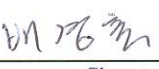




SK TECH CO., LTD.

Page 1 of 31

FCC- Certificate of Compliance

Test Report No.:	SKTFCE-091215-127		
NVLAP CODE :	200220-0		
Applicant :	SAMSUNG ELECTRONICS CO., LTD.		
Applicant Address:	#416, Meatan3-Dong, Yeongtong-Gu, Suwon City, Gyunggi-Do, South Korea		
Manufacturer :	SAMSUNG ELECTRO-MECHANICS CO., LTD.		
Manufacturer Address:	#314, Meatan3-Dong, Yeongtong-Gu, Suwon City, Gyunggi-Do, South Korea		
Product:	2.4 GHz WLAN Module		
Model No.:	CLX-NWA20L	FCC ID:	A3LSWL-2920U
Buyer Model/ Multi Model No.:	N/A	Serial No.:	N/A
Receipt No.:	SKTEU09-1179	Date of receipt:	Nov. 13, 2009
Date of Issue:	Dec. 15, 2009		
Testing location:	SK TECH CO., LTD. 820-2, Wolmoon-Ri, Wabu-Up, Namyangju-Si, Kyunggi-Do, Korea		
Test Standards:	ANSI C63.4 / 2003		
Rule Parts:	FCC part 15 Subpart B		
Equipment Class :	Class B personal computers and peripherals		
Test Result:	The above mentioned product has been tested and passed.		
Tested by: K.H. Bae / Engineer		Approved by: S.H. Yoon / Manager & Chief Engineer	
 Signature		 Signature	
Other Aspects :			
Abbreviations :	· OK, Pass = passed · Fail = failed · N/A = not applicable		
•This test report should not be reproduced except in full, without the written approval of our laboratory. •This test result is based on a single evaluation of one sample of the above mentioned. •This test report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government.			
 NVLAP Lab. Code: 200220-0			



» » Contents « «

Contents	2
List of Supplements	3
List of Tables	3
List of Photographs	3
1. General	4
2. Test Site	4
2.1 Location	4
2.2 List of Test and Measurement Instruments	5
2.3 Test Date	5
2.4 Test Environment	5
3. Summary of test results	6
4. Description of the tested samples	7
4.1 Rating and Physical Characteristics	7
4.2 Submitted Documents	7
5. Measurement Conditions	8
5.1 Modes of Operation	8
5.2 Additional Equipments	8
5.3 Type of Used Cables	8
5.4 Test Setup	9
5.5 Uncertainty	10
6. Test Results	11
6.1 Conducted Emissions	11
6.2 Radiated Emissions	30



» List of Supplements

Supplement 1	Test Data, conducted Disturbance(Transmitter mode 11b)	12
Supplement 2	Spectral Diagram, LINE-PE	13
Supplement 3	Spectral Diagram, NEUTRAL-PE	14
Supplement 4	Test Data, conducted Disturbance(Transmitter mode 11g)	15
Supplement 5	Spectral Diagram, LINE-PE	16
Supplement 6	Spectral Diagram, NEUTRAL-PE	17
Supplement 7	Test Data, conducted Disturbance(Transmitter mode 11n)	18
Supplement 8	Spectral Diagram, LINE-PE	19
Supplement 9	Spectral Diagram, NEUTRAL-PE	20
Supplement 10	Test Data, conducted Disturbance(Receiver mode 11b)	21
Supplement 11	Spectral Diagram, LINE-PE	22
Supplement 12	Spectral Diagram, NEUTRAL-PE	23
Supplement 13	Test Data, conducted Disturbance(Receiver mode 11g)	24
Supplement 14	Spectral Diagram, LINE-PE	25
Supplement 15	Spectral Diagram, NEUTRAL-PE	26
Supplement 16	Test Data, conducted Disturbance(Receiver mode 11n)	27
Supplement 17	Spectral Diagram, LINE-PE	28
Supplement 18	Spectral Diagram, NEUTRAL-PE	29

» List of Tables

Table 1	List of test and measurement Equipment	5
Table 2	Test Data, Radiated Emissions	31



1. General

This equipment has been shown to be capable of compliance with the applicable technical standards and was tested in accordance with the measurement procedures as indicated in this report.

We attest to the accuracy of data. All measurements reported herein were performed by SK Tech Co., Ltd. and were made under Chief Engineer's supervision.

We assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

2. Test Site

SK TECH Co., Ltd.

2.1 Location

820-2, Wolmoon Ri, Wabu-Up, Namyangju-Si, Kyunggi-Do, KOREA



The test site is in compliance with ISO/IEC 17025 for general requirements for the competence of testing and calibration laboratories. This laboratory is recognized as a Conformity Assessment Body (CAB) for CAB's Designation Number: **KR0007** by FCC, is accredited by NVLAP for NVLAP Lab. Code: **200220-0** and DATech for DAR-Registration No. **DAT-P-076/97-02** and KOLAS for Accreditation No.: **KT191**.



2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Kind of Equipment	Type	S/N	Calibrated until	Calibration Interval
EMI Receiver	ESHS10	862970/019	07.2010	1 year
Artificial Mains Network	ESH3-Z5	836679/018	07.2010	1 year
EMI TEST Receiver	ESPI	101206	07.2010	1 year
Amplifier	8447F	3113A05153	07.2010	1 year
Trilog-Broadband Antenna	VULB9168	9168-230	07.2010	1 year
Antenna Turntable Driver	5907	91X518	N/A	-
Antenna Turntable controller	5906	91X519	N/A	-
EMI Receiver	ESVS10	834468/008	07.2010	1 year
4-WIRE ISN	ENY41	836077/005	03.2010	1 year
Horn Antenna (1G~18G)	3115	836077/005	03.2010	1 year
Pre-Amplifier	AFS44-00101800-25-10P-44	1116321	10.2010	1 year

2.3 Test Date

Date of Application : Nov. 13, 2009

Date of Test : Dec. 04, 2009 ~ Dec. 07, 2009

2.4 Test Environment

See each test item's description.



3. Summary of test results

The following table represents the list of measurements required under the FCC CFR47 Part 15.107 and 15.109

FCC Rules	Test Requirements	Result	Remark
15.107	AC conducted Emission	Pass	
15.109(a)	Radiated Emission	Pass	

Note 1: Test results reported in this document relate only to the items tested

Note 2: The required tests demonstrated compliance as per client declaration of test configuration, monitoring

Note 3: Test results apply only to the item(s) tested

* EMI Suppression Device(s)

EMI suppression device(s) added and/or modified during testing:

- none



4. Description of the tested samples

The EUT is a 2.4 GHz WLAN Module.

4.1 Rating and Physical Characteristics

Type of EUT	Wireless LAN device
Type designation	2.4 GHz WLAN Module/CLX-NWA20L
Power source	DC 5.0V(supplied by Host Equipment)
Transmit Frequency	2412 ~ 2462 MHz (802.11b/g/n HT20) 2422 ~ 2452 MHz (802.11n HT40)
Antenna Type	Integral(PCB antenna, declared PEAK.Gain: 2.66 dBi)
Type of Modulation	Modulation technologies: DSSS(IEEE 802.11b), OFDM(IEEE 802.11g), OFDM(IEEE 802.11n) Modulation: DBPSK, DQPSK, CCK, BPSK, QPSK, 16QAM, 64QAM
Transfer Data Rate	1/2/5.5/11Mbps(802.11b) 6/9/12/18/24/36/48/54Mbps(802.11g) 6.5/13/19.5/26/39/52/58.5/65Mbps(802.11n,20MHz) 15/30/45/60/90/120/135/150Mbps(802.11n,40MHz)
RF Output power	17 dBm for IEEE 802.11b, 13 dBm for IEEE 802.11g, 17 dBm for IEEE 802.11n
Operating Temperature	0 °C ~ +50°C
Operating Humidity	25% ~ 65%RH

4.2 Submitted Documents

N/A



5. Measurement Conditions

Operating voltage of the EUT is supplied from Note PC.

5.1 Modes of Operation

The communication link between the EUT and Wireless Broadband Router was established with WLAN technology as PING TEST Mode during the all tests.

- Transmitter Condition: IEEE 802.11b & 802.11g & 802.11n
- Receiver Condition: : IEEE 802.11b & 802.11g & 802.11n
- Channel No. : 5

5.2 Additional Equipments

Equipment	Manufacturer	Model No.	Serial No.
Note PC	DELL	PP22L	N/A
Adaptor(Note PC)	Dongguang Lite Power 2 nd Plant	PA-1900-02b	N/A
Wireless Router	IP Time	N5004	09101000248
Adaptor(Wireless Router)	SHENZHEN TOP-ASIA ELECTRONICS CO., LTD.	SW10-05002000EK	N/A

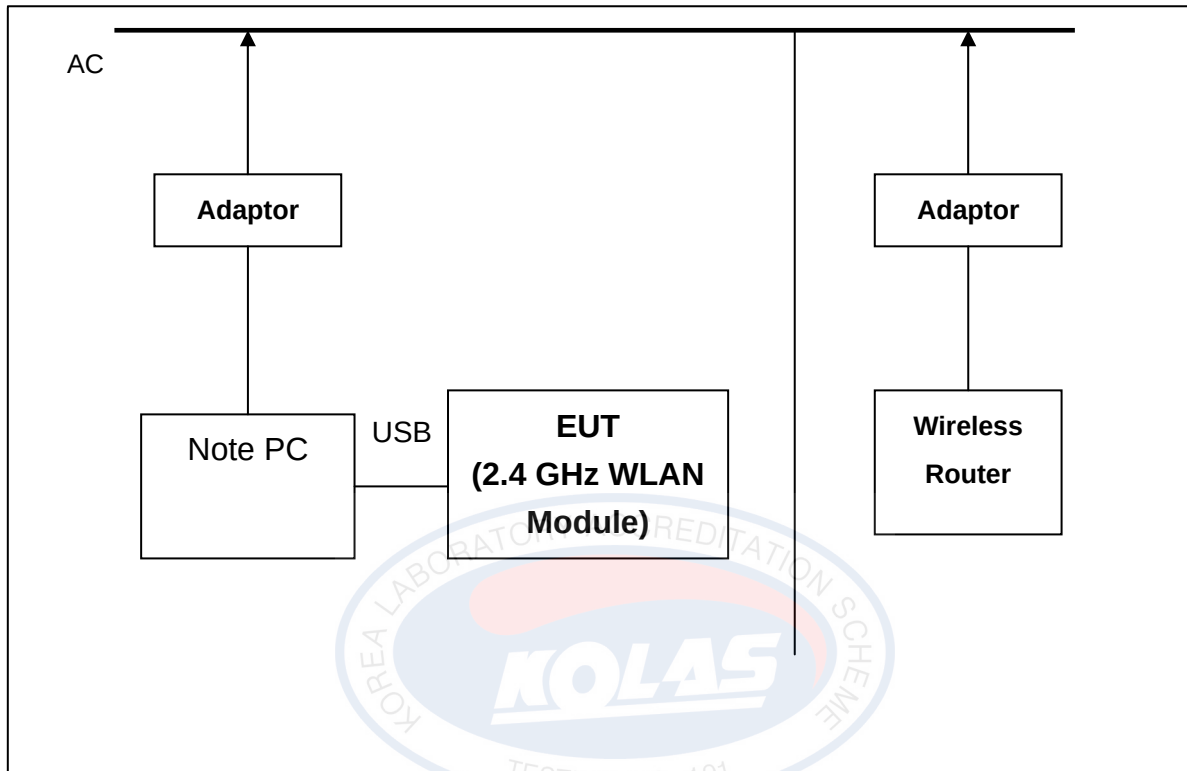
5.3 Type of Used Cables

#	START		END		Cable	
	Name	I/O Port	Name	I/O Port	Length	Shielded / Unshielded
1	EUT	USB	Note PC	USB	3.2	Shielded
2	Note PC	DC	Adaptor	-	2.0	Unshielded
3	Wireless Router	DC	Adaptor	-	1.8	Unshielded



5.4 Test Setup

The test setup photographs showed the external supply connections and Interfaces



[System Block Diagram of Test Configuration]



5.5 Uncertainty

1) Radiated disturbances from 30 MHz to 1000 MHz at a distance of 3m and 10 m

Expanded Uncertainty

$$U = k * U_c(x_i) = 2 * 2.10 = 4.20\text{dB}$$

The coverage factor $k = 2$ yields approximately a 95% level of confidence.

2) Conducted disturbance from 150 KHz to 30 MHz using a 50 Ω /50 μ H AMN

Expanded uncertainty

$$U = k * U_c(x_i) = 2 * 1.57 = 3.14\text{dB}$$

The coverage factor $k = 2$ yields approximately a 95% level of confidence.

※ When the measured emission is positioned within the range of the uncertainty of measurement from the emission limit, the uncertainty of measurement shall be concerned as follow.

Compliance or non-compliance with a disturbance limit shall be determined in the following manner.

If U_{lab} is less than or equal to U_{cisp}

- compliance is deemed to occur if no measured disturbance exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance exceeds the disturbance limit.

If U_{lab} is greater than U_{cisp}

- compliance is deemed to occur if no measured disturbance, increased by $(U_{lab} - U_{cisp})$, exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance, increased by $(U_{lab} - U_{cisp})$, exceeds the disturbance limit.

※ If the measurement value is lower or equal to the limit, the EUT is considered to pass the test.



6. Test Results

6.1 Conducted Emissions

Result

PASS

The line-conducted facility is located inside a 2.6 M x 3.6 M x 7.0 M shielded enclosure. The shielding effectiveness of the shielded room is in accordance with MIL-Std-285 or NSA 604-05. A 1 m x 1.5 m wooden table 80 cm. high is placed 40 cm. away from the vertical wall and 1.5 m away from the side wall of the shielded room. ROHDE & SCHWARZ Model ESH3-Z5 (10 kHz-30 MHz) 50 ohm/50 uH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room. The EUT is powered from the ROHDE & SCHWARZ LISN and the support equipment is powered from the ROHDE & SCHWARZ LISN. Power to the LISNs is filtered by a high-current high-insertion loss Lindgren enclosures power line filters (100 dB 14 kHz-10 GHz). The purpose of the filter is to attenuate ambient signal interference and this filter is also bonded to the shielded enclosure. All electrical cables are shielded by braided tinned copper zipper tubing with inner diameter of 1/2". If the EUT is a DC-powered device, power will be derived from the source power supply it normally will be powered from and this supply lines will be connected to the ROHDE & SCHWARZ LISN. All interconnecting cables more than 1 meter were shortened by non-inductive bundling (serpentine fashion) to a 1-meter length.

Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the spectrum analyzer to determine the frequency producing the maximum EME from the EUT. The spectrum was scanned from 150 kHz to 30 MHz with 100 msec. sweep time. The frequency producing the maximum level was reexamined using EMI/field Intensity Meter (ESHS 10) and Quasi-Peak adapter. The detector function was set to CISPR quasi-peak mode. The bandwidth of the receiver was set to 10 kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each EME emission. Each emission was maximized by: switching power lines; varying the mode of operation or resolution; clock or data exchange speed; if applicable; whichever determined the worst-case emission. Photographs of the worst-case emission can be seen in photograph of conducted test. Each EME reported was calibrated using self-calibrating mode.

● Test Environment

Room temperature : 23 °C

Relative Humidity : 40 % R.H.

※ *Supplementing the conduction test data and graphs at next 18 pages.*



Supplement 1: Test Data, Conducted Disturbance

Transmitter Mode (11b)

<Quasi-Peak>

Frequency (MHz)	Reading (dBuV)	Line	C/F (dB)	C/L (dB)	Actual (dBuV)	Limit (dBuV)	Margin (dB)
0.446	42.53	N	0.27	0.06	42.86	56.95	14.09
0.450	42.30	L	0.25	0.06	42.61	56.88	14.27
0.565	39.12	L	0.25	0.06	39.43	56.00	16.57
0.732	40.54	L	0.49	0.07	41.10	56.00	14.90
0.735	41.26	N	0.26	0.07	41.59	56.00	14.41
0.893	37.71	L	0.49	0.09	38.29	56.00	17.71

<Average>

Frequency (MHz)	Reading (dBuV)	Line	C/F (dB)	C/L (dB)	Actual (dBuV)	Limit (dBuV)	Margin (dB)
0.336	28.56	L	0.29	0.05	28.90	49.30	20.40
0.446	32.11	N	0.27	0.06	32.44	46.95	14.51
0.450	31.88	L	0.25	0.06	32.19	46.88	14.69
0.565	27.16	N	0.27	0.06	27.49	46.00	18.51
0.732	26.01	L	0.49	0.07	26.57	46.00	19.43
0.735	25.61	N	0.26	0.07	25.94	46.00	20.06

► NOTE

- * C/F = Correction Factor
- * C/L = Cable Loss
- * LINE : L = Line-PE, N = Neutral-PE
- * Margin Calculation

$$\text{Margin(Q.P)} = \text{Limit} - \text{Actual}$$

$$[\text{Actual(Q.P)} = \text{Reading(Q.P)} + \text{C/F} + \text{C/L}]$$

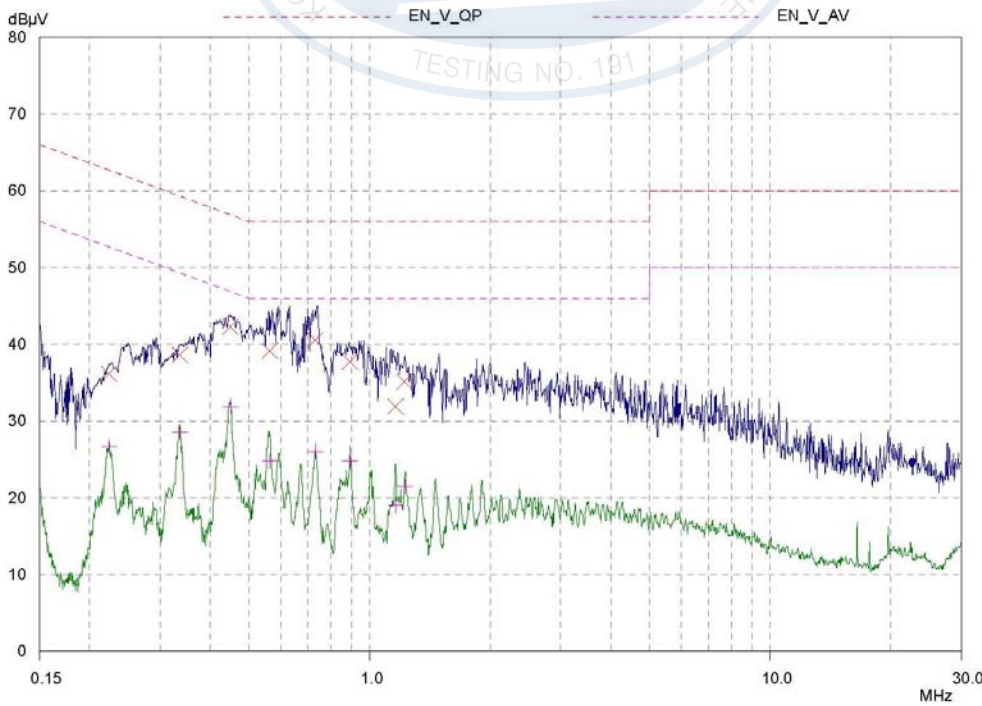


Supplement 2 : Spectral Diagram, LINE – PE (Transmitter Mode 11b)

SK TECH Co., Ltd.
CONDUCTED DISTURBANCE
EUT: CLX-NWA20L
Manuf:
Op Cond:
Operator:
Test Spec: FCC Part15 SubpartB
Comment: LINE
11b.TX

04 Dec 2009 14:45

Scan Settings		(1 Range)		Receiver Settings					
Frequencies		Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge	
Start	Stop								
150kHz	30MHz	0.4%	10kHz	PK+AV	20msec	Auto	OFF	60dB	
Final Measurement:		Detectors:	X QP / + AV						
		Meas Time:	1sec						
		Peaks:	8						
		Acc Margin:	35 dB						





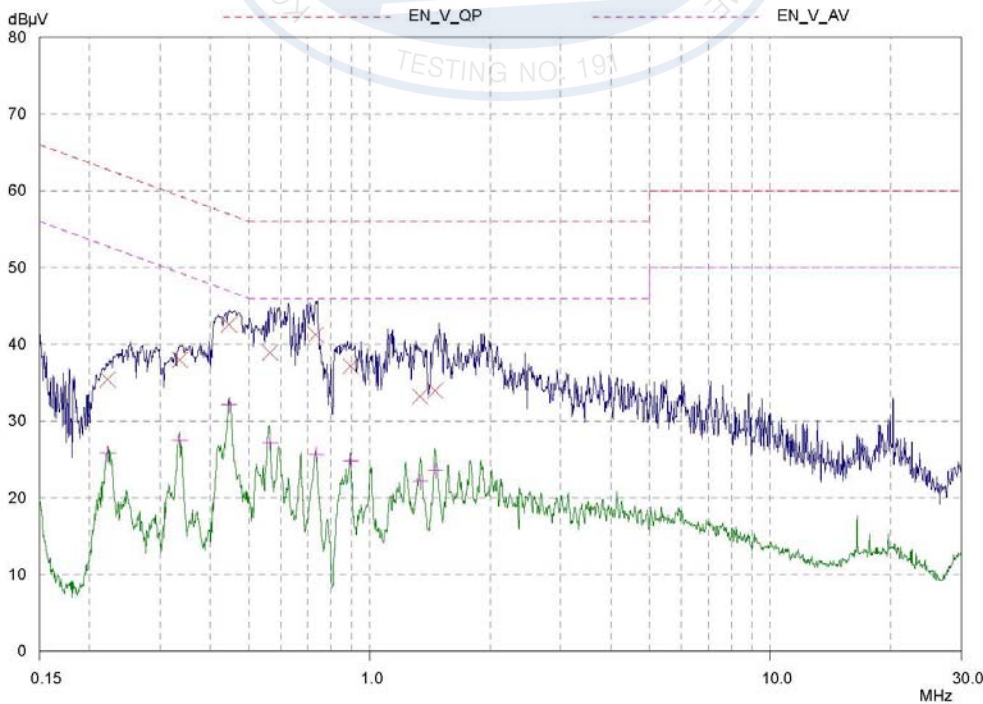
Supplement 3 : Spectral Diagram, NEUTRAL – PE (Transmitter Mode 11b)

SK TECH Co., Ltd.
CONDUCTED DISTURBANCE
EUT: CLX-NWA20L
Manuf:
Op Cond:
Operator:
Test Spec: FCC Part15 SubpartB
Comment: NEUTRAL
11b.TX

04 Dec 2009 14:40

Scan Settings		(1 Range)		Receiver Settings			
Frequencies							
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150kHz	30MHz	0.4%	10kHz	PK+AV	20msec	Auto	OFF
							OpRge
							60dB

Final Measurement: Detectors: X QP / + AV
Meas Time: 1sec
Peaks: 8
Acc Margin: 35 dB





Supplement 4: Test Data, Conducted Disturbance

Transmitter Mode (11g)

<Quasi-Peak>

Frequency (MHz)	Reading (dBuV)	Line	C/F (dB)	C/L (dB)	Actual (dBuV)	Limit (dBuV)	Margin (dB)
0.446	42.37	N	0.27	0.06	42.70	56.95	14.25
0.450	42.22	L	0.25	0.06	42.53	56.88	14.35
0.560	39.68	L	0.25	0.06	39.99	56.00	16.01
0.590	40.54	N	0.27	0.06	40.87	56.00	15.13
0.729	40.25	L	0.49	0.07	40.81	56.00	15.19
0.735	41.32	N	0.26	0.07	41.65	56.00	14.35

<Average>

Frequency (MHz)	Reading (dBuV)	Line	C/F (dB)	C/L (dB)	Actual (dBuV)	Limit (dBuV)	Margin (dB)
0.336	28.38	L	0.29	0.05	28.72	49.30	20.58
0.446	32.20	N	0.27	0.06	32.53	46.95	14.42
0.450	31.75	L	0.25	0.06	32.06	46.88	14.82
0.560	28.59	L	0.25	0.06	28.90	46.00	17.10
0.729	25.60	L	0.49	0.07	26.16	46.00	19.84
0.735	25.38	N	0.26	0.07	25.71	46.00	20.29

► NOTE

- * C/F = Correction Factor
- * C/L = Cable Loss
- * LINE : L = Line-PE, N = Neutral-PE
- * Margin Calculation

$$\text{Margin(Q.P)} = \text{Limit} - \text{Actual}$$

$$[\text{Actual(Q.P)} = \text{Reading(Q.P)} + \text{C/F} + \text{C/L}]$$

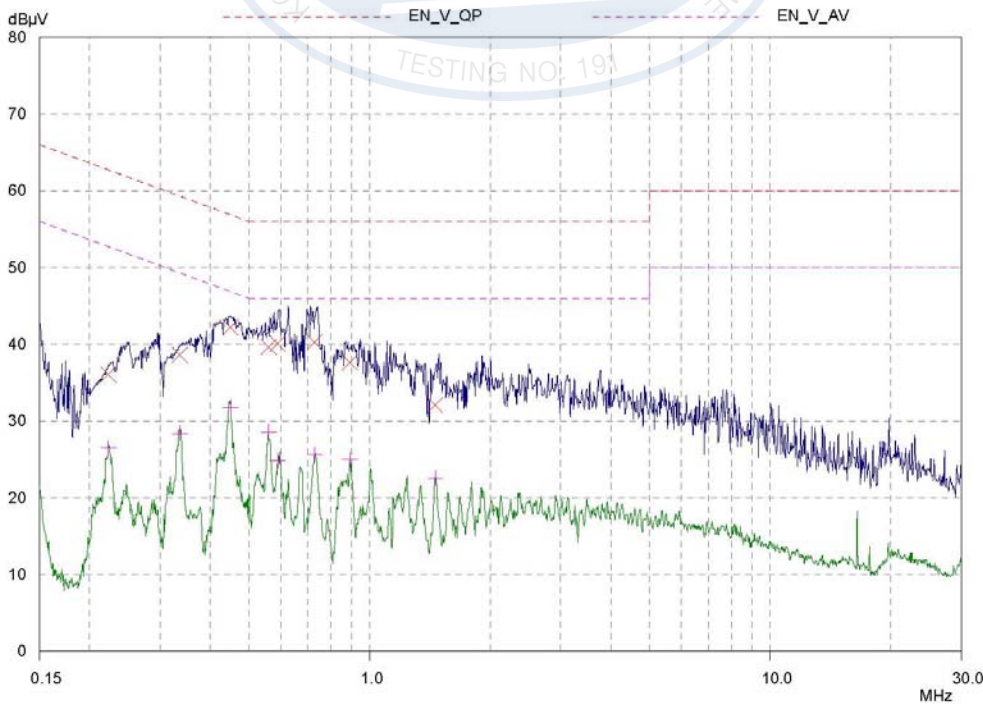


Supplement 5 :Spectral Diagram, LINE – PE (Transmitter Mode 11g)

SK TECH Co., Ltd.
CONDUCTED DISTURBANCE
EUT: CLX-NWA20L
Manuf:
Op Cond:
Operator:
Test Spec: FCC Part15 SubpartB
Comment: LINE
11g.TX

04 Dec 2009 14:27

Scan Settings		(1 Range)		Receiver Settings			
Frequencies							
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150kHz	30MHz	0.4%	10kHz	PK+AV	20msec	Auto	OFF
OpRge		60dB					
Final Measurement:		Detectors:	X QP / + AV				
		Meas Time:	1sec				
		Peaks:	8				
		Acc Margin:	35 dB				





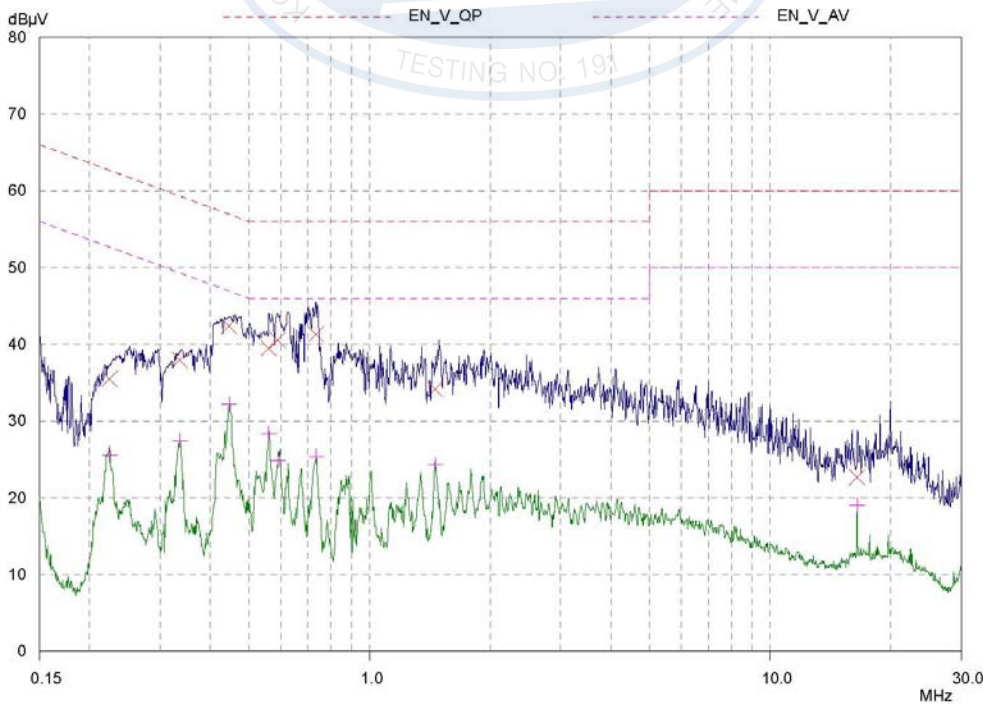
Supplement 6:Spectral Diagram, NEUTRAL – PE (Transmitter Mode 11g)

SK TECH Co., Ltd.
CONDUCTED DISTURBANCE
EUT: CLX-NWA20L
Manuf:
Op Cond:
Operator:
Test Spec: FCC Part15 SubpartB
Comment: NEUTRAL
11g.TX

04 Dec 2009 14:33

Scan Settings		(1 Range)		Receiver Settings			
Frequencies							
Start	Stop	Step	IF BW	Detector	M-Time	Atten	OpRge
150kHz	30MHz	0.4%	10kHz	PK+AV	20msec	Auto	60dB

Final Measurement: Detectors: X QP / + AV
Meas Time: 1sec
Peaks: 8
Acc Margin: 35 dB





Supplement 7: Test Data, Conducted Disturbance

Transmitter Mode (11n)

<Quasi-Peak>

Frequency (MHz)	Reading (dBuV)	Line	C/F (dB)	C/L (dB)	Actual (dBuV)	Limit (dBuV)	Margin (dB)
0.444	42.43	L	0.25	0.06	42.74	56.98	14.24
0.446	42.53	N	0.27	0.06	42.86	56.95	14.09
0.558	39.79	L	0.25	0.06	40.10	56.00	15.90
0.626	40.90	L	0.49	0.07	41.46	56.00	14.54
0.729	40.01	N	0.26	0.07	40.34	56.00	15.66
0.735	41.14	L	0.49	0.07	41.70	56.00	14.30

<Average>

Frequency (MHz)	Reading (dBuV)	Line	C/F (dB)	C/L (dB)	Actual (dBuV)	Limit (dBuV)	Margin (dB)
0.335	28.73	L	0.29	0.05	29.07	49.34	20.27
0.444	31.66	L	0.25	0.06	31.97	46.98	15.01
0.446	32.37	N	0.27	0.06	32.70	46.95	14.25
0.558	28.11	L	0.25	0.06	28.42	46.00	17.58
0.729	25.31	N	0.26	0.07	25.64	46.00	20.36
0.735	25.73	L	0.49	0.07	26.29	46.00	19.71

► NOTE

- * C/F = Correction Factor
- * C/L = Cable Loss
- * LINE : L = Line-PE, N = Neutral-PE
- * Margin Calculation

$$\text{Margin(Q.P)} = \text{Limit} - \text{Actual}$$

$$[\text{Actual(Q.P)} = \text{Reading(Q.P)} + \text{C/F} + \text{C/L}]$$

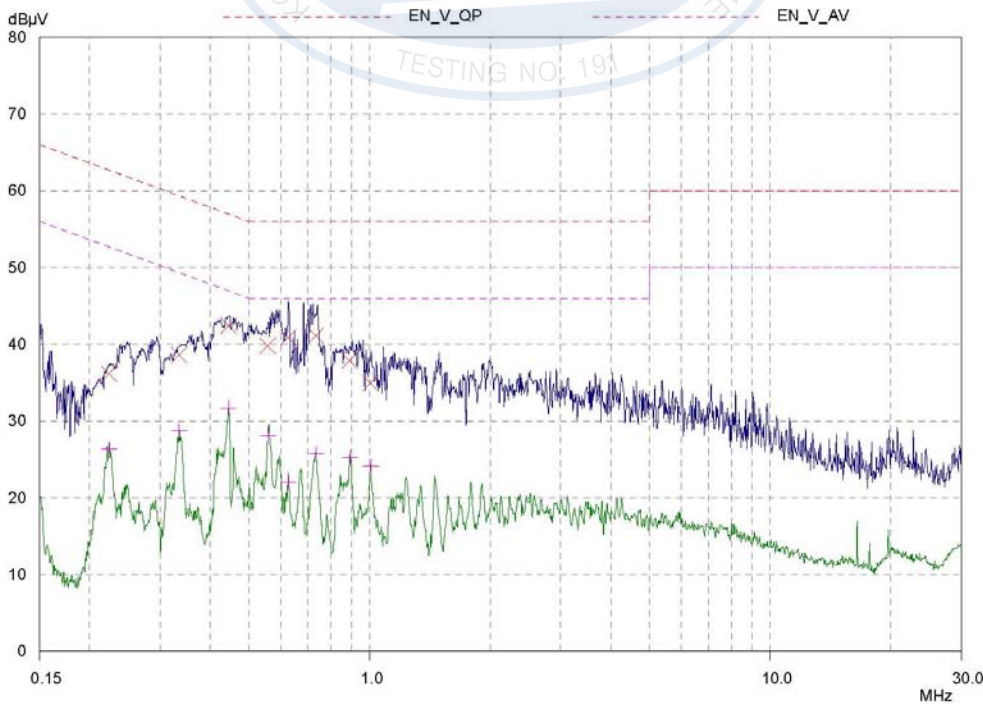


Supplement 8 :Spectral Diagram, LINE – PE (Transmitter Mode 11n)

SK TECH Co., Ltd.
CONDUCTED DISTURBANCE
EUT: CLX-NWA20L
Manuf:
Op Cond:
Operator:
Test Spec: FCC Part15 SubpartB
Comment: LINE
11n.TX

04 Dec 2009 15:12

Scan Settings		(1 Range)		Receiver Settings			
Frequencies							
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150kHz	30MHz	0.4%	10kHz	PK+AV	20msec	Auto	OFF
Final Measurement:				Detectors:	X QP / + AV		
				Meas Time:	1sec		
				Peaks:	8		
				Acc Margin:	35 dB		





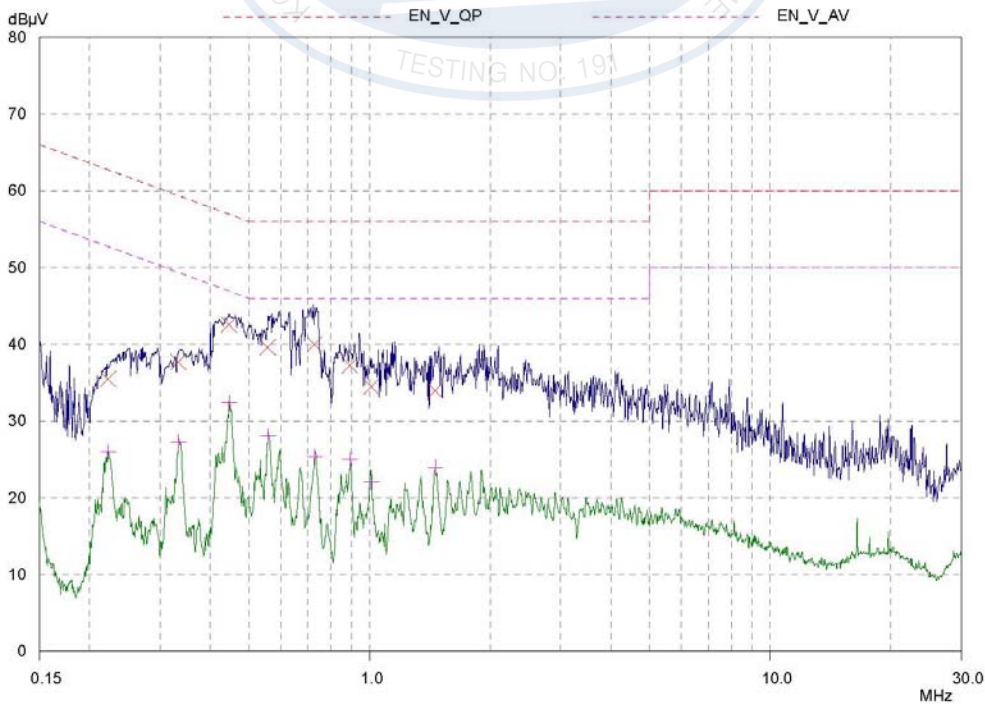
Supplement 9:Spectral Diagram, NEUTRAL – PE (Transmitter Mode 11n)

SK TECH Co., Ltd.
CONDUCTED DISTURBANCE
EUT: CLX-NWA20L
Manuf:
Op Cond:
Operator:
Test Spec: FCC Part15 SubpartB
Comment: NEUTRAL
11n.TX

04 Dec 2009 15:05

Scan Settings		(1 Range)		Receiver Settings			
Frequencies							
Start	Stop	Step	IF BW	Detector	M-Time	Atten	OpRge
150kHz	30MHz	0.4%	10kHz	PK+AV	20msec	Auto	60dB

Final Measurement: Detectors: X QP / + AV
 Meas Time: 1sec
 Peaks: 8
 Acc Margin: 35 dB





Supplement 10: Test Data, Conducted Disturbance

Receiver Mode (11b)

<Quasi-Peak>

Frequency (MHz)	Reading (dBuV)	Line	C/F (dB)	C/L (dB)	Actual (dBuV)	Limit (dBuV)	Margin (dB)
0.444	42.16	N	0.27	0.06	42.49	56.98	14.49
0.446	42.43	L	0.25	0.06	42.74	56.95	14.21
0.560	39.44	N	0.27	0.06	39.77	56.00	16.23
0.732	40.56	L	0.49	0.07	41.12	56.00	14.88
0.735	41.30	N	0.26	0.07	41.63	56.00	14.37
0.558	39.64	L	0.25	0.06	39.95	56.00	16.05

<Average>

Frequency (MHz)	Reading (dBuV)	Line	C/F (dB)	C/L (dB)	Actual (dBuV)	Limit (dBuV)	Margin (dB)
0.444	31.22	N	0.27	0.06	31.55	46.98	15.43
0.446	32.20	L	0.25	0.06	32.51	46.95	14.44
0.558	28.33	L	0.25	0.06	28.64	46.00	17.36
0.560	28.11	N	0.27	0.06	28.44	46.00	17.56
0.732	26.07	L	0.49	0.07	26.63	46.00	19.37
0.735	25.61	N	0.26	0.07	25.94	46.00	20.06

► NOTE

* C/F = Correction Factor

* C/L = Cable Loss

* LINE : L = Line-PE, N = Neutral-PE

* Margin Calculation

Margin(Q.P) = Limit - Actual

[Actual(Q.P) = Reading(Q.P) + C/F + C/L]



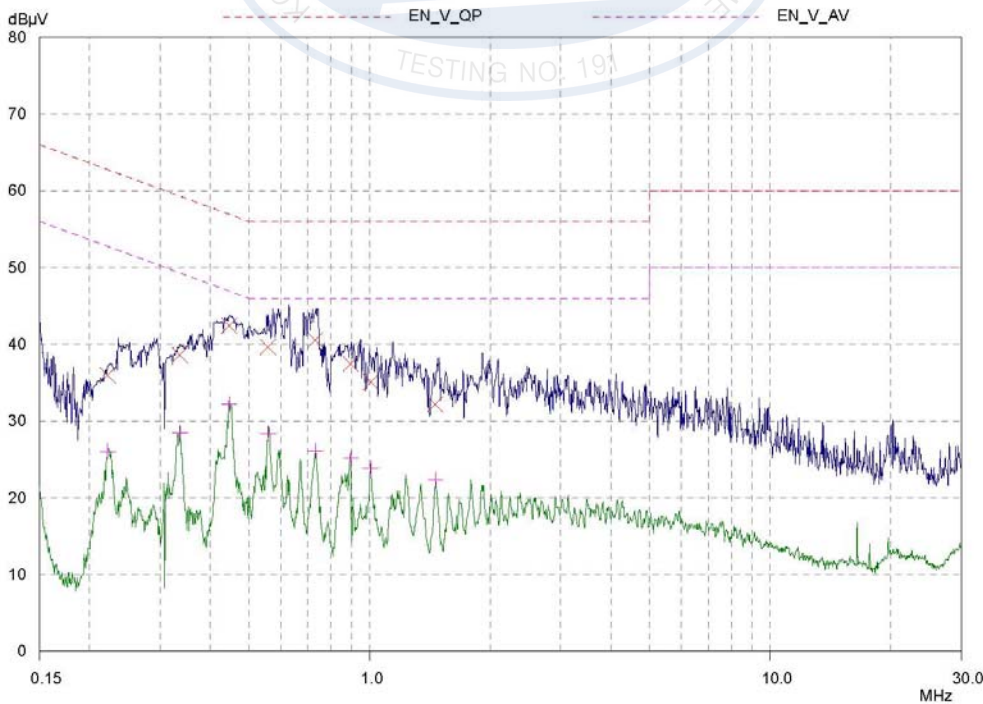
Supplement 11 :Spectral Diagram, LINE – PE (Receiver Mode 11b)

SK TECH Co., Ltd.
CONDUCTED DISTURBANCE
EUT: CLX-NWA20L
Manuf:
Op Cond:
Operator:
Test Spec: FCC Part15 SubpartB
Comment: LINE
11b.RX

04 Dec 2009 14:51

Scan Settings		(1 Range)		Receiver Settings			
Frequencies							
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150kHz	30MHz	0.4%	10kHz	PK+AV	20msec	Auto	OFF
				OpRge			
				60dB			

Final Measurement: Detectors: X QP / + AV
Meas Time: 1sec
Peaks: 8
Acc Margin: 35 dB



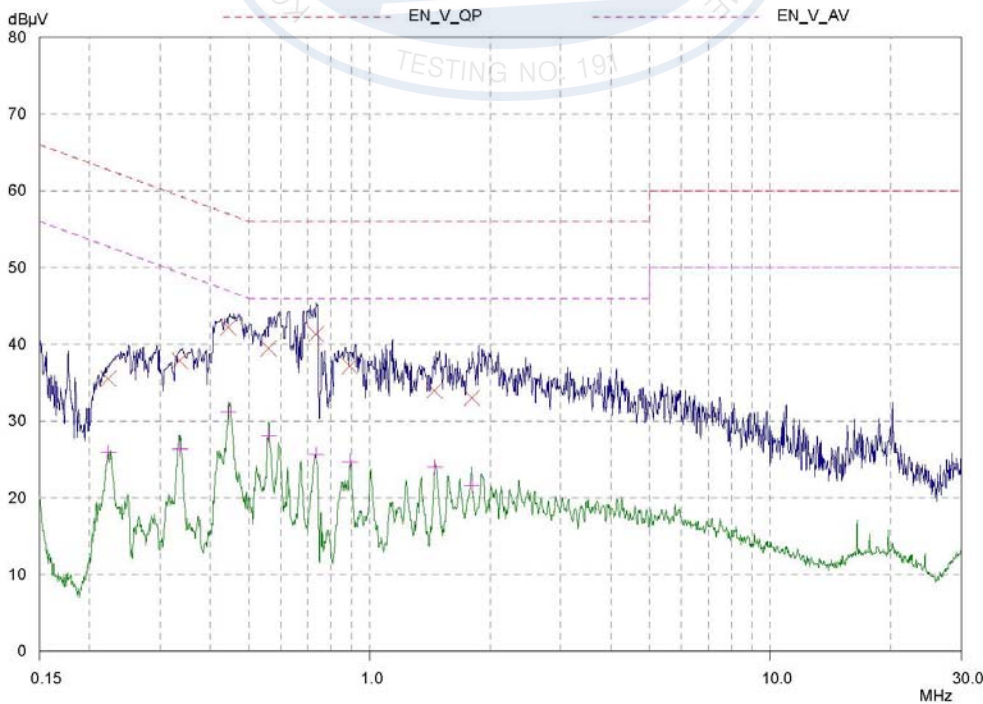


Supplement 12 :Spectral Diagram, NEUTRAL – PE (Receiver Mode 11b)

SK TECH Co., Ltd.
CONDUCTED DISTURBANCE
EUT: CLX-NWA20L
Manuf:
Op Cond:
Operator:
Test Spec: FCC Part15 SubpartB
Comment: NEUTRAL
11b.RX

04 Dec 2009 14:58

Scan Settings		(1 Range)		Receiver Settings			
Frequencies							
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150kHz	30MHz	0.4%	10kHz	PK+AV	20msec	Auto	OFF
Final Measurement:				Detectors:	X QP / + AV	OpRge	60dB
				Meas Time:	1sec		
				Peaks:	8		
				Acc Margin:	35 dB		





Supplement 13: Test Data, Conducted Disturbance

Receiver Mode (11g)

<Quasi-Peak>

Frequency (MHz)	Reading (dBuV)	Line	C/F (dB)	C/L (dB)	Actual (dBuV)	Limit (dBuV)	Margin (dB)
0.448	42.24	L	0.25	0.06	42.55	56.92	14.37
0.450	42.20	N	0.27	0.06	42.53	56.88	14.35
0.560	39.62	L	0.25	0.06	39.93	56.00	16.07
0.595	41.11	N	0.27	0.06	41.44	56.00	14.56
0.732	40.42	L	0.49	0.07	40.98	56.00	15.02
0.735	41.32	N	0.26	0.07	41.65	56.00	14.35

<Average>

Frequency (MHz)	Reading (dBuV)	Line	C/F (dB)	C/L (dB)	Actual (dBuV)	Limit (dBuV)	Margin (dB)
0.448	32.28	L	0.25	0.06	32.59	46.92	14.33
0.450	31.97	N	0.27	0.06	32.30	46.88	14.58
0.560	28.33	N	0.27	0.06	28.66	46.00	17.34
0.595	25.93	N	0.27	0.06	26.26	46.00	19.74
0.732	26.18	L	0.49	0.07	26.74	46.00	19.26
0.735	25.73	N	0.26	0.07	26.06	46.00	19.94

► NOTE

* C/F = Correction Factor

* C/L = Cable Loss

* LINE : L = Line-PE, N = Neutral-PE

* Margin Calculation

Margin(Q.P) = Limit - Actual

[Actual(Q.P) = Reading(Q.P) + C/F + C/L]



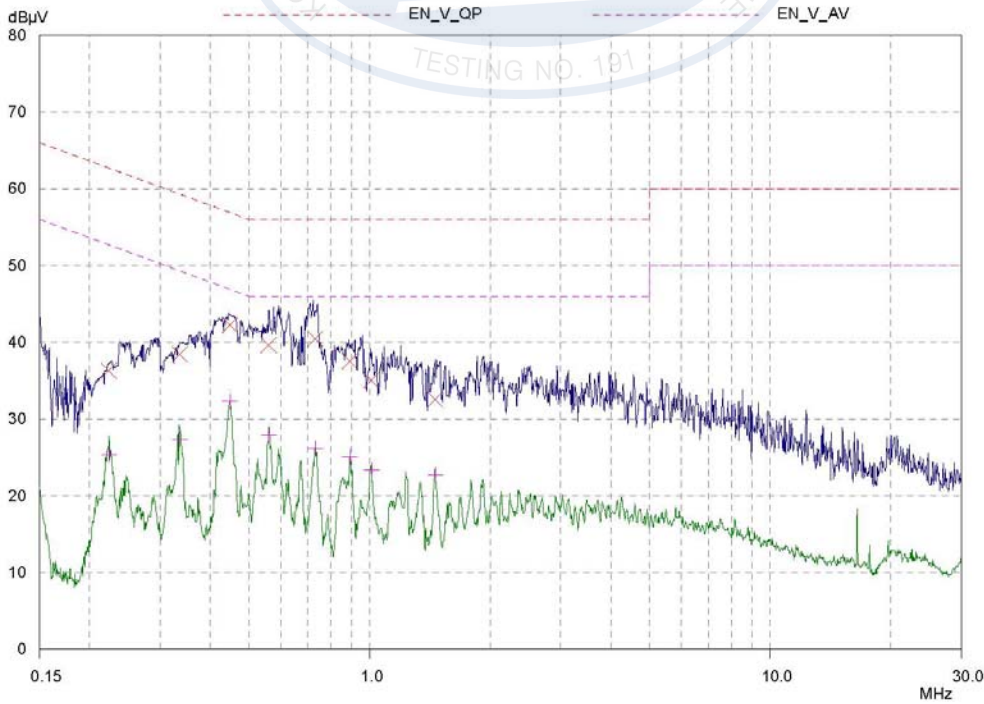
Supplement 14 :Spectral Diagram, LINE – PE (Receiver Mode 11g)

SK TECH Co., Ltd.
CONDUCTED DISTURBANCE
EUT: CLX-NWA20L
Manuf:
Op Cond:
Operator:
Test Spec: FCC Part15 SubpartB
Comment: LINE
11g.RX

04 Dec 2009 14:21

Scan Settings			(1 Range)			Receiver Settings			
Frequencies									
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge	
150kHz	30MHz	0.4%	10kHz	PK+AV	20msec	Auto	OFF	60dB	

Final Measurement: Detectors: X QP / + AV
 Meas Time: 1sec
 Peaks: 8
 Acc Margin: 35 dB





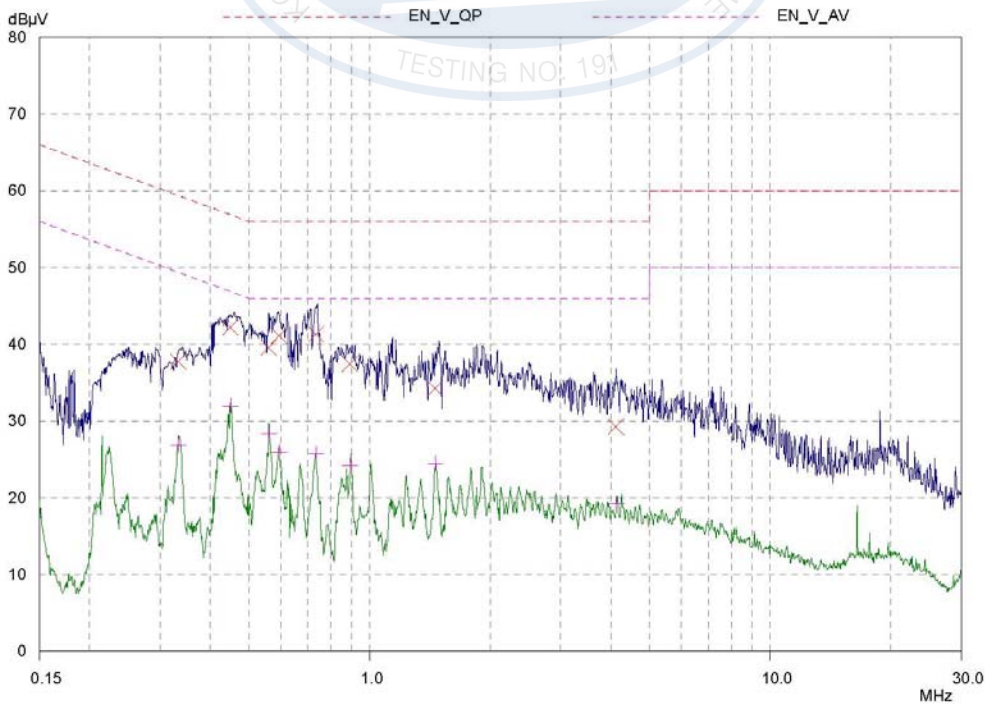
Supplement 15 :Spectral Diagram, NEUTRAL – PE (Receiver Mode 11g)

SK TECH Co., Ltd.
CONDUCTED DISTURBANCE
EUT: CLX-NWA20L
Manuf:
Op Cond:
Operator:
Test Spec: FCC Part15 SubpartB
Comment: NEUTRAL
11g.RX

04 Dec 2009 14:13

Scan Settings			(1 Range)				Receiver Settings			
Frequencies										
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge		
150kHz	30MHz	0.4%	10kHz	PK+AV	20msec	Auto	OFF	60dB		

Final Measurement: Detectors: X QP / + AV
Meas Time: 1sec
Peaks: 8
Acc Margin: 35 dB





Supplement 16: Test Data, Conducted Disturbance

Receiver Mode (11n)

<Quasi-Peak>

Frequency (MHz)	Reading (dBuV)	Line	C/F (dB)	C/L (dB)	Actual (dBuV)	Limit (dBuV)	Margin (dB)
0.444	42.20	L	0.25	0.06	42.51	56.98	14.47
0.448	42.37	N	0.27	0.06	42.70	56.92	14.22
0.560	39.72	L	0.25	0.06	40.03	56.00	15.97
0.592	40.90	L	0.25	0.06	41.21	56.00	14.79
0.732	40.60	L	0.49	0.07	41.16	56.00	14.84
0.735	41.26	N	0.26	0.07	41.59	56.00	14.41

<Average>

Frequency (MHz)	Reading (dBuV)	Line	C/F (dB)	C/L (dB)	Actual (dBuV)	Limit (dBuV)	Margin (dB)
0.440	31.27	L	0.25	0.06	31.58	46.98	15.40
0.448	32.20	N	0.27	0.06	32.53	46.92	14.39
0.560	28.92	L	0.25	0.06	29.23	46.00	16.77
0.562	27.88	N	0.27	0.06	28.21	46.00	17.79
0.592	26.00	L	0.25	0.06	26.31	46.00	19.69
0.732	26.12	L	0.49	0.07	26.68	46.00	19.32

► NOTE

* C/F = Correction Factor

* C/L = Cable Loss

* LINE : L = Line-PE, N = Neutral-PE

* Margin Calculation

Margin(Q.P) = Limit - Actual

[Actual(Q.P) = Reading(Q.P) + C/F + C/L]



Supplement 17 :Spectral Diagram, LINE – PE (Receiver Mode 11n)

SK TECH Co., Ltd.

04 Dec 2009 15:17

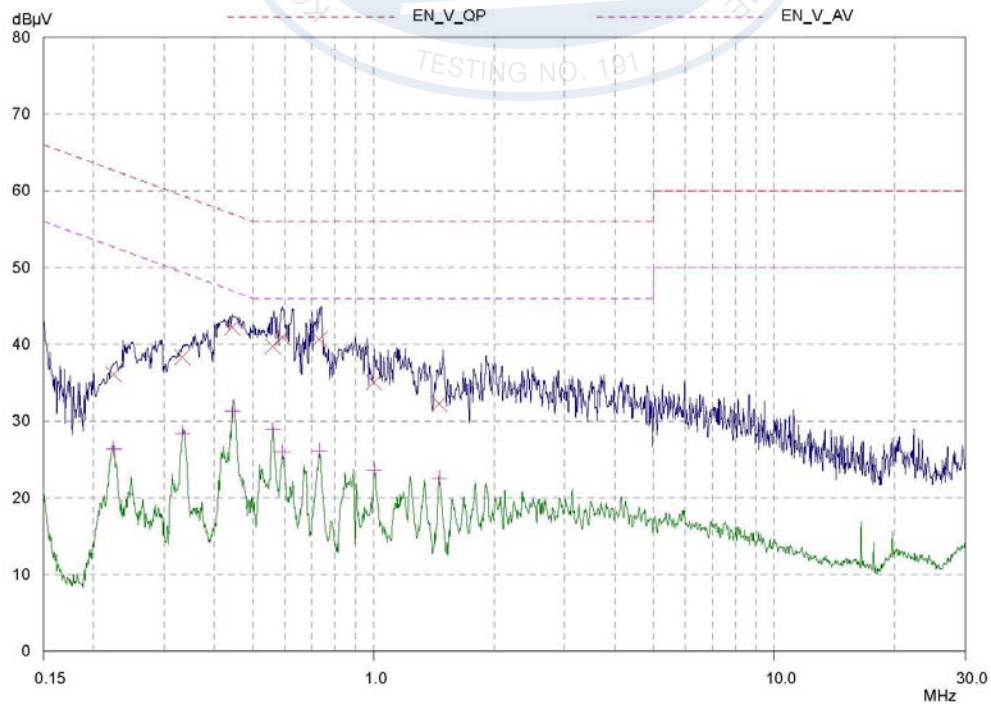
CONDUCTED DISTURBANCE

EUT: CLX-NWA20L
Manuf:
Op Cond:
Operator:
Test Spec: FCCPart15 SubpartB
Comment: LINE
11n.RX

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	0.4%	10kHz	PK+AV	20msec	Auto	OFF	60dB

Final Measurement: Detectors: X QP / + AV
Meas Time: 1sec
Peaks: 8
Acc Margin: 35 dB



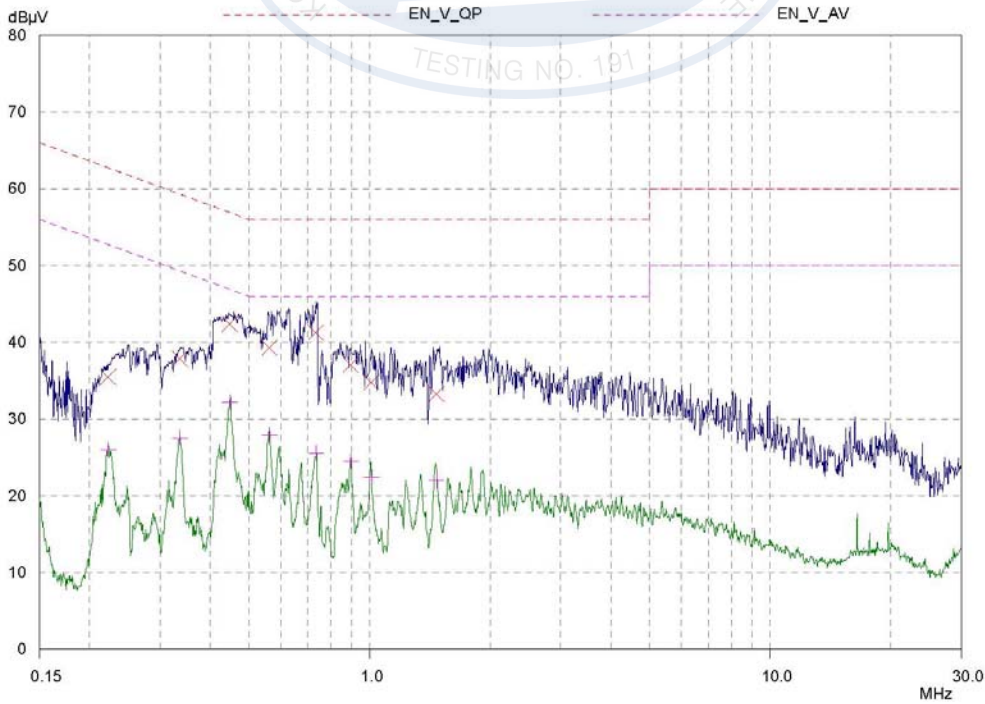


Supplement 18 :Spectral Diagram, NEUTRAL – PE (Receiver Mode 11n)

SK TECH Co., Ltd.
CONDUCTED DISTURBANCE
EUT: CLX-NWA20L
Manuf:
Op Cond:
Operator:
Test Spec: FCC Part15 SubpartB
Comment: NEUTRAL
11n.RX

04 Dec 2009 15:24

Scan Settings			(1 Range)			Receiver Settings			
Frequencies									
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge	
150kHz	30MHz	0.4%	10kHz	PK+AV	20msec	Auto	OFF	60dB	
Final Measurement:			Detectors:	X QP / + AV					
			Meas Time:	1sec					
			Peaks:	8					
			Acc Margin:	35 dB					





6.2 Radiated Emissions

Result

PASS

Preliminary measurements were made indoors at 3 meter using broadband antennas, broadband amplifier, and spectrum analyzer to determine the frequency producing the maximum EME. Appropriate precaution was taken to ensure that all EME from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, turntable azimuth with respect to the antenna was noted for each frequency found. The spectrum was scanned from 30 MHz to 1 GHz using Trilog-Broadband antenna. Above 1 GHz, linearly polarized double ridge horn antennas were used. Final measurements were made outdoors at 10 meter test range using Trilog-Broadband Antenna.

The test equipment was placed on a wooden table situated on a area adjacent to the measurement area. Turntable was to protect from weather in the dome that made with FRP. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. Each frequency found during pre-scan measurements was re-examined and investigated using EMI/Field Intensity Meter(ESVS 10) and Quasi-Peak Adapter. The detector function was set to CISPR quasi-peak mode and the bandwidth of the receiver was set to 100 kHz or 1 MHz depending on the frequency or type of signal. The EUT, support equipment and interconnecting cables were re-configured to the set-up producing the maximum emission for the frequency and were placed on top of a 0.8-meter high non-metallic wooden table (1 m x 1.5 m). The EUT, support equipment, and interconnecting cables were re-arranged and manipulated to maximize each EME emission. The turntable containing the system was rotated; the antenna height was varied 1 m to 4 m and stopped at the azimuth or height producing the maximum emission. Each emission was maximized by: varying the mode of operation or resolution; clock or data exchange speed, and/or support equipment, if applicable; and changing the polarity of the antenna, whichever determined the worst-case emission. Photographs of the worst-case emission can be seen in photograph of radiated emission test. Each EME reported was calibrated using self-calibrating mode.

● Test Environment

Room temperature	: 2 °C
Relative Humidity	: 43 % R.H.

**Table 2: Test Data, Radiated Emissions**

Frequency	Reading	Pol.	Angle	Height	Correction Factor		T-Fact	Data	Limits	Margin
[MHz]	[dBuV]			[m]	Antenna	Cable	[dB]	[dBuV/m]	[dBuV/m]	[dB]
282.50	26.3	V	238	1.0	12.3	2.1	14.4	40.7	46.0	5.3
285.07	27.4	V	250	1.0	12.3	2.1	14.4	41.8	46.0	4.2
287.65	25.9	H	276	1.1	12.3	2.1	14.4	40.3	46.0	5.7
290.09	25.0	V	245	1.0	12.6	2.2	14.7	39.7	46.0	6.3
307.96	22.1	H	277	1.0	12.9	2.2	15.1	37.1	46.0	8.9
341.05	22.5	H	260	1.0	13.8	2.4	16.2	38.7	46.0	7.3

Table. Radiated Measurements at 3-meters

*Note) The data related with a 11b. 11g. 11n. (Transmitter & Receiver) is same as above.

All other emission 20dB below than the permitted limit.

NOTES:

1. All modes of operation were investigated and the worst-case emission was reported.
2. All other emission is non-significant.
3. Measurements using CISPR Quasi-Peak mode (between 30 MHz and 1GHz)
4. Measurements using Peak and Average mode (above 1GHz)
5. H = Horizontal, V = Vertical Polarization
6. Data = Real Reading + T - Factor (Antenna + Cable)
7. Margin = Limits – Data
8. The lower limit applies at the transition frequency.

*The IF bandwidth of test receiver is 120kHz for Quasi-peak detection at frequency below 1GHz.

*The IF bandwidth of test receiver is 1MHz for Average detection at frequency above 1GHz and measurement distance is 3m.