







Annex I



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.

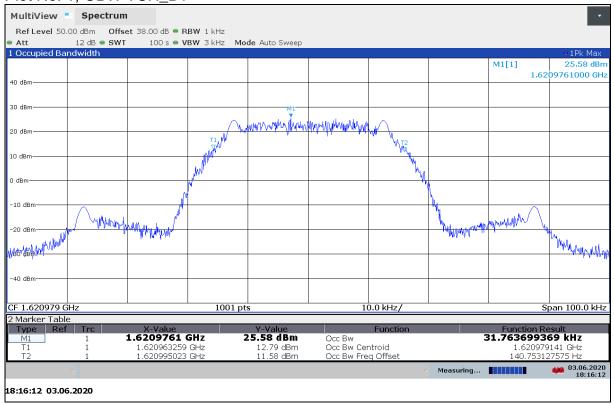
Test report annex authorized:		

Meheza Walla Lab Manager Radio Communications & EMC

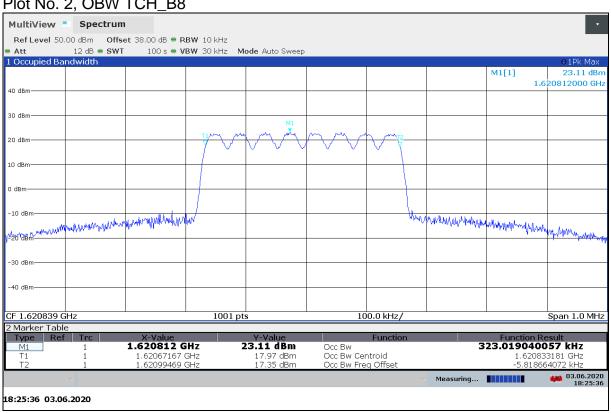
© CTC advanced GmbH Page 1 of 51



Plot No. 1, OBW TCH_B1



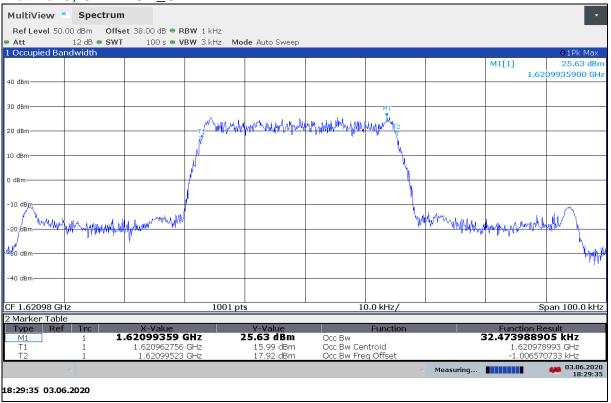
Plot No. 2, OBW TCH_B8



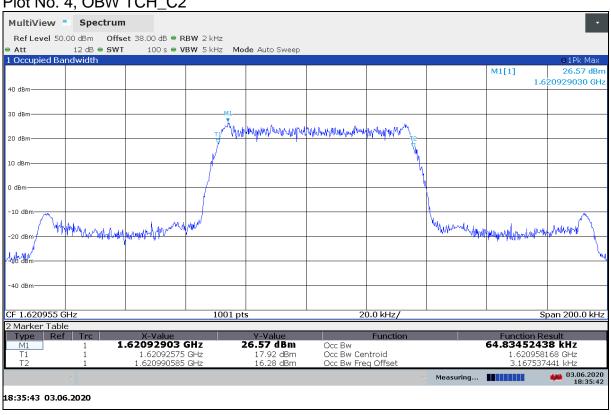
© CTC advanced GmbH Page 2 of 51



Plot No. 3, OBW TCH_C1



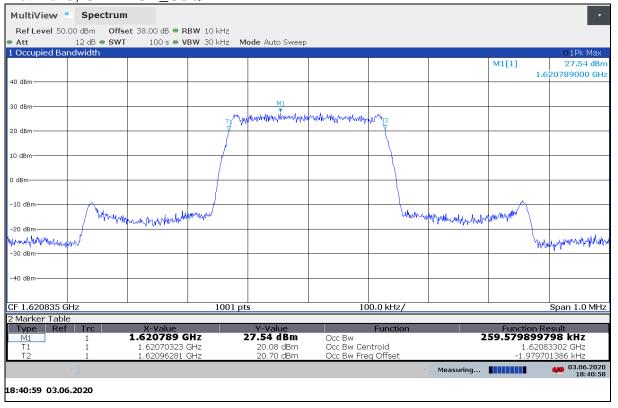
Plot No. 4, OBW TCH_C2



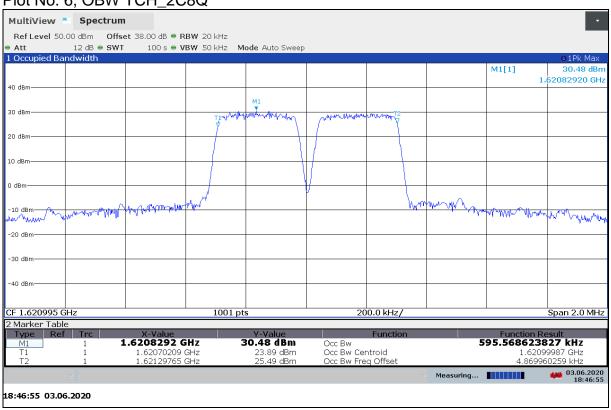
© CTC advanced GmbH Page 3 of 51



Plot No. 5, OBW TCH_C8Q



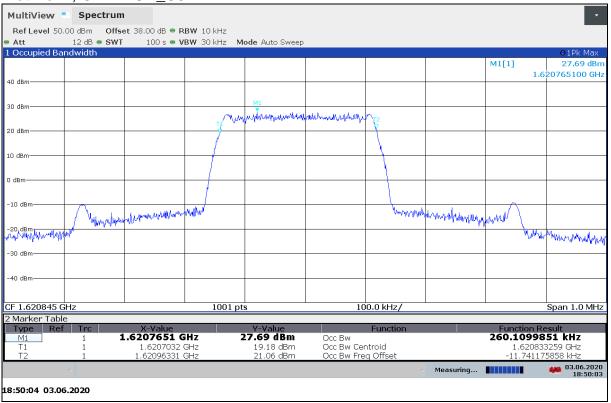
Plot No. 6, OBW TCH_2C8Q



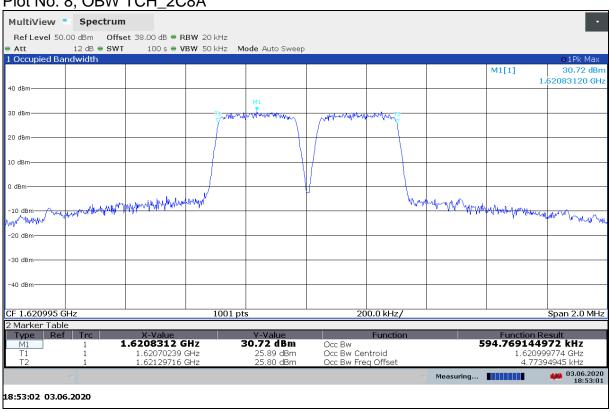
© CTC advanced GmbH Page 4 of 51



Plot No. 7, OBW TCH_C8A



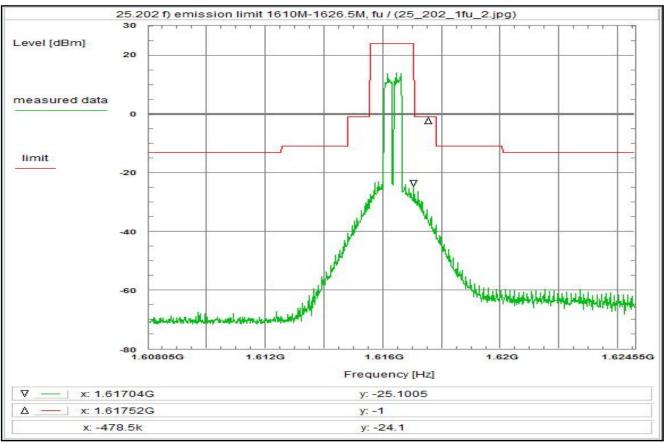
Plot No. 8, OBW TCH_2C8A



© CTC advanced GmbH Page 5 of 51



Plot No. 9



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

Limit:
Limit according to 25.202 f):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW
The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule.

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

Operating condition of DUT:
operating condition of DUT:
operating condition 1, see test report chapter 5.2
Modulation TCH_2C8A, fl

Test setup:
see test report chapter 6.2

Test equipment:
see test report chapter 6.1 - 6.2: C220, R001, U005 + POWER SPLITTER

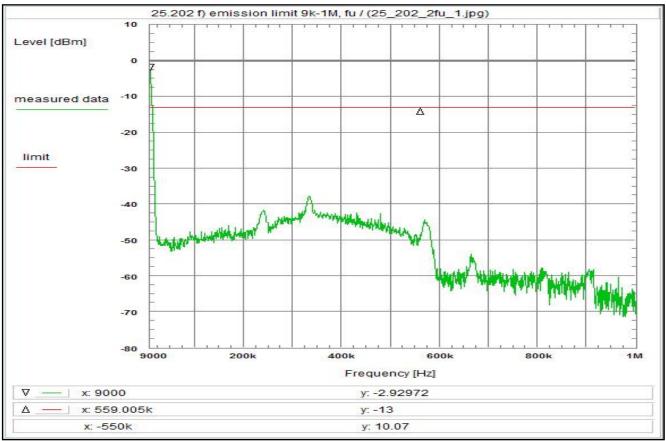
Remark:

Test result: Test passed

Environment condition: Mon 08/Jun/2020 13:10:58 Date & Time: Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS $22\ ^{\circ}\text{C}$ Humidity: 55 % Voltage: 24 VDC Setup of measurement equipment: 1 60805 GHz Start frequency: 1.62455 GHz Stop frequency: Center frequency: 1.6163 Frequency span: Resolution-BW: 16.5 MHz kHz 10 Video-BW: kHz Input attenuation: 12 dB Trace-Mode: Max-Hold Detector-Mode: AVG Correction: Directional coupler 0.0 dB 0.0 dB Coaxial cable 10.4 dBi DUT-Antenna (on-axis) 0.0 dB 4.0 dB BW correction factor (10k -> 4k) Atten. between HPA and feedhorn + 0.0 dB (U005 + POWER SPLITTER) 37.5 dB + 43.9 dB TOTAL CORRECTION: Carrier-on state / Carrier at the lower edge of the band (fu) RMS detector



Plot No. 10



Subclause:

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

Limit:
Limit according to 25.202 f):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW
The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule.

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

Operating condition of DUT:
operating condition 1, see test report chapter 5.2
Modulation TCH_2C8A, fl-fm-fh, valid for all modulations

Test setup:
see test report chapter 6.2

Test equipment:
see test report chapter 6.1 - 6.2: C220, R001, U005 + POWER SPLITTER

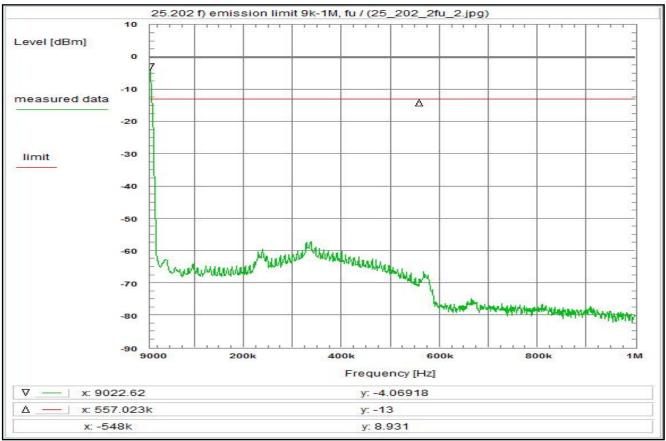
Remark:

Test result: Test passed

Environment condition: Mon 08/Jun/2020 13:57:50 Date & Time: Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 $^{\circ}\mathrm{C}$ Humidity: 55 Voltage: 24 VDC Setup of measurement equipment: 9 kHz Start frequency: 1 MHz Stop frequency: Center frequency: 504.5 kHz Frequency span: Resolution-BW: 991 kHz kHz 10 Video-BW: 100 Input attenuation: 0 dB Max-Hold Trace-Mode: Detector-Mode: Pos Peak Correction: Directional coupler 0.0 dB 0.0 dB Coaxial cable 10.4 dBi DUT-Antenna (on-axis) 0.0 dB 4.0 dB BW correction factor (10k -> 4k) Atten. between HPA and feedhorn + 0.0 dB (U005 + POWER SPLITTER) + 37.0 dB + 43.4 dB TOTAL CORRECTION: Carrier-on state / Carrier at the lower edge of the band (fu) Peak detector Rather left the plot, shows the zero line of the PXA



Plot No. 11



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

Limit:
Limit according to 25.202 f):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW

The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule.

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

Operating condition of DUT: operating condition of DUT: operating condition 1, see test report chapter 5.2 Modulation TCH_2C8A, fl-fm-fh, valid for all modulations

Test setup: see test report chapter 6.2

Test equipment: see test report chapter 6.1 - 6.2: C220, R001, U005 + POWER SPLITTER

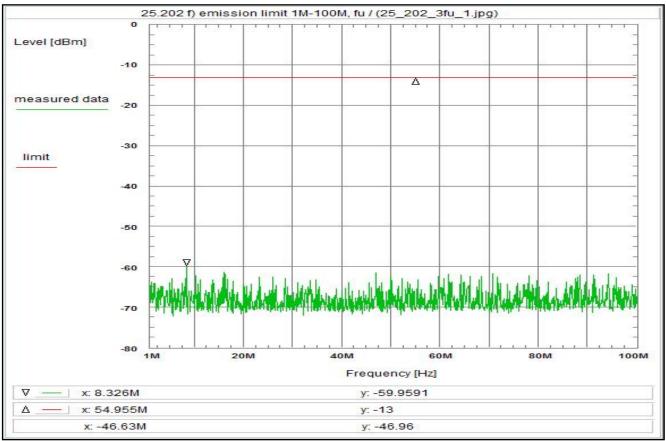
Remark:

Test result: Test passed

Environment condition: Mon 08/Jun/2020 14:00:37 Date & Time: Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 $^{\circ}\mathrm{C}$ Humidity: 55 Voltage: 24 VDC Setup of measurement equipment: 9 kHz Start frequency: 1 MHz Stop frequency: Center frequency: 504.5 kHz Frequency span: Resolution-BW: 991 kHz kHz 10 Video-BW: Input attenuation: 0 dB Trace-Mode: Max-Hold Detector-Mode: AVG Correction: Directional coupler 0.0 dB 0.0 dB Coaxial cable DUT-Antenna (on-axis) 10.4 dBi 0.0 dB 4.0 dB BW correction factor (10k -> 4k) Atten. between HPA and feedhorn + 0.0 dB (U005 + POWER SPLITTER) + 37.0 dB + 43.4 dB TOTAL CORRECTION: Carrier-on state / Carrier at the lower edge of the band (fu) RMS detector Rather left the plot, shows the zero line of the PXA



Plot No. 12



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

Limit:
Limit according to 25.202 f): 50-100% of assigned bw: -25dBc/4kHz 100-250% of assigned bw: -43+10log(Pmax)dBc/4kHz > 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW

The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule.

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

Operating condition of DUT: operating condition 1, see test report chapter 5.2 Modulation TCH_2C8A, fl-fm-fh, valid for all modulations

Test setup: see test report chapter 6.2

Test equipment: see test report chapter 6.1 - 6.2: C220, R001, U005 + POWER SPLITTER

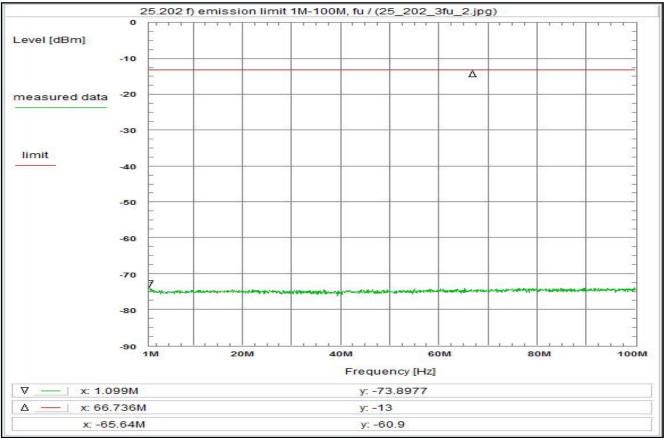
Remark:

Test result: Test passed

Environment condition: Mon 08/Jun/2020 13:51:11 Date & Time: Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 $^{\circ}\mathrm{C}$ Humidity: 55 % Voltage: 24 VDC Setup of measurement equipment: 1 MHz Start frequency: 100 MHz Stop frequency: Center frequency: MHz Frequency span: Resolution-BW: 99 MHz 10 kHz Video-BW: 100 Input attenuation: 0 dB Max-Hold Trace-Mode: Detector-Mode: Pos Peak Correction: Directional coupler 0.0 dB 0.0 dB 10.4 dBi Coaxial cable DUT-Antenna (on-axis) 0.0 dB 4.0 dB BW correction factor (10k -> 4k) Atten. between HPA and feedhorn + 0.0 dB (U005 + POWER SPLITTER) + 37.0 dB + 43.4 dB TOTAL CORRECTION: Carrier-on state / Carrier at the lower edge of the band (fu) Peak detector



Plot No. 13



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

Limit:
Limit according to 25.202 f):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW
The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule.

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

Operating condition of DUT:
operating condition of DUT:
operating condition 1, see test report chapter 5.2
Modulation TCH_2C8A, fl-fm-fh, valid for all modulations

Test setup:
see test report chapter 6.2

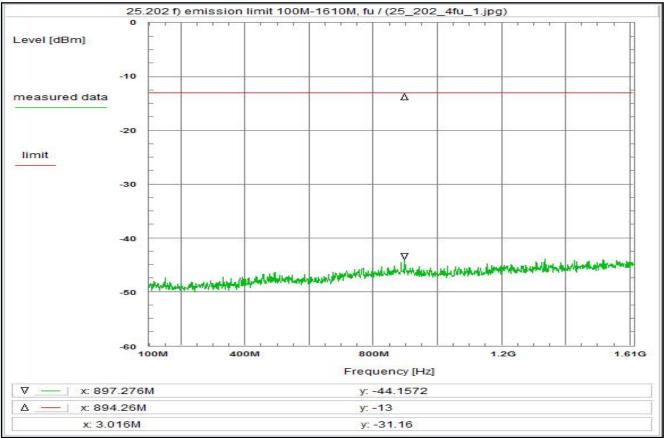
Test equipment:
see test report chapter 6.1 - 6.2: C220, R001, U005 + POWER SPLITTER

Test result: Test passed

Environment condition: Mon 08/Jun/2020 13:53:43 Date & Time: Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 $^{\circ}\mathrm{C}$ Humidity: 55 % Voltage: 24 VDC Setup of measurement equipment: 1 MHz Start frequency: 100 MHz Stop frequency: Center frequency: 50.5 MHz Frequency span: Resolution-BW: 99 MHz 10 kHz Video-BW: Input attenuation: 0 dB Trace-Mode: Max-Hold Detector-Mode: AVG Correction: + 0.0 dB + 0.0 dB + 10.4 dBi Directional coupler Coaxial cable DUT-Antenna (on-axis) + 0.0 dB - 4.0 dB BW correction factor (10k -> 4k) Atten. between HPA and feedhorn + 0.0 dB (U005 + POWER SPLITTER) + 37.0 dB + 43.4 dB TOTAL CORRECTION: Carrier-on state / Carrier at the lower edge of the band (fu) RMS detector



Plot No. 14

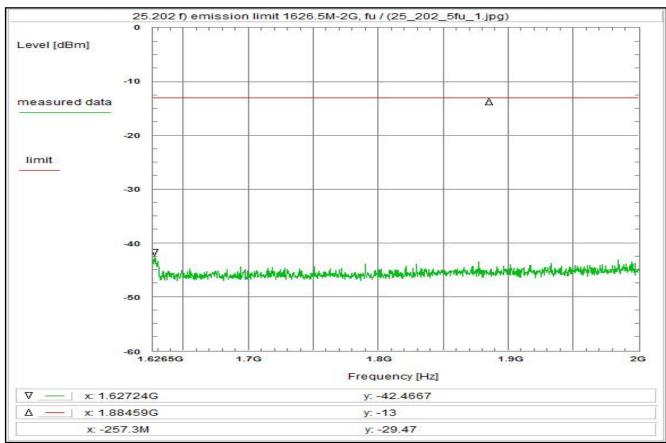


Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations Emission limitations Modulated rf-carrier at the lower edge of the band (fu) Limit: Limit according to 25.202 f): 50-100% of assigned bw: -25dBc/4kHz 100-250% of assigned bw: -35dBc/4kHz > 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule. Test results: see plot (an explicit table was not generated) Operating condition of DUT: operating condition 1, see test report chapter 5.2 Modulation TCH_2C8A, fl see test report chapter 6.2 <u>Test equipment:</u> see test report chapter 6.1 - 6.2: C220, R001, U005 + POWER SPLITTER Test result: Test passed

Environment condition: Mon 08/Jun/2020 13:14:58 Date & Time: Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 $^{\circ}\mathrm{C}$ Humidity: 55 Voltage: 24 VDC Setup of measurement equipment: 100 MHz Start frequency: Stop frequency: 1.61 GHz Center frequency: MHz Frequency span: Resolution-BW: 1.51 GHz kHz 10 Video-BW: 100 Input attenuation: 12 dB Max-Hold Trace-Mode: Detector-Mode: Pos Peak Correction: Directional coupler 0.0 dB 0.0 dB 10.4 dBi Coaxial cable DUT-Antenna (on-axis) 0.0 dB 4.0 dB BW correction factor (10k -> 4k) Atten. between HPA and feedhorn + 0.0 dB (U005 + POWER SPLITTER) 37.0 dB TOTAL CORRECTION: 43.4 dB Remarks: Carrier-on state / Carrier at the lower edge of the band (fu)



Plot No. 15

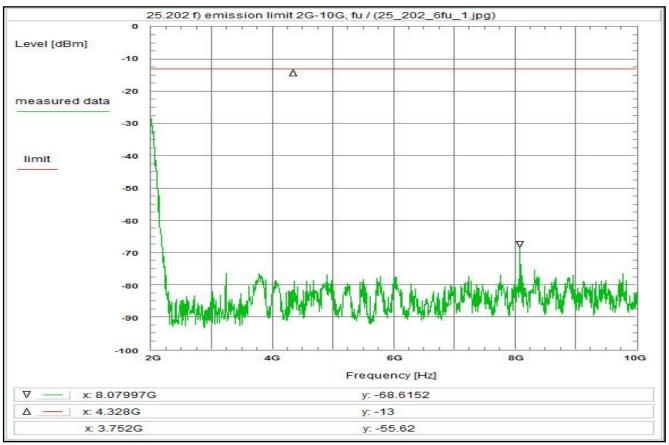


25.202 f) Frequencies, frequency tolerance and emission limitations Subclause: Emission limitations Modulated rf-carrier at the lower edge of the band (fu) Limit: Limit according to 25.202 f): 50-100% of assigned bw: -25dBc/4kHz 100-250% of assigned bw: -35dBc/4kHz > 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule. Test results: see plot (an explicit table was not generated) Operating condition of DUT: operating condition 1, see test report chapter 5.2 Modulation TCH_2C8A, fl see test report chapter 6.2 see test report chapter 6.1 - 6.2: C220, R001, U005 + POWER SPLITTER Test result: Test passed

Environment condition: Mon 08/Jun/2020 13:16:40 Date & Time: Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 $^{\circ}\mathrm{C}$ Humidity: 55 Voltage: 24 VDC Setup of measurement equipment: 1.6265 GHz Start frequency: GHz Stop frequency: Center frequency: 1.81325 Frequency span: Resolution-BW: 373.5 MHz kHz 10 Video-BW: Input attenuation: 12 dB Max-Hold Trace-Mode: Detector-Mode: Pos Peak Correction: Directional coupler 0.0 dB 0.0 dB Coaxial cable 10.4 dBi DUT-Antenna (on-axis) 0.0 dB 4.0 dB BW correction factor (10k -> 4k) Atten. between HPA and feedhorn + 0.0 dB (U005 + POWER SPLITTER) 37.7 dB + 44.1 dB TOTAL CORRECTION: Carrier-on state / Carrier at the lower edge of the band (fu)



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 (fu)

Limit:
Limit according to 25.202 f):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW
The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule.

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

Operating condition of DUT: operating condition 1, see test report chapter 5.2
Mode TCH_2C8A, fl

Test setup: see test report chapter 6.2

Test equipment: see test report chapter 6.1 - 6.2: C220, C220, FHPF, R001

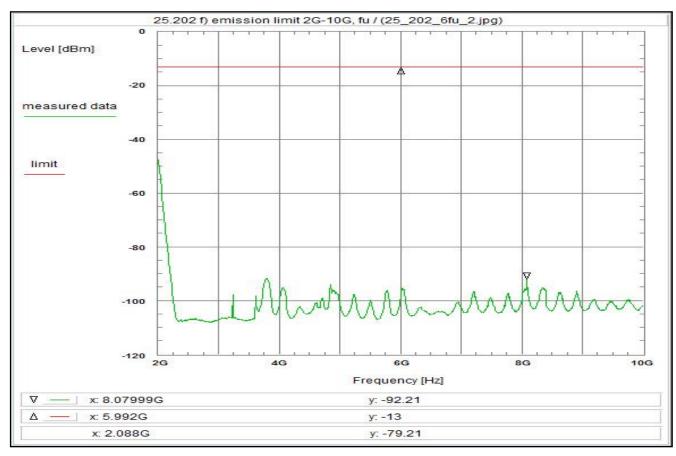
Remark:

Test result: Test passed

Environment condition: Wed 10/Jun/2020 15:27:59 Date & Time: Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 $^{\circ}\mathrm{C}$ Humidity: 55 % Voltage: 24 VDC Setup of measurement equipment: 2 GHz Start frequency: 10 GHz Stop frequency: Center frequency: Frequency span: Resolution-BW: 8 GHz kHz 100 1 MH: 0 dB Video-BW: Input attenuation: Max-Hold Trace-Mode: Detector-Mode: Pos Peak Correction: Directional coupler 0.0 dB Coaxial cable (C220) 1.7 dB DUT-Antenna (on-axis) 10.4 dBi Test antenna 0.0 BW correction factor (100k -> 4k) 14.0 dB Atten. between HPA and feedhorn + 0.0 dB (FHPF) 12.5 dB + 10.6 dB TOTAL CORRECTION: Carrier-on state / Carrier at the lower edge of the band (fu) Peak Detector Rather left the plot show the behaviour of the HPF



Plot No. 17



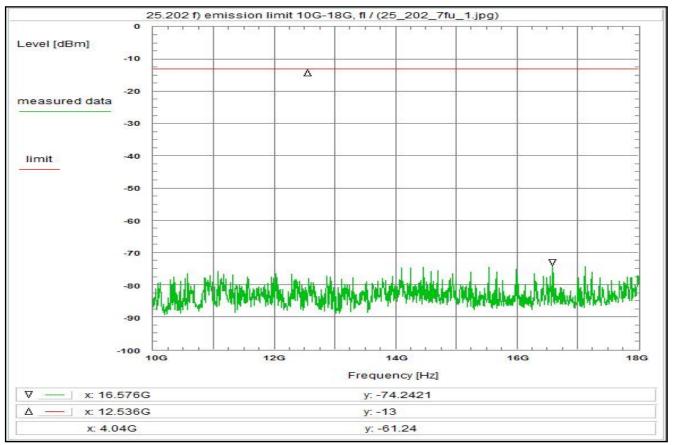
25.202 f) Frequencies, frequency tolerance and emission limitations Subclause: Emission limitations Modulated rf-carrier at the lower edge of the band (fu) Limit: Limit according to 25.202 f): 50-100% of assigned bw: -25dBc/4kHz 100-250% of assigned bw: -35dBc/4kHz > 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule. Test results: see plot (an explicit table was not generated) Operating condition of DUT: operating condition 1, see test report chapter 5.2 Mode TCH_2C8A, fl see test report chapter 6.2 <u>Test equipment:</u> see test report chapter 6.1 - 6.2: C220, C220, FHPF, R001 Remark:

Test result: Test passed

Environment condition: Date & Time: Wed 10/Jun/2020 15:31:10 Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 $^{\circ}\mathrm{C}$ Humidity: 55 Voltage: 24 VDC Setup of measurement equipment: GHz Start frequency: 10 GHz Stop frequency: Center frequency: Frequency span: Resolution-BW: 8 GHz 100 kHz Video-BW: 10 Input attenuation: 0 dB Trace-Mode: Max-Hold Detector-Mode: AVG Correction: Directional coupler 0.0 dB Coaxial cable (C220) 1.7 dB DUT-Antenna (on-axis) 10.4 dBi 0.0 dB 14.0 dB BW correction factor (100k -> 4k) Atten. between HPA and feedhorn + 0.0 dB (FHPF) 12.5 dB TOTAL CORRECTION: 10.6 dB Carrier-on state / Carrier at the lower edge of the band (fu) RMS Detector Rather left the plot show the behaviour of the HPF



Plot No. 18



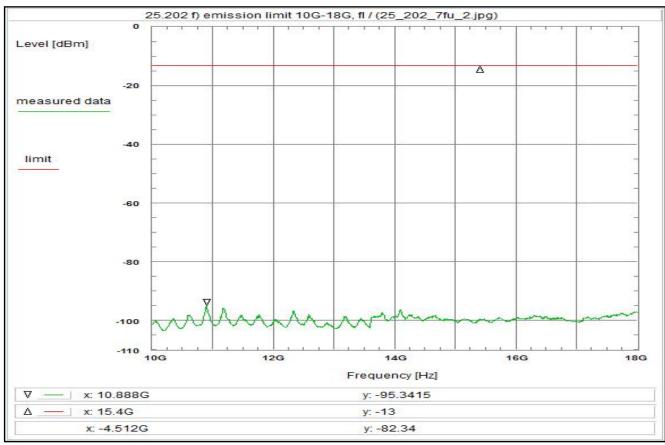
25.202 f) Frequencies, frequency tolerance and emission limitations Subclause: Emission limitations Modulated rf-carrier at the lower edge of the band (fl) Limit: Limit according to 25.202 f): 50-100% of assigned bw: -25dBc/4kHz 100-250% of assigned bw: -35dBc/4kHz > 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule. Test results: see plot (an explicit table was not generated) Operating condition of DUT: operating condition 1, see test report chapter 5.2 Mode TCH_2C8A, fl see test report chapter 6.2 <u>Test equipment:</u> see test report chapter 6.1 - 6.2: C220, C220, FHPF, R001 Remark:

Test result: Test passed

Environment condition: Wed 10/Jun/2020 16:08:43 Date & Time: Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 $^{\circ}\mathrm{C}$ Humidity: 55 % Voltage: 24 VDC Setup of measurement equipment: 10 GHz Start frequency: 18 GHz Stop frequency: Center frequency: Frequency span: Resolution-BW: 8 GHz 100 kHz 1 MH: 0 dB Video-BW: Input attenuation: Max-Hold Trace-Mode: Detector-Mode: Pos Peak Correction: Directional coupler 0.0 dB 2.7 dB 10.4 dBi Coaxial cable (C220) DUT-Antenna (on-axis) 14.0 dB BW correction factor (100k -> 4k) Atten. between HPA and feedhorn + 0.0 dB (FHPF) 12.5 dB + 11.6 dB TOTAL CORRECTION: Carrier-on state / Carrier at the lower edge of the band (fu) Peak Detector



Plot No. 19

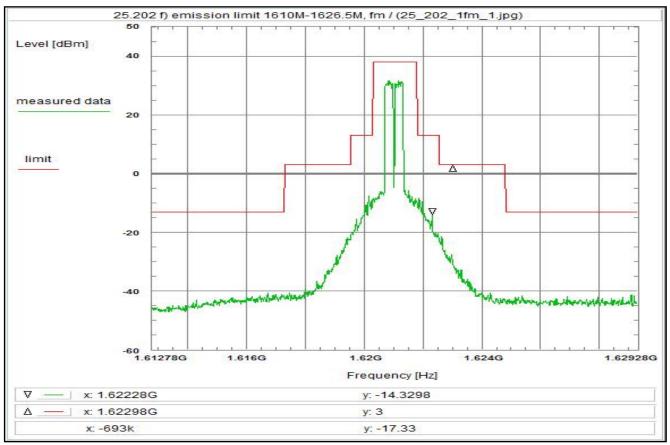


25.202 f) Frequencies, frequency tolerance and emission limitations Subclause: Emission limitations Modulated rf-carrier at the lower edge of the band (fl) Limit: Limit according to 25.202 f): 50-100% of assigned bw: -25dBc/4kHz 100-250% of assigned bw: -35dBc/4kHz > 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule. Test results: see plot (an explicit table was not generated) Operating condition of DUT: operating condition 1, see test report chapter 5.2 Mode TCH_2C8A, fl see test report chapter 6.2 <u>Test equipment:</u> see test report chapter 6.1 - 6.2: C220, C220, FHPF, R001 Remark: Test result: Test passed

Environment condition: Date & Time: Wed 10/Jun/2020 16:11:10 Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 $^{\circ}\mathrm{C}$ Humidity: 55 Voltage: 24 VDC Setup of measurement equipment: 10 GHz Start frequency: 18 14 Stop frequency: GHz Center frequency: Frequency span: Resolution-BW: 8 GHz 100 kHz Video-BW: 10 Input attenuation: 0 dB Trace-Mode: Max-Hold Detector-Mode: AVG Correction: Directional coupler 0.0 dB 2.7 dB 10.4 dBi Coaxial cable (C220) DUT-Antenna (on-axis) 0.0 dB 14.0 dB BW correction factor (100k -> 4k) Atten. between HPA and feedhorn 0.0 dB (FHPF) 12.5 dB TOTAL CORRECTION: 11.6 dB Carrier-on state / Carrier at the lower edge of the band (fu) RMS Detector



Plot No. 20



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

Limit:
Limit according to 25.202 f):
50-100% of assigned bw: -35dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW

The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule.

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

Operating condition of DUT: operating condition of DUT: operating condition 1, see test report chapter 5.2

Modulation TCH_2C8A, fm

Test setup: see test report chapter 6.2

Test equipment: see test report chapter 6.1 - 6.2: C220, R001, U005 + POWER SPLITTER

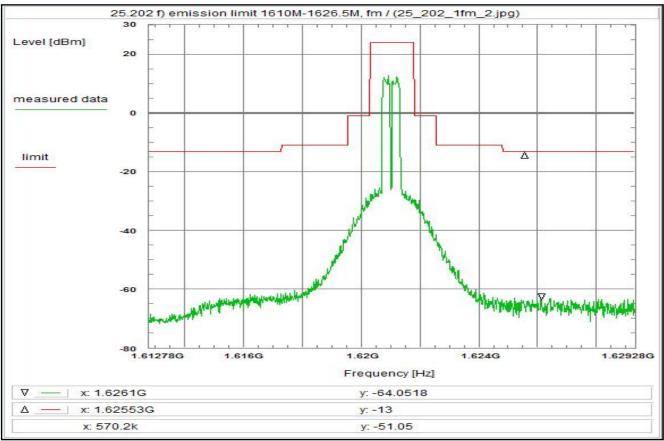
Remark:

Test result: Test passed

Environment condition: Mon 08/Jun/2020 14:03:58 Date & Time: Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 $^{\circ}\mathrm{C}$ Humidity: 55 % Voltage: 24 VDC Setup of measurement equipment: 1 61278 GHz Start frequency: 1.62928 GHz Stop frequency: Center frequency: 1.62103 GHz Frequency span: Resolution-BW: 16.5 MHz 10 kHz Video-BW: 100 Input attenuation: 12 dB Max-Hold Trace-Mode: Detector-Mode: Pos Peak Correction: Directional coupler 0.0 dB 0.0 dB 10.4 dBi Coaxial cable DUT-Antenna (on-axis) 0.0 dB 4.0 dB BW correction factor (10k -> 4k) Atten. between HPA and feedhorn + 0.0 dB (U005 + POWER SPLITTER) 37.5 dB TOTAL CORRECTION: 43.9 dB $\frac{Remarks:}{\text{Carrier-on state / Carrier in the middle of the band (fm)}}$ Peak detector



Plot No. 21



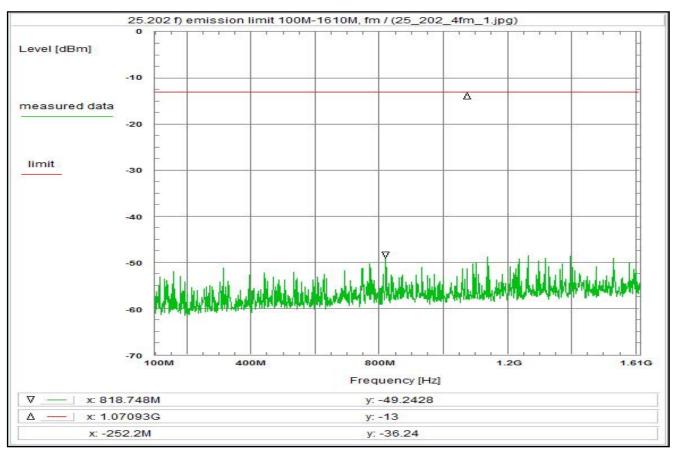
Environment condition:

Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations Emission limitations Modulated rf-carrier in the middle of the band (fm) Limit: Limit according to 25.202 f): 50-100% of assigned bw: -25dBc/4kHz 100-250% of assigned bw: -35dBc/4kHz > 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule. Test results: see plot (an explicit table was not generated) Operating condition of DUT: operating condition 1, see test report chapter 5.2 Modulation TCH_2C8A, fm see test report chapter 6.2 <u>Test equipment:</u> see test report chapter 6.1 - 6.2: C220, R001, U005 + POWER SPLITTER Test result: Test passed

Mon 08/Jun/2020 14:07:29 Date & Time: Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 $^{\circ}\mathrm{C}$ Humidity: 55 % Voltage: 24 VDC Setup of measurement equipment: 1 61278 GHz Start frequency: 1.62928 GHz Stop frequency: Center frequency: 1.62103 Frequency span: Resolution-BW: 16.5 MHz kHz 10 Video-BW: kHz Input attenuation: 12 dB Trace-Mode: Max-Hold Detector-Mode: AVG Correction: Directional coupler 0.0 dB 0.0 dB Coaxial cable 10.4 dBi DUT-Antenna (on-axis) 0.0 dB 4.0 dB BW correction factor (10k -> 4k) Atten. between HPA and feedhorn + 0.0 dB (U005 + POWER SPLITTER) 37.5 dB TOTAL CORRECTION: 43.9 dB $\frac{Remarks:}{Carrier\text{-on state / Carrier in the middle of the band (fm)}}$ RMS detector



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 according to 25.202 f):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -35dBc/4kHz
| The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with the above schedule.

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

Operating condition of DUT:
operating condition 1, see test report chapter 5.2
Modulation TCH_2C8A, fm

Test setup:
see test report chapter 6.2

Test equipment:
see test report chapter 6.1 - 6.2: C220, R001, U005 + POWER SPLITTER

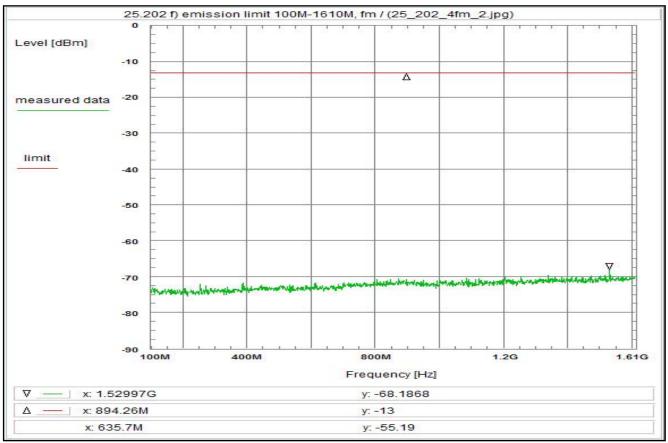
Remark:

Test result: Test passed

Environment condition: Mon 08/Jun/2020 14:10:38 Date & Time: Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 $^{\circ}\mathrm{C}$ Humidity: 55 % Voltage: 24 VDC Setup of measurement equipment: 100 MHz Start frequency: 1.61 GHz Stop frequency: Center frequency: MHz Frequency span: Resolution-BW: 1.51 GHz kHz 10 Video-BW: Input attenuation: 12 dB Clear Write Trace-Mode: Detector-Mode: Pos Peak Correction: Directional coupler 0.0 dB 0.0 dB 10.4 dBi Coaxial cable DUT-Antenna (on-axis) 0.0 dB 4.0 dB BW correction factor (10k -> 4k) Atten. between HPA and feedhorn + 0.0 dB (U005 + POWER SPLITTER) + 37.0 dB + 43.4 dB TOTAL CORRECTION: Carrier-on state / Carrier in the middle of the band (fm) Peak detector



Plot No. 23

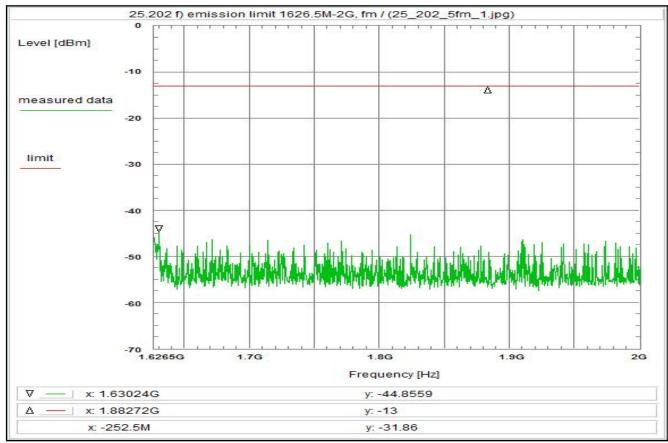


25.202 f) Frequencies, frequency tolerance and emission limitations Subclause: Emission limitations Modulated rf-carrier in the middle of the band (fm) Limit: Limit according to 25.202 f): 50-100% of assigned bw: -25dBc/4kHz 100-250% of assigned bw: -35dBc/4kHz > 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule. Test results: see plot (an explicit table was not generated) Operating condition of DUT: operating condition 1, see test report chapter 5.2 Modulation TCH_2C8A, fm see test report chapter 6.2 <u>Test equipment:</u> see test report chapter 6.1 - 6.2: C220, R001, U005 + POWER SPLITTER Test result: Test passed

Environment condition: Mon 08/Jun/2020 14:14:44 Date & Time: Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 $^{\circ}\mathrm{C}$ Humidity: 55 % Voltage: 24 VDC Setup of measurement equipment: 100 MHz Start frequency: 1.61 GHz Stop frequency: Center frequency: MHz Frequency span: Resolution-BW: 1.51 GHz kHz 10 Video-BW: Input attenuation: 12 dB Trace-Mode: Clear Write Detector-Mode: AVG Correction: Directional coupler 0.0 dB 0.0 dB Coaxial cable DUT-Antenna (on-axis) 10.4 dBi 0.0 dB 4.0 dB BW correction factor (10k -> 4k) Atten. between HPA and feedhorn + 0.0 dB (U005 + POWER SPLITTER) 37.0 dB TOTAL CORRECTION: 43.4 dB Remarks: Carrier-on state / Carrier in the middle of the band (fm) RMS detector



Plot No. 24

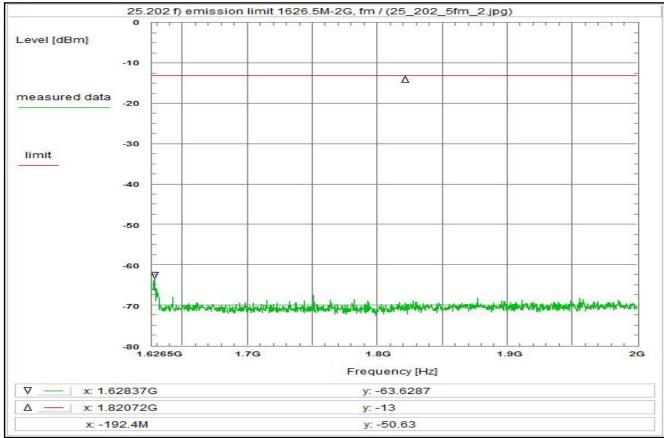


Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations Emission limitations Modulated rf-carrier in the middle of the band (fm) Limit: Limit according to 25.202 f): 50-100% of assigned bw: -25dBc/4kHz 100-250% of assigned bw: -35dBc/4kHz > 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule. Test results: see plot (an explicit table was not generated) Operating condition of DUT: operating condition 1, see test report chapter 5.2 Modulation TCH_2C8A, fm Test setup: see test report chapter 6.2 see test report chapter 6.1 - 6.2: C220, R001, U005 + POWER SPLITTER Remark: Test result: Test passed

Environment condition: Mon 08/Jun/2020 14:18:09 Date & Time: Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 $^{\circ}\mathrm{C}$ Humidity: 55 % Voltage: 24 VDC Setup of measurement equipment: 1.6265 GHz Start frequency: GHz Stop frequency: Center frequency: 1.81325 Frequency span: Resolution-BW: 373.5 MHz kHz 10 Video-BW: Input attenuation: 12 dB Max-Hold Trace-Mode: Detector-Mode: Pos Peak Correction: + 0.0 dB + 0.0 dB Directional coupler Coaxial cable 10.4 dBi DUT-Antenna (on-axis) + 0.0 dB - 4.0 dB BW correction factor (10k -> 4k) Atten. between HPA and feedhorn + 0.0 dB (U005 + POWER SPLITTER) TOTAL CORRECTION: + 37.7 dB + 44.1 dB Carrier-on state / Carrier in the middle of the band (fm) Peak detector



Plot No. 25



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 according to 25.202 f): 50.100% of assigned bw: -25dBc/4kHz 100-250% of assigned bw: -35dBc/4kHz > 2509 of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW

The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule.

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

Operating condition of DUT: operating condition 1, see test report chapter 5.2 Modulation TCH_2C8A, fm

Test setup: see lest report chapter 6.2

Test equipment: see test report chapter 6.1 - 6.2: C220, R001, U005 + POWER SPLITTER

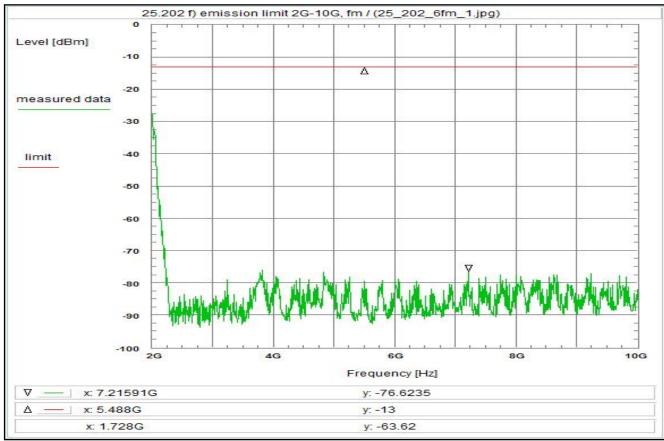
Remark:

Test result: Test passed

Mon 08/Jun/2020 14:20:29 Date & Time: Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 $^{\circ}\mathrm{C}$ Humidity: 55 % Voltage: 24 VDC Setup of measurement equipment: 1.6265 GHz Start frequency: GHz Stop frequency: Center frequency: 1.81325 Frequency span: Resolution-BW: 373.5 MHz kHz 10 Video-BW: Input attenuation: 12 dB Trace-Mode: Max-Hold Detector-Mode: AVG Correction: Directional coupler 0.0 dB 0.0 dB Coaxial cable 10.4 dBi DUT-Antenna (on-axis) + 0.0 dB - 4.0 dB BW correction factor (10k -> 4k) Atten. between HPA and feedhorn + 0.0 dB (U005 + POWER SPLITTER) + 37.7 dB + 44.1 dB TOTAL CORRECTION: Carrier-on state / Carrier in the middle of the band (fm) RMS detector



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 according to 25.202 f):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW
The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule.

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

Operating condition of DUT:
operating condition 1, see test report chapter 5.2
Mode TCH_2C8A, fm

Test setup:
see test report chapter 6.2

Test equipment:
see test report chapter 6.1 - 6.2: C220, C220, FHPF, R001

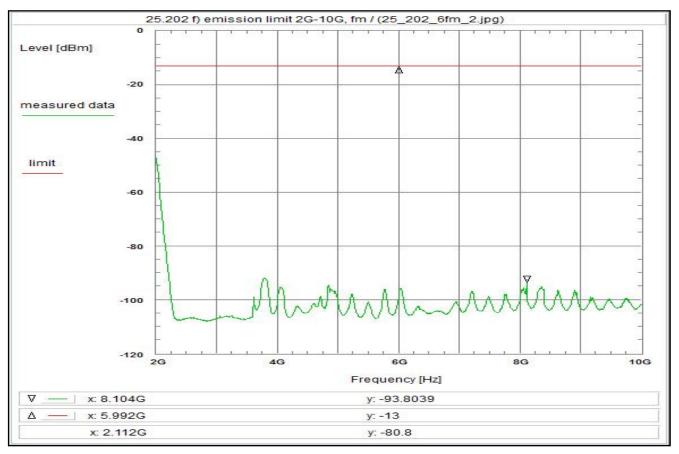
Remark:

Test result: Test passed

Environment condition: Wed 10/Jun/2020 15:37:25 Date & Time: Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 $^{\circ}\mathrm{C}$ Humidity: 55 % Voltage: 24 VDC Setup of measurement equipment: 2 GHz Start frequency: 10 GHz Stop frequency: Center frequency: Frequency span: Resolution-BW: 8 GHz kHz 100 1 MH: 0 dB Video-BW: MHz Input attenuation: Max-Hold Trace-Mode: Detector-Mode: Pos Peak Correction: Directional coupler 0.0 dB Coaxial cable (C220) 1.7 dB DUT-Antenna (on-axis) 10.4 dBi Test antenna 0.0 BW correction factor (100k -> 4k) 14.0 dB Atten. between HPA and feedhorn + 0.0 dB (FHPF) 12.5 dB TOTAL CORRECTION: 10.6 dB Carrier-on state / Carrier in the middle of the band (fm) Peak Detector Rather left the plot show the behaviour of the HPF



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 according to 25.202 f):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule. Test results: see plot (an explicit table was not generated) Operating condition of DUT: operating condition 1, see test report chapter 5.2 Mode TCH_2C8A, fm Test setup: see test report chapter 6.2

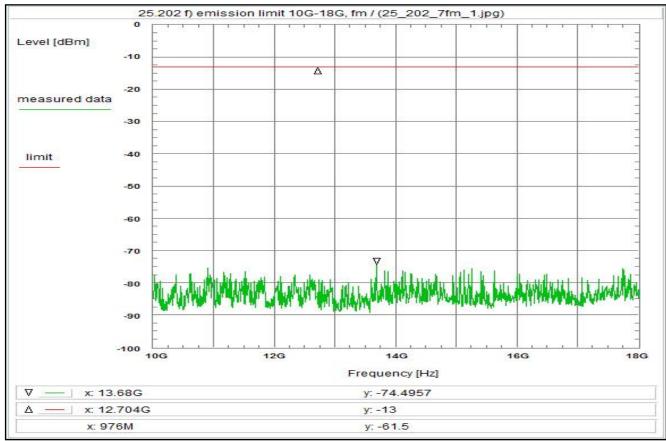
<u>Test equipment:</u> see test report chapter 6.1 - 6.2: C220, C220, FHPF, R001

Remark:

Test result: Test passed



Plot No. 28

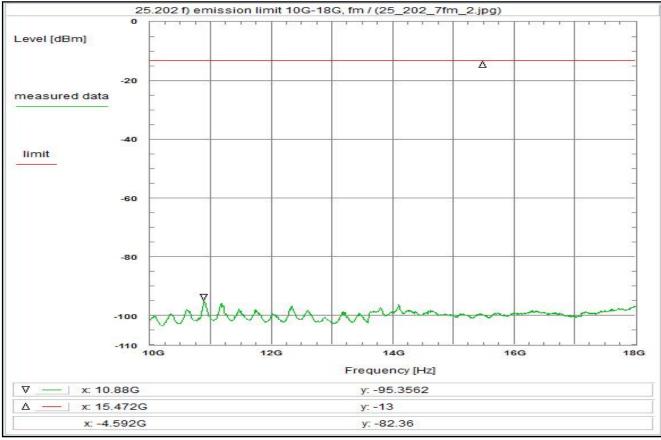


Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations Emission limitations Modulated rf-carrier in the middle of the band (fm) Limit: Limit according to 25.202 f): 50-100% of assigned bw: -25dBc/4kHz 100-250% of assigned bw: -35dBc/4kHz > 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule. Test results: see plot (an explicit table was not generated) Operating condition of DUT: operating condition 1, see test report chapter 5.2 Mode TCH_2C8A, fm see test report chapter 6.2 <u>Test equipment:</u> see test report chapter 6.1 - 6.2: C220, C220, FHPF, R001 Remark: Test result: Test passed

Environment condition: Wed 10/Jun/2020 16:01:59 Date & Time: Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS $22\ ^{\circ}\text{C}$ Humidity: 55 % Voltage: 24 VDC Setup of measurement equipment: 10 GHz Start frequency: 18 GHz Stop frequency: Center frequency: Frequency span: Resolution-BW: 8 GHz 100 kHz 1 MH: 0 dB Video-BW: Input attenuation: Max-Hold Trace-Mode: Detector-Mode: Pos Peak Correction: Directional coupler 0.0 dB + 2.7 dB + 10.4 dBi Coaxial cable (C220) DUT-Antenna (on-axis) Test antenna BW correction factor (100k -> 4k) 14.0 dB Atten. between HPA and feedhorn + 0.0 dB (FHPF) 12.5 dB TOTAL CORRECTION: 11.6 dB Carrier-on state / Carrier in the middle of the band (fm) Peak Detector



Plot No. 29

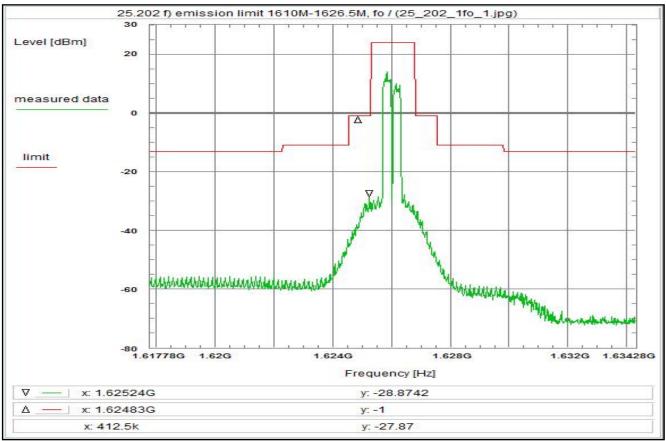


25.202 f) Frequencies, frequency tolerance and emission limitations Subclause: Emission limitations Modulated rf-carrier in the middle of the band (fm) Limit: Limit according to 25.202 f): 50-100% of assigned bw: -25dBc/4kHz 100-250% of assigned bw: -35dBc/4kHz > 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule. Test results: see plot (an explicit table was not generated) Operating condition of DUT: operating condition 1, see test report chapter 5.2 Mode TCH_2C8A, fm see test report chapter 6.2 <u>Test equipment:</u> see test report chapter 6.1 - 6.2: C220, C220, FHPF, R001 Remark: Test result: Test passed

Environment condition: Date & Time: Wed 10/Jun/2020 16:04:36 Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 $^{\circ}\mathrm{C}$ Humidity: 55 Voltage: 24 VDC Setup of measurement equipment: 10 GHz Start frequency: 18 14 Stop frequency: GHz Center frequency: Frequency span: Resolution-BW: 8 GHz 100 kHz Video-BW: 10 Input attenuation: 0 dB Trace-Mode: Max-Hold Detector-Mode: AVG Correction: Directional coupler 0.0 dB 2.7 dB 10.4 dBi Coaxial cable (C220) DUT-Antenna (on-axis) 0.0 dB 14.0 dB BW correction factor (100k -> 4k) Atten. between HPA and feedhorn 0.0 dB (FHPF) 12.5 dB TOTAL CORRECTION: 11.6 dB Carrier-on state / Carrier in the middle of the band (fm) RMS Detector



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 according to 25.202 f):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW
The mean power of emissions shall be attenuated
below the mean output power of the transmitter
in accordance with the above schedule.

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

Operating condition of DUT:
operating condition 1, see test report chapter 5.2
Modulation TCH_2C8A, fh

Test setup:
see test report chapter 6.2

Test equipment:
see test report chapter 6.1 - 6.2: C220, R001, U005 + POWER SPLITTER

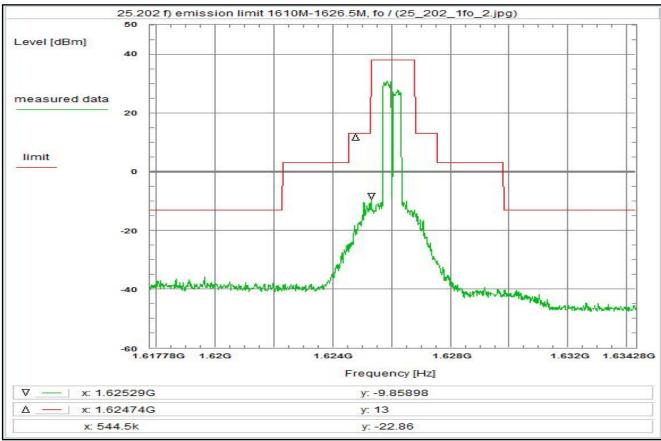
Remark:

Test result: Test passed

Environment condition: Mon 08/Jun/2020 15:25:46 Date & Time: Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 $^{\circ}\mathrm{C}$ Humidity: 55 % Voltage: 24 VDC Setup of measurement equipment: 1 61778 GHz Start frequency: 1.63428 GHz Stop frequency: Center frequency: 1.62603 Frequency span: Resolution-BW: 16.5 MHz kHz 10 Video-BW: kHz Input attenuation: 12 dB Trace-Mode: Max-Hold Detector-Mode: AVG Correction: Directional coupler 0.0 dB 0.0 dB Coaxial cable 10.4 dBi DUT-Antenna (on-axis) 0.0 dB 4.0 dB BW correction factor (10k -> 4k) Atten. between HPA and feedhorn + 0.0 dB (U005 + POWER SPLITTER) 37.6 dB + 44.0 dB TOTAL CORRECTION: Carrier-on state / Carrier at the upper edge of the band (fo) RMS detector



Plot No. 31

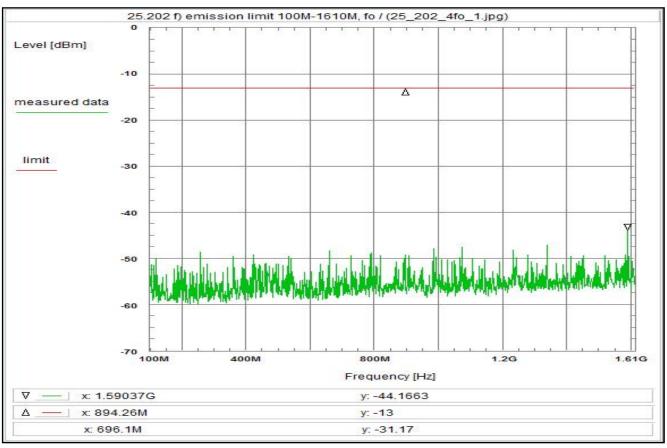


Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations Modulated rf-carrier at the upper edge of the band (fo) Limit: Limit according to 25.202 f): 50-100% of assigned bw: -25dBc/4kHz 100-250% of assigned bw: -35dBc/4kHz > 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule. Test results: see plot (an explicit table was not generated) Operating condition of DUT: operating condition 1, see test report chapter 5.2 Modulation TCH_2C8A, fh see test report chapter 6.2 <u>Test equipment:</u> see test report chapter 6.1 - 6.2: C220, R001 Remark: Test result: Test passed

Environment condition: Date & Time: Mon 08/Jun/2020 15:29:30 Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 $^{\circ}\mathrm{C}$ Humidity: 55 % Voltage: 24 VDC Setup of measurement equipment: 1 61778 GHz Start frequency: 1.63428 GHz Stop frequency: Center frequency: 1.62603 Frequency span: Resolution-BW: 16.5 MHz 10 kHz Video-BW: 100 Input attenuation: 12 dB Max-Hold Trace-Mode: Detector-Mode: Pos Peak Correction: Directional coupler 0.0 dB 0.0 dB 10.4 dBi Coaxial cable DUT-Antenna (on-axis) 0.0 dB 4.0 dB BW correction factor (10k -> 4k) Atten. between HPA and feedhorn + 0.0 dB (U005 + POWER SPLITTER) 37.6 dB + 44.0 dB TOTAL CORRECTION: Remarks:
Carrier-on state / Carrier at the upper edge of the band (fo) RMS detector



Plot No. 32

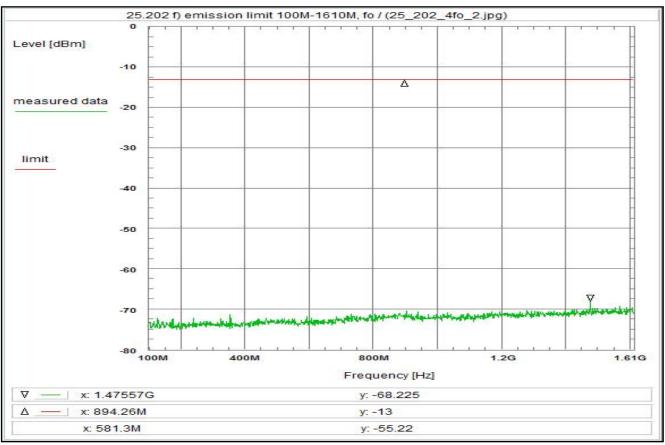


25.202 f) Frequencies, frequency tolerance and emission limitations Subclause: Emission limitations Modulated rf-carrier at the upper edge of the band (fh) Limit: Limit according to 25.202 f): 50-100% of assigned bw: -25dBc/4kHz 100-250% of assigned bw: -35dBc/4kHz > 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule. Test results: see plot (an explicit table was not generated) Operating condition of DUT: operating condition 1, see test report chapter 5.2 Modulation TCH_2C8A, fh see test report chapter 6.2 see test report chapter 6.1 - 6.2: C220, R001, U005 + POWER SPLITTER Test result: Test passed

Environment condition: Mon 08/Jun/2020 15:32:17 Date & Time: Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 $^{\circ}\mathrm{C}$ Humidity: 55 % Voltage: 24 VDC Setup of measurement equipment: 100 MHz Start frequency: 1.61 GHz Stop frequency: Center frequency: MHz Frequency span: Resolution-BW: 1.51 GHz kHz 10 Video-BW: 100 Input attenuation: 12 dB Max-Hold Trace-Mode: Detector-Mode: Pos Peak Correction: Directional coupler 0.0 dB 0.0 dB 10.4 dBi Coaxial cable DUT-Antenna (on-axis) 0.0 dB 4.0 dB BW correction factor (10k -> 4k) Atten. between HPA and feedhorn + 0.0 dB (U005 + POWER SPLITTER) 37.0 dB + 43.4 dB TOTAL CORRECTION: Carrier-on state / Carrier at the upper edge of the band (fo) Peak detector



Plot No. 33

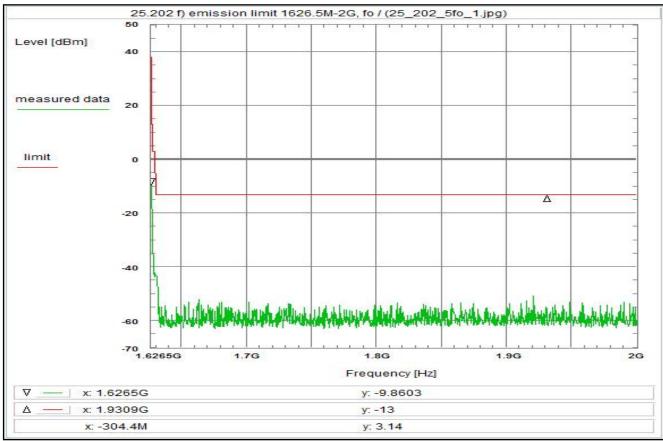


25.202 f) Frequencies, frequency tolerance and emission limitations Subclause: Emission limitations Modulated rf-carrier at the upper edge of the band (fh) Limit: Limit according to 25.202 f): 50-100% of assigned bw: -25dBc/4kHz 100-250% of assigned bw: -35dBc/4kHz > 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule. Test results: see plot (an explicit table was not generated) Operating condition of DUT: operating condition 1, see test report chapter 5.2 Modulation TCH_2C8A, fh see test report chapter 6.2 <u>Test equipment:</u> see test report chapter 6.1 - 6.2: C220, R001, U005 + POWER SPLITTER Test result: Test passed

Environment condition: Mon 08/Jun/2020 15:35:40 Date & Time: Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 $^{\circ}\mathrm{C}$ Humidity: 55 % Voltage: 24 VDC Setup of measurement equipment: 100 MHz Start frequency: 1.61 GHz Stop frequency: Center frequency: MHz Frequency span: Resolution-BW: 1.51 GHz kHz 10 Video-BW: Input attenuation: 12 dB Trace-Mode: Max-Hold Detector-Mode: AVG Correction: Directional coupler 0.0 dB 0.0 dB 10.4 dBi Coaxial cable DUT-Antenna (on-axis) 0.0 dB 4.0 dB BW correction factor (10k -> 4k) Atten. between HPA and feedhorn + 0.0 dB (U005 + POWER SPLITTER) 37.0 dB + 43.4 dB TOTAL CORRECTION: Carrier-on state / Carrier at the upper edge of the band (fo) RMS detector



Plot No. 34

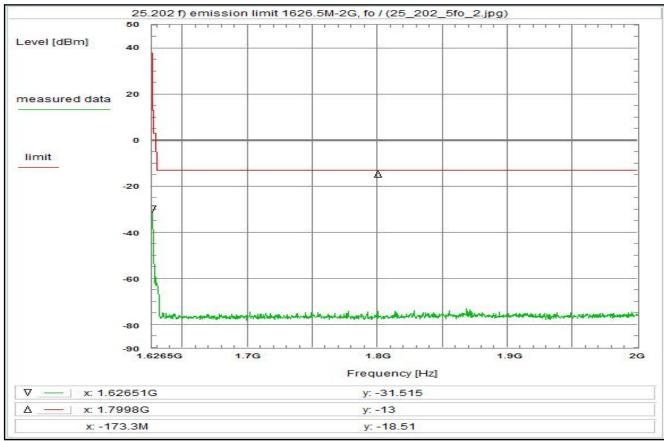


Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations Emission limitations Modulated rf-carrier at the upper edge of the band (fo) Limit: Limit according to 25.202 f): 50-100% of assigned bw: -25dBc/4kHz 100-250% of assigned bw: -35dBc/4kHz > 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule. Test results: see plot (an explicit table was not generated) Operating condition of DUT: operating condition 1, see test report chapter 5.2 Modulation TCH_2C8A, fh see test report chapter 6.2 see test report chapter 6.1 - 6.2: C220, R001, U005 + POWER SPLITTER Test result: Test passed

Environment condition: Mon 08/Jun/2020 15:41:52 Date & Time: Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 $^{\circ}\mathrm{C}$ Humidity: 55 Voltage: 24 VDC Setup of measurement equipment: 1.6265 GHz Start frequency: GHz Stop frequency: Center frequency: 1.81325 Frequency span: Resolution-BW: 373.5 MHz kHz 10 Video-BW: 100 Input attenuation: 6 dB Max-Hold Trace-Mode: Detector-Mode: Pos Peak Correction: Directional coupler 0.0 dB 0.0 dB Coaxial cable DUT-Antenna (on-axis) 10.4 dBi 0.0 dB 4.0 dB BW correction factor (10k -> 4k) Atten. between HPA and feedhorn + 0.0 dB (U005 + POWER SPLITTER) 37.7 dB + 44.1 dB TOTAL CORRECTION: Carrier-on state / Carrier at the upper edge of the band (fo) Peak detector Marker shows the wanted signal



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 according to 25.202 f):
50-100% of assigned bw: -25dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -310log(Pmax)dBc/4kHz = -43 dBW
The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule.

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

Operating condition of DUT:
operating condition of DUT:
operating condition 1, see test report chapter 5.2
Modulation TCH_2C8A, fh

Test setup:
see test report chapter 6.2

Test equipment:
see test report chapter 6.1 - 6.2: C220, R001, U005 + POWER SPLITTER

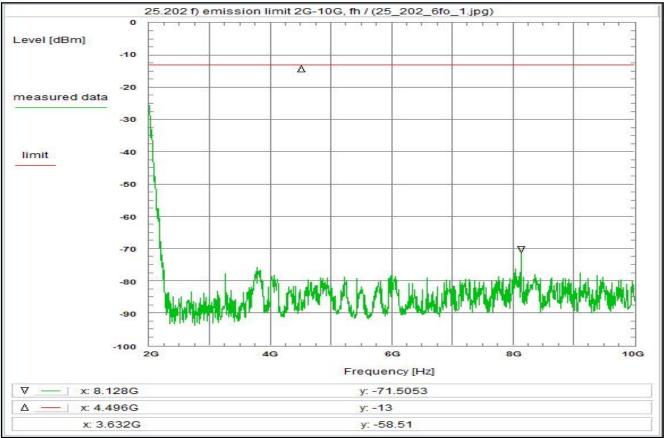
Remark:

Test result: Test passed

Environment condition: Mon 08/Jun/2020 15:45:11 Date & Time: Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 °C Humidity: 55 % Voltage: 24 VDC Setup of measurement equipment: 1.6265 GHz Start frequency: GHz Stop frequency: Center frequency: 1.81325 Frequency span: Resolution-BW: 373.5 MHz kHz 10 Video-BW: Input attenuation: 6 dB Trace-Mode: Max-Hold Detector-Mode: AVG Correction: + 0.0 dB + 0.0 dB Directional coupler Coaxial cable 10.4 dBi DUT-Antenna (on-axis) + 0.0 dB - 4.0 dB BW correction factor (10k -> 4k) Atten. between HPA and feedhom + 0.0 dB (U005 + POWER SPLITTER) + 37.7 dB + 44.1 dB TOTAL CORRECTION: Carrier-on state / Carrier at the upper edge of the band (fo) RMS detector Marker shows the wanted signal



Plot No. 36



Subclause: 25.202 f) Frequencies, frequency tolerance and emission limitations Emission limitations Modulated rf-carrier at the upper edge of the band (fh) Limit: Limit according to 25.202 f): 50-100% of assigned bw: -25dBc/4kHz 100-250% of assigned bw: -35dBc/4kHz > 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule. Test results: see plot (an explicit table was not generated) Operating condition of DUT: operating condition 1, see test report chapter 5.2 Mode TCH_2C8A, fh see test report chapter 6.2 <u>Test equipment:</u> see test report chapter 6.1 - 6.2: C220, C220, FHPF, R001 Remark: Test result: Test passed

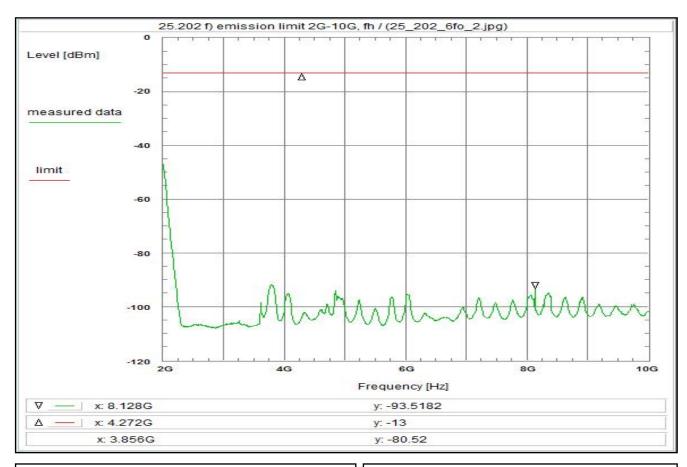
Environment condition: Wed 10/Jun/2020 15:45:50 Date & Time: Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 $^{\circ}\mathrm{C}$ Humidity: 55 % Voltage: 24 VDC Setup of measurement equipment: 2 GHz Start frequency: 10 GHz Stop frequency: Center frequency: Frequency span: Resolution-BW: 8 GHz kHz 100 1 MH: 0 dB Video-BW: Input attenuation: Max-Hold Trace-Mode: Detector-Mode: Pos Peak Correction: Directional coupler 0.0 dB Coaxial cable (C220) 1.7 dB DUT-Antenna (on-axis) 10.4 dBi 0.0 BW correction factor (100k -> 4k) 14.0 dB Atten. between HPA and feedhorn + 0.0 dB (FHPF) 12.5 dB + 10.6 dB TOTAL CORRECTION: Carrier-on state / Carrier at the upper edge of the band (fo) Peak Detector Rather left the plot show the behaviour of the HPF



Plot No. 37

Remark:

Test result: Test passed



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

Limit:
Limit according to 25.202 f):
50-100% of assigned bw: -35dBc/4kHz
100-250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -35dBc/4kHz
> 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW
The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule.

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

Operating condition of DUT:
operating condition of DUT:
operating condition 1, see test report chapter 5.2
Mode TCH_2C8A, fh

Test setup:
see test report chapter 6.2

Test equipment:
see test report chapter 6.1 - 6.2: C220, C220, FHPF, R001

Humidity: 55 Voltage: 24 VDC Setup of measurement equipment: GHz Start frequency: 10 GHz Stop frequency: Center frequency: Frequency span: Resolution-BW: 8 GHz 100 kHz Video-BW: 10 Input attenuation: 0 dB Trace-Mode: Max-Hold Detector-Mode: AVG Correction: Directional coupler 0.0 dB Coaxial cable (C220) 1.7 dB DUT-Antenna (on-axis) 10.4 dBi 0.0 dB 14.0 dB BW correction factor (100k -> 4k) Atten. between HPA and feedhorn 0.0 dB (FHPF) 12.5 dB TOTAL CORRECTION: 10.6 dB Carrier-on state / Carrier at the upper edge of the band (fo) RMS Detector Rather left the plot show the behaviour of the HPF

Wed 10/Jun/2020 15:51:26

CTC advanced GmbH, Laboratory RC-SYS 22 $^{\circ}\mathrm{C}$

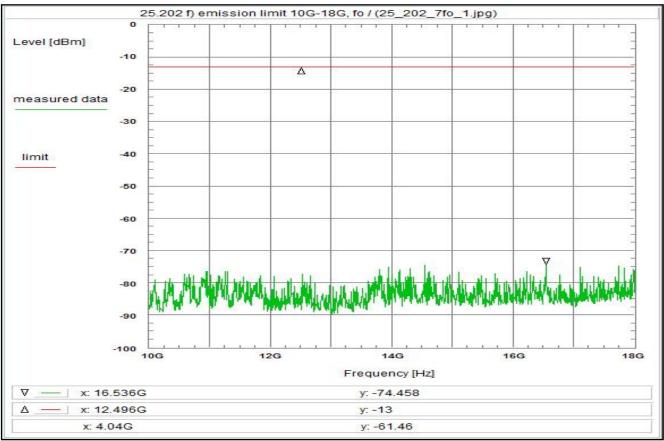
Environment condition:

Date & Time:

Location: Temperature:



Plot No. 38

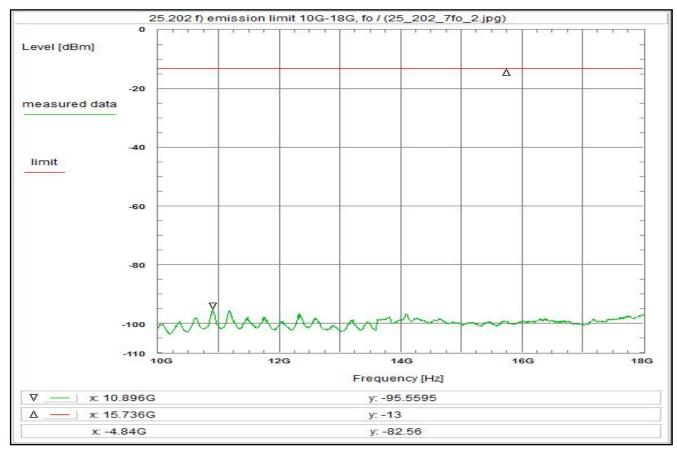


25.202 f) Frequencies, frequency tolerance and emission limitations Subclause: Emission limitations Modulated rf-carrier at the upper edge of the band (fo) Limit: Limit according to 25.202 f): 50-100% of assigned bw: -25dBc/4kHz 100-250% of assigned bw: -35dBc/4kHz > 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule. Test results: see plot (an explicit table was not generated) Operating condition of DUT: operating condition 1, see test report chapter 5.2 Mode TCH_2C8A, fh see test report chapter 6.2 <u>Test equipment:</u> see test report chapter 6.1 - 6.2: C220, C220, FHPF, R001 Remark: Test result: Test passed

Environment condition: Wed 10/Jun/2020 15:55:20 Date & Time: Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 $^{\circ}\mathrm{C}$ Humidity: 55 % Voltage: 24 VDC Setup of measurement equipment: 10 GHz Start frequency: 18 GHz Stop frequency: Center frequency: Frequency span: Resolution-BW: 8 GHz 100 kHz 1 MH: 0 dB Video-BW: Input attenuation: Max-Hold Trace-Mode: Detector-Mode: Pos Peak Correction: Directional coupler 0.0 dB 2.7 dB 10.4 dBi Coaxial cable (C220) DUT-Antenna (on-axis) 14.0 dB BW correction factor (100k -> 4k) Atten. between HPA and feedhorn + 0.0 dB (FHPF) 12.5 dB + 11.6 dB TOTAL CORRECTION: Carrier-on state / Carrier at the upper edge of the band (fo) Peak Detector



Plot No. 39



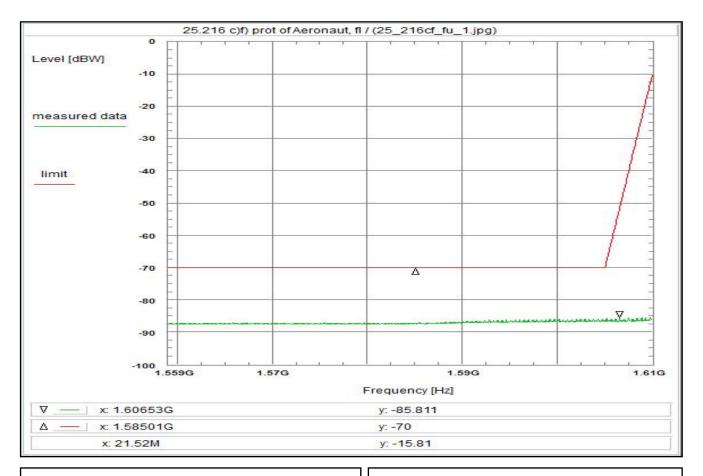
25.202 f) Frequencies, frequency tolerance and emission limitations Subclause: Emission limitations Modulated rf-carrier at the upper edge of the band (fo) Limit: Limit according to 25.202 f): 50-100% of assigned bw: -25dBc/4kHz 100-250% of assigned bw: -35dBc/4kHz > 250% of assigned bw: -43+10log(Pmax)dBc/4kHz = -43 dBW The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the above schedule. Test results: see plot (an explicit table was not generated) Operating condition of DUT: operating condition 1, see test report chapter 5.2 Mode TCH_2C8A, fh see test report chapter 6.2 <u>Test equipment:</u> see test report chapter 6.1 - 6.2: C220, C220, FHPF, R001 Remark:

Test result: Test passed

Environment condition: Date & Time: Wed 10/Jun/2020 15:58:21 Location: Temperature: CTC advanced GmbH, Laboratory RC-SYS 22 $^{\circ}\mathrm{C}$ Humidity: 55 Voltage: 24 VDC Setup of measurement equipment: 10 GHz Start frequency: 18 14 Stop frequency: GHz Center frequency: Frequency span: Resolution-BW: 8 GHz 100 kHz Video-BW: 10 Input attenuation: 0 dB Trace-Mode: Max-Hold Detector-Mode: AVG Correction: Directional coupler 0.0 dB 2.7 dB 10.4 dBi Coaxial cable (C220) DUT-Antenna (on-axis) 0.0 dB 14.0 dB BW correction factor (100k -> 4k) Atten. between HPA and feedhorn 0.0 dB (FHPF) 12.5 dB TOTAL CORRECTION: 11.6 dB Carrier-on state / Carrier at the upper edge of the band (fo) RMS Detector



Plot No. 40



Subclause: 25.216 g) Limits on emissions from mobile earth stations for protection of aeronautical radionavigation-satellite service

Carrier-on state, modulated carrier at the lower edge of the band (fu) Conducted measurement at the antenna-connector

Limit:

Limit according to 25.216 g): 1559.0 - 1605.0MHz: -70 1605.0 - 1610MHz: -70

-70dBW/1MHz -70 to -10dBW/1MHz)linear interpolated) The EIRP, averaged over any two-millisecond active transmission interval from the MESs in the carrier-on state shall not exceed the limits above.

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see test report chapter 5.2 Modulation TCH_2C8A, fl

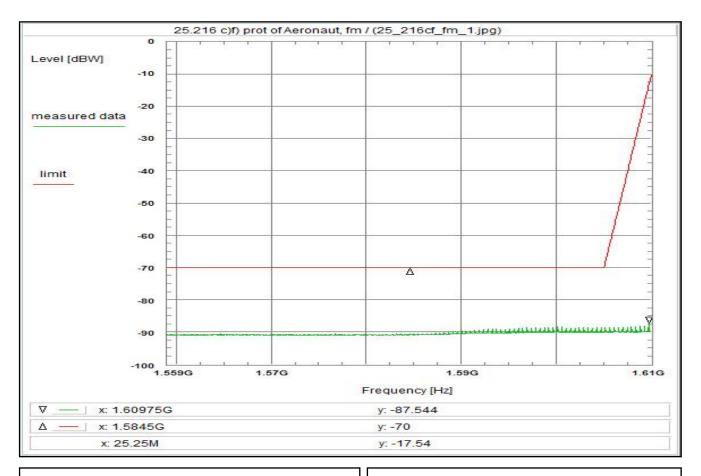
Test setup: see test report chapter 6.2

<u>Test equipment:</u> see test report chapter 6.1 - 6.2: C220, R001, U005 + POWER SPLITTER

Environment condition: Date & Time: Location: Temperature: Humidity: Voltage:	Mon 08/Jun/202 CTC advanced 0 22 55 24	GmbH, °C %	3:21 Laboratory RC-SYS
Setup of measurement ed Start frequency: Stop frequency: Center frequency: Frequency span: Resolution-BW: Video-BW: Input attenuation: Trace-Mode: Detector-Mode:	1.559 1.61 1.5845 51 1	GHz GHz MHz	
Correction: Directional coupler Coaxial cable DUT-Antenna (on-axis) Test antenna BW correction factor Atten. between HPA and (U005 + POWER SPLITT TOTAL CORRECTION: Remarks: Carrier-on state / Carrier Measurement with 1 MHz For EIRP calculation: 'worst-case' = maximum RMS detector	feedhorn + ER) + + at the lower edge	0.0 10.4 0.0 0.0 0.0 37.5 47.9	dB dBi dB dB dB dB dB



Plot No. 41



25.216 g) Limits on emissions from mobile earth stations for protection of Subclause: aeronautical radionavigation-satellite service

Carrier-on state, modulated carrier in the middle of the band (fm) Conducted measurement at the antenna-connector

Limit:

Limit according to 25.216 g):

1559.0 - 1605.0MHz: 1605.0 - 1610MHz:

-70dBW/1MHz -70 to -10dBW/1MHz)linear interpolated) The EIRP, averaged over any two-millisecond active transmission interval from the MESs in the carrier-on state shall not exceed the limits above.

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see test report chapter 5.2 Modulation TCH_2C8A, fm

Test setup: see test report chapter 6.2:

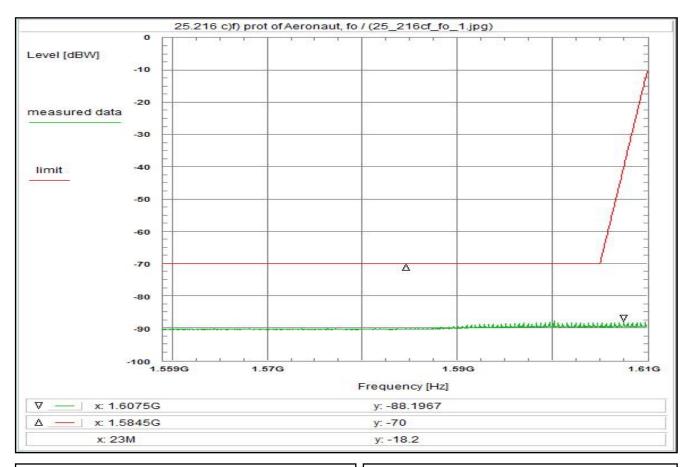
<u>Test equipment:</u> see test report chapter 6.1 - 6.2: C220, R001, U005 + POWER SPLITTER

Remark:

Environment condition:				
Date & Time:	Mon 08/Jun/202	0 16:04	1:57	
Location:	CTC advanced GmbH, Laboratory RC-SYS			
Temperature:	22	°C	•	
Humidity:	55	%		
Voltage:	24	VDC		
0.1 (
Setup of measurement equ		011		
Start frequency:	1.559			
Stop frequency:		GHz		
Center frequency:	1.5845			
Frequency span:		MHz		
Resolution-BW:		MHz		
Video-BW:		kHz		
Input attenuation:	0	dB		
Trace-Mode:	Max-Hold			
Detector-Mode:	AVG			
Correction:				
Directional coupler	+	0.0	dB	
Coaxial cable	+		dB	
DUT-Antenna (on-axis)		10.4		
Test antenna	+		dB	
BW correction factor				
Atten, between HPA and fe		0.0	dB	
(U005 + POWER SPLITTE		37.5		
TOTAL CORRECTION:	+			
TOTAL CONNECTION.	,	41.3	db	
Remarks:				
Carrier-on state / Carrier in	the middle of the	e band	(fm)	
Measurement with 1 MHz i	esolution/video f	ilter an	d RMS Detector.	
For EIRP calculation:				
'worst-case' = maximum a	ntenna gain			
RMS detector				



Plot No. 42



Subclause: 25.216 g) Limits on emissions from mobile earth stations for protection of aeronautical radionavigation-satellite service

Carrier-on state, modulated carrier at the upper edge of the band (fo) Conducted measurement at the antenna-connector

Limit:

Limit according to 25.216 g):

1559.0 - 1605.0MHz: -70dBW/1MHz -70 to -10dBW/1MHz)linear interpolated) The EIRP, averaged over any two-millisecond active transmission interval from the MESs in the carrier-on state shall not exceed the limits above.

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see test report chapter 5.2 Modulation TCH_2C8A, fh

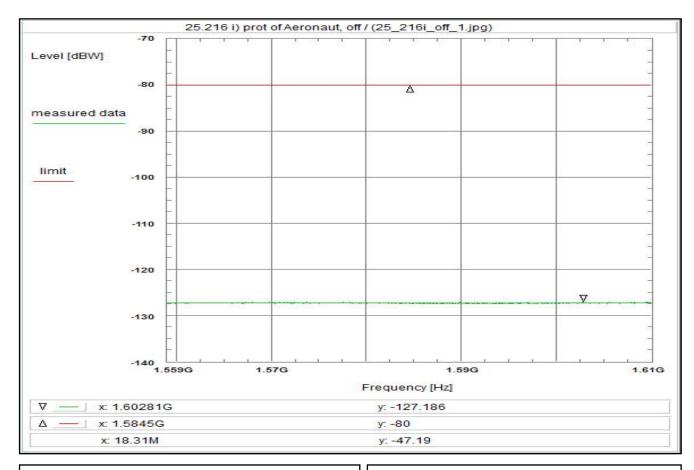
Test setup: see test report chapter 6.2

<u>Test equipment:</u> see test report chapter 6.1 - 6.2: C220, R001, U005 + POWER SPLITTER

Remark:



Plot No. 43



25.216 i) Limits on emissions from mobile earth stations for protection of aeronautical <u>Subclause:</u> 25.216 i) Limits radionavigation-satellite service

Carrier-off state, conducted measurement at the antenna-connector

<u>Limit:</u> Limit according to 25.216 i): -80dBW/1MHz

The EIRP, averaged over any two-millisecond active transmission interval from the MESs in the carrier-off state shall not exceed the limit above.

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

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

Test setup: see test report chapter 6.2

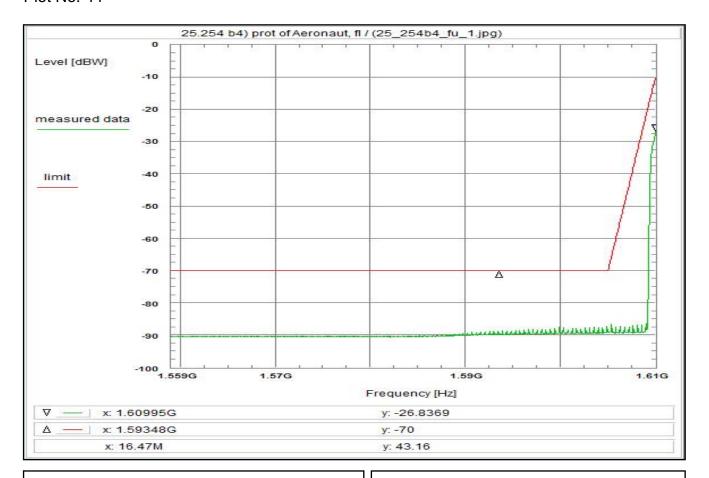
<u>Test equipment:</u> see test report chapter 6.1 - 6.2: C220, C220, R001

Remark:

Environment condition: Date & Time: Location:		GmbH,	42:50 H, Laboratory RC-SYS
Temperature:	22	°C	
Humidity:	55	%	
Voltage:	24	VDC	C
Setup of measurement equivalent Start frequency: Stop frequency: Center frequency:	uipment: 1.559 1.61 1.5845	GHz	z Z
Frequency span:	51	MHz	_ 7
Resolution-BW:	1		
Video-BW:		kHz	
Input attenuation:	0	dB	=
Trace-Mode:	Max-Hold	uD.	
Detector-Mode:	AVG		
Botostor Mode.	7.00		
Correction:			
Directional coupler	+	0.0	dB
Coaxial cable (C220)	+		
DUT-Antenna (on-axis)	+	10.4	4 dBi
Test antenna	+		dB
BW correction factor	+	0.0	dB
Atten. between HPA and fe	eedhorn +	0.0	dB
Freefield attenuation	+	0.0	dB
TOTAL CORRECTION:	+	11.3	3 dB
Remarks: Carrier-off state. Measurement with 1 MHz For EIRP calculation: 'worst-case' = maximum a		nd RM	MS Detector.



Plot No. 44



 $\underline{\underline{Subclause:}} \qquad 25.254 \text{ b)4}) \quad \text{Special requirements for ancillary terrestrial components operating in the } \\ 1610-1626.5 \text{ MHz} / 1525-1559 \text{ MHz bands}$

Carrier-on state, modulated carrier at the lower edge of the band (fu) Conducted measurement at the antenna-connector

Limit:

Limit according to 25.254 b)4):

1559.0 - 1605.0MHz: 1605.0 - 1610MHz:

4 <u>0)4).</u> -70dBW/1MHz -70 to -10dBW/1MHz)linear interpolated) The EIRP, averaged over any two-millisecond active transmission interval from the MESs in the carrier-on state shall not exceed the limits above.

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see test report chapter 5.2 Modulation TCH_2C8A, fl

Test setup: see test report chapter 6.2

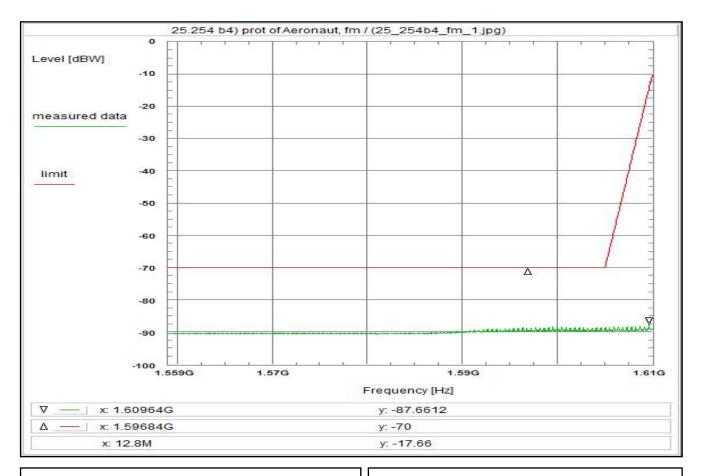
<u>Test equipment:</u> see test report chapter 6.1 - 6.2: C220, R001, U005 + POWER SPLITTER

Remark:

Environment condition: Date & Time: Location: Temperature: Humidity: Voltage:	Mon 08/Jun/202 CTC advanced 0 22 55 24		5:32 Laboratory RC-SYS	
Setup of measurement equal Start frequency: Stop frequency: Center frequency: Frequency span: Resolution-BW: Video-BW: Input attenuation: Trace-Mode: Detector-Mode:	1.559 1.61 1.5845 51	GHz GHz MHz MHz kHz		
Correction: Directional coupler Coaxial cable DUT-Antenna (on-axis) Test antenna BW correction factor Atten. between HPA and fi (U005 + POWER SPLITTE TOTAL CORRECTION:	+ + eedhorn +	0.0 10.4 0.0 0.0 0.0 37.5	dB dB dB dB	
Remarks: Carrier-on state / Carrier at the lower edge of the band (fu) Measurement with 1 MHz resolution/video filter and RMS Detector. For EIRP calculation: 'worst-case' = maximum antenna gain RMS detector Marker shows the wanted signal				



Plot No. 45



 $\underline{Subclause:} \qquad 25.254 \text{ b)4}) \quad \text{Special requirements for ancillary terrestrial components operating in the } \\ 1610-1626.5 \text{ MHz} / 1525-1559 \text{ MHz bands}$

Carrier-on state, modulated carrier in the middle of the band (fm) Conducted measurement at the antenna-connector

Limit:

Limit according to 25.254 b)4):

1559.0 - 1605.0MHz: 1605.0 - 1610MHz:

4 <u>0)4).</u> -70dBW/1MHz -70 to -10dBW/1MHz)linear interpolated) The EIRP, averaged over any two-millisecond active transmission interval from the MESs in the carrier-on state shall not exceed the limits above.

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see test report chapter 5.2 Modulation TCH_2C8A, fm

Test setup: see test report chapter 6.2

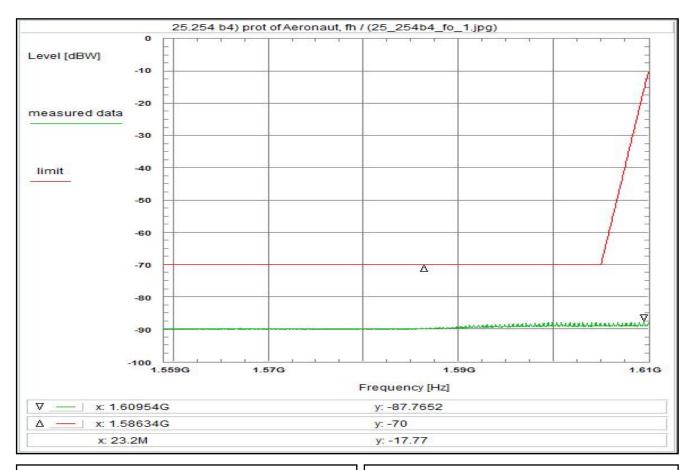
<u>Test equipment:</u> see test report chapter 6.1 - 6.2: C220, R001, U005 + POWER SPLITTER

Remark:

Environment condition: Date & Time: Mon 08/Jun/202 Location: CTC advanced C Temperature: 22 Humidity: 55 Voltage: 24	GmbH, Laboratory RC-SYS °C %			
Center frequency: 1.5845 Frequency span: 51 Resolution-BW: 1	GHz GHz MHz			
DUT-Antenna (on-axis) + Test antenna + BW correction factor + Atten. between HPA and feedhom +	0.0 dB 10.4 dBi 0.0 dB 0.0 dB 0.0 dB 37.5 dB			
Remarks: Carrier-on state / Carrier in the middle of the band (fm) Measurement with 1 MHz resolution/video filter and RMS Detector. For EIRP calculation: 'worst-case' = maximum antenna gain RMS detector				



Plot No. 46



 $\underline{Subclause:} \qquad 25.254 \text{ b)4}) \quad \text{Special requirements for ancillary terrestrial components operating in the } \\ 1610-1626.5 \text{ MHz} / 1525-1559 \text{ MHz bands}$

Carrier-on state, modulated carrier at the upper edge of the band (fo) Conducted measurement at the antenna-connector

Limit:

Limit according to 25.254 b)4):

1559.0 - 1605.0MHz: 1605.0 - 1610MHz:

+ <u>0)+).</u> -70dBW/1MHz -70 to -10dBW/1MHz)linear interpolated) The EIRP, averaged over any two-millisecond active transmission interval from the MESs in the carrier-on state shall not exceed the limits above.

Test results:

see plot (an explicit table was not generated)

Operating condition of DUT:

operating condition 1, see test report chapter 5.2 Modulation TCH_2C8A, fh

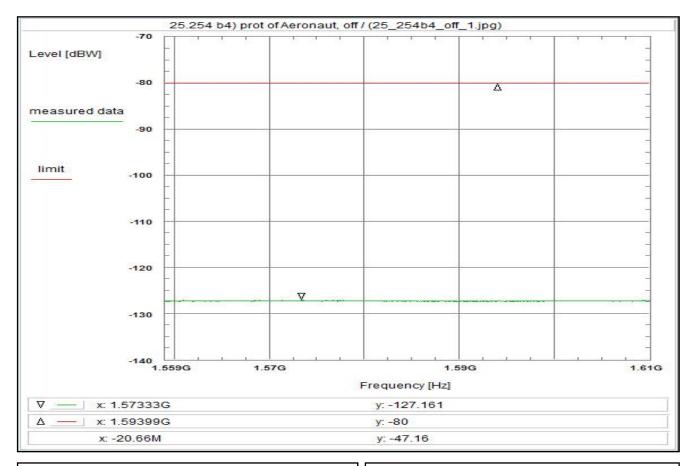
Test setup: see test report chapter 6.2

<u>Test equipment:</u> see test report chapter 6.1 -6.2: R001, U005 + POWER SPLITTER

	22 55	GmbH, °C	Laboratory RC-SYS
Setup of measurement equ Start frequency: Stop frequency: Center frequency: Frequency span: Resolution-BW: Video-BW: Input attenuation: Trace-Mode: Detector-Mode:	1.559 1.61 1.5845 51 1	GHz GHz MHz MHz kHz	
Correction: Directional coupler Coaxial cable DUT-Antenna (on-axis) Test antenna BW correction factor Atten. between HPA and fe (U005 + POWER SPLITTE TOTAL CORRECTION:	+ + + + edhorn + R) +	0.0 0.0 10.4 0.0 0.0 0.0 37.5 47.9	dB dBi dB dB dB
Remarks: Carrier-on state / Carrier at Measurement with 1 MHz n For EIRP calculation: 'worst-case' = maximum an RMS detector	esolution/video f		



Plot No. 47



 $\underline{Subclause:} \qquad 25.254 \text{ b)4}) \quad \text{Special requirements for ancillary terrestrial components operating in the } \\ 1610-1626.5 \text{ MHz} / 1525-1559 \text{ MHz bands}$

Carrier-off state, conducted measurement at the antenna-connector

<u>Limit:</u> Limit according to 25.254 b)4): -80dBW/1MHz

The EIRP, averaged over any two-millisecond active transmission interval from the MESs in the carrier-off state shall not exceed the limit above.

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

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

Test setup: see test report chapter 6.2

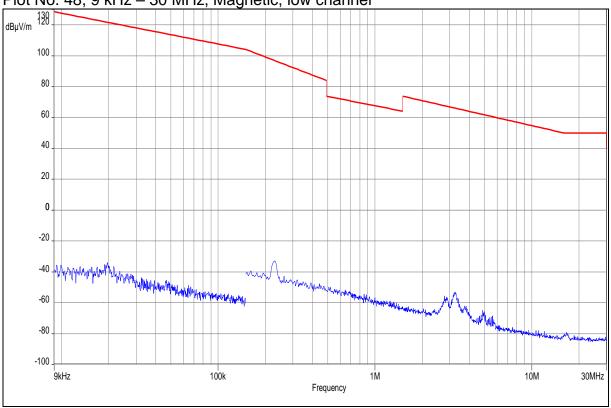
<u>Test equipment:</u> see test report chapter 6.1 - 6.2: C220, R001, U005 + POWER SPLITTER

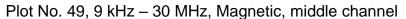
Remark:

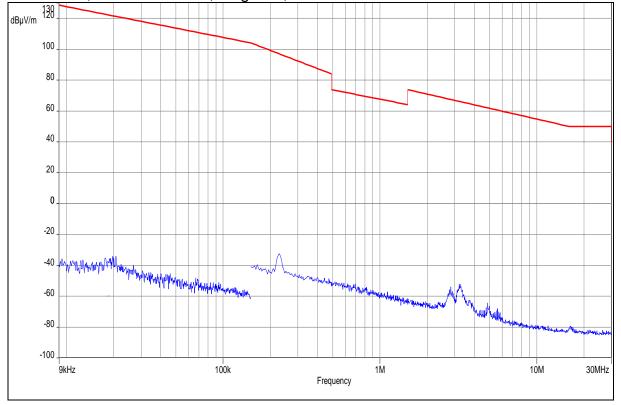
	22 55		9:34 Laboratory RC-SYS	
Setup of measurement equipolitics Start frequency: Stop frequency: Center frequency: Frequency span: Resolution-BW: Video-BW: Input attenuation: Trace-Mode: Detector-Mode:	1.559 1.61 1.5845 51 1	GHz		
Correction: Directional coupler Coaxial cable (C220) DUT-Antenna (on-axis) Test antenna BW correction factor Atten. between HPA and fee Freefield attenuation TOTAL CORRECTION:	+ + +	0.0 0.0 0.0 0.0	dB dBi dB dB dB dB	
Remarks: Carrier-off state. Measurement with 1 MHz resolution filter and RMS Detector. For EIRP calculation: 'worst-case' = maximum antenna gain				



Plot No. 48, 9 kHz - 30 MHz, Magnetic, low channel

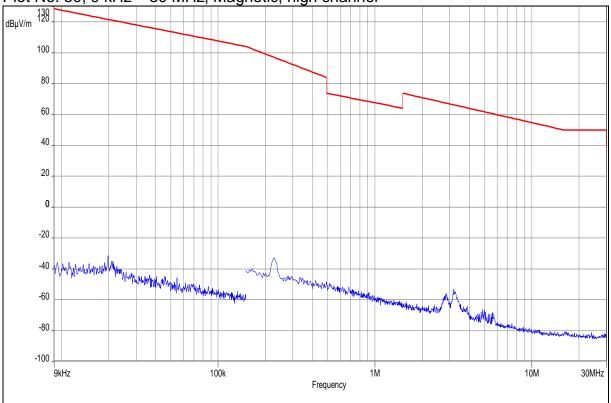




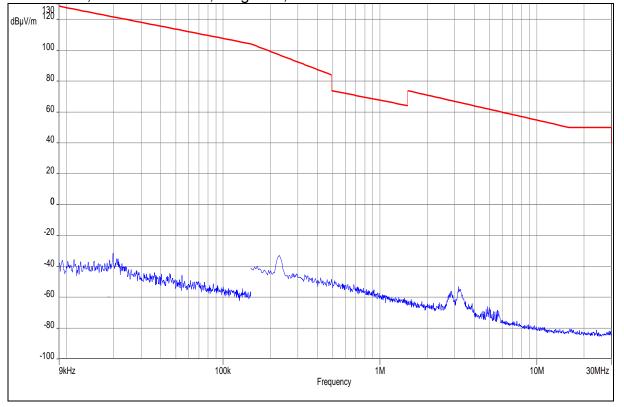




Plot No. 50, 9 kHz - 30 MHz, Magnetic, high channel

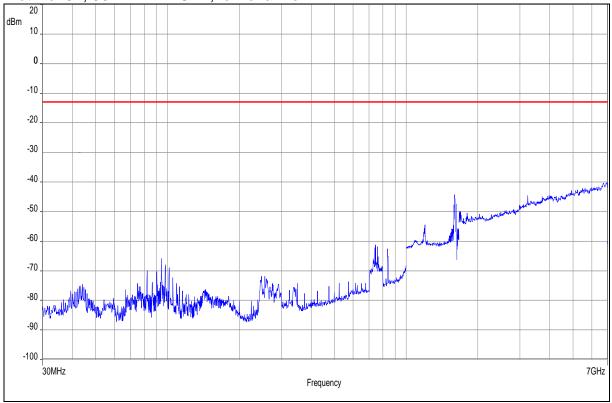






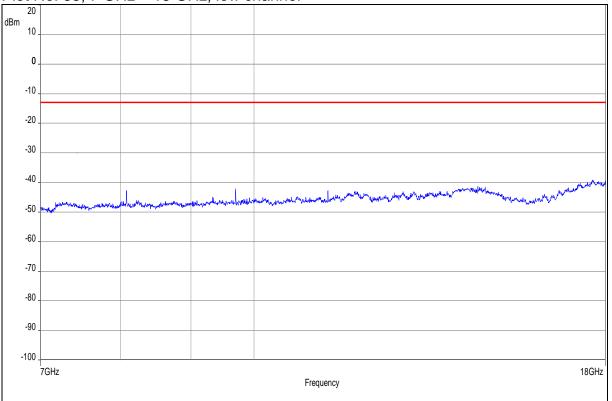


Plot No. 52, 30 MHz - 7 GHz, low channel

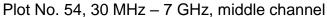


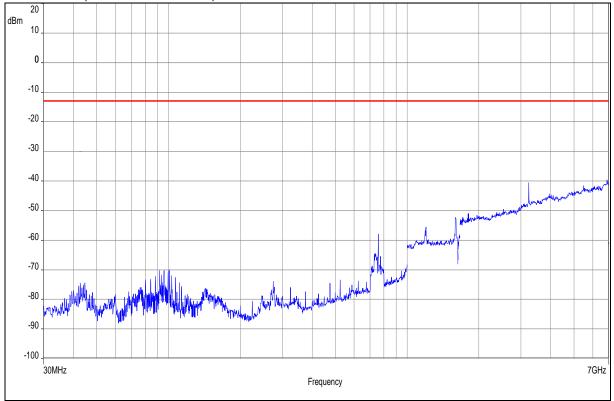
Signal notched by a rejection filter

Plot No. 53, 7 GHz – 18 GHz, low channel



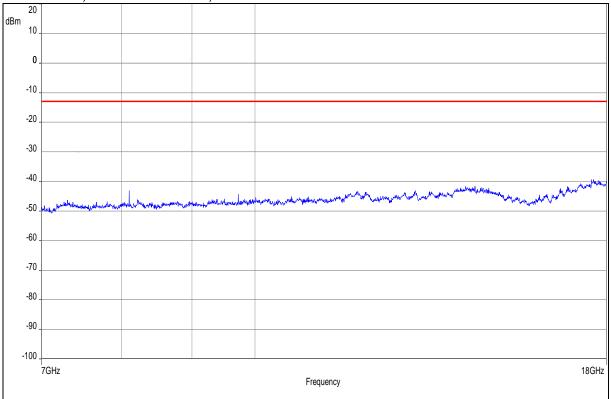






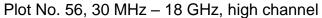
Signal notched by a rejection filter

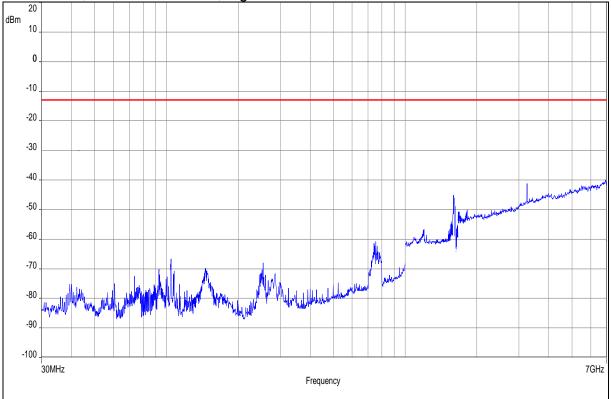
Plot No. 55, 7 GHz – 18 GHz, middle channel



© CTC advanced GmbH Page 48 of 51

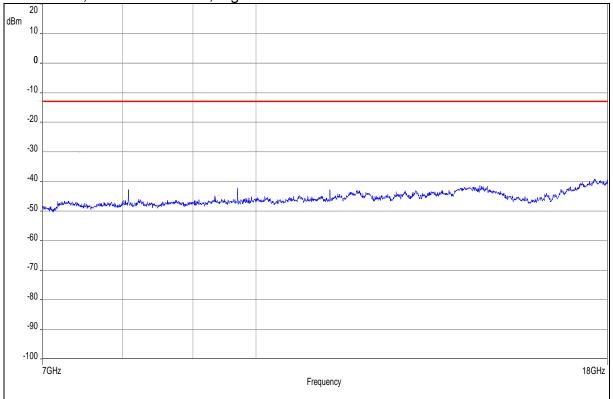






Signal notched by a rejection filter

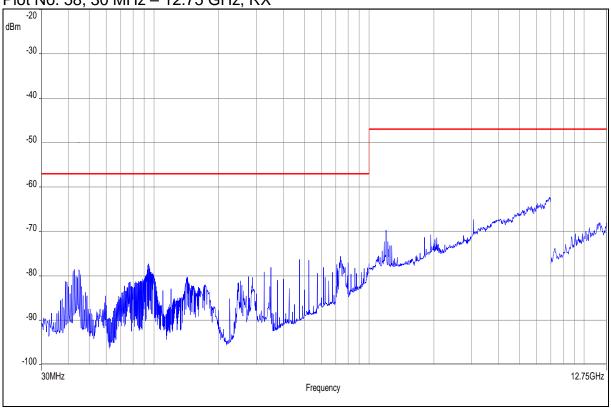
Plot No. 57, 7 GHz – 18 GHz, high channel



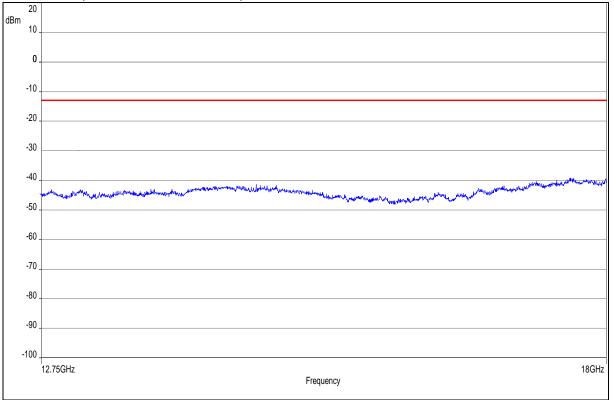
© CTC advanced GmbH Page 49 of 51



Plot No. 58, 30 MHz - 12.75 GHz, RX



Plot No. 59, 12.75 GHz – 18 GHz, RX





Document history

Version	Applied changes	Date of release
	Initial release - DRAFT	2020-06-30
	Editorial changes based on applicant's remarks	2020-08-07

© CTC advanced GmbH Page 51 of 51