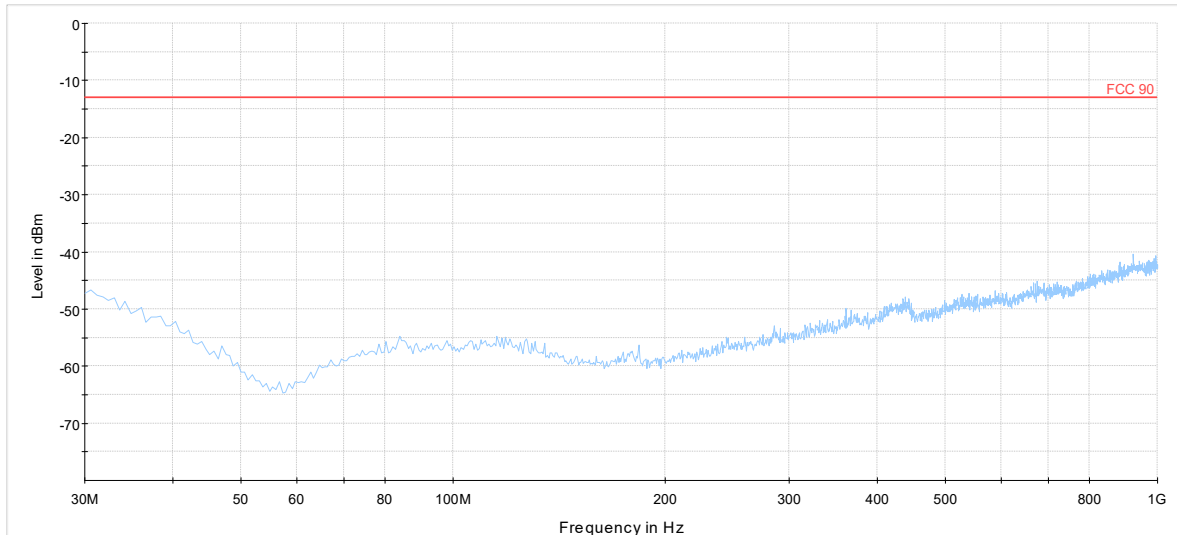
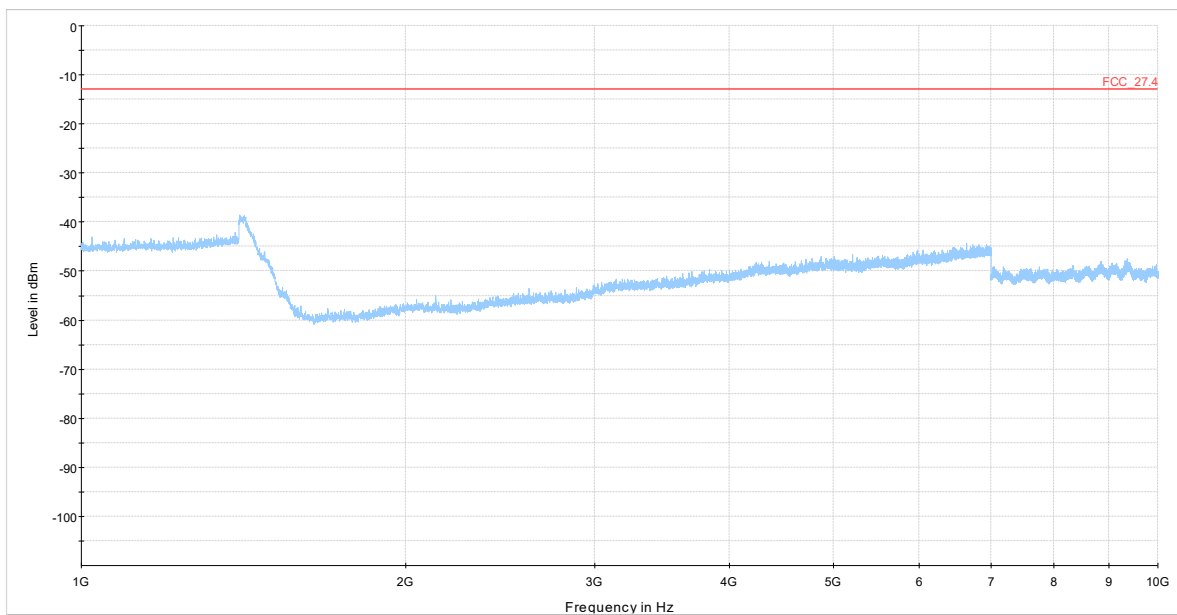


Frequency Band = Band 806 – 809 MHz, Direction = RF uplink  
(S01\_AA01)

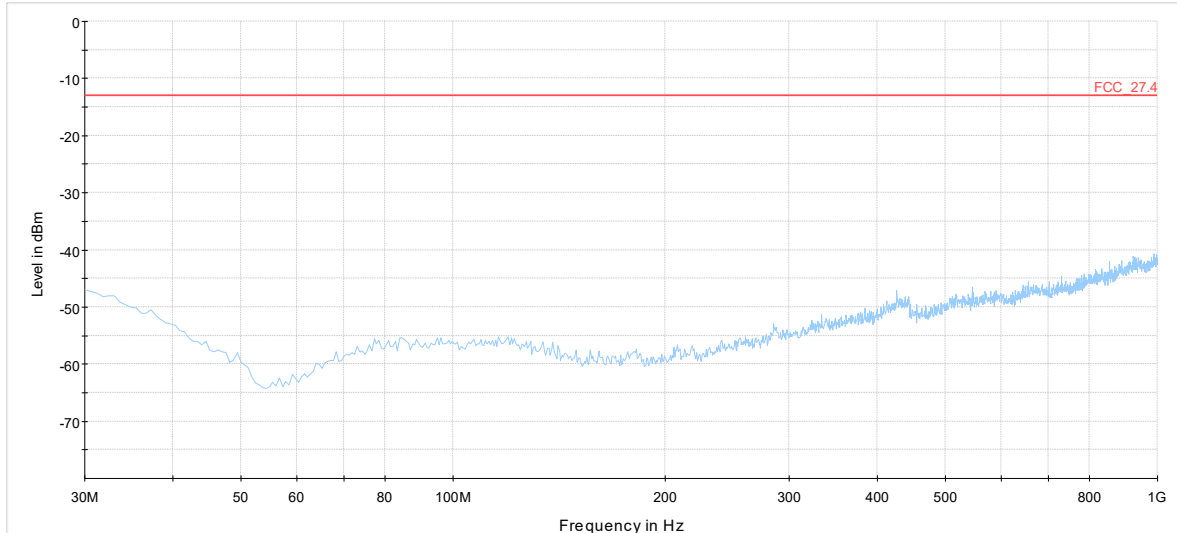


30 MHz - 1 GHz

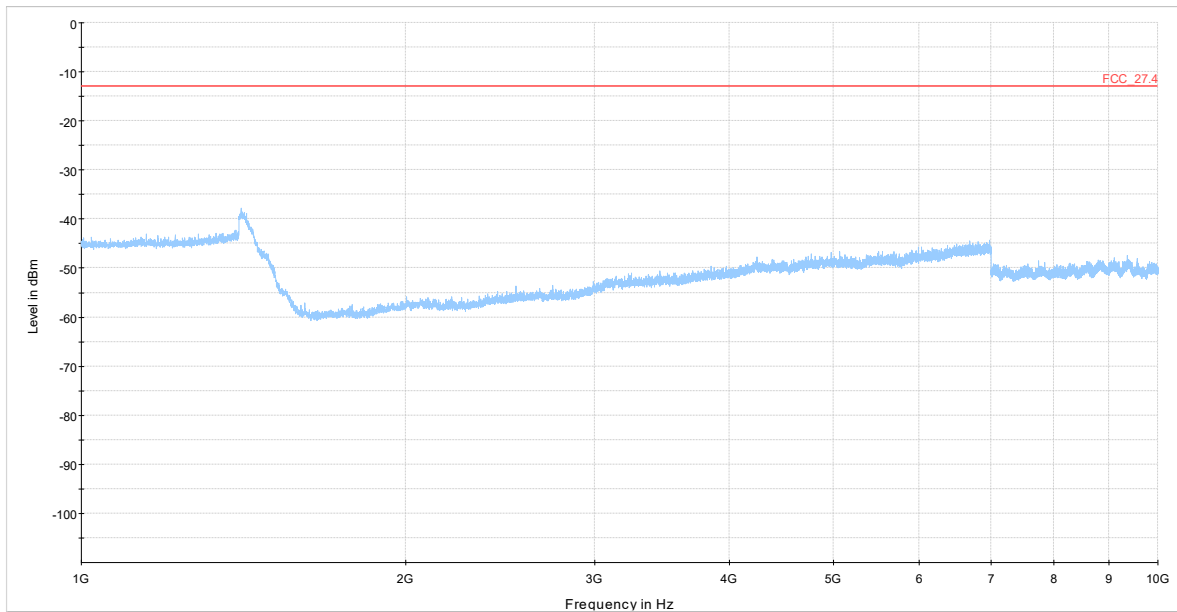


1 GHz - 10 GHz

Frequency Band = Band 854 – 862 MHz, Direction = RF downlink  
(S01\_AA01)

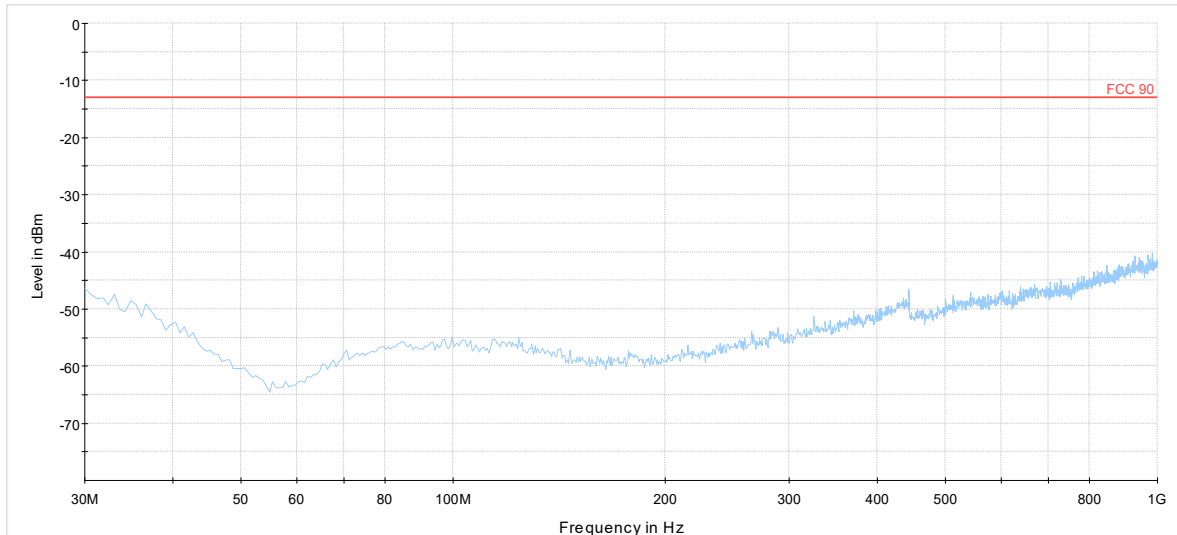


30 MHz - 1 GHz

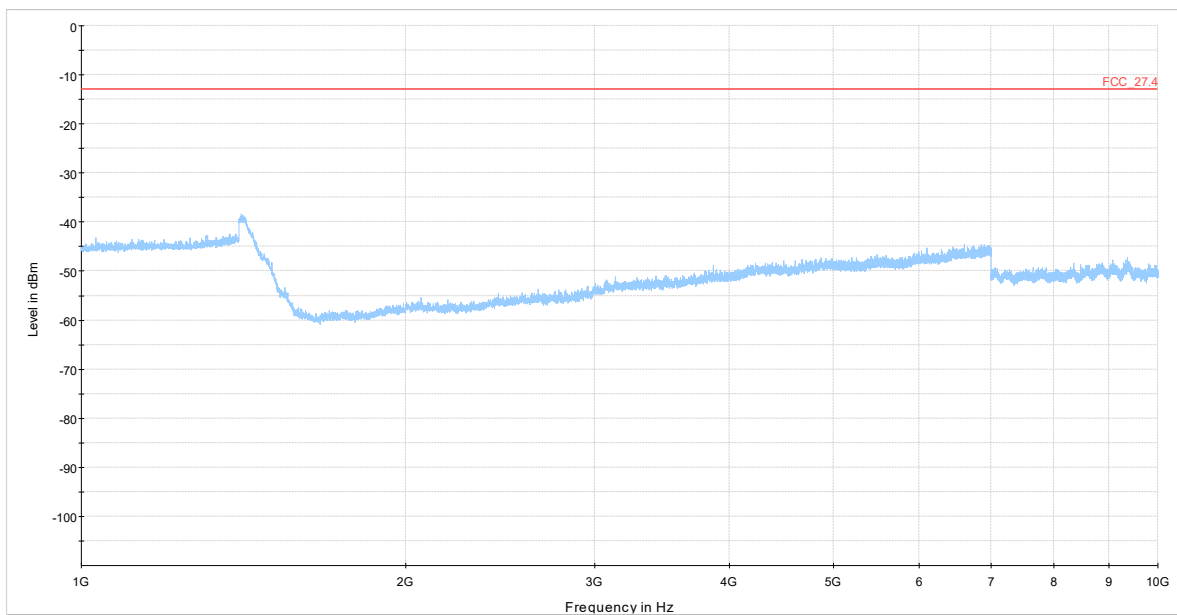


1 GHz - 10 GHz

Frequency Band = Band 809 – 817 MHz, Direction = RF uplink  
(S01\_AA01)

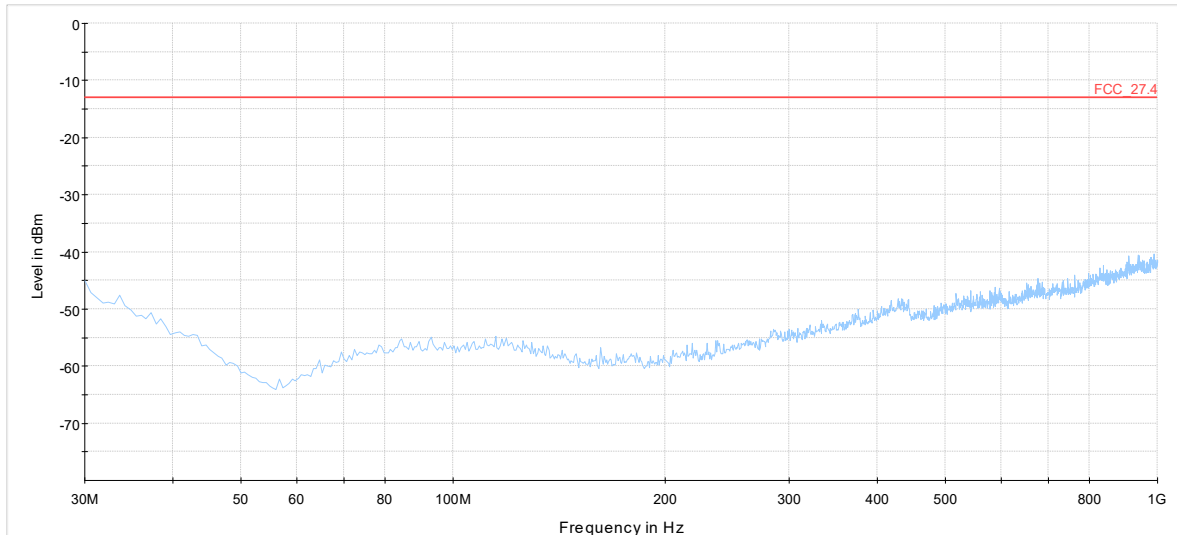


30 MHz - 1 GHz

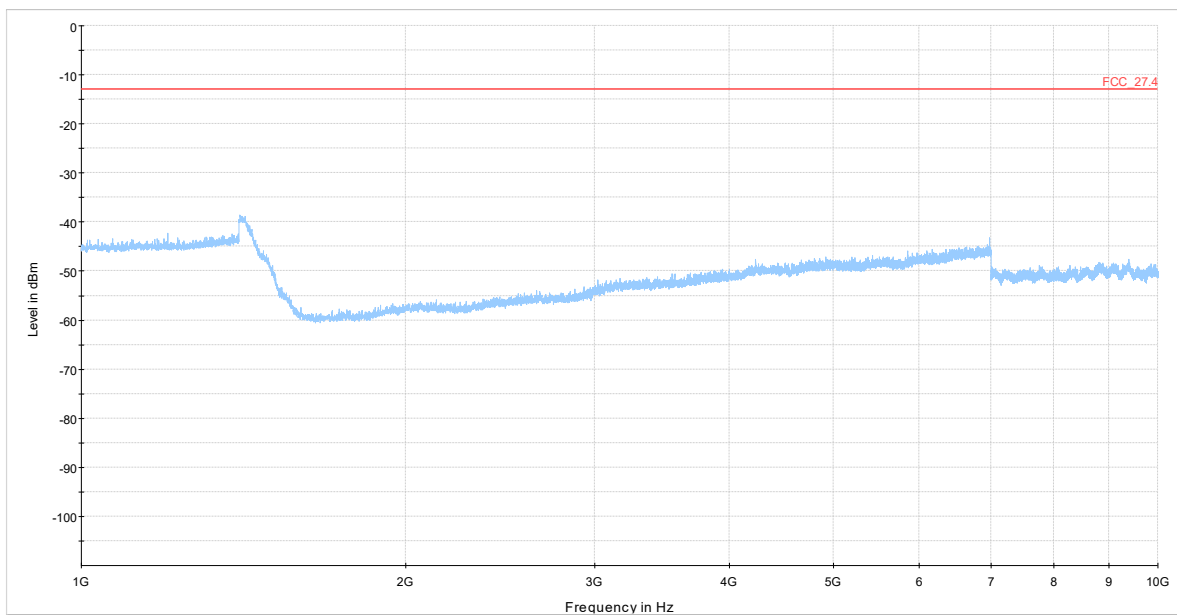


1 GHz - 10 GHz

Frequency Band = Band 862 – 869 MHz, Direction = RF downlink  
(S01\_AA01)

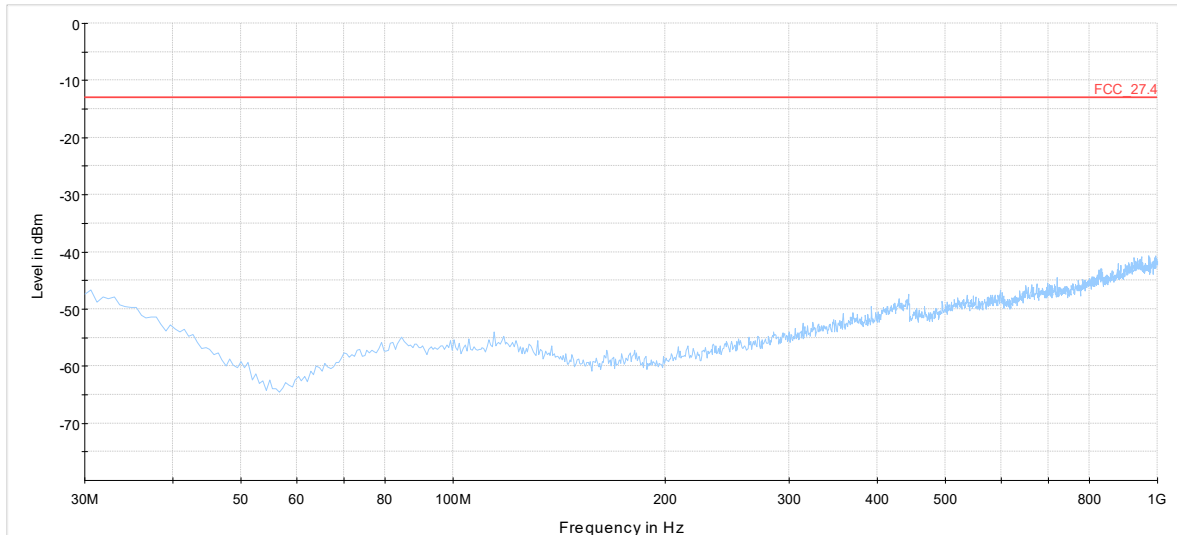


30 MHz - 1 GHz

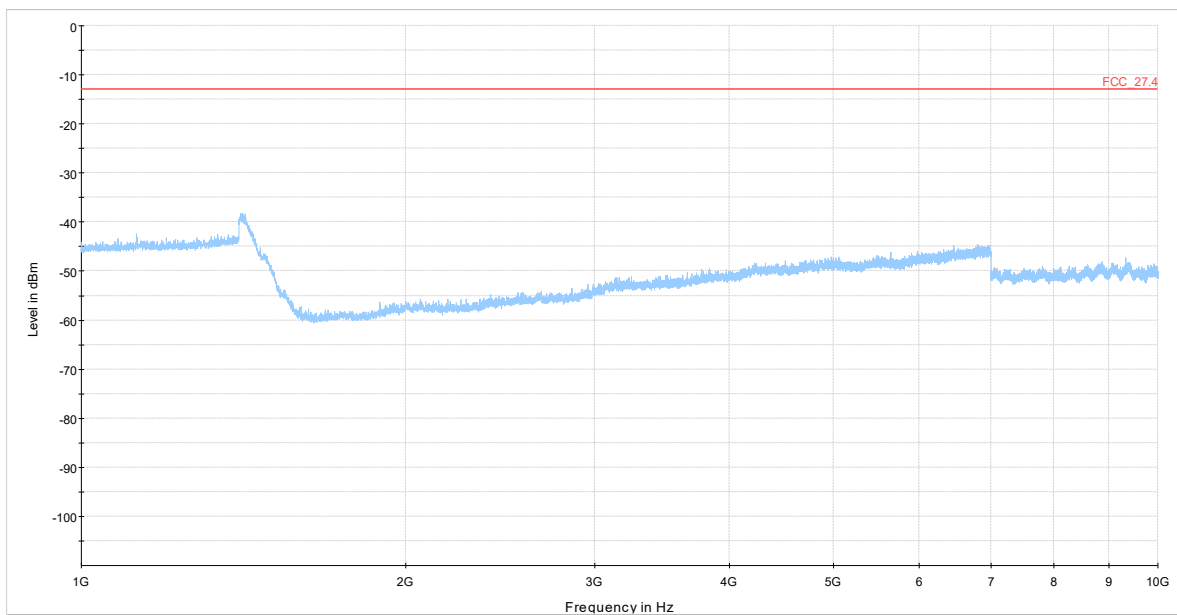


1 GHz - 10 GHz

Frequency Band = Band 817 – 824 MHz, Direction = RF uplink  
(S01\_AA01)



30 MHz - 1 GHz



1 GHz - 10 GHz

#### 4.7.5 TEST EQUIPMENT USED

- Radiated Emissions

## 5 TEST EQUIPMENT

- 1 R&S TS8997  
EN300328/301893/FCC cond. Test Lab

| Ref.No. | Device Name          | Description                                | Manufacturer                      | Serial Number  | Last Calibration | Calibration Due |
|---------|----------------------|--|-----------------------------------|----------------|------------------|-----------------|
| 1.1     | SMB100A              | Signal Generator 9 kHz - 6 GHz             | Rohde & Schwarz                   | 107695         | 2017-07          | 2020-07         |
| 1.2     | MFS                  | Rubidium Frequency Standard                | Datum-Beverly                     | 5489/001       | 2018-07          | 2020-07         |
| 1.3     | 1515 / 93459         | Broadband Power Divider SMA (Aux)          | Weinschel Associates              | LN673          |                  |                 |
| 1.4     | FSV30                | Signal Analyser 10 Hz - 30 GHz             | Rohde & Schwarz                   | 103005         | 2018-04          | 2020-04         |
| 1.5     | Fluke 177            | Digital Multimeter 03 (Multimeter)         | Fluke Europe B.V.                 | 86670383       | 2018-04          | 2020-04         |
| 1.6     | VT 4002              | Climatic Chamber                           | Vötsch                            | 58566002150010 | 2018-04          | 2020-04         |
| 1.7     | A8455-4              | 4 Way Power Divider (SMA)                  |                                   | -              |                  |                 |
| 1.8     | Opus10 THI (8152.00) | ThermoHygro Datalogger 03 (Environ)        | Lufft Mess- und Regeltechnik GmbH | 7482           | 2019-06          | 2021-06         |
| 1.9     | SMBV100A             | Vector Signal Generator 9 kHz - 6 GHz      | Rohde & Schwarz                   | 259291         | 2016-10          | 2019-10         |
| 1.10    | OSP120               | Switching Unit with integrated power meter | Rohde & Schwarz                   | 101158         | 2018-05          | 2021-05         |

- 2 Radiated Emissions  
Lab to perform radiated emission tests

| Ref.No. | Device Name           | Description                               | Manufacturer                      | Serial Number | Last Calibration   | Calibration Due    |
|---------|-----------------------|---|-----------------------------------|---------------|--------------------|--------------------|
| 2.1     | NRV-Z1                | Sensor Head A                             | Rohde & Schwarz                   | 827753/005    | 2018-07<br>2019-08 | 2019-07<br>2020-08 |
| 2.2     | MFS                   | Rubidium Frequency Normal MFS             | Datum GmbH                        | 002           | 2018-10            | 2020-10            |
| 2.3     | Opus10 TPR (8253.00)  | ThermoAirpressure Datalogger 13 (Environ) | Lufft Mess- und Regeltechnik GmbH | 13936         | 2017-04            | 2019-04            |
| 2.4     | ESW44                 | EMI Test Receiver                         | Rohde & Schwarz                   | 101603        | 2018-05            | 2019-05            |
| 2.5     | Anechoic Chamber      | 10.38 x 6.38 x 6.00 m <sup>3</sup>        | Frankonia                         | none          | 2018-06            | 2020-06            |
| 2.6     | HL 562                | Ultralog new biconicals                   | Rohde & Schwarz                   | 830547/003    | 2018-07            | 2021-07            |
| 2.7     | 5HC2700/12750 -1.5-KK | High Pass Filter                          | Trilithic                         | 9942012       |                    |                    |

| Ref.No. | Device Name                   | Description                                     | Manufacturer                      | Serial Number          | Last Calibration | Calibration Due |
|---------|-------------------------------|---|-----------------------------------|------------------------|------------------|-----------------|
| 2.8     | ASP 1.2/1.8-10 kg             | Antenna Mast                                    | Maturo GmbH                       | -                      |                  |                 |
| 2.9     | Fully Anechoic Room           | 8.80m x 4.60m x 4.05m (l x w x h)               | Albatross Projects                | P26971-647-001-PRB     | 2018-06          | 2020-06         |
| 2.10    | Fluke 177                     | Digital Multimeter 03 (Multimeter)              | Fluke Europe B.V.                 | 86670383               | 2018-04          | 2020-04         |
| 2.11    | JS4-18002600-32-5P            | Broadband Amplifier 18 GHz - 26 GHz             | Miteq                             | 849785                 |                  |                 |
| 2.12    | FSW 43                        | Spectrum Analyser                               | Rohde & Schwarz                   | 103779                 | 2019-02          | 2021-02         |
| 2.13    | 3160-09                       | Standard Gain / Pyramidal Horn Antenna 26.5 GHz | EMCO Elektronik GmbH              | 00083069               |                  |                 |
| 2.14    | WHKX 7.0/18G-8SS              | High Pass Filter                                | Wainwright                        | 09                     |                  |                 |
| 2.15    | 4HC1600/12750-1.5-KK          | High Pass Filter                                | Trilithic                         | 9942011                |                  |                 |
| 2.16    | Chroma 6404                   | AC Power Source                                 | Chroma ATE INC.                   | 64040001304            |                  |                 |
| 2.17    | JS4-00102600-42-5A            | Broadband Amplifier 30 MHz - 26 GHz             | Miteq                             | 619368                 |                  |                 |
| 2.18    | TT 1.5 WI                     | Turn Table                                      | Maturo GmbH                       | -                      |                  |                 |
| 2.19    | HL 562 Ultralog               | Log.-per. Antenna                               | Rohde & Schwarz                   | 100609                 | 2019-05          | 2022-05         |
| 2.20    | 3160-10                       | Standard Gain / Pyramidal Horn Antenna 40 GHz   | EMCO Elektronik GmbH              | 00086675               |                  |                 |
| 2.21    | 5HC3500/18000-1.2-KK          | High Pass Filter                                | Trilithic                         | 200035008              |                  |                 |
| 2.22    | Opus10 THI (8152.00)          | ThermoHygro Datalogger 12 (Environ)             | Lufft Mess- und Regeltechnik GmbH | 12482                  | 2019-06          | 2021-06         |
| 2.23    | ESR 7                         | EMI Receiver / Spectrum Analyser                | Rohde & Schwarz                   | 101424                 | 2019-01          | 2020-01         |
| 2.24    | JS4-00101800-35-5P            | Broadband Amplifier 30 MHz - 18 GHz             | Miteq                             | 896037                 |                  |                 |
| 2.25    | AS 620 P                      | Antenna mast                                    | HD GmbH                           | 620/37                 |                  |                 |
| 2.26    | Tilt device Maturo (Rohacell) | Antrieb TD1.5-10kg                              | Maturo GmbH                       | TD1.5-10kg/024/3790709 |                  |                 |
| 2.27    | PAS 2.5 - 10 kg               | Antenna Mast                                    | Maturo GmbH                       | -                      |                  |                 |
| 2.28    | AM 4.0                        | Antenna mast                                    | Maturo GmbH                       | AM4.0/180/11920513     |                  |                 |
| 2.29    | HF 907                        | Double-ridged horn                              | Rohde & Schwarz                   | 102444                 | 2018-07          | 2021-07         |

3 FCC Conducted Base Station / Repeater  
EN300328/301893/FCC cond. Test Lab

| Ref.No. | Device Name | Description                           | Manufacturer    | Serial Number | Last Calibration | Calibration Due |
|---------|-------------|---------------------------------------|-----------------|---------------|------------------|-----------------|
| 3.1     | FSV40       | Signal Analyser 10 Hz - 40 GHz        | Rohde & Schwarz | 100886        | 2018-10          | 2019-10         |
| 3.2     | ESR7        | Test Receiver/Analyser                | Rohde & Schwarz | 101099        | 2018-10          | 2019-10         |
| 3.3     | SMBV100A    | Vector Signal Generator 9 kHz - 6 GHz | Rohde & Schwarz | 255975        | 2017-08          | 2019-08         |
| 3.4     | SMIQ 03B    | Signal Generator                      | Rohde & Schwarz | 831389/062    | 2018-10          | 2021-10         |
| 3.5     | SMIQ 03B    | Signal Generator                      | Rohde & Schwarz | 831389/063    | 2018-10          | 2021-10         |

The calibration interval is the time interval between "Last Calibration" and "Calibration Due"



## 6 ANTENNA FACTORS, CABLE LOSS AND SAMPLE CALCULATIONS

This chapter contains the antenna factors with their corresponding path loss of the used measurement path for all antennas as well as the insertion loss of the LISN.

### 6.1 LISN R&S ESH3-Z5 (150 KHZ – 30 MHZ)

| Frequency<br>MHz | Corr.<br>dB | LISN<br>insertion<br>loss<br>ESH3-<br>Z5<br>dB | cable<br>loss<br>(incl. 10<br>dB<br>atten-<br>uator)<br>dB |
|------------------|-------------|--|--|
| 0.15             | 10.1        | 0.1  | 10.0   |
| 5                | 10.3        | 0.1  | 10.2   |
| 7                | 10.5        | 0.2  | 10.3   |
| 10               | 10.5        | 0.2  | 10.3   |
| 12               | 10.7        | 0.3  | 10.4   |
| 14               | 10.7        | 0.3  | 10.4   |
| 16               | 10.8        | 0.4  | 10.4   |
| 18               | 10.9        | 0.4  | 10.5   |
| 20               | 10.9        | 0.4  | 10.5   |
| 22               | 11.1        | 0.5  | 10.6   |
| 24               | 11.1        | 0.5  | 10.6   |
| 26               | 11.2        | 0.5  | 10.7   |
| 28               | 11.2        | 0.5  | 10.7   |
| 30               | 11.3        | 0.5  | 10.8   |

#### Sample calculation

$$U_{\text{LISN}} (\text{dB } \mu\text{V}) = U (\text{dB } \mu\text{V}) + \text{Corr. (dB)}$$

U = Receiver reading

LISN Insertion loss = Voltage Division Factor of LISN

Corr. = sum of single correction factors of used LISN, cables, switch units (if used)

Linear interpolation will be used for frequencies in between the values in the table.

## 6.2 ANTENNA R&S HFH2-Z2 (9 KHZ – 30 MHZ)

| Frequency<br>MHz | AF<br>HFH-Z2)<br>dB (1/m) | Corr.<br>dB | cable<br>loss 1<br>(inside<br>chamber)<br>dB | cable<br>loss 2<br>(outside<br>chamber)<br>dB | cable<br>loss 3<br>(switch<br>unit)<br>dB | cable<br>loss 4<br>(to<br>receiver)<br>dB | distance<br>corr.<br>(-40 dB/<br>decade)<br>dB | d <sub>Limit</sub><br>(meas.<br>distance<br>(limit)<br>m | d <sub>used</sub><br>(meas.<br>distance<br>(used)<br>m |
|------------------|---------------------------|-------------|--|---|---|---|--|--|--|
| 0.009            | 20.50                     | -79.6       | 0.1  | 0.1   | 0.1                                       | 0.1                                       | -80  | 300  | 3  |
| 0.01             | 20.45                     | -79.6       | 0.1  | 0.1   | 0.1                                       | 0.1                                       | -80  | 300  | 3  |
| 0.015            | 20.37                     | -79.6       | 0.1  | 0.1   | 0.1                                       | 0.1                                       | -80  | 300  | 3  |
| 0.02             | 20.36                     | -79.6       | 0.1  | 0.1   | 0.1                                       | 0.1                                       | -80  | 300  | 3  |
| 0.025            | 20.38                     | -79.6       | 0.1  | 0.1   | 0.1                                       | 0.1                                       | -80  | 300  | 3  |
| 0.03             | 20.32                     | -79.6       | 0.1  | 0.1   | 0.1                                       | 0.1                                       | -80  | 300  | 3  |
| 0.05             | 20.35                     | -79.6       | 0.1  | 0.1   | 0.1                                       | 0.1                                       | -80  | 300  | 3  |
| 0.08             | 20.30                     | -79.6       | 0.1  | 0.1   | 0.1                                       | 0.1                                       | -80  | 300  | 3  |
| 0.1              | 20.20                     | -79.6       | 0.1  | 0.1   | 0.1                                       | 0.1                                       | -80  | 300  | 3  |
| 0.2              | 20.17                     | -79.6       | 0.1  | 0.1   | 0.1                                       | 0.1                                       | -80  | 300  | 3  |
| 0.3              | 20.14                     | -79.6       | 0.1  | 0.1   | 0.1                                       | 0.1                                       | -80  | 300  | 3  |
| 0.49             | 20.12                     | -79.6       | 0.1  | 0.1   | 0.1                                       | 0.1                                       | -80  | 300  | 3  |
| 0.490001         | 20.12                     | -39.6       | 0.1  | 0.1   | 0.1                                       | 0.1                                       | -40  | 30   | 3  |
| 0.5              | 20.11                     | -39.6       | 0.1  | 0.1   | 0.1                                       | 0.1                                       | -40  | 30   | 3  |
| 0.8              | 20.10                     | -39.6       | 0.1  | 0.1   | 0.1                                       | 0.1                                       | -40  | 30   | 3  |
| 1                | 20.09                     | -39.6       | 0.1  | 0.1   | 0.1                                       | 0.1                                       | -40  | 30   | 3  |
| 2                | 20.08                     | -39.6       | 0.1  | 0.1   | 0.1                                       | 0.1                                       | -40  | 30   | 3  |
| 3                | 20.06                     | -39.6       | 0.1  | 0.1   | 0.1                                       | 0.1                                       | -40  | 30   | 3  |
| 4                | 20.05                     | -39.5       | 0.2  | 0.1   | 0.1                                       | 0.1                                       | -40  | 30   | 3  |
| 5                | 20.05                     | -39.5       | 0.2  | 0.1   | 0.1                                       | 0.1                                       | -40  | 30   | 3  |
| 6                | 20.02                     | -39.5       | 0.2  | 0.1   | 0.1                                       | 0.1                                       | -40  | 30   | 3  |
| 8                | 19.95                     | -39.5       | 0.2  | 0.1   | 0.1                                       | 0.1                                       | -40  | 30   | 3  |
| 10               | 19.83                     | -39.4       | 0.2  | 0.1   | 0.2                                       | 0.1                                       | -40  | 30   | 3  |
| 12               | 19.71                     | -39.4       | 0.2  | 0.1   | 0.2                                       | 0.1                                       | -40  | 30   | 3  |
| 14               | 19.54                     | -39.4       | 0.2  | 0.1   | 0.2                                       | 0.1                                       | -40  | 30   | 3  |
| 16               | 19.53                     | -39.3       | 0.3  | 0.1   | 0.2                                       | 0.1                                       | -40  | 30   | 3  |
| 18               | 19.50                     | -39.3       | 0.3  | 0.1   | 0.2                                       | 0.1                                       | -40  | 30   | 3  |
| 20               | 19.57                     | -39.3       | 0.3  | 0.1   | 0.2                                       | 0.1                                       | -40  | 30   | 3  |
| 22               | 19.61                     | -39.3       | 0.3  | 0.1   | 0.2                                       | 0.1                                       | -40  | 30   | 3  |
| 24               | 19.61                     | -39.3       | 0.3  | 0.1   | 0.2                                       | 0.1                                       | -40  | 30   | 3  |
| 26               | 19.54                     | -39.3       | 0.3  | 0.1   | 0.2                                       | 0.1                                       | -40  | 30   | 3  |
| 28               | 19.46                     | -39.2       | 0.3  | 0.1   | 0.3                                       | 0.1                                       | -40  | 30   | 3  |
| 30               | 19.73                     | -39.1       | 0.4  | 0.1   | 0.3                                       | 0.1                                       | -40  | 30   | 3  |

### Sample calculation

$$E \text{ (dB } \mu\text{V/m)} = U \text{ (dB } \mu\text{V)} + AF \text{ (dB 1/m)} + Corr. \text{ (dB)}$$

U = Receiver reading

AF = Antenna factor

Corr. = sum of single correction factors of used cables, switch unit, distance correction, amplifier (if applicable)

distance correction =  $-40 * \text{LOG} (d_{\text{Limit}} / d_{\text{used}})$

Linear interpolation will be used for frequencies in between the values in the table.

Table shows an extract of values

### 6.3 ANTENNA R&S HL562 (30 MHZ – 1 GHZ)

( $d_{Limit} = 3\text{ m}$ )

| Frequency | AF<br>R&S<br>HL562 | Corr. |
|-----------|--------------------|-------|
| MHz       | dB (1/m)           | dB    |
| 30        | 18.6               | 0.6   |
| 50        | 6.0                | 0.9   |
| 100       | 9.7                | 1.2   |
| 150       | 7.9                | 1.6   |
| 200       | 7.6                | 1.9   |
| 250       | 9.5                | 2.1   |
| 300       | 11.0               | 2.3   |
| 350       | 12.4               | 2.6   |
| 400       | 13.6               | 2.9   |
| 450       | 14.7               | 3.1   |
| 500       | 15.6               | 3.2   |
| 550       | 16.3               | 3.5   |
| 600       | 17.2               | 3.5   |
| 650       | 18.1               | 3.6   |
| 700       | 18.5               | 3.6   |
| 750       | 19.1               | 4.1   |
| 800       | 19.6               | 4.1   |
| 850       | 20.1               | 4.4   |
| 900       | 20.8               | 4.7   |
| 950       | 21.1               | 4.8   |
| 1000      | 21.6               | 4.9   |

| cable<br>loss 1<br>(inside<br>chamber) | cable<br>loss 2<br>(outside<br>chamber) | cable<br>loss 3<br>(switch<br>unit) | cable<br>loss 4<br>(to<br>receiver) | distance<br>corr.<br>(-20 dB/<br>decade) | $d_{Limit}$<br>(meas.<br>distance<br>(limit)) | $d_{used}$<br>(meas.<br>distance<br>(used)) |
|--|---|-------------------------------------|-------------------------------------|--|---|---|
| dB                                     | dB                                      | dB                                  | dB                                  | dB                                       | m   | m   |
| 0.29                                   | 0.04                                    | 0.23                                | 0.02                                | 0.0                                      | 3   | 3   |
| 0.39                                   | 0.09                                    | 0.32                                | 0.08                                | 0.0                                      | 3   | 3   |
| 0.56                                   | 0.14                                    | 0.47                                | 0.08                                | 0.0                                      | 3   | 3   |
| 0.73                                   | 0.20                                    | 0.59                                | 0.12                                | 0.0                                      | 3   | 3   |
| 0.84                                   | 0.21                                    | 0.70                                | 0.11                                | 0.0                                      | 3   | 3   |
| 0.98                                   | 0.24                                    | 0.80                                | 0.13                                | 0.0                                      | 3   | 3   |
| 1.04                                   | 0.26                                    | 0.89                                | 0.15                                | 0.0                                      | 3   | 3   |
| 1.18                                   | 0.31                                    | 0.96                                | 0.13                                | 0.0                                      | 3   | 3   |
| 1.28                                   | 0.35                                    | 1.03                                | 0.19                                | 0.0                                      | 3   | 3   |
| 1.39                                   | 0.38                                    | 1.11                                | 0.22                                | 0.0                                      | 3   | 3   |
| 1.44                                   | 0.39                                    | 1.20                                | 0.19                                | 0.0                                      | 3   | 3   |
| 1.55                                   | 0.46                                    | 1.24                                | 0.23                                | 0.0                                      | 3   | 3   |
| 1.59                                   | 0.43                                    | 1.29                                | 0.23                                | 0.0                                      | 3   | 3   |
| 1.67                                   | 0.34                                    | 1.35                                | 0.22                                | 0.0                                      | 3   | 3   |
| 1.67                                   | 0.42                                    | 1.41                                | 0.15                                | 0.0                                      | 3   | 3   |
| 1.87                                   | 0.54                                    | 1.46                                | 0.25                                | 0.0                                      | 3   | 3   |
| 1.90                                   | 0.46                                    | 1.51                                | 0.25                                | 0.0                                      | 3   | 3   |
| 1.99                                   | 0.60                                    | 1.56                                | 0.27                                | 0.0                                      | 3   | 3   |
| 2.14                                   | 0.60                                    | 1.63                                | 0.29                                | 0.0                                      | 3   | 3   |
| 2.22                                   | 0.60                                    | 1.66                                | 0.33                                | 0.0                                      | 3   | 3   |
| 2.23                                   | 0.61                                    | 1.71                                | 0.30                                | 0.0                                      | 3   | 3   |

( $d_{Limit} = 10\text{ m}$ )

|      |      |      |
|------|------|------|
| 30   | 18.6 | -9.9 |
| 50   | 6.0  | -9.6 |
| 100  | 9.7  | -9.2 |
| 150  | 7.9  | -8.8 |
| 200  | 7.6  | -8.6 |
| 250  | 9.5  | -8.3 |
| 300  | 11.0 | -8.1 |
| 350  | 12.4 | -7.9 |
| 400  | 13.6 | -7.6 |
| 450  | 14.7 | -7.4 |
| 500  | 15.6 | -7.2 |
| 550  | 16.3 | -7.0 |
| 600  | 17.2 | -6.9 |
| 650  | 18.1 | -6.9 |
| 700  | 18.5 | -6.8 |
| 750  | 19.1 | -6.3 |
| 800  | 19.6 | -6.3 |
| 850  | 20.1 | -6.0 |
| 900  | 20.8 | -5.8 |
| 950  | 21.1 | -5.6 |
| 1000 | 21.6 | -5.6 |

|      |      |      |      |       |    |   |
|------|------|------|------|-------|----|---|
| 0.29 | 0.04 | 0.23 | 0.02 | -10.5 | 10 | 3 |
| 0.39 | 0.09 | 0.32 | 0.08 | -10.5 | 10 | 3 |
| 0.56 | 0.14 | 0.47 | 0.08 | -10.5 | 10 | 3 |
| 0.73 | 0.20 | 0.59 | 0.12 | -10.5 | 10 | 3 |
| 0.84 | 0.21 | 0.70 | 0.11 | -10.5 | 10 | 3 |
| 0.98 | 0.24 | 0.80 | 0.13 | -10.5 | 10 | 3 |
| 1.04 | 0.26 | 0.89 | 0.15 | -10.5 | 10 | 3 |
| 1.18 | 0.31 | 0.96 | 0.13 | -10.5 | 10 | 3 |
| 1.28 | 0.35 | 1.03 | 0.19 | -10.5 | 10 | 3 |
| 1.39 | 0.38 | 1.11 | 0.22 | -10.5 | 10 | 3 |
| 1.44 | 0.39 | 1.20 | 0.19 | -10.5 | 10 | 3 |
| 1.55 | 0.46 | 1.24 | 0.23 | -10.5 | 10 | 3 |
| 1.59 | 0.43 | 1.29 | 0.23 | -10.5 | 10 | 3 |
| 1.67 | 0.34 | 1.35 | 0.22 | -10.5 | 10 | 3 |
| 1.67 | 0.42 | 1.41 | 0.15 | -10.5 | 10 | 3 |
| 1.87 | 0.54 | 1.46 | 0.25 | -10.5 | 10 | 3 |
| 1.90 | 0.46 | 1.51 | 0.25 | -10.5 | 10 | 3 |
| 1.99 | 0.60 | 1.56 | 0.27 | -10.5 | 10 | 3 |
| 2.14 | 0.60 | 1.63 | 0.29 | -10.5 | 10 | 3 |
| 2.22 | 0.60 | 1.66 | 0.33 | -10.5 | 10 | 3 |
| 2.23 | 0.61 | 1.71 | 0.30 | -10.5 | 10 | 3 |

#### Sample calculation

$$E \text{ (dB } \mu\text{V/m)} = U \text{ (dB } \mu\text{V)} + \text{AF (dB 1/m)} + \text{Corr. (dB)}$$

U = Receiver reading

AF = Antenna factor

Corr. = sum of single correction factors of used cables, switch unit, distance correction, amplifier (if applicable)

distance correction =  $-20 * \text{LOG} (d_{Limit} / d_{used})$

Linear interpolation will be used for frequencies in between the values in the table.

Tables show an extract of values.

### 6.4 ANTENNA R&S HF907 (1 GHZ – 18 GHZ)

| Frequency<br>MHz | AF<br>R&S<br>HF907<br>dB (1/m) | Corr.<br>dB |
|------------------|--------------------------------|-------------|
| 1000             | 24.4                           | -19.4       |
| 2000             | 28.5                           | -17.4       |
| 3000             | 31.0                           | -16.1       |
| 4000             | 33.1                           | -14.7       |
| 5000             | 34.4                           | -13.7       |
| 6000             | 34.7                           | -12.7       |
| 7000             | 35.6                           | -11.0       |

| cable<br>loss 1<br>(relay +<br>cable<br>inside<br>chamber)<br>dB | cable<br>loss 2<br>(outside<br>chamber)<br>dB | cable<br>loss 3<br>(switch<br>unit,<br>atten-<br>uator &<br>pre-amp)<br>dB | cable<br>loss 4 (to<br>receiver)<br>dB |
|--|---|--|--|
| 0.99   | 0.31  | -21.51   | 0.79                                   |
| 1.44   | 0.44  | -20.63   | 1.38                                   |
| 1.87   | 0.53  | -19.85   | 1.33                                   |
| 2.41   | 0.67  | -19.13   | 1.31                                   |
| 2.78   | 0.86  | -18.71   | 1.40                                   |
| 2.74   | 0.90  | -17.83   | 1.47                                   |
| 2.82   | 0.86  | -16.19   | 1.46                                   |

| Frequency<br>MHz | AF<br>R&S<br>HF907<br>dB (1/m) | Corr.<br>dB |
|------------------|--------------------------------|-------------|
| 3000             | 31.0                           | -23.4       |
| 4000             | 33.1                           | -23.3       |
| 5000             | 34.4                           | -21.7       |
| 6000             | 34.7                           | -21.2       |
| 7000             | 35.6                           | -19.8       |

| cable<br>loss 1<br>(relay<br>inside<br>chamber)<br>dB | cable<br>loss 2<br>(inside<br>chamber)<br>dB | cable<br>loss 3<br>(outside<br>chamber)<br>dB | cable<br>loss 4<br>(switch<br>unit,<br>atten-<br>uator &<br>pre-amp)<br>dB | cable<br>loss 5 (to<br>receiver)<br>dB | used<br>for<br>FCC<br>15.247 |
|---|--|---|--|--|------------------------------|
| 0.47  | 1.87   | 0.53  | -27.58   | 1.33                                   |                              |
| 0.56  | 2.41   | 0.67  | -28.23   | 1.31                                   |                              |
| 0.61  | 2.78   | 0.86  | -27.35   | 1.40                                   |                              |
| 0.58  | 2.74   | 0.90  | -26.89   | 1.47                                   |                              |
| 0.66  | 2.82   | 0.86  | -25.58   | 1.46                                   |                              |

| Frequency<br>MHz | AF<br>R&S<br>HF907<br>dB (1/m) | Corr.<br>dB |
|------------------|--------------------------------|-------------|
| 7000             | 35.6                           | -57.3       |
| 8000             | 36.3                           | -56.3       |
| 9000             | 37.1                           | -55.3       |
| 10000            | 37.5                           | -56.2       |
| 11000            | 37.5                           | -55.3       |
| 12000            | 37.6                           | -53.7       |
| 13000            | 38.2                           | -53.5       |
| 14000            | 39.9                           | -56.3       |
| 15000            | 40.9                           | -54.1       |
| 16000            | 41.3                           | -54.1       |
| 17000            | 42.8                           | -54.4       |
| 18000            | 44.2                           | -54.7       |

| cable<br>loss 1<br>(relay<br>inside<br>chamber)<br>dB | cable<br>loss 2<br>(High<br>Pass)<br>dB | cable<br>loss 3<br>(pre-<br>amp)<br>dB | cable<br>loss 4<br>(inside<br>chamber)<br>dB | cable<br>loss 5<br>(outside<br>chamber)<br>dB | cable<br>loss 6<br>(to<br>receiver)<br>dB |
|---|---|--|--|---|---|
| 0.56  | 1.28                                    | -62.72                                 | 2.66   | 0.94  | 1.46                                      |
| 0.69  | 0.71                                    | -61.49                                 | 2.84   | 1.00  | 1.53                                      |
| 0.68  | 0.65                                    | -60.80                                 | 3.06   | 1.09  | 1.60                                      |
| 0.70  | 0.54                                    | -61.91                                 | 3.28   | 1.20  | 1.67                                      |
| 0.80  | 0.61                                    | -61.40                                 | 3.43   | 1.27  | 1.70                                      |
| 0.84  | 0.42                                    | -59.70                                 | 3.53   | 1.26  | 1.73                                      |
| 0.83  | 0.44                                    | -59.81                                 | 3.75   | 1.32  | 1.83                                      |
| 0.91  | 0.53                                    | -63.03                                 | 3.91   | 1.40  | 1.77                                      |
| 0.98  | 0.54                                    | -61.05                                 | 4.02   | 1.44  | 1.83                                      |
| 1.23  | 0.49                                    | -61.51                                 | 4.17   | 1.51  | 1.85                                      |
| 1.36  | 0.76                                    | -62.36                                 | 4.34   | 1.53  | 2.00                                      |
| 1.70  | 0.53                                    | -62.88                                 | 4.41   | 1.55  | 1.91                                      |

#### Sample calculation

$$E \text{ (dB } \mu\text{V/m)} = U \text{ (dB } \mu\text{V)} + \text{AF (dB 1/m)} + \text{Corr. (dB)}$$

U = Receiver reading

AF = Antenna factor

Corr. = sum of single correction factors of used cables, switch unit, distance correction, amplifier (if applicable)

Linear interpolation will be used for frequencies in between the values in the table.

Tables show an extract of values.

### 6.5 ANTENNA EMCO 3160-09 (18 GHZ – 26.5 GHZ)

| Frequency<br>MHz | AF<br>EMCO<br>3160-09<br>dB (1/m) | Corr.<br>dB | cable<br>loss 1<br>(inside<br>chamber)<br>dB | cable<br>loss 2<br>(pre-<br>amp)<br>dB | cable<br>loss 3<br>(inside<br>chamber)<br>dB | cable<br>loss 4<br>(switch<br>unit)<br>dB | cable<br>loss 5<br>(to<br>receiver)<br>dB |
|------------------|-----------------------------------|-------------|--|--|--|---|---|
| 18000            | 40.2                              | -23.5       | 0.72   | -35.85                                 | 6.20   | 2.81                                      | 2.65                                      |
| 18500            | 40.2                              | -23.2       | 0.69   | -35.71                                 | 6.46   | 2.76                                      | 2.59                                      |
| 19000            | 40.2                              | -22.0       | 0.76   | -35.44                                 | 6.69   | 3.15                                      | 2.79                                      |
| 19500            | 40.3                              | -21.3       | 0.74   | -35.07                                 | 7.04   | 3.11                                      | 2.91                                      |
| 20000            | 40.3                              | -20.3       | 0.72   | -34.49                                 | 7.30   | 3.07                                      | 3.05                                      |
| 20500            | 40.3                              | -19.9       | 0.78   | -34.46                                 | 7.48   | 3.12                                      | 3.15                                      |
| 21000            | 40.3                              | -19.1       | 0.87   | -34.07                                 | 7.61   | 3.20                                      | 3.33                                      |
| 21500            | 40.3                              | -19.1       | 0.90   | -33.96                                 | 7.47   | 3.28                                      | 3.19                                      |
| 22000            | 40.3                              | -18.7       | 0.89   | -33.57                                 | 7.34   | 3.35                                      | 3.28                                      |
| 22500            | 40.4                              | -19.0       | 0.87   | -33.66                                 | 7.06   | 3.75                                      | 2.94                                      |
| 23000            | 40.4                              | -19.5       | 0.88   | -33.75                                 | 6.92   | 3.77                                      | 2.70                                      |
| 23500            | 40.4                              | -19.3       | 0.90   | -33.35                                 | 6.99   | 3.52                                      | 2.66                                      |
| 24000            | 40.4                              | -19.8       | 0.88   | -33.99                                 | 6.88   | 3.88                                      | 2.58                                      |
| 24500            | 40.4                              | -19.5       | 0.91   | -33.89                                 | 7.01   | 3.93                                      | 2.51                                      |
| 25000            | 40.4                              | -19.3       | 0.88   | -33.00                                 | 6.72   | 3.96                                      | 2.14                                      |
| 25500            | 40.5                              | -20.4       | 0.89   | -34.07                                 | 6.90   | 3.66                                      | 2.22                                      |
| 26000            | 40.5                              | -21.3       | 0.86   | -35.11                                 | 7.02   | 3.69                                      | 2.28                                      |
| 26500            | 40.5                              | -21.1       | 0.90   | -35.20                                 | 7.15   | 3.91                                      | 2.36                                      |

#### Sample calculation

$$E \text{ (dB } \mu\text{V/m)} = U \text{ (dB } \mu\text{V)} + AF \text{ (dB 1/m)} + Corr. \text{ (dB)}$$

U = Receiver reading

AF = Antenna factor

Corr. = sum of single correction factors of used cables, switch unit, distance correction, amplifier (if applicable)

Linear interpolation will be used for frequencies in between the values in the table.

Table shows an extract of values.

### 6.6 ANTENNA EMCO 3160-10 (26.5 GHZ – 40 GHZ)

| Frequency<br>GHz | AF<br>EMCO<br>3160-10<br>dB (1/m) | Corr.<br>dB | cable<br>loss 1<br>(inside<br>chamber)<br>dB | cable<br>loss 2<br>(outside<br>chamber)<br>dB | cable<br>loss 3<br>(switch<br>unit)<br>dB | cable<br>loss 4<br>(to<br>receiver)<br>dB | distance<br>corr.<br>(-20 dB/<br>decade)<br>dB | d <sub>Limit</sub><br>(meas.<br>distance<br>(limit)<br>m | d <sub>used</sub><br>(meas.<br>distance<br>(used)<br>m |
|------------------|-----------------------------------|-------------|--|---|---|---|--|--|--|
| 26.5             | 43.4                              | -11.2       | 4.4  |   |   |   | -9.6   | 3  | 1.0  |
| 27.0             | 43.4                              | -11.2       | 4.4  |   |   |   | -9.6   | 3  | 1.0  |
| 28.0             | 43.4                              | -11.1       | 4.5  |   |   |   | -9.6   | 3  | 1.0  |
| 29.0             | 43.5                              | -11.0       | 4.6  |   |   |   | -9.6   | 3  | 1.0  |
| 30.0             | 43.5                              | -10.9       | 4.7  |   |   |   | -9.6   | 3  | 1.0  |
| 31.0             | 43.5                              | -10.8       | 4.7  |   |   |   | -9.6   | 3  | 1.0  |
| 32.0             | 43.5                              | -10.7       | 4.8  |   |   |   | -9.6   | 3  | 1.0  |
| 33.0             | 43.6                              | -10.7       | 4.9  |   |   |   | -9.6   | 3  | 1.0  |
| 34.0             | 43.6                              | -10.6       | 5.0  |   |   |   | -9.6   | 3  | 1.0  |
| 35.0             | 43.6                              | -10.5       | 5.1  |   |   |   | -9.6   | 3  | 1.0  |
| 36.0             | 43.6                              | -10.4       | 5.1  |   |   |   | -9.6   | 3  | 1.0  |
| 37.0             | 43.7                              | -10.3       | 5.2  |   |   |   | -9.6   | 3  | 1.0  |
| 38.0             | 43.7                              | -10.2       | 5.3  |   |   |   | -9.6   | 3  | 1.0  |
| 39.0             | 43.7                              | -10.2       | 5.4  |   |   |   | -9.6   | 3  | 1.0  |
| 40.0             | 43.8                              | -10.1       | 5.5  |   |   |   | -9.6   | 3  | 1.0  |

#### Sample calculation

$$E \text{ (dB } \mu\text{V/m)} = U \text{ (dB } \mu\text{V)} + AF \text{ (dB 1/m)} + Corr. \text{ (dB)}$$

U = Receiver reading

AF = Antenna factor

Corr. = sum of single correction factors of used cables, switch unit, distance correction, amplifier (if applicable)

Linear interpolation will be used for frequencies in between the values in the table.

$$\text{distance correction} = -20 * \text{LOG} (d_{\text{Limit}} / d_{\text{used}})$$

Linear interpolation will be used for frequencies in between the values in the table.

Table shows an extract of values.

## 7 MEASUREMENT UNCERTAINTIES

| <b>Test Case(s)</b>   | <b>Parameter</b>   | <b>Uncertainty</b>     |
|---|--------------------|------------------------|
| - Field strength of spurious radiation  | Power              | ± 5.5 dB               |
| - Out-of-band rejection<br>- Occupied Bandwidth<br>- Input versus output spectrum               | Power<br>Frequency | ± 2.9 dB<br>± 11.2 kHz |
| - Effective radiated power, mean output power and zone enhancer gain<br>- Peak to Average Ratio | Power              | ± 2.2 dB               |
| - Out-of-band emission limits<br>- Conducted Spurious Emissions at Antenna Terminal             | Power<br>Frequency | ± 2.2 dB<br>± 11.2 kHz |

## 8 PHOTO REPORT

Please see separate photo report.