

Test Report No. 7191136534-EEC16/05
dated 21 Jun 2016



PSB Singapore

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**FORMAL REPORT ON TESTING IN ACCORDANCE WITH
47 CFR FCC Parts 15B & C
OF A
MARITIME COMMUNICATION SYSTEM
[Model : Fleet One V2]
[FCC ID : QO4-WEFLONEVTWO]**

TEST FACILITY TÜV SÜD PSB Pte Ltd
Electrical & Electronics Centre (EEC), Product Services,
No. 1 Science Park Drive, Singapore 118221 Or

FCC REG. NO. 99142 (3m and 10m Semi-Anechoic Chamber, Science Park)

IND. CANADA REG. NO. 2932I-1 (3m and 10m Semi-Anechoic Chamber, Science Park)

PREPARED FOR Addvalue Innovation Pte Ltd
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QUOTATION NUMBER 2191039334

JOB NUMBER 7191136534

TEST PERIOD 25 Apr 2016 – 16 Jun 2016

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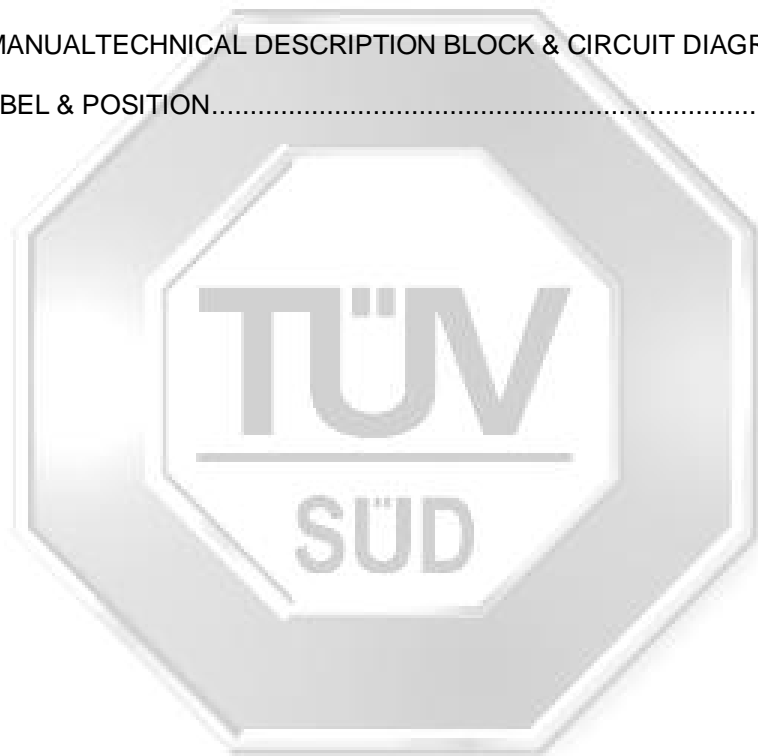
LA-2007-0380-A LA-2007-0384-G
LA-2007-0381-F LA-2007-0385-E
LA-2007-0382-B LA-2007-0386-C
LA-2007-0383-G LA-2010-0464-D

The results reported herein have been performed in accordance with the terms of accreditation under the Singapore Accreditation Council. Inspections/Calibrations/Tests marked "Not SAC-SINGLAS Accredited" in this Report are not included in the SAC-SINGLAS Accreditation Schedule for our inspection body/laboratory.



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TEST SUMMARY

The product was tested in accordance with the customer's specifications.

Test Results Summary

Test Standard	Description	Pass / Fail
47 CFR FCC Part 15		
15.107(a), 15.207	Conducted Emissions	Not Applicable *See Note 6
15.109(a), 15.205, 15.209	Radiated Emissions (Spurious Emissions inclusive Restricted Bands Requirement)	Pass
15.247(a)(2)	Spectrum Bandwidth (6dB Bandwidth Measurement)	Not Tested *See Note 8
15.247(b)(3)	Maximum Peak Power	Not Tested *See Note 8
15.247(d)	RF Conducted Spurious Emissions (Non-Restricted Bands)	Not Tested *See Note 8
15.247(d)	RF Conducted Spurious Emissions (Restricted Bands)	Not Tested *See Note 8
15.247(d)	Band Edge Compliance (Conducted)	Not Tested *See Note 8
15.247(d)	Band Edge Compliance (Radiated)	Not Tested *See Note 8
15.247(e)	Peak Power Spectral Density	Not Tested *See Note 8
1.1310	Maximum Permissible Exposure	Not Tested *See Note 8

TEST SUMMARY

Notes

1. The channels as listed below, under the different configurations were tested for 802.11b WLAN.

Transmit Channel	Frequency (GHz)	Modulation	Data Rate
Channel 1 (Lower Channel)	2.412	DBPSK	1Mbps
Channel 6 (Middle Channel)	2.437	DBPSK	1Mbps
Channel 11 (Upper Channel)	2.462	DBPSK	1Mbps
Channel 1 (Lower Channel)	2.412	DQPSK	2Mbps
Channel 6 (Middle Channel)	2.437	DQPSK	2Mbps
Channel 11 (Upper Channel)	2.462	DQPSK	2Mbps
Channel 1 (Lower Channel)	2.412	CCK	11Mbps
Channel 6 (Middle Channel)	2.437	CCK	11Mbps
Channel 11 (Upper Channel)	2.462	CCK	11Mbps

2. The channels as listed below, under the different configurations were tested for 802.11g WLAN.

Transmit Channel	Frequency (GHz)	Modulation	Data Rate
Channel 1 (Lower Channel)	2.412	BPSK	9Mbps
Channel 6 (Middle Channel)	2.437	BPSK	9Mbps
Channel 11 (Upper Channel)	2.462	BPSK	9Mbps
Channel 1 (Lower Channel)	2.412	QPSK	18Mbps
Channel 6 (Middle Channel)	2.437	QPSK	18Mbps
Channel 11 (Upper Channel)	2.462	QPSK	18Mbps
Channel 1 (Lower Channel)	2.412	16QAM	36Mbps
Channel 6 (Middle Channel)	2.437	16QAM	36Mbps
Channel 11 (Upper Channel)	2.462	16QAM	36Mbps
Channel 1 (Lower Channel)	2.412	64QAM	54Mbps
Channel 6 (Middle Channel)	2.437	64QAM	54Mbps
Channel 11 (Upper Channel)	2.462	64QAM	54Mbps

3. The channels as listed below, under the different configurations were tested for 802.11n WLAN.

Transmit Channel	Frequency (GHz)	Modulation	Data Rate
Channel 1 (Lower Channel)	2.412	BPSK	6.5Mbps
Channel 6 (Middle Channel)	2.437	BPSK	6.5Mbps
Channel 11 (Upper Channel)	2.462	BPSK	6.5Mbps
Channel 1 (Lower Channel)	2.412	QPSK	19.5Mbps
Channel 6 (Middle Channel)	2.437	QPSK	19.5Mbps
Channel 11 (Upper Channel)	2.462	QPSK	19.5Mbps
Channel 1 (Lower Channel)	2.412	16QAM	39Mbps
Channel 6 (Middle Channel)	2.437	16QAM	39Mbps
Channel 11 (Upper Channel)	2.462	16QAM	39Mbps
Channel 1 (Lower Channel)	2.412	64QAM	65Mbps
Channel 6 (Middle Channel)	2.437	64QAM	65Mbps
Channel 11 (Upper Channel)	2.462	64QAM	65Mbps

TEST SUMMARY

Notes (Continued)

4. The EUT is a Class B device when in non-transmitting state and meets the 47 CFR FCC Part15B Class B requirements.
5. All test measurement procedures are according to ANSI C63.4: 2014, ANSI C63.10: 2013 and KDB 558074 D01 DTS Measurement Guidance V03R05.
6. The Equipment Under Test (EUT) is a battery operated device / DC operated device and contains no provision for public utility connections.
7. The EUT was tested using fully charged batteries with DC voltage of 12.8V.
8. As per Addvalue Innovation Pte Ltd's declaration, the Embedded WiFi Module, HF-A21-SMT (FCC ID: 2ACSV-HF-A21-SMT) from High-Flying Electronics Technology Co., Ltd. was integrated to Maritime Communication System, Fleet One V2 without any hardware or software modifications. No changes were made to the WiFi module in integrating to this product.

The WiFi Module, HF-A21-SMT from High-Flying Electronics Technology Co., Ltd. was tested and reported in R011506375 issued by Anbotek Compliance Laboratory Limited on 24 Jul 2015.

Modifications

No modifications were made.

PRODUCT DESCRIPTION

Description	: The Equipment Under Test (EUT) is a MARITIME COMMUNICATION SYSTEM named as Fleet One V2 . It consists of <ol style="list-style-type: none">Below Deck Unit (BDU)Above Deck unit (ADU)Fleet One V2 Primary Handset (PHS)
Applicant	: Addvalue Innovation Pte Ltd 8 Tai Seng Link, Level 5 (Wing 2) Singapore 534158
Manufacturer	: Addvalue Innovation Pte Ltd 8 Tai Seng Link, Level 5 (Wing 2) Singapore 534158
Factory (ies)	: Beyonics Technology (Senai) Sdn Bhd No. 96 (Plot 128), Jalan i-Park 1/10, Kawasan Perindustrian i-Park, 81000 Bandar Indahpura, Kulaijaya, Johor, Malaysia
Brand	: Wideye
Model Number	: Fleet One V2
FCC ID	: QO4-WEFLONEVTWO
Serial Number	: Nil
Microprocessor	: OMAP L138
Operating / Transmitting Frequency	: <u>Satellite Transmitting</u> 1626.5 MHz – 1660.5 MHz <u>Satellite Receiving</u> 1518.0 MHz – 1559.0 MHz <u>GPS Receiving</u> 1575.42MHz
Clock / Oscillator Frequency	: <u>Baseband Board</u> 32.768KHz, 4.9152MHz, 24MHz, 25MHz, 16.384MHz <u>RF Board</u> 4.0MHz, 24.192MHz
Modulation / Emissions Designator	: pi/4QPSK and 16QAM (Satellite Transmit) pi/4QPSK and 16QAM (Satellite Receive) QPSK (GPS)
Antenna Gain	: WLAN Antenna Monopole , 2dBi Satellite antenna, 10 dBi
Port / Connectors	: 1xRJ45 LAN Port 1xCircular Connector for Primary Handset 1xRJ11 Phone Port 1xRS232 serial Port GPS output NMEA 0183 1x10pin I/O Connector port for External devices
Rated Input Power	: 12Vdc / 24Vdc via Battery

Addvalue Innovation Pte Ltd
Maritime Communication System [Model : Fleet One V2]
[FCC ID : QO4-WEFLONEVTWO]



SUPPORTING EQUIPMENT DESCRIPTION

The EUT was tested as a stand-alone unit without any supporting equipment.





EUT OPERATING CONDITIONS

47 CFR FCC Part 15

1. Radiated Emissions (Spurious Emissions inclusive Restricted Bands Requirement)

The EUT was exercised by operating in maximum continuous transmission in test mode, i.e transmitting at lower, middle and upper channels respectively at one time.



RADIATED EMISSION TEST

47 CFR FCC Part 15.205 Restricted Bands

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	Above 38.6
13.36 - 13.41			

47 CFR FCC Parts 15.109(a) and 15.209 Radiated Emission Limits

Frequency Range (MHz)	Quasi-Peak Limit Values (dBµV/m)
0.009 - 0.490	20 log [2400 / F (kHz)] @ 300m
0.490 - 1.705	20 log [24000 / F (kHz)] @ 30m
1.705 - 30.0	30.0 @ 30m
30 - 88	40.0 @ 3m
88 - 216	43.5 @ 3m
216 - 960	46.0 @ 3m
Above 960	54.0* @ 3m

* For frequency bands 9kHz – 90kHz, 110kHz – 490kHz and above 1GHz, average detector was used. A peak limit of 20dB above the average limit does apply.

47 CFR FCC Parts 15.109(a) and 15.209 Radiated Emission Test Instrumentation

Instrument	Model	S/No	Cal Due Date
R&S Test Receiver – ESI1	ESI40	100010	14 Jul 2016
TDK-RF Horn Antenna	HRN-0118	130256	18 Sep 2016
Schaffner Bilog Antenna –(30MHz-2GHz) BL4	CBL6112B	2593	15 Dec 2016
R&S Preamplifier (1GHz -18GHz)	SCU18	102191	11 Mar 2017
Com-Power Preamplifier (1MHz-1GHz)	PAM-103	441096	09 Oct 2016
ETS Horn Antenna(18GHz-40GHz)(Ref)	3116	0004-2474	14 Oct 2016
Toyo Preamplifier (26.5GHz-40GHz)	HAP26-40W	00000005	14 Oct 2016
Agilent Preamplifier(1GHz-26.5GHz) (PA18)	8449D	3008A02305	06 Oct 2016
EMCO Loop Ant (ext)_red_00134413	6502	134413	01 Oct 2016
K&L Microwave Tunable Band Reject Filter	3TNF-1000/2000-N/N	436	Output Monitor
Micro-tronics Bandstop Filter (2.4GHz)	BRM50701-02	007	13 Aug 2016



RADIATED EMISSION TEST

47 CFR FCC Parts 15.109(a) and 15.209 Radiated Emission Test Setup

1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m X 1.0m X 0.8m high, non-metallic table for measurement up to 1GHz. For measurement above 1GHz, 1.5m height table was used.
2. The filtered power supply for the EUT and supporting equipment were tapped from the appropriate power sockets located on the turntable.
3. The relevant broadband antenna was set at the required test distance away from the EUT and supporting equipment boundary.

47 CFR FCC Parts 15.109(a) and 15.209 Radiated Emission Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition.
2. A prescan was carried out to pick the worst emission frequencies from the EUT. For EUT which is a portable device, the prescan was carried out by rotating the EUT through three orthogonal axes to determine which altitude and equipment arrangement produces such emissions.
3. The test was carried out at the selected frequency points obtained from the prescan in step 2. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner:
 - a. Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen.
 - b. The EUT was then rotated to the direction that gave the maximum emission.
 - c. Finally, the antenna height was adjusted to the height that gave the maximum emission.
4. A Quasi-peak measurement was made for that frequency point if it was less than or equal to 1GHz. For frequency point in the range of 9kHz – 90kHz, 110kHz – 490kHz and above 1GHz, both Peak and Average measurements were carried out.
5. Steps 3 and 4 were repeated for the next frequency point, until all selected frequency points were measured.
6. The frequency range covered was from the lowest radio frequency signal generated from the EUT, without going below 9kHz to 10th harmonics of the EUT fundamental frequency, using the loop antenna for frequency below 30MHz, Bi-log antenna for frequencies from 30MHz up to 1GHz, and the Horn antenna above 1GHz.

Sample Calculation Example

At 300 MHz	Q-P limit (Class B) = 46.0 dB μ V/m
Log-periodic antenna factor & cable loss at 300 MHz = 18.5 dB	
Q-P reading obtained directly from EMI Receiver = 40.0 dB μ V/m (Calibrated level including antenna factors & cable losses)	
Therefore, Q-P margin = 46.0 - 40.0 = 6.0	i.e. 6.0 dB below Q-P limit

RADIATED EMISSION TEST

47 CFR FCC Parts 15.109(a), 15.205 and 15.209 Radiated Emission Results

Test Input Power	12Vdc	Temperature	22°C
Test Distance	3m (≥30MHz – 25GHz)	Relative Humidity	52%
Data Speed	IEEE 802.11b 11Mbps (Worst)	Atmospheric Pressure	1030mbar
		Tested By	Dylan Lin

Spurious Emissions ranging from 9kHz – 30MHz (for 9kHz – 90kHz, 110kHz – 490kHz) *See Note 3

Freq (GHz)	Peak Value (dBμV/m)	Peak Limit (dBμV/m)	Peak Margin (dB)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Azimuth (Degrees)	Pol (H/V)	Ch
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Spurious Emissions ranging from 9kHz – 30MHz *See Note 3

Frequency (MHz)	Q-P Value (dBμV/m)	Q-P Limit (dBμV/m)	Q-P Margin (dB)	Height (cm)	Azimuth (Degrees)	Pol (H/V)	Channel
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Spurious Emissions ranging from 30MHz – 1GHz

Frequency (MHz)	Q-P Value (dBμV/m)	Q-P Limit (dBμV/m)	Q-P Margin (dB)	Height (cm)	Azimuth (Degrees)	Pol (H/V)	Channel
61.4130	34.6	40.0	5.4	300	74	H	1
181.1760	32.4	43.5	11.1	100	304	V	1
483.5280	27.3	46.0	18.7	202	260	H	1
499.2350	28.0	46.0	18.0	300	257	H	1
864.4140	31.3	46.0	14.7	100	19	V	1
952.7640	34.9	46.0	11.1	100	19	V	1

RADIATED EMISSION TEST

47 CFR FCC Parts 15.109(a), 15.205 and 15.209 Radiated Emission Results

Test Input Power	12Vdc	Temperature	22°C
Test Distance	3m (≥30MHz – 25GHz)	Relative Humidity	52%
Data Speed	IEEE 802.11b 11Mbps (Worst)	Atmospheric Pressure	1030mbar
		Tested By	Dylan Lin

Spurious Emissions above 1GHz – 25GHz

Freq (GHz)	Peak Value (dBμV/m)	Peak Limit (dBμV/m)	Peak Margin (dB)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Azimuth (Degrees)	Pol (H/V)	Ch
3.6009	51.5	74.0	22.5	44.3	54.0	9.7	100	82	H	1
4.8255	55.8	74.0	18.2	44.6	54.0	9.4	400	236	H	1
7.2144	65.0	74.0	9.0	47.0	54.0	7.0	200	174	V	1
12.0479	55.5	74.0	18.5	50.9	54.0	3.1	400	359	V	1
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Spurious Emissions above 1GHz – 25GHz

Freq (GHz)	Peak Value (dBμV/m)	Peak Limit (dBμV/m)	Peak Margin (dB)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Azimuth (Degrees)	Pol (H/V)	Ch
4.8761	56.9	74.0	17.1	45.5	54.0	8.5	400	241	H	6
5.9488	51.8	74.0	22.2	46.7	54.0	7.3	400	74	V	6
7.2873	67.2	74.0	6.8	49.1	54.0	4.9	300	359	V	6
12.1693	55.8	74.0	18.2	51.2	54.0	2.8	300	168	V	6
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Spurious Emissions above 1GHz – 25GHz

Freq (GHz)	Peak Value (dBμV/m)	Peak Limit (dBμV/m)	Peak Margin (dB)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Azimuth (Degrees)	Pol (H/V)	Ch
4.9267	56.3	74.0	17.7	44.8	54.0	9.2	300	326	V	11
7.3844	65.3	74.0	8.7	47.1	54.0	6.9	200	10	V	11
12.3150	54.2	74.0	19.8	49.7	54.0	4.3	200	168	V	11
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RADIATED EMISSION TEST

47 CFR FCC Parts 15.109(a), 15.205 and 15.209 Radiated Emission Results

Test Input Power	12Vdc	Temperature	22°C
Test Distance	3m (≥30MHz – 25GHz)	Relative Humidity	52%
Data Speed	IEEE 802.11g 54Mbps (Worst)	Atmospheric Pressure	1030mbar
		Tested By	Dylan Lin

Spurious Emissions above 1GHz – 25GHz

Freq (GHz)	Peak Value (dBμV/m)	Peak Limit (dBμV/m)	Peak Margin (dB)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Azimuth (Degrees)	Pol (H/V)	Ch
7.2351	60.5	74.0	13.5	45.0	54.0	9.0	186	12	V	1
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Spurious Emissions above 1GHz – 25GHz

Freq (GHz)	Peak Value (dBμV/m)	Peak Limit (dBμV/m)	Peak Margin (dB)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Azimuth (Degrees)	Pol (H/V)	Ch
7.3130	61.5	74.0	12.5	46.0	54.0	8.0	153	11	V	6
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Spurious Emissions above 1GHz – 25GHz

Freq (GHz)	Peak Value (dBμV/m)	Peak Limit (dBμV/m)	Peak Margin (dB)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Azimuth (Degrees)	Pol (H/V)	Ch
7.3849	62.0	74.0	12.0	46.5	54.0	7.5	259	359	V	11
7.4672	62.7	74.0	11.3	49.1	54.0	4.9	203	12	V	11
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RADIATED EMISSION TEST

47 CFR FCC Parts 15.109(a), 15.205 and 15.209 Radiated Emission Results

Test Input Power	12Vdc	Temperature	22°C
Test Distance	3m (≥30MHz – 25GHz)	Relative Humidity	52%
Data Speed	IEEE 802.11n MCS12 (Worst)	Atmospheric Pressure	1030mbar
		Tested By	Dylan Lin

Spurious Emissions above 1GHz – 25GHz

Freq (GHz)	Peak Value (dBμV/m)	Peak Limit (dBμV/m)	Peak Margin (dB)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Azimuth (Degrees)	Pol (H/V)	Ch
4.8237	58.5	74.0	15.5	41.9	54.0	12.1	398	236	H	1
7.2346	67.2	74.0	6.8	51.0	54.0	3.0	227	173	V	1
12.0576	55.6	74.0	18.4	39.1	54.0	14.9	400	0	V	1
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Spurious Emissions above 1GHz – 25GHz

Freq (GHz)	Peak Value (dBμV/m)	Peak Limit (dBμV/m)	Peak Margin (dB)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Azimuth (Degrees)	Pol (H/V)	Ch
4.8743	58.6	74.0	15.4	42.0	54.0	12.0	376	244	H	6
7.3060	67.5	74.0	6.5	50.5	54.0	3.5	225	359	V	6
12.1796	58.1	74.0	15.9	39.8	54.0	14.2	337	164	V	6
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Spurious Emissions above 1GHz – 25GHz

Freq (GHz)	Peak Value (dBμV/m)	Peak Limit (dBμV/m)	Peak Margin (dB)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Azimuth (Degrees)	Pol (H/V)	Ch
4.9252	58.2	74.0	15.8	41.2	54.0	12.8	301	330	V	11
7.3862	67.2	74.0	6.8	50.4	54.0	3.6	218	12	V	11
12.3076	58.0	74.0	16.0	40.1	54.0	13.9	178	166	V	11
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RADIATED EMISSION TEST

Notes

1. All possible modes of operation were investigated. Only the worst case emissions measured, using the correct CISPR detectors, are reported. All other emissions were relatively insignificant.
2. "--" indicates no emissions were found and shows compliance to the limits.
3. The measurement was done at 10m. The measured results were extrapolated to the specified test limits as specified in § 15.209 (a) based on 40dB/decade.
4. Quasi-peak measurement was used for frequency measurement up to 1GHz. Average and peak measurements were used for emissions above 1GHz. The average measurement was done by averaging over a complete cycle of the pulse train, including the blanking interval as the pulse train duration does not exceed 0.1 second.
5. A "positive" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency. Conversely, a "negative" margin indicates a FAIL.
6. EMI receiver Resolution Bandwidth (RBW) and Video Bandwidth (VBW) settings:
30MHz - 1GHz
RBW: 120kHz VBW: 1MHz
>1GHz
RBW: 1MHz VBW: 3MHz
7. The upper frequency of radiated emission investigations was according to requirements stated in Section 15.33(a) for intentional radiators & Section 15.33(b) for unintentional radiators.
8. The channel in the table refers to the transmit channel of the EUT.
9. Radiated Emissions Measurement Uncertainty
All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95%, with a coverage factor of 2, in the range 30MHz – 25GHz is $\pm 4.0\text{dB}$.



Please note that this Report is issued under the following terms :

1. This report applies to the sample of the specific product/equipment given at the time of its testing/calibration. The results are not used to indicate or imply that they are applicable to other similar items. In addition, such results must not be used to indicate or imply that TÜV SÜD PSB approves, recommends or endorses the manufacturer, supplier or user of such product/equipment, or that TÜV SÜD PSB in any way "guarantees" the later performance of the product/equipment. Unless otherwise stated in this report, no tests were conducted to determine long term effects of using the specific product/equipment.
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5. Unless otherwise stated, the tests were carried out in TÜV SÜD PSB Pte Ltd, No.1 Science Park Drive Singapore 118221.

July 2011



RF EXPOSURE EVALUATION

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency(RF) Radiation as specified in §1.1307(b)

FCC ID: **2ACSV-HF-A21-SMT**

EUT Specification

EUT	SPORT DVR
Frequency band (Operating)	<input checked="" type="checkbox"/> WLAN: 2.412GHz ~ 2.462GHz <input type="checkbox"/> WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz <input type="checkbox"/> WLAN: 5.745GHz ~ 5825GHz <input type="checkbox"/> Others
Device category	<input type="checkbox"/> Portable (<20cm separation) <input checked="" type="checkbox"/> Mobile (>20cm separation) <input type="checkbox"/> Others ____
Exposure classification	<input type="checkbox"/> Occupational/Controlled exposure (S = 5mW/cm ²) <input checked="" type="checkbox"/> General Population/Uncontrolled exposure (S=1mW/cm ²)
Antenna diversity	<input checked="" type="checkbox"/> Single antenna <input type="checkbox"/> Multiple antennas <input type="checkbox"/> Tx diversity <input type="checkbox"/> Rx diversity <input type="checkbox"/> Tx/Rx diversity
Max. output power	17.29dBm (0.054W)
Antenna gain (Max)	2.07 dBi
Evaluation applied	<input checked="" type="checkbox"/> MPE Evaluation <input type="checkbox"/> SAR Evaluation

Limits for Maximum Permissible Exposure(MPE)

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density(mW/cm ²)	Average Time
(A) Limits for Occupational/Control Exposures				
300-1500	--	--	F/300	6
1500-100000	--	--	5	6
(B) Limits for General Population/Uncontrol Exposures				
300-1500	--	--	F/1500	6
1500-100000	--	--	1	30

Friis transmission formula: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

P_d = Power density in mW/cm²

P_{out} = output power to antenna in Mw

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

P_d the limit of MPE, 1mW/cm². If we know the maximum gain of the antenna and total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

Measurement Result

Operating Mode	Channel Frequency (MHz)	Measured Power (dBm)	Tune up tolerance (dBm)	Max. Tune up Power (dBm)	Antenna Gain (dBi)	Power density at 20cm (mW/ cm ²)	Power density Limits (mW/cm ²)
802.11b	2412	16.91	16.91±1	17.91	2.07	0.01980	1
	2437	17.03	17.03±1	18.03	2.07	0.02037	1
	2462	17.29	17.29±1	18.29	2.07	0.02161	1
802.11g	2412	14.63	14.63±1	15.63	2.07	0.01171	1
	2437	14.77	14.77±1	15.77	2.07	0.01210	1
	2462	14.48	14.48±1	15.48	2.07	0.01132	1
802.11n (HT20)	2412	14.18	14.18±1	15.18	2.07	0.01056	1
	2437	14.17	14.17±1	15.17	2.07	0.01054	1
	2462	14.30	14.30±1	15.30	2.07	0.01086	1
802.11n (HT40)	2422	16.38	16.38±1	17.38	2.07	0.01753	1
	2437	16.33	16.33±1	17.33	2.07	0.01733	1
	2452	16.56	16.56±1	17.56	2.07	0.01827	1

TCB**GRANT OF EQUIPMENT
AUTHORIZATION****TCB****Certification****Issued Under the Authority of the
Federal Communications Commission****By:****Siemic Inc.
775 Montague Expressway
Milpitas, CA 95035****Date of Grant: 08/10/2015****Application Dated: 08/10/2015****High-Flying Electronics Technology Co., Ltd.
Room 1002, Building 1, No.3000, Longdong Avenue,
Pudong New Area,
Shanghai, 201203
China****Attention: Sen Xie , General Manager****NOT TRANSFERABLE**

EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and
is VALID ONLY for the equipment identified hereon for use under the
Commission's Rules and Regulations listed below.

FCC IDENTIFIER: 2ACSV-HF-A21-SMT**Name of Grantee:** High-Flying Electronics Technology Co.,
Ltd.**Equipment Class:** Digital Transmission System**Notes:** Embedded Wi-Fi Module**Modular Type:** Single Modular**Grant Notes****FCC Rule Parts****15C****Frequency
Range (MHZ)****2412.0 - 2462.0****Output
Watts****0.054****Frequency
Tolerance****Emission
Designator**

Single Modular Approval for Mobile platform.

Power listed is the maximum conducted output power. Device contains 20 and 40 MHz
signal bandwidth.

The antenna(s) used for this transmitter must be installed to provide a separation
distance of at least 20 cm from all persons and must not be co-located or operating in
conjunction with any other antenna or transmitter, except in accordance with FCC
multi-transmitter product procedures. End-Users must be provided with transmitter
operation conditions for satisfying RF exposure compliance