



**Spectrum Research & Testing Lab., Inc.**

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

# TEST REPORT

Reference No.: A16082304  
Report No.: FCCA16082304-01  
FCC ID : 2AH2P683345  
Page: 1 of 25  
Date: Feb. 14, 2017

Product Name: DUAL HRM BELT  
TRADE MARK: DECATHLON  
Model No.: ZT26D  
Applicant: USport LLC  
2415 3rd Street, Suite 231, San Francisco,  
CA 94107, United States  
Date of Receipt: Aug. 23, 2016  
Finished date of Test: Feb. 14, 2017  
Applicable Standards: 47 CFR Part 15, Subpart C, 15.249  
ANSI C63.4: 2014

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: 2/14/2017  
(Richard Lin)

Approved By : JH , Date: 2/14/2017  
( Johnson Ho, Director )





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## Revisions History

Report No.	Issue Date	Revisions
FCCA16082304-01	Feb. 14, 2017	Initial issue



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## 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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## 2. DESCRIPTION OF EUT AND TEST MODE

### 2.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	DUAL HRM BELT
<b>TRADE MARK</b>	DECATHLON
<b>MODEL NO.</b>	ZT26D
<b>POWER SUPPLY</b>	DC power source from CR2032 battery : DC 3.0V
<b>CABLE</b>	NA
<b>FREQUENCY BAND</b>	2.400 GHz ~ 2.4835 GHz (ANT+)
<b>CARRIER FREQUENCY</b>	2.457 GHz
<b>NUMBER OF CHANNEL</b>	1
<b>RATED RF OUTPUT POWER</b>	80.76 dBuV/m@2457 MHz
<b>MODULATION TYPE</b>	GFSK
<b>MODE OF OPERATION</b>	Duplex
<b>ANTENNA TYPE</b>	Chip Antenna
<b>ANTENNA GAIN</b>	1.57 dBi
<b>OPERATING TEMPERATURE RANGE</b>	-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

<b>DEVICE</b>	<b>BRAND / MAKER</b>	<b>MODEL #</b>	<b>FCC ID / DOC</b>	<b>REMARK</b>

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**2.3 DESCRIPTION OF TEST MODE**

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

966 chamber Pre-test result summary:

<b>Axis</b>	<b>Polarizatio</b>	<b>Frequency (MHz)</b>	<b>Result (dBuV/m)</b>
<b>X</b>	<b>H</b>	<b>736.34</b>	<b>30.25</b>
<b>X</b>	<b>V</b>	<b>740.42</b>	<b>31.38</b>
Y	H	643.82	29.42
Y	V	740.09	28.55
Z	H	736.91	28.93
Z	V	683.26	29.28

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

**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.



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## 2.5 DESCRIPTION OF SUPPORT UNIT

The EUT was configured by the requirement of ANSI C63.4:2014. 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



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### 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: 2014

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



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Date: Feb. 14, 2017**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 below1000MHz. The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

<b>FREQUENCY (MHz)</b>	<b>DISTANCE (m)</b>	<b>FIELD STRENGTH (dBmV/m)</b>
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 below1000MHz (Average).

<b>FREQUENCY (MHz)</b>	<b>FIELD STRENGTH OF FUNDAMENTAL (millivolts/meter)</b>	<b>FIELD STRENGTH OF HARMONICS (millivolts/meter)</b>
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

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Date: Feb. 14, 2017**4.1.2 TEST EQUIPMENT**

Below 1 GHz The following test equipment was used during the radiated emission test:

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER	FINAL TEST BE USED
EMI TEST RECEIVER	9 kHz ~ 2.75 GHz	ROHDE & SCHWARZ	ESCS30 / 100376	JAN. 02, 2018 ETC	■
SPECTRUM ANALYZER	9 kHz ~ 40GHz	ROHDE & SCHWARZ	FSP40 / 100093	JAN. 02, 2018 ETC	■
LOOP ANTENNA	9 kHz ~ 30 MHz	ROHDE & SCHWARZ	HFH2-Z2 / 860605/002	FEB. 24, 2018 ETC	■
BI-LOG ANTENNA & 6 dB ATTENUATOR	200 MHz ~ 1 GHz	SCHAFFNER	CBL6141A & N-6-06/ 4181 & AT-N0627	MAY 31, 2017 ETC	■
BICONICAL ANTENNA	30 MHz ~ 200 MHz	EMCO	3110/ 11966C	MAY 04, 2017 ETC	■
LOG PERIODIC ANTENNA	200 MHz ~ 1 GHz	EMCO	3146/ 9002-2686	OCT. 27, 2017 ETC	□
OPEN AREA TEST SITE	3 – 10 M MEASUREMENT	SRT	A02 / SRT002	MAR. 17, 2017 SRT	■
COAXIAL CABLE	30 M	TIMES	LMR-400 / #30M(L1TCAB014 )	MAY 16, 2017 ETC	■
FILTER	2 LINE, 30 A	FIL.COIL	FC-943 / 869	NCR	■
CDN	0.15 MHz ~ 300 MHz	LUTHI	CDN L-801 M2/M3 / 2790	MAY 15, 2017 ETC	□
PRE-AMPLIFIER	0.1 MHz ~ 1.3 GHz	HP	8447D / 2944A06746	NOV. 14, 2017 ETC	■

**NOTE:** The Open Area Test Site (SRT-1) is registered by FCC with No. 90957

Above 1 GHz The following test equipment was used during the radiated emission test:

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER	FINAL TEST BE USED
SPECTRUM ANALYZER	9 kHz ~ 40GHz	ROHDE & SCHWARZ	FSP40 / 100093	JAN. 02, 2018 ETC	■
HORN ANTENNA	1 GHz ~ 18 GHz	EMCO	3115/ 9602-4681	NOV. 24, 2017 ETC	■
HORN ANTENNA	18 ~ 40 GHZ	ETS-LINDGREN	3116 /00032255	DEC. 25, 2017 ETC	■
PRE-AMPLIFIER	1 GHz ~ 26.5 GHz	AGILENT	8449B/ 3008A01995	DEC. 29, 2017 ETC	■
OPEN AREA TEST SITE	3 – 10 M MEASUREMENT	SRT	A02 / SRT002	MAR. 17, 2017 SRT	■
K-TYPE CABLE	UP TO 40 GHz 3 m	HUBER+SUHNE R	SF102-46/2*11SK2 52 /MY2611/2	FEB. 28, 2017 ETC	■
K-TYPE CABLE	UP TO 40 GHz, 1 m	HUBER+SUHNE R	SF102/2*11SK252 /MY3331/2	OCT. 03, 2017 ETC	■
FILTER	2 LINE, 30 A	FIL.COIL	FC-943/ 869	NCR	■



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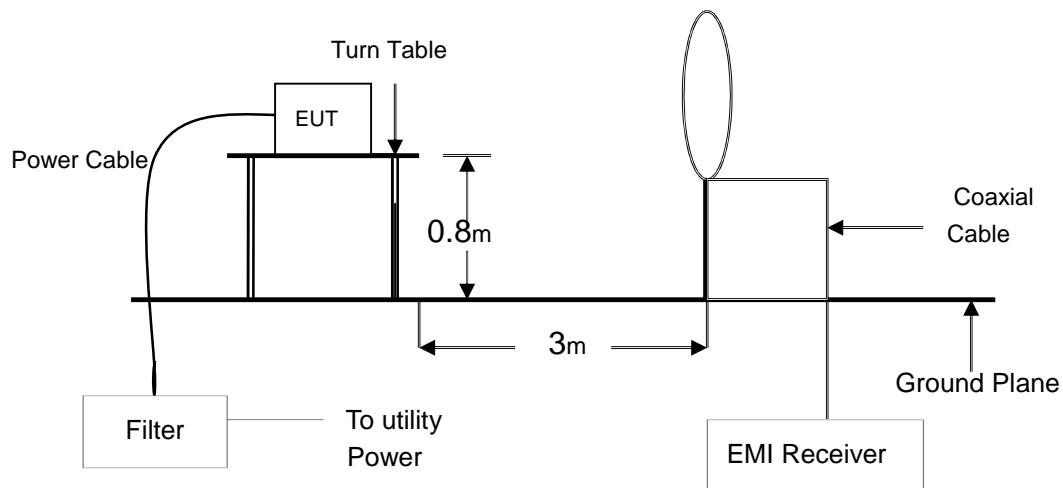
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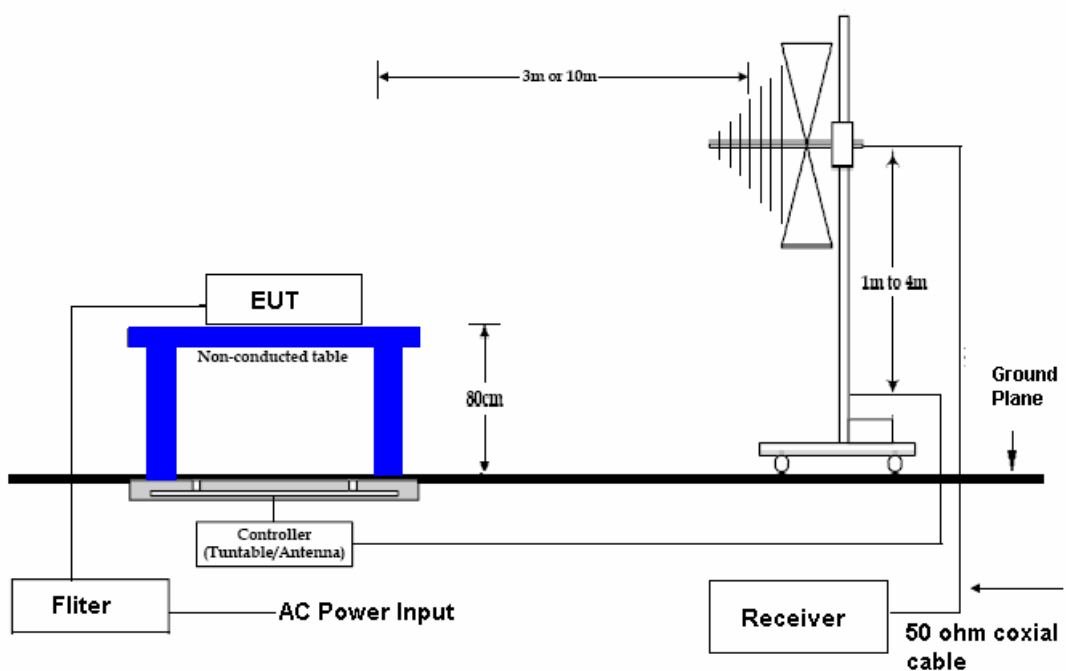
THERMO-HYGRO	15 - 40 °C, 0- 100% RH	TOP	20-A / 7685	SEP. 20, 2017 ETC	■
TEST SOFTWARE	---	EZ-EMC	SRT-03A1	NCR	■

### 4.1.3 TEST SET-UP

#### 9KHz ~ 30MHz

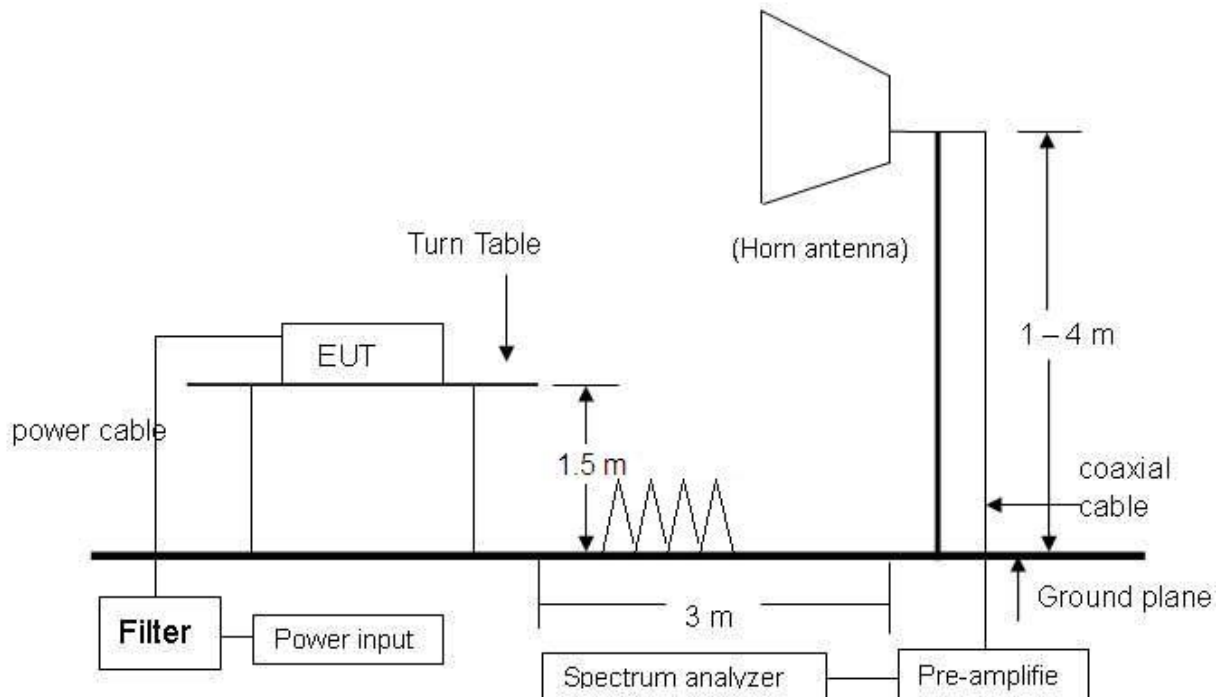


#### 30 MHz ~ 1 GHz





## 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 C63.4:2014 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.

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Temperature:	22 °C	Humidity:	59 %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:	Sep. 27, 2016

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:	22 °C	Humidity:	59 %RH
Frequency Range:	9 kHz – 30 MHz	Measured Distance:	3 m
Receiver Detector:	AV.	Tested Mode:	Standby
Tested By:	Richard Lin	Tested Date:	Sep. 27, 2016

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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Temperature:	22 °C	Humidity:	59 %RH
Frequency Range:	9 kHz – 30 MHz	Measured Distance:	3 m
Receiver Detector:	AV.	Tested Mode:	Link
Tested By:	Richard Lin	Tested Date:	Sep. 27, 2016

Frequency (KHz)	Cable Loss (dB)	Ant. Fac. (dB)	Reading (dB $\mu$ V)	Emission (dB $\mu$ V/m)	Limit Line (dB $\mu$ V/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

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Temperature:	23 °C	Humidity:	63 %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:	Sep. 27, 2016

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 4.20 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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Temperature:	23 °C	Humidity:	63 %RH
Frequency Range:	30 M – 1 GHz	Tested Mode:	Standby
Detector Type:	Quasi-peak	IF Bandwidth:	120 kHz
Tested By:	Richard Lin	Tested Date:	Sep. 27, 2016

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 4.20 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.



**Spectrum Research & Testing Lab., Inc.**

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**TEST REPORT**Reference No.: A16082304  
Report No.: FCCA16082304-01  
FCC ID : 2AH2P683345  
Page: 17 of 25  
Date: Feb. 14, 2017

Temperature:	23 °C	Humidity:	63 %RH
Frequency Range:	30 M – 1 GHz	Tested Mode:	Link
Detector Type:	Quasi-peak	IF Bandwidth:	120 kHz
Tested By:	Richard Lin	Tested Date:	Sep. 27, 2016

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 4.20 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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FCC ID : 2AH2P683345  
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Temperature:	24 °C	Humidity:	65 %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:	Sep. 27, 2016

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB $\mu$ V)		Emission Level (dB $\mu$ V/m)		Limit (dB $\mu$ V/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 (dB $\mu$ V)		Emission Level (dB $\mu$ V/m)		Limit (dB $\mu$ V/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 3.85 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.

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Temperature:	24 °C	Humidity:	65 %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:	Sep. 27, 2016

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 3.85 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.

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Temperature:	24 °C	Humidity:	65 %RH
Frequency Range:	1 GHz – 25 GHz	Tested Mode:	Standby
Detector Type:	PK. and AV.	IF Bandwidth:	1 MHz
VBW:	3 MHz	Tested Date:	Sep. 27, 2016

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB $\mu$ V)		Emission Level (dB $\mu$ V/m)		Limit (dB $\mu$ V/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 (dB $\mu$ V)		Emission Level (dB $\mu$ V/m)		Limit (dB $\mu$ V/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 3.85 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.

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Temperature:	24 °C	Humidity:	65 %RH
Frequency Range:	1 GHz – 25 GHz	Tested Mode:	Link
Detector Type:	PK. and AV.	IF Bandwidth:	1 MHz
VBW:	3 MHz	Tested Date:	Sep. 27, 2016

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dB $\mu$ V)		Emission Level (dB $\mu$ V/m)		Limit (dB $\mu$ V/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 (dB $\mu$ V)		Emission Level (dB $\mu$ V/m)		Limit (dB $\mu$ V/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 3.85 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.



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## 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.

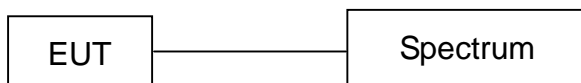
### 4.2.2 TEST EQUIPMENT

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	MAY 22, 2017 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.



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# TEST REPORT

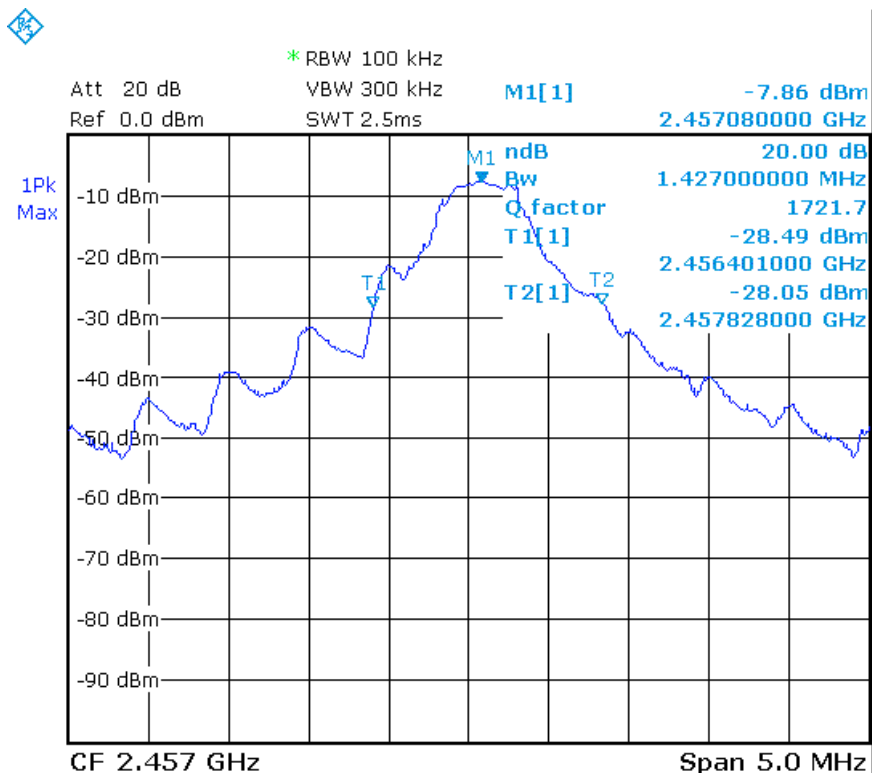
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## 4.2.5 TEST RESULT

Temperature:	22 °C	Humidity:	60 %RH
Detector:	Peak	Test Mode:	ANT_Tx-1
RBW:	100 kHz	VBW:	300 kHz
Tested By:	Richard Lin	Tested Date:	Sep. 28, 2016

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

CH01 :





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## 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.





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## 6. 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