

**CETECOM™****CETECOM ICT Services**
consulting - testing - certification >>>

TEST REPORT

Test report no.: 1-1110/16-13-02-D

Deutsche
Akkreditierungsstelle
D-PL-12076-01-00

Testing laboratory

CETECOM ICT Services GmbH

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Internet: <http://www.cetecom.com>e-mail: ict@cetecom.com**Accredited Testing Laboratory:**

The testing laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025 (2005) by the Deutsche Akkreditierungsstelle GmbH (DAkkS)

The accreditation is valid for the scope of testing procedures as stated in the accreditation certificate with the registration number: D-PL-12076-01-00

Applicant

Pacific Industrial Co., Ltd

Godo-Cho, Anpachi

Gifu 503-2397 / JAPAN

Phone: -/-

Fax: -/-

Contact: Kunitaka Yano

e-mail: knyano@pacific-ind.co.jp

Phone: -/-

Manufacturer

Pacific Industrial Co., Ltd

Godo-Cho, Anpachi

Gifu 503-2397 / JAPAN

Test standard/s

47 CFR Part 15

Title 47 of the Code of Federal Regulations; Chapter I; Part 15 - Radio frequency devices

RSS - 210 Issue 8

Spectrum Management and Telecommunications Radio Standards Specification - Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment

For further applied test standards please refer to section 3 of this test report.

Test Item

Kind of test item: Tire Pressure Monitoring System Transmitter**Model name:** PMV-CA74**FCC ID:** PAXPMVCA74**IC:** 3729A-PMVCA74

Frequency: 433.92 MHz

Technology tested: Modulated carrier

Antenna: Integrated antenna

Power supply: 3.3 V DC by lithium battery

Temperature range: -20°C to +60°C



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

Test report authorized:

Stefan BöS
Lab Manager
Radio Communications & EMC

Test performed:

Marco Bertolino
Lab Manager
Radio Communications & EMC

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2 General information

2.1 Notes and disclaimer

The test results of this test report relate exclusively to the test item specified in this test report. CETECOM ICT Services GmbH does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of CETECOM ICT Services GmbH.

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This report replaces test report 1-1110/16-13-02-A dated from 2016-02-19.

2.2 Application details

Date of receipt of order:	2016-02-04
Date of receipt of test item:	2016-02-09
Start of test:	2016-02-10
End of test:	2016-02-11
Person(s) present during the test:	-/-

3 Test standard/s and references

Test standard	Date	Description
47 CFR Part 15	-/-	Title 47 of the Code of Federal Regulations; Chapter I; Part 15 - Radio frequency devices
RSS - 210 Issue 8	December 2010	Spectrum Management and Telecommunications Radio Standards Specification - Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment
RSS - 210 Issue 8 Amendment 1	February 2015	RSS-210, Amendment 1 — Licence-Exempt, Low-Power Radio Apparatus Operating in the Television Bands (February 2015)

Guidance	Version	Description
ANSI C63.4-2014	-/-	American national standard for methods of measurement of radio-noise emissions from low-voltage electrical and electronic equipment in the range of 9 kHz to 40 GHz
ANSI C63.10-2013	-/-	American national standard of procedures for compliance testing of unlicensed wireless devices

4 Test environment

Temperature	:	T_{nom} T_{max} T_{min}	+23 °C during room temperature tests +60 °C during high temperature tests -20 °C during low temperature tests
Relative humidity content	:		55 %
Barometric pressure	:		not relevant for this kind of testing
Power supply	:	V_{nom} V_{max} V_{min}	3.0 V DC by lithium battery -/- V -/- V

5 Test item

5.1 General description

Kind of test item	:	Tire Pressure Monitoring System Transmitter
Type identification	:	PMV-CA74
HMN	:	-/-
PMN	:	PMV-CA74
HVIN	:	PMV-CA74
FVIN	:	-/-
S/N serial number	:	ID: 00015CC ID: 00015CD
HW hardware status	:	No information available!
SW software status	:	No information available!
Frequency band	:	433.92 MHz
Type of radio transmission	:	Modulated carrier
Use of frequency spectrum	:	
Type of modulation	:	F1D
Number of channels	:	1
Antenna	:	Integrated antenna
Power supply	:	3.0 V DC by lithium battery
Temperature range	:	-20°C to +60°C

5.2 Additional information

The content of the following annexes is defined in the QA. It may be that not all of the listed annexes are necessary for this report, thus some values in between may be missing.

Test setup-photos are included in test report:

1-1110/16-13-01_AnnexD

6 Test laboratories sub-contracted

None

7 Description of the test setup

Typically, the calibrations of the test apparatus are commissioned to and performed by an accredited calibration laboratory. The calibration intervals are determined in accordance with the DIN EN ISO/IEC 17025. In addition to the external calibrations, the laboratory executes comparison measurements with other calibrated test systems or effective verifications. Weekly chamber inspections and range calibrations are performed. Where possible, RF generating and signaling equipment as well as measuring receivers and analyzers are connected to an external high-precision 10 MHz reference (GPS-based or rubidium frequency standard).

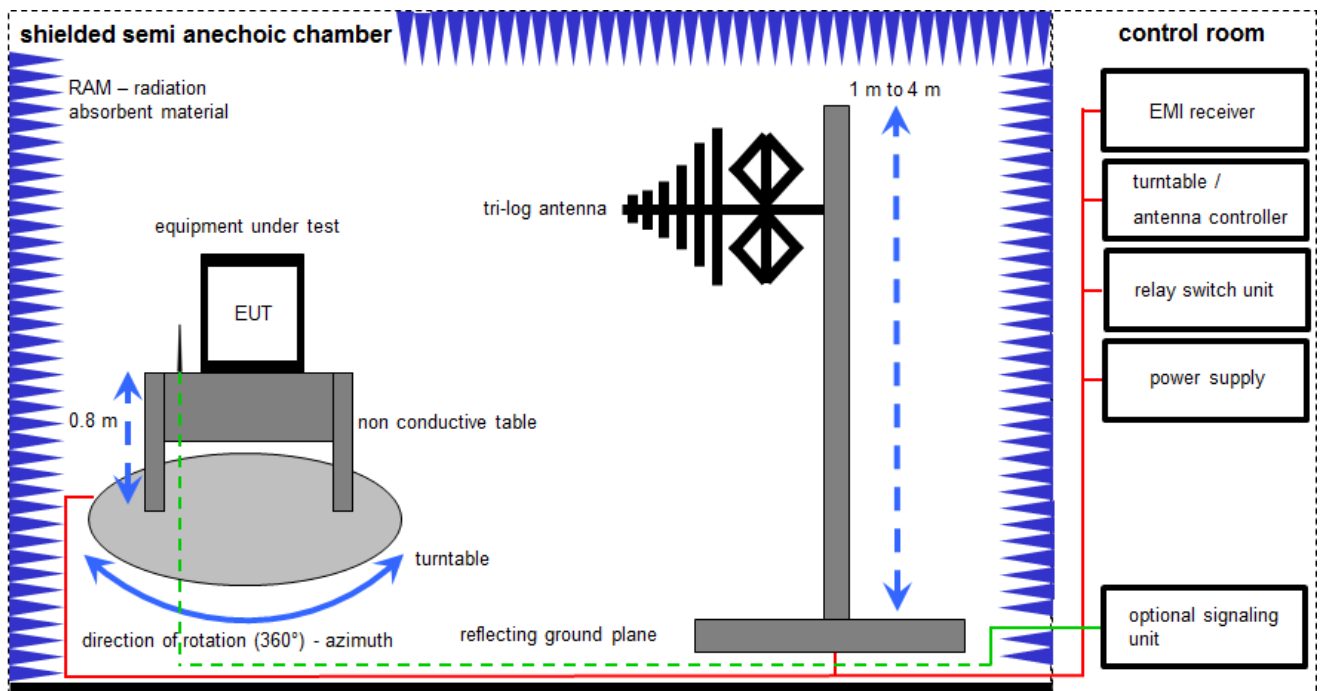
In order to simplify the identification of the equipment used at some special tests, some items of test equipment and ancillaries can be provided with an identifier or number in the equipment list below (Lab/Item).

Agenda: Kind of Calibration

k	calibration / calibrated	EK	limited calibration
ne	not required (k, ev, izw, zw not required)	zw	cyclical maintenance (external cyclical maintenance)
ev	periodic self verification	izw	internal cyclical maintenance
Ve	long-term stability recognized	g	blocked for accredited testing
v/k!	Attention: extended calibration interval		
NK!	Attention: not calibrated	*)	next calibration ordered / currently in progress

7.1 Shielded semi anechoic chamber

The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 1 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber. The receiving antennas are confirmed with specifications ANSI C63. These antennas can be moved over the height range between 1.0 m and 4.0 m in order to search for maximum field strength emitted from EUT. The measurement distances between EUT and receiving antennas are indicated in the test setups for the various frequency ranges. For each measurement, the EUT is rotated in all three axes until the maximum field strength is received. The wanted and unwanted emissions are received by spectrum analyzers where the detector modes and resolution bandwidths over various frequency ranges are set according to requirement ANSI C63.



Measurement distance: tri-log antenna 10 meter

$$FS = UR + CL + AF$$

(FS-field strength; UR-voltage at the receiver; CL-loss of the cable; AF-antenna factor)

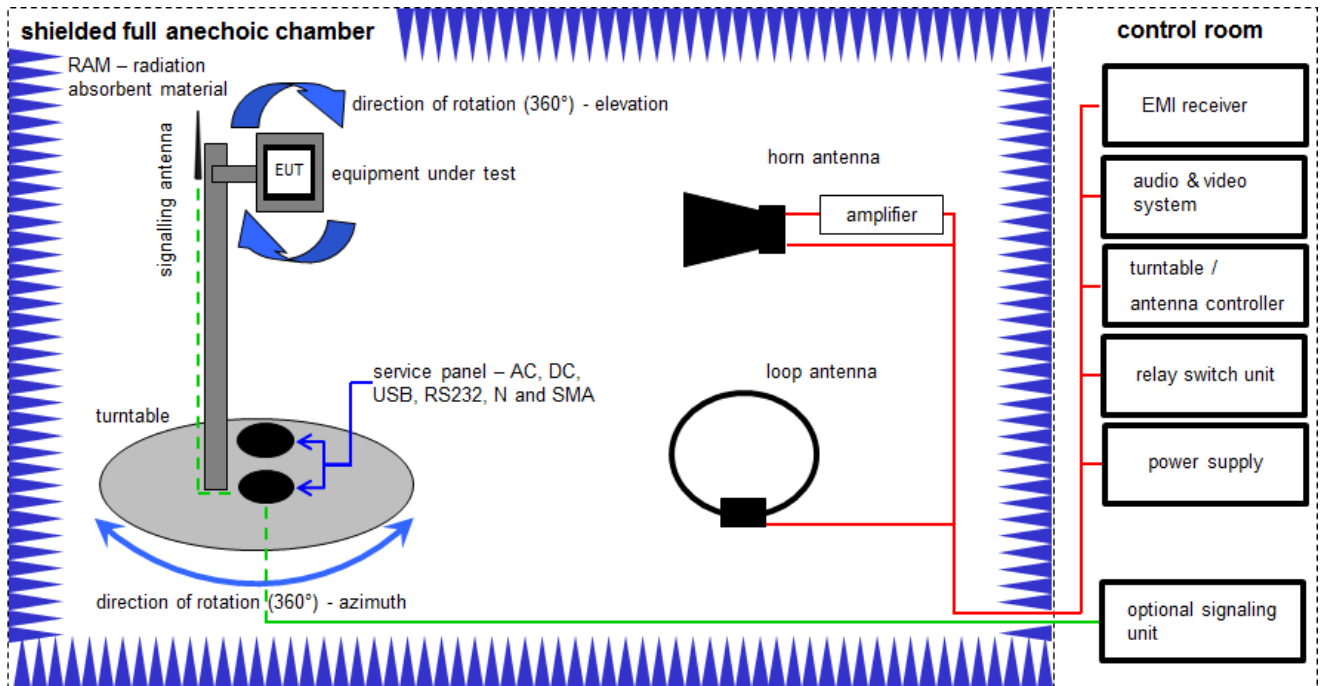
Example calculation:

$$FS [dB\mu V/m] = 12.35 [dB\mu V/m] + 1.90 [dB] + 16.80 [dB/m] = 31.05 [dB\mu V/m] \quad (35.69 \mu V/m)$$

Equipment table:

No.	Lab / Item	Equipment	Type	Manufacturer	Serial No.	INV. No Cetecom	Kind of Calibration	Last Calibration	Next Calibration
1	A	EMI Test Receiver	ESCI 3	R&S	100083	300003312	k	26.01.2016	26.01.2017
2	A	Positioning Controller	Model 2090	ETS-Lindgren	64672	300003746	izw	-/-	-/-
3	A	Turntable Interface-Box	Model 105637	ETS-Lindgren	44583	300003747	izw	-/-	-/-
4	A	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	295	300003787	k	22.04.2014	22.04.2016

7.2 Shielded fully anechoic chamber



Measurement distance: horn antenna 3 meter; loop antenna 3 meter

$$FS = UR + CA + AF$$

(FS-field strength; UR-voltage at the receiver; CA-loss of the signal path; AF-antenna factor)

Example calculation:

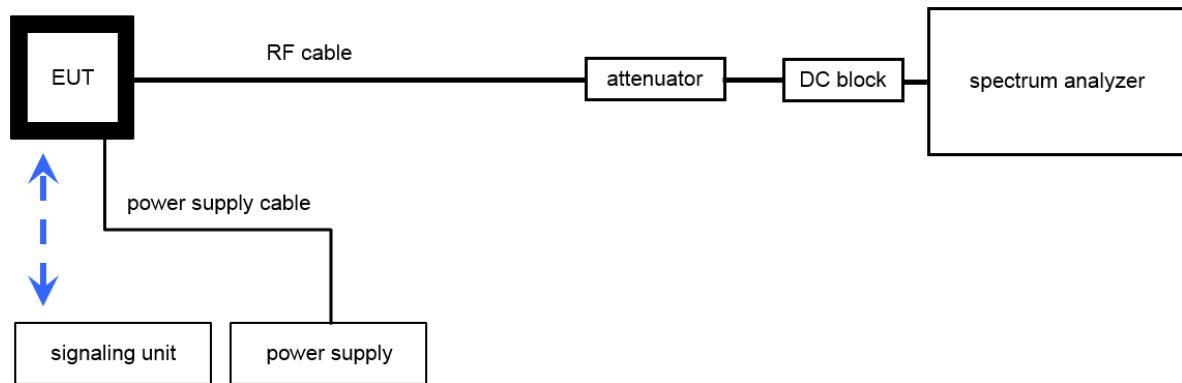
$$FS [dB\mu V/m] = 40.0 [dB\mu V/m] + (-35.8) [dB] + 32.9 [dB/m] = 37.1 [dB\mu V/m] (71.61 \mu V/m)$$

Equipment table:

No.	Lab / Item	Equipment	Type	Manufacturer	Serial No.	INV. No Cetecom	Kind of Calibration	Last Calibration	Next Calibration
1	A	Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	8812-3088	300001032	vIKI!	20.05.2015	20.05.2017
2	A	Anechoic chamber	FAC 3/5m	MWB / TDK	87400/02	300000996	ev	-/-	-/-
3	A	Switch / Control Unit	3488A	HP	*	300000199	ne	-/-	-/-
4	A	Active Loop Antenna 10 kHz to 30 MHz	6502	EMCO/2	8905-2342	300000256	k	24.06.2015	24.06.2017
5	A	Amplifier	js42-00502650-28-5a	Parzich GMBH	928979	300003143	ne	-/-	-/-
6	A	4U RF Switch Platform	L4491A	Agilent Technologies	MY50000037	300004509	ne	-/-	-/-
7	A	EMI Test Receiver 9kHz-26,5GHz	ESR26	R&S	101376	300005063	k	04.09.2015	04.09.2016

7.3 Conducted measurements

Conducted measurements normal conditions



OP = AV + CA
 (OP-output power; AV-analyzer value; CA-loss signal path)

Example calculation:

OP [dBm] = 6.0 [dBm] + 11.7 [dB] = 17.7 [dBm] (58.88 mW)

Equipment table:

No.	Lab / Item	Equipment	Type	Manufacturer	Serial No.	INV. No Cetecom	Kind of Calibration	Last Calibration	Next Calibration
1	A	Signal Analyzer 40 GHz	FSV40	R&S	101042	300004517	k	21.01.2016	21.01.2017
2	A	RF-Cable	ST18/SMAM/SMAM/72	Huber & Suhner	Batch no. 699714	400001184	ev	-/-	-/-
3	A	DC-Blocker 0.1-40 GHz	8141A	Inmet	Batch no. 699714	400001185	ev	-/-	-/-
4	A	Coax Attenuator 10 dB 2W 0-40 GHz	MCL BW-K10-2W44+	Mini Circuits	Batch no. 699714	400001186	ev	-/-	-/-

8 Sequence of testing

8.1 Sequence of testing radiated spurious 9 kHz to 30 MHz

Setup

- The equipment is set up to simulate normal operation mode as described in the user manual or defined by the manufacturer.
- If the EUT is a tabletop system, a 2-axis positioner with 1.5 m height is used.
- If the EUT is a floor standing device, it is placed directly on the turn table.
- Auxiliary equipment and cables are positioned to simulate normal operation conditions as described in ANSI C 63.4.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- Measurement distance is 3 m (see ANSI C 63.4) – see test details.
- EUT is set into operation.

Premeasurement

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna height is 1.5 m.
- At each turntable position the analyzer sweeps with positive-peak detector to find the maximum of all emissions.

Final measurement

- Identified emissions during the premeasurement are maximized by the software by rotating the turntable from 0° to 360°. In case of the 2-axis positioner is used the elevation axis is also rotated from 0° to 360°.
- The final measurement is done in the position (turntable and elevation) causing the highest emissions with quasi-peak (as described in ANSI C 63.4).
- Final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. A plot with the graph of the premeasurement and the limit is stored.

8.2 Sequence of testing radiated spurious 30 MHz to 1 GHz

Setup

- The equipment is set up to simulate normal operation mode as described in the user manual or defined by the manufacturer.
- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.
- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- Auxiliary equipment and cables are positioned to simulate normal operation conditions as described in ANSI C 63.4.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- Measurement distance is 10 m or 3 m (see ANSI C 63.4) – see test details.
- EUT is set into operation.

Premeasurement

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna is polarized vertical and horizontal.
- The antenna height changes from 1 m to 3 m.
- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

Final measurement

- The final measurement is performed for at least six highest peaks according to the requirements of the ANSI C63.4.
- Based on antenna and turntable positions at which the peak values are measured the software maximize the peaks by changing turntable position $\pm 45^\circ$ and antenna height between 1 and 4 m.
- The final measurement is done with quasi-peak detector (as described in ANSI C 63.4).
- Final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit are recorded. A plot with the graph of the premeasurement with marked maximum final results and the limit is stored.

8.3 Sequence of testing radiated spurious 1 GHz to 5 GHz

Setup

- The equipment is set up to simulate normal operation mode as described in the user manual or defined by the manufacturer.
- If the EUT is a tabletop system, a 2-axis positioner with 1.5 m height is used.
- If the EUT is a floor standing device, it is placed directly on the turn table.
- Auxiliary equipment and cables are positioned to simulate normal operation conditions as described in ANSI C 63.4.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- Measurement distance is 3 m (see ANSI C 63.4) – see test details.
- EUT is set into operation.

Premeasurement

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna is polarized vertical and horizontal.
- The antenna height is 1.5 m.
- At each turntable position and antenna polarization the analyzer sweeps with positive peak detector to find the maximum of all emissions.

Final measurement

- The final measurement is performed for at least six highest peaks according to the requirements of the ANSI C63.4.
- Based on antenna and turntable positions at which the peak values are measured the software maximizes the peaks by rotating the turntable from 0° to 360°. This measurement is repeated for different EUT-table positions (0° to 150° in 30°-steps) and for both antenna polarizations.
- The final measurement is done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and RMS detector (as described in ANSI C 63.4).
- Final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit are recorded. A plot with the graph of the premeasurement with marked maximum final results and the limit is stored.

9 Summary of measurement results

<input checked="" type="checkbox"/>	No deviations from the technical specifications were ascertained
<input type="checkbox"/>	There were deviations from the technical specifications ascertained
<input type="checkbox"/>	This test report is only a partial test report. The content and verdict of the performed test cases are listed below.

TC Identifier	Description	Verdict	Date	Remark
RF-Testing	CFR Part 15 RSS 210, Issue 8, Annex 8	See table!	2016-03-03	-/-

Test specification clause	Test case	Temperature conditions	Power source voltages	C	NC	NA	NP	Remark
§ 15.35 (c) 15.231(e) RSS-GEN	Timing of the transmitter (Duty cycle correction factor)	Nominal	Nominal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-/-
§ 15.231 (e) RSS-210 Issue 8	Silent period between transmissions	Nominal	Nominal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-/-
§ 15.231 (c) RSS-210 Issue 8	Emission bandwidth	Nominal	Nominal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-/-
§ 15.231 (e) RSS-210 Issue 8	Fieldstrength of Fundamental	Nominal	Nominal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-/-
§ 15.209 RSS-210 Issue 8	Fieldstrength of harmonics and spurious	Nominal	Nominal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-/-
§ 15.209 RSS-GEN	Receiver spurious emissions (radiated)	Nominal	Nominal	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	-/-

Note: C = Compliant; NC = Not compliant; NA = Not applicable; NP = Not performed

9.1 Additional comments

Reference documents:

PMV_CA14_LF_Trigger_Manual (Test mode and timing)

TPMS_Technical_Document (PMV-CA74) V1.2 (Timing, external & internal photos)

Special test descriptions: None

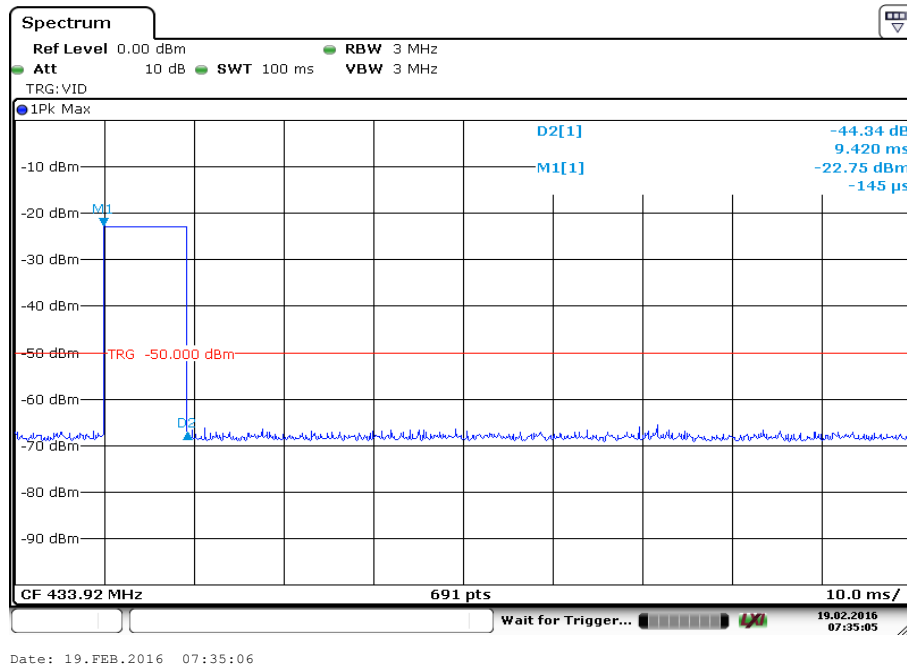
Configuration descriptions: None

10 Measurement results**10.1 Timing of the transmitter and silent periods between transmissions****Measurement:**

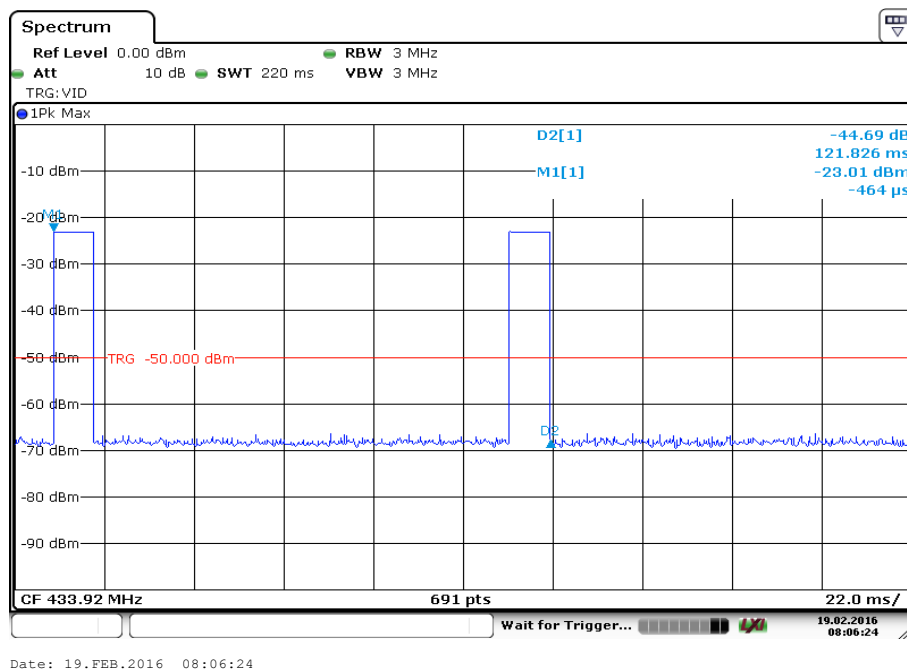
Measurement parameter	
Detector:	Peak
Sweep time:	100 ms
Resolution bandwidth:	1 MHz
Video bandwidth:	3 MHz
Span:	Zero
Trace mode:	Single sweep

Limits:

FCC	IC
<p>(c) Unless otherwise specified, e.g. Section 15.255(b), when the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value. The exact method of calculating the average field strength shall be submitted with any application for certification or shall be retained in the measurement data file for equipment subject to notification or verification.</p>	
<p style="text-align: center;">§15.231 (e)</p> <p>In addition, devices operated under the provisions of this paragraph shall be provided with a means for automatically limiting operation so that the duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds.</p>	

Result:**Plot 1: one transmit burst**

Burst length within 100 ms: 9.42 ms

Burst transmission duration average correction factor: $20 \log (0.0942) = 20.52 \text{ dB}$ **Plot 2: TX on time (complete pulse train which is always followed by a silent period)**

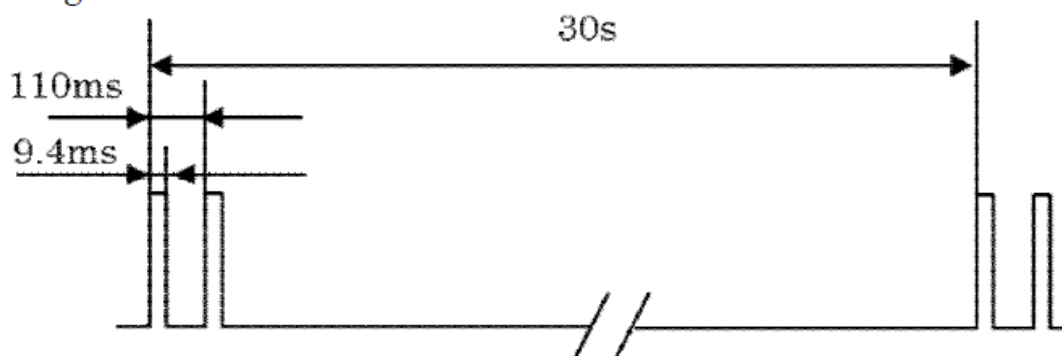
Timings according technical description “TPMS_Technical_Document (PMV-CA74) V1.2”Rotating mode:

1 burst within 110 ms = 9.42 % correction factor: $20 \log (0.0942) = 20.52 \text{ dB}$

2 burst within 30 s (every 110 ms) same correction factor

Minimum silent period: $30 \text{ s} - 121.8 \text{ ms} = \mathbf{29.8782 \text{ s}}$

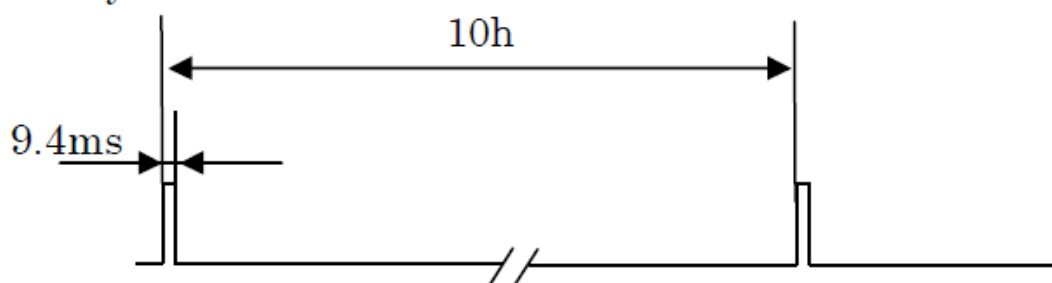
Limit: 1. > 30 times of the transmission = $30 * 121.8 \text{ ms} = 3.654 \text{ s}$ (only relevant if greater than 10 s)
 2. > 10 s

☐ Rotating modeStationary mode:

1 burst within 10 h = 9.42 % correction factor: $20 \log (0.0942) = 20.52 \text{ dB}$

Minimum silent period: $36000 \text{ s} - 9.42 \text{ ms} = \mathbf{35990.58 \text{ s}}$

Limit: 1. > 30 times of the transmission = $30 * 9.42 \text{ ms} = 0.2826 \text{ s}$ (only relevant if greater than 10 s)
 2. > 10 s

☐ Stationary mode

Pressure alert during the pressure change (stationary mode only):

1 burst within 110 ms = 9.42 % correction factor: $20 \log (0.0942) = 20.52 \text{ dB}$

Minimum silent period: only single transmission

Limit: 1. > 30 times of the transmission = $30 * 9.42 \text{ ms} = 0.2826 \text{ s}$ (only relevant if greater than 10 s)
 2. > 10 s

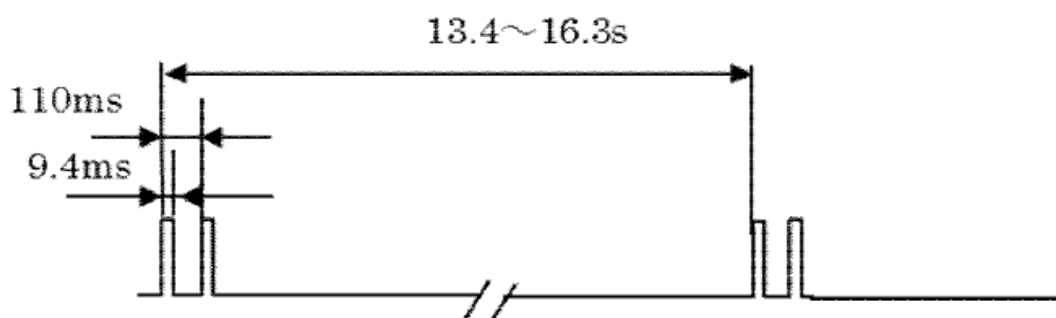
☐ Pressure alert during the pressure change (Stationary mode only)
Pressure alert after the pressure change (stationary mode only):

1 burst within 110 ms = 9.42 % correction factor: $20 \log (0.0942) = 20.52 \text{ dB}$

2 burst within 13.4 s ~ 16.3 s (every 110 ms) same correction factor

Minimum silent period: $13.4 \text{ s} - 121.8 \text{ ms} = 13.2782 \text{ s}$; $16.3 \text{ s} - 121.8 \text{ ms} = 16.1782 \text{ s}$

Limit: 1. > 30 times of the transmission = $30 * 121.8 \text{ ms} = 3.654 \text{ s}$ (only relevant if greater than 10 s)
 2. > 10 s

☐ Pressure alert after the pressure change (Stationary mode only)


FAT mode (Rotating mode only):

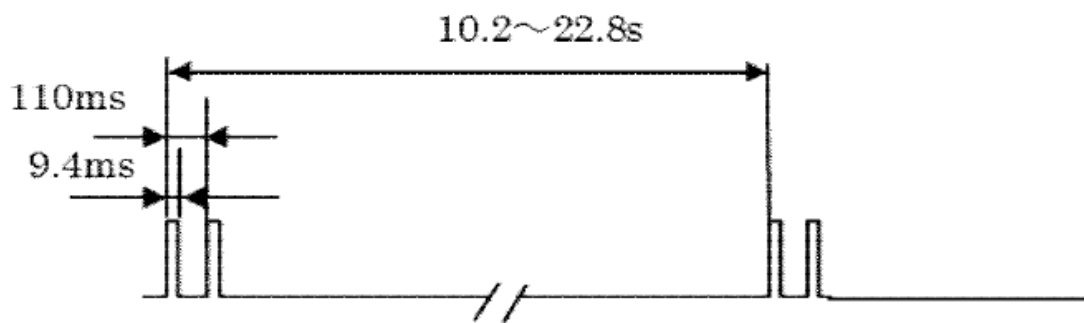
1 burst within 110 ms = 9.42 % $20 \log (0.0942) = 20.52 \text{ dB}$

2 burst within 10.2 s ~ 22.8 s (every 110 ms) same correction factor

Minimum silent period: 10.2 s – 121.8 ms = 10.0782 s

Limit: 1. > 30 times of the transmission = $30 * 121.8 \text{ ms} = 3.654 \text{ s}$ (only relevant if greater than 10 s)
2. > 10 s

☐ FAT mode (Rotating mode only)



10.2 Emission bandwidth

Measurement:

Measurement of the 99 % bandwidth of the modulated signal

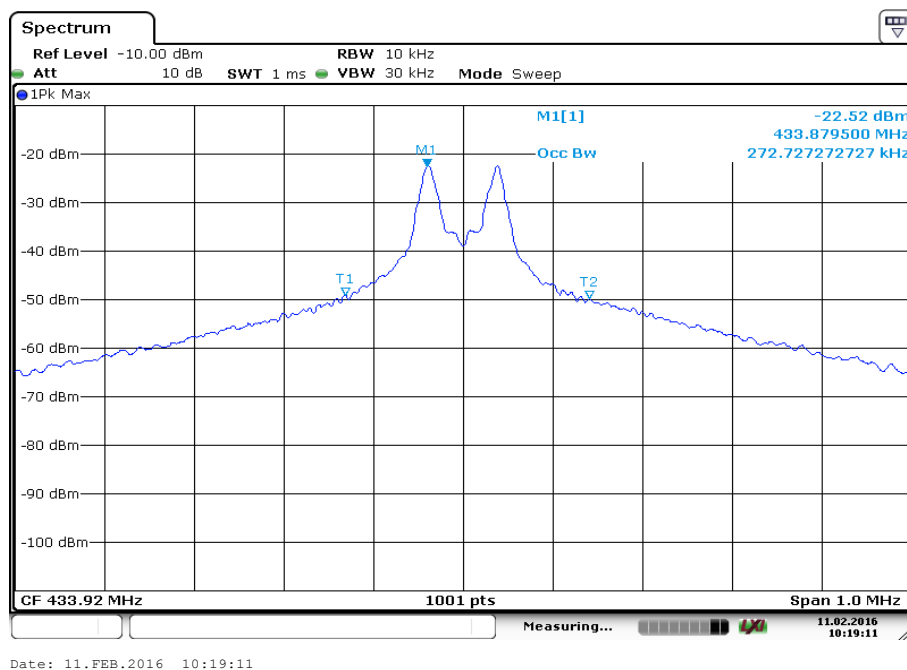
Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	1 % of the span (10 kHz)
Video bandwidth:	3 x RBW (30 kHz)
Span:	1 MHz
Trace mode:	Max. hold
Test setup:	Chapter 7.3 – A

Limits:

FCC	IC
The OBW shall not be wider than 0.25% of the centre frequency.	

Result:

Plot 1: Emissions bandwidth



99 % emission bandwidth: 272.7 kHz

Verdict: **compliant**

10.3 Field strength of the fundamental**Measurement:**

Measurement parameter	
Detector:	Peak / pulse averaging / quasi peak
Sweep time:	Auto
Resolution bandwidth:	120 kHz
Video bandwidth:	3 x RBW
Trace Mode:	Max. hold
Test setup:	Chapter 7.1 – A

Limits:

FCC		IC
Field strength of the fundamental.		
In addition to the provisions of Section 15.205, the field strength of emissions from intentional radiators operated under this Section shall not exceed the following:		
Fundamental Frequency (MHz)	Field strength of Fundamental (μV/m)	Measurement distance (m)
40.66 – 40.70	1,000	3
70-130	500	3
130-174	500 to 1,500	3
174-260	1,500	3
260-470	1,500 to 5,000	3
Above 470	5,000	3
433.92	4,398.7 [72.87 dBμV/m]	3

Result:

TEST CONDITIONS		Maximum power (dBμV/m at 3 m distance)	
Frequency		MHz	MHz
Mode		Peak	Average
T _{nom}	V _{nom}	76.2	55.68
Measurement uncertainty		±3dB	

Verdict: **compliant**

10.4 Field strength of the harmonics and spurious

Measurement:

Measurement parameter	
Detector:	Peak / average / quasi peak
Sweep time:	Auto
Resolution bandwidth:	200 Hz / 9 kHz / 120 kHz / 1 MHz
Video bandwidth:	3 x RBW
Span:	See plots
Trace mode:	Max. hold
Test setup:	Chapter 7.1 – A & 7.2 – A

Limits:

FCC		IC
Field strength of the fundamental.		
In addition to the provisions of Section 15.205, the field strength of emissions from intentional radiators operated under this Section shall not exceed the following:		
Fundamental Frequency (MHz)	Field strength of spurious (µV/m)	Measurement distance (m)
40.66 – 40.70	100	3
70-130	50	3
130-174	50 to 150	3
174-260	150	3
260-470	150 to 500	3
Above 470	500	3

The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level. Spurious emissions shall be attenuated to the average (or, alternatively, CISPR quasi-peak) limits shown in this table or to the general limits shown in Section 15.209, whichever limit permits a higher field strength.

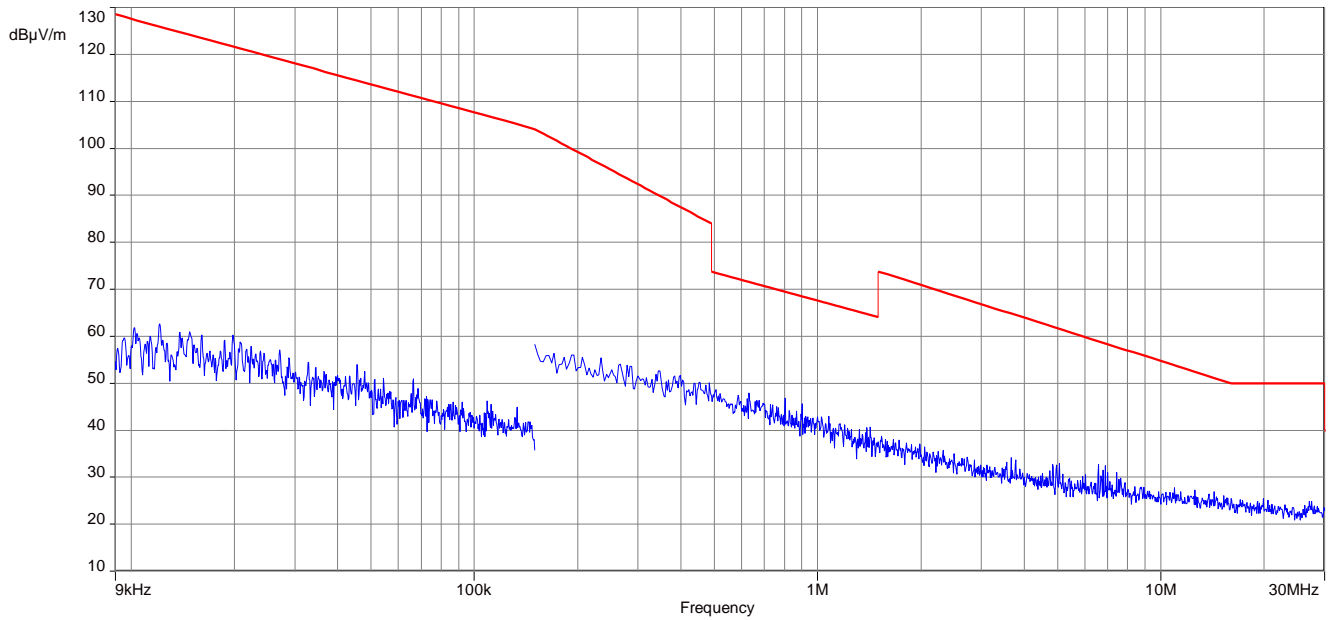
FCC		IC
Frequency (MHz)	Field strength (µV/m)	Measurement distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30 – 88	100	3
88 – 216	150	3
216 – 960	200	3
above 960	500	3

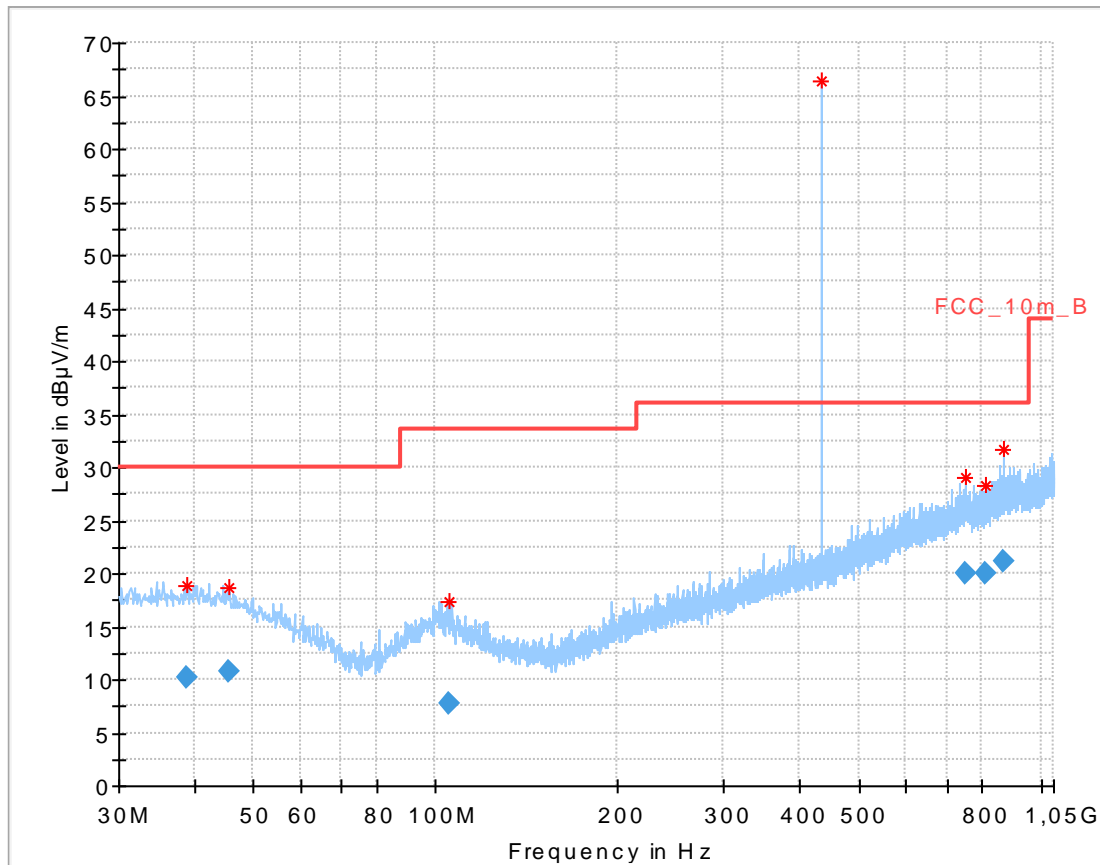
Results:

f [MHz]	Detector	Limit max. allowed [dBμV/m]	Amplitude of emission [dBμV/m]	Results
For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.				
1301.7	Peak	74	44.7	Compliant
	RMS	54	-/-	Peak value below average limit!
1735.6	Not in restricted band and peak value below average limit!			
2169.4	Not in restricted band and peak value below average limit!			
2603.3	Peak	80.8	64.0	Compliant
	RMS	60.8	43.5*)	Compliant
3037.2	Not in restricted band and peak value below average limit!			
3471.1	Not in restricted band and peak value below average limit!			

*) corrected with correction factor according chapter 10.1

Verdict: **compliant**

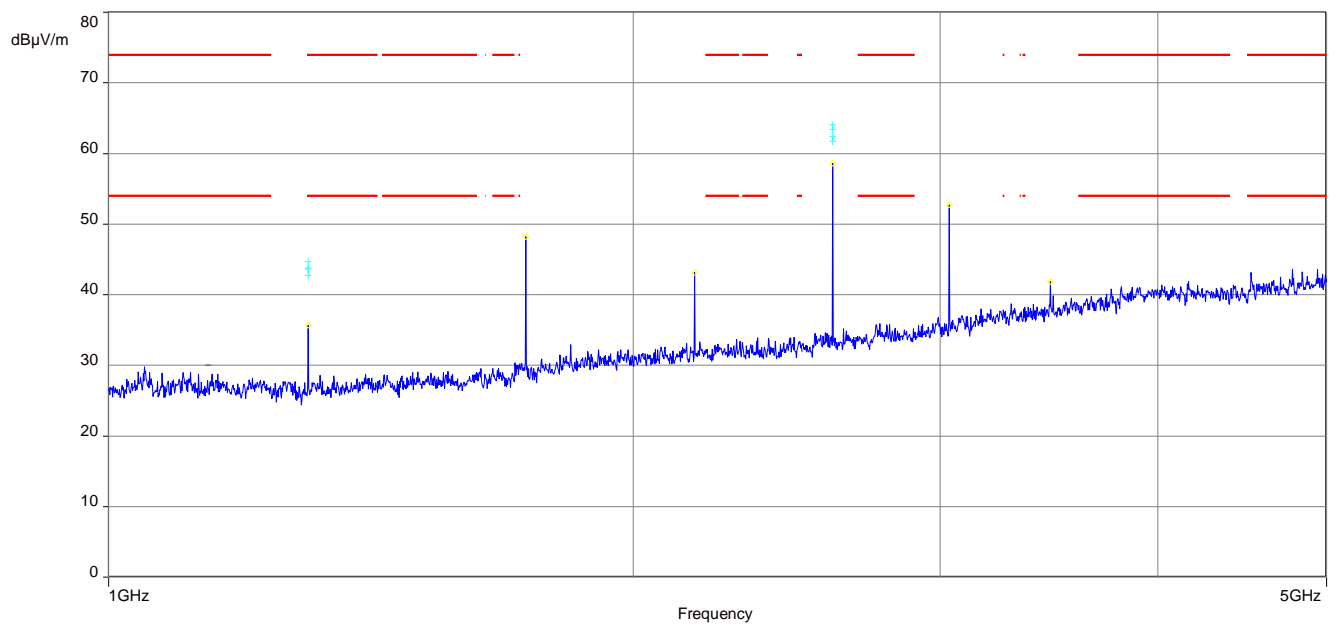
Plots:**Plot 1: 9 kHz to 30 MHz**

Plot 2: 30 MHz to 1000 MHz, vertical & horizontal polarisation**Final_Result:**

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
38.845950	10.21	30.00	19.79	1000.0	120.000	349.0	H	-5.0	14.0
45.438150	10.77	30.00	19.23	1000.0	120.000	275.0	V	216.0	13.7
104.980950	7.71	33.50	25.79	1000.0	120.000	351.0	H	253.0	11.6
751.873200	20.00	36.00	16.00	1000.0	120.000	275.0	H	140.0	22.7
809.011350	19.99	36.00	16.01	1000.0	120.000	174.0	V	162.0	22.9
868.278750	21.06	36.00	14.94	1000.0	120.000	200.0	H	277.0	23.7

Carrier_Frequency: (@10 m)

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
433.881900	66.44	70.83	4.39	100.0	V	5.0	17.4

Plot 3: 1000 MHz to 5000 MHz, vertical & horizontal polarisation

11 Observations

No observations except those reported with the single test cases have been made.

Annex A Document history

Version	Applied changes	Date of release
	Initial release	2016-02-18
A	Timing plots added Average field strength calculated with duty cycle correction factor	2016-02-19
B	Editorial changes	2016-02-24
C	Timing information changed	2016-02-29
D	Timing limit information clarified	2016-03-03

Annex B Further information

Glossary

AVG	-	Average
DUT	-	Device under test
EMC	-	Electromagnetic Compatibility
EN	-	European Standard
EUT	-	Equipment under test
ETSI	-	European Telecommunications Standard Institute
FCC	-	Federal Communication Commission
FCC ID	-	Company Identifier at FCC
HW	-	Hardware
IC	-	Industry Canada
Inv. No.	-	Inventory number
N/A	-	Not applicable
PP	-	Positive peak
QP	-	Quasi peak
S/N	-	Serial number
SW	-	Software
PMN		Product marketing name
HMN		Host marketing name
HVIN		Hardware version identification number
FVIN		Firmware version identification number

Annex C Accreditation Certificate

Front side of certificate

Back side of certificate



Deutsche Akkreditierungsstelle GmbH

Befehlens gemäß § 8 Absatz 1 AkkStelleG i.V.m. § 1 Absatz 1 AkkStelleGBV
Unterzeichnerin der Multilateralen Abkommen
von EA, ILAC und IAF zur gegenseitigen Anerkennung

Akkreditierung



Die Deutsche Akkreditierungsstelle GmbH bestätigt hiermit, dass das Prüflaboratorium

CETECOM ICT Services GmbH
Unterrückheimer Straße 6-10, 66117 Saarbrücken

die Kompetenz nach DIN EN ISO/IEC 17025:2005 besitzt, Prüfungen in folgenden Bereichen
durchzuführen:

Drahtgebundene Kommunikation einschließlich xDSL
VoIP und DECT
Akustik
Funk einschließlich WLAN
Short Range Devices (SRD)
RFID
WiMax und Richtfunk
Mobilfunk (GSM / GPRS, Over the Air (OTA) Performance)
Elektromagnetische Verträglichkeit (EMV) einschließlich Automotive
Produktsicherheit
SAR und Hearing Aid Compatibility (HAC)
Umweltsimulation
Smart Card Terminals
Bluetooth
Wi-Fi-Services

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Frankfurt am Main, 07.03.2014

Date Stempel auf der Rückseite

Im Auftrag D-PL-12076-01-00
Hildegard Kögler

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und des Rates vom 9. Juli 2008 über die Vorschriften für die Akkreditierung und Marktüberwachung
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