# FCC PART 15C TEST REPORT FOR CERTIFICATION
On Behalf of

TCL Entertainment Solutions Limited

2.0 CH Sound Bar

Model Number: TS3100

Additional Model: TDS3100,3100,Alto 3,FS3100,OS3100,***3100

FCC ID: 2ARUDTS3100

| | |
|---|---|
| Prepared for: | TCL Entertainment Solutions Limited |
| | 7/F, building 22E, 22 science park east avenue, Hong Kong science park, |
| | SHATIN, N.T., Hong Kong 999077 China |
| | |
| Prepared By: | EST Technology Co., Ltd. |
| | Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China |
| Tel: 86-769-83081888-808 | |

| | |
|---|---|
| Report Number: | ESTE-R2007176 |
| Date of Test: | Jul. 16-Aug. 22, 2020 |
| Date of Report: | Aug. 26, 2020 |

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# EST Technology Co., Ltd.

| | |
|---|---|
| **Applicant:**<br>**Address:** | TCL Entertainment Solutions Limited<br>7/F, building 22E, 22 science park east avenue, Hong Kong science park, SHATIN, N.T., Hong Kong 999077 China |
| **Manufacturer:**<br>**Address:** | TCL Entertainment Solutions Limited<br>7/F, building 22E, 22 science park east avenue, Hong Kong science park, SHATIN, N.T., Hong Kong 999077 China |
| **Factory:**<br>**Address:** | Guangzhou Panyu Juda Car Audio Equipment Co., Ltd.<br>NO.5 Building, No. 139, Zhouxing Street, Dongchong Town, Nansha District, Guangzhou City, Guangdong Province, China |
| **E.U.T:** | 2.0 CH Sound Bar |
| **Model Number:** | TS3100 |
| **Additional Model:** | TDS3100,3100,Alto 3,FS3100,OS3100,***3100<br>(* can be any alphanumeric character including blank for marketing differences) |
| **Power Supply:** | AC 120/60Hz |
| **Trade Name:** | TCL  Serial No.: ------ |
| **Date of Receipt:** | Jul. 16, 2020  Date of Test: Jul. 16-Aug. 22, 2020 |
| **Test Specification:** | FCC Part 15 Subpart C (15.247)<br>ANSI C63.10:2013<br>FCC KDB 558074 D01 15.247 Meas Guidance v05r02 |
| **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 C requirements.<br><br>This report applies to above tested sample only and shall not be reproduced in part without written approval of EST Technology Co., Ltd.<br>**Date:** Aug. 26, 2020 |

| Prepared by: | Reviewed by: | Approved by: |
|---|---|---|
| Ring Yang | Seven Wang | |
| Ring Yang / Assistant | Seven Wang / 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*

*This test report is based on a single evaluation of one sample of above mentioned products ,It is not permitted to be duplicated in extracts without written approval of EST Technology Co., Ltd.*

# 1. GENERAL INFORMATION

## 1.1. Description of Device (EUT)

| | | |
|---|---|---|
| Product Name | : | 2.0 CH Sound Bar |
| Model Number | : | TS3100 |
| Software Version | : | N/A |
| Hardware Version | : | N/A |
| Operation frequency | : | 2402MHz~2480MHz |
| Number of channel | : | 40 |
| Max Output Power (PEAK) | : | GFSK :2.52dBm |
| Modulation Type | : | GFSK |
| Sample Type | : | Prototype production |

Note:

For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

## 1.2. Antenna Information

| Ant No. | Brand | Model Name | Antenna Type | Connector | Gain (dBi) |
|---|---|---|---|---|---|
| 1 | N/A | N/A | Internal antenna | N/A | 0 |

# 2. SUMMARY OF TEST

## 2.1. Summary of test result

| Report Section | Description of Test Item | FCC Standard Section | Results |
|---|---|---|---|
| 3 | 6dB Bandwidth | 15.247(a)(2) | PASS |
| 4 | Maximum Peak Output Power | 15.247(b)(3) | PASS |
| 5 | Power Spectral Density | 15.247(e) | PASS |
| 6 | Conducted Band Edge | 15.247(d) | PASS |
| 7 | Conducted Spurious Emissions | 15.247(d) | PASS |
| 8 | Radiated Spurious Emissions and Band Edge | 15.205<br>15.209<br>15.247(d) | PASS |
| 9 | AC Power Line Conducted Emissions | 15.207 | PASS |
| 10 | Antenna Requirement | 15.203 | PASS |

Note:

(1) “N/A” denotes test is not applicable in this test report

## 2.2. Test Facilities

| | | |
|---|---|---|
| EMC Lab | : | Certificated by CNAS, CHINA<br>Registration No.: L5288<br>This Certificate is valid until: November 12, 2023<br><br>Certificated by FCC, USA<br>Designation Number: CN1215<br>This Certificate is valid until: January 31, 2022<br><br>Certificated by A2LA, USA<br>Registration No.: 4366.01<br>This Certificate is valid until: January 31, 2022<br><br>Certificated by Industry Canada<br>CAB identifier No.: CN0035<br>This Certificate is valid until: January 31, 2022<br><br>Certificated by VCCI, Japan<br>Registration No.:C-14103; T-20073; R-13663;<br>R-20103; G-20097<br>Date of registration: Apr. 20, 2020<br>This Certificate is valid until: Apr. 19, 2023<br><br>Certificated by TUV Rheinland, Germany<br>Registration No.: UA 50413872 0001<br>Date of registration: July 31, 2018<br><br>Certificated by Intertek<br>Registration No.: 2011-RTL-L2-64<br>Date of registration: November 08, 2018 |
| Name of Firm | : | EST Technology Co., Ltd. |
| Site Location | : | Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China |

## 2.3. Measurement uncertainty

| Test Item | Uncertainty |
|---|---|
| Uncertainty for Conduction emission test | ±3.48dB |
| Uncertainty for spurious emissions test (30MHz-1GHz) | ±4.60 dB(Polarize: H) |
| | ±4.68 dB(Polarize: V) |
| Uncertainty for spurious emissions test (1GHz to 25GHz) | ±4.96dB |
| Uncertainty for radio frequency | $7\times10^{-8}$ |
| Uncertainty for conducted RF Power | 0.20dB |
| Uncertainty for Power density test | 0.26dB |

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

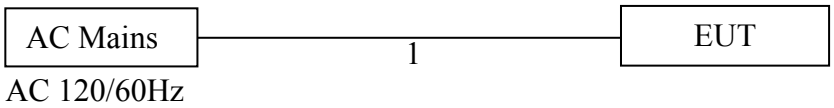
## 2.4. Assistant equipment used for test

| Item | Equipment | Brand | Model Name/Type No. | FCC ID | Series No. |
|---|---|---|---|---|---|
| N/A | N/A | N/A | N/A | N/A | N/A |

| Item | Shielded Type | Ferrite Core | Length | Note |
|---|---|---|---|---|
| 1 | NO | NO | 1.5m | AC Cable |

## 2.5. Block Diagram

For radiated emissions test: EUT was placed on a turn table, which is 0.8 (or 1.5) meter high above ground. EUT was beset into BLE test mode by software before test.




(EUT: 2.0 CH Sound Bar)

## 2.6. Test Mode

The test mode was selected for the final test as listed below.

| Test Item | Modulation Type | Test Channel |
|---|---|---|
| 6dB Bandwidth | GFSK | Low/Middle/High |
| Maximum Peak Output Power | GFSK | Low/Middle/High |
| Power Spectral Density | GFSK | Low/Middle/High |
| Conducted Band Edge | GFSK | Low/ High |
| Conducted Spurious Emissions | GFSK | Low/Middle/High |
| Radiated Spurious Emissions(Below 1GHz) | GFSK | Low/Middle/High |
| Radiated Spurious Emissions(Above 1GHz) | GFSK | Low/Middle/High |
| Radiated Band Edge | GFSK | Low/High |
| AC Power Line Conducted Emissions | GFSK | Low/Middle/High |

Note:

1. In radiated measurement,the EUT had been pre-scan on the positioned of each 3 axis(X,Y,Z), the worst case was found when positioned on **X-plane.**

## 2.7. Power Setting of Test Software

| Software Name | FCC_20190313_V2.20 | | |
|---|---|---|---|
| Frequency(MHz) | 2402 | 2440 | 2480 |
| Setting | 3 | 3 | 3 |

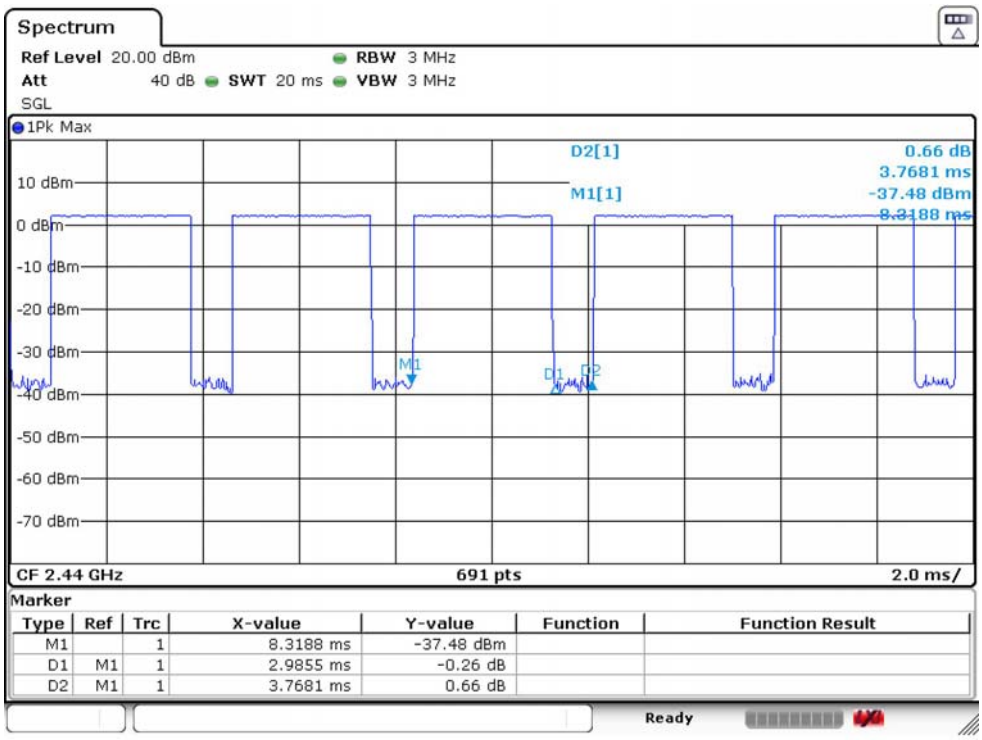
## 2.8. Duty Cycle

| Temperature | 26℃ | Relative Humidity | 53% | Test Voltage | 120V/60Hz |
|---|---|---|---|---|---|
| Mode | Fre(MHz) | On time(ms) | Total Time(ms) | Duty Cycle | Duty Factor |
| GFSK | 2440 | 2.9855 | 3.7681 | 79.23 | 1.01 |

Note:

1. If duty cycle <98 %, the conducted average output power and average power spectral density should be add duty factor.
2. If duty cycle≥98 %,the EUT is consider to be transmitting continuously,the conducted average output power and average power spectral density no need to add duty factor(consider to be zero).
3. The conducted peak output power and peak power spectral density no need to consider duty factor.
4. The on-time time is transmission duration(T).

**GFSK 2440MHz**



## 2.9. Channel List

| Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) |
|---|---|---|---|
| 0 | 2402 | 1 | 2404 |
| 2 | 2406 | 3 | 2408 |
| 4 | 2410 | 5 | 2412 |
| 6 | 2414 | 7 | 2416 |
| 8 | 2418 | 9 | 2420 |
| 10 | 2422 | 11 | 2424 |
| 12 | 2426 | 13 | 2428 |
| 14 | 2430 | 15 | 2432 |
| 16 | 2434 | 17 | 2436 |
| 18 | 2438 | 19 | 2440 |
| 20 | 2442 | 21 | 2444 |
| 22 | 2446 | 23 | 2448 |
| 24 | 2450 | 25 | 2452 |
| 26 | 2454 | 27 | 2456 |
| 28 | 2458 | 29 | 2460 |
| 30 | 2462 | 31 | 2464 |
| 32 | 2466 | 33 | 2468 |
| 34 | 2470 | 35 | 2472 |
| 36 | 2474 | 37 | 2476 |
| 38 | 2478 | 39 | 2480 |

## 2.10. Test Equipment List

| For conducted emission test | | | | | | |
|---|---|---|---|---|---|---|
| Equipment | Manufacturer | Model No. | Serial No. | Calibration Body | Last Cal. | Next Cal. |
| EMI Test Receiver | Rohde & Schwarz | ESHS30 | EST-E001 | LISAI | June 13,20 | 1 Year |
| Artificial Mains Network | Rohde & Schwarz | ENV216 | EST-E002 | LISAI | June 13,20 | 1 Year |
| Pulse Limiter | Rohde & Schwarz | ESH3-Z2 | EST-E078 | LISAI | June 13,20 | 1 Year |
| Test Software | Audix | e3-6.111221a | N/A | N/A | N/A | N/A |

| For radiated emission test(9kHz-30MHz) | | | | | | |
|---|---|---|---|---|---|---|
| Equipment | Manufacturer | Model No. | Serial No. | Calibration Body | Last Cal. | Next Cal. |
| EMI Test Receiver | Rohde & Schwarz | ESR7 | EST-E047 | LISAI | June 13,20 | 1 Year |
| Active Loop Antenna | SCHWAREB ECK | FMZB 1519B | EST-E054 | LISAI | June 13,20 | 1 Year |
| Test Software | Audix | e3-6.111221a | N/A | N/A | N/A | N/A |
| 9kHz-30MHz Cable | N/A | EST-001 | N/A | N/A | N/A | N/A |

| For radiated emissions test (30MHz-1000MHz) | | | | | | |
|---|---|---|---|---|---|---|
| Equipment | Manufacturer | Model No. | Serial No. | Calibration Body | Last Cal. | Next Cal. |
| EMI Test Receiver | Rohde & Schwarz | ESR7 | EST-E047 | LISAI | June 13,20 | 1 Year |
| Bilog Antenna | Teseq | CBL 6111D | EST-E034 | LISAI | June 13,20 | 1 Year |
| Test Software | Audix | e3-6.111221a | N/A | N/A | N/A | N/A |
| 30-1000MHz Cable | N/A | EST-002 | N/A | N/A | N/A | N/A |

| For radiated emission test(Above 1000MHz) | | | | | | |
|---|---|---|---|---|---|---|
| Equipment | Manufacturer | Model No. | Serial No. | Calibration Body | Last Cal. | Next Cal. |
| Horn Antenna | SCHWARZB ECK | BBHA9120D | EST-E031 | LISAI | June 13,20 | 1 Year |
| Signal Amplifier | SCHWARZB ECK | BBV9718 | EST-E032 | LISAI | June 13,20 | 1 Year |
| Spectrum Analyzer | Rohde &Schwarz | FSV40 | EST-E069 | LISAI | June 13,20 | 1 Year |
| Test Software | Audix | e3-6.111221a | N/A | N/A | N/A | N/A |
| Above 1GHz Cable | N/A | EST-003 | N/A | N/A | N/A | N/A |

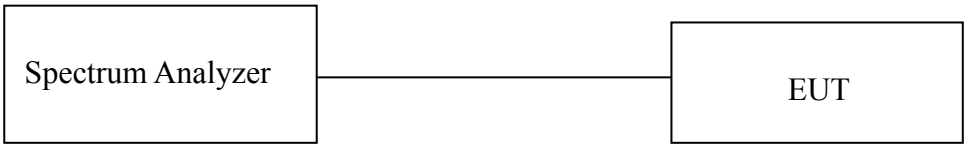
| For connect EUT antenna terminal test | | | | | | |
|---|---|---|---|---|---|---|
| Equipment | Manufacturer | Model No. | Serial No. | Calibration Body | Last Cal. | Next Cal. |
| Spectrum Analyzer | Rohde&Schwarz | FSV40 | EST-E069 | LISAI | June 13,20 | 1 Year |

# 3. 6DB BANDWIDTH

## 3.1. Limit

Systems using digital modulation techniques operate in the 2400-2483.5 MHz,the minimum 6 dB bandwidth shall be at least 500 kHz.

## 3.2. Test Setup




## 3.3. Spectrum Analyzer Setting

| Spectrum Parameters | Setting |
|---|---|
| RBW | 100KHz |
| VBW | 300KHz |
| Span | 3MHz |
| Sweep Time | Auto |
| Detector | Peak |
| Trace Mode | Max Hold |

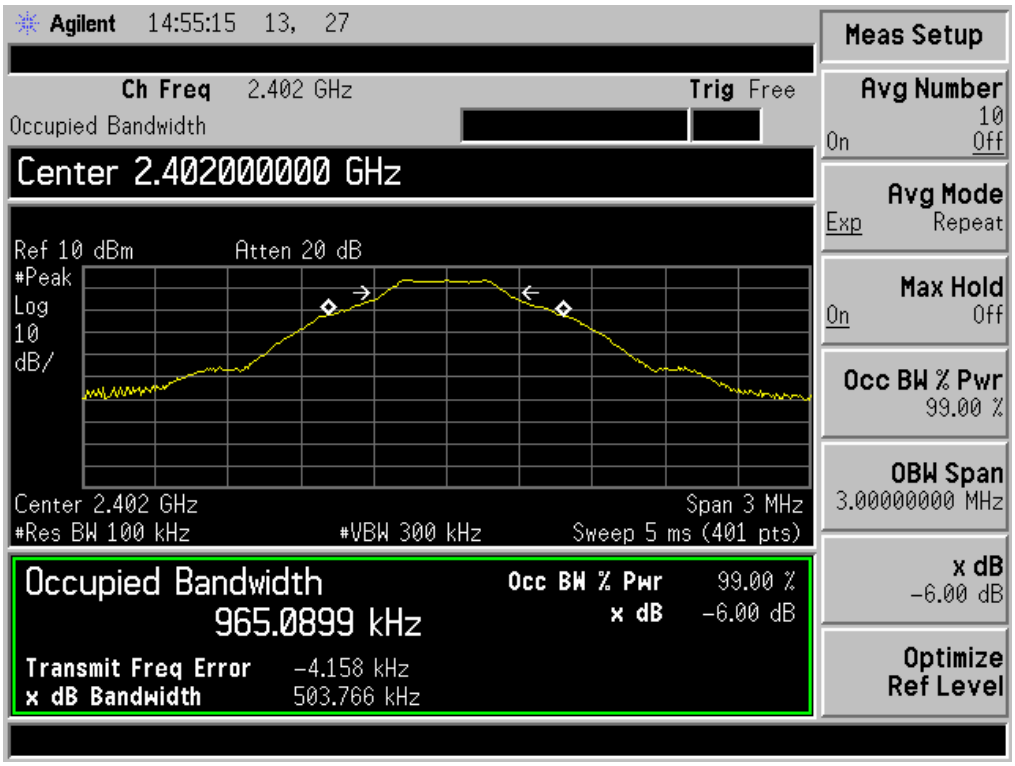
## 3.4. Test Procedure

a. Connect EUT antenna terminal to the spectrum analyzer with RF cable.
b. Spectrum analyzer setting parameters in accordance with section 3.3.
c. Set the EUT transmit continuously with maximum output power.
d. Allow trace to stabilize, use the ndB down function to measure 6dB Bandwidth.
e. Repeat above procedures until all channels were measured.
f. Record the results in the test report.

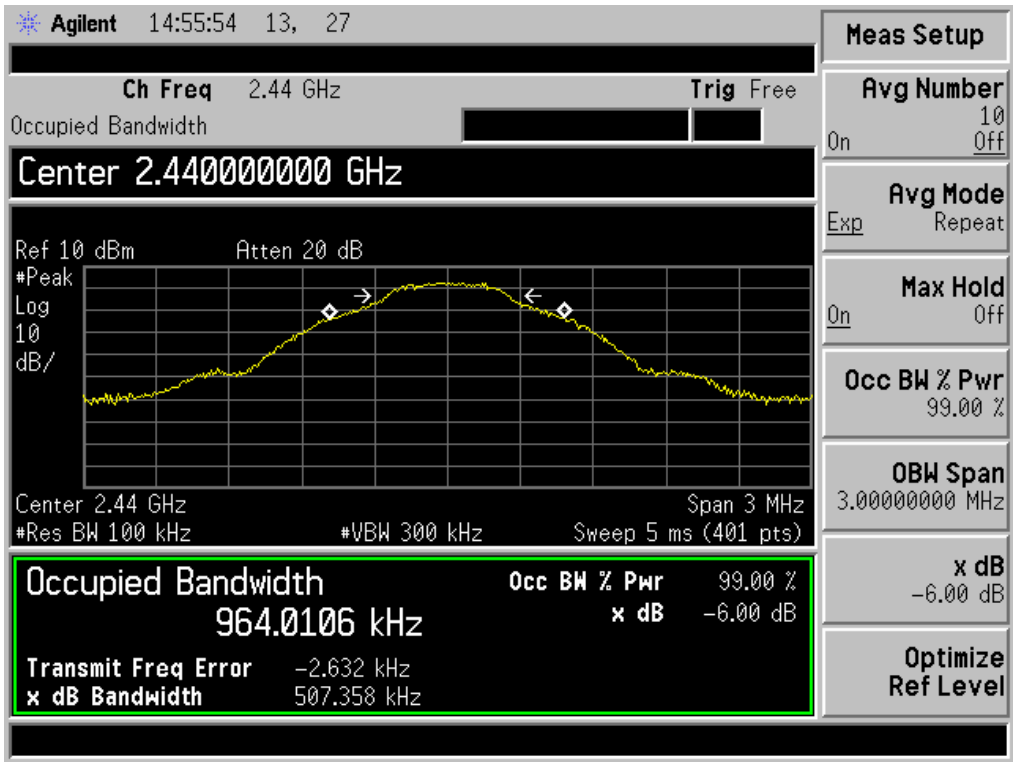
## 3.5. Test Result

| Temperature | 26℃ | Relative Humidity | 53% | |
|---|---|---|---|---|
| Test Voltage | 120V/60Hz | | | |
| Mode | Freq (MHz) | 6dB Bandwidth (MHz) | 6dB BW Limit (MHz) | Result |
| GFSK | 2402 | 0.5038 | ≥0.5 | PASS |
| | 2440 | 0.5074 | ≥0.5 | PASS |
| | 2480 | 0.5044 | ≥0.5 | PASS |

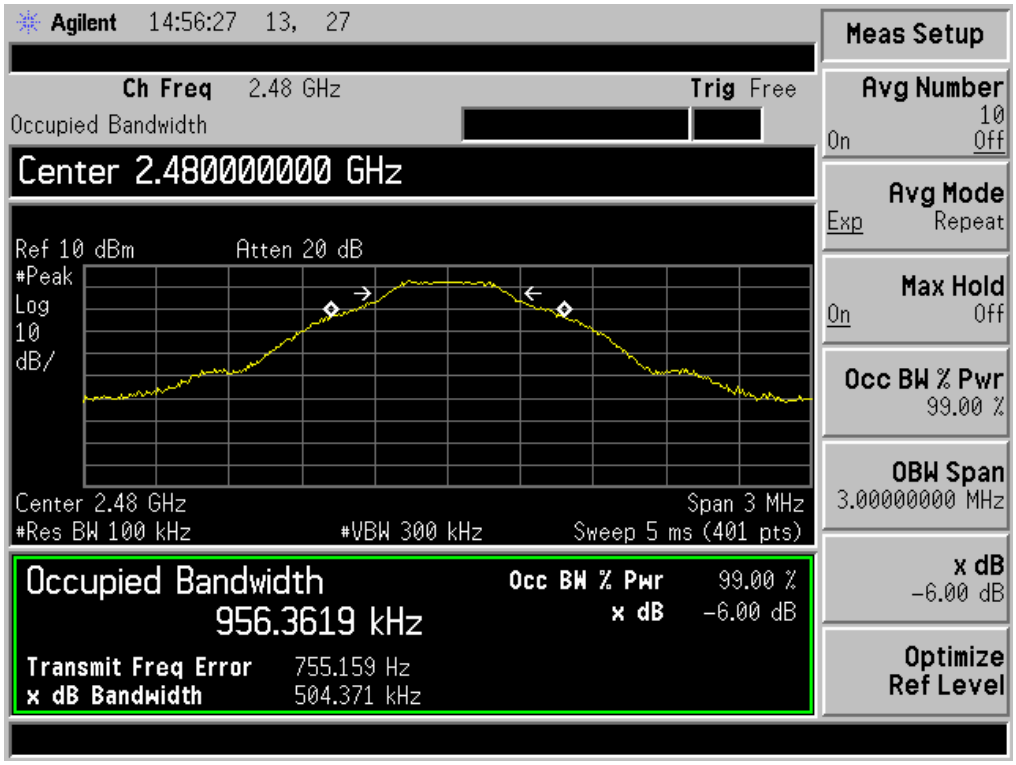
**GFSK 2402 MHz**



**GFSK 2440 MHz**




**GFSK 2480 MHz**



# 4. MAXIMUM PEAK OUTPUT POWER

## 4.1. Limit

For systems using digital modulation in 2400-2483.5 MHz,the maximum peak output power is 1 Watt(30dBm).

## 4.2. Test Setup

## 4.3. Spectrum Analyzer Setting

| Spectrum Parameters | Setting |
|---|---|
| RBW | 1MHz |
| VBW | 3MHz |
| Span | 3MHz |
| Sweep Time | Auto |
| Detector | Peak |
| Trace Mode | Max Hold |

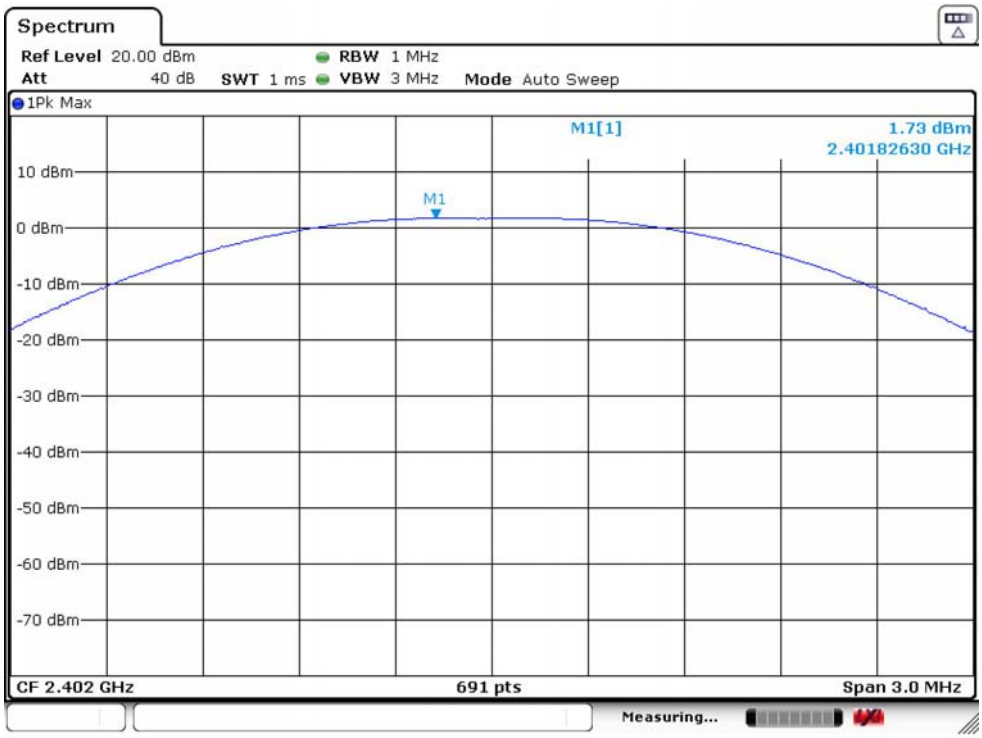
## 4.4. Test Procedure

a. Connect EUT antenna terminal to the spectrum analyzer with RF cable.
b. Spectrum analyzer setting parameters in accordance with section 4.3.
c. Set the EUT transmit continuously with maximum output power.
d. Allow trace to stabilize, use the marker-to-peak function to set the marker to the peak of the emission.
e. Repeat above procedures until all channels were measured.
f. Record the results in the test report.

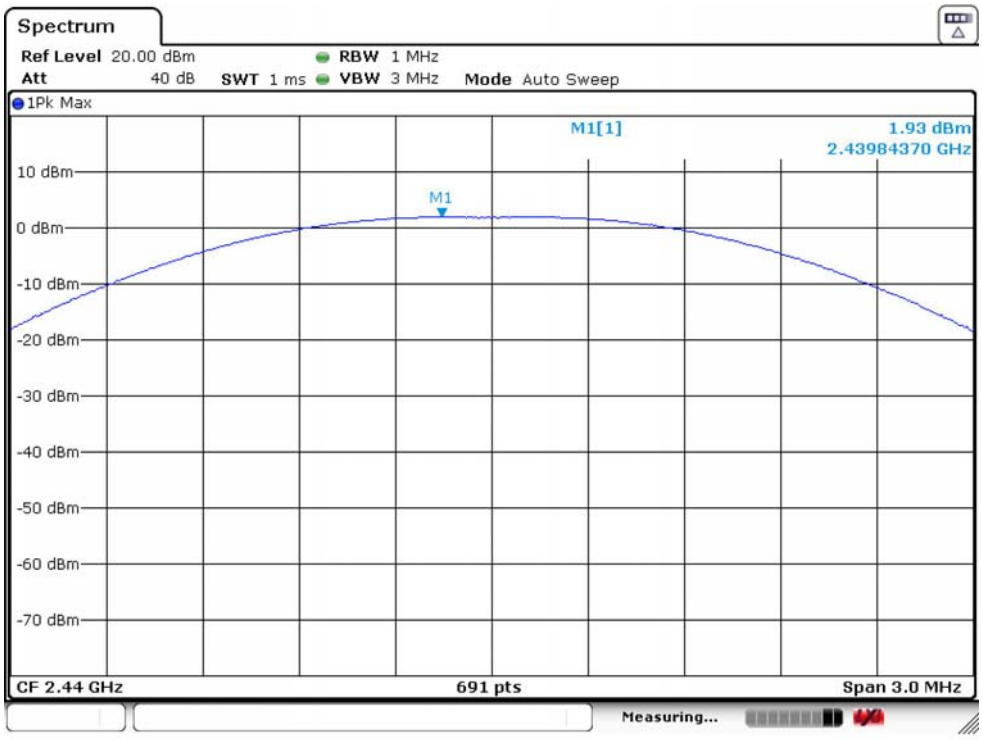
## 4.5. Test Result

| Temperature | 26℃ | Relative Humidity | 53% | Test Voltage | | 120V/60Hz |
|---|---|---|---|---|---|---|
| Mode | Freq (MHz) | Peak Output Power | | Limit | | Result |
| | | dBm | W | dBm | W | |
| GFSK | 2402 | 1.73 | 0.0015 | 30.00 | 1.0000 | PASS |
| | 2440 | 1.93 | 0.0016 | 30.00 | 1.0000 | PASS |
| | 2480 | 2.52 | 0.0018 | 30.00 | 1.0000 | PASS |

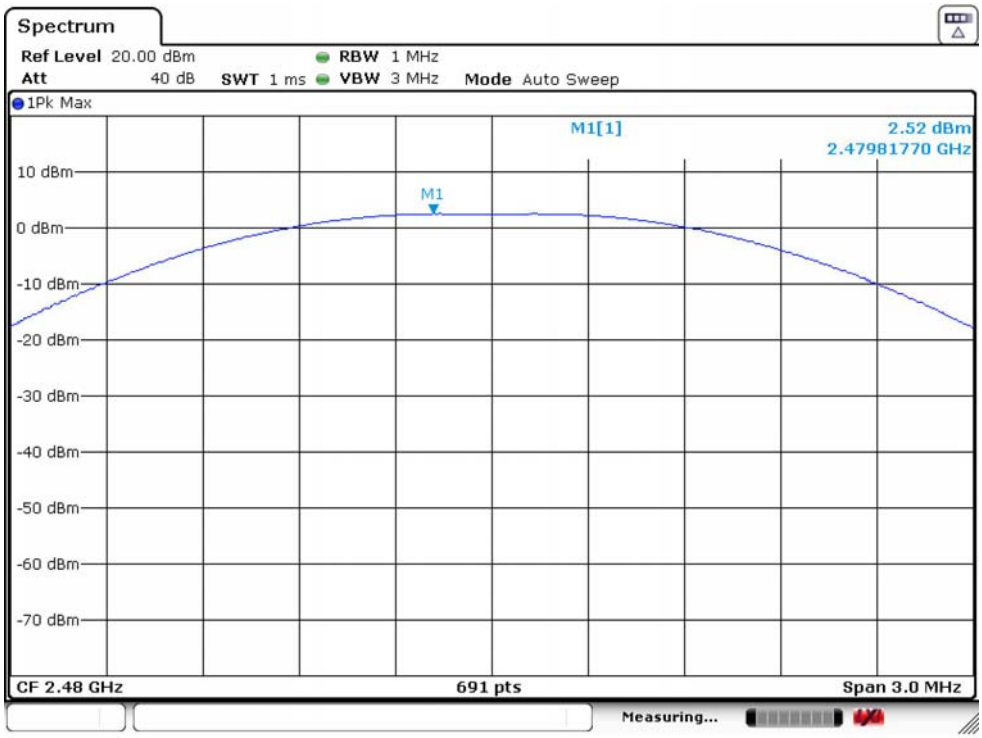
**GFSK 2402MHz**



## GFSK 2440MHz




## GFSK 2480MHz

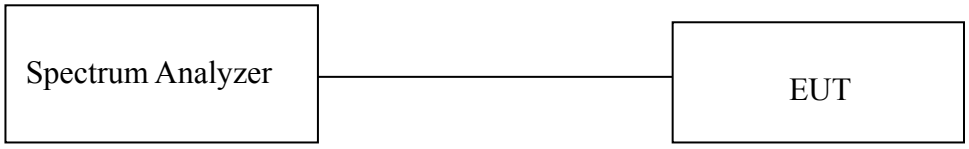


# 5. POWER SPECTRAL DENSITY

## 5.1. Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

## 5.2. Test Setup




## 5.3. Spectrum Analyzer Setting

| Spectrum Parameters | Setting |
|---|---|
| RBW | 3KHz |
| VBW | 10KHz |
| Span | 2MHz |
| Sweep Time | Auto |
| Detector | Peak |
| Trace Mode | Max Hold |

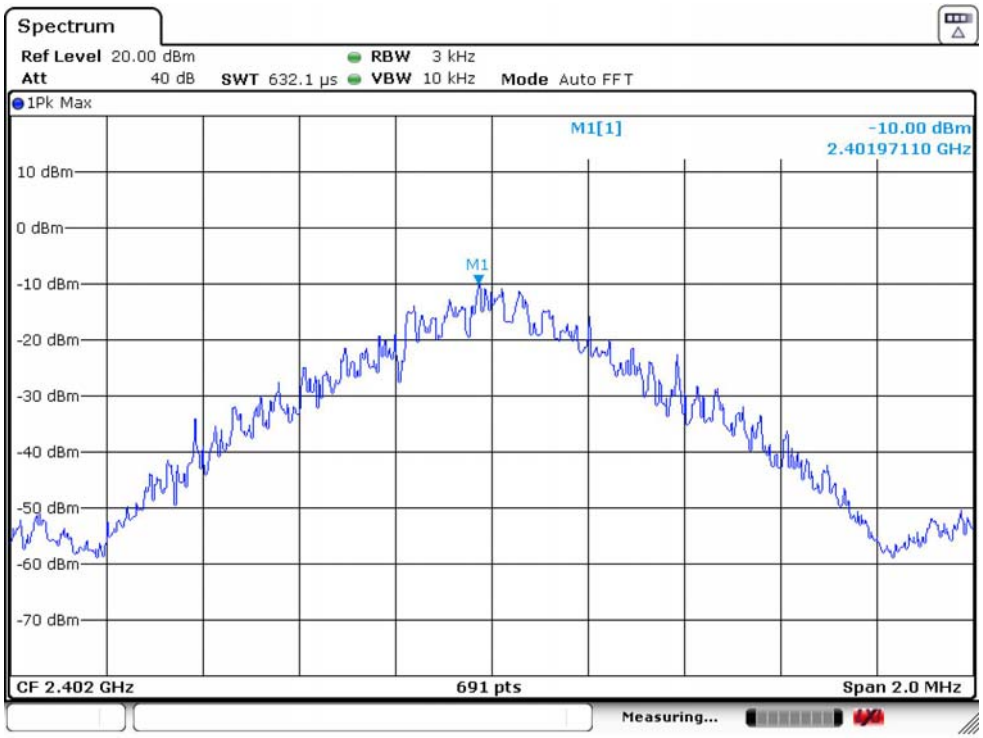
## 5.4. Test Procedure

a. Connect EUT antenna terminal to the spectrum analyzer with RF cable.
b. Spectrum analyzer setting parameters in accordance with section 5.3.
c. Set the EUT transmit continuously with maximum output power.
d. Allow trace to stabilize, use the marker-to-peak function to set the marker to the peak of the emission.
e. Repeat above procedures until all channels were measured.
f. Record the results in the test report.

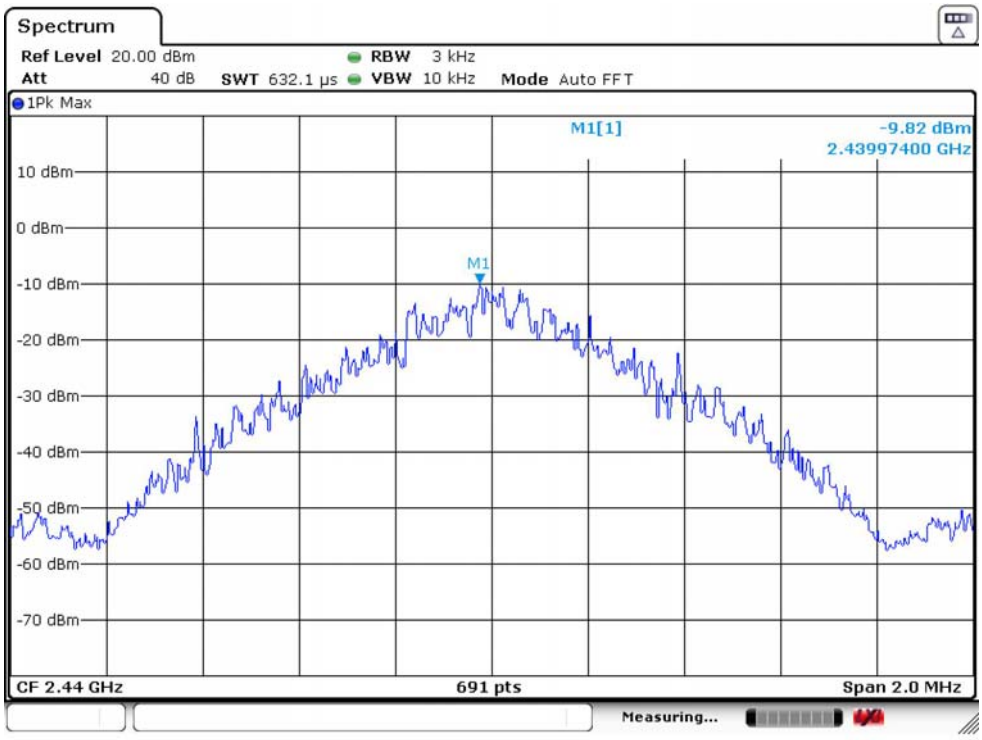
## 5.5. Test Result

| Temperature | 26℃ | Relative Humidity | 53% | Test Voltage | 120V/60Hz |
|---|---|---|---|---|---|
| Mode | Freq (MHz) | Power Density (dBm/3kHz) | | Limit (dBm/3kHz) | Result |
| GFSK | 2402 | -10.00 | | 8.00 | PASS |
| | 2440 | -9.82 | | 8.00 | PASS |
| | 2480 | -9.22 | | 8.00 | PASS |

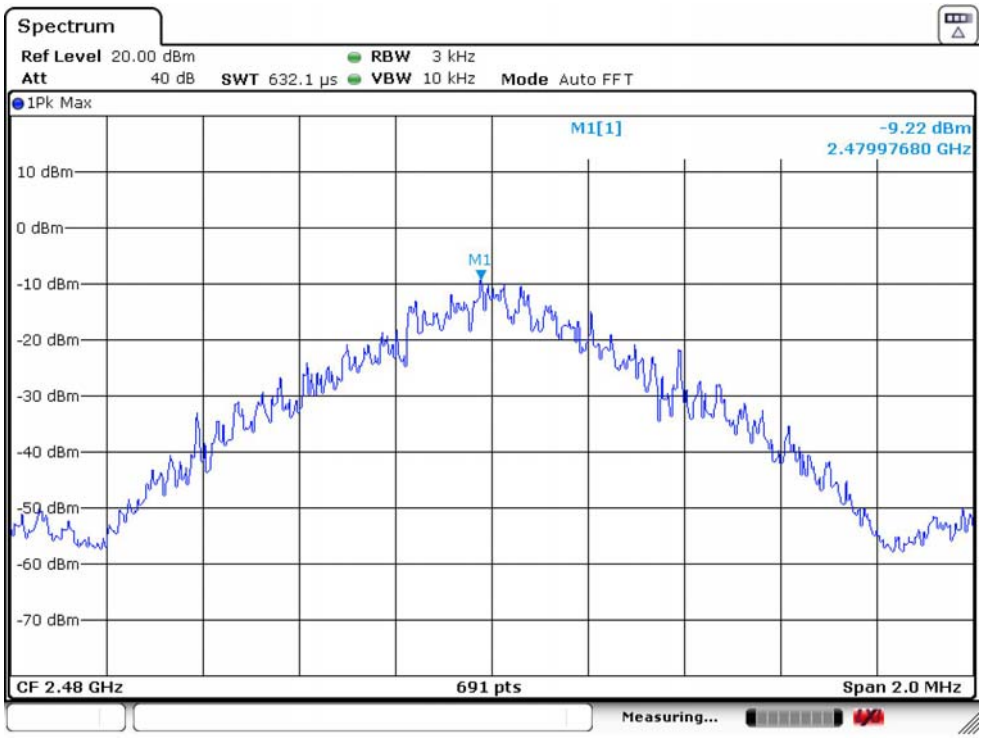
**GFSK 2402MHz**



## GFSK 2440MHz




## GFSK 2480MHz

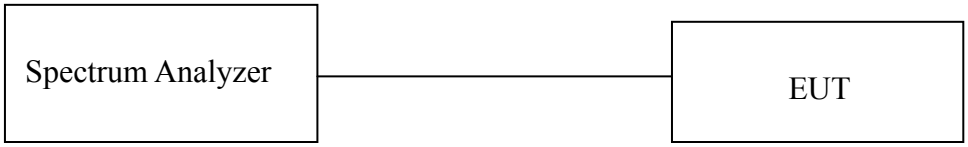


# 6. CONDUCTED BAND EDGE

## 6.1. Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

## 6.2. Test Setup




## 6.3. Spectrum Analyzer Setting

| Spectrum Parameters | Setting |
|---|---|
| RBW | 100KHz |
| VBW | 300KHz |
| Span | 100MHz |
| Sweep Time | Auto |
| Detector | Peak |
| Trace Mode | Max Hold |

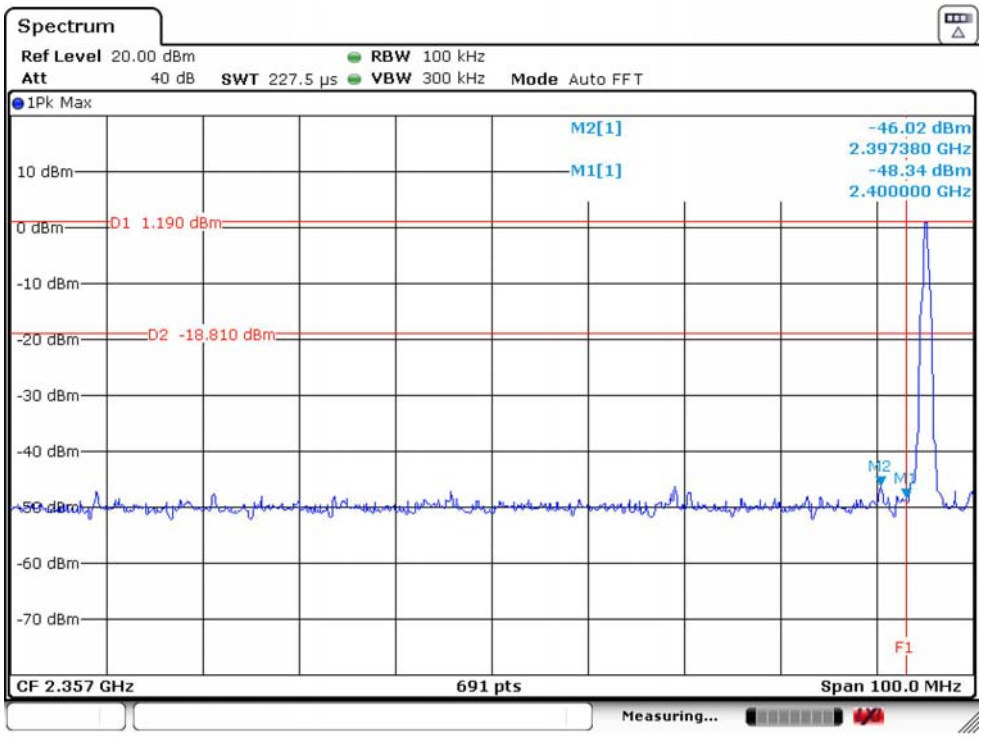
## 6.4. Test Procedure

a. Connect EUT antenna terminal to the spectrum analyzer with RF cable.
b. Spectrum analyzer setting parameters in accordance with section 6.3.
c. Set the EUT transmit continuously with maximum output power.
d. Allow trace to stabilize, use the marker function to mark the highest emission level outside the authorized band.
e. Repeat above procedures until all channels were measured.
f. Record the results in the test report.

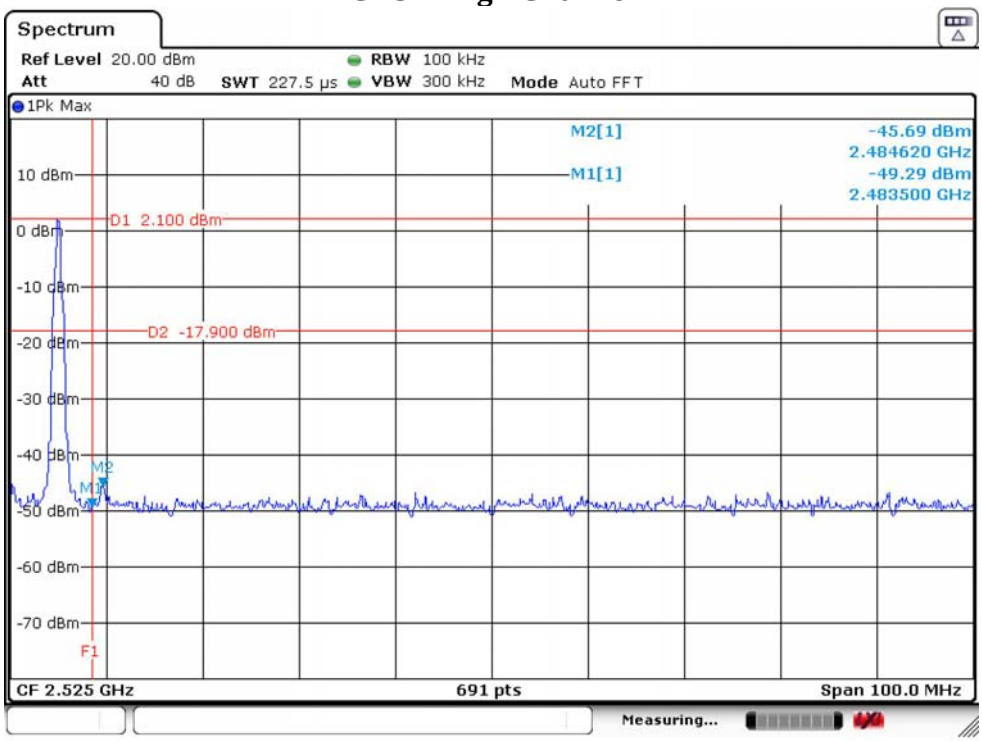
## 6.5. Test Result

| Temperature | 26℃ | Relative Humidity | 53% | Test Voltage | 120V/60Hz |
|---|---|---|---|---|---|
| Result | PASS | | | | |

**GFSK Low Channel**




**GFSK High Channel**

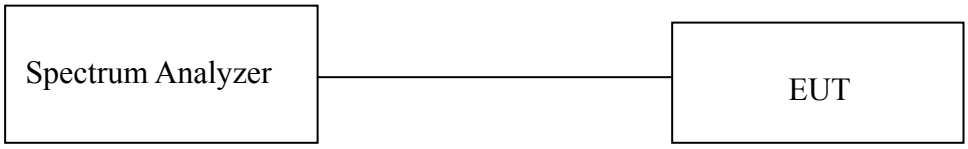


# 7. CONDUCTED SPURIOUS EMISSIONS

## 7.1. Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

## 7.2. Test Setup




## 7.3. Spectrum Analyzer Setting

| Spectrum Parameters | Setting |
|---|---|
| RBW | 100KHz |
| VBW | 300KHz |
| Start frequency | 30MHz |
| Stop frequency | 25GHz |
| Sweep Time | Auto |
| Detector | Peak |
| Trace Mode | Max Hold |

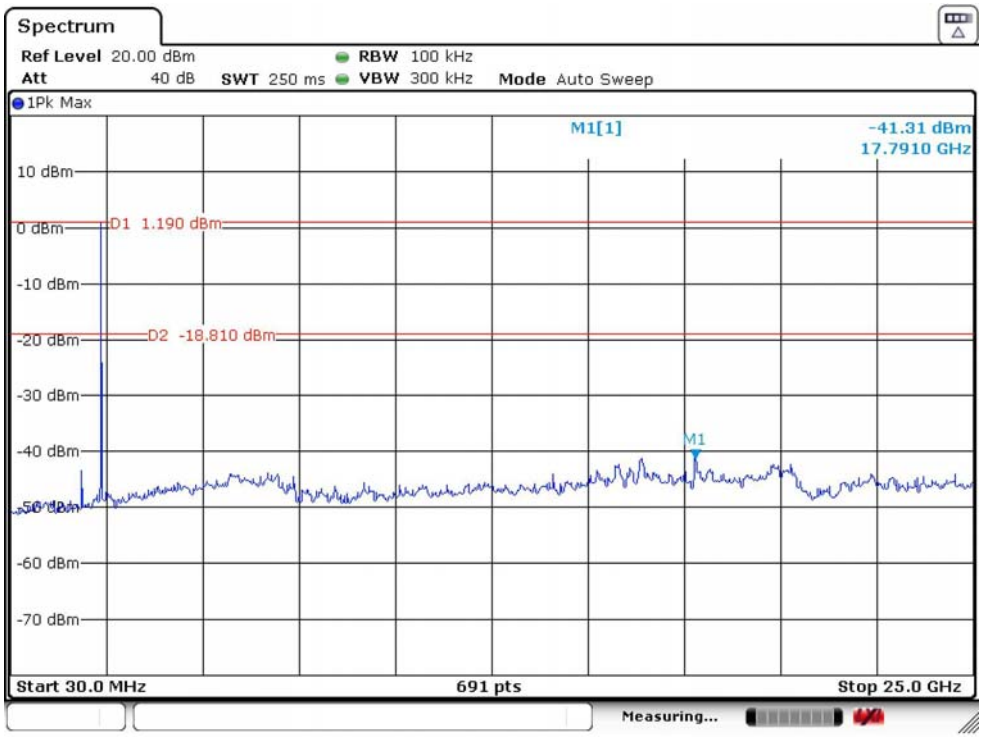
## 7.4. Test Procedure

a. Connect EUT antenna terminal to the spectrum analyzer with RF cable.
b. Spectrum analyzer setting parameters in accordance with section 7.3.
c. Set the EUT transmit continuously with maximum output power.
d. Allow trace to stabilize, use the marker function to mark the highest emission level outside the authorized band.
e. Repeat above procedures until all channels were measured.
f. Record the results in the test report.

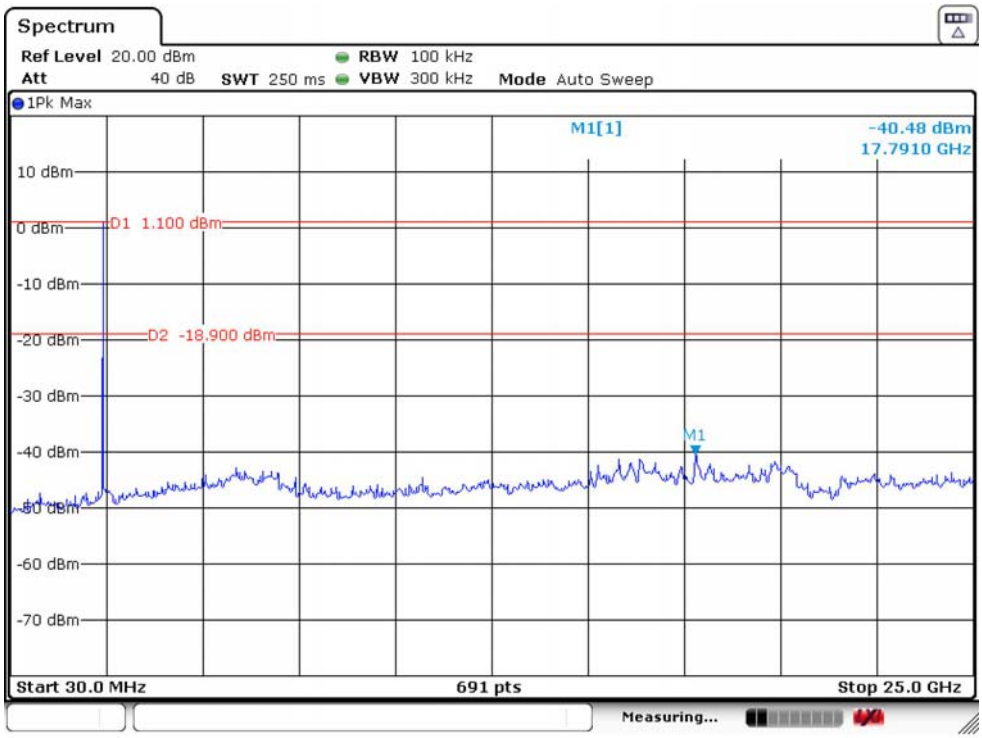
## 7.5. Test Result

| Temperature | 26℃ | Relative Humidity | 53% | Test Voltage | 120V/60Hz |
|---|---|---|---|---|---|
| Result | PASS | | | | |

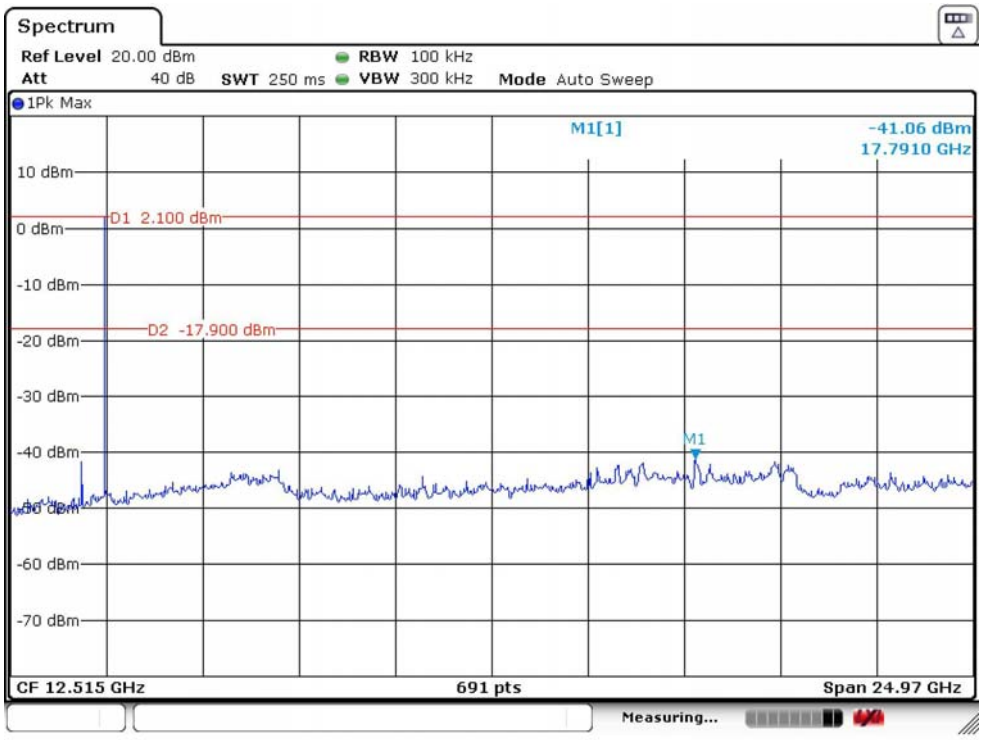
**GFSK 2402MHz**




**GFSK 2440MHz**



**GFSK 2480MHz**



# 8. RADIATED SPURIOUS EMISSIONS AND BAND EDGE

## 8.1. Limit

All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

15.205 Restricted frequency band

| MHz | MHz | MHz | GHz |
|---|---|---|---|
| 0.090 - 0.110 | 16.42 - 16.423 | 399.9 - 410 | 4.5 - 5.15 |
| [1]0.495 - 0.505 | 16.69475 - 16.69525 | 608 - 614 | 5.35 - 5.46 |
| 2.1735 - 2.1905 | 16.80425 - 16.80475 | 960 - 1240 | 7.25 - 7.75 |
| 4.125 - 4.128 | 25.5 - 25.67 | 1300 - 1427 | 8.025 - 8.5 |
| 4.17725 - 4.17775 | 37.5 - 38.25 | 1435 - 1626.5 | 9.0 - 9.2 |
| 4.20725 - 4.20775 | 73 - 74.6 | 1645.5 - 1646.5 | 9.3 - 9.5 |
| 6.215 - 6.218 | 74.8 - 75.2 | 1660 - 1710 | 10.6 - 12.7 |
| 6.26775 - 6.26825 | 108 - 121.94 | 1718.8 - 1722.2 | 13.25 - 13.4 |
| 6.31175 - 6.31225 | 123 - 138 | 2200 - 2300 | 14.47 - 14.5 |
| 8.291 - 8.294 | 149.9 - 150.05 | 2310 - 2390 | 15.35 - 16.2 |
| 8.362 - 8.366 | 156.52475 - 156.52525 | 2483.5 - 2500 | 17.7 - 21.4 |
| 8.37625 - 8.38675 | 156.7 - 156.9 | 2690 - 2900 | 22.01 - 23.12 |
| 8.41425 - 8.41475 | 162.0125 - 167.17 | 3260 - 3267 | 23.6 - 24.0 |
| 12.29 - 12.293 | 167.72 - 173.2 | 3332 - 3339 | 31.2 - 31.8 |
| 12.51975 - 12.52025 | 240 - 285 | 3345.8 - 3358 | 36.43 - 36.5 |
| 12.57675 - 12.57725 | 322 - 335.4 | 3600 - 4400 | ([2]) |

15.209 Limit

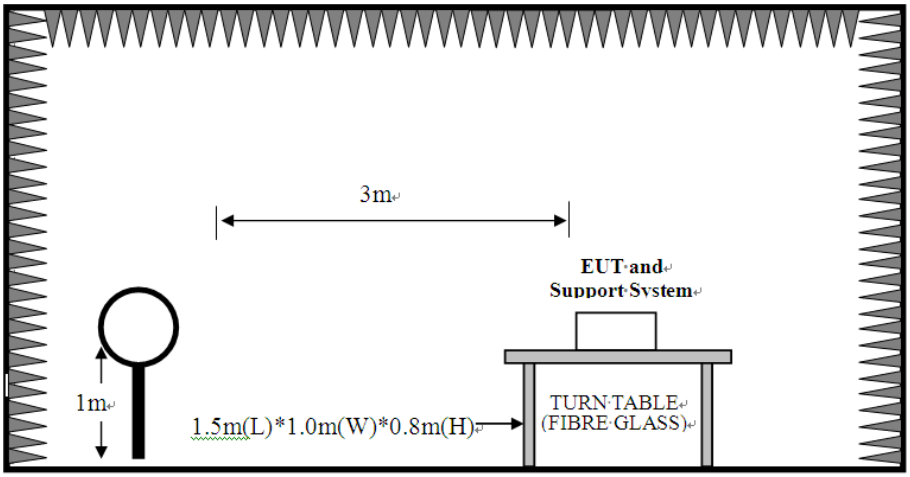
| Frequency (MHz) | Field Strength(μV/m) | Distance(m) |
|---|---|---|
| 0.009-0.490 | 2400/F(kHz) | 300 |
| 0.490-1.705 | 24000/F(kHz) | 30 |
| 1.705-30 | 30 | 30 |
| 30-88 | 100 | 3 |
| 88-216 | 150 | 3 |
| 216-960 | 200 | 3 |
| Above 960 | 500 | 3 |

Note:

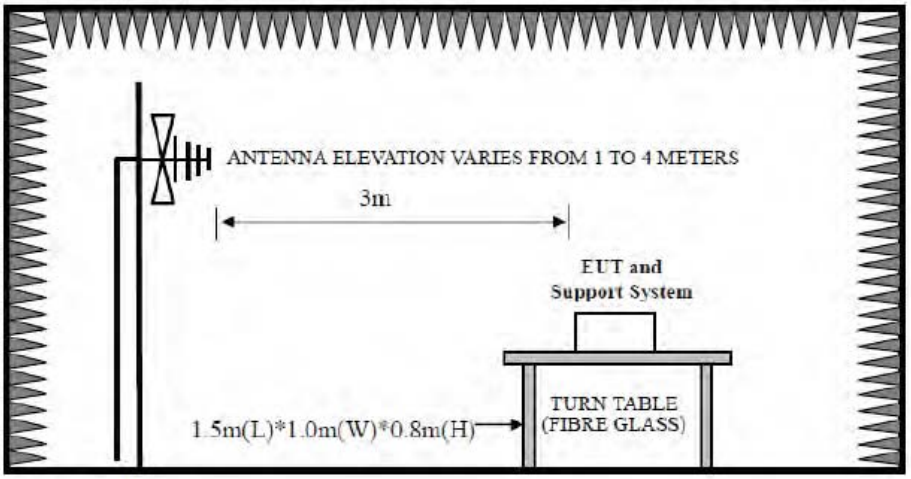
(1) Emission level dBμV = 20 log Emission level μV/m.
(2) The smaller limit shall apply at the cross point between two frequency bands.
(3) Distance is the distance in meters between the measuring instrument,antenna and the closest point of any part of the device or system.

## 8.2. Test Setup

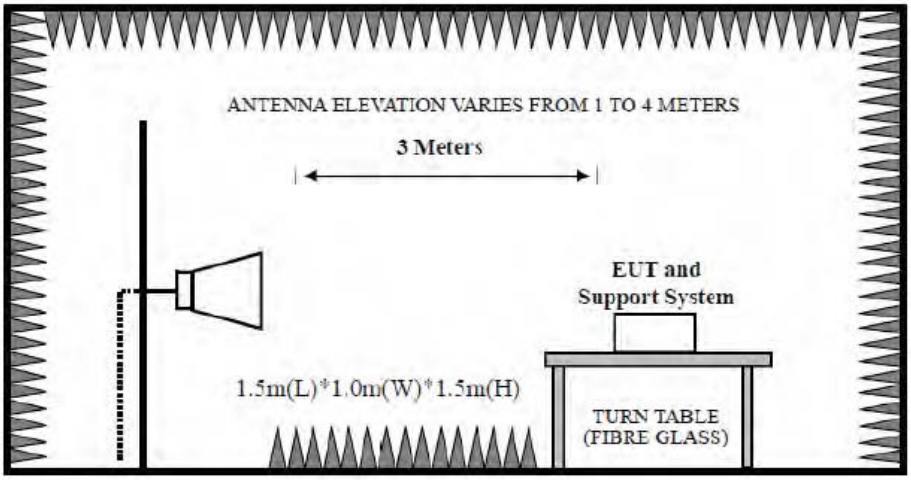
9kHz~30MHz




30~1000MHz




Above 1GHz



## 8.3. Spectrum Analyzer Setting

For 9KHz-150KHz

| Spectrum Parameters | Setting |
|---|---|
| RBW | 300Hz(for Peak&AVG)/CISPR 200Hz(for QP) |
| VBW | 300Hz(for Peak&AVG)/CISPR 200Hz(for QP) |
| Start frequency | 9KHz |
| Stop frequency | 150KHz |
| Sweep Time | Auto |
| Detector | PEAK/QP/AVG |
| Trace Mode | Max Hold |

For 150KHz-30MHz

| Spectrum Parameters | Setting |
|---|---|
| RBW | 9KHz |
| VBW | 9KHz |
| Start frequency | 150KHz |
| Stop frequency | 30MHz |
| Sweep Time | Auto |
| Detector | QP |
| Trace Mode | Max Hold |

For 30MHz-1GHz

| Spectrum Parameters | Setting |
|---|---|
| RBW | 120KHz |
| VBW | 300KHz |
| Start frequency | 30MHz |
| Stop frequency | 1GHz |
| Sweep Time | Auto |
| Detector | QP |
| Trace Mode | Max Hold |

For Above 1GHz

| Spectrum Parameters | Setting | |
|---|---|---|
| RBW | 1MHz | |
| VBW | PEAK Measurement | AVG Measurement |
| | 3MHz | Duty cycle≥98%,VBW=10Hz |
| | | Duty cycle＜98%,VBW≥1/T |
| Start frequency | 1GHz | |
| Stop frequency | 25GHz | |
| Sweep Time | Auto | |
| Detector | PEAK | |
| Trace Mode | Max Hold | |

Note :

1. T is the on-time time of the duty cycle,when EUT transmit continuously with maximum output power,unit is seconds. reference section 2.8 for the on-time time.

## 8.4. Test Procedure

a. EUT was placed on a turn table, which is 0.8 meter high above ground for below 1GHz test, and which is 1.5 meter high above ground for above 1GHz test.
b. EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower.
c. Set the EUT transmit continuously with maximum output power.
d. The turn table can rotate 360 degrees to determine the position of the maximum emission level.
e. The antenna can be moved up and down between 1 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on test.
f. Spectrum analyzer setting parameters in accordance with section 8.3.
g. Repeat above procedures until all channels were measured.
h. Record the results in the test report.

Note:

1. For emissions above 1GHz, if peak level comply with average limit, then the average level is deemed to comply with average limit.
2. The frequency 2402MHz ,2440MHz and 2480MHz is fundamental frequency which no limit, the limit on plots is automatically generated by the software, it's not fundamental limit, we can't remove it.

## 8.5. Test Result

### Radiated Emissions Below 1GHz

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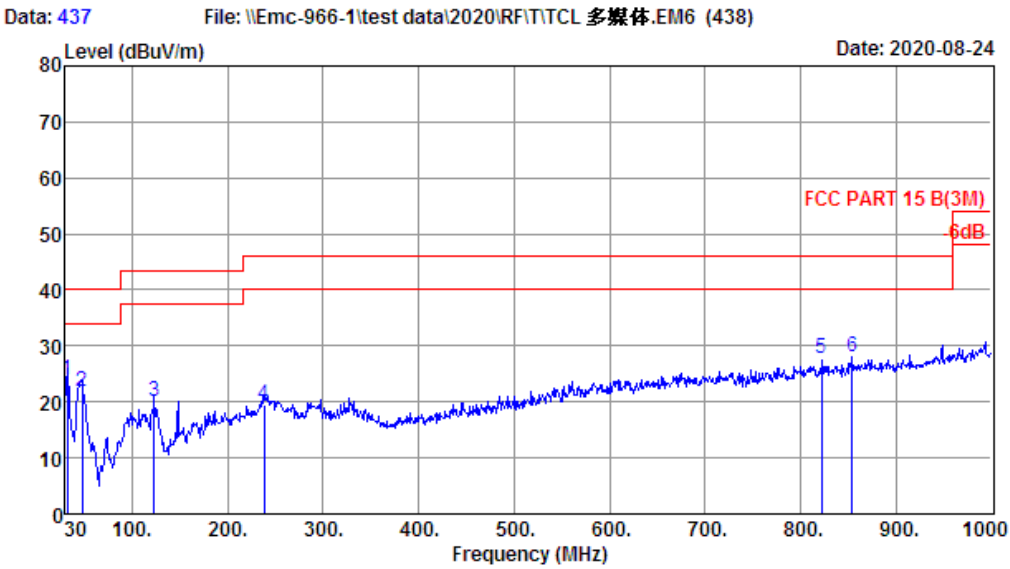


Site no. : 1# 966 Chamber Data no. : 437
Dis. / Ant. : 3m 37062 Ant. pol. : VERTICAL
Limit : FCC PART 15 B(3M)
Env. / Ins. : Temp:27.2';Humi:50.5%;Press:101.52kPa
Engineer : Pablo
EUT : 2.0 CH Sound Bar
Power : AC 120V/60Hz
M/N : TS3100
Test Mode : TX Mode

| | Freq. (MHz) | ANT Factor (dB/m) | Cable Loss (dB) | Reading (dBuV) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 31.940 | 16.80 | 0.15 | 6.92 | 23.87 | 40.00 | 16.13 | QP |
| 2 | 47.460 | 9.60 | 0.29 | 12.08 | 21.97 | 40.00 | 18.03 | QP |
| 3 | 123.120 | 11.42 | 0.95 | 7.66 | 20.03 | 43.50 | 23.47 | QP |
| 4 | 238.550 | 11.22 | 1.57 | 6.56 | 19.35 | 46.00 | 26.65 | QP |
| 5 | 822.490 | 23.33 | 3.72 | 0.81 | 27.86 | 46.00 | 18.14 | QP |
| 6 | 854.500 | 23.51 | 3.74 | 0.72 | 27.97 | 46.00 | 18.03 | 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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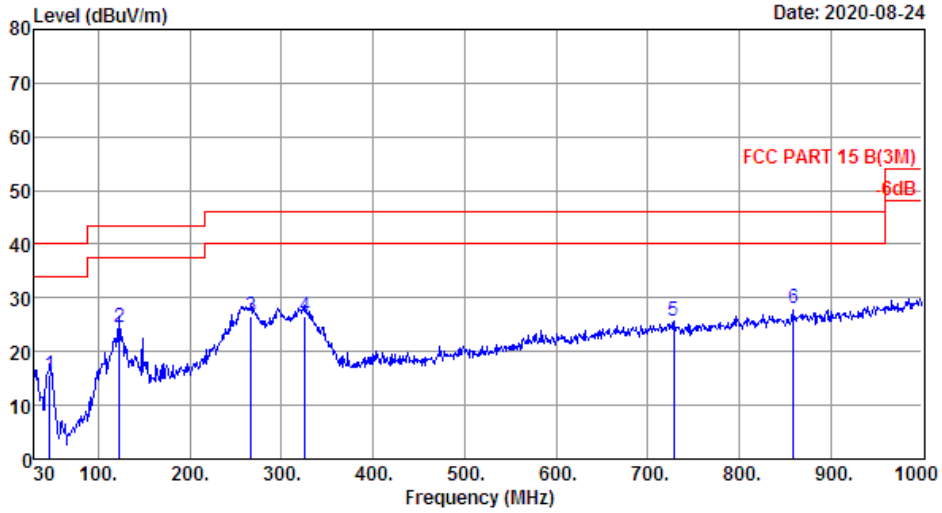
Data: 438 File: \\Emc-966-1\test data\2020\RF\T\TCL 多媒体.EM6 (438)




```
Site no.      : 1# 966 Chamber            Data no.  : 438
Dis. / Ant.   : 3m   37062                Ant. pol. : HORIZONTAL
Limit         : FCC PART 15 B(3M)
Env. / Ins.   : Temp:27.2';Humi:50.5%;Press:101.52kPa
Engineer      : Pablo
EUT           : 2.0 CH Sound Bar
Power         : AC 120V/60Hz
M/N           : TS3100
Test Mode     : TX Mode
```

| | Freq. (MHz) | ANT Factor (dB/m) | Cable Loss (dB) | Reading (dBuV) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 46.490 | 9.70 | 0.27 | 5.63 | 15.60 | 40.00 | 24.40 | QP |
| 2 | 123.120 | 11.42 | 0.95 | 12.23 | 24.60 | 43.50 | 18.90 | QP |
| 3 | 266.680 | 13.30 | 1.72 | 11.57 | 26.59 | 46.00 | 19.41 | QP |
| 4 | 325.850 | 14.36 | 1.94 | 10.29 | 26.59 | 46.00 | 19.41 | QP |
| 5 | 728.400 | 21.70 | 3.53 | 0.58 | 25.81 | 46.00 | 20.19 | QP |
| 6 | 859.350 | 23.92 | 3.76 | 0.24 | 27.92 | 46.00 | 18.08 | 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.

Note:

1. The amplitude of 9KHz to 30MHz spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.
2. All channels had been pre-test,only the worst case was reported.

# Radiated Emissions Above 1G

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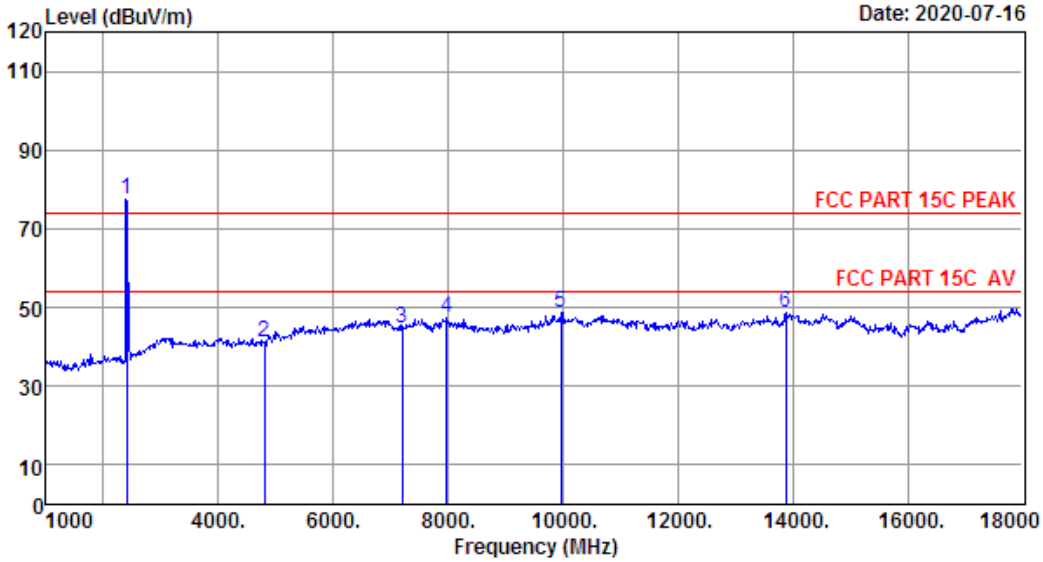
Data: 205 File: \\Emc-966-1\test data\2020\RF\T\TCL 多媒体.EM6 (222)




Site no. : 1# 966 Chamber Data no. : 205
Dis. / Ant. : 3m ANT9120D 1-18G Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : Temp:27.3';Humi:54%;Press:101.52kPa
Engineer : SEVEN
EUT : 2.0 CH Sound Bar
Power : AC 120V/60Hz
M/N : TS3100
Test Mode : GFSK TX 2402MHz

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Amp Factor (dB) | Reading (dBuV) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2402.00 | 27.26 | 1.45 | 34.64 | 83.23 | 77.30 | 74.00 | -3.30 | Peak |
| 2 | 4804.00 | 31.12 | 3.25 | 34.66 | 41.65 | 41.36 | 74.00 | 32.64 | Peak |
| 3 | 7206.00 | 36.21 | 5.19 | 34.82 | 37.99 | 44.57 | 74.00 | 29.43 | Peak |
| 4 | 7970.00 | 36.89 | 5.78 | 34.90 | 39.77 | 47.54 | 74.00 | 26.46 | Peak |
| 5 | 9959.00 | 38.83 | 5.86 | 34.21 | 38.33 | 48.81 | 74.00 | 25.19 | Peak |
| 6 | 13886.00 | 40.90 | 6.48 | 34.31 | 35.65 | 48.72 | 74.00 | 25.28 | Peak |

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

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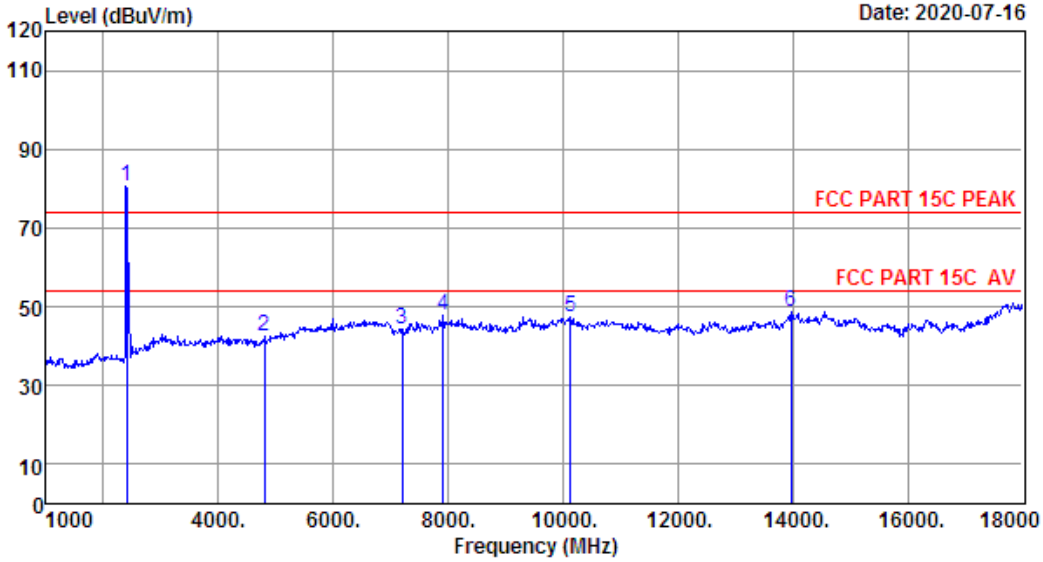
Data: 206 File: \\Emc-966-1\test data\2020\RF\T\TCL 多媒体.EM6 (222)




Site no. : 1# 966 Chamber Data no. : 206
Dis. / Ant. : 3m ANT9120D 1-18G Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : Temp:27.3';Humi:54%;Press:101.52kPa
Engineer : SEVEN
EUT : 2.0 CH Sound Bar
Power : AC 120V/60Hz
M/N : TS3100
Test Mode : GFSK TX 2402MHz

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Amp Factor (dB) | Reading (dBuV) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2402.00 | 27.26 | 1.45 | 34.64 | 86.36 | 80.43 | 74.00 | -6.43 | Peak |
| 2 | 4804.00 | 31.12 | 3.25 | 34.66 | 42.80 | 42.51 | 74.00 | 31.49 | Peak |
| 3 | 7206.00 | 36.21 | 5.19 | 34.82 | 37.51 | 44.09 | 74.00 | 29.91 | Peak |
| 4 | 7919.00 | 36.88 | 5.73 | 34.89 | 40.01 | 47.73 | 74.00 | 26.27 | Peak |
| 5 | 10129.00 | 39.04 | 5.92 | 34.24 | 36.56 | 47.28 | 74.00 | 26.72 | Peak |
| 6 | 13971.00 | 41.04 | 6.52 | 34.30 | 35.55 | 48.81 | 74.00 | 25.19 | Peak |

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

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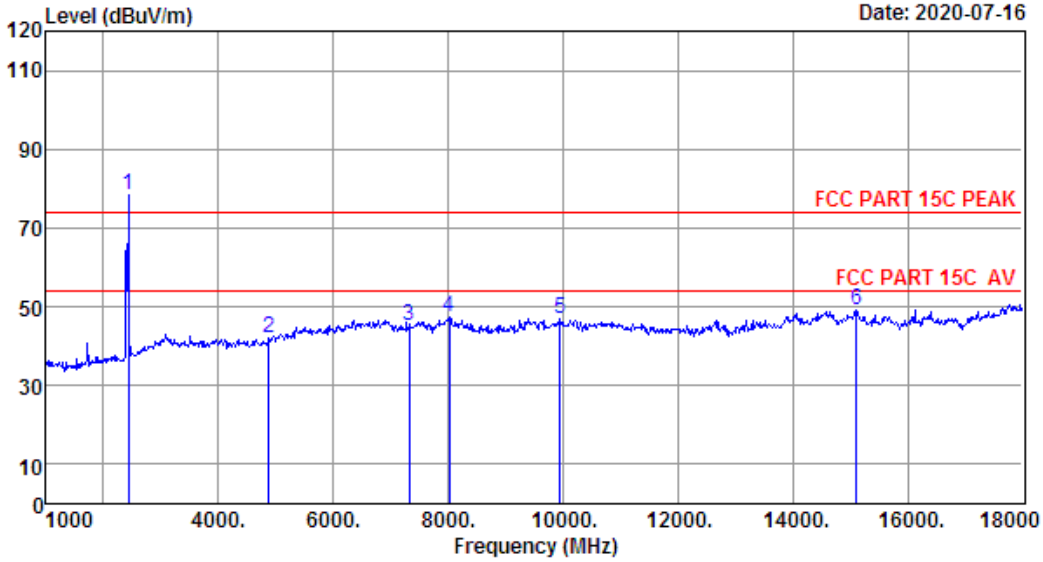
Data: 207 File: \\Emc-966-1\test data\2020\RF\T\TCL 多媒体.EM6 (222)




Site no. : 1# 966 Chamber Data no. : 207
Dis. / Ant. : 3m ANT9120D 1-18G Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : Temp:27.3';Humi:54%;Press:101.52kPa
Engineer : SEVEN
EUT : 2.0 CH Sound Bar
Power : AC 120V/60Hz
M/N : TS3100
Test Mode : GFSK TX 2440MHz

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Amp Factor (dB) | Reading (dBuV) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2440.00 | 27.33 | 1.47 | 34.62 | 84.28 | 78.46 | 74.00 | -4.46 | Peak |
| 2 | 4880.00 | 31.37 | 3.31 | 34.68 | 41.92 | 41.92 | 74.00 | 32.08 | Peak |
| 3 | 7320.00 | 36.46 | 5.22 | 34.83 | 38.23 | 45.08 | 74.00 | 28.92 | Peak |
| 4 | 8021.00 | 36.90 | 5.80 | 34.89 | 39.59 | 47.40 | 74.00 | 26.60 | Peak |
| 5 | 9942.00 | 38.80 | 5.85 | 34.21 | 36.53 | 46.97 | 74.00 | 27.03 | Peak |
| 6 | 15110.00 | 40.79 | 6.73 | 34.56 | 36.07 | 49.03 | 74.00 | 24.97 | Peak |

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

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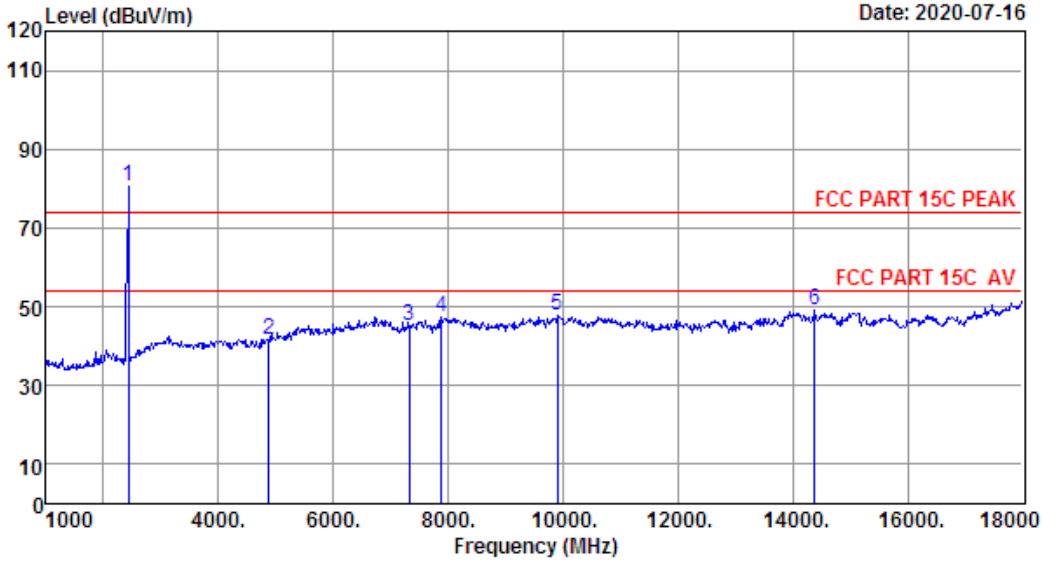
Data: 208 File: \\Emc-966-1\test data\2020\RF\T\TCL 多媒体.EM6 (222)




Site no. : 1# 966 Chamber Data no. : 208
Dis. / Ant. : 3m ANT9120D 1-18G Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : Temp:27.3';Humi:54%;Press:101.52kPa
Engineer : SEVEN
EUT : 2.0 CH Sound Bar
Power : AC 120V/60Hz
M/N : TS3100
Test Mode : GFSK TX 2440MHz

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Amp Factor (dB) | Reading (dBuV) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2440.00 | 27.33 | 1.47 | 34.62 | 86.57 | 80.75 | 74.00 | -6.75 | Peak |
| 2 | 4880.00 | 31.37 | 3.31 | 34.68 | 41.43 | 41.43 | 74.00 | 32.57 | Peak |
| 3 | 7320.00 | 36.46 | 5.22 | 34.83 | 38.30 | 45.15 | 74.00 | 28.85 | Peak |
| 4 | 7885.00 | 36.88 | 5.69 | 34.89 | 39.49 | 47.17 | 74.00 | 26.83 | Peak |
| 5 | 9908.00 | 38.73 | 5.82 | 34.22 | 37.29 | 47.62 | 74.00 | 26.38 | Peak |
| 6 | 14379.00 | 41.03 | 6.81 | 34.41 | 35.60 | 49.03 | 74.00 | 24.97 | Peak |

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

EST Technology

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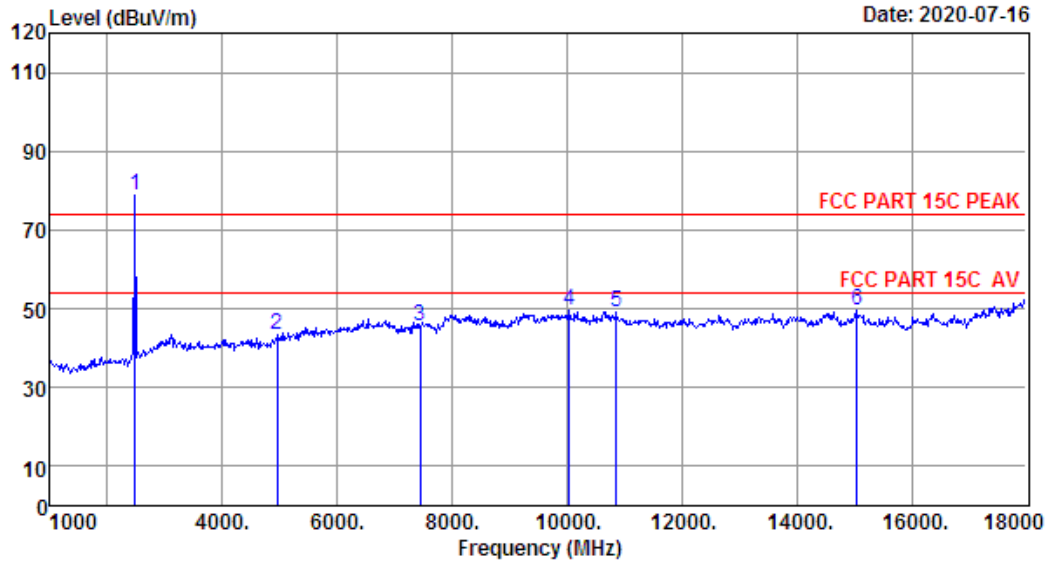
Data: 209 File: \\Emc-966-1\test data\2020\RF\T\TCL 多媒体.EM6 (222)




Site no. : 1# 966 Chamber Data no. : 209
Dis. / Ant. : 3m ANT9120D 1-18G Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : Temp:27.3';Humi:54%;Press:101.52kPa
Engineer : SEVEN
EUT : 2.0 CH Sound Bar
Power : AC 120V/60Hz
M/N : TS3100
Test Mode : GFSK TX 2480MHz

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Amp Factor (dB) | Reading (dBuV) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2480.00 | 27.38 | 1.48 | 34.61 | 84.55 | 78.80 | 74.00 | -4.80 | Peak |
| 2 | 4960.00 | 31.68 | 3.38 | 34.69 | 43.22 | 43.59 | 74.00 | 30.41 | Peak |
| 3 | 7440.00 | 36.70 | 5.26 | 34.84 | 38.44 | 45.56 | 74.00 | 28.44 | Peak |
| 4 | 10044.00 | 38.95 | 5.90 | 34.22 | 39.10 | 49.73 | 74.00 | 24.27 | Peak |
| 5 | 10860.00 | 39.76 | 6.09 | 34.46 | 37.92 | 49.31 | 74.00 | 24.69 | Peak |
| 6 | 15042.00 | 40.86 | 6.78 | 34.59 | 36.76 | 49.81 | 74.00 | 24.19 | Peak |

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

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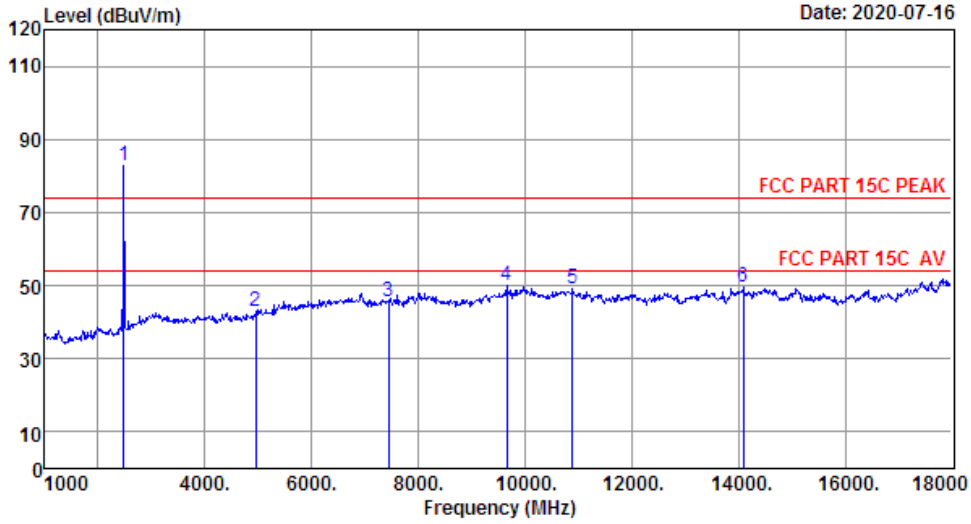
Data: 210 File: \\Emc-966-1\test data\2020\RF\T\TCL 多媒体.EM6 (222)




```
Site no.       : 1# 966 Chamber              Data no.  : 210
Dis. / Ant.    : 3m   ANT9120D 1-18G         Ant. pol. : VERTICAL
Limit          : FCC PART 15C PEAK
Env. / Ins.    : Temp:27.3';Humi:54%;Press:101.52kPa
Engineer       : SEVEN
EUT            : 2.0 CH Sound Bar
Power          : AC 120V/60Hz
M/N            : TS3100
Test Mode      : GFSK TX 2480MHz
```

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Amp Factor (dB) | Reading (dBuV) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2480.00 | 27.38 | 1.48 | 34.61 | 88.63 | 82.88 | 74.00 | -8.88 | Peak |
| 2 | 4960.00 | 31.68 | 3.38 | 34.69 | 42.39 | 42.76 | 74.00 | 31.24 | Peak |
| 3 | 7440.00 | 36.70 | 5.26 | 34.84 | 38.50 | 45.62 | 74.00 | 28.38 | Peak |
| 4 | 9653.00 | 38.21 | 5.62 | 34.27 | 40.31 | 49.87 | 74.00 | 24.13 | Peak |
| 5 | 10894.00 | 39.80 | 6.09 | 34.47 | 37.76 | 49.18 | 74.00 | 24.82 | Peak |
| 6 | 14090.00 | 41.08 | 6.59 | 34.33 | 36.14 | 49.48 | 74.00 | 24.52 | Peak |

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

Note:

1. The amplitude of 18GHz to 25GHz spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

# Radiated Band Edge

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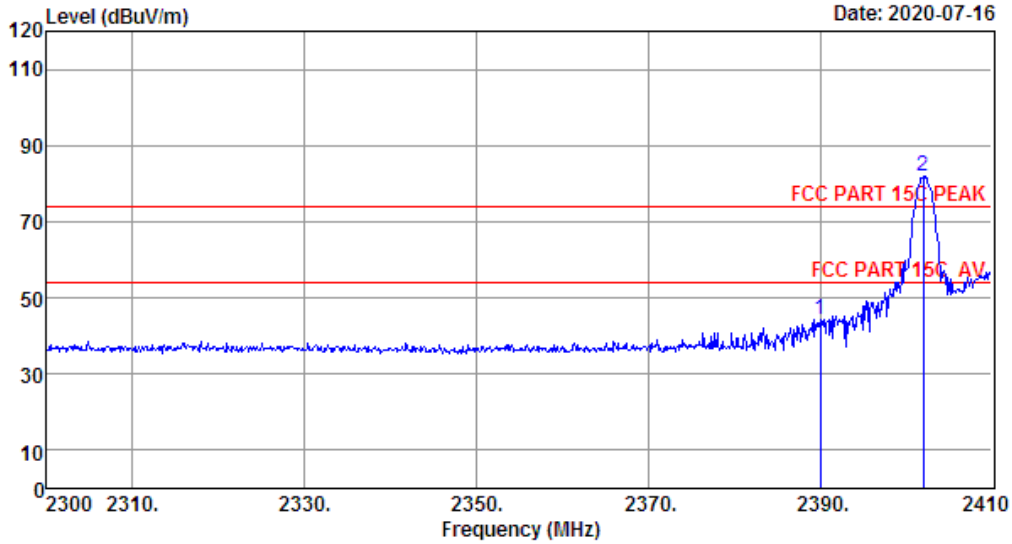
Data: 211 File: \\Emc-966-1\test data\2020\RF\T\TCL 多媒体.EM6 (222)




```
Site no.      : 1# 966 Chamber              Data no.  : 211
Dis. / Ant.   : 3m   ANT9120D 1-18G         Ant. pol. : VERTICAL
Limit         : FCC PART 15C PEAK
Env. / Ins.   : Temp:27.3';Humi:54%;Press:101.52kPa
Engineer      : SEVEN
EUT           : 2.0 CH Sound Bar
Power         : AC 120V/60Hz
M/N           : TS3100
Test Mode     : GFSK TX 2402MHz
```

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Amp Factor (dB) | Reading (dBuV) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2390.00 | 27.26 | 1.45 | 34.64 | 50.15 | 44.22 | 74.00 | 29.78 | Peak |
| 2 | 2401.97 | 27.26 | 1.45 | 34.64 | 88.04 | 82.11 | 74.00 | -8.11 | Peak |

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

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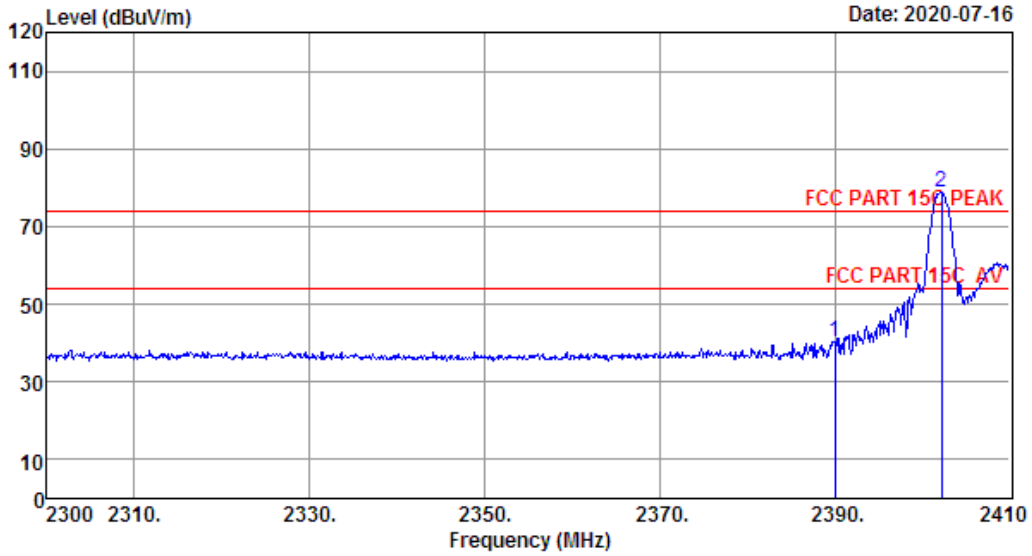
Data: 212 File: \\Emc-966-1\test data\2020\RF\T\TCL 多媒体.EM6 (222)




Site no. : 1# 966 Chamber Data no. : 212
Dis. / Ant. : 3m ANT9120D 1-18G Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : Temp:27.3';Humi:54%;Press:101.52kPa
Engineer : SEVEN
EUT : 2.0 CH Sound Bar
Power : AC 120V/60Hz
M/N : TS3100
Test Mode : GFSK TX 2402MHz

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Amp Factor (dB) | Reading (dBuV) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2390.00 | 27.26 | 1.45 | 34.64 | 46.19 | 40.26 | 74.00 | 33.74 | Peak |
| 2 | 2402.19 | 27.26 | 1.45 | 34.64 | 84.84 | 78.91 | 74.00 | -4.91 | Peak |

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

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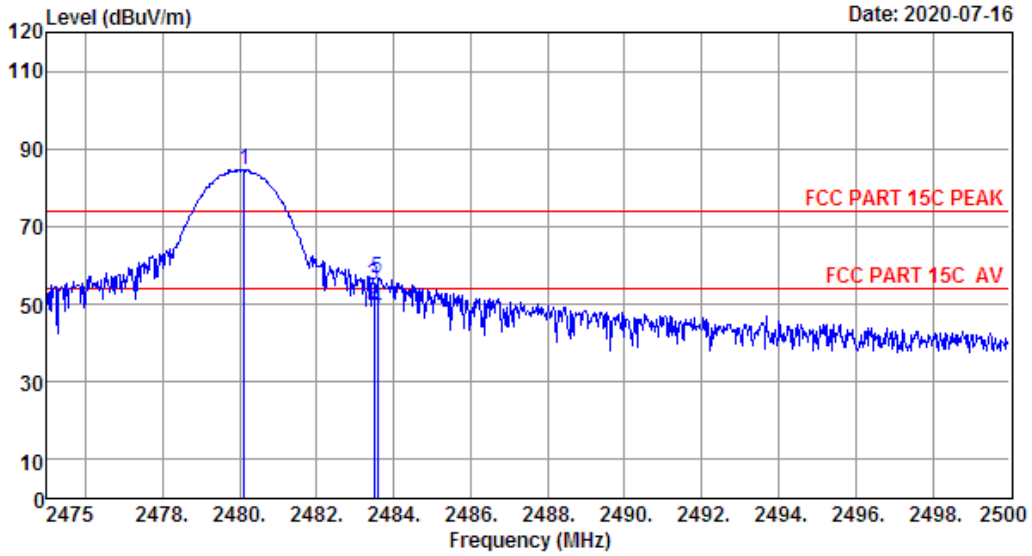
Data: 213 File: \\Emc-966-1\test data\2020\RF\T\TCL 多媒体.EM6 (438)




Site no. : 1# 966 Chamber Data no. : 213
Dis. / Ant. : 3m ANT9120D 1-18G Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : Temp:27.3';Humi:54%;Press:101.52kPa
Engineer : SEVEN
EUT : 2.0 CH Sound Bar
Power : AC 120V/60Hz
M/N : TS3100
Test Mode : GFSK TX 2480MHz

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Amp Factor (dB) | Reading (dBuV) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2480.13 | 27.38 | 1.48 | 34.61 | 90.33 | 84.58 | 74.00 | -10.58 | Peak |
| 2 | 2483.50 | 27.38 | 1.48 | 34.61 | 55.73 | 49.98 | 54.00 | 4.02 | Average |
| 3 | 2483.50 | 27.38 | 1.48 | 34.61 | 60.48 | 54.73 | 74.00 | 19.27 | Peak |
| 4 | 2483.58 | 27.38 | 1.48 | 34.61 | 54.49 | 48.74 | 54.00 | 5.26 | Average |
| 5 | 2483.58 | 27.38 | 1.48 | 34.61 | 62.49 | 56.74 | 74.00 | 17.26 | Peak |

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

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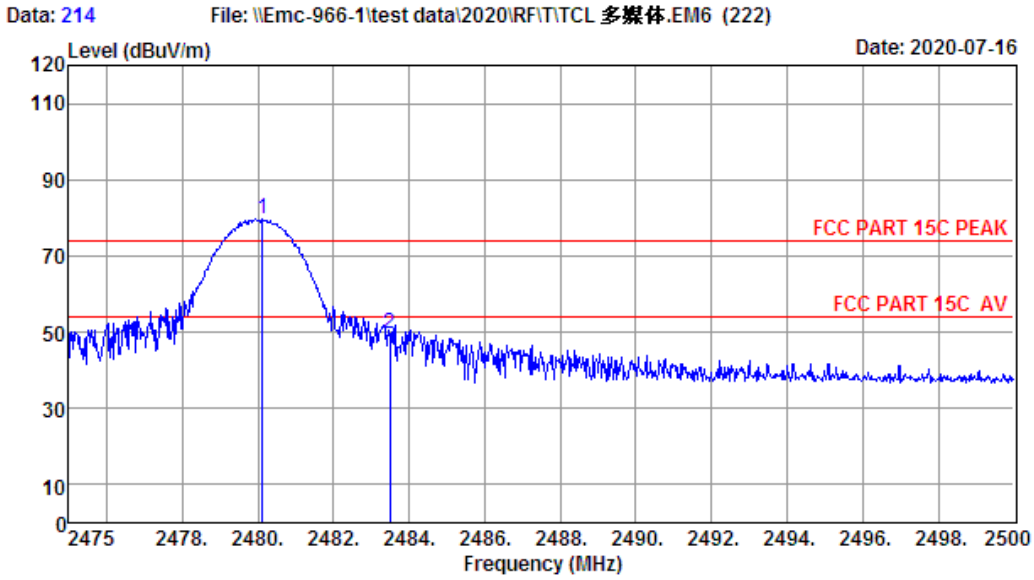



```
Site no.      : 1# 966 Chamber              Data no.  : 214
Dis. / Ant.   : 3m   ANT9120D 1-18G         Ant. pol. : HORIZONTAL
Limit         : FCC PART 15C PEAK
Env. / Ins.   : Temp:27.3';Humi:54%;Press:101.52kPa
Engineer      : SEVEN
EUT           : 2.0 CH Sound Bar
Power         : AC 120V/60Hz
M/N           : TS3100
Test Mode     : GFSK TX 2480MHz
```

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Amp Factor (dB) | Reading (dBuV) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2480.13 | 27.38 | 1.48 | 34.61 | 85.27 | 79.52 | 74.00 | -5.52 | Peak |
| 2 | 2483.50 | 27.38 | 1.48 | 34.61 | 55.53 | 49.78 | 74.00 | 24.22 | Peak |

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

Note:

1. All channels had been pre-test,only of the worst case channels were reported.

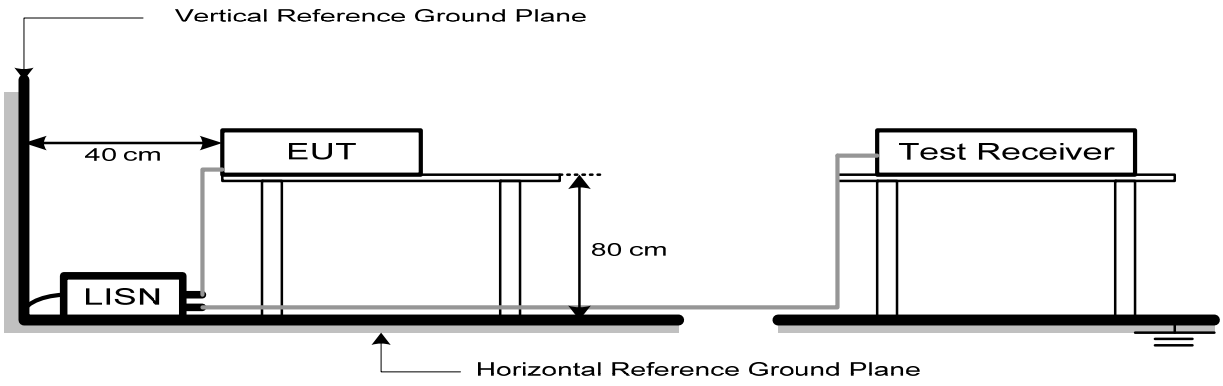
# 9. AC POWER LINE CONDUCTED EMISSIONS

## 9.1. Limit

| Frequency | | | Maximum RF Line Voltage | |
|---|---|---|---|---|
| | | | Quasi-Peak Level dB(μV) | Average Level dB(μV) |
| 150kHz | ~ | 500kHz | 66 ~ 56* | 56 ~ 46* |
| 500kHz | ~ | 5MHz | 56 | 46 |
| 5MHz | ~ | 30MHz | 60 | 50 |

Note:
1. * Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

## 9.2. Test Setup




## 9.3. Spectrum Analyzer Setting

| Spectrum Parameters | Setting |
|---|---|
| RBW | 9KHz |
| VBW | 9KHz |
| Start frequency | 150KHz |
| Stop frequency | 30MHz |
| Sweep Time | Auto |
| Detector | QP/AVG |
| Trace Mode | Max Hold |

## 9.4. Test Procedure

a. The EUT was placed on a non-metallic table, 80cm above the ground plane.
b. The EUT Power connected to the power mains through a line impedance stabilization network.
c. Provides a 50 ohm coupling impedance for the EUT (Please refer the block diagram of the test setup and photographs).
d. Set the EUT transmit continuously with maximum output power.
e. Spectrum analyzer setting parameters in accordance with section 9.3.
f. The AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.10: 2013 on Conducted Emission Test.
g. Record the results in the test report.

## 9.5. Test Result

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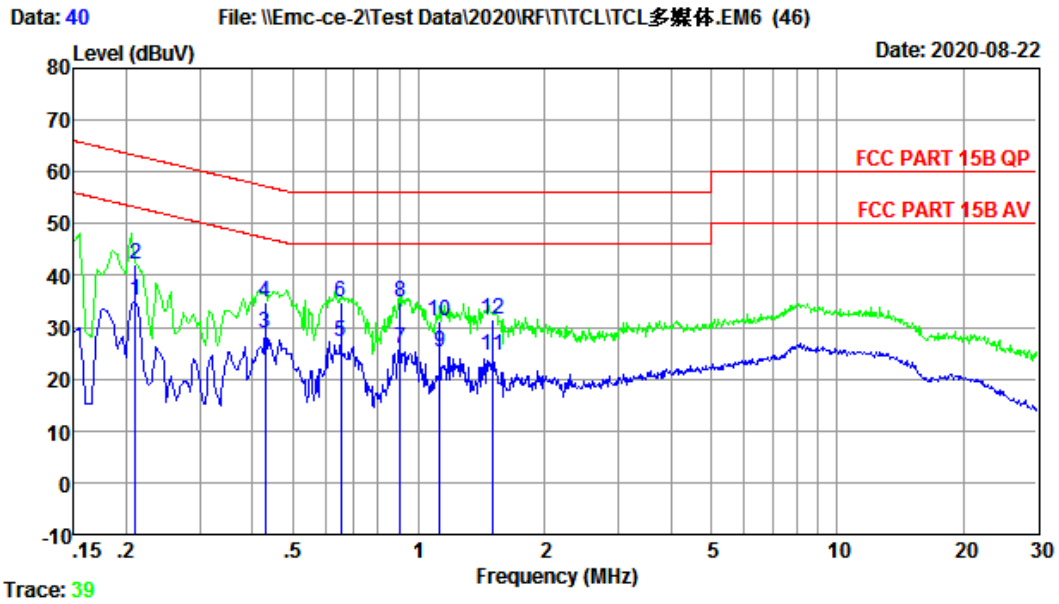


Site no : 2#CE Shield Room Data no. : 40
Env. / Ins. : Temp:23.2℃ Humi:54.3% Press:101.40PaLINE Phase : LINE
Limit : FCC PART 15B QP
Engineer : YYB
EUT : 2.0 CH Sound Bar
Power : AC 120V/60Hz
M/N : TS3100
Test Mode : TX Mode

| | Freq. (MHz) | LISN Factor (dB) | Cable Loss (dB) | Reading (dBuV) | Emission Level (dBuv) | Limits (dBuv) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 0.2106 | 9.70 | 9.84 | 15.79 | 35.33 | 53.18 | 17.85 | Average |
| 2 | 0.2106 | 9.70 | 9.84 | 22.50 | 42.04 | 63.18 | 21.14 | QP |
| 3 | 0.4305 | 9.77 | 9.92 | 9.29 | 28.98 | 47.24 | 18.26 | Average |
| 4 | 0.4305 | 9.77 | 9.92 | 15.30 | 34.99 | 57.24 | 22.25 | QP |
| 5 | 0.6508 | 9.82 | 9.92 | 7.39 | 27.13 | 46.00 | 18.87 | Average |
| 6 | 0.6508 | 9.82 | 9.92 | 15.10 | 34.84 | 56.00 | 21.16 | QP |
| 7 | 0.9039 | 9.88 | 9.94 | 5.90 | 25.72 | 46.00 | 20.28 | Average |
| 8 | 0.9039 | 9.88 | 9.94 | 14.90 | 34.72 | 56.00 | 21.28 | QP |
| 9 | 1.1233 | 9.88 | 9.94 | 5.41 | 25.23 | 46.00 | 20.77 | Average |
| 10 | 1.1233 | 9.88 | 9.94 | 11.40 | 31.22 | 56.00 | 24.78 | QP |
| 11 | 1.5033 | 9.86 | 9.96 | 4.57 | 24.39 | 46.00 | 21.61 | Average |
| 12 | 1.5033 | 9.86 | 9.96 | 11.57 | 31.39 | 56.00 | 24.61 | QP |

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

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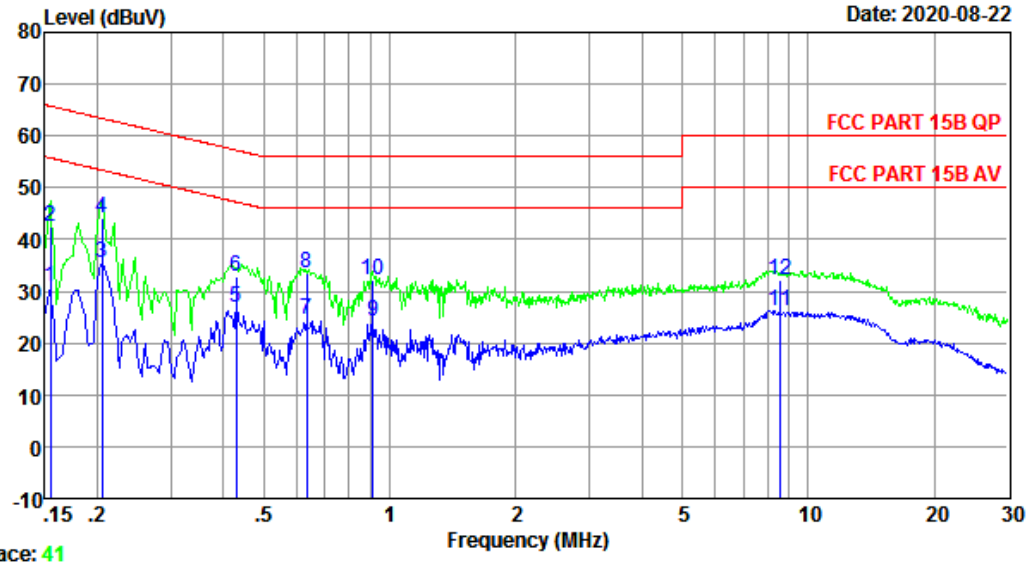
Data: 42 File: \\Emc-ce-2\Test Data\2020\RF\T\TCL\TCL多媒体.EM6 (46)




Site no : 2#CE Shield Room Data no. : 42
Env. / Ins. : Temp:23.2℃ Humi:54.3% Press:101.40PaLINE Phase : NEUTRAL
Limit : FCC PART 15B QP
Engineer : YYB
EUT : 2.0 CH Sound Bar
Power : AC 120V/60Hz
M/N : TS3100
Test Mode : TX Mode

| | Freq. (MHz) | LISN Factor (dB) | Cable Loss (dB) | Reading (dBuV) | Emission Level (dBuv) | Limits (dBuv) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 0.1548 | 9.64 | 9.69 | 11.49 | 30.82 | 55.74 | 24.92 | Average |
| 2 | 0.1548 | 9.64 | 9.69 | 23.10 | 42.43 | 65.74 | 23.31 | QP |
| 3 | 0.2050 | 9.65 | 9.84 | 16.15 | 35.64 | 53.40 | 17.76 | Average |
| 4 | 0.2050 | 9.65 | 9.84 | 24.81 | 44.30 | 63.40 | 19.10 | QP |
| 5 | 0.4305 | 9.69 | 9.92 | 7.15 | 26.76 | 47.24 | 20.48 | Average |
| 6 | 0.4305 | 9.69 | 9.92 | 13.29 | 32.90 | 57.24 | 24.34 | QP |
| 7 | 0.6338 | 9.71 | 9.92 | 4.77 | 24.40 | 46.00 | 21.60 | Average |
| 8 | 0.6338 | 9.71 | 9.92 | 13.77 | 33.40 | 56.00 | 22.60 | QP |
| 9 | 0.9136 | 9.74 | 9.94 | 4.48 | 24.16 | 46.00 | 21.84 | Average |
| 10 | 0.9136 | 9.74 | 9.94 | 12.48 | 32.16 | 56.00 | 23.84 | QP |
| 11 | 8.5917 | 9.71 | 10.06 | 6.55 | 26.32 | 50.00 | 23.68 | Average |
| 12 | 8.5917 | 9.71 | 10.06 | 12.54 | 32.31 | 60.00 | 27.69 | QP |

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

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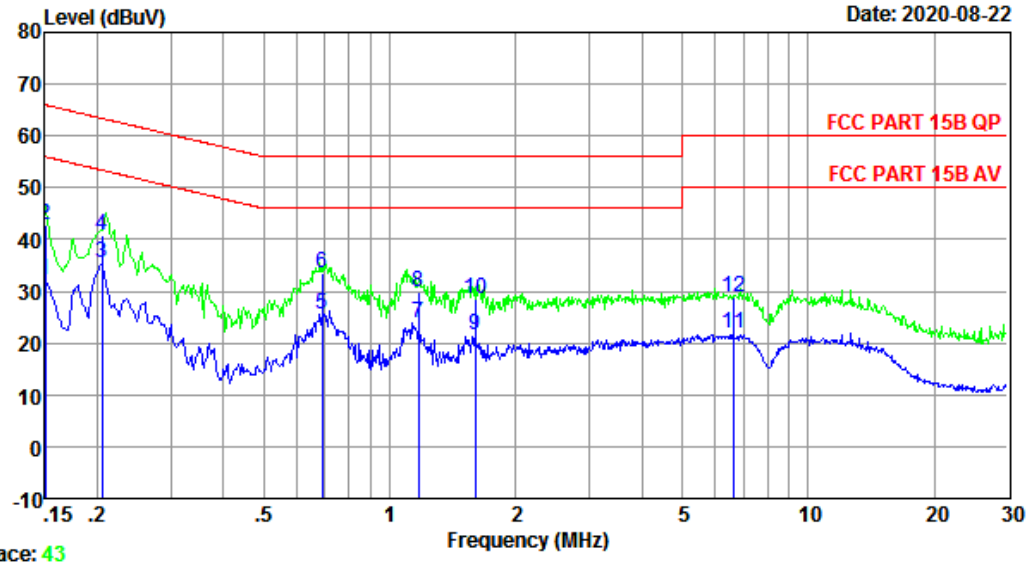
Data: 44 File: \\Emc-ce-2\Test Data\2020\RF\T\TCL\TCL多媒体.EM6 (46)




Site no : 2#CE Shield Room Data no. : 44
Env. / Ins. : Temp:23.2℃ Humi:54.3% Press:101.40PaLINE Phase : LINE
Limit : FCC PART 15B QP
Engineer : YYB
EUT : 2.0 CH Sound Bar
Power : AC 240V/60Hz
M/N : TS3100
Test Mode : TX Mode

| | Freq. (MHz) | LISN Factor (dB) | Cable Loss (dB) | Reading (dBuV) | Emission Level (dBuv) | Limits (dBuv) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 0.1500 | 9.68 | 9.69 | 12.66 | 32.03 | 56.00 | 23.97 | Average |
| 2 | 0.1500 | 9.68 | 9.69 | 23.51 | 42.88 | 66.00 | 23.12 | QP |
| 3 | 0.2050 | 9.70 | 9.84 | 15.82 | 35.36 | 53.40 | 18.04 | Average |
| 4 | 0.2050 | 9.70 | 9.84 | 21.20 | 40.74 | 63.40 | 22.66 | QP |
| 5 | 0.6899 | 9.84 | 9.93 | 5.86 | 25.63 | 46.00 | 20.37 | Average |
| 6 | 0.6899 | 9.84 | 9.93 | 13.70 | 33.47 | 56.00 | 22.53 | QP |
| 7 | 1.1719 | 9.88 | 9.94 | 4.10 | 23.92 | 46.00 | 22.08 | Average |
| 8 | 1.1719 | 9.88 | 9.94 | 10.10 | 29.92 | 56.00 | 26.08 | QP |
| 9 | 1.6020 | 9.86 | 9.95 | 1.65 | 21.46 | 46.00 | 24.54 | Average |
| 10 | 1.6020 | 9.86 | 9.95 | 8.65 | 28.46 | 56.00 | 27.54 | QP |
| 11 | 6.6272 | 10.40 | 10.03 | 1.41 | 21.84 | 50.00 | 28.16 | Average |
| 12 | 6.6272 | 10.40 | 10.03 | 8.41 | 28.84 | 60.00 | 31.16 | QP |

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

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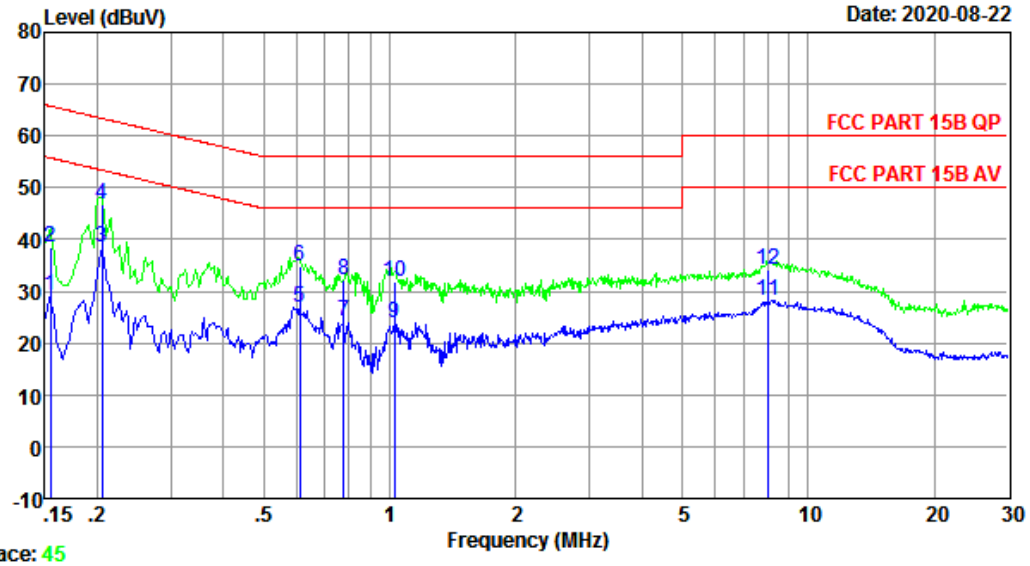
Data: 46 File: \\Emc-ce-2\Test Data\2020\RF\T\TCL\TCL多媒体.EM6 (46)




Site no : 2#CE Shield Room Data no. : 46
Env. / Ins. : Temp:23.2℃ Humi:54.3% Press:101.40PaLINE Phase : NEUTRAL
Limit : FCC PART 15B QP
Engineer : YYB
EUT : 2.0 CH Sound Bar
Power : AC 240V/60Hz
M/N : TS3100
Test Mode : TX Mode

| | Freq. (MHz) | LISN Factor (dB) | Cable Loss (dB) | Reading (dBuV) | Emission Level (dBuv) | Limits (dBuv) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 0.1548 | 9.64 | 9.69 | 10.02 | 29.35 | 55.74 | 26.39 | Average |
| 2 | 0.1548 | 9.64 | 9.69 | 19.20 | 38.53 | 65.74 | 27.21 | QP |
| 3 | 0.2050 | 9.65 | 9.84 | 18.86 | 38.35 | 53.40 | 15.05 | Average |
| 4 | 0.2050 | 9.65 | 9.84 | 27.21 | 46.70 | 63.40 | 16.70 | QP |
| 5 | 0.6108 | 9.71 | 9.92 | 7.18 | 26.81 | 46.00 | 19.19 | Average |
| 6 | 0.6108 | 9.71 | 9.92 | 15.22 | 34.85 | 56.00 | 21.15 | QP |
| 7 | 0.7752 | 9.73 | 9.93 | 4.52 | 24.18 | 46.00 | 21.82 | Average |
| 8 | 0.7752 | 9.73 | 9.93 | 12.52 | 32.18 | 56.00 | 23.82 | QP |
| 9 | 1.0265 | 9.76 | 9.94 | 4.11 | 23.81 | 46.00 | 22.19 | Average |
| 10 | 1.0265 | 9.76 | 9.94 | 12.11 | 31.81 | 56.00 | 24.19 | QP |
| 11 | 8.0198 | 9.65 | 10.04 | 8.61 | 28.30 | 50.00 | 21.70 | Average |
| 12 | 8.0198 | 9.65 | 10.04 | 14.60 | 34.29 | 60.00 | 25.71 | QP |

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

# 10. ANTENNA REQUIREMENTS

## 10.1. Limit

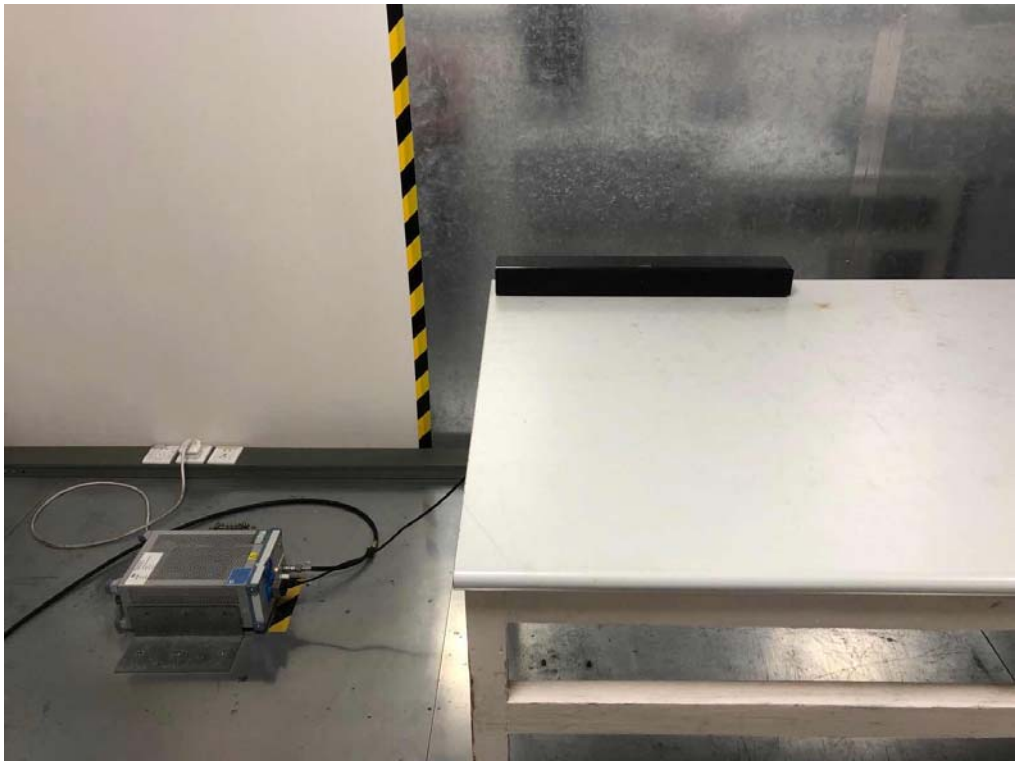
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §§15.211, 15.213, 15.217, 15.219, 15.221, or §15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

## 10.2. Test Result

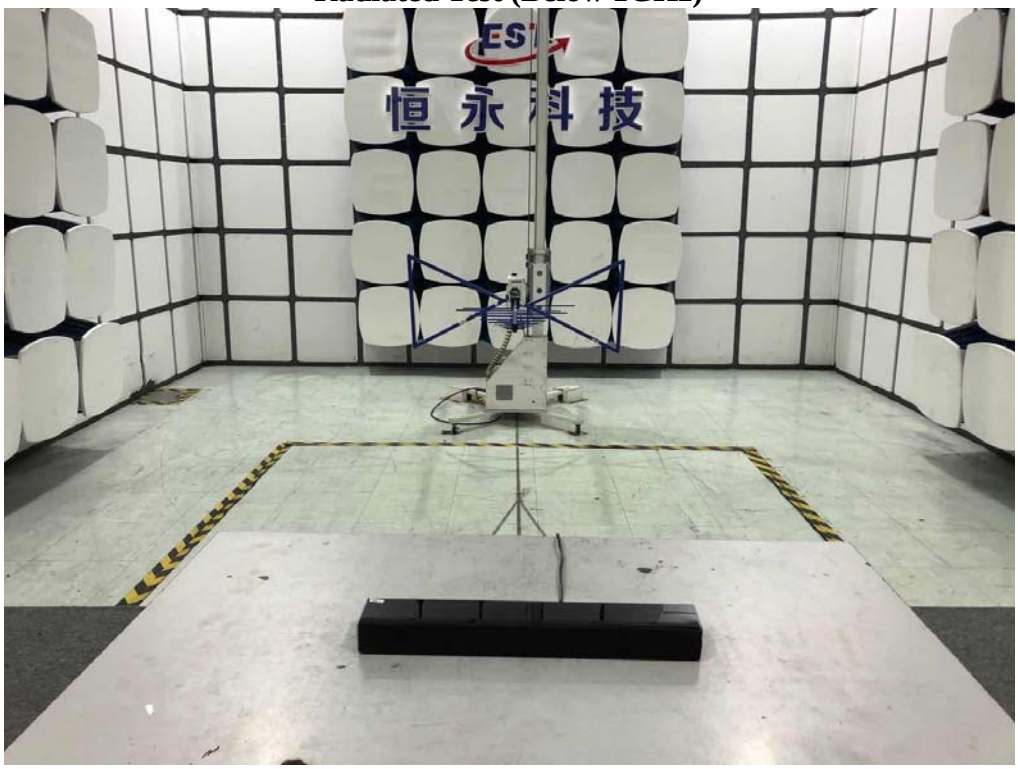
The antennas used for this product is integral antenna ,so compliance with antenna requirements.
( Please refer to the EUT photo for details)

# 11. TEST SETUP PHOTO

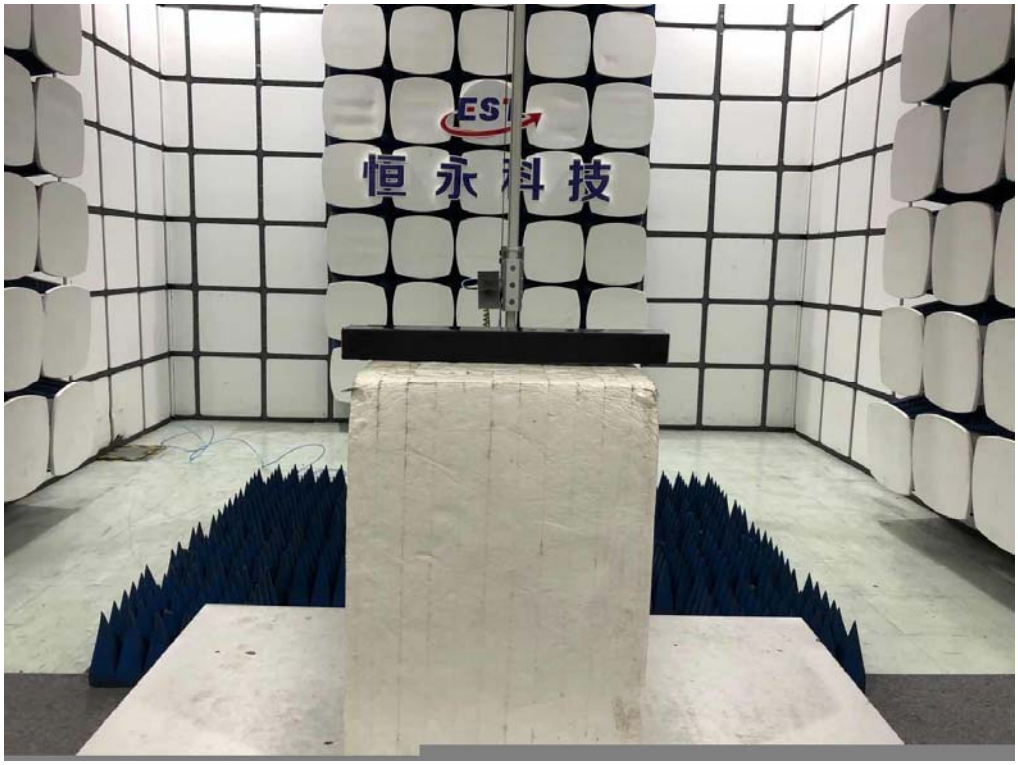
**Conducted Test**



**Radiated Test (Below 1GHz)**

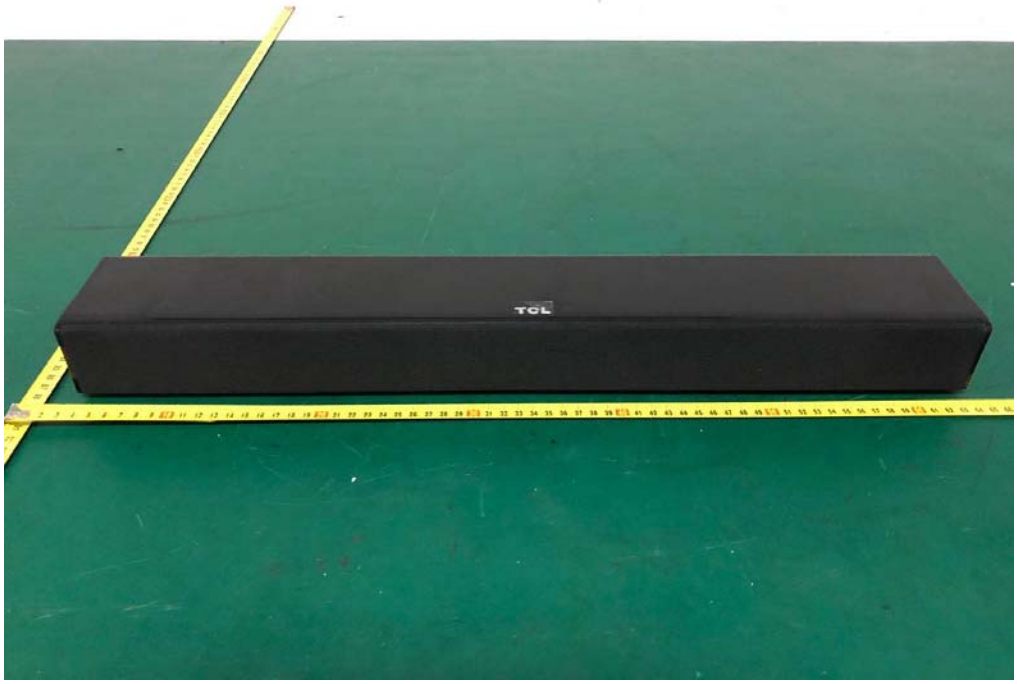


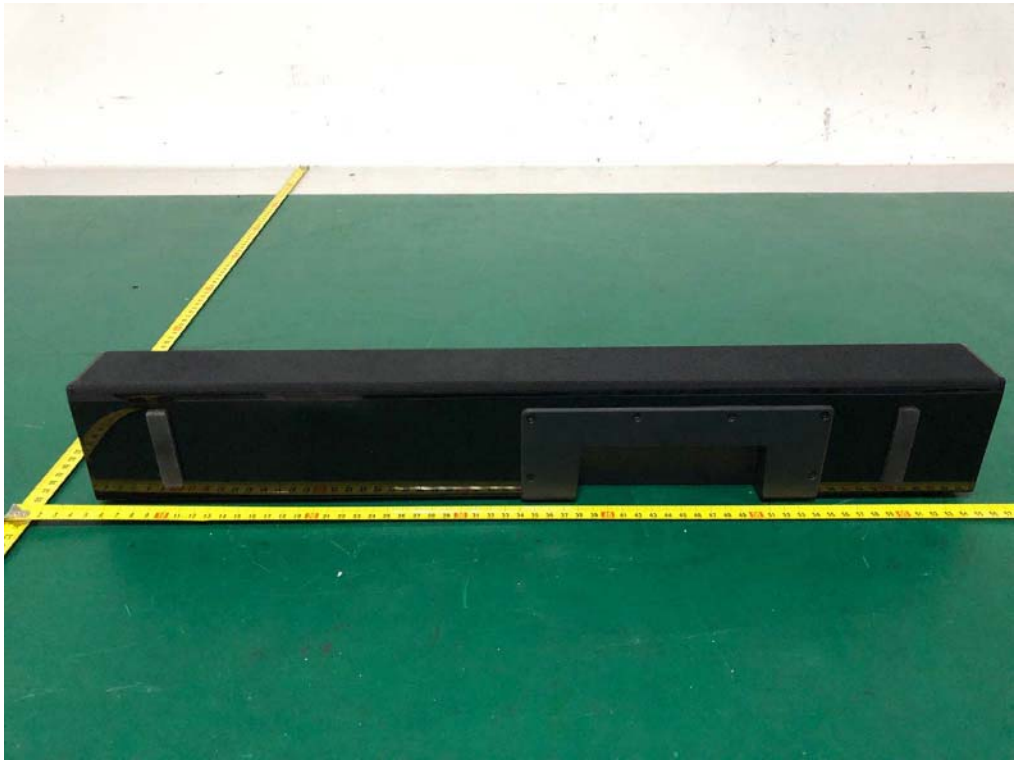

**Radiated Test (Above 1GHz)**



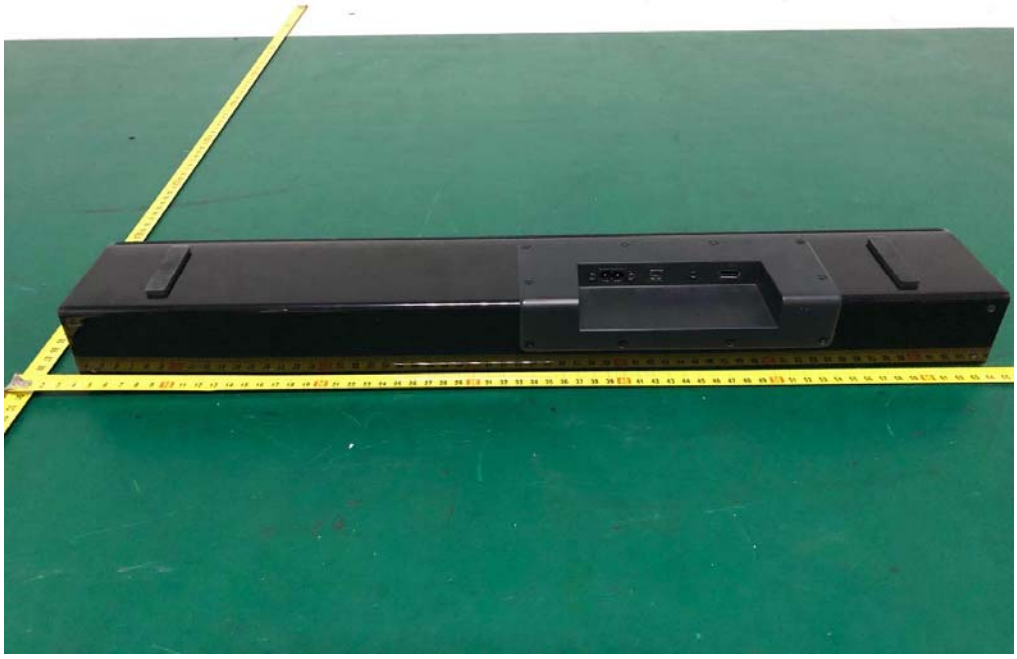
# 12. EUT PHOTO

**External Photos**
M/N: TS3100

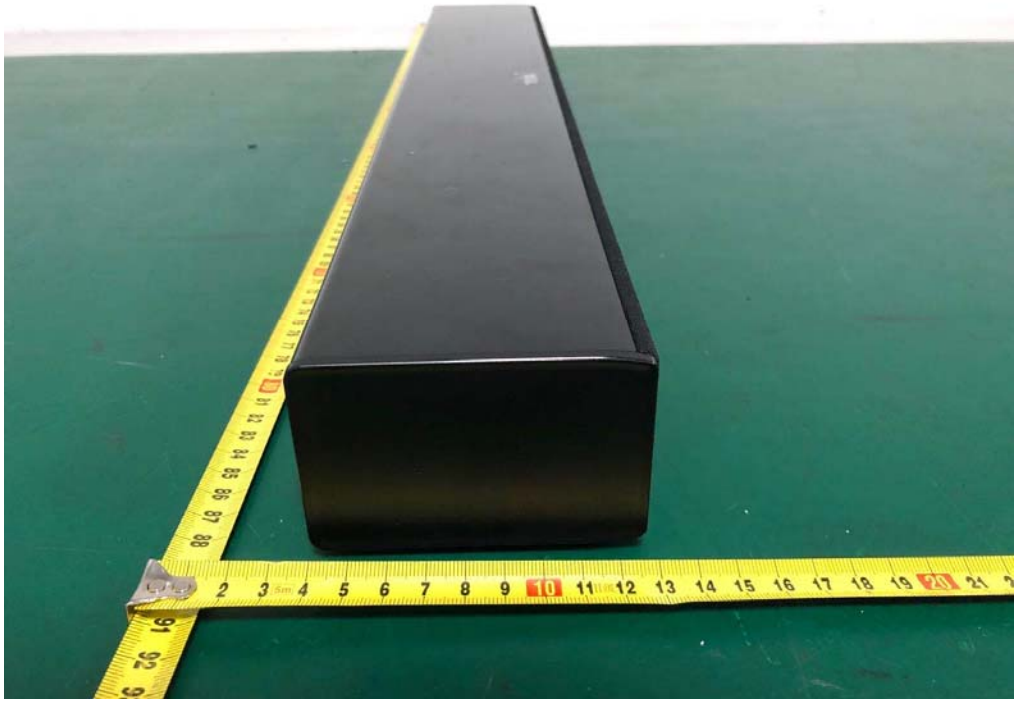


**External Photos**
M/N: TS3100



**External Photos**
M/N: TS3100

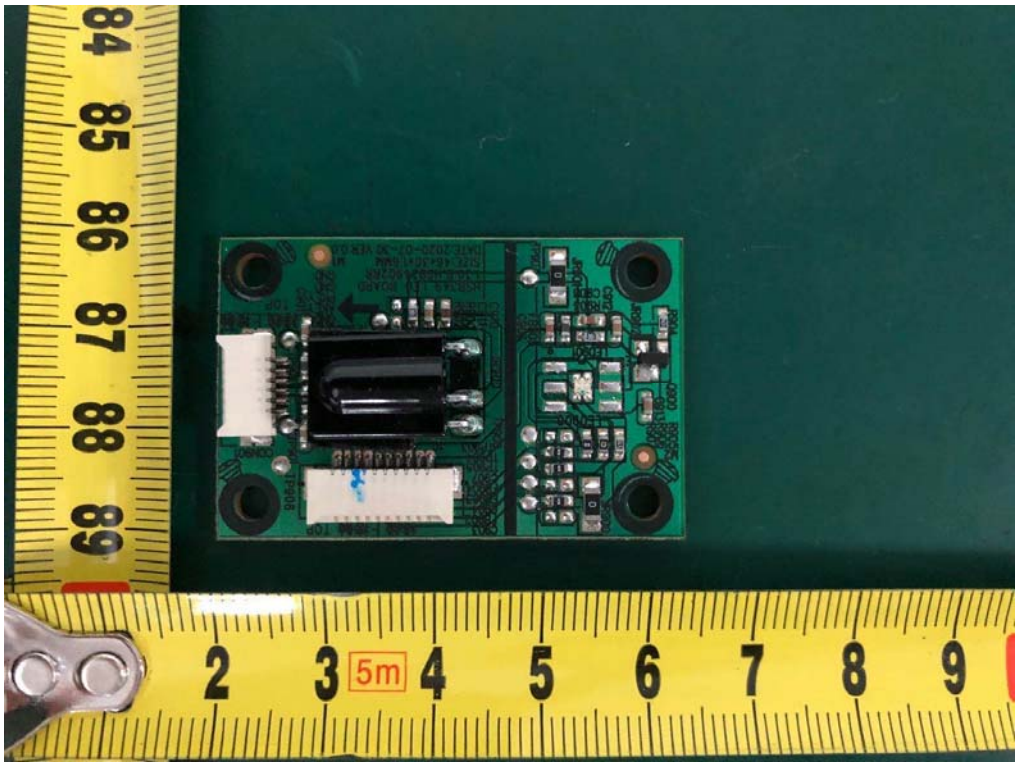


**External Photos**

M/N: TS3100

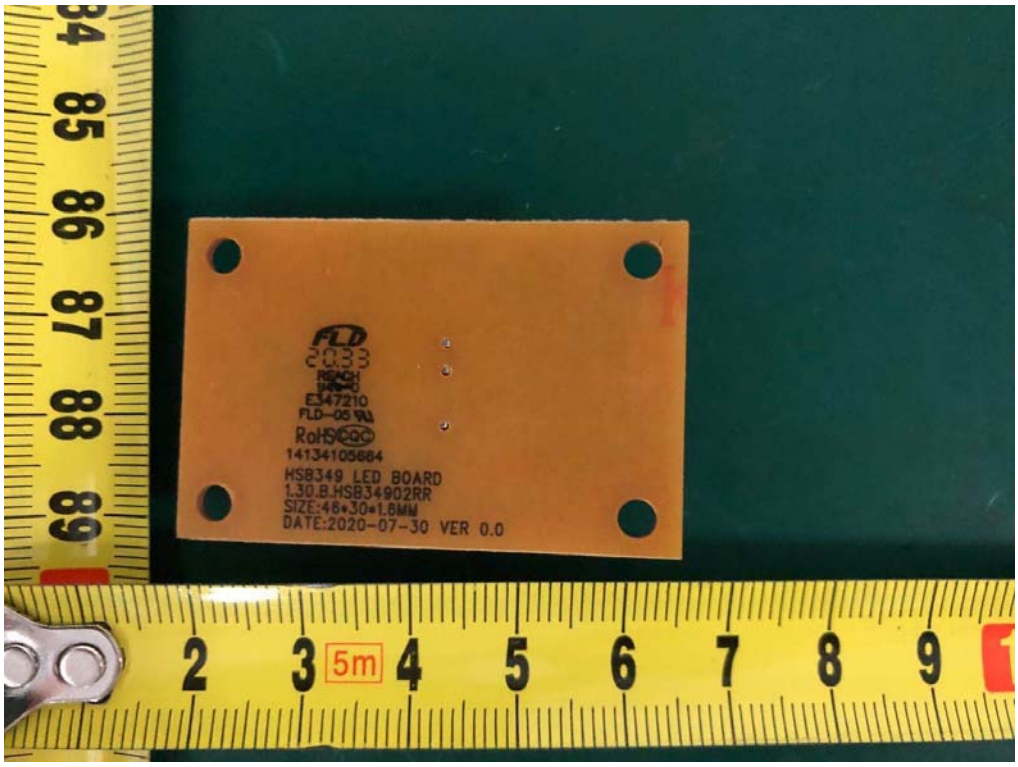
**Internal Photos**

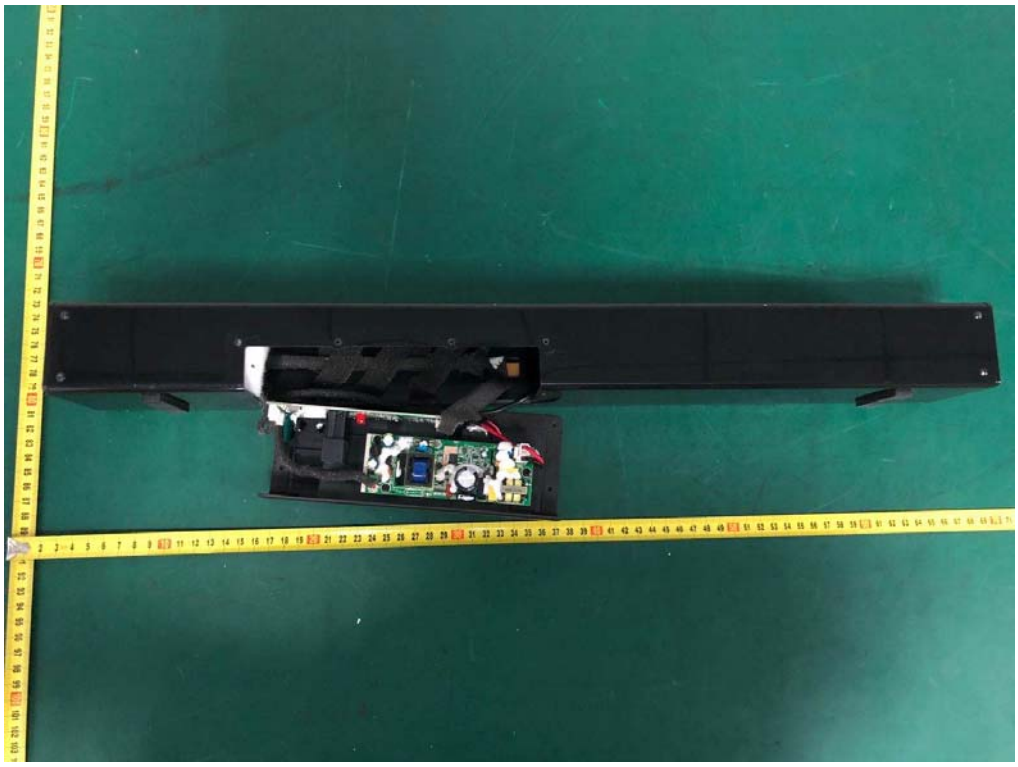
M/N: TS3100



**Internal Photos**

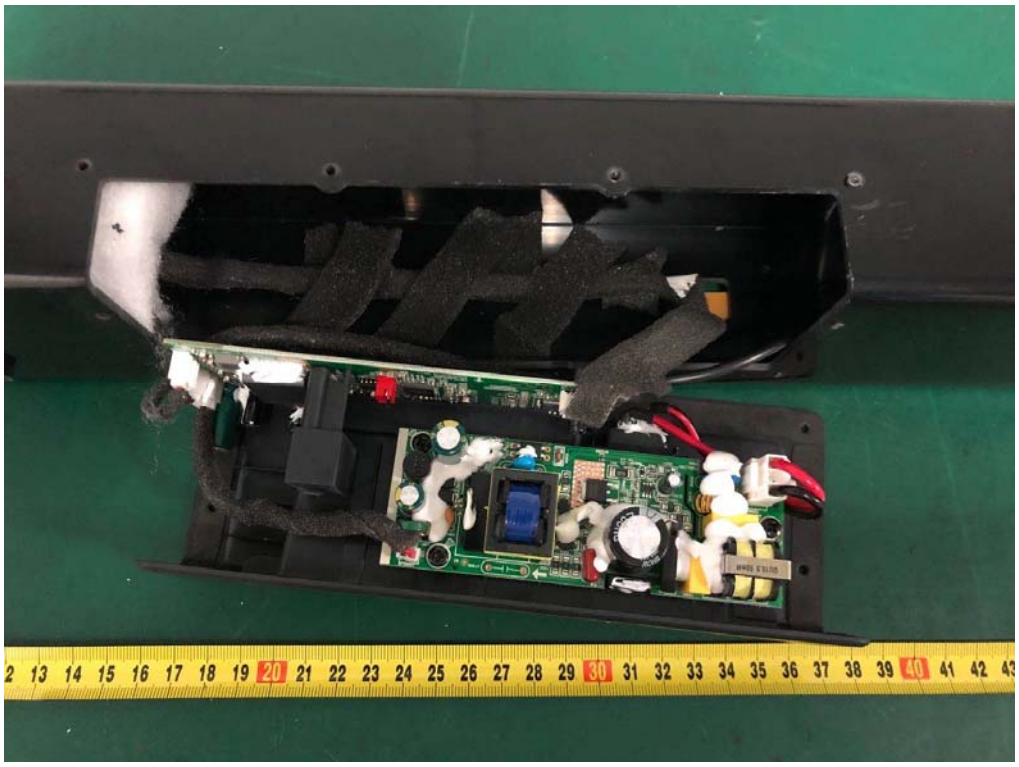
M/N: TS3100

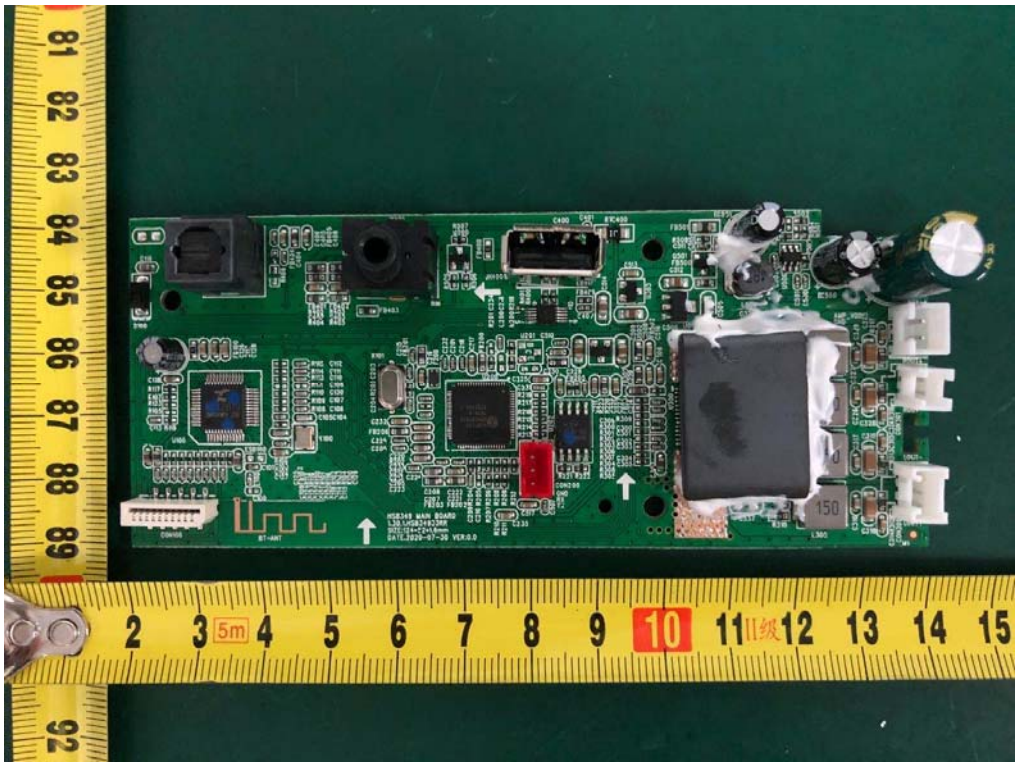


**Internal Photos**

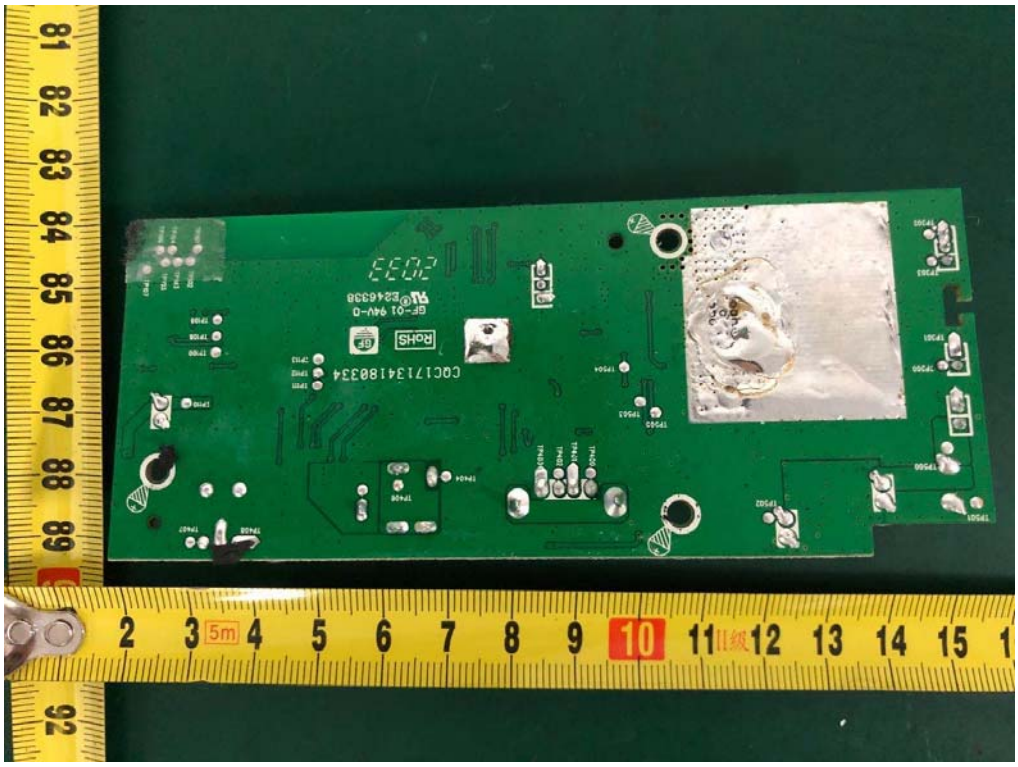
M/N: TS3100

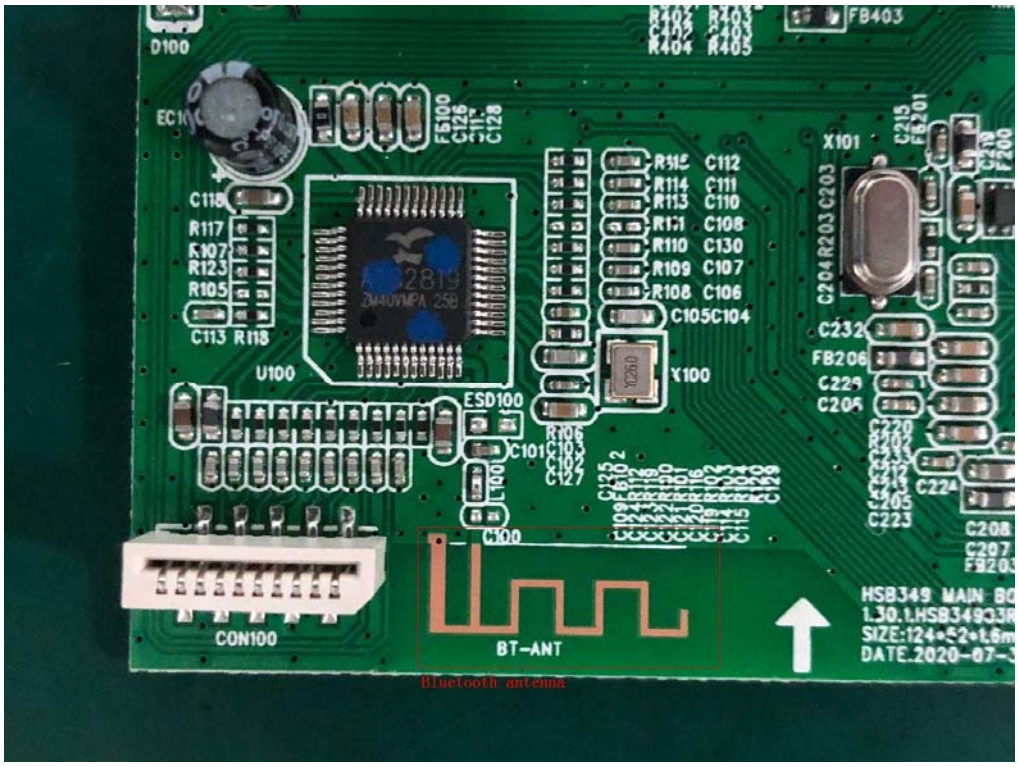




**Internal Photos**

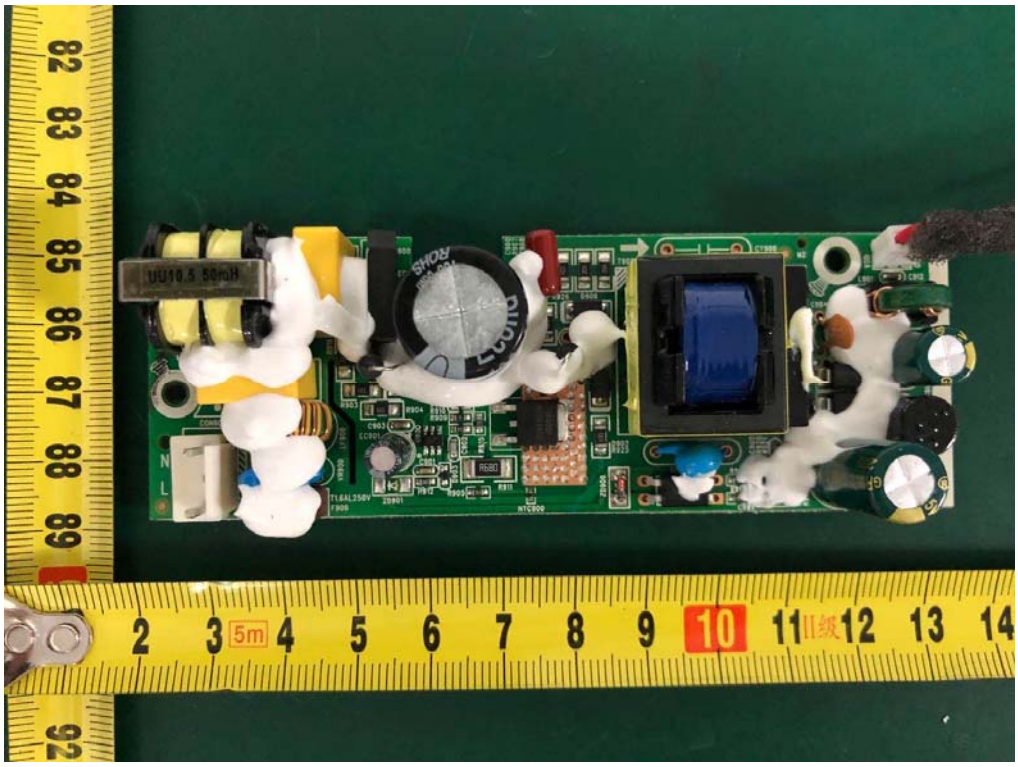
M/N: TS3100

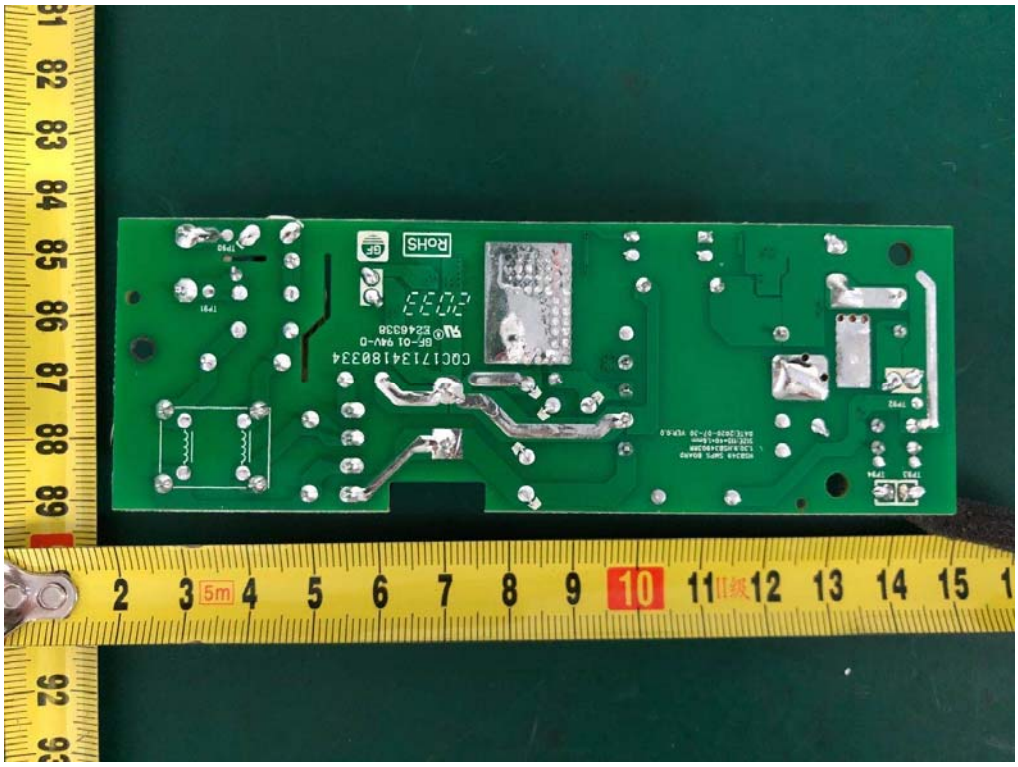




**Internal Photos**

M/N: TS3100





**Internal Photos**

M/N: TS3100

**End of Test Report**