

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

Applicant: HP Inc.
1501 Page Mill Road, Palo Alto CA 94304 USA
Product Name: Notebook Computer
Brand Name: HP
Model No.: HSN-I41C-4
Model Difference: N/A
Report Number: ER/2020/80161
FCC ID: B94HNI41C4TKR
FCC Rule Part: 2, 96E
Issue Date: Oct. 28, 2020
Date of Test: Aug. 31, 2020 ~ Sep. 21, 2020
Date of EUT Received: Aug. 31, 2020

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Central RF Lab. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.26-2015 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits.

The test results of this partial report relate only to the tested sample identified in this report.

Approved By:



Jim Chang / Manager



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Revision History

Report Number	Revision	Description	Issue Date	Remark
ER/2020/80161	Rev.00	Original.	Oct. 28, 2020	Revised By: Violetta Tang

Note:

1、Disclaimer

Antenna information is provided by the applicant, test results of this report are applicable to the sample EUT received.

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1. GENERAL PRODUCT INFORMATION

1.1. Product Description

General:

Product Name:	Notebook Computer	
Brand Name:	HP	
Model No.:	HSN-I41C-4	
Model Difference:	N/A	
Hardware Version:	N/A	
Software Version:	N/A	
WWAN Module:	Model No.: T99W175, Supplier: HON LIN Technology Co., Ltd.	
Power Supply:	11.55Vdc from Rechargeable Li-ion Battery or 19.5V from AC/DC Adapter	
	Battery:	Model No.: HSTNN-LB8Q, Supplier: HP
	Adapter:	Model No.: TPN-DA16, Supplier: DELTA
IMEI:	356081110011236	

1.2. LTE: Cellular Phone Standards Frequency Range 3500~3700MHz

LTE Band	BW (MHz)	Operation Frequency (MHz)	
42	5	3552.5	- 3597.5
	10	3555.0	- 3592.5
	15	3557.5	- 3585.0
	20	3560.0	- 3575.0
48	5	3552.5	- 3697.5
	10	3555.0	- 3695.0
	15	3557.5	- 3692.5
	20	3560.0	- 3690.0

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1.3. Antenna Designation

Vendor	Type	TX1 / TX2	Antenna Part No.	Modulation	Frequency (MHz)	Peak Antenna Gain (dBi)
AWAN	PIFA	TX2	6036B0281201 (AUP6Y-100073)	LTE Band 42	3400 ~ 3600	-1.54
				LTE Band 48	3550 ~ 3700	-1.54

Vendor	Type	TX1 / TX2	Antenna Part No.	Modulation	Frequency (MHz)	Peak Antenna Gain (dBi)
HONG-BO	PIFA	TX2	6036B0278401 (260-27440)	LTE Band 42	3400 ~ 3600	-0.16
				LTE Band 48	3550 ~ 3700	-0.16

Vendor	Type	TX1 / TX2	Antenna Part No.	Modulation	Frequency (MHz)	Peak Antenna Gain (dBi)
WNC	PIFA	TX2	6036B0277601 (81EABD15.G07)	LTE Band 42	3400 ~ 3600	0.82
				LTE Band 48	3550 ~ 3700	1.59

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1.4. Test Methodology of Applied Standards

FCC 47 CFR Part 2, Part 96E

ANSI C63.26-2015

ANSI/ITA C603-E.2016

KDB 971168 D01 Power Meas license Digital System v03r01

KDB 940660 D01 Part 96 CBRS Eqpt v02

KDB 412172 D01 Determining ERP and EIRP V01r01

Note: All test items have been performed and record as per the above standards.

1.5. Test Facility

SGS Taiwan Ltd. Central RF Lab (TAF code 3702)

No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803

FCC Registration Numbers: TW0027

1.6. Special Accessories

No special accessories were used during testing.

1.7. Equipment Modifications

There were no modifications incorporated into the EUT.

1.8. Radiated Emission Test Sites For Measurements From 9 kHz To 30 MHz

Radiated emission below 30MHz is measured in a 9m*9m*6m semi-anechoic chamber, the measurements correspond to those obtained at an open-field test site.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

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2. SYSTEM TEST CONFIGURATION

2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2. EUT Exercise

The EUT (Transmitter) was operated in the continuous transmission mode employed with the simulator of the Base Station that fixates at test default channels to fix the Tx frequency which was for the purpose of the measurements.

2.3. Test Procedure

2.3.1 Radiated Emissions (ERP/EIRP)

According to measurement procured ANSI C63.26-2015, The EUT is placed on a turn table, for emission measurements below 1 GHz is 0.8 m above ground plane, for emission measurements above 1 GHz, the table height shall be 1.5 m. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both Horizontal and Vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.

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2.4. Configuration of Tested System

Fig. 2-1 Configuration of Tested System (Fixed Channel-Radiated)

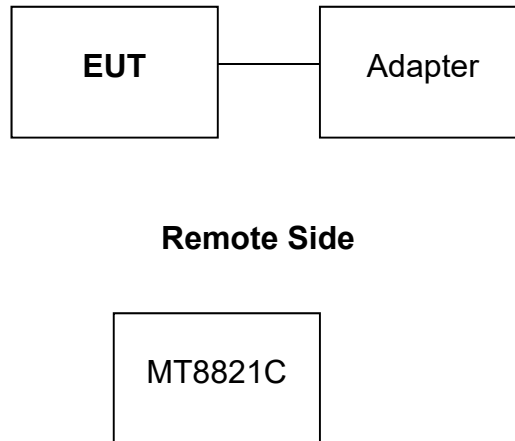


Table 2-1 Equipment Used in

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
1.	Radio Communication Analyzer	Anritsu	MT8820C	6201465317	shielded	Un-shielded

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3. SUMMARY OF TEST RESULTS

3.1. Decision rules

Reported measurement data comply with ANSI C63.26-2015:

Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

3.2. Summary of test results

FCC Rules	Description Of Test	Result
§2.1053, §96.41(e)	FIELD STRENGTH OF SPURIOUS RADIATION	Compliant

3.3. Reporting statements of conformity

The conformity statement in this report is based solely on the test results, measurement uncertainty is excluded.

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4. DESCRIPTION OF TEST MODES

4.1. The Worst Test Modes and Channel Details

1. The EUT has been tested under operating condition.
2. The LTE B42 & 48 are operating in a same frequency range with same technology, observation upon both bands that result same emission level, therefore, LTE B48 is demonstrated in this report to cover LTE B42.
3. The field strength of radiation emission was measured as NB Plane for Transmitter for channel Low, Mid and High.

4.2. Measurement Configuration

LTE Band	Test Channel	Channel Bandwidth (MHz)	Modulation	Resource Block Allocation		Antenna
				RBs allocated	RB Start	
48	L,M,H	20	QPSK	1	0	WNC

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5. MEASUREMENT UNCERTAINTY

Radiated Spurious Emission:

Measurement uncertainty (Polarization : Vertical)	9kHz – 30MHz: +/- 2.87 dB
	30MHz - 180MHz: +/- 3.37dB
	180MHz -417MHz: +/- 3.19dB
	0.417GHz-1GHz: +/- 3.19dB
	1GHz - 18GHz: +/- 4.04dB
	18GHz - 40GHz: +/- 4.04dB

Measurement uncertainty (Polarization : Horizontal)	9kHz – 30MHz: +/- 2.87 dB
	30MHz - 167MHz: +/- 4.22dB
	167MHz -500MHz: +/- 3.44dB
	0.5GHz-1GHz: +/- 3.39dB
	1GHz - 18GHz: +/- 4.08dB
	18GHz - 40GHz: +/- 4.08dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

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6. FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT

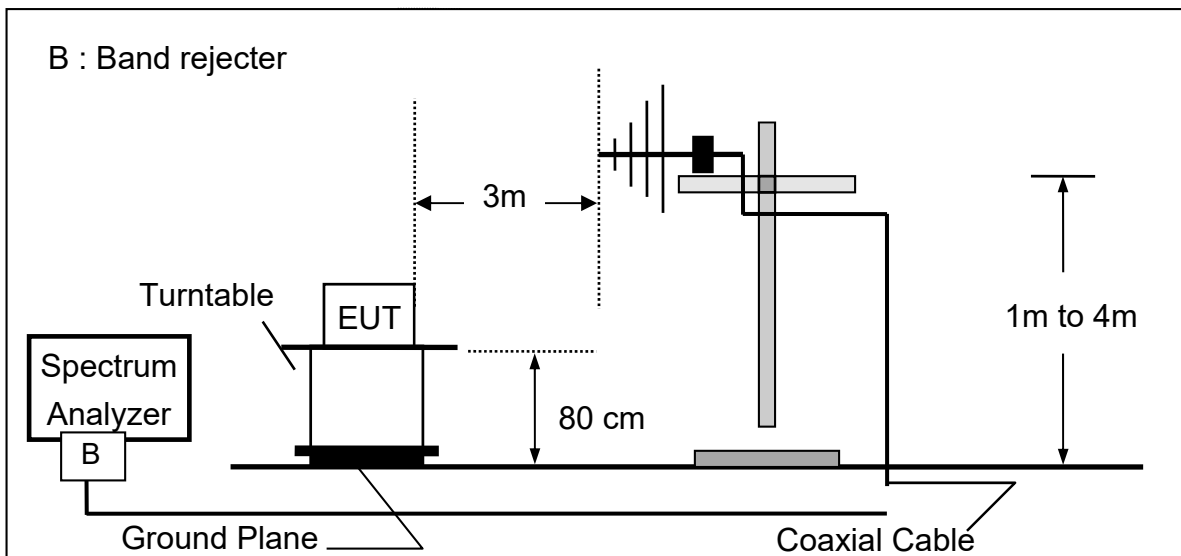
6.1. Standard Applicable

FCC Part 2.1053, Part 96.41 , C63.26 Clause 5.7

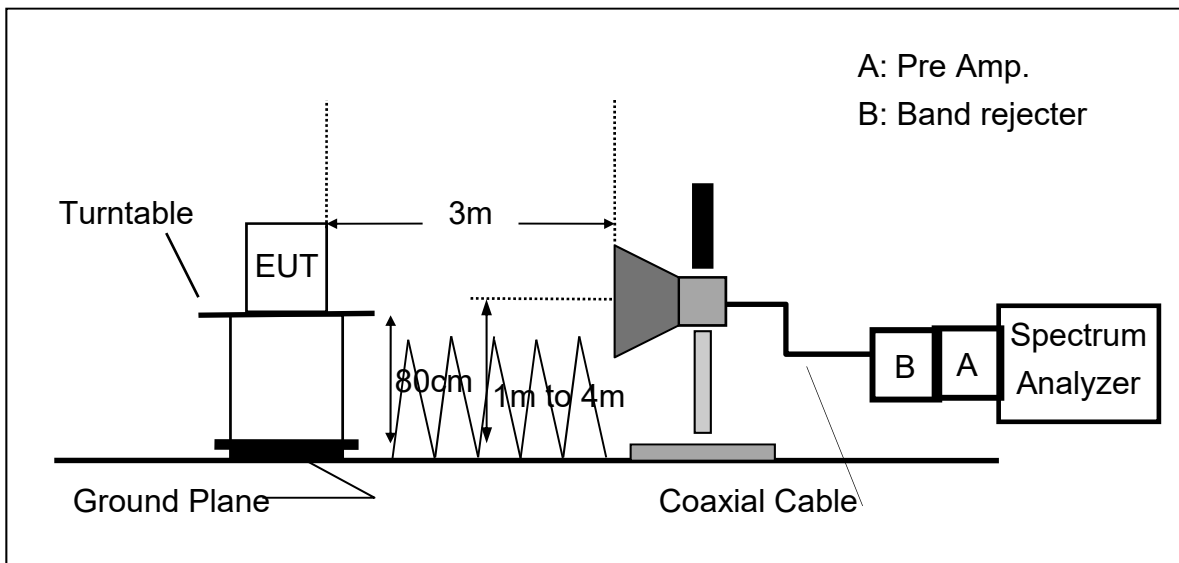
1. within 0 MHz to 10 MHz above and below the **assigned channel** ≤ -13 dBm/MHz
2. greater than 10 MHz above and below the **assigned channel** ≤ -25 dBm/MHz
3. any emission below 3530 MHz and above 3720 MHz ≤ -40 dBm/MHz

6.2. EUT Setup

Radiated Emission Test Set-Up, Frequency Below 1000MHz



Radiated Emission Test Set-UP Frequency Over 1 GHz



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6.3. Measurement Procedure:

The EUT was placed on a non-conductive; the measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

The frequency range up to tenth harmonic was investigated for each of three fundamental frequencies (low, middle and high channels). Once spurious emission was identified, the power of the emission was determined using the substitution method.

The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency.

$$\text{ERP (dBm)} = \text{SG Level(dBm)} + \text{Antenna Gain(dBd)} + \text{Cable Loss(dB)}$$

$$\text{EIRP (dBm)} = \text{SG Level(dBm)} + \text{Antenna Gain(dBi)} + \text{Cable Loss(dB)}$$

6.4. Measurement Equipment Used:

ERP, EIRP MEASUREMENT EQUIPMENT List 966 Chamber					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Horn Antenna	Schwarzbeck	BBHA9170	184	12/25/2019	12/24/2020
Horn Antenna	Schwarzbeck	BBHA9120D	D803	12/20/2019	12/19/2020
Bi-log Antenna	TESEO	CBL 6112D	35242 & AT-N0555	01/13/2020	01/12/2021
Spectrum Analyzer	Agilent	E4446A	MY51100003	10/23/2019	10/22/2020
Radio Communication Analyzer	Anritsu	MT8821C	6261786084	01/18/2020	01/17/2021
EMI Test Receiver	R&S	ESCI 7	100759	07/13/2020	07/12/2021
Pre-Amplifier	EMC Instruments	EMC184045B	980135	01/02/2020	01/01/2021
Pre-Amplifier	EMC Instruments	EMC051825	980152	01/02/2020	01/01/2021
Pre-Amplifier	HP	8447D	2944A09469	01/02/2020	01/01/2021
Filter 3300-3800	Micro-Tronics	WI	1	01/02/2020	01/01/2021
1GHz High Pass Filter	Micro-Tronics	HPM50108	32	01/02/2020	01/01/2021
2GHz High Pass Filter	Micro-Tronics	HPM50110	36	01/02/2020	01/01/2021
High Pass Filter	WI	WHKX4.0/18G-10SS	22	01/02/2020	01/01/2021
Coaxial Cable	Huber Suhner	succoflex 102	MY2622/2	01/02/2020	01/01/2021
Coaxial Cable	Huber Suhner	succoflex 104A	800086/4a	01/02/2020	01/01/2021
Coaxial Cable	Huber Suhner	EMC 104-SM-SM-2000	160123	01/02/2020	01/01/2021

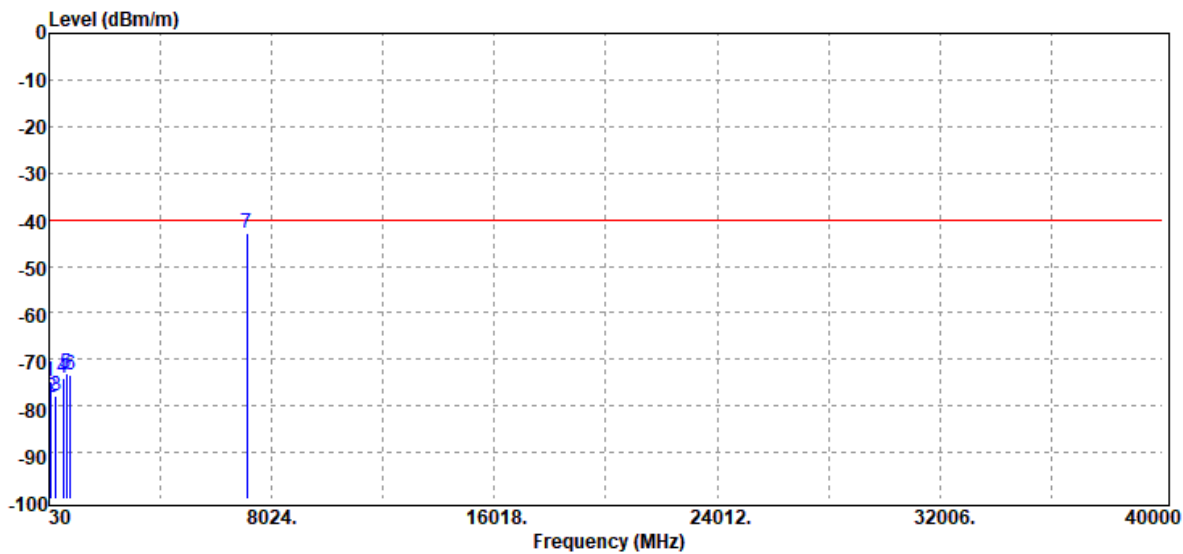
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6.5. Measurement Result:

Report Number	:ER/2020/80161	Test Site	:SAC I Chamber
Operation Mode	:LTE B48	Test Date	:2020-09-19
Test Mode	:Tx CH Low	Temp./Humi.	:22.5/63
EUT Pol	:NB Plane	Antenna Pol.	:VERTICAL
Test Frequency	:3560 MHz	Engineer	:Neo



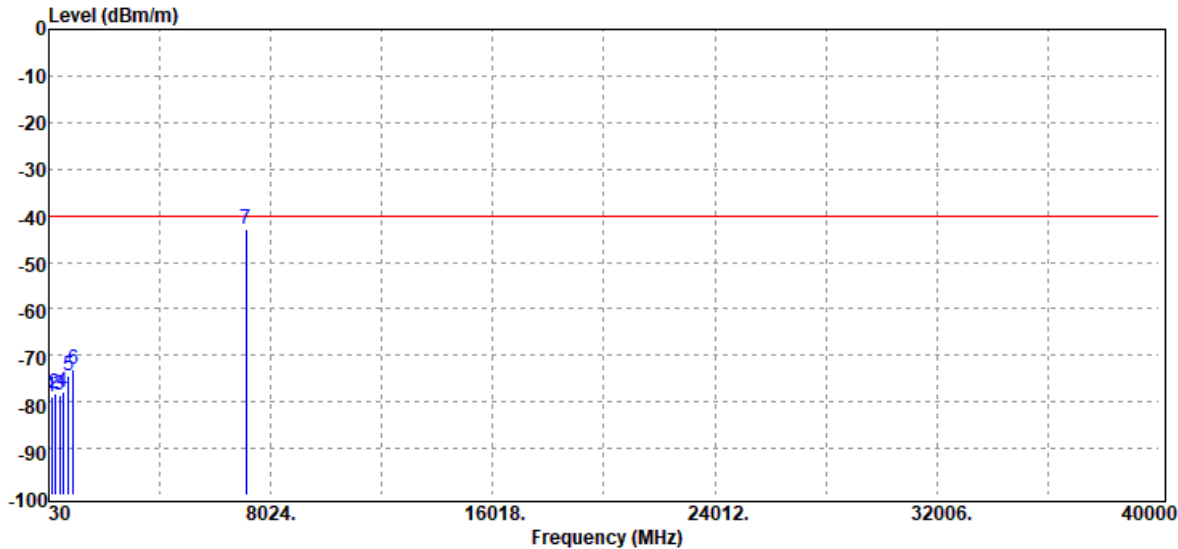
Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
62.01	-74.85	-59.71	-14.38	-0.76	-40.00	-34.85
99.84	-78.09	-71.13	-6.01	-0.95	-40.00	-38.09
272.50	-77.94	-74.64	-1.77	-1.53	-40.00	-37.94
524.70	-73.88	-70.55	-1.33	-2.00	-40.00	-33.88
644.01	-73.05	-69.10	-1.45	-2.50	-40.00	-33.05
791.45	-73.45	-69.15	-1.59	-2.71	-40.00	-33.45
7120.00	-42.91	-45.77	11.22	-8.36	-40.00	-2.91

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Report Number :ER/2020/80161
Operation Mode :LTE B48
Test Mode :Tx CH Low
EUT Pol :NB Plane
Test Frequency :3560 MHz

Test Site :SAC I Chamber
Test Date :2020-09-19
Temp./Humi. :22.5/63
Antenna Pol. :HORIZONTAL
Engineer :Neo


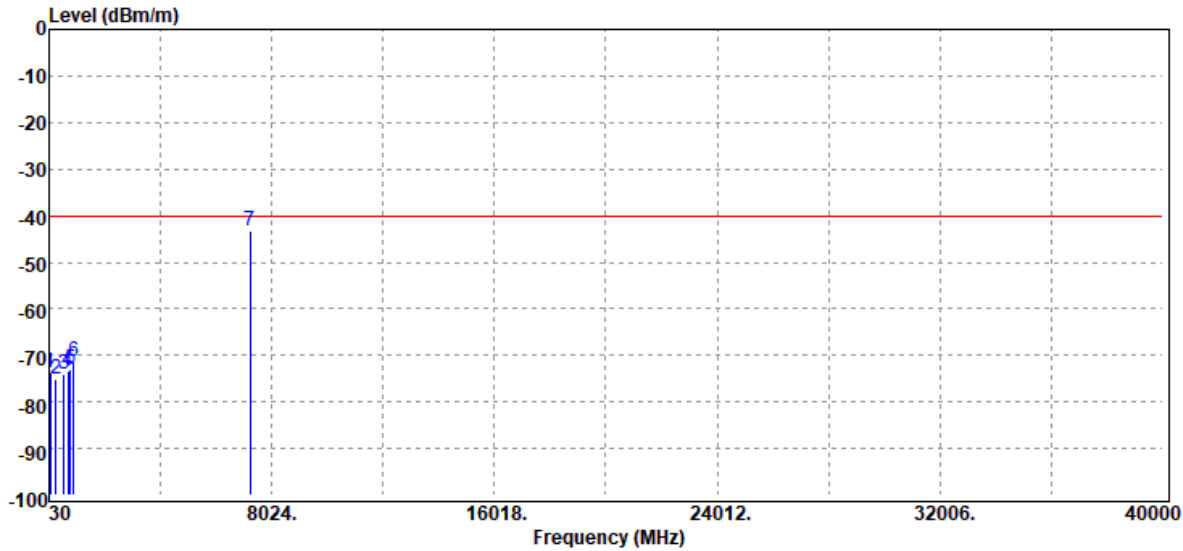
Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
124.09	-78.99	-70.50	-7.46	-1.03	-40.00	-38.99
253.10	-78.09	-74.95	-1.62	-1.52	-40.00	-38.09
427.70	-78.69	-74.93	-1.61	-2.15	-40.00	-38.69
522.76	-77.84	-74.41	-1.36	-2.07	-40.00	-37.84
752.65	-74.36	-69.76	-1.75	-2.85	-40.00	-34.36
901.06	-72.99	-68.35	-1.65	-2.99	-40.00	-32.99
7120.00	-43.03	-45.89	11.22	-8.36	-40.00	-3.03

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Report Number :ER/2020/80161
Operation Mode :LTE B48
Test Mode :Tx CH Mid
EUT Pol :NB Plane
Test Frequency :3625 MHz

Test Site :SAC I Chamber
Test Date :2020-09-19
Temp./Humi. :22.5/63
Antenna Pol. :VERTICAL
Engineer :Neo


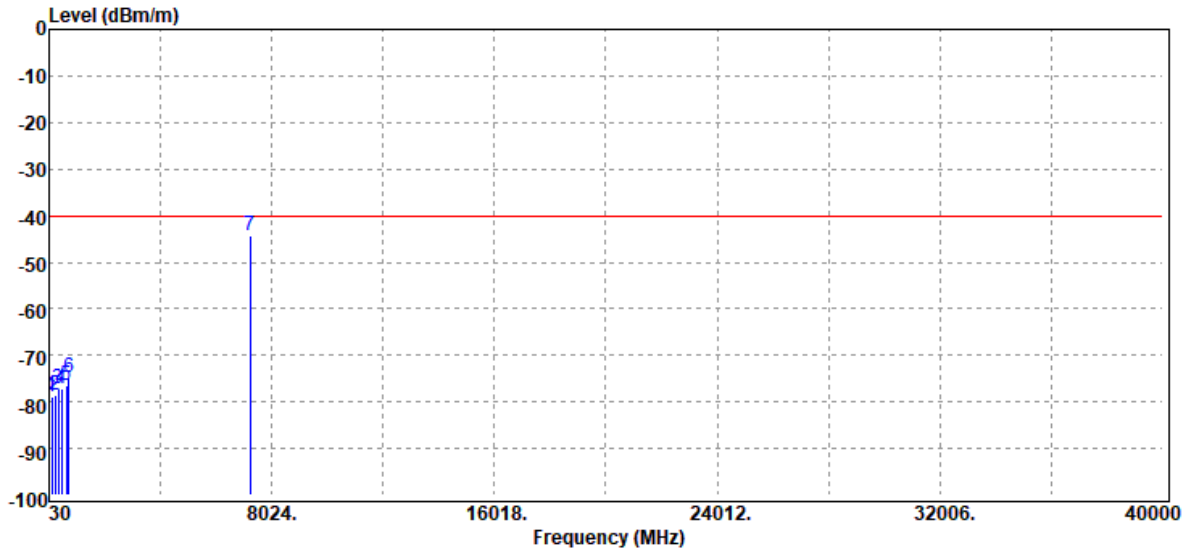
Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
61.04	-73.80	-58.44	-14.61	-0.75	-40.00	-33.80
272.50	-75.15	-71.85	-1.77	-1.53	-40.00	-35.15
560.59	-73.89	-70.24	-1.37	-2.28	-40.00	-33.89
710.94	-73.21	-69.32	-1.39	-2.50	-40.00	-33.21
801.15	-72.98	-68.58	-1.58	-2.82	-40.00	-32.98
912.70	-71.43	-66.68	-1.77	-2.98	-40.00	-31.43
7250.00	-43.21	-45.76	11.10	-8.55	-40.00	-3.21

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Report Number :ER/2020/80161
Operation Mode :LTE B48
Test Mode :Tx CH Mid
EUT Pol :NB Plane
Test Frequency :3625 MHz

Test Site :SAC I Chamber
Test Date :2020-09-19
Temp./Humi. :22.5/63
Antenna Pol. :HORIZONTAL
Engineer :Neo


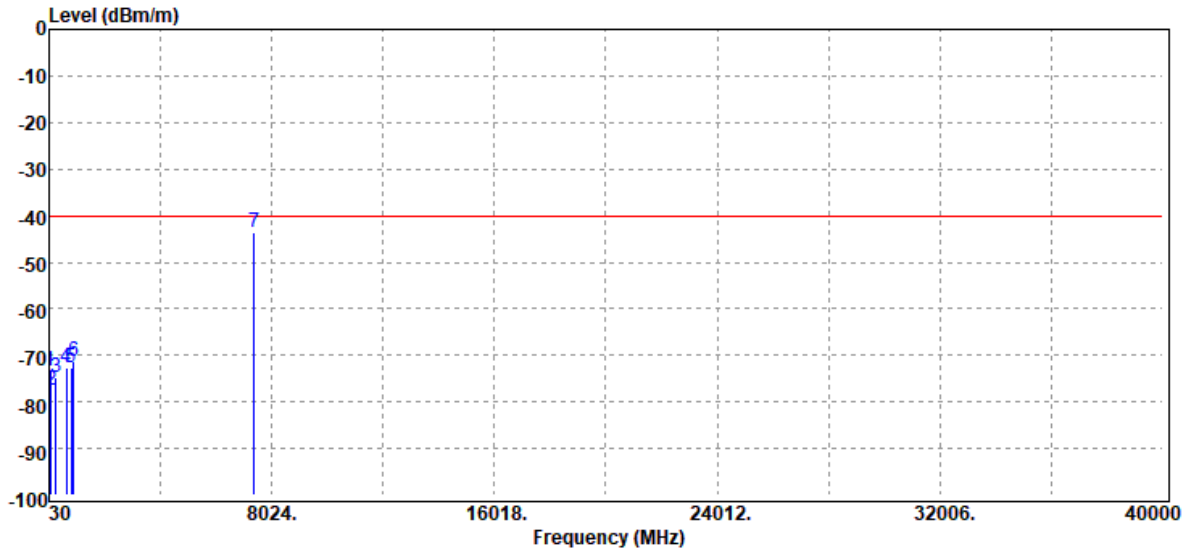
Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
122.15	-78.76	-70.31	-7.40	-1.05	-40.00	-38.76
255.04	-78.57	-75.44	-1.60	-1.53	-40.00	-38.57
362.71	-76.99	-73.74	-1.54	-1.71	-40.00	-36.99
479.11	-77.29	-73.48	-1.72	-2.09	-40.00	-37.29
643.04	-76.35	-72.39	-1.46	-2.50	-40.00	-36.35
741.01	-74.79	-70.26	-1.75	-2.78	-40.00	-34.79
7250.00	-44.19	-46.74	11.10	-8.55	-40.00	-4.19

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Report Number :ER/2020/80161
Operation Mode :LTE B48
Test Mode :Tx CH High
EUT Pol :NB Plane
Test Frequency :3690 MHz

Test Site :SAC I Chamber
Test Date :2020-09-19
Temp./Humi. :22.5/63
Antenna Pol. :VERTICAL
Engineer :Neo


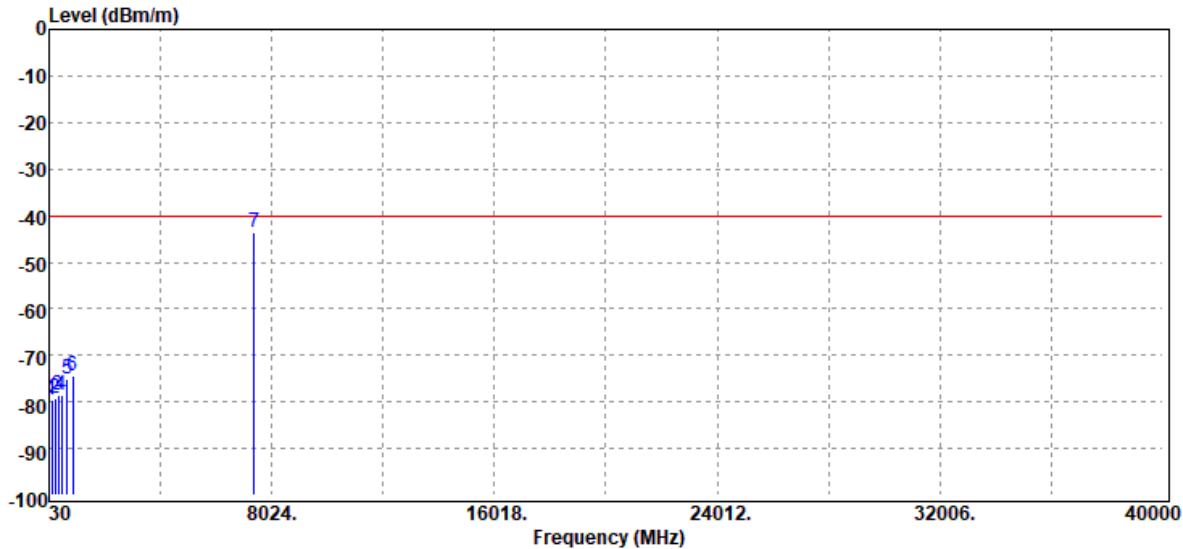
Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
61.04	-73.26	-57.90	-14.61	-0.75	-40.00	-33.26
99.84	-77.51	-70.55	-6.01	-0.95	-40.00	-37.51
272.50	-74.84	-71.54	-1.77	-1.53	-40.00	-34.84
655.65	-72.79	-68.88	-1.31	-2.60	-40.00	-32.79
828.31	-72.78	-68.16	-1.63	-2.99	-40.00	-32.78
898.15	-71.30	-66.70	-1.62	-2.98	-40.00	-31.30
7380.00	-43.56	-46.08	11.02	-8.50	-40.00	-3.56

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Report Number :ER/2020/80161
Operation Mode :LTE B48
Test Mode :Tx CH High
EUT Pol :NB Plane
Test Frequency :3690 MHz

Test Site :SAC I Chamber
Test Date :2020-09-19
Temp./Humi. :22.5/63
Antenna Pol. :HORIZONTAL
Engineer :Neo


Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
122.15	-79.56	-71.11	-7.40	-1.05	-40.00	-39.56
248.25	-79.13	-75.93	-1.69	-1.51	-40.00	-39.13
357.86	-78.47	-75.23	-1.51	-1.73	-40.00	-38.47
468.44	-78.41	-74.57	-1.84	-2.00	-40.00	-38.41
681.84	-75.21	-71.48	-1.45	-2.28	-40.00	-35.21
880.69	-74.24	-69.80	-1.44	-3.00	-40.00	-34.24
7380.00	-43.61	-46.13	11.02	-8.50	-40.00	-3.61

~ End of Report ~

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