Application for FCC Certificate
On Behalf of

TTE Technology, Inc.

LCD TV

Model Number: 49R81

Additional Model: 49D1800，49RH1

FCC ID: W8U49R81

Prepared for:	TTE Technology, Inc.
	2455 Anselmo Drive Suite 101 Corona California United States
Prepared By:	EST Technology Co., Ltd.
	Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China
Tel: 86-769-83081888-808	

Report Number:	ESTE-F1711049
Date of Test:	November 22~28, 2017
Date of Report:	November 29, 2017

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EST Technology Co., Ltd.

Applicant: **Address:**	TTE Technology, Inc. 2455 Anselmo Drive Suite 101 Corona California United States		
Manufacturer **Address:**	TCL King Electrical Appliances (Huizhou) Co., Ltd Section 19, ZhongKai New and High-tech Industries Development Zone, Huizhou. Guangdong, P.R.China		
E.U.T:	LCD TV		
Model Number:	49R81		
Additional Model:	49D1800，49RH1 Note: products are only different models and sales methods.		
Trade Name:	HITACHI, TCL	**Serial No.:**	------
Date of Receipt:	November 22, 2017	**Date of Test:**	November 22~28, 2017
Test Specification:	FCC Rules and Regulations Part 15 Subpart B:2016 ANSI C63.4:2014		
Test Result:	The device described above is tested by EST Technology Co., Ltd.. The measurement results were contained in this test report and EST Technology Co., Ltd. was assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliance with the FCC Rules and Regulations Part 15 Subpart B requirements. This report applies to above tested sample only and shall not be reproduced in part without written approval of EST Technology Co., Ltd. **Issue Date:** November 29, 2017		

Prepared by:	Reviewed by:	Approved by:
Amy / Assistant	Tony / Engineer	Iceman Hu / Manager

Other Aspects:
None.

Abbreviations: OK/P=passed fail/F=failed n.a/N=not applicable E.U.T=equipment under tested

1. GENERAL PRODUCT INFORMATION

1.1. Product Function

Refer to Technical Construction Form and User Manual.

1.2. Difference between Model Numbers

Note: products are only different models and sales methods.

1.3. Independent Operation Modes

1.3.1. Conducted Modes

1	HDMI(3840*2160+Running “H” Pattern)	Worst case
2	HDMI(1920*1080+Running “H” Pattern)	
3	HDMI(800*600+Running “H” Pattern)	
4	Connect to PC	
Note: The worst case will be recorded in this report.		

1.3.2. Radiated Modes

30MHz~1GHz		
1	HDMI(3840*2160+Running “H” Pattern)	Worst case
2	HDMI(1920*1080+Running “H” Pattern)	
3	HDMI(800*600+Running “H” Pattern)	
4	Connect to PC	
Above 1GHz		
1	HDMI(3840*2160+Running “H” Pattern)	Worst case
2	HDMI(1920*1080+Running “H” Pattern)	
3	HDMI(800*600+Running “H” Pattern)	
4	Connect to PC	
Note: The worst case will be recorded in this report.		

2. TEST SITES

2.1. Description of Standards and Results

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

EMISSION			
Description of Test Item	**Standard**	**Limits**	**Results**
Conducted disturbance at mains terminals	FCC Rules and Regulations Part 15 Subpart B:2016 ANSI C63.4:2014	15.107(a) Class B	PASS
		Minimum passing margin is 11.46dB at 0.15MHz	
Radiated Emission Test	FCC Rules and Regulations Part 15 Subpart B:2016 ANSI C63.4:2014	15.109(a) Class B	PASS
		Minimum passing margin is 11.41dB at 115.360MHz for 30-1000MHz; Minimum passing margin is 11.47dB at 1590.00MHz for above 1GHZ;	

2.2. Test Facilities

EMC Lab : Certificated by CNAS, CHINA
Registration No.: L5288
Date of registration: November 13, 2017

Certificated by A2LA, USA
Registration No.: 4366.01
Date of registration: November 07, 2017

Certificated by FCC, USA
Designation Number: CN1215
Registration No.: 722932
Date of registration: November 21, 2017

Certificated by Industry Canada
Registration No.: 9405A
Date of registration: December 03, 2015

Certificated by VCCI, Japan
Registration No.: R-13663; C-14103
Date of registration: July 25, 2017
This Certificate is valid until: July 24, 2020

Certificated by TUV Rheinland, Germany
Registration No.: UA 50195514 0001
Date of registration: February 07, 2015

Certificated by TUV/PS, Shenzhen
Registration No.: SCN1017
Date of registration: January 27, 2011

Certificated by Intertek ETL SEMKO
Registration No.: 2011-RTL-L2-64
Date of registration: April 28, 2011

Certificated by Nemko, Hong Kong
Registration No.: 175193
Date of registration: May 4, 2011

Name of Firm : EST Technology Co., Ltd.

Site Location : Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China

2.3. List of Test and Measurement Instruments

2.3.1. For conducted emission at the mains terminals test (844 Room)

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESHS30	832354	June 17,17	1 Year
Artificial Mains Network	Rohde & Schwarz	ENV216	101260	June 17,17	1 Year
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	101100	June 17,17	1 Year
Test Software	Audix	e3-6.111221a	N/A	N/A	N/A

2.3.2. For radiated emission test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESR7	101780	June 17,17	1 Year
Bilog Antenna	Teseq	CBL 6111D	37062	June 08,17	1 Year
Horn Antenna	SCHWARZBECK	BBHA9120D	8128-290	June 08,17	3 Year
Signal Amplifier	SCHWARZBECK	BBV9718	9718-212	June 17,17	1 Year
Test Software	Audix	e3-6.111221a	N/A	N/A	N/A

Note: All calibration reports of the equipment were provided by CEPREI calibration and Test Center

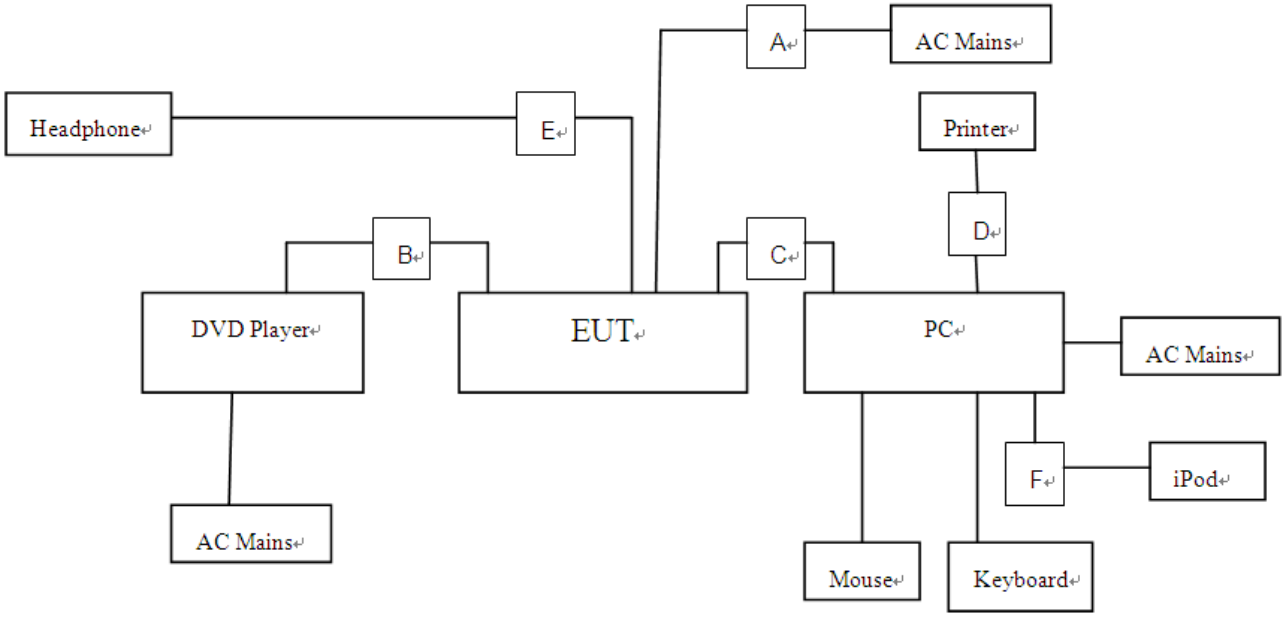
3. TEST SET-UP AND OPERATION MODES

3.1. Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the Operating Instructions.

3.2. Block Diagram of Test Set-up

System Diagram of Connections between EUT and Simulators



(EUT: LCD TV)

A	AC Line	Unshielded, Undetachable 1.2m
B	AV IN	Unshielded, Detachable 1.2m
C	HDMI	Shielded, Detachable 1.2m
D	USB Cabel	Shielded, Detachable 1.8m
F	USB Cabel	Shielded, Detachable 1.0m

3.3. Test Operation Mode and Test Software

Refer to Test Setup in clause 4.

3.4. Special Accessories and Auxiliary Equipment

3.4.1. PC

M / N	:	VOSTRO
Manufacturer	:	DELL
Power Cord	:	Unshielded, Detachable, 1.6m

3.4.2. DVD Player

M / N	:	DVDHDMI01
Manufacturer	:	SAMWIN
Data Cable	:	Shielded, Undetachable, 1.6m

3.4.3. Printer

M / N	:	HP1020
Manufacturer	:	HP
Data Cable	:	Non-shielded, Detachable, 1.5m

3.4.4. Mouse

M / N	:	MOL5VO
S / N	:	JOQ03RNT
Manufacturer	:	Dell
cable	:	Shielded, Undetachable, 1.5m

3.4.5. Keyboard

M / N	:	L100
S / N	:	CN-0RH656-65890-01M-070T
Manufacturer	:	Dell
cable	:	Shielded, Undetachable, 1.8m

3.4.6. iPod

M / N	:	A1238
S/N	:	8K044D2Z9ZU
Manufacturer	:	Apple

3.5. Countermeasures to Achieve EMC Compliance

None.

4. EMISSION TEST RESULTS

4.1. Conducted Emission at the Mains Terminals Test

RESULT	**:**	**Pass**
Test Procedure	:	ANSI C63.4:2014
Frequency Range	:	0.15 to 30MHz
Test Site	:	Shielded Room
Limits	:	FCC Part 15:2016 Class B

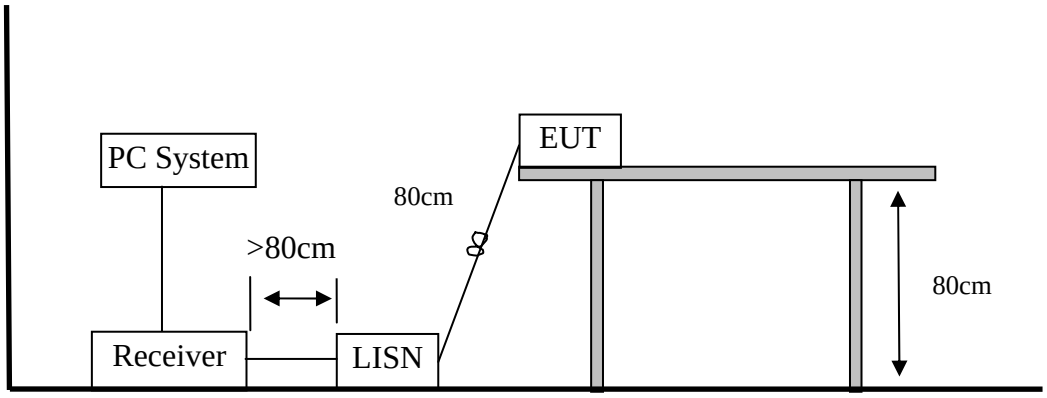
Test Setup

Date of Test	:	November 27, 2017
M/N	:	49R81
Input Voltage	:	AC 120V/60Hz
Operation Mode	:	HDMI

The frequency range from 150 kHz to 30 MHz was investigated.

The bandwidth of the test receiver was set at 9 kHz.

The test data of the worst case condition(s) was reported on the following page.



Note: Measurement Uncertainty: ±3.48 dB at a level of confidence of 95%.

Test Data

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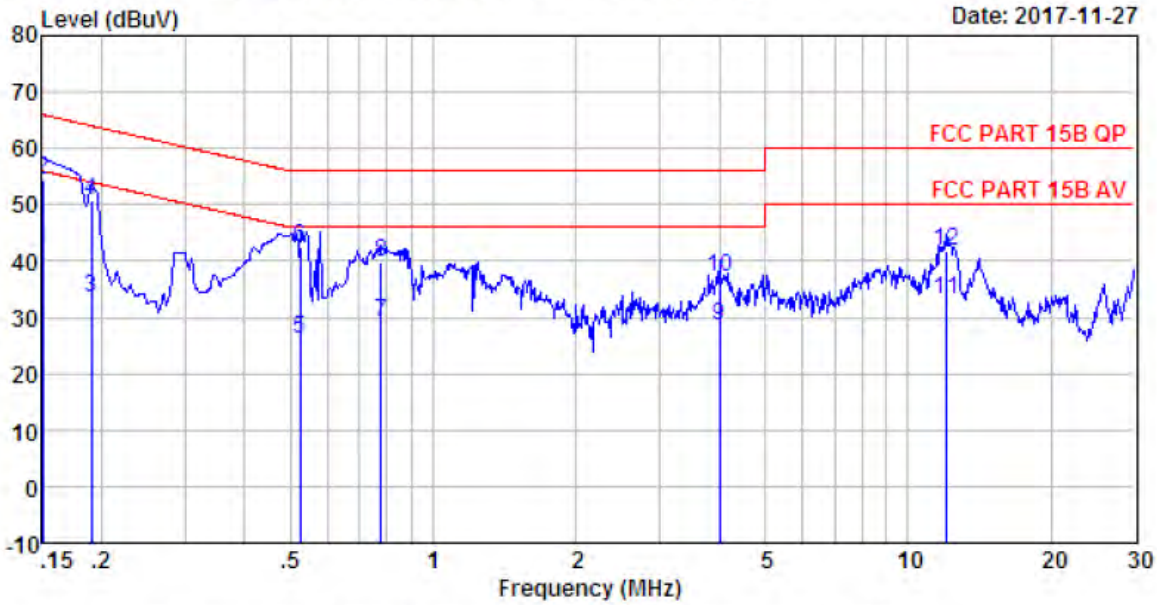
Data: 512 File: \\Emc-ce-2\Test Data\2017\T\TCL-1.EM6 (547)



Site no. : 2# Conduction Shield Room Data no. : 512
Dis. / Ant. : Temp:20.2'C Humi:38% Press:101.50kPa Ant. pol. : NEUTRAL
Limit : FCC PART 15B QP
Env. / Ins. : Temp:20.2'C Humi:38% Press:101.50kPa
Engineer : Bible
EUT : LCD TV
Power : AC 120V/60Hz
M/N : 49R81
Test Mode : HDMI(3840*2160+Running "H" Pattern)

	Freq. (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuv)	Limits (dBuv)	Margin (dB)	Remark
1	0.15	9.64	0.04	32.54	42.22	56.00	13.78	Average
2	0.15	9.64	0.04	44.86	54.54	66.00	11.46	QP
3	0.19	9.66	0.04	23.87	33.57	54.02	20.45	Average
4	0.19	9.66	0.04	41.12	50.82	64.02	13.20	QP
5	0.52	9.76	0.05	16.32	26.13	46.00	19.87	Average
6	0.52	9.76	0.05	32.56	42.37	56.00	13.63	QP
7	0.78	9.80	0.05	19.22	29.07	46.00	16.93	Average
8	0.78	9.80	0.05	30.11	39.96	56.00	16.04	QP
9	4.01	9.89	0.07	18.52	28.48	46.00	17.52	Average
10	4.01	9.89	0.07	27.27	37.23	56.00	18.77	QP
11	12.00	10.02	0.08	22.97	33.07	50.00	16.93	Average
12	12.00	10.02	0.08	31.63	41.73	60.00	18.27	QP

Remarks: 1. Emission Level= LISN Factor + Cable Loss + Reading.
2. If the average limit is met when useing a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

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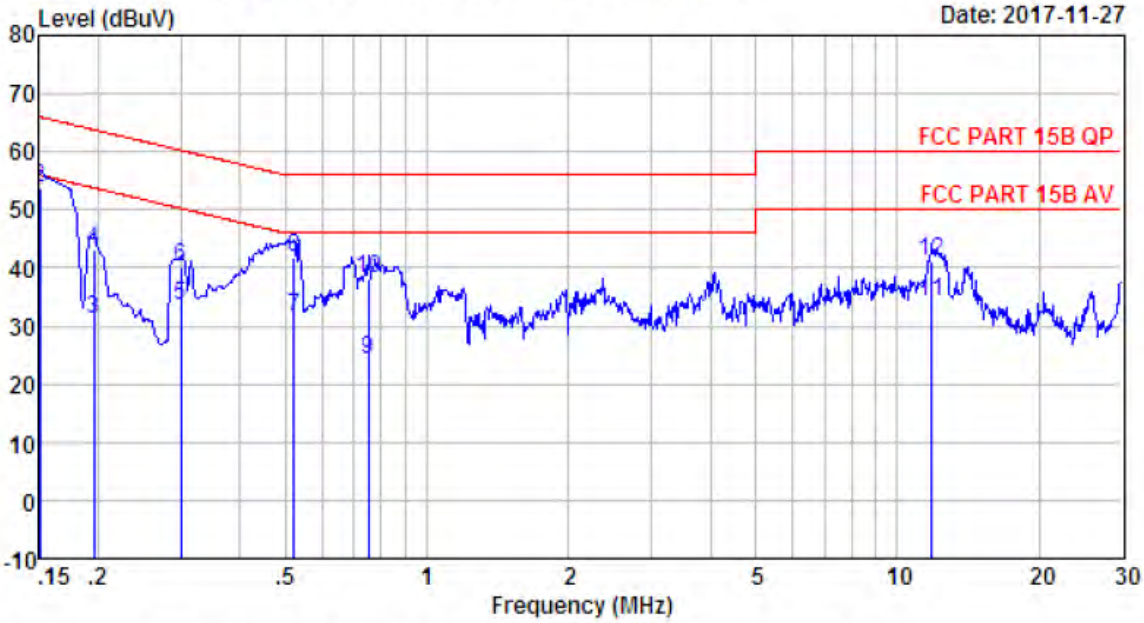
Data: 514 File: \\Emc-ce-2\Test Data\2017\T\TCL-1.EM6 (547)



Site no. : 2# Conduction Shield Room Data no. : 514
Dis. / Ant. : Temp:20.2'C Humi:38% Press:101.50kPa Ant. pol. : LINE
Limit : FCC PART 15B QP
Env. / Ins. : Temp:20.2'C Humi:38% Press:101.50kPa
Engineer : Bible
EUT : LCD TV
Power : AC 120V/60Hz
M/N : 49R81
Test Mode : HDMI(3840*2160+Running "H" Pattern)

	Freq. (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuv)	Limits (dBuv)	Margin (dB)	Remark
1	0.15	9.66	0.04	26.48	36.18	56.00	19.82	Average
2	0.15	9.66	0.04	44.20	53.90	66.00	12.10	QP
3	0.20	9.67	0.04	21.58	31.29	53.80	22.51	Average
4	0.20	9.67	0.04	33.55	43.26	63.80	20.54	QP
5	0.30	9.71	0.04	23.81	33.56	50.24	16.68	Average
6	0.30	9.71	0.04	30.28	40.03	60.24	20.21	QP
7	0.52	9.76	0.05	21.57	31.38	46.00	14.62	Average
8	0.52	9.76	0.05	32.08	41.89	56.00	14.11	QP
9	0.75	9.78	0.05	14.33	24.16	46.00	21.84	Average
10	0.75	9.78	0.05	28.26	38.09	56.00	17.91	QP
11	11.87	9.91	0.08	24.09	34.08	50.00	15.92	Average
12	11.87	9.91	0.08	31.08	41.07	60.00	18.93	QP

Remarks: 1. Emission Level= LISN Factor + Cable Loss + Reading.
2. If the average limit is met when useing a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

4.2. Radiated Emission Test

RESULT	**:**	**Pass**
Test Procedure	:	ANSI C63.4:2014
Frequency Range	:	30-1000 MHz;1-6 GHz
Test Site	:	966 Chamber
Limits	:	FCC Part 15:2016 Class B

Test Setup

Date of Test	:	November 27, 2017
M/N	:	49R81
Input Voltage	:	AC 120V/60Hz
Operation Mode	:	HDMI

The EUT was placed on a turn table which was 0.8 m above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was set 3 m away from the receiving antenna which was mounted on an antenna tower. The measuring antenna moved up and down to find out the maximum emission level. It moved from 1 m to 4 m for both horizontal and vertical polarizations.

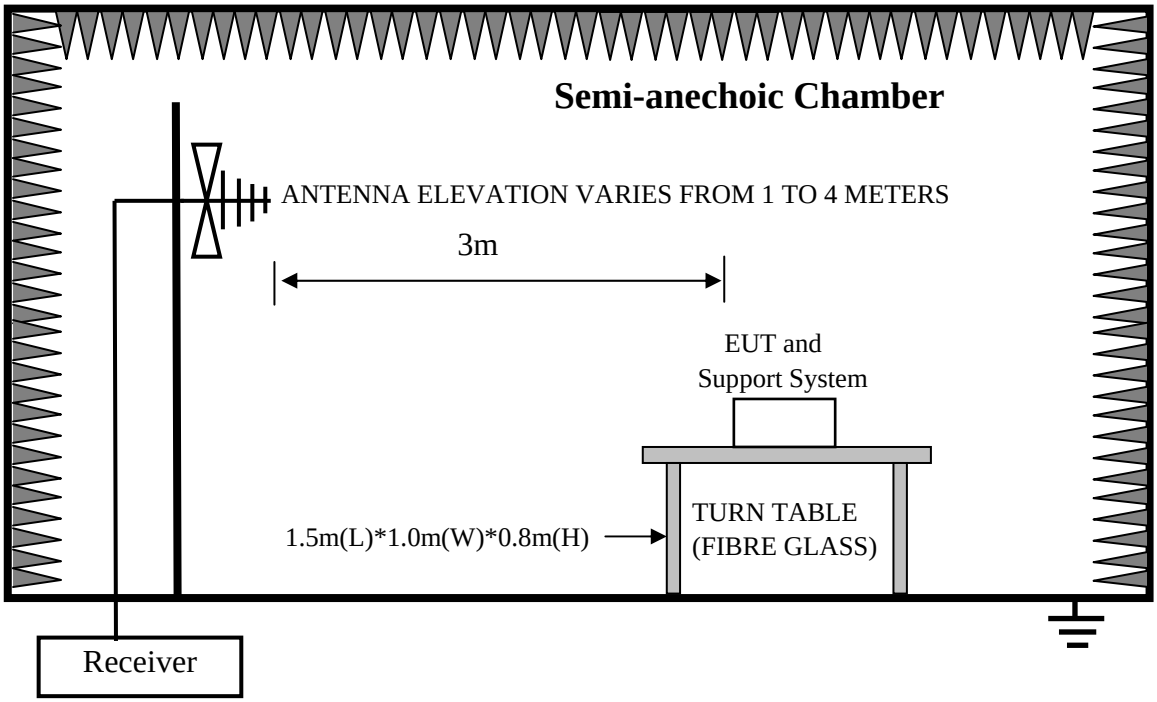
The EUT was tested in the Chamber Site. It was pre-scanned with a Peak detector from the spectrum, and all the final readings from the test receiver were measured with the Quasi-Peak detector.

The bandwidth setting on the test receiver was 120 kHz.

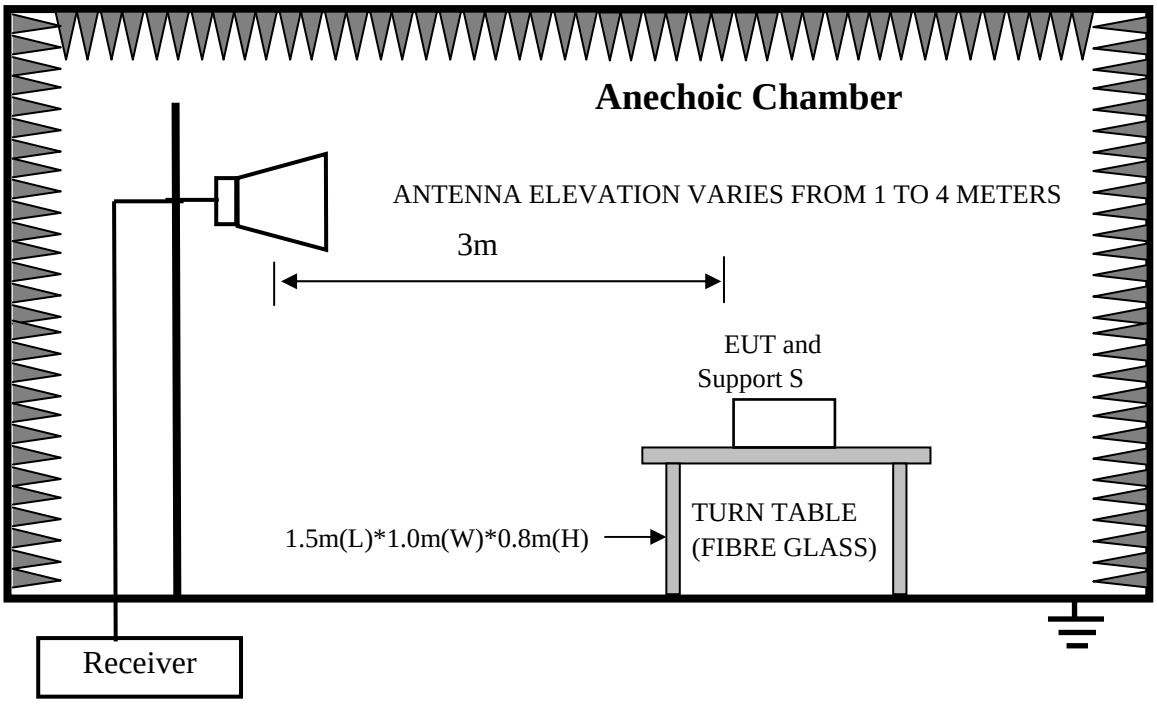
The bandwidth of the Spectrum's VBW is set at 3MHz and RBW is set at 1MHz for peak emissions measurement above 1GHz and 1MHz RBW, 10Hz VBW for average emissions measure above 1GHz

The test data of the worst case condition(s) was reported on the following page.

1、In Semi-anechoic Chamber Test Setup Diagram for 30MHz~1000MHz



2、In Anechoic Chamber Test Setup Diagram for 1-6GHz



Note: Test uncertainty: ±4.6 dB (H);±4.68 dB (V) at a level of confidence of 95%(30MHz ~ 1GHz); Test uncertainty: ±4.96dB at a level of confidence of 95%(Above 1GHz).

Test Data

30MHz-1GHz

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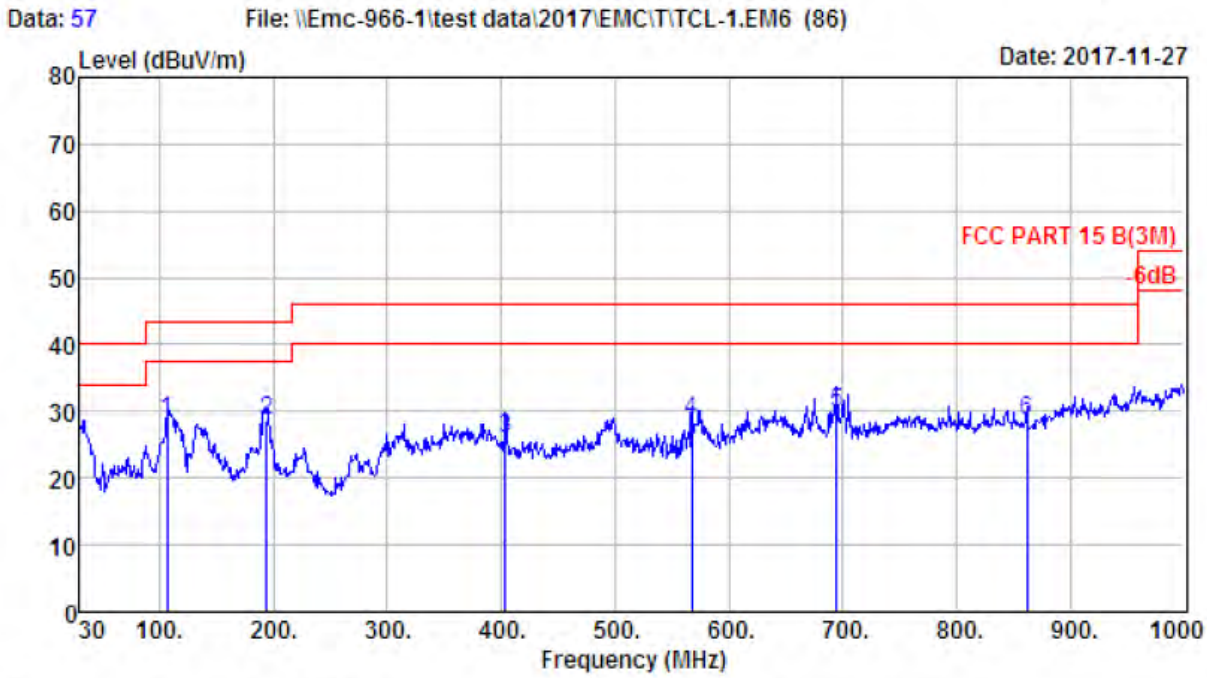


```
Site no       : 1# 966 Chamber                      Data no.    : 57
Env. / Ins.   : Temp:24.7';Humi:52%;Press:101.52kPa  LINE Phase : VERTICAL
Limit         : FCC PART 15 B(3M)
Engineer      : Bible
EUT           : LCD TV
Power         : AC 120V/60Hz
M/N           : 49R81
Test Mode     : HDMI(3840*2160+Running "H" Pattern)
```

	Freq. (MHz)	ANT Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	106.630	10.60	1.10	17.08	28.78	43.50	14.72	QP
2	193.930	8.44	1.46	18.64	28.54	43.50	14.96	QP
3	403.450	16.11	2.30	7.49	25.90	46.00	20.10	QP
4	567.380	19.47	3.09	6.01	28.57	46.00	17.43	QP
5	694.450	21.25	3.47	4.98	29.70	46.00	16.30	QP
6	862.260	23.40	3.98	1.33	28.71	46.00	17.29	QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. Margin= Limit - Emission Level.
3. The emission levels that are 20dB below the official limit are not reported.

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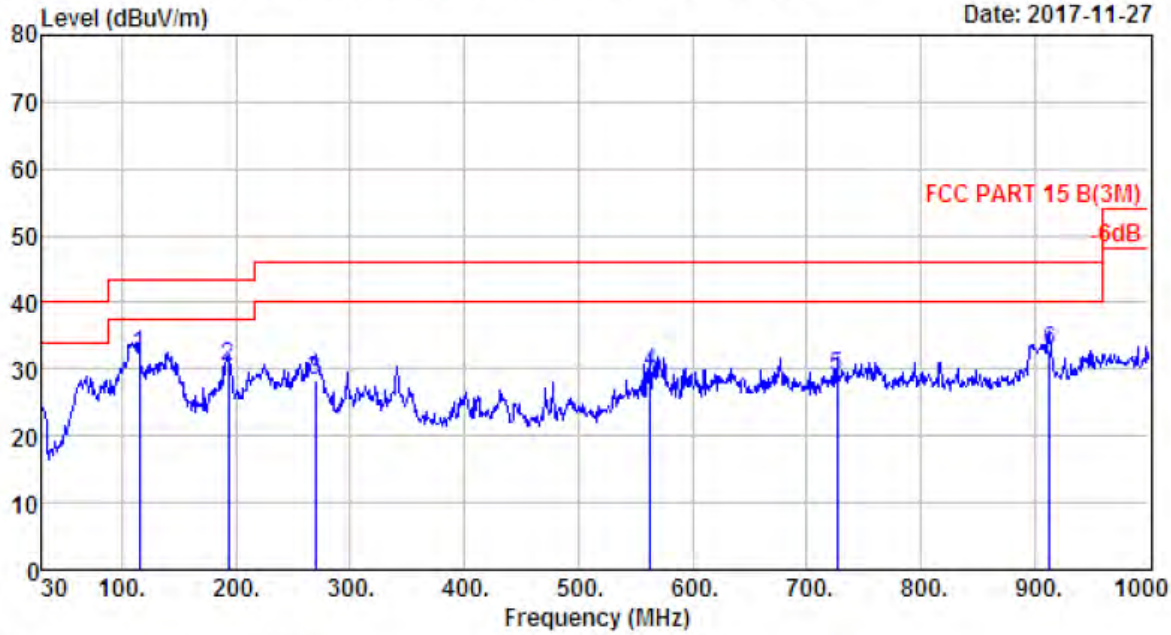
Data: 58 File: \\Emc-966-1\test data\2017\EMC\T\TCL-1.EM6 (86)



Site no : 1# 966 Chamber Data no. : 58
Env. / Ins. : Temp:24.7';Humi:52%;Press:101.52kPa LINE Phase : HORIZONTAL
Limit : FCC PART 15 B(3M)
Engineer : Bible
EUT : LCD TV
Power : AC 120V/60Hz
M/N : 49R81
Test Mode : HDMI(3840*2160+Running "H" Pattern)

	Freq. (MHz)	ANT Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	115.360	11.30	1.12	19.67	32.09	43.50	11.41	QP
2	192.960	8.48	1.46	20.36	30.30	43.50	13.20	QP
3	269.590	13.10	1.93	13.25	28.28	46.00	17.72	QP
4	563.500	19.44	3.08	6.93	29.45	46.00	16.55	QP
5	726.460	21.63	3.70	3.61	28.94	46.00	17.06	QP
6	912.700	24.13	4.13	4.37	32.63	46.00	13.37	QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. Margin= Limit - Emission Level.
3. The emission levels that are 20dB below the official limit are not reported.

Above 1GHz

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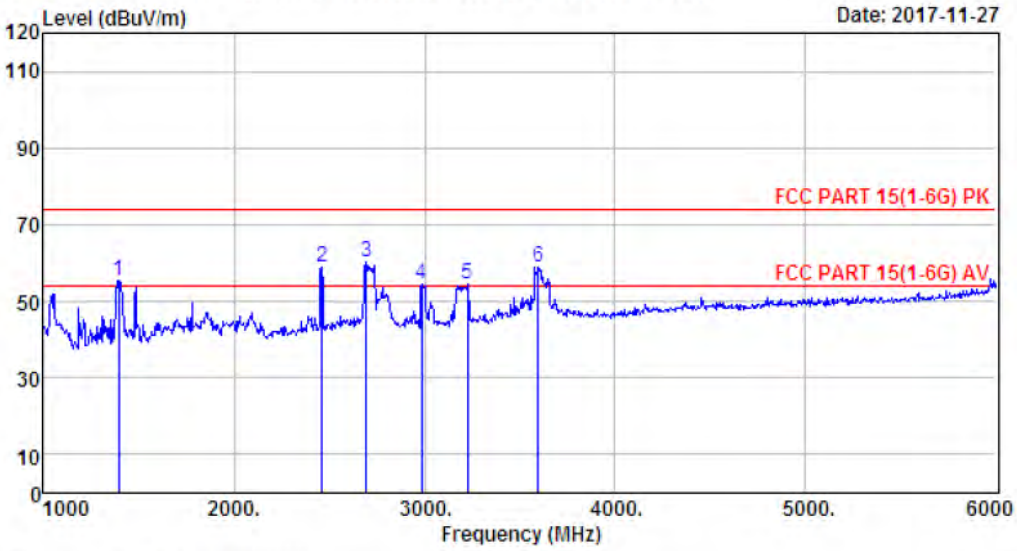
Data: 77 File: \\Emc-966-1\test data\2017\EMC\T\TCL-1.EM6 (86)




```
Site no.       : 1# 966 Chamber              Data no.  : 77
Dis. / Ant.    : 3m   ANT9120D 1-18G         Ant. pol. : VERTICAL
Limit          : FCC PART 15(1-6G) PK
Env. / Ins.    : Temp:28.1';Humi:50%;Press:101.52kPa
Engineer       : Bible
EUT            : LCD TV
Power          : AC 120V/60Hz
M/N            : 49R81
Test Mode      : HDMI(3840*2160+Running "H" Pattern)
```

	Freq. (MHz)	ANT Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1395.00	25.39	2.50	27.54	55.43	74.00	18.57	Peak
2	2460.00	27.52	3.27	28.20	58.99	74.00	15.01	Peak
3	2695.00	27.92	3.45	28.98	60.35	74.00	13.65	Peak
4	2985.00	28.37	3.60	22.37	54.34	74.00	19.66	Peak
5	3225.00	28.85	3.74	21.84	54.43	74.00	19.57	Peak
6	3595.00	29.59	3.99	25.35	58.93	74.00	15.07	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. Margin= Limit - Emission Level.
3. The emission levels that are 20dB below the official limit are not reported.

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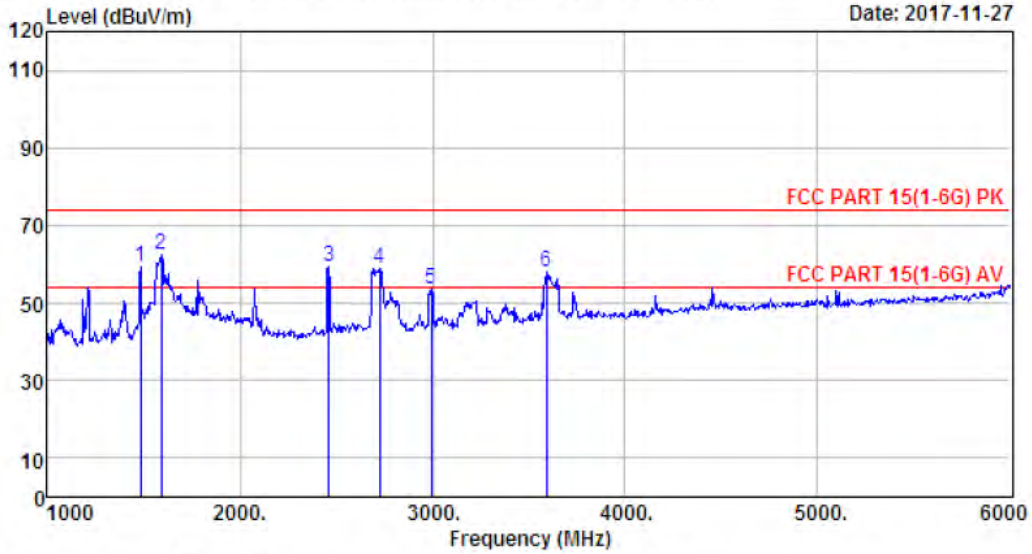
Data: 78 File: \\Emc-966-1\test data\2017\EMC\T\TCL-1.EM6 (86)




```
Site no.      : 1# 966 Chamber              Data no.  : 78
Dis. / Ant.   : 3m   ANT9120D 1-18G         Ant. pol. : HORIZONTAL
Limit         : FCC PART 15(1-6G) PK
Env. / Ins.   : Temp:28.1';Humi:50%;Press:101.52kPa
Engineer      : Bible
EUT           : LCD TV
Power         : AC 120V/60Hz
M/N           : 49R81
Test Mode     : HDMI(3840*2160+Running "H" Pattern)
```

	Freq. (MHz)	ANT Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1485.00	25.60	2.50	31.09	59.19	74.00	14.81	Peak
2	1590.00	25.76	2.57	34.20	62.53	74.00	11.47	Peak
3	2460.00	27.52	3.27	28.61	59.40	74.00	14.60	Peak
4	2725.00	27.95	3.46	27.59	59.00	74.00	15.00	Peak
5	2995.00	28.37	3.60	21.62	53.59	74.00	20.41	Peak
6	3590.00	29.56	3.97	24.62	58.15	74.00	15.85	Peak

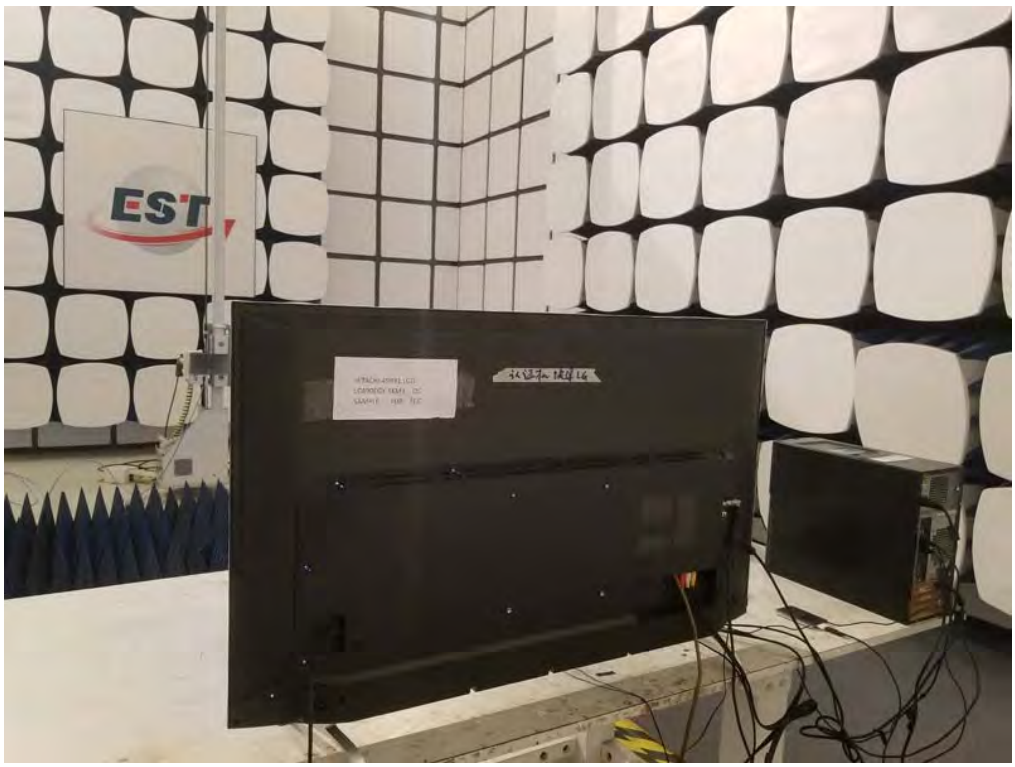
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. Margin= Limit - Emission Level.
3. The emission levels that are 20dB below the official limit are not reported.

5. PHOTOGRAPHS OF TEST SET-UP

5.1. Set-up for conducted emission at the mains terminals test

5.2. Set-up for radiated emission test (30-1000MHz)

5.3. Set-up for radiated emission test (Above 1GHz)



6. PHOTOGRAPHS OF THE EUT

External Photos

M/N: 49R81

External Photos

M/N: 49R81

External Photos

M/N: 49R81

External Photos

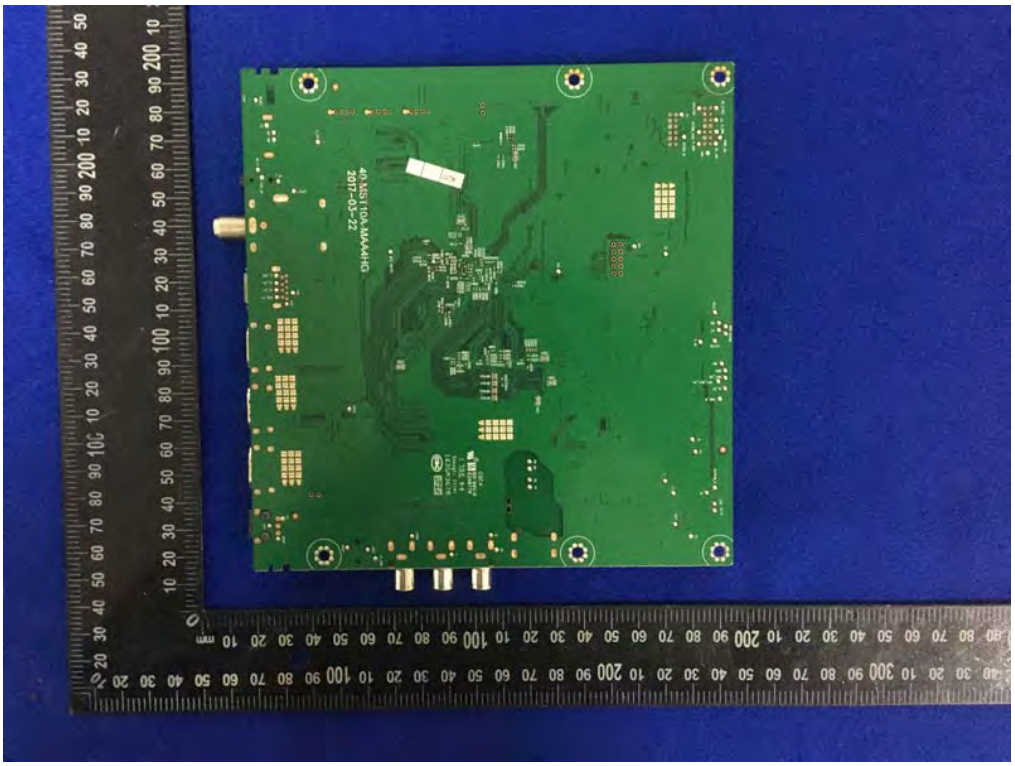
M/N: 49R81

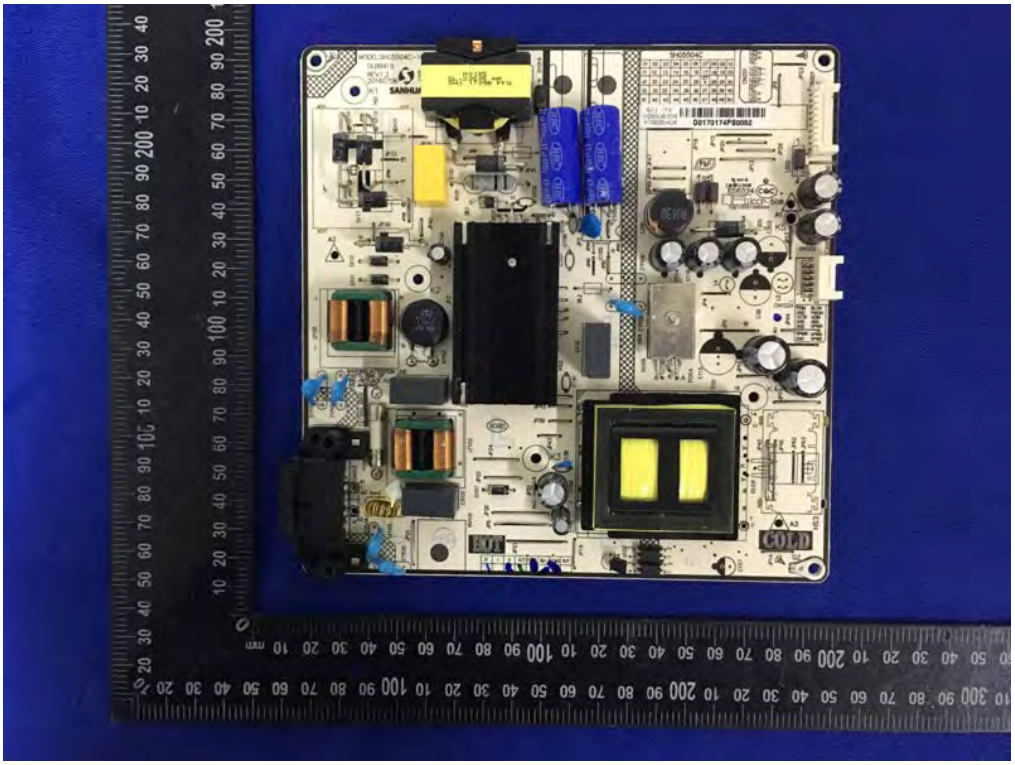
Internal Photos

M/N: 49R81

Internal Photos

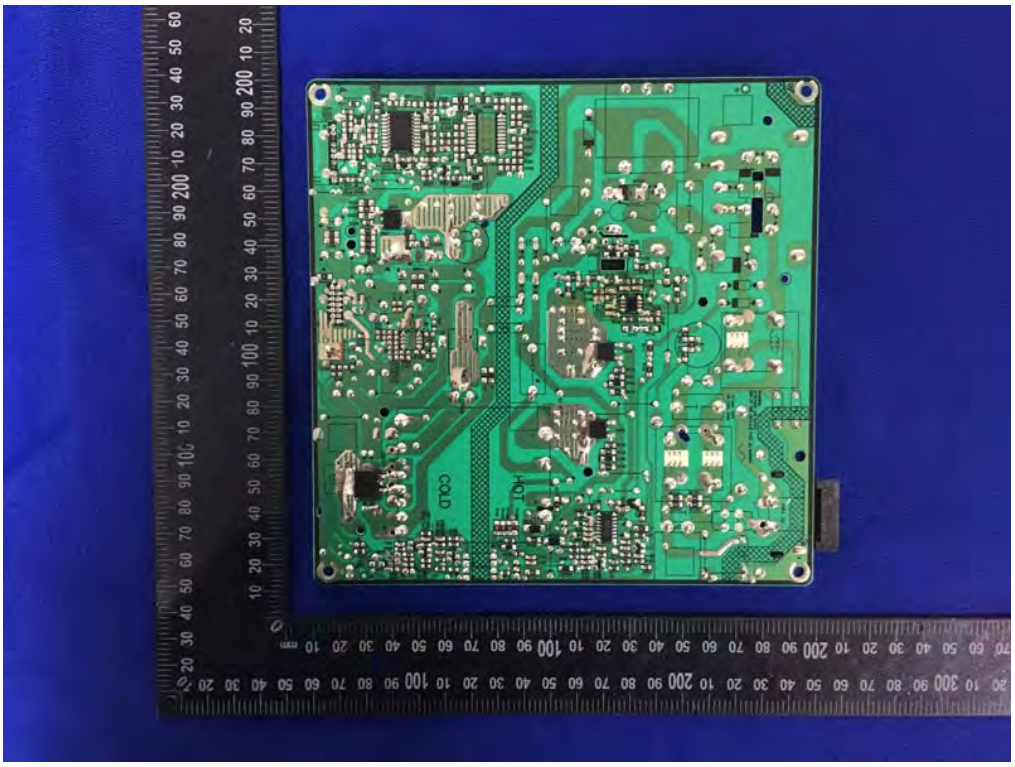
M/N: 49R81

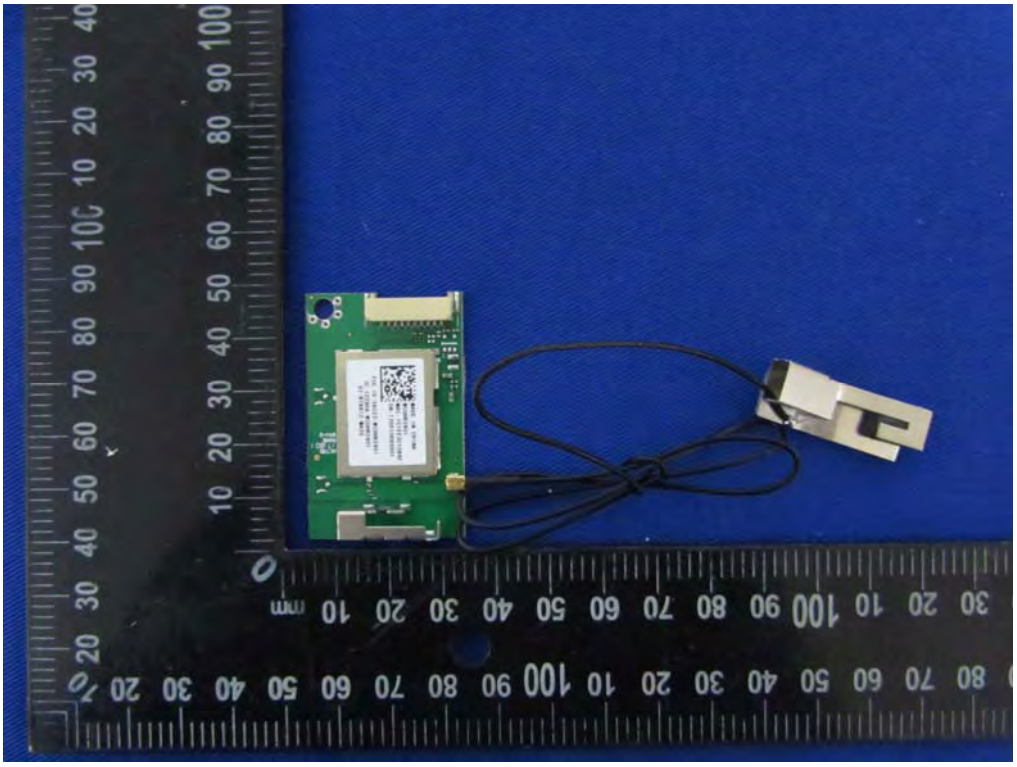




Internal Photos

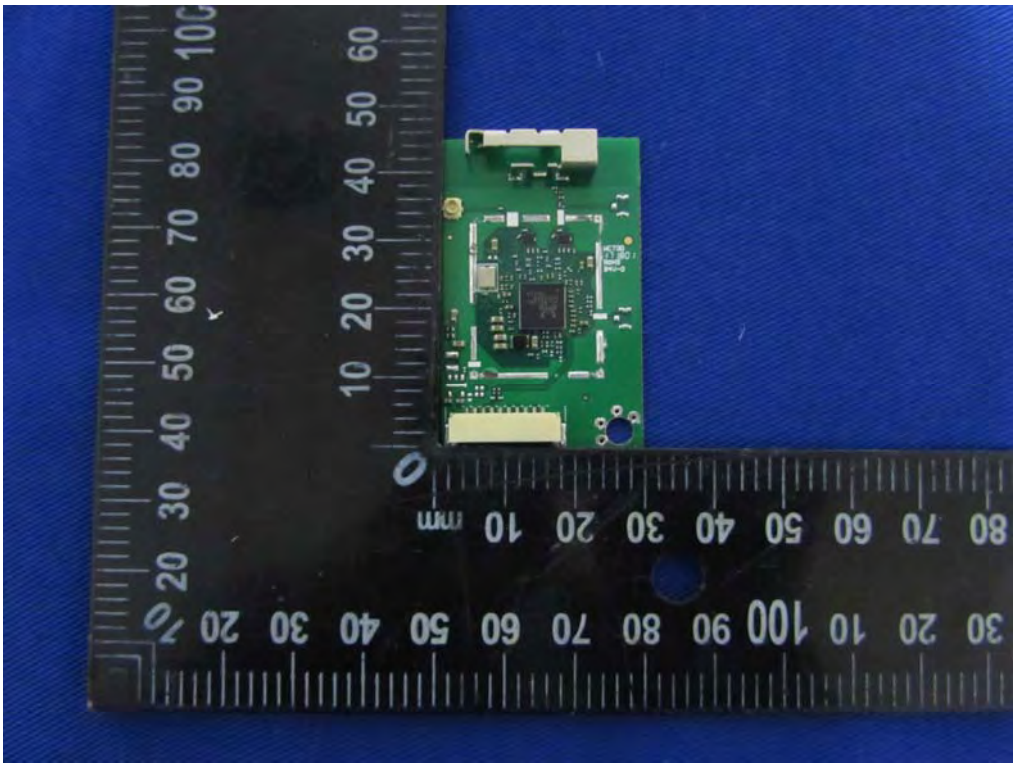
M/N: 49R81

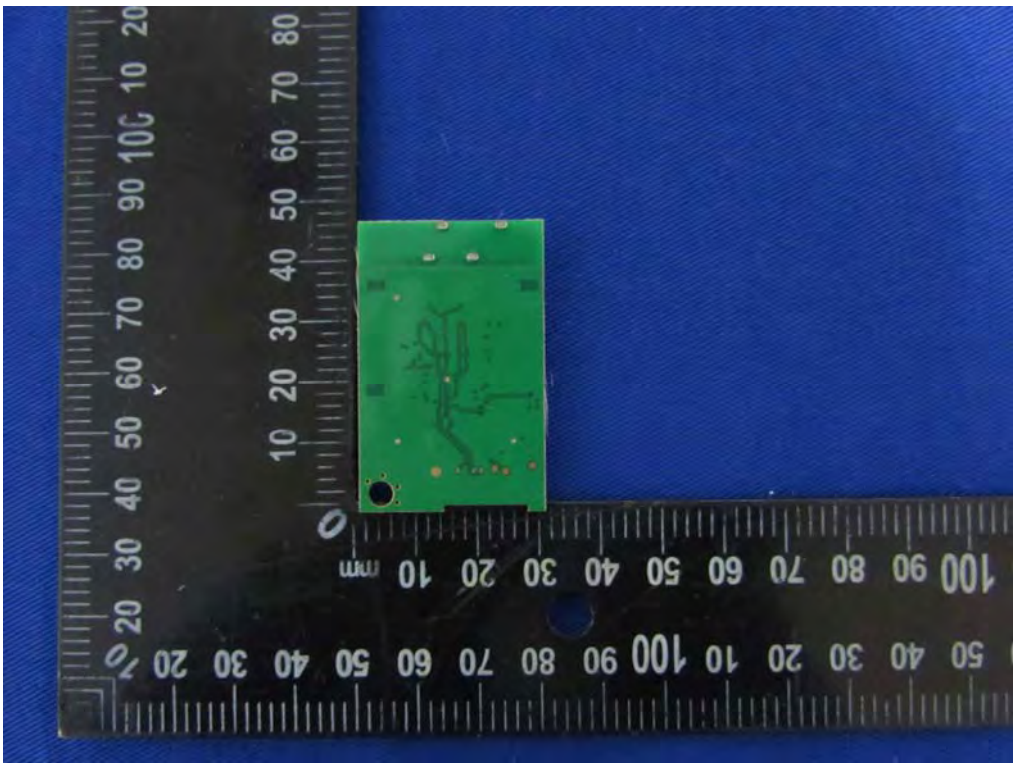


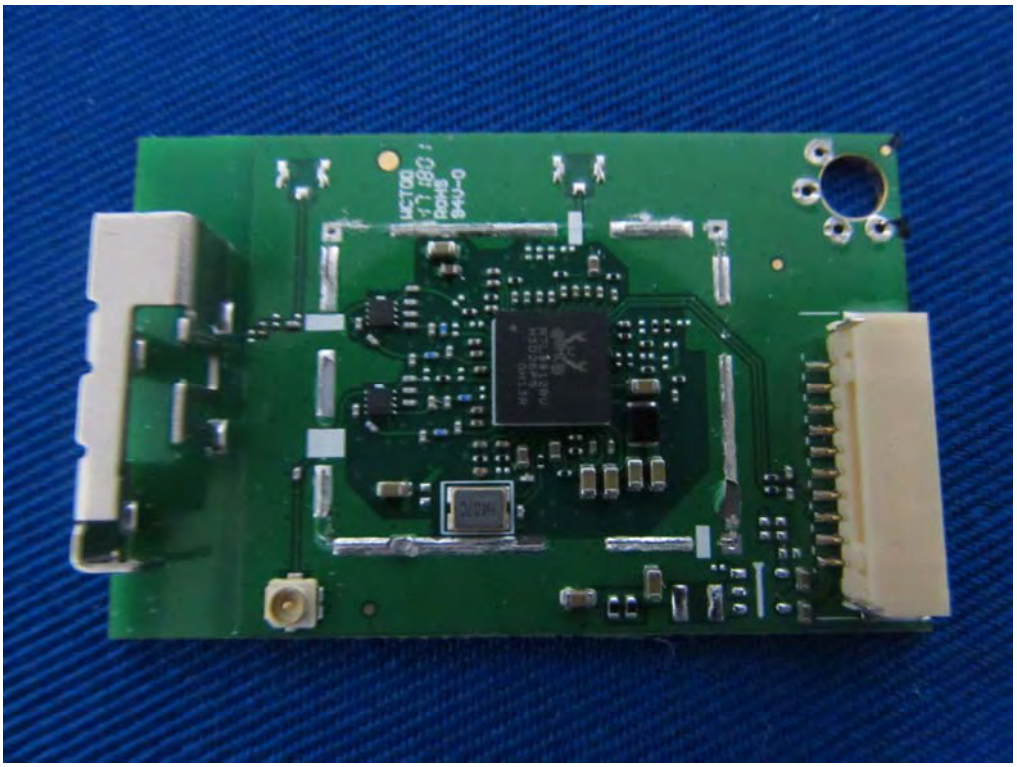


Internal Photos

M/N: 49R81





Internal Photos

M/N: 49R81