Hong Kong

FCC / IC - TEST REPORT

Report Number	: **60/790.13.013.01**	Date of Issue:	30th May 2013
Model	: **WL388**		
Product Type	: **illumi Shine Wake Up Clock**		
Applicant	: Oregon Scientific Global Distribution Limited		
Address	: Block C, 9/F., Kaiser Estate, Phase 1, 41 Man Yue Street, Hunghom, Hong Kong		
Test Result	: ■ **Positive** ☐ **Negative**		
Total pages including Appendices	: 45		

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TÜV SÜD Hong Kong Ltd. reports apply only to the specific samples tested under stated test conditions. Construction of the actual test samples has been documented. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. The manufacturer/importer is responsible to the Competent Authorities in Europe for any modifications made to the production units which result in non-compliance to the relevant regulations. TÜV SÜD Hong Kong Ltd. shall have no liability for any deductions, inferences or generalizations drawn by the client or others from TÜV SÜD Hong Kong Ltd. issued reports.

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1. Table of Contents

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2. Details about the Test Laboratory

Details about the Test Laboratory

Test site 1:

Company name: TÜV SÜD HONG KONG LTD.
3/F, West Wing, Lakeside 2,
10 Science Park West Avenue,
Science Park, Shatin
HK.

Telephone: 852 2776 1323
Fax: 852 2776 1372

Test site 2:

Company name: TMC-Telecommunication Metrology Center of M.I.I.T
No. 52 Hua Yuanbei Road, Haidian District, Beijing, P.R.China

3. Description of the Equipment Under Test

Description of the Equipment Under Test

Product:	illumi Shine Wake Up Clock
Model no.:	WL388
Serial number:	NIL
Options and accessories:	AC/DC Adaptor Model no. – SHE0751000PU Input – 100–240VAC, 50–60Hz, 300mA Output – 7.5VDC, 1000mA
Rated Voltage:	7.5VDC
Rated Current:	1.0A
Rated Power:	NIL
Frequency:	NIL
Modulation type:	GFSK
Antenna gain:	0 dBi
RF Transmission Frequency:	2402MHz-2480MHz

Auxiliary Equipment Used during Test:

DESCRIPTION	MANUFACTURER	MODEL NO.(SHIELD)	S/N(LENGTH)
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4. Summary of Test Standards

Test Standards	
FCC Part 15 Subpart C, Intentional Radiators, 10-1-12 Edition	PART 15 – RADIO FREQUENCY DEVICES Subpart C – Intentional Radiators
RSS-Gen Issue 3 December 2010	General Requirements and Information for the Certification of Radio Apparatus
RSS-210 Issue 8 December 2010	RSS-210 — Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment

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5. Summary of Test Results

Technical Requirements					
FCC Part 15 Subpart C, RSS-Gen, RSS-210					
Test Condition	Pages	Test site	Test Result		
			Pass	Fail	N/A
15.207 & RSS-GEN A7.2.4 Conducted Emission AC Power Port	8	Site 2	☒	☐	☐
15.247 (b) (1) & RSS-210 A8.4 Conducted peak output power	11	Site 2	☒	☐	☐
15.247(d) & RSS-210 A8.5 Band edge compliance of RF emissions	14	Site 2	☒	☐	☐
15.247(d) & RSS-210 A8.5 Spurious RF conducted emissions	20	Site 2	☒	☐	☐
15.247(d) & 15.209 & RSS-210 2.5 & RSS-GEN 7.2.5 & RSS-GEN 6.1 Spurious radiated emissions for transmitter	25	Site 2	☒	☐	☐
15.247(a)(2) & RSS-210 A8.2(a) 6dB bandwidth	33	Site 2	☒	☐	☐
RSSGEN 4.6.1 20dB Occupied Bandwidth	33	Site 2	☒	☐	☐
15.247(e) & RSS-210 A8.2(b) Power spectral density	41	Site 2	☒	☐	☐

6. General Remarks

Remarks
This submittal(s) (test report) is intended for FCC ID: YPG-WL388 & IC: 3277A-WL388 complies with Section 15.207, 15.209, 15.247 of the FCC Part 15; and RSS-210.

All the configurations of the product were tested and only the worst test results listed in the report.

SUMMARY:

All tests according to the regulations cited on page 5 were

■ - Performed

☐ - **Not** Performed

The Equipment Under Test

■ - **Fulfills** the general approval requirements.

☐ - **Does not** fulfill the general approval requirements.

Sample Received Date:	19th April 2013
Testing Start Date:	19th April 2013
Testing End Date:	14th May 2013

- TÜV SÜD HONG KONG LTD. -

Reviewed by: Prepared by:

Edmond FUNG Sam WONG

7. Technical Requirement

7.1 Conducted Emission Test 150kHz – 30MHz

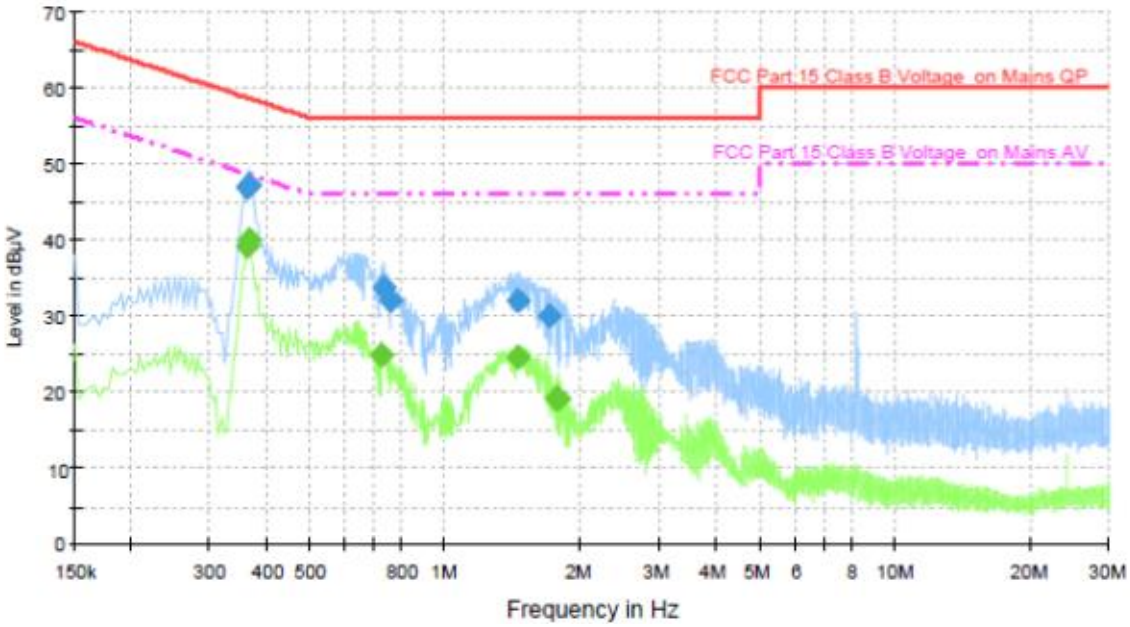
Date of test : 07th May 2013

Operating mode : Transmitter Mode

Tested on : Adaptor AC Mains, Live

Remarks : NIL

Test Result
☒ Passed
☐ Not Passed



Frequency (MHz)	Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector
0.362000	46.8	58.7	-11.9	QP
0.366000	47.1	58.6	-11.5	QP
0.734000	33.6	56.0	-22.4	QP
0.758000	32.0	56.0	-24.0	QP
1.454000	32.0	56.0	-24.0	QP
1.714000	30.0	56.0	-26.0	QP

Frequency (MHz)	Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector
0.362000	39.1	48.7	-9.6	AV
0.366000	40.0	48.6	-8.6	AV
0.722000	24.8	46.0	-21.2	AV
1.454000	24.5	46.0	-21.5	AV
1.774000	19.1	46.0	-26.9	AV
1.782000	19.1	46.0	-26.9	AV

Conducted Emission Test 150kHz – 30MHz

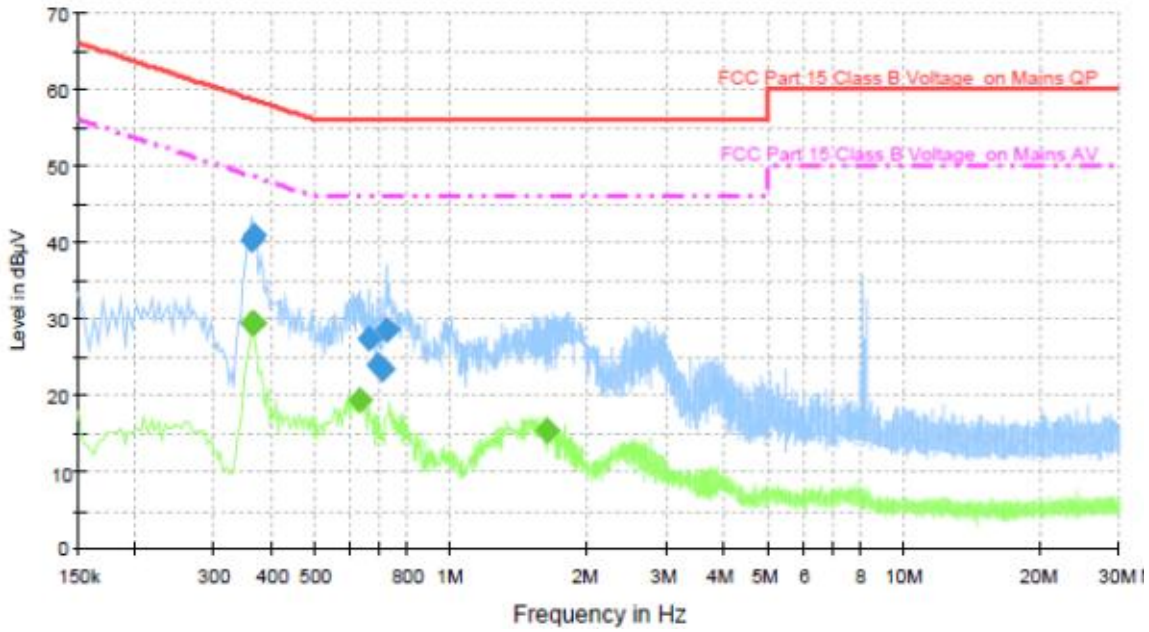
Date of test : 07th May 2013

Operating mode : Transmitter Mode

Tested on : Adaptor AC Mains, Neutral

Remarks : NIL

Test Result
☒ Passed
☐ Not Passed



Frequency (MHz)	Result (QP)	Limit (QP)	Margin (dB)	Detector
0.362000	40.4	58.7	-18.3	QP
0.366000	40.8	58.6	-17.8	QP
0.662000	27.4	56.0	-28.6	QP
0.686000	24.1	56.0	-31.9	QP
0.702000	23.3	56.0	-32.7	QP
0.718000	28.6	56.0	-27.4	QP

Frequency (MHz)	Result (AV)	Limit (AV)	Margin (dB)	Detector
0.362000	29.4	48.7	-19.3	AV
0.366000	29.4	48.6	-19.2	AV
0.626000	19.4	46.0	-26.6	AV
1.626000	15.6	46.0	-30.4	AV

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Test Equipment List

Conducted Emission Test

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	LISN	R&S	ENV216	101112	Aug. 05, 2013
2	LISN	R&S	ENV216	101113	Aug. 05, 2013
3	50Ω Terminator	N/A	N/A	N/A	Jul. 01, 2013
4	Test Cable	N/A	C01	N/A	Jul. 01, 2013
5	EMI Test Receiver	R&S	ESCI	100920	Aug. 04, 2013

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7.2 Conducted peak output power

Test Method

The transmitter output connected to the Spectrum analyzer and set to the peak power detection.

Limits for conducted peak output power measurements

Frequency Range MHz	Limit W	Limit dBm
2400-2483.5	≤1.0	≤30.0

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Conducted peak output power

Date of test : 07th May 2013

Remarks : NIL

Test Result
☒ Passed
☐ Not Passed

Type	Channel		
	2402 MHz	2442 MHz	2480 MHz
GFSK	-1.22 dBm	-2.47 dBm	-1.70 dBm

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Conducted peak output power

Test Equipment

DESCRIPTION	Type No.	Serial No.	Calibrated until
Antenna	VULB9163	9163 330	2014.02.24
Antenna	3164-05	85724	2014.02.17
Loop Antenna	6512	29604	2013.09.24
Spectrum Analyzer	FSP 40	100378	2013.12.22
EMI Test Receiver	ESCI	100701	2013.08.03
Spectrum Analyzer	FSV40	100903	2014.01.26
Test Cable	SUCOFLEX 104	MY2320/4	2014.02.17
Amplifier	150A250	326446	2014.03.17

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7.3 Band edge Measurement

Test Method

The band edge compliance of RF radiated emission should be measured by following the guidance in ANSI C63.4 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization etc. Set RBW and VBW to 1MHz to measure the peak field strength and set RBW to 1MHz and VBW to 10Hz to measure the average radiated field strength.
The conducted RF band edge was measured by using a spectrum analyzer. Set span wide enough to capture the highest in-band emission and the emission at the band edge. Set RBW and VBW to 100kHz, to measure the conducted peak band edge.

Limits

According to §15.247(d), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in 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. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in 15.209(a) (see Section 15.205(c)).

Frequency MHz	Limit Average dBuV/m	Limit Peak dBuV/m
Below 2390 Above 2483.5	54	74

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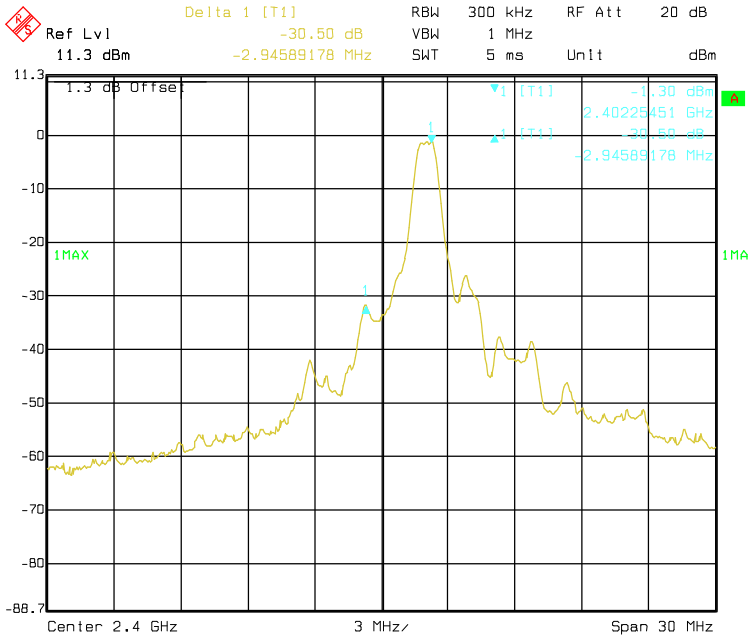
Band edge Measurement

Date of test : 07th May 2013

Remarks : NIL

Test Result
☒ Passed
☐ Not Passed

Conducted measurement



Frequency (MHz)	Reading (dBm)	Limit (-20dBc)	Margin (dB)
2400.000	-34.56	-21.30	-13.26
2402.254	-1.30	-	-

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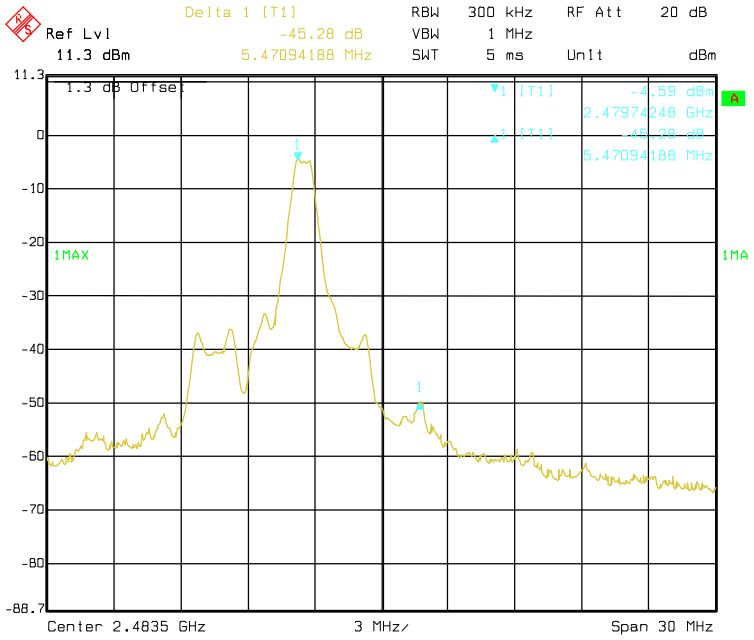
Band edge Measurement

Date of test : 07th May 2013

Remarks : NIL

Test Result
☒ Passed
☐ Not Passed

Conducted measurement



Frequency (MHz)	Reading (dBm)	Limit (-20dBc)	Margin (dB)
2479.742	-4.59	-	-
2483.500	-51.97	-24.59	-27.38

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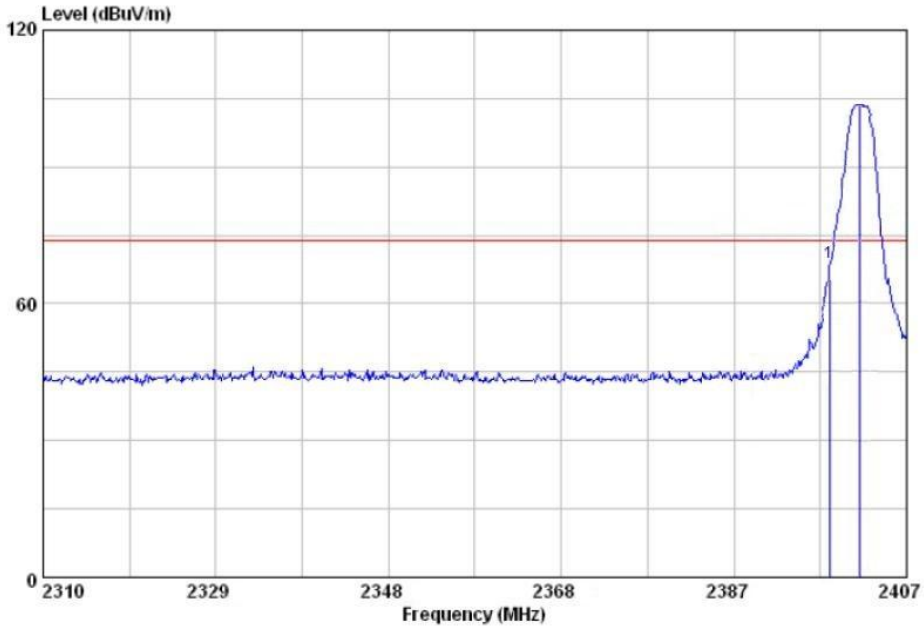
Band edge Measurement

Date of test : 07th May 2013

Remarks : NIL

Test Result
☒ Passed
☐ Not Passed

Radiated measurement



Frequency (MHz)	Reading (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
2400.000	69.6	74.0	-4.4	PK
2400.000	50.9	54.0	-3.1	AV

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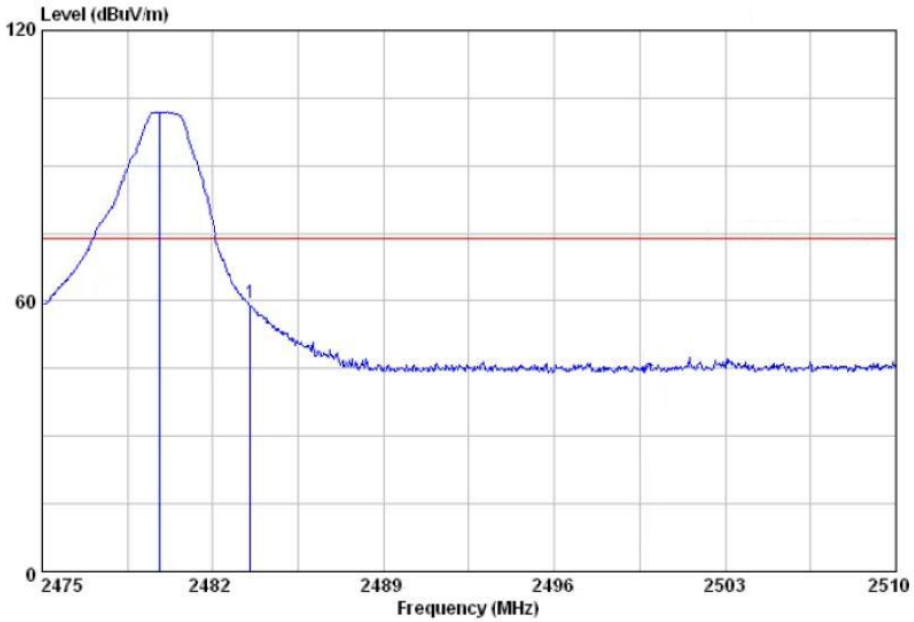
Band edge Measurement

Date of test : 07th May 2013

Remarks : NIL

Test Result
☒ Passed
☐ Not Passed

Radiated measurement



Frequency (MHz)	Reading (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
2483.500	59.6	74.0	-14.4	PK
2483.500	43.4	54.0	-10.6	AV

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Band edge Measurement

Test Equipment List

DESCRIPTION	Type No.	Serial No.	Calibrated until
Antenna	VULB9163	9163 330	2014.02.24
Antenna	3164-05	85724	2014.02.17
Loop Antenna	6512	29604	2013.09.24
Spectrum Analyzer	FSP 40	100378	2013.12.22
EMI Test Receiver	ESCI	100701	2013.08.03
Spectrum Analyzer	FSV40	100903	2014.01.26
Test Cable	SUCOFLEX 104	MY2320/4	2014.02.17
Amplifier	150A250	326446	2014.03.17

7.4 Spurious RF conducted emissions

Test Method

The transmitter output is connected to the Spectrum analyzer. The Spectrum analyzer is set to the peak power detection.
Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

The resolution bandwidth(RBW) and the video bandwidth (VBW) of the spectrum analyzer were respectively set to 100kHz and 100kHz.

Limit

Frequency Range MHz	Limit (dBc)
1000-25000	-20

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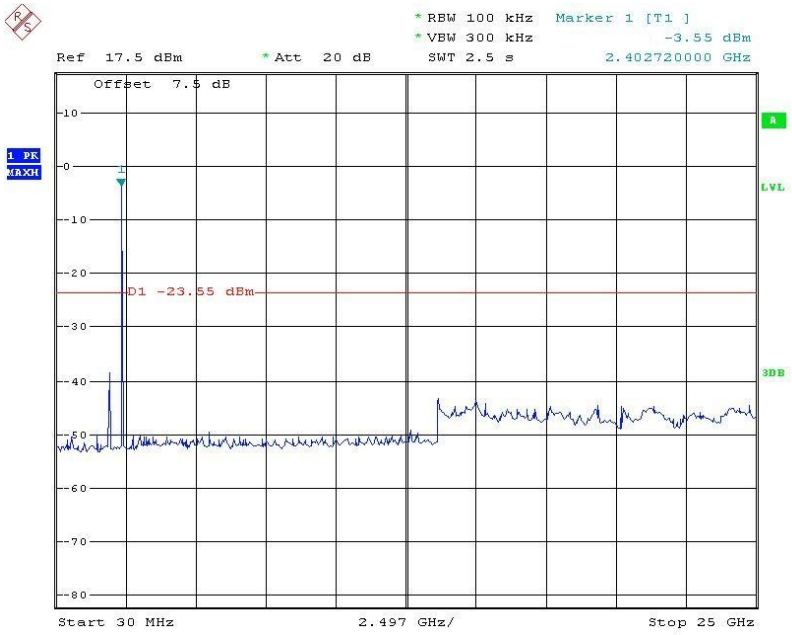
Spurious RF conducted emissions

Date of test : 08th May 2013

Channel : 2402 MHz

Remark : NIL

Test Result
☒ Passed
☐ Not Passed



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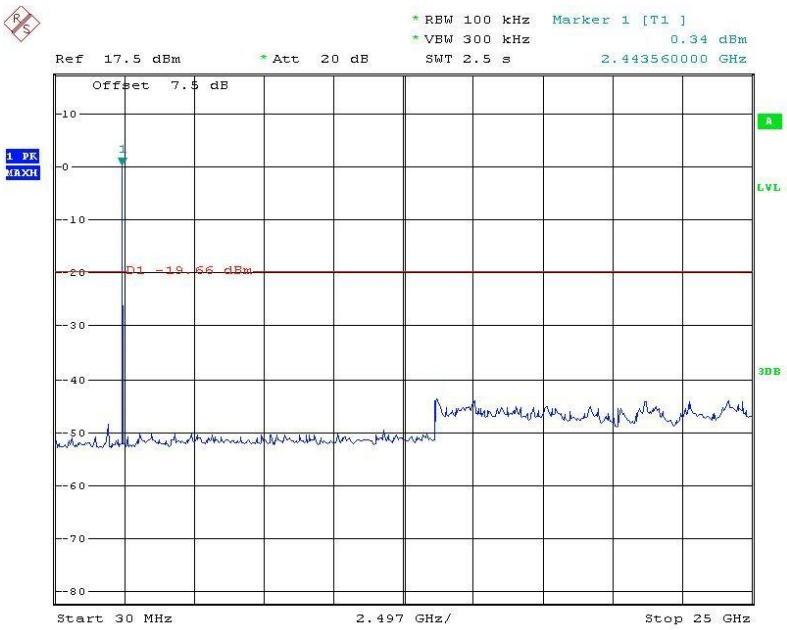
Spurious RF conducted emissions

Date of test : 08th May 2013

Channel : 2442MHz

Remark : NIL

Test Result
☒ Passed
☐ Not Passed



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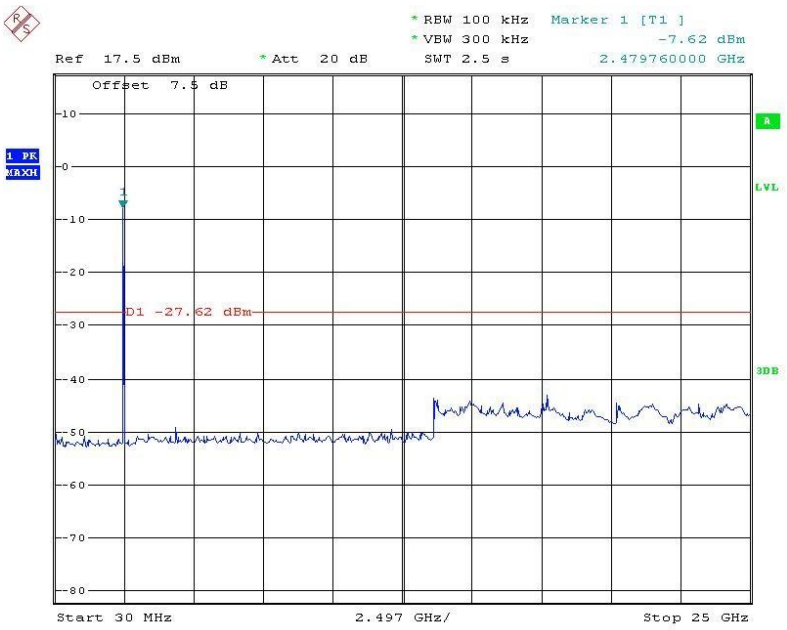
Spurious RF conducted emissions

Date of test : 08th May 2013

Channel : 2480MHz

Remark : NIL

Test Result
☒ Passed
☐ Not Passed



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Test Equipment List

DESCRIPTION	Type No.	Serial No.	Calibrated until
Antenna	VULB9163	9163 330	2014.02.24
Antenna	3164-05	85724	2014.02.17
Loop Antenna	6512	29604	2013.09.24
Spectrum Analyzer	FSP 40	100378	2013.12.22
EMI Test Receiver	ESCI	100701	2013.08.03
Spectrum Analyzer	FSV40	100903	2014.01.26
Test Cable	SUCOFLEX 104	MY2320/4	2014.02.17
Amplifier	150A250	326446	2014.03.17

7.5 Spurious radiated emissions

Test Method

1 The EUT is placed on a turntable, which is 0.8m above ground plane.
2 The turntable shall be rotated for 360 degrees to determine the position of maximum emission level
3 EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4 Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5 Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

Limit

Frequency MHz	Field Strength uV/m	Field Strength dBµV/m	Detector
30-88	100	40	QP
88-216	150	43.5	QP
216-960	200	46	QP
960-1000	500	54	QP
Above 1000	500	54	AV
Above 1000	5000	74	PK

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Spurious radiated emissions

Date of test : 08th May 2013

Operating mode : Transmitter mode

Frequency : 2402MHz

Remark : NIL

Test Result
☒ Passed
☐ Not Passed

Frequency (MHz)	Polarity (H/V)	Read Level (dBµV)	Corr. (dB)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
59.859	H	39.97	-15.10	24.87	40.0	-15.1	QP
71.832	H	52.55	-20.26	32.29	40.0	-7.7	QP
143.830	H	49.93	-18.66	31.27	43.5	-12.2	QP
180.017	H	53.99	-14.10	39.89	43.5	-3.6	QP
191.745	H	56.76	-16.46	40.30	43.5	-3.2	QP
216.024	H	52.03	-15.82	36.21	46.0	-9.8	QP
227.691	H	48.66	-15.34	33.32	46.0	-12.7	QP
287.990	H	45.64	-13.72	31.92	46.0	-14.1	QP
*324.456	H	47.54	-13.01	34.53	46.0	-11.5	QP
360.448	H	49.77	-12.20	37.57	46.0	-8.4	QP
2402.000	H	96.33	1.95	98.28	/	/	PK
2402.000	H	94.60	1.95	96.55	/	/	Ave.
*4804.000	H	51.32	0.01	51.33	74.0	-22.67	PK
*4804.000	H	40.40	0.01	40.41	54.0	-13.59	Ave.

"*" means the emission(s) appear within the restricted bands shall follow the requirement of section 15.205.

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Spurious radiated emissions

Date of test : 08th May 2013

Operating mode : Transmitter mode

Frequency : 2402MHz

Remark : NIL

Test Result
☒ Passed
☐ Not Passed

Frequency (MHz)	Polarity (H/V)	Read Level (dBµV)	Corr. (dB)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
32.749	V	44.46	-13.35	31.11	40.0	-8.89	QP
47.994	V	43.16	-13.47	29.69	40.0	-10.31	QP
59.859	V	46.79	-15.10	31.69	40.0	-8.31	QP
71.832	V	50.85	-20.26	30.59	40.0	-9.41	QP
180.017	V	46.00	-14.10	31.90	43.5	-11.60	QP
191.745	V	54.78	-16.46	38.32	43.5	-5.18	QP
216.024	V	48.77	-15.82	32.95	46.0	-13.05	QP
287.990	V	47.45	-13.72	33.73	46.0	-12.27	QP
360.448	V	45.87	-12.20	33.67	46.0	-12.33	QP
2402.000	V	94.81	1.95	96.76	/	/	PK
2402.000	V	86.22	1.95	88.17	/	/	Ave.
*4804.000	V	48.31	0.01	48.32	74.0	-25.68	PK
*4804.000	V	35.14	0.01	35.15	54.0	-18.85	Ave.

"*" means the emission(s) appear within the restricted bands shall follow the requirement of section 15.205.

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Spurious radiated emissions

Date of test : 08th May 2013

Operating mode : Transmitter mode

Frequency : 2442MHz

Remark : NIL

Test Result
☒ Passed
☐ Not Passed

Frequency (MHz)	Polarity (H/V)	Read Level (dBµV)	Corr. (dB)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
59.861	H	40.01	-15.10	24.91	40.0	-15.1	QP
71.830	H	52.43	-20.26	32.17	40.0	-7.8	QP
143.833	H	50.31	-18.66	31.65	43.5	-11.9	QP
180.017	H	53.85	-14.10	39.75	43.5	-3.8	QP
191.745	H	56.85	-16.46	40.39	43.5	-3.1	QP
216.024	H	51.88	-15.82	36.06	46.0	-9.9	QP
227.691	H	48.95	-15.34	33.61	46.0	-12.4	QP
287.991	H	46.00	-13.72	32.28	46.0	-13.7	QP
*324.453	H	47.54	-13.01	34.53	46.0	-11.5	QP
360.446	H	50.13	-12.20	37.93	46.0	-8.1	QP
2442.000	H	103.39	-1.75	101.64	/	/	PK
2442.000	H	96.35	-1.75	94.60	/	/	Ave.
*4884.000	H	45.88	0.41	46.29	74.0	-27.71	PK
*4884.000	H	42.12	0.41	42.53	54.0	-11.47	Ave.

"*" means the emission(s) appear within the restricted bands shall follow the requirement of section 15.205.

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Tel: +852-2776 1323 Fax: +852-2776 1206

Spurious radiated emissions

Date of test : 08th May 2013

Operating mode : Transmitter mode

Frequency : 2442MHz

Remark : NIL

Test Result
☒ Passed
☐ Not Passed

Frequency (MHz)	Polarity (H/V)	Read Level (dBµV)	Corr. (dB)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
32.753	V	44.41	-13.35	31.06	40.0	-8.94	QP
47.999	V	43.22	-13.47	29.75	40.0	-10.25	QP
59.861	V	46.83	-15.10	31.73	40.0	-8.27	QP
71.835	V	50.89	-20.26	30.63	40.0	-9.37	QP
180.012	V	46.03	-14.10	31.93	43.5	-11.57	QP
191.749	V	54.86	-16.46	38.40	43.5	-5.10	QP
216.020	V	48.72	-15.82	32.90	46.0	-13.10	QP
287.996	V	47.41	-13.72	33.69	46.0	-12.31	QP
360.448	V	45.87	-12.20	33.67	46.0	-12.33	QP
2442.000	V	101.28	-1.75	99.53	/	/	PK
2442.000	V	100.08	-1.75	98.33	/	/	Ave.
*4884.000	V	41.75	0.41	42.16	74.0	-31.84	PK
*4884.000	V	46.23	0.41	46.64	54.0	-7.36	Ave.

"*" means the emission(s) appear within the restricted bands shall follow the requirement of section 15.205.

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Spurious radiated emissions

Date of test : 08th May 2013

Operating mode : Transmitter mode

Frequency : 2480MHz

Remark : NIL

Test Result
☒ Passed
☐ Not Passed

Frequency (MHz)	Polarity (H/V)	Read Level (dBµV)	Corr. (dB)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
59.855	H	39.89	-15.10	24.79	40.0	-15.21	QP
71.836	H	52.39	-20.26	32.13	40.0	-7.87	QP
143.83	H	50.33	-18.66	31.67	43.5	-11.83	QP
180.022	H	53.88	-14.10	39.78	43.5	-3.72	QP
191.747	H	56.81	-16.46	40.35	43.5	-3.15	QP
216.021	H	51.92	-15.82	36.10	46.0	-9.90	QP
227.690	H	48.98	-15.34	33.64	46.0	-12.36	QP
287.986	H	46.05	-13.72	32.33	46.0	-13.67	QP
*324.450	H	47.57	-13.01	34.56	46.0	-11.44	QP
360.449	H	50.07	-12.20	37.87	46.0	-8.13	QP
2480.000	H	103.9	-4.04	99.86	/	/	PK
2480.000	H	102.6	-4.04	98.56	/	/	Ave.
*4960.000	H	59.45	0.74	60.19	74.0	-13.81	PK
*4960.000	H	43.68	0.74	44.42	54.0	-9.58	Ave.

"*" means the emission(s) appear within the restricted bands shall follow the requirement of section 15.205.

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Spurious radiated emissions

Date of test : 08th May 2013

Operating mode : Transmitter mode

Frequency : 2480MHz

Remark : NIL

Test Result
☒ Passed
☐ Not Passed

Frequency (MHz)	Polarity (H/V)	Read Level (dBµV)	Corr. (dB)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
32.756	V	44.46	-13.35	31.11	40.0	-8.89	QP
47.992	V	43.23	-13.47	29.76	40.0	-10.24	QP
59.863	V	46.86	-15.10	31.76	40.0	-8.24	QP
71.831	V	50.91	-20.26	30.65	40.0	-9.35	QP
180.016	V	46.04	-14.10	31.94	43.5	-11.56	QP
191.751	V	54.81	-16.46	38.35	43.5	-5.15	QP
216.023	V	48.75	-15.82	32.93	46.0	-13.07	QP
287.993	V	47.44	-13.72	33.72	46.0	-12.28	QP
360.445	V	45.90	-12.20	33.70	46.0	-12.30	QP
2480.000	V	100.15	-4.04	96.11	/	/	PK
2480.000	V	98.18	-4.04	94.14	/	/	Ave.
*4960.000	V	51.86	0.74	52.6	74.0	-21.40	PK
*4960.000	V	44.32	0.74	45.06	54.0	-8.94	Ave.

"*" means the emission(s) appear within the restricted bands shall follow the requirement of section 15.205.

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Test Equipment List

DESCRIPTION	Type No.	Serial No.	Calibrated until
Antenna	VULB9163	9163 330	2014.02.24
Antenna	3164-05	85724	2014.02.17
Loop Antenna	6512	29604	2013.09.24
Spectrum Analyzer	FSP 40	100378	2013.12.22
EMI Test Receiver	ESCI	100701	2013.08.03
Spectrum Analyzer	FSV40	100903	2014.01.26
Test Cable	SUCOFLEX 104	MY2320/4	2014.02.17
Amplifier	150A250	326446	2014.03.17

TÜV SÜD HONG KONG LTD., 3/F, West Wing, Lakeside 2, 10 Science Park West Avenue, Science Park, Shatin, HK.
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7.6 6dB bandwidth and 20dB bandwidth

Test Method

1 Place the EUT on the table and set it in the 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 Mark the peak frequency and 6dB (upper and lower) frequency.

Limit

Limit [kHz]
≥500

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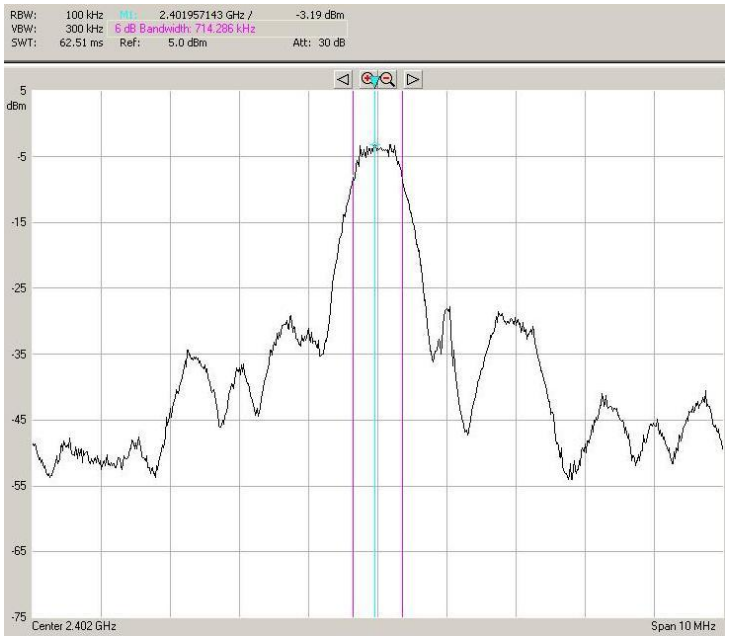
6dB bandwidth and 20dB bandwidth

6dB bandwidth test result
(GFSK)

Bandwidth kHz	Result
714.286	Pass

Remark : NIL



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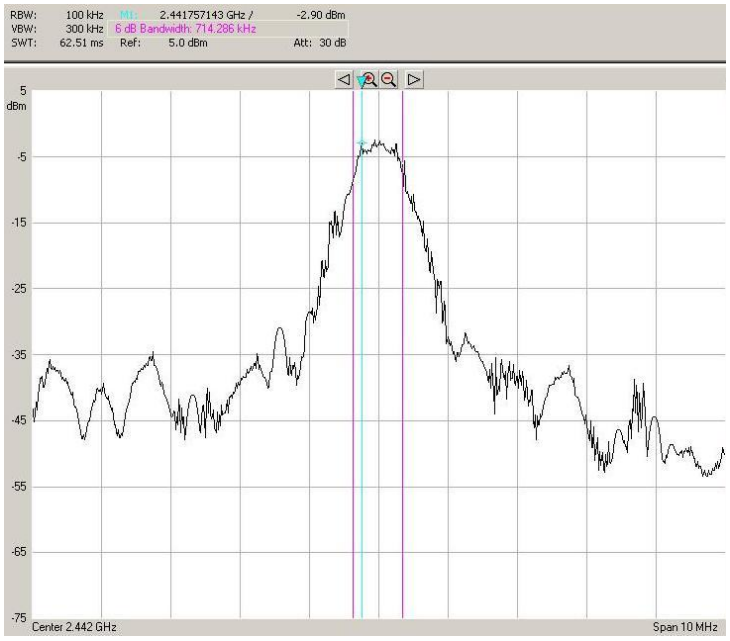
6dB bandwidth and 20dB bandwidth

6dB bandwidth test result
(GFSK)

Bandwidth kHz	Result
714.286	Pass

Remark : NIL



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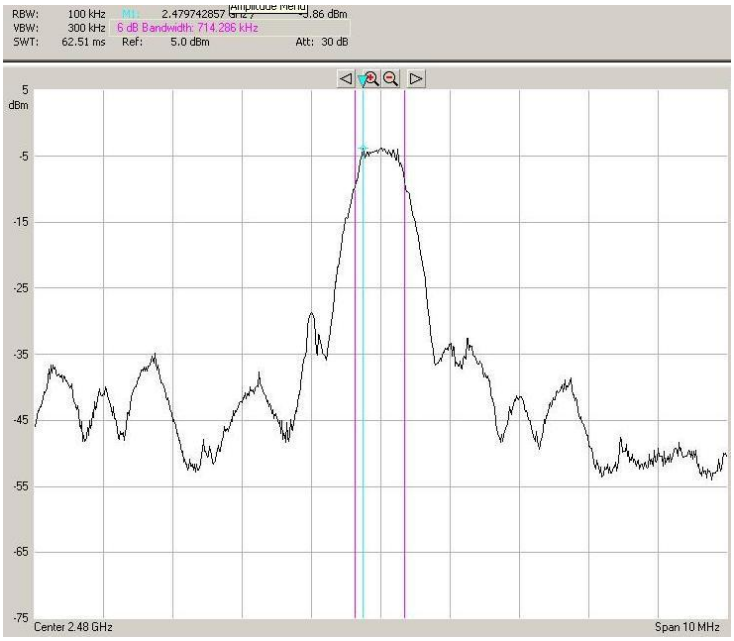
6dB bandwidth and 20dB bandwidth

6dB bandwidth test result
(GFSK)

Bandwidth MHz	Result
714.286	Pass

Remark : NIL



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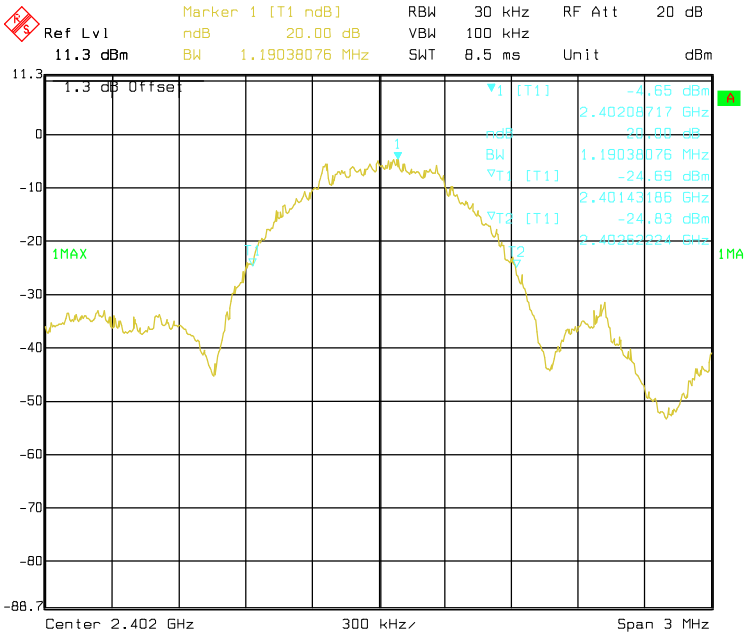
6dB bandwidth and 20dB bandwidth

20dB bandwidth test result
(GFSK)

Bandwidth MHz	Result
1.019	Pass

Remark : All the configurations of the product were tested and only the worst test results (GFSK) listed in the report.



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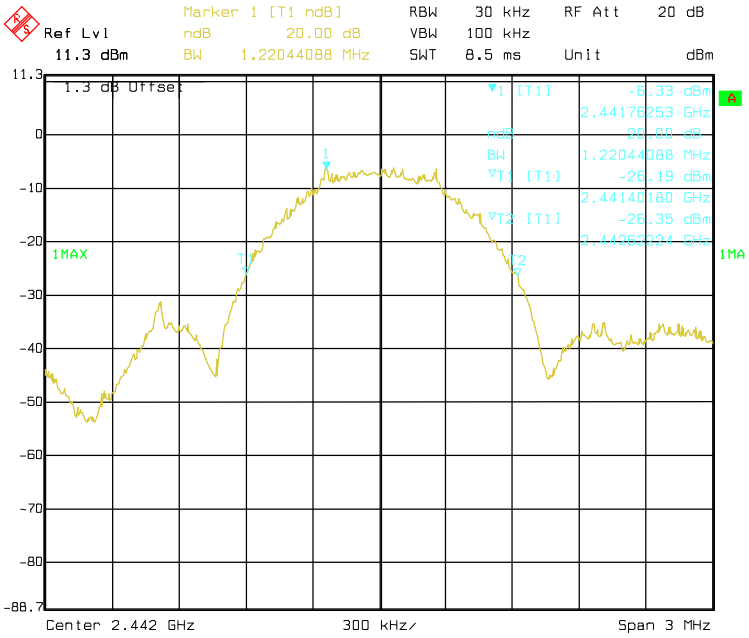
6dB bandwidth and 20dB bandwidth

20dB bandwidth test result
(GFSK)

Bandwidth MHz	Result
1.22	Pass

Remark : All the configurations of the product were tested and only the worst test results (GFSK) listed in the report.



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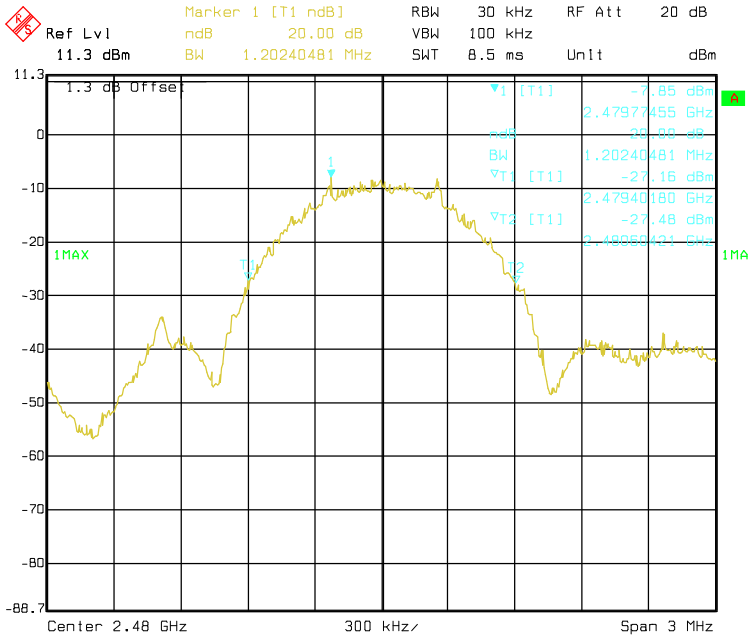
6dB bandwidth and 20dB bandwidth

20dB bandwidth test result
(GFSK)

Bandwidth MHz	Result
1.202	Pass

Remark : All the configurations of the product were tested and only the worst test results (GFSK) listed in the report.



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Test Equipment

6dB bandwidth and 20dB bandwidth Test

DESCRIPTION	Type No.	Serial No.	Calibrated until
Antenna	VULB9163	9163 330	2014.02.24
Antenna	3164-05	85724	2014.02.17
Loop Antenna	6512	29604	2013.09.24
Spectrum Analyzer	FSP 40	100378	2013.12.22
EMI Test Receiver	ESCI	100701	2013.08.03
Spectrum Analyzer	FSV40	100903	2014.01.26
Test Cable	SUCOFLEX 104	MY2320/4	2014.02.17
Amplifier	150A250	326446	2014.03.17

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7.7 Power spectral density

Test Method

1 Place the EUT on the table and set it in transmitting mode. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2 Set the spectrum analyzer as RBW = 3 kHz, VBW = 10 kHz, Span = 300 kHz, Sweep = 500s
3 Record the max reading.

Limit

Limit dBm / 3kHz
8

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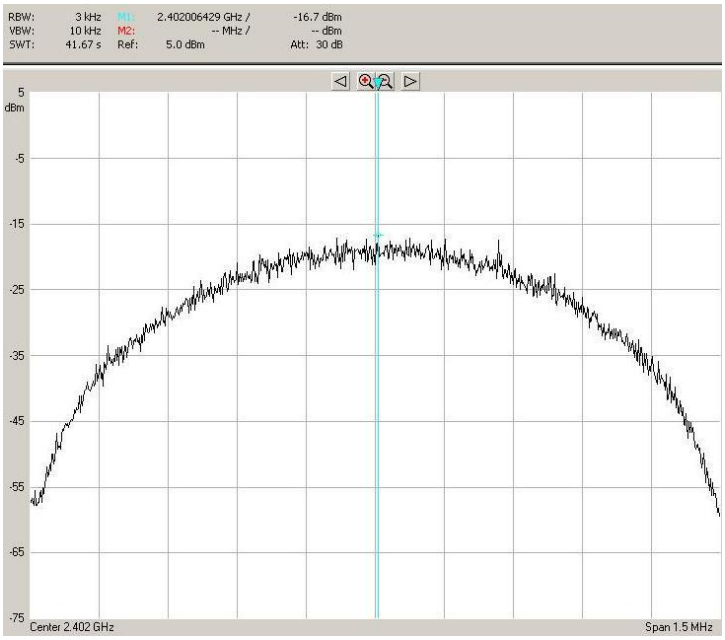
Power spectral density

Test result
(GFSK)

Frequency (MHz)	Power spectral density (dBm)	Result
2402	-16.7	Pass
2442	-16.2	Pass
2480	-17.1	Pass



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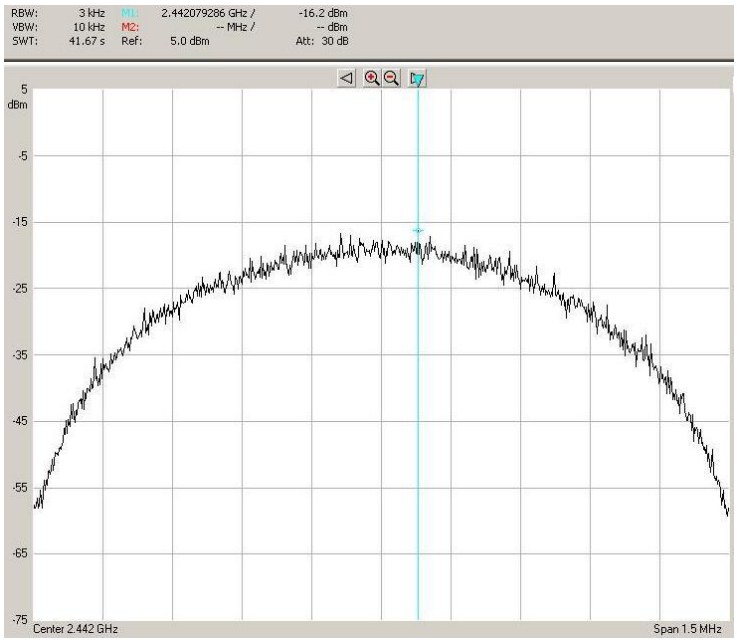
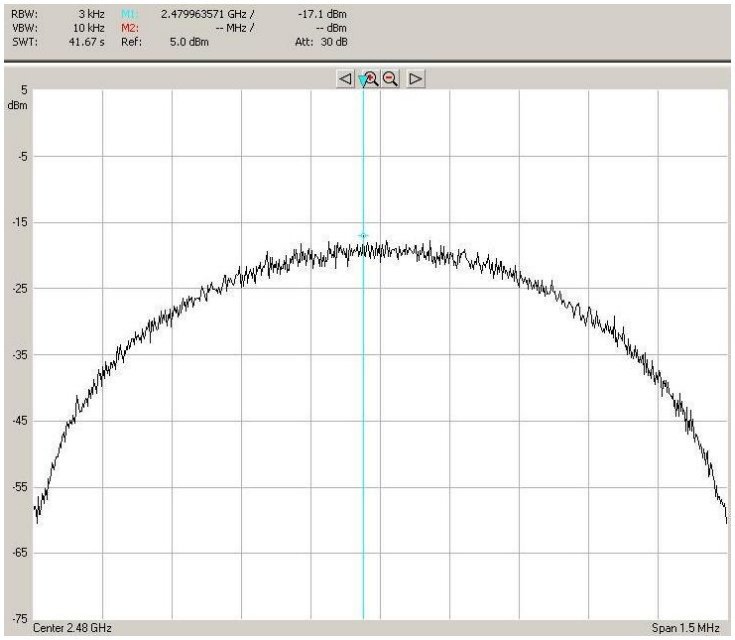
Power spectral density





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Test Equipment

Power spectral density Test

DESCRIPTION	Type No.	Serial No.	Calibrated until
Antenna	VULB9163	9163 330	2014.02.24
Antenna	3164-05	85724	2014.02.17
Loop Antenna	6512	29604	2013.09.24
Spectrum Analyzer	FSP 40	100378	2013.12.22
EMI Test Receiver	ESCI	100701	2013.08.03
Spectrum Analyzer	FSV40	100903	2014.01.26
Test Cable	SUCOFLEX 104	MY2320/4	2014.02.17
Amplifier	150A250	326446	2014.03.17

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8. System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

System Measurement Uncertainty

Items		Extended Uncertainty
RE	Field strength (dBµV/m)	U=5.08dB (30MHz-1GHz) U=4.56dB (1GHz-6GHz)
CE	Disturbance Voltage (dBµV)	U=2.7dB

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