RADIO TEST REPORT

Product	:	Buddi Clip
Model Name	:	Clip 3G
FCC ID	:	ZDL353B
Test Regulation	:	FCC 47 CFR Part 15 Subpart C (Section 15.249)
Received Date	:	June 12, 2018
Test Date	:	July 6, 2018 ~ July 20, 2018
Issued Date	:	October 26, 2018
Applicant	:	Buddi Limited Talbot House, 17 Church Street, Rickmansworth, Hertfordshire, WD3 1DE, United Kingdom
Issued By	:	Underwriters Laboratories Taiwan Co., Ltd. Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Testing Laboratory
3398

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REVISION HISTORY

Original Test Report No.: 4788469429-US-R0-V0

Rev.	Test report No.	Date	Page revised	Contents
Original	4788469429-US-R0-V0	September 17, 2018	-	Initial issue
V1	4788469429-US-R0-V1	October 26, 2018	15-17	Add remark 5
V1	4788469429-US-R0-V1	October 26, 2018	18-23	Modify plots and test data of below 1GHz
V1	4788469429-US-R0-V1	October 26, 2018	24	Add fundamental radiated emission

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1. Attestation of Test Results

APPLICANT:	Buddi Limited Talbot House, 17 Church Street, Rickmansworth, Hertfordshire, WD3 1DE, United Kingdom
EUT DESCRIPTION:	The Clip 3G is a portable hub to communicate alerts triggered by the wristband or raised directly by the clip itself; these alerts will be sent to the server via GPRS communications. The clip will provide the wearer's location when an alert happens and can also be used to track the person should this be desired by the user; activity monitoring and fall detection are other optional features. In an emergency event the Clip could provide a two way voice call with the emergency centre.
BRAND:	Buddi Clip
MODEL:	Clip 3G
SAMPLE STAGE:	Production Unit
DATE of TESTED:	July 6, 2018 ~ July 20, 2018

APPLICABLE STANDARDS	
STANDARD	**Test Results**
FCC 47 CFR PART 15 Subpart C (Section 15.249)	PASS

Underwriters Laboratories Taiwan Co., Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by Underwriters Laboratories Taiwan Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Underwriters Laboratories Taiwan Co., Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Underwriters Laboratories Taiwan Co., Ltd. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Prepared By:

Evelyn Lee Date : October 26, 2018
Project Handler

Approve By:

John Cheng Date : October 26, 2018
Project Engineer

2. Summary of Test Results

FCC Clause	Test Item	Result
15.203	Antenna requirement	PASS
15.207	AC Power Conducted Emission	PASS
15.215 (c)	20dB Bandwidth	PASS
15.209 15.249 15.249 (d)	Radiated Emission Test Band Edge Measurement Limit: 50dB less than the peak value of fundamental frequency or meet radiated emission limit in section 15.209	PASS

3. Test Methodology

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, KDB414788 D01 Radiated Test Site v01, ANSI C63.10-2013.

4. Facilities and Accreditation

Test Location	Underwriters Laboratories Taiwan Co., Ltd.
Address	Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan
Accreditation Certificate	Underwriters Laboratories Taiwan Co., Ltd. is accredited by TAF, Laboratory Code 3398. The full scope of accreditation can be viewed at http://accreditation.taftw.org.tw/taf/public/basic/viewApplyItems.action?unitNo=3398

5. Measurement Uncertainty

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor k=2.

Test Item	Measurement Frequency Range	K	U(dB)
Conducted disturbance at mains terminals ports	0.15MHz ~ 30MHz	2	2.6
Radiated disturbance below 30MHz	9 kHz - 30 MHz	2	2.4
Radiated disturbance below 1 GHz	30MHz ~ 1GHz	2	5.5
Radiated disturbance above 1GHz	1GHz ~ 40GHz	2	5.0

6. Equipment under Test

6.1. Description of EUT

Product	Buddi Clip
Model Name	Clip 3G
Operating Frequency	914.5 ~ 921 MHz
Modulation	4-FSK
Normal Voltage	120Vac (Adapter)
Hardware Version	3530001
Software Version	1.12
Maximum Field Strength (dBuV/m)	93.3dBuV/m

6.2. Test Condition

Test Item	Test Site No.	Environmental Condition	Input Power	Tested by
Radiated Spurious Emission	966-2	22°C / 65%RH	120Vac / 60Hz	Waternil Guan
AC power Line Conducted Emission	SR1	26°C / 64%RH	120Vac / 60Hz	Waternil Guan

FCC Test Firm Registration Number: 498077

6.3. Duty Cycle

Single Channel Tx On time (ms)	Total Tx On time (ms)	Observation period (ms)	Duty (%)	Calculated Factor (dB)
5.75	5.75	100	5.75	24.81

Note:
1. Correction factor (dB) = 20 x (Log10 Calculated Duty Cycle)
2. Therefore the calculated duty cycle was determined:
   Duty cycle = the sum of the highest average value pulse widths over 100ms / 100ms

6.4. Description Of Available Antennas

Antenna	Brand Name	Model Name	Antenna Type	Connector Type	Antenna Gain(dBi)
Di-pole	Prestta Series	P522304	Integral PCB	Integral-NA	0

6.5. Test Mode Applicability and Tested Channel Detail

Test item	Modulation Type	Available Channel	Test Channel
Radiated Emissions (Above 1GHz)	4-FSK	Bottom, Middle, Top	Bottom, Middle, Top
Radiated Emissions (Below 1GHz)	4-FSK	Bottom, Middle, Top	Bottom, Middle, Top
Fundamental radiated emission	4-FSK	Bottom, Middle, Top	Bottom, Middle, Top
AC Power Line Conducted Emission	4-FSK	Bottom	Bottom
20dB Bandwidth	4-FSK	Bottom, Middle, Top	Bottom, Middle, Top

Note:

1. Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
2. For AC power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case.
3. The fundamental of the EUT was investigated in three orthogonal axes X/Y/Z, it was determined that X axis were worst-case . Therefore, all final radiated testing was performed with the EUT in X axis.

7. Test Equipment

Test Equipment List					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date**	**Cal. Interval**
Radiated Spurious Emission					
Spectrum Analyzer	Keysight	N9010A	MY56070821	Nov. 28, 2017	1 year
Loop Antenna	ETS lindgren	6502	00213440	Dec. 7, 2017	1 year
Trilog-Broadband Antenna with 5dB Attenuator	Schwarzbeck & EMCI	VULB 9168 & N-6-05	VULB 9168-773 & AT-N0539	Feb. 12, 2018	1 year
Horn Antenna (1-18 GHz)	Schwarzbeck	BBHA 9120 D	BBHA 9120D-01686	Jan. 23, 2018	1 year
Preamplifier (30-1000 MHz)	EMCI	RMC330E	980404	Jan. 9, 2018	1 year
Preamplifier (1-18 GHz)	EMCI	EMC051835B E	980407	Jan. 10, 2018	1 year
RF Cable (9 KHz~18 GHz)	UltraPhase & EMC Instrument	A1K50-UP0358-A1K50-1500&EMC106-NM-SM-2500/8000	170111-3&170104/170223	Feb. 1, 2018	1 year
AC power Line Conducted Emission					
EMI Test Receiver	Rohde & Schwarz	ESR7	101753	Nov. 28, 2017	1 year
Two-Line V-Network	Rohde & Schwarz	ENV216	102136	Aug. 2, 2017	1 year
Impuls-Begrenzer Pulse Limiter	Rohde & Schwarz	ESH3-Z2	102219-Qt	July 31, 2017	1 year
Cables	Huber+Suhner	RG 214/U	FCC-BCICF-4_RF	Feb. 1, 2018	1 year

UL Software

Description	Name	Version
Radiated measurement	EZ_EMC	1.1.4.2
AC power Line Conducted Emission	EZ_EMC	1.1.4.2

8. Description of Test Setup

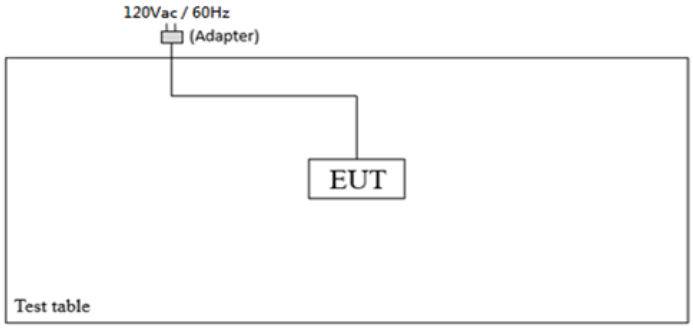
Support Equipment

Item	Equipment	Brand Name	Model Name	P/N	Description
1	AC Adapter 1	STONTRONICS LTD.	DSA-15P-12 UK 120150	T4641RW	I/P: 100-240Vac, 0.5A, O/P: 12Vdc, 1.25A 2.09meter, non-shielded cable, without ferrite core
2	AC Adapter 2	Power Pax	KSAS0050500100VKU	SW4492-W-V4	I/P: 100-240Vac, 0.18A, O/P: 5Vdc, 1A 1.97meter, non-shielded cable, with w/o ferrite core
3	Charger	Buddi Ltd	3510000_A - Travel Charger - Clip Only	N/A	N/A
4	Micro USB to USB Cable	DongGuan HYX Industrial Co.,Ltd.	USB2.0AM TO MICR, PVC type	N/A	Signal Line, 1.97meter, non-shielded cable, with w/o ferrite core
5	Wristband	Buddi Itd	Wristband	RWB00433	N/A

Test Setup

Transmitting a modulated carrier on operating frequencies at 100 % duty cycle.
Transmitting in normal operation for duty cycle measurements.

Setup Diagram for Test



9. Test Result

9.1. Radiated Spurious Emission

Requirements

The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following

Fundamental Frequency (MHz)	Field Strength of Fundamental (millivolts/meter)	Field Strength of Harmonics (microvolts/meter)
902 ~ 928 MHz	50	500
2400 ~ 2483.5 MHz	50	500
5725 ~ 5875 MHz	50	500
24 ~ 24.25 GHz	250	2500

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits as below table, whichever is the lesser attenuation

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

Note：

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

Test Procedures

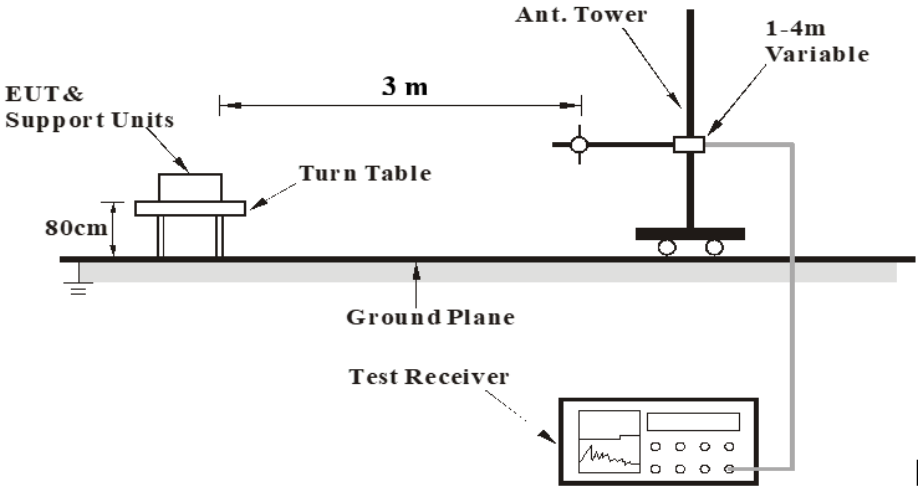
[For above 30 MHz]

a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. 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.
d. 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.
e. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
f. The test-receiver system was set to peak and average detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

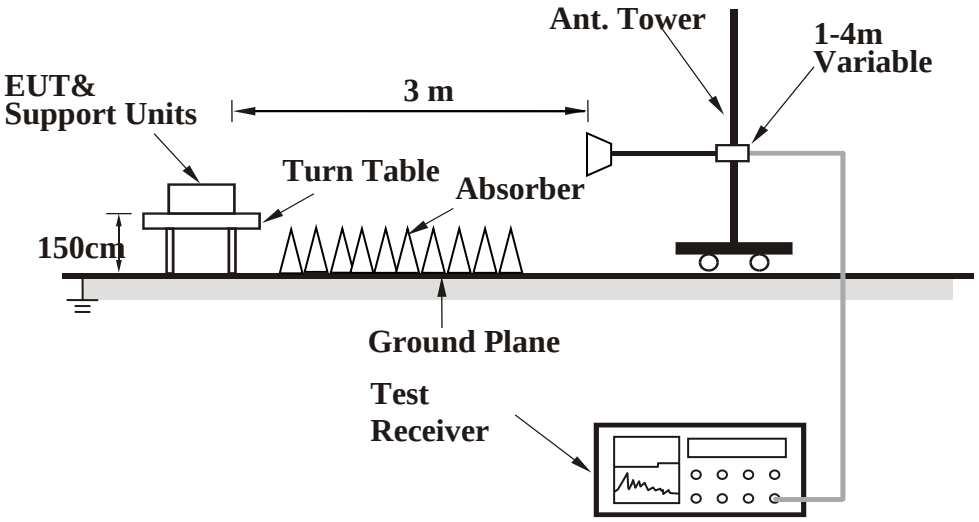
Note:
a. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
b. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
c. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.
d. All modes of operation were investigated and the worst-case emissions are reported.

Test Setup

<Frequency Range 30 MHz ~ 1 GHz >



<Frequency Range above 1 GHz>



For the actual test configuration, please refer to the Appendix I.

Test Data

Above 1GHz Data

EUT Test Condition		Measurement Detail	
Frequency	914.5 MHz	**Frequency Range**	1 GHz ~ 10 GHz

Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	**Frequency**	**Reading**	**Correct**	**Result**	**Limit**	**Margin**	**Remark**
	(MHz)	**(dBuV/m)**	**dB/m**	**(dBuV/m)**	**(dBuV/m)**	**(dB)**	
-	1829.000	64.45	-9.23	55.22	74.00	-18.78	peak
-	1829.000	39.64	-9.23	30.41	54.00	-23.59	AVG
-	2743.600	55.99	-7.98	48.01	74.00	-25.99	peak
-	2743.600	31.18	-7.98	23.20	54.00	-30.80	AVG
-	3658.000	59.83	-6.99	52.84	74.00	-21.16	peak
-	3658.000	35.02	-6.99	28.03	54.00	-25.97	AVG
-	4572.700	51.40	-4.92	46.48	74.00	-27.52	peak
-	4572.700	26.59	-4.92	21.67	54.00	-32.33	AVG
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	**Frequency**	**Reading**	**Correct**	**Result**	**Limit**	**Margin**	**Remark**
	(MHz)	**(dBuV/m)**	**dB/m**	**(dBuV/m)**	**(dBuV/m)**	**(dB)**	
-	1829.000	67.85	-9.23	58.62	74.00	-15.38	peak
-	1829.000	43.04	-9.23	33.81	54.00	-20.19	AVG
-	2743.600	54.59	-7.98	46.61	74.00	-27.39	peak
-	2743.600	29.78	-7.98	21.80	54.00	-32.20	AVG
-	3658.000	63.80	-6.99	56.81	74.00	-17.19	peak
-	3658.000	38.99	-6.99	32.00	54.00	-22.00	AVG
-	4572.700	52.54	-4.92	47.62	74.00	-26.38	peak
-	4572.700	27.73	-4.92	22.81	54.00	-31.19	AVG

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. The calculation of average value :

   Average value = Peak value + Duty cycle correction factor (The duty cycle correction factor refer to section 6.3)
5. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Frequency	917.5 MHz	**Frequency Range**	1 GHz ~ 10 GHz

Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	**Frequency**	**Reading**	**Correct**	**Result**	**Limit**	**Margin**	**Remark**
	(MHz)	**(dBuV/m)**	**dB/m**	**(dBuV/m)**	**(dBuV/m)**	**(dB)**	
-	1835.000	64.89	-9.19	55.70	74.00	-18.30	peak
-	1835.000	40.08	-9.19	30.89	54.00	-23.11	AVG
-	2752.600	54.92	-7.97	46.95	74.00	-27.05	peak
-	2752.600	30.11	-7.97	22.14	54.00	-31.86	AVG
-	3670.000	60.11	-6.96	53.15	74.00	-20.85	peak
-	3670.000	35.30	-6.96	28.34	54.00	-25.66	AVG
-	4587.700	51.71	-4.88	46.83	74.00	-27.17	peak
-	4587.700	26.90	-4.88	22.02	54.00	-31.98	AVG
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	**Frequency**	**Reading**	**Correct**	**Result**	**Limit**	**Margin**	**Remark**
	(MHz)	**(dBuV/m)**	**dB/m**	**(dBuV/m)**	**(dBuV/m)**	**(dB)**	
-	1835.000	68.03	-9.19	58.84	74.00	-15.16	peak
-	1835.000	43.22	-9.19	34.03	54.00	-19.97	AVG
-	2752.900	53.76	-7.97	45.79	74.00	-28.21	peak
-	2752.900	28.95	-7.97	20.98	54.00	-33.02	AVG
-	3670.000	63.74	-6.96	56.78	74.00	-17.22	peak
-	3670.000	38.93	-6.96	31.97	54.00	-22.03	AVG
-	4587.700	53.27	-4.88	48.39	74.00	-25.61	peak
-	4587.700	28.46	-4.88	23.58	54.00	-30.42	AVG

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. The calculation of average value :

   Average value = Peak value + Duty cycle correction factor (The duty cycle correction factor refer to section 6.3)
5. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Frequency	921 MHz	**Frequency Range**	1 GHz ~ 10 GHz

Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	**Frequency**	**Reading**	**Correct**	**Result**	**Limit**	**Margin**	**Remark**
	(MHz)	**(dBuV/m)**	**dB/m**	**(dBuV/m)**	**(dBuV/m)**	**(dB)**	
-	1842.000	65.11	-9.15	55.96	74.00	-18.04	peak
-	1842.000	40.30	-9.15	31.15	54.00	-22.85	AVG
-	2763.100	54.26	-7.94	46.32	74.00	-27.68	peak
-	2763.100	29.45	-7.94	21.51	54.00	-32.49	AVG
-	3684.000	61.73	-6.94	54.79	74.00	-19.21	peak
-	3684.000	36.92	-6.94	29.98	54.00	-24.02	AVG
-	4605.400	50.89	-4.84	46.05	74.00	-27.95	peak
-	4605.400	26.08	-4.84	21.24	54.00	-32.76	AVG
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	**Frequency**	**Reading**	**Correct**	**Result**	**Limit**	**Margin**	**Remark**
	(MHz)	**(dBuV/m)**	**dB/m**	**(dBuV/m)**	**(dBuV/m)**	**(dB)**	
-	1842.000	68.53	-9.15	59.38	74.00	-14.62	peak
-	1842.000	43.72	-9.15	34.57	54.00	-19.43	AVG
-	2763.100	53.89	-7.94	45.95	74.00	-28.05	peak
-	2763.100	29.08	-7.94	21.14	54.00	-32.86	AVG
-	3684.000	64.08	-6.94	57.14	74.00	-16.86	peak
-	3684.000	39.27	-6.94	32.33	54.00	-21.67	AVG
-	4605.100	51.57	-4.84	46.73	74.00	-27.27	peak
-	4605.100	26.76	-4.84	21.92	54.00	-32.08	AVG

Remarks:

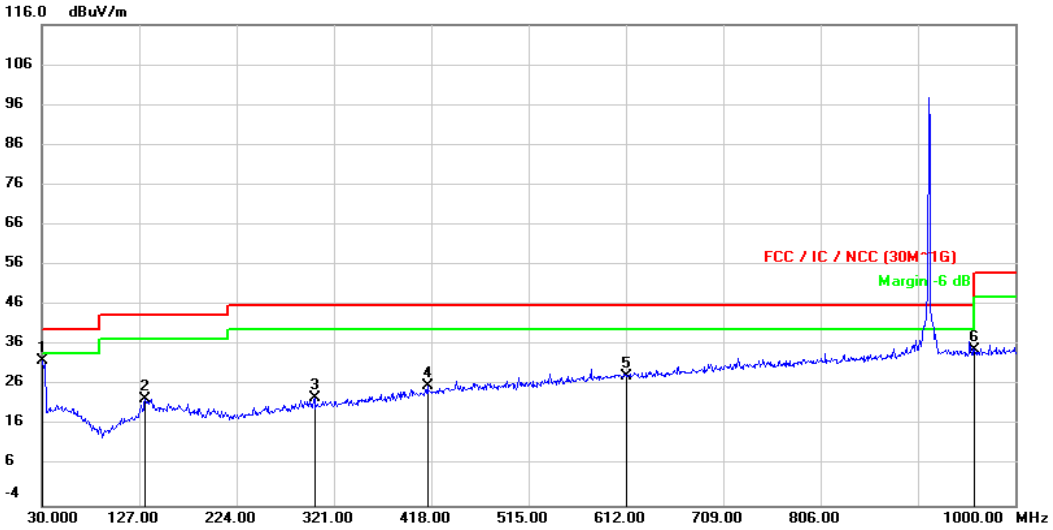
1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. The calculation of average value :

   Average value = Peak value + Duty cycle correction factor (The duty cycle correction factor refer to section 6.3)
5. The other emission levels were very low against the limit.

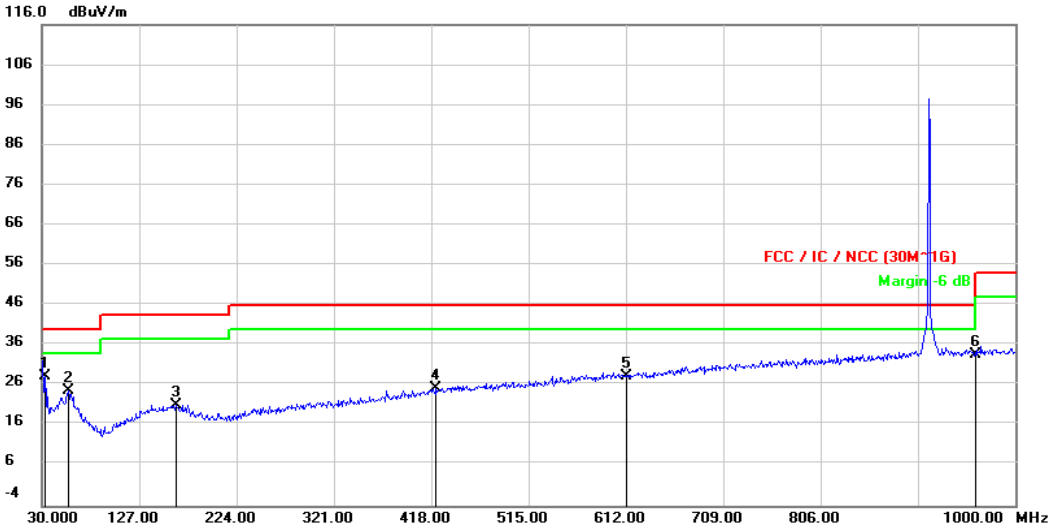
Below 1GHz Data

EUT Test Condition		Measurement Detail	
Frequency	914.5 MHz	**Frequency Range**	30 MHz ~ 1 GHz

Horizontal



Vertical



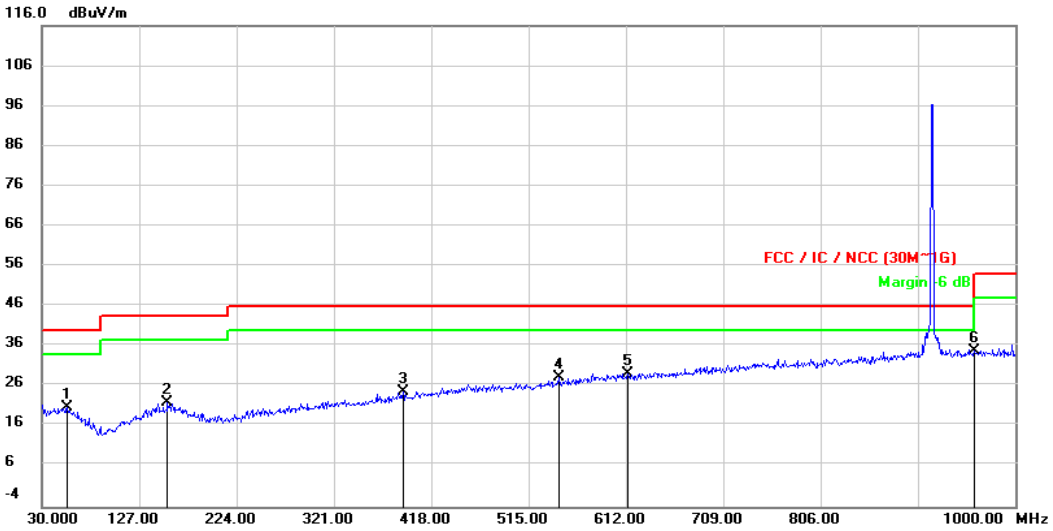
Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	**Frequency**	**Reading**	**Correct**	**Result**	**Limit**	**Margin**	**Remark**
	(MHz)	**(dBuV/m)**	**dB/m**	**(dBuV/m)**	**(dBuV/m)**	**(dB)**	
-	31.8430	48.58	-16.36	32.22	40.00	-7.78	peak
-	133.4020	39.19	-16.74	22.45	43.50	-21.05	peak
-	302.4083	37.24	-14.41	22.83	46.00	-23.17	peak
-	414.3463	37.50	-11.54	25.96	46.00	-20.04	peak
-	614.0000	35.59	-7.25	28.34	46.00	-17.66	peak
-	960.0000	36.87	-2.03	34.84	46.00	-11.16	peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	**Frequency**	**Reading**	**Correct**	**Result**	**Limit**	**Margin**	**Remark**
	(MHz)	**(dBuV/m)**	**dB/m**	**(dBuV/m)**	**(dBuV/m)**	**(dB)**	
-	33.2333	44.67	-16.34	28.33	40.00	-11.67	peak
-	56.6427	40.42	-15.67	24.75	40.00	-15.25	peak
-	164.5390	36.56	-15.45	21.11	43.50	-22.39	peak
-	422.8823	36.65	-11.32	25.33	46.00	-20.67	peak
-	614.0000	35.40	-7.25	28.15	46.00	-17.85	peak
-	960.0000	35.57	-2.03	33.54	46.00	-12.46	peak

Remarks:

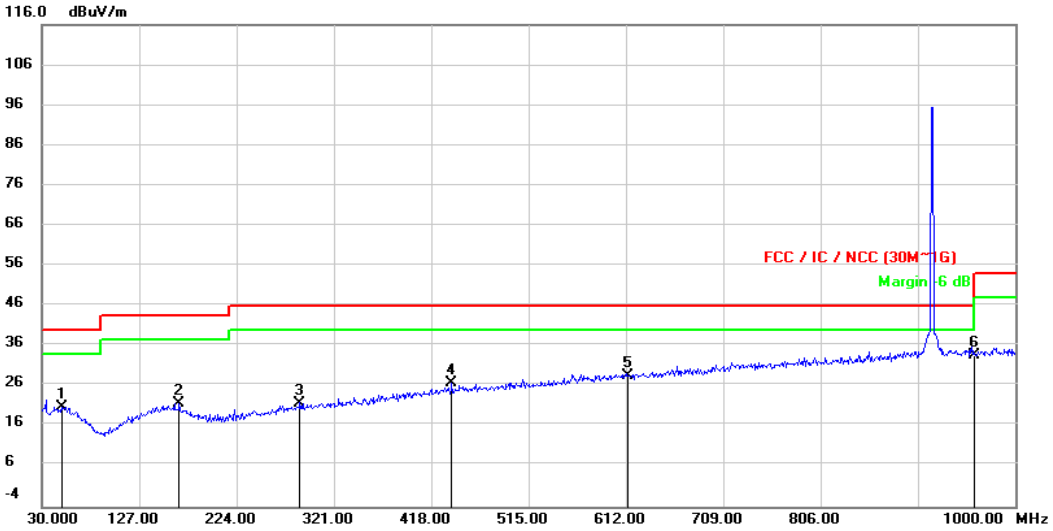
1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Frequency	917.5 MHz	**Frequency Range**	30 MHz ~ 1 GHz

Horizontal



Vertical



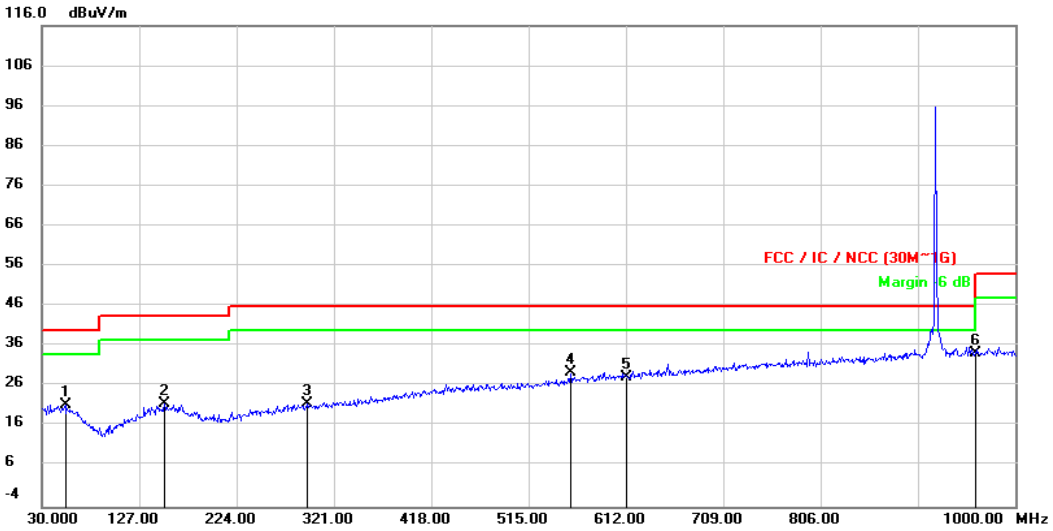
Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	**Frequency**	**Reading**	**Correct**	**Result**	**Limit**	**Margin**	**Remark**
	(MHz)	**(dBuV/m)**	**dB/m**	**(dBuV/m)**	**(dBuV/m)**	**(dB)**	
-	55.4140	36.21	-15.58	20.63	40.00	-19.37	peak
-	156.0677	37.19	-15.35	21.84	43.50	-21.66	peak
-	390.2580	36.97	-12.19	24.78	46.00	-21.22	peak
-	545.5549	37.19	-8.92	28.27	46.00	-17.73	peak
-	614.0000	36.31	-7.25	29.06	46.00	-16.94	peak
-	960.0000	36.94	-2.03	34.91	46.00	-11.09	peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	**Frequency**	**Reading**	**Correct**	**Result**	**Limit**	**Margin**	**Remark**
	(MHz)	**(dBuV/m)**	**dB/m**	**(dBuV/m)**	**(dBuV/m)**	**(dB)**	
-	49.9820	36.10	-15.23	20.87	40.00	-19.13	peak
-	167.3843	37.33	-15.56	21.77	43.50	-21.73	peak
-	287.7613	36.59	-14.79	21.80	46.00	-24.20	peak
-	438.6933	37.76	-10.92	26.84	46.00	-19.16	peak
-	614.0000	35.79	-7.25	28.54	46.00	-17.46	peak
-	960.0000	35.81	-2.03	33.78	46.00	-12.22	peak

Remarks:

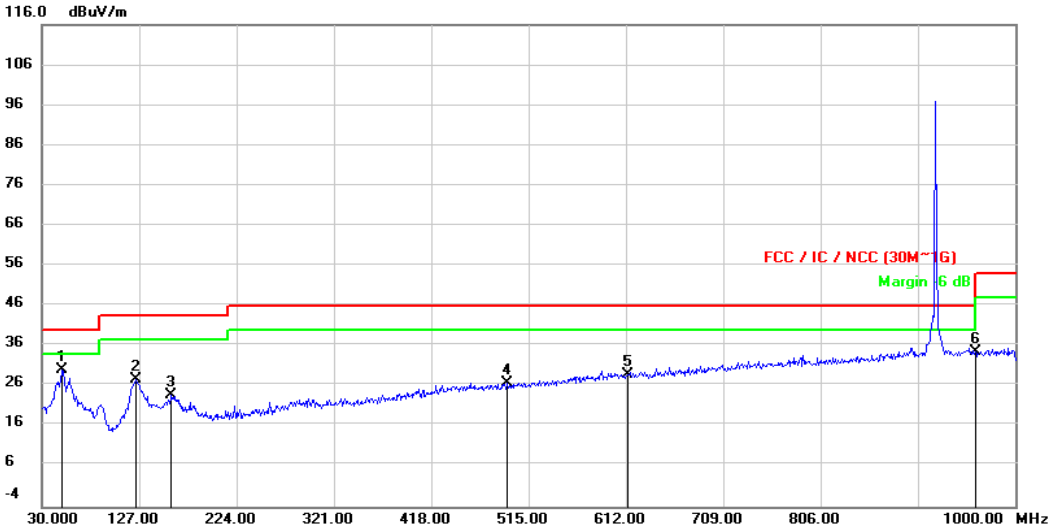
1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. The other emission levels were very low against the limit.

EUT Test Condition		Measurement Detail	
Frequency	921 MHz	**Frequency Range**	30 MHz ~ 1 GHz

Horizontal



Vertical



Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	**Frequency**	**Reading**	**Correct**	**Result**	**Limit**	**Margin**	**Remark**
	(MHz)	**(dBuV/m)**	**dB/m**	**(dBuV/m)**	**(dBuV/m)**	**(dB)**	
-	53.9590	36.76	-15.49	21.27	40.00	-18.73	peak
-	152.3493	37.06	-15.40	21.66	43.50	-21.84	peak
-	294.9070	36.22	-14.59	21.63	46.00	-24.37	peak
-	557.3567	37.92	-8.62	29.30	46.00	-16.70	peak
-	614.0000	35.43	-7.25	28.18	46.00	-17.82	peak
-	960.0000	36.35	-2.03	34.32	46.00	-11.68	peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	**Frequency**	**Reading**	**Correct**	**Result**	**Limit**	**Margin**	**Remark**
	(MHz)	**(dBuV/m)**	**dB/m**	**(dBuV/m)**	**(dBuV/m)**	**(dB)**	
-	50.8550	45.27	-15.29	29.98	40.00	-10.02	peak
-	123.8960	45.33	-17.70	27.63	43.50	-15.87	peak
-	159.5597	39.12	-15.30	23.82	43.50	-19.68	peak
-	494.5330	36.74	-9.93	26.81	46.00	-19.19	peak
-	614.0000	36.09	-7.25	28.84	46.00	-17.16	peak
-	960.0000	36.53	-2.03	34.50	46.00	-11.50	peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. The other emission levels were very low against the limit.

Fundamental radiated emission

Frequency	914.5 MHz

Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	**Frequency**	**Reading**	**Correct**	**Result**	**Limit**	**Margin**	**Remark**
	(MHz)	**(dBuV/m)**	**dB/m**	**(dBuV/m)**	**(dBuV/m)**	**(dB)**	
-	914.50	96.06	-2.76	93.30	94.00	-0.70	QP
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	**Frequency**	**Reading**	**Correct**	**Result**	**Limit**	**Margin**	**Remark**
	(MHz)	**(dBuV/m)**	**dB/m**	**(dBuV/m)**	**(dBuV/m)**	**(dB)**	
-	914.50	93.63	-2.76	90.87	94.00	-3.13	QP

Frequency	917.5 MHz

Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	**Frequency**	**Reading**	**Correct**	**Result**	**Limit**	**Margin**	**Remark**
	(MHz)	**(dBuV/m)**	**dB/m**	**(dBuV/m)**	**(dBuV/m)**	**(dB)**	
-	917.50	94.78	-2.70	92.08	94.00	-1.92	QP
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	**Frequency**	**Reading**	**Correct**	**Result**	**Limit**	**Margin**	**Remark**
	(MHz)	**(dBuV/m)**	**dB/m**	**(dBuV/m)**	**(dBuV/m)**	**(dB)**	
-	917.50	91.97	-2.70	89.27	94.00	-4.73	QP

Frequency	921 MHz

Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	**Frequency**	**Reading**	**Correct**	**Result**	**Limit**	**Margin**	**Remark**
	(MHz)	**(dBuV/m)**	**dB/m**	**(dBuV/m)**	**(dBuV/m)**	**(dB)**	
-	921.00	94.05	-2.65	91.40	94.00	-2.60	QP
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	**Frequency**	**Reading**	**Correct**	**Result**	**Limit**	**Margin**	**Remark**
	(MHz)	**(dBuV/m)**	**dB/m**	**(dBuV/m)**	**(dBuV/m)**	**(dB)**	
-	921.00	91.42	-2.65	88.77	94.00	-5.23	QP

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).

9.2. AC Power Line Conducted Emission

Requirements

Frequency (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 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.

Test Procedures

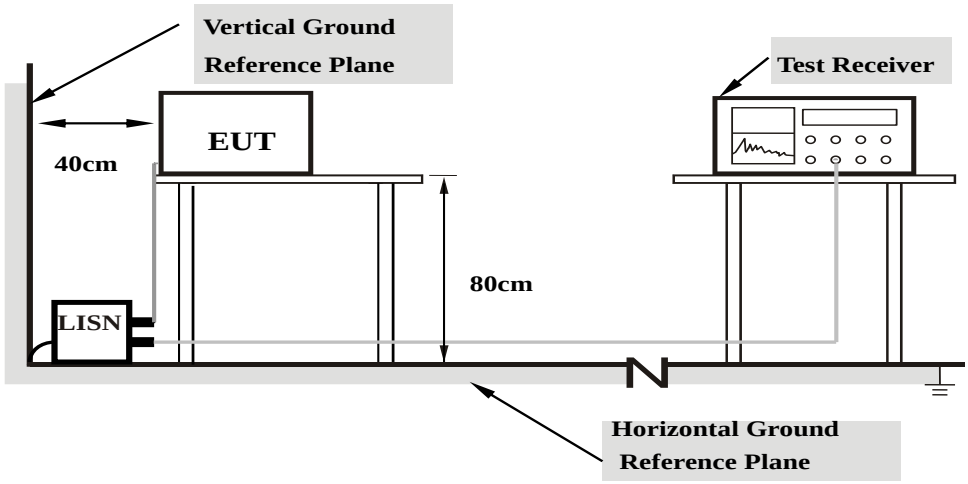
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

Test Setup



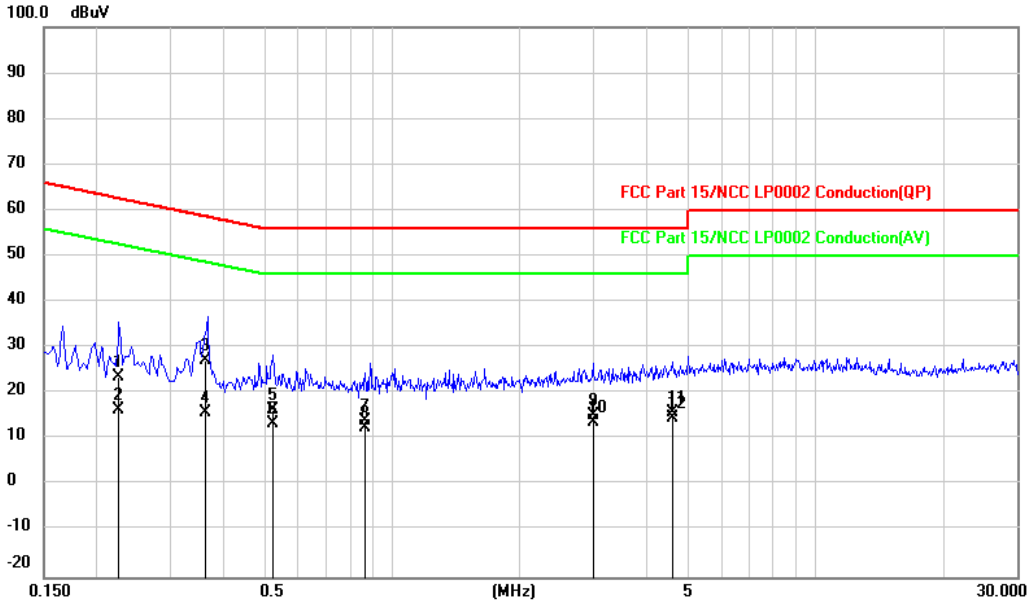
Note: 1.Support units were connected to second LISN.

For the actual test configuration, please refer to the Appendix II.

Test Data

EUT Test Condition		Measurement Detail	
Frequency	914.5 MHz	**Frequency Range**	150 kHz ~ 30 MHz

Phase of Power：Line (L)

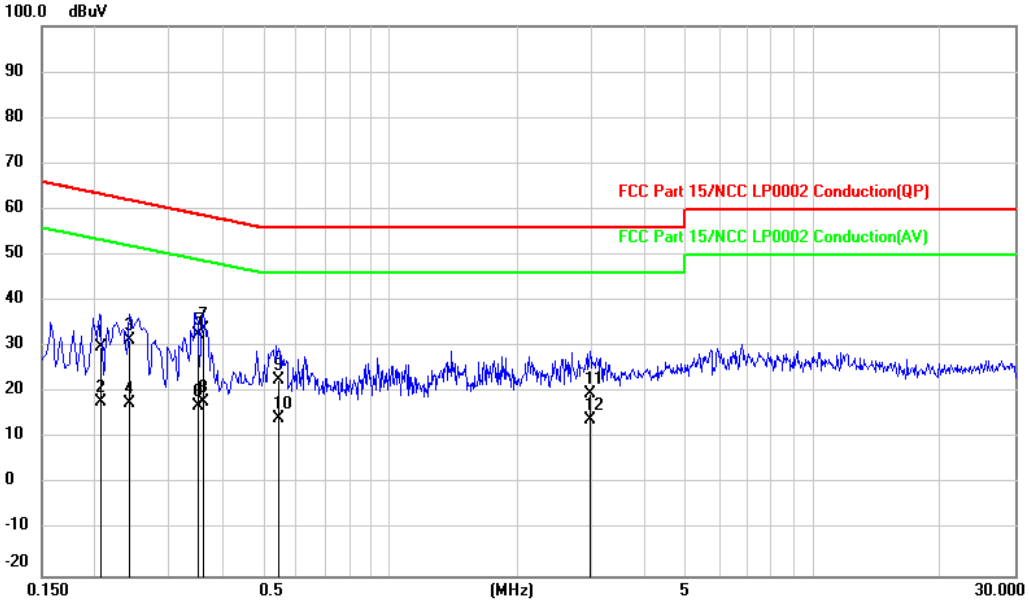


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	dB	(dBuV)	(dBuV)	(dB)	
1	0.2245	4.14	19.59	23.73	62.65	-38.92	QP
2	0.2245	-3.23	19.59	16.36	52.65	-36.29	AVG
3	0.3610	7.52	19.60	27.12	58.71	-31.59	QP
4	0.3610	-3.81	19.60	15.79	48.71	-32.92	AVG
5	0.5220	-3.14	19.59	16.45	56.00	-39.55	QP
6	0.5220	-6.10	19.59	13.49	46.00	-32.51	AVG
7	0.8668	-5.57	19.61	14.04	56.00	-41.96	QP
8	0.8668	-6.97	19.61	12.64	46.00	-33.36	AVG
9	3.0000	-4.29	19.68	15.39	56.00	-40.61	QP
10	3.0000	-5.89	19.68	13.79	46.00	-32.21	AVG
11	4.6374	-3.93	19.75	15.82	56.00	-40.18	QP
12	4.6374	-5.19	19.75	14.56	46.00	-31.44	AVG

Remarks:

1. Result value (dBuV) = Reading value (dBuV) + Correction Factor (dB)
2. Margin(dB) = Result value (dBuV) - Limit value (dBuV)
3. Correction Factor(dB) = Insertion loss(dB) + Cable loss(dB)
4. The other emission levels were very low against the limit.

Phase of Power：Neutral (N)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	dB	(dBuV)	(dBuV)	(dB)	
1	0.2063	10.37	19.59	29.96	63.35	-33.39	QP
2	0.2063	-1.79	19.59	17.80	53.35	-35.55	AVG
3	0.2420	11.99	19.60	31.59	62.03	-30.44	QP
4	0.2420	-1.93	19.60	17.67	52.03	-34.36	AVG
5	0.3506	12.99	19.62	32.61	58.95	-26.34	QP
6	0.3506	-2.50	19.62	17.12	48.95	-31.83	AVG
7	0.3625	14.20	19.62	33.82	58.67	-24.85	QP
8	0.3625	-1.80	19.62	17.82	48.67	-30.85	AVG
9	0.5448	3.12	19.60	22.72	56.00	-33.28	QP
10	0.5448	-5.39	19.60	14.21	46.00	-31.79	AVG
11	2.9632	-0.08	19.69	19.61	56.00	-36.39	QP
12	2.9632	-5.50	19.69	14.19	46.00	-31.81	AVG

Remarks:

1. Result value (dBuV) = Reading value (dBuV) + Correction Factor (dB)
2. Margin(dB) = Result value (dBuV) - Limit value (dBuV)
3. Correction Factor(dB) = Insertion loss(dB) + Cable loss(dB)
4. The other emission levels were very low against the limit.

9.3. 20 dB Bandwidth

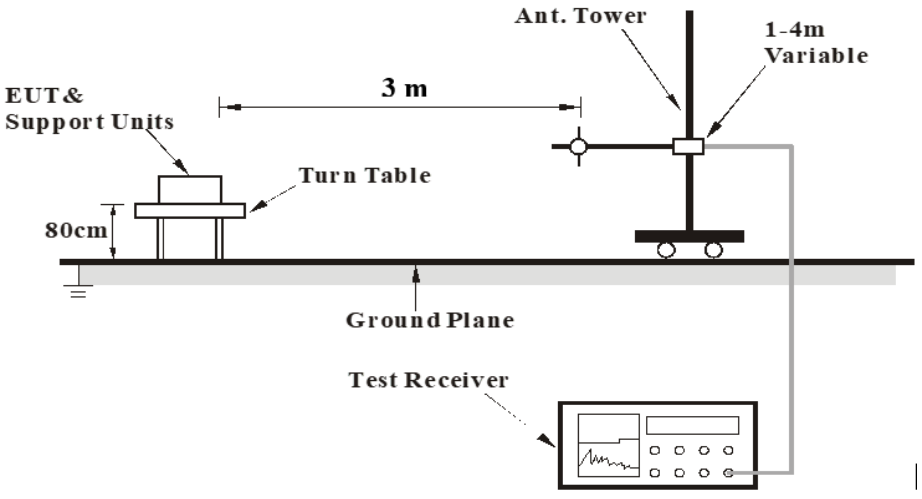
Requirements

The 20 dB bandwidth shall be specified in operating frequency band.

Test Procedures

a. The testing follows the guidelines in ANSI C63.10-2013.
b. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
c. The EUT was placed on a turntable with 0.8m above ground.
d. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
e. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 1 kHz RBW and 3 kHz VBW. The 20 dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20 dB.

Test Setup



Test Data

Channel	Frequency (MHz)	20 dB Bandwidth (kHz)
		FSK
Bottom	914.5	67.37
Middle	917.5	67.5
Top	921	67.75

Spectrum Plot of Worst Value