
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

Correction:
Directional coupler + 0.0 dB
Coaxial cable (C220) + 0.9 dB
DUT-Antenna (on-axis) + 0.0 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: + 33.2 dB

Remarks:
Determination of the 'occupied bandwidth' at fl:
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 (fl)
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

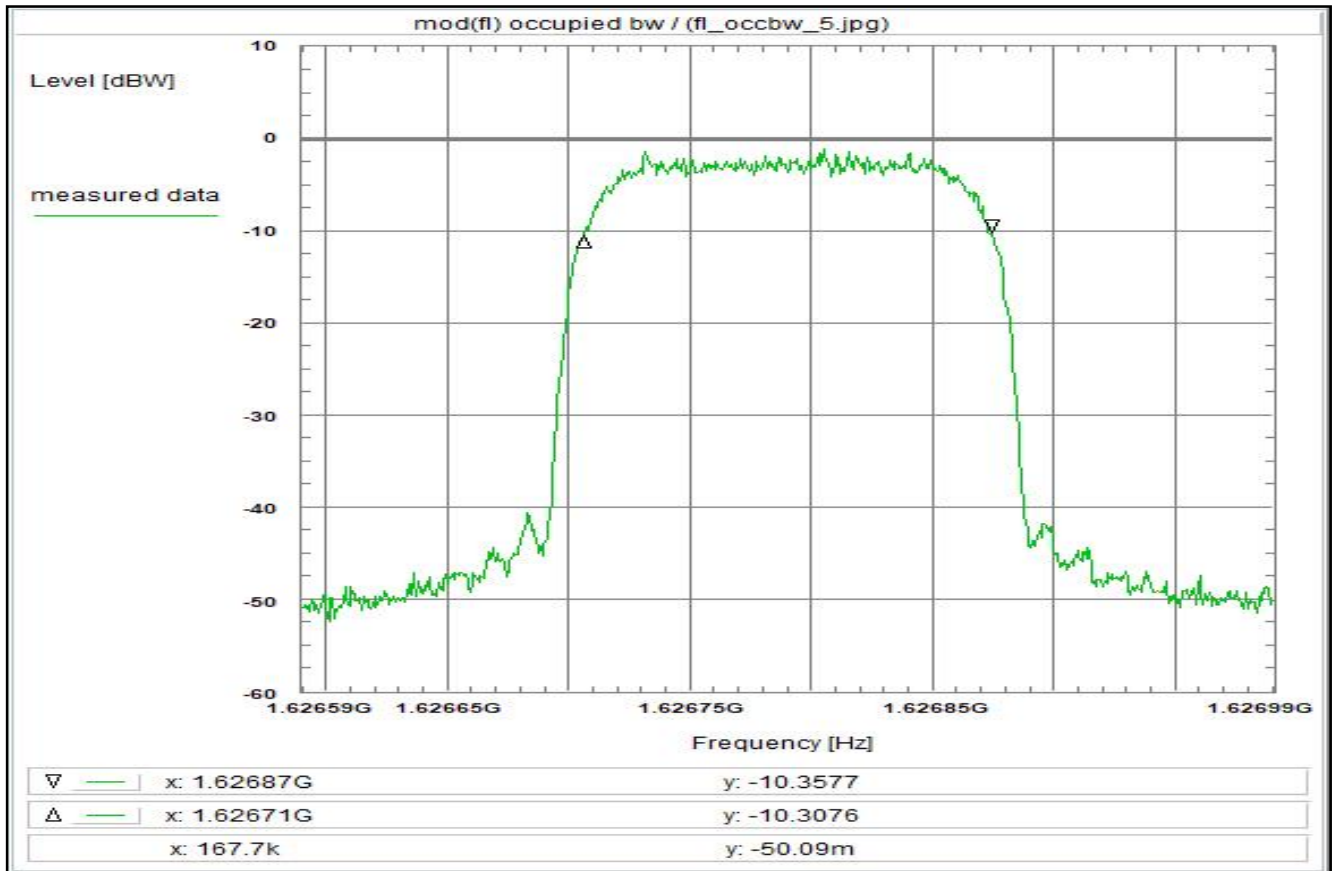
Environment condition:
Date & Time: Fri 09/Oct/2020 15:10:59
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 24 Vdc

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 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: + 33.2 dB

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

Plot No. 5



Subclause: -/- Function test
Modulated rf-carrier at the lower edge of the band (fl)
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-2B

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

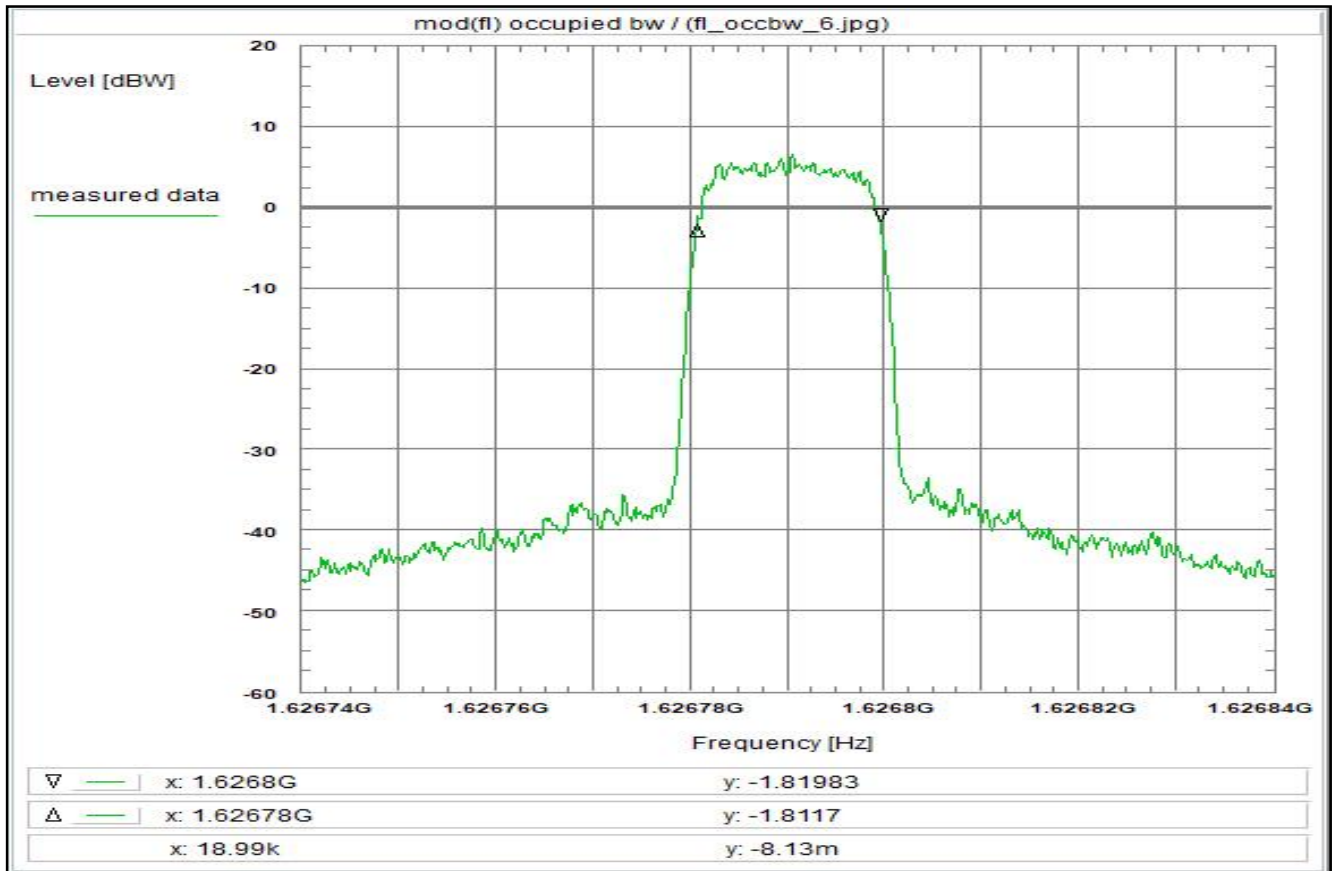
Environment condition:
Date & Time: Fri 09/Oct/2020 15:16:20
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 24 Vdc

Setup of measurement equipment:
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

Correction:
Directional coupler + 0.0 dB
Coaxial cable (C220) + 0.9 dB
DUT-Antenna (on-axis) + 0.0 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: + 33.2 dB

Remarks:
Determination of the 'occupied bandwidth' at fl:
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 (fl)
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

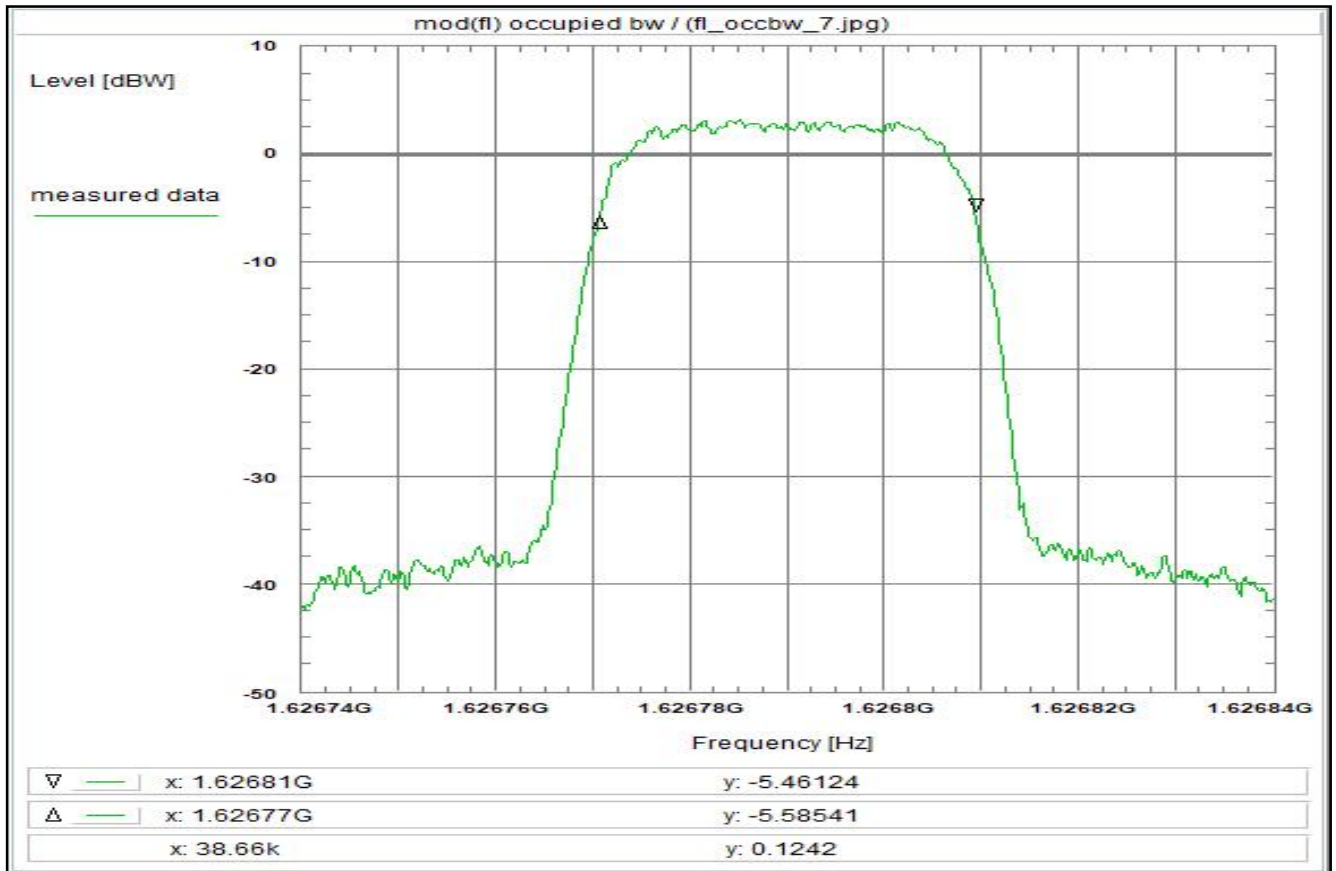
Environment condition:
Date & Time: Fri 09/Oct/2020 15:20:32
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 24 Vdc

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 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: + 38.0 dB

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

Plot No. 7



Subclause: -/- Function test
Modulated rf-carrier at the lower edge of the band (fl)
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: 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:
determination of the occupied bandwidth

Test result: Determination of the occupied bandwidth

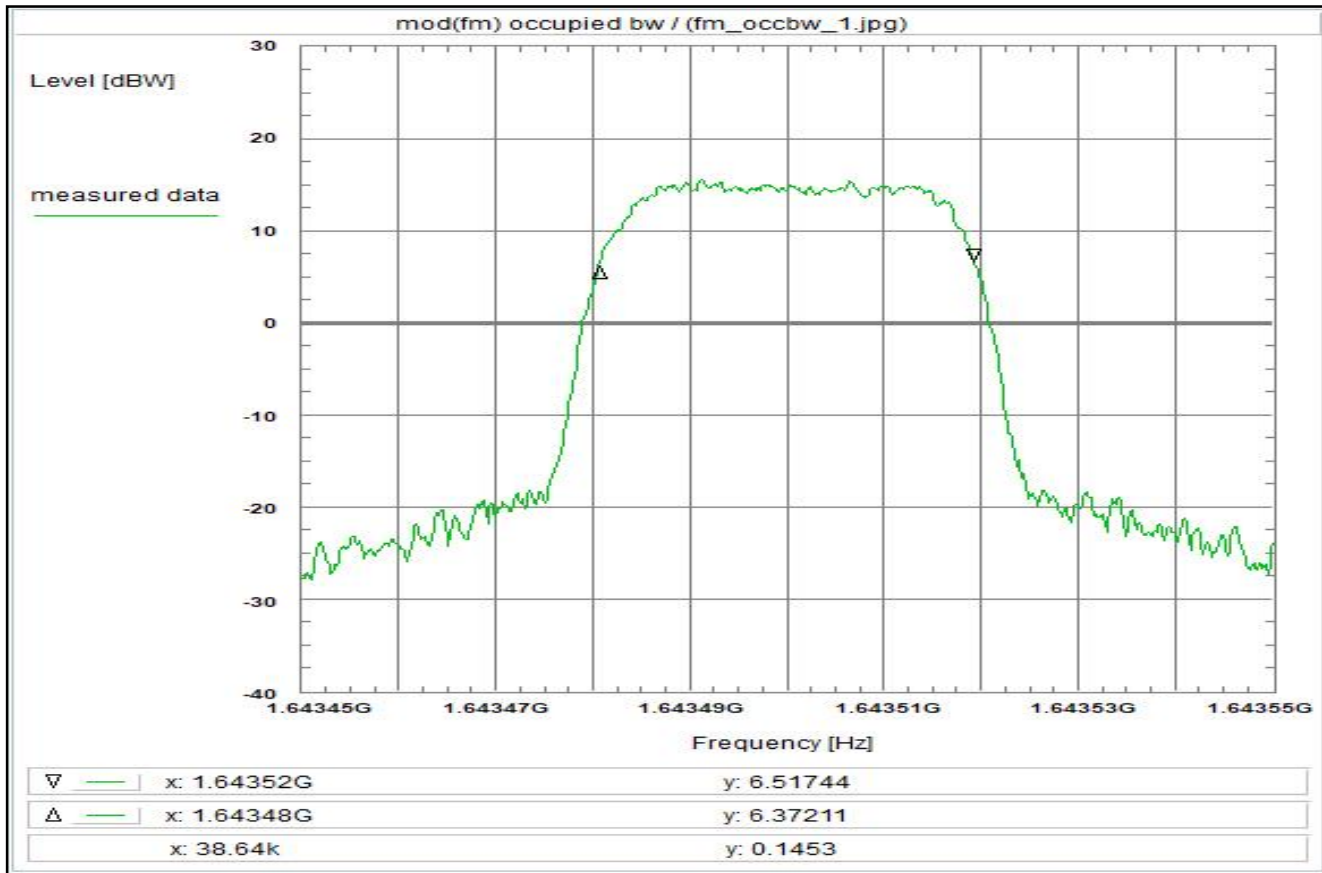
Environment condition:
Date & Time: Fri 09/Oct/2020 15:24:49
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 24 Vdc

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: 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 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: + 33.2 dB

Remarks:
Determination of the 'occupied bandwidth' at fl:
The measured value is about 38.6 kHz (delta marker)
Measurement with 3 kHz resolution filter and noise averaging.

Plot No. 8



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 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:
determination of the occupied bandwidth

Test result: Determination of the occupied bandwidth

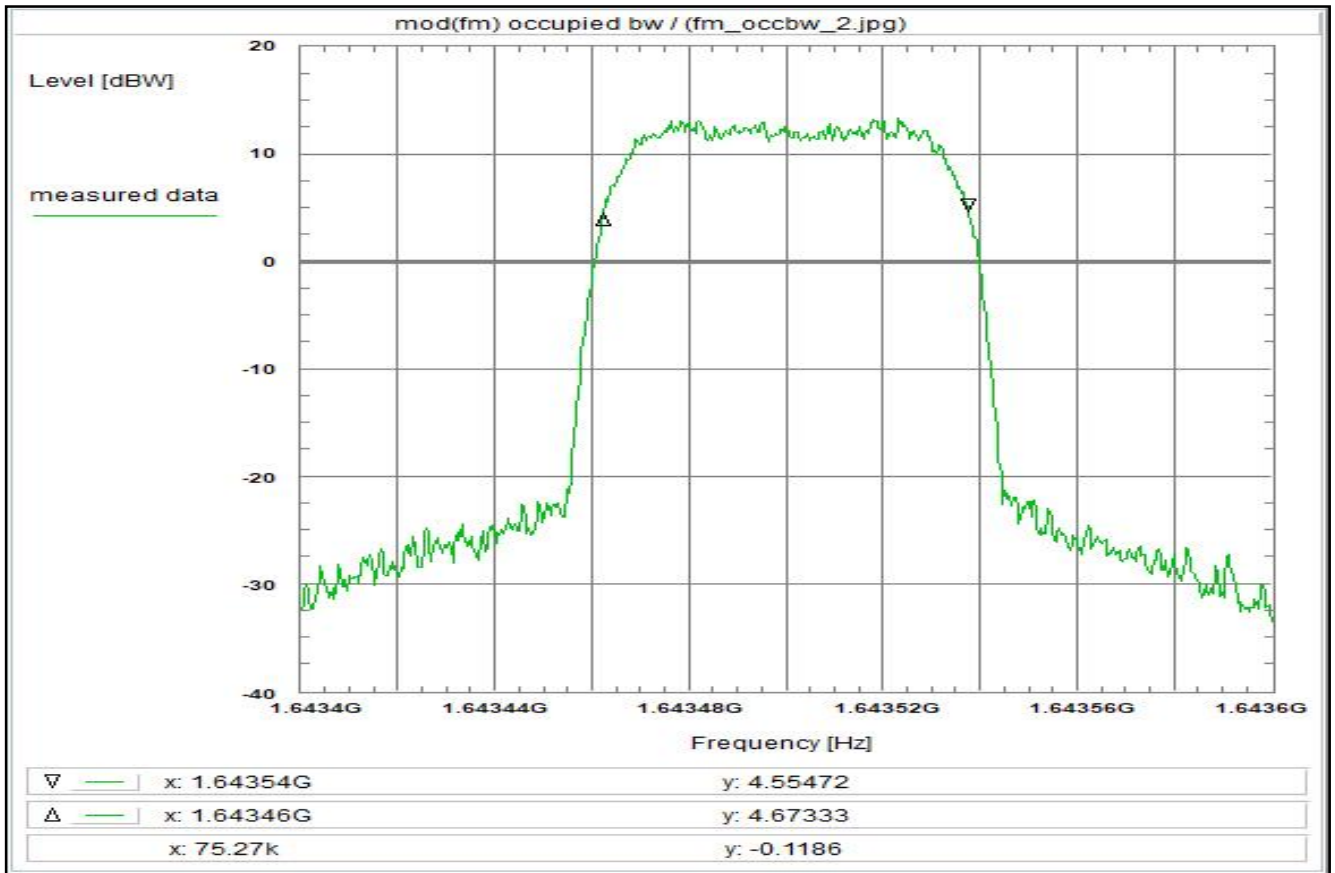
Environment condition:
Date & Time: Fri 09/Oct/2020 14:21:27
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 24 Vdc

Setup of measurement equipment:
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

Correction:
Directional coupler + 0.0 dB
Coaxial cable (C220) + 0.9 dB
DUT-Antenna + 11.3 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: + 44.5 dB

Remarks:
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 1.1hvj

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

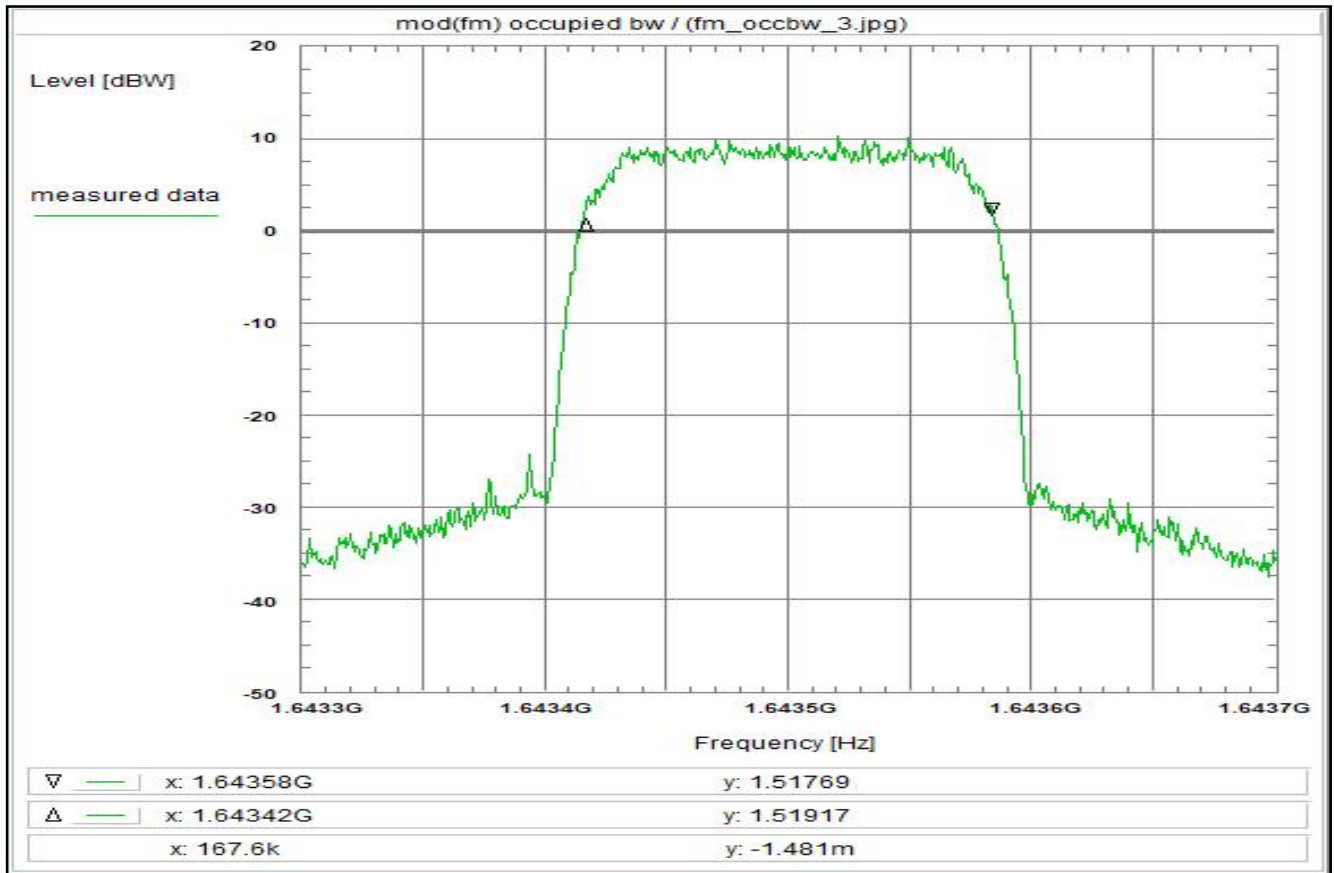
Correction:

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



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: R5T4.5X-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:
determination of the occupied bandwidth

Test result: Determination of the occupied bandwidth

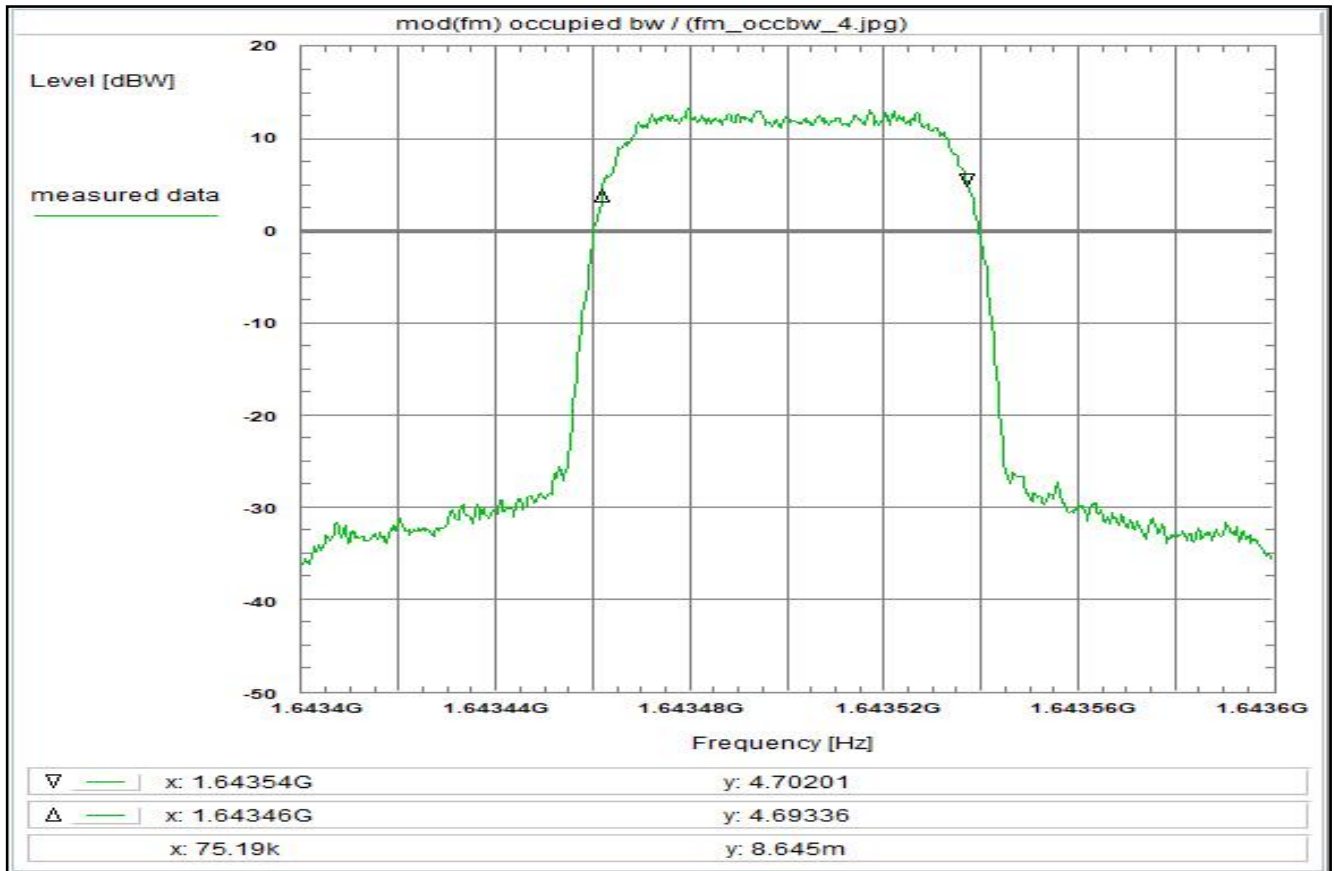
Environment condition:
Date & Time: Fri 09/Oct/2020 14:32:22
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 24 Vdc

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. 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

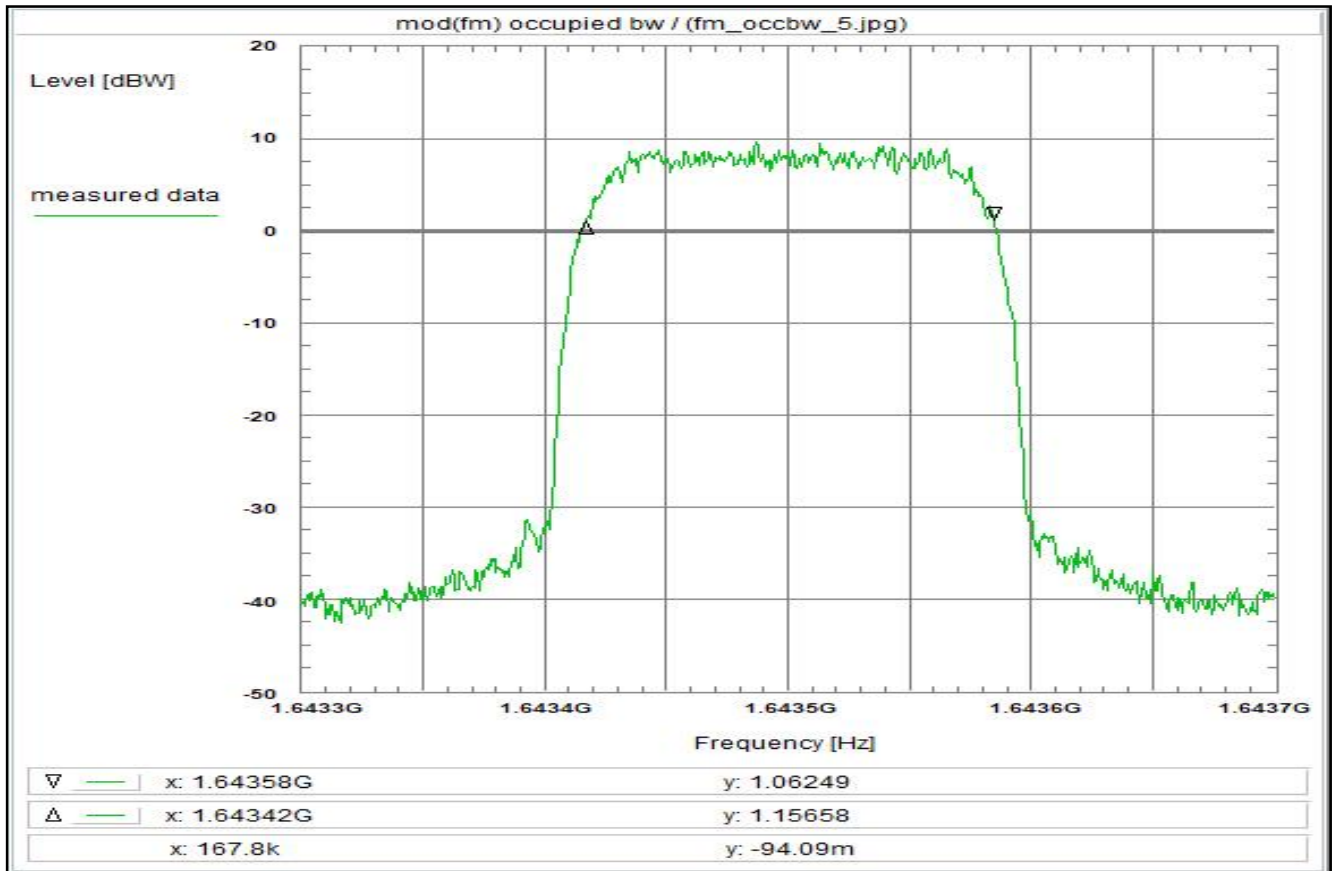
Environment condition:
Date & Time: Fri 09/Oct/2020 14:45:12
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 24 Vdc

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

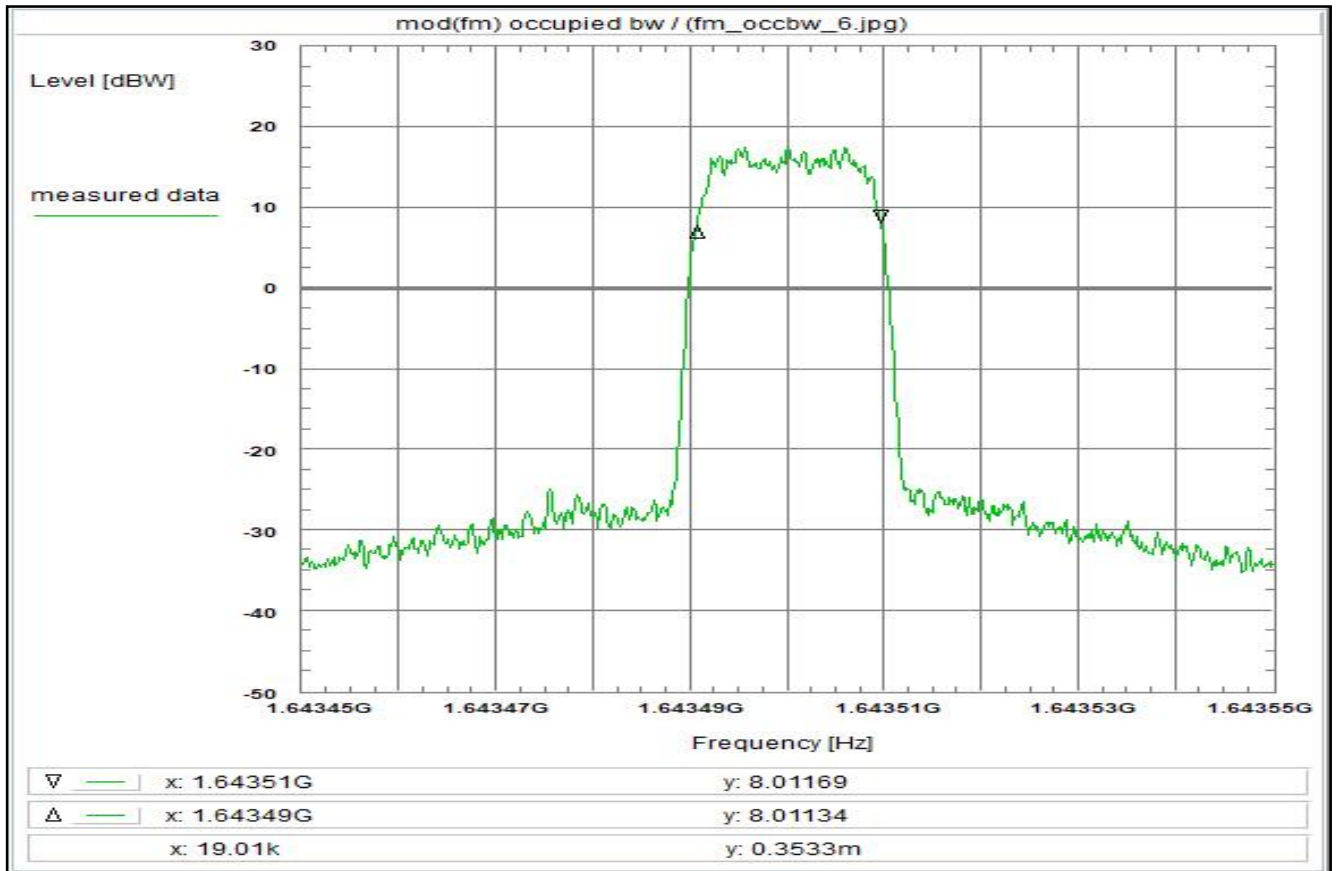
Environment condition:
Date & Time: Fri 09/Oct/2020 14:47:24
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 24 Vdc

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



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: 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

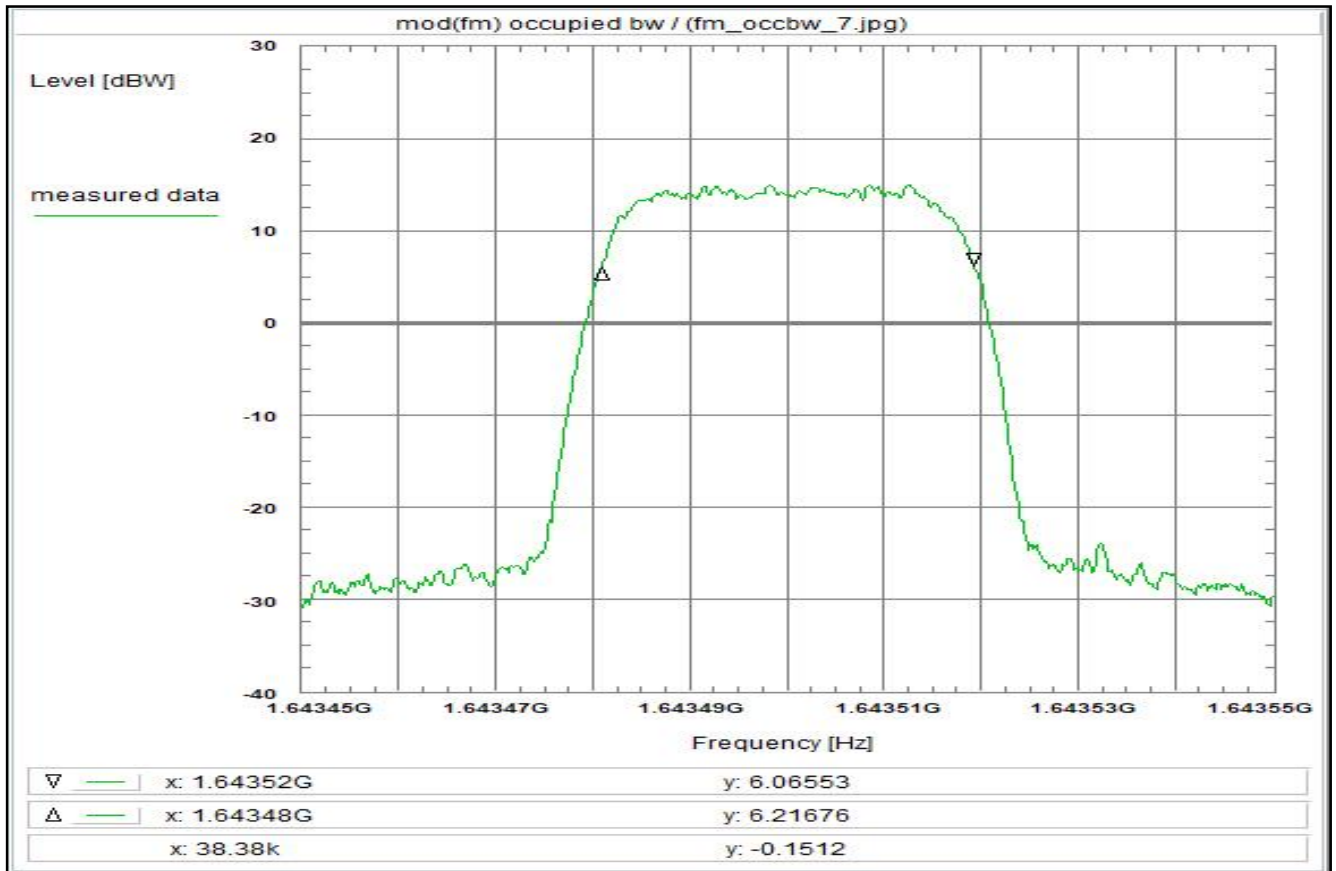
Environment condition:
Date & Time: Fri 09/Oct/2020 14:48:54
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 24 Vdc

Setup of measurement equipment:
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

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 (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

Remarks:
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



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: 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:
determination of the occupied bandwidth

Test result: Determination of the occupied bandwidth

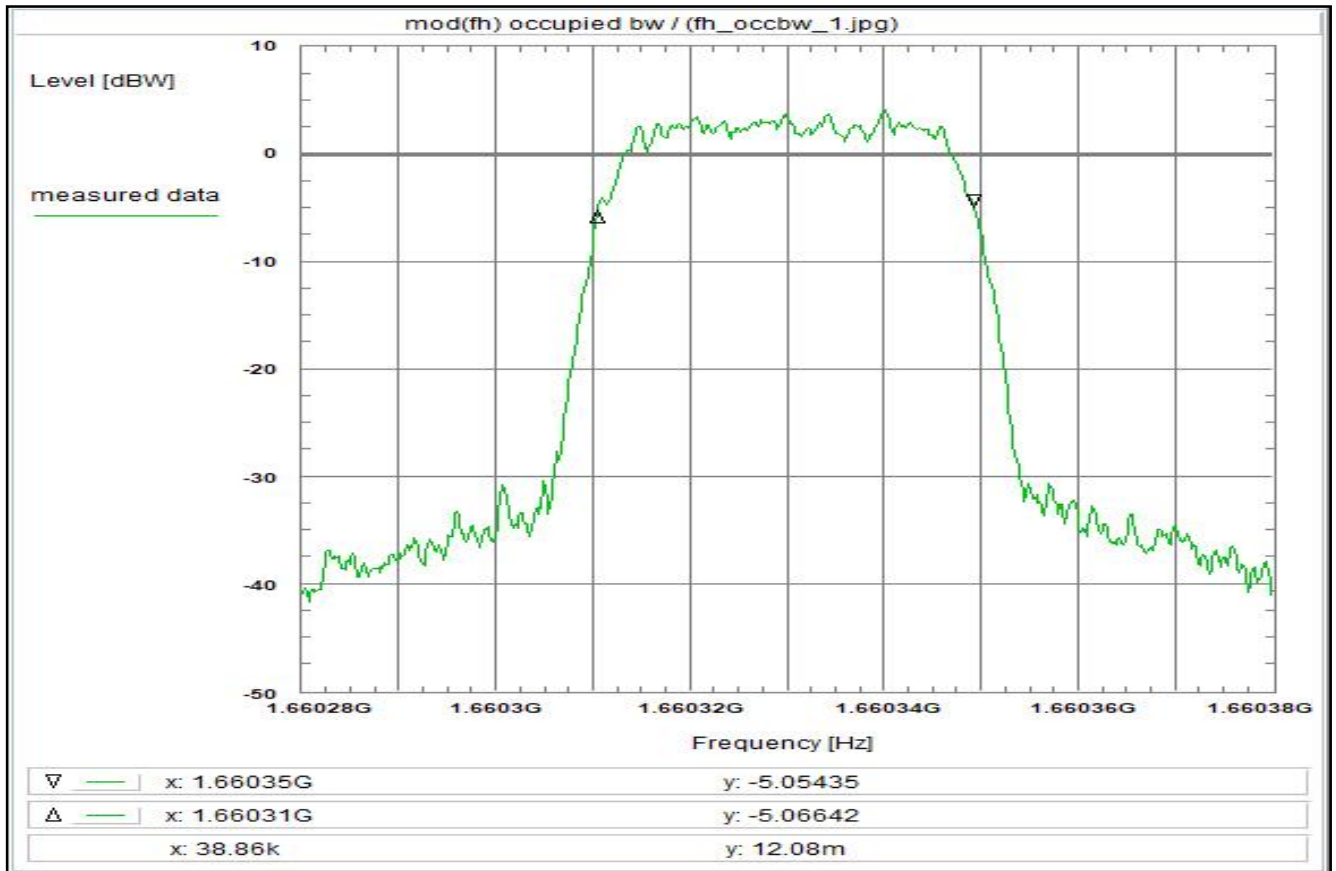
Environment condition:
Date & Time: Fri 09/Oct/2020 14:53:35
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 24 Vdc

Setup of measurement equipment:
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

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 38.4 kHz (delta marker)
Measurement with 3 kHz resolution filter and noise averaging.

Plot No. 15



Subclause: -/- Function test
Modulated rf-carrier at the upper edge of the band (fh)
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: 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:
determination of the occupied bandwidth

Test result: Determination of the occupied bandwidth

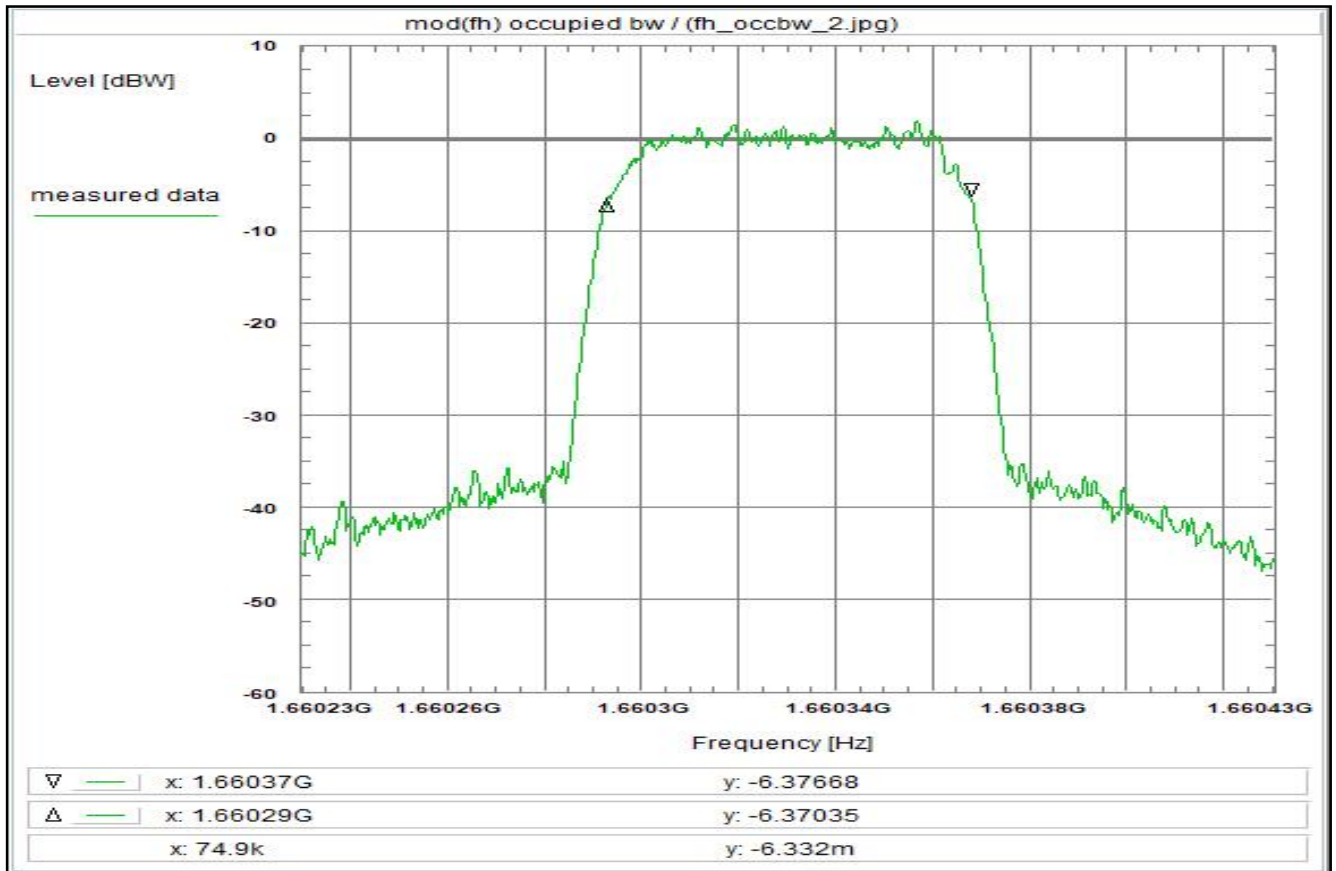
Environment condition:
Date & Time: Fri 09/Oct/2020 15:29:19
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 24 Vdc

Setup of measurement equipment:
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

Correction:
Directional coupler + 0.0 dB
Coaxial cable (C220) + 0.9 dB
DUT-Antenna (on-axis) + 0.0 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: + 33.2 dB

Remarks:
Determination of the 'occupied bandwidth' at fh:
The measured value is about 38.8 kHz (delta marker)
Measurement with 3 kHz resolution filter and noise averaging.

Plot No. 16



Subclause: -/- Function test
Modulated rf-carrier at the upper edge of the band (fh)
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

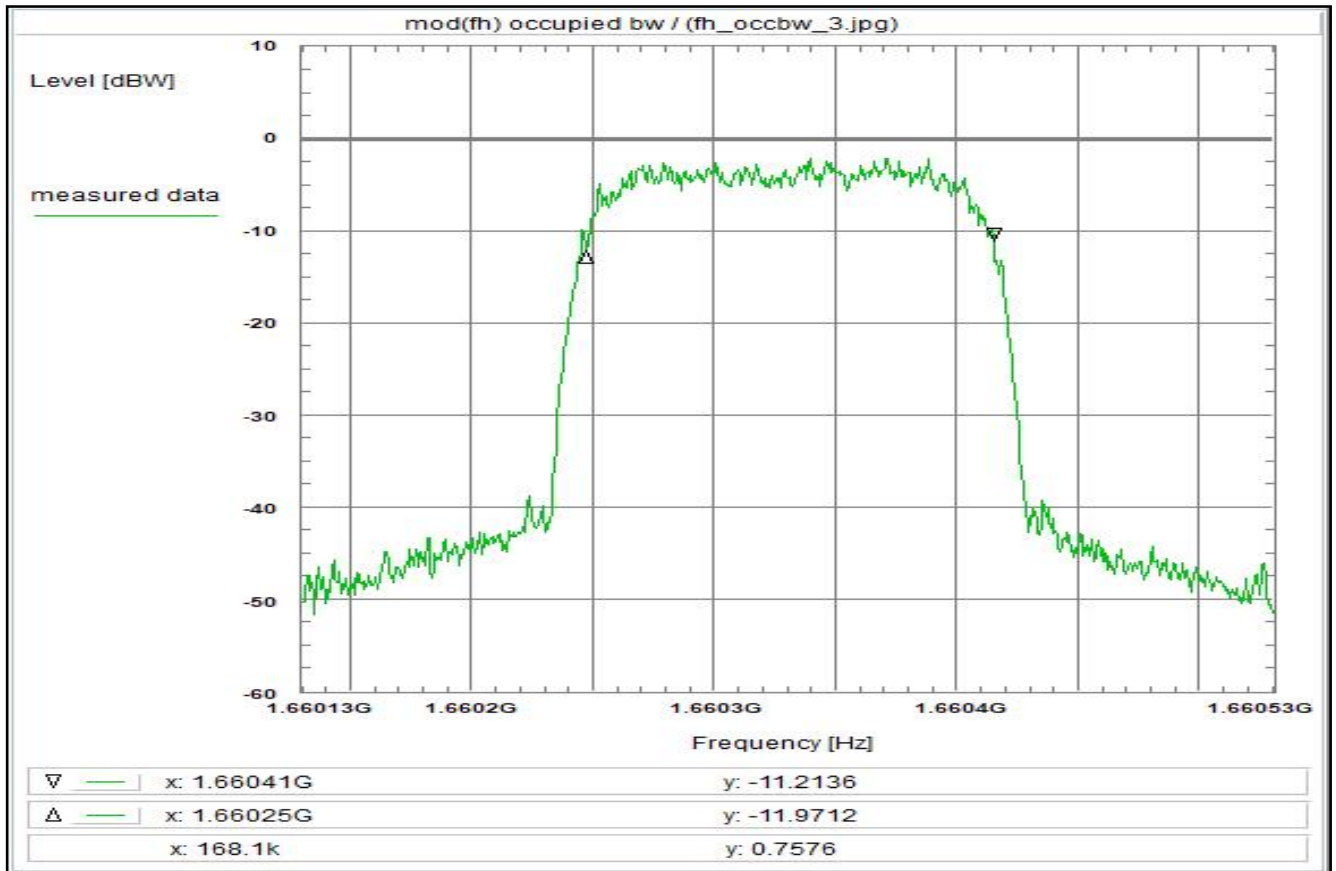
Environment condition:
Date & Time: Fri 09/Oct/2020 15:31:16
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 24 Vdc

Setup of measurement equipment:
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

Correction:
Directional coupler + 0.0 dB
Coaxial cable (C220) + 0.9 dB
DUT-Antenna (on-axis) + 0.0 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: + 33.2 dB

Remarks:
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. 17



Subclause: -/- Function test
Modulated rf-carrier at the upper edge of the band (fh)
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: R5T4.5X-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:
determination of the occupied bandwidth

Test result: Determination of the occupied bandwidth

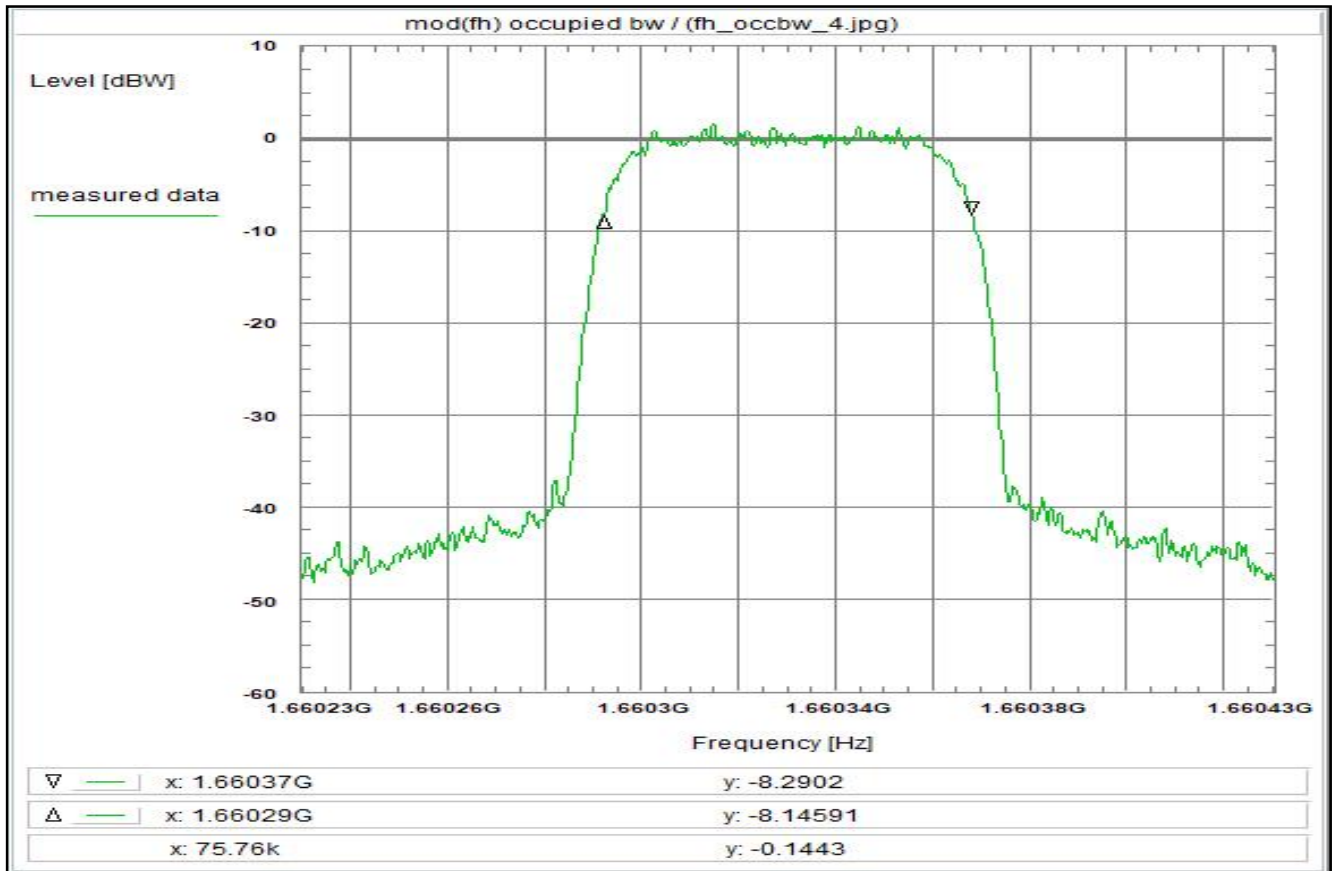
Environment condition:
Date & Time: Fri 09/Oct/2020 15:35:14
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 24 Vdc

Setup of measurement equipment:
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

Correction:
Directional coupler + 0.0 dB
Coaxial cable (C220) + 0.9 dB
DUT-Antenna (on-axis) + 0.0 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: + 33.2 dB

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

Plot No. 18



Subclause: -/- Function test
Modulated rf-carrier at the upper edge of the band (fh)
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

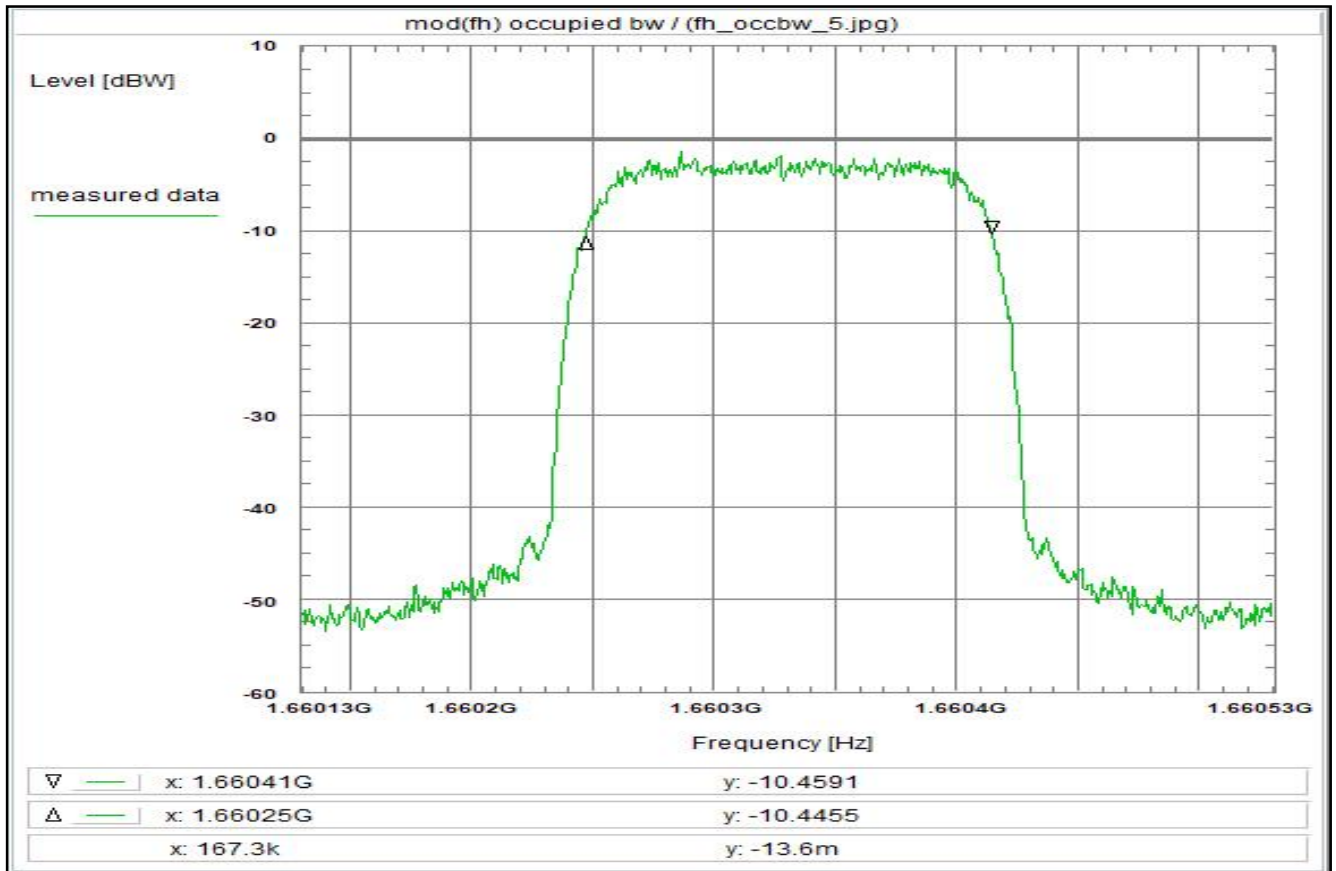
Environment condition:
Date & Time: Fri 09/Oct/2020 15:38:30
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 24 Vdc

Setup of measurement equipment:
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

Correction:
Directional coupler + 0.0 dB
Coaxial cable (C220) + 0.9 dB
DUT-Antenna (on-axis) + 0.0 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: + 33.2 dB

Remarks:
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



Subclause: -/- Function test
Modulated rf-carrier at the upper edge of the band (fh)
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

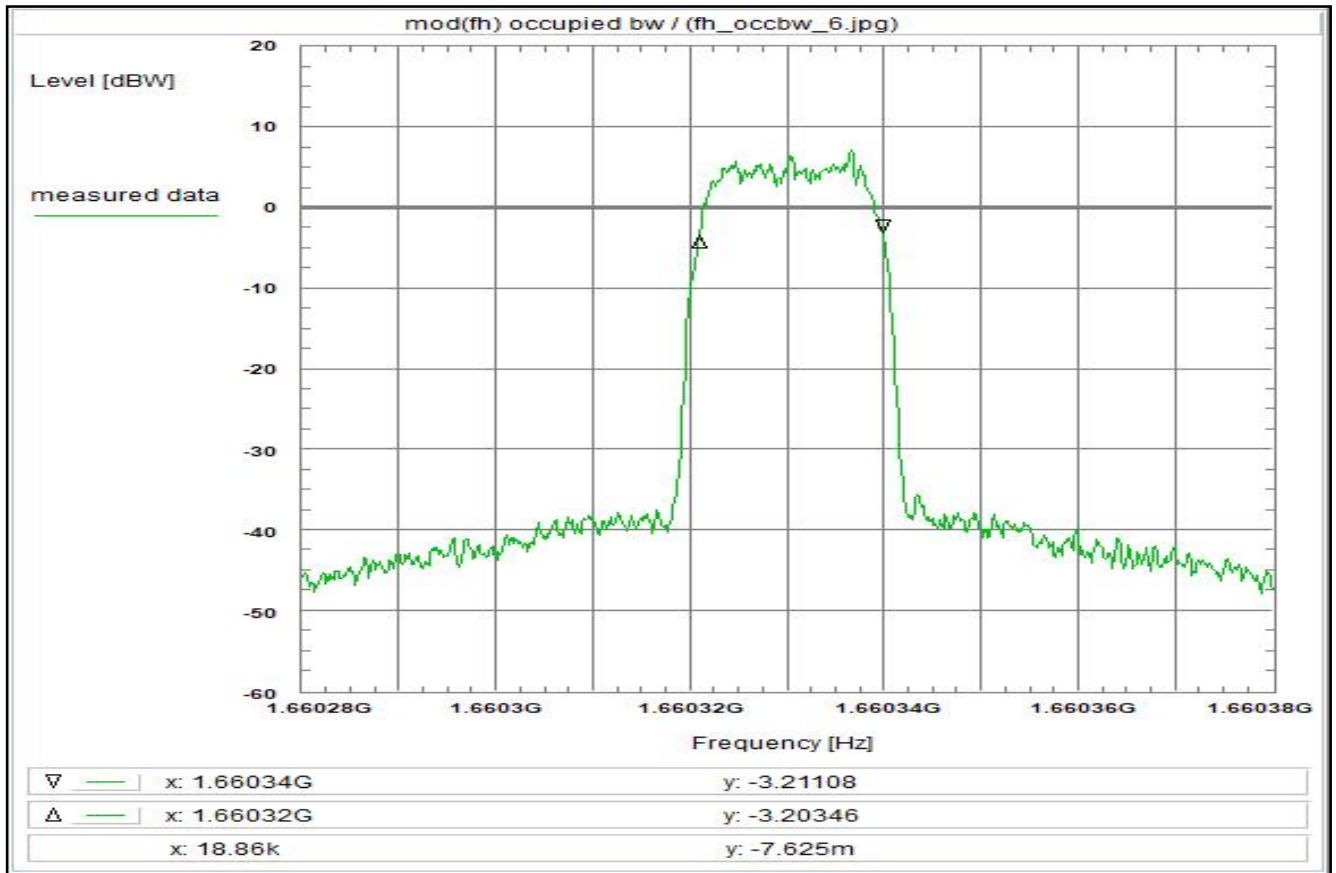
Environment condition:
Date & Time: Fri 09/Oct/2020 15:40:40
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 24 Vdc

Setup of measurement equipment:
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

Correction:
Directional coupler + 0.0 dB
Coaxial cable (C220) + 0.9 dB
DUT-Antenna (on-axis) + 0.0 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: + 33.2 dB

Remarks:
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



Subclause: -/- Function test
Modulated rf-carrier at the upper edge of the band (fh)
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

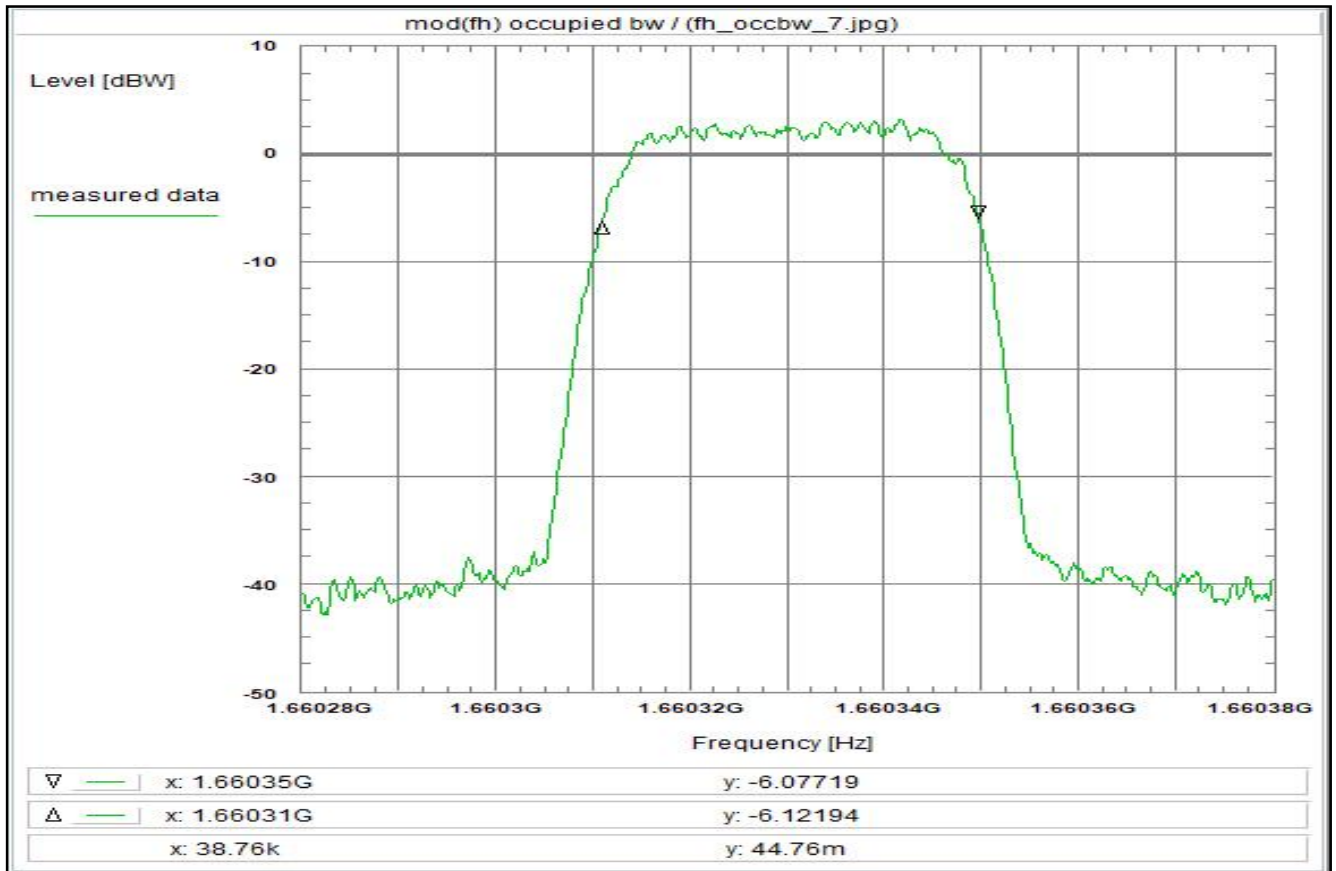
Environment condition:
Date & Time: Fri 09/Oct/2020 15:43:46
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 24 Vdc

Setup of measurement equipment:
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

Correction:
Directional coupler + 0.0 dB
Coaxial cable (C220) + 0.9 dB
DUT-Antenna (on-axis) + 0.0 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: + 38.0 dB

Remarks:
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



Subclause: -/- Function test
Modulated rf-carrier at the upper edge of the band (fh)
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: 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:
determination of the occupied bandwidth

Test result: Determination of the occupied bandwidth

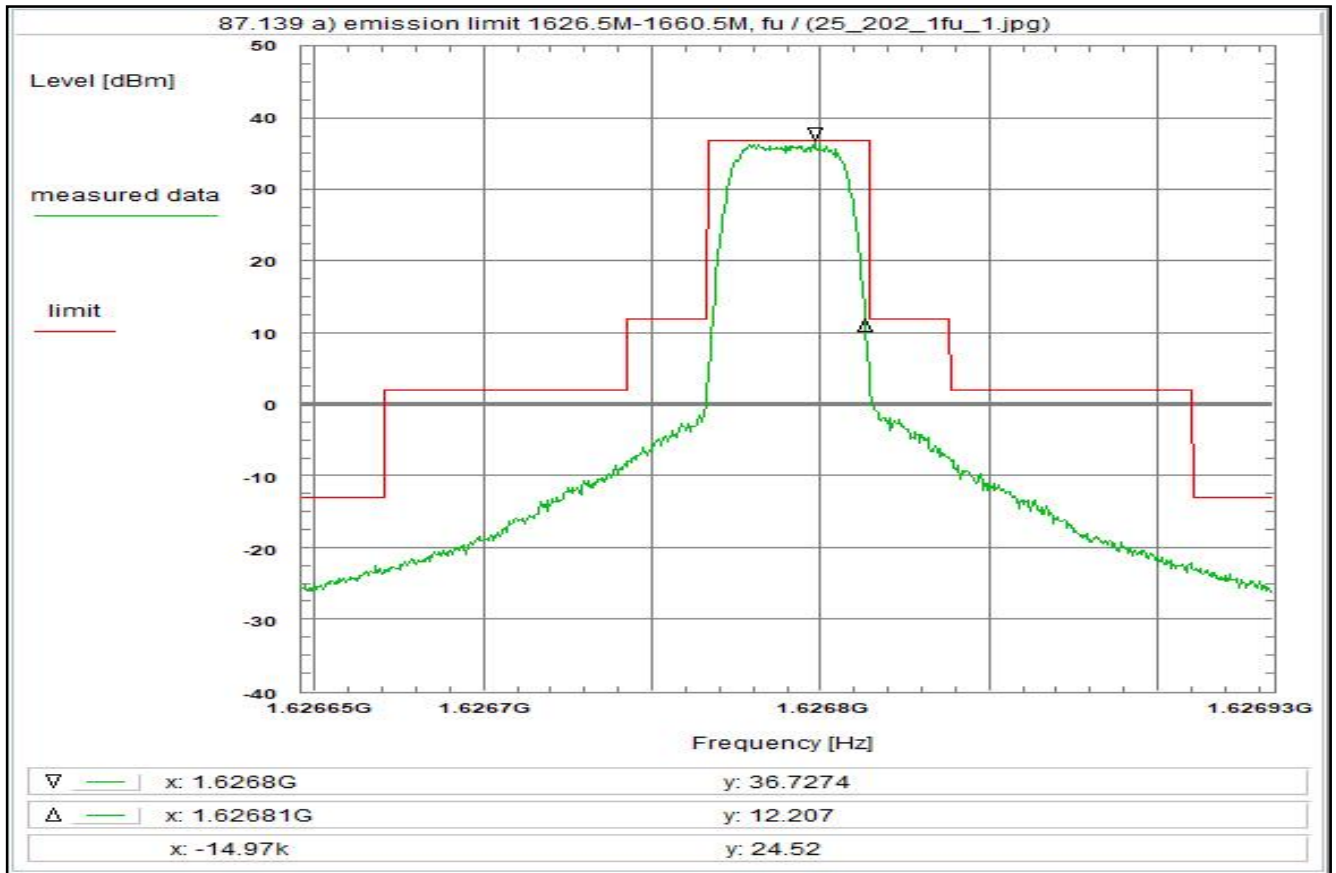
Environment condition:
Date & Time: Fri 09/Oct/2020 15:46:07
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 24 Vdc

Setup of measurement equipment:
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

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 fh:
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 rf-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: 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

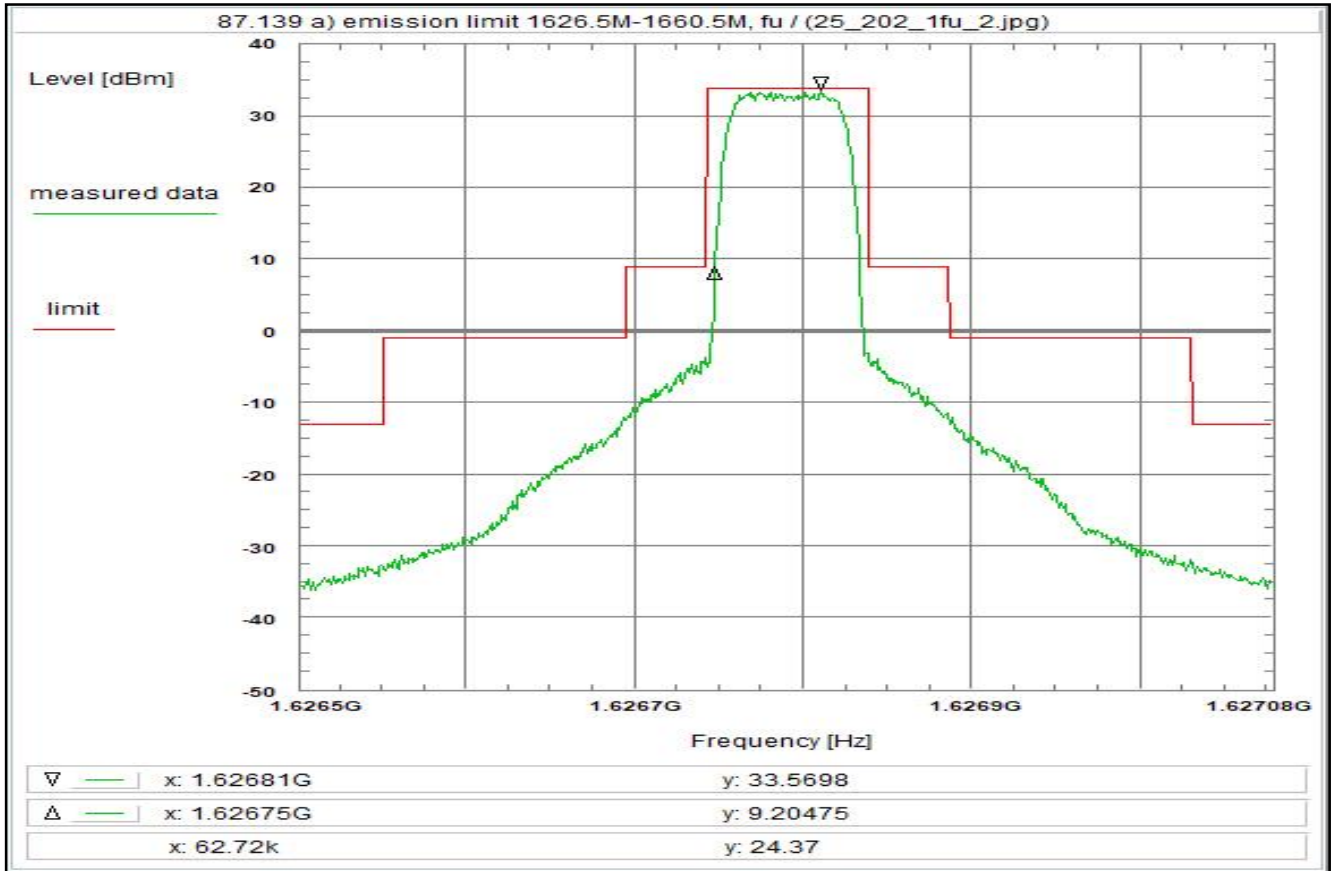
Correction:

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 rf-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: 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

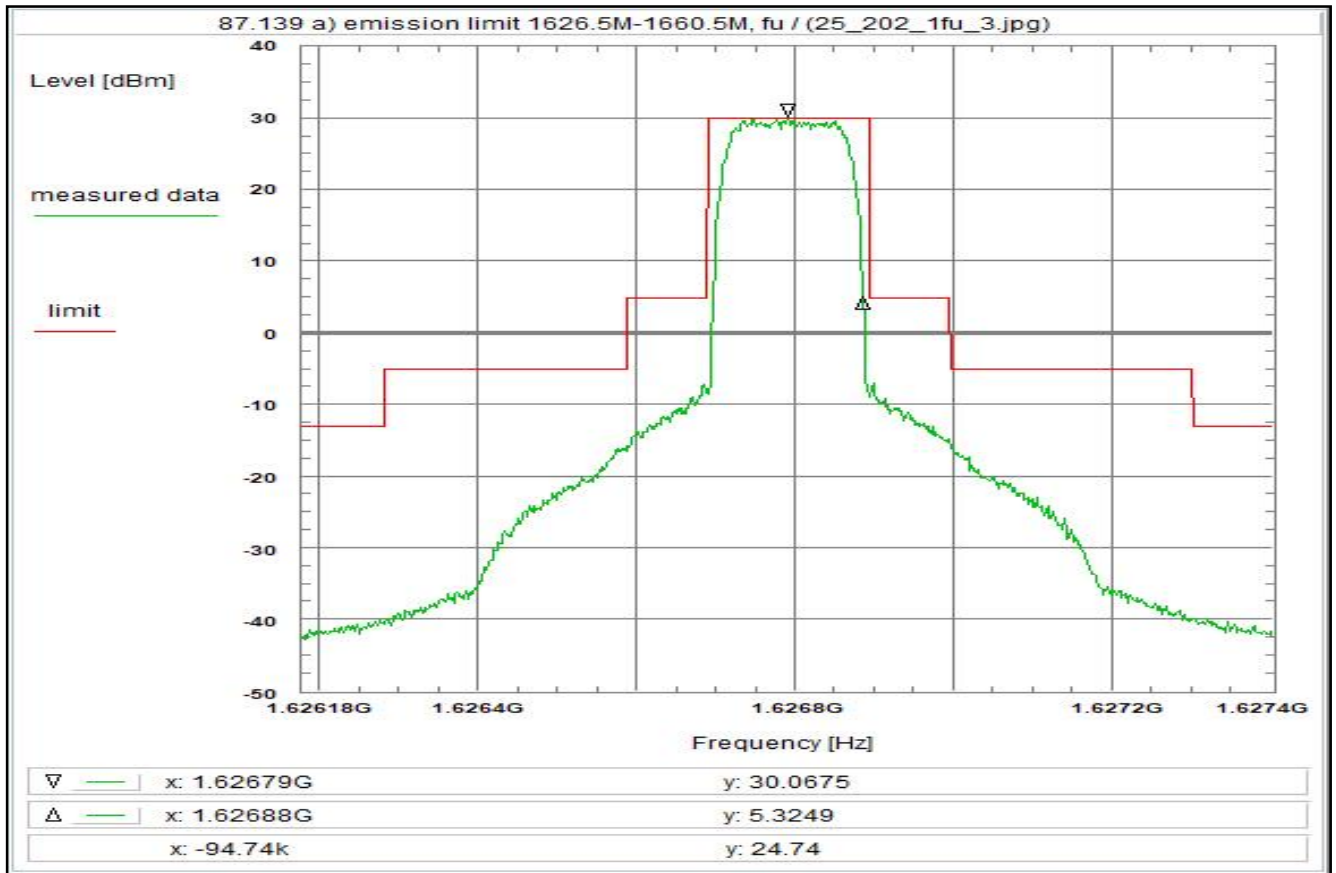
Correction:

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 rf-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

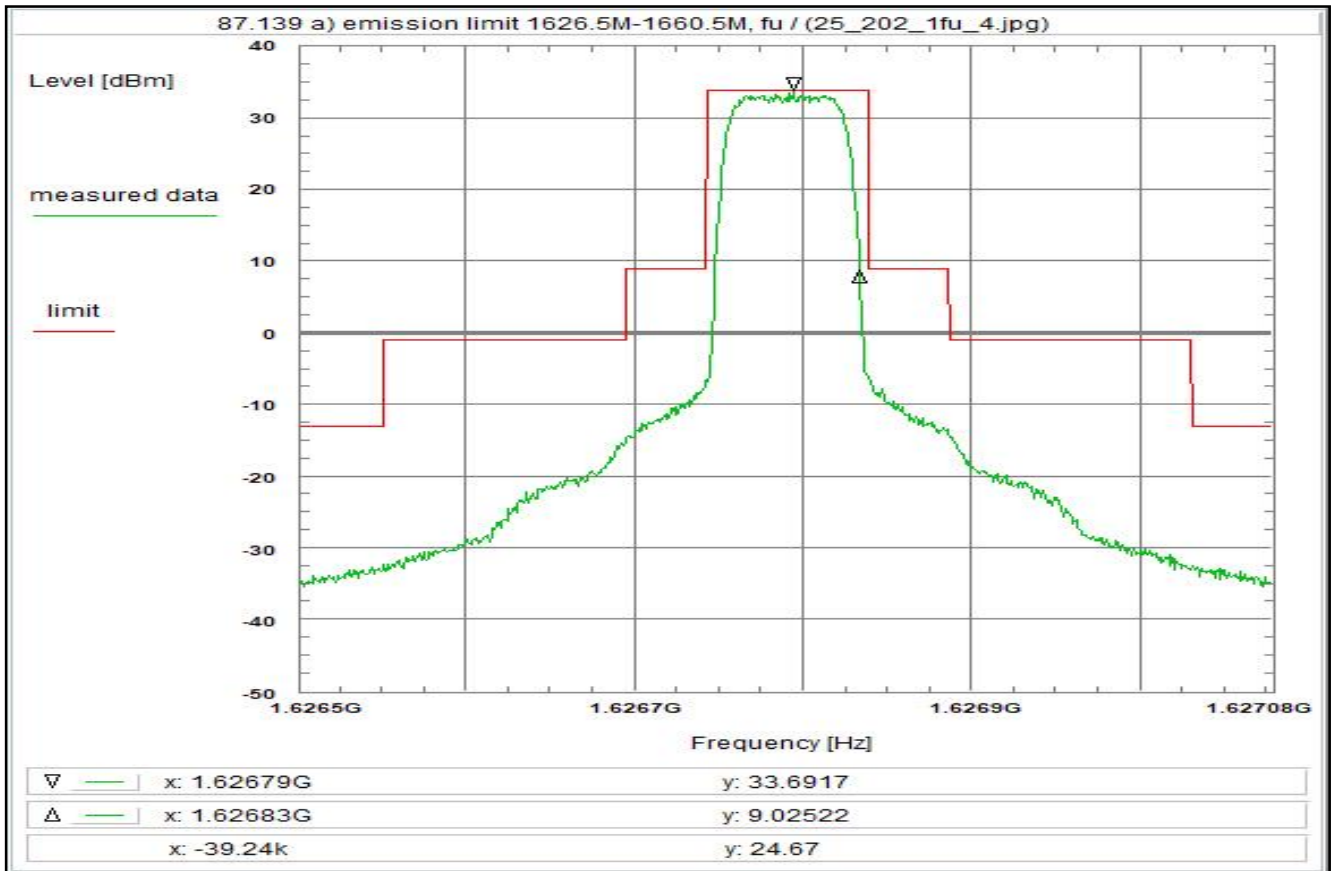
Correction:

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 rf-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: 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

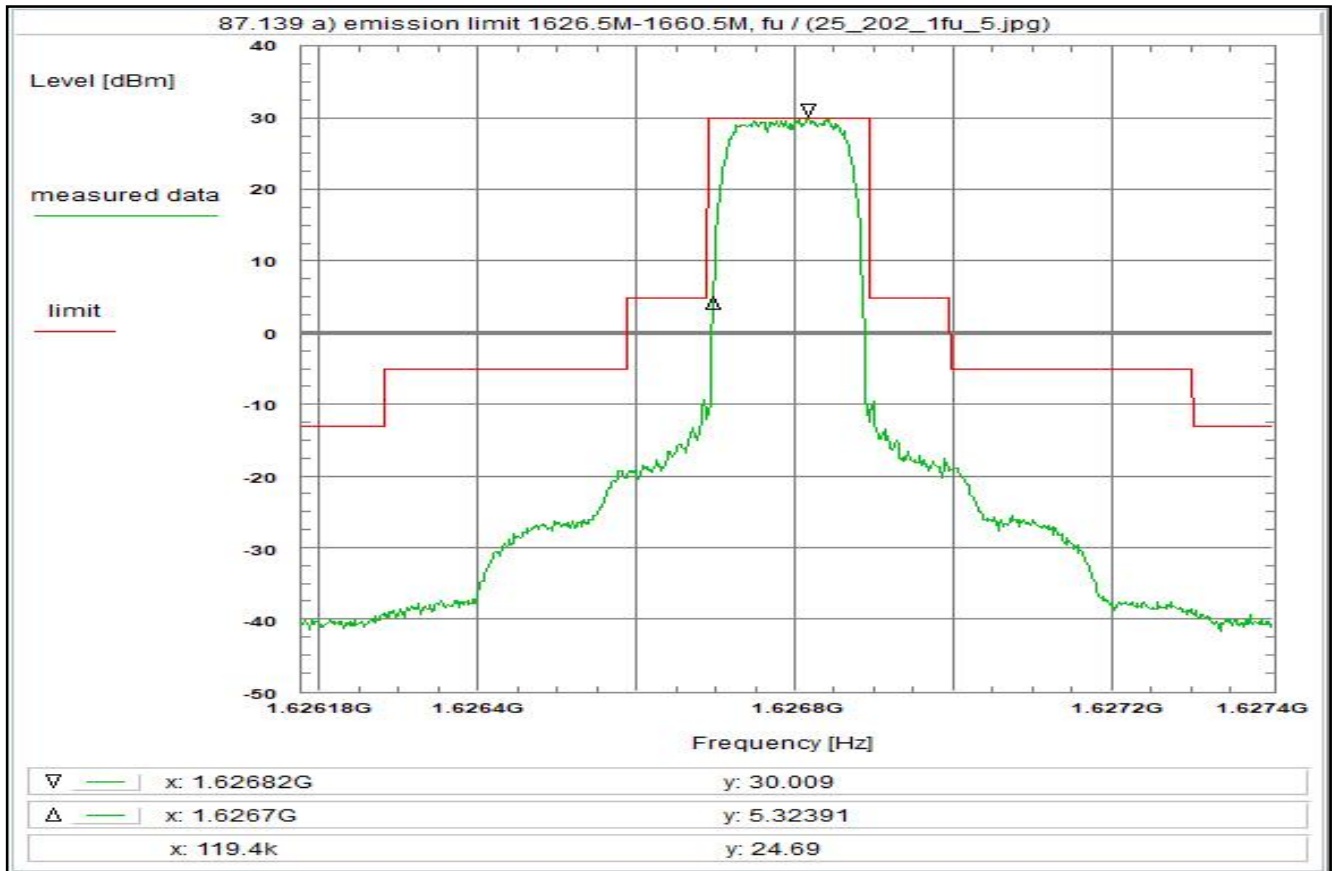
Correction:

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 rf-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: R5T4.5Q-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

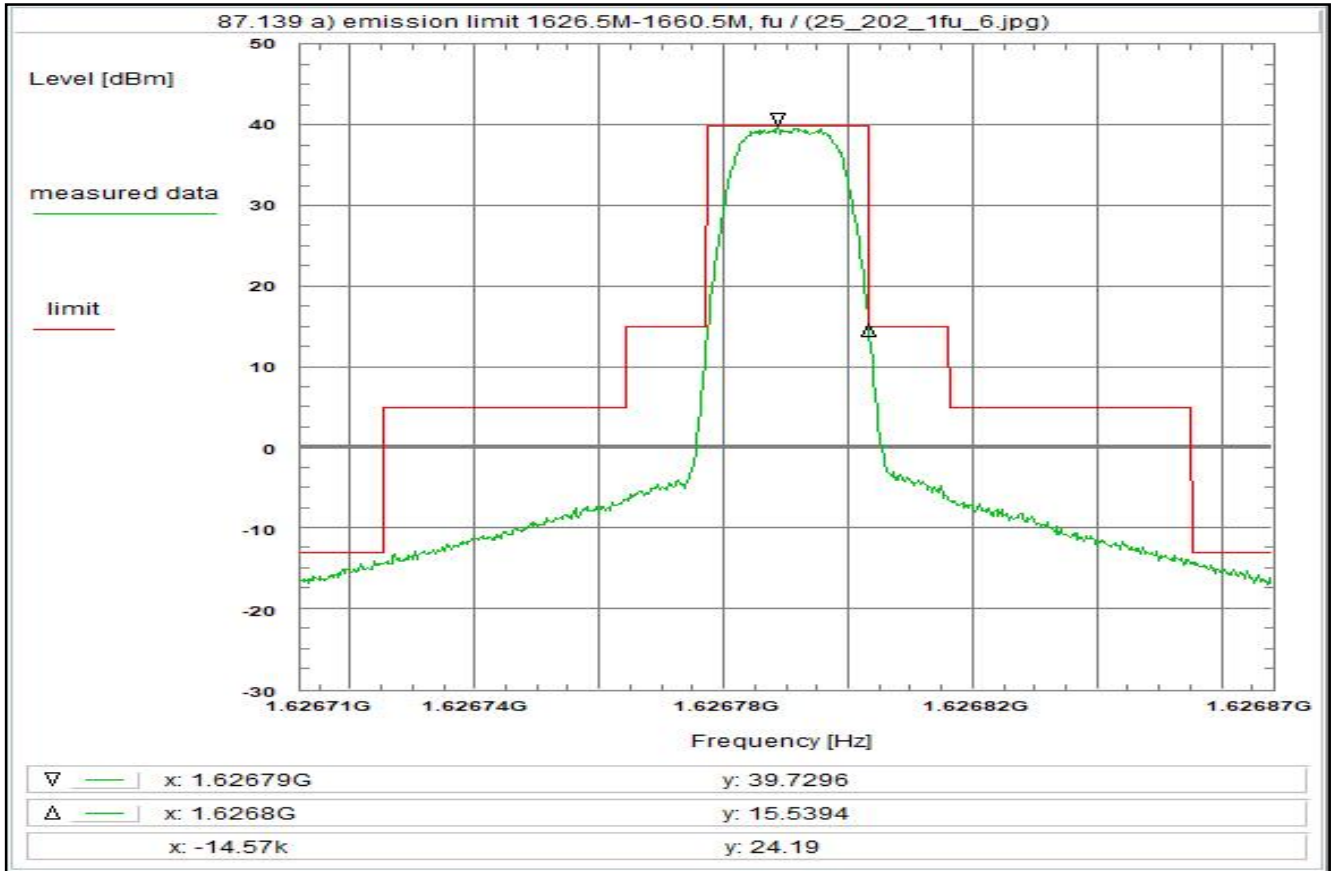
Correction:

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 rf-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

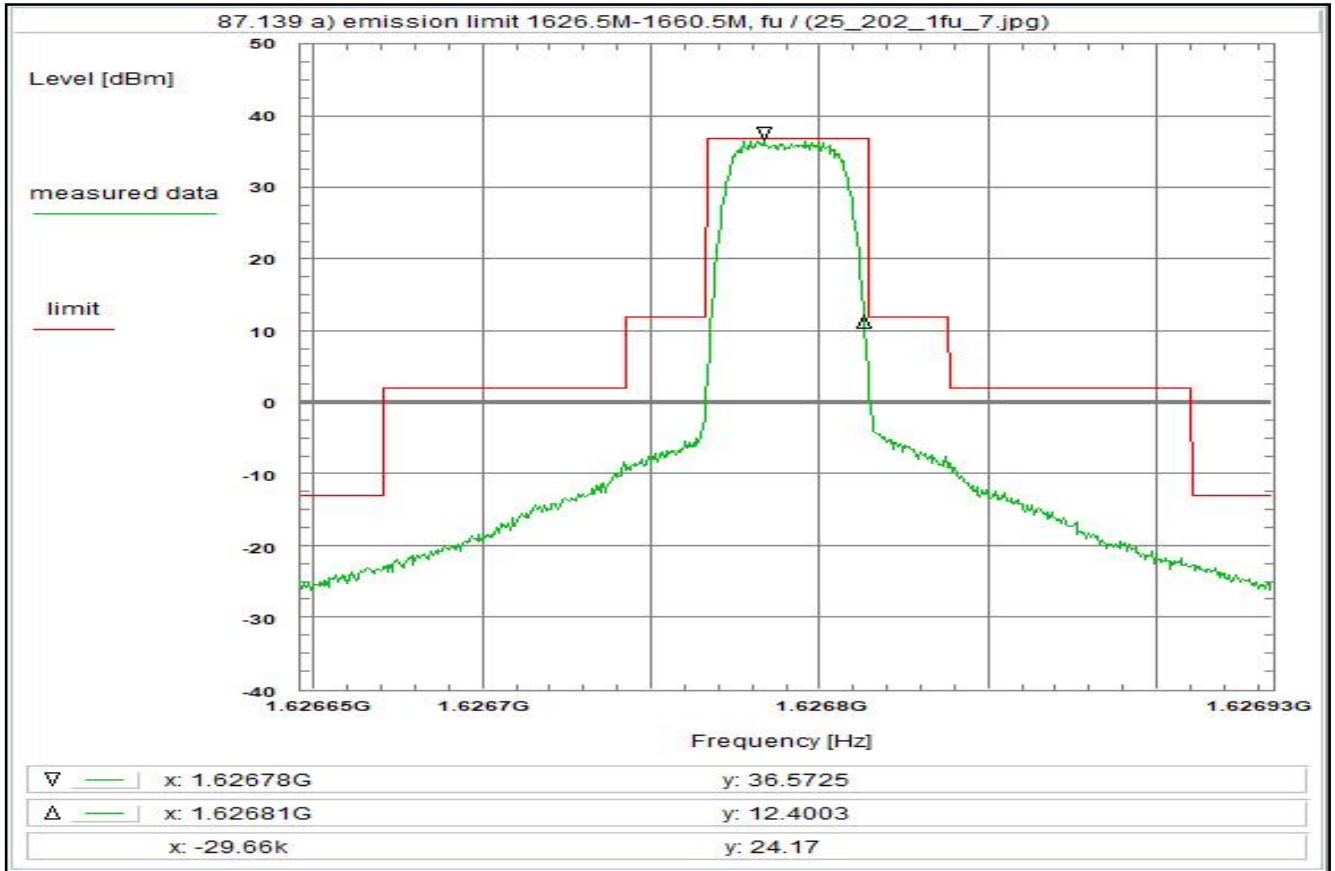
Correction:

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 rf-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

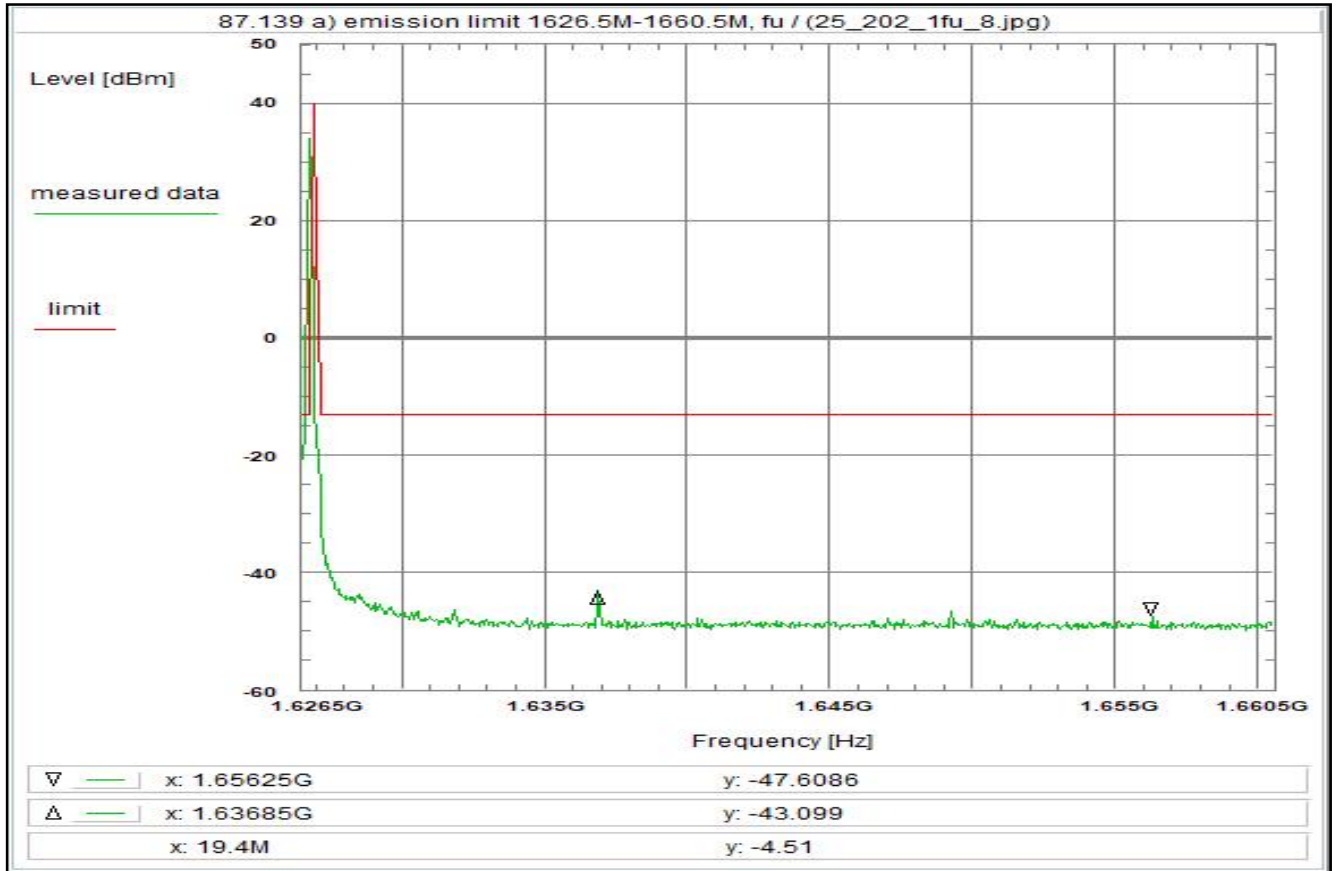
Correction:

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 rf-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

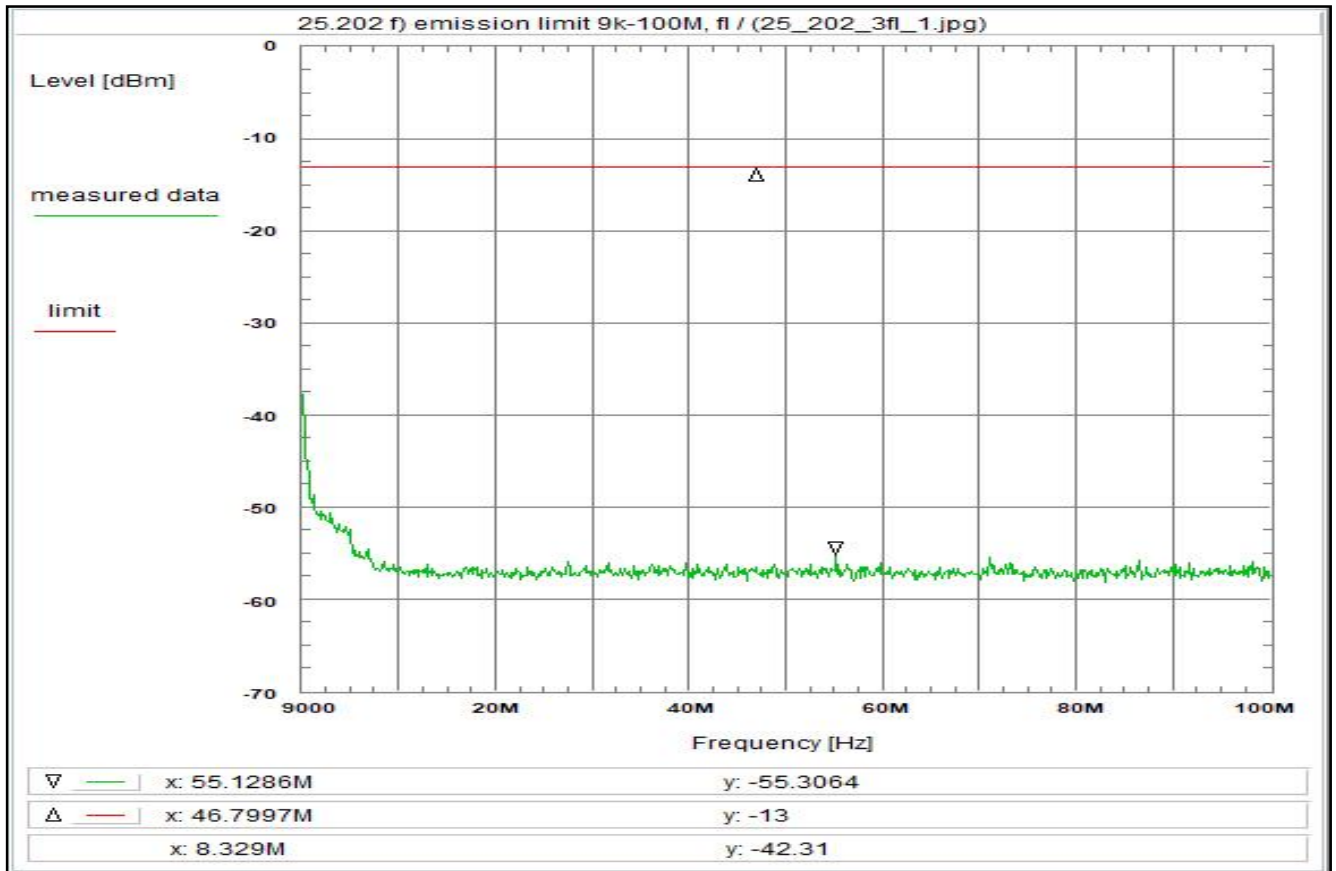
Correction:

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 rf-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:

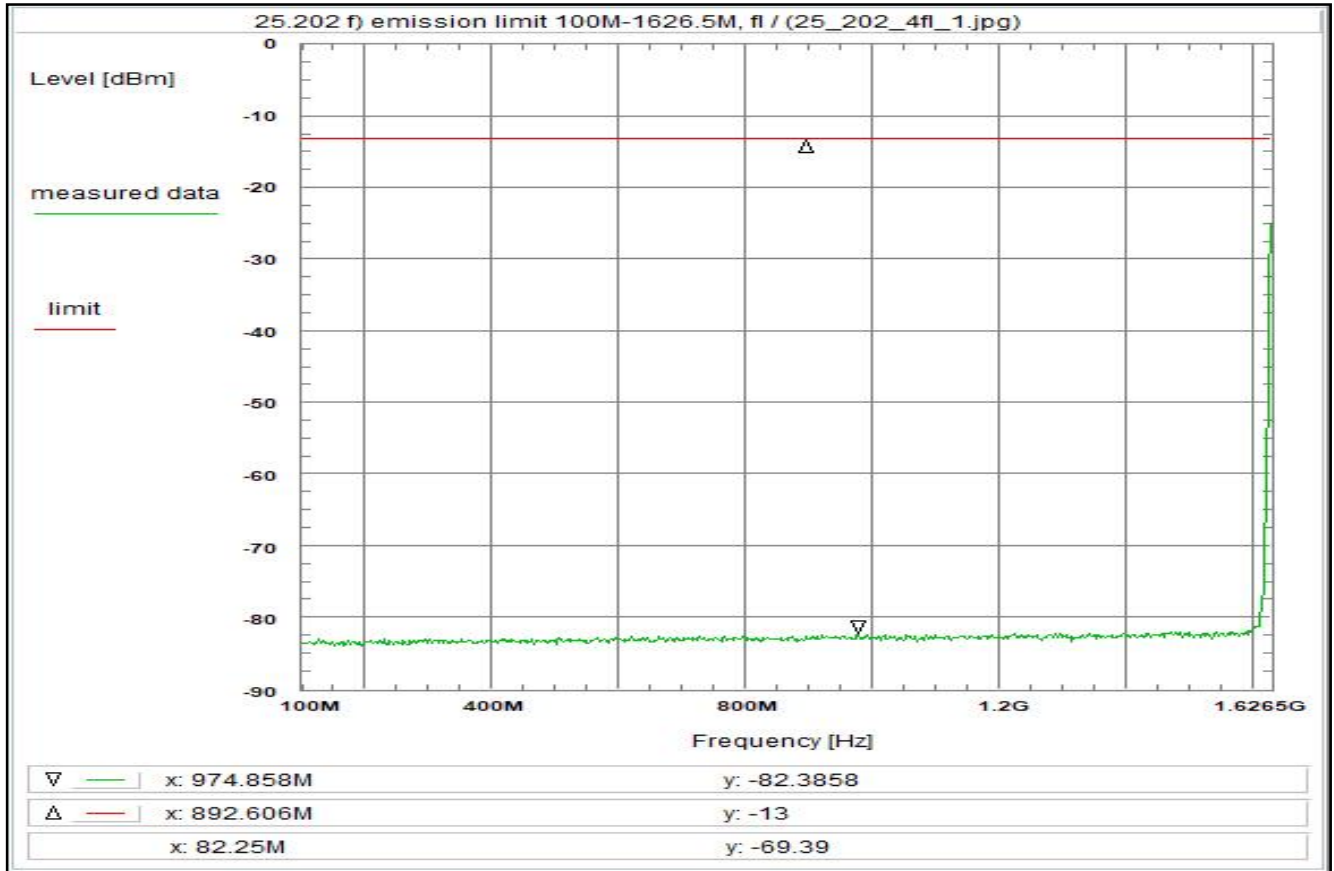
Directional coupler + 0.0 dB
Coaxial cable (C220) + 0.2 dB
DUT-Antenna + 11.3 dBi
Test antenna + 0.0 dB
BW correction factor (1k -> 4k) + 6.0 dB
(U317) + 9.6 dB
TOTAL CORRECTION: + 27.1 dB

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 rf-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 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

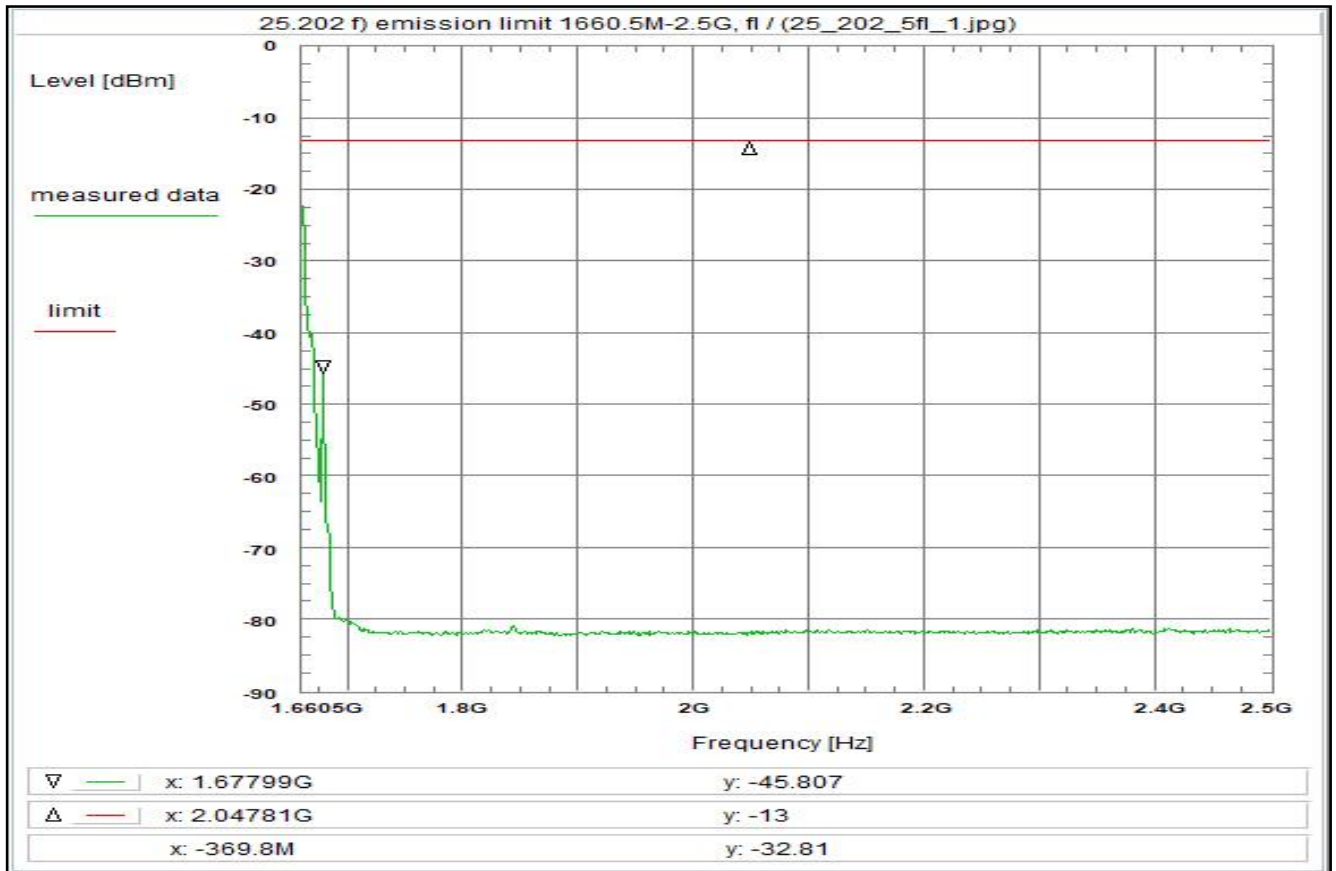
Correction:

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 rf-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 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:

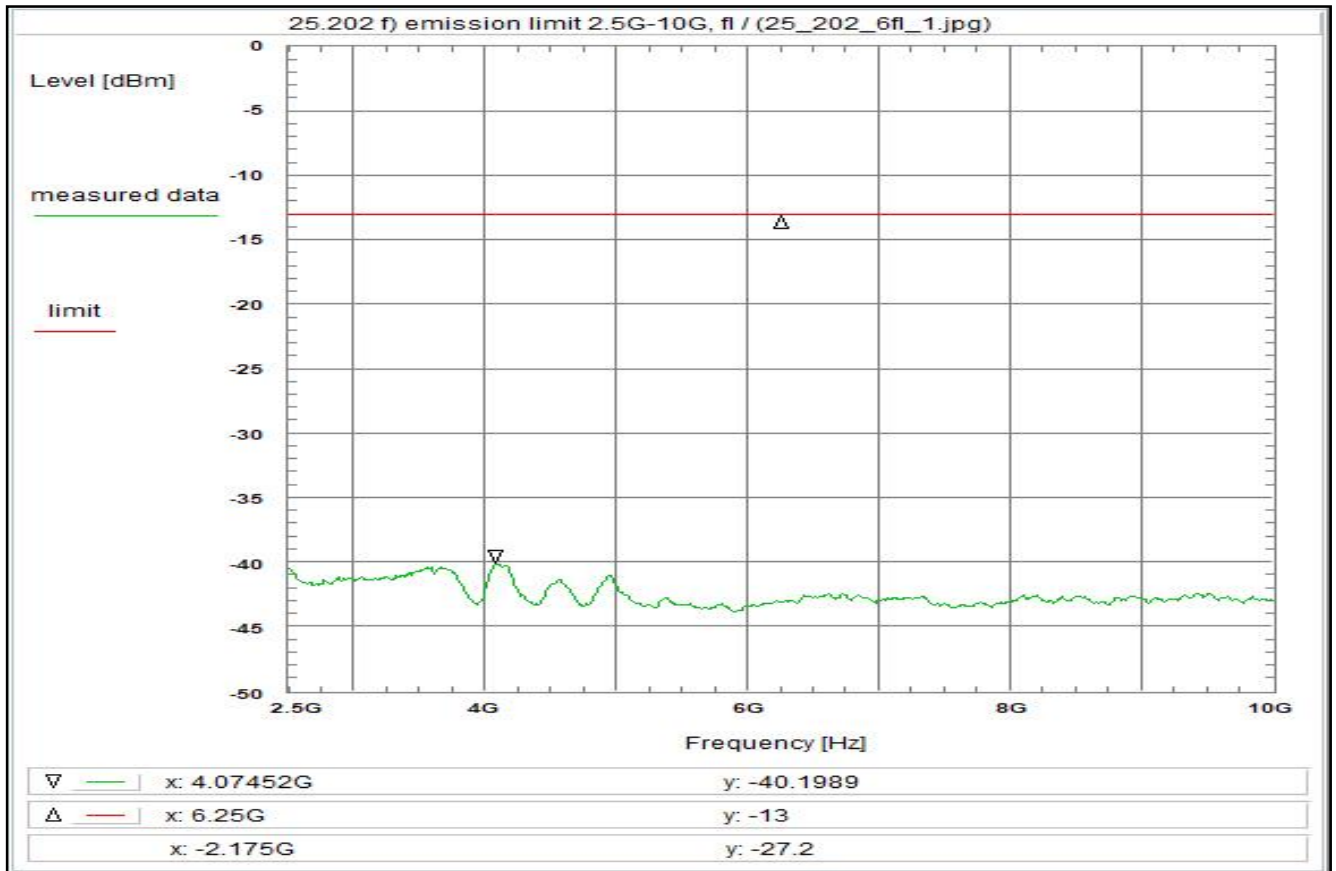
Directional coupler + 0.0 dB
Coaxial cable (C220) + 1.0 dB
DUT-Antenna (on-axis) + 11.3 dB
Test antenna + 0.0 dB
BW correction factor (10k -> 4k) - 4.0 dB
Atten. between HPA and feedhorn - 0.0 dB
(U317) + 10.9 dB
TOTAL CORRECTION: + 19.2 dB

Remarks:

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

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 rf-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, 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

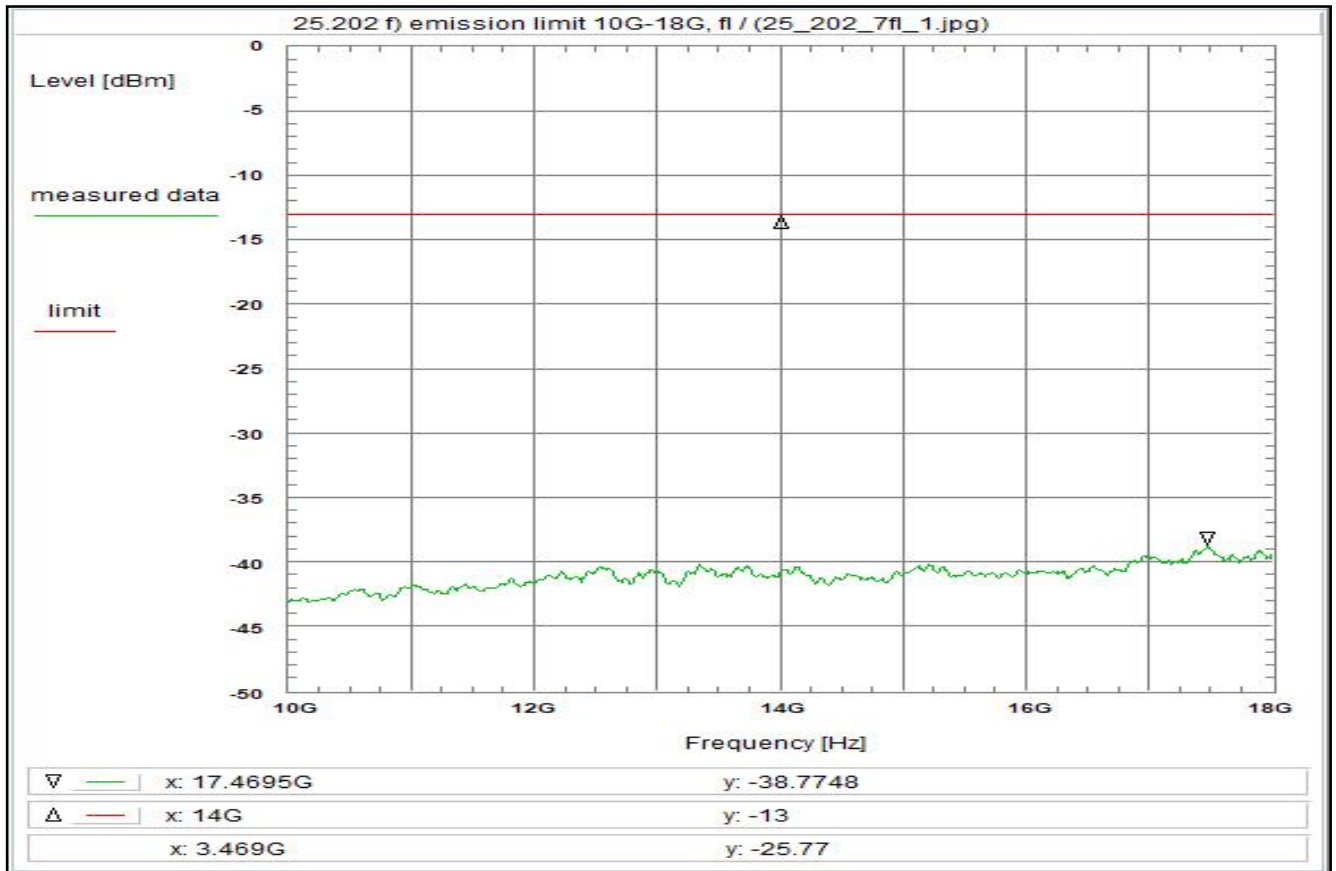
Correction:

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:

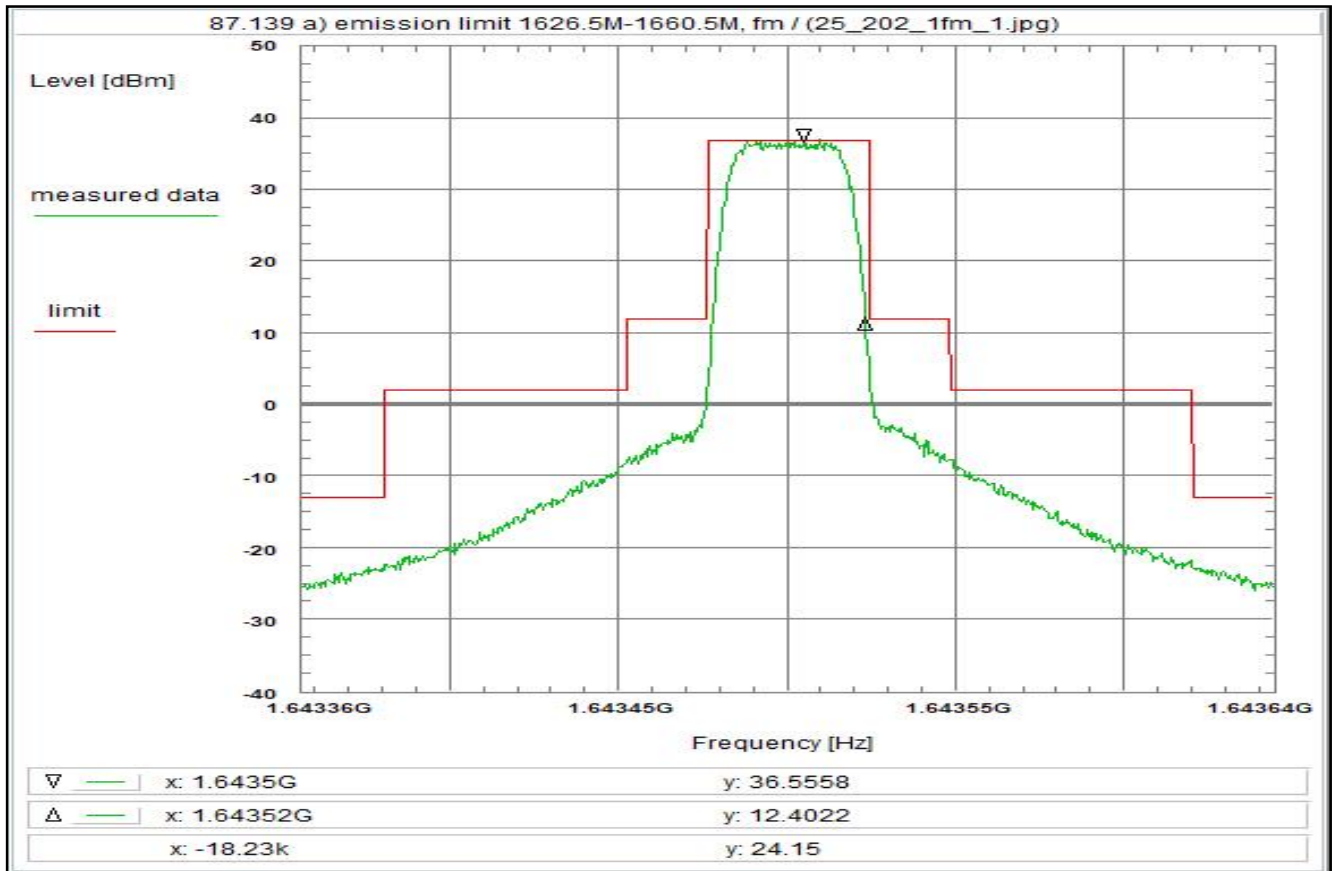
Carrier-on state / Carrier at the lower edge of the band (fl)

Plot No. 34



<p><u>Subclause:</u> 25.202 f) Frequencies, frequency tolerance and emission limitations Emission limitations Modulated rf-carrier at the lower edge of the band (fl)</p> <p><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.</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, U319</p> <p>Remark:</p> <p>Test result: Test passed</p>	<p><u>Environment condition:</u> Date & Time: Tue 13/Oct/2020 16:16:52 Location: CTC advanced GmbH, Laboratory RC-SYS Temperature: 22 °C Humidity: 55 % Voltage: 24 Vdc</p> <p><u>Setup of measurement equipment:</u> 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</p> <p><u>Correction:</u> 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</p> <p><u>Remarks:</u> Carrier-on state / Carrier at the lower edge of the band (fl)</p>
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Plot No. 35



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: 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 12:33:33
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

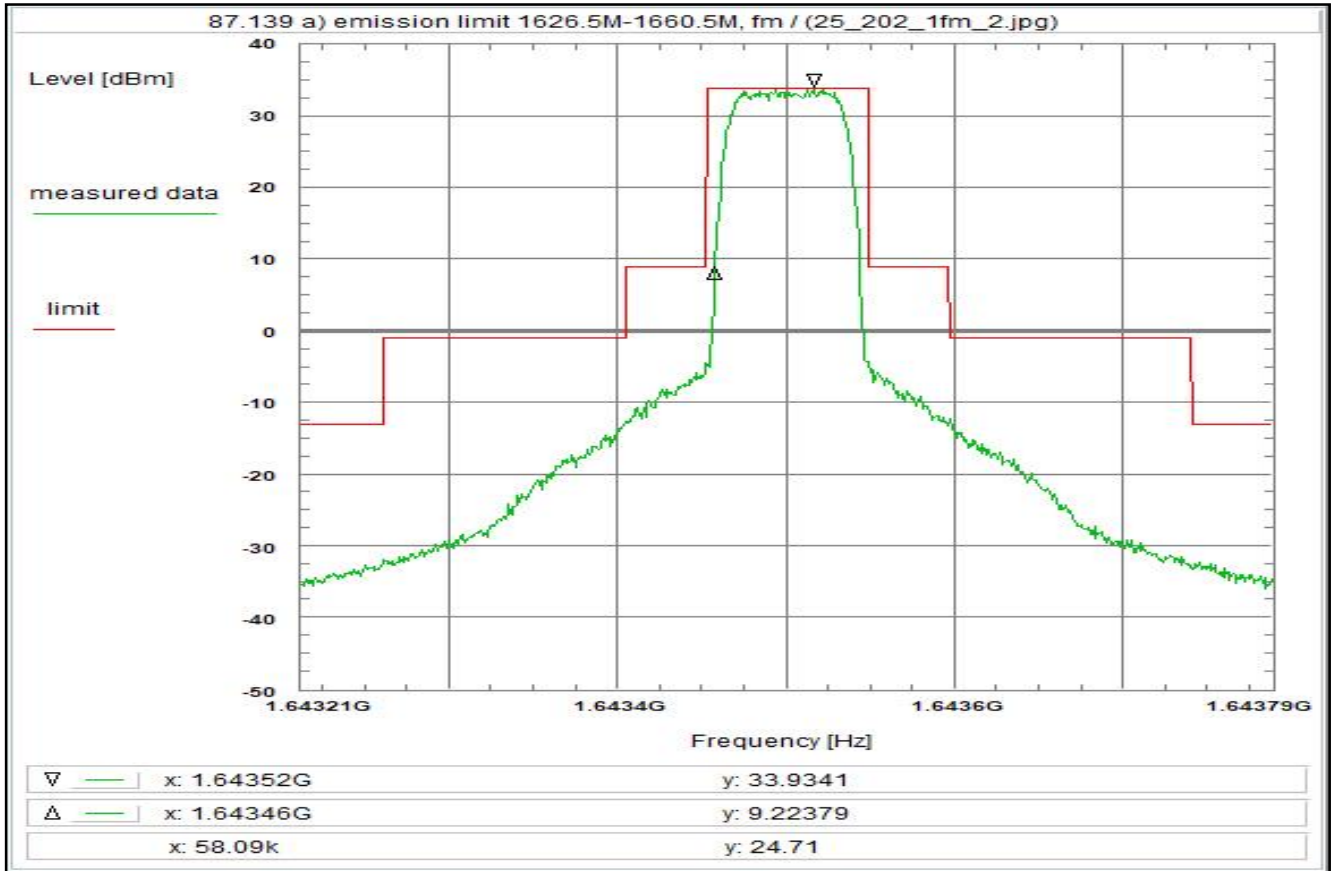
Correction:

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. 36



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: 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

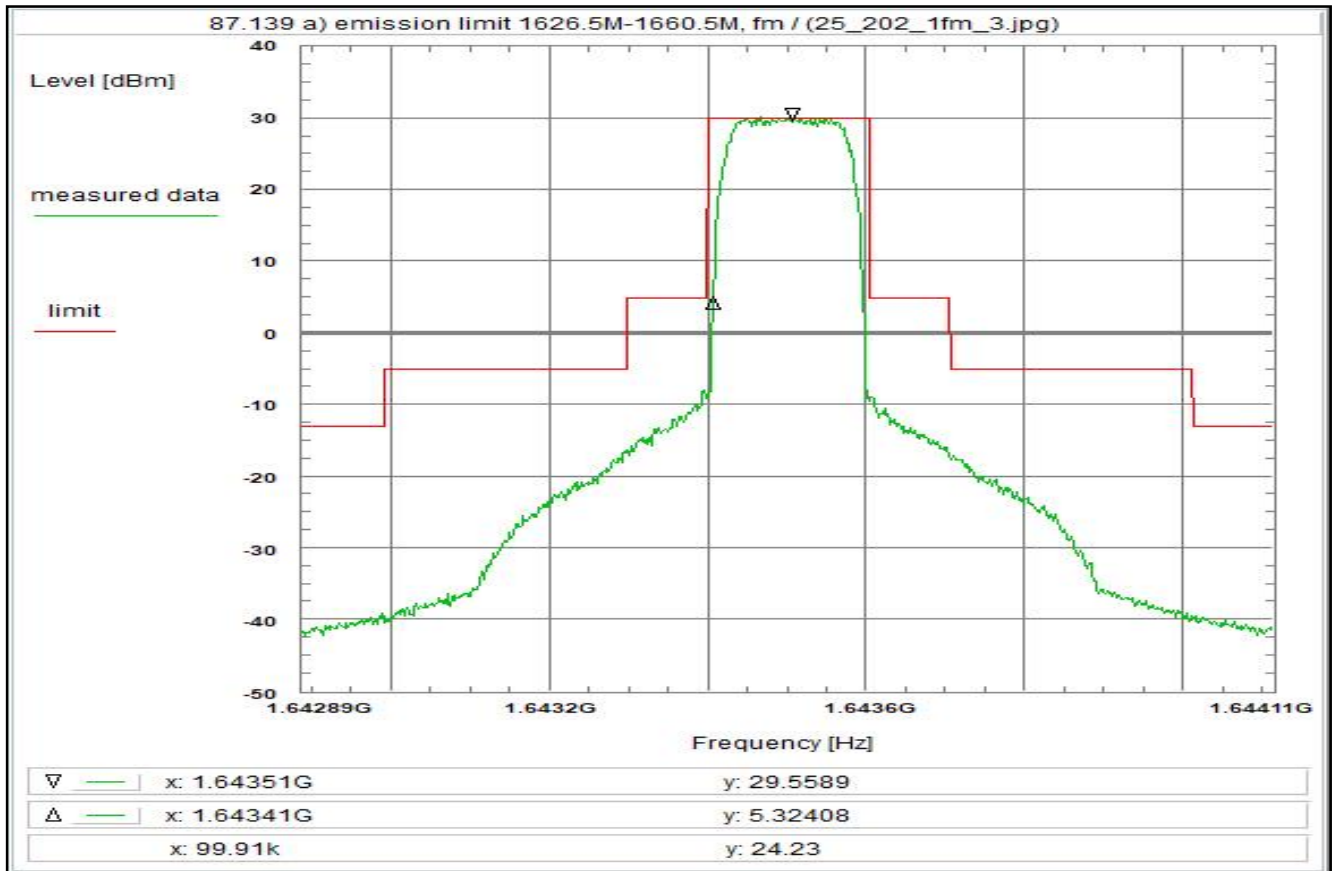
Correction:

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 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: R5T4.5X-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

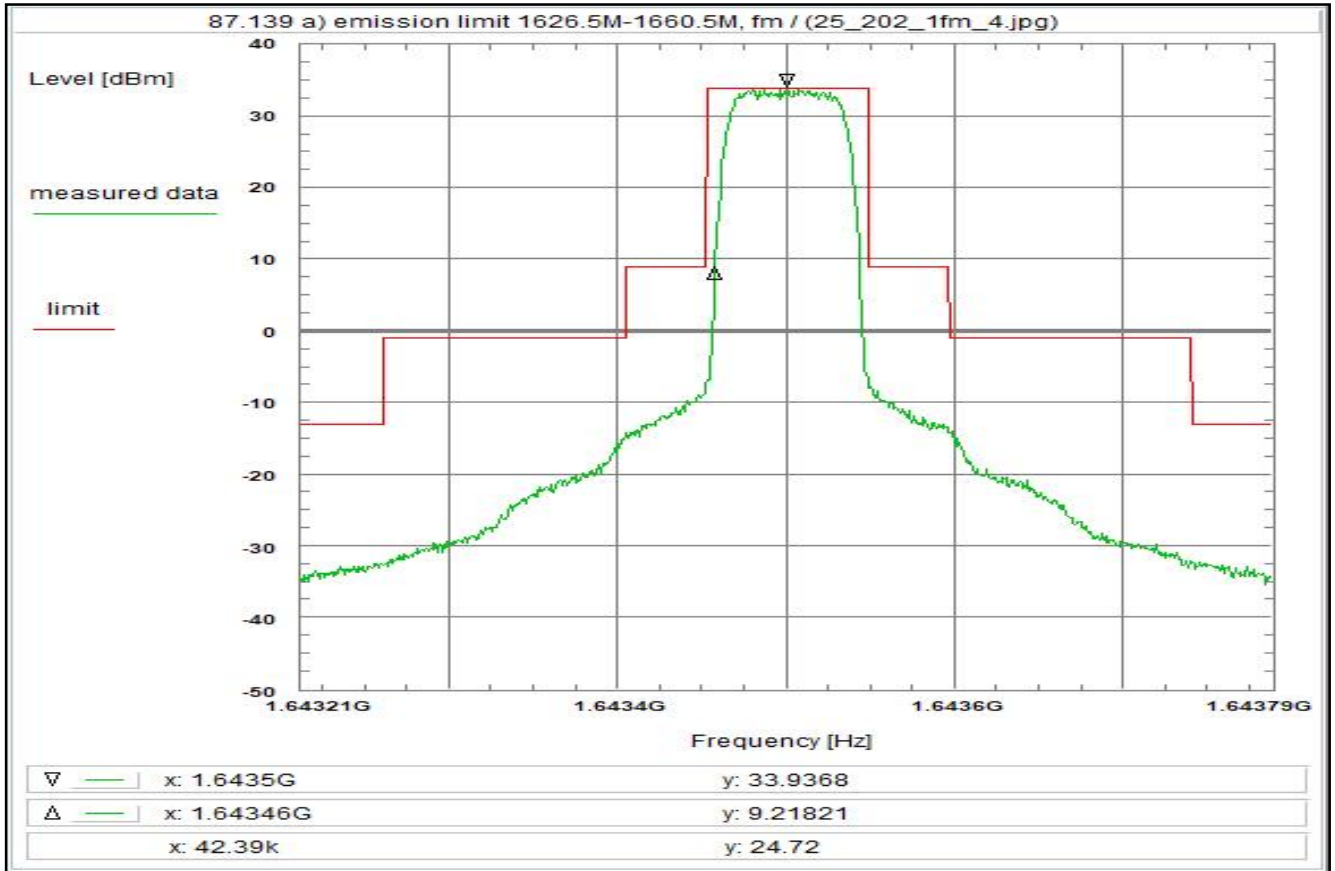
Correction:

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 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: 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

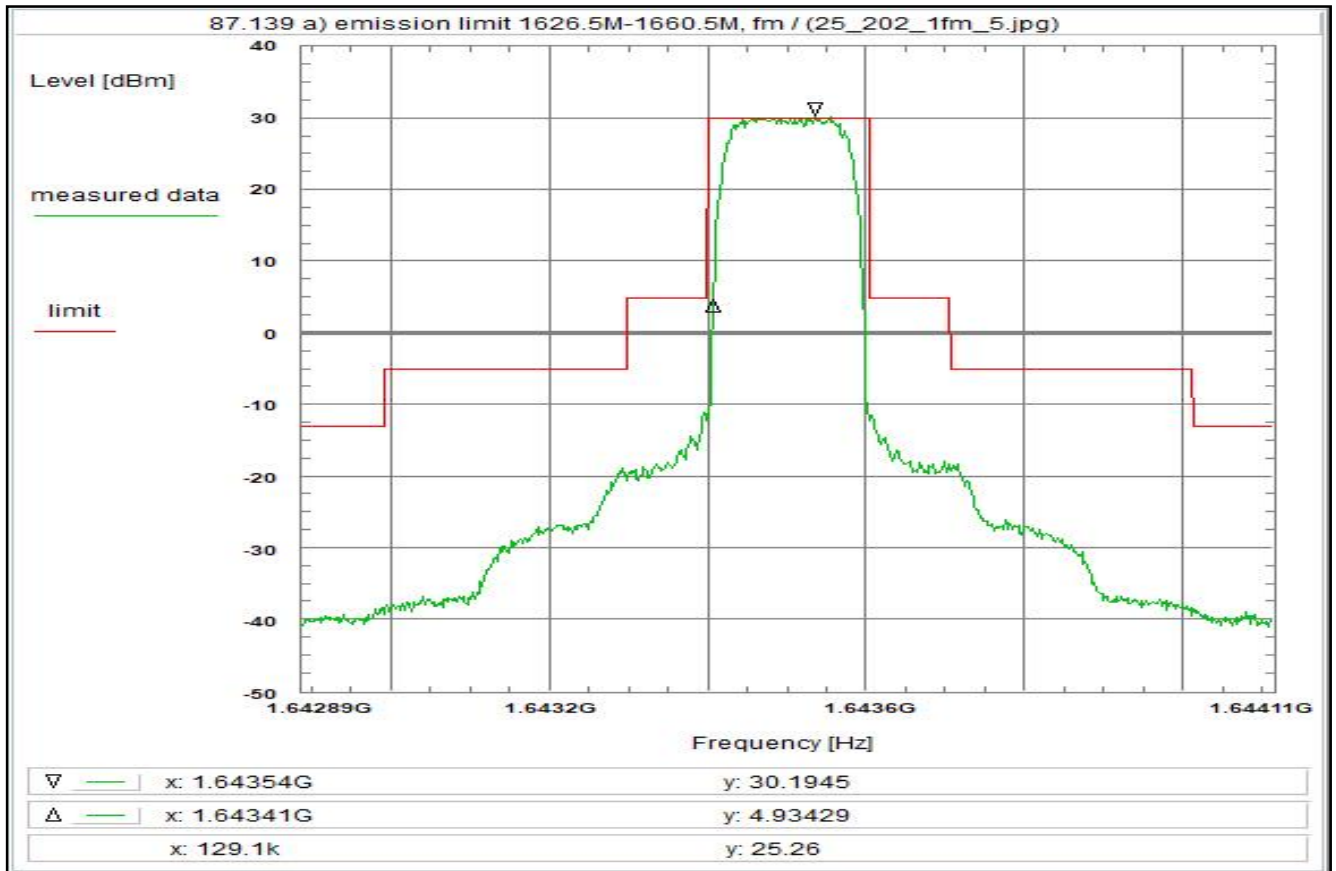
Correction:

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

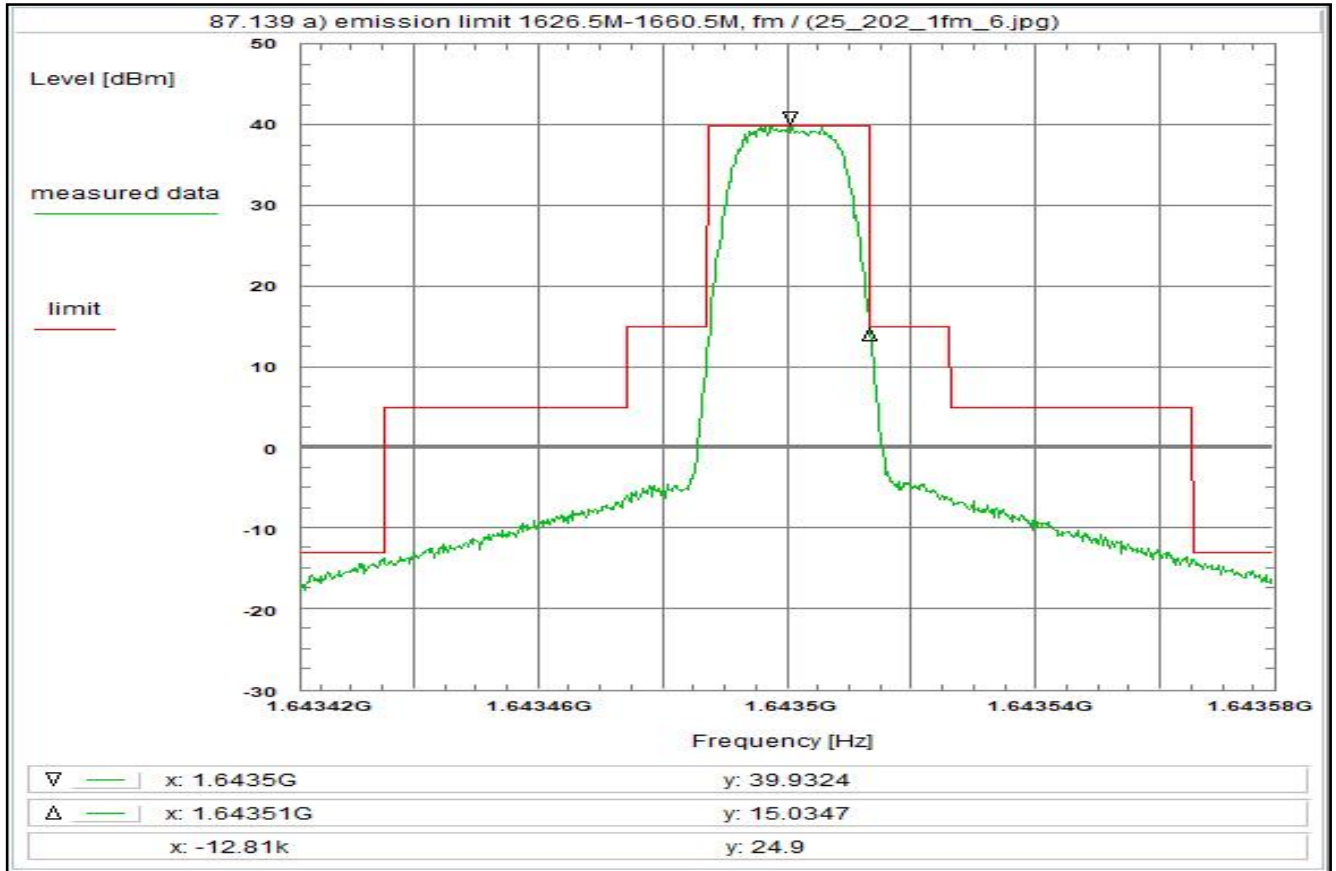
Correction:

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 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: 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

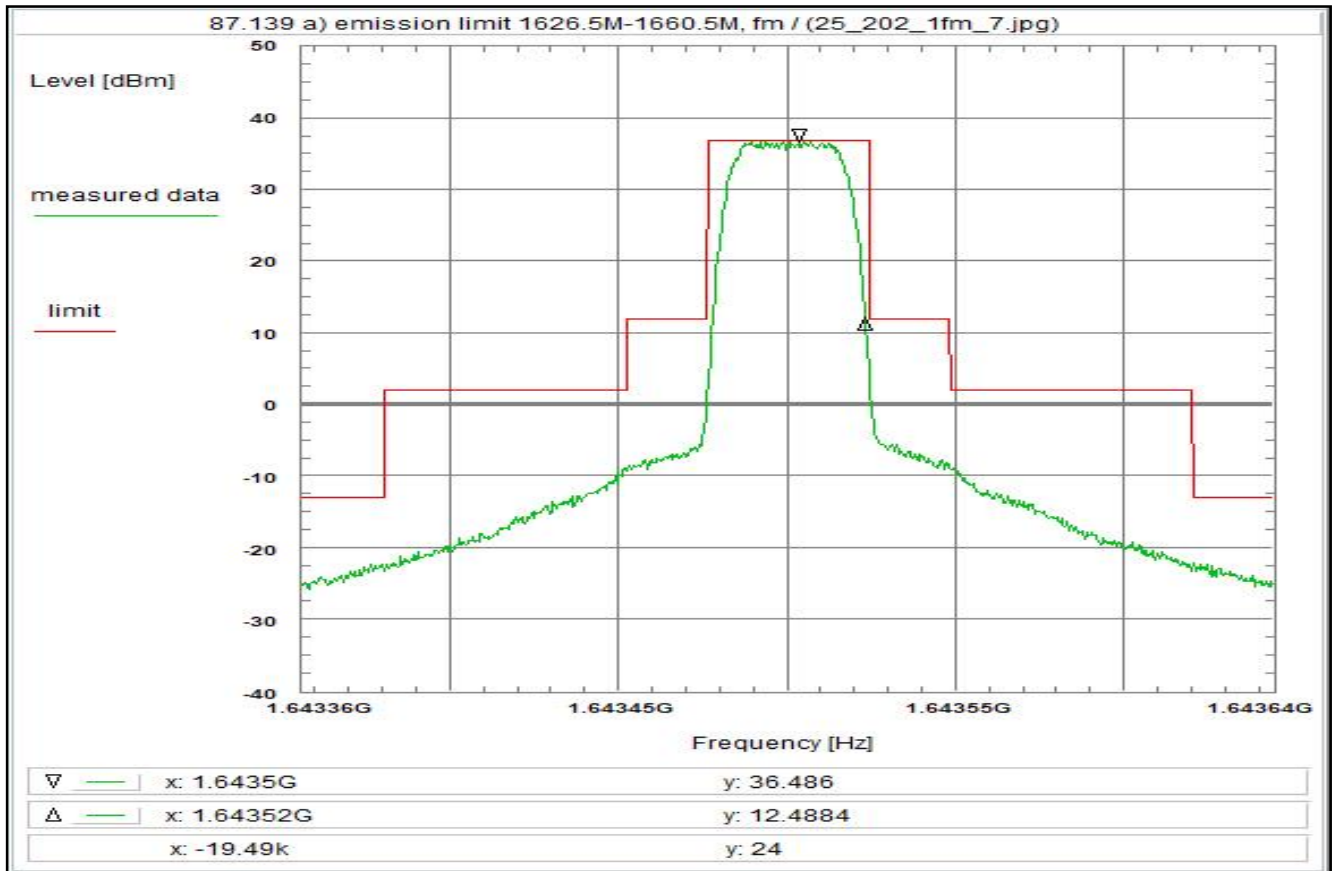
Correction:

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 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: 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

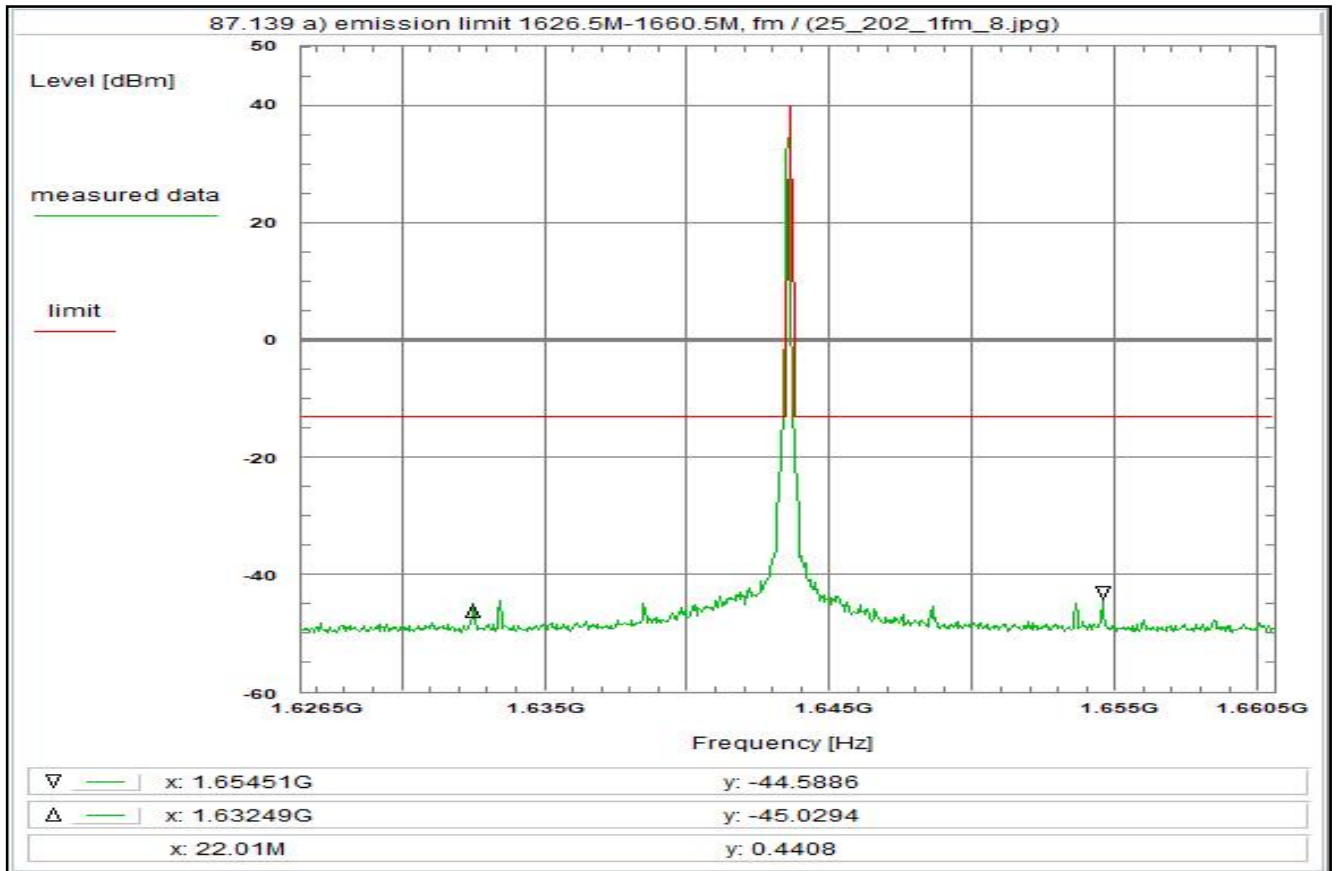
Correction:

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 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: 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

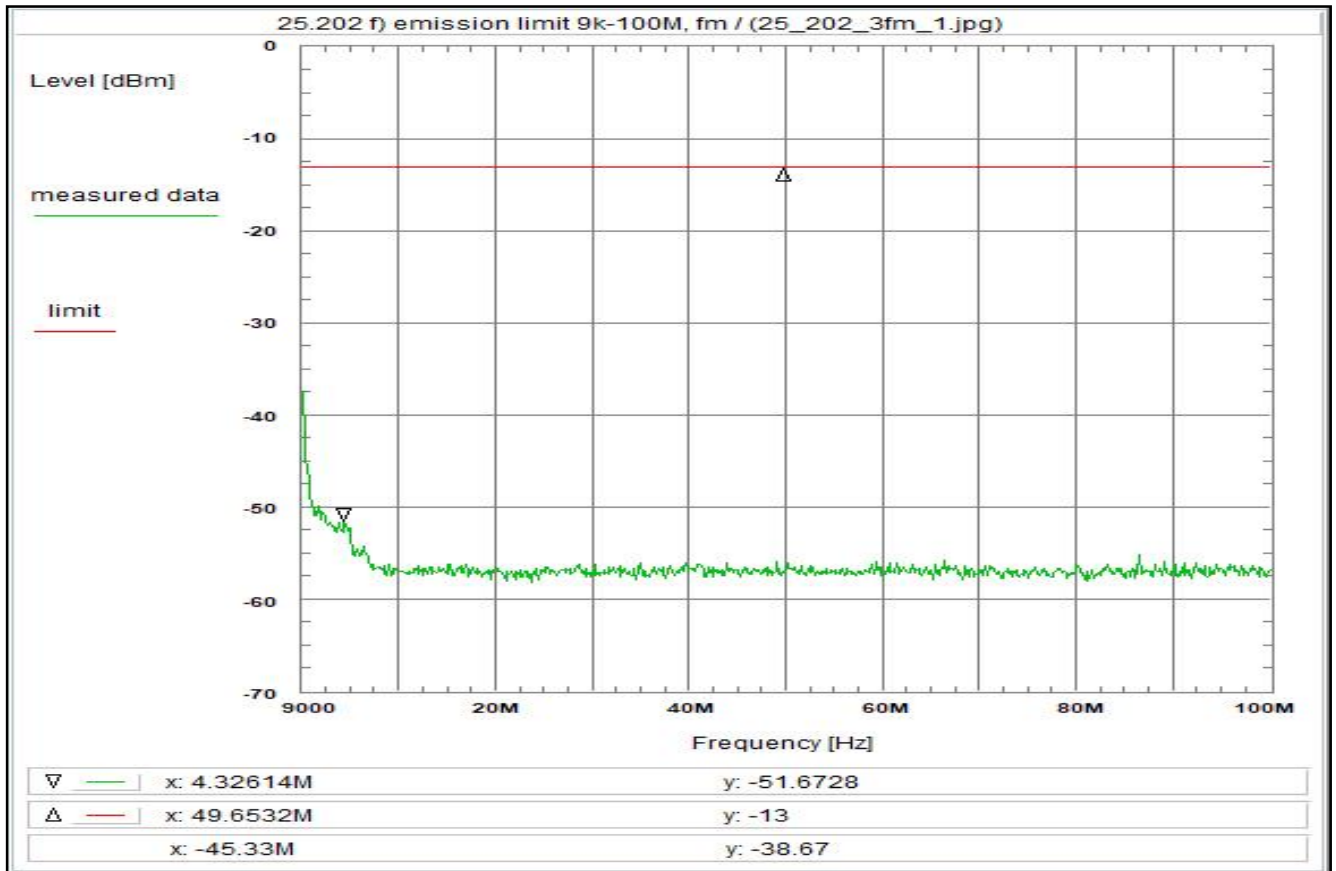
Correction:

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 rf-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:

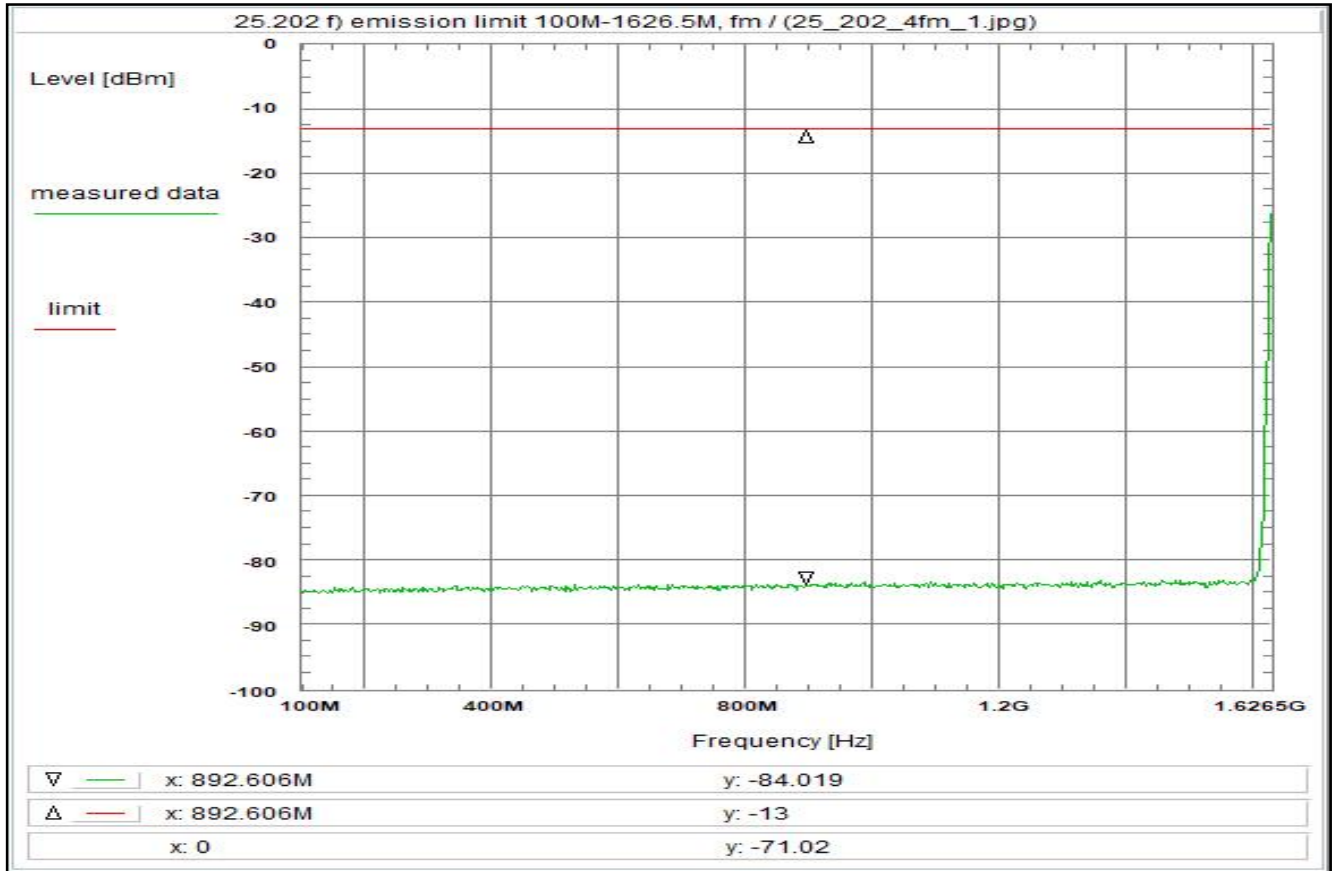
Directional coupler + 0.0 dB
Coaxial cable (C220) + 0.2 dB
DUT-Antenna + 11.3 dBi
Test antenna + 0.0 dB
BW correction factor (1k -> 4k) + 6.0 dB
(U317) + 9.6 dB
TOTAL CORRECTION: + 27.1 dB

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 rf-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 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

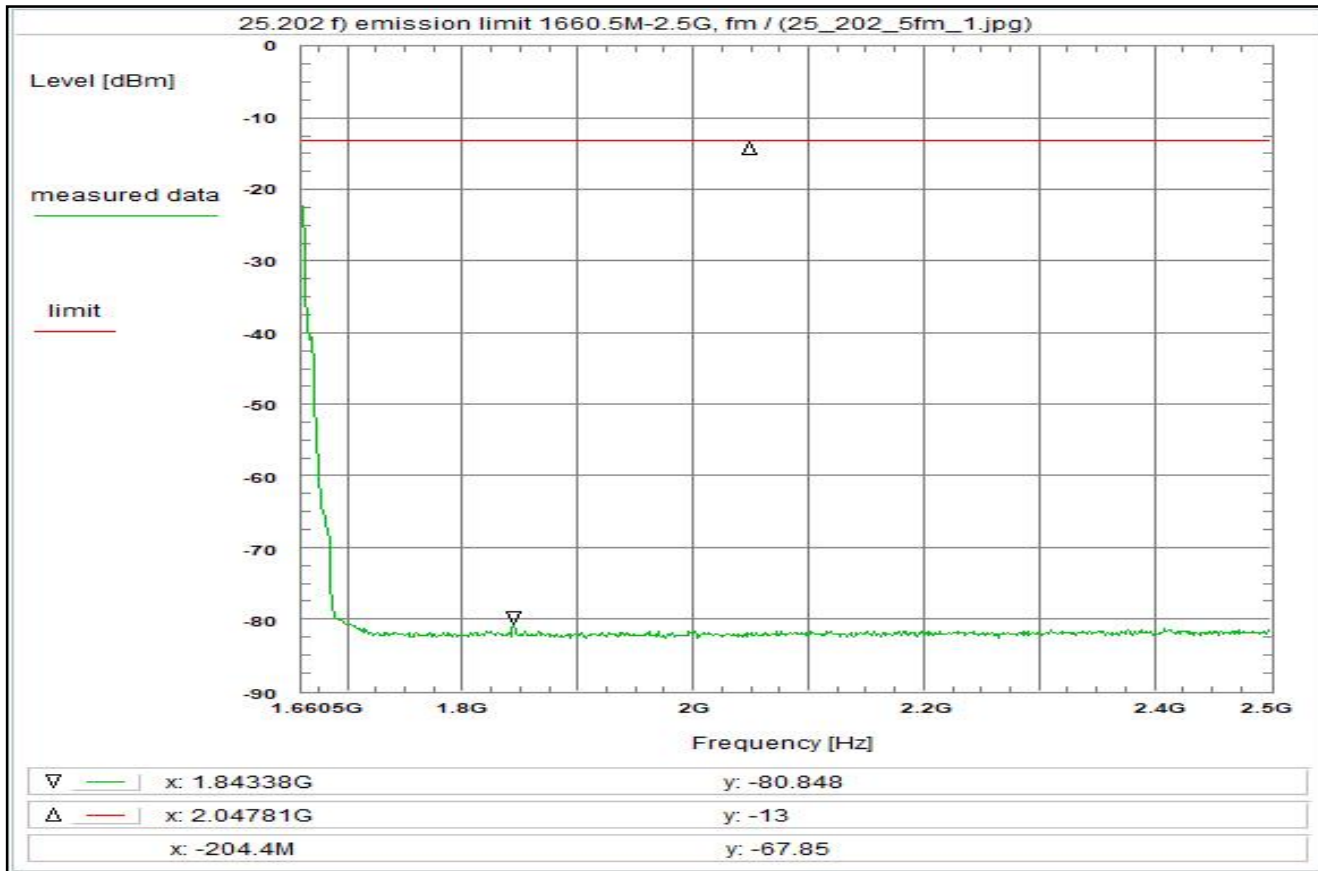
Correction:

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 - 0.0 dB
(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



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-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+10log(Pmax)dBc/4kHz = -43 dBW
The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule.

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

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

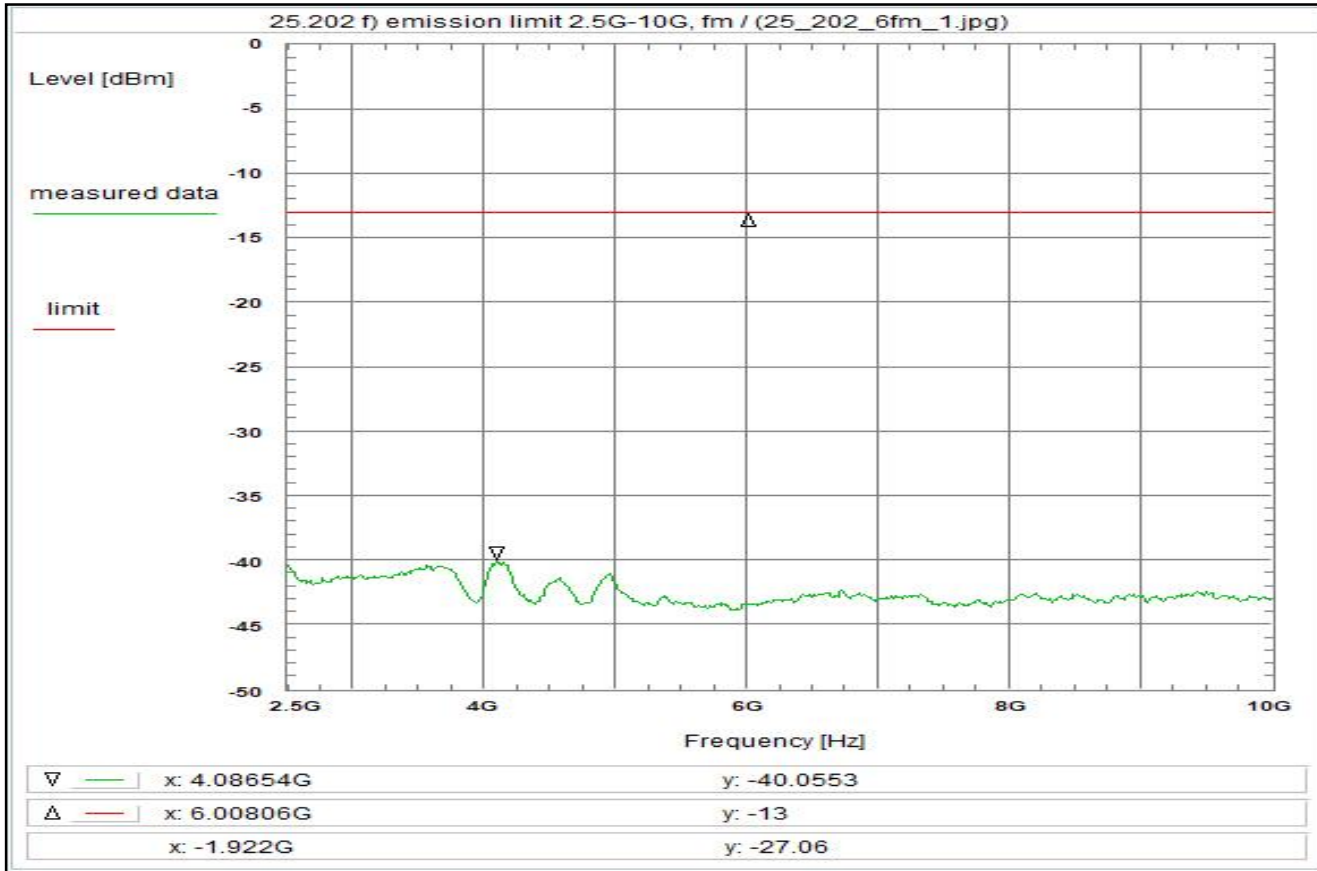
Environment condition:
Date & Time: Tue 13/Oct/2020 17:24:47
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 24 Vdc

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 dB
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 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 rf-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

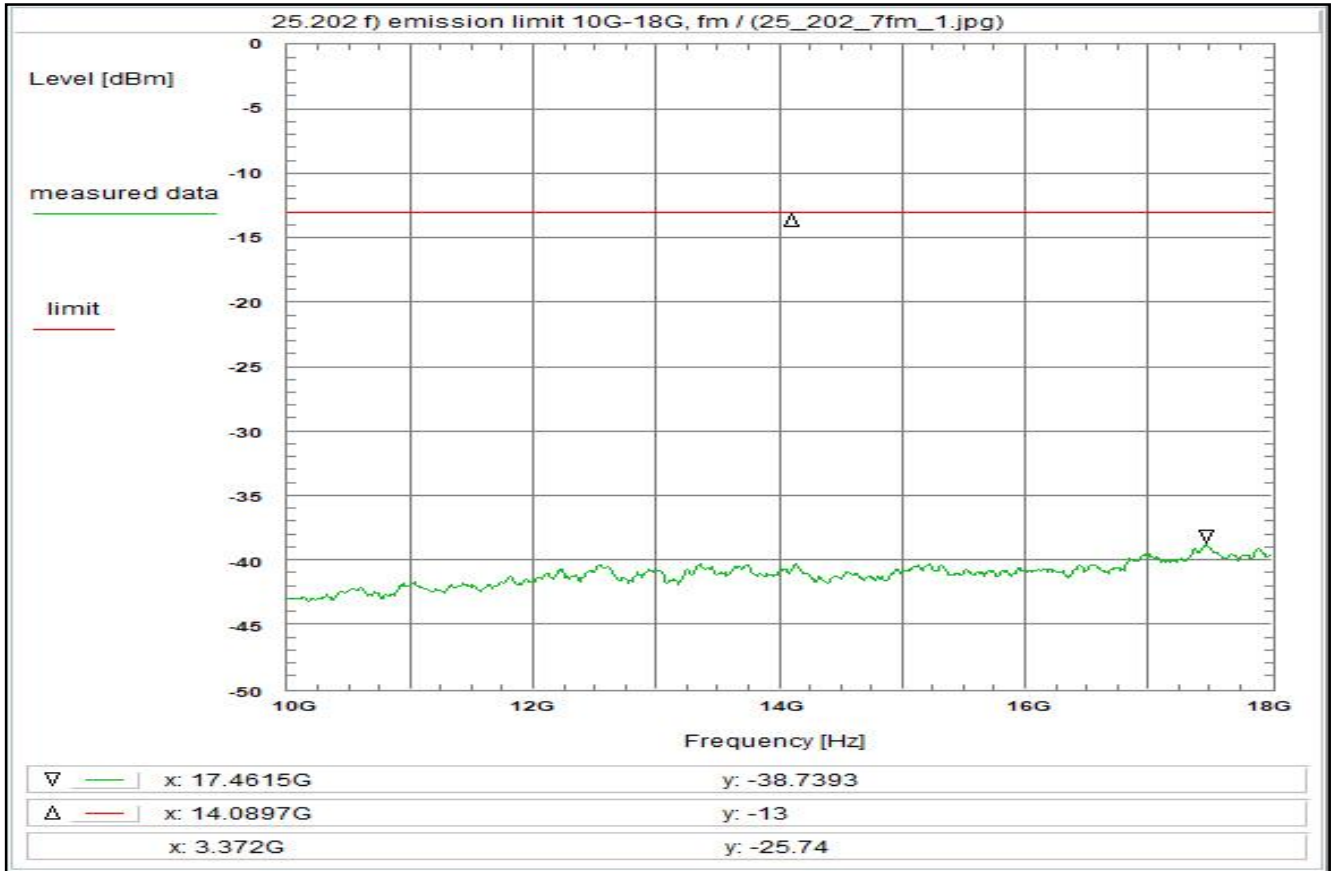
Environment condition:
Date & Time: Tue 13/Oct/2020 16:19:36
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 24 Vdc

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 rf-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 16:18:28
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

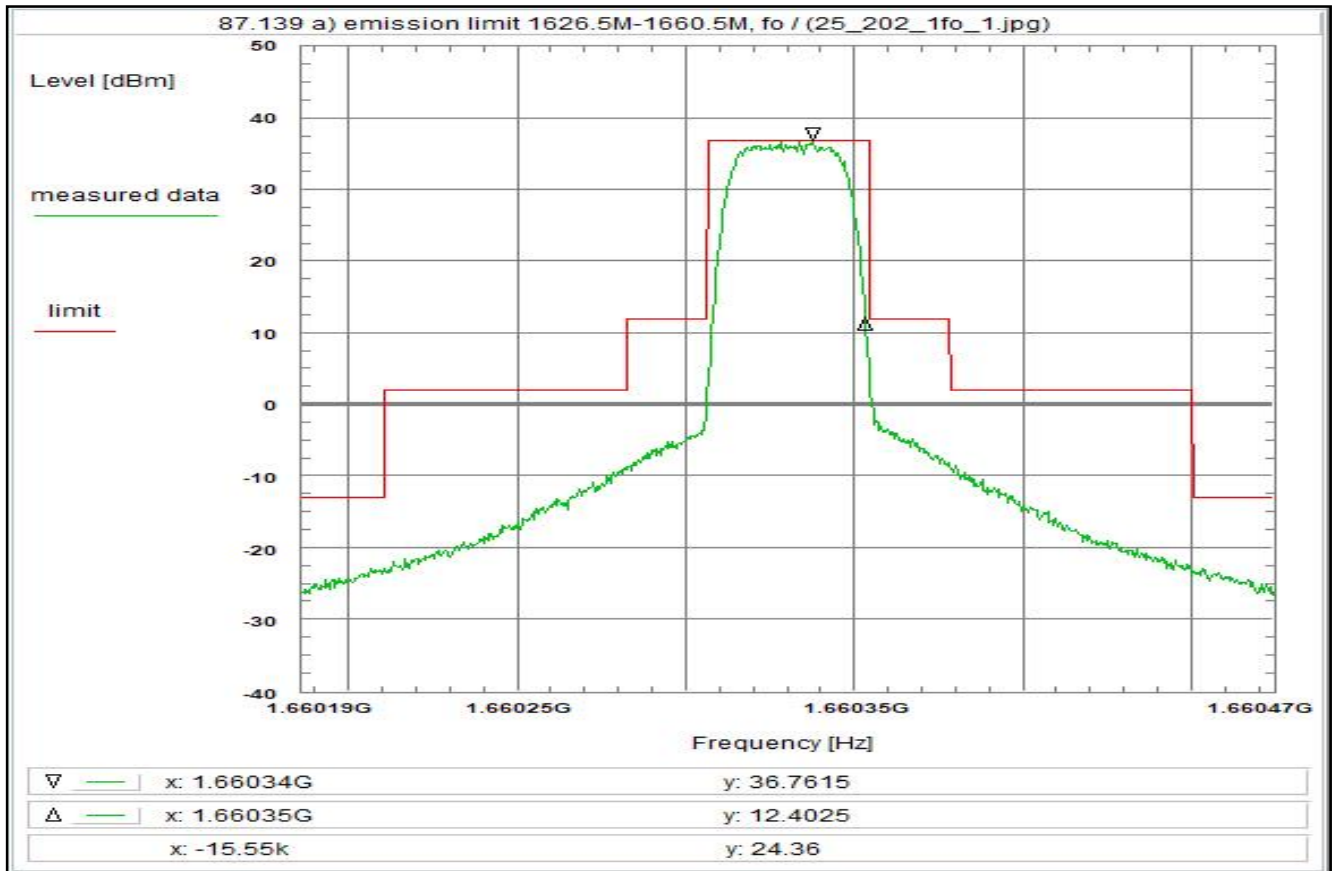
Correction:

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 rf-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: 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

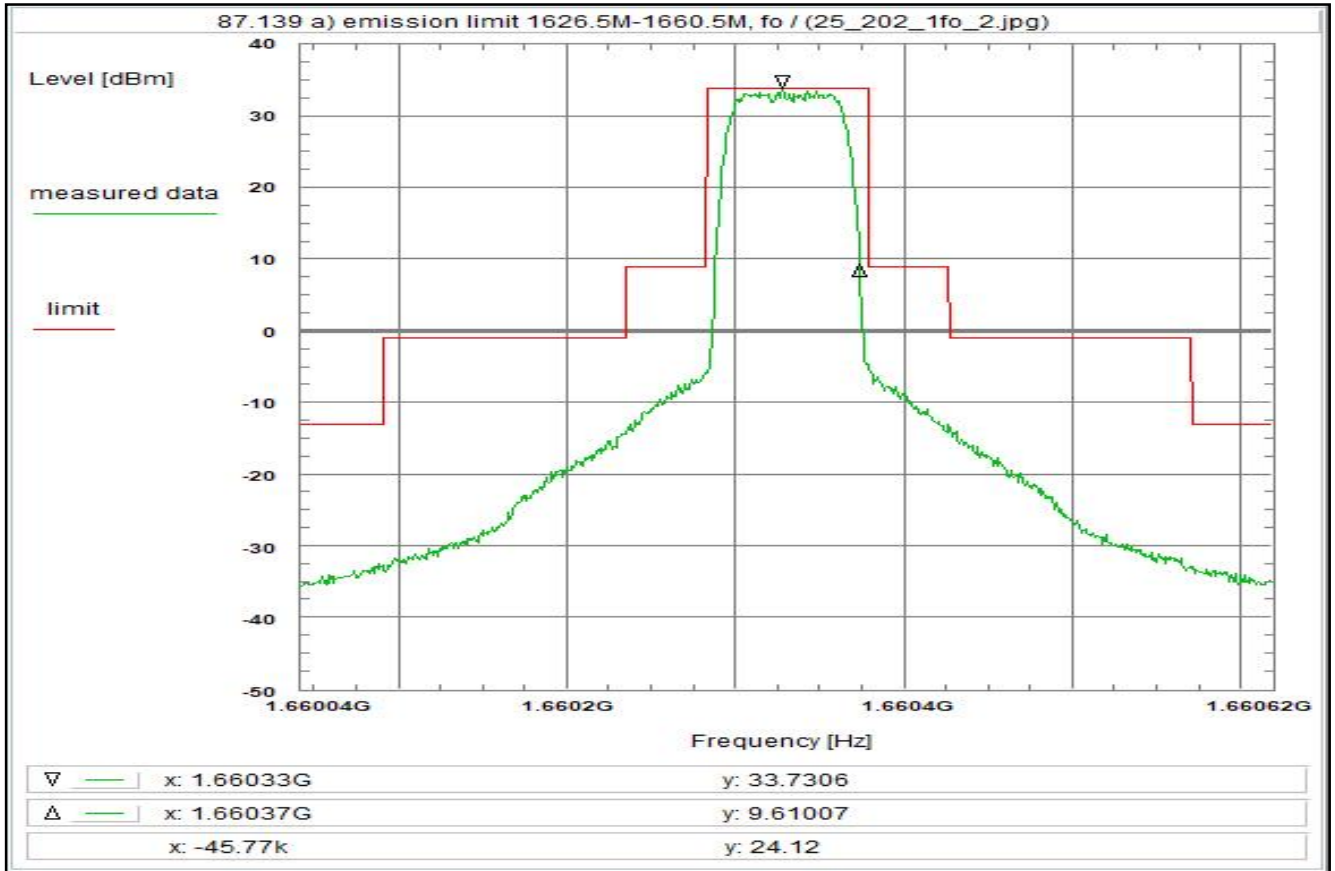
Correction:

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 (fo)

Plot No. 49



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-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: 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

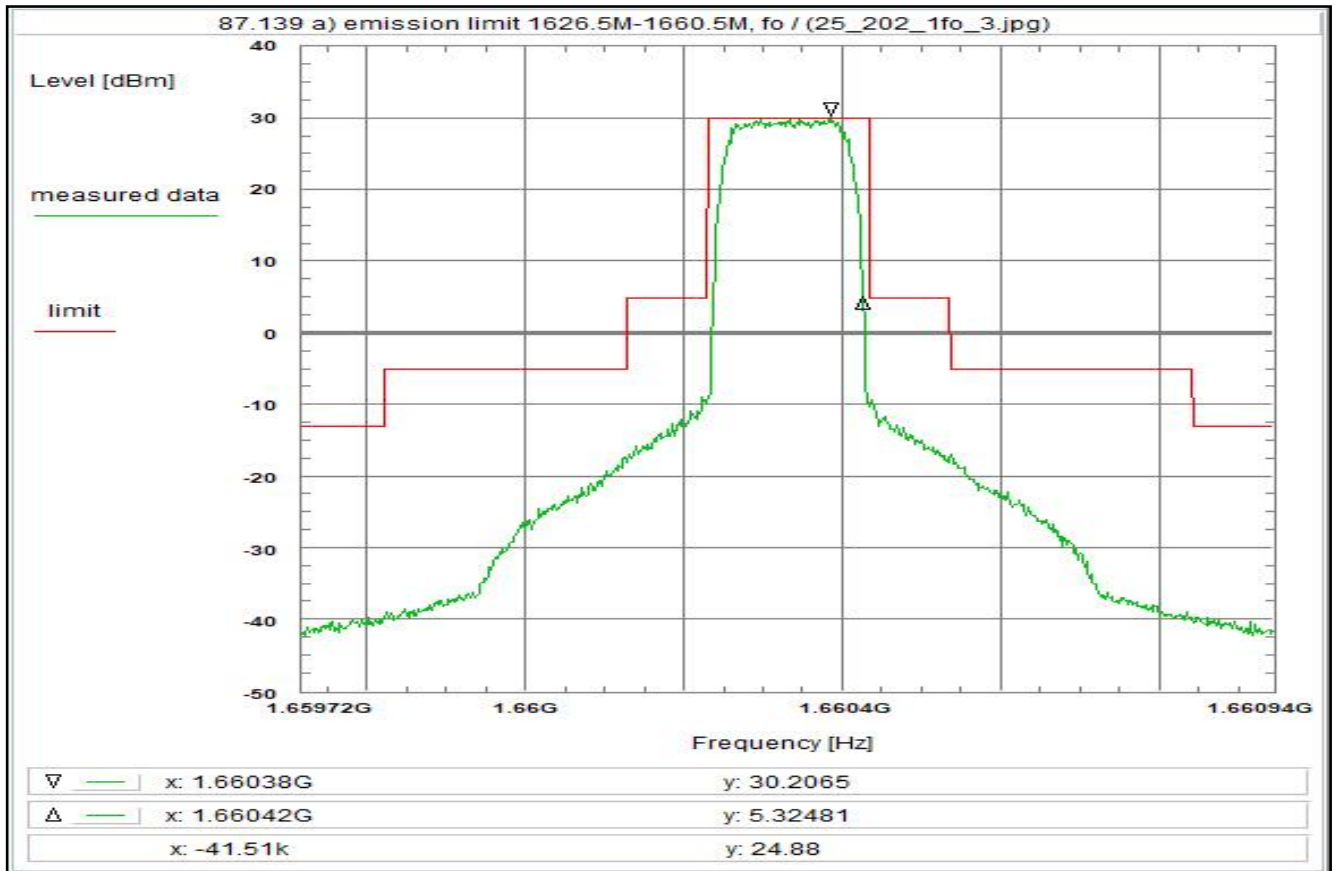
Correction:

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 (fo)

Plot No. 50



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-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: R5T4.5X-1B/R5T4.5Q-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 13:57:04
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

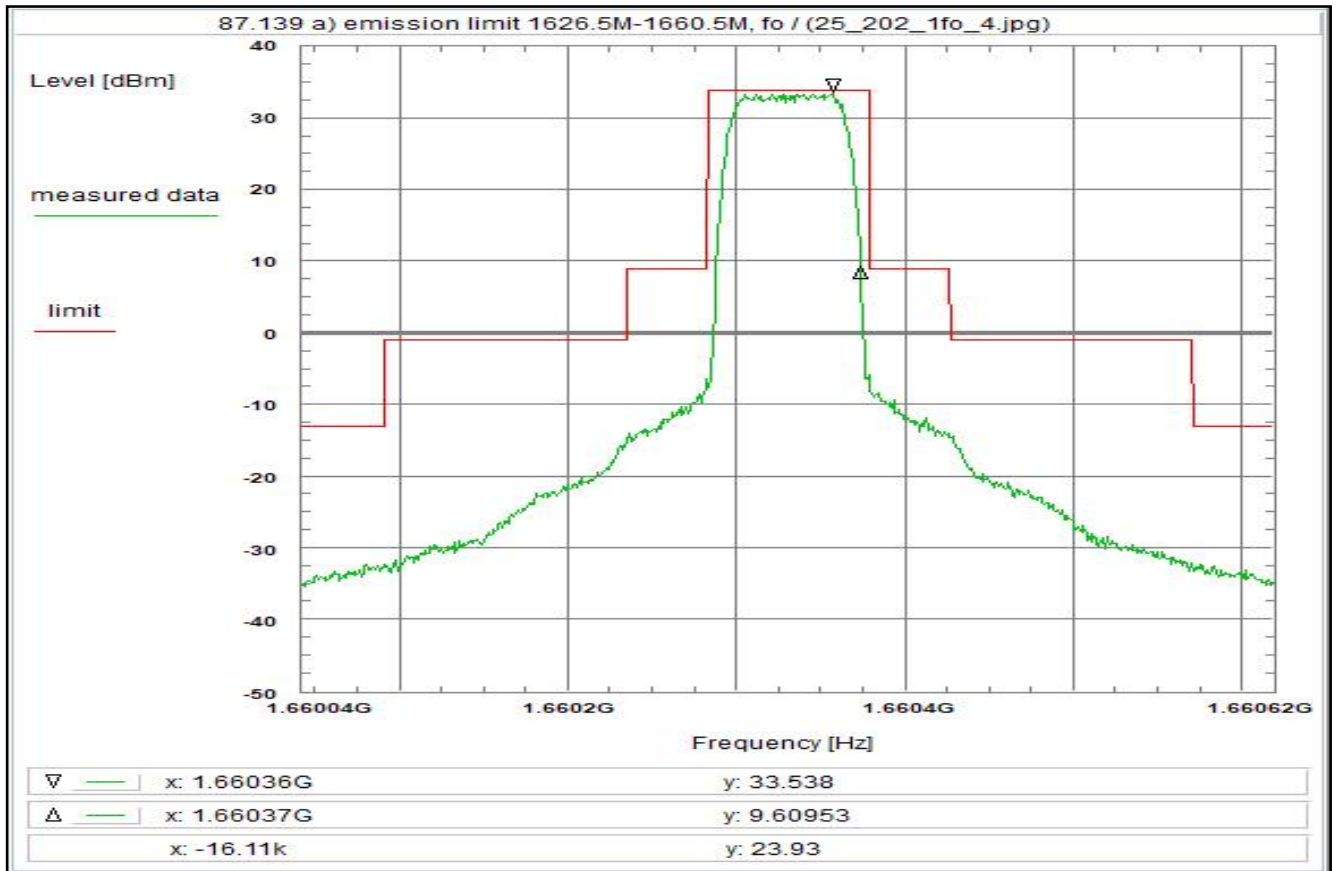
Correction:

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 (fo)

Plot No. 51



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

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: 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

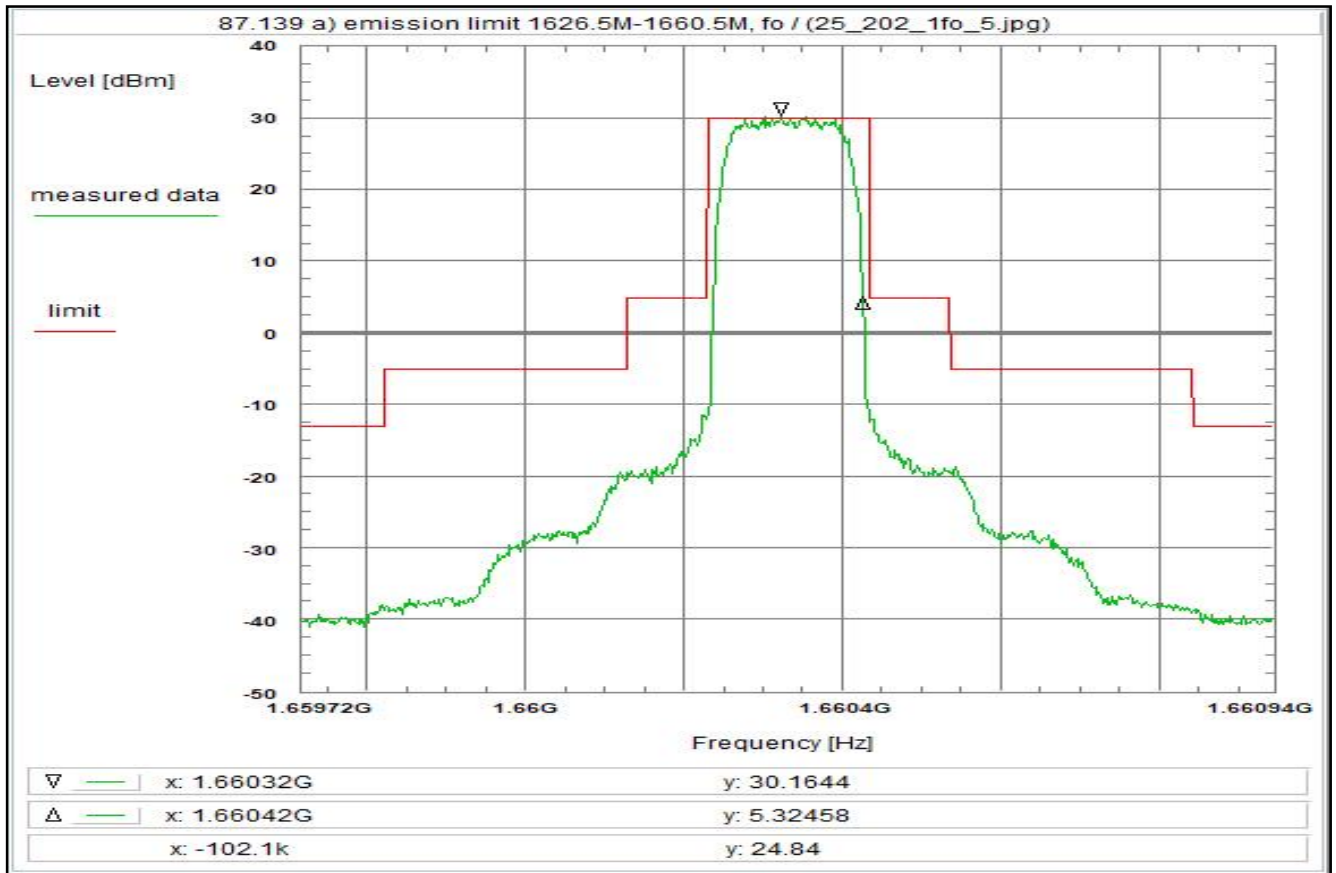
Correction:

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 (fo)

Plot No. 52



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-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: 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 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

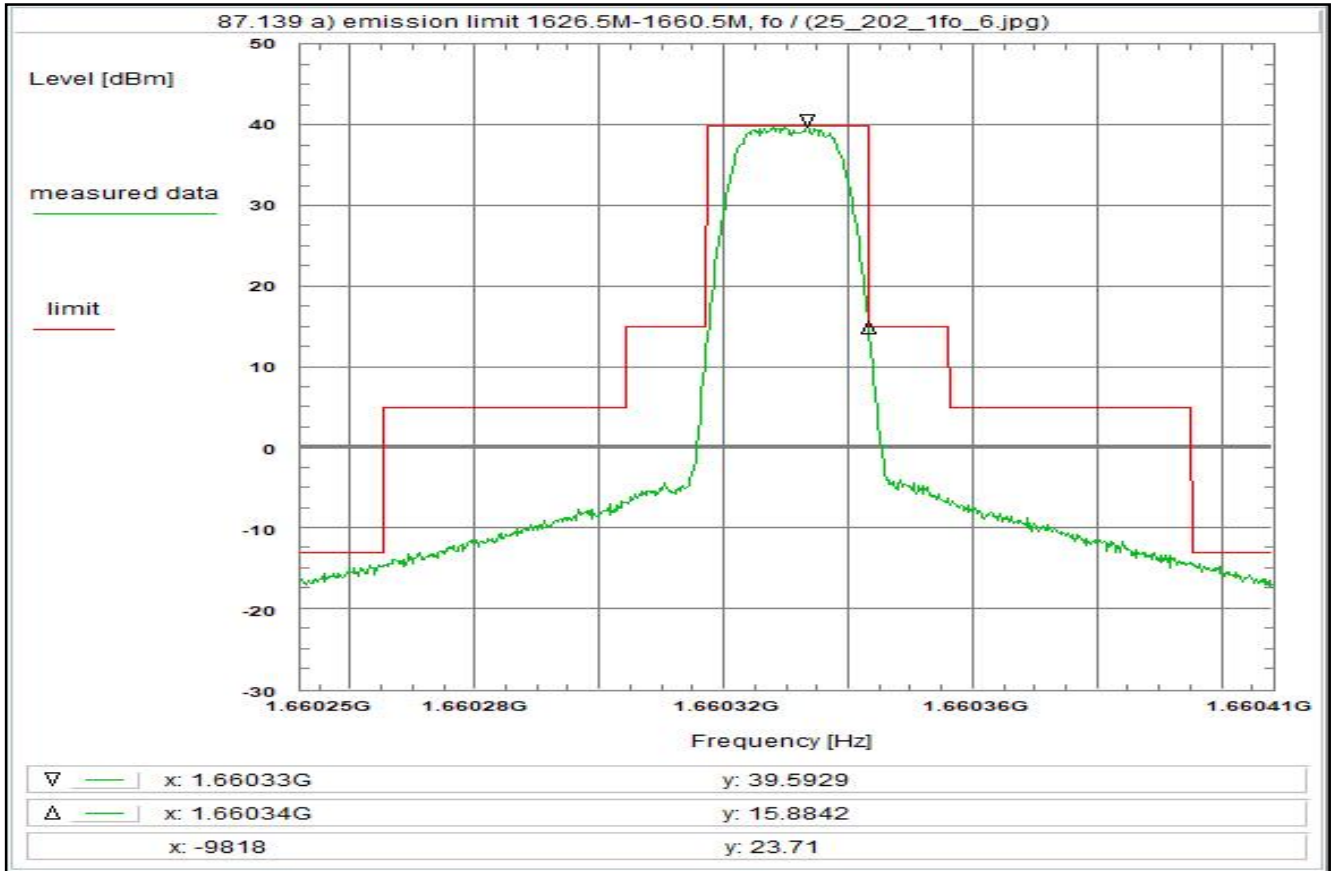
Correction:

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 (fo)

Plot No. 53



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-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: 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

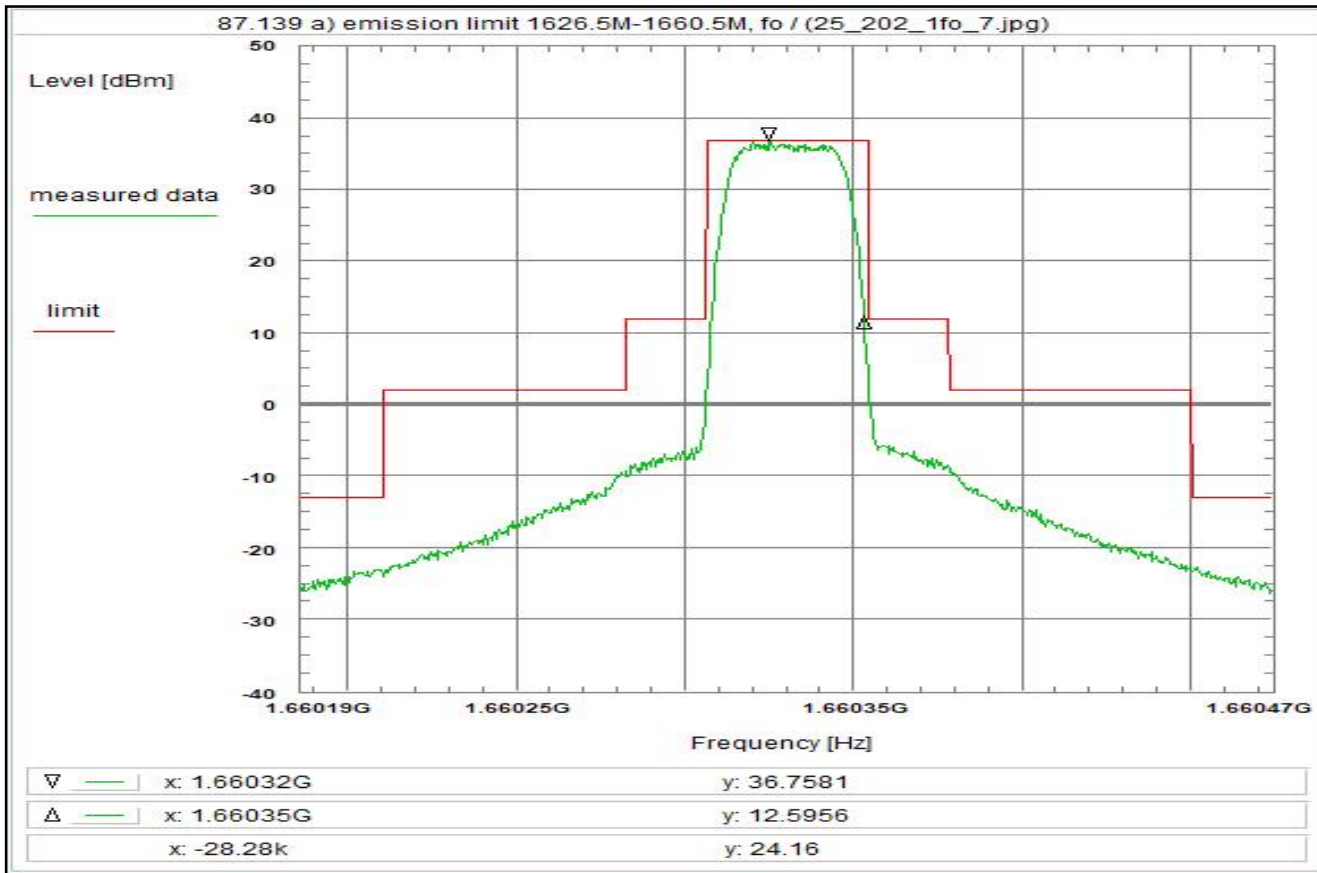
Correction:

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 (fo)

Plot No. 54



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-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: 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

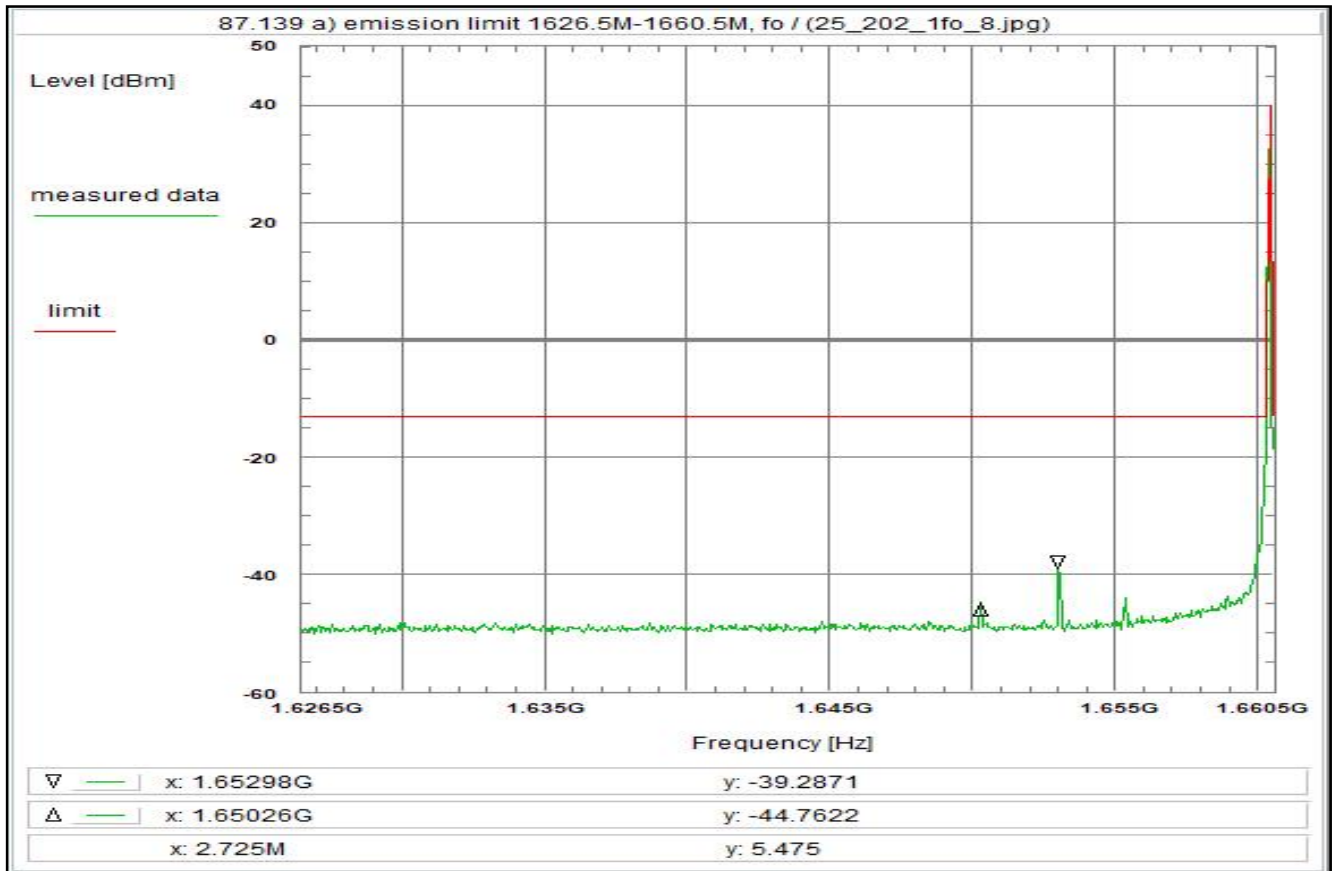
Correction:

Directional coupler + 0.0 dB
Coaxial cable (C220) + 0.9 dB
DUT-Antenna + 11.3 dB
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 (fo)

Plot No. 55



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-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, U316

Remark:

Test result: Test passed

Environment condition:

Date & Time: Tue 13/Oct/2020 14:22:01
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

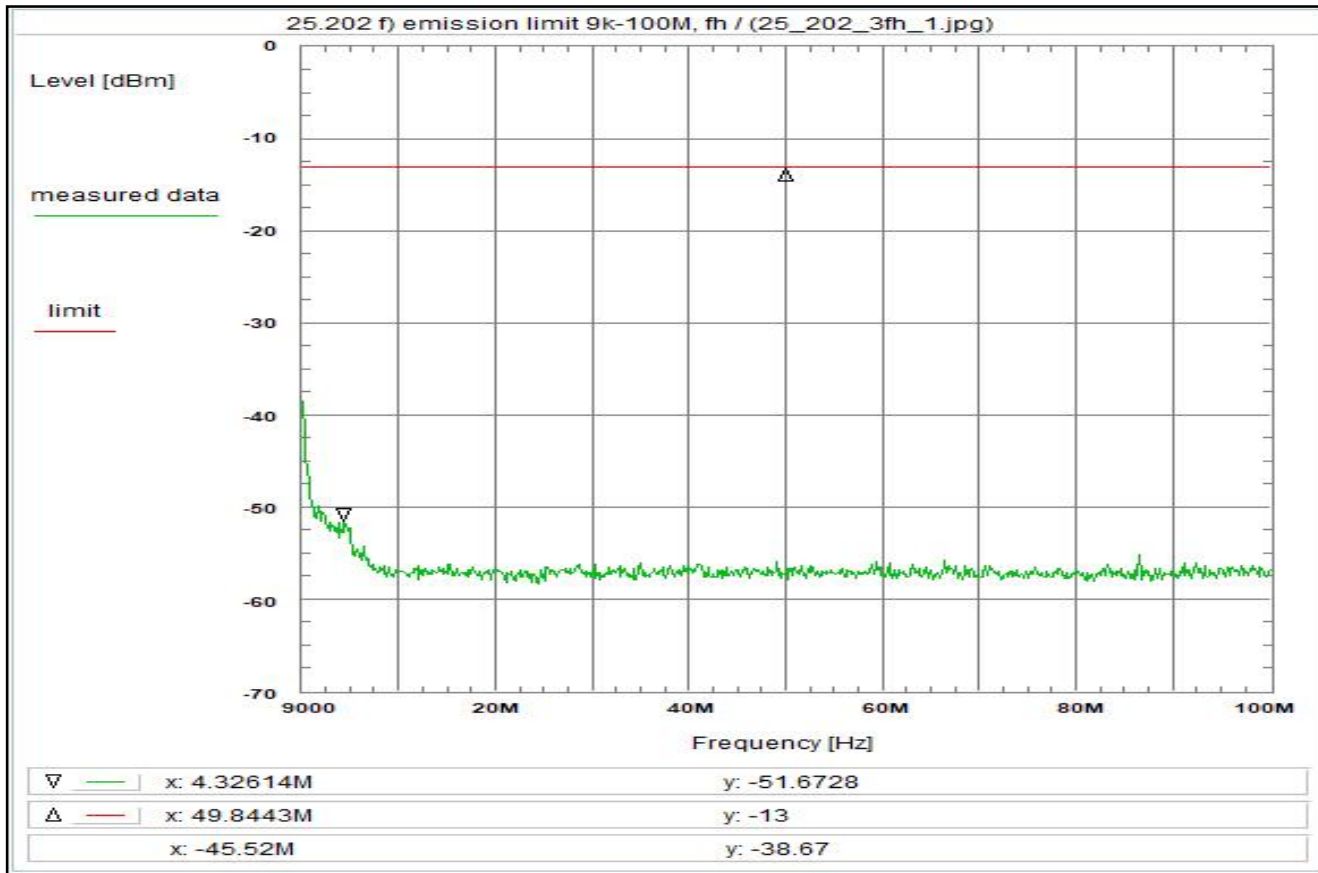
Correction:

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 upper edge of the band (fo)

Plot No. 56



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-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

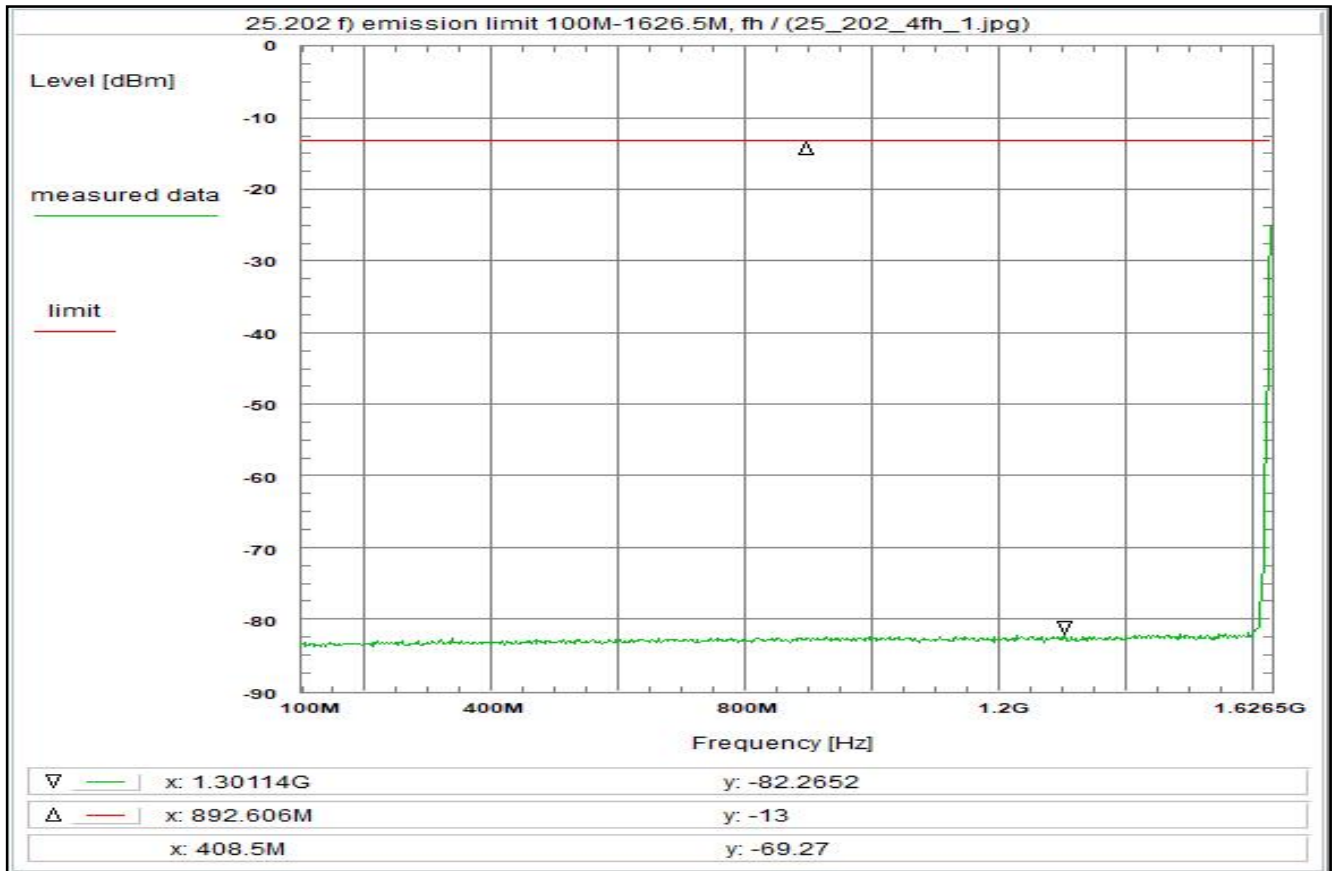
Environment condition:
Date & Time: Tue 13/Oct/2020 16:41:09
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 24 Vdc

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 rf-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

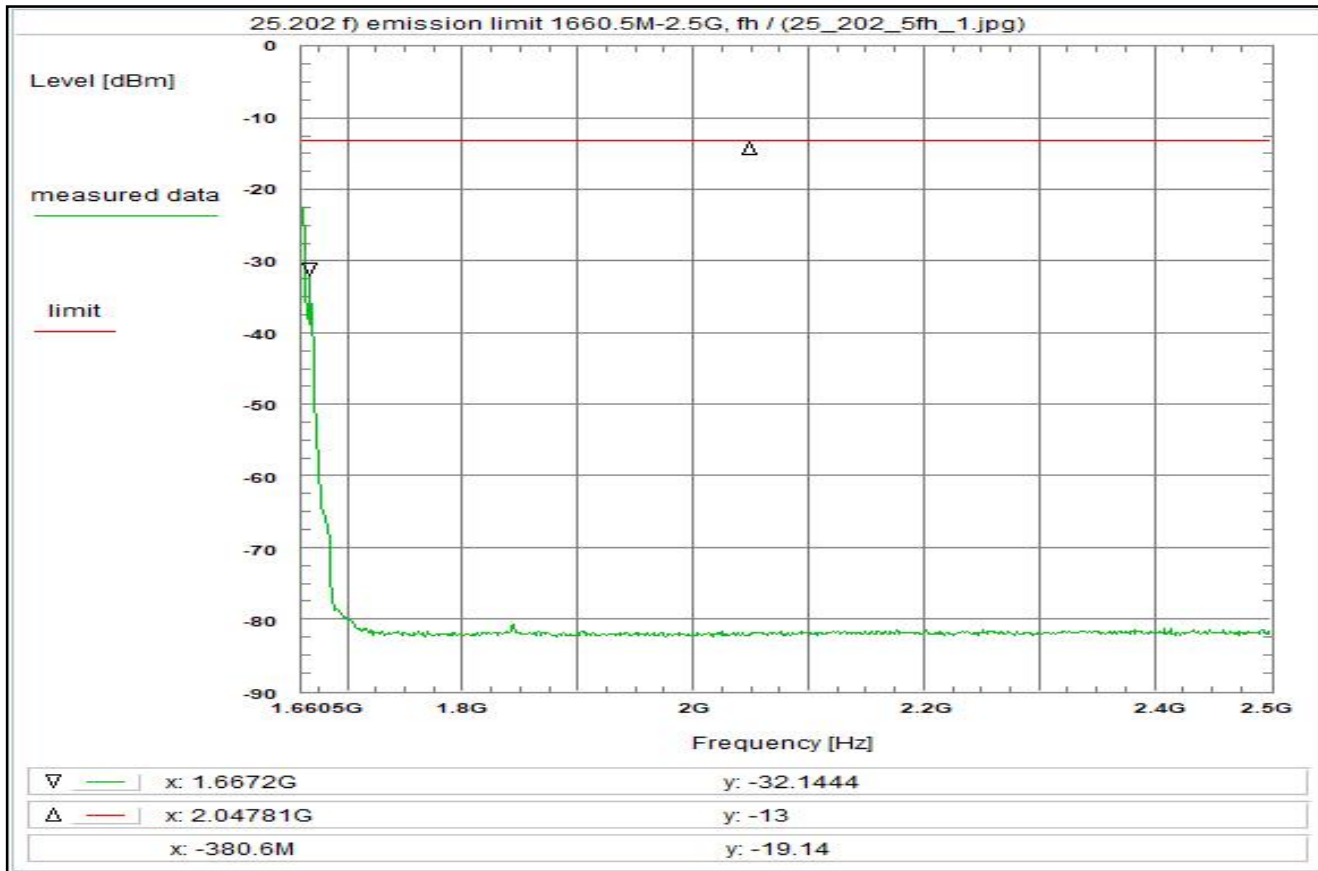
Correction:

Directional coupler + 0.0 dB
Coaxial cable (C220) + 0.6 dB
DUT-Antenna (on-axis) + 11.3 dB
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 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 rf-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+10log(Pmax)dBc/4kHz = -43 dBW
The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule.

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

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

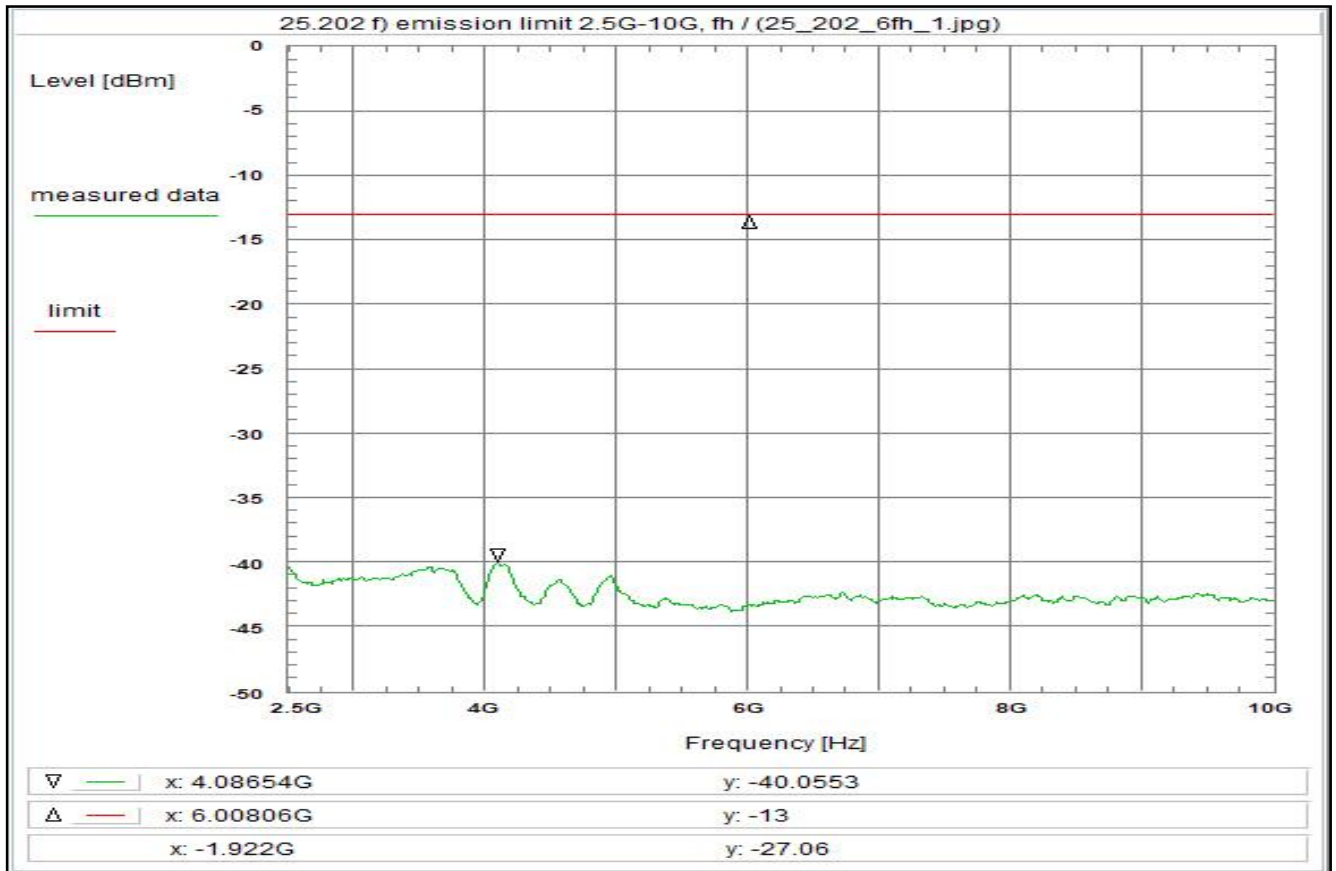
Environment condition:
Date & Time: Tue 13/Oct/2020 17:33:54
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 24 Vdc

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 dB
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

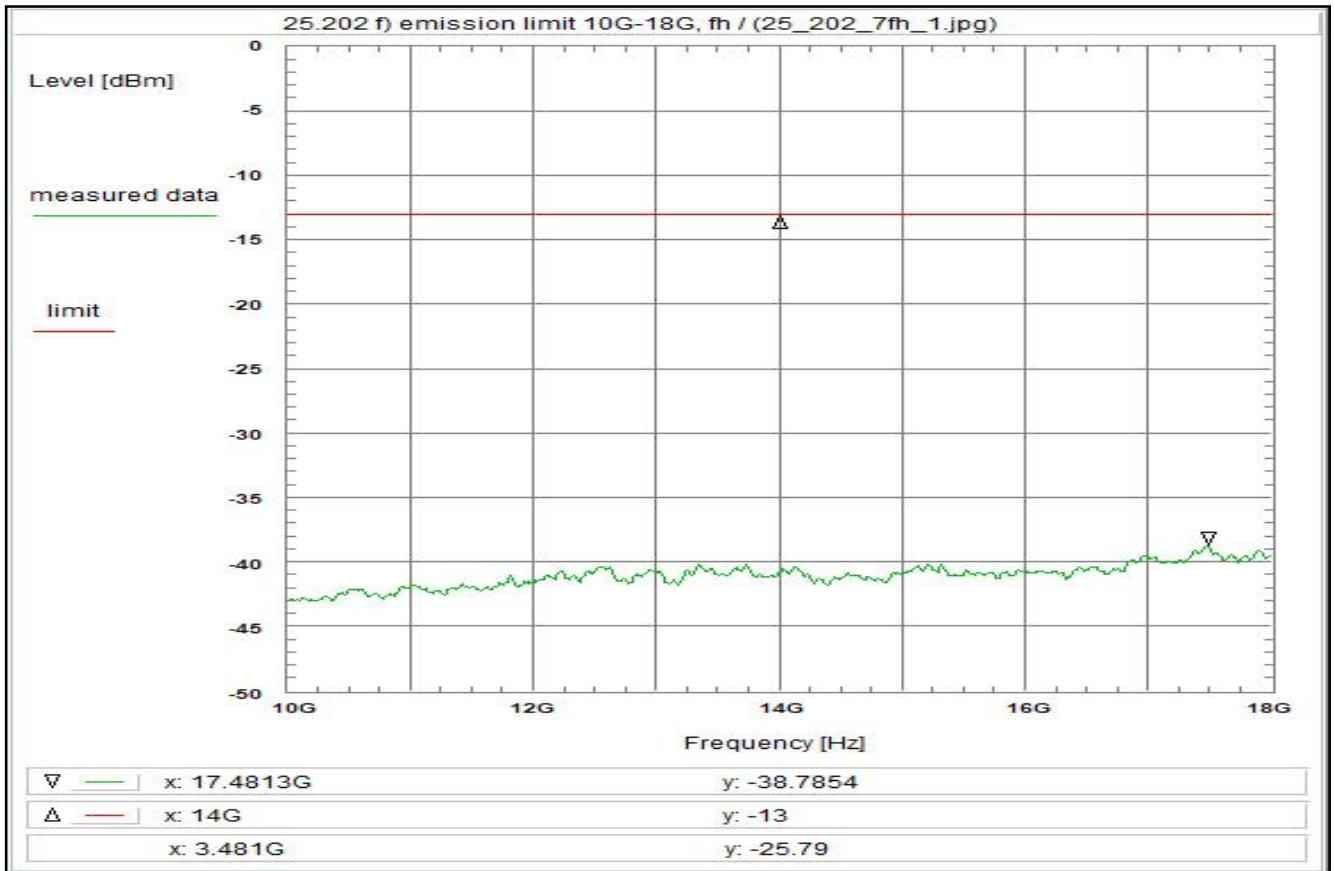
Remarks:
Carrier-on state / Carrier at the upper edge of the band (fh)
rather left the plot shows the correction curve of the band notch filter

Plot No. 59



<p><u>Subclause:</u> 25.202 f) Frequencies, frequency tolerance and emission limitations Emission limitations Modulated rf-carrier at the upper edge of the band (fh)</p> <p><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.</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, U319</p> <p>Remark:</p> <p>Test result: Test passed</p>	<p><u>Environment condition:</u> Date & Time: Tue 13/Oct/2020 16:21:16 Location: CTC advanced GmbH, Laboratory RC-SYS Temperature: 22 °C Humidity: 55 % Voltage: 24 Vdc</p> <p><u>Setup of measurement equipment:</u> 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</p> <p><u>Correction:</u> 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</p> <p><u>Remarks:</u> Carrier-on state / Carrier at the upper edge of the band (fh)</p>
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Plot No. 60



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations
Emission limitations
Modulated rf-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

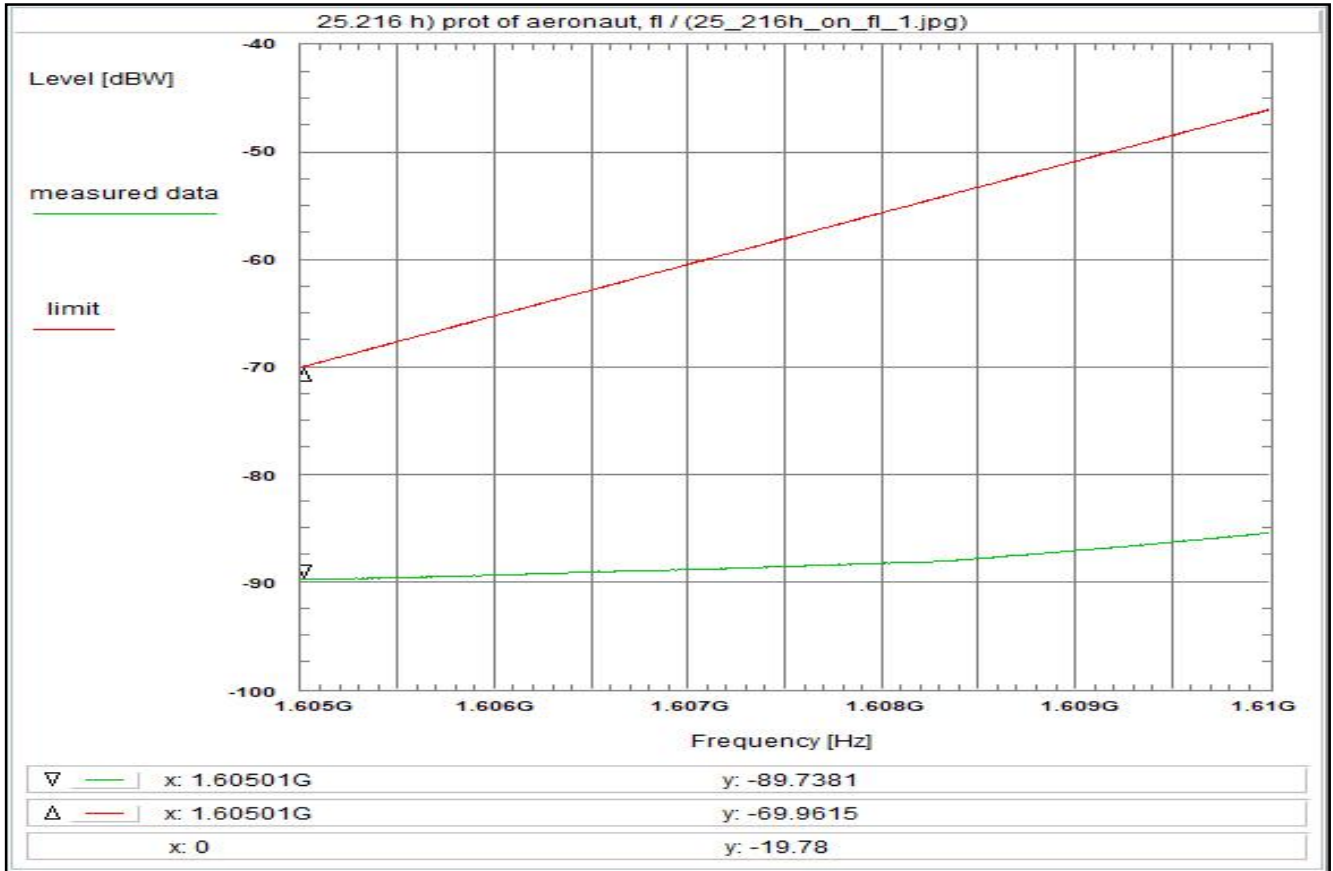
Correction:

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:

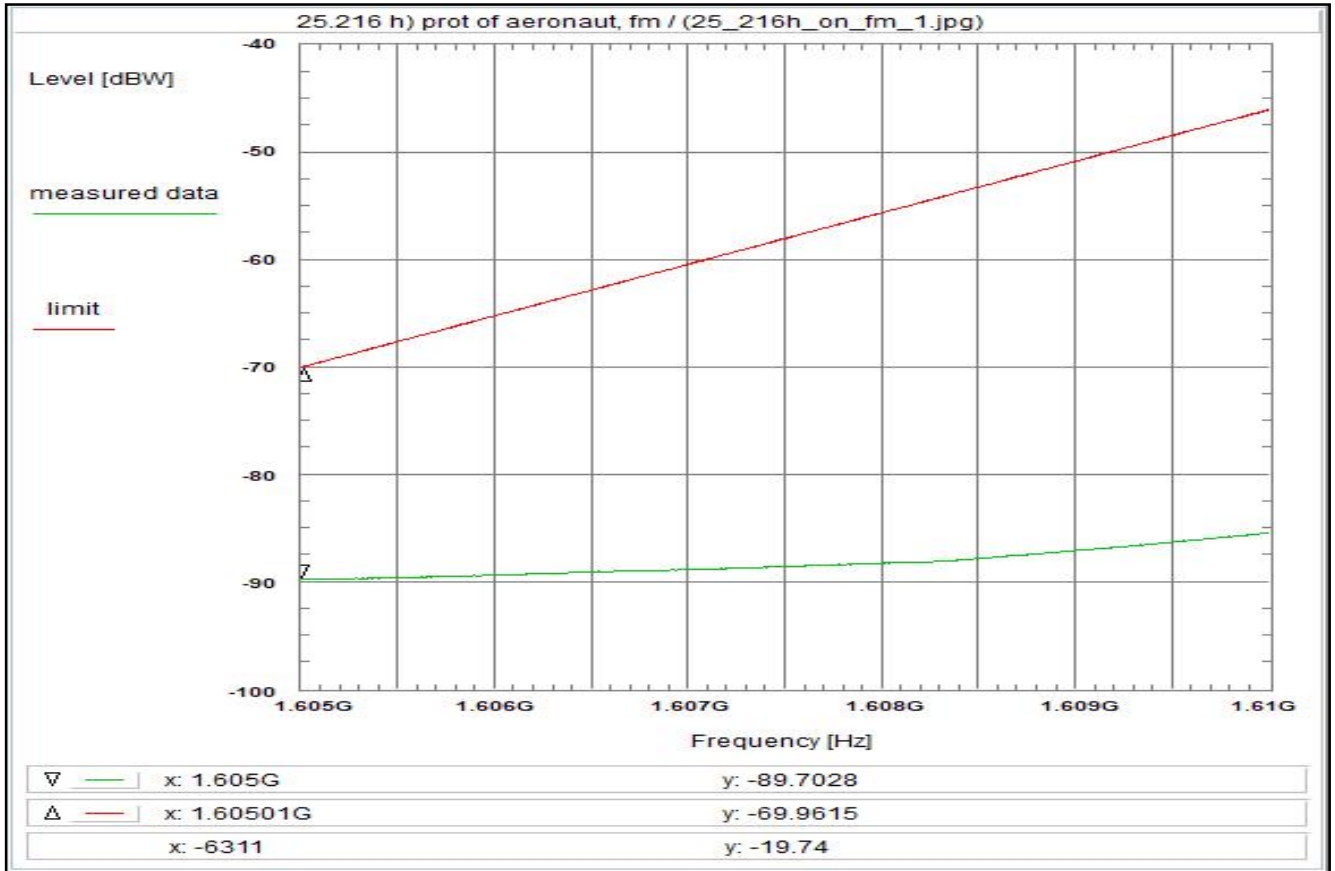
Directional coupler + 0.0 dB
Coaxial cable (C220) + 0.9 dB
DUT-Antenna (on-axis) + 11.3 dB
Test antenna + 0.0 dB
BW correction factor + 0.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Band Notch Filter + 10 dB Att. (U317) + 10.5 dB
TOTAL CORRECTION: + 22.7 dB

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 MESSs 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:

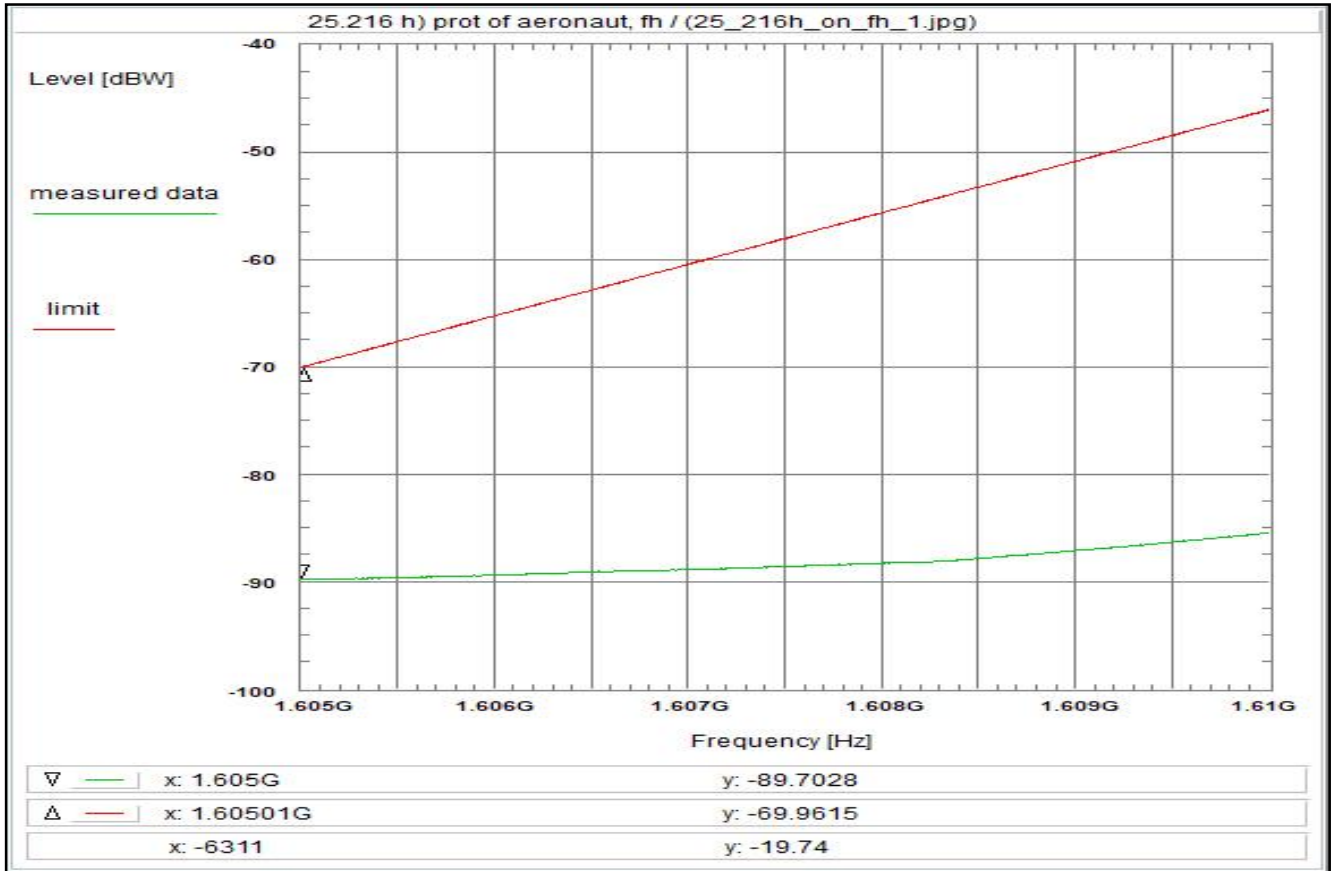
Directional coupler + 0.0 dB
Coaxial cable (C220) + 0.9 dB
DUT-Antenna (on-axis) + 11.3 dB
Test antenna + 0.0 dB
BW correction factor + 0.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Band Notch Filter + 10 dB Att. (U317) + 10.5 dB
TOTAL CORRECTION: + 22.7 dB

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:

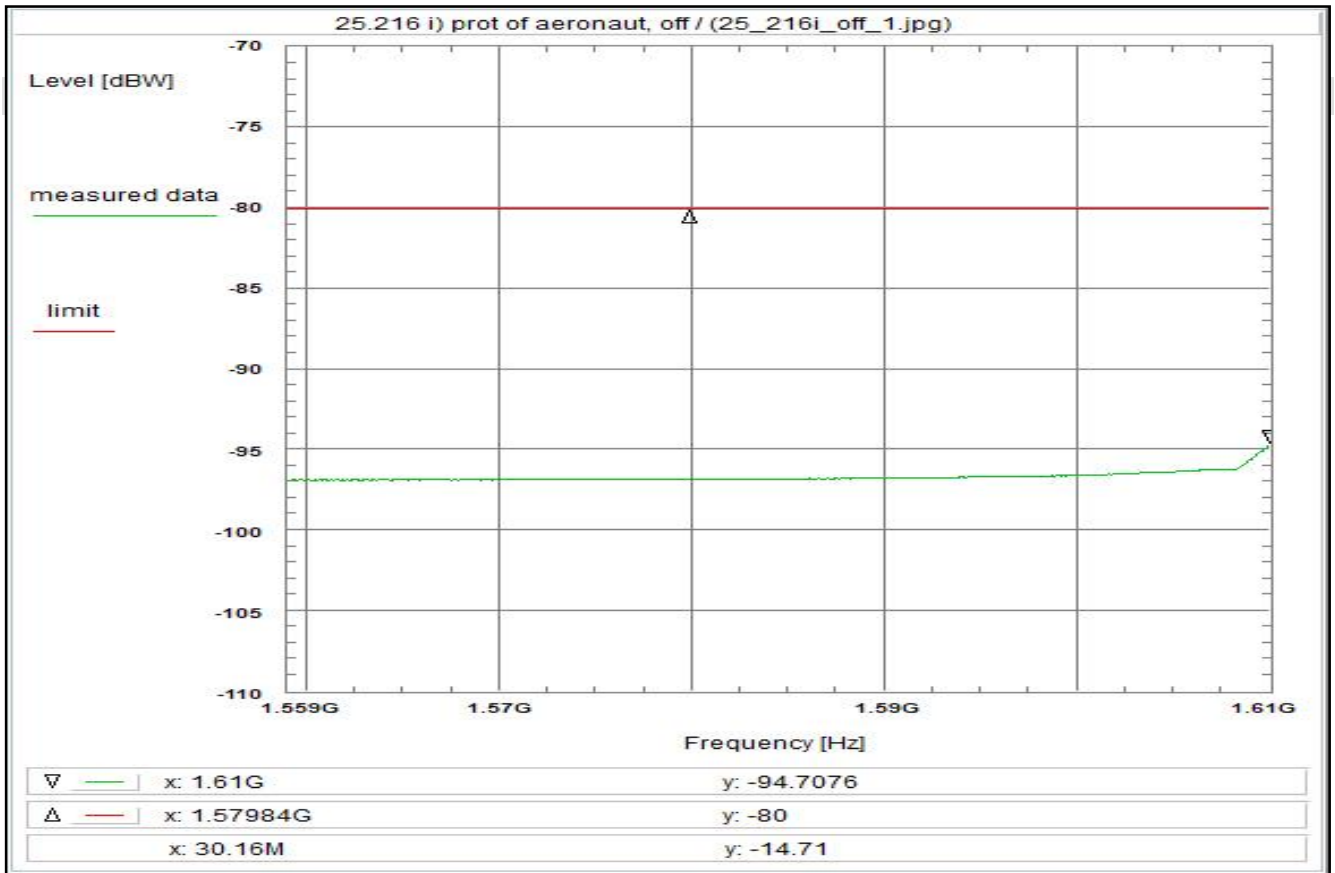
Directional coupler + 0.0 dB
Coaxial cable (C220) + 0.9 dB
DUT-Antenna (on-axis) + 11.3 dBi
Test antenna + 0.0 dB
BW correction factor + 0.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Band Notch Filter + 10 dB Att. (U317) + 10.5 dB
TOTAL CORRECTION: + 22.7 dB

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 + 0.0 dB
(U317) + 10.3 dB
TOTAL CORRECTION: + 22.5 dB

Remarks:

Carrier-off state.
Measurement with 1 MHz resolution filter and RMS detector.

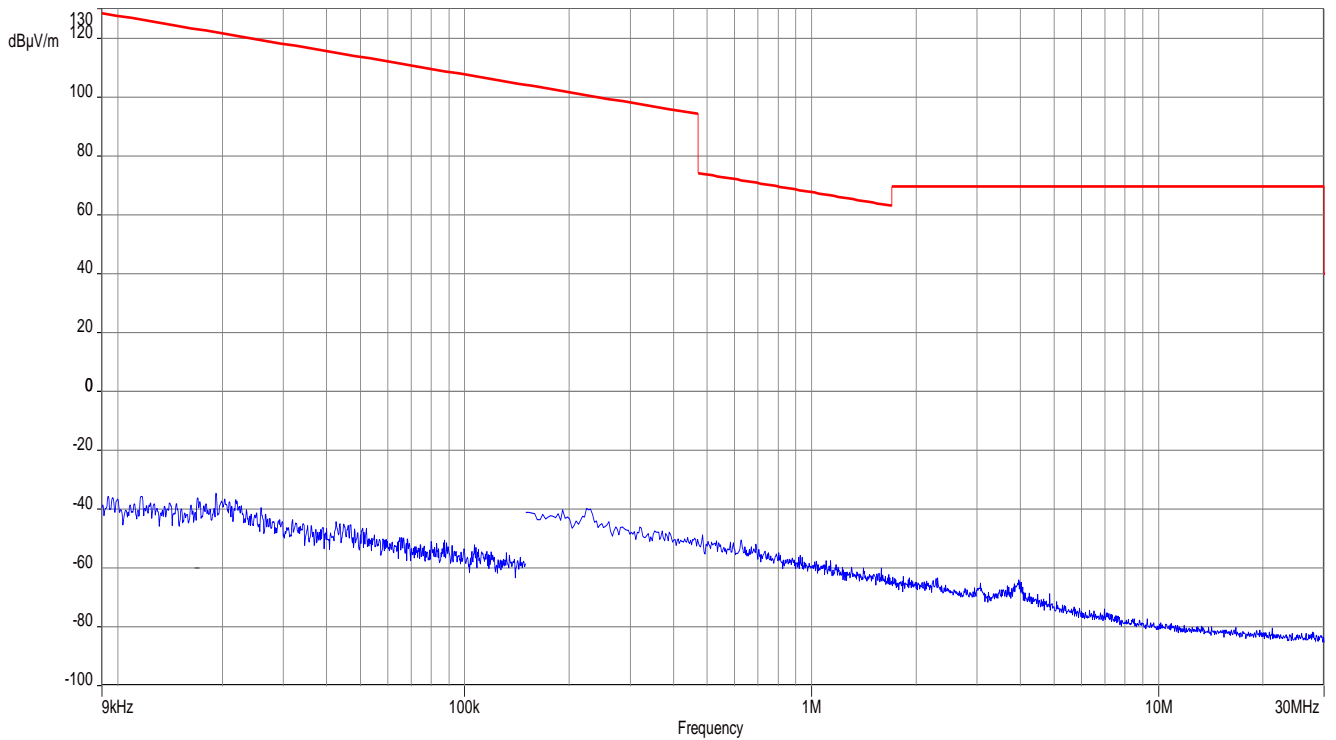
For EIRP calculation:
'worst-case' = maximum antenna gain

3 Radiated spurious emissions

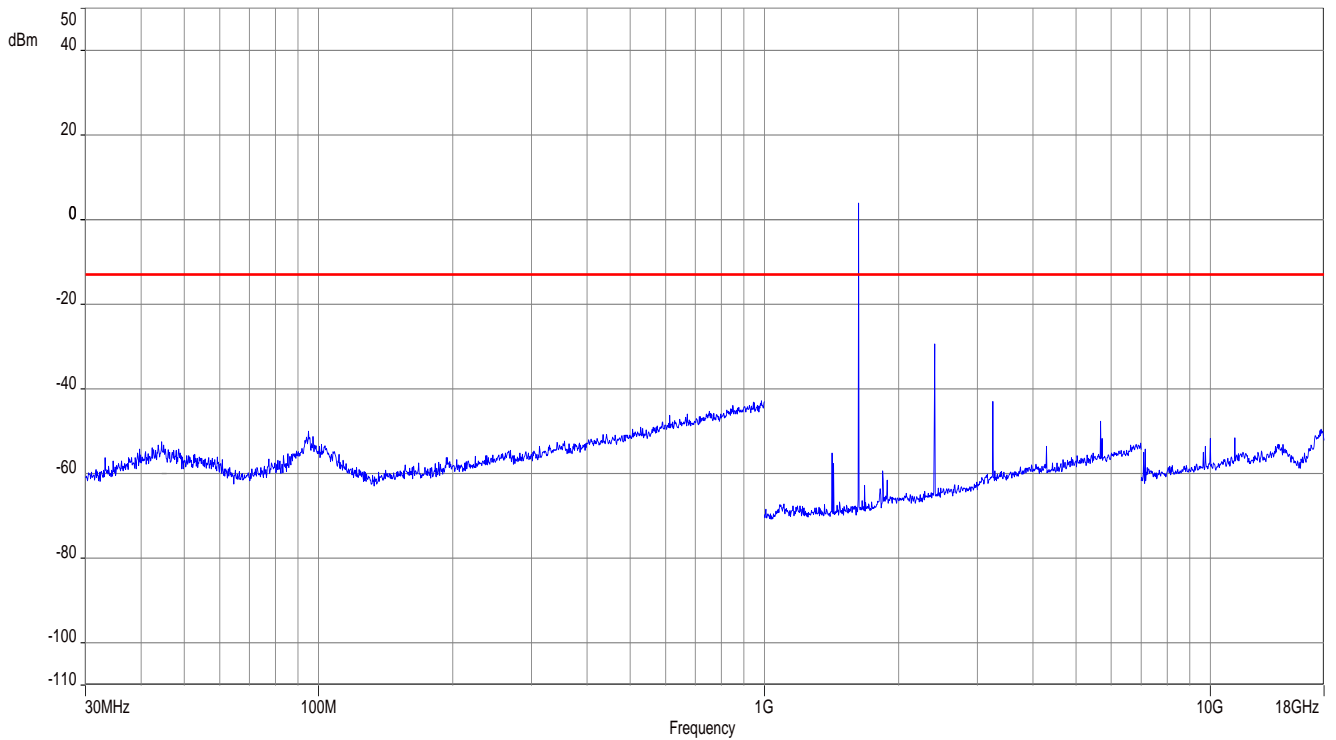
This part consists of 3 pages including this page.

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

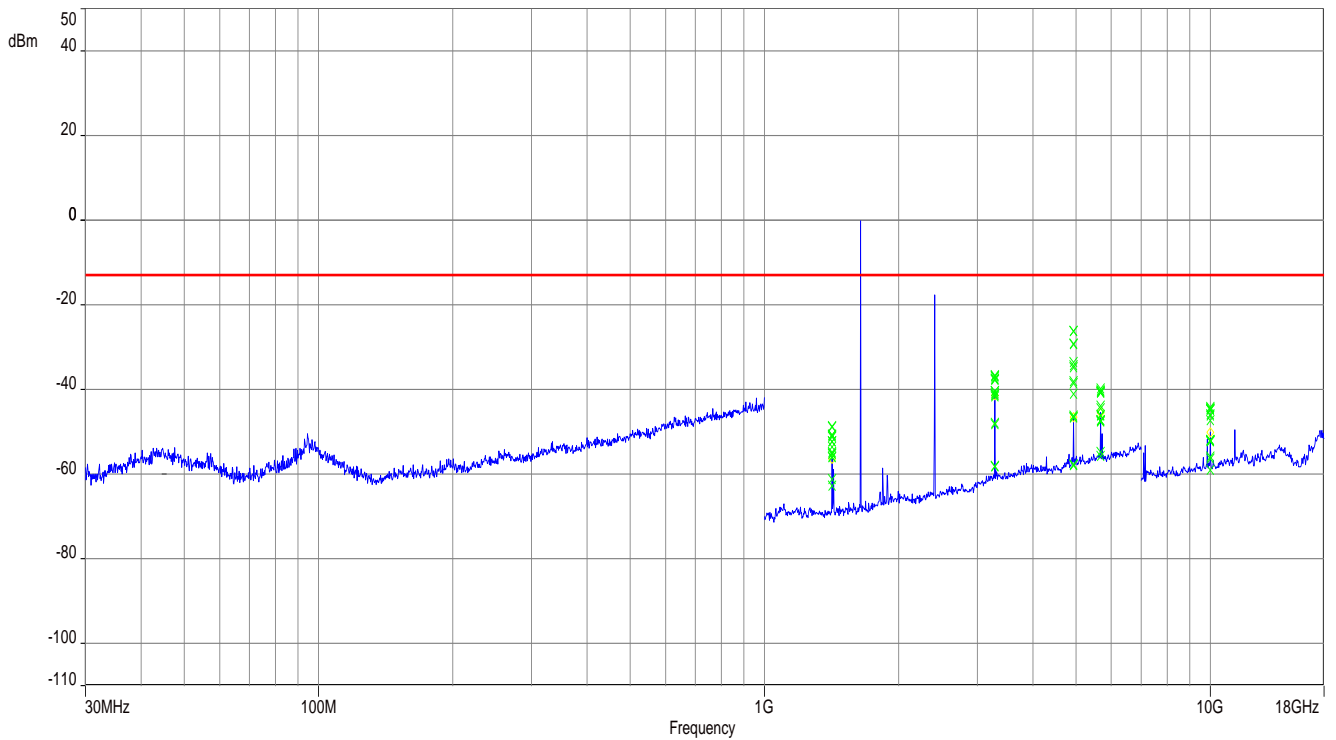
Plot No. 1: magnetic field 9 kHz to 30 MHz



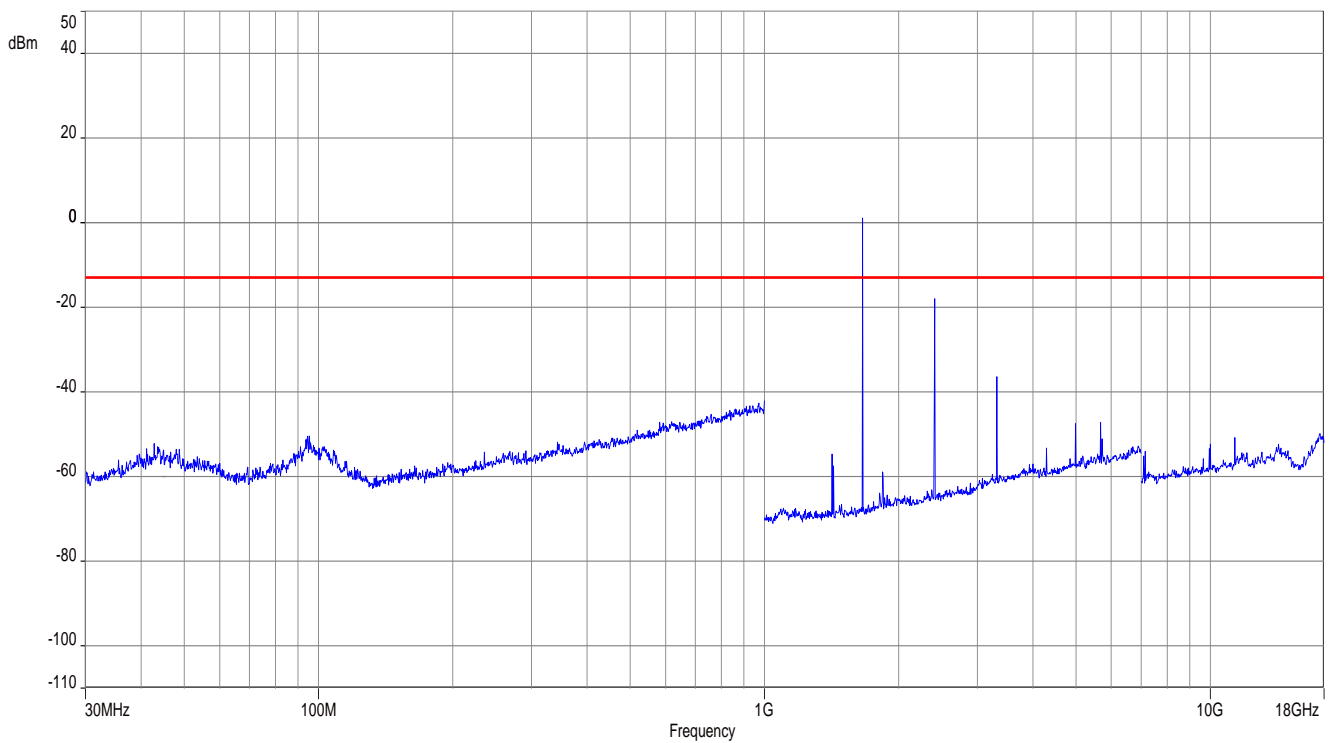
Plot No. 2: BGAN Tx on, bottom frequency, 30 MHz – 18 GHz



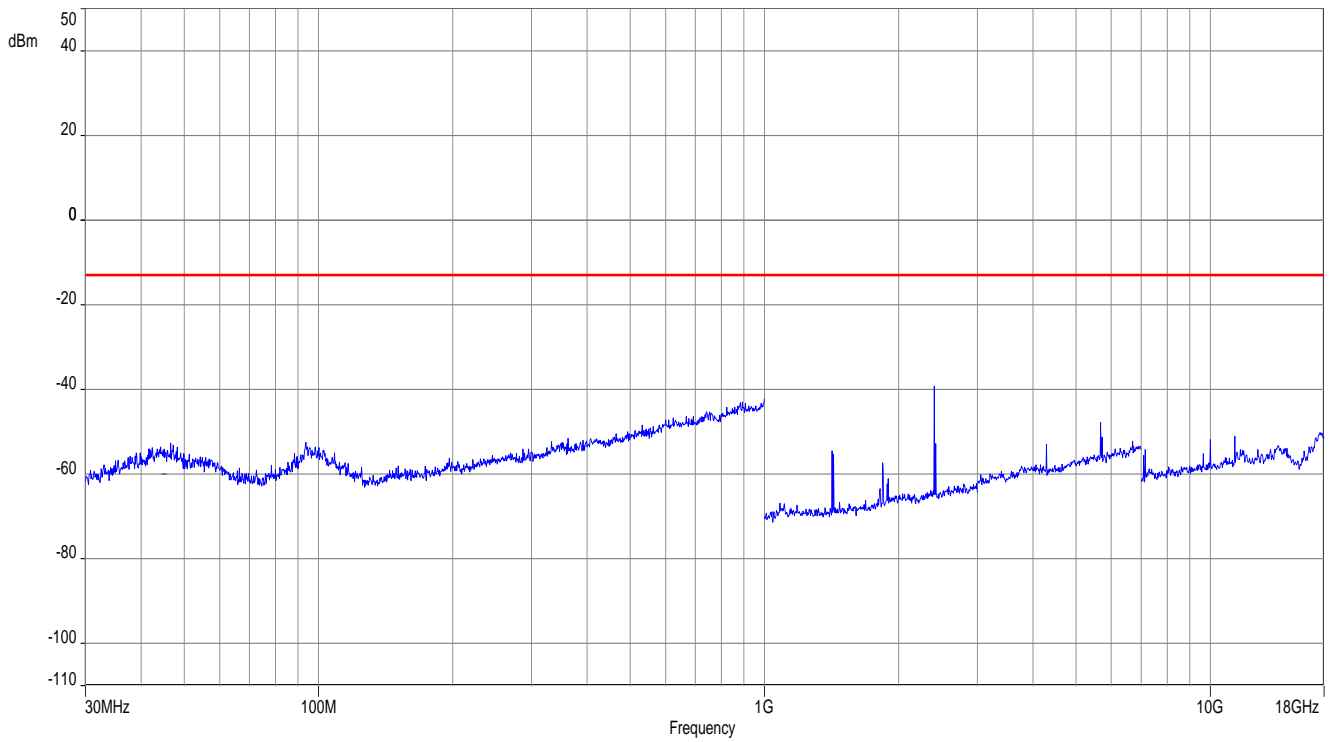
Plot No. 3: BGAN Tx on, center frequency, 30 MHz – 18 GHz



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