IMQ S.p.A. con socio unico
Via Quintiliano, 43
20138 MILANO - I

TELECOMMUNICATIONS & TELEMATICS FOR TRANSPORTS LABORATORY

TEST REPORT
No. ARSL00305/a

performed in accordance with

FCC Rules: Code of Federal Regulations (CFR) no. 47
Part 15 Subpart C Section 15.249

PRODUCT	WIRELESS ELECTROMYOGRAPH
MODEL(s) TESTED	WAVE PLUS EMG
FCC ID	Y9SWPRX
TRADE MARK(s)	COMETA

APPLICANT	COMETA S.r.l. – Via G. Verdi, 24 – 20080 CISLIANO (MI) - ITALY

Tested by	Roberto Radice	Roberto Radice
Approved by	Giorgio Belussi *[Laboratory Head]*	

Revision Sheet

Release No.	Date	Revision Description
Rev. 0	2012-05-29	First edition
Rev. 1	2012-10-09	Modify par. 7.3 Radiated disturbances – Average measures

1. GENERAL DATA

SAMPLE		
Samples received on	**2012-01-17**	**(item sent and sampling by applicant)**
IMQ reference samples	**BEM**	**62416**
Samples tested No.	3 (1 for every frequency tested)	
Object under analysis recognition	**Not carried out** Except where stated, characteristics of products were taken from client description and were not verified by the laboratory	
TEST LOCATION		
Testing dates	2012-01-18 ÷ 2012-05-29	
Testing laboratory.	IMQ S.p.A. - Via Quintiliano, 43 – I-20138 Milano	
Testing site	Via Quintiliano, 43 – I-20138 Milano	
ENVIRONMENTAL CONDITIONING		
Parameter	***Measured***	
Ambient Temperature	25 ÷ 35 °C	
Relative Humidity	50 ÷ 60 %	
Atmospheric Pressure	900 ÷ 1000 mbar	

2. REFERENCE DOCUMENT

DOCUMENT		DATE	TITLE
☒	47 CFR Part 15	2008	Radio Frequency Device
☒	ANSI C63.4	2009	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	2009	American National Standard for Testing Unlicensed Wireless Devices

3. UNIT UNDER TEST (EUT) DETAILS

GENERAL DATA

MODEL (basic)	Description
WAVE FORM EMG	Wireless Electromyograph (Base unit)
VARIANTS (derived)	Description
None	

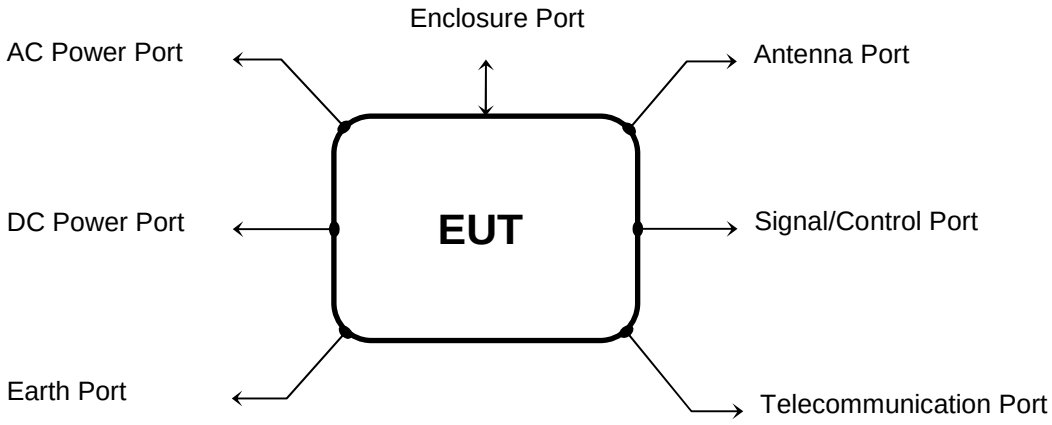
FCC ID	Y9SWPRX

Manufacturer	COMETA S.r.l. – Via G. Verdi, 24 – 20080 CISLIANO (MI) - ITALY

Type of equipment	Wireless Electromyograph for medical use
Operating frequency:	2402÷2480MHz
Maximum RF radiated power:	96,46 dBµV/m
Modulation:	FSK
Channel Spacing:	None
Antenna:	External dedicated 6dBi gain antenna
RX sensitivity:	/
Main SW identification	/
Main HW Board identification	WMAIN V02
Peripherals included (for system application)	None
Interfaces :	USB cable for Personal Computer interface
Integrated interfaces :	None
AC adapter:	AC/DC Adapter 100÷240V~/ 50-60Hz/ 400mA – Output 9Vdc/ 1,5A
Data cable	None
Telecom cable	None
Power supply type :	FWGB type FW 755M/09
AC power input cable :	None
DC power input cable :	None

4. TEST CONFGURATION OF UNIT UNDER TEST

EUT PORTS



Port	Description	Max length
Enclosure	Plastic enclosure	
AC power	Input 100÷240Vac/50÷60Hz (from AC/DC power supply)	-----
DC power	Port not present	-----
Earth	Port not present	-----
Telecommunication	Port not present	-----
Signal	Usb Port (for PC connection)	< 3m.
Control	Analog outputs	< 3m.
Antenna	Dedicated 6dBi antennas (RX and TX)	-----

CHANNEL CONFIGURATION

Channel (No.)	Selectable frequency (MHz)
01	2402
	2410
	2418
	2426
	2440
	2456
	2464
	2472
	2480

N.B. the equipment is a single frequency channel; the frequency is setting via software by the manufacturer; the user cannot change the working frequency.

STATE OF THE EUT DURING TESTS

Ref.	Mode	Description
#1	Operating	Continuous transmission (single channel transmission)

SUPPORT EQUIPMENT

Defined as equipment needed for correct operation or loading of the EUT, but not considered as tested:

Equipment	Manufacturer	Model
None		

ELECTROMAGNETICALLY RELEVANT COMPONENTS

Component	No.	Manufacturer	Model
Microprocessor	1	MICROCHIP	PIC18F46K22

RFI SUPPRESSION DEVICES

Component	No.	Manufacturer	Model
Ferrite (on DC input cable – 3 turns)	1	/	/ - 270 Ω at 100 MHz
Ferrite (on internal input cable – 15 turns)	1	EASYMAGNET CO.	33RI 25X12X15 – 120 Ω at 100 MHz
CM choke	2	WURTH	744272102

EMI PROTECTION DEVICES

Component	No.	Manufacturer	Model
/			

EUT TECHNICAL DOCUMENTATION

Document	Reference
WAVE PLUS EMG MULTICHANNEL ELECTROMYOGRAPH – USER MANUAL	COD. WPMENG Rev.0 – 02/11/2011

5. METHODS OF MEASUREMENT

All compliance measurements have been carried out using the procedures described in the standard ANSI C63.4-2009, ANSI C63.10-2009 and Section 15.31 of CFR47 Part 15 – Subpart A (General). Additional test requirements have been adopted according to the reference Section indicated in the § 6 of this test report.
FREQUENCY RANGE INVESTIGATED
Conducted emission tests : from 150 kHz to 30 MHz. Radiated emission tests: from 0,15 MHz to tenth harmonic of fundamental.

6. SUMMARY OF TEST RESULTS

POSSIBLE TEST CASE VERDICTS:	
Test object does meet the requirement	PASS
Test object does not meet the requirement	FAIL
Test case does not apply to the test object	N.A.
Test not performed	N.P.

CFR47 Part 15	TITLE	RESULT
§ 15.203	Antenna Requirements	PASS
§ 15.207 (a)	Conducted Emission	PASS
§ 15.209 (a) (f) § 15.249 (a)	Radiated Emission	PASS
§ 15.209 (a) § 15.249 (a) (d) (e)	Emissions radiated outside of the specified frequency bands	PASS
§ 15.209 (a) § 15.249 (d)	100 kHz Bandwidth of Frequency Band Edges	PASS
§ 15.209 (a) § 15.249 (d)	Spurious Emission in restricted band near 2400-2483.5 MHz	PASS
Part 2.1049	Transmitter 20dB Bandwidth	PASS

7. TEST RESULTS

7.1 ANTENNA REQUIREMENTS

TEST REQUIREMENT
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall 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 manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

Antenna specifications	
N° of authorized antenna types	1
Antenna type	Dedicated external antenna AIR802 type ANRD2405-SMA
Maximum total gain	6dBi
External power amplifiers	Not present

TEST RESULT
The EUT meets the requirements of section 15.203 and 15.204

7.2 CONDUCTED DISTURBANCES

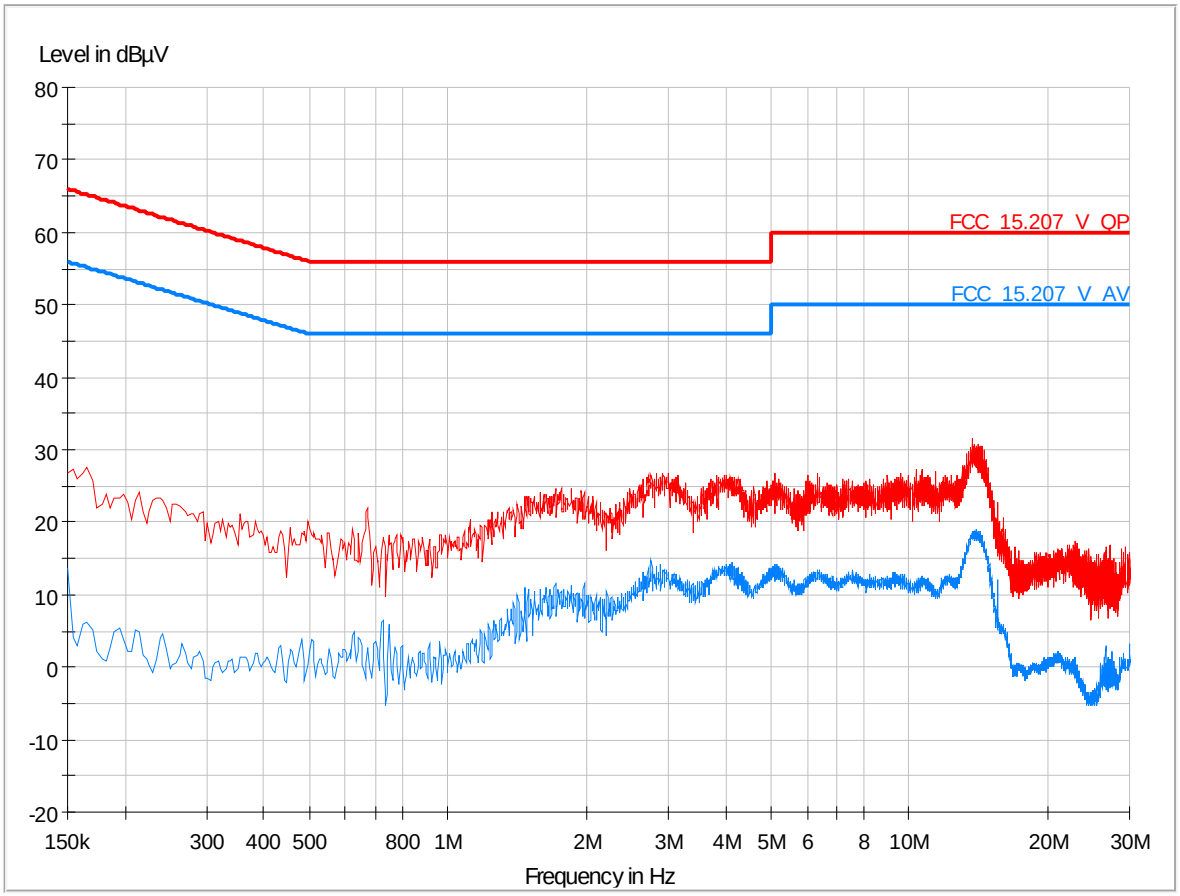
TEST REQUIREMENT	
Test setup	ANSI C63.4
Frequency range	150 kHz ÷ 30 MHz
IF bandwidth	9 kHz
EMC class	B
Limits	sections 15.207 (a)
EUT operating condition	#1
Remark	None

TEST RESULT
The EUT meets the requirements of sections 15.207.

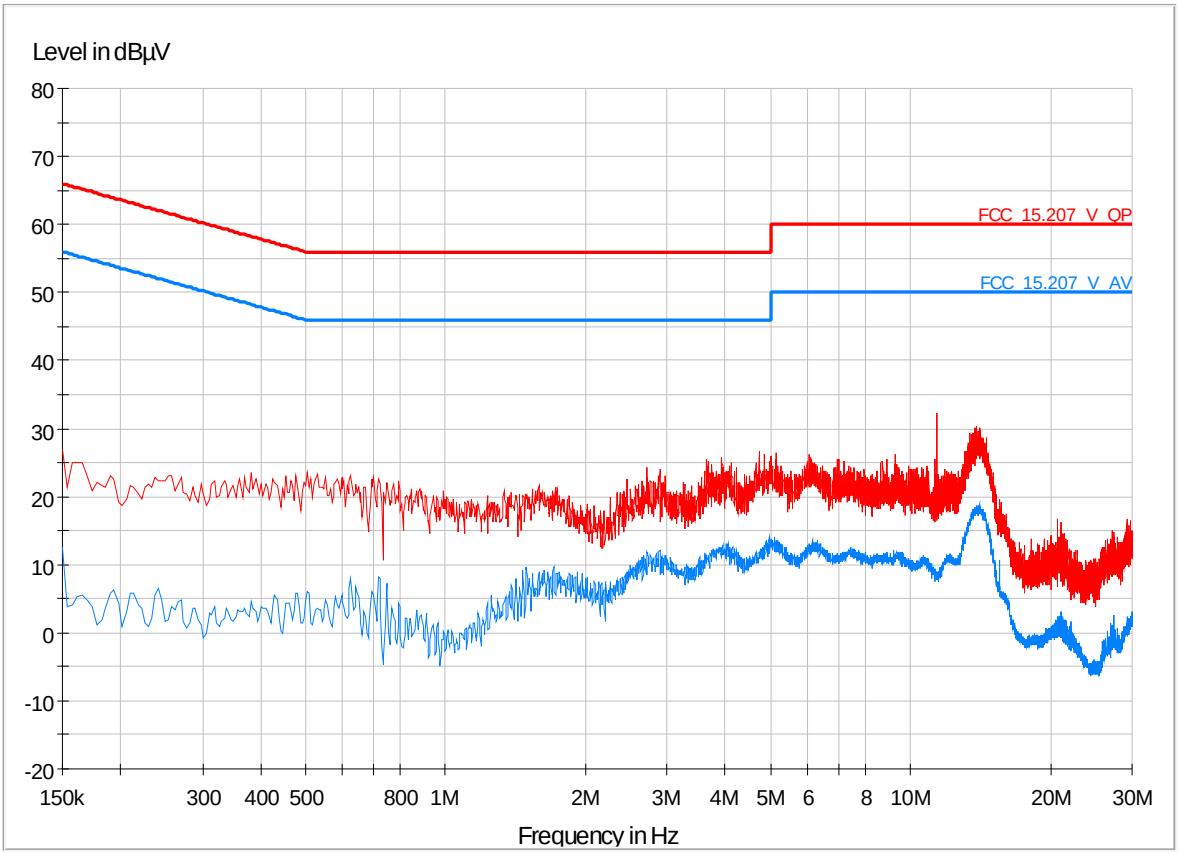
TEST PROCEDURE
1) The EUT was placed on a wooden table of size, 80 cm by 80 cm, raised 80 cm in which is located 40 cm away from the vertical wall the shielded room.
2) Each EUT power cord input cord was individually connected through a 50Ω/50µH LISN to the input power source.
3) Exploratory measurements were made to identify the frequency of the emission that had the highest amplitude relative to the limit by operating the EUT in a range of typical modes of operation, cable position, and with a typical system equipment configuration and arrangement. Based on the exploratory tests of the EUT, the one EUT cable configuration and arrangement and mode of operation that had produced the emission with the highest amplitude relative to the limit was selected for the final measurement.
4) The final test on all current-carrying conductors of all of the power cords to the equipment that comprises the EUT (but not the cords associated with other non-EUT equipment is the system) was then performed over the frequency range of 0.15 MHz to 30 MHz.
5) The measurements were made with the detector set to PEAK and AVERAGE amplitude within a bandwidth of 10 kHz during the measurements.
6) The measurements with Quasi-Peak detector are performed only for frequencies for which the Peak values are ≥ (Q.P. limit - 6 dB).

MEASUREMENTS RESULTS

Port: AC MAINS POWER PORT OF AC/DC ADAPTER
Line: PHASE

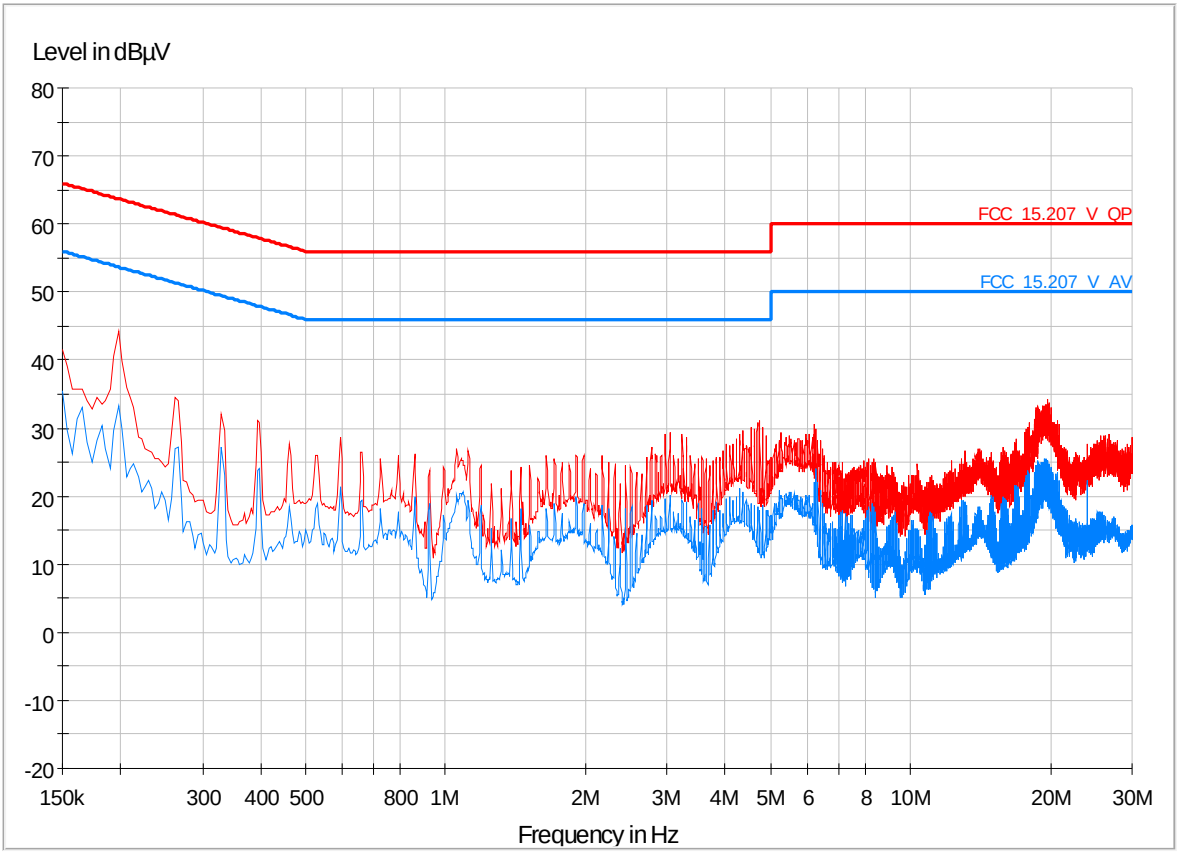


Port: AC MAINS POWER PORT OF AC/DC ADAPTER
Line: NEUTRAL



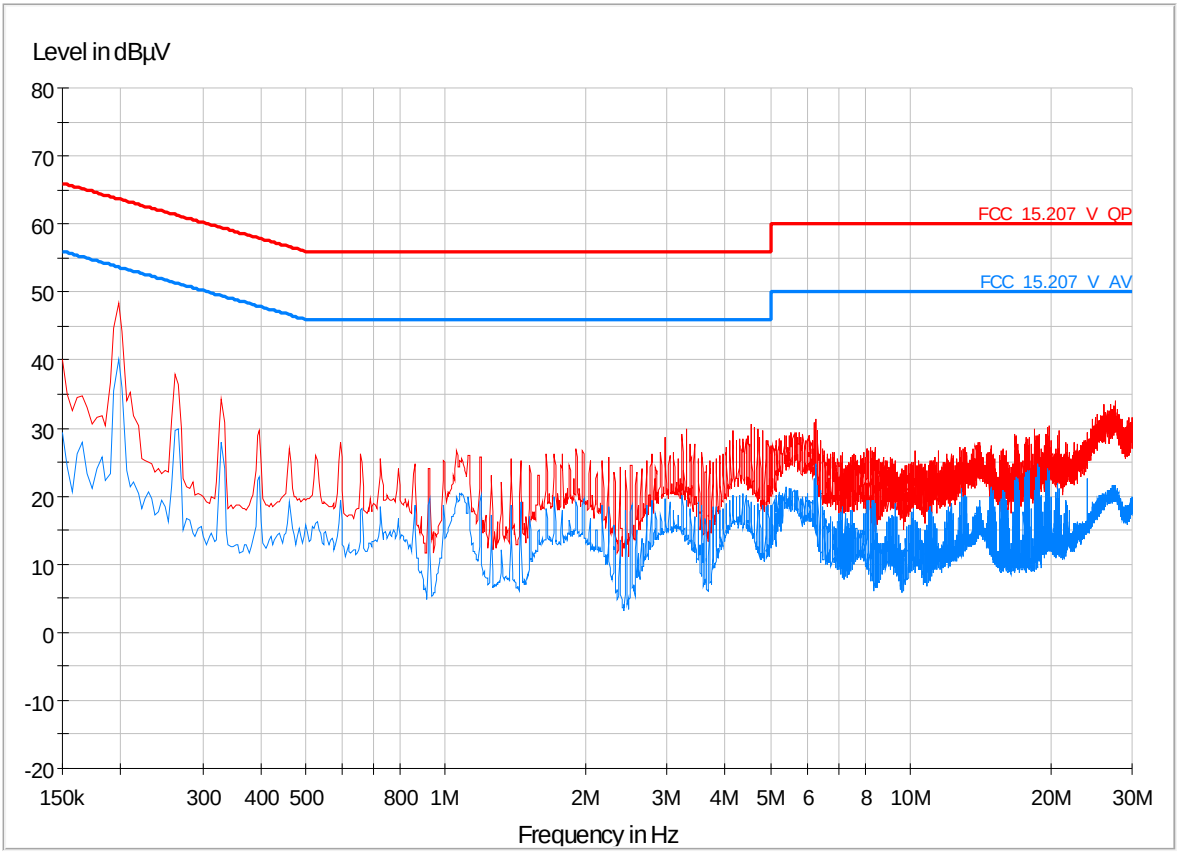
Port: AC MAINS POWER PORT OF PERSONAL COMPUTER WHEN THE EQUIPMENT IS CONNECTED THROUGH THE USB PORT

Line: PHASE



Port: AC MAINS POWER PORT OF PERSONAL COMPUTER WHEN THE EQUIPMENT IS CONNECTED THROUGH THE USB PORT

Line: NEUTRAL



7.3 RADIATED DISTURBANCES

TEST REQUIREMENT	
Test setup	ANSI C63.4
Test facility	Semi-anechoic chamber
Test distance	3 meters
Frequency range	9 kHz to tenth harmonic of fundamental
IF bandwidth (below 30 MHz)	9 kHz
IF bandwidth (below 1,000 MHz)	120 kHz
IF bandwidth (above 1,000 MHz)	1 MHz
Deviation to test procedure	None
Limits	sections 15.209 (a)
EUT operating condition	#1
Remark	(*) In accordance with part 15.31 (f) (2), where the measurement distance was specified to be 30 or 300 meters, a correction factor was applied in order to permit measurement to be performed at a separation distance. The applied formula for limits at 3 meter is: Extrapolation (dB) = 40log (300meter / 3meter) = +80db Extrapolation (dB) = 40log (30meter / 3meter) = +40db

TEST RESULT
The EUT meets the requirements of sections 15.205 (b), 15.215 (b) and 15.249 (d).

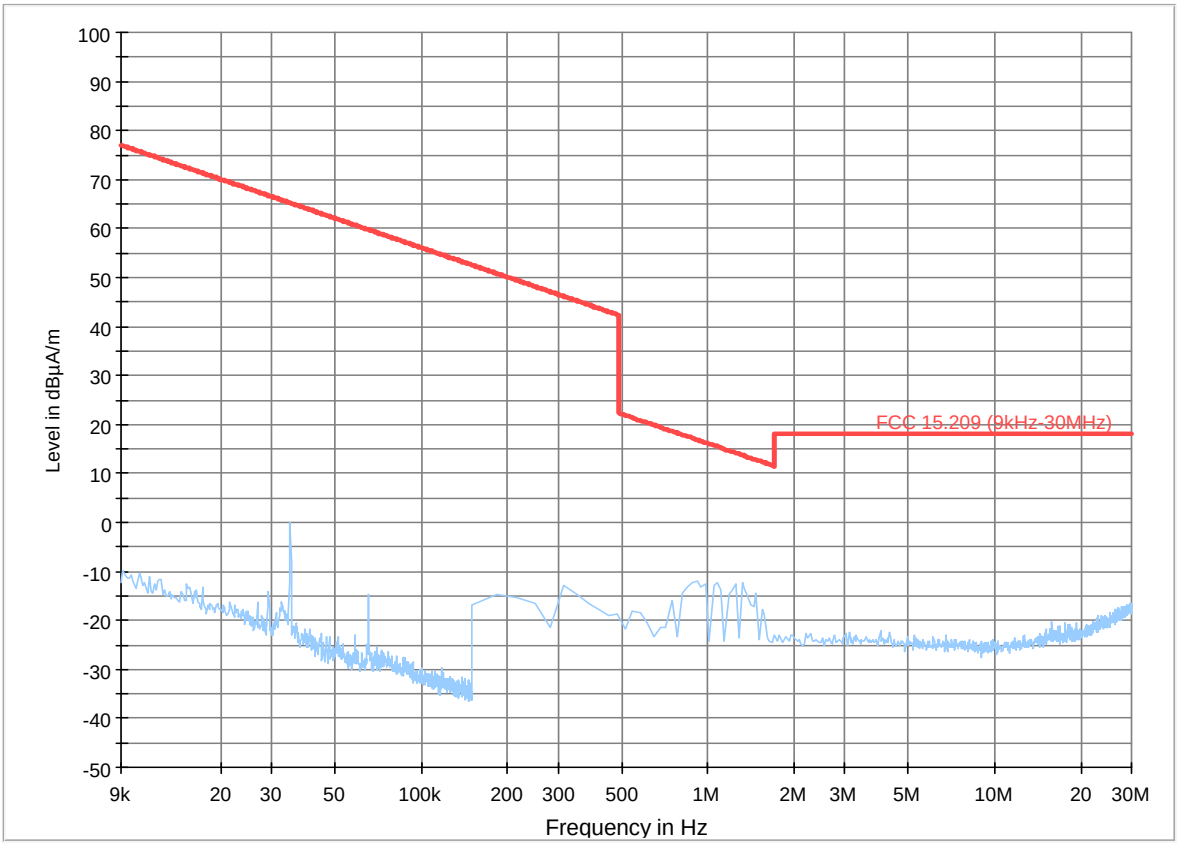
LIMITS FOR SPURIOUS		
Band of operations	**Peak (dBµV/m)**	**Average Limit (dBµV/m)**
Restricted bands (par. 15.205)	74	54
Other bands	According to 15.209 or fundamental –20dB (which is greater)	According to 15.209 or fundamental –20dB (which is greater)

TEST PROCEDURE

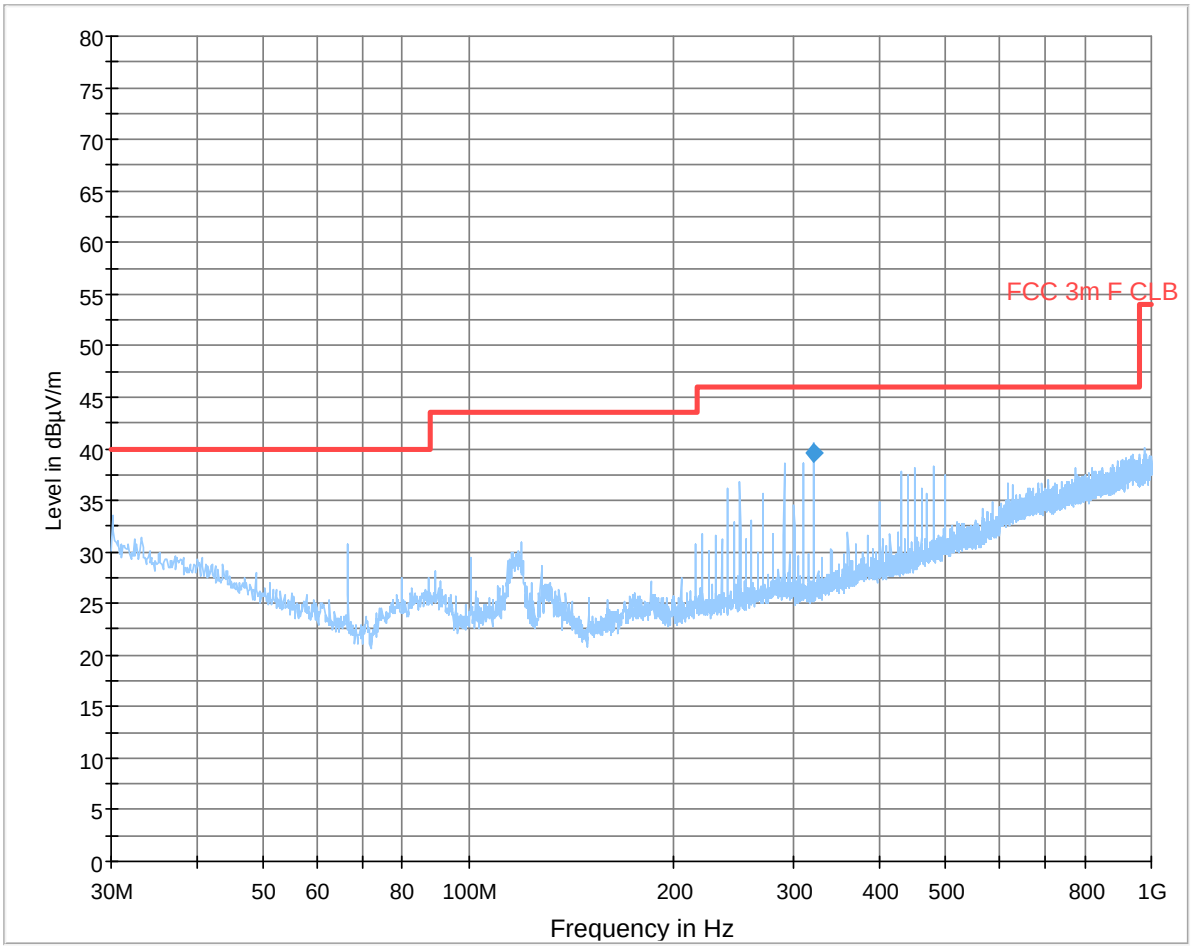
1) The EUT was placed on turntable which is 0.8 m above the ground plane
2) The turntable shall rotate from 0° to 360° degrees to determine the position of maxim um emission level.
3) The EUT is positioned 3 m away from the receiving antenna which varied from 1 to 4 m to find the highest emission.
4) The measurements were made with the detector set to PEAK and AVERAGE amplitude within a bandwidth of 100 kHz below 1000 MHz and 1 MHz above 1000 MHz.
5) The receiving antenna was positioned in both horizontal and vertical polarization.
6) The measurements with Quasi-Peak detector, below 1000 MHz are performed only for frequencies for which the Peak values are ≥ (Q.P. limit – 6 dB).

MEASUREMENTS RESULTS

Range: 9kHz÷30MHz



Range: 30 ÷ 1000 MHz



Range: 1000 ÷ 24800 MHz

Frequency: 2,402 MHz

PEAK RESULT (RBW=1MHz; VBW=1MHz)								
Frequency	**Reading value**	**Antenna Factor**	**Cable Loss**	**Pre-Amp. Gain**	**Correcting reading**	**PK Limit (AV + 20dB)**	**PK Limit (AV + 20dB)**	**Margin**
(MHz)	**(dBµV)**	**(dB1/m)**	**(dB)**	**(dB)**	**(dBµV/m)**	**(µV/m)**	**(dBµV/m)**	**(dB)**
2402 (fundamental)	97.05	27.40	3.55	-33.00	95.00	500000	114.00	19
4804	43.15	31.54	5.44	-32.80	47.33	5000	74.00	>26
7206	48.95	36.06	6.90	-32.76	59.15	5000	74.00	>15
9608	28,31	38.08	9.36	-32.15	43.60	5000	74.00	>30
12010	< 30	39.10	11.55	-31.66	< 40	5000	74.00	>34
f>12010	not significant	---	---	---	---	5000	74.00	---

AVERAGE FACTOR			
T. Pulse (ms)	TX on + TX off (ms)	Duty cycle	Average Factor (dB)
0,2 x 15pulses: 3	100	0,03	30,45

CALCULATE AVERAGE (PEAK – AVERAGE FACTOR)								
Frequency	**Reading value**	**Antenna Factor**	**Cable Loss**	**Pre-Amp. Gain**	**Correcting reading**	**AV Limit**	**AV Limit**	**Margin**
(MHz)	**(dBµV)**	**(dB1/m)**	**(dB)**	**(dB)**	**(dBµV/m)**	**(µV/m)**	**(dBµV/m)**	**(dB)**
2402 (fundamental)	66.60	27.40	3.55	-33.00	64.55	50000	94.00	>30
4804	12.70	31.54	5.44	-32.80	16.88	500	54.00	>37
7206	18.50	36.06	6.90	-32.76	28.70	500	54.00	>25
9608*	---	---	---	---	---	500	54.00	---
12010*	---	---	---	---	---	500	54.00	---
f>12010*	---	---	---	---	---	500	54.00	---

*NOTE: The peak levels measured are under Average Limit (54 dBµV/m), so the Average spurious levels are not been measured.

Frequency: 2.440 MHz

PEAK RESULT (RBW=1MHz; VBW=1MHz)								
Frequency	**Reading value**	**Antenna Factor**	**Cable Loss**	**Pre-Amp. Gain**	**Correcting reading**	**PK Limit (AV + 20dB)**	**PK Limit (AV + 20dB)**	**Margin**
(MHz)	**(dBµV)**	**(dB1/m)**	**(dB)**	**(dB)**	**(dBµV/m)**	**(µV/m)**	**(dBµV/m)**	**(dB)**
2440 (fundamental)	98.51	27.40	3.55	-33.00	96.46	500000	114.00	>17
4880	43.41	31.54	5.44	-32.80	47.59	5000	74.00	>26
7320	53.73	36.06	6.90	-32.76	63.93	5000	74.00	>10
9760	29.29	38.08	9.36	-32.15	44.58	5000	74.00	>29
12200	< 30	39.10	11.55	-31.66	< 40	5000	74.00	>34
F<12200	not significant	---	---	---	---	5000	74.00	---

AVERAGE FACTOR			
T. Pulse (ms)	TX on + TX off (ms)	Duty cycle	Average Factor (dB)
0,2 x 15pulses: 3	100	0,03	30,45

CALCULATE AVERAGE (PEAK – AVERAGE FACTOR)								
Frequency	**Reading value**	**Antenna Factor**	**Cable Loss**	**Pre-Amp. Gain**	**Correcting reading**	**Limit**	**Limit**	**Margin**
(MHz)	**(dBµV)**	**(dB1/m)**	**(dB)**	**(dB)**	**(dBµV/m)**	**(µV/m)**	**(dBµV/m)**	**(dB)**
2440 (fundamental)	68.06	27.40	3.55	-33.00	66.01	50000	94.00	>27
4880	12.96	31.54	5.44	-32.80	17.14	500	54.00	>36
7320	23.28	36.06	6.90	-32.76	33.48	500	54.00	>20
9760*	---	---	---	---	---	500	54.00	---
12200*	---	---	---	---	---	500	54.00	---
F<12200*	---	---	---	---	---	500	54.00	---

*NOTE: The peak levels measured are under Average Limit (54 dBµV/m), so the Average spurious levels are not been measured.

Frequency: 2.480 MHz

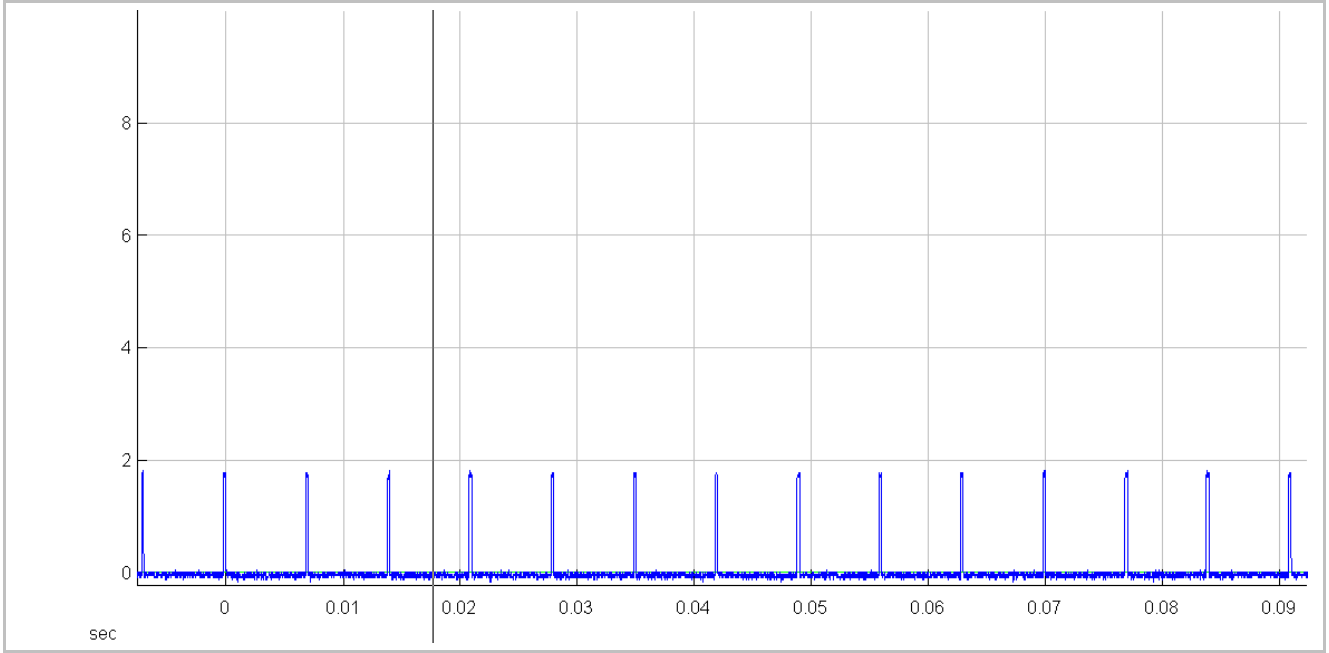
PEAK RESULT (RBW=1MHz; VBW=1MHz)								
Frequency	**Reading value**	**Antenna Factor**	**Cable Loss**	**Pre-Amp. Gain**	**Correcting reading**	**PK Limit (AV + 20dB)**	**PK Limit (AV + 20dB)**	**Margin**
(MHz)	**(dBµV)**	**(dB1/m)**	**(dB)**	**(dB)**	**(dBµV/m)**	**(µV/m)**	**(dBµV/m)**	**(dB)**
2480 (fundamental)	97.50	27.40	3.55	-33.00	95.45	500000	114.00	>18
4960	44.80	31.54	5.44	-32.80	48.98	5000	74.00	>25
7440	53.80	36.06	6.90	-32.76	64.00	5000	74.00	10
9920	28.83	38.08	9.36	-32.15	44.12	5000	74.00	>29
12400	< 30	39.10	11.55	-31.66	< 40	5000	74.00	>34
F<12400	not significant	---	---	---	---	5000	74.00	---

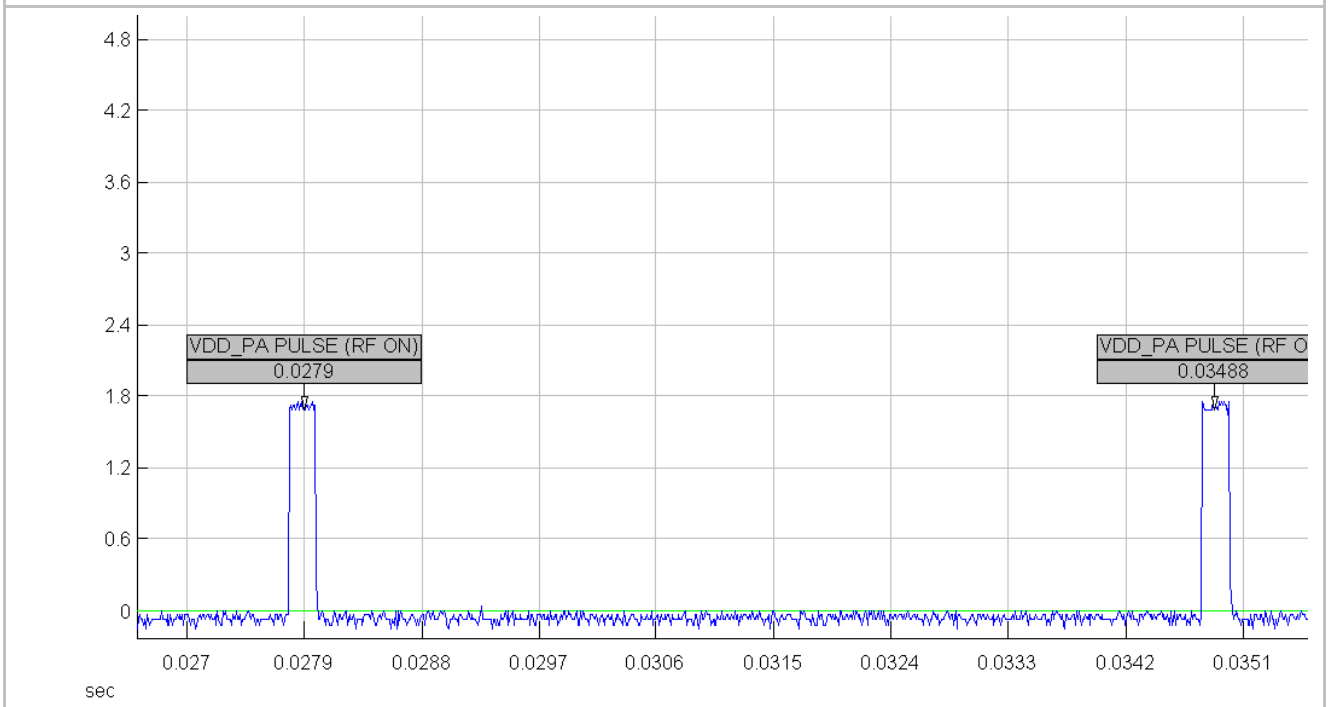
AVERAGE FACTOR			
T. Pulse (ms)	TX on + TX off (ms)	Duty cycle	Average Factor (dB)
0,2 x 15pulses: 3	100	0,03	30,45

CALCULATE AVERAGE (PEAK – AVERAGE FACTOR)								
Frequency	**Reading value**	**Antenna Factor**	**Cable Loss**	**Pre-Amp. Gain**	**Correcting reading**	**Limit**	**Limit**	**Margin**
(MHz)	**(dBµV)**	**(dB1/m)**	**(dB)**	**(dB)**	**(dBµV/m)**	**(µV/m)**	**(dBµV/m)**	**(dB)**
2480 (fundamental)	67.05	27.40	3.55	-33.00	65.00	50000	94.00	>29
4960	14.35	31.54	5.44	-32.80	18.53	500	54.00	>35
7440	23.35	36.06	6.90	-32.76	33.55	500	54.00	>20
9920*	---	---	---	---	---	500	54.00	---
12400*	---	---	---	---	---	500	54.00	---
F<12400*	---	---	---	---	---	500	54.00	---

*NOTE: The peak levels measured are under Average Limit (54 dBµV/m), so the Average spurious levels are not been measured.

DUTY CYCLE





Duty cycle: Ton=0,2ms x 15pulses= 3ms. Ton+Toff= 100ms

7.4 BAND-EDGE COMPLIANCE OF RF RADIATED EMISSIONS

TEST REQUIREMENT	
Spectrum analyzer settings	
Span	Wide enough to capture 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
Resolution bandwidth (RBW)	1 MHz (100 kHz band-edge)
Video bandwidth (VBW)	1 MHz (100 kHz band-edge)
Sweep time (SWT)	Auto
Detector function	Peak
Trace	Max hold
Attenuator	/
Deviation to test procedure	None
EUT operating condition	#1
Remark	None

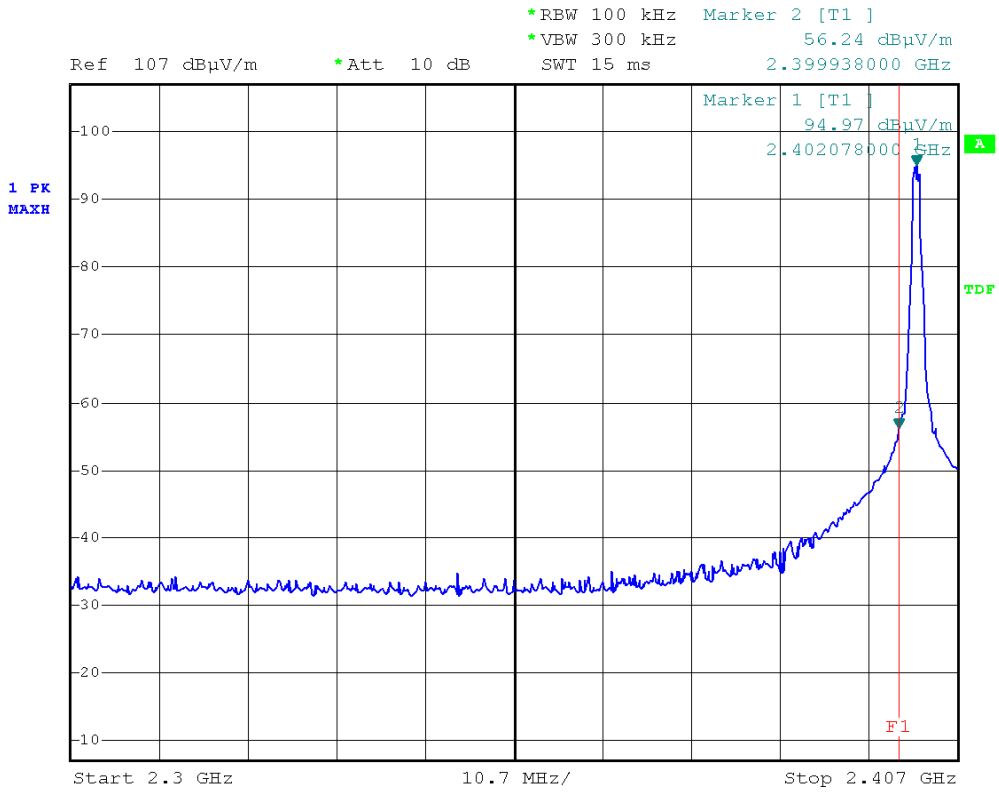
TEST RESULT
The EUT meets the requirements of sections 15.209 (a) and 15.249 (d)

LIMITS
At least 50dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

TEST PROCEDURE
Only for measuring emissions up to 2 MHz removed from the band-edge the "delta" technique for Radiated emissions was used. Delta technique: The transmitter output was connected to the spectrum analyzer through a test fixture (radio frequency coupling device associated with the dedicated antenna of the equipment under test) Once the trace is stabilized, by the marker the emission at the band edge (or on the highest modulation product outside of the band, if this level is greater than that at the band edge) was set. The “n” by the marker-delta function and the marker-to-peak function the peak of the in-band emission was selected. The marker-delta value displayed was compared with the limit specified in this Section

MEASUREMENTS RESULTS

Band-edge compliance, lower band edge, (Peak)



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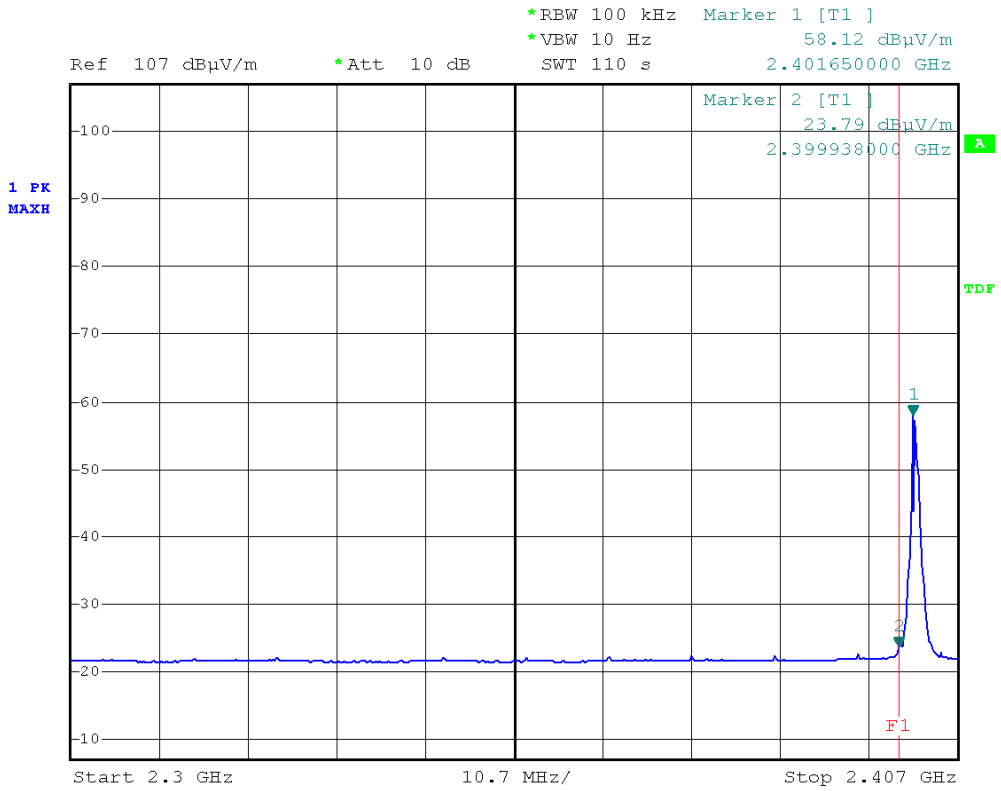
Band-edge compliance to radiated emission test					
Band edge Lower (MHz)	Measured power (dBµV/m)	Measured power at the band edge (dBµV/m)	Peak Limit (dBµV/m)	Margin (dB)	
2,402	94,97	56.24	74.00	17.76	

Band-edge compliance, lower band edge, (Average)



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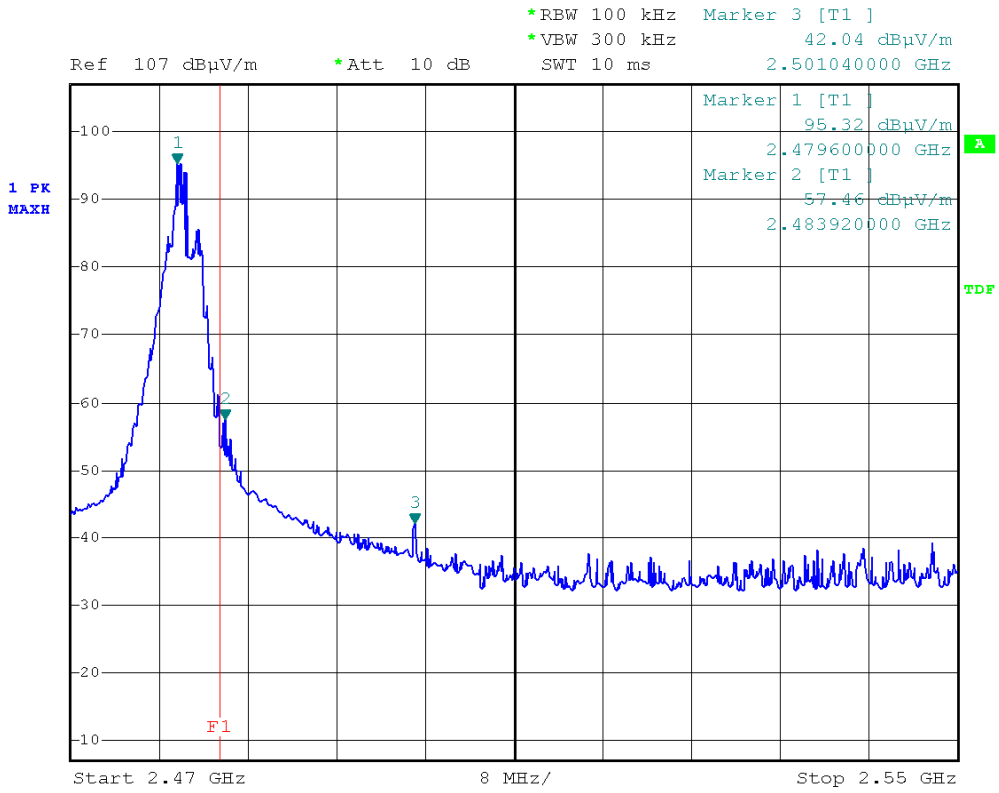
Band-edge compliance to radiated emission test					
Band edge Lower (MHz)	**Measured power (dBµV/m)**	**Measured power at the band edge (dBµV/m)**	**Average Limit (dBµV/m)**	**Margin (dB)**	
2,402	58,12	23.79	54.00	30.21	

Band-edge compliance, upper band edge, (Peak)



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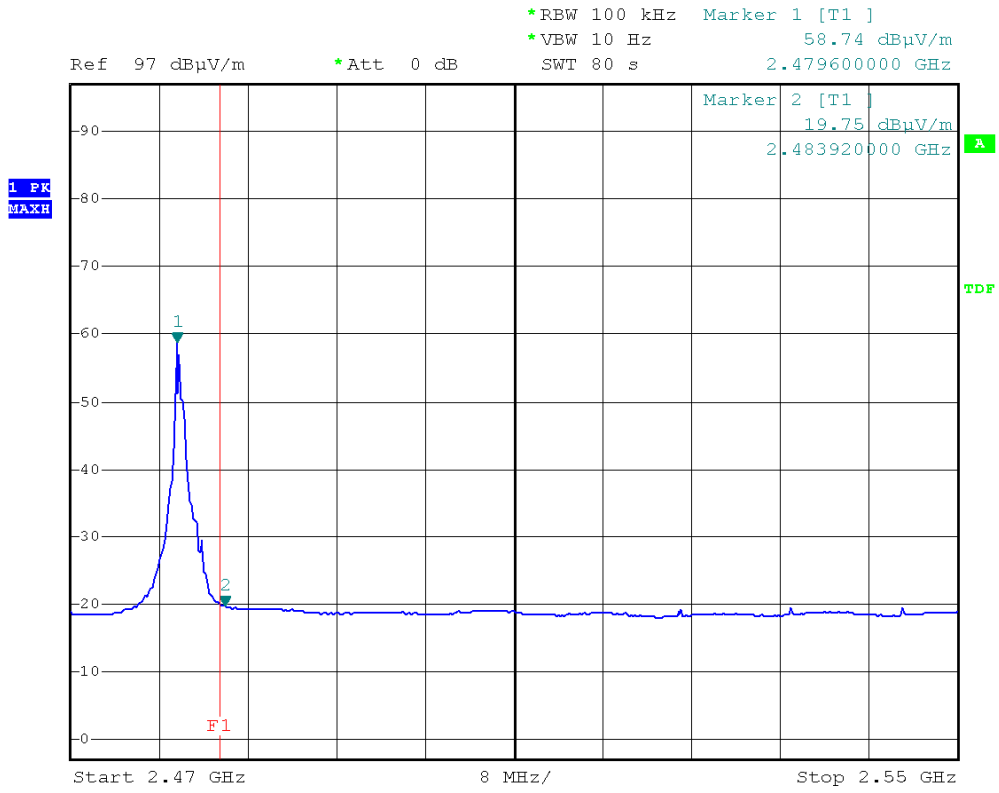
Band-edge compliance to radiated emission test					
Band edge Lower (MHz)	**Measured power (dBµV/m)**	**Measured power at the band edge (dBµV/m)**	**Peak Limit (dBµV/m)**	**Margin (dB)**	
2,480 MHz	95.32	57.46	74.00	16.54	

Band-edge compliance, upper band edge, (Average)



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Band-edge compliance to radiated emission test					
Band edge Lower (MHz)	**Measured power (dBµV/m)**	**Measured power at the band edge (dBµV/m)**	**Average Limit (dBµV/m)**	**Margin (dB)**	
2,480 MHz	58.74	19.75	54.00	34.25	

7.6 SPURIOUS EMISSION IN RESTRICTED BAND NEAR 2400-2483.5 MHz

TEST REQUIREMENT	
Spectrum analyzer settings	
Span	Wide enough to capture 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
Resolution Bandwidth (RBW)	1 MHz with peak detector
Video (or Average) Bandwidth (VBW)	1 MHz with peak detector
Resolution Bandwidth (RBW)	1 MHz with average detector
Video (or Average) Bandwidth (VBW)	10 Hz with average detector
Sweep time (SWT)	Auto
Detector function	Peak and Average
Trace	Max hold
Attenuator	/
Deviation to test procedure	None
EUT operating condition	#1
Remark	None

TEST RESULT
The EUT meets the requirements of sections 15.209 (a) and 15.249 (d)

LIMITS	
Peak (µV/m)	**Average (µV/m)**
5000	500

TEST PROCEDURE
Only for measuring emissions up to 2 MHz removed from the band-edge the "delta" technique for Radiated emissions was used. Delta technique: The transmitter output was connected to the spectrum analyzer through a test fixture (radio frequency coupling device associated with the dedicated antenna of the equipment under test) Once the trace is stabilized, by the marker the emission at the band edge (or on the highest modulation product outside of the band, if this level is greater than that at the band edge) was set. The “n” by the marker-delta function and the marker-to-peak function the peak of the in-band emission was selected. The marker-delta value displayed was compared with the limit specified in this Section

Spurious Emission in restricted band near 2400-2483.5 MHz

PEAK DETECTOR

Frequency (MHz)	Reading Value (dBµV)	Antenna Factor (dB1/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Correcting Reading (dBµV/m)	Limit (µV/m)	Limit (dBµV/m)	Margin (dB)
2397,79	70,17	27,40	3,55	-33,00	68,12	5000	74.00	> 5
2485,68	68,27	27,65	3,95	-33,00	66,22	5000	74.00	> 7
2507,76	40,16	27,65	3,95	-33,00	38,11	5000	74.00	> 35

AVERAGE DETECTOR

Frequency (MHz)	Reading Value (dBµV)	Antenna Factor (dB1/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Correcting Reading (dBµV/m)	Limit (µV/m)	Limit (dBµV/m)	Margin (dB)
2397,79	36,28	27,40	3,55	-33,00	34,23	500	54.00	> 19
2485,68	34,06	27,65	3,95	-33,00	32,01	500	54.00	> 21
2507,76*	---	---	---	---	---	500	54.00	---

***Note:** the peak levels measured are under Average Limit (54 dBµV/m), so the Average spurious levels are not been measured.

7.6 20 dB BANDWIDTH

TEST REQUIREMENT	
Spectrum analyzer settings	
Span	10 MHz
Resolution bandwidth (RBW)	100 kHz
Video bandwidth (VBW)	300 kHz
Sweep time (SWT)	Auto
Detector function	Peak
Trace	Max hold
Attenuator	/
Deviation to test procedure	None
EUT operating condition	#1
Remark	None

TEST RESULT
The EUT meets the requirements of sections 2.1049

LIMITS

TEST PROCEDURE
The EUT is set to transmit has its maximum data rate

MEASUREMENTS RESULTS

Channel (No.)	Frequency (MHz)	Channel Bandwidth (MHz)	Plot (No.)
01	2,402	4.030	1
01	2,440	3.740	2
01	2,480	4.020	3

Plot 1

Plot 2


*RBW 100 kHz
*VBW 300 kHz
Ref 107 dBµV/m
*Att 10 dB
SWT 2.5 ms
Delta 3 [T1]
-20.34 dB
1.940000000 MHz
Marker 1 [T1]
96.47 dBµV/m
2.439980000 GHz
Delta 2 [T1]
-20.03 dB
-1.800000000 MHz
D1 96.47 dB*
D2 76.47 dB*
1 PK
MAXH
A
TDF
100
90
80
70
60
50
40
30
20
10
Center 2.44 GHz
1 MHz/
Span 10 MHz

Plot 3


*RBW 100 kHz
*VBW 300 kHz
Ref 115 dBµV/m
*Att 20 dB
SWT 2.5 ms
Delta 3 [T1]
-20.48 dB
2.140000000 MHz
Marker 1 [T1]
95.31 dBµV/m
2.479980000 GHz
Delta 2 [T1]
-19.54 dB
-1.880000000 MHz
1 PK
MAXH
D1 95.31 dB*
D2 75.31 dB*
A
TDF
110
100
90
80
70
60
50
40
30
20
Center 2.48 GHz
1 MHz/
Span 10 MHz

8. MEASUREMENTS AND TESTS UNCERTAINTY

The measurement uncertainties stated were calculated in accordance with the IMQ procedure No. IO-DT-U01 and requirement of NIST Technical Note 1297 and NIS 81: 1994 “The Treatment of Uncertainty in EMC Measurements”

Methods	Expanded Uncertainty	Unit	confidence level	Coverage factor	Degree of freedom
Radiated emission (30 ÷ 1000 MHz)	4.77	dB	95 %	2	9
Radiated emission (above 1000 MHz)	3.53	dB	95 %	2	9

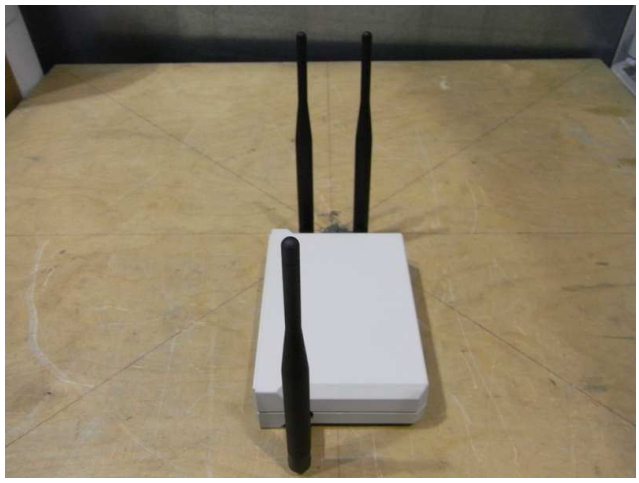
9. LIST OF MEASURING EQUIPMENT AND CALIBRATION INFORMATION

IMQ Serial Number	Instrument	Manufacturer	Type	Last Cal.	Cal. Period.	Calibration Company
P01709	Shielded semi-anechoic chamber	SIDT	/	02-11	12	IMQ
P02486	Turntable controller unit	FRANKONIA	FCTAM01			
P02488	Mast antenna	FRANKONIA	FAM4			
S05562	EMI Receiver	ROHDE & SCHWARZ	ESU 8	06-11	12	INRIM
S02350	EMI Receiver	ROHDE & SCHWARZ	ESMI-RF	05-11	12	INRIM
S04271	Log antenna	ARA	LPB-2513/A	03-09	36	NPL
S02385	Log antenna	ARA	LPB-2513	06-09	36	OKD
S03463	Horn Antenna	SCHWARZBECK	BBHA 9120D	09-11	36	NPL
S03629	Spectrum Analyzer	Rohde & Schwarz	FSP40	09-11	12	I.N.RI.M.
S03542	Preamplifier	Hewlett Packard	HP 8449B	02-11	24	IMQ
S-05041	Micro-coax cable	Rosenberger micro	UFB311A	02-11	12	IMQ
S-05042	Micro-coax cable	Rosenberger micro	UFB311A	09-11	12	IMQ
S-05043	Micro-coax cable	Rosenberger micro	UFB311A	09-11	12	IMQ
S-05044	Micro-coax cable	Rosenberger micro	UFB311A	09-11	12	IMQ
S03745	Oscilloscope	Yokogawa	DL 7200	06-11	12	AVIATRONIK
W-00199/E	Software	ROHDE & SCHWARZ	EMC32 Ver. 6.30			
H-00165	PC		/			

Note: The IMQ instruments are tested and calibrated according to UNI EN 45001, the IMQ procedure IP-037 "Calibration test equipment and measurement" and according to plans set on IMQ operating instruction IO-FT-034 “Criteria for the calibration of test equipment and measurement” which are an integral part of the Quality Manual of IMQ.

10. PHOTOGRAPHIC DOCUMENTATION

EUT IDENTIFICATION



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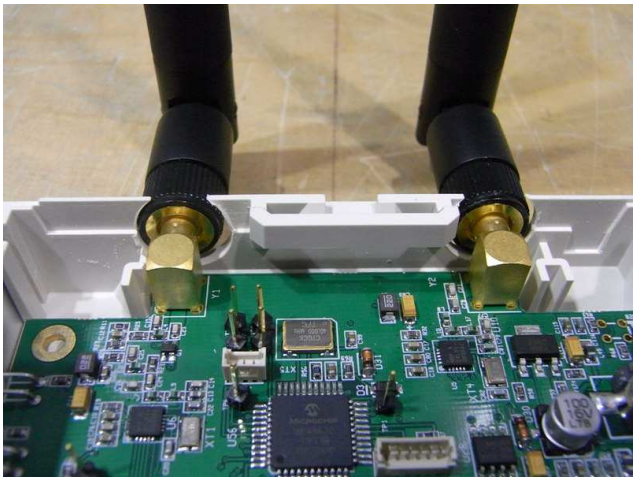

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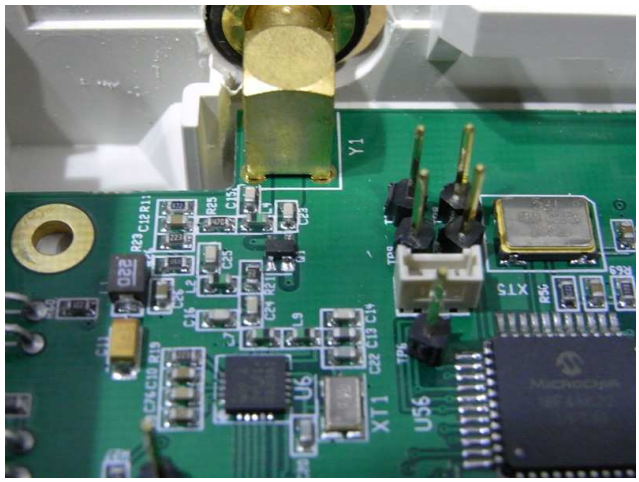
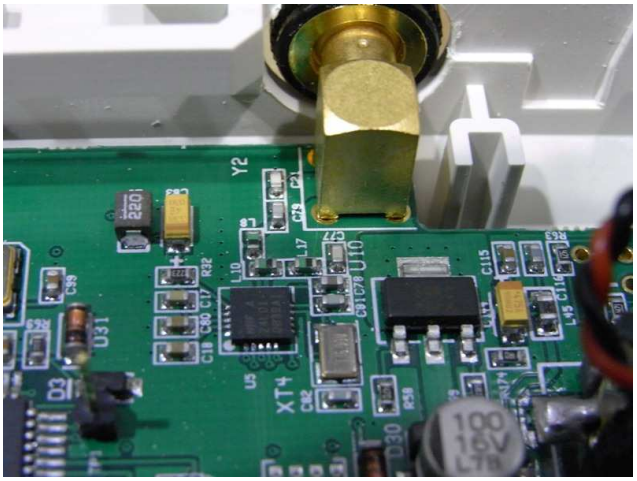
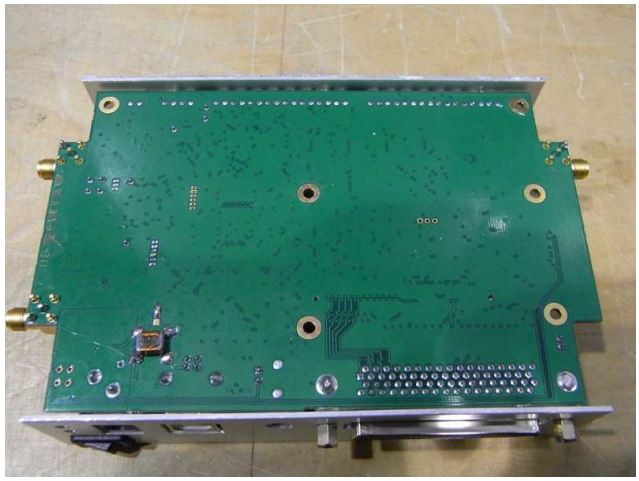


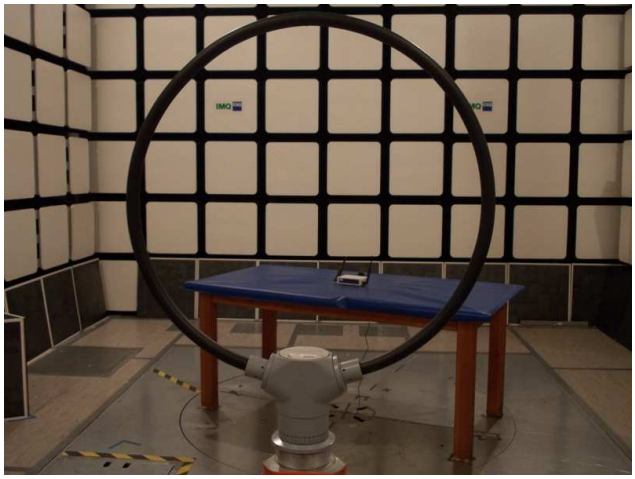


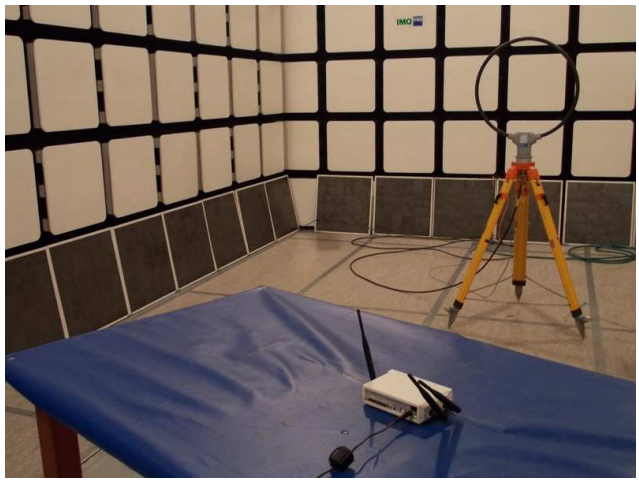


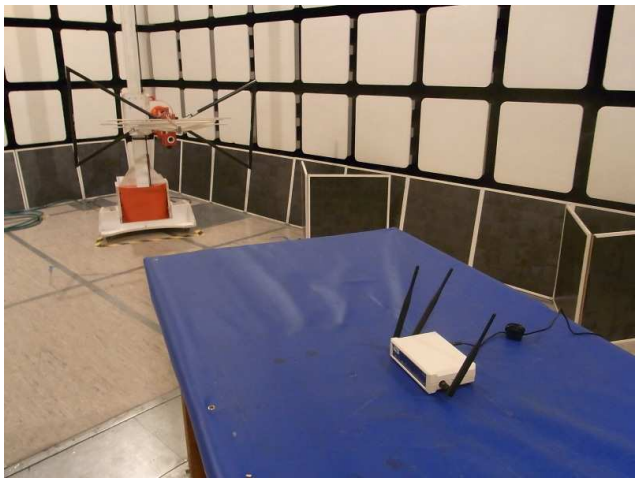
EUT IDENTIFICATION – ANTENNA & AC/DC ADAPTER

SET-UP

Test set-up radiated emission test







SET-UP

Test set-up conducted emission test

END OF REPORT