FORCE Technology Test Report

TEST Reg. no. 19

Radio parameter test of BELLPAL ONE BP01 according to FCC specifications

Performed for TritechTechnology AB

Project no.: 118-28731-2

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24 September 2018

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Title	Radio parameter test of BELLPAL ONE BP01 according to FCC and IC specifications
Test object	BELLPAL ONE BP01
Project no.	118-28731-2
Test period	16 August 2018 to 24 August 2018
Client	Tritech Technology AB Järnvägsgatan 10 172 22 Sundbyberg Sweden Tel.: +46 8 410 120 00
Contact person	Martin Sikström E-mail: Martin Sikström
Manufacturer	BellPal AB
Specifications	47 CFR Part 15, Subpart C (Specific rule part §15.249)
Results	The test object was found to be in compliance with the specifications
Test personnel	Finn Erik Brøsen
Test site	FORCE Technology, Venlighedsvej 4, 2970 Hørsholm, Denmark

Date 24 September 2018

Project Manager

Finn Erik Brøsen
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FORCE Technology

Responsible

Karsten Kruse Jensen
Head of Department
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1. Summary of tests

Tests	Test methods	Rule Section	Results
Measurement of radiated emission / field strength of harmonics	ANSI C63.10:2013	47 CFR Part 15.249	Passed
Measurement of field strength of fundamental	ANSI C63.10:2013	47 CFR Part 15.249	Passed
Measurement of band edge compliance	ANSI C63.10:2013	47 CFR Part 15.249	Passed
Measurement of 20 dB bandwidth	ANSI C63.10:2013	47 CFR Part 15.215(c)	Passed

The given result is based on a shared risk principle with respect to the measurement uncertainty.

Conclusion

The test objects mentioned in this report meet the requirements of the standard stated below, with respect to the tests listed above.

- 47 CFR Part 15, Subpart C (Specific rule part §15.249)

The test results relate only to the objects tested.

2. Test objects and auxiliary equipment

2.1 Test objects

Photo 2.1.1 Test objects.

Test object 2.1.1

Name of test object	BELLPAL ONE
Model / type	BP01
Part no.	BP01
Serial no.	31
Manufacturer	BellPal AB
FCC Id.	2AQQN-BP01
Supply voltage	3 VDC
Software version	1.4.1
Hardware version	2.1.0
Cycle time	< 1 ms
Highest frequency used	2480 MHz
Comment	-
Received	Date: 16 August 2018. Status: Test object sampled and provided by customer.

Test object 2.1.2

Name of test object	BELLPAL ONE
Model / type	BP01
Part no.	BP01
Serial no.	33
Manufacturer	BellPal AB
FCC Id.	2AQQN-BP01
Supply voltage	3 VDC
Software version	1.4.1
Hardware version	2.1.0
Cycle time	< 1 ms
Highest frequency generated or used	2483.5 MHz
Comment	-
Received	Date: 16 August 2018. Status: Test object sampled and provided by customer.

Test object 2.1.3

Name of test object	BELLPAL ONE
Model / type	BP01
Part no.	BP01
Serial no.	42
FCC Id.	2AQQN-BP01
Manufacturer	BellPal AB
Supply voltage	3 VDC
Software version	1.4.1
Hardware version	2.1.0
Cycle time	< 1 ms
Highest frequency generated or used	2483.5 MHz
Comment	-
Received	Date: 16 August 2018. Status: Test object sampled and provided by customer.

Test object 2.1.4

Name of test object	BELLPAL ONE
Model / type	BP01
Part no.	BP01
Serial no.	10
Manufacturer	BellPal AB
FCC Id.	2AQQN-BP01
Supply voltage	3 VDC
Software version	1.4.1
Hardware version	2.1.0
Cycle time	15 Sec.
Highest frequency generated or used	2483.5 MHz
Comment	Special SRD version for continuous transmission at frequencies 2402 MHz, 2440 MHz, and 2480 MHz. Antenna replaced by SMA connector.
Received	Date: 16 August 2018. Status: Test object sampled and provided by customer.

3. General test conditions

3.1 Test setup during test

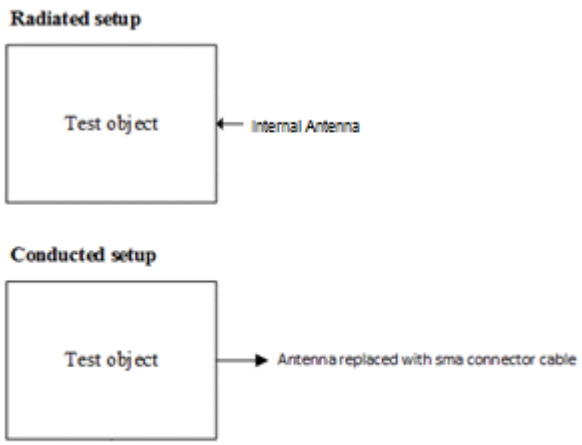


Figure 3.1.1 Block diagram of test objects with cables and auxiliary equipment.

3.1.1 Description of test setup

Two different test setups were used:

- Radiated setup: Wireless connection with continuous transmission (low, mid or high channel).
- Conducted set-up: Antenna replaced with a SMA connector and continuous transmission (low, mid or high channel).

3.1.2 Description and intended use of test object

The test object is a fall sensor that is incorporated in a watch case. If the device detects that the user has fallen, it will send a signal to a mobile phone connected via Bluetooth.

3.1.3 Test modes during emission tests

Test software was implemented to operate at worst case (continuous transmission cycle), conditions for the low, mid, and high bands.

3.1.4 Radio parameter specifications

Client data:

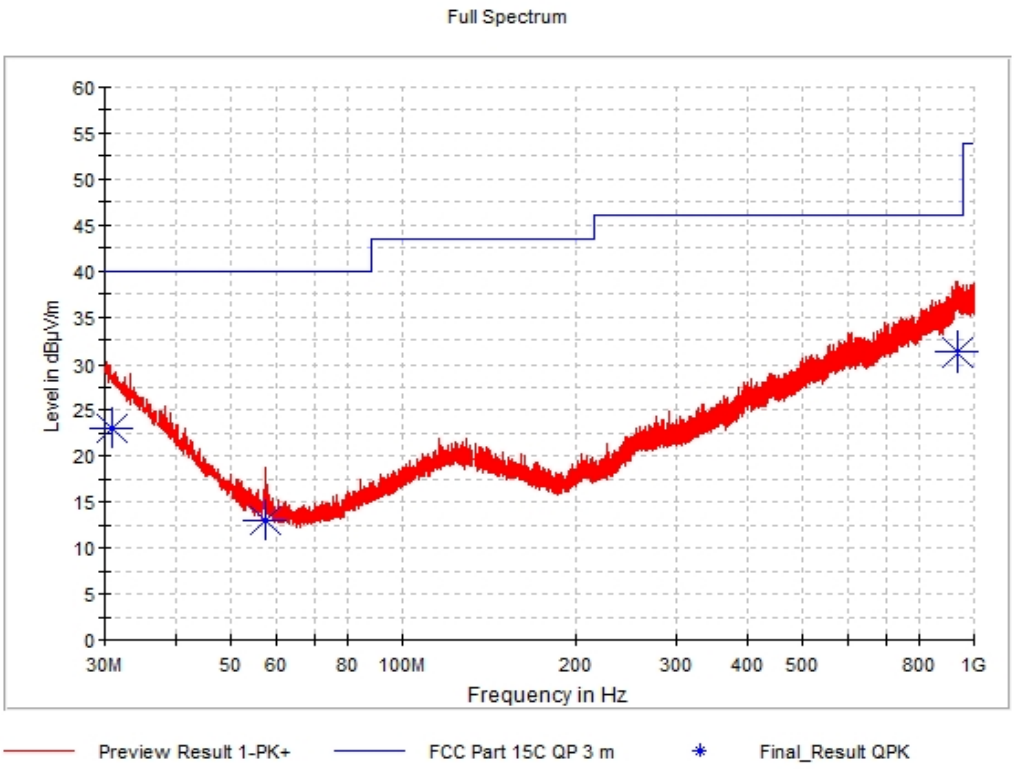
- Frequency range: 2400-2483.5 MHz
- Bluetooth Mode: LE V4.2 using GFSK modulation
- Channel Frequencies: 2402 - 2480 MHz – 2 MHz spaced
- Channel Number: 0-39 [40]
- Data Rate: 1 Mbps
- Power setting: None
- Pout of the chipset [dBm]: 0

4. Test results

4.1 Measurement of radiated emission (below 1 GHz)

Test object	Combination of 2.1.4: BELLPAL ONE 2.1.5: BELLPAL ONE 2.1.6: BELLPAL ONE	Sheet	RE_Spur-1
Type	BP01	Project no.	118-28731-2
Serial no.	See section 2	Date	17 Aug. 2018
Client	Tritech Technology AB	Initials	FBS
Specification	47 CFR Part 15, Subpart C (Specific rule part §15.249)	Frequency	30-1000 MHz

Test method Characteristics	ANSI C63.10:2013 Complete search, antenna distance 3 m	Temperature Humidity	23 °C 51 % RH
Detector	Peak and quasi peak	Bandwidth	120 kHz
Test equipm.	EMI room Hørsholm 49900 49704 49590 49817 29797 49808 29953	Uncertainty	6.3 dB



Comments Continuous Tx - GFSK modulation - hopping off.

Test object	Combination of 2.1.4: BELLPAL ONE 2.1.5: BELLPAL ONE 2.1.6: BELLPAL ONE	Sheet	RE_Spur-2
Type	See section 2	Project no.	118-28731-2
Serial no.	See section 2	Date	17 Aug. 2018
Client	Tritech Technology AB	Initials	FBS
Specification	47 CFR Part 15, Subpart C (Specific rule part §15.249)	Frequency	30-1000 MHz

Test method Characteristics	ANSI C63.10:2013 Complete search, antenna distance 3 m	Temperature Humidity	23 °C 51 % RH
Detector	Quasi peak	Bandwidth	120 kHz
Test equipm.	EMI room Hørsholm 49900 49704 49590 49817 29797 49808 29953	Uncertainty	6.3 dB

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
30.93	23.12	40.0	16.88	15000	259.0	V	27	26
57.48	12.96	40.0	27.04	15000	100.0	V	217	14
933.99	31.27	46.0	14.73	15000	187.0	H	347	36

Test result	The measured field strengths are below the limit
Test Port	Enclosure
Test frequency	2402, 2440, and 2480 MHz
Test mode	Continuous Tx - GFSK modulation - hopping off
Condition	Normal
Compliant	Yes
Comments	Final maximal measurements by variation of turntable azimuth, antenna height, and antenna polarisation. Test voltage: Internal battery 3 VDC.

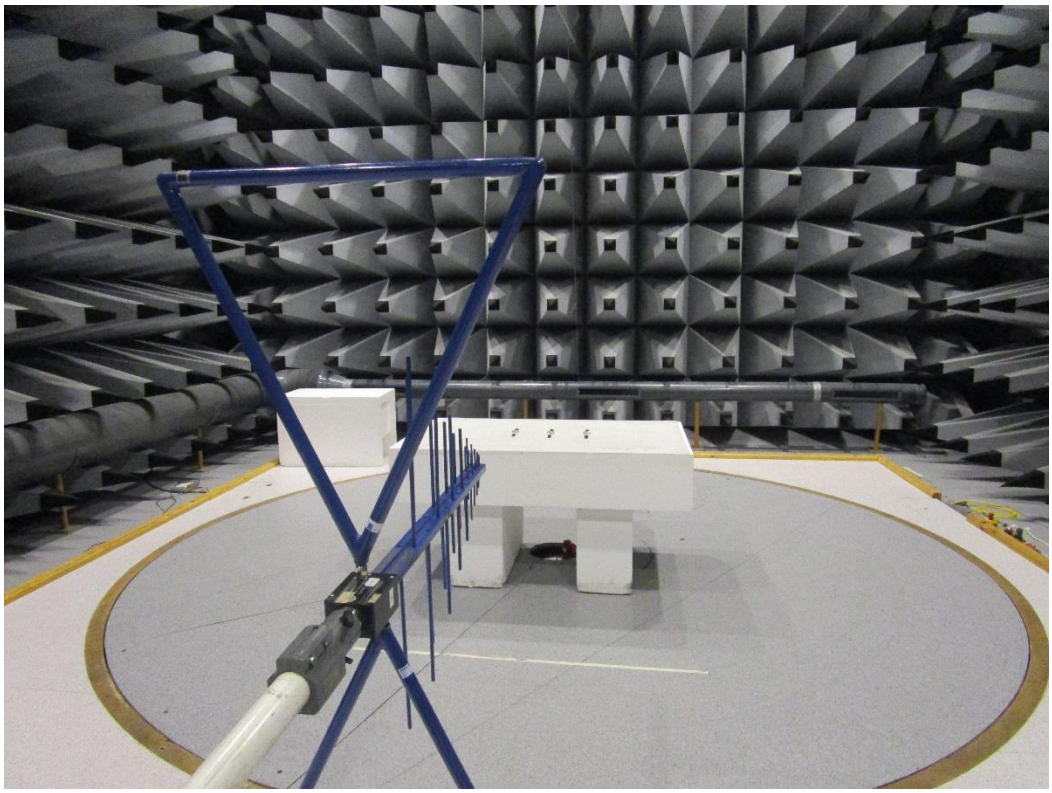


Photo 4.1.1 Test setup regarding measurement of radiated emission (below 1 GHz).

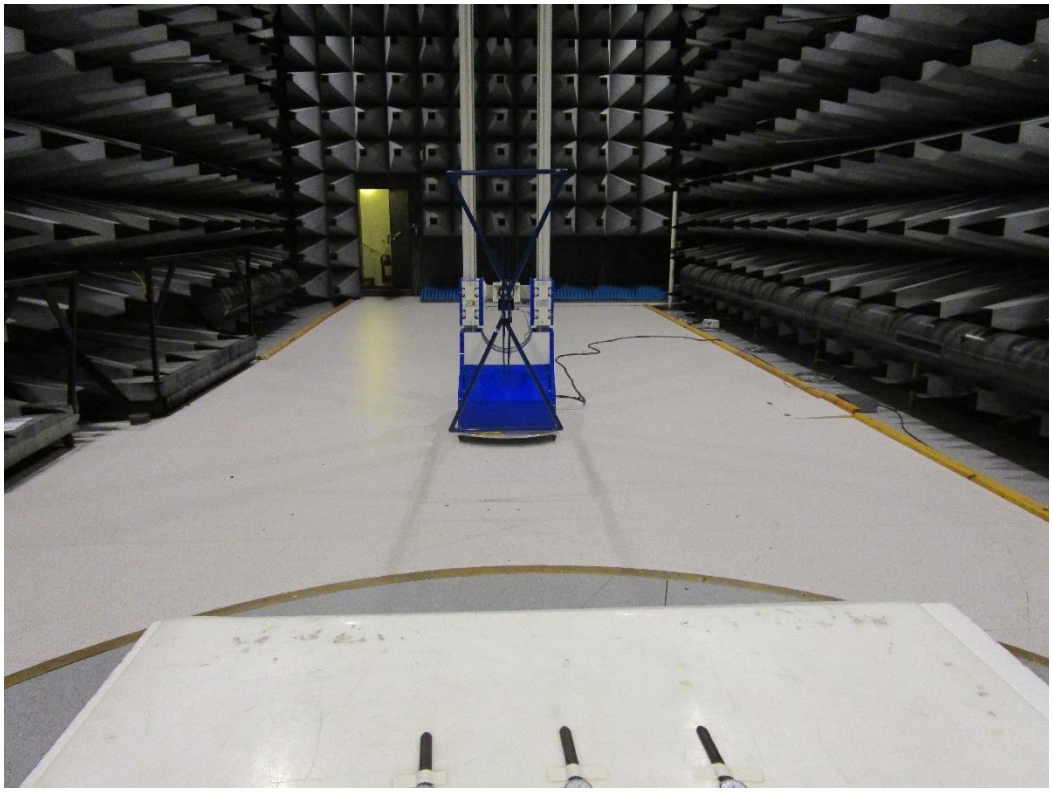
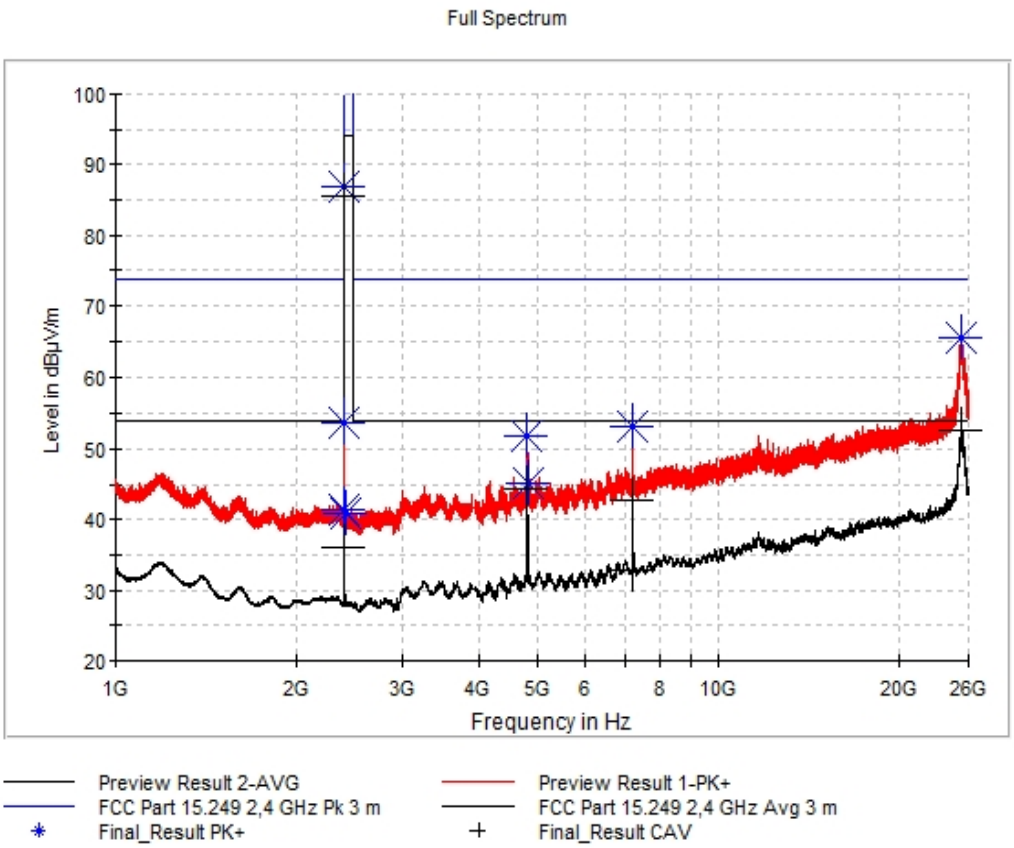


Photo 4.1.2 Test setup regarding measurement of radiated emission (below 1 GHz).

4.2 Measurement of radiated emission (above 1 GHz), TX Low

Test object	BELLPAL ONE	Sheet	RE_Spur-3
Type	BP01	Project no.	118-28731-2
Serial no.	33	Date	01 June 2018
Client	Tritech Technology AB	Initials	FBS
Specification	47 CFR Part 15, Subpart C (Specific rule part §15.249)	Frequency	1-25 GHz

Test method Characteristics	ANSI C63.10:2013 Complete search, antenna distance 3 m	Temperature Humidity	22 °C 55 % RH
Detector	Peak and average	Bandwidth	1 MHz
Test equipm.	EMI room Hørsholm 49900 49624 49625 49823 49869 49870 49999 29953	Uncertainty	4.9 dB



Comments Continuous Tx - GFSK modulation - hopping off.

Test object	BELLPAL ONE	Sheet	RE_Spur-4
Type	BP01	Project no.	118-28731-2
Serial no.	33	Date	17 Aug. 2018
Client	Tritech Technology AB	Initials	FBS
Specification	47 CFR Part 15, Subpart C (Specific rule part §15.249)	Frequency	1-25 GHz

Test method Characteristics	ANSI C63.10:2013 Complete search, antenna distance 3 m	Temperature Humidity	22 °C 55 % RH
Detector	Quasi peak	Bandwidth	1 MHz
Test equipm.	EMI room Hørsholm 49900 49624 49625 49823 49869 49870 49999 29953	Uncertainty	4.9 dB

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Corr. (dB/m)
2392.50	41.30	---	73.9	32.60	15000	280.0	V	-10
2400.00	53.62	---	73.9	20.28	15000	195.0	V	-10
2400.00	---	36.00	53.9	17.90	15000	332.0	V	-10
2401.75	86.99	---	114.0	27.01	15000	228.0	V	-10
2402.00	---	85.64	94.0	8.36	15000	296.0	V	-10
2416.75	40.84	---	114.0	73.16	15000	278.0	V	-10
4803.50	51.81	---	73.9	22.09	15000	279.0	V	-36
4804.00	---	44.45	53.9	9.45	15000	368.0	V	-36
4829.50	45.17	---	73.9	28.73	15000	245.0	H	-36
7186.75	---	32.71	53.9	21.19	15000	391.0	V	-30
7205.50	---	42.83	53.9	11.07	15000	385.0	V	-30
7205.50	53.11	---	73.9	20.79	15000	319.0	V	-30
25287.25	65.48	---	73.9	8.42	15000	128.0	H	12
25301.25	---	52.60	53.9	1.30	15000	100.0	V	12

Test result	The measured field strengths are below the limit
Test Port	Enclosure
Test frequency	2402 MHz
Test mode	Continuous Tx - GFSK modulation - hopping off
Condition	Normal
Compliant	Yes
Comments	Final maximal measurements by variation of turntable azimuth, antenna height, and antenna polarisation. Test voltage: Internal battery 3 VDC.

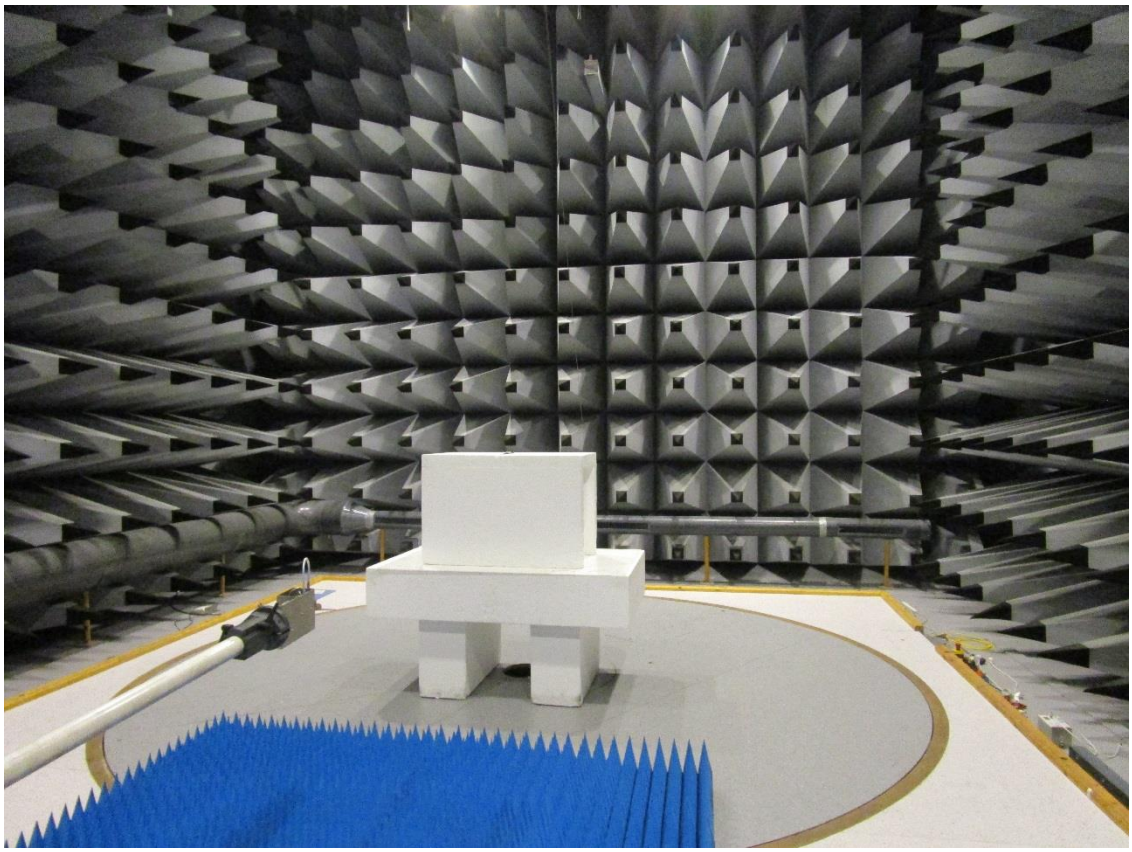
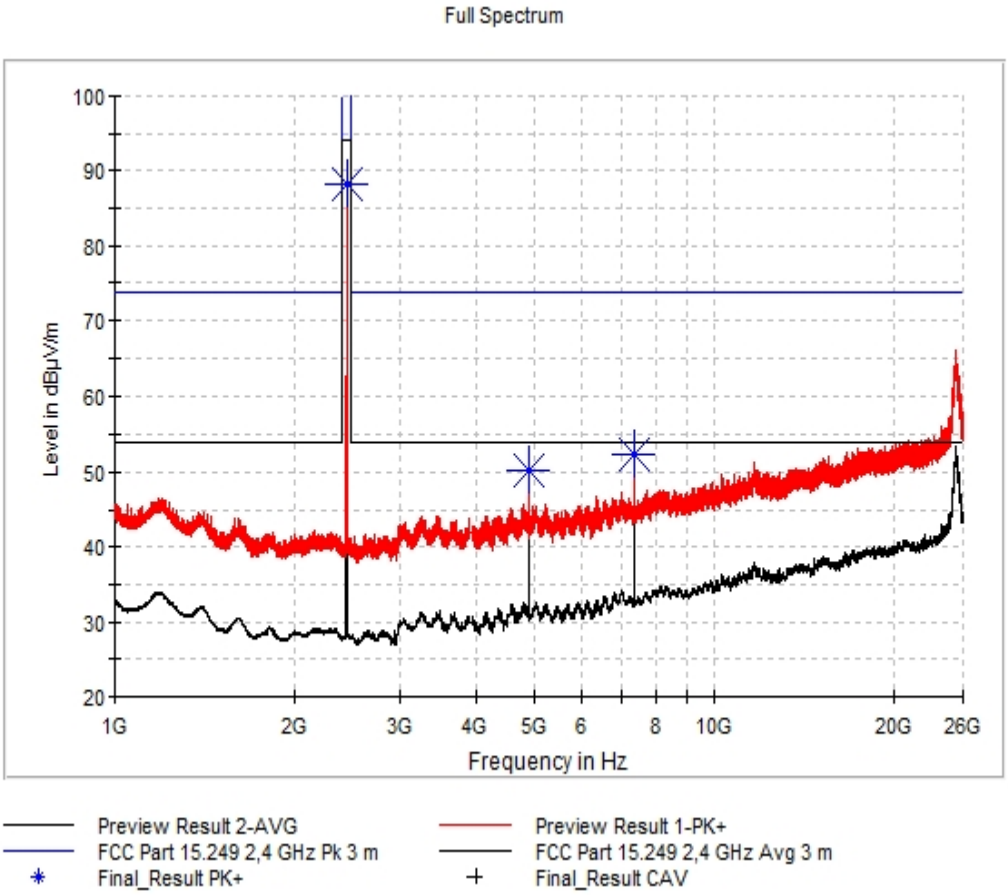


Photo 4.2.1 Test setup regarding measurement of radiated emission (above 1 GHz)

4.3 Measurement of radiated emission (above 1 GHz), TX Mid

Test object	BELLPAL ONE	Sheet	RE_Spur-5
Type	BP01	Project no.	118-28731-2
Serial no.	33	Date	17 Aug. 2018
Client	Tritech Technology AB	Initials	FBS
Specification	47 CFR Part 15, Subpart C (Specific rule part §15.249)	Frequency	1-25 GHz

Test method Characteristics	ANSI C63.10:2013 Complete search, antenna distance 3 m	Temperature Humidity	22 °C 55 % RH
Detector	Peak and average	Bandwidth	1 MHz
Test equipm.	EMI room Hørsholm 49900 49624 49625 49823 49869 49870 49999 29953	Uncertainty	4.9 dB



Comments Continuous Tx - GFSK modulation - hopping off.

Test object	BELLPAL ONE	Sheet	RE_Spur-6
Type	BP01	Project no.	118-28731-2
Serial no.	33	Date	17 Aug. 2018
Client	Tritech Technology AB	Initials	FBS
Specification	47 CFR Part 15, Subpart C (Specific rule part §15.249)	Frequency	1-25 GHz

Test method Characteristics	ANSI C63.10:2013 Complete search, antenna distance 3 m	Temperature Humidity	22 °C 55 % RH
Detector	Quasi peak	Bandwidth	1 MHz
Test equipm.	EMI room Hørsholm 49900 49624 49625 49823 49869 49870 49999 29953	Uncertainty	4.9 dB

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2439.75	**88.30**	**114.0**	**25.70**	**15000**	**297.0**	**V**	**101**	**-10**
4880.75	**50.14**	**73.9**	**23.76**	**15000**	**400.0**	**V**	**46**	**-35**
7319.25	**52.47**	**73.9**	**21.43**	**15000**	**400.0**	**V**	**323**	**-30**

Test result	The measured field strengths are below the limit
Test Port	Enclosure
Test frequency	2440 MHz
Test mode	Continuous Tx - GFSK modulation - hopping off
Condition	Normal
Compliant	Yes
Comments	Final maximal measurements by variation of turntable azimuth, antenna height, and antenna polarisation. Test voltage: Internal battery 3 VDC.

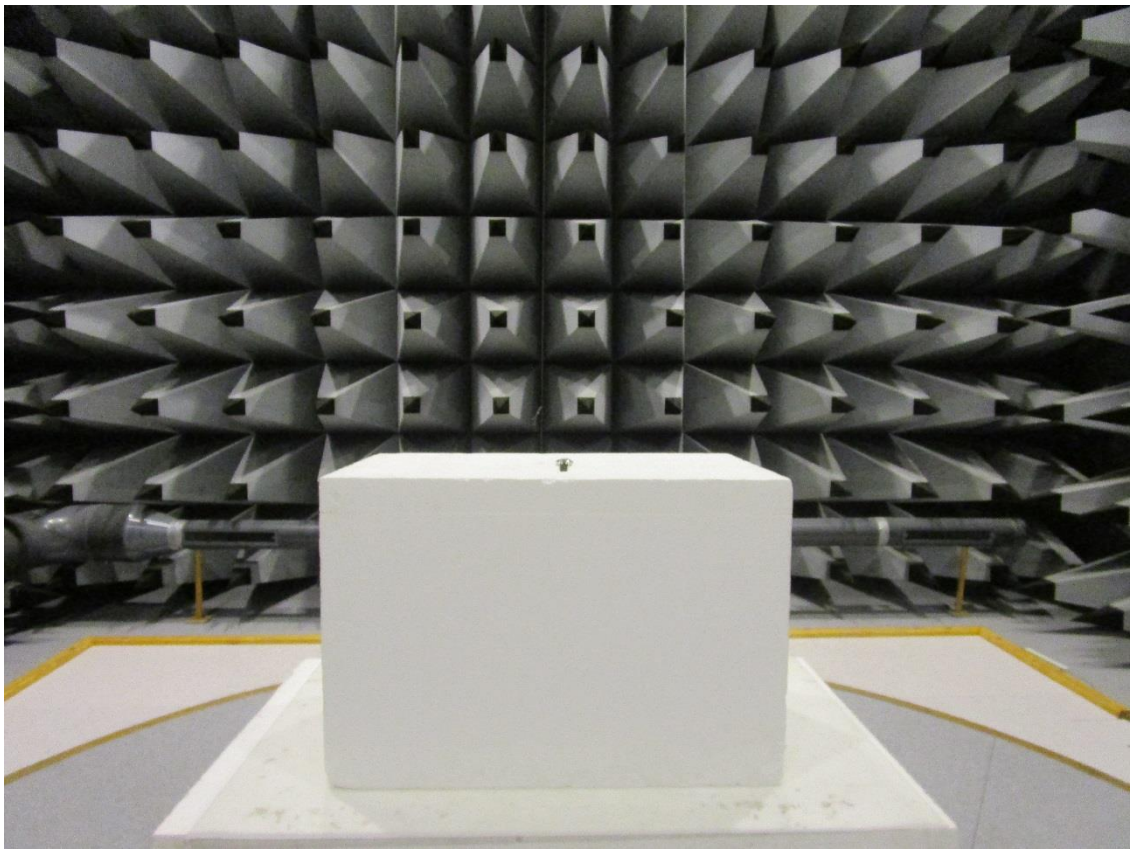
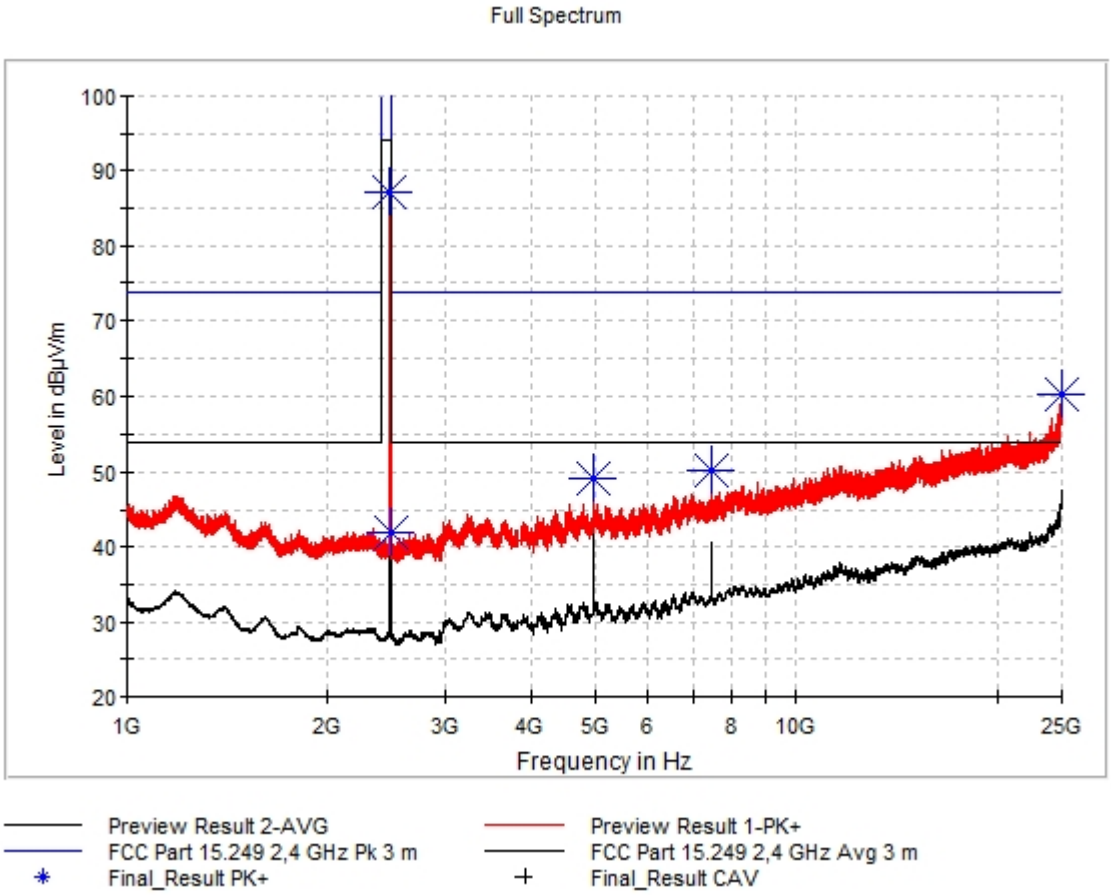


Photo 4.3.1 Test setup regarding measurement of radiated emission (above 1 GHz)

4.4 Measurement of radiated emission (above 1 GHz), TX High

Test object	BELLPAL ONE	Sheet	RE_Spur-7
Type	BP01	Project no.	118-28731-2
Serial no.	33	Date	17 Aug. 2018
Client	Tritech Technology AB	Initials	FBS
Specification	47 CFR Part 15, Subpart C (Specific rule part §15.249)	Frequency	1-25 GHz

Test method Characteristics	ANSI C63.10:2013 Complete search, antenna distance 3 m	Temperature Humidity	22 °C 55 % RH
Detector	Peak and average	Bandwidth	1 MHz
Test equipm.	EMI room Hørsholm 49900 49624 49625 49823 49869 49870 49999 29953	Uncertainty	4.9 dB



Comments Continuous Tx - GFSK modulation - hopping off.

Test object	BELLPAL ONE	Sheet	RE_Spur-8
Type	BP01	Project no.	118-28731-2
Serial no.	33	Date	17 Aug. 2018
Client	Tritech Technology AB	Initials	FBS
Specification	47 CFR Part 15, Subpart C (Specific rule part §15.249)	Frequency	1-25 GHz

Test method Characteristics	ANSI C63.10:2013 Complete search, antenna distance 3 m	Temperature Humidity	22 °C 55 % RH
Detector	Quasi peak	Bandwidth	1 MHz
Test equipm.	EMI room Hørsholm 49900 49624 49625 49823 49869 49870 49999 29953	Uncertainty	4.9 dB

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Corr. (dB/m)
2479.75	87.27	---	114.0	26.73	15000	302.0	V	-10
2483.50	41.84	---	73.9	32.06	15000	250.0	V	-10
4960.50	49.27	---	73.9	24.63	15000	386.0	H	-36
7439.25	50.27	---	73.9	23.63	15000	400.0	V	-28
24981.00	60.12	---	73.9	13.78	15000	259.0	H	12

Test result	The measured field strengths are below the limit
Test Port	Enclosure
Test frequency	2480 MHz
Test mode	Continuous Tx - GFSK modulation - hopping off
Condition	Normal
Compliant	Yes
Comments	Final maximal measurements by variation of turntable azimuth, antenna height, and antenna polarisation. Test voltage: Internal battery 3 VDC.

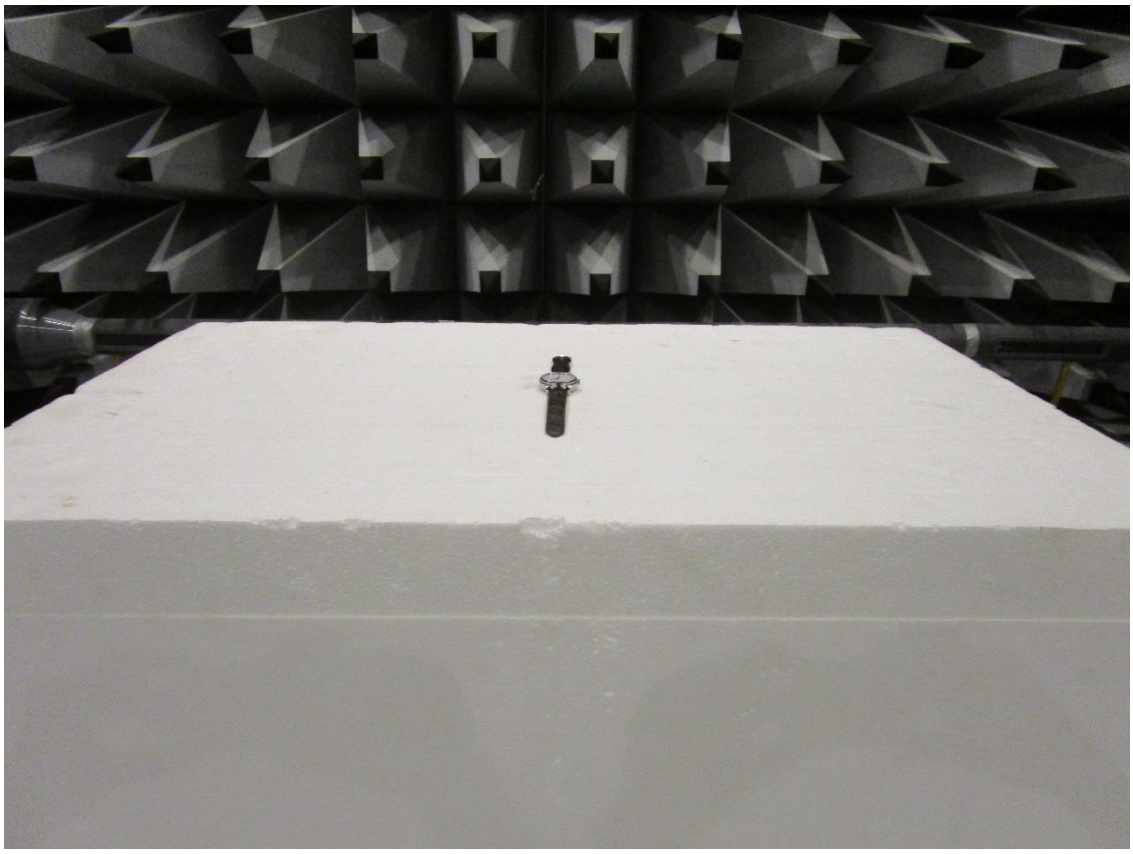
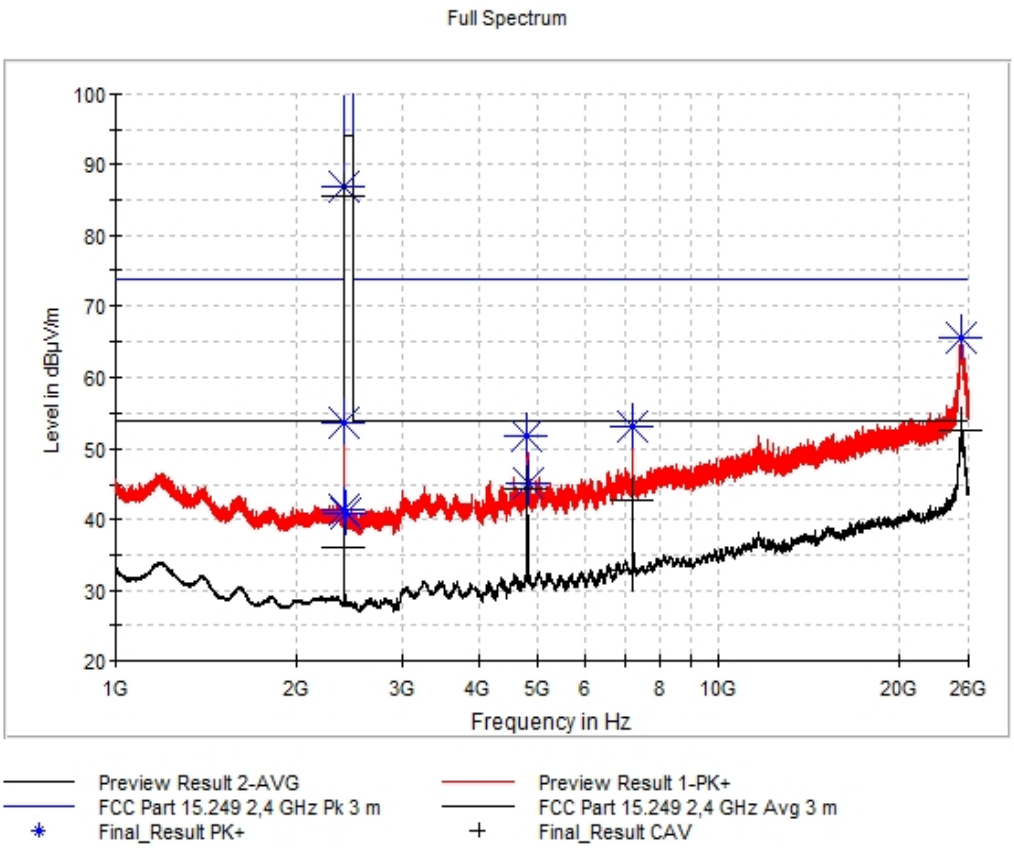


Photo 4.4.1 Test setup regarding measurement of radiated emission (above 1 GHz)

4.5 Measurement of field strength of fundamental, TX Low

Test object	BELLPAL ONE	Sheet	RE_Spur-9
Type	BP01	Project no.	118-28731-2
Serial no.	33	Date	17 Aug. 2018
Client	Tritech Technology AB	Initials	FBS
Specification	47 CFR Part 15, Subpart C (Specific rule part §15.249)	Frequency	2402 MHz

Test method Characteristics	ANSI C63.10:2013 Complete search, antenna distance 3 m	Temperature Humidity	22 °C 55 % RH
Detector	Peak and average	Bandwidth	1 MHz
Test equipm.	EMI room Hørsholm 49900 49624 49625 49823 49869 49870 49999	Uncertainty	4.9 dB



Polarization Vertical and horizontal peak and average measurements

Comments Continuous Tx - GFSK modulation - hopping off.

Test object	BELLPAL ONE	Sheet	RE_Spur-10
Type	BP01	Project no.	118-28731-2
Serial no.	33	Date	17 Aug. 2018
Client	Tritech Technology AB	Initials	FBS
Specification	47 CFR Part 15, Subpart C (Specific rule part §15.249)	Frequency	2402 MHz

Test method Characteristics	ANSI C63.10:2013 Complete search, antenna distance 3 m	Temperature Humidity	22 °C 55 % RH
Detector	Peak and average	Bandwidth	1 MHz
Test equipm.	EMI room Hørsholm 49900 49624 49625 49823 49869 49870 49999	Uncertainty	4.9 dB

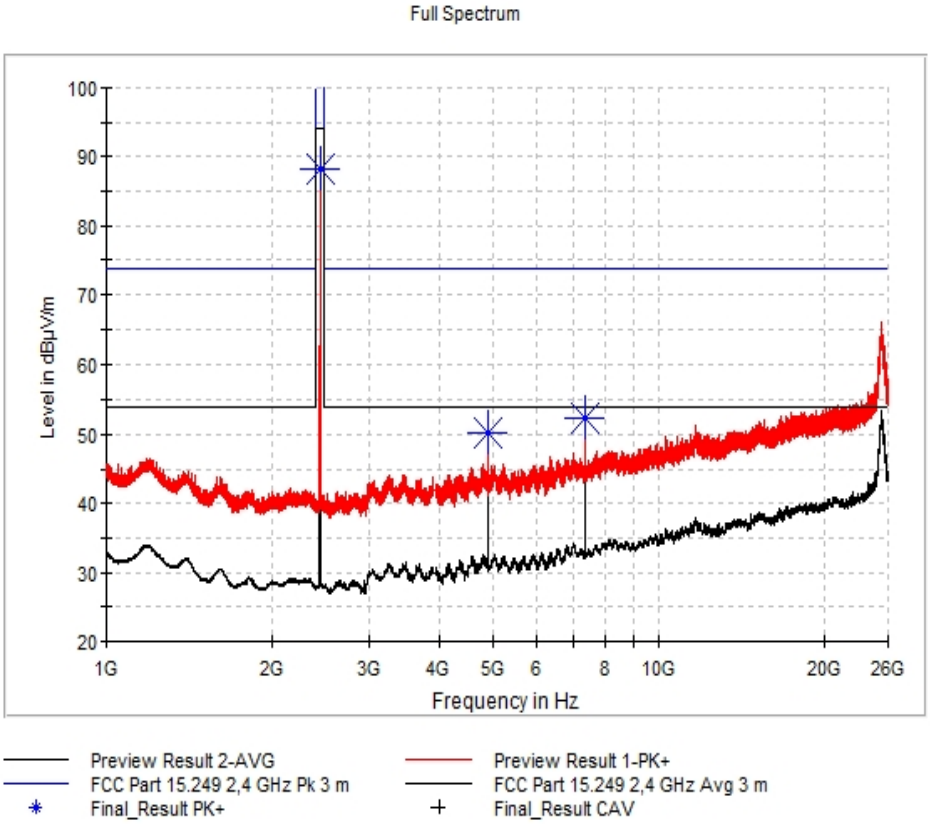
Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Corr. (dB/m)	Azimuth (deg)
2401.75	86.99	---	114.0	27.01	15000	1000.0	22	-10	227
2402.00	---	85.64	94.0	8.36	15000	1000.0	29	-10	205

Test result	The measured peak field strengths are below the peak and average limits
Test Port	Enclosure
Test frequency	2402 MHz
Test mode	Continuous Tx - GFSK modulation - hopping off
Condition	Normal
Compliant	Yes
Comments	Final maximal measurements by variation of turntable azimuth, antenna height and antenna polarization. Test voltage: Internal battery 3 VDC.

4.6 Measurement of field strength of fundamental, TX Mid

Test object	HGVSN TPMS sensor node V1	Sheet	RE_Spur-11
Type	BP01	Project no.	118-28731-2
Serial no.	33	Date	17 Aug. 2018
Client	Tritech Technology AB	Initials	FBS
Specification	47 CFR Part 15, Subpart C (Specific rule part §15.249)	Frequency	2442 MHz

Test method Characteristics	ANSI C63.10:2013 Complete search, antenna distance 3 m	Temperature Humidity	22 °C 55 % RH
Detector	Peak and average	Bandwidth	1 MHz
Test equipm.	EMI room Hørsholm 49900 49624 49625 49823 49869 49870 49999	Uncertainty	4.9 dB



Polarization	Vertical and horizontal peak and average measurements
Comments	Continuous Tx - GFSK modulation - hopping off.

Test object	BELLPAL ONE	Sheet	RE_Spur-12
Type	BP01	Project no.	118-28731-2
Serial no.	33	Date	17 Aug. 2018
Client	Tritech Technology AB	Initials	FBS
Specification	47 CFR Part 15, Subpart C (Specific rule part §15.249)	Frequency	2442 MHz

Test method Characteristics	ANSI C63.10:2013 Complete search, antenna distance 3 m	Temperature Humidity	22 °C 55 % RH
Detector	Peak and average	Bandwidth	1 MHz
Test equipm.	EMI room Hørsholm 49900 49624 49625 49823 49869 49870 49999	Uncertainty	4.9 dB

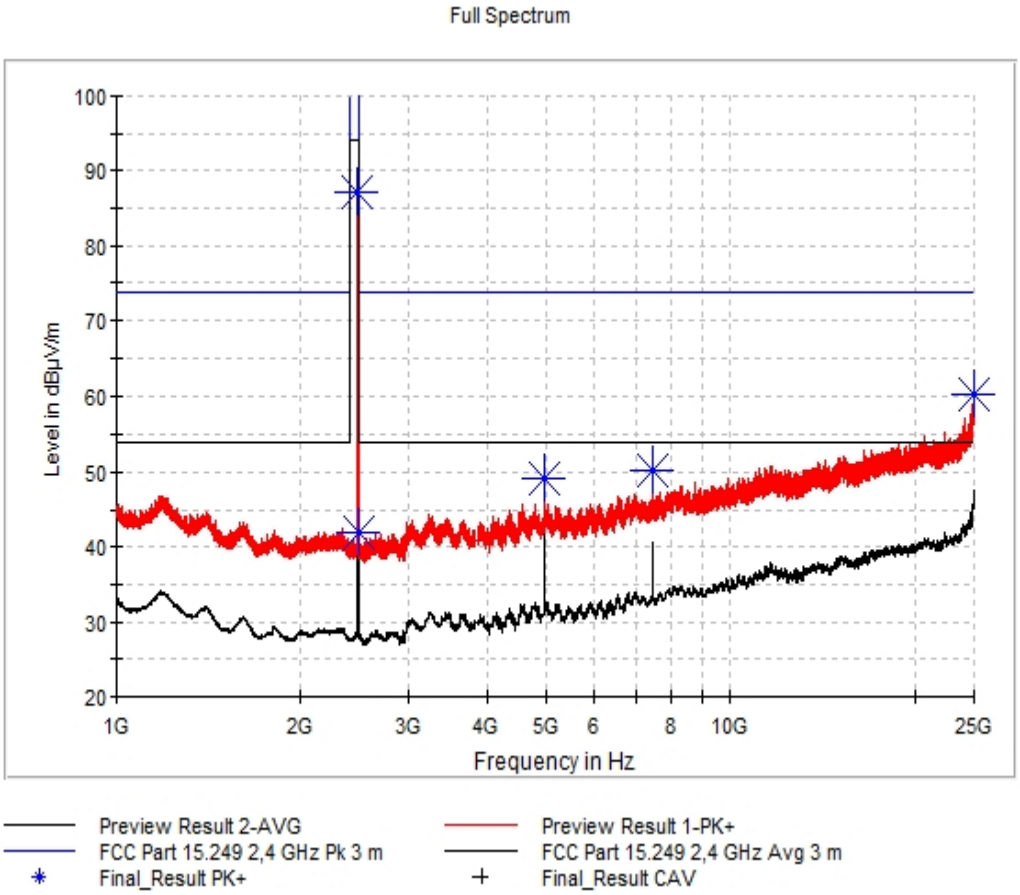
Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Corr. (dB/m)	Azimuth (deg)
2439.75	**88.30**	**---**	**114.0**	**25.70**	**15000**	**1000.0**	**29**	**-10**	**101**

Test result	The measured peak field strengths are below the peak and average limits
Test Port	Enclosure
Test frequency	2442 MHz
Test mode	Continuous Tx - GFSK modulation - hopping off
Condition	Normal
Compliant	Yes
Comments	Final maximal measurements by variation of turntable azimuth, antenna height and antenna polarization. Test voltage: Internal battery 3 VDC.

4.7 Measurement of field strength of fundamental, TX High

Test object	BELLPAL ONE	Sheet	RE_Spur-13
Type	BP01	Project no.	118-28731-2
Serial no.	33	Date	17 Aug. 2018
Client	Tritech Technology AB	Initials	FBS
Specification	47 CFR Part 15, Subpart C (Specific rule part §15.249)	Frequency	2480 MHz

Test method Characteristics	ANSI C63.10:2013 Complete search, antenna distance 3 m	Temperature Humidity	22 °C 55 % RH
Detector	Peak and average	Bandwidth	1 MHz
Test equipm.	EMI room Hørsholm 49900 49624 49625 49823 49869 49870 49999	Uncertainty	4.9 dB



Polarization	Vertical and horizontal peak and average measurements
Comments	Continuous Tx - GFSK modulation - hopping off.

Test object	BELLPAL ONE	Sheet	RE_Spur-14
Type	BP01	Project no.	118-28731-2
Serial no.	33	Date	17 Aug. 2018
Client	Tritech Technology AB	Initials	FBS
Specification	47 CFR Part 15, Subpart C (Specific rule part §15.249)	Frequency	2480 MHz

Test method Characteristics	ANSI C63.10:2013 Complete search, antenna distance 3 m	Temperature Humidity	22 °C 55 % RH
Detector	Peak and average	Bandwidth	1 MHz
Test equipm.	EMI room Hørsholm 49900 49624 49625 49823 49869 49870 49999	Uncertainty	4.9 dB

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Corr. (dB/m)	Azimuth (deg)
2479.75	**87.27**	**---**	**114.0**	**26.73**	**15000**	**1000.0**	**302**	**-10**	**216**

Test result	The measured peak field strengths are below the peak and average limits
Test Port	Enclosure
Test frequency	2482 MHz
Test mode	Continuous Tx - GFSK modulation - hopping off
Condition	Normal
Compliant	Yes
Comments	Final maximal measurements by variation of turntable azimuth, antenna height and antenna polarization. Test voltage: Internal battery 3 VDC.

4.8 Measurement of band edge compliance

Test object	Combination of 2.1.1: BELLPAL ONE 2.1.3: BELLPAL ONE	Sheet	PROF-1
Type	See section 2	Project no.	118-28731-2
Serial no.	See section 2	Date	17 Aug. 2018
Client	Tritech Technology AB	Initials	FBS
Specification	47 CFR Part 15, Subpart C (Specific rule part §15.249)		

Test method Characteristics	ANSI C63.10:2013 Complete search, antenna distance 3 m	Temperature Humidity	22 °C 55 % RH
Detector	Peak and average	Bandwidth	1 MHz
Test equipm.	EMI room Hørsholm 49900 49624 49625 49823 49869 49870 49999	Uncertainty	4.9 dB

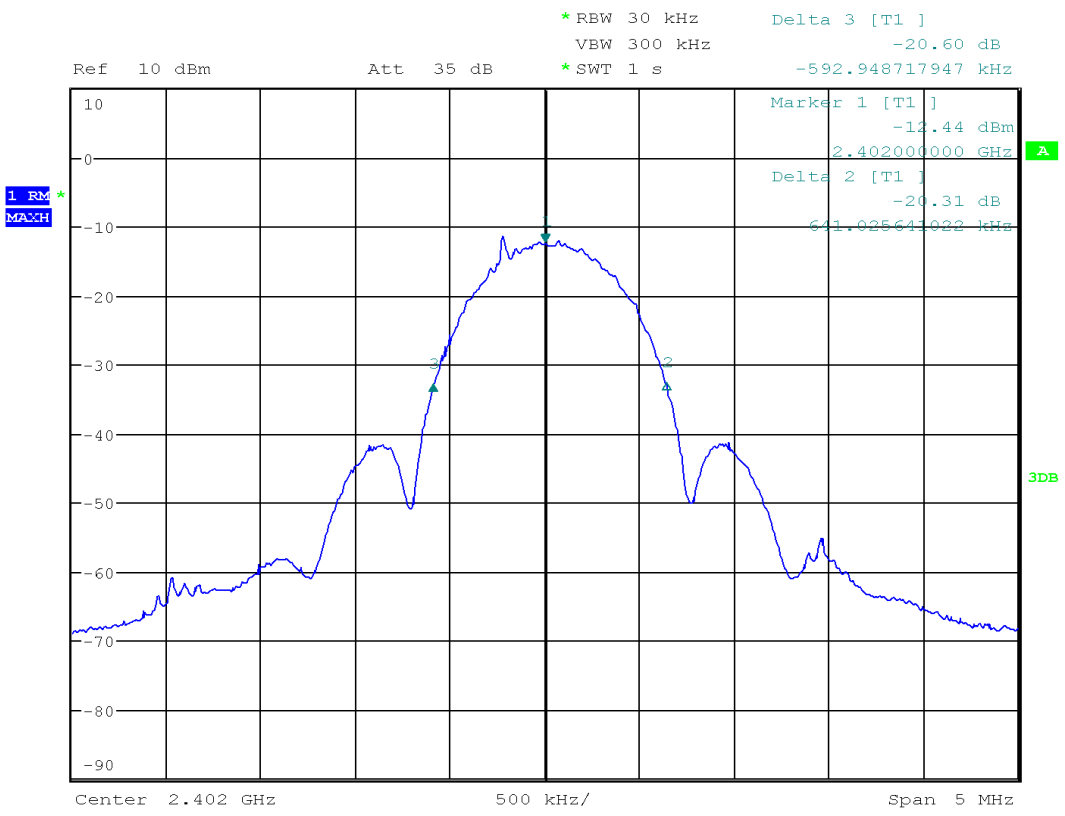
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Pol	Height (cm)	Azimuth (deg)
2400.00	53.62	---	73.9	20.28	15000	V	195.0	205
2483.50	41.84	---	73.9	32.06	15000	V	250.0	109

Band edge criteria	The measured peak field strengths were within the peak and average limit of the band edge.
Test port	Enclosure
Test frequency	2402 and 2480 MHz
Test mode	Continuous Tx - GFSK modulation - hopping off
Condition	Normal
Compliant	Yes
Comments	Test voltage: Internal battery 3 VDC.

4.9 Measurement of 20 dB bandwidth

Test object	BELLPAL ONE	Sheet	PROF-2
Type	BP01	Project no.	118-28731-2
Serial no.	33	Date	24 Aug. 2018
Client	Tritech Technology AB	Initials	FBS
Specification	47 CFR Part 15, Subpart C (Specific rule part §15.249)		

Test method Characteristics	ANSI C63.10:2013 Test voltage: 3 VDC	Temperature Humidity	23 °C 52 % RH
Test equipm.	EMC room 4 Hørsholm 49550	Uncertainty	1.6 dB
SA Settings	RBW: 30 kHz VBW: 300 kHz SPAN: 5 MHz DET: Peak CF: Operating freq. Trace: Max. hold		

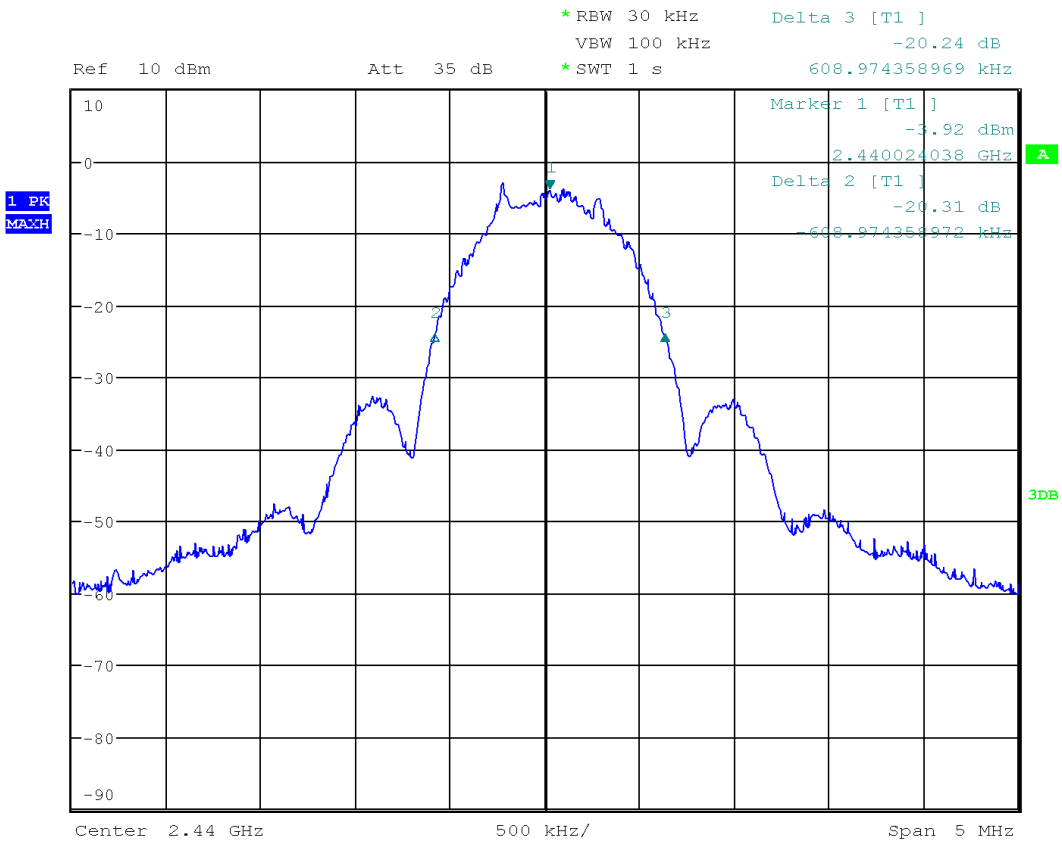


Date: 24.AUG.2018 13:44:51

Comments Operating frequency: 2402 MHz.

Test object	BELLPAL ONE	Sheet	PROF-3
Type	BP01	Project no.	118-28731-2
Serial no.	33	Date	24 Aug. 2018
Client	Tritech Technology AB	Initials	FBS
Specification	47 CFR Part 15, Subpart C (Specific rule part §15.249)		

Test method Characteristics	ANSI C63.10:2013 Test voltage: External power supply at 3 VDC	Temperature Humidity	23 °C 52 % RH
Test equipm.	EMC room 4 Hørsholm 49550	Uncertainty	1.6 dB
SA Settings	RBW: 30 kHz VBW: 100 kHz SPAN: 5 MHz DET: Peak CF: Operating freq. Trace: Max. hold		

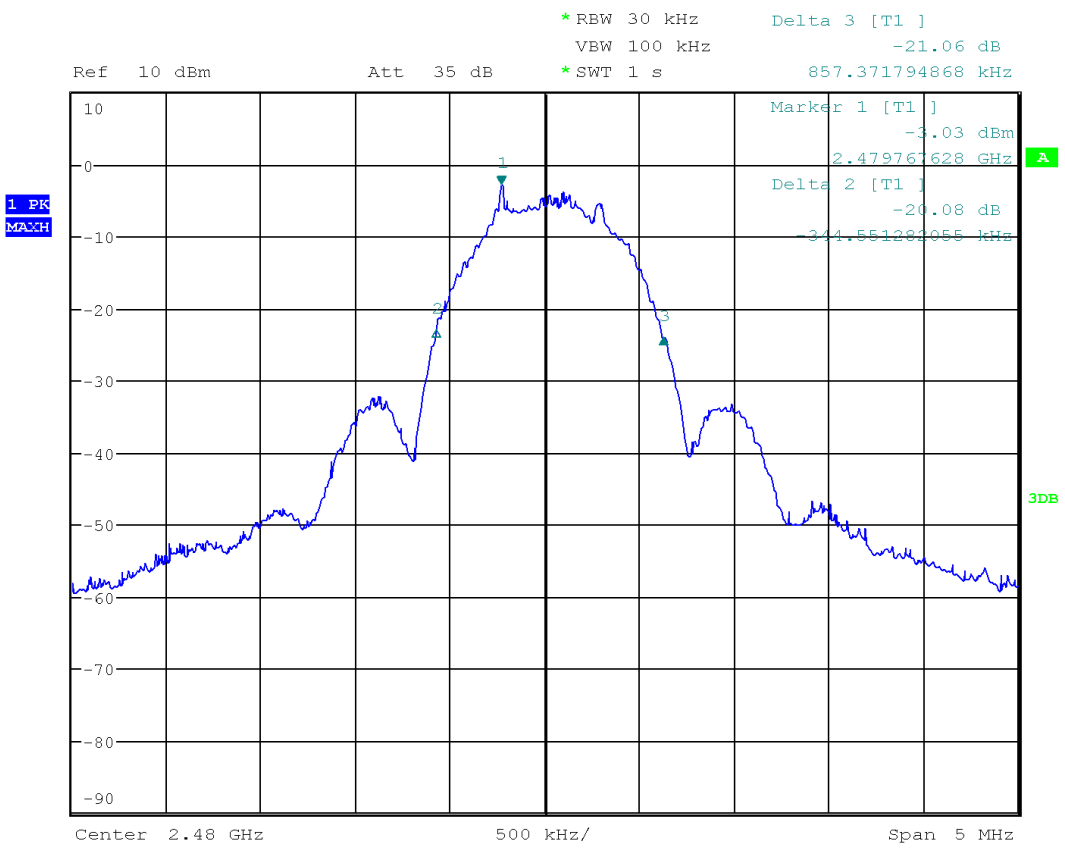


Date: 24.AUG.2018 13:51:43

Comments Operating frequency: 2440 MHz.

Test object	BELLPAL ONE	Sheet	PROF-4
Type	BP01	Project no.	118-28731-2
Serial no.	33	Date	24 Aug. 2018
Client	Tritech Technology AB	Initials	FBS
Specification	47 CFR Part 15, Subpart C (Specific rule part §15.249)		

Test method Characteristics	ANSI C63.10:2013 Test voltage: External power supply at 3 VDC	Temperature Humidity	23 °C 52 % RH
Test equipm.	EMC room 4 Hørsholm 49550	Uncertainty	1.6 dB
SA Settings	RBW: 30 kHz VBW: 100 kHz SPAN: 5 MHz DET: Peak CF: Operating freq. Trace: Max. hold		



Date: 24.AUG.2018 13:54:33

Comments Operating frequency: 2480 MHz.

Test object	2.1.2: BELLPAL ONE	Sheet	PROF-5
Type	See section 2	Project no.	118-28731-2
Serial no.	10	Date	24 Aug. 2018
Client	Tritech Technology AB	Initials	FBS
Specification	47 CFR Part 15, Subpart C (Specific rule part §15.249)		

Test method Characteristics	ANSI C63.10:2013 Test voltage: 3 VDC	Temperature Humidity	23 °C 52 % RH
Test equipm.	EMC room 4 Hørsholm 49550	Uncertainty:	1.6 dB
SA Settings	RBW: 100 kHz VBW: 300 kHz SPAN: 5 MHz DET: Peak CF: Operating freq. Trace: Max. hold		

Operating frequency [MHz]	Low frequency [MHz]	High frequency [MHz]	Remarks
2402	2401.41	2402.64	-
2440	2439,40	2440,61	-
2480	2479.42	2480.62	-
Note 1:			

Operating frequency [MHz]	Measured [MHz]	Limit [MHz]	Remarks
Lowest frequency	2401.41	2400.00	Passed
Highest frequency	2480.62	2483.50	Passed

Band edge criteria	20 dB bandwidth (-20 dBc)
Test result	The measured 20 dBc bandwidth were within the limit designated in 15.215(c)
Test port	Antenna replaced by SMA connector
Test frequency	2402, 2440 and 2480 MHz
Test mode	Continuous Tx - GFSK modulation - hopping off
Condition	Normal
Compliant	Yes
Comments	Test voltage: 3 VDC.

Photo 4.9.1 Test setup regarding measurement of 20 dB bandwidth.

5. National registrations and accreditations

5.1 DANAK Accreditation

Organization: Danish Accreditation and Metrology Fund - DANAK, see www.danak.dk and www.ilac.org

Registration Number: 19

Area Number: C

DANAK is part of ILAC (International Laboratory Accreditation Cooperation) including its MRA (Mutual Recognition Arrangement). The MRA includes the Australian NATA and Canadian SCC.

5.2 FCC Registrations

Organization: Federal Communications Commission, USA

Registration Number: 913950

Facilities: EMC room 2 Hørsholm (EMC-2)
EMC room 3 Hørsholm (EMC-3)
EMC room 4 Hørsholm (EMC-4)
EMI room Hørsholm (EMC-5)

5.3 VCCI Registrations

Organization: Voluntary Control Council for Interference by Information Technology, Japan

Member Number: 910

Facilities: EMC room 3 Hørsholm (EMC-3): C-12532 and T-11548

EMI room Hørsholm (EMC-5): R-11180, C-706, T-11550 and G-10470

5.4 IC Registrations

Organization: Industry Canada, Certification and Engineering Bureau

Registration Number: IC4187A-5

Facilities: EMI room Hørsholm (EMC-5)

6. List of instruments

No	Category	Manufacturer	Type no	Cal. date	Cal. exp.
29797	BILOG ANTENNA, 30-2000 MHz	CHASE ELECTRICS LTD	CBL 6111A	22-06-2017	22-06-2019
29953	ANTENNA TOWER/TURNTABLE CONTROLLER	EMCO	2090		
49590	CABLE, LOW-LOSS uWAVE CABLE, N-N, 8.0 m "EMI"	SUHNER	SUCOFLEX 104 PB	02-11-2017	02-11-2018
49624	DUAL RIDGE HORN ANTENNA – 1GHZ-26GHZ (2GHZ-32GHZ)	SATIMO	SH2000	01-03-2018	01-03-2021
49625	SRD COAX SWITCH MATRIX USED IN 1GHZ TO 26GHZ SRD ANTENNASYSTEM	DELTA	COAX SWITCH MATRIX	24-05-2018	24-05-2019
49704	CABLE 3 m SMA-N	SUHNER	SUCOFLEX104	04-11-2017	04-11-2018
49808	ATTENUATOR, DC-12.4GHz, 6 dB	HUBER-SUHNER	6806.17A	09-03-2018	09-03-2019
49817	CABLE, LOW-LOSS uWAVE CABLE, N-N, 8.0 m "EMI"	SUHNER	SUCOFLEX 104 PB	02-11-2017	02-11-2018
49823	CABLE SF126 SMA-SMA 7 m	HUBER & SUHNER	SF126/11SMA/11SMA/7000	15-12-2017	15-12-2018
49869	CABLE 3 M PC3.5 MALE-FEMALE SUCOFLEX 126	HUBER+SUHNER		05-04-2018	05-04-2019
49870	CABLE 13 M PC3.5 MALE-MALE SUCOFLEX 126EA	HUBER+SUHNER		05-04-2018	05-04-2019
49900	SPECTRUM ANALYZER / MEASUREMENT RECEIVER	ROHDE & SCHWARZ	ESW26	03-05-2018	03-05-2019
49999	EMC32-SOFTWARE	ROHDE & SCHWARZ	Ver. 10.35		