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DATE: 23 December 2018

I.T.L. (PRODUCT TESTING) LTD.

FCC/IC Radio Test Report

For

Magos Systems Ltd.

Equipment under test:

Outdoor Radar Based Perimeter Security Sensor

SR500 , SR250*

*See customer declaration on page 5

Tested by: _____
M. Zohar

Approved by: _____
D. Shidlowsky

Measurement/Technical Report for

Magos Systems Ltd.

Outdoor Radar Based Perimeter Security Sensor

SR500 , SR250*

FCC ID: 2AFHU-SR500F

IC: 22587-SR500

This report concerns:	Original Grant:	X
	Class I Change:	
	Class II Change:	

Equipment type:	FCC: DSS Part 15 Spread Spectrum Transmitter IC: Low Power Device (5725-5875MHz) Radar Device Security Device/Alarm System
Limits used:	47CFR15 Section 15.247 RSS 247, Issue 2, February 2017, Section 5 RSS-Gen, Issue 5, April 2018

Measurement procedures used are KDB 558074 D01 v05, and ANSI C63.10: 2013.

Application for Certification
prepared by:

R. Pinchuck
ITL (Product Testing) Ltd.
1 Bat Sheva Street
Lod 7116002
Israel
e-mail Rpinchuck@itlglobal.org

Applicant for this device:
(different from "prepared by")

Amit Isseroff
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Israel
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Fax: +972-77-414-0165
Email: amit@magosys.com

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1. General Information

1.1 *Administrative Information*

Manufacturer:	Magos Systems Ltd.
Manufacturer's Address:	13 Gad Feinstein St., Rehovot, 7638517 Israel Tel: +972-77-414-0155 Fax: +972-77-414-0165
Manufacturer's Representative:	Amit Isserof
Equipment Under Test (E.U.T):	Outdoor Radar Based Perimeter Security Sensor
Equipment PMN:	SR500 , SR250* (*See declaration on following page)
Equipment Serial No.:	Not designated
HVIN:	SR500F
Date of Receipt of E.U.T:	July 10, 2018
Start of Test:	July 10, 2018
End of Test:	July 15, 2018
Test Laboratory Location:	I.T.L (Product Testing) Ltd. 1 Batsheva St., Lod ISRAEL 7120101
Test Specifications:	FCC, Subpart C, Section 15.247 RSS 247, Issue 2, February 2017, Section 5 RSS-Gen, Issue 5, April 2018

Magos Ltd.
C.N. 514474691
Gad Feinstein 13, Rehovot, Israel
Tel: +972-77-4140155
Fax: +972-77-4140165

Date: June 13, 2018

To ITL

Our company is in the process of launching a new product labeled "SR250".
We hereby declare that the SR250 is identical to the SR500 in terms of:

1) electrical schematics,
2) HW components,
3) RF behavior: transmit power, transmit frequency, emitted radiation, susceptibility etc.
4) Power consumption
5) External enclosure
6) PCB layout
7) All mechanical components

In fact the SR250 and the SR500 are one and the same product. The only difference between them is that SR250 SW is limited to process and produce detections only up to roughly 300m, while the SR500 is limited to 700m.

Sincerely,

Amit Isseroff
VP R&D
Magos Ltd.

1.2 *List of Accreditations*

The EMC laboratory of I.T.L. is accredited by the following bodies:

1. The American Association for Laboratory Accreditation (A2LA) (U.S.A.), Certificate No. 1152.01.
2. The Federal Communications Commission (FCC) (U.S.A.), FCC Designation No. IL1005.
3. The Israel Ministry of the Environment (Israel), Registration No. 1104/01.
4. Industry Canada (Canada), IC File No.: 46405-4025; Site Nos. IC 4025A-1, IC 4025A-2.

I.T.L. Product Testing Ltd. is accredited by the American Association for Laboratory Accreditation (A2LA) and the results shown in this test report have been determined in accordance with I.T.L.'s terms of accreditation unless stated otherwise in the report.

1.3 *Product Description*

High Resolution Short-Range Ground Surveillance Radar

The SR-500 is the most cost effective perimeter protection solution for both rural and more saturated environments, without compromising detection performance.

By utilizing state of the art MIMO & Digital beam forming technology the SR-500 covers

an area of more than 250,000m2(>61acres) with a detection range of 400m for Walker and 600m for vehicle/boat, and yet consumes extremely low power (<5W) and small form factor.

The SR-500 boasts an ultra-high range resolution of 0.4m giving it excellent performance in cluttered environments. Its small size, low power consumption and low weight make it simple to install and renders it ideal as a deployable system.

Working voltage	48VDC via POE
Mode of operation	Transceiver
Modulation	N/A
Assigned Frequency Range	5725.0-5850.0MHz
Operating Frequency Range	5726.0-5849.0MHz
Transmit power(conducted)	~ 17.0dBm
Antenna Gain	+9dBi integral Patch antenna
Modulation BW	N/A(CW mode)
Bit rate (Mbit/s)	N/A

1.4 *Test Methodology*

Radiated testing was performed according to the procedures in KDB 558074 D01 v05 and ANSI C63.10: 2013. Radiated testing was performed at an antenna to EUT distance of 3 meters.

1.5 *Test Facility*

Emissions tests were performed at I.T.L.'s testing facility in Lod, Israel. I.T.L.'s EMC Laboratory is accredited by A2LA, certificate No. 1152.01 and its FCC Designation Number is IL1005.

1.6 *Measurement Uncertainty*

Conducted Emission

Conducted Emission (CISPR 11, EN 55011, CISPR 22, EN 55022, ANSI C63.4) 0.15 – 30 MHz:

Expanded Uncertainty (95% Confidence, K=2):

± 3.6 dB

Radiated Emission

Radiated Emission (CISPR 11, EN 55011, CISPR 22, EN 55022, ANSI C63.4) for open site:
30-1000MHz:
Expanded Uncertainty (95% Confidence, K=2):
± 4.96 dB

1 GHz to 6 GHz
Expanded Uncertainty (95% Confidence, K=2):
±5.19 dB

>6 GHz
Expanded Uncertainty (95% Confidence, K=2):
±5.51 dB

2. System Test Configuration

2.1 *Justification*

1. The E.U.T contains a 5.7GHz transceiver.
2. Some evaluations were performed in hopping mode and some in non-hopping mode in the low channel (5726MHz), mid channel (5787MHz) and high channel (5849MHz).
3. Testing was performed with the E.U.T in installation orientation position.

2.2 *EUT Exercise Software*

No special exercise software was used.

2.3 *Special Accessories*

Equipment	Manufacturer	Part Number	Serial Number
Laptop	Lenovo	2518-R8G	R8-0YHG8
AC/DC Laptop Charger	Lenovo	ADLX90NLT3A	N/A
POE Injector	TP-LINK TECHNOLOGIES CO, LTD.	TL-POE150S	2166533000679
AC/DC Power Supply	TP-LINK TECHNOLOGIES CO, LTD.	T480050-2C1	N/A

2.4 *Equipment Modifications*

No modifications were needed in order to achieve compliance.

2.5 *Configuration of Tested System*

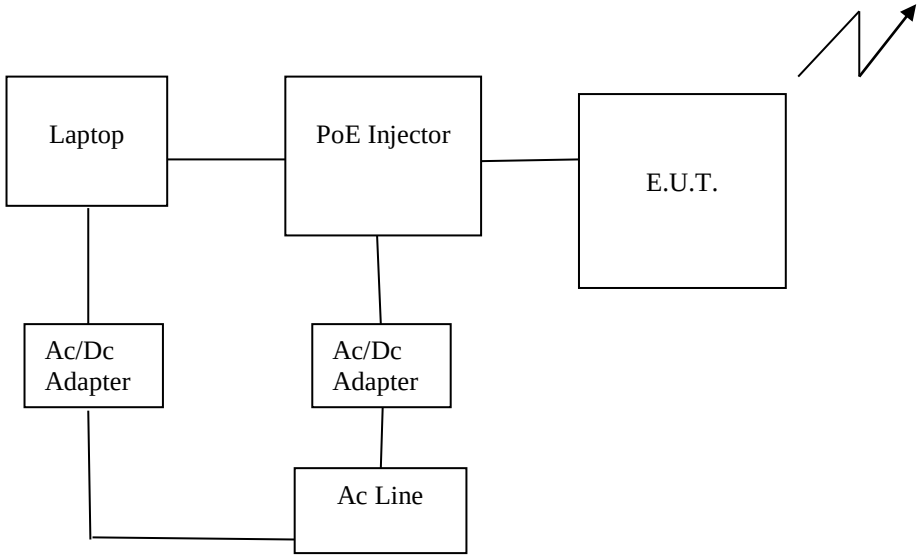


Figure 1. Configuration of Tested System

3. Conducted & Radiated Measurement Test Set-Up Photos

Figure 2. Conducted Emission From AC Mains

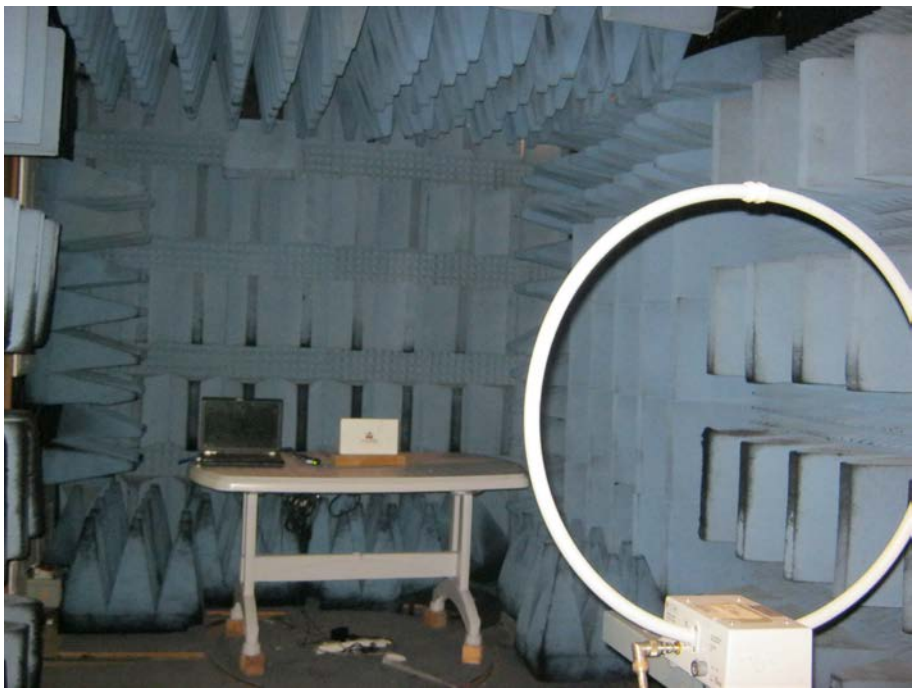


Figure 3. Radiated Emission Test, 0.009-30MHz band

Figure 4. Radiated Emission Test, 30-200MHz band

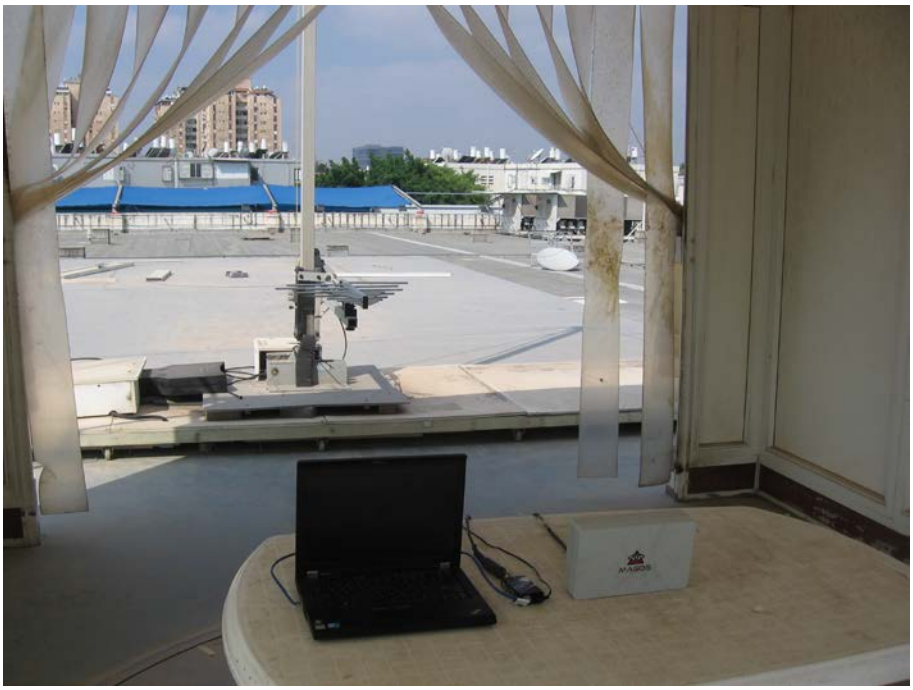


Figure 5. Radiated Emission Test, 200-1000MHz band

Figure 6. Radiated Emission Test, 1000-18,000MHz band

Figure 7. Radiated Emission Test, 18,000-26,500MHz band

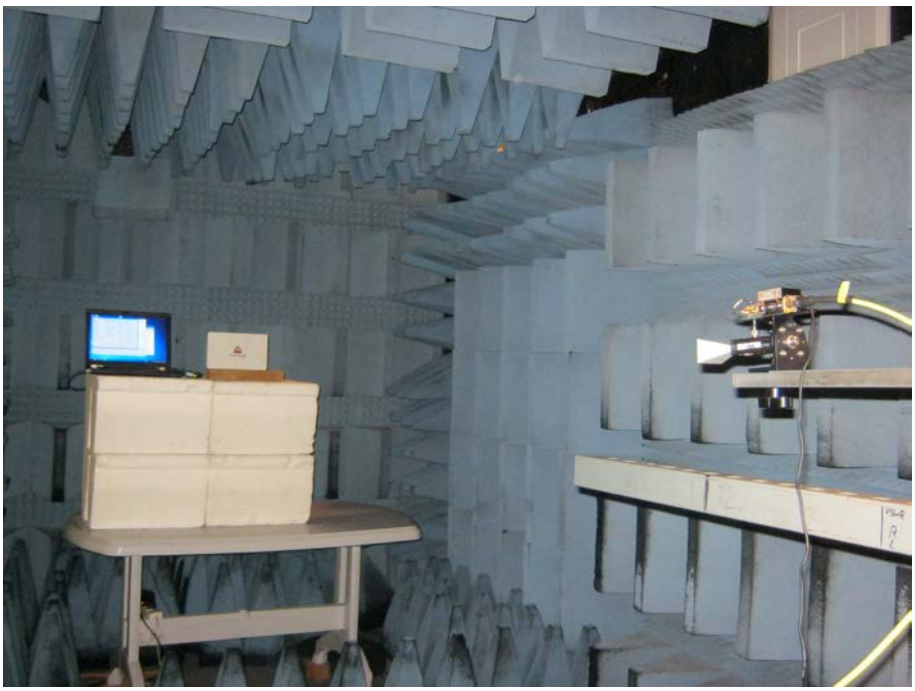


Figure 8. Radiated Emission Test, 26,500-40,000MHz band

4. Conducted Emission From AC Mains

4.1 *Test Specification*

FCC Part 15, Subpart C, Section 15.207
RSS Gen, Issue 5, Section 8.8

4.2 *Test Procedure*

(Temperature (22°C)/ Humidity (55%RH))

The E.U.T operation mode and test setup are as described in Section 2 of this report. In order to minimize background noise interference, the conducted emission testing was performed inside a shielded room, with the E.U.T placed on a 0.8 meter high wooden table, 0.4 meter from the room's vertical wall. In the case of a floor-standing E.U.T., it was placed on the horizontal ground plane.

The E.U.T was powered from 115 V AC / 60 Hz via 50 Ohm / 50 µHn Line Impedance Stabilization Network (LISN) on the phase and neutral lines. The LISN's were grounded to the shielded room ground plane (floor), and were kept at least 0.8 meters from the nearest boundary of the E.U.T.

The center of the E.U.T.'s AC cable was folded back and forth, in order to form a bundle less than 0.40 meters and a total cable length of 1 meter.

The effect of varying the position of the cables was investigated to find the configuration that produces maximum emission. The configuration tested is shown in the photograph, *Figure 2. Conducted Emission From AC Mains.*

The emission voltages at the LISN's outputs were measured using a computerized receiver, complying with CISPR 16 requirements. The specification limits are loaded to the receiver and are displayed on the receiver's spectrum display.

The E.U.T was evaluated in TX operation mode.

A frequency scan between 0.15 and 30 MHz was performed at 9 kHz I.F. band width, using peak detection.

The spectral components having the highest level on each line were measured using a quasi-peak and average detector.

4.3 *Test Limit*

Frequency of emission (MHz)	**Conducted limit (dBµV)**	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

4.4 *Test Results*

JUDGEMENT: Passed by 6.9 dB

The margin between the emission levels and the specification limit is, in the worst case, 7.7 dB for the phase line at 0.53 MHz and 6.9 dB at 0.51 MHz for the neutral line.

The EUT met the F.C.C. Part 15, Subpart C and RSS-Gen, Issue 5, clause 8.8 specification requirements.

The details of the highest emissions are given in *Figure 9* to *Figure 12.*

Conducted Emission

E.U.T Description	Outdoor Radar Based Perimeter Security Sensor
Type	SR500
Serial Number:	Not designated

Specification:	FCC Part 15, Subpart C; RSS-Gen, Issue 5, clause 8.8
Lead:	Phase
Detectors: :	Peak, Quasi-peak, Average
Power Operation	POE

EDIT PEAK LIST (Final Measurement Results)

Trace1: CE22BQP
Trace2: CE22BAP
Trace3: ---

	TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1	Quasi Peak	158 kHz	46.23	-19.33
2	Average	158 kHz	29.66	-25.90
2	Average	186 kHz	26.37	-27.83
1	Quasi Peak	194 kHz	41.84	-22.02
2	Average	194 kHz	26.59	-27.26
1	Quasi Peak	254 kHz	35.79	-25.83
1	Quasi Peak	526 kHz	45.09	-10.90
2	Average	526 kHz	38.34	-7.65
2	Average	1.086 MHz	26.73	-19.26
1	Quasi Peak	1.102 MHz	32.01	-23.98
1	Quasi Peak	1.41 MHz	30.91	-25.08
2	Average	1.734 MHz	26.47	-19.52
1	Quasi Peak	1.818 MHz	31.24	-24.75
2	Average	2.426 MHz	25.94	-20.05
1	Quasi Peak	2.502 MHz	31.10	-24.89
2	Average	6.974 MHz	24.74	-25.25
2	Average	7.162 MHz	24.69	-25.30
2	Average	7.67 MHz	24.49	-25.50
1	Quasi Peak	8.054 MHz	30.59	-29.40

Date: 15.JUL.2018 08:32:15

Figure 9. Detectors: Peak, Quasi-peak, Average

Note: QP Delta/Av Delta refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

Conducted Emission

E.U.T Description	Outdoor Radar Based Perimeter Security Sensor
Type	SR500
Serial Number:	Not designated

Specification:	FCC Part 15, Subpart C RSS-Gen, Issue 5, clause 8.8
Lead:	Phase
Detectors:	Peak, Quasi-peak, Average
Power Operation	POE

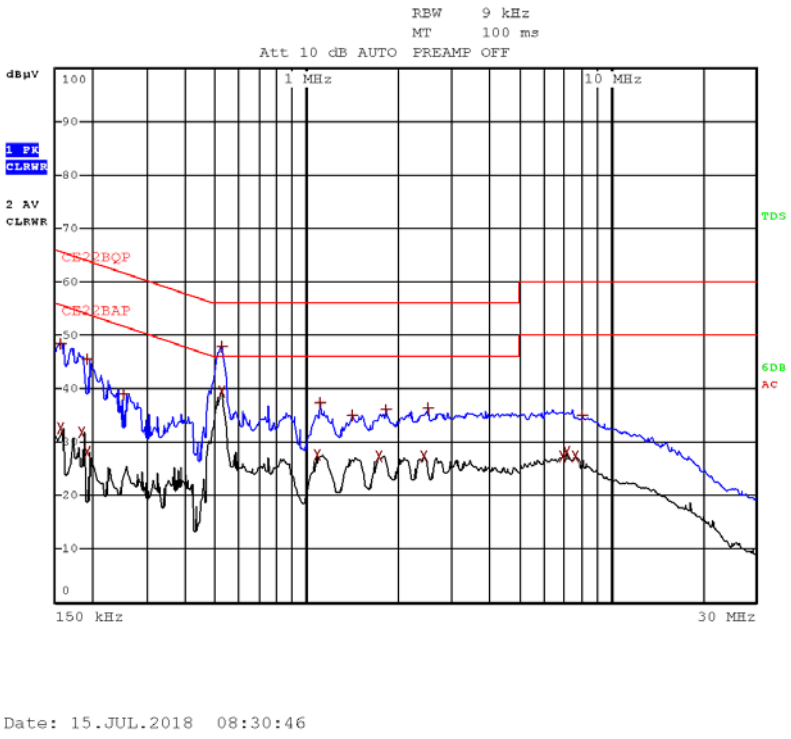


Figure 10. Detectors: Peak, Quasi-peak, Average

Conducted Emission

E.U.T Description	Outdoor Radar Based Perimeter Security Sensor
Type	SR500
Serial Number:	Not designated

Specification:	FCC Part 15, Subpart C RSS-Gen, Issue 5, clause 8.8
Lead:	Neutral
Detectors:	Peak, Quasi-peak, Average
Power Operation	POE

EDIT PEAK LIST (Final Measurement Results)

Trace1: CE22BQP
Trace2: CE22BAP
Trace3: ---

	TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1	Quasi Peak	150 kHz	47.31	-18.68
2	Average	150 kHz	32.87	-23.12
1	Quasi Peak	178 kHz	43.48	-21.09
1	Quasi Peak	190 kHz	42.40	-21.63
2	Average	190 kHz	27.48	-26.55
2	Average	202 kHz	25.21	-28.31
1	Quasi Peak	206 kHz	39.88	-23.48
1	Quasi Peak	238 kHz	36.18	-25.97
2	Average	514 kHz	39.14	-6.85
1	Quasi Peak	522 kHz	45.83	-10.17
1	Quasi Peak	1.122 MHz	31.65	-24.34
1	Quasi Peak	1.494 MHz	30.85	-25.14
1	Quasi Peak	1.818 MHz	31.24	-24.75
1	Quasi Peak	5.198 MHz	31.66	-28.33
2	Average	6.406 MHz	25.54	-24.45
2	Average	6.518 MHz	25.35	-24.64
2	Average	6.65 MHz	25.37	-24.63
2	Average	6.706 MHz	25.41	-24.58
2	Average	7.338 MHz	25.26	-24.73
2	Average	7.414 MHz	25.37	-24.62

Date: 15.JUL.2018 08:40:23

Figure 11. Detectors: Peak, Quasi-peak, Average

Note: QP Delta/Av Delta refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

Conducted Emission

E.U.T Description	Outdoor Radar Based Perimeter Security Sensor
Type	SR500
Serial Number:	Not designated

Specification:	FCC Part 15, Subpart C RSS-Gen, Issue 5, clause 8.8
Lead:	Neutral
Detectors:	Peak, Quasi-peak, Average
Power Operation	POE

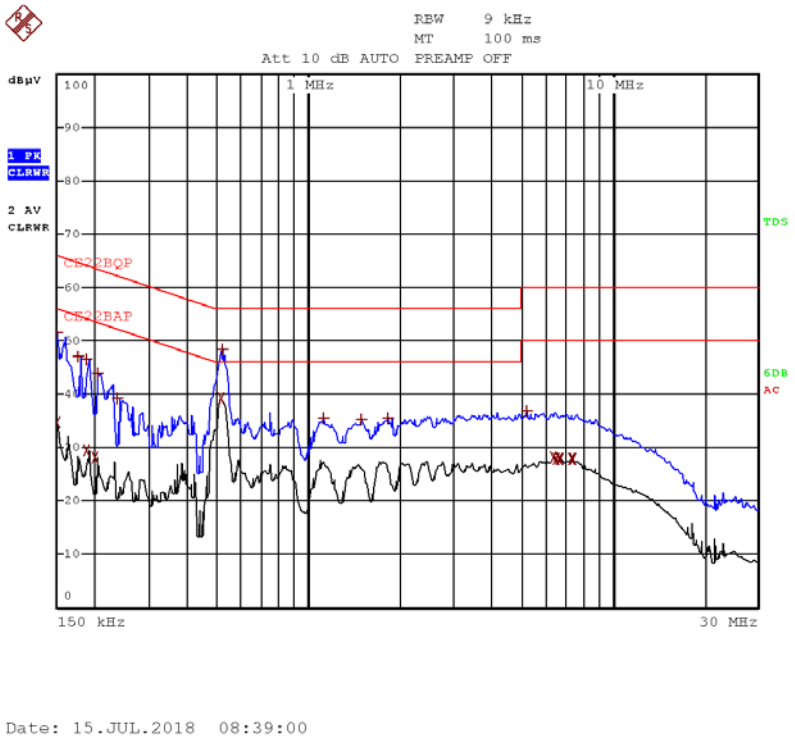


Figure 12 Detectors: Peak, Quasi-peak, Average

4.5 *Test Equipment Used; Conducted Emission from AC Mains*

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Next Calibration Due
LISN	Fischer	FCC-LISN-25A	127	July 20, 2017	July 20, 2018
Transient Limiter	HP	11947A	3107A03041	June 25, 2018	June 25, 2019
EMI Receiver	Rohde & Schwarz	ESCI7	100724	February 19, 2018	February 19, 2019
Cable CE Chamber 3M + 3M	Testline 18 + RJ214	11556	-	March 31, 2018	March 31, 2019

Figure 13 Test Equipment Used

5. 20dB Minimum Bandwidth

5.1 *Test Specification*

FCC Part 15, Subpart C, section 15.247(a)(1)
RSS 247, Issue 2, Section 5.1(a)

5.2 *Test Procedure*

(Temperature (22°C)/ Humidity (58%RH))
The E.U.T operation mode and test set-up are as described in Section 2 of this report.
The E.U.T was tested in the chamber, and placed on a remote-controlled turntable.
The E.U.T was placed on a non-metallic table, 1.5 meters above the ground and 3 meter distance from testing antenna.
The spectrum analyzer was set to the following parameters:
Span = ~ 2 to 3 times the 20 dB bandwidth, centered on a hopping channel
RBW ≥ 1% of the 20 dB bandwidth
Detector Function: Peak, Trace: Maximum Hold.

5.3 *Test Limit*

The maximum 20 dB bandwidth of the hopping channel is 1 MHz.

5.4 *Test Results*

Operation Frequency (MHz)	Bandwidth Reading (kHz)
5,726.0	78.2
5,787.0	77.8
5,849.0	77.8

Figure 14 — Test Results

JUDGEMENT: Passed

For additional information see *Figure 15* to *Figure 17*.

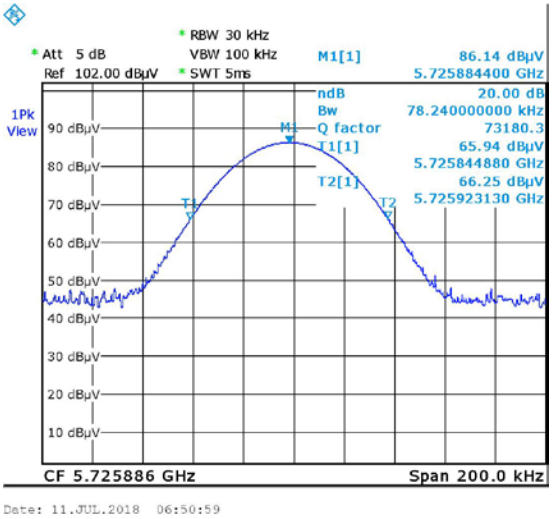


Figure 15. Low Channel

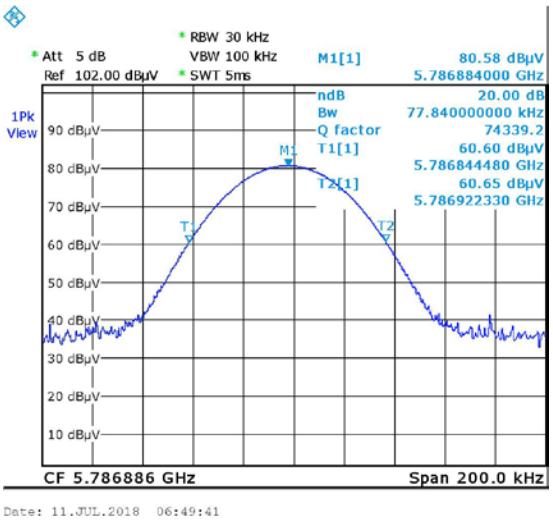


Figure 16. Mid Channel

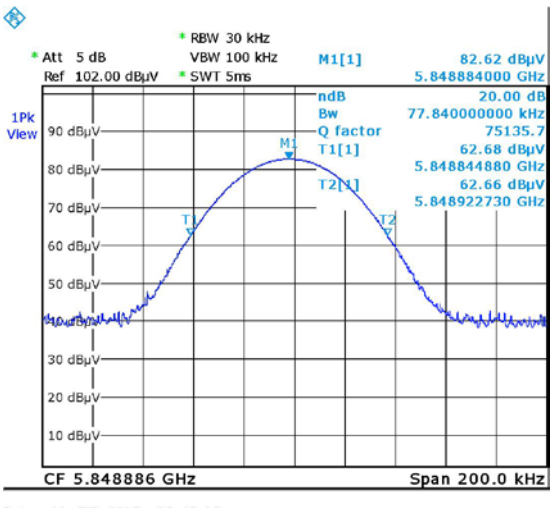


Figure 17. High Channel

5.5 *Test Equipment Used, 20 dB Minimum Bandwidth*

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Next Calibration Due
EMI Receiver	R&S	ESCI7	100724	February 19, 2018	February 19, 2019
Horn Antenna	ETS	3115	6142	May 31, 2018	May 31, 2021
RF Cable	Commscope ORS	0623 WBC-400	G020132	October 1, 2017	October 1, 2018
Semi Anechoic Civil Chamber	ETS	S81	SL 11643	NCR	NCR

Figure 18 Test Equipment Used

6. Occupied Bandwidth

6.1 *Test Specification*

FCC Part 15, Subpart C: section 2.1048
RSS Gen, Issue 5, Section 6.6

6.2 *Test Procedure*

(Temperature (22°C)/ Humidity (55%RH))
The E.U.T operation mode and test set-up are as described in Section 2 of this report.
The E.U.T was tested in the chamber, and placed on a remote-controlled turntable.
The E.U.T was placed on a non-metallic table, 1.5 meters above the ground and a 3 meter distance from testing antenna. The spectrum analyzer was set to the following parameters:
Span = ~ 2 to 3 times the occupied bandwidth, centered on a hopping channel
Detector Function: Peak, Trace: Maximum Hold.
99% Occupied bandwidth function was turn on.

6.3 *Test Limit*

N/A

6.4 *Test Results*

Operation Frequency (MHz)	Bandwidth Reading (kHz)
5,726.0	65.8
5,787.0	66.2
5,849.0	66.2

Figure 19 Test Results

JUDGEMENT: Passed

For additional information see *Figure 15* to *Figure 17*.

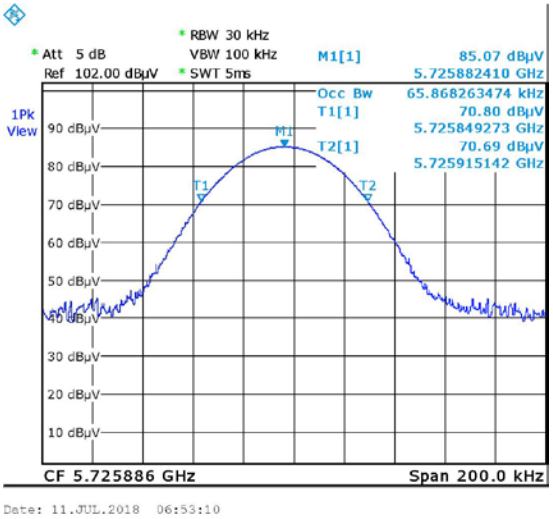


Figure 20. Low Channel

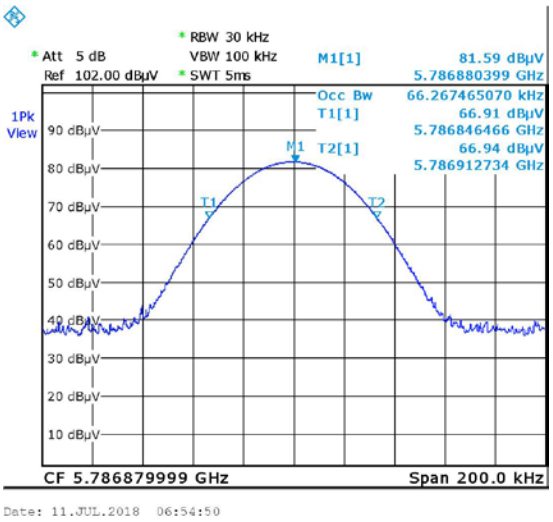


Figure 21. Mid Channel

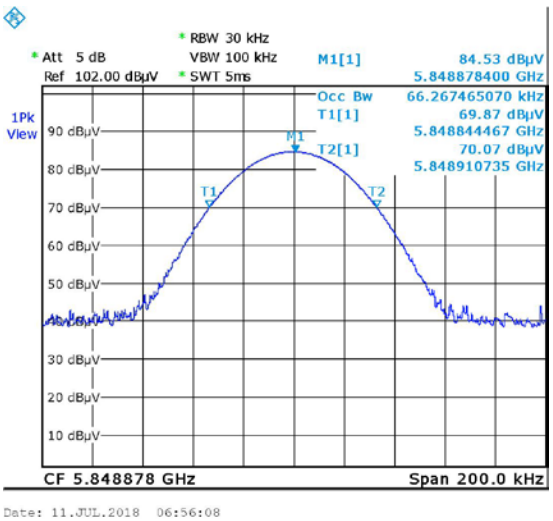


Figure 22. High Channel

6.5 *Test Equipment Used, Occupied Bandwidth*

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Next Calibration Due
EMI Receiver	R&S	FSL6	100194	February 19, 2018	February 19, 2019
Horn Antenna	ETS	3115	6142	May 31, 2018	May 31, 2021
RF Cable	Commscope ORS	0623 WBC-400	G020132	October 1, 2017	October 1, 2018
Semi Anechoic Civil Chamber	ETS	S81	SL 11643	NCR	NCR

Figure 23 Test Equipment Used

7. Number of Hopping Frequencies

7.1 *Test Specification*

FCC Part 15, Subpart C Section 15.247(a)(1)(ii)

RSS 247, Issue 2, Section 5.1(e)

7.2 *Test Procedure*

(Temperature (22°C)/ Humidity (62%RH))
The E.U.T operation mode and test set-up are as described in Section 2 of this report.
The E.U.T was tested in the chamber, and placed on a remote-controlled turntable.
The E.U.T was placed on a non-metallic table, 1.5 meters above the ground and a 3 meter distance from testing antenna.

The E.U.T. was set to hopping mode.
The spectrum analyzer was set to the following parameters:
RBW: 30 kHz, VBW: 100 kHz
Detector Function: Peak, Trace: Maximum Hold.

7.3 *Test Limit*

Frequency hopping systems operating in the 5725-5850 MHz band shall use at least 75 hopping frequencies.

7.4 *Test Results*

Number of Hopping Frequencies	Specification
247	≥75

Figure 24 Test Results

JUDGEMENT: Passed

For additional information see *Figure 25* to *Figure 30.*

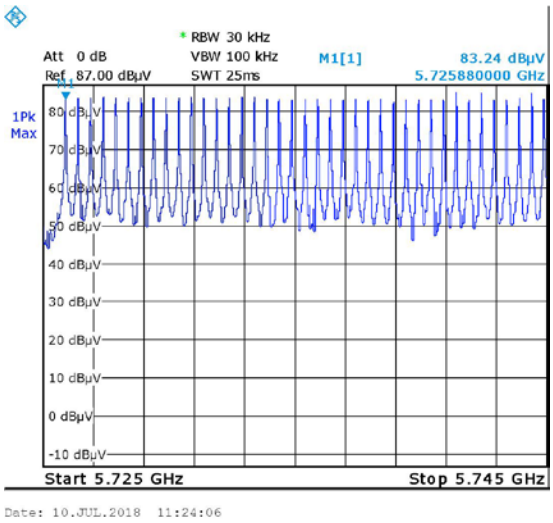


Figure 25. Number of Channels 5725-5745MHz band

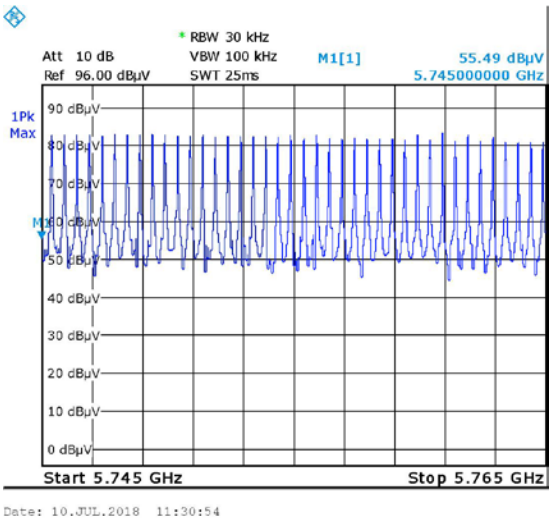


Figure 26. Number of Channels 5745-5765MHz band

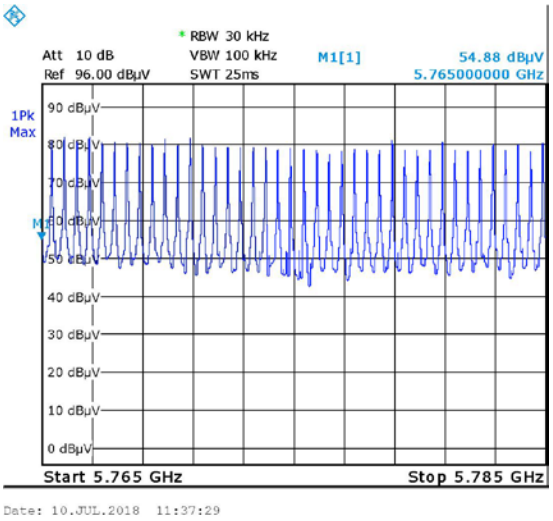


Figure 27. Number of Channels 5765-5785MHz band

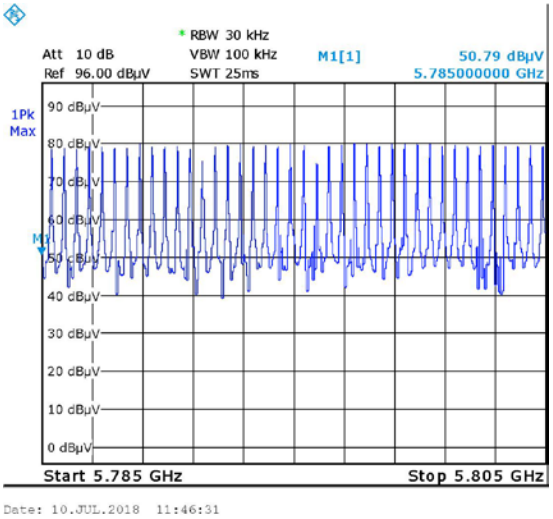


Figure 28. Number of Channels 5785-5805MHz band

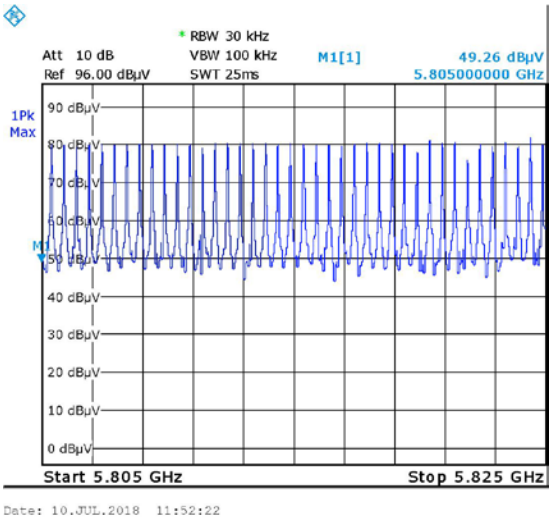


Figure 29. Number of Channels 5805-5825MHz band

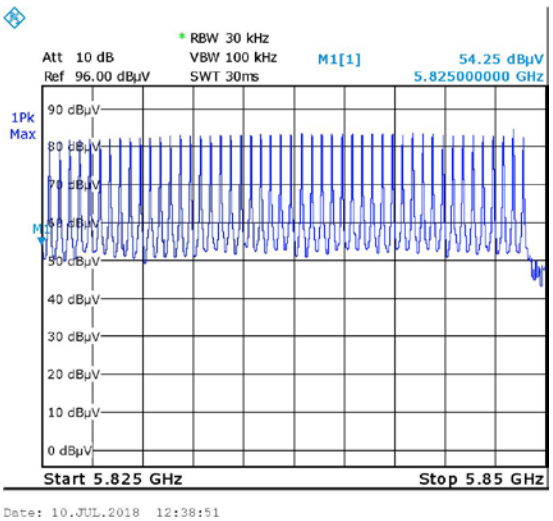


Figure 30. Number of Channels 5825-5850MHz band

7.5 *Test Equipment Used, Number of Hopping Frequencies*

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Next Calibration Due
EMI Receiver	R&S	FSL6	100194	February 19, 2018	February 19, 2019
Horn Antenna	ETS	3115	6142	May 31, 2018	May 31, 2021
RF Cable	Commscope ORS	0623 WBC-400	G020132	October 1, 2017	October 1, 2018
Semi Anechoic Civil Chamber	ETS	S81	SL 11643	NCR	NCR

Figure 31 Test Equipment Used

8. Channel Frequency Separation

8.1 *Test Specification*

FCC Part 15, Subpart C, Section 15.247(a) (1)

RSS 247. Issue 2, Section 5.1(b)

8.2 *Test Procedure*

(Temperature (22°C)/ Humidity (55%RH))
The E.U.T operation mode and test set-up are as described in Section 2 of this report.
The E.U.T was tested in the chamber, and placed on a remote-controlled turntable.
The E.U.T was placed on a non-metallic table, 1.5 meters above the ground and a 3 meter distance from testing antenna.

The E.U.T. was set to hopping mode.

The spectrum analyzer was set to the following parameters:
Span = wide enough to capture two adjacent channels, RBW≥ 1% of the span
Detector Function: Peak, Trace: Maximum Hold.

8.3 *Test Limit*

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

8.4 *Test Results*

Channel Frequency Separation (kHz)	**Limit (kHz)**
499.0	77.8

Figure 32 Test Results

JUDGEMENT: Passed

For additional information see *Figure 33*.

Channel Frequency Separation

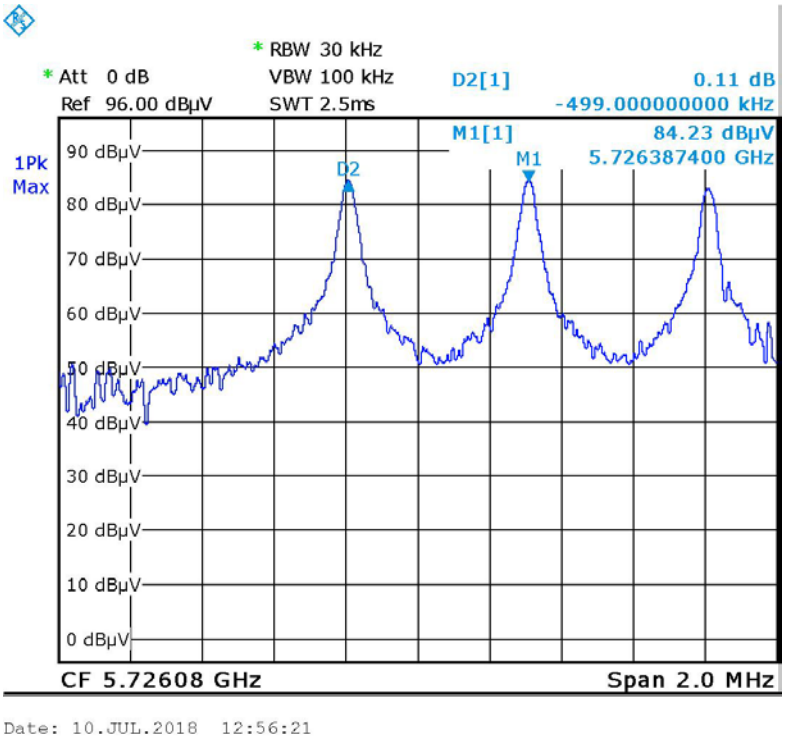


Figure 33. Channel Frequency Separation

8.5 *Test Equipment Used, Channel Frequency Separation*

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Next Calibration Due
EMI Receiver	R&S	ESCI7	100724	February 19, 2018	February 19, 2019
Horn Antenna	ETS	3115	6142	May 31, 2018	May 31, 2021
RF Cable	Commscope ORS	0623 WBC-400	G020132	October 1, 2017	October 1, 2018
Semi Anechoic Civil Chamber	ETS	S81	SL 11643	NCR	NCR

Figure 34 Test Equipment Used

9. Peak Output Power

9.1 *Test Specification*

FCC Part 15, Subpart C, Section 15.247(b)(1)
RSS, Issue 2, Section 5.4(c)

9.2 *Test Procedure*

(Temperature (22°C)/ Humidity (55%RH))
The E.U.T operation mode and test set-up are as described in Section 2 of this report.
The E.U.T was tested in the chamber, and placed on a remote-controlled turntable.
The E.U.T was placed on a non-metallic table, 1.5 meters above the ground and a 3 meter distance from testing antenna.
The spectrum analyzer was set to the following parameters:
Span = ~5 times the 20 dB bandwidth, centered on a hopping channel RBW ≥ of the 20 dB bandwidth of the emission being measured.
Detector Function: Peak, Trace: Maximum Hold.
Radiated output power levels were measured at selected operation frequencies and the results were converted to power level according to the formula as shown below:

$$P = \frac{(E_{V/m} \times d)^2}{(30 \times G)} \text{ [W]}$$

E - Field Strength (V/m)

d – Distance from transmitter (m)

G – Antenna gain

P – Peak power (W)

9.3 *Test Limit*

The maximum peak conducted output power for all frequency hopping systems in the 5725-5850 MHz band: 1 watt.

9.4 *Test Results*

Operation Frequency (MHz)	Polarization (V/H)	Field Strength (dBuV/m)	EIRP (dBm)	Antenna Gain (dBi)	Conducted Power (dBm)	Conducted Power (mW)	Limit* (mW)	Margin (mW)
5726.0	V	123.3	28.1	9.0	19.1	81.3	500.0	-418.7
	H	107.7	12.5	9.0	3.5	2.2	500.0	-497.8
5787.0	V	122.9	27.7	9.0	18.7	74.1	500.0	-425.9
	H	108.2	13.0	9.0	4.0	2.5	500.0	-497.5
5849.0	V	123.3	28.1	9.0	19.1	81.3	500.0	-418.7
	H	111.1	15.9	9.0	6.9	4.9	500.0	-495.1

*Note – Limit value reduced by 3dBi because antenna gain exceeds 6dBi by 3dB.

Figure 35 Radiated Power Output Test Results

JUDGEMENT: Passed by 419 mW

For additional information see *Figure 36* to *Figure 41*.

Peak Output Power

E.U.T Description	Outdoor Radar Based Perimeter Security Sensor
Type	SR500
Serial Number:	Not designated

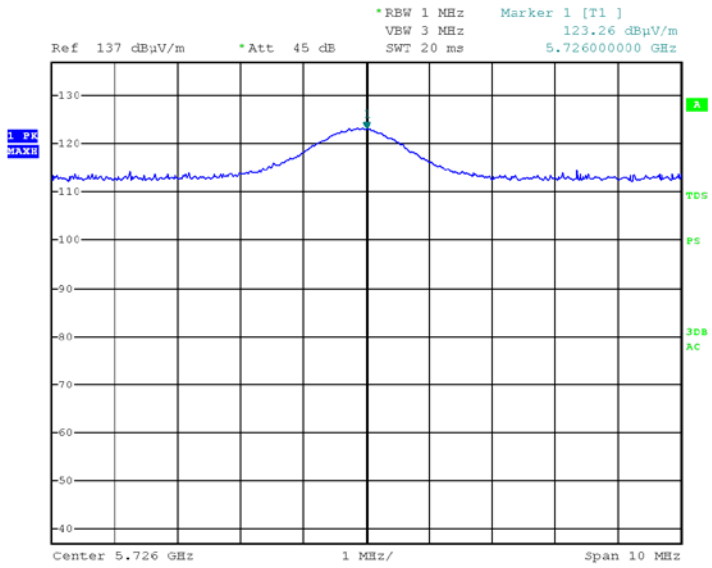


Figure 36 Low, Vertical

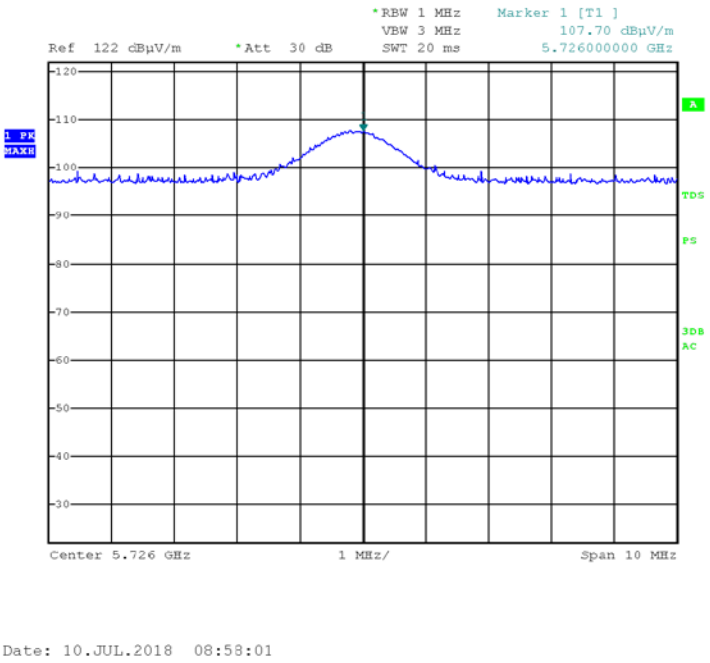


Figure 37 Low, Horizontal

Peak Output Power

E.U.T Description	Outdoor Radar Based Perimeter Security Sensor
Type	SR500
Serial Number:	Not designated

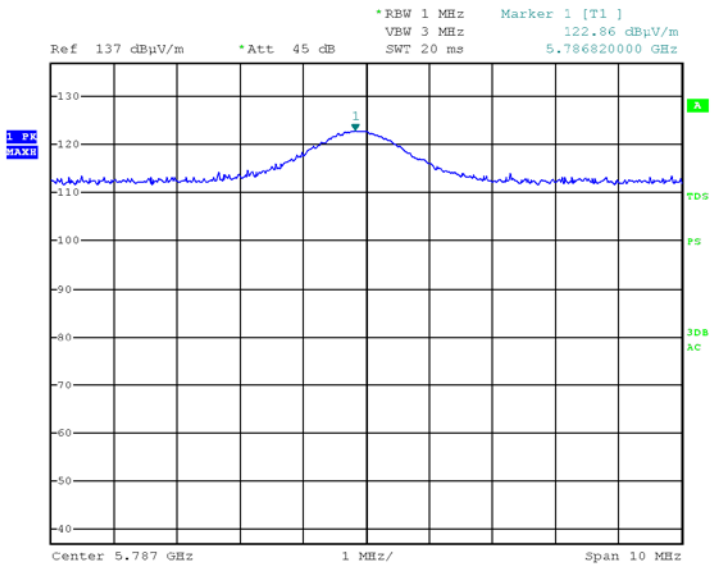


Figure 38 Mid, Vertical

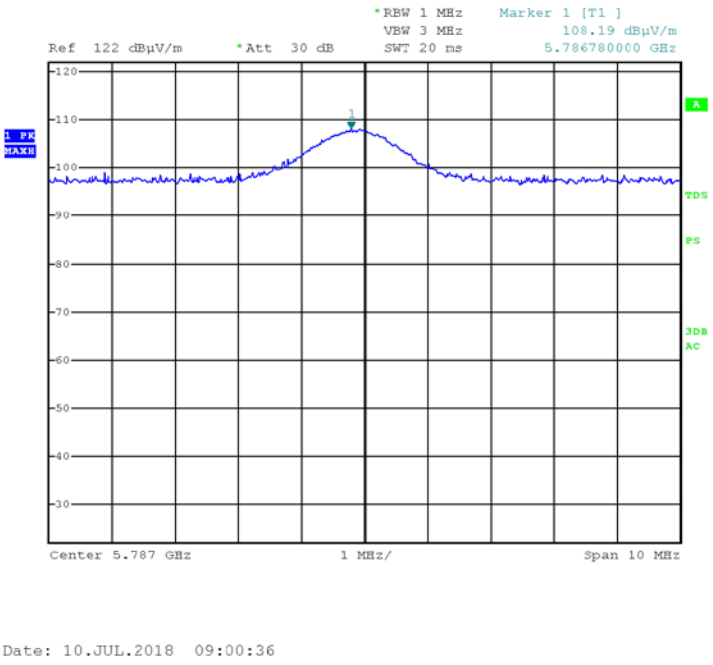


Figure 39 Mid, Horizontal

Peak Output Power

E.U.T Description	Outdoor Radar Based Perimeter Security Sensor
Type	SR500
Serial Number:	Not designated

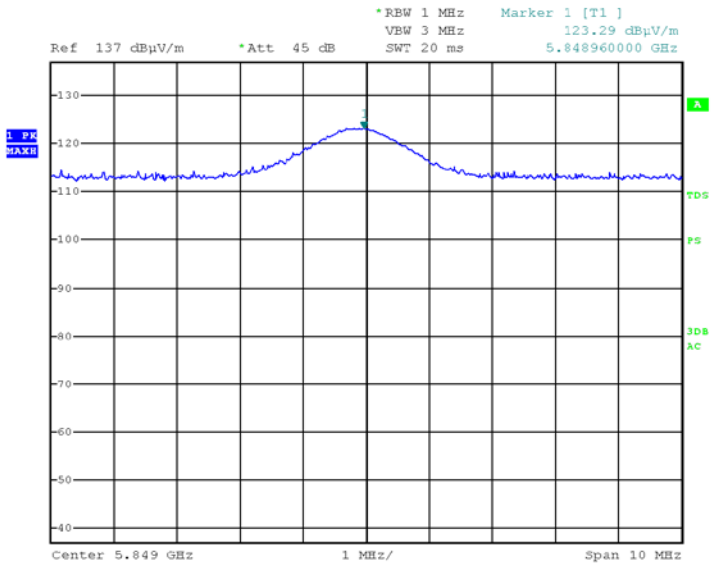


Figure 40 High, Vertical

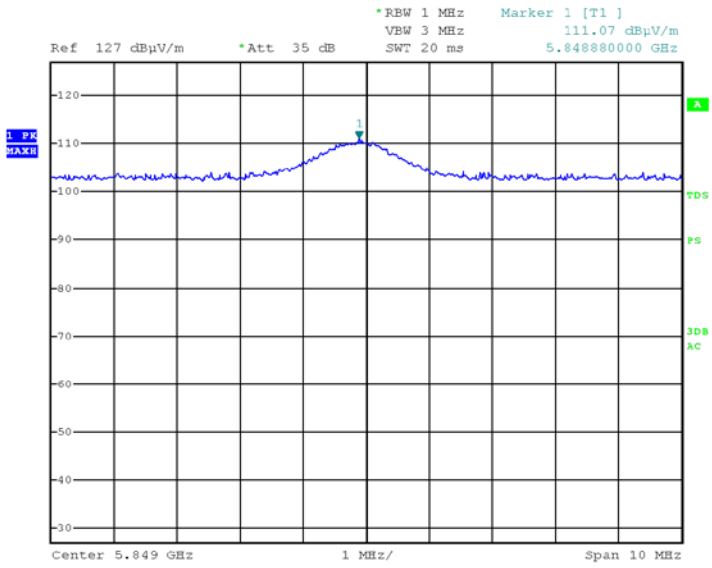


Figure 41 High, Horizontal

9.5 *Test Equipment Used, Peak Output Power*

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Next Calibration Due
EMI Receiver	R&S	ESCI7	100724	February 19, 2018	February 19, 2019
Horn Antenna	ETS	3115	6142	May 31, 2018	May 31, 2021
RF Cable	Commscope ORS	0623 WBC-400	G020132	October 1, 2017	October 1, 2018
Semi Anechoic Civil Chamber	ETS	S81	SL 11643	NCR	NCR

Figure 42 Test Equipment Used

10. Dwell Time on Each Channel

10.1 *Test Specification*

FCC Part 15, sub part C, Section 15.247(a)(1)(ii)

RSS 247, Issue 2, Section 5.1(e)

10.2 *Test Procedure*

(Temperature (22°C)/ Humidity (55%RH))
The E.U.T operation mode and test set-up are as described in Section 2 of this report.
The E.U.T was tested in the chamber, and placed on a remote-controlled turntable.
The E.U.T was placed on a non-metallic table, 1.5 meters above the ground and 3 meter distance from testing antenna.
The spectrum analyzer was set to the following parameters:
Span = zero span, centered on a hopping channel, RBW≥ 1MHz
Detector Function: Peak, Trace: Maximum Hold

10.3 *Test Limit*

The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 30 second period.

10.4 *Test Results*

JUDGEMENT: Passed

The E.U.T met the requirements of the FCC Part 15, Section 15.247(a)(1)(ii) and RSS 247, Issue 2, clause 5.1(e).

Additional information of the results is given in *Figure 43* to *Figure 45*.

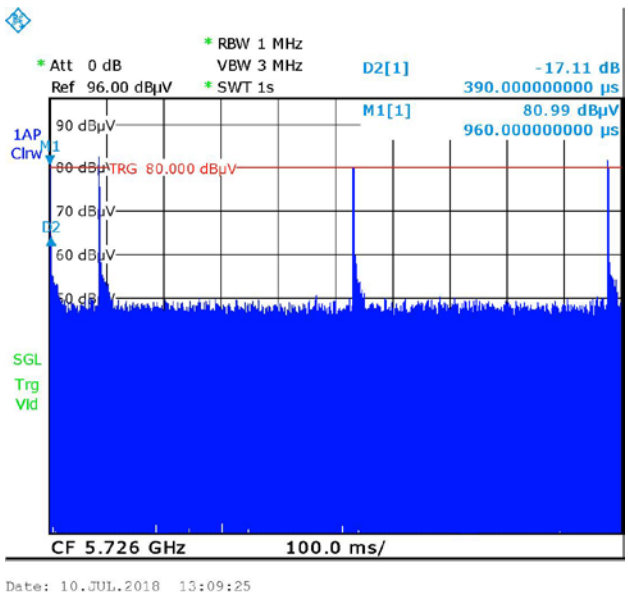


Figure 43 — Number of Bursts in 1sec=4, in 30sec=120

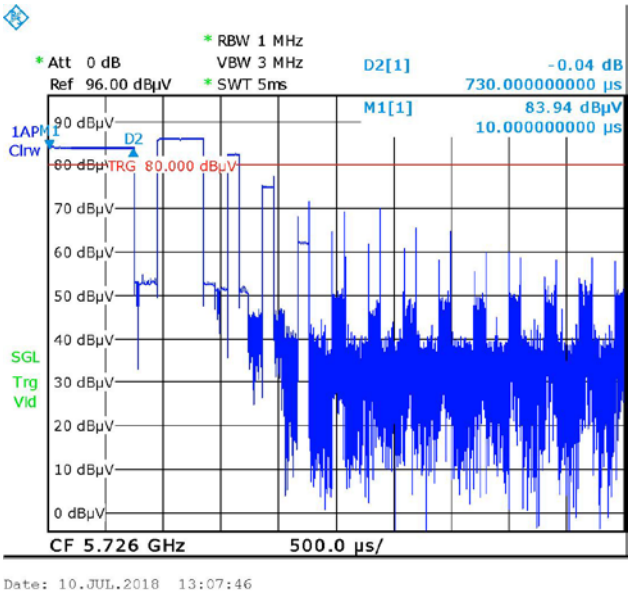


Figure 44 — Burst Duration1 =0.73ms

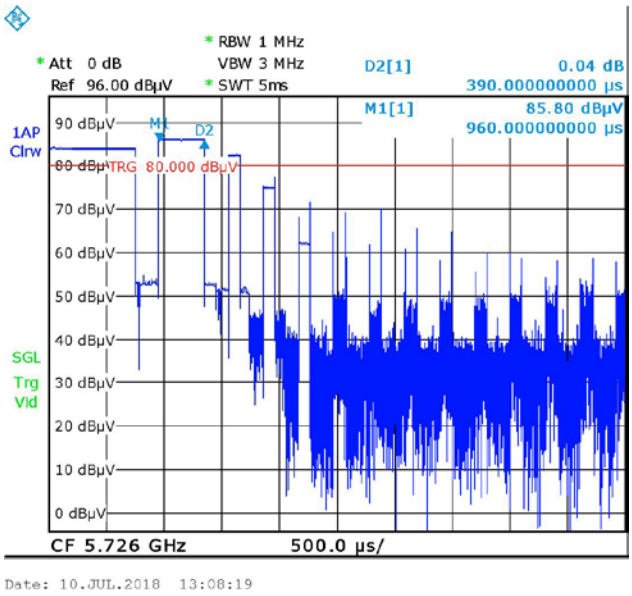


Figure 45 — Burst Duration2 =0.39ms

DWELL TIME = (0.73+0.39)msec*120= 134msec<0.4s

10.5 *Test Equipment Used, Dwell Time on Each Channel*

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Next Calibration Due
EMI Receiver	R&S	ESCI7	100724	February 19, 2018	February 19, 2019
Horn Antenna	ETS	3115	6142	May 31, 2018	May 31, 2021
RF Cable	Commscope ORS	0623 WBC-400	G020132	October 1, 2017	October 1, 2018
Semi Anechoic Civil Chamber	ETS	S81	SL 11643	NCR	NCR

Figure 46 Test Equipment Used

11. Band Edge

11.1 *Test Specification*

FCC Part 15, Section 15.247(d)

RSS 247, Issue 2, Section 5.5

11.2 *Test Procedure*

(Temperature (22°C)/ Humidity (55%RH))
The E.U.T operation mode and test set-up are as described in Section 2 of this report.
The E.U.T was tested in the chamber, and placed on a remote-controlled turntable.
The E.U.T was placed on a non-metallic table, 1.5 meters above the ground and a 3 meter distance from testing antenna.
The transmitter unit operated in 2 modes: hopping enabled and hopping disabled.
The RBW was set to 100 kHz.
The display line was set to 20 dBc

The E.U.T. was tested at the lower and the upper channels.

11.3 *Test 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 20dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

11.4 *Test Results*

Mode	Operation Frequency	Band Edge Frequency	Spectrum Level	Limit	Margin
	(MHz)	(MHz)	(dBuV/m)	(dBuV/m)	(dB)
Hopping	5726.0	5725.0	59.1	62.5	-3.4
	5849.0	5850.0	56.6	61.3	-4.7
Non- Hopping	5726.0	5725.0	38.9	64.3	-25.4
	5849.0	5850.0	38.5	62.3	-23.8

Figure 47 Band Edge Test Results

JUDGEMENT: Passed by 3.4 dB

For additional information see *Figure 48* to *Figure 51*.

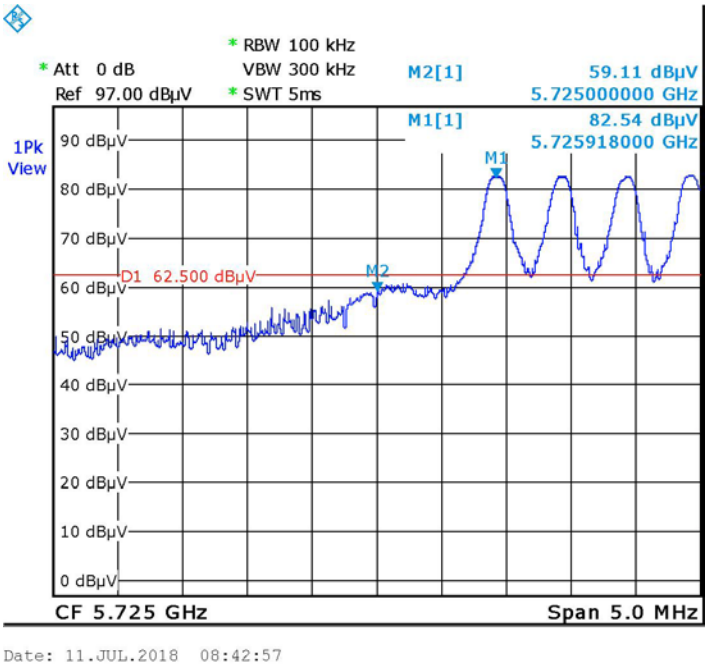


Figure 48 Hopping, Lower Band Edge

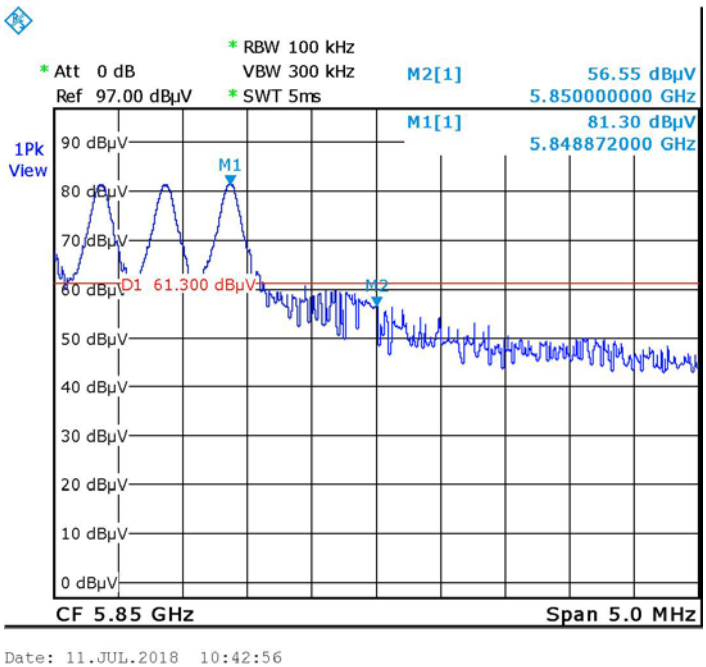


Figure 49 Hopping, Higher Band Edge

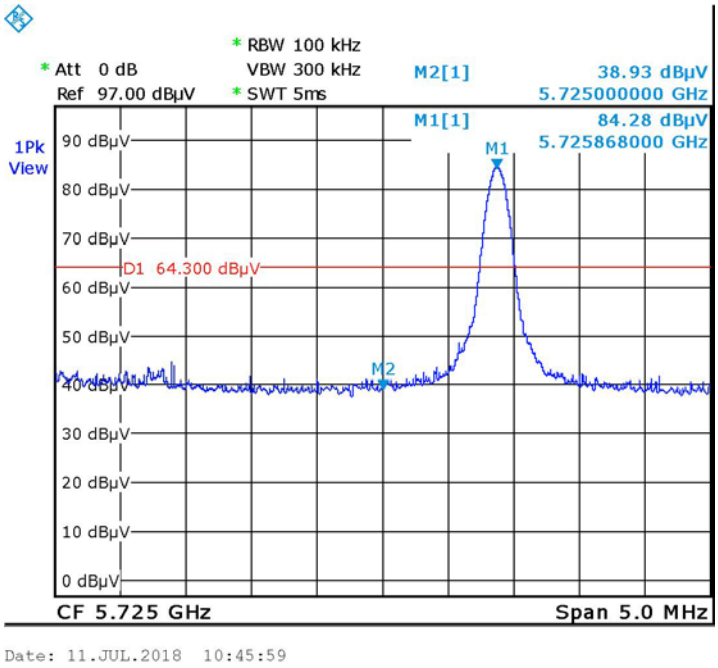


Figure 50 Non-Hopping, Lower Band Edge

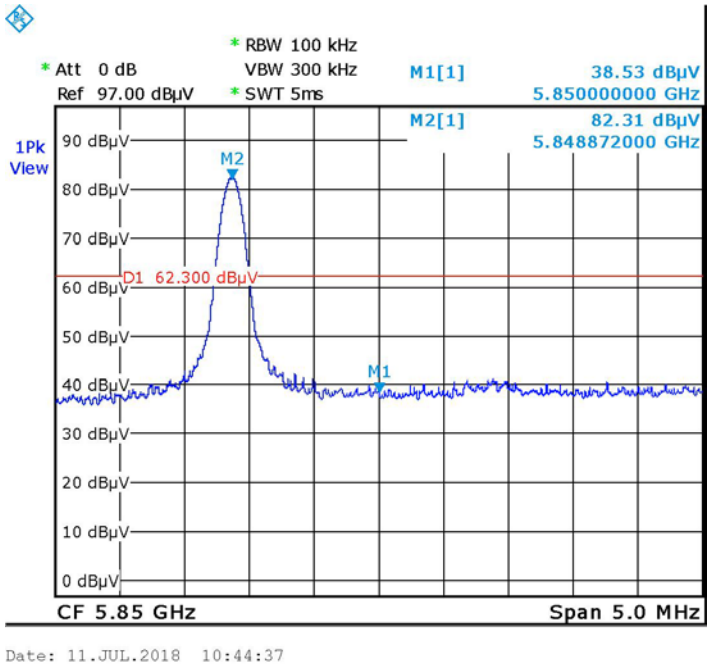


Figure 51 Non-Hopping, Higher Band Edge

11.5 *Test Equipment Used, Band Edge*

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Next Calibration Due
EMI Receiver	R&S	ESCI7	100724	February 19, 2018	February 19, 2019
Horn Antenna	ETS	3115	6142	May 31, 2018	May 31, 2021
RF Cable	Commscope ORS	0623 WBC-400	G020132	October 1, 2017	October 1, 2018
Semi Anechoic Civil Chamber	ETS	S81	SL 11643	NCR	NCR

Figure 52 Test Equipment Used

12. Emissions in Non-Restricted Frequency Bands

12.1 *Test Specification*

FCC, Part 15, Subpart C, Section 247(d)

RSS 247, Issue 2, Section 5.5

12.2 *Test Procedure*

(Temperature (22°C)/ Humidity (55%RH))
The E.U.T. operation mode and test set-up are as described in Section 2 of this report.

For measurements between 0.009MHz-30MHz:

The E.U.T was tested inside the shielded room and placed on a non-metallic table, 0.8 meters above the ground. The emissions were measured at a distance of 3 meters. The readings were maximized by the turntable azimuth between 0-360°, and the antenna polarization.
The frequency range 0.009MHz-30MHz was scanned.

For measurements between 30.0MHz-1.0GHz:
A preliminary measurement to characterize the E.U.T was performed inside the shielded room at a distance of 3 meters, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The emissions were measured at a distance of 3 meters. The readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization. The frequency range 30.0MHz -1.0GHz was scanned and the list of the highest emissions was verified and updated accordingly.

For measurements between 1.0GHz-40.0GHz:

The E.U.T was tested inside the shielded room and placed on a non-metallic table, 1.5 meters above the ground. The emissions were measured at a distance of 3 meters. The readings were maximized by the turntable azimuth between 0-360°, and the antenna polarization.
The frequency range 1.0GHz -40.0GHz was scanned.

RBW was set to 100 kHz and detector set to max peak and trace to “max hold”.

12.3 *Test 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.

12.4 *Test Results*

JUDGEMENT: Passed

The EUT met the requirements of the F.C.C. Part 15, Subpart C, Section 247 (d) and RSS 247, Issue 2, Section 5.5 specification.

All detected emissions were greater than 20dBc below the fundamental level.

12.5 *Test Equipment Used, Emissions in Non-Restricted Frequency Bands*

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Next Calibration Due
EMI Receiver	R&S	ESCI7	100724	February 19, 2018	February 19, 2019
Spectrum Analyzer	HP	8593EM	3536A00120 ADI	February 20, 2018	February 20, 2019
EMI Receiver	HP	8542E	3906A00276	February 19, 2018	February 19, 2019
RF Filter Section	HP	85420E	3705A00248	February 19, 2018	February 19, 2019
Spectrum Analyzer	HP	8564E	3442A00275	February 28, 2018	February 28, 2019
Biconical Antenna	EMCO	3110B	9912-3337	May 15, 2017	May 15, 2019
Log Periodic Antenna	EMCO	3146	9505-4081	May 31, 2018	May 31, 2019
Horn Antenna	ETS	3115	6142	May 31, 2018	May 31, 2021
Horn Antenna	ARA	SWH-28	1007	December 31, 2017	December 31, 2020
Horn Antenna Ka Band	OSR Electronics	PE9850R-20	J202021732	February 1, 2018	February 28, 2021
Active Loop Antenna	EMCO	6502	9506-2950	October 19, 2017	October 19, 2018
MicroWave System Amplifier	HP	83006A	3104A00589	October 1, 2017	October 1, 2018
Low noise amplifier 1GHz-18GHz	Miteq	AFSX4-02001800-50-8P	-	October 1, 2017	October 1, 2018
Low noise amplifier 13GHz-32GHz	Narda	DBS-0411N313	13	October 1, 2017	October 1, 2018
RF Cable	Commscope ORS	0623 WBC-400	G020132	October 1, 2017	October 1, 2018
RF Cable (OATS)	EIM	RG214-11N(X2)		August 13, 2017	August 13, 2018
Filter Band pass 8-16 GHz	Serno	MFR01341-HI-3816JJ-1	322	October 1, 2017	October 1, 2018
Semi Anechoic Civil Chamber	ETS	S81	SL 11643	NCR	NCR
Antenna Mast	ETS	2070-2	9608-1497	NCR	NCR
Turntable	ETS	2087	-	NCR	NCR
Mast & Table Controller	ETS/EMCO	2090	9608-1456	NCR	NCR

Figure 53 Test Equipment Used

13. Emissions in Restricted Frequency Bands

13.1 *Test Specification*

FCC, Part 15, Subpart C, Sections 247(d), 15.205, 15.209
RSS 247, Issue 2, section 3.3
RSS Gen, Issue 5, Section 8.10

13.2 *Test Procedure*

(Temperature (22°C)/ Humidity (54%RH))

For measurements between 0.009-30MHz:

The E.U.T was tested inside the shielded room and placed on a non-metallic table, 0.8 meters above the ground. The emissions were measured at a distance of 3 meters. The readings were maximized by the turntable azimuth between 0-360°, and the antenna polarization.
The frequency range 0.009MHz-30MHz was scanned.

For measurements between 30-1000MHz:
A preliminary measurement to characterize the E.U.T was performed inside the shielded room at a distance of 3 meters, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The emissions were measured at a distance of 3 meters. The readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization. The frequency range 30MHz -1000MHz was scanned and the list of the highest emissions was verified and updated accordingly.

For measurements between 1GHz-40GHz:

The E.U.T was tested inside the shielded room and placed on a non-metallic table, 1.5 meters above the ground. The emissions were measured at a distance of 3 meters. The readings were maximized by the turntable azimuth between 0-360°, and the antenna polarization.
The frequency range 1GHz -40GHz was scanned.

The levels of the emissions within the frequency ranges of the restricted bands (Section 15.205 of FCC Part 15) were compared to the limits of the table in Section 15.209 (a), General Requirements.

13.3 *Test Limit*

Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c))

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)	Field strength* (dBµV/m)	Field strength* (dBµV/m)@3m
0.009-0.490	2400/F(kHz)	300	48.5-13.8	128.5-73.8
0.490-1.705	24000/F(kHz)	30	33.8-23.0	73.8-63.0
1.705-30.0	30	30	29.5	69.5
30-88	100	3	40.0	40.0
88-216	150	3	43.5	43.5
216-960	200	3	46.0	46.0
Above 960	500	3	54.0	54.0

*The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector. For average radiated emission measurements above 1000 MHz, there is also a limit corresponding to 20 dB above the indicated values in the table is specified when measuring with peak detector function.

13.4 *Test Results*

JUDGEMENT: Passed

The EUT met the requirements of the F.C.C. Part 15, Subpart C 209 and RSS Gen, Issue 5, Section 8.10 specification.

For additional information see Figure 54.

Radiated Emission

E.U.T Description	Outdoor Radar Based Perimeter Security Sensor
Type	SR500
Serial Number:	Not designated

Specification: FCC, Part 15, Subpart C, Sections 15.209, 15.205, 15.247(d); RSS Gen, Issue 5, Section 8.10

Antenna Polarization: Horizontal/Vertical Frequency Range: 9kHz to 40.0 GHz

Protocol type: CW Detector: Peak, Average

Operation Frequency	Freq.	Pol.	Peak Reading	Peak Limit	Peak Margin	Average Reading	Average Limit	Average Margin
(MHz)	(MHz)	(H/V)	(dBµV/m)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV/m)	(dB)
5726.0	11,452.0	V	66.5	74.0	-7.5	33.5	54.0	-20.5
	11,452.0	H	71.8	74.0	-2.2	38.8	54.0	-15.2
	22,904.0	V	63.5	74.0	-10.5	30.5	54.0	-23.5
	22,904.0	H	64.3	74.0	-9.7	31.3	54.0	-22.7
5787.0	11,574.0	V	65.6	74.0	-8.4	32.6	54.0	-21.4
	11,574.0	H	69.7	74.0	-4.3	36.7	54.0	-17.3
5849.0	11,698.0	V	62.7	74.0	-11.3	29.7	54.0	-24.3
	11,698.0	H	71.7	74.0	-2.3	38.7	54.0	-15.3

Figure 54. Radiated Emission Results

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

"Peak Amp" includes correction factor.

* "Correction Factor" = Antenna Factor + Cable Loss- Low Noise Amplifier Gain

13.5 *Test Equipment Used, Emissions in Restricted Frequency Bands*

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Next Calibration Due
EMI Receiver	R&S	ESCI7	100724	February 19, 2018	February 19, 2019
Spectrum Analyzer	HP	8593EM	3536A00120 ADI	February 20, 2018	February 20, 2019
EMI Receiver	HP	8542E	3906A00276	February 19, 2018	February 19, 2019
RF Filter Section	HP	85420E	3705A00248	February 19, 2018	February 19, 2019
Spectrum Analyzer	HP	8564E	3442A00275	February 28, 2018	February 28, 2019
Biconical Antenna	EMCO	3110B	9912-3337	May 15, 2017	May 15, 2019
Log Periodic Antenna	EMCO	3146	9505-4081	May 31, 2018	May 31, 2021
Horn Antenna	ETS	3115	6142	May 31, 2018	May 31, 2021
Horn Antenna	ARA	SWH-28	1007	December 31, 2017	December 31, 2020
Horn Antenna Ka Band	OSR Electronics	PE9850R-20	J202021732	February 1, 2018	February 28, 2021
Active Loop Antenna	EMCO	6502	9506-2950	October 19, 2017	October 19, 2018
MicroWave System Amplifier	HP	83006A	3104A00589	October 1, 2017	October 1, 2018
Low noise amplifier 1GHz-18GHz	Miteq	AFSX4-02001800-50-8P	-	October 1, 2017	October 1, 2018
High Pass Band Filter	Meuro	MFL040120H50	902252	October 1, 2017	October 1, 2018
RF Cable	Commscope ORS	0623 WBC-400	G020132	October 1, 2017	October 1, 2018
RF Cable (OATS)	EIM	RG214-11N(X2)		August 13, 2017	August 13, 2018
Semi Anechoic Civil Chamber	ETS	S81	SL 11643	NCR	NCR
Antenna Mast	ETS	2070-2	9608-1497	NCR	NCR
Turntable	ETS	2087	-	NCR	NCR
Mast & Table Controller	ETS/EMCO	2090	9608-1456	NCR	NCR

Figure 55 Test Equipment Used

14. Avg. Factor Calculation

1. Pulse period = 1 (worst scenario)
2. Pulse duration = 1 (worst scenario)
3. Burst duration = 0.85msec

4. $$\text{Average Factor} = 20\log\left[\frac{\text{Pulse duration}}{\text{Pulse period}} \times \frac{\text{burst duration}}{100\text{msec}} \times \text{Num of burst within } 100\text{msec}\right]$$

Average Factor = 20log [1*(0.73+0.39)*2/100] = -33.0

5. Average Factor= -33.0dB

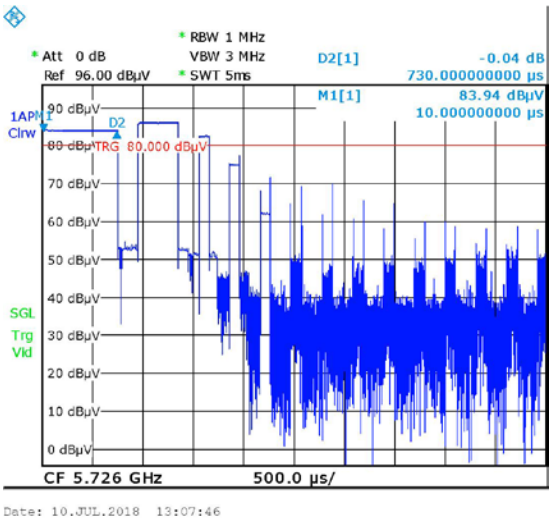


Figure 56 — Burst Duration1 =0.73ms

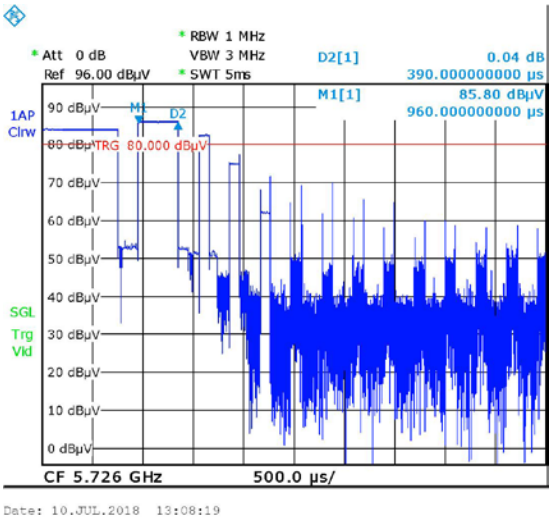


Figure 57 — Burst Duration2 =0.39ms

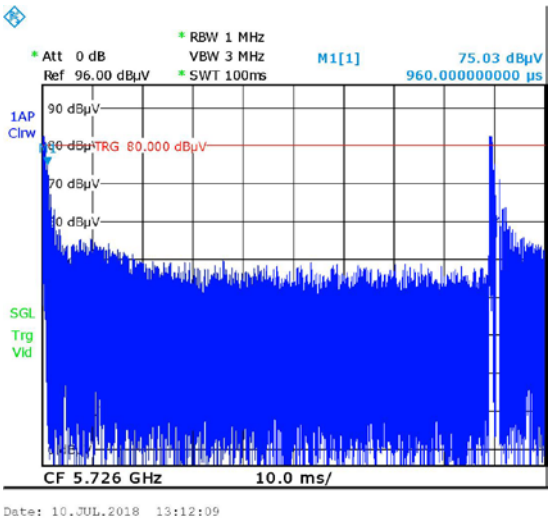


Figure 58. Number of Bursts in 100msec=2

14.1 *Test Equipment Used, Average Factor*

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Next Calibration Due
EMI Receiver	R&S	ESCI7	100724	February 19, 2018	February 19, 2019
Horn Antenna	ETS	3115	6142	May 31, 2018	May 31, 2021
RF Cable	Commscope ORS	0623 WBC-400	G020132	October 1, 2017	October 1, 2018
Semi Anechoic Civil Chamber	ETS	S81	SL 11643	NCR	NCR

Figure 59 Test Equipment Used

15. Antenna Gain/Information

The antenna gain is 9 dBi, patch.

16. R.F Exposure/Safety

The typical placement of the E.U.T. is wall mounted. The typical distance between the E.U.T. and the user is at least 20cm.

Calculation of Maximum Permissible Exposure (MPE)
Based on 47CFR1 Section 1.1307(b)(1) and RSS 102 Issue 5, Table 4 Requirements

(a) FCC Limit at 5726 MHz is: $1\frac{mW}{cm^2}$

Using Table 1 of 47CFR1 Section 1.1310 limit for general population/uncontrolled exposures, the above levels are an average over 30 minutes.

(b) ISED Limit: 300-6000MHz = $0.02619f^{0.6834}$ W/m^2=
$0.02619 \times 5726^{0.6834} = 0.02619 \times 369.93 = 9.69$ W/m^2 = 0.969 mW/cm^2

(c) The power density produced by the E.U.T. is:

$$S = \frac{P_t G_t}{4\pi R^2}$$

P_t = Conducted Transmitted Power 19.1 dBm = 81.3 mW
G_t = Antenna Gain 9dBi = 7.9 numeric
R = Distance From Transmitter 20 cm

(d) The peak power density produced by the E.U.T. is:

$S = 81.3*7.9/4\pi(20)^2 = 0.128$ mW/cm^2

(e) This is below the FCC/ISED limit.

17. APPENDIX A - CORRECTION FACTORS

17.1 *Correction factors for RF OATS Cable 35m*

ITL #1911

Frequency (MHz)	Ref&cable loss (dBm)	Ref loss (dBm)	Cable loss (dB)
1.00	0.7	0.2	0.5
10.00	1.3	0.3	1
20.00	1.7	0.3	1.34
30.00	2.0	0.5	1.5
50.00	2.3	0.5	1.83
100.00	3.0	0.3	2.67
150.00	3.7	0.5	3.17
200.00	4.3	0.5	3.83
250.00	4.5	0.3	4.17
300.00	5.0	0.5	4.5
350.00	5.7	0.5	5.17
400.00	6.0	0.5	5.5
450.00	6.5	0.7	5.83
500.00	6.8	0.5	6.33
550.00	7.2	0.5	6.67
600.00	7.5	0.7	6.83
650.00	7.7	0.5	7.17
700.00	8.3	0.7	7.66
750.00	8.5	0.7	7.83
800.00	8.8	0.7	8.16
850.00	9.0	0.5	8.5
900.00	9.5	0.7	8.83
950.00	9.7	0.8	8.84
1000.00	9.7	0.7	9

17.2 *Correction factor for RF cable for Anechoic Chamber*

ITL #1841

FREQ (MHz)	LOSS (dB)
1000.0	1.5
2000.0	2.1
3000.0	2.7
4000.0	3.1
5000.0	3.5
6000.0	4.1
7000.0	4.6
8000.0	4.9
9000.0	5.7
10000.0	5.7
11000.0	6.1
12000.0	6.1
13000.0	6.2
14000.0	6.7
15000.0	7.4
16000.0	7.5
17000.0	7.9
18000.0	8.1
19000.0	8.8
20000.0	9.1

NOTES:

1. The cable is manufactured by Commscope

2. The cable type is 0623 WBC-400, serial # G020132 and 10m long

17.3 *Correction factors for Active Loop Antenna*

Model 6502 S/N 9506-2950

ITL # 1075:

f(MHz)	MAF(dBs/m)	AF(dB/m)
0.01	-33.1	18.4
0.02	-37.2	14.3
0.03	-38.2	13.3
0.05	-39.8	11.7
0.1	-40.1	11.4
0.2	-40.3	11.2
0.3	-40.3	11.2
0.5	-40.3	11.2
0.7	-40.3	11.2
1	-40.1	11.4
2	-40	11.5
3	-40	11.5
4	-40.1	11.4
5	-40.2	11.3
6	-40.4	11.1
7	-40.4	11.1
8	-40.4	11.1
9	-40.5	11
10	-40.5	11
20	-41.5	10
30	-43.5	8

17.4 Correction factors for biconical antenna

ITL #1356
Model: EMCO 3110B
Serial No.: 9912-3337

Frequency [MHz]	AF [dB/m]
30	13.00
35	10.89
40	10.59
45	10.63
50	10.12
60	9.26
70	7.74
80	6.63
90	8.23
100	11.12
120	13.16
140	13.07
160	14.80
180	16.95
200	17.17

17.5 Correction factors for log periodic antenna

ITL # 1349
Model:EMCO 3146
Serial No.: 9505-4081

Frequency [MHz]	AF [dB/m]
200	11.58
250	12.04
300	14.76
400	15.55
500	17.85
600	18.66
700	20.87
800	21.15
900	22.32
1000	24.22

17.6 Correction factors for Double –Ridged Waveguide Horn ANTENNA

Model: 3115
Serial number:6142
3 meter range; ITL # 1354

Frequency	**Antenna #1: ITL 1354 AF1**
[MHz]	**[dB/m]**
1000	23.64
1500	26.14
2000	27.20
2500	28.20
3000	29.63
3500	31.28
4000	31.97
4500	32.25
5000	33.34
5500	33.67
6000	34.63
6500	35.71
7000	35.92
7500	36.34
8000	37.21
8500	37.28
9000	37.24
9500	37.28
10000	37.37
10500	37.77
11000	37.96
11500	38.55
12000	38.52
13000	39.30
14000	40.75
15000	40.32
16000	42.51
17000	42.35
18000	41.58

CALIBRATION DATA

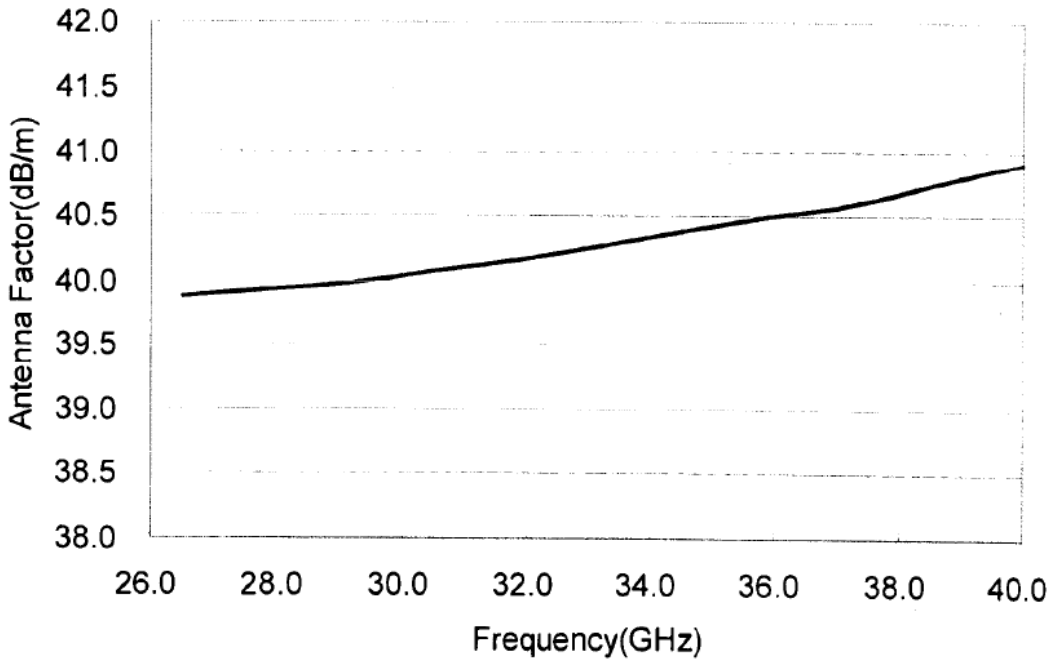
3 m distance

Frequency, MHz	Measured antenna factor, dB/m [1]
18000	32.4
18500	32.0
19000	32.3
19500	32.4
20000	32.3
20500	32.8
21000	32.8
21500	32.7
22000	33.1
22500	33.0
23000	33.1
23500	33.8
24000	33.5
24500	33.5
25000	33.8
25500	33.9
26000	34.2
26500	34.7

[1] The antenna factor shall be added to receiver reading in dBµV to obtain field strength in dBµV/m.

17.7 Correction factors for Horn Antenna Model: SWH-28

17.8 Correction factors for Horn Antenna Ka Band Model: PE9850R-20



Frequency(GHz)	Gain(dB)	Antenna Factor(dB/m)
26.50	18.80	39.87
27.85	19.18	39.93
29.20	19.53	39.99
30.55	19.83	40.08
31.90	20.12	40.17
33.25	20.37	40.28
34.60	20.60	40.39
35.95	20.82	40.50
37.30	21.05	40.59
38.65	21.20	40.75
40.00	21.34	40.91

Frequency	Low Signal Gain (dB)	Noise Figure	Supply Current
20.0 GHz	47.7	2.9 dB	0.37A
20.5 GHz	50.1	2.9 dB	0.37A
21.0 GHz	50.5	2.9 dB	0.37A
21.5 GHz	51.2	2.9 dB	0.37A
22.0 GHz	50.8	2.9 dB	0.37A
22.5 GHz	50.4	2.9 dB	0.37A
23.0 GHz	50.0	2.9 dB	0.37A
23.5 GHz	50.0	2.9 dB	0.37A
24.0 GHz	50.0	2.9 dB	0.37A
24.5 GHz	50.6	2.9 dB	0.37A
25.0 GHz	51.3	2.9 dB	0.37A
25.5 GHz	51.5	2.9 dB	0.37A
26.0 GHz	52.0	2.9 dB	0.37A
26.5 GHz	51.5	2.9 dB	0.37A
27.0 GHz	52.2	2.9 dB	0.37A
27.5 GHz	52.5	2.9 dB	0.37A
28.0 GHz	52.1	2.9 dB	0.37A
28.5 GHz	51.8	2.9 dB	0.37A
29.0 GHz	52.0	2.9 dB	0.37A
29.5 GHz	52.2	2.9 dB	0.37A
30.0 GHz	52.0	2.9 dB	0.37A
30.5 GHz	51.5	2.9 dB	0.37A
31.0 GHz	51.3	2.9 dB	0.37A
31.5 GHz	50.5	2.9 dB	0.37A
32.0 GHz	49.3	2.9 dB	0.37A
32.5 GHz	49.2	2.9 dB	0.37A
33.0 GHz	48.2	2.9 dB	0.37A
33.5 GHz	48.5	2.9 dB	0.37A
34.0 GHz	47.7	2.9 dB	0.37A
34.5 GHz	48.1	2.9 dB	0.37A
35.0 GHz	47.9	2.9 dB	0.37A
35.5 GHz	48.2	2.9 dB	0.37A
36.0 GHz	47.8	2.9 dB	0.37A
36.5 GHz	48.4	2.9 dB	0.37A
37.0 GHz	48.3	2.9 dB	0.37A
37.5 GHz	48.6	2.9 dB	0.37A
38.0 GHz	47.8	2.9 dB	0.37A
38.5 GHz	47.0	2.9 dB	0.37A
39.0 GHz	47.1	2.9 dB	0.37A
39.5 GHz	47.1	2.9 dB	0.37A
40.0 GHz	48.3	2.9 dB	0.37A