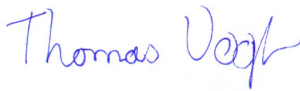


Annex G



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

Test report annex authorized:



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Thomas Vogler
Lab Manager
Radio Communications & EMC

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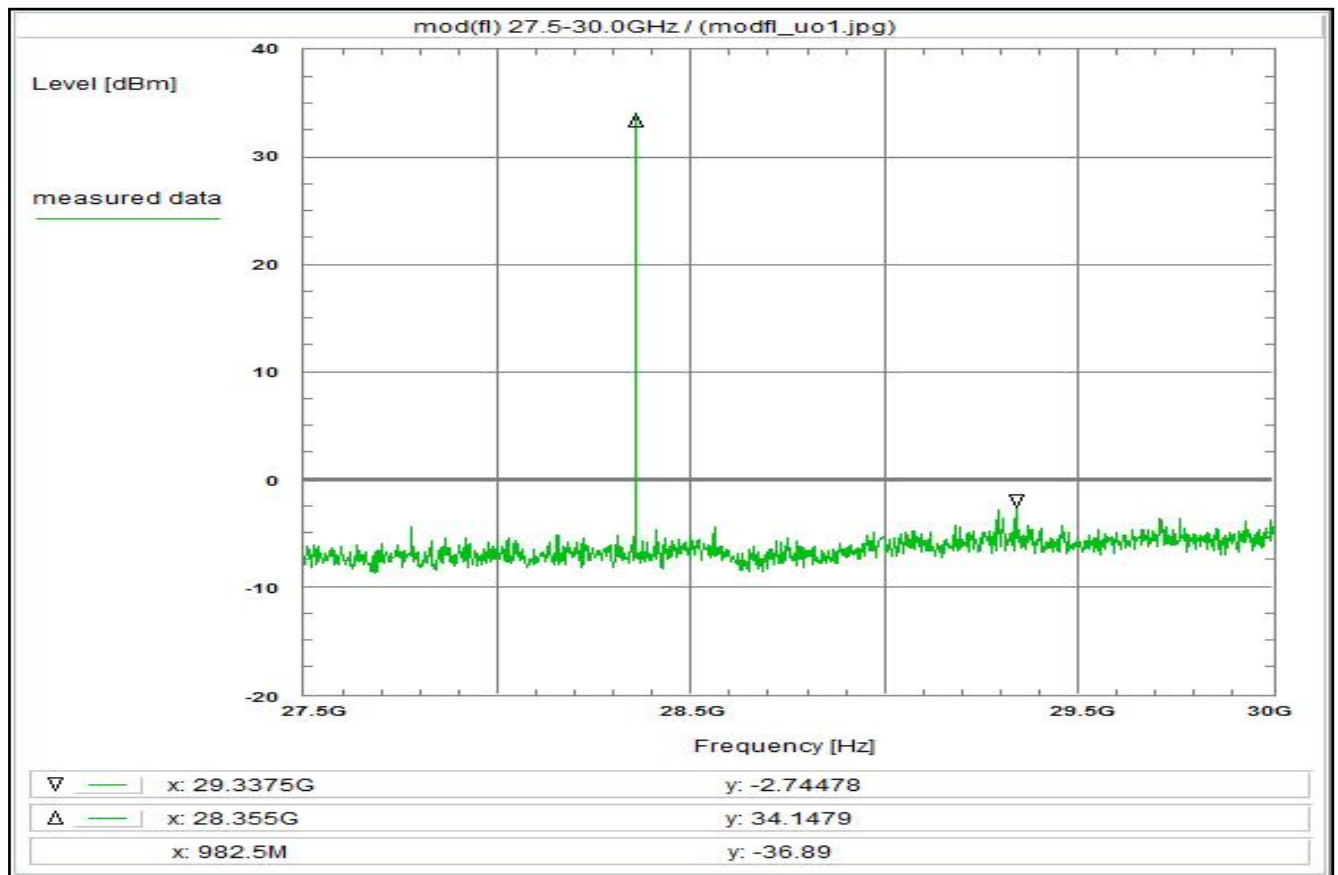
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2 Measurement results, FCC Part 25, SRSP-101

This chapter consists of 40 pages including this page.

Plot No. 1



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

Limit:
no limits defined
This test serves to verify the general function of the EUT and for orientation regarding to the spurious emissions which are expected within the band, furthermore for comparison of the actual power with the rated value at modulated carrier adjusted as close to the lower edge of the operating frequency band.

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

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

Test setup:
see test report chapter 7.3:

Test equipment:
see test report chapter 7.4: A031, C220, R001

Remark:

Test result: measurement for orientation

Environment condition:

Date & Time: Mon 13/Feb/2023 16:40:57
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 230 Vac

Setup of measurement equipment:

Start frequency: 27.5 GHz
Stop frequency: 30 GHz
Center frequency: 28.75 GHz
Frequency span: 2.5 GHz
Resolution-BW: 100 kHz
Video-BW: 300 kHz
Input attenuation: 10 dB
Trace-Mode: Max-Hold
Detector-Mode: Pos Peak

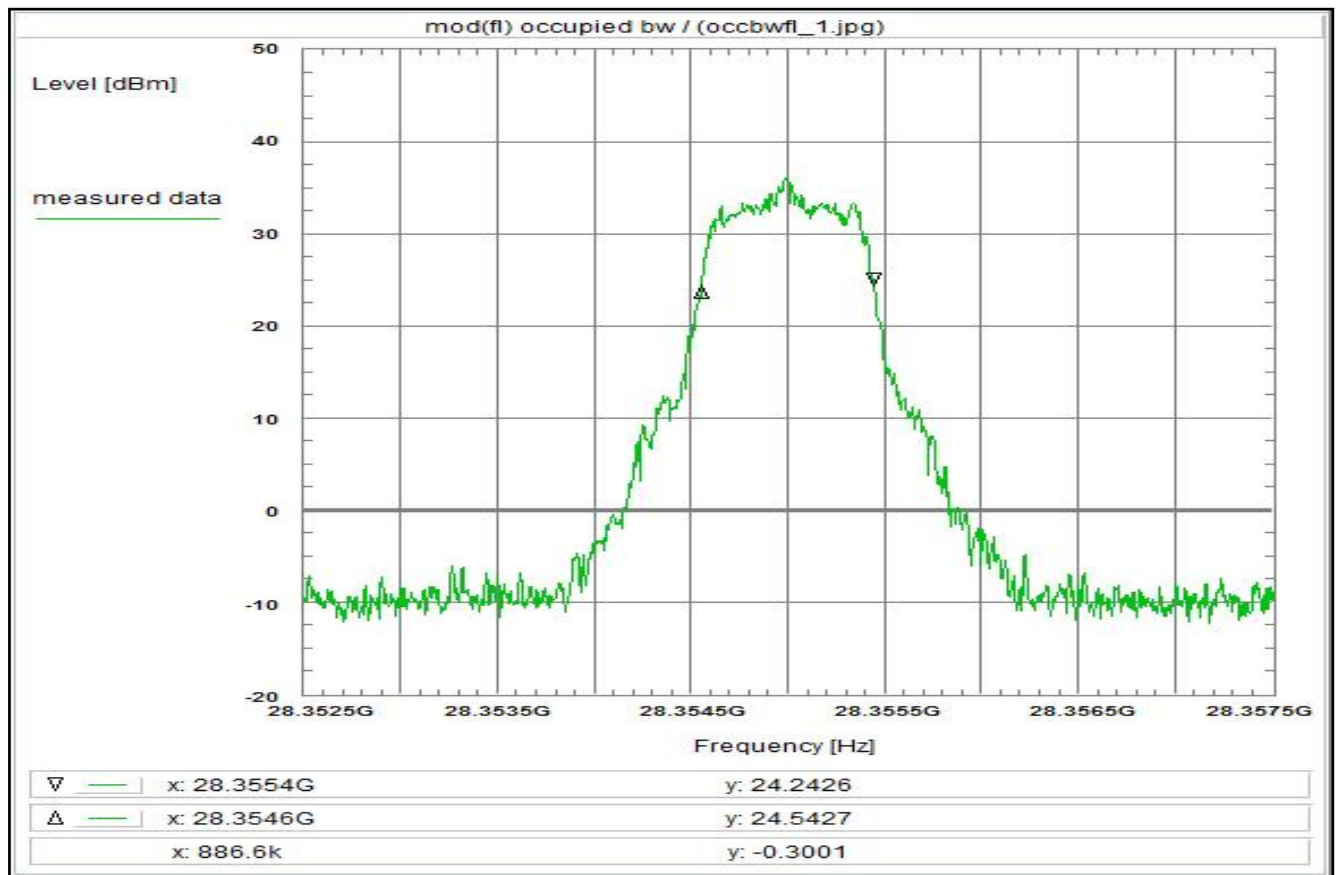
Correction:

Directional coupler + 0.0 dB
Coaxial cable (C220) + 4.0 dB
DUT-Antenna (on-axis) + 0.0 dBi
Test antenna (A031) - 15.5 dB
BW correction factor + 0.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Freefield attenuation (28.75GHz, 4.7m) + 75.1 dB
Circular Polarization + 3.0 dB
TOTAL CORRECTION: + 66.6 dB

Remarks:

Test of general function and measurement for orientation

Plot No. 2



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

Limit:
no limits defined

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

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

Test setup:
see test report chapter 7.3:

Test equipment:
see test report chapter 7.4: A031, C220, R001

Remark:

Test result: determination of the occupied bandwidth

Environment condition:

Date & Time: Mon 13/Feb/2023 16:44:35
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 230 Vac

Setup of measurement equipment:

Start frequency: 28.3525 GHz
Stop frequency: 28.3575 GHz
Center frequency: 28.355 GHz
Frequency span: 5 MHz
Resolution-BW: 100 kHz
Video-BW: 300 kHz
Input attenuation: 10 dB
Trace-Mode: Max-Hold
Detector-Mode: Pos Peak

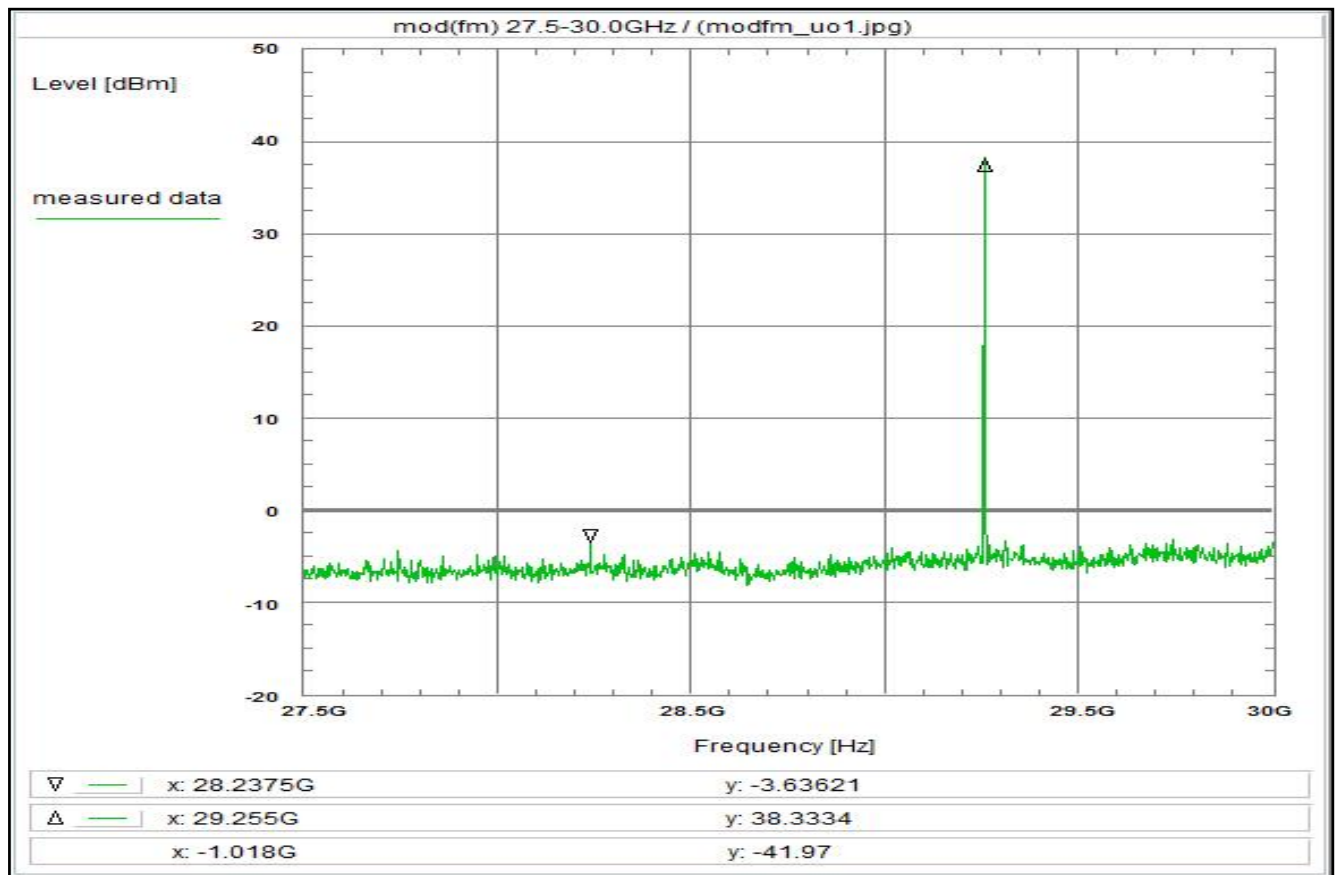
Correction:

Directional coupler	+ 0.0 dB
Coaxial cable (C220)	+ 3.9 dB
DUT-Antenna (on-axis)	+ 0.0 dBi
Test antenna (A031)	- 15.2 dB
BW correction factor	+ 0.0 dB
Atten. between HPA and feedhorn	+ 0.0 dB
Freefield attenuation (28.75GHz, 4.7m)	+ 75.1 dB
Circular Polarization	+ 3.0 dB
TOTAL CORRECTION:	+ 66.8 dB

Remarks:

Determination of the occupied bandwidth. Average measurement.
The measured value is about 0.89 MHz (delta marker)
(according to the definition: 99% of the total mean power)
The internal function of the analyzer was used for determination.

Plot No. 3



Subclause: -/- Function test
Modulated rf-carrier in the middle of the band (fm)
Measurement within the band

Limit:

no limits defined

This test serves to verify the general function of the EUT and for orientation regarding to the spurious emissions which are expected within the band, furthermore for comparison of the actual power with the rated value at modulated carrier adjusted in the middle of the band (EIRP).

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see test report chapter 6.4

Test setup:

see test report chapter 7.3:

Test equipment:

see test report chapter 7.4: A031, C220, R001

Remark:

Test result: measurement for orientation

Environment condition:

Date & Time: Mon 13/Feb/2023 15:57:06
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 230 Vac

Setup of measurement equipment:

Start frequency: 27.5 GHz
Stop frequency: 30 GHz
Center frequency: 28.75 GHz
Frequency span: 2.5 GHz
Resolution-BW: 100 kHz
Video-BW: 300 kHz
Input attenuation: 10 dB
Trace-Mode: Max-Hold
Detector-Mode: Pos Peak

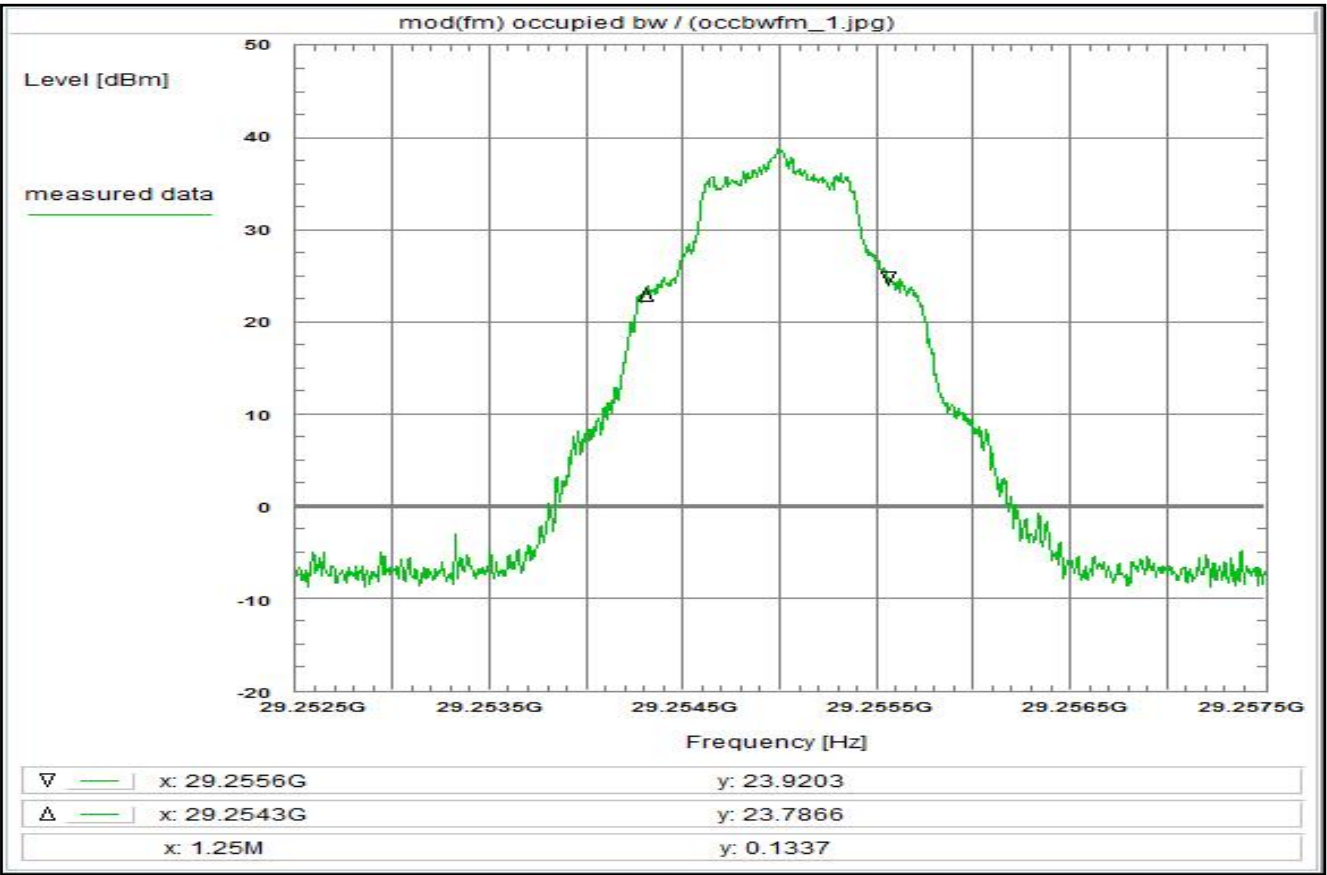
Correction:

Directional coupler + 0.0 dB
Coaxial cable (C220) + 4.0 dB
DUT-Antenna (on-axis) + 0.0 dBi
Test antenna (A031) - 15.5 dB
BW correction factor + 0.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Freefield attenuation (29.26GHz, 4.7m) + 75.2 dB
Circular Polarization + 3.0 dB
TOTAL CORRECTION: + 66.7 dB

Remarks:

Test of general function and measurement for orientation

Plot No. 4



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 6.4

Test setup:
see test report chapter 7.3:

Test equipment:
see test report chapter 7.4: A031, C220, R001

Remark:

Test result: determination of the occupied bandwidth

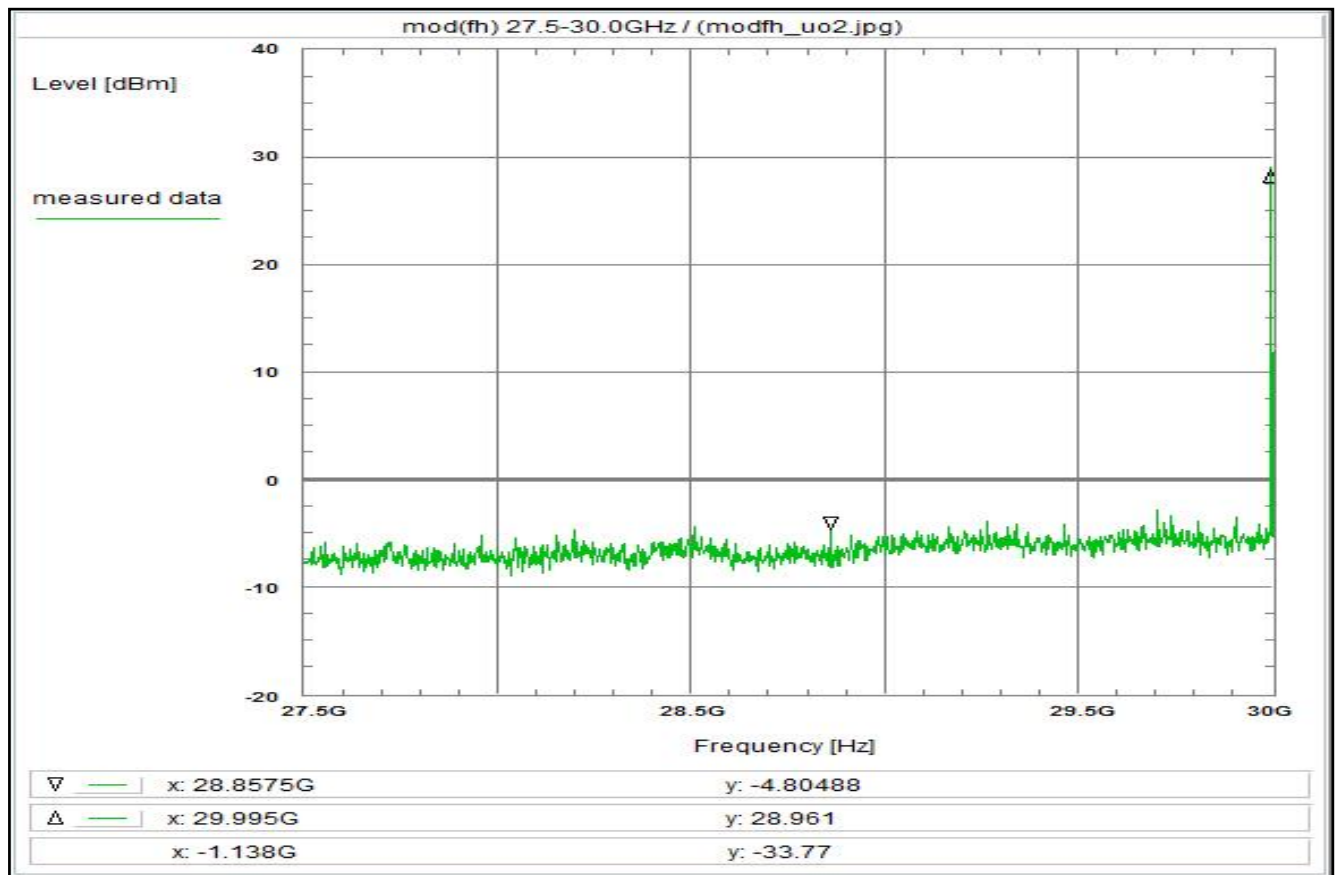
Environment condition:
Date & Time: Mon 13/Feb/2023 16:03:06
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 230 Vac

Setup of measurement equipment:
Start frequency: 29.2525 GHz
Stop frequency: 29.2575 GHz
Center frequency: 29.255 GHz
Frequency span: 5 MHz
Resolution-BW: 100 kHz
Video-BW: 300 kHz
Input attenuation: 10 dB
Trace-Mode: Max-Hold
Detector-Mode: Pos Peak

Correction:
Directional coupler + 0.0 dB
Coaxial cable (C220) + 4.0 dB
DUT-Antenna (on-axis) + 0.0 dBi
Test antenna (A031) - 15.8 dB
BW correction factor + 0.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Freefield attenuation (29.26GHz, 4.7m) + 75.2 dB
Circular Polarization + 3.0 dB
TOTAL CORRECTION: + 66.4 dB

Remarks:
Determination of the occupied bandwidth. Average measurement.
The measured value is about 1.26 MHz (delta marker)
(according to the definition: 99% of the total mean power)
The internal function of the analyzer was used for determination.

Plot No. 5



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

Limit:
no limits defined
This test serves to verify the general function of the EUT and for orientation regarding to the spurious emissions which are expected within the band, furthermore for comparison of the actual power with the rated value at modulated carrier adjusted as close to the upper edge of the operating frequency band.

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

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

Test setup:
see test report chapter 7.3:

Test equipment:
see test report chapter 7.4: A031, C220, R001

Remark:

Test result: measurement for orientation

Environment condition:

Date & Time: Mon 13/Feb/2023 17:12:54
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 230 Vac

Setup of measurement equipment:

Start frequency: 27.5 GHz
Stop frequency: 30 GHz
Center frequency: 28.75 GHz
Frequency span: 2.5 GHz
Resolution-BW: 100 kHz
Video-BW: 300 kHz
Input attenuation: 10 dB
Trace-Mode: Max-Hold
Detector-Mode: Pos Peak

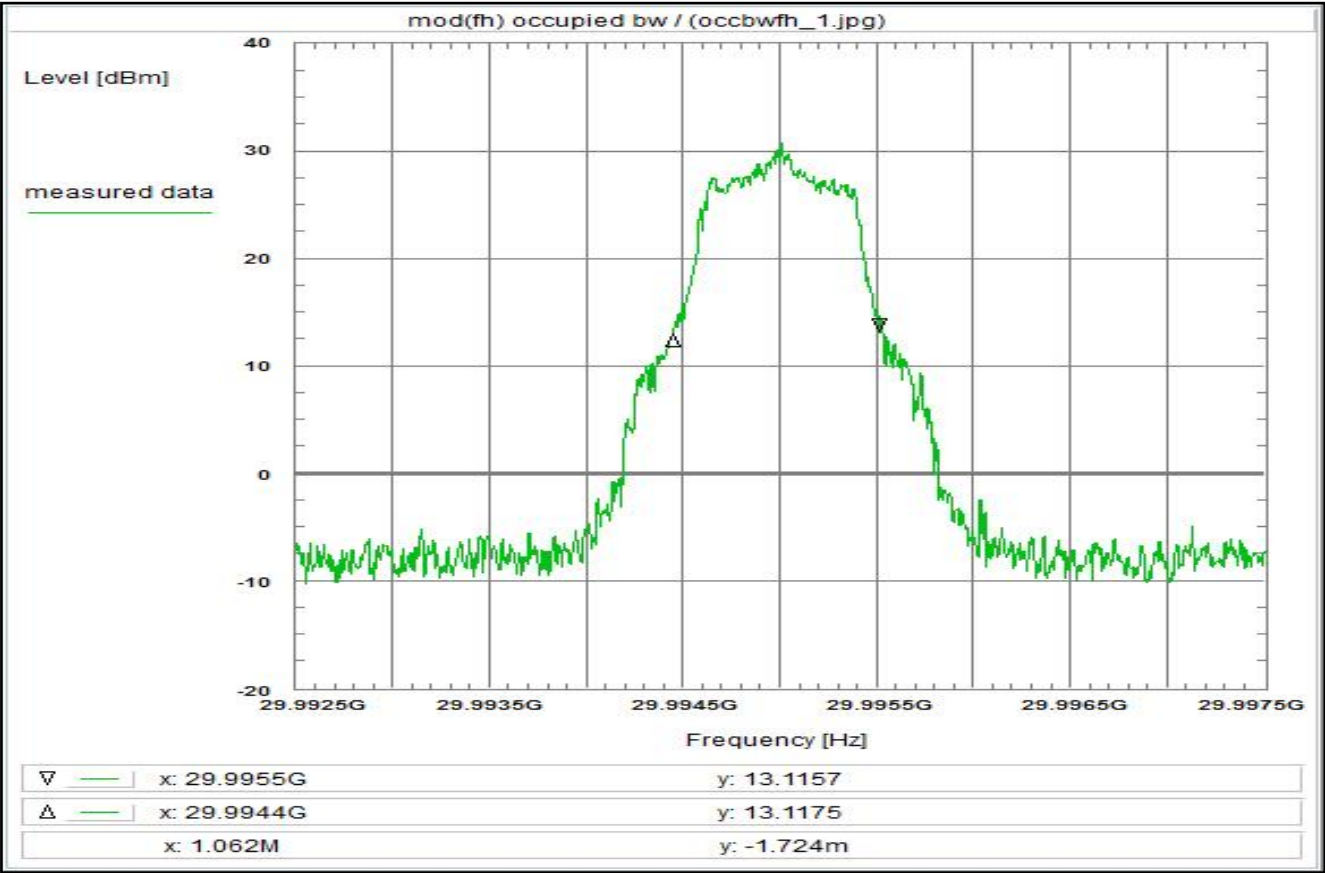
Correction:

Directional coupler + 0.0 dB
Coaxial cable (C220) + 4.0 dB
DUT-Antenna (on-axis) + 0.0 dBi
Test antenna (A031) - 15.5 dB
BW correction factor + 0.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Freefield attenuation (28.75GHz, 4.7m) + 75.1 dB
Circular Polarization + 3.0 dB
TOTAL CORRECTION: + 66.6 dB

Remarks:

Test of general function and measurement for orientation

Plot No. 6



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 6.4

Test setup:
see test report chapter 7.3:

Test equipment:
see test report chapter 7.4: A031, C220, R001

Remark:

Test result: determination of the occupied bandwidth

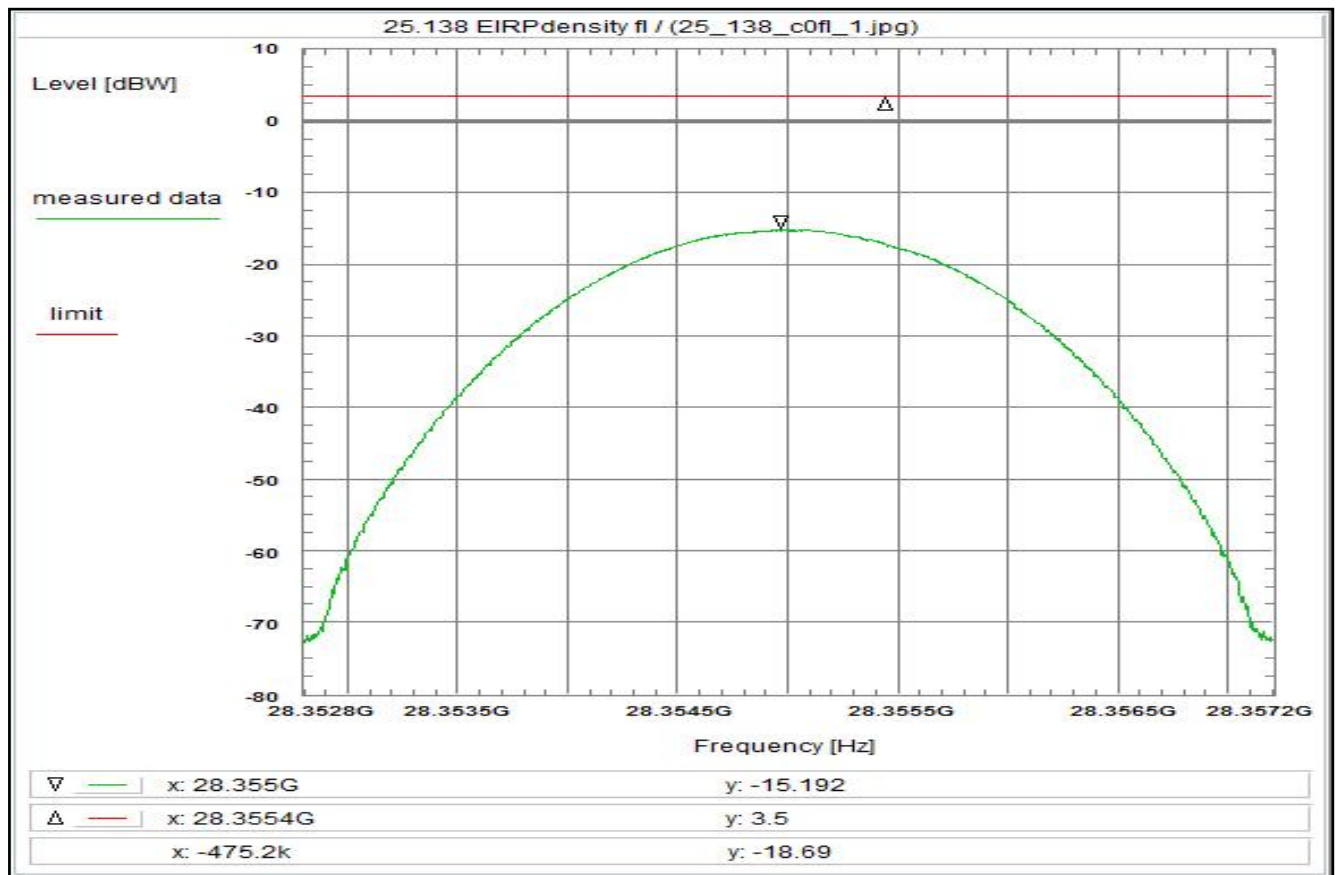
Environment condition:
Date & Time: Mon 13/Feb/2023 17:15:40
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 230 Vac

Setup of measurement equipment:
Start frequency: 29.9925 GHz
Stop frequency: 29.9975 GHz
Center frequency: 29.995 GHz
Frequency span: 5 MHz
Resolution-BW: 100 kHz
Video-BW: 300 kHz
Input attenuation: 10 dB
Trace-Mode: Max-Hold
Detector-Mode: Pos Peak

Correction:
Directional coupler + 0.0 dB
Coaxial cable (C220) + 4.1 dB
DUT-Antenna (on-axis) + 0.0 dBi
Test antenna (A031) - 15.8 dB
BW correction factor + 0.0 dB
Atten. between HPA and feedhorn + 0.0 dB
Freefield attenuation (28.75GHz, 4.7m) + 75.1 dB
Circular Polarization + 3.0 dB
TOTAL CORRECTION: + 66.4 dB

Remarks:
Determination of the occupied bandwidth. Average measurement.
The measured value is about 1.07 MHz (delta marker)
(according to the definition: 99% of the total mean power)
The internal function of the analyzer was used for determination.

Plot No. 7



Subclause: 25.218 Off-axis EIRP spectral density (co-, cross-polar) within the band
Modulated rf-carrier at the lower edge of the band (fl)
Measurement of the wanted signal within 5 * occupied bandwidth

Limit:

Limit acc. to §25.218: 32.5-25log2° dBW/MHz
-ant.-pattern envelope: -(29-25log2° dBi)
==>: 3.5 dBW/MHz (copolar)
resp.: 3.5 dBW/MHz (crosspolar)

The subtraction of the terms results in a constant limit.

The antenna gain is set to zero in the correction data for this calculation.

§25.204(e)(3) For stations employing uplink power control, the values in paragraphs (a)(1), (2), and (4) of §25.218 may be exceeded by up to 20 dB under conditions of uplink fading due to precipitation.

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see test report chapter 6.4

Test setup:

see test report chapter 7.3:

Test equipment:

see test report chapter 7.4: A031, C220, R001

Remark:

Test result: Test passed

Environment condition:

Date & Time: Mon 13/Feb/2023 16:46:31
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 230 Vac

Setup of measurement equipment:

Start frequency: 28.3528 GHz
Stop frequency: 28.3572 GHz
Center frequency: 28.355 GHz
Frequency span: 4.4 MHz
Resolution-BW: 1 MHz
Video-BW: 100 kHz
Input attenuation: 10 dB
Trace-Mode: Clear Write
Detector-Mode: AVG

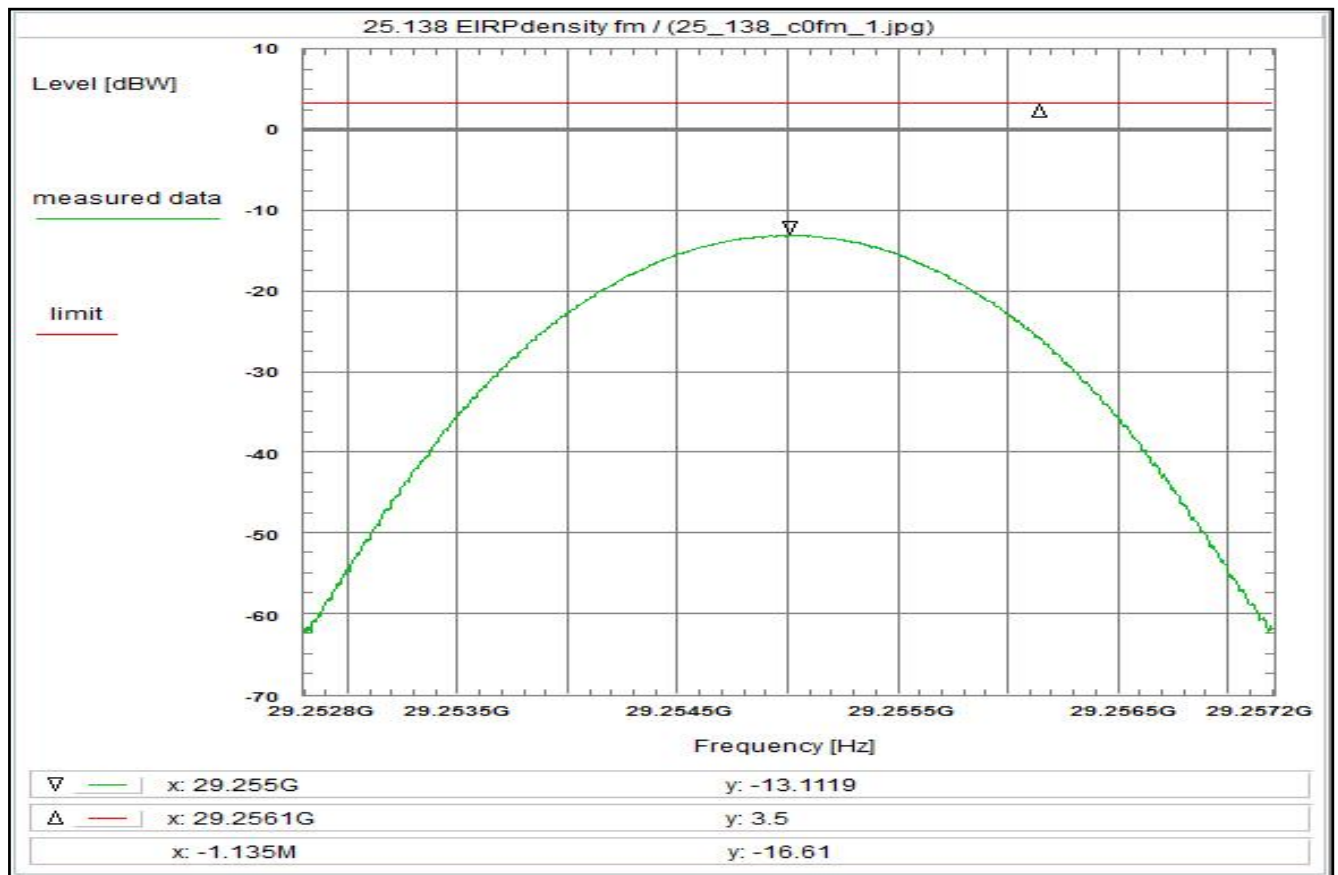
Correction:

Directional coupler	+ 0.0 dB
Coaxial cable (C220)	+ 3.9 dB
DUT-Antenna (see under limit)	- 21.0 dBi
Test antenna (A031)	- 15.2 dB
BW correction factor	+ 0.0 dB
Atten. between HPA and feedhorn	- 0.0 dB
Freefield attenuation (28.75GHz, 4.7m)	+ 75.1 dB
Circular Polarization	+ 3.0 dB
TOTAL CORRECTION:	+ 45.8 dB

Remarks:

The envelope curves for the antenna patterns ('worst case') are used for this calculation - the actual antenna patterns have to fulfill these requirements (co- and crosspolar envelope curves).
See the separate plot after the measurement plots, too.
Measurement with 30 kHz resolution filter and noise averaging.

Plot No. 8



Subclause: 25.218 Off-axis EIRP spectral density (co-, cross-polar) within the band
Modulated rf-carrier in the middle of the band (fm)
Measurement of the wanted signal within 5° occupied bandwidth

Limit:

Limit acc. to §25.218: 32.5-25log2° dBW/MHz
-ant.-pattern envelope: -(29-25log2° dBi)
==>: 3.5 dBW/MHz (copolar)
resp.: 3.5 dBW/MHz (crosspolar)

The subtraction of the terms results in a constant limit.

The antenna gain is set to zero in the correction data for this calculation.

§25.204(e)(3) For stations employing uplink power control, the values in paragraphs (a)(1), (2), and (4) of §25.218 may be exceeded by up to 20 dB under conditions of uplink fading due to precipitation.

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see test report chapter 6.4

Test setup:

see test report chapter 7.3:

Test equipment:

see test report chapter 7.4: A031, C220, R001

Remark:

Test result: Test passed

Environment condition:

Date & Time: Mon 13/Feb/2023 16:05:09
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 230 Vac

Setup of measurement equipment:

Start frequency: 29.2528 GHz
Stop frequency: 29.2572 GHz
Center frequency: 29.255 GHz
Frequency span: 4.4 MHz
Resolution-BW: 1 MHz
Video-BW: 100 kHz
Input attenuation: 10 dB
Trace-Mode: Clear Write
Detector-Mode: AVG

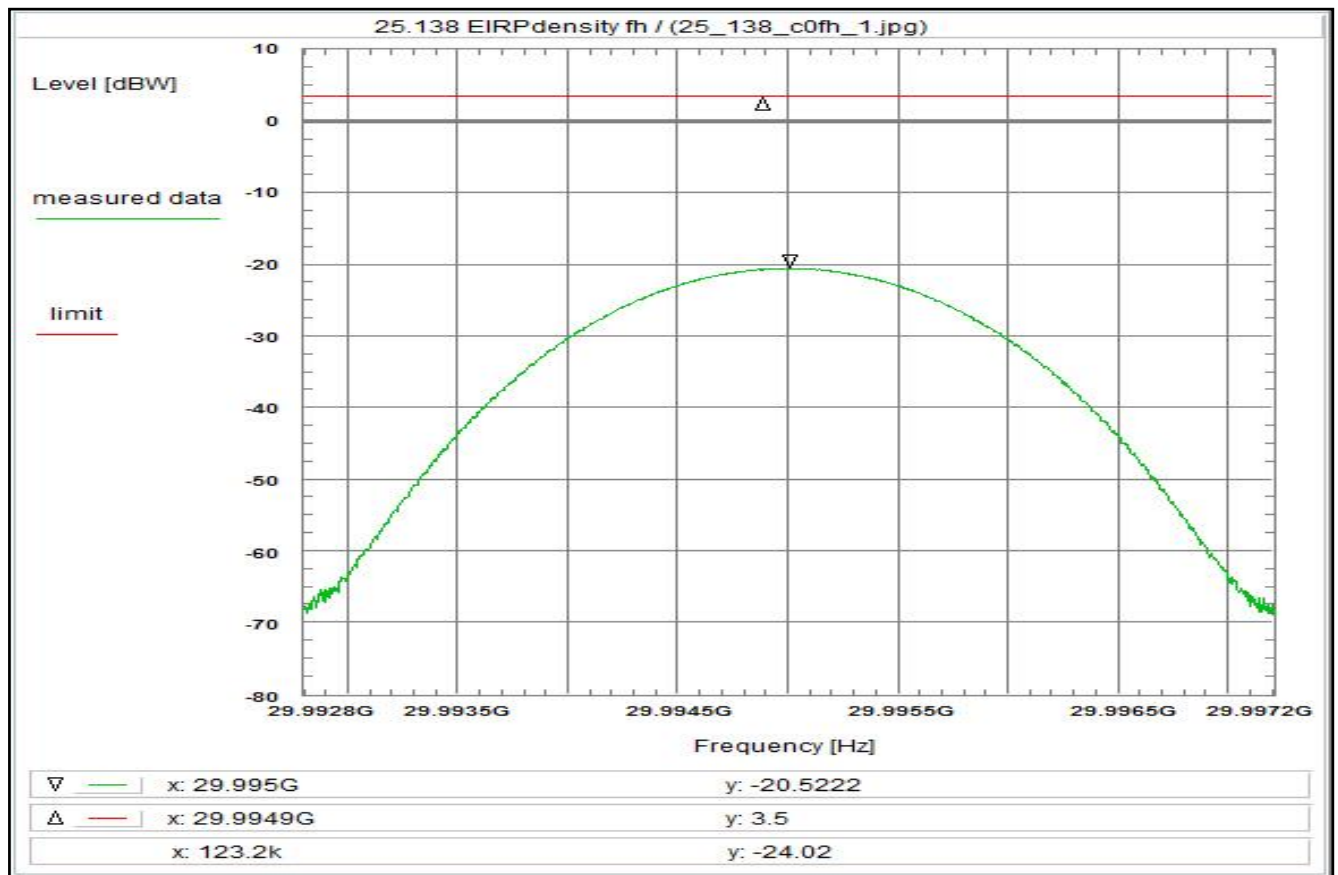
Correction:

Directional coupler + 0.0 dB
Coaxial cable (C220) + 4.0 dB
DUT-Antenna (see under limit) - 21.0 dBi
Test antenna (A031) - 15.8 dB
BW correction factor + 0.0 dB
Atten. between HPA and feedhorn - 0.0 dB
Freefield attenuation (29.26GHz, 4.7m) + 75.2 dB
Circular Polarization + 3.0 dB
TOTAL CORRECTION: + 45.4 dB

Remarks:

The envelope curves for the antenna patterns ('worst case') are used for this calculation - the actual antenna patterns have to fulfill these requirements (co- and crosspolar envelope curves).
See the separate plot after the measurement plots, too.
Measurement with 30 kHz resolution filter and noise averaging.

Plot No. 9



Subclause: 25.218 Off-axis EIRP spectral density (co-, cross-polar) within the band
Modulated rf-carrier at the upper edge of the band (fh)
Measurement of the wanted signal within 5 * occupied bandwidth

Limit:

Limit acc. to §25.218: 32.5-25log2° dBW/MHz
-ant.-pattern envelope: -(29-25log2° dBi)
=>: 3.5 dBW/MHz (copolar)
resp.: 3.5 dBW/MHz (crosspolar)

The subtraction of the terms results in a constant limit.

The antenna gain is set to zero in the correction data for this calculation.

§25.204(e)(3) For stations employing uplink power control, the values in paragraphs (a)(1), (2), and (4) of §25.218 may be exceeded by up to 20 dB under conditions of uplink fading due to precipitation.

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see test report chapter 6.4

Test setup:

see test report chapter 7.3:

Test equipment:

see test report chapter 7.4: A031, C220, R001

Remark:

Test result: Test passed

Environment condition:

Date & Time: Mon 13/Feb/2023 17:17:24
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 230 Vac

Setup of measurement equipment:

Start frequency: 29.9928 GHz
Stop frequency: 29.9972 GHz
Center frequency: 29.995 GHz
Frequency span: 4.4 MHz
Resolution-BW: 1 MHz
Video-BW: 100 kHz
Input attenuation: 10 dB
Trace-Mode: Clear Write
Detector-Mode: AVG

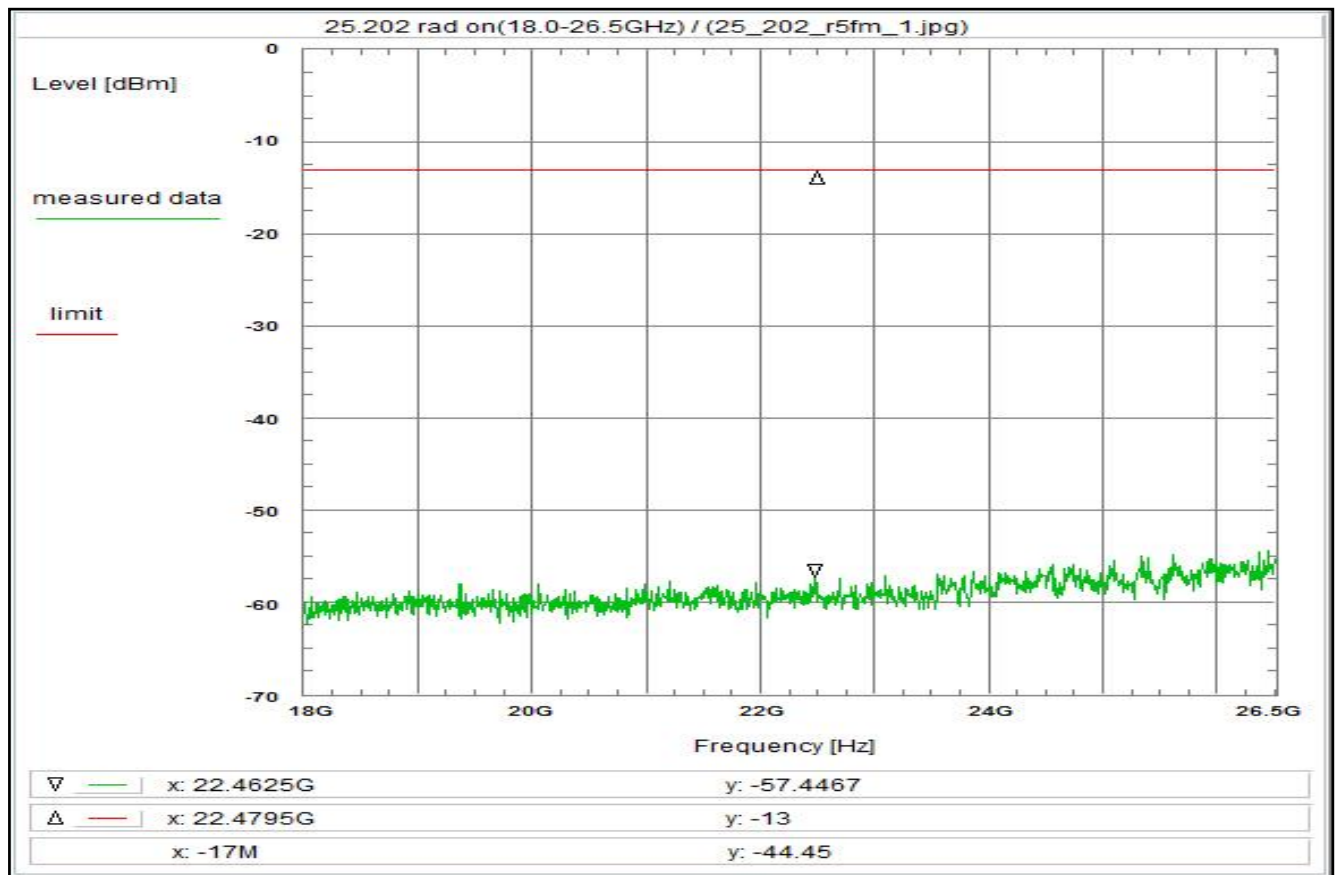
Correction:

Directional coupler	+ 0.0 dB
Coaxial cable (C220)	+ 4.1 dB
DUT-Antenna (see under limit)	- 21.0 dBi
Test antenna (A031)	- 15.8 dB
BW correction factor	+ 0.0 dB
Atten. between HPA and feedhorn	- 0.0 dB
Freefield attenuation (28.75GHz, 4.7m)	+ 75.1 dB
Circular Polarization	+ 3.0 dB
TOTAL CORRECTION:	+ 45.4 dB

Remarks:

The envelope curves for the antenna patterns ('worst case') are used for this calculation - the actual antenna patterns have to fulfill these requirements (co- and crosspolar envelope curves).
See the separate plot after the measurement plots, too.
Measurement with 30 kHz resolution filter and noise averaging.

Plot No. 10



Subclause: 25.202 Emission limitations
Modulated rf-carrier in the middle of the band (fm)
Radiation coming out of DUT-cabinet(s): 18.0 GHz - 26.5 GHz

Limit:
Limit acc. to §25.202): -13.0 dBm

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

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

Test setup:
see test report chapter 7.3:

Test equipment:
see test report chapter 7.4: A019, C220, R001

Remark:

Test result: Test passed

Environment condition:

Date & Time: Wed 15/Feb/2023 15:03:15
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 230 Vac

Setup of measurement equipment:

Start frequency: 18 GHz
Stop frequency: 26.5 GHz
Center frequency: 22.25 GHz
Frequency span: 8.5 GHz
Resolution-BW: 1 MHz
Video-BW: 3 MHz
Input attenuation: 0 dB
Trace-Mode: Max-Hold
Detector-Mode: AVG

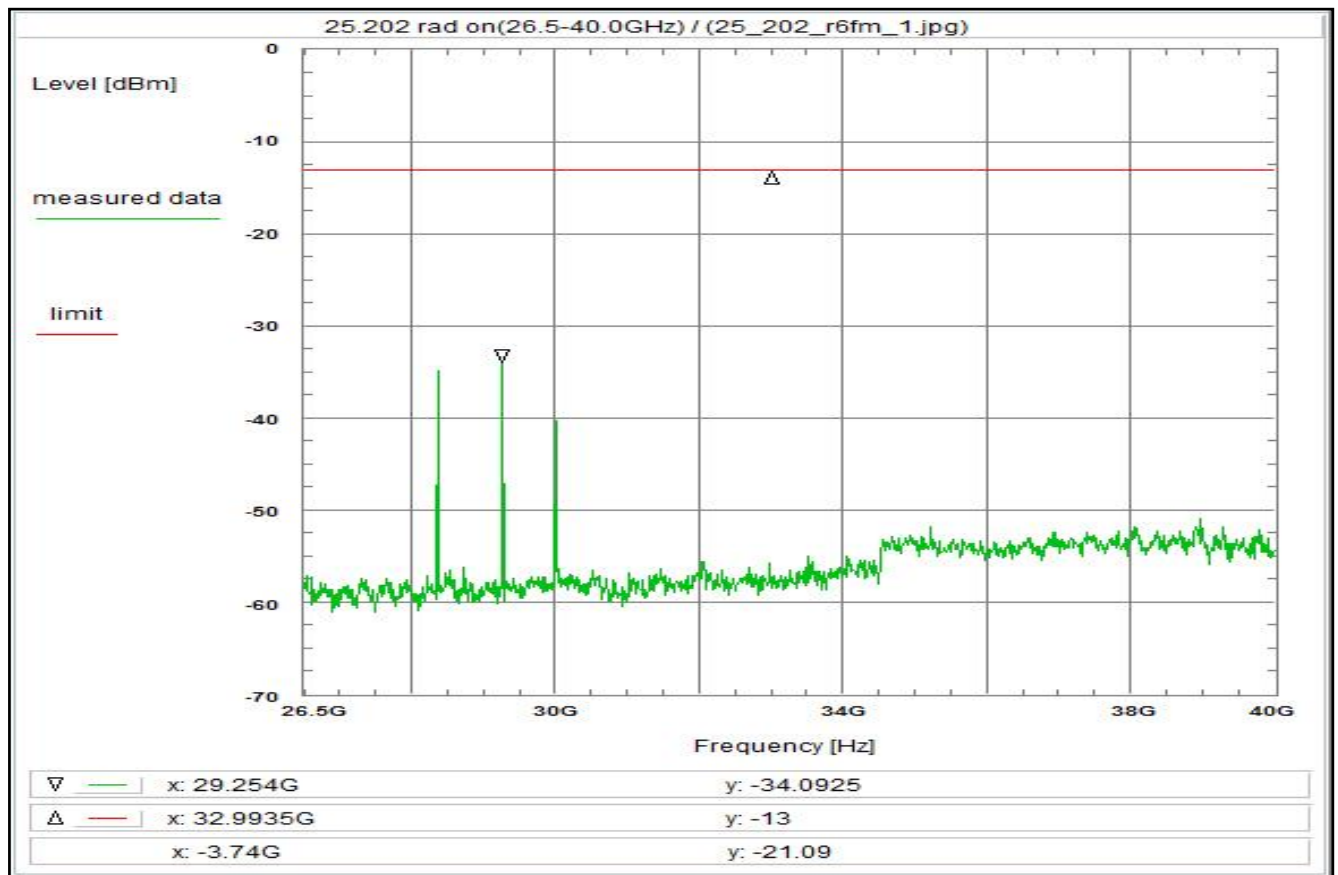
Correction:

Directional coupler	+ 0.0 dB
Coaxial cable (C220)	+ 3.5 dB
DUT-Antenna	+ 0.0 dBi
Test antenna (A019)	- 19.3 dB
BW correction factor	+ 0.0 dB
Atten. between HPA and feedhorn	- 0.0 dB
Freefield attenuation (22.25GHz, 0.3m)	+ 48.9 dB
TOTAL CORRECTION:	+ 33.1 dB

Remarks:

Carrier-on state / Carrier in the middle of the band (fm)
Measurement for orientation with a measuring antenna close to the DUT-cabinets (about 1m distance).
If any critical spurious radiations are detected a measurement in an exactly defined distance will be carried out.

Plot No. 11



Subclause: 25.202 Emission limitations
Modulated rf-carrier in the middle of the band (fm)
Radiation coming out of DUT-cabinet(s): 26.5 GHz - 40.0 GHz

Limit:
Limit acc. to §25.202): -13.0 dBm

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

Operating condition of DUT:
operating condition 1, see test report chapter 6.4
fl - fm - fh

Test setup:
see test report chapter 7.3:

Test equipment:
see test report chapter 7.4: A021, C220, R001

Remark:

Test result: Test passed

Environment condition:

Date & Time: Wed 15/Feb/2023 15:11:17
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 230 Vac

Setup of measurement equipment:

Start frequency: 26.5 GHz
Stop frequency: 40 GHz
Center frequency: 33.25 GHz
Frequency span: 13.5 GHz
Resolution-BW: 1 MHz
Video-BW: 3 MHz
Input attenuation: 0 dB
Trace-Mode: Max-Hold
Detector-Mode: AVG

Correction:

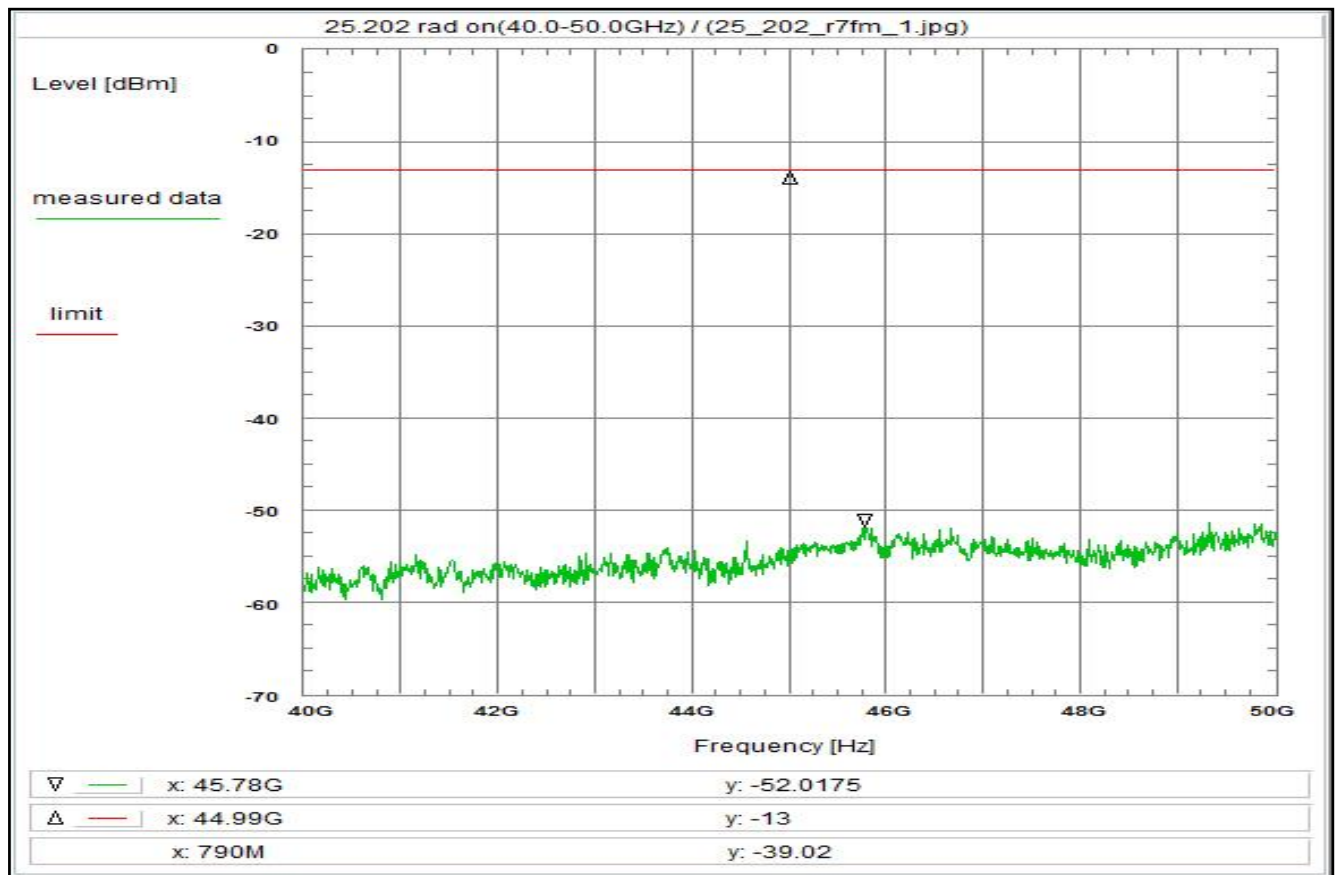
Directional coupler + 0.0 dB
Coaxial cable (C220) + 4.3 dB
DUT-Antenna + 0.0 dBi
Test antenna (A021) - 19.6 dB
BW correction factor + 0.0 dB
Atten. between HPA and feedhorn - 0.0 dB
Freefield attenuation (33.25GHz, 0.2m) + 48.9 dB
TOTAL CORRECTION: + 33.6 dB

Remarks:

Carrier-on state / Carrier in the middle of the band (fm)
Measurement for orientation with a measuring antenna close to the DUT-cabinets (about 1m distance).
If any critical spurious radiations are detected a measurement in an exactly defined distance will be carried out.

carrier frequencies made visible on plot

Plot No. 12



Subclause: 25.202 Emission limitations
Modulated rf-carrier in the middle of the band (fm)
Radiation coming out of DUT-cabinet(s): 40.0 GHz - 50.0 GHz

Limit:
Limit acc. to §25.202): -13.0 dBm

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

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

Test setup:
see test report chapter 7.3:

Test equipment:
see test report chapter 7.4: A023, C220, R001

Remark:

Test result: Test passed

Environment condition:

Date & Time: Wed 15/Feb/2023 14:59:44
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 230 Vac

Setup of measurement equipment:

Start frequency: 40 GHz
Stop frequency: 50 GHz
Center frequency: 45 GHz
Frequency span: 10 GHz
Resolution-BW: 1 MHz
Video-BW: 3 MHz
Input attenuation: 0 dB
Trace-Mode: Max-Hold
Detector-Mode: AVG

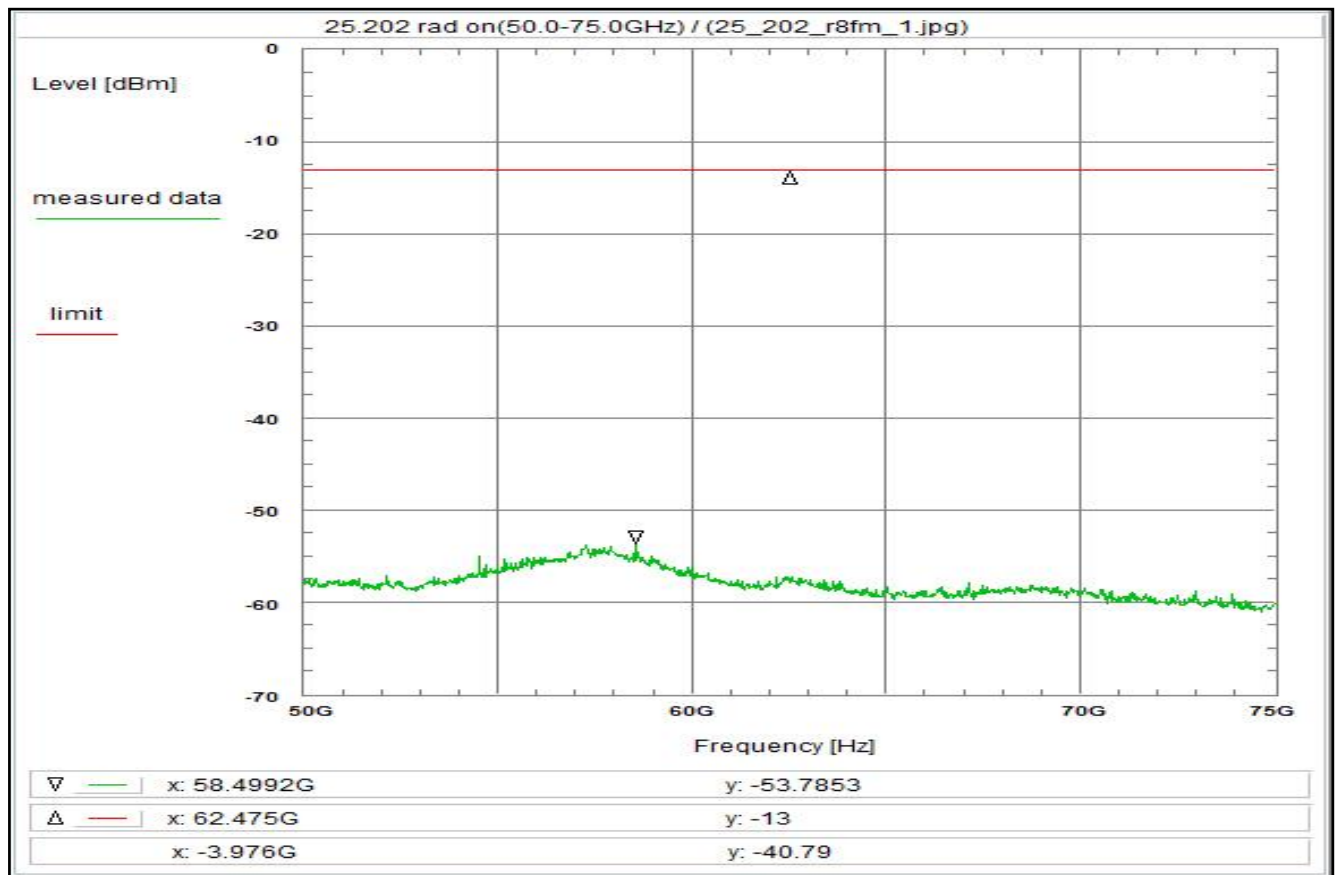
Correction:

Directional coupler + 0.0 dB
Coaxial cable (C220) + 5.2 dB
DUT-Antenna + 0.0 dBi
Test antenna (A023) - 18.9 dB
BW correction factor + 0.0 dB
Atten. between HPA and feedhorn - 0.0 dB
Freefield attenuation (45.00GHz, 0.1m) + 45.5 dB
TOTAL CORRECTION: + 31.8 dB

Remarks:

Carrier-on state / Carrier in the middle of the band (fm)
Measurement for orientation with a measuring antenna close to the DUT-cabinets (about 1m distance).
If any critical spurious radiations are detected a measurement in an exactly defined distance will be carried out.

Plot No. 13



Subclause: 25.202 Emission limitations
Modulated rf-carrier in the middle of the band (fm)
Radiation coming out of DUT-cabinet(s): 50.0 GHz - 75.0 GHz

Limit:
Limit acc. to §25.202): -13.0 dBm

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

Operating condition of DUT:
operating condition 2, see test report chapter 6.4

Test setup:
see test report chapter 7.3:

Test equipment:
see test report chapter 7.4: A025, R001, R025

Remark:

Test result: Test passed

Environment condition:

Date & Time: Wed 15/Feb/2023 14:46:46
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 230 Vac

Setup of measurement equipment:

Start frequency: 50 GHz
Stop frequency: 75 GHz
Center frequency: 62.5 GHz
Frequency span: 25 GHz
Resolution-BW: 1 MHz
Video-BW: 3 MHz
Input attenuation: 0 dB
Trace-Mode: Max-Hold
Detector-Mode: AVG

Correction:

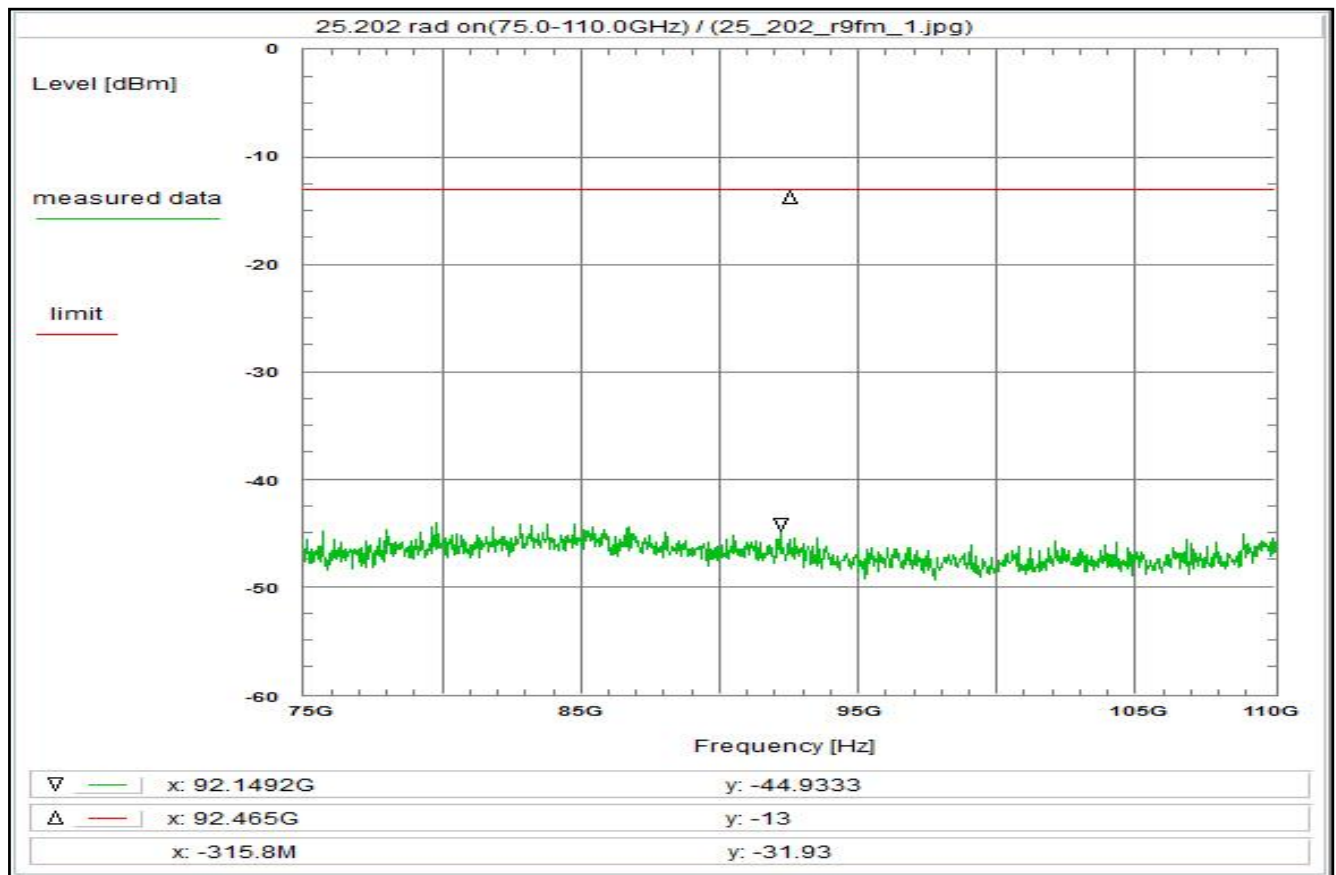
Directional coupler + 0.0 dB
Coaxial cable + 0.0 dB
DUT-Antenna + 0.0 dBi
Test antenna (A025) - 20.0 dB
BW correction factor + 0.0 dB
Atten. between HPA and feedhorn - 0.0 dB
Freefield attenuation (62.50GHz, 0.05m) + 42.3 dB
TOTAL CORRECTION: + 22.3 dB

Remarks:

Carrier-on state / Carrier in the middle of the band (fm)
Measurement for orientation with a measuring antenna close to the DUT-cabinets (about 1m distance).
If any critical spurious radiations are detected a measurement in an exactly defined distance will be carried out.

noise floor only

Plot No. 14



Subclause: 25.202 Emission limitations
Modulated rf-carrier in the middle of the band (fm)
Radiation coming out of DUT-cabinet(s): 75.0 GHz - 100.0 GHz

Limit:
Limit acc. to §25.202): -13.0 dBm

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

Operating condition of DUT:
operating condition 2, see test report chapter 6.4

Test setup:
see test report chapter 7.3:

Test equipment:
see test report chapter 7.4: A028, R001, R022

Remark:

Test result: Test passed

Environment condition:

Date & Time: Wed 15/Feb/2023 14:52:02
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 230 Vac

Setup of measurement equipment:

Start frequency: 75 GHz
Stop frequency: 110 GHz
Center frequency: 92.5 GHz
Frequency span: 35 GHz
Resolution-BW: 1 MHz
Video-BW: 3 MHz
Input attenuation: 0 dB
Trace-Mode: Max-Hold
Detector-Mode: Pos Peak

Correction:

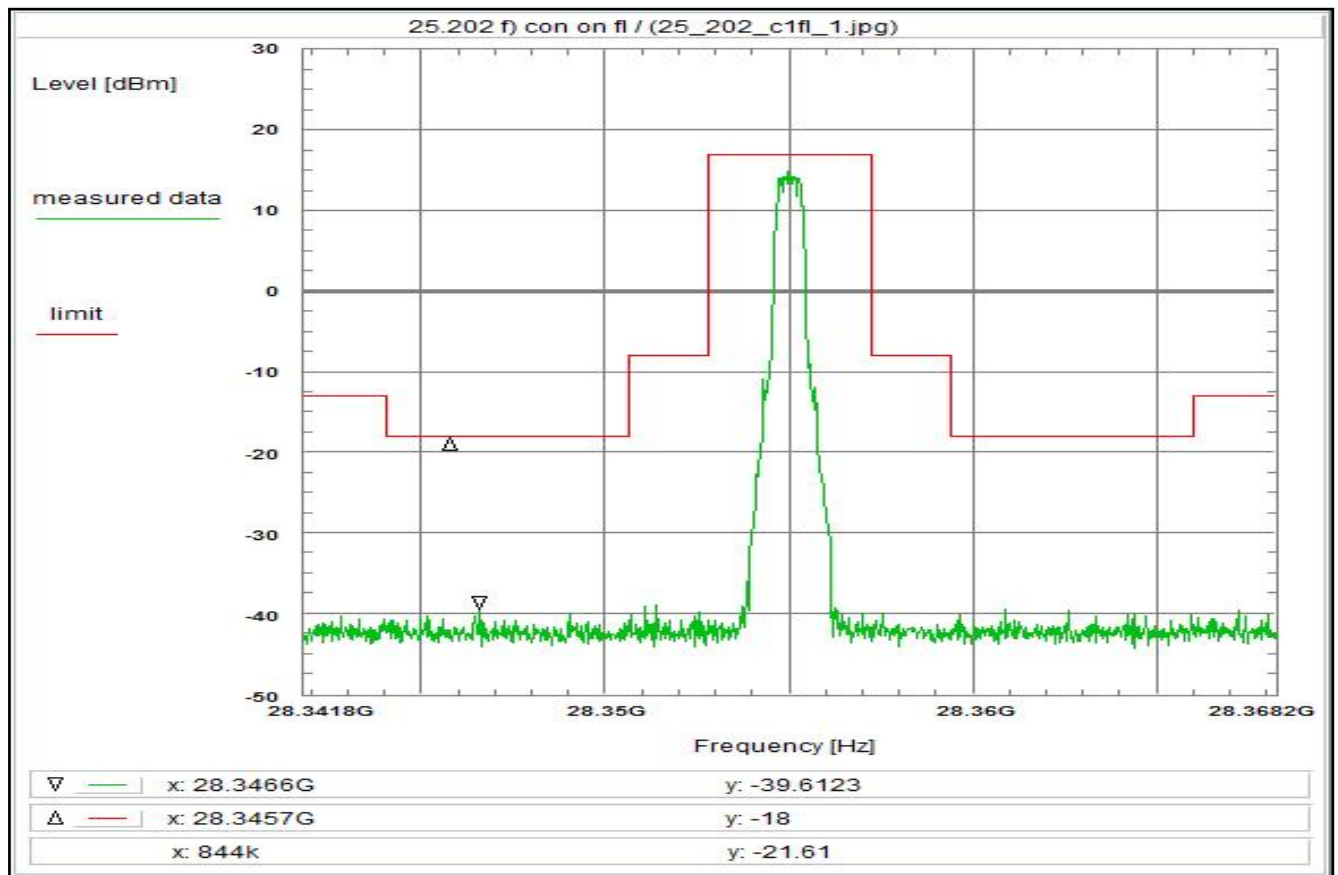
Directional coupler + 0.0 dB
Coaxial cable + 0.0 dB
DUT-Antenna + 0.0 dBi
Test antenna (A028) - 19.4 dB
BW correction factor + 0.0 dB
Atten. between HPA and feedhorn - 0.0 dB
Freefield attenuation (92.50GHz, 0.05m) + 45.7 dB
TOTAL CORRECTION: + 26.3 dB

Remarks:

Carrier-on state / Carrier in the middle of the band (fm)
Measurement for orientation with a measuring antenna close to the DUT-cabinets (about 1m distance).
If any critical spurious radiations are detected a measurement in an exactly defined distance will be carried out.

noise floor only

Plot No. 15



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 acc. to §25.202 f):**

50-100% of assigned bw: -25 dBc/4 kHz

100-250% of assigned bw: -35 dBc/4 kHz

> 250% of assigned bw: -43+10log(Pmax) dBc/4 kHz

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see test report chapter 6.4

Test setup:

see test report chapter 7.3:

Test equipment:

see test report chapter 7.4: A031, C220, R001

Remark:

Test result: Test passed**Environment condition:**

Date & Time: Mon 13/Feb/2023 16:34:27
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 230 Vac

Setup of measurement equipment:

Start frequency: 28.3418 GHz
Stop frequency: 28.3682 GHz
Center frequency: 28.355 GHz
Frequency span: 26.4 MHz
Resolution-BW: 10 kHz
Video-BW: 30 kHz
Input attenuation: 10 dB
Trace-Mode: Clear Write
Detector-Mode: AVG

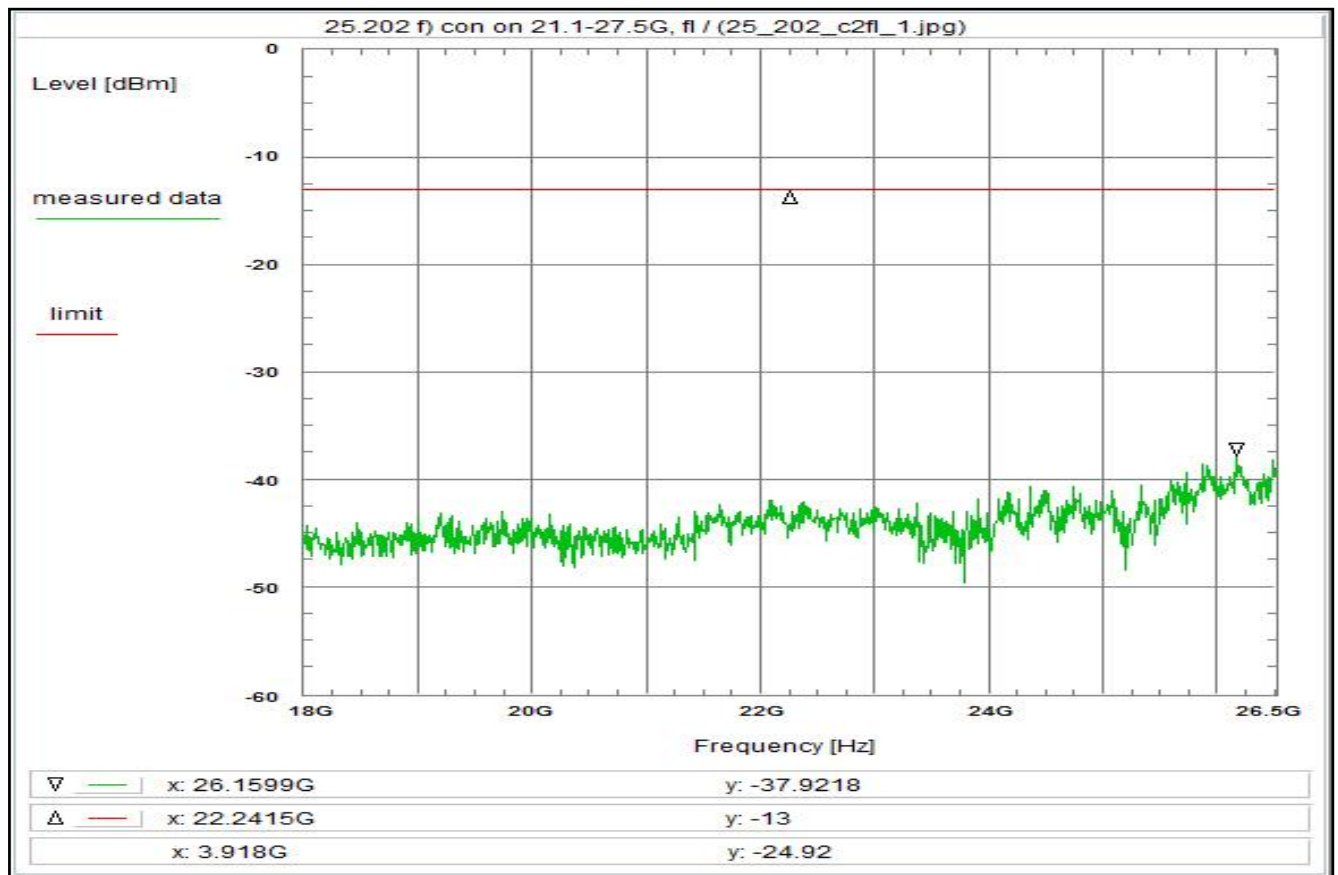
Correction:

Directional coupler	+ 0.0 dB
Coaxial cable (C220)	+ 3.9 dB
DUT-Antenna (on-axis)	+ 0.0 dBi
Test antenna (A031)	- 15.2 dB
BW correction factor (10k -> 4k)	- 4.0 dB
Atten. between HPA and feedhorn	- 0.0 dB
Freefield attenuation (28.75GHz, 4.7m)	+ 75.1 dB
Circular Polarization	+ 3.0 dB
TOTAL CORRECTION:	+ 62.8 dB

Remarks:

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

Plot No. 16



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 acc. to §25.202 f):

50-100% of assigned bw: -25 dBc/4 kHz

100-250% of assigned bw: -35 dBc/4 kHz

> 250% of assigned bw: -43+10log(Pmax) dBc/4 kHz

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see test report chapter 6.4

Test setup:

see test report chapter 7.3:

Test equipment:

see test report chapter 7.4: A019, C220, R001

Remark:

Test result: Test passed

Environment condition:

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

Setup of measurement equipment:

Start frequency: 18 GHz
Stop frequency: 26.5 GHz
Center frequency: 22.25 GHz
Frequency span: 8.5 GHz
Resolution-BW: 100 kHz
Video-BW: 300 kHz
Input attenuation: 10 dB
Trace-Mode: Max-Hold
Detector-Mode: AVG

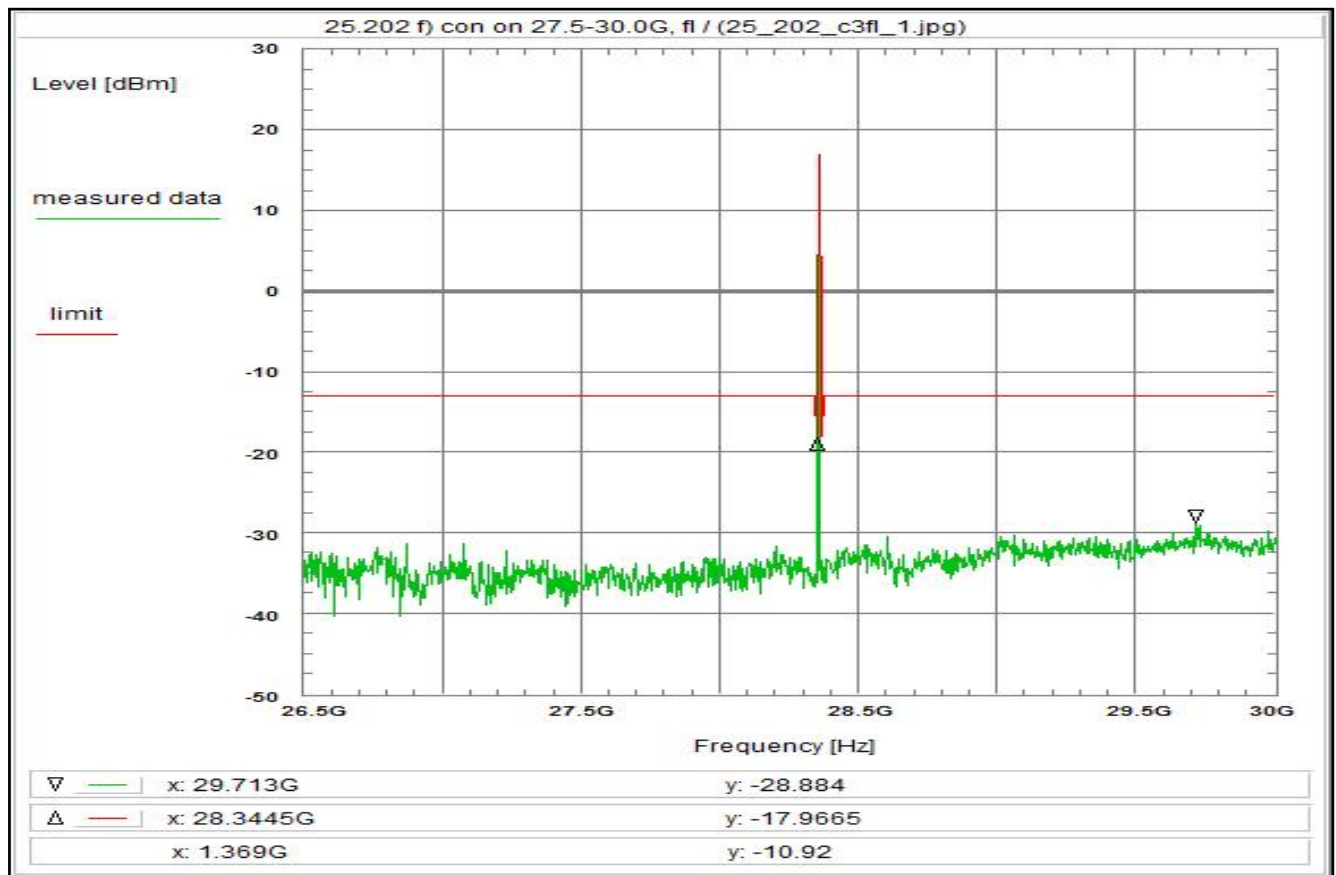
Correction:

Directional coupler + 0.0 dB
Coaxial cable (C220) + 3.5 dB
DUT-Antenna (see under limit) - 0.0 dBi
Test antenna (A019) - 19.3 dB
BW correction factor (100k -> 4k) - 14.0 dB
Atten. between HPA and feedhorn - 0.0 dB
Freefield attenuation (22.25GHz, 4.7m) + 72.8 dB
Circular Polarization + 3.0 dB
TOTAL CORRECTION: + 46.0 dB

Remarks:

Carrier-on state / Carrier at the lower edge of the band (fl)
Rather left the plot shows the cut-off of the wave guide.

Plot No. 17



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 acc. to §25.202 f):

50-100% of assigned bw: -25 dBc/4 kHz

100-250% of assigned bw: -35 dBc/4 kHz

> 250% of assigned bw: -43+10log(Pmax) dBc/4 kHz

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see test report chapter 6.4

Test setup:

see test report chapter 7.3:

Test equipment:

see test report chapter 7.4: A031, C220, R001

Remark:

Test result: Test passed

Environment condition:

Date & Time: Mon 13/Feb/2023 17:04:00
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 230 Vac

Setup of measurement equipment:

Start frequency: 26.5 GHz
Stop frequency: 30 GHz
Center frequency: 28.25 GHz
Frequency span: 3.5 GHz
Resolution-BW: 100 kHz
Video-BW: 300 kHz
Input attenuation: 10 dB
Trace-Mode: Max-Hold
Detector-Mode: AVG

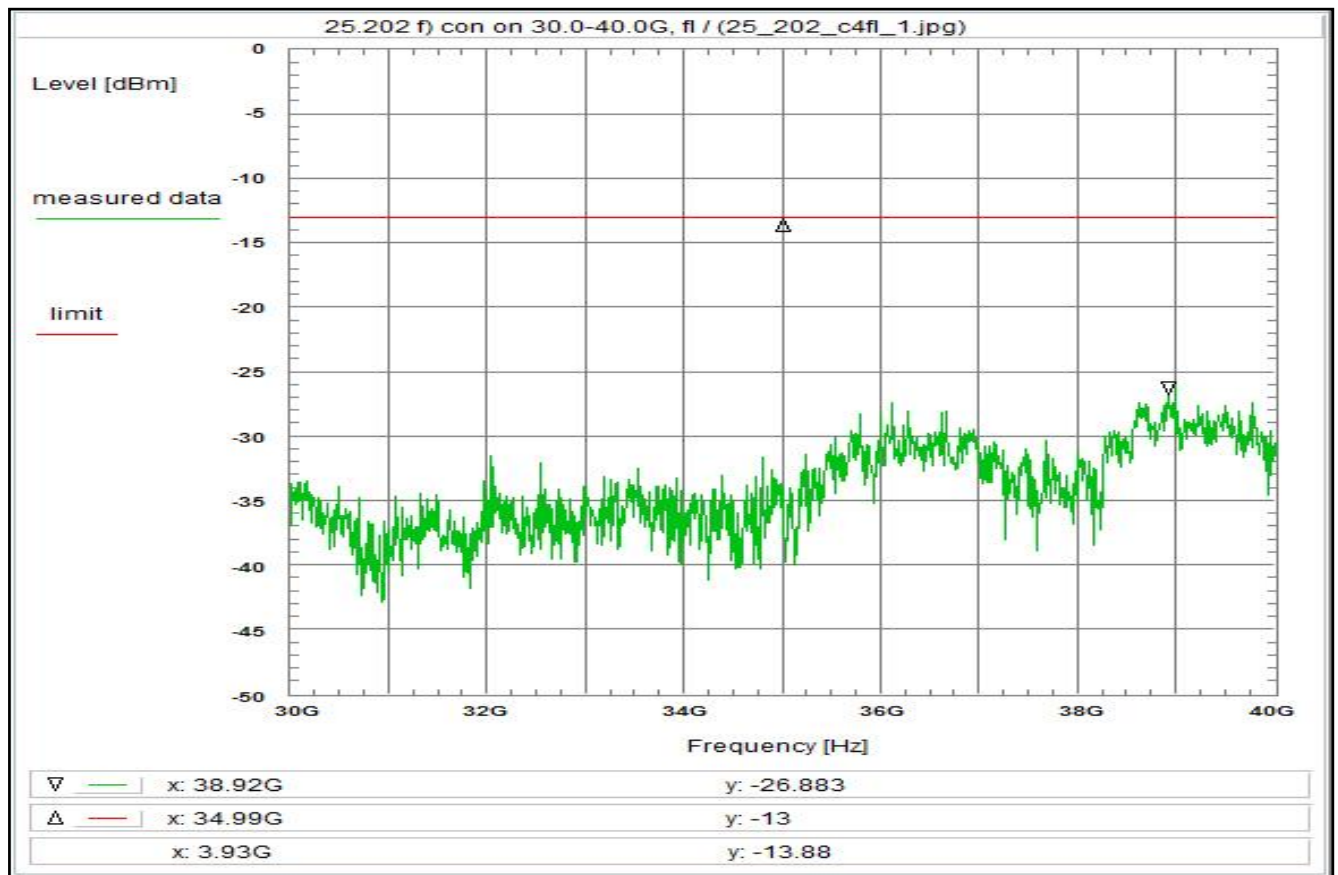
Correction:

Directional coupler + 0.0 dB
Coaxial cable (C220) + 3.9 dB
DUT-Antenna (see under limit) - 0.0 dBi
Test antenna (A031) - 15.4 dB
BW correction factor (100k -> 4k) - 14.0 dB
Atten. between HPA and feedhorn - 0.0 dB
Freefield attenuation (28.75GHz, 4.7m) + 75.1 dB
Circular Polarization + 3.0 dB
TOTAL CORRECTION: + 52.6 dB

Remarks:

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

Plot No. 18



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 acc. to §25.202 f):

50-100% of assigned bw: -25 dBc/4 kHz

100-250% of assigned bw: -35 dBc/4 kHz

> 250% of assigned bw: $-43+10\log(P_{max})$ dBc/4 kHz

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see test report chapter 6.4

Test setup:

see test report chapter 7.3:

Test equipment:

see test report chapter 7.4: A031, C220, R001

Remark:

Test result: Test passed

Environment condition:

Date & Time: Mon 13/Feb/2023 16:37:00
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 230 Vac

Setup of measurement equipment:

Start frequency: 30 GHz
Stop frequency: 40 GHz
Center frequency: 35 GHz
Frequency span: 10 GHz
Resolution-BW: 100 kHz
Video-BW: 300 kHz
Input attenuation: 10 dB
Trace-Mode: Max-Hold
Detector-Mode: AVG

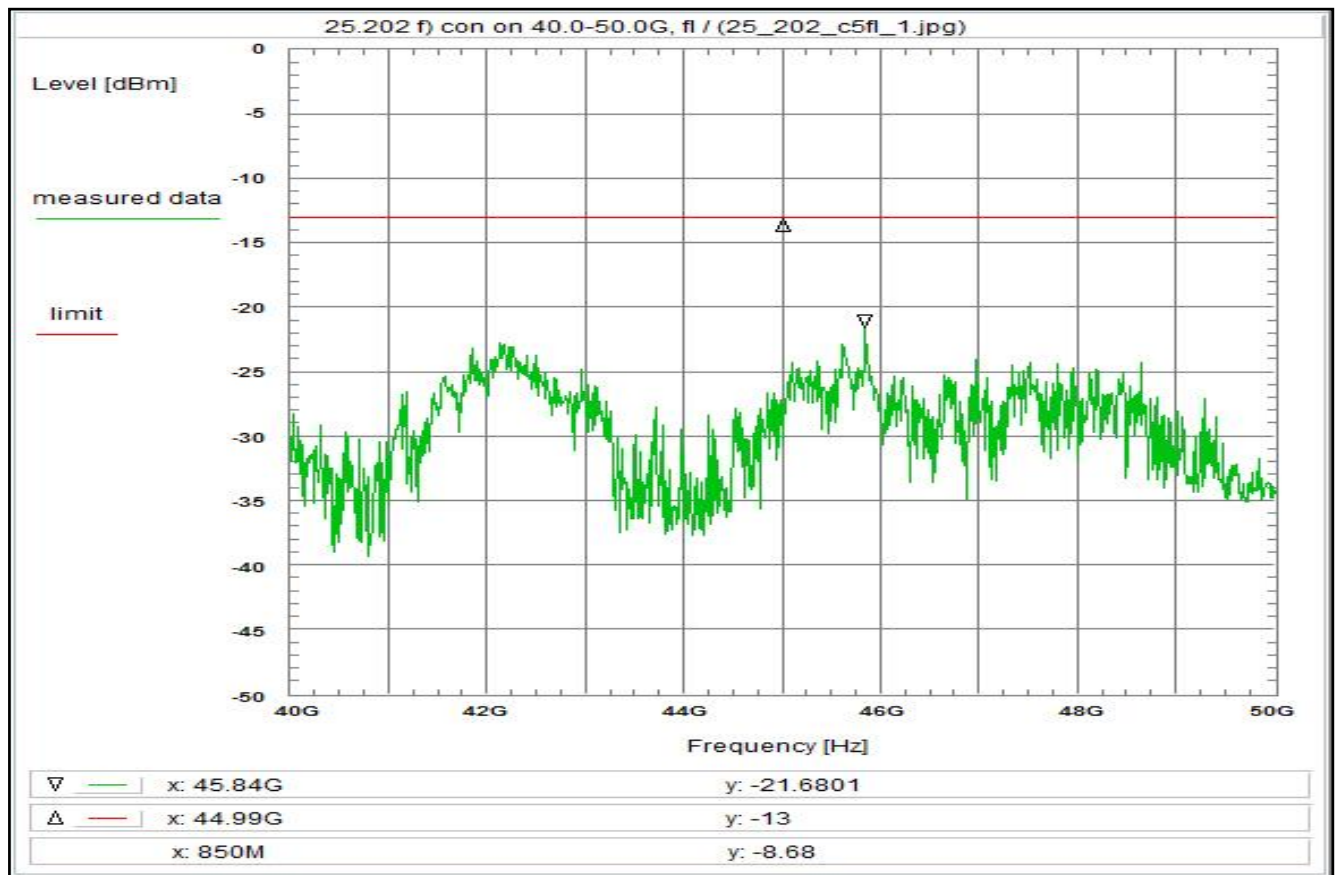
Correction:

Directional coupler + 0.0 dB
Coaxial cable (C220) + 4.4 dB
DUT-Antenna (on-axis) + 0.0 dBi
Test antenna (A031) - 16.9 dB
BW correction factor (100k -> 4k) - 14.0 dB
Atten. between HPA and feedhorn - 0.0 dB
Freefield attenuation (28.75GHz, 4.7m) + 75.1 dB
Circular Polarization + 3.0 dB
TOTAL CORRECTION: + 51.6 dB

Remarks:

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

Plot No. 19



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 acc. to §25.202 f):**

50-100% of assigned bw: -25 dBc/4 kHz

100-250% of assigned bw: -35 dBc/4 kHz

> 250% of assigned bw: -43+10log(Pmax) dBc/4 kHz

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see test report chapter 6.4

Test setup:

see test report chapter 7.3:

Test equipment:

see test report chapter 7.4: A023, C220, R001

Remark:

Test result: Test passed**Environment condition:**

Date & Time: Mon 13/Feb/2023 16:59:49
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 230 Vac

Setup of measurement equipment:

Start frequency: 40 GHz
Stop frequency: 50 GHz
Center frequency: 45 GHz
Frequency span: 10 GHz
Resolution-BW: 100 kHz
Video-BW: 300 kHz
Input attenuation: 10 dB
Trace-Mode: Max-Hold
Detector-Mode: AVG

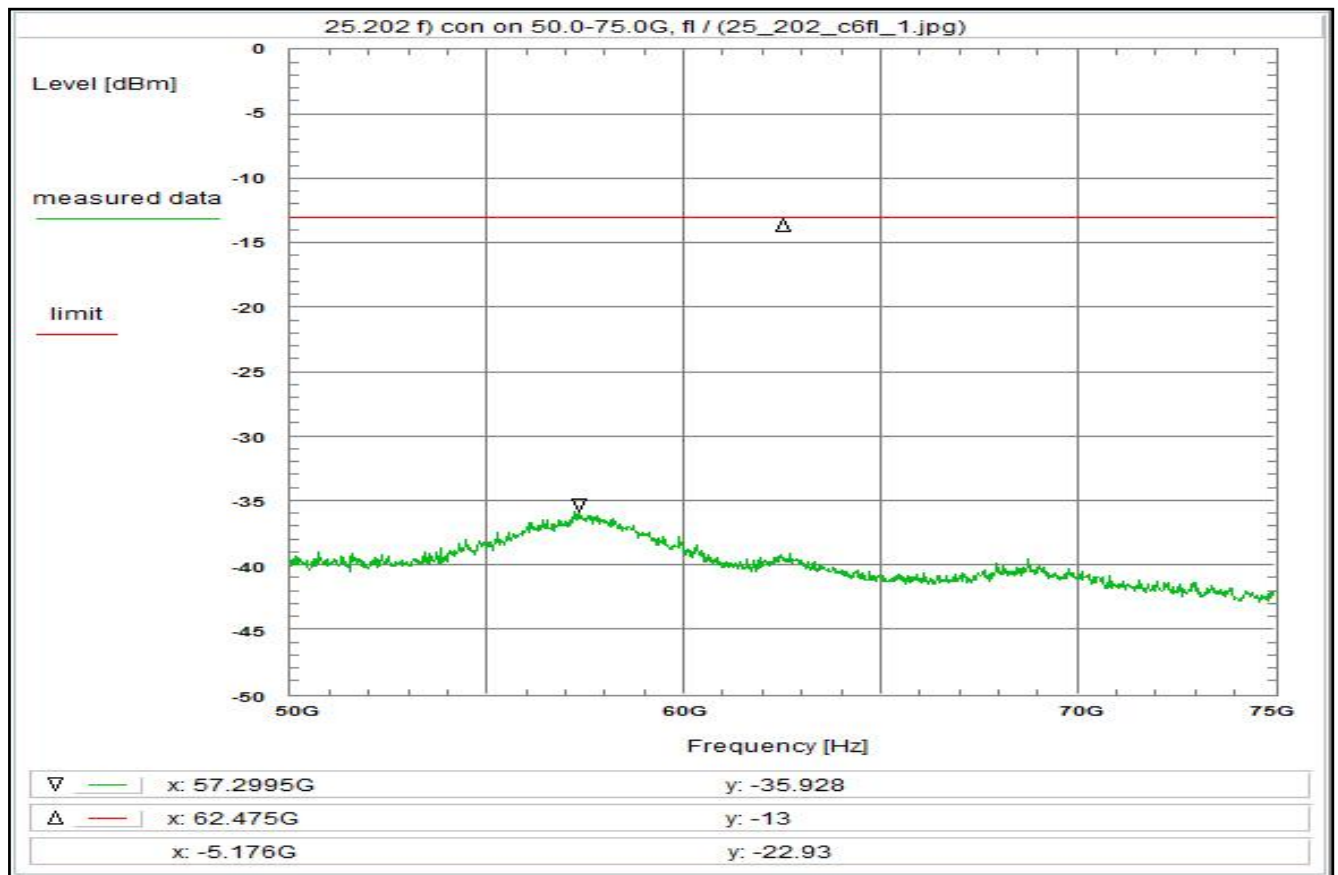
Correction:

Directional coupler + 0.0 dB
Coaxial cable (C220) + 5.2 dB
DUT-Antenna (see under limit) - 0.0 dBi
Test antenna (A023) - 18.9 dB
BW correction factor (100k -> 4k) - 14.0 dB
Atten. between HPA and feedhorn - 0.0 dB
Freefield attenuation (45.00GHz, 4.7m) + 78.9 dB
Circular Polarization + 3.0 dB
TOTAL CORRECTION: + 54.2 dB

Remarks:

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

Plot No. 20



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 acc. to §25.202 f):

50-100% of assigned bw: -25 dBc/4 kHz

100-250% of assigned bw: -35 dBc/4 kHz

> 250% of assigned bw: -43+10log(Pmax) dBc/4 kHz

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see test report chapter 6.4

Test setup:

see test report chapter 7.3:

Test equipment:

see test report chapter 7.4: A025, R001, R025

Remark:

Test result: Test passedEnvironment condition:

Date & Time: Mon 13/Feb/2023 17:51:42
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 230 Vac

Setup of measurement equipment:

Start frequency: 50 GHz
Stop frequency: 75 GHz
Center frequency: 62.5 GHz
Frequency span: 25 GHz
Resolution-BW: 1 MHz
Video-BW: 3 MHz
Input attenuation: 10 dB
Trace-Mode: Max-Hold
Detector-Mode: AVG

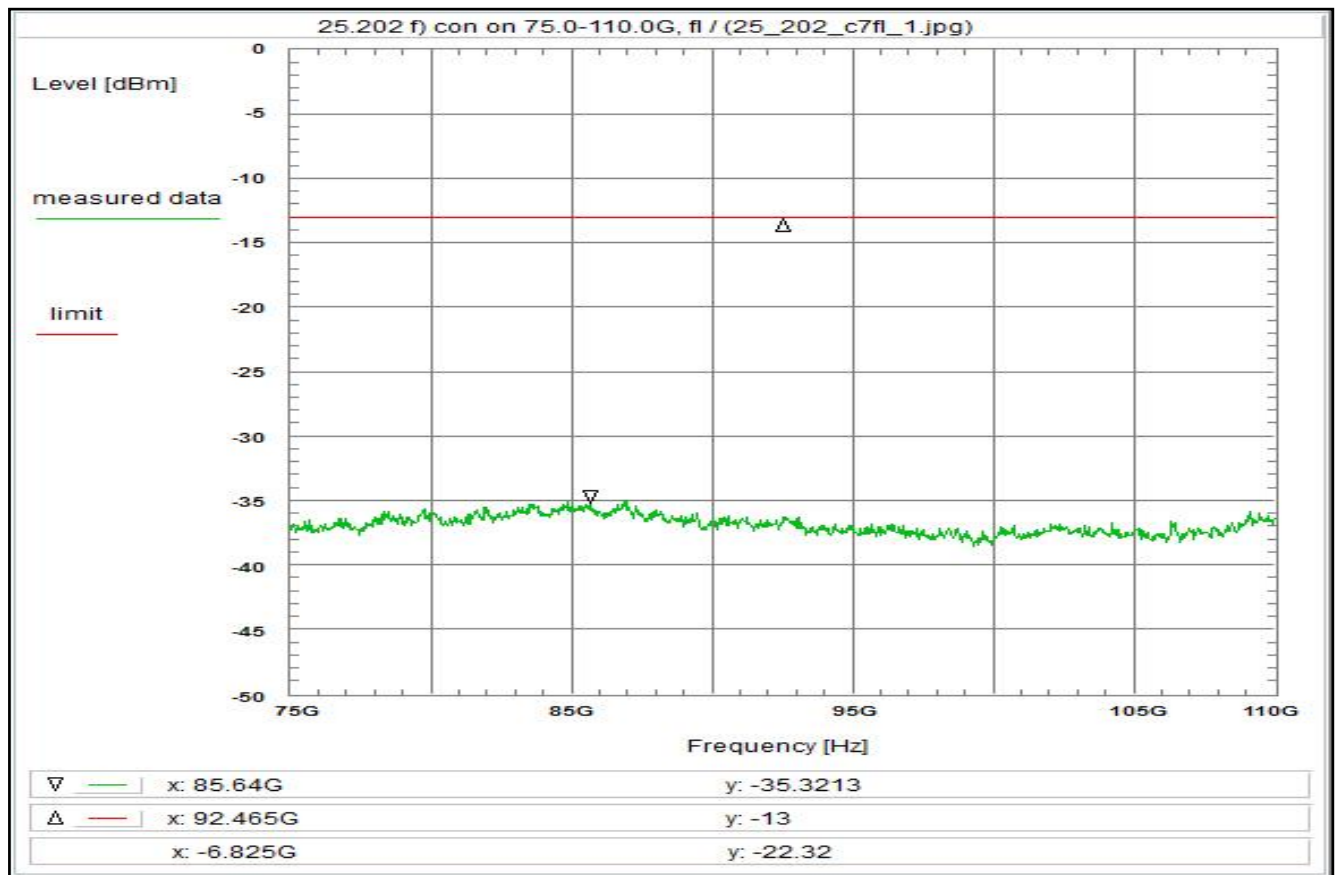
Correction:

Directional coupler + 0.0 dB
Coaxial cable + 0.0 dB
DUT-Antenna (see under limit) - 0.0 dBi
Test antenna (A025) - 20.0 dB
BW correction factor (1M -> 4k) - 24.0 dB
Atten. between HPA and feedhorn - 0.0 dB
Freefield attenuation (62.50GHz, 4.7m) + 81.8 dB
Circular Polarization + 3.0 dB
TOTAL CORRECTION: + 40.8 dB

Remarks:

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

Plot No. 21



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 acc. to §25.202 f):

50-100% of assigned bw: -25 dBc/4 kHz

100-250% of assigned bw: -35 dBc/4 kHz

> 250% of assigned bw: $-43+10\log(P_{max})$ dBc/4 kHz

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see test report chapter 6.4

Test setup:

see test report chapter 7.3:

Test equipment:

see test report chapter 7.4: A028, R001, R029

Remark:

Test result: Test passed

Environment condition:

Date & Time: Mon 13/Feb/2023 17:57:12
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 230 Vac

Setup of measurement equipment:

Start frequency: 75 GHz
Stop frequency: 110 GHz
Center frequency: 92.5 GHz
Frequency span: 35 GHz
Resolution-BW: 1 MHz
Video-BW: 3 MHz
Input attenuation: 10 dB
Trace-Mode: Max-Hold
Detector-Mode: AVG

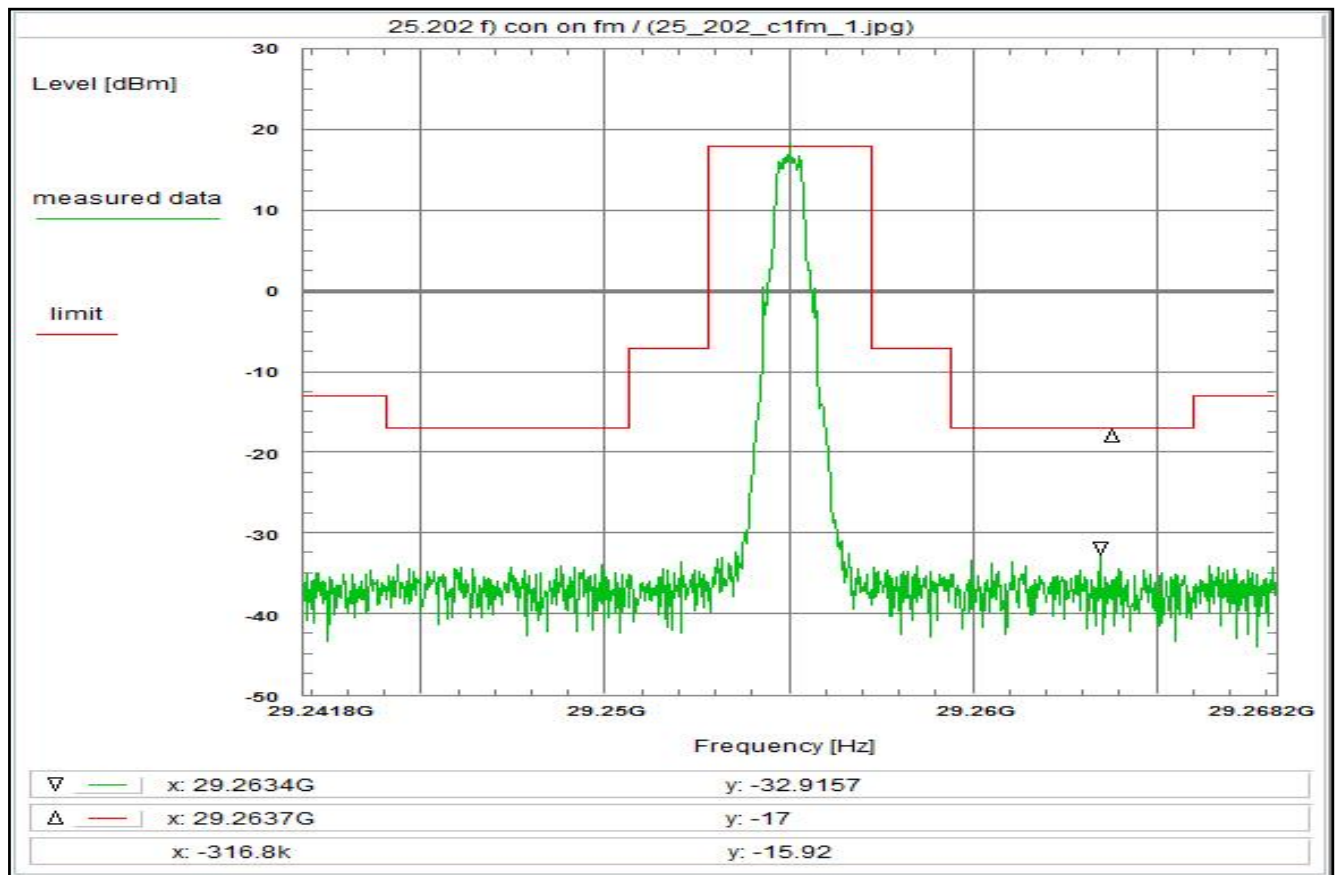
Correction:

Directional coupler + 0.0 dB
Coaxial cable + 0.0 dB
DUT-Antenna (see under limit) - 0.0 dBi
Test antenna (A028) - 19.4 dB
BW correction factor (1M -> 4k) - 24.0 dB
Atten. between HPA and feedhorn - 0.0 dB
Freefield attenuation (92.50GHz, 4.7m) + 85.2 dB
Circular Polarization + 3.0 dB
TOTAL CORRECTION: + 44.8 dB

Remarks:

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

Plot No. 22



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

Limit:

Limit acc. to §25.202 f):

50-100% of assigned bw: -25 dBc/4 kHz

100-250% of assigned bw: -35 dBc/4 kHz

> 250% of assigned bw: -43+10log(Pmax) dBc/4 kHz

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see test report chapter 6.4

Test setup:

see test report chapter 7.3:

Test equipment:

see test report chapter 7.4: A031, C220, R001

Remark:

Test result: Test passed

Environment condition:

Date & Time: Mon 13/Feb/2023 16:10:11
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 230 Vac

Setup of measurement equipment:

Start frequency: 29.2418 GHz
Stop frequency: 29.2682 GHz
Center frequency: 29.255 GHz
Frequency span: 26.4 MHz
Resolution-BW: 10 kHz
Video-BW: 30 kHz
Input attenuation: 10 dB
Trace-Mode: Max-Hold
Detector-Mode: AVG

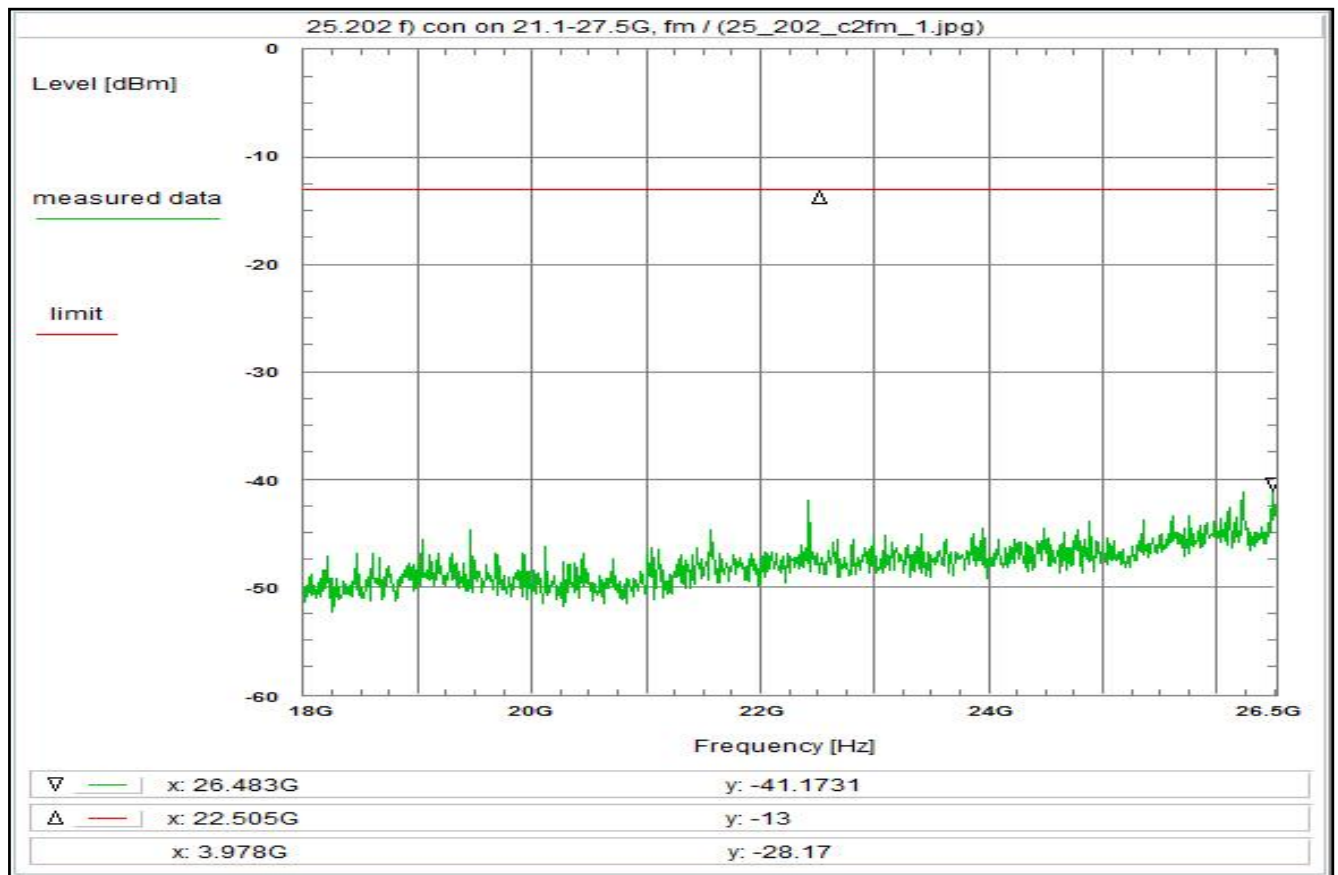
Correction:

Directional coupler	+ 0.0 dB
Coaxial cable (C220)	+ 4.0 dB
DUT-Antenna (see under limit)	+ 0.0 dBi
Test antenna (A031)	- 15.8 dB
BW correction factor (10k -> 4k)	- 4.0 dB
Atten. between HPA and feedhorn	- 0.0 dB
Freefield attenuation (29.26GHz, 4.7m)	+ 75.2 dB
Circular Polarization	+ 3.0 dB
TOTAL CORRECTION:	+ 62.4 dB

Remarks:

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

Plot No. 23



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

Limit:

Limit acc. to §25.202 f):

50-100% of assigned bw: -25 dBc/4 kHz

100-250% of assigned bw: -35 dBc/4 kHz

> 250% of assigned bw: -43+10log(Pmax) dBc/4 kHz

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see test report chapter 6.4

Test setup:

see test report chapter 7.3:

Test equipment:

see test report chapter 7.4: A019, C220, R001

Remark:

Test result: Test passed

Environment condition:

Date & Time: Mon 13/Feb/2023 16:27:03
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 230 Vac

Setup of measurement equipment:

Start frequency: 18 GHz
Stop frequency: 26.5 GHz
Center frequency: 22.25 GHz
Frequency span: 8.5 GHz
Resolution-BW: 100 kHz
Video-BW: 300 kHz
Input attenuation: 10 dB
Trace-Mode: Clear Write
Detector-Mode: AVG

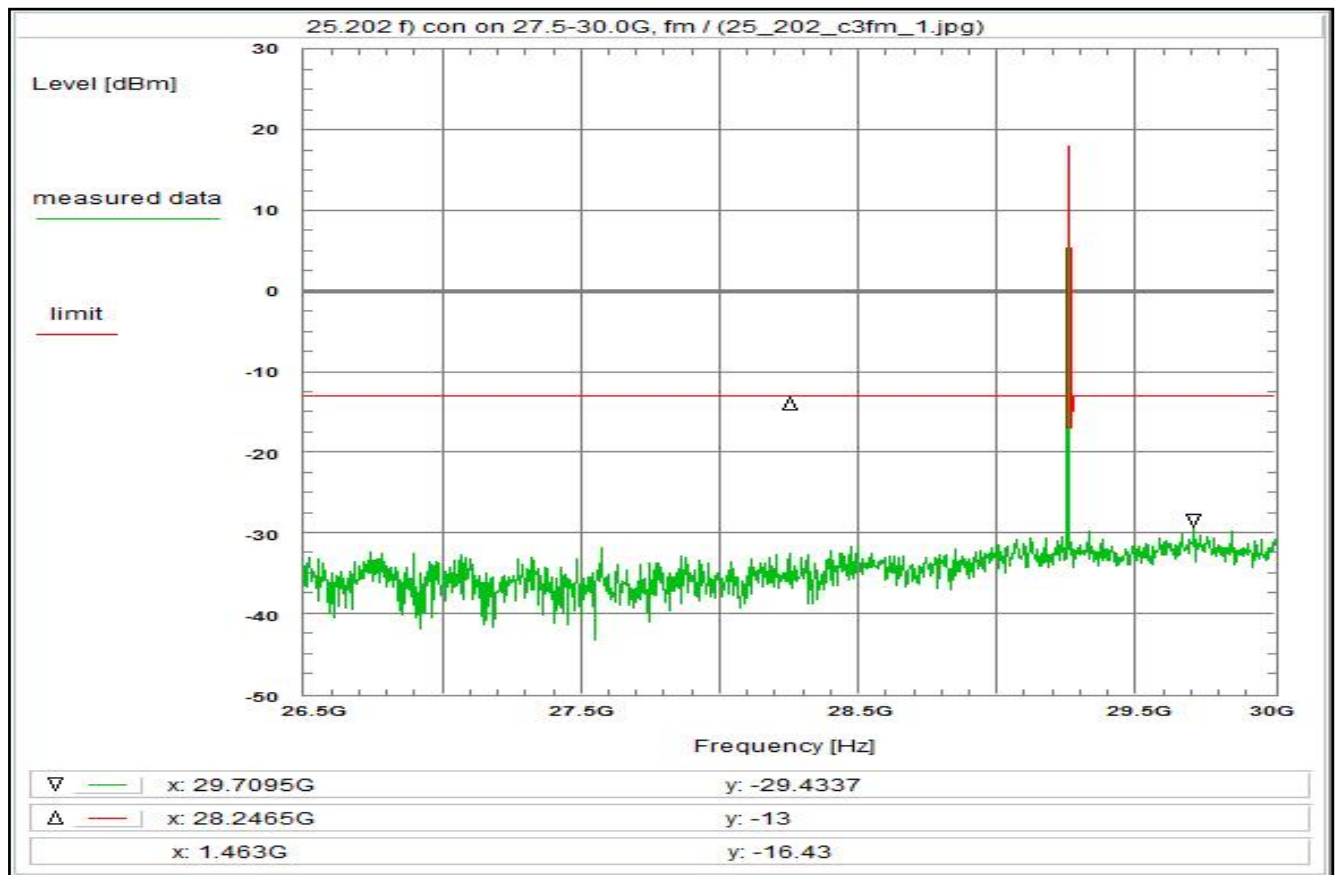
Correction:

Directional coupler + 0.0 dB
Coaxial cable (C220) + 3.5 dB
DUT-Antenna (see under limit) + 0.0 dBi
Test antenna (A019) - 19.3 dB
BW correction factor (100k -> 4k) - 14.0 dB
Atten. between HPA and feedhorn - 0.0 dB
Freefield attenuation (24.30GHz, 4.7m) + 73.6 dB
Circular Polarization + 3.0 dB
TOTAL CORRECTION: + 46.8 dB

Remarks:

Carrier-on state / Carrier in the middle of the band (fm)
Rather left the plot shows the cut-off of the wave guide.

Plot No. 24



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

Limit:**Limit acc. to §25.202 f):**

50-100% of assigned bw: -25 dBc/4 kHz

100-250% of assigned bw: -35 dBc/4 kHz

> 250% of assigned bw: -43+10log(Pmax) dBc/4 kHz

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see test report chapter 6.4

Test setup:

see test report chapter 7.3:

Test equipment:

see test report chapter 7.4: A031, C220, R001

Remark:

Test result: Test passed**Environment condition:**

Date & Time: Mon 13/Feb/2023 16:11:55
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 230 Vac

Setup of measurement equipment:

Start frequency: 26.5 GHz
Stop frequency: 30 GHz
Center frequency: 28.25 GHz
Frequency span: 3.5 GHz
Resolution-BW: 100 kHz
Video-BW: 300 kHz
Input attenuation: 10 dB
Trace-Mode: Max-Hold
Detector-Mode: AVG

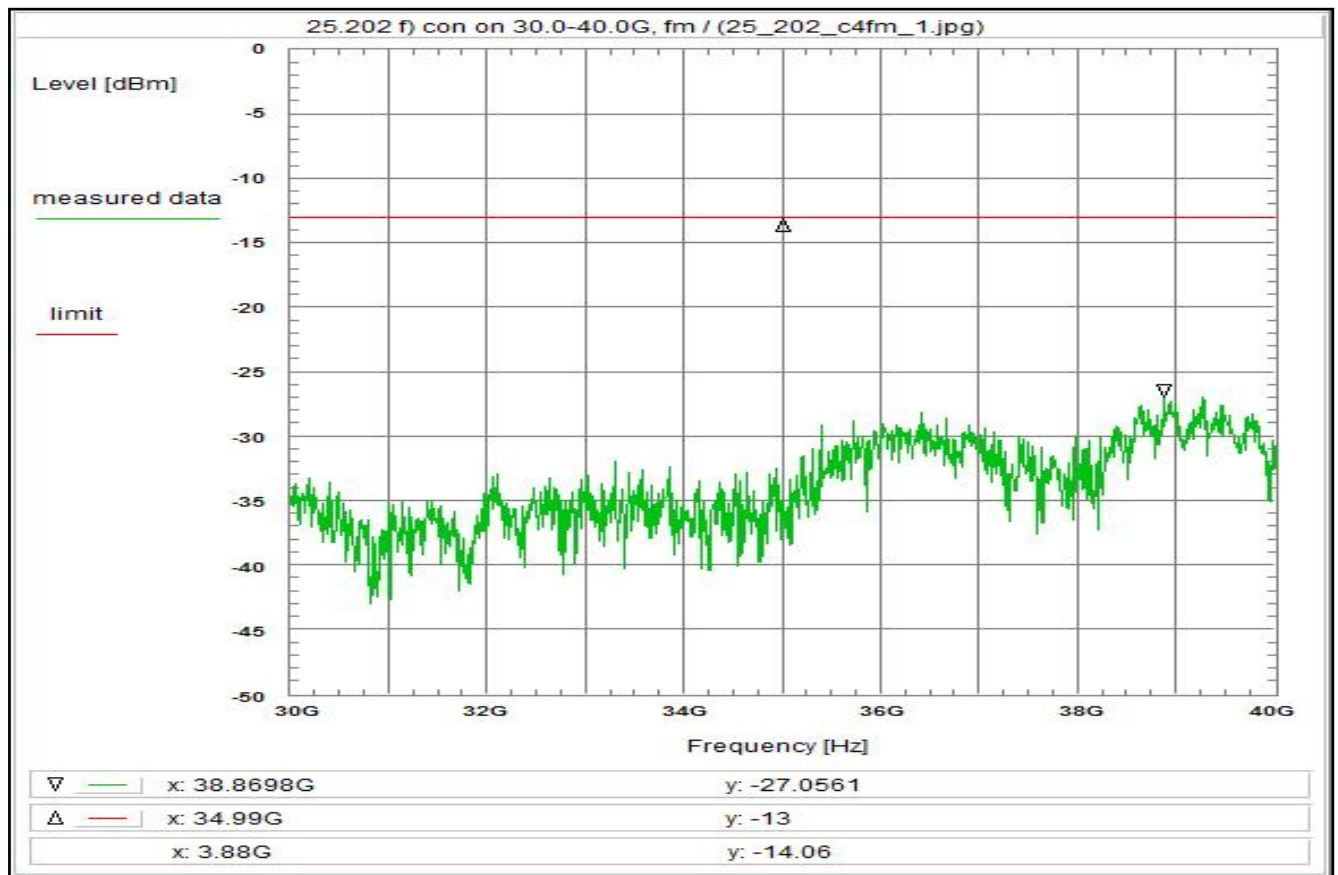
Correction:

Directional coupler + 0.0 dB
Coaxial cable (C220) + 3.9 dB
DUT-Antenna (see under limit) + 0.0 dBi
Test antenna (A031) - 15.4 dB
BW correction factor (100k -> 4k) - 14.0 dB
Atten. between HPA and feedhorn - 0.0 dB
Freefield attenuation (29.26GHz, 4.7m) + 75.2 dB
Circular Polarization + 3.0 dB
TOTAL CORRECTION: + 52.7 dB

Remarks:

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

Plot No. 25



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

Limit:

Limit acc. to §25.202 f):

50-100% of assigned bw: -25 dBc/4 kHz

100-250% of assigned bw: -35 dBc/4 kHz

> 250% of assigned bw: $-43+10\log(P_{max})$ dBc/4 kHz

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see test report chapter 6.4

Test setup:

see test report chapter 7.3:

Test equipment:

see test report chapter 7.4: A031, C220, R001

Remark:

Test result: Test passed

Environment condition:

Date & Time: Mon 13/Feb/2023 16:12:53
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 230 Vac

Setup of measurement equipment:

Start frequency: 30 GHz
Stop frequency: 40 GHz
Center frequency: 35 GHz
Frequency span: 10 GHz
Resolution-BW: 100 kHz
Video-BW: 300 kHz
Input attenuation: 10 dB
Trace-Mode: Max-Hold
Detector-Mode: AVG

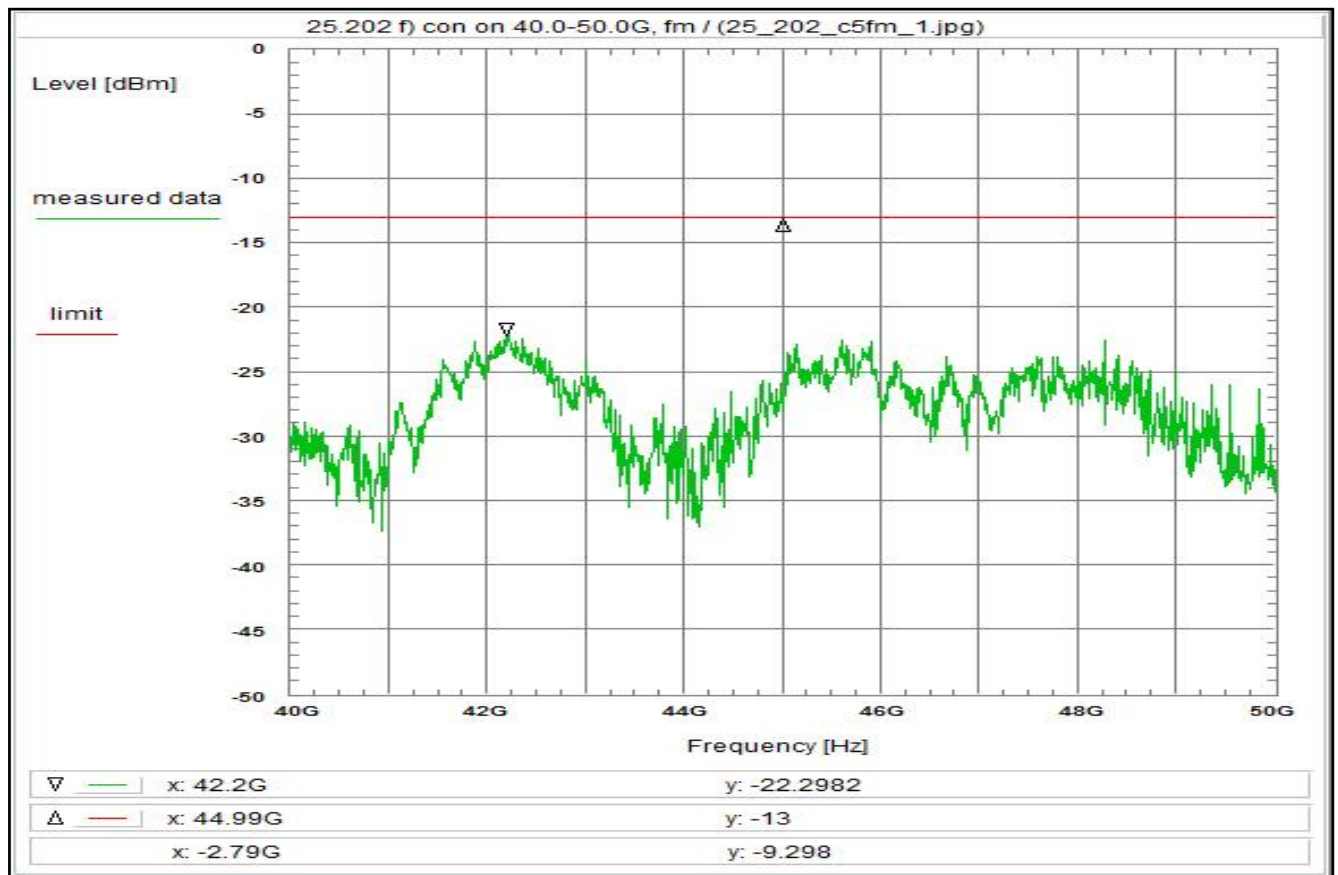
Correction:

Directional coupler + 0.0 dB
Coaxial cable (C220) + 4.4 dB
DUT-Antenna (see under limit) + 0.0 dBi
Test antenna (A031) - 16.9 dB
BW correction factor (100k -> 4k) - 14.0 dB
Atten. between HPA and feedhorn - 0.0 dB
Freefield attenuation (29.26GHz, 4.7m) + 75.2 dB
Circular Polarization + 3.0 dB
TOTAL CORRECTION: + 51.7 dB

Remarks:

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

Plot No. 26



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

Limit:

Limit acc. to §25.202 f):

50-100% of assigned bw: -25 dBc/4 kHz

100-250% of assigned bw: -35 dBc/4 kHz

> 250% of assigned bw: -43+10log(Pmax) dBc/4 kHz

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see test report chapter 6.4

Test setup:

see test report chapter 7.3:

Test equipment:

see test report chapter 7.4: A023, C220, R001

Remark:

Test result: Test passed

Environment condition:

Date & Time: Mon 13/Feb/2023 16:18:34
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 230 Vac

Setup of measurement equipment:

Start frequency: 40 GHz
Stop frequency: 50 GHz
Center frequency: 45 GHz
Frequency span: 10 GHz
Resolution-BW: 100 kHz
Video-BW: 300 kHz
Input attenuation: 10 dB
Trace-Mode: Max-Hold
Detector-Mode: AVG

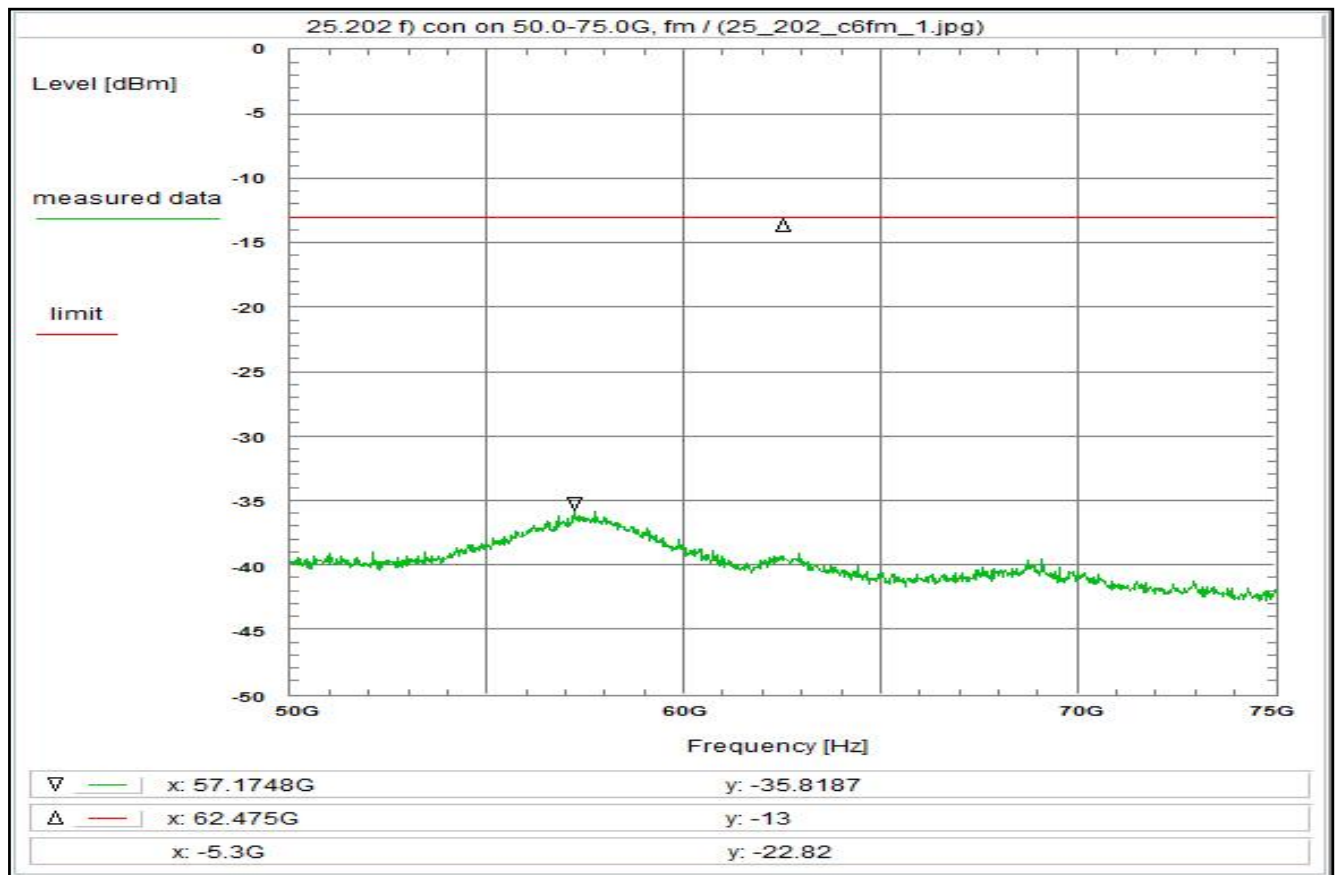
Correction:

Directional coupler + 0.0 dB
Coaxial cable (C220) + 5.2 dB
DUT-Antenna (see under limit) + 0.0 dBi
Test antenna (A023) - 18.9 dB
BW correction factor (100k -> 4k) - 14.0 dB
Atten. between HPA and feedhorn - 0.0 dB
Freefield attenuation (45.00GHz, 4.7m) + 78.9 dB
Circular Polarization + 3.0 dB
TOTAL CORRECTION: + 54.2 dB

Remarks:

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

Plot No. 27



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

Limit:

Limit acc. to §25.202 f):

50-100% of assigned bw: -25 dBc/4 kHz

100-250% of assigned bw: -35 dBc/4 kHz

> 250% of assigned bw: -43+10log(Pmax) dBc/4 kHz

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see test report chapter 6.4

Test setup:

see test report chapter 7.3:

Test equipment:

see test report chapter 7.4: A025, R001, R025

Remark:

Test result: Test passed

Environment condition:

Date & Time: Mon 13/Feb/2023 17:49:49
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 230 Vac

Setup of measurement equipment:

Start frequency: 50 GHz
Stop frequency: 75 GHz
Center frequency: 62.5 GHz
Frequency span: 25 GHz
Resolution-BW: 1 MHz
Video-BW: 3 MHz
Input attenuation: 10 dB
Trace-Mode: Max-Hold
Detector-Mode: AVG

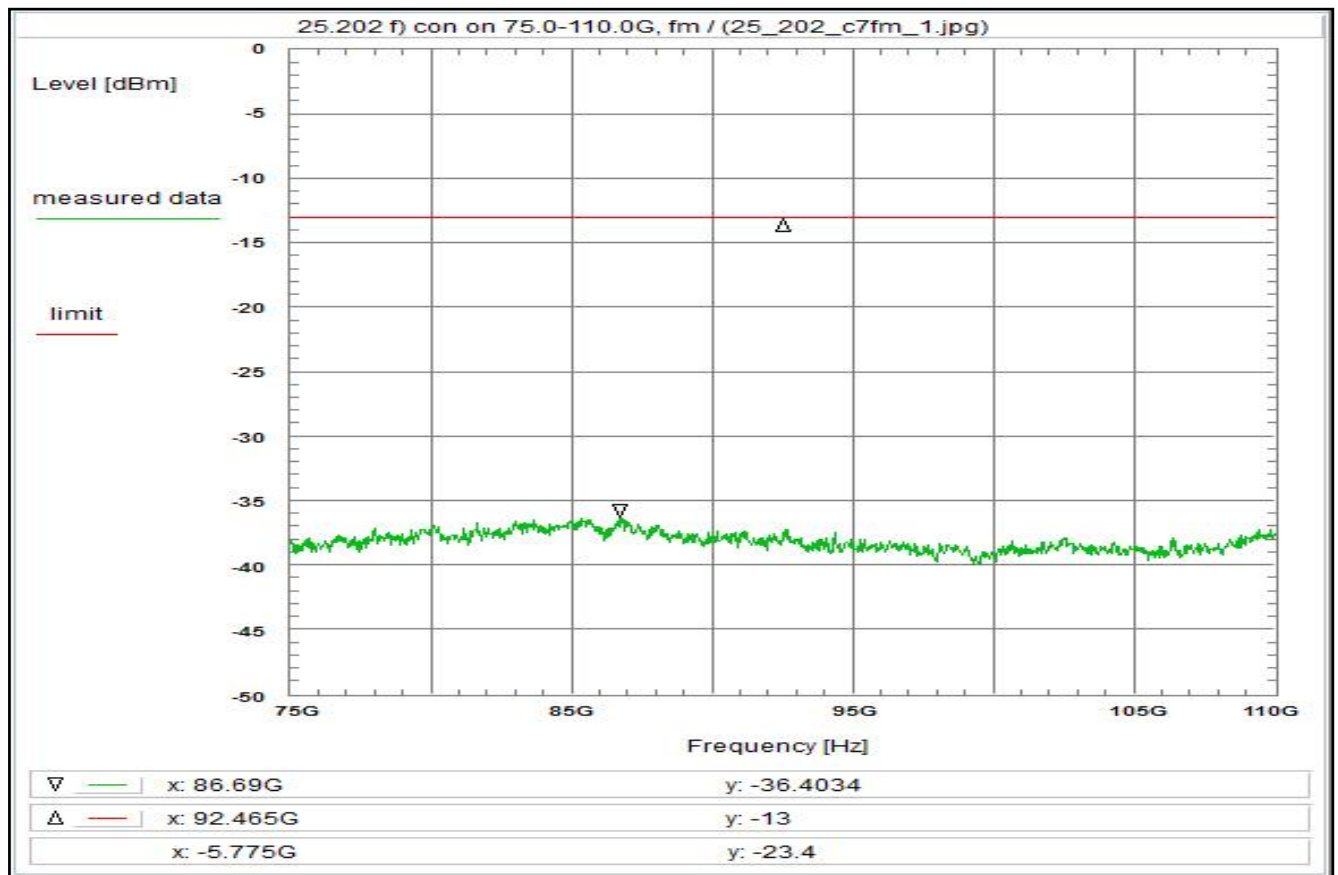
Correction:

Directional coupler + 0.0 dB
Coaxial cable + 0.0 dB
DUT-Antenna (see under limit) - 0.0 dBi
Test antenna (A025) - 20.0 dB
BW correction factor (1M -> 4k) - 24.0 dB
Atten. between HPA and feedhorn - 0.0 dB
Freefield attenuation (62.50GHz, 4.7m) + 81.8 dB
Circular Polarization + 3.0 dB
TOTAL CORRECTION: + 40.8 dB

Remarks:

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

Plot No. 28



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

Limit:

Limit acc. to §25.202 f):

50-100% of assigned bw: -25 dBc/4 kHz

100-250% of assigned bw: -35 dBc/4 kHz

> 250% of assigned bw: $-43+10\log(P_{max})$ dBc/4 kHz

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see test report chapter 6.4

Test setup:

see test report chapter 7.3:

Test equipment:

see test report chapter 7.4: A028, R001, R029

Remark:

Test result: Test passed

Environment condition:

Date & Time: Mon 13/Feb/2023 17:58:44
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 230 Vac

Setup of measurement equipment:

Start frequency: 75 GHz
Stop frequency: 110 GHz
Center frequency: 92.5 GHz
Frequency span: 35 GHz
Resolution-BW: 100 kHz
Video-BW: 300 kHz
Input attenuation: 10 dB
Trace-Mode: Clear Write
Detector-Mode: AVG

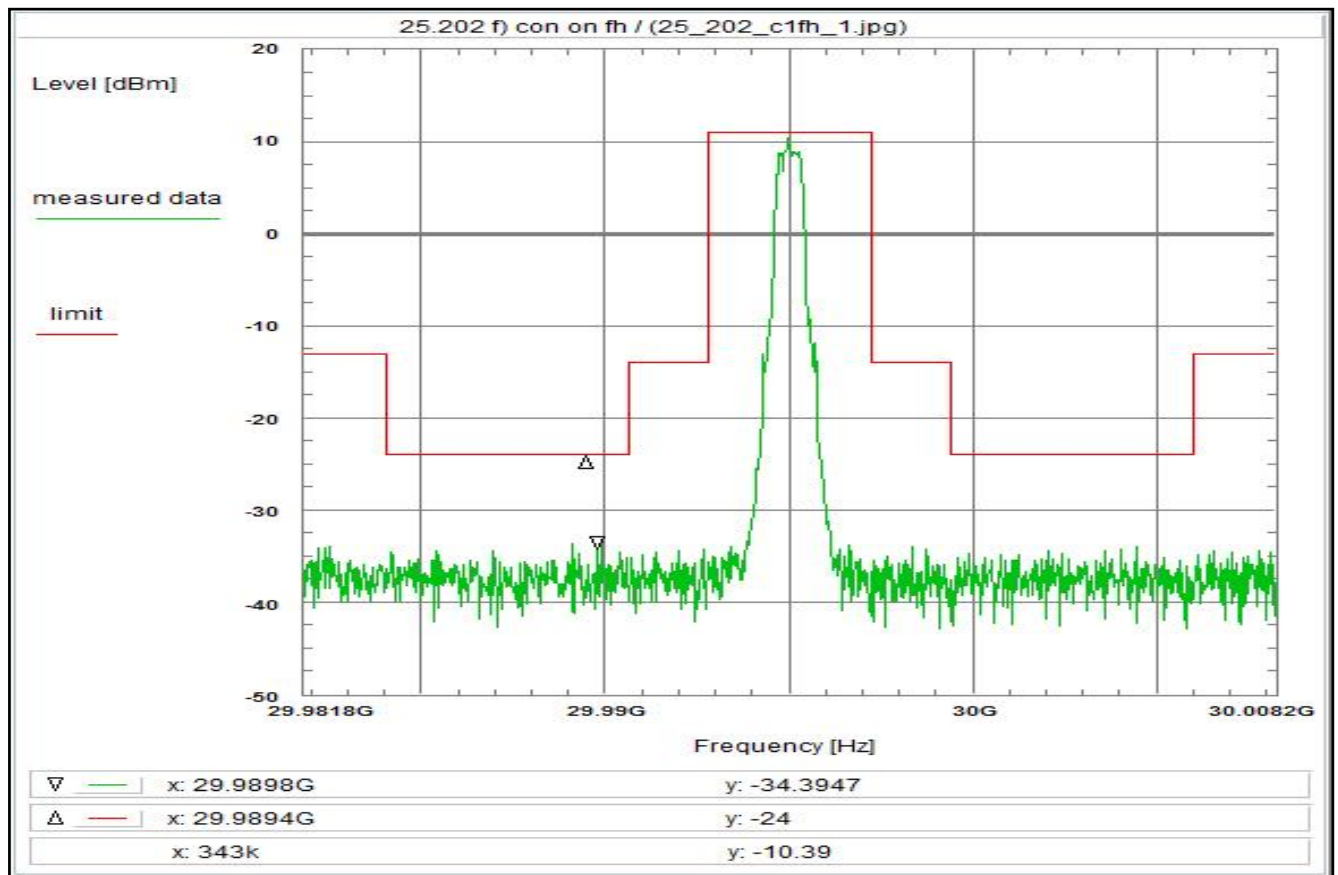
Correction:

Directional coupler + 0.0 dB
Coaxial cable + 0.0 dB
DUT-Antenna (see under limit) - 0.0 dBi
Test antenna (A028) - 19.4 dB
BW correction factor (100k -> 4k) - 14.0 dB
Atten. between HPA and feedhorn - 0.0 dB
Freefield attenuation (92.50GHz, 4.7m) + 85.2 dB
Circular Polarization + 3.0 dB
TOTAL CORRECTION: + 54.8 dB

Remarks:

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

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 (fh)

Limit:Limit acc. to §25.202 f):

50-100% of assigned bw: -25 dBc/4 kHz

100-250% of assigned bw: -35 dBc/4 kHz

> 250% of assigned bw: -43+10log(Pmax) dBc/4 kHz

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see test report chapter 6.4

Test setup:

see test report chapter 7.3:

Test equipment:

see test report chapter 7.4: A031, C220, R001

Remark:

Test result: Test passedEnvironment condition:

Date & Time: Mon 13/Feb/2023 17:07:57
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 230 Vac

Setup of measurement equipment:

Start frequency: 29.9818 GHz
Stop frequency: 30.0082 GHz
Center frequency: 29.995 GHz
Frequency span: 26.4 MHz
Resolution-BW: 10 kHz
Video-BW: 30 kHz
Input attenuation: 10 dB
Trace-Mode: Max-Hold
Detector-Mode: AVG

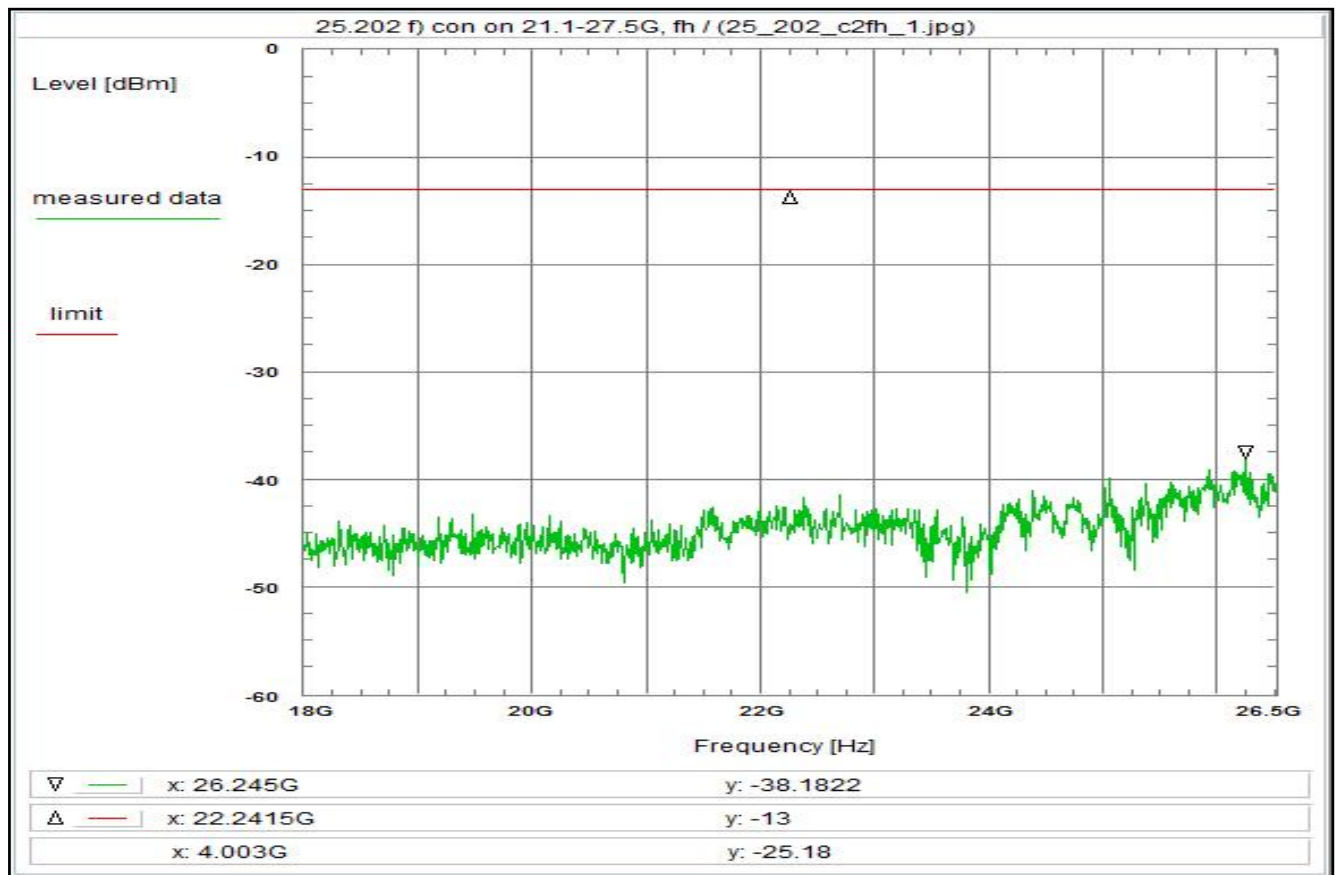
Correction:

Directional coupler	+ 0.0 dB
Coaxial cable (C220)	+ 4.1 dB
DUT-Antenna (on-axis)	+ 0.0 dBi
Test antenna (A031)	- 15.9 dB
BW correction factor (10k -> 4k)	- 4.0 dB
Atten. between HPA and feedhorn	- 0.0 dB
Freefield attenuation (28.75GHz, 4.7m)	+ 75.1 dB
Circular Polarization	+ 3.0 dB
TOTAL CORRECTION:	+ 62.3 dB

Remarks:

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

Plot No. 30



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 acc. to §25.202 f):

50-100% of assigned bw: -25 dBc/4 kHz

100-250% of assigned bw: -35 dBc/4 kHz

> 250% of assigned bw: -43+10log(Pmax) dBc/4 kHz

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see test report chapter 6.4

Test setup:

see test report chapter 7.3:

Test equipment:

see test report chapter 7.4: A019, C220, R001

Remark:

Test result: Test passed

Environment condition:

Date & Time: Mon 13/Feb/2023 17:32:07
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 230 Vac

Setup of measurement equipment:

Start frequency: 18 GHz
Stop frequency: 26.5 GHz
Center frequency: 22.25 GHz
Frequency span: 8.5 GHz
Resolution-BW: 100 kHz
Video-BW: 300 kHz
Input attenuation: 10 dB
Trace-Mode: Max-Hold
Detector-Mode: AVG

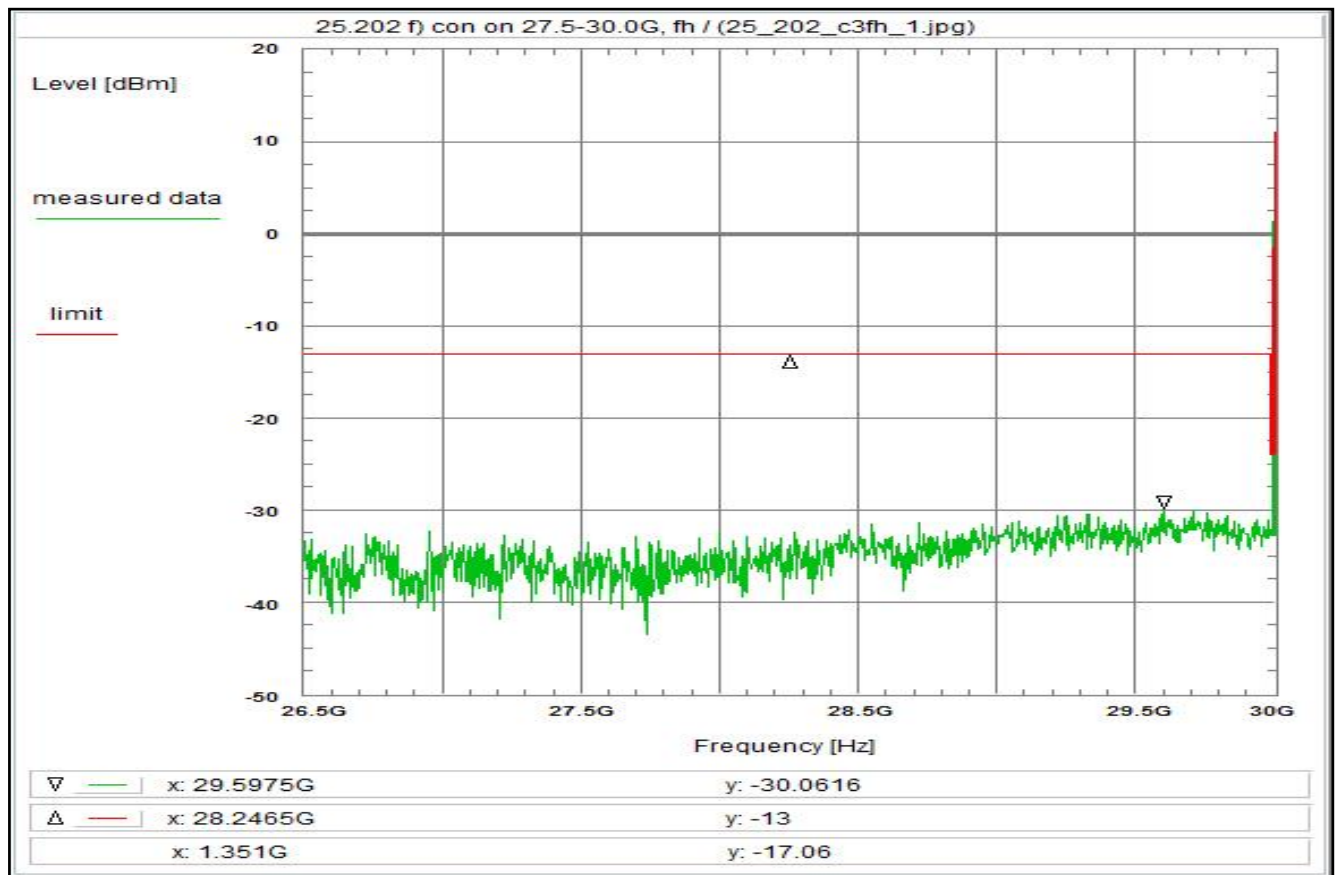
Correction:

Directional coupler + 0.0 dB
Coaxial cable (C220) + 3.5 dB
DUT-Antenna (see under limit) - 0.0 dBi
Test antenna (A019) - 19.3 dB
BW correction factor (100k -> 4k) - 14.0 dB
Atten. between HPA and feedhorn - 0.0 dB
Freefield attenuation (22.25GHz, 4.7m) + 72.8 dB
Circular Polarization + 3.0 dB
TOTAL CORRECTION: + 46.0 dB

Remarks:

Carrier-on state / Carrier at the upper edge of the band (fh)
Rather left the plot shows the cut-off of the wave guide.

Plot No. 31



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 acc. to §25.202 f):

50-100% of assigned bw: -25 dBc/4 kHz

100-250% of assigned bw: -35 dBc/4 kHz

> 250% of assigned bw: -43+10log(Pmax) dBc/4 kHz

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see test report chapter 6.4

Test setup:

see test report chapter 7.3:

Test equipment:

see test report chapter 7.4: A031, C220, R001

Remark:

Test result: Test passedEnvironment condition:

Date & Time: Mon 13/Feb/2023 17:09:15
 Location: CTC advanced GmbH, Laboratory RC-SYS
 Temperature: 22 °C
 Humidity: 55 %
 Voltage: 230 Vac

Setup of measurement equipment:

Start frequency: 26.5 GHz
 Stop frequency: 30 GHz
 Center frequency: 28.25 GHz
 Frequency span: 3.5 GHz
 Resolution-BW: 100 kHz
 Video-BW: 300 kHz
 Input attenuation: 10 dB
 Trace-Mode: Max-Hold
 Detector-Mode: AVG

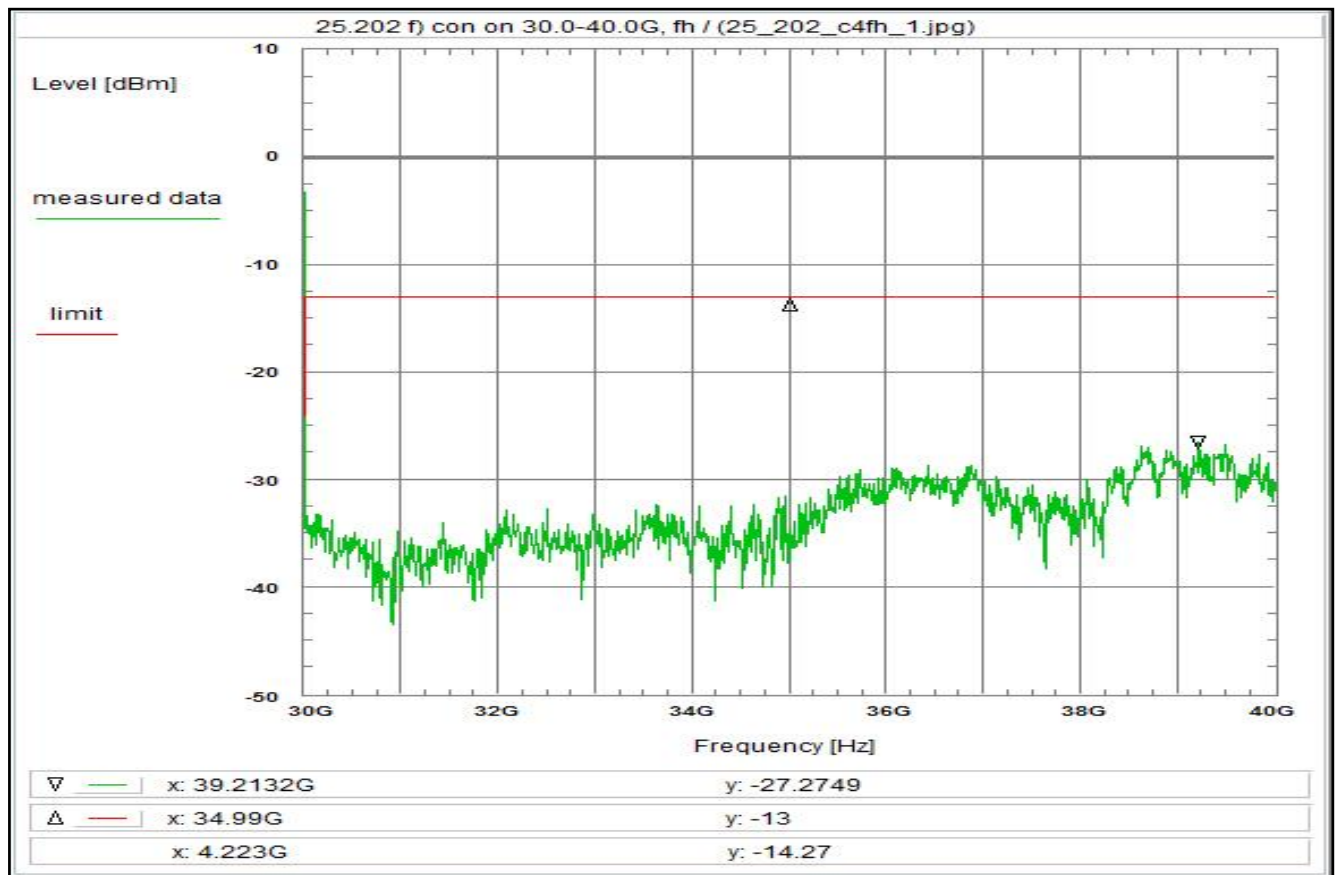
Correction:

Directional coupler	+ 0.0 dB
Coaxial cable (C220)	+ 3.9 dB
DUT-Antenna (on-axis)	+ 0.0 dBi
Test antenna (A031)	- 15.4 dB
BW correction factor (100k -> 4k)	- 14.0 dB
Atten. between HPA and feedhorn	- 0.0 dB
Freefield attenuation (28.75GHz, 4.7m)	+ 75.1 dB
Circular Polarization	+ 3.0 dB
TOTAL CORRECTION:	+ 52.6 dB

Remarks:

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

Plot No. 32



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 acc. to 25.202 f):

50-100% of assigned bw: -25 dBc/4 kHz

100-250% of assigned bw: -35 dBc/4 kHz

> 250% of assigned bw: -43+10log(Pmax) dBc/4 kHz

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see test report chapter 6.4

Test setup:

see test report chapter 7.3:

Test equipment:

see test report chapter 7.4: A031, C220, R001

Remark:

Test result: Test passed

Environment condition:

Date & Time: Mon 13/Feb/2023 17:10:37
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 230 Vac

Setup of measurement equipment:

Start frequency: 30 GHz
Stop frequency: 40 GHz
Center frequency: 35 GHz
Frequency span: 10 GHz
Resolution-BW: 100 kHz
Video-BW: 300 kHz
Input attenuation: 10 dB
Trace-Mode: Max-Hold
Detector-Mode: AVG

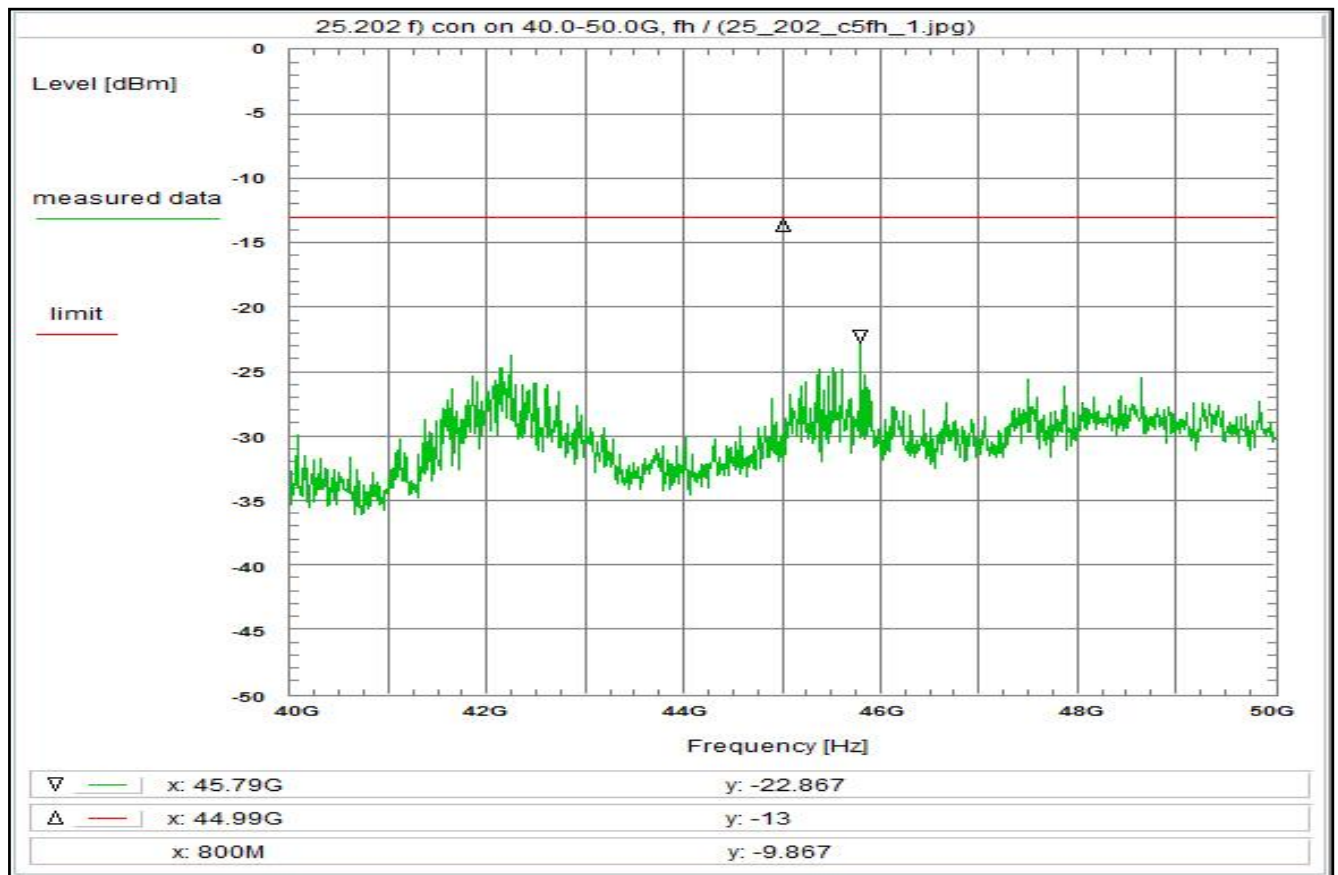
Correction:

Directional coupler + 0.0 dB
Coaxial cable (C220) + 4.4 dB
DUT-Antenna (on-axis) + 0.0 dBi
Test antenna (A031) - 16.9 dB
BW correction factor (100k -> 4k) - 14.0 dB
Atten. between HPA and feedhorn - 0.0 dB
Freefield attenuation (28.75GHz, 4.7m) + 75.1 dB
Circular Polarization + 3.0 dB
TOTAL CORRECTION: + 51.6 dB

Remarks:

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

Plot No. 33



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 acc. to §25.202 f):

50-100% of assigned bw: -25 dBc/4 kHz
100-250% of assigned bw: -35 dBc/4 kHz
> 250% of assigned bw: -43+10log(Pmax) dBc/4 kHz

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see test report chapter 6.4

Test setup:

see test report chapter 7.3:

Test equipment:

see test report chapter 7.4: A023, C220, R001

Remark:

Test result: Test passed

Environment condition:

Date & Time: Mon 13/Feb/2023 17:36:22
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 230 Vac

Setup of measurement equipment:

Start frequency: 40 GHz
Stop frequency: 50 GHz
Center frequency: 45 GHz
Frequency span: 10 GHz
Resolution-BW: 100 kHz
Video-BW: 300 kHz
Input attenuation: 10 dB
Trace-Mode: Clear Write
Detector-Mode: AVG

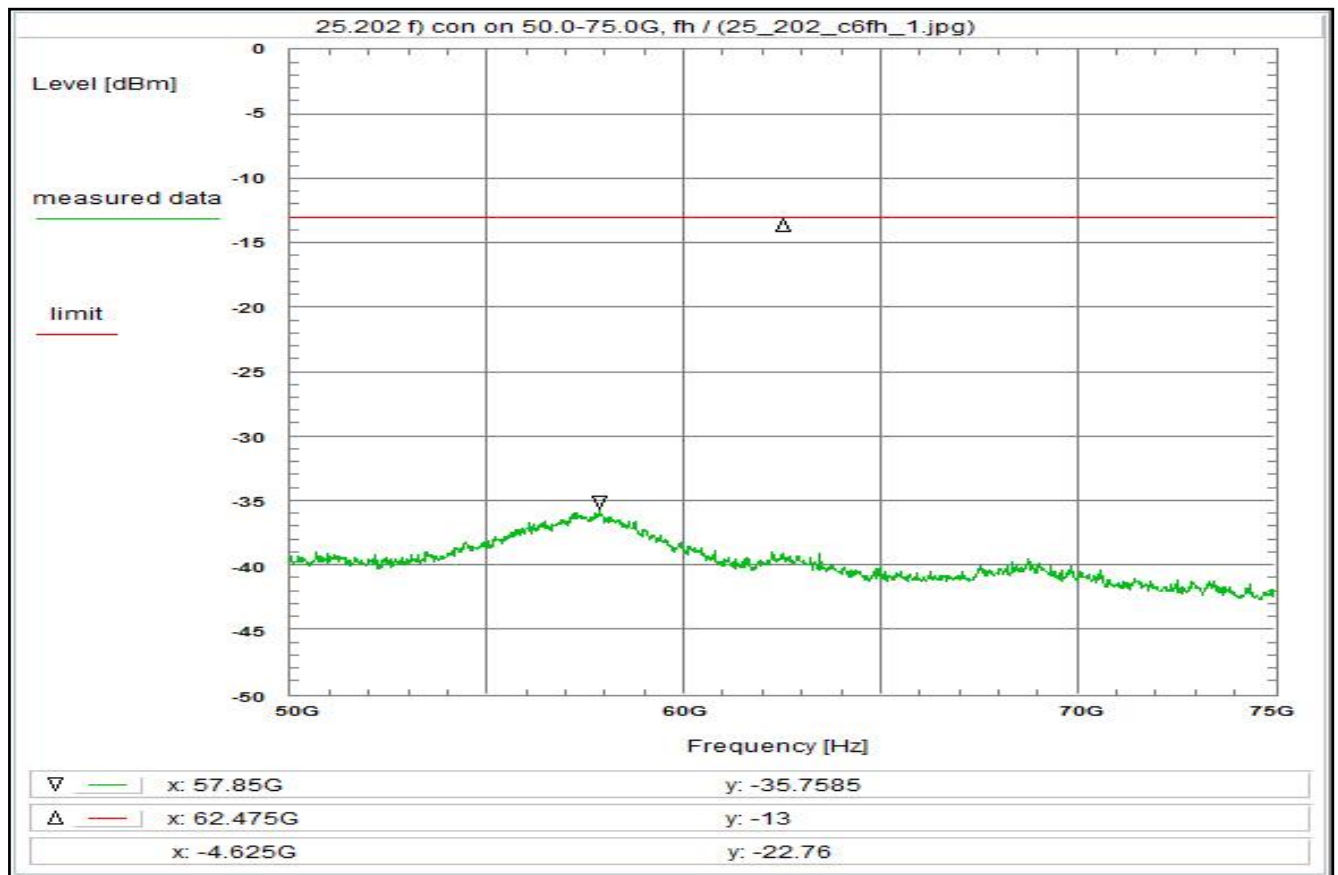
Correction:

Directional coupler + 0.0 dB
Coaxial cable (C220) + 5.2 dB
DUT-Antenna (see under limit) - 0.0 dBi
Test antenna (A023) - 18.9 dB
BW correction factor (100k -> 4k) - 14.0 dB
Atten. between HPA and feedhorn - 0.0 dB
Freefield attenuation (45.00GHz, 4.7m) + 78.9 dB
Circular Polarization + 3.0 dB
TOTAL CORRECTION: + 54.2 dB

Remarks:

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

Plot No. 34



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 acc. to §25.202 f):

50-100% of assigned bw: -25 dBc/4 kHz

100-250% of assigned bw: -35 dBc/4 kHz

> 250% of assigned bw: -43+10log(Pmax) dBc/4 kHz

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see test report chapter 6.4

Test setup:

see test report chapter 7.4:

Test equipment:

see test report chapter 7.4: A025, R001, R025

Remark:

Test result: Test passedEnvironment condition:

Date & Time: Mon 13/Feb/2023 17:46:42
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 230 Vac

Setup of measurement equipment:

Start frequency: 50 GHz
Stop frequency: 75 GHz
Center frequency: 62.5 GHz
Frequency span: 25 GHz
Resolution-BW: 1 MHz
Video-BW: 3 MHz
Input attenuation: 10 dB
Trace-Mode: Max-Hold
Detector-Mode: AVG

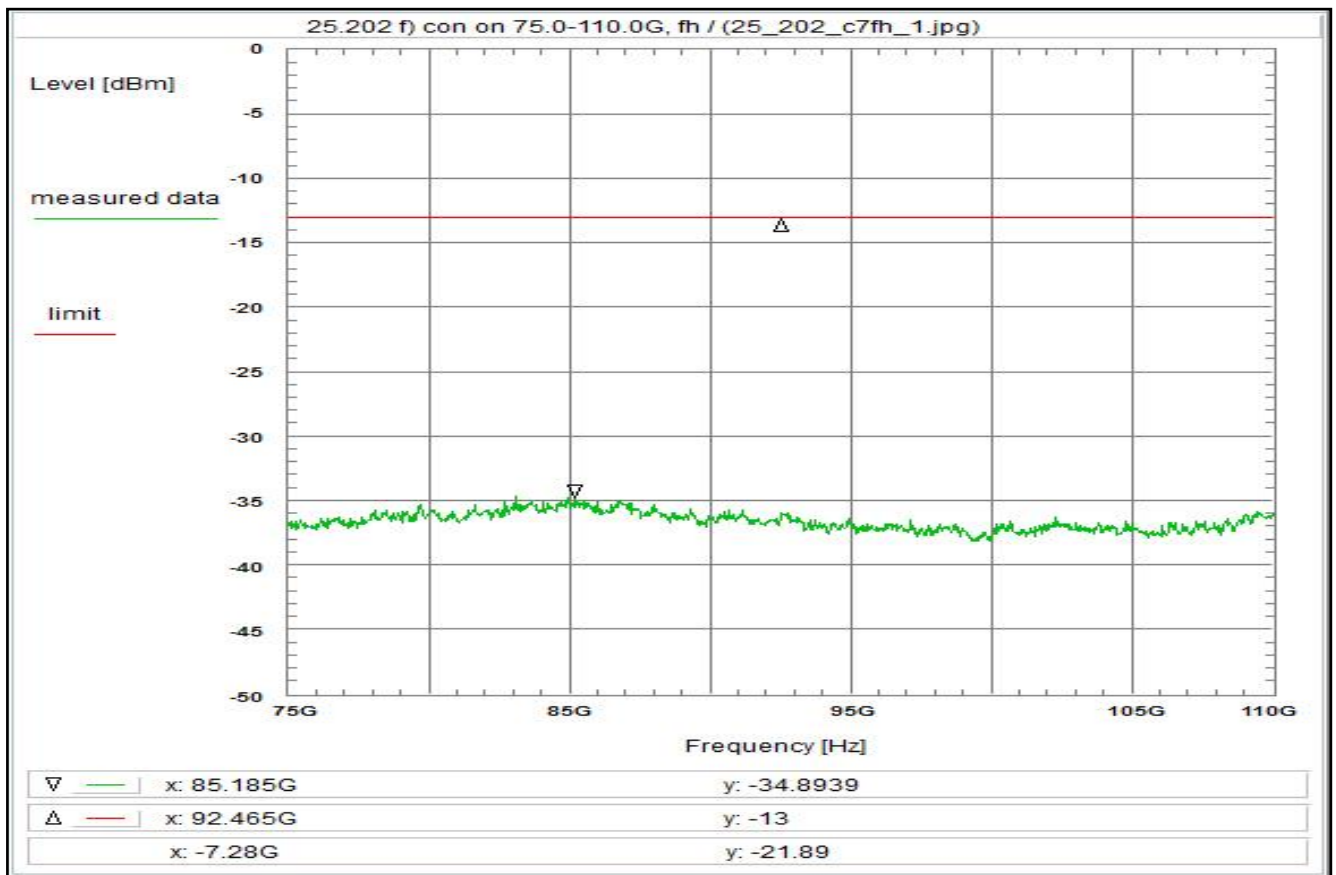
Correction:

Directional coupler + 0.0 dB
Coaxial cable + 0.0 dB
DUT-Antenna (see under limit) - 0.0 dBi
Test antenna (A025) - 20.0 dB
BW correction factor (1M -> 4k) - 24.0 dB
Atten. between HPA and feedhorn - 0.0 dB
Freefield attenuation (62.50GHz, 4.7m) + 81.8 dB
Circular Polarization + 3.0 dB
TOTAL CORRECTION: + 40.8 dB

Remarks:

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

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 (fh)

Limit:

Limit acc. to §25.202 f):

50-100% of assigned bw: -25 dBc/4 kHz

100-250% of assigned bw: -35 dBc/4 kHz

> 250% of assigned bw: -43+10log(Pmax) dBc/4 kHz

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see test report chapter 6.4

Test setup:

see test report chapter 7.4:

Test equipment:

see test report chapter 7.4: A028, R001, R025

Remark:

Test result: Test passed

Environment condition:

Date & Time: Mon 13/Feb/2023 17:59:59
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 230 Vac

Setup of measurement equipment:

Start frequency: 75 GHz
Stop frequency: 110 GHz
Center frequency: 92.5 GHz
Frequency span: 35 GHz
Resolution-BW: 1 MHz
Video-BW: 3 MHz
Input attenuation: 10 dB
Trace-Mode: Max-Hold
Detector-Mode: AVG

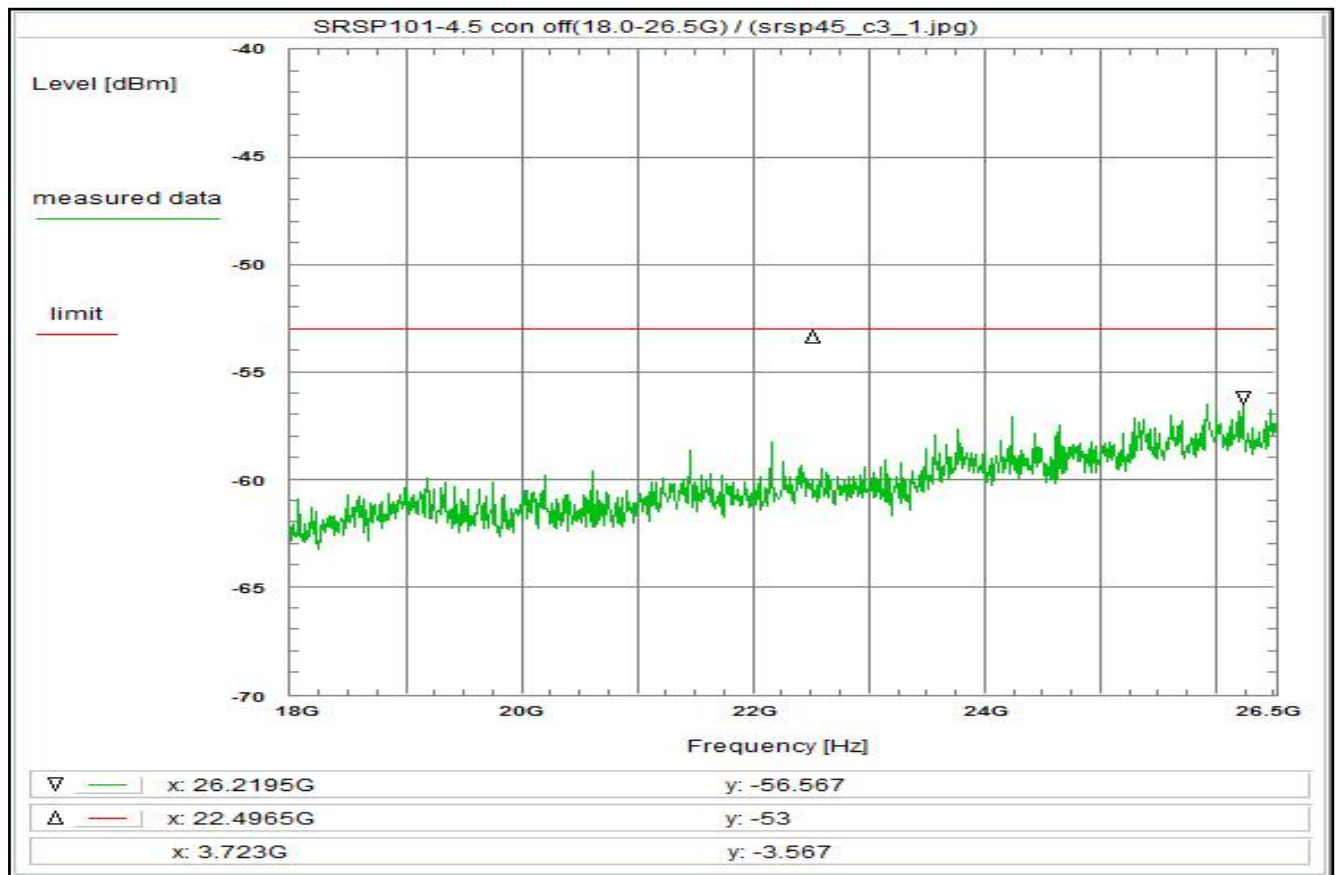
Correction:

Directional coupler + 0.0 dB
Coaxial cable + 0.0 dB
DUT-Antenna (see under limit) - 0.0 dBi
Test antenna (A028) - 19.4 dB
BW correction factor (1M -> 4k) - 24.0 dB
Atten. between HPA and feedhorn - 0.0 dB
Freefield attenuation (92.50GHz, 4.7m) + 85.2 dB
Circular Polarization + 3.0 dB
TOTAL CORRECTION: + 44.8 dB

Remarks:

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

Plot No. 36



Subclause: SRSP-101, 4.5 Receiver spurious emissions
Conducted emissions: 12.0 GHz - 18.0 GHz

Limit:
Limit acc. to SRSP-101, 4.5: -53.0 dBm

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

Operating condition of DUT:
operating condition 2, see test report chapter 6.4

Test setup:
see test report chapter 7.3:

Test equipment:
see test report chapter 7.4: A019, C220, R001

Remark:

Test result: Test passed

Environment condition:

Date & Time: Wed 15/Feb/2023 14:19:19
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 230 Vac

Setup of measurement equipment:

Start frequency: 18 GHz
Stop frequency: 26.5 GHz
Center frequency: 22.25 GHz
Frequency span: 8.5 GHz
Resolution-BW: 100 kHz
Video-BW: 3 MHz
Input attenuation: 0 dB
Trace-Mode: Max-Hold
Detector-Mode: Pos Peak

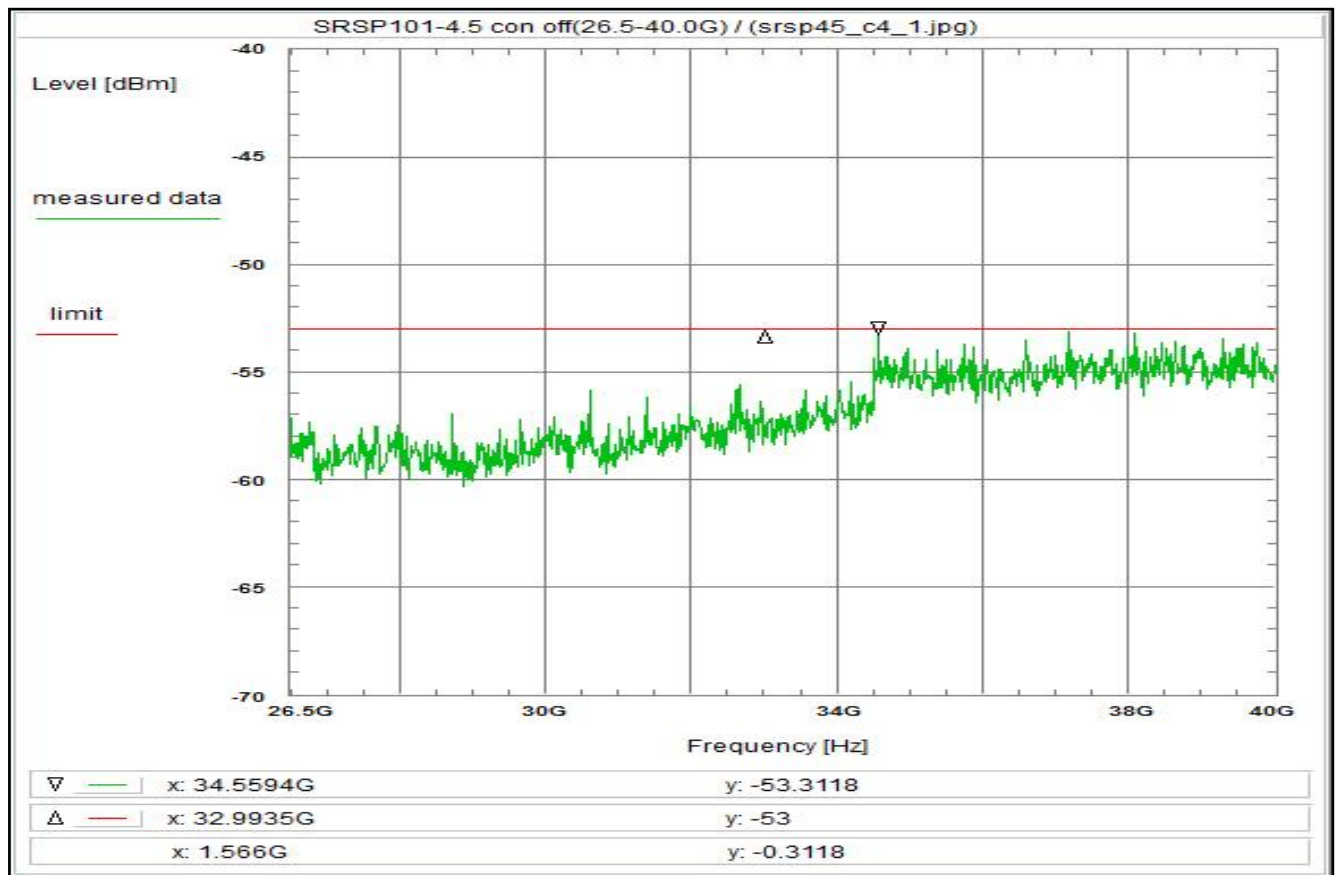
Correction:

Directional coupler + 0.0 dB
Coaxial cable (C220) + 3.5 dB
DUT-Antenna + 0.0 dBi
Test antenna (A019) - 19.3 dB
BW correction factor (100k -> 1M) + 0.0 dB
Atten. between HPA and feedhorn - 0.0 dB
Freefield attenuation (22.25GHz, 0.2m) + 45.4 dB
TOTAL CORRECTION: + 29.6 dB

Remarks:

Carrier-off state / Receiver spurious emissions

Plot No. 37



Subclause: SRSP-101, 4.5 Receiver spurious emissions
Conducted emissions: 12.0 GHz - 18.0 GHz

Limit:
Limit acc. to SRSP-101, 4.5: -53.0 dBm

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

Operating condition of DUT:
operating condition 2, see test report chapter 6.4

Test setup:
see test report chapter 7.3:

Test equipment:
see test report chapter 7.4: A031, C220, R001

Remark:

Test result: Test passed

Environment condition:

Date & Time: Wed 15/Feb/2023 14:22:58
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 230 Vac

Setup of measurement equipment:

Start frequency: 26.5 GHz
Stop frequency: 40 GHz
Center frequency: 33.25 GHz
Frequency span: 13.5 GHz
Resolution-BW: 100 kHz
Video-BW: 300 kHz
Input attenuation: 0 dB
Trace-Mode: Max-Hold
Detector-Mode: Pos Peak

Correction:

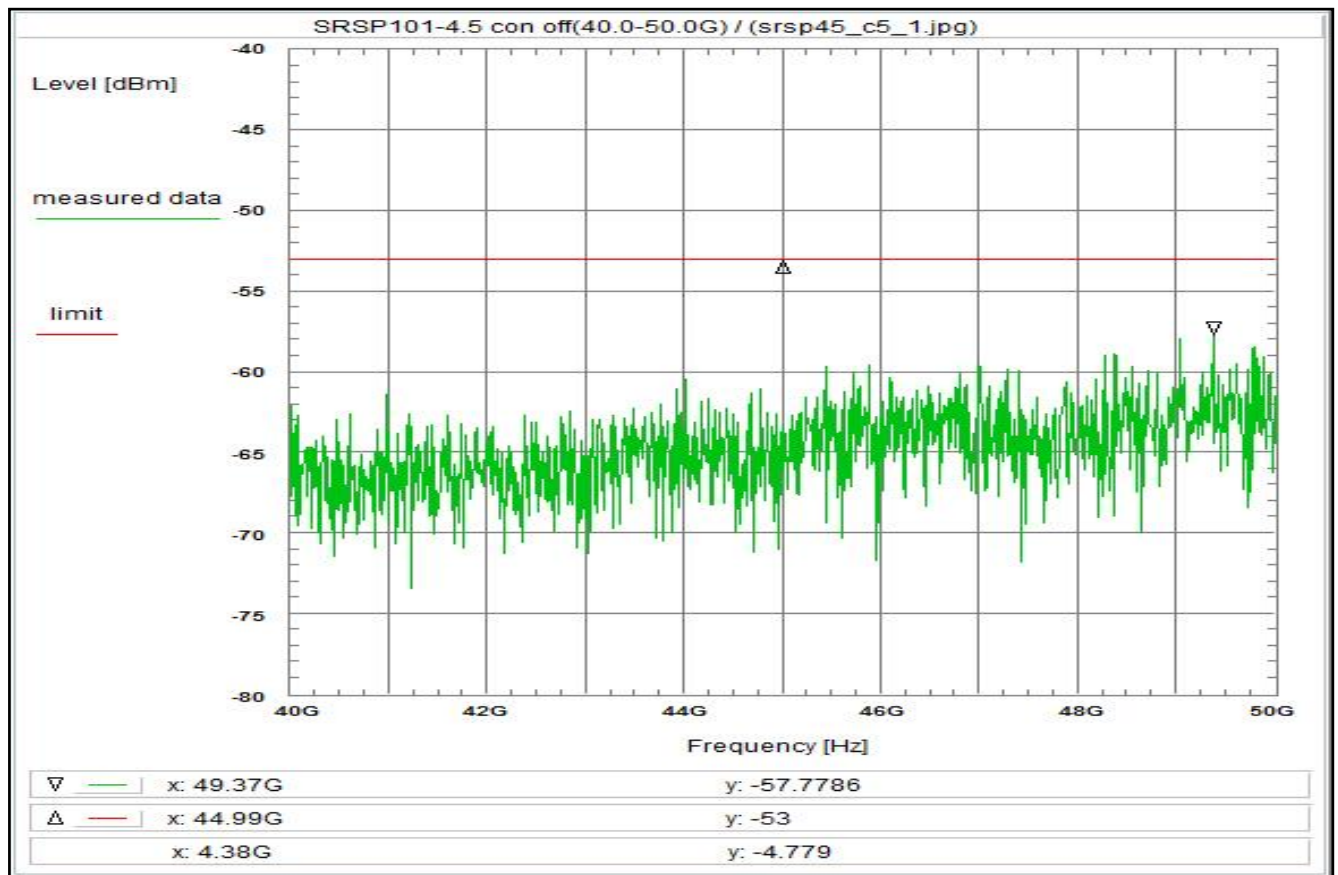
Directional coupler + 0.0 dB
Coaxial cable (C220) + 4.3 dB
DUT-Antenna + 0.0 dBi
Test antenna (A031) - 16.2 dB
BW correction factor (100k -> 1M) + 0.0 dB
Atten. between HPA and feedhorn - 0.0 dB
Freefield attenuation (33.25GHz, 0.1m) + 42.9 dB
TOTAL CORRECTION: + 31.0 dB

Remarks:

Carrier-off state / Receiver spurious emissions

noise floor only

Plot No. 38



Subclause: SRSP-101, 4.5 Receiver spurious emissions
Conducted emissions: 12.0 GHz - 18.0 GHz

Limit:
Limit acc. to SRSP-101, 4.5: -53.0 dBm

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

Operating condition of DUT:
operating condition 2, see test report chapter 6.4

Test setup:
see test report chapter 7.3:

Test equipment:
see test report chapter 7.4: A023, C220, R001

Remark:

Test result: Test passed

Environment condition:

Date & Time: Wed 15/Feb/2023 14:31:39
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 230 Vac

Setup of measurement equipment:

Start frequency: 40 GHz
Stop frequency: 50 GHz
Center frequency: 45 GHz
Frequency span: 10 GHz
Resolution-BW: 100 kHz
Video-BW: 300 kHz
Input attenuation: 0 dB
Trace-Mode: Average
Detector-Mode: Sample

Correction:

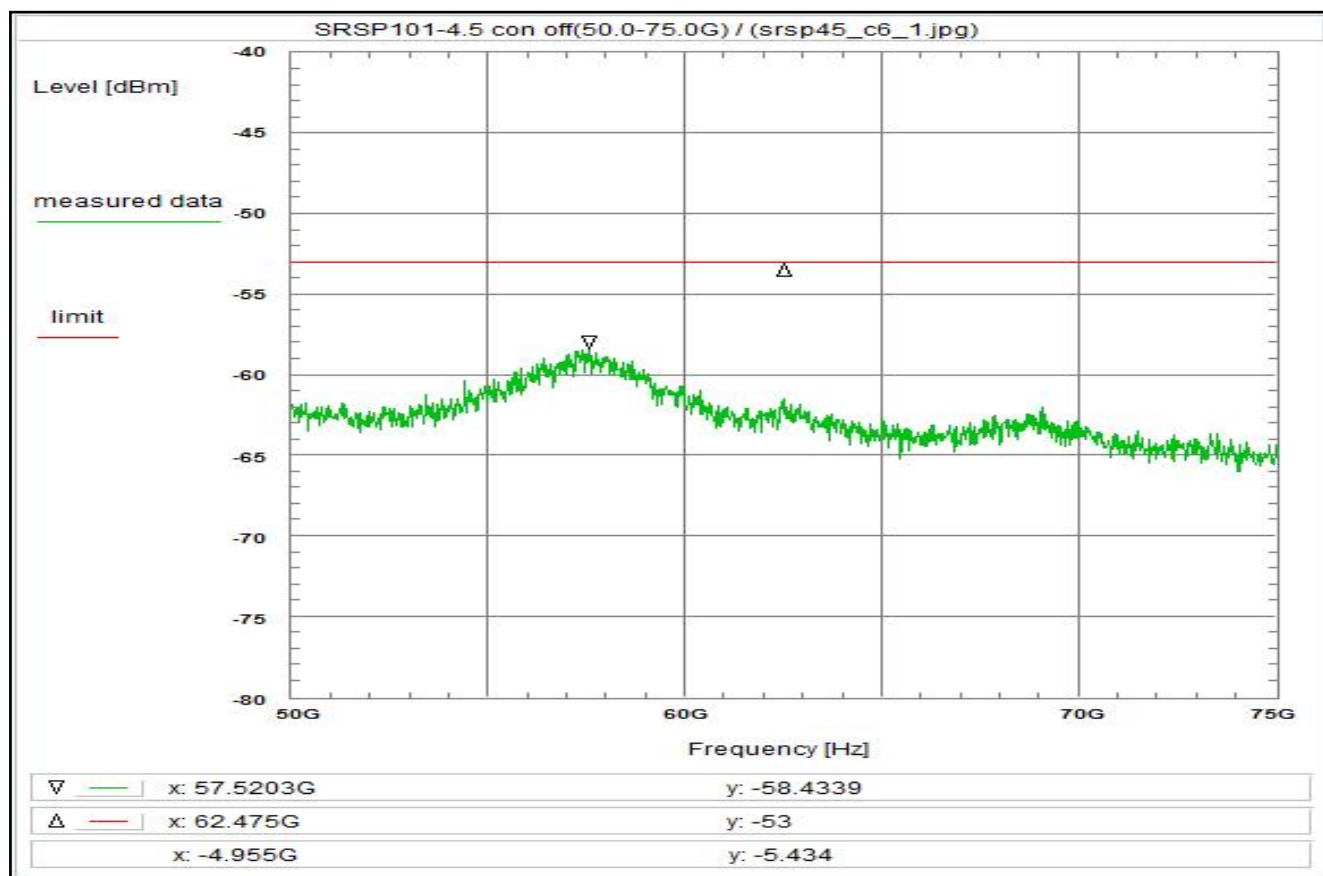
Directional coupler + 0.0 dB
Coaxial cable (C220) + 5.2 dB
DUT-Antenna + 0.0 dBi
Test antenna (A023) - 18.9 dB
BW correction factor (100k -> 1M) + 0.0 dB
Atten. between HPA and feedhorn - 0.0 dB
Freefield attenuation (45.00GHz, 0.1m) + 45.5 dB
TOTAL CORRECTION: + 31.8 dB

Remarks:

Carrier-off state / Receiver spurious emissions

noise floor only

Plot No. 39



Subclause: SRSP-101, 4.5 Receiver spurious emissions
Conducted emissions: 12.0 GHz - 18.0 GHz

Limit:
Limit acc. to SRSP-101, 4.5: -53.0 dBm

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

Operating condition of DUT:
operating condition 2, see test report chapter 6.4

Test setup:
see test report chapter 7.4:

Test equipment:
see test report chapter 7.4: A025, R001, R025

Remark:

Test result: Test passed

Environment condition:

Date & Time: Wed 15/Feb/2023 14:40:25
Location: CTC advanced GmbH, Laboratory RC-SYS
Temperature: 22 °C
Humidity: 55 %
Voltage: 230 Vac

Setup of measurement equipment:

Start frequency: 50 GHz
Stop frequency: 75 GHz
Center frequency: 62.5 GHz
Frequency span: 25 GHz
Resolution-BW: 100 kHz
Video-BW: 300 kHz
Input attenuation: 0 dB
Trace-Mode: Average
Detector-Mode: Sample

Correction:

Directional coupler + 0.0 dB
Coaxial cable + 0.0 dB
DUT-Antenna + 0.0 dBi
Test antenna (A025) - 20.0 dB
BW correction factor (100k -> 1M) + 10.0 dB
Atten. between HPA and feedhorn - 0.0 dB
Freefield attenuation (62.50GHz, 0.05m) + 42.3 dB
TOTAL CORRECTION: + 32.3 dB

Remarks:

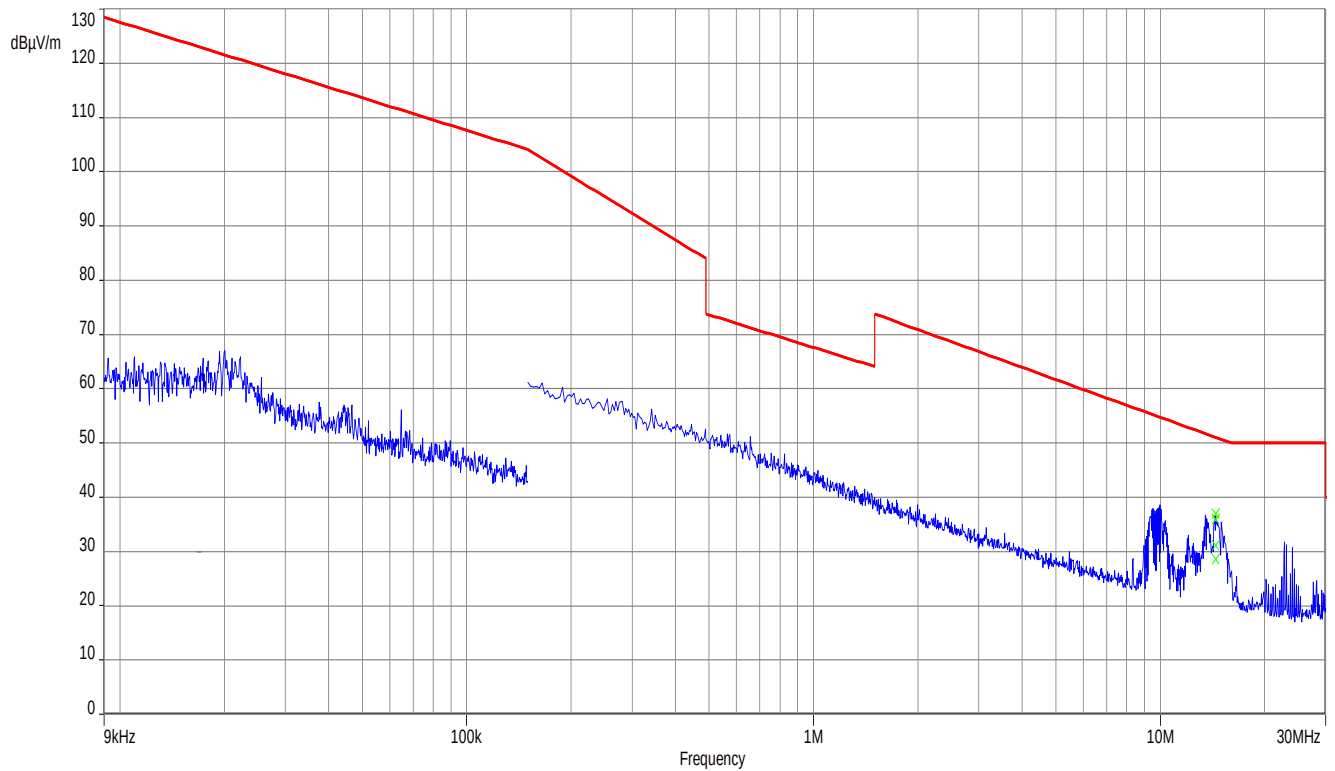
Carrier-off state / Receiver spurious emissions

noise floor only

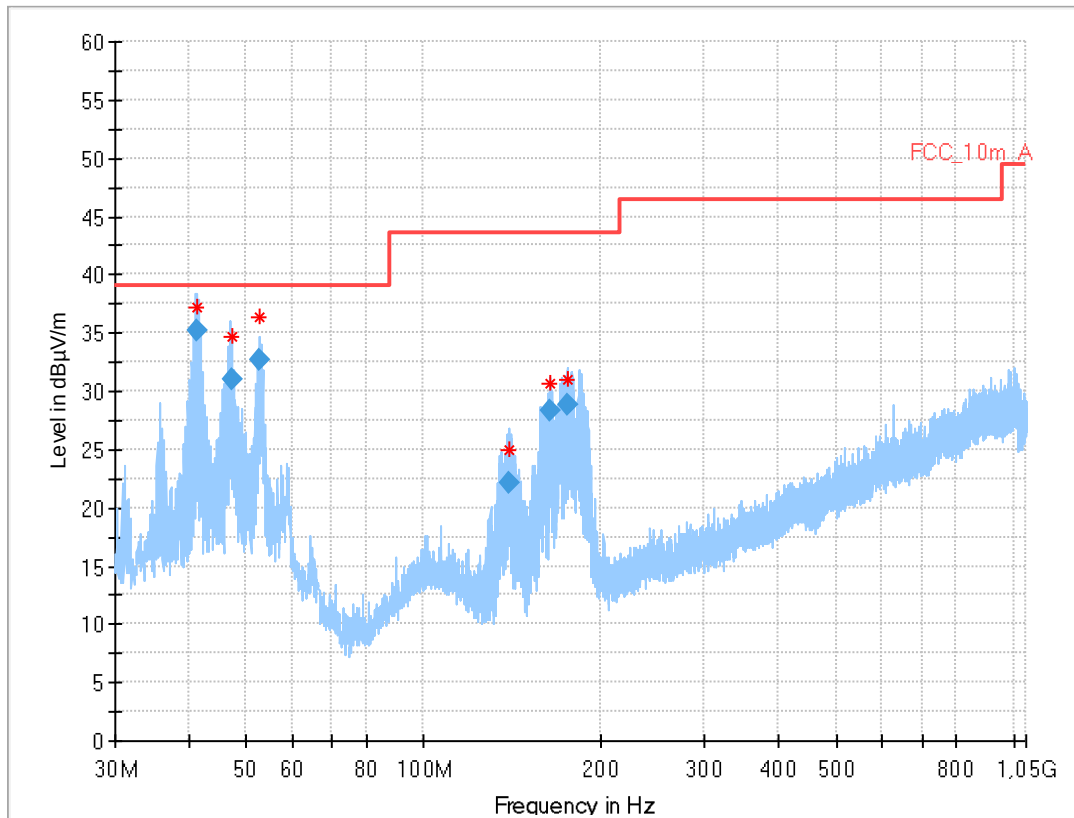
3 Measurement results, Spurious emissions 30MHz - 18 GHz

This Chapter 3 consists of 3 pages including this page.

Plot No. 1: 150 kHz – 30 MHz, antenna vertical / horizontal Tx/Rx



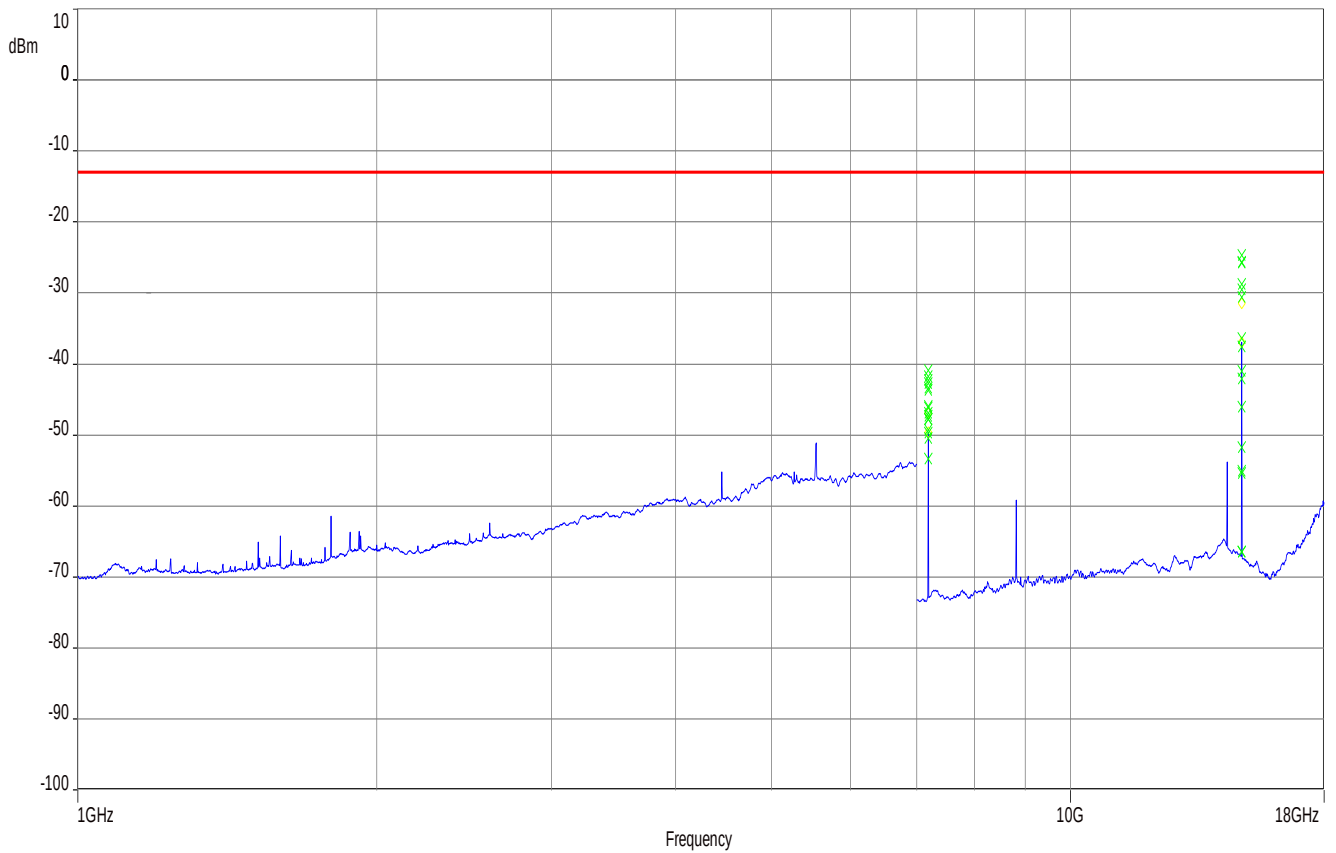
Plot No. 2: 30 MHz – 1 GHz, antenna vertical / horizontal Tx



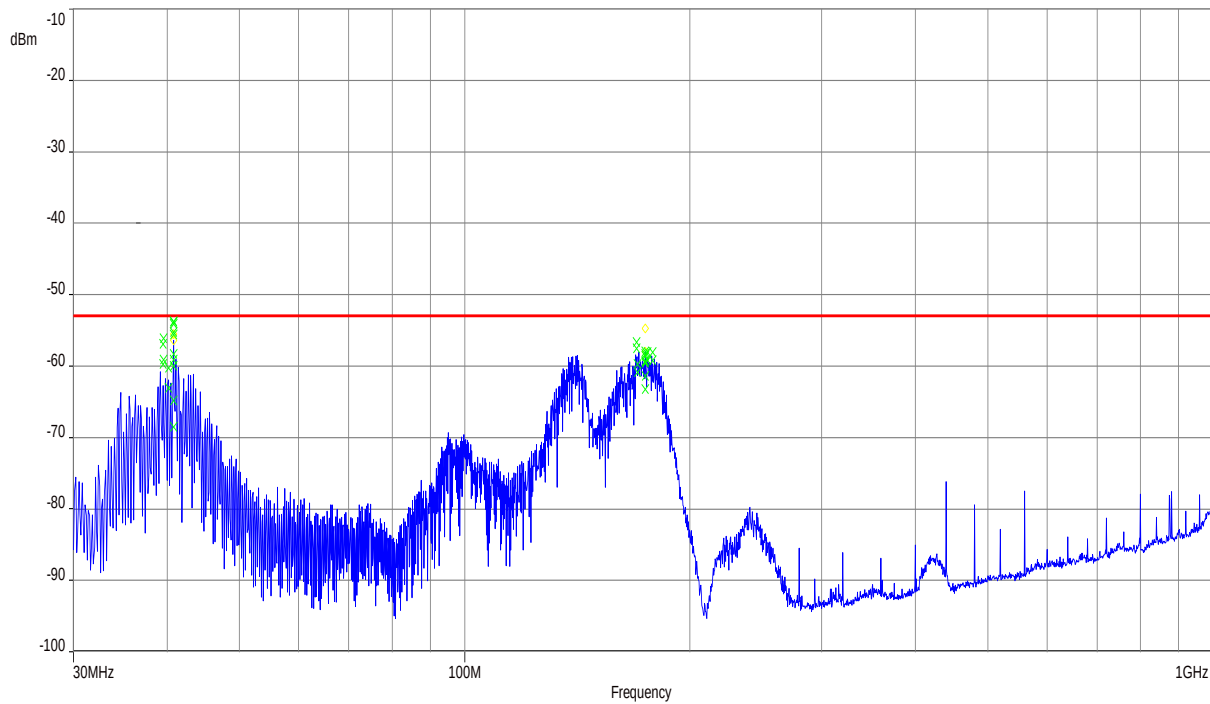
Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
41.148	35.17	39.1	3.9	1000	120.0	109.0	V	202	15
47.252	31.08	39.1	8.0	1000	120.0	151.0	V	225	16
52.748	32.69	39.1	6.4	1000	120.0	146.0	V	104	15
139.252	22.16	43.5	21.3	1000	120.0	242.0	V	90	10
163.958	28.29	43.5	15.2	1000	120.0	116.0	V	9	11
175.506	28.78	43.5	14.7	1000	120.0	100.0	V	-40	11

Plot No. 3: 1 GHz – 18 GHz, antenna vertical / horizontal Tx

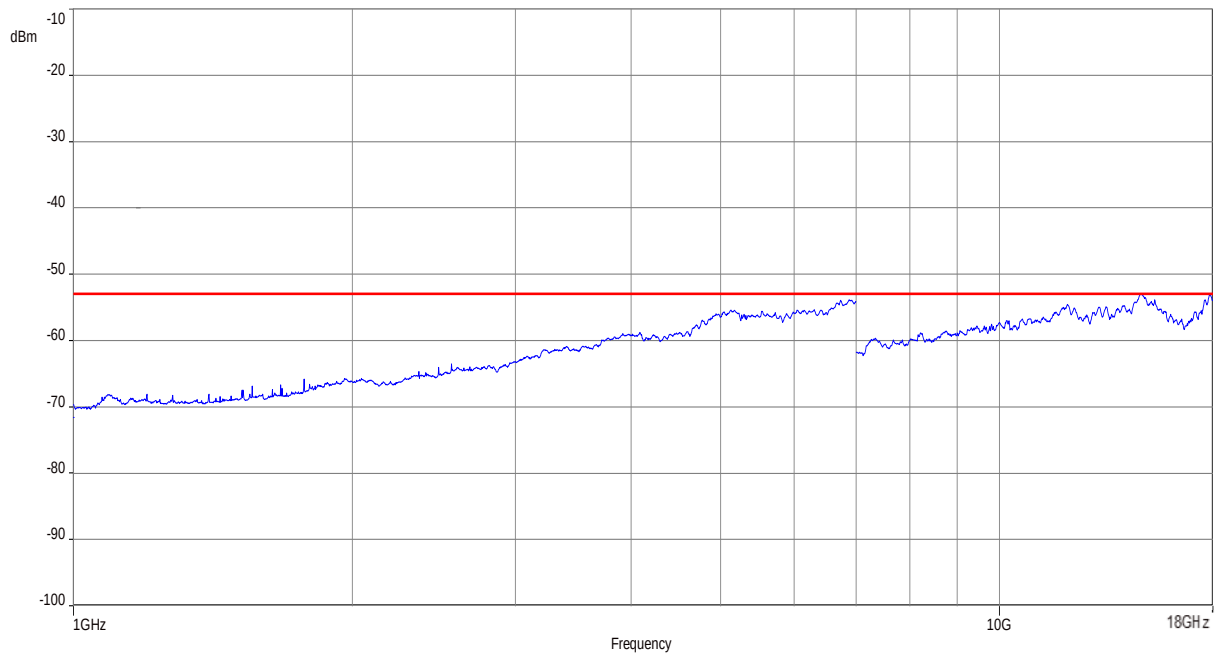


Plot No. 4: 30 MHz – 1 GHz, antenna vertical / horizontal Rx RSP-101



Max: -53.8 dBm RMS @40.8 MHz

Plot No. 5: 1 GHz – 18 GHz, antenna vertical / horizontal Rx RSP-101



Note: noise floor only

4 Measurement results, FCC Part 15B

This Chapter 3 consists of 1 pages including this page.

Refer to test report 1-0037_20-01-07.pdf

5 Document history

Version	Applied changes	Date of release
	Initial release - DRAFT	2023-02-22
	Initial release	