

FCC C2PC Test Report

Equipment	:	Bluetooth + ANC Headphone		
Brand Name	:	Bang & Olufsen		
Model No.	:	BeoPlay H8		
FCC ID	:	TTUBEOPLAYH8		
Standard	:	47 CFR FCC Part 15.247		
Operating Band	:	2400 MHz – 2483.5 MHz		
FCC Classification	:	DSS		
Applicant	:	Bang & Olufsen A/S Peter Bangs Vej 15, DK-7600 Struer, Denmark		

The product sample received on Sep. 25, 2015 and completely tested on Oct. 07, 2015. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by:

James Fan / Assistant Manager





Table of Contents

1	GENERAL DESCRIPTION	5
1.1	Information	5
1.2	Accessories and Support Equipment	7
1.3	Testing Applied Standards	7
1.4	Testing Location Information	7
1.5	Measurement Uncertainty	8
2	TEST CONFIGURATION OF EUT	9
2.1	The Worst Case Modulation Configuration	9
2.2	The Worst Case Power Setting Parameter	9
2.3	The Worst Case Measurement Configuration	
2.4	Test Setup Diagram	10
3	TRANSMITTER TEST RESULT	11
3.1	AC Power-line Conducted Emissions	11
3.2	Transmitter Unwanted Emissions	14
4	TEST EQUIPMENT AND CALIBRATION DATA	21
APPEI	NDIX A. TEST PHOTOS A	1~A5



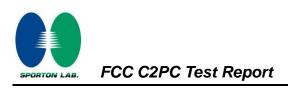
Summary	of Te	est Result
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	Conformance Test Specifications				
Report Clause	Ref. Std. Clause	Description	Measured	Limit	Result
3.1	15.207	AC Power-line Conducted Emissions	[dBuV]: 0.165MHz 40.89 (Margin 14.32dB) - AV 50.44 (Margin 14.77dB) - QP	FCC 15.207	Complied
3.2	15.247(d)	Transmitter Unwanted Emissions	Restricted Bands [dBuV/m at 3m]: 937.92MHz 34.85 (Margin 11.15dB) - PK	Non-Restricted Bands: > 20 dBc Restricted Bands: FCC 15.209.	Complied



Revision History

Report No.	Version	Description	Issued Date
FR591830	Rev. 01	Initial issue of report	Oct. 19, 2015



1 General Description

1.1 Information

This report is prepared for FCC class II Permissive change.

This report is issued as a supplementary report to original Sporton report no. FR4O2304. The difference compared with original design is adding copper foil on PCB. In this report, AC Power-line conducted emission and radiated emission tests had been re-tested and only its data was presented in the following sections.

1.1.1 RF General Information

RF General Information					
Frequency Range (MHz)	Bluetooth Mode	Ch. Frequency (MHz)	Channel Number	RF Output Power (dBm)	
2400-2483.5	BR / EDR	2402-2480	0-78 [79]	4.76	
Note 1: Bluetooth BR uses a GFSK (1Mbps). Note 2: Bluetooth EDR uses a combination of π/4-DQPSK (2Mbps) and 8DPSK (3Mbps). Note 3: RF output power specifies that Maximum Peak Conducted Output Power.					

1.1.2 Antenna Information

	Antenna Category				
\boxtimes	Integral antenna (antenna permanently attached)				
	Temporary RF connector provided				
		No temporary RF connector provided Transmit chains bypass antenna and soldered temporary RF connector provided for connected measurement. In case of conducted measurements the transmitter shall be connected to the measuring equipment via a suitable attenuator and correct for all losses in the RF path.			
	External antenna (dedicated antennas)				
		RF connector provided			
		Unique antenna connector. (e.g., MMCX, U.FL, IPX, and RP-SMA, RP-N type)			
		Standard antenna connector. (e.g., SMA, N, BNC, and TNC type)			
		Standard antenna connector. (e.g., SMA, N, BNC, and TNC type)			

	Antenna General Information			
No.	Ant. Cat.	Ant. Type	Connector	Gain _(dBi)
1	Integral	CHIP	No Connector	1.99



1.1.3 Type of EUT

	Identify EUT			
EUT	Serial Number	N/A		
Pre	Presentation of Equipment Droduction ; Pre-Production ; Prototype			
	Type of EUT			
\square	Stand-alone			
	Combined (EUT where the radio part is fully integrated within another device)			
	Combined Equipment - Brand Name / Model No.:			
	Plug-in radio (EUT intended for a variety of host systems)			
	Host System - Brand Name / Model No.:			
	Other:			

1.1.4 Test Signal Duty Cycle

Operated Mode for Worst Duty Cycle		
Operated normally hopping mode for worst duty cycle		
Operated test mode for worst duty cycle		
Test Signal Duty Cycle (x)Power Duty Factor[dB] - (10 log 1/x)		
79.58% - test mode single channel – DH1	0.99	
Image: 79.58% - test mode single channel – DH30.99		
Image: 79.35% - test mode single channel – DH51.00		
Bluetooth ACL packets can be 1, 3, or 5 time slots. The DH1 packet can cover a single time slot. The DH3 packet can cover up to 3 time slots. The DH5 packet can cover up to 5 time slots. Operate DH5 at maximum		

1.1.5 EUT Operational Condition

dwell time and maximum duty cycle.

Power Supply Type	From battery: 3.7Vdc, 770mAh, 2.9Wh From host: 5Vdc
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1.2 Accessories and Support Equipment

	Accessories			
No.	o. Equipment Description			
1	USB to Micro USB cable	1.28m shielded w/o core		
2	Audio cable	1.25m non-shielded w/o core		

		Support Equ	ipment	
No.	Equipment	Brand Name	Model Name	FCC ID
1	Notebook	DELL	Latitude E6430	DoC

1.3 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR FCC Part 15
- ANSI C63.10-2013
- FCC Public notice DA 00-705

1.4 Testing Location Information

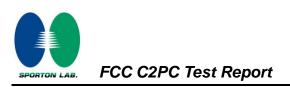
					Testing Location	n	
\boxtimes	Hwa Ya	ADD	:		∕a 1 st Rd., Hwa Ya Te en, Taiwan, R.O.C.	echnology Park, Kwe	i-Shan Hsiang,
		TEL	:	886-3-327-34	56 FAX : 8	386-3-327-0973	
Т	est Conditio	on	Te	est Site No.	Test Engineer	Test Environment	Test Date
A	C Conductio	n	(CO01-WS	Skys Huang	22°C / 58%	Oct. 07, 2015
Rad	diated Emiss	sion	0	3CH09-HY	Mark Liao	20-22°C / 62-65%	Sep. 25 ~ Oct. 05, 2015
				r [213289] with r [4086G-1] wit			



1.5 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)

Meas	surement Uncertainty	/	
Test Item	Uncertainty	Limit	
AC power-line conducted emissions		±2.26 dB	N/A
Emission bandwidth, 6dB bandwidth		±1.42 %	N/A
RF output power, conducted		±0.63 dB	N/A
Power density, conducted	±0.81 dB	N/A	
All emissions, radiated	30 – 1000 MHz	±3.62 dB	N/A
	Above 1GHz	±5.60 dB	N/A
Temperature		±0.8 °C	N/A
Humidity		±3 %	N/A
DC and low frequency voltages		±3 %	N/A
Time		±1.42 %	N/A
Duty Cycle		±1.42 %	N/A



2 Test Configuration of EUT

2.1 The Worst Case Modulation Configuration

	Worst N	Iodulation Used	for Conformance	Testing	
Bluetooth Mode	Transmit Chains (N _{TX})	Data Rate	Modulation Mode	RF Output Power (dBm)	Worst Mode
BR	1	1 Mbps	BR-1Mbps	4.76	EDR-1Mbps
EDR	1	2 Mbps	EDR-2Mbps	3.24	
EDR	1	3 Mbps	EDR-3Mbps	3.84	

2.2 The Worst Case Power Setting Parameter

The Worst Case Pow	ver Setting Param	eter	
Test Software Version / Instrument	Software: Bluetes	t 3, Bluetooth Test	ter: R&S CBT
Modulation Mode	2402 MHz	2440 MHz	2480 MHz
BR,1Mbps	Default	Default	Default
EDR,2Mbps	Default	Default	Default
EDR,3Mbps	Default	Default	Default

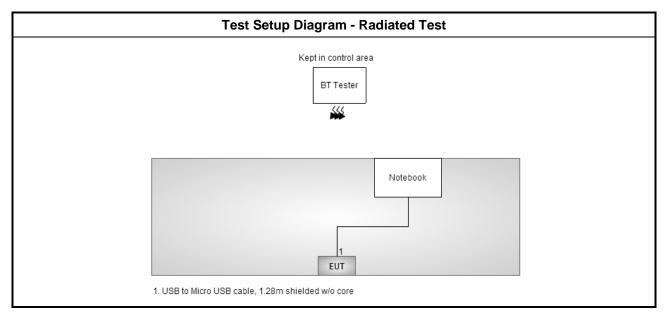


2.3 The Worst Case Measurement Configuration

	The Worst Case Mode for Following Conformance Tests
Tests Item	AC power-line conducted emissions
Condition	AC power-line conducted measurement for line and neutral Test Voltage: 120Vac / 60Hz
1	USB charging + Radio link

Th	The Worst Case Mode for Following Conformance Tests								
Tests Item	Transmitter Radiated Unwanted Emissions								
Test Condition	Radiated measurement								
	EUT will be placed in	fixed position.							
User Position	EUT will be placed in mobile position and operating multiple positions. shall be performed two orthogonal planes. The worst planes is Y.								
		powered devices and opera ed two or three orthogonal p	ating multiple positions. blanes. The worst planes is						
Operating Mode	🛛 1. USB charging + F	Radio link							
Modulation Mode	BR-1Mbps, EDR-3Mbps								
	X Plane	Y Plane	Z Plane						
Orthogonal Planes of EUT									

2.4 Test Setup Diagram





Transmitter Test Result 3

3.1 **AC Power-line Conducted Emissions**

3.1.1 **AC Power-line Conducted Emissions Limit**

AC Powe	er-line Conducted Emissions I	Limit
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50
5-30 Note 1: * Decreases with the logarithm of		50

ecreases with the logarithm of the frequency

3.1.2 Measuring Instruments

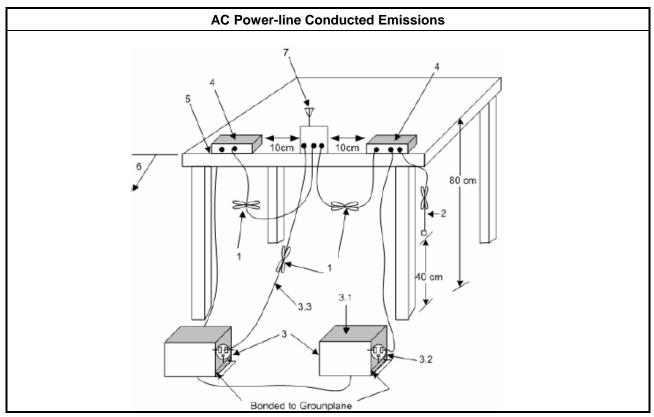
Refer a test equipment and calibration data table in this test report.

3.1.3 **Test Procedures**

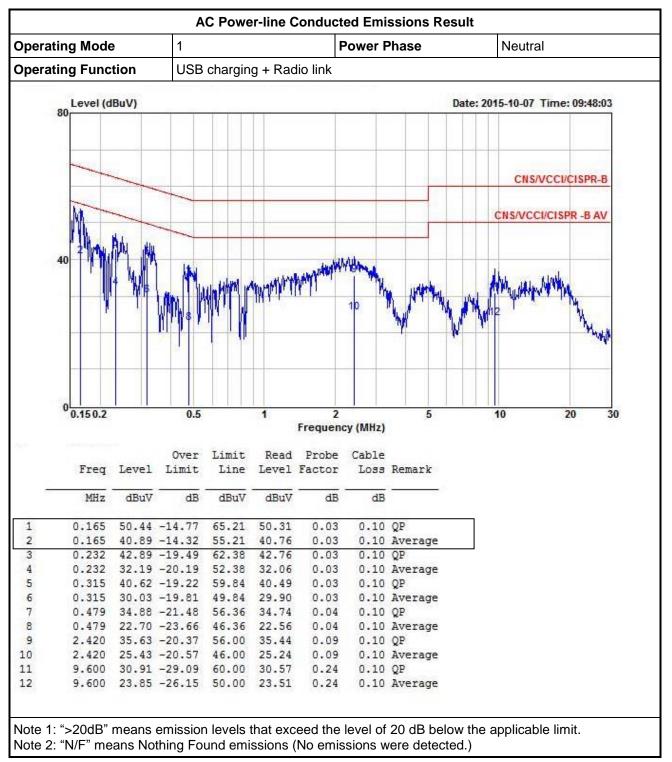
Test Method

Refer as ANSI C63.10-2013, clause 6.2 for AC power-line conducted emissions.

3.1.4 Test Setup

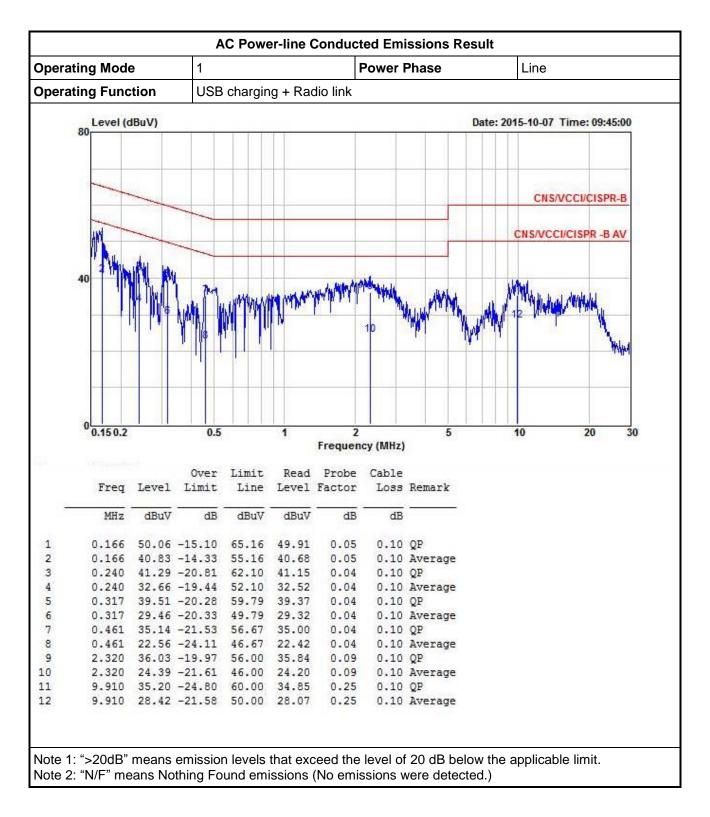






3.1.5 Test Result of AC Power-line Conducted Emissions







3.2 Transmitter Unwanted Emissions

3.2.1 Transmitter Radiated Unwanted Emissions Limit

Restricted Band Emissions Limit								
Measure Distance (m)								
00								
0								
0								
3								
3								
3								
3								
3								

Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below 30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

Un-restricted Ban	d Emissions Limit
RF output power procedure	Limit (dB)
Peak output power procedure	20
Average output power procedure	30
	n the peak conducted output power measured within band shall be attenuated by at least 20 dB relative to vel.

Note 2: If the average output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured in-band average PSD level.

3.2.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

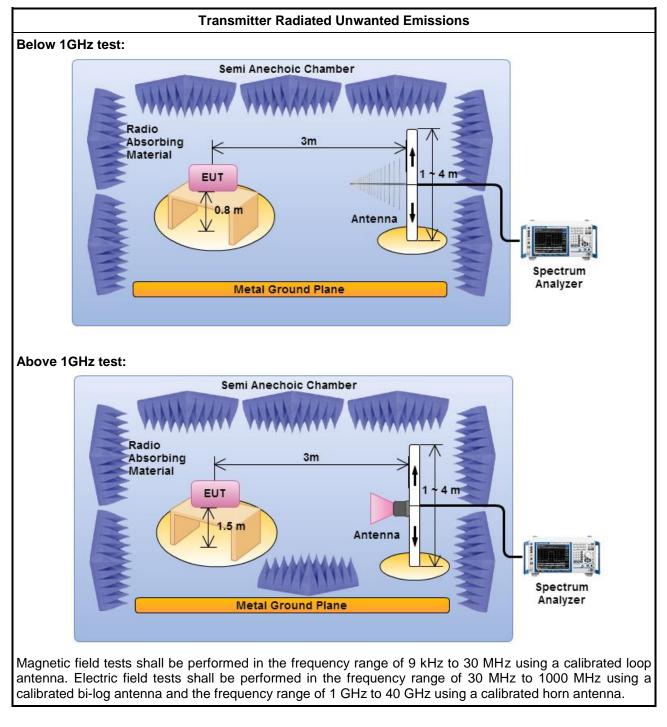


3.2.3 Test Procedures

		Test Method – General Information
\boxtimes	perfo equi extra dista	surements may be performed at a distance other than the limit distance provided they are not ormed in the near field and the emissions to be measured can be detected by the measurement pment. When performing measurements at a distance other than that specified, the results shall be apolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear ince for field-strength measurements, inverse of linear distance-squared for power-density surements).
\square	For	the transmitter unwanted emissions shall be measured using following options below:
	\boxtimes	Refer as FCC DA 00-0705, for spurious radiated emissions. The dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a "duty cycle correction factor", derived from 20log (dwell time/100 ms)
	\boxtimes	For unwanted emissions into non-restricted bands. Peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak PSD level.
	\boxtimes	For unwanted emissions into restricted bands.
		□ Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW). VBW \ge 1/T, where T is pulse time.
		Refer as ANSI C63.10, clause 4.2.3.2.4 average value of pulsed emissions.
		Refer as ANSI C63.10, clause 4.2.3.2.2 measurement procedure peak limit.
\boxtimes	For	radiated measurement.
	\boxtimes	Refer as ANSI C63.10, clause 6.4 for radiated emissions from below 30 MHz.
	\boxtimes	Refer as ANSI C63.10, clause 6.5 for radiated emissions from 30 MHz to 1000 MHz.
	\boxtimes	Refer as ANSI C63.10, clause 6.6 for radiated emissions from above 1 GHz.



3.2.4 Test Setup



3.2.5 Transmitter Radiated Unwanted Emissions (Below 30MHz)

All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.



Modulation Mode	I	BR-1Mbps				Test Freq. (MHz)				2480		
Polarization												
90 Level (dBuV/m) Date: 2015-09-25												
	,											
81.0												
72.0												
63.0										FCC CI	LASS-B	
54.0										100 01		
45.0												
36.0		1 2 3			4				5		6	
27.0											+	
18.0												
9.0												
0 <mark>0</mark>	00.	200.	300.	400.	500.	600	7()0.	800.	900.	1000	
50		200.			Frequenc						1000	
			0ver	Limit	Read	Antenna	Cable	Preamp	A/Pos	T/Pos		
	Freq	Level	Limit	Line	Level	Factor	Loss	Factor			Remark	
4	MHz	dBuV/m	dB			dB/m	dB	dB	cm	deg	Deals	
1 2	188.11	30.48 31.90			49.69 51.39			31.57 31.55			Peak Peak	
2	259.89			45.00	47.58			31.46			Peak	
4		29.69			42.03			31.39			Peak	
5		29.76			36.41			31.34			Peak	
6		29.17				24.50		31.33			Peak	
Note 1: ">20dB" mea				1 41		14.1			L. (L.			

3.2.6 Transmitter Radiated Unwanted Emissions (Below 1GHz)

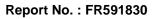


Polarization V 90 Level (dBuV/m) Date: 2015-09 81.0 72.0 63.0 63.0 63.0 54.0 56.0 63.0 54.0 55.0 66.0 63.0 27.0 2 3 4 5 6
81.0 72.0 63.0 54.0 45.0 36.0 1 0 0 3
81.0 72.0 63.0 54.0 45.0 36.0 1 0 0 3
72.0 63.0 54.0 45.0 36.0 1 0 0 3
63.0 54.0 45.0 36.0 1 0 0 3 1 0 0 3 1 0 0 3 1 0 0 1 1 0 0 0 1 1 0 0 0 1 1 0 0 0 1 1 0 0 0 0 1 1 0 0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
54.0 45.0 36.0 1 2 3 3 3 4 3 4 5 6 3 6 3 6 3 6 1 5 3 6
54.0 45.0 45.0 45.0 36.0 4 5 6
36.0 4 5 6
36.0 1 0 3
9.0
0 30 100. 200. 300. 400. 500. 600. 700. 800. 900. Frequency (MHz)
Over Limit Read Antenna Cable Preamp A/Pos T/Pos
Freq Level Limit Line Level Factor Loss Factor Re
MHz dBuV/m dB dBuV/m dBuV dB/m dB dB cm deg
1 48.43 26.21 -13.79 40.00 42.78 14.71 0.53 31.81 Per
2 165.80 25.49 -18.01 43.50 42.77 13.45 0.87 31.60 Pe 3 232.73 27.75 -18.25 46.00 46.23 12.04 0.98 31.50 Pe
3 232.73 27.75 -18.25 46.00 46.23 12.04 0.98 31.50 Pe 4 746.83 31.80 -14.20 46.00 39.15 22.24 1.77 31.36 Pe
5 797.27 34.70 -11.30 46.00 41.64 22.58 1.82 31.34 Pe
6 937.92 34.85 -11.15 46.00 39.72 24.48 1.98 31.33 Pe



3.2.7 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 8DPSK

Modulation N	lode					1	t Frea /	•	ove 1G	, 2441		
Operating Function		EDR-3Mbps Transmit				Test Freq. (MHz) Polarization			244 I H			
Operating Fu	nctio	'n	Iransmi	t		Pola	arization	1		н		
9	0 Level	(dBuV/m)									Date: 201	5-10-05
81.	0										TCC CI	ACCD
72.	0										FLUCI	LASS-B
63.	0											
54.			6						_	FCC	CLASS-	B (AVG)
45.		2+		8								
36.		8										
27.			5	-								
18.												
9.	0											
	0 <mark>1000</mark>	4000	. 6000.	8000.	10000.	12000.	14000. 1	6000. 1	8000. 2	20000. 2	22000.	25000
						Frequenc						
				0ver	Limit	Read	Antenna	Cable	Preamp	A/Pos	T/Pos	
		Freq	Level	Limit			Factor				.,	Remark
		MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
	1	2390.00	36.97				28.08	4.57	34.38	357		Average
	2	2390.00	48.29	-25.71	74.00	50.02	28.08	4.57	34.38	357	121	Peak
	3	2483.50	37.51	-16.49	54.00	39.31	27.93	4.62	34.35	357	121	Average
	4	2483.50	49.23	-24.77	74.00	51.03	27.93	4.62	34.35	357	121	Peak
	5		21.91			15.28	32.76	6.82	32.95	154	114	Average
	6	4882.00	52.01	-21.99	74.00		32.76		32.95	154		Peak
	7		16.61				37.18		34.40	268		Average
	8	7323.00	9 46.71	-27.29	74.00	35.43	37.18	8.50	34.40	268	202	Peak
Note 1: ">20d	B" me	ane enu	rious on	niesion la	avale the	at avca	d the lev	al of 2	0 dB be	low the	annlic	ahla limit
Note 2: Meas											applic	
Note 3: For re										field str	onath .	ae moaei
		ak-Dele	JUI Mee	is the A	v-LIIIII S	o inat t	ne AV lev		S HOL NE		e iebo	
additio		rioto d h -	ndo		minele			- ا احمد		at 00 -	Drelat	
Note 4: For ur					mission	is shall	be attent	lated b	y at lea	st 20 d	в relati	ive to the
		neasure									4000	
Note 5: Avera												
					: RBW=	=1MHz;	vBW ≥ 1	/I, whe	ere T is	"Pulse	On Tin	ne", e.g.,
VRW/>	:1/3.1	25ms, V	BVV=1k	1Z.								





Modulation Mode		E	EDR-3Mbps				Test Freq. (MHz)			2441			
Operating Function			Transmit				Polarization				V		
le	vel (dBuV/	m)								1	Date: 201	5-10-05	
81.0											FCC CI	LASS-B	
72.0													
63.0									_	ECC	CLASS-		
54.0	- 2	+•		8						ru	CLASS-	B (AVG)	
45.0													
36.0		_											
27.0		- ,	-										
18.0				1									
9.0													
0 <mark>-</mark> 10	00 4	000.	6000.	8000.	10000.	12000. Frequenc		6000. 1	8000. 2	0000. 2	22000.	25000	
				0ver	Limit	Read	Antenna	Cable	Preamp	A/Pos	T/Pos		
	Fr	eq	Level	Limit			Factor					Remark	
	MH		dBuV/m	dB	dBuV/m		dB/m	dB	dB	 ст	deg		
1			-		54.00				34.38	311		Average	
2							28.08		34.38	311		Peak	
3				-16.44					34.35	311		Average	
4				-22.77		53.03	27.93	4.62	34.35	311	222	_	
5	4882	.00	20.22	-33.78	54.00	13.59	32.76	6.82	32.95	309	138	Average	
6	4882	.00	50.32	-23.68	74.00	43.69	32.76	6.82	32.95	309	138	Peak	
7	7323	.00	19.20	-34.80	54.00	7.92	37.18	8.50	34.40	326	217	Average	
8	7323	.00	49.30	-24.70	74.00	38.02	37.18	8.50	34.40	326	217	Peak	
Note 1: ">20dB" Note 2: Measure Note 3: For restr with the addition. Note 4: For un-re maximur	ment red icted bai Peak-De estricted	ceive nds, etecte ban	e antenr the pea or meet ds, unw	na polar ak meas s the A\ vanted e	ization: uremen /-Limit s	H (Hori t is fully to that th	zontal), \ sufficier ne AV le\	V (Vertiont, as the vel does	cal) ie max i s not ne	field str ed to b	ength be repo	as meas rted in	
Note 5: Average -30.1dB VBW≥1/3	emissio or Avera	n ob ge e	tained f	rom the n setting									



4 Test Equipment and Calibration Data

Test Item	Radiated Emission									
Test Site	966 chamber / (03CH09-HY)									
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until					
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	Jul. 01, 2015	Jun. 30, 2016					
Amplifier	EMC	EMC9135	980232	Jan. 27, 2015	Jan. 26, 2016					
Amplifier	EMC	EMC051845	980240	Mar. 04, 2015	Mar. 03, 2016					
Spectrum	KEYSIGHT	N9010A	MY54200885	Jul. 15, 2015	Jul. 14, 2016					
Bilog Antenna	TESEQ	CBL 6112D	35418	Mar. 30, 2015	Mar. 29, 2016					
Horn Antenna	AARONIA AG	POWERLOG 70180	05192	Jan. 05, 2015	Jan. 04, 2016					
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170614	Dec. 29, 2014	Dec. 28, 2015					
RF Cable-R03m	Jye Bao	RG142	CB021	Jul. 23, 2015	Jul. 22, 2016					
RF Cable-high	Jye Bao	RG142	03CH09-HY	Jul. 23, 2015	Jul. 22, 2016					
Turn Table	Chain Tek	T-200S	1308028	N/A	N/A					
Antenna Mast	Chain Tek	MBS-400	1308049	N/A	N/A					
Bluetooth Tester	ROHDE&SCHWARZ	CBT	100959	Mar. 03, 2015	Mar. 02, 2016					

Test Item	Conducted Emission									
Test Site	Conduction room / (CO01-HY)									
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until					
EMC Receiver	R&S	ESCS 30	100132	Nov. 07, 2014	Nov. 06, 2015					
LISN	MessTec	NNB-2/16Z	2001/004	Nov. 04, 2014	Nov. 03, 2015					
EMI Filter	LINDGREN	LRE-2060	1004	N/A	N/A					
RF Cable-CON	HUBER+SUHNER	RG213/U	07611832010001	Feb. 27, 2015	Feb. 26, 2016					
Bluetooth Tester	ROHDE&SCHWARZ	CBT	100959	Mar. 03, 2015	Mar. 01, 2016					
Note: Calibration Interval of instruments listed above is one year.										