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Test – Results

Order-No.:

T38836-02-00GK

Client	Lifescan Scotland Ltd.				
Manufacturer	Lifescan, Division of Cilag GmbH International				
Product Description	Blood glucose meter with Bluetooth 4.0 Low Energy				
Type / Model Name	One Touch Verio Element				
Testing commenced on	2015-04-28	Re-test are made according to FCC 15.247			
Testing concluded on	2015-04-28				
Serial - No.	ZAHBV0XB				

Type of test		Limits		Test Results		
Emission		Margin (dB)	exceeded by (dB)	ok	not ok	meet criteria
Maximum peak radiated output power		-44.8		☒	☐	-
Radiated emissions in restricted bands		-5.2		☒	☐	-
Spurious emissions radiated		-18.4		☒	☐	-

Remarks: The reason for re-measurement is the change of the following 4 items:

- Meter housing colour changed from white to blue.
- Meter branding changed (details not yet finalized).
- SPC changed to switch position of the long and short contacts.
(except for SPC – Strip Port Connector)
- Keypad colour changed to match blue housing.

Note: • RF part is identical for both Models

- The limits are met.

Photo documentation of the EUT you can see in Attachment B

This test result consists of 16 page(s). The test result only corresponds to the tested sample. It is not permitted to copy extracts of these test results without the written permission of the test laboratory.

Date	Checked by	Tested by	Result
2015-04-30			☒ passed
			☐ not passed

Test conditions and results

1. Maximum peak radiated output power

For test instruments and accessories used see section 6 Part **CPR 3**.

Description of the test location

Test location: Anechoic chamber 1

Photo documentation of the test setup

Note: Photo documentation of the test setup can be viewed in Attachment A

Applicable standard

According to FCC Part 15, Section 15.247(b)(3):

For systems using digital modulation in the 2400-2483.5 MHz and 5725 – 5850 MHz bands, the maximum peak output power of the transmitter shall not exceed 1 Watt. The limit is based on transmitting antennas of directional gain that do not exceed 6 dBi.

Description of Measurement

The maximum peak radiated output power is measured using a spectrum analyser with the function “integrated bandpower measurement” following the procedure set out in KDB 558074, item 9.1.1. The EUT is set in TX continuous advertising mode while measuring. The radiated measurement was performed in a fieldstrength measurement. Therefore the formula set out in KDB 558074, item 12.2.2 e) is changed into the following term:

$$E = \text{EIRP} - (20 \cdot \log_{10} 3) + 104.8$$

Test result

802.15.1, 1000 kbps, TX		Test results radiated			
		Fieldstrength E (dBμV/m)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)
Lowest frequency: CH37					
T_{nom}	V_{nom}	86.5	-8.8	36.0	-44.8
Middle frequency: CH38					
T_{nom}	V_{nom}	84.8	-10.5	36.0	-46.5
Highest frequency: CH39					
T_{nom}	V_{nom}	80.8	-14.4	36.0	-50.4

Peak Power Limit according to FCC Part 15, Section 15.247(b)(3):

Frequency (MHz)	Peak Power Limit	
	(dBm)	(Watt)
902-928	36	4.0
2400-2483.5	36	4.0
5725-5850	36	4.0

The requirements are **FULFILLED**.

Remarks: N/A

1.1 Radiated emissions in restricted bands

For test instruments and accessories used see section 6 Part **SER 2, SER 3**.

1.1.1 Description of the test location

Test location: OATS 1
Test location: Anechoic Chamber 1

Test distance: 3 m

1.1.2 Photo documentation of the test setup

Note: Photo documentation of the test setup can be viewed in Attachment A

According to FCC Part 15, Section 15.205(a):

In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limit specified in Section 15.209(a).

1.1.3 Description of Measurement

The restricted bands are measured radiated. The span of the spectrum analyser is set wide enough to capture the restricted band and measure the peak level of the emission operating on the channel closest to the band edge, as well as any modulation products which fall outside of the authorized band of operation. The restricted bands are measured falling emissions into it and the nearest restricted band are checked for emissions also the restricted band for the harmonics of the carrier. To show compliance the FCC Part 15, section 15.35(c) was used. The correction factor being calculated in section 5.9 was taken into account for pulsed emissions and is shown in a separate table.

Test receiver settings for SER2:

RBW: 120 MHz, Detector: Quasi peak, Meas. Time: 1 s,

Spectrum analyser settings for SER3:

RBW: 1 MHz, VBW: 3 MHz, Detector: Max. peak, Trace: Max. hold, Sweep: Auto

Spectrum analyser settings for SER3 re-measurements:

RBW: 1 MHz, VBW: 3 MHz, Detector: RMS, Trace: Max. hold, Sweep: Auto

1.1.1 Test result

Standard 802.15.1

Emissions 30 MHz – 1000 MHz, SER2

Advertising mode with CH37, CH38, CH39							
Test conditions: TX, P2, 1000 kbps							
			Test results				
Start <i>f</i>	Stop <i>f</i>	RBW	Maximum emission		Limit	Margin	Detector
(MHz)	(MHz)	(kHz)	(MHz)	(dBμV/m)	(dBμV/m)	(dB)	
30	1000	120	205.53	9.6	43.5	-33.9	QP
30	1000	120	349.63	16.7	46.0	-29.3	QP
30	1000	120	458.03	19.6	46.0	-26.4	QP
30	1000	120	548.43	22.3	46.0	-23.7	QP
30	1000	120	734.73	30.0	46.0	-16.0	QP
30	1000	120	975.03	31.3	54.0	-22.7	QP
Measurement uncertainty				±6 dB			

Note: Only ambient noise could be detected.

Emissions 1 GHz – 25 GHz

Advertising mode with CH37, CH38, CH39							
Test conditions: TX, P2, 1000 kbps							
Peak pre-scan			Test results				
Start <i>f</i>	Stop <i>f</i>	RBW	Maximum emission		AVLimit	Margin	Detector
(MHz)	(MHz)	(kHz)	(MHz)	(dBμV/m)	(dBμV/m)	(dB)	
1000	2400	1000	1212.80	43.9	54.0	-10.2	Pk
1000	2400	1000	2336.30	50.6	54.0	-3.4	Pk
1000	2400	1000	2400.00	60.6	54.0	6.6	Pk
2483.5	4000	1000	3926.40	41.8	54.0	-12.2	Pk
4000	8000	1000	4960.50	50.9	54.0	-3.2	Pk
8000	12000	1000	11963.00	52.2	54.0	-1.8	Pk
12000	18000	1000	12006.00	57.5	54.0	3.5	Pk
12000	18000	1000	17039.25	57.1	54.0	3.1	Pk
18000	25000	1000	24825.00	54.9	54.0	0.9	Pk
Measurement uncertainty				±6 dB			

Note: The value at 2400 Mhz will be regarded in part "Spurious emissions radiated"

Re-measurement for wideband emissions

Advertising mode with CH37, CH38, CH39							
Test conditions: TX, P2, 1000 kbps							
AV re-measurement			Test results				
Start f	Stop f	RBW	Maximum emission		AVLimit	Margin	Detector
(MHz)	(MHz)	(kHz)	(MHz)	(dBµV/m)	(dBµV/m)	(dB)	
12000	18000	1000	12006.00	48.8	54.0	-5.2	RMS
12000	18000	1000	17039.25	47.1	54.0	-6.9	RMS
18000	25000	1000	24825.00	44.1	54.0	-9.9	RMS
Measurement uncertainty				±6 dB			

Radiated limits according to FCC Part 15 Section 15.209(a) for spurious emissions which fall in restricted bands:

Frequency	Field strength of spurious emissions		Measurement distance
(MHz)	(µV/m)	dB(µV/m)	(metres)
0.009-0.490	2400/F (kHz)		300
0.490-1.705	24000/F (kHz)		30
1.705-30	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

Restricted bands of operation:

The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209

MHz	MHz	MHz	GHz
0.090 – 0.110	16.42 – 16.423	399.9 – 410	4.5 – 5.15
0.495 – 0.505	16.69475 – 16.69525	608 – 614	5.35 – 5.46
2.1735 – 2.1905	16.80425 – 16.80475	960 – 1240	7.25 – 7.75
4.125 – 4.128	25.5 – 25.67	1300 – 1427	8.025 – 8.5
4.17725 – 4.17775	37.5 – 38.25	1435 – 1626.5	9.0 – 9.2
4.20725 – 4.20775	73 – 74.6	1645.5 – 1646.5	9.3 – 9.5
6.215 – 6.218	74.8 – 75.2	1660 – 1710	10.6 – 12.7
6.26775 – 6.26825	108 – 121.94	1718.8 – 1722.2	13.25 – 13.4
6.31175 – 6.31225	123 – 138	2200 – 2300	14.47 – 14.5
8.291 – 8.294	149.9 – 150.05	2310 – 2390	15.35 – 16.2
8.362 – 8.366	156.52475 – 156.52525	2483.5 – 2500	17.7 – 21.4
8.37625 – 8.38675	156.7 – 156.9	2690 – 2900	22.01 – 23.12
8.41425 – 8.41475	162.0125 – 167.17	3260 – 3267	23.6 – 24.0
12.29 – 12.293	167.72 – 173.2	3332 – 3339	31.2 – 31.8
12.51975 – 12.52025	240 – 285	3345.8 – 3358	36.43 – 36.5
12.57675 – 12.57725	322 – 335.4	3600 – 4400	Above 38.6

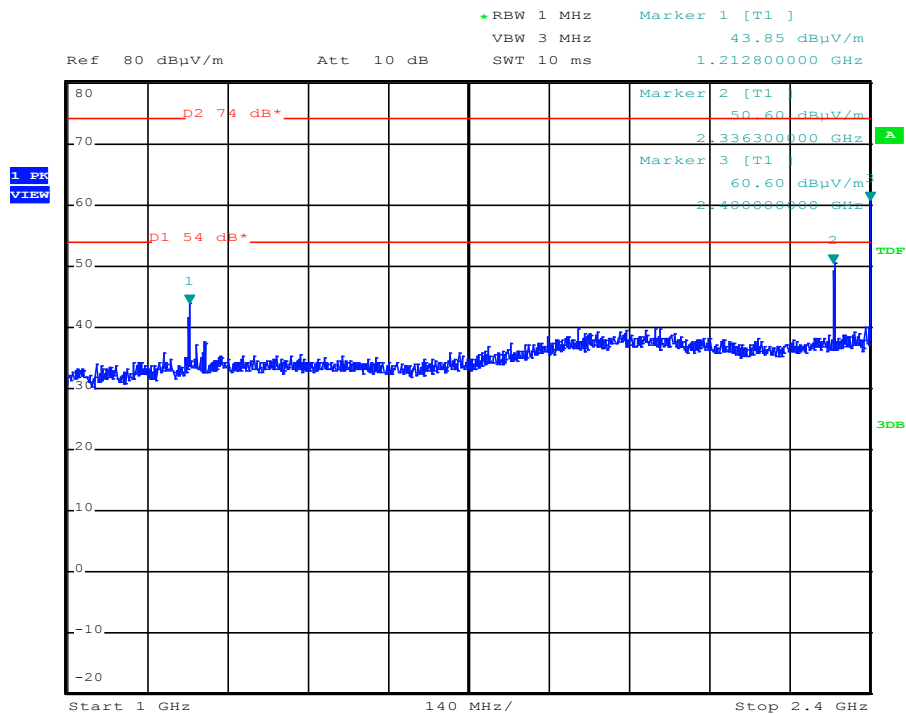
The requirements are **FULFILLED**.

Remarks: The measurement was performed up to the 10th harmonic. All emissions not reported in this test report are more than 20 dB below the specified limit. For detailed test results please see the following test protocols.

1.1.2 Test protocols radiated emissions SER3

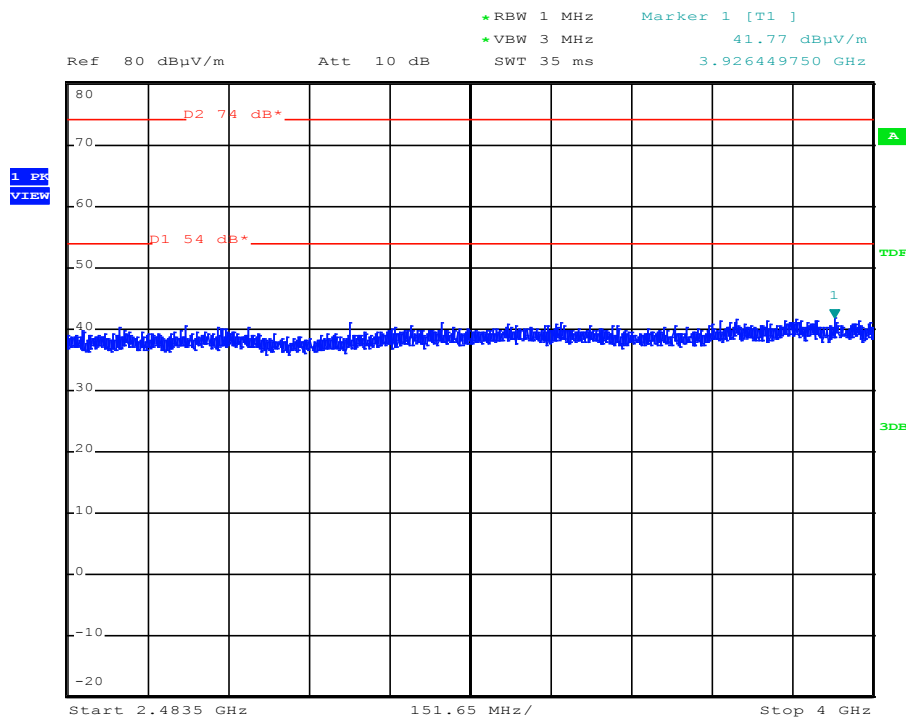
802.15.1, Channel 37, 38, 39 (Advertising mode)

1000-2400 MHz, Detector: Peak

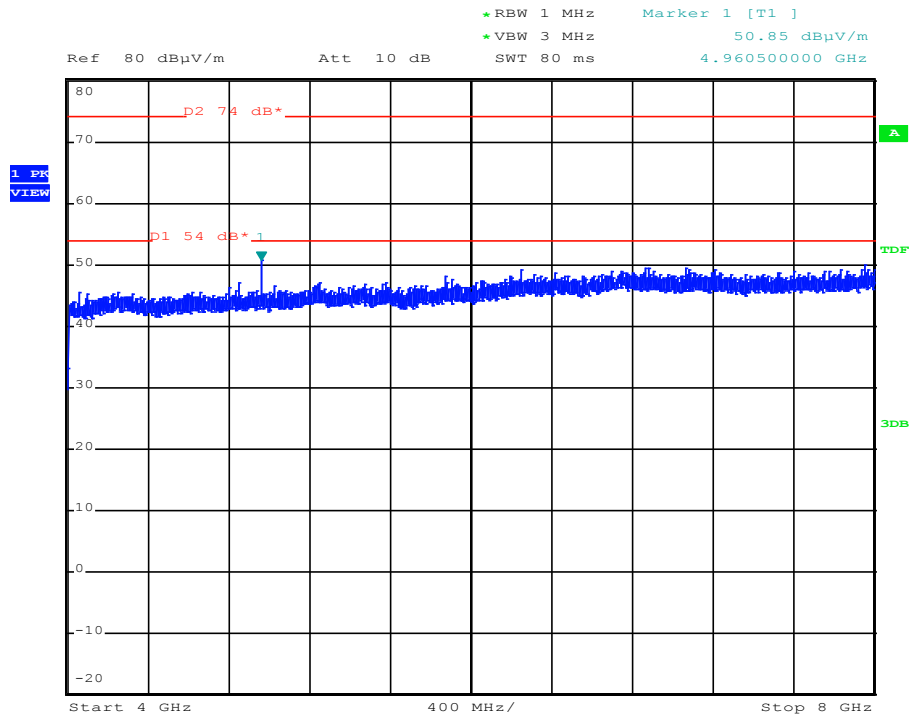


Note: The value at 2400 MHz will be regarded in part "Spurious emissions radiated"

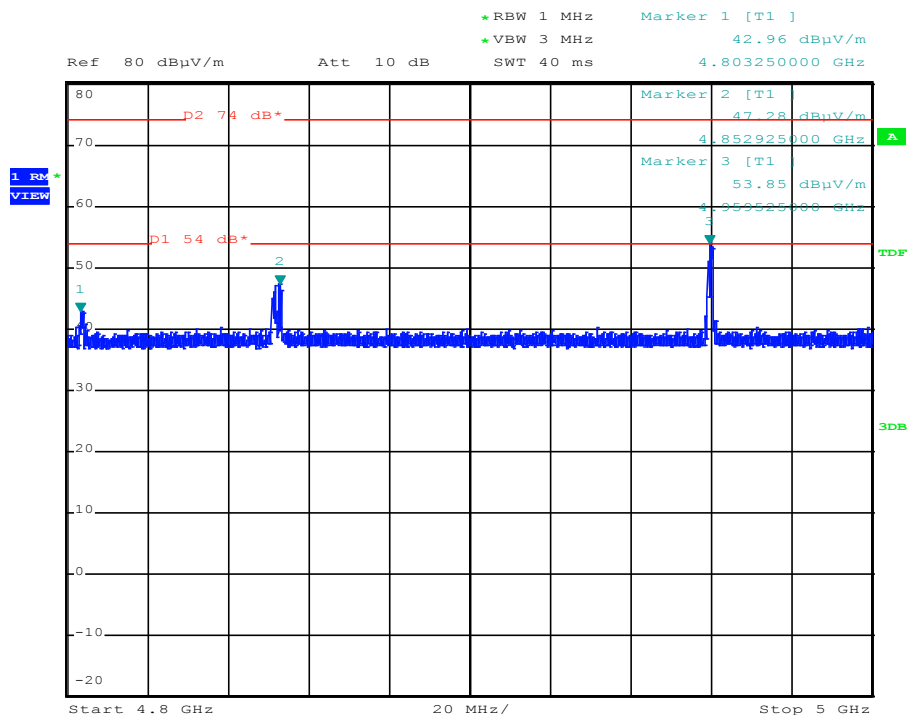
2483.5-4000 MHz, Detector: Peak



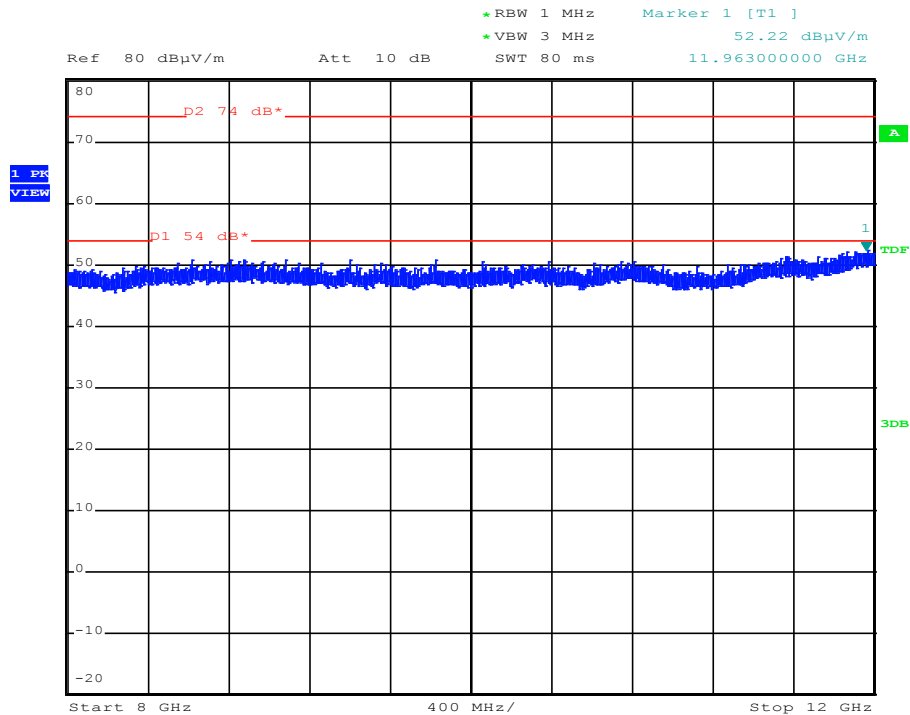
4000-8000 MHz, Detector: Peak



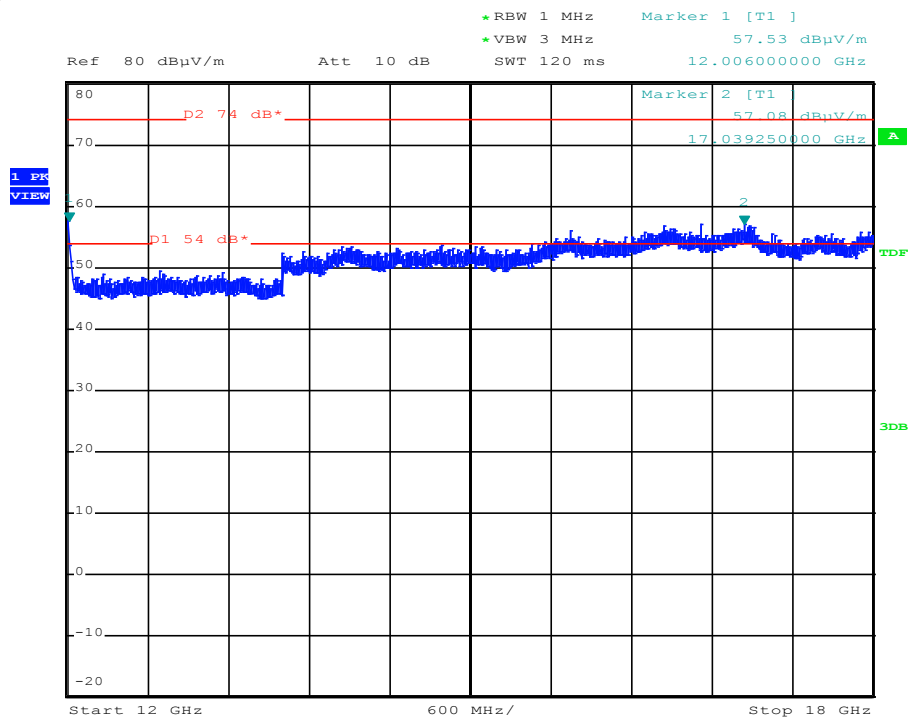
4800-5000 MHz, Detector: RMS



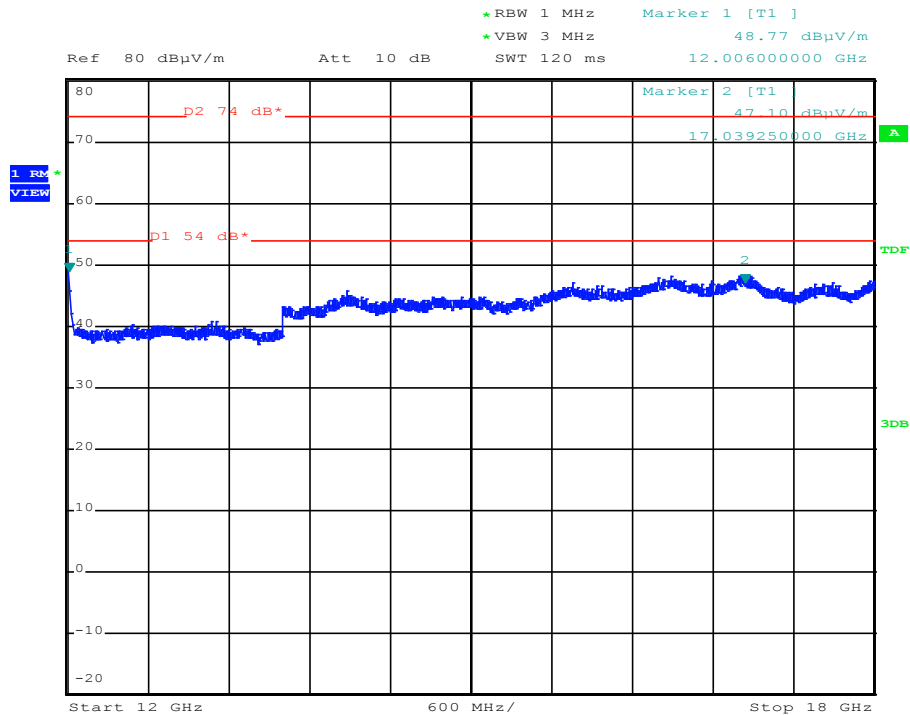
8000-12000 MHz, Detector: Peak



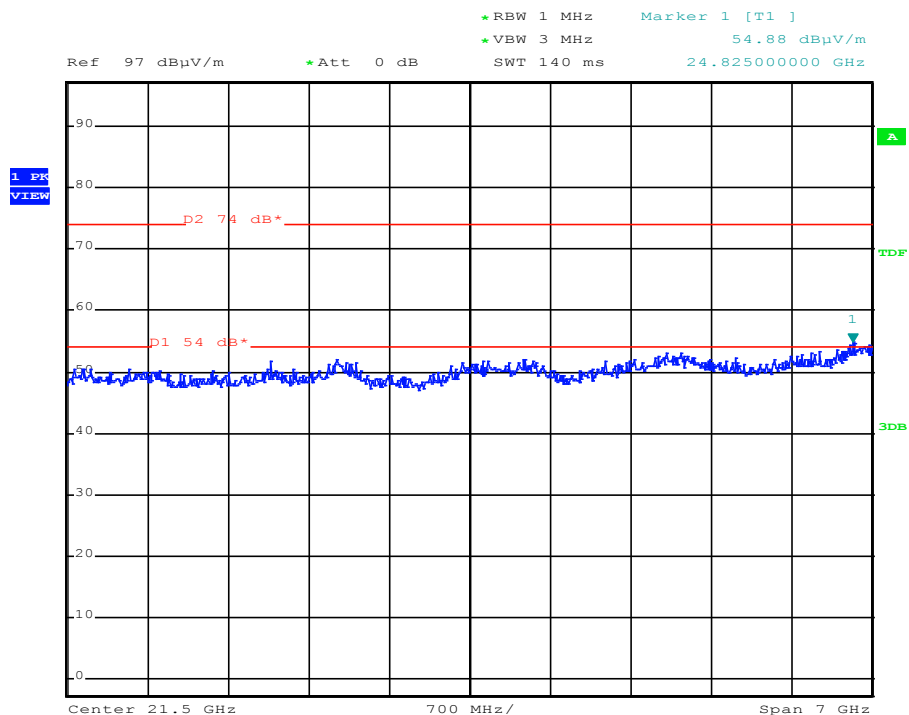
12000-18000 MHz, Detector: Peak



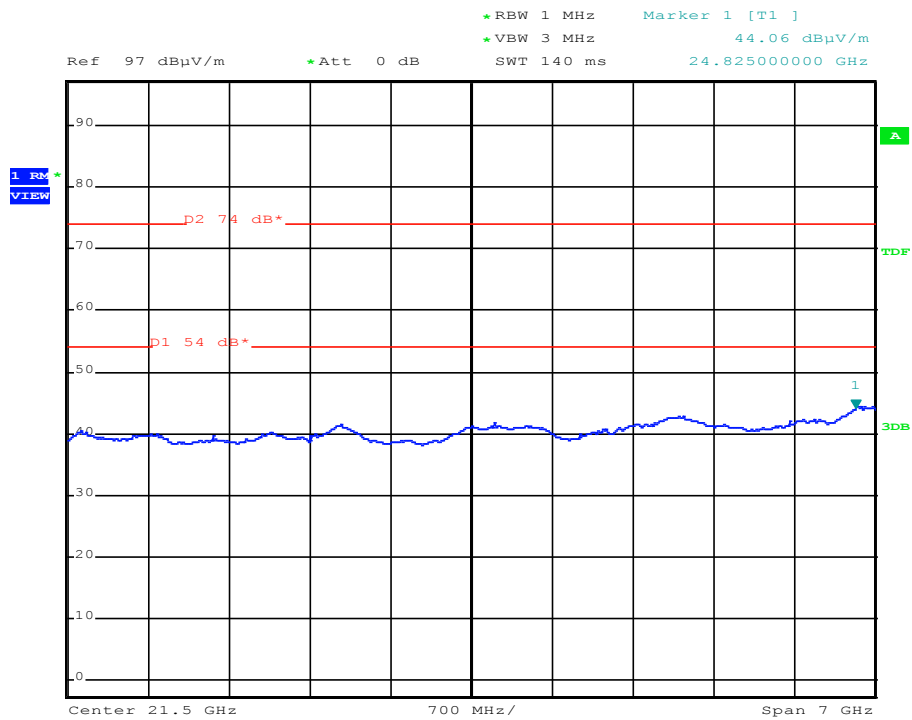
12000-18000 MHz, Detector: RMS



18000-25000 MHz, Detector: Peak



18000-25000 MHz, Detector: RMS



1.2 Spurious emissions radiated

For test instruments and accessories used see section 6 Part **SER1, SER 2, SER 3.**

1.2.1 Description of the test location

Test location: Anechoic chamber 1

Test distance: 3 m

Note: Photo documentation of the test setup can be viewed in Attachment A

1.2.2 Applicable standard

According to FCC Part 15, Section 15.247(d):

In any 100 kHz bandwidth outside the frequency bands 2400 – 2483.50 MHz and 5725 – 5850 MHz, the digitally modulated radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or an radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limit specified in Section 15.209(a) (see Section 15.205(c)).

1.2.3 Description of Measurement

The radiated power of the spurious emission from the EUT is measured in a test setup following the procedures set out in ANSI C63.4. If the emission level of the EUT in peak mode complies with the average limit is 20 dB lower, then testing will be stopped and peak values of the EUT will be reported, otherwise the emission will be measured in average mode again and reported.

Spectrum analyser settings for SER3:

RBW: 100 kHz, VBW: 300 kHz, Detector: Max. peak, Trace: Max. hold, Sweep: Auto

1.2.4 Test result

Advertising mode with CH37, CH38, CH39							
Test conditions: TX, P2, 1000 kbps							
			Test results				
Start <i>f</i>	Stop <i>f</i>	RBW	Maximum emission		Peak Limit	Margin	Detector
(MHz)	(MHz)	(kHz)	(MHz)	(dB μ V/m)	(dB μ V/m)	(dB)	
2390	2400	100	2391.20	44.0	62.3	-18.4	Peak
2390	2400	100	2396.86	37.3	62.3	-25.0	Peak
2390	2400	100	2400.00	33.7	62.3	-28.6	Peak
Measurement uncertainty				± 6 dB			

Note:

Measurements were performed in the frequency range from 1 GHz up to 25 GHz with the analyser settings for restricted band measurements to show compliance for emissions falling into restricted bands, else the band edge compliance is fulfilled. In the frequency ranges from 9 kHz up to 30 MHz and from 18 GHz up to 25 GHz no emission can be detected.

According to FCC Part 15, Section 15.205(a):

In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limit specified in Section 15.209(a).

Limit according to FCC Part 15, Section 15.247(d) for emissions falling not in restricted bands:

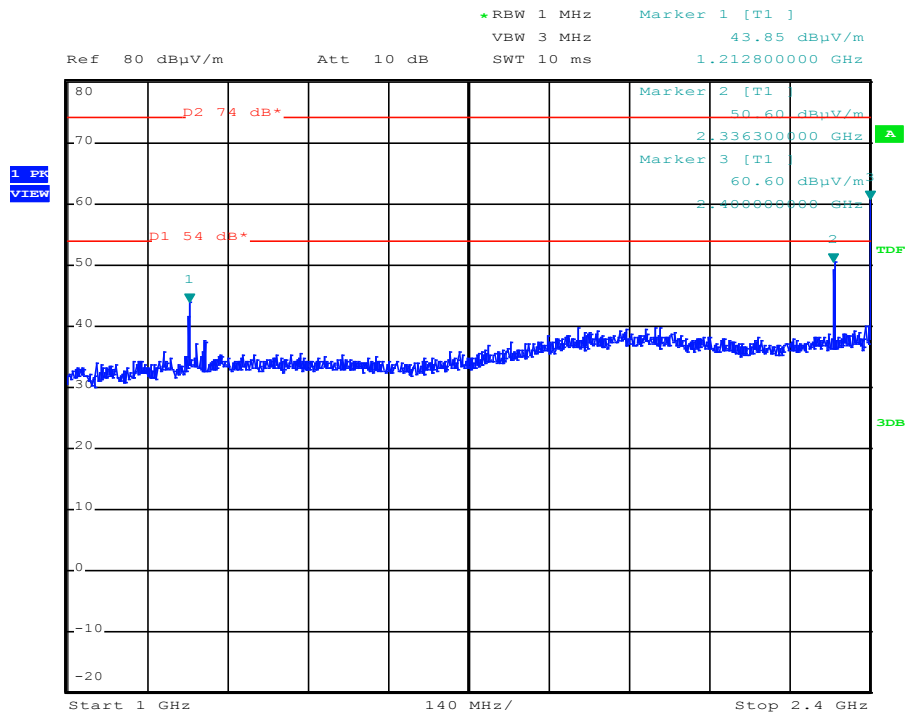
In any 100 kHz bandwidth outside the frequency bands 2400 – 2483.50 MHz and 5725 – 5850 MHz, the digitally modulated radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or an radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required.

Frequency (MHz)	Spurious emission limit
Below 1000	20 dB below the highest level of the desired power
Above 1000	20 dB below the highest level of the desired power

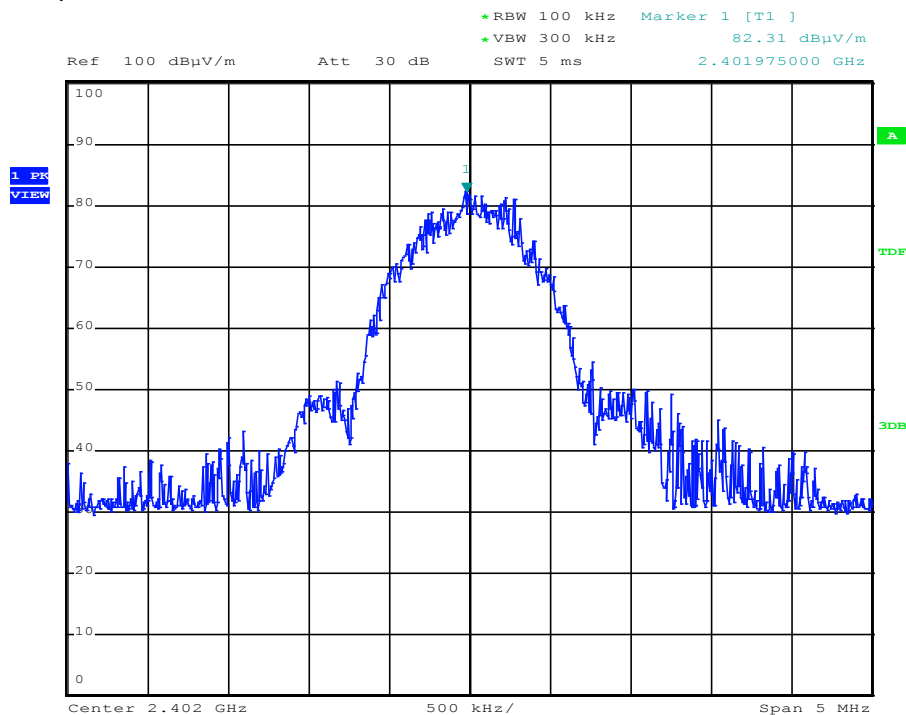
The requirements are **FULFILLED**.

Remarks: Only the value at 2400 MHz is regarded. For detailed information see following plots.

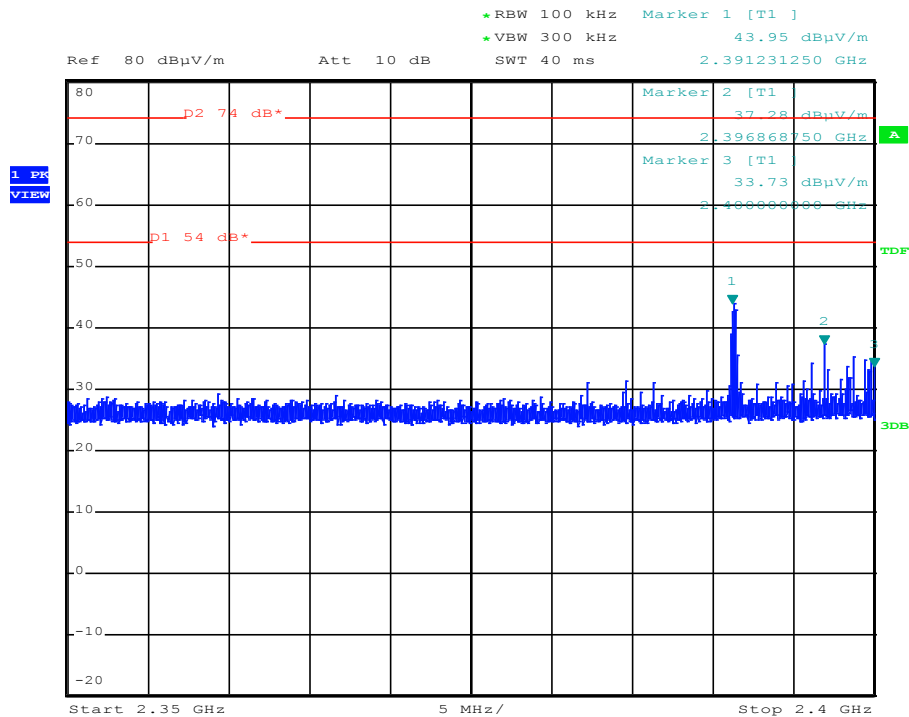
1000-2400 MHz, Detector: Peak



Peak measurement in operation band at 2402 MHz, RBW: 100 kHz



Peak measurement in the frequency range 2350-2400 MHz, RBW: 100 kHz



Note: The delta between the peak in the operation band and the peak outside the operation band is more than 20 dB.

2. USED TEST EQUIPMENT AND ACCESSORIES

All test instruments used are calibrated and verified regularly. The calibration history is available on request.

Test ID	Model Type	Equipment No.	Next Calib.	Last Calib.	Next Verif.	Last Verif.
CPR 3	FSP 40	02-02/11-11-001	02/10/2015	02/10/2014		
	AFS5-12001800-18-10P-6	02-02/17-06-002				
	AFS4-01000400-10-10P-4	02-02/17-13-002				
	AMF-4F-04001200-15-10P	02-02/17-13-003				
	3117	02-02/24-05-009	07/05/2015	07/05/2014		
	Sucoflex N-2000-SMA	02-02/50-05-075				
	SF104/11N/11N/1500MM	02-02/50-13-015				
SER 2	ESVS 30	02-02/03-05-006	03/07/2015	03/07/2014		
	VULB 9168	02-02/24-05-005	17/04/2016	17/04/2015	17/10/2015	17/04/2015
	S10162-B	02-02/50-05-032				
	NW-2000-NB	02-02/50-05-113				
	KK-EF393/U-16N-21N20 m	02-02/50-12-018				
SER 3	FSP 40	02-02/11-11-001	02/10/2015	02/10/2014		
	JS4-18004000-30-5A	02-02/17-05-017				
	AFS5-12001800-18-10P-6	02-02/17-06-002				
	AFS4-01000400-10-10P-4	02-02/17-13-002				
	AMF-4F-04001200-15-10P	02-02/17-13-003				
	3117	02-02/24-05-009	07/05/2015	07/05/2014		
	BBHA 9170	02-02/24-05-014				
	Sucoflex N-2000-SMA	02-02/50-05-075				
	KMS102-0.2 m	02-02/50-11-020				
	SF104/11N/11N/1500MM	02-02/50-13-015				