Test Report No. 7112322441

***Applicant*: CardiacSense Ltd.**

Equipment Under Test: **CS System 3**

Model: **CS-FG0015BK**
FCC ID: 2A4CTCS322

Issued by:
The Standards Institution of Israel
Industry Division
Electrical & Electronics Laboratory
EMC Branch

ANAB
ANSI National Accreditation Board
ACCREDITED
ISO/IEC 17025
TESTING LABORATORY
Certificate Number: AT-1359

Management: Tel: 972-3-6467800 Fax: 972-3-6467779 Electronics: Tel 972-3-6465050 Fax: 972-3-7454026
Alarms Systems Section: Tel: 972-3-6467626 Fax: 972-3-6465370 Electrical: Tel: 972-3-6465160, Fax: 972-3-6465287
42 Chaim Levanon St, Tel Aviv 6997701 Israel. www.sii.org.il

Applicant:	CardiacSense Ltd.
Address:	6 Leshem St. Northern Industrial Park, Caesarea, Israel 3088989
Sample for test selected by:	The customer
The date of test:	October & November 2021

Description of Equipment under Test (EUT):	CS System 3
Model:	CS-FG0015BK
Software version:	SW 1.6.2
Hardware version:	12.1
Manufactured by:	CardiacSense Ltd.

Reference Documents:

❖ CFR 47 FCC (2020) Rules and Regulations: Part 15. Radio frequency devices, Subpart C: Intentional radiators. Section 15.247: Operation within the bands 902 - 928 MHz, 2400 - 2483.5 MHz, 5725 - 5875 MHz

Test Results: The EUT was found to be in compliance with the following standard:

CFR47 Part 15 Subpart C
sections: 15.203, 15.205, 15.207, 15.209 and 15.247.

This Test Report contains 36 pages and may be used only in its entirety.	This Test Report applies only to the specimen tested and may not be applied to other specimens of the same product.

Table of Contents

1. Summary of Test Results

Transmitter characteristic	Ref. Section
6dB and occupied bandwidth	15.247 (a) (2)
Maximum peak conducted output power	15.247 (b) (3)
Power spectral density	15.247 (e)
Radiated emission in restricted and non-restricted bands	15.247 (d), 15.209, 15.205
Band-edge compliance of RF conducted emission	15.247 (d)
AC power line conducted emission measurements	15.207
Antenna requirement	15. 203

Name: Eng. Yuri Rozenberg
Position: Head of Branch

Electrical & Electronics Laboratory
29 August 2022

Tested by: Alexander Konkov
Position: Testing Technician

2. EUT Description

Note: All information in this section was provided by the customer.

2.1. General description:

The EUT, is A wearable device for the continues monitoring of medical parameters such as heart rate and pulse rate and detection of atrial fibrillation lasting more than 5 minutes.

CS System 3 is a wrist-worn medical device similar to a watch, designed to monitor user's heartrate and detect atrial fibrillation (A-Fib) based on PPG and ECG readings.

By combining off-the-shelf ECG and unique PPG chipsets with proprietary algorithms, the device detects the onset of A-Fib and provides indications to the user.

CS System 3 is a single user device, comprising of the watch itself (CS Watch 3), a cradle, a dedicated mobile application and a cloud application. The watch continuously records pulse rate data from its PPG sensor. When prompted by an indication generated by the PPG sensor or if feeling an episode of A-Fib, the patient initiates a spot-check ECG measurement.

CS System 3 includes a proprietary, highly sensitive, pressure sensor (Artifact) that can mask interference caused by hand, palm, and finger movement, which is the main source of false alarms in similar devices.

The measurements results can be stored and managed on the mobile dedicated app. The application generates a report that can be shared with the physician in complete confidentiality.

CS System 3 includes transmitter BLE (Bluetooth Low Energy),
BLE is a wireless personal area network technology, uses the 2.4 GHz and using data transmission over the air.

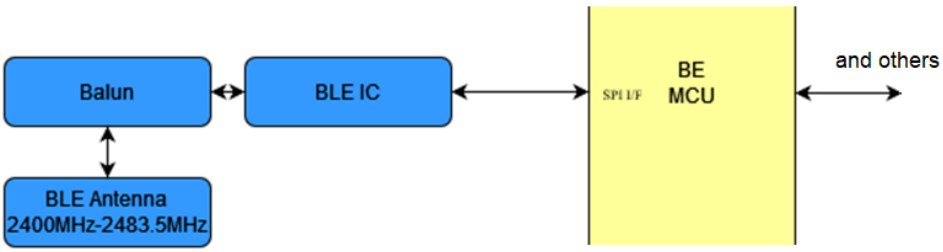


Figure 1. CS System 3 block diagram

2.2. Transmitter description:

Type of equipment
Combined equipment (Equipment where the radio part is fully integrated within another type of equipment)

BLE standards	BLE v4.2

Assigned frequency range	from 2400MHz to 2483.5MHz	
Operating frequency range	from 2402MHz to 2480MHz (BLE transmitter)	
Maximum rated output power	Effective radiated power (for equipment with no RF connector)	1.48 dBm (1.406 mWatt)
Declare temperature range:	0°C - 40°C	Normal indoor use

Antenna information
Antenna with RF connector inside case box
Manufacturer: Cardiacsense Ltd. PCB Antenna
Antenna gain = -0.4 dBi

Transmitter 99% power bandwidth	
Type of modulation	GFSK
Modulating test signal (baseband)	PRBS

Transmitter power source
Nominal rated voltage 3.85 VDC

2.3. Test setup:

The EUT was tested per the guidance ANSI C63.10: 2013.
The test setup is shown in Figure 2 and 3. EUT gets 3.85 V DC power from battery.

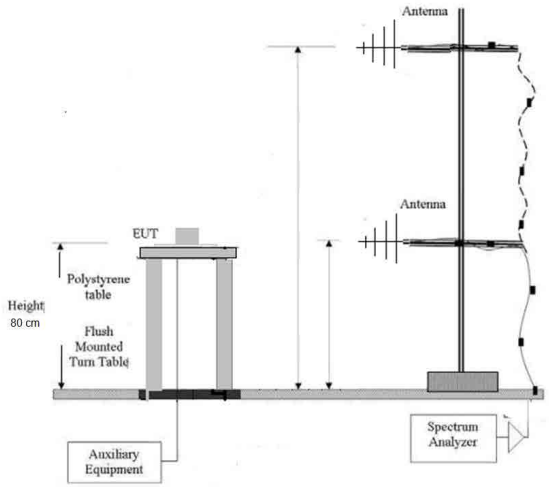


Figure 2. EUT test setup

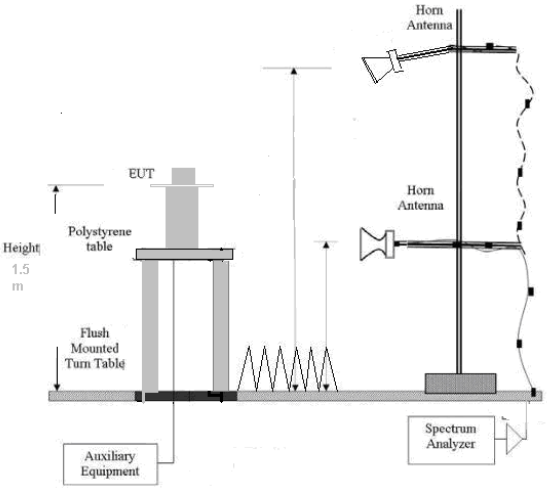


Figure 3. RE test setup above 1 GHz.

2.4. System test configuration:

Table 1. BLE channels / frequencies

Channel	Frequency MHz	Channel	Frequency MHz
37	2402	18	2442
0	2404	19	2444
1	2406	20	2446
2	2408	21	2448
2	2410	22	2450
4	2412	23	2452
5	2414	24	2454
6	2416	25	2456
7	2418	26	2458
8	2420	27	2460
9	2422	28	2462
10	2424	29	2464
38	2426	30	2466
11	2428	31	2468
12	2430	32	2470
13	2432	33	2472
14	2434	34	2474
15	2436	35	2476
16	2438	36	2478
17	2440	39	2480

3. Test specification, methods and procedures

❖ CFR 47 FCC	Rules and Regulations: Part 15. Radio frequency devices, Subpart C: Intentional radiators (2020)
❖ ANSI C63.4:2014	American National Standard for Method of Measurement of Radio Noise Emissions from Low Voltage Electrical and Electronic Equipment in the Range 9 kHz to 40 GHz.
❖ ANSI C63.10: 2013	American National Standard for Testing of Unlicensed Wireless Devices

4. Testing Facility:

Laboratory Name: Standards Institution of Israel (SII)

Test site location: 42 Haim Levanon st., Tel-Aviv Israel

Laboratory Accreditations:

ANAB: AT-1359

5. Measurement uncertainty

The test equipment has been calibrated according to its recommended procedures and is within the manufacturer's published limit of error.
The laboratory calibrates its standards by a third party (traceable to NIST, USA) on a regular basis according to equipment manufacturer requirements.

Test description	Calculated uncertainty U_{LAB}
Conducted measurements	
Frequency error	37.6 Hz
Spurious emission	± 2.98 dB
Radiated measurements	
Electric field strength in a SAR at 3 m distance 30 MHz – 1.0 GHz	±4.32 dB
Electric field strength in a FAR at 3 m distance 1.0 GHz – 18 GHz	± 4.47
Substitution measurements	
In a FAR at 3 m distance 1.0 GHz – 18 GHz	± 3.41 dB

6. Transmitter characteristics - test results

6.1. Duty Cycle

Limits & methods:

FCC requirements	15.247		
Test procedure	ANSI 63.10 --- 11.6 Duty cycle Radiated Measurement		
Operating mode	BLE, Hight Mid and Low		
Ambient Temperature 22^{0}C	Relative Humidity 46%	Air Pressure	1006hPa

Results:

Table 2. Transmitter characteristics - result parameters

Tx	continuous	-
DT	100	%

6.2. 6dB and Occupied Bandwidth

Limits & methods:

FCC requirements	15.247(a)(2)		
Test procedure	ANSI 63.10 --- 11.8.2 Option 2 Radiated Measurement		
Operating mode	BLE, Hight Mid and Low		
Ambient Temperature 22^{0}C	Relative Humidity 46%	Air Pressure	1006hPa

Limit:

The minimum 6dB bandwidth shall be at least 500 kHz.

Test procedure

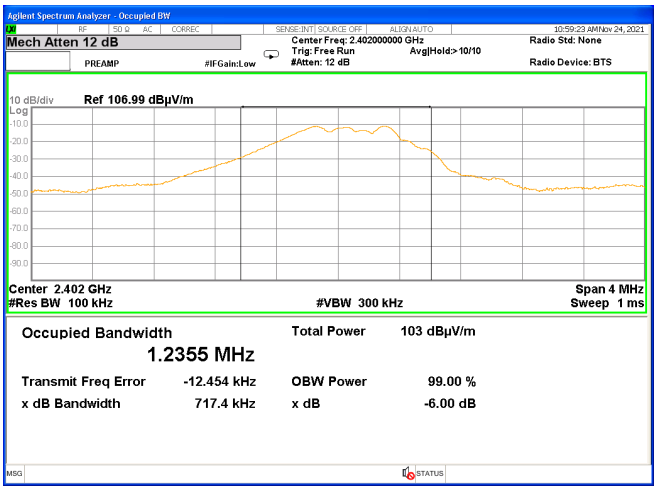
The measurements were performed in hopping transmission mode of operation for carrier (channel) frequency at bottom, middle and at the top of 2402MHz to 2480MHz frequency band and maximum transmitting data rate.

Results:

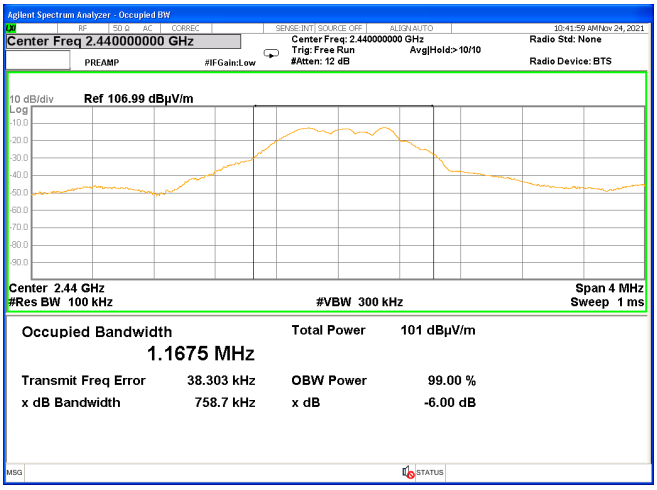
Table 3. 6dB Bandwidth & Occupied Bandwidth Results

Frequency MHz	6dB Bandwidth kHz	Limit kHz	Verdict	Ref. Plot
2402	717.4	500	Pass	1
2440	758.7	500	Pass	2
2480	790.3	500	Pass	3

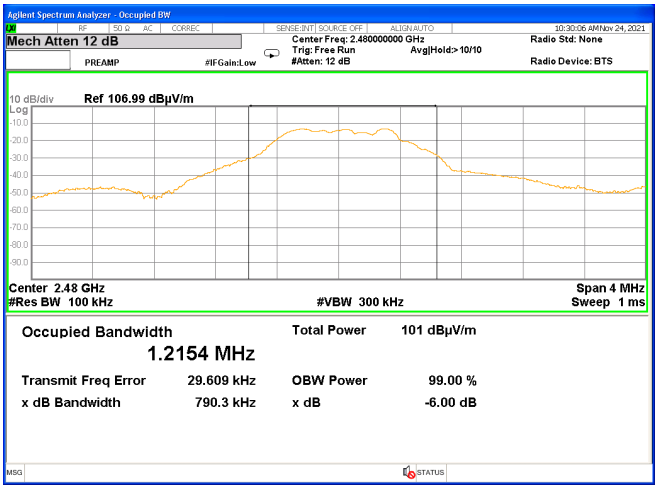
BLE



Plot 1



Plot 2



Plot 3

6.3. Maximum Peak Conducted Output Power

Limits & methods:

FCC requirements	15.247(b)(3)		
Test procedure	ANSI 63.10 Section 11.9.1.1 Radiated Measurement		
Operating mode	BLE, Hight Mid and Low		
Ambient Temperature 22^{0}C	Relative Humidity 46%	Air Pressure 1006hPa	

Limit

The maximum peak conducted output power shall not exceed 1 watt.

Test procedure

The measurements were performed in hopping transmission mode of operation for carrier (channel) frequency at bottom, middle and at the top of 2402 MHz to 2480 MHz frequency band and maximum transmitting data rate.

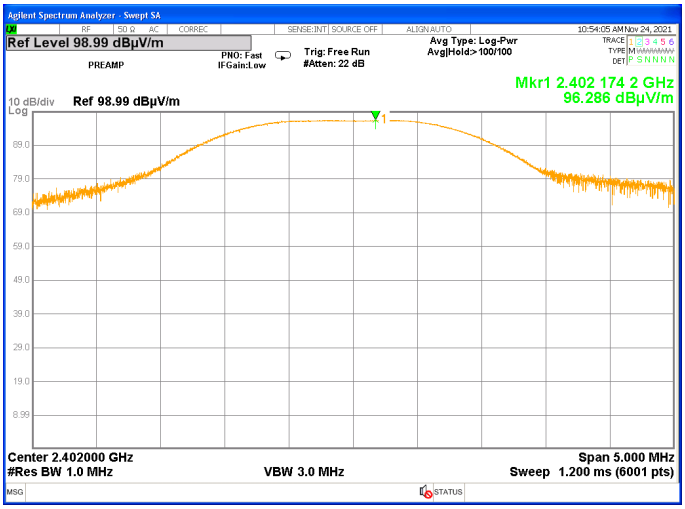
Results:

Table 4. Maximum Peak Conducted Output Power Results

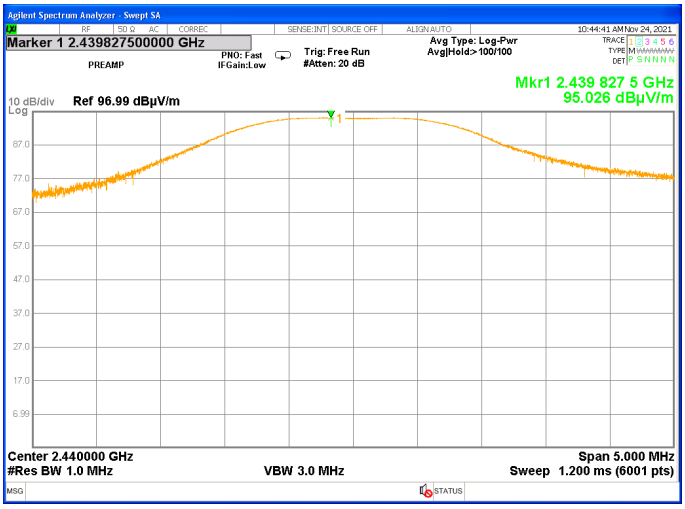
Freq. MHz	Measure dBm	Calculated mWatt	Limit Watt	Verdict	Plot
2402	1.48	1.406	1	Pass	4
2440	0.226	1.053	1	Pass	5
2480	-0.168	0.962	1	Pass	6

Note:
Total power(dBm) = P Measure(dBuV/m) – 95.2 – Antenna Gain(dBi)
In our case the Antenna Gain(dBi) = -0.4 (dBi)

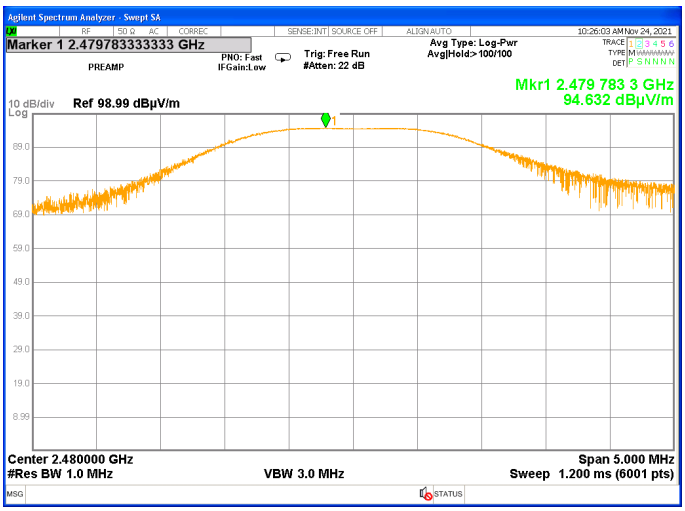
BLE



Plot 4



Plot 5



Plot 6

6.4. Power Spectral Density

Limits & methods:

FCC requirements	15.247(e)		
Test procedure	ANSI 63.10 11.10.5 Method AVGPSD-2 Radiated Measurement		
Operating mode	BLE, Hight Mid and Low		
Ambient Temperature 22^{0}C	Relative Humidity 46%	Air Pressure	1006hPa

Limit

The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission

Test procedure

The measurements were performed in hopping transmission mode of operation for carrier (channel) frequency at bottom, middle and at the top of 2402MHz to 2480MHz frequency band and maximum transmitting data rate.

Results:

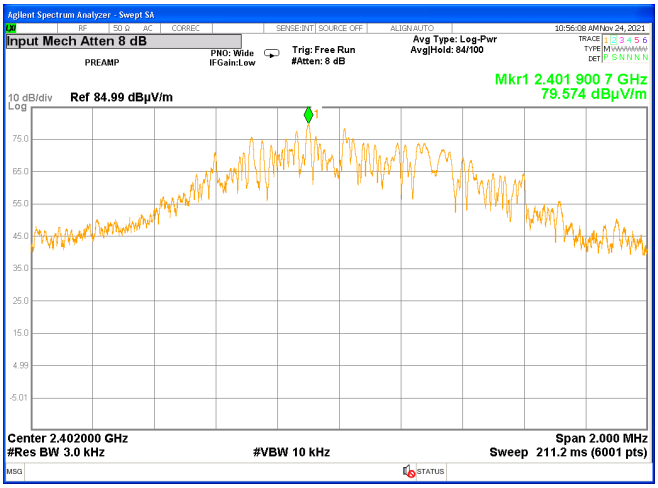
Table 5. Power Spectral Densiry Test Results

Freq. MHz	Measure dBm/3kHz	Limit dBm/3kHz	Verdict	Plot
2402	-15.226	8	Pass	7
2442	-16.943	8	Pass	8
2480	-17.847	8	Pass	9

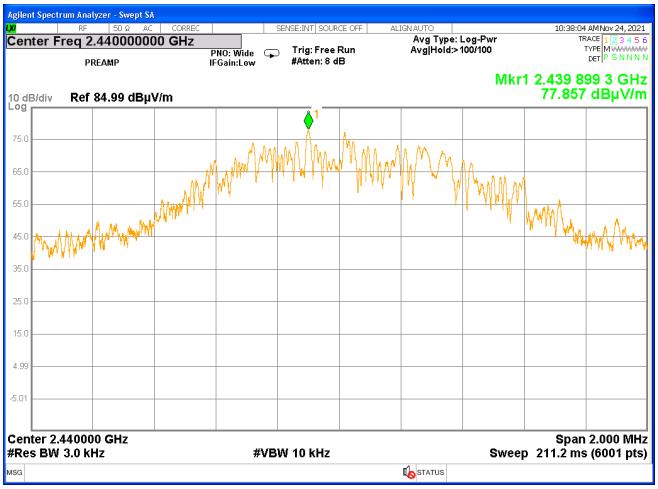
Note:
PSD (dBm/3kHz) = PSD Measure(dBuV/m) – 95.2 – Antenna Gain(dBi)
In our case the Antenna Gain(dBi) = -0.4 (dBi)

.

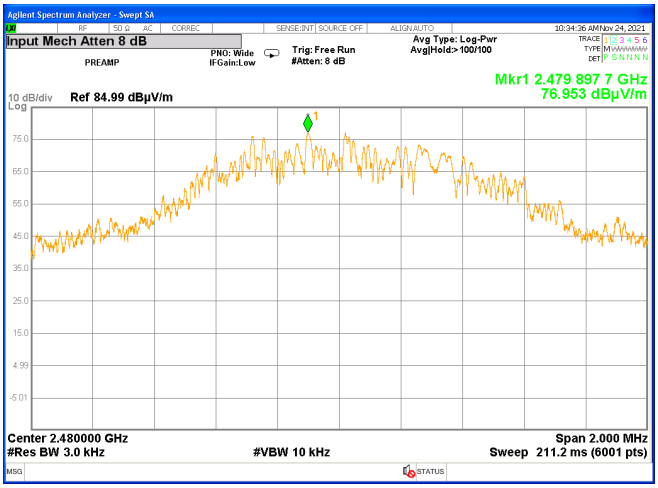
BLE



Plot 7



Plot 8



Plot 9

6.5. Radiated Emissions in Restricted and non-Restricted bands

Limits & methods:

FCC requirements	15.247(d), 15.209, 15.205		
Test procedure	ANSI 63.10 Sections 6.5, 6.6, 11.11, 11.12 Radiated Measurement		
Operating mode	BLE, Hight Mid and Low		
Ambient Temperature 22^{0}C	Relative Humidity 46%	Air Pressure 1006hPa	

Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the 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 a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.
Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see below)

FREQUENCIES (MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

Test procedure

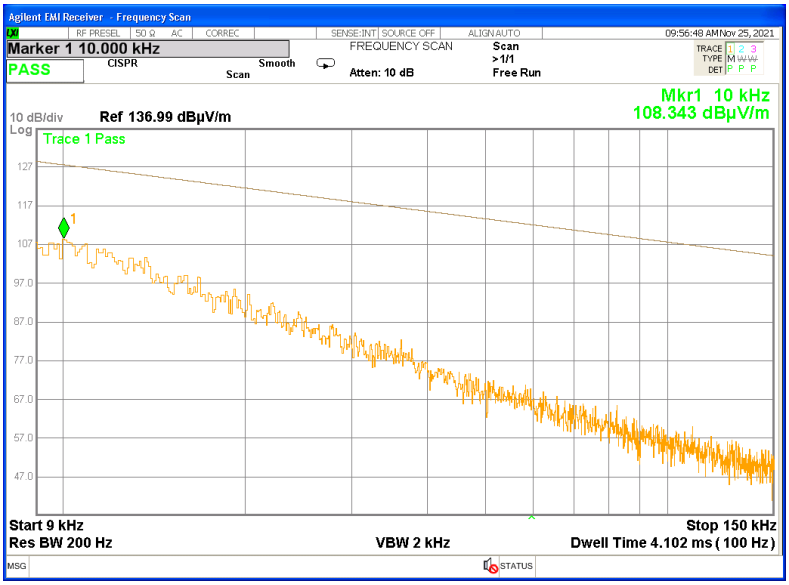
The frequency spectrum was investigated from the lowest radio frequency signal generated in the equipment and up to ten harmonics. The measurements were performed in hopping transmission mode of operation for carrier (channel) frequency at bottom, middle and at the top 2402MHz to 2480MHz frequency band and maximum transmitting data rate.

Results:

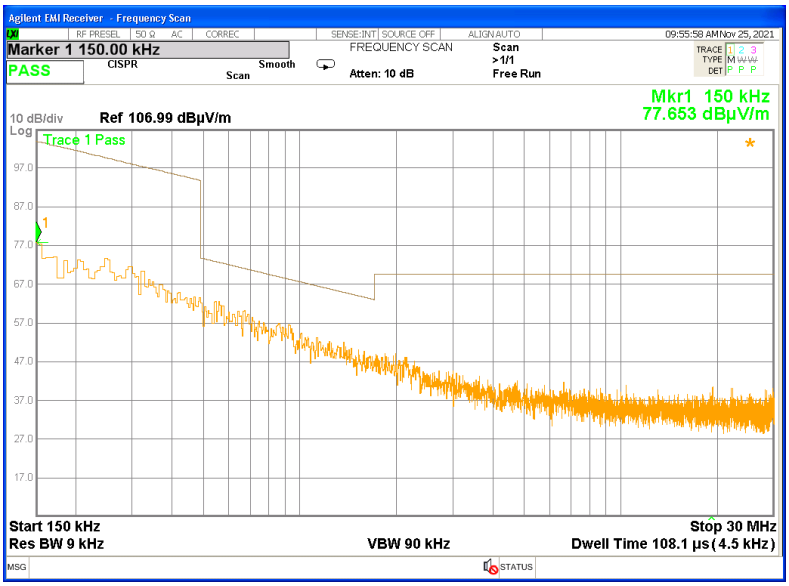
Range: 9 kHz-30 MHz

All detected emissions in this range meet the -20dBc requirement.

The results are presented in Plots # 10-11.



Plot 10

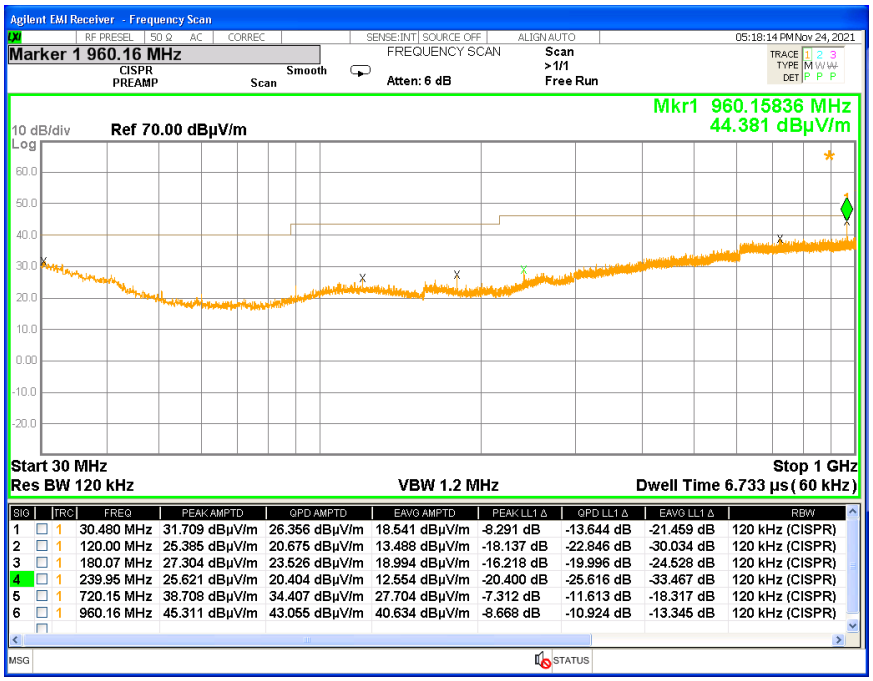


Plot 11

Range: 30 MHz – 40 GHz:

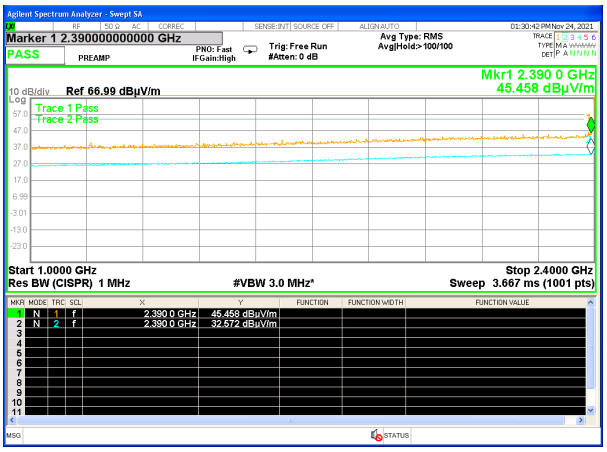
Table 6. CH1 2402 MHz – modulation PRBS - Results

Frequency MHz	Meas Freq. MHz	Pk Det. dbuV/m	QPk Det. dbuV/m	Limit Pk dbuV/m	Limit QPk dbuV/m	Verdict	Ref. Plot
CH 37 2402	30.480	31.709	26.356	-	40	Pass	12
	120.00	25.385	20.675	-	43.5	Pass	12
	180.07	27.304	23.526	-	43.5	Pass	12
	239.95	25.621	20.404	-	46.02	Pass	12
	720.15	38.708	34.407	-	46.02	Pass	12
	960.16	45.311	43.055	-	46.02	Pass	12
			AVG Det. dbuV/m		Limit AVG Det. dbuV/m		
	2390	45.458		74	-	Pass	13
	2390	-	32.572	-	54	Pass	13
	4389	46.319	-	74	-	Pass	14
	4389	-	34.906	-	54	Pass	14
	11844	53.864		74	-	Pass	15
	11844	-	42.250	-	54	Pass	15
	13380	55.593	-	74	-	Pass	16
	13380	-	44.423	-	54	Pass	16
	13380	55.593	-	74	-	Pass	17
	13380	-	44.423	-	54	Pass	17
	20767.7	50.260	-	74	-	Pass	18
	20767.7	-	37.331	-	54	Pass	18

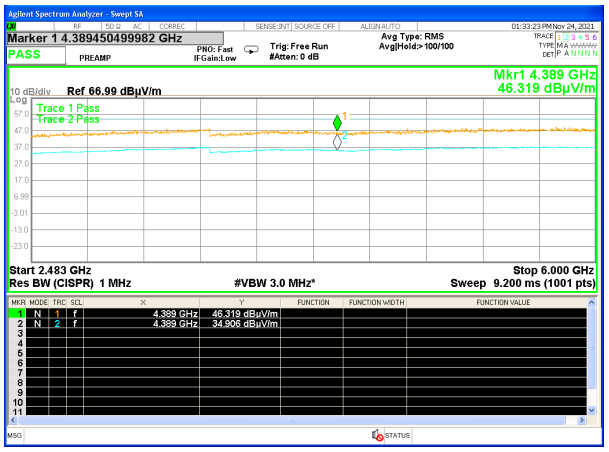


SIG	TRC	FREQ	PEAK AMPTD	QPD AMPTD	EAVG AMPTD	PEAK LL1 Δ	QPD LL1 Δ	EAVG LL1 Δ	RBW
1	1	30.480 MHz	31.709 dBµV/m	26.356 dBµV/m	18.541 dBµV/m	-8.291 dB	-13.644 dB	-21.459 dB	120 kHz (CISPR)
2	1	120.00 MHz	25.385 dBµV/m	20.675 dBµV/m	13.488 dBµV/m	-18.137 dB	-22.846 dB	-30.034 dB	120 kHz (CISPR)
3	1	180.07 MHz	27.304 dBµV/m	23.526 dBµV/m	18.994 dBµV/m	-16.218 dB	-19.996 dB	-24.528 dB	120 kHz (CISPR)
4	1	239.95 MHz	25.621 dBµV/m	20.404 dBµV/m	12.554 dBµV/m	-20.400 dB	-25.616 dB	-33.467 dB	120 kHz (CISPR)
5	1	720.15 MHz	38.708 dBµV/m	34.407 dBµV/m	27.704 dBµV/m	-7.312 dB	-11.613 dB	-18.317 dB	120 kHz (CISPR)
6	1	960.16 MHz	45.311 dBµV/m	43.055 dBµV/m	40.634 dBµV/m	-8.668 dB	-10.924 dB	-13.345 dB	120 kHz (CISPR)

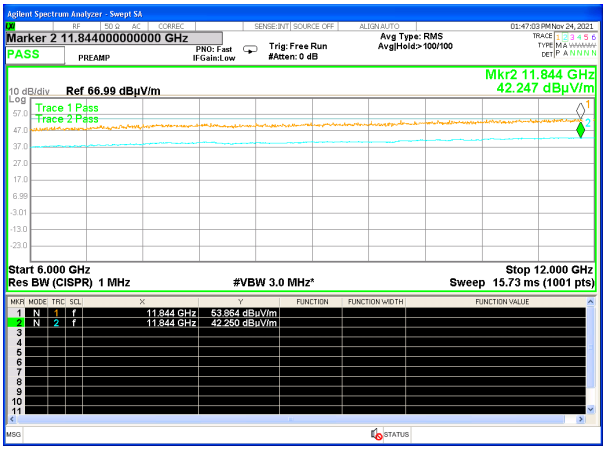
Plot 12



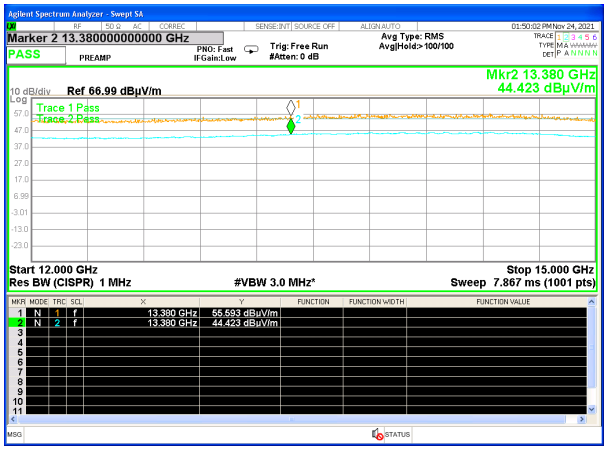
Plot 13



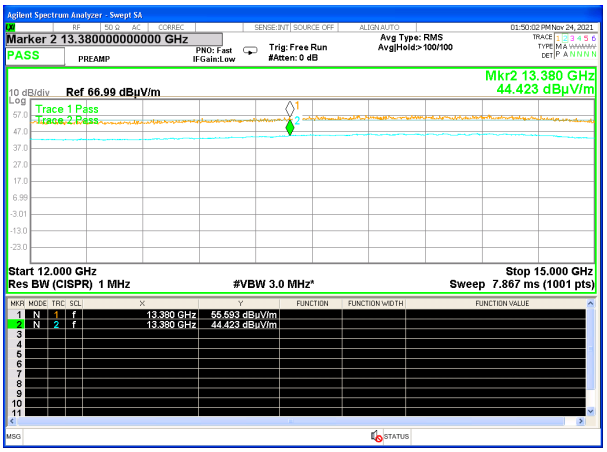
Plot 14



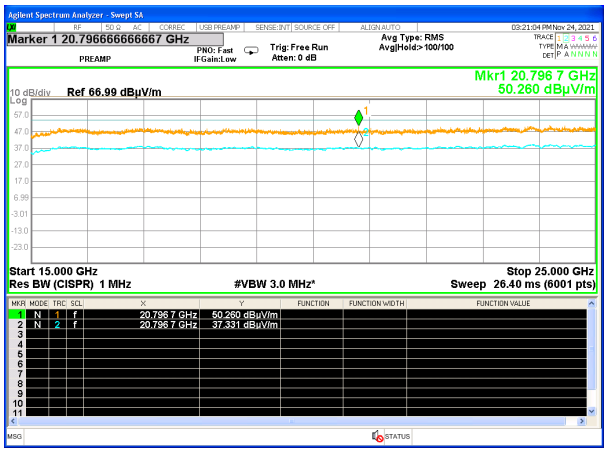
Plot 15



Plot 16



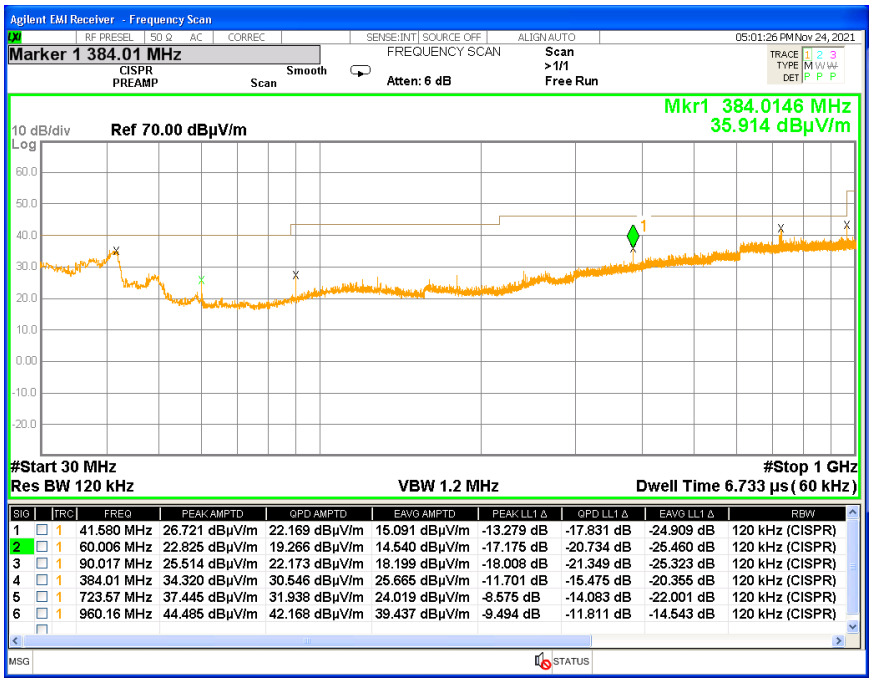
Plot 17



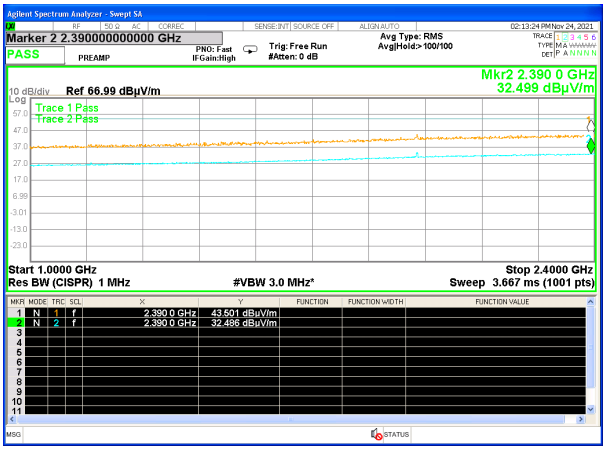
Plot 18

Table 7. CH6 2440 MHz – modulation PRBS - Results

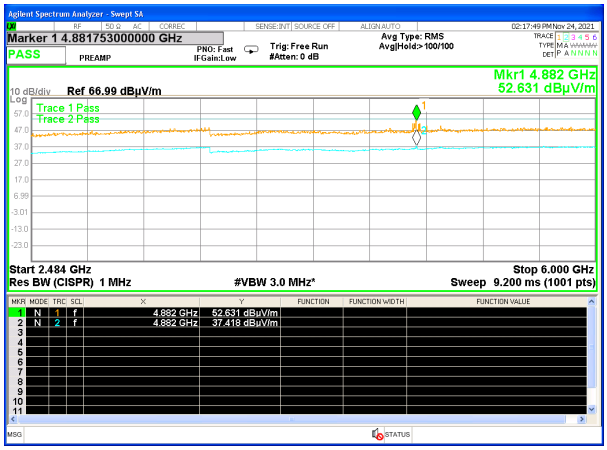
Frequency MHz	Meas Freq. MHz	Pk Det. dbuV/m	QPk Det. dbuV/m	Limit Pk dbuV/m	Limit QPk dbuV/m	Verdict	Ref. Plot
CH 17 2440	41.580	26.721	22.169	-	40.00	Pass	19
	60.006	22.825	19.266	-	43.5	Pass	19
	90.017	25.514	22.173	-	43.5	Pass	19
	384.017	34.320	30.546	-	46.02	Pass	19
	723.57	37.445	31.938	-	46.02	Pass	19
	960.16	44.485	42.168	-	46.02	Pass	19
			AVG Det. dbuV/m		Limit AVG Det. dbuV/m		
	2390	43.501	-	74	-	Pass	20
	2390	-	32.486	-	54	Pass	20
	4879.71	51.768	-	74	-	Pass	22
	4879.65	-	40.539	-	54	Pass	22
	11586	52.240	-	74	-	Pass	23
	11586	-	42.157	-	54	Pass	23
	14484	52.254	-	74	-	Pass	24
	14484	-	45.228	-	54	Pass	24
	23876.7	50.189	-	74	-	Pass	25
	23876.0	-	38.995	-	54	Pass	25



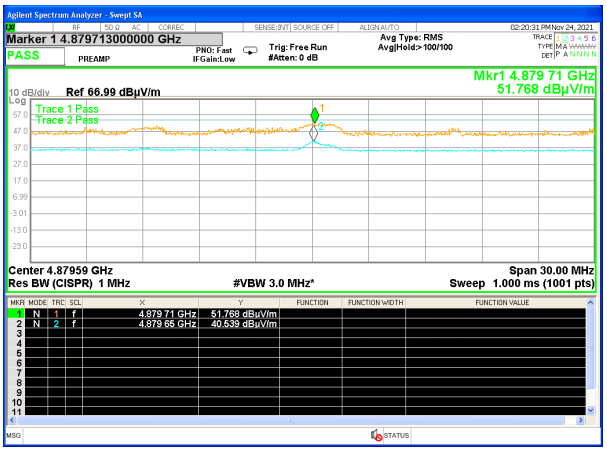
Plot 19



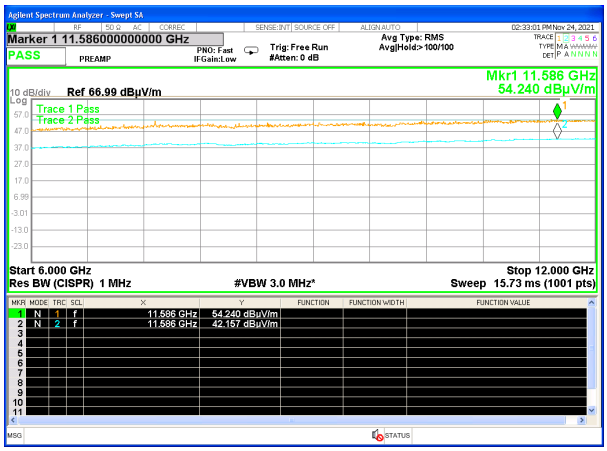
Plot 20



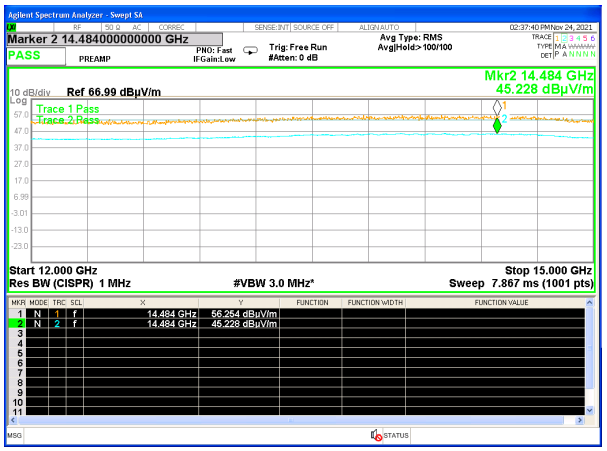
Plot 21



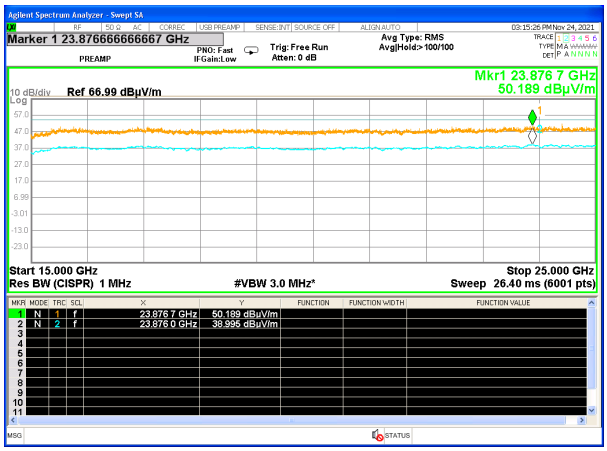
Plot 22



Plot 23



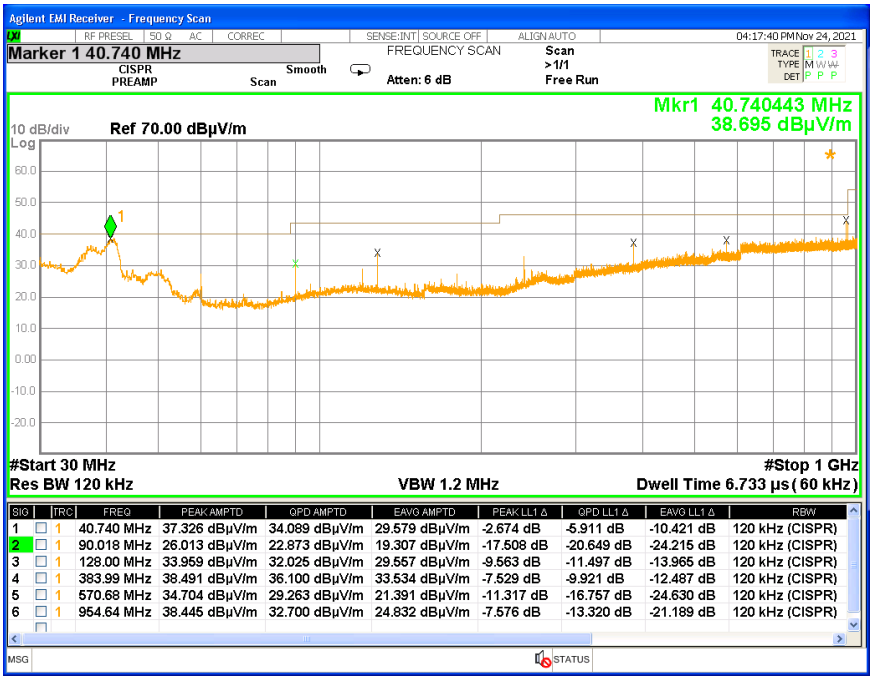
Plot 24



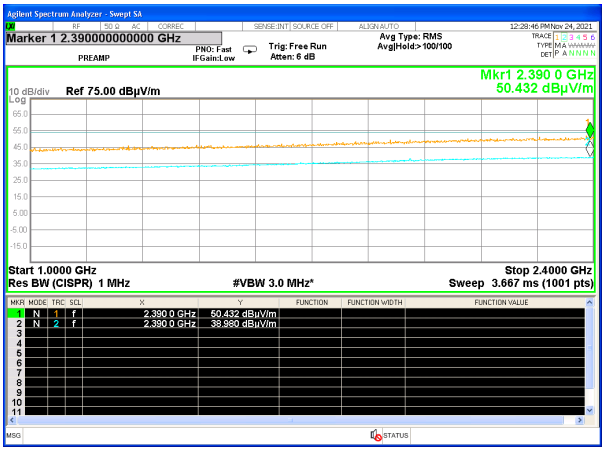
Plot 25

Table 8. CH11 2480 MHz – modulation PRBS - Results

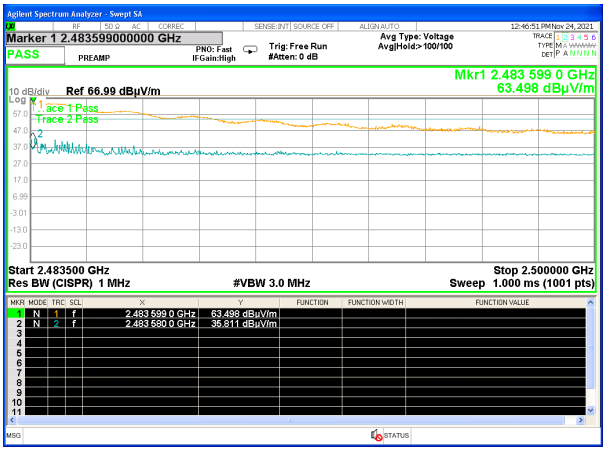
Frequency MHz	Meas Freq. MHz	Pk Det. dbuV/m	QPk Det. dbuV/m	Limit Pk dbuV/m	Limit QPk dbuV/m	Verdict	Ref. Plot
CH 39 2480	40.740	37.326	34.089	-	40	Pass	26
	90.018	26.013	22.873	-	43.5	Pass	26
	128.00	33.959	32.025	-	43.5	Pass	26
	383.99	38.491	36.100	-	46.02	Pass	26
	570.68	34.704	29.263	-	46.02	Pass	26
	954.64	38.445	32.700	-	46.02	Pass	26
			AVG Det. dbuV/m		Limit AVG Det. dbuV/m		
	2390	50.432	-	74	-	Pass	27
	2390	-	38.98	-	54	Pass	27
	2483.599	63.498	-	74	-	Pass	28
	2483.58	-	35.811	-	54	Pass	28
	2484.2425	62.832	-	74	-	Pass	29
	2484.2425	-	41.496	-	54	Pass	29
	4959.65	52.73	-	74	-	Pass	31
	4959.85	-	41.608	-	54	Pass	31
	11814	53.807	-	74	-	Pass	32
	11814	-	42.303	-	54	Pass	32
	14499	56.048	-	74	-	Pass	33
	14499	-	45.096	-	54	Pass	33
	22526.7	49.434	-	74	-	Pass	34
	22526.7	-	37.682	-	54	Pass	34



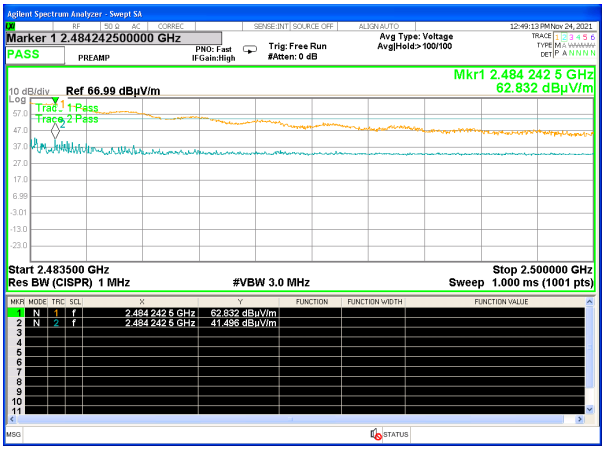
Plot 26



Plot 27

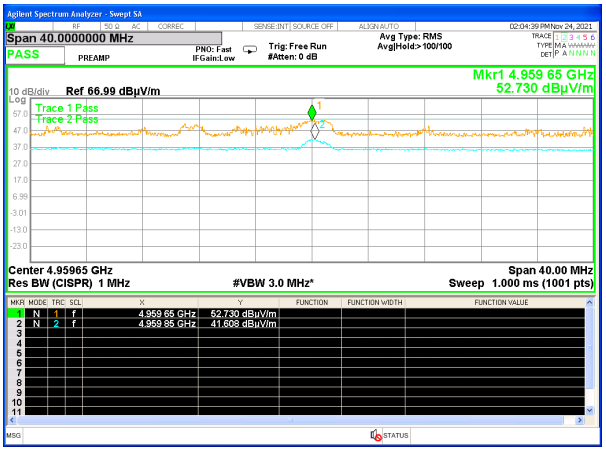


Plot 28

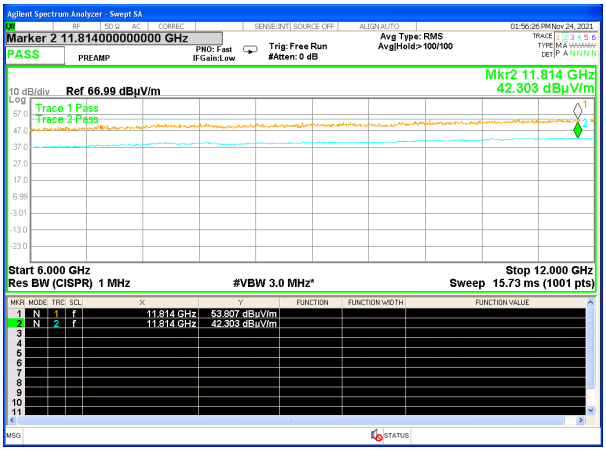


Plot 29

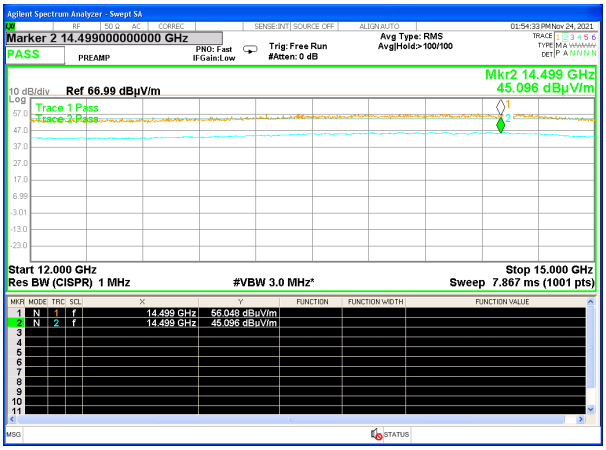
Plot 30



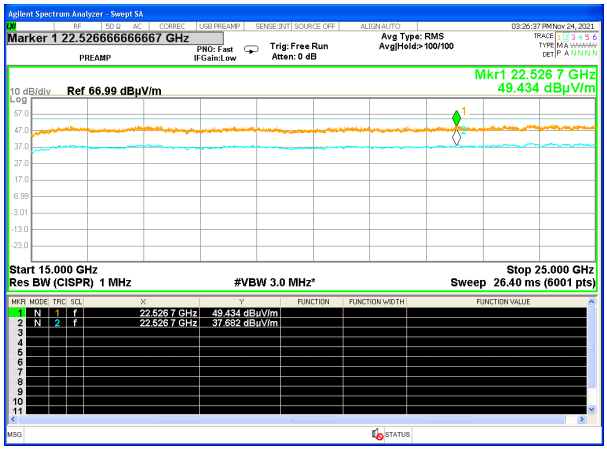
Plot 31



Plot 32



Plot 33



Plot 34

6.6. Band-edge measurements

Limits & methods:

FCC requirements	15.247(d)		
Test procedure	ANSI 63.10 Section 11.13 Radiated Measurement		
Operating mode	BLE, Hight Mid and Low		
Ambient Temperature 22^{0}C	Relative Humidity 46%	Air Pressure	1006hPa

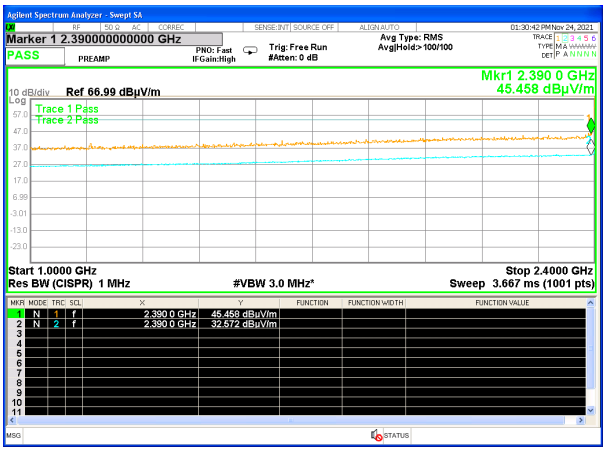
Limit

In any 100 kHz bandwidth outside the frequency band the radio frequency power shall be at least 20 dB below that in the 100 kHz bandwidth within the band

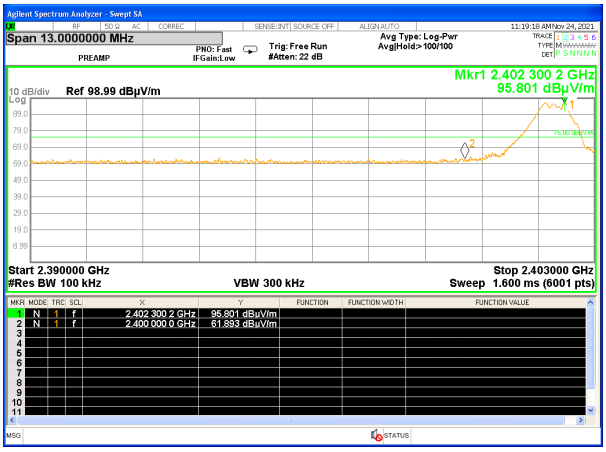
Results:

Table 9. Band-edge Results

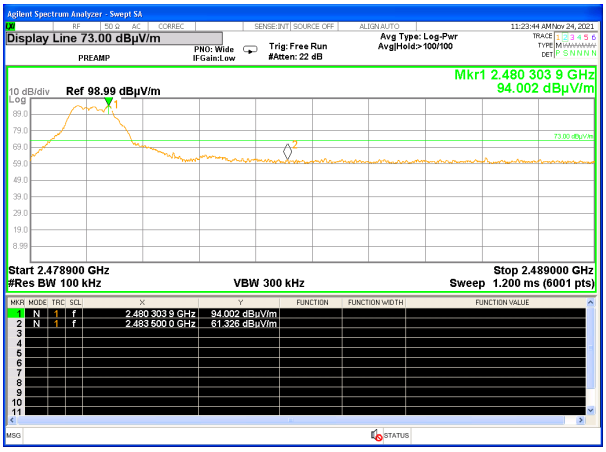
Channel	Freq MHz	Peak, dBµV/m	Limit 20dBc dBµV/m	Verdict	Plot
CH 37	2390	45.45	75	Pass	35,36
CH 39	2483.5	61.32	73	Pass	37



Plot 35



Plot 36



Plot 37

6.7. AC power line conducted emission measurement

Limits & methods:

FCC requirements	15.207		
Test procedure	ANSI 63.10 Section 6.2		
Ambient Temperature 22^{0}C	Relative Humidity 46%	Air Pressure 1006hPa	

Limit:

Frequency, MHz	Class B equipment, dB (μV)	
	QP	AVRG
0.15 - 0.5	66 - 56*	56 - 46*
0.5 - 5	56	46
5 - 30	60	50

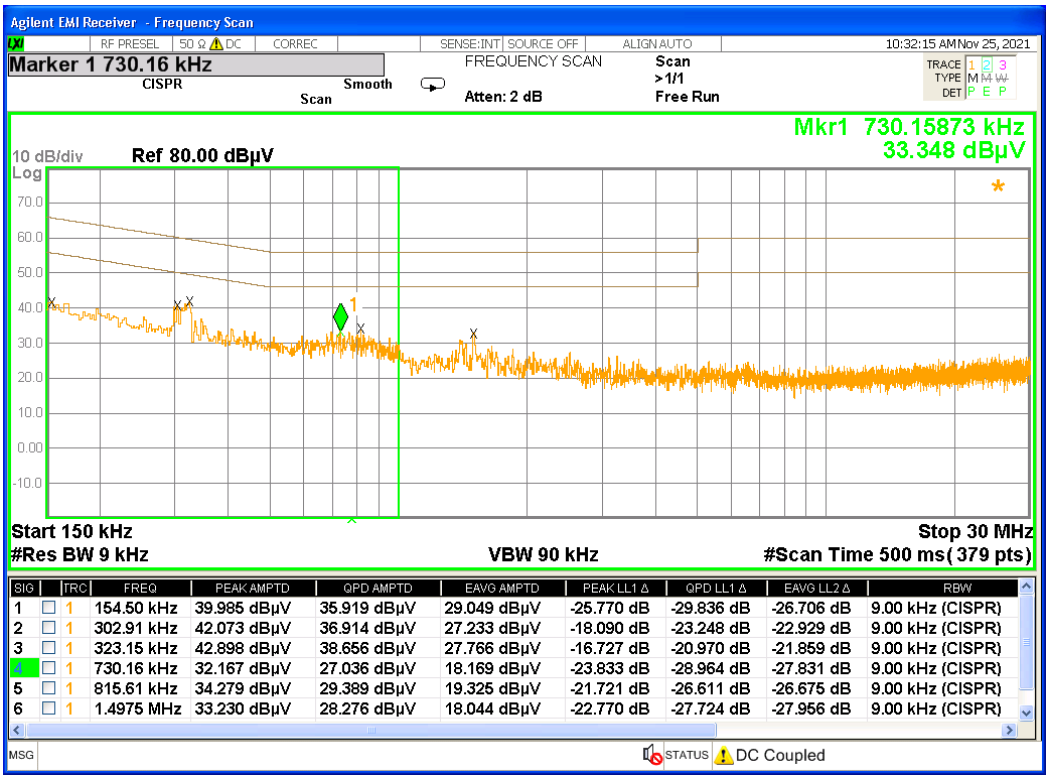
* Decreases linearly with the logarithm of the frequency.

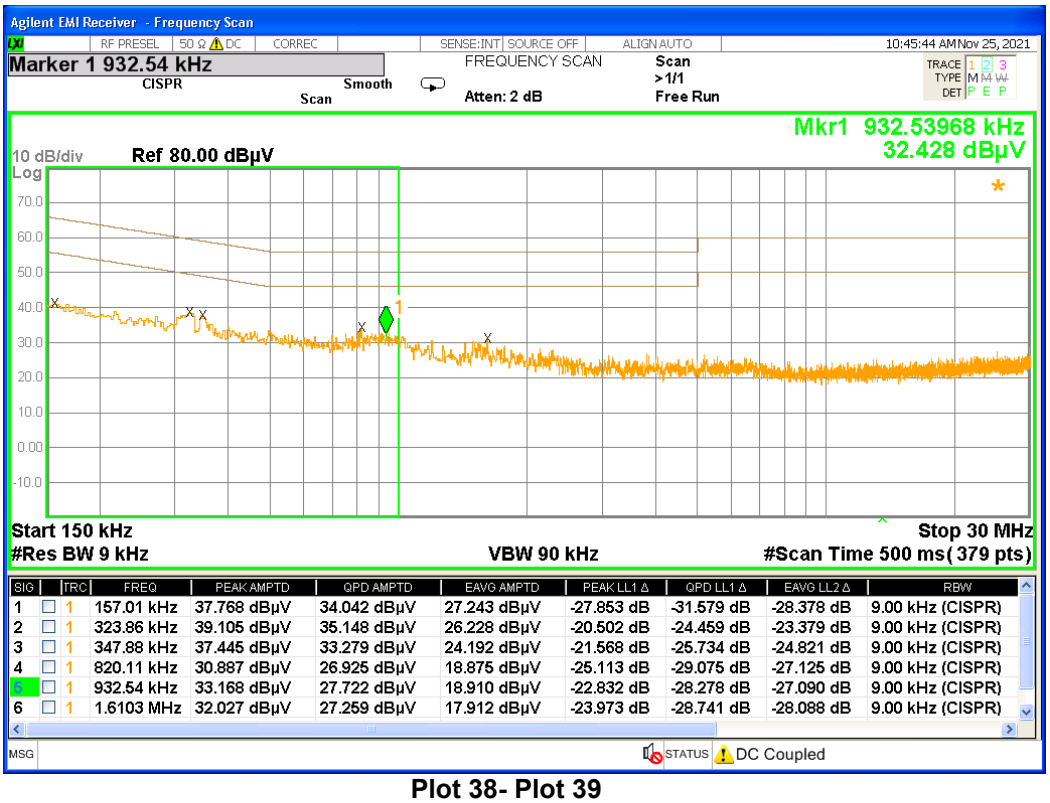
Test Procedure:

EUT was connected to 120VAC main via auxiliary power supply.
The EUT was placed on a table in shielded room at a height 80 cm from floor and 40 cm from the vertical reference plane and at more than 80 cm from any other metal surfaces. The measurements were performed at mains terminals by means of LISN, connected to spectrum analyzer in the frequency range as referred to in the table above. The measurements were made with quasi-peak (CISPR) and average detectors. The position of the EUT cables was varied to determine maximum emission level.

Results:

The results are presented in Plots # 38-39.





Plot 38- Plot 39
Conducted emission on 120VAC mains. Phase & Neutral

7. Antenna requirements

Excerpt from §15.203 of the FCC Rules/Regulations:

"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section."

The antenna of the device is **-** inside case box and non-detachable antenna.
There are no provisions for connection to an external antenna.

Conclusion: The unit complies with the requirement of §15.203.

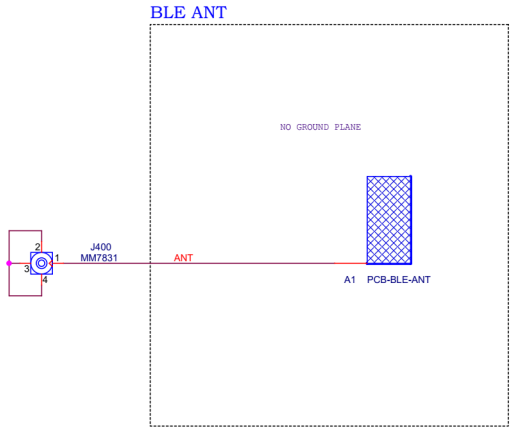


Figure 4. Antenna of Cardiacsense Watch

8. Appendix 1: Test equipment used

All measurements equipment is on SII calibration schedule with a recalibration interval not exceeding one year.

Instrument	Manufac-turer	Model	SII No.	Last calibration date	Next calibration date
EMI Analyzer 10 kHz - 26.5 GHz	HP	E7405A	4944	09/21	09/22
EMI RECEIVER-MXE 3Hz-44GHz	Keysight	N9038B	6505208	04/21	04/22
LISN 9 kHz – 30 MHz	FCC	LISN-50/250-32-4-16	5023	03/21	03/23
Active Receiving Loop Antenna	ETS-Lindgren	6507	00144641	11/20	04/22
Bigonilog Antenna 20 MHz - 6000 MHz	ETS-Lindgren	3142D	146490	10/21	10/23
Double Ridged Waveguide Antenna 1-18 GHz	EMCO	3115	0143138	07/21	07/23
Antenna Broad-Band Horn, 14 GHz - 40 GHz	SCHWARBECK MESS-ELEKTRONIK	BBHA 9170	5854	07/21	07/23
Data +Power splitter	-	-	-	N/A	N/A
Semi Anechoic Chamber	ETS-Lindgren	RFSD-F/A-100	5002	N/A	N/A
Multi-Device Positioning Controller	ETS-Lindgren	2090	5002	N/A	N/A
Antenna Tower	ETS-Lindgren	2175	5002	N/A	N/A
Boresight Antenna Tower	ETS-Lindgren	2171B	5002	N/A	N/A
Turntable	ETS-Lindgren	2188	5002	N/A	N/A
Cable RF 1 m	SUCOFLEX	104PE	21325	04/21	04/22
Cable RF 3 m	VPO 2930	K30K30-5003-300cm5VI	005	04/21	04/22
Cable RF 3 m	VPO 2930	K30K30-5003-300cm6VI	006	04/21	04/22
Cable RF 3 m	VPO 2930	K30K30-5003-300cm7VI	007	04/21	04/22
Cable RF 3 m	VPO 2930	K30K30-5003-300cm8VI	008	04/21	04/22
Attenuator 10dB 5W	-	5W	6502987	04/20	04/22
Attenuator 20dB 5W	-	5W	6502992	04/20	04/22
USB preamplifier 2 GHz – 50 GHz	Keysight	U7227F	MY 55380004	04/21	04/22
Transient limiter 0.009-200 MHz	HP	11947A	3107105	10/20	10/21
Cable	EIM	RG 214/U	8 & 10	01/21	01/22

9. Appendix 2: Antenna Factor and Cable Loss

Cable Loss (RG214 (6 m) + 5005 (3.8 m) + 5005 (3 m))

NO.	Frequency (MHz)	Attenuation (dB)	Frequency (MHz)	Attenuation (dB)	Frequency (MHz)	Attenuation (dB)	Frequency (MHz)	Attenuation (dB)
1	0.00	0.0	2.16	0.1	46.76	0.6	1011.06	3.0
2	0.11	0.0	2.27	0.1	49.10	0.7	1061.61	3.1
3	0.11	0.0	2.38	0.1	51.55	0.7	1114.70	3.1
4	0.12	0.0	2.50	0.1	54.13	0.7	1170.43	3.4
5	0.12	0.0	2.63	0.1	56.83	0.7	1228.95	3.5
6	0.13	0.0	2.76	0.1	59.68	0.8	1290.40	3.8
7	0.13	0.0	2.90	0.1	62.66	0.8	1354.92	4.2
8	0.14	0.0	3.04	0.1	65.79	0.8	1422.66	4.3
9	0.15	0.0	3.19	0.2	69.09	0.8	1493.80	4.4
10	0.16	0.0	3.35	0.2	72.54	0.9	1568.49	4.5
11	0.16	0.0	3.52	0.2	76.16	0.9	1646.91	4.6
12	0.17	0.0	3.70	0.2	79.97	0.9	1729.26	4.7
13	0.18	0.0	3.88	0.2	83.97	1.0	1815.72	4.8
14	0.19	0.0	4.08	0.2	88.17	1.0	1906.51	5.0
15	0.20	0.0	4.28	0.2	92.58	1.0	2001.83	5.1
16	0.21	0.0	4.50	0.2	97.21	1.0	2101.92	5.3
17	0.22	0.1	4.72	0.2	102.07	1.0	2207.02	5.4
18	0.23	0.1	4.96	0.2	107.17	1.1	2317.37	5.5
19	0.24	0.1	5.20	0.2	112.53	1.1	2433.24	5.6
20	0.25	0.1	5.46	0.2	118.15	1.1	2554.90	5.6
21	0.27	0.1	5.74	0.2	124.06	1.2	2682.65	5.7
22	0.28	0.1	6.02	0.2	130.26	1.2	2816.78	5.8
23	0.29	0.1	6.33	0.2	136.78	1.2	2957.62	5.8
24	0.31	0.1	6.64	0.2	143.62	1.3	3105.50	5.9
25	0.32	0.1	6.97	0.2	150.80	1.3	3260.77	6.0
26	0.34	0.1	7.32	0.2	158.34	1.3	3423.81	6.0
27	0.36	0.1	7.69	0.3	166.25	1.3	3595.00	6.3
28	0.37	0.1	8.07	0.2	174.57	1.4	3774.75	6.4
29	0.39	0.1	8.48	0.2	183.30	1.4	3963.49	6.6
30	0.41	0.1	8.90	0.2	192.46	1.5	4161.67	6.6
31	0.43	0.1	9.35	0.3	202.08	1.5	4369.75	6.6
32	0.45	0.1	9.81	0.3	212.19	1.6	4588.24	6.5
33	0.48	0.1	10.30	0.3	222.80	1.6	4817.65	7.0
34	0.50	0.1	10.82	0.3	233.94	1.6	5058.53	6.8
35	0.53	0.1	11.36	0.3	245.63	1.7	5311.46	7.2
36	0.55	0.1	11.93	0.3	257.92	1.7	5577.03	7.6
37	0.58	0.1	12.52	0.4	270.81	1.8	5855.88	8.1
38	0.61	0.1	13.15	0.3	284.35	1.8	6148.68	7.9
39	0.64	0.1	13.81	0.4	298.57	1.9	6456.11	8.2
40	0.67	0.1	14.50	0.4	313.50	1.9	6778.91	8.1
41	0.70	0.1	15.23	0.4	329.17	1.9	7117.86	8.4
42	0.74	0.1	15.99	0.4	345.63	2.0	7473.75	8.6
43	0.78	0.1	16.79	0.4	362.91	2.0	7847.44	8.7
44	0.81	0.1	17.62	0.4	381.06	2.0	8239.81	9.0
45	0.85	0.1	18.50	0.4	400.11	1.9	8651.80	9.7
46	0.90	0.1	19.43	0.4	420.12	1.9	9084.39	10.4
47	0.94	0.1	20.40	0.4	441.12	1.9	9538.61	11.0
48	0.99	0.1	21.42	0.4	463.18	1.9	10015.54	11.8
49	1.04	0.1	22.49	0.5	486.34	1.9	10516.32	11.9
50	1.09	0.1	23.62	0.4	510.65	2.2	11042.14	13.4
51	1.15	0.1	24.80	0.5	536.19	2.1	11594.25	13.9
52	1.20	0.1	26.04	0.5	563.00	2.3	12173.96	13.9
53	1.26	0.1	27.34	0.5	591.15	2.5	12782.66	14.0
54	1.33	0.1	28.71	0.4	620.70	2.4	13421.79	13.9
55	1.39	0.1	30.14	0.5	651.74	2.4	14092.88	15.7
56	1.46	0.1	31.65	0.5	684.33	2.7	14797.52	15.7
57	1.54	0.1	33.23	0.5	718.54	2.7	15537.40	16.6
58	1.61	0.1	34.89	0.5	754.47	2.6	16314.27	17.5
59	1.69	0.1	36.64	0.5	792.19	2.7	17129.98	17.7
60	1.78	0.1	38.47	0.6	831.80	2.7	17986.48	18.7
61	1.87	0.1	40.39	0.6	873.39	2.9	18000.00	18.3
62	1.96	0.1	42.41	0.6	917.06	2.8		
63	2.06	0.1	44.53	0.6	962.92	2.9		

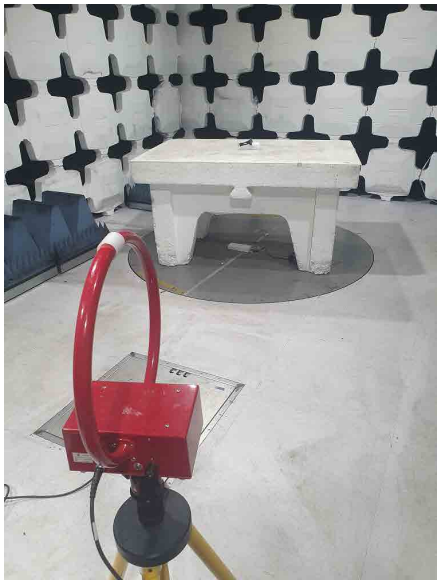
Antenna Factor
Biconilog Antenna Model No: 3142D Ser.No: 146490. 3 m distance

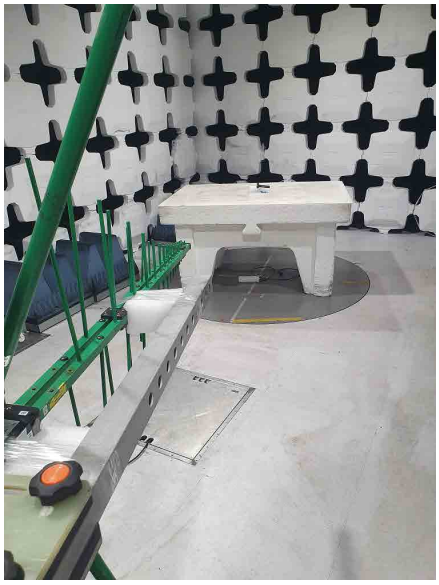
No.	f / MHz	ACF / dB/m	f / MHz	AF / dB/m
1	30	24.163	200	16.944
2	35	21.253	250	19.108
3	40	18.627	300	20.008
4	45	16.523	400	22.244
5	50	15.030	500	24.997
6	60	13.445	600	26.581
7	70	13.336	700	27.633
8	80	12.720	800	28.829
9	90	13.742	900	30.078
10	100	14.609	1000	30.820
11	120	13.716	1250	33.670
12	140	14.187	1500	36.896
13	160	14.964	1750	34.459
14	180	16.537	2000	35.148

Antenna Factor
Double Ridged Waveguide Horn Antenna manufacturer EMCO Type 3115
1 GHz to 18 GHz. 3 m distance

No.	f / MHz	AF / dB/m	f / MHz	AF / dB/m	f / MHz	AF / dB/m
1	1000	23.6	7000	36.6	13000	39.7
2	1500	25.5	7500	37.3	13500	40.3
3	2000	28.2	8000	37.0	14000	41.0
4	2500	27.6	8500	37.4	14500	40.8
5	3000	29.2	9000	37.7	15000	39.4
6	3500	30.5	9500	38.0	15500	38.8
7	4000	31.7	10000	38.2	16000	39.0
8	4500	31.9	10500	38.5	16500	40.1
9	5000	32.7	11000	38.6	17000	40.8
10	5500	33.8	11500	38.9	17500	42.2
11	6000	35.2	12000	38.8	18000	42.3
12	6500	35.7	12500	39.0		

10. Appendix 3: Test illustrations





Picture 1
Radiated spurious emission test setup below 1 GHz

Picture 2. Radiated spurious emission test setup above 1 GHz

END OF THE DOCUMENT