

FCC Test Report

Application No.: HKES140100023301
Applicant: ALCO ELECTRONICS LTD
Address: 11/F, Zung Fu Industrial Building
1067 King's Road, Quarry Bay
Hong Kong

Product Information:

Product Description: Soundbar with Bluetooth
Model: SBT17010BGE1, RTS7010B, SBT17110BG2, RTS7110B-22, RTS7010B-E1, SBT17630B, RTS7010BE, SBT17010BGE ♣

♣ Please refer to section 2 of this report which indicates which item was actually tested and which were electrically identical.

Brand Name: VENTURER, RCA
Product Class : Low Power Communication Device – Transmitter (2.4 GHz)
FCC ID: A2HRTS7010B1
Requirement: CFR 47 FCC PART 15 SUBPART C, 2013 - Intentional Radiators. (Section: 15.249)
Date of Receipt: 2014-01-29
Date of Test: 2014-03-04 to 2014-03-11
Date of Issue: 2014-03-21

Test Result :	PASS*
----------------------	--------------

* In the configuration tested, the EUT complied with the requirements for the relevant clauses of Federal Communications Commission Rules as specified above.

Authorized Signature:



CHEN Jian-feng, Jeffrey

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 IECC Limited or testing done by SGS IECC Limited in connection with, distribution or use of the product described in this report must be approved by SGS IECC Limited in writing.

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.

2 Test Summary

Test	Test Requirement	Test Method	Result
Conducted Emission (150KHz to 30MHz)	FCC PART 15, SUBPART C: 2013	ANSI C63.4:2003	PASS
Radiated Emission (9kMHz to 1GHz)	FCC PART 15, SUBPART C: 2013	ANSI C63.4:2003	PASS
Radiated Emission above 1 GHz	FCC PART 15, SUBPART C: 2013	ANSI C63.4:2003	PASS
Band edge / 20 dB Bandwidth	FCC PART 15, SUBPART C: 2013	ANSI C63.4:2003 Marker-Delta measurement	PASS
<p>♣ Item no.: SBT17010BGE1, RTS7010B, SBT17110BG2, RTS7110B-22, RTS7010B-E1, SBT17630B, RTS7010BE, SBT17010BGE</p> <p>According to the confirmation from the applicant, the above models are identical in all electrical aspects in relating to the circuit design, PCB layout and construction. The difference is the model number for trading purpose.</p> <p>Therefore only the item SBT17010BGE1 was tested in this report.</p>			

3 Contents

	Page
1 COVER PAGE	1
2 TEST SUMMARY	2
3 CONTENTS	3
4 GENERAL INFORMATION	4
4.1 GENERAL DESCRIPTION OF EUT	4
4.2 DETAILS OF EUT	4
4.3 CONDITIONS OF EUT	4
4.4 DESCRIPTION OF SUPPORT UNITS	4
4.5 STANDARDS APPLICABLE FOR TESTING	4
4.6 TEST LOCATION	5
4.7 TEST FACILITY	5
4.8 DEVIATION FROM STANDARDS	5
4.9 ABNORMALITIES FROM STANDARD CONDITIONS	5
4.10 DECLARATION OF FAMILY GROUPING	5
4.11 ABBREVIATIONS	5
5 EQUIPMENTS USED DURING TEST	6
6 TEST RESULTS	8
6.1 CONDUCTED EMISSIONS MAINS TERMINALS, 150KHZ TO 30MHZ	8
6.1.1 EUT Operation	8
6.1.2 Test Setup and Procedure	9
6.1.3 Measurement Data	10
6.2 RADIATED EMISSIONS, 9KHZ TO 1GHZ	14
6.2.1 EUT Operation	14
6.2.2 Test Setup and Procedure	16
6.2.3 Measurement Data	17
6.3 RADIATED EMISSIONS ABOVE 1 GHZ	19
6.3.1 EUT Operation	19
6.3.2 Test Setup and Procedure	20
6.3.3 Measurement Data	21
6.4 BAND EDGE / 20 DB BANDWIDTH	23
7 PHOTOGRAPHS	25
7.1 CONDUCT EMISSION TEST SETUP	25
7.2 RADIATED EMISSION TEST SETUP	26
7.2 EUT CONSTRUCTIONAL DETAILS	27

4 General Information

4.1 General Description of EUT

EUT Name: Soundbar with Bluetooth
Model: SBT17010BGE1
Serial No.: --

4.2 Details of EUT

Power Supply: AC 120V to DC 13V adaptor: GT-WAAL 13000180-302
Power Cable: 2 wires unscreened adaptor output cable
Operating Frequency: 2402-2480MHz
Antenna Type: Integral antenna
Modulation Type: GFSK, $\Pi/4$ -DQPSK and 8DPSK
Bluetooth version: 2.1+EDR

Modulation	Packet	Packet Type	Packet Size	Data rate
GFSK	DH1	4	24	1/2/3 Mbit/s
	DH3	11	183	1/2/3 Mbit/s
	DH5	15	339	1/2/3 Mbit/s
$(\pi/4)$ DQPSK	2DH1	20	54	1/2/3 Mbit/s
	2DH3	26	367	1/2/3 Mbit/s
	2DH5	30	379	1/2/3 Mbit/s
8DPSK	3DH1	24	83	1/2/3 Mbit/s
	3DH3	27	552	1/2/3 Mbit/s
	3DH5	31	1021	1/2/3 Mbit/s

4.3 Conditions of EUT

The received sample was under good condition.

4.4 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Notebook	DELL	PP05L	N/A
BT test board	Supplied by client	--	--
Test software	RDA_BT_TESTER		
Cable	Aux in cable (RCA jack) with 22k ohms Terminator		
Cable	Line in cable (3.5mm jack) with 22k ohms Terminator		

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.

All field strength measures in this test report were done by the aid of test software which places the device in continuous transmission with 100% duty cycle under different package type and the test software above allowed to set the frequency fixed and hopping stopped.

When testing, the software about power grade setting is 15 as worse case.

4.5 Standards Applicable for Testing

CFR 47, FCC Part 15, Oct 2013

ANSI C63.4:2003

4.6 Test Location

All tests were performed at:

SGS IECC Limited (Member of the SGS Group (SGS SA))

Units 303-305, 3/F., 31 Lok Yip Road, On Lok Tsuen, Fanling, N.T., Hong Kong

Tel: +852 2305 2570 Fax: +852 2756 4480

4.7 Test Facility

Measurement facility located at Fanling (Hong Kong), placed on file with the FCC Pursuant to Section 2.948 of the FCC Rules (FCC Registration No. : 97774).

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

FCC – CAB Registration No.: 446297

Measurement facility located at Fanling (Hong Kong), accredited as a Conformity Assessment Body (CAB) and was designated by FCC to perform compliance testing on equipment subject to Declaration Of Conformity (DOC) and Certification under Part 15 and 18 of the Commission's Rules.

4.8 Deviation from Standards

None.

4.9 Abnormalities from Standard Conditions

None.

4.10 Declaration of Family Grouping

None.

4.11 Abbreviations

N/A: Not Applicable

EUT: Equipment Under Test

5 Equipments Used during Test

Conducted Emission				
Equipment	Manufacturer	Model / Serial No.	Cal. Date	Cal. Due Date
Test Receiver	Rohde & Schwarz	ESHS 30 / 839667/002	2013/10/23	2014/10/22
Artificial Mains Network (LISN)	Schwarzbeck	NSLK 8127 / 8127312	2013/4/17	2014/4/16
Impulse Limiter	Rohde & Schwarz	ESH-3-Z2 / 375881052	2013/1/21	2015/1/20

Radiated Emission				
Equipment	Manufacturer	Model / Serial No.	Cal. Date	Cal. Due Date
3m Semi-Anechoic Chamber (pre-test)	--	--	--	--
3m / 10m Open Area Test Site	--	--	--	--
Test Receiver	Rohde & Schwarz	ESCS 30 / 100388	2013/10/23	2014/10/22
Spectrum Analyzer	Rohde & Schwarz	FSP 30 / 101474	2013/8/8	2014/8/7
Loop antenna	Rohde & Schwarz	HFH2-Z2 / 871336/48	2012/12/27	2015/12/26
Antenna 30-1000MHz	Schaffner	CBL6111C / 2791	2012/10/12	2014/10/11
Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D / 9120D-1070	2014/1/13	2016/1/12
Horn Antenna 15-26.5GHz	Schwarzbeck	BBHA9170 / 9170-492	2012/11/12	2014/11/11
Preamplifier 10MHz – 6GHz	Schwarzbeck	BBV9743 / 9743-052	2014/1/13	2016/1/12
Preamplifier 1-18GHz	Schwarzbeck	BBV9718 / 9718-223	2014/1/13	2016/1/12
Preamplifier 18- 26.5GHz	Schwarzbeck	BBV9719 / 9719-019	2012/11/13	2014/11/12
Coaxial Cable	--	E167	2013/06/28	2014/06/27
RF Cable	HUBER+SUHNER	E207	2012/11/14	2014/11/13
Antenna Mast System	Schwarzbeck	AM9104 / -	--	--

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.

Turntable with Controller	Drehtisch	DT312 / -	--	--
---------------------------	-----------	-----------	----	----

General Use Equipment				
Equipment	Manufacturer	Model / Serial No.	Cal. Date	Cal. Due Date
Digital Multimeter	Fluke	189 / 83640020	2013/4/10	2014/4/9
Temperature / Humidity meter	-	E158	2013-11-05	2014-11-04

6 Test Results

6.1 Conducted Emissions Mains Terminals, 150kHz to 30MHz

Test Requirement: FCC Part15 C
 Test Method: ANSI C63.4
 Test Date: 2014-03-11
 Frequency Range: 150kHz to 30MHz
 Class / Severity: Class B
 Detector: Peak for pre-scan (9kHz Resolution Bandwidth)
 Quasi-Peak if maximised peak within 6dB of Quasi-Peak limit

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

Note:
 1) The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.
 2) The lower limit is applicable at the transition frequency.

6.1.1 EUT Operation

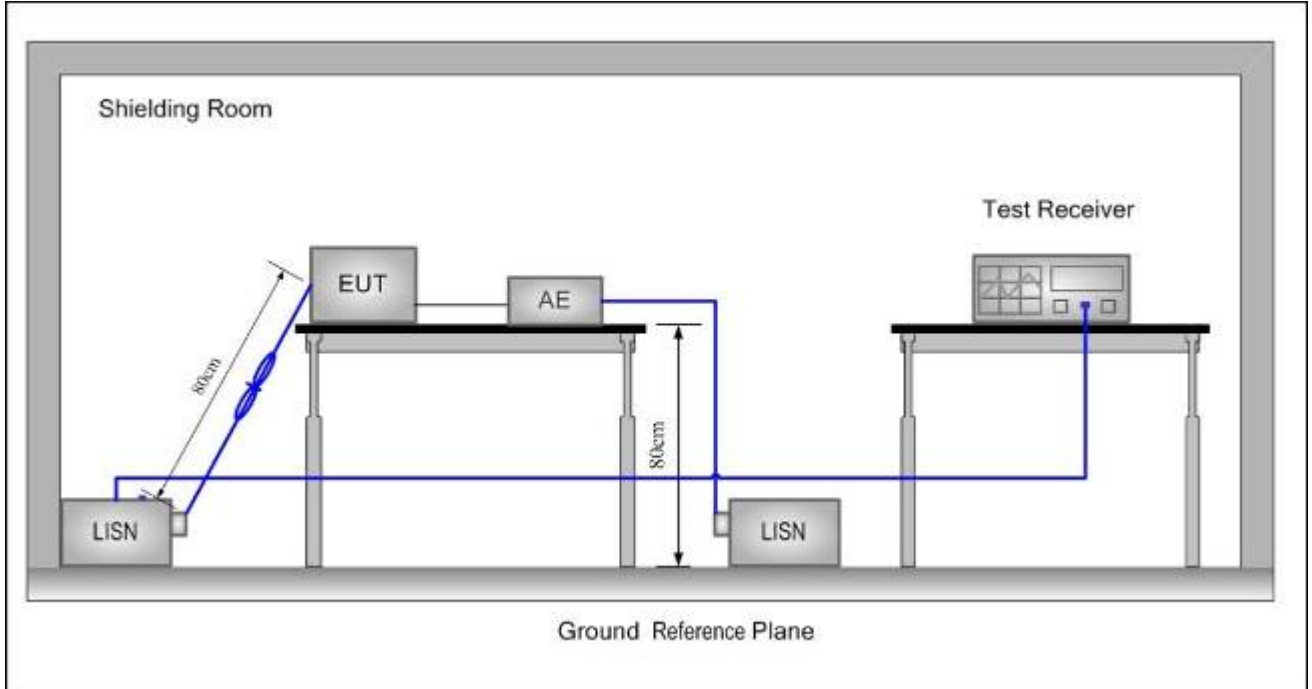
Operating Environment:

Temperature: 18 °C Humidity: 56% RH

EUT Operation: Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports.

Remark: for EUT the communicating with GFSK modulation, 3 M bit/s data rate and 339 packet size was worst case mode.

6.1.2 Test Setup and Procedure



1. The mains terminal conducted emission test was conducted in a shielded room.
2. The EUT was connected to AC power source through a LISN (Line Impedance Stabilization Network) which provides a $50\Omega/50\mu\text{H} + 5\Omega$ linear impedance. For Load terminal voltage measurement, a voltage probe was used on the load terminals. Measurement at control terminals were carried out by means of an impedance stabilization network (ISN). The ISN was bounded to ground.
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 EUT kept a distance of at least 0.8m from any other earthed conducting surface. The Artificial Mains Network was situated at a distance of 0.8m from 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.

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.

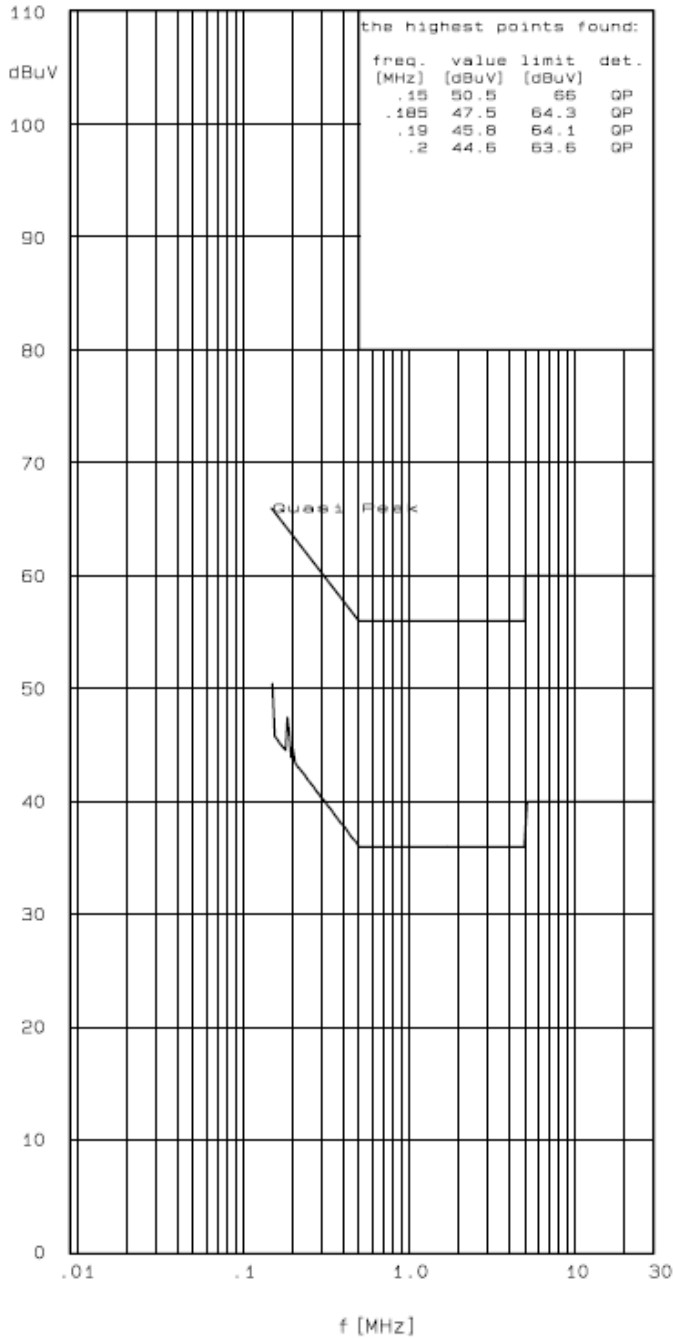
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

6.1.3 Measurement Data

Live Line:

BT mode

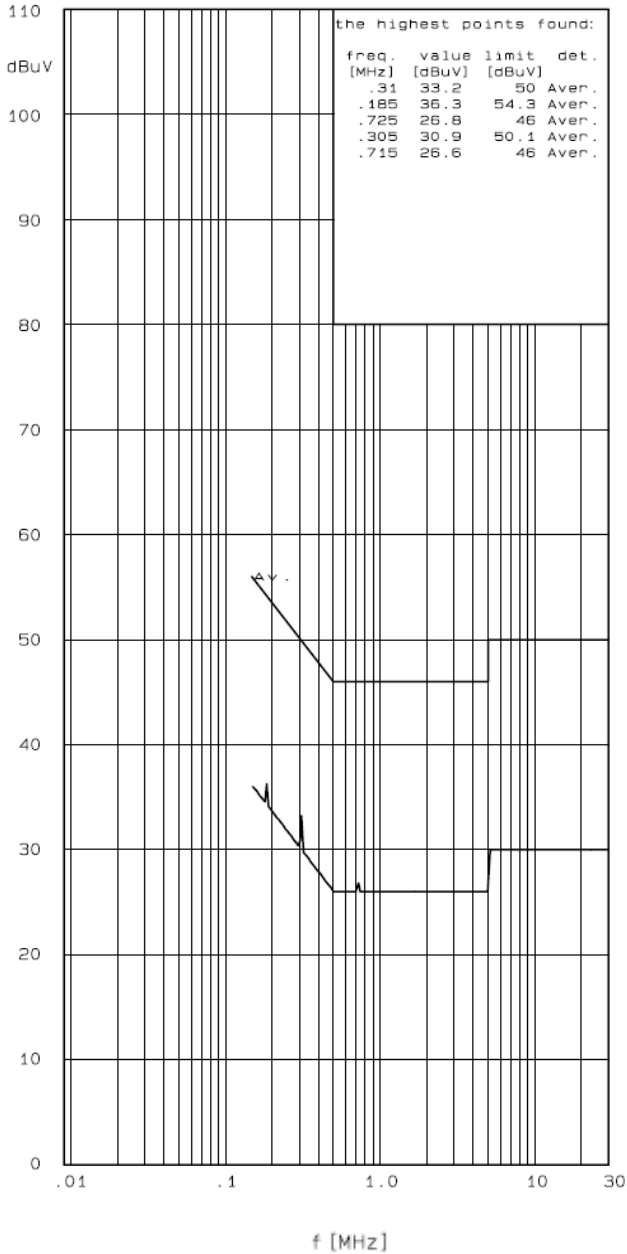
Quasi-peak measurement:



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.

BT mode

Average measurement:

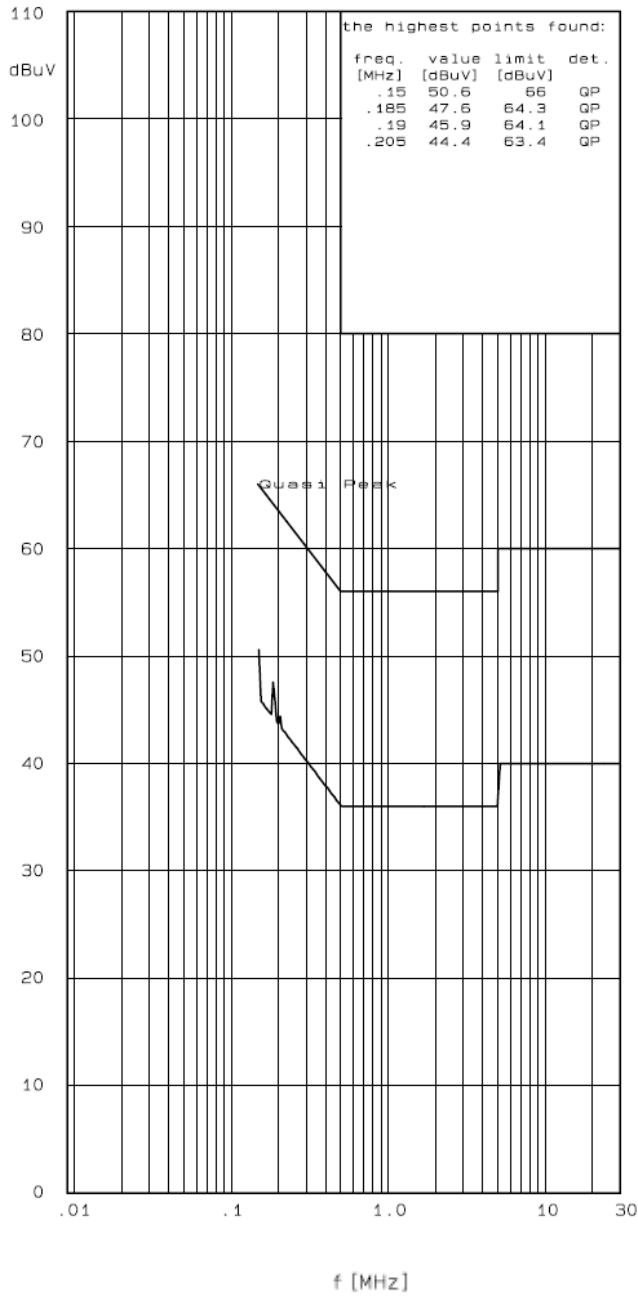


This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. 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.

Neutral Line:

BT mode

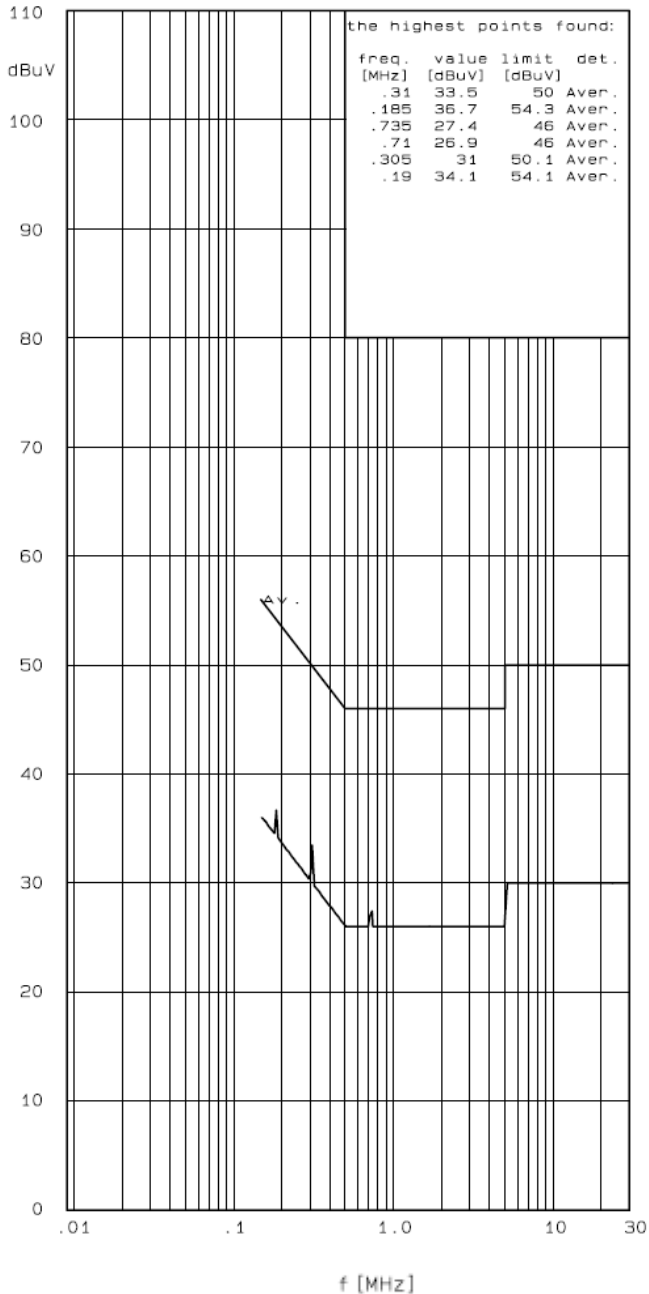
Quasi-peak measurement:



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.

BT mode

Average measurement:



Note:

- 1) The headphone port and RCA audio port is terminated by resistor during test.

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.

6.2 Radiated Emissions, 9kHz to 1GHz

Test Requirement: FCC Part15 Subpart C Section 15.209 and 15.249(d)
 Test Method: ANSI C63.4:2003
 Test Date: 2014-03-11
 Frequency Range: The lowest frequency generated by EUT, 12MHz to 1GHz
 Measurement Distance: 3m
 Detector: For PK value:
 RBW \geq 1 MHz for $f \geq$ 1 GHz, 100 kHz for $f <$ 1 GHz
 VBW \geq RBW
 Sweep = auto
 Detector function = peak
 Trace = max hold
 For AV value:
 RBW \geq 1 MHz for $f \geq$ 1 GHz, 100 kHz for $f <$ 1 GHz
 VBW =10 Hz
 Sweep = auto
 Detector function = peak
 Trace = max hold

Limit :

Frequency range MHz	Quasi-peak limits dB (μ V/m)
0.009 – 0.490	-72.4 – 20logF(MHz)
0.490 – 1.705	-12.4 – 20logF(MHz)
1.705 – 30.0	-10.5
30 to 88	40
88 to 216	43.5
216 to 960	46
Above 960	54

Note: 1) At transitional frequencies the lower limit applies.
 2) F is the frequency of the spurious emission measured in MHz.
 3) Limit from 0.009 – 30 MHz is converted from measuring distance 300m or 30m to 3m with the formulat provided in FCC Part 15, section 15.31(f)(2)
 4) The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

6.2.1 EUT Operation

Operating Environment:

Temperature: 18 °C Humidity: 56%

EUT Operation: Pre-test with Peak detector with the following mode(s):

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.

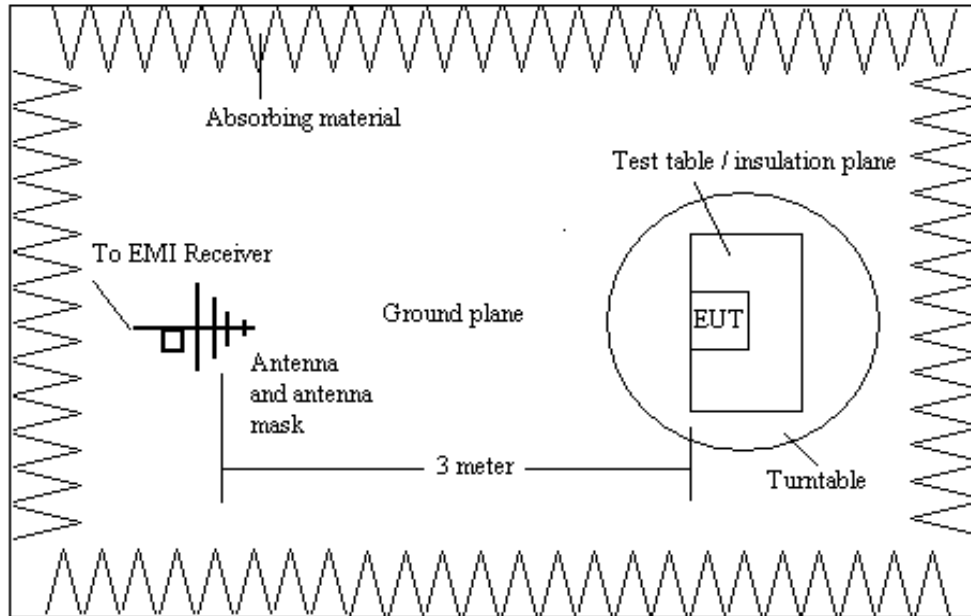
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

- 1: Transmission with GFSK
- 2: Transmission with $\pi/4$ -DQPSK;
- 3: Transmission with 8DPSK;

Final test with Quasi-Peak detector with the following mode(s):

- 1: Transmission with GFSK and in continuous transmission with 100% duty cycle mode

6.2.2 Test Setup and Procedure



1. The pre-test of the radiated emissions test was conducted in a semi-anechoic chamber and the final measurement was conducted in the open area test site.
2. The EUT was connected to AC power source through a mains power outlet which was bonded to the ground reference plane. The EUT was placed upon a non-metallic table 0.8m above the ground reference plane.
3. Loop antenna and Bilog antenna was used for the frequency range from the lowest generated frequency to 30MHz and 30MHz to 1GHz respectively
4. Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emissions spectrum plots of the EUT with located frequencies.
5. The actual frequencies of maximum emission were confirmed in the final radiated emissions measurement. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters for Bilog antenna (Loop antenna is still maintain in 1m high) in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization.

6.2.3 Measurement Data

An initial pre-scan was performed in the 3m chamber using the spectrum analyser in peak detection mode. The EUT was measured by Bilog antenna with 2 orthogonal polarities and frequencies of peak emissions from the EUT were detected within 6dB of the limit line. Final measurement was conducted in the open area test site with data as follows:

Test results:

(1) Operation Frequency : 2402.0 MHz

Frequency (MHz)	Antenna Polarization	Correction Factor (dB/m)	Receiver QP Reading (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)
30.875	H	19.0	6.7	25.7	40.0	-14.3
38.625	V	15.9	13.1	29.0	40.0	-11.0
44.375	H	13.9	15.1	29.0	40.0	-11.0
88.875	V	9.5	14.4	23.9	43.5	-19.6
116.750	V	11.3	24.9	36.2	43.5	-7.3
184.563	H	9.4	15.5	24.9	43.5	-18.6

(2) Operation Frequency : 2441.0 MHz

Frequency (MHz)	Antenna Polarization	Correction Factor (dB/m)	Receiver QP Reading (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)
30.500	V	19.2	3.2	22.4	40.0	-17.6
69.563	V	9.3	8.2	17.5	40.0	-22.5
82.688	V	9.2	29.7	38.9	40.0	-1.1
118.313	V	11.4	27.9	39.3	43.5	-4.2
141.500	H	11.7	9.9	21.6	43.5	-21.9
185.125	V	9.4	18.5	27.9	43.5	-15.6

(3) Operation Frequency : 2480.0 MHz

Frequency (MHz)	Antenna Polarization	Correction Factor (dB/m)	Receiver QP Reading (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)
31.563	V	18.8	6.9	25.7	40.0	-14.3
38.375	V	16.0	14.0	30.0	40.0	-10.0
43.813	V	14.1	17.9	32.0	40.0	-8.0
68.500	V	9.4	16.9	26.3	40.0	-13.7
83.750	V	9.2	29.8	39.0	40.0	-1.0
119.688	V	11.5	26.4	37.9	43.5	-5.6

Note:

- 2) All readings are Quasi-Peak values.
- 3) Correction Factor = Antenna Factor + Cable Loss.
- 4) The above results were the worst case results with the EUT positioned in all 3 axis during the test. The EUT was positioned vertically and horizontally on the table for vertical and horizontal measurement respectively.
- 5) Other emissions more than 20dB below the limit are not shown on the above table and only worst six emissions below 1GHz are listed.
- 6) There is not any other emission which falls in restricted bands which set out in Section 15.205 Restricted bands can be detected and reported.
- 7) The headphone port and RCA audio port is terminated by resistor during test.

6.3 Radiated Emissions above 1 GHz

Test Requirement: FCC Part15 Subpart C Section 15.209 & 15.249(a) & (d)
 Test Method: ANSI C63.4:2003
 Test Date: 2014-03-11
 Frequency Range: 1GHz – 26GHz
 Measurement Distance: 3m
 Detector: For PK value:
 RBW \geq 1 MHz for $f \geq$ 1 GHz, 100 kHz for $f <$ 1 GHz
 VBW \geq RBW
 Sweep = auto
 Detector function = peak
 Trace = max hold
 For AV value:
 RBW \geq 1 MHz for $f \geq$ 1 GHz, 100 kHz for $f <$ 1 GHz
 VBW =10 Hz
 Sweep = auto
 Detector function = peak
 Trace = max hold

Limit :

Fundamental Frequency :

Frequency range MHz	Limits (Peak) dB (μ V/m)	Limits (Average) dB (μ V/m)
2400 to 2483.5	114	94

Spurious Emission :

Frequency range MHz	Limits (Peak) dB (μ V/m)	Limits (Average) dB (μ V/m)
Over 1000	74	54

6.3.1 EUT Operation

Operating Environment:

Temperature: 18 °C Humidity: 56 %

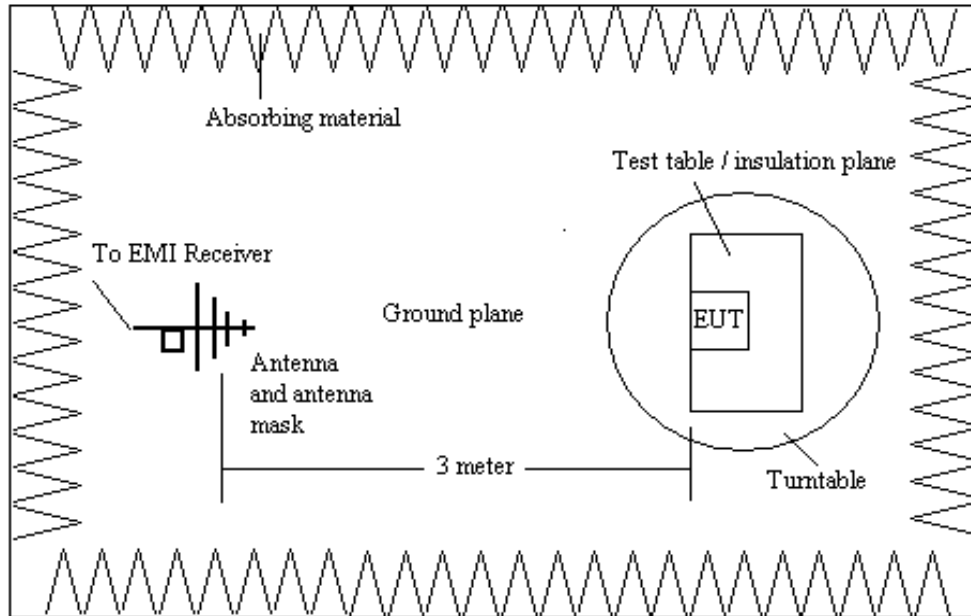
EUT Operation: Pre-test with Peak detector with the following mode(s):

- 1: Transmission with GFSK
- 2: Transmission with $\Pi/4$ -DQPSK;
- 3: Transmission with 8DPSK;

Final test with Peak and Average detector with the following mode(s):

- 1: Transmission with GFSK and in continuous transmission with 100% duty cycle mode

6.3.2 Test Setup and Procedure



1. The pre-test of the radiated emissions test was conducted in a semi-anechoic chamber and the final measurement was conducted in the open area test site.
2. The EUT was connected to AC power source through a mains power outlet which was bonded to the ground reference plane. The EUT was placed upon a non-metallic table 0.8m above the ground reference plane.
3. Horn antenna was used for the frequency over 1GHz
4. Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emissions spectrum plots of the EUT with located frequencies.
5. The actual frequencies of maximum emission were confirmed in the final radiated emissions measurement. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization.

6.3.3 Measurement Data

An initial pre-scan was performed in the 3m chamber using the spectrum analyser in peak detection mode. The EUT was measured with 2 orthogonal polarities and frequencies of average emissions from the EUT were measured as follows:

Test results :

(1) Fundamental Frequency

(a) Test with GFSK modulation and RBW=1MHz

Frequency (MHz)	Antenna Polarization	Emission Level (dB μ V/m)		Limit (dB μ V/m)		Remark
		Peak	Average	Peak	Average	
2402.0	H	92.6	59.5	114	94	Pass
2402.0	V	85.7	57.1	114	94	Pass
2441.0	H	94.5	60.1	114	94	Pass
2441.0	V	85.0	57.0	114	94	Pass
2480.0	H	94.6	60.2	114	94	Pass
2480.0	V	89.9	58.1	114	94	Pass

(b) Test with $\Pi/4$ -DQPSK modulation and RBW=3MHz

Frequency (MHz)	Antenna Polarization	Emission Level (dB μ V/m)		Limit (dB μ V/m)		Remark
		Peak	Average	Peak	Average	
2402.0	H	92.2	59.1	114	94	Pass
2402.0	V	85.3	56.7	114	94	Pass
2441.0	H	94.1	59.6	114	94	Pass
2441.0	V	84.6	56	114	94	Pass
2480.0	H	94.2	59.8	114	94	Pass
2480.0	V	89.5	57.7	114	94	Pass

(C) Test with 8DPSK modulation and RBW=3MHz

Frequency (MHz)	Antenna Polarization	Emission Level (dB μ V/m)		Limit (dB μ V/m)		Remark
		Peak	Average	Peak	Average	
2402.0	H	92.1	58.9	114	94	Pass
2402.0	V	85.2	56.5	114	94	Pass
2441.0	H	94	59.5	114	94	Pass
2441.0	V	84.5	56.4	114	94	Pass
2480.0	H	94.1	59.6	114	94	Pass
2480.0	V	89.4	57.5	114	94	Pass

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.

(2) Spurious Emission

Operation Frequency : 2402.0 MHz

Frequency (MHz)	Antenna Polarization	Emission Level (dB μ V/m)		Limit (dB μ V/m)		Remark
		Peak	Average	Peak	Average	
4804.0	V	58.0	39.2	74	54	Pass
7206.0	V	49.5	36.0	74	54	Pass
9608.0	V	49.4	35.1	74	54	Pass
12010.0	V	52.0	38.1	74	54	Pass
14410.0	V	62.5	47.0	74	54	Pass
16811.0	V	60.0	46.0	74	54	Pass

Operation Frequency : 2441.0 MHz

Frequency (MHz)	Antenna Polarization	Emission Level (dB μ V/m)		Limit (dB μ V/m)		Remark
		Peak	Average	Peak	Average	
4882.0	V	57.5	38.2	74	54	Pass
7323.0	V	47.7	33.9	74	54	Pass
9764.0	V	48.6	34.9	74	54	Pass
12206.0	V	51.5	37.4	74	54	Pass
14646.0	V	60.0	46.2	74	54	Pass
17087.0	V	60.5	46.8	74	54	Pass

Operation Frequency : 2480.0 MHz

Frequency (MHz)	Antenna Polarization	Emission Level (dB μ V/m)		Limit (dB μ V/m)		Remark
		Peak	Average	Peak	Average	
4960.0	V	58.0	38.6	74	54	Pass
7440.0	V	50.7	35.0	74	54	Pass
9920.0	V	49.3	35.1	74	54	Pass
12400.0	V	52.5	38.0	74	54	Pass
14880.0	V	59.0	46.0	74	54	Pass
17360.0	V	61.0	46.1	74	54	Pass

Note:

- 1) **The above results were the worst case results .**
- 2) **Other emissions more than 20dB below the limit are not shown on the above table and only worst six emissions below 1GHz are listed.**
- 3) **There is not any other emission which falls in restricted bands which set out in Section 15.205 Restricted bands can be detected and reported.**

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.

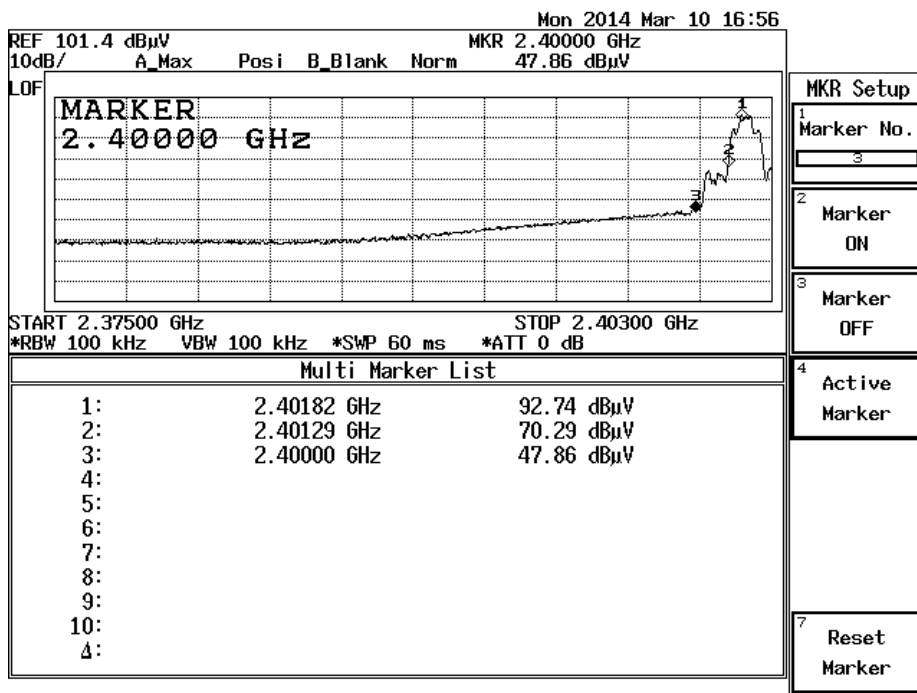
4) The headphone port and RCA audio port is terminated by resistor during test.

6.4 Band Edge / 20 dB Bandwidth

Test Requirement: FCC Part15 Subpart C Section 15.215, 15.249(d)
 Test Method: ANSI C63.4:2003 and Marker-Delta Method
 Test Date: 2014-03-10
 EUT Operation: 1: Transmission with GFSK
 2: Transmission with $\Pi/4$ -DQPSK;
 3: Transmission with 8DPSK;
 Result: Pass

Test Plot : (Worst case: Transmission with 8DPSK)

Operation frequency : 2402.0 MHz

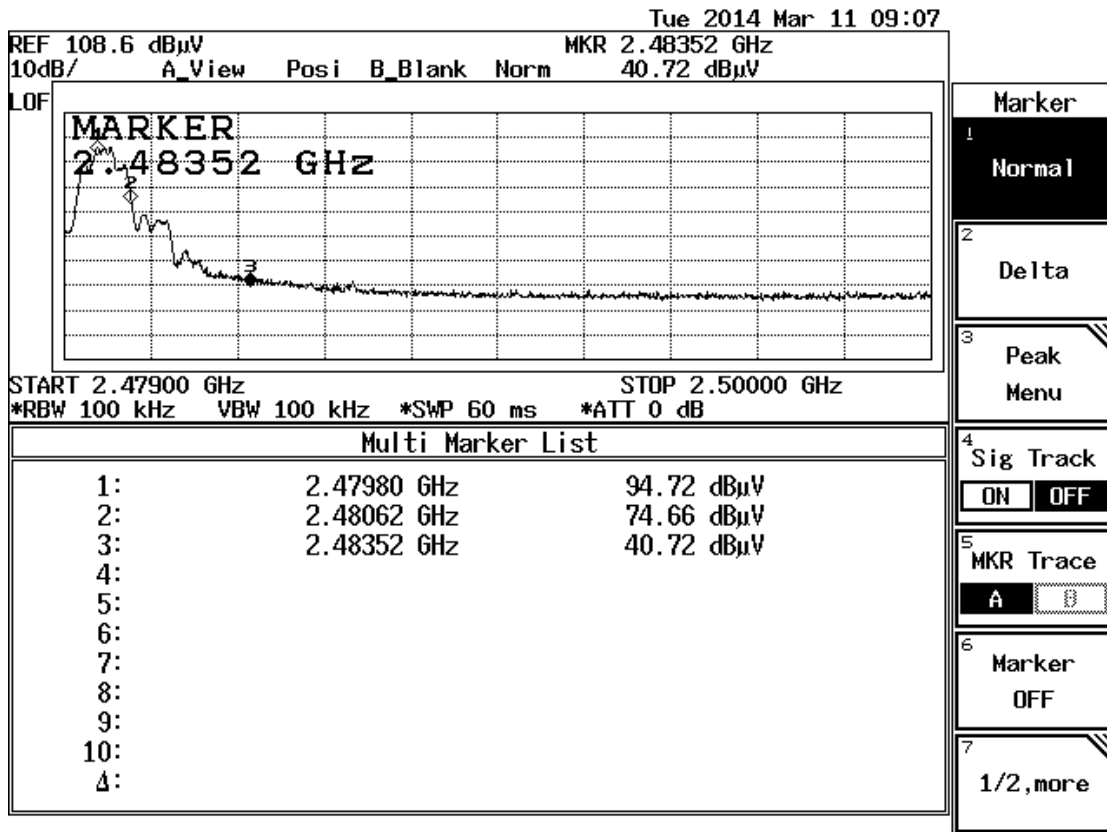


According to the page 22 of this report, the emission of the fundamental frequency 2402MHz is 92.1dBuV/m and 58.9dBuV/m for peak and average level respectively. Based on the delta method, the emission at the bandedge, 2400MHz, is more than 40dB below the fundamental and 20dB bandwidth falls in assigned band. It is deemed to comply with section 15.215. Besides, it is below the limit of 74dBuV/m and 54dBuV/m for peak and average level under 15.209. It is deemed to comply with section 15.249(d).

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 Plot : (Worst case: Transmission with 8DPSK)

Operation frequency : 2480.0 MHz



According to the page 22 of this report, the emission of the fundamental frequency 2480MHz is 94.1dBuV/m and 59.6dBuV/m for peak and average level respectively. Based on the delta method, the emission at the bandedge, 2483.5MHz, is more than 40dB below the fundamental and 20dB bandwidth falls in the assigned band. It is deemed to comply with section 15.215. Besides, it is below the limit of 74dBuV/m and 54dBuV/m for peak and average level under 15.209. It is deemed to comply with section 15.249(d).

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.

7 Photographs

7.1 Conduct Emission Test Setup



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.

7.2 Radiatd Emission Test Setup



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.

7.2 EUT Constructional Details



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.



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.



--End of Report--