

# Test Report No.50135963 001

## Appendix D: Radiated and Mains Spurious Emission Data

(File: 50135963AppendixD)

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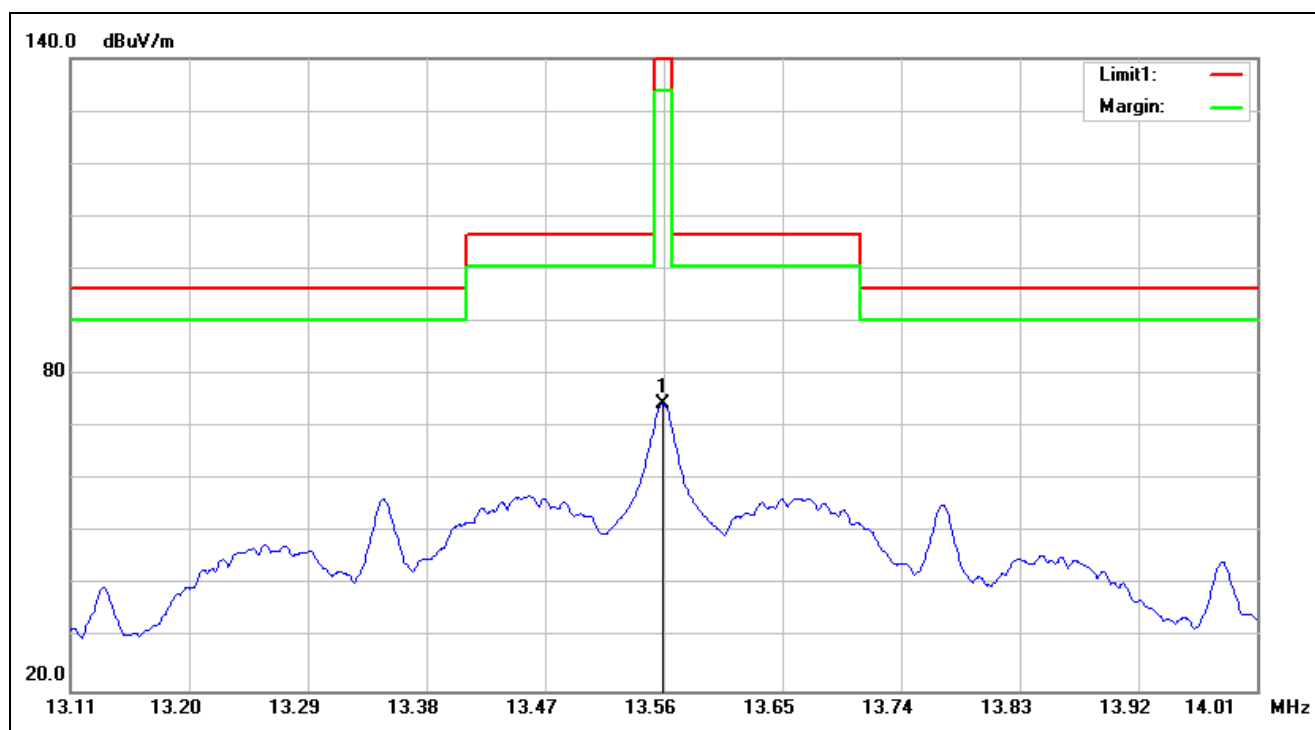
## Emissions, Fundamental



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|                |                                      |                    |                    |
|----------------|--------------------------------------|--------------------|--------------------|
| Service No.:   | 114074050(MACE READER SMART)_FCC     | Test Distance:     | 1.2m               |
| Test Standard: | FCC 15.225_Fundamental_1.2m(dBuV/m)  | Ant. Polarization: |                    |
| Test item:     | Radiation Emission                   | Test Time:         | 2018/3/23 18:52:54 |
| Applicant:     | Nedap                                | Test Rating:       | DC 24V             |
| Product:       | Reader for 13.56MHz NFC cards and BT | Temp.(°C)/Hum.(%): | 20(°C)/50%         |
| Model No.:     | MACE READER SMART                    | Test Engineer:     | Curry Chen         |
| Test Mode:     | 13.56-TX+RX                          |                    |                    |
| Remark:        |                                      |                    |                    |

| No. | Frequency<br>(MHz) | Factor<br>(dB/m) | Reading<br>(dBuV) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Det. | Height<br>(cm) | Azimuth<br>( ° ) | Remark |
|-----|--------------------|------------------|-------------------|-------------------|-------------------|----------------|------|----------------|------------------|--------|
| 1   | 13.5591            | 20.85            | 53.70             | 74.55             | 139.90            | -65.35         | QP   | 100            | 181              |        |

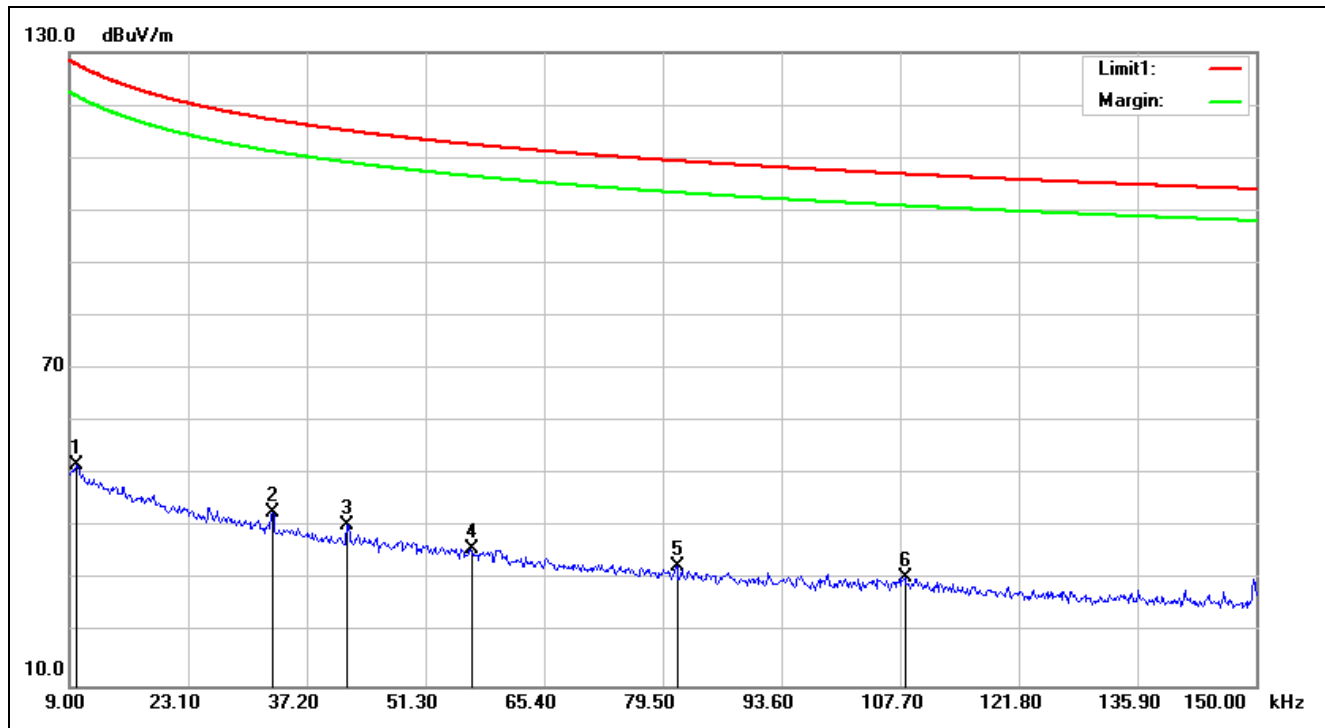
# Spurious Emissions, TX Mode, 9-150 kHz



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|                |                                      |                    |                    |
|----------------|--------------------------------------|--------------------|--------------------|
| Service No.:   | 114074050(MACE READER SMART)_FCC     | Test Distance:     | 3m                 |
| Test Standard: | FCC 15.225_9k-30M_3m(dBuV/m)         | Ant. Polarization: |                    |
| Test item:     | Radiation Emission                   | Test Time:         | 2018/3/23 18:58:36 |
| Applicant:     | Nedap                                | Test Rating:       | DC 24V             |
| Product:       | Reader for 13.56MHz NFC cards and BT | Temp.(°C)/Hum.(%): | 20(°C)/50%         |
| Model No.:     | MACE READER SMART                    | Test Engineer:     | Curry Chen         |
| Test Mode:     | 13.56-TX+RX                          |                    |                    |
| Remark:        |                                      |                    |                    |

| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Det. | Height (cm) | Azimuth (°) | Remark |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|------|-------------|-------------|--------|
| 1   | 0.0098          | 19.85         | 31.86          | 51.71          | 127.78         | -76.07      | QP   | 100         | 279         |        |
| 2   | 0.0331          | 20.02         | 22.93          | 42.95          | 117.21         | -74.26      | QP   | 100         | 249         |        |
| 3   | 0.0420          | 19.71         | 20.83          | 40.54          | 115.14         | -74.60      | QP   | 100         | 279         |        |
| 4   | 0.0567          | 19.39         | 16.49          | 35.88          | 112.53         | -76.65      | QP   | 100         | 41          |        |
| 5   | 0.0811          | 19.24         | 13.29          | 32.53          | 109.42         | -76.89      | QP   | 100         | 251         |        |
| 6   | 0.1083          | 19.12         | 11.48          | 30.60          | 106.91         | -76.31      | QP   | 100         | 261         |        |

## Spurious Emissions, TX Mode 150 kHz -30MHz

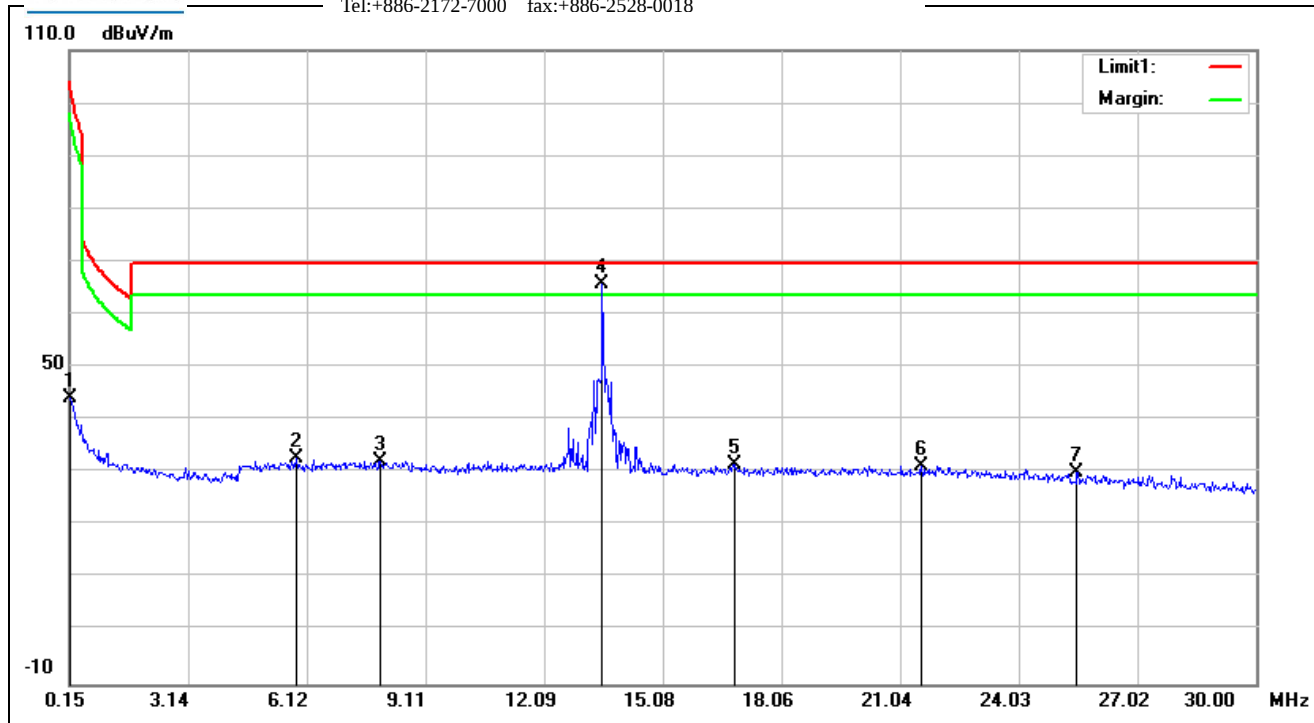
# Spurious Emissions, TX Mode, 150 kHz -30MHz



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|                |                                      |                    |                    |
|----------------|--------------------------------------|--------------------|--------------------|
| Service No.:   | 114074050(MACE READER SMART)_FCC     | Test Distance:     | 3m                 |
| Test Standard: | FCC 15.225_9k-30M_3m(dBuV/m)         | Ant. Polarization: |                    |
| Test item:     | Radiation Emission                   | Test Time:         | 2018/3/23 19:00:05 |
| Applicant:     | Nedap                                | Test Rating:       | DC 24V             |
| Product:       | Reader for 13.56MHz NFC cards and BT | Temp.(°C)/Hum.(%)  | 20(°C)/50%         |
| Model No.:     | MACE READER SMART                    | Test Engineer:     | Curry Chen         |
| Test Mode:     | 13.56-TX+RX                          |                    |                    |
| Remark:        |                                      |                    |                    |

| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Det. | Height (cm) | Azimuth ( ° ) | Remark      |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|------|-------------|---------------|-------------|
| 1   | 0.1799          | 19.06         | 25.23          | 44.29          | 102.50         | -58.21      | QP   | 100         | 334           |             |
| 2   | 5.8514          | 19.84         | 12.92          | 32.76          | 69.54          | -36.78      | QP   | 100         | 45            |             |
| 3   | 7.9707          | 20.04         | 12.16          | 32.20          | 69.54          | -37.34      | QP   | 100         | 168           |             |
| 4   | 13.5600         | 20.85         | 44.84          | 65.69          | 69.54          | -3.85       | QP   | 100         | 0             | Fundamental |
| 5   | 16.8660         | 21.43         | 10.20          | 31.63          | 69.54          | -37.91      | QP   | 100         | 12            |             |
| 6   | 21.5823         | 22.09         | 9.20           | 31.29          | 69.54          | -38.25      | QP   | 100         | 340           |             |
| 7   | 25.4927         | 22.35         | 7.70           | 30.05          | 69.54          | -39.49      | QP   | 100         | 147           |             |

# Spurious Emissions, TX Mode 150 kHz -30MHz

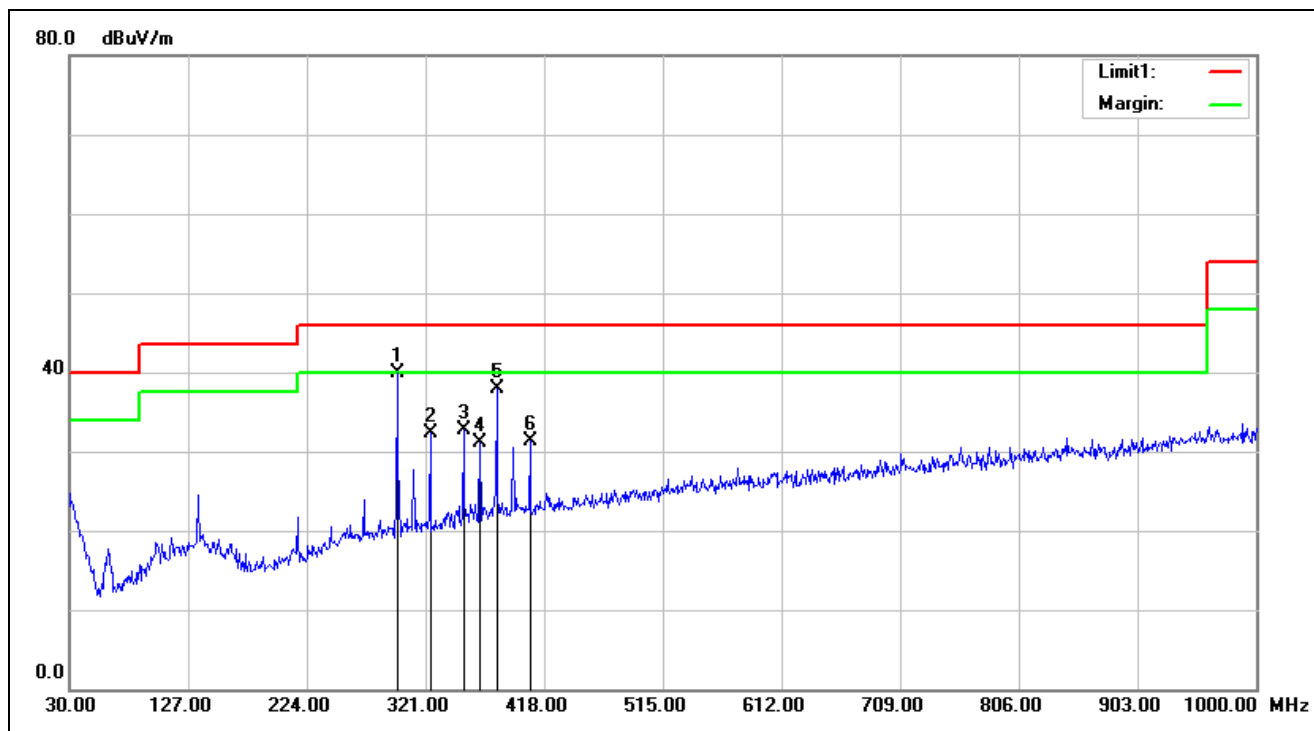
# Spurious Emissions, TX Mode, 30MHz-1GHz



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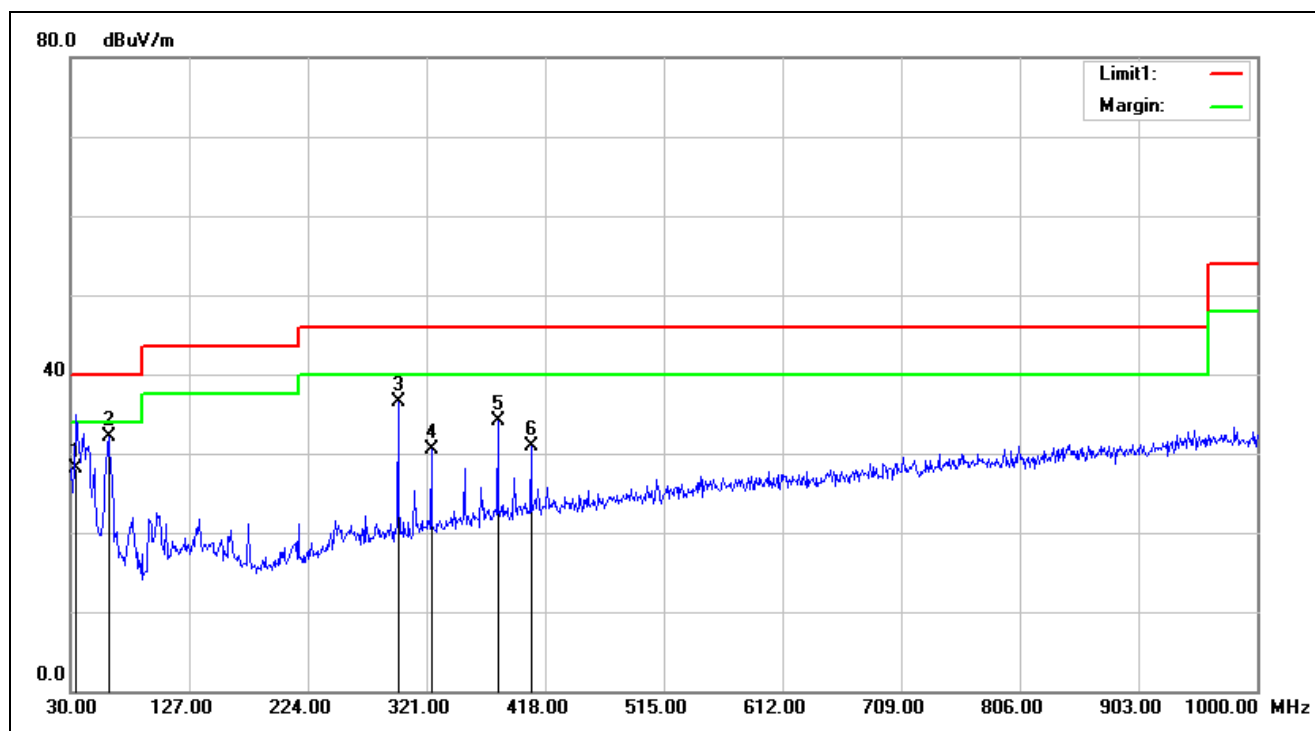
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|                |                                      |                    |                    |
|----------------|--------------------------------------|--------------------|--------------------|
| Service No.:   | 114074050(MACE READER SMART)_FCC     | Test Distance:     | 3m                 |
| Test Standard: | FCC Class B 3M Radiation             | Ant. Polarization: | Horizontal         |
| Test item:     | Radiation Emission                   | Test Time:         | 2018/3/26 18:54:56 |
| Applicant:     | Nedap                                | Test Rating:       | DC 24V             |
| Product:       | Reader for 13.56MHz NFC cards and BT | Temp.(°C)/Hum.(%)  | 21(°C)/60%         |
| Model No.:     | MACE READER SMART                    | Test Engineer:     | Curry Chen         |
| Test Mode:     | 13.56-TX+RX                          |                    |                    |
| Remark:        |                                      |                    |                    |

| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Det. | Height (cm) | Azimuth (°) | Remark |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|------|-------------|-------------|--------|
| 1   | 297.7200        | -4.62         | 44.53          | 39.91          | 46.00          | -6.09       | QP   | 100         | 139         |        |
| 2   | 324.8800        | -3.95         | 36.35          | 32.40          | 46.00          | -13.60      | QP   | 100         | 132         |        |
| 3   | 352.0400        | -3.31         | 36.03          | 32.72          | 46.00          | -13.28      | QP   | 100         | 144         |        |
| 4   | 365.6200        | -3.06         | 34.19          | 31.13          | 46.00          | -14.87      | QP   | 100         | 132         |        |
| 5   | 379.2000        | -2.81         | 40.77          | 37.96          | 46.00          | -8.04       | QP   | 100         | 132         |        |
| 6   | 406.3600        | -2.37         | 33.69          | 31.32          | 46.00          | -14.68      | QP   | 100         | 139         |        |

## Spurious Emissions, Mains, 150kHz - 30MHz



|                |                                      |                    |                    |
|----------------|--------------------------------------|--------------------|--------------------|
| Service No.:   | 114074050(MACE READER SMART)_FCC     | Test Distance:     | 3m                 |
| Test Standard: | FCC Class B 3M Radiation             | Ant. Polarization: | Vertical           |
| Test item:     | Radiation Emission                   | Test Time:         | 2018/3/26 18:55:53 |
| Applicant:     | Nedap                                | Test Rating:       | DC 24V             |
| Product:       | Reader for 13.56MHz NFC cards and BT | Temp.(°C)/Hum.(%)  | 21(°C)/60%         |
| Model No.:     | MACE READER SMART                    | Test Engineer:     | Curry Chen         |
| Test Mode:     | 13.56-TX+RX                          |                    |                    |
| Remark:        |                                      |                    |                    |

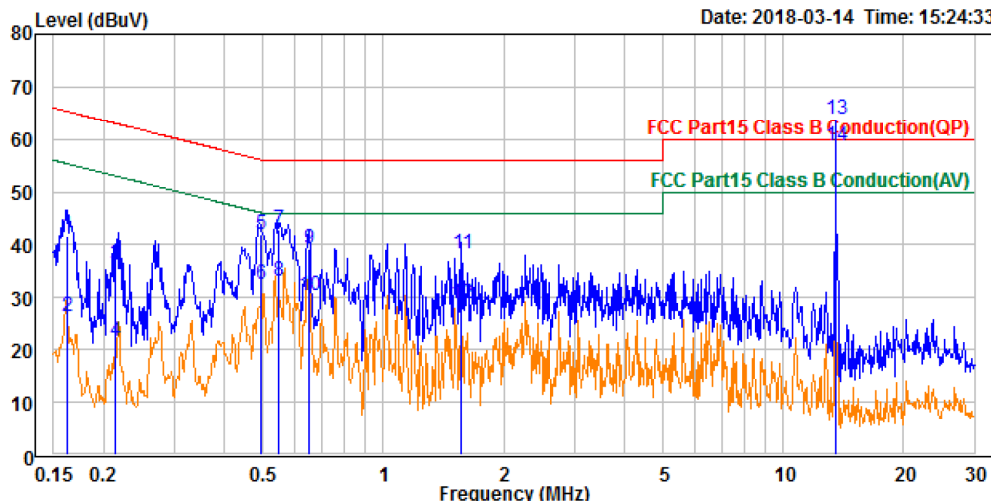
| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Det. | Height (cm) | Azimuth (°) | Remark |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|------|-------------|-------------|--------|
| 1   | 34.8500         | -3.01         | 31.21          | 28.20          | 40.00          | -11.80      | QP   | 100         | 357         |        |
| 2   | 61.0400         | -13.72        | 45.73          | 32.01          | 40.00          | -7.99       | QP   | 100         | 117         |        |
| 3   | 297.7200        | -4.62         | 41.22          | 36.60          | 46.00          | -9.40       | QP   | 100         | 219         |        |
| 4   | 324.8800        | -3.95         | 34.54          | 30.59          | 46.00          | -15.41      | QP   | 100         | 207         |        |
| 5   | 379.2000        | -2.81         | 36.87          | 34.06          | 46.00          | -11.94      | QP   | 100         | 69          |        |
| 6   | 406.3600        | -2.37         | 33.19          | 30.82          | 46.00          | -15.18      | QP   | 100         | 204         |        |

**Spurious Emissions, Mains, 150kHz - 30MHz**

# Mains Spurious Emissions

File: C:\EMC\Report\2018\Nedap\114074050(XXX)\1\_00001.EMI

Date: 2018-03-14 Time: 15:24:33



Trace: 1

Site : Conduction room  
Condition : FCC Part15 Class B Conduction(QP) line1  
Test Engineer: George Yang  
Applicant : Nedap  
Product : Mace reader smart  
Model No. : Mace reader smart  
Test Rating : 24Vdc  
Tmp/Hum : 21.3 °C / 44 %  
Memo : RFID + BT link

|      | Freq   | Read Level | Factor | Level | Limit Line | Over Limit | Remark  |
|------|--------|------------|--------|-------|------------|------------|---------|
|      | MHz    | dBuV       | dB     | dBuV  | dBuV       | dB         |         |
| 1    | 0.162  | 32.01      | 9.65   | 41.66 | 65.38      | -23.72     | QP      |
| 2    | 0.162  | 16.87      | 9.65   | 26.52 | 55.38      | -28.86     | Average |
| 3    | 0.214  | 26.40      | 9.65   | 36.05 | 63.05      | -27.00     | QP      |
| 4    | 0.214  | 11.80      | 9.65   | 21.45 | 53.05      | -31.60     | Average |
| 5    | 0.493  | 32.21      | 9.66   | 41.87 | 56.11      | -14.24     | QP      |
| 6    | 0.493  | 23.01      | 9.66   | 32.67 | 46.11      | -13.44     | Average |
| 7    | 0.547  | 33.26      | 9.66   | 42.92 | 56.00      | -13.08     | QP      |
| 8    | 0.547  | 23.49      | 9.66   | 33.15 | 46.00      | -12.85     | Average |
| 9    | 0.652  | 29.56      | 9.66   | 39.22 | 56.00      | -16.78     | QP      |
| 10   | 0.652  | 20.82      | 9.66   | 30.48 | 46.00      | -15.52     | Average |
| 11   | 1.569  | 28.54      | 9.68   | 38.22 | 56.00      | -17.78     | QP      |
| 12   | 1.569  | 19.30      | 9.68   | 28.98 | 46.00      | -17.02     | Average |
| 13 * | 13.559 | 54.01      | 9.81   | 63.82 | 60.00      | 3.82       | QP      |
| 14 * | 13.559 | 48.99      | 9.81   | 58.80 | 50.00      | 8.80       | Average |

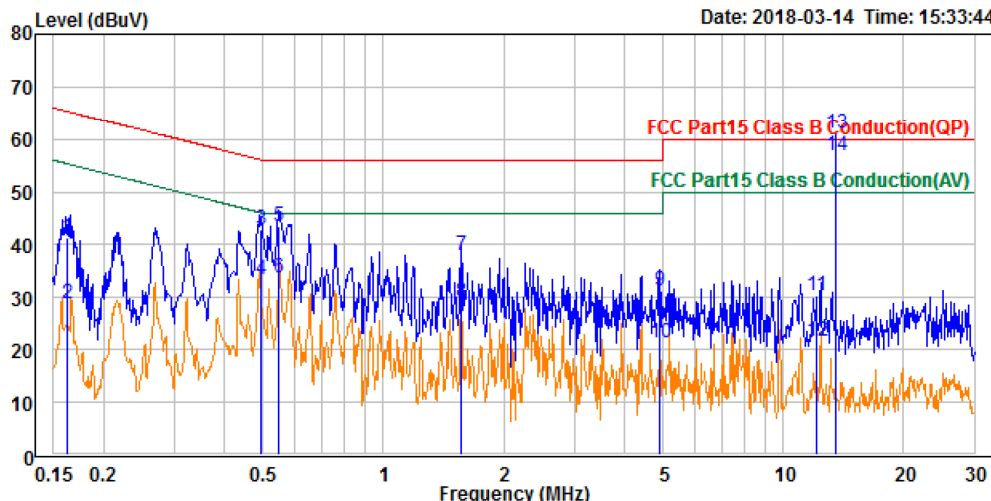
- 1 -

Note: The frequency 13.56MHz is coming from RFID function, so it's not requested by this standard.  
(Requested by EN 300 330)

**Spurious Emissions, Mains, 150kHz - 30MHz**

File: C:\EMC\Report\2018\Nedap\114074050(XXX)\1\_00003.EMI

Date: 2018-03-14 Time: 15:33:44



Trace: 1

Site : Conduction room  
Condition : FCC Part15 Class B Conduction(QP) neutral  
Test Engineer: George Yang  
Applicant : Nedap  
Product : Mace reader smart  
Model No. : Mace reader smart  
Test Rating : 24Vdc  
Tmp/Hum : 21.3 °C / 44 %  
Memo : RFID + BT link

|      | Freq   | Read Level | Factor | Level | Limit Line | Over Limit | Remark  |
|------|--------|------------|--------|-------|------------|------------|---------|
|      | MHz    | dBuV       | dB     | dBuV  | dBuV       | dB         |         |
| 1    | 0.163  | 31.74      | 9.66   | 41.40 | 65.32      | -23.92     | QP      |
| 2    | 0.163  | 19.11      | 9.66   | 28.77 | 55.32      | -26.55     | Average |
| 3    | 0.495  | 33.10      | 9.66   | 42.76 | 56.08      | -13.32     | QP      |
| 4    | 0.495  | 23.73      | 9.66   | 33.39 | 46.08      | -12.69     | Average |
| 5    | 0.547  | 33.93      | 9.66   | 43.59 | 56.00      | -12.41     | QP      |
| 6    | 0.547  | 24.11      | 9.66   | 33.77 | 46.00      | -12.23     | Average |
| 7    | 1.570  | 28.27      | 9.69   | 37.96 | 56.00      | -18.04     | QP      |
| 8    | 1.570  | 19.40      | 9.69   | 29.09 | 46.00      | -16.91     | Average |
| 9    | 4.927  | 21.57      | 9.74   | 31.31 | 56.00      | -24.69     | QP      |
| 10   | 4.927  | 11.44      | 9.74   | 21.18 | 46.00      | -24.82     | Average |
| 11   | 12.072 | 20.66      | 9.83   | 30.49 | 60.00      | -29.51     | QP      |
| 12   | 12.072 | 11.62      | 9.83   | 21.45 | 50.00      | -28.55     | Average |
| 13 * | 13.560 | 51.40      | 9.84   | 61.24 | 60.00      | 1.24       | QP      |
| 14 * | 13.560 | 46.99      | 9.84   | 56.83 | 50.00      | 6.83       | Average |

Note: The frequency 13.56MHz is coming from RFID function, so it's not requested by this standard.  
(Requested by EN 300 330)

**Spurious Emissions, Mains, 150kHz - 30MHz**