



SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

588 West Jindu Road, Songjiang District, Shanghai, China

Telephone: +86 (0) 21 6191 5666
Fax: +86 (0) 21 6191 5678
ee.shanghai@sgs.com

Report No.: SHEM130200024001
Page 1 of 40

FCC Part 15C TEST REPORT

Application No. :	SHEM1302000240ME
Applicant:	Andon Health Co., Ltd
FCC ID:	ZRYPO3
Equipment Under Test (EUT): NOTE: The following sample(s) submitted was/were identified on behalf of the client as	
Product Name:	iHealth Pulse Oximeter
Brand Name:	iHealth
Model:	PO3
Added Model:	N/A
Standards:	FCC PART 15 Subpart C: 2011
Date of Receipt:	Feb.22, 2013
Date of Test:	Feb.27, 2013 to Mar.07, 2013
Date of Issue:	Mar.15, 2013
Test Result :	PASS *

*In the configuration tested, the EUT detailed in this report complied with the standards specified above.



Mar. 2013

Tony Wu

E&E Section Manager

SGS-CSTC (Shanghai) Co., Ltd.

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.



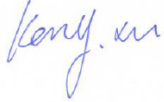
The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only



Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
00	/	Mar.15, 2013	/	Original

Authorized for issue by:				
Engineer		Zenger Zhang _____ Print Name		 _____ Print Name
Clerk		Amy Wang _____ Print Name		 _____ Print Name
Reviewer		Keny Xu _____ Print Name		 _____ Print Name

2 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	FCC Part 15, Subpart C Section 15.203/15.247 (c)	---	PASS
AC Power Line Conducted Emission	FCC Part 15, Subpart C Section 15.207	ANSI C63.10 (2009) Section 6.2	PASS
Minimum 6dB Bandwidth	FCC Part 15, Subpart C Section 15.247 (a)(2)	ANSI C63.10 (2009) Section 6.9	PASS
Conducted Peak Output Power	FCC Part 15, Subpart C Section 15.247 (b)(3)	ANSI C63.10 (2009) Section 6.10	PASS
Power Spectrum Density	FCC Part 15, Subpart C Section 15.247 (e)	ANSI C63.10 (2009) Section 6.11	PASS
RF Conducted Spurious Emissions	FCC Part 15, Subpart C Section 15.247(d)	ANSI C63.10 (2009) Section 7.7.10	PASS
Band-edge for RF Conducted Emissions	FCC Part 15, Subpart C Section 15.247(d)	ANSI C63.10 (2009) Section 7.7.10	PASS
Radiated Spurious emissions	FCC Part 15, Subpart C Section 15.209 and Section 15.205	ANSI C63.10 (2009) Section 6.12	PASS
Radiated Band-edge	FCC Part 15, Subpart C Section 15.205 and Section 15.209	ANSI C63.10 (2009) Section 6.5	PASS



3 Contents

	Page
1 COVER PAGE	1
VERSION	2
2 TEST SUMMARY.....	3
3 CONTENTS	4
4 GENERAL INFORMATION.....	5
4.1 CLIENT INFORMATION	5
4.2 GENERAL DESCRIPTION OF E.U.T.	5
4.3 TECHNICAL SPECIFICATIONS:.....	5
4.4 ACCESSORIES OF PRODUCT:.....	6
4.5 SUPPORT EQUIPMENTS FOR TESTING	6
4.6 DETAILS OF TEST MODE.....	6
4.7 TEST LOCATION	8
4.8 TEST FACILITY.....	8
5 EQUIPMENTS USED DURING TEST.....	9
6 TEST RESULTS.....	11
6.1 E.U.T. TEST CONDITIONS	11
6.2 ANTENNA REQUIREMENT	11
6.3 CONDUCTED EMISSIONS ON MAINS TERMINALS	12
6.4 6dB OCCUPIED BANDWIDTH	16
6.5 CONDUCTED PEAK OUTPUT POWER	19
6.6 PEAK POWER SPECTRAL DENSITY	22
6.7 CONDUCTED SPURIOUS EMISSIONS	25
6.8 CONDUCTED BAND-EDGE	28
6.9 RADIATED SPURIOUS EMISSIONS	30
6.10 BAND EDGE (RADIATED EMISSION)	34
7 TEST SETUP PHOTOGRAPHS.....	40
8 EUT CONSTRUCTIONAL DETAILS.....	40
END.....	44

4 General Information

4.1 Client Information

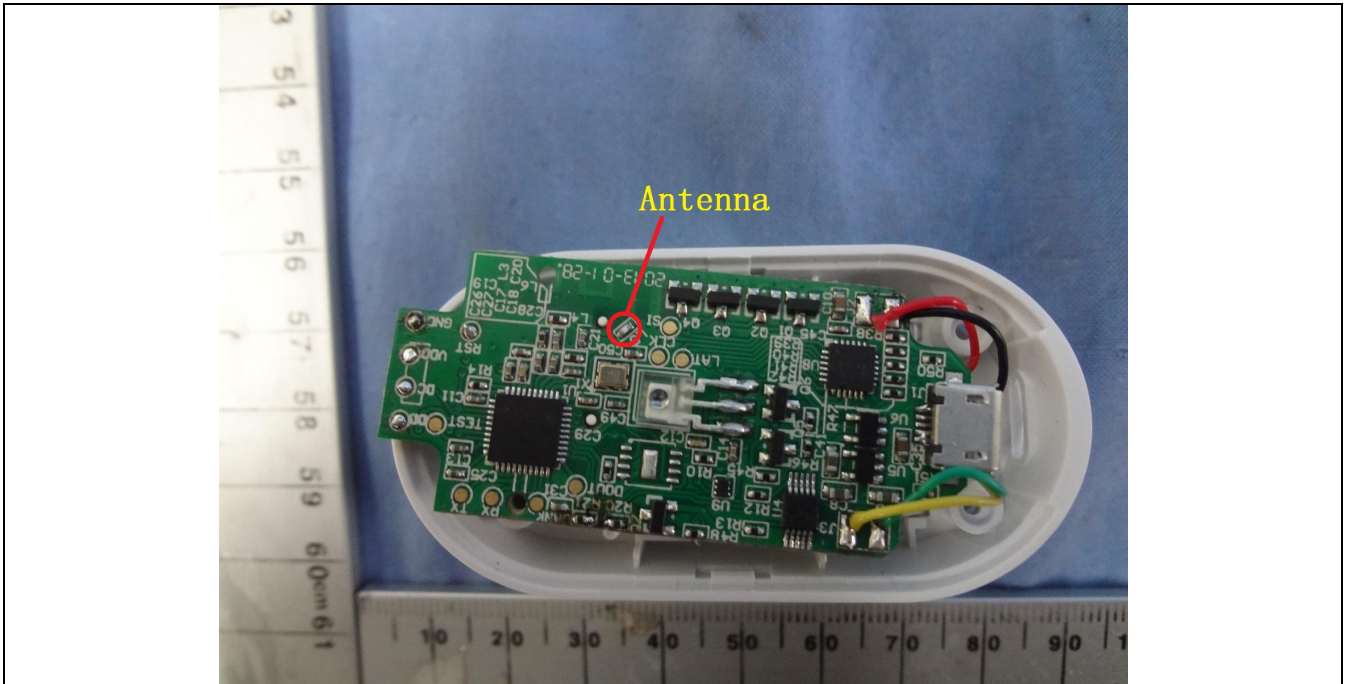
Applicant:	Andon Health Co., Ltd
Address of Applicant:	No. 3 JinPing Street, YaAn Road, Nankai District, Tianjin 300190, China
Manufacturer:	Andon Health Co., Ltd
Address of Manufacturer:	No. 3 JinPing Street, YaAn Road, Nankai District, Tianjin 300190, China
Factory:	Andon Health Co., Ltd

4.2 General Description of E.U.T.

Product Name	iHealth Pulse Oximeter
Brand Name:	iHealth
Model No:	PO3
Added Model:	N/A
Product Description:	Portable production

4.3 Technical Specifications:

Operation Frequency:	2402MHz~2480MHz
Modulation Type:	GFSK
Number of Channel:	40
Power Supply:	Battery supply
Antenna Type	Integral
Antenna Gain	2.00dBi



4.4 Accessories of Product:

Battery:	Battery Type:	Li-on Rechargeable Battery
	Manufacturer:	N/A
	Model No.:	EEMB LP402024
	Technical Spec.:	3.7 V dc, 165 mAh
Charging:	USB Cable	15cm

4.5 Support equipments for Testing

The EUT has been tested independently.

Software name	Manufacturer	Supplied By
SmartRF_Studio	N/A	Client

4.6 Details of Test Mode

Test Mode	Description of Test Mode
Continue transmitting mode:	Keep the EUT continue transmit data from Bluetooth modular.
Normal working mode:	Keep EUT on normal working mode
Charging mode:	The EUT on charging.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only



Test Channel:

Channel	Frequency
The Lowest channel	2402MHz
The Middle channel	2440MHz
The Highest channel	2480MHz

4.7 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.
No.588 West Jindu Road, Songjiang District, Shanghai, China.201612.

Tel: +86 21 6191 5666 Fax: +86 21 6191 5678

4.8 Test Facility

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

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. 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. Date of expiry: 2014-07-26.

- **FCC – Registration No.: 402683**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered and fully described in a report filed with the Federal Communications Commission (FCC). The acceptance letter from the FCC is maintained in our files. Registration No.: 402683, Expiry Date: 2015-02-22.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A. Expiry Date: 2014-09-20.

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-3868 and C-4336 respectively. Date of Registration: 2012-05-29. Date of Expiry: 2015-05-28.

5 Equipments Used during Test

Conducted Emission

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due date
1	EMI test receiver	Rohde & Schwarz	ESCS30	100086	2012-04-13	2013-04-12
2	Line impedance stabilization network (LISN)	SCHWARZBECK	NSLK8127	8127-490	2012-10-15	2013-10-24
3	Line impedance stabilization network (LISN)	ETS	3816/2	00034161	2012-10-15	2013-10-24

Radiated Spurious Emission

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due date
1	EMI test receiver	Rohde & Schwarz	ESU40	100109	2012-06-02	2013-06-01
2	Antenna	SCHWARZBECK	VULB9168	9168-313	2012-10-15	2013-10-24
3	CONTROLLER	INNCO	CO200	474	/	/
4	Antenna	SCHWARZBECK	BBHA9120D	9120D-679	2012-10-15	2013-10-24
5	Antenna	SCHWARZBECK	BBHA9170	9170-373	2012-10-15	2013-10-24
6	Low noise amplifier	LNA6900	TESEQ	71033	2012-10-15	2013-10-24

RF Conducted Test

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due date
1	EMI test receiver	Rohde & Schwarz	ESU40	100109	2012-06-03	2013-06-01
2	Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-679	2012-06-03	2013-06-01
3	Horn Antenna	Rohde & Schwarz	HF906	100284	2012-06-03	2013-06-01
4	ANTENNA	SCHWARZBECK	VULB9168	9168-313	2012-06-03	2013-06-01
5	Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA91703 73	2013-03-15	2014-03-14
6	Ultra broadband antenna	Rohde & Schwarz	HL562	100227	2012-10-09	2013-10-08
7	Atmosphere pressure meter	Shanghai ZhongXuan Electronic Co;Ltd	BY—2009P	--	2012-10-09	2013-10-08
8	CLAMP METER	FLUKE	316	86080010	2012-06-03	2013-06-01
9	Thermo-Hygrometer	ZHICHEN	ZC1-2	01050033	2012-10-09	2013-10-08

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only

11	High-low temperature cabinet	Shanghai YuanZhen	GW2050	--	2012-06-03	2013-06-01
12	Tunable Notch Filter	Wainwright instruments Gmbh	WRCT1800.0/2000.0-0.2/40-5SSK	11	2012-06-03	2013-06-01
13	Tunable Notch Filter	Wainwright instruments Gmbh	WRCT800.0/880.0-0.2/40-5SSK	9	2012-06-03	2013-06-01
14	High pass Filter	FSCW	HP 12/2800-5AA2	19A45-02	2012-06-03	2013-06-01
15	Low noise amplifier	TESEQ	LNA6900	70133	2012-06-03	2013-06-01
16	EMI test receiver	Rohde & Schwarz	ESCS30	100086	2012-06-03	2013-06-01
17	Line impedance stabilization network	SCHWARZBECK	NSLK8127	8127-490	2012-06-03	2013-06-01

6 Test Results

6.1 E.U.T. test conditions

Test Power:	3.7V DC
Requirements:	15.31(e) For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.
Operating Environment:	
Temperature:	20.0 -25.0 °C
Humidity:	35-75 % RH
Atmospheric Pressure:	992 -1020 mbar

6.2 Antenna Requirement

Standard requirement

15.203 requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

EUT Antenna

The antenna is integrated on the main PCB and no consideration of replacement. The gain of the antenna is less than 2.0 dBi.

6.3 Conducted Emissions on Mains Terminals

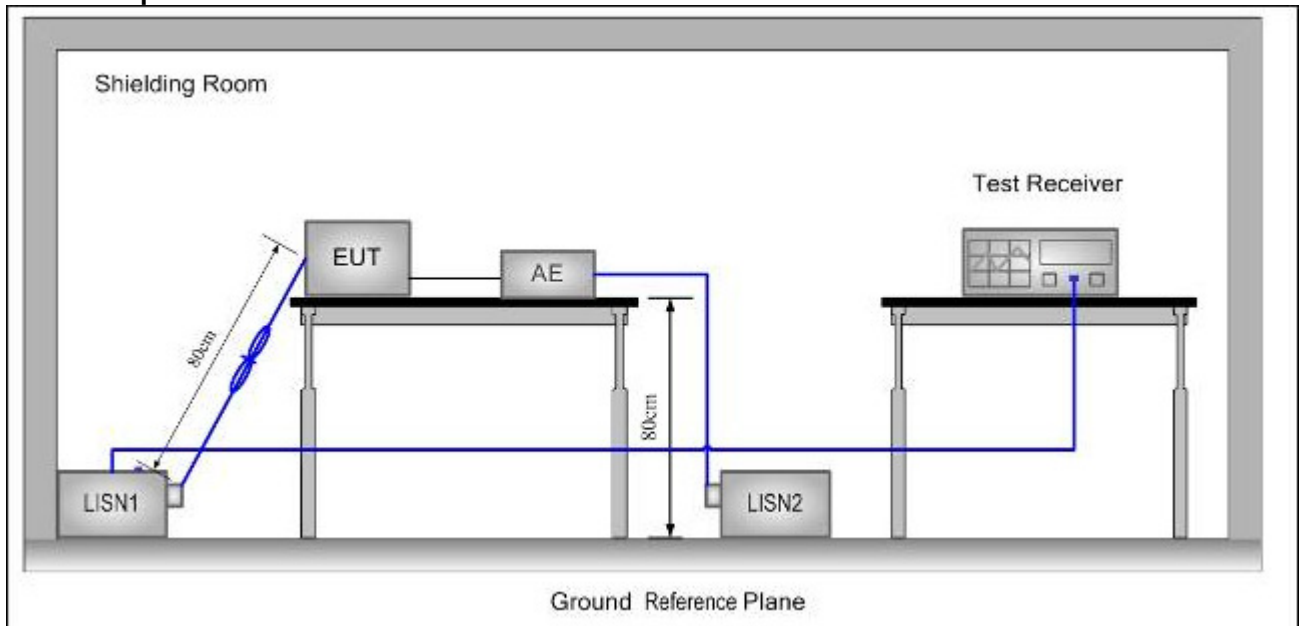
Test Requirement: FCC Part 15C, Section 15.207
Test Method: ANSI C63.10:2009 Section 6.2
Test Date: Mar.01, 2013
Test Result: Pass
Test Voltage: AC 120V 60Hz
Frequency Range: 150 KHz to 30 MHz
Class/Severity: Class B
Test mode: Charging mode

Limit:

Frequency range MHz	Class B Limits dB (µV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Note1: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50MHz.
 Note2: The lower limit is applicable at the transition frequency.

Test Setup and Procedure



1. The mains terminal disturbance voltage was measured with the EUT in a shielded room.
2. The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a $50\Omega/50\mu\text{H} + 5\Omega$ linear impedance. The power cables of all other units of the EUT was connected to a second LISN, which was bonded to the ground reference plane in the same way as the LISN for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded
3. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.
4. The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance was between the closest points of the LISN and the EUT. The mains lead of EUT excess 0.8m was folded back and forth parallel to the lead so as to form a horizontal bundle with a length between 0.3m and 0.4m. All other units of the EUT and associated equipment was at least 0,8 m from the LISN.

Measurement Data

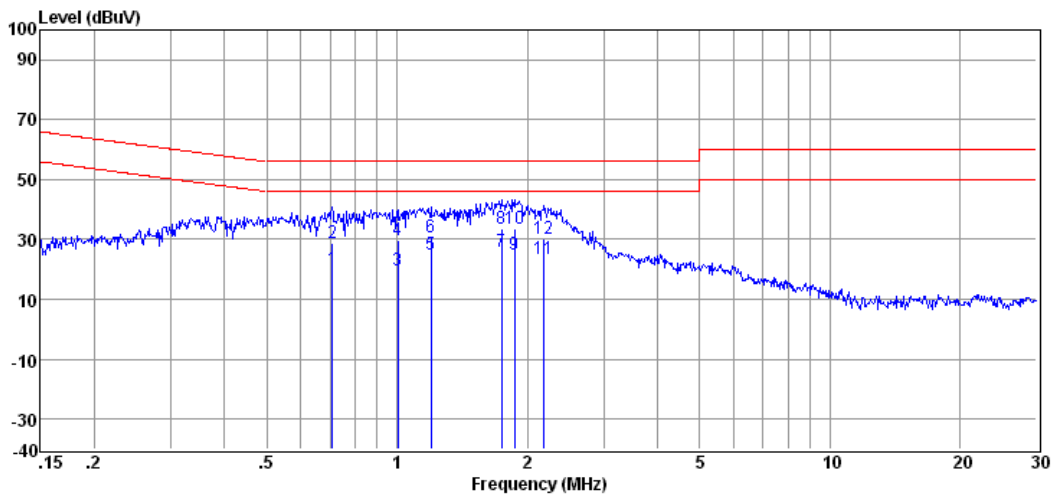
Pre-scan was performed with peak detected on all ports, Quasi-peak & average measurements were performed at the frequencies at which maximum peak emission level were detected.

Please see the attached Quasi-peak and Average test results.

Level = Read Level + LISN/ISN Factor + Cable Loss.

Test Mode: Charging mode

Test Port: AC Live Line



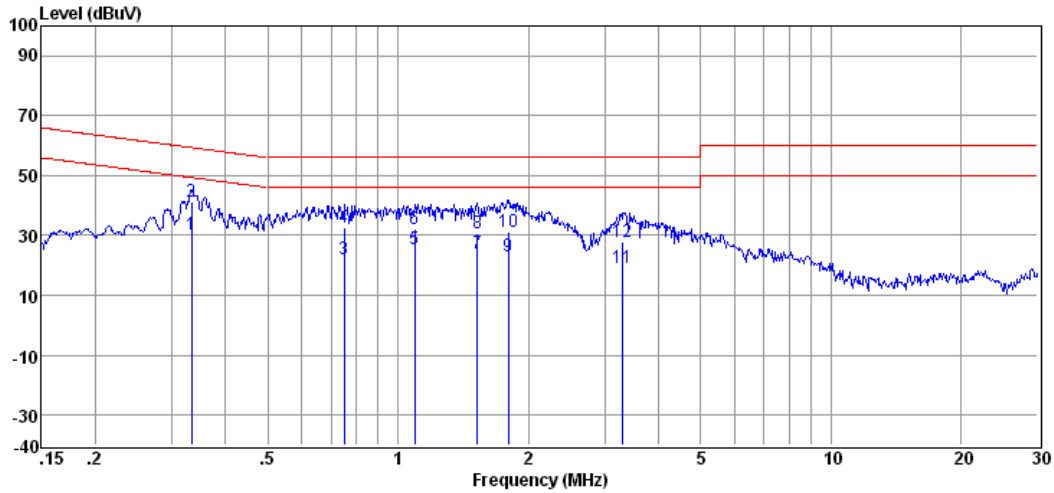
Item	Freq.	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBμV)	(dB)	(dB)	(dBμV)	(dBμV)	(dB)	
1	0.708	19.73	0.20	0.10	20.03	46.00	-25.97	Average
2	0.708	28.40	0.20	0.10	28.70	56.00	-27.30	QP
3	1.005	19.28	0.20	0.10	19.58	46.00	-26.42	Average
4	1.005	29.41	0.20	0.10	29.71	56.00	-26.29	QP
5	1.197	24.63	0.22	0.10	24.95	46.00	-21.05	Average
6	1.197	30.19	0.22	0.10	30.51	56.00	-25.49	QP
7	1.744	25.63	0.27	0.10	26.00	46.00	-20.00	Average
8	1.744	33.18	0.27	0.10	33.55	56.00	-22.45	QP
9	1.868	24.59	0.29	0.10	24.98	46.00	-21.02	Average
10	1.868	33.36	0.29	0.10	33.75	56.00	-22.25	QP
11	2.190	22.95	0.30	0.11	23.36	46.00	-22.64	Average
12	2.190	29.72	0.30	0.11	30.13	56.00	-25.87	QP

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only



Test Mode: Charging mode

Test Port: Neutral Line:



Item	Freq.	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBμV)	(dB)	(dB)	(dBμV)	(dBμV)	(dB)	
1	0.334	29.93	0.14	0.10	30.17	49.35	-19.18	Average
2	0.334	41.10	0.14	0.10	41.34	59.35	-18.01	QP
3	0.751	21.97	0.20	0.10	22.27	46.00	-23.73	Average
4	0.751	32.23	0.20	0.10	32.53	56.00	-23.47	QP
5	1.094	25.14	0.21	0.10	25.45	46.00	-20.55	Average
6	1.094	31.84	0.21	0.10	32.15	56.00	-23.85	QP
7	1.527	23.84	0.25	0.10	24.19	46.00	-21.81	Average
8	1.527	30.37	0.25	0.10	30.72	56.00	-25.28	QP
9	1.800	22.85	0.28	0.10	23.23	46.00	-22.77	Average
10	1.800	30.71	0.28	0.10	31.09	56.00	-24.91	QP
11	3.310	18.69	0.30	0.14	19.13	46.00	-26.87	Average
12	3.310	27.63	0.30	0.14	28.07	56.00	-27.93	QP

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only

6.4 6dB Occupied Bandwidth

Test Requirement: FCC Part 15 C Section 15.247 (a)(2)
Test Method: ANSI C63.10 (2009) Section 6.9
Test Date: Mar.06, 2013
Test Result: Pass
Final Test Mode: The EUT on continue transmitting mode with GFSK.
Limit: ≥ 500 kHz

Test Procedure:

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW=100KHz, VBW =3* RBW, Span=30/50MHz, Sweep=auto
4. Mark the peak frequency and -6dB (upper and lower) frequency.
5. Repeat above procedures until all frequency measured were complete.

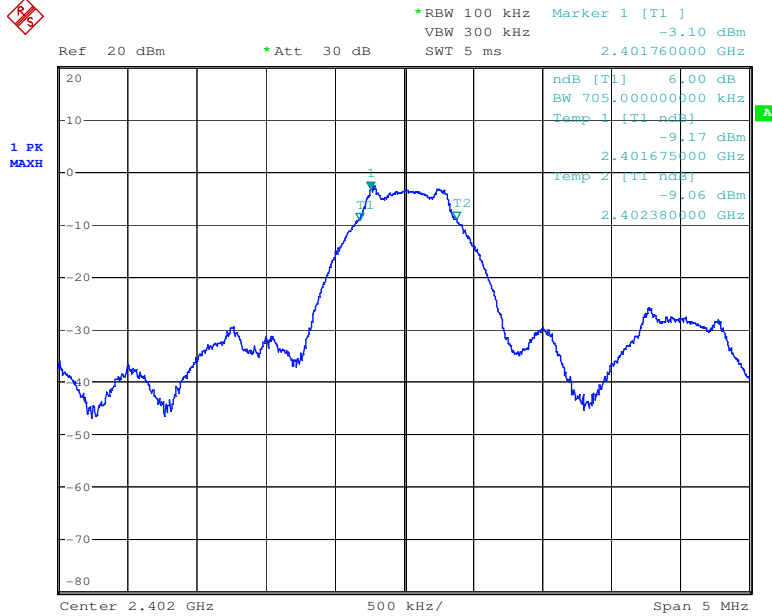
Test date

EUT Mode	Test Channel	6dB Occupy Bandwidth (kHz)	Limit (kHz)	Results
GFSK	Low	705	500	Pass
	Middle	690	500	Pass
	High	680	500	Pass



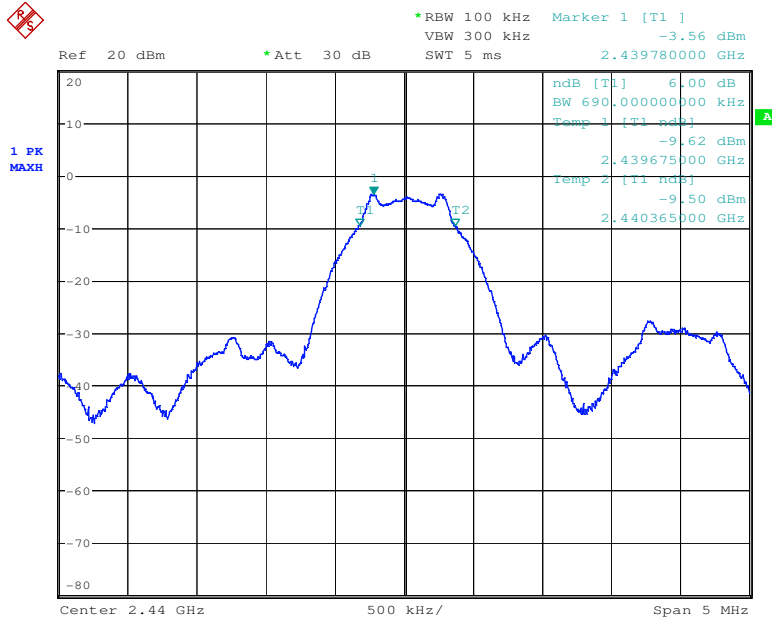
Test plot as follows:

Test mode:	GFSK	Test channel:	Lowest
------------	------	---------------	--------



Date: 27.FEB.2013 18:22:07

Test mode:	GFSK	Test channel:	Middle
------------	------	---------------	--------

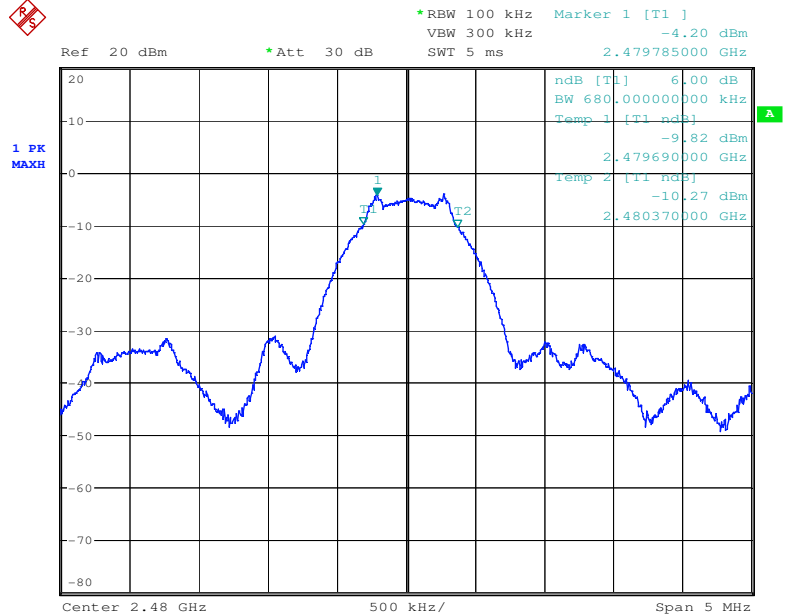


Date: 27.FEB.2013 18:21:26

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only



Test mode:	GFSK	Test channel:	Highest
------------	------	---------------	---------

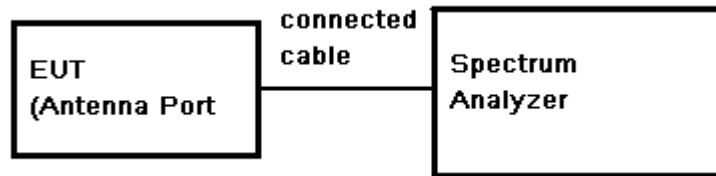


Date: 27.FEB.2013 18:22:44

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only

6.5 Conducted Peak Output Power

Test Requirement: FCC Part 15.247 Section 15.247(b)(1)
Test Method: ANSI C63.10 (2009) Section 6.10
Test Date: Feb.27, 2013
Test Result: Pass
Test Limit: 30dBm
Final Test Mode: The EUT on continue transmitting mode with GFSK.
Test Configuration:



Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 3 MHz. VBW = 10 MHz. Sweep = auto; Detector Function = Peak.
3. Keep the EUT in transmitting at lowest, middle and highest channel individually. Record the max value.

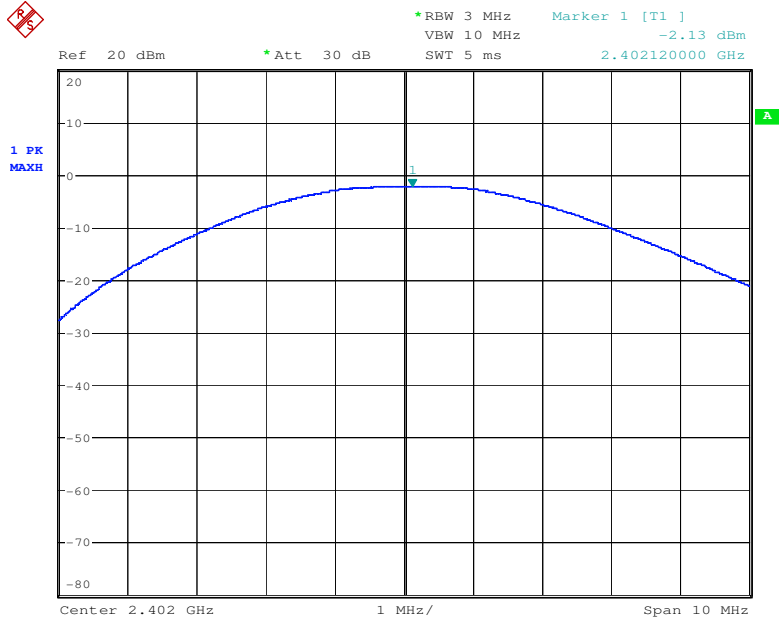
Test Results record:

Test Channel	Modulation	Fundamental Frequency (MHz)	Reading Power (dBm)	Cable Loss (dB)	Output Power		Limit (dBm)	Margin (dB)
					(dBm)	(mW)		
Lowest	GFSK	2402	-2.13	1.2	-0.93	0.81	30	30.93
Middle	GFSK	2441	-2.92	1.2	-1.72	0.67	30	31.72
Highest	GFSK	2480	-3.65	1.2	-2.45	0.57	30	32.45



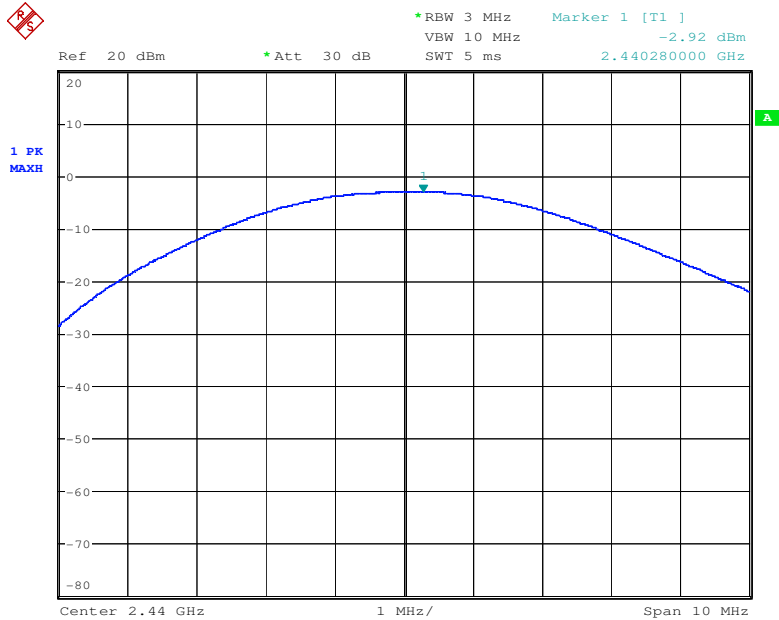
Test result plot as follows:

Test mode:	GFSK	Test channel:	Lowest
------------	------	---------------	--------



Date: 27.FEB.2013 18:35:56

Test mode:	GFSK	Test channel:	Middle
------------	------	---------------	--------

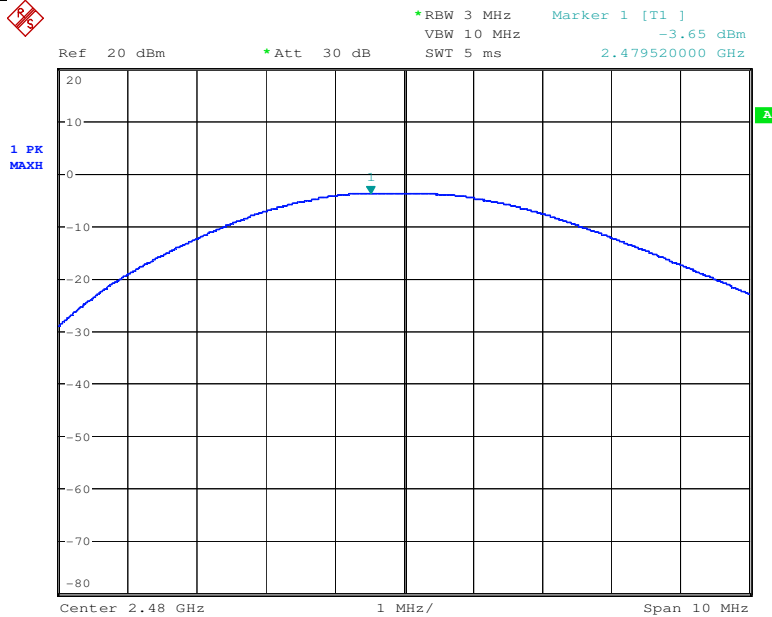


Date: 27.FEB.2013 18:34:54

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only



Test mode:	GFSK	Test channel:	Highest
------------	------	---------------	---------



Date: 27.FEB.2013 18:26:48

6.6 Peak Power Spectral Density

Test Requirement:	FCC Part 15, Subpart C Section 15.247 (e)
Test Method:	ANSI C63.10,2009 Section 6.11.2
Test Date:	Feb.27, 2013
Test Result:	Pass
Test Limit:	8dBm/3kHz
Final Test Mode:	The EUT on continue transmitting mode with GFSK.
Measurement Procedure:	<ol style="list-style-type: none"> 1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum. 2. Set the spectrum analyzer: Center Frequency= Channel Frequency, RBW = 3kHz VBW = 10kHz. Span= fully encompass the bandwidth, Sweep = auto; Detector Function = Peak Trace mode=max hold, 3. Set MKR=Center Frequency, Trace=Clear Write. 4. Adjust the Span = 300kHz, Sweep Time=100s, Trace=Max Hold, MKR=Peak Search. 5. Record the marker level for the particular mode. 6. Repeat these steps for other channel and device modes.

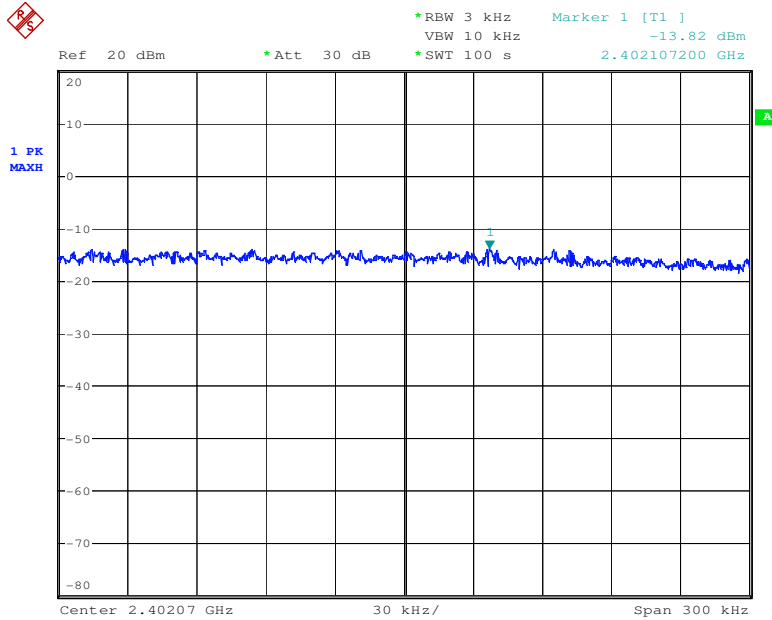
Test Results record:

Test mode	Channel	Reading (dBm)	Cable Loss (dB)	RF Power Density (dBm)	Peak Power Limit (dBm)	Result
GFSK	Low	-13.82	1.2	-12.62	8	PASS
	Mid	-14.72	1.2	-13.52	8	PASS
	High	-15.10	1.2	-13.90	8	PASS



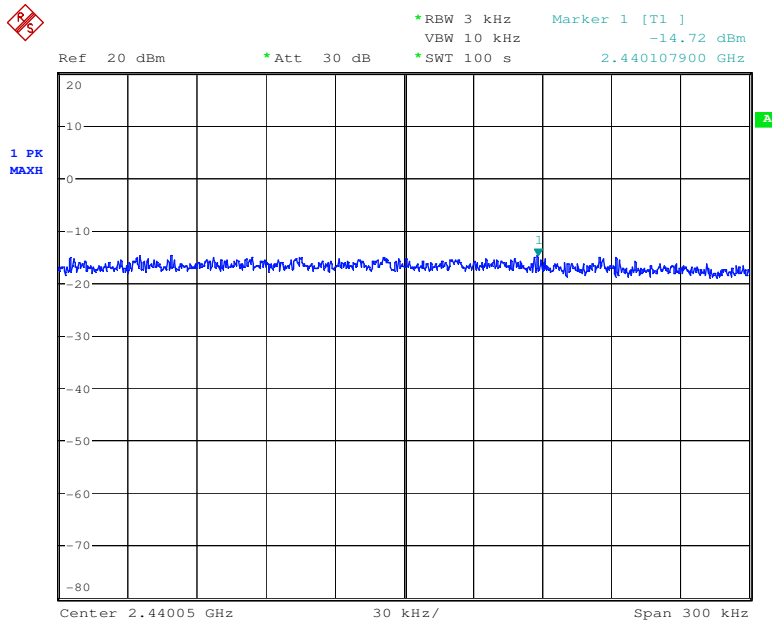
Test plot as follows:

Test mode:	GFSK	Test channel:	Lowest
------------	------	---------------	--------



Date: 27.FEB.2013 19:06:23

Test mode:	GFSK	Test channel:	Middle
------------	------	---------------	--------

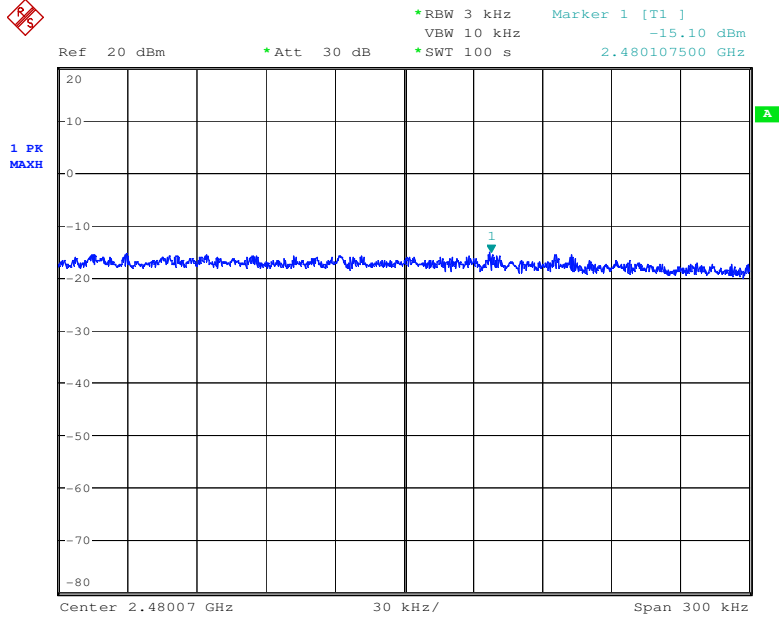


Date: 27.FEB.2013 18:52:43

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only



Test mode:	GSFK	Test channel:	Highest
------------	------	---------------	---------



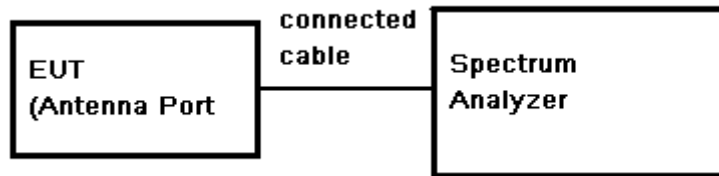
Date: 27.FEB.2013 18:57:21

6.7 Conducted Spurious Emissions

Test Requirement: FCC Part 15 Section 15.247(d)
Test Method: ANSI C63.10:2009 Clause 7.7.10
Test Date: Feb.27, 2013
Test Result: Pass
Limit: (d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating. the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power. based on either an RF conducted or a radiated measurement. provided the transmitter demonstrates compliance with the peak conducted power limits.

Final Test Mode: The EUT on continue transmitting mode with GFSK.

Test Configuration:



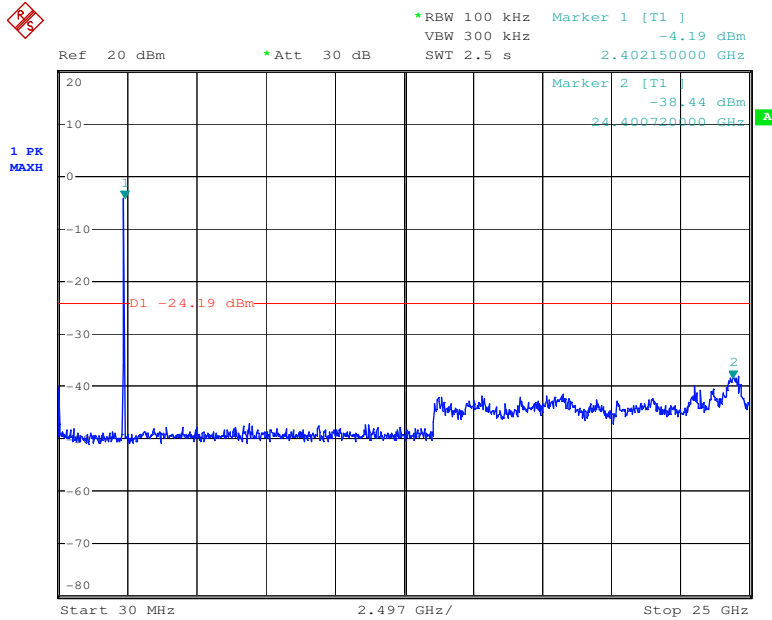
Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 100KHz. VBW >= RBW. Sweep = auto; Detector Function = Peak (Max. hold).



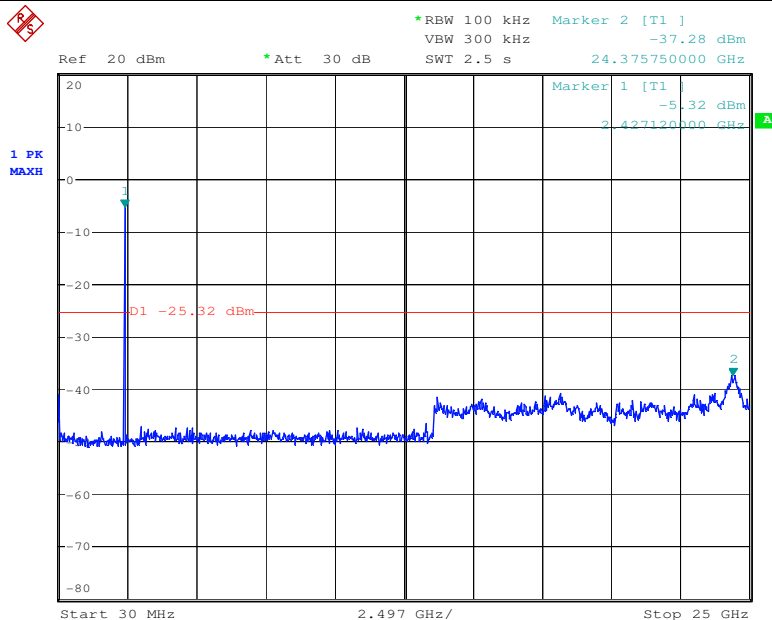
Test plot as follows:

Test mode:	GFSK	Test channel:	Lowest
------------	------	---------------	--------



Date: 27.FEB.2013 16:54:08

Test mode:	GFSK	Test channel:	Middle
------------	------	---------------	--------

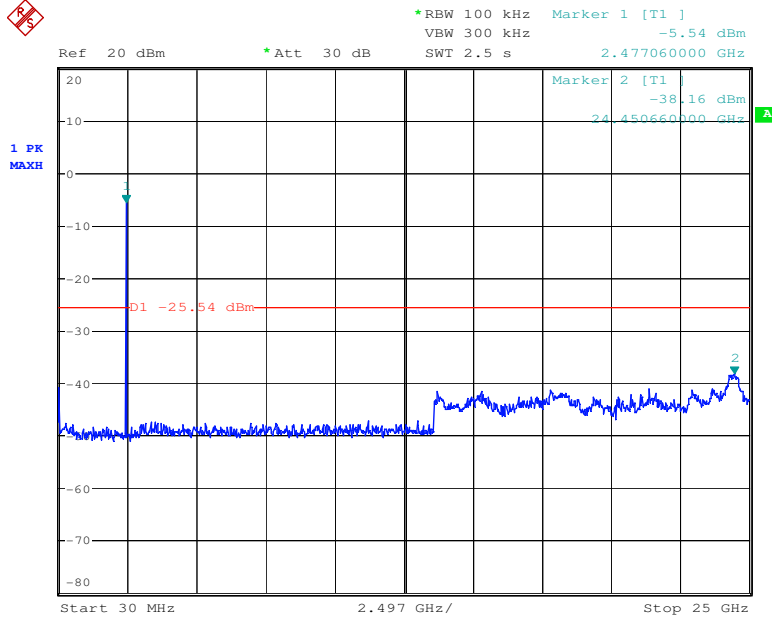


Date: 27.FEB.2013 16:55:19

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only



Test mode:	GFSK	Test channel:	Highest
------------	------	---------------	---------



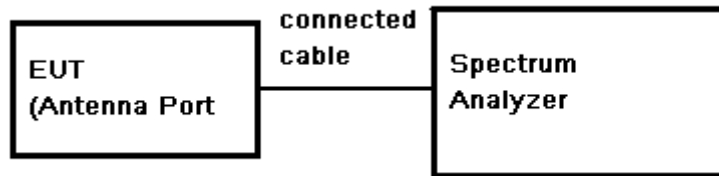
Date: 27.FEB.2013 16:57:40

6.8 Conducted Band-edge

Test Requirement: FCC Part 15 Section 15.247(d)
Test Method: ANSI C63.10:2009 Clause 7.7.10
Test Date: Feb.27, 2013
Test Result: Pass
Limit: (d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

Final Test Mode: The EUT on continue transmitting mode with GFSK.

Test Configuration:



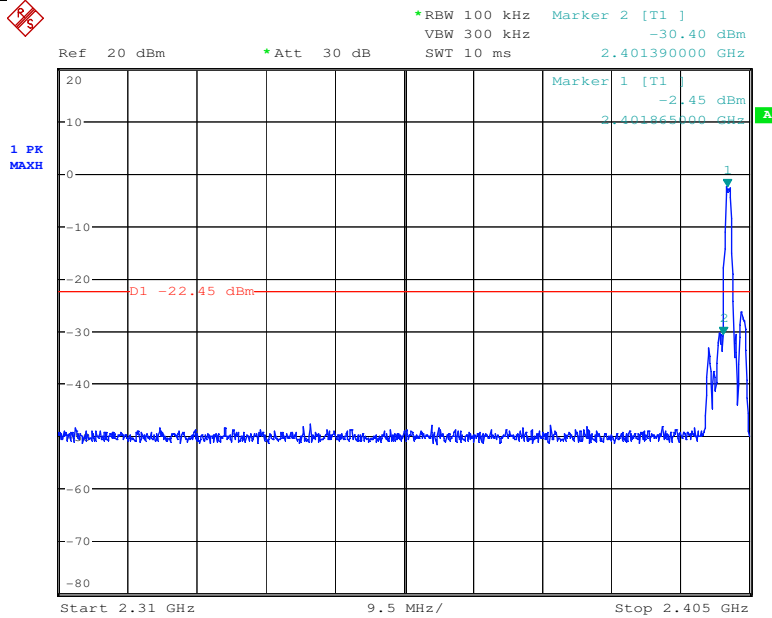
Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 100KHz. VBW >= RBW. Sweep = auto; Detector Function = Peak (Max. hold).



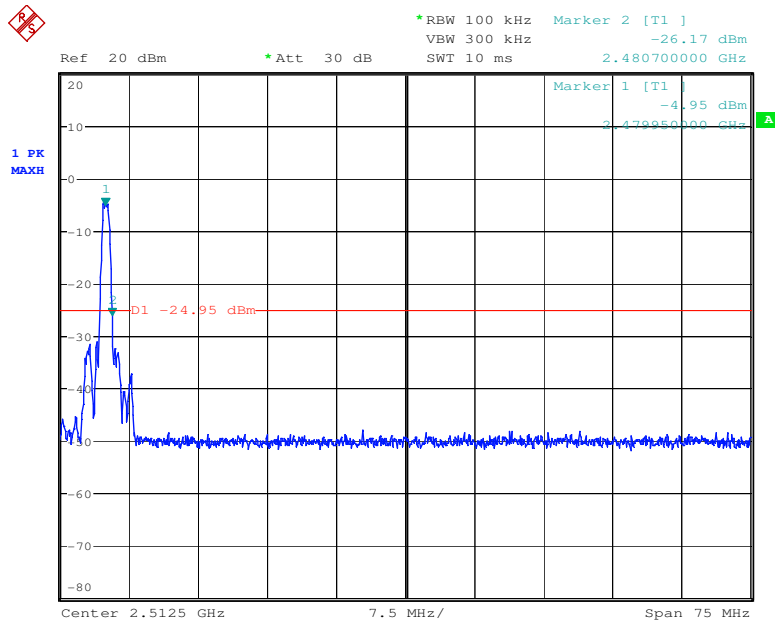
Test plot as follows:

Test mode:	GFSK	Test channel:	Lowest
------------	------	---------------	--------



Date: 27.FEB.2013 16:38:13

Test mode:	GFSK	Test channel:	Highest
------------	------	---------------	---------



Date: 27.FEB.2013 16:44:27

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only

6.9 Radiated Spurious Emissions

Test Requirement:	FCC Part 15 Section 15.209 and Section 15.205
Test Method:	ANSI C63.10:2009 Clause 6.12
Test Date:	Feb.27, 2013
Test Result:	Pass
Final Test Mode:	The EUT on continue transmitting mode with GFSK.
Test site/setup:	Measurement Distance: 3m (Semi-Anechoic Chamber) Test instrumentation resolution bandwidth 120 kHz and Quasi-Peak detector applies (30 MHz - 1000 MHz). For PK value: RBW = 1 MHz for $f \geq 1$ GHz VBW \geq RBW; Sweep = auto Detector function = peak Trace = max hold For AV value: RBW = 1 MHz for $f \geq 1$ GHz VBW = 10Hz; Sweep = auto Detector function = peak Trace = max hold Receive antenna scan height 1 m - 4 m. polarization Vertical / Horizontal
15.209 Limit:	40.0 dB μ V/m between 30MHz & 88MHz 43.5 dB μ V/m between 88MHz & 216MHz 46.0 dB μ V/m between 216MHz & 960MHz 54.0 dB μ V/m above 960MHz

Test Configuration:

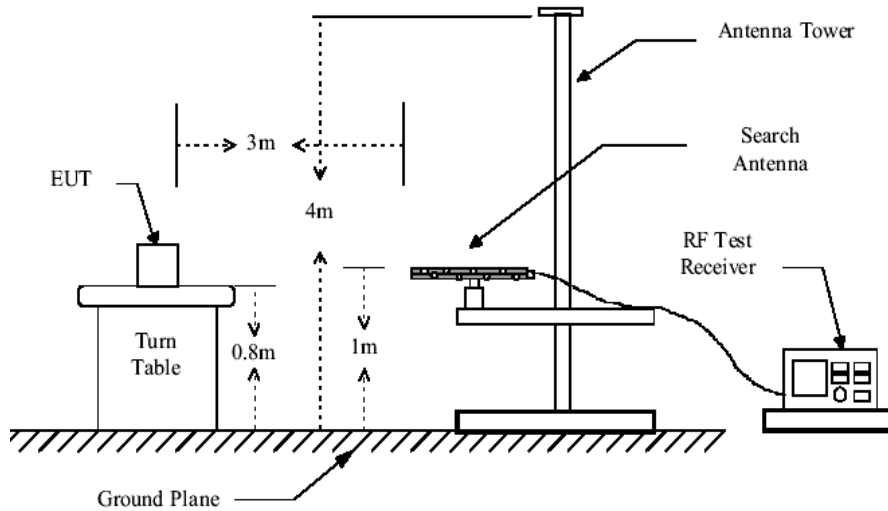


Figure 1. 30MHz to 1GHz radiated emissions test configuration

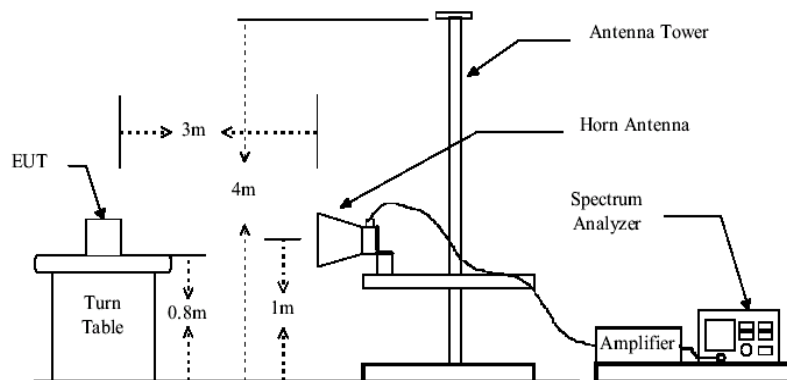


Figure 2. Above 1GHz radiated emissions test configuration

Test Procedure:

The procedure used was ANSI Standard C63.10:2009. The receiver was scanned from 30MHz to 25GHz. When an emission was found, the table was rotated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. The worst case emissions were reported.

Low noise amplifier was used below 1GHz, High pass Filter was used above 3GHz.

Between 1G and 3GHz, we did not use any amplifier or filter.

Test were performed for three spatial orthogonal (X, Y, Z), the worst test data (X orthogonal) was submitted.

1) For this intentional radiator operates below 25 GHz. the spectrum shall be investigated to the tenth harmonic of the highest fundamental frequency. And above the third harmonic of this intentional radiator, the disturbance is very low. So the test result only displays to 5rd harmonic.

As shown in Section, for frequencies above 1000 MHz. the above 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.

The test only perform the EUT in transmitting status since the test frequencies were over 1GHz only required transmitting status.

Test data as follows:

Test Antenna: Horizontal

Test Channel: Low

MK.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Margin (dB)
1	1787.250	46.68	Peak	-8.81	37.87	54.00	16.13
2	4807.000	49.13	Peak	-0.61	48.97	54.00	5.03
3	7932.500	39.43	Peak	7.74	47.17	54.00	6.83
4	9542.250	37.97	Peak	11.84	49.81	54.00	4.19

Note: The Peak Emission is below the Average Limit, so the Average Emission doesn't need to be test.

Test Antenna: Vertical

Test Channel: Low

MK.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Margin (dB)
1	4807.000	51.45	Peak	-0.61	51.29	54.00	2.71
2	7768.000	39.38	Peak	7.74	47.12	54.00	6.88
3	9859.500	37.89	Peak	11.38	49.27	54.00	4.73

Note: The Peak Emission is below the Average Limit, so the Average Emission doesn't need to be test.

Test Antenna: Horizontal

Test Channel: Middle

MK.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Margin (dB)
1	1963.500	46.29	Peak	-7.42	38.87	54.00	15.13
2	4877.500	43.69	Peak	0.12	43.81	54.00	10.19
3	7321.500	40.05	Peak	6.82	46.87	54.00	7.13
4	9530.500	37.40	Peak	11.86	49.26	54.00	4.74

Note: The Peak Emission is below the Average Limit, so the Average Emission doesn't need to be test.

Test Antenna: Vertical

Test Channel: Middle

MK.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Margin (dB)
1	1987.000	50.58	Peak	-7.23	43.35	54.00	10.65
2	4877.500	45.73	Peak	0.12	45.85	54.00	8.15
3	7603.500	40.15	Peak	7.73	47.88	54.00	6.12
4	9530.500	38.15	Peak	11.86	50.01	54.00	3.99

Note: The Peak Emission is below the Average Limit, so the Average Emission doesn't need to be test.

Test Antenna: Horizontal

Test Channel: High

MK.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Margin (dB)
1	1810.750	48.03	Peak	-8.63	39.40	54.00	14.60
2	4959.750	43.70	Peak	0.45	44.15	54.00	9.85
3	7439.000	41.98	Peak	7.42	49.40	54.00	4.60
4	9448.250	38.63	Peak	11.71	50.34	54.00	3.66

Note: The Peak Emission is below the Average Limit, so the Average Emission doesn't need to be test.

Test Antenna: Vertical

Test Channel: High

MK.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Margin (dB)
1	1951.750	54.73	Peak	-7.51	47.22	54.00	6.78
2	4959.750	45.28	Peak	0.45	45.73	54.00	8.27
3	7803.250	39.46	Peak	7.73	47.19	54.00	6.81
4	9589.250	37.59	Peak	11.78	49.37	54.00	4.63

Note: The Peak Emission is below the Average Limit, so the Average Emission doesn't need to be test.

Remark: No other radiation has been found.

Test Level =Receiver Reading + Corrected factor(Antenna Factor + Cable Loss –Preamplifier Factor).

Remark: No any other emissions level which are attenuated less than 20dB below the limit.

According to 15.31(o), The amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this Part. Hence there no other emissions have been reported.

6.10 Band edge (Radiated Emission)

Test Requirement:	Section 15.247(d) In addition, radiated emissions which fall in the restricted bands. as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c).
Test Method:	ANSI 63.10:2009 Clause 6.12
Test Date:	Feb.27, 2013
Test Result:	Pass
Measurement Distance:	3m (Semi-Anechoic Chamber)
Limit:	40.0 dB μ V/m between 30MHz & 88MHz; 43.5 dB μ V/m between 88MHz & 216MHz; 46.0 dB μ V/m between 216MHz & 960MHz; 54.0 dB μ V/m above 960MHz.
Detector:	For PK value: RBW = 1 MHz for $f \geq 1$ GHz VBW \geq RBW; Sweep = auto Detector function = peak Trace = max hold For AV value: RBW = 1 MHz for $f \geq 1$ GHz VBW =10Hz; Sweep = auto Detector function = peak Trace = max hold

According to section,15.35(b) for frequencies above 1000 MHz. the above 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.

Pre-test were performed for there spatial orthogonal(X, Y, Z), the worst test data (X orthogonal) was submitted.

Test Result: The EUT does meet the FCC requirements.

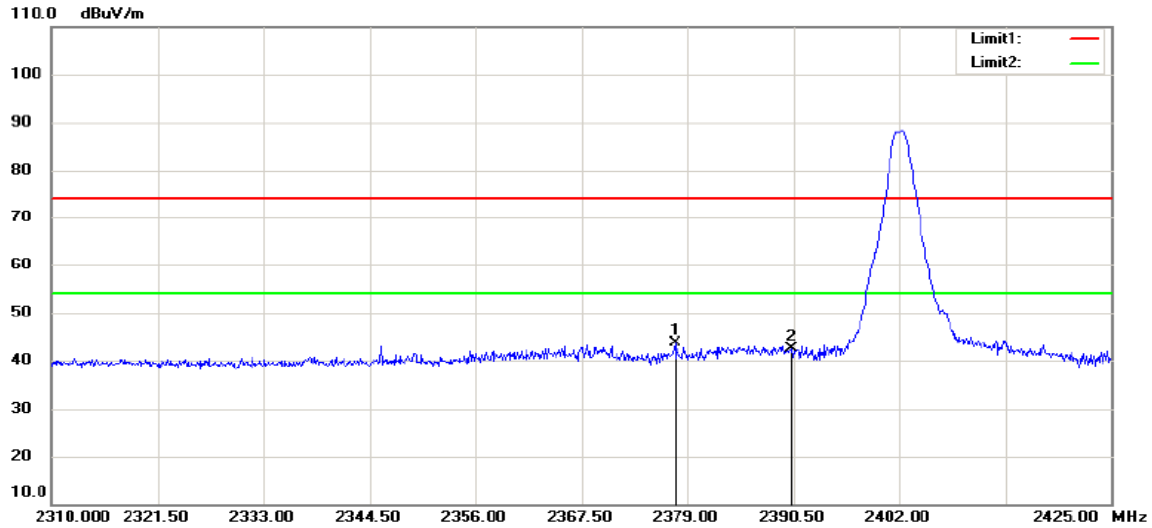


Measurement Result:

CH Low 2402MHz Radiated Bandage

Modulation: GFSK

Horizontal:

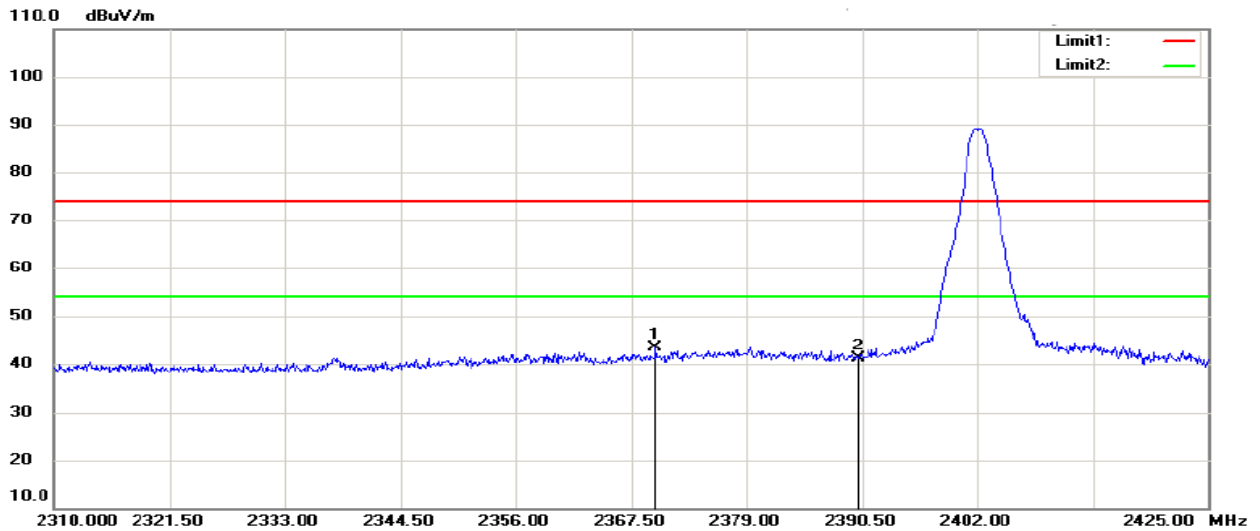


MK.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Margin (dB)
1	2377.620	50.08	Peak	-6.57	43.51	54.00	10.49
2	2390.270	48.88	Peak	-6.55	42.33	54.00	11.67

Note: The Peak Emission is below the Average Limit, so the Average Emission doesn't need to be test.



Vertical:



MK.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Margin (dB)
1	2369.915	50.01	Peak	-6.58	43.43	54.00	10.57
2	2390.155	47.73	Peak	-6.55	41.18	54.00	12.82

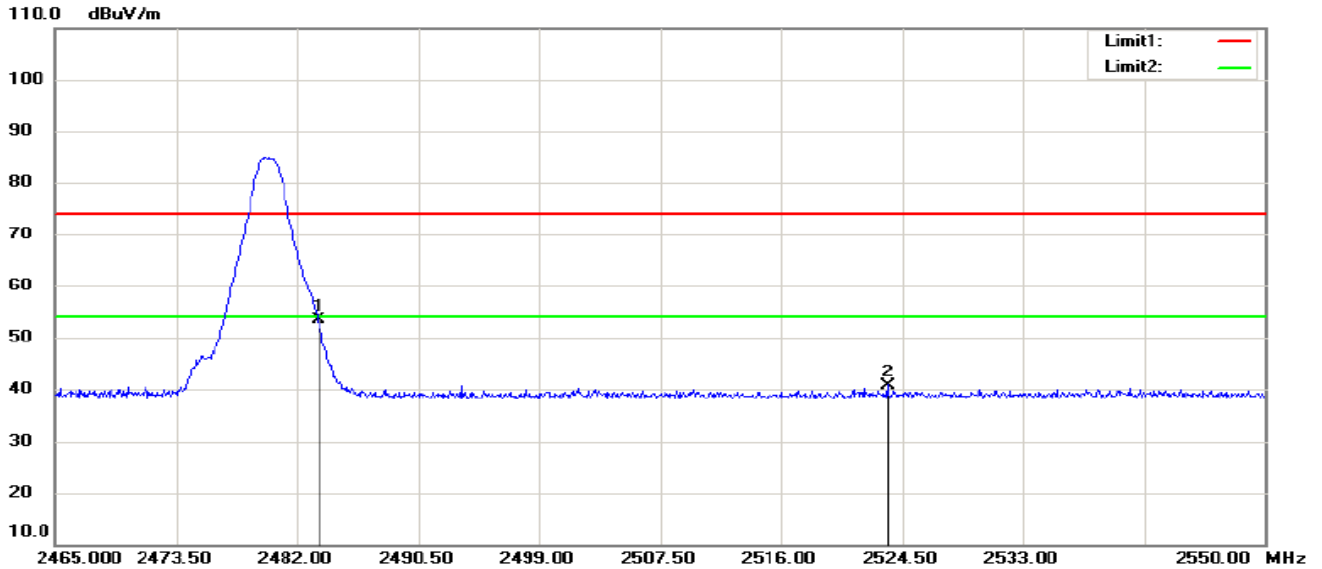
Note: The Peak Emission is below the Average Limit, so the Average Emission doesn't need to be test.



CH Low 2480MHz Radiated Bandedge

Modulation: GFSK

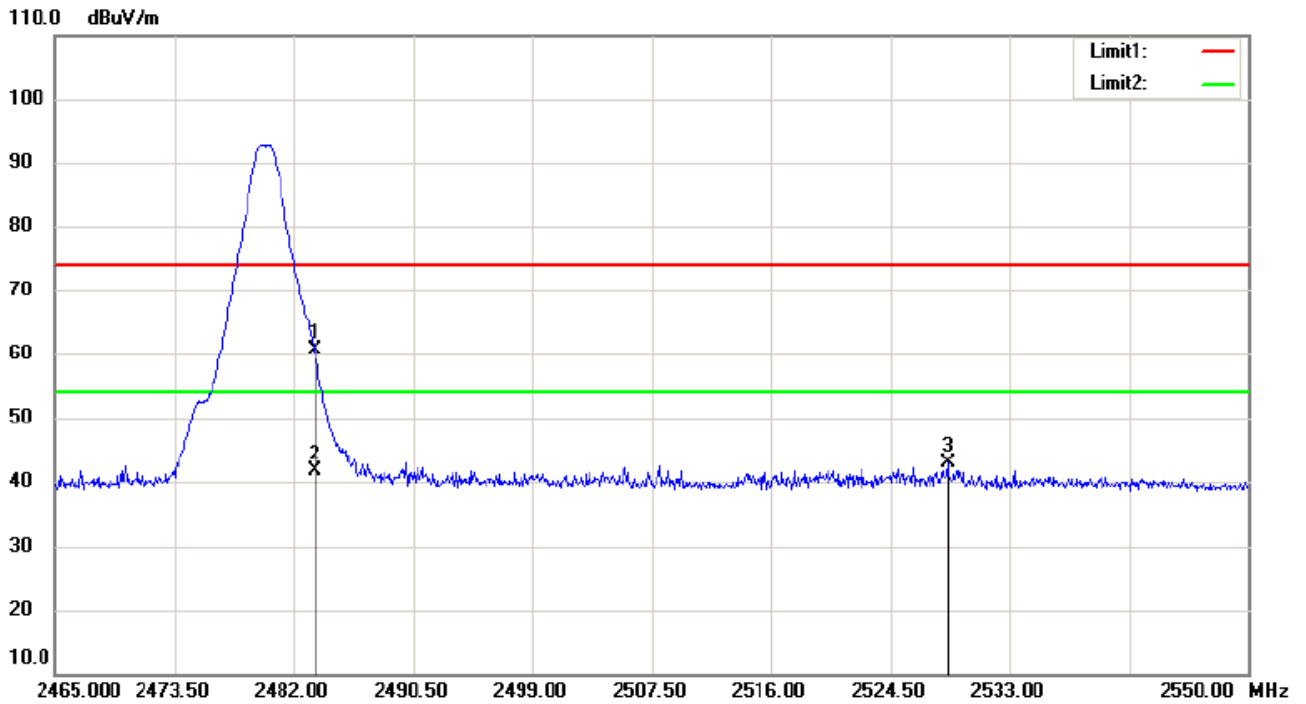
Horizontal:



MK.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Margin (dB)
1	2483.500	59.88	Peak	-6.41	53.47	54.00	0.53
2	2523.480	47.09	Peak	-6.34	40.75	54.00	13.25

Note: The Peak Emission is below the Average Limit, so the Average Emission doesn't need to be test.

Vertical:



MK.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dB uV/m)	Limit (dB uV/m)	Margin (dB)
1	2483.500	67.08	Peak	-6.41	60.67	74.00	13.33
2	2483.500	48.01	AVG	-6.41	41.60	54.00	12.40
3	2528.580	49.10	Peak	-6.32	42.78	54.00	13.33

Note: The Peak Emission is below the Average Limit, so the Average Emission doesn't need to be test.

Remark: No any other emission which fall in restricted bands can be detected and be reported.

Test Level = Receiver Reading + Antenna Factor + Cable Loss- Preamplifier Factor

All frequencies within the "Restricted bands" have been evaluated to compliance. Section 15.205 Restricted bands of operation.

Except as shown in paragraph of this section. only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 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 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	
13.36 - 13.41	322 - 335.4		



7 Test Setup Photographs

Refer to the < Appendix A Test Setup photos>.

8 EUT Constructional Details

Refer to the < Appendix A External Photos > & < Appendix B Internal Photos >.

End of Report