

Japan Test Report

Equipment : HD 4.40BT
HD 4.50BTNC

Model No. : SCBT6
SCBT7
(Refer to item 1.1.1 for more details)

Brand Name : Sennheiser

Applicant : Sennheiser Communications A/S

Address : Industriparken 27, Ballerup 2750 , Denmark

Standard : ARIB STD-T66 Ver. 3.7

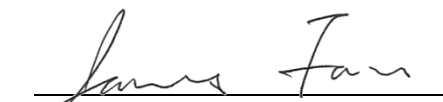
Received Date : Aug. 29, 2016

Tested Date : Sep. 07 ~ Sep. 08, 2016

Measurement was conducted by the following test method:
the test method of Ordinance Concerning Technical Regulations Conformity Certification
etc. of Specified Radio Equipment in Annex 1, the Ministry of Internal Affairs and
Communication notification in Annex "43" of Article 88, Paragraph 1 or the test method
more than equivalent.

We, International Certification Corp., would like to declare that the tested sample has been
evaluated and in compliance with the requirement of the above standards. The test results
contained in this report refer exclusively to the product. It may be duplicated completely for
legal use with the approval of the applicant. It shall not be reproduced except in full without
the written approval of our laboratory.

Reviewed by:


James Fan / Assistant Manager

Approved by:


Gary Chang / Manager

Table of Contents

1	GENERAL DESCRIPTION	5
1.1	Information.....	5
1.2	Test Equipment and Calibration Data	9
1.3	Testing Applied Standards	9
1.4	Measurement Uncertainty	9
2	TEST CONFIGURATION	10
2.1	Testing Location and Conditions	10
2.2	Supporting Units	10
2.3	The Worst Test Modes and Channel Details	10
3	TRANSMITTER TEST RESULTS.....	11
3.1	Antenna Power	11
3.2	Frequency Tolerance	12
3.3	Occupied Bandwidth	13
3.4	Spreading Bandwidth and Factor	14
3.5	Transmitter Spurious Emissions.....	15
3.6	Interference prevention function.....	16
4	RECEIVER TEST RESULTS	17
4.1	Receiver Spurious Emissions.....	17
5	PHOTOGRAPHS OF THE TEST CONFIGURATION	18
6	TEST LABORATORY INFORMATION	19
APPENDIX A. TEST RESULTS.....		A1
APPENDIX B. ANTENNA INFORMATION.....		B1

Release Record

Report No.	Version	Description	Issued Date
JR682901AE	Rev. 01	Initial issue	Oct. 20, 2016

Summary of Test Results

Ref. Std. Clause	Description	Result
3.2(2)(3)	Antenna Power	Pass
3.2(4)	Frequency Tolerance	Pass
3.2(6)	Transmitter Spurious Emission	Pass
3.2(7)	Occupied Bandwidth	Pass
3.2(8)	Spreading Bandwidth	Pass
3.2(9)	Spreading Factor	Pass
3.3(1)	Receiver Emission	Pass
3.4.1	Interference prevention function	Pass

1 General Description

1.1 Information

1.1.1 Product Details

The following models are provided to this EUT.

Brand Name	Model Name	Product Name	Description
Sennheiser	SCBT6	HD 4.40BT	---
	SCBT7	HD 4.50BTNC	Having components for Active Noise Cancellation

1.1.2 Specification of the Equipment under Test (EUT)

Power Type	5Vdc from Host / 3.7Vdc from battery
Type(s) of Modulation / Technology	FHSS/ GFSK = 1Mbps
Frequency Range (MHz)	2402 ~ 2480 MHz
Total Channel Number	40
HW Version	7
SW Version	12

1.1.3 Accessories

Accessories		
No.	Equipment	Description
1	Battery	Brand Name: SYNergy ScienTech Corp. Model Name: AHB622540PCT-02 Power Rating: Typical Voltage: 3.7 V, 630 mAh Charging Voltage: 4.2 V, 262 mAh
2	Audio cable	1.4m non-shielded without core
3	USB cable (for charging use)	1.07m shielded cable without core.

1.1.4 Antenna Details

Ant. No.	Type	Connector	Gain (dBi)	Remark
1	PIFA	N/A	2	---

Note: Please refer to Appendix B for more details about antenna pattern and other information.

1.1.5 Antenna Power

Operating Mode	Rated Power (mW)	Measured Conducted Power (mW)	Radiated Power (mW)
LE	7.50	7.261	11.508

1.1.6 Channel List

Frequency band (MHz)				2400~2483.5			
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
37	2402	9	2422	18	2442	28	2462
0	2404	10	2424	19	2444	29	2464
1	2406	38	2426	20	2446	30	2466
2	2408	11	2428	21	2448	31	2468
3	2410	12	2430	22	2450	32	2470
4	2412	13	2432	23	2452	33	2472
5	2414	14	2434	24	2454	34	2474
6	2416	15	2436	25	2456	35	2476
7	2418	16	2438	26	2458	36	2478
8	2420	17	2440	27	2460	39	2480

1.1.7 Test Tool and Power Setting

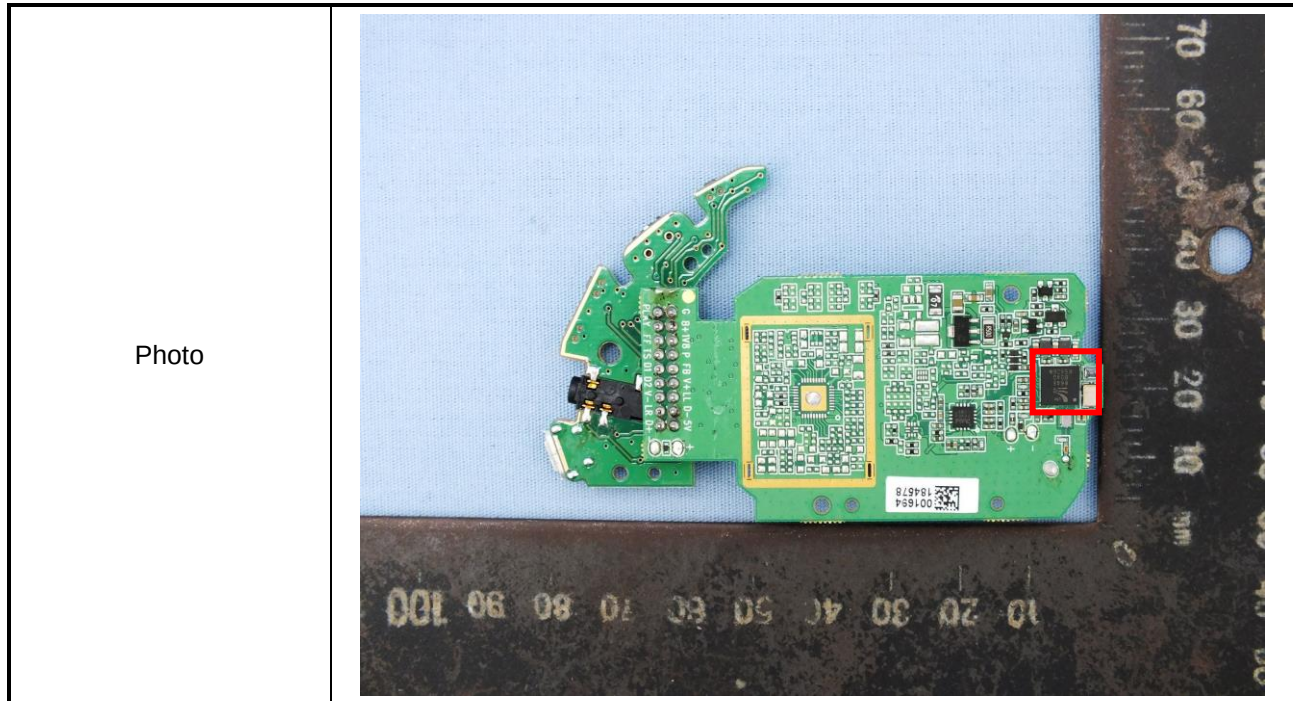
Test Tool
CSR BlueSuite, Version: 2.5.0

Modulation Mode	Test Frequency (MHz)		
	2402	2440	2480
GFSK/1Mbps	Default	Default	Default

1.1.8 Protection Method for High Frequency and Modulation Section

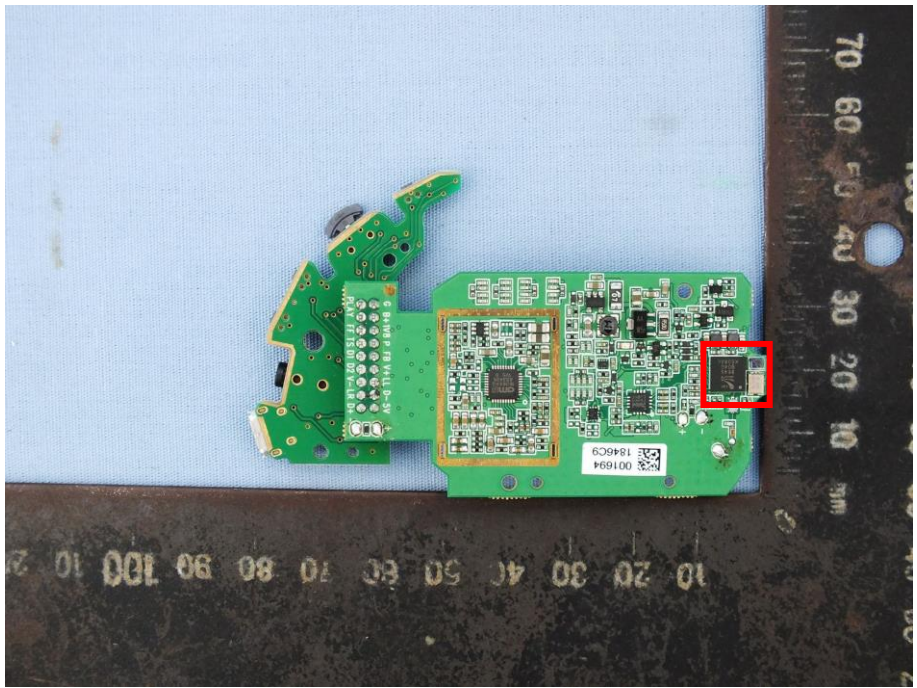
Protected Method	Description
IC Package	IC Package of RF and Modulation portions is BGA type.

HD 4.40BT



Protected Method	Description
IC Package	IC Package of RF and Modulation portions is BGA type.

HD 4.50BTNC

Photo	
-------	---

1.2 Test Equipment and Calibration Data

Test Item	RF Conducted				
Test Site	(TH01-WS)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101063	Feb. 17, 2016	Feb. 16, 2017
Power Meter	Anritsu	ML2495A	1241002	Sep. 21, 2015	Sep. 20, 2016
Power Sensor	Anritsu	MA2411B	1207366	Sep. 21, 2015	Sep. 20, 2016
Signal Generator	R&S	SMB100A	175727	Oct. 05, 2015	Oct. 04, 2016
DC POWER SOURCE	GW INSTEK	GPC-3060D	EM884797	Oct. 20, 2015	Oct. 19, 2016
Measurement Software	Sporton	Sporton_1	1.3.30	NA	NA
Note 1: Calibration Interval of instruments listed above is one year. Note 2: Above instruments are calibrated by Electronics Testing Center					

1.3 Testing Applied Standards

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

ARIB STD-T66 Ver. 3.7

1.4 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 ($k=2$))

Measurement Uncertainty	
Parameters	Uncertainty
Frequency error	± 33.988 Hz
Bandwidth	± 33.988 Hz
Conducted power	± 0.537 dB
TX Conducted emission	± 2.308 dB
RX Conducted emission	± 2.525 dB

2 Test Configuration

2.1 Testing Location and Conditions

Test Site	Site Category	Ambient Condition	Tested By
TH01-WS	OVEN Room	25°C / 65%	Ryan Lee

2.2 Supporting Units

Support Unit	Brand	Model	FCC ID
Notebook	DELL	Latitude E6440	DoC

Note: Support unit was supplied by applicant.

2.3 The Worst Test Modes and Channel Details

Test item	Mode	Test Frequency (MHz)
Antenna Power Frequency Tolerance Transmitter Spurious Emission Occupied Bandwidth Spreading Bandwidth Collateral Emission of Receiver Spreading Factor Interference prevention function	BT LE	2402 / 2440 / 2480

3 Transmitter Test Results

3.1 Antenna Power

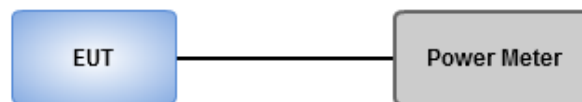
3.1.1 Limit of Antenna Power

Mode	Limit	Tolerance
1) FH, FH+DS, FH+OFDM	3 mW / MHz	+20 % , -80 %
2) OFDM(Narrow- bandwidht), DS	10 mW / MHz	
3) Other than 1) & 2)	10mW	
4) OFDM (Wide-band)	5 mW / MHz	

3.1.2 Test Procedures

Measure the total power by Power Meter

3.1.3 Test Setup



3.1.4 Test Result of Maximum Transmit Power

Reference Documents	Test Mode	Test Items
Appendix A 19-LE	LE	1. Test Results 2. Antenna Power (Conducted Power)

3.2 Frequency Tolerance

3.2.1 Limit of Frequency Tolerance

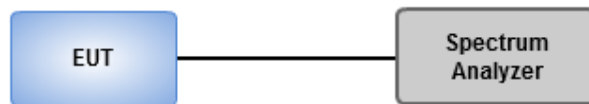
Frequency tolerance shall be +/- 50ppm.

3.2.2 Test Procedures

1. Set Span = 150kHz, RBW = 1kHz, VBW = 30kHz, Sweep time = Auto, detector = Peak.
2. Use Peak search function to find the max peak value and record this value (RF).
3. Calculate frequency tolerance by below formula
$$FT(ppm) = \{ (RF) - (MF) / (MF) \} \times 1000000$$

(FT: Frequency Tolerance, RF: Reading Frequency, MF: Measurement Frequency.)

3.2.3 Test Setup



3.2.4 Test Result of Frequency Tolerance

Reference Documents	Test Mode	Test Items
Appendix A 19-LE	LE	1.Test Results

3.3 Occupied Bandwidth

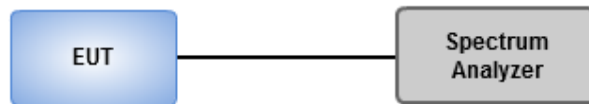
3.3.1 Limit of Occupied Bandwidth

Mode	Limit (MHz)
FH	83.5
FH+DS	83.5
FH+OFDM	83.5
OFDM(Narrow- bandwidht), DS	26
Others	26
OFDM (Wide-band)	38

3.3.2 Test Procedures

1. Set Span = 40MHz, RBW = VBW = 300kHz, detector = Peak, Sweep time = Auto.
2. Enable OBW function of spectrum analyzer to measure OBW and capture test plot.

3.3.3 Test Setup



3.3.4 Test Result of Occupied Bandwidth

Reference Documents	Test Mode	Test Items
Appendix A 19-LE	LE	1.Test Results

3.4 Spreading Bandwidth and Factor

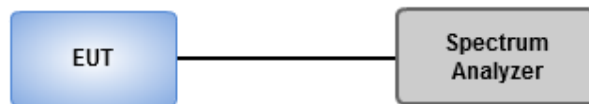
3.4.1 Limit of Spreading Bandwidth and Factor

Item	Limit
Spreading bandwidth	$\geq 500\text{kHz}$
Spreading factor for DSSS (operates at 2400~2483.5 MHz)	≥ 5
Spreading factor for DSSS (operates at 2471~2497 MHz)	≥ 10

3.4.2 Test Procedures

1. Set Span = 20MHz, RBW = VBW = 300kHz, detector = Peak, Sweep time = Auto.
2. Enable OBW (90%) function of spectrum analyzer to measure OBW (90%) and capture test plot.

3.4.3 Test Setup



3.4.4 Test Result of Spreading Bandwidth and Factor

Reference Documents	Test Mode	Test Items
Appendix A 19-LE	LE	1. Test Results

3.5 Transmitter Spurious Emissions

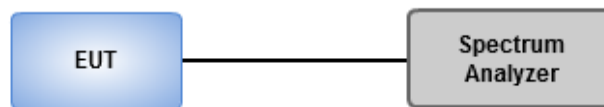
3.5.1 Limit of Transmitter Spurious Emissions

Item	Limits
Tx Spurious Emission	$\leq 2.5 \mu\text{W}$ ($2387\text{MHz} > f$; $2496.5\text{MHz} < f$).
	$\leq 25 \mu\text{W}$. ($2387\text{MHz} \leq f < 2400\text{MHz}$) and ($2483.5\text{MHz} < f \leq 2496.5\text{MHz}$).

3.5.2 Test Procedures

1. Set EUT to transmit at rated power and channel to perform test.
2. Set RBW = VBW = 1MHz, Detector type = Peak, Sweep time = Auto.
3. Following above setting of spectrum analyzer to measure spurious emission of 30~12750 MHz.

3.5.3 Test Setup



3.5.4 Test Result of Transmitter Spurious Emissions

Reference Documents	Test Mode	Test Items
Appendix A 19-LE	LE	1. Test Results 4. Unwanted Emission Intensity

3.6 Interference prevention function

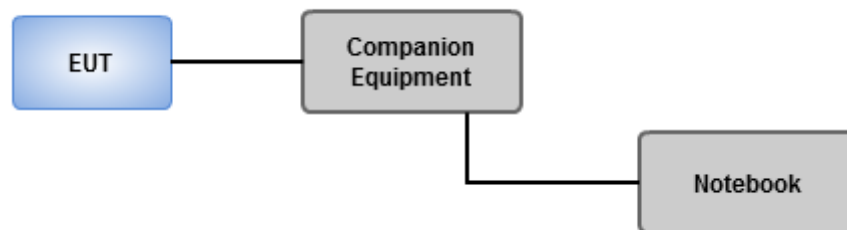
3.6.1 Limit of Interference Prevention Function

Limits
The identification code shall be 48 bits long

3.6.2 Test Procedures

1. Set EUT under operating mode and link up with companion equipment
2. Check communication status between EUT and companion equipment is normal
3. Confirm the MAC address of EUT

3.6.3 Test Setup



3.6.4 Test Result of Interference Prevention Function

Reference Documents	Test Mode	Test Items
Appendix A 19-LE	LE	1. Test Results

4 Receiver Test Results

4.1 Receiver Spurious Emissions

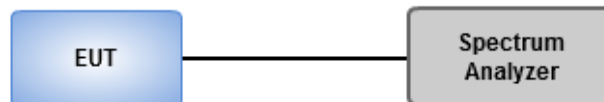
4.1.1 Limit of Receiver Spurious Emissions

Item	Limits
Rx Spurious Emission	$\leq 4\text{nW}$ ($f < 1\text{GHz}$).
	$\leq 20\text{nW}$ ($1\text{GHz} \leq f$).

4.1.2 Test Procedures

1. Set EUT to transmit at rated power and channel to perform test
2. Set RBW = VBW = 100kHz, detector = Peak, Sweep time = Auto for emission measurement below 1GHz.
3. Set RBW = VBW=1MHz, detector = Peak, Sweep time = Auto for emission measurement above 1GHz.

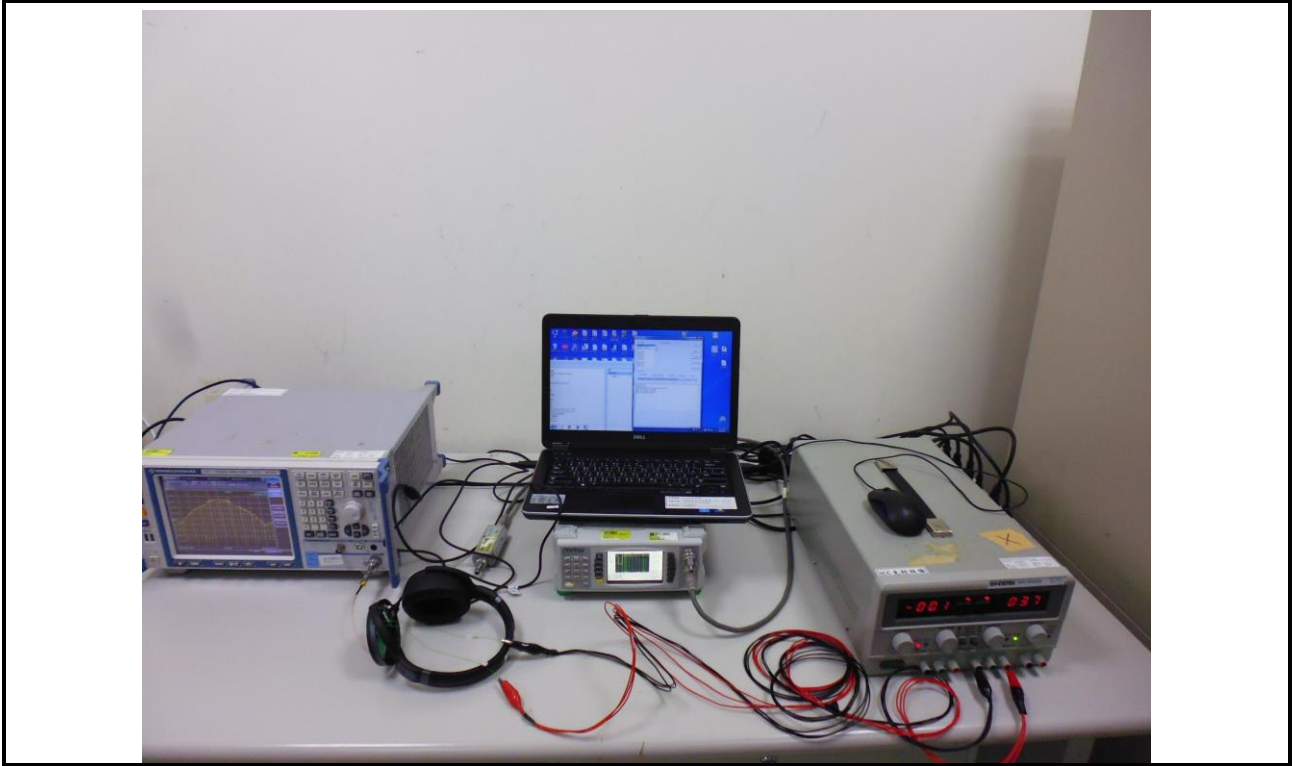
4.1.3 Test Setup



4.1.4 Test Result of Receiver Spurious Emissions

Reference Documents	Test Mode	Test Items
Appendix A 19-LE	LE	1. Test Results 5. Limitation of Collateral Emission of Receiver

5 Photographs of the Test Configuration



6 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corp (EMC and Wireless Communication Laboratory), it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan District. Location map can be found on our website <http://www.icertifi.com.tw>.

Linkou

Tel: 886-2-2601-1640

No. 30-2, Ding Fwu Tsuen, Lin Kou
District, New Taipei City, Taiwan,
R.O.C.

Kwei Shan

Tel: 886-3-271-8666

No. 3-1, Lane 6, Wen San 3rd
St., Kwei Shan District, Tao Yuan
City 333, Taiwan, R.O.C.

Kwei Shan Site II

Tel: 886-3-271-8640

No. 14-1, Lane 19, Wen San 3rd
St., Kwei Shan District, Tao Yuan
City 333, Taiwan, R.O.C.

If you have any suggestion, please feel free to contact us as below information

Tel: 886-3-271-8666

Fax: 886-3-318-0155

Email: ICC_Service@icertifi.com.tw

==END==

Appendix A 19-LE

1. Test Results

[illegible]

※ 1: Frequency Band 1 ($30 \text{ MHz} \leq f \leq 2387 \text{ MHz}$)

※ 4: Frequency Band 4 ($2496.5 \text{ MHz} \leq f < 12.5 \text{ GHz}$)

※ 2: Frequency Band 2 (2387 MHz < f ≤ 2400 MHz)

※ 5: Frequency Band 5 ($30 \text{ MHz} \leq f < 1000 \text{ MHz}$)

※ 3: Frequency Band 3 ($2483.5 \text{ MHz} \leq f < 2496.5 \text{ MHz}$)

※ 6: Frequency Band 6 ($1000 \text{ MHz} \leq f < 12.5 \text{ GHz}$)

2. Antenna Power (Conducted Power)

Testing for Electrical Specification	Test Voltage	V	Normal Voltage (3.7V)			High Voltage (4.2V)			Low Voltage (3.3V)			Remarks
	Test Frequency	MHz	2402	2440	2480	2402	2440	2480	2402	2440	2480	
	Power Meter Raw from EUT	dBm	4.63	5.43	5.54	4.64	5.44	5.55	4.63	5.42	5.53	
	Cable Loss	dB	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	Refer to Calibration Result
	Duty Cycle Factor	dB	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	
	Antenna Power (Conducted)	dBm	7.69	8.49	8.60	7.70	8.50	8.61	7.69	8.48	8.59	Limit ≤ 10 mW (10 dBm)
	Antenna Power (Conducted)	mW	5.875	7.063	7.244	5.888	7.078	7.261	5.875	7.047	7.228	
	Antenna Power Error	mW	-1.63	-0.44	-0.26	-1.61	-0.42	-0.24	-1.63	-0.45	-0.27	Limit + 20% - - 80%
		%	-21.67	-5.82	-3.41	-21.49	-5.61	-3.19	-21.67	-6.04	-3.63	
	Transmitter ON _{Time}	msec	0.4492									RBW : 1 MHz ; VBW : 1 MHz ; SP : 0Hz
Transmitter (ON+OFF) _{Time}	msec	0.6449										
Transmitter Duty Cycle	%	69.65%										

3. Transmission Radiation Angle Width (This test item will not be applied to the EIRP power is lower than 12.14dBm)

[illegible]

International Certification Corp.

4. Unwanted Emission Intensity

Test Voltage		V	Normal Voltage (3.7V)			High Voltage (4.2V)			Low Voltage (3.3V)			Remarks
Test Frequency		MHz	2402	2440	2480	2402	2440	2480	2402	2440	2480	
Unwanted Emission Frequency	※ 1	MHz	795.80	899.60	902.40	790.10	992.30	946.00	617.50	972.60	901.00	RBW : 100 kHz ; VBW : 100k Hz
	※ 2	MHz	2297.70	2335.80	2376.00	2297.70	2335.80	2376.00	2297.70	2335.80	2376.00	RBW : 1 MHz ; VBW : 1 MHz
	※ 3	MHz	2399.99	2387.98	2387.32	2399.99	2387.63	2389.66	2399.99	2387.70	2390.79	
	※ 4	MHz	2493.98	2492.42	2483.58	2493.17	2491.67	2483.54	2483.92	2492.23	2483.58	
	※ 5	MHz	7208.50	7324.50	7440.50	7208.50	7324.50	7440.50	7208.50	7324.50	7440.50	
Cable Loss	※ 1	dB	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	
	※ 2	dB	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	
	※ 3	dB	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	
	※ 4	dB	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	
	※ 5	dB	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	
Spectrum Raw	※ 1	dBm	-61.66	-61.90	-62.31	-61.68	-61.99	-62.42	-61.75	-61.97	-61.61	
	※ 2	dBm	-47.51	-46.41	-46.19	-47.79	-46.24	-46.48	-47.30	-46.54	-47.47	
	※ 3	dBm	-26.55	-48.39	-48.69	-26.90	-47.81	-48.69	-26.36	-47.96	-48.61	
	※ 4	dBm	-48.35	-47.30	-39.56	-48.27	-47.63	-39.29	-48.86	-47.07	-39.89	
	※ 5	dBm	-39.43	-35.16	-34.73	-39.03	-34.75	-34.95	-39.48	-34.84	-35.05	
Unwanted Emission Intensity	※ 1	dBm	-60.78	-61.02	-61.43	-60.80	-61.11	-61.54	-60.87	-61.09	-60.73	Limit ≤ 2.5 μW (-26 dBm)
	※ 2	dBm	-46.02	-44.92	-44.70	-46.30	-44.75	-44.99	-45.81	-45.05	-45.98	Limit ≤ 25 μW (-16 dBm)
	※ 3	dBm	-25.06	-46.90	-47.20	-25.41	-46.92	-47.20	-24.87	-46.47	-47.12	Limit ≤ 25 μW (-16 dBm)
	※ 4	dBm	-46.86	-45.81	-38.07	-46.78	-46.14	-37.80	-47.37	-45.58	-38.40	Limit ≤ 25 μW (-16 dBm)
	※ 5	dBm	-37.67	-33.40	-32.97	-37.27	-32.99	-33.19	-37.72	-33.08	-33.29	Limit ≤ 2.5 μW (-26 dBm)
Unwanted Emission Intensity	※ 1	μW	0.0008	0.0008	0.0007	0.0008	0.0008	0.0007	0.0008	0.0008	0.0008	Limit ≤ 2.5 μW (-26 dBm)
	※ 2	μW	0.0294	0.0322	0.0339	0.0294	0.0335	0.0317	0.0262	0.0313	0.0252	Limit ≤ 2.5 μW (-26 dBm)
	※ 3	μW	3.1189	0.0204	0.0191	2.8774	0.0233	0.0191	3.2584	0.0225	0.0194	Limit ≤ 2.5 μW (-26 dBm)
	※ 4	μW	0.0206	0.0262	0.1560	0.0210	0.0243	0.1660	0.0183	0.0277	0.1445	Limit ≤ 2.5 μW (-26 dBm)
	※ 5	μW	0.1710	0.4571	0.5047	0.1875	0.5023	0.4797	0.1690	0.4920	0.4688	Limit ≤ 2.5 μW (-26 dBm)

※ 1: Frequency Band 1 (30 MHz ≤ f ≤ 1000 MHz)

※ 5: Frequency Band 5 (2496.5 MHz ≤ f < 12.5 GHz)

※ 2: Frequency Band 2 (1000 MHz < f ≤ 2387 MHz)

※ 6: Frequency Band 6 (30 MHz ≤ f < 1000 MHz)

※ 3: Frequency Band 3 (2387 MHz < f ≤ 2400 MHz)

※ 7: Frequency Band 7 (1000 MHz ≤ f < 12.5 GHz)

※ 4: Frequency Band 4 (2483.5 MHz ≤ f < 2496.5 MHz)

5. Limitation of Collateral Emission of Receiver

Test Voltage		V	Normal Voltage (3.7V)			High Voltage (4.2V)			Low Voltage (3.3V)			Remarks
Test Frequency		MHz	2402	2440	2480	2402	2440	2480	2402	2440	2480	
Spurious Emission Frequency	※ 6	MHz	957.20	957.20	693.30	957.20	957.20	957.20	957.20	957.20	957.20	1st 30MHz~1000MHz:: Maximum emission and all emissions beyond 1/10 of the limitation must be indicated.
	※ 6	MHz	-	-	-	-	-	-	-	-	-	2nd
	※ 6	MHz	-	-	-	-	-	-	-	-	-	3rd
	※ 7	MHz	9596.00	9762.00	9912.00	9596.00	9762.00	9912.00	9596.00	9762.00	9912.00	1st 1000MHz~12.5GHz:: Maximum emission and all emissions beyond 1/10 of the limitation must be indicated.
	※ 7	MHz	-	-	-	-	-	-	-	-	-	2nd
Cable Loss	※ 6	dB	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	1st
	※ 6	dB	-	-	-	-	-	-	-	-	-	2nd
	※ 6	dB	-	-	-	-	-	-	-	-	-	3rd
	※ 7	dB	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1st
	※ 7	dB	-	-	-	-	-	-	-	-	-	2nd
Spectrum Raw	※ 6	dBm	-91.07	-90.53	-89.96	-91.76	-90.61	-90.88	-88.94	-90.43	-89.31	1st
	※ 6	dBm	-	-	-	-	-	-	-	-	-	2nd
	※ 6	dBm	-	-	-	-	-	-	-	-	-	3rd
	※ 7	dBm	-71.36	-70.27	-69.67	-72.52	-70.60	-69.78	-72.27	-70.44	-69.44	1st
	※ 7	dBm	-	-	-	-	-	-	-	-	-	2nd
Spurious Emission Intensity	※ 6	dBm	-90.19	-89.65	-89.08	-90.88	-89.73	-90.00	-88.06	-89.55	-88.43	1st Limit ≤ 4 nW (-54 dBm)
	※ 6	dBm	-	-	-	-	-	-	-	-	-	2nd RBW : 100 kHz ; VBW : 100 kHz
	※ 6	dBm	-	-	-	-	-	-	-	-	-	3rd
	※ 7	dBm	-69.60	-68.51	-67.91	-70.76	-68.84	-68.02	-70.51	-68.68	-67.68	1st Limit ≤ 20 nW (-47 dBm)
	※ 7	dBm	-	-	-	-	-	-	-	-	-	2nd RBW : 1 MHz ; VBW : 1 MHz
Spurious Emission Intensity	※ 6	nW	0.0010	0.0011	0.0012	0.0008	0.0011	0.0010	0.0016	0.0011	0.0014	Total Emission Power
	※ 6	nW	0.0010	0.0011	0.0012	0.0008	0.0011	0.0010	0.0016	0.0011	0.0014	1st Limit ≤ 4 nW (-54 dBm)
	※ 6	nW	-	-	-	-	-	-	-	-	-	2nd RBW : 100 kHz ; VBW : 100 kHz
	※ 7	nW	0.1096	0.1409	0.1618	0.0839	0.1306	0.1578	0.0889	0.1355	0.1706	Total Emission Power
	※ 7	nW	0.1096	0.1409	0.1618	0.0839	0.1306	0.1578	0.0889	0.1355	0.1706	1st Limit ≤ 20 nW (-47 dBm)
Spurious Emission Intensity	※ 7	nW	-	-	-	-	-	-	-	-	-	2nd RBW : 1 MHz ; VBW : 1 MHz
	※ 7	nW	-	-	-	-	-	-	-	-	-	3rd

※ 1: Frequency Band 1 (30 MHz ≤ f ≤ 1000 MHz)

※ 5: Frequency Band 5 (2496.5 MHz ≤ f < 12.5 GHz)

※ 2: Frequency Band 2 (1000 MHz < f ≤ 2387 MHz)

※ 6: Frequency Band 6 (30 MHz ≤ f < 1000 MHz)

※ 3: Frequency Band 3 (2387 MHz < f ≤ 2400 MHz)

※ 7: Frequency Band 7 (1000 MHz ≤ f < 12.5 GHz)

※ 4: Frequency Band 4 (2483.5 MHz ≤ f < 2496.5 MHz)

Calibration Result

1. Linearity Check

SG Output (dBm)	Spectrum Raw (dBm)	Power Meter Raw (dBm)	Remark
0	-1.3	-0.93	• SG Test Frequency : 2450 MHz • RBW : 1 MHz ; VBW : 1 MHz ; SP : 0Hz • ATT(30dB) ; Ref : 20 dBm
-5	-6.34	-5.88	
-10	-11.17	-10.84	
0	-1.64	-1.66	• SG Test Frequency : 5250 MHz • RBW : 1 MHz ; VBW : 1 MHz ; SP : 0Hz • ATT(30dB) ; Ref : 20 dBm
-5	-6.6	-6.62	
-10	-11.48	-11.58	

2. Frequency Accuracy Confirmation

SG Output (dBm)	Spectrum Raw (MHz)	Frequency Error (ppm)	Remark
2450	2450.0002	0.0816	• SG Output : 0dBm • RBW : 30 kHz ; VBW : 30 kHz ; SP : 300kHz • Limit $\leq$ 10% of frequency error limits
5250	5250.0012	0.2286	

3. Cable Loss

SG Output (MHz)	Power Meter Raw Without Cable (dBm)	Power Meter Raw With Cable (dBm)	Cable Loss (dB)	Remark
1000	-0.23	-1.11	0.88	• SG Output : 0dBm
2450	-0.87	-2.36	1.49	
5250	-1.67	-3.43	1.76	
12500	-3.69	-9.37	5.68	
26000	-5.55	-19.13	13.58	

4. Power Measurement System Loss (EUT Output to IF Output of Spectrum)

SG Output (MHz)	Spectrum Raw (dBm)	Power Meter Raw With Cable form IF (dBm)	System Path Loss EUT to IF (dB)	Remark
2450	-1.03	-20.58	19.71	• SG : 0 dBm • RBW : 1 MHz ; VBW : 1 MHz ; SP : 0Hz • ATT(30dB) ; Ref : 20 dBm
5250	-5.39	-22.01	20.34	

Appendix B. Antenna Information

Antenna Specification for HD 4.40BT & HD 4.50BTNC

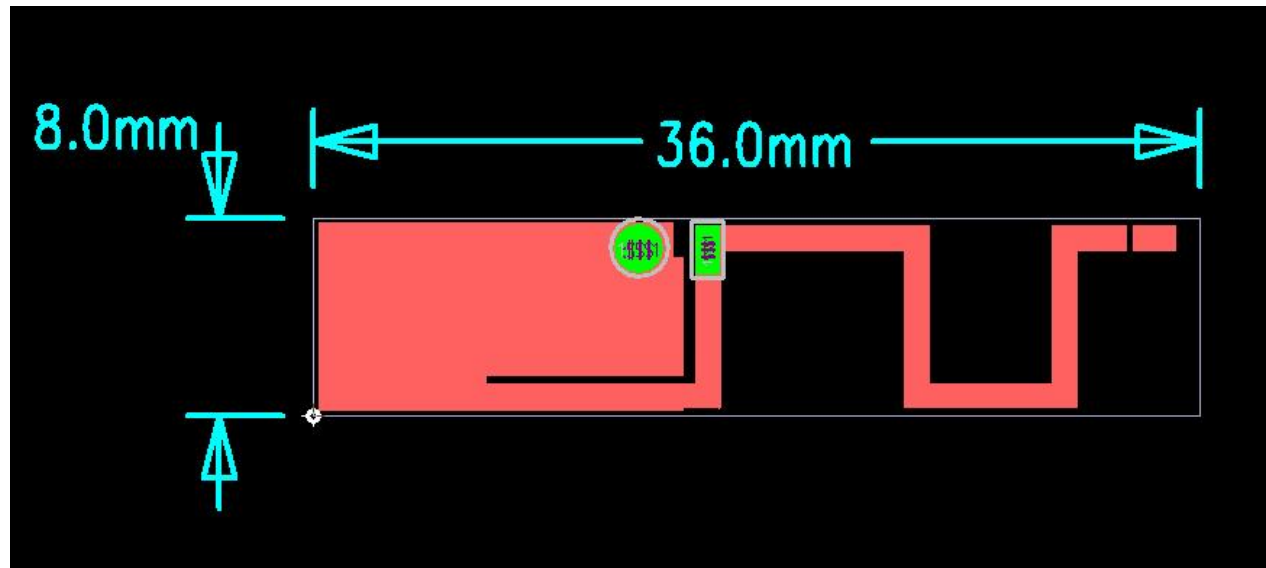
General Specifications:

1. Antenna type: PIFA
2. Frequency range: 2400-2500 MHz
3. Impedance: 50Ω
4. Peak gain: 2 dBi
5. Average gain: -0.5 dBi

6. Maximum return loss: -10dB

7. Maximum VSWR: 2:1

8. Size: see below figure



9. Antenna pattern:

