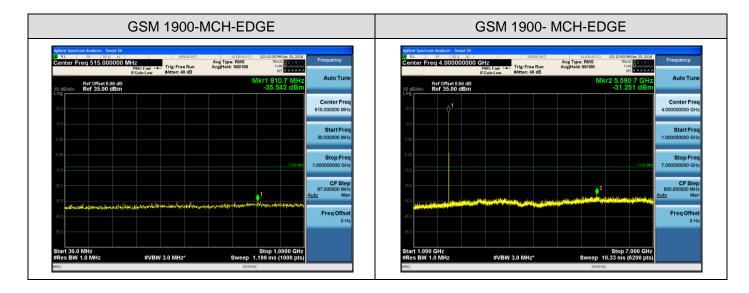


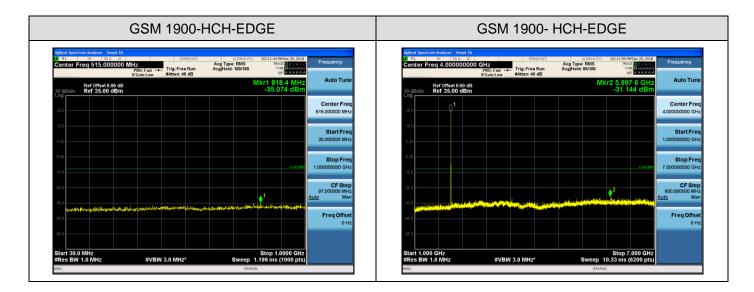
| Center Fre | IFGai | Fast + Trig: Free Run #Atten: 40 dB | Avg Type: RMS Avg Hold: 90/100 | 02:09:56 PMDec 25, 2018 TRACE 23, 23,45 C TYPE A & A & A & A OET A & A & A & A r1 13, 128 2 GHz | Frequency Auto Tune | Aglent Spectrum Analyzer - Swept SA CR RL RF 50 AC C Center Freq 15.800000000 | O GHZ PNO: Fast → Trig: Free Run IFGain:Low #Atten: 40 dB | ALIGNAUTO 02:10:05 PM Dec 25, 2018 Avg Type: RMS TRACE 1234 5 C Avg Hold: 62/100 Oct AAAAAA Mkr1 19,982 0 GHz | Frequency Auto Tur |
|------------|--------------------------------------|--|-----------------------------------|---|---------------------------------------|---|---|--|---|
| 10 dB/div | Ref Offset 10.48 dB Ref 35.00 dBm | | WIK | -27.842 dBm | | Ref Offset 11.01 dB 10 dB/div Ref 35.00 dBm | | -22.701 dBm | |
| 25.0 | | | | | Center Freq 10.300000000 GHz | 25.0 | | | Center Fre 16.800000000 GH |
| 5.00 | | | | | Start Freq 7.000000000 GHz | 5.00 | | | Start Fre 13.600000000 GH |
| -5.00 | | | | -13.00 dBn | Stop Freq 13.60000000 GHz | -5.00 | | -13.00 dBn | Stop Fre 20.000000000 GH |
| -25.0 | ووالمنافق والمحاوية | al analise dividue la satel la sua | والمتجنس وتتواطل وأقص | مانات المراجع الفات الديامي ومانات الماني جوانف الديامي | CF Step 660.000000 MHz Auto Man | -25 0 -26 0 | | | CF Ste 640.000000 MH <u>Auto</u> Ma |
| -45.0 | | | | | Freq Offset 0 Hz | -45.0 | | | Freq Offse 0 H |
| -55.0 | | | | | | -55.0 | | | |





| UN RL | RF 50 Q RF 50 Q Freq 10.3000 | | ast Trig: Fre | e Run Avg | ALIGNAUTO Type: RMS [Hold: 90/100 | 02:11:00 PMDec 25, 201 TRACE 2 3 4 5 TYPE MULTINE DET A A A A A | Frequency | Agilent Spectrum Analy CR RL RF Center Freq 16 | 50.9 AC | Trig: Free Run #Atten: 40 dB | ALIGNAUTO Avg Type: RMS Avg Hold: 62/100 | 02:11:10 PMDec 25, 2018 TRACE 2 3 4 5 6 TYPE 0 DET A A A A A A | Frequency |
|----------------|------------------------------------|------------------------|-----------------------|--------------------|---|--|---------------------------------------|--|---|---------------------------------|--|---|---|
| 10 dB/div | Ref Offset 10 Ref 35.00 (| .48 dB d B m | | | Mkr | 1 13.202 0 GH -26.728 dBr | z Auto Tune n | 10 dB/div Ref 3 | ffset 11.01 dB 35.00 dBm | | Mkr | 1 19.975 0 GHz -22.655 dBm | Auto Tur |
| 25.0 | | | | | | | Center Freq 10.300000000 GHz | 25.0 | | | | | Center Fre 16.800000000 GH |
| 5.00 | | | | | | | Start Freq 7.000000000 GHz | 5.00 | | | | | Start Fre 13.600000000 GF |
| -5.00 | | | | | | -13.00 #8 | Stop Freq 13.60000000 GHz | -5.00 | | | | -13.00 dBn | Stop Fre 20.00000000 GF |
| -25.0 -35.0 | the fillent was a fillent | ندرومه الحوريد ا | 4.com/bitistratel.htt | فاجتهده المتهديطية | territory and the second second | | CF Step 660.000000 MHz Auto Man | -25.0 | a a substance of the second | | مترا المجاور ومعالم ومطغ | an titer yang bishen yang b | CF Ste 640.000000 MF <u>Auto</u> Ma |
| -45.0 | | | | | | | Freq Offset 0 Hz | -45.0 | | | | | Freq Offs 0 F |



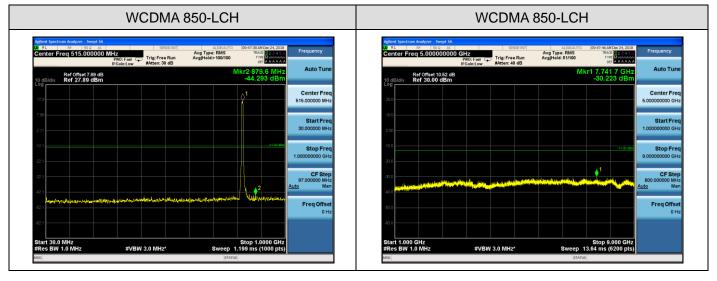


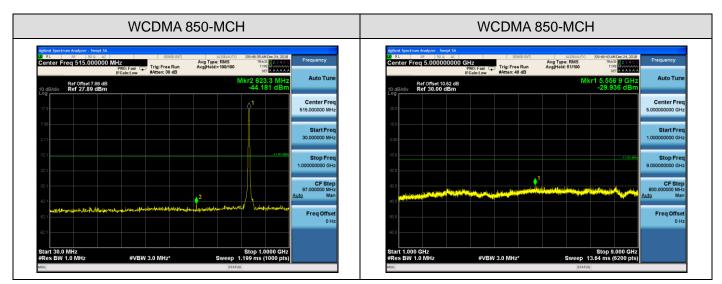
| DI RL | RE 50 R AC | PNO: Fast T | rig: Free Run Atten: 40 dB | ALIGN Avg Type: RM Avg Hold: 90/10 | S TR Mkr1 12.6 | | Frequency Auto Tune | Center Fre | n Analyzer - Swept SA RF 50 p AC eq 16.800000000 G P IFI Ref Offset 11.01 dB | ree Run Avgl | Type: RMS Iold: 62/100 | 02:12:15 PMDec 25, 2018 TRACE 1 2 3 4 5 6 TYPE MARKED 0 0ET A A A A A A 1 19.960 0 GHz | Frequency Auto Tur |
|-------------------------|-------------------------|-------------------|---------------------------------------|--|-------------------|------------|--|-------------------------|---|--------------|---------------------------|--|---|
| 25.0 | Ref 35.00 dBm | | | | -28. | 117 dBm | Center Freq 10.30000000 GHz | 10 dB/div Log | Ref 35.00 dBm | | | -22.976 dBm | Center Fre 16.80000000 GF |
| 5.00 | | | | | | | Start Freq 7.000000000 GHz Stop Freq | -5.00 | | | | | Start Fre 13.600000000 GF Stop Fre |
| -15 0 -25 0 -35 0 | التروية المروية المروية | less, maleriale d | la disebulit di _{terr} orenj | a state in a state | | -13.00 dBn | 13.60000000 GHz CF Step 660.00000 MHz <u>Auto</u> Man | -15 0 -25 0 -36 0 | len andre see andre see | | antes a constantina (| | 20.00000000 GF CF Ste 640.000000 MH <u>Auto</u> Ma |
| -45.0 | | | | | | | Freq Offset 0 Hz | -45.0 | | | | | Freq Offse 0 H |

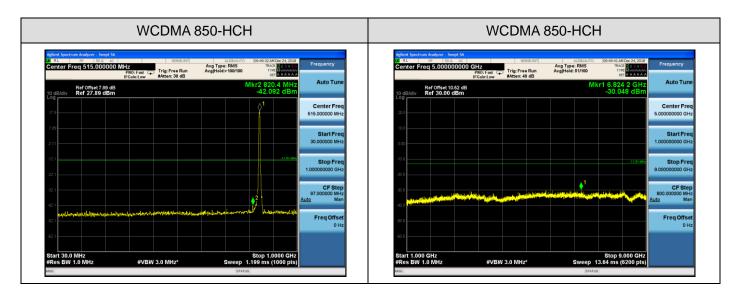


Test Band=WCDMA850/WCDMA1700/WCDMA1900

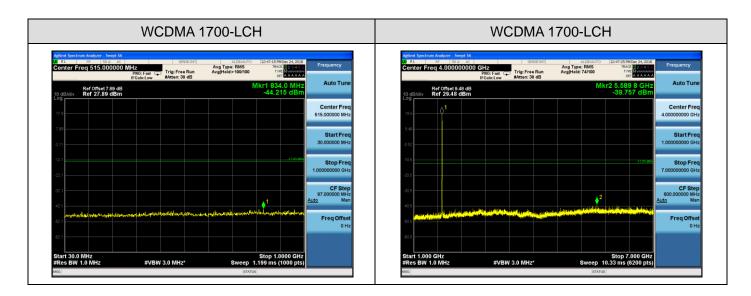
Test Mode=UMTS



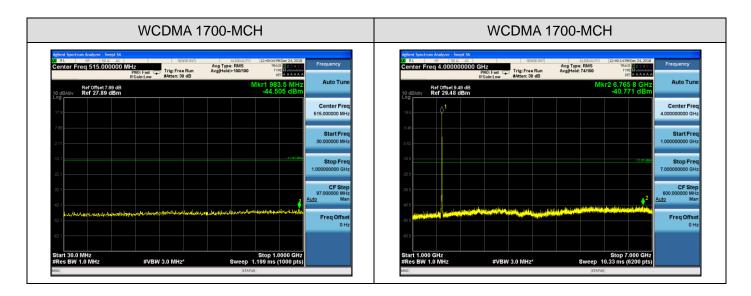






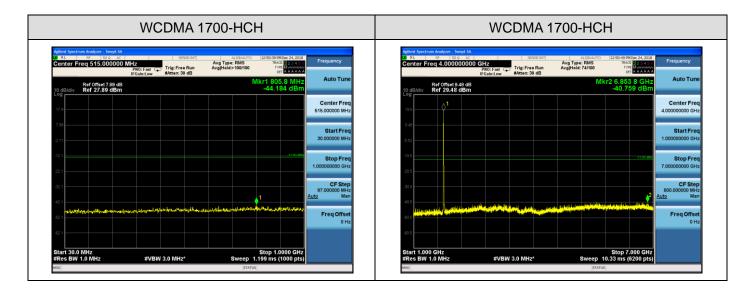


| WCDMA 1700-LCH | WCDMA 1700-LCH |
|---|--|
| Added Spectrum Andycer Spectrum Andycer Spectrum Andycer File Spectrum Andycer File File | Action Spectrum Advance - Avery Marce - Avery Type: EMS Avery Type: EMS Marce - Avery Type: EMS Frequency Center Freq 16.8000000000 GHz Figure - Marce - Avery Type: EMS Avery Type: EMS Marce - Avery Type: EMS Trice - Frequency Ref of Souther - Avery Type: EMS Avery Type: EMS Avery Type: EMS Trice - Frequency Ref of Souther - Avery Type: EMS Avery Type: EMS Trice - Frequency Frequency Ref of Souther - Avery Type: EMS Avery Type: EMS Trice - Frequency Frequency Bit Galaxies Trice - Frequency Frequency Frequency Frequency Bit Galaxies Micro - Frequency Frequency Frequency Frequency |
| Control Center Freq 10.2 | Corr Center Freq Center Freq |
| Start 7.000 GHz Stop 13.600 GHz #Res BW 1.0 MHz #VBW 3.0 MHz* Sweep 11.33 ms (6800 pts) Into: [startus] | Start 13.600 CHz Stop 20.000 CHz #Res BW 1.0 MHz #VBW 3.0 MHz* Sweep 16.21 ms (6400 pts) MIG [\$TATU\$] |



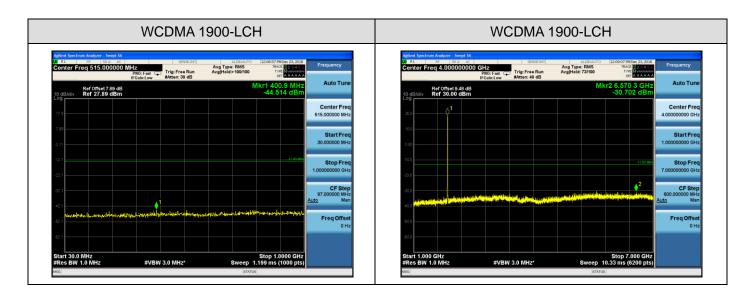
| WCDMA 1700-MCH | WCDMA 1700-MCH |
|--|--|
| Appliet System Analyzer - Swyst XA Stote Skyl AUDIA/I/O 12-89-23 Mole 24,2038 Frequency Center Freq 10.300000000 GHz Firster 2000 Stote Skyl Aug Type: RMS Avg Type: RMS WayHold: 7/1/00 The provide Skyle Frequency Ref Offset 11.33 dB 20 Biolity Mkr1 13.273 8 GHz Auto Tune | Agence Spectra Makyper: Sengt SA Special XI Allow UP Allow UP Special XI Allow UP Allow UP Special XI Specia XI |
| Center Freq 10.300000000 GHz | 200 Center Freq 15.80000000 GHz |
| 000 Start Freq 7.00000000 GHz | 000 Start Freq 000 13 60000000 GHz |
| 000 Stop Freq 200 | 300 Stop Free 20 0000000 CH |
| CON CF Step | 20.0 CF Step 40.0 MH2 CF Step |
| The second secon | 800 FreqOffset 0Hz |
| Start 7.000 GHz #Res BW 1.0 MHz #VBW 3.0 MHz' Sweep 11.33 ms (6800 GHz) | Star 13.000 CHz Stop 20.000 CHz #Res 15W 1.0 MHz #VBW 3.0 MHz* Sweep 16.21 ms (6400 pts) |
| #Res BW 1.0 MHz #VBW 3.0 MHz* Sweep 11.33 ms (6800 pts) | #Res BW 1.0 MHz #VBW 3.0 MHz* Sweep 16.21 ms (6400 pts) |



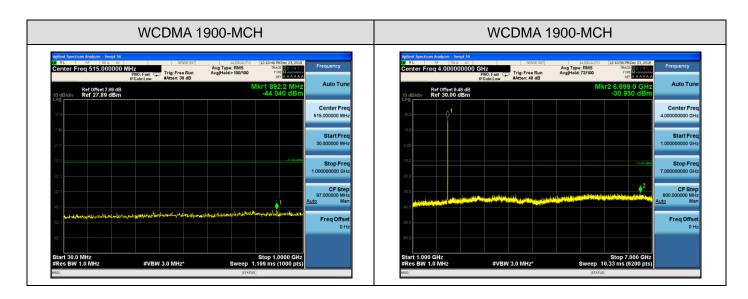


| UN RL | Im Analyzer - Swept SA RF 50 P AC eq 10.300000000 | GHZ PNO: Fast C Trig: | | ALIGNAUTO Avg Type: RMS Avg Hold: 71/100 | 12:50:58 PMDec 24, 2018 TRACE 2 2 3 4 5 6 TYPE UNIT A A A A A A | Frequency | Agliont Spectrum Analyzer - Swept SA (# RL RF 50 P AC Center Freq 16:8000000 | PNO: Fast 😱 Trig: Free Run | ALIGNAUTO 12:51:07 PMDec 24, 2018 Avg Type: RMS TRACE 12:0 LISE Avg Hold: 49/100 TYPE | Frequency |
|----------------------|---|---------------------------|-----------------|--|---|--|--|---|---|--------------------------------------|
| 10 dB/div | Ref Offset 11.38 dB Ref 30.00 dBm | FGain:Low #Atte | n: 30 dB | Mk | r1 13.129 2 GHz -36.949 dBm | Auto Tune | Ref Offset 11.91 dB 10 dB/div Ref 30.00 dBm | IFGain:Low #Atten: 30 dB | Mkr1 19.925 0 GHz -31.627 dBm | Auto Tur |
| 20.0 | | | | | | Center Freq 10.30000000 GHz | 20.0 | | | Center Free 16.800000000 GH |
| 0.00 | | | | | | Start Freq 7.000000000 GHz | 0.00 | | | Start Free 13.600000000 GH |
| -10.0 | | | | | | Stop Freq 13.60000000 GHz | -10.0 | | -13.00 dbm | Stop Free 20.000000000 GH |
| -30.0 | | a sa guna talifaidas ka t | | | 1 | CF Step 660.000000 MHz <u>Auto</u> Man | -30.0 | and the second secon | د. الاست. المانية من المانية عن المانية ال | CF Step 640.000000 MH Auto Mar |
| -50.0 | | | anite a safari. | | | Freq Offset 0 Hz | -50.0 | | | Freq Offse 0 H |
| -80.0 Start 7.000 | | | | | Stop 13.600 GHz | | -60.0 Start 13.600 GHz | | Stop 20.000 GHz | |



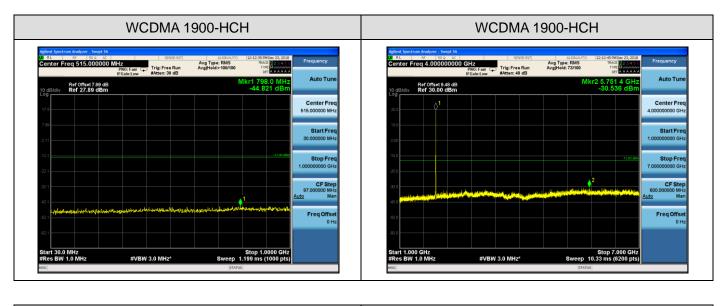


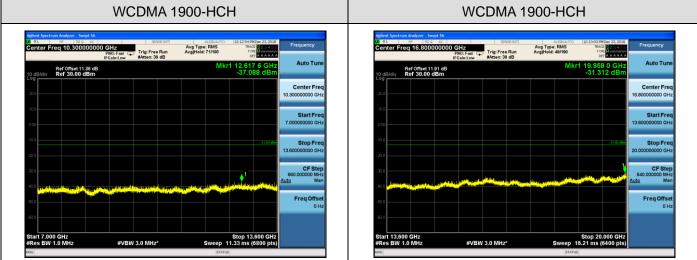
| WCDMA 1900-LCH | WCDMA 1900-LCH |
|---|---|
| Agelost Spectrum Analyzer S and Section 2010 (2010) (2010 | Agtiont Spectrum Analyser Swept 503 State All Social Spectrum Analyser Swept 503 Frequency 21 All on processing 100 mon 100 mon 100 mon 100 mon 100 mon Program Program <t< th=""></t<> |
| Log Center Freq 000 Start Freq 0000 Start Freq 00000 Start Freq 00000 Start Freq 000000 Start Freq 000000 Start Freq 000000 Start Freq 000000 Start Freq 0000000 Start Freq 000000000 Start Freq 000000000 | Control Center Freq 200 100 100 100 000 100 <t< th=""></t<> |
| 201 Image: Start 7.000 GHz #VBW 3.0 MHz* Stop 13.600 GHz Image: Start 7.000 | 600 Freq Offset 600 Start 13.600 GHz #Res BW 1.0 MHz #VBW 3.0 MHz* Start 13.600 GHz Start 13.600 GHz |



| Ref Offset 11.38 dB | IZ Avg Or Fast Trig: Free Run Avg ain:Low #Atten: 30 dB | ALIMAJTO 12:11:05 Mile: 23, 2018 Type: RMS Two: IP Dates F Held: 71/100 Two: IP Dates F Held: 71/100 Two: IP Dates F Held: 71/100 Tune Auto Tune | Address Several Sole And Sole | Avg Type: RMS Avg Hold: 49/100 Mkr1 19.948 0 GHz Avg Hold: 49/100 Mkr1 19.948 0 GHz |
|---|---|--|---|--|
| 200 A C C C C C C C C C C C C C C C C C C | | -36,663 dBm Center Freq 10.3000000 GHz 10.30000000 GHz Start Freq 7.0000000 GHz Start Freq 7.0000000 GHz CF Step 66000000 MHz Auto Freq Offset 0 Hz | 10 gBMdv Ref 30.00 dBm 200 | -31,632 dBm Center Fr 10,5000000 G Start Fr 13,50000000 G Start Fr 13,50000000 G Start Fr 20,0000000 G Center Fr 13,5000000 G Start Fr 20,0000000 G Center Fr 13,5000000 G Start Fr 20,000000 G Start Fr 20,000000 G Start Fr 20,000000 G Start Fr 20,00000 G Start Fr 540,0000 M Start Fr 540,0000 M Start Fr 640,0000 M Start Fr 640,000 M Start Fr 640,0000 M Start Fr 640,000 M Start Fr 640,000M |







Note:1. Below 30MHZ no Spurious found and Above is the worst mode data.

2. As no emission found in standby or receive mode, no recording in this report.



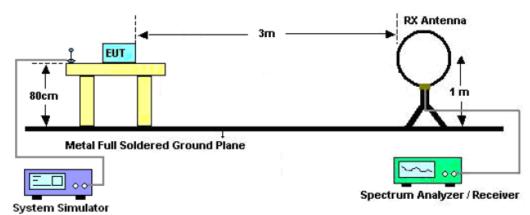
9.2 RADIATED SPURIOUS EMISSION

9.2.1MEASUREMENT METHOD

- 1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
- 2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
- 3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
- 4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
- 5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
- 6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
- 7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
- 8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
- 9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
- 10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High Low scan is not required in this case.

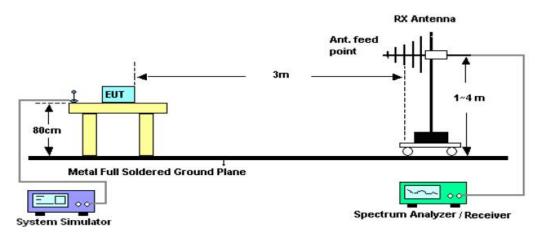


9.2.2 TEST SETUP

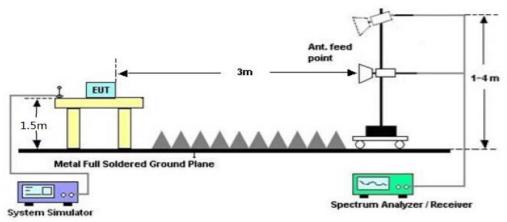


Radiated Emission Test-Setup Frequency Below 30MHz

RADIATED EMISSION TEST SETUP 30MHz-1000MHz



RADIATED EMISSION TEST SETUP ABOVE 1000MHz





9.2.3 PROVISIONS APPLICABLE

(a) On any frequency outside a licensee's frequency block (e.g. A, D, B, etc.) within the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log(P) dB. The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out. **Note:** only result the worst condition of each test mode:



9.2.4 MEASUREMENT RESULT

GSM 850:

| | The Worst Test | Results for Channel | 251/848.8 MHz | |
|-----------|----------------|---------------------|---------------|------------|
| Frequency | Emission Level | Limits | Margin | Comment |
| (MHz) | (dBm) | (dBm) | (dB) | Comment |
| 1967.60 | -48.98 | -13 | -35.98 | Horizontal |
| 3456.47 | -32.69 | -13 | -19.69 | Horizontal |
| 6722.25 | -45.25 | -13 | -32.25 | Horizontal |
| 1967.60 | -38.18 | -13 | -25.18 | Vertical |
| 3399.54 | -49.66 | -13 | -36.66 | Vertical |
| 6749.64 | -32.23 | -13 | -19.23 | Vertical |

GSM 850(EDGE 8):

| | The Worst Test Results for Channel 251/848.8 MHz | | | | | | | | |
|-----------|--|--------|--------|------------|--|--|--|--|--|
| Frequency | Emission Level | Limits | Margin | Comment | | | | | |
| (MHz) | (dBm) | (dBm) | (dB) | Comment | | | | | |
| 1967.60 | -50.16 | -13 | -37.16 | Horizontal | | | | | |
| 3485.45 | -39.55 | -13 | -26.55 | Horizontal | | | | | |
| 6799.64 | -48.16 | -13 | -35.16 | Horizontal | | | | | |
| 1967.60 | -36.23 | -13 | -23.23 | Vertical | | | | | |
| 3464.47 | -50.59 | -13 | -37.59 | Vertical | | | | | |
| 6846.25 | -31.44 | -13 | -18.44 | Vertical | | | | | |



PCS 1900:

| | The Worst Test Results for Channel 810/1909.8MHz | | | | | | | | |
|-----------|--|--------|--------|------------|--|--|--|--|--|
| Frequency | Emission Level | Limits | Margin | Comment | | | | | |
| (MHz) | (dBm) | (dBm) | (dB) | Comment | | | | | |
| 1847.52 | -48.88 | -13 | -35.88 | Horizontal | | | | | |
| 3819.60 | -35.64 | -13 | -22.64 | Horizontal | | | | | |
| 7569.22 | -47.11 | -13 | -34.11 | Horizontal | | | | | |
| 1845.48 | -36.33 | -13 | -23.33 | Vertical | | | | | |
| 3845.12 | -47.42 | -13 | -34.42 | Vertical | | | | | |
| 7644.23 | -35.18 | -13 | -22.18 | Vertical | | | | | |

PCS 1900(EDGE):

| | The Worst Test Results for Channel 810/1909.8MHz | | | | | | | | |
|-----------|--|--------|--------|------------|--|--|--|--|--|
| Frequency | Emission Level | Limits | Margin | Comment | | | | | |
| (MHz) | (dBm) | (dBm) | (dB) | Comment | | | | | |
| 1800.12 | -51.44 | -13 | -38.44 | Horizontal | | | | | |
| 3819.60 | -39.36 | -13 | -26.36 | Horizontal | | | | | |
| 7635.22 | -49.49 | -13 | -36.49 | Horizontal | | | | | |
| 1814.21 | -38.35 | -13 | -25.35 | Vertical | | | | | |
| 3819.60 | -47.55 | -13 | -34.55 | Vertical | | | | | |
| 7631.47 | -33.43 | -13 | -20.43 | Vertical | | | | | |



HSPA band II:

| | The Worst Test | Results for Channel 9 | 9538/1907.6MHz | |
|-----------|----------------|-----------------------|----------------|------------|
| Frequency | Emission Level | Limits | Margin | Comment |
| (MHz) | (dBm) | (dBm) | (dB) | Comment |
| 1489.55 | -45.44 | -13 | -32.44 | Horizontal |
| 3815.20 | -30.27 | -13 | -17.27 | Horizontal |
| 7621.02 | -49.14 | -13 | -36.14 | Horizontal |
| 1815.42 | -31.62 | -13 | -18.62 | Vertical |
| 3815.20 | -45.49 | -13 | -32.49 | Vertical |
| 7633.53 | -30.2 | -13 | -17.2 | Vertical |

HSPA band IV:

| | The Worst Test | Results for Channel 8 | 8763/1752.6MHz | |
|-----------|----------------|-----------------------|----------------|------------|
| Frequency | Emission Level | Limits | Margin | Comment |
| (MHz) | (dBm) | (dBm) | (dB) | Comment |
| 1854.15 | -49.44 | -13 | -36.44 | Horizontal |
| 3505.20 | -35.33 | -13 | -22.33 | Horizontal |
| 7833.46 | -49.10 | -13 | -36.10 | Horizontal |
| 1486.22 | -38.59 | -13 | -25.59 | Vertical |
| 3505.20 | -48.42 | -13 | -35.42 | Vertical |
| 7641.36 | -34.19 | -13 | -21.19 | Vertical |

HSPA band V:

| | The Worst Test | Results for Channel | 4233/846.6MHz | |
|-----------|----------------|---------------------|---------------|------------|
| Frequency | Emission Level | Limits | Margin | Comment |
| (MHz) | (dBm) | (dBm) | (dB) | Comment |
| 1693.20 | -48.33 | -13 | -35.33 | Horizontal |
| 3025.46 | -32.85 | -13 | -19.85 | Horizontal |
| 6643.97 | -47.48 | -13 | -34.48 | Horizontal |
| 1693.20 | -30.16 | -13 | -17.16 | Vertical |
| 315.23 | -44.52 | -13 | -31.52 | Vertical |
| 6513.18 | -32.15 | -13 | -19.15 | Vertical |

RESULT: PASS

Note:

- 1. Margin = Emission Level -Limit
- 2. Below 30MHZ no Spurious found and Above is the worst mode data



10. FREQUENCY STABILITY

10.1 MEASUREMENT METHOD

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a "call mode". This is accomplished with the use of R&S CMU200 DIGITAL RADIO COMMUNICATION TESTER.

- 1 Measure the carrier frequency at room temperature.
- 2 Subject the EUT to overnight soak at -10° C.

3 With the EUT, powered via nominal voltage, connected to the CMU200 and in a simulated call on channel 661 for PCS 1900 band, channel 190 for GSM 850 band, channel 9400 for UMTS band II and channel 4175 for UMTS band V measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.

4 Repeat the above measurements at 10° C increments from -10° C to $+50^{\circ}$ C. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.

5 Re-measure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments re-measuring carrier frequency at each voltage. Pause at nominal voltage for 1 1/2 hours unpowered, to allow any self-heating to stabilize, before continuing.

6 Subject the EUT to overnight soak at +50℃.

7 With the EUT, powered via nominal voltage, connected to the CMU200 and in a simulated call on the centre channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.

8 Repeat the above measurements at 10° C increments from $+50^{\circ}$ C to -10° C. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.

9 At all temperature levels hold the temperature to +/- 0.5° during the measurement procedure.



10.2 PROVISIONS APPLICABLE

10.2.1 FOR HAND CARRIED BATTERY POWERED EQUIPMENT

According to the ANSI/TIA-603-E-2016, the frequency stability of the carrier shall be accurate to within 0.1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235, Frequency Stability. 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 3.23VDC and 4.35VDC, 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 overstress. These voltages represent a tolerance of -10 % and +12.5 %. For the purposes of measuring frequency stability these voltage limits are to be used.

10.2.2 FOR EQUIPMENT POWERED BY PRIMARY SUPPLY VOLTAGE

According to the ANSI/TIA-603-E-2016, the frequency stability of the carrier shall be accurate to within 0.1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. For this EUT section 2.1055(d)(1) applies. This requires varying primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment, the normal environment temperature is 20°C.



10.3 MEASUREMENT RESULT

Test Results

Frequency Error vs. Voltage:

| Test | Test | Test | Test | Test | Freq.Error | Freq.vs.rated | Limit | Vardiat |
|--------|------|---------|-------|----------|------------|---------------|-------|---------|
| Band | Mode | Channel | Temp. | Volt.(V) | (Hz) | (ppm) | (ppm) | Verdict |
| | | | TN | 3.23 | 10.72 | 0.013007 | ±2.5 | PASS |
| | | LCH | TN | 3.80 | 8.20 | 0.009949 | ±2.5 | PASS |
| | | | TN | 4.35 | 12.66 | 0.015360 | ±2.5 | PASS |
| | | м мсн | TN | 3.23 | 1.61 | 0.001924 | ±2.5 | PASS |
| GSM850 | GSM | | TN | 3.80 | 1.68 | 0.002008 | ±2.5 | PASS |
| | | | TN | 4.35 | 3.87 | 0.004626 | ±2.5 | PASS |
| | | | TN | 3.23 | 13.43 | 0.015822 | ±2.5 | PASS |
| | | HCH | TN | 3.80 | 6.33 | 0.007458 | ±2.5 | PASS |
| | | | TN | 4.35 | 2.65 | 0.003122 | ±2.5 | PASS |

| Test | Test | Test | Test | Test | Freq.Error | Freq.vs.rated | Limit | Vardiat |
|--------|------|----------|-------|----------|------------|---------------|-------|---------|
| Band | Mode | Channel | Temp. | Volt.(V) | (Hz) | (ppm) | (ppm) | Verdict |
| | | | TN | 3.23 | 16.69 | 0.020250 | ±2.5 | PASS |
| | | LCH | TN | 3.80 | 18.63 | 0.022604 | ±2.5 | PASS |
| | | | TN | 4.35 | 15.79 | 0.019158 | ±2.5 | PASS |
| | | | TN | 3.23 | 14.43 | 0.017248 | ±2.5 | PASS |
| GSM850 | EDGE | EDGE MCH | TN | 3.80 | 13.08 | 0.015635 | ±2.5 | PASS |
| | | | TN | 4.35 | 11.69 | 0.013973 | ±2.5 | PASS |
| | | | TN | 3.23 | 18.37 | 0.021642 | ±2.5 | PASS |
| | | | TN | 3.80 | 16.66 | 0.019628 | ±2.5 | PASS |
| | | | TN | 4.35 | 16.50 | 0.019439 | ±2.5 | PASS |



| Test | Test | Test | Test | Test | Freq.Error | Freq.vs.rated | Verdict |
|-------------|------|---------|-------|-----------|------------|---------------|---------|
| Band | Mode | Channel | Temp. | Volt. (V) | (Hz) | (ppm) | |
| | | | TN | 3.23 | 10.14 | 0.005480 | PASS |
| | | LCH | TN | 3.80 | 13.62 | 0.007361 | PASS |
| | | | TN | 4.35 | 11.69 | 0.006318 | PASS |
| DOO | | м мсн | TN | 3.23 | 8.39 | 0.004463 | PASS |
| PCS 1900 | GSM | | TN | 3.80 | 13.43 | 0.007144 | PASS |
| 1900 | | | TN | 4.35 | 11.62 | 0.006181 | PASS |
| | | | TN | 3.23 | -7.23 | -0.003786 | PASS |
| | | HCH | TN | 3.80 | -8.14 | -0.004262 | PASS |
| | | | TN | 4.35 | -2.65 | -0.001388 | PASS |

| Test | Test | Test | Test | Test | Freq.Error | Freq.vs.rated | Verdict |
|------|------|---------|-------|-----------|------------|---------------|---------|
| Band | Mode | Channel | Temp. | Volt. (V) | (Hz) | (ppm) | |
| | | | ΤN | 3.23 | -7.97 | -0.004308 | PASS |
| | | LCH | TN | 3.80 | -3.68 | -0.001989 | PASS |
| | | | TN | 4.35 | -3.26 | -0.001762 | PASS |
| PCS | | | TN | 3.23 | 0.16 | 0.000085 | PASS |
| 1900 | EDGE | MCH | TN | 3.80 | -1.87 | -0.000995 | PASS |
| 1900 | | | TN | 4.35 | -0.94 | -0.000500 | PASS |
| | | НСН | TN | 3.23 | -12.75 | -0.006676 | PASS |
| | | | TN | 3.80 | -9.78 | -0.005121 | PASS |
| | | | TN | 4.35 | -10.17 | -0.005325 | PASS |



Frequency Error vs. Temperature:

| Test | Test | Test | Test | Test | Freq.Error | Freq.vs.rated | Limit | Vordict |
|--------|------|---------|-------|-------------------|------------|---------------|-------|---------|
| Band | Mode | Channel | Volt. | Tem. (° ℃) | (Hz) | (ppm) | (ppm) | Verdict |
| | | | VN | -10 | 10.72 | 0.013007 | ±2.5 | PASS |
| | | | VN | 0 | 7.43 | 0.009015 | ±2.5 | PASS |
| | | | VN | 10 | 12.14 | 0.014729 | ±2.5 | PASS |
| GSM850 | GSM | LCH | VN | 20 | 14.46 | 0.017544 | ±2.5 | PASS |
| | | | VN | 30 | 12.01 | 0.014572 | ±2.5 | PASS |
| | | | VN | 40 | 9.43 | 0.011441 | ±2.5 | PASS |
| | | | VN | 50 | 5.75 | 0.006976 | ±2.5 | PASS |
| | | SM МСН | VN | -10 | 3.81 | 0.004554 | ±2.5 | PASS |
| | | | VN | 0 | 2.45 | 0.002929 | ±2.5 | PASS |
| | | | VN | 10 | 7.49 | 0.008953 | ±2.5 | PASS |
| GSM850 | GSM | | VN | 20 | 13.95 | 0.016675 | ±2.5 | PASS |
| | | | VN | 30 | 6.39 | 0.007638 | ±2.5 | PASS |
| | | | VN | 40 | 9.04 | 0.010806 | ±2.5 | PASS |
| | | | VN | 50 | 8.07 | 0.009646 | ±2.5 | PASS |
| | | | VN | -10 | 6.46 | 0.007611 | ±2.5 | PASS |
| | | | VN | 0 | 7.55 | 0.008895 | ±2.5 | PASS |
| | | | VN | 10 | 6.39 | 0.007528 | ±2.5 | PASS |
| GSM850 | GSM | НСН | VN | 20 | 4.97 | 0.005855 | ±2.5 | PASS |
| | | | VN | 30 | 6.46 | 0.007611 | ±2.5 | PASS |
| | | | VN | 40 | 3.49 | 0.004112 | ±2.5 | PASS |
| | | | VN | 50 | 8.65 | 0.010191 | ±2.5 | PASS |



| Test | Test | Test | Test | Test | Freq.Error | Freq.vs.rated | Limit | Verdict | |
|--------|-----------|---------|-------|------------------|------------|---------------|----------|---------|------|
| Band | Mode | Channel | Volt. | Tem. (℃) | (Hz) | (ppm) | (ppm) | verdict | |
| | | | VN | -10 | 17.85 | 0.021657 | ±2.5 | PASS | |
| | | | VN | 0 | 15.50 | 0.018806 | ±2.5 | PASS | |
| | M850 EDGE | | VN | 10 | 15.17 | 0.018406 | ±2.5 | PASS | |
| GSM850 | | LCH | VN | 20 | 13.79 | 0.016731 | ±2.5 | PASS | |
| | | | VN | 30 | 14.30 | 0.017350 | ±2.5 | PASS | |
| | | | | VN | 40 | 12.59 | 0.015275 | ±2.5 | PASS |
| | | | VN | 50 | 11.85 | 0.014378 | ±2.5 | PASS | |
| | | Е МСН | VN | -10 | 14.63 | 0.017751 | ±2.5 | PASS | |
| | | | VN | 0 | 14.14 | 0.017156 | ±2.5 | PASS | |
| | | | VN | 10 | 11.24 | 0.013435 | ±2.5 | PASS | |
| GSM850 | EDGE | | VN | 20 | 13.43 | 0.016053 | ±2.5 | PASS | |
| | | | VN | 30 | 12.72 | 0.015204 | ±2.5 | PASS | |
| | | | VN | 40 | 13.46 | 0.016089 | ±2.5 | PASS | |
| | | | VN | 50 | 11.07 | 0.013232 | ±2.5 | PASS | |
| | | | VN | -10 | 11.43 | 0.013662 | ±2.5 | PASS | |
| | | | VN | 0 | 12.11 | 0.014475 | ±2.5 | PASS | |
| | | | VN | 10 | 14.79 | 0.017679 | ±2.5 | PASS | |
| GSM850 | EDGE | HCH | VN | 20 | 12.66 | 0.015133 | ±2.5 | PASS | |
| | | | VN | 30 | 17.08 | 0.020123 | ±2.5 | PASS | |
| | | | VN | 40 | 17.21 | 0.020276 | ±2.5 | PASS | |
| | | | VN | 50 | 18.73 | 0.022066 | ±2.5 | PASS | |



Report No.: HK1901140097E

| Test | Test | Test | Test | Test | Freq.Error | Freq.vs.rated | Verdiet |
|-------------|------|---------|-------|-------------------|------------|---------------|---------|
| Band | Mode | Channel | Volt. | Tem. (° ℃) | (Hz) | (ppm) | Verdict |
| | | | VN | -10 | 12.66 | 0.006843 | PASS |
| | | | VN | 0 | 16.14 | 0.008723 | PASS |
| PCS | | | VN | 10 | 13.30 | 0.007188 | PASS |
| 1900 | GSM | LCH | VN | 20 | 12.07 | 0.006524 | PASS |
| 1900 | | | VN | 30 | 13.62 | 0.007361 | PASS |
| | | | VN | 40 | 12.40 | 0.006702 | PASS |
| | | | VN | 50 | 9.88 | 0.005340 | PASS |
| | | | VN | -10 | 10.59 | 0.005724 | PASS |
| | | | VN | 0 | 12.01 | 0.006491 | PASS |
| DOO | | МСН | VN | 10 | 12.46 | 0.006628 | PASS |
| PCS 1900 | GSM | | VN | 20 | 17.05 | 0.009069 | PASS |
| 1900 | | | VN | 30 | 16.27 | 0.008654 | PASS |
| | | | VN | 40 | 13.37 | 0.007112 | PASS |
| | | | VN | 50 | 15.11 | 0.008037 | PASS |
| | | | VN | -10 | 14.40 | 0.007660 | PASS |
| | | | VN | 0 | 19.31 | 0.010271 | PASS |
| DOO | | | VN | 10 | 16.66 | 0.008862 | PASS |
| PCS | GSM | HCH | VN | 20 | 16.98 | 0.009032 | PASS |
| 1900 | 1900 | | VN | 30 | 5.04 | 0.002639 | PASS |
| | | | VN | 40 | 4.84 | 0.002534 | PASS |
| | | | VN | 50 | 5.23 | 0.002739 | PASS |



Report No.: HK1901140097E

| Test | Test | Test | Test | Test | Freq.Error | Freq.vs.rated | Vordict |
|---------|--------------|---------|-------|-----------------|------------|---------------|---------|
| Band | Mode | Channel | Volt. | Tem. (℃) | (Hz) | (ppm) | Verdict |
| | | | VN | -30 | -4.65 | -0.002513 | PASS |
| | | | VN | -20 | -6.36 | -0.003437 | PASS |
| | | | VN | -10 | -3.68 | -0.001989 | PASS |
| | | | VN | 0 | -7.01 | -0.003789 | PASS |
| GSM1900 | GSM1900 EDGE | LCH | VN | 10 | -7.26 | -0.003924 | PASS |
| | | | VN | 20 | -6.39 | -0.003454 | PASS |
| | | | VN | 30 | -9.10 | -0.004918 | PASS |
| | | | VN | 40 | -8.52 | -0.004605 | PASS |
| | | | VN | 50 | -5.81 | -0.003140 | PASS |
| | | | VN | -30 | 1.61 | 0.000856 | PASS |
| | | | VN | -20 | 3.87 | 0.002059 | PASS |
| | | | VN | -10 | -1.26 | -0.000670 | PASS |
| | | | VN | 0 | -1.58 | -0.000840 | PASS |
| GSM1900 | EDGE | МСН | VN | 10 | -1.97 | -0.001048 | PASS |
| | | | VN | 20 | -2.52 | -0.001340 | PASS |
| | | | VN | 30 | 1.13 | 0.000601 | PASS |
| | | | VN | 40 | -2.49 | -0.001324 | PASS |
| | | | VN | 50 | -1.84 | -0.000979 | PASS |
| | | | VN | -30 | -13.50 | -0.007069 | PASS |
| | | | VN | -20 | -9.65 | -0.005053 | PASS |
| | | | VN | -10 | -13.50 | -0.007069 | PASS |
| | | | VN | 0 | -9.40 | -0.004922 | PASS |
| GSM1900 | EDGE | НСН | VN | 10 | -15.17 | -0.007943 | PASS |
| | | | VN | 20 | -10.62 | -0.005561 | PASS |
| | | | VN | 30 | -11.88 | -0.006221 | PASS |
| | | | VN | 40 | -13.59 | -0.007116 | PASS |
| | | | VN | 50 | -12.40 | -0.006493 | PASS |



Frequency Error vs. Voltage:

| Test | Test | Test | Test | Test | Freq.Error | Freq.vs.rated | Limit | Vordiat |
|----------|------|---------|-------|----------|------------|---------------|-------|---------|
| Band | Mode | Channel | Temp. | Volt.(V) | (Hz) | (ppm) | (ppm) | Verdict |
| | | | ΤN | 3.23 | 4.49 | 0.005433 | ±2.5 | PASS |
| | | LCH | ΤN | 3.80 | 2.75 | 0.003328 | ±2.5 | PASS |
| | | | ΤN | 4.35 | 2.44 | 0.002953 | ±2.5 | PASS |
| | | ITS MCH | ΤN | 3.23 | -0.18 | -0.000215 | ±2.5 | PASS |
| WCDMA850 | UMTS | | ΤN | 3.80 | 2.11 | 0.002523 | ±2.5 | PASS |
| | | | ΤN | 4.35 | 0.96 | 0.001148 | ±2.5 | PASS |
| | | | ΤN | 3.23 | -2.76 | -0.003260 | ±2.5 | PASS |
| | | НСН | ΤN | 3.80 | 0.52 | 0.000614 | ±2.5 | PASS |
| | | | ΤN | 4.35 | -0.06 | -0.000071 | ±2.5 | PASS |

| Test | Test | Test | Test | Test | Freq.Error | Freq.vs.rated | Verdict |
|-----------|------|---------|-------|----------|------------|---------------|---------|
| Band | Mode | Channel | Temp. | Volt.(V) | (Hz) | (ppm) | verdici |
| WCDMA1700 | UMTS | LCH | TN | 3.23 | 16.07 | 0.009384 | PASS |
| | | | TN | 3.80 | 15.20 | 0.008876 | PASS |
| | | | TN | 4.35 | 16.75 | 0.009782 | PASS |
| | | МСН | TN | 3.23 | -5.81 | -0.003354 | PASS |
| | | | TN | 3.80 | -4.23 | -0.002442 | PASS |
| | | | TN | 4.35 | -3.91 | -0.002257 | PASS |
| | | НСН | TN | 3.23 | 93.43 | 0.053309 | PASS |
| | | | TN | 3.80 | -18.86 | -0.010761 | PASS |
| | | | TN | 4.35 | -21.80 | -0.012439 | PASS |



| Test | Test | Test | Test | Test | Freq.Error | Freq.vs.rated | Vardiat |
|-----------|------|---------|-------|----------|------------|---------------|---------|
| Band | Mode | Channel | Temp. | Volt.(V) | (Hz) | (ppm) | Verdict |
| WCDMA1900 | UMTS | LCH | TN | 3.23 | 0.40 | 0.000216 | PASS |
| | | | TN | 3.80 | -1.22 | -0.000659 | PASS |
| | | | TN | 4.35 | 3.57 | 0.001927 | PASS |
| | | МСН | TN | 3.23 | -2.38 | -0.001266 | PASS |
| | | | TN | 3.80 | -5.33 | -0.002835 | PASS |
| | | | TN | 4.35 | -6.59 | -0.003505 | PASS |
| | | НСН | TN | 3.23 | 305.33 | 0.160060 | PASS |
| | | | TN | 3.80 | 450.07 | 0.235935 | PASS |
| | | | ΤN | 4.35 | 111.10 | 0.058241 | PASS |



Frequency Error vs. Temperature:

| Test | Test | Test | Test | Test | Freq.Error | Freq.vs.rated | Limit | Verdiet |
|----------|------|---------|-------|-----------------|------------|---------------|-------|---------|
| Band | Mode | Channel | Volt. | Tem. (℃) | (Hz) | (ppm) | (ppm) | Verdict |
| | | | VN | -10 | 3.94 | 0.004768 | ±2.5 | PASS |
| | | | VN | 0 | 3.62 | 0.004380 | ±2.5 | PASS |
| WCDMA850 | | | VN | 10 | 3.49 | 0.004223 | ±2.5 | PASS |
| | UMTS | LCH | VN | 20 | -3.42 | -0.004138 | ±2.5 | PASS |
| | | | VN | 30 | 3.48 | 0.004211 | ±2.5 | PASS |
| | | | VN | 40 | 6.06 | 0.007333 | ±2.5 | PASS |
| | | | VN | 50 | 4.78 | 0.005784 | ±2.5 | PASS |
| | UMTS | МСН | VN | -10 | 4.75 | 0.005679 | ±2.5 | PASS |
| | | | VN | 0 | 0.87 | 0.001040 | ±2.5 | PASS |
| | | | VN | 10 | 1.24 | 0.001483 | ±2.5 | PASS |
| WCDMA850 | | | VN | 20 | 2.38 | 0.002846 | ±2.5 | PASS |
| | | | VN | 30 | 4.00 | 0.004782 | ±2.5 | PASS |
| | | | VN | 40 | 1.65 | 0.001973 | ±2.5 | PASS |
| | | | VN | 50 | 3.62 | 0.004328 | ±2.5 | PASS |
| | UMTS | S HCH | VN | -10 | 2.06 | 0.002433 | ±2.5 | PASS |
| | | | VN | 0 | 0.73 | 0.000862 | ±2.5 | PASS |
| WCDMA850 | | | VN | 10 | 1.98 | 0.002339 | ±2.5 | PASS |
| | | | VN | 20 | 1.48 | 0.001748 | ±2.5 | PASS |
| | | | VN | 30 | -4.44 | -0.005245 | ±2.5 | PASS |
| | | | VN | 40 | -1.31 | -0.001547 | ±2.5 | PASS |
| | | | VN | 50 | 1.22 | 0.001441 | ±2.5 | PASS |



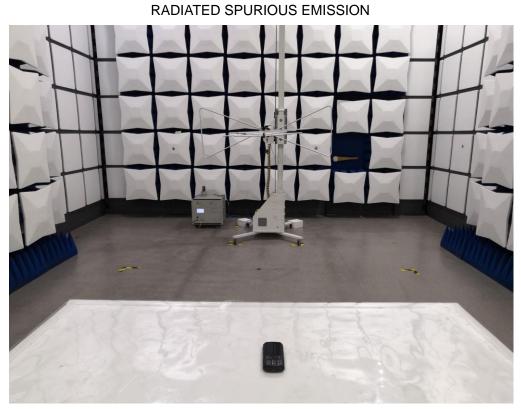
| Test | Test | Test | Test | Test | Freq.Error | Freq.vs.rated |) (a reliet |
|-----------|------|---------|-------|---------|------------|---------------|-------------|
| Band | Mode | Channel | Volt. | Temp. ℃ | (Hz) | (ppm) | Verdict |
| | | | VN | -10 | 17.12 | 0.009998 | PASS |
| | | | VN | 0 | 18.08 | 0.010558 | PASS |
| WCDMA1700 | | | VN | 10 | 19.81 | 0.011569 | PASS |
| | UMTS | LCH | VN | 20 | 15.01 | 0.008765 | PASS |
| | | | VN | 30 | 15.99 | 0.009338 | PASS |
| | | | VN | 40 | 15.63 | 0.009128 | PASS |
| | | | VN | 50 | 16.34 | 0.009542 | PASS |
| | UMTS | 6 MCH | VN | -10 | 16.85 | 0.009726 | PASS |
| | | | VN | 0 | 15.58 | 0.008993 | PASS |
| | | | VN | 10 | -3.07 | -0.001772 | PASS |
| WCDMA1700 | | | VN | 20 | -1.50 | -0.000866 | PASS |
| | | | VN | 30 | -3.51 | -0.002026 | PASS |
| | | | VN | 40 | -5.75 | -0.003319 | PASS |
| | | | VN | 50 | 0.46 | 0.000266 | PASS |
| | UMTS | 6 НСН | VN | -10 | 1.79 | 0.001021 | PASS |
| | | | VN | 0 | -0.15 | -0.000086 | PASS |
| WCDMA1700 | | | VN | 10 | -0.96 | -0.000548 | PASS |
| | | | VN | 20 | -4.90 | -0.002796 | PASS |
| | | | VN | 30 | 96.86 | 0.055266 | PASS |
| | | | VN | 40 | 96.79 | 0.055227 | PASS |
| | | | VN | 50 | 181.90 | 0.103789 | PASS |



Report No.: HK1901140097E

| Test | Test | Test | Test | Test | Freq.Error | Freq.vs.rated |) (a seli a t |
|-----------|------|---------|-------|-----------------|------------|---------------|---------------|
| Band | Mode | Channel | Volt. | Tem. (℃) | (Hz) | (ppm) | Verdict |
| WCDMA1900 | | LCH | VN | -10 | 2.81 | 0.001517 | PASS |
| | | | VN | 0 | 4.59 | 0.002478 | PASS |
| | | | VN | 10 | 0.99 | 0.000534 | PASS |
| | UMTS | | VN | 20 | 5.49 | 0.002964 | PASS |
| | | | VN | 30 | 3.34 | 0.001803 | PASS |
| | | | VN | 40 | 2.59 | 0.001398 | PASS |
| | | | VN | 50 | 0.93 | 0.000502 | PASS |
| | UMTS | 6 MCH | VN | -10 | 2.73 | 0.001452 | PASS |
| | | | VN | 0 | 0.98 | 0.000521 | PASS |
| | | | VN | 10 | -3.40 | -0.001809 | PASS |
| WCDMA1900 | | | VN | 20 | -7.22 | -0.003840 | PASS |
| | | | VN | 30 | -3.75 | -0.001995 | PASS |
| | | | VN | 40 | -3.74 | -0.001989 | PASS |
| | | | VN | 50 | -4.73 | -0.002516 | PASS |
| | UMTS | 6 НСН | VN | -10 | -2.47 | -0.001295 | PASS |
| | | | VN | 0 | -2.38 | -0.001248 | PASS |
| WCDMA1900 | | | VN | 10 | -2.72 | -0.001426 | PASS |
| | | | VN | 20 | -4.91 | -0.002574 | PASS |
| | | | VN | 30 | 231.26 | 0.121231 | PASS |
| | | | VN | 40 | 106.92 | 0.056049 | PASS |
| | | | VN | 50 | 385.65 | 0.202165 | PASS |





APPENDIX A: PHOTOGRAPHS OF TEST SETUP

RADIATED SPURIOUS ABOVE 1G EMISSION



----END OF REPORT----