FCC RF Test Report

APPLICANT	:	LugTrack, LLC.
EQUIPMENT	:	GLOBAL LOCATOR
BRAND NAME	:	TUMI, SAMSONITE, MONTBLANC
MODEL NAME	:	014341D, 110548-1090, 110574-1090, 110620-1090, LTCS1
MARKETING NAME	:	TUMI Global Locator, Samsonite Track&Go
FCC ID	:	2AFPZ-TGL001
STANDARD	:	FCC Part 15 Subpart C §15.247
CLASSIFICATION	:	(DTS) Digital Transmission System

The product was completed on Jan. 16, 2018. We, Sporton International (Shenzhen) Inc., would like to declare that the tested sample has been evaluated in accordance with the test procedures 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

NVLAP TESTING
NVLAP LAB CODE 600156-0

Sporton International (Shenzhen) Inc.
1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan Shenzhen City
Guangdong Province 518055 China

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR582403-04B	Rev. 01	Initial issue of report	Jan. 19, 2018
FR582403-04B	Rev. 02	Upgrade the Brand Name and Model Name	Jan. 23, 2018

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
-	15.247(a)(2)	6dB Bandwidth	≥ 0.5MHz	Not Required	-
-	-	99% Bandwidth	-	Not Required	-
3.1	15.247(b)(3)	Peak Output Power	≤ 30dBm	Pass	-
-	15.247(e)	Power Spectral Density	≤ 8dBm/3kHz	Not Required	-
-	15.247(d)	Conducted Band Edges and Spurious Emission	≤ 20dBc	Not Required	-
3.2	15.247(d)	Radiated Band Edges and Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 10.47 dB at 53.280 MHz
3.3	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 2.30 dB at 0.540 MHz
3.4	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass	-
Remark: Not Required means the change does not affect the test result.					

1 General Description

1.1 Applicant

LugTrack, LLC.
225 US Highway 35, Suite #201, Red Bank, New Jersey, 07701 USA

1.2 Manufacturer

LugTrack, LLC.
225 US Highway 35, Suite #201, Red Bank, New Jersey, 07701 USA

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	GLOBAL LOCATOR
Brand Name	TUMI, SAMSONITE, MONTBLANC
Model Name	014341D, 110548-1090, 110574-1090, 110620-1090, LTCS1
Marketing Name	TUMI Global Locator, Samsonite Track&Go
FCC ID	2AFPZ-TGL001
EUT supports Radios application	GPRS/EGPRS/WCDMA/HSPA/ HSPA+(16QAM uplink is not supported)/ WLAN2.4GHz 802.11b/g/n HT20/HT40/ Bluetooth v2.1+EDR/Bluetooth v4.0 LE
IMEI Code	Conducted:N/A Radiation: 014646000016661 Conduction: 014646000032502
HW Version	LGT-001-V1
SW Version	MOLY.WR8.W1315.MD.WG.MP.V35.P4
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 014341D, 110548-1090, 110574-1090, 110620-1090, LTCS1. The product equality declaration could be referred to Appendix E. Based on the similarity between current and previous project, only the conducted power, conduction and the worst cases of RSE from original test report (Sporton Report Number FR582403B) were verified for the differences.

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Frequency Range	2402 MHz ~ 2480 MHz
Number of Channels	40
Carrier Frequency of Each Channel	40 Channel(37 hopping + 3 advertising channel)
Maximum Output Power to Antenna	-4.24 dBm (0.00038 W)
Antenna Type / Gain	PIFA Antenna with gain 1 dBi
Type of Modulation	Bluetooth LE : GFSK

1.5 Modification of EUT

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

1.6 Testing Location

Sporton International (Shenzhen) Inc. is accredited to ISO 17025 by National Voluntary Laboratory Accreditation Program (NVLAP code: 600156-0) and the FCC designation No. are CN5018 and CN5019.

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 Test Firm Registration No.**
	TH01-SZ	CO01-SZ	251365

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 Test Firm Registration No.**
	03CH03-SZ	577730

Note: The test site complies with ANSI C63.4 2014 requirement.

1.7 Applicable Standards

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

- FCC Part 15 Subpart C §15.247
- FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04
- ANSI C63.10-2013

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

2.1 Descriptions of Test Mode

The RF output power was recorded in the following table:

Channel	Frequency	Bluetooth LE RF Output Power
		Data Rate / Modulation
		GFSK
		1Mbps
Ch00	2402MHz	-4.24 dBm
Ch19	2440MHz	-4.55 dBm
Ch39	2480MHz	-5.05 dBm

a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction (150 kHz to 30 MHz), radiation (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). Pre-scanned tests, X, Y, Z in three orthogonal panels to determine the final configuration (Z plane as worst plane) from all possible combinations.

b. AC power line Conducted Emission was tested under maximum output power.

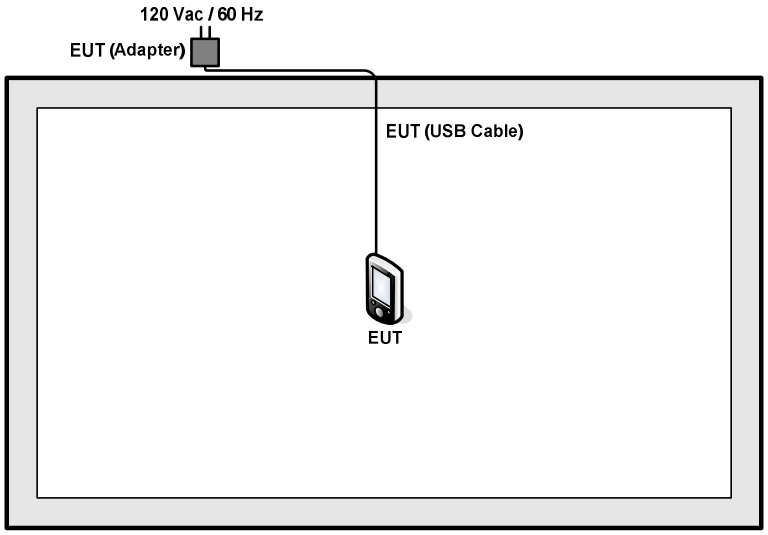
2.2 Test Mode

The following summary table is showing all test modes to demonstrate in compliance with the standard.

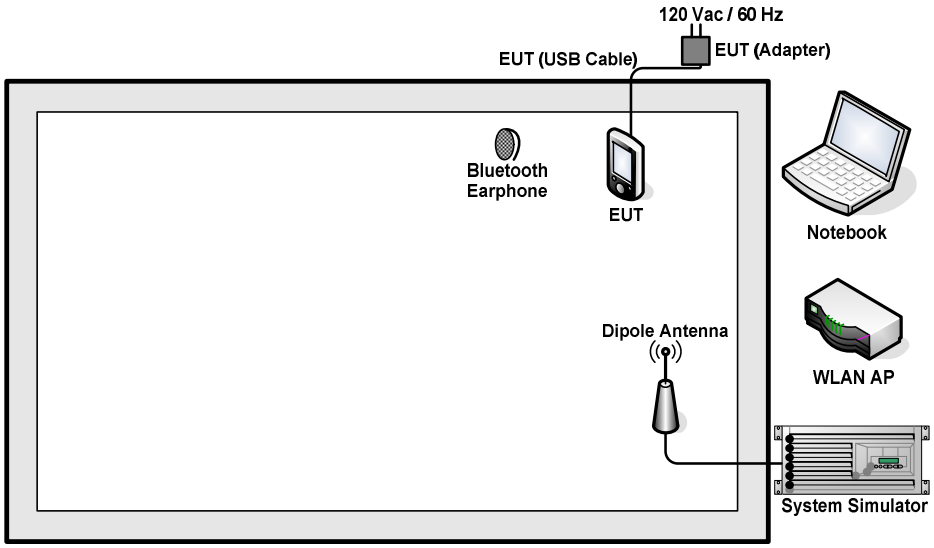
Summary table of Test Cases	
Test Item	**Data Rate / Modulation**
	Bluetooth LE / GFSK
Conducted TCs	Mode 1: Bluetooth Tx CH00_2402 MHz_1Mbps Mode 2: Bluetooth Tx CH19_2440 MHz_1Mbps Mode 3: Bluetooth Tx CH39_2480 MHz_1Mbps
Radiated TCs	Mode 1: Bluetooth Tx CH00_2402 MHz_1Mbps Mode 2: Bluetooth Tx CH19_2440 MHz_1Mbps Mode 3: Bluetooth Tx CH39_2480 MHz_1Mbps
AC Conducted Emission	Mode 1: GPRS850 Idle + Bluetooth Link + WLAN Link + Battery + USB Cable (Charging from Adapter)
Remark: For Radiated TCs, The tests were performed with Adapter, Battery and USB Cable.	

2.3 Connection Diagram of Test System

<Bluetooth LE Tx Mode>



<AC Conducted Emission Mode>



2.4 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.	Notebook	Lenovo	E540	FCC DoC	N/A	shielded cable DC O/P 1.8 m unshielded AC I/P cable1.2 m
4.	Bluetooth Earphone	Samsung	EO-MG900	N/A	N/A	N/A

2.5 EUT Operation Test Setup

For Bluetooth v4.0 function, the engineering test program was provided and enabled to make EUT continuous transmit/receive.

For AC power line conducted emissions, the EUT was set to connect with the WLAN AP under large package sizes transmission.

3 Test Result

3.1 Peak Output Power Measurement

3.1.1 Limit of Peak Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. If transmitting antenna of directional gain greater than 6dBi is used, the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

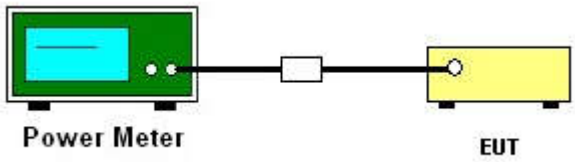
3.1.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.1.3 Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v04 section 9.1.2 PKPM1 Peak power meter method.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

3.1.4 Test Setup



3.1.5 Test Result of Peak Output Power

Test data refers to Appendix A.

3.2 Radiated Band Edges and Spurious Emission Measurement

3.2.1 Limit of Radiated Band Edges and Spurious Emission

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the limits as below.

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

3.2.2 Measuring Instruments

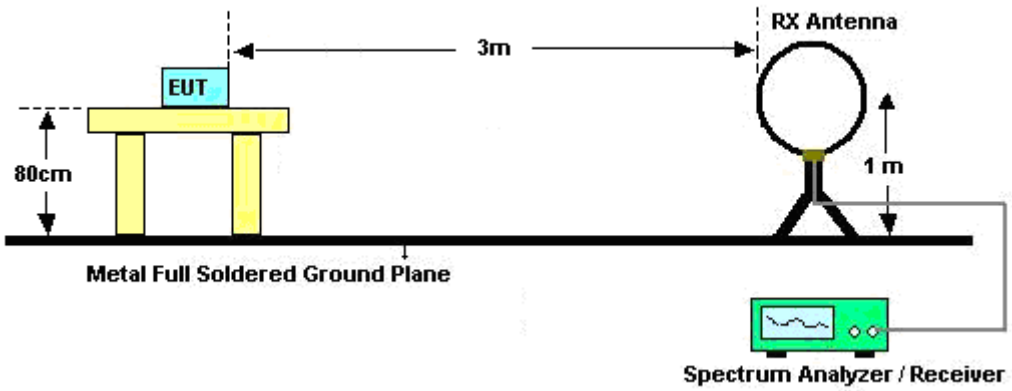
The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.2.3 Test Procedures

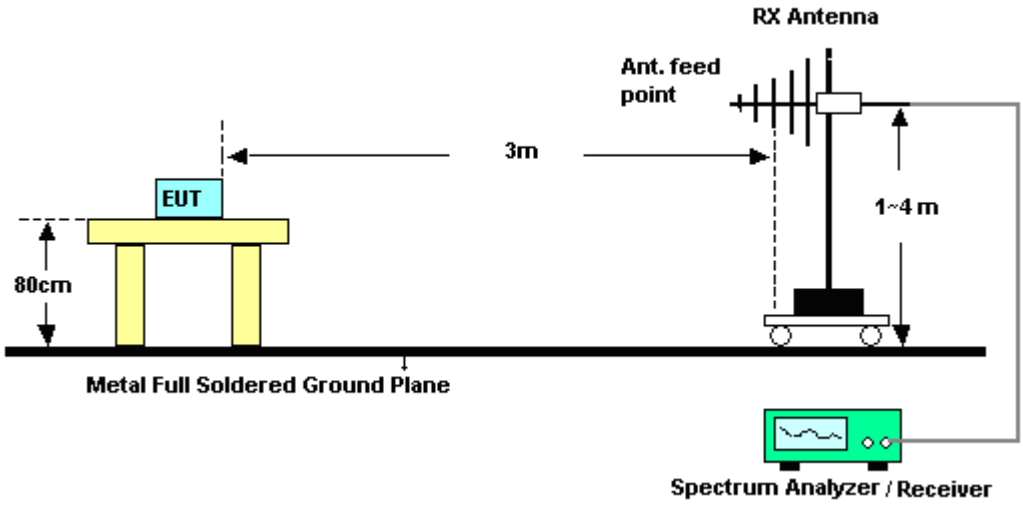
1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. Use the following spectrum analyzer settings:
   (1) Span shall wide enough to fully capture the emission being measured;
   (2) Set RBW=100 kHz for f < 1 GHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
   (3) Set RBW = 1 MHz, VBW= 3MHz for f ≥ 1 GHz for peak measurement.
   For average measurement:
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

3.2.4 Test Setup

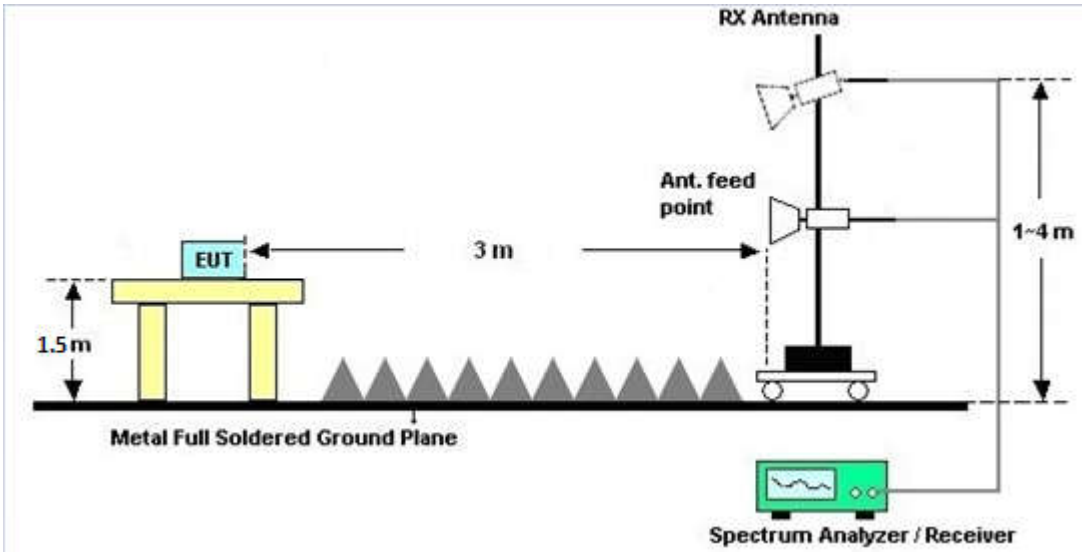
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.2.5 Test Results of Radiated Spurious Emissions (9 kHz ~ 30 MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

3.2.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix B.

3.2.7 Duty Cycle

Please refer to Appendix C.

3.2.8 Test Result of Radiated Spurious Emission (30MHz ~ 10th Harmonic)

Please refer to Appendix B.

3.3 AC Conducted Emission Measurement

3.3.1 Limit 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.

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.

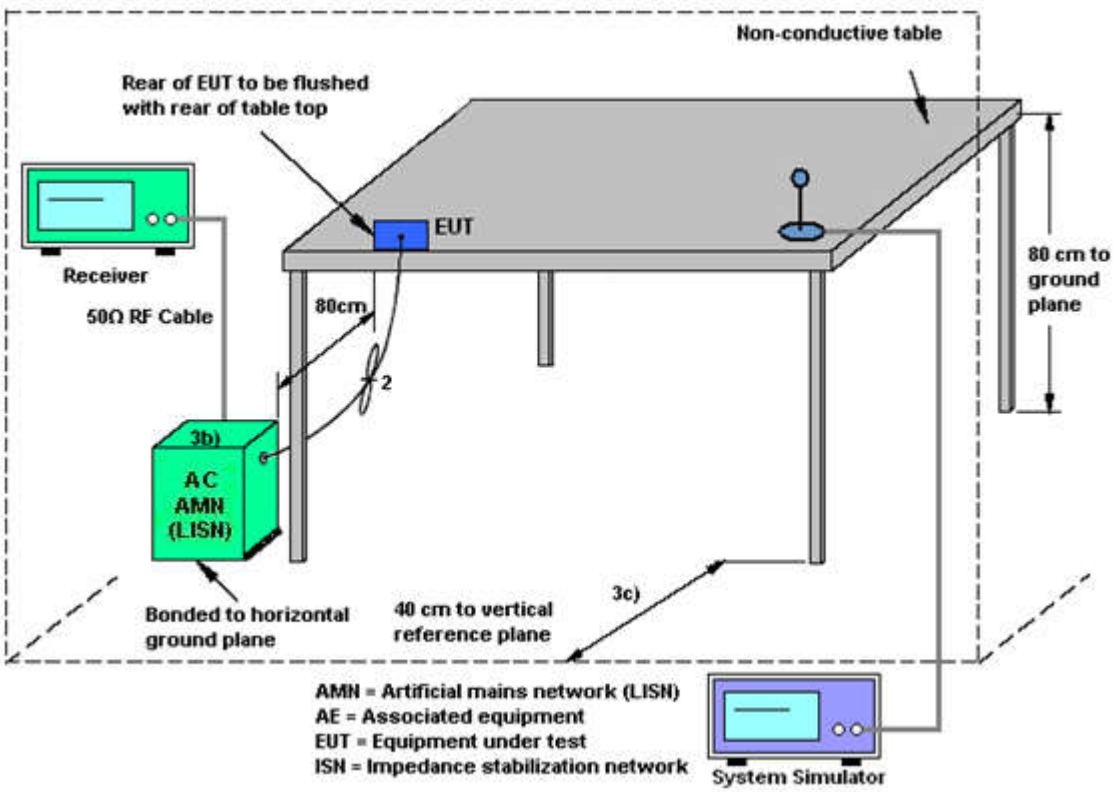
3.3.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.3.3 Test Procedures

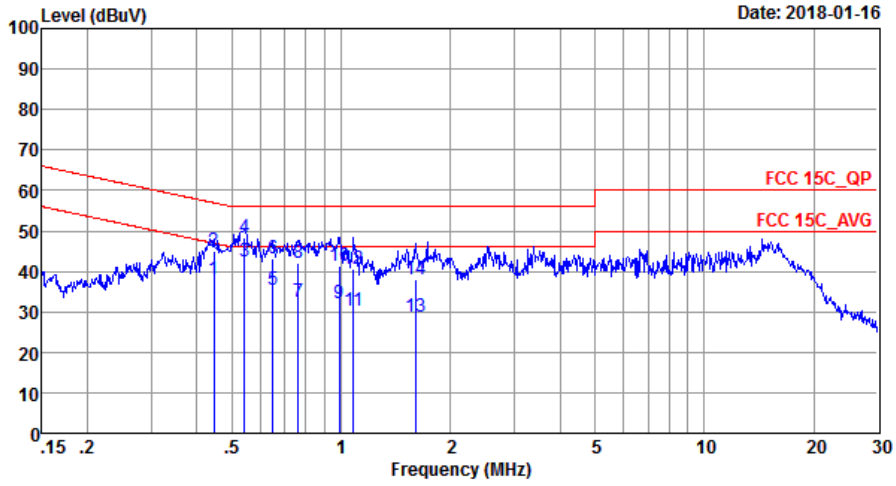
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
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.

3.3.4 Test Setup



3.3.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	22~25℃
Test Engineer :	Peng Wang	Relative Humidity :	50~55%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GPRS850 Idle + Bluetooth Link + WLAN Link + Battery + USB Cable (Charging from Adapter)		

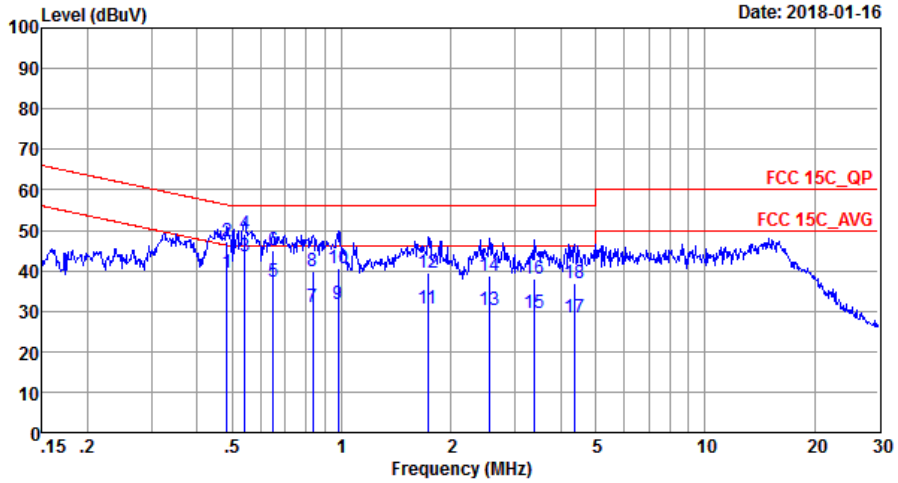


Site : CO01-SZ
Condition: FCC 15C_QP LISN_20170907_L LINE

Mode : Mode 1
IMEI : 014646000032502

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1		0.45	38.01	-8.92	46.93	27.90	0.03	10.08	Average
2		0.45	45.01	-11.92	56.93	34.90	0.03	10.08	QP
3	*	0.54	42.40	-3.60	46.00	32.30	0.02	10.08	Average
4		0.54	48.20	-7.80	56.00	38.10	0.02	10.08	QP
5		0.65	35.60	-10.40	46.00	25.50	0.02	10.08	Average
6		0.65	43.00	-13.00	56.00	32.90	0.02	10.08	QP
7		0.76	32.61	-13.39	46.00	22.50	0.03	10.08	Average
8		0.76	42.01	-13.99	56.00	31.90	0.03	10.08	QP
9		0.99	32.16	-13.84	46.00	22.00	0.07	10.09	Average
10		0.99	41.46	-14.54	56.00	31.30	0.07	10.09	QP
11		1.08	30.27	-15.73	46.00	20.11	0.07	10.09	Average
12		1.08	40.47	-15.53	56.00	30.31	0.07	10.09	QP
13		1.60	28.80	-17.20	46.00	18.60	0.10	10.10	Average
14		1.60	37.90	-18.10	56.00	27.70	0.10	10.10	QP

Test Mode :	Mode 1	Temperature :	22~25℃
Test Engineer :	Peng Wang	Relative Humidity :	50~55%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GPRS850 Idle + Bluetooth Link + WLAN Link + Battery + USB Cable (Charging from Adapter)		



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

Mode : Mode 1
IMEI : 014646000032502

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1		0.48	39.50	-6.77	46.27	29.40	0.02	10.08	Average
2		0.48	47.10	-9.17	56.27	37.00	0.02	10.08	QP
3	*	0.54	43.70	-2.30	46.00	33.60	0.02	10.08	Average
4		0.54	48.90	-7.10	56.00	38.80	0.02	10.08	QP
5		0.65	37.40	-8.60	46.00	27.30	0.02	10.08	Average
6		0.65	44.90	-11.10	56.00	34.80	0.02	10.08	QP
7		0.83	31.12	-14.88	46.00	21.00	0.03	10.09	Average
8		0.83	39.82	-16.18	56.00	29.70	0.03	10.09	QP
9		0.98	31.74	-14.26	46.00	21.60	0.05	10.09	Average
10		0.98	40.54	-15.46	56.00	30.40	0.05	10.09	QP
11		1.73	30.75	-15.25	46.00	20.60	0.05	10.10	Average
12		1.73	39.35	-16.65	56.00	29.20	0.05	10.10	QP
13		2.54	30.36	-15.64	46.00	20.19	0.04	10.13	Average
14		2.54	38.86	-17.14	56.00	28.69	0.04	10.13	QP
15		3.40	29.49	-16.51	46.00	19.30	0.04	10.15	Average
16		3.40	38.19	-17.81	56.00	28.00	0.04	10.15	QP
17		4.36	28.53	-17.47	46.00	18.30	0.06	10.17	Average
18		4.36	36.83	-19.17	56.00	26.60	0.06	10.17	QP

3.4 Antenna Requirements

3.4.1 Standard Applicable

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the rule.

3.4.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.4.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Pulse Power Senor	Anritsu	MA2411B	1207253	30MHz~40GHz	Dec. 26, 2017	Jan. 11, 2018	Dec. 25, 2018	Conducted (TH01-SZ)
Power Meter	Anritsu	ML2495A	1218010	50MHz Bandwidth	Dec. 26, 2017	Jan. 11, 2018	Dec. 25, 2018	Conducted (TH01-SZ)
EMI Test Receiver&SA	KEYSIGHT	N9038A	MY54450083	20Hz~8.4GHz	Apr. 20, 2017	Jan. 16, 2018	Apr. 19, 2018	Radiation (03CH03-SZ)
EXA Spectrum Anaiyzer	KEYSIGHT	N9010A	MY55150246	10Hz~44GHz;	Apr. 20, 2017	Jan. 16, 2018	Apr. 19, 2018	Radiation (03CH03-SZ)
Loop Antenna	R&S	HFH2-Z2	100354	9kHz~30MHz	May 14, 2017	Jan. 16, 2018	May 13, 2018	Radiation (03CH03-SZ)
Bilog Antenna	TeseQ	CBL6112D	35408	30MHz-2GHz	May 14, 2017	Jan. 16, 2018	May 13, 2018	Radiation (03CH03-SZ)
Double Ridge Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-1355	1GHz~18GHz	Jul. 09, 2017	Jan. 16, 2018	Jul. 08, 2018	Radiation (03CH03-SZ)
HF Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz	Jul. 18, 2017	Jan. 16, 2018	Jul. 17, 2018	Radiation (03CH03-SZ)
SHF-EHF Horn	com-power	AH-840	101071	18Ghz-40GHz	Jun. 16, 2017	Jan. 16, 2018	Jun. 15, 2018	Radiation (03CH03-SZ)
Amplifier	Burgeon	BPA-530	102210	0.01Hz ~3000MHz	Oct. 19, 2017	Jan. 16, 2018	Oct. 18, 2018	Radiation (03CH03-SZ)
HF Amplifier	MITEQ	AMF-7D-00101800-30-10P-R	1943528	1GHz~18GHz	Oct. 19, 2017	Jan. 16, 2018	Oct. 18, 2018	Radiation (03CH03-SZ)
Amplifier	Agilent Technologies	83017A	MY39501302	500MHz~26.5GHz	Jan. 06, 2017	Jan. 16, 2018	Jan. 05, 2018	Radiation (03CH03-SZ)
AC Power Source	Chroma	61601	616010001985	N/A	NCR	Jan. 16, 2018	NCR	Radiation (03CH03-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Jan. 16, 2018	NCR	Radiation (03CH03-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Jan. 16, 2018	NCR	Radiation (03CH03-SZ)
EMI Receiver	R&S	ESR7	101630	9kHz~7GHz;	Dec. 26, 2017	Jan. 16, 2018	Dec. 25, 2018	Conduction (CO01-SZ)
AC LISN	EMCO	3816/2SH	00103912	9kHz~30MHz	Dec. 26, 2017	Jan. 16, 2018	Dec. 25, 2018	Conduction (CO01-SZ)
AC LISN (for auxiliary equipment)	MessTec	3816/2SH	00103892	9kHz~30MHz	Nov. 01, 2017	Jan. 16, 2018	Oct. 31, 2018	Conduction (CO01-SZ)
AC Power Source	Chroma	61602	616020000891	100Vac~250Vac	Jul. 19, 2017	Jan. 16, 2018	Jul. 18, 2018	Conduction (CO01-SZ)

NCR: No Calibration Required

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.5dB**

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.1dB**

Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.0dB**

Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.0dB**

Appendix A. Conducted Test Results

Bluetooth Low Energy

Test Engineer:	Sam Zhang	Temperature:	21~25	°C
Test Date:	2018/1/11	Relative Humidity:	51~54	%

TEST RESULTS DATA
Peak Power Table

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak Conducted Power (dBm)	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
BLE	1Mbps	1	0	2402	-4.24	30.00	1.00	-3.24	36.00	Pass
BLE	1Mbps	1	19	2440	-4.55	30.00	1.00	-3.55	36.00	Pass
BLE	1Mbps	1	39	2480	-5.05	30.00	1.00	-4.05	36.00	Pass

TEST RESULTS DATA
Average Power Table
(Reporting Only)

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)
BLE	1Mbps	1	0	2402	2.21	-6.47
BLE	1Mbps	1	19	2440	2.21	-7.15
BLE	1Mbps	1	39	2480	2.21	-8.14

Appendix B. Radiated Spurious Emission

15C 2.4GHz 2400~2483.5MHz

BLE (Band Edge @ 3m)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE CH 39 2480MHz	*	2480	92.43	-	-	93.91	27.46	5.19	34.13	137	112	P	H
	*	2480	91.99	-	-	93.47	27.46	5.19	34.13	137	112	A	H
		2490.84	49.48	-24.52	74	50.92	27.5	5.19	34.13	137	112	P	H
		2491.8	40.27	-13.73	54	41.69	27.5	5.19	34.11	137	112	A	H
	*	2480	88.78	-	-	90.26	27.46	5.19	34.13	328	10	P	V
	*	2480	87.45	-	-	88.93	27.46	5.19	34.13	328	10	A	V
		2490.48	49.4	-24.6	74	50.84	27.5	5.19	34.13	328	10	P	V
		2491	40.31	-13.69	54	41.75	27.5	5.19	34.13	328	10	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

15C 2.4GHz 2400~2483.5MHz

BLE (Harmonic @ 3m)

BLE	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE CH 39 2480MHz		4960	39.64	-34.36	74	57.44	31.87	8.65	58.32	251	0	P	H
		7440	45.58	-28.42	74	58.89	35.91	10.25	59.47	251	0	P	H
		4960	40.48	-33.52	74	58.28	31.87	8.65	58.32	251	0	P	V
		7440	46.14	-27.86	74	59.45	35.91	10.25	59.47	251	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

15C Emission below 1GHz

2.4GHz BLE (LF)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2.4GHz BLE LF		30.97	24.64	-15.36	40	30.39	26.28	0.57	32.6	-	-	P	H
		108.57	18.07	-25.43	43.5	30.48	18.63	1.07	32.11	-	-	P	H
		182.29	23.98	-19.52	43.5	37.85	16.38	1.37	31.62	-	-	P	H
		275.41	34.67	-11.33	46	46.42	18.56	1.74	32.05	100	125	P	H
		559.62	26.82	-19.18	46	30.75	25.02	2.57	31.52	-	-	P	H
		746.83	28.93	-17.07	46	30.43	27.32	2.97	31.79	-	-	P	H
		30	27.5	-12.5	40	32.84	26.7	0.56	32.6	-	-	P	V
		53.28	29.53	-10.47	40	45.91	15.38	0.74	32.5	100	136	P	V
		84.32	25.21	-14.79	40	40.12	16.44	0.95	32.3	-	-	P	V
		185.2	25.76	-17.74	43.5	39.68	16.25	1.39	31.56	-	-	P	V
		294.81	28.13	-17.87	46	39.35	18.99	1.8	32.01	-	-	P	V
		699.3	28.01	-17.99	46	29.1	27.65	2.86	31.6	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

Note symbol

*	**Fundamental Frequency** which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency per 15.209(c).
!	Test result is **over limit** line.
P/A	**P**eak or **A**verage
H/V	**H**orizontal or **V**ertical

A calculation example for radiated spurious emission is shown as below:

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Level(dBμV/m) =

Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

2. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)

= 55.45 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)

= 43.54 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

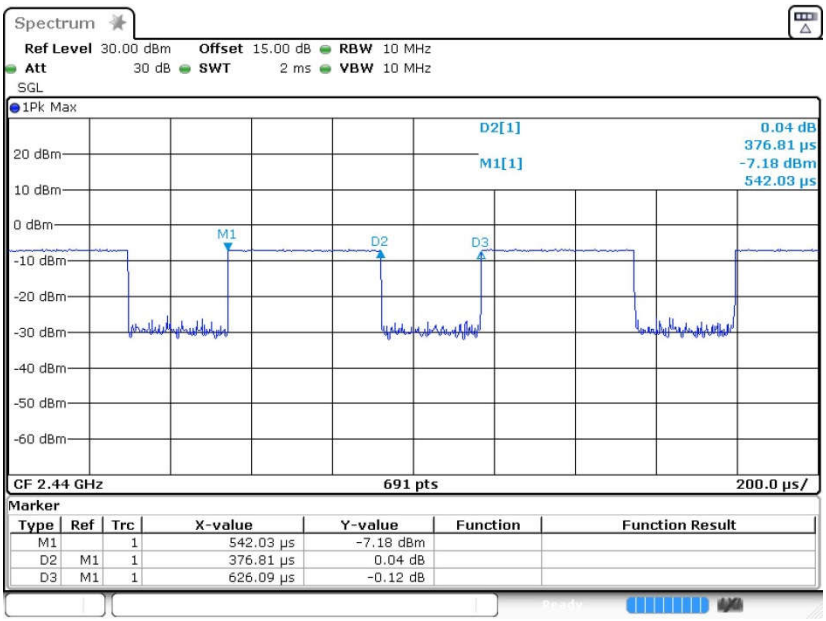
= -10.46(dB)

Both peak and average measured complies with the limit line, so test result is "PASS".

Appendix C. Duty Cycle Plots

Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
Bluetooth v4.0 LE	60.18	0.377	2.654	3kHz

Bluetooth v4.0 LE



Appendix E. Product Equality Declaration

LugTrack, LLC.

225 US Highway 35, Suite #201, Red Bank, New Jersey, 07701 USA

Date: January 19, 2018

Product Equality Declaration

We, LugTrack, LLC., declare on our sole responsibility for the differences between initially FCC-certified product:
FCC ID: 2AFPZ-TGL001
BRAND NAME: TUMI
MODEL NAME: 014341D
MARKETING NAME: TUMI Global Locator
and the current product:
FCC ID: 2AFPZ-TGL001
BRAND NAME: "TUMI" or "SAMSONITE" or "MONTBLANC"
MODEL NAME: "014341D" or "110548-1090" or "110574-1090" or "110620-1090" or "LTCS1"
MARKETING NAME: "TUMI Global Locator" or "Samsonite Track&Go"
which are listed as below:

1. Change of RAM

Description:
Original component defined and used on the first risk batch production as during certification , namely, ELPIDA with p.n. B4432BAPA-8D-F had to be substituted by the market equivalent comeponent by LEAHKINN with p.n KPN005DS-ZHw1.
The LEAHKINN product is equivalent in terms of layout, performance and electrical specs:
512Mb LP-DDR2
Density: 4G bits
Organization 16M words × 32 bits × 8 banks
Package: 168-ball FBGA
Package size: 12.0mm × 12.0mm
Power supply:VDD1 = 1.70V to 1.95V

Cause:
ELPID Memory failure and relative obsolescence and lack of availability of their market led to the selection of a pin to pin compatible solution which was found in the LEAHKINN RAM.
The new component has been tested internally and as there has not been any PCBA rerouting, no Software adaptation/modification, seen the exact "characteristics" of both components, we can declare the component has no impact in the overall device RF or power management nor electrical safety.

2. Change of ROM

   Description:

   Longsys FORESEE eMMC NCEFES88-04G eMMC ROM has been substituted with the equivalent component FORESEE NCEMAD7B-08G provided by the same Manufacturer but with upgraded storage capacity from 4GB to 8GB.

   Cause:

   Shenzhen based Longsys Technology has stopped producing the 04GB eMMC ROM components FORESEE NCEFES86-04G and actually the 4GB eMMC chips in general as the market is requiring a higher minimum storage standard, which is now 8 GB.

   To be able to produce our device we had to adapt to market decisions and switch to the upgraded version of the same vendor.

   The component does not have any difference in the logic, layout nor electrical characteristics. The substitution did not impact the PCBA layout nor the SW hence non impact in the overall RF and power management.

3. Change of RF amplifier:

   SKY77592 is a transmit and receive Front End Module (FEM) that has the same function and electrical parameters characteristics of the VANCHIP VC7590-21.

   Cause:

   Limited availability during supply management

4. Visual change of USB daughter board :

   slight visual difference and removal of a not used IC.

   Cause:

   industrialization of a sample used for certification purposes only, gerber files prove the routing is exactly the same.

5. WIFI and main RF antenna change.

   Description:

   Copper trace modification.

   Cause:

   the antenna was changed to adapt to 3GPP / ATT&T standard of TRP and TIS, the copper traces are sligthly different in shape but the values are inside the parameters as confirmed by the result testing from PTCRB OTA.

Except for those mentioned above, the remaining parts are identical.
Should you have any questions or comments regarding this matter, please have my best attention.

Sincerely yours,

Davide Fattor
Project Manager
LugTrack, LLC.
dfattor@lugtrack.com