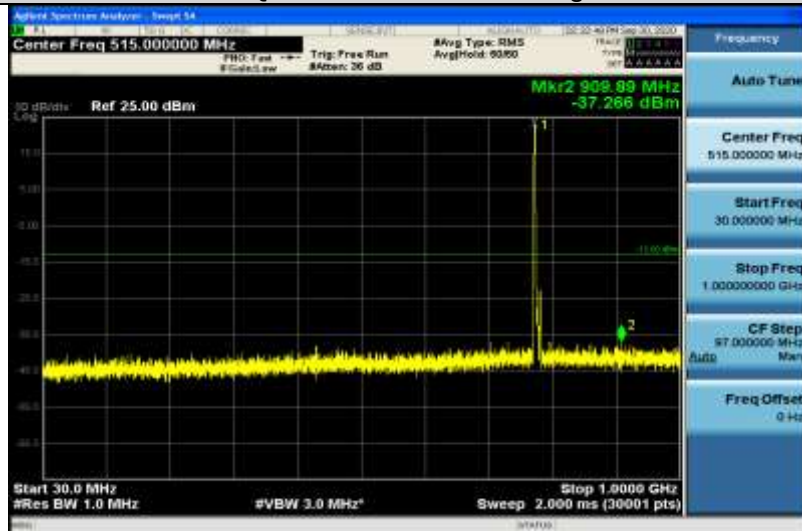




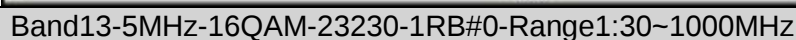
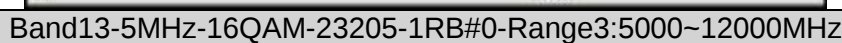
Band13-5MHz-QPSK-23255-1RB#0-Range4:12000~26500MHz

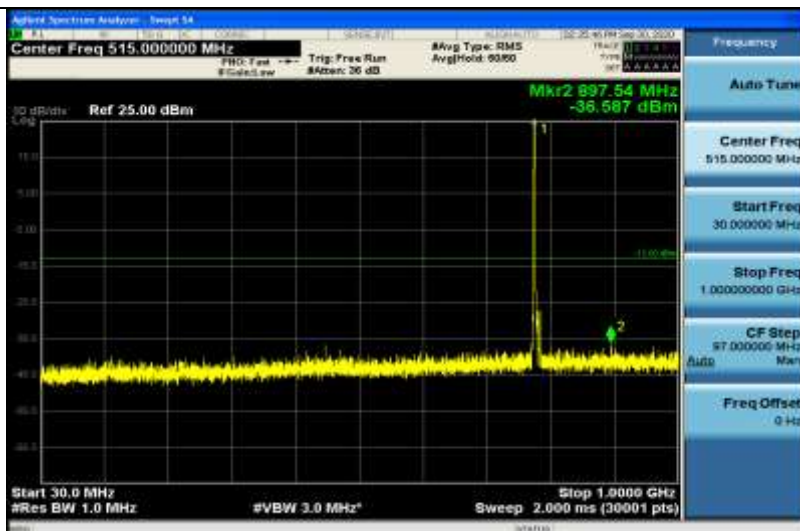


Band13-5MHz-16QAM-23205-1RB#0-Range1:30~1000MHz



Band13-5MHz-16QAM-23205-1RB#0-Range2:1000~5000MHz





Band13-5MHz-16QAM-23230-1RB#0-Range2:1000~5000MHz



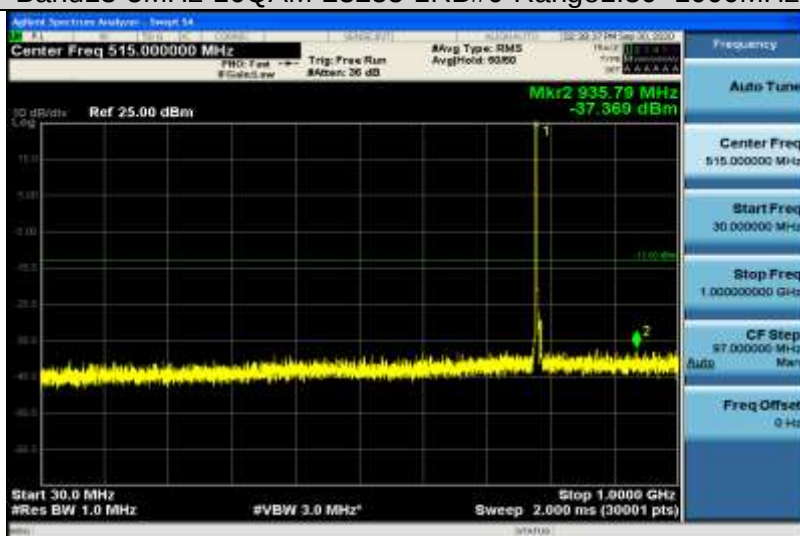
Band13-5MHz-16QAM-23230-1RB#0-Range3:5000~12000MHz



Band13-5MHz-16QAM-23230-1RB#0-Range4:12000~26500MHz



Band13-5MHz-16QAM-23255-1RB#0-Range1:30~1000MHz



Band13-5MHz-16QAM-23255-1RB#0-Range2:1000~5000MHz



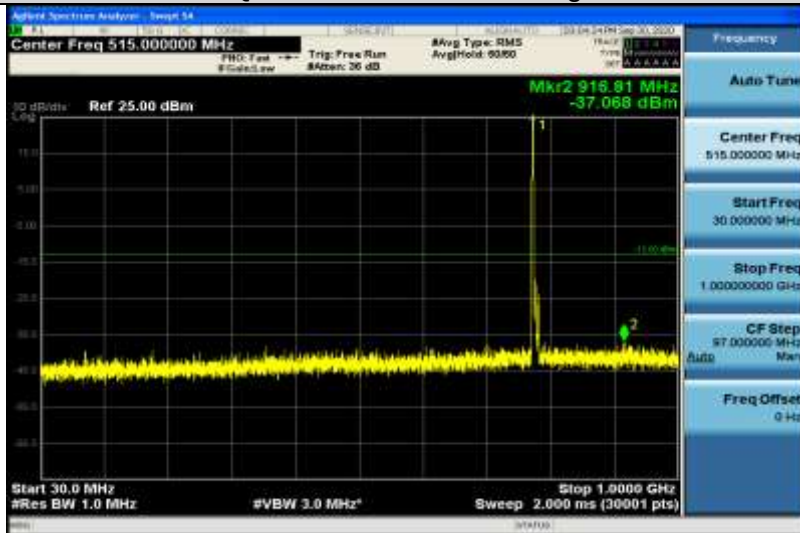
Band13-5MHz-16QAM-23255-1RB#0-Range3:5000~12000MHz



Band13-5MHz-16QAM-23255-1RB#0-Range4:12000~26500MHz



Band13-10MHz-QPSK-23230-1RB#0-Range1:30~1000MHz



Band13-10MHz-QPSK-23230-1RB#0-Range2:1000~5000MHz



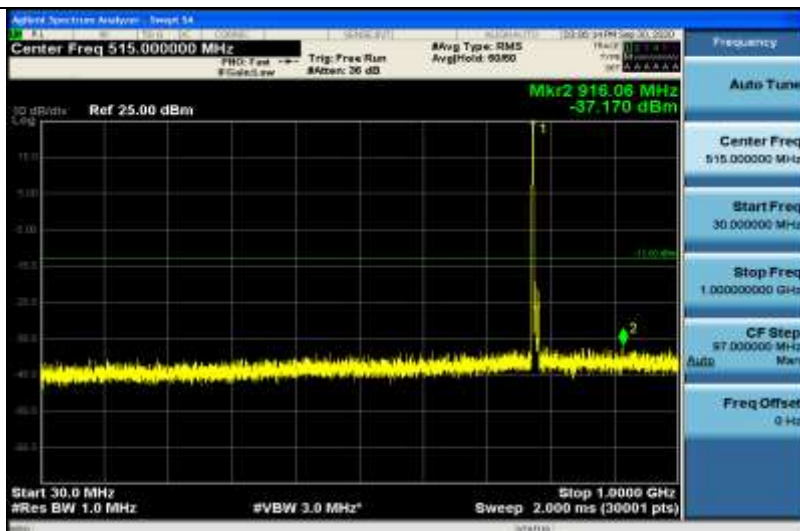
Band13-10MHz-QPSK-23230-1RB#0-Range3:5000~12000MHz



Band13-10MHz-QPSK-23230-1RB#0-Range4:12000~26500MHz



Band13-10MHz-16QAM-23230-1RB#0-Range1:30~1000MHz



Band13-10MHz-16QAM-23230-1RB#0-Range2:1000~5000MHz



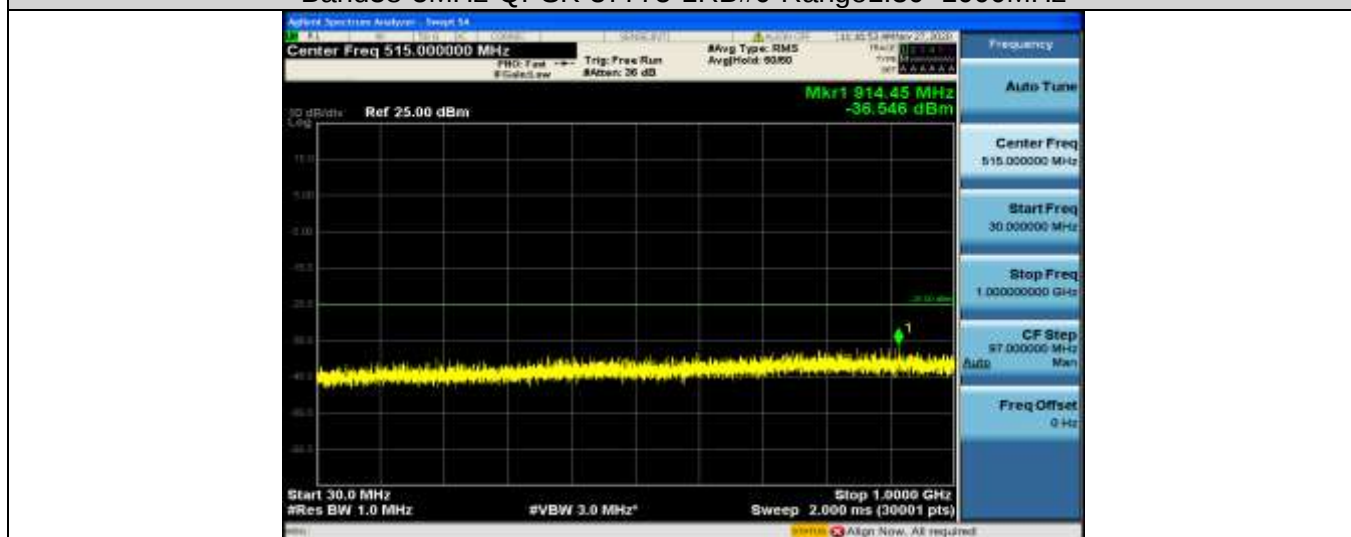
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Band13-10MHz-16QAM-23230-1RB#0-Range4:12000~26500MHz



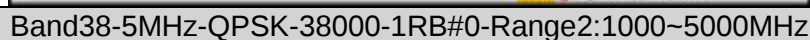
Band38-5MHz-QPSK-37775-1RB#0-Range1:30~1000MHz



Band38-5MHz-QPSK-37775-1RB#0-Range2:1000~5000MHz



Band38-5MHz-QPSK-37775-1RB#0-Range3:5000~12000MHz





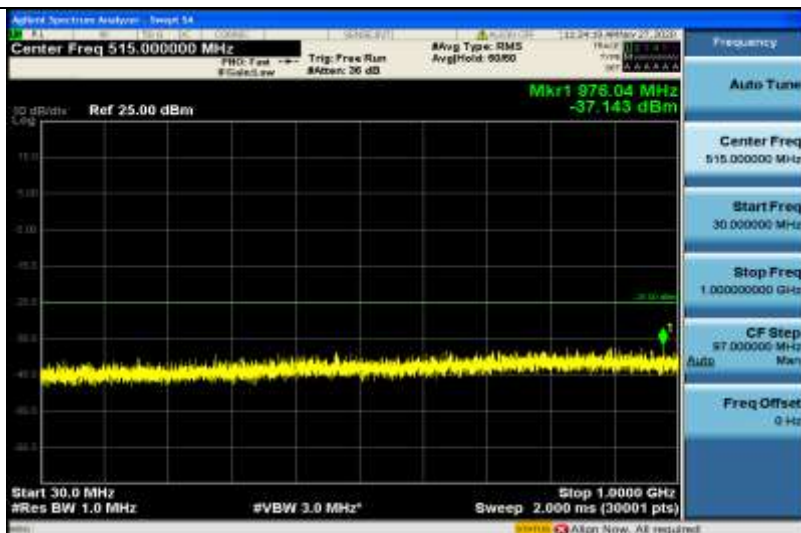
Band38-5MHz-QPSK-38000-1RB#0-Range3:5000~12000MHz



Band38-5MHz-QPSK-38000-1RB#0-Range4:12000~26500MHz



Band38-5MHz-QPSK-38225-1RB#0-Range1:30~1000MHz



Band38-5MHz-QPSK-38225-1RB#0-Range2:1000~5000MHz



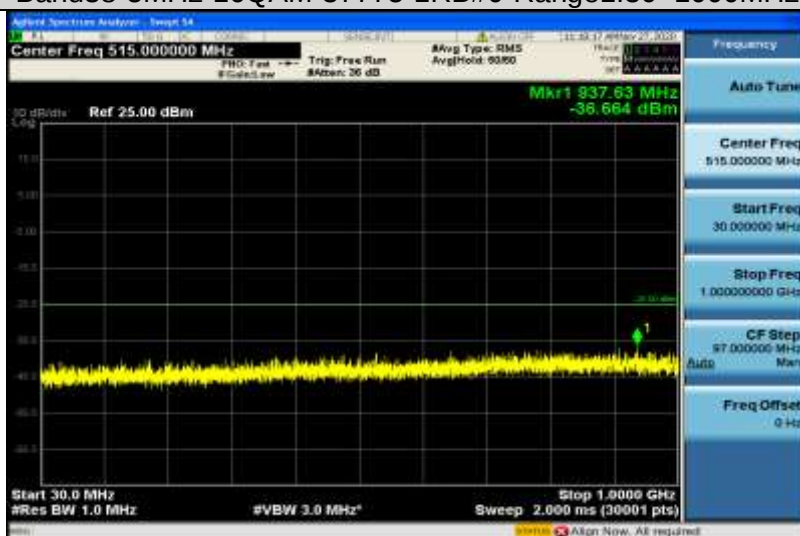
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Band38-5MHz-QPSK-38225-1RB#0-Range4:12000~26500MHz



Band38-5MHz-16QAM-37775-1RB#0-Range1:30~1000MHz



Band38-5MHz-16QAM-37775-1RB#0-Range2:1000~5000MHz



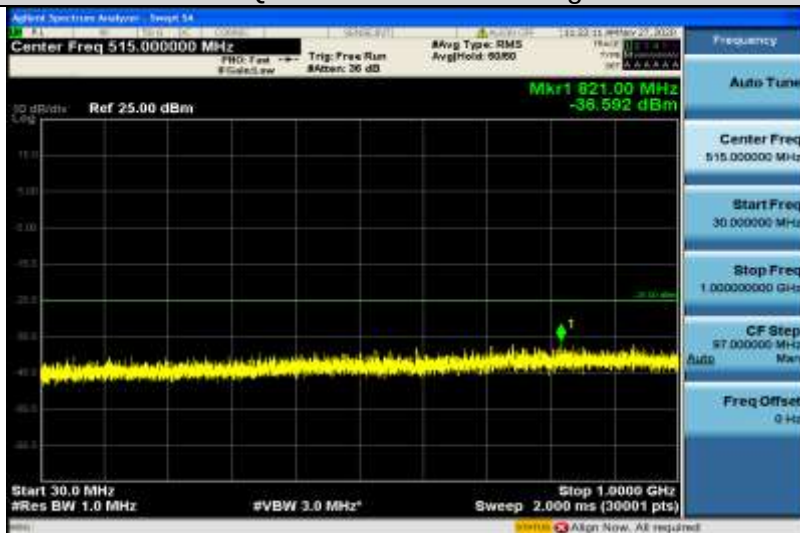
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Band38-5MHz-16QAM-37775-1RB#0-Range4:12000~26500MHz



Band38-5MHz-16QAM-38000-1RB#0-Range1:30~1000MHz



Band38-5MHz-16QAM-38000-1RB#0-Range2:1000~5000MHz



Band38-5MHz-16QAM-38000-1RB#0-Range3:5000~12000MHz



Band38-5MHz-16QAM-38000-1RB#0-Range4:12000~26500MHz



Band38-5MHz-16QAM-38225-1RB#0-Range1:30~1000MHz



Band38-5MHz-16QAM-38225-1RB#0-Range2:1000~5000MHz



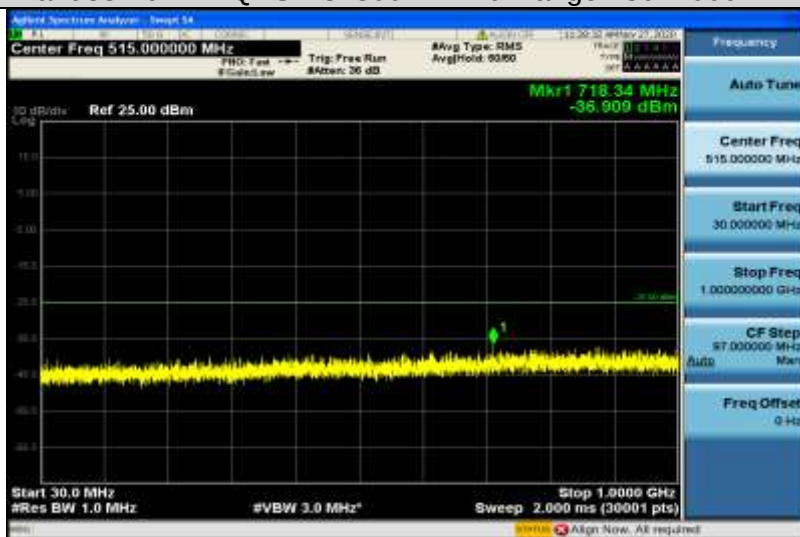
Band38-5MHz-16QAM-38225-1RB#0-Range3:5000~12000MHz



Band38-5MHz-16QAM-38225-1RB#0-Range4:12000~26500MHz



Band38-10MHz-QPSK-37800-1RB#0-Range1:30~1000MHz



Band38-10MHz-QPSK-37800-1RB#0-Range2:1000~5000MHz



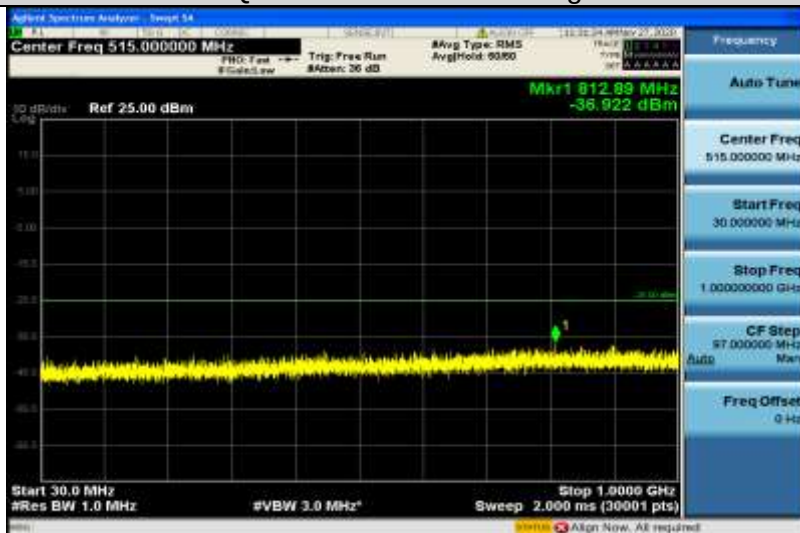
Band38-10MHz-QPSK-37800-1RB#0-Range3:5000~12000MHz



Band38-10MHz-QPSK-37800-1RB#0-Range4:12000~26500MHz



Band38-10MHz-QPSK-38000-1RB#0-Range1:30~1000MHz



Band38-10MHz-QPSK-38000-1RB#0-Range2:1000~5000MHz



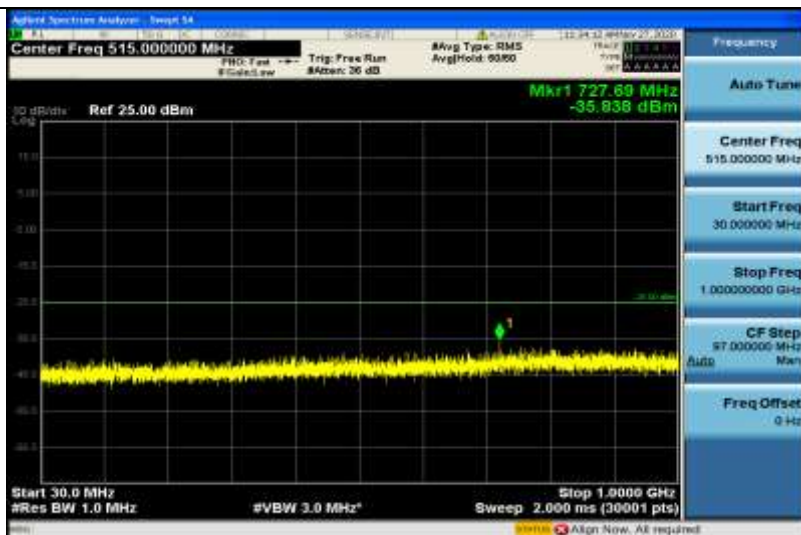
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Band38-10MHz-QPSK-38000-1RB#0-Range4:12000~26500MHz



Band38-10MHz-QPSK-38200-1RB#0-Range1:30~1000MHz



Band38-10MHz-QPSK-38200-1RB#0-Range2:1000~5000MHz



Band38-10MHz-QPSK-38200-1RB#0-Range3:5000~12000MHz



Band38-10MHz-QPSK-38200-1RB#0-Range4:12000~26500MHz



Band38-10MHz-16QAM-37800-1RB#0-Range1:30~1000MHz



Band38-10MHz-16QAM-37800-1RB#0-Range2:1000~5000MHz



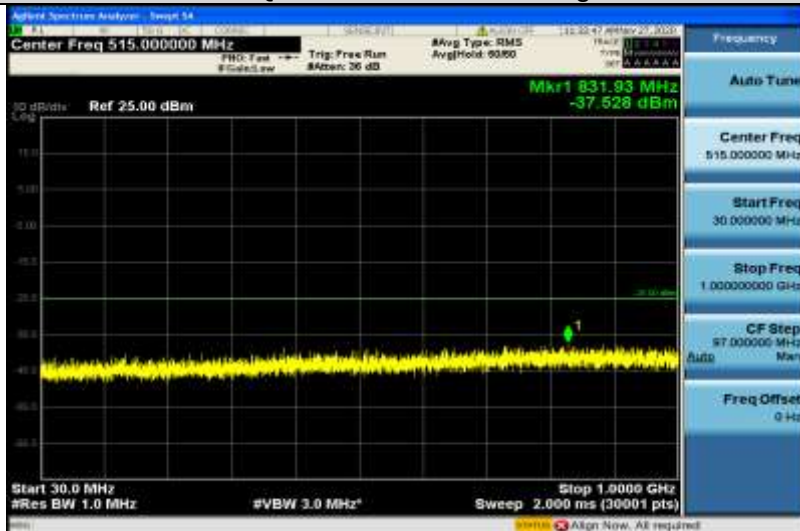
Band38-10MHz-16QAM-37800-1RB#0-Range3:5000~12000MHz



Band38-10MHz-16QAM-37800-1RB#0-Range4:12000~26500MHz



Band38-10MHz-16QAM-38000-1RB#0-Range1:30~1000MHz



Band38-10MHz-16QAM-38000-1RB#0-Range2:1000~5000MHz



Band38-10MHz-16QAM-38000-1RB#0-Range3:5000~12000MHz



Band38-10MHz-16QAM-38000-1RB#0-Range4:12000~26500MHz



Band38-10MHz-16QAM-38200-1RB#0-Range1:30~1000MHz



Band38-10MHz-16QAM-38200-1RB#0-Range2:1000~5000MHz



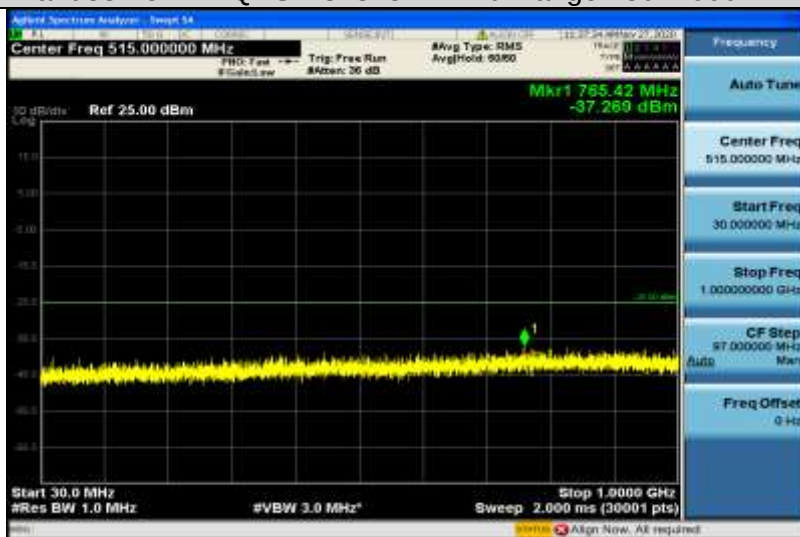
Band38-10MHz-16QAM-38200-1RB#0-Range3:5000~12000MHz



Band38-10MHz-16QAM-38200-1RB#0-Range4:12000~26500MHz



Band38-15MHz-QPSK-37825-1RB#0-Range1:30~1000MHz



Band38-15MHz-QPSK-37825-1RB#0-Range2:1000~5000MHz



Band38-15MHz-QPSK-37825-1RB#0-Range3:5000~12000MHz



Band38-15MHz-QPSK-37825-1RB#0-Range4:12000~26500MHz



Band38-15MHz-QPSK-38000-1RB#0-Range1:30~1000MHz



Band38-15MHz-QPSK-38000-1RB#0-Range2:1000~5000MHz



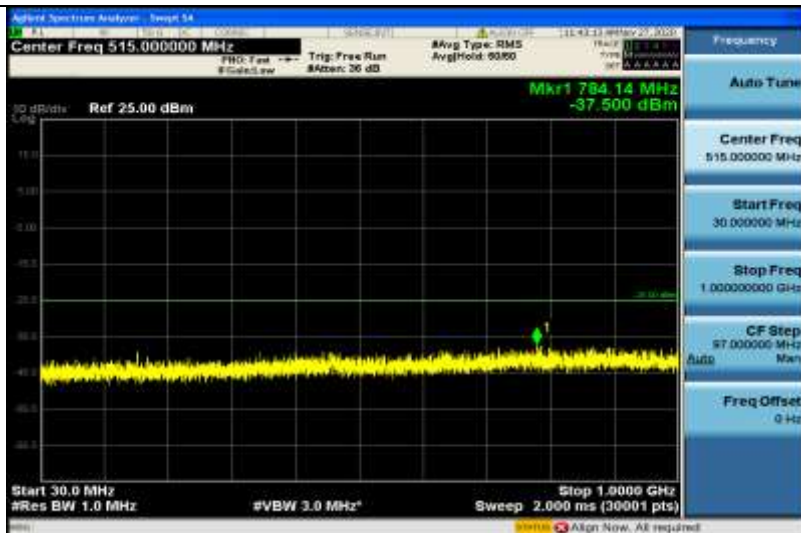
Band38-15MHz-QPSK-38000-1RB#0-Range3:5000~12000MHz



Band38-15MHz-QPSK-38000-1RB#0-Range4:12000~26500MHz



Band38-15MHz-QPSK-38175-1RB#0-Range1:30~1000MHz



Band38-15MHz-QPSK-38175-1RB#0-Range2:1000~5000MHz



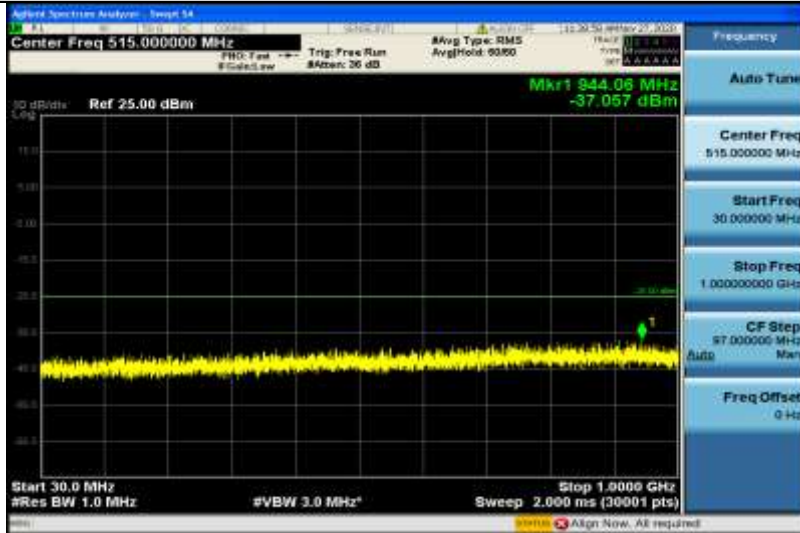
Band38-15MHz-QPSK-38175-1RB#0-Range3:5000~12000MHz



Band38-15MHz-QPSK-38175-1RB#0-Range4:12000~26500MHz



Band38-15MHz-16QAM-37825-1RB#0-Range1:30~1000MHz



Band38-15MHz-16QAM-37825-1RB#0-Range2:1000~5000MHz



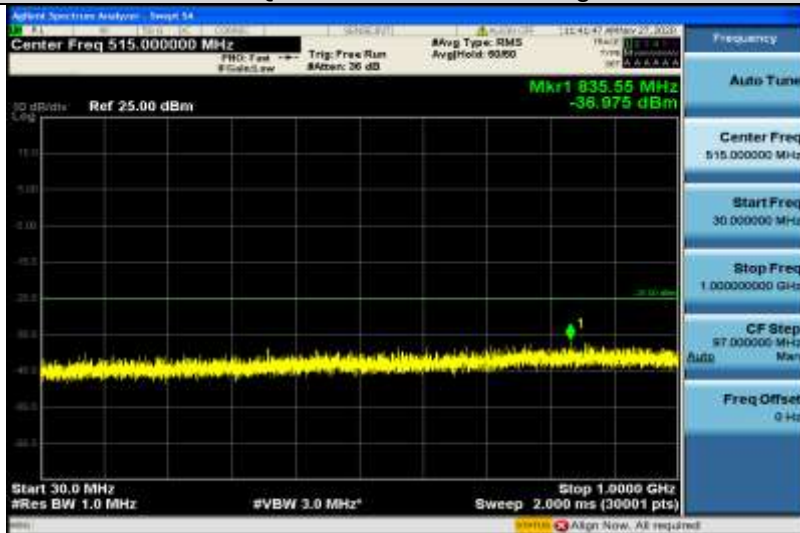
Band38-15MHz-16QAM-37825-1RB#0-Range3:5000~12000MHz



Band38-15MHz-16QAM-37825-1RB#0-Range4:12000~26500MHz



Band38-15MHz-16QAM-38000-1RB#0-Range1:30~1000MHz



Band38-15MHz-16QAM-38000-1RB#0-Range2:1000~5000MHz



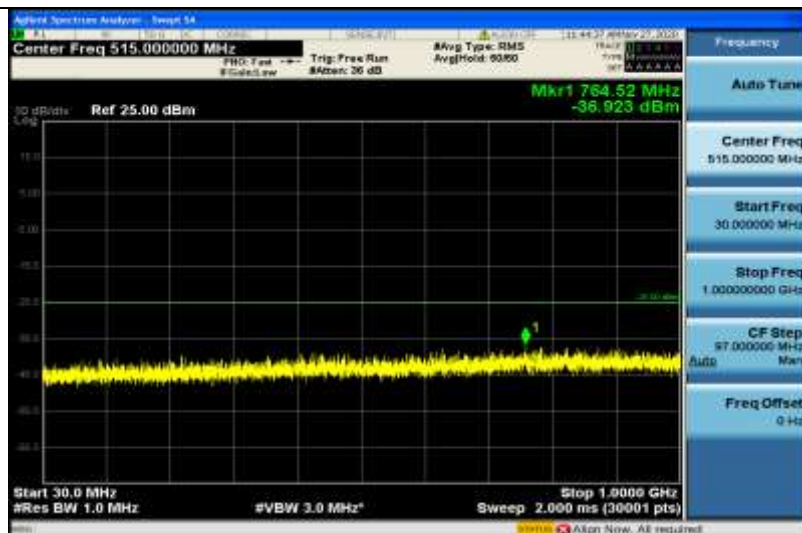
Band38-15MHz-16QAM-38000-1RB#0-Range3:5000~12000MHz



Band38-15MHz-16QAM-38000-1RB#0-Range4:12000~26500MHz



Band38-15MHz-16QAM-38175-1RB#0-Range1:30~1000MHz



Band38-15MHz-16QAM-38175-1RB#0-Range2:1000~5000MHz



Band38-15MHz-16QAM-38175-1RB#0-Range3:5000~12000MHz



Band38-15MHz-16QAM-38175-1RB#0-Range4:12000~26500MHz



Band38-20MHz-QPSK-37850-1RB#0-Range1:30~1000MHz



Band38-20MHz-QPSK-37850-1RB#0-Range2:1000~5000MHz



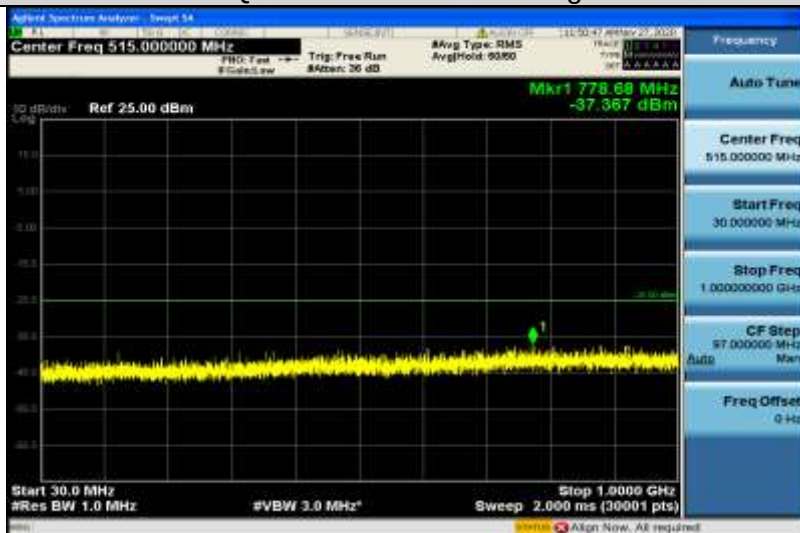
Band38-20MHz-QPSK-37850-1RB#0-Range3:5000~12000MHz



Band38-20MHz-QPSK-37850-1RB#0-Range4:12000~26500MHz



Band38-20MHz-QPSK-38000-1RB#0-Range1:30~1000MHz



Band38-20MHz-QPSK-38000-1RB#0-Range2:1000~5000MHz



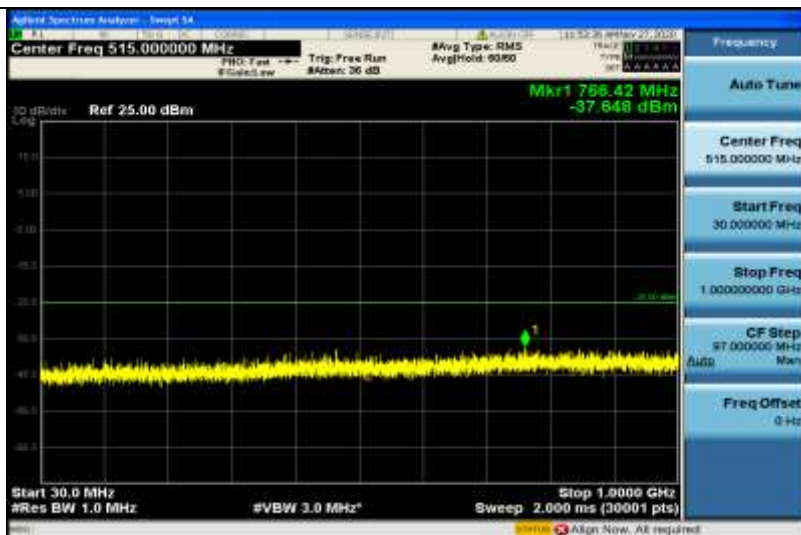
Band38-20MHz-QPSK-38000-1RB#0-Range3:5000~12000MHz



Band38-20MHz-QPSK-38000-1RB#0-Range4:12000~26500MHz



Band38-20MHz-QPSK-38150-1RB#0-Range1:30~1000MHz



Band38-20MHz-QPSK-38150-1RB#0-Range2:1000~5000MHz



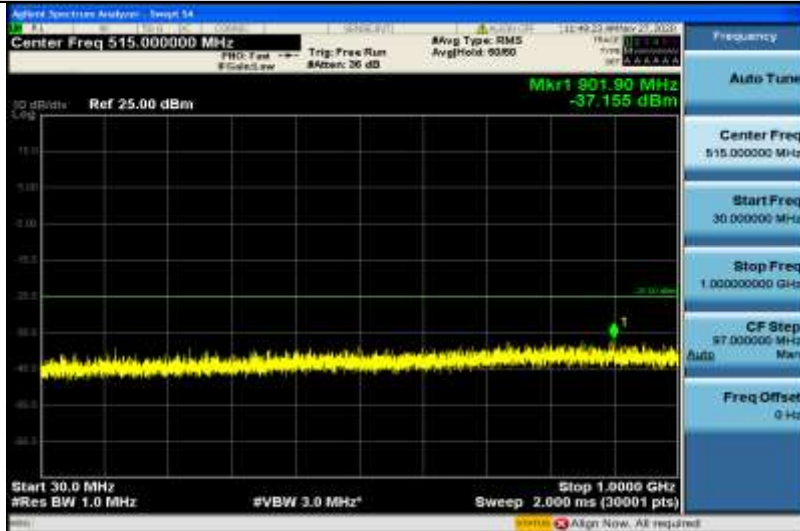
Band38-20MHz-QPSK-38150-1RB#0-Range3:5000~12000MHz



Band38-20MHz-QPSK-38150-1RB#0-Range4:12000~26500MHz



Band38-20MHz-16QAM-37850-1RB#0-Range1:30~1000MHz



Band38-20MHz-16QAM-37850-1RB#0-Range2:1000~5000MHz



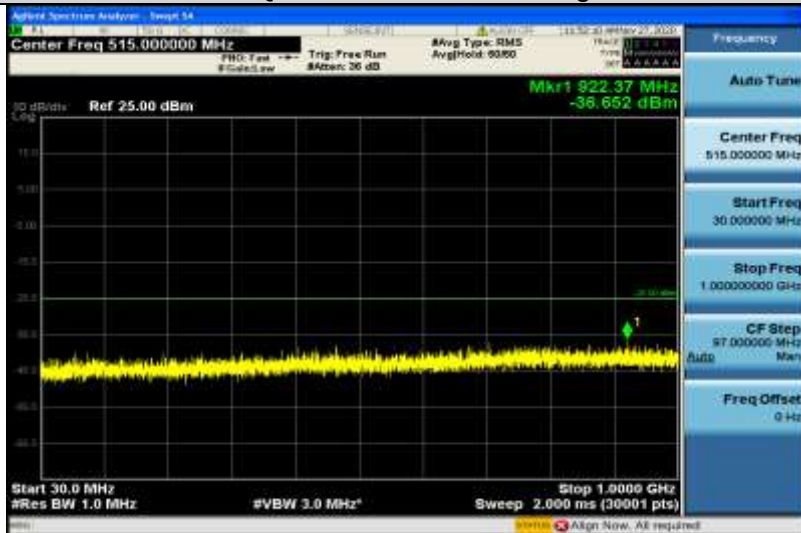
Band38-20MHz-16QAM-37850-1RB#0-Range3:5000~12000MHz



Band38-20MHz-16QAM-37850-1RB#0-Range4:12000~26500MHz



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Band38-20MHz-16QAM-38000-1RB#0-Range2:1000~5000MHz



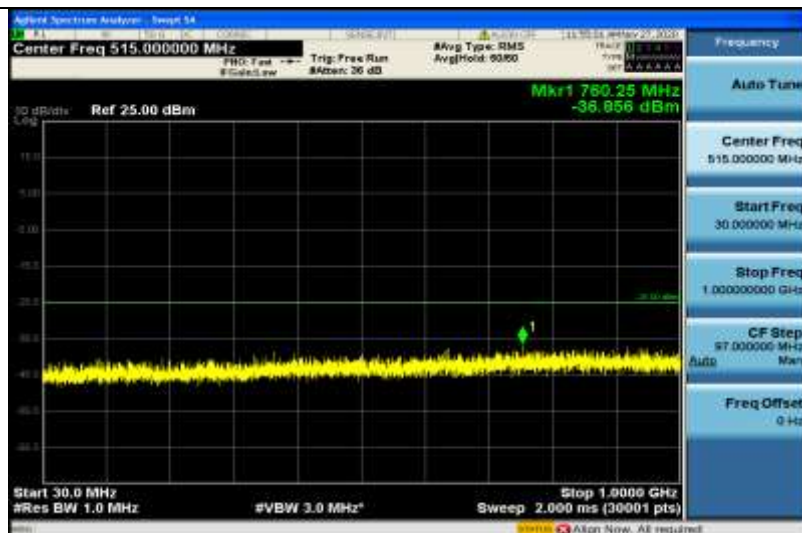
Band38-20MHz-16QAM-38000-1RB#0-Range3:5000~12000MHz



Band38-20MHz-16QAM-38000-1RB#0-Range4:12000~26500MHz



Band38-20MHz-16QAM-38150-1RB#0-Range1:30~1000MHz



Band38-20MHz-16QAM-38150-1RB#0-Range2:1000~5000MHz



Band38-20MHz-16QAM-38150-1RB#0-Range3:5000~12000MHz

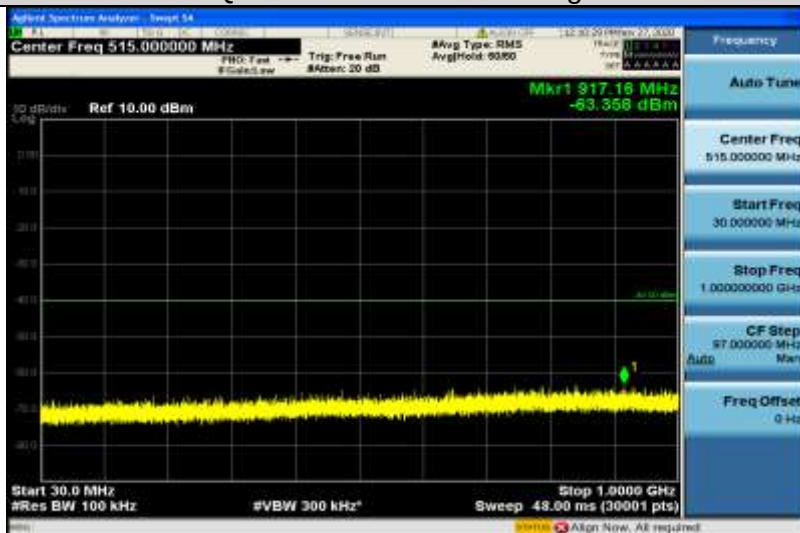




Band38-20MHz-16QAM-38150-1RB#0-Range4:12000~26500MHz



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Band40-5MHz-QPSK-38725-25RB#0-Range2:1000~5000MHz



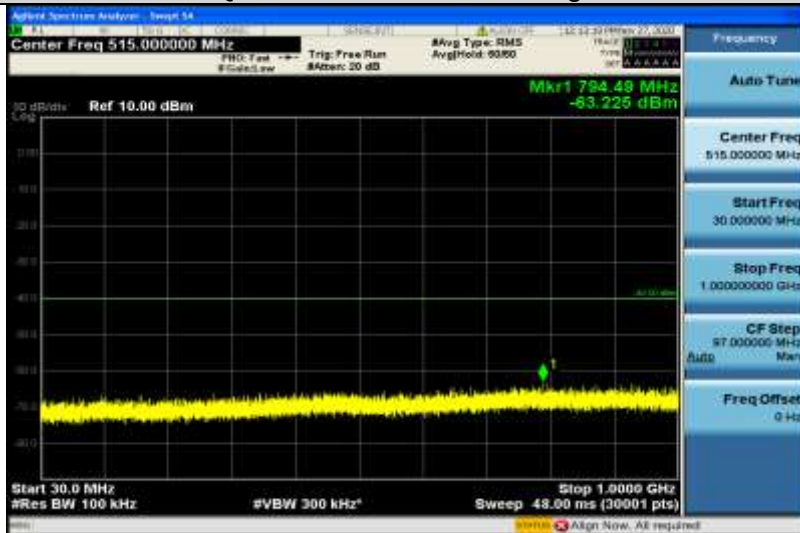
Band40-5MHz-QPSK-38725-25RB#0-Range3:5000~12000MHz



Band40-5MHz-QPSK-38725-25RB#0-Range4:12000~26500MHz



Band40-5MHz-QPSK-38775-25RB#0-Range1:30~1000MHz



Band40-5MHz-QPSK-38775-25RB#0-Range2:1000~5000MHz



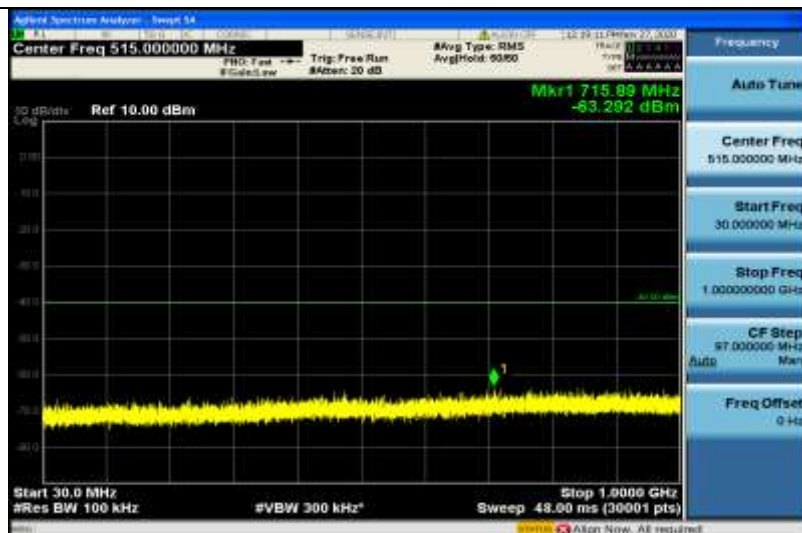
Band40-5MHz-QPSK-38775-25RB#0-Range3:5000~12000MHz



Band40-5MHz-QPSK-38775-25RB#0-Range4:12000~26500MHz



Band40-5MHz-QPSK-39175-25RB#0-Range1:30~1000MHz



Band40-5MHz-QPSK-39175-25RB#0-Range2:1000~5000MHz



Band40-5MHz-QPSK-39175-25RB#0-Range3:5000~12000MHz



Band40-5MHz-QPSK-39175-25RB#0-Range4:12000~26500MHz



Band40-5MHz-QPSK-39225-25RB#0-Range1:30~1000MHz



Band40-5MHz-QPSK-39225-25RB#0-Range2:1000~5000MHz



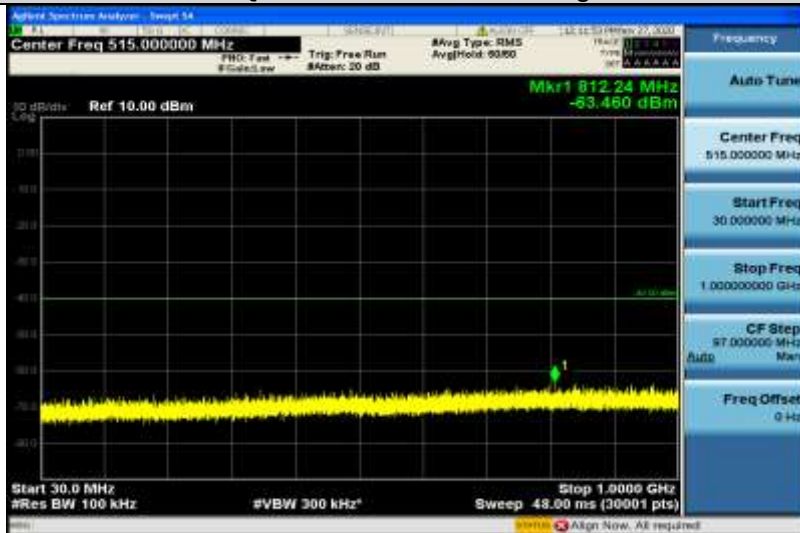
Band40-5MHz-QPSK-39225-25RB#0-Range3:5000~12000MHz



Band40-5MHz-QPSK-39225-25RB#0-Range4:12000~26500MHz



Band40-5MHz-16QAM-38725-25RB#0-Range1:30~1000MHz



Band40-5MHz-16QAM-38725-25RB#0-Range2:1000~5000MHz



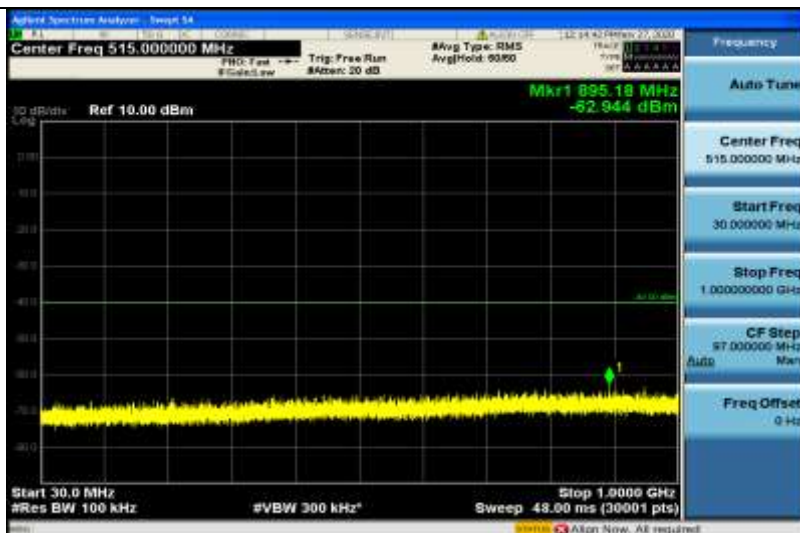
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Band40-5MHz-16QAM-38725-25RB#0-Range4:12000~26500MHz



Band40-5MHz-16QAM-38775-25RB#0-Range1:30~1000MHz



Band40-5MHz-16QAM-38775-25RB#0-Range2:1000~5000MHz



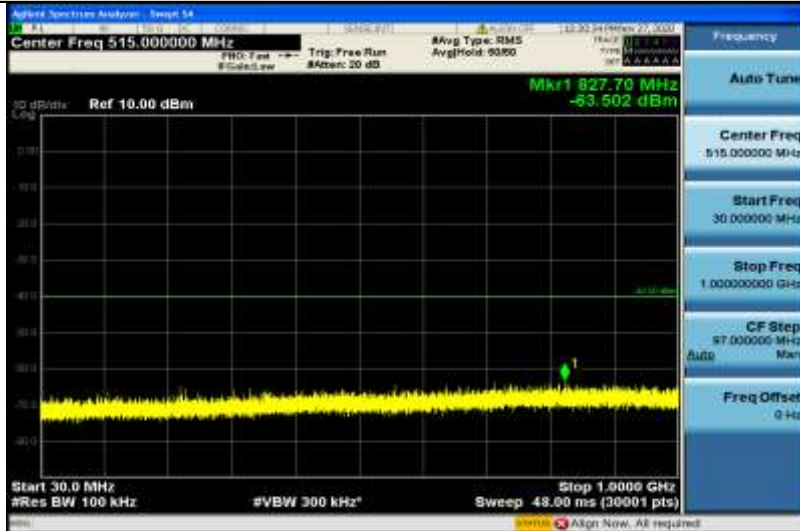
Band40-5MHz-16QAM-38775-25RB#0-Range3:5000~12000MHz



Band40-5MHz-16QAM-38775-25RB#0-Range4:12000~26500MHz



Band40-5MHz-16QAM-39175-25RB#0-Range1:30~1000MHz



Band40-5MHz-16QAM-39175-25RB#0-Range2:1000~5000MHz



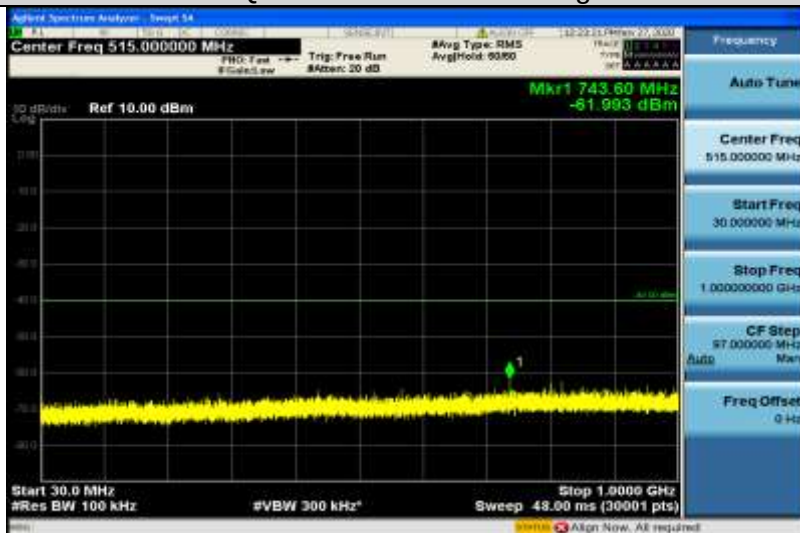
Band40-5MHz-16QAM-39175-25RB#0-Range3:5000~12000MHz



Band40-5MHz-16QAM-39175-25RB#0-Range4:12000~26500MHz



Band40-5MHz-16QAM-39225-25RB#0-Range1:30~1000MHz



Band40-5MHz-16QAM-39225-25RB#0-Range2:1000~5000MHz



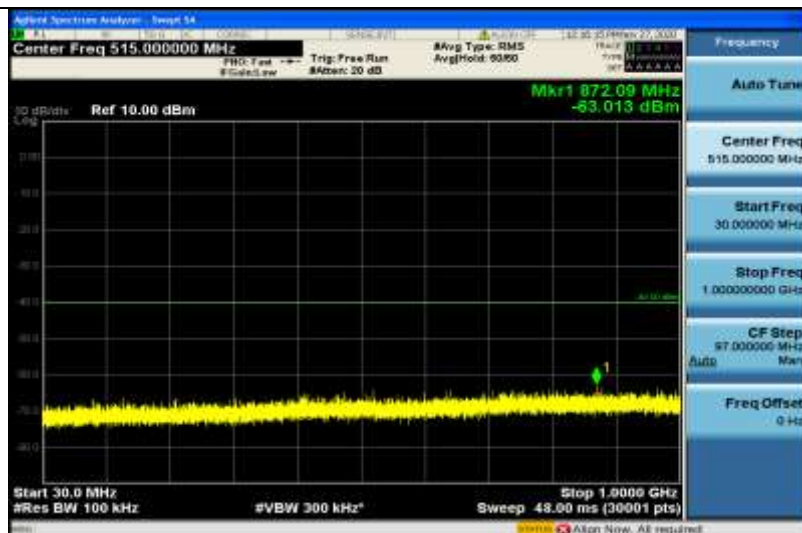
Band40-5MHz-16QAM-39225-25RB#0-Range3:5000~12000MHz



Band40-5MHz-16QAM-39225-25RB#0-Range4:12000~26500MHz



Band40-10MHz-QPSK-38750-50RB#0-Range1:30~1000MHz



Band40-10MHz-QPSK-38750-50RB#0-Range2:1000~5000MHz



Band40-10MHz-QPSK-38750-50RB#0-Range3:5000~12000MHz



Band40-10MHz-QPSK-38750-50RB#0-Range4:12000~26500MHz



Band40-10MHz-QPSK-39200-50RB#0-Range1:30~1000MHz



Band40-10MHz-QPSK-39200-50RB#0-Range2:1000~5000MHz



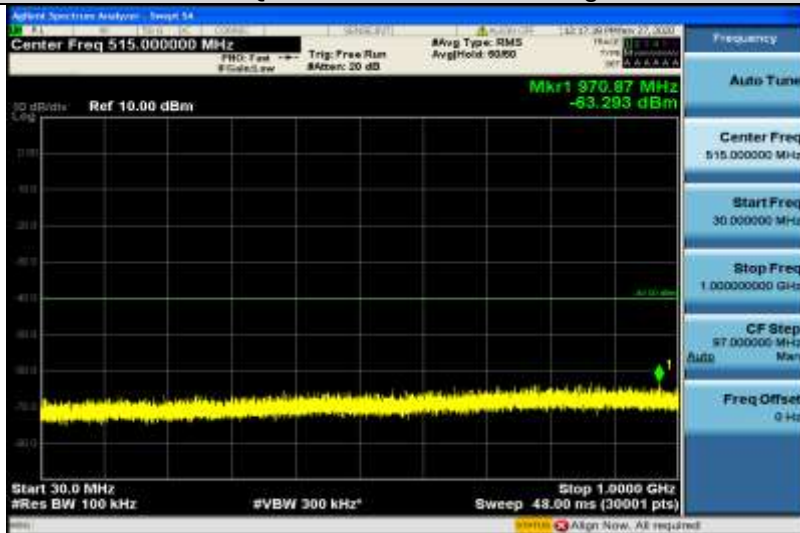
Band40-10MHz-QPSK-39200-50RB#0-Range3:5000~12000MHz



Band40-10MHz-QPSK-39200-50RB#0-Range4:12000~26500MHz



Band40-10MHz-16QAM-38750-50RB#0-Range1:30~1000MHz



Band40-10MHz-16QAM-38750-50RB#0-Range2:1000~5000MHz



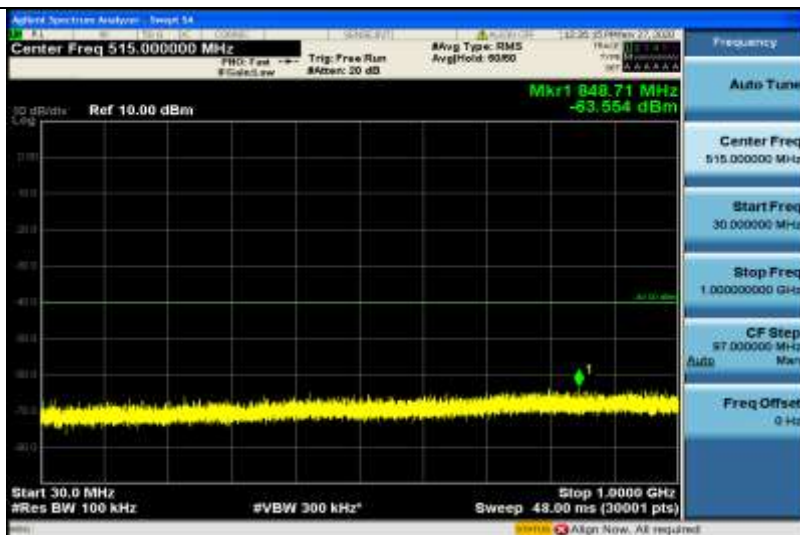
Band40-10MHz-16QAM-38750-50RB#0-Range3:5000~12000MHz



Band40-10MHz-16QAM-38750-50RB#0-Range4:12000~26500MHz



Band40-10MHz-16QAM-39200-50RB#0-Range1:30~1000MHz



Band40-10MHz-16QAM-39200-50RB#0-Range2:1000~5000MHz



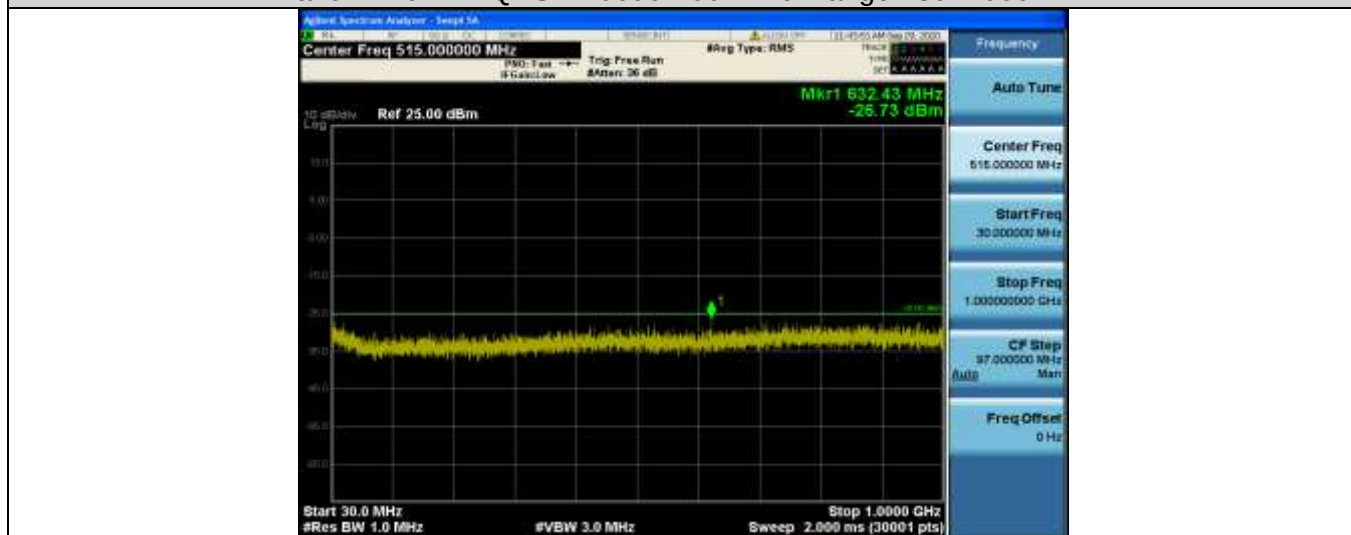
Band40-10MHz-16QAM-39200-50RB#0-Range3:5000~12000MHz



Band40-10MHz-16QAM-39200-50RB#0-Range4:12000~26500MHz



Band41-20MHz-QPSK-40690-100RB#0-Range1:30~1000MHz



Band41-20MHz-QPSK-40690-100RB#0-Range2:1000~5000MHz



Band41-20MHz-QPSK-40690-100RB#0-Range3:5000~12000MHz



Band41-20MHz-QPSK-40690-100RB#0-Range4:12000~26500MHz



5.6 Band edge at antenna terminals

5.6.1 Limit

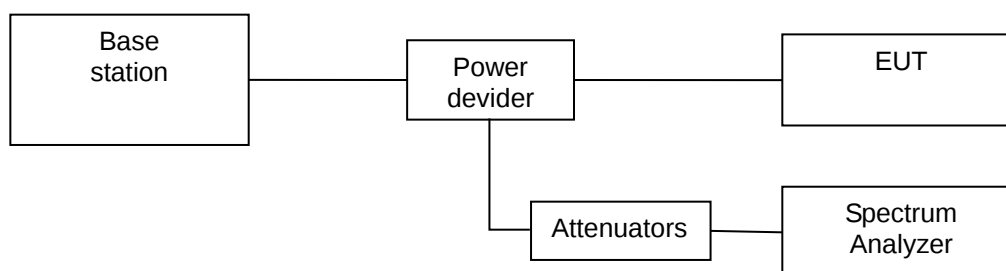
The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB.

It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

5.6.2 Test procedure

1. The testing follows FCC KDB 971168 v03 Section 6.0.
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
4. The middle channel for the highest RF power within the transmitting frequency was measured.
5. The conducted spurious emission for the whole frequency range was taken.
6. Make the measurement with the spectrum analyzer's RBW = 200kHz, VBW = 620kHz.
7. Set spectrum analyzer with RMS detector.
8. Taking the record of maximum spurious emission.
9. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
10. The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)
= P(W)- $[43 + 10\log(P)]$ (dB)
= $[30 + 10\log(P)]$ (dBm) - $[43 + 10\log(P)]$ (dB)
= -13dBm.

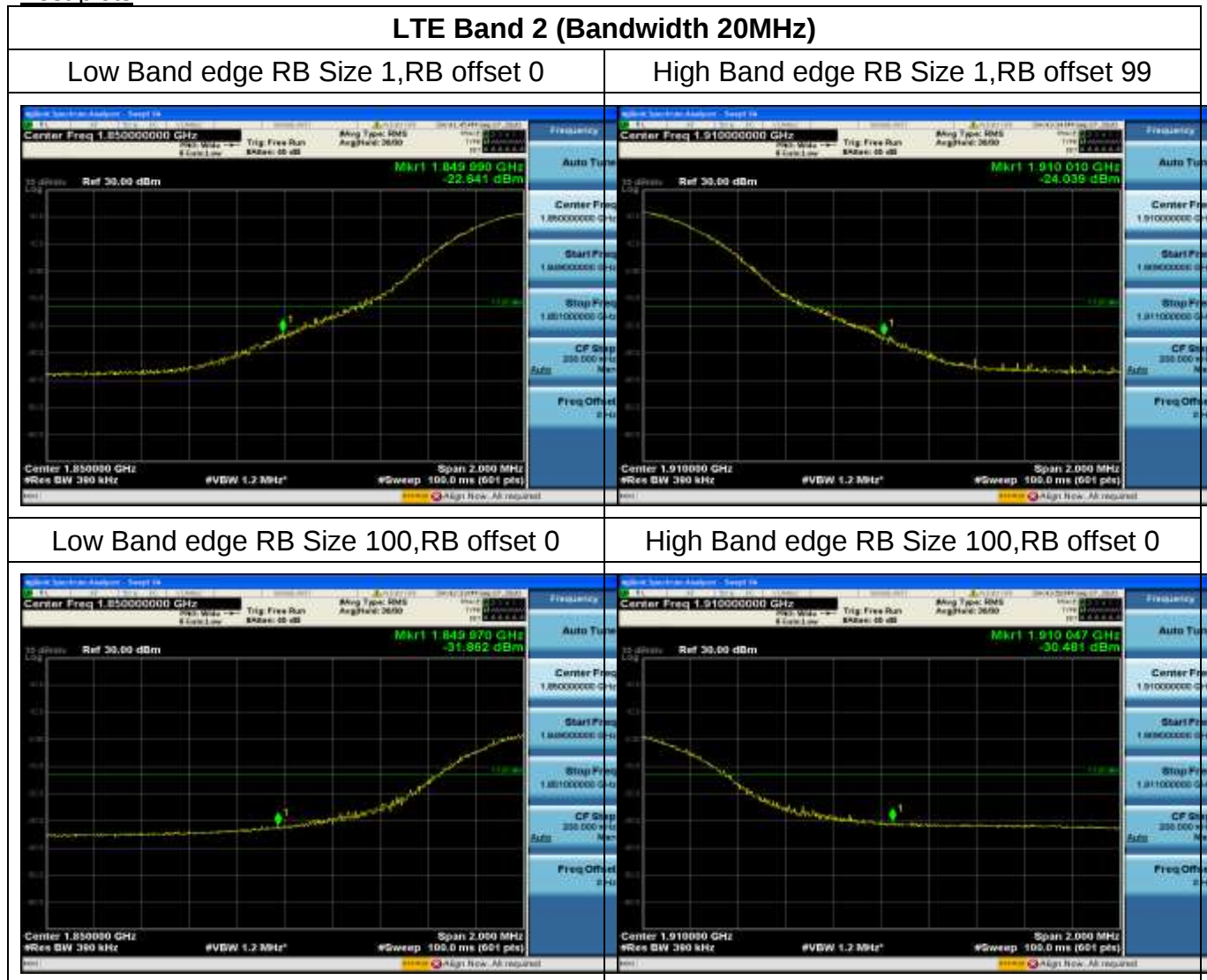
5.6.3 Test setup



5.6.4 Test results

Note: All mode has been tested, only worst data shown in this report.

Test plots



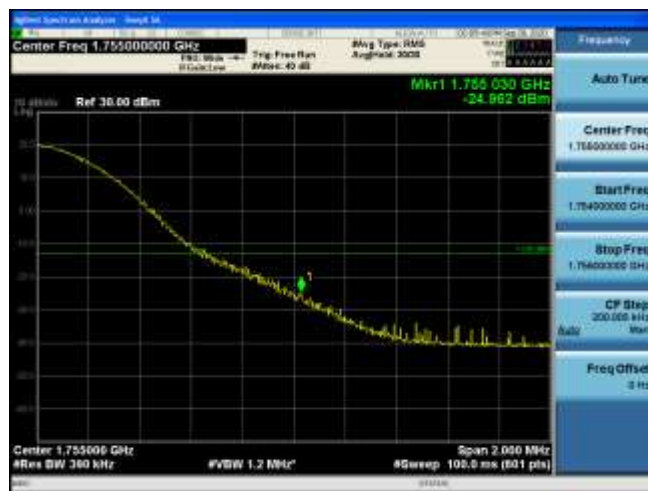


LTE Band 4 (Bandwidth 20MHz)

Low Band edge RB Size 1, RB offset 0



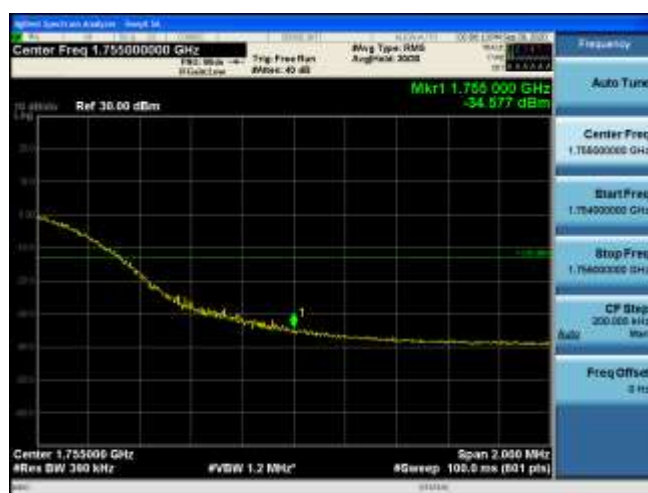
High Band edge RB Size 1, RB offset 99



Low Band edge RB Size 100, RB offset 0



High Band edge RB Size 100, RB offset 0





LTE Band 5 (Bandwidth 10MHz)

Low Band edge RB Size 1, RB offset 0



High Band edge RB Size 1, RB offset 49



Low Band edge RB Size 50, RB offset 0



High Band edge RB Size 50, RB offset 0



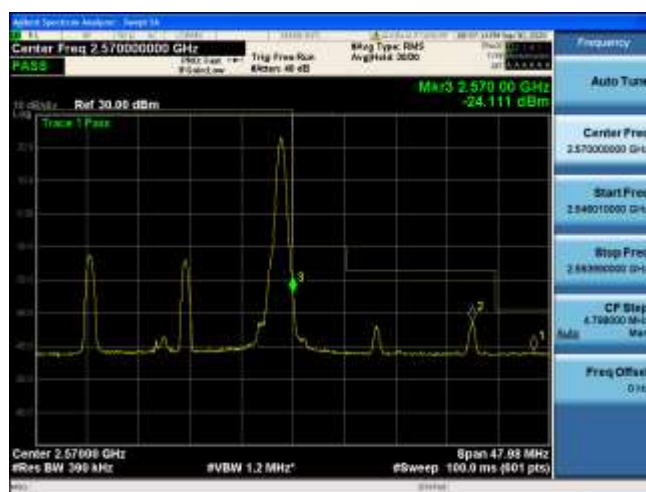


LTE Band 7 (Bandwidth 20MHzq)

Low Band edge RB Size 1, RB offset 0



High Band edge RB Size 1, RB offset 99



Low Band edge RB Size 100, RB offset 0



High Band edge RB Size 100, RB offset 0





LTE Band 12 (Bandwidth 10MHz)

Low Band edge RB Size 1, RB offset 0



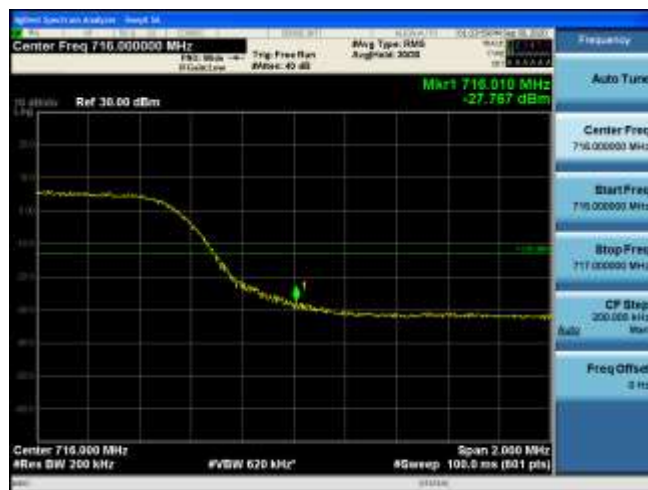
High Band edge RB Size 1, RB offset 49



Low Band edge RB Size 50, RB offset 0



High Band edge RB Size 50, RB offset 0





LTE Band 13 (Bandwidth 10MHz)

Low Band edge RB Size 1, RB offset 0



High Band edge RB Size 1, RB offset 99



Low Band edge RB Size 50, RB offset 0



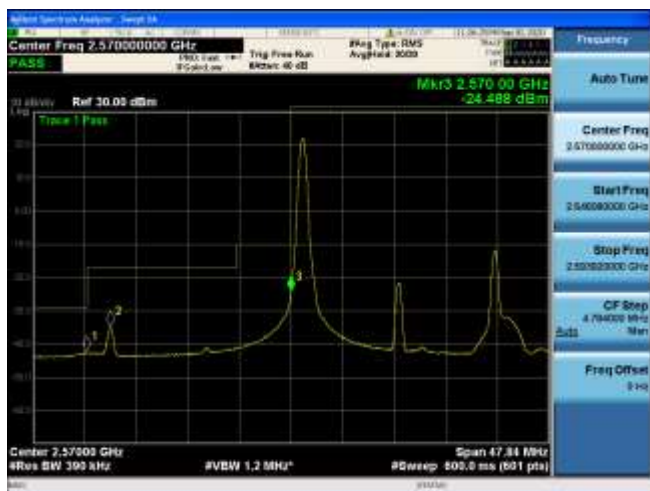
High Band edge RB Size 50, RB offset 0





LTE Band 38 (Bandwidth 20MHz)

Low Band edge RB Size 1,RB offset 0



High Band edge RB Size 1,RB offset 99



Low Band edge RB Size 100,RB offset 0



High Band edge RB Size 100,RB offset 0





LTE Band 40	
2305-2315MHz	2350-2360MHz
Low Band edge 25RB0(5MHz)	Low Band edge 25RB0(5MHz)
High Band edge 25RB0(5MHz)	High Band edge 25RB0(5MHz)
Band edge 50RB0(10MHz)	Band edge 50RB0(10MHz)



LTE Band 41 (Bandwidth 20MHz)

Low Band edge RB Size 100, RB offset 0



High Band edge RB Size 100, RB offset 0



Low Band edge RB Size 100, RB offset 0



High Band edge RB Size 100, RB offset 0



5.7 Field strength of spurious radiation measurement

5.7.1 Limit

LTE Band 2, LTE Band 4, LTE Band 5, LTE Band 12, LTE Band 13: -13dBm

LTE Band7, LTE Band 38, LTE Band 41: -25dBm

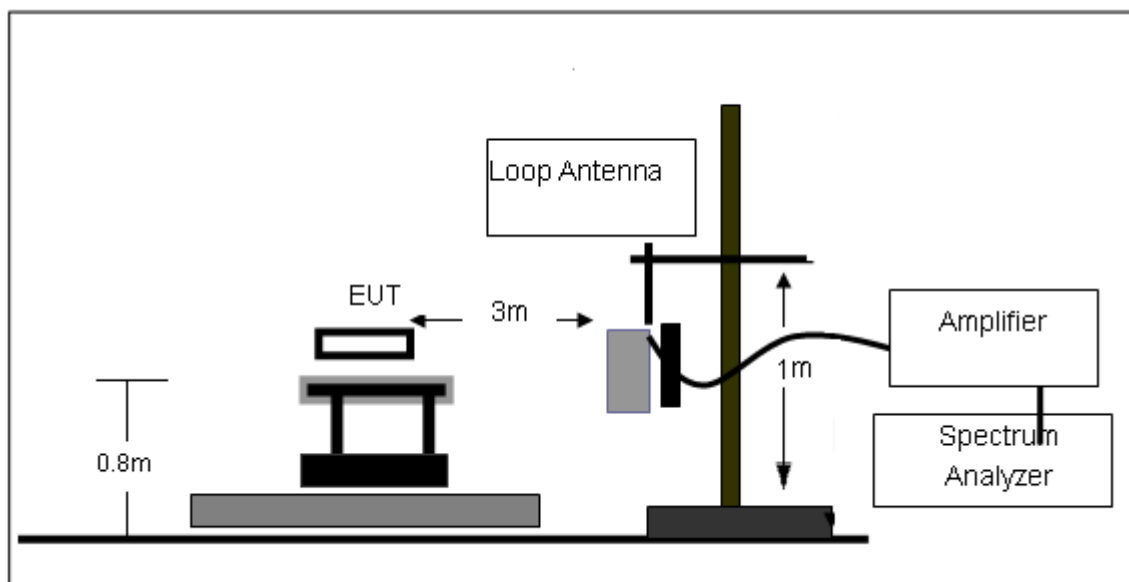
LTE Band 40: -40dBm

5.7.2 Test procedure

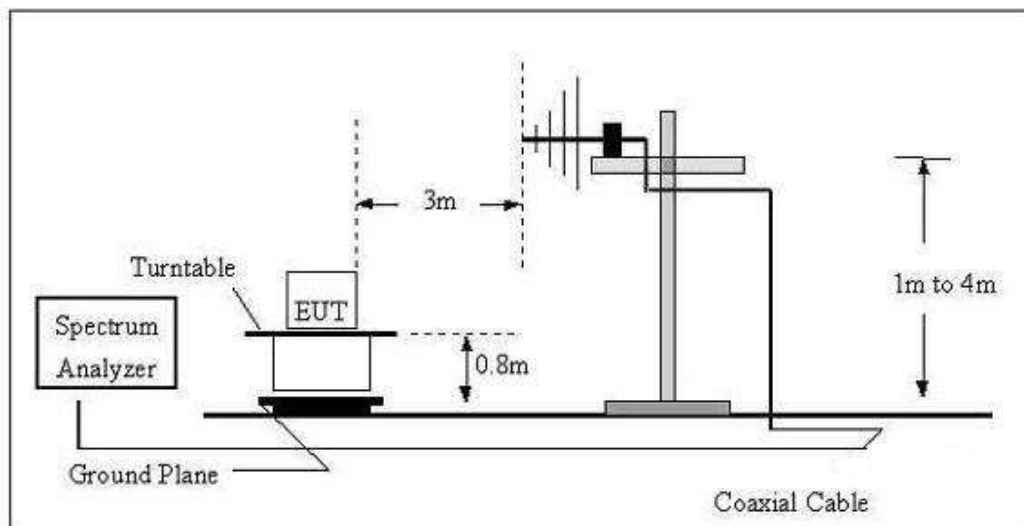
1. The EUT was placed on a non-conductive turntable using a nonconductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer.
2. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.
3. The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission was identified, the power of the emission was determined using the substitution method.
4. The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency. $ERP / EIRP = S.G. \text{ output (dBm)} + \text{Antenna Gain(dB/dBi)} - \text{Cable Loss (dB)}$.

5.7.3 Test setup

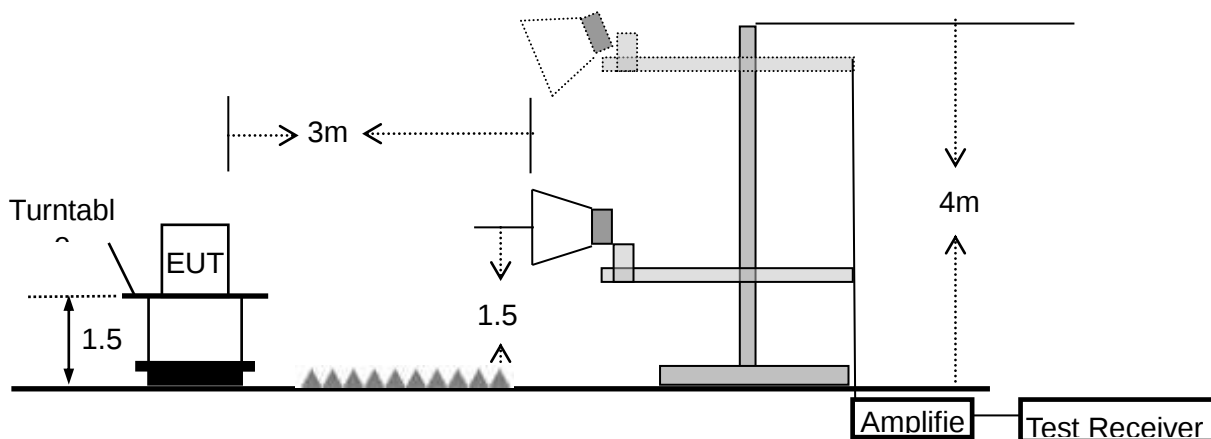
Radiated emission test-up frequency below 30MHz



Radiated emission test-up frequency 30MHz~1GHz



Radiated emission test-up frequency above 1GHz



5.7.4 Test results

Note: All bandwidth low, middle, high channel channels are tested, and the report only reflects the channel data with the worst bandwidth.

LTE Band 2 (30MHz – 19GHz): 10MHz Middle:1880MHz

Frequency (MHz)	Reading Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)	Measurement (dBm)	Limit (dBm)	Margin	Polarization	Result
278.225	-68.59	0.44	5.5	-63.53	-13	-50.53	H	Pass
278.197	-65.39	0.45	5.9	-59.94	-13	-46.94	V	Pass
3760.475	-61.72	2.65	14.3	-50.07	-13	-37.07	H	Pass
3763.707	-58.15	2.65	14.3	-46.50	-13	-33.50	V	Pass
5644.488	-63.03	3.92	14.5	-52.45	-13	-39.45	H	Pass
5640.576	-63.92	3.92	14.5	-53.34	-13	-40.34	V	Pass
7522.397	-62.19	4.36	12.9	-53.65	-13	-40.65	H	Pass
7521.197	-60.75	4.36	12.9	-52.21	-13	-39.21	V	Pass

LTE Band 4 (30MHz – 18GHz): 10MHz Middle:1732.5MHz

Frequency (MHz)	Reading Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)	Measurement (dBm)	Limit (dBm)	Margin	Polarization	Result
281.436	-66.48	0.44	5.5	-61.42	-13	-48.42	H	Pass
298.885	-67.99	0.45	5.9	-62.54	-13	-49.54	V	Pass
3466.749	-62.54	2.28	14.2	-50.62	-13	-37.62	H	Pass
3466.076	-62.24	2.28	14.2	-50.32	-13	-37.32	V	Pass
5197.807	-62.51	3.62	14.5	-51.63	-13	-38.63	H	Pass
5198.219	-61.89	3.62	14.5	-51.01	-13	-38.01	V	Pass
6932.604	-66.47	4.03	13.3	-57.20	-13	-44.20	H	Pass
6932.661	-68.63	4.03	13.3	-59.36	-13	-46.36	V	Pass



LTE Band 5 (30MHz – 18GHz): 10MHz Middle:836.5MHz

Frequency	Reading Level	Cable Loss	Antenna Gain	Measurement	Limit	Margin	Polarization	Result
(MHz)	(dBm)	(dB)	(dB)	(dBm)	(dBm)			
279.622	-68.97	0.44	5.5	-63.91	-13	-50.91	H	Pass
300.154	-66.61	0.45	5.9	-61.16	-13	-48.16	V	Pass
1673.853	-52.70	7.99	9.8	-50.89	-13	-37.89	H	Pass
1678.976	-54.31	7.99	9.8	-52.50	-13	-39.50	V	Pass
2513.262	-62.73	8.64	12.3	-59.07	-13	-46.07	H	Pass
2512.623	-59.96	8.64	12.3	-56.30	-13	-43.30	V	Pass
3352.273	-64.67	9.92	13.6	-60.99	-13	-47.99	H	Pass
3350.474	-66.10	9.92	13.6	-62.42	-13	-49.42	V	Pass

LTE Band 7 (30MHz – 26.5GHz): 10MHz Middle:2535MHz

Frequency	Reading Level	Cable Loss	Antenna Gain	Measurement	Limit	Margin	Polarization	Result
(MHz)	(dBm)	(dB)	(dB)	(dBm)	(dBm)			
278.066	-66.07	0.44	5.5	-61.01	-25	-36.01	H	Pass
301.494	-64.75	0.45	5.9	-59.30	-25	-34.30	V	Pass
5075.020	-67.71	3.65	14.5	-56.86	-25	-31.86	H	Pass
5073.125	-66.57	3.65	14.5	-55.72	-25	-30.72	V	Pass
7607.290	-67.82	4.34	12.9	-59.26	-25	-34.26	H	Pass
7606.359	-58.13	4.34	12.9	-49.57	-25	-24.57	V	Pass
10140.658	-65.90	6.02	12.6	-59.32	-25	-34.32	H	Pass
10142.647	-67.77	6.02	12.6	-61.19	-25	-36.19	V	Pass

LTE Band 12 (30MHz – 18G): 10MHz Middle:707.5MHz

Frequency	Reading Level	Cable Loss	Antenna Gain	Measurement	Limit	Margin	Polarization	Result
(MHz)	(dBm)	(dB)	(dB)	(dBm)	(dBm)			
278.029	-64.53	0.44	5.5	-59.47	-13	-46.47	H	Pass
299.920	-65.91	0.45	5.9	-60.46	-13	-47.46	V	Pass
1418.356	-52.52	7.82	9.7	-50.64	-13	-37.64	H	Pass
1417.398	-50.32	7.82	9.7	-48.44	-13	-35.44	V	Pass
2125.133	-60.30	8.11	10.3	-58.11	-13	-45.11	H	Pass
2127.481	-59.69	8.11	10.3	-57.50	-13	-44.50	V	Pass
2832.493	-64.39	8.52	13.6	-59.31	-13	-46.31	H	Pass
2832.367	-63.60	8.52	13.6	-58.52	-13	-45.52	V	Pass

LTE Band 13 (30MHz – 18GHz): 10MHz Middle:782MHz

Frequency	Reading Level	Cable Loss	Antenna Gain	Measurement	Limit	Margin	Polarization	Result
(MHz)	(dBm)	(dB)	(dB)	(dBm)	(dBm)			
278.526	-62.60	0.44	5.5	-57.54	-13	-44.54	H	Pass
301.584	-63.20	0.45	5.9	-57.75	-13	-44.75	V	Pass
1565.420	-50.74	7.82	9.7	-48.86	-13	-35.86	H	Pass
1568.473	-51.18	7.82	9.7	-49.30	-13	-36.30	V	Pass
2347.774	-57.73	8.11	10.3	-55.54	-13	-42.54	H	Pass
2351.003	-56.61	8.11	10.3	-54.42	-13	-41.42	V	Pass
3130.387	-60.04	8.52	13.6	-54.96	-13	-41.96	H	Pass
3129.531	-61.53	8.52	13.6	-56.45	-13	-43.45	V	Pass

LTE Band 38 (30MHz – 26.5GHz): 10MHz Middle:2595MHz

Frequency	Reading Level	Cable Loss	Antenna Gain	Measurement	Limit	Margin	Polarization	Result
(MHz)	(dBm)	(dB)	(dB)	(dBm)	(dBm)			
280.898	-69.29	0.44	5.5	-64.23	-25	-39.23	H	Pass
292.338	-70.71	0.45	5.9	-65.26	-25	-40.26	V	Pass
5190.811	-62.68	3.65	14.5	-51.83	-25	-26.83	H	Pass
5190.318	-61.36	3.65	14.5	-50.51	-25	-25.51	V	Pass
7790.505	-65.27	4.34	12.9	-56.71	-25	-31.71	H	Pass
7787.876	-53.21	4.34	12.9	-44.65	-25	-19.65	V	Pass
10383.460	-68.02	6.02	12.6	-61.44	-25	-36.44	H	Pass
10384.808	-67.13	6.02	12.6	-60.55	-25	-35.55	V	Pass



LTE Band 40 10MHz (30MHz – 26.5GHz)

Frequency	Reading Level	Cable Loss	Antenna Gain	Measurement	Limit	Margin	Polarization	Result
(MHz)	(dBm)	(dB)	(dB)	(dBm)	(dBm)			
Frequency:2310MHz								
278.739	-67.57	0.44	5.5	-62.51	-40	-22.51	H	Pass
391.520	-68.15	0.45	5.9	-62.70	-40	-22.70	V	Pass
4622.175	-65.86	3.65	14.9	-54.61	-40	-14.61	H	Pass
4621.836	-66.48	3.65	14.9	-55.23	-40	-15.23	V	Pass
6932.300	-69.78	4.34	13.4	-60.72	-40	-20.72	H	Pass
6931.592	-64.50	4.34	13.4	-55.44	-40	-15.44	V	Pass
9244.012	-67.40	6.02	12.6	-60.82	-40	-20.82	H	Pass
9241.867	-66.97	6.02	12.6	-60.39	-40	-20.39	V	Pass
Frequency:2355MHz								
278.773	-67.09	0.44	5.5	-62.03	-40	-22.03	H	Pass
391.979	-67.75	0.45	5.9	-62.30	-40	-22.30	V	Pass
4711.823	-65.35	3.65	14.9	-54.10	-40	-14.10	H	Pass
4713.245	-65.23	3.65	14.9	-53.98	-40	-13.98	V	Pass
7066.416	-60.15	4.34	13.4	-51.09	-40	-11.09	H	Pass
7068.399	-62.67	4.34	13.4	-53.61	-40	-13.61	V	Pass
9425.685	-67.80	6.02	12.6	-61.22	-40	-21.22	H	Pass
9425.614	-67.15	6.02	12.6	-60.57	-40	-20.57	V	Pass

LTE Band 41 (30MHz – 26.5GHz): 10MHz Middle: 2605MHz

Frequency	Reading Level	Cable Loss	Antenna Gain	Measurement	Limit	Margin	Polarization	Result
(MHz)	(dBm)	(dB)	(dB)	(dBm)	(dBm)			
278.865	-70.40	0.44	5.5	-65.34	-25	-40.34	H	Pass
393.798	-70.12	0.45	5.9	-64.67	-25	-39.67	V	Pass
5211.115	-65.73	3.65	14.5	-54.88	-25	-29.88	H	Pass
5212.818	-66.33	3.65	14.5	-55.48	-25	-30.48	V	Pass
7818.492	-65.58	4.34	12.9	-57.02	-25	-32.02	H	Pass
7818.419	-67.79	4.34	12.9	-59.23	-25	-34.23	V	Pass
10423.787	-68.84	6.02	12.6	-62.26	-25	-37.26	H	Pass
10422.655	-69.71	6.02	12.6	-63.13	-25	-38.13	V	Pass

5.8 Frequency Stability

5.8.1 Limit

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. As this transceiver is considered "Hand carried, battery powered equipment" Section 2.1055(d) (2) applies. This requires that the lower voltage for frequency stability testing be specified by the manufacturer. This transceiver is specified to operate with an input voltage of between 3.42VDC and 4.18VDC, with a nominal voltage of 3.8VDC. Operation above or below these voltage limits is prohibited by transceiver software in order to prevent improper operation as well as to protect components from over stress. These voltages represent a tolerance from -5.4% to 10.8%. For the purposes of measuring frequency stability these voltage limits are to be used.

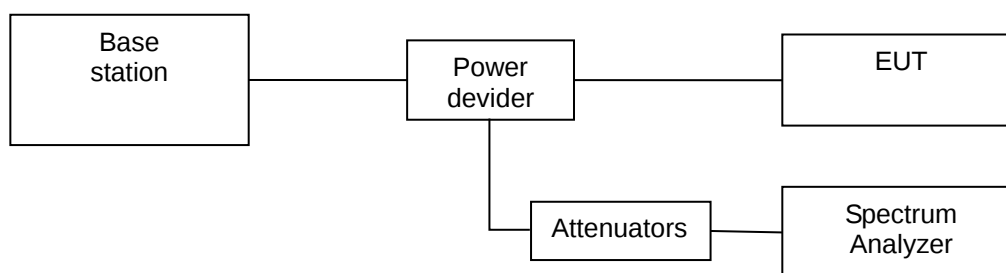
5.8.2 Test procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to communication test set via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the communication test set.

Frequency Stability vs. Voltage: An external variable DC power supply was connected to the battery terminals of the equipment under test. The voltage was set to 115% of the nominal value and was then decreased until the transmitter light no longer illuminated; i.e., the battery end point. The output frequency was recorded for each battery voltage.

5.8.3 Test setup



5.8.4 Test results

LTE Band 2

QPSK, Channel Bandwidth:10MHz					
Temperature(°C)	Test channels (MHz)	Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	1880	3.8	-15.3	-0.008	Pass
-20			-5.3	-0.003	Pass
-10			-8.21	-0.004	Pass
0			-6.8	-0.004	Pass
10			-4.56	-0.002	Pass
20			-4.22	-0.002	Pass
30			-4.94	-0.003	Pass
40			3.32	0.002	Pass
50			6.78	0.004	Pass
20		3.42	10.23	0.005	Pass
20		4.18	14.77	0.008	Pass

16QAM, Channel Bandwidth:10MHz					
Temperature(°C)	Test channels (MHz)	Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	1880	3.8	6.69	0.004	Pass
-20			2.33	0.001	Pass
-10			-2.61	-0.001	Pass
0			2.95	0.002	Pass
10			4.68	0.002	Pass
20			3.37	0.002	Pass
30			-4.22	-0.002	Pass
40			-5.36	-0.003	Pass
50			-6.82	-0.004	Pass
20		3.42	10.29	0.005	Pass
20		4.18	6.27	0.003	Pass



LTE Band 4

QPSK, Channel Bandwidth:10MHz					
Temperature	Voltage	Test Result (MHz)		Limit (MHz)	
(°C)	(V)	FL	FH	FL	FH
-30	3.8	1710.923	1754.793	1710	1755
-20		1710.391	1754.089	1710	1755
-10		1710.617	1754.440	1710	1755
0		1710.152	1754.106	1710	1755
10		1710.821	1754.060	1710	1755
20		1710.443	1754.416	1710	1755
30		1710.462	1754.008	1710	1755
40		1710.105	1754.796	1710	1755
50		1710.830	1754.722	1710	1755
20	3.42	1710.105	1754.899	1710	1755
20	4.18	1710.415	1754.770	1710	1755

16QAM, Channel Bandwidth:10MHz					
Temperature	Voltage	Test Result (MHz)		Limit (MHz)	
(°C)	(V)	FL	FH	FL	FH
-30	3.8	1710.339	1754.017	1710	1755
-20		1710.505	1754.502	1710	1755
-10		1710.892	1754.506	1710	1755
0		1710.175	1754.349	1710	1755
10		1710.534	1754.429	1710	1755
20		1710.436	1754.459	1710	1755
30		1710.330	1754.873	1710	1755
40		1710.138	1754.871	1710	1755
50		1710.225	1754.065	1710	1755
20	3.42	1710.455	1754.946	1710	1755
20	4.18	1710.550	1754.760	1710	1755

LTE Band 5

QPSK, Channel Bandwidth:10MHz					
Temperature(°C)	Test channels (MHz)	Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	836.5	3.8	-5.36	-0.006	Pass
-20			-3.85	-0.005	Pass
-10			-4.46	-0.005	Pass
0			-4.98	-0.006	Pass
10			-4.85	-0.006	Pass
20			-3.23	-0.004	Pass
30			5.16	0.006	Pass
40			-3.92	-0.005	Pass
50			3.4	0.004	Pass
20		3.42	-5.28	-0.006	Pass
20		4.18	-6.07	-0.007	Pass

16QAM, Channel Bandwidth:10MHz					
Temperature(°C)	Test channels (MHz)	Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	836.5	3.8	-7.7	-0.009	Pass
-20			-4.42	-0.005	Pass
-10			-5.04	-0.006	Pass
0			-4.05	-0.005	Pass
10			4.39	0.005	Pass
20			-3.73	-0.004	Pass
30			-6.38	-0.008	Pass
40			-4.22	-0.005	Pass
50			-3.02	-0.004	Pass
20		3.42	-3.23	-0.004	Pass
20		4.18	-3.4	-0.004	Pass

LTE Band 7

QPSK, Channel Bandwidth:10MHz					
Temperature	Voltage	Test Result (MHz)		Limit (MHz)	
(°C)	(V)	FL	FH	FL	FH
-30	3.8	2500.674	2569.042	2500	2570
-20		2500.740	2569.499	2500	2570
-10		2500.212	2569.492	2500	2570
0		2500.333	2569.096	2500	2570
10		2500.648	2569.667	2500	2570
20		2500.584	2569.680	2500	2570
30		2500.918	2569.556	2500	2570
40		2500.911	2569.028	2500	2570
50		2500.929	2569.426	2500	2570
20	3.42	2500.258	2569.683	2500	2570
20	4.18	2500.584	2569.762	2500	2570

16QAM, Channel Bandwidth:10MHz					
Temperature	Voltage	Test Result (MHz)		Limit (MHz)	
(°C)	(V)	FL	FH	FL	FH
-30	3.8	2500.097	2569.493	2500	2570
-20		2500.589	2569.156	2500	2570
-10		2500.758	2569.219	2500	2570
0		2500.398	2569.319	2500	2570
10		2500.528	2569.782	2500	2570
20		2500.211	2569.081	2500	2570
30		2500.381	2569.459	2500	2570
40		2500.348	2569.853	2500	2570
50		2500.205	2569.750	2500	2570
20	3.42	2500.093	2569.699	2500	2570
20	4.18	2500.216	2569.823	2500	2570

LTE Band 12

QPSK, Channel Bandwidth:10MHz					
Temperature	Voltage	Test Result (MHz)		Limit (MHz)	
(°C)	(V)	FL	FH	FL	FH
-30	3.8	699.898	715.738	699	716
-20		699.690	715.770	699	716
-10		699.237	715.413	699	716
0		699.686	715.672	699	716
10		699.037	715.803	699	716
20		699.813	715.932	699	716
30		699.662	715.450	699	716
40		699.671	715.913	699	716
50		699.861	715.509	699	716
20	3.42	699.517	715.467	699	716
20	4.18	699.479	715.417	699	716

16QAM, Channel Bandwidth:10MHz					
Temperature	Voltage	Test Result (MHz)		Limit (MHz)	
(°C)	(V)	FL	FH	FL	FH
-30	3.8	699.704	715.961	699	716
-20		699.185	715.111	699	716
-10		699.163	715.128	699	716
0		699.384	715.150	699	716
10		699.073	715.057	699	716
20		699.708	715.488	699	716
30		699.587	715.917	699	716
40		699.425	715.214	699	716
50		699.049	715.852	699	716
20	3.42	699.227	715.916	699	716
20	4.18	699.315	715.863	699	716

LTE Band 13

QPSK, Channel Bandwidth:10MHz					
Temperature	Voltage	Test Result (MHz)		Limit (MHz)	
(°C)	(V)	FL	FH	FL	FH
-30	3.8	777.716	786.152	777	787
-20		777.919	786.813	777	787
-10		777.975	786.737	777	787
0		777.078	786.577	777	787
10		777.165	786.814	777	787
20		777.053	786.906	777	787
30		777.855	786.989	777	787
40		777.357	786.044	777	787
50		777.452	786.378	777	787
20	3.42	777.833	786.965	777	787
20	4.18	777.861	786.830	777	787

16QAM, Channel Bandwidth:10MHz					
Temperature	Voltage	Test Result (MHz)		Limit (MHz)	
(°C)	(V)	FL	FH	FL	FH
-30	3.8	777.539	786.254	777	787
-20		777.296	786.103	777	787
-10		777.917	786.119	777	787
0		777.055	786.628	777	787
10		777.628	786.447	777	787
20		777.800	786.396	777	787
30		777.056	786.060	777	787
40		777.044	786.453	777	787
50		777.523	786.799	777	787
20	3.42	777.207	786.417	777	787
20	4.18	777.722	786.636	777	787



LTE Band 38

QPSK, Channel Bandwidth:10MHz					
Temperature	Voltage	Test Result (MHz)		Limit (MHz)	
(°C)	(V)	FL	FH	FL	FH
-30	3.8	2570.197	2619.737	2570	2620
-20		2570.546	2619.951	2570	2620
-10		2570.281	2619.179	2570	2620
0		2570.691	2619.340	2570	2620
10		2570.181	2619.236	2570	2620
20		2570.018	2619.882	2570	2620
30		2570.364	2619.564	2570	2620
40		2570.654	2619.337	2570	2620
50		2570.183	2619.325	2570	2620
20	3.42	2570.897	2619.851	2570	2620
20	4.18	2570.744	2619.580	2570	2620

16QAM, Channel Bandwidth:10MHz					
Temperature	Voltage	Test Result (MHz)		Limit (MHz)	
(°C)	(V)	FL	FH	FL	FH
-30	3.8	2570.139	2619.302	2570	2620
-20		2570.138	2619.307	2570	2620
-10		2570.802	2619.027	2570	2620
0		2570.727	2619.725	2570	2620
10		2570.598	2619.558	2570	2620
20		2570.302	2619.630	2570	2620
30		2570.136	2619.663	2570	2620
40		2570.293	2619.631	2570	2620
50		2570.105	2619.361	2570	2620
20	3.42	2570.103	2619.233	2570	2620
20	4.18	2570.434	2619.200	2570	2620



LTE Band 40 (2305-2315)

QPSK, Channel Bandwidth:10MHz					
Temperature	Voltage	Test Result (MHz)		Limit (MHz)	
(°C)	(V)	FL	FH	FL	FH
-30	3.8	2305.786	2314.390	2305	2315
-20		2305.368	2314.872	2305	2315
-10		2305.566	2314.792	2305	2315
0		2305.441	2314.949	2305	2315
10		2305.880	2314.807	2305	2315
20		2305.249	2314.255	2305	2315
30		2305.649	2314.433	2305	2315
40		2305.951	2314.071	2305	2315
50		2305.367	2314.352	2305	2315
20	3.42	2305.478	2314.477	2305	2315
20	4.18	2305.888	2314.773	2305	2315

16QAM, Channel Bandwidth:10MHz					
Temperature	Voltage	Test Result (MHz)		Limit (MHz)	
(°C)	(V)	FL	FH	FL	FH
-30	3.8	2305.882	2314.575	2305	2315
-20		2305.058	2314.225	2305	2315
-10		2305.735	2314.645	2305	2315
0		2305.241	2314.421	2305	2315
10		2305.940	2314.128	2305	2315
20		2305.863	2314.354	2305	2315
30		2305.020	2314.968	2305	2315
40		2305.458	2314.970	2305	2315
50		2305.045	2314.399	2305	2315
20	3.42	2305.405	2314.156	2305	2315
20	4.18	2305.445	2314.650	2305	2315

LTE Band 40 (2350-2360)

QPSK, Channel Bandwidth:10MHz					
Temperature	Voltage	Test Result (MHz)		Limit (MHz)	
(°C)	(V)	FL	FH	FL	FH
-30	3.8	2350.888	2359.470	2350	2360
-20		2350.488	2359.697	2350	2360
-10		2350.111	2359.891	2350	2360
0		2350.287	2359.541	2350	2360
10		2350.414	2359.075	2350	2360
20		2350.357	2359.204	2350	2360
30		2350.007	2359.977	2350	2360
40		2350.793	2359.732	2350	2360
50		2350.362	2359.974	2350	2360
20	3.42	2350.035	2359.863	2350	2360
20	4.18	2350.190	2359.033	2350	2360

16QAM, Channel Bandwidth:10MHz					
Temperature	Voltage	Test Result (MHz)		Limit (MHz)	
(°C)	(V)	FL	FH	FL	FH
-30	3.8	2350.576	2359.632	2350	2360
-20		2350.985	2359.745	2350	2360
-10		2350.520	2359.544	2350	2360
0		2350.054	2359.539	2350	2360
10		2350.595	2359.198	2350	2360
20		2350.118	2359.914	2350	2360
30		2350.523	2359.928	2350	2360
40		2350.277	2359.038	2350	2360
50		2350.100	2359.903	2350	2360
20	3.42	2350.075	2359.228	2350	2360
20	4.18	2350.231	2359.337	2350	2360

LTE Band 41

QPSK, Channel Bandwidth:10MHz					
Temperature	Voltage	Test Result (MHz)		Limit (MHz)	
(°C)	(V)	FL	FH	FL	FH
-30	3.8	2555.329	2564.334	2555	2565
-20		2555.850	2564.751	2555	2565
-10		2555.654	2564.927	2555	2565
0		2555.070	2564.618	2555	2565
10		2555.292	2564.723	2555	2565
20		2555.884	2564.712	2555	2565
30		2555.625	2564.711	2555	2565
40		2555.547	2564.037	2555	2565
50		2555.584	2564.280	2555	2565
20	3.42	2555.535	2564.568	2555	2565
20	4.18	2555.651	2564.317	2555	2565

16QAM, Channel Bandwidth:10MHz					
Temperature	Voltage	Test Result (MHz)		Limit (MHz)	
(°C)	(V)	FL	FH	FL	FH
-30	3.8	2555.227	2564.865	2555	2565
-20		2555.327	2564.551	2555	2565
-10		2555.391	2564.800	2555	2565
0		2555.541	2564.410	2555	2565
10		2555.356	2564.282	2555	2565
20		2555.512	2564.804	2555	2565
30		2555.567	2564.779	2555	2565
40		2555.876	2564.219	2555	2565
50		2555.559	2564.727	2555	2565
20	3.42	2555.761	2564.767	2555	2565
20	4.18	2555.971	2564.592	2555	2565



Photographs of the Test Setup

Radiated emission





Photographs of the EUT

See the APPENDIX 1: EUT PHOTO in the report No.: MTi20061009-2E1-1.

----END OF REPORT----