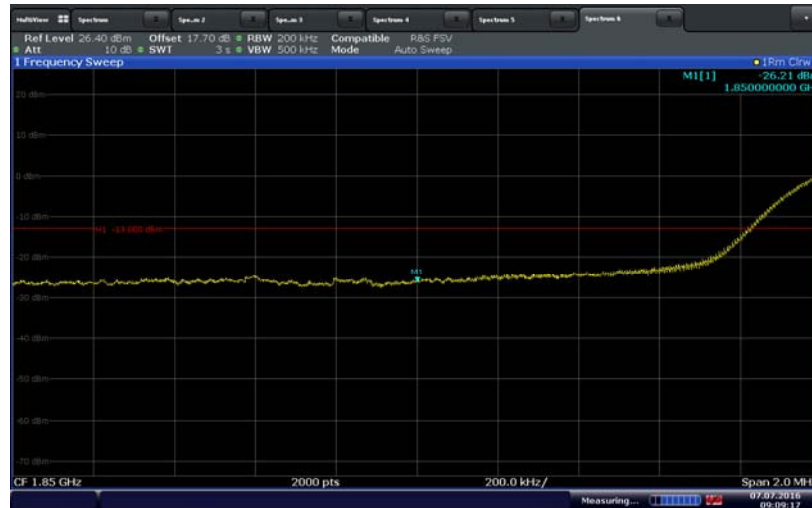
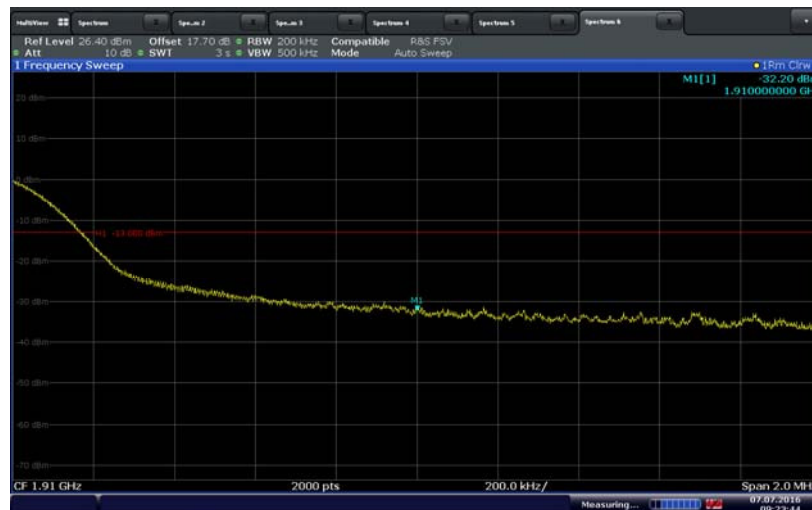


### LTE Band 2 (20 MHz BW)/QPSK/Low Channel (18700) Band Edge @ 1850 MHz



Date: 7 JUL 2016 09:09:18

### LTE Band 2 (20 MHz BW)/QPSK/High Channel (19100) Band Edge @ 1910 MHz



Date: 7 JUL 2016 09:23:44



## **2.7 CONDUCTED SPURIOUS EMISSIONS**

### **2.7.1 Specification Reference**

FCC 47 CFR Part 2, Clause 2.1051  
FCC 47 CFR Part 22, Clause 22.917(a)  
FCC 47 CFR Part 24, Clause 24.238(a)  
RSS-132, Clause 5.5  
RSS-133, Clause 6.5

### **2.7.2 Standard Applicable**

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.

### **2.7.3 Equipment Under Test and Modification State**

Serial No: SZ17061900005 / Test Configuration A

### **2.7.4 Date of Test/Initial of test personnel who performed the test**

July 06 to 08, 2016 / XYZ  
July 11, 15 and 18, 2016 / FC and AC

### **2.7.5 Test Equipment Used**

The major items of test equipment used for the above tests are identified in Section 3.1.

### **2.7.6 Environmental Conditions/ Test Location**

Test performed at TÜV SÜD America Inc. Rancho Bernardo facility

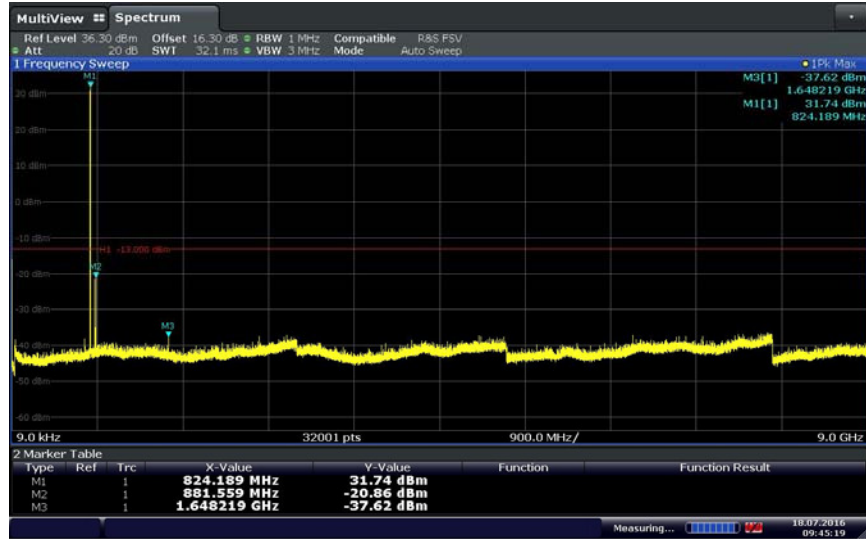
|                     |                 |
|---------------------|-----------------|
| Ambient Temperature | 24.3 - 25.7°C   |
| Relative Humidity   | 37.8 - 41.5%    |
| ATM Pressure        | 99.2 - 99.8 kPa |

### **2.7.7 Additional Observations**

- This is a conducted test.
- The spectrum was searched from 9 kHz to the 10<sup>th</sup> harmonic.
- The path loss was measured and entered as a level offset.
- For RBW was set to 1 MHz.
- Only worst case configuration for all technologies presented in this test report.

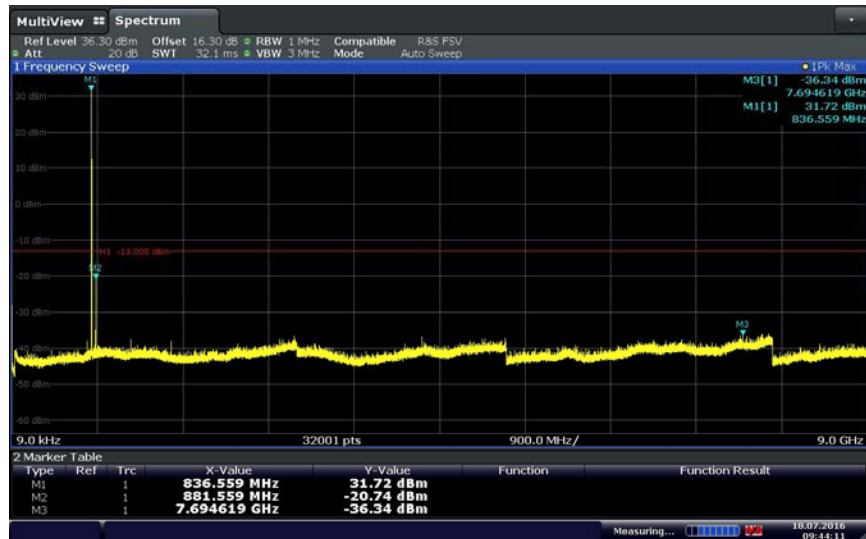
## 2.7.8 Test Results

### GPRS850-BC0/Low Channel (128)/ @ 824.2 MHz



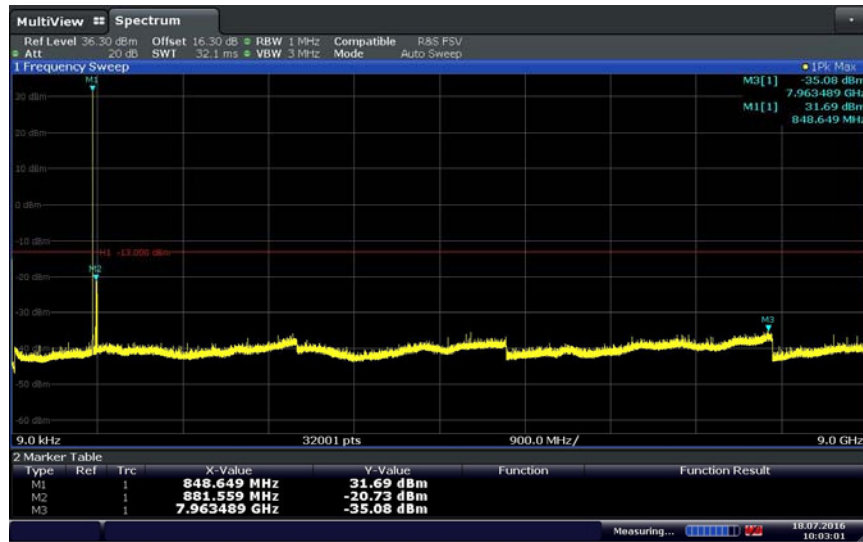
Date: 18 JUL 2016 09:45:19

### GPRS850-BC0/Mid Channel (190)/ @ 836.6 MHz



Date: 18 JUL 2016 09:44:11

### GPRS850-BC0/High Channel (251)/ @ 848.8 MHz



Date: 18 JUL 2016 10:03:01

### GPRS1900-BC1/Low Channel (512)/ @ 1850.2 MHz



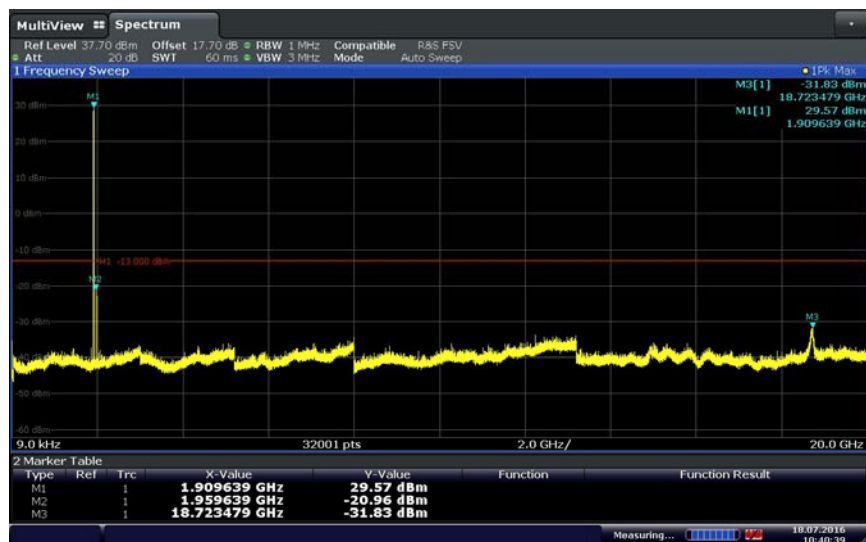
Date: 18 JUL 2016 10:09:34

### GPRS1900-BC1/Mid Channel (661)/ @ 1880.0 MHz



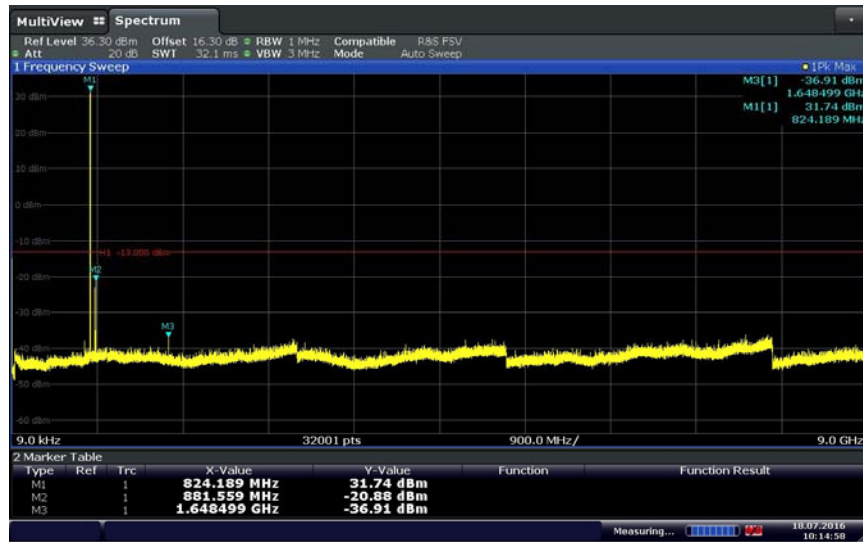
Date: 18 JUL 2016 10:29:59

### GPRS1900-BC1/High Channel (810)/ @ 1909.8 MHz



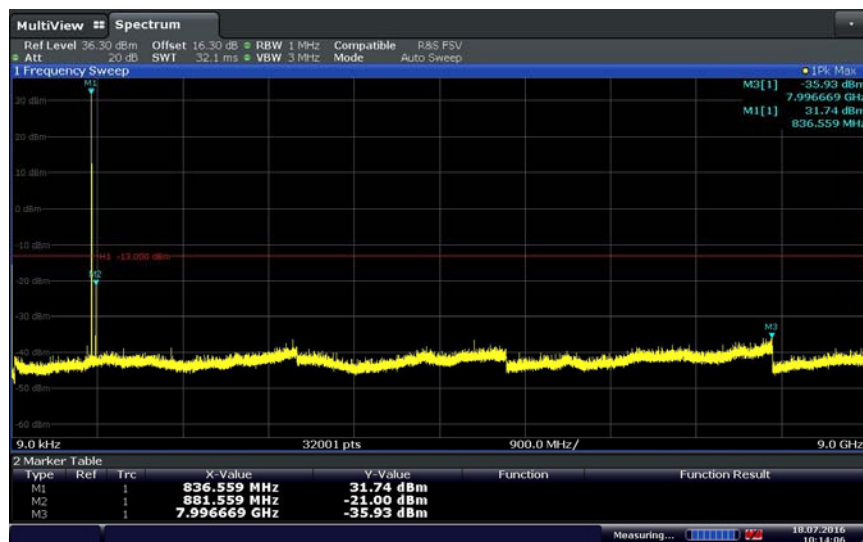
Date: 18 JUL 2016 10:40:39

### EGPRS850-BC0/Low Channel (128)/ @ 824.2 MHz



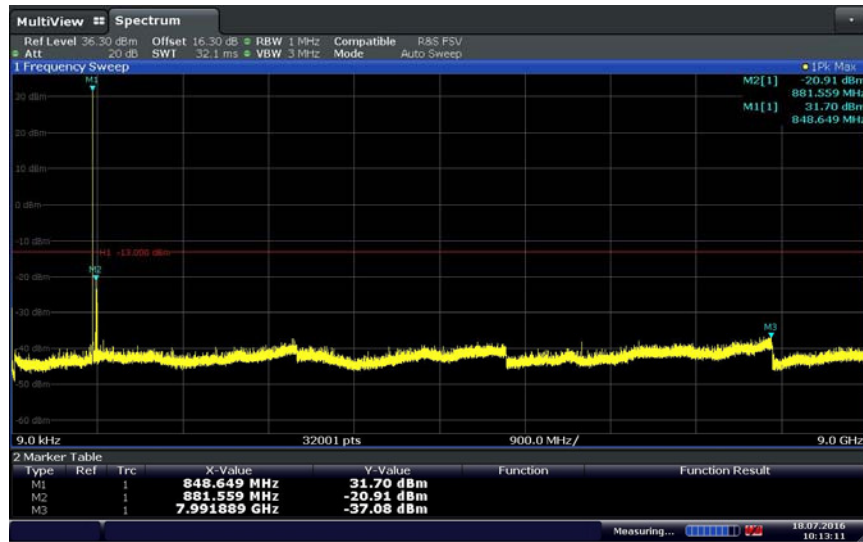
Date: 18 JUL 2016 10:14:58

### EGPRS850-BC0/Mid Channel (190)/ @ 836.6 MHz



Date: 18 JUL 2016 10:14:07

### EGPRS850-BC0/High Channel (251)/ @ 848.8 MHz



Date: 18 JUL 2016 10:13:11

### EGPRS1900-BC1/Low Channel (512)/ @ 1850.2 MHz



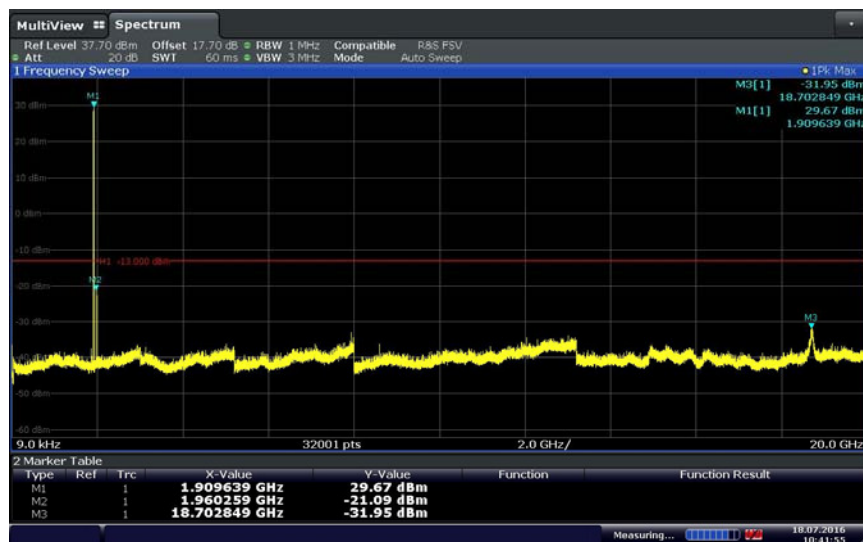
Date: 18 JUL 2016 10:45:37

### EGPRS1900-BC1/Mid Channel (661)/ @ 1880.0 MHz



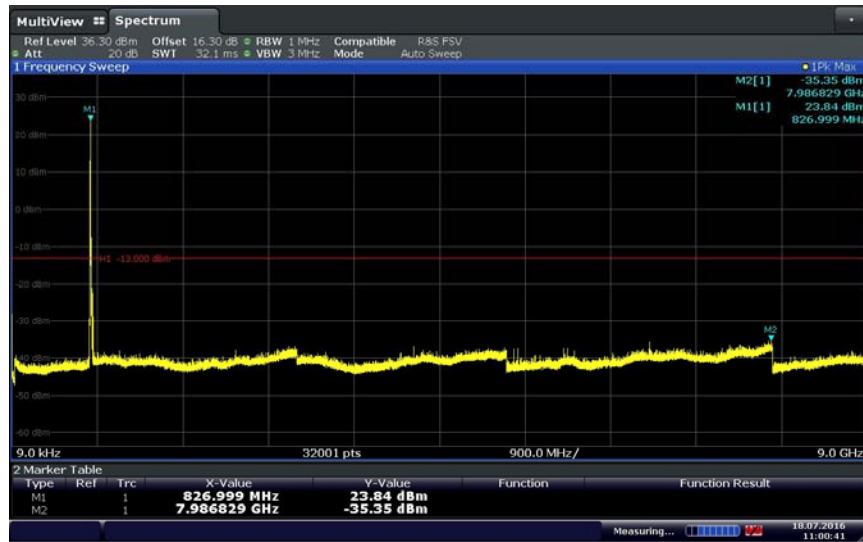
Date: 18 JUL 2016 10:43:41

### EGPRS1900-BC1/High Channel (810)/ @ 1909.8 MHz



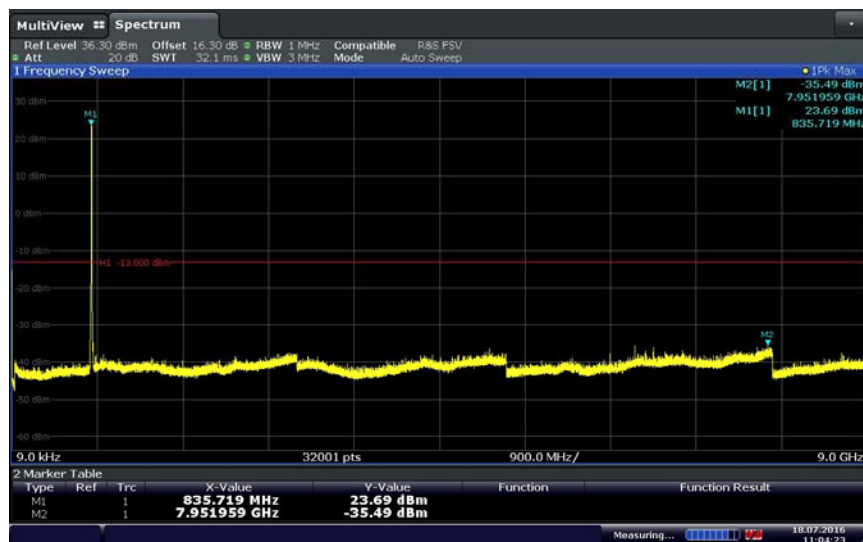
Date: 18 JUL 2016 10:41:55

### WCDMA – Band 5/Low Channel (4132) @ 826.4 MHz



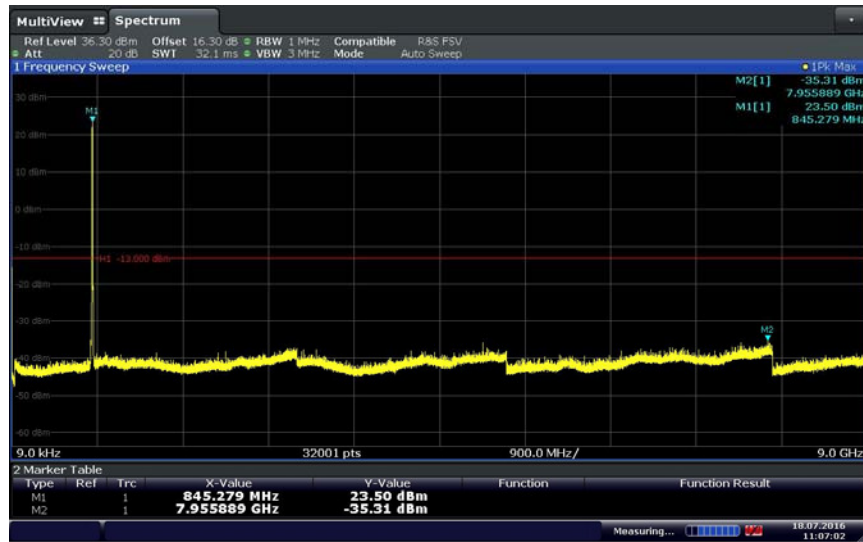
Date: 18 JUL 2016 11:00:41

### WCDMA – Band 5/Mid Channel (4183) @ 836.6 MHz



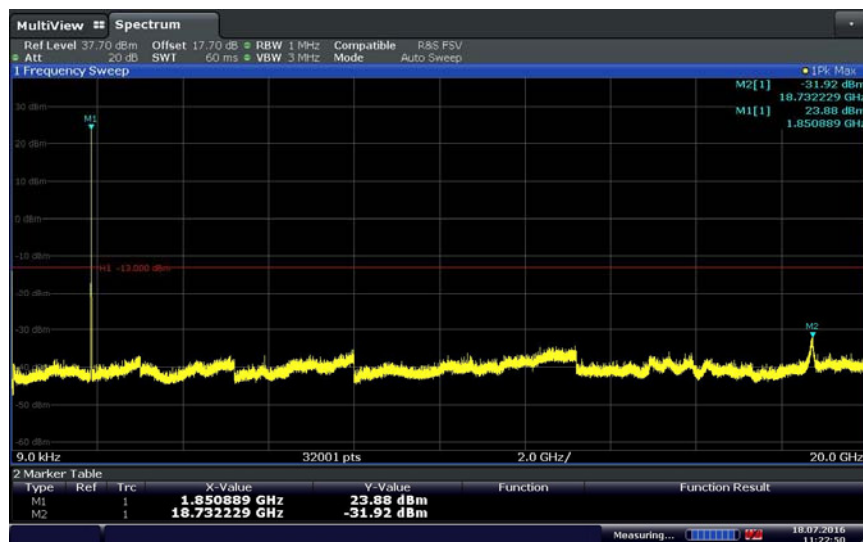
Date: 18 JUL 2016 11:04:23

### WCDMA – Band 5/High Channel (4233) @ 846.6 MHz



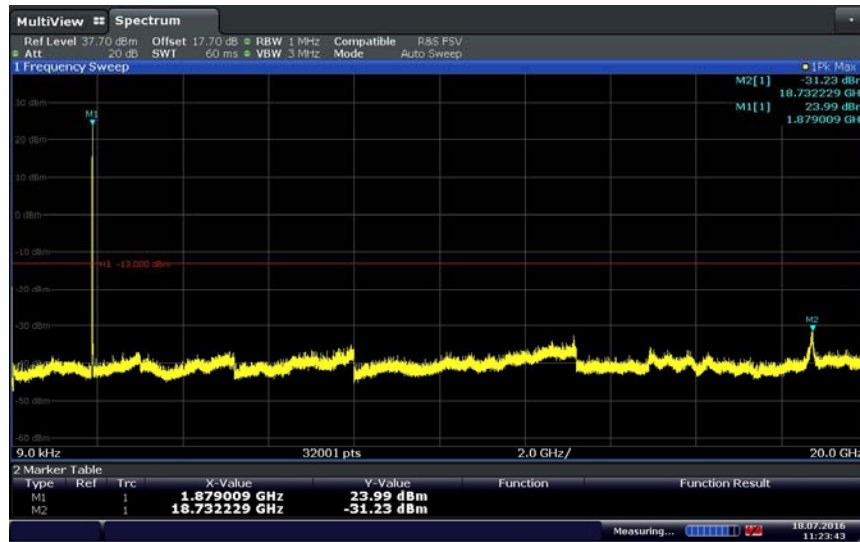
Date: 18 JUL 2016 11:07:02

### WCDMA – Band 2/Low Channel (9262) @ 1852.4 MHz



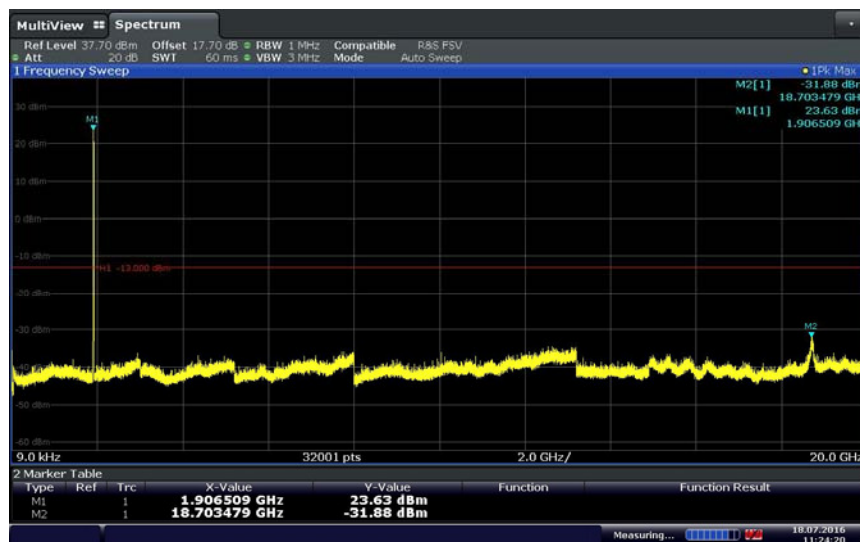
Date: 18 JUL 2016 11:22:50

### WCDMA – Band 2/Mid Channel (9400) @ 1880.0 MHz



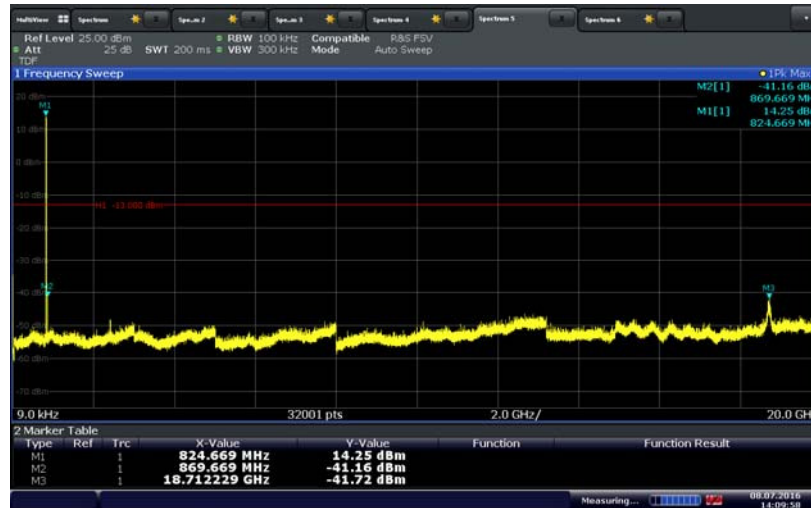
Date: 18 JUL 2016 11:23:43

### WCDMA – Band 2/High Channel (9538) @ 1907.6 MHz



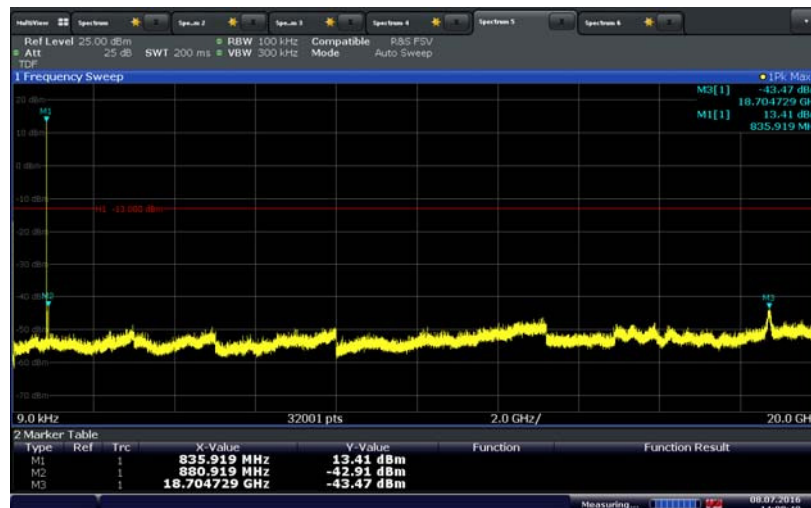
Date: 18 JUL 2016 11:24:20

### LTE Band 5 (1.4 MHz BW)/QPSK/Low Channel (20407) @ 824.7 MHz



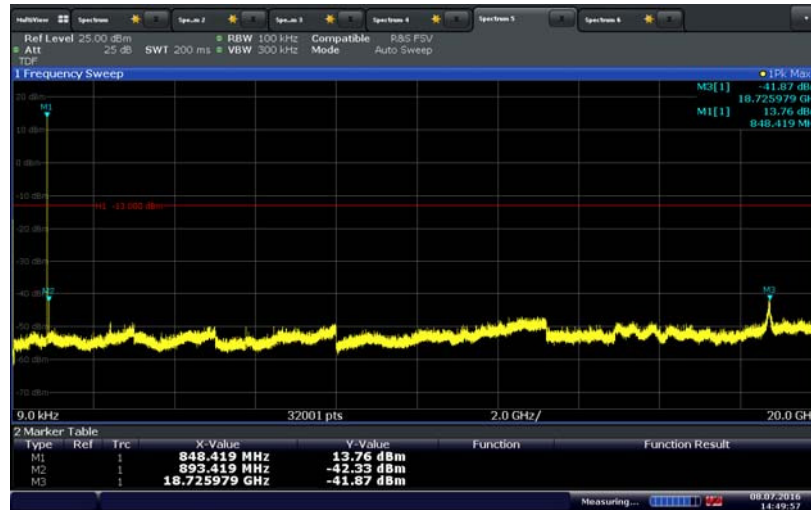
Date: 8 JUL 2016 14:09:59

### LTE Band 5 (1.4 MHz BW)/QPSK/Mid Channel (20525) @ 836.5 MHz



Date: 8 JUL 2016 14:08:49

### LTE Band 5 (1.4 MHz BW)/QPSK/High Channel (20643) @ 848.3 MHz



Date: 8 JUL 2016 14:49:58

### LTE Band 2 (1.4 MHz BW)/QPSK/Low Channel (18607) @ 1850.7 MHz



Date: 7 JUL 2016 11:17:37

### LTE Band 2 (1.4 MHz BW)/QPSK/Mid Channel (18900) @ 1880.0 MHz



Date: 7 JUL 2016 11:07:00

### LTE Band 2 (1.4 MHz BW)/QPSK/High Channel (19193) @ 1909.3 MHz



Date: 7 JUL 2016 11:19:57



## **2.8 FIELD STRENGTH OF SPURIOUS RADIATION**

### **2.8.1 Specification Reference**

FCC 47 CFR Part 2, Clause 2.1053  
FCC 47 CFR Part 22, Clause 22.917(a)  
FCC 47 CFR Part 24, Clause 24.238(a)  
RSS-132, Clause 5.5  
RSS-133, Clause 6.5

### **2.8.2 Standard Applicable**

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.

### **2.8.3 Equipment Under Test and Modification State**

Serial No: SZ17061900005 / Test Configuration B

### **2.8.4 Date of Test/Initial of test personnel who performed the test**

July 13 and 23, 2016 / IR and AC

### **2.8.5 Test Equipment Used**

The major items of test equipment used for the above tests are identified in Section 3.1.

### **2.8.6 Environmental Conditions/ Test Location**

Test performed at TÜV SÜD America Inc. Rancho Bernardo facility

|                     |                 |
|---------------------|-----------------|
| Ambient Temperature | 23.8 - 24.6°C   |
| Relative Humidity   | 45.2 - 47.0%    |
| ATM Pressure        | 99.5 - 99.9 kPa |

### **2.8.7 Additional Observations**

- This is a radiated test using substitution method as per Unwanted Emissions: Radiated Spurious method of measurement of ANSI/TIA/EIA-603-C 2004, August 17, 2004.
- Only the worst case configuration presented in this test report.
- Only noise floor measurements observed above 18GHz.
- Measurement was done using EMC32 V8.52 automated software. Reported level is the actual level with all the correction factors factored in. Correction Factor column is for informational purposes only. See Section 2.8.8 for sample computation.



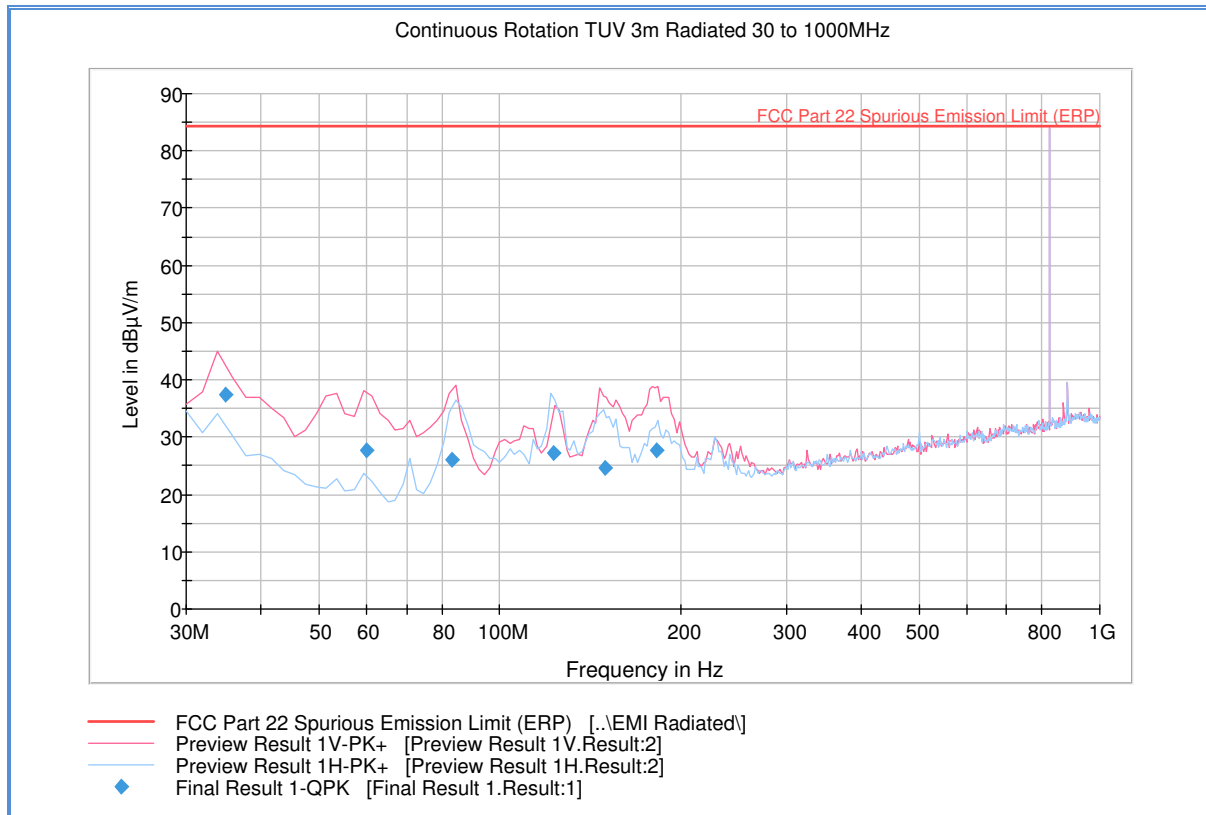
## 2.8.8 Sample Computation (Radiated Emission)

|                                                         |                           |       |      |
|---------------------------------------------------------|---------------------------|-------|------|
| Measuring equipment raw measurement (dBμV) @ 2400 MHz   |                           |       | 53.9 |
| Correction Factor (dB)                                  | Asset# 1153 (cable)       | 3.4   | -0.4 |
|                                                         | Asset# 8628(preamplifier) | -36.5 |      |
|                                                         | Asset#7575 (antenna)      | 32.7  |      |
| Reported Max Peak Final Measurement (dBμV/m) @ 2400 MHz |                           |       | 53.5 |

## 2.8.9 Test Results

Compliant. See attached plots.

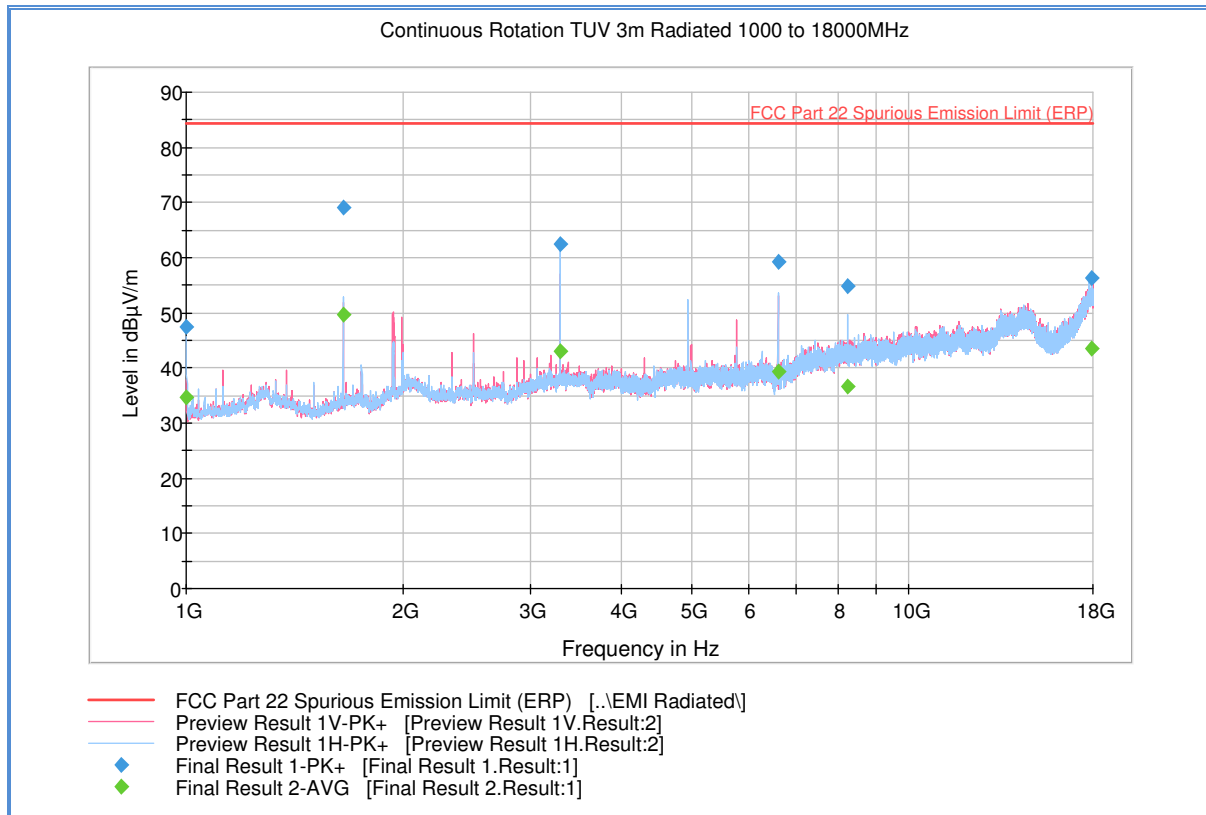
## 2.8.10 Radiated Emission Test Results Below 1GHz\_Worst Case Configuration\_GPRS850-BC0\_Low Channel 128



### Quasi Peak Data

| Frequency (MHz) | QuasiPeak (dBµV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) |
|-----------------|--------------------|-----------------|-----------------|-------------|--------------|---------------|------------|-------------|----------------|
| 34.967776       | 37.5               | 1000.0          | 120.000         | 109.0       | V            | 29.0          | -8.5       | 46.9        | 84.4           |
| 60.038317       | 27.7               | 1000.0          | 120.000         | 146.0       | V            | 288.0         | -16.2      | 56.7        | 84.4           |
| 83.308858       | 26.0               | 1000.0          | 120.000         | 105.0       | V            | 307.0         | -16.2      | 58.3        | 84.4           |
| 122.906613      | 27.1               | 1000.0          | 120.000         | 360.0       | H            | 54.0          | -15.4      | 57.2        | 84.4           |
| 149.833267      | 24.7               | 1000.0          | 120.000         | 100.0       | V            | 139.0         | -13.3      | 59.7        | 84.4           |
| 182.767134      | 27.8               | 1000.0          | 120.000         | 100.0       | V            | 175.0         | -12.0      | 56.6        | 84.4           |

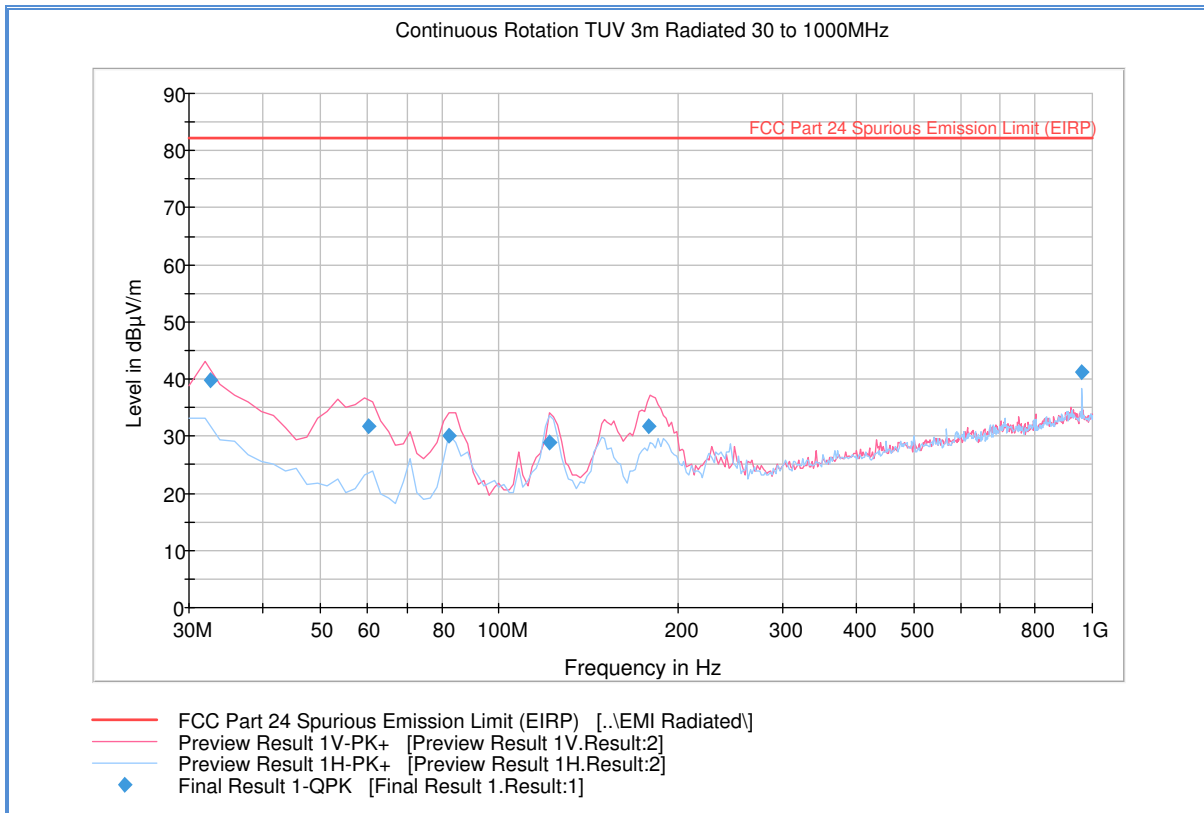
## 2.8.11 Radiated Emission Test Results Above 1GHz\_Worst Case Configuration\_GPRS850-BC0\_Low Channel 128



### Peak Data

| Frequency (MHz) | MaxPeak (dBµV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) |
|-----------------|------------------|-----------------|-----------------|-------------|--------------|---------------|------------|-------------|----------------|
| 1000.000000     | 47.5             | 1000.0          | 1000.000        | 102.7       | H            | 121.0         | -11.2      | 36.9        | 84.4           |
| 1648.466667     | 69.0             | 1000.0          | 1000.000        | 112.7       | H            | 181.0         | -8.0       | 15.3        | 84.4           |
| 3296.900000     | 62.5             | 1000.0          | 1000.000        | 103.7       | H            | 140.0         | -1.1       | 21.9        | 84.4           |
| 6593.366667     | 59.3             | 1000.0          | 1000.000        | 141.7       | H            | 119.0         | 4.5        | 25.1        | 84.4           |
| 8242.200000     | 54.8             | 1000.0          | 1000.000        | 149.6       | H            | 124.0         | 8.8        | 29.6        | 84.4           |
| 17931.566667    | 56.2             | 1000.0          | 1000.000        | 394.0       | V            | 294.0         | 24.1       | 28.1        | 84.4           |

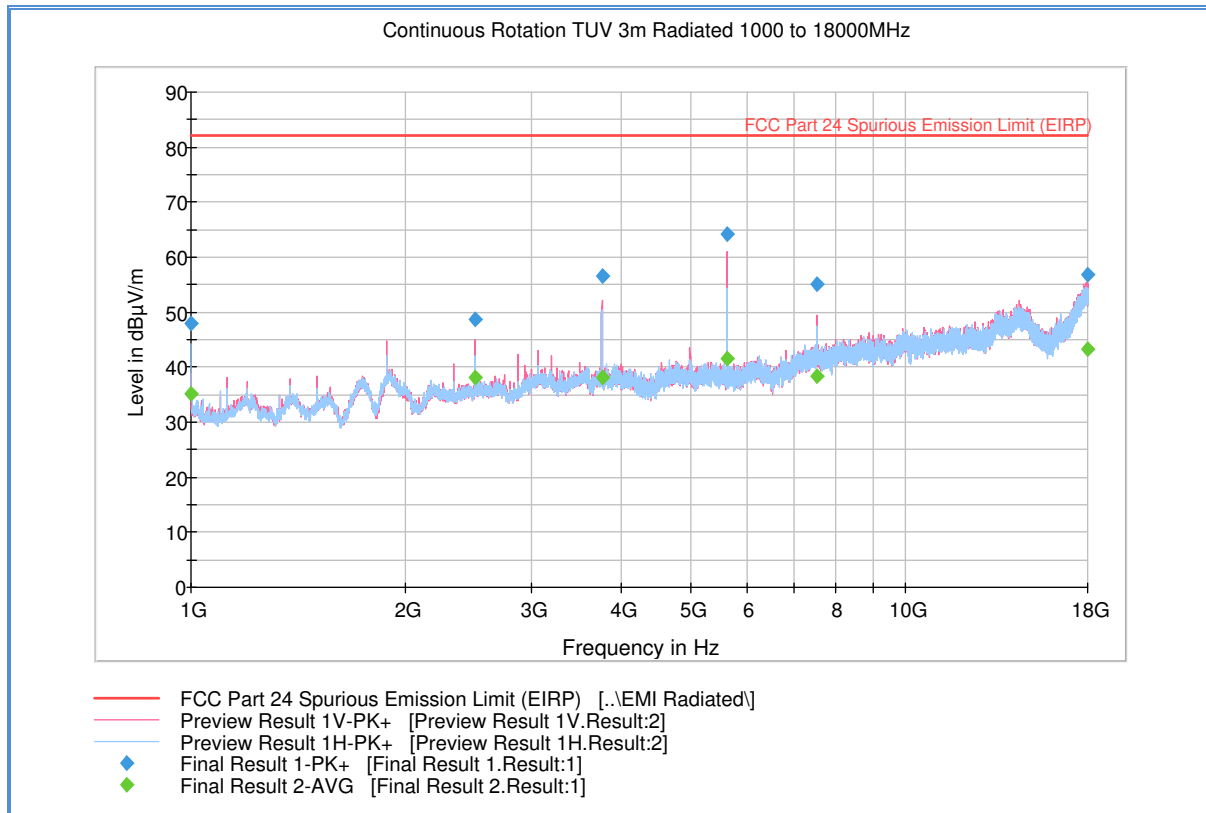
## 2.8.12 Radiated Emission Test Results Below 1GHz\_Worst Case Configuration\_GPRS1900-BC1\_Mid Channel 661



### Quasi Peak Data

| Frequency (MHz) | QuasiPeak (dBµV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) |
|-----------------|--------------------|-----------------|-----------------|-------------|--------------|---------------|------------|-------------|----------------|
| 32.600000       | 39.8               | 1000.0          | 120.000         | 100.0       | V            | 2.0           | -7.3       | 42.4        | 82.2           |
| 60.158317       | 31.7               | 1000.0          | 120.000         | 100.0       | V            | 191.0         | -16.2      | 50.5        | 82.2           |
| 82.428858       | 30.2               | 1000.0          | 120.000         | 100.0       | V            | 265.0         | -16.3      | 52.1        | 82.2           |
| 121.442725      | 28.9               | 1000.0          | 120.000         | 150.0       | V            | 103.0         | -15.4      | 53.3        | 82.2           |
| 178.823246      | 31.6               | 1000.0          | 120.000         | 114.0       | V            | 198.0         | -12.5      | 50.6        | 82.2           |
| 960.082244      | 41.2               | 1000.0          | 120.000         | 115.0       | H            | 111.0         | 6.2        | 41.0        | 82.2           |

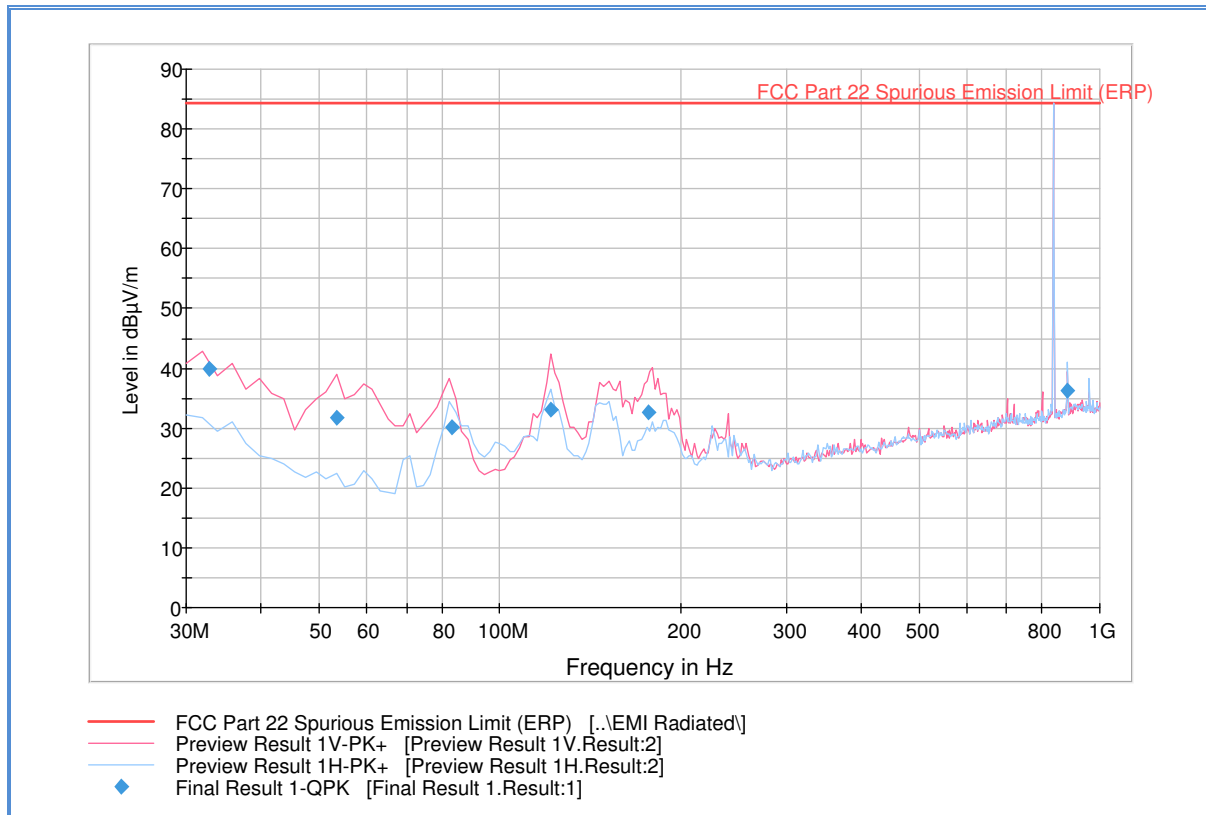
## 2.8.13 Radiated Emission Test Results Above 1GHz\_Worst Case Configuration\_GPRS1900-BC1\_Mid Channel 661



### Peak Data

| Frequency (MHz) | MaxPeak (dBµV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) |
|-----------------|------------------|-----------------|-----------------|-------------|--------------|---------------|------------|-------------|----------------|
| 1000.000000     | 48.1             | 1000.0          | 1000.000        | 102.7       | H            | 142.0         | -11.2      | 34.2        | 82.2           |
| 2500.200000     | 48.6             | 1000.0          | 1000.000        | 103.7       | V            | 20.0          | -4.9       | 33.6        | 82.2           |
| 3760.666667     | 56.6             | 1000.0          | 1000.000        | 159.6       | V            | 338.0         | 0.6        | 25.6        | 82.2           |
| 5640.666667     | 64.2             | 1000.0          | 1000.000        | 302.2       | V            | 196.0         | 3.4        | 18.0        | 82.2           |
| 7519.866667     | 55.0             | 1000.0          | 1000.000        | 147.7       | V            | 326.0         | 8.1        | 27.2        | 82.2           |
| 17975.433333    | 56.8             | 1000.0          | 1000.000        | 186.5       | V            | 72.0          | 24.2       | 25.5        | 82.2           |

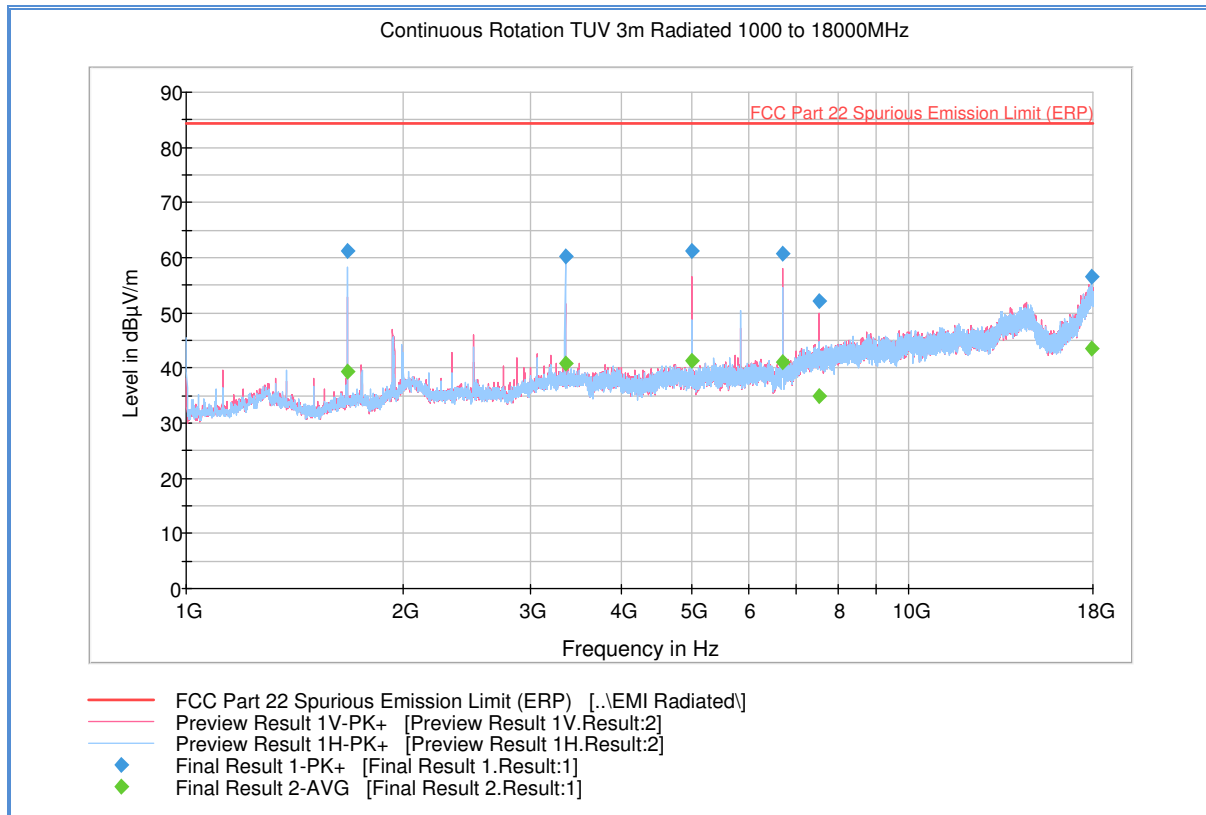
## 2.8.14 Radiated Emission Test Results Below 1GHz\_Worst Case Configuration\_EGPRS850-BC0\_Mid Channel 190



### Quasi Peak Data

| Frequency (MHz) | QuasiPeak (dBμV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBμV/m) |
|-----------------|--------------------|-----------------|-----------------|-------------|--------------|---------------|------------|-------------|----------------|
| 32.800000       | 40.0               | 1000.0          | 120.000         | 100.0       | V            | 198.0         | -7.4       | 44.4        | 84.4           |
| 53.366653       | 31.6               | 1000.0          | 120.000         | 105.0       | V            | 283.0         | -15.1      | 52.7        | 84.4           |
| 83.004970       | 30.2               | 1000.0          | 120.000         | 109.0       | V            | 282.0         | -16.2      | 54.1        | 84.4           |
| 121.482725      | 33.2               | 1000.0          | 120.000         | 116.0       | V            | 316.0         | -15.4      | 51.2        | 84.4           |
| 177.159359      | 32.7               | 1000.0          | 120.000         | 100.0       | V            | 223.0         | -12.6      | 51.7        | 84.4           |
| 883.366783      | 36.3               | 1000.0          | 120.000         | 100.0       | V            | 200.0         | 5.5        | 48.1        | 84.4           |

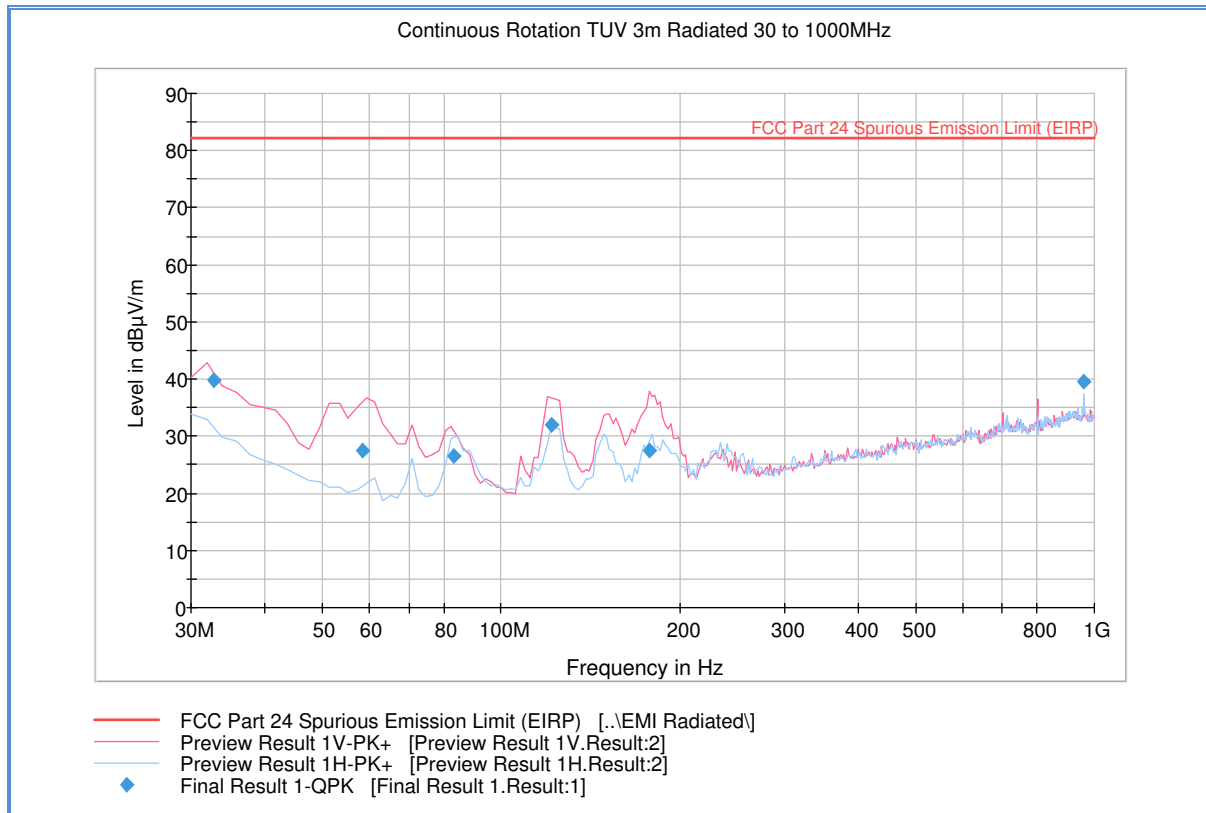
## 2.8.15 Radiated Emission Test Results Above 1GHz\_Worst Case Configuration\_EGPRS850-BC0\_Mid Channel 190



### Peak Data

| Frequency (MHz) | MaxPeak (dBµV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) |
|-----------------|------------------|-----------------|-----------------|-------------|--------------|---------------|------------|-------------|----------------|
| 1673.433333     | 61.3             | 1000.0          | 1000.000        | 102.7       | H            | 4.0           | -7.6       | 23.0        | 84.4           |
| 3346.200000     | 60.3             | 1000.0          | 1000.000        | 103.7       | H            | 141.0         | -0.8       | 24.0        | 84.4           |
| 5019.966667     | 61.2             | 1000.0          | 1000.000        | 145.7       | V            | 192.0         | 2.2        | 23.2        | 84.4           |
| 6693.100000     | 60.7             | 1000.0          | 1000.000        | 169.6       | V            | 189.0         | 5.1        | 23.7        | 84.4           |
| 7528.766667     | 52.2             | 1000.0          | 1000.000        | 257.3       | V            | 341.0         | 8.1        | 32.1        | 84.4           |
| 17934.500000    | 56.4             | 1000.0          | 1000.000        | 143.7       | H            | 334.0         | 24.1       | 27.9        | 84.4           |

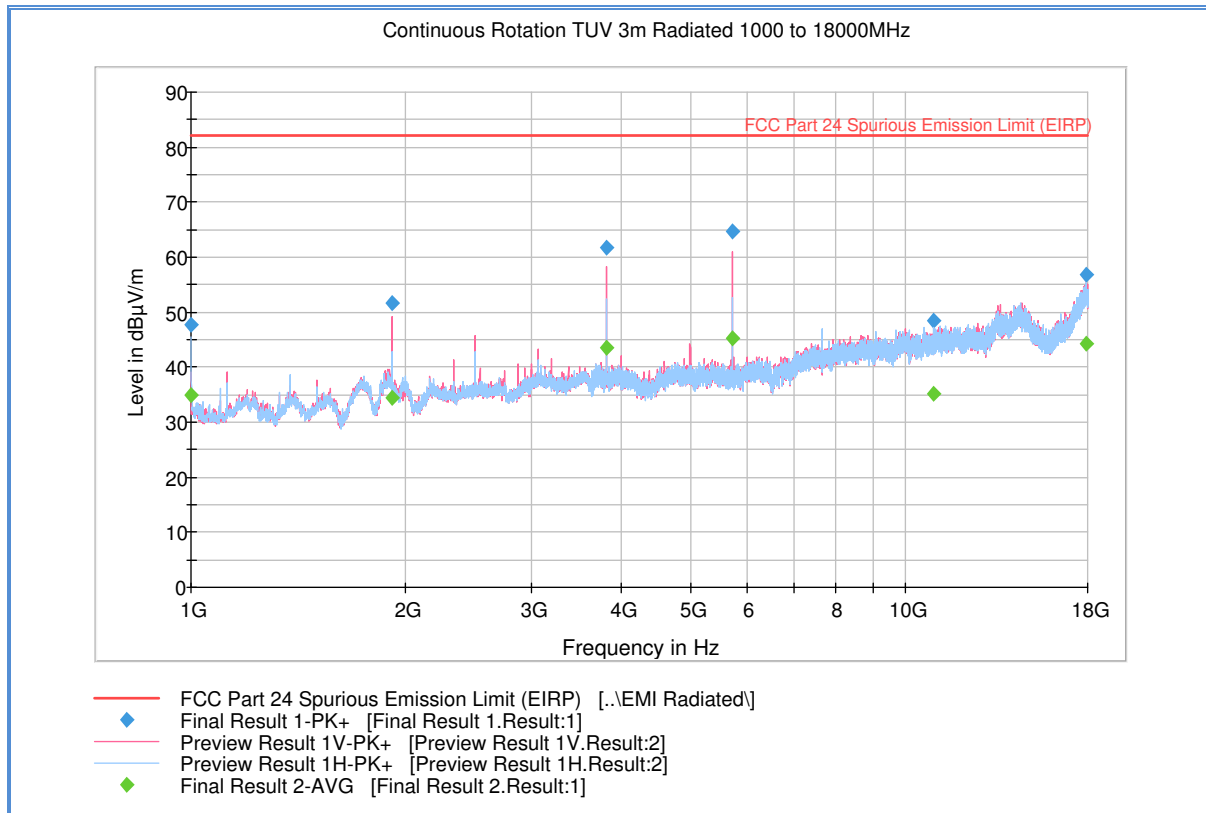
## 2.8.16 Radiated Emission Test Results Below 1GHz\_Worst Case Configuration\_EGPRS1900-BC1\_High Channel 810



### Quasi Peak Data

| Frequency (MHz) | QuasiPeak (dBµV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) |
|-----------------|--------------------|-----------------|-----------------|-------------|--------------|---------------|------------|-------------|----------------|
| 32.840000       | 39.9               | 1000.0          | 120.000         | 100.0       | V            | 9.0           | -7.4       | 42.3        | 82.2           |
| 58.398317       | 27.6               | 1000.0          | 120.000         | 133.0       | V            | 114.0         | -16.0      | 54.7        | 82.2           |
| 83.004970       | 26.4               | 1000.0          | 120.000         | 109.0       | V            | 280.0         | -16.2      | 55.8        | 82.2           |
| 121.298838      | 31.9               | 1000.0          | 120.000         | 109.0       | V            | 64.0          | -15.3      | 50.3        | 82.2           |
| 177.815471      | 27.5               | 1000.0          | 120.000         | 100.0       | V            | 198.0         | -12.6      | 54.7        | 82.2           |
| 960.082244      | 39.5               | 1000.0          | 120.000         | 122.0       | H            | 103.0         | 6.2        | 42.7        | 82.2           |

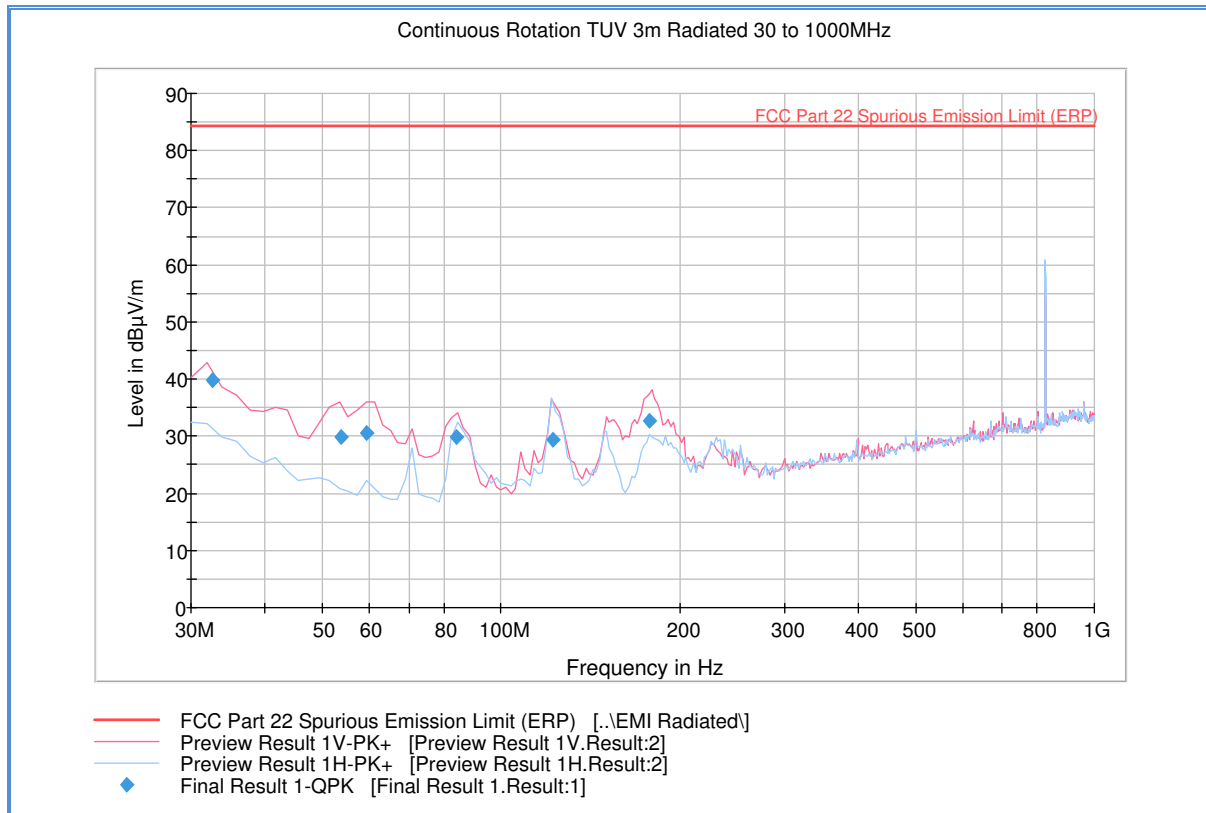
## 2.8.17 Radiated Emission Test Results Above 1GHz\_Worst Case Configuration\_EGPRS1900-BC1\_High Channel 810



### Peak Data

| Frequency (MHz) | MaxPeak (dBµV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) |
|-----------------|------------------|-----------------|-----------------|-------------|--------------|---------------|------------|-------------|----------------|
| 1000.000000     | 47.7             | 1000.0          | 1000.000        | 102.7       | H            | 136.0         | -11.2      | 34.5        | 82.2           |
| 1909.700000     | 51.6             | 1000.0          | 1000.000        | 103.7       | V            | 240.0         | -4.6       | 30.7        | 82.2           |
| 3819.566667     | 61.7             | 1000.0          | 1000.000        | 114.7       | V            | 357.0         | 0.9        | 20.6        | 82.2           |
| 5729.600000     | 64.6             | 1000.0          | 1000.000        | 177.5       | V            | 194.0         | 3.6        | 17.6        | 82.2           |
| 10970.533333    | 48.5             | 1000.0          | 1000.000        | 403.0       | H            | 168.0         | 13.0       | 33.8        | 82.2           |
| 17937.633333    | 56.9             | 1000.0          | 1000.000        | 403.0       | V            | 220.0         | 24.2       | 25.3        | 82.2           |

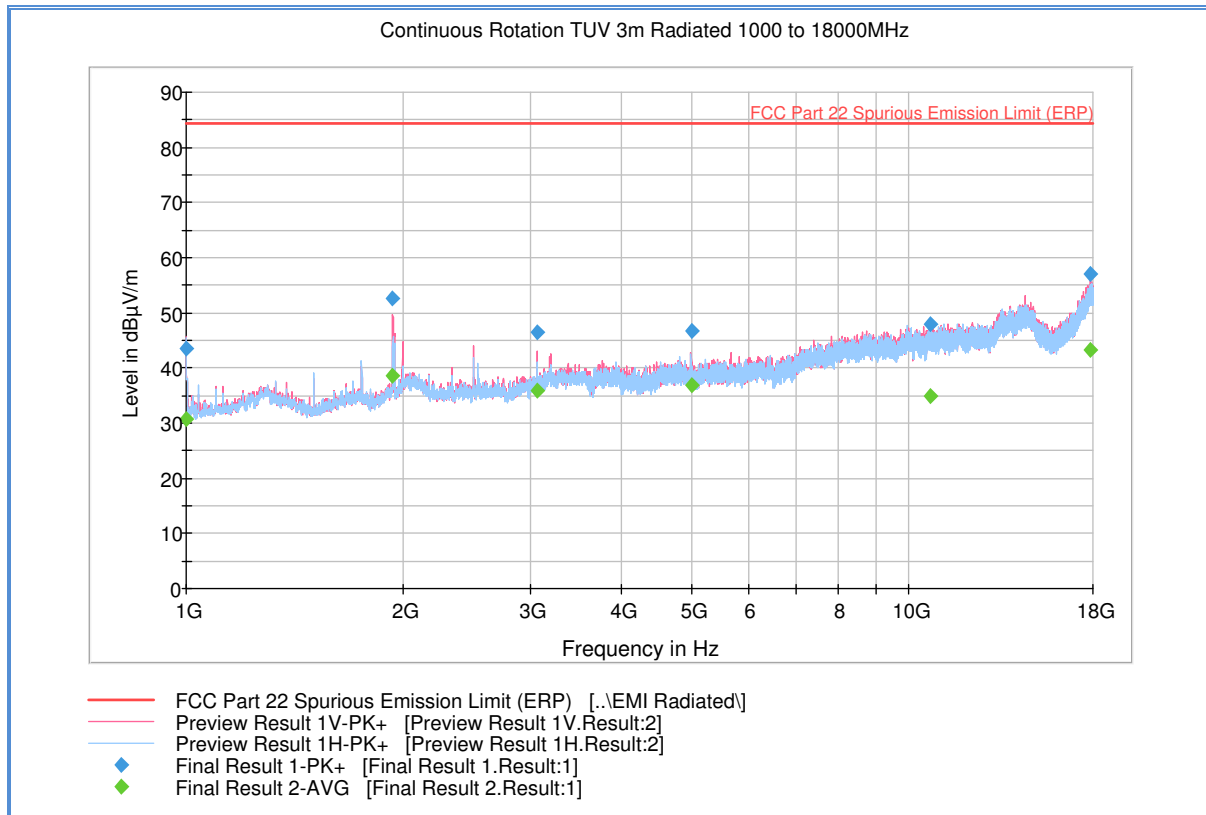
## 2.8.18 Radiated Emission Test Results Below 1GHz\_Worst Case Configuration\_WCDMA\_Band 5\_Low Channel 4132



### Quasi Peak Data

| Frequency (MHz) | QuasiPeak (dBµV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) |
|-----------------|--------------------|-----------------|-----------------|-------------|--------------|---------------|------------|-------------|----------------|
| 32.600000       | 39.8               | 1000.0          | 120.000         | 100.0       | V            | 292.0         | -7.3       | 44.6        | 84.4           |
| 53.806653       | 29.9               | 1000.0          | 120.000         | 100.0       | V            | 188.0         | -15.2      | 54.5        | 84.4           |
| 59.382204       | 30.6               | 1000.0          | 120.000         | 100.0       | V            | 188.0         | -16.1      | 53.8        | 84.4           |
| 84.124970       | 29.7               | 1000.0          | 120.000         | 100.0       | V            | 260.0         | -16.2      | 54.6        | 84.4           |
| 122.522725      | 29.4               | 1000.0          | 120.000         | 150.0       | H            | 228.0         | -15.4      | 55.0        | 84.4           |
| 178.079359      | 32.6               | 1000.0          | 120.000         | 100.0       | V            | 216.0         | -12.5      | 51.8        | 84.4           |

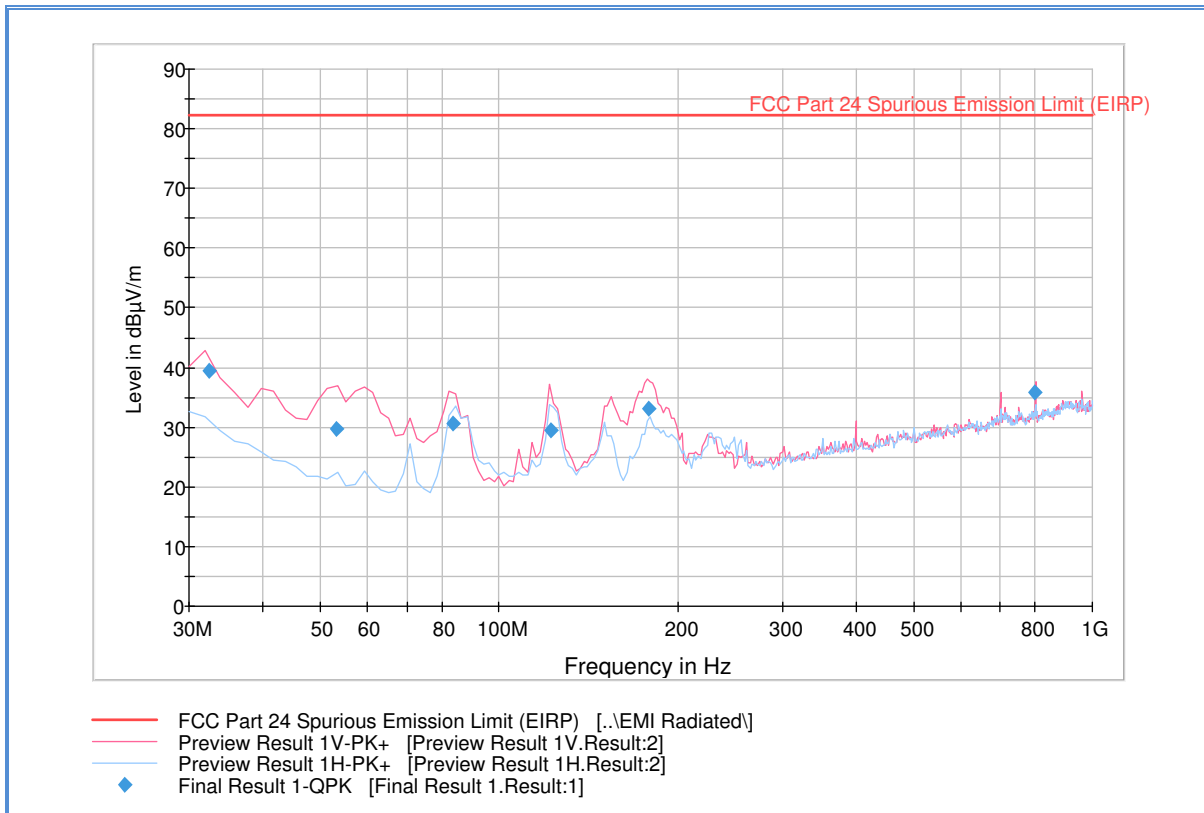
## 2.8.19 Radiated Emission Test Results Above 1GHz\_Worst Case Configuration\_WCDMA\_Band 5\_Low Channel 4132



### Peak Data

| Frequency (MHz) | MaxPeak (dBμV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBμV/m) |
|-----------------|------------------|-----------------|-----------------|-------------|--------------|---------------|------------|-------------|----------------|
| 1000.000000     | 43.5             | 1000.0          | 1000.000        | 155.6       | V            | 293.0         | -11.2      | 40.9        | 84.4           |
| 1931.966667     | 52.6             | 1000.0          | 1000.000        | 192.5       | V            | 110.0         | -4.6       | 31.8        | 84.4           |
| 3062.500000     | 46.4             | 1000.0          | 1000.000        | 129.7       | V            | 10.0          | -2.3       | 38.0        | 84.4           |
| 4999.933333     | 46.7             | 1000.0          | 1000.000        | 168.6       | V            | 157.0         | 2.2        | 37.7        | 84.4           |
| 10696.833333    | 48.0             | 1000.0          | 1000.000        | 174.6       | V            | 229.0         | 12.5       | 36.4        | 84.4           |
| 17852.233333    | 57.0             | 1000.0          | 1000.000        | 403.0       | V            | 220.0         | 23.7       | 27.4        | 84.4           |

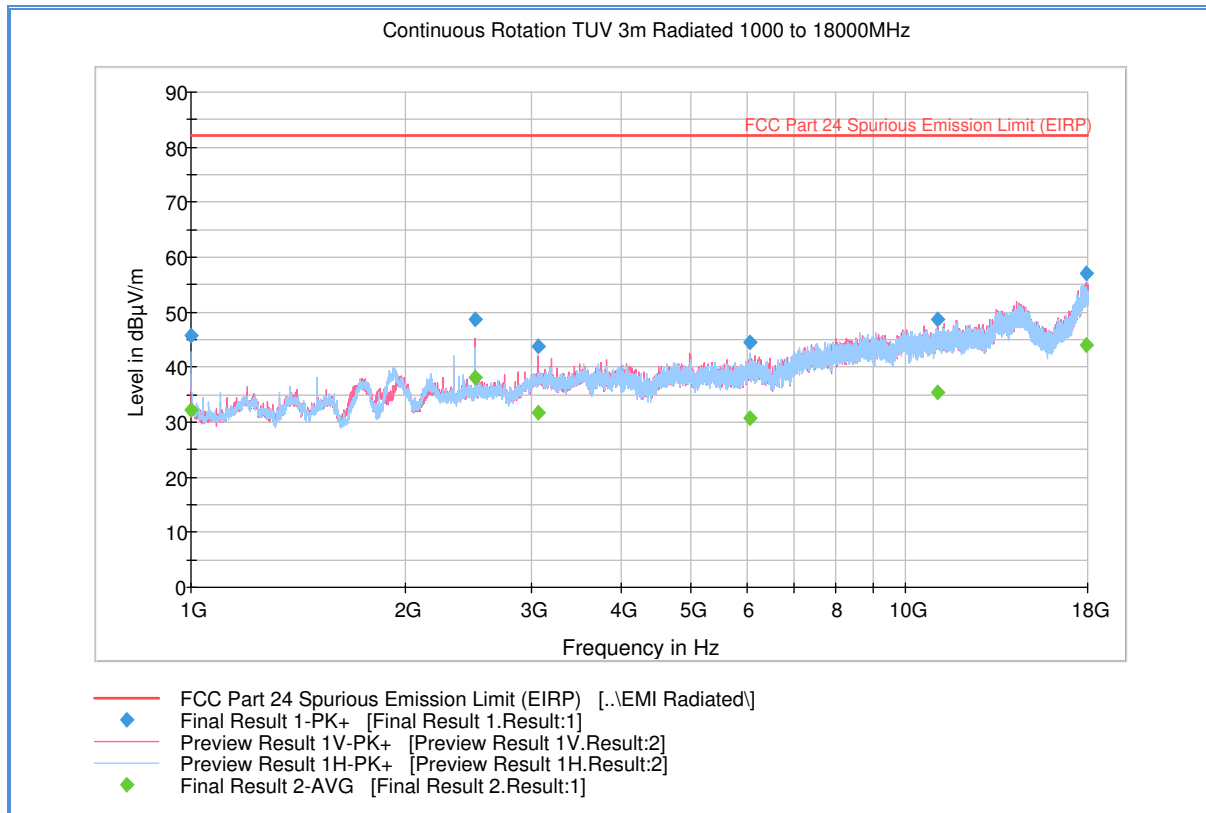
## 2.8.20 Radiated Emission Test Results Below 1GHz\_Worst Case Configuration\_WCDMA\_Band 2\_Mid Channel 9400



### Quasi Peak Data

| Frequency (MHz) | QuasiPeak (dBμV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBμV/m) |
|-----------------|--------------------|-----------------|-----------------|-------------|--------------|---------------|------------|-------------|----------------|
| 32.400000       | 39.6               | 1000.0          | 120.000         | 100.0       | V            | 269.0         | -7.2       | 42.7        | 82.2           |
| 53.086653       | 29.6               | 1000.0          | 120.000         | 100.0       | V            | 9.0           | -15.0      | 52.6        | 82.2           |
| 83.684970       | 30.5               | 1000.0          | 120.000         | 106.0       | V            | 249.0         | -16.2      | 51.7        | 82.2           |
| 122.002725      | 29.5               | 1000.0          | 120.000         | 100.0       | V            | 284.0         | -15.4      | 52.7        | 82.2           |
| 178.455471      | 33.1               | 1000.0          | 120.000         | 100.0       | V            | 206.0         | -12.5      | 49.1        | 82.2           |
| 800.003447      | 35.9               | 1000.0          | 120.000         | 100.0       | V            | 4.0           | 3.8        | 46.4        | 82.2           |

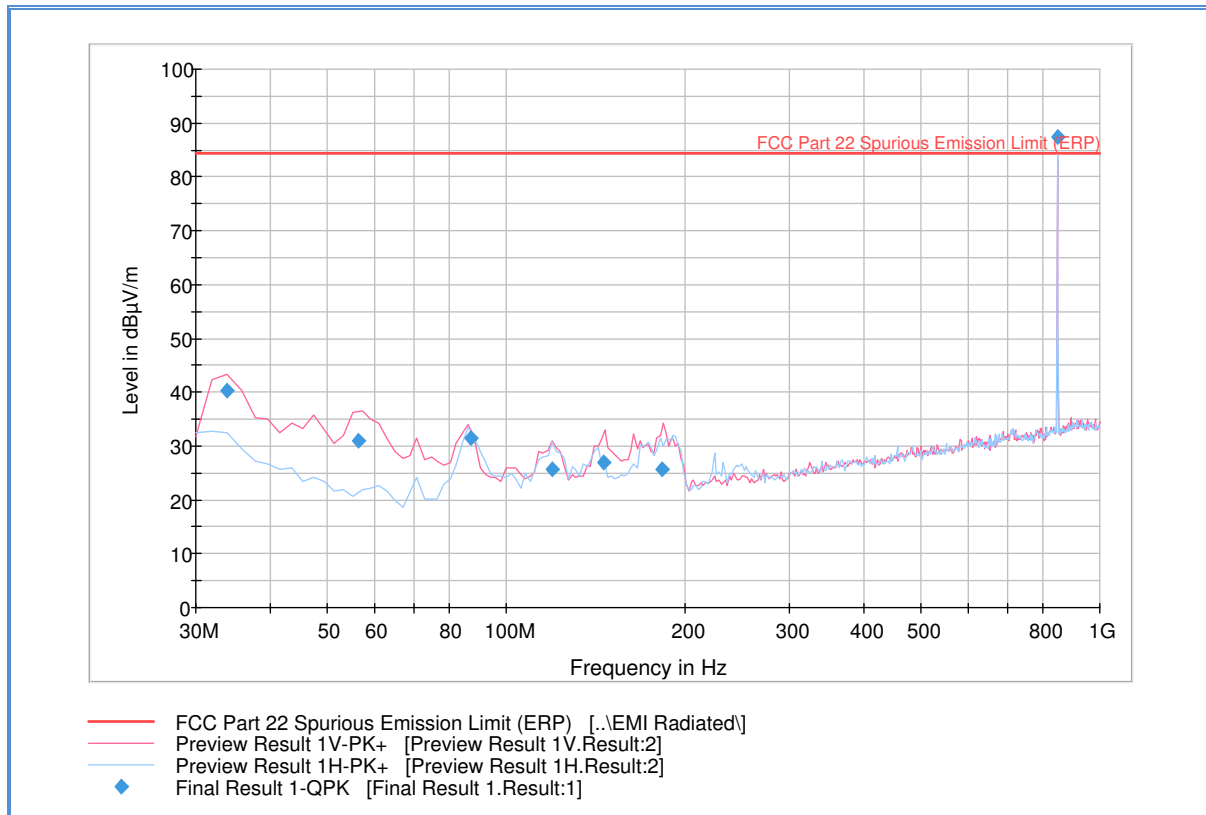
## 2.8.21 Radiated Emission Test Results Above 1GHz\_Worst Case Configuration\_WCDMA\_Band 2\_Mid Channel 9400



### Peak Data

| Frequency (MHz) | MaxPeak (dBµV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) |
|-----------------|------------------|-----------------|-----------------|-------------|--------------|---------------|------------|-------------|----------------|
| 1000.400000     | 45.7             | 1000.0          | 1000.000        | 102.7       | H            | 10.0          | -11.2      | 36.6        | 82.2           |
| 2499.800000     | 48.6             | 1000.0          | 1000.000        | 116.7       | V            | 352.0         | -5.0       | 33.6        | 82.2           |
| 3062.500000     | 43.8             | 1000.0          | 1000.000        | 116.7       | V            | -13.0         | -2.3       | 38.4        | 82.2           |
| 6050.333333     | 44.4             | 1000.0          | 1000.000        | 328.2       | H            | 60.0          | 4.3        | 37.8        | 82.2           |
| 11086.333333    | 48.7             | 1000.0          | 1000.000        | 145.7       | V            | 154.0         | 13.2       | 33.6        | 82.2           |
| 17913.500000    | 57.0             | 1000.0          | 1000.000        | 403.0       | V            | -13.0         | 24.1       | 25.2        | 82.2           |

## 2.8.22 Radiated Emission Test Results Below 1GHz\_Worst Case Configuration\_LTE Band 5\_1.4MHz BW\_High Channel 20643

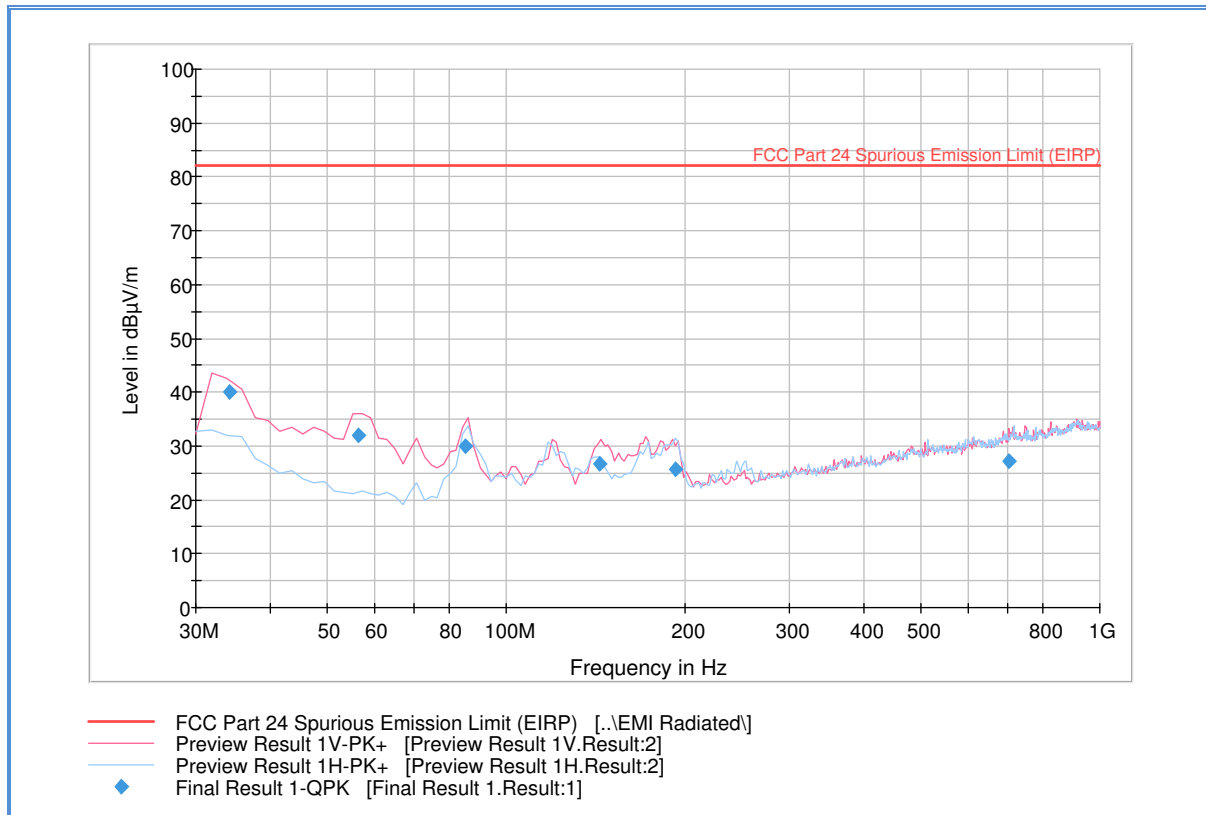


### Quasi Peak Data

| Frequency (MHz) | QuasiPeak (dBμV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB)         | Limit (dBμV/m) |
|-----------------|--------------------|-----------------|-----------------|-------------|--------------|---------------|------------|---------------------|----------------|
| 33.927776       | 40.3               | 1000.0          | 120.000         | 100.0       | V            | 277.0         | -7.9       | 44.1                | 84.4           |
| 56.430541       | 31.0               | 1000.0          | 120.000         | 100.0       | V            | 341.0         | -15.6      | 53.3                | 84.4           |
| 87.012745       | 31.5               | 1000.0          | 120.000         | 100.0       | V            | 265.0         | -15.8      | 52.9                | 84.4           |
| 119.858838      | 25.6               | 1000.0          | 120.000         | 100.0       | V            | 95.0          | -15.2      | 58.8                | 84.4           |
| 146.153267      | 26.9               | 1000.0          | 120.000         | 100.0       | V            | 222.0         | -13.7      | 57.5                | 84.4           |
| 182.887134      | 25.7               | 1000.0          | 120.000         | 150.0       | V            | 159.0         | -12.0      | 58.7                | 84.4           |
| 847.816754      | 87.3               | 1000.0          | 120.000         | 100.0       | H            | 333.0         | 4.6        | * Fundamental Freq. |                |

\* This is the fundamental frequency not part of spurious emission evaluation. Data provided for information purpose only.

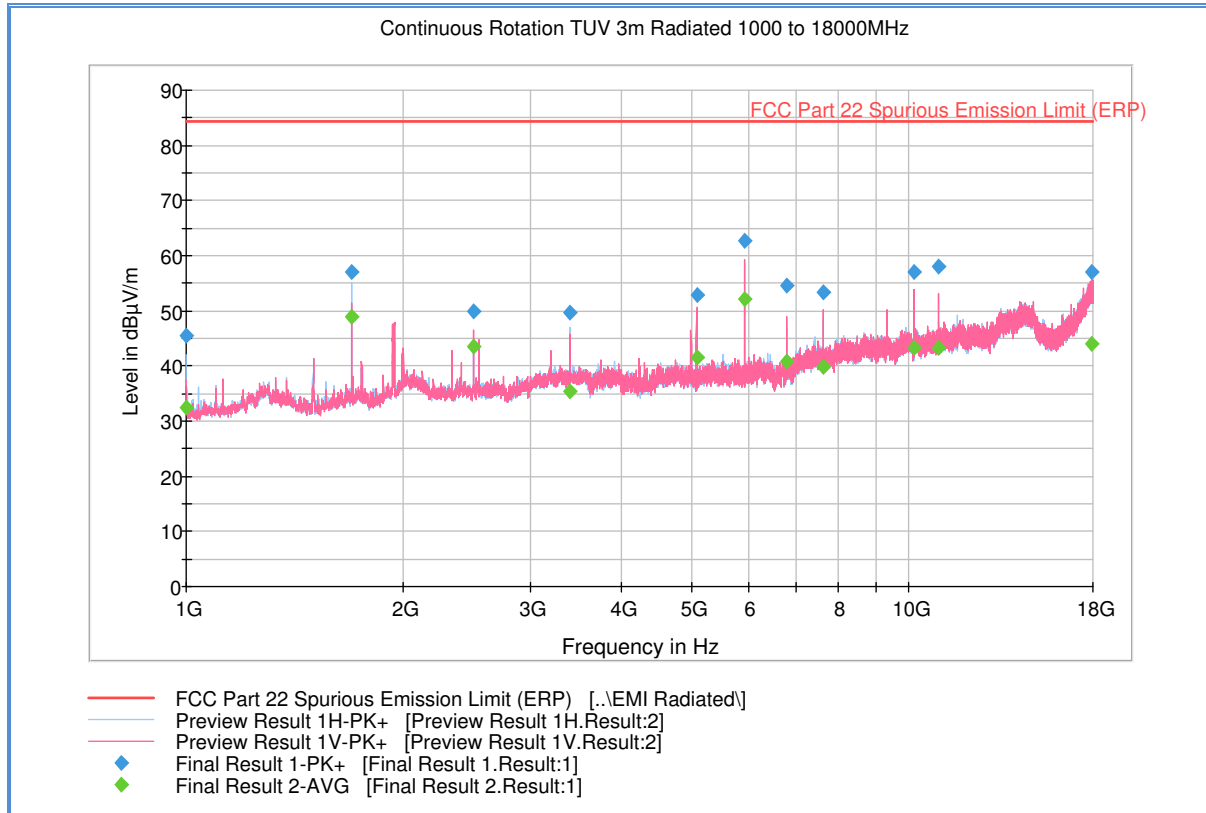
## 2.8.23 Radiated Emission Test Results Below 1GHz\_Worst Case Configuration\_LTE Band 2\_20MHz BW\_Mid Channel 18900



### Quasi Peak Data

| Frequency (MHz) | QuasiPeak (dBμV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBμV/m) |
|-----------------|--------------------|-----------------|-----------------|-------------|--------------|---------------|------------|-------------|----------------|
| 34.200000       | 40.1               | 1000.0          | 120.000         | 100.0       | V            | 279.0         | -8.1       | 42.2        | 82.2           |
| 56.350541       | 31.9               | 1000.0          | 120.000         | 100.0       | V            | 184.0         | -15.6      | 50.3        | 82.2           |
| 85.612745       | 29.9               | 1000.0          | 120.000         | 114.0       | V            | 247.0         | -16.0      | 52.3        | 82.2           |
| 143.985491      | 26.6               | 1000.0          | 120.000         | 100.0       | V            | 344.0         | -14.0      | 55.6        | 82.2           |
| 193.406573      | 25.8               | 1000.0          | 120.000         | 145.0       | H            | 83.0          | -11.1      | 56.5        | 82.2           |
| 703.609058      | 27.3               | 1000.0          | 120.000         | 350.0       | V            | 70.0          | 3.0        | 55.0        | 82.2           |

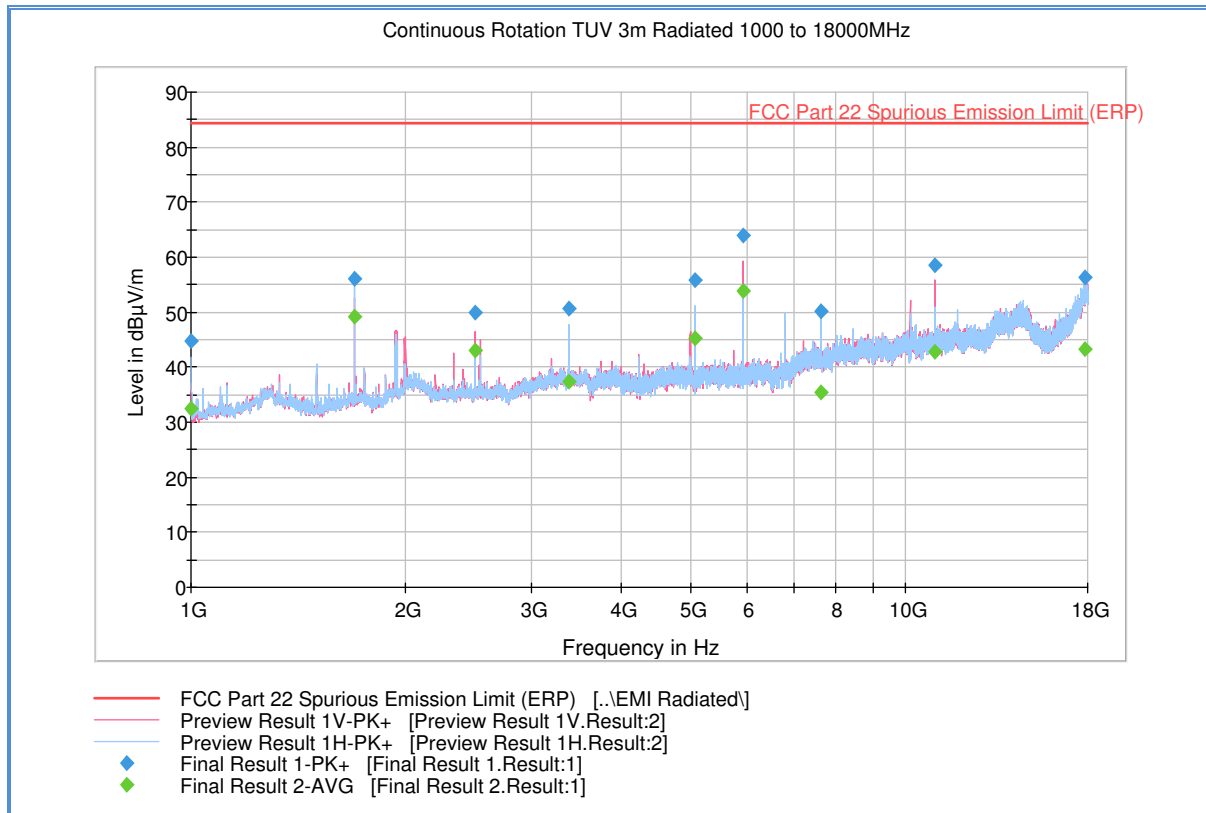
## 2.8.24 Radiated Emission Test Results Above 1GHz\_Worst Case Configuration\_LTE Band 5\_1.4MHz BW\_High Channel 20643



### Peak Data

| Frequency (MHz) | MaxPeak (dBµV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) |
|-----------------|------------------|-----------------|-----------------|-------------|--------------|---------------|------------|-------------|----------------|
| 1000.400000     | 45.6             | 1000.0          | 1000.000        | 120.7       | H            | 261.0         | -11.2      | 38.8        | 84.4           |
| 1695.700000     | 56.9             | 1000.0          | 1000.000        | 157.6       | H            | 197.0         | -7.3       | 27.4        | 84.4           |
| 2500.000000     | 49.9             | 1000.0          | 1000.000        | 146.7       | V            | 350.0         | -4.9       | 34.5        | 84.4           |
| 3391.533333     | 49.7             | 1000.0          | 1000.000        | 120.7       | H            | 222.0         | -1.0       | 34.7        | 84.4           |
| 5087.000000     | 52.9             | 1000.0          | 1000.000        | 303.2       | V            | 202.0         | 2.3        | 31.5        | 84.4           |
| 5934.933333     | 62.7             | 1000.0          | 1000.000        | 185.5       | V            | 195.0         | 4.0        | 21.6        | 84.4           |
| 6783.033333     | 54.7             | 1000.0          | 1000.000        | 193.5       | V            | 220.0         | 5.5        | 29.7        | 84.4           |
| 7630.800000     | 53.4             | 1000.0          | 1000.000        | 297.2       | V            | 150.0         | 8.1        | 30.9        | 84.4           |
| 10174.133333    | 57.2             | 1000.0          | 1000.000        | 103.7       | V            | 224.0         | 11.8       | 27.2        | 84.4           |
| 11022.033333    | 57.9             | 1000.0          | 1000.000        | 199.5       | V            | 207.0         | 13.1       | 26.4        | 84.4           |
| 17933.700000    | 57.0             | 1000.0          | 1000.000        | 143.7       | V            | 7.0           | 24.1       | 27.4        | 84.4           |

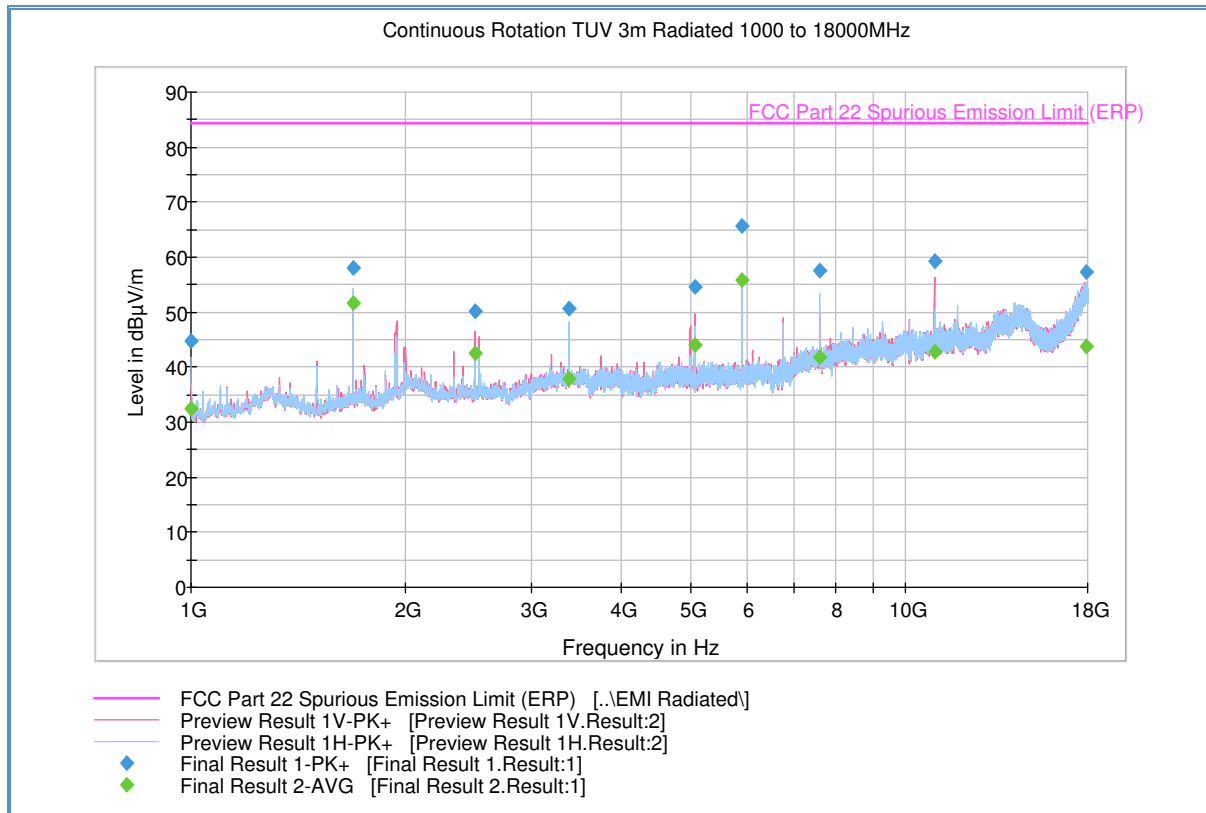
## 2.8.25 Radiated Emission Test Results Above 1GHz\_Worst Case Configuration\_LTE Band 5\_3MHz BW\_High Channel 20635



### Peak Data

| Frequency (MHz) | MaxPeak (dBµV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) |
|-----------------|------------------|-----------------|-----------------|-------------|--------------|---------------|------------|-------------|----------------|
| 1000.000000     | 44.7             | 1000.0          | 1000.000        | 132.7       | H            | 210.0         | -11.2      | 39.7        | 84.4           |
| 1692.266667     | 56.1             | 1000.0          | 1000.000        | 195.5       | H            | 144.0         | -7.4       | 28.2        | 84.4           |
| 2500.166667     | 49.8             | 1000.0          | 1000.000        | 147.6       | V            | 348.0         | -4.9       | 34.6        | 84.4           |
| 3384.933333     | 50.6             | 1000.0          | 1000.000        | 138.7       | H            | 151.0         | -1.0       | 33.8        | 84.4           |
| 5077.366667     | 55.7             | 1000.0          | 1000.000        | 237.3       | H            | 234.0         | 2.2        | 28.7        | 84.4           |
| 5923.600000     | 64.0             | 1000.0          | 1000.000        | 187.5       | V            | 214.0         | 3.9        | 20.4        | 84.4           |
| 7616.033333     | 50.2             | 1000.0          | 1000.000        | 103.7       | V            | 44.0          | 8.1        | 34.2        | 84.4           |
| 11000.900000    | 58.5             | 1000.0          | 1000.000        | 190.5       | V            | 207.0         | 13.0       | 25.9        | 84.4           |
| 17857.633333    | 56.4             | 1000.0          | 1000.000        | 371.0       | V            | 75.0          | 23.8       | 28.0        | 84.4           |

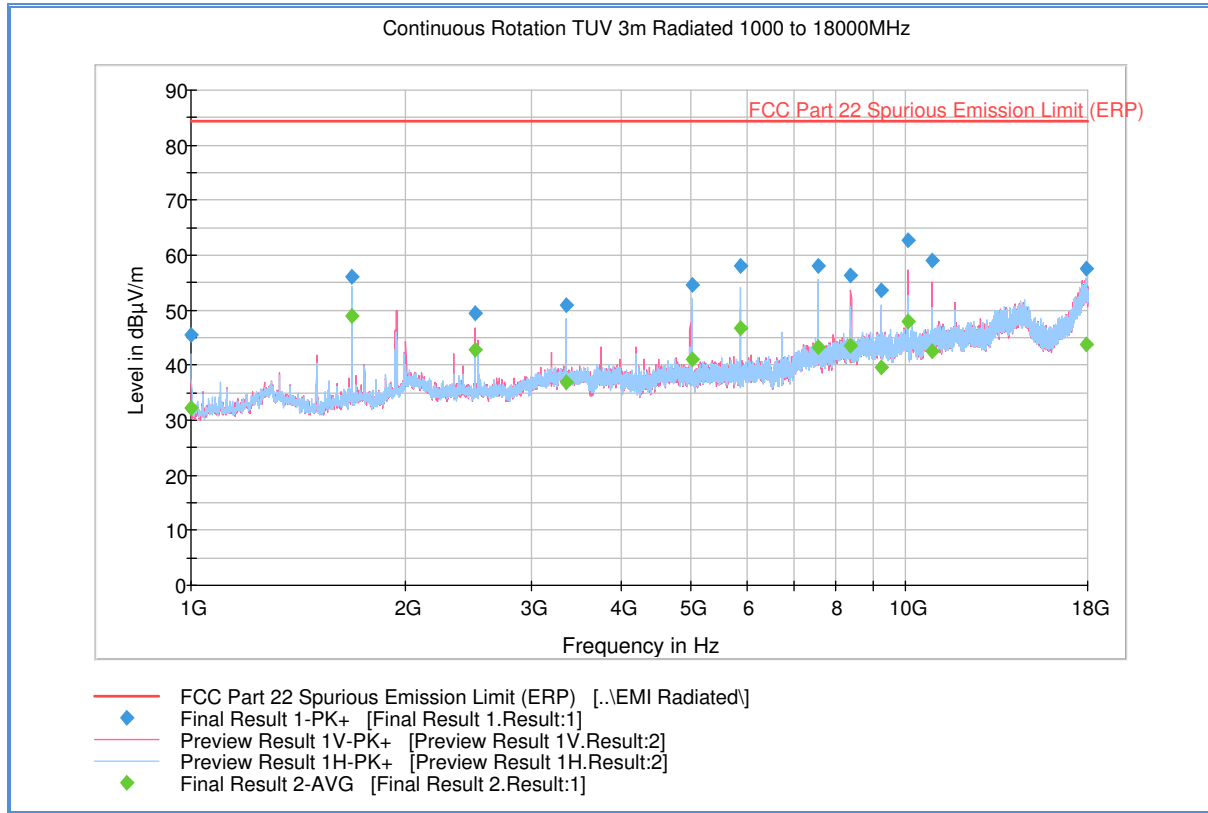
## 2.8.26 Radiated Emission Test Results Above 1GHz\_Worst Case Configuration\_LTE Band 5\_5MHz BW\_High Channel 20625



### Peak Data

| Frequency (MHz) | MaxPeak (dBµV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) |
|-----------------|------------------|-----------------|-----------------|-------------|--------------|---------------|------------|-------------|----------------|
| 1000.000000     | 44.8             | 1000.0          | 1000.000        | 126.7       | H            | 47.0          | -11.2      | 39.6        | 84.4           |
| 1688.700000     | 58.0             | 1000.0          | 1000.000        | 157.6       | H            | 206.0         | -7.4       | 26.4        | 84.4           |
| 2500.200000     | 50.2             | 1000.0          | 1000.000        | 135.7       | V            | 351.0         | -4.9       | 34.2        | 84.4           |
| 3377.366667     | 50.6             | 1000.0          | 1000.000        | 138.7       | H            | 152.0         | -0.9       | 33.7        | 84.4           |
| 5066.033333     | 54.6             | 1000.0          | 1000.000        | 161.6       | V            | 192.0         | 2.2        | 29.8        | 84.4           |
| 5910.366667     | 65.7             | 1000.0          | 1000.000        | 186.5       | V            | 208.0         | 3.9        | 18.7        | 84.4           |
| 7599.033333     | 57.5             | 1000.0          | 1000.000        | 169.6       | H            | 352.0         | 8.1        | 26.8        | 84.4           |
| 10976.366667    | 59.3             | 1000.0          | 1000.000        | 141.7       | V            | 205.0         | 13.0       | 25.1        | 84.4           |
| 17888.966667    | 57.3             | 1000.0          | 1000.000        | 162.6       | H            | 71.0          | 24.0       | 27.1        | 84.4           |

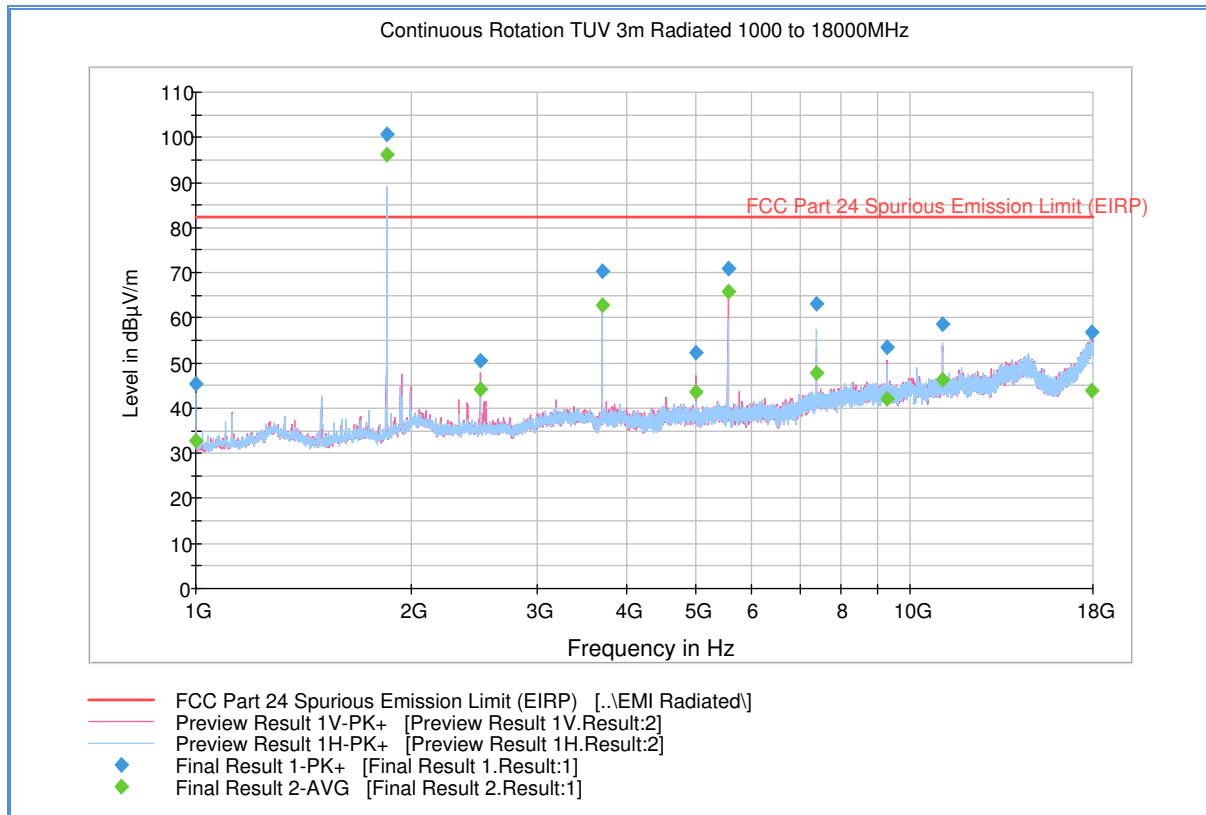
## 2.8.27 Radiated Emission Test Results Above 1GHz\_Worst Case Configuration\_LTE Band 5\_10MHz BW\_High Channel 20600



### Peak Data

| Frequency (MHz) | MaxPeak (dBµV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) |
|-----------------|------------------|-----------------|-----------------|-------------|--------------|---------------|------------|-------------|----------------|
| 1000.400000     | 45.4             | 1000.0          | 1000.000        | 124.7       | H            | 157.0         | -11.2      | 39.0        | 84.4           |
| 1679.066667     | 56.0             | 1000.0          | 1000.000        | 204.4       | H            | 187.0         | -7.6       | 28.4        | 84.4           |
| 2499.766667     | 49.4             | 1000.0          | 1000.000        | 143.6       | V            | 348.0         | -5.0       | 35.0        | 84.4           |
| 3358.300000     | 50.9             | 1000.0          | 1000.000        | 103.7       | H            | 150.0         | -0.8       | 33.5        | 84.4           |
| 5037.300000     | 54.7             | 1000.0          | 1000.000        | 245.3       | H            | 128.0         | 2.2        | 29.7        | 84.4           |
| 5877.133333     | 58.0             | 1000.0          | 1000.000        | 182.5       | H            | 228.0         | 3.8        | 26.3        | 84.4           |
| 7556.133333     | 58.1             | 1000.0          | 1000.000        | 218.4       | H            | 322.0         | 8.1        | 26.3        | 84.4           |
| 8395.766667     | 56.4             | 1000.0          | 1000.000        | 278.2       | V            | 211.0         | 9.1        | 27.9        | 84.4           |
| 9235.566667     | 53.5             | 1000.0          | 1000.000        | 303.2       | V            | 211.0         | 10.4       | 30.9        | 84.4           |
| 10075.166667    | 62.6             | 1000.0          | 1000.000        | 112.7       | V            | 231.0         | 11.7       | 21.7        | 84.4           |
| 10914.766667    | 59.0             | 1000.0          | 1000.000        | 200.5       | V            | 255.0         | 12.9       | 25.4        | 84.4           |
| 17905.766667    | 57.6             | 1000.0          | 1000.000        | 300.6       | H            | 155.0         | 24.1       | 26.8        | 84.4           |

## 2.8.28 Radiated Emission Test Results Above 1GHz\_Worst Case Configuration\_LTE Band 2\_1.4MHz BW\_Low Channel 18607

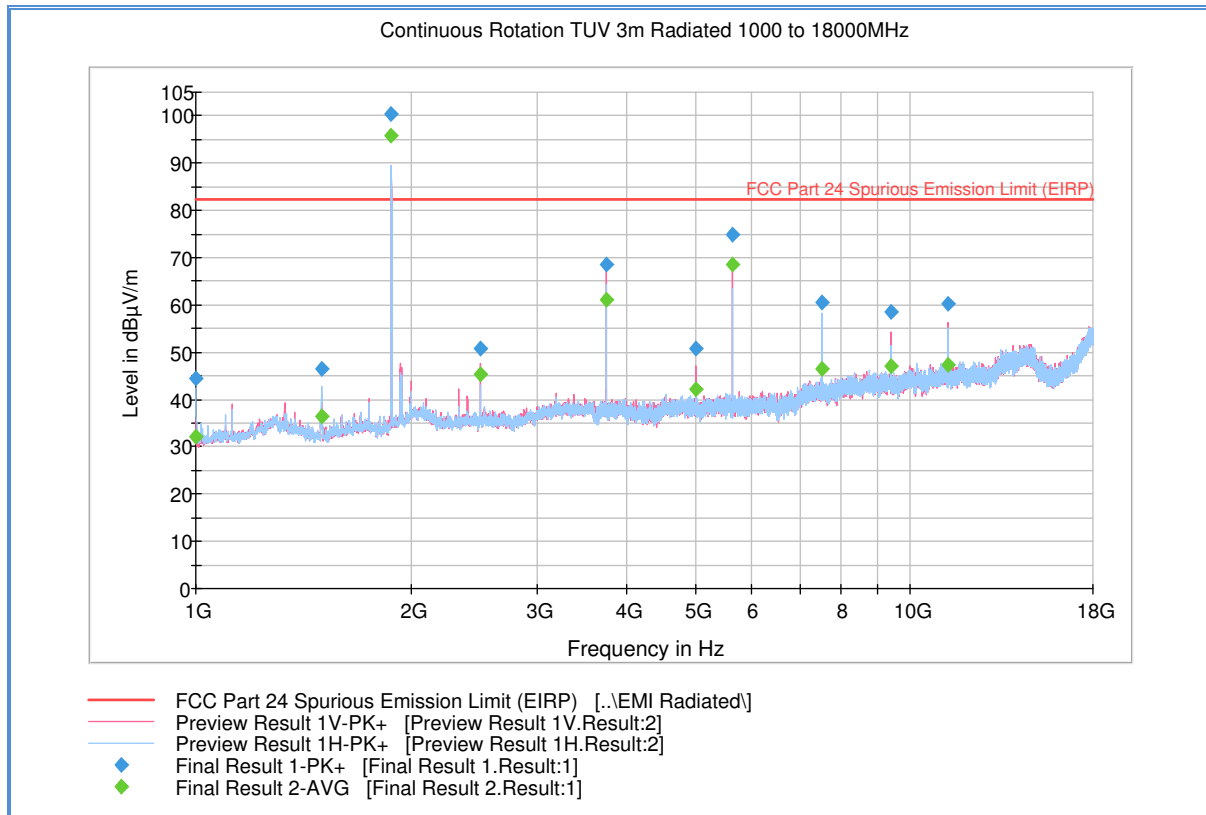


### Peak Data

| Frequency (MHz) | MaxPeak (dBμV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB)         | Limit (dBμV/m) |
|-----------------|------------------|-----------------|-----------------|-------------|--------------|---------------|------------|---------------------|----------------|
| 1000.000000     | 45.2             | 1000.0          | 1000.000        | 150.7       | H            | 58.0          | -11.2      | 37.0                | 82.2           |
| 1850.200000     | 100.6            | 1000.0          | 1000.000        | 103.7       | V            | 329.0         | -6.2       | * Fundamental Freq. |                |
| 2500.200000     | 50.4             | 1000.0          | 1000.000        | 116.7       | V            | 349.0         | -4.9       | 31.8                | 82.2           |
| 3700.533333     | 70.3             | 1000.0          | 1000.000        | 171.6       | H            | 144.0         | -0.2       | 12.0                | 82.2           |
| 4999.733333     | 52.3             | 1000.0          | 1000.000        | 149.6       | V            | -19.0         | 2.2        | 29.9                | 82.2           |
| 5550.533333     | 70.9             | 1000.0          | 1000.000        | 178.6       | V            | 186.0         | 3.3        | 11.3                | 82.2           |
| 7400.866667     | 63.2             | 1000.0          | 1000.000        | 119.7       | H            | 82.0          | 8.1        | 19.1                | 82.2           |
| 9251.433333     | 53.6             | 1000.0          | 1000.000        | 111.7       | H            | 277.0         | 10.5       | 28.7                | 82.2           |
| 11101.600000    | 58.6             | 1000.0          | 1000.000        | 405.3       | H            | 289.0         | 13.2       | 23.6                | 82.2           |
| 17943.300000    | 56.7             | 1000.0          | 1000.000        | 402.7       | V            | 220.0         | 24.2       | 25.5                | 82.2           |

\* This is the fundamental frequency not part of spurious emission evaluation. Data provided for information purpose only.

## 2.8.29 Radiated Emission Test Results Above 1GHz\_Worst Case Configuration\_LTE Band 2\_3MHz BW\_Mid Channel 18900

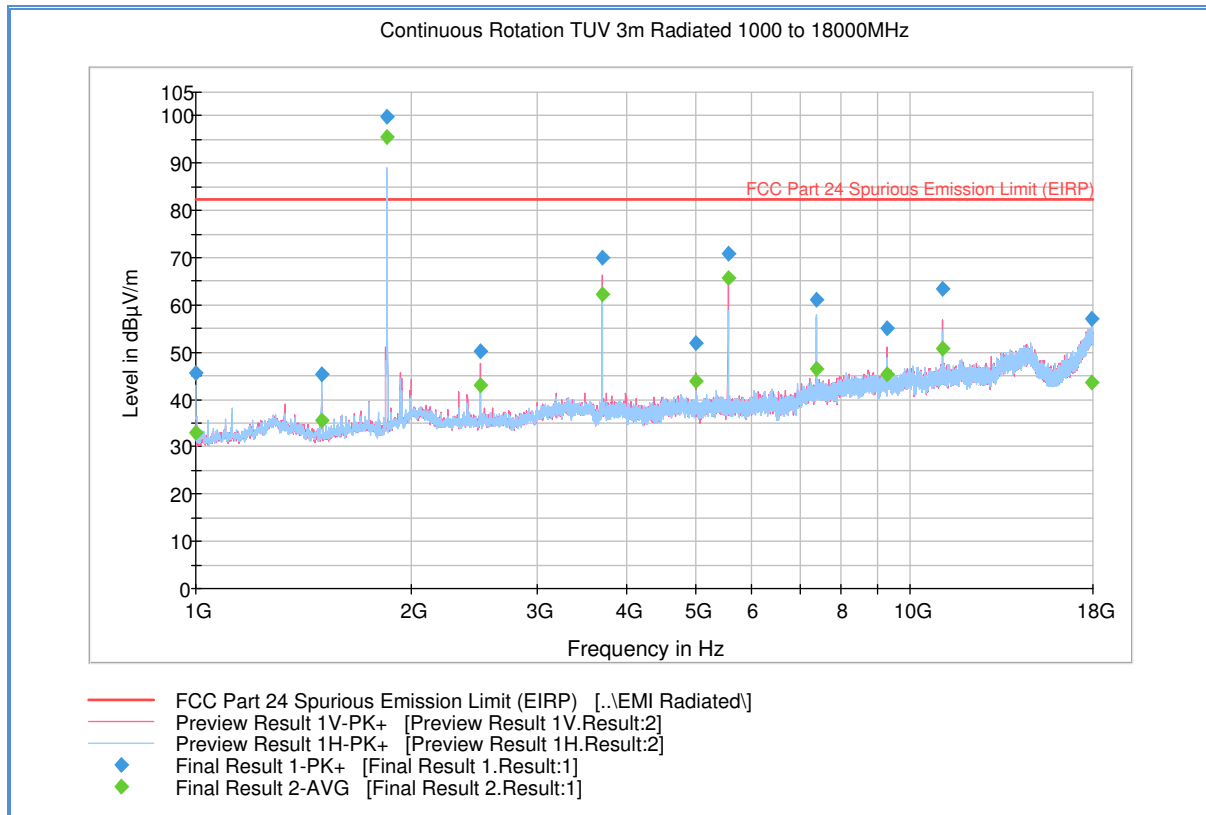


### Peak Data

| Frequency (MHz) | MaxPeak (dBμV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB)         | Limit (dBμV/m) |
|-----------------|------------------|-----------------|-----------------|-------------|--------------|---------------|------------|---------------------|----------------|
| 1000.000000     | 44.5             | 1000.0          | 1000.000        | 142.7       | H            | 55.0          | -11.2      | 37.7                | 82.2           |
| 1499.800000     | 46.5             | 1000.0          | 1000.000        | 102.7       | H            | 284.0         | -9.1       | 35.7                | 82.2           |
| 1878.533333     | 100.4            | 1000.0          | 1000.000        | 306.2       | H            | 321.0         | -5.4       | * Fundamental Freq. |                |
| 2500.166667     | 50.8             | 1000.0          | 1000.000        | 103.7       | V            | 350.0         | -4.9       | 31.4                | 82.2           |
| 3757.600000     | 68.7             | 1000.0          | 1000.000        | 103.7       | V            | 295.0         | 0.6        | 13.6                | 82.2           |
| 5000.300000     | 50.8             | 1000.0          | 1000.000        | 131.7       | V            | 332.0         | 2.2        | 31.4                | 82.2           |
| 5636.100000     | 74.9             | 1000.0          | 1000.000        | 252.3       | V            | 199.0         | 3.4        | 7.4                 | 82.2           |
| 7514.766667     | 60.5             | 1000.0          | 1000.000        | 150.7       | H            | 113.0         | 8.1        | 21.8                | 82.2           |
| 9393.833333     | 58.6             | 1000.0          | 1000.000        | 139.7       | V            | 216.0         | 11.2       | 23.6                | 82.2           |
| 11272.333333    | 60.2             | 1000.0          | 1000.000        | 161.6       | V            | 197.0         | 13.4       | 22.0                | 82.2           |

\* This is the fundamental frequency not part of spurious emission evaluation. Data provided for information purpose only.

## 2.8.30 Radiated Emission Test Results Above 1GHz\_Worst Case Configuration\_LTE Band 2\_5MHz BW\_Low Channel 18625

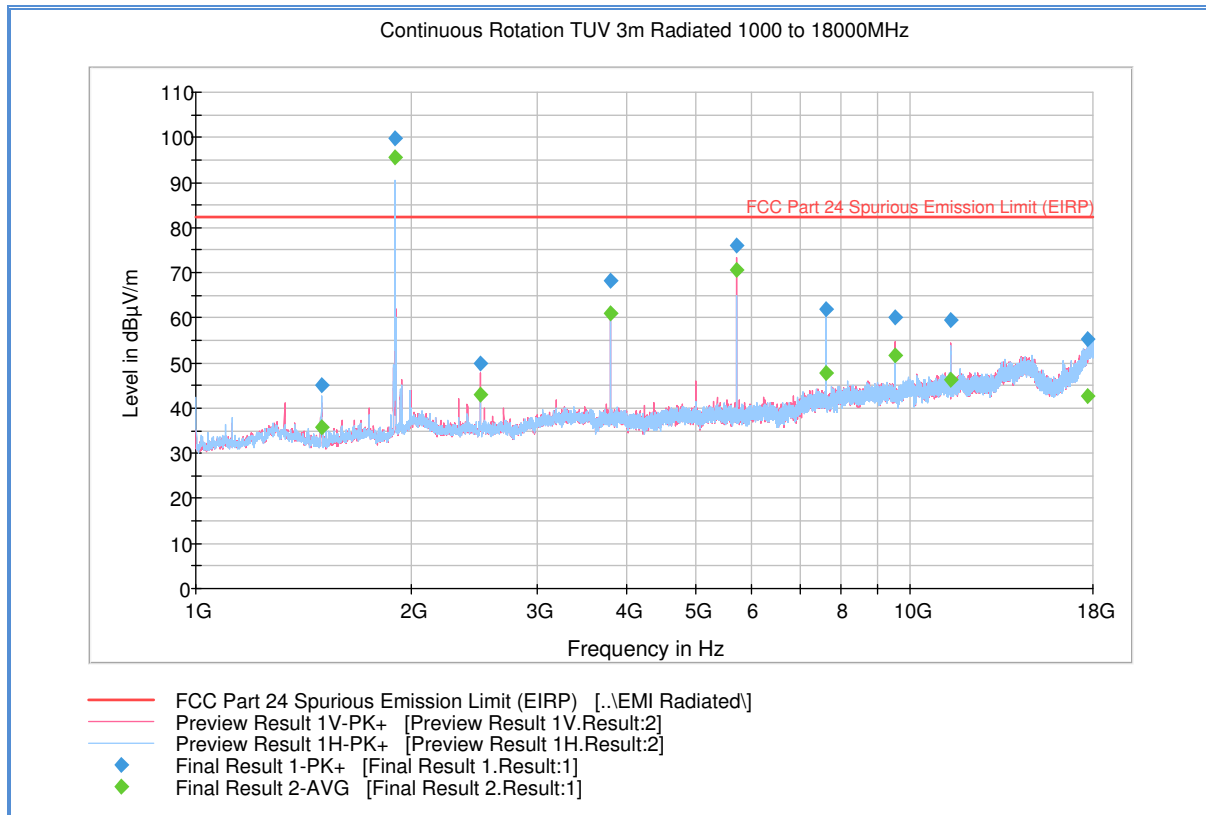


### Peak Data

| Frequency (MHz) | MaxPeak (dBμV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB)         | Limit (dBμV/m) |
|-----------------|------------------|-----------------|-----------------|-------------|--------------|---------------|------------|---------------------|----------------|
| 1000.000000     | 45.5             | 1000.0          | 1000.000        | 146.7       | H            | 124.0         | -11.2      | 36.7                | 82.2           |
| 1500.000000     | 45.3             | 1000.0          | 1000.000        | 131.7       | H            | 279.0         | -9.1       | 36.9                | 82.2           |
| 1850.200000     | 99.8             | 1000.0          | 1000.000        | 99.7        | V            | 324.0         | -6.2       | * Fundamental Freq. |                |
| 2500.200000     | 50.1             | 1000.0          | 1000.000        | 147.7       | V            | 347.0         | -4.9       | 32.1                | 82.2           |
| 3700.566667     | 69.9             | 1000.0          | 1000.000        | 99.7        | V            | 298.0         | -0.2       | 12.3                | 82.2           |
| 4999.900000     | 51.9             | 1000.0          | 1000.000        | 108.7       | V            | 335.0         | 2.2        | 30.3                | 82.2           |
| 5551.100000     | 70.9             | 1000.0          | 1000.000        | 195.5       | V            | 186.0         | 3.3        | 11.4                | 82.2           |
| 7401.433333     | 61.2             | 1000.0          | 1000.000        | 112.7       | H            | 116.0         | 8.1        | 21.0                | 82.2           |
| 9251.433333     | 55.1             | 1000.0          | 1000.000        | 199.5       | V            | 119.0         | 10.5       | 27.1                | 82.2           |
| 11102.166667    | 63.3             | 1000.0          | 1000.000        | 135.7       | V            | 206.0         | 13.2       | 18.9                | 82.2           |
| 17925.200000    | 57.1             | 1000.0          | 1000.000        | 405.3       | H            | 339.0         | 24.1       | 25.1                | 82.2           |

\* This is the fundamental frequency not part of spurious emission evaluation. Data provided for information purpose only.

## 2.8.31 Radiated Emission Test Results Above 1GHz\_Worst Case Configuration\_LTE Band 2\_10MHz BW\_High Channel 19150

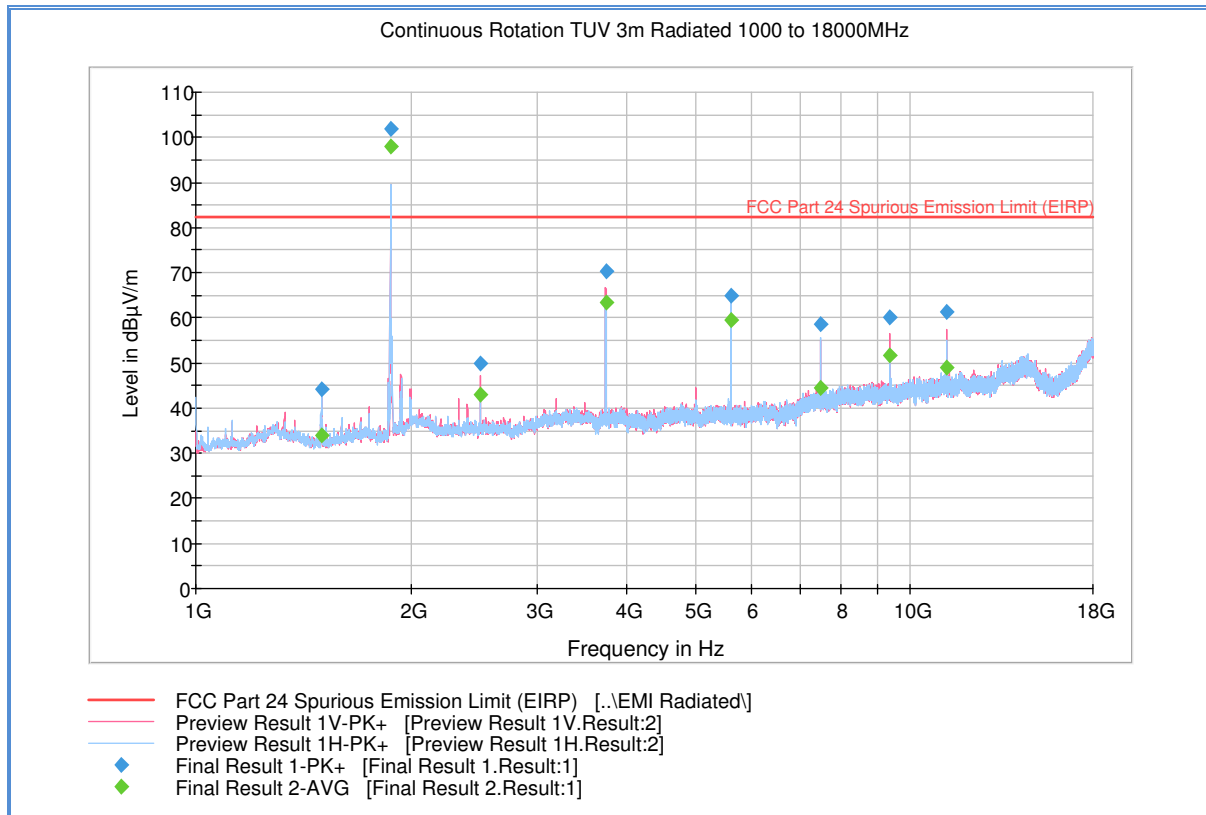


### Peak Data

| Frequency (MHz) | MaxPeak (dBμV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB)         | Limit (dBμV/m) |
|-----------------|------------------|-----------------|-----------------|-------------|--------------|---------------|------------|---------------------|----------------|
| 1500.000000     | 45.2             | 1000.0          | 1000.000        | 103.7       | H            | 281.0         | -9.1       | 37.0                | 82.2           |
| 1900.633333     | 99.9             | 1000.0          | 1000.000        | 286.2       | H            | 166.0         | -4.7       | * Fundamental Freq. |                |
| 2500.166667     | 50.0             | 1000.0          | 1000.000        | 151.6       | V            | 347.0         | -4.9       | 32.2                | 82.2           |
| 3801.233333     | 68.3             | 1000.0          | 1000.000        | 166.6       | H            | 147.0         | 0.8        | 13.9                | 82.2           |
| 5701.833333     | 76.1             | 1000.0          | 1000.000        | 247.3       | V            | 199.0         | 3.6        | 6.2                 | 82.2           |
| 7602.433333     | 61.8             | 1000.0          | 1000.000        | 173.6       | H            | 145.0         | 8.1        | 20.4                | 82.2           |
| 9503.033333     | 60.1             | 1000.0          | 1000.000        | 204.5       | V            | 117.0         | 11.2       | 22.1                | 82.2           |
| 11403.633333    | 59.4             | 1000.0          | 1000.000        | 214.4       | V            | 194.0         | 13.4       | 22.8                | 82.2           |
| 17721.000000    | 55.2             | 1000.0          | 1000.000        | 184.5       | V            | 215.0         | 22.9       | 27.1                | 82.2           |

\* This is the fundamental frequency not part of spurious emission evaluation. Data provided for information purpose only.

## 2.8.32 Radiated Emission Test Results Above 1GHz\_Worst Case Configuration\_LTE Band 2\_15MHz BW\_Mid Channel 18900

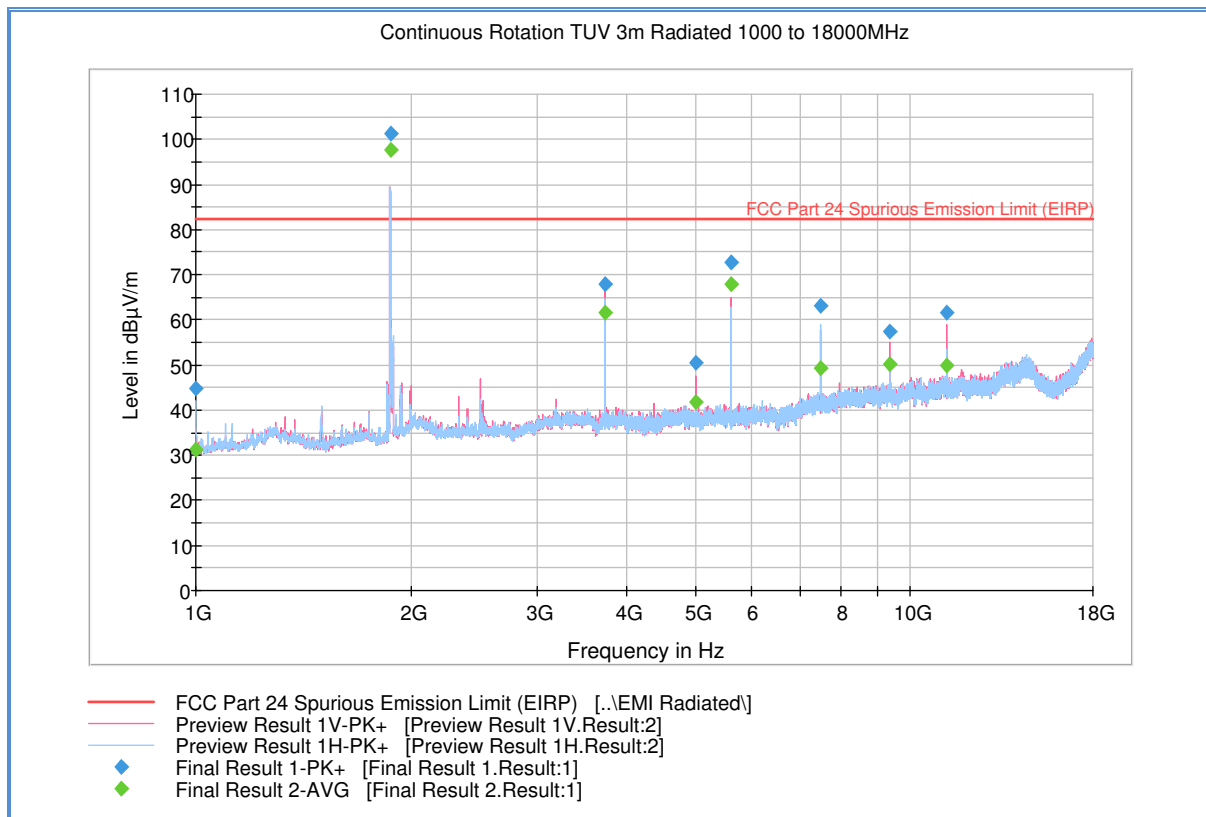


### Peak Data

| Frequency (MHz) | MaxPeak (dBµV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB)         | Limit (dBµV/m) |
|-----------------|------------------|-----------------|-----------------|-------------|--------------|---------------|------------|---------------------|----------------|
| 1500.000000     | 44.2             | 1000.0          | 1000.000        | 134.7       | H            | 241.0         | -9.1       | 38.1                | 82.2           |
| 1873.433333     | 101.7            | 1000.0          | 1000.000        | 100.7       | V            | 293.0         | -5.6       | * Fundamental Freq. |                |
| 2500.166667     | 49.8             | 1000.0          | 1000.000        | 101.7       | V            | 19.0          | -4.9       | 32.5                | 82.2           |
| 3746.466667     | 70.4             | 1000.0          | 1000.000        | 99.7        | V            | 297.0         | 0.5        | 11.8                | 82.2           |
| 5619.866667     | 65.0             | 1000.0          | 1000.000        | 115.7       | V            | 64.0          | 3.4        | 17.2                | 82.2           |
| 7493.633333     | 58.7             | 1000.0          | 1000.000        | 134.7       | V            | 5.0           | 8.1        | 23.5                | 82.2           |
| 9366.666667     | 60.0             | 1000.0          | 1000.000        | 103.7       | V            | 226.0         | 11.1       | 22.3                | 82.2           |
| 11240.066667    | 61.4             | 1000.0          | 1000.000        | 400.0       | V            | 210.0         | 13.4       | 20.9                | 82.2           |

\* This is the fundamental frequency not part of spurious emission evaluation. Data provided for information purpose only.

### 2.8.33 Radiated Emission Test Results Above 1GHz\_Worst Case Configuration\_LTE Band 2\_20MHz BW\_Mid Channel 18900



#### Peak Data

| Frequency (MHz) | MaxPeak (dBµV/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB)         | Limit (dBµV/m) |
|-----------------|------------------|-----------------|-----------------|-------------|--------------|---------------|------------|---------------------|----------------|
| 1000.500000     | 44.7             | 1000.0          | 1000.000        | 147.7       | H            | 55.0          | -11.2      | 37.5                | 82.2           |
| 1871.166667     | 101.3            | 1000.0          | 1000.000        | 99.7        | V            | 330.0         | -5.6       | * Fundamental Freq. |                |
| 3742.300000     | 67.9             | 1000.0          | 1000.000        | 99.7        | V            | 326.0         | 0.4        | 14.3                | 82.2           |
| 4999.900000     | 50.6             | 1000.0          | 1000.000        | 117.7       | V            | 334.0         | 2.2        | 31.6                | 82.2           |
| 5613.433333     | 72.7             | 1000.0          | 1000.000        | 189.5       | V            | 207.0         | 3.3        | 9.5                 | 82.2           |
| 7484.166667     | 63.0             | 1000.0          | 1000.000        | 102.7       | H            | 120.0         | 8.1        | 19.3                | 82.2           |
| 9355.333333     | 57.4             | 1000.0          | 1000.000        | 208.5       | V            | 114.0         | 11.1       | 24.9                | 82.2           |
| 11226.433333    | 61.5             | 1000.0          | 1000.000        | 400.0       | V            | 210.0         | 13.4       | 20.7                | 82.2           |

\* This is the fundamental frequency not part of spurious emission evaluation. Data provided for information purpose only.



## **2.9 FREQUENCY STABILITY**

### **2.9.1 Specification Reference**

FCC 47 CFR Part 2, Clause 2.1055  
FCC 47 CFR Part 22, Clause 22.355  
FCC 47 CFR Part 24, Clause 24.235  
RSS-132, Clause 5.3  
RSS-133, Clause 6.3

### **2.9.2 Standard Applicable**

FCC:

Part 22, Clause 22.355: Except as otherwise provided in this part, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table C-1 of this section.

**Table C-1—Frequency Tolerance for Transmitters in the Public Mobile Services**

| Frequency range (MHz) | Mobile $\leq 3$ watts (ppm) |
|-----------------------|-----------------------------|
| 821 to 896            | 2.5                         |

Part 24, Clause 24.235: The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

IC:

RSS-132 Clause 5.3: The carrier frequency shall not depart from the reference frequency in excess of  $\pm 2.5$  ppm for mobile stations.

RSS-133 Clause 6.3: The carrier frequency shall not depart from the reference frequency, in excess of  $\pm 2.5$  ppm for mobile stations.

### **2.9.3 Equipment Under Test and Modification State**

Serial No: SZ17061900005 / Test Configuration A

### **2.9.4 Date of Test/Initial of test personnel who performed the test**

July 11, 18 and 19 2016 / AC

### **2.9.5 Test Equipment Used**

The major items of test equipment used for the above tests are identified in Section 3.1.



## 2.9.6 Environmental Conditions/ Test Location

Test performed at TÜV SÜD America Inc. Rancho Bernardo facility

Ambient Temperature 25.1 – 25.4°C  
 Relative Humidity 23.0 - 24.5%  
 ATM Pressure 98.7 kPa

## 2.9.7 Additional Observations

- This is a conducted test. The EUT was operated at 3.7VDC nominal voltage and was placed in the temperature chamber for this evaluation. The EUT was controlled by a CMW500 and utilizing a spectrum analyzer for measurement.
- Test performed in worst case channel based on RF power output measurement.
- An offset were added to compensate for the external attenuator and cable used.
- f1 and f2 are lower and upper -10dBc points in relation to the peak value of the power envelope.
- The EUT was tested over the temperature -30°C to +50°C in 10°C steps and allowed to sit for 1 hour to allow the equipment and chamber temperature to stabilize. The measurements were then performed.
- Voltage variation was also performed at voltage 3.3VDC and higher 4.3VDC of the nominal voltage at 20°C.

## 2.9.8 Test Results

| GPRS850-BC0 – Low Ch 128 @ 824.2 MHz |                  |            |            |                        |                   |             |
|--------------------------------------|------------------|------------|------------|------------------------|-------------------|-------------|
| Voltage (VDC)                        | Temperature (°C) | f1 (MHz)   | f2 (MHz)   | Center Freq. (f1+f2)/2 | Freq. Error (ppm) | Limit (ppm) |
| 3.7                                  | -30              | 824.046567 | 824.355276 | 824.200922             | -1.12             | 2.5         |
|                                      | -20              | 824.045099 | 824.355870 | 824.200485             | -0.59             | 2.5         |
|                                      | -10              | 824.046786 | 824.355620 | 824.201203             | -1.46             | 2.5         |
|                                      | 0                | 824.045880 | 824.355041 | 824.200461             | -0.56             | 2.5         |
|                                      | +10              | 824.043161 | 824.356808 | 824.199985             | 0.02              | 2.5         |
|                                      | +20              | 824.046036 | 824.354339 | 824.200188             | -0.23             | 2.5         |
|                                      | +30              | 824.042942 | 824.354776 | 824.198859             | 1.38              | 2.5         |
|                                      | +40              | 824.046442 | 824.351683 | 824.199063             | 1.14              | 2.5         |
|                                      | +50              | 824.046599 | 824.354089 | 824.200344             | -0.42             | 2.5         |
| GPRS850-BC0 – Low Ch 128 @ 824.2 MHz |                  |            |            |                        |                   |             |
| Voltage (VDC)                        | Temperature (°C) | f1 (MHz)   | f2 (MHz)   | Center Freq. (f1+f2)/2 | Freq. Error (ppm) | Limit (ppm) |
| 3.3                                  | 20               | 824.046161 | 824.354558 | 824.200360             | -0.44             | 2.5         |
| 4.3                                  |                  | 824.045442 | 824.354964 | 824.200203             | -0.25             | 2.5         |

| GPRS1900-BC1 – Mid Ch 661 @ 1880 MHz |                  |             |             |                        |                   |             |
|--------------------------------------|------------------|-------------|-------------|------------------------|-------------------|-------------|
| Voltage (VDC)                        | Temperature (°C) | f1 (MHz)    | f2 (MHz)    | Center Freq. (f1+f2)/2 | Freq. Error (ppm) | Limit (ppm) |
| 3.7                                  | -30              | 1879.90666  | 1880.09913  | 1880.002895            | -1.54             | 2.5         |
|                                      | -20              | 1879.92113  | 1880.07308  | 1879.997105            | 1.54              | 2.5         |
|                                      | -10              | 1879.90883  | 1880.09262  | 1880.000725            | -0.39             | 2.5         |
|                                      | 0                | 1879.90955  | 1880.09262  | 1880.001085            | -0.58             | 2.5         |
|                                      | +10              | 1879.90666  | 1880.09986  | 1880.00326             | -1.73             | 2.5         |
|                                      | +20              | 1879.913003 | 1880.091278 | 1880.002141            | -1.14             | 2.5         |
|                                      | +30              | 1879.909409 | 1880.091278 | 1880.000344            | -0.18             | 2.5         |
|                                      | +40              | 1879.909378 | 1880.088435 | 1879.998907            | 0.58              | 2.5         |
|                                      | +50              | 1879.846536 | 1880.154558 | 1880.000547            | -0.29             | 2.5         |
| GPRS1900-BC1 – Mid Ch 661 @ 1880 MHz |                  |             |             |                        |                   |             |
| Voltage (VDC)                        | Temperature (°C) | f1 (MHz)    | f2 (MHz)    | Center Freq. (f1+f2)/2 | Freq. Error (ppm) | Limit (ppm) |
| 3.3                                  | 20               | 1879.90955  | 1880.09334  | 1880.001445            | -0.77             | 2.5         |
| 4.3                                  |                  | 1879.921002 | 1880.076404 | 1879.998703            | 0.69              | 2.5         |

| WCDMA – Band 5 – Low Ch 4132 @ 826.4 MHz |                  |            |            |                        |                   |             |
|------------------------------------------|------------------|------------|------------|------------------------|-------------------|-------------|
| Voltage (VDC)                            | Temperature (°C) | f1 (MHz)   | f2 (MHz)   | Center Freq. (f1+f2)/2 | Freq. Error (ppm) | Limit (ppm) |
| 3.7                                      | -30              | 826.399966 | 826.399969 | 826.399968             | 0.04              | 2.5         |
|                                          | -20              | 826.399874 | 826.400107 | 826.399991             | 0.01              | 2.5         |
|                                          | -10              | 826.399932 | 826.400107 | 826.400020             | -0.02             | 2.5         |
|                                          | 0                | 826.399933 | 826.400167 | 826.400050             | -0.06             | 2.5         |
|                                          | +10              | 826.400212 | 826.400250 | 826.400231             | -0.28             | 2.5         |
|                                          | +20              | 826.399313 | 826.399406 | 826.399360             | 0.77              | 2.5         |
|                                          | +30              | 826.400415 | 826.400421 | 826.400418             | -0.51             | 2.5         |
|                                          | +40              | 826.399415 | 826.399421 | 826.399418             | 0.70              | 2.5         |
|                                          | +50              | 826.399415 | 826.399420 | 826.399418             | 0.70              | 2.5         |
| WCDMA – Band 5 – Low Ch 4132 @ 826.4 MHz |                  |            |            |                        |                   |             |
| Voltage (VDC)                            | Temperature (°C) | f1 (MHz)   | f2 (MHz)   | Center Freq. (f1+f2)/2 | Freq. Error (ppm) | Limit (ppm) |
| 3.3                                      | 20               | 826.399313 | 826.399375 | 826.399344             | 0.79              | 2.5         |
| 4.3                                      |                  | 826.399281 | 826.399375 | 826.399328             | 0.81              | 2.5         |

| WCDMA – Band 2 – Mid Ch 9400 @ 1880 MHz |                  |           |           |                        |                   |             |
|-----------------------------------------|------------------|-----------|-----------|------------------------|-------------------|-------------|
| Voltage (VDC)                           | Temperature (°C) | f1 (MHz)  | f2 (MHz)  | Center Freq. (f1+f2)/2 | Freq. Error (ppm) | Limit (ppm) |
| 3.7                                     | -30              | 1877.8582 | 1882.1418 | 1880.0                 | 0.0               | 2.5         |
|                                         | -20              | 1877.8509 | 1882.1418 | 1879.99635             | 1.94              | 2.5         |
|                                         | -10              | 1877.8582 | 1882.1346 | 1879.9964              | 1.91              | 2.5         |
|                                         | 0                | 1877.8509 | 1882.1418 | 1879.99635             | 1.94              | 2.5         |
|                                         | +10              | 1877.8654 | 1882.1346 | 1880.0                 | 0.0               | 2.5         |
|                                         | +20              | 1877.8582 | 1882.1346 | 1879.9964              | 1.91              | 2.5         |
|                                         | +30              | 1877.8509 | 1882.1418 | 1879.99635             | 1.94              | 2.5         |
|                                         | +40              | 1877.8582 | 1882.1418 | 1880.0                 | 0.0               | 2.5         |
|                                         | +50              | 1877.9113 | 1882.0813 | 1879.9963              | 1.97              | 2.5         |
| WCDMA – Band 2 – Mid Ch 9400 @ 1880 MHz |                  |           |           |                        |                   |             |
| Voltage (VDC)                           | Temperature (°C) | f1 (MHz)  | f2 (MHz)  | Center Freq. (f1+f2)/2 | Freq. Error (ppm) | Limit (ppm) |
| 3.3                                     | 20               | 1877.8509 | 1882.1418 | 1879.99635             | 1.94              | 2.5         |
| 4.3                                     |                  | 1877.8582 | 1882.1491 | 1880.00365             | -1.94             | 2.5         |

| LTE Band 5 – QPSK 1.4MHz BW-High Channel 20643 @ 848.3 MHz |                  |            |            |                        |                   |             |
|------------------------------------------------------------|------------------|------------|------------|------------------------|-------------------|-------------|
| Voltage (VDC)                                              | Temperature (°C) | f1 (MHz)   | f2 (MHz)   | Center Freq. (f1+f2)/2 | Freq. Error (ppm) | Limit (ppm) |
| 3.7                                                        | -30              | 847.759079 | 848.841421 | 848.300250             | -0.29             | 2.5         |
|                                                            | -20              | 847.759079 | 848.841421 | 848.300250             | -0.29             | 2.5         |
|                                                            | -10              | 847.759079 | 848.841421 | 848.300250             | -0.29             | 2.5         |
|                                                            | 0                | 847.759079 | 848.841421 | 848.300250             | -0.29             | 2.5         |
|                                                            | +10              | 847.759079 | 848.841421 | 848.300250             | -0.29             | 2.5         |
|                                                            | +20              | 847.759079 | 848.841421 | 848.300250             | -0.29             | 2.5         |
|                                                            | +30              | 847.759017 | 848.841421 | 848.300219             | -0.26             | 2.5         |
|                                                            | +40              | 847.759079 | 848.841421 | 848.300250             | -0.29             | 2.5         |
|                                                            | +50              | 847.759017 | 848.841421 | 848.300219             | -0.26             | 2.5         |
| LTE Band 5 – QPSK 1.4MHz BW-High Channel 20643 @ 848.3 MHz |                  |            |            |                        |                   |             |
| Voltage (VDC)                                              | Temperature (°C) | f1 (MHz)   | f2 (MHz)   | Center Freq. (f1+f2)/2 | Freq. Error (ppm) | Limit (ppm) |
| 3.3                                                        | 20               | 847.759079 | 848.841421 | 848.300250             | -0.29             | 2.5         |
| 4.3                                                        |                  | 847.759079 | 848.841421 | 848.300250             | -0.29             | 2.5         |

| LTE Band 2 – QPSK 20MHz BW-Mid Channel 18900 @ 1880.0 MHz |                  |           |           |                        |                   |             |
|-----------------------------------------------------------|------------------|-----------|-----------|------------------------|-------------------|-------------|
| Voltage (VDC)                                             | Temperature (°C) | f1 (MHz)  | f2 (MHz)  | Center Freq. (f1+f2)/2 | Freq. Error (ppm) | Limit (ppm) |
| 3.7                                                       | -30              | 1870.9987 | 1889.0013 | 1880.0                 | 0                 | 2.5         |
|                                                           | -20              | 1870.9987 | 1889.0013 | 1880.0                 | 0                 | 2.5         |
|                                                           | -10              | 1870.9987 | 1889.0013 | 1880.0                 | 0                 | 2.5         |
|                                                           | 0                | 1870.9972 | 1889.0013 | 1879.99925             | 0.39              | 2.5         |
|                                                           | +10              | 1870.9987 | 1889.0013 | 1880.0                 | 0                 | 2.5         |
|                                                           | +20              | 1870.9972 | 1889.0013 | 1879.99925             | 0.39              | 2.5         |
|                                                           | +30              | 1870.9972 | 1889.0013 | 1879.99925             | 0.39              | 2.5         |
|                                                           | +40              | 1870.9972 | 1889.0013 | 1879.99925             | 0.39              | 2.5         |
|                                                           | +50              | 1870.9972 | 1889.0013 | 1879.99925             | 0.39              | 2.5         |
| LTE Band 2 – QPSK 20MHz BW-Mid Channel 18900 @ 1880.0 MHz |                  |           |           |                        |                   |             |
| Voltage (VDC)                                             | Temperature (°C) | f1 (MHz)  | f2 (MHz)  | Center Freq. (f1+f2)/2 | Freq. Error (ppm) | Limit (ppm) |
| 3.3                                                       | 20               | 1870.9972 | 1889.0013 | 1879.99925             | 0.39              | 2.5         |
| 4.3                                                       |                  | 1870.9972 | 1889.0013 | 1879.99925             | 0.39              | 2.5         |

## 2.9.9 Sample Calculation and plot

Variables (from test plot): M1 = (Peak value of the power envelope)  
 T1 = (-10 dBc point)  
 T2 = (+10 dBc point)

Center Frequency Formula:  $= (T1+T2) / 2$   
 $= 1870.9972+1889.0013) / 2$   
 $= 1879.99925 \text{ MHz}$

$\Delta$  (MHz):  $= \text{Center Frequency} - \text{Calculated Center Frequency}$   
 $= 1880 \text{ MHz} - 1879.99925 \text{ MHz}$   
 $= 0.00075 \text{ MHz}$

Ppm Calculation:  $= (\Delta \text{ (MHz)} / \text{Center Frequency}) \times 1000000$   
 $= (0.00075 \text{ MHz} / 1880 \text{ MHz}) \times 1000000$   
 $= 0.39894 \text{ ppm}$



Date: 22.JUL.2016 11:27:30



### **SECTION 3**

#### **TEST EQUIPMENT USED**



### 3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

| ID Number<br>(SDGE/SDRB)    | Test Equipment                             | Type            | Serial Number          | Manufacturer               | Cal Date                                             | Cal Due Date |
|-----------------------------|--------------------------------------------|-----------------|------------------------|----------------------------|------------------------------------------------------|--------------|
| <b>Conducted Port Setup</b> |                                            |                 |                        |                            |                                                      |              |
| 7611                        | Signal/Spectrum Analyzer                   | FSW26           | 102017                 | Rhode & Schwarz            | 02/01/16                                             | 02/01/17     |
| 8825                        | 20dB Attenuator                            | 46-20-34        | BK5773                 | Weinschel Corp.            | Verified by 7611 and 7608                            |              |
| 7578                        | Wideband Radio Communication Tester        | CMW 500         | 1201.0002K50-116735-rQ | Rhode & Schwarz            | Used for connectivity only, calibration not required |              |
| 7608                        | Vector Signal Generator                    | SMBV100A        | 259021                 | Rhode & Schwarz            | 07/29/15                                             | 07/29/16     |
| <b>Radiated Test Setup</b>  |                                            |                 |                        |                            |                                                      |              |
| 1033                        | Bilog Antenna                              | 3142C           | 00044556               | EMCO                       | 09/25/14                                             | 09/25/16     |
| 1040                        | EMI Test Receiver                          | ESIB40          | 100292                 | Rhode & Schwarz            | 09/29/15                                             | 09/29/16     |
| 1016                        | Pre-amplifier                              | PAM-0202        | 187                    | PAM                        | 12/15/15                                             | 12/15/16     |
| 7575                        | Double-ridged waveguide horn antenna       | 3117            | 00155511               | EMCO                       | 05/12/16                                             | 05/12/17     |
| 1049                        | EMI Test Receiver                          | ESU             | 100133                 | Rhode & Schwarz            | 03/17/16                                             | 03/17/17     |
| 8628                        | Pre-amplifier                              | QLJ 01182835-JO | 8986002                | QuinStar Technologies Inc. | 01/11/16                                             | 01/11/17     |
| 1054                        | Horn antenna (18-40 GHz)                   | 3116            | 9407-2233              | EMCO                       | 12/22/15                                             | 12/22/17     |
| n/a                         | Pre-amplifier (18-40 GHz)                  | SLKka-30-6      | 15G27                  | Spacek Labs                | Verified by 1003 and 7611                            |              |
| 7578                        | Wideband Radio Communication Tester        | CMW 500         | 1201.0002K50-116735-rQ | Rhode & Schwarz            | Used for connectivity only, calibration not required |              |
| 1003                        | Signal Generator                           | SMR-40          | 1104.0002.40           | Rhode & Schwarz            | 05/16/16                                             | 05/16/17     |
| 7611                        | Signal/Spectrum Analyzer                   | FSW26           | 102017                 | Rhode & Schwarz            | 02/01/16                                             | 02/01/17     |
| <b>Miscellaneous</b>        |                                            |                 |                        |                            |                                                      |              |
|                             | Test Software                              | EMC32           | V8.53                  | Rhode & Schwarz            | N/A                                                  |              |
| 1123                        | DC Power Supply                            | E3631A          | N/A                    | Hewlett Packard            | Verified by 6452                                     |              |
| 6792                        | Multimeter                                 | 3478A           | 2911A70964             | Hewlett Packard            | 08/14/15                                             | 08/14/16     |
| 7579                        | Temperature Chamber                        | 115             | 151617                 | TestQuity                  | 08/14/15                                             | 08/14/16     |
| 7560                        | Barometer/Temperature/Humidity Transmitter | iBTHX-W         | 1240476                | Omega                      | 10/19/15                                             | 10/19/16     |

### 3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:

#### 3.2.1 Radiated Emission Measurements (Below 1GHz)

| Contribution                    |                            | Probability Distribution Type | Probability Distribution $x_i$ | Standard Uncertainty $u(x_i)$ | $[u(x_i)]^2$ |
|---------------------------------|----------------------------|-------------------------------|--------------------------------|-------------------------------|--------------|
| 1                               | Receiver/Spectrum Analyzer | Rectangular                   | 0.45                           | 0.26                          | 0.07         |
| 2                               | Cables                     | Rectangular                   | 0.50                           | 0.29                          | 0.08         |
| 3                               | Preamp                     | Rectangular                   | 0.50                           | 0.29                          | 0.08         |
| 4                               | Antenna                    | Rectangular                   | 0.75                           | 0.43                          | 0.19         |
| 5                               | Site                       | Rectangular                   | 2.70                           | 1.56                          | 2.43         |
| 6                               | EUT Setup                  | Rectangular                   | 1.00                           | 0.58                          | 0.33         |
| Combined Uncertainty ( $u_c$ ): |                            |                               |                                |                               | 1.78         |
| Coverage Factor (k):            |                            |                               |                                |                               | 2            |
| Expanded Uncertainty:           |                            |                               |                                |                               | 3.57         |

#### 3.2.2 Radiated Emission Measurements (Above 1GHz)

| Contribution                    |                            | Probability Distribution Type | Probability Distribution $x_i$ | Standard Uncertainty $u(x_i)$ | $[u(x_i)]^2$ |
|---------------------------------|----------------------------|-------------------------------|--------------------------------|-------------------------------|--------------|
| 1                               | Receiver/Spectrum Analyzer | Rectangular                   | 0.57                           | 0.33                          | 0.11         |
| 2                               | Cables                     | Rectangular                   | 0.70                           | 0.40                          | 0.16         |
| 3                               | Preamp                     | Rectangular                   | 0.50                           | 0.29                          | 0.08         |
| 4                               | Antenna                    | Rectangular                   | 0.37                           | 0.21                          | 0.05         |
| 5                               | Site                       | Rectangular                   | 2.70                           | 1.56                          | 2.43         |
| 6                               | EUT Setup                  | Rectangular                   | 1.00                           | 0.58                          | 0.33         |
| Combined Uncertainty ( $u_c$ ): |                            |                               |                                |                               | 1.78         |
| Coverage Factor (k):            |                            |                               |                                |                               | 2            |
| Expanded Uncertainty:           |                            |                               |                                |                               | 3.56         |

#### 3.2.3 Conducted Antenna Port Measurement

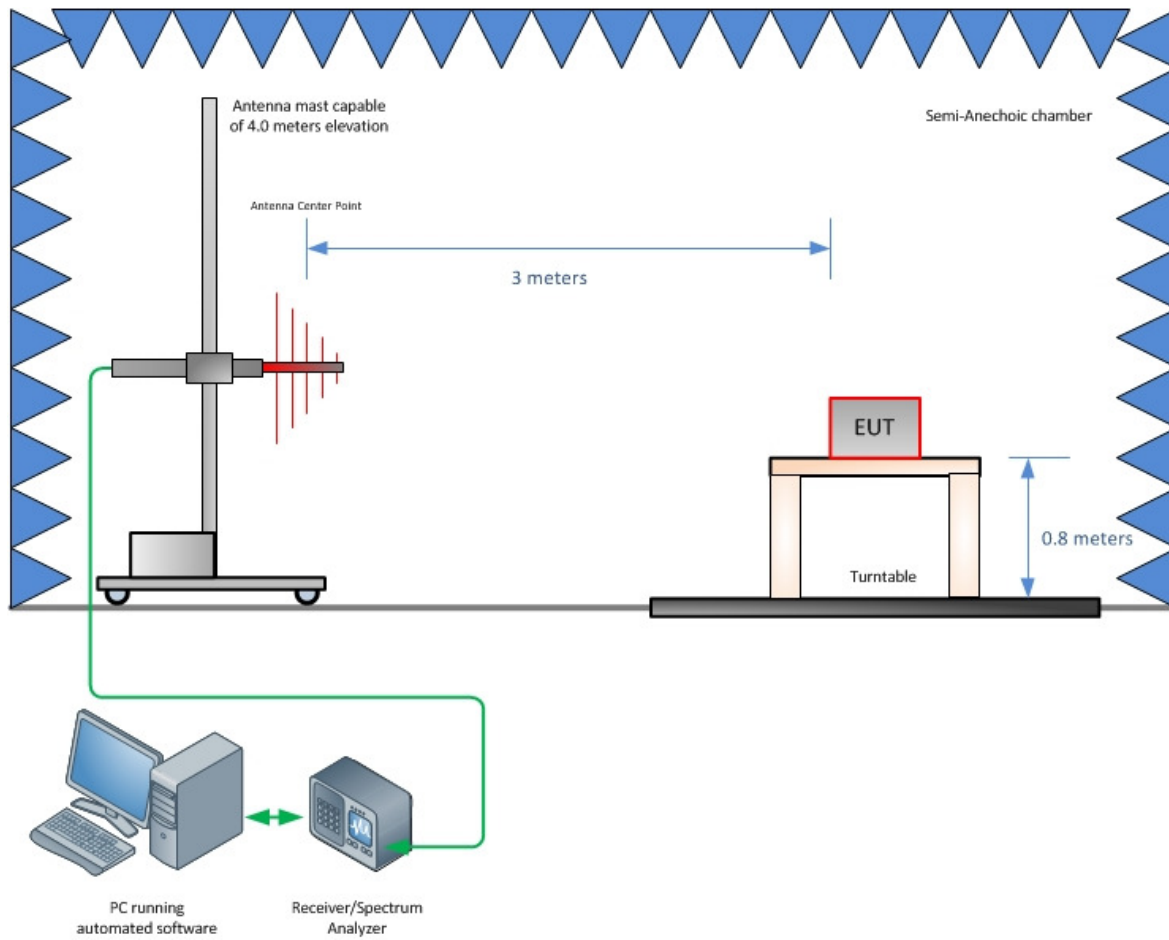
| Contribution                    |                            | Probability Distribution Type | Probability Distribution $x_i$ | Standard Uncertainty $u(x_i)$ | $[u(x_i)]^2$ |
|---------------------------------|----------------------------|-------------------------------|--------------------------------|-------------------------------|--------------|
| 1                               | Receiver/Spectrum Analyzer | Rectangular                   | 0.34                           | 0.20                          | 0.04         |
| 2                               | Cables                     | Rectangular                   | 0.30                           | 0.17                          | 0.03         |
| 3                               | EUT Setup                  | Rectangular                   | 0.50                           | 0.29                          | 0.08         |
| Combined Uncertainty ( $u_c$ ): |                            |                               |                                |                               | 0.39         |
| Coverage Factor (k):            |                            |                               |                                |                               | 1.96         |
| Expanded Uncertainty:           |                            |                               |                                |                               | 0.76         |



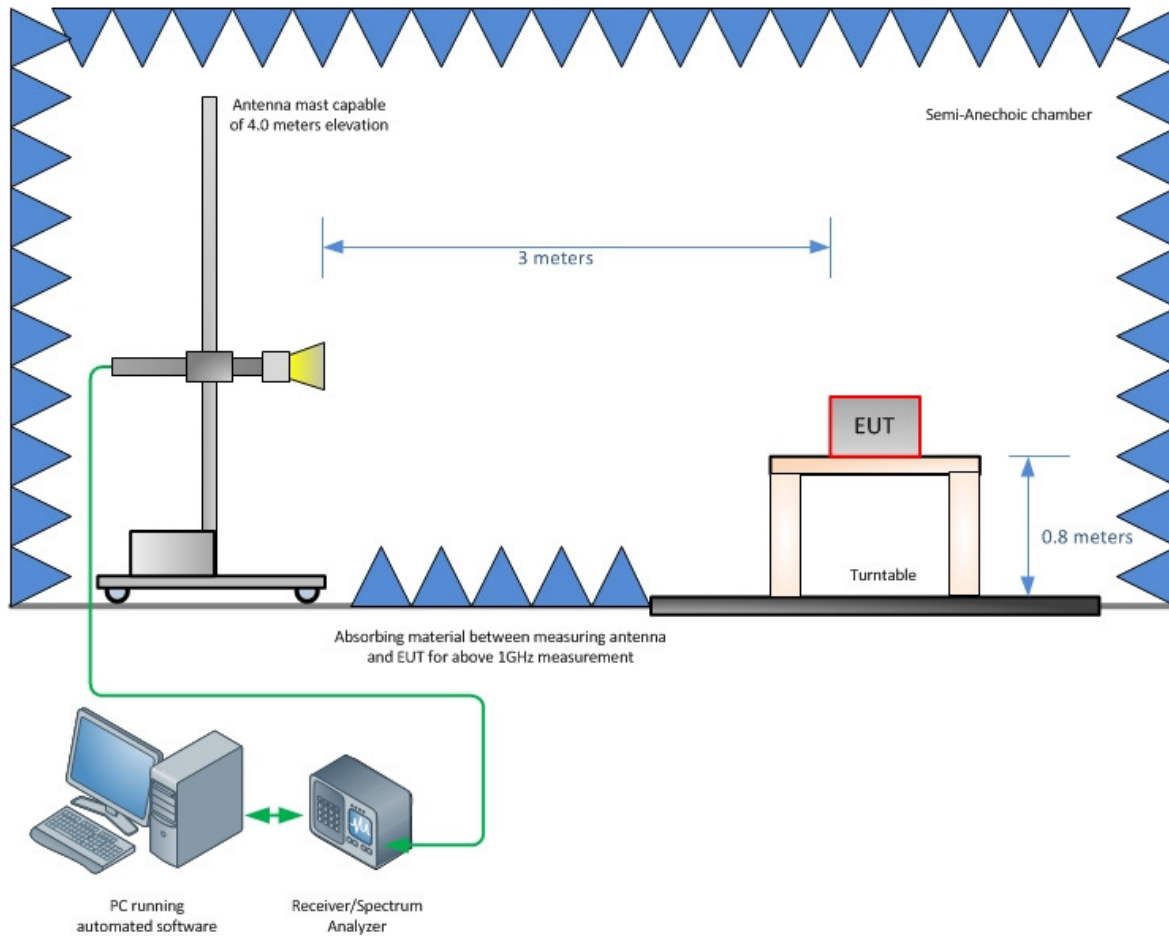
#### **SECTION 4**

#### **DIAGRAM OF TEST SETUP**

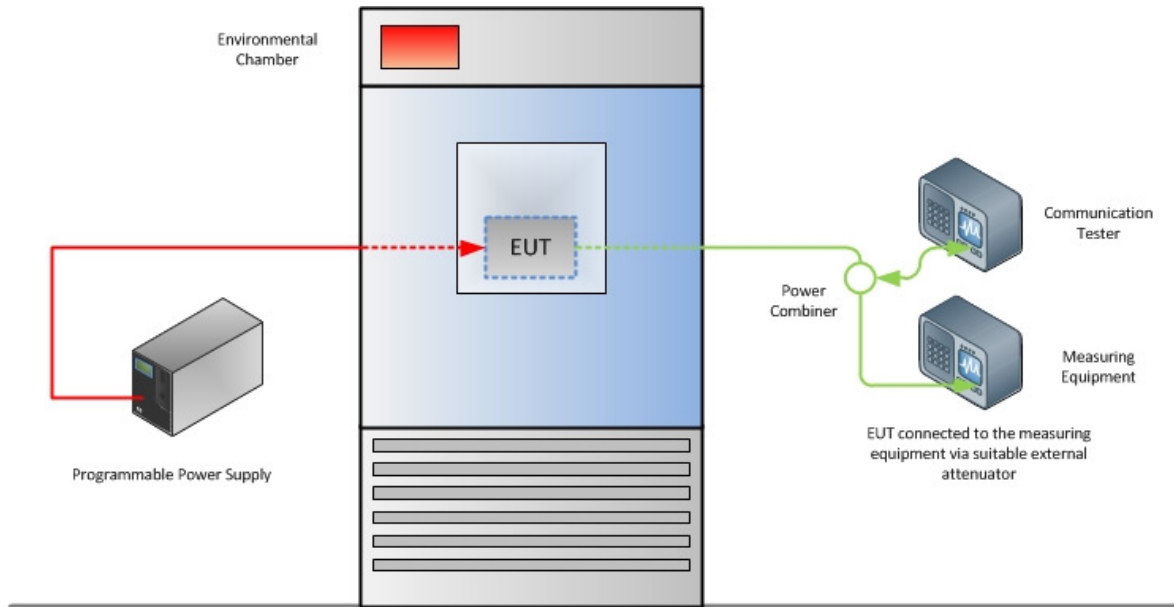
#### 4.1 TEST SETUP DIAGRAM



**Radiated Emission Test Setup (Below 1GHz)**



**Radiated Emission Test Setup (Above 1GHz)**



**Frequency Stability Test Configuration**



## **SECTION 5**

### **ACCREDITATION, DISCLAIMERS AND COPYRIGHT**



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