TEST REPORT

EUT Description	**Convertible PC**
Brand Name	**HP**
Model Name	**HSN-I57C**
FCC ID	**B94HNI57CPT**
ISED ID	**21374-L860GL16**
Date of Test Start/End	**2022-09-08 / 2022-09-08**
Features	**802.11ax, Tri Band, 2x2 Wi-Fi6E + Bluetooth® 5.2**

Applicant	**HP Inc.**
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Test Report identification	**220815-02.TR06**
Revision Control	**Rev. 02** **This test report replaces any previous versions of this test report** (see Section 8)

The test results relate only to the samples tested.

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1. Standards, reference documents and applicable test methods

    a. KDB 388624 D02 Pre-Approval Guidance List v18, PRE-APPROVAL GUIDANCE LIST

    b. FCC Presentations TCB Workshop November 2019, RF exposure procedures.

2. General conditions, competences and guarantees

✓ Intel WRF Lab only provides testing services and is committed to providing reliable, unbiased test results and interpretations.

✓ Intel WRF Lab is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

✓ Intel WRF Lab has developed calibration and proficiency programs for its measurement equipment to ensure correlated and reliable results to its customers.

✓ This report is only referred to the item that has undergone the test.

✓ This report does not imply an approval of the product by the Certification Bodies or competent Authorities.

3. Environmental Conditions

✓ At the site where the measurements were performed the following limits were not exceeded during the tests:

Temperature	26.6ºC ± 2ºC
Humidity	36.3% ± 2.5%

4. Test Sample

Sample	ID #	Description	Model	Serial #	Note
#1	220815-02.S01	Convertible PC	HSN-I57C	C902NL001S	n/a

5. EUT Features

The herein information is provided by the customer.
Intel WRF Lab declines any responsibility for the accuracy of the stated customer provided information, especially if it has any impact on the correctness of test results presented in this report.

Brand Name	HP
Model Name	HSN-I57C
FW	M2_7560_R_01.2140.05
Driver Version Fibocom	18601.5001.00.01.15.19 V1.3
Host Identification	Prototype

Supported radios

The module is a data only DUT supporting UMTS and LTE, with carrier aggregation. The applicable frequency bands and operating modes are identified in the following table.
WWAN:

Mode	Bands	Supported Tx Mode			
		WCDMA	HSDPA	HSUPA	DC-HSDPA
WCDMA / HSPA+	FDD II (1850.0 – 1910.0 MHz)	✓	✓	✓	✓
	FDD IV (1710.0 – 1755.0 MHz)	✓	✓	✓	✓
	FDD V (824.0 – 849.0 MHz)	✓	✓	✓	✓

FDD/TDD	Band	Modulation	Bandwidth					
			1.4	3	5	10	15	20
LTE FDD	Band 2 (1850.0 – 1910.0 MHz)	QPSK/16QAM	✓	✓	✓	✓	✓	✓
	Band 4 (1710.0 – 1755.0 MHz)	QPSK/16QAM	✓	✓	✓	✓	✓	✓
	Band 5 (824.0 – 849.0 MHz)	QPSK/16QAM	✓	✓	✓	✓		
	Band 7 (2500.0 – 2570.0 MHz)	QPSK/16QAM			✓	✓	✓	✓
	Band 12 (699.0 – 716.0 MHz)	QPSK/16QAM	✓	✓	✓	✓		
	Band 13 (777.0 – 787.0 MHz)	QPSK/16QAM			✓	✓		
	Band 14 (788.0 – 798.0 MHz)	QPSK/16QAM			✓	✓		
	Band 17 (704.0 – 716.0 MHz)	QPSK/16QAM			✓	✓		
	Band 25 (1850.0 – 1915.0 MHz)	QPSK/16QAM	✓	✓	✓	✓	✓	✓
	Band 26 (814.0 – 849.0 MHz)	QPSK/16QAM	✓	✓	✓	✓	✓	
	Band 30 (2305.0 – 2315.0 MHz)	QPSK/16QAM			✓	✓		
	Band 66 (1710.0 – 1780.0 MHz)	QPSK/16QAM	✓	✓	✓	✓	✓	✓
LTE TDD	Band 38 (2570.0 – 2620.0 MHz)	QPSK/16QAM			✓	✓	✓	✓
	Band 41 (2496.0 – 2690.0 MHz)	QPSK/16QAM			✓	✓	✓	✓
	Band 48 (3550.0 – 3700.0 MHz)	QPSK/16QAM			✓	✓	✓	✓

UL carrier aggregation LTE (Intra-band)
FDD Band 5B
FDD Band 7C
FDD Band 38C
FDD Band 41C
FDD Band 66B
FDD Band 66C

6. Remarks and comments

1. The test report is validation of the dynamic SAR feature using G/Hall sensors

7. Test Results summary

7.1.   WWAN Tx Power Table Summary

Device Mode	Lid Angle range	LCD Direction	LTE Band 7	
			Target Power (dBm)	Measured Power (dBm)
			Antenna 5	Antenna 5
Lid Close	0°≤ - <30°	-	Standby	Standby
Notebook	30°≤ - <130°	0°	24.0	23.2
Tent	200°≤ - <340°	180°	20.0	19.3
Stand	200°≤ - <340°	0°	24.0	23.2
Tablet	130°≤ - <200° 340°≤ - <360°	-	20.0	19.3
Book	30°≤ - <200°	90°; 270°	20.0	19.3

8. Document Revision History

| Revision #	Date	Modified by	Revision Details
Rev.00	2022-10-14	Cheiel In	Initial release
Rev.01	2022-10-18	Cheiel In	Correction of section 6, model name and FCC ID
Rev.02	2022-11-14	Cheiel In	Clarification of triggering angle per FCC comments in Annex B table test results

Annex A.   Test & System description

A.1   Test setup

The conducted power measurement test setup is described in the following and illustrated in Figure 1.

- The DUT which is a Fibocom M2 L860-GL-16 module contains the XMM7560 R+ cellular modem, and installed inside HP model HSN-I57C convertible PC

- Uplink signal power is measured with the call box.
- Path loss in the power measurement setup from the XMM7560 R+ main antenna port to the call box is taken into account.

Figure.1 – Power measurement test setup.
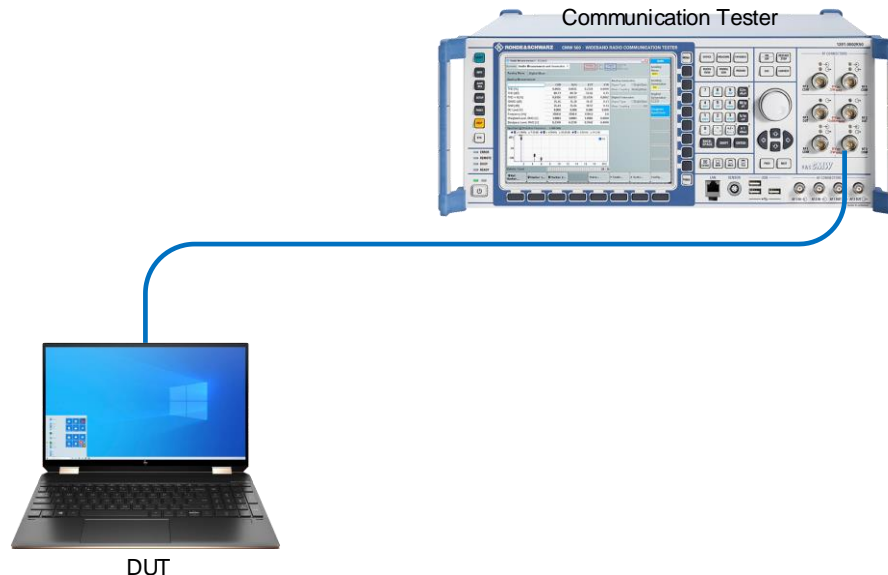
A.2   Procedure

The following additional guidance applies only to convertible laptops whose screen rotates around one axis, from 0 degrees to 360 degrees, in a clamshell style, i.e., from closed mode to open mode, to "tent" mode, and finally, to tablet mode. This process must be followed to determine the lid angle where a power reduction occurs, by taking power measurements at each step, as indicated in the step listed here below:

1.   From the lid in closed mode (0 degrees), open the screen in 10-degree steps until laptop mode is obtained
2.   Lower the screen by 5 degrees increments to verify that the "closed mode" is triggered
3.   From the position of the previous step, open the screen in 1-degree increments until laptop mode is triggered again
4.   Continue opening the screen in 1-degree increments until at least 5 degrees past where "laptop mode" was obtained, then continue opening the screen in 10-degree steps until the device switches to tablet mode
5.   Reverse the previous procedure to go from tablet mode back down to closed mode

A.3 Test Equipment List

Equipment and accessories used for the conducted power measurement test setup are listed below. The Test Platform (DUT), test setup and associated equipment are shown in A.1.3.

ID#	Device	Type/Model	Serial #	Manufacturer	Cal. Date	Cal. Due Date
144-000	Communication tester	CMW500	169123	R&S	2021-05-18	2023-05-18

Annex B. Test Results

B.1   Trigger lid angle detection and power verification

B.1.1   LCD direction 0°

The lid is rotating from 0 to 360. The screen is vertical, LCD direction is 0 degree.

Mode	Angle (degree)	Measured power LTE Band 7 Ant5
Lid close	0	Standby
	10	Standby
	20	Standby
Notebook	30	23.2
Lid close	25	Standby
	26	Standby
	27	Standby
	28	Standby
	29	Standby
Notebook	30	23.2
	31	23.2
	32	23.2
	33	23.2
	34	23.2
	35	23.2
	40	23.2
	50	23.2
	60	23.2
	70	23.2
	80	23.2
	90	23.2
	100	23.2
	110	23.2
	120	23.2
	130	23.2
Tablet	140	19.3
	135	19.3
Notebook	130	23.2
Tablet	131	19.3
	132	19.3
	133	19.3
	134	19.3
	135	19.3
	140	19.3
	150	19.3
	160	19.3

Mode	Angle (degree)	Measured power LTE Band 7 Ant5
Tablet	160	19.3
	170	19.3
	180	19.3
	190	19.3
	200	19.3
Stand	210	23.2
	205	23.2
Tablet	200	19.3
Stand	201	23.2
	202	23.2
	203	23.2
	204	23.2
	205	23.2
	210	23.2
	220	23.2
	230	23.2
	240	23.2
	250	23.2
	260	23.2
	270	23.2
	280	23.2
	290	23.2
	300	23.2
	310	23.2
	320	23.2
	330	23.2
	335	23.2
	336	23.2
	337	23.2
	338	23.2
	339	23.2
	340	23.2
Tablet	350	19.3

Mode	Angle (degree)	Measured power LTE Band 7 Ant5
Tablet	345	19.3
Stand	340	23.2
Tablet	341	19.3
	342	19.3
	343	19.3
	344	19.3
	345	19.3
	350	19.3
	360	19.3

The lid is rotating from 360 degrees to 0 degree. The screen is vertical, LCD direction to 0 degree.

Mode	Angle (degree)	Measured power LTE Band 7 Ant5
Tablet	360	19.3
	350	19.3
Stand	340	23.2
	345	19.3
	344	19.3
Tablet	343	19.3
	342	19.3
	341	19.3
	340	23.2
	339	23.2
	338	23.2
	337	23.2
	336	23.2
	335	23.2
	330	23.2
	320	23.2
	310	23.2
Stand	300	23.2
	290	23.2
	280	23.2
	270	23.2
	260	23.2
	250	23.2
	240	23.2
	230	23.2
	220	23.2
	210	23.2
Tablet	200	19.3
	205	23.2
	204	23.2
Stand	203	23.2
	202	23.2
	201	23.2
	200	19.3
	199	19.3
	198	19.3
Tablet	197	19.3
	196	19.3
	195	19.3
	190	19.3
	180	19.3

Mode	Angle (degree)	Measured power LTE Band 7 Ant5
	170	19.3
	160	19.3
Tablet	150	19.3
	140	19.3
Notebook	130	23.2
	135	19.3
	134	19.3
Tablet	133	19.3
	132	19.3
	131	19.3
	130	23.2
	129	23.2
	128	23.2
	127	23.2
	126	23.2
	125	23.2
	120	23.2
	110	23.2
Notebook	100	23.2
	90	23.2
	80	23.2
	70	23.2
	60	23.2
	50	23.2
	40	23.2
	30	23.2
Lid close	20	Standby
	25	Standby
Notebook	30	23.2
	29	Standby
	28	Standby
	27	Standby
	26	Standby
Lid Close	25	Standby
	20	Standby
	10	Standby
	0	Standby

B.1.2   LCD direction 90/270°

The lid is rotating from 0 to 360 degrees. The screen is vertical, LCD direction to 90 degrees.

Mode	Angle (degree)	Measured power LTE Band 7 Ant5
Lid close	0	Standby
	10	Standby
	20	Standby
Book	30	19.3
Lid close	25	Standby
	26	Standby
	27	Standby
	28	Standby
	29	Standby
Book	30	19.3
	31	19.3
	32	19.3
	33	19.3
	34	19.3
	35	19.3
	40	19.3
	50	19.3
	60	19.3
	70	19.3
	80	19.3
	90	19.3
	100	19.3
	110	19.3
	120	19.3
	130	19.3
	140	19.3
	150	19.3
	160	19.3
	170	19.3
	180	19.3
	190	19.3
Tablet	200	19.3
Book	195	19.3
	196	19.3
	197	19.3
	198	19.3
	199	19.3
Tablet	200	19.3
	201	19.3
	202	19.3
	203	19.3
	204	19.3
	205	19.3
	210	19.3
	220	19.3
	230	19.3
	240	19.3
	250	19.3
	260	19.3
	270	19.3
	280	19.3
	290	19.3
	300	19.3
	310	19.3
	320	19.3
	330	19.3
	340	19.3
	350	19.3
	360	19.3

The lid is rotating from 360 to 0 degree. The screen is vertical, LCD direction to 90 or 270 degrees.

Mode	Angle (degree)	Measured power LTE Band 7 Ant5
Tablet	360	19.3
	350	19.3
	340	19.3
	330	19.3
	320	19.3
	310	19.3
	300	19.3
	290	19.3
	280	19.3
	270	19.3
	260	19.3
	250	19.3
	240	19.3
	230	19.3
	220	19.3
	210	19.3
	200	19.3
Book	190	19.3
	195	19.3
Tablet	200	19.3
Book	199	19.3
	198	19.3
	197	19.3
	196	19.3
	195	19.3
	190	19.3
	180	19.3
	170	19.3
	160	19.3
	150	19.3
	140	19.3
	130	19.3
	120	19.3
	110	19.3
	100	19.3
	90	19.3
	80	19.3
	70	19.3
	60	19.3
	50	19.3
	40	19.3
	30	19.3
Lid close	20	Standby
	25	Standby
Book	30	19.3
Lid close	29	Standby
	28	Standby
	27	Standby
	26	Standby
	25	Standby
	20	Standby
	10	Standby
	0	Standby

B.1.3   LCD direction 180°

The lid is rotating from 360 degrees to 180 degrees. The screen is vertical, LCD direction to 180 degrees.
Note: The LCD direction switch to 0 degrees for low angle.

Mode	Angle (degree)	Measured power LTE Band 7 Ant5
Tablet	360	19.3
Tablet	350	19.3
Tent	340	19.3
Tablet	345	19.3
Tablet	344	19.3
Tablet	343	19.3
Tablet	342	19.3
Tablet	341	19.3
Tent	340	19.3
Tent	339	19.3
Tent	338	19.3
Tent	337	19.3
Tent	336	19.3
Tent	335	19.3
Tent	330	19.3
Tent	320	19.3
Tent	310	19.3
Tent	300	19.3
Tent	290	19.3
Tent	280	19.3
Tent	270	19.3
Tent	260	19.3
Tent	250	19.3
Tent	240	19.3
Tent	230	19.3
Tent	220	19.3
Tent	210	19.3
Tablet	200	19.3
Tent	205	19.3
Tent	204	19.3
Tent	203	19.3
Tent	202	19.3
Tent	201	19.3
Tablet	200	19.3
Tablet	199	19.3
Tablet	198	19.3
Tablet	197	19.3
Tablet	196	19.3
Tablet	195	19.3
Tablet	190	19.3
Tablet	180	19.3

The lid is rotating from 180 degrees to 360 degrees. The screen is vertical, LCD direction to 180 degrees.
Note: The LCD direction switch to 0 degrees for low angle.

Mode	Angle (degree)	Power measured LTE Band 7 Ant5
Tablet	180	19.3
	190	19.3
Tent	200	19.3
Tablet	195	19.3
	196	19.3
	197	19.3
	198	19.3
	199	19.3
Tent	200	19.3
	201	19.3
	202	19.3
	203	19.3
	204	19.3
	205	19.3
	210	19.3
	220	19.3
	230	19.3
	240	19.3
	250	19.3
	260	19.3
	270	19.3
	280	19.3
	290	19.3
	300	19.3
	310	19.3
	320	19.3
	330	19.3
	340	19.3
Tent	350	19.3
	345	19.3
	340	19.3
Tablet	341	19.3
	342	19.3
	343	19.3
	344	19.3
	345	19.3
	350	19.3
	360	19.3