



FCC TEST REPORT

Report No:STS1805086W01

Issued for
RISCO LTD.

14 Hachoma Street,Rishon Lezion,75655,Israel

Product Name:	2W WL iWAVE PIR,915 2W WL iWAVE Pet,915
Brand Name:	RISCO
Model Name:	RWX95,RWX95P
Series Model:	N/A
FCC ID:	JE4RWX95915
Test Standard:	FCC Part 15.249

Any reproduction of this document must be done in full. No single part of this document may be reproduced without permission from STS, All Test Data Presented in this report is only applicable to presented Test sample.



**TEST RESULT CERTIFICATION**

Applicant's name : RISCO LTD.
Address : 14 Hachoma Street,Rishon Lezion,75655,Israel
Manufacture's Name : RISCO LTD.
Address : Sderot Yahalom 6 Kiryat Gat, Israel

Product description

Product name : 2W WL iWAVE PIR,915
2W WL iWAVE Pet,915
Brand name : RISCO
Model and/or type reference : RWX95,RWX95P

Standards : FCC Part15.249
Test procedure : ANSI C63.4-2014
ANSI C63.10-2013

This device described above has been tested by STS, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

This report shall not be reproduced except in full, without the written approval of STS, this document may be altered or revised by STS, personal only, and shall be noted in the revision of the document.

Date of Test :
Date of performance of tests : 07 May 2018 ~15 May 2018
Date of Issue : 16 May 2018
Test Result : **Pass**

Testing Engineer :

(Chris chen)

Technical Manager :

(Sean she)

Authorized Signatory :

(Bovey Yang)





Table of Contents	Page
1. SUMMARY OF TEST RESULTS	5
1.1 TEST FACTORY	6
1.2 MEASUREMENT UNCERTAINTY	6
2. GENERAL INFORMATION	7
2.1 GENERAL DESCRIPTION OF EUT	7
2.2 DESCRIPTION OF TEST MODES	8
2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED	8
2.4 DESCRIPTION OF SUPPORT UNITS	9
2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS	10
3. EMC EMISSION TEST	11
3.1 CONDUCTED EMISSION MEASUREMENT	11
3.2 RADIATED EMISSION MEASUREMENT	14
4. BANDWIDTH TEST	21
4.1 TEST PROCEDURE	21
4.2 TEST SETUP	21
4.3 EUT OPERATION CONDITIONS	21
4.4 TEST RESULTS	22
5. ANTENNA REQUIREMENT	23
5.1 STANDARD REQUIREMENT	23
5.2 EUT ANTENNA	23
APPENDIX I- PHOTOS OF TEST SETUP	24



Revision History

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	25 Aug. 2016	STS1608169F01	ALL	Initial Issue
00	16 May 2018	STS1805086W01	ALL	Changed the PCB





1. SUMMARY OF TEST RESULTS

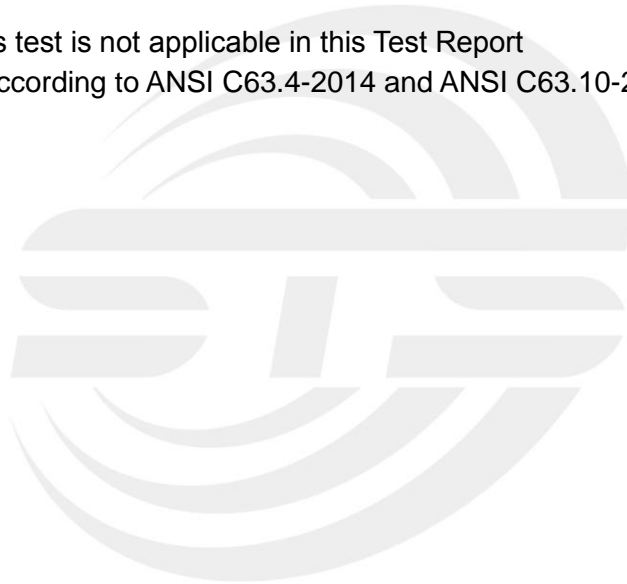
Test procedures according to the technical standards:

FCC Part 15.249,Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	N/A	
15.203	Antenna Requirement	Pass	
15.249	Radiated Spurious Emission	Pass	
15.249	20dB Bandwidth	Pass	

NOTE:

(1) "N/A" denotes test is not applicable in this Test Report

(2) All tests are according to ANSI C63.4-2014 and ANSI C63.10-2013





1.1 TEST FACTORY

Shenzhen STS Test Services Co., Ltd.

Add. : 1/F., Building B, Zhuoke Science Park, No.190, Chongqing Road,
Fuyong Street, Bao'an District, Shenzhen, Guangdong, China

CNAS Registration No.: L7649;

FCC Registration No.: 842334; IC Registration No.: 12108A-1

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately **95** %.

No.	Item	Uncertainty
1	Conducted Emission (9KHz-150KHz)	$\pm 2.88\text{Db}$
2	Conducted Emission (150KHz-30MHz)	$\pm 2.67\text{Db}$
3	RF power,conducted	$\pm 0.70\text{Db}$
4	Spurious emissions,conducted	$\pm 1.19\text{Db}$
5	All emissions,radiated(<1G) 30MHz-200MHz	$\pm 2.83\text{Db}$
6	All emissions,radiated(<1G) 200MHz-1000MHz	$\pm 2.94\text{Db}$
7	All emissions,radiated(>1G)	$\pm 3.03\text{Db}$
8	Temperature	$\pm 0.5^{\circ}\text{C}$
9	Humidity	$\pm 2\%$



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	2W WL iWAVE PIR,915 2W WL iWAVE Pet,915
Trade Name	RISCO
Model Name	RWX95,RWX95P
Series Model	N/A
Model Difference	N/A
Product Description	The EUT is a 2W WL iWAVE PIR,915, 2W WL iWAVE Pet,915
	Operation Frequency: 915MHz
	Modulation Type: OOK
	Antenna Designation: Spring
	Antenna Gain(Peak) 3 dBi
	Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.
Channel List	Please refer to the Note 2.
Battery	DC 3V,20mAh

Model	Description	PCB	SW Ver	HW Ver	Note	Remark
RWX95	2W WL iWAVEPIR ,915	1PCX95DT000RC	V1.23	B	Main card	Was tested
		1PCTRSS10000C	V1.29	B0	RF	
RWX95P	2W WL iWAVE Pet, 915	1PCX95DT000RC	V1.23P	B	Main card	Variant
		1PCTRSS10000C	V1.29	B0	RF	

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.



2.

Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	915		

3. Table for Filed Antenna

Ant	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	RISCO	RWX95,RWX95P	Spring	NA	3	Antenna

The EUT antenna is Spring Antenna. No antenna other than that furnished by the responsible party shall be used with the device.

2.2 DESCRIPTION OF TEST MODES

For conducted test items and radiated spurious emissions

Each of these EUT operation mode(s) or test configuration mode(s) mentioned below was evaluated respectively..

Pretest Mode	Description	Data/Modulation
Mode 1	TX CH01	1 MHz/OOK

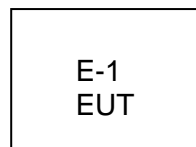
Note:

- (1) All above mode have been measurement, only worst data was reported.
- (2) New Battery is used during all test.
- (3) The EUT was programmed to be in continuously transmitting mode and the transmit duty cycle is not less than 98%.

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters

Radiated Spurious Emission Test



2.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note
N/A	N/A	N/A	N/A	N/A	N/A

Item	Shielded Type	Ferrite Core	Length	Note
N/A	N/A	N/A	N/A	N/A

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.



2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
EMI Test Receiver	R&S	ESW	101535	2017.06.01	2018.05.31
Bilog Antenna	TESEQ	CBL6111D	34678	2017.11.02	2018.11.01
Horn Antenna	Schwarzbeck	BBHA 9120D(1201)	9120D-1343	2017.10.27	2018.10.26
Passive Loop (9K--30MHz)	ZHNAN	ZN3090C	16035	2018.03.11	2019.03.10
Pre-mpifier (0.1M-3GHz)	EM	EM330	60538	2018.03.11	2019.03.10
PreAmplifier	Agilent	8449B	60538	2017.10.15	2018.10.14
USB RF power sensor	DARE	RPR3006W	15I00041SNO03	2017.10.15	2018.10.14
Semi-anechoic chamber	Changling	966	N/A	2017.10.15	2018.10.14

Conduction Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Test Receiver	R&S	ESCI	101427	2017.10.15	2018.10.14
LISN	R&S	ENV216	101242	2017.10.15	2018.10.14
conduction Cable	EM	C01	N/A	2018.03.11	2019.03.10
Temperature & Humidity	Mieo	HH660	N/A	2017.10.15	2018.10.14

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION LIMITS

Operating frequency band. In case the emission fall within the restricted band specified on Part 15.207(a) limit in the table below has to be followed.

FREQUENCY (MHz)	Class B (dBuV)		Standard
	Quasi-peak	Average	
0.15 -0.5	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	56.00	46.00	CISPR
5.0 -30.0	60.00	50.00	CISPR

0.15 -0.5	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	56.00	46.00	FCC
5.0 -30.0	60.00	50.00	FCC

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

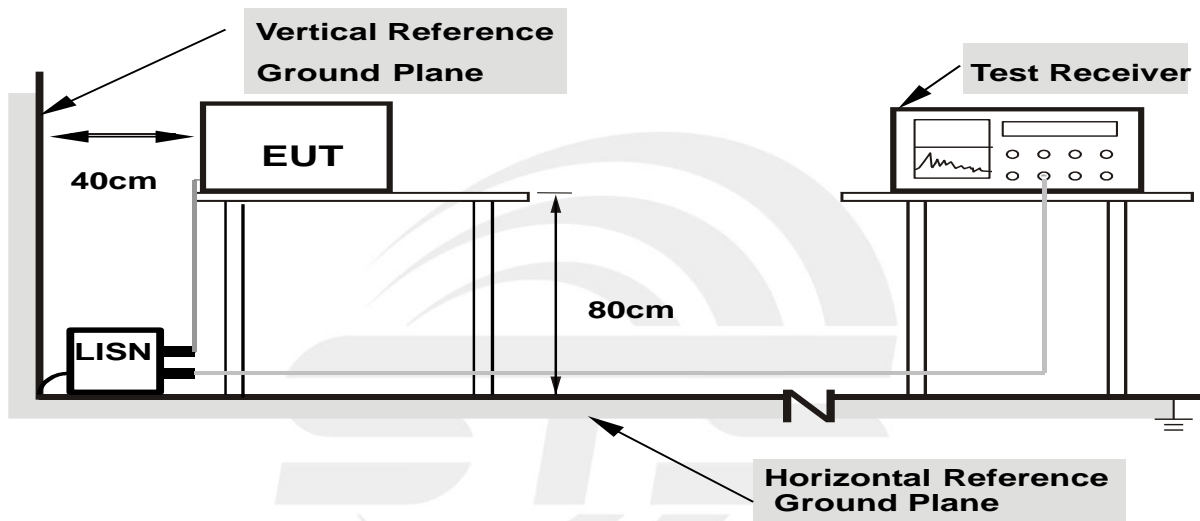
The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.1.2 TEST PROCEDURE

- a. The EUT was 0.8 meters from the horizontal ground plane and 0.4 meters from the vertical ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 TEST SETUP



- Note: 1.Support units were connected to second LISN.**
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.1.4 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.



3.1.5 TEST RESULTS

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	1010hPa	Phase:	L/N
Test Voltage:	N/A	Test Mode:	N/A

Note: denotes test is not applicable in this test report.





3.2 RADIATED EMISSION MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on Part 15.205(a), then the Part 15.209(a) and Part 15.231(b) limit in the table below has to be followed.

LIMITS OF RADIATED EMISSION MEASUREMENT (0.009MHz - 1000MHz)

Frequencies (MHz)	Field Strength (micovolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~40.66	100	3
40.70~70	100	3

LIMITS OF RADIATED EMISSION MEASUREMENT (FCC 15.249)

Frequency of Emission (MHz)	Field Strength of fundamental ((millivolts /meter)	Field Strength of Harmonics (microvolts/meter)
902-928	50	500

Notes:

- (1) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

Spectrum Parameter	Setting
Detector	Peak
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 3 MHz

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
	150kHz~30MHz / RB 9kHz for QP
	30MHz~1000MHz / RB 100kHz for PK
	Above 1GHz / RB 1MHz VB 1M for PK



3.2.2 TEST PROCEDURE

- a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit,
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

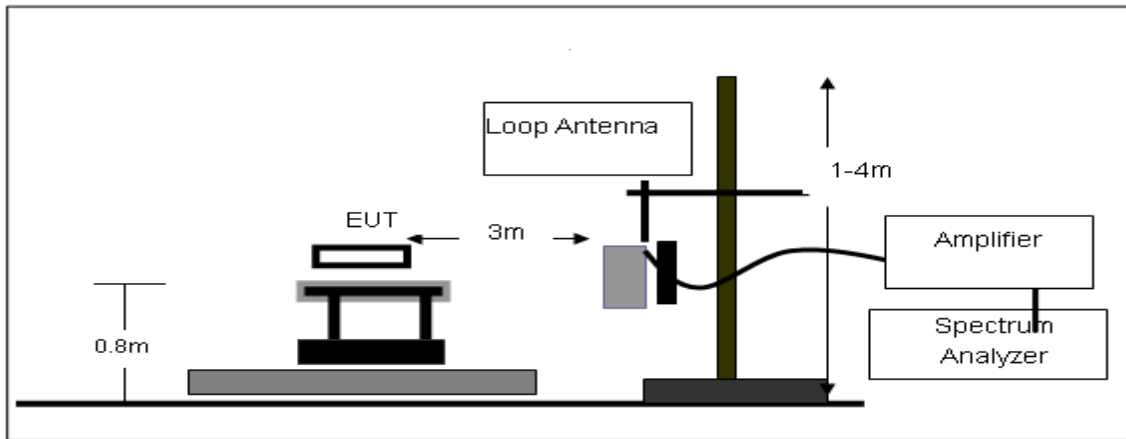
3.2.3 DEVIATION FROM TEST STANDARD

No deviation

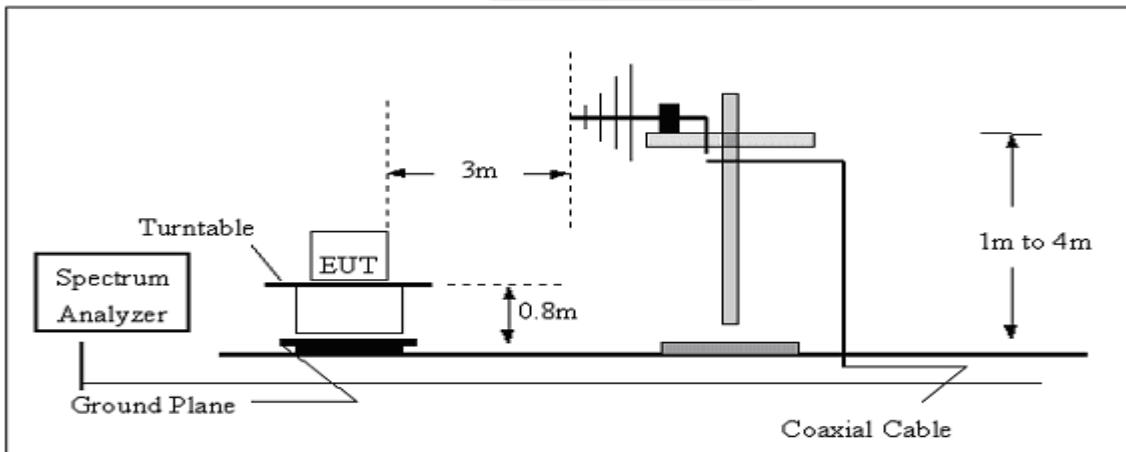


3.2.4 TEST SETUP

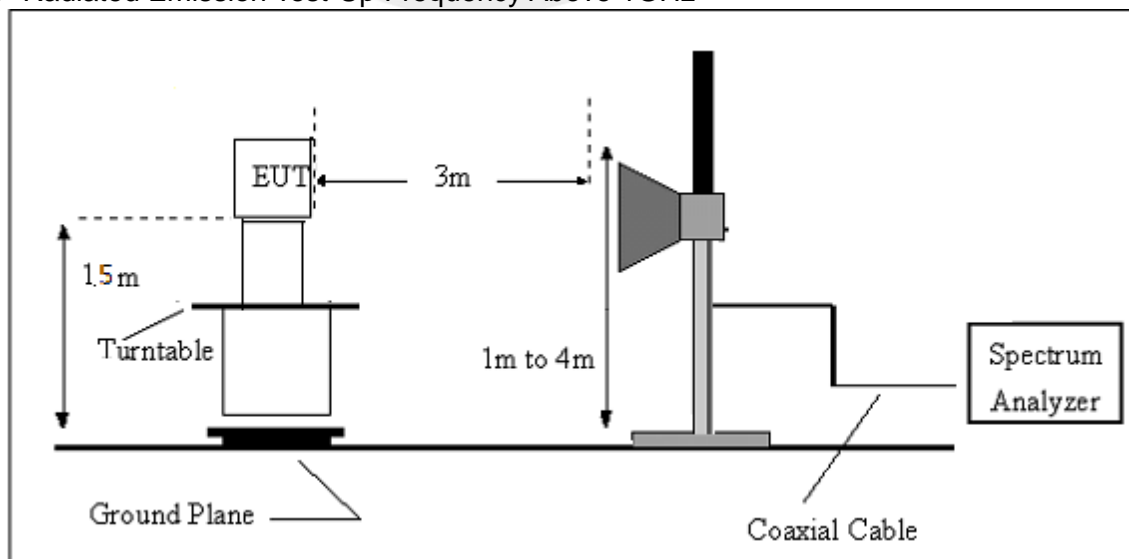
(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz



3.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.



Below 30 MHz

Temperature :	23 °C	Relative Humidity :	50%
Pressure :	1010 hPa	Polarization :	---
Test Voltage :	DC 3V		
Test Mode :	TX Mode		

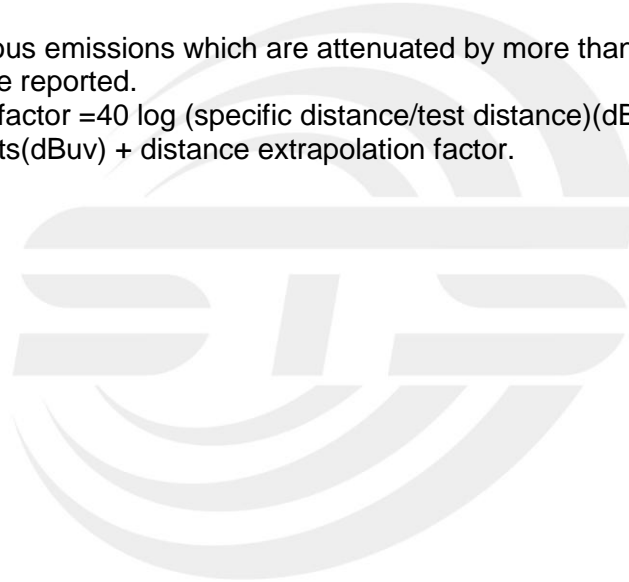
Freq. (MHz)	Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	State P/F
--	--	--	--	PASS
--	--	--	--	PASS

NOTE:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor = $40 \log(\text{specific distance}/\text{test distance})$ (dB);

Limit line = specific limits(dBuV) + distance extrapolation factor.





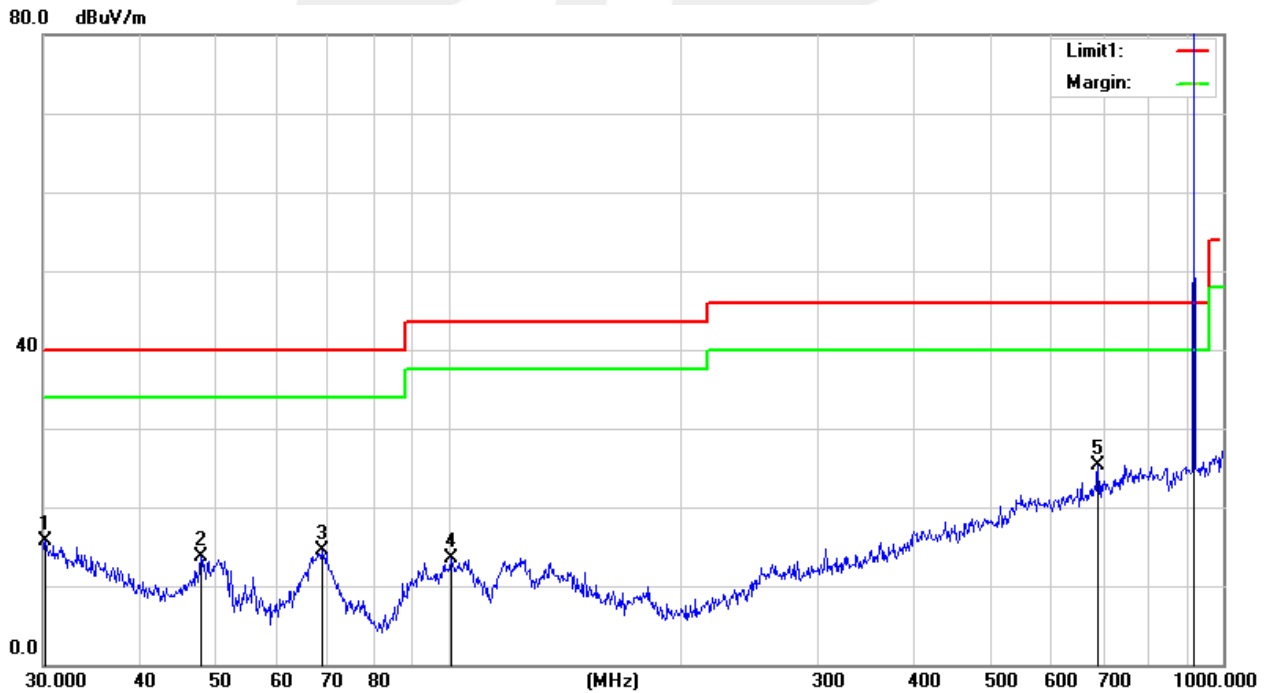
Between 30MHz – 1000 MHz Radiation Spurious

Temperature:	26.1 °C	Relative Humidity:	64%
Test Voltage:	DC 3V	Phase:	Horizontal
Test Mode:	915 MHz		

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
30.2110	27.01	-11.30	15.71	40.00	-24.29	QP
47.9940	34.07	-20.45	13.62	40.00	-26.38	QP
68.6310	38.71	-24.14	14.57	40.00	-25.43	QP
100.9340	32.55	-19.12	13.43	43.50	-30.07	QP
689.5643	30.97	-5.57	25.40	46.00	-20.60	QP
915.0687	74.49	-1.71	80.78	94.00	-13.22	PK

Remark:

1. All readings are Quasi-Peak.
2. Margin = Result (Result =Reading + Factor)–Limit



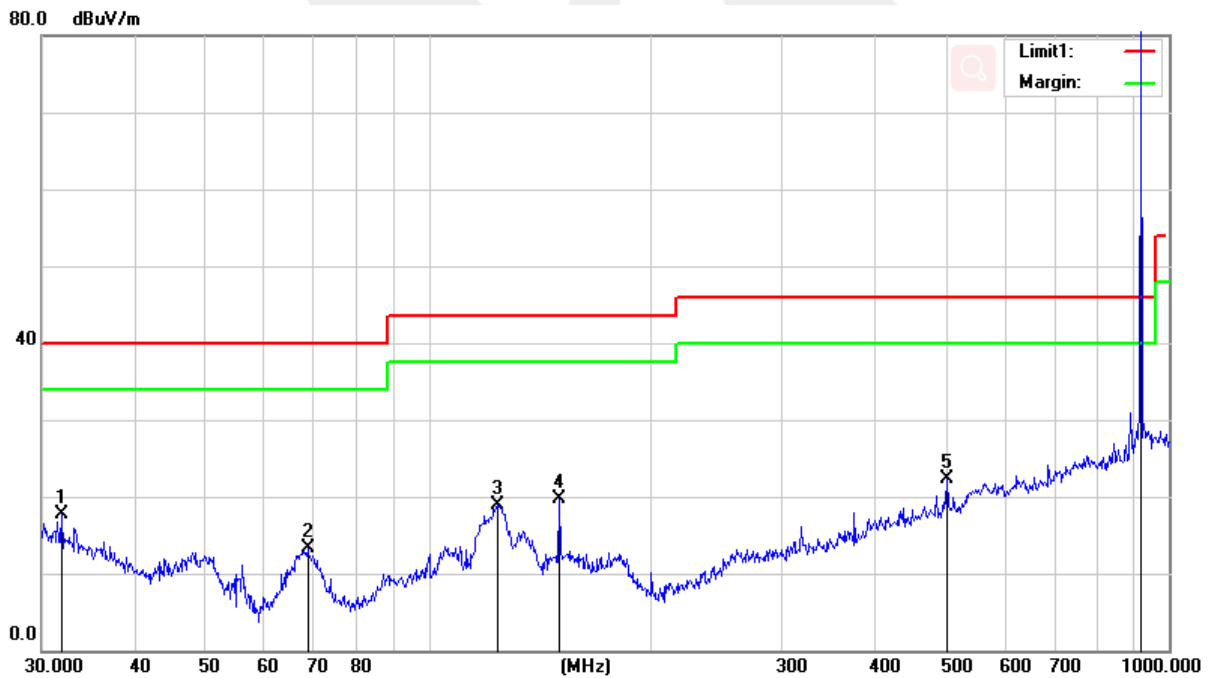


Temperature:	26.1 °C	Relative Humidity:	64%
Test Voltage:	DC 3V	Phase:	Vertical
Test Mode:	915 MHz		

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
31.9545	29.87	-12.20	17.67	40.00	-22.33	QP
68.6310	37.40	-24.14	13.26	40.00	-26.74	QP
124.1330	36.47	-17.64	18.83	43.50	-24.67	QP
150.0107	37.72	-17.97	19.75	43.50	-23.75	QP
501.1790	31.20	-8.90	22.30	46.00	-23.70	QP
915.0687	77.87	-1.71	81.16	94.00	-12.84	PK

Remark:

1. All readings are Quasi-Peak.
2. Margin = Result (Result = Reading + Factor)–Limit





Above 1G Radiation Spurious

Frequency (MHz)	Meter Reading (dBμV)	Amplifier (dB)	Loss (dB)	Antenna Factor (dB/m)	Orrected Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
915MHz										
1099.97	67.89	46.30	3.70	24.30	-18.30	49.59	74	-24.41	PK	Vertical
1099.97	49.72	46.30	3.70	24.30	-18.30	31.42	54	-22.58	AV	Vertical
1100.04	67.64	46.30	3.70	24.30	-18.30	49.34	74	-24.66	PK	Horizontal
1100.04	49.24	46.30	3.70	24.30	-18.30	30.94	54	-23.06	AV	Horizontal
1830.54	79.54	44.10	5.30	25.00	-13.80	65.74	74	-8.26	PK	Vertical
1830.54	62.27	44.10	5.30	25.00	-13.80	48.47	54	-5.53	AV	Vertical
1829.92	80.34	44.10	5.30	25.00	-13.80	66.54	74	-7.46	PK	Horizontal
1829.92	61.25	44.10	5.30	25.00	-13.80	47.45	54	-6.55	AV	Horizontal
2745.65	73.77	44.40	6.20	27.60	-10.60	63.17	74	-10.83	PK	Vertical
2745.65	54.16	44.40	6.20	27.60	-10.60	43.56	54	-10.44	AV	Vertical
2744.92	74.05	44.40	6.20	27.60	-10.60	63.45	74	-10.55	PK	Horizontal
2744.92	53.40	44.40	6.20	27.60	-10.60	42.80	54	-11.20	AV	Horizontal
3999.99	64.39	44.20	7.90	29.70	-6.60	57.79	74	-16.21	PK	Vertical
3999.99	47.97	44.20	7.90	29.70	-6.60	41.37	54	-12.63	AV	Vertical
3999.82	67.58	44.20	7.90	29.70	-6.60	60.98	74	-13.02	PK	Horizontal
3999.82	49.01	44.20	7.90	29.70	-6.60	42.41	54	-11.59	AV	Horizontal
7235.97	55.55	43.50	11.40	35.50	3.40	58.95	74	-15.05	PK	Vertical
7235.97	38.59	43.50	11.40	35.50	3.40	41.99	54	-12.01	AV	Vertical
7236.04	56.35	43.50	11.40	35.50	3.40	59.75	74	-14.25	PK	Horizontal
7236.04	38.29	43.50	11.40	35.50	3.40	41.69	54	-12.31	AV	Horizontal
8124.89	48.36	44.20	12.00	37.00	4.80	53.16	74	-20.84	PK	Vertical
8124.89	38.57	44.20	12.00	37.00	4.80	43.37	54	-10.63	AV	Vertical
8124.57	48.33	44.20	12.00	37.00	4.80	53.13	74	-20.87	PK	Horizontal
8124.57	38.47	44.20	12.00	37.00	4.80	43.27	54	-10.73	AV	Horizontal
9105.52	43.47	45.00	12.57	37.40	4.97	48.44	74	-25.56	PK	Vertical
9105.52	34.42	45.00	12.57	37.40	4.97	39.39	54	-14.61	AV	Vertical
9105.23	43.60	45.00	12.57	37.40	4.97	48.57	74	-25.43	PK	Horizontal
9105.23	34.48	45.00	12.57	37.40	4.97	39.45	54	-14.55	AV	Horizontal
11036.46	39.45	43.60	14.33	39.50	10.23	49.68	74	-24.32	PK	Vertical
11036.46	29.57	43.60	14.33	39.50	10.23	39.80	54	-14.20	AV	Vertical
11036.65	39.26	43.60	14.33	39.50	10.23	49.49	74	-24.51	PK	Horizontal
11036.65	29.55	43.60	14.33	39.50	10.23	39.78	54	-14.22	AV	Horizontal

4. BANDWIDTH TEST

4.1 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting : RBW= 100KHz, VBW \geq RBW, Sweep time = Auto.

4.2 TEST SETUP



4.3 EUT OPERATION CONDITIONS

TX mode.

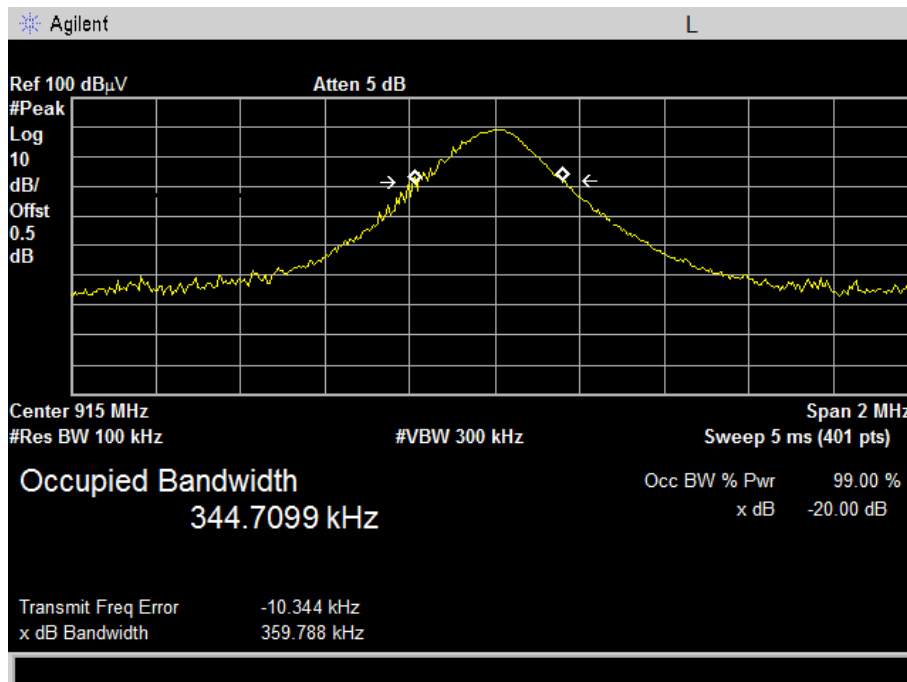




4.4 TEST RESULTS

Temperature :	25 °C	Relative Humidity :	50%
Frequency:	915MHz	Test Voltage :	DC 3V

Test Channel	Frequency (MHz)	20 dB Bandwidth (MHz)	99% Bandwidth (MHz)
CH01	915MHz	0.360	0.345





5. ANTENNA REQUIREMENT

5.1 STANDARD REQUIREMENT

According to the FCC Part 15 Paragraph 15.203, 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 to the intentional radiator shall be considered sufficient to comply with the provisions of this section. This product use a permanent ceramic printed antenna, fulfill the requirement of this section

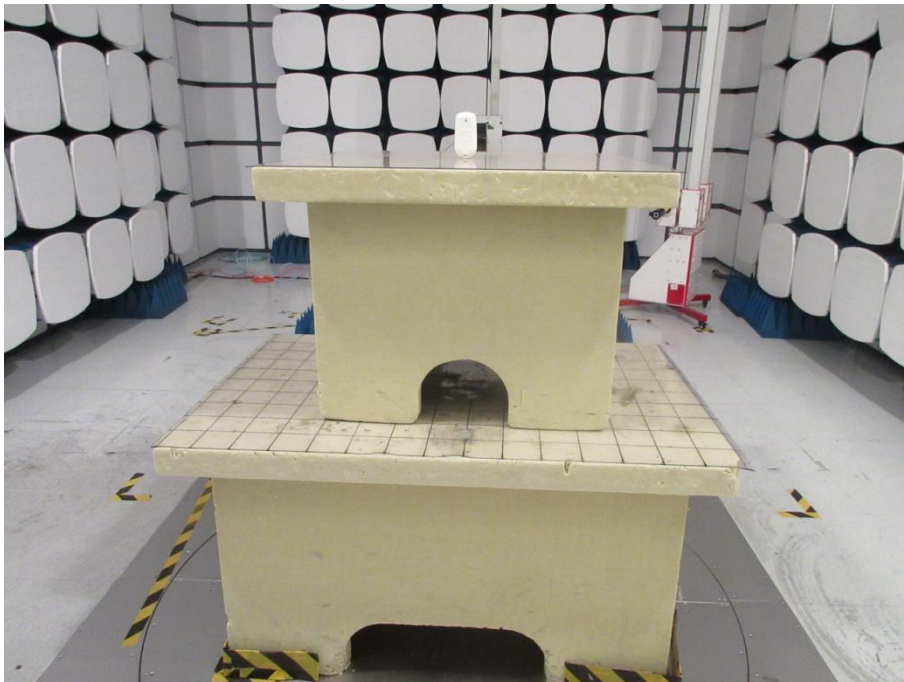
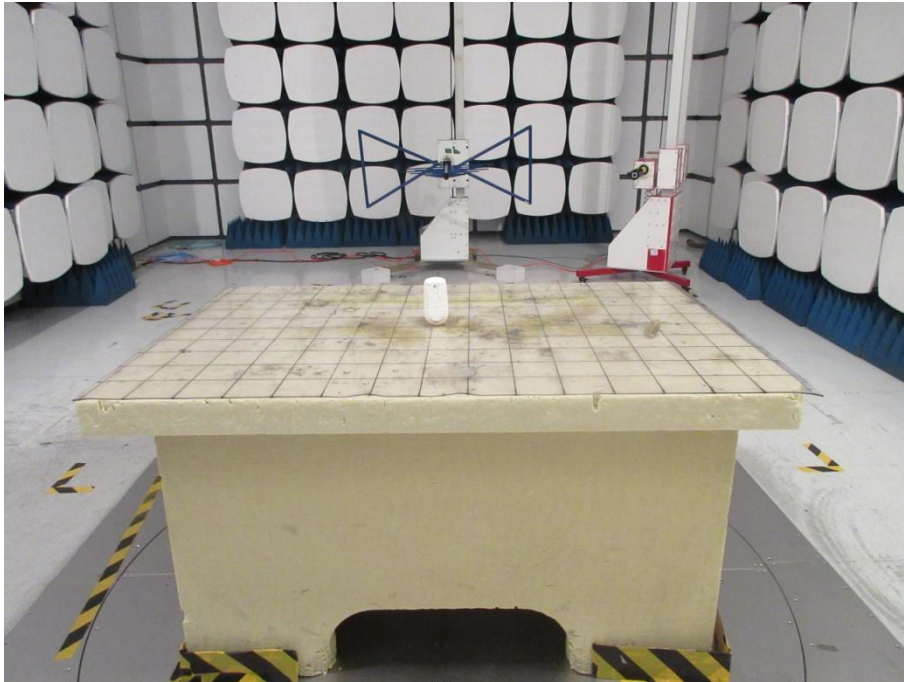
5.2 EUT ANTENNA

The EUT antenna is Spring Antenna.It conforms to the standard requirements.



APPENDIX I- PHOTOS OF TEST SETUP

Radiated Measurement Photos



*****END OF THE REPORT*****