

FCC/IC - TEST REPORT

Report Number : **68.760.19.0789.01** Date of Issue: December 16, 2019

Model : **Theragun Prime**

Product Type : Hand held Massager

Applicant : Theragun, Inc.

Address : 2803 Colorado Avenue, Santa Monica, California, 90404, United States

Production Facility : Suzhou WinTech Tools Manufacturing Co., Ltd.

Address : NO. 286, Caofeng Road, Hefeng Industry Area, Xukou Town,
Wuzhong District, 215156 Suzhou, Jiangsu,
PEOPLE'S REPUBLIC OF CHINA

Test Result : ☒ **Positive** ☐ **Negative**

Total pages including Appendices : 29

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2 Details about the Test Laboratory

Details about the Test Laboratory

Test Site 1

Company name: TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13, Zhiheng Wisdomland Business Park,
Nantou Checkpoint Road 2, Nanshan District,
Shenzhen City, 518052,
P. R. China

FCC Registration Number: 514049

ISED#: 10320A

CAB identifier: CN0077

Telephone: 86 755 8828 6998
Fax: 86 755 8828 5299

Test Site 2

Company name: Dongguan Dongdian Testing Service Co., Ltd.
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Dongguan City,Guangdong Province, China, 523808

Telephone: +86-0769-38826678
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IC Registration No.: 10288A

CAB identifier: CN0048

3 Description of the Equipment under Test

Product/PMN:	Hand held Massager
Model no./HVIN:	Theragun Prime
FCC ID:	2AU6TPRIME-01
IC:	25672-PRIME01
Rated Input:	100-240VAC, 50/60Hz, 0.8A (for adapter) 15VDC, 1.5A (for Hand held Massager)
RF Transmission Frequency:	2402MHz-2480MHz
No. of Operated Channel:	40
Modulation:	GFSK
Antenna Type:	PCB Antenna
Antenna Gain:	-4dBi
Description of the EUT:	The Equipment Under Test (EUT) is a Hand held Massager supports 2.4GHz BLE function.

4 Summary of Test Standards

Test Standards	
FCC Part 15 Subpart C 10-1-2018 Edition	PART 15 - RADIO FREQUENCY DEVICES Subpart C - Intentional Radiators
RSS-Gen Issue 5, Amendment 1, March 2019	General Requirements and Information for the Certification of Radio Apparatus
RSS-247 Issue 2 February 2017	Digital Transmission Systems (DTSS), Frequency Hopping Systems (FHSS) and License-Exempt Local Area Network (LE-LAN) Devices

All the test methods were according to KDB558074 D01 DTS Meas Guidance v05r02 and ANSI C63.10 (2013).

5 Summary of Test Results

Technical Requirements						
FCC Part 15 Subpart C/RSS-247 Issue 2/RSS-Gen Issue 5						
Test Condition		Pages	Test Site	Test Result		
				Pass	Fail	N/A
§15.207 RSS-GEN 8.8	Conducted emission AC power port	10	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.247 (b) (1) RSS-247 5.4(d)	Conducted peak output power	13	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.247(a)(1) RSS-247 5.1(b)	20dB bandwidth	---	---	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
§15.247(a)(1) §RSS-247 5.1(b)	Carrier frequency separation	---	---	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
§15.247(a)(1)(iii) RSS-247 5.1(d)	Number of hopping frequencies	---	---	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
§15.247(a)(1)(iii) RSS-247 5.1(d)	Dwell Time	---	---	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
§15.247(a)(2) RSS-247 5.2(a) & RSS-GEN 6.7	6dB and 99% Occupied Bandwidth	16	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.247(e) RSS-247 5.2(b)	Power spectral density	19	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.247(d) RSS-247 5.5	Spurious RF conducted emissions	22	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.247(d) RSS-247 5.5	Band edge	30	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.247(d) & §15.209 RSS-247 5.5 & RSS-Gen 6.13	Spurious radiated emissions for transmitter	33	Site 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.203 RSS-Gen 6.8	Antenna requirement	See note 1		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Remark: N/A=Not Applicable.

Note 1: The EUT uses a PCB antenna, which gain is -4dBi. In accordance to §15.203 and RSS-Gen 6.8, it is considered sufficiently to comply with the provisions of this section.

6 General Remarks

Remarks

This submittal(s) (test report) is intended for FCC ID: 2AU6TPRIME-01 complies with Section 15.207, 15.209, 15.247 of the FCC Part 15, Subpart C rules.

This submittal(s) (test report) is intended for IC: 25672-PRIME01 complies with RSS-247, RSS-GEN.

SUMMARY:

All tests according to the regulations cited on page 5 were

■ - Performed

□ - **Not** Performed

The Equipment under Test

■ - **Fulfills** the general approval requirements.

□ - **Does not** fulfill the general approval requirements.

Sample Received Date: November 22, 2019

Testing Start Date: December 06, 2019

Testing End Date: December 09, 2019

- TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch -

Reviewed by: _____ Prepared by: _____ Tested by: _____ Tested by: _____





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EMC Project Manager
Test Site 1

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EMC Test Engineer
Test Site 1

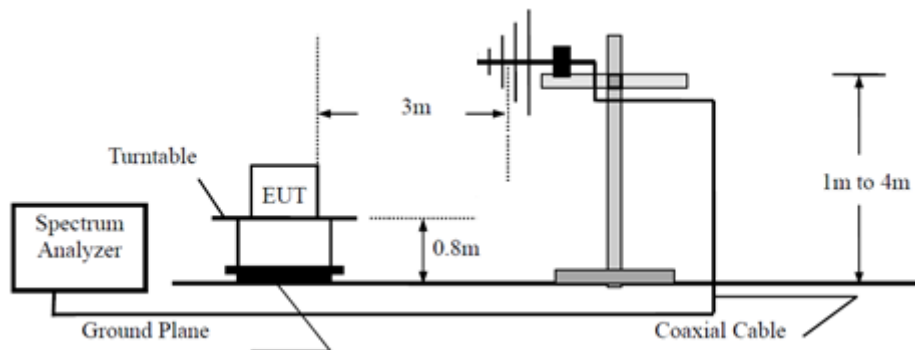


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EMC Test Engineer
Test Site 2

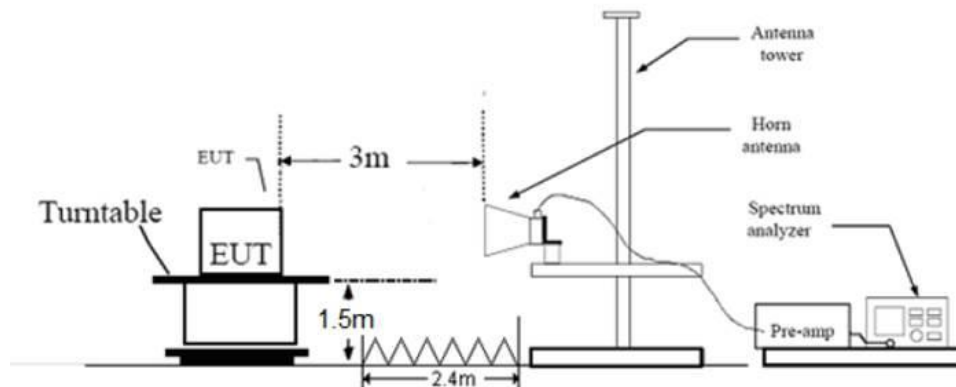
7 Test Setups

7.1 Radiated test setups

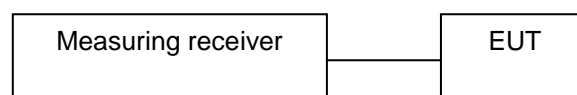
Below 1GHz



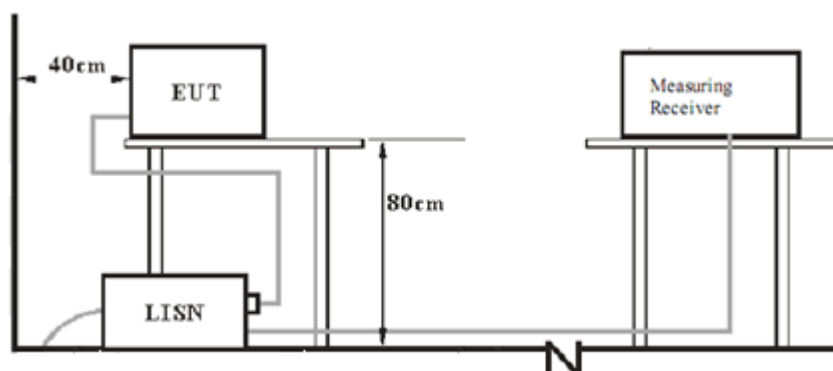
Above 1GHz



7.2 Conducted RF test setups



7.3 AC Power Line Conducted Emission test setups



8 Systems test configuration

Auxiliary Equipment Used during Test:

DESCRIPTION	MANUFACTURER	MODEL NO.	S/N
---	---	---	---

Test software information:

Test Software Version	SmartRF Studio 7 - 1.16.1	
Modulation	Setting TX Power	Packet Type
GFSK	0dBm	/

The system was configured to channel 0, 19, and 39 for the test.

9 Technical Requirement

9.1 Conducted Emission

Test Method

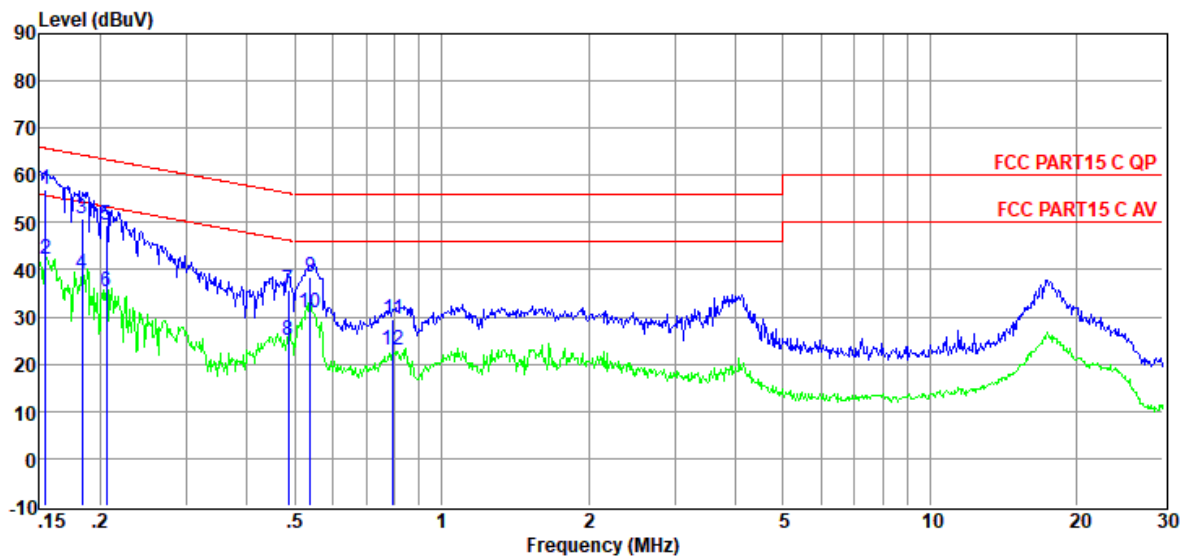
1. The EUT was placed on a table, which is 0.8m above ground plane
2. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.).
3. Maximum procedure was performed to ensure EUT compliance
4. A EMI test receiver is used to test the emissions from both sides of AC line

Limit

Frequency MHz	QP Limit dB μ V	AV Limit dB μ V
0.150-0.500	66-56*	56-46*
0.500-5	56	46
5-30	60	50

Conducted Emission

Product Type : Hand held Massager
 M/N : Theragun Prime
 Operating Condition : Charging
 Test Specification : Power Line, Live
 Comment : AC 120V/60Hz

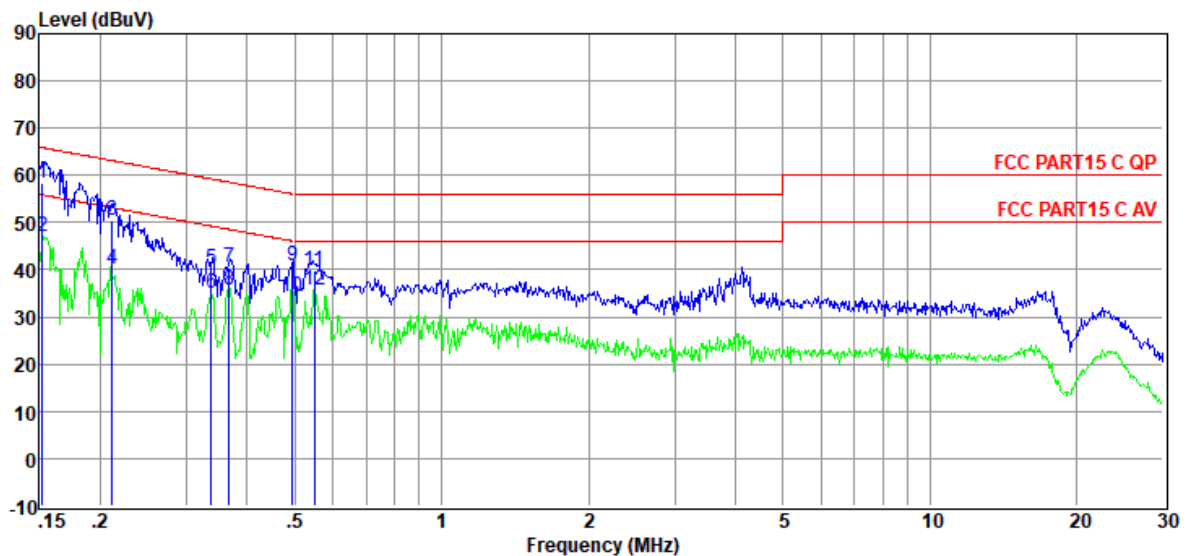


Item (Mark)	Freq. (MHz)	Read Level (dBμV)	LISN Factor (dB)	Cable Loss (dB)	Pulse Limiter Factor (dB)	Result Level (dBμV)	Limit Line (dBμV)	Over Limit (dB)	Detector	Phase
1	0.15	37.47	9.63	0.02	9.86	56.98	65.74	-8.76	QP	LINE
2	0.15	22.56	9.63	0.02	9.86	42.07	55.74	-13.67	Average	LINE
3	0.18	31.38	9.63	0.02	9.86	50.89	64.33	-13.44	QP	LINE
4	0.18	19.63	9.63	0.02	9.86	39.14	54.33	-15.19	Average	LINE
5	0.21	30.00	9.63	0.02	9.86	49.51	63.36	-13.85	QP	LINE
6	0.21	16.01	9.63	0.02	9.86	35.52	53.36	-17.84	Average	LINE
7	0.49	16.33	9.64	0.02	9.86	35.85	56.23	-20.38	QP	LINE
8	0.49	5.61	9.64	0.02	9.86	25.13	46.23	-21.10	Average	LINE
9	0.54	18.76	9.64	0.02	9.86	38.28	56.00	-17.72	QP	LINE
10	0.54	11.52	9.64	0.02	9.86	31.04	46.00	-14.96	Average	LINE
11	0.80	9.82	9.64	0.05	9.86	29.37	56.00	-26.63	QP	LINE
12	0.80	3.52	9.64	0.05	9.86	23.07	46.00	-22.93	Average	LINE

Note: 1. Result Level = Read Level + LISN Factor + Pulse Limiter Factor + Cable loss.
 2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.

Conducted Emission

Product Type : Hand held Massager
 M/N : Theragun Prime
 Operating Condition : Charging
 Test Specification : Power Line, Neutral
 Comment : AC 120V/60Hz



Item (Mark)	Freq. (MHz)	Read Level (dBμV)	LISN Factor (dB)	Cable Loss (dB)	Pulse Limiter Factor (dB)	Result Level (dBμV)	Limit Line (dBμV)	Over Limit (dB)	Detector	Phase
1	0.15	38.76	9.64	0.02	9.86	58.28	65.87	-7.59	QP	NEUTRAL
2	0.15	27.67	9.64	0.02	9.86	47.19	55.87	-8.68	Average	NEUTRAL
3	0.21	30.79	9.64	0.02	9.86	50.31	63.14	-12.83	QP	NEUTRAL
4	0.21	20.67	9.64	0.02	9.86	40.19	53.14	-12.95	Average	NEUTRAL
5	0.34	20.79	9.64	0.02	9.86	40.31	59.27	-18.96	QP	NEUTRAL
6	0.34	15.61	9.64	0.02	9.86	35.13	49.27	-14.14	Average	NEUTRAL
7	0.37	20.96	9.64	0.02	9.86	40.48	58.56	-18.08	QP	NEUTRAL
8	0.37	16.09	9.64	0.02	9.86	35.61	48.56	-12.95	Average	NEUTRAL
9	0.49	21.28	9.64	0.02	9.86	40.80	56.10	-15.30	QP	NEUTRAL
10	0.49	14.80	9.64	0.02	9.86	34.32	46.10	-11.78	Average	NEUTRAL
11	0.55	20.30	9.64	0.02	9.86	39.82	56.00	-16.18	QP	NEUTRAL
12	0.55	16.19	9.64	0.02	9.86	35.71	46.00	-10.29	Average	NEUTRAL

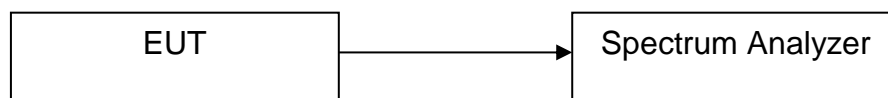
Note: 1. Result Level = Read Level + LISN Factor + Pulse Limiter Factor + Cable loss.
 2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.

9.2 Conducted Peak output power

Test Method

1. The EUT was placed on 0.8m height table, the RF output of EUT was connected to the test receiver by RF cable. The path loss was compensated to the results for each measurement.
2. Setting the highest output power level of the EUT
3. Use the following spectrum analyzer settings:
RBW \geq DTS bandwidth, VBW \geq 3RBW, Sweep = auto, Detector function = peak, Trace = max hold, allow trace to fully stabilize.
4. Record the peak power value.

Test Setup



Limits

According to §15.247 (b) (3), conducted AV output power limit as below:

Frequency Range MHz	Limit W	Limit dBm
2400-2483.5	≤ 1	≤ 30

Test result as below table

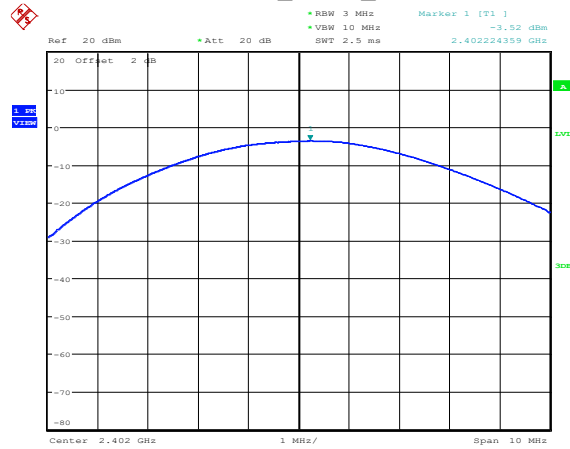
For BLE

Frequency MHz	Conducted peak Output Power dBm	Result
Top channel 2402MHz	-3.52	Pass
Middle channel 2440MHz	-2.98	Pass
Bottom channel 2480MHz	-2.71	Pass

Test Graphs

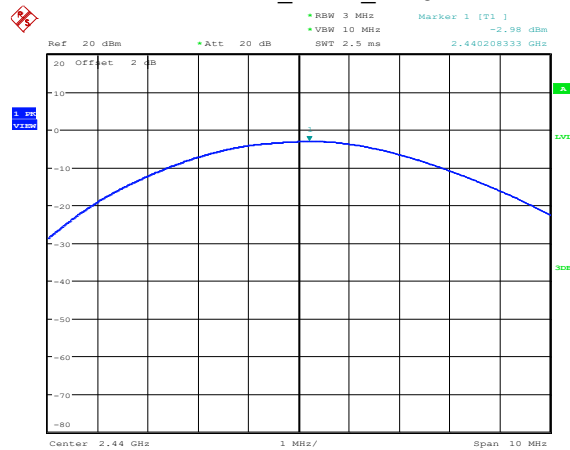
For BLE

BLE_ANT1_2402



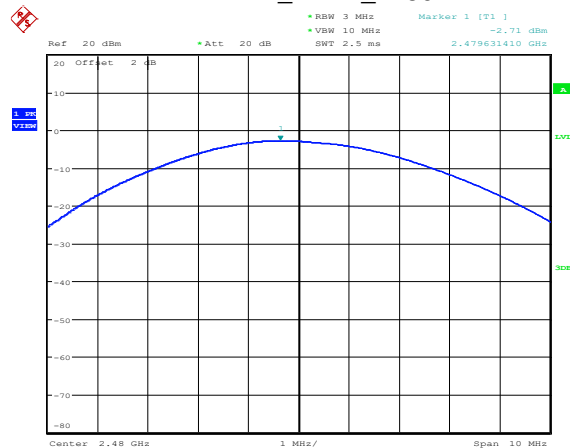
Date: 6.DEC.2019 08:21:08

BLE_ANT1_2440



Date: 6.DEC.2019 08:24:07

BLE_ANT1_2480



Date: 6.DEC.2019 08:26:30

9.3 6dB and 99% bandwidth

Test Method

1. Connect EUT test port to spectrum analyzer.
2. Use the following spectrum analyzer settings:
Set RBW $\geq 1\%$ of the 99% bandwidth, VBW \geq RBW.
Sweep = auto, Detector function = peak, Trace = max hold
3. Use the automatic bandwidth measurement capability of an instrument, may be employed using the X dB bandwidth mode with X set to 6 dB, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be ≥ 6 dB.
4. Allow the trace to stabilize, record the X dB Bandwidth value.

Limit

Limit [kHz]

≥ 500

Test result

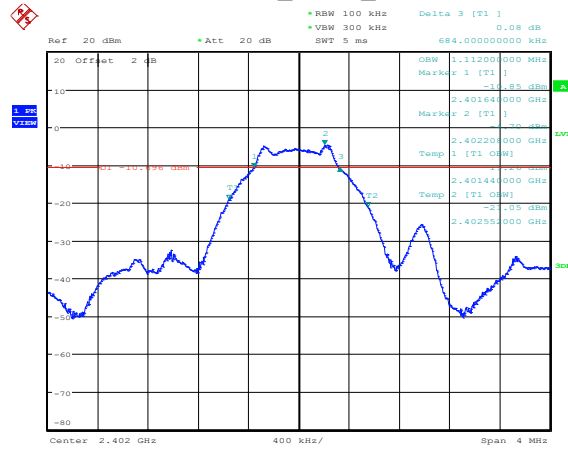
For BLE

Test Mode	Channel (MHz)	6dB bandwidth (MHz)	99% bandwidth (MHz)	Limit (KHz)	Verdict
BLE	2402	0.684	1.112	≥ 500	PASS
BLE	2440	0.668	1.108	≥ 500	PASS
BLE	2480	0.684	1.096	≥ 500	PASS

Test Graphs

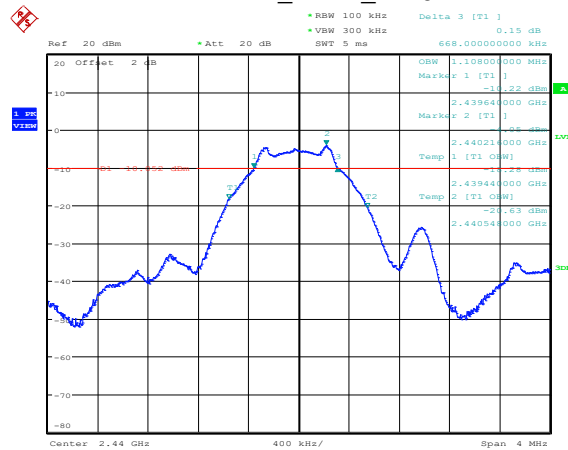
For BLE

BLE_ANT1_2402



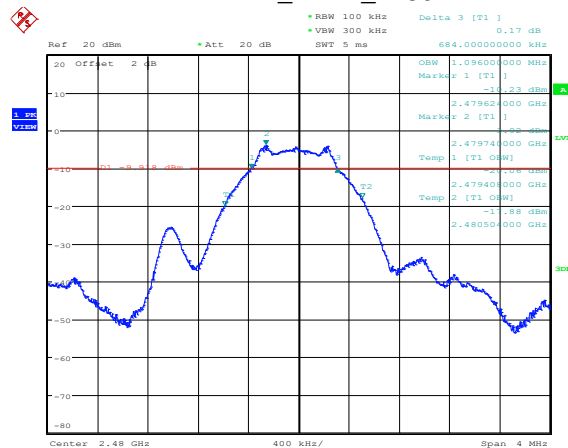
Date: 6.DEC.2019 08:20:39

BLE_ANT1_2440



Date: 6.DEC.2019 08:23:30

BLE_ANT1_2480



Date: 6.DEC.2019 08:26:05

9.4 Power spectral density

Test Method

1. Connect EUT test port to spectrum analyzer.
2. Set analyzer center frequency to DTS channel center frequency. RBW=3kHz, VBW \geq 3RBW, Span=1.5 times DTS bandwidth, Detector=Peak, Sweep=auto, Trace= max hold.
3. Allow trace to fully stabilize, use the peak marker function to determine the maximum amplitude level within the RBW.
4. Repeat above procedures until other frequencies measured were completed.

Limit

Limit [dBm/3KHz]

≤ 8

Test result

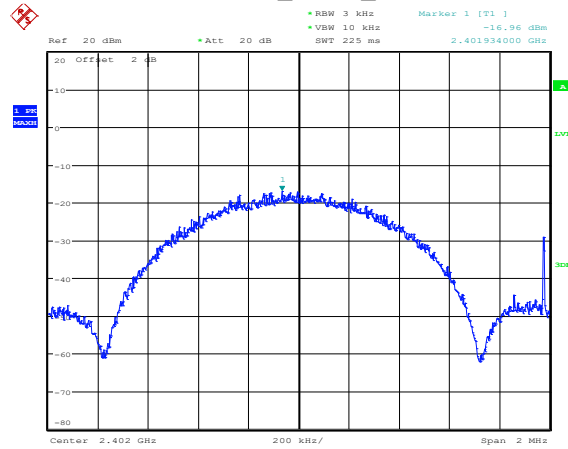
For BLE

Test Mode	Channel (MHz)	Result (dBm/3KHz)	Limit(dBm/3KHz)	Verdict
BLE	2402	-16.96	8	PASS
BLE	2440	-16.21	8	PASS
BLE	2480	-15.9	8	PASS

Test Graphs

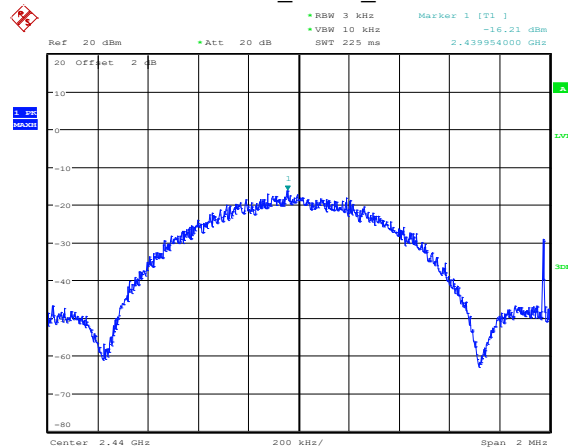
For BLE

BLE_ANT1_2402



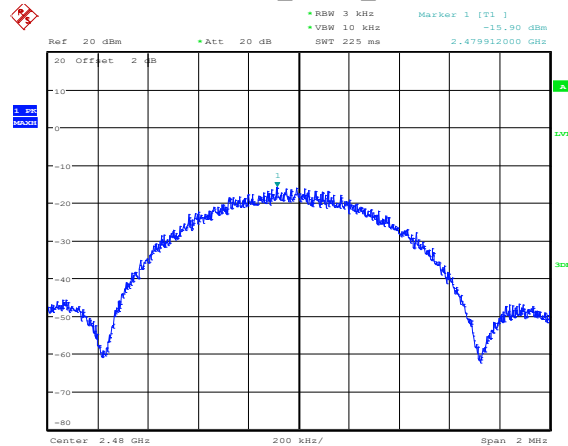
Date: 6.DEC.2019 08:21:35

BLE_ANT1_2440



Date: 6.DEC.2019 08:24:19

BLE_ANT1_2480



Date: 6.DEC.2019 08:26:49

9.5 Spurious RF conducted emissions

Test Method

1. Connect EUT test port to spectrum analyzer.
2. Establish a reference level by using the following procedure:
 - a. Set RBW=100 kHz. VBW \geq 3RBW. Detector =peak, Sweep time = auto couple, Trace mode = max hold.
 - b. Allow trace to fully stabilize, use the peak marker function to determine the maximum PSD level.
3. Use the maximum PSD level to establish the reference level.
 - a. Set the center frequency and span to encompass frequency range to be measured.
 - b. Use the peak marker function to determine the maximum amplitude level. Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements, report the three highest emissions relative to the limit.
4. Repeat above procedures until other frequencies measured were completed.

Limit

Frequency Range MHz	Limit (dBc)
30-25000	-20

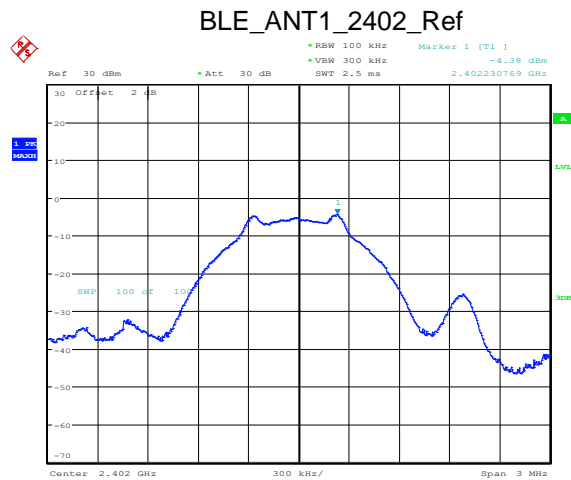
Test Result

For BLE

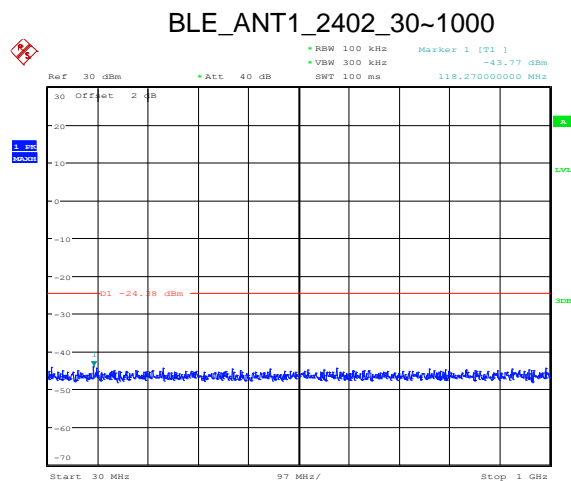
TestMode	Antenna	Channel (MHz)	FreqRange (MHz)	RefLevel (dBm)	Result (dBm)	Limit (dBm)	Verdict
BLE	ANT1	2402	30~1000	-4.38	-43.77	-24.38	PASS
BLE	ANT1	2402	1000~26500	-4.38	-52.59	-24.38	PASS
BLE	ANT1	2440	30~1000	-4.17	-43.49	-24.17	PASS
BLE	ANT1	2440	1000~26500	-4.17	-52.99	-24.17	PASS
BLE	ANT1	2480	30~1000	-3.67	-43.87	-23.67	PASS
BLE	ANT1	2480	1000~26500	-3.67	-52.98	-23.67	PASS

Test Graphs

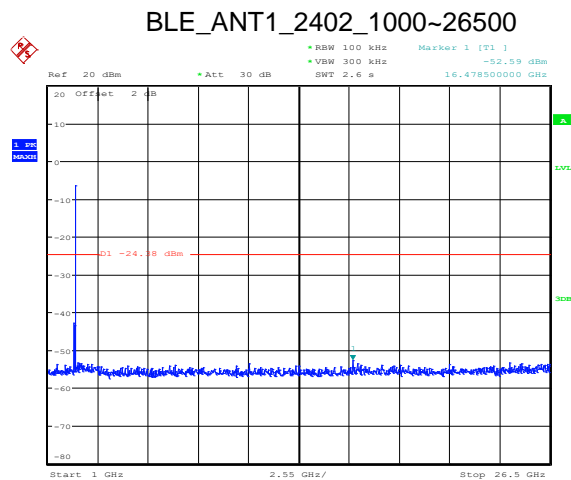
For BLE



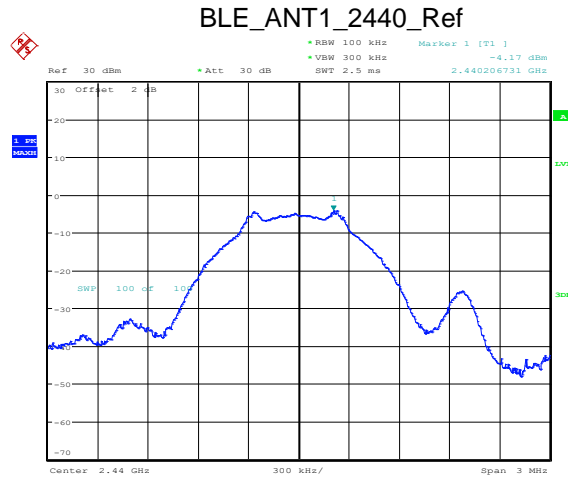
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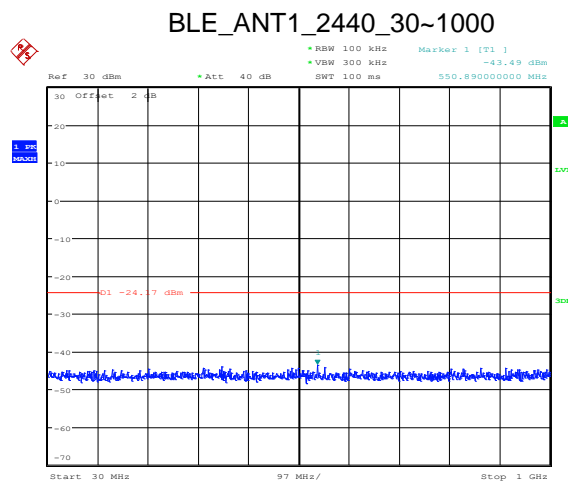
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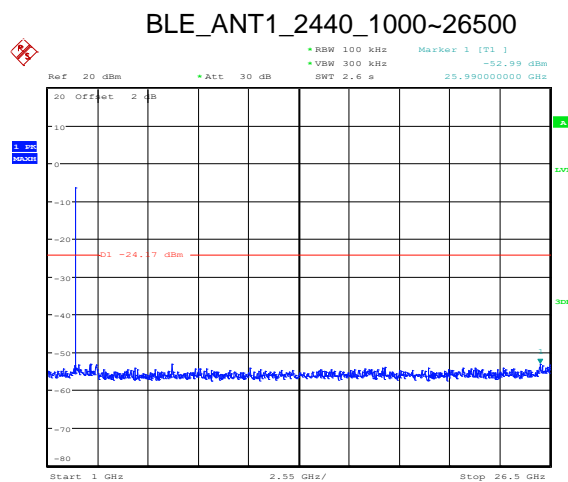
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Date: 6.DEC.2019 08:25:18

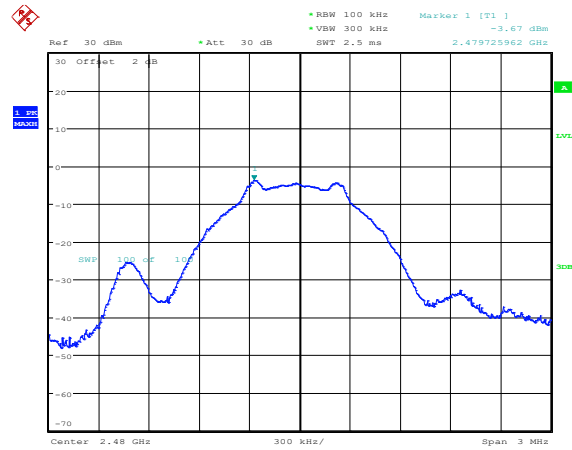


Date: 6.DEC.2019 08:25:26



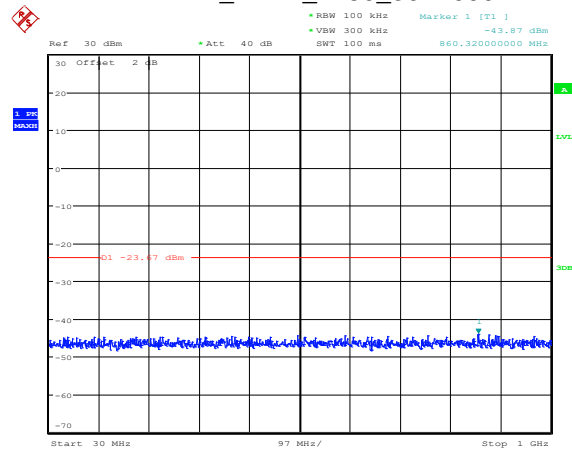
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BLE_ANT1_2480_Ref



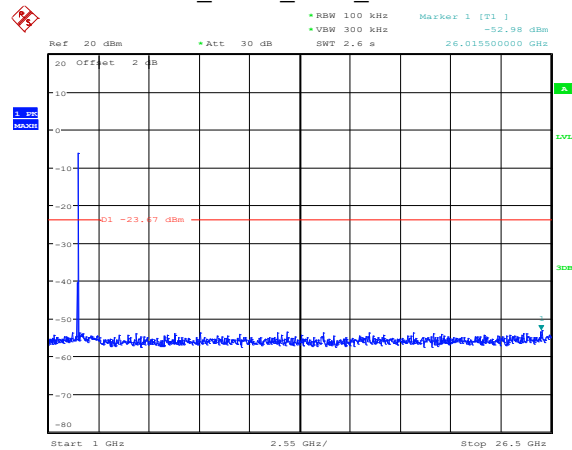
Date: 6.DEC.2019 08:28:08

BLE_ANT1_2480_30~1000



Date: 6.DEC.2019 08:28:16

BLE_ANT1_2480_1000~26500



Date: 6.DEC.2019 08:28:29

9.6 Band edge

Test Method

1. Connect EUT test port to spectrum analyzer.
2. Set spectrum analyzer setting as below:
Set RBW \geq 1% of the span, VBW \geq RBW.
Set Sweep = auto. Set Detector function = peak. Allow the trace to stabilize.
Set Span = wide enough to capture the peak level of the emission operating on the channel closest to the band edge, as well as any modulation products which fall outside of the authorized band of operation.
3. Repeat above procedures until all frequencies measured were complete.

Limit

Frequency Range MHz	Limit (dBc)
30-25000	-20

Test result

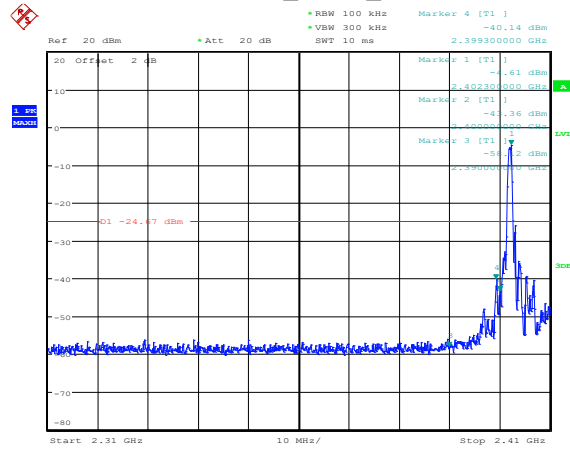
For BLE

Test Mode	Ch Name	Channel (MHz)	Result (dBm)	Limit (dBm)	Verdict
BLE	Low	2402	-41.27	-24.67	PASS
BLE	High	2480	-51.52	-24.04	PASS

Test Graphs

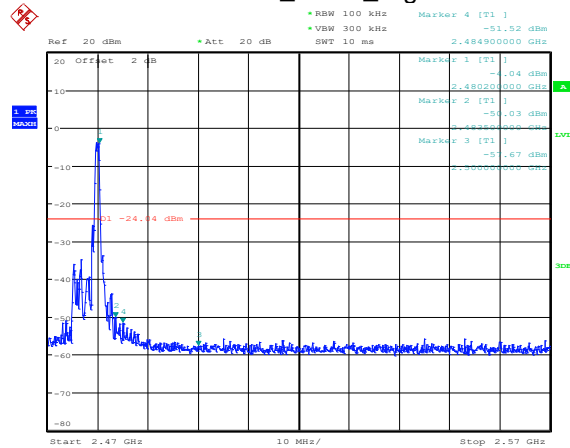
For BLE

BLE_ANT1_Low



Date: 6.DEC.2019 08:21:48

BLE_ANT1_High



Date: 6.DEC.2019 08:27:00

9.7 Spurious radiated emissions for transmitter

Test Method

- 1: The EUT was placed on a turn table which is 1.5m above ground plane for above 1GHz and 0.8m above ground for below 1GHz at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- 2: The EUT was set 3 meters away from the interference – receiving antenna, which was mounted on the top of a variable – height antenna tower.
- 3: The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- 4: For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- 5: Use the following spectrum analyzer settings According to C63.10:
For Below 1GHz
Use the following spectrum analyzer settings:
Span = wide enough to capture the peak level of the in-band emission and all spurious
RBW = 100 KHz to 120KHz, VBW ≥ RBW for peak measurement, Sweep = auto, Detector function = peak, Trace = max hold.

For Peak unwanted emissions Above 1GHz:

Span = wide enough to capture the peak level of the in-band emission and all spurious
RBW = 1MHz, VBW ≥ RBW for peak measurement, Sweep = auto, Detector function = peak, Trace = max hold.

Procedures for average unwanted emissions measurements above 1000 MHz

- a) RBW = 1 MHz.
- b) VBW \ [3 × RBW].
- c) Detector = RMS (power averaging), if [span / (# of points in sweep)] \ RBW / 2.
Satisfying this condition can require increasing the number of points in the sweep or reducing the span. If the condition is not satisfied, then the detector mode shall be set to peak.
- d) Averaging type = power (i.e., rms) (As an alternative, the detector and averaging type may be set for linear voltage averaging. Some instruments require linear display mode to use linear voltage averaging. Log or dB averaging shall not be used.)
- e) Sweep time = auto.
- f) Perform a trace average of at least 100 traces if the transmission is continuous. If the transmission is not continuous, then the number of traces shall be increased by a factor of 1 / D, where D is the duty cycle. For example, with 50% duty cycle, at least 200 traces shall be averaged. (If a specific emission is demonstrated to be continuous—i.e., 100% duty cycle—then rather than turning ON and OFF with the transmit cycle, at least 100 traces shall be averaged.)
- g) If tests are performed with the EUT transmitting at a duty cycle less than 98%, then a correction factor shall be added to the measurement results prior to comparing with the emission limit, to compute the emission level that would have been measured had the test been performed at 100% duty cycle. The correction factor is computed as follows:
1) If power averaging (rms) mode was used in the preceding step e), then the correction

factor is $[10 \log (1 / D)]$, where D is the duty cycle. For example, if the transmit duty cycle was 50%, then 3 dB shall be added to the measured emission levels.

2) If linear voltage averaging mode was used in the preceding step e), then the correction factor is $[20 \log (1 / D)]$, where D is the duty cycle. For example, if the transmit duty cycle was 50%, then 6 dB shall be added to the measured emission levels.

3) If a specific emission is demonstrated to be continuous (100% duty cycle) rather than turning ON and OFF with the transmit cycle, then no duty cycle correction is required for that emission.

Limit

The radio emission outside the operating frequency band 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.

Radiated emissions which fall in the restricted bands, as defined in section 15.205, must comply with the radiated emission limits specified in section 15.209.

Frequency MHz	Field Strength uV/m	Field Strength dBμV/m	Detector
30-88	100	40	QP
88-216	150	43.5	QP
216-960	200	46	QP
960-1000	500	54	QP
Above 1000	500	54	AV
Above 1000	5000	74	PK

According to C63.10, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement, so AV emission value did not show in below table if the peak value complies with average limit.

Spurious radiated emissions for transmitter

Transmitting spurious emission test result as below:

For BLE

(30MHz – 1GHz)

Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
37.55	5.66	12.89	3.74	22.29	40.00	-17.71	QP	HORIZONTAL
49.36	2.58	14.53	3.86	20.97	40.00	-19.03	QP	HORIZONTAL
191.75	13.76	10.25	4.78	28.79	43.50	-14.71	QP	HORIZONTAL
318.82	14.47	14.34	5.25	34.06	46.00	-11.94	QP	HORIZONTAL
677.58	3.37	19.76	6.31	29.44	46.00	-16.56	QP	HORIZONTAL
860.04	3.55	21.31	6.76	31.62	46.00	-14.38	QP	HORIZONTAL
37.68	4.56	12.92	3.74	21.22	40.00	-18.78	QP	VERTICAL
50.41	2.29	14.46	3.87	20.62	40.00	-19.38	QP	VERTICAL
836.24	2.29	21.08	6.69	30.06	46.00	-15.94	QP	VERTICAL

2402MHz (Above 1GHz)

Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
17966.00	43.25	44.54	41.61	11.85	58.03	74.00	-15.97	Peak	HORIZONTAL
17966.00	33.15	44.54	41.61	11.85	47.93	54.00	-6.07	Average	HORIZONTAL
17830.00	42.56	44.30	41.55	11.70	57.01	74.00	-16.99	Peak	VERTICAL
17830.00	33.32	44.30	41.55	11.70	47.77	54.00	-6.23	Average	VERTICAL

2440MHz (Above 1GHz)

Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
14640.00	37.45	40.41	41.72	11.18	47.32	54.00	-6.68	Average	HORIZONTAL
17541.00	42.55	43.77	41.44	11.38	56.26	74.00	-17.74	Peak	HORIZONTAL
17541.00	34.12	43.77	41.44	11.38	47.83	54.00	-6.17	Average	HORIZONTAL
17609.00	42.97	43.90	41.46	11.46	56.87	74.00	-17.13	Peak	VERTICAL
17609.00	33.87	43.90	41.46	11.46	47.77	54.00	-6.23	Average	VERTICAL

2480MHz (Above 1GHz)

Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
17711.00	42.68	44.08	41.50	11.57	56.83	74.00	-17.17	Peak	HORIZONTAL
17711.00	33.36	44.08	41.50	11.57	47.51	54.00	-6.49	Average	HORIZONTAL
14880.00	43.89	40.61	41.71	11.21	54.00	74.00	-20.00	Peak	VERTICAL
14880.00	37.41	40.61	41.71	11.21	47.52	54.00	-6.48	Average	VERTICAL
18000.00	43.17	44.60	41.62	11.89	58.04	74.00	-15.96	Peak	VERTICAL
18000.00	33.00	44.60	41.62	11.89	47.87	54.00	-6.13	Average	VERTICAL

Remark:

- (1) “*” means the emission(s) appear within the restrict bands shall follow the requirement of section 15.205.
- (2) Data of measurement within this frequency range shown “-” in the table above means the reading of emissions are the noise floor or attenuated more than 10dB below the permissible limits or the field strength is too small to be measured.
- (3) Level=Reading Level + Correction Factor
Above 1GHz: Corrector factor = Antenna Factor + Cable Loss- Amplifier Gain
Below 1GHz: Corrector factor = Antenna Factor + Cable Loss
(The Reading Level is recorded by software which is not shown in the sheet)

10 Test Equipment List

Test Site 2:

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
RF Connected Test (Tonscend RF Measurement System)					
Spectrum analyzer	R&S	FSU26	200071	Oct. 12, 2019	1 Year
DC Power Source	MATRIS	MPS-3005L-3	D813058W	Aug. 18, 2019	1 Year
Attenuator	Mini-Circuits	BW-S10W2	101109	Aug. 18, 2019	1 Year
RF Cable	Micable	C10-01-01-1	100309	Oct. 21, 2019	1 Year
Temp&Humi Programmable	ZHIXIANG	ZXGDJS-150L	ZX170110-A	Oct. 21, 2019	1 Year
Test Software	JS Tonscend	JS1120-3	Ver.2.7	N/A	N/A
Radiation 1#chamber					
EMI Test Receiver	R&S	ESU8	100316	Oct. 12, 2019	1 Year
Spectrum analyzer	Agilent	E4447A	MY50180031	Jun. 25, 2019	1 Year
Trilog Broadband Antenna	Schwarzbeck	VULB9163	9163-462	Nov. 09, 2019	1 Year
Double Ridged Horn Antenna	R&S	HF907	100276	Nov. 16, 2019	1 Year
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	790	Oct. 25, 2019	1 Year
Pre-amplifier	A.H.	PAM-0118	360	Oct. 12, 2019	1 Year
Pre-amplifier	TERA-MW	TRLA-0040G35	101303	Oct. 12, 2019	1 Year
RF Cable	HUBSER	CP-X2+ CP-X1	W11.03+ W12.02	Oct. 21, 2019	1 Year
RF Cable	N/A	SMAJ-SMAJ-1M+ 11M	17070133+17070131	Nov. 08, 2019	1 Year
MI Cable	HUBSER	C10-01-01-1M	1091629	Oct. 21, 2019	1 Year
Test software	Audix	E3	V 6.11111b	N/A	N/A
Power Line Conducted Emissions Test					
EMI Test Receiver	R&S	ESU8	100316	Oct. 21, 2019	1 Year
LISN 1	R&S	ENV216	101109	Oct. 21, 2019	1 Year
LISN 2	R&S	ESH2-Z5	100309	Oct. 21, 2019	1 Year
Pulse Limiter	R&S	ESH3-Z2	101242	Oct. 21, 2019	1 Year
CE Cable 1	HUBSER	N/A	W10.01	Oct. 21, 2019	1 Year
Test software	Audix	E3	V 6.11111b	N/A	N/A

11 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

Site 2:

Test Item	Uncertainty
Bandwidth	1.1%
Peak Output Power(Conducted)(Spectrum analyzer)	0.86dB (10 MHz \leq f < 3.6GHz);
	1.38dB (3.6GHz \leq f < 8GHz)
Peak Output Power(Conducted)(Power Sensor)	0.74dB
Power Spectral Density	0.74dB (10 MHz \leq f < 3.6GHz);
	1.38dB (3.6GHz \leq f < 8GHz)
Frequencies Stability	6.7×10^{-8} (Antenna couple method)
	5.5×10^{-8} (Conducted method)
Conducted spurious emissions	0.86dB (10 MHz \leq f < 3.6GHz);
	1.40dB (3.6GHz \leq f < 8GHz)
	1.66dB (8GHz \leq f < 22GHz)
Uncertainty for radio frequency (RBW<20kHz)	3×10^{-8}
Temperature	0.4°C
Humidity	2%
Uncertainty for Radiation Emission test (30MHz-1GHz)	4.70 dB (Antenna Polarize: V)
	4.84 dB (Antenna Polarize: H)
Uncertainty for Radiation Emission test (1GHz-40GHz)	4.10dB (1-6GHz)
	4.40dB (6GHz-18GHz)
	3.54dB (18GHz-26GHz)
	4.30dB (26GHz-40GHz)
Uncertainty for Power line conduction emission test	3.32dB (150kHz-30MHz)

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