

Annex E



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Test report annex authorized:						
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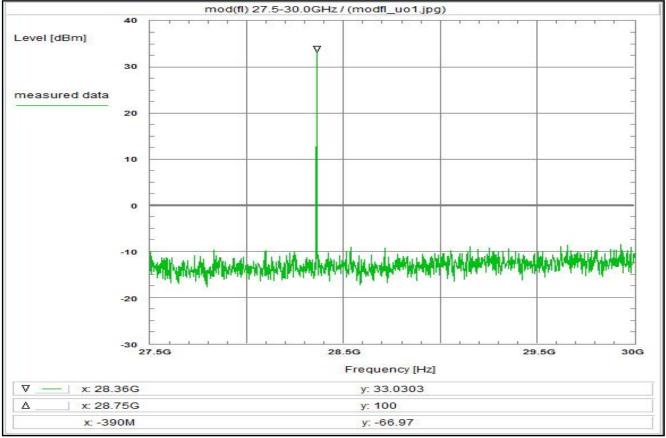
2 Measurement results, FCC Part 25, SRSP-101

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Plot No. 1

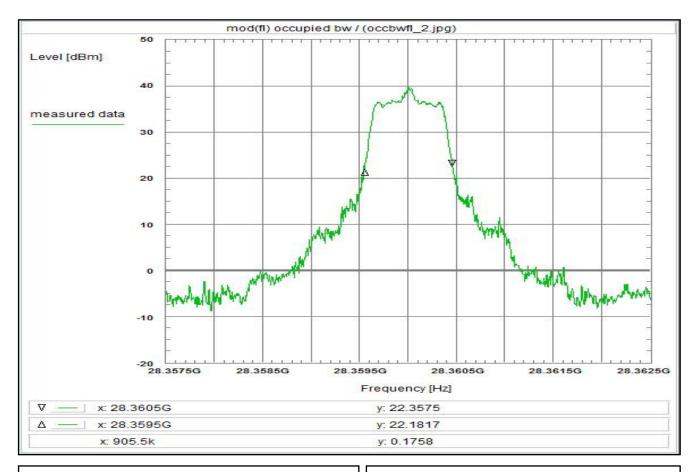


Subclause: Function test Modulated rf-carrier at the lower edge of the band (fl) Measurement within the band <u>Limit:</u> no limits defined This test serves to verify the general function of the EUT and for orientation regarding to the spurious emissions which are expected within the band, furthermore 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 7.2: Test equipment: see test report chapter 7.3: A031, C220, R001 Remark: Test result: measurement for orientation

Environment condition: Date & Time: Fri 20/May/2022 14:12:25 Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 °C Humidity: 55 Voltage: 230 Vac Setup of measurement equipment: 27.5 GHz Start frequency: 30 GHz Stop frequency: Center frequency: 28.75 Frequency span: Resolution-BW: 2.5 GHz 100 kHz Video-BW: 300 Input attenuation: 6 dB Clear Write Trace-Mode: Detector-Mode: Pos Peak Correction: Directional couple 0.0 dB Coaxial cable (C220) DUT-Antenna (on-axis) 4.0 dB 0.0 dBi Test antenna (A031) 0.0 dB BW correction factor Atten. between HPA and feedhorn Freefield attenuation (28.75GHz, 5m) 75.6 dB Circular polarization 3.0 dB Additional Attenuation TOTAL CORRECTION: 67.3 dB Test of general function and measurement for orientation



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 6.4

Test setup:

see test report chapter 7.2:

Test equipment:

see test report chapter 7.3: A031, C220, R001

Remark:

Test result: measurement for orientation

Environment condition:
Date & Time:
Location:

Fri 20/May/2022 15:07:38

CTC advanced GmbH, Laboratory RC-SYS 22 °C

 Temperature:
 22 °C

 Humidity:
 55 %

 Voltage:
 230 Vac

Setup of measurement equipment:

28 3575 GHz Start frequency: GHz Stop frequency: 28.3625 Center frequency: Frequency span: Resolution-BW: 5 MHz 100 kHz Video-BW: 300 Input attenuation: 6 dB Max-Hold Trace-Mode: Detector-Mode: Pos Peak

Correction:

. .

Additional Attenuation

TOTAL CORRECTION:

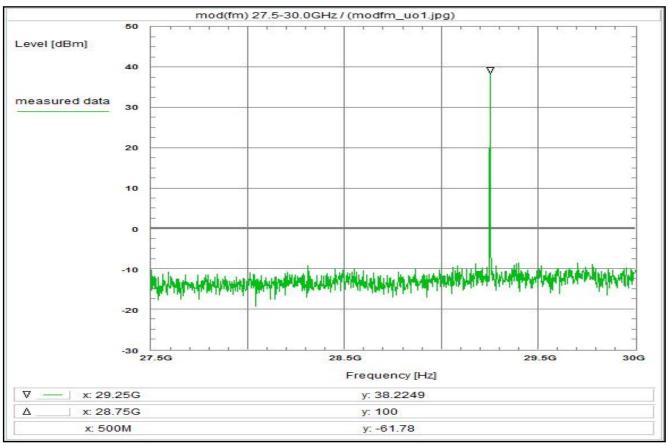
Determination of the occupied bandwidth. Average measurement. The measured value is about 0.89 MHz (delta marker) (according to the definition: 99% of the total mean power) The internal function of the analyzer was used for determination.

0.2 dB

67.9 dB



Plot No. 3

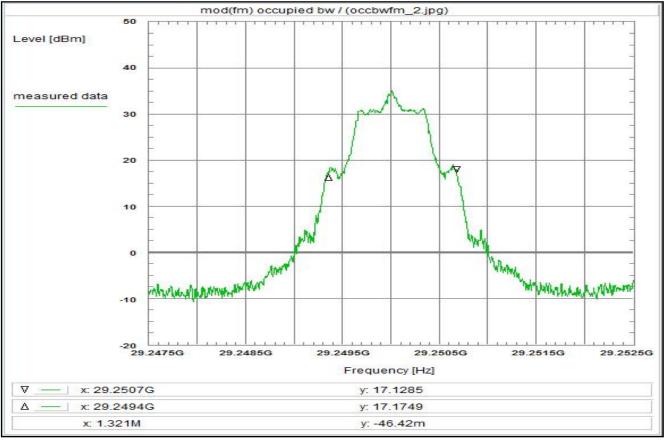


Subclause: Function test Modulated rf-carrier in the middle of the band (fm) Measurement within the band <u>Limit:</u> no limits defined This test serves to verify the general function of the EUT and for orientation regarding to the spurious emissions which are expected within the band, furthermore for 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 7.2: Test equipment: see test report chapter 7.3: A031, C220, R001 Remark: Test result: measurement for orientation

Environment condition: Date & Time: Fri 20/May/2022 14:24:04 Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 °C Humidity: 55 Voltage: 230 Vac Setup of measurement equipment: 27.5 GHz Start frequency: 30 GHz Stop frequency: Center frequency: 28.75 GHz Frequency span: Resolution-BW: 2.5 GHz 100 kHz Video-BW: 300 Input attenuation: 6 dB Clear Write Trace-Mode: Detector-Mode: Pos Peak Correction: Directional couple 0.0 dB Coaxial cable (C220) DUT-Antenna (on-axis) 4.0 dB 0.0 dBi Test antenna (A031) 0.0 dB BW correction factor Atten. between HPA and feedhorn 0.0 dB Freefield attenuation (28.75GHz, 5m) 75.6 dB Circular polarization 3.0 dB Additional Attenuation TOTAL CORRECTION: 67.3 dB 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 7.2:

Test equipment: see test report chapter 7.3: A031, C220, R001

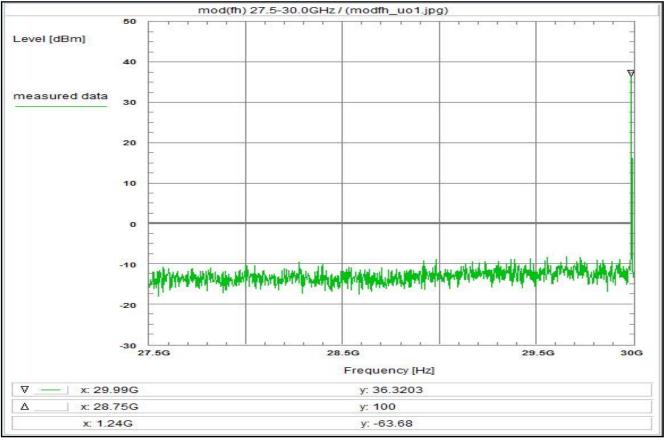
Remark:

Test result: measurement for orientation

Environment condition: Fri 20/May/2022 14:58:08 Date & Time: Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 °C Humidity: 55 Voltage: 230 Vac Setup of measurement equipment: 29 2475 GHz Start frequency: 29.2525 GHz Stop frequency: Center frequency: GHz Frequency span: Resolution-BW: 5 MHz 100 kHz Video-BW: 300 Input attenuation: 6 dB Max-Hold Trace-Mode: Detector-Mode: Pos Peak Correction: Directional couple 0.0 dB Coaxial cable (C220) DUT-Antenna (on-axis) 4.0 dB 0.0 dBi Test antenna (A031) 15.8 dB 0.0 dB BW correction factor Atten. between HPA and feedhorn 0.0 dB Freefield attenuation (29.99GHz, 5m) 76.0 dB Circular polarization 3.0 dB Additional Attenuation 0.2 dB TOTAL CORRECTION: 67.4 dB Determination of the occupied bandwidth. Average measurement. The measured value is about 1.3 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



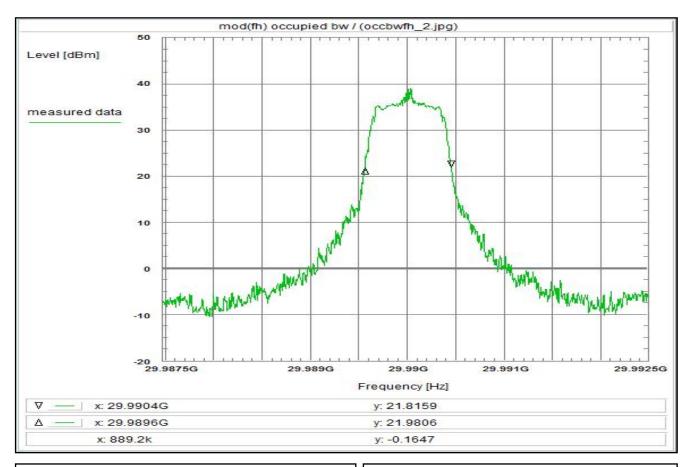
Environment condition:

Subclause: Function test Modulated rf-carrier at the upper edge of the band (fh) Measurement within the band <u>Limit:</u> 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 7.2: Test equipment: see test report chapter 7.3: A031, C220, R001 Remark: measurement for orientation Test result: Test passed

Date & Time: Fri 20/May/2022 14:42:00 Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 °C Humidity: 55 Voltage: 230 Vac Setup of measurement equipment: 27.5 GHz Start frequency: 30 GHz Stop frequency: Center frequency: 28.75 GHz Frequency span: Resolution-BW: 2.5 GHz 100 kHz Video-BW: 300 Input attenuation: 6 dB Clear Write Trace-Mode: Detector-Mode: Pos Peak Correction: Directional couple 0.0 dB Coaxial cable (C220) DUT-Antenna (on-axis) 4.0 dB 0.0 dBi Test antenna (A031) 0.0 dB BW correction factor Atten. between HPA and feedhorn 0.0 dB Freefield attenuation (35.00GHz, 5m) 77.3 dB Circular polarization 3.0 dB Additional Attenuation TOTAL CORRECTION: 69.0 dB Test of general function and measurement for orientation



Plot No. 6



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

<u>Limit:</u> no limits defined

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 7.2:

Test equipment:

see test report chapter 7.3: A031, C220, R001

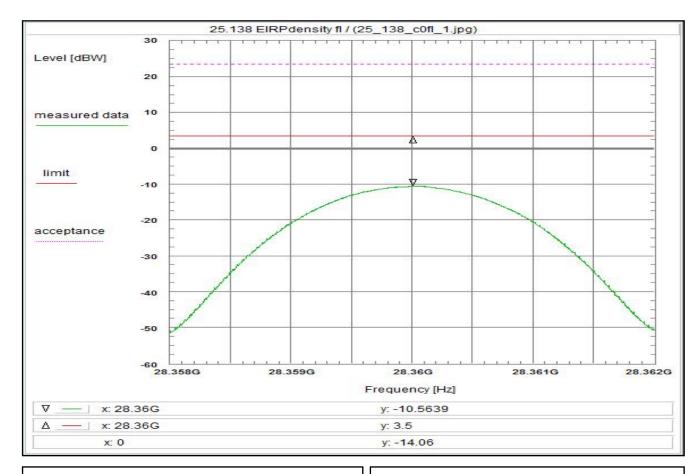
Remark:

Test result: measurement for orientation

Environment condition: Fri 20/May/2022 15:03:38 Date & Time: Location: CTC advanced GmbH, Laboratory RC-SYS 22 °C Temperature: Humidity: 55 Voltage: 230 Vac Setup of measurement equipment: 29.987475 GHz Start frequency: 29.992475 GHz Stop frequency: Center frequency: 29.989975 GHz Frequency span: Resolution-BW: 5 MHz 100 kHz Video-BW: 300 Input attenuation: 6 dB Max-Hold Trace-Mode: Detector-Mode: Pos Peak Correction: Directional couple 0.0 dB Coaxial cable (C220) DUT-Antenna (on-axis) 4.1 dB 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 (29.99GHz, 5m) 76.0 dB Circular polarization 3.0 dB Additional Attenuation 0.2 dB TOTAL CORRECTION: 67.5 dB Determination of the occupied bandwidth. Average measurement. The measured value is about 0.86 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



<u>Subclause:</u> 25.138 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 §25.138: 32.5-25log2° dBW/MHz -ant.-pattern envelope: -(29-25log2° dBi) dBW/MHz (copolar) ==>: 3.5

dBW/MHz (crosspolar) 3.5 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 §25.138 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 7.2:

Test equipment:

see test report chapter 7.3: A031, C220, R001

Remark:

Test result: Test passed

Environment condition:

Fri 20/May/2022 14:22:49 Date & Time:

Location: CTC advanced GmbH, Laboratory RC-SYS 22 °C Temperature: Humidity: 55 Voltage: 230 Vac

Setup of measurement equipment:

Start frequency: 28 358 GHz GHz Stop frequency: 28.362 Center frequency: GHz Frequency span: Resolution-BW: 4 MHz MHz Video-BW: 100 Input attenuation: 6 dB Clear Write Trace-Mode: Detector-Mode: AVG

Correction:

Directional couple 0.0 dB Coaxial cable (C220)
DUT-Antenna (see under limit) 3.9 dB 21.0 dBi Test antenna (A031) BW correction factor 0.0 dB Atten. between HPA and feedhorn 0.0 dB Freefield attenuation (28.75GHz, 5m) 75.6 dB Circular polarization 3.0 dB Additional Attenuation TOTAL CORRECTION: 46.5 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: 25.138 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 §25.138: 32.5-25log2° dBW/MHz -ant.-pattern envelope: -(29-25log2° dBi) dBW/MHz (copolar) ==>: 3.5

dBW/MHz (crosspolar) 3.5 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 §25.138 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 7.2:

Test equipment:

see test report chapter 7.3: A031, C220, R001

Remark:

Test result: Test passed

Environment condition:

Fri 20/May/2022 14:27:12 Date & Time:

Location: CTC advanced GmbH, Laboratory RC-SYS 22 °C Temperature:

Humidity: 55 Voltage: 230 Vac

Setup of measurement equipment:

Start frequency: 29 248 GHz 29.252 GHz Stop frequency: Center frequency: GHz Frequency span: Resolution-BW: 4 MHz MHz Video-BW: 100 Input attenuation: 6 dB Clear Write Trace-Mode:

Detector-Mode: AVG

Correction:

Directional couple 0.0 dB Coaxial cable (C220)
DUT-Antenna (see under limit) 4.0 dB 21.0 dBi Test antenna (A031) BW correction factor 0.0 dB Atten. between HPA and feedhorn 0.0 dB Freefield attenuation (28.75GHz, 5m) 75.6 dB Circular polarization 3.0 dB Additional Attenuation

Remarks:

TOTAL CORRECTION:

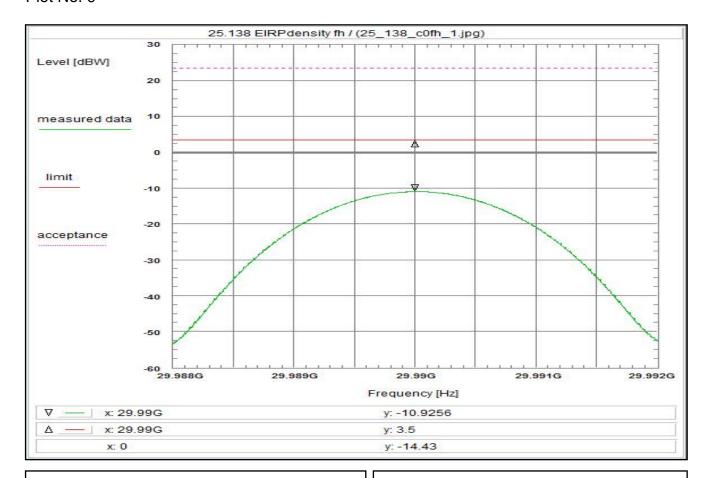
The envelope curves for the antenna patterns ('worst case') are used for this calculation - the actual antenna patterns have to fulfill these requirements (co- and crosspolar envelope curves). See the separate plot after the measurement plots, too.

Measurement with 30 kHz resolution filter and noise averaging.

46.0 dB



Plot No. 9



Subclause: 25.138 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 §25.138: 32.5-25log2° dBW/MHz -ant.-pattern envelope: -(29-25log2° dBi) dBW/MHz (copolar) ==>: 3.5 dBW/MHz (crosspolar) 3.5 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 §25.138 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 7.2:

Test equipment

see test report chapter 7.3: A031, C220, R001

Remark:

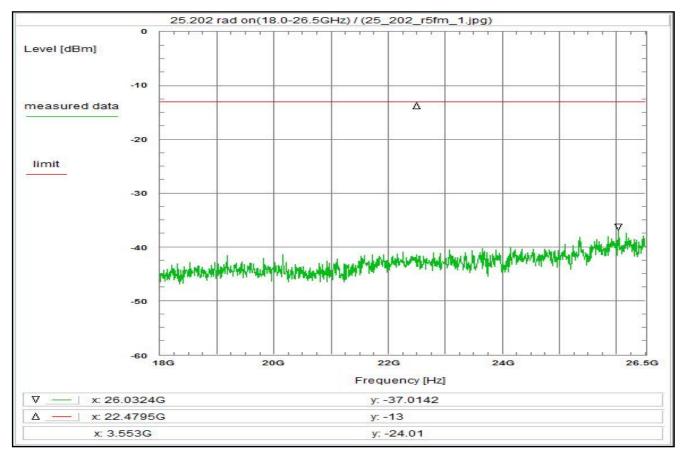
Test result: Test passed

Environment condition: Fri 20/May/2022 14:45:53 Date & Time: Location: CTC advanced GmbH, Laboratory RC-SYS 22 °C Temperature: Humidity: 55 Voltage: 230 Vac Setup of measurement equipment: Start frequency: 29 988 GHz GHz Stop frequency: 29.992 Center frequency: GHz Frequency span: Resolution-BW: 4 MHz MHz Video-BW: 100 Input attenuation: 6 dB Clear Write Trace-Mode: Detector-Mode: AVG Correction: Directional couple 0.0 dB Coaxial cable (C220)
DUT-Antenna (see under limit) 4.1 dB 21.0 dBi Test antenna (A031) BW correction factor 0.0 dB Atten. between HPA and feedhorn 0.0 dB Freefield attenuation (29.99GHz, 5m) 76.0 dB Circular polarization 3.0 dB Additional Attenuation TOTAL CORRECTION: 46.5 dB Remarks: The envelope curves for the antenna patterns ('worst case') are used

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 7.2:

Test equipment: see test report chapter 7.3: A019, C220, R001

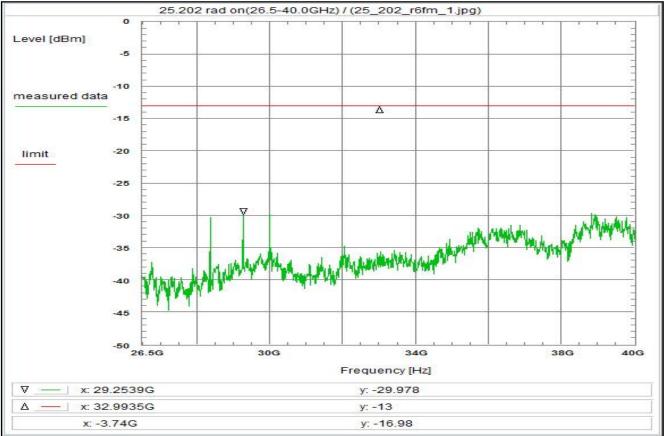
Remark:

Test result: Test passed

Environment condition: Thu 19/May/2022 17:53:03 Date & Time: Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 °C Humidity: 55 Voltage: 230 Vac Setup of measurement equipment: 18 GHz Start frequency: 26.5 GHz Stop frequency: Center frequency: Frequency span: Resolution-BW: 8.5 GHz MHz Video-BW: MHz Input attenuation: 10 dB Trace-Mode: Max-Hold Detector-Mode: AVG Correction: Directional coupler 0.0 dB 3.5 dB 0.0 dBi Coaxial cable (C220) DUT-Antenna Test antenna (A019) 19.3 dB + 0.0 dB BW correction factor Atten. between HPA and feedhorn - 0.0 dB Freefield attenuation (22.25GHz, 0.3m) + 48.9 dB TOTAL CORRECTION: + 33.1 dB 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

Test setup:
see test report chapter 7.2:
Test equipment:
see test report chapter 7.3: A031, C220, R001

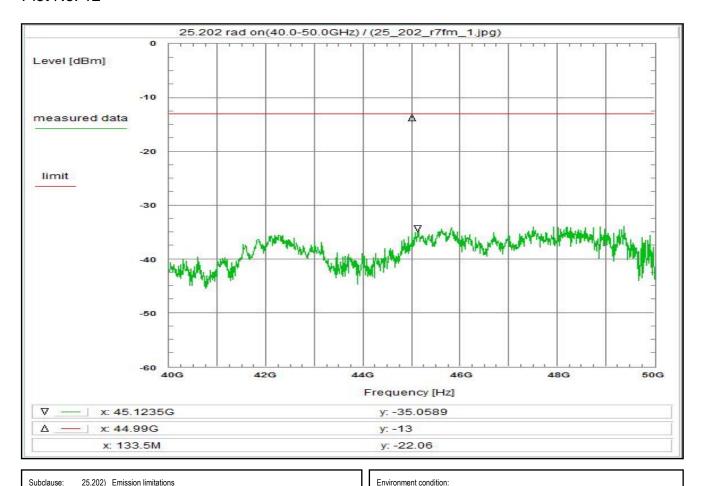
Remark:

Test result: Test passed

Environment condition: Fri 20/May/2022 13:29:12 Date & Time: Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 °C Humidity: 55 Voltage: 230 Vac Setup of measurement equipment: 26.5 GHz Start frequency: 40 GHz Stop frequency: Center frequency: 33.25 Frequency span: Resolution-BW: 13.5 GHz MHz Video-BW: MHz Input attenuation: 10 dB Trace-Mode: Max-Hold Detector-Mode: AVG Correction: Directional coupler 0.0 dB Coaxial cable (C220) 4.3 dB 0.0 dBi DUT-Antenna Test antenna (A031) 16.2 dB BW correction factor 0.0 dB Atten. between HPA and feedhorn 0.0 dB Freefield attenuation 48.9 dB TOTAL CORRECTION: 37.0 dB 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. low - mid - high Tx frequencies shown 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

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 7.2:

Test equipment:

see test report chapter 7.3: A_50, C220, R001

Remark:

Test result: Test passed

Date & Time: Thu 19/May/2022 17:57:19 Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 °C Humidity: 55 Voltage: 230 Vac Setup of measurement equipment: 40 GHz Start frequency:

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

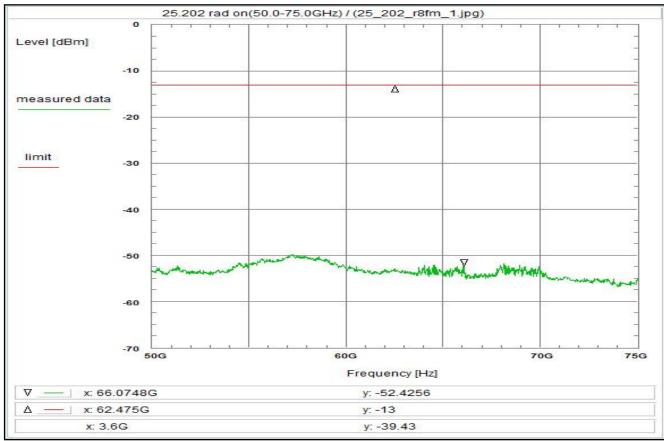
Correction:

Directional coupler 0.0 dB 5.2 dB 0.0 dBi Coaxial cable (C220) DUT-Antenna Test antenna (A_50) 19.9 dB + 0.0 dB BW correction factor Atten. between HPA and feedhorn - 0.0 dB Freefield attenuation (45.00GHz, 0.1m) + 45.5 dB TOTAL CORRECTION: + 30.8 dB

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 1, see test report chapter 6.4

Test setup: see test report chapter 7.2:
Test equipment: see test report chapter 7.3: A025, R001, R025

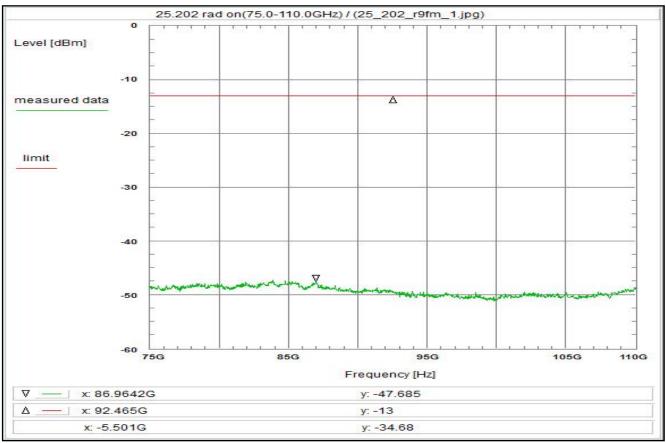
Remark:

Test result: Test passed

Environment condition: Date & Time: Thu 19/May/2022 18:11:11 Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 °C Humidity: 55 Voltage: 230 Vac Setup of measurement equipment: 50 GHz Start frequency: 75 GHz Stop frequency: Center frequency: Frequency span: Resolution-BW: 25 GHz MHz 3 MH: 10 dB Video-BW: MHz Input attenuation: Trace-Mode: Max-Hold Detector-Mode: AVG Correction: Directional coupler 0.0 dB 0.0 dB 0.0 dBi Coaxial cable DUT-Antenna Test antenna (A025) 20.0 dB + 0.0 dB BW correction factor Atten. between HPA and feedhorn - 0.0 dB Freefield attenuation (62.50GHz, 0.1m) + 48.4 dB TOTAL CORRECTION: + 28.4 dB 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. 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 1, see test report chapter 6.4

Test setup:
see test report chapter 7.2:
Test equipment:
see test report chapter 7.3: A028, R001, R029

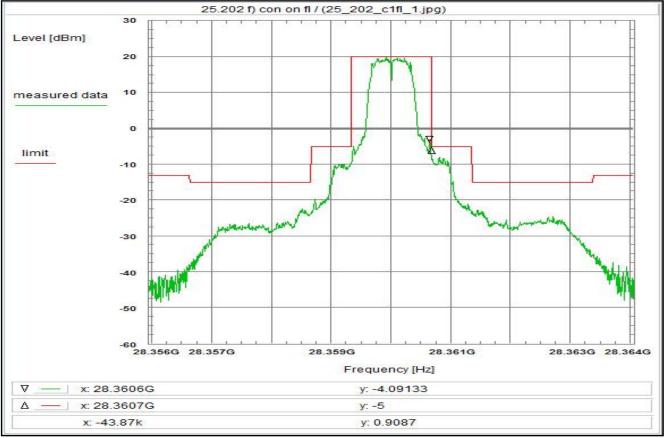
Remark:

Test result: Test passed

Environment condition: Date & Time: Thu 19/May/2022 18:18:16 Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 °C Humidity: 55 Voltage: 230 Vac Setup of measurement equipment: 75 GHz Start frequency: Stop frequency: 110 GHz Center frequency: Frequency span: Resolution-BW: 35 GHz MHz 3 MH: 10 dB Video-BW: MHz Input attenuation: Trace-Mode: Max-Hold Detector-Mode: AVG Correction: Directional coupler 0.0 dB 0.0 dB 0.0 dBi Coaxial cable DUT-Antenna Test antenna (A028) 19.4 dB + 0.0 dB BW correction factor Atten. between HPA and feedhorn - 0.0 dB Freefield attenuation (92.50GHz, 0.1m) + 51.8 dB TOTAL CORRECTION: + 32.4 dB 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. 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

> 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 7.2:

Test equipment:
see test report chapter 7.3: A031, C220, R001

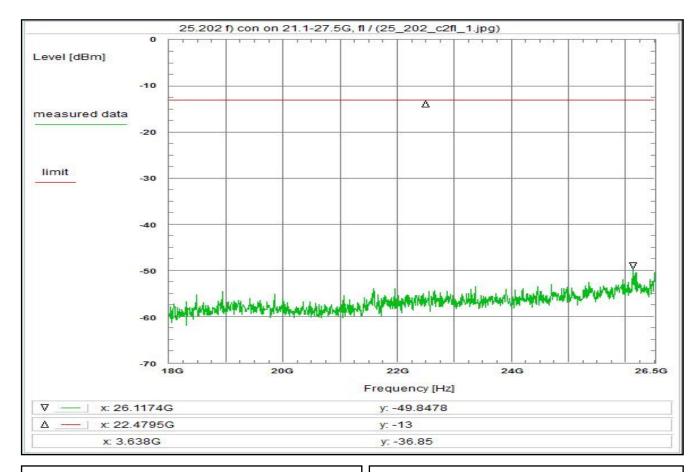
Remark:

Test result: Test passed

Environment condition: Date & Time: Fri 20/May/2022 14:07:08 Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 °C Humidity: 55 Voltage: 230 Vac Setup of measurement equipment: 28 35595 GHz Start frequency: 28.36405 GHz Stop frequency: Center frequency: Frequency span: Resolution-BW: 8.1 MHz 10 kHz Video-BW: Input attenuation: 6 dΒ Max-Hold Trace-Mode: Detector-Mode: AVG Correction: Directional coupler 0.0 dB Coaxial cable (C220) 3.9 dB 0.0 dBi DUT-Antenna Test antenna (A031) BW correction factor (10k -> 4k) 4.0 dB Atten. between HPA and feedhorn 0.0 dB Freefield attenuation (28.36GHz, 5m) 75.5 dB 3.0 dB Circular polarization Additional Attenuation TOTAL CORRECTION: 63.4 dB 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 7.2:

Test equipment:

see test report chapter 7.3: A019, C220, R001

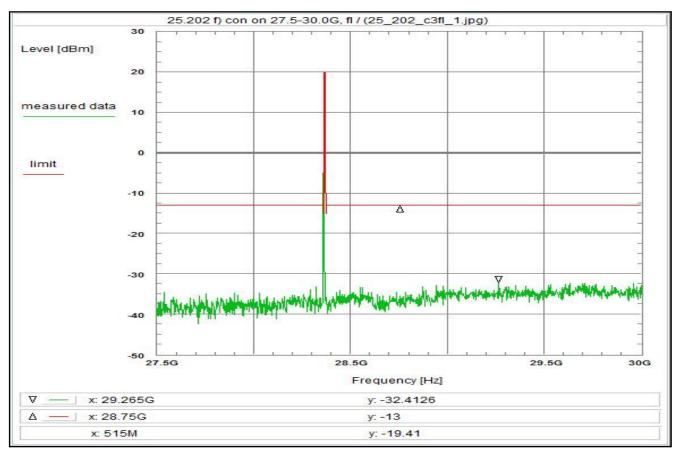
Remark

Test result: Test passed

Environment condition: Thu 19/May/2022 15:31:42 Date & Time: Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 °C Humidity: 55 Voltage: 230 Vac Setup of measurement equipment: 18 GHz Start frequency: 26.5 GHz Stop frequency: Center frequency: Frequency span: Resolution-BW: 8.5 GHz 100 kHz Video-BW: 300 Input attenuation: 0 dB Clear Write Trace-Mode: Detector-Mode: AVG Correction: Directional coupler 0.0 dB Coaxial cable (C220) 3.5 dB 0.0 dBi DUT-Antenna Test antenna (A019) BW correction factor (100k -> 4k) 14.0 dB Atten. between HPA and feedhorn 0.0 dB Freefield attenuation (22.25GHz, 5m) 73.4 dB Circular Polarization 3.0 dB Additional attenuation TOTAL CORRECTION: 46.8 dB 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 7.2:
Test equipment:
see lest report chapter 7.3: A031, C220, R001

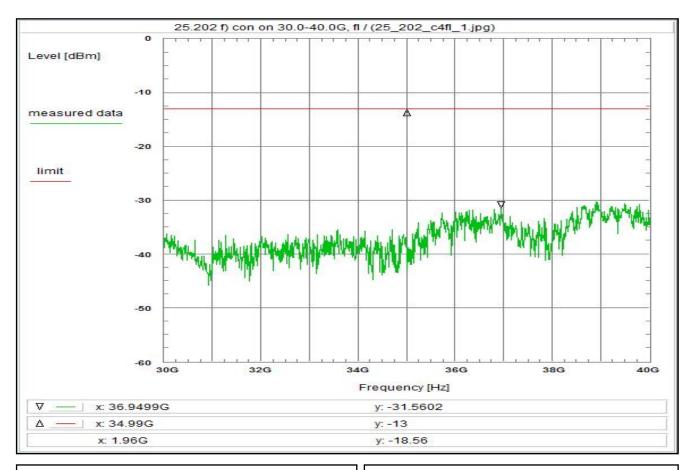
Remark:

Test result: Test passed

Environment condition: Fri 20/May/2022 14:08:37 Date & Time: Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 °C Humidity: 55 Voltage: 230 Vac Setup of measurement equipment: 27.5 GHz Start frequency: 30 GHz Stop frequency: Center frequency: 28.75 Frequency span: Resolution-BW: 2.5 GHz 100 kHz Video-BW: 300 Input attenuation: 6 dB Max-Hold Trace-Mode: Detector-Mode: AVG Correction: Directional coupler 0.0 dB 4.0 dB 0.0 dBi Coaxial cable (C220) DUT-Antenna Test antenna (A031) BW correction factor (100k -> 4k) 14.0 dB Atten. between HPA and feedhorn 0.0 dB Freefield attenuation (28.36GHz, 5m) 75.5 dB Circular polarization 3.0 dB Additional Attenuation 0.2 dB TOTAL CORRECTION: 53.2 dB Carrier-on state / Carrier at the lower edge of the band (fl)



Plot No. 18



Environment condition:

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 7.2:

Test equipment:

see test report chapter 7.3: A031, C220, R001

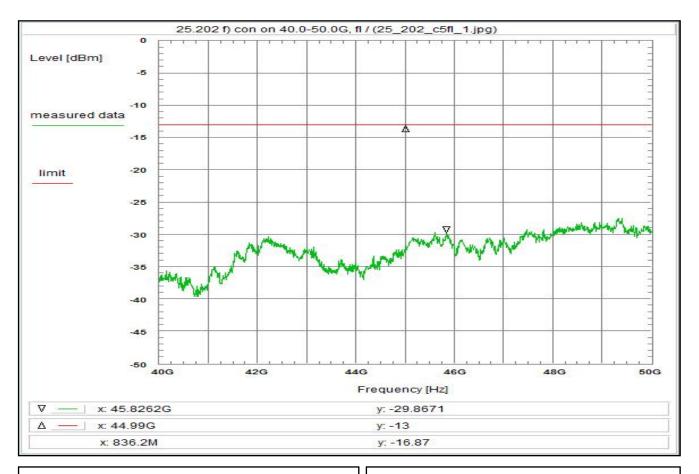
Remark

Test result: Test passed

Fri 20/May/2022 14:10:26 Date & Time: Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 °C Humidity: 55 Voltage: 230 Vac Setup of measurement equipment: 30 GHz Start frequency: 40 GHz 35 GHz 10 GHz Stop frequency: Center frequency: Frequency span: Resolution-BW: 100 kHz Video-BW: Input attenuation: 6 dB Max-Hold Trace-Mode: Detector-Mode: AVG Correction: Directional coupler 0.0 dB 4.4 dB 0.0 dBi Coaxial cable (C220) DUT-Antenna Test antenna (A031) BW correction factor (100k -> 4k) 14.0 dB Atten. between HPA and feedhorn 0.0 dB Freefield attenuation (35.00GHz, 5m) 77.3 dB Circular polarization 3.0 dB Additional Attenuation TOTAL CORRECTION: 54.0 dB Carrier-on state / Carrier at the lower edge of the band (fl)



Plot No. 19



25.202 f) Frequencies, frequency tolerance and emission limitations Subclause: Emission limitations Modulated rf-carrier at the lower edge of the band (fl) 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 7.2:

Test equipment:

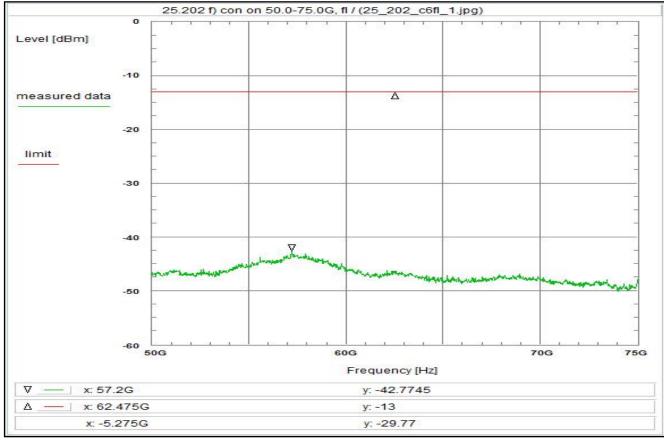
see test report chapter 7.3: A_50, C220, R001

Test result: Test passed

Environment condition: Date & Time: Thu 19/May/2022 15:24:38 Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 °C Humidity: 55 Voltage: 230 Vac Setup of measurement equipment: 40 GHz Start frequency: 50 45 10 Stop frequency: GHz Center frequency: Frequency span: Resolution-BW: GHz 100 kHz Video-BW: 300 Input attenuation: 0 dB Max-Hold Trace-Mode: Detector-Mode: AVG Correction: Directional coupler 0.0 dB Coaxial cable (C220) 5.2 dB 0.0 dBi DUT-Antenna Test antenna (A_50) 19.9 dB BW correction factor (100k -> 4k) 14.0 dB Atten. between HPA and feedhorn 0.0 dB Freefield attenuation (45.00GHz, 5m) 79.5 dB Circular Polarization 3.0 dB Additional attenuation TOTAL CORRECTION: 54.0 dB 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: -35 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 7.2:
Test equipment:
see test report chapter 7.3: A025, R001, R025

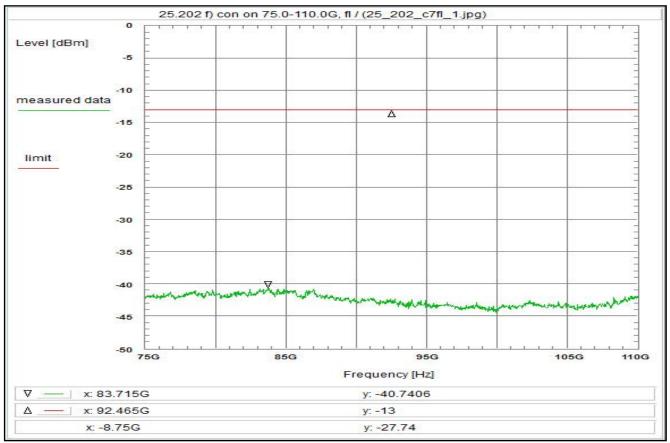
Remark:

Test result: Test passed

Environment condition: Date & Time: Thu 19/May/2022 14:51:52 Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 °C Humidity: 55 Voltage: 230 Vac Setup of measurement equipment: 50 GHz Start frequency: 75 GHz Stop frequency: Center frequency: 62.5 GHz Frequency span: Resolution-BW: 25 GHz MHz Video-BW: 3 MHz Input attenuation: dΒ Trace-Mode: Max-Hold Detector-Mode: AVG Correction: Directional coupler 0.0 dB 0.0 dB 3.0 dBi Coaxial cable DUT-Antenna Test antenna (A025) BW correction factor (1M -> 4k) 20.0 dB 24.0 dB Atten. between HPA and feedhorn 0.0 dB Freefield attenuation 81.2 dB TOTAL CORRECTION: 34.2 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+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 7.2:
Test equipment:
see test report chapter 7.3: A028, R001, R029

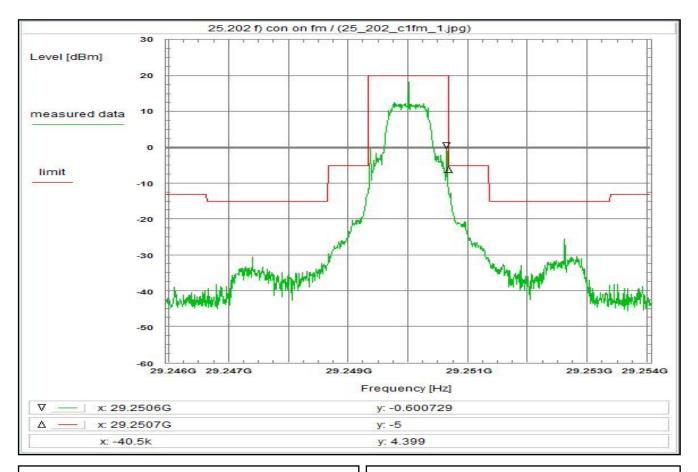
Remark:

Test result: Test passed

Environment condition: Date & Time: Thu 19/May/2022 15:03:10 Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 °C Humidity: 55 Voltage: 230 Vac Setup of measurement equipment: 75 GHz Start frequency: Stop frequency: 110 GHz Center frequency: Frequency span: Resolution-BW: 35 GHz MHz Video-BW: 3 MHz Input attenuation: dΒ Trace-Mode: Max-Hold Detector-Mode: AVG Correction: Directional coupler 0.0 dB 0.0 dB 3.0 dBi Coaxial cable DUT-Antenna 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, 5m) + TOTAL CORRECTION: + 85.7 dB 39.3 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 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 7.2:

Test equipment:

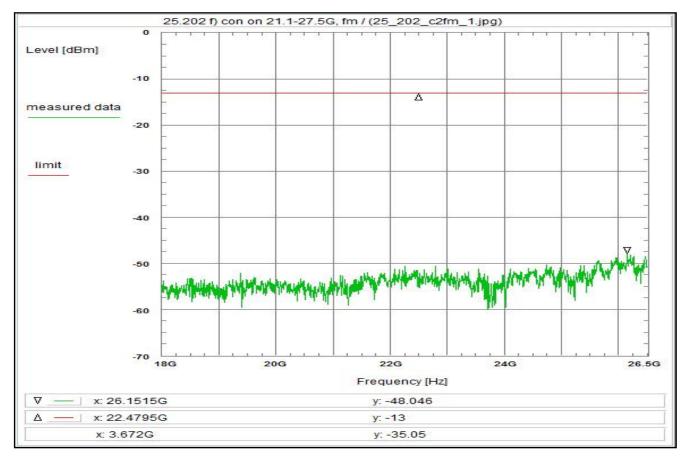
see test report chapter 7.3: A031, C220, R001

Test result: Test passed

Environment condition: Date & Time: Fri 20/May/2022 14:52:01 Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 °C Humidity: 55 % Voltage: 230 Vac Setup of measurement equipment: 29 24595 GHz Start frequency: 29.25405 GHz Stop frequency: Center frequency: Frequency span: Resolution-BW: 8.1 MHz kHz 10 Video-BW: Input attenuation: 6 dB Clear Write Trace-Mode: Detector-Mode: AVG Correction: Directional couple 0.0 dB Coaxial cable (C220)
DUT-Antenna (see under limit) 4.0 dB 0.0 dBi Test antenna (A031) BW correction factor (10k -> 4k) 15.8 dB 4.0 dB Atten. between HPA and feedhorn Freefield attenuation (29.99GHz, 5m) 76.0 dB Circular polarization 3.0 dB Additional Attenuation TOTAL CORRECTION: 63.4 dB Carrier-on state / Carrier in the middle of the band (fm)



Plot No. 23



Environment condition:

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 7.2:

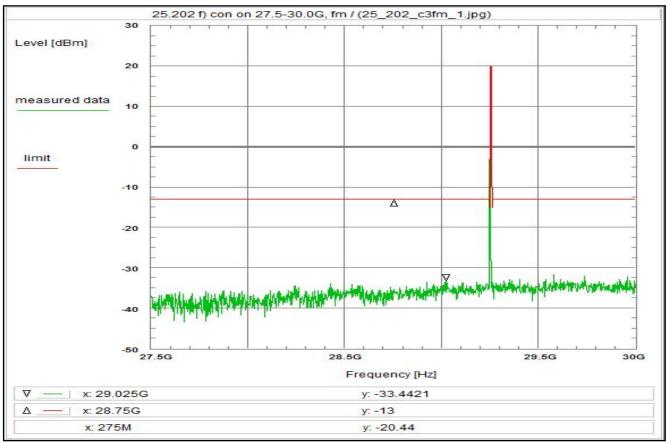
Test equipment: see test report chapter 7.3: A021, C220, R001

Test result: Test passed

Date & Time:	Thu 19/May/2022 15:35:32			
Location:			Laboratory RC-SYS	
Temperature:	22	°C		
Humidity:	55			
Voltage:	230	Vac		
Setup of measurement e	quipment:			
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:	0	dB		
Trace-Mode:	Max-Hold			
Detector-Mode:	AVG			
Correction: Directional coupler Coaxial cable (C220)	+	0.0 3.5	dB dB	
DUT-Antenna		0.0	dBi	
Test antenna (A019)	-	19.3	dB	
BW correction factor (100		14.0		
Atten. between HPA and		0.0		
Freefield attenuation (22.	.25GHz, 5m) +	73.4		
Circular Polarization	+	3.0		
Additional attenuation	+	0.2		
TOTAL CORRECTION:	+	46.8	dB	
Remarks: Carrier-on state / Carrier Rather left the plot shows				



Plot No. 24

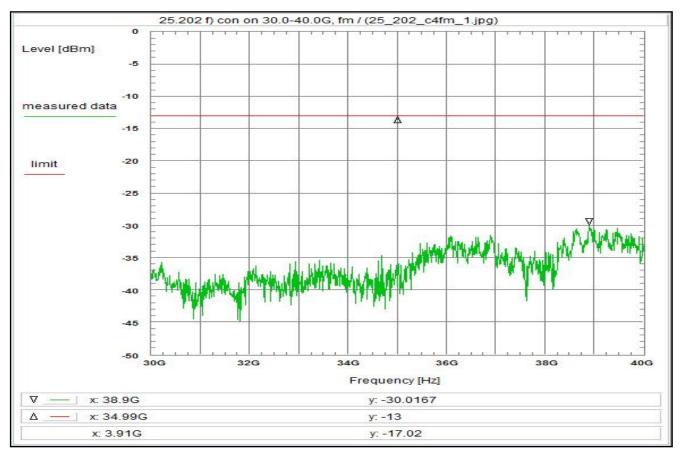


25.202 f) Frequencies, frequency tolerance and emission limitations Subclause: Emission limitations Modulated rf-carrier in the middle of the band (fm) Limit acc. to §25.202 f): 50-100% of assigned bw: -25 dBc/4 kHz 100-250% of assigned bw: -35 dBc/4 kHz > 250% of assigned bw: -43+10log(Pmax) dBc/4 kHz 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 7.2: Test equipment: see test report chapter 7.3: A031, C220, R001 Test result: Test passed

Environment condition: Fri 20/May/2022 14:33:12 Date & Time: Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 °C Humidity: 55 Voltage: 230 Vac Setup of measurement equipment: 27.5 GHz Start frequency: 30 GHz Stop frequency: Center frequency: 28.75 GHz Frequency span: Resolution-BW: 2.5 GHz 100 kHz Video-BW: 300 Input attenuation: 6 dB Max-Hold Trace-Mode: Detector-Mode: Correction: Directional couple 0.0 dB Coaxial cable (C220)
DUT-Antenna (see under limit) 4.0 dB 0.0 dBi Test antenna (A031) BW correction factor (100k -> 4k) 14.0 dB Atten. between HPA and feedhorn 0.0 dB Freefield attenuation (28.75GHz, 5m) 75.6 dB Circular polarization 3.0 dB Additional Attenuation TOTAL CORRECTION: 53.3 dB 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+10log(Pmax) 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 7.2:

Test equipment:
see test report chapter 7.3: A031, C220, R001

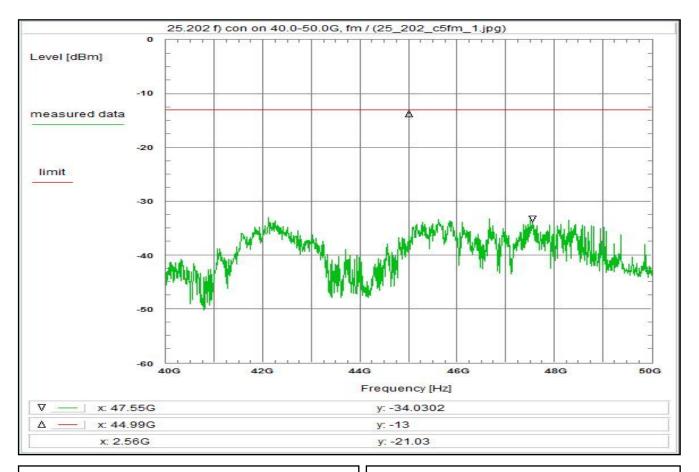
Remark:

Test result: Test passed

Environment condition: Fri 20/May/2022 14:35:28 Date & Time: Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 °C Humidity: 55 % Voltage: 230 Vac Setup of measurement equipment: 30 GHz Start frequency: 40 GHz 35 GHz 10 GHz Stop frequency: Center frequency: Frequency span: Resolution-BW: 100 kHz Video-BW: Input attenuation: 6 dB Max-Hold Trace-Mode: Detector-Mode: Correction: Directional couple 0.0 dB Coaxial cable (C220)
DUT-Antenna (see under limit) 4.4 dB 0.0 dBi Test antenna (A031) BW correction factor (100k -> 4k) 16.9 dB 14.0 dB Atten. between HPA and feedhorn 0.0 dB Freefield attenuation (35.00GHz, 5m) 77.3 dB Circular polarization 3.0 dB Additional Attenuation TOTAL CORRECTION: 54.0 dB Carrier-on state / Carrier in the middle of the band (fm)



Plot No. 26



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

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 7.2:

Test equipment:

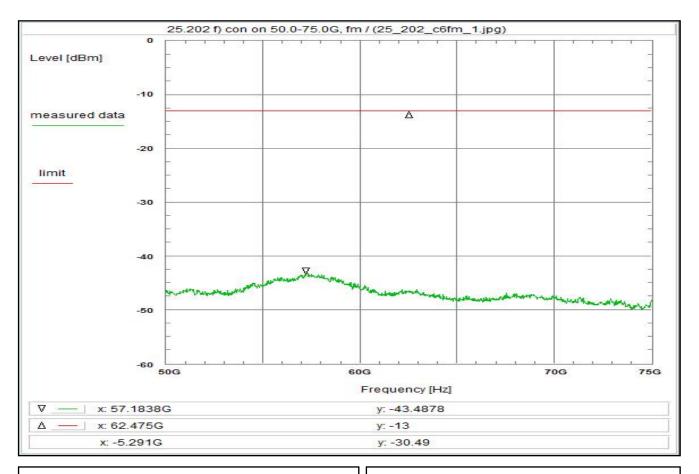
see test report chapter 7.3: A_50, C220, R001

Test result: Test passed

Environment condition: Thu 19/May/2022 15:23:03 Date & Time: Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 °C Humidity: 55 Voltage: 230 Vac Setup of measurement equipment: 40 GHz Start frequency: 50 GHz 45 GHz 10 GHz Stop frequency: Center frequency: Frequency span: Resolution-BW: 100 kHz Video-BW: Input attenuation: 0 dB Max-Hold Trace-Mode: Detector-Mode: AVG Correction: Directional coupler 0.0 dB Coaxial cable (C220) 5.2 dB 0.0 dBi DUT-Antenna Test antenna (A_50) BW correction factor (100k -> 4k) 14.0 dB Atten. between HPA and feedhorn 0.0 dB Freefield attenuation (45.00GHz, 5m) 79.5 dB Circular Polarization 3.0 dB Additional attenuation TOTAL CORRECTION: 54.0 dB 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

<u>Test results:</u> 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 7.2:

<u>Test equipment:</u> see test report chapter 7.3: A025, R001, R025

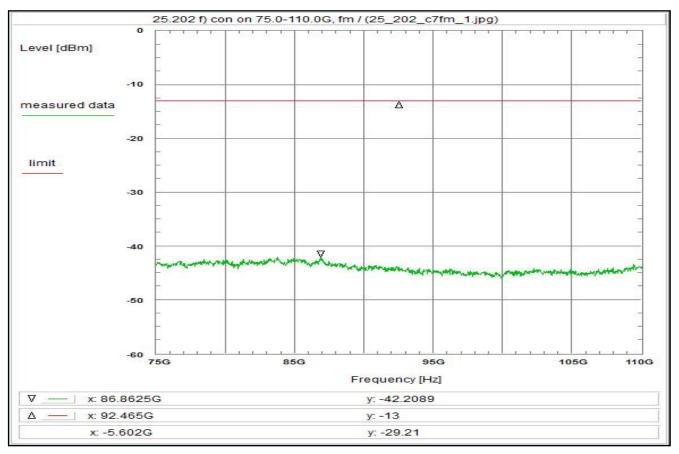
Remark:

Test result: Test passed

Environment condition: Date & Time: Thu 19/May/2022 14:49:13 Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 °C Humidity: 55 Voltage: 230 Vac Setup of measurement equipment: 50 GHz Start frequency: 75 GHz Stop frequency: Center frequency: 62.5 GHz Frequency span: Resolution-BW: 25 GHz MHz Video-BW: 3 MHz Input attenuation: dΒ Trace-Mode: Max-Hold Detector-Mode: AVG Correction: Directional coupler 0.0 dB 0.0 dB 3.0 dBi Coaxial cable DUT-Antenna Test antenna (A025) BW correction factor (1M -> 4k) 20.0 dB 24.0 dB Atten. between HPA and feedhorn 0.0 dB Freefield attenuation 81.2 dB TOTAL CORRECTION: 34.2 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+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 7.2:
Test equipment:
see test report chapter 7.3: A028, R001, R029

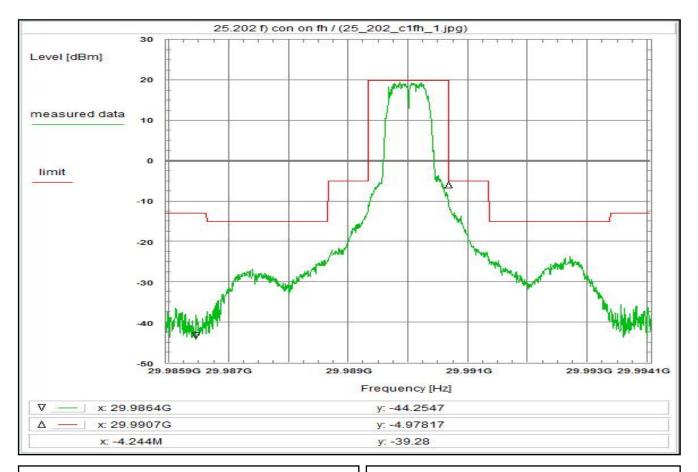
Remark:

Test result: Test passed

Environment condition: Date & Time: Thu 19/May/2022 15:01:42 Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 °C Humidity: 55 Voltage: 230 Vac Setup of measurement equipment: 75 GHz Start frequency: 110 GHz Stop frequency: Center frequency: Frequency span: Resolution-BW: 35 GHz 100 kHz Video-BW: 300 Input attenuation: 0 dB Clear Write Trace-Mode: Detector-Mode: AVG Correction: Directional coupler 0.0 dB 0.0 dB 3.0 dBi Coaxial cable DUT-Antenna 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, 5m) + TOTAL CORRECTION: + 85.7 dB 49.3 dB Remarks:
Carrier-on state / Carrier in the middle of the band (fm)



Plot No. 29



Environment condition:

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

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 7.2:

Test equipment:

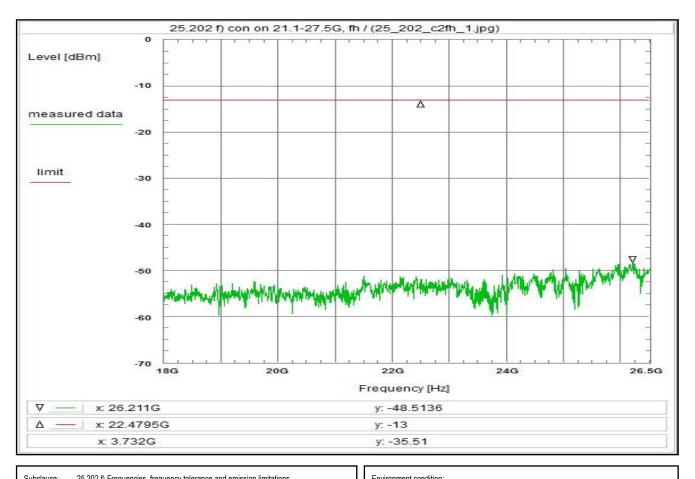
see test report chapter 7.3: A031, C220, R001

Test result: Test passed

Date & Time: Fri 20/May/2022 14:38:25 Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 °C Humidity: 55 Voltage: 230 Vac Setup of measurement equipment: 29 98595 GHz Start frequency: 29.99405 GHz Stop frequency: Center frequency: Frequency span: Resolution-BW: 8.1 MHz kHz 10 Video-BW: Input attenuation: 6 dB Clear Write Trace-Mode: Detector-Mode: AVG Correction: Directional couple 0.0 dB Coaxial cable (C220)
DUT-Antenna (see under limit) 4.1 dB 0.0 dBi Test antenna (A031) BW correction factor (10k -> 4k) 15.8 dB 4.0 dB Atten. between HPA and feedhorn Freefield attenuation (29.99GHz, 5m) 76.0 dB 3.0 dB Circular polarization Additional Attenuation TOTAL CORRECTION: 63.5 dB 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 7.2:

Test equipment:

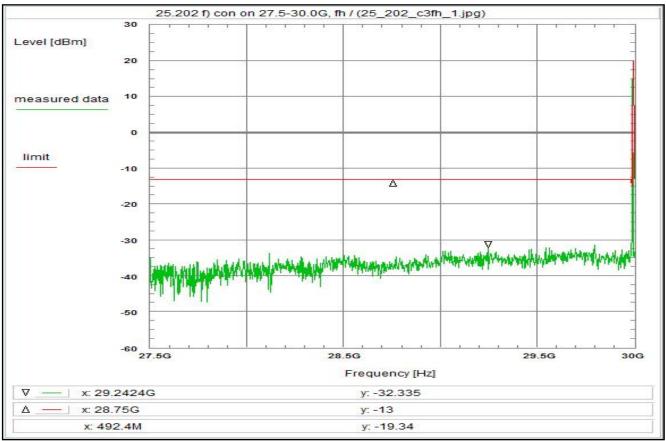
see test report chapter 7.3: A019, C220, R001

Test result: Test passed

Environment condition:				
Date & Time:	Thu 19/May/2022 15:38:46			
Location:	CTC advanced			Laboratory RC-SYS
Temperature:	22	_	°C	
Humidity:		-	%	
Voltage:	230)	Vac	
Setup of measurement eq Start frequency: Stop frequency: Center frequency: Frequency span:	26.5 22.25	5	GHz GHz GHz GHz	
Resolution-BW:			kHz	
Video-BW:			kHz	
Input attenuation:		-	dB	
Trace-Mode:	Max-Hold	t		
Detector-Mode:	AVC	3		
Correction: Directional coupler Coaxial cable (C220) DUT-Antenna Test antenna (A019) BW correction factor (100) Atten. between HPA and f Freefield attenuation (22.2 Circular Polarization Additional attenuation TOTAL CORRECTION:	> 4k) eedhorn 5GHz, 5m)	+ - - +	0.0 3.5 0.0 19.3 14.0 0.0 73.4 3.0 0.2 46.8	dB dBi dB dB dB dB
Remarks: Carrier-on state / Carrier a Rather left the plot shows				



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 of DUT: see test report chapter 6.4

Test setup: see test report chapter 7.2:

Test equipment: see test report chapter 7.3: A031, C220, R001

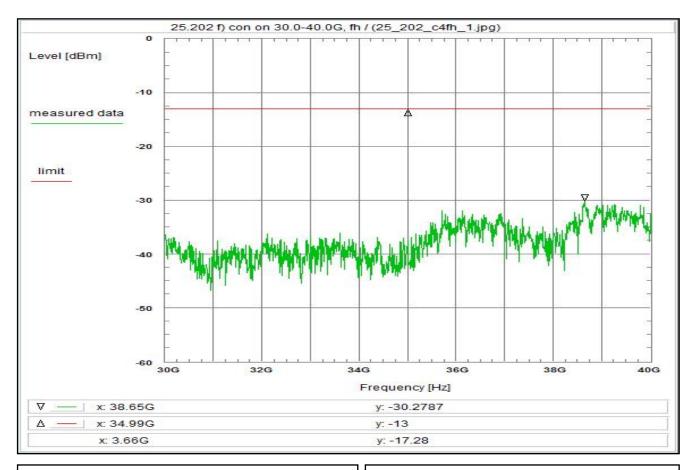
Remark:

Test result: Test passed

Environment condition: Date & Time: Fri 20/May/2022 14:39:18 Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 °C Humidity: 55 Voltage: 230 Vac Setup of measurement equipment: 27.5 GHz Start frequency: 30 GHz Stop frequency: Center frequency: 28.75 GHz Frequency span: Resolution-BW: 2.5 GHz 100 kHz Video-BW: 300 Input attenuation: 6 dB Max-Hold Trace-Mode: Detector-Mode: Correction: Directional couple 0.0 dB Coaxial cable (C220)
DUT-Antenna (see under limit) 4.0 dB 0.0 dBi Test antenna (A031) BW correction factor (100k -> 4k) 14.0 dB Atten. between HPA and feedhorn Freefield attenuation (29.99GHz, 5m) 76.0 dB 3.0 dB Circular polarization Additional Attenuation TOTAL CORRECTION: 53.7 dB 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 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 7.2:

Test equipment:

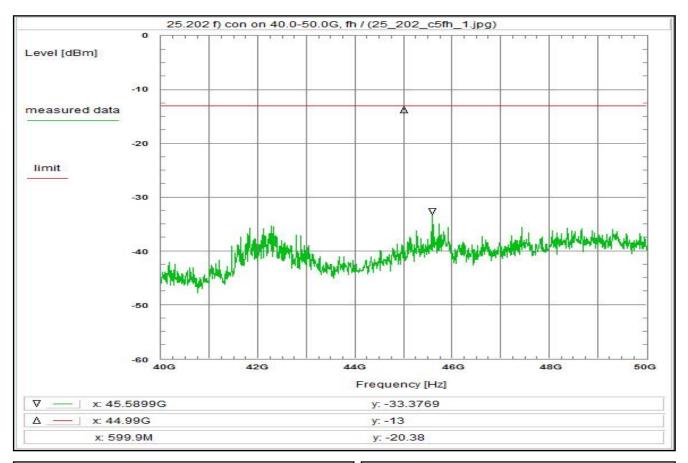
see test report chapter 7.3: A031, C220, R001

Test result: Test passed

Environment condition: Fri 20/May/2022 14:40:39 Date & Time: Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 °C Humidity: 55 Voltage: 230 Vac Setup of measurement equipment: 30 GHz Start frequency: 40 GHz 35 GHz 10 GHz Stop frequency: Center frequency: Frequency span: Resolution-BW: 100 kHz Video-BW: Input attenuation: 6 dB Max-Hold Trace-Mode: Detector-Mode: AVG Correction: Directional couple 0.0 dB Coaxial cable (C220)
DUT-Antenna (see under limit) 4.4 dB 0.0 dBi Test antenna (A031) BW correction factor (100k -> 4k) 16.9 dB 14.0 dB Atten. between HPA and feedhorn 0.0 dB Freefield attenuation (35.00GHz, 5m) 77.3 dB Circular polarization 3.0 dB Additional Attenuation TOTAL CORRECTION: 54.0 dB Carrier-on state / Carrier at the upper edge of the band (fh)



Plot No. 33



Environment condition:

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 7.2:

Test equipment:

see test report chapter 7.3: A_50, C220, R001

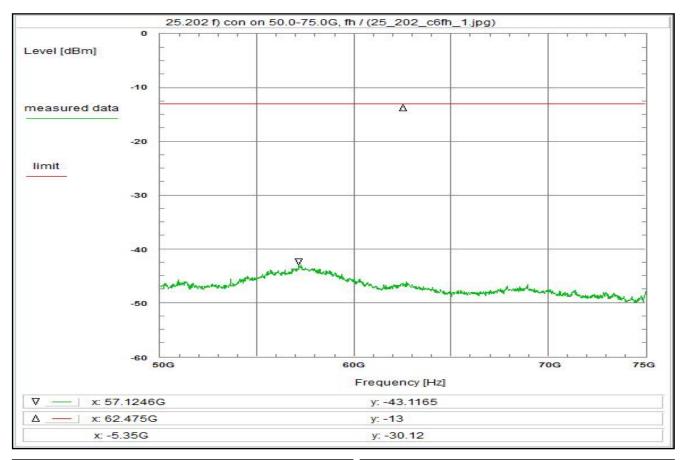
Remark

Test result: Test passed

Thu 19/May/2022 15:20:57 Date & Time: Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 °C Humidity: 55 Voltage: 230 Vac Setup of measurement equipment: 40 GHz Start frequency: 50 45 10 GHz Stop frequency: Center frequency: Frequency span: Resolution-BW: GHz 100 kHz Video-BW: 300 Input attenuation: 0 dB Clear Write Trace-Mode: Detector-Mode: AVG Correction: Directional coupler 0.0 dB Coaxial cable (C220) 5.2 dB 0.0 dBi DUT-Antenna Test antenna (A_50) BW correction factor (100k -> 4k) 14.0 dB Atten. between HPA and feedhorn 0.0 dB Freefield attenuation (45.00GHz, 5m) 79.5 dB Circular Polarization 3.0 dB Additional attenuation TOTAL CORRECTION: 54.0 dB 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 (fth)

Limit:
Limit ac. 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

> 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 of DUT:
see test report chapter 7.2:

Test equipment:
see test report chapter 7.3: A025, R001, R025

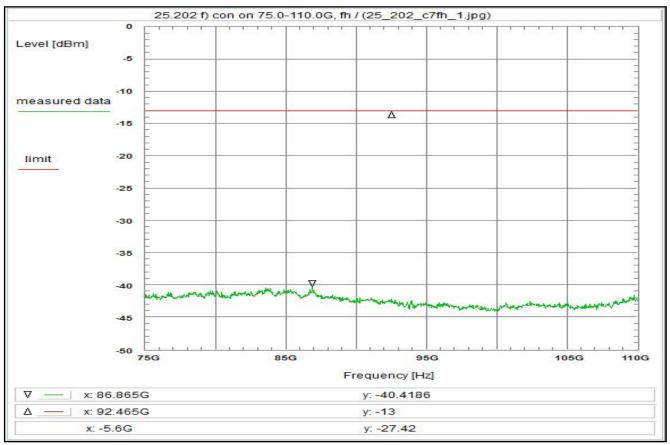
Remark:

Test result: Test passed

Environment condition: Date & Time: Thu 19/May/2022 14:53:45 Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 °C Humidity: 55 Voltage: 230 Vac Setup of measurement equipment: 50 GHz Start frequency: 75 GHz Stop frequency: Center frequency: 62.5 GHz Frequency span: Resolution-BW: 25 GHz MHz Video-BW: 3 MHz Input attenuation: dΒ Trace-Mode: Max-Hold Detector-Mode: AVG Correction: Directional coupler 0.0 dB 0.0 dB 3.0 dBi Coaxial cable DUT-Antenna Test antenna (A025) 20.0 dB BW correction factor (1M -> 4k) 24.0 dB Atten. between HPA and feedhorn 0.0 dB Freefield attenuation 81.2 dB TOTAL CORRECTION: 34.2 dB $\label{eq:Remarks:} \underline{\text{Remarks:}}$ 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 7.2:

Test equipment: see test report chapter 7.3: A028, R001, R029

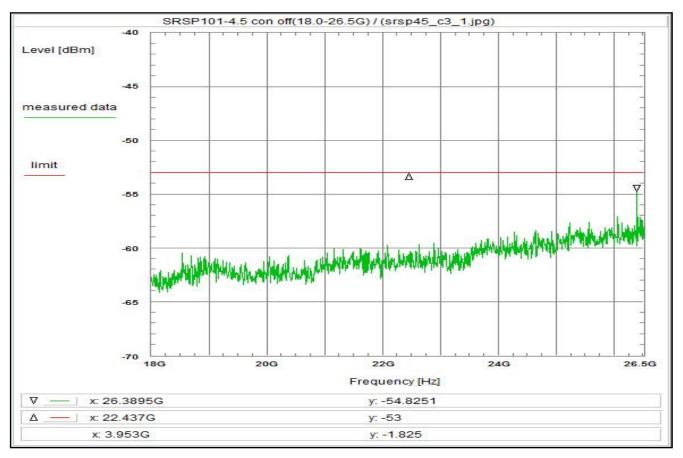
Remark:

Test result: Test passed

Environment condition: Date & Time: Thu 19/May/2022 15:00:43 Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 °C Humidity: 55 Voltage: 230 Vac Setup of measurement equipment: 75 GHz Start frequency: Stop frequency: 110 GHz Center frequency: Frequency span: Resolution-BW: 35 GHz MHz Video-BW: 3 MHz Input attenuation: dΒ Trace-Mode: Max-Hold Detector-Mode: AVG Correction: Directional coupler 0.0 dB 0.0 dB 3.0 dBi Coaxial cable DUT-Antenna 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, 5m) + TOTAL CORRECTION: + 85.7 dB $\label{eq:Remarks:} \underline{\text{Remarks:}}$ 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 1, see test report chapter 6.4

Test setup: see test report chapter 7.2:

Test equipment: see test report chapter 7.3: A019, C220, R001

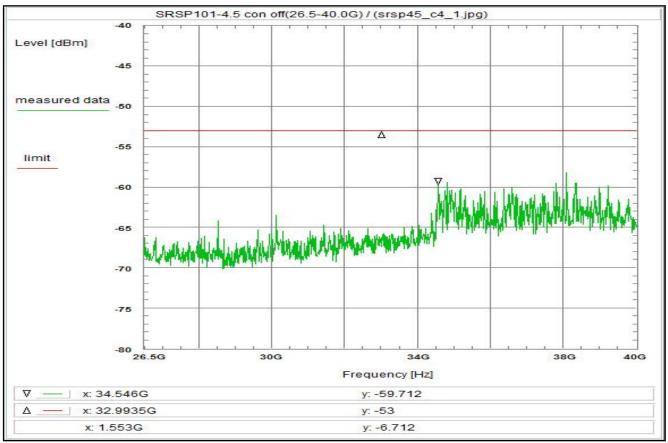
Remark:

Test result: Test passed

Environment condition: Tue 24/May/2022 13:13:41 Date & Time: Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 °C Humidity: 55 Voltage: 230 Vac Setup of measurement equipment: 18 GHz Start frequency: 26.5 GHz Stop frequency: Center frequency: Frequency span: Resolution-BW: 8.5 GHz 100 kHz Video-BW: 300 Input attenuation: 0 dB Max-Hold Trace-Mode: Detector-Mode: Pos Peak Correction: Directional coupler 0.0 dB 3.5 dB 0.0 dBi Coaxial cable (C220) DUT-Antenna - 19.3 dB + 0.0 dB Test antenna (A019) BW correction factor (100k -> 1M) 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 1, see test report chapter 6.4

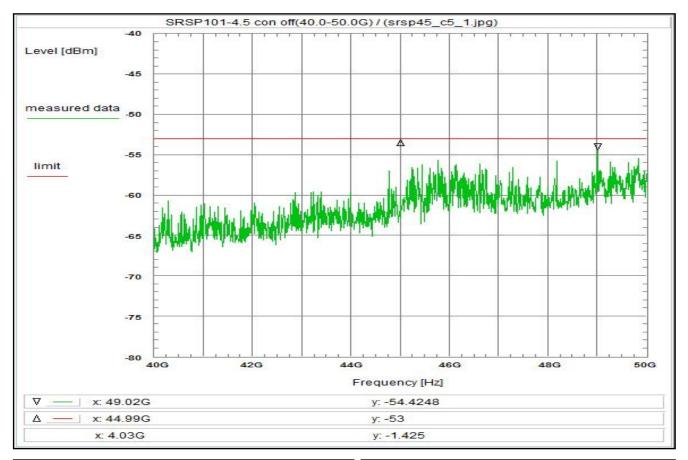
Test setup: see test report chapter 7.2:
Test equipment: see test report chapter 7.3: A031, C220, R001
Remark:

Test result: Test passed

Environment condition: Date & Time: Tue 24/May/2022 13:22:36 Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 °C Humidity: 55 Voltage: 230 Vac Setup of measurement equipment: 26.5 GHz Start frequency: Stop frequency: 40 GHz Center frequency: 33.25 Frequency span: Resolution-BW: 13.5 GHz 100 kHz Video-BW: 300 Input attenuation: 0 dB Trace-Mode: Average Detector-Mode: Sample Correction: Directional coupler 0.0 dB Coaxial cable (C220) 4.3 dB 0.0 dBi DUT-Antenna Test antenna (A031) 16.2 dB BW correction factor (100k -> 1M) 10.0 dB Atten. between HPA and feedhorn - 0.0 dB Freefield attenuation (33.25GHz, 0.1m) + 42.9 dB TOTAL CORRECTION: + 41.0 dB Remarks: Carrier-off state / Receiver spurious emissions



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 1, see test report chapter 6.4

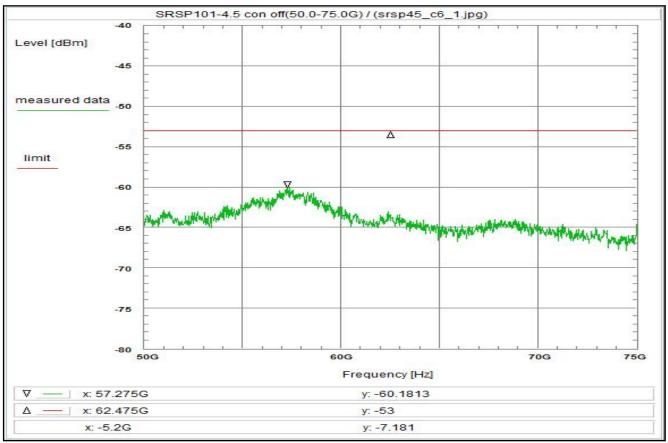
Test setup:
see test report chapter 7.2:
Test equipment:
see test report chapter 7.3: A_50, C220, R001,
Remark:

Test result: Test passed

Environment condition: Date & Time: Tue 24/May/2022 13:25:44 Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 °C Humidity: 55 Voltage: 230 Vac Setup of measurement equipment: 40 GHz Start frequency: 50 GHz 45 GHz 10 GHz Stop frequency: Center frequency: Frequency span: Resolution-BW: 100 kHz Video-BW: Input attenuation: 0 dB Trace-Mode: Average Detector-Mode: Sample Correction: Directional coupler 0.0 dB 5.2 dB 0.0 dBi Coaxial cable (C220) DUT-Antenna Test antenna (A_50) 19.9 dB BW correction factor (100k -> 1M) 10.0 dB Atten. between HPA and feedhorn - 0.0 dB Freefield attenuation (45.00GHz, 0.1m) + 45.5 dB TOTAL CORRECTION: + 40.8 dB Remarks: Carrier-off state / Receiver spurious emissions



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 1, see test report chapter 6.4

Test setup: see lest report chapter 7.2:

Test equipment: see test report chapter 7.3: A025, R001, R025

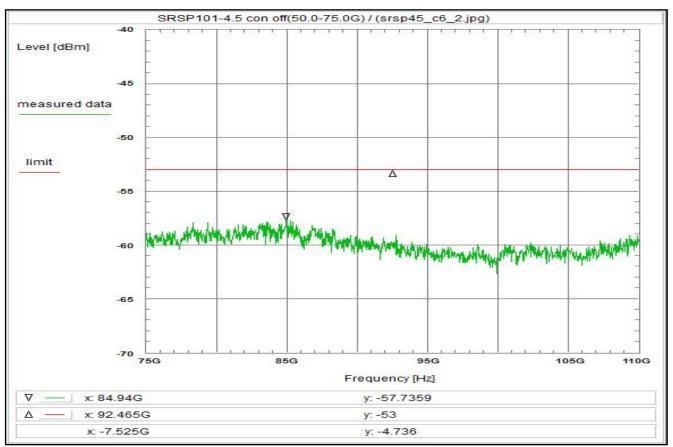
Remark:

Test result: Test passed

Environment condition: Date & Time: Tue 24/May/2022 13:35:02 Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 °C Humidity: 55 Voltage: 230 Vac Setup of measurement equipment: 50 GHz Start frequency: 75 GHz Stop frequency: 62.5 GHz 25 GHz 100 kHz Center frequency: Frequency span: Resolution-BW: Video-BW: Input attenuation: 0 dB Trace-Mode: Average Detector-Mode: Sample Correction: Directional coupler 0.0 dB 0.0 dB 0.0 dBi Coaxial cable DUT-Antenna 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



Plot No. 40



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 1, see test report chapter 6.4

Test setup: see test report chapter 7.2:

Test equipment: see test report chapter 7.3: A028, R001, R029

Remark:

Test result: Test passed

Environment condition: Date & Time: Tue 24/May/2022 13:39:24 Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 °C Humidity: 55 Voltage: 230 Vac Setup of measurement equipment: 75 GHz Start frequency: 110 GHz Stop frequency: Center frequency: Frequency span: Resolution-BW: 35 GHz 100 kHz Video-BW: 300 Input attenuation: 0 dB Trace-Mode: Average Detector-Mode: Sample Correction: Directional coupler 0.0 dB 0.0 dB 0.0 dBi Coaxial cable DUT-Antenna Test antenna (A028) 19.4 dB BW correction factor (100k -> 1M) 10.0 dB Atten. between HPA and feedhorn - 0.0 dB Freefield attenuation (92.50GHz, 0.05m) + 45.7 dB TOTAL CORRECTION: + 36.3 dB Remarks: Carrier-off state / Receiver spurious emissions



3 Measurement results, Spurious emissions 30MHz - 18 GHz

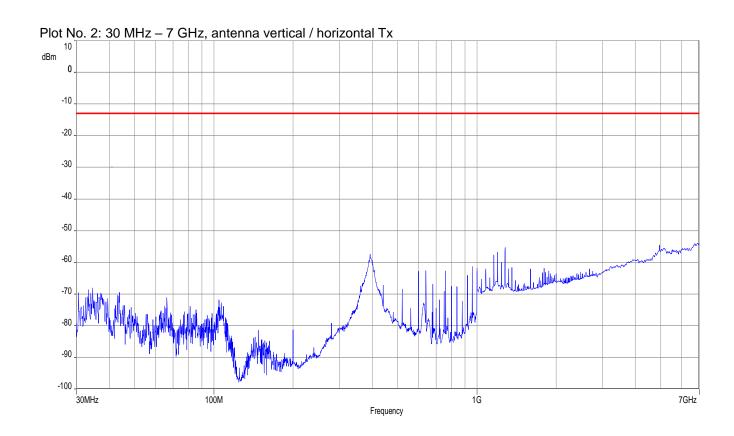
This Chapter 3 consists of 3 pages including this page.

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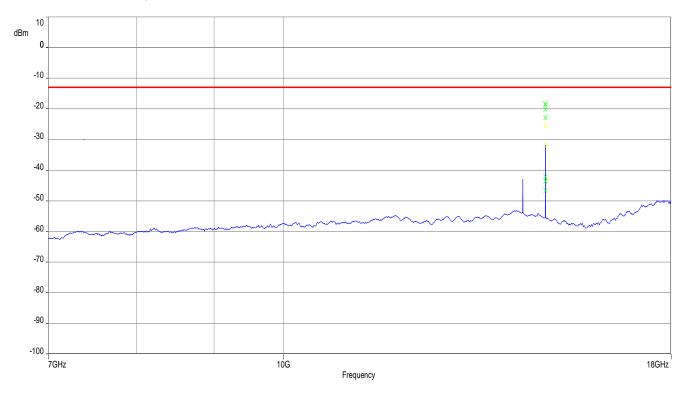
Plot No. 1: 150 kHz - 30 MHz, antenna vertical / horizontal Tx/Rx dBµV/m 120 110. 100. 90 80 70. ublichader production and the second of the second ,~~~WWWWW 50 40 30 20. 10. 0. 9kHz 100k 1M 10M 30MHz

Frequency



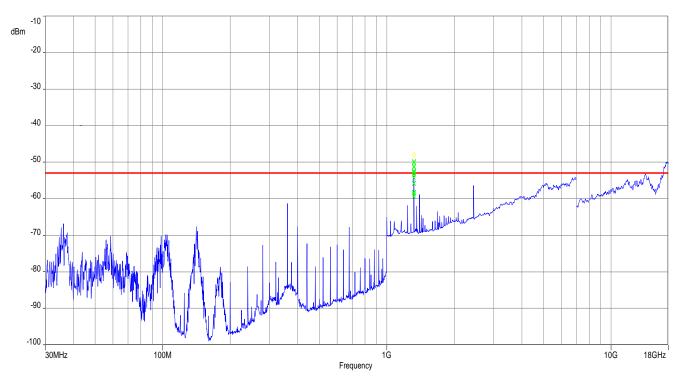


Plot No. 3: 7 – 18 GHz, antenna vertical / horizontal Tx



Worst case: -18.5 dBm RMS @14.875 GHz

Plot No. 4: 30 MHz - 18 GHz, antenna vertical / horizontal Rx RSP-101



Worst case RMS value: -53.5 dBm at 1320 MHz

Note: Noise floor only at frequencies above 10 GHz



4 Measurement results, FCC Part 15B

This Chapter 3 consists of 1 pages including this page.

Refer to test report 1-3566_21-01-06.pdf

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5 Document history

Version	Applied changes	Date of release
	Initial release - DRAFT	2022-06-01
	Initial release	2022-06-21

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