

Produkte
Products

Prüfbericht - Nr.: 14037989 001			Seite 1 von 11 Page 1 of 11		
<i>Test Report No.:</i>					
Auftraggeber: <i>Client:</i>		Nugg-it, LLC (DBA Kapture) 1331 Vine St Cincinnati, Ohio 45202 United States			
Gegenstand der Prüfung: <i>Test Item:</i>		Bluetooth Audio Recorder			
Bezeichnung: <i>Identification:</i>	WBK1	Serien-Nr.: <i>Serial No.:</i>	Engineering sample		
Wareneingangs-Nr.: <i>Receipt No.:</i>	A000165936-001	Eingangsdatum: <i>Date of Receipt:</i>	11.02.2015		
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of test item at delivery:</i>		Test sample(s) is/are not damaged and suitable for testing.			
Prüfort: <i>Testing Location:</i>		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			
Prüfergebnis: <i>Test Results:</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. 8 - 10/F., Goldin Financial Global Square, 7 Wang Tai Road, Kowloon Bay, Kowloon, Hong Kong			
geprüft/ tested by:			kontrolliert/ reviewed by:		
<div style="display: flex; justify-content: space-between;"> <div> 15.12.2015 Benny Lau Senior Project Manager <i>(Signature)</i> </div> <div> 15.12.2015 Sharon Li Department Manager <i>(Signature)</i> </div> </div>					
Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>
Sonstiges: Other Aspects		FCC ID: 2ADZ27293			
Abkürzungen:		Abbreviations:			
P(ass) = entspricht Prüfgrundlage F(ail) = entspricht nicht Prüfgrundlage N/A = nicht anwendbar N/T = nicht getestet		P(ass) = passed F(ail) = failed N/A = not applicable N/T = not tested			
<p>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.</p> <p><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></p>					

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Product information

Manufacturers declarations

	Transceiver
Operating frequency range	2402 - 2480 MHz
Type of modulation	GFSK; $\pi/4$ -DQPSK; 8DPSK
Number of channels	79
Channel separation	1 MHz
Type of antenna	Chip Antenna
Antenna gain (dBi)	2.1 dBi
Power level	Fixed
Type of equipment	Standalone radio device
Connection to public utility power line	No
Nominal voltage	V_{nor} : 3.7 Vdc
Independent Operation Modes	Transmitting Mode

Product function and intended use

The equipment under test (EUT) is a Bluetooth v3.0 Transceiver operating at 2.4GHz. It is an audio recorder which can transmit audio signal to mobile phone through Bluetooth connection.

FCC ID: 2ADZ27293

Models	Product description
WBK1	Bluetooth v3.0 Audio Recorder

Submitted documents

Circuit Diagram
Block Diagram
Bill of material
User manual
Rating Label

Special accessories and auxiliary equipment

Nil

Independent Operation Modes

The basic operation modes are: Transmitting Bluetooth signal .

For further information refer to User Manual

Related Submittal(s) Grants

This is a single application for certification of the transmitter.

Remark

Nil.

Test Set-up and Operation Mode

Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

Test Operation and Test Software

Test operation should refer to test methodology.

- Test software provided by the applicant is used to fix the transmitting channel.

Special Accessories and Auxiliary Equipment

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

- none

Countermeasures to achieve EMC Compliance

- none

Test Methodology

Radiated Emission

The radiated emission measurements were performed according to the procedures in ANSI C63.4-2003.

The equipment under test (EUT) was placed at the middle of the 80 cm height turntable, and the turntable is 3 meters far from the measuring antenna. During the testing, the EUT was operated standalone and arranged for maximum emissions. The EUT was tested in three orthogonal planes.

The investigation is performed with the EUT rotated 360 °, the antenna height scanned between 1m and 4m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations. Repeat the measurement steps until the maximum emissions were obtained.

All radiated tests were performed at an antenna to EUT with 3 meters distance, unless stated otherwise in particular parts of this test report.

Field Strength Calculation

The field strength at 3 m was established by adding the meter reading of the spectrum analyzer to the factors associated with antenna correction factor, cable loss, preamplifiers and filter attenuation.

The equation is expressed as follow:

$$FS = R + AF + CF + FA - PA$$

Where FS = Field Strength in dBuV/m at 3 meters.
R = Reading of Spectrum Analyzer in dBuV.
AF = Antenna Factor in dB.
CF = Cable Attenuation Factor in dB.
FA = Filter Attenuation Factor in dB.
PA = Preamplifier Factor in dB.

FA and PA are only be used for the measuring frequency above 1 GHz.

List of Test and Measurement Instruments

Hong Kong Productivity Council (Registration number: 90656)

Radiated Emission

Equipment	Manufacturer	Type	S/N	Cal. Due date
Semi-anechoic Chamber	Frankonia	Nil	Nil	14-Apr-15
Cable	Hubersuhner	SUCOFLEX 104	N/A	31-Mar-16
Test Receiver	R & S	ESU40	72799 /6	20-Jun-15
Bi-conical Antenna	R & S	HK116	100190	11-Jun-15
Log Periodic Antenna	R & S	HL223	100241	10-Jun-15
Coaxial cable	Harbour	LL335	841516/017	10-Jun-16
Microwave amplifier 0.5-26.5GHz, 25dB gain	HP	83017A	N/A	30-Dec-15
High Pass Filter (cutoff freq. =1000MHz)	Trilithic	23042	3123A00437	28-Oct-15
Horn Antenna	EMCO	3115	9829213	11-Jun-15
Active Loop Antenna	EMCO	6502	9002-3347	17-May-15

Bandwidth and Timing Measurement

Equipment	Manufacturer	Type	S/N	Cal Due Date
Spectrum Analyzer	R & S	FSP30	Nil	Jan. 12 2017

Results FCC Part 15 – Subpart C

Subclause 15.203 – Antenna Information		Pass
FCC Requirement: No antenna other than that furnished by the responsible party shall be used with the device		
Results:	Antenna type:	Integral Chip antenna
Verdict:	Pass	

Subclause 15.207 – Conducted Emission on AC Mains	N/A
There is no AC power input or output ports on the EUT. The transmitter will be turn off automatically during charging. Refer test report 14038915 issued on 20.04.2015 for test result of Charging mode	

Subclause 15.215 (c) – 20 dB Bandwidth		Pass		
Test Specification : ANSI C63.4 – 2003 Mode of operation : Tx mode Port of testing : Enclosure RBW/VBW : 10 kHz/ 30 kHz Supply voltage : 3.7VDC Test date : 17.03.2015 Temperature : 23°C Humidity : 50%				
Requirement:	The intentional radiators must be designed to ensure that the 20dB bandwidth of the emission, is contained within the frequency band designated in the rule section under which the equipment is operated.			
Results:	Pass			
Frequency (MHz)	20 dB left (MHz)	Limit (MHz)	20 dB right (MHz)	Limit (MHz)
2402	2401.336	> 2400	2402.644	< 2483.5
2441	2441.332	> 2400	2441.648	< 2483.5
2480	2479.332	> 2400	2480.648	< 2483.5

Subclause 15.35 (c) – Worst Case Duty Factor		
ON time of a pulse	2.9ms	See Appendix 1
Number of pulse found in 100ms	3	See Appendix 1
Duty cycle factor = $20 \times \log ((\text{on time of 1 pulse} \times \text{no. of pulse in 100ms}) / 100\text{ms})$ = -21.2 dB		

Subclause 15.249 (a) – Field Strength of Fundamental and Harmonics		Pass
Test Specification : ANSI C63.4 – 2003 Mode of operation : Tx mode Port of testing : Enclosure RBW/VBW : 120 kHz for f < 1 GHz 1 MHz / 3 MHz for f > 1 GHz Supply voltage : 3.7VDC Frequency range : 9kHz to tenth harmonic Test date : 10.03.2015 Temperature : 23°C Humidity : 50%		
Requirement: The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following limit.		
Results: Pass		
Fundamental Frequency 2402 MHz Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2402.000	95.73	114.0 / P
2402.000	74.53	94.0 / A
Fundamental Frequency 2402 MHz Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2402.000	94.74	114.0 / P
2402.000	73.54	94.0 / A
Harmonics 2402MHz Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
7206.000	70.99	74.0 / P
7206.000	49.79	54.0 / A
Harmonics 2402 MHz Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
7206.000	67.34	74.0 / P
7206.000	46.14	54.0 / A
Fundamental Frequency 2441 MHz Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2441.000	94.32	114.0 / P
2441.000	73.12	94.0 / A
Fundamental Frequency 2441 MHz Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2441.000	92.87	114.0 / P
2441.000	71.67	94.0 / A

Harmonics 2441 MHz			Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m	Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
7323.000	68.03	74.0 / P	7323.000	46.83	54.0 / A
7323.000					
Harmonics 2441 MHz			Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m	Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
7323.000	65.65	74.0 / P	7323.000	44.45	54.0 / A
7323.000					
Fundamental Frequency 2480 MHz			Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m	Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2480.000	86.39	114.0 / P	2480.000	65.19	94.0 / A
2480.000					
Fundamental Frequency 2480 MHz			Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m	Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2480.000	86.34	114.0 / P	2480.000	65.14	94.0 / A
2480.000					
Harmonics 2480 MHz			Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m	Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
No peak found	---	74.0 / P	No peak found	---	54.0 / A
No peak found			No peak found		
Harmonics 2480 MHz			Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m	Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
No peak found	---	74.0 / P	No peak found	---	54.0 / A
No peak found			No peak found		

Remark: Average reading using duty cycle correction factor on peak measurement.

Subclause 15.205, 15.249 (d) – Out of Band Radiated Emission		Pass
Test Specification : ANSI C63.4 - 2003 Mode of operation : Tx mode Port of testing : Enclosure Detector : Peak RBW/VBW : 120 kHz for f < 1 GHz 1 MHz / 3 MHz for f > 1 GHz Supply voltage : 3.7VDC Test date : 10.03.2015 Frequency range : 9kHz to tenth harmonic Temperature : 23°C Humidity : 50%		
Requirement: Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.		
Results: All three transmit frequency modes comply with the field strength limit of section 15.209. There is no spurious found below 30MHz.		
Tx frequency 2402 MHz Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2400.000	50.49	74.0 / P
2400.000	29.29	54.0 / A
Tx frequency 2402 MHz Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2400.000	49.50	74.0 / P
2400.000	28.30	54.0 / A
Tx frequency 2441 MHz Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
No peak found	---	74.0 / P
No peak found	---	54.0 / A
Tx frequency 2441 MHz Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
No peak found	---	74.0 / P
No peak found	---	54.0 / A
Tx frequency 2480 MHz Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2483.500	48.82	74.0 / P
2483.500	27.62	54.0 / A
Tx frequency 2480 MHz Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2483.500	46.19	74.0 / P
2483.500	24.99	54.0 / A

Remark: Average reading using duty cycle correction factor on peak measurement