

FCC PART 15 SUBPART B MEASUREMENT AND TEST REPORT

For

Prentke Romich Company, LLC

1022 Heyl Rd. Wooster, Ohio 44691

MODEL: ACN1400

March 06, 2015

This Report Concerns: ☒ Original Report	Equipment Type: Accent 1400
Test By:	Kare Gao / <i>Kare Gao</i>
Report Number:	QCT15BR-1201E
Test Date:	February 12~ March 06, 2015
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1 - GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: **Prentke Romich Company, LLC**
Address of applicant: 1022 Heyl Rd. Wooster, Ohio 44691
Manufacturer: **Prentke Romich Company, LLC**
Address of manufacturer: 1022 Heyl Rd. Wooster, Ohio 44691

General Description of E.U.T

EUT Description: **Accent 1400**
Trade Mark: 
Model No.: **ACN1400**
Power Rating: 7.4VDC from battery, AC 120V/60Hz for adapter.
Adapter Information: Model No: MENB1060A1800N02;
Manufacturer: SL POWER and AULT
Input: 100-240V~ 50-60Hz 1.5A Max ; Output: 18.0V 3.4A

Remark: * The test data gathered are from the production sample provided by the manufacturer.

1.2 Test Standards

The following Declaration of Conformity report of EUT is prepared in accordance with FCC Rules and Regulations Part 15 Subpart B

The objective of the manufacturer is to demonstrate compliance with the described above standards.

1.3 Test Summary

For the EUT described above. The standards used were FCC Part 15 Subpart B for Emissions

Table 1 : Tests Carried Out Under FCC Part 15 Subpart B

Standard	Test Items	Status
FCC Part 15 Subpart B	Conduction Emission, 0.15MHz to 30MHz	√
FCC Part 15 Subpart B	Radiation Emission, 30MHz to 1GHz	√

√ Indicates that the test is applicable
× Indicates that the test is not applicable

1.4 Test Methodology

All measurements contained in this report were conducted with CISPR 16-1-1: 2006, radio disturbance and immunity measuring apparatus, and CISPR 16-2-3: 2010, Method of measurement of disturbances and immunity. All measurement required was performed at Shenzhen CTL Testing Technology Co., Ltd. at Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road, Nanshan District, Shenzhen, China 518055

1.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

CNAS – Registration No.: L5540

Shenzhen CTL Testing Technology Co., Ltd. To ISO/IEC 17025:25 General Requirements for the Competence of Testing and Calibration Laboratories(CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.The acceptance letter from the CNAS is maintained in our files: Registration: L5540, March, 2012.

FCC – Registration No.: 970318

Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been Registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration:970318, December 19, 2013.

2 - SYSTEM TEST CONFIGURATION

2.1 Justification

The system was configured for testing in a typical fashion (as only used by a typical user).

2.2 EUT Exercise Software

The EUT exercising program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The software offered by manufacture, can let the EUT being ON operation.

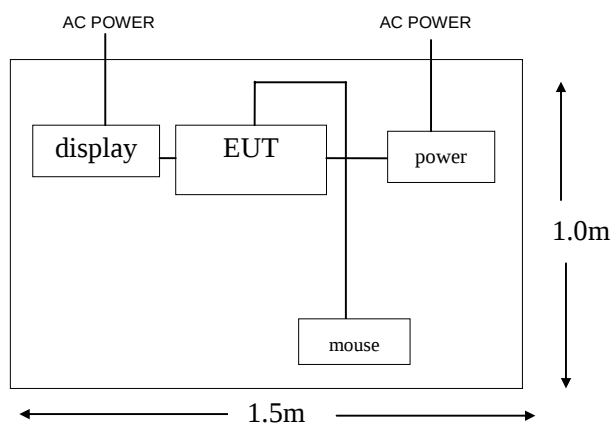
2.3 Special Accessories

As shown in section 2.5, interface cable used for compliance testing is shielded as normally supplied by Prentke Romich Company, LLC and its respective support equipment manufacturers.

2.4 Equipment Modifications

The EUT tested was not modified by QCT.

2.5 Configuration of Test System



3 - DISTURBANCE VOLTAGE AT THE MAINS TERMINALS

3.1 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement is ± 3.1 dB.

3.2 Limit of Disturbance Voltage at The Mains Terminals

Frequency Range (MHz)	Limits (dBuV)	
	Quasi-Peak	Average
0.150~0.500	66~56	56~46
0.500~5.000	56	46
5.000~30.00	60	50

Note: (1)The tighter limit shall apply at the edge between two frequency bands.

3.3 EUT Setup

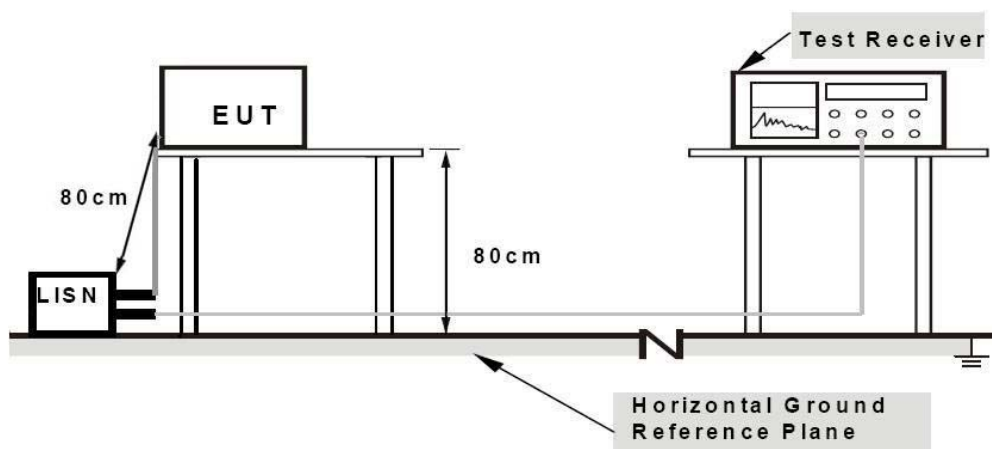
The setup of EUT is according with ANSI C63.4-2009 measurement procedure. The specification used was the FCC Rules and Regulations Part 15 Subpart B limits.

The EUT was placed center and the back edge of the test table.

The AV cables were draped along the test table and bundled to 30-40cm in the middle.

The spacing between the peripherals was 10 cm.

Maximum emission emitted from EUT was determined by manipulating the EUT, support equipment, interconnecting cables and varying the mode of operation and the levels in the final result of the test were recorded with the EUT running in the operating mode that maximum emission was emitted.



3.4 Instrument Setup

The test receiver was set with the following configurations:

Test Receiver Setting:

Frequency Range.....150 KHz to 30 MHz
Detector.....Peak & Quasi-Peak & Average
Sweep Speed.....Auto
IF Band Width.....9 KHz

3.5 Test Procedure

During the conducted emission test, the EUT power cord was connected to the auxiliary outlet of the first Artificial Mains.

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance using all installation combination.

All data was recorded in the peak detection mode. Quasi-peak and Average readings were only performed when an emission was found to be marginal (within -10 dB μ V of specification limits). Quasi-peak readings are distinguished with a "QP". Average readings are distinguished with a "AV".

3.6 Summary of Test Results

According to the data in section 3.6, the EUT complied with the FCC Part 15 B Conducted margin, with the *worst* margin reading of:

3.7 Disturbance Voltage Test Data

Temperature (°C)	22~25
Humidity (%RH)	50~55
Barometric Pressure (mbar)	950~1000
EUT	Accent 1400
M/N	ACN1400
Operating Mode	ON

Test data see following pages

Remark: (1) When PK reading is less than relevant limit 20dB, the QP reading and AV reading will not be recorded.
(2) Where QP reading is less than relevant AV limit, the AV reading will not be measured

3.8 Test Equipment List and Details

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESCI	1166.5950.03	2014.03.19
2	Teo Line Single Phase Module	R&S	ESH2-Z5	100393	2014.03.19

3.9 Test Result

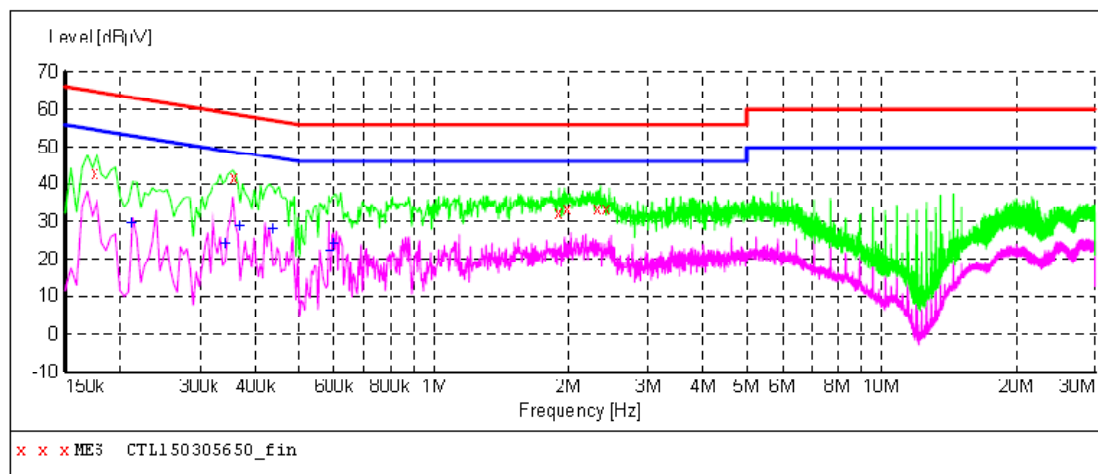
PASS

Conducted Emission Test Data

EUT: Accent 1400
M/N: ACN1400
Operating Condition: ON
Test Site: Shielded Room
Operator: Cheng
Test Specification: AC 120V/60Hz
Comment: Live Line
Start of Test: Tem:25°C Hum:50%

SCAN TABLE: "Voltage (9K-30M) FIN"

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "CTL150305650_fin"

3/5/2015 9:21AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.174000	42.80	10.2	65	22.0	QP	L1	GND
0.358000	41.70	10.2	59	17.1	QP	L1	GND
1.386000	32.20	10.3	56	23.8	QP	L1	GND
1.988000	33.30	10.3	56	22.7	QP	L1	GND
2.318000	33.40	10.4	56	22.6	QP	L1	GND
2.426000	33.30	10.4	56	22.7	QP	L1	GND

MEASUREMENT RESULT: "CTL150305650_fin2"

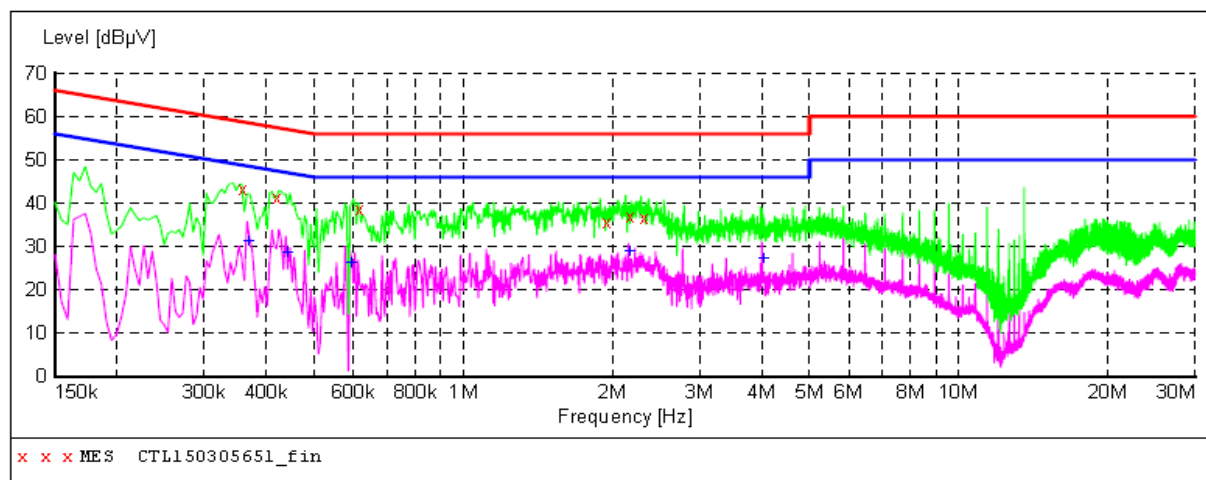
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Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.210000	29.50	10.2	53	23.7	AV	L1	GND
0.342000	24.30	10.2	49	24.9	AV	L1	GND
0.366000	29.00	10.2	49	19.6	AV	L1	GND
0.434000	27.90	10.2	47	19.3	AV	L1	GND
0.584000	22.50	10.2	46	23.5	AV	L1	GND
0.596000	24.10	10.2	46	21.9	AV	L1	GND

Conducted Emission Test Data

EUT: Accent 1400
M/N: ACN1400
Operating Condition: ON
Test Site: Shielded Room
Operator: Cheng
Test Specification: AC 120V/60Hz
Comment: Neutral Line
Start of Test: Tem:25°C Hum:50%

SCAN TABLE: "Voltage (9K-30M) FIN"
Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "CTL150305651_fin"

3/5/2015 9:25AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.358000	43.30	10.2	59	15.5	QP	N	GND
0.418000	41.10	10.2	58	16.4	QP	N	GND
0.614000	38.50	10.2	56	17.5	QP	N	GND
1.934000	35.50	10.3	56	20.5	QP	N	GND
2.162000	36.90	10.4	56	19.1	QP	N	GND
2.306000	36.50	10.4	56	19.5	QP	N	GND

MEASUREMENT RESULT: "CTL150305651_fin2"

3/5/2015 9:25AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.366000	31.30	10.2	49	17.3	AV	N	GND
0.438000	28.80	10.2	47	18.3	AV	N	GND
0.590000	26.30	10.2	46	19.7	AV	N	GND
2.162000	29.10	10.4	46	16.9	AV	N	GND
4.010000	27.30	10.4	46	18.7	AV	N	GND

4 - RADIATED DISTURBANCES

4.1 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement is ± 3.4 dB.

4.2 Limit of Radiated Disturbances

Frequency (MHz)	Distance (Meters)	Field Strengths Limits (dB μ V/m)
30 ~ 88	3	40
88~216	3	43.5
216 ~ 960	3	46
960 ~ 1000	3	54

Note: (1) The tighter limit shall apply at the edge between two frequency bands.
(2) Distance refers to the distance in meters between the test instrument antenna and the closest point of any part of the E.U.T.

4.3 EUT Setup

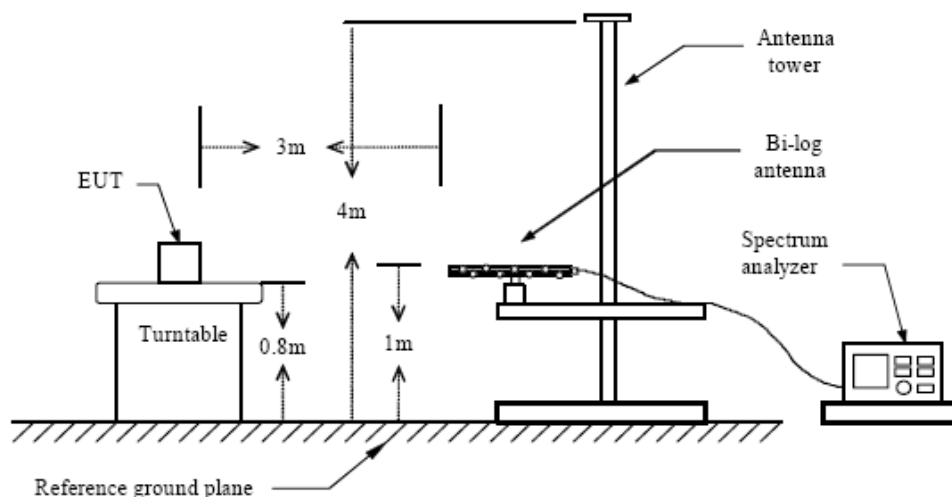
The radiated emission tests were performed in the in the 3-meter anechoic chamber, using the setup accordance with the ANSI C63.4-2009. The specification used was the FCC Part 15 Subpart B limits.

The EUT was placed on the center of the test table.

Maximum emission emitted from EUT was determined by manipulating the EUT, support equipment, interconnecting cables and varying the mode of operation and the levels in the final result of the test were recorded with the EUT running in the operating mode that maximum emission was emitted.

Block diagram of test setup (In chamber)

Below 1 GHz



4.4 Test Receiver Setup

According to FCC Part 15 rule, the frequency was investigated from 30 to 1000 MHz. During the radiated emission test, the test receiver was set with the following configurations:

Test Receiver Setting:

Detector.....Peak & Quasi-Peak
IF Band Width.....120KHz
Frequency Range.....30MHz to 1000MHz
Turntable Rotated.....0 to 360 degrees

Antenna Position:

Height.....1m to 4m
Polarity.....Horizontal and Vertical

4.5 Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the peak detection mode. Quasi-peak readings performed only when an emission was found to be marginal (within -10 dB μ V of specification limits), and are distinguished with a "QP" in the data table.

4.6 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB μ V means the emission is 7dB μ V below the maximum limit for Subpart B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corr. Ampl.}$$

4.7 Radiated Emissions Test Result

Temperature (°C)	22~25
Humidity (%RH)	50~54
Barometric Pressure (mbar)	950~1000
EUT	Accent 1400
M/N	ACN1400
Operating Mode	ON

4.8 Test Equipment List and Details

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	ULTRA-BROADBAND ANTENNA	Sunol Sciences Corp.	JB1 Antenna	A061713	2014.05.22
2	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESCI	1166.5950.03	2014.03.19

4.9 Test Result

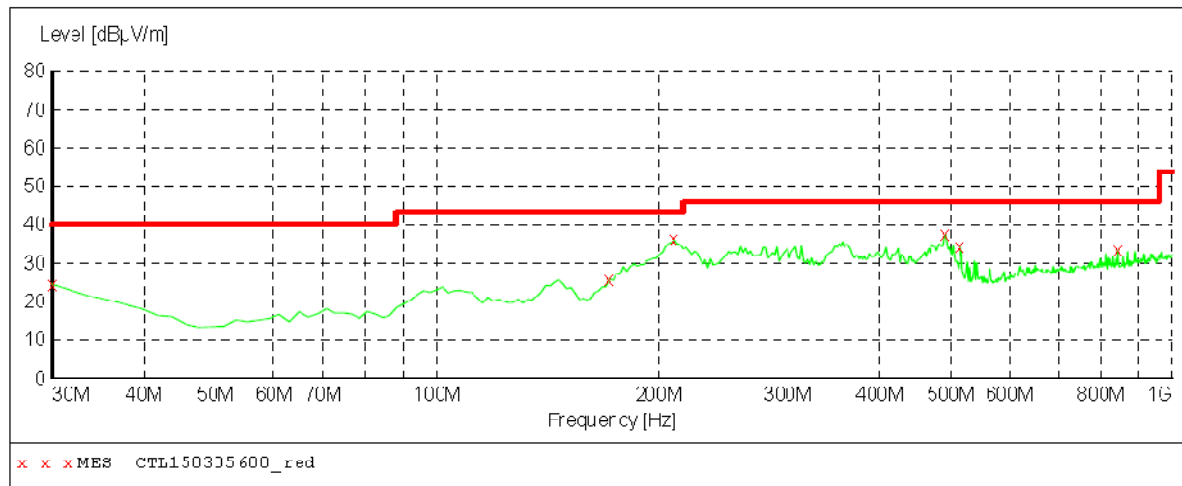
PASS

Radiated Emission Test Data

EUT: Accent 1400
 M/N: ACN1400
 Operating Condition: HD Playing
 Test Site: CHAMBER
 Operator: Pan
 Test Specification: AC 120V/60Hz
 Comment: Polarization: Horizontal
 Start of Test: Tem:25°C Hum:50%

SWEEP TABLE: "test (30M-1G)"

Short Description:		Field Strength				Transducer
Start	Stop	Detector	Meas. Time	IF Bandw.		
Frequency	Frequency					
30.0 MHz	1.0 GHz	MaxPeak	300.0 ms	120 kHz	JB1	



MEASUREMENT RESULT: "CTL150305600_red"

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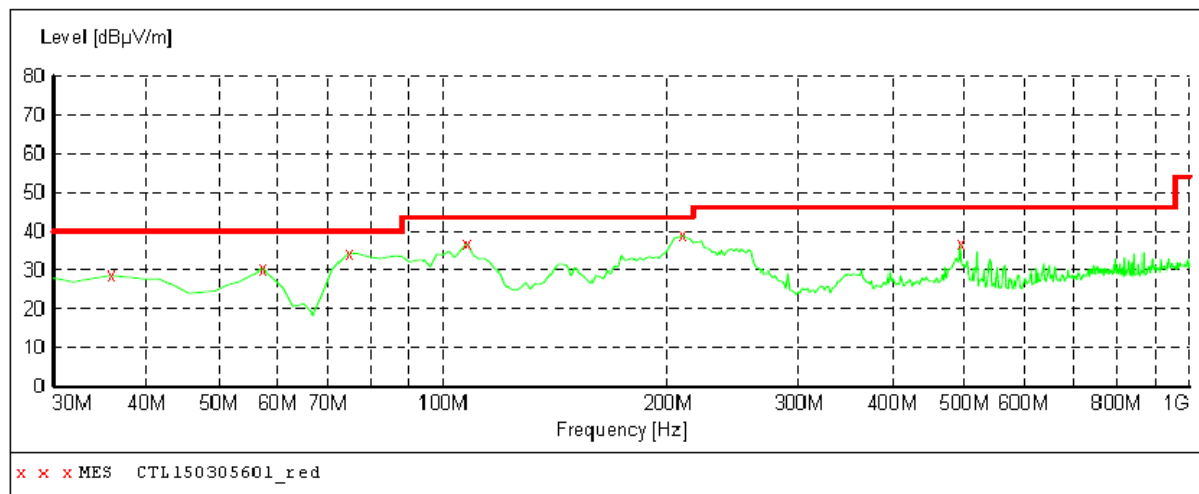
Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	24.60	21.1	40.0	15.4	QP	0.0	0.00	HORIZONTAL
171.620000	25.90	13.4	43.5	17.6	QP	0.0	0.00	HORIZONTAL
210.420000	36.20	14.3	43.5	7.3	QP	0.0	0.00	HORIZONTAL
491.720000	37.60	20.3	46.0	8.4	QP	0.0	0.00	HORIZONTAL
515.000000	34.40	20.5	46.0	11.6	QP	0.0	0.00	HORIZONTAL
842.860000	33.40	25.3	46.0	12.6	QP	0.0	0.00	HORIZONTAL

Radiated Emission Test Data

EUT: Accent 1400
 M/N: ACN1400
 Operating Condition: HD Playing
 Test Site: CHAMBER
 Operator: Pan
 Test Specification: AC 120V/60Hz
 Comment: Polarization: Vertical
 Start of Test: Tem:25°C Hum:50%

SWEEP TABLE: "test (30M-1G)"

Short Description:		Field Strength			
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
30.0 MHz	1.0 GHz	MaxPeak	300.0 ms	120 kHz	JB1



MEASUREMENT RESULT: "CTL150305601_red"

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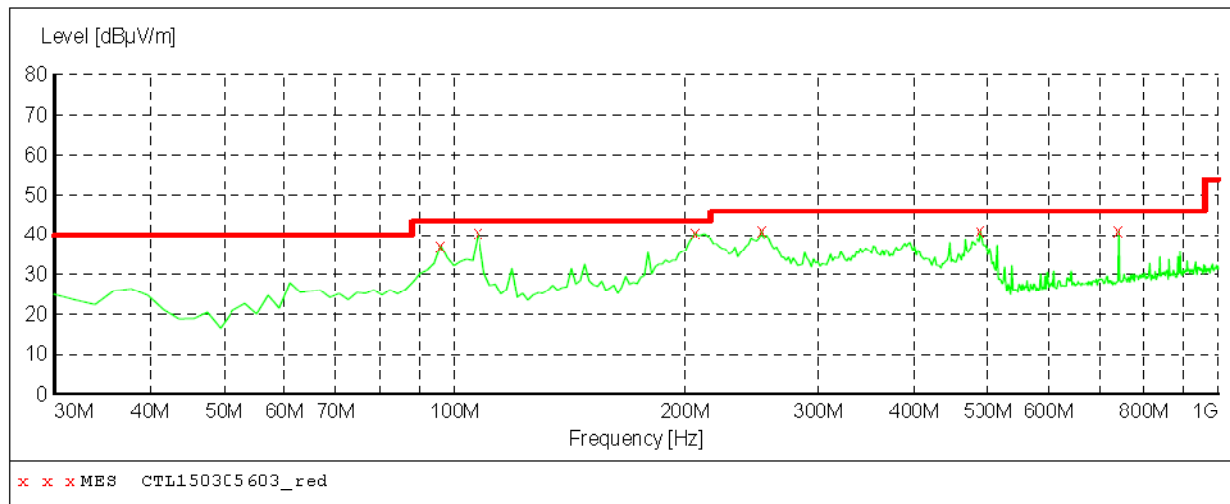
Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
35.820000	28.80	16.7	40.0	11.2	QP	0.0	0.00	VERTICAL
57.160000	30.30	8.3	40.0	9.7	QP	0.0	0.00	VERTICAL
74.620000	34.30	8.5	40.0	5.7	QP	0.0	0.00	VERTICAL
107.600000	36.80	13.3	43.5	6.7	QP	0.0	0.00	VERTICAL
208.480000	39.10	14.3	43.5	4.4	QP	0.0	0.00	VERTICAL
493.660000	36.70	20.3	46.0	9.3	QP	0.0	0.00	VERTICAL

Radiated Emission Test Data

EUT: Accent 1400
 M/N: ACN1400
 Operating Condition: HD Playing With HDMI Display
 Test Site: CHAMBER
 Operator: Pan
 Test Specification: AC 120V/60Hz
 Comment: Polarization: Horizontal
 Start of Test: Tem:25°C Hum:50%

SWEEP TABLE: "test (30M-1G)"

Short Description:		Field Strength			
Start	Stop	Detector	Meas. Time	IF Bandw.	Transducer
Frequency	Frequency				
30.0 MHz	1.0 GHz	MaxPeak	300.0 ms	120 kHz	JB1



MEASUREMENT RESULT: "CTL150305603_red"

3/5/2015 9:11AM

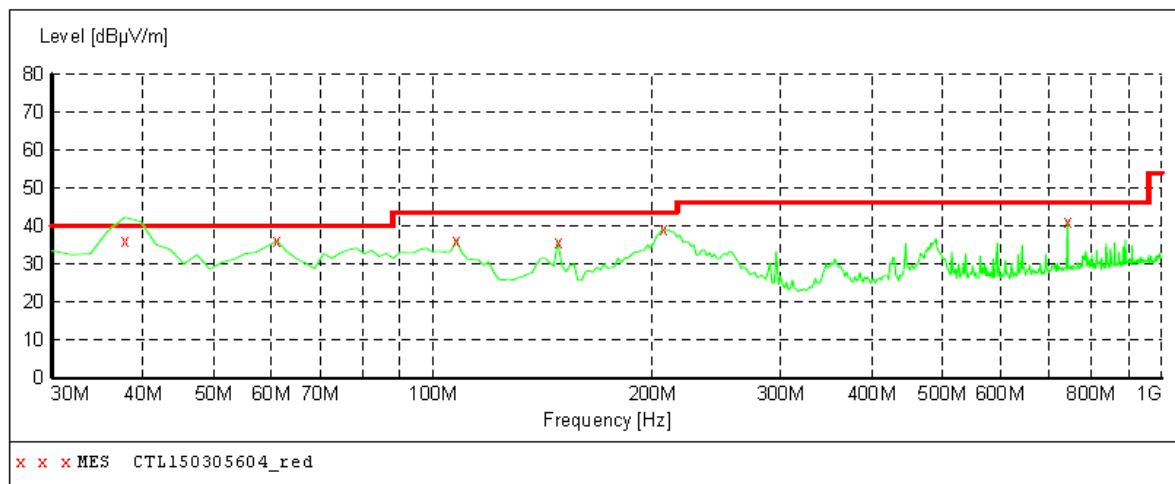
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
95.960000	37.00	10.6	43.5	6.5	QF	0.0	0.00	HORIZONTAL
107.600000	40.50	13.3	43.5	3.0	QF	0.0	0.00	HORIZONTAL
206.540000	40.50	14.3	43.5	3.0	QF	0.0	0.00	HORIZONTAL
253.100000	41.10	14.4	46.0	4.9	QF	0.0	0.00	HORIZONTAL
489.780000	41.10	20.3	46.0	4.9	QF	0.0	0.00	HORIZONTAL
741.980000	41.00	24.1	46.0	5.0	QF	0.0	0.00	HORIZONTAL

Radiated Emission Test Data

EUT: Accent 1400
 M/N: ACN1400
 Operating Condition: HD Playing With HDMI Display
 Test Site: CHAMBER
 Operator: Pan
 Test Specification: AC 120V/60Hz
 Comment: Polarization: Vertical
 Start of Test: Tem:25°C Hum:50%

SWEEP TABLE: "test (30M-1G)"

Short Description:		Field Strength			
Start	Stop	Detector	Meas. Time	IF Bandw.	Transducer
Frequency	Frequency				
30.0 MHz	1.0 GHz	MaxPeak	300.0 ms	120 kHz	JB1



MEASUREMENT RESULT: "CTL150305604_red"

3/5/2015 9:17AM

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
37.760000	36.20	15.3	40.0	3.8	QP	0.0	0.00	VERTICAL
61.040000	36.10	8.4	40.0	3.9	QP	0.0	0.00	VERTICAL
107.600000	36.10	13.3	43.5	7.4	QP	0.0	0.00	VERTICAL
148.340000	35.90	14.2	43.5	7.6	QP	0.0	0.00	VERTICAL
206.540000	39.00	14.3	43.5	4.5	QP	0.0	0.00	VERTICAL
741.980000	41.20	24.1	46.0	4.8	QP	0.0	0.00	VERTICAL