Application for FCC Certificate On Behalf of Hisense Electric Co., Ltd.

LED LCD TV

Model No.	Serial No.	Brand
LTDN50K316XWUS3D	E1204416-02/02	Llisonso
50K316DW		Hisense

FCC ID : W9HLCDF0006

- Prepared For : Hisense Electric Co., Ltd. No.218 Qianwangang Road, Economy & Technology Development Zone, Qingdao, China
- Prepared By : Audix Technology (Shanghai) Co., Ltd. 3F and 4F, 34Bldg 680 Guiping Rd, Caohejing Hi-Tech Park, Shanghai 200233, China
 - Tel: +86-21-64955500 Fax: +86-21-64955491

Report No. : ACI-F12087 Date of Test : May 14, 2012 Date of Report : May 16, 2012

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TEST REPORT FOR FCC CERTIFICATION

Applicant : Hisense

: Hisense Electric Co., Ltd.

Manufacturer : Hisense Electric Co., Ltd..

EUT Description : LED LCD TV

Model No.	Serial No.	Brand	Power Supply	
LTDN50K316XWUS3D	E1204416-02/02	Iliaanaa	1201///011-	
50K316DW		Hisense	120V/60Hz	

Test Procedure Used:

FCC RULES AND REGULATIONS PART 15 SUBPART C OCTOBER 2011 AND ANSI C63.4:2003

The device described above is tested by Audix Technology (Shanghai) Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C limits radiated emission.

The test results are contained in this test report and Audix Technology (Shanghai) Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. This report shows that the EUT (M/N: Refer to Sec2.1; S/N: Refer to Sec2.1), which was tested in 3m anechoic chamber on May. 14, 2012 to be technically compliant with the FCC official limits also.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Audix Technology (Shanghai) Co., Ltd.

This report contains data that are not covered by the NVLAP accreditation.

This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government by the client.

Date of Test :	May. 14, 2012	_ Date of Report : _	May. 16, 2012
Producer :	YENNY YU Assistant		•
Review :	DIO YANG / Assistant Manager		
Audix Technology (Shan Signatory :	d on behalf of ghai) Co., Ltd. Samp C. C. SAMMY CHEN / Deputy Manager		
Autorized Digitature Dari	V Standy Deputy Manager	-	

1 SUMMARY OF STANDARDS AND RESULTS

1.1 Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below:

Description / Test Item	scription / Test Item Test Standard			
Conducted Emission at the Mains Terminal	FCC RULES AND REGULATIONS PART 15 SUBPART C OCTOBER 2011 AND ANSI C63.4:2003	15.207	N/A	
Radiated Emission	FCC RULES AND REGULATIONS PART 15 SUBPART C OCTOBER 2011 AND ANSI C63.4:2003	15.209	Pass	
Fundamental and Harmonics Emission	FCC RULES AND REGULATIONS PART 15 SUBPART C OCTOBER 2011 AND ANSI C63.4:2003	15.249	Pass	
Band-Edge Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C OCTOBER 2011 AND ANSI C63.4:2003	15.249	Pass	
N/A is an abbreviation fo	r Not Applicable.			

2 GENERAL INFORMATION

2.1 Description of Equipment Under Test

Description : LED LCD TV

Type of EUT: \square Production \square Pre-product \square Pro-type

	Model N	lo.		Serial No.	Brand	
	LTDN50K316X	KWUS3	D	E1204416-02/02	Hisense	
	50K316E	OW		Hiselise		
Note :			dif The	e above models are al ferent model name. e LTDN50K316XWU orted in the report.	1	
Applicant :			No	sense Electric Co., Lt .218 Qianwangang R chnology Developme	oad, Economy &	
Manufacturer :			Hisense Electric Co., Ltd. No.218 Qianwangang Road, Economy & Technology Development Zone, Qingdao, China			
Modu	lation	:	MSK 500kbps			
Opera	tion Frequency	:	2458 MHz			
Frequ	ency Channel	:	Total 1 Channel			
Tested Frequency :			2458 MHz			
Antenna Location :			Top of the RF module Please see Figure 21 in APPENDIX III "Photographs of EUT" for further information.			nation.
Anten	na Type	:	Int	ernal permanently att	ached antenna	

2.2 Description of Test Facility

Site Description (Semi-Anechoic Chamber)	:	Sept. 17, 1998 file on April 29, 2009 Renewed Federal Communications Commission FCC Engineering Laboratory 7435 Oakland Mills Road Columbia, MD 21046, USA
Name of Firm	:	Audix Technology (Shanghai) Co., Ltd.
Site Location	:	3F 34Bldg 680 Guiping Rd., Caohejing Hi-Tech Park, Shanghai 200233, China
FCC registration Number	:	91789
Accredited by NVLAP, Lab Code	:	200371-0

2.3 Measurement Uncertainty

Radiated Emission Expanded Uncertainty (30-200MHz):				
	U = 4.67 dB (Horizontal)			
	U = 4.72 dB (Vertical)			
Radiated Emission Expanded Uncertainty (200M-10	GHz):			
	U = 4.81 dB (Horizontal)			
	U = 4.69 dB (Vertical)			
Radiated Emission Expanded Uncertainty (Above 10	GHz):			
	U= 4.50 dB (Horizontal)			
	U= 4.16 dB (Vertical)			

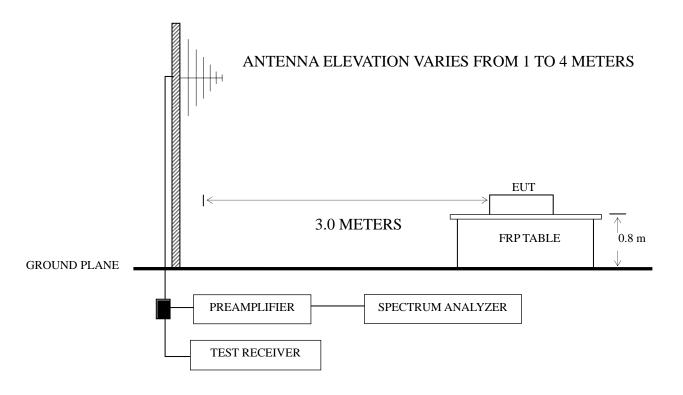
3 RADIATED EMISSION TEST

3.1 Test Equipment

The following test equipments are used during the radiated emission test in a semi-anechoic chamber:

Item	Туре	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	E7405A	MY45106600	Mar 22, 2012	Mar 22, 2013
2.	Bi-log Antenna	TESEQ	CBL6112D	23192	Dec 01, 2011	Dec 01, 2012
3.	Horn Antenna	EMCO	3115	9607-4878	May 06, 2012	May 06, 2013
4.	Horn Antenna	EMCO	3116	00062643	Jul 21, 2012	Jul 21, 2013
5.	Test Receiver	R&S	ESVS10	844594/001	Mar 22, 2012	Mar 22, 2013
6.	Preamplifier	HP	8447D	2944A10548	Mar 18, 2012	Sep 18, 2012
7.	Preamplifier	HP	8449B	3008A00864	Apr 29, 2012	Apr 29, 2013
8.	50Ω Coaxial Switch	Anritsu	MP59B	6200426390	Mar 18, 2012	Sep 18, 2012
9.	Software	Audix	E3	SET00200 9912M295-2		

3.2 Block Diagram of Test Setup



■ : 50 ohm Coaxial Switch

Frequency	Distance	Field strength limits (μ V/m)				
(MHz)	(m)	(µV/m)	$dB (\mu V/m)$			
30 ~ 88	3	100	40.0			
88 ~ 216	3	150	43.5			
216 ~ 960	3	200	46.0			
Above 960	3	500	54.0			
 NOTE 1 - Emission Level dB (μV/m) = 20 lg Emission Level (μV/m) NOTE 2 - The tighter limit applies at the band edges. NOTE 3 - Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system. 						
NOTE 4 - The limits shown are based on Quasi-peak value detector below or equal to 1GHz and Average value detector above 1GHz.						
NOTE 5 - Above 1 GHz, the limit on peak emission is 20 dB above the maximum						

3.3 Radiated Emission Limit [FCC Part 15 Subpart C 15.209]

3.4 Test Configuration

The EUT was installed as show on Sec. 3.2 in radiated emission test to meet FCC requirement and operating in a manner, which tend to maximize emission level in a normal application.

permitted average emission limit applicable to the EUT

3.5 Operating Condition of EUT

- 3.5.1 Setup the EUT as shown in Sec. 3.2.
- 3.5.2 Turn on the power of all equipment.
- 3.5.3 Set the EUT on the test mode (Transmitting) and then test.

3.6 Test Procedures

The EUT was placed on a FRP turntable that is 0.8 meter above ground. The FRP turntable rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna, which was mounted on an antenna tower. Broadband antenna (Calibrated Bilog Antenna) and horn antenna was used as receiving antenna. The antenna moved up and down between 1 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarizations of the antenna were set on measurement. In order to find the maximum emission, all of the interference cables were manipulated according to ANSI C63.4:2003 requirements during radiated emission test.

The bandwidth of Test Receiver R&S ESVS10 was set at 120 kHz for frequency range from 30MHz to 1000MHz.

The bandwidth of the VBW was set at 1MHz and RBW was set at 1MHz for peak emission measurement above 1GHz and 1MHz RBW, 10Hz VBW for average emission above 1GHz for Spectrum Agilent E7405A.

The frequency range from 30 MHz to 25 GHz (Up to 10th harmonics from fundamental frequency) was checked.

The test mode (Transmitting) was done on radiated emission test.

Please refer to Sec.3.7.

3.7 Test Results

<PASS>

The frequency and amplitude of the highest radiated emission relative the limit is reported. All the emissions not reported below are too low against the FCC limit.

- NOTE 1 Level = Read Level + Antenna Factor + Cable Loss (<1GHz)
- NOTE 2 Level = Read Level + Antenna Factor + Cable Loss

- Preamp Factor (>1GHz)

- NOTE $3 0^{\circ}$ was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.
- NOTE 4 The emission levels which not reported are too low against the official limit.
- NOTE 5 All reading are Quasi-Peak values below or equal to 1GHz and Peak values and Average values above 1GHz. For above 1GHz test, if the peak measured value complies with the average limit, it is unnecessary to perform an average measurement.

FCC ID: W9HLCDF0006

EUT	:	LED LCD TV	Temperature :	25 ℃
Model No.	:	LTDN50K316XWUS3D	Humidity :	50%RH
Serial No.	:	E1204416-02/02	Date of Test :	May. 14, 2012
Test Mode	:	Transmitting 2458 MHz		

Antenna Preamp Limits Read Cable Level Frequency Margin Factor Remark Polarization Level Factor dB Loss dB (MHz) (dB) $(\mu V/m)$ $dB (\mu V)$ (dB)(dB)(dB/m) $(\mu V/m)$ 11.04 1.75 23.87 43.50 92.080 11.08 19.63 --145.430 15.43 10.50 2.20 28.13 43.50 15.37 --218.180 12.70 2.50 25.72 10.52 46.00 20.28 --QP 284.140 17.45 13.24 2.71 33.40 46.00 12.60 --436.430 17.46 16.79 3.09 37.34 46.00 --8.66 667.290 11.55 19.12 3.62 34.29 46.00 11.71 --Horizontal 2056.00 46.08 27.63 36.19 6.48 44.00 74.00 30.00 4300.00 45.09 33.62 35.56 8.56 51.71 74.00 22.29 PK 7192.00 46.10 37.64 34.73 9.83 58.84 74.00 15.16 9280.00 39.50 12.28 62.73 45.86 34.91 74.00 11.27 7192.00 27.03 37.64 34.73 9.83 39.77 54.00 14.23 AV 9280.00 26.62 39.50 34.91 12.28 43.49 54.00 10.51 30.970 2.56 17.78 0.81 21.15 40.00 18.85 --153.190 11.76 10.36 2.24 24.36 43.50 19.14 --218.180 12.95 10.52 --2.50 25.97 46.00 20.03 QP 284.140 11.96 13.24 2.71 27.91 46.00 18.09 __ 400.540 2.99 8.73 16.30 28.02 46.00 17.98 ___ 870.990 7.26 20.38 4.60 32.24 46.00 13.76 --Vertical 1684.00 46.68 27.15 6.06 43.28 74.00 30.72 36.61 4324.00 52.69 45.96 33.64 35.55 8.64 74.00 21.31 PK 6784.00 45.78 37.03 34.76 9.57 57.62 74.00 16.38 9364.00 45.09 74.00 11.91 39.50 34.92 12.42 62.09 6784.00 25.87 37.03 34.76 9.57 37.71 54.00 16.29 AV 9364.00 25.30 39.50 34.92 12.42 42.30 54.00 11.70

TEST ENGINEER: RAVEN JIN

4 FUNDAMENTAL AND HARMONICS EMISSIONS TEST

4.1 Test Equipment

The following test equipments are used during the fundamental and spurious emission test in a semi-anechoic chamber:

Ite	em	Туре	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
	1.	Preamplifier	HP	8449B	3008A00864	Apr 29, 2012	Apr 29, 2013
	2.	Spectrum Analyzer	Agilent	E7405A	MY45106600	Mar 22, 2012	Mar 22, 2013
	3.	Horn Antenna	EMCO	3115	9607-4878	May 06, 2012	May 06, 2013
	4.	Horn Antenna	EMCO	3116	00062643	Jul 21, 2012	Jul 21, 2013

4.2 Block Diagram of Test Setup

Same as Sec 3.2

4.3 Fundamental and Harmonics Emission Limit [FCC Part 15 Subpart C 15.249(a)]

Fundamental Frequency	Distance	Field Strength of Fundamental		Field Strength of Harmonics		
(MHz)	(m)	(millivolts/meter)	$dB \ (\mu V/m)$	(microvolts/meter)	$dB (\mu V/m)$	
2400 ~ 2483.5	3	50 94		500	54	
NOTE 2 - Distan antenn NOTE 3 - The li NOTE 4 - The li	nce refers to na and the c mits shown mit on peak	losed point of any are based on Aver	eters betweer part of the de age value de above the m	n the measuring instruevice or system.		

4.4 Test Configuration

The EUT was installed as show on Sec. 3.2 in fundamental and spurious emission test to meet ANSI C63.4:2003 requirements and operating in a manner that tend to maximize emission level in a normal application.

4.5 Operating Condition of EUT

- 4.5.1 Setup the EUT as shown in Sec. 3.2.
- 4.5.2 Turn on the power of all equipment.
- 4.5.3 Set the EUT on the test mode (Transmitting) and then test.

4.6 Test Procedures

The EUT was placed on a FRP turntable that is 0.8 meter above ground. The turntable rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna, which was mounted on an antenna tower. Both horizontal and vertical polarization of the antenna was set on measurement. In order to find the maximum emission, all of the interference cables were manipulated according to FCC PART 15 Subpart C and ANSI C63.4:2003 requirements during fundamental and harmonics emission test.

The frequency range from 2.4 GHz to 25 GHz (Up to 10th harmonics from fundamental frequency) was checked.

The test mode (Transmitting) was done on Fundamental and Harmonics Emission test.

4.7 Test Results

<PASS>

The frequency and amplitude of the highest radiated emission relative the limit is reported. All the emissions not reported below are too low against the FCC limit.

- NOTE 1 All readings are Peak values.
- NOTE 2 The harmonics emission levels which not reported are too low against the official limit.
- NOTE 3 PK Level = Read Level + Factor

AV Level = PK Level - Correction Factor.

NOTE 4 - Factor = Antenna Factor + Cable Loss - Preamp Factor

NOTE 5 - Correction factor is measured as follows:

Duty Cycle $x = Tx$ on / (Tx on + Tx off) = 0.9691 / 16.76 = 0.0578
Correction Factor = $ 20\log(\text{Duty Cycle}) = 24.76 \text{ dB}$

NOTE 6 - The duty cycle was calculated according to the plot in Appendix I

FCC ID: W9HLCDF0006

EUT	:	LED LCD TV	Temperature :	25°C
Model No.	:	LTDN50K316XWUS3D	Humidity :	50% RH
Serial No.	:	E1204416-02/02	Date of Test :	May. 14, 2012

Test Mode

Transmitting 2458 MHz

Polarization	Frequency (MHz)	Read Level dB (µV)	Factor (dB/m)	Correction factor (dB)	Level dB (µV/m)	Limits dB (µV/m)	Margin (dB)	Remark	
	2458.00	89.59	0.37		89.96	114.00	24.04		
	4916.00	43.57	10.30		53.87	74.00	20.13	PK	
	7374.00	45.58	13.44		59.02	74.00	14.98	ΓK	
Horizontal	9832.00	44.61	16.99		61.60	74.00	12.40		
Horizontai	2458.00			24.76	65.20	94.00	28.80		
	4916.00			24.76	29.11	54.00	24.89	477	
	7374.00			24.76	34.26	54.00	19.74	AV	
	9832.00			24.76	36.84	54.00	17.16		
	2458.00	91.54	0.34		91.88	114.00	22.12		
	4916.00	44.78	10.48		55.26	74.00	18.74	DV	
Vertical	7374.00	46.11	13.29		59.40	74.00	14.60	PK	
	9832.00	44.56	16.89		61.45	74.00	12.55		
	2458.00			24.76	67.12	94.00	26.88		
	4916.00			24.76	30.50	54.00	23.50	AV	
	7374.00			24.76	34.64	54.00	19.36		
	9832.00			24.76	36.69	54.00	17.31		

TEST ENGINEER: RAVEN JIN

5 BAND-EDGE MEASUREMENT

Item	Туре	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	E7405A	MY45106600	Mar 22, 2012	Mar 22, 2013
2.	Horn Antenna	EMCO	3115	9607-4878	May 06, 2012	May 06, 2013
3.	Preamplifier	HP	8449B	3008A00864	Apr 29, 2012	Apr 29, 2013
4.	Software	Audix	E3	SET00200 9912M295-2		

5.1 Test Equipment

5.2 Band-Edge Limit [FCC Part 15 Subpart C 15.249(d)]

Emissions radiated outside of the specified frequency bands, except for harmonic, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209 whichever is the lesser attenuation.

For peak value, The RBW of Spectrum Analyzer Agilent E7405A was set at 1MHz and the VBW was set at 3MHz.

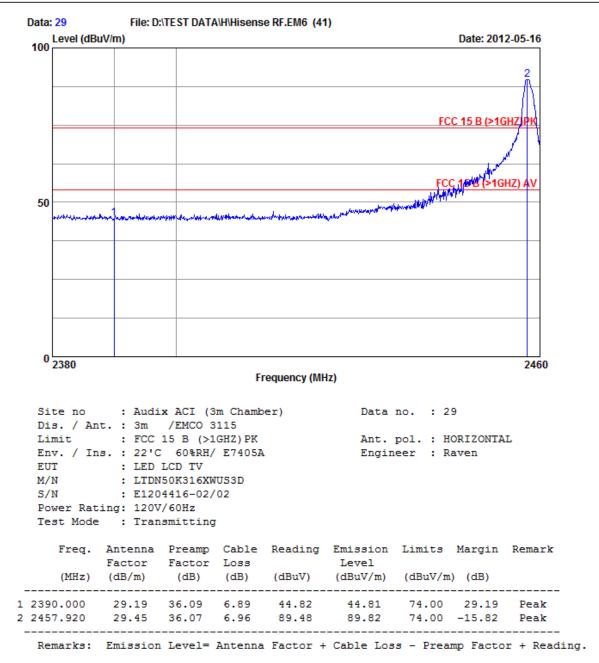
5.3 Test Results

<PASS>

All the test results are attached in next pages.



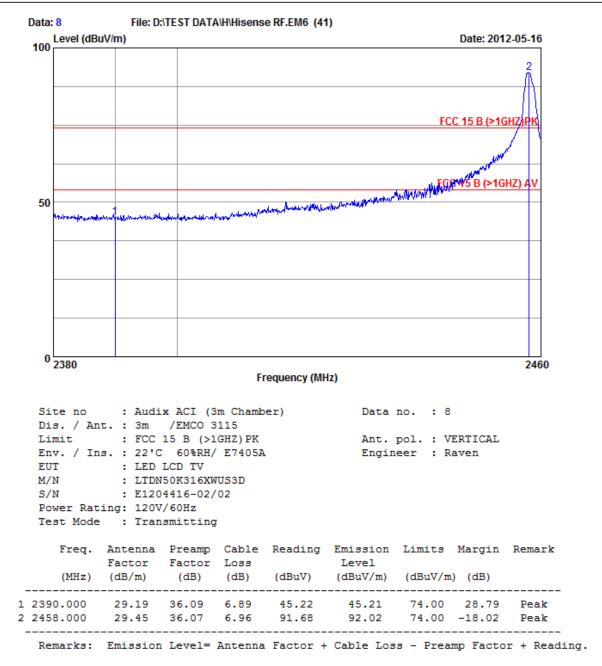
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Audix Technology (Shanghai) Co., Ltd.
3F #34Bldg. No.680 GuiPing Rd.,
CaoHeJing Hi-Tech Park,
Shanghai 200233, China
Tel:+86-21-64955500 Fax:+86-21-64955491
audixaci@audix.com
```



Average value @ 2390MHz = Peak value - Correction Factor = 44.81 dBuV/m - 24.76 dB= 20.05 dBuV/m(Average limit = 54.00 dBuV/m)



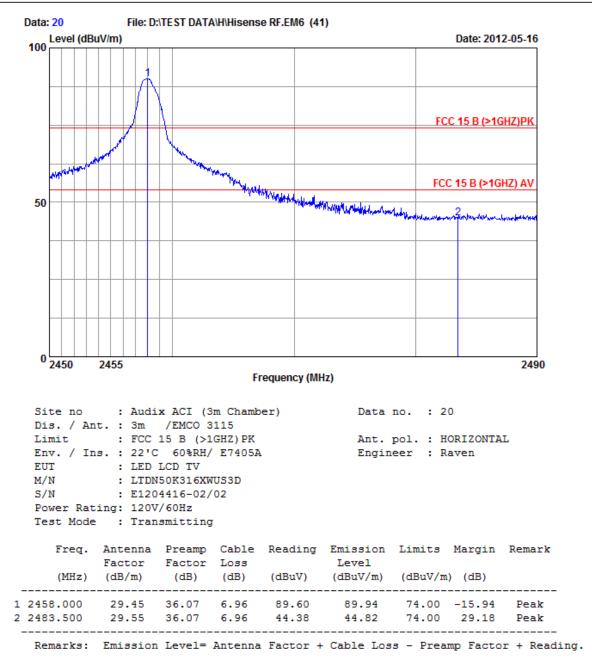
```
Audix Technology (Shanghai) Co., Ltd.
3F #34Bldg. No.680 GuiPing Rd.,
CaoHeJing Hi-Tech Park,
Shanghai 200233, China
Tel:+86-21-64955500 Fax:+86-21-64955491
audixaci@audix.com
```



Average value @ 2390MHz = Peak value - Correction Factor = 45.21 dBuV/m - 24.76 dB= 20.45 dBuV/m(Average limit = 54.00 dBuV/m)



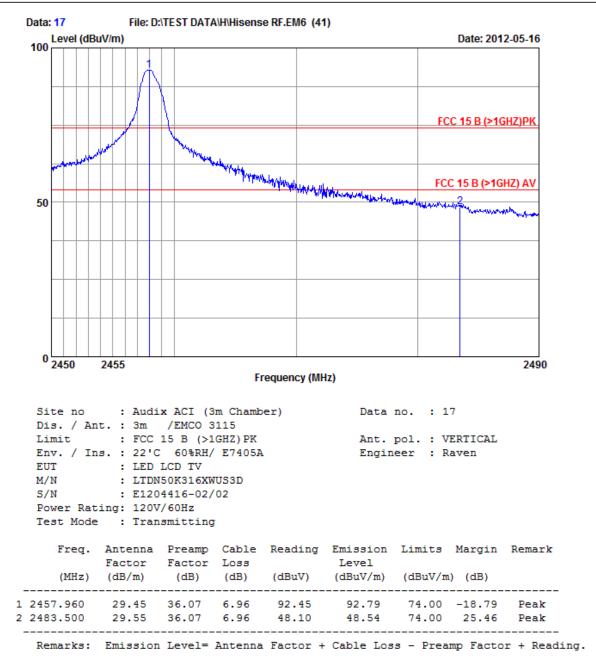
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Audix Technology (Shanghai) Co., Ltd.
3F #34Bldg. No.680 GuiPing Rd.,
CaoHeJing Hi-Tech Park,
Shanghai 200233, China
Tel:+86-21-64955500 Fax:+86-21-64955491
audixaci@audix.com
```



Average value @ 2483.5MHz = Peak value - Correction Factor = 44.82 dBuV/m - 24.76 dB= 20.06 dBuV/m(Average limit = 54.00 dBuV/m)



```
Audix Technology (Shanghai) Co., Ltd.
3F #34Bldg. No.680 GuiPing Rd.,
CaoHeJing Hi-Tech Park,
Shanghai 200233, China
Tel:+86-21-64955500 Fax:+86-21-64955491
audixaci@audix.com
```



Average value @ 2483.5MHz = Peak value - Correction Factor = 48.54 dBuV/m - 24.76 dB= 23.78 dBuV/m(Average limit = 54.00 dBuV/m)

6 DEVIATION TO TEST SPECIFICATIONS

None.

APPENDIX I

PLOT OF DUTY CYCLE

🔆 Agilent 🛛 09:5	i0:03 May 14	4,2012	L
Ref 11 <u>0 dB</u> µV	Atten 15	5 dB	Hkr2 کے 969.1 Hs 0.028 dB
#Peak Log → 10 dB/			2R 2
del	م (ور اور به ۱۸ ال ماه بار به اور	กรุ่างสี่ว่านี้เคริงที่สูงประวัติเสรียก อยู่การจะเห	Settingen descention of the setting of the set of the s
Center 2.458 GH: Res BW 1 MHz	Z	#VBW 3 MHz	Span 0 Hz Sweep 20 ms (971 pts)
Marker Trace 1R (1) 1Δ (1) 2R (1) 2Δ (1)	e Type Time Time Time Time	X Axis 1.427 ms 16.76 ms 17.22 ms 969.1 µs	е 0.023 dB е 93.2 dBµV
		Duty Cycl F	

DUTY CYCLE