FCC DoC
TEST REPORT

for

NS-600

MODEL: NS-600

Test Report Number:
60904404-D

Issued for

NXTAR TECHNOLOGIES, INC.

51 Hwangong Rd., Yongkang Industrial Park, Tainan 710, Taiwan

Issued By:

Compliance Certification Services Inc.

Tainan Laboratory

No. 8, Jiu Cheng Ling, Jiaokeng Village, Sinhua Township, Tainan Hsien 712, Taiwan R.O.C.
TEL: 886-6-580-2201

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Issued Date: September 21, 2006

NVLAP LAB CODE 200627-0

Testing Laboratory 1109

Revision History

Rev.		Issue Date		Revisions	Effect Page	Revised By
00				Initial Issue	ALL	

TABLE OF CONTENTS

1 TEST RESULT CERTIFICATION

Product:	NS-600
Model:	NS-600
Data Applies To:	NS-400-1; NS-400-2
Applicant:	NXTAR TECHNOLOGIES, INC.
	51 Hwangong Rd., Yongkang Industrial Park, Tainan 710, Taiwan
Manufacturer:	NXTAR TECHNOLOGIES, INC.
	51 Hwangong Rd., Yongkang Industrial Park, Tainan 710, Taiwan
Tested:	September 7, 2006 ~ September 9, 2006

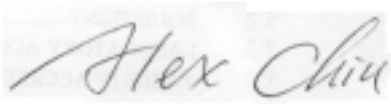
EMISSION			
Standard	**Item**	**Result**	**Remarks**
FCC 47 CFR Part 15 Subpart B, ICES-003 Issue 4 ANSI C63.4-2003	Conducted (Main Port)	PASS	Meet Class B limit
	Radiated	PASS	Meet Class B limit

Note: 1. The test result judgment is decided by the limit of measurement standard
2. The information of measurement uncertainty is available upon the customer's request.

Deviation from Applicable Standard
None

The above equipment has been tested by Compliance Certification Services Inc., and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Approved by:



Alex Chiu
Manager

Reviewed by:

Jeter Wu
Section Manger

2 EUT DESCRIPTION

Product	NS-600
Model	NS-600
Data Applies To	NS-4001; NS-400-2
Applicant	NXTAR TECHNOLOGIES, INC.
Housing material	Metal
EUT Type	☒Engineering Sample. ☐ Product Sample, ☐ Mass Product Sample.
Serial Number	None
Received Date	September 4, 2006
Power Source	AC 100~240V 1.3A 60Hz or DC 12V 1.5A 60Hz
Power cord	Unshielded, 1.1m

Note: 1. Client consigns only one model sample to test (Model Number: NS-600), Therefore, the testing Lab. just guarantees the unit, which has been tested.

2. According to customer declaration, the EUT included power cable for sale.

Model Number / Appearance/ Function	NS-600	NS-400-1	NS400-2
Front Penal LED Display	TAMPER 1~6 Normal: Green Abnormal: Red ALARM 1~6 Normal: None Alarm: Red	TAMPER 1~4 Normal: Green Abnormal: Red ALARM 1~4 Normal: None Alarm: Red	TAMPER 1~4 Normal: Green Abnormal: Red ALARM 1~4 Normal: None Alarm: Red
Back Penal Light Source Output & Signal Input	Light Source Output port:1 Signal Input Ports: 6 Optical Connectors: 7	Light Source Output port:4 Signal Input Ports: 4 Optical Connectors: 8	Light Source Output port:1 Signal Input Ports: 4 Optical Connectors: 5
Optical Structure Inside Controller	6 sets of OE converters are connected to signal input ports separately. LD is connected to Isolator then connected to Light Source Output Port.	4 sets of OE converters are connected to signal input ports separately. LD is connected to an Isolator, then thru 3 units of 1x2 coupler, the light is split into 4 outputs.	4 sets of OE converters are connected to signal input ports separately. LD is connected to Isolator then connected to Light Source Output Port.
Circuit Structure Inside Controller	Solder the pieces onto the circuit as indicated by the NS600-5 circuit design	Solder the pieces onto the circuit as indicated by the NS600-5 circuit design except for page 5 and 6 (as referred to C on the Circuit.	Solder the pieces onto the circuit as indicated by the NS600-5 circuit design except for page 5 and 6 (as referred to C on the Circuit.
Number of Relay Ports	14	10	10

3 TEST METHODOLOGY

3.1. DECISION OF FINAL TEST MODE

The EUT was tested together with the above additional components, and a configuration, which produced the worst emission levels, was selected and recorded in this report.

The test configuration/ mode is as the following:

Test Mode: Normal link

3.2. EUT SYSTEM OPERATION

1. Setup whole system for test completely for test as shown on setup diagram.
2. Turn on power.
3. Check EUT function.
4. Start testing.

Note: *Test program is self-repeating throughout the test.*

4 SETUP OF EQUIPMENT UNDER TEST

4.1. DESCRIPTION OF SUPPORT UNITS

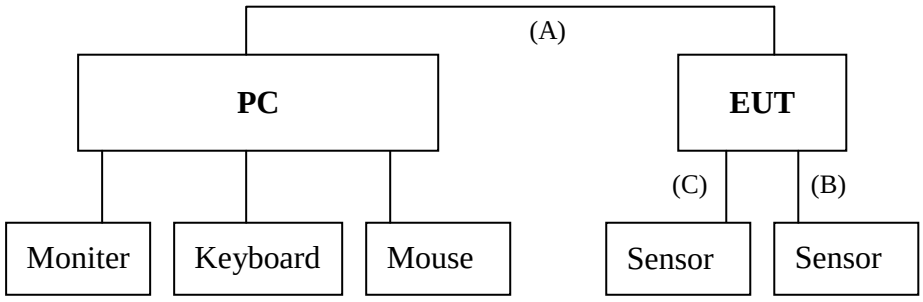
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Product	Manufacturer	Model No.	Certify No.	Signal cable
1	PC	HP	d330uT	R33001	Power cable, unshd, 1.5m
2	LCD Monitor	SAMPO	SL7003	R4AA03	VGA cable, shd, 1.5m
3	Keyboard(PS2)	HP	KB-0133	DOC	Keyboard cable, shd, 1.9m
4	Mouse(PS2)	HP	M-S69	JNZ211443	Mouse cable, shd, 1.8m

No.	Signal cable description	
A	RS-232 cable	1.9m, unshielded, 1pcs
B	Fiber cable	10m, unshielded, 4pcs
C	Fiber cable	3m, unshielded, 3pcs

Note:
1) All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2) Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

4.2. CONFIGURATION OF SYSTEM UNDER TEST



5 FACILITIES AND ACCREDITATIONS

5.1. FACILITIES

All measurement facilities used to collect the measurement data are located at

No. 8, Jiu Cheng Ling, Jiaokeng Village,Sinhua Township, Tainan Hsien 712, Taiwan R.O.C.

The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

5.2. ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

USA	FCC, NVLAP
Germany	TUV Rheinland
Japan	VCCI
Canada	INDUSTRY CANADA
Taiwan	TAF, BSMI

Copies of granted accreditation certificates are available for downloading from our web site, http://www.ccsemc.com.tw

5.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency		Uncertainty
Conducted emissions	9kHz~30MHz		± 0.98 dB
Radiated emissions	Horizontal	30MHz ~ 200MHz	± 0.78 dB
		200MHz ~1000MHz	± 0.78 dB
	Vertical	30MHz ~ 200MHz	± 0.78 dB
		200MHz ~1000MHz	± 0.78 dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

6 EMISSION TEST

6.1. CONDUCTED EMISSION MEASUREMENT

6.1.1. LIMITS

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	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 A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

6.1.2. TEST INSTRUMENTS

Conducted Emission room				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
L.I.S.N.	SCHWARZBECK	NNLK 8121	8121-446	OCT.21, 2006 For Insertion loss
	Rohde & Schwarz	ESH-Z5	840062/021	N/A
TEST RECEIVER	Rohde & Schwarz	ESCS 30	100348	JUN. 17, 2007
TYPE N COAXIAL CABLE	SUHNER	--------	----------	FEB. 26, 2007
Test S/W	e-3 (5.04211c) R&S (2.27)			

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. N.C.R = No Calibration Request.

6.1.3. TEST PROCEDURES (SOP : SI-SP-010)

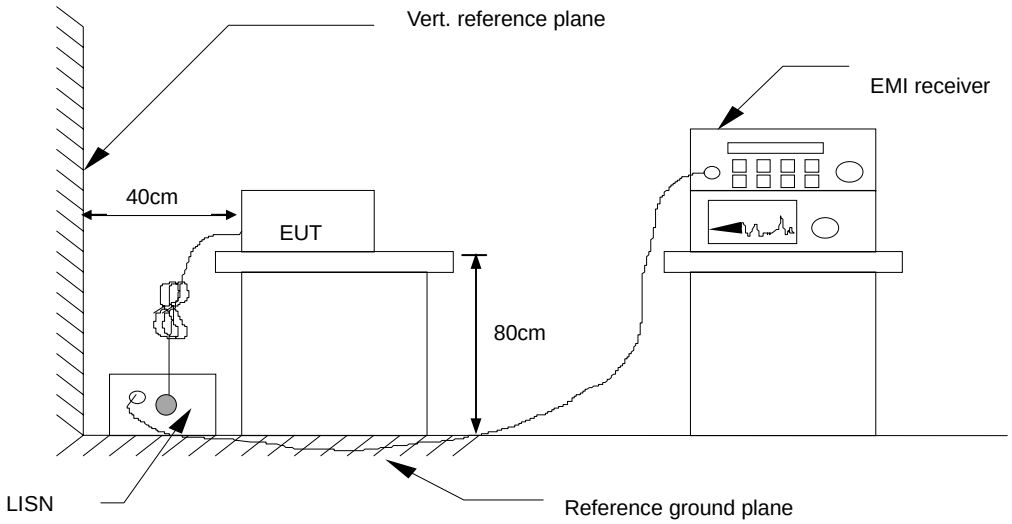
Procedure of Preliminary Test

- The EUT and Support equipment, if needed, was set up as per the test configuration to simulate typical usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per EN 55022 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor standing equipment, it is placed on the ground plane, which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- All I/O cables were positioned to simulate typical actual usage as per EN 55022.
- The test equipment EUT installed received AC main power, through a Line Impedance Stabilization Network (LISN), which supplied power source and was grounded to the ground plane.
- All support equipment power received from a second LISN.
- The EUT test program was started. Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.
- The Receiver scanned from 150kHz to 30MHz for emissions in each of the test modes.
- During the above scans, the emissions were maximized by cable manipulation.
- The test mode(s) described in Item 3.1 were scanned during the preliminary test.
- After the preliminary scan, we found the test mode described in Item 3.1 producing the highest emission level.
- The EUT configuration and cable configuration of the above highest emission levels were recorded for reference of the final test.

Procedure of Final Test

- EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.
- A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.
- The test data of the worst-case condition(s) was recorded.

6.1.4. TEST SETUP



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

6.1.5. Data Sample:

Freq. (MHz)	LISN Factor (dB)	Cable Loss (dB)	Meter Reading (dBuV)	Measured Level (dBuV)	Limits (dBuV)	Over Limits (dBuV)	Detector
x.xx	9.6	0.1	15.7	25.4	46	-20.6	QP

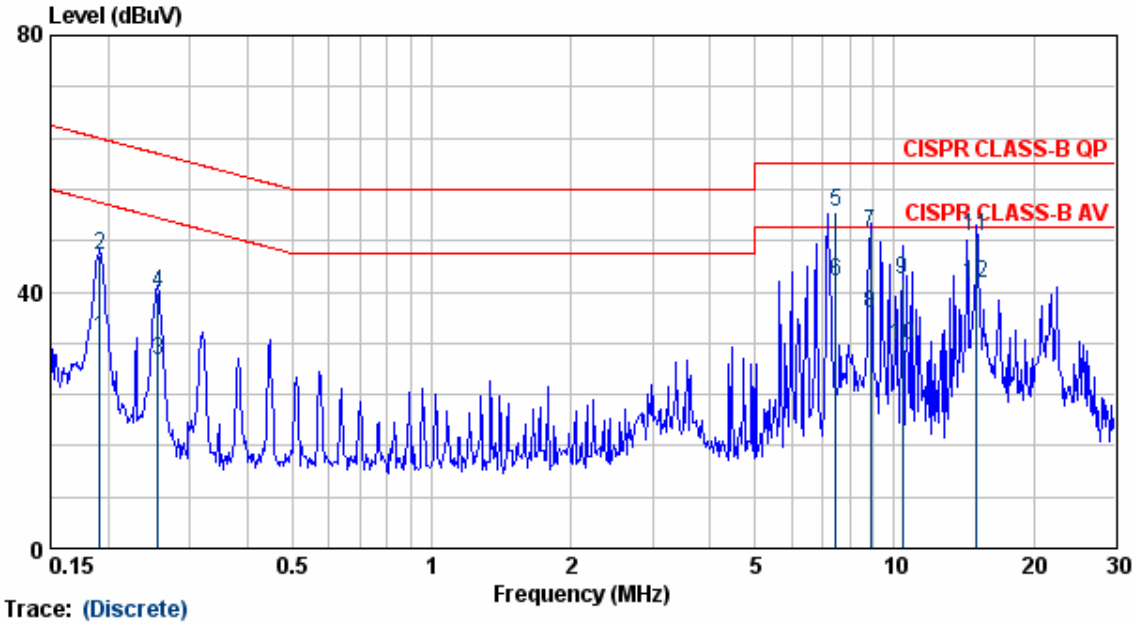
REMARKS： 1. Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB)

2. Over Limit value (dB) = Level (dBuV) – Limit Line (dBuV)

6.1.6. TEST RESULTS

Model No.	NS-600	**6dB BANDWIDTH**	9 kHz
Environmental Conditions	25.7deg.C, 49% RH,	**Test Mode**	Normal link
Tested by:	Agun		

LINE



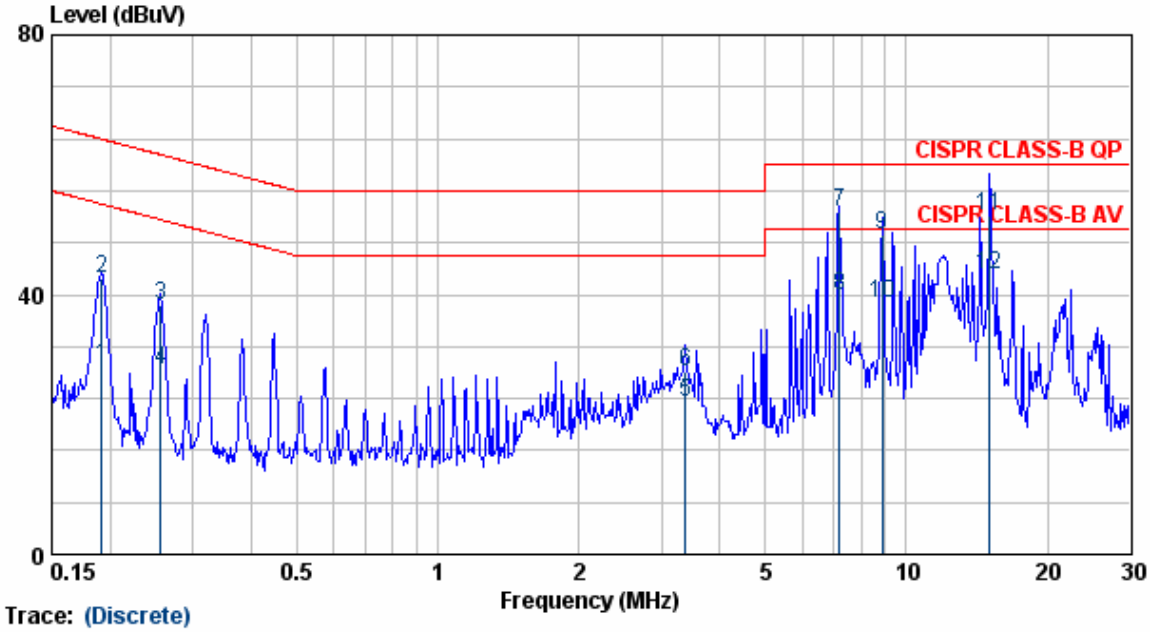
	Freq. MHz	LISN Factor dB	Cable Loss dB	Meter Reading dBuV	Measured Level dBuV	Limits dBuV	Over Limits dBuV	Detector
	0.191	9.80	0.05	23.02	32.87	53.98	-21.10	AVERAGE
	0.191	9.80	0.05	35.86	45.71	63.98	-18.26	QP
@	0.256	9.84	0.05	19.31	29.20	51.56	-22.36	AVERAGE
@	0.256	9.84	0.05	29.86	39.75	61.56	-21.81	QP
	7.466	9.87	0.46	42.17	52.50	60.00	-7.50	QP
	7.466	9.87	0.46	31.29	41.62	50.00	-8.38	AVERAGE
	8.869	9.89	0.56	38.68	49.13	60.00	-10.87	QP
	8.869	9.89	0.56	26.07	36.52	50.00	-13.48	AVERAGE
	10.397	9.90	0.59	31.52	42.01	60.00	-17.99	QP
@	10.397	9.90	0.59	21.11	31.60	50.00	-18.40	AVERAGE
	15.063	9.90	0.21	38.67	48.79	60.00	-11.22	QP
	15.063	9.90	0.21	31.18	41.30	50.00	-8.71	AVERAGE

REMARKS： 1.Level (dBuV/m) = Read Level (dBuV) + Antenna Factor (dB/m) + Cable loss (dB)

2.Over Limit value (dB) = Level (dBuV/m)-Limit Line(dBuV/m)

Model No.	NS-600	**6dB BANDWIDTH**	9 kHz
Environmental Conditions	25.7deg.C, 49% RH,	**Test Mode**	Normal Link
Tested by:	Agun		

NEUTRAL



Trace: (Discrete)

	Freq. MHz	LISN Factor dB	Cable Loss dB	Meter Reading dBuV	Measured Level dBuV	Limits dBuV	Over Limits dBuV	Detector
	0.191	9.80	0.05	19.05	28.90	53.98	-25.07	AVERAGE
	0.191	9.80	0.05	32.68	42.53	63.98	-21.44	QP
	0.256	9.84	0.05	28.62	38.51	61.56	-23.05	QP
@	0.256	9.84	0.05	18.57	28.46	51.56	-23.10	AVERAGE
@	3.381	9.85	0.10	13.63	23.58	46.00	-22.42	AVERAGE
	3.381	9.85	0.10	18.16	28.11	56.00	-27.89	QP
	7.213	9.86	0.45	42.49	52.80	60.00	-7.20	QP
@	7.213	9.86	0.45	29.67	39.98	50.00	-10.02	AVERAGE
@	8.869	9.89	0.56	38.86	49.31	60.00	-10.69	QP
	8.869	9.89	0.56	28.09	38.54	50.00	-11.46	AVERAGE
	15.064	9.90	0.21	42.02	52.14	60.00	-7.87	QP
	15.064	9.90	0.21	33.07	43.19	50.00	-6.81	AVERAGE

REMARKS： 1.Level (dBuV/m) = Read Level (dBuV) + Antenna Factor (dB/m) + Cable loss (dB)

2.Over Limit value (dB) = Level (dBuV/m)-Limit Line(dBuV/m)

6.2. LIMITS OF RADIATED EMISSION MEASUREMENT

FREQUENCY (MHz)	dBuV/m (At 10m)	
	Class A	Class B
30 ~ 230	40	30
230 ~ 1000	47	37

NOTE: (1) The lower limit shall apply at the transition frequencies.
(2) Emission level (dBuV/m) = 20 log Emission level (uV/m).

6.2.1. TEST INSTRUMENTS

Open Area Test Site # 5				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
O.A.T.S	----------	----------	No.5	SEP. 12, 2007
TEST RECEIVER	Rohde & Schwarz	ESCS 30	100294	JAN. 09, 2007
Pre-Amplifier	CCS	EPA-3000A	----------	MAR. 09, 2007
SPECTRUM ANALYZER	HP	8595E	3308A00344	APR. 08, 2007
TYPE N COAXIAL CABLE	SUHNER	CHA9513	004	SEP. 12, 2007
BILOG ANTENNA	CHASE	CBL6112B	2563	FEB. 06, 2007
Test Software	EMI e-3 / AUDIX (5.04211c)			

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. N.C.R = No Calibration Request.

6.2.2. TEST PROCEDURES(SOP : SI-SP-016)

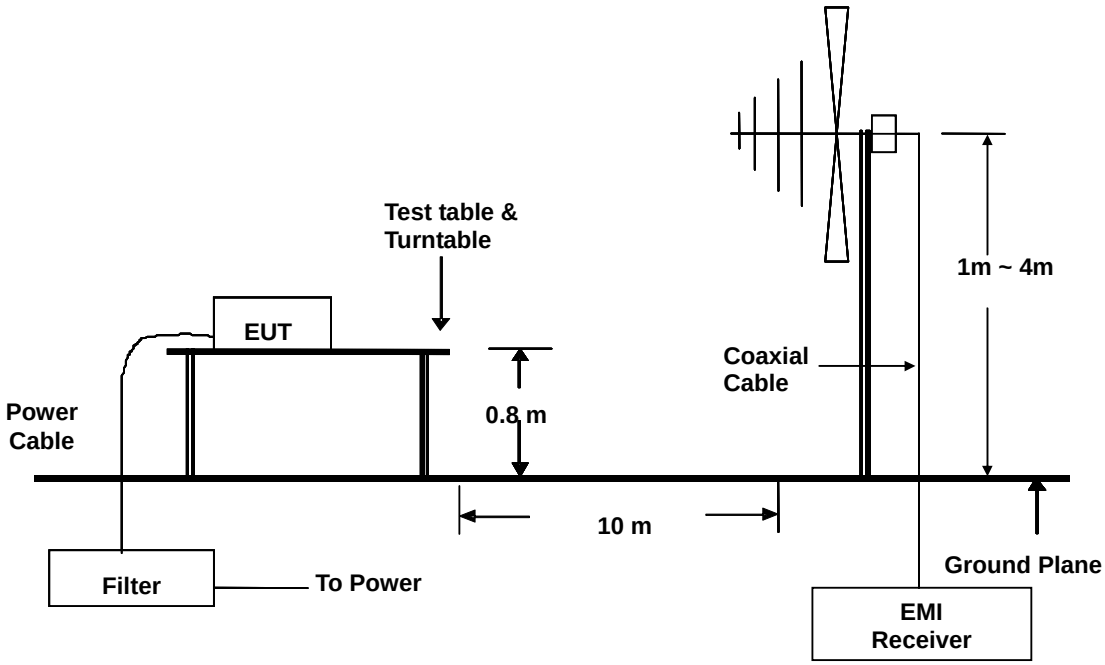
Procedure of Preliminary Test

- The equipment was set up as per the test configuration to simulate typical usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane. When the EUT is a floor standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- Support equipment, if needed, was placed as per ANSI C63.4.
- All I/O cables were positioned to simulate typical usage as per ANSI C63.4.
- The EUT received AC power source from the outlet socket under the turntable. All support equipment power received from another socket under the turntable.
- Mains cables, telephone lines or other connections to auxiliary equipment located outside the test shall drape to the floor, be fitted with ferrite clamps or ferrite tubes placed on the floor at the point where the cable reaches the floor and then routed to the place where they leave the turntable. No extension cords shall be used to mains receptacle.
- The antenna was placed at 10 meter away from the EUT as stated in ANSI C63.4. The antenna connected to the Spectrum Analyzer via a cable and at times a pre-amplifier would be used.
- The Analyzer / Receiver quickly scanned from 30MHz to 1000MHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- The test mode(s) described in Item 3.1 were scanned during the preliminary test:
- After the preliminary scan, we found the test mode described in Item 3.1 producing the highest emission level.
- The EUT and cable configuration, antenna position, polarization and turntable position of the above highest emission level were recorded for the final test.

Procedure of Final Test

- EUT and support equipment were set up on the turntable as per the configuration with highest emission level in the preliminary test.
- The Analyzer / Receiver scanned from 30MHz to 1000MHz. Emissions were scanned and measured rotating the EUT to 360 degrees, varying cable placement and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- Recorded at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and only Q.P. reading is presented.
- The test data of the worst-case condition(s) was recorded.

6.2.3. TEST SETUP



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

6.2.4. Data Sample:

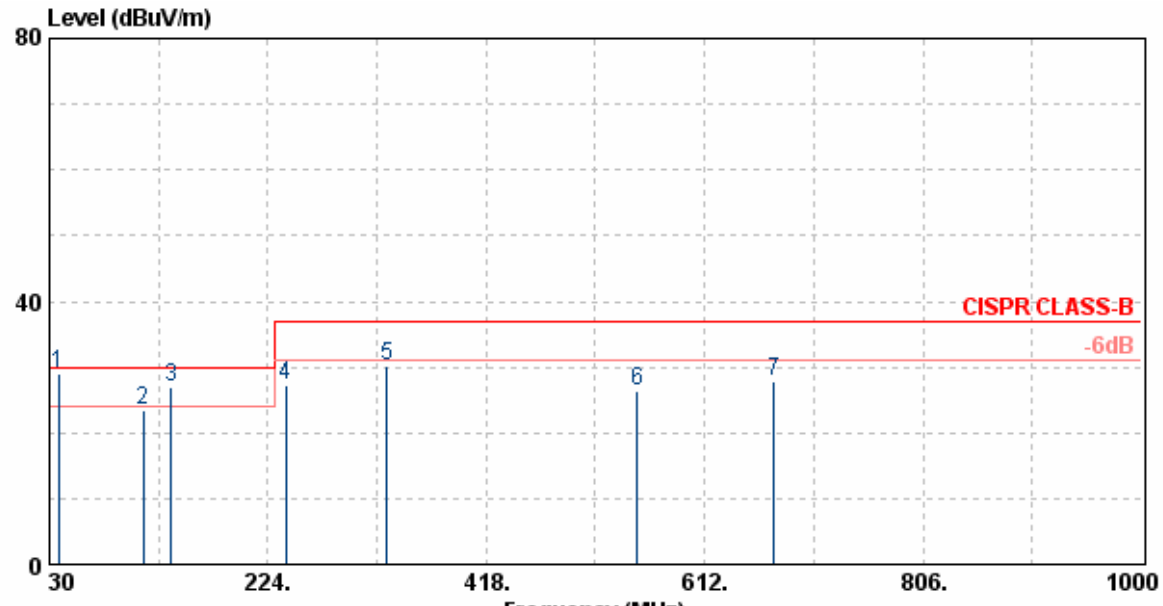
Freq. (MHz)	Reading Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dBuV/m)
xx.xx	14.00	12	0.2	26.2	30	-3.80

REMARKS： 1.Level (dBuV/m) = Read Level (dBuV) + Antenna Factor (dB/m) + Cable loss (dB)

2.Over Limit value (dB) = Level (dBuV/m)-Limit Line(dBuV/m)

6.2.5. TEST RESULTS

Model No.	NS-600	**Test Mode**	Normal operation
Environmental Conditions	31.2deg.C, 48% RH,	**6dB BANDWIDTH**	120 kHz
Antenna Pole	Vertical	**Antenna Distance**	10m
Detector Function:	Quasi-peak.	**Tested by:**	Eric yang



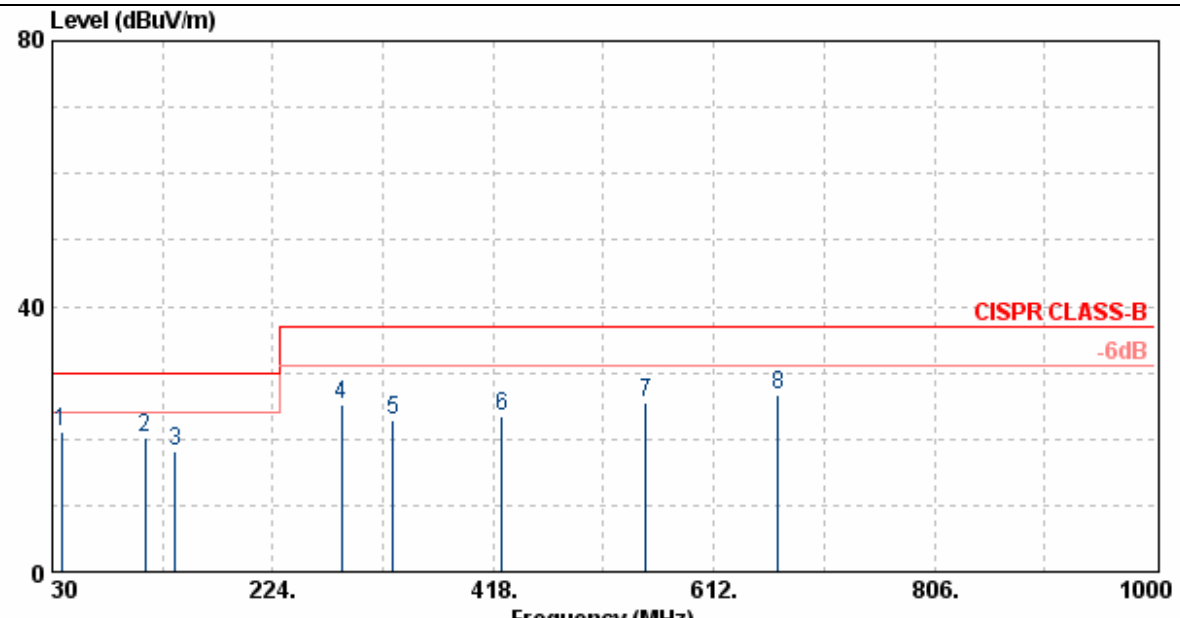
Trace: (Discrete)

Freq. MHz	Reading Level dBuV	Antenna Factor dB/m	Cable Loss dB	Measure Level dBuV/m	Limit dBuV/m	Over Limit dBuV/m
37.73	12.46	15.00	1.53	28.99	30.00	-1.01
113.28	8.22	13.17	2.05	23.43	30.00	-6.57
138.43	11.90	12.88	2.05	26.83	30.00	-3.17
240.30	13.20	11.42	2.77	27.39	37.00	-9.61
330.00	12.85	13.70	3.72	30.27	37.00	-6.73
552.30	3.11	18.22	5.15	26.48	37.00	-10.52
673.50	2.58	19.81	5.51	27.90	37.00	-9.10

REMARKS： 1.Level (dBuV/m) = Read Level (dBuV) + Antenna Factor (dB/m) + Cable loss (dB)

2.Over Limit value (dB) = Level (dBuV/m)-Limit Line(dBuV/m)

Model No.	NS-600	**Test Mode**	Normal operation
Environmental Conditions	31.2deg.C, 48% RH,	**6dB BANDWIDTH**	120 kHz
Antenna Pole	Horizontal	**Antenna Distance**	10m
Detector Function:	Quasi-peak.	**Tested by:**	Eric yang



Trace: (Discrete)

Freq. MHz	Reading Level dBuV	Antenna Factor dB/m	Cable Loss dB	Measure Level dBuV/m	Limit dBuV/m	Over Limit dBuV/m
37.73	4.53	15.00	1.53	21.06	30.00	-8.94
111.50	5.11	12.93	2.07	20.11	30.00	-9.89
138.20	3.15	12.88	2.05	18.08	30.00	-11.92
284.30	8.47	13.38	3.49	25.34	37.00	-11.66
330.20	5.48	13.70	3.72	22.90	37.00	-14.10
425.30	2.58	16.44	4.33	23.35	37.00	-13.65
552.10	2.15	18.22	5.15	25.52	37.00	-11.48
668.20	1.57	19.85	5.37	26.79	37.00	-10.21

REMARKS： 1.Level (dBuV/m) = Read Level (dBuV) + Antenna Factor (dB/m) + Cable loss (dB)

2.Over Limit value (dB) = Level (dBuV/m)-Limit Line(dBuV/m)

7 PHOTOGRAPHS OF THE TEST CONFIGURATION

CONDUCTED EMISSION TEST

RADIATED EMISSION TEST

END OF REPORT