



Spectrum Research & Testing Lab., Inc.

No.167, Ln. 780, Shan-Tong Rd., Ling 8, Shan-Tong Li, Chung-Li City, Taoyuan County 320, Taiwan (R.O.C.)

TEST REPORT

Reference No.: A14101501

Report No.: FCCA14101501-01

FCC ID : QSWDHRCS1

Page: 1 of 29

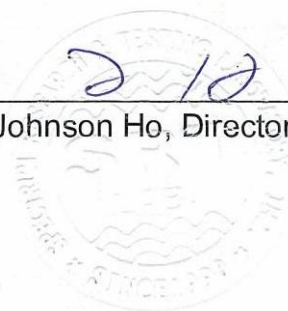
Date: Nov. 10, 2014

Product Name: TP3 Duplex Heart Rate Transmitter
Model No.: ZT26D
Applicant: Zentan Technology Co., Ltd
NO.92, Hsing-Sheng Road, Chia-Li District, Tainan City, 72254 Taiwan
Date of Receipt: Oct. 15, 2014
Finished date of Test: Nov. 05, 2014
Applicable Standards: 47 CFR Part 15, Subpart C, 15.249
ANSI C63.4: 2003

We, **Spectrum Research & Testing Laboratory Inc.**, hereby certify that one sample of the above was tested in our laboratory with positive results according to the above-mentioned standards. The records in the report are an accurate account of the results. Details of the results are given in the subsequent pages of this report.

Tested By : Richard Lin , Date: 11/10/2014
(Richard Lin)

Approved By : [Signature] , Date: 11/10/2014
(Johnson Ho, Director)



	Spectrum Research & Testing Lab., Inc. No.167, Ln. 780, Shan-Tong Rd., Ling 8, Shan-Tong Li, Chung-Li City, Taoyuan County 320, Taiwan (R.O.C.)	TEST REPORT	Reference No.: A14101501 Report No.: FCCA14101501-01 FCC ID : QSWDHRCS1 Page: 2 of 29 Date: Nov. 10, 2014
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Revisions History

Report No.	Issue Date	Revisions
FCCA14101501-01	Nov. 10, 2014	Initial issue



Table of Contents

1. DOCUMENT POLICY AND TEST STATEMENT	4
1.1 DOCUMENT POLICY	4
1.2 TEST STATEMENT	4
1.3 EUT MODIFICATION	4
2. DESCRIPTION OF EUT AND TEST MODE	5
2.1 GENERAL DESCRIPTION OF EUT	5
2.2 DESCRIPTION OF EUT INTERNAL DEVICE	5
2.3 DESCRIPTION OF TEST MODE	6
2.4 EUT OPERATING CONDITION	6
2.5 DESCRIPTION OF SUPPORT UNIT	7
2.6 CHANNEL AND FREQUENCY TABLE	7
3. DESCRIPTION OF APPLIED STANDARDS	8
3.1 SUMMARY OF TEST RESULTS	8
4. TECHNICAL CHARACTERISTICS TEST	9
4.1 RADIATED EMISSION TEST	9
4.1.1 LIMIT	9
4.1.2 TEST EQUIPMENT	10
4.1.3 TEST SET-UP	11
4.1.4 TEST PROCEDURE	12
4.1.5 TEST RESULT	13
4.2 20DB OCCUPIED BANDWIDTH TEST	22
4.2.1 LIMIT	22
4.2.2 TEST EQUIPMENT	22
4.2.3 TEST SET-UP	22
4.2.4 EUT OPERATING CONDITION	22
4.2.5 TEST RESULT	23
5. ANTENNA APPLICATION	24
5.1 ANTENNA REQUIREMENT	24
5.2 RESULT	24
6. DESCRIPTION OF RF EXPOSURE	25
7. PHOTOS OF TESTING	26
8. TERMS OF ABBREVIATION	29



Spectrum Research & Testing Lab., Inc.
No.167, Ln. 780, Shan-Tong Rd., Ling 8, Shan-Tong Li, Chung-Li City, Taoyuan County 320, Taiwan (R.O.C.)

TEST REPORT

Reference No.: A14101501
Report No.: FCCA14101501-01
FCC ID : QSWDHRCS1
Page: 4 of 29
Date: Nov. 10, 2014

1. DOCUMENT POLICY AND TEST STATEMENT

1.1 DOCUMENT POLICY

- The report shall not be reproduced except in full, without the written approval of SRT Lab, Inc.

1.2 TEST STATEMENT

- The test results in the report apply only to the unit tested by SRT Lab.
- There was no deviation from the requirements of test standards during the test.
- DC power source, 3Vdc of CR2032 battery.
- New DC dry battery (CR2032) was used during testing.

1.3 EUT MODIFICATION

- No modification in SRT Lab.



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TEST REPORT

Reference No.: A14101501
Report No.: FCCA14101501-01
FCC ID : QSWDHRCS1
Page: 5 of 29
Date: Nov. 10, 2014

2. DESCRIPTION OF EUT AND TEST MODE

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT	TP3 Duplex Heart Rate Transmitter
MODEL NO.	ZT26D
POWER SUPPLY	DC power source from CR2032 battery : DC 3.0V
CABLE	NA
FREQUENCY BAND	2.400 GHz ~ 2.4835 GHz (ANT+)
CARRIER FREQUENCY	2.457 GHz
NUMBER OF CHANNEL	1
RATED RF OUTPUT POWER	80.76 dBuV/m@2457 MHz
MODULATION TYPE	GFSK
MODE OF OPERATION	Duplex
ANTENNA TYPE	Chip Antenna
ANTENNA GAIN	1.57 dBi
OPERATING TEMPERATURE RANGE	-20 ~ 55°C

NOTE:

1. For more detailed information, please refer to the EUT's specification or user's manual provided by manufacturer.

2.2 DESCRIPTION OF EUT INTERNAL DEVICE

DEVICE	BRAND / MAKER	MODEL #	FCC ID / DOC	REMARK

 Spectrum Research & Testing Lab., Inc. No.167, Ln. 780, Shan-Tong Rd., Ling 8, Shan-Tong Li, Chung-Li City, Taoyuan County 320, Taiwan (R.O.C.)	TEST REPORT	Reference No.: A14101501 Report No.: FCCA14101501-01 FCC ID : QSWDHRCS1 Page: 6 of 29 Date: Nov. 10, 2014
---	----------------------	---

2.3 DESCRIPTION OF TEST MODE

	Mode	Frequency
1	ANT_Tx-1	2457 MHz
2	Standby	N/A
3	Link	N/A

NOTE: The axis X,Y and Z we evaluate in chamber, the X axis is worst case.

X axis:



Y axis:



Z axis:



2.4 EUT OPERATING CONDITION

ANT_Tx-1 :

1. For use customer provided continuous transmission EUT.
2. Setup 3V CR2032 Battery to EUT. Turn on the power.
3. Shake four time. Into mode : ANT_Tx-1.

Standby, Link :

1. For use customer provided normal EUT.
2. Setup 3V CR2032 Battery to EUT. Turn on the power.
3. Into mode : Standby.
4. Turn on peripheral devices (iPad) & open Cadence Pod App.
5. Connect & Pair the EUT to iPad App. Into mode : Link.



Spectrum Research & Testing Lab., Inc.
No.167, Ln. 780, Shan-Tong
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Chung-Li City, Taoyuan County
320, Taiwan (R.O.C.)

TEST REPORT

Reference No.: A14101501
Report No.: FCCA14101501-01
FCC ID : QSWDHRCS1
Page: 7 of 29
Date: Nov. 10, 2014

2.5 DESCRIPTION OF SUPPORT UNIT

The EUT was configured by the requirement of ANSI C63.4:2003. All interface ports were connected to the appropriate support units via specific cables. The support units and cables are listed below.

NO	DEVICE	BRAND	MODEL #	FCC ID/DOC	CABLE
1	iPad Wi-Fi 16G	Apple	A1458	BCGA1458	N/A
2	WAHOO KEY	Wahoo Fitness	WAHOO KEY	04GIPDWAP2	ANT Dongle

NOTE: For the actual test configuration, please refer to the photos of testing.

2.6 CHANNEL AND FREQUENCY TABLE

Channel	Frequency
CH01	2457 MHz



3. DESCRIPTION OF APPLIED STANDARDS

The EUT is a wireless product. According to the specifications provided by the applicant, it must comply with the requirements of the following standards:

47 CFR Part 15, Subpart C, 15.249

ANSI C63.4: 2003

All tests have been performed and recorded as the above standards.

3.1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

STANDARD SECTION	TEST TYPE AND LIMIT RESULTS	RESULTS
15.203	Antenna requirement	PASS
15.207	AC Power Line Conducted Emission	N/A
15.249 (a)	Field Strength of the Fundamental signal	PASS
15.249 (a) (d) /15.209	Spurious Emissions	PASS
15.215(c)	20dB Occupied Band Width	PASS



4. TECHNICAL CHARACTERISTICS TEST

4.1 RADIATED EMISSION TEST

4.1.1 LIMIT

FCC Part15, Subpart C Section 15.209 limit of radiated emission for frequency below 1000MHz. The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

FREQUENCY (MHz)	DISTANCE (m)	FIELD STRENGTH (dB _m V/m)
0.009 - 0.490	300	2400/F(KHz)
0.490 - 1.705	30	24000/F(KHz)
1.705 - 30	30	30
30 - 88	3	40.0
88 - 216	3	43.5
216 - 960	3	46.0
Above 960	3	54.0

FCC Part15, Subpart C Section 15.249 limit of radiated emission for frequency below 1000MHz (Average).

FREQUENCY (MHz)	FIELD STRENGTH OF FUNDAMENTAL (millivolts/meter)	FIELD STRENGTH OF HARMONICS (millivolts/meter)
902 - 928	50	500
2400 - 2483.5	50	500
5725 - 5875	50	500
24000 - 24250	250	2500

NOTE:

1. In the emission tables above, the tighter limit applies at the band edges.
2. Distance refers to the distance between measuring instrument, antenna, and the closest point of any part of the device or system.
3. 50mV = 94dBuV

 Spectrum Research & Testing Lab., Inc. No.167, Ln. 780, Shan-Tong Rd., Ling 8, Shan-Tong Li, Chung-Li City, Taoyuan County 320, Taiwan (R.O.C.)	TEST REPORT	Reference No.: A14101501 Report No.: FCCA14101501-01 FCC ID : QSWDHRCS1 Page: 10 of 29 Date: Nov. 10, 2014
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4.1.2 TEST EQUIPMENT

The following test equipment was used during the radiated emission test:

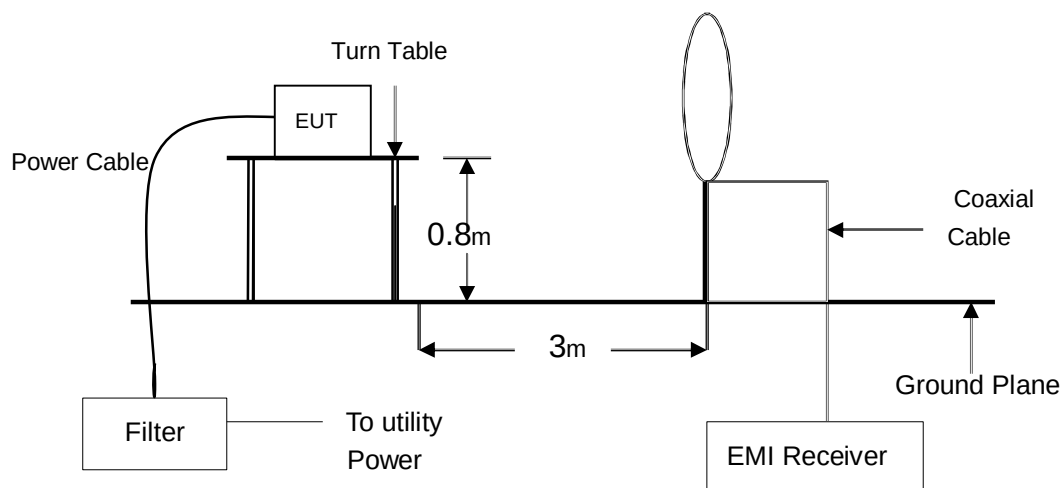
EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
EMI TEST RECEIVER	9 kHz ~ 2.75 GHz	ROHDE & SCHWARZ	ESCS30 / 100376	JAN. 12, 2015 ETC
EMI TEST RECEIVER	20 MHz ~ 1000 MHz	ROHDE & SCHWARZ	ESVS30 / 841977/003	DEC. 08, 2014 ETC
SPECTRUM ANALYZER	9 kHz ~ 40GHz	ROHDE & SCHWARZ	FSP40 / 100093	DEC 08, 2014 ETC
EMI TEST RECEIVER (INCLUDE SPECTRUM ANALYZER)	9 KHz ~ 6 GHz	ROHDE & SCHWARZ	ESL /100176	MAR. 28, 2015 ETC
LOOP ANTENNA	9 kHz ~ 30 MHz	ETS.LINDGREN	HFH2-Z2/ 860605/002 (1162 1/2)	MAR. 17, 2015 ETC
BI-LOG ANTENNA	30 MHz ~ 2 GHz	SCHAFFNER	CBL6141A / 4181	JUN. 18, 2015 ETC
HORN ANTENNA	1 GHz ~ 18 GHz	EMCO	3115/ 9602-4681	DEC. 12, 2014 ETC
HORN ANTENNA	18 ~ 40 GHZ	ETS-LINDGREN	3116 /00032255	JAN. 10, 2015 ETC
PRE-AMPLIFIER	1 GHz ~ 26.5 GHz	AGILENT	8449B/ 3008A01995	DEC. 10, 2014 ETC
OPEN AREA TEST SITE	3 – 10 M MEASUREMENT	SRT	A02 / SRT002	MAR. 07, 2015 SRT
ANECHOIC CHAMBER	3 M MEASUREMENT	SRT	A01 / SRT001	MAY. 7, 2015 SRT
COAXIAL CABLE	30 M	TIMES	LMR-400 / #30M(L1TCAB014)	MAY. 21, 2015 ETC
FILTER	2 LINE, 30 A	FIL.COIL	FC-943 / 869	NCR
K-TYPE CABLE	UP TO 40 GHz 3 m	HUBER+SUHNER	SF102-46/2*11SK 252 /MY2611/2	MAR. 09, 2015 ETC
K-TYPE CABLE	UP TO 40 GHz, 1 m	HUBER+SUHNER	SF 102-40/2*11 /23934/2	OCT. 12, 2015 ETC
CDN	0.15 MHz ~ 300 MHz	LUTHI	CDN L-801 M2/M3 / 2790	MAY. 20, 2015 ETC

NOTE: The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

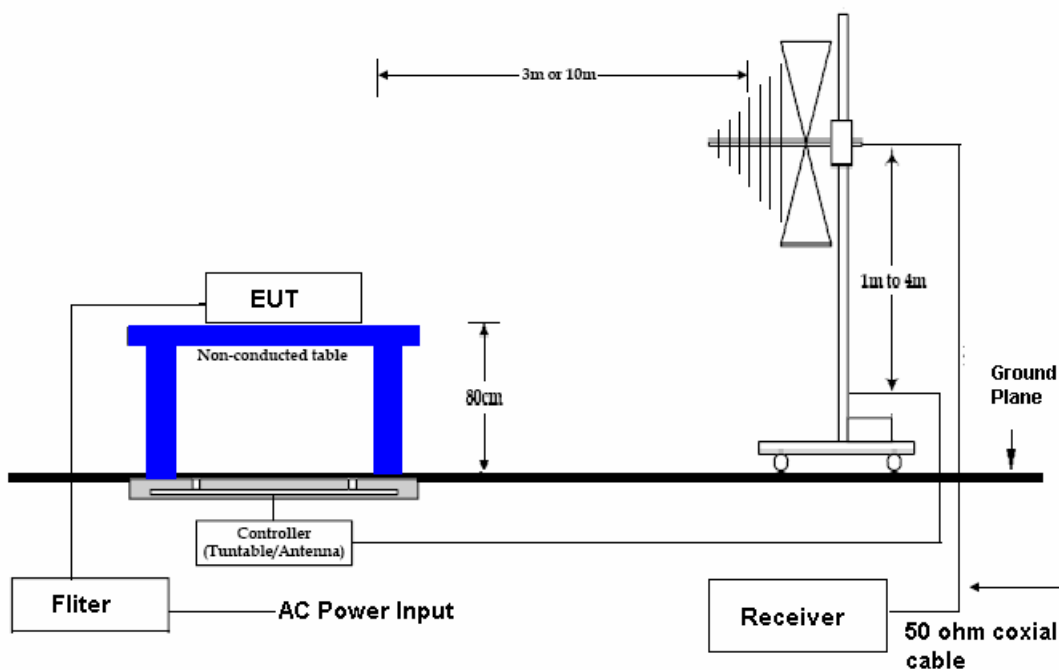


4.1.3 TEST SET-UP

9KHz ~ 30MHz

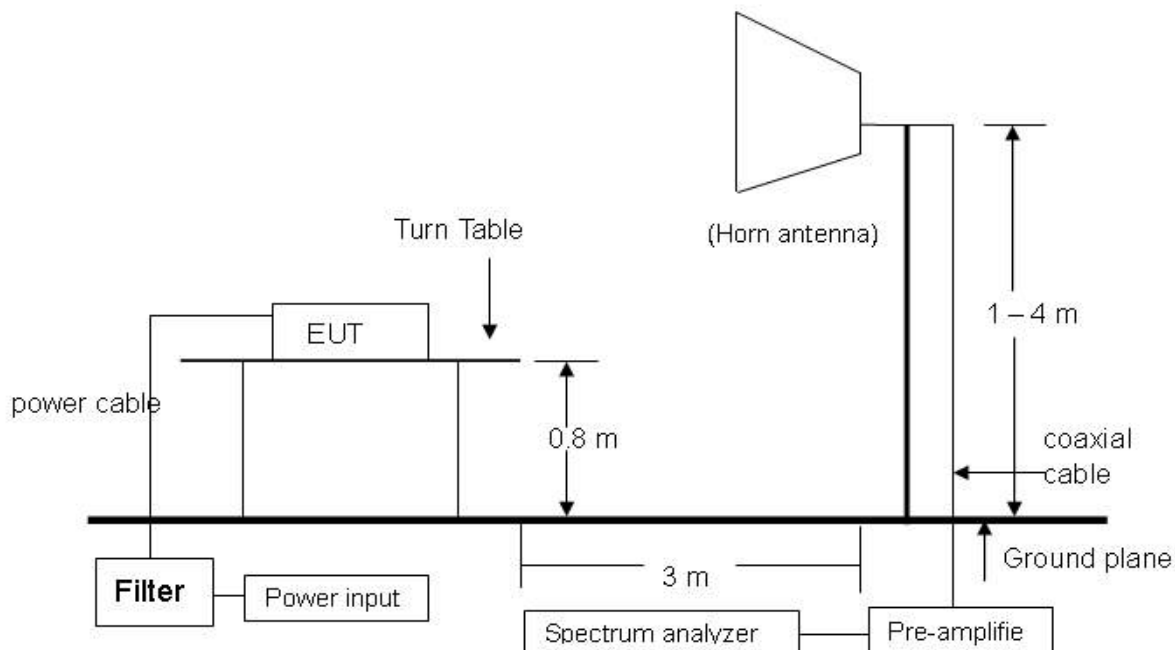


30 MHz ~ 1 GHz





Above 1 GHz



NOTE: The EUT system was put on a wooden table with 0.8m heights above a ground plane.
For the actual test configuration, please refer to the photos of testing.

4.1.4 TEST PROCEDURE

The EUT was tested according to the requirement of ANSI C63.4:2003 and CISPR 22:2003. When the frequency spectrum measured started from 9 kHz to 30 MHz, then use antenna is a loop antenna. The measurements were made at an open area test site with 3 meter measurement distance under 1 GHz and with 3m distance above 1GHz. The frequency spectrum measured started from 9kHz to 30MHz and 30 MHz to 1 GHz, all readings were quasi-peak values with 120 kHz resolution bandwidth of the test receiver. Above 1 GHz, the measurements were made at an open area test site with 3 meter measurement distance and all readings were peak or average values with 1 MHz resolution bandwidth of the test receiver. The EUT system was operated in all typical methods by users. The cables connected to EUT and support units were moved to find the maximum emission levels for each frequency. First, find the margin or higher points at least 6 points by software, then use manual to find the maximum data. The procedure is referred on the test procedure of SRT LAB.



TEST REPORT

4.1.5 TEST RESULT

Temperature:	24 °C	Humidity:	60 %RH
Frequency Range:	9 kHz – 30 MHz	Measured Distance:	3 m
Receiver Detector:	AV.	Tested Mode:	ANT_Tx-1
Tested By:	Richard Lin	Tested Date:	Nov. 05, 2014

Frequency (KHz)	Cable Loss (dB)	Ant. Fac. (dB)	Reading (dBμV)	Emission (dBμV/m)	Limit Line (dBμV/m)	Margin (dB)
8.59	0.63	20.56	8.47	29.66	70.00	-40.34
10.50	0.70	20.76	6.73	28.18	70.00	-41.82
22.38	1.05	21.82	6.77	29.64	70.00	-40.36
25.03	1.12	21.85	7.23	30.20	70.00	-39.80
25.82	1.14	21.86	6.42	29.42	70.00	-40.58
29.60	1.23	21.90	7.60	30.73	70.00	-39.27

Temperature:	24 °C	Humidity:	60 %RH
Frequency Range:	9 kHz – 30 MHz	Measured Distance:	3 m
Receiver Detector:	AV.	Tested Mode:	Standby
Tested By:	Richard Lin	Tested Date:	Nov. 05, 2014

Frequency (KHz)	Cable Loss (dB)	Ant. Fac. (dB)	Reading (dBμV)	Emission (dBμV/m)	Limit Line (dBμV/m)	Margin (dB)
8.57	0.63	20.56	8.05	29.24	70.00	-40.76
14.85	0.83	21.23	6.86	28.92	70.00	-41.08
19.62	0.97	21.75	5.94	28.66	70.00	-41.34
22.77	1.06	21.83	6.10	28.99	70.00	-41.01
23.51	1.08	21.84	6.21	29.12	70.00	-40.88
25.06	1.12	21.85	7.11	30.08	70.00	-39.92



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TEST REPORT

Reference No.: A14101501
Report No.: FCCA14101501-01
FCC ID : QSWDHRCS1
Page: 14 of 29
Date: Nov. 10, 2014

Temperature:	24 °C	Humidity:	60 %RH
Frequency Range:	9 kHz – 30 MHz	Measured Distance:	3 m
Receiver Detector:	AV.	Tested Mode:	Link
Tested By:	Richard Lin	Tested Date:	Nov. 05, 2014

Frequency (KHz)	Cable Loss (dB)	Ant. Fac. (dB)	Reading (dBμV)	Emission (dBμV/m)	Limit Line (dBμV/m)	Margin (dB)
8.44	0.62	20.54	8.26	29.43	70.00	-40.57
15.95	0.87	21.35	6.96	29.18	70.00	-40.82
19.73	0.97	21.76	5.87	28.61	70.00	-41.39
22.85	1.06	21.83	6.05	28.94	70.00	-41.06
25.07	1.12	21.85	7.49	30.46	70.00	-39.54
29.61	1.23	21.90	5.79	28.92	70.00	-41.08



TEST REPORT

Temperature:	21 °C	Humidity:	62 %RH
Frequency Range:	30 M – 1 GHz	Tested Mode:	ANT_Tx-1
Detector Type:	Quasi-peak	IF Bandwidth:	120 kHz
Tested By:	Richard Lin	Tested Date:	Oct. 31, 2014

Antenna Polarization : Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
53.15	1.41	13.54	3.45	18.40	40	-21.60	209	3.43
499.90	4.16	17.59	3.66	25.41	46	-20.60	253	2.75
633.87	4.78	19.96	3.81	28.55	46	-17.45	187	2.19
741.01	5.33	21.33	3.38	30.04	46	-15.96	68	1.83
772.72	5.48	21.69	4.03	31.19	46	-14.81	193	1.75
869.30	5.87	23.30	3.57	32.74	46	-13.26	200	1.44

Antenna Polarization : Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
74.83	1.53	8.20	8.36	18.09	40	-21.91	326	1.15
514.21	4.24	18.08	3.75	26.07	46	-19.93	155	2.51
684.05	5.01	20.13	3.47	28.61	46	-17.39	276	3.01
767.55	5.45	21.67	4.11	31.23	46	-14.77	301	3.29
849.18	5.79	22.98	3.59	32.35	46	-13.65	138	3.34
937.62	6.17	24.76	4.23	35.16	46	-10.84	235	3.51

NOTE :

1. Measurement uncertainty is 4.73 dB.
2. "*": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



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TEST REPORT

Reference No.: A14101501
Report No.: FCCA14101501-01
FCC ID : QSWDHRCS1
Page: 16 of 29
Date: Nov. 10, 2014

Temperature:	21 °C	Humidity:	62 %RH
Frequency Range:	30 M – 1 GHz	Tested Mode:	Standby
Detector Type:	Quasi-peak	IF Bandwidth:	120 kHz
Tested By:	Richard Lin	Tested Date:	Oct. 31, 2014

Antenna Polarization : Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
414.90	3.70	16.52	3.74	23.97	46	-22.03	248	2.83
490.48	4.11	17.50	3.52	25.13	46	-20.87	159	2.59
660.22	4.90	20.18	4.17	29.25	46	-16.75	61	2.02
697.74	5.07	20.11	3.62	28.79	46	-17.21	174	1.96
793.15	5.57	21.77	3.79	31.13	46	-14.87	83	1.65
933.88	6.15	24.66	3.80	34.61	46	-11.39	302	1.22

Antenna Polarization : Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
44.69	1.38	17.32	3.58	22.28	40	-17.72	180	1.06
74.18	1.53	8.20	7.87	17.60	40	-22.40	225	1.17
414.02	3.70	16.52	3.64	23.87	46	-22.13	146	2.14
499.73	4.16	17.59	3.72	25.47	46	-20.54	281	2.44
713.12	5.16	20.49	3.63	29.28	46	-16.72	75	3.12
922.35	6.10	24.37	3.51	33.98	46	-12.02	113	3.52

NOTE :

1. Measurement uncertainty is 4.73 dB.
2. "*": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



TEST REPORT

Temperature:	21 °C	Humidity:	62 %RH
Frequency Range:	30 M – 1 GHz	Tested Mode:	Link
Detector Type:	Quasi-peak	IF Bandwidth:	120 kHz
Tested By:	Richard Lin	Tested Date:	Oct. 31, 2014

Antenna Polarization : Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
56.49	1.42	12.58	3.77	17.77	40	-22.23	208	3.42
339.11	3.26	14.44	3.66	21.35	46	-24.65	135	3.15
410.56	3.68	16.46	4.12	24.26	46	-21.74	247	2.89
499.82	4.16	17.59	3.53	25.28	46	-20.73	155	2.51
640.91	4.81	20.06	3.81	28.68	46	-17.32	169	2.17
736.34	5.30	21.18	3.58	30.06	46	-15.94	277	1.83

Antenna Polarization : Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
56.72	1.42	12.58	5.86	19.86	40	-20.14	312	1.12
74.95	1.53	8.20	13.04	22.77	40	-17.23	61	1.29
497.88	4.15	17.57	5.93	27.65	46	-18.36	171	2.43
514.07	4.24	18.08	3.72	26.04	46	-19.96	252	2.56
681.19	5.00	20.14	3.94	29.07	46	-16.93	337	3.02
740.42	5.32	21.30	3.46	30.08	46	-15.92	48	3.37

NOTE :

1. Measurement uncertainty is 4.73 dB.
2. "*": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



TEST REPORT

Temperature:	23 °C	Humidity:	59 %RH
Frequency Range:	1 GHz – 25 GHz	Tested Mode:	ANT_Tx-1
Detector Type:	PK. and AV.	IF Bandwidth:	1 MHz
VBW:	3 MHz	Tested Date:	Nov. 04, 2014

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1713.12	-31.87	26.07	49.98	39.42	44.18	33.62	74	54	-29.82	-20.38	337	2.59
1895.98	-31.57	26.72	45.75	35.17	40.90	30.32	74	54	-33.10	-23.68	107	2.20
3612.54	-29.12	31.57	44.87	34.38	47.32	36.83	74	54	-26.68	-17.17	258	1.84
4284.78	-27.92	32.50	43.45	32.96	48.03	37.54	74	54	-25.97	-16.46	302	1.63
4761.33	-27.33	33.07	42.82	32.45	48.57	38.20	74	54	-25.43	-15.80	75	1.33
5748.69	-26.43	34.15	42.41	31.94	50.13	39.66	74	54	-23.87	-14.34	95	1.10

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1997.69	-31.40	27.09	44.57	34.01	40.25	29.69	74	54	-33.75	-24.31	135	1.35
3068.25	-29.91	30.35	44.22	33.70	44.66	34.14	74	54	-29.34	-19.86	214	1.67
3696.07	-28.93	31.77	43.50	33.06	46.34	35.90	74	54	-27.66	-18.10	318	1.84
4527.86	-27.62	32.56	43.07	32.58	48.01	37.52	74	54	-25.99	-16.48	78	2.09
4652.55	-27.46	32.83	42.81	32.34	48.18	37.71	74	54	-25.82	-16.29	195	2.22
5774.80	-26.47	34.15	41.19	30.69	48.87	38.37	74	54	-25.13	-15.63	228	2.48

NOTE:

1. Measurement uncertainty is 3.81 dB.
2. "F": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.: Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F): The field strength of fundamental frequency.



TEST REPORT

Temperature:	23 °C	Humidity:	59 %RH
Frequency Range:	1 GHz – 25 GHz	Tested Mode:	ANT_Tx-1 (Fundamental and Harmonics)
Detector:	PK. and AV.	IF Bandwidth:	1 MHz
VBW:	3 MHz	Tested Date:	Nov. 04, 2014

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2457.00 (F)	-30.64	28.38	83.02	71.63	80.76	69.37	114	94	-33.24	-24.63	125	1.51
4914.00	-27.14	33.41	41.61	31.15	47.88	37.42	74	54	-26.12	-16.58	71	1.56
7371.00	-26.08	36.09	38.51	28.09	48.52	38.10	74	54	-25.48	-15.90	314	1.48
9828.00	-25.01	37.96	37.69	27.12	50.64	40.07	74	54	-23.36	-13.93	59	1.43
12285.0	-22.57	39.03	34.83	24.30	51.29	40.76	74	54	-22.71	-13.24	159	1.57
14742.0	-20.68	41.27	29.30	18.84	49.90	39.44	74	54	-24.10	-14.56	270	1.62

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2457.00 (F)	-30.64	28.38	77.55	65.18	75.29	62.92	114	94	-38.71	-31.08	294	1.60
4914.00	-27.14	33.41	40.94	30.42	47.21	36.69	74	54	-26.79	-17.31	216	1.58
7371.00	-26.08	36.09	38.46	28.02	48.47	38.03	74	54	-25.53	-15.97	144	1.55
9828.00	-25.01	37.96	37.48	26.94	50.43	39.89	74	54	-23.57	-14.11	92	1.64
12285.0	-22.57	39.03	34.67	24.04	51.13	40.50	74	54	-22.87	-13.50	335	1.49
14742.0	-20.68	41.27	29.85	19.41	50.45	40.01	74	54	-23.55	-13.99	76	1.56

NOTE:

1. Measurement uncertainty is 3.81 dB.
2. "※": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.: Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F): The field strength of fundamental frequency.



TEST REPORT

Temperature:	23 °C	Humidity:	59 %RH
Frequency Range:	1 GHz – 25 GHz	Tested Mode:	Standby
Detector Type:	PK. and AV.	IF Bandwidth:	1 MHz
VBW:	3 MHz	Tested Date:	Nov. 04, 2014

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
3562.88	-29.22	31.45	43.79	33.24	46.01	35.46	74	54	-27.99	-18.54	116	1.95
3619.46	-29.10	31.59	43.59	33.01	46.08	35.50	74	54	-27.92	-18.50	301	1.76
4368.17	-27.81	32.50	42.09	31.59	46.78	36.28	74	54	-27.22	-17.72	88	1.52
4814.02	-27.26	33.19	41.24	30.76	47.17	36.69	74	54	-26.83	-17.31	322	1.33
5174.83	-26.68	33.81	41.20	30.72	48.33	37.85	74	54	-25.67	-16.15	60	1.29
5319.96	-26.39	33.98	41.05	30.57	48.64	38.16	74	54	-25.36	-15.84	132	1.20

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
3287.93	-29.63	30.83	43.04	32.57	44.24	33.77	74	54	-29.76	-20.23	215	1.68
3549.22	-29.25	31.42	43.43	32.96	45.59	35.12	74	54	-28.41	-18.88	194	1.74
3912.56	-28.46	32.29	42.57	32.01	46.40	35.84	74	54	-27.60	-18.16	255	1.92
4611.85	-27.51	32.74	42.33	31.88	47.56	37.11	74	54	-26.44	-16.89	194	1.98
5214.06	-26.60	33.86	41.57	31.04	48.82	38.29	74	54	-25.18	-15.71	278	2.11
5778.34	-26.47	34.14	40.44	29.95	48.11	37.62	74	54	-25.89	-16.38	314	2.34

NOTE:

1. Measurement uncertainty is 3.81 dB.
2. "F": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.: Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F): The field strength of fundamental frequency.



TEST REPORT

Temperature:	23 °C	Humidity:	59 %RH
Frequency Range:	1 GHz – 25 GHz	Tested Mode:	Link
Detector Type:	PK. and AV.	IF Bandwidth:	1 MHz
VBW:	3 MHz	Tested Date:	Nov. 04, 2014

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
3103.59	-29.87	30.43	44.08	33.59	44.64	34.15	74	54	-29.36	-19.85	216	2.03
3306.63	-29.61	30.87	44.42	33.92	45.68	35.18	74	54	-28.32	-18.82	61	1.83
3984.03	-28.30	32.46	42.89	32.30	47.05	36.46	74	54	-26.95	-17.54	104	1.67
4337.80	-27.85	32.50	42.95	32.45	47.60	37.10	74	54	-26.40	-16.90	97	1.52
4782.54	-27.30	33.12	41.41	30.96	47.23	36.78	74	54	-26.77	-17.22	45	1.38
5399.77	-26.23	34.08	41.39	30.86	49.24	38.71	74	54	-24.76	-15.29	263	1.19

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2984.50	-30.02	30.15	43.46	33.02	43.59	33.15	74	54	-30.41	-20.85	115	1.62
3487.76	-29.38	31.27	43.99	33.47	45.88	35.36	74	54	-28.12	-18.64	79	1.74
3621.19	-29.10	31.59	44.07	33.57	46.56	36.06	74	54	-27.44	-17.94	304	1.87
4358.47	-27.83	32.50	42.48	31.98	47.15	36.65	74	54	-26.85	-17.35	196	2.04
5147.04	-26.74	33.78	41.80	31.41	48.84	38.45	74	54	-25.16	-15.55	89	2.25
5539.29	-26.09	34.19	40.64	30.25	48.74	38.35	74	54	-25.26	-15.65	282	2.48

NOTE:

1. Measurement uncertainty is 3.81 dB.
2. "F": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.: Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F): The field strength of fundamental frequency.



4.2 20dB OCCUPIED BANDWIDTH TEST

4.2.1 LIMIT

FCC Part15, Subpart C Section 15.215 (c). Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

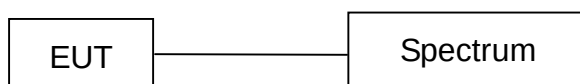
4.2.2 TEST EQUIPMENT

The following test equipment was used during the test :

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
EMI TEST RECEIVER (INCLUDE SPECTRUM ANALYZER)	9 KHz ~ 6 GHz	ROHDE & SCHWARZ	ESL /100176	MAR. 28, 2015 ETC

NOTE: The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

4.2.3 TEST SET-UP



The EUT was connected to a spectrum through a 50Ω RF cable.

4.2.4 EUT OPERATING CONDITION

1. Set the EUT under continuous transmission condition.
2. The EUT was set to the highest available power level.

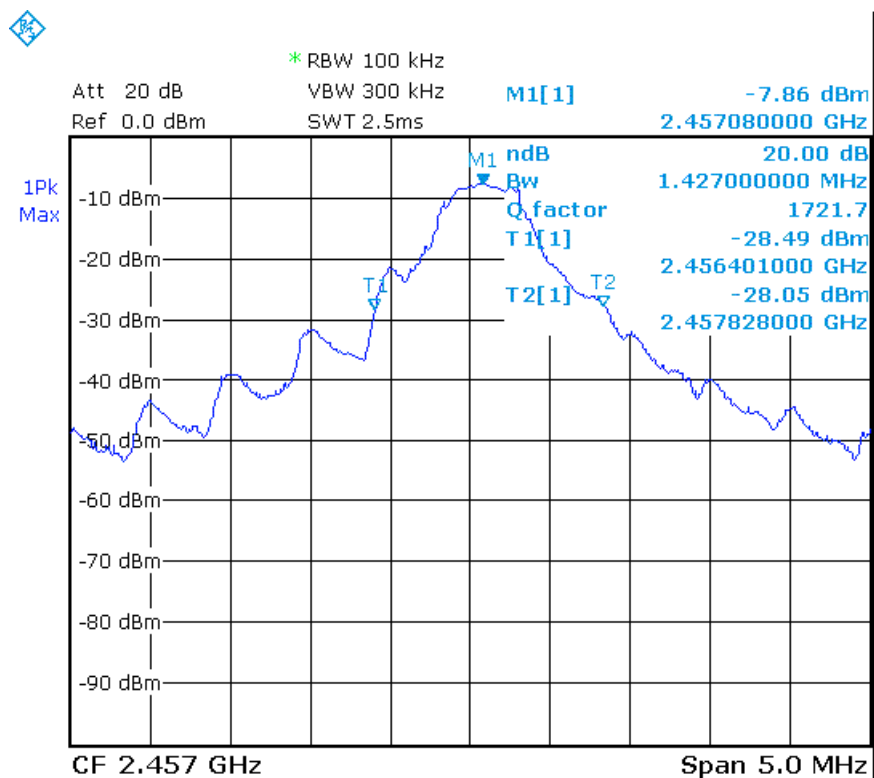


4.2.5 TEST RESULT

Temperature:	25 °C	Humidity:	64 %RH
Detector:	Peak	Test Mode:	ANT_Tx-1
RBW:	100 kHz	VBW:	300 kHz
Tested By:	Richard Lin	Tested Date:	Nov. 03, 2014

Channel Number	Channel Frequency (MHz)	20dB Bandwidth (MHz)
CH01	2457	1.427

CH01 :





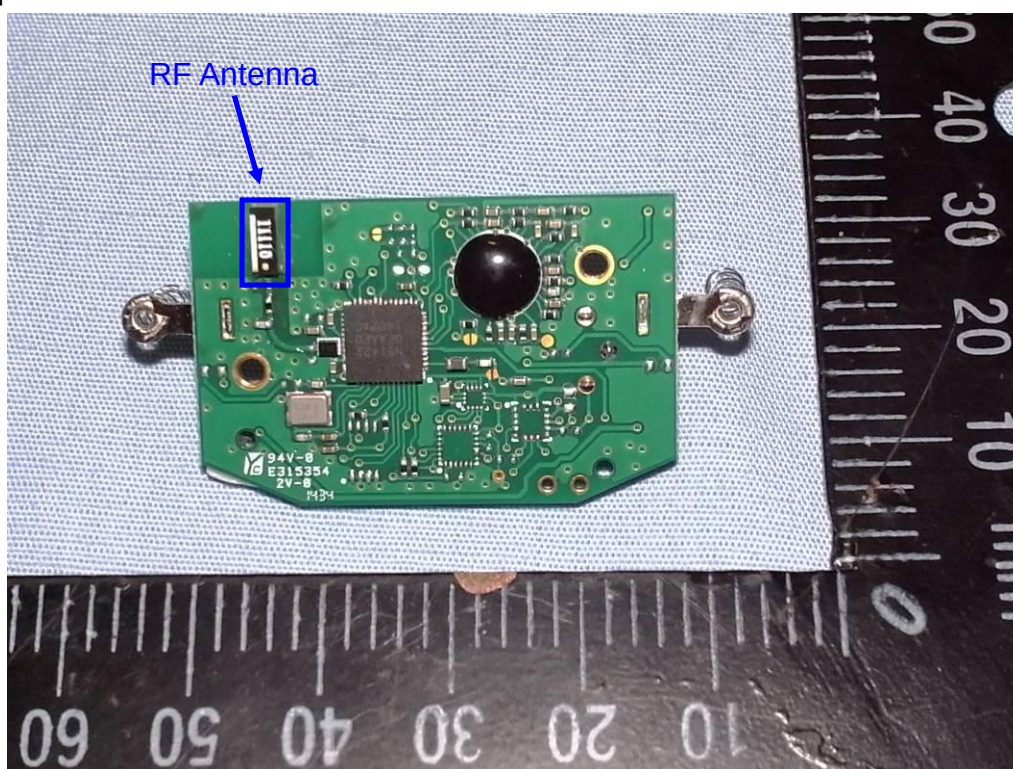
5. Antenna application

5.1 Antenna requirement

The EUT's antenna is met the requirement of FCC Part 15C section 15.203.

5.2 Result

The EUT's antenna used a Chip Antenna. Gain of antenna types is 1.57 dBi that meet the requirement.



	Spectrum Research & Testing Lab., Inc. No.167, Ln. 780, Shan-Tong Rd., Ling 8, Shan-Tong Li, Chung-Li City, Taoyuan County 320, Taiwan (R.O.C.)	TEST REPORT	Reference No.: A14101501 Report No.: FCCA14101501-01 FCC ID : QSWDHRCS1 Page: 25 of 29 Date: Nov. 10, 2014
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6. Description of RF Exposure

SAR compliance has been evaluated in the product(s), and can be used in host product(s) with substantially similar physical dimensions, construction, and electrical and RF characteristics. End-users must be provided with specific information required to satisfy RF exposure compliance for all final host devices. Compliance of this device in all final host configurations is the responsibility of the Grantee.

- I The separation distance -20 cm must be clearly stated in the operating and/or installation manual that is supplied to the User.
- I This application is being made on behalf of the “Grantee”.



7. PHOTOS OF TESTING

- Radiated test (below 30M , Tx, Standby)





Spectrum Research & Testing Lab., Inc.
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320, Taiwan (R.O.C.)

TEST REPORT

Reference No.: A14101501
Report No.: FCCA14101501-01
FCC ID : QSWDHRCS1
Page: 27 of 29
Date: Nov. 10, 2014

- Radiated test (below 1G , Tx, Standby)





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320, Taiwan (R.O.C.)

TEST REPORT

Reference No.: A14101501
Report No.: FCCA14101501-01
FCC ID : QSWDHRCS1
Page: 28 of 29
Date: Nov. 10, 2014

- Radiated test (above 1G , Tx, Standby)





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TEST REPORT

Reference No.: A14101501
Report No.: FCCA14101501-01
FCC ID : QSWDHRCS1
Page: 29 of 29
Date: Nov. 10, 2014

8. TERMS OF ABBREVIATION

AV.	Average detection
AZ(°)	Turn table azimuth
Correct.	Correction
EL(m)	Antenna height (meter)
EUT	Equipment Under Test
Horiz.	Horizontal direction
LISN	Line Impedance Stabilization Network
NSA	Normalized Site Attenuation
Q.P.	Quasi-peak detection
SRT Lab	Spectrum Research & Testing Laboratory, Inc.
Vert.	Vertical direction