

Test Setup

The EUT and measurement equipment were set up as shown in the diagrams below.

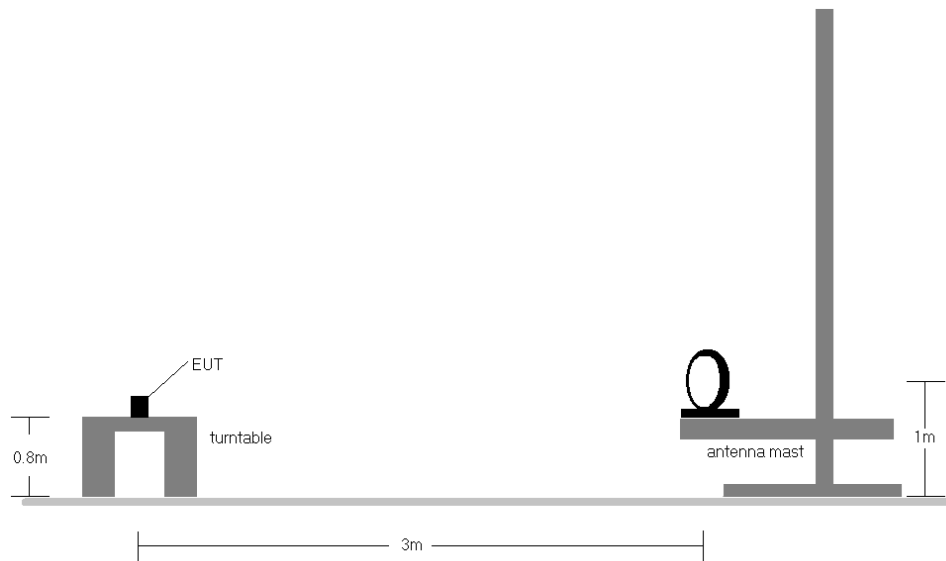


Figure 7-6. Radiated Test Setup < 30MHz

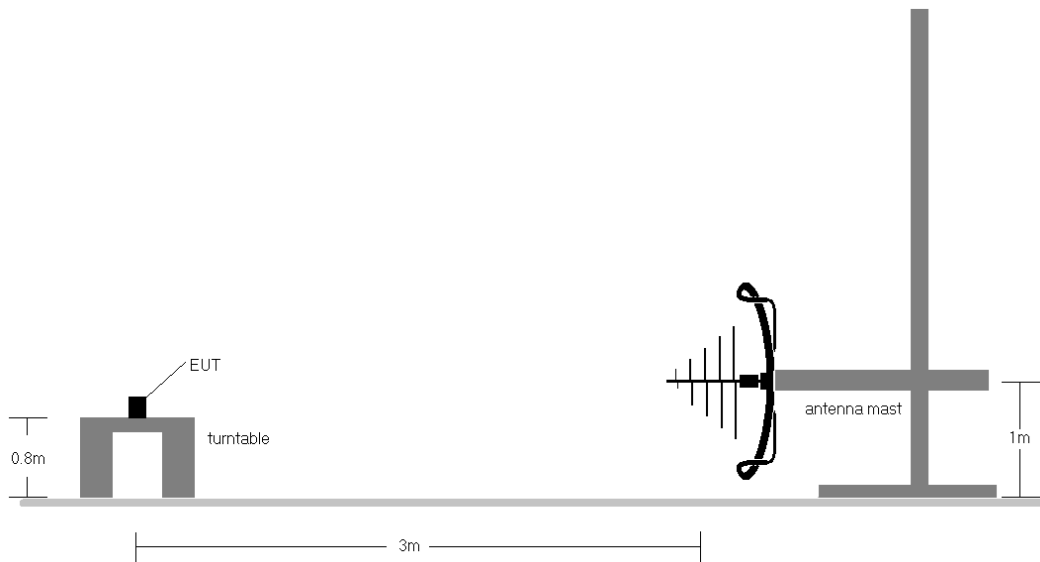


Figure 7-7. Radiated Test Setup < 1GHz

FCC ID: BCGA1980	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806220013-07.BCG	Test Dates: 07/27/2018-09/21/2018	EUT Type: Tablet Device	Page 274 of 282

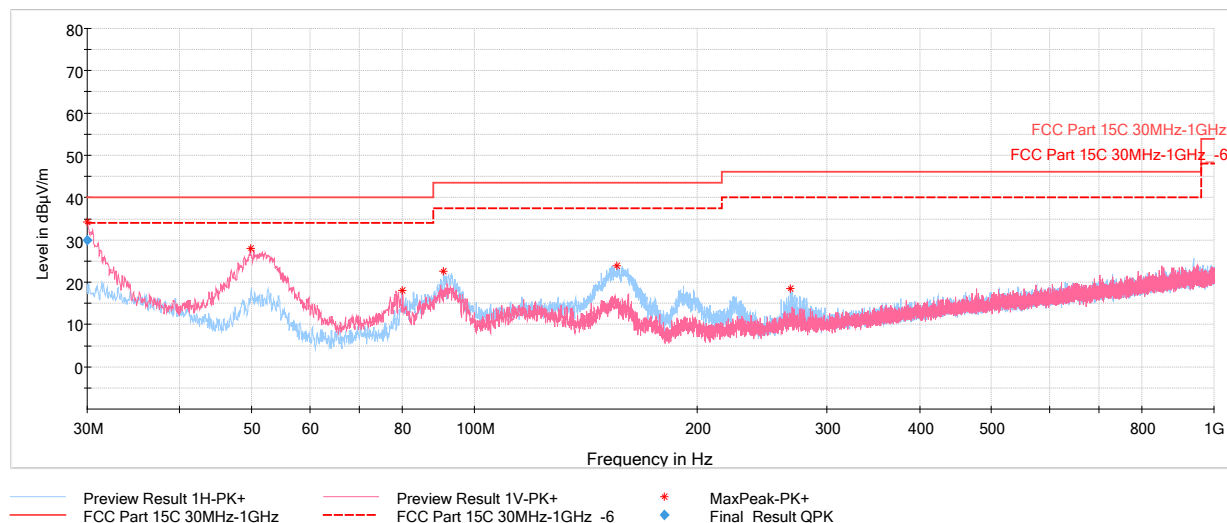
Test Notes

1. All emissions lying in restricted bands specified in §15.205 and RSS-Gen (8.10) are below the limit shown in Table 7-75.
2. The broadband receive antenna is manipulated through vertical and horizontal polarizations during the tests. The EUT is manipulated through three orthogonal planes.
3. This unit was tested with its standard battery.
4. The spectrum is investigated using a peak detector and final measurements are recorded using CISPR quasi peak detector. The worst-case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.
5. Emissions were measured at a 3 meter test distance.
6. Emissions are investigated while operating on the center channel of the mode, band, and modulation that produced the worst case results during the transmitter spurious emissions testing.
7. No spurious emissions were detected within 20dB of the limit below 30MHz.
8. The results recorded using the broadband antenna is known to correlate with the results obtained by using a tuned dipole with an acceptable degree of accuracy. The VSWR for the measurement antenna was found to be less than 2:1.
9. The wide spectrum spurious emissions plots shown on the following pages are used only for the purpose of emission identification. There were no emissions detected in the 30MHz – 1GHz frequency range, as shown in the subsequent plots.

FCC ID: BCGA1980	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806220013-07.BCG	Test Dates: 07/27/2018-09/21/2018	EUT Type: Tablet Device	Page 275 of 282

CDD Radiated Spurious Emissions Measurements (Below 1GHz)

§15.209; RSS-Gen [8.9]



Plot 7-322. Radiated Spurious Plot below 1GHz CDD with Laptop (802.11n - U1 Ch. 36)

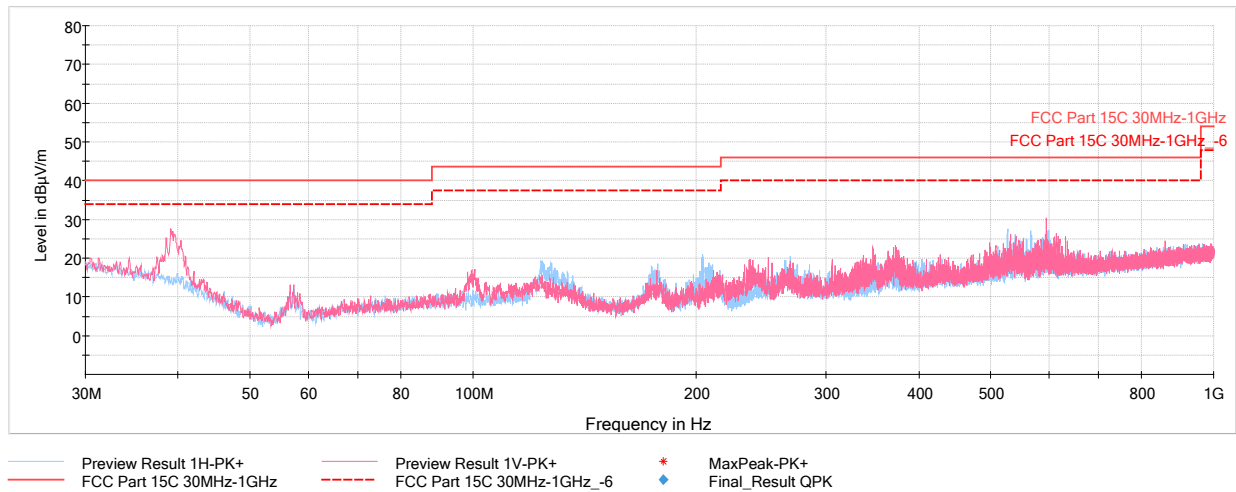
Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
30.00	Quasi-Peak	V	100	39	-68.96	-8.89	29.15	40.00	-10.85
49.84	Max-Peak	V	100	11	-57.75	-21.36	27.89	40.00	-12.11
90.92	Max-Peak	V	250	324	-66.20	-18.17	22.63	43.52	-20.90
156.15	Max-Peak	V	250	230	-63.96	-19.13	23.91	43.52	-19.61
191.80	Max-Peak	V	100	349	-68.54	-19.22	19.24	43.52	-24.28
267.46	Max-Peak	H	100	238	-71.89	-16.58	18.53	46.02	-27.49

Plot 7-323. Radiated Spurious Plot below 1GHz CDD with Laptop (802.11n - U1 Ch. 36)

FCC ID: BCGA1980	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806220013-07.BCG	Test Dates: 07/27/2018-09/21/2018	EUT Type: Tablet Device	Page 276 of 282

Simultaneous Tx Radiated Spurious Emissions Measurements (Below 1GHz)

§15.209; RSS-Gen [8.9]



Plot 7-324. Radiated Spurious Plot below 1GHz (2.4GHz – 5GHz)

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
39.12	Quasi-Peak	V	100	78	-65.04	-14.48	27.48	40.00	-12.52
57.35	Quasi-Peak	V	250	111	-69.95	-23.93	13.12	40.00	-26.88
204.50	Max-Peak	V	100	246	-66.81	-19.35	20.84	43.52	-22.68
250.68	Max-Peak	V	100	184	-69.14	-17.69	20.17	46.02	-25.85
346.95	Max-Peak	V	100	179	-69.46	-14.78	22.76	46.02	-23.26
594.64	Max-Peak	H	100	142	-67.16	-9.48	30.36	46.02	-15.66

Plot 7-325. Radiated Spurious Plot below 1GHz (Dual Band Simult. Tx)

FCC ID: BCGA1980	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806220013-07.BCG	Test Dates: 07/27/2018-09/21/2018	EUT Type: Tablet Device	Page 277 of 282

7.8 Line-Conducted Test Data

§15.407; RSS-Gen [8.8]

Test Overview and Limit

All AC line conducted spurious emissions are measured with a receiver connected to a grounded LISN while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates and modes were investigated for conducted spurious emissions. Only the conducted emissions of the configuration that produced the worst case emissions are reported in this section.

All conducted emissions must not exceed the limits shown in the table below, per Section 15.207 and RSS-Gen (8.8).

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

Table 7-76. Conducted Limits

*Decreases with the logarithm of the frequency.

Test Procedures Used

ANSI C63.10-2013, Section 6.2

Test Settings

Quasi-Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the spurious emission of interest
2. RBW = 9kHz (for emissions from 150kHz – 30MHz)
3. Detector = quasi-peak
4. Sweep time = auto couple
5. Trace mode = max hold
6. Trace was allowed to stabilize

Average Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the spurious emission of interest
2. RBW = 9kHz (for emissions from 150kHz – 30MHz)
3. Detector = RMS
4. Sweep time = auto couple
5. Trace mode = max hold
6. Trace was allowed to stabilize

FCC ID: BCGA1980	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806220013-07.BCG	Test Dates: 07/27/2018-09/21/2018	EUT Type: Tablet Device	Page 278 of 282

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

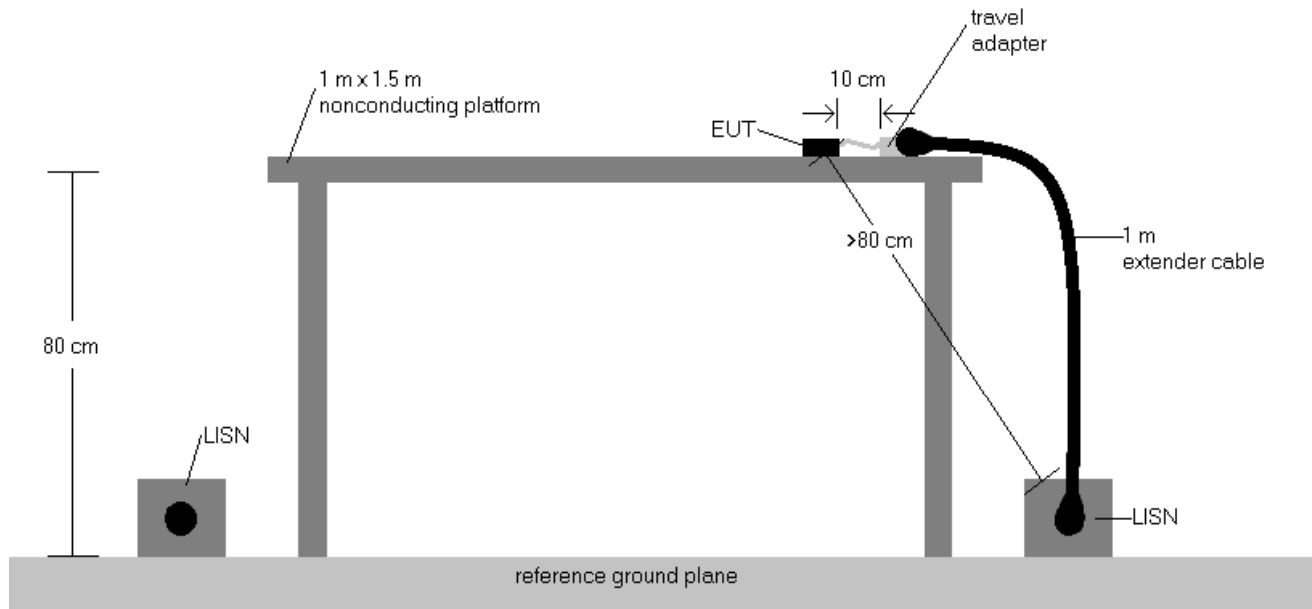
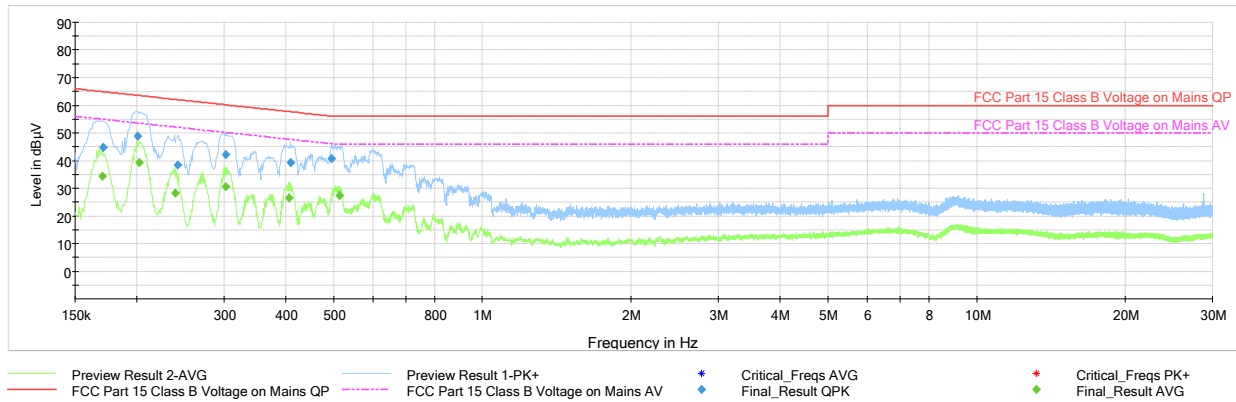


Figure 7-8. Test Instrument & Measurement Setup

Test Notes

1. All modes of operation were investigated and the worst-case emissions are reported using mid channel. The emissions found were not affected by the choice of channel used during testing.
2. The limit for an intentional radiator from 150kHz to 30MHz are specified in 15.207 and RSS-Gen (8.8).
3. $\text{Corr. (dB)} = \text{Cable loss (dB)} + \text{LISN insertion factor (dB)}$
4. $\text{QP/AV Level (dB}\mu\text{V)} = \text{QP/AV Analyzer/Receiver Level (dB}\mu\text{V)} + \text{Corr. (dB)}$
5. $\text{Margin (dB)} = \text{QP/AV Limit (dB}\mu\text{V)} - \text{QP/AV Level (dB}\mu\text{V)}$
6. Traces shown in plot are made using a peak detector.
7. Deviations to the Specifications: None.

FCC ID: BCGA1980	 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806220013-07.BCG	Test Dates: 07/27/2018-09/21/2018	EUT Type: Tablet Device	Page 279 of 282

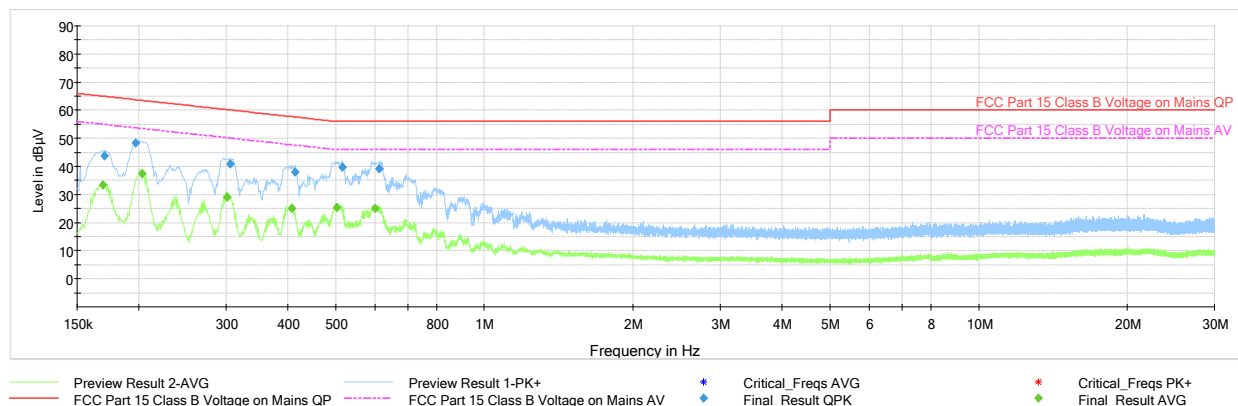


Plot 7-326. Line Conducted Plot with 802.11a UNII Band 1 (L1)

Frequency MHz	Process State	QuasiPeak dBμV	Average dBμV	Limit dBμV	Margin dB	Bandwidth kHz	Line	PE
0.170000	FINAL	---	34.36	54.96	20.60	9.000	L1	GND
0.171000	FINAL	44.73	---	64.91	20.18	9.000	L1	GND
0.201000	FINAL	48.77	---	63.57	14.80	9.000	L1	GND
0.202000	FINAL	---	39.38	53.53	14.15	9.000	L1	GND
0.239000	FINAL	---	28.26	52.13	23.87	9.000	L1	GND
0.242000	FINAL	38.43	---	62.03	23.60	9.000	L1	GND
0.302000	FINAL	42.03	---	60.19	18.16	9.000	L1	GND
0.303000	FINAL	---	30.61	50.16	19.55	9.000	L1	GND
0.406000	FINAL	---	26.57	47.73	21.16	9.000	L1	GND
0.410000	FINAL	39.35	---	57.65	18.30	9.000	L1	GND
0.495000	FINAL	40.62	---	56.08	15.46	9.000	L1	GND
0.513000	FINAL	---	27.35	46.00	18.65	9.000	L1	GND

Table 7-77. Line Conducted Data with 802.11a UNII Band 1 (L1)

FCC ID: BCGA1980	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806220013-07.BCG	Test Dates: 07/27/2018-09/21/2018	EUT Type: Tablet Device	Page 280 of 282



Plot 7-327. Line Conducted Plot with 802.11a UNII Band 1 (N)

Frequency MHz	Process State	QuasiPeak dBμV	Average dBμV	Limit dBμV	Margin dB	Meas. Time ms	Bandwidth kHz	Line	PE
0.169000	FINAL	---	33.31	55.01	21.70	10000.0	9.000	N	GND
0.170000	FINAL	43.79	---	64.96	21.17	10000.0	9.000	N	GND
0.197000	FINAL	48.31	---	63.74	15.43	10000.0	9.000	N	GND
0.203000	FINAL	---	37.50	53.49	15.99	10000.0	9.000	N	GND
0.301000	FINAL	---	29.20	50.22	21.02	10000.0	9.000	N	GND
0.306000	FINAL	40.81	---	60.08	19.27	10000.0	9.000	N	GND
0.408000	FINAL	---	25.17	47.69	22.52	10000.0	9.000	N	GND
0.414000	FINAL	37.98	---	57.57	19.59	10000.0	9.000	N	GND
0.502000	FINAL	---	25.44	46.00	20.56	10000.0	9.000	N	GND
0.515000	FINAL	39.81	---	56.00	16.19	10000.0	9.000	N	GND
0.600000	FINAL	---	25.07	46.00	20.93	10000.0	9.000	N	GND
0.613000	FINAL	39.20	---	56.00	16.80	10000.0	9.000	N	GND

Table 7-78. Line Conducted Data with 802.11a UNII Band 1 (N)

FCC ID: BCGA1980	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1C1806220013-07.BCG	Test Dates: 07/27/2018-09/21/2018	EUT Type: Tablet Device	Page 281 of 282

8.0 CONCLUSION

The data collected relate only the item(s) tested and show that the **Apple Tablet Device FCC ID: BCGA1980** is in compliance with Part 15 Subpart E (15.407) of the FCC Rules and RSS-247 of the Innovation, Science and Economic Development Canada Rules.

FCC ID: BCGA1980	 MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1C1806220013-07.BCG	Test Dates: 07/27/2018-09/21/2018	EUT Type: Tablet Device
		Page 282 of 282