FCC/IC - TEST REPORT

Report Number	:	**68.760.17.0899.01**	Date of Issue:	**December 20, 2017**
Model	:	**BT adaptor**		
Product Type	:	Bluetooth adaptor		
Applicant	:	Widex A/S		
Address	:	Nymoellevej 6, DK-3540 Lynge, Denmark		
Production Facility	:	Widex A/S		
Address	:	Nymoellevej 6, DK-3540 Lynge, Denmark		
Test Result	:	**n Positive o Negative**		
Total pages including Appendices	:	**17**		

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1. Table of Contents

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2. Details about the Test Laboratory

Details about the Test Laboratory

Company name:	TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, Shenzhen City, 518052, P. R. China
FCC Registration Number:	514049
IC Registration No.:	10320A
Telephone:	86 755 8828 6998
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3. Description of the Equipment Under Test

Product:	Bluetooth adaptor
Model no.:	BT adaptor
FCC ID:	TTY-BA
IC ID:	5676B-BA
Options and accessories:	Nil
Rating:	5.0Vdc supplied by USB port
RF Transmission Frequency:	2402MHz-2480MHz
Description of the EUT:	The Equipment Under Test (EUT) is a USB Dongle which support Bluetooth function operated at 2.4GHz

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4. Summary of Test Standards

Test Standards	
FCC Part 15 Subpart B 10-1-16 Edition	Unintentional Radiators
ICES-003 Issue 6 January 2016	Information Technology Equipment (Including Digital Apparatus) - Limits and Methods of Measurement

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5. Summary of Test Results

Emission Tests				
FCC Part 15 Subpart B 10-1-16 Edition / ICES-003 Issue 6				
Test Condition	Pages	Test Result		
		Pass	Fail	N/A
Conducted Emission on AC 150kHz to 30MHz	10	☒	☐	☐
Radiated Emission 30MHz to 1000MHz	13	☒	☐	☐
Radiated Emission 1000MHz to 18000MHz	15	☒	☐	☐

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6. General Remarks

Remarks

The Equipment Under Test (EUT) is a USB Dongle which support Bluetooth function operated at 2.4GHz.

SUMMARY:

All tests according to the regulations cited on page 5 were

n - Performed

o - **Not** Performed

The Equipment under Test

n - **Fulfills** the general approval requirements.

o - **Does not** fulfill the general approval requirements.

Sample Received Date:	December 14, 2017
Testing Start Date:	December 15, 2017
Testing End Date:	December 19, 2017

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Prepared by:

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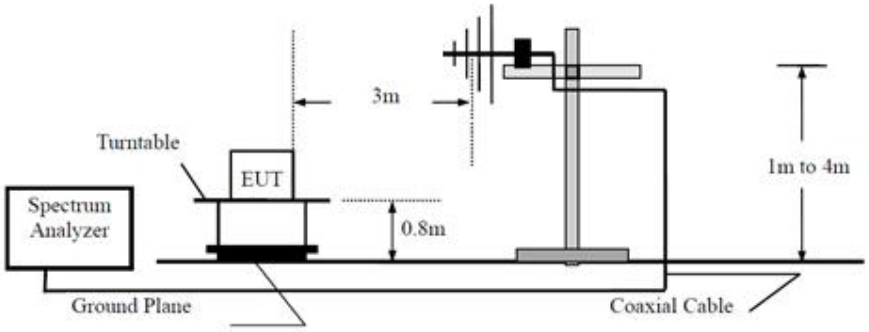
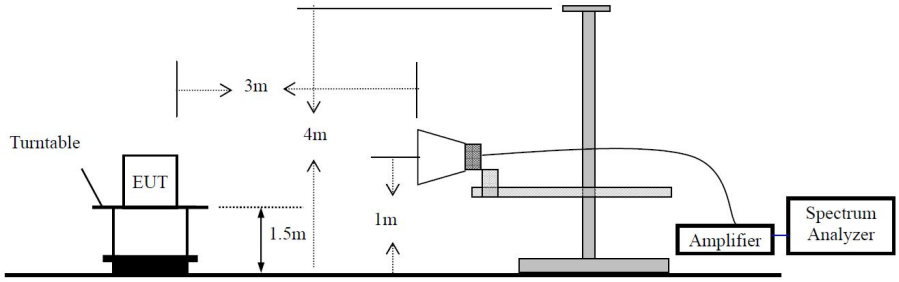
7. Test Setups

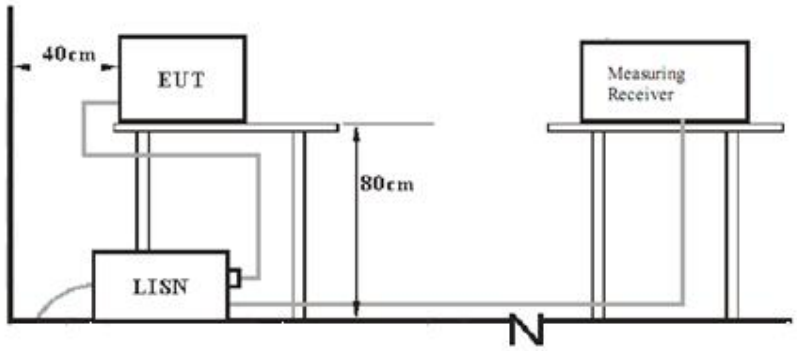
Below 1GHz



Above 1GHz



AC Power Line Conducted Emission test setups



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8. Systems test configuration

Auxiliary Equipment Used during Test:

DESCRIPTION	MANUFACTURER	MODEL NO.	S/N
Notebook	Lenovo	T460s	---

Test software: CSR tool, which used to control the EUT in continues transmitting mode.

9. Technical Requirement

9.1 Conducted Emission Test

Test Method

1. The EUT was placed on a table, which is 0.8m above ground plane
2. The power line of the EUT is connected to the AC mains through an Artificial Mains Network (A.M.N.).
3. Maximum procedure was performed to ensure EUT compliance
4. A EMI test receiver is used to test the emissions from both sides of AC line

Limit

According to §15.107 & ICES-003 6.1, conducted emissions limit as below:

Frequency MHz	QP Limit dBµV	AV Limit dBµV
0.150-0.500	66-56*	56-46*
0.500-5	56	46
5-30	60	50

*Decreasing linearly with logarithm of the frequency

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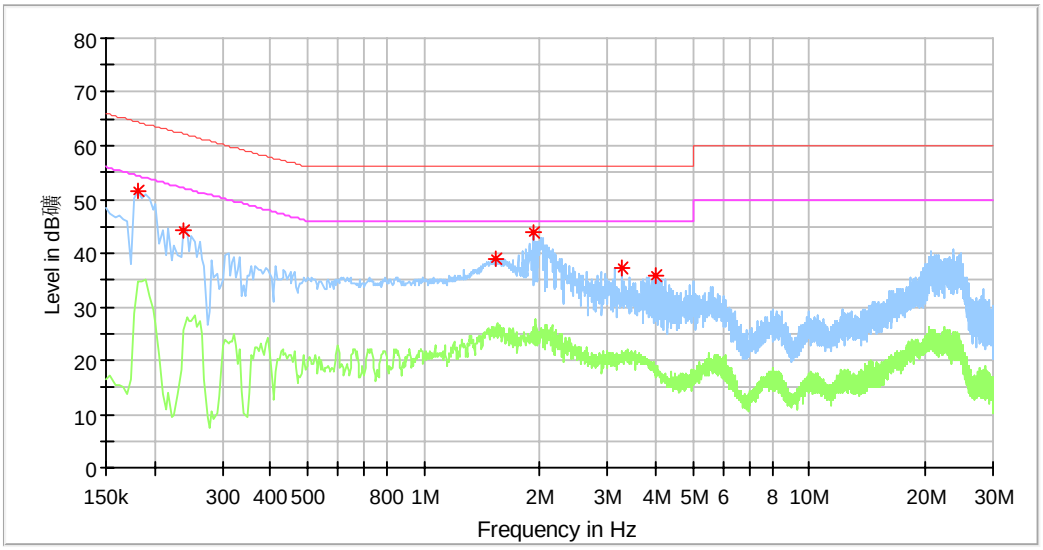
Conducted Emission

Product Type	:	Bluetooth adaptor
M/N	:	BT adaptor
Operating Condition	:	Data transmission mode
Test Specification	:	Line
Comment	:	AC 120V/60Hz



Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.182000	51.75	---	64.39	12.65	L1	10.2
0.238000	44.33	---	62.17	17.84	L1	10.2
1.534000	38.96	---	56.00	17.04	L1	10.2
1.926000	44.01	---	56.00	11.99	L1	10.3
3.282000	37.26	---	56.00	18.74	L1	10.3
3.998000	35.94	---	56.00	20.06	L1	10.3

*Correct factor=cable loss + LISN factor

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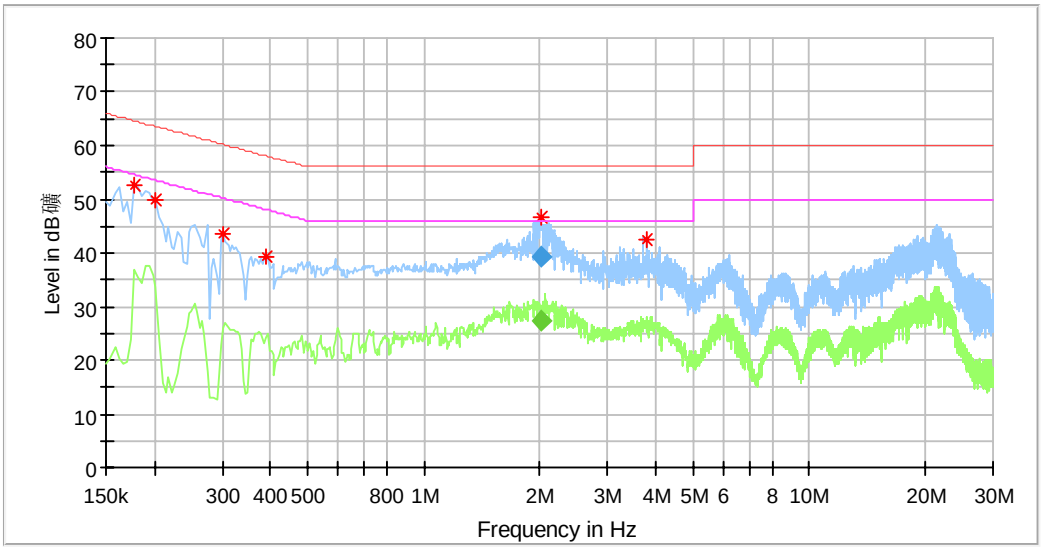
Conducted Emission

Product Type	:	Bluetooth adaptor
M/N	:	BT adaptor
Operating Condition	:	Data transmission mode
Test Specification	:	Neutral
Comment	:	AC 120V/60Hz



Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.178000	52.64	---	64.58	11.93	N	10.3
0.202000	49.93	---	63.53	13.60	N	10.3
0.302000	43.39	---	60.19	16.79	N	10.3
0.390000	39.15	---	58.06	18.91	N	10.3
2.009500	---	27.23	46.00	18.77	N	10.4
2.009500	39.25	---	56.00	16.75	N	10.4
3.794000	42.56	---	56.00	13.44	N	10.5

*Correct factor=cable loss + LISN factor

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9.2 Radiated Emission Test

Test Method

1: The EUT was place on a turn table which is 1.5m above ground plane for above 1GHz and 0.8m above ground for below 1GHz at 3 meters chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

2: The EUT was set 3 meters away from the interference – receiving antenna, which was mounted on the top of a variable – height antenna tower.

3: The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

4: For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

5: Use the following spectrum analyzer settings According to C63.10:

For Above 1GHz

Span = wide enough to capture the peak level of the in-band emission and all spurious
RBW = 1MHz, VBW≥RBW for peak measurement and VBW = 10Hz for average measurement,
Sweep = auto, Detector function = peak, Trace = max hold.

For Below 1GHz

Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the in-band emission and all spurious
RBW = 100 KHz, VBW≥RBW for peak measurement, Sweep = auto, Detector function = peak, Trace = max hold.

Note:

1: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 KHz for Quasi-peak detection (QP) at frequency below 1GHz.

2: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for peak detection (PK) at frequency above 1GHz.

3: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average ((duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor (20log(1/duty cycle).

4: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (duty cycle > 98%) for Average detection (AV) at frequency above1GHz

Limits

The radio emission outside the operating frequency band 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. Radiated emissions which fall in the restricted bands, as defined in section15.205, must comply with the radiated emission limits specified in section 15.209 and ICES-003 clause 6.2.

Frequency MHz	Field Strength uV/m	Field Strength dBµV/m	Detector
30-88	100	40	QP
88-216	150	43.5	QP
216-960	200	46	QP
960-1000	500	54	QP
Above 1000	500	54	AV
Above 1000	5000	74	PK

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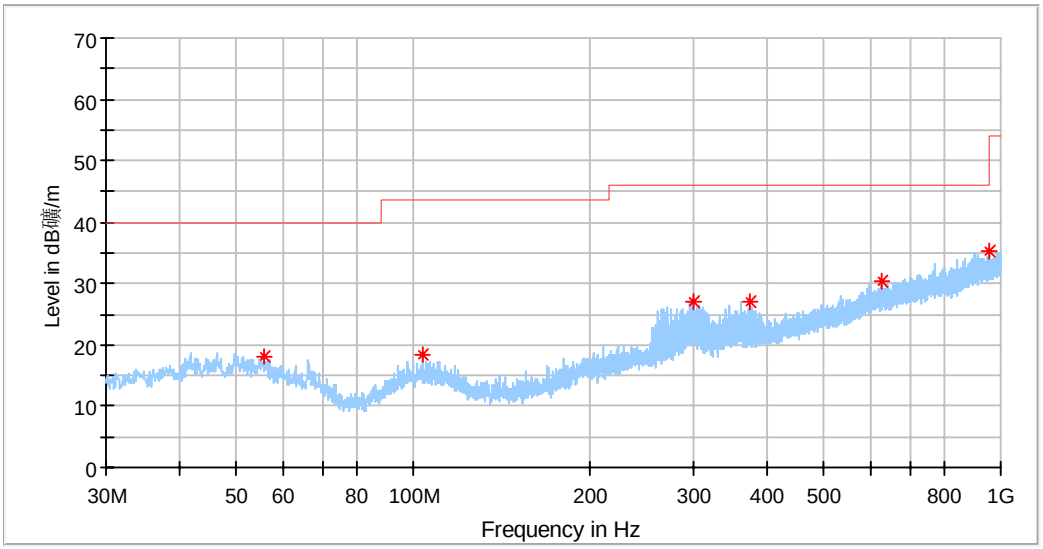
Radiated Emission

Product Type	:	Bluetooth adaptor
M/N	:	BT adaptor
Operating Condition	:	Data transmission mode
Ant. Polarity	:	Horizontal
Comment	:	30-1000MHz



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
55.705000	18.04	40.00	21.96	100.0	H	0.0	17.5
103.901875	18.39	43.50	25.11	100.0	H	341.0	16.1
300.326875	27.04	46.00	18.96	100.0	H	132.0	19.0
375.501875	26.99	46.00	19.01	100.0	H	306.0	20.9
626.307500	30.42	46.00	15.58	100.0	H	0.0	26.6
959.441875	35.17	46.00	10.83	100.0	H	341.0	31.5

Corrector factor = Antenna Factor + Cable Loss

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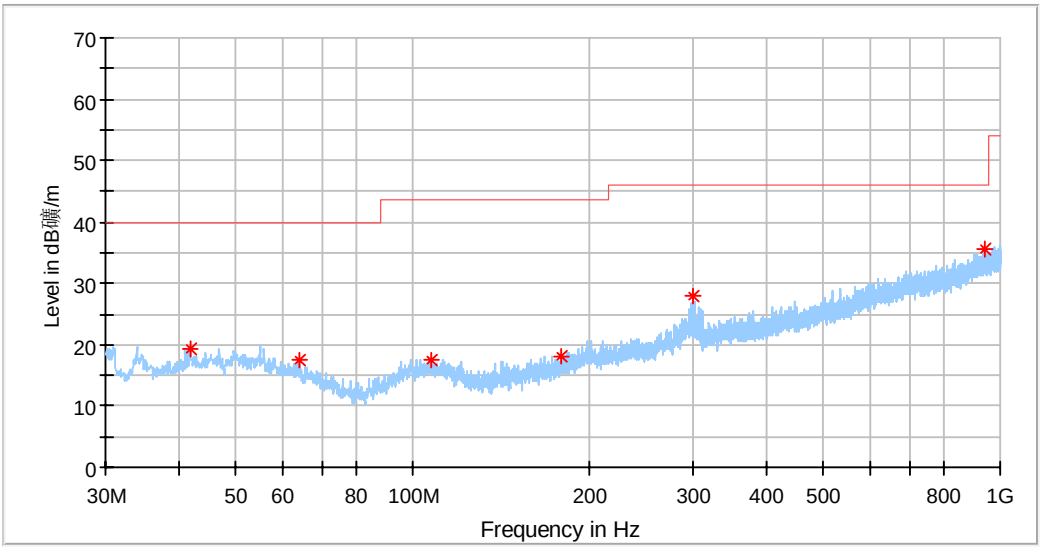
Radiated Emission

Product Type	:	Bluetooth adaptor
M/N	:	BT adaptor
Operating Condition	:	Data transmission mode
Ant. Polarity	:	Vertical
Comment	:	30-1000MHz



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
41.761250	19.46	40.00	20.54	100.0	V	254.0	17.6
63.950000	17.43	40.00	22.57	200.0	V	174.0	15.9
107.418125	17.65	43.50	25.85	200.0	V	174.0	16.2
179.501250	18.20	43.50	25.30	100.0	V	0.0	14.2
300.811875	27.84	46.00	18.16	200.0	V	155.0	19.4
941.496875	35.72	46.00	10.28	100.0	V	53.0	31.6

Corrector factor = Antenna Factor + Cable Loss

Note: Testing is carried out with frequency rang 30MHz to 12.75GHz, which above 1GHz are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

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10. Test Equipment List

Radiated Emission Test

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESR 26	101269	2018-7-14
Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9163	707	2018-7-14
Horn Antenna	Rohde & Schwarz	HF907	102294	2018-7-14
Pre-amplifier	Rohde & Schwarz	SCU 18	102230	2018-7-14
Signal Generator	Rohde & Schwarz	SMY01	839369/005	2018-7-7
Attenuator	Agilent	8491A	MY39264334	2018-7-7
3m Semi-anechoic chamber	TDK	9X6X6	----	2020-7-7
Test software	Rohde & Schwarz	EMC32	Version 9.15.00	N/A

Conducted Emission Test

Description	Manufacturer	Model no.	Serial no.	cal. due date
EMI Test Receiver	Rohde & Schwarz	ESR 3	101782	2018-7-14
LISN	Rohde & Schwarz	ENV4200	100249	2018-7-14
LISN	Rohde & Schwarz	ENV432	101318	2018-7-14
LISN	Rohde & Schwarz	ENV216	100326	2018-7-14
ISN	Rohde & Schwarz	ENY81	100177	2018-7-14
ISN	Rohde & Schwarz	ENY81-CA6	101664	2018-7-14
High Voltage Probe	Rohde & Schwarz	TK9420(VT9420)	9420-584	2018-7-14
RF Current Probe	Rohde & Schwarz	EZ-17	100816	2018-7-14
Attenuator	Shanghai Huaxiang	TS2-26-3	080928189	2018-7-7
Test software	Rohde & Schwarz	EMC32	Version9.15.00	N/A

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11. Measurement System Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

System Measurement Uncertainty	
Items	**Extended Uncertainty**
Uncertainty for Conducted Emission 150kHz-30MHz (for test using High Voltage Probe TK9420(VT9420))	2.92 dB
Uncertainty for Radiated Emission in 3m chamber 30MHz-1000MHz	Horizontal: 4.83dB; Vertical: 4.91dB;
Uncertainty for Radiated Spurious Emission 3000MHz-18000MHz	Horizontal: 4.95dB; Vertical: 4.94dB;
Uncertainty for Conducted Emission 150kHz-30MHz	3.50dB

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