SGS-CSTC Standards Technical Services Ltd.

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FCC REPORT

Application No.:	SZEM1209005057RF
Applicant:	Stonex Europe Srl
Manufacturer:	Stonex Europe Srl
Factory:	Stonex Europe Srl
Product Name:	GPS Receiver
Model No.(EUT):	S9III GNSS
FCC ID:	Y44-B2029
Standards:	47 CFR Part 15, Subpart C (2011)
Date of Receipt:	2012-09-05
Date of Test:	2012-09-10 to 2012-09-25
Date of Issue:	2013-08-11
Test Result:	**PASS ***

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Jack Zhang
EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.
The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

2 Test Summary

Test Item	Test Requirement	Test method	Result
Conducted Peak Output Power	47 CFR Part 15, Subpart C Section 15.247 (b)(1)	ANSI C63.10 (2009)	PASS
Radiated Spurious emissions	47 CFR Part 15, Subpart C Section 15.205/15.209	ANSI C63.10 (2009)	PASS

Remark:

Limit Bluetooth module (FCC ID: Y44-B2029) be used into the new host (Host Product Name: GPS Receiver Model No.: S9III GNSS).

Conducted output power, Radiated Spurious emissions were fully retested on the host and shown the data in this report, other tests please refer to the original report FCC ID:Y44-B2029.

3 Contents

4 General Information

4.1 Client Information

Applicant:	Stonex Europe Srl
Address of Applicant:	Via Zucchi 1, 20090 Monza (MB), Italy
Manufacturer:	Stonex Europe Srl
Address of Manufacturer:	Via Zucchi 1, 20090 Monza (MB), Italy
Factory:	Stonex Europe Srl
Address of Factory:	Via Zucchi 1, 20090 Monza (MB), Italy

4.2 General Description of EUT

Name:	GPS Receiver	
Model No.	S9III GNSS	
Trade Mark:	STONEX	
Operation Frequency:	2402MHz~2480MHz	
Bluetooth Version:	2.0 +EDR	
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)	
Modulation Type:	GFSK, π/4DQPSK, 8DPSK	
Number of Channel:	79	
Hopping Channel Type:	Adaptive Frequency Hopping systems	
Sample Type:	Mobile production	
Test Power Grade:	50 (manufacturer declare)	
Test Software of EUT:	CSR BlueSuite (manufacturer declare)	
Antenna Type:	Integral	
Antenna Gain:	0.9dBi	
Power Supply:	AC Adapter:	MODEL:PSA18R-120P INPUT: AC 100-240V 0.5A 50-60Hz 40-60VA OUTPUT : DC 12V 1.5A
	Battery Charger:	Type: CH-S932X84 INPUT: 12V DC 1.5A max OUTPUT: 2*8.4V DC 400mA max
EUT Power Supply:	Type: BT-S9374 DC 7.4V 2500mAh 18.5Wh Li-Ion Battery	
Test Voltage:	DC 7.4V	

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2402MHz	21	2422MHz	41	2442MHz	61	2462MHz
2	2403MHz	22	2423MHz	42	2443MHz	62	2463MHz
3	2404MHz	23	2424MHz	43	2444MHz	63	2464MHz
4	2405MHz	24	2425MHz	44	2445MHz	64	2465MHz
5	2406MHz	25	2426MHz	45	2446MHz	65	2466MHz
6	2407MHz	26	2427MHz	46	2447MHz	66	2467MHz
7	2408MHz	27	2428MHz	47	2448MHz	67	2468MHz
8	2409MHz	28	2429MHz	48	2449MHz	68	2469MHz
9	2410MHz	29	2430MHz	49	2450MHz	69	2470MHz
10	2411MHz	30	2431MHz	50	2451MHz	70	2471MHz
11	2412MHz	31	2432MHz	51	2452MHz	71	2472MHz
12	2413MHz	32	2433MHz	52	2453MHz	72	2473MHz
13	2414MHz	33	2434MHz	53	2454MHz	73	2474MHz
14	2415MHz	34	2435MHz	54	2455MHz	74	2475MHz
15	2416MHz	35	2436MHz	55	2456MHz	75	2476MHz
16	2417MHz	36	2437MHz	56	2457MHz	76	2477MHz
17	2418MHz	37	2438MHz	57	2458MHz	77	2478MHz
18	2419MHz	38	2439MHz	58	2459MHz	78	2479MHz
19	2420MHz	39	2440MHz	59	2460MHz	79	2480MHz
20	2421MHz	40	2441MHz	60	2461MHz		

Note:
In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency
The Lowest channel	2402MHz
The Middle channel	2441MHz
The Highest channel	2480MHz

4.3 Test Environment

Operating Environment:	
Temperature:	26.0 °C
Humidity:	53 % RH
Atmospheric Pressure:	1003mbar

4.4 Description of Support Units

The EUT has been tested independent unit.

4.5 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch E&E Lab,
No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China. 518057.
Tel: +86 755 2601 2053 Fax: +86 755 2671 0594
No tests were sub-contracted.

4.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L2929)**

  CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **VCCI**

  The 3m Semi-anechoic chamber, Full-anechoic Chamber and Shielded Room (7.5m x 4.0m x 3.0m) of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2197, G-416, T-1153 and C-2383 respectively.

- **FCC – Registration No.: 556682**

  SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 556682.

- **Industry Canada (IC)**

  Two 3m Semi-anechoic chambers of SGS-CSTC Standards Technical Services Co., Ltd. have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1 & 4620C-2.

4.7 Deviation from Standards

None.

4.8 Abnormalities from Standard Conditions

None.

4.9 Other Information Requested by the Customer

None.

4.10 Equipment List

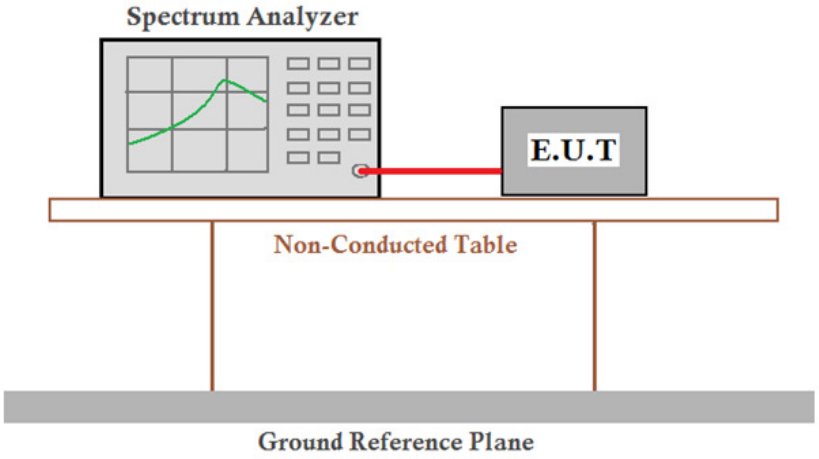
RE in Chamber					
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Due date (yyyy-mm-dd)**
1	3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEL0017	2014-06-10
2	EMI Test Receiver	Rohde & Schwarz	ESIB26	SEL0023	2014-05-16
3	EMI Test software	AUDIX	E3	SEL0050	N/A
4	BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEL0015	2013-10-24
5	Double-ridged horn (1-18GHz)	ETS-LINDGREN	3117	SEL0006	2013-10-24
6	Horn Antenna (18-26GHz)	ETS-LINDGREN	3160	SEL0076	2013-10-24
7	Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEL0053	2014-05-16
8	Pre-Amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEL0168	2013-10-24
9	Coaxial cable	SGS	N/A	SEL0027	2014-05-59
10	Coaxial cable	SGS	N/A	SEL0189	2014-05-29
11	Coaxial cable	SGS	N/A	SEL0121	2014-05-29
12	Coaxial cable	SGS	N/A	SEL0178	2014-05-29
13	Band filter	Amindeon	82346	SEL0094	2014-05-16
14	Barometer	Chang Chun	DYM3	SEL0088	2014-05-24
15	DC Power Supply	Zhao Xin	RXN-305D	SEL0117	2013-10-24
16	Humidity/ Temperature Indicator	Shanhai Qixiang	ZJ1-2B	SEL0103	2013-10-24
17	Signal Generator (10M-27GHz)	Rohde & Schwarz	SMR27	SEL0067	2014-05-16
18	Signal Generator	Rohde & Schwarz	SMY01	SEL0155	2013-10-24
19	Loop Antenna	Beijing Daze	ZN30401	SEL0203	2014-06-04

RF connected test					
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Due date (yyyy-mm-dd)**
1	DC Power Supply	Zhao Xin	RXN-305D	SEL0117	2013-10-24
2	Humidity/ Temperature Indicator	HYGRO	ZJ1-2B	SEL0033	2013-10-24
3	Spectrum Analyzer	Rohde & Schwarz	FSP	SEL0154	2013-10-24
4	Coaxial cable	SGS	N/A	SEL0178	2014-05-29
5	Coaxial cable	SGS	N/A	SEL0179	2014-05-29
6	Barometer	ChangChun	DYM3	SEL0088	2014-05-24
7	Signal Generator	Rohde & Schwarz	SML03	SEL0068	2014-05-16
8	Band filter	amideon	82346	SEL0094	2014-05-16
9	POWER METER	R & S	NRVS	SEL0144	2013-10-24
10	Attenuator	Beijin feihang taida	TST-2-6dB	SEL0205	2014-05-16
11	Power Divider(splitter)	Agilent Technologies	11636B	SEL0130	2013-10-24

Note: The calibration interval is one year, all the instruments are valid.

5 Test results and Measurement Data

5.1 Conducted Peak Output Power

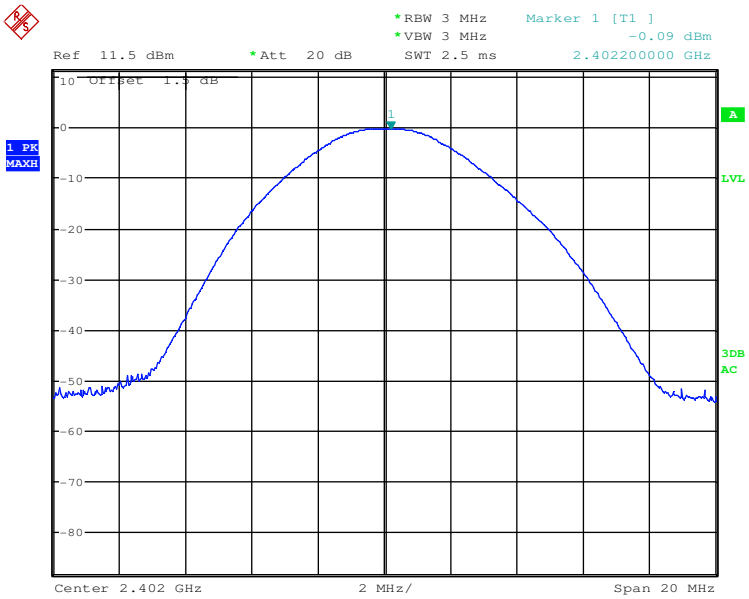
Test Requirement:	47 CFR Part 15C Section 15.247 (b)(1)
Test Method:	ANSI C63.10:2009
Test Setup:	 *Remark:* *Offset the High-Frequency cable loss 1.5dB in the spectrum analyzer.*
Exploratory Test Mode:	Non-hopping transmitting with all kind of modulation and all kind of data type
Final Test Mode:	Through Pre-scan, find the DH1 of date type is the worse case of GFSK modulation type, 2-DH1 of date type is worse case of π/4DQPSK modulation type, 3-DH1 of date type is worse case of 8DPSK modulation type.
Instruments Used:	Refer to section 4.10 for details
Test Results:	Pass

Measurement Data

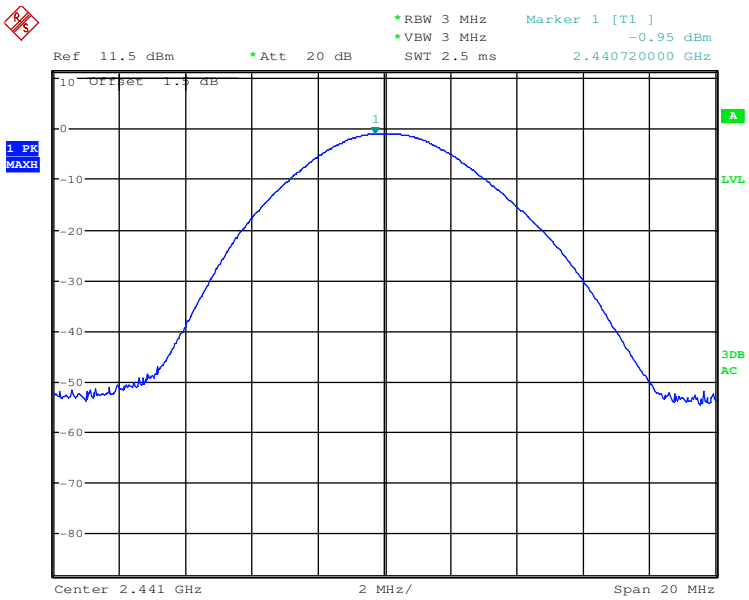
GFSK mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	-0.09	20.00	Pass
Middle	-0.95	20.00	Pass
Highest	-1.78	20.00	Pass
π/4DQPSK mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	-0.62	20.00	Pass
Middle	-1.53	20.00	Pass
Highest	-1.84	20.00	Pass
8DPSK mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	-0.06	20.00	Pass
Middle	-0.97	20.00	Pass
Highest	-1.39	20.00	Pass

Test plot as follows:

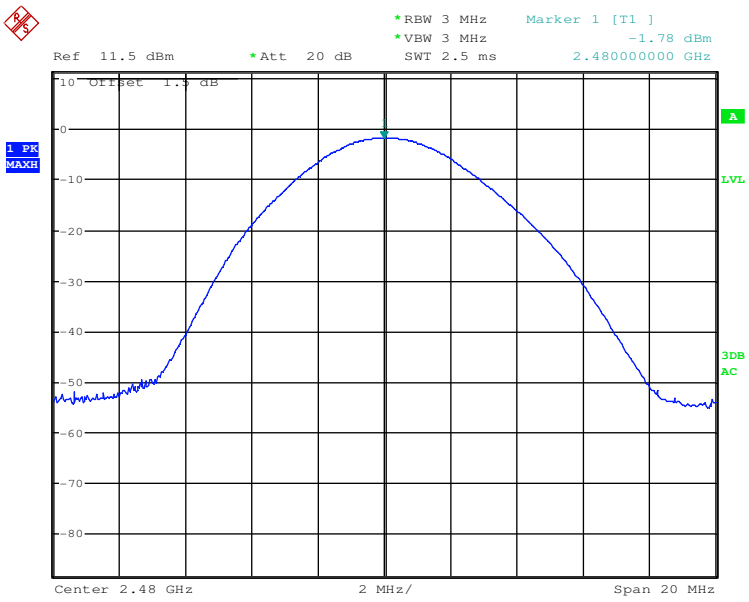
Test mode:	GFSK	Test channel:	Lowest



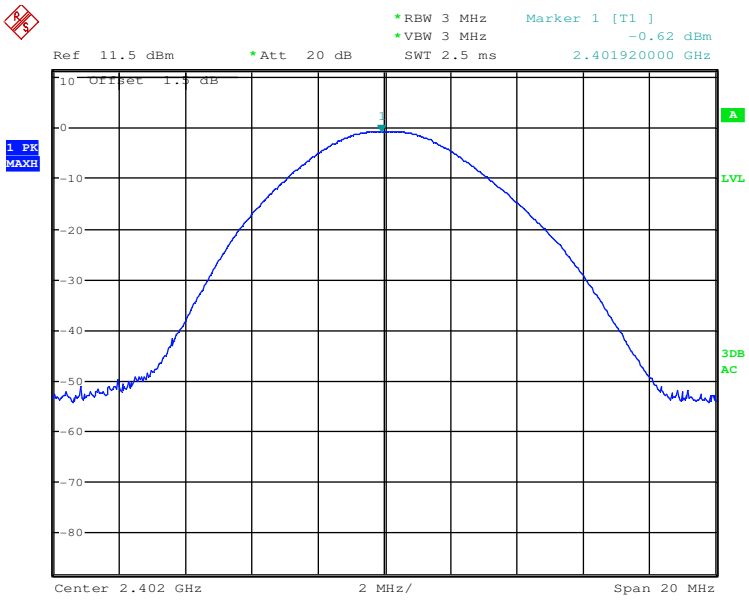
Test mode:	GFSK	Test channel:	Middle



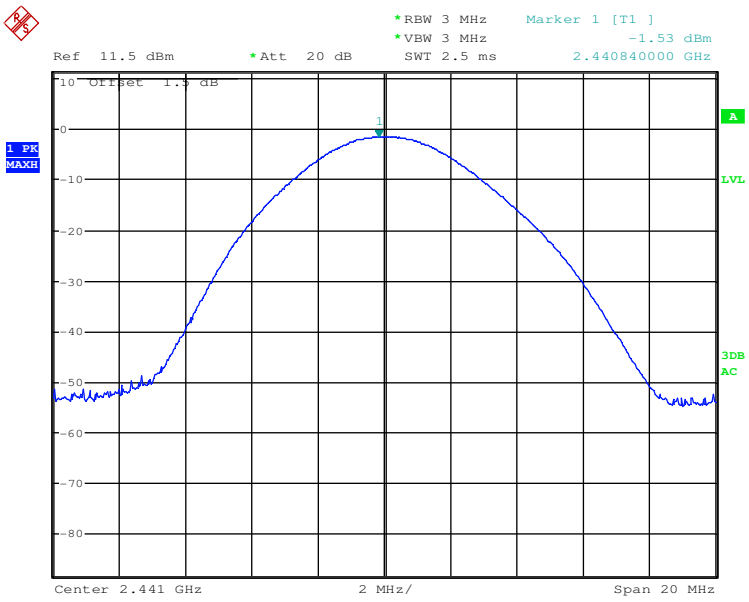
Test mode:	GFSK	Test channel:	Highest



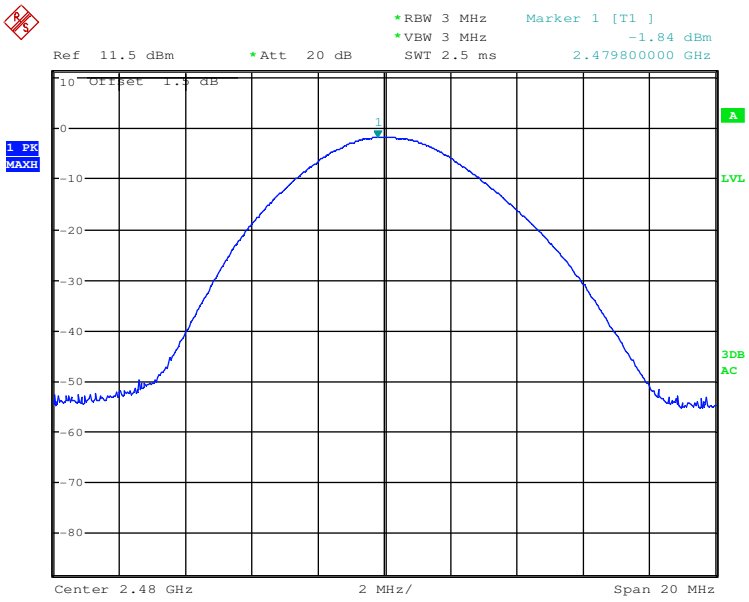
Test mode:	π/4DQPSK	Test channel:	Lowest



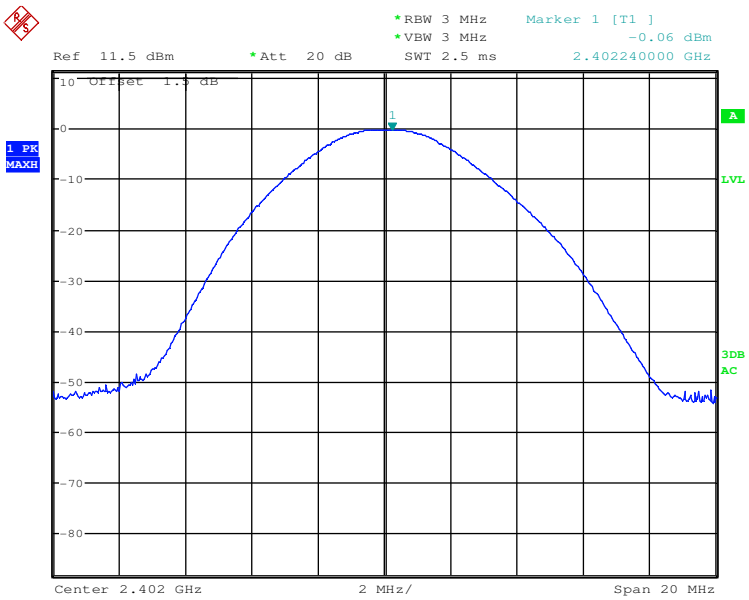
Test mode:	π/4DQPSK	Test channel:	Middle



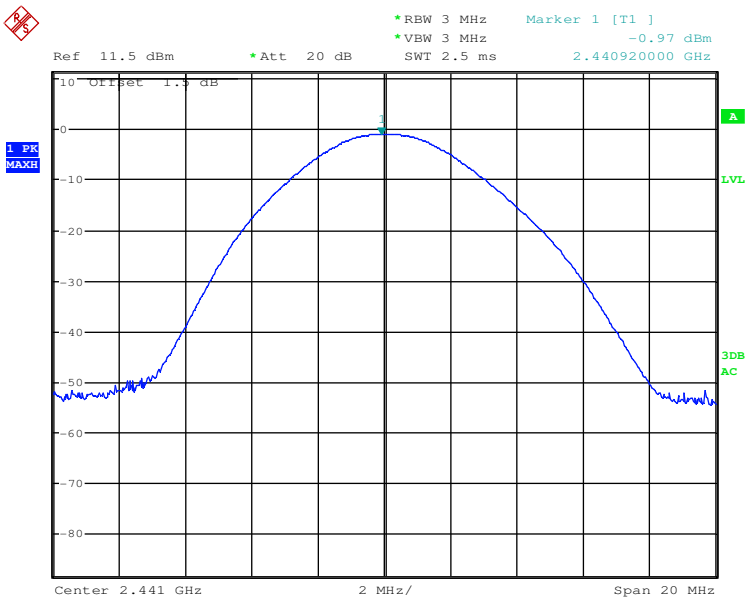
Test mode:	π/4DQPSK	Test channel:	Highest



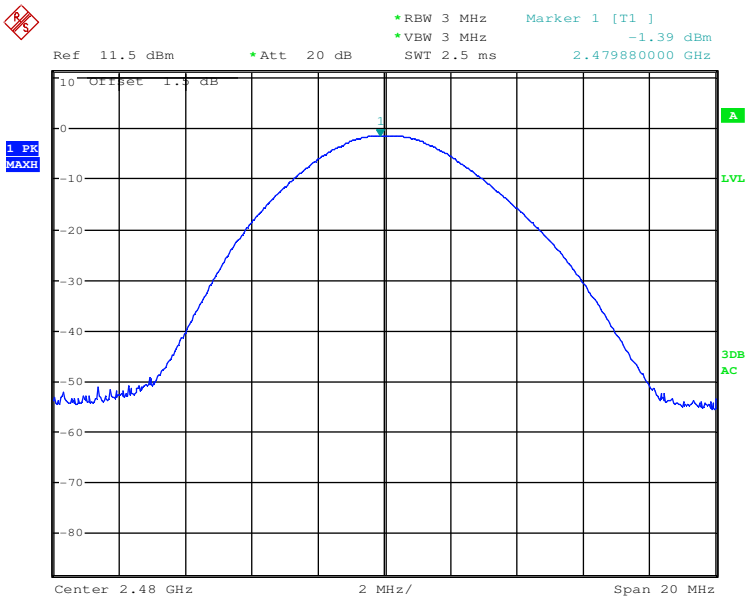
Test mode:	8DPSK	Test channel:	Lowest



Test mode:	8DPSK	Test channel:	Middle



Test mode:	8DPSK	Test channel:	Highest



5.2 Radiated Spurious Emission

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205
Test Method:	ANSI C63.10: 2009
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)

Receiver Setup:

Frequency	Detector	RBW	VBW	Remark
0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak
0.009MHz-0.090MHz	Average	10kHz	30kHz	Average
0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak
0.110MHz-0.490MHz	Average	10kHz	30kHz	Average
0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
30MHz-1GHz	Quasi-peak	100 kHz	300kHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
	Peak	1MHz	10Hz	Average

Limit:

Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
1.705MHz-30MHz	30	-	-	30
30MHz-88MHz	100	40.0	Quasi-peak	3
88MHz-216MHz	150	43.5	Quasi-peak	3
216MHz-960MHz	200	46.0	Quasi-peak	3
960MHz-1GHz	500	54.0	Quasi-peak	3
Above 1GHz	500	54.0	Average	3

Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

Test Setup:	

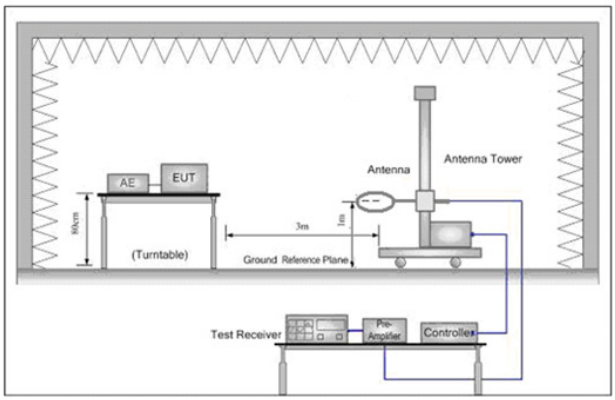


Figure 1. Below 30MHz

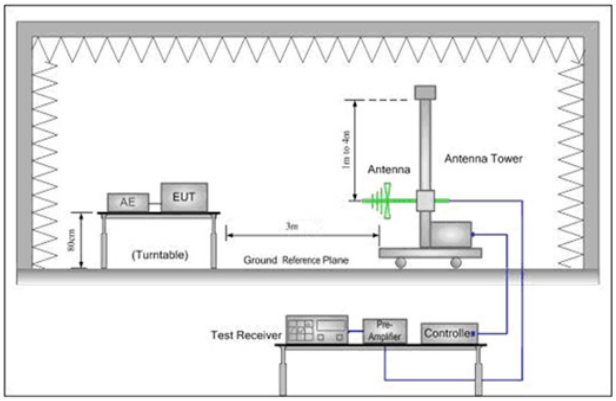


Figure 2. 30MHz to 1GHz

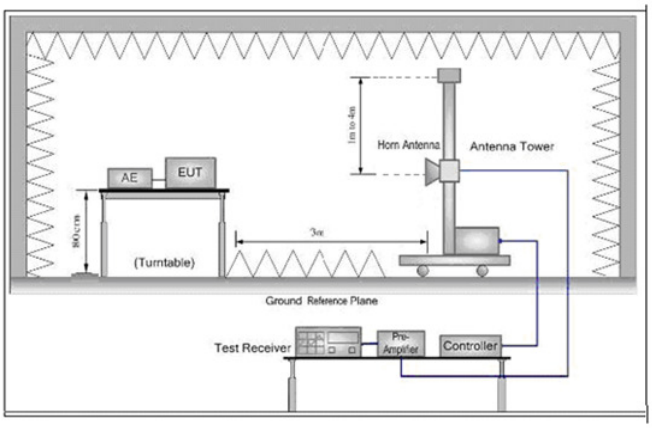


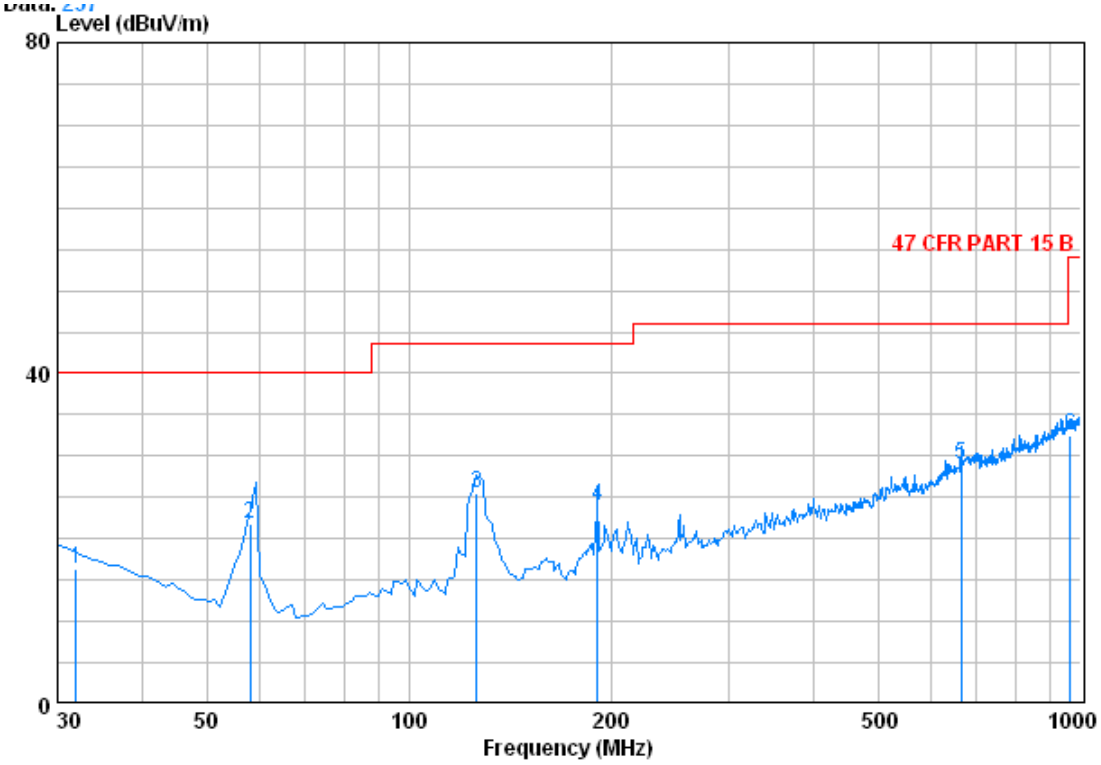
Figure 3. Above 1 GHz

Test Procedure:	a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation. b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB

	margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. g. Test the EUT in the lowest channel (2402MHz),the middle channel (2441MHz),the Highest channel (2480MHz) h. Repeat above procedures until all frequencies measured was complete.
Exploratory Test Mode:	Non-hopping transmitting mode with all kind of modulation and all kind of data type
Final Test Mode:	Through Pre-scan, find the DH1 of date type is the worse case of GFSK modulation type
Instruments Used:	Refer to section 4.10 for details
Test Results:	Pass

5.2.1 Radiated Emission below 1GHz

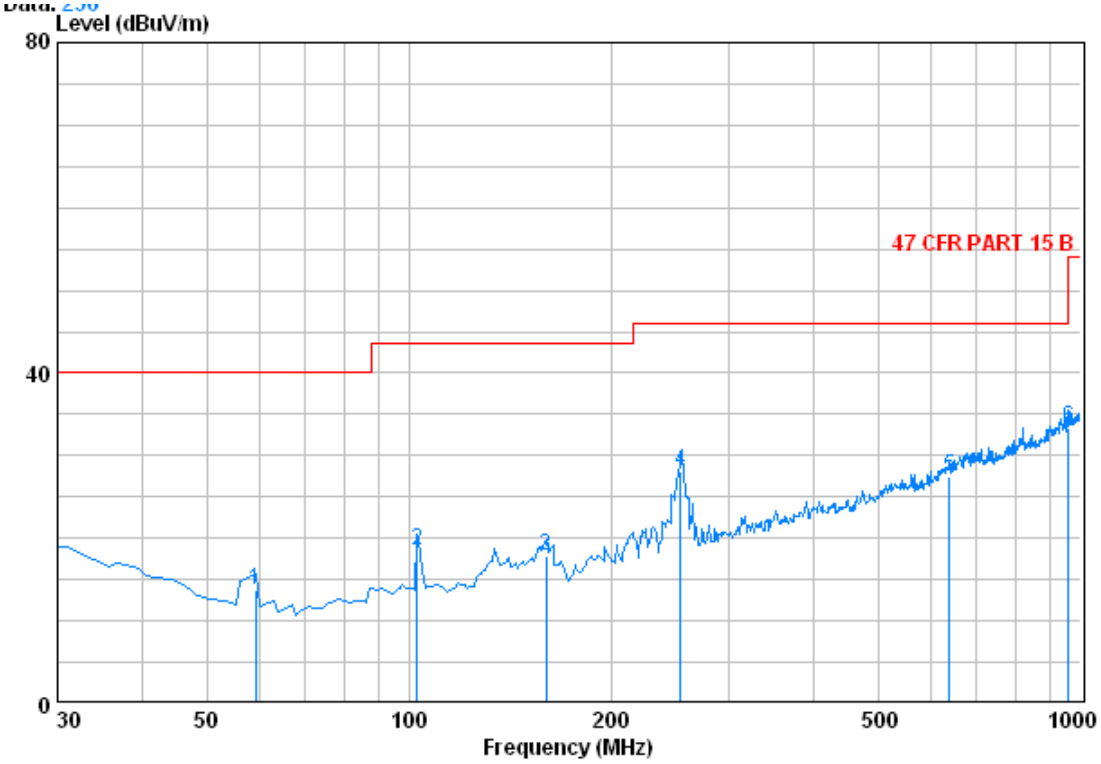
30MHz~1GHz (QP)		
Test mode:	Transmitting	Vertical



Condition : 47 CFR PART 15 B 3m 3142C VERTICAL
Job No. : 5057RF
test mode : Transmitting

	Freq	Cable Loss	Antenna Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	31.940	0.60	14.43	27.35	28.70	16.38	40.00	-23.62
2	58.130	0.80	7.33	27.27	40.91	21.77	40.00	-18.23
3	126.030	1.27	7.77	27.03	43.58	25.59	43.50	-17.91
4	191.020	1.39	10.11	26.73	39.23	23.99	43.50	-19.51
5 @	664.380	2.83	21.08	27.45	32.62	29.07	46.00	-16.93
6	964.110	3.67	23.70	26.47	31.61	32.51	54.00	-21.49

Test mode:	Transmitting	Horizontal



Condition : 47 CFR PART 15 B 3m 3142C HORIZONTAL
Job No. : 5057RF
test mode : Transmitting

	Freq	Cable Loss	Antenna Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	59.100	0.80	7.31	27.27	32.93	13.76	40.00	-26.24
2	102.750	1.21	8.97	27.18	35.49	18.48	43.50	-25.02
3	159.980	1.34	9.60	26.86	33.69	17.77	43.50	-25.73
4 @	254.070	1.69	12.40	26.53	40.58	28.15	46.00	-17.85
5	638.190	2.78	20.55	27.49	31.65	27.50	46.00	-18.50
6	960.230	3.66	23.60	26.51	32.69	33.45	54.00	-20.55

5.2.2 Transmitter Emission above 1GHz

Test mode:	GFSK(DH1)	Test channel:	Lowest	Remark:	Peak

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
3018.502	5.09	33.39	40.31	29.00	27.17	74	-46.83	Vertical
4785.075	7.42	34.73	41.61	45.00	45.54	74	-28.46	Vertical
5747.586	7.86	35.29	41.14	30.00	32.01	74	-41.99	Vertical
6678.987	8.21	36.13	40.33	30.29	34.30	74	-39.70	Vertical
7941.185	9.31	36.00	39.24	29.00	35.07	74	-38.93	Vertical
9465.979	9.66	37.16	37.91	27.40	36.31	74	-37.69	Vertical
3049.394	5.12	33.38	40.34	31.00	29.16	74	-44.84	Horizontal
4785.075	7.42	34.73	41.61	44.52	45.06	74	-28.94	Horizontal
6172.197	8.03	35.90	40.78	30.81	33.96	74	-40.04	Horizontal
7721.909	9.25	36.00	39.43	30.00	35.82	74	-38.18	Horizontal
8441.459	9.46	36.18	38.80	28.00	34.84	74	-39.16	Horizontal
9538.543	9.67	37.23	37.86	27.60	36.64	74	-37.36	Horizontal

Test mode:	GFSK(DH1)	Test channel:	Middle	Remark:	Peak

Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Over limit (dB)	Polarization
3709.691	6.05	33.45	40.83	30.00	28.67	74	-45.33	Vertical
4883.519	7.48	34.59	41.68	43.40	43.79	74	-30.21	Vertical
5850.919	7.91	35.45	41.06	30.01	32.31	74	-41.69	Vertical
6478.053	8.14	36.26	40.51	29.80	33.69	74	-40.31	Vertical
7566.249	9.17	36.00	39.56	30.00	35.61	74	-38.39	Vertical
10036.730	9.88	37.76	37.47	28.00	38.17	74	-35.83	Vertical
3561.636	5.85	33.28	40.72	30.01	28.42	74	-45.58	Horizontal
4883.519	7.48	34.59	41.68	43.00	43.39	74	-30.61	Horizontal
6032.401	7.99	35.74	40.89	30.99	33.83	74	-40.17	Horizontal
6974.358	8.43	35.83	40.08	30.10	34.28	74	-39.72	Horizontal
8527.851	9.49	36.23	38.73	28.49	35.48	74	-38.52	Horizontal
9441.913	9.66	37.14	37.94	27.99	36.85	74	-37.15	Horizontal

Test mode:		GFSK(DH1)		Test channel:	Highest	Remark:		Peak
Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Over limit (dB)	Polarization
3738.129	6.11	33.49	40.84	30.19	28.95	74	-45.05	Vertical
4971.316	7.53	34.43	41.75	31.99	32.20	74	-41.80	Vertical
5674.896	7.83	35.18	41.20	30.09	31.90	74	-42.10	Vertical
6886.154	8.35	35.92	40.15	30.00	34.12	74	-39.88	Vertical
8703.294	9.54	36.36	38.59	28.20	35.51	74	-38.49	Vertical
9370.083	9.65	37.03	37.99	27.61	36.30	74	-37.70	Vertical
3026.195	5.09	33.39	40.33	30.01	28.16	74	-45.84	Horizontal
3973.622	6.43	33.78	41.02	28.20	27.39	74	-46.61	Horizontal
4971.316	7.53	34.43	41.75	32.19	32.40	74	-41.60	Horizontal
6428.771	8.12	36.20	40.55	30.01	33.78	74	-40.22	Horizontal
8441.459	9.46	36.18	38.80	29.00	35.84	74	-38.16	Horizontal
9490.104	9.66	37.18	37.89	26.30	35.25	74	-38.75	Horizontal

Remark:

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
   Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor
2) The disturbance range 9kHz~30MHz and 10GHz~25GHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.
3) As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak measurements were shown in the report.