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Report On

FCC and Industry Canada Testing of the Yanfeng Visteon Automotive Electronics Co.,Ltd. Bluetooth Module of R0-13 BTM01

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FCC ID: RQ9BTM01 IC ID: 5444A-BTM01

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August 2013



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Document 57013010 Report 01 Issue 2

August 2013

PREPARED FOR

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PREPARED BY

Le Mucinjie

Test Engineer

APPROVED BY

C Zhang Test Manager

DATED

02 August 2013

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC CFR 47: Part 15 and Industry Canada RSS-210. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s); Ide quanjie Y He

Mary Cherg Xin C Zhang



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SECTION 1

REPORT SUMMARY

FCC and Industry Canada Testing of the Yanfeng Visteon Automotive Electronics Co.,Ltd. Bluetooth Module of R0-13 BTM01



1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Yanfeng Visteon Automotive Electronics Co.,Ltd. Bluetooth Module of R0-13 BTM01 to the requirements of FCC CFR 47 Part 15 and Industry Canada RSS-210.

Objective	To perform FCC and Industry Canada Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	Yanfeng Visteon Automotive Electronics Co., Ltd.
Product Name	Bluetooth Module of R0-13
Product Type	BTM01
Serial Number(s)	ENGINEERING SAMPLE
Software Version	A05
Hardware Version	VPDNMF14E115FAA
Number of Samples Tested	1
Test Specification/Issue/Date	FCC CFR 47 Part 15: 2012 Industry Canada RSS-210 issue 8: 2010
Incoming Release Date	Declaration of Build Status 19 January 2013
Order Number Date	PTP 20 January 2013
Start of Test	21 January 2013
Finish of Test	28 January 2013
Name of Engineer(s)	Y He X Zhang

This report has been up-issued to Issue 2 due to amend the incorrect version of the specification using on page 4.

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1.2 BRIEF SUMMARY OF RESULTS

A brief summary of results in accordance with FCC CFR 47 Part 15 and Industry Canada RSS-210.

Configuration 1 - Bluetooth Module of R0-13							
Section	Spec Clause		Test Description	Mada	Mad Ctata		Commente
	FCC Part 15 RSS-210			Mode	Mod State	Result	Comments
				2402 MHz	0	Pass	
2.1	15.247(b)(1)	Annex 8.4(2)	Maximum Peak Output Power	2441 MHz	0	Pass	-
				2480 MHz	0	Pass	
				2402 MHz	0	Pass	
2.2	15.247(a)(1)	15.247(a)(1) Annex 8.1(b)	20dB Bandwidth	2441 MHz	0	Pass	-
				2480 MHz	0	Pass	
		.205,15.247(d) Annex 8.5	Band Edge Compliance	2402 MHz	0	Pass	
2.3	15.205,15.247(d)			2441 MHz	0	N/A	-
				2480 MHz	0	Pass	
				2402 MHz	0	Pass	
2.4	15.247(d) Ar	Annex 8.5	Conducted Spurious Emissions	2441 MHz	0	Pass	-
				2480 MHz	0	Pass	
				2402 MHz	0	Pass	
2.5	15.209,15.247(d) 2.5, Anne	2.5, Annex 8.5	Radiated Spurious Emissions	2441 MHz	0	Pass	-
					0	Pass	
2.6	15.247(a)(1)(iii)	Annex 8.1(d)	Channel Dwell Time	Hopping	0	Pass	-
2.7	15.247(a)(1)	Annex 8.1(b)	Channel Separation	Hopping	0	Pass	-
2.8	15.247(a)(1)(iii)	Annex 8.1(d)	Number of Hopping Channels	Hopping	0	Pass	-
2.9	15.109	2.3	Receiver Spurious Emissions	Receiving	0	Pass	-

N/A - Not Applicable



1.3 DECLARATION OF BUILD STATUS

MAIN EUT			
Manufacture Yanfeng Visteon Automotive Electronics Co.,Ltd.			
Product Name	Product Name Bluetooth Module of R0-13		
Product Type	BTM01		
Serial Number	ENGINEERING SAMPLE		
Radio Access Technology	Bluetooth		
Hardware Version	VPDNMF14E115FAA		
Software Version	A05		
Operating Frequency	2400MHz to 2483.5MHz		
Transfer Rate	1Mbps, 2Mbps, 3Mbps		
Number of channel	Number of channel 79		
Modulation Type GFSK, π/4DQPSK, 8DPSK			
Output Power (dBm)	IBm) 4dBm		
OUTPUT POWER (mW or dBm)	JTPUT POWER (mW or dBm) 2.51mW / 4dBm		
FCC ID	RQ9BTM01		
IC ID	5444A-BTM01		
IC Model NO	BTM01		
Environment temperature range(s)	Minimum	Maximum	
	-35	85	
DC Power source	Power source 3.3VDC		
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	SN intended BTM01 is a Bluetooth Module. The function of this Module is to establish Bluetooth communication.		

Jiangsu TÜV Product Service Ltd. formally certifies that the manufacturer's declaration as reproduced in this report is a true and accurate record of the original received from the applicant.



1.4 **PRODUCT INFORMATION**

1.4.1 Technical Description

The Equipment Under Test (EUT) was a Yanfeng Visteon Automotive Electronics Co.,Ltd. Bluetooth Module of R0-13 BTM01 as shown in the photograph below. A full technical description is held by Yanfeng Visteon Automotive Electronics Co.,Ltd.

The Equipment Under Test (EUT) is shown in the photograph below. A full technical description can be found in the Manufacturers documentation.



Equipment Under Test



1.4.2 Test Configuration

Configuration 1: 2.4GHz Bluetooth Module

Packet type DH5 was found to be representative for all traffic scenarios when different packet types were tested to find the worst case setting. The settings were used for all measurements if not otherwise noted.

The EUT was powered by a +3.3VDC Power supply.

1.4.3 Modes of Operation

Modes of operation of the EUT during testing were as follows:

Test Mode 1 – 2402 MHz (Tx) Test Mode 2 – 2441 MHz (Tx) Test Mode 3 – 2480 MHz (Tx) Test Mode 4 – Frequency Hopping (Tx) Test Mode 5 – 2441MHz (Rx)

Information on the specific test modes utilised are detailed in the test procedure for each individual test.

1.5 TEST CONDITIONS

For all tests the EUT was set up in accordance with the relevant test standard and to represent typical operating conditions. Tests were applied with the EUT situated in a shielded enclosure, test laboratories or an open test area as appropriate.

1.6 DEVIATIONS FROM THE STANDARD

No deviations from the applicable test standards or test plan were made during testing.

1.7 MODIFICATION RECORD

No modifications were made to the EUT during testing.

1.8 ALTERNATIVE TEST SITE

The testing was conducted at following site registrations:

FCC Accreditation 910917: The State Radio Monitoring Center, No.80 Beilishi Road Xicheng District Beijing, China.

Industry Canada Accreditation 7308A-1: The State Radio Monitoring Center, No.80 Beilishi Road Xicheng District Beijing, China.



SECTION 2

TEST DETAILS

FCC and Industry Canada Testing of the Yanfeng Visteon Automotive Electronics Co.,Ltd. Bluetooth Module of R0-13 BTM01



2.1 MAXIMUM PEAK OUTPUT POWER

2.1.1 Specification Reference

FCC CFR 47 Part 15, Clause 15.247(b)(1) Industry Canada RSS-210, Annex 8.4(2)

2.1.2 Equipment Under Test

Bluetooth Module of R0-13 BTM01, S/N: ENGINEERING SAMPLE

2.1.3 Date of Test and Modification State

21 January 2013 – Modification State 0

2.1.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.1.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 15 and Industry Canada RSS-210.

The EUT was connected to the spectrum analyzer via an RF cable. The path loss of the cable was measured and entered as an offset. The peak level was recorded and compared with the test limits.

The path loss was measured and entered as a reference level offset.

The test was performed with the EUT in the following configurations and modes of operation:

Configuration1	- Mode 1
-	- Mode 2
	- Mode 3

2.1.6 Environmental Conditions

21	January 2013
	~~ ~

Ambient Temperature	25.0°C
Relative Humidity	50.0%



2.1.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15 and Industry Canada RSS-210 for Maximum Peak Output Power

The test results are shown below.

Configuration 1 - Mode 1, 2 & 3

GFSK

Frequency (MHz)	Path Loss (dB)	Gain (dBi)	Output Power (dBm)	Output Power (mW)
2402	1.6	0	6.37	4.34
2441	1.6	0	6.77	4.75
2480	1.6	0	7.01	5.02

π/4DQPSK

Frequency (MHz)	Path Loss (dB)	Gain (dBi)	Output Power (dBm)	Output Power (mW)
2402	1.6	0	5.73	3.74
2441	1.6	0	6.10	4.07
2480	1.6	0	6.25	4.22

8DPSK

Frequency (MHz)	Path Loss (dB)	Gain (dBi)	Output Power (dBm)	Output Power (mW)
2402	1.6	0	5.84	3.84
2441	1.6	0	6.20	4.17
2480	1.6	0	6.37	4.34

Limit	≤30dBm or ≤1000mW

Remarks

The EUT does not exceed 1000mW or 30dBm at the measured frequencies.



2.2 20DB BANDWIDTH

2.2.1 Specification Reference

FCC CFR 47 Part 15, Clause 15.247(a)(1) Industry Canada RSS-210, Annex 8.1(b)

2.2.2 Equipment Under Test

Bluetooth Module of R0-13 BTM01, S/N: ENGINEERING SAMPLE

2.2.3 Date of Test and Modification State

21 and 22 January 2013 - Modification State 0

2.2.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.2.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 15 and Industry Canada RSS-210.

Using the spectrum analyzer to test the 20dB bandwidth. Set the

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 1	- Mode 1
U U	- Mode 2
	- Mode 3

2.2.6 Environmental Conditions

	21 January 2013	22 January 2013
Ambient Temperature	25.0°C	24.0°C
Relative Humidity	50.0%	50.0%



2.2.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15 and Industry Canada RSS-210 for Occupied Bandwidth.

The test results are shown below.

Configuration 1 - Mode 1, 2 & 3

<u>GFSK</u>

🗊 Agilent Spe	ctrum Analyzer - 1	Swept SA		- 35				2		
Marker 1	50 Ω 2 4024020	00000 C	H -	AC SEF	VSE:INT	Ava Type	ALIGNAUTO	01:17:45 TRA	M Jan 21, 2013	Peak Search
Marker	2.4021520 In	put: RF P	NO: Far 🖵	Trig: Free	Run	Avg Hold:	>100/100	TY D		
		11-6	ain:Low	#Atten: ou			Miked	2 402 1	02 CH-	Next Peak
10 dB/div	Ref Offset 4.9	97 dB 1Bm					WINT	10.9	17 dBm	
Log										
45.0					.1					Next Pk Right
15.0				~~~	∼ ?' —					
4.97										
										Next Pk Left
-5.03				1	h	-20.00 (B			NEXTERLET
						1.118	Hz			
-15.0			- /			1				
-25.0						1		m		Marker Delta
-20.0	ΛΛ	. ^	~~~^				/	$\langle \rangle$		
-35.0	1 mm -	with with the second second				- 1	put	۰ ۲		
and the	t.		ι Γ				ww		What a	Mkr→CF
-45.0									"how	
-55.0										Mkr→RefLvl
-00.0										
										More
Center 2.4	02000 GHz		#\/R\4	300 682			Sween	Span 6	.000 MHz	1 of 2
MSG	100 KH2		<i></i> v D v v	500 KH2			STATUS	noo ins i	roor pts)	
mod							STATUS			

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Configuration 1 - Mode 1, 2 & 3

<u>π/4DQPSK</u>





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💴 Agilent Spectr	um Analyzer - Swept SA							
Marker 1 2	50 Ω 2.48003600000) GHz	SENSE:INT	Avg Type	ALIGNAUTO	11:12:14 A	M Jan 21, 2013	Peak Search
10 dB/div	Input: RF Ref Offset 4.97 dB Ref 24.97 dBm	PNO: Far 😱 IFGain:Low	Trig: Free Run #Atten: 30 dB	Avg Hold:	>100/100 Mkr1	2.480 0 9.75	36 GHz 59 dBm	Next Peak
15.0			1					Next Pk Right
4.97		_		20.0	dB			Next Pk Left
-15.0	<u>ſ</u>	hour		1.387		mm		Marker Delta
-35.0 -45.0	navatva						North North	Mkr→CF
-55.0								Mkr→RefLvi
Center 2.48 #Res BW 10	0000 GHz 00 kHz	#VBW	300 kHz		Sweep	Span 6. 1.00 ms (′	000 MHz 1001 pts)	More 1 of 2
MSG					STATU	5		

Configuration 1 - Mode 1, 2 & 3

8DPSK



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鱦 Agilent Spectrum Analyzer - Swept SA				
Marker 1 2.441036000000	GHz SENSE:INT	ALIGNAUTO Avg Type: Log-Pwr	11:10:59 AM Jan 21, 2013 TRACE 1 2 3 4 5 6	Peak Search
Ref Offset 4.97 dB	PNO: Far C Trig: Free Run IFGain:Low #Atten: 30 dB	Mkr1	2.441 036 GHz 10.005 dBm	Next Peak
15.0	1			Next Pk Right
4.97		-20.00 dB		Next Pk Left
-15.0 -25.0	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	1.388 MHz	M	Marker Delta
-35.0			- M	Mkr→CF
-65.0				Mkr→RefLvl
Center 2.441000 GHz #Res BW 100 kHz	#VBW 300 kHz	Sweep	Span 6.000 MHz 1.00 ms (1001 pts)	More 1 of 2
MSG		STATUS	5	



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2.3 BAND EDGE COMPLIANCE

2.3.1 Specification Reference

FCC CFR 47 Part 15, Clause 15.205, 15.247(d) Industry Canada RSS-210, Annex 8.5

2.3.2 Equipment Under Test

Bluetooth Module of R0-13 BTM01, S/N: ENGINEERING SAMPLE

2.3.3 Date of Test and Modification State

21 January 2013 – Modification State 0

2.3.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.3.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 15 and Industry Canada RSS-210.

The EUT was transmitted at maximum power to the Spectrum Analyser. The Analyser settings were adjusted to display the resluted trace on screen. The peak point of the trace was meausured and the markers positioned to give the -20dBc points of the displayed sprectrum.

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 1 - Mode 1 - Mode 3

2.3.6 Environmental Conditions

	21 January 2013
Ambient Temperature	25.0°C
Relative Humidity	50.0%



2.3.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15 and Industry Canada RSS-210 for Band Edge Compliance.

The test results are shown below.

Configuration 1 - Mode 1 & 3

<u>GFSK</u>







Configuration 1 - Mode 1 & 3

<u>π/4DQPSK</u>







Configuration 1 - Mode 1 & 3

8DPSK







2.4 SPURIOUS CONDUCTED EMISSIONS ON ANTENNA PORT

2.4.1 Specification Reference

FCC CFR 47 Part 15, Clause 15.247(d) Industry Canada RSS-210, Annex 8.5

2.4.2 Equipment Under Test

Bluetooth Module of R0-13 BTM01, S/N: ENGINEERING SAMPLE

2.4.3 Date of Test and Modification State

21 January 2013 – Modification State 0

2.4.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.4.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 15 and Industry Canada RSS-210.

The Spurious Conducted Emissions from the antenna terminal were measured. The frequency spectrum investigated from 9kHz to 25 GHz. The EUT was set to transmit on full power. The spectrum analyser detector was set to Max Hold.

With the EUT transmitting at maximum power, the Spectrum Analyser was set to Max Hold and the fundamental peak measured in a RBW and VBW of 1MHz. The level was used to determin the limit line as displayed on the plots of -20dBc.

The maximum path loss across each measurement band was used as the reference level offset to ensure worst case results.

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 1 - Mode 1 - Mode 2 - Mode 3

2.4.6 Environmental Conditions

	21 January 2013
Ambient Temperature	25.0°C
Relative Humidity	50.0%



2.4.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15 and Industry Canada RSS-210 for Spurious Conducted Emissions on Antenna Port.

The plots of test results are shown below.

Remark:

The emission at 9kHz on the plots was not generated by the test object. A complementary measurement with a smaller span showed that it was related to the LO feedthrough.

🅦 Agilent Spectrum Analyz	er - Swept SA						
50 Ω		<u>∧</u> DC	SENSE:INT	Avg Type	ALIGNAUTO	02:48:15 PM Jan 21, 2013 TRACE 1 2 3 4 5 6	Marker
	Input: RF I	PNO: Far 😱 FGain:Low	Trig: Free Run #Atten: 30 dB	Avg Hold:	> 100/100	TYPE MWWWWW DET PNNNNN	Select Marker
Ref Offse 10 dB/div Ref 11.0	et 1.6 dB 60 dBm						2
1.60							Normal
-8.40							
-18.4						-14.49 dBm	
-28.4							Deita
-38.4							
48.4							Fixed⊳
-58.4	mm	m.	^				
-68.4				m		mmm	Off
-78.4							
							Properties►
Start 9.00 kHz #Res BW 2.0 kHz		#VBW 6	ô.2 kHz		Sweep 2	Stop 100.00 kHz 21.7 ms (1001 pts)	
MKR MODE TRC SCL	× 9.0	000 kHz -	Y 45,660 dBm	FUNCTION FU	NCTION WIDTH	FUNCTION VALUE	More
2						×	1 of 2
MSG.					STATUS	L DC Coupled	



<u>GFSK</u>

Configuration 1 - Mode 1

<u>9kHz – 3GHz</u>

🗊 Agiler	nt Spectrum Anal	yzer - Swept SA								
<mark>w</mark> Mark <i>i</i>	50 Ω or 1 2 / 03 (0179100		DC SEN:	SE:INT	Ava Type:	ALIGNAUTO	02:07:31 P TRAC	M Jan 21, 2013	Marker
		Input: RF	PNO: Fast G IFGain:Low	Trig: Free Atten: 20 d	Run A dB	Avg Hold:>	100/100	TYF		Select Marker
10 dB/	Ref Offs div Ref 11	et 1.6 dB .60 dBm					Mk	r1 2.403 7.52	3 0 GHz 20 dBm	1*
1.60								1		Normal
-8.40									-12.44 dBm	Delta
-28.4										Fixed⊳
-40.4					2 1 H-14-14		المحطنينا	Jogway	ghr-gupondus	Off
-88.4 - 4	deserved and the deserved of the local sectors of the sector of the sector of the sector of the sector of the s	ىلىمەلىرىيەن يەرىكىلىرىيە ^{لى}	n den af see an							Properties >
Start #Res	9 kHz BW 100 kHz	<u>.</u>	#VBW	/ 300 kHz			Sweep	Stop 3 287 ms (.000 GHz 1001 pts)	Fropences
MKR MO	ide TRC SCL J 1 f J 1 f	× 2. 1.	403 0 GHz 584 0 GHz	7.520 dB -66.738 dB	FUNCTIO m m	DN FUN	CTION WIDTH	FUNCTIO	IN VALUE	More 1 of 2
MSG							STATUS	L DC Cou	pled	





Configuration 1 - Mode 2

<u>9kHz – 3GHz</u>

🌉 Agilent Spec	trum Analyzer - Swept							
w Marker 2	^{50 Ω} 1.3830048510	000 GHz	C SENSE:IM	Avg Avg	ALIGNAUTO Type: Log-Pwr	02:28:09 P TRAC	M Jan 21, 2013 E 1 2 3 4 5 6	Marker
	Input: R	F PNO: Fast 🖵 IFGain:Low	#Atten: 30 dB	i Avgir	1010: 29/100 Mk	DE		Select Marker
10 dB/div	Ref Offset 1.6 dB Ref 11.60 dBm)				-56.50	09 dBm	2
1.60						∨1		Normal
-8.40							-12.81 dBm	
-18.4								Delta
-28.4								_
-38.4								Fixed⊳
-48.4			¢ ²		مەر بىلەردىك الەر بىدا بىر .	of ordere provide	white	
-50.4 mm.	vni-ferencfingeter Antonio aller	en gegener ander sterker keiner	fyllanter ffren fan gelekker fan feren					Off
-78.4								
Start 9 kH	7					Stop 3	000 GH7	Properties►
#Res BW	100 kHz	#VBW	300 kHz		Sweep	287 ms (1001 pts)	2
MKR MODE TR	C SCL 2 f f	× 2.441 19 GHz 1.383 0 GHz	Y 7.010 dBm -56.509 dBm	FUNCTION	FUNCTION WIDTH	FUNCTIO	IN VALUE	More 1 of 2
MSG					STATUS	上 DC Coi	pled	





Configuration 1 - Mode 3

<u>9kHz – 3GHz</u>







<u>π/4DQPSK</u>

Configuration 1 - Mode 1

<u>9kHz – 3GHz</u>

🗊 Agilent Spe	ctrum Analyz	er - Swept SA								
Warker 2	50 Ω 1 / 220 (14734000	GH7	DC SE	NSE:INT		ALIGNAUTO	02:40:50 F	M Jan 21, 2013	Marker
	1.42200	Input: RF	PNO: Fast G	Trig: Free #Atten: 30	e Run) dB	AvgHold	45/100	TYI Di		Select Marker
10 dB/div	Ref Offse Ref 11.6	t 1.6 dB 6 0 dBm					Mk	r2 1.42 -56.8	2 0 GHz 85 dBm	2
160								¢ ¹		Normal
-8.40										
-18.4									-14.49 dBm	Delta
-28.4									2	
-38.4										Fixed
-48.4				2						Theup
-58.4	had the second second	ntality.antroast	felmennekskilasperset	annon marchada	internation and the second	eetydenter\${%\$	ndunnund	have be from	monthese	Off
-68.4									· · · ·	
-78.4										Properties N
Start 9 kH #Res BW	iz 100 kHz		#VBW	/ 300 kHz			Sweep	Stop 3 287 ms (.000 GHz 1001 pts)	Fioperaes
MKR MODE TF	IC SCL	× 24	03.0 GHz	Y 3 196 d	FUN	CTION FU	NCTION WIDTH	FUNCTIO	DN VALUE	More
2 N 1	f	1.4	22 0 GHz	-56.885 dl	3m				~	1 of 2
MSG							STATUS	L DC Cou	upled	





Configuration 1 - Mode 2

<u>9kHz – 3GHz</u>

🅦 Agilent Spectrum	n Analyzer - S	Swept SA								
Marker 1 2.4	Ω 4420016	74000 G	Hz	DC SEI	VSE:INT	Avg Typ	ALIGNAUTO	02:35:30 F	M Jan 21, 2013	Marker
	Inj	out: RF PI IFC	NO: Fast 🗣 Gain:Low	#Atten: 30	Run IdB	Avg Hold	1: 54/100	TY D		Select Marker
Re 10 dB/div Re	of Offset 1.6 ef 11.60 c	dB IBm					Mk	r1 2.44: 1.5	2 0 GHz 39 dBm	1*
1 M								∮ ¹		Normal
0.40										NOTIN
+0.4U									-14.03 dBm	
-18.4										Delta
-28.4										
-38.4										Fixed⊳
-48.4								a shh odde	الدراطر والعرب	
-58.4 martenality	m hunderstelet	monthelin	modelment	dering bergrafer filmely	www.edwarthyroldyw	appendence and the	vad ljuge of age of the	Car (Brand Anna a		Off
-68.4										
-78.4										Droportion
Start 9 kHz			#\/B\A	300 647			Sween	Stop 3	.000 GHz	Fioperales
MKR MODE TRC SC	1	X	** U D 44	Y	FU	NCTION F	UNCTION WIDTH	FUNCTI		More
1 N 1 f 2 N 1 f		2.442 1.896	0 GHz 0 GHz	1.539 dl -55.882 dl	3m 3m					1 of 2
MSG				W			STATUS	DC Co	upled	

💴 Agilent Spe	ctrum Analyzi	er - Swept SA		- 16						
Marker 1	50 Ω 4.89200	0000000	GHz	AC SEN	SE:INT		ALIGNAUTO	02:34:56 PM TRACE	1 Jan 21, 2013	Marker
		Input: RF	PNO: Fast G	#Atten: 30	dB	Avginola.	10/100	DET	PNNNNN	Select Marker
10 dB/div	Ref Offse Ref 11.6	t 1.6 dB i0 dBm					M	lkr1 4.89 -48.59	92 GHz 5 dBm	1
1.60										Normal
-18.4									-14.03 dBm	Delta
-38.4	↓ 1	²				201 - 6-164	n U r	رور رور الارور الارور الارور ال	J. control for a grade	Fixed⊳
-58.4	ng landor Million	And the second second	nt gernere and	helingen of the second days	40.00 mm - 400					Off
-78.4 Start 3.00 #Res BW	GHz 100 kHz		#VB\A	300 kHz	~		Sween	Stop 25	.00 GHz	Properties►
MKR MODE TR	IC SCL	× 4 7	892 GHz 334 GHz	-48.595 dB -51.168 dB	FUNC m m	TION FUP	NCTION WIDTH	FUNCTION	VALUE	More 1 of 2
MSG							STATUS			



Configuration 1 - Mode 3

<u>9kHz – 3GHz</u>

🎵 Agilent Spec	trum Analyzer -	Swept SA								
Marker 2	50 Ω 1.5930042	221000 G	Hz	DC SEM	ISE:INT	Avg Typ	ALIGNAUTO e: Log-Pwr	02:33:25 P	M Jan 21, 2013	Marker
	In	put: RF PN IFG	IO: Fast 🕞 ain:Low	#Atten: 30	Run dB	Avg Hold	i: 55/100	TYI Di		Select Marker
10 dB/div	Ref Offset 1. Ref 11.60	S dB d Bm					MK	r2 1.59 -56.3	3 0 GHz 20 dBm	2
1.60										Normal
-8.40										
-18.4									-14.02 dBm	Delta
-28.4										
-38.4										Fixed⊳
-48.4					¢ ²					
-58.4 www.tplbt	n van hafelwyn llerwlyfe	an a	deflately any day of the	waaroo faandadadada	هوا م _و ساری دو ا طراعت	Mall produces of	dellaneer van der	C. P. S. M. M. Martine	davoren jaratra 1994	Off
-68.4										
-78.4										Properties►
Start 9 kH #Res BW	z 100 kHz		#VBW	/ 300 kHz			Sweep	Stop 3 287 ms (.000 GHz 1001 pts)	
MKR MODE TR	C SCL f	× 2.481 () GHz	ې 3.608 dE	FUN 3m	ICTION FI	JNCTION WIDTH	FUNCTIO		More
2 N 1	T.	1.593	JGHZ	-56.320 dE	sm				>	1012
MSG							STATUS	DC Cou	upled	





8DPSK

Configuration 1 - Mode 1

<u>9kHz – 3GHz</u>

🎵 Agilent Sp	ectrum Analyze	er - Swept SA								
Marker 1	50 Ω 2 40300	1791000 0		C SE	NSE:INT	Avg Typ	ALIGNAUTO e: Log-Pwr	02:43:02 F	M Jan 21, 2013	Marker
	2.40300	Input: RF F	PNO: Fast 😱 Gain:Low	Trig: Free #Atten: 30	e Run) dB	AvgiHoid	: 52/100	TYI Di		Select Marker
10 dB/div	Ref Offsel Ref 11.6	: 1.6 dB i 0 dBm					Mk	r1 2.40 5.2	3 0 GHz 21 dBm	1*
1.60								1		Normal
-8.40									-14.49 dBm	Delta
-28.4										Fixed⊳
-48.4 -58.4	ubourtohn	n frank frank	Leven and mails/shough f	waterborder	and the last of the set of the se	2 and the second	araa ahaa haa	l _{yderedwin} rda	Hyrvapologytosa	Off
-68.4 -78.4										
Start 9 ki #Res BW	Hz 100 kHz		#VBW	300 kHz			Sweep	Stop 3 287 ms (.000 GHz 1001 pts)	Properties►
MKR MODE T 1 N 2 N	RC SCL 1 f 1 f	× 2.403 1.839	0 GHz 0 GHz	Y 5.221 dl -59.041 dl	FUN 3m 3m	ICTION FU	NCTION WIDTH	FUNCTIO	DN VALUE	More 1 of 2
MSG							STATUS	LDC Cou	upled	





Configuration 1 - Mode 2

<u>9kHz – 3GHz</u>

🎵 Agilent Spec	ctrum Analyzer - Sw	ept SA						
Marker 2	^{50 Ω} 1.92900321	3000 GHz	DC SENSE:INT	Avg Typ	ALIGNAUTO	02:44:51 P TRAC	M Jan 21, 2013 E 1 2 3 4 5 6	Marker
	Inpu	t: RF PNO: Fast G IFGain:Low	#Atten: 30 dB	Avginoid	: 41/100	DE	PNNNNN	Select Marker
10 dB/div	Ref Offset 1.6 c Ref 11.60 dE	iB Sm			Mk	r2 1.929 -56.09	9 0 GHz 94 dBm	2
1 61						_1 		Normal
-8.40								Horma
-18.4							-13.95 dBm	Dates
-28.4								Deita
-38.4								
-48.4				2				Fixed⊳
-58.4	har televise New Address	wishmakadatahwadaku	and more thank and the second	اد المالي و المالي و المالي و المالي و	www.eashbaassil	a where and	non-airfelightullysiensi	
-68.4								Off
-78.4								
Start 9 kH	7					Stop 3	000 GH7	Properties►
#Res BW	100 kHz	#VB\	N 300 kHz		Sweep	287 ms (1001 pts)	
MKR MODE TR	C SCL	× 2.442 0 GHz	Y 4.934 dBm	FUNCTION FU	NCTION WIDTH	FUNCTIO	IN VALUE	More
2 N 1		1.929 0 GHz	-56.094 dBm				>	1012
MSG					STATUS	L DC Cou	pled	





Configuration 1 - Mode 3

<u>9kHz – 3GHz</u>

🇊 Agilent Spec	ctrum Analyz	er - Swept SA								
Warker 2	50 Ω 1 67700	13969000	GHz 🚹	DC SEI	NSE:INT	Avg Typ	ALIGNAUTO e: Log-Pwr	02:46:52 TRA	M Jan 21, 2013	Peak Search
		Input: RF	PNO: Fast G FGain:Low	Trig: Free #Atten: 30	e Run) dB	AvgHold	1: 39/100 M k	TY D T2 1.67		Next Peak
10 dB/div	Ref Offse Ref 11.6	t 1.6 dB 60 dBm						-57.3	20 dBm	
1.60								≬1 		Next Pk Right
-8.40									-14.05 dBm	
-18.4										Next Pk Left
-28.4										
-38.4										Marker Delta
-48.4					¢ ²		u talka, a. ask	the Weden	marter and a start	
-58.4 www.	nahanyatudahtisin	aphyness Martin Martin a Ar	al warmen have	and the second	indial and a second		and a still and the second			Mkr→CF
-68.4										
-/8.4										Mkr→RefLvi
Start 9 kH #Res BW	z 100 kHz		#VBV	V 300 kHz			Sweep	Stop 3 287 ms (.000 GHz 1001 pts)	
MKR MODE TR 1 N 1 2 N 1 <	C SCL f f	× 2.48 1.67	1 0 GHz 7 0 GHz	Y 5.816 dl -57.320 dl	FUN Bm Bm	CTION FL	JNCTION WIDTH	FUNCTI	DN VALUE	More 1 of 2
MSG							STATUS	DC Co	upled	





2.5 RADIATED SPURIOUS EMISSIONS

2.5.1 Specification Reference

FCC CFR 47 Part 15, Clause 15.209, 15.247(d), 15.205 Industry Canada RSS-210, Clause 2.5, Annex 8.5

2.5.2 Equipment Under Test

Bluetooth Module of R0-13 BTM01, S/N: ENGINEERING SAMPLE

2.5.3 Date of Test and Modification State

28 January 2013 – Modification State 0

2.5.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.5.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 15 and Industry Canada RSS-210.

A preliminary profile of the Spurious Radiated Emissions was obtained by operating the EUT on a remotely controlled turntable within the chamber. Measurements of emissions from the EUT were obtained with the Measurement Antenna in both Horizontal and Vertical Polarisations.

Emissions identified within the range 30MHz - 25GHz were then formally measured using a Peak detector as the worst case.

In the frequency Range 30MHz - 25GHz, the measurement was performed with a resolution bandwidth of 1MHz.

The measurements were performed at a 3m distance unless otherwise stated.

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 1 - Mode 1 - Mode 2 - Mode 3

2.5.6 Environmental Conditions

28 January 2013 Ambient Temperature 22.9°C Relative Humidity 24.2%



2.5.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15 and Industry Canada RSS-210 Radiated Spurious Emissions.

The test results are shown below.

<u>GFSK</u>

Configuration 1 - Mode 1

No emissions were dectected within 20dB of the limit.

Configuration 1 - Mode 2

No emissions were dectected within 20dB of the limit.

Configuration 1 - Mode 3

<u> 30MHz – 1GHz</u>





<u> 1GHz – 3GHz</u>



Note: The emission beyond the limit is the operating frequency.

<u> 3GHz – 18GHz</u>



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<u> 18GHz – 25GHz</u>



<u>π/4DQPSK</u>

Configuration 1 - Mode 2

No emissions were dectected within 20dB of the limit.

<u>8DPSK</u>

Configuration 1 - Mode 2

No emissions were dectected within 20dB of the limit.

Frequency range	Limit
30 MHz to 88 MHz	40dBµV/m
88 MHz to 216 MHz	43.5dBµV/m
216 MHz to 960 MHz	46dBµV/m
>960MHz	Average:54dBµV/m, Peak:74dBµV/m

Remarks

The EUT does not exceed the limit during the test.



2.6 CHANNEL DWELL TIME

2.6.1 Specification Reference

FCC CFR 47 Part 15, Clause15.247(a)(1)(iii)

2.6.2 Equipment Under Test

Bluetooth Module of R0-13 BTM01, S/N: ENGINEERING SAMPLE

2.6.3 Date of Test and Modification State

21 January 2013 – Modification State 0

2.6.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.6.5 Test Method and Operating Modes

The test was applied in accordance with 15.247.

The Bluetooth system hops at a rate of 1600 times per second. Thus, this equates to 1600 timeslots in 1 second.

Thus:

1 Timeslot = $\frac{1}{1600}$ = 625µs

(a) The DH1 data rate operates on a Transmit on 1 timeslot and Receive on 1 timeslot basis. Thus, in 1 second, there are 800 Transmit timeslots and 800 Receive timeslots.

In 1 transmit timeslot, the transmit on time is only 405µs. 220µs is reserved as off time for the synthesizer to re-tune ready for the next transmit frequency. The following timeslot is a receive slot. This process continues assuming the data rate remains the same.



DH1 Timeslot Arrangement Showing One Complete Transmit and Receive Cycle

So, with 800 Tx and 800 Rx timeslots, the transmitter is on for 800 x 405µs = 0.324 seconds.

 $\frac{\text{Total Tx Time On}}{\text{No of Channels}} = \frac{0.324}{79} = 4.10 \text{ms}$

So, in 31.6 seconds, the transmitter dwell time per channel is:

31.6 x 4.10ms = 0.1296 seconds

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(b) With data rate DH3, the data payload is higher and can use up to 3 timeslots. When more than one timeslot is used, the frequency does not hop and transmission is continuous on all 3 slots, (ie. no receive slot in-between the 3 transmit slots). The 220µs off time for synthesizer retuning at the end of a slot is only used on the final slot. Thus, for one cycle, there are 3 transmit timeslots. 2 are 625µs long and the final slot is transmitting for 405µs.

The first 2 Transmit timeslots are transmitting for the complete 625µs. In the third transmit slot, the transmit on time is only 405µs. 220µs is reserved as off time for the synthesizer to re-tune ready for the next transmit frequency. The following timeslot is a receive slot. This process continues assuming the data rate remains the same.



DH3 Timeslot Arrangement Showing One Complete Transmit and Receive Cycle

Thus, the transmitter for one complete transmit and receive cycle would be on for:

Tx	(2 x 62	5µs)+(1 x 405µ	is)	=	1.655ms
So: 800 x 625µs 400 x 405 µs	=	0.5 sec 0.162 s	onds econds			
Thus: 0.5 + 0.	162	=	0.662 s	econds		
<u>Total Tx Time</u> No of Channe	<u>On</u> Is	=	<u>0.662</u> 79	=	8.379m	IS

So, in 31.6 seconds, the transmitter dwell time per channel is:

31.6 x 8.379ms = 0.2648 seconds

(c) With data rate DH5, the data payload is higher and can use up to 5 timeslots. When more than one timeslot is used, the frequency does not hop and transmission is continuous on all 5 slots, (ie. no receive slot in-between the 5 transmit slots). The 220 μ s off time for synthesizer retuning at the end of a slot is only used on the final slot. Thus, for one cycle, there are 5 transmit timeslots. 4 are 625 μ s long and the final slot is transmitting for 405 μ s.

The DH5 data rate operates on a Transmit on 5 timeslots and Receives on 1 timeslot basis, (assuming maximum data payload). The frequency-hopping rate is the same. Thus, in 1 second, there are 1333.3 Transmit timeslots and 266.7 Receive timeslots.

The first 4 Transmit timeslots are transmitting for the complete 625µs. In the fifth transmit slot, the transmit on time is only 405µs. 220µs is reserved as off time for the synthesizer to re-tune ready for the next transmit frequency. The following timeslot is a receive slot. This process continues assuming the data rate remains the same.

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DH5 Timeslot Arrangement Showing One Complete Transmit and Receive Cycle

Thus, the transmitter for one complete transmit and receive cycle would be on for:

Тх (4 x 625µs) + (1 x 405µs) 2.905ms = So: 1066.7 x 625µs 0.666 seconds = 266.7 x 405µs = 0.108 seconds Thus: 0.666 + 0.108 = 0.774 seconds Total Tx Time On <u>0.774</u> 9.797ms = = No of Channels 79

So, in 31.6 seconds, the transmitter dwell time per channel is:

31.6 x 9.797 ms = 0.31 seconds

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 1 - Mode 4

2.6.6 Environmental Conditions

	21 January 2013
Ambient Temperature	25.0°C
Relative Humidity	50.0%



2.6.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15 and Industry Canada RSS-210 for Dwell Time.

The plots of test results are shown below.

Configuration 1 - Mode 4

Dwell time:

Packet Type	Dwell Time Calculate Formula	Result(ms)
DH1	79 * 0.4 * 1600 / 79 / 2 * 0.396	126.72
DH3	79 * 0.4 * 1600 / 79 / 4 * 1.640	262.40
DH5	79 * 0.4 * 1600 / 79 / 6 * 2.880	307.20



DH1 Timeslot

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💴 Agilent Spectrum Analyzer - Swept SA					
<mark>0//</mark> Marker 1 Δ 1.64000 ms	4	AC SENSE:INT	ALIGNAUTO Avg Type: Log-Pwr	10:05:45 AM Jan 21, 2013 TRACE 1 2 3 4 5 6	Marker
Input: RF	PNO: Fast 🖵 IFGain:Low	#Atten: 20 dB		DET A NNNN N	Select Marker
10 dB/div Ref 10.00 dBm				-0.17 dB	1
X2		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			Normal
0.00					
-10.0					Delta
-20.0					20114
-30.0	-				Fixed
-40:0					I IACU /
-50.0					0#
-60.0		Color Specific and a	้างประสมครั้งการเล่าเหนือเรื่อง	water -	
-70.0		10.8.29			
10.0					Properties►
-80.0					More
Center 2.441000000 GHz			Swaan d	Span 0 Hz	1 of 2
NES DW 8 WITZ	VBW	5.0 WIEZ	status	5 (1001 pts)	

DH3 Timeslot

🗊 Agilent Spectru	ım Analyzer - Swept SA	Sec				
Marker 1 A	2 88000 mc	AC SEN	BE:INT AVA T	ALIGNAUTO	10:07:38 AM Jan 21, 2013 TRACE 1 2 3 4 5	Marker
	Input: RF P	NO: Fast 😱 Trig: Free Gain:Low #Atten: 20	Run dB		DET A N N N N N	SolootMarkor
10 dB/div R	tef 10.00 dBm			Δ	Mkr1 2.880 ms -0.03 dB	1
0.00	X2	<u></u> 1∆2				Normal
-10.0						Delta
-30.0						Fixed⊳
-50.0	gearstrystrategitiques	affatuationser	nutationer and a second		Kophystowedstratest armonys-Av	Off
-70.0						Properties►
Center 2.441 Res BW 8 M	1000000 GHz Hz	VBW 8.0 MHz		Sweep 1	Span 0 Hz 5.00 ms (1001 pts)	More 1 of 2
MSG				STATUS		-

DH5 Timeslot

Limit	≤ 0.4s
-------	--------



2.7 CHANNEL SEPARATION

2.7.1 Specification Reference

FCC CFR 47 Part 15, Clause 15.247(a)(1) Industry Canada RSS-210, Annex 8.1(b)

2.7.2 Equipment Under Test

Bluetooth Module of R0-13 BTM01, S/N: ENGINEERING SAMPLE

2.7.3 Date of Test and Modification State

21 January 2013 – Modification State 0

2.7.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.7.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 15 and Industry Canada RSS-210.

The EUT was transmitted at maximum power into a Spectrum Analyser. The trace was set to Max Hold to store several adjacent channels on screen. Using the marker delta function, the marker were positioned to show the separation between adjacent channels.

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 1 - Mode 4

2.7.6 Environmental Conditions

21 January 2013

Ambient Temperature25.0°CRelative Humidity50.0%



2.7.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15 and Industry Canada RSS-210 for Channel Separation.

The test results are shown below.

Configuration 1 - Mode 4



The system channel separation is specified as being 1MHz. The measured channel separation from the plt above is: 1000kHz.

|--|

Remarks

The channel separation of the EUT is more than 25 kHz.



2.8 NUMBER OF HOPPING CHANNELS

2.8.1 Specification Reference

FCC CFR 47 Part 15, Clause 15.247(a)(1) Industry Canada RSS-210, Annex 8.1(d)

2.8.2 Equipment Under Test

Bluetooth Module of R0-13 BTM01, S/N: ENGINEERING SAMPLE

2.8.3 Date of Test and Modification State

21 January 2013 – Modification State 0

2.8.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.8.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 15 and Industry Canada RSS-210.

The EUT was connected to a spectrum Analyser via a cable. The EUT was set to transmit on maximum power and hopping on all channels. The span was adjusted to show the individual channels. To reasonably display the number of channels, the occupied band was split into two traces. The display trace was set to Max Hold and the plots recorded.

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 1 - Mode 4

2.8.6 Environmental Conditions

	21 January 2013		
Ambient Temperature	25.0°C		
Relative Humidity	50.0%		



2.8.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15 and Industry Canada RSS-210 for Number of Hopping Channels.

The test results are shown below.

Configuration 1 - Mode 4



1.1.1.1	
Limit	>15 channels



2.9 RECEIVER SPURIOUS EMISSIONS

2.9.1 Specification Reference

FCC CFR 47 Part 15, Clause 15.109 Industry Canada RSS-210, Clause 2.3

2.9.2 Equipment Under Test

Bluetooth Module of R0-13 BTM01, S/N: ENGINEERING SAMPLE

2.9.3 Date of Test and Modification State

28 January 2013 – Modification State 0

2.9.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.9.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 15 and Industry Canada RSS-210.

A preliminary profile of the Receiver Spurious Emissions was obtained by operating the EUT on a remotely controlled turntable within a semi-anechoic chamber. Measurements of emissions from the EUT were obtained with the Measurement Antenna in both Horizontal and Vertical Polarisations. The profiling produced a list of the worst-case emissions together with the EUT azimuth and antenna polarisation.

Emissions identified within the range 30MHz – 1GHz were formally measured using a CISPR Quasi-Peak detector. 1GHz – 15GHz were formally measured using Peak and Average detector.

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 1 - Mode 5

2.9.6 Environmental Conditions

28 January 2013

Ambient Temperature	22.9°C	
Relative Humidity	24.2%	



2.9.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15 and Industry Canada RSS-210 for Number of Hopping Channels.

The test results are shown below.

Configuration 1 - Mode 5

<u> 30MHz – 1GHz</u>





<u>1GHz - 15GHz</u>



Frequency range	Limit
30 MHz to 88 MHz	40dBµV/m
88 MHz to 216 MHz	43.5dBµV/m
216 MHz to 960 MHz	46dBµV/m
>960MHz	Average:54dBµV/m, Peak:74dBµV/m

Remarks

The EUT does not exceed the limit during the test.



SECTION 3

TEST EQUIPMENT USED



3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

Instrument	Manufacturer	Туре No.	Serial No.	Calibration Period (months)	Calibration Due
Section 2.1, 2.2, 2.3 2.4, 2.6. 2.7 and 2.8 – Maximum Peak Output Power, 20dB Bandwidth, Band Edge Compliance, Conducted Spurious Emissions, Channel Dwell Time, Channel Separation, Number of Hopping Channels.					
Spectrum Analyzer	Agilent	N9020A	MY48010771	12	19-Aug-2013
Power Meter	Agilent	E4416A	MY45101138	12	19-Aug-2013
Power Sensor	Agilent	8482A	MY41092445	12	19-Aug-2013
Temperature Chamber	Espec	SH-241	92000390	12	19-Aug-2013
Power Supply	Agilent	E3645A	MY40000747	12	19-Aug-2013
Digital Multimeter	FLUKE	179	91820401	12	13-Dec-2013
Thermo-hygrom eter	AZ Instruments	8705	9151655	12	16-Dec-2013
Section 2.5 and 2.9 -	Radiated Spurious En	nissions and Rec	eiver Spurious E	missions.	
EMI Receiver	Rohde & Schwarz	ESI 40	100015	12	19-Aug-2013
Ultra log test antenna	Rohde & Schwarz	HL562	100167	12	19-Aug-2013
Double-Ridged Wave-guide Horn Antenna	Rohde & Schwarz	HF 906	100029	12	19-Aug-2013
Pyramidal Horn Antenna	EMCO	3160-09	-	-	-
Antenna master	Frankonia	MA 260	-	12	19-Aug-2013
Relay Switch Unit	Rohde & Schwarz	331.1601.31	338965002	-	TU
Semi Anechoic Chamber	Frankonia	23.18m×16.88 m× 9.60m	-	12	19-Aug-2013
Digital Multimeter	FLUKE	179	91820401	12	13-Dec-2013
Thermo-hygrom eter	AZ Instruments	8705	9151655	12	16-Dec-2013

O/P MONOutput monitored with calibration equipmentTUTraceability Unscheduled



3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:-

Test Discipline	Frequency / Parameter	MU	
Radiated Emissions, Bilog Antenna, AOATS	30MHz to 1GHz Amplitude	5.1dB*	
Radiated Emissions, Horn Antenna, AOATS	1GHz to 40GHz Amplitude	6.3dB*	
Substitution Antenna, Radiated Field	30MHz to 22GHz Amplitude	2.6dB	
Worst case error for both Time and Frequency measurement 12 parts in 10 ⁶ .			

* In accordance with CISPR 16-4



SECTION 4

DISCLAIMERS AND COPYRIGHT



4.1 DISCLAIMERS AND COPYRIGHT

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