

Prüfbericht - Nr.: 14016311 001		Seite 1 von 14 Page 1 of 14	
<i>Test Report No.:</i>			
Auftraggeber: <i>Client:</i>	Nokia Corporation Joensuunkatu 7E 24100 SALO FINLAND		
Gegenstand der Prüfung: <i>Test Item:</i>	Wideband Transmission System - Bluetooth Headphone		
Bezeichnung: <i>Identification:</i>	HS-95W (BH-503)	Serien-Nr.: <i>Serial No.:</i>	Engineering sample
Wareneingangs-Nr.: <i>Receipt No.:</i>	070627002-1, 071005012, 071116011	Eingangsdatum: <i>Date of Receipt:</i>	27.06.2007, 05.10.2007, 16.11.2007
Prüfört: <i>Testing Location:</i>	TÜV Rheinland Hong Kong Ltd. 9th Floor, Oriental News Building, 7 Wang Tai Road, Kowloon Bay, Kowloon, Hong Kong Hong Kong Productivity Council HKPC Building, 78 Tat Chee Avenue, Kowloon, Hong Kong		
Prüfgrundlage: <i>Test Specification:</i>	FCC Part 15 Subpart C ANSI C63.4-2003 CISPR 22:1997		
Prüfergebnis: <i>Test Result:</i>	Das vorstehend beschriebene Gerät wurde geprüft und entspricht oben genannter Prüfgrundlage. The above mentioned product was tested and passed.		
Prüflaboratorium: <i>Testing Laboratory:</i>	TÜV Rheinland Hong Kong Ltd. 9th Floor, Oriental News Building, 7 Wang Tai Road, Kowloon Bay, Kowloon, Hong Kong		
geprüft/ tested by:		kontrolliert/ checked by:	
28.11.2007	Sharon Li Project Engineer	28.11.2007	Thomas Berns Manager
Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>
Sonstiges: Other Aspects		FCCID: PYAHS-95W	
Abkürzungen: P(ass) = entspricht Prüfgrundlage F(ail) = entspricht nicht Prüfgrundlage N/A = nicht anwendbar N/T = nicht getestet		Abbreviations: P(ass) = passed F(ail) = failed N/A = not applicable N/T = not tested	
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products.</i>			

Table of Content

Page

Cover Page	1
Table of Content	2
Product information.....	3
Manufacturers declarations	3
Product function and intended use.....	4
Submitted documents.....	4
Remark	4
Special accessories and auxiliary equipment	4
List of Test and Measurement Instruments.....	5
Result FCC Part 15 – Subpart C	6
Subclause 15.203 – Antenna Information	Pass..... 6
Subclause 15.204 – Antenna Information	Pass..... 6
Subclause 15.207 – Disturbance Voltage on AC Mains.....	Pass..... 6
Subclause 15.247 (a) – Carrier Frequency Separation	Pass..... 7
Subclause 15.247 (a) – Time of Occupancy (Dwell Time)	Pass..... 8
Subclause 15.247 (a) – 20 dB Bandwidth.....	Pass..... 9
Subclause 15.247 (a) – Hopping Sequence	Pass..... 9
Subclause 15.247 (a) – Equal Hopping Frequency Use.....	Pass..... 10
Subclause 15.247 (a) – Receiver Input Bandwidth.....	Pass..... 11
Subclause 15.247 (a) – Receiver Hopping Capability	Pass..... 11
Subclause 15.247 (b) – Peak Output Power.....	Pass..... 11
Subclause 15.247 (b) – Band edge compliance	Pass..... 12
Subclause 15.247 (c) – Spurious Conducted Emissions	Pass..... 12
Subclause 15.247 (c) – Spurious Radiated Emissions	Pass..... 13
Appendix 1 – Test protocols	17 pages
Appendix 2 – Test setup	3 pages
Appendix 3 – Photo documentation	6 pages
Appendix 4 – Product documentation	30 pages

www.tuv.com

Product information

Manufacturers declarations

	Transceiver
Operating frequency range	2402 - 2480 MHz
Type of modulation	GFSK, Pi/4 DQPSK, 8 DPSK
Number of channels	79
Channel separation	1 MHz
Type of antenna	Integral Antenna
Antenna gain (dBi)	1.2
Power level	fix
Type of equipment	stand alone, plug-in radio device
Connection to public utility power line	No
Nominal voltage	V _{nom} : 3.7 V
Independent Operation Modes	Page scan Inquiry scan Connection state - ACL Link Connection state - SCO Link

Product function and intended use

The test item is a Bluetooth Headphone based on the Bluetooth technology.

Bluetooth is a short-range radio link intended to be a cable replacement between portable and/or fixed electronic devices.

Bluetooth operates in the unlicensed ISM Band at 2.4 GHz. In the US a band of 83.5 MHz width is available. In this band, 79 RF channels spaced 1 MHz apart are defined.

The channel is represented by a pseudo-random hopping sequence through the 79 channels. The channel is divided into time slots, with a nominal slot length of 625 μ s, where each slot corresponds to different RF hop frequencies. The nominal hop rate is 1600 hops/s. The symbol rate on the channel is 1 Ms/s.

Submitted documents

Circuit Diagram
Block Diagram
Bill of material
User manual

Remark

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases.

Special accessories and auxiliary equipment

The product has been tested together with the following additional accessory:

AC/DC power adaptor
Model: AC-4E
Input: 100-240VAC, 50/60Hz, 1800mA
Output: 5.0VDC 890mA

AC/DC power adaptor
Model: AC-5E
Input: 100-240VAC, 50/60Hz, 1800mA
Output: 5.0VDC 890mA

List of Test and Measurement Instruments

	Equipment used	Manufacturer	Model No.	S/N	Cal. Date	Due Date
<input checked="" type="checkbox"/>	Semi-anechoic Chamber	Frankonia	Nil	Nil	28-Mar-07	28-Mar-08
<input checked="" type="checkbox"/>	Test Receiver	R & S	ESVS30	842807/009	06-Aug-07	06-Aug-08
<input checked="" type="checkbox"/>	Bi-conical Antenna	R & S	HK116	841489/016	08-Feb-06	08-Feb-08
<input checked="" type="checkbox"/>	Log Periodic Antenna	R & S	HL223	841516/020	03-Feb-06	03-Feb-08
<input checked="" type="checkbox"/>	Coaxial cable 50ohm	Rosenberger	RTK081-05S-05S-10m	LA2-001-10M / 002	15-May-07	15-May-08
<input checked="" type="checkbox"/>	Microwave amplifier 0.5-26.5GHz, 25dB gain	HP	83017A	3950M00241	Nil	Nil
<input checked="" type="checkbox"/>	High Pass Filter (cutoff freq. =1000MHz)	Trilithic	23042	9829213	Nil	Nil
<input checked="" type="checkbox"/>	Horn Antenna	EMCO	3115	9002-3347	02-Feb-06	02-Feb-08
<input checked="" type="checkbox"/>	Spectrum Analyser	R & S	FSP 30	100416	08-Jun-07	08-Jun-08
<input checked="" type="checkbox"/>	Loop Antenna	EMCO	6502	9107-2651	16-Nov-05	16-Nov-07
<input checked="" type="checkbox"/>	EMI Test receiver	R & S	ESCS 30	100201	05-Dec-06	05-Dec-07
<input checked="" type="checkbox"/>	Artificial Mains Network	R & S	ESH3-Z5	100230	05-Dec-06	05-Dec-07
<input checked="" type="checkbox"/>	Pulse Limiter	R & S	ESH3-Z2	100161	06-Dec-06	06-Dec-07
<input checked="" type="checkbox"/>	Spectrum Analyzer	R & S	FSP 30	100007	13-Feb-06	12-Feb-08

Result FCC Part 15 – Subpart C

Subclause 15.203 – Antenna Information		Pass
Requirement:	No antenna other than that furnished by the responsible party shall be used with the device	
Result:	Permanent attached antenna	
Verdict:	Pass	

Subclause 15.204 – Antenna Information		Pass
Requirement:	Provide information for every antenna proposed for the use with the EUT	
Result:	a) Antenna type: Integral antenna soldered to the circuit board b) Manufacturer and model no: N.A. c) Gain with reference to an isotropic radiator: 1.2 dBi	
Verdict:	Pass	

Subclause 15.207 – Disturbance Voltage on AC Mains						Pass
Test Port: AC mains input port of the charger Applied voltage: 110VAC Applicable only to equipment designed to be connected to the public utility power line. 1) Mode of operation: Charging and operating (Test Adaptor: AC-5E)						
Live measurement						
Frequency range (MHz)	Frequency (MHz)	Quasi-peak dBµV	Average dBµV	Limit QP (dBµV)	Limit AV (dBµV)	Verdict
0,15 – 0,5	0.348	32.1	25.1	66 - 56	56 - 46	Pass
> 0,5 - 5	-	-	-	56	46	Pass
> 5 - 30	5.232	27.3	23.0	60	50	Pass
Neutral measurement						
Frequency range (MHz)	Frequency (MHz)	Quasi-peak dBµV	Average dBµV	Limit QP (dBµV)	Limit AV (dBµV)	Verdict
0,15 – 0,5	0.342	32.9	27.3	66 - 56	56 - 46	Pass
> 0,5 - 5	-	-	-	56	46	Pass
> 5 - 30	5.316	32.9	19.1	60	50	Pass
Result: The radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150kHz to 30MHz does not exceed the limits.						

Test Port: AC mains input port of the charger
Applied voltage: 110VAC
Applicable only to equipment designed to be connected to the public utility power line.

- 1) Mode of operation: Charging only
(Test Adaptor : AC-4E)

Live measurement

Frequency range (MHz)	Frequency (MHz)	Quasi-peak dBµV	Average dBµV	Limit QP (dBµV)	Limit AV (dBµV)	Verdict
0,15 – 0,5	-	-	-	66 - 56	56 - 46	Pass
> 0,5 - 5	0.720	30.0	16.7	56	46	Pass
	1.674	22.8	19.4	56	46	Pass
> 5 - 30	-	-	-	60	50	Pass

Neutral measurement

Frequency range (MHz)	Frequency (MHz)	Quasi-peak dBµV	Average dBµV	Limit QP (dBµV)	Limit AV (dBµV)	Verdict
0,15 – 0,5	0.348	36.1	24.3	66 - 56	56 - 46	Pass
> 0,5 - 5	0.840	34.1	19.6	56	46	Pass
> 5 - 30	-	-	-	60	50	Pass

Result: The radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150kHz to 30MHz does not exceed the limits.

Subclause 15.247 (a) – Carrier Frequency Separation
Pass

Requirement: Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25kHz or the 20dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25KHz or two-thirds of the 20 dB bandwidth of hopping channel, whichever is greater, ;provided the systems operate with an output power no greater than 125mW.

Test Specification : FCC Part 15 Subpart A – Subclause 15.31
Mode of operation : Tx mode (hopping on)
Port of testing : Temporary antenna port
Detector : Peak
RBW/VBW : 100 kHz / 300 kHz
Supply voltage : 3.7VDC from DC power supply
Temperature : 23°C
Humidity : 50%

Result:

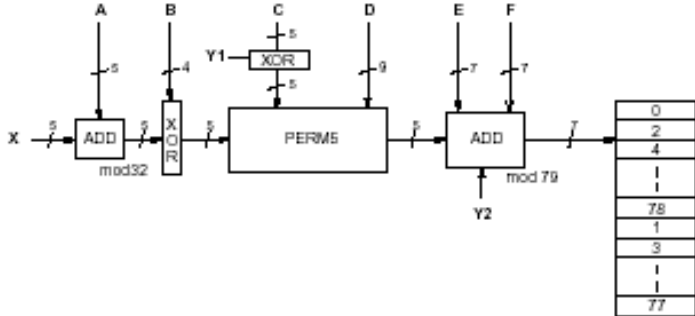
Pre-scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and packet types.

The centre frequencies of the hopping channels are separated by more than the 20dB bandwidth.
For test results plots refer to Appendix 1, page 2.

Verdict: Pass

Subclause 15.247 (a) – Time of Occupancy (Dwell Time)	Pass
Requirement: Frequency hopping systems in the 2400 – 2483.5 MHz band shall use at least 15 non-overlapping channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.	
Test Specification : FCC Part 15 Subpart A – Subclause 15.31 Mode of operation : Tx mode (hopping on), DH5 packet Port of testing : Temporary antenna port Detector : Peak RBW/VBW : 1 MHz / 3 MHz Supply voltage : 3.7VDC from DC power supply Temperature : 23°C Humidity : 50%	
Result: The screenshot in Appendix 1 page 4 shows the occurrence of a channel in a 31.6 s time period. In normal hopping mode Bluetooth is using 79 hopping channels only. The frequency was used 64 times. The dwell time for the longest supported packet type is about 3 ms. As a result the average time of occupancy will not be greater than 400 ms. i.e. Time period calculation: $0.4 \times 79 = 31.6\text{s}$ Limit calculation: $110 \times 2.856 \times 10^{-3} = 316.16 \times 10^{-3}$ $\leq 400 \times 10^{-3} \text{ s}$ For test protocols please refer to Appendix 1, page 3. Verdict: Pass	

Subclause 15.247 (a) – 20 dB Bandwidth		Pass	
Requirement:	Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25kHz or the 20dB bandwidth of the hopping channel, whichever is greater.		
Test Specification : FCC Part 15 Subpart A – Subclause 15.31 Mode of operation : Tx mode (2402MHz, 2441MHz, 2480MHz), (8DPSK) Port of testing : Temporary antenna port Detector : Peak RBW/VBW : 30 kHz / 100 kHz Supply voltage : 3.7VDC from DC power supply Temperature : 23°C Humidity : 50%			
Results For test protocols refer to Appendix 1, page 4-5.			
Frequency (MHz)	20 dB left (MHz)	20 dB right (MHz)	20dB bandwidth (MHz)
2402	0.648	0.624	1.272
2441	0.640	0.640	1.280
2480	0.640	0.652	1.292

Subclause 15.247 (a) – Hopping Sequence	Pass
Requirement:	The hopping sequence is generated and provided with an example.
Hopping sequence The channel is represented by a pseudo-random hopping sequence hopping through the 79 RF channels. The hopping sequence is unique for the piconet and is determined by the Bluetooth device address of the master. The X input determines the phase in the 32-hop segment, whereas Y1 and Y2 selects between master-to-slave and slave-to-master transmission. The inputs A to D determine the ordering within the segment, the inputs E and F determine the mapping onto the hop frequencies.	
	

www.tuv.com

Example data:

Hop sequence {k} for CONNECTION STATE:

CLK start: 0x0000010

ULAP: 0x00000000

#ticks: 00 02 | 04 06 | 08 0a | 0c 0e | 10 12 | 14 16 | 18 1a | 1c 1e |

```

-----
0x0000010: 08 66 | 10 70 | 12 19 | 14 23 | 16 01 | 18 05 | 20 33 | 22 37 |
0x0000030: 24 03 | 26 07 | 28 35 | 30 39 | 32 72 | 34 76 | 36 25 | 38 29 |
0x0000050: 40 74 | 42 78 | 44 27 | 46 31 | 48 09 | 50 13 | 52 41 | 54 45 |
0x0000070: 56 11 | 58 15 | 60 43 | 62 47 | 32 17 | 36 19 | 34 49 | 38 51 |
0x0000090: 40 21 | 44 23 | 42 53 | 46 55 | 48 33 | 52 35 | 50 65 | 54 67 |
0x00000b0: 56 37 | 60 39 | 58 69 | 62 71 | 64 25 | 68 27 | 66 57 | 70 59 |
0x00000d0: 72 29 | 76 31 | 74 61 | 78 63 | 01 41 | 05 43 | 03 73 | 07 75 |
0x00000f0: 09 45 | 13 47 | 11 77 | 15 00 | 64 49 | 66 53 | 68 02 | 70 06 |
0x0000110: 01 51 | 03 55 | 05 04 | 07 08 | 72 57 | 74 61 | 76 10 | 78 14 |
0x0000130: 09 59 | 11 63 | 13 12 | 15 16 | 17 65 | 19 69 | 21 18 | 23 22 |
0x0000150: 33 67 | 35 71 | 37 20 | 39 24 | 25 73 | 27 77 | 29 26 | 31 30 |
0x0000170: 41 75 | 43 00 | 45 28 | 47 32 | 17 02 | 21 04 | 19 34 | 23 36 |
0x0000190: 33 06 | 37 08 | 35 38 | 39 40 | 25 10 | 29 12 | 27 42 | 31 44 |
0x00001b0: 41 14 | 45 16 | 43 46 | 47 48 | 49 18 | 53 20 | 51 50 | 55 52 |
0x00001d0: 65 22 | 69 24 | 67 54 | 71 56 | 57 26 | 61 28 | 59 58 | 63 60 |
0x00001f0: 73 30 | 77 32 | 75 62 | 00 64 | 49 34 | 51 42 | 57 66 | 59 74 |
0x0000210: 53 36 | 55 44 | 61 68 | 63 76 | 65 50 | 67 58 | 73 03 | 75 11 |
0x0000230: 69 52 | 71 60 | 77 05 | 00 13 | 02 38 | 04 46 | 10 70 | 12 78 |
0x0000250: 06 40 | 08 48 | 14 72 | 16 01 | 18 54 | 20 62 | 26 07 | 28 15 |
0x0000270: 22 56 | 24 64 | 30 09 | 32 17 | 02 66 | 06 74 | 10 19 | 14 27 |
0x0000290: 04 70 | 08 78 | 12 23 | 16 31 | 18 03 | 22 11 | 26 35 | 30 43 |
0x00002b0: 20 07 | 24 15 | 28 39 | 32 47 | 34 68 | 38 76 | 42 21 | 46 29 |
0x00002d0: 36 72 | 40 01 | 44 25 | 48 33 | 50 05 | 54 13 | 58 37 | 62 45 |
0x00002f0: 52 09 | 56 17 | 60 41 | 64 49 | 34 19 | 36 35 | 50 51 | 52 67 |
0x0000310: 38 21 | 40 37 | 54 53 | 56 69 | 42 27 | 44 43 | 58 59 | 60 75 |
0x0000330: 46 29 | 48 45 | 62 61 | 64 77 | 66 23 | 68 39 | 03 55 | 05 71 |
0x0000350: 70 25 | 72 41 | 07 57 | 09 73 | 74 31 | 76 47 | 11 63 | 13 00 |
0x0000370: 78 33 | 01 49 | 15 65 | 17 02 | 66 51 | 70 67 | 03 04 | 07 20 |
0x0000390: 68 55 | 72 71 | 05 08 | 09 24 | 74 59 | 78 75 | 11 12 | 15 28 |
0x00003b0: 76 63 | 01 00 | 13 16 | 17 32 | 19 53 | 23 69 | 35 06 | 39 22 |
0x00003d0: 21 57 | 25 73 | 37 10 | 41 26 | 27 61 | 31 77 | 43 14 | 47 30 |
0x00003f0: 29 65 | 33 02 | 45 18 | 49 34 | 19 04 | 21 08 | 23 20 | 25 24 |

```

Subclause 15.247 (a) – Equal Hopping Frequency Use

Pass

Requirement: Each of the transmitter's hopping channels is used equally on average.

Equal hopping frequency use

The EUT complies with the Bluetooth RF specifications. For details refer to the Bluetooth standard.

Subclause 15.247 (a) – Receiver Input Bandwidth		Pass
Requirement:	The associated receiver(s) complies with the requirement that its input bandwidth matches the bandwidth of the transmitted signal.	
Receiver input bandwidth		
The receiver bandwidth is equal to the receiver bandwidth in the 79 hopping channel mode, which is 1 MHz. The receiver bandwidth was verified during Bluetooth RF conformance testing.		

Subclause 15.247 (a) – Receiver Hopping Capability		Pass
Requirement:	The associated receiver has the ability to shift frequencies in synchronisation with the transmitted signals.	
Receiver hopping Capability		
The EUT complies with the Bluetooth RF specifications. For details refer to the Bluetooth standard.		

Subclause 15.247 (b) – Peak Output Power					Pass
Test Specification : FCC Part 15 Subpart A – Subclause 15.31 Mode of operation : Tx mode (2402MHz, 2441MHz, 2480MHz), DH1 packet, GFSK Port of testing : Temporary antenna port Detector : Peak RBW/VBW : 1 MHz / 3 MHz Supply voltage : 3.7VDC from DC power supply Temperature : 23°C Humidity : 50%					
Requirement: For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 Watt. For all other frequency hopping systems in the 2400 – 2483.5 MHz band: 0.125 Watts.					
Result Pre-scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and packet types. All three transmit frequency modes comply with the maximum peak output power limit. For test protocols please refer to Appendix 1, page 6-7.					
Frequency (MHz)	Maximum peak output power (dBm)	Cable attenuation (dB)	Output power (dBm)	Limit (W/dBm)	Verdict
2402	4.59	3.52	8.11	1 / 30.0	Pass
2441	3.78	3.65	7.43	1 / 30.0	Pass
2480	3.37	3.60	6.97	1 / 30.0	Pass

Subclause 15.247 (b) – Band edge compliance		Pass
Test Specification : FCC Part 15 Subpart A – Subclause 15.31 Mode of operation : Tx mode (2402MHz, 2441MHz, 2480MHz), 8DPSK Port of testing : Temporary antenna port Detector : Peak RBW/VBW : 300 kHz / 1 MHz Supply voltage : 3.7VDC from DC power supply Temperature : 23°C Humidity : 50%		
Requirement: In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is 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.		
Result Pre-scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and packet types. There is no peak found outside any 100 kHz bandwidth of the operating frequency band in the three transmit frequency. All three transmit frequency modes comply with the limit stated in subclause 15.247(c). For test protocols refer to Appendix 1, page 8-12.		

Subclause 15.247 (c) – Spurious Conducted Emissions				Pass	
Test Specification : FCC Part 15 Subpart A – Subclause 15.31 Mode of operation : Tx mode (2402MHz, 2441MHz, 2480MHz), GFSK Port of testing : Temporary antenna port Detector : Peak RBW/VBW : 100 kHz / 300 kHz Supply voltage : 3.7VDC from DC power supply Temperature : 23 °C Humidity : 50 %					
Requirement: In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is 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.					
Result Pre-scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and packet types. There is no peak found outside any 100kHz bandwidth of the operating frequency band in the three transmit frequency. All three transmit frequency modes comply with the limit stated in subclause 15.247(c). For test protocols refer to Appendix 1, page 13-17.					
Operating frequency (MHz)	Spurious frequency (MHz)	Spurious Level (dBm)	Reference value (dBm)	Delta (dB)	Verdict
2402	4795.600	-48.25	4.18	-52.43	Pass
2441	4875.420	-45.73	3.46	-49.19	Pass

2480	4955.180	-46.46	1.15	-47.61	Pass
2480	67569.720	-48.70	1.15	-49.85	Pass

Subclause 15.247 (c) – Spurious Radiated Emissions		Pass
Test Specification : ANSI C63.4 - 2003 Mode of operation : Tx mode (2402MHz, 2441MHz, 2480MHz), 8PSK Port of testing : Enclosure Detector : Peak RBW/VBW : 100 kHz / 300 kHz for f < 1 GHz 1 MHz / 3 MHz for f > 1 GHz Supply voltage : internal batteries has been activated Temperature : 23°C Humidity : 50%		
Requirement:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is 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.	
Result Pre-scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and packet types. All three transmit frequency modes comply with the field strength within the restricted bands. There is no spurious found below 30MHz.		
Tx frequency 2402MHz Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
336.00	33.60	43.5 / QP
616.04	33.10	43.5 / QP
1602.00	49.66	74.0 / P
1602.04	49.05	54.0 / A
4804.01	55.51	74.0 / P
4803.94	51.85	54.0 / A
Tx frequency 2402MHz Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
176.00	26.00	43.5 / QP
416.00	31.30	43.5 / QP
648.02	37.80	43.5 / QP
1601.36	46.50	74.0 / P
1601.28	45.64	54.0 / A
4804.10	50.54	74.0 / P
4803.99	47.20	54.0 / A

Tx frequency 2441MHz Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
599.90	30.80	43.5 / QP
1627.31	49.55	74.0 / P
1627.39	48.78	54.0 / A
4882.00	52.33	74.0 / P
4881.92	49.47	54.0 / A
Tx frequency 2441MHz Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
424.04	28.40	43.5 / QP
615.98	38.70	43.5 / QP
1627.32	50.81	74.0 / P
1627.39	50.26	54.0 / A
4882.07	50.82	74.0 / P
4882.05	48.13	54.0 / A
Tx frequency 2480MHz Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
552.08	30.70	43.5 / QP
1653.35	49.02	74.0 / P
1653.35	48.31	54.0 / A
4959.98	51.39	74.0 / P
4959.95	48.67	54.0 / A
Tx frequency 2480MHz Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
656.00	33.50	43.5 / QP
1653.33	48.30	74.0 / P
1653.35	47.25	54.0 / A
4960.02	52.90	74.0 / P
4960.05	51.13	54.0 / A