TEST REPORT

Product Name	:	Mobile Phone
Brand Mark	:	TECNO
Model No.	:	B1f
FCC ID	:	2ADYY-B1F
Report Number	:	BLA-EMC-202006-A52-01
Date of Sample Receipt	:	2020/6/18
Date of Test	:	2020/6/18 to 2020/7/7
Date of Issue	:	2020/7/8
Test Standard	:	47 CFR Part 15, Subpart C 15.247
Test Result	:	Pass

Prepared for:

TECNO MOBILE LIMITED

ROOM 604 6/F SOUTH TOWER WORLD FINANCE CTR HARBOUR CITY 17 CANTON ROAD TST KL

Prepared by:

BlueAsia of Technical Services(Shenzhen) Co.,Ltd.
IOT Test Centre of BlueAsia
No. 448 Bulong Road, Bantian Street, Longgang District, Shenzhen,China
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Compiled by: Jason

Review by: Sweet. Liang

Approved by: Tomen Li

Date: 2020/7/8

REPORT REVISE RECORD

Version No.	Date	Description
00	2020/7/8	Original

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1 TEST SUMMARY

Test item	Test Requirement	Test Method	Class/Severity	Result
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart C 15.207	Pass
Conducted Band Edges Measurement	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.8 & Section 11.13.3.2	47 CFR Part 15, Subpart C 15.247(d)	Pass
Conducted Spurious Emissions	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.6 & Section 11.11	47 CFR Part 15, Subpart C 15.247(d)	Pass
Minimum 6dB Bandwidth	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.8.1	47 CFR Part 15, Subpart C 15.247a(2)	Pass
Power Spectrum Density	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.10.2	47 CFR Part 15, Subpart C 15.247(e)	Pass
Conducted Peak Output Power	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.5	47 CFR Part 15, Subpart C 15.247(b)(3)	Pass
Radiated Emissions which fall in the restricted bands	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.10.5	47 CFR Part 15, Subpart C 15.209 & 15.247(d)	Pass
Radiated Spurious Emissions	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.4,6.5,6.6	47 CFR Part 15, Subpart C 15.209 & 15.247(d)	Pass
Antenna Requirement	47 CFR Part 15, Subpart C 15.247	N/A	47 CFR Part 15, Subpart C 15.203 & 15.247(c)	Pass

2 GENERAL INFORMATION

Applicant	TECNO MOBILE LIMITED
Address	ROOM 604 6/F SOUTH TOWER WORLD FINANCE CTR HARBOUR CITY 17 CANTON ROAD TST KL
Manufacturer	TECNO MOBILE LIMITED
Address	ROOM 604 6/F SOUTH TOWER WORLD FINANCE CTR HARBOUR CITY 17 CANTON ROAD TST KL
Factory	SHENZHEN TECNO TECHNOLOGY CO.,LTD.
Address	101,Building 24,Waijing Industrial Park,Fumin Community,Fucheng Street,Longhua District,Shenzhen City,P.R.China
Product Name	Mobile Phone
Test Model No.	B1f

3 GENERAL DESCRIPTION OF E.U.T.

EUT Input Rating	AC120V60Hz
Adapter Model	A8-501000
Input	100~240V~50/60Hz, 200mA
OutPut	5.0V, 1.0A
Battery	3.8V 2400mAh/2350mAh(typ/min) 9.12Wh/8.93Wh(typ/min)
Hardware Version	N/A
Software Version	N/A
Operation Frequency:	2402MHz-2480MHz
Channel Numbers:	40
Channel Separation:	2MHz
Modulation Type:	GFSK
Antenna Type:	Internal Antenna
Antenna Gain:	0.6 dBi(Provided by the customer)

4 TEST ENVIRONMENT

Environment	Temperature	Voltage
1010mpa	26	DC3.8V

5 TEST MODE

TEST MODE	TEST MODE DESCRIPTION
TX	Keep the EUT in transmitting mode
TX mode (SE) below 1G	Keep the EUT in transmitting mode
TX mode (SE) Above 1G	Keep the EUT in transmitting mode
Remark:Only the data of the worst mode would be recorded in this report.	

6 MEASUREMENT UNCERTAINTY

Parameter	Expanded Uncertainty (Confidence of 95%)
Radiated Emission	±4.34dB
Radiated Emission	±4.24dB
Radiated Emission	±4.68dB
AC Power Line Conducted Emission	±3.45dB

Parameter	Expanded Uncertainty (Confidence of 95%)
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±1.5 dB
Power Spectral Density, conducted	±3.0 dB
Unwanted Emissions, conducted	±3.0 dB
Temperature	±3 °C
Supply voltages	±3 %
Time	±5 %
Radiated Emission (30MHz ~ 1000MHz)	±4.35 dB
Radiated Emission (1GHz ~ 18GHz)	±4.44 dB

7 DESCRIPTION OF SUPPORT UNIT

Device Type	Manufacturer	Model Name	Serial No.	Remark
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Note:
"--" means no any support device during testing.

8 LABORATORY LOCATION

All tests were performed at:
BlueAsia of Technical Services(Shenzhen) Co., Ltd.
IOT Test Centre of BlueAsia
No. 448 Bulong Road, Bantian Street, Longgang District, Shenzhen,China
Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673
No tests were sub-contracted.

9 TEST INSTRUMENTS LIST

Test Equipment Of Conducted Emissions at AC Power Line (150kHz-30MHz)					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal.Date**	**Cal.Due**
Shield room	SKET	833	N/A	6/10/2018	6/9/2021
Receiver	R&S	ESPI3	101082	4/20/2020	4/19/2021
LISN	R&S	ENV216	3560.6550.15	7/4/2020	7/3/2021
LISN	AT	AT166-2	AKK1806000003	12/17/2019	12/16/2020
EMI software	EZ	EZ-EMC	N/A	N/A	N/A

Test Equipment Of Conducted Band Edges Measurement					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal.Date**	**Cal.Due**
Spectrum	R&S	FSP40	100817	7/4/2020	7/3/2021
Spectrum	Agilent	N9020A	MY49100060	12/17/2019	12/16/2020
Signal Generator	Agilent	N5182A	MY49060650	12/17/2019	12/16/2020
Signal Generator	Agilent	E8257D	MY44320250	4/20/2020	4/19/2021

Test Equipment Of Conducted Spurious Emissions					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal.Date**	**Cal.Due**
Spectrum	R&S	FSP40	100817	7/4/2020	7/3/2021
Spectrum	Agilent	N9020A	MY49100060	12/17/2019	12/16/2020
Signal Generator	Agilent	N5182A	MY49060650	12/17/2019	12/16/2020
Signal Generator	Agilent	E8257D	MY44320250	4/20/2020	4/19/2021

Test Equipment Of Minimum 6dB Bandwidth					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal.Date**	**Cal.Due**
Spectrum	R&S	FSP40	100817	7/4/2020	7/3/2021
Spectrum	Agilent	N9020A	MY49100060	12/17/2019	12/16/2020
Signal Generator	Agilent	N5182A	MY49060650	12/17/2019	12/16/2020
Signal Generator	Agilent	E8257D	MY44320250	4/20/2020	4/19/2021

Test Equipment Of Power Spectrum Density					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal.Date**	**Cal.Due**
Spectrum	R&S	FSP40	100817	7/4/2020	7/3/2021
Spectrum	Agilent	N9020A	MY49100060	12/17/2019	12/16/2020
Signal Generator	Agilent	N5182A	MY49060650	12/17/2019	12/16/2020
Signal Generator	Agilent	E8257D	MY44320250	4/20/2020	4/19/2021

Test Equipment Of Conducted Peak Output Power					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal.Date**	**Cal.Due**
Spectrum	R&S	FSP40	100817	7/4/2020	7/3/2021
Spectrum	Agilent	N9020A	MY49100060	12/17/2019	12/16/2020
Signal Generator	Agilent	N5182A	MY49060650	12/17/2019	12/16/2020
Signal Generator	Agilent	E8257D	MY44320250	4/20/2020	4/19/2021

Test Equipment Of Radiated Emissions which fall in the restricted bands					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal.Date**	**Cal.Due**

Chamber	SKET	966	N/A	5/8/2018	5/7/2021
Spectrum	R&S	FSP40	100817	7/4/2020	7/3/2021
Receiver	R&S	ESR7	101199	4/20/2020	4/19/2021
broadband Antenna	Schwarzbeck	VULB9168	00836 P:00227	7/14/2018	7/13/2020
Horn Antenna	Schwarzbeck	9120D	01892 P:00331	7/14/2018	7/13/2020
Amplifier	SKET	LNPA-0118-45	N/A	7/4/2020	7/3/2021
EMI software	EZ	EZ-EMC	N/A	N/A	N/A
Loop antenna	SCHNARZBECK	FMZB1519B	00102	2/14/2019	2/13/2022
Controller	SKET	N/A	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-02	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-03	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-01	N/A	N/A	N/A

Test Equipment Of Radiated Spurious Emissions

Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Chamber	SKET	966	N/A	5/8/2018	5/7/2021
Spectrum	R&S	FSP40	100817	7/4/2020	7/3/2021
Receiver	R&S	ESR7	101199	4/20/2020	4/19/2021
broadband Antenna	Schwarzbeck	VULB9168	00836 P:00227	7/14/2018	7/13/2020
Horn Antenna	Schwarzbeck	9120D	01892 P:00331	7/14/2018	7/13/2020
Amplifier	SKET	LNPA-0118-45	N/A	7/4/2020	7/3/2021
EMI software	EZ	EZ-EMC	N/A	N/A	N/A

Loop antenna	SCHNARZBECK	FMZB1519B	00102	2/14/2019	2/13/2022
Controller	SKET	N/A	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-02	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-03	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-01	N/A	N/A	N/A

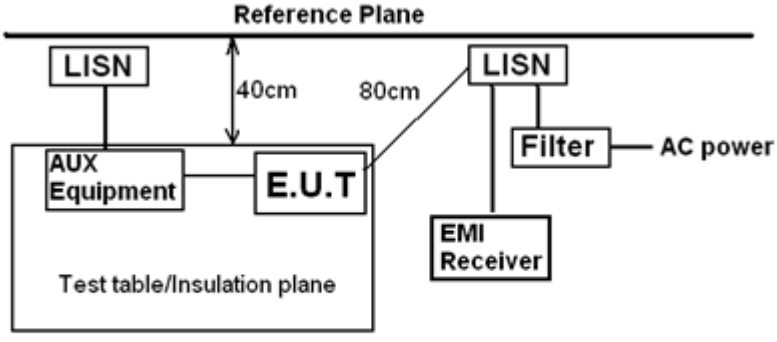
CONDUCTED EMISSIONS AT AC POWER LINE (150KHZ-30MHZ)

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 6.2
Test Mode (Pre-Scan)	TX mode (SE)
Test Mode (Final Test)	TX mode (SE)
Tester	Eason
Temperature	26℃
Humidity	54%

LIMITS

Frequency of emission(MHz)	Conducted limit(dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50
*Decreases with the logarithm of the frequency.		

BLOCK DIAGRAM OF TEST SETUP



Remark
E.U.T: Equipment Under Test
LISN: Line Impedence Stabilization Network
Test table height=0.8m

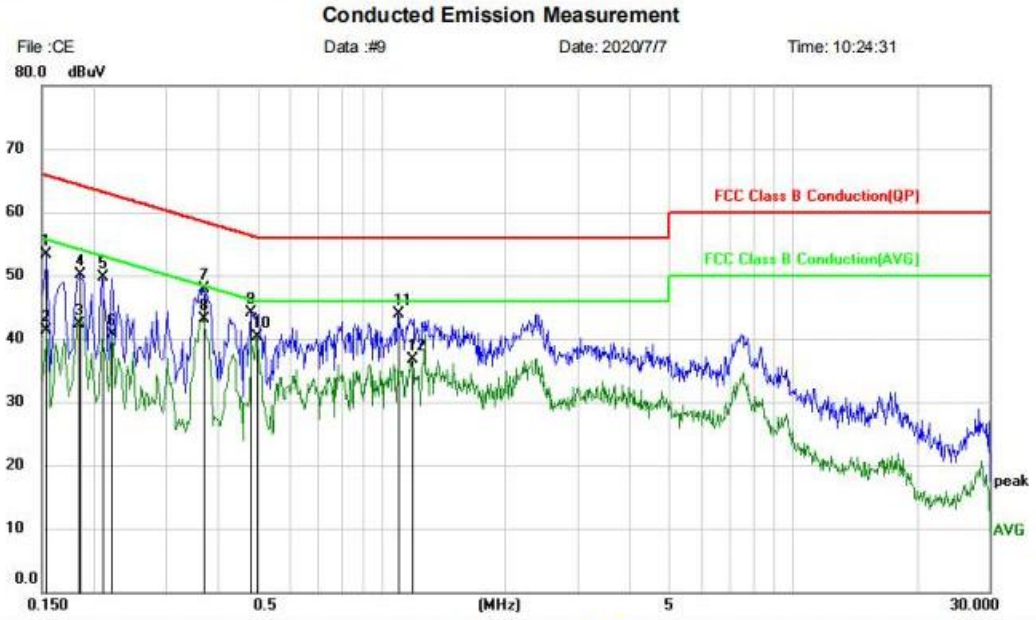
PROCEDURE

1) The mains terminal disturbance voltage test was conducted in a shielded room.
2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50?H + 5ohm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as

the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,
4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.
Remark: LISN=Read Level+ Cable Loss+ LISN Factor

TEST DATA

[Line: Line]



Site
Limit: FCC Class B Conduction(QP)
EUT: Mobile Phone
M/N: B1f
Mode: BLE
Note:

Phase: L1
Power: AC120V/60Hz

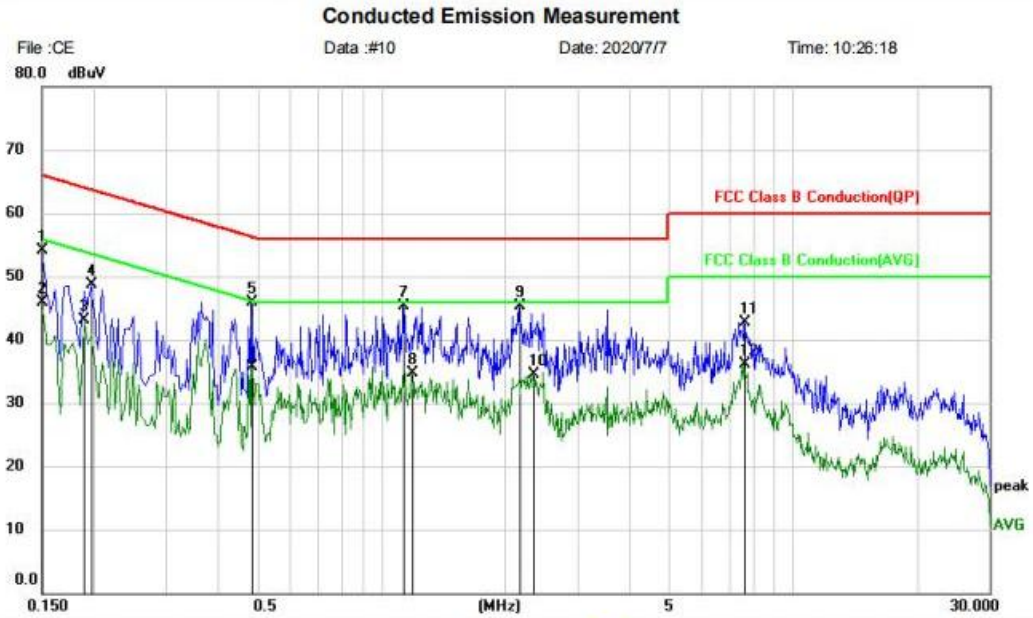
Temperature: 26
Humidity: 60 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1539	43.37	9.88	53.25	65.79	-12.54	QP	
2		0.1539	31.48	9.88	41.36	55.79	-14.43	AVG	
3		0.1835	32.33	9.89	42.22	54.33	-12.11	AVG	
4		0.1860	40.29	9.88	50.17	64.21	-14.04	QP	
5		0.2100	39.85	9.89	49.74	63.21	-13.47	QP	
6		0.2220	30.87	9.91	40.78	52.74	-11.96	AVG	
7		0.3700	38.22	9.75	47.97	58.50	-10.53	QP	
8	*	0.3700	33.27	9.75	43.02	48.50	-5.48	AVG	
9		0.4820	34.37	9.72	44.09	56.30	-12.21	QP	
10		0.4980	30.65	9.73	40.38	46.03	-5.65	AVG	
11		1.0980	34.08	9.85	43.93	56.00	-12.07	QP	
12		1.1860	26.86	9.81	36.67	46.00	-9.33	AVG	

*:Maximum data x:Over limit !:over margin 〈Reference Only

Test Result: Pass

[Line: Nutral]



Site
Limit: FCC Class B Conduction(QP)
EUT: Mobile Phone
M/N: B1f
Mode: BLE
Note:

Phase: N
Power: AC120V/60Hz

Temperature: 26
Humidity: 60 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	44.28	9.88	54.16	66.00	-11.84	QP	
2	*	0.1500	36.07	9.88	45.95	56.00	-10.05	AVG	
3		0.1900	33.15	9.88	43.03	54.04	-11.01	AVG	
4		0.1980	38.91	9.89	48.80	63.69	-14.89	QP	
5		0.4860	36.13	9.72	45.85	56.24	-10.39	QP	
6		0.4860	26.01	9.72	35.73	46.24	-10.51	AVG	
7		1.1340	35.46	9.81	45.27	56.00	-10.73	QP	
8		1.1900	24.94	9.83	34.77	46.00	-11.23	AVG	
9		2.1580	35.41	9.86	45.27	56.00	-10.73	QP	
10		2.3340	24.60	9.86	34.46	46.00	-11.54	AVG	
11		7.6260	32.86	9.86	42.72	60.00	-17.28	QP	
12		7.6260	26.16	9.86	36.02	50.00	-13.98	AVG	

*:Maximum data x:Over limit !:over margin (Reference Only

Test Result: Pass

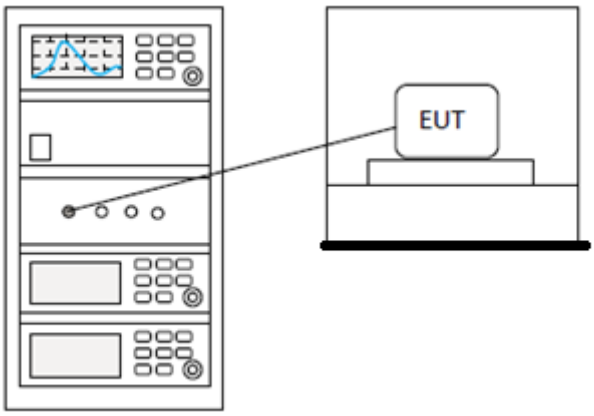
CONDUCTED BAND EDGES MEASUREMENT

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 7.8.8 & Section 11.13.3.2
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Eason
Temperature	26℃
Humidity	54%

LIMITS

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)).

BLOCK DIAGRAM OF TEST SETUP



TEST DATA

Pass: Please Refer To Appendix: For Details

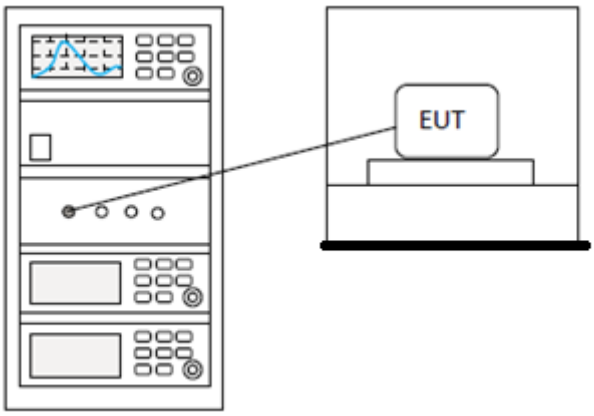
CONDUCTED SPURIOUS EMISSIONS

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 7.8.6 & Section 11.11
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Eason
Temperature	26℃
Humidity	54%

LIMITS

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)).

BLOCK DIAGRAM OF TEST SETUP



TEST DATA

Pass: Please Refer To Appendix: For Details

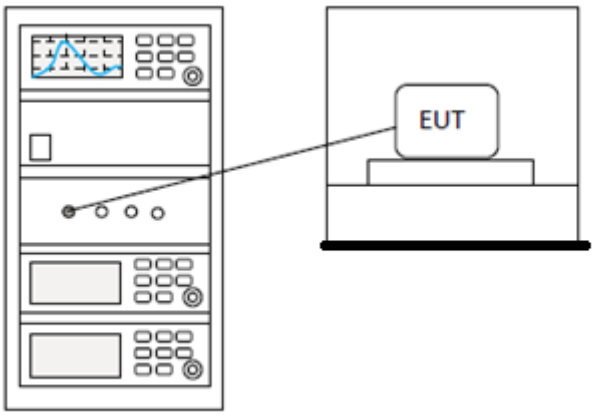
MINIMUM 6DB BANDWIDTH

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 11.8.1
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Eason
Temperature	26℃
Humidity	54%

LIMITS

Limit:	≥500 kHz

BLOCK DIAGRAM OF TEST SETUP



TEST DATA

Pass: Please Refer To Appendix: For Details

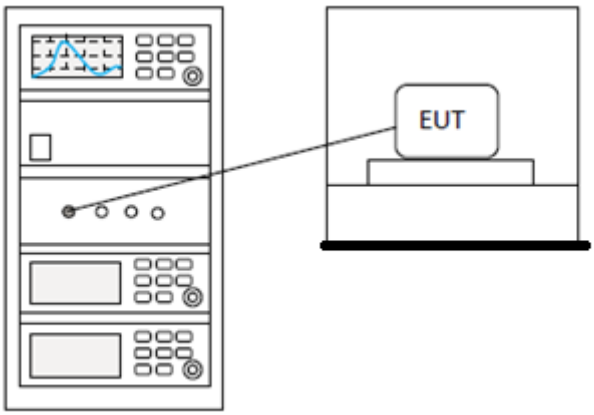
POWER SPECTRUM DENSITY

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 11.10.2
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Eason
Temperature	26℃
Humidity	54%

LIMITS

Limit:	≤8dBm in any 3 kHz band during any time interval of continuous transmission

BLOCK DIAGRAM OF TEST SETUP



TEST DATA

Pass: Please Refer To Appendix: For Details

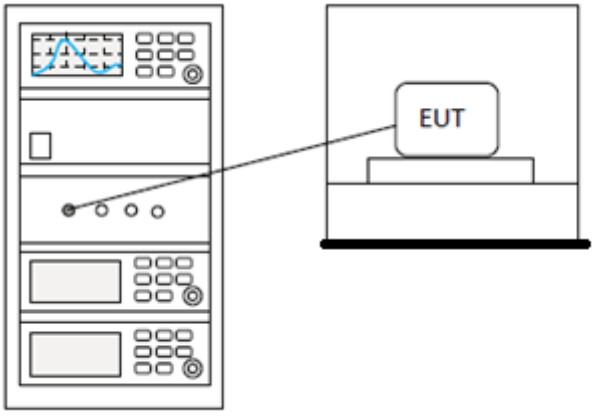
CONDUCTED PEAK OUTPUT POWER

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 7.8.5
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Eason
Temperature	26℃
Humidity	54%

LIMITS

Frequency range(MHz)	Output power of the intentional radiator(watt)
902-928	1 for ≥50 hopping channels
	0.25 for 25≤ hopping channels <50
	1 for digital modulation
2400-2483.5	1 for ≥75 non-overlapping hopping channels
	0.125 for all other frequency hopping systems
	1 for digital modulation
5725-5850	1 for frequency hopping systems and digital modulation

BLOCK DIAGRAM OF TEST SETUP



TEST DATA

Pass: Please Refer To Appendix: For Details

RADIATED EMISSIONS WHICH FALL IN THE RESTRICTED BANDS

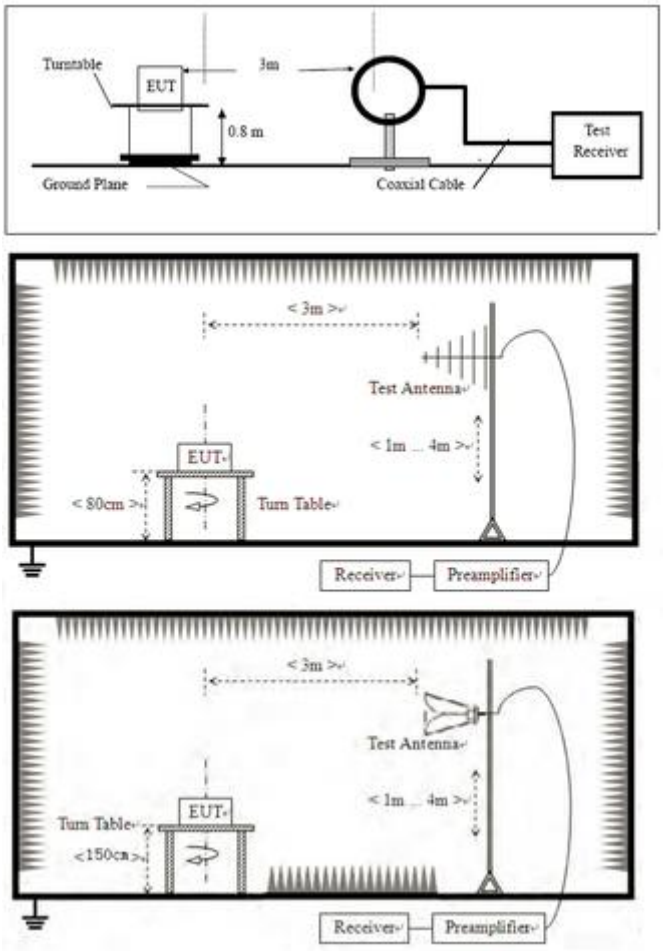
Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 6.10.5
Test Mode (Pre-Scan)	Test channel:lowest;Test channel:Highest;TX
Test Mode (Final Test)	Test channel:lowest;Test channel:Highest
Tester	Eason
Temperature	26℃
Humidity	54%

LIMITS

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

BLOCK DIAGRAM OF TEST SETUP



PROCEDURE

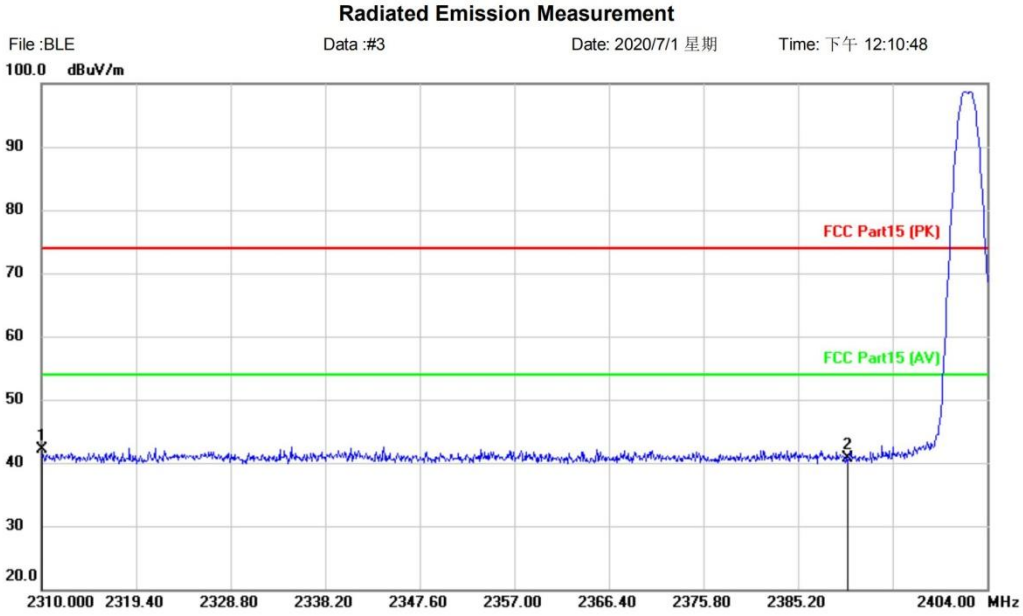
a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
d. The antenna height 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.
e. 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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
j. Repeat above procedures until all frequencies measured was complete.
Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
Remark 2: For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

TEST DATA

[TestMode: Test channel:lowest]; [Polarity: Horizontal]

Peak value:



Site

Limit: FCC Part15 (PK)

EUT: Mobile Phone

M/N: B1f

Mode: TX-L

Note:

Polarization: ***Horizontal***

Power:

Distance: 3m

Temperature:

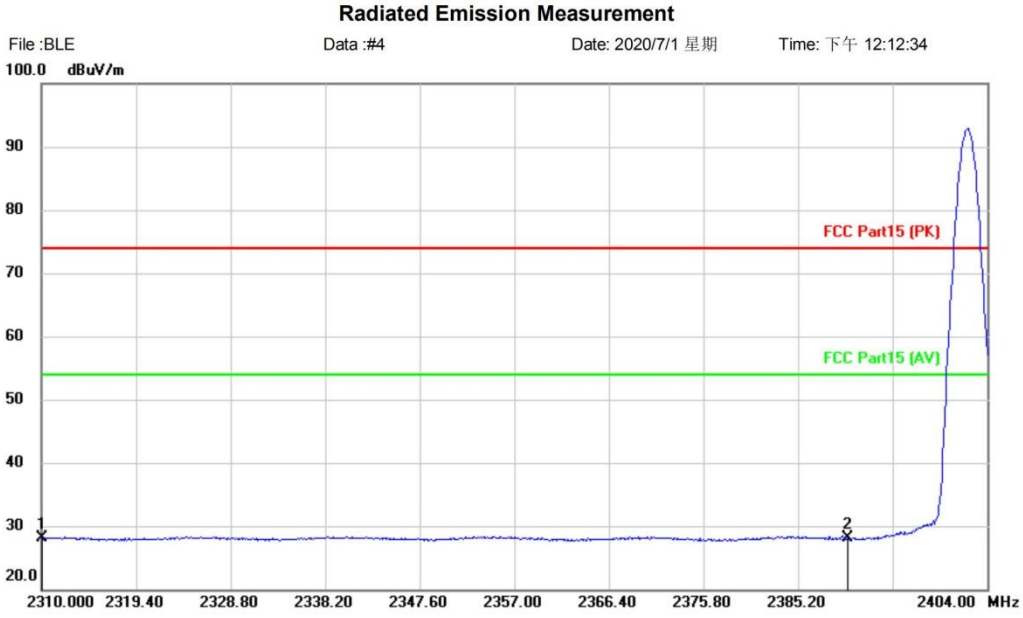
Humidity: %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	2310.000	46.32	-4.20	42.12	74.00	-31.88	peak			
2		2390.000	44.59	-3.88	40.71	74.00	-33.29	peak			

*:Maximum data x:Over limit !:over margin 〈Reference Only

Test Result: Pass

[TestMode: Test channel:lowest]; [Polarity: Horizontal];
Average value:



Site	Polarization: *Horizontal*	Temperature:
Limit: FCC Part15 (PK)	Power:	Humidity: %
EUT: Mobile Phone	Distance: 3m	
M/N: B1f		
Mode: TX-L		
Note:		

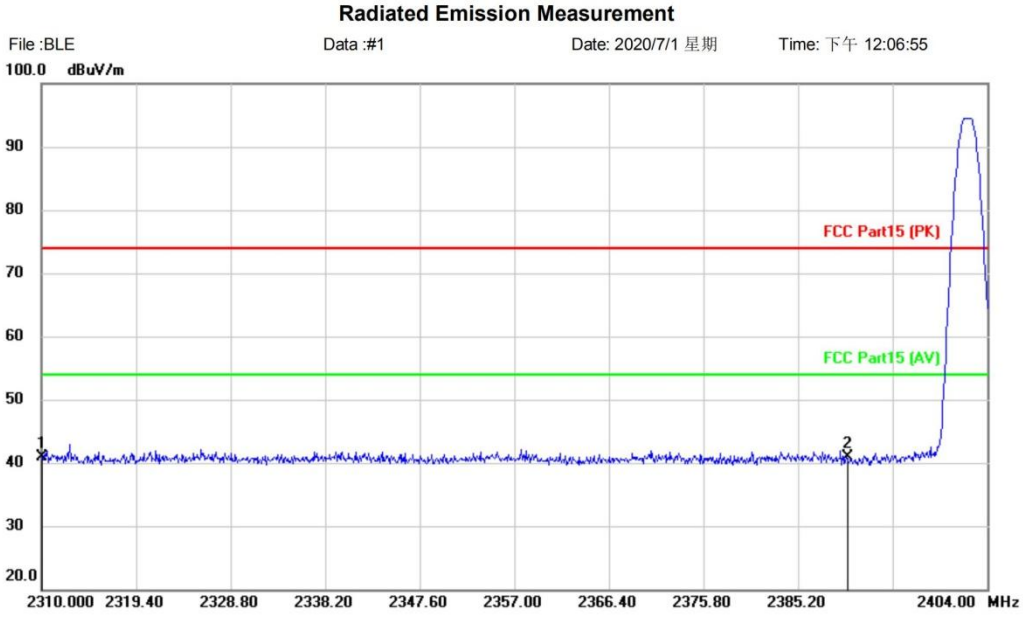
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	2310.000	32.38	-4.20	28.18	54.00	-25.82	AVG			
2		2390.000	31.93	-3.88	28.05	54.00	-25.95	AVG			

*:Maximum data x:Over limit !:over margin 〈Reference Only

Test Result: Pass

[TestMode: Test channel:lowest]; [Polarity: Vertical]

Peak value:



Site	Polarization: *Vertical*	Temperature:
Limit: FCC Part15 (PK)	Power:	Humidity: %
EUT: Mobile Phone	Distance: 3m	
M/N: B1f		
Mode: TX-L		
Note:		

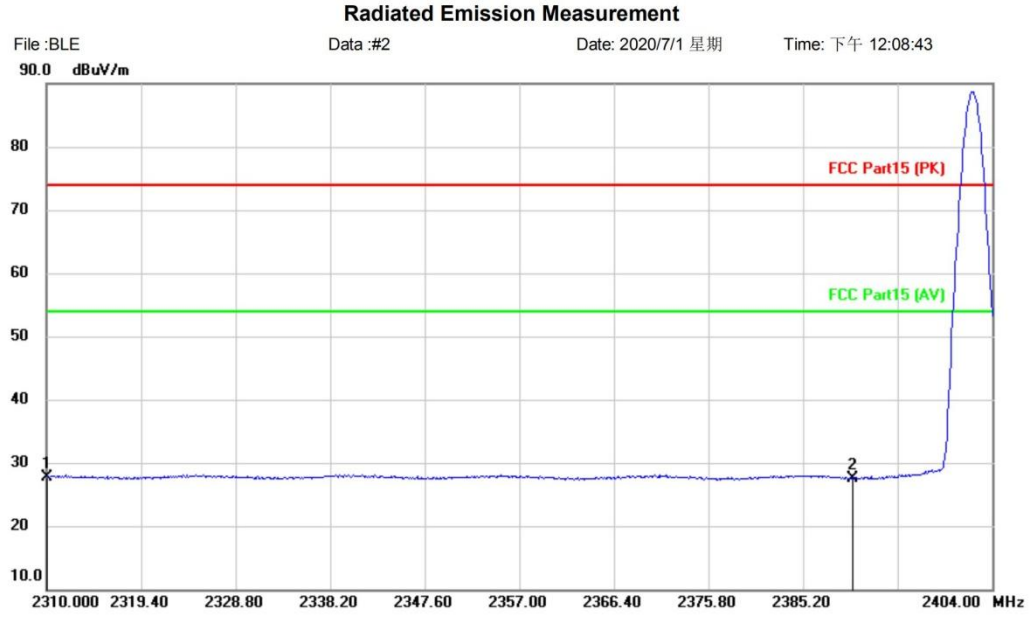
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	2310.000	45.45	-4.49	40.96	74.00	-33.04	peak			
2		2390.000	45.10	-4.21	40.89	74.00	-33.11	peak			

*:Maximum data x:Over limit !:over margin 〈Reference Only

Test Result: Pass

[TestMode: Test channel:lowest]; [Polarity: Vertical]

Average value:



Site	Polarization: *Vertical*	Temperature:
Limit: FCC Part15 (PK)	Power:	Humidity: %
EUT: Mobile Phone	Distance: 3m	
M/N: B1f		
Mode: TX-L		
Note:		

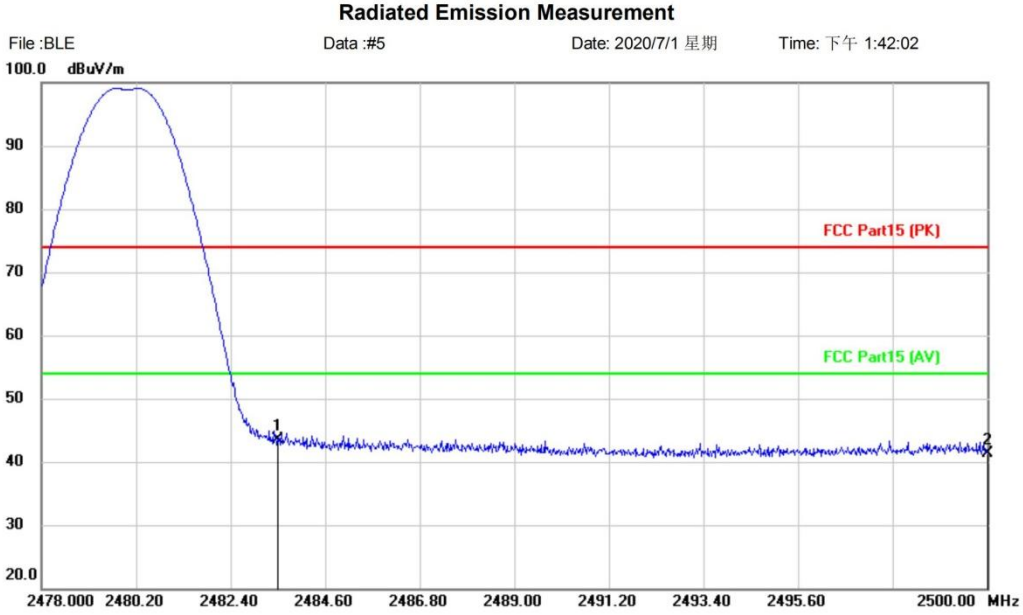
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	2310.000	32.25	-4.49	27.76	54.00	-26.24	AVG			
2		2390.000	31.76	-4.21	27.55	54.00	-26.45	AVG			

*:Maximum data x:Over limit !:over margin 〈Reference Only

Test Result: Pass

[TestMode: Test channel:Highest]; [Polarity: Horizontal]

Peak value:



Site

Limit: FCC Part15 (PK)

EUT: Mobile Phone

M/N: B1f

Mode: TX-H

Note:

Polarization: ***Horizontal***

Power:

Distance: 3m

Temperature:

Humidity: %

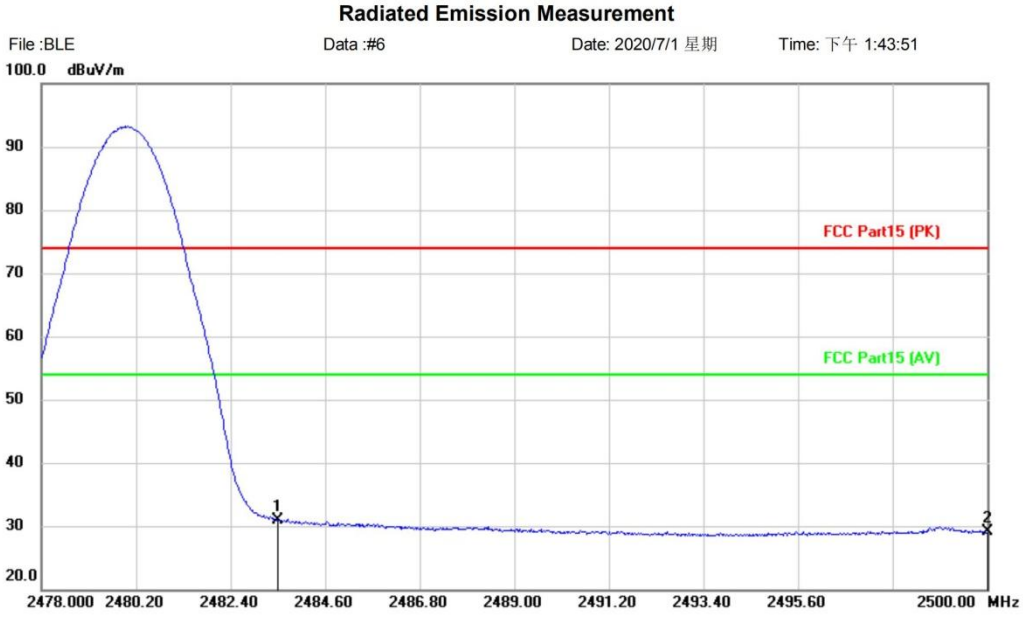
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	2483.500	46.79	-3.38	43.41	74.00	-30.59	peak			
2		2500.000	44.66	-3.30	41.36	74.00	-32.64	peak			

*:Maximum data x:Over limit !:over margin 〈Reference Only

Test Result: Pass

[TestMode: Test channel:Highest]; [Polarity: Horizontal]

Average value:



Site	Polarization: *Horizontal*	Temperature:
Limit: FCC Part15 (PK)	Power:	Humidity: %
EUT: Mobile Phone	Distance: 3m	
M/N: B1f		
Mode: TX-H		
Note:		

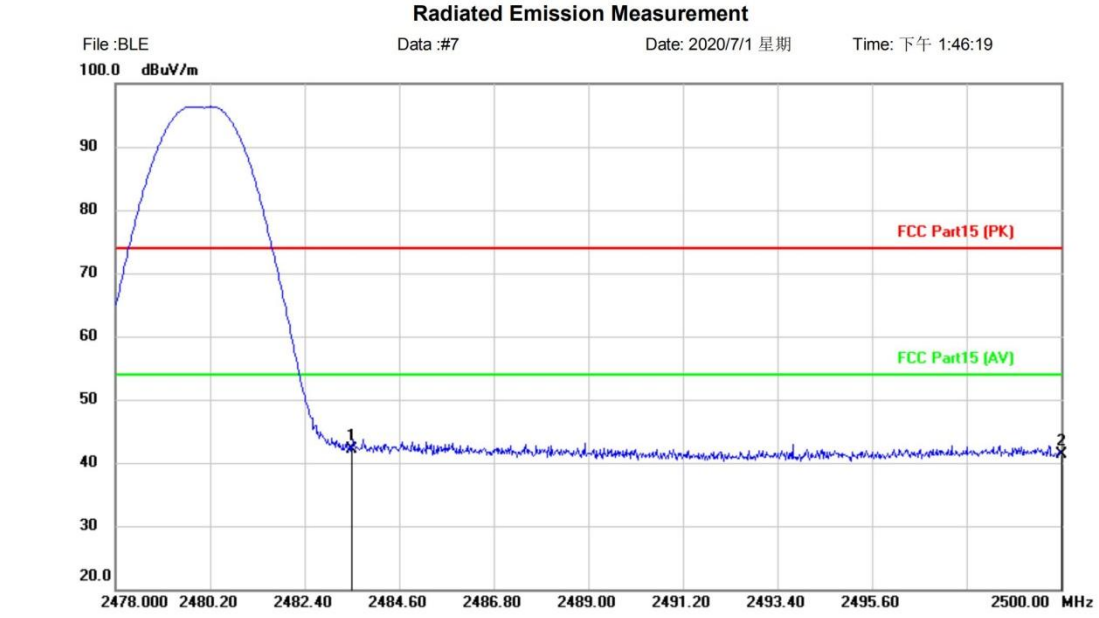
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	2483.500	34.36	-3.38	30.98	54.00	-23.02	AVG			
2		2500.000	32.49	-3.30	29.19	54.00	-24.81	AVG			

*:Maximum data x:Over limit !:over margin 〈Reference Only

Test Result: Pass

[TestMode: Test channel:Highest]; [Polarity: Vertical]

Peak value:



Site	Polarization: *Vertical*	Temperature:
Limit: FCC Part15 (PK)	Power:	Humidity: %
EUT: Mobile Phone	Distance: 3m	
M/N: B1f		
Mode: TX-H		
Note:		

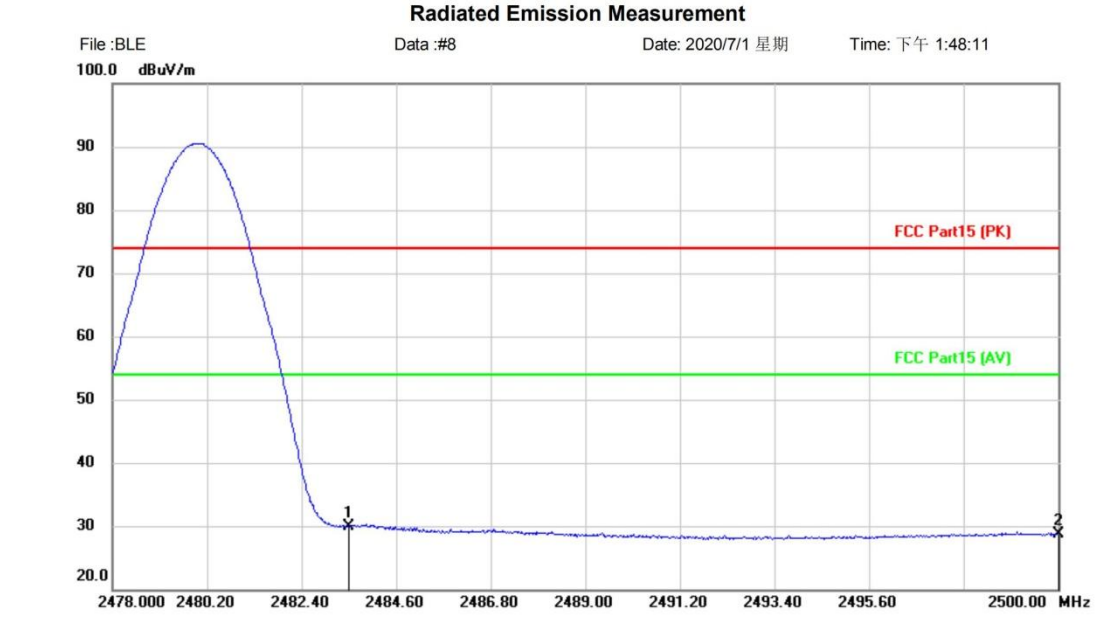
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	2483.500	45.82	-3.77	42.05	74.00	-31.95	peak			
2		2500.000	45.01	-3.70	41.31	74.00	-32.69	peak			

*:Maximum data x:Over limit !:over margin 〈Reference Only

Test Result: Pass

[TestMode: Test channel:Highest]; [Polarity: Vertical]

Average value:



Site	Polarization: *Vertical*	Temperature:
Limit: FCC Part15 (PK)	Power:	Humidity: %
EUT: Mobile Phone	Distance: 3m	
M/N: B1f		
Mode: TX-H		
Note:		

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	2483.500	33.64	-3.77	29.87	54.00	-24.13	AVG			
2		2500.000	32.38	-3.70	28.68	54.00	-25.32	AVG			

*:Maximum data x:Over limit !:over margin 〈Reference Only

Test Result: Pass

RADIATED SPURIOUS EMISSIONS

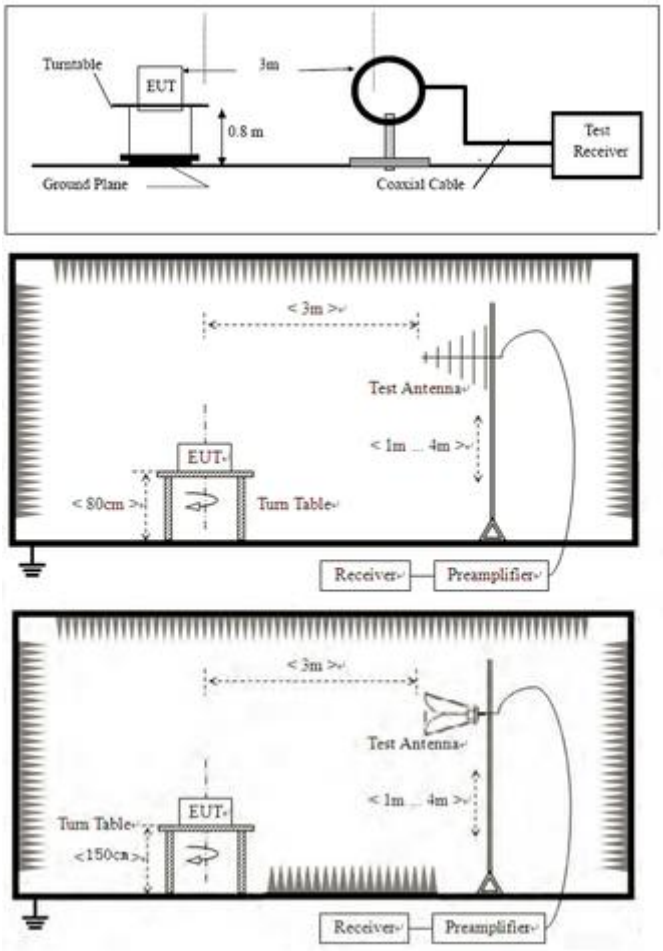
Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 6.4,6.5,6.6
Test Mode (Pre-Scan)	Test channel:lowest;Test channel:Middle;Test channel:Highest;TX
Test Mode (Final Test)	Test channel:lowest;TX;Test channel:Middle;Test channel:Highest
Tester	Eason
Temperature	26℃
Humidity	54%

LIMITS

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

BLOCK DIAGRAM OF TEST SETUP



PROCEDURE

a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
d. The antenna height 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.
e. 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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
j. Repeat above procedures until all frequencies measured was complete.

Remark:
1) For emission below 1GHz, through pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.
2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
Final Test Level =Receiver Reading + Antenna Factor + Cable Factor ¨C Preamplifier Factor
3) Scan from 9kHz to 25GHz, the disturbance above 18GHz and below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.
4) For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

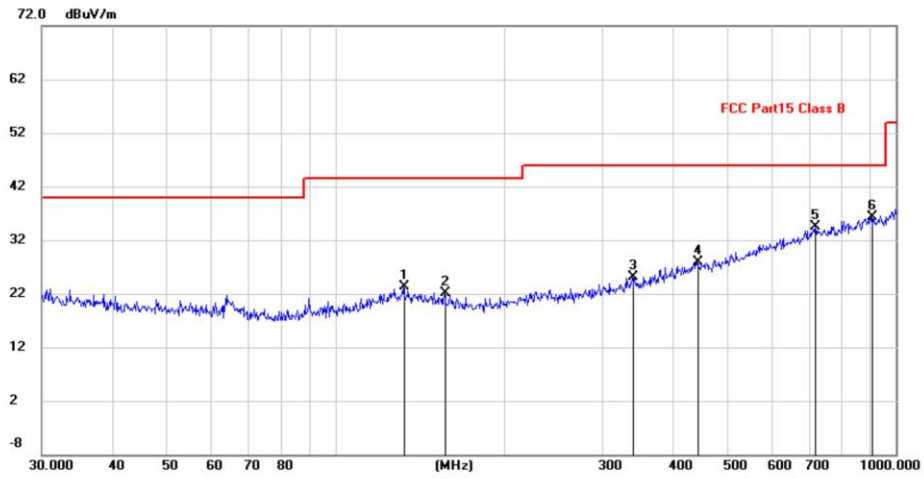
TEST DATA

[TestMode: TX]; [Polarity: Horizontal]

Company:Qianhai BlueAsia of Technical Services(Shenzhen) Co.,Ltd.
Address:深圳市龙岗区坂田街道布龙路448号BlueAsia物联网测试中心
Tel:+86-755-28682673 or +86-755-23059481

Radiated Emission Measurement

File :RE Data :#20 Date: 2020/7/7 星期 Time: 下午 1:48:46



Site
Limit: FCC Part15 Class B
EUT: Mobile Phone
M/N: B1f
Mode: BLE
Note:

Polarization: *Horizontal*
Power:
Distance: 3m

Temperature:
Humidity: %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		132.2206	0.18	23.06	23.24	43.50	-20.26	QP			
2		156.4578	-1.16	23.24	22.08	43.50	-21.42	QP			
3		338.4001	0.07	25.04	25.11	46.00	-20.89	QP			
4		441.7426	-0.08	27.90	27.82	46.00	-18.18	QP			
5		719.1995	1.51	33.02	34.53	46.00	-11.47	QP			
6	*	903.3094	1.04	35.22	36.26	46.00	-9.74	QP			

*:Maximum data x:Over limit !:over margin 〈Reference Only

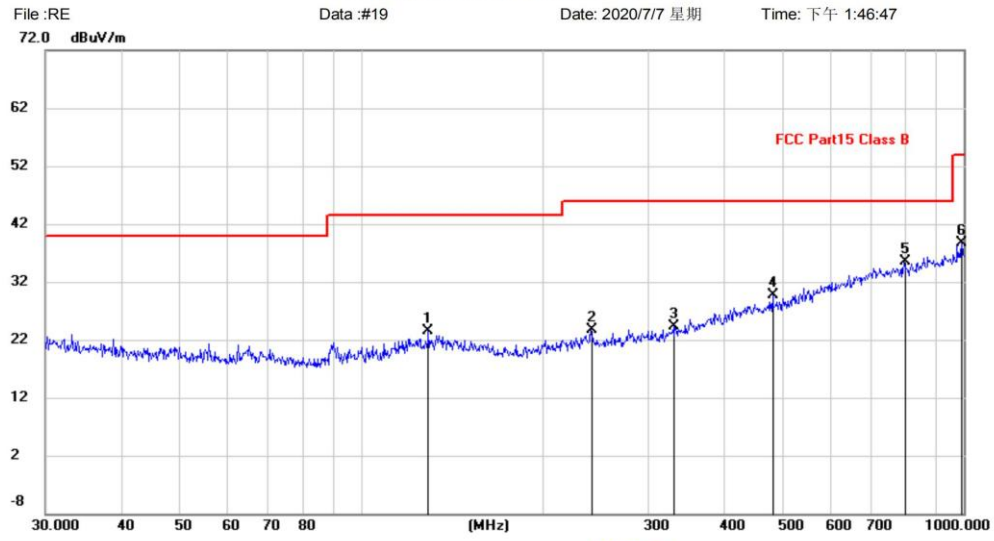
File :RE\Data :#20 *Page: 1* Engineer Signature:

Test Result: Pass

[TestMode: TX]; [Polarity: Vertical]

Company:Qianhai BlueAsia of Technical Services(Shenzhen) Co.,Ltd.
Address:深圳市龙岗区坂田街道布龙路448号BlueAsia物联网测试中心
Tel:+86-755-28682673 or +86-755-23059481

Radiated Emission Measurement



Site
Limit: FCC Part15 Class B
EUT: Mobile Phone
M/N: B1f
Mode: BLE
Note:

Polarization: *Vertical*
Power:
Distance: 3m

Temperature:
Humidity: %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		129.4677	0.46	22.97	23.43	43.50	-20.07	QP			
2		240.8304	0.75	23.02	23.77	46.00	-22.23	QP			
3		331.3546	-0.57	24.82	24.25	46.00	-21.75	QP			
4		482.2156	0.97	28.64	29.61	46.00	-16.39	QP			
5	*	796.1830	1.25	34.22	35.47	46.00	-10.53	QP			
6		993.0114	2.34	36.43	38.77	54.00	-15.23	QP			

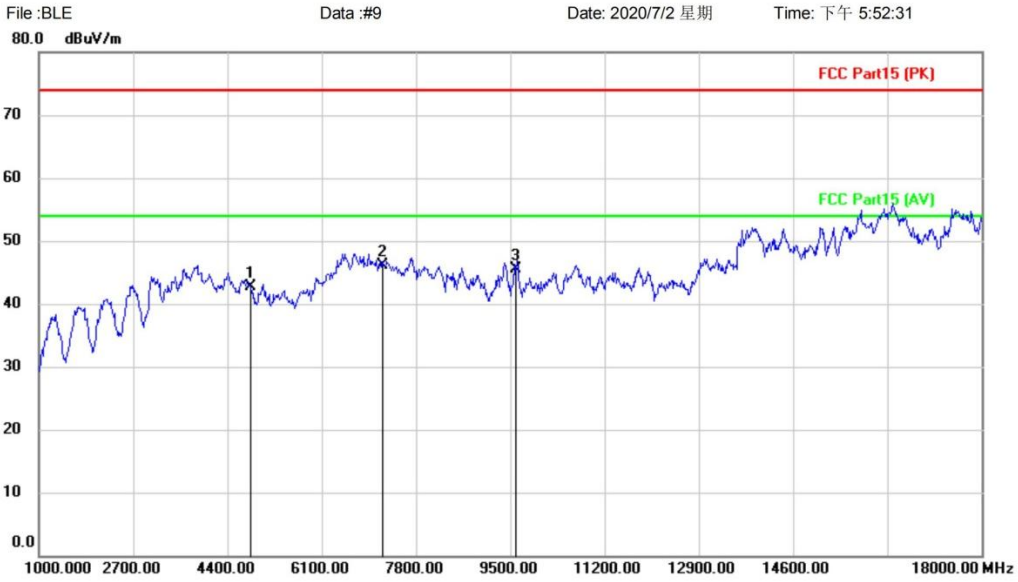
*:Maximum data x:Over limit !:over margin 〈Reference Only

File :RE\Data :#19 *Page: 1* Engineer Signature:

Test Result: Pass

[TestMode: Test channel:lowest]; [Polarity: Horizontal]

Radiated Emission Measurement



Site
Limit: FCC Part15 (PK)
EUT: Mobile Phone
M/N: B1f
Mode: TX-L
Note:

Polarization: ***Horizontal***
Power:
Distance: 3m

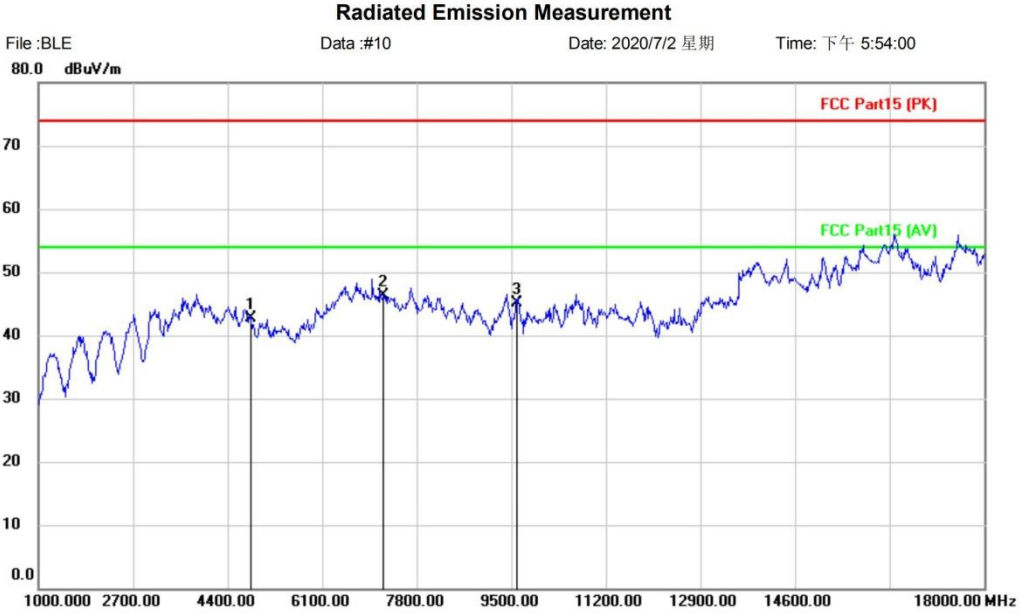
Temperature:
Humidity: %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		4825.000	40.77	1.89	42.66	74.00	-31.34	peak			
2	*	7205.000	39.49	6.53	46.02	74.00	-27.98	peak			
3		9602.000	37.42	8.17	45.59	74.00	-28.41	peak			

*:Maximum data x:Over limit !:over margin 〈Reference Only

Test Result: Pass

[TestMode: Test channel:lowest]; [Polarity: Vertical]



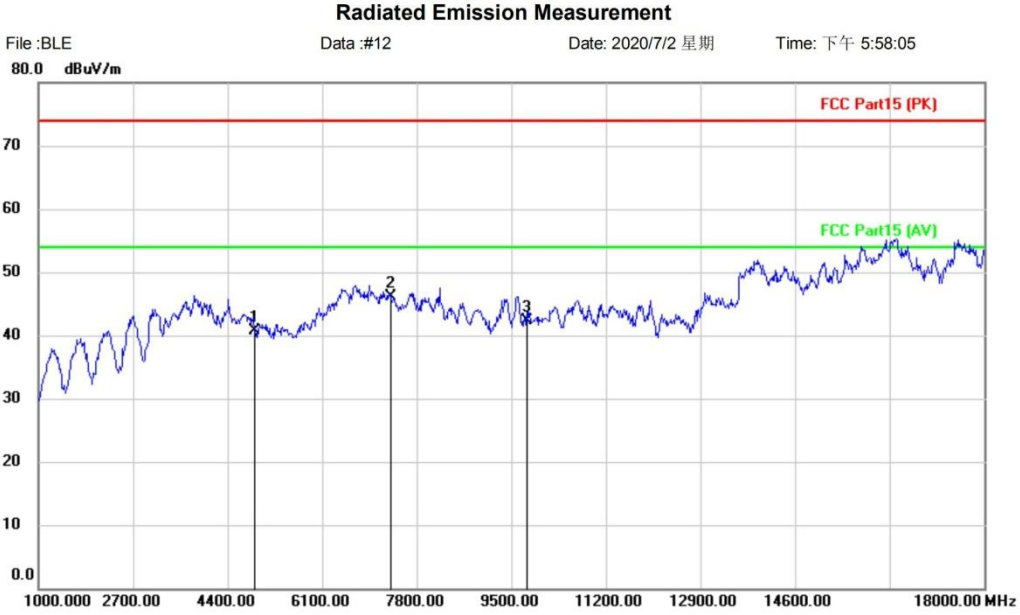
Site	Polarization: *Vertical*	Temperature:
Limit: FCC Part15 (PK)	Power:	Humidity: %
EUT: Mobile Phone	Distance: 3m	
M/N: B1f		
Mode: TX-L		
Note:		

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		4825.000	40.90	1.89	42.79	74.00	-31.21	peak			
2	*	7205.000	39.48	6.78	46.26	74.00	-27.74	peak			
3		9602.000	37.17	7.98	45.15	74.00	-28.85	peak			

*:Maximum data x:Over limit !:over margin 〈Reference Only

Test Result: Pass

[TestMode: Test channel:Middle]; [Polarity: Horizontal]



Site	Polarization: ***Horizontal***	Temperature:
Limit: FCC Part15 (PK)	Power:	Humidity: %
EUT: Mobile Phone	Distance: 3m	
M/N: B1f		
Mode: TX-M		
Note:		

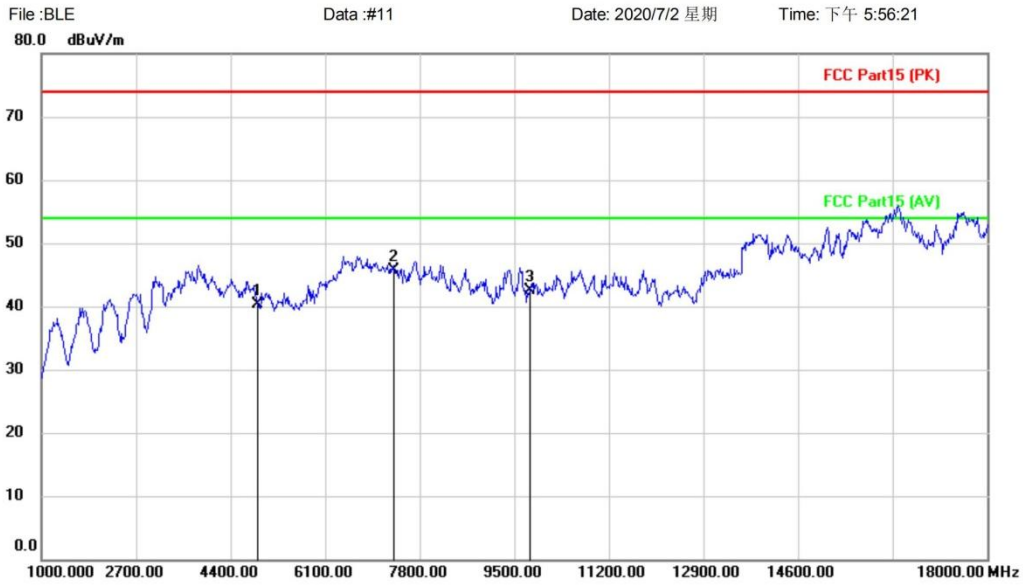
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		4893.000	40.90	-0.10	40.80	74.00	-33.20	peak			
2	*	7341.000	39.82	6.19	46.01	74.00	-27.99	peak			
3		9789.000	36.51	5.84	42.35	74.00	-31.65	peak			

*:Maximum data x:Over limit !:over margin 〈Reference Only

Test Result: Pass

[TestMode: Test channel:Middle]; [Polarity: Vertical]

Radiated Emission Measurement



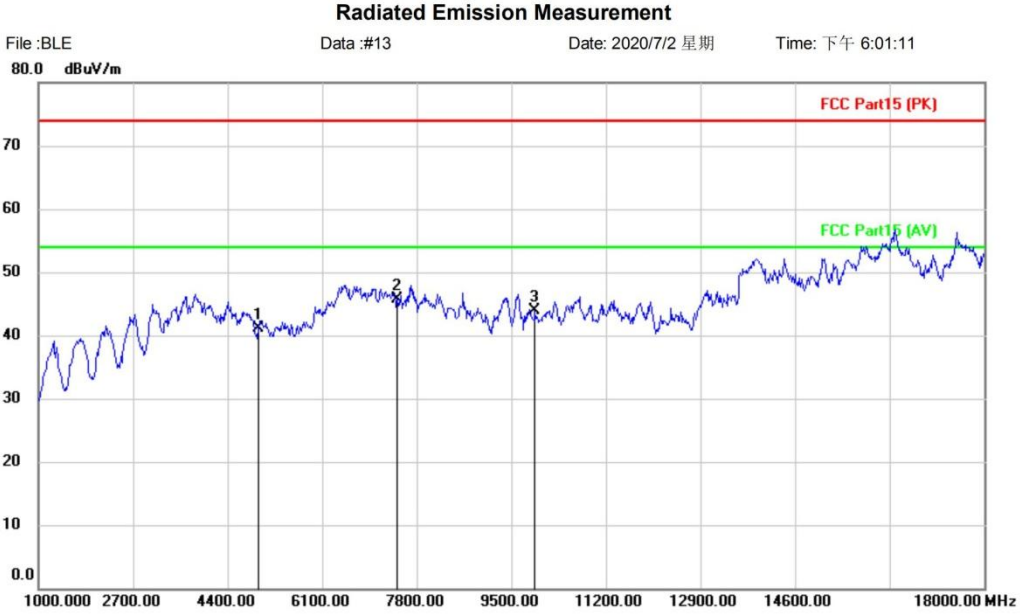
Site	Polarization: *Vertical*	Temperature:
Limit: FCC Part15 (PK)	Power:	Humidity: %
EUT: Mobile Phone	Distance: 3m	
M/N: B1f		
Mode: TX-M		
Note:		

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		4893.000	40.35	-0.10	40.25	74.00	-33.75	peak			
2	*	7341.000	39.72	6.00	45.72	74.00	-28.28	peak			
3		9789.000	36.68	5.83	42.51	74.00	-31.49	peak			

*:Maximum data x:Over limit !:over margin 〈Reference Only

Test Result: Pass

[TestMode: Test channel:Highest]; [Polarity: Horizontal]



Site
Limit: FCC Part15 (PK)
EUT: Mobile Phone
M/N: B1f
Mode: TX-H
Note:

Polarization: ***Horizontal***
Power:
Distance: 3m

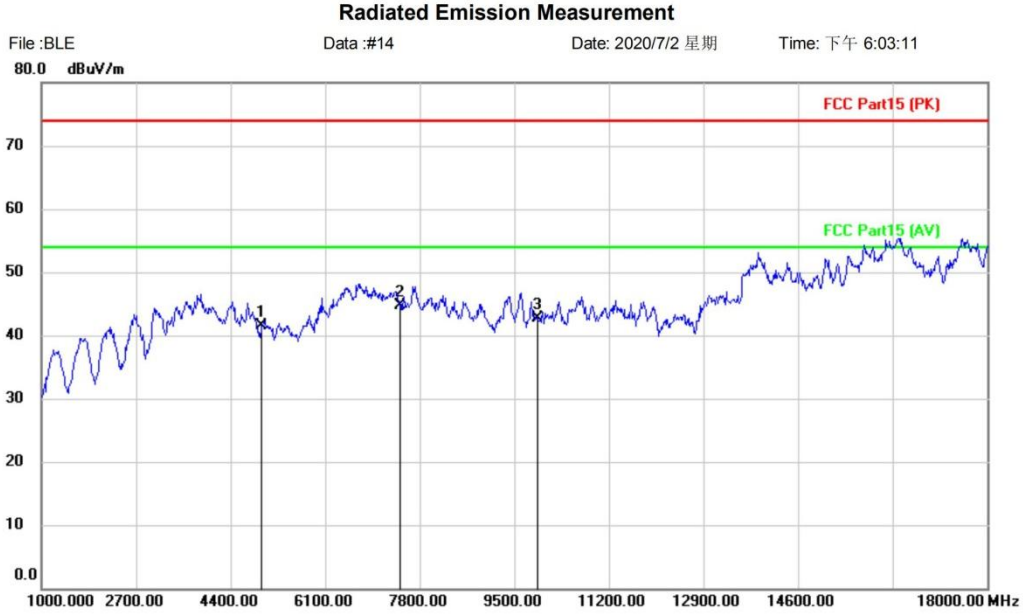
Temperature:
Humidity: %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		4961.000	39.97	1.05	41.02	74.00	-32.98	peak			
2	*	7443.000	40.39	5.23	45.62	74.00	-28.38	peak			
3		9925.000	38.67	5.21	43.88	74.00	-30.12	peak			

*:Maximum data x:Over limit !:over margin 〈Reference Only

Test Result: Pass

[TestMode: Test channel:Highest]; [Polarity: Vertical]



Site	Polarization: *Vertical*	Temperature:
Limit: FCC Part15 (PK)	Power:	Humidity: %
EUT: Mobile Phone	Distance: 3m	
M/N: B1f		
Mode: TX-H		
Note:		

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		4961.000	40.44	1.05	41.49	74.00	-32.51	peak			
2	*	7443.000	40.05	4.72	44.77	74.00	-29.23	peak			
3		9925.000	37.41	5.33	42.74	74.00	-31.26	peak			

*:Maximum data x:Over limit !:over margin 〈Reference Only

Test Result: Pass

ANTENNA REQUIREMENT

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	N/A

CONCLUSION

Standard Requirement:
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 antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit permanently attached antenna or of an so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT Antenna:
The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0.6dBi.

10 APPENDIX

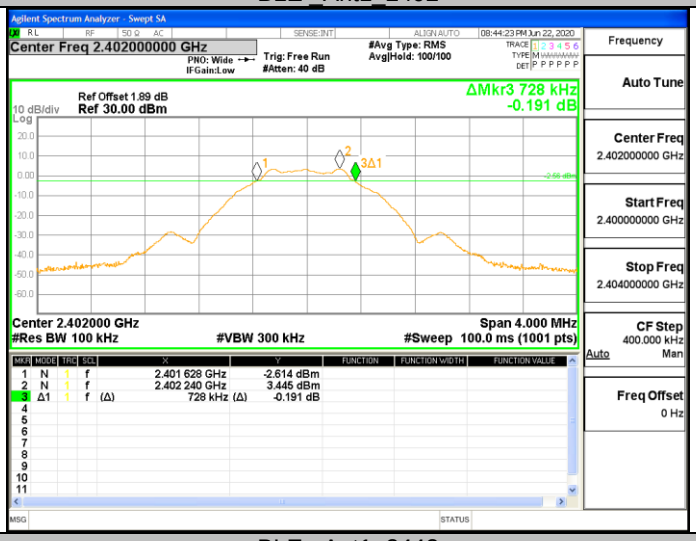
10.1 APPENDIX : DTS BANDWIDTH

Test Result

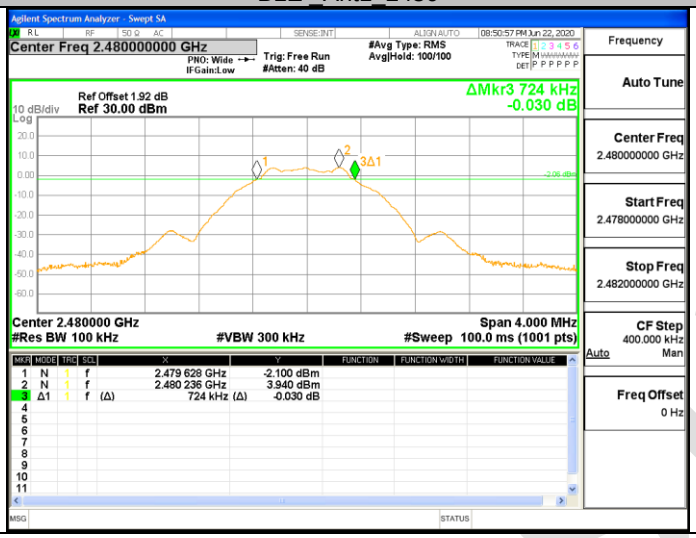
TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE	Ant1	2402	0.728	2401.628	2402.356	>=0.5	PASS
		2442	0.732	2441.624	2442.356	>=0.5	PASS
		2480	0.724	2479.628	2480.352	>=0.5	PASS

Test Graphs

BLE_Ant1_2402



BLE_Ant1_2442

BLE _Ant1_2480


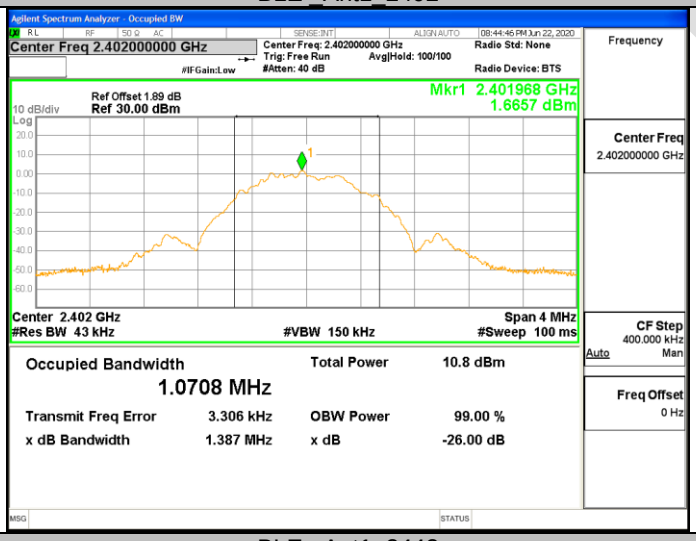
10.2 APPENDIX : OCCUPIED CHANNEL BANDWIDTH

Test Result

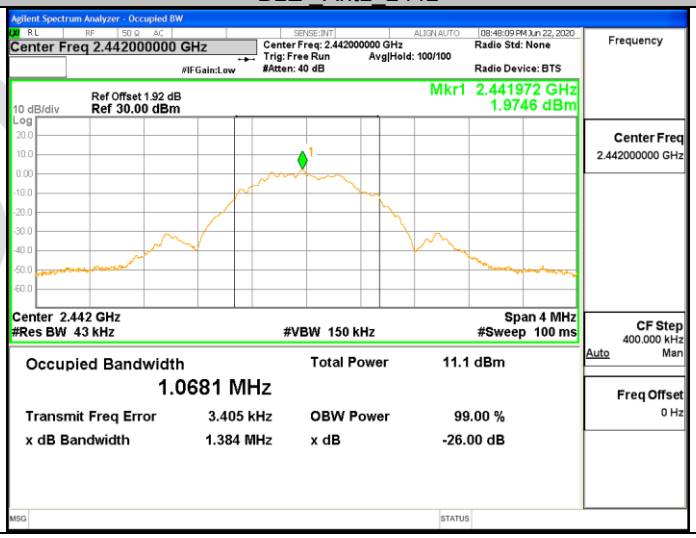
TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE	Ant1	2402	1.0708	2401.468	2402.539	---	PASS
		2442	1.0681	2441.469	2442.537	---	PASS
		2480	1.0674	2479.470	2480.537	---	PASS

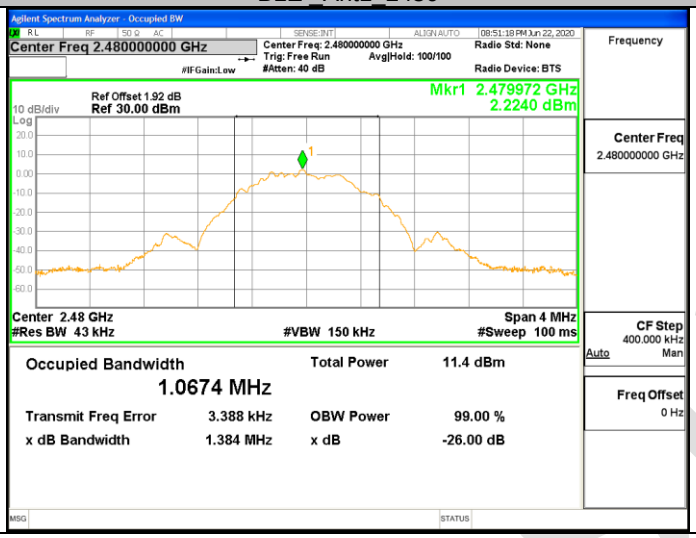
Test Graphs

BLE_Ant1_2402



BLE_Ant1_2442



BLE _Ant1_2480


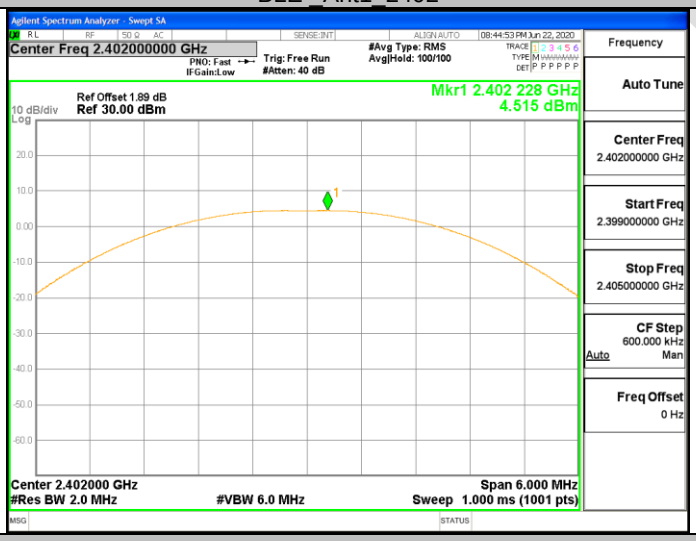
10.3 APPENDIX : MAXIMUM CONDUCTED OUTPUT POWER

Test Result

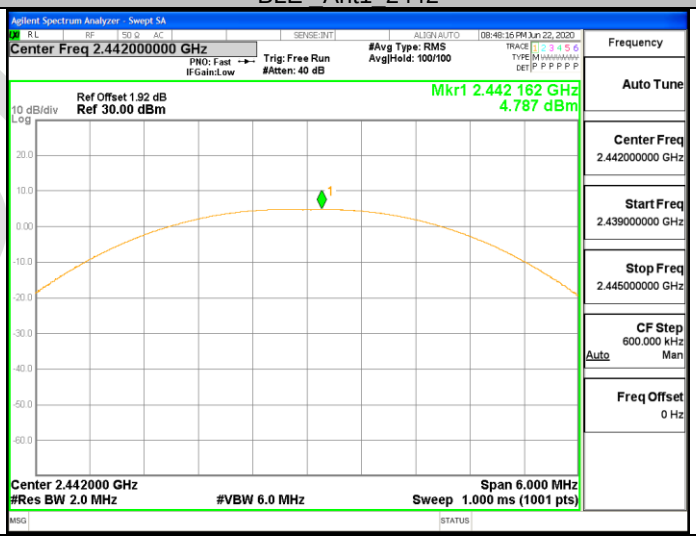
TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
BLE	Ant1	2402	4.51	<=30	PASS
		2442	4.79	<=30	PASS
		2480	5.01	<=30	PASS

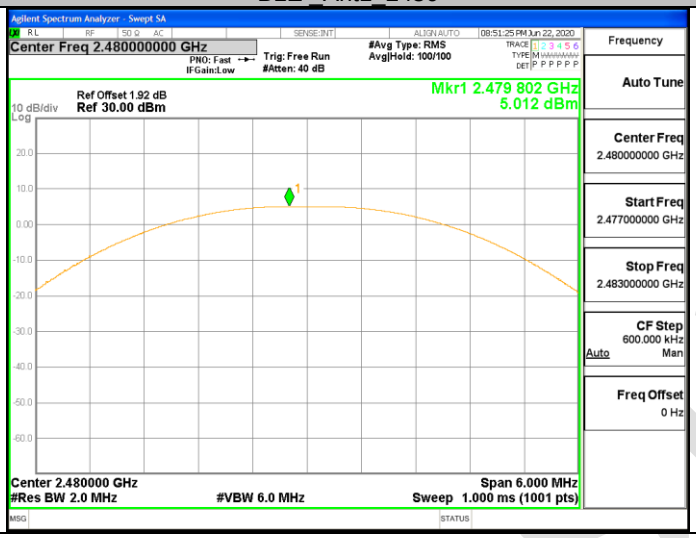
Test Graphs

BLE _Ant1_2402



BLE _Ant1_2442



BLE _Ant1_2480


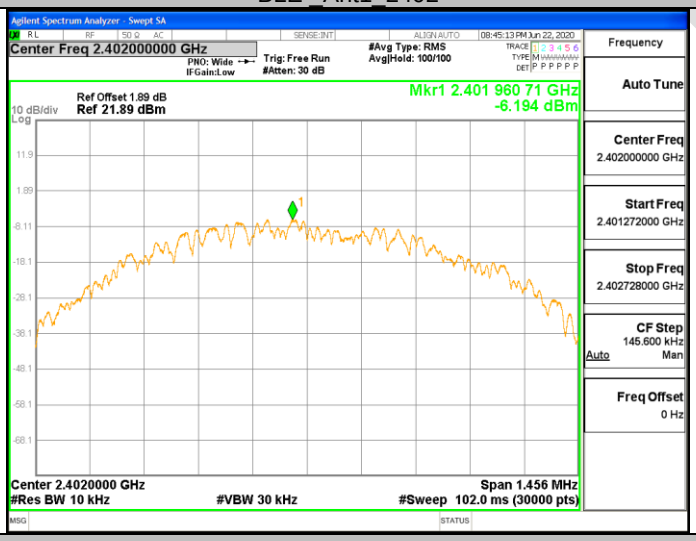
10.4 APPENDIX : MAXIMUM POWER SPECTRAL DENSITY

Test Result

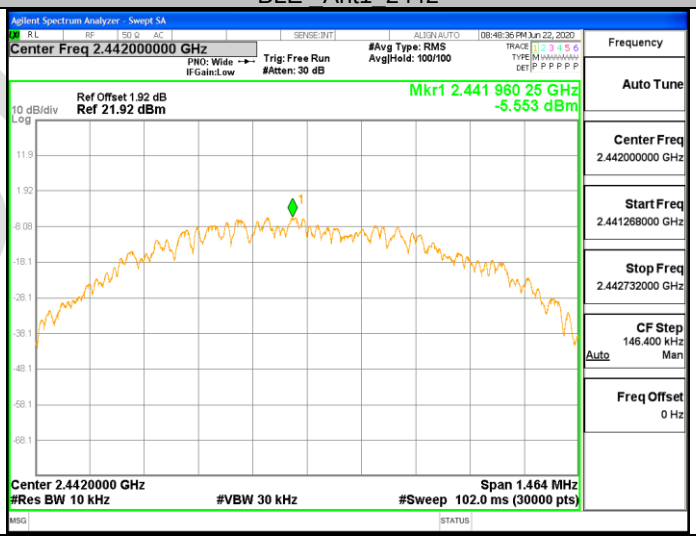
TestMode	Antenna	Channel	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
BLE	Ant1	2402	-6.19	<=8	PASS
		2442	-5.55	<=8	PASS
		2480	-5.59	<=8	PASS

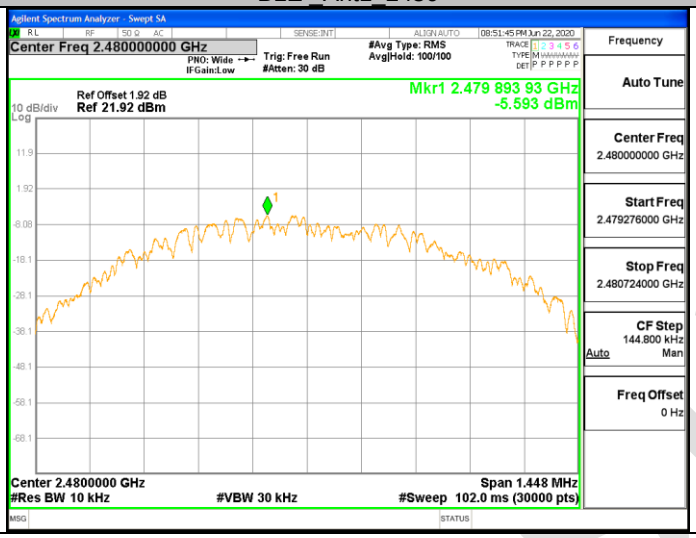
Test Graphs

BLE _Ant1_2402



BLE _Ant1_2442



BLE _Ant1_2480


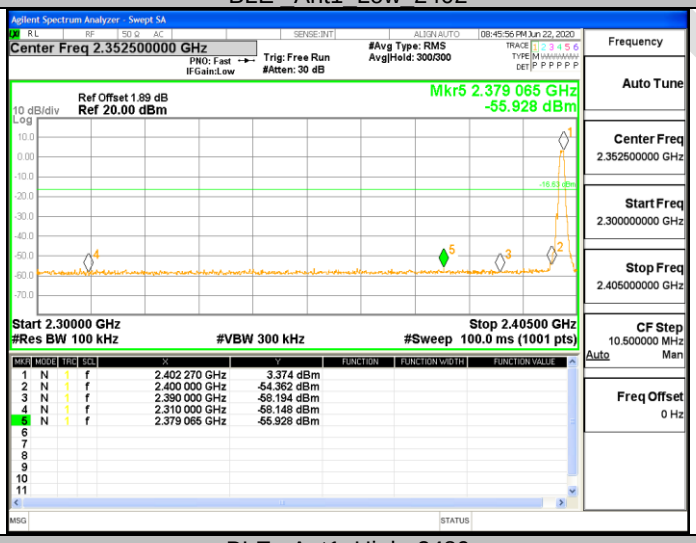
10.5 APPENDIX : BAND EDGE MEASUREMENTS

Test Result

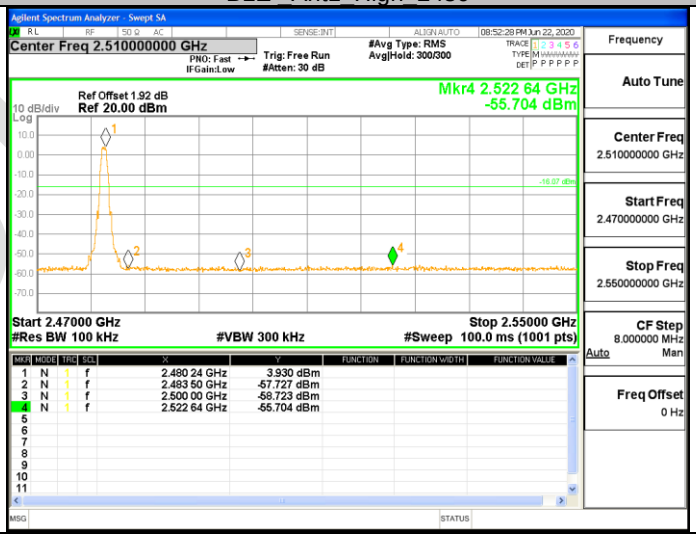
TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE	Ant1	Low	2402	3.37	-55.93	<=-16.63	PASS
		High	2480	3.93	-55.7	<=-16.07	PASS

Test Graphs

BLE_Ant1_Low_2402



BLE_Ant1_High_2480



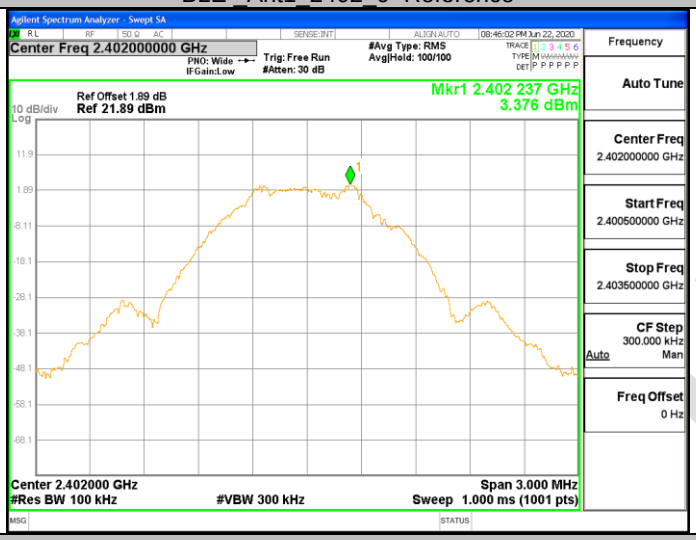
10.6 APPENDIX : CONDUCTED SPURIOUS EMISSION

Test Result

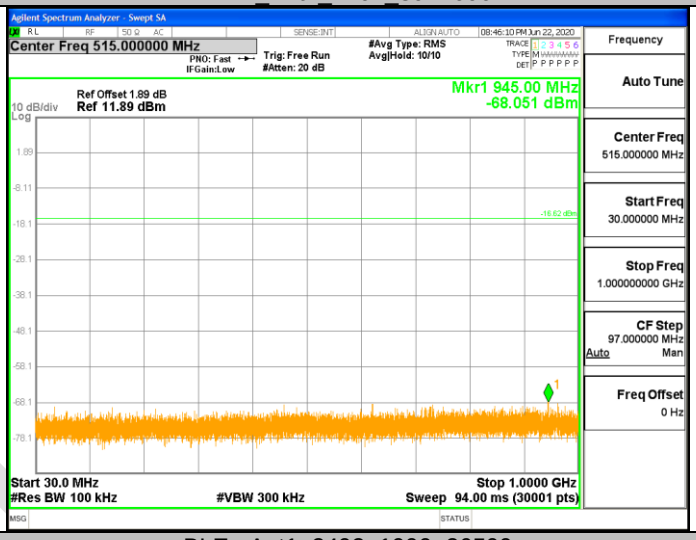
TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE	Ant1	2402	Reference	3.38	3.38	---	PASS
			30~1000	30~1000	-68.051	<=-16.624	PASS
			1000~26500	1000~26500	-53.327	<=-16.624	PASS
		2442	Reference	4.01	4.01	---	PASS
			30~1000	30~1000	-67.81	<=-15.99	PASS
			1000~26500	1000~26500	-53.851	<=-15.99	PASS
		2480	Reference	3.94	3.94	---	PASS
			30~1000	30~1000	-68.07	<=-16.065	PASS
			1000~26500	1000~26500	-53.561	<=-16.065	PASS

Test Graphs

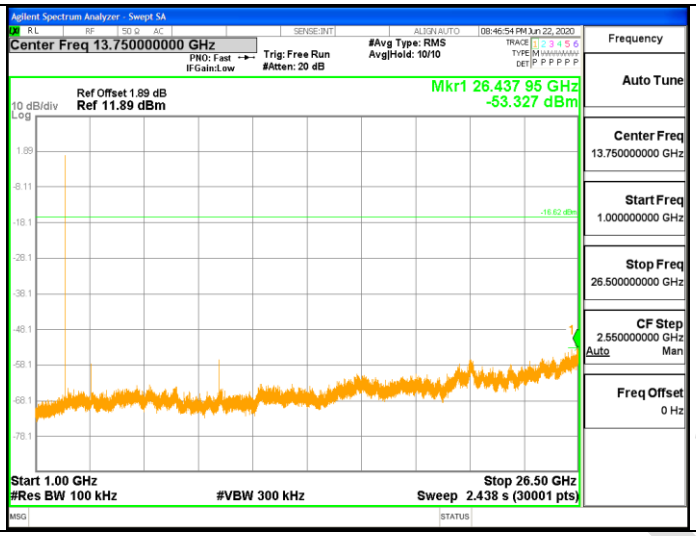
BLE _Ant1_2402_0~Reference



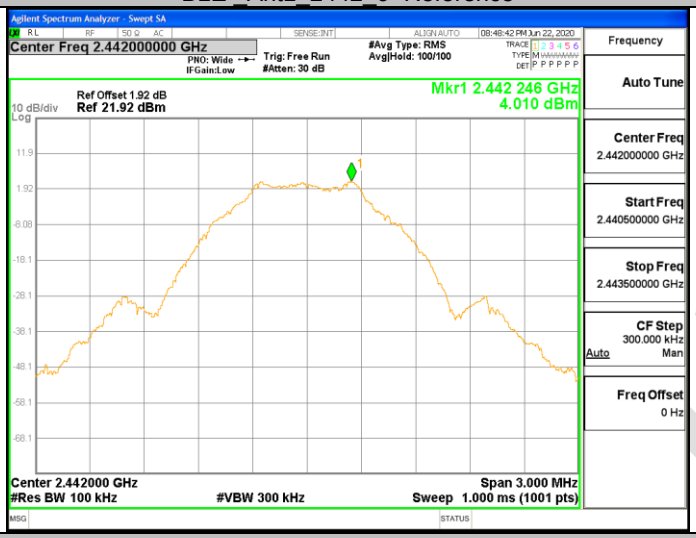
BLE _Ant1_2402_30~1000



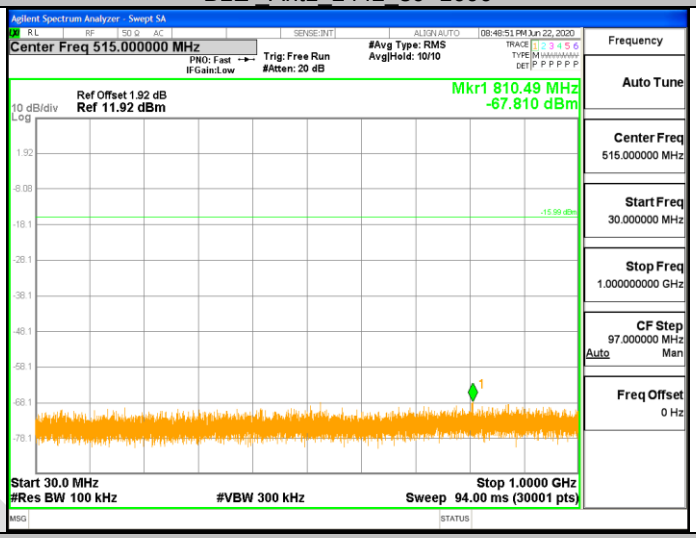
BLE _Ant1_2402_1000~26500


Agilent Spectrum Analyzer - Swept SA
Center Freq 13.750000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
Avg|Hold: 10/10
08:46:54 PM Jun 22, 2020
Frequency
Ref Offset 1.89 dB
10 dB/div
Log
Ref 11.89 dBm
Mkr1 26.437 95 GHz
-53.327 dBm
-16.62 dBm
Start 1.00 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 2.438 s (30001 pts)
Auto Tune
Center Freq
13.750000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
26.500000000 GHz
CF Step
2.550000000 GHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

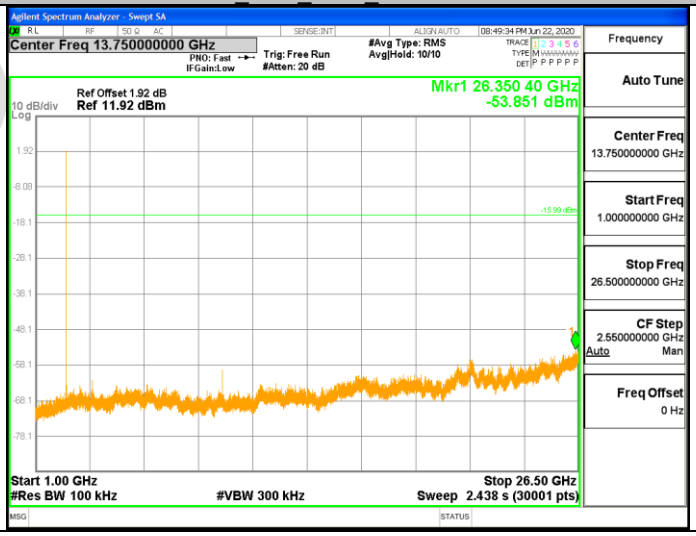
BLE _Ant1_2442_0~Reference

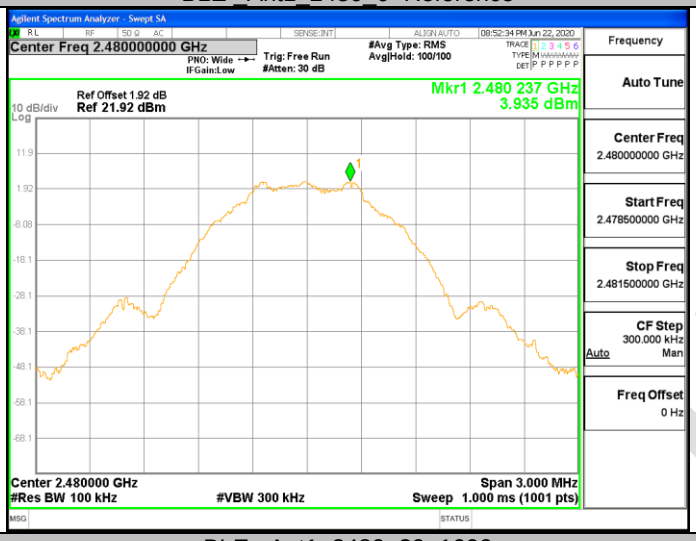
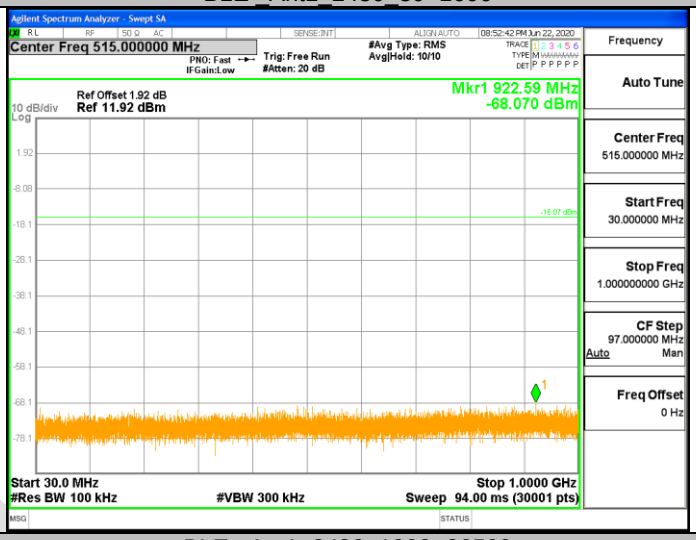
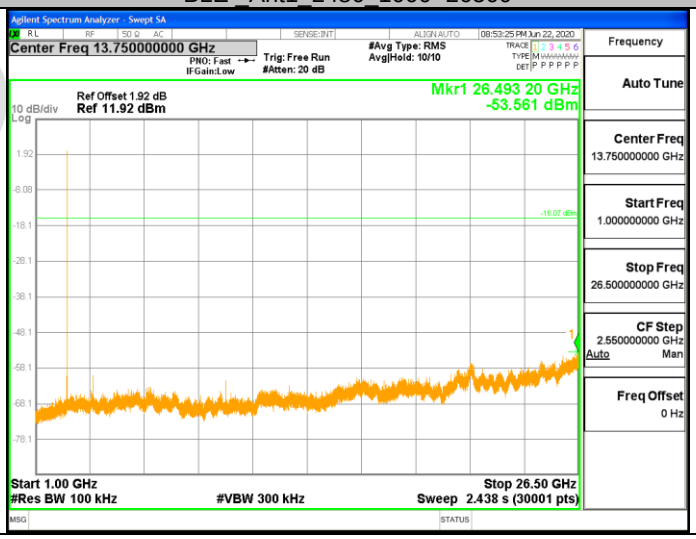


BLE _Ant1_2442_30~1000



BLE _Ant1_2442_1000~26500



BLE _Ant1_2480_0~Reference

BLE _Ant1_2480_30~1000

BLE _Ant1_2480_1000~26500


----END OF REPORT----

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