

FCC Test Report

APPLICANT : Bullitt Group
EQUIPMENT : Rugged Smart Phone
BRAND NAME : CAT
MODEL NAME : S48c
FCC ID : ZL5S48C
STANDARD : FCC CFR Title 47 Part 15 Subpart B
CLASSIFICATION : Certification

The product was received on Aug. 08, 2018 and testing was completed on Sep. 19, 2018. We, Sporton International (Shenzhen) Inc., would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI C63.4-2014 and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International (Shenzhen) Inc., the test report shall not be reproduced except in full.



Approved by: Eric Shih / Manager



Sporton International (Shenzhen) Inc.

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FC850804-04	Rev. 01	Initial issue of report	Sep. 27, 2018



SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.107	AC Conducted Emission	< 15.107 limits	PASS	Under limit 14.15 dB at 0.200 MHz
3.2	15.109	Radiated Emission	< 15.109 limits	PASS	Under limit 6.66 dB at 30.000 MHz

1. General Description

1.1. Applicant

Bullitt Group

One Valpy, Valpy Street, Reading, Berkshire, England RG1 1AR

1.2. Product Feature of Equipment Under Test

Product Feature	
Equipment	Rugged Smart Phone
Brand Name	CAT
Model Name	S48c
FCC ID	ZL5S48C
EUT supports Radios application	CDMA/EV-DO/GSM/GPRS/EGPRS/WCDMA/HSPA/ DC-HSDPA/HSPA+/LTE/NFC/ WLAN 2.4GHz 802.11b/g/n HT20/HT40/ WLAN 5GHz 802.11a/n HT20/HT40/ WLAN 5GHz 802.11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE
IMEI Code	Conduction: 358016090018148 for Sample 1 352109100004640 for Sample 2 Radiation: 358016090018197 for Sample 1 352109100005167 for Sample 2
EUT Stage	Identical Prototype

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. This is a variant report for S48c. The product equality declaration could be referred to Appendix B. Based on the similarity between current and previous project, only the test cases from original test report (Sporton Report Number FC850804-03) were verified for the differences.

1.3. Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz WCDMA Band IV : 1712.4 MHz ~ 1752.6 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz LTE Band 2 : 1850.7 MHz ~ 1909.3 MHz LTE Band 4 : 1710.7 MHz ~ 1754.3 MHz LTE Band 5 : 824.7 MHz ~ 848.3 MHz LTE Band 7 : 2502.5 MHz ~ 2567.5 MHz LTE Band 12 : 699.7 MHz ~ 715.3 MHz LTE Band 13 : 779.5 MHz ~ 784.5 MHz LTE Band 14 : 790.5 MHz ~ 795.5 MHz LTE Band 25 : 1850.7 MHz ~ 1914.3 MHz LTE Band 26 : 814.7 MHz ~ 848.3 MHz LTE Band 41 : 2498.5 MHz ~ 2687.5 MHz LTE Band 66 : 1710.7 MHz ~ 1779.3 MHz CDMA2000 BC0: 824.70 MHz ~ 848.31 MHz CDMA2000 BC1: 1851.25 MHz ~ 1908.75 MHz CDMA2000 BC10: 817.9 MHz ~ 823.1 MHz 802.11b/g/n: 2412 MHz ~ 2462 MHz 802.11a/n/ac: 5180 MHz ~ 5240 MHz; 5260 MHz ~ 5320 MHz; 5500MHz ~ 5720 MHz ; 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz NFC : 13.56 MHz
Rx Frequency	GSM850: 869.2 MHz ~ 893.8 MHz GSM1900: 1930.2 MHz ~ 1989.8 MHz WCDMA Band V: 871.4 MHz ~ 891.6 MHz WCDMA Band IV : 2112.4 MHz ~ 2152.6 MHz WCDMA Band II: 1932.4 MHz ~ 1987.6 MHz LTE Band 2 : 1930.7 MHz ~ 1989.3 MHz LTE Band 4 : 2110.7 MHz ~ 2154.3 MHz LTE Band 5 : 869.7 MHz ~ 893.3 MHz LTE Band 7 : 2622.5 MHz ~ 2687.5 MHz LTE Band 12 : 729.7 MHz ~ 745.3 MHz LTE Band 13 : 748.5 MHz ~ 753.5 MHz LTE Band 14 : 760.5 MHz ~ 765.5 MHz LTE Band 25 : 1930.7 MHz ~ 1994.3 MHz LTE Band 26 : 859.7 MHz ~ 893.3 MHz LTE Band 41 : 2498.5 MHz ~ 2687.5 MHz LTE Band 66 : 2110.7 MHz~ 2199.3 MHz CDMA2000 BC0: 869.70 MHz ~ 893.31 MHz CDMA2000 BC1: 1931.25 MHz ~ 1988.75 MHz CDMA2000 BC10: 862.9 MHz ~ 868.1 MHz 802.11b/g/n: 2412 MHz ~ 2462 MHz 802.11a/n/ac: 5180 MHz ~ 5240 MHz; 5260 MHz ~ 5320 MHz; 5500MHz ~ 5720 MHz ; 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz GNSS: 1559 MHz to 1610 MHz FM : 88 MHz ~ 108 MHz NFC : 13.56 MHz

Antenna Type	WWAN : Fixed Internal Antenna WLAN : IFA Antenna Bluetooth : IFA Antenna GNSS: IFA Antenna NFC : Loop Antenna FM: External Handset Antenna
Type of Modulation	GSM: GMSK GPRS: GMSK EDGE(MCS 0-4): GMSK / (MCS 5-9): 8PSK WCDMA : BPSK (Uplink) HSDPA/DC-HSDPA : QPSK (Uplink) HSUPA : QPSK (Uplink) HSPA+ : 16QAM (Uplink) DC-HSDPA : 64QAM LTE: QPSK / 16QAM / 64QAM 802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11a/g/n/ac : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM) Bluetooth LE : GFSK Bluetooth (1Mbps) : GFSK Bluetooth (2Mbps) : $\pi/4$ -DQPSK Bluetooth (3Mbps) : 8-DPSK GNSS : BPSK NFC: ASK FM

Note: GNSS=GPS RX +GLONASS RX + BDS RX

1.4. Modification of EUT

No modifications are made to the EUT during all test items.

1.5. Test Location

Sporton International (Shenzhen) Inc. is accredited to ISO 17025 by National Voluntary Laboratory Accreditation Program (NVLAP code: 600156-0).

Test Site	Sporton International (Shenzhen) Inc.		
Test Site Location	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen City, Guangdong Province 518055, China TEL: +86-755-8637-9589 FAX: +86-755-8637-9595		
Test Site No.	Sporton Site No.	FCC designation No.	FCC Test Firm Registration No.
	CO01-SZ	CN5018	337463
Test Site	Sporton International (Shenzhen) Inc.		
Test Site Location	No. 3 Bldg the third floor of south, Shahe River west, Fengzeyuan Warehouse, Nanshan District, Shenzhen City, Guangdong Province 518055, China TEL: +86-755- 3320-2398		
Test Site No.	Sporton Site No.	FCC designation No.	FCC Test Firm Registration No.
	03CH04-SZ	CN5019	577730

1.6. Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ FCC CFR Title 47 Part 15 Subpart B
- ♦ ANSI C63.4-2014

Remark: All test items were verified and recorded according to the standards and without any deviation during the test.

2. Test Configuration of Equipment Under Test

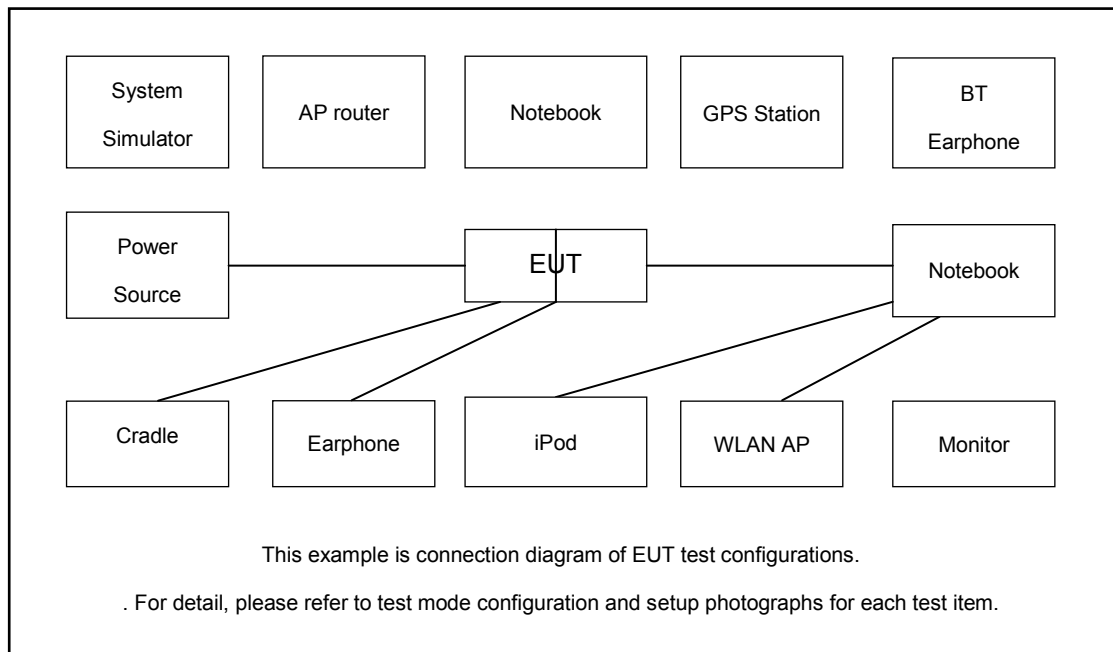
2.1. Test Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2014 and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (30MHz to the 5th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

Test Items	Function Type
AC Conducted Emission	Mode 1: GSM850 Idle + Bluetooth Idle + WLAN(2.4G) Idle + USB Cable (Charging from Adapter) + Earphone + Camera(Rear) for Sample 1
	Mode 2: LTE Band 13 Idle + Bluetooth Idle + WLAN(2.4G) Idle + USB Cable (Charging from Adapter) + Earphone + GNSS Rx for Sample 1
	Mode 3: GSM850 Idle + Bluetooth Idle + WLAN(2.4G) Idle + USB Cable (Charging from Adapter) + Earphone + Camera(Rear) for Sample 2
Radiated Emissions	Mode 1: GSM1900 Idle + Bluetooth Idle + WLAN(5G) Idle + USB Cable (Charging from Adapter) + Earphone + Camera(Front) for Sample 1
	Mode 2: LTE Band 13 Idle + Bluetooth Idle + WLAN(5G) Idle + USB Cable (Charging from Adapter) + Earphone + GNSS Rx for Sample 1
	Mode 3: GSM1900 Idle + Bluetooth Idle + WLAN(5G) Idle + USB Cable (Charging from Adapter) + Earphone + Camera(Rear) for Sample 2
	Mode 4: GSM850 Idle + Bluetooth Idle + WLAN(2.4G) Idle + USB Cable (Data Link with Notebook) + Earphone for Sample 2
Remark: <ol style="list-style-type: none"> 1. The worst case of AC is mode 1; only the test data of this mode was reported. 2. The worst case of RE is mode 3, only the test data of this mode was reported. 3. Data Link with Notebook means data application transferred mode between EUT and Notebook. 	

2.2.Connection Diagram of Test System



2.3. Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
2.	WLAN AP	D-Link	DIR-820L	KA2IR820LA1	N/A	Unshielded, 1.8m
3.	WLAN AP	Netcore	NW616	N/A	N/A	Unshielded, 1.8m with Core
4.	Notebook	DELL	VOSTRO 1440	Fcc DoC	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m
5.	Bluetooth Earphone	Samsung	EO-MG900	CCAH14LP1680T5	N/A	N/A
6.	Bluetooth Earphone	Samsung	EO-MG900	PYAHS-107W	N/A	N/A
7.	SD Card	Kingston	3300-10000-078	FCC DoC	N/A	SD Card
8.	SD Card	N/A	MicroSD HC	FCC DoC	N/A	N/A
9.	Earphone	Apple	MC690ZP/A	N/A	Shielded, 1.0m	N/A
10.	Earphone	Apple	DCAY1V-A9007ZJW3-000	N/A	Shielded, 1.0m	N/A
11.	GNSS Station	RACELOGIC	18645	N/A	N/A	Unshielded, 1.8m

2.4. EUT Operation Test Setup

The EUT was in GSM or LTE idle mode during the testing. The EUT was synchronized to the BCCH, and is in continuous receiving mode by setting system simulator's paging reorganization.

At the same time, the EUT was attached to the Bluetooth earphone or WLAN AP, and the following programs installed in the EUT were programmed during the test.

1. Data application is transferred between Notebook and EUT via USB cable.
2. Turn on camera to capture images.
3. Execute "GPS Test" to make the EUT receive continuous signals from GNSS station.

3. Test Result

3.1. Test of AC Conducted Emission Measurement

3.1.1 Limits of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

<Class B Limit>

Frequency of emission (MHz)	Conducted limit (dBuV)	
	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.

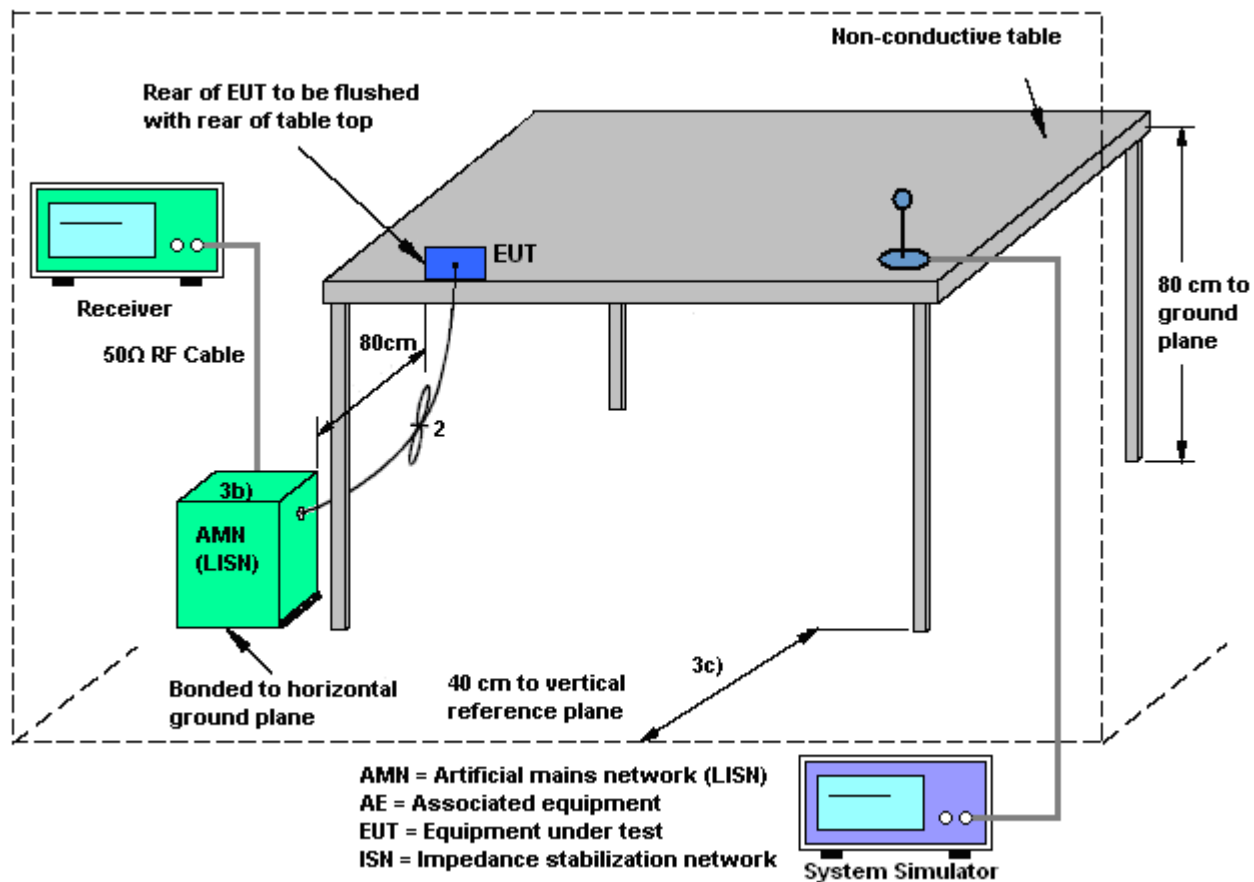
3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedure

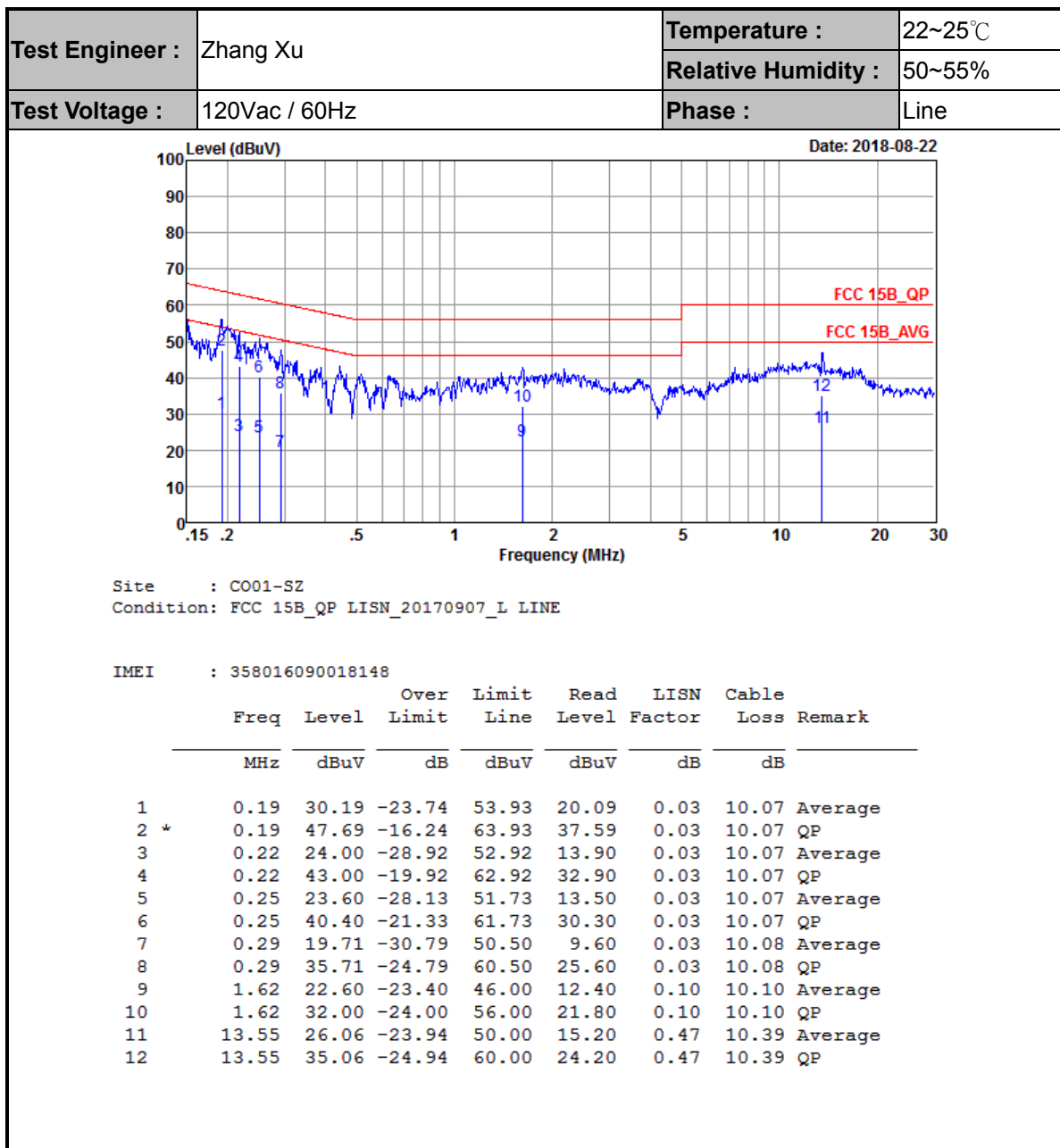
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

3.1.4 Test Setup



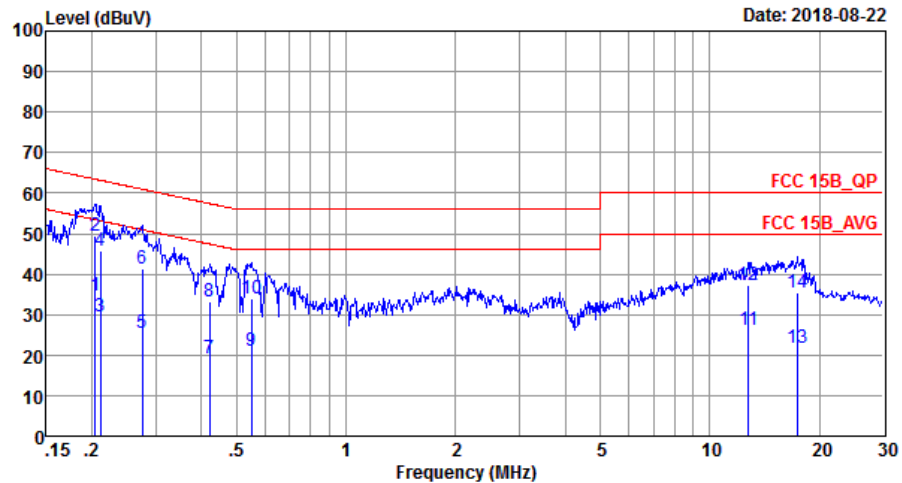


3.1.5 Test Result of AC Conducted Emission





Test Engineer :	Zhang Xu	Temperature :	22~25℃
		Relative Humidity :	50~55%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral



Site : CO01-SZ
Condition: FCC 15B_QP LISN_20170907_N NEUTRAL

IMEI : 358016090018148

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.20	34.60	-18.85	53.45	24.50	0.03	10.07	Average
2 *	0.20	49.30	-14.15	63.45	39.20	0.03	10.07	QP
3	0.21	29.40	-23.74	53.14	19.30	0.03	10.07	Average
4	0.21	45.90	-17.24	63.14	35.80	0.03	10.07	QP
5	0.28	25.61	-25.33	50.94	15.50	0.03	10.08	Average
6	0.28	41.51	-19.43	60.94	31.40	0.03	10.08	QP
7	0.42	19.20	-28.22	47.42	9.10	0.02	10.08	Average
8	0.42	33.10	-24.32	57.42	23.00	0.02	10.08	QP
9	0.55	21.20	-24.80	46.00	11.10	0.02	10.08	Average
10	0.55	34.10	-21.90	56.00	24.00	0.02	10.08	QP
11	12.78	26.24	-23.76	50.00	15.60	0.26	10.38	Average
12	12.78	37.24	-22.76	60.00	26.60	0.26	10.38	QP
13	17.38	21.94	-28.06	50.00	11.10	0.46	10.38	Average
14	17.38	35.44	-24.56	60.00	24.60	0.46	10.38	QP

3.2. Test of Radiated Emission Measurement

3.2.1. Limit of Radiated Emission

The emissions from an unintentional radiator shall not exceed the field strength levels specified in the following table:

<Class B Limit>

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.2.2. Measuring Instruments

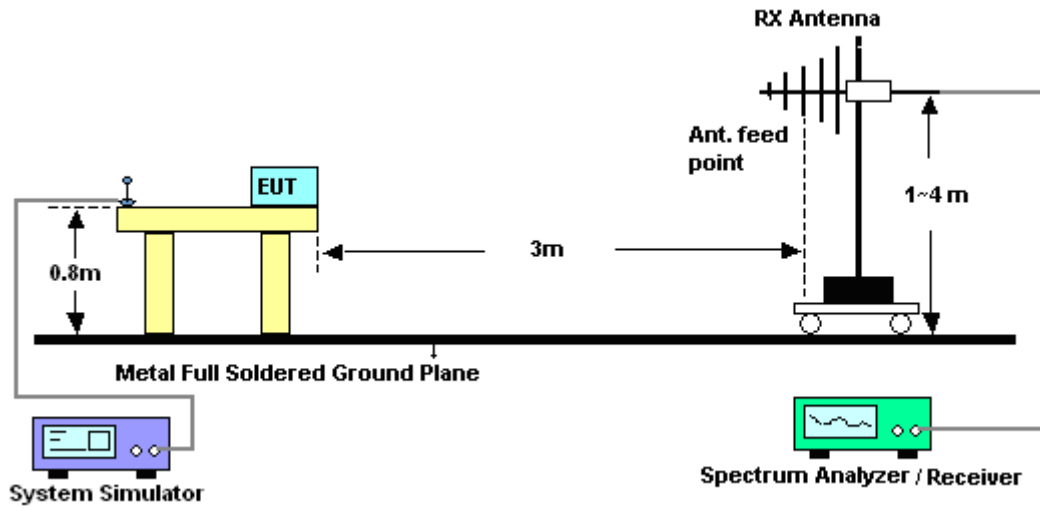
The measuring equipment is listed in the section 4 of this test report.

3.2.3. Test Procedures

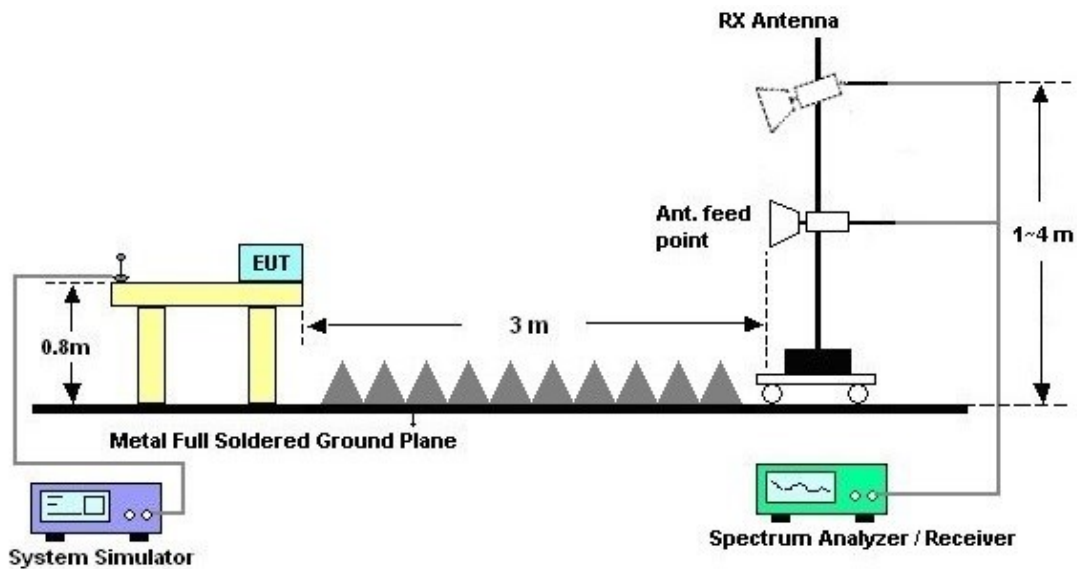
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna is a Bi-Log antenna and its height is adjusted between one to four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode (RBW=120kHz/VBW=300kHz for frequency below 1GHz; RBW=1MHz VBW=3MHz (Peak), RBW=1MHz/VBW=10Hz (Average) for frequency above 1GHz).
7. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, peak values of EUT will be reported. Otherwise, the emission will be repeated by using the quasi-peak method and reported.
8. Emission level (dB μ V/m) = 20 log Emission level (μ V/m)
9. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

3.2.4. Test Setup of Radiated Emission

For radiated emissions from 30MHz to 1GHz

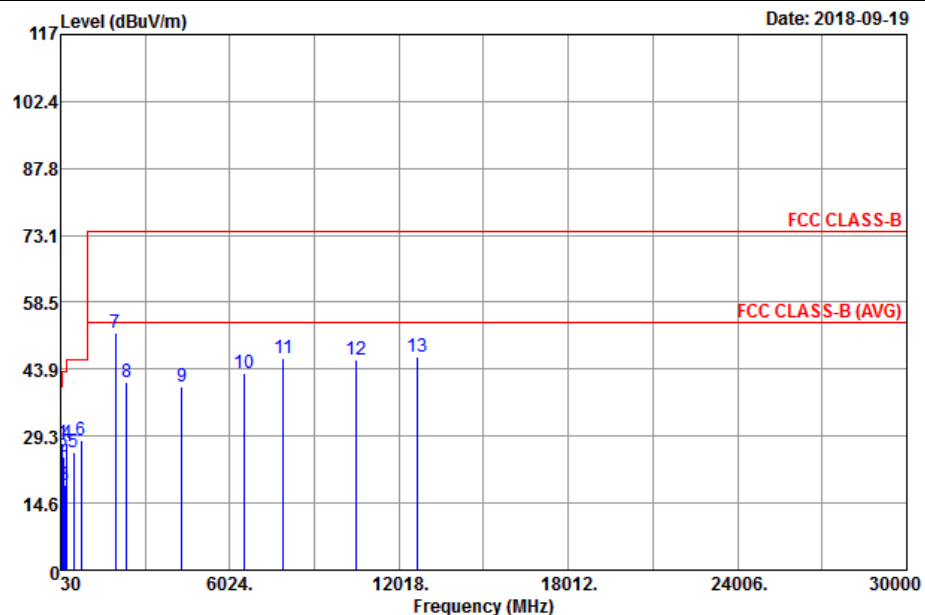


For radiated emissions above 1GHz



3.2.5. Test Result of Radiated Emission

Test Engineer :	Zeiyan Zhang	Temperature :	24~25°C
		Relative Humidity :	48~49%
Test Distance :	3m	Polarization :	Horizontal
Remark :	#7 is system simulator signal which can be ignored.		



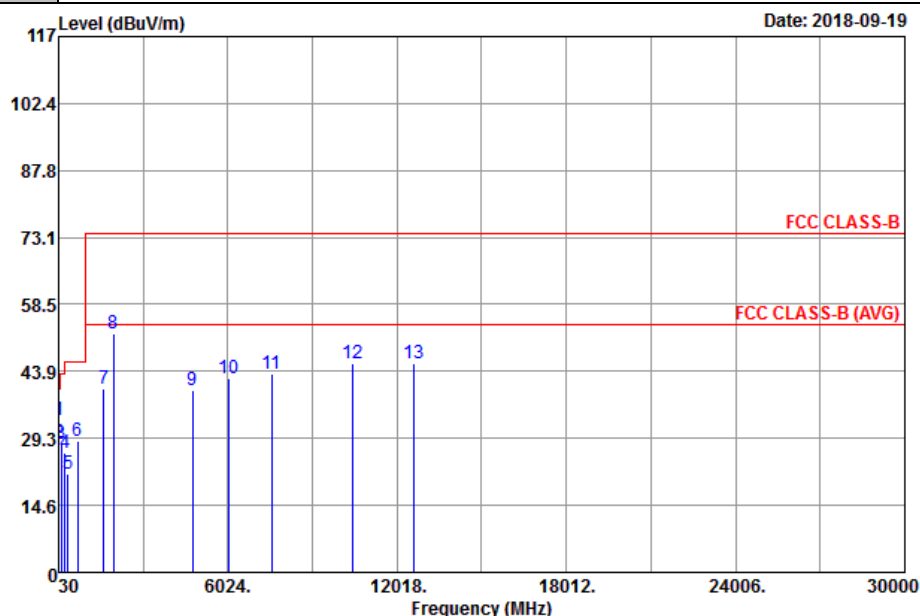
Site : 03CH04-SZ
Condition : FCC CLASS-B 3m LF ANT41909 18 HORIZONTAL

IMEI : 352109100005167

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	91.11	27.81	-15.69	43.50	43.64	14.93	1.00	31.76	100	146	Peak
2	116.33	24.91	-18.59	43.50	38.31	17.15	1.12	31.67	---	---	Peak
3	187.14	18.60	-24.90	43.50	33.47	15.03	1.48	31.38	---	---	Peak
4	259.89	27.79	-18.21	46.00	36.89	20.40	1.74	31.24	---	---	Peak
5	503.36	25.79	-20.21	46.00	30.62	23.96	2.44	31.23	---	---	Peak
6	751.68	28.39	-17.61	46.00	28.93	27.63	3.04	31.21	---	---	Peak
7	1960.00	51.81			80.04	25.80	4.31	58.34	---	---	Peak
8	2382.00	41.09	-32.91	74.00	66.58	27.72	4.72	57.93	---	---	Peak
9	4334.00	40.06	-33.94	74.00	63.35	30.63	5.10	59.02	---	---	Peak
10	6524.00	43.04	-30.96	74.00	60.35	34.19	6.59	58.09	---	---	Peak
11	7922.00	46.17	-27.83	74.00	57.44	37.27	7.43	55.97	---	---	Peak
12	10510.00	46.03	-27.97	74.00	54.29	38.37	9.27	55.90	---	---	Peak
13	12674.00	46.71	-27.29	74.00	54.17	39.71	9.80	56.97	100	55	Peak



Test Engineer :	Zeiyan Zhang	Temperature :	24~25°C
		Relative Humidity :	48~49%
Test Distance :	3m	Polarization :	Vertical
Remark :	#8 is system simulator signal which can be ignored.		



Site : 03CH04-SZ
Condition : FCC CLASS-B 3m LF_ANT41909_18 VERTICAL

IMEI : 352109100005167

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	30.00	33.34	-6.66	40.00	40.26	24.80	0.25	31.97	100	215	Peak
2	50.37	28.20	-11.80	40.00	45.32	14.20	0.63	31.95	---	---	Peak
3	121.18	28.14	-15.36	43.50	41.25	17.40	1.14	31.65	---	---	Peak
4	256.98	26.11	-19.89	46.00	35.63	19.99	1.73	31.24	---	---	Peak
5	356.89	21.45	-24.55	46.00	29.78	20.77	2.11	31.21	---	---	Peak
6	697.36	28.80	-17.20	46.00	30.47	26.67	2.92	31.26	---	---	Peak
7	1638.00	40.14	-33.86	74.00	69.30	25.51	3.91	58.58	---	---	Peak
8	1960.00	52.28			80.51	25.80	4.31	58.34	---	---	Peak
9	4770.00	39.76	-34.24	74.00	60.94	31.64	5.45	58.27	---	---	Peak
10	6082.00	42.40	-31.60	74.00	59.99	33.13	6.62	57.34	---	---	Peak
11	7588.00	43.27	-30.73	74.00	55.71	37.52	7.04	57.00	---	---	Peak
12	10426.00	45.51	-28.49	74.00	53.84	38.29	9.25	55.87	---	---	Peak
13	12630.00	45.75	-28.25	74.00	53.07	39.68	9.79	56.79	100	177	Peak



4. List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Test Receiver	R&S	ESR7	101404	9kHz~7GHz	Apr. 19, 2018	Sep. 19, 2018	Apr. 18, 2019	Radiation (03CH04-SZ)
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY55150213	10Hz~44GHz	Apr. 19, 2018	Sep. 19, 2018	Apr. 18, 2019	Radiation (03CH04-SZ)
Bilog Antenna	TeseQ	CBL6111D	41909	30MHz~1GHz	Aug. 28, 2018	Sep. 19, 2018	Aug. 27, 2019	Radiation (03CH04-SZ)
Double Ridge Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-1285	1GHz~18GHz	Dec. 13, 2017	Sep. 19, 2018	Dec. 12, 2018	Radiation (03CH04-SZ)
Horn Antenna	SCHWARZBECK	BBHA9170	9170#679	15GHz~40GHz	Apr. 20, 2018	Sep. 19, 2018	Apr. 19, 2019	Radiation (03CH04-SZ)
Amplifier	Burgeon	BPA-530	102211	0.01Hz~3000MHz	Oct. 19, 2017	Sep. 19, 2018	Oct. 18, 2018	Radiation (03CH04-SZ)
HF Amplifier	MITEQ	AMF-7D-0010 1800-30-10P-R	1989346	1GHz~18GHz	Jul. 30, 2018	Sep. 19, 2018	Jul. 29, 2019	Radiation (03CH04-SZ)
HF Amplifier	MITEQ	TTA1840-35-H G	1988315	18GHz~40GHz	Jul. 30, 2018	Sep. 19, 2018	Jul. 29, 2019	Radiation (03CH04-SZ)
AC Power Source	Chroma	61601	N/A	N/A	NCR	Sep. 19, 2018	NCR	Radiation (03CH04-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Sep. 19, 2018	NCR	Radiation (03CH04-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Sep. 19, 2018	NCR	Radiation (03CH04-SZ)
EMI Receiver	R&S	ESR7	101630	9kHz~7GHz;	Dec. 26, 2017	Aug. 22, 2018	Dec. 25, 2018	Conduction (CO01-SZ)
AC LISN	EMCO	3816/2SH	00103912	9kHz~30MHz	Dec. 26, 2017	Aug. 22, 2018	Dec. 25, 2018	Conduction (CO01-SZ)
AC LISN (for auxiliary equipment)	MessTec	3816/2SH	00103892	9kHz~30MHz	Nov. 01, 2017	Aug. 22, 2018	Oct. 31, 2018	Conduction (CO01-SZ)
AC Power Source	Chroma	61602	61602000089 1	100Vac~250Vac	Jul. 18, 2018	Aug. 22, 2018	Jul. 17, 2019	Conduction (CO01-SZ)

NCR: No Calibration Required

5. Uncertainty of Evaluation

Uncertainty of Conducted Emission Measurement (150 kHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.6dB
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	5.0dB
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Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	4.8dB
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Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	5.1dB
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Appendix B. Product Equality Declaration

Bullitt Group

One Valpy, Valpy Street, Reading, Berkshire, England RG1 1AR, United Kingdom

Tel: +44 118 9580449

Date: September 27, 2018

Product Equality Declaration

We, Bullitt Group, declare on our sole responsibility for the product of Smartphone as below:

The differences between S48c (VzW Sku) and previous model, S48c (Sprint Sku) are as below:

1. L3613&C3637&L3247&C3232&L3232&C3215&C3018&C3001&U3002 Changed from NC to 0201 8.2nH & 0201 4.7pF & 0201 15nH & 0201 39pF & 0201 22nH & 0201 39pF & 0201 33pF & 0201 33pF & FILTER, SAW FOR GPS 1109
2. R3319&L3238&U3213&L3240&R3005&R3001 Changed from 0201 10nH&0201 15nH&Duplexer, Band 13,1814& 0201 15nH &0201 0Ω&0201 0Ω to 0201 5.6nH & NC& Duplexer, Band 13(NB07), 1814&0201 18Nh&NC&NC
3. S48c (VzW Sku) Based on S48c (Sprint Sku), add the following manufacturers and models of 4+64G memory:
1st_ Samsung, 2nd_ Hynix

Software change:

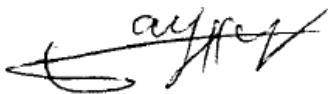
In addition, S48c (VzW Sku) vs. S48c (Sprint Sku), the UL CA was cancelled, and the DL CA was changed to the following combination.

CA_4A-13A, CA_13A-66A, CA_2A-13A, CA_2A-5A, CA_4A-5A, CA_5A-66A, CA_2A-2A, CA_5B, CA_5A-5A, CA_4A-4A

Except listings above, the others are all the same as previous version.

Should you have any questions or comments regarding this matter, please have my best attention.

Sincerely yours,



Wayne Huang

whuang@bullitt-group.com