



FCC Test Report

For:
Itron, Inc.

Brand:
Itron

Marketing Name:
Solar Battery AP

Model Name:
Solar Battery AP

Product Description:
Solar battery access point

FCC ID: EWQ-SBAP
IC: 864D-SBAP

Applied Rules and Standards:
47 CFR Parts 24, 27 – KDB996369 Cellular
RSS: 130 Issue 2, 133 Issue 6, 139 Issue 4

REPORT #: EMC_ITRO1_071_23001_KDB996369_Rev1

DATE: 7/3/2024



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3462B

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1 Assessment

The following device as further described in section 3 of this report was evaluated against the applicable criteria specified in the Code of Federal Regulations Title 47 parts 24, 27 and Industry Canada Standards RSS-GEN issue 5, RSS-130 issue 2, RSS-133 issue 6 and RSS-139 issue 4

No deficiencies were ascertained.

Company	Description	Model #
ltron, Inc	Solar Battery Access Point	Solar Battery AP

Responsible for the Report:

2024-07-03	Compliance	Art Thammanavarat (Senior EMC Engineer)	
Date	Section	Name	Signature

The test results of this test report relate exclusively to the test item specified in Section3.

CETECOM Inc. USA does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of CETECOM Inc. USA.

2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the EMC Test Report

Company Name:	CETECOM Inc.
Department:	Compliance
Street Address:	411 Dixon Landing Road
City/Zip Code	Milpitas, CA 95035
Country	USA
Telephone:	+1 (408) 586 6200
Fax:	+1 (408) 586 6299
EMC Lab Manager:	Issa Ghama
Project Manager:	Rami Saman

2.2 Identification of the Client

Client's Name:	Itron, Inc.
Street Address:	2401 North State St
City/Zip Code	Waseca, MN 56093
Country	USA

2.3 Identification of the Manufacturer

Manufacturer's Name:	Itron, Inc.
Manufacturers Address:	313 North Hwy 11
City/Zip Code	West Union, SC 29696-2706
Country	USA

3 Equipment Under Test (EUT)

3.1 EUT Specifications

Model No:	Solar Battery AP
Marketing Name:	Solar Battery AP
HW Version :	3
SW Version :	CSL 10.0.7.0
FCC ID :	EWQ-SBAP
IC	864D-SBAP
FVIN:	CSL 10.0.7.0
HVIN:	SBAP
PMN:	Solar Battery AP
Product Description:	Solar battery access point
Bands/Modes Supported	Cellular Modules Model Name : SKYWORKS Part Number : SKY66431-11 Wireless Technologies LTE FDD/TDD Band: 2,4,12,13
Frequency Range	FCC BANDS LTE Band 2: 1850 – 1910 MHz LTE Band 4: 1710 – 1755 MHz LTE Band 12: 699 – 716 MHz LTE Band 13: 777 – 787 MHz
Antenna Information as declared:	Name : Itron Model Number : EWQ-SBAP Type : Integral PCB Antennas Peak Gain • LTE Band 2: 2.5 dBi • LTE Band 4: 2.2 dBi • LTE Band 12: 2.4 dBi • LTE Band 13: 2.6 dBi
Power Supply / Rated operating Voltage Range:	3.3V / 3.6V / 3.9V
Operating Temperature Range	-40C - 70C
Other Radios included in the device:	900MHz Radio
Sample Revision	Pre-production
EUT Dimensions	160 x 236 x 77 mm
Note: The information of the EUT specifications in the table above is provided by the client.	

3.2 EUT details

EUT #	Part Number	Series Number	HW Version	SW Version	Comments
1	200-9000000/1	2956120-01	3	CSL 10.0.7.0	Radiated Emission

Note: information provided by the customer.

3.3 Accessory Equipment (AE) details

AE #	Type	Model	Manufacturer	Serial Number	Comments
1	Laptop	Latitude 5420	Dell	36638266611	Support laptop provided by client

3.4 Test Setup Configurations

Set-up #	EUT / AE used for set-up	Comments
1	EUT1 + AE1	- EUT power by 3.6Vdc battery - Radiated RF measurements were performed with EUT configured via customer provided CLI Tool and instructions

3.5 Mode of Operation

Mode #	Mode of Operation	Comments
1	Cellular	Cellular was tested on Mid Channels at maximum power. Continuously transmitting continuous wave (for compliance test purpose only)

3.6 Justification for Worst Case Mode of Operation

During the testing process, the EUT was tested with transmitter sets on mid channels, and continuous wave transmission.

For radiated measurements, all data in this report shows the worst case between horizontal and vertical antenna polarizations and for all orientations of the EUT.

4 Subject of Investigation

The objective of the measurements done by CETECOM Inc. was to evaluate the compliance of the EUT against the relevant requirements specified in the Code of Federal Regulations Title 47 parts 24, 27 and ISSED Standards RSS-133 issue 6, RSS-139 issue 4 and RSS-130 Issue 2.

4.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus, with 95% confidence interval (in dB delta to result), based on a coverage factor $k=2$.

Radiated measurement

Measurement System	EMC 1	EMC 2
Conducted emissions (mains port)	1.12	N/A
Radiated emissions (< 30 MHz)	3.28	2.98
(30 MHz – 1 GHz)	3.16	2.81
(1 – 3 GHz)	4.71	4.51
(3 – 18 GHz)	4.23	4.16
(18 – 40 GHz)	2.42	2.42

RF conducted measurement ± 0.5 dB

According to TR 102 273 a multiplicative propagation of error is assumed for RF measurement systems. For this reason the RMS method is applied to dB values and not to linear values as appropriate for additive propagation of error. Also used: <http://physics.nist.gov/cuu/Uncertainty/typeb.html>. The above calculated uncertainties apply to direct application of the Substitution method. The Substitution method is always used when the EUT comes closer than 3dB to the limit.

4.2 Environmental Conditions During Testing:

The following environmental conditions were maintained during the course of testing:

- Ambient Temperature: 20-25°C
- Relative humidity: 40-60%

4.3 Dates of Testing:

2/29/2024 - 4/10/2024

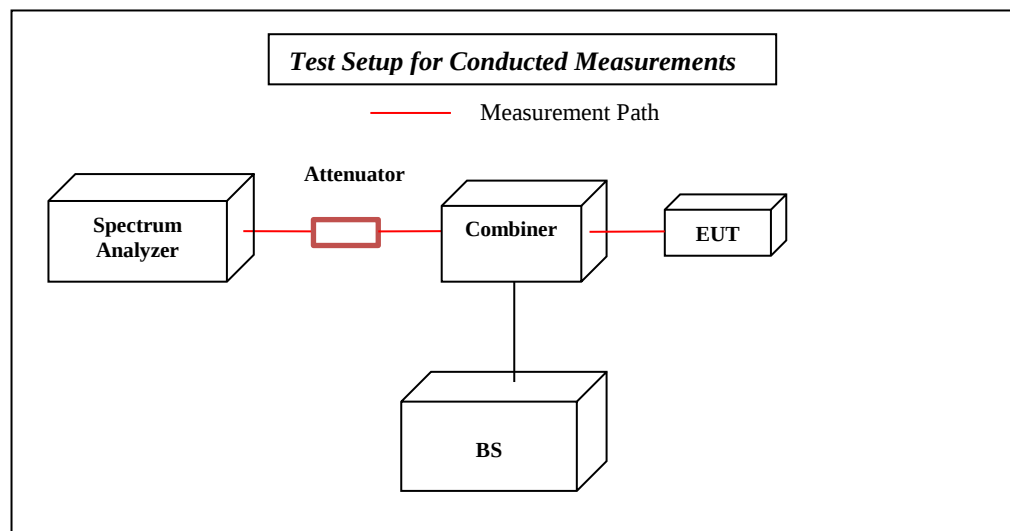
4.4 Decision Rule:

Cetecom advanced follows ILAC G8:2019 chapter 4.2.1 (Simple Acceptance Rule).

Only the measured values related to their corresponding limits will be used to decide whether the equipment under test meets the requirements of the test standards listed in chapter 3. The measurement uncertainty is mentioned in this test report, See chapter 9, but is not taken into account – neither to the limits nor to the measurement results. Measurement results with a smaller margin to the corresponding limits than the measurement uncertainty have a potential risk of more than 5% that the decision might be wrong.

5 Measurement Procedures

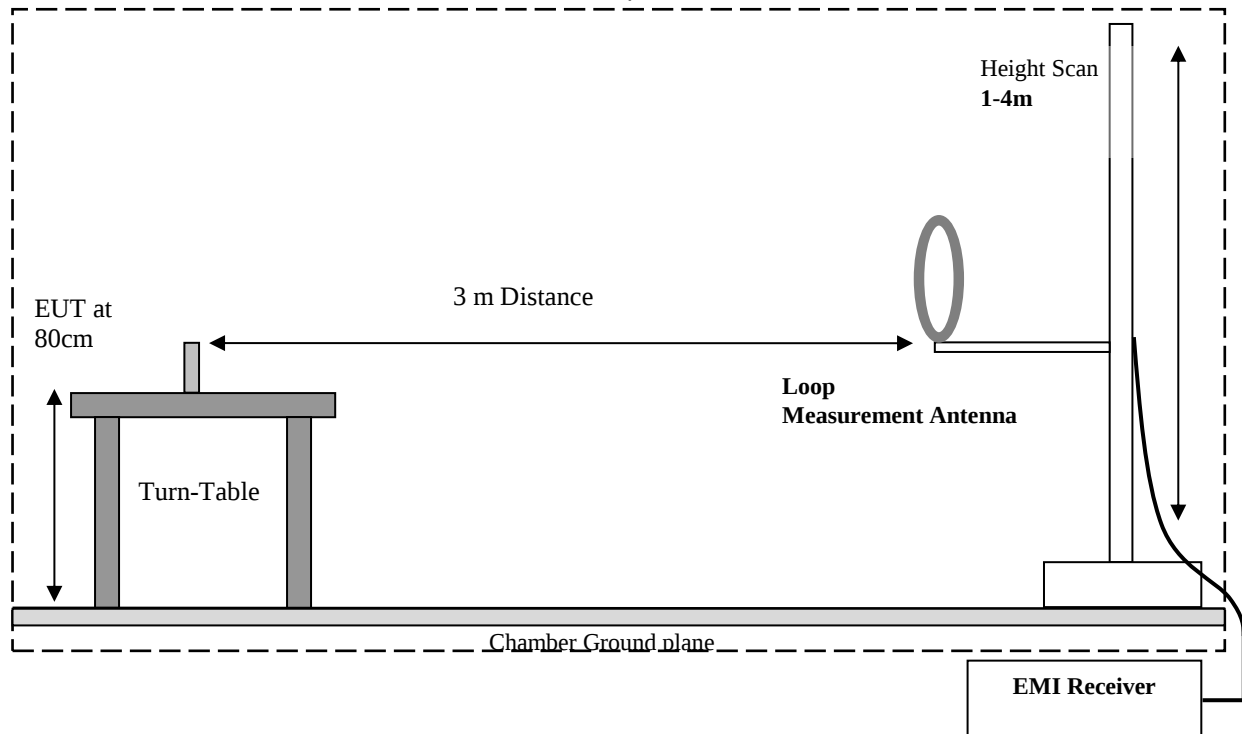
Testing is performed according to the guidelines provided in FCC publication (KDB) 971168 D01 v03r01 – “Measurement Guidance for Certification of Licensed Digital Transmitters” and according to relevant parts of ANSI/TIA-603-D-2010 as detailed below.



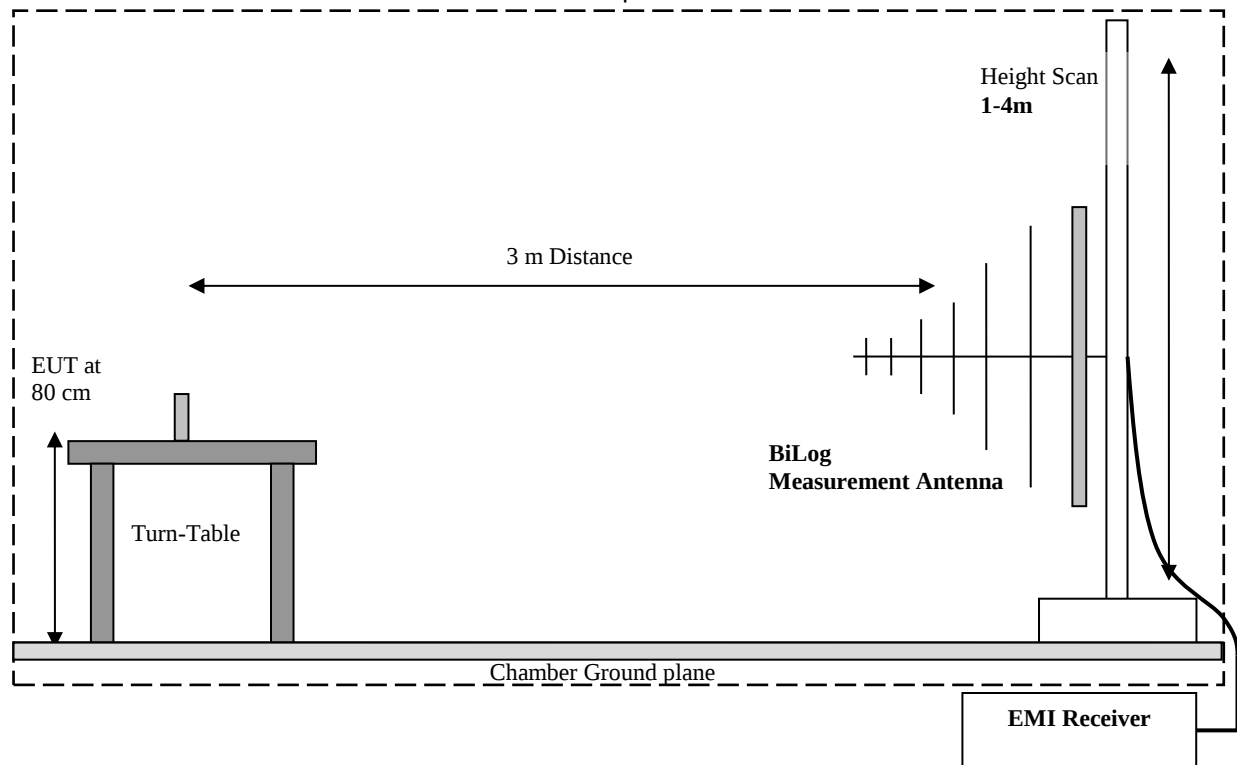
5.1 Radiated Measurement

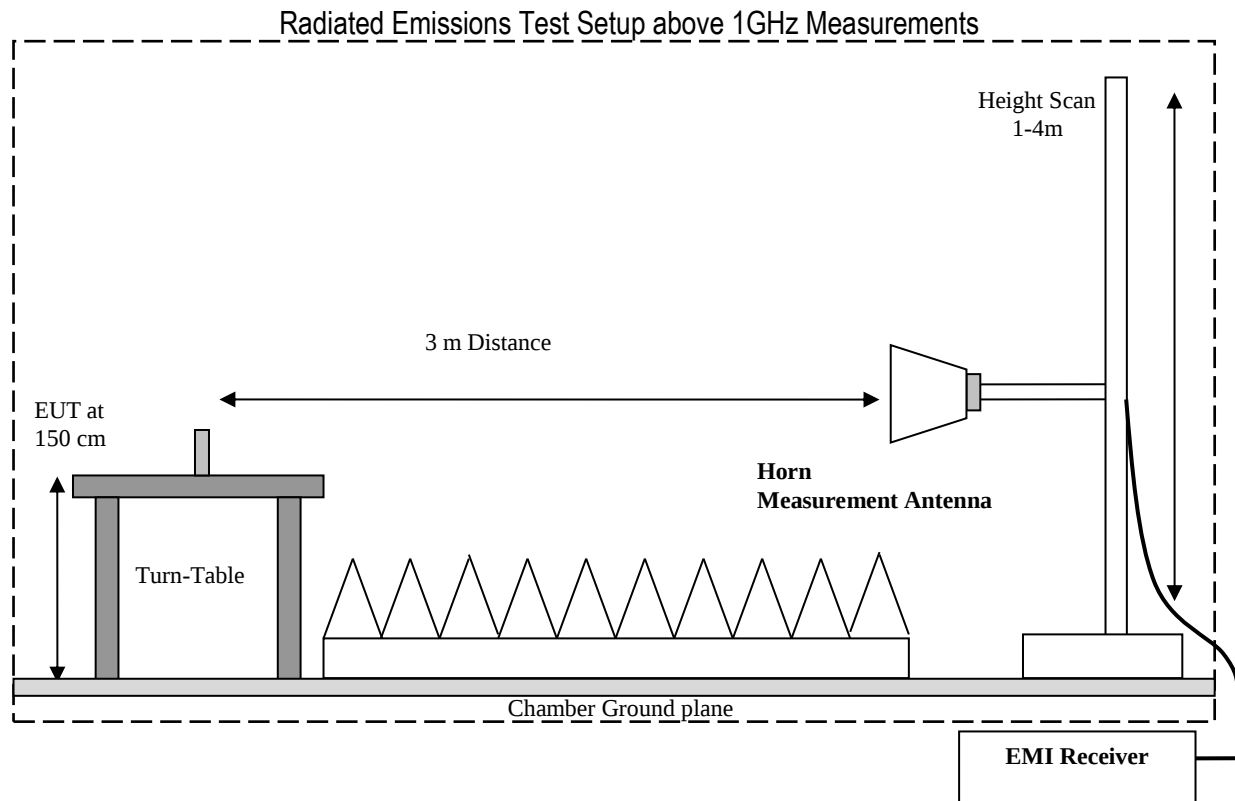
- The exploratory measurement is accomplished by running a matrix of 16 sweeps over the required frequency range with R&S Test-SW EMC32 for 4 positions of the turntable, two orthogonal positions of the EUT and both antenna polarizations. This procedure exceeds the requirement of the above standards to cover the 3 orthogonal axis of the EUT. A max peak detector is utilized during the exploratory measurement. The Test-SW creates an overall maximum trace for all 12 sweeps and saves the settings for each point of this trace. The maximum trace is part of the test report.
- The 10 highest emissions are selected with an automatic algorithm of EMC32 searching for peaks in the noise floor and ensuring that broadband signals are not selected multiple times.
- The maxima are then put through the final measurement and again maximized in a 90deg range of the turntable, fine search in frequency domain and height scan between 1m and 4m.
- The above procedure is repeated for all possible ways of power supply to EUT and for all supported modulations.
- In case there are no emissions above noise floor level only the maximum trace is reported as described above.
- The results are split up into up to 4 frequency ranges due to antenna bandwidth restrictions. A magnetic loop is used from 9 kHz to 30 MHz, a Biconilog antenna is used from 30 MHz to 1 GHz, and two different horn antennas are used to cover frequencies up to 40 GHz.

Radiated Emissions Test Setup below 30MHz Measurements



Radiated Emissions Test Setup 30MHz-1GHz Measurements





5.2 Sample Calculations for Field Strength Measurements

Field Strength is calculated from the Spectrum Analyzer/ Receiver readings, taking into account the following parameters:

- Measured reading in dB μ V
- Cable Loss between the receiving antenna and SA in dB and
- Antenna Factor in dB/m

All radiated measurement plots in this report are taken from a test SW that calculates the Field Strength based on the following equation:

$$FS \text{ (dB}\mu\text{V/m)} = \text{Measured Value on SA (dB}\mu\text{V)} + \text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)}$$

Example:

Frequency (MHz)	Measured SA (dB μ V)	Cable Loss (dB)	Antenna Factor Correction (dB)	Field Strength Result (dB μ V/m)
1000	80.5	3.5	14	98.0

6 Measurement Results Summary

6.1 Part 24 / RSS-133

Test Specification	Test Case	Temperature and Voltage Conditions	Mode	Pass	Fail	NA	NP	Result
§2.1046; §24.232 (a) RSS-133 Clause 6.4	RF Output Power	Nominal	-	☐	☐	☐	■	Complies Note 1 Note 2
§2.1047, RSS-132 Clause 6.2	Modulation Characteristics	Nominal	-	☐	☐	☐	■	Complies Note 1 Note 2
§2.1055; §24.235 RSS-133 Clause 6.3	Frequency Stability	Extreme Temperature and Voltage	-	☐	☐	☐	■	Complies Note 1 Note 2
§2.1049; §24.238 RSS-133 Clause 2.3	Occupied Bandwidth	Nominal	-	☐	☐	☐	■	Complies Note 1 Note 2
§2.1051; §24.238 RSS-133 Clause 6.5	Band Edge Compliance	Nominal	-	☐	☐	☐	■	Complies Note 1 Note 2
§2.1051; §24.238 RSS-133 Clause 6.5	Conducted Spurious Emissions	Nominal	-	☐	☐	☐	■	Complies Note 1 Note 2
§2.1053; §24.238 RSS-133 Clause 6.6	Radiated Spurious Emissions	Nominal	Op. 1	■	☐	☐	☐	Complies

Note 1: NA= Not Applicable; NP= Not Performed.

Note 2: Leveraged from module certification Sequans Communication SKY66431 (FCC ID: 2AAGM66431, IC: 12732A-66431)

6.2 FCC 27 / RSS-130/ RSS-139

Test Specification	Test Case	Temperature and Voltage Conditions	Mode	Pass	Fail	NA	NP	Result
§2.1046; §27.50 /RSS-130 Clause 4.6/ RSS-139 Clause 6.5	RF Output Power	Nominal	-	☐	☐	☐	■	Complies Note 1 Note 2
§2.1047; §27.50, /RSS-130 Clause 4.2/ RSS-Clause 6.2	Modulation Characteristics	Nominal	-	☐	☐	☐	■	Complies Note 1 Note 2
§2.1055; §27.54 /RSS-130 Clause 4.5 /RSS-Clause 6.4	Frequency Stability	Extreme Temperature and Voltage	-	☐	☐	☐	■	Complies Note 1 Note 2
§2.1049; §27.53 RSS-199 Clause 4.2	Occupied Bandwidth	Nominal	-	☐	☐	☐	■	Complies Note 1 Note 2
§2.1051; §27.53 /RSS-130 Clause 4.7/ RSS-Clause 6.6	Band Edge Compliance	Nominal	-	☐	☐	☐	■	Complies Note 1 Note 2
§2.1051; §27.53 RSS-199 Clause 4.5 /RSS-130 Clause 4.7/ RSS-Clause 6.6	Conducted Spurious Emissions	Nominal	-	☐	☐	☐	■	Complies Note 1 Note 2
§2.1053; §27.53 RSS-199 Clause 4.5 /RSS-130 Clause 4.7/ RSS-Clause 6.6	Radiated Spurious Emissions	Nominal	Op. 1	■	☐	☐	☐	Complies

Note 1: NA= Not Applicable; NP= Not Performed.

Note 2: Leveraged from module certification Sequans Communication SKY66431 (FCC ID: 2AAGM66431, IC: 12732A-66431)

7 Test Result Data

7.1 ERP/EIRP

FCC Rule Parts	Band	Frequency Range	Power Conducted Note 1	Power Conducted	Gain	EIRP Note 2	ERP Note 2	Limit EIRP (W)	Limit ERP (W)
		(MHz)	(dBm)	(W)	(dBi)	(W)	(W)		
24E	LTE 2	1850 – 1910	23.73	0.236	2.50	0.420	-	2	-
27	LTE 4	1710 – 1755	23.46	0.222	2.20	0.368	-	1	-
27	LTE 12	699 – 716	23.78	0.239	2.40	-	0.253	-	1
27	LTE 13	777 – 787	23.18	0.208	2.60	-	0.231	-	1

Note 1: Power Conducted (dBm) leveraged from test report “71232RAN.001” prepared by DEKRA Testing and Certification, S.A.U. of cellular module Sequans Communication SKY66431 (FCC ID: 2AAGM66431, IC: 12732A-66431).

Note 2: ERP/EIRP are based on calculations from Power Conducted by adding the declared maximum gain of the utilized cellular antenna per operational description.

7.2 Radiated Spurious Emissions

7.2.1 Measurement utilizing KDB 971168 D01 Power Meas License Digital Systems v03r01, and according to ANSI/TIA-603-D-2010

Spectrum Analyzer Settings for FCC 22

Frequency Range	30MHz – 1 GHz	1 – 1.58 GHz	1.58 – 9 GHz
Resolution Bandwidth	100 kHz	1 MHz	1 MHz
Video Bandwidth	100 kHz	1 MHz	1 MHz
Detector	Peak	Peak	Peak
Trace Mode	Max Hold	Max Hold	Max Hold
Sweep Time	Auto	Auto	Auto

Spectrum Analyzer Settings for FCC 24 and 27

Frequency Range	30MHz – 1 GHz	1 – 2.7 GHz	2.7 – 18 GHz	18 – 19.1 GHz
Resolution Bandwidth	100 kHz	1 MHz	1 MHz	1 MHz
Video Bandwidth	100 kHz	1 MHz	1 MHz	1 MHz
Detector	Peak	Peak	Peak	Peak
Trace Mode	Max Hold	Max Hold	Max Hold	Max Hold
Sweep Time	Auto	Auto	Auto	Auto

7.2.2 Limits:

7.2.2.1 FCC Part 24.238 (a); FCC Part 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.

7.2.2.2 RSS-130 Part 4.7, RSS-133 Part 6.5; RSS-139 Part 5.6 Transmitter Unwanted Emissions

Mobile and base station equipment shall comply with the limits in (i) and (ii) below.

i. In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1% of the occupied bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10} p$ (watts).

ii. After the first 1.0 MHz immediately outside and adjacent to each of the sub-bands, the power of emissions in any 100 kHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10} p$ (watts). If the measurement is performed using 1% of the occupied bandwidth, power integration over 100 kHz is required.

Note: The limit calculation result is a constant of -13 dBm.

7.2.3 Test conditions and setup:

Ambient Temperature (°C)	EUT Set-Up #	EUT operating mode	Power Input
21.8	1	1	Operate By 3.6Vdc battery

7.2.4 Measurement result:

Plot #	Channel	EUT operating mode	Scan Frequency	Lowest margin emission (dBm)	Limit (dBm)	Result
1-4	Mid	LTE Band 2	30 MHz – 22 GHz	-14.84	-13	Pass
5-7	Mid	LTE Band 4	30 MHz – 18 GHz	-16.00	-13	Pass
8-10	Mid	LTE Band 12	30 MHz – 18 GHz	-15.03	-13	Pass
11-13	Mid	LTE Band 13	30 MHz – 18 GHz	-16.78	-13	Pass

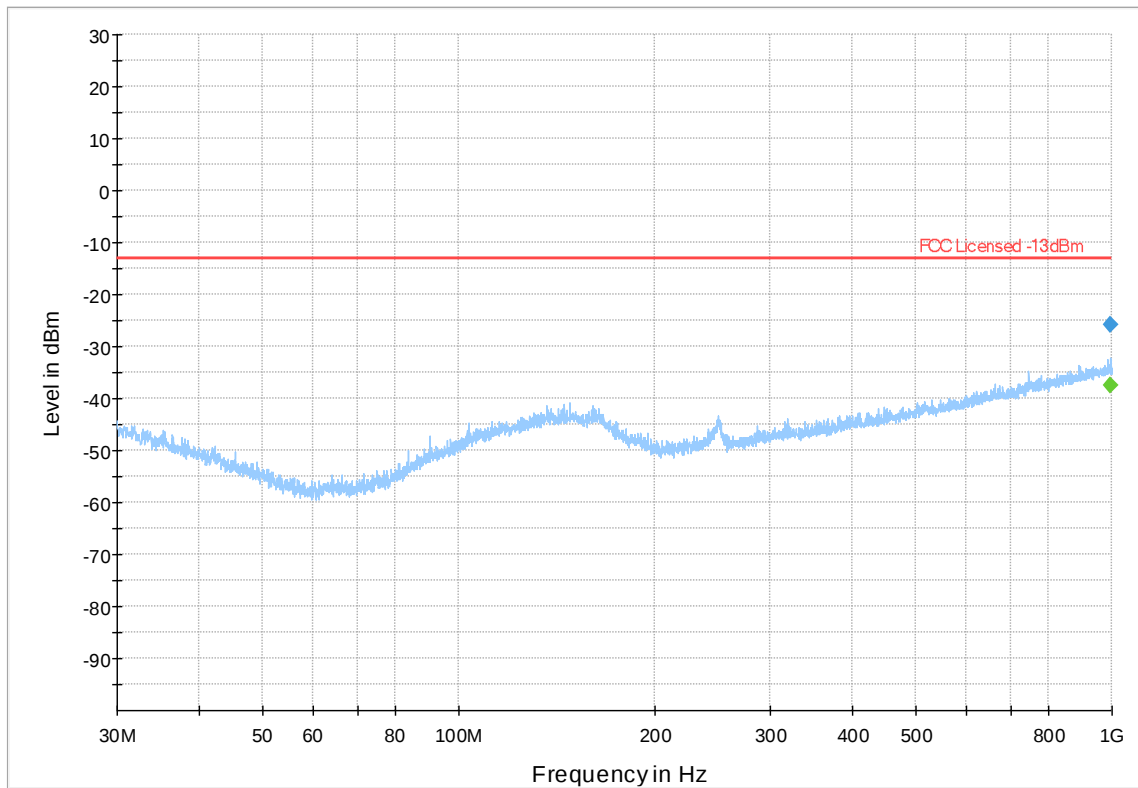
7.2.5 Measurement plots:

Plot # 1 Radiated Emissions: 30 MHz – 1GHz

Channel: Mid

Final_Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Sig Path	Preamp (dB)	Trd Corr.	Raw Rec
993.968	---	-37.42	---	---	500.0	120.000	132.0	V	273.0	-62.9	2.7	0.0	-65.6	25.5
993.968	-25.85	---	-13.00	12.85	500.0	120.000	132.0	V	273.0	-62.9	2.7	0.0	-65.6	37.0



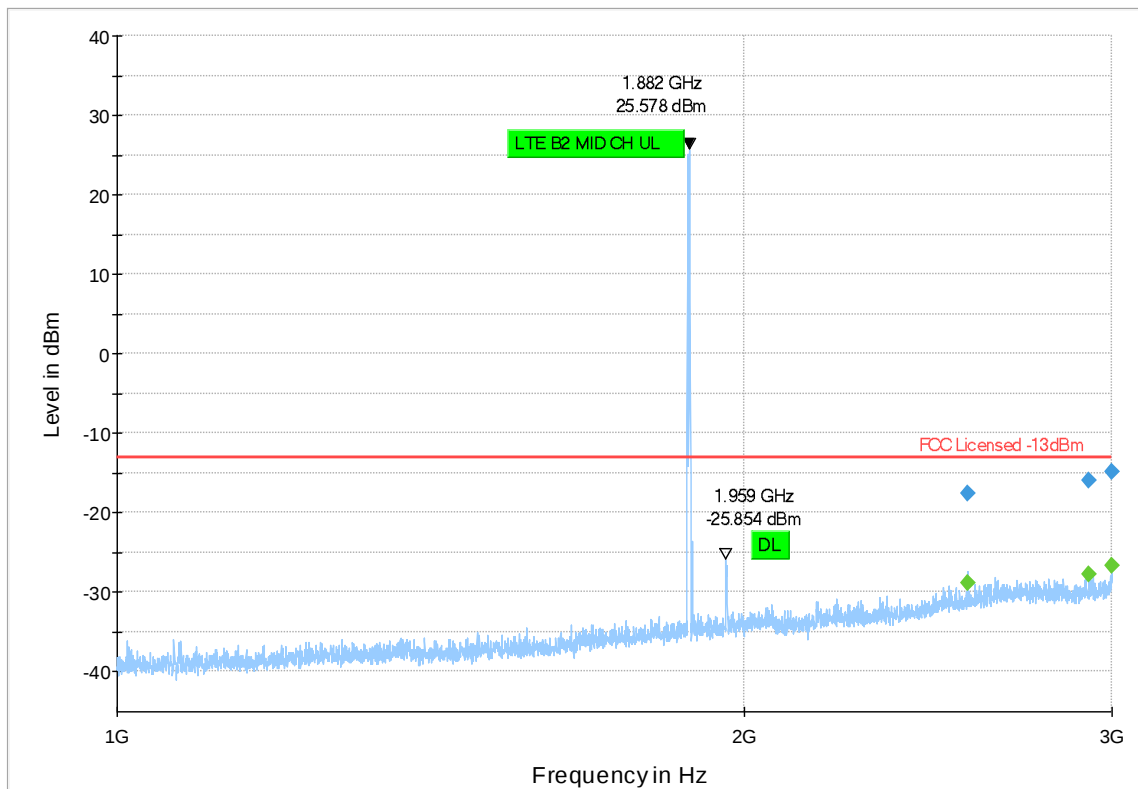
Preview Result 1-PK+ FCC Licensed -13dBm Final_Result PK+ Final_Result RMS

Plot # 2 Radiated Emissions: 1 GHz - 3 GHz

Channel: Mid

Final Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Sig Path	Preamp (dB)	Trd Corr.	Raw Rec
2559.500	-17.51	---	-13.00	4.51	500.0	1000.000	400.0	V	89.0	-61.7	4.9	0.0	-66.7	44.2
2559.500	---	-28.77	---	---	500.0	1000.000	400.0	V	89.0	-61.7	4.9	0.0	-66.7	33.0
2925.500	---	-27.69	---	---	500.0	1000.000	150.0	H	37.0	-60.6	5.2	0.0	-65.7	32.9
2925.500	-15.86	---	-13.00	2.86	500.0	1000.000	150.0	H	37.0	-60.6	5.2	0.0	-65.7	44.7
2999.250	-14.84	---	-13.00	1.84	500.0	1000.000	330.0	V	12.0	-59.4	5.9	0.0	-65.4	44.6
2999.250	---	-26.58	---	---	500.0	1000.000	330.0	V	12.0	-59.4	5.9	0.0	-65.4	32.9



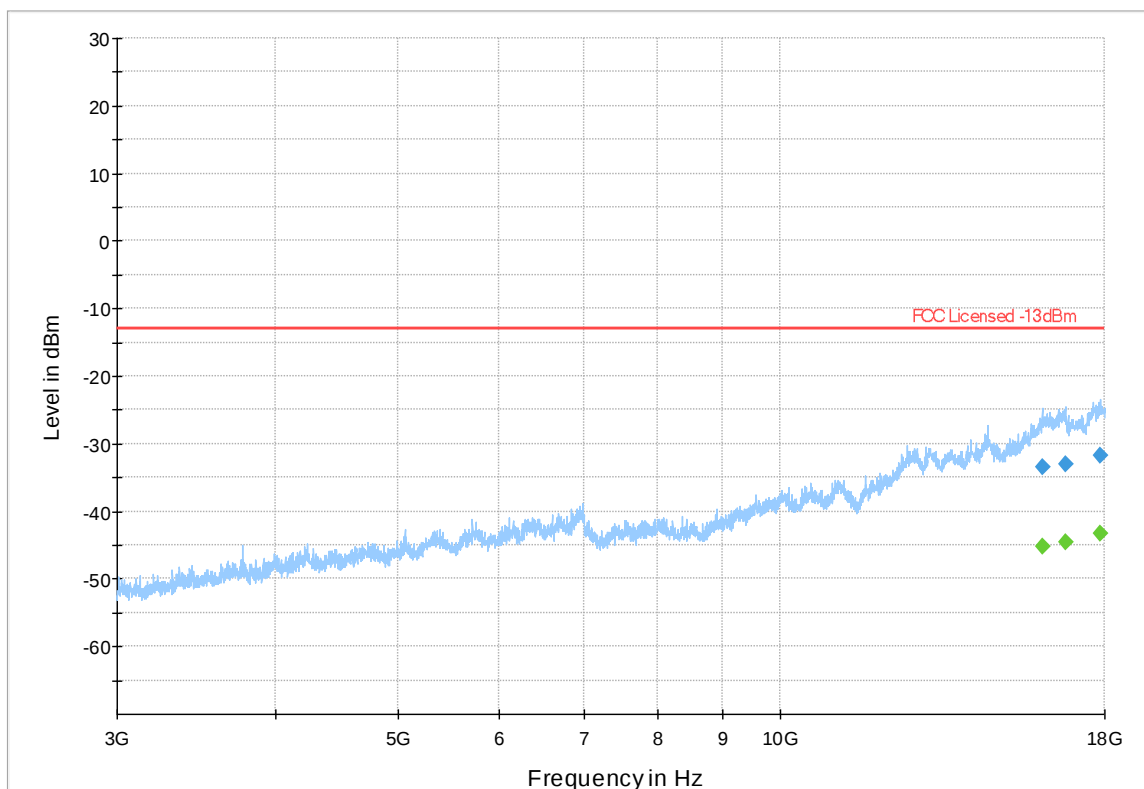
Preview Result 1-PK+ FCC Licensed -13dBm Final_ResultPK+ Final_ResultRMS

Plot # 3 Radiated Emissions: 3 GHz – 18 GHz

Channel: Mid

Final Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Sig Path	Preamp (dB)	Trd Corr.	Raw Rec
16067.344	---	-45.20	---	---	500.0	1000.000	297.0	V	217.0	-81.2	15.7	-42.7	-54.3	36.0
16067.344	-33.36	---	-13.00	20.36	500.0	1000.000	297.0	V	217.0	-81.2	15.7	-42.7	-54.3	47.9
16750.781	-33.07	---	-13.00	20.07	500.0	1000.000	276.0	V	235.0	-81.2	15.6	-42.8	-54.0	48.1
16750.781	---	-44.57	---	---	500.0	1000.000	276.0	V	235.0	-81.2	15.6	-42.8	-54.0	36.6
17857.500	-31.71	---	-13.00	18.71	500.0	1000.000	158.0	H	51.0	-79.9	16.1	-42.4	-53.6	48.2
17857.500	---	-43.39	---	---	500.0	1000.000	158.0	H	51.0	-79.9	16.1	-42.4	-53.6	36.6



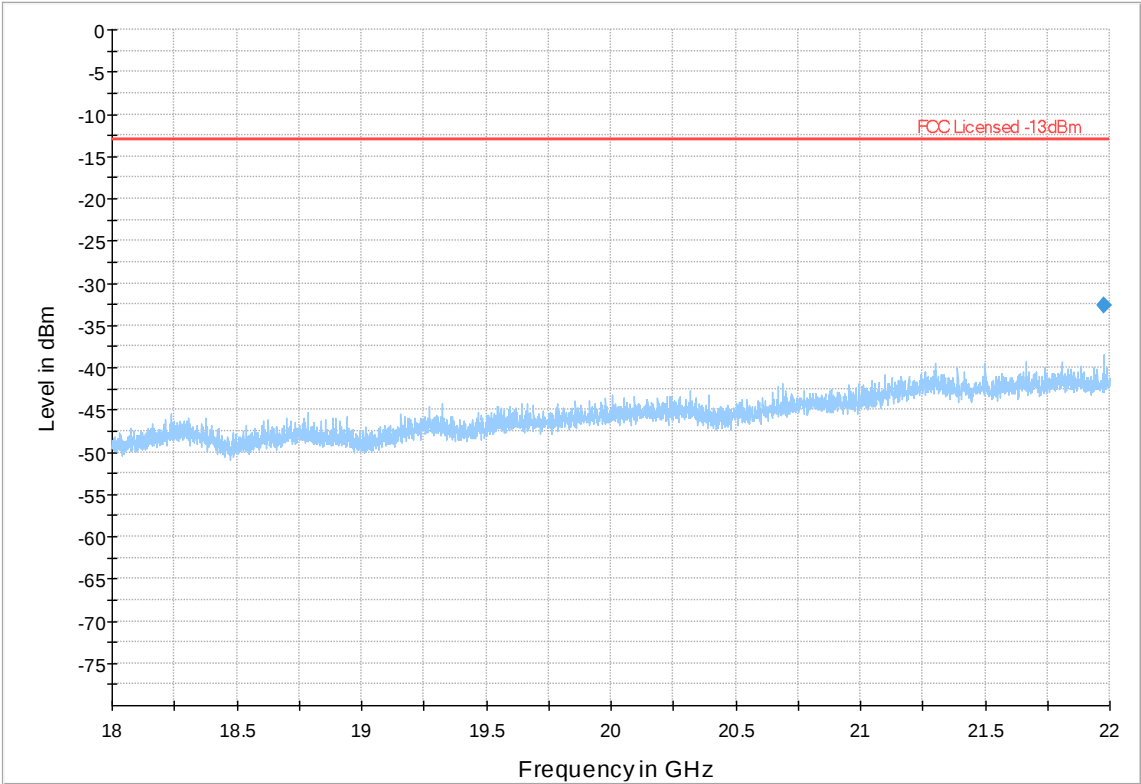
Preview Result 1-PK+ FCC Licensed -13dBm Final_Result PK+ Final_Result RMS

Plot # 4 Radiated Emissions: 18 GHz – 22 GHz

Channel: Mid

Final Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Sig Path	Preamp (dB)	Trd Corr.	Raw Rec
21975.250	-32.56	---	-13.00	19.56	500.0	1000.000	150.0	H	101.0	-76.0	9.7	0.0	-85.8	43.5



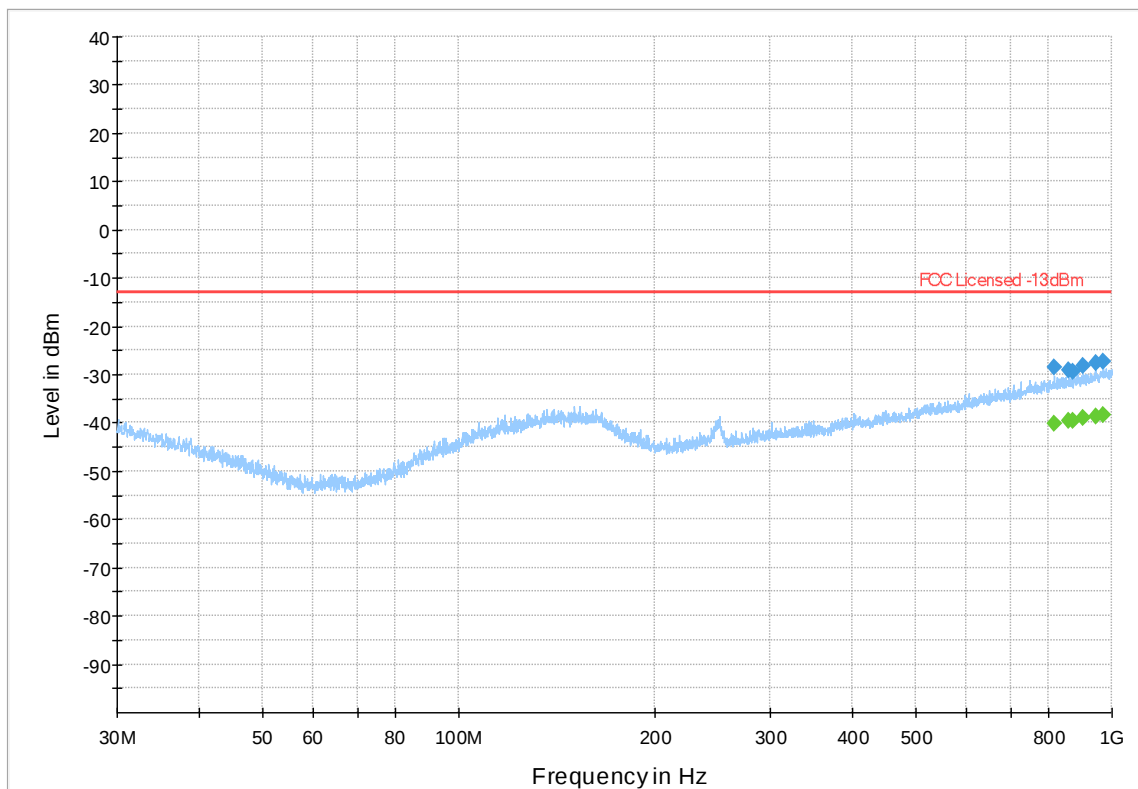
Preview Result 1-PK+ FCC Licensed -13dBm Final_Result PK+ Final_Result RMS

Plot # 5 Radiated Emissions: 30 MHz – 1GHz

Channel: Mid

Final Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Sig Path	Preamp (dB)	Trd Corr.	Raw Rec
817.610	-28.41	---	-13.00	15.41	500.0	100.000	386.0	V	223.0	-64.7	2.5	0.0	-67.2	36.3
817.610	---	-40.29	-13.00	27.29	500.0	100.000	386.0	V	223.0	-64.7	2.5	0.0	-67.2	24.4
860.350	-29.07	---	-13.00	16.07	500.0	100.000	181.0	H	-23.0	-64.2	2.4	0.0	-66.6	35.1
860.350	---	-39.59	-13.00	26.59	500.0	100.000	181.0	H	-23.0	-64.2	2.4	0.0	-66.6	24.6
870.535	---	-39.66	-13.00	26.66	500.0	100.000	335.0	V	320.0	-64.3	2.4	0.0	-66.7	24.6
870.535	-29.31	---	-13.00	16.31	500.0	100.000	335.0	V	320.0	-64.3	2.4	0.0	-66.7	35.0
905.031	-28.10	---	-13.00	15.10	500.0	100.000	233.0	H	222.0	-63.8	2.6	0.0	-66.4	35.7
905.031	---	-39.01	-13.00	26.01	500.0	100.000	233.0	H	222.0	-63.8	2.6	0.0	-66.4	24.8
943.285	-27.59	---	-13.00	14.59	500.0	100.000	257.0	V	18.0	-63.4	2.7	0.0	-66.0	35.8
943.285	---	-38.56	-13.00	25.56	500.0	100.000	257.0	V	18.0	-63.4	2.7	0.0	-66.0	24.8
968.293	---	-38.34	-13.00	25.34	500.0	100.000	132.0	V	247.0	-63.0	2.7	0.0	-65.7	24.7
968.293	-27.20	---	-13.00	14.20	500.0	100.000	132.0	V	247.0	-63.0	2.7	0.0	-65.7	35.8



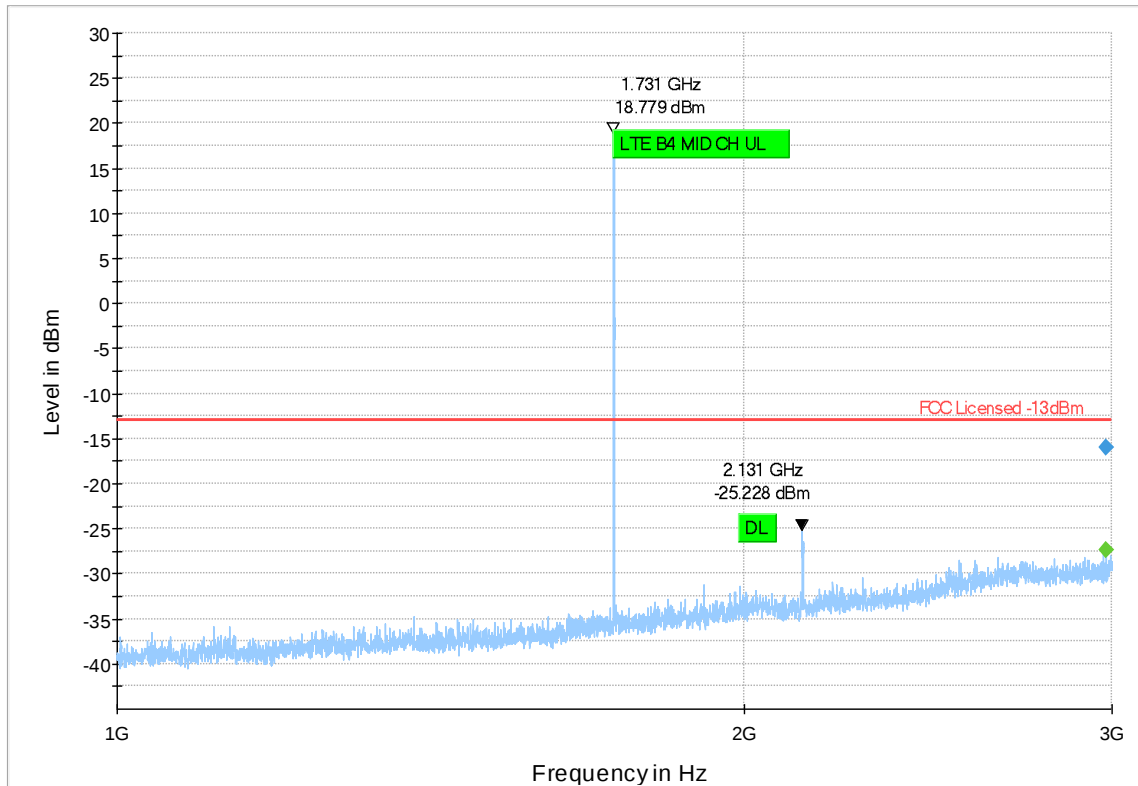
Preview Result 1-PK+ FCC Licensed -13dBm Final_Result PK+ Final_Result RMS

Plot # 6 Radiated Emissions: 1 GHz - 3 GHz

Channel: Mid

Final_Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Sig Path	Preamp (dB)	Trd Corr.	Raw Rec
2982.250	---	-27.41	---	---	500.0	1000.000	239.0	H	237.0	-60.3	5.0	0.0	-65.4	32.9
2982.250	-16.00	---	-13.00	3.00	500.0	1000.000	239.0	H	237.0	-60.3	5.0	0.0	-65.4	44.3



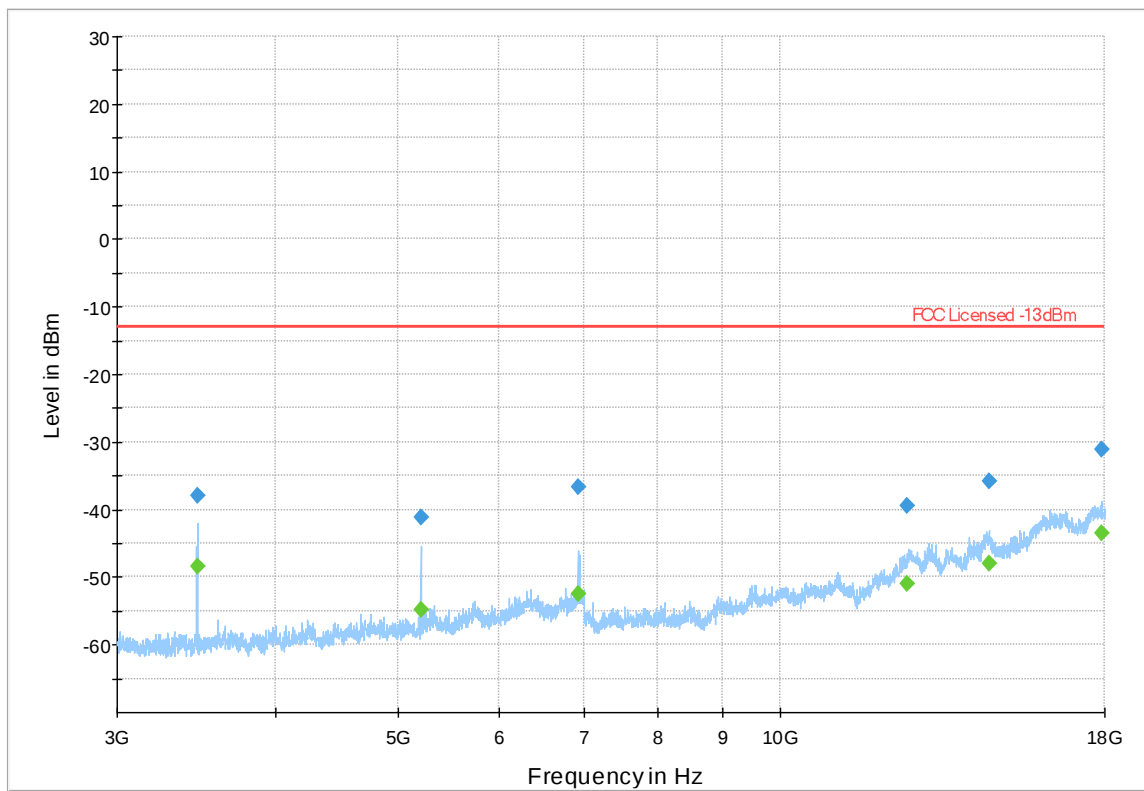
Preview Result 1-PK+ FCC Licensed -13dBm Final_Result PK+ Final_Result RMS

Plot # 7 Radiated Emissions: 3 GHz – 18 GHz

Channel: Mid

Final Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Sig Path	Preamp (dB)	Trd Corr.	Raw Rec
3469.219	---	-48.45	-13.00	35.45	500.0	1000.000	308.0	V	266.0	-	6.6	-46.1	-62.5	53.5
3469.219	-37.88	---	-13.00	24.88	500.0	1000.000	308.0	V	266.0	-	6.6	-46.1	-62.5	64.1
5204.063	---	-54.74	-13.00	41.74	500.0	1000.000	179.0	V	100.0	-98.9	8.1	-46.2	-60.8	44.1
5204.063	-41.19	---	-13.00	28.19	500.0	1000.000	179.0	V	100.0	-98.9	8.1	-46.2	-60.8	57.7
6921.563	-36.75	---	-13.00	23.75	500.0	1000.000	100.0	V	-22.0	-95.8	10.1	-47.0	-58.9	59.0
6921.563	---	-52.52	-13.00	39.52	500.0	1000.000	100.0	V	-22.0	-95.8	10.1	-47.0	-58.9	43.3
12575.156	---	-51.03	-13.00	38.03	500.0	1000.000	400.0	H	284.0	-87.3	13.2	-44.0	-56.5	36.3
12575.156	-39.51	---	-13.00	26.51	500.0	1000.000	400.0	H	284.0	-87.3	13.2	-44.0	-56.5	47.8
14583.750	---	-47.97	-13.00	34.97	500.0	1000.000	242.0	H	163.0	-84.5	14.6	-44.9	-54.3	36.5
14583.750	-35.81	---	-13.00	22.81	500.0	1000.000	242.0	H	163.0	-84.5	14.6	-44.9	-54.3	48.7
17886.094	-31.17	---	-13.00	18.17	500.0	1000.000	177.0	V	274.0	-79.8	16.2	-42.4	-53.6	48.6
17886.094	---	-43.41	-13.00	30.41	500.0	1000.000	177.0	V	274.0	-79.8	16.2	-42.4	-53.6	36.4



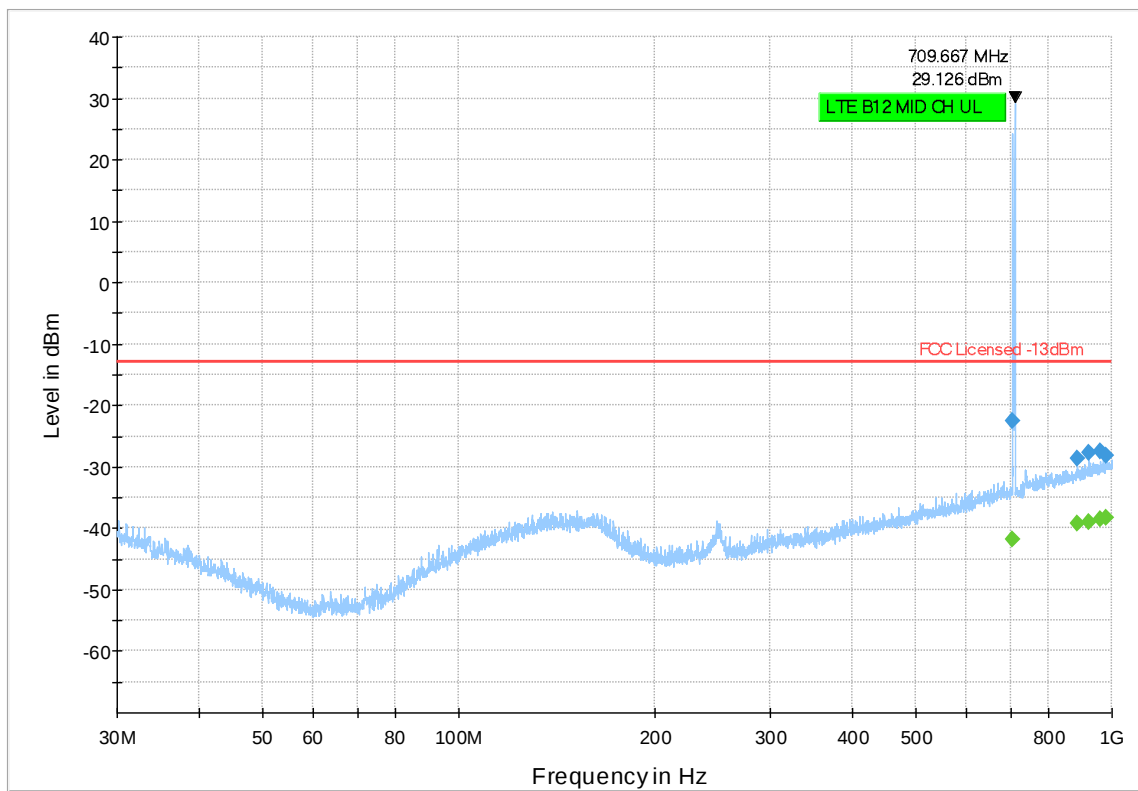
Preview Result 1-PK+ FCC Licensed -13dBm Final_Result PK+ Final_Result RMS

Plot # 8 Radiated Emissions: 30 MHz – 1GHz

Channel: Mid

Final Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Sig Path	Preamp (dB)	Trd Corr.	Raw Rec
703.210	-22.42	---	-13.00	9.42	500.0	100.000	150.0	V	210.0	-66.5	2.3	0.0	-68.7	44.0
703.210	---	-41.79	-13.00	28.79	500.0	100.000	150.0	V	210.0	-66.5	2.3	0.0	-68.7	24.7
886.965	-28.67	---	-13.00	15.67	500.0	100.000	291.0	H	68.0	-63.8	2.6	0.0	-66.4	35.2
886.965	---	-39.19	-13.00	26.19	500.0	100.000	291.0	H	68.0	-63.8	2.6	0.0	-66.4	24.6
920.884	-27.70	---	-13.00	14.70	500.0	100.000	183.0	V	50.0	-63.6	2.7	0.0	-66.3	35.9
920.884	---	-38.91	-13.00	25.91	500.0	100.000	183.0	V	50.0	-63.6	2.7	0.0	-66.3	24.7
958.320	-27.57	---	-13.00	14.57	500.0	100.000	256.0	H	290.0	-63.1	2.6	0.0	-65.8	35.6
958.320	---	-38.56	-13.00	25.56	500.0	100.000	256.0	H	290.0	-63.1	2.6	0.0	-65.8	24.6
982.328	---	-38.25	-13.00	25.25	500.0	100.000	332.0	V	57.0	-62.9	2.7	0.0	-65.7	24.7
982.328	-28.15	---	-13.00	15.15	500.0	100.000	332.0	V	57.0	-62.9	2.7	0.0	-65.7	34.8



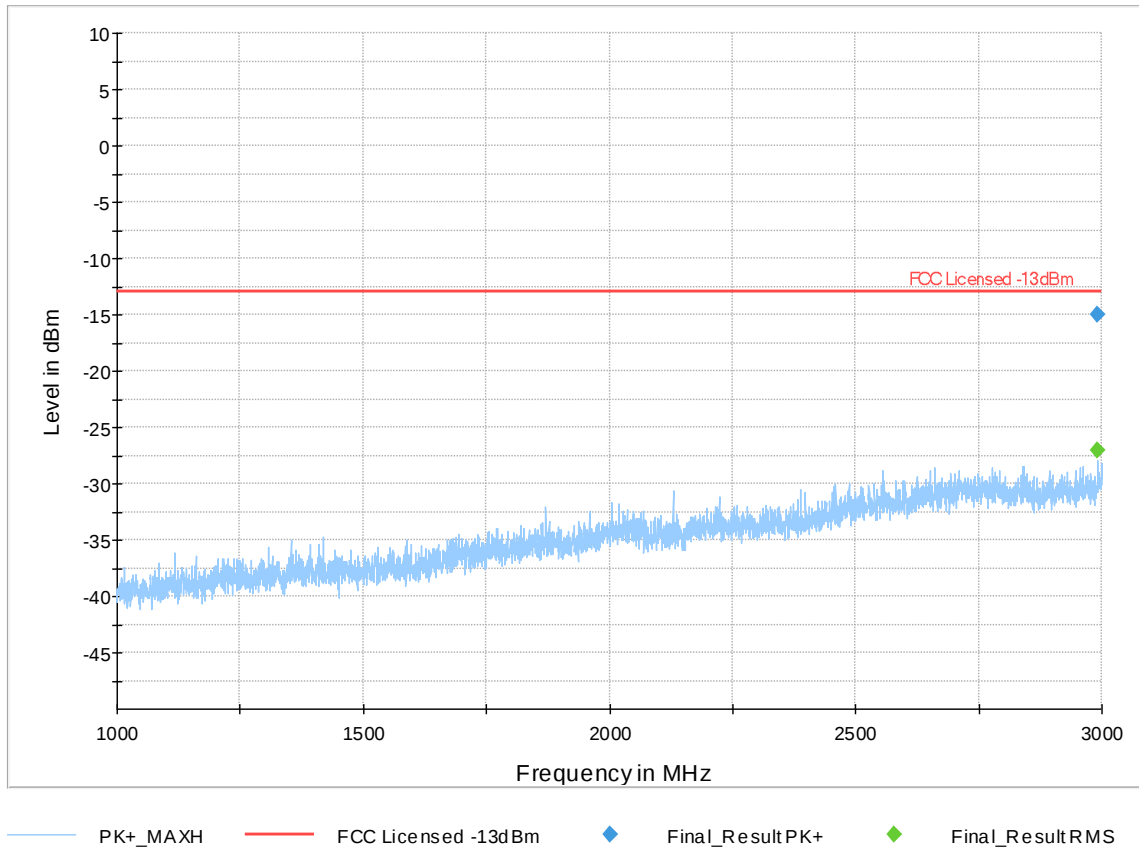
Preview Result 1-PK+ FCC Licensed -13dBm Final_Result PK+ Final_Result RMS

Plot # 9 Radiated Emissions: 1 GHz - 3 GHz

Channel: Mid

Final_Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Sig Path	Preamp (dB)	Trd Corr.	Raw Rec
2991.250	-15.03	---	-13.00	2.03	500.0	1000.000	276.0	H	336.0	-60.0	5.3	0.0	-65.3	45.0
2991.250	---	-27.11	---	---	500.0	1000.000	276.0	H	336.0	-60.0	5.3	0.0	-65.3	32.9

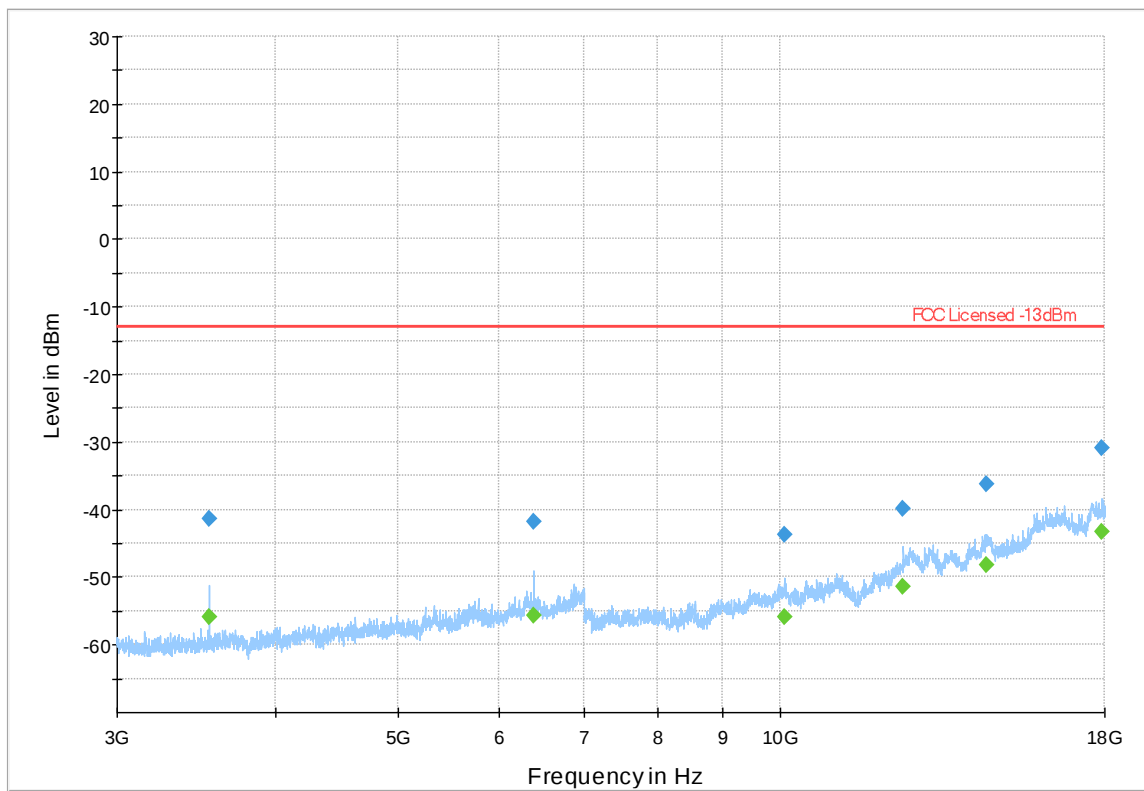


Plot # 10 Radiated Emissions: 3 GHz – 18 GHz

Channel: Mid

Final Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Sig Path	Preamp (dB)	Trd Corr.	Raw Rec
3548.438	-41.38	---	-13.00	28.38	500.0	1000.000	168.0	V	93.0	-	6.8	-46.0	-62.4	60.1
3548.438	---	-55.92	-13.00	42.92	500.0	1000.000	168.0	V	93.0	-	6.8	-46.0	-62.4	45.6
6386.719	---	-55.58	-13.00	42.58	500.0	1000.000	175.0	V	100.0	-95.7	10.1	-46.2	-59.6	40.1
6386.719	-41.89	---	-13.00	28.89	500.0	1000.000	175.0	V	100.0	-95.7	10.1	-46.2	-59.6	53.8
10070.156	---	-55.86	-13.00	42.86	500.0	1000.000	364.0	H	348.0	-92.1	11.5	-46.0	-57.6	36.2
10070.156	-43.74	---	-13.00	30.74	500.0	1000.000	364.0	H	348.0	-92.1	11.5	-46.0	-57.6	48.3
12495.000	---	-51.46	-13.00	38.46	500.0	1000.000	252.0	H	20.0	-87.9	13.0	-44.4	-56.5	36.4
12495.000	-39.93	---	-13.00	26.93	500.0	1000.000	252.0	H	20.0	-87.9	13.0	-44.4	-56.5	47.9
14516.250	---	-48.16	-13.00	35.16	500.0	1000.000	179.0	H	251.0	-84.8	14.6	-44.8	-54.5	36.6
14516.250	-36.32	---	-13.00	23.32	500.0	1000.000	179.0	H	251.0	-84.8	14.6	-44.8	-54.5	48.5
17911.406	-30.83	---	-13.00	17.84	500.0	1000.000	116.0	H	111.0	-79.7	16.2	-42.3	-53.6	48.9
17911.406	---	-43.26	-13.00	30.26	500.0	1000.000	116.0	H	111.0	-79.7	16.2	-42.3	-53.6	36.4



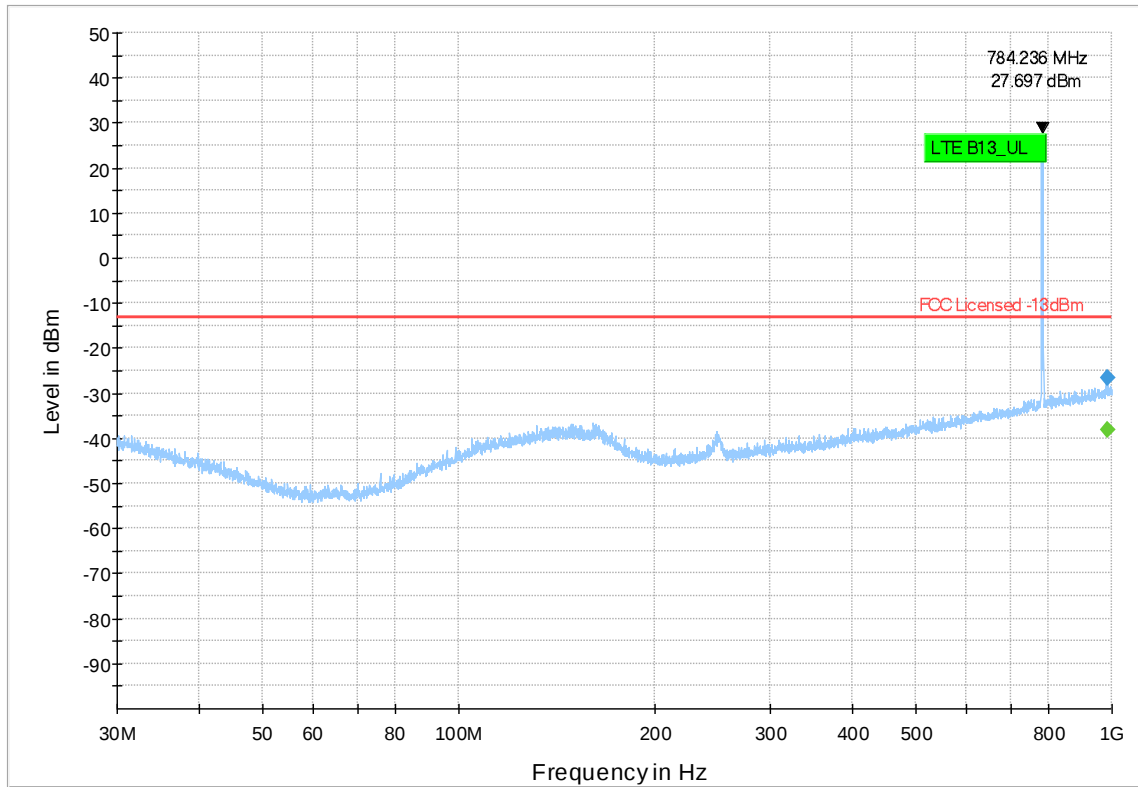
Preview Result 1-PK+ FCC Licensed -13dBm Final_Result PK+ Final_Result RMS

Plot # 11 Radiated Emissions: 30 MHz – 1GHz

Channel: Mid

Final Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Sig Path	Preamp (dB)	Trd Corr.	Raw Rec
983.389	---	-38.06	-13.00	25.06	500.0	100.000	370.0	H	-38.0	-62.7	2.7	0.0	-65.4	24.6
983.389	-26.70	---	-13.00	13.70	500.0	100.000	370.0	H	-38.0	-62.7	2.7	0.0	-65.4	36.0



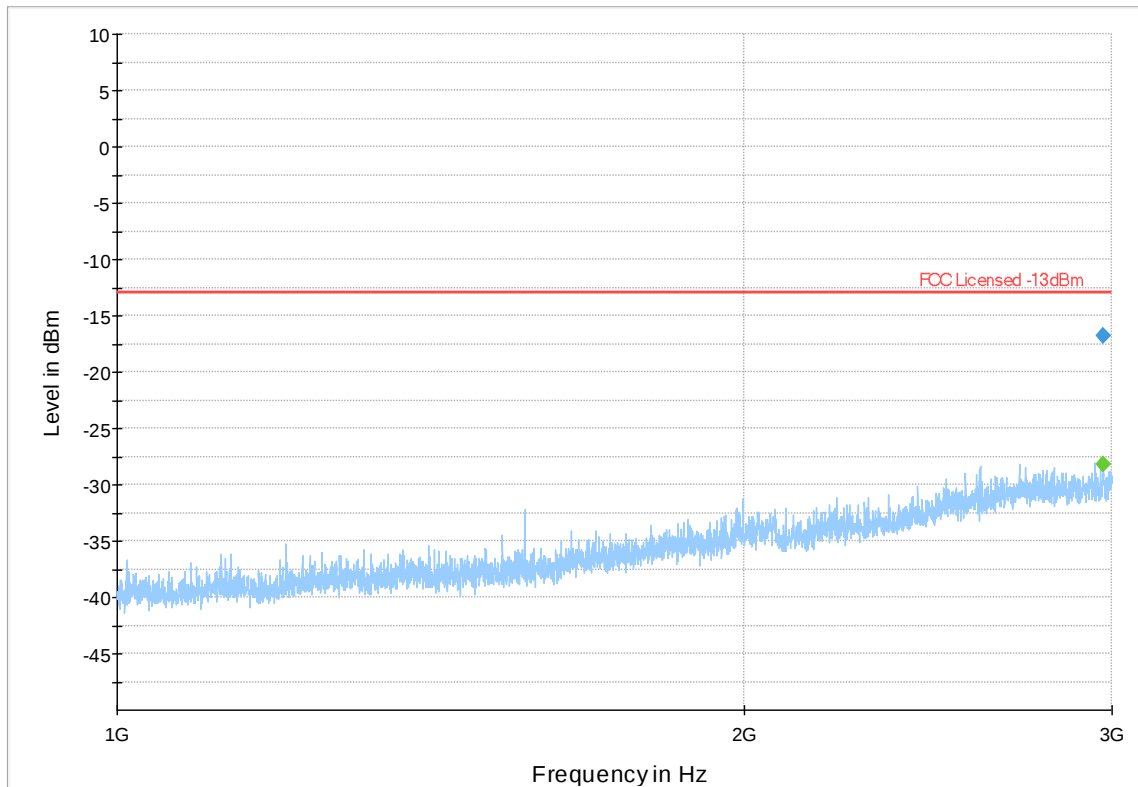
Preview Result 1-PK+ FCC Licensed -13dBm Final Result PK+ Final Result RMS

Plot # 12 Radiated Emissions: 1 GHz - 3 GHz

Channel: Mid

Final Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Sig Path	Preamp (dB)	Trd Corr.	Raw Rec
2972.500	-16.78	---	-13.00	3.78	500.0	1000.000	235.0	H	303.0	-60.4	5.1	0.0	-65.4	43.6
2972.500	---	-28.23	---	---	500.0	1000.000	235.0	H	303.0	-60.4	5.1	0.0	-65.4	32.1



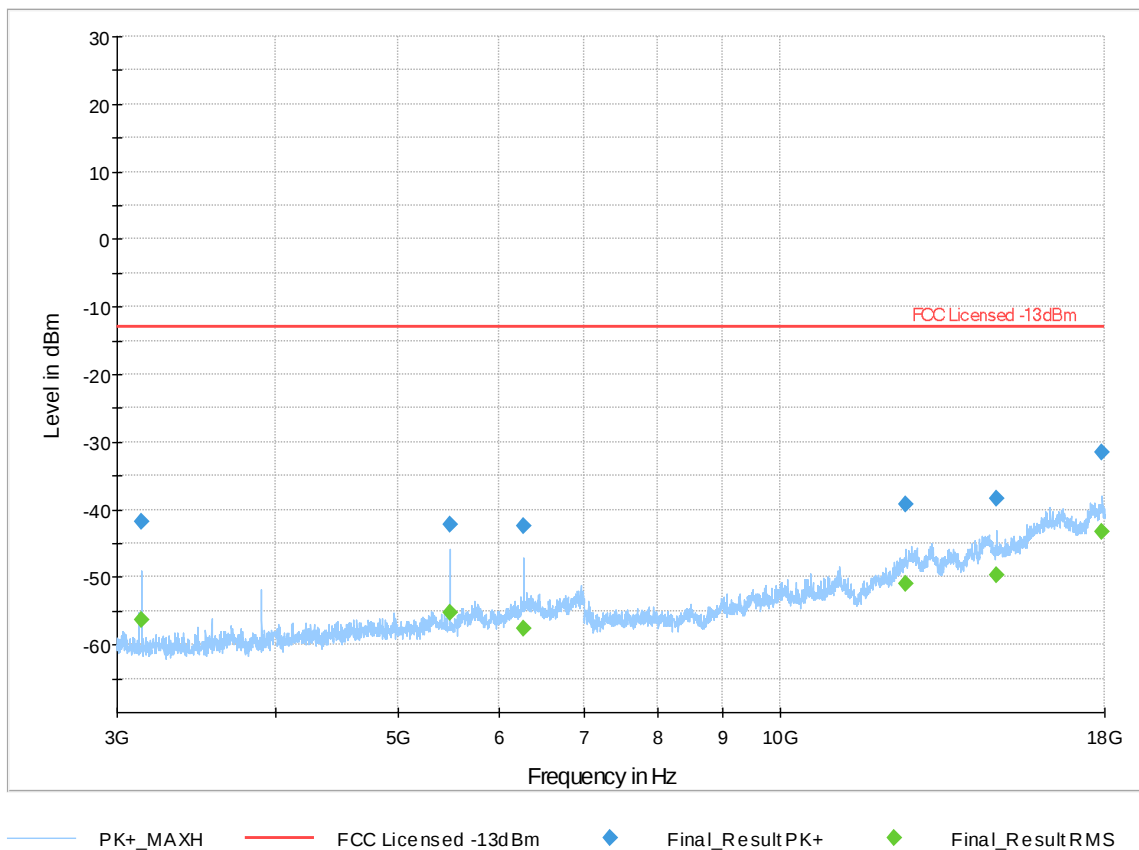
PK+_MAXH FCC Licensed -13dBm Final_Result PK+ Final_Result RMS

Plot # 13 Radiated Emissions: 3 GHz – 18 GHz

Channel: Mid

Final Result

Frequency (MHz)	MaxPeak (dBm)	RMS (dBm)	Limit (dBm)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Sig Path	Preamp (dB)	Trd Corr.	Raw Rec
3136.406	---	-56.31	-13.00	43.31	500.0	1000.000	100.0	H	37.0	-	6.1	-46.0	-62.6	46.1
3136.406	-41.73	---	-13.00	28.73	500.0	1000.000	100.0	H	37.0	-	6.1	-46.0	-62.6	60.7
5489.063	-42.29	---	-13.00	29.29	500.0	1000.000	208.0	V	97.0	-98.6	8.2	-46.4	-60.4	56.3
5489.063	---	-55.30	-13.00	42.30	500.0	1000.000	208.0	V	97.0	-98.6	8.2	-46.4	-60.4	43.3
6272.813	---	-57.60	-13.00	44.60	500.0	1000.000	100.0	V	305.0	-96.6	9.6	-46.5	-59.7	39.0
6272.813	-42.52	---	-13.00	29.52	500.0	1000.000	100.0	V	305.0	-96.6	9.6	-46.5	-59.7	54.1
12556.406	-39.31	---	-13.00	26.31	500.0	1000.000	145.0	V	119.0	-87.5	13.2	-44.2	-56.5	48.2
12556.406	---	-51.05	-13.00	38.05	500.0	1000.000	145.0	V	119.0	-87.5	13.2	-44.2	-56.5	36.5
14788.125	-38.38	---	-13.00	25.38	500.0	1000.000	375.0	V	-1.0	-85.4	14.4	-45.8	-54.0	47.0
14788.125	---	-49.78	-13.00	36.78	500.0	1000.000	375.0	V	-1.0	-85.4	14.4	-45.8	-54.0	35.6
17926.875	-31.55	---	-13.00	18.55	500.0	1000.000	165.0	H	106.0	-79.6	16.3	-42.3	-53.6	48.1
17926.875	---	-43.29	-13.00	30.29	500.0	1000.000	165.0	H	106.0	-79.6	16.3	-42.3	-53.6	36.3



8 Test setup photos

Setup photos are included in supporting file name: "EMC_ITRO1_071_23001_KDB996369_Setup_photos.pdf"

9 Test Equipment And Ancillaries Used For Testing

Equipment Type	Manufacturer	Model	Serial #	Calibration Cycle	Last Calibration Date
BILOG ANTENNA	A.H. SYSTEMS	BiLA2G	569	3 YEARS	10/30/2023
HORN ANTENNA	EMCO	3115	00035111	3 YEARS	10/26/2023
HORN ANTENNA	ETS LINDGREN	3117-PA	00167061	3 YEARS	9/25/2023
HORN ANTENNA	ETS LINDGREN	3116C-PA	00166821	3 YEARS	10/26/2023
ESW.EMI TEST RECEIVER	ROHDE & SCHWARZ	ESW44	101715	3 YEARS	10/24/2023
DIGITAL THERMOMETER	Control Company	4410,90080-03	230712972	3 YEARS	10/18/2023
Software	EMC32	Version 10.50.40	-	-	-

Note: Equipment used meets the measurement uncertainty requirements as required per applicable standards for 95% confidence levels.

Calibration due dates, unless defined specifically, falls on the last day of the month. Items indicated "N/A" for cal status either do not specifically require calibration or is internally characterized before use.

10 Revision History

Date	Report Name	Changes to report	Prepared by
6/3/2024	EMC_ITRO1_071_23001_KDB996369	Initial Version	Art Thammanavarat
7/3/2024	EMC_ITRO1_071_23001_KDB996369_Rev1	Section 3.5: Removed note from table.	Art Thammanavarat

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