Deqing Sideli Electrical lamp decoration Co.,Ltd.

Wireless Candle

Model: TPC109

December 19, 2011
Report No.: 11021467-RX

(This report supersedes NONE)

Modifications made to the product : None

This Test Report is Issued Under the Authority of:	
Deon Dai	Alex Liu
Deon Dai Test Engineer	Alex Liu Technical Manager

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Test result presented in this test report is applicable to the representative sample only.

EMC Test Report

TO:FCC Part 15 Subpart B Class B: Oct. 2011, ANSI C63.4: 2009

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Accreditations for Product Certifications

Country	Accreditation Body	Scope
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Canada	IC FCB , NIST	EMC , RF , Telecom
Singapore	iDA, NIST	EMC , RF , Telecom
EU	NB	EMC & R&TTE Directive
Japan	MIC, (RCB 208)	RF , Telecom
HongKong	OFTA (US002)	RF , Telecom

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CONTENTS

1 Executive Summary & EUT Information

The purpose of this test program was to demonstrate compliance of the Deqing Sideli Electrical lamp decoration Co.,Ltd. Wireless Candle, against the current Stipulated Standards. The Wireless Candle has demonstrated compliance with the FCC Part 15 Subpart B Class B: Oct.2011, ANSI C63.4: 2009

EUT Information

EUT Description	**Wireless Candle**
Model No	**TPC109**
Serial No	**N/A**
Input Power	**Alkaline battery 1.5V (1Pcs)**
Classification Per Stipulated Test Standard	**FCC Part 15 Subpart B Class B: Oct. 2011**

2 TECHNICAL DETAILS

Purpose	Compliance testing of Wireless Candle with stipulated standards
Applicant / Client	Deqing Sideli Electrical lamp decoration Co.,Ltd. Leidian Industry area Deqing county Zhejiang Province, China
Manufacturer	Deqing Sideli Electrical lamp decoration Co.,Ltd. Leidian Industry area Deqing county Zhejiang Province, China
Laboratory performing the tests	SIEMIC Nanjing (China) Laboratories NO.2-1,Longcang Dadao, Yuhua Economic Development Zone, Nanjing, China Tel:+86(25)86730128/86730129 Fax:+86(25)86730127 Email:info@siemic.com
Test report reference number	11021467-RX
Date EUT received	November 28, 2011
Standard applied	FCC Part 15 Subpart B Class B: Oct. 2011, ANSI C63.4: 2009
Dates of test (from – to)	December 8, 2011
No of Units	#1
Equipment Category	CYY
Trade Name	N/A
Model	TPC109
RF Operating Frequency (ies)	433.95MHz
Clock/Oscillator Frequency (ies)	32.768
Port/Connectors	N/A
FCC ID	A65-13867264480

3 MODIFICATION

NONE

4 TEST SUMMARY

The product was tested in accordance with the following specifications. All testing has been performed according to below product classification:

Class B Emission product

Test Results Summary

Emissions			
Test Standard	**Description**	**Product Class**	**Pass / Fail**
FCC Part 15 Subpart B Class B: Oct. 2011, ANSI C63.4: 2009	Conducted Emissions	See Above	N/A
FCC Part 15 Subpart B Class B: Oct. 2011, ANSI C63.4: 2009	Radiated Spurious Emissions	See Above	Pass

All measurement uncertainty is not taken into consideration for all presented test result.

5 MEASUREMENTS, EXAMINATION AND DERIVED RESULTS

5.1 AC Line Conducted Emission Test Result

Note:

1. All possible modes of operation were investigated. Only the several worst case emissions measured, using the correct CISPR and Average detectors, are reported. All other emissions were relatively insignificant.
2. A "-ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
3. Conducted Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 9kHz – 30MHz (Average & Quasi-peak) is ±3.86dB.
4. Environmental Conditions

	Temperature	25ºC
	Relative Humidity	50%
	Atmospheric Pressure	1009mbar

5. Test Date : December 8, 2011
   Tested By : Deon Dai

Test Result: N/A (Batteries operated)

5.2 Radiated Spurious Emission Test Results

Note:

1. All possible modes of operation were investigated. Only the 6 worst case emissions measured, using the correct CISPR detectors, are reported. All other emissions were relatively insignificant.
2. A "-ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
3. Radiated Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 30MHz – 1GHz (QP only @ 3m & 10m) is +6dB/-6dB (for EUTs < 0.5m X 0.5m X 0.5m).
4. Environmental Conditions

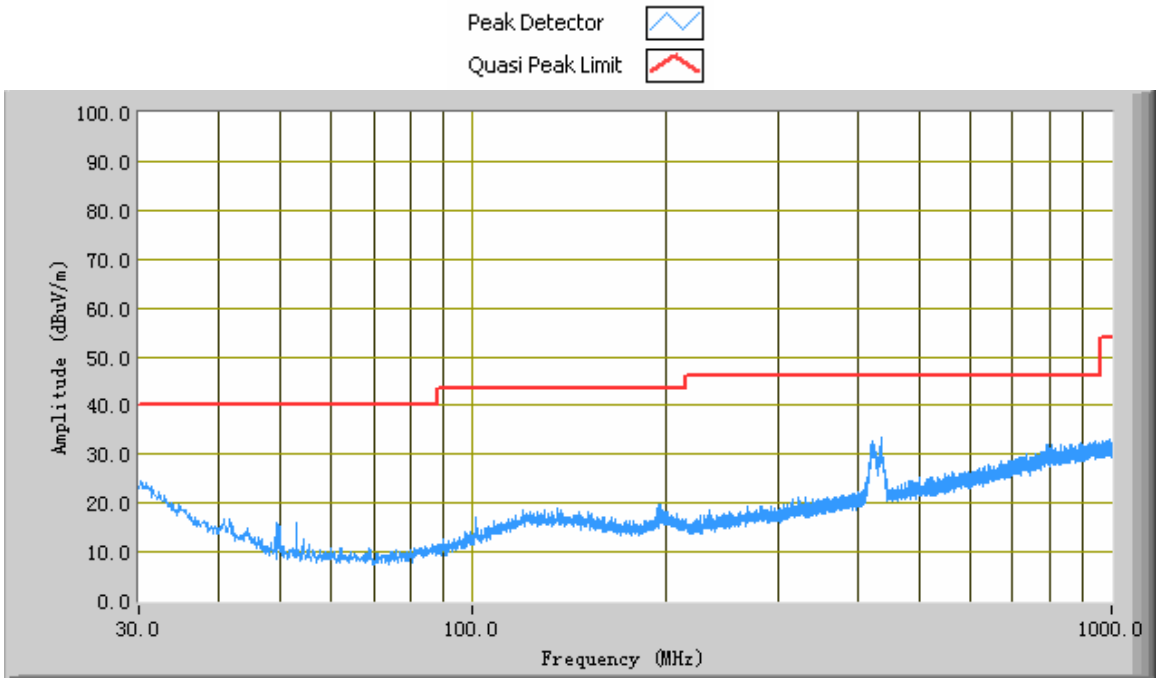
Temperature	25ºC
Relative Humidity	50%
Atmospheric Pressure	1011mbar

5. Test Date : December 8, 2011
   Tested By : Deon Dai

Test Result: Pass
See next page

Radiated Emission Test Result

Test Mode:	Vertical



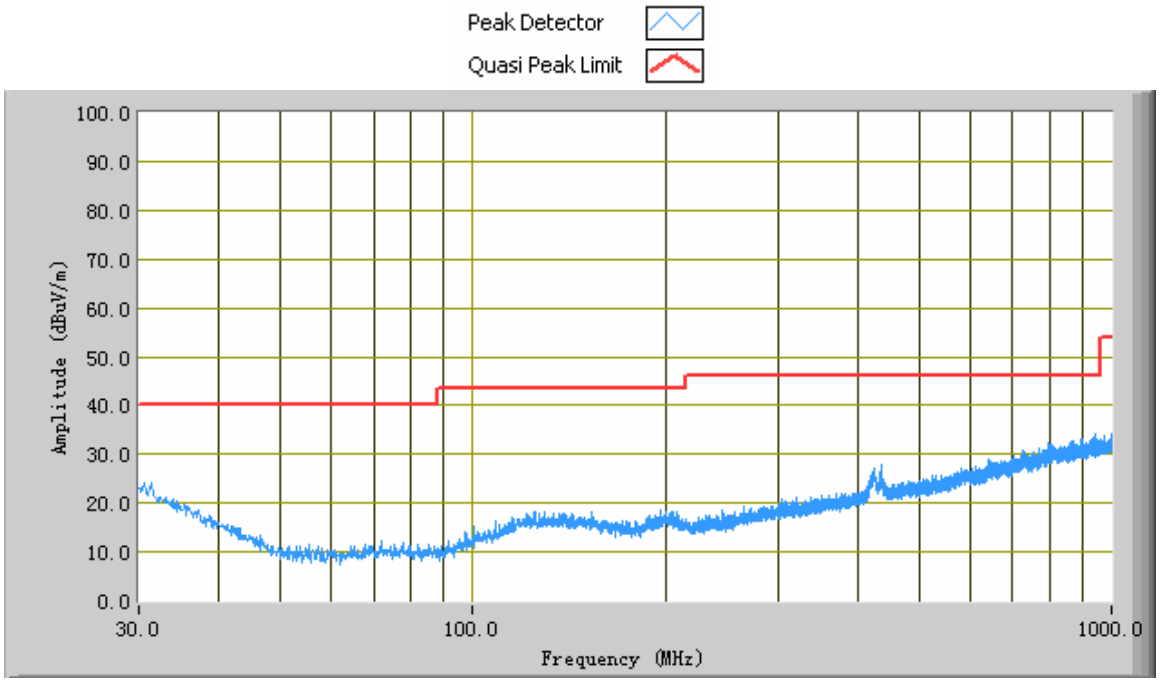
30MHz ~1000MHz Result @ 3m

Frequency (MHz)	*Peak (dBuV/m)*	*Azimuth*	*Polarity(H/V)*	*Height (cm)*	*Factors (dB)*	*Limit (dBuV/m)*	*Margin (dB)*
435.10	*33.53*	*50.20*	*V*	*100.00*	*-27.52*	*46.00*	*-12.47*
421.52	*32.78*	*38.20*	*V*	*100.00*	*-27.60*	*46.00*	*-13.22*
945.20	*32.63*	*276.50*	*V*	*200.00*	*-15.50*	*46.00*	*-13.37*
894.27	*32.51*	*206.90*	*V*	*100.00*	*-15.46*	*46.00*	*-13.49*
934.28	*32.50*	*230.60*	*V*	*100.00*	*-15.51*	*46.00*	*-13.50*
955.74	*32.30*	*333.70*	*V*	*200.00*	*-15.31*	*46.00*	*-13.70*

Remark:

Factor (dB) = Antenna factor + Cable loss – Amplifier gain
Peak Emiss. Level (dBuV/m) = Raw Data (dBuV) + Corr. Factor (dB/m)
Limit (dBuV/m) = Limit stated in standard
Margin (dB) = Peak Emiss. Level (dBuV/m) – Limits (dBuV/m)

Test Mode:	Horizontal



30MHz ~1000MHz Result @ 3m

Frequency (MHz)	*Peak (dBuV/m)*	*Azimuth*	*Polarity(H/V)*	*Height (cm)*	*Factors (dB)*	*Limit (dBuV/m)*	*Margin (dB)*
945.32	*34.31*	*124.10*	*H*	*200.00*	*-15.05*	*46.00*	*-11.69*
937.80	*33.60*	*128.20*	*H*	*100.00*	*-15.17*	*46.00*	*-12.40*
930.52	*32.99*	*287.70*	*H*	*100.00*	*-15.09*	*46.00*	*-13.01*
902.03	*32.97*	*313.10*	*H*	*200.00*	*-14.75*	*46.00*	*-13.03*
868.20	*32.84*	*160.50*	*H*	*100.00*	*-15.86*	*46.00*	*-13.16*
958.53	*32.65*	*1.80*	*H*	*200.00*	*-14.67*	*46.00*	*-13.35*

Remark:

Factor (dB) = Antenna factor + Cable loss – Amplifier gain
Peak Emiss. Level (dBuV/m) = Raw Data (dBuV) + Corr. Factor (dB/m)
Limit (dBuV/m) = Limit stated in standard
Margin (dB) = Peak Emiss. Level (dBuV/m) – Limits (dBuV/m)

Note: Emissions from 1GHz to 5GHz is very low under transmit mode so test data is not presented in this report.

Annex A. TEST INSTRUMENTATION & METHOD

Annex A.i. TEST INSTRUMENTATION & GENERAL PROCEDURES

Instrument	Model	Serial #	Calibration Due
Radiated Emissions			
R&S Receiver	ESPI 3	101216	05/25/2012
HP Pre-amplifier (0.1-1300MHz)	8447F	1937A01160	05/25/2012
Sunol Sciences, Inc. Antenna (30MHz~2GHz)	JB1	A112107	10/03/2012

Annex A.ii. CONDUCTED EMISSIONS TEST DESCRIPTION

Limits Of Conducted Emissions Measurement

Frequency Range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
3. All emanations from a class B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

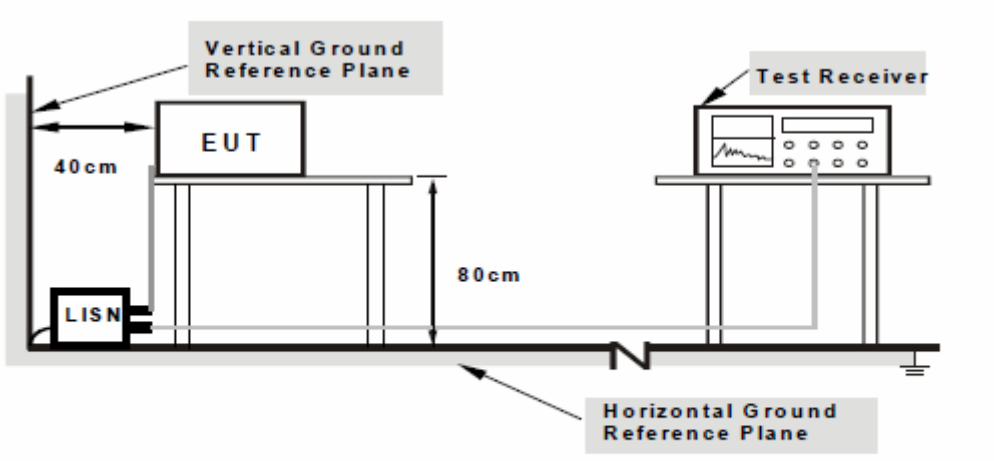
Test Set-up

1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table, as shown in Photographs of the Test Configuration1.

2. The power supply for the EUT was fed through a 50Ω/50μH EUT LISN, connected to filtered mains.

3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable.

4. All other supporting equipments were powered separately from another main supply.



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration1.

Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition.

2. A scan was made on the NEUTRAL line (for AC mains) or Earth line (for DC power) over the required frequency range using an EMI test receiver.

3. High peaks, relative to the limit line, were then selected.

4. The EMI test receiver was then tuned to the selected frequencies and the necessary measurements made with a receiver bandwidth setting of 10 KHz. For FCC tests, only Quasi-peak measurements were made; while for CISPR/EN tests, both Quasi-peak and Average measurements were made.

5. Steps 2 to 4 were then repeated for the LIVE line (for AC mains) or DC line (for DC power).

Description of Conducted Emission Program

This EMC Measurement software run LabView automation software and offers a common user interface for electromagnetic interference (EMI) measurements. This software is a modern and powerful tool for controlling and monitoring EMI test receivers and EMC test systems. It guarantees reliable collection, evaluation, and documentation of measurement results. Basically, this program will run a pre-scan measurement before it proceeds with the final measurement. The pre-scan routine will run the common scan range from 150 kHz to 30 MHz; the program will first start a peak and average scan on selectable measurement time and step size. After the program complete the pre-scan, this program will perform the Quasi Peak and Average measurement, based on the pre-scan peak data reduction result.

Sample Calculation Example

At 20 MHz limit = 250 μV = 47.96 dBμV

Transducer factor of LISN, pulse limiter & cable loss at 20 MHz = 11.20 dB

Q-P reading obtained directly from EMI Receiver = 40.00 dBμV
(Calibrated for system losses)

Therefore, Q-P margin = 47.96 – 40.00 = 7.96 i.e. **7.96 dB below limit**

Annex A. iii RADIATED EMISSIONS TEST DESCRIPTION

Limits Of Radiated Emissions Measurement

Frequency (Hz)	Field Strength (μV/m at 3-meter)	Field Strength (dBμV/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

EUT Characterisation

EUT characterisation, over the frequency range from 30MHz to 1GHz (for FCC tests, until the 5th harmonic for operating frequencies ≥ 108MHz),, was done in order to minimise radiated emissions testing time while still maintaining high confidence in the test results.

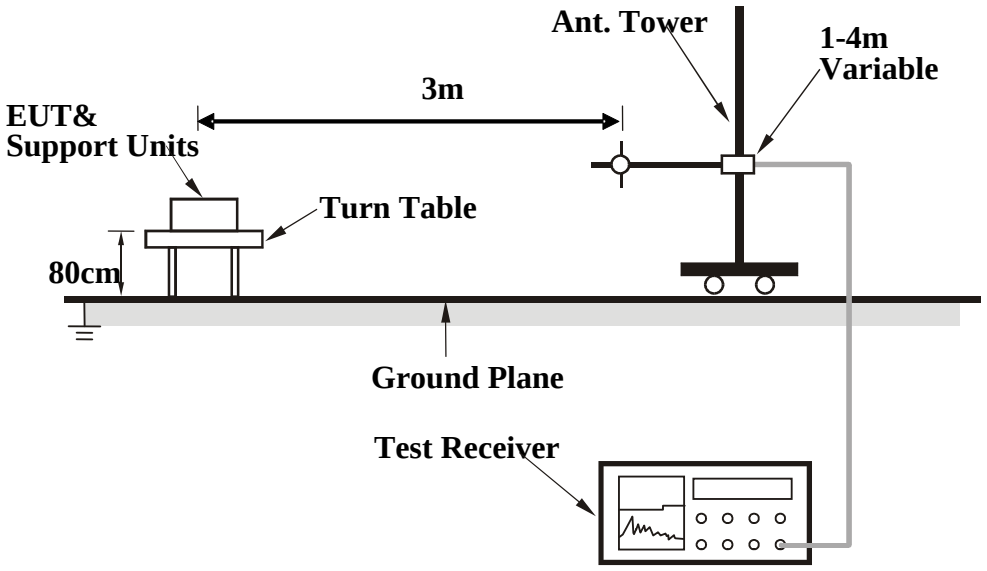
The EUT was placed in the chamber, at a height of about 0.8m on a turntable. Its radiated emissions frequency profile was observed, using a spectrum analyzer /receiver with the appropriate broadband antenna placed 3m or 10m away from the EUT. Radiated emissions from the EUT were maximised by rotating the turntable manually, changing the antenna polarisation and manipulating the EUT cables while observing the frequency profile on the spectrum analyzer / receiver. Frequency points at which maximum emissions occurred, clock frequencies and operating frequencies were then noted for the formal radiated emissions test at the Open Area Test Site (OATS) or EMC 10m chamber.

Test Set-up

1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m X 1.0m X 0.8m high, non-metallic table.

2. The filtered power supply for the EUT and supporting equipment were tapped from the appropriate power sockets located on the turntable.

3. The relevant broadband antenna was set at the required test distance away from the EUT and supporting equipment boundary.



Test Method

The following procedure was performed to determine the maximum emission axis of EUT:
1. With the receiving antenna is H polarization, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
2. With the receiving antenna is V polarization, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
3. Compare the results derived from above two steps. So, the axis of maximum emission from EUT was determined and the configuration was used to perform the final measurement.

Final Radiated Emission Measurement
1. Setup the configuration according to figure 1. Turn on EUT and make sure that it is in normal function.
2. For emission frequencies measured below 1 GHz, a pre-scan is performed in a shielded chamber to determine the accurate frequencies of higher emissions will be checked on a open test site or EMC 10m chamber. As the same purpose, for emission frequencies measured above 1 GHz, a pre-scan also be performed with a 1 meter measuring distance before final test.
3. For emission frequencies measured below and above 1 GHz, set the spectrum analyzer on a 100 kHz and 1 MHz resolution bandwidth respectively for each frequency measured in step 2.
4. The search antenna is to be raised and lowered over a range from 1 to 4 meters in horizontally polarized orientation. Position the highness when the highest value is indicated on spectrum analyzer, then change the orientation of EUT on test table over a range from 0 ◦ to 360 ◦ with a speed as slow as possible, and keep the azimuth that highest emission is indicated on the spectrum analyzer. Vary the antenna position again and record the highest value as a final reading.
5. Repeat step 4 until all frequencies need to be measured were complete.
6. Repeat step 5 with search antenna in vertical polarized orientations.

During the radiated emission test, the Spectrum Analyzer was set with the following configurations:

Frequency Band (MHz)	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	Peak	100 kHz	100 kHz
Above 1000	Peak	1 MHz	1 MHz
	Average	1 MHz	10 Hz

Description of Radiated Emission Program

This EMC Measurement software run LabView automation software and offers a common user interface for electromagnetic interference (EMI) measurements. This software is a modern and powerful tool for controlling and monitoring EMI test receivers and EMC test systems. It guarantees reliable collection, evaluation, and documentation of measurement results. Basically, this program will run a pre-scan measurement before it proceeds with the final measurement. The pre-scan routine will run the scan on four different antenna heights, 2 antenna polarity, and 360 degrees table rotation. For example, the program was set to run 30 MHz to 1 GHz scan; the program will first start from a meter antenna height and divide the 30 MHz to 1 GHz into 10 separate parts of maximum hold sweeps. Each parts of maximum hold sweep, the program will collect the data from 0 degree to 360 degrees table rotation. After the program complete the 1m scan, the antenna continues to rise to 2m and continue the scan. The step will repeated for all specified antenna height and polarity. This program will perform the Quasi Peak measurement after the signal maximization process and pre-scan routine. The final measurement will be base on the pre-scan data reduction result.

Sample Calculation Example

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. For the limit is employed average value, therefore the peak value can be transferred to average value by subtracting the duty factor. The basic equation with a sample calculation is as follows:

Peak = Reading + Corrected Factor

where
Corr. Factor = Antenna Factor + Cable Factor - Amplifier Gain (if any)
And the average value is

Average = Peak Value + Duty Factor or
Set RBW = 1MHz, VBW = 10Hz.

Note :
If the measured frequencies are fall in the restricted frequency band, the limit employed must be quasi peak value when frequencies are below or equal to 1 GHz. And the measuring instrument is set to quasi peak detector function.

Annex B. TEST SETUP AND SUPPORTING EQUIPMENT

EUT TEST CONDITIONS

Annex B. i. SUPPORTING EQUIPMENT DESCRIPTION

The following is a description of supporting equipment and details of cables used with the EUT.

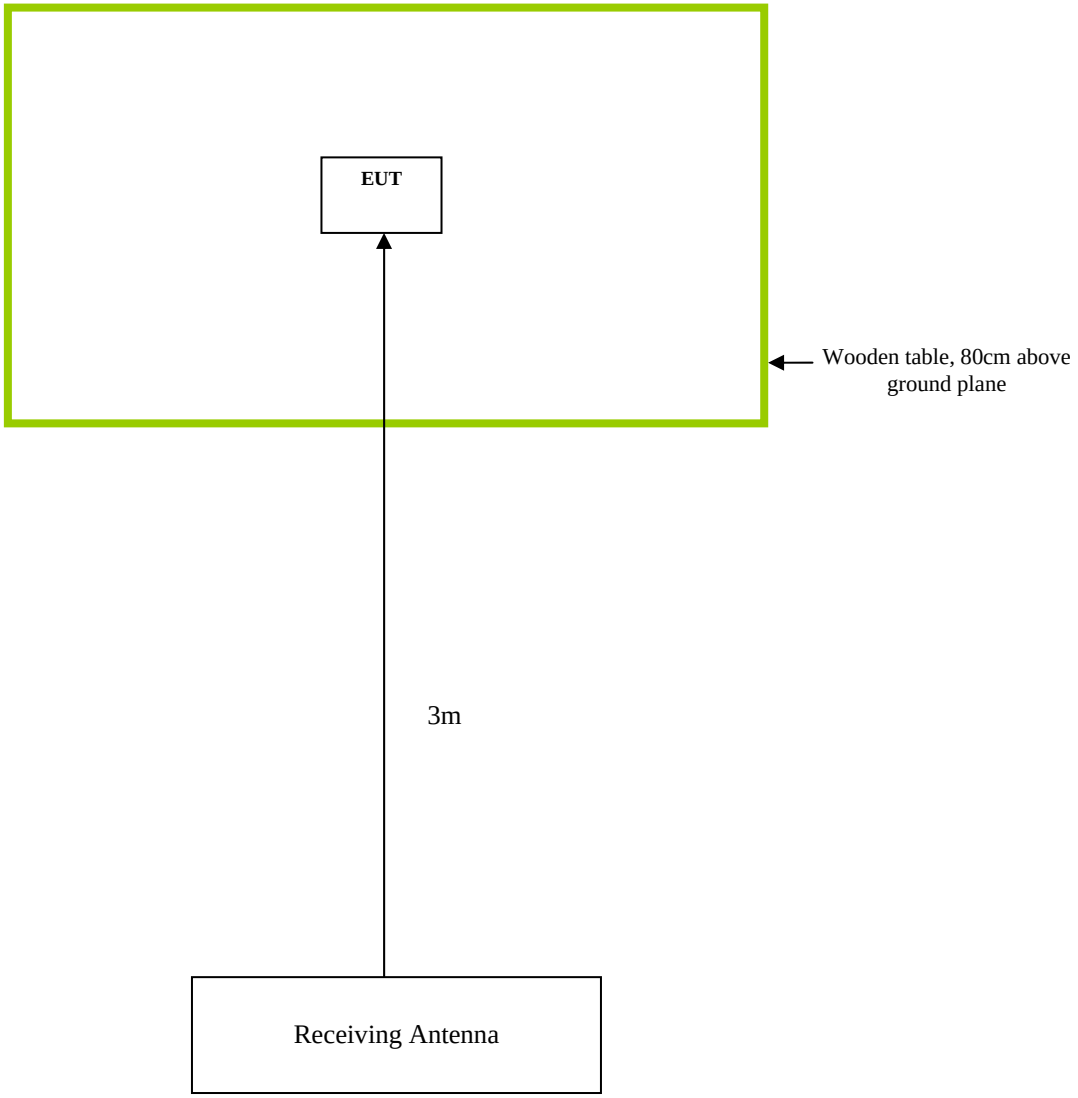
Equipment Description (Including Brand Name)	Model & Serial Number	Cable Description (List Length, Type & Purpose)
N/A	N/A	N/A

NOTE: No special supporting equipment used or needed during testing to achieve compliance.

Block Configuration Diagram for Conducted Emission

N/A

Block Configuration Diagram for Radiated Emission



Annex B.ii. EUT OPERATING CONDITIONS

The following is the description of how the EUT is exercised during testing.

Test	Description Of Operation
Emissions Testing	Continuous Receiving

Annex C. USER MANUAL / BLOCK DIAGRAM / SCHEMATICS / PART LIST

Please see attachment