SUPPLEMENTAL "UP LINK CARRIER AGGREGATION" TEST REPORT

CLASS II PC REPORT

OF

Applicant:	Acer Incorporated 8F,88, Sec. 1, Hsin Tai Wu Rd. Hsichih, Taipei Hsien Taiwan
Product Name:	7c Modular Platform
Brand Name:	acer
Model No.:	QSIP7180
Model Difference:	N/A
Report Number:	ER/2020/C0100
FCC ID	HLZQSIP7180
FCC Rule Part:	2, 22H & 24E & 27C
Issue Date:	February 9, 2021
Date of Test:	December 16, 2020 - February 2, 2021
Date of EUT Received:	December 16, 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: _____

Blue Yang / Asst. Manager

Testing Laboratory
3702

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Revision History

Report Number	Revision	Description	Issue Date	Remark
ER/2020/C0100	Rev.00	Original.	February 9, 2021	Revised By: Elle Chang

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:	acer
Model No. of Host:	N20Q8
Model Difference:	N/A
Hardware Version:	N/A
Software Version:	N/A
Model No. of WWAN/BT/WLAN Module:	QSIP7180
Class II Permissive change:	7c Modular Platform INSTALLED IN Notebook Computer
Power Supply:	11.25Vdc from Rechargeable Li-ion Battery or 5 / 9 / 12 / 15 / 20 Vdc from AC/DC Adapter

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1.2 Operation Frequency Range

LTE Band	BW (MHz)	Operation Frequency (MHz)		
7	5	2502.5	-	2567.5
	10	2505.0	-	2565.0
	15	2507.5	-	2562.5
	20	2510.0	-	2560.0
38	5	2572.5	-	2617.5
	10	2575.0	-	2615.0
	15	2577.5	-	2612.5
	20	2580.0	-	2610.0
41	5	2498.5	-	2687.5
	10	2501.0	-	2685.0
	15	2503.5	-	2682.5
	20	2506.0	-	2680.0

1.3 Antenna Designation

Operating Frequency (MHz)		Antenna Type	Main Peak Gain (dBi)	Aux Peak Gain (dBi)
LTE-Band 7	2502.5 ~ 2567.5	PIFA	**-2.97**	-5.22
LTE-Band 38	2572.5 ~ 2617.5		**-3.04**	-4.74
LTE-Band 41	2498.5 ~ 2687.5		**-2.97**	-4.50

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1.4 Test Methodology of Applied Standards

FCC 47 CFR Part 2, 22H, 24E, 27C.

ANSI C63.26-2015

KDB971168 D01 Power Meas license Digital System v03r01

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 Designation number: TW0027

1.6 Special Accessories

No special accessories were used during testing.

1.7 Equipment Modifications

There was 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 Conducted Measurement at Antenna Port

The EUT is placed on a table which is 0.8 m above ground plane. A low loss of RF cable was used to connect the antenna port of EUT to measurement equipment.

2.3.2 Radiated Emissions (ERP/EIRP)

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-Conducted)

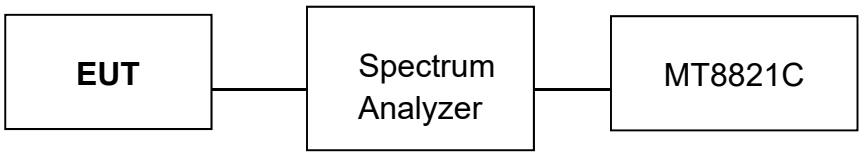

Fig. 2-2 Configuration of Tested System (Fixed Channel-Radiated)

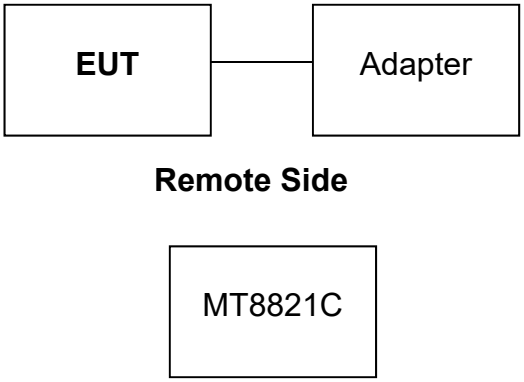

Table 2-1 Equipment Used in

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
1.	Radio Communication Analyer	Anritsu	MT8821C	6262044670	shielded	Un-shielded

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3 SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§2.1046(a)	RF Power Output	Compliant
§22.913(a)(5) §24.232(c) §27.50(c)(10) §27.50(h)(2) §27.50(d)(4)	ERP/ EIRP measurement	Compliant
§2.1053 §22.917(a) §24.238(a) §27.53(g) §27.53(h) §27.53(m)(4)	Field Strength of Spurious Radiation	Compliant

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4 DESCRIPTION OF TEST MODES

4.1 The Worst-CaseTest Modes and Details

This device is Notebook Computer that supports with carrier aggregation (two carrier) uplink. Intra-Band contiguous specification as below:

E-UTRA Intra-Band CA configuration / Bandwidth combination set				
E-UTRA CA configuration	Component carriers in order of increasing carrier frequency		Maximum aggregated bandwidth [MHz]	Bandwidth combination set
	Channel bandwidth for carrier [MHz]	Channel bandwidth for carrier [MHz]		
CA_7C	15	15	40	0
	20	20		
	10	20	40	1
	15	15,20		
	20	10,15,20		
	15	10,15	40	2
	20	15,20		
CA_38C	5,10,15,20	20		
	20	5,10,15		
CA_41C	10	20	40	0
	15	15,20		
	20	10,15,20		
	5,10	20	40	1
	15	15,20		
	20	5,10,15,20		
	10	15,20	40	2
	15	10,15,20		
	20	10,15,20		
	10	20	40	3
	20	20		

Intra-Band Test Mode	Band	Description
2	7C	CA_PCC Ant0 Band 7_ SCC Ant 0 Band 7
3	38C	CA_PCC Ant0 Band 38_ SCC Ant 0 Band 38
4	41C	CA_PCC Ant0 Band 41_ SCC Ant 0 Band 41

4.2 The Worst-CaseTest Modes and Details

1. Pre-Scan has been conducted to determine the worst-case mode from all possible positions of X(E1)Y(E2)Z(H) and NB axis for radiated emission. The worst case was found as NB plane as in normal use position.

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4.2.1 Intra-Band

For uplink Intra-Band CA, evaluation has been done for contiguous and non-contiguous channel and bandwith, configurations that generates highest output power in standalone transmission have been selected for the final test.

E-UTRA Band	Test Channel	Channel Band-width (MHz)	Modula-tion	Resource Block Allocation	
				RBs allocated	RB Start
7C	Mid	15+15	QPSK	Full	
38C	Mid	20+20	QPSK	Full	
41C	Mid	5+20	QPSK	Full	

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5 MEASUREMENT UNCERTAINTY

Test Items	Uncertainty
RF Power Output	+/- 1 dB
ERP/ EIRP measurement	Vertical Polarization = +/- 3dB Horizontal Polarization =+/- 3dB
Temperature	+/- 0.4 °C
Humidity	+/- 3.5 %
DC / AC Power Source	DC= +/- 1%, AC=+/- 1%

Radiated Spurious Emission Measurement Uncertainty				
Polarization: Vertical	+/-	2.64	dB	9kHz~30MHz: +-2.3dB
	+/-	4.93	dB	30MHz - 1000MHz: +/- 3.37dB
	+/-	4.81	dB	1GHz - 18GHz: +/- 4.04dB
	+/-	4.52	dB	18GHz - 40GHz: +/- 4.04dB
Polarization: Horizontal	+/-	2.64	dB	9kHz~30MHz: +-2.3dB
	+/-	4.45	dB	30MHz - 1000MHz: +/- 4.22dB
	+/-	4.81	dB	1GHz - 18GHz: +/- 4.08dB
	+/-	4.52	dB	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 MAXIMUM OUTPUT POWER

6.1 Standard Applicable

A base station simulator was used to establish communication with the EUT. Its parameters were set to transmit the maximum power on the EUT. The measured power in the radio frequency on the transmitter output terminals.

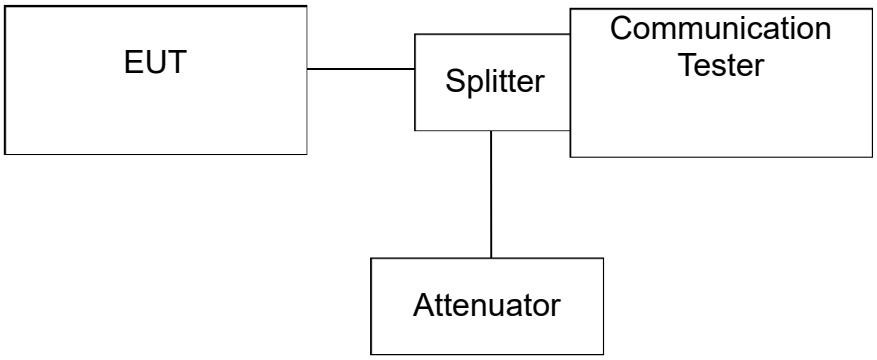
6.1.1 ERP/EIRP LIMIT

According to FCC §2.1046

FCC 27, 50(h)

(2) Mobile and other user stations transmitting in the BRS and EBS bands are limited to 2 W EIRP.

6.2 Test Set-up



Note: *Measurement setup for testing on Antenna connector*

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6.3 Output Power Measurement Applicable Guideance

The transmitter output was connected to a calibrated attenuator, the other end of which was connected to a power meter. Transmitter output was read off the power meter in dBm. The power output at the transmitter antenna port was determined by adding the value of the attenuator to the power meter reading.

The Procedure of KDB941225 (SAR Measurement Procedures for 3G devices, (WCDMA/HSPA) was used for EUT and Base station setting. RMC 12.2kps is used for this testing, and KDB 971168 D01 Power Meas License Digital System as the supplemental test methodology to adjust the proper setting obtaining the measurement results.

All LTE bands conducted average power is obtained from the simulator telecommunication test set.

6.4 Determining ERP and/or EIRP from conducted RF output power measurements

According to KDB 412172 D01 Power Approach,

$EIRP = P_T + G_T - L_C$,

$ERP = EIRP - 2.15$,

Where:

ERP or EIRP = effective radiated power or equivalent isotropically radiated power (expressed in the same units as PT, typically dBW, dBm, or power spectral density (PSD)2), relative to either a dipole antenna (ERP) or an isotropic antenna (EIRP);

P_T = transmitter output power, expressed in dBW, dBm, or PSD;

G_T = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);

L_C = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

6.5 Measurement Equipment Used

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Radio Communication Analyer	Anritsu	MT8821C	6262044670	08/06/2020	08/05/2021

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6.6 LTE Measurement Results:

6.6.1 Intra-Band

Antenna gain (dBi) -2.97

First Band								Second Band							Power(dBm)				EIRP Limit	Margin (dBm)
Band	Range	Modulation	Band width	Channel	Frequency	RB		Band	Range	Modulation	Band width	Channel	Frequency	RB	PCC	SCC	Total	EIRP		
CA_7C	Low	QPSK	10	20805	2505.5	Full	+	CA_7C	Low	QPSK	20	20949	2519.9	Full	20.90	13.73	**21.54**	18.57	33	-14.43
		QPSK	20	20850	2510	Full				QPSK	10	20994	2524.4	Full	20.98	13.51	**21.40**	18.43	33	-14.57
		QPSK	15	20825	2507.5	Full				QPSK	10	20945	2519.5	Full	21.13	13.94	**22.02**	19.05	33	**-13.95**
		QPSK	15	20825	2507.5	Full				QPSK	15	20975	2522.5	Full	21.03	13.93	**21.47**	18.50	33	-14.50
		QPSK	15	20828	2507.8	Full				QPSK	20	20999	2524.9	Full	20.93	14.26	**21.81**	18.84	33	-14.16
		QPSK	20	20850	2510	Full				QPSK	15	21021	2527.1	Full	21.47	13.94	**22.00**	19.03	33	-13.97
		QPSK	20	20850	2510	Full				QPSK	20	21048	2529.8	Full	20.98	13.75	**21.82**	18.85	33	-14.15
	Mid	QPSK	10	21006	2525.6	Full			Mid	QPSK	20	21150	2540	Full	20.64	14.25	**21.67**	18.70	33	-14.30
		QPSK	20	21051	2530.1	Full				QPSK	10	21195	2544.5	Full	21.25	13.52	**22.26**	19.29	33	-13.71
		QPSK	15	21051	2530.1	Full				QPSK	10	21171	2542.1	Full	20.60	13.70	**21.39**	18.42	33	-14.58
		QPSK	15	21025	2527.5	Full				QPSK	15	21175	2542.5	Full	21.44	14.18	**22.36**	19.39	33	-13.61
		QPSK	15	21003	2525.3	Full				QPSK	20	21174	2542.4	Full	21.16	13.95	**21.51**	18.54	33	-14.46
		QPSK	20	21026	2527.6	Full				QPSK	15	21197	2544.7	Full	20.85	14.18	**21.63**	18.66	33	-14.34
		QPSK	20	21001	2525.1	Full				QPSK	20	21199	2544.9	Full	21.46	13.62	**21.62**	18.65	33	-14.35
	High	QPSK	10	21206	2545.6	Full			High	QPSK	20	21350	2560	Full	21.11	14.49	**21.18**	18.21	33	-14.79
		QPSK	20	21251	2550.1	Full				QPSK	10	21395	2564.5	Full	21.37	14.14	**21.65**	18.68	33	-14.32
		QPSK	15	21277	2552.7	Full				QPSK	10	21397	2564.7	Full	21.31	13.91	**21.42**	18.45	33	-14.55
		QPSK	15	21225	2547.5	Full				QPSK	15	21375	2562.5	Full	20.78	13.71	**21.64**	18.67	33	-14.33
		QPSK	15	21179	2542.9	Full				QPSK	20	21350	2560	Full	20.92	14.08	**22.18**	19.21	33	-13.79
		QPSK	20	21201	2545.1	Full				QPSK	15	21372	2562.2	Full	20.80	13.44	**21.48**	18.51	33	-14.49
		QPSK	20	21152	2540.2	Full				QPSK	20	21350	2560	Full	20.95	14.31	**21.80**	18.83	33	-14.17

Antenna gain (dBi) -3.13

First Band								Second Band							Power(dBm)				EIRP Limit	Margin (dBm)
Band	Range	Modulation	Band width	Channel	Frequency	RB		Band	Range	Modulation	Band width	Channel	Frequency	RB	PCC	SCC	Total	EIRP		
CA_38C	Low	QPSK	15	37825	2577.5	Full	+	CA_38C	Low	QPSK	15	37975	2592.5	Full	21.53	13.88	**22.20**	19.07	33	-13.93
		QPSK	20	37850	2580	Full				QPSK	20	38048	2599.8	Full	21.44	13.91	**21.69**	18.56	33	-14.44
	Mid	QPSK	15	37925	2587.5	Full			Mid	QPSK	15	38075	2602.5	Full	21.15	14.42	**21.64**	18.51	33	-14.49
		QPSK	20	37901	2585.1	Full				QPSK	20	38099	2604.9	Full	20.99	14.58	**22.42**	19.29	33	-13.71
	High	QPSK	15	38025	2597.5	Full			High	QPSK	15	38175	2612.5	Full	21.66	14.15	**22.29**	19.16	33	-13.84
		QPSK	20	37952	2590.2	Full				QPSK	20	38150	2610	Full	21.20	14.40	**22.34**	19.21	33	-13.79

Antenna gain (dBi) -2.97

First Band								Second Band							Power(dBm)				EIRP Limit	Margin (dBm)
Band	Range	Modulation	Band width	Channel	Frequency	RB		Band	Range	Modulation	Band width	Channel	Frequency	RB	PCC	SCC	Total	EIRP		
CA_41C	Low	QPSK	5	39683	2499.3	Full	+	CA_41C	Low	QPSK	20	39800	2511	Full	20.98	14.27	**21.81**	18.84	33	-14.16
		QPSK	20	39750	2506	Full				QPSK	5	39867	2517.7	Full	20.65	13.94	**22.12**	19.15	33	-13.85
		QPSK	10	39703	2501.3	Full				QPSK	15	39823	2513.3	Full	21.17	14.03	**21.80**	18.83	33	-14.17
		QPSK	15	39725	2503.5	Full				QPSK	10	39845	2515.5	Full	21.31	13.79	**21.80**	18.83	33	-14.17
		QPSK	10	39705	2501.5	Full				QPSK	20	39849	2515.9	Full	21.40	14.20	**21.99**	19.02	33	-13.98
		QPSK	20	39750	2506	Full				QPSK	10	39894	2520.4	Full	21.37	14.83	**21.79**	18.82	33	-14.18
		QPSK	15	39725	2503.5	Full				QPSK	15	39875	2518.5	Full	21.66	14.29	**21.74**	18.77	33	-14.23
		QPSK	15	39728	2503.8	Full				QPSK	20	39899	2520.9	Full	21.64	14.26	**21.61**	18.64	33	-14.36
		QPSK	20	39750	2506	Full				QPSK	15	39921	2523.1	Full	21.57	14.23	**21.48**	18.51	33	-14.49
		QPSK	20	39750	2506	Full				QPSK	20	39948	2525.8	Full	21.35	13.98	**22.26**	19.29	33	-13.71
	Mid	QPSK	5	40528	2583.8	Full			Mid	QPSK	20	40645	2595.5	Full	21.34	13.83	**22.45**	19.48	33	-13.52
		QPSK	20	40595	2590.5	Full				QPSK	5	40712	2602.2	Full	20.57	14.48	**21.67**	21.67	33	-11.33
		QPSK	10	40549	2585.9	Full				QPSK	15	40669	2597.9	Full	21.02	13.90	**21.68**	18.71	33	-14.29
		QPSK	15	40571	2588.1	Full				QPSK	10	40691	2600.1	Full	20.95	14.46	**21.47**	18.50	33	-14.5
		QPSK	10	40526	2583.6	Full				QPSK	20	40670	2598	Full	21.21	13.96	**22.15**	19.18	33	-13.82
		QPSK	20	40571	2588.1	Full				QPSK	10	40715	2602.5	Full	21.45	14.07	**22.12**	19.15	33	-13.85
		QPSK	15	40545	2585.5	Full				QPSK	15	40695	2600.5	Full	21.64	13.90	**21.86**	18.89	33	-14.11
		QPSK	15	40523	2583.3	Full				QPSK	20	40694	2600.4	Full	20.79	14.04	**22.19**	19.22	33	-13.78
		QPSK	20	40546	2585.6	Full				QPSK	15	40717	2602.7	Full	21.64	14.05	**22.17**	19.20	33	-13.8
		QPSK	20	40521	2583.1	Full				QPSK	20	40719	2602.9	Full	21.51	14.43	**21.74**	18.77	33	-14.23
		QPSK	20	40529	2583.9	Full				QPSK	20	40712	2602.2	Full	20.81	14.64	**22.03**	19.06	33	-13.94
	High	QPSK	5	41373	2668.3	Full			High	QPSK	20	41490	2680	Full	20.91	14.66	**21.48**	18.51	33	-14.49
		QPSK	20	41440	2675	Full				QPSK	5	41557	2686.7	Full	20.74	14.53	**22.29**	19.32	33	-13.68
		QPSK	10	41395	2670.5	Full				QPSK	15	41515	2682.5	Full	21.52	14.11	**22.38**	19.41	33	-13.59
		QPSK	15	41417	2672.7	Full				QPSK	10	41537	2684.7	Full	21.18	14.12	**21.76**	18.79	33	-14.21
		QPSK	10	41346	2665.6	Full				QPSK	20	41490	2680	Full	20.77	13.94	**22.32**	19.35	33	-13.65
		QPSK	20	41391	2670.1	Full				QPSK	10	41535	2684.5	Full	20.67	14.46	**21.75**	18.78	33	-14.22
		QPSK	15	41365	2667.5	Full				QPSK	15	41515	2682.5	Full	21.14	14.01	**21.98**	19.01	33	-13.99
		QPSK	15	41319	2662.9	Full				QPSK	20	41490	2680	Full	20.90	14.57	**21.57**	18.60	33	-14.4
		QPSK	20	41341	2665.1	Full				QPSK	15	41512	2682.2	Full	21.19	13.80	**21.52**	18.55	33	-14.45
		QPSK	20	41292	2660.2	Full				QPSK	20	41490	2680	Full	21.46	14.45	**21.68**	18.71	33	-14.29

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7 FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT

7.1 Standard Applicable

According to FCC §2.1053,

FCC§27.53(h)

Out of band emissions.The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

FCC §27.53(m) (4) (6) for LTE B7, 41

For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

Measurement procedure. Compliance with these rules is based on the use of measurement nstrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed; for mobile digital stations, in the 1 megahertz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed, except when the 1 megahertz band is 2495-2496 MHz, in which case a resolution bandwidth of at least one percent may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 megahertz or 1 percent of emission bandwidth, as specified; or 1 megahertz or 2 percent for mobile digital stations, except in the band 2495-2496 MHz). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. With respect to television operations, measurements must be made of the separate visual and aural operating powers at sufficiently frequent intervals to ensure compliance with the rules.

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Table 2 — Unwanted Emissions for Mobile, Portable and Low-Power Fixed Subscriber Equipment

Frequency (MHz)	Attenuation (dB)
<2200	$43 + 10 \log_{10}(p)$
2200 - 2288	$70 + 10 \log_{10}(p)$
2288 - 2292	$67 + 10 \log_{10}(p)$
2292 - 2296	$61 + 10 \log_{10}(p)$
2296 - 2300	$55 + 10 \log_{10}(p)$
2300 - 2305	$43 + 10 \log_{10}(p)$
2305 - 2320	$43 + 10 \log_{10}(p)$ Note
2320 - 2324	$55 + 10 \log_{10}(p)$
2324 - 2328	$61 + 10 \log_{10}(p)$
2328 - 2337	$67 + 10 \log_{10}(p)$
2337 - 2341	$61 + 10 \log_{10}(p)$
2341 - 2345	$55 + 10 \log_{10}(p)$
2345 - 2360	$43 + 10 \log_{10}(p)$ Note
2360 - 2365	$43 + 10 \log_{10}(p)$
2365 - 2395	$70 + 10 \log_{10}(p)$
>2395	$43 + 10 \log_{10}(p)$

Note: Measured at the edges of the highest and lowest frequency range(s) in which the equipment is designed to operate. See Section 1.2 for the permitted frequency ranges for various equipment types.

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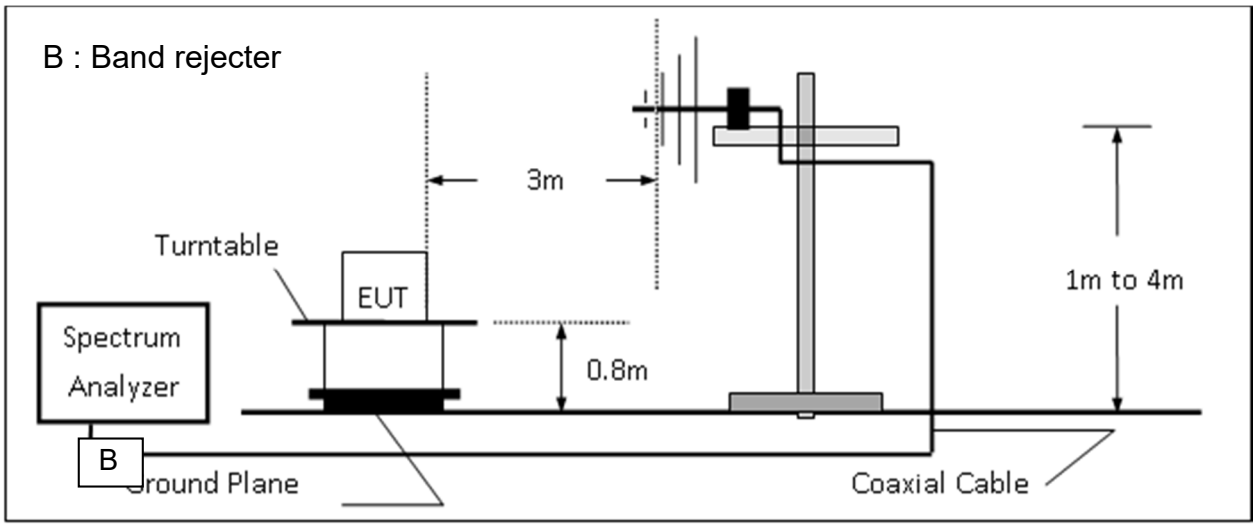
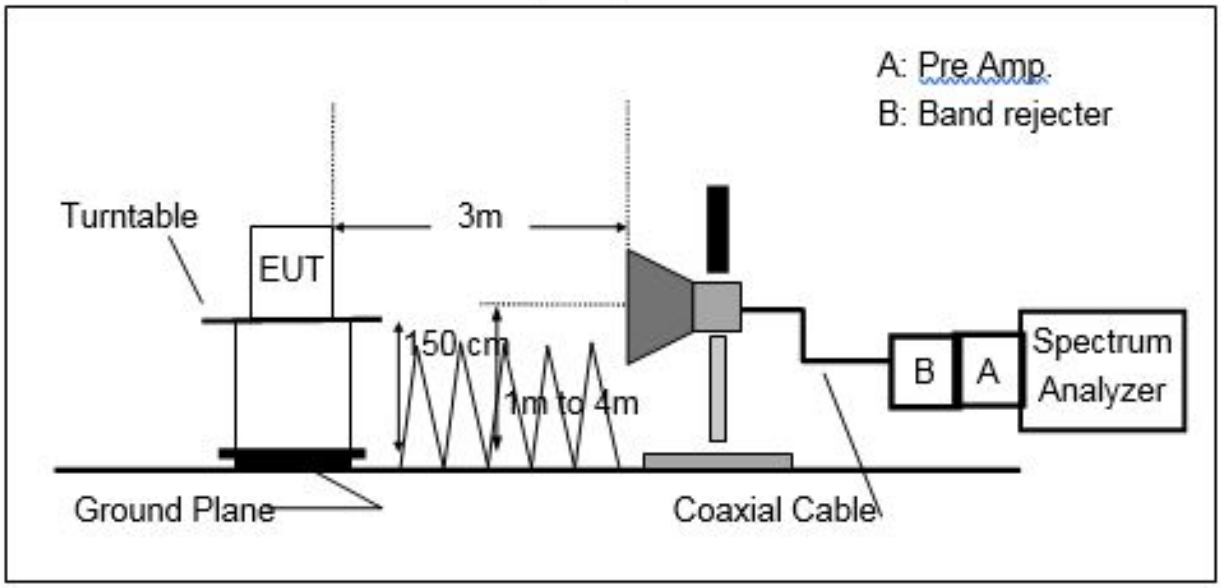
7.2 EUT Setup

Radiated Emission Test Set-Up, Frequency Below 1000MHz



Radiated Emission Test Set-UP Frequency Over 1 GHz



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7.3 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.
ERP (dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)
EIRP (dBm) = SG Level(dBm) + Antenna Gain(dBi) + Cable Loss(dB)

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7.4 Measurement Equipment Used:

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Bi-log Antenna	SCHWAZBECK	VULB9168	300	11/18/2020	11/17/2021
Horn Antenna	Schwarzbeck	BBHA9120D	603	04/29/2020	04/28/2021
Horn Antenna	Schwarzbeck	BBHA9170	184	12/11/2020	12/10/2021
Horn Antenna	Schwarzbeck	BBHA9170	185	07/30/2020	07/29/2021
Site Cal	SGS	SAC I chamber	N/A	01/01/2021	12/31/2021
Horn Antenna	Schwarzbeck	BBHA9120D	D803	12/17/2020	12/16/2021
Bi-log Antenna	TESEO	CBL 6112D	35242 & AT-N0555	01/13/2021	01/12/2022
Spectrum Analyzer	Agilent	E4446A	MY51100003	10/29/2020	10/28/2021
Radio Communica-tion Analyer	Anritsu	MT8821C	6262044670	08/06/2020	08/05/2021
Test Software	audix	e3	Ver. 6.11-20180413	01/01/2021	12/31/2021
Pre-Amplifier	EMC Instruments	EMC184045B	980135	12/16/2020	12/15/2021
Pre-Amplifier	HP	8449B	3008A01973	12/16/2020	12/15/2021
Pre-Amplifier	HP	8447D	2944A09469	12/16/2020	12/15/2021
Filter 2240-2700	Micro-Tronics	WI	2	12/16/2020	12/15/2021
High Pass Filter	WI	WHKX4.0/18G-10SS	WHKX4.0/18G-10SS	12/16/2020	12/15/2021
Coaxial Cable	Huber Suhner	succoflex 102	MY2622/2	12/16/2020	12/15/2021
Coaxial Cable	Huber Suhner	succoflex 104A	800086/4a	12/16/2020	12/15/2021
Coaxial Cable	Huber Suhner	EMC 104-SM-SM-2000	160123	12/16/2020	12/15/2021
Coaxial Cable	Huber Suhner	SUCOFLEX 104	160125	12/16/2020	12/15/2021
Coaxial Cable	Huber Suhner	SUCOFLEX 106	76096/6	12/16/2020	12/15/2021

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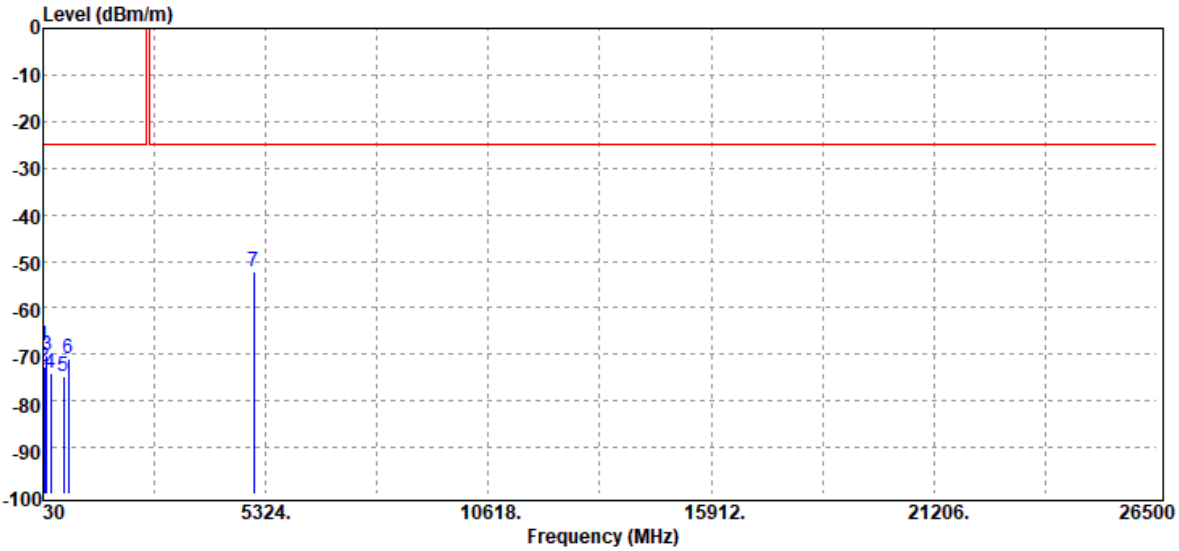
7.5 Measurement Result:
Radiated Spurious Emission Measurement Result: LTE Band 7C Mode

Report Number	:ER/2020/C0100	Test Site	:SAC I Chamber
Operation Mode	:LTE 7C	Test Date	:2021-01-26
Test Mode	:Tx CH Low	Temp./Humi.	:23.6/63
EUT Pol	:NB Plane	Antenna Pol.	:VERTICAL
Test Frequency	:2507.5_2522.5 MHz	Engineer	:Neo Tsai



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
46.49	-68.11	-54.84	-12.57	-0.70	-25.00	-43.11
65.89	-72.78	-64.19	-7.79	-0.80	-25.00	-47.78
112.45	-70.17	-67.45	-1.65	-1.07	-25.00	-45.17
211.39	-74.22	-77.52	4.78	-1.48	-25.00	-49.22
517.91	-74.70	-76.64	4.11	-2.17	-25.00	-49.70
631.40	-71.06	-72.15	3.46	-2.37	-25.00	-46.06
5030.00	-52.10	-56.77	12.26	-7.59	-25.00	-27.10

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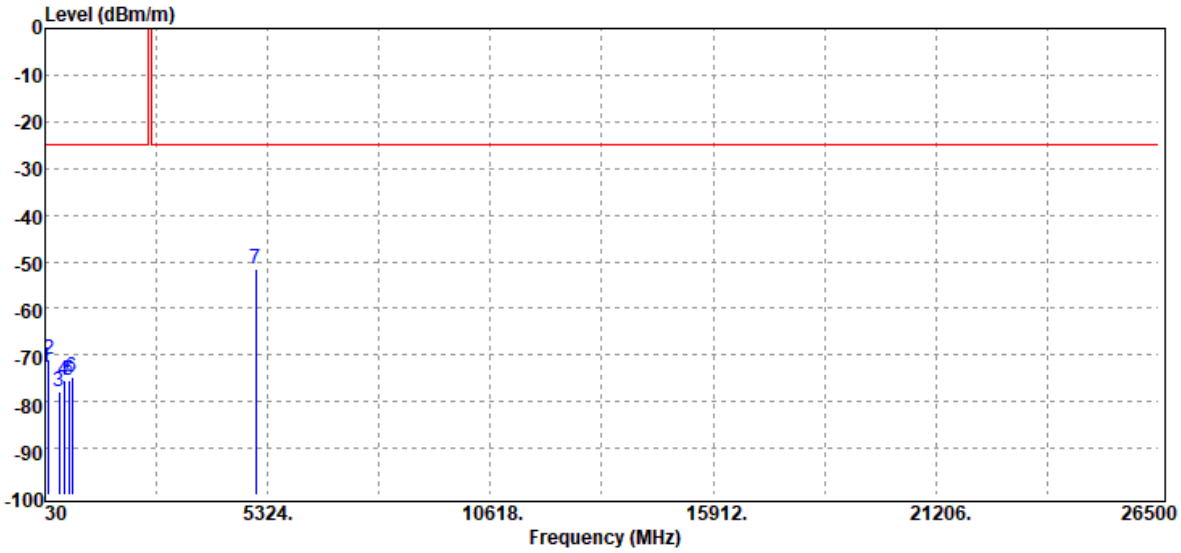
Report Number	:ER/2020/C0100	Test Site	:SAC I Chamber
Operation Mode	:LTE 7C	Test Date	:2021-01-26
Test Mode	:Tx CH Low	Temp./Humi.	:23.6/63
EUT Pol	:NB Plane	Antenna Pol.	:HORIZONTAL
Test Frequency	:2507.5_2522.5 MHz	Engineer	:Neo Tsai



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
44.55	-72.55	-59.01	-12.85	-0.69	-25.00	-47.55
115.36	-70.94	-68.13	-1.71	-1.10	-25.00	-45.94
357.86	-77.80	-80.34	4.50	-1.96	-25.00	-52.80
476.20	-75.38	-77.22	4.21	-2.37	-25.00	-50.38
600.36	-75.29	-76.29	3.64	-2.64	-25.00	-50.29
677.96	-74.61	-75.54	3.84	-2.91	-25.00	-49.61
5030.00	-51.40	-56.07	12.26	-7.59	-25.00	-26.40

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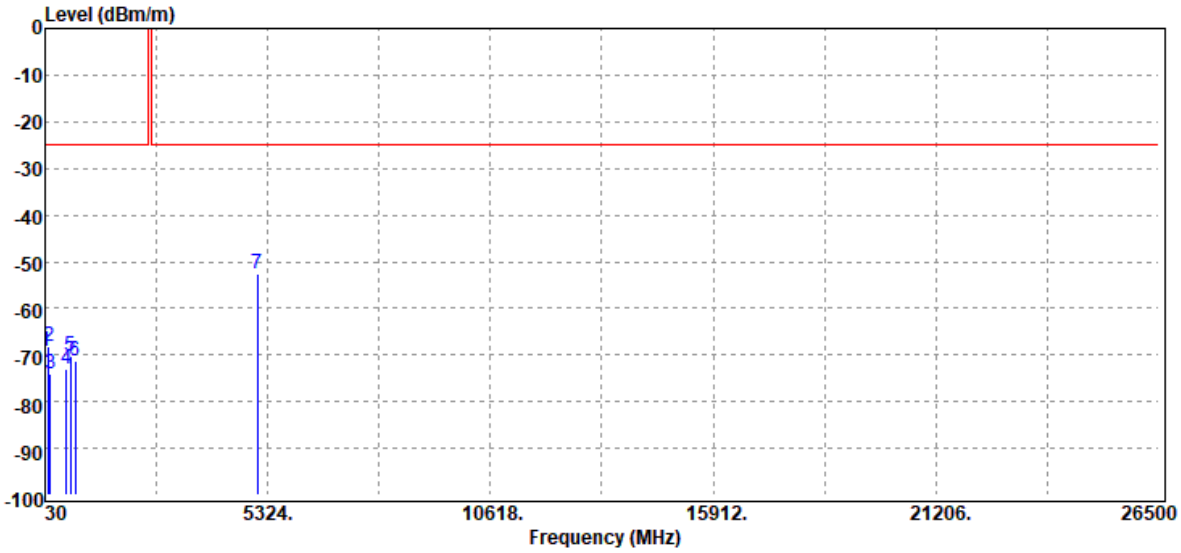
Report Number	:ER/2020/C0100	Test Site	:SAC I Chamber
Operation Mode	:LTE 7C	Test Date	:2021-01-26
Test Mode	:Tx CH Mid	Temp./Humi.	:23.6/63
EUT Pol	:NB Plane	Antenna Pol.	:VERTICAL
Test Frequency	:2527.5_2542.5 MHz	Engineer	:Neo Tsai



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
44.55	-69.17	-55.63	-12.85	-0.69	-25.00	-44.17
117.30	-68.30	-65.46	-1.73	-1.11	-25.00	-43.30
145.43	-74.01	-71.01	-1.78	-1.22	-25.00	-49.01
531.49	-73.08	-75.24	4.19	-2.03	-25.00	-48.08
631.40	-70.37	-71.46	3.46	-2.37	-25.00	-45.37
744.89	-71.21	-71.58	2.82	-2.45	-25.00	-46.21
5070.00	-52.58	-56.85	12.10	-7.83	-25.00	-27.58

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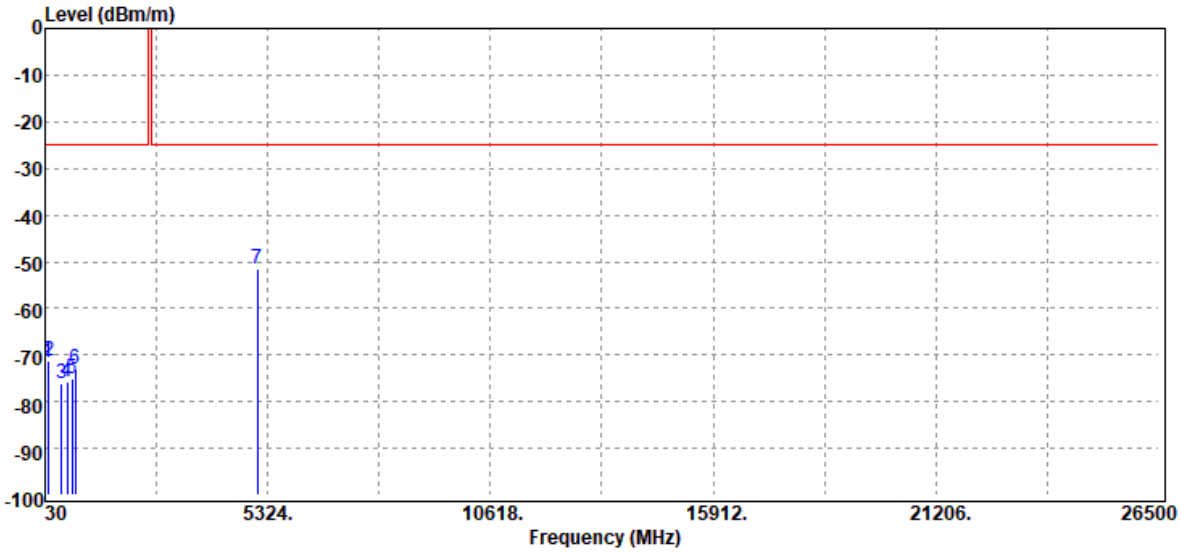
Report Number	:ER/2020/C0100	Test Site	:SAC I Chamber
Operation Mode	:LTE 7C	Test Date	:2021-01-26
Test Mode	:Tx CH Mid	Temp./Humi.	:23.6/63
EUT Pol	:NB Plane	Antenna Pol.	:HORIZONTAL
Test Frequency	:2527.5_2542.5 MHz	Engineer	:Neo Tsai



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
105.66	-71.52	-69.14	-1.34	-1.04	-25.00	-46.52
113.42	-71.37	-68.62	-1.67	-1.08	-25.00	-46.37
425.76	-76.11	-78.18	4.03	-1.96	-25.00	-51.11
555.74	-75.94	-77.73	4.26	-2.47	-25.00	-50.94
677.96	-75.21	-76.14	3.84	-2.91	-25.00	-50.21
744.89	-72.89	-73.26	2.82	-2.45	-25.00	-47.89
5070.00	-51.39	-55.66	12.10	-7.83	-25.00	-26.39

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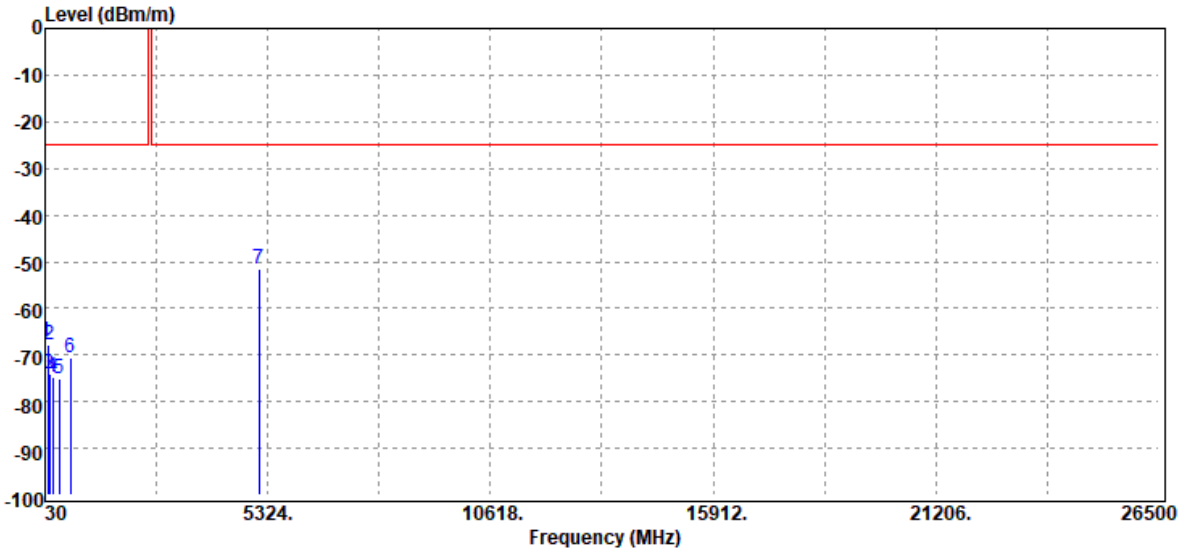
Report Number	:ER/2020/C0100	Test Site	:SAC I Chamber
Operation Mode	:LTE 7C	Test Date	:2021-01-26
Test Mode	:Tx CH High	Temp./Humi.	:23.6/63
EUT Pol	:NB Plane	Antenna Pol.	:VERTICAL
Test Frequency	:2547.5_2562.5 MHz	Engineer	:Neo Tsai



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
44.55	-67.24	-53.70	-12.85	-0.69	-25.00	-42.24
115.36	-67.97	-65.16	-1.71	-1.10	-25.00	-42.97
144.46	-74.18	-71.01	-1.93	-1.24	-25.00	-49.18
211.39	-74.90	-78.20	4.78	-1.48	-25.00	-49.90
361.74	-75.07	-77.60	4.48	-1.95	-25.00	-50.07
631.40	-70.54	-71.63	3.46	-2.37	-25.00	-45.54
5110.00	-51.71	-55.82	12.10	-7.99	-25.00	-26.71

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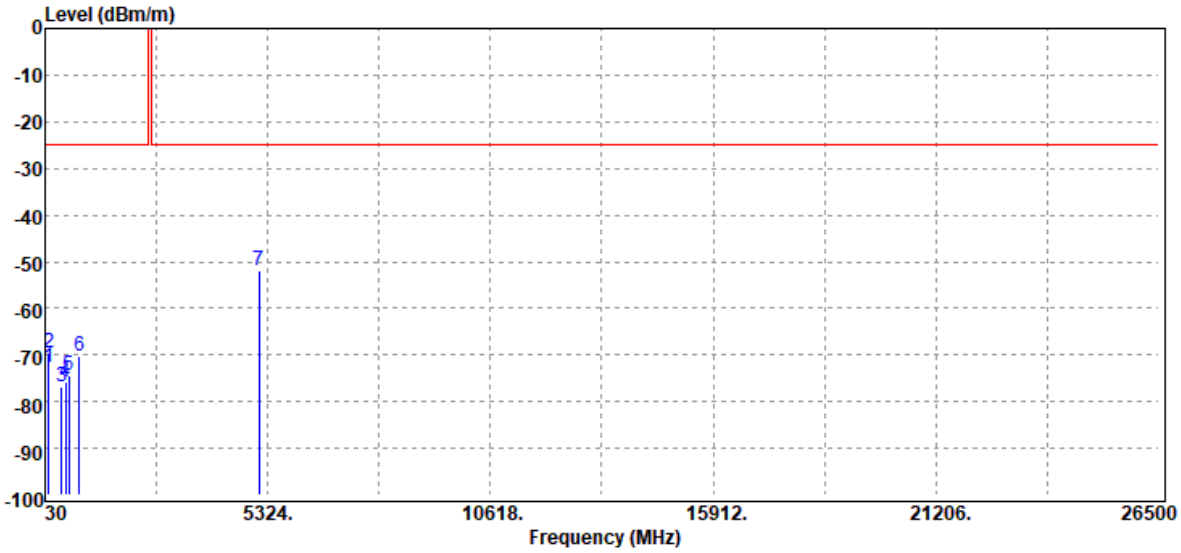
Report Number	:ER/2020/C0100	Test Site	:SAC I Chamber
Operation Mode	:LTE 7C	Test Date	:2021-01-26
Test Mode	:Tx CH High	Temp./Humi.	:23.6/63
EUT Pol	:NB Plane	Antenna Pol.	:HORIZONTAL
Test Frequency	:2547.5_2562.5 MHz	Engineer	:Neo Tsai



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
109.54	-72.79	-70.20	-1.54	-1.05	-25.00	-47.79
117.30	-69.62	-66.78	-1.73	-1.11	-25.00	-44.62
420.91	-76.79	-79.10	4.21	-1.90	-25.00	-51.79
526.64	-75.78	-77.91	4.18	-2.05	-25.00	-50.78
604.24	-74.43	-75.47	3.62	-2.58	-25.00	-49.43
841.89	-70.26	-71.98	4.69	-2.97	-25.00	-45.26
5110.00	-52.03	-56.14	12.10	-7.99	-25.00	-27.03

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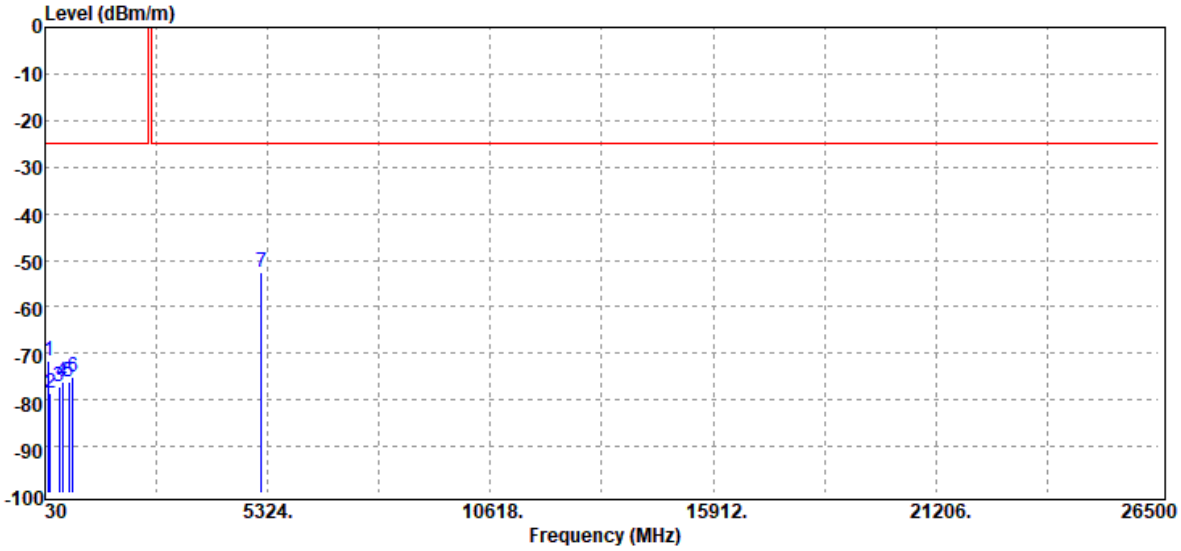
Radiated Spurious Emission Measurement Result: LTE Band 38C Mode

Report Number	:ER/2020/C0100	Test Site	:SAC I Chamber
Operation Mode	:LTE 38C	Test Date	:2021-01-26
Test Mode	:Tx CH Low	Temp./Humi.	:23.6/63
EUT Pol	:NB Plane	Antenna Pol.	:HORIZONTAL
Test Frequency	:2580_2599.8 MHz	Engineer	:Neo Tsai



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
117.30	-71.75	-68.91	-1.73	-1.11	-25.00	-46.75
149.31	-78.62	-75.83	-1.64	-1.15	-25.00	-53.62
357.86	-77.16	-79.70	4.50	-1.96	-25.00	-52.16
445.16	-76.10	-78.05	4.15	-2.20	-25.00	-51.10
589.69	-75.97	-77.12	3.80	-2.65	-25.00	-50.97
681.84	-75.18	-76.12	3.82	-2.88	-25.00	-50.18
5179.80	-52.75	-57.13	12.28	-7.90	-25.00	-27.75

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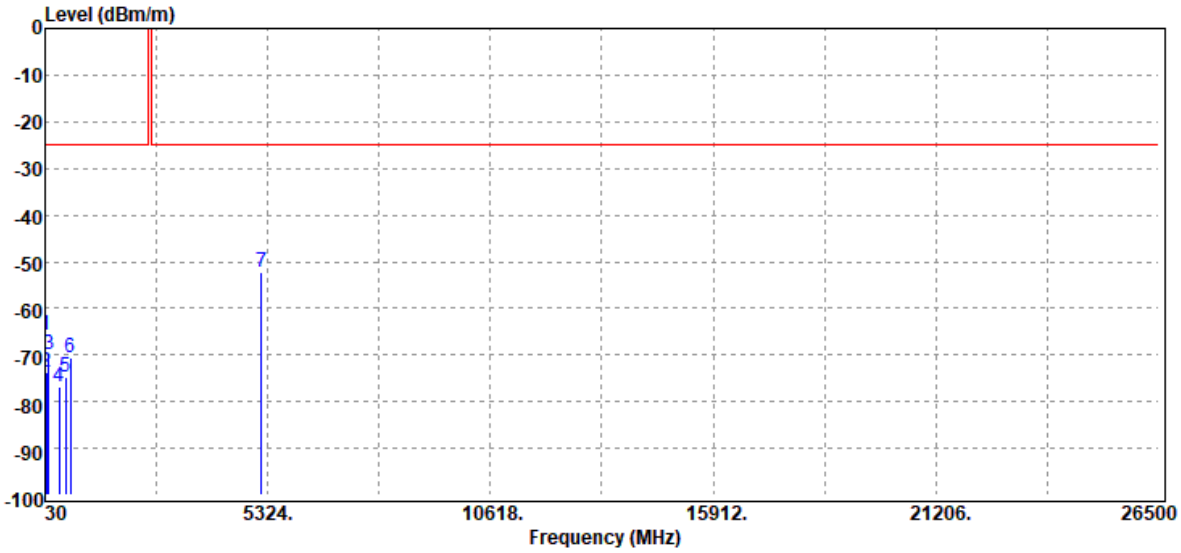
Report Number	:ER/2020/C0100	Test Site	:SAC I Chamber
Operation Mode	:LTE 38C	Test Date	:2021-01-26
Test Mode	:Tx CH Low	Temp./Humi.	:23.6/63
EUT Pol	:NB Plane	Antenna Pol.	:VERTICAL
Test Frequency	:2580_2599.8 MHz	Engineer	:Neo Tsai



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
44.55	-65.80	-52.26	-12.85	-0.69	-25.00	-40.80
63.95	-73.75	-64.37	-8.60	-0.78	-25.00	-48.75
117.30	-69.82	-66.98	-1.73	-1.11	-25.00	-44.82
357.86	-76.95	-79.49	4.50	-1.96	-25.00	-51.95
526.64	-74.59	-76.72	4.18	-2.05	-25.00	-49.59
631.40	-70.55	-71.64	3.46	-2.37	-25.00	-45.55
5179.80	-52.37	-56.75	12.28	-7.90	-25.00	-27.37

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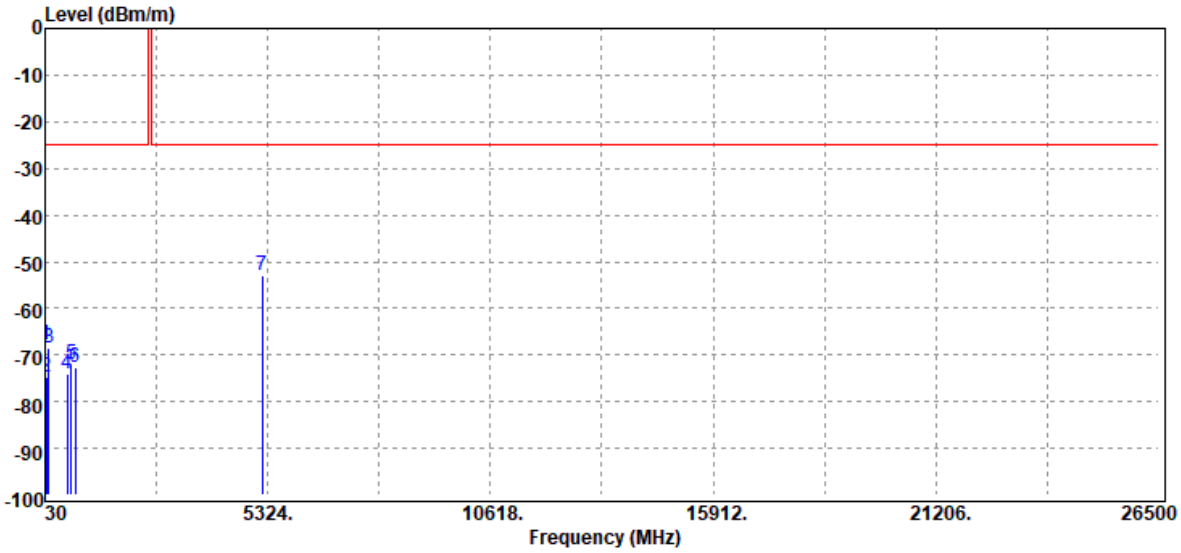
Report Number	:ER/2020/C0100	Test Site	:SAC I Chamber
Operation Mode	:LTE 38C	Test Date	:2021-01-26
Test Mode	:Tx CH Mid	Temp./Humi.	:23.6/63
EUT Pol	:NB Plane	Antenna Pol.	:VERTICAL
Test Frequency	:2585.1_2604.9 MHz	Engineer	:Neo Tsai



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
46.49	-67.90	-54.63	-12.57	-0.70	-25.00	-42.90
63.95	-74.67	-65.29	-8.60	-0.78	-25.00	-49.67
117.30	-68.59	-65.75	-1.73	-1.11	-25.00	-43.59
556.71	-74.20	-75.95	4.26	-2.51	-25.00	-49.20
660.50	-71.81	-73.08	3.68	-2.41	-25.00	-46.81
744.89	-72.78	-73.15	2.82	-2.45	-25.00	-47.78
5190.00	-52.92	-57.37	12.34	-7.89	-25.00	-27.92

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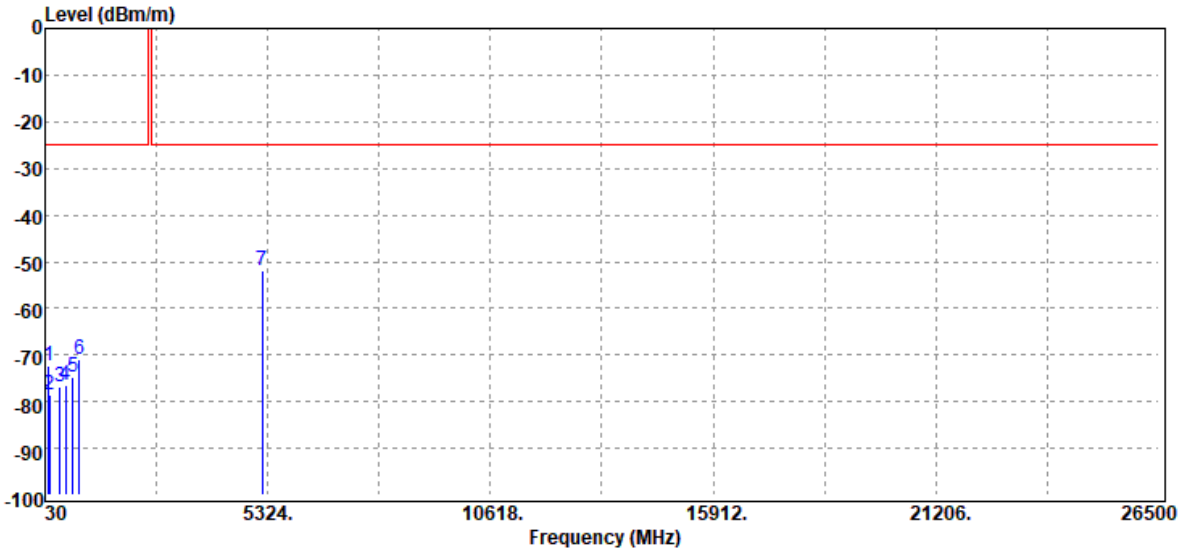
Report Number	:ER/2020/C0100	Test Site	:SAC I Chamber
Operation Mode	:LTE 38C	Test Date	:2021-01-26
Test Mode	:Tx CH Mid	Temp./Humi.	:23.6/63
EUT Pol	:NB Plane	Antenna Pol.	:HORIZONTAL
Test Frequency	:2585.1_2604.9 MHz	Engineer	:Neo Tsai



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
114.39	-72.29	-69.47	-1.73	-1.09	-25.00	-47.29
143.49	-78.41	-75.22	-1.93	-1.26	-25.00	-53.41
381.14	-76.68	-79.04	4.38	-2.02	-25.00	-51.68
515.00	-76.52	-78.52	4.12	-2.12	-25.00	-51.52
692.51	-74.65	-75.43	3.74	-2.96	-25.00	-49.65
838.01	-71.00	-72.59	4.64	-3.05	-25.00	-46.00
5190.00	-52.07	-56.52	12.34	-7.89	-25.00	-27.07

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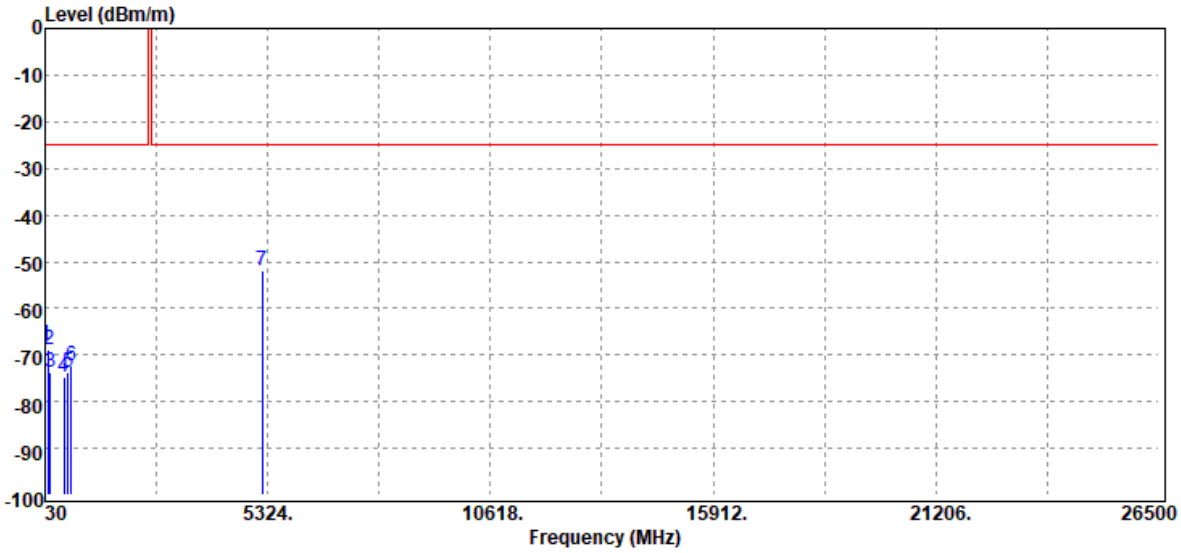
Report Number	:ER/2020/C0100	Test Site	:SAC I Chamber
Operation Mode	:LTE 38C	Test Date	:2021-01-26
Test Mode	:Tx CH High	Temp./Humi.	:23.6/63
EUT Pol	:NB Plane	Antenna Pol.	:VERTICAL
Test Frequency	:2590.2_2610 MHz	Engineer	:Neo Tsai



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
46.49	-67.73	-54.46	-12.57	-0.70	-25.00	-42.73
114.39	-68.84	-66.02	-1.73	-1.09	-25.00	-43.84
146.40	-73.88	-70.94	-1.73	-1.21	-25.00	-48.88
473.29	-74.64	-76.50	4.18	-2.32	-25.00	-49.64
579.99	-73.84	-75.08	3.95	-2.71	-25.00	-48.84
650.80	-72.26	-73.45	3.63	-2.44	-25.00	-47.26
5200.20	-52.07	-56.59	12.40	-7.88	-25.00	-27.07

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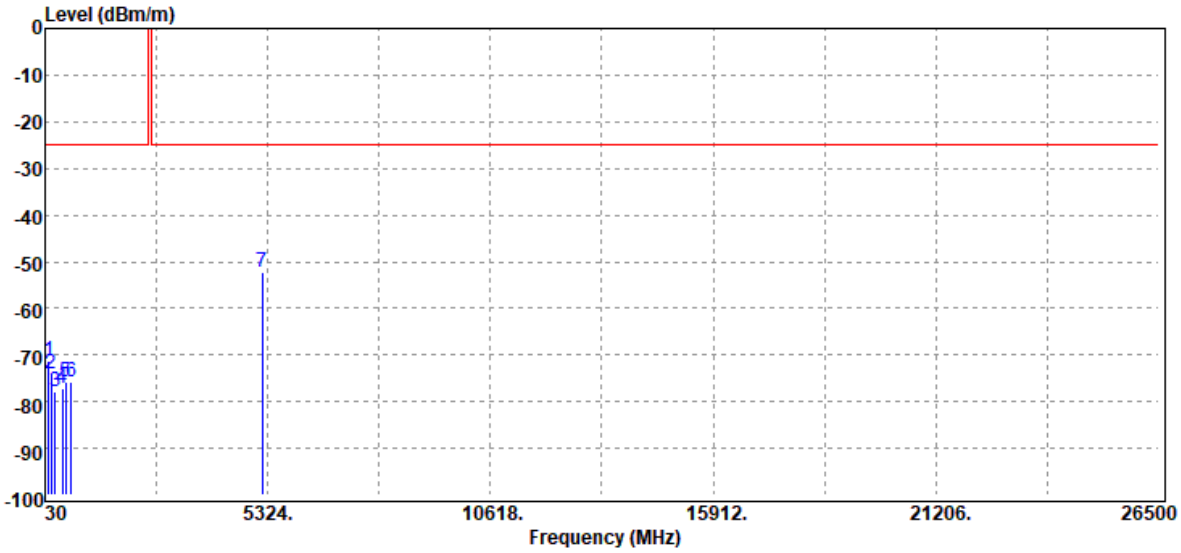
Report Number	:ER/2020/C0100	Test Site	:SAC I Chamber
Operation Mode	:LTE 38C	Test Date	:2021-01-26
Test Mode	:Tx CH High	Temp./Humi.	:23.6/63
EUT Pol	:NB Plane	Antenna Pol.	:HORIZONTAL
Test Frequency	:2590.2_2610 MHz	Engineer	:Neo Tsai



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
112.45	-71.27	-68.55	-1.65	-1.07	-25.00	-46.27
167.74	-74.06	-72.25	-0.55	-1.26	-25.00	-49.06
269.59	-77.88	-80.37	4.13	-1.64	-25.00	-52.88
447.10	-77.07	-79.03	4.15	-2.19	-25.00	-52.07
524.70	-75.80	-77.88	4.18	-2.10	-25.00	-50.80
657.59	-75.67	-76.92	3.64	-2.39	-25.00	-50.67
5200.20	-52.33	-56.85	12.40	-7.88	-25.00	-27.33

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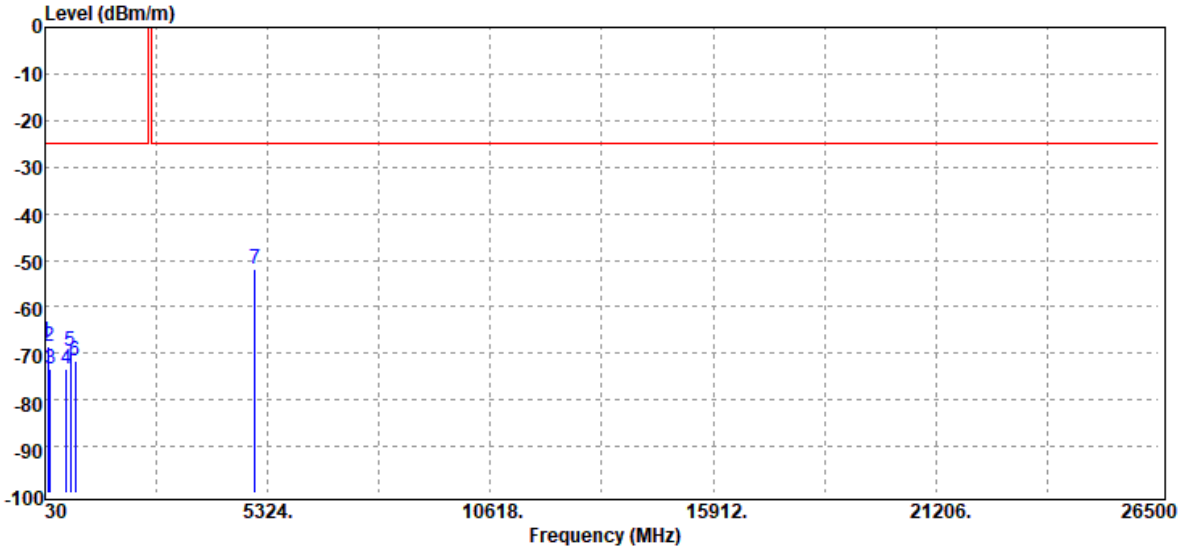
Radiated Spurious Emission Measurement Result: LTE Band 41C Mode

Report Number	:ER/2020/C0100	Test Site	:SAC I Chamber
Operation Mode	:LTE 41C	Test Date	:2021-01-26
Test Mode	:Tx CH Low	Temp./Humi.	:23.6/63
EUT Pol	:NB Plane	Antenna Pol.	:VERTICAL
Test Frequency	:2499.3_2511 MHz	Engineer	:Neo Tsai



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
46.49	-67.40	-54.13	-12.57	-0.70	-25.00	-42.40
112.45	-68.53	-65.81	-1.65	-1.07	-25.00	-43.53
146.40	-73.21	-70.27	-1.73	-1.21	-25.00	-48.21
534.40	-73.36	-75.45	4.24	-2.15	-25.00	-48.36
631.40	-69.71	-70.80	3.46	-2.37	-25.00	-44.71
749.74	-71.56	-71.96	2.88	-2.48	-25.00	-46.56
5010.30	-52.07	-57.02	12.42	-7.47	-25.00	-27.07

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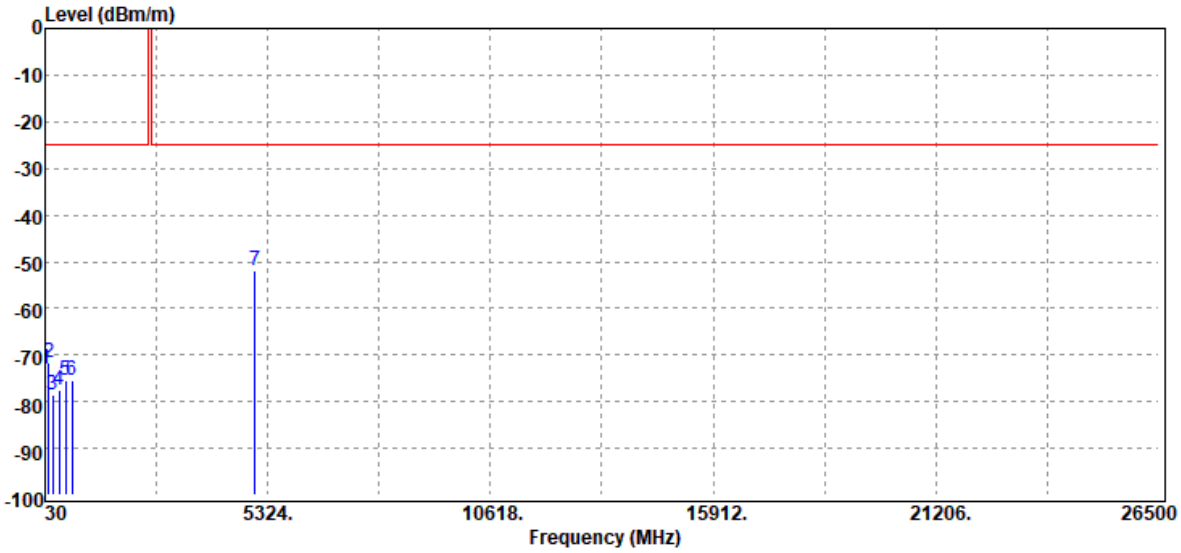
Report Number	:ER/2020/C0100	Test Site	:SAC I Chamber
Operation Mode	:LTE 41C	Test Date	:2021-01-26
Test Mode	:Tx CH Low	Temp./Humi.	:23.6/63
EUT Pol	:NB Plane	Antenna Pol.	:HORIZONTAL
Test Frequency	:2499.3_2511 MHz	Engineer	:Neo Tsai



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
44.55	-72.92	-59.38	-12.85	-0.69	-25.00	-47.92
114.39	-71.64	-68.82	-1.73	-1.09	-25.00	-46.64
211.39	-78.63	-81.93	4.78	-1.48	-25.00	-53.63
359.80	-77.46	-80.03	4.51	-1.94	-25.00	-52.46
524.70	-75.40	-77.48	4.18	-2.10	-25.00	-50.40
675.05	-75.52	-76.38	3.87	-3.01	-25.00	-50.52
5010.30	-51.85	-56.80	12.42	-7.47	-25.00	-26.85

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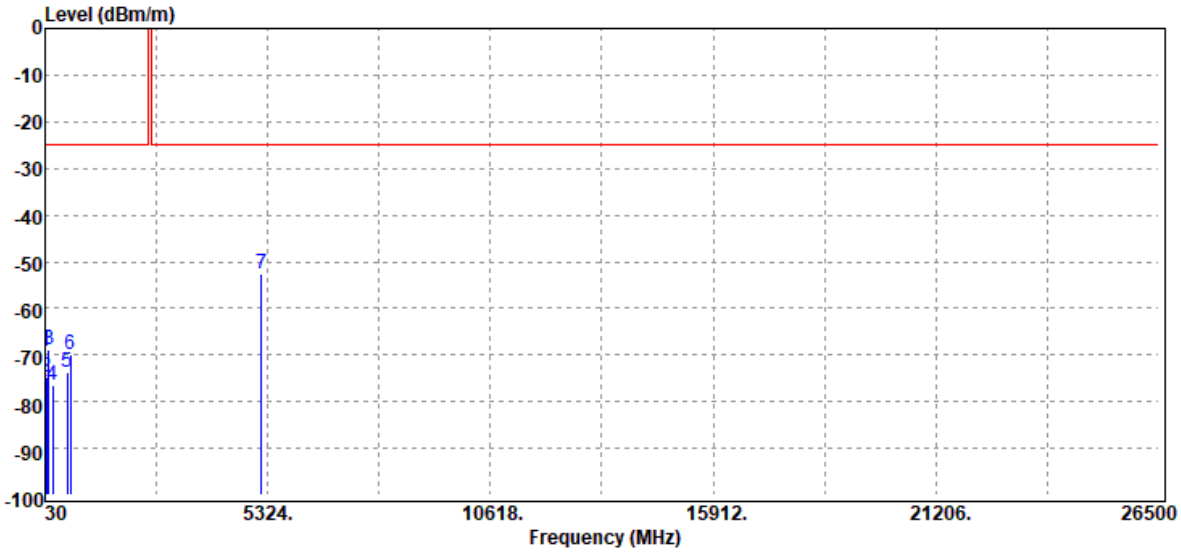
Report Number	:ER/2020/C0100	Test Site	:SAC I Chamber
Operation Mode	:LTE 41C	Test Date	:2021-01-26
Test Mode	:Tx CH Mid	Temp./Humi.	:23.6/63
EUT Pol	:NB Plane	Antenna Pol.	:VERTICAL
Test Frequency	:2583.8_2595.5 MHz	Engineer	:Neo Tsai



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
44.55	-69.27	-55.73	-12.85	-0.69	-25.00	-44.27
63.95	-74.78	-65.40	-8.60	-0.78	-25.00	-49.78
117.30	-68.94	-66.10	-1.73	-1.11	-25.00	-43.94
211.39	-76.56	-79.86	4.78	-1.48	-25.00	-51.56
548.95	-73.55	-75.46	4.19	-2.28	-25.00	-48.55
631.40	-69.80	-70.89	3.46	-2.37	-25.00	-44.80
5179.30	-52.75	-57.13	12.28	-7.90	-25.00	-27.75

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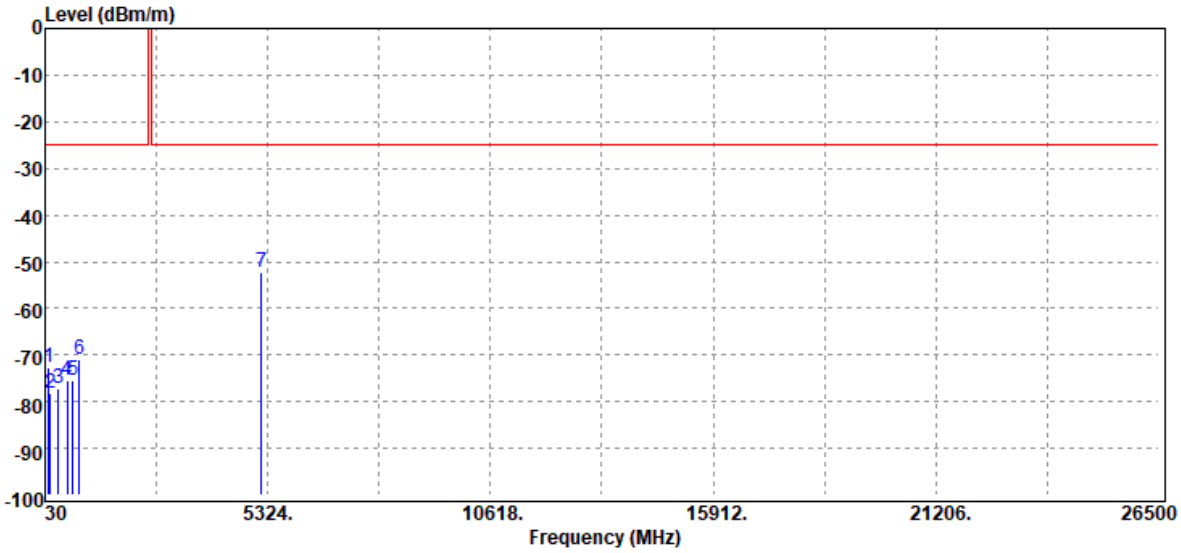
Report Number	:ER/2020/C0100	Test Site	:SAC I Chamber
Operation Mode	:LTE 41C	Test Date	:2021-01-26
Test Mode	:Tx CH Mid	Temp./Humi.	:23.6/63
EUT Pol	:NB Plane	Antenna Pol.	:HORIZONTAL
Test Frequency	:2583.8_2595.5 MHz	Engineer	:Neo Tsai



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
116.33	-72.75	-70.04	-1.61	-1.10	-25.00	-47.75
146.40	-78.31	-75.37	-1.73	-1.21	-25.00	-53.31
353.01	-77.14	-79.65	4.52	-2.01	-25.00	-52.14
551.86	-75.44	-77.32	4.22	-2.34	-25.00	-50.44
694.45	-75.46	-76.28	3.72	-2.90	-25.00	-50.46
841.89	-71.07	-72.79	4.69	-2.97	-25.00	-46.07
5179.30	-52.15	-56.53	12.28	-7.90	-25.00	-27.15

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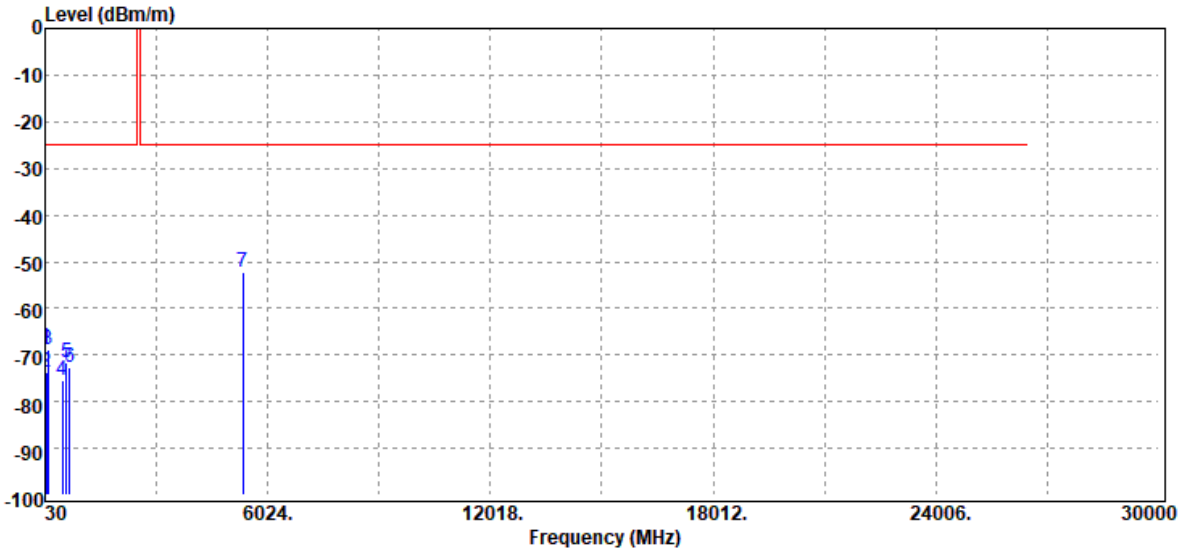
Report Number	:ER/2020/C0100	Test Site	:SAC I Chamber
Operation Mode	:LTE 41C	Test Date	:2021-01-26
Test Mode	:Tx CH High	Temp./Humi.	:23.6/63
EUT Pol	:NB Plane	Antenna Pol.	:VERTICAL
Test Frequency	:2668.3_2680 MHz	Engineer	:Neo Tsai



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
44.55	-68.48	-54.94	-12.85	-0.69	-25.00	-43.48
63.95	-73.59	-64.21	-8.60	-0.78	-25.00	-48.59
114.39	-68.86	-66.04	-1.73	-1.09	-25.00	-43.86
495.60	-75.55	-77.38	4.18	-2.35	-25.00	-50.55
599.39	-71.46	-72.48	3.66	-2.64	-25.00	-46.46
686.69	-72.70	-73.51	3.78	-2.97	-25.00	-47.70
5348.30	-52.21	-56.49	13.00	-8.72	-25.00	-27.21

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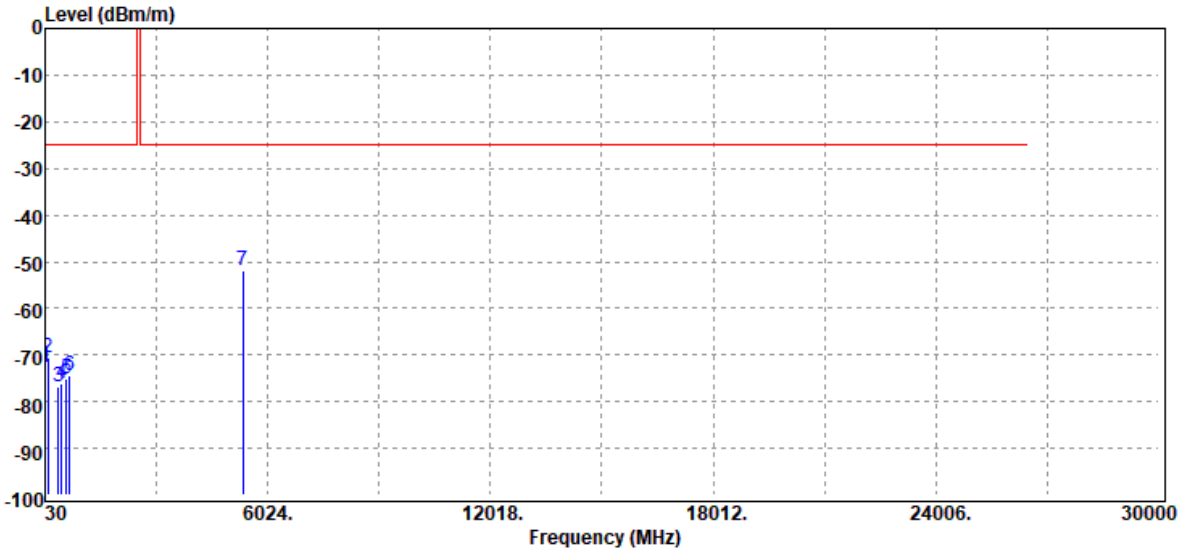
Report Number	:ER/2020/C0100	Test Site	:SAC I Chamber
Operation Mode	:LTE 41C	Test Date	:2021-01-26
Test Mode	:Tx CH High	Temp./Humi.	:23.6/63
EUT Pol	:NB Plane	Antenna Pol.	:HORIZONTAL
Test Frequency	:2668.3_2680 MHz	Engineer	:Neo Tsai



Freq. MHz	EIRP/ERP dBm	SG Output Level dBm	Antenna Gain dBi/dBd	Cable Loss dB	Limit dBm	Margin dB
46.49	-72.58	-59.31	-12.57	-0.70	-25.00	-47.58
114.39	-70.53	-67.71	-1.73	-1.09	-25.00	-45.53
393.75	-76.69	-78.94	4.33	-2.08	-25.00	-51.69
483.96	-76.23	-78.15	4.28	-2.36	-25.00	-51.23
600.36	-75.13	-76.13	3.64	-2.64	-25.00	-50.13
682.81	-74.42	-75.33	3.81	-2.90	-25.00	-49.42
5348.30	-51.82	-56.10	13.00	-8.72	-25.00	-26.82

~ End of Report ~

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