EXHIBIT 11

TEST REPORT

This test report presents the measurement data required by the Commission for certifying the Alcatel-Lucent CDMA-LTE 65MHz PCS RRH 4x45W, subject of this application, for operation in the domestic PCS A, D, B, E, F, C and G bands (1930-1995 MHz), with CDMA and LTE technologies.

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As stated before, the distributed wireless RRH base station system is comprised of two separate modules 1) the BBU and 2) the RRH. These two modules are interconnected by CPRI though optic fiber or metallic coax cables. All RF functionality is contained in the RRH, including transceiver, power amplifier and transmitting and receiving filters. The BBU provides the digital I and Q baseband signals, plus the timing reference signal to the RRH. The BBU and RRH units can be co-located or remotely located.

The PCS 4x45W RRH supports multiple carriers and CDMA and LTE dual technology by sharing available TX power and bandwidth between two air interface technologies at each antenna port. It also supports transmit diversity and/or MIMO operation (for LTE only). The hardware can support 4x4 MIMO for LTE. The software in the current release supports 2x2 MIMO only.

The PCS 4x45W RRH has 4 antenna ports. The CDMA and/or 5MHz LTE carriers can be placed on all 4 TX/RX paths in a single sector. The PCS 4x45W RRH uses two 2x45W RRHs placed back to back inside a physical enclosure with two external CPRI interfaces: one from 3G BBU (CDMA) while the other one from 4G BBU (LTE). Internally, there is a daisy chaining of two CPRI ports enabling routing and managing the carriers (LTE and CDMA) across two logical halves of the RRH. Either CPRI port can be configured to be a Primary port. Each 2x45W RRH consists of one radio CRP1900, one power amplifier RHPA1900 and one transceiver filter with two transmitting paths, dual PA pallet and dual Filter panel inside. Therefore, the PCS 4x45W RRH has four independent transmitting paths.

The PCS RRH can provide up to 25 Watts (44dBm) per CDMA carrier and 20 Watts (43dBm) per 5MHz LTE carrier, 45 Watts (46.5dBm) per port for multi-carriers and 180 Watts (49dBm) per RRH at the base station transmitting antenna terminals. The PCS 4x45W RRH currently is powered by -48 VDC and available in indoor and outdoor versions.

All testing results submitted in this report were performed on the -48VDC CDMA-LTE PCS 4x45W RRH outdoor with the 9928 BBU during the period of February 1~ April 20, 2012. The above PCS 4x45W RRH passed FCC Part 15 Class A radiated emissions requirements. The performance of indoor version of the PCS 4x45W RRH will be evaluated and authorized through FCC Class I permissive change procedure.

The measurement results have demonstrated that Alcatel-Lucent CDMA-LTE PCS 4x45W RRH is in full compliance with the Rules of the Commission.

SUBEXHIBIT 11.1

Section 2.1033 (c)(14) REQUIRED MEASUREMENT DATA

The required measurement data is presented in the following exhibits as follows:

SUBEXHIBIT 11.2	Section 2.1046	Measurements Required: RF Power Output
SUBEXHIBIT 11.3	Section 2.1047	Modulation Characteristics
SUBEXHIBIT 11.4	Section 2.1049, 24.238	Measurements Required: Occupied Bandwidth and Out-of-Band Emissions
SUBEXHIBIT 11.5	Sections 2.1051, 24.238	Measurements Required: Spurious Emissions at Antenna Terminals
SUBEXHIBIT 11.6	Sections 2.1053, 24.238	Measurements Required: Field Strength of Spurious Radiation
SUBEXHIBIT 11.7	Sections 2.1055, 24.235	Measurements Required: Frequency Stability
SUBEXHIBIT 11.8	Section 2.947	List of Test Equipment Used

SUBEXHIBIT 11.2

Section 2.1046 MEASUREMENT REQUIRED: RF POWER OUTPUT

This test is a measurement of the total RF power level transmitted at the antenna-transmitting terminal (J4), as shown in the accompanying test set-up diagram. The radio was tuned to a channel which is transmitting in the 1930-1995MHz frequency band. The power level of the base station was calibrated to allow the base station to operate at the manufacturer's maximum rated mean power level, i.e., +44dBm (25W) per carrier for CDMA, +43dBm (20W) per carrier for LTE, and +46.5 dBm (45W) per port at the antenna-transmitting terminal.

For CDMA2000 voice application, all the carriers were configured with a combination of the Pilot, Sync, Paging and Traffic channels. The Pilot/Sync/Page channels were set up according to the recommended test model for base stations given in 3GPP2 C.S0010-C v 2.0 (Section 6) with 37 traffic channels for total power & conducted RF unwanted emissions measurements and 6 traffic channels for other tests, as shown in the following table.

Table 11.2.1. Base Station Test Model

Type	Number of Channels	Fraction of Power (linear)	Fraction of Power (dB)
Pilot 1		0.2000	-7.0
Sync 1		0.0471	-13.3
Paging 1		0.1882	-7.3
Traffic	M	0.5647/M	-2.48 - 10 log M

For CDMA2000 high rate packet data application, the carriers were configured with time-division multiplexed Pilot Channel, the MAC (Medium Access Control) Channel with 14 active MAC indices, and the Forward Traffic or Control Channels in each time slot in accordance with 3GPP2 C.S.0032. All time-division multiplexed channels were transmitted at equal power.

For LTE, the RF power output with QPSK, 16QAM and 64QAM modulation were measured respectively.

Power measurements were made with a Hewlett-Packard Power Meter with 8481A Power Sensor (0.01 – 18 GHz) in the average mode. The test set-up for conducting the RF power output measurement is shown in the following figure. Before the testing was started, the Base Station was given a sufficient "warm-up" period as required.

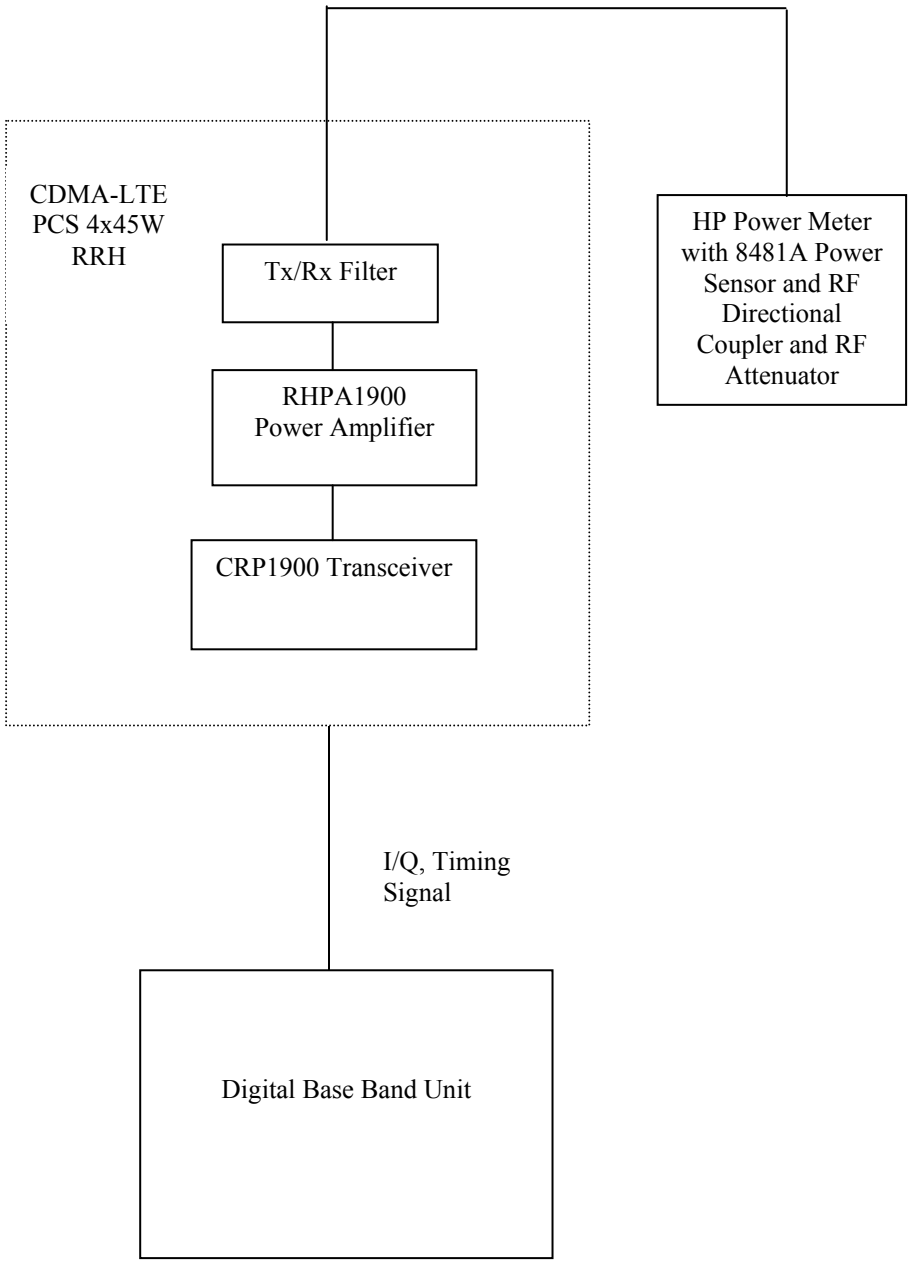
The maximum rated mean power at the antenna transmitting terminal was measured for a single carrier and multiple carriers with CDMA voice and data and LTE technologies across PCS band 1930-1995MHz.

The RF power output measured for each configuration was shown as "Ref Lvl" in the plots provided in SubExhibit 11.4.

Results:

The maximum rated mean RF power outputs of the Alcatel-Lucent CDMA-LTE 4x45W PCS RRH at its antenna transmitting terminals across the PCS frequency band 1930 – 1995 MHz measured are 25W (+44 dBm) per carrier, 45W (+46.5 dBm) per port and 180 W (+52.56 dBm) per RRH, within ±1dB derivation, and are in full compliance with the Rules of the Commission.

FIGURE 11.2.1 TEST SET-UP FOR MEASUREMENT OF RADIO FREQUENCY POWER OUTPUT



SUBEXHIBIT 11.3

Section 2.1047 MEASUREMENT REQUIRED: MODULATION CHARACTERISTICS

The PCS 4x45W RRH supports both CDMA and LTE technologies. The CDMA utilizes digital Quadrature Phase Shift Keying (QPSK) and Quadrature Amplitude Modulation (QAM) scheme. The LTE utilizes Orthogonal Frequency Division Multiplex (OFDM) modulation techniques, where the data is distributed over a large number of closely spaced orthogonal subcarriers. The sub carriers are modulated with conventional modulation scheme, such as QPSK, 16QAM and 64QAM.

The modulation accuracy measures the ability of the transmitter to generate the ideal signal.

In CDMA, the modulation accuracy is defined by the waveform quality which is measured by determining the normalized correlated power between the actual waveform and the ideal waveform. For CDMA voice application, the 3GPP2 C.S0010 recommends the normalized cross correlation coefficient, ρ, shall be greater than 0.912 (excess power < 0.4 dB). For CDMA EVDO application, the waveform quality is tested by measuring the normalized cross correlation coefficients ρ_{data}, ρ_{MAC}, and ρ_{pilot}. The 3GPP2 C.S.0032 recommends ρ_{pilot} shall be greater than 0.97 (excess power < 0.13 dB), ρ_{MAC} shall be greater than 0.912 (excess power < 0.4 dB), and ρ_{data} shall be greater than 0.97 (excess power < 0.13 dB) for all data rates. For CDMA2000 voice application, the radio was configured to transmit the Forward Pilot Channel only. For CDMA EVDO application, the modulation accuracy measurements were performed with a carrier configured with time-division multiplexed Pilot Channel, the MAC Channel, and the Forward Traffic Channels with full data rate. For CDMA, the measurements were made at Ch 25, 275, 325, 375, 675, 1225 and 1275 for both voice and EVDO, where the carrier power level was adjusted to the rated maximum mean power +44 dBm (25W) at the output terminal.

In LTE, the modulation characteristics for QPSK, 16QAM and 64QAM modulations are measured, which measures the difference between the ideal symbols and the measured symbols after the equalization. The measurement was performed at ch 50, 650, 850 and 1250 for QPSK, 16QAM and 64QAM, respectively, where the carrier power level was adjusted to the rated maximum mean power +43dBm (20W) at the output terminal.

The measurements were performed at the antenna transmitting terminal of the base station system with an Agilent N9020A MXA Signal Analyzer which was calibrated in accordance with ISO 9001 process.

The test set-up diagram is given in the Figure 11.3.1, where the Agilent N9020A MXA used the external signals from the base station as its trigger source and time reference.

Results:

The wave quality factors measured for CDMA carriers are all > 0.912. Figure 11.3.2 shows four representative screen plots of the modulation accuracy measurement at 1931.25MHz Ch 25 for a CDMA carrier in both voice and data modes. Figure 11.3.3 shows three representative screen plots of the modulation measurement at 1992.5MHz Ch 1250 for a LTE carrier in QPSK, 16QAM and 64QAM modulations, respectively. The modulation characteristics of the CDMA-LTE PCS 4x45W RRH is in full compliance with the Rules of the Commission across the Frequency Band 1930 – 1995 MHz.

FIGURE 11.3.1 TEST SET-UP FOR MEASUREMENT OF MODULATION ACCURACY, OCCUPIED BANDWIDTH AND OUT-OF-BAND EMISSIONS

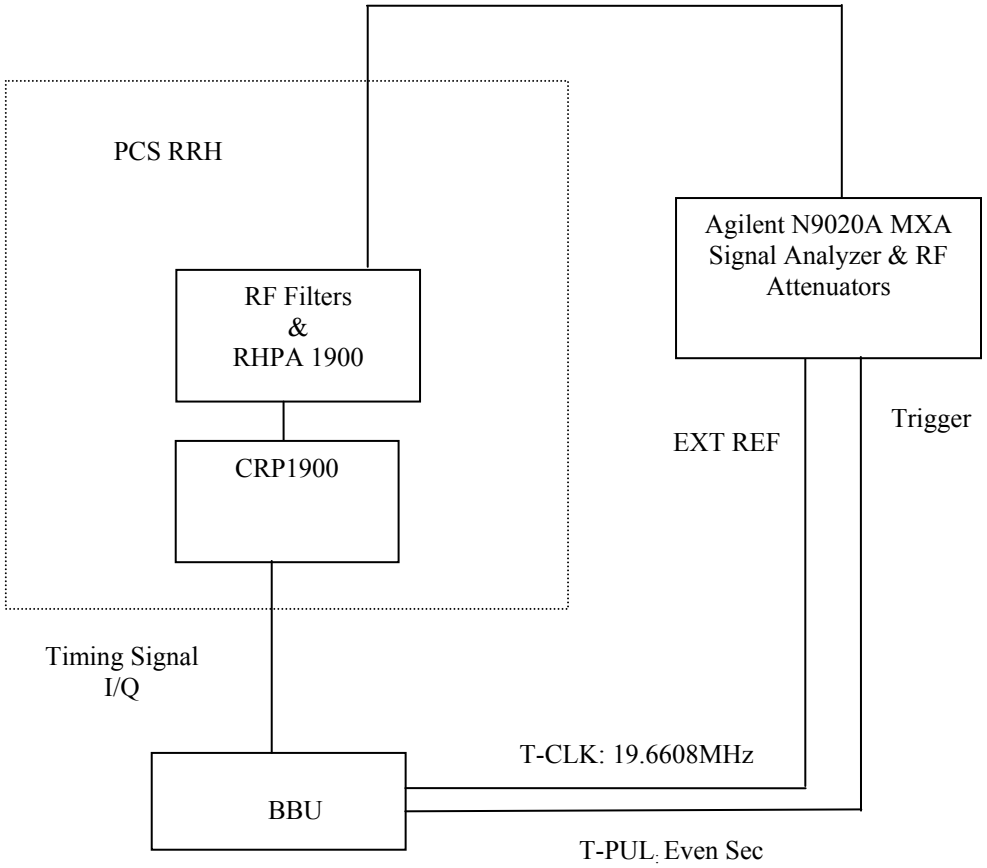


FIGURE 11.3.2 SCREEN PLOT OF MODULATION ACCURACY MEASUREMENT AT CHANNEL 25, 1931.25 MHz, FOR CDMA2000 VOICE

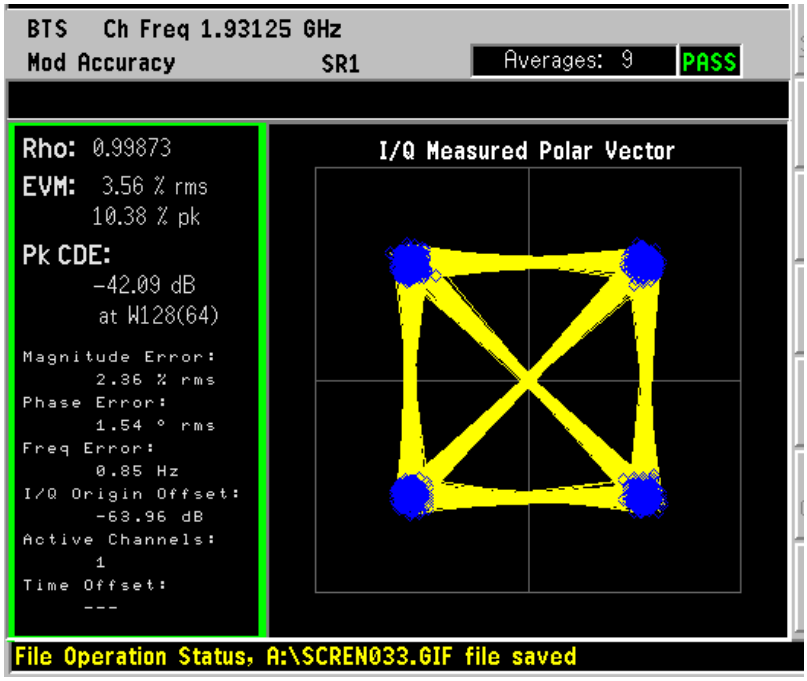
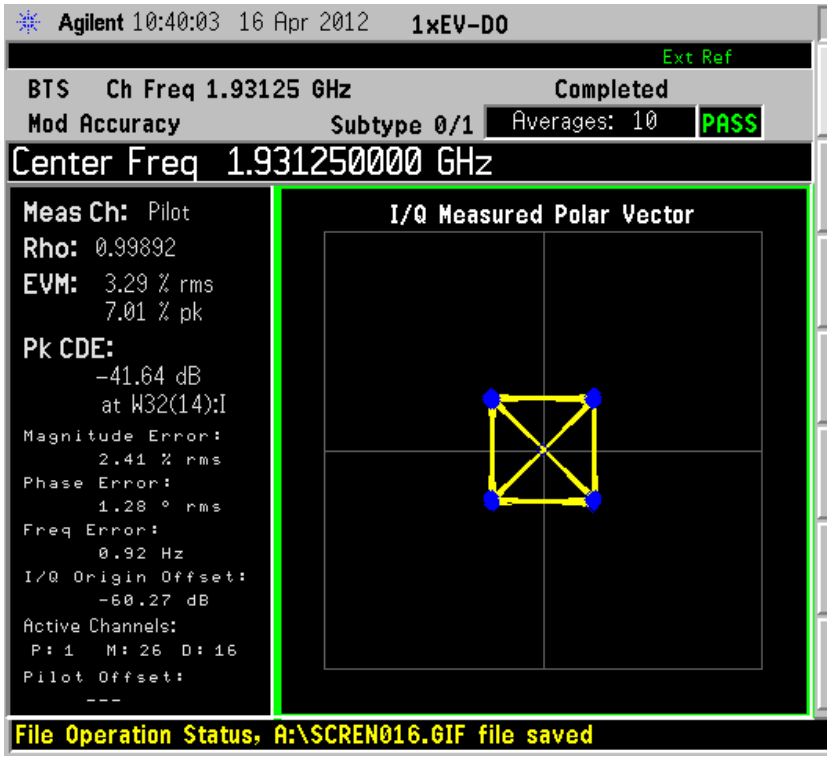
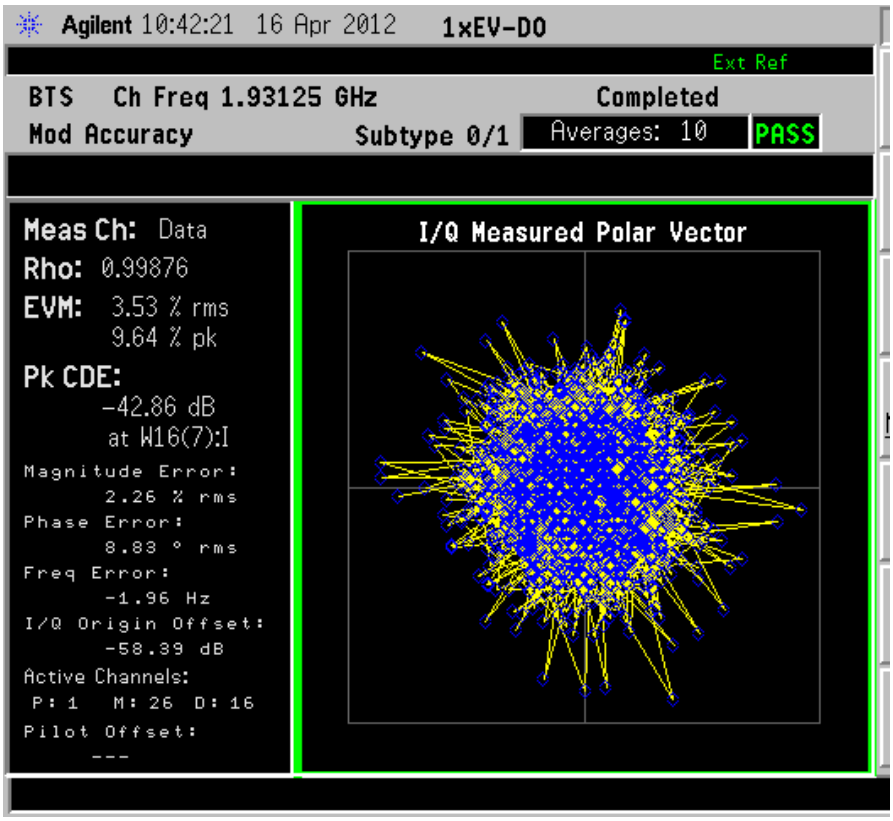
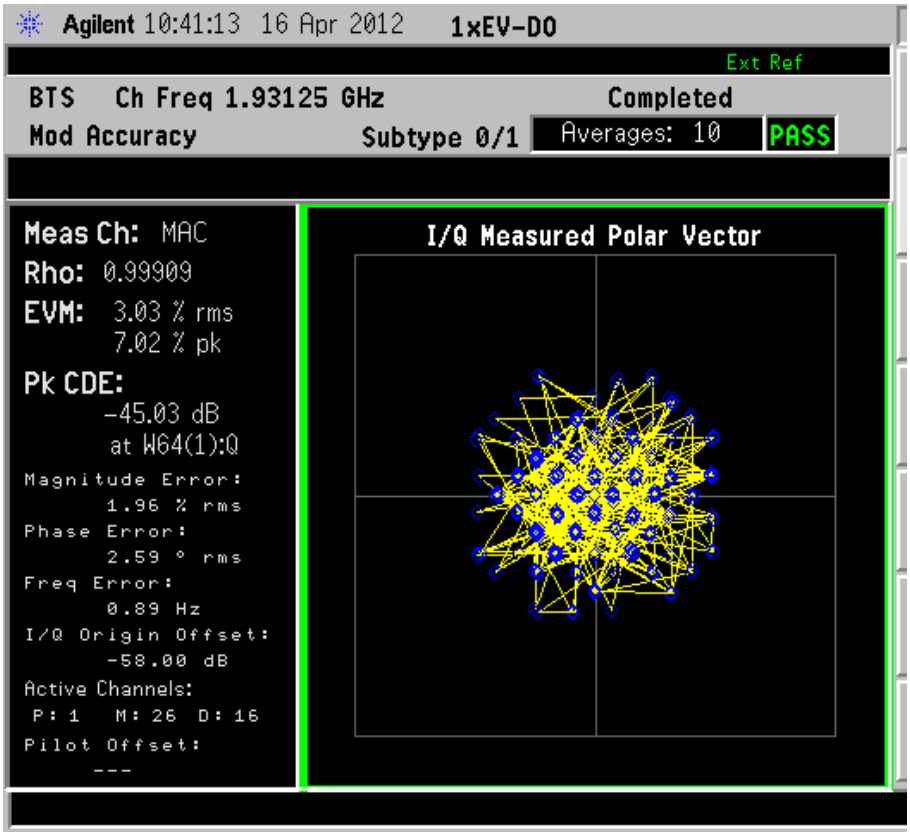


FIGURE 11.3.3 SCREEN PLOT OF MODULATION ACCURACY MEASUREMENT AT CHANNEL 25, 1931.25 MHz, FOR CDMA2000 DATA



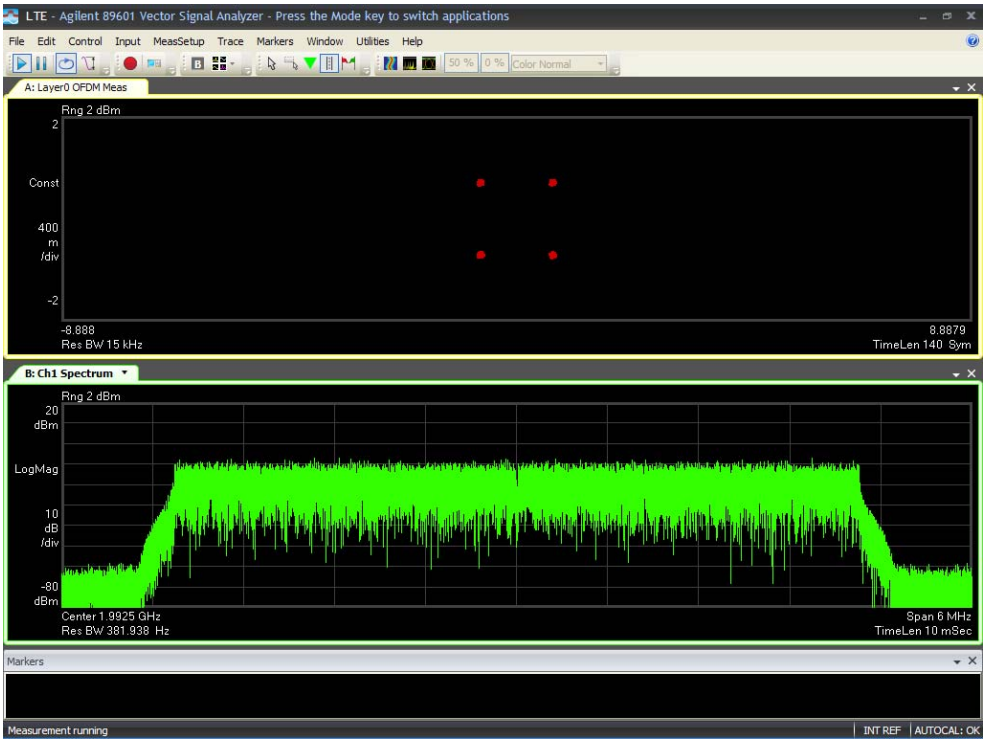

Agilent 10:42:21 16 Apr 2012
1xEV-DO
Ext Ref
BTS Ch Freq 1.93125 GHz
Completed
Mod Accuracy
Subtype 0/1
Averages: 10
PASS
Meas Ch: Data
Rho: 0.99876
EVM: 3.53 % rms
9.64 % pk
Pk CDE:
-42.86 dB
at W16(7):I
Magnitude Error:
2.26 % rms
Phase Error:
8.83 ° rms
Freq Error:
-1.96 Hz
I/Q Origin Offset:
-58.39 dB
Active Channels:
P: 1 M: 26 D: 16
Pilot Offset:

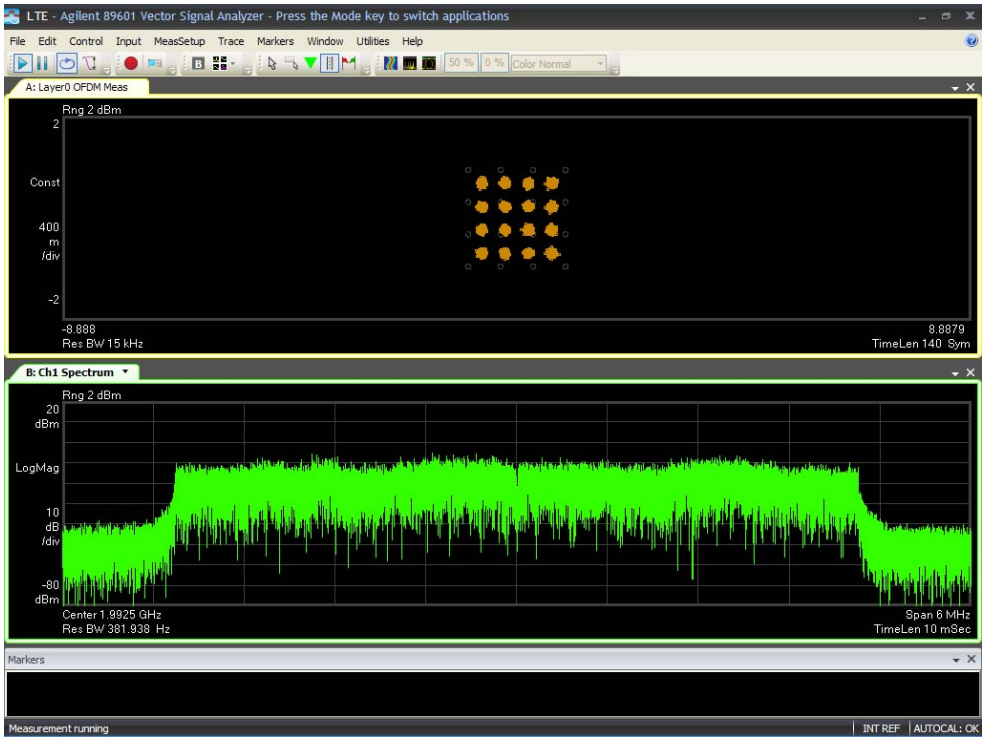
I/Q Measured Polar Vector

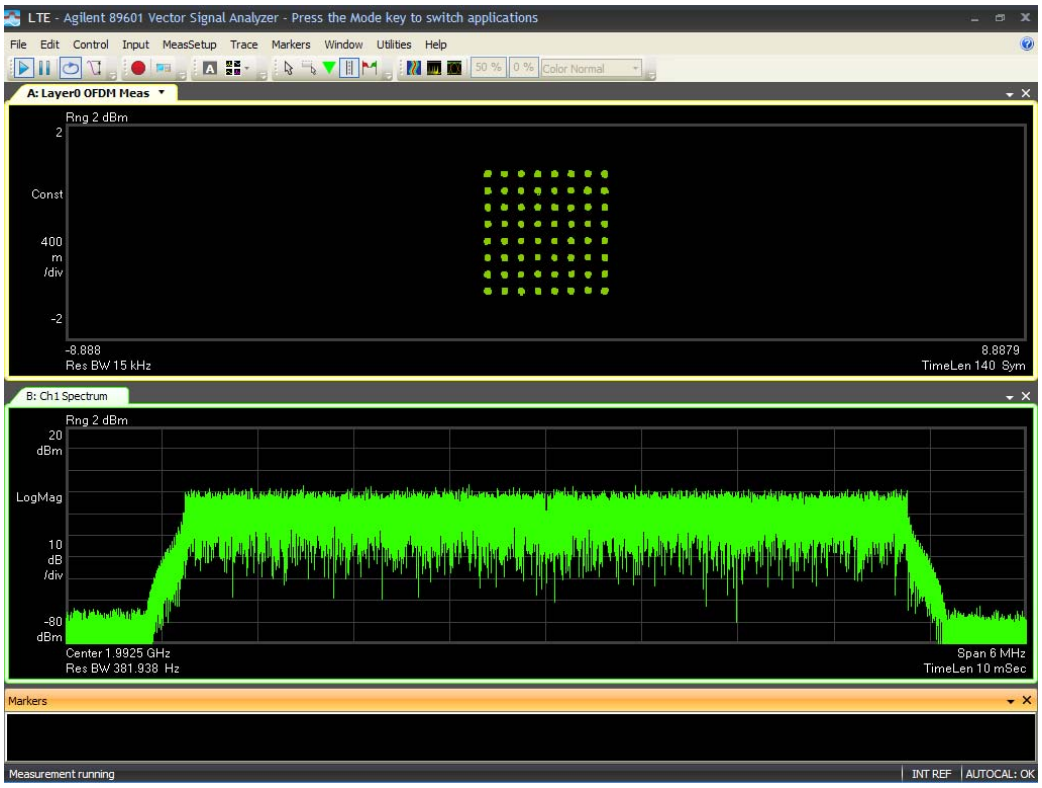

Agilent 10:41:13 16 Apr 2012
1xEV-DO
Ext Ref
BTS Ch Freq 1.93125 GHz
Completed
Mod Accuracy
Subtype 0/1
Averages: 10
PASS
Meas Ch: MAC
Rho: 0.99909
EVM: 3.03 % rms
7.02 % pk
Pk CDE:
-45.03 dB
at W64(1):Q
Magnitude Error:
1.96 % rms
Phase Error:
2.59 ° rms
Freq Error:
0.89 Hz
I/Q Origin Offset:
-58.00 dB
Active Channels:
P: 1 M: 26 D: 16
Pilot Offset:

I/Q Measured Polar Vector

FIGURE 11.3.4 SCREEN PLOTS OF MODULATION MEASUREMENT AT CHANNEL 1250, 1992.50 MHZ, 5MHZ LTE WITH QPSK, 16QAM AND 64QAM MODULATIONS






LTE - Agilent 89601 Vector Signal Analyzer - Press the Mode key to switch applications
File Edit Control Input MeasSetup Trace Markers Window Utilities Help
A: Layer0 OFDM Meas
Rng 2 dBm
2
Const
400
m
/div
-2
-8.888
Res BW 15 kHz
8.8879
TimeLen 140 Sym
B: Ch1 Spectrum
Rng 2 dBm
20
dBm
LogMag
10
dB
/div
-80
dBm
Center 1.9925 GHz
Res BW 381.938 Hz
Span 6 MHz
TimeLen 10 mSec
Markers
Measurement running
INT REF
AUTOCAL: OK

SUBEXHIBIT 11.4

Section 2.1049 MEASUREMENT REQUIRED: OCCUPIED BANDWIDTH AND OUT-OF-BAND EMISSIONS

In compliance with Section 2.1049, all the CDMA voice carriers were configured with a combination of the Pilot, Sync , Paging a nd Traffic c hannels. The P ilot/Sync/Page c hannels were set up according t o the recommended test model f or base st ations given i n 3 GPP2 C .S0010, as sh own i n Ta ble 11 .2.1 wi th 3 7 traffic chann els. All CDMA2 000 d ata carriers were con figured with ti me-division multiplexed Pilot Channel, t he M AC C hannel, a nd t he Fo rward Traffic Chan nels at full d ata rate. Th e Pilot/MAC/Traffic/Control channels were setup according to the recommended test model for base stations given i n 3GPP2 C .S.0032. F or L TE car riers, the a ppropriate E-UTR A t est model spe cified i n 3GPP TS 36.141 was used.

The two 65MHz bandwidth PCS spectrum is divided into 7 blocks (A, B, C, D, E, F and G) as shown in the following table.

PCS Blocks	Tx Frequency (MHz)	Rx Frequency (MHz)	Bandwidth (MHz)
A	1930 - 1945	1850 - 1865	15
B	1950 - 1965	1870 - 1885	15
C	1975 - 1990	1895 - 1910	15
D	1945 - 1950	1865 - 1870	5
E	1965 - 1970	1885 - 1890	5
F	1970 - 1975	1890 - 1895	5
G	1990 - 1995	1910 - 1915	5

The PCS RRH 4x 45W Distributed Base statio n syst em su pports on e-carrier an d multiple-carrier configurations with CDMA and LTE technologies. The RRH can operate in a CDMA-only mode or a LTE-only m ode or a CDMA and LTE m ixed m ode. The c urrent release supports one 5M Hz LTE carrie r and maximum two CDMA carriers only per transmitting path.

For the LTE-only operation mode, the occupied bandwidth and out-of-band emissions measurements were made at the antenna transmitting terminal (J4) for one 5 MHz LTE carrier in each of the PCS D, E, F and G 5MHz blocks. For the 15MHz PCS A, B and C blocks, the occupied bandwidth and out-of-band emissions measurements were m ade at the antenna t ransmitting terminal for one 5 MHz LTE carrier on the two channels which correspond to the lo west and highest available LTE channels in each of the PCS A, B and C fre quency blocks, respectively. The m easurement w as per formed fo r Q PSK, 16QAM a nd 64QAM modulations, respectively. At each of the carrier frequencies, the carrier power level at the antenna terminal was adjusted to the maximum rated mean power +43 dBm (20W).

For single C DMA-only carri er c onfiguration, t he occupied ba ndwidth an d out-of-band em issions measurements were m ade at the antenna transmitting terminal (J4) on two ch annels which correspon d to the lowest and hi ghest available CDMA channels in each of the PCS frequency blocks (A, B, C, D, E, F and G) for C DMA voice and EVDO, respectively. At e ach of the carrier fre quencies, the ca rrier power level at the antenna terminal was adjusted to the maximum rated mean power +44 dBm (25W).

For the m ultiple-carrier c onfiguration, ei ther CDM A (voice an d data) only or CDMA a nd LTE combination, t he carri er pl acements whi ch p otentially give t he w orst em issions based o n en gineering judgment for available carrier configurations in the current release were evaluated for each PCS block. The maximum rated power at each transmitting antenna port is 45W.

The minimum emission requirements and the setting of measurement equipment for the occupied bandwidth measurement of a PCS carrier were specified in FCC Part 24. The FCC's requirements are tabulated in the following table:

Table 11.4.1 FCC Part 24.238 Transmitter Unwanted Emission Limits

Frequency	Required Minimum Attenuation below the Mean Carrier Power *P*	Minimum Resolution Bandwidth of Spectrum Analyzer
1MHz Bands Immediately Outside the Transmitting Frequency Band	(43 + *P* dBW) dBc	12.5kHz for a 1.25MHz carrier 50kHz for a 5MHz carrier
Outside the Above Frequency Band	(43 + *P* dBW) dBc	1MHz

The requirement of FCC Part 24.238 was used as the required emission limit mask in the LTE measurement.

The requirements for CDMA carriers specified in 3GPP2 C.S0010-D and C.S.0032-C Section 4.4 for Band Class 14 are tabulated in the following tables:

Table 11.4.2(a) 3GPP2 C.S0010 and C.S0032 Transmitter Spurious Emission Limits for Single Carrier Configuration

Displacement from the Carrier Center Frequency f_c	Required Minimum Attenuation below the Mean Carrier Power P	Resolution Bandwidth of Spectrum Analyzer
885 kHz < $\|f - f_c\|$ ≤ 1.25 MHz	-45 dBc	30 kHz
1.25 MHz < $\|f - f_c\|$ ≤ 1.98 MHz	Min{-45dBc, -9dBm}	30 kHz
1.98 MHz < $\|f - f_c\|$ ≤ 2.25 MHz	-55dBc if P ≥ 33dBm;	30 kHz
2.25 MHz < $\|f - f_c\|$ ≤ 4.0 MHz	-13dBm 1	MHz

Table 11.4.2(b) 3GPP2 C.S0010 and C.S0032 Transmitter Spurious Emission Limits for Multiple Carrier Configuration

Displacement from the Carrier Center Frequency f_c	Required Minimum Attenuation below the Mean Carrier Power P	Resolution Bandwidth of Spectrum Analyzer
1.25 MHz < $\|f - f_c\|$ ≤ 2.25 MHz	-9dBm 30	kHz
2.25 MHz < $\|f - f_c\|$ ≤ 4.0 MHz	-13dBm 1	MHz

The mask of the emission limit displayed in the CDMA measurement plots is a combined requirement of FCC Part 24.238 and 3GPP2 C.S0010/C.S0032.

The measurements were performed with a Rohde & Schwarz EMI Receiver, which was calibrated in accordance with ISO 9001 process. The test set-up diagram is same as the one shown in the Figure 11.3.1.

For the CDMA only measurement, the spectrum analyzer was set with a 30 kHz resolution bandwidth and 8 MHz span, as shown in the plots of the occupied bandwidth measurement attached in the following pages. The emissions outside the 8MHz-span were evaluated in Measurement Required: Out-of-block Spurious Conducted Emissions. The maximum mean output power of the CDMA carrier, measured with a

3 MHz resolution bandwidth, aligns with the top of the spectrum analyzer display reticule or Ref Lvl. For CDMA carriers, the top of the carrier measured with a 30 kHz resolution bandwidth, thus, was 16.2 dB below one carrier power measured with a resolution bandwidth greater than the carrier bandwidth 1.25 MHz. This 16.2dB offset was due to the fact that 10 log (1250kHz/30kHz) = 16.2 dB.

For the LTE only and the CDMA & LTE combined measurements, the spectrum analyzer was set with a 100 kHz resolution bandwidth, and 20 MHz and 35MHz spans, respectively, as shown in the plots of the occupied bandwidth measurement attached in the following pages. The emissions outside the above spans were evaluated in Measurement Required: Out-of-block Spurious Conducted Emissions. The maximum mean output power of the LTE carrier, measured with a 3 MHz resolution bandwidth (maximum available), aligns with the top of the spectrum analyzer display reticule (Ref Lvl) minus 2.2dB. The 2.2 dB offset for LTE carrier was due to the fact that 10 log (5MHz/3MHz) = 2.2 dB. The top of the carrier measured with a 100 kHz resolution bandwidth, thus, was 17 dB below the LTE carrier power measured with a resolution bandwidth greater than the carrier bandwidth 5 MHz (if available). This 17dB offset was due to the fact that 10 log (5000kHz/100kHz) = 17 dB. For CDMA carriers, the top of the carrier measured with a 100 kHz resolution bandwidth, was 11 dB below one CDMA carrier power measured with a 3M Hz resolution bandwidth. This 11dB offset was due to the fact that 10 log (1250kHz/100kHz) = 11 dB. The sampling average was used in all measurement.

The four 99% Occupied Bandwidth plots were submitted for CDMA voice and data with one carrier and two carriers, respectively. The three 99% Occupied Bandwidth plots were submitted for LTE one carrier with QPSK, 16QAM and 64 QAM, respectively.

For one-carrier CDMA configuration, two emission plots are submitted. These two plots correspond to the lower and higher edge channels which have the least margin among all PCS blocks evaluated for both CDMA2000 voice and data applications. Similarly, for the two-carrier CDMA configurations, two emission plots, one for adjacent carriers and one for non-adjacent carrier, are submitted which give the least margin for both CDMA2000 voice and data applications evaluated for each PCS block. The 3GPP2 C.S0010/C.S0032 emissions requirements for CDMA which are tougher than the FCC Part 24.238 out-of-band requirement were displayed in the mask as well.

For one LTE carrier configuration, one emission plot is submitted which has the least margin among all PCS blocks evaluated for each QPSK, 16QAM and 64QAM modulation. The limits specified in FCC Part 24.238 are displayed in the plots.

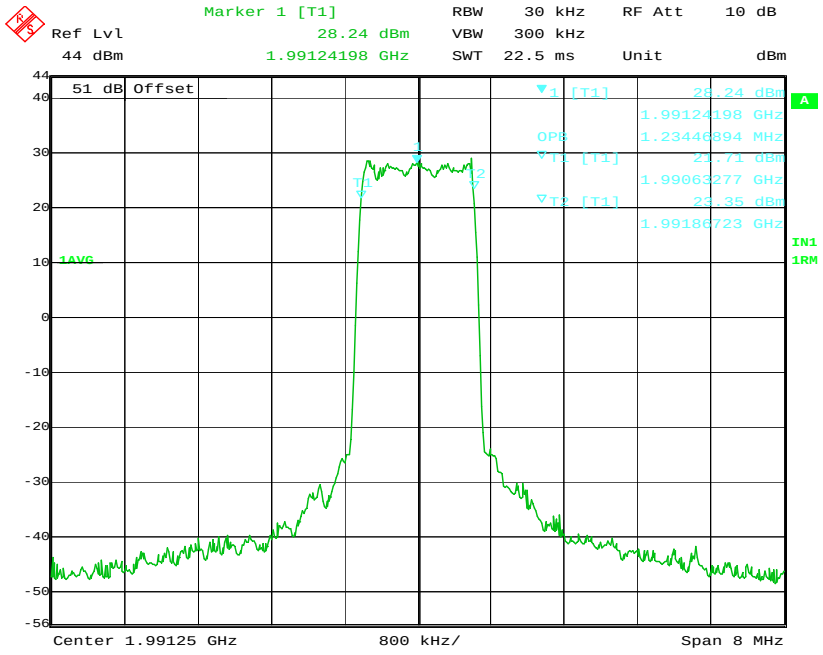
For LTE and CDMA combined configuration, two emission plots (one shows the margin for the CDMA carrier and one shows the margin for the LTE carrier) are submitted which give the least margin for the configurations of one LTE carrier with one CDMA carrier evaluated in each of PCS A, B and C blocks; and two emission plots (one shows the margin for CDMA carriers and one shows the margin for the LTE carrier) are submitted which have the least margin for one LTE carrier and two CDMA carriers configurations in each of PCS A, B and C blocks evaluated.

Results:

From the occupied bandwidth and out-of-band plots attached in the following, it can be seen that all the waveforms, both CDMA and LTE carriers, are under the required FCC emission mask with margins. For LTE carriers, the minimum margin is greater than 6dB. The measurement results demonstrate the full compliance with the Rules of the Commission at the lowest and highest settable channels of each PCS block.

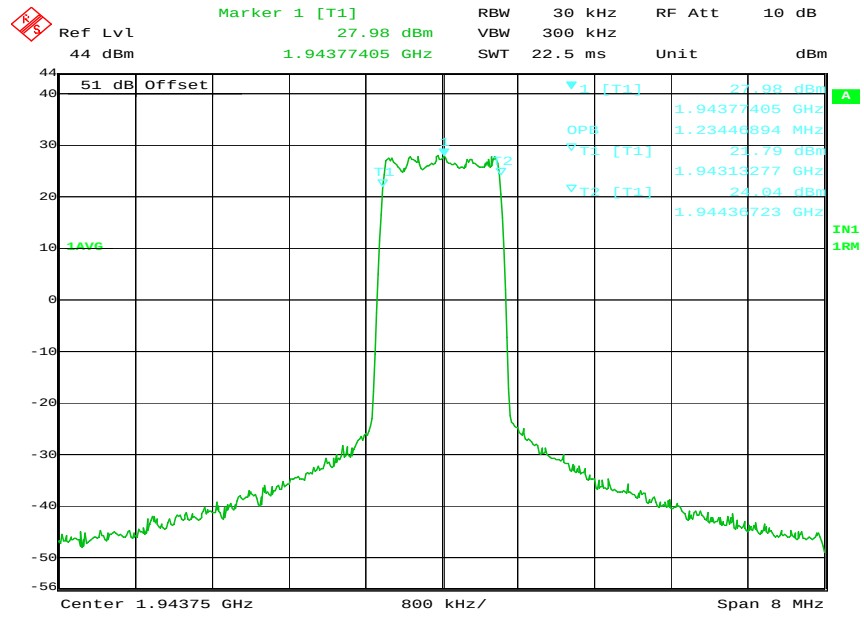
FIGURE 11.4.1 99% OCCUPIED BANDWIDTH PLOTS

(a) CDMA VOICE 1C CHANNEL 1225 (G BAND) AT 1991.25 MHz— 1.234MHZ



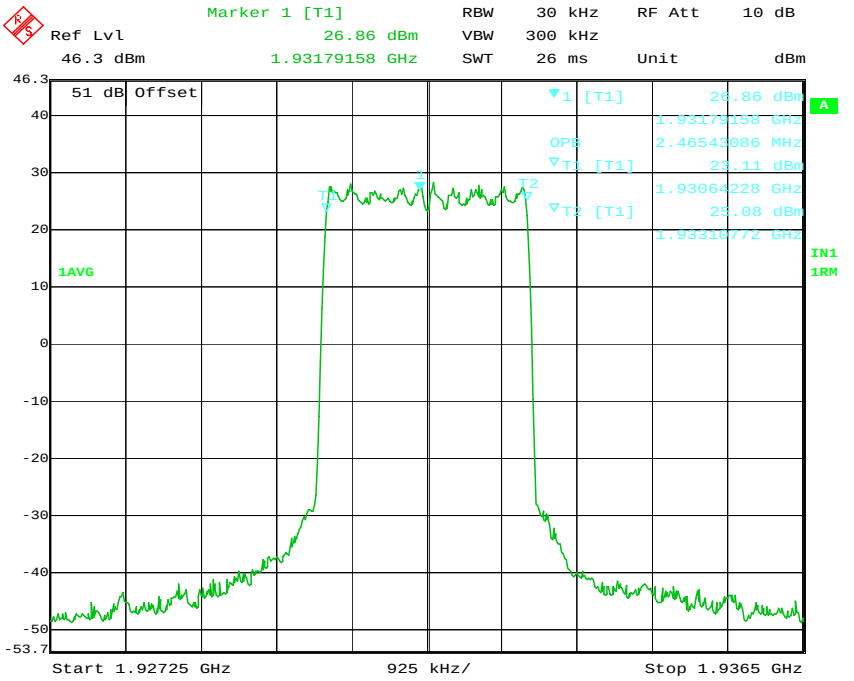
Title: 99 POWER BANDWIDTH: Test Engineer: SEG
Comment A: 65MHz RRH LTE and CDMA; 1.25MHz CDMA 1x; CH:1225; BLK G(Low)
1991.25 MHz; PWR: 25 Watts; FCC Part 24; FCCID: AS5BBTRX-05
Date: 19.FEB.2012 10:53:20

(b) CDMA EVDO 1C CHANNEL 275 (A BAND) AT 1943.75 MHz— 1.234MHZ



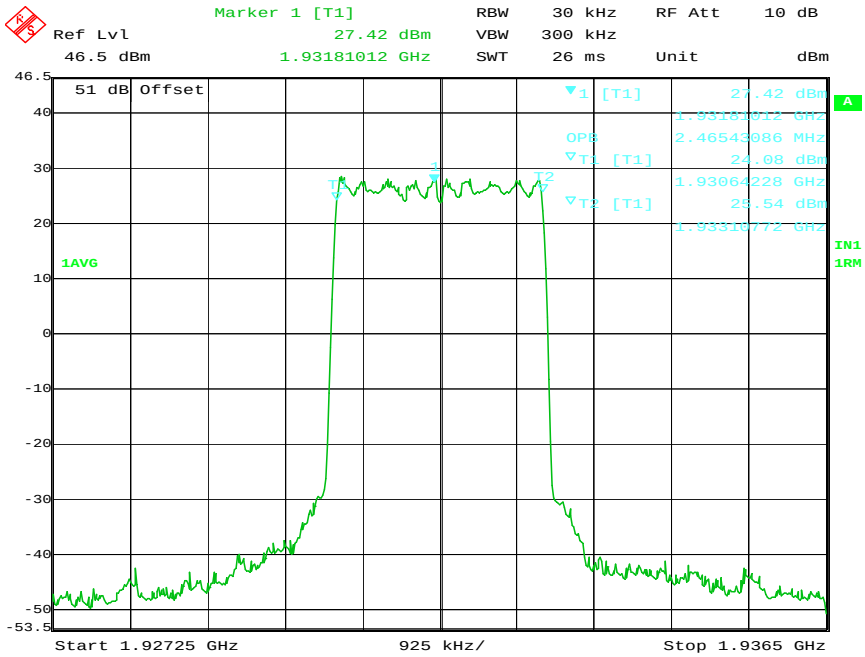
Title: 99 POWER BANDWIDTH: Test Engineer: SEG
Comment A: 65MHz RRH LTE and CDMA; 1.25MHz CDMA EVDO;CH:275;BLK A(High)
1943.75 MHz; PWR: 25 Watts; FCC Part 24; FCCID: AS5BBTRX-05
Date: 23.FEB.2012 14:11:31

(c) CDMA VOICE 2C CHANNEL 25 & 50 (A BAND) — 2.465MHZ



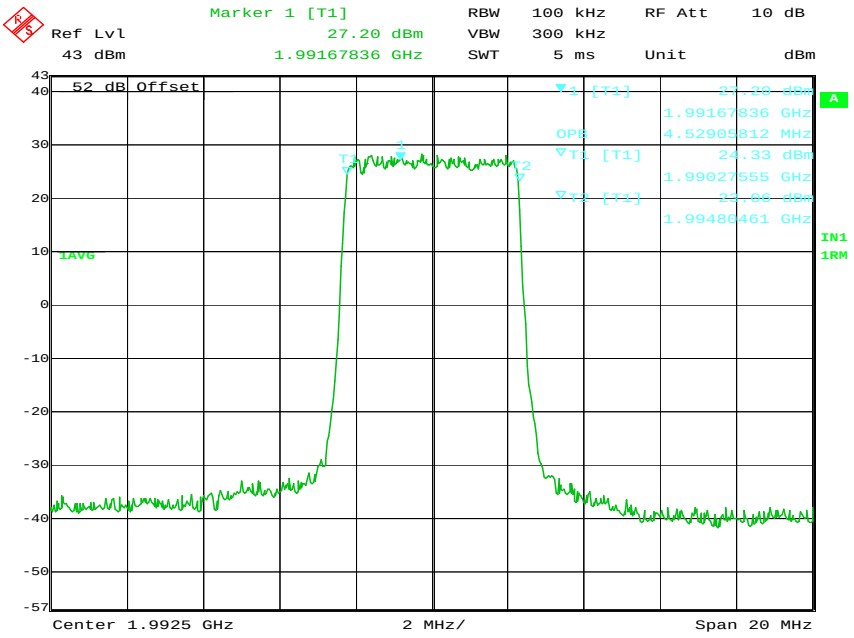
Title: 99 POWER BANDWIDTH: Test Engineer: SEG
Comment A: 65MHz RRH LTE and CDMA; 1.25MHz CDMA 2C; CH:25,50; BLK A-Low
PWR: 43Watts; FCC Part 24; FCCID: AS5BBTRX-05
Date: 20.FEB.2012 15:03:17

(d) CDMA DATA 2C CHANNEL 25 & 50 (A BAND) — 2.465MHZ



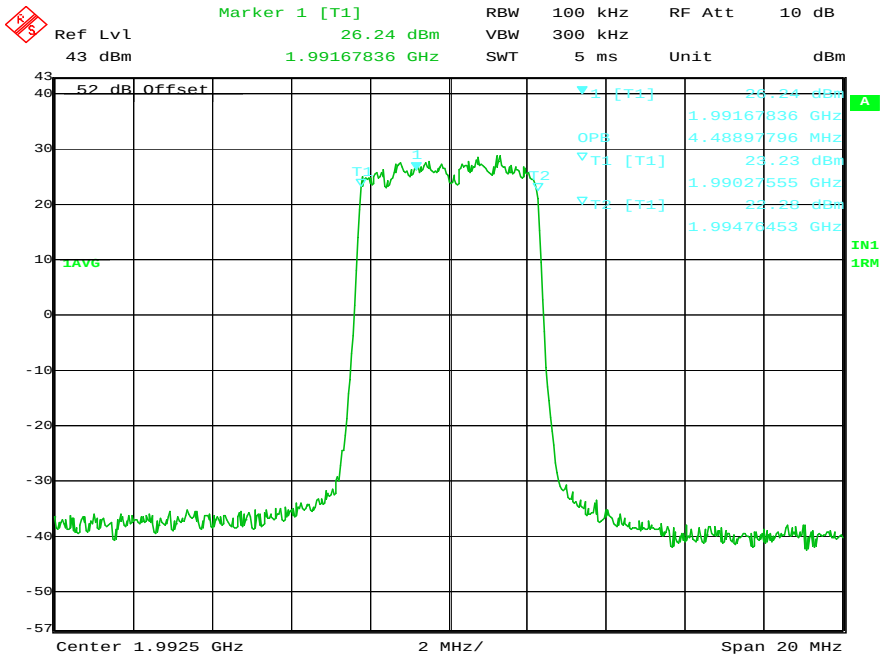
Title: 99 POWER BANDWIDTH: Test Engineer: SEG
Comment A: 65MHz RRH LTE and CDMA; 1.25MHz CDMA 2C EVDO; CH:25,50
BLK A-Low; PWR: 45Watts; FCC Part 24; FCCID: AS5BBTRX-05
Date: 14.MAR.2012 07:19:31

(e) 5MHZ LTE CHANNEL1250 (G BAND) AT 1992.50 MHZ WITH QPSK MODULATION — 4.529MHZ



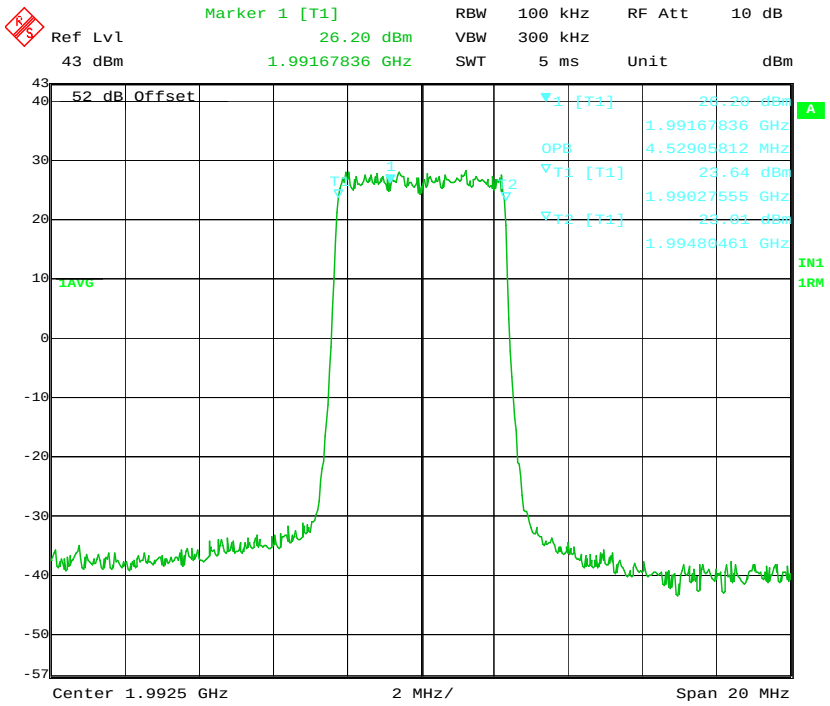
Title: 99 POWER BANDWIDTH: Test Engineer: SEG
Comment A: 65MHz RRH LTE and CDMA; 5 MHz LTE; CH:1250; BLOCK G; 1992.5 MHz; PWR: 20Watts; QPSK; FCC Part 24; FCCID: AS5BBTRX-05
Date: 2.FEB.2012 14:00:57

(f) 5MHZ LTE CHANNEL1250 (G BAND) 1992.50 MHz WITH 16QAM MODULATION — 4.489MHZ



Title: 99 POWER BANDWIDTH: Test Engineer: SEG
Comment A: 65MHz RRH LTE and CDMA; 5 MHz LTE; CH:1250; BLOCK G; 1992.5 MHz; PWR: 20Watts; 16QAM; FCC Part 24; FCCID: AS5BBTRX-05
Date: 5.FEB.2012 10:26:59

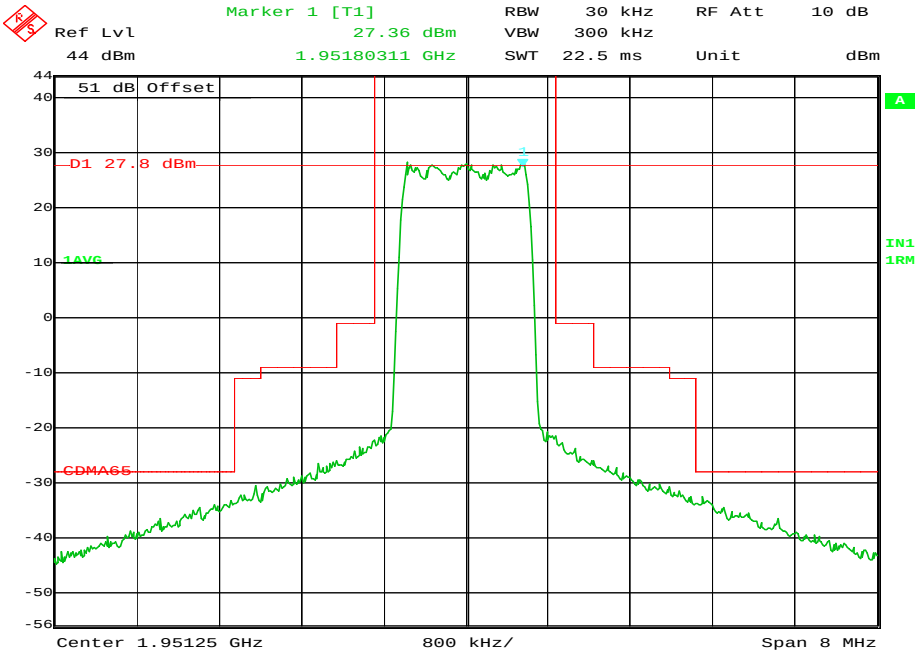
(g) 5MHZ LTE CHANNEL 1250 (G BAND) 1992.50 MHz WITH 64QAM MODULATION — 4.529MHZ



Title: 99 POWER BANDWIDTH: Test Engineer: SEG
Comment A: 65MHz RRH LTE and CDMA; 5 MHz LTE; CH:1250; BLOCK G; 1992.5 MHz; PWR: 20Watts; 64QAM; FCC Part 24; FCCID: AS5BBTRX-05
Date: 2.FEB.2012 13:42:29

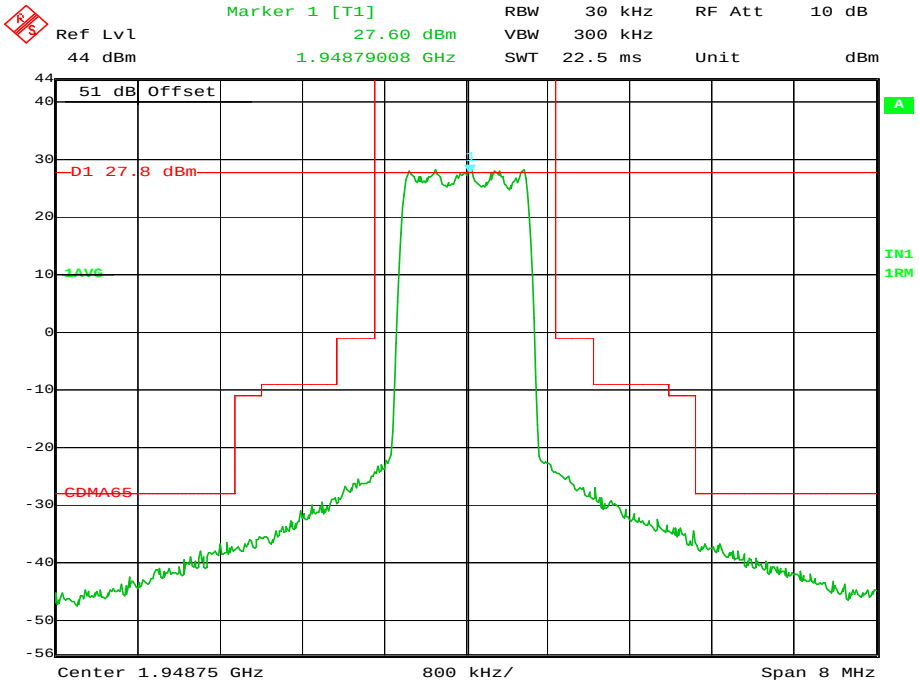
FIGURE 11.4.2 OCCUPIED BANDWIDTH AND OUT-OF-BAND EMISSIONS PLOTS

(a) CDMA EVDO 1C, B BAND, LOWER EDGE CHANNEL CH 425, 1951.25MHz, 25W/C



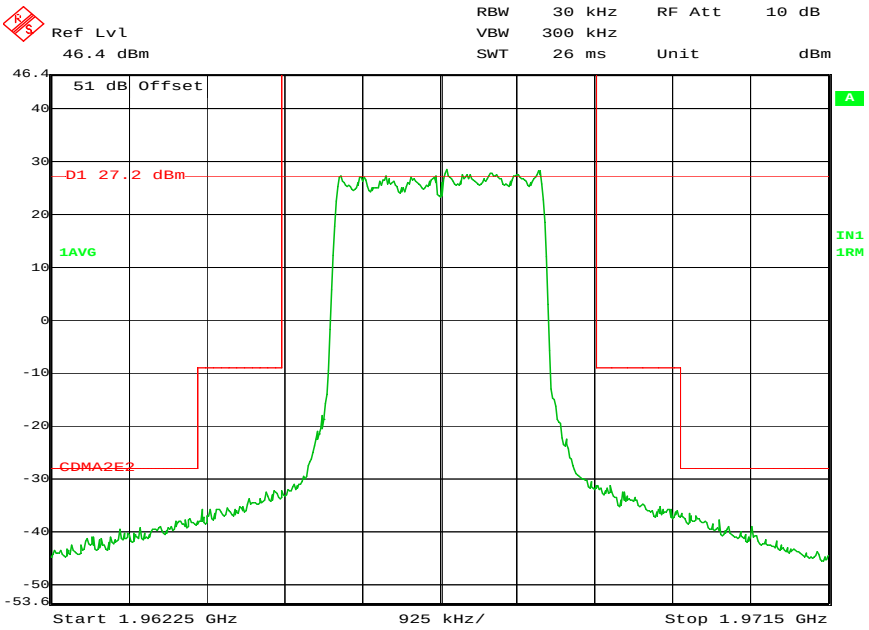
Title: OCCUPIED BANDWIDTH: Test Engineer: SEG
Comment A: 65MHz RRH LTE and CDMA; 1.25MHz CDMA EVDO; CH:425;BLK B(Low)
1951.25 MHz; PWR: 25 Watts; FCC Part 24; FCCID: AS5BBTRX-05
Date: 26.FEB.2012 08:11:12

(b) CDMA EVDO 1C, D BAND, HIGHER EDGE CHANNEL, CH 375, 1948.75MHz, 25W/C



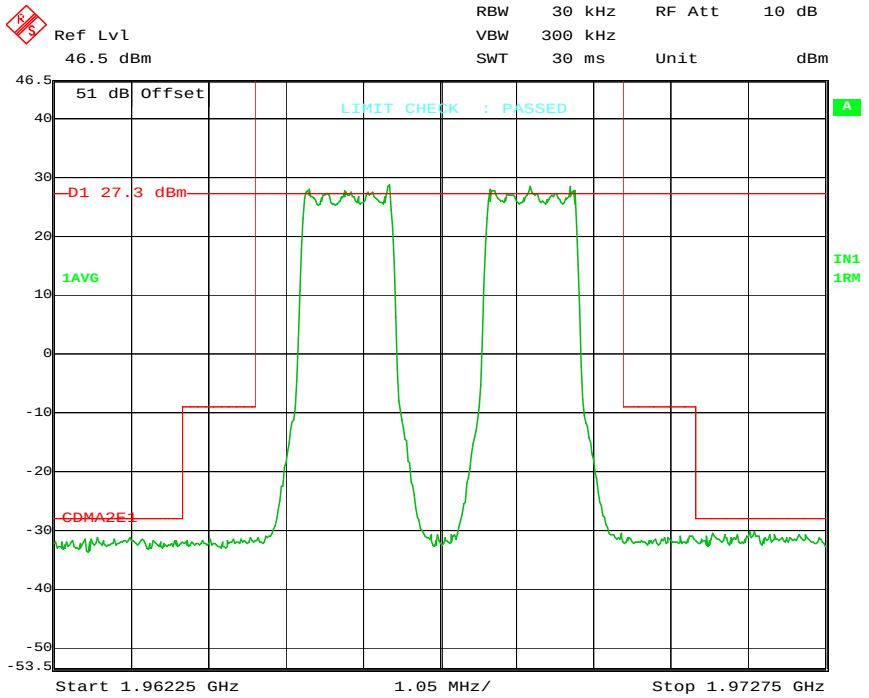
Title: OCCUPIED BANDWIDTH: Test Engineer: SEG
Comment A: 65MHz RRH LTE and CDMA; 1.25MHz CDMA EVDO;CH:375;BLK D(High)
1948.75 MHz; PWR: 25 Watts; FCC Part 24; FCCID: AS5BBTRX-05
Date: 23.FEB.2012 13:27:38

(c) CDMA 2C, E BAND, CH 725 (VOICE), 750 (DATA), ADJACENT, 45W/PORT



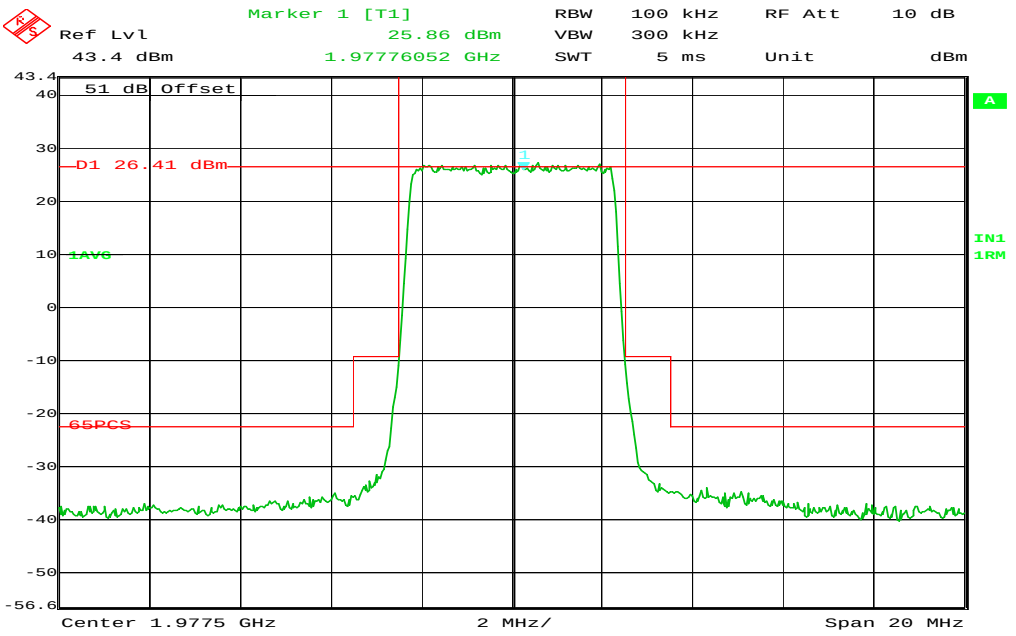
Title: OCCUPIED BANDWIDTH: Test Engineer: SEG
Comment A: 65MHz RRH LTE and CDMA; 1.25MHz CDMA 2C;CH:725 V,750EVDO
BLK E; PWR: 44 Watts; FCC Part 24; FCCID: AS5BBTRX-05
Date: 25.MAR.2012 11:28:11

(d) CDMA DATA 2C, E BAND, CH 725, 775, NON-ADJACENT, 45W/PORT



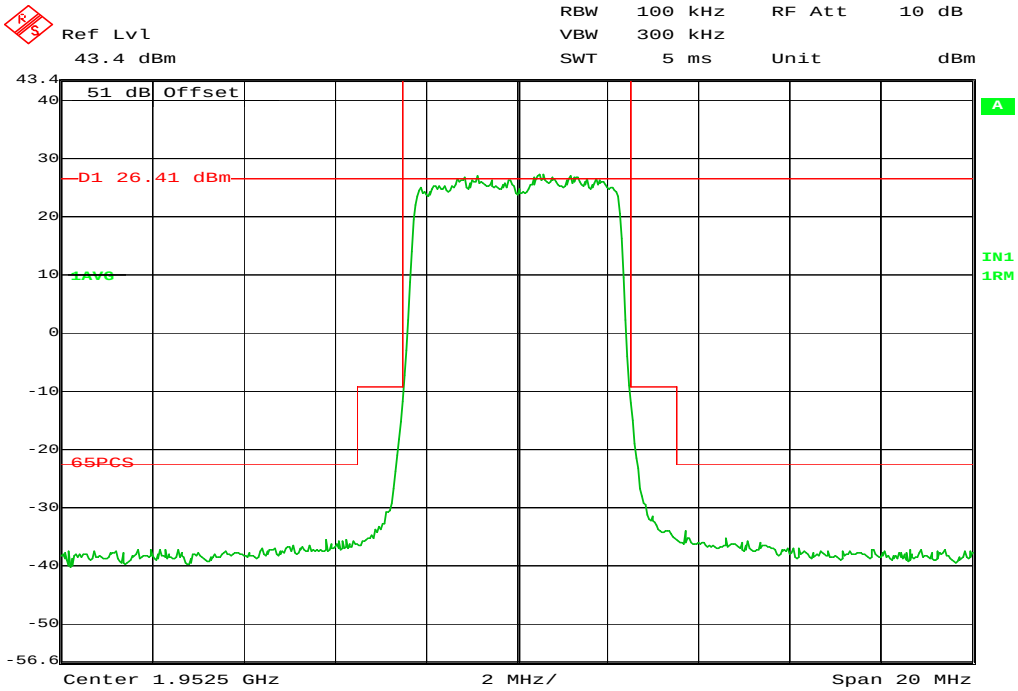
Title: OCCUPIED BANDWIDTH: Test Engineer: SEG
Comment A: 65MHz RRH LTE and CDMA; 1.25MHz CDMA 2C EVDO; CH:725, 775
BLK E; PWR: 45Watts; FCC Part 24; FCCID: AS5BBTRX-05
Date: 15.MAR.2012 08:31:38

(e) LTE, C BAND, LOWER EDGE CHANNEL, CH 950, 1977.50MHZ, 20W/C, QPSK



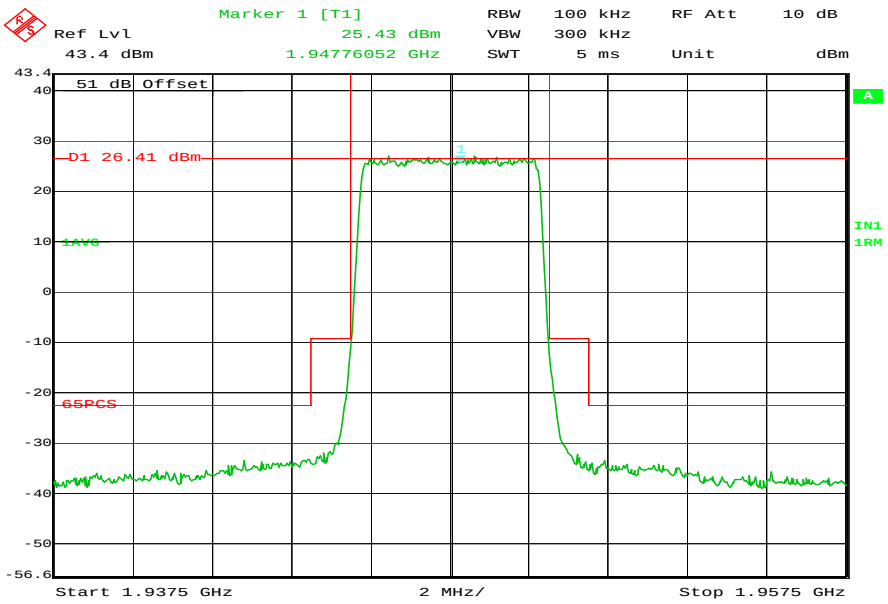
Title: OCCUPIED BANDWIDTH: Test Engineer: SEG
Comment A: 65MHz RRH LTE and CDMA; 5 MHz LTE; CH:950; BLOCK C; 1977.5 MHz; PWR: 20Watts; QPSK; FCC Part 24; FCCID: AS5BBTRX-05
Date: 9.FEB.2012 09:57:14

(f) LTE, B BAND, LOWER EDGE CHANNEL, CH 450, 1952.50MHZ, 20W/C, 16QAM



Title: OCCUPIED BANDWIDTH: Test Engineer: SEG
Comment A: 65MHz RRH LTE and CDMA; 5 MHz LTE; CH:450; BLOCK B; 1952.5 MHz; PWR: 20Watts; 16QAM; FCC Part 24; FCCID: AS5BBTRX-05
Date: 7.FEB.2012 12:11:18

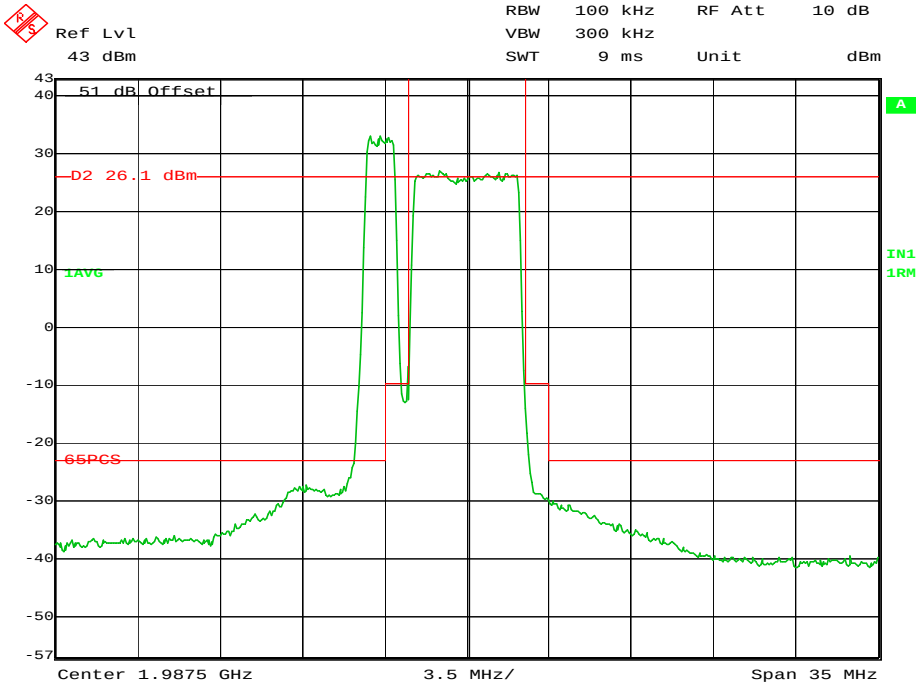
(g) LTE, D BAND, CH 350, 1947.50MHZ, 20W/C, 64QAM



Title: OCCUPIED BANDWIDTH: Test Engineer: SEG
Comment A: 65MHz RRH LTE and CDMA; 5 MHz LTE; CH:350; BLOCK D; 1947.5 MHz; PWR: 20Watts; 64QAM; FCC Part 24; FCCID: AS5BBTRX-05
Date: 6.FEB.2012 15:12:59

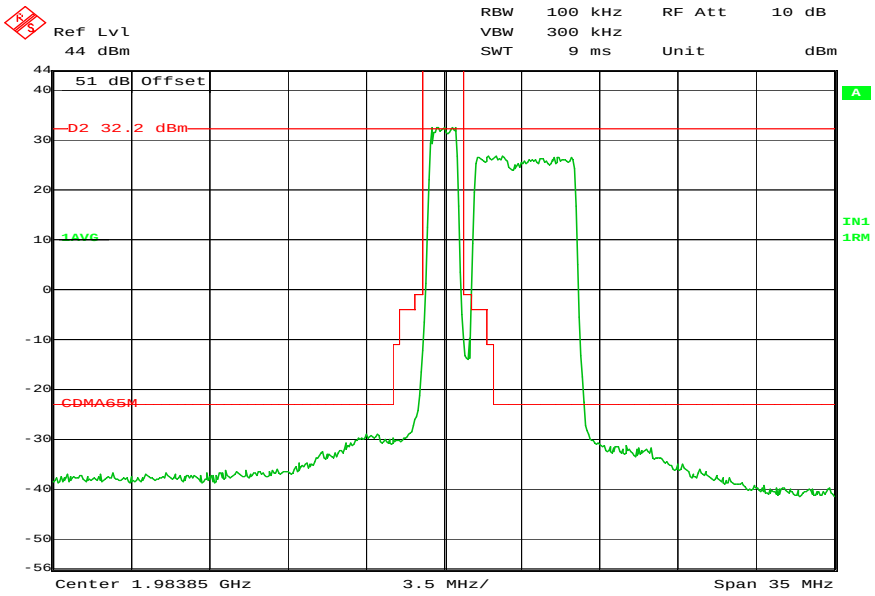
(h) C BAND, CH 1150 (LTE), 1987.50MHZ, 20W, 16QAM AND CH 1077 (CDMA EVDO), 1983.85MHZ, 25W

Margin for LTE Carrier
(See Mask with *f* > 1987.50 MHz)



Title: OCCUPIED BANDWIDTH: Test Engineer: SEG
Comment A: 65MHz RRH LTE and CDMA; LTE_CDMA; CH:1150,1077 EVDO BLK C; PWR: 20Watts; FCC Part 24; FCCID: AS5BBTRX-05
Date: 29.MAR.2012 14:21:15

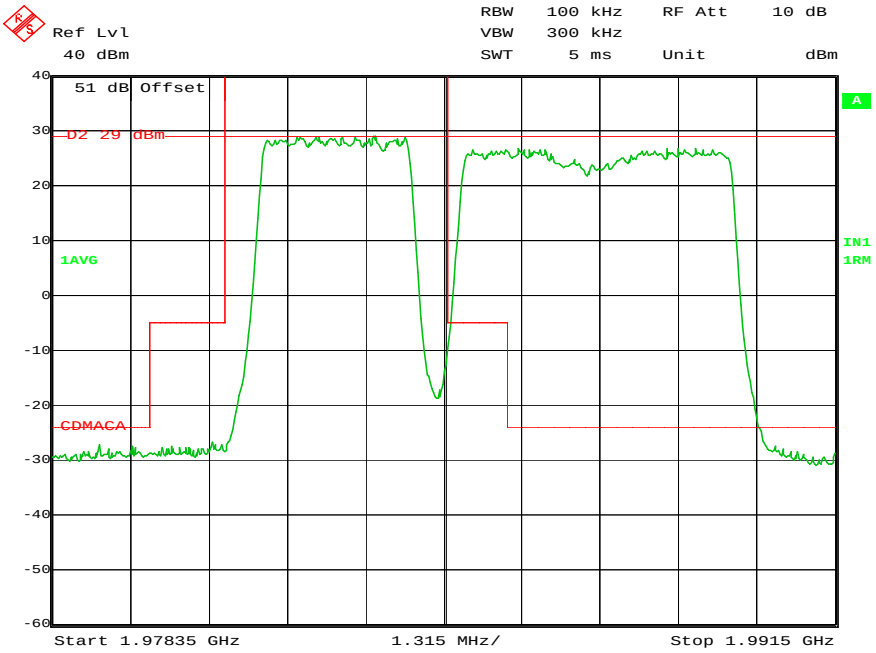
Margin for CDMA Carrier
(See Mask with *f* < 1983.85 MHz)



Title: OCCUPIED BANDWIDTH: Test Engineer: SEG
Comment A: 65MHz RRH LTE and CDMA; LTE_CDMA; CH:1150,1077 EVDO
BLK C; PWR: 25Watts; FCC Part 24; FCCID: AS5BBTRX-05
Date: 29.MAR.2012 14:23:00

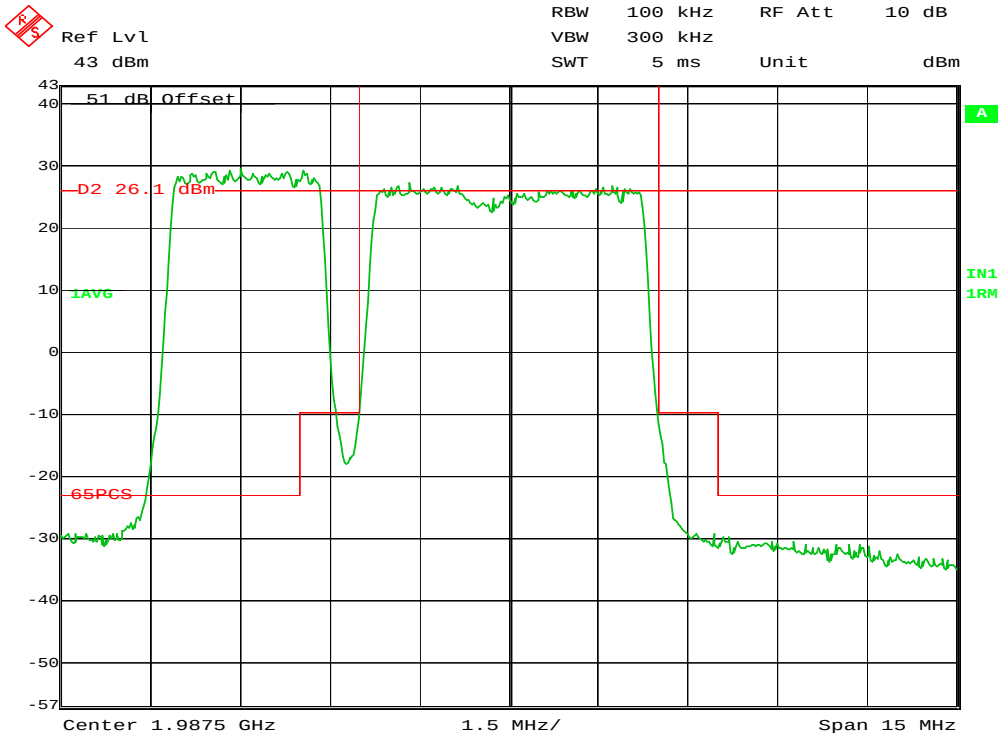
(i) C BAND, CH 1150 (LTE), 1987.50MHZ, 20W, 16QAM AND CH 1050 AND 1075 (CDMA EVDO), 10W/C

Margin for CDMA Carriers
(See Mask with *f* < 1982.50 MHz)



Title: OCCUPIED BANDWIDTH: Test Engineer: SEG
Comment A: 65MHz RRH LTE and CDMA; LTE_CDMA; CH:1050,1075 EVDO
1150 LTE;BLK C;PWR:10W/c; FCC Prt 24; FCCID: AS5BBTRX-05
Date: 4.APR.2012 09:38:16

Margin for LTE Carrier
(See Mask with *f* > 1987.50 MHz)



Title: OCCUPIED BANDWIDTH: Test Engineer: SEG
Comment A: 65MHz RRH LTE and CDMA; LTE_CDMA; CH:1050,1075 EVDO
1150 LTE;BLK C;PWR:20W; FCC Prt 24; FCCID: AS5BBTRX-05
Date: 2.APR.2012 09:31:55

SUBEXHIBIT 11.5

Section 2.1051 MEASUREMENT REQUIRED: SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS

The out-of-block spurious emissions at the antenna transmitting terminal were investigated from 10 MHz to the 10th harmonic of the carrier or 20 GHz, per Section 2.1057(a)(1).

The carrier setup and configurations are same as in Sub-exhibit 11.4.

The emission limitations and the setting of measurement equipment for the unwanted emissions measurement of 1.25MHz CDMA PCS carriers and 5MHz LTE carrier were specified in 24.238 and shown in Sub-exhibit 11.4.

For the mean output power of +44 dBm (25 W) at J4, the required spurious emissions attenuation per (43 + *P* dBW) dBc, is 57dBc. FCC CFR 47, Sections 2.1051 and 2.1057(c) specify that the spurious emissions attenuated more than 20 dB below the permissible value need not be reported. So the reportable limit is –77 dBc.

For the mean output power of +43 dBm (20 W) at J4, the required spurious emissions attenuation per (43 + *P* dBW) dBc, is 56dBc. So the FCC reportable limit is –76 dBc.

The required attenuation is reduced accordingly with the output power per carrier reduced.

The measurements were performed with a Rohde & Schwarz EMI Receiver, which was calibrated in accordance with ISO 9001 process. The test set-up diagram is given in the Figure 11.3.1.

The carrier power level at the antenna transmitting terminal was calibrated before the conducted spurious emissions testing for each test.

The spectrum analyzer was set to a 1MHz resolution bandwidth. The sampling average was used.

The emissions in the frequency range of 10MHz to 1GHz are well under the required emission limit with more than 20dB margins, except for the configuration with two CDMA EVDO carriers. Therefore, one emission plot is submitted for the configuration with two CDMA data carriers which has the least margin in this frequency range (10MHz to 1GHz). For the emissions in the frequency range of 1GHz to 12.75GHz, four emissions plots are submitted which give the least margins for the worst-case configurations or carrier placement (based on engineering judgment) in each operation mode and various modulations (voice and data for CDMA and QPSK, 16QAM and 64QAM for LTE) evaluated for all PCS blocks: a) two emissions plots for one CDMA carrier and two CDMA carriers configurations, respectively, b) one emissions plot for one LTE carrier configuration, and c) one emissions plot for CDMA and LTE combined configuration. For the emissions in the frequency range of 12.75GHz to 20GHz, only one emission plot is submitted for one CDMA carrier configuration which has the least margin of 19.83dB among all configurations, modulations and PCS blocks evaluated.

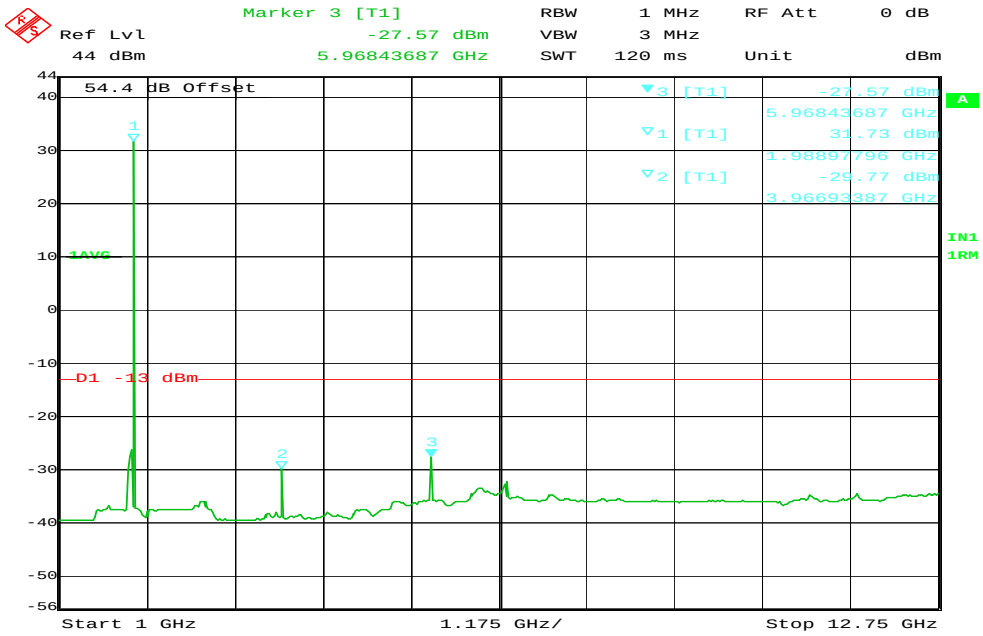
The limit specified in FCC Part 24.238 is displayed in the plots.

Results:

The out-of-block spurious emissions of the Alcatel-Lucent CDMA-LTE PCS RRH4x45W in the entire spectrum investigated (10MHz to 20GHz) are under the required emission limit with more than 6dB margins. The measurement results demonstrate that the subject of the application is in full compliance with the Rules of the Commission.

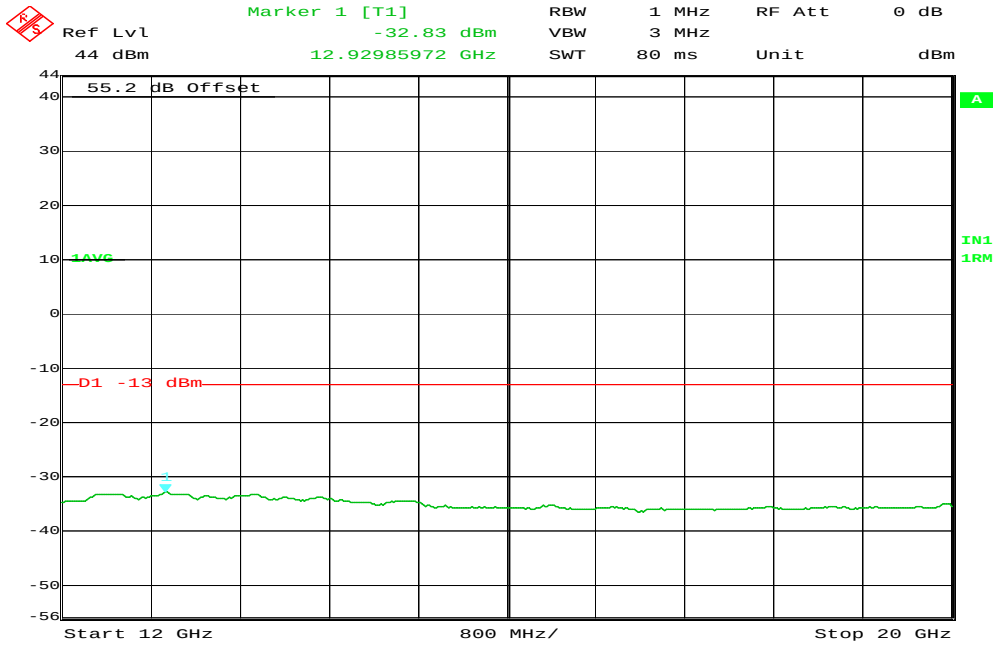
FIGURE 11.5.1 OUT-OF-BOCK SPURIOUS EMISSIONS PLOTS

(a) CDMA VOICE 1C CHANNEL 1225 (G BAND) AT 1991.25 MHZ, 25W/C, 1GHZ-12.75GHZ



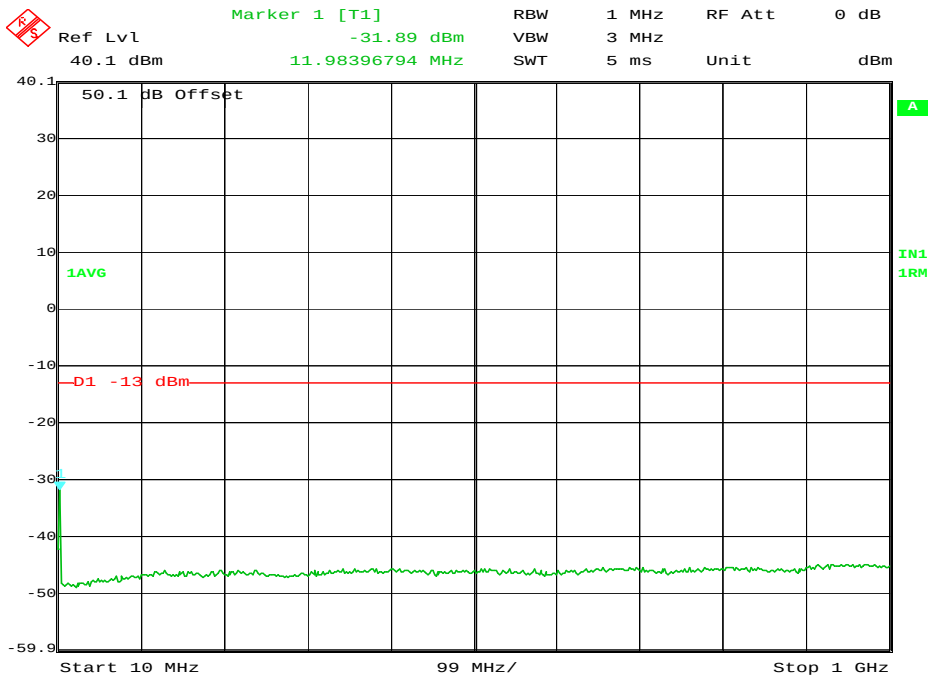
Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT: Test Engineer: SEG
Comment A: 65MHz RRH LTE and CDMA; 1.25MHz CDMA 1x; CH:1225; BLK G(Low)
1991.25 MHz; PWR: 25 Watts; FCC Part 24; FCCID: AS5BBTRX-05
Date: 19.FEB.2012 11:04:56

(b) CDMA DATA 1C CHANNEL 325 (D BAND) AT 1946.25 MHZ, 25W/C, 12.75GHZ-20GHZ



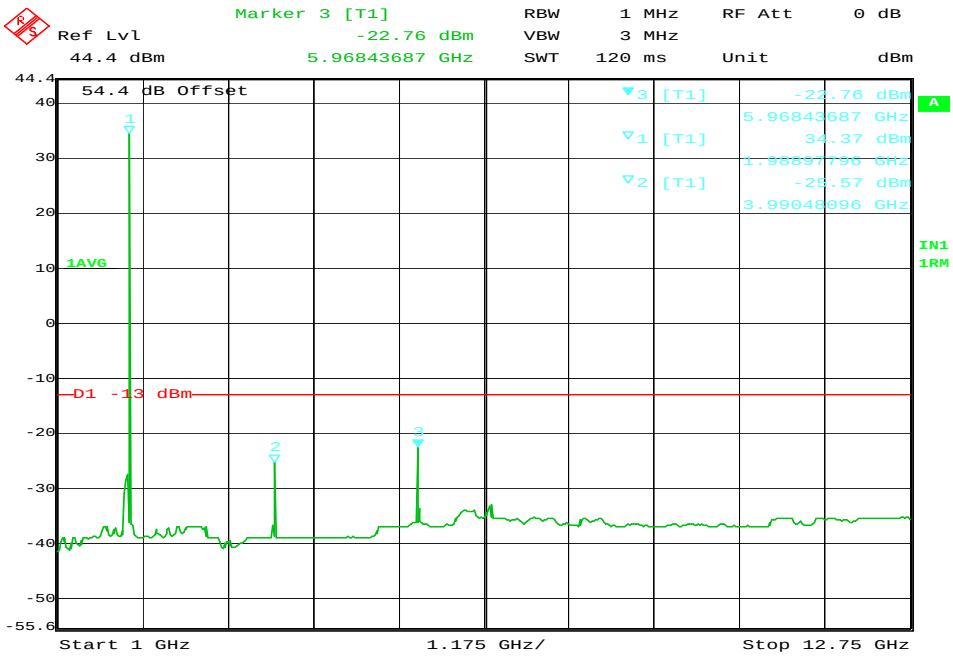
Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT: Test Engineer: SEG
Comment A: 65MHz RRH LTE and CDMA; 1.25MHz EVDO; CH: 325; BLK D(Low)
1946.25 MHz; PWR: 25 Watts; FCC Part 24; FCCID: AS5BBTRX-05
Date: 23.FEB.2012 13:49:48

(c) CDMA DATA 2C CHANNEL 25 & 275 (A BAND), 45W/PORT, 10 MHZ-1GHZ



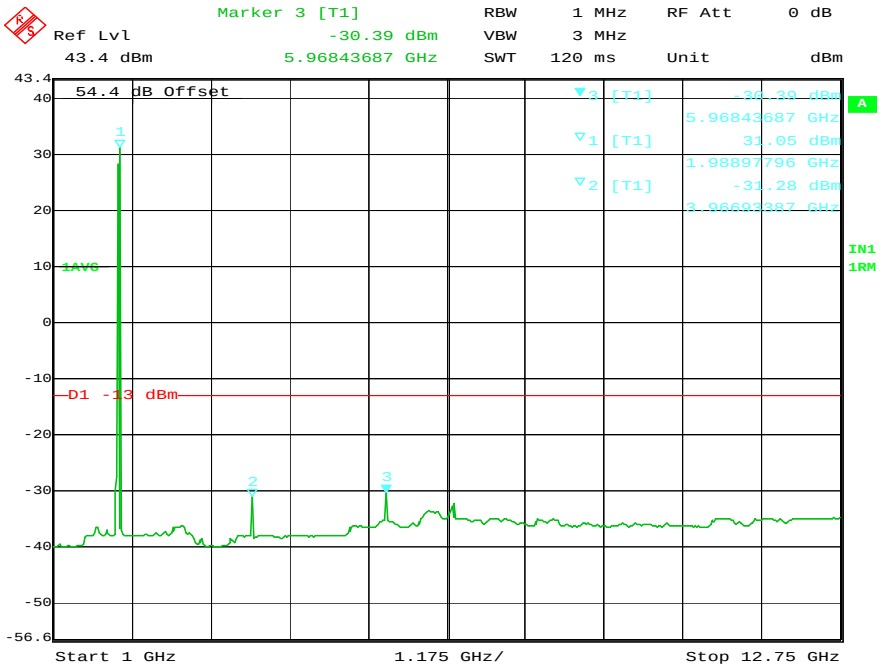
Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT: Test Engineer: SEG
Comment A: 65MHz RRH LTE and CDMA; 1.25MHz CDMA 2C EVDO; CH:25,275
BLK A; PWR: 45 Watts; FCC Part 24; FCCID: AS5BBTRX-05
Date: 15.MAR.2012 09:32:03

(d) CDMA DATA 2C CHANNEL 1250 & 1275 (G BAND), 45W/PORT, 1GHZ-12.75GHZ



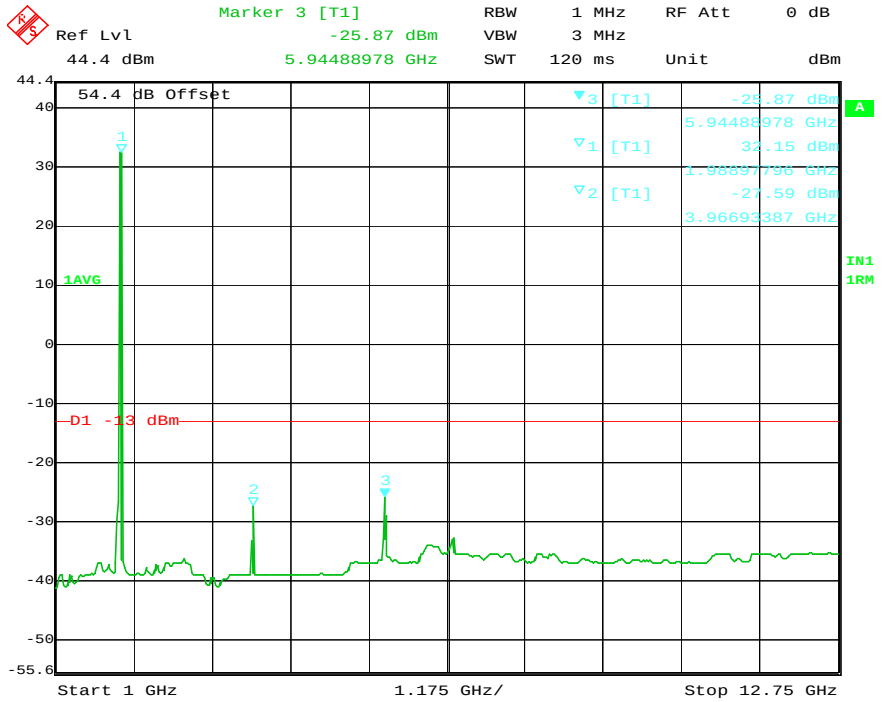
Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT: Test Engineer: SEG
Comment A: 65MHz RRH LTE and CDMA; 1.25MHz CDMA2C EVDO; CH:1250,1275
BLK G; PWR: 45 Watts; FCC Part 24; FCCID: AS5BBTRX-05
Date: 14.MAR.2012 12:53:45

(e) LTE 1C CHANNEL 1150 (C BAND) AT 1987.50 MHZ, 20W/C, 16QAM, 1GHZ-12.75GHZ



Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT: Test Engineer: SEG
Comment A: 65MHz RRH LTE and CDMA; 5 MHz LTE; CH:1150; BLOCK C; 1987.5 MHz; PWR: 20Watts; 16QAM; FCC Part 24; FCCID: AS5BBTRX-05
Date: 9.FEB.2012 11:08:35

(f) LTE 1C CHANNEL 950 (C BAND) AT 1977.50 MHZ, 20W/C, 16QAM, CDMA 1C CHANNEL 1175 (C BAND) CDMA 1X AT 1988.75MHZ, 25W/C, 1GHZ-12.75GHZ



Title: SPURIOUS EMISSIONS AT TX ANTENNA PORT: Test Engineer: SEG
Comment A: 65MHz RRH LTE and CDMA; LTE_CDMA; CH:950 ,1175
BLK C; PWR: 45 Watts; FCC Part 24; FCCID: AS5BBTRX-05
Date: 29.MAR.2012 09:43:12

SUBEXHIBIT 11.6

Section 2.1053 MEASUREMENT REQUIRED: FIELD STRENGTH OF SPURIOUS RADIATION

The field strength measurements of radiated spurious emissions were made in a FCC (Site Registration Number: 515091) and IC (Filing Number: 6933F-5) registered three meter semi-anechoic chamber AR-5 which is maintained by Alcatel-Lucent in Murray Hill, New Jersey.

The -48VDC CDMA-LTE PCS 4x45W RRH was investigated from 10 MHz to the 10th harmonic of the carrier or 20 GHz, per Section 2.1057(a)(1). The equipment under test (EUT) was configured as in the normal mode of the installation and operation. The recommendations of ANSI C63.4–2009 were followed for EUT testing setup and cabling.

The base station was configured 1) to transmit one LTE carrier in G band Ch 1250 with the maximum mean power of 40W at each antenna port of TX1 and TX2, respectively, 2) two CDMA carriers at the antenna port TX3 with the full power, but not transmitting, and 3) to transmit two CDMA carriers in E band, Ch 750 and Ch 775, with the maximum mean power of 45W at the antenna port TX4. The test models used for configuring the CDMA and LTE carriers were described in Sub-exhibit 11.4. All carriers were transmitting to non-radiating 50 Ω resistive loads.

The emission limitations and the setting of measurement equipment for the conducted spurious emissions measurement of a PCS carrier were specified in 24.238 and shown in Sub-Exhibit 11.4.

By using the relation between the electric field strength of an ideal dipole and its excitation power given in Reference Data for Radio Engineers, page 676, 4th edition, ITT Corp., the emission limit calculated equals

Frequency of Emission (MHz)	Separation Distance (m)	E (dBμV/m)	Detector/RBW
10-20,000 3		84.1	Average/1MHz

The field strength of radiated spurious emissions measured was determined by

$$E\ (\text{dB}\mu\text{V/m}) = V_{meas}\ (\text{dB}\mu\text{V}) + \text{Cable Loss (dB)} + \text{Antenna Factor (dB1/m)}.$$

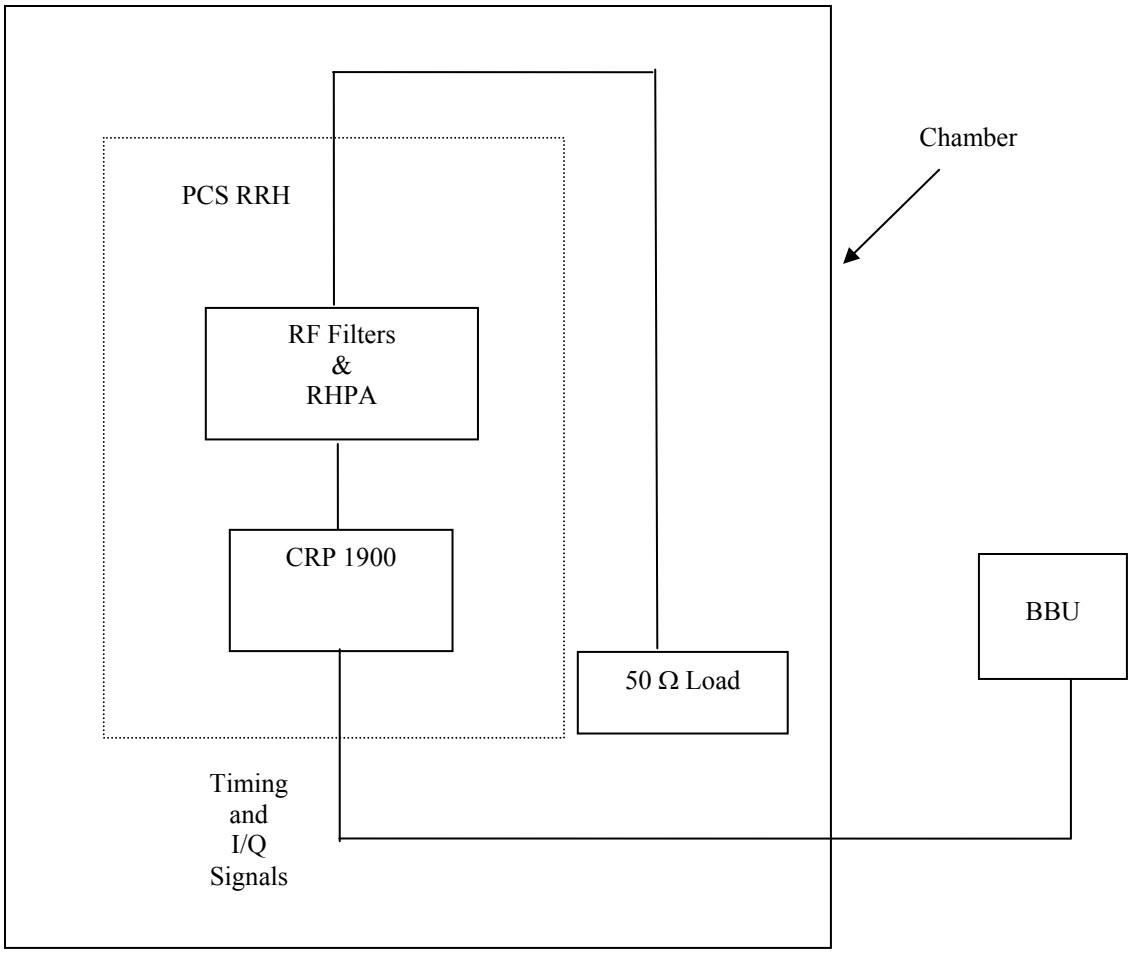
Sections 2.1051 and 2.1057(c) specify that the spurious emissions attenuated more than 20 dB below the permissible value need not be reported. Therefore, the reportable limit at 3 meter is 64.1 dBμV/m.

All the measurement equipment used, including antennas, was calibrated in accordance with ISO 9001 process. The EUT setup diagram is given in the Figure 11.6.1.

Results:

Over the frequency spectrum investigated (10MHz to 20GHz), no reportable radiated spurious emissions were detected. The measurement results of the Alcatel-Lucent CDMA-LTE PCS 4x45W RRH, subject of this application, demonstrate the full compliance with the Rules of the Commission.

FIGURE 11.6.1 EUT FOR MEASUREMENT OF RADIATED SPURIOUS EMISSIONS



SUBEXHIBIT 11.7

Section 2.1055 MEASUREMENT REQUIRED: FREQUENCY STABILITY

This test evaluates the frequency difference between the actual transmit carrier frequency and the specified transmit frequency assignment.

The Alcatel-Lucent CDMA-LTE PCS RRH 4x45W Distributed Base Station System, comprising of RRH and BBU modules, was designed to transmit in the frequency spectrum 1930-1995MHz with a 1.25 MHz carrier emission bandwidth for CDMA application and 5MHz carrier emission bandwidth for LTE application. The BBU provides the time and frequency reference to the RRH which incorporates CRP1900. The carrier frequency is determined by the up-conversion of digital baseband signals to IF.

The frequency stabilization of the carrier frequency of the above unit is achieved by the highly stable 15 MHz reference frequency generated by an accurate Oscillator Modules (OM) plus proprietary phase locked loop (PLL) circuitry and GPS reference.

The frequency stability testing was conducted on the -48VDC CDMA-LTE PCS 4x45W RRH Distributed Base Station System which consists of a PCS Outdoor RRH (Serial Number: 11W 367P10002 and Comcode: 201370400) and a 9928 MMBTS (Multi-Mode Base Transceiver Station) Outdoor BBU cabinet with fresh air filter. The outdoor system was designed for a wider temperature range than the indoor frame. The primary power supplier is -48 VDC. The stability of the output frequency of the PCS RRH was measured at its antenna transmitting terminal 1) from –40 °C to +55 °C in 10 °C steps at the rated supply voltage; and 2) at 85% and 115% of the nominal supply voltage, per Section 2.1055. The primary supply voltage, -48 VDC, was varied from 85% to 115%. The 85% of -48 VDC is 40.8 V and 115% is -55.2 V. The RRH was set to transmit one CDMA voice carrier at Channel 650 (1962.5MHz) with Pilot only (RRH Side A) and one LTE carrier at 1250 (1992.5MHz) (RRH Side B) at the rated RF power. The carrier frequencies at 1962.5MHz and 1992.50 MHz were measured at the antenna terminal (J4) at each temperature and each supply voltage by an Agilent VSA Series Transmitter Tester, respectively. To gain further confidence in the frequency stability of the unit under test, the 15MHz reference output from the CTU (Common Timing Unit) in the BBU was also monitored and measured with a high precision Frequency Counter. In addition, Rho parameters and transmit power were monitored by an Agilent MXA Signal Analyzer to ensure proper cell performance throughout the test interval.

The above PCS 4x45W RRH Distributed Outdoor Base Station System was installed in an environmental chamber. At each temperature and each supply voltage, the EUT was given sufficient time for its thermal stabilization. The testing was performed during the period of February 27~March 2, 2012.

FCC Section 24.235 specifies that the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation. The 3GPP2 C.S0032 & C.S0010 and 3GPP TS 36.104 specify the minimum standard is ±0.050 ppm for both CDMA and LTE (observed over one period of one subframe (1 ms)) carriers.

The maximum frequency derivations (Δf) at the antenna terminal from the assigned carrier frequency at each temperature and supply voltage are summarized in the following tables.

TABLE 11.7.1 FREQUENCY DERIVATION FOR CDMA CARRIER AT 1962.5MHZ FROM -40°C TO +55°C

Stabilized Temp. (°C)	Δ*f* 85% V_{norm} (Hz)	Δ*f* 100% V_{norm} (Hz)	Δ*f* 115% V_{norm} (Hz)
-40 31	.88	-22.97	-28.14
-30 15	.82	-19.06	-20.84
-20 -2	4.90	18.37	26.30
-10 25	.14	-22.61	26.26
0 27	.11	20.26	-8.61
+10	27.80 22	.63 21	.82
+20 21	.56	-15.59	18.01
+30	13.58 12	.53 24	.28
+40	22.41 14	.95 25	.77
+50	19.14 -9	.94 12	.79
+55	10.02 14	.80 20	.77

TABLE 11.7.2 FREQUENCY DERIVATION FOR LTE CARRIER AT 1992.5MHZ FROM -40°C TO +55°C

Stabilized Temp. (°C)	Δ*f* 85% V_{norm} (Hz)	Δ*f* 100% V_{norm} (Hz)	Δ*f* 115% V_{norm} (Hz)
-40 -1	.41	1.46	1.37
-30 1.	65	-1.67	-1.45
-20 -1	.67	-1.36	1.44
-10	-1.35 -1	.46 -1	.52
0 1.	33	-1.52	-1.46
+10 -1	.52	-1.45	1.67
+20 -1	.52	1.37	-1.46
+30 -1	.92	1.73	1.65
+40	1.76 1.	92 1.	65
+50 1.	88	-1.75	1.52
+55 -1	.67	1.52	-1.75

The maximum frequency derivations (Δ*f*) at +20 °C and 85% and 115% of the supply voltage from the carrier frequency at +20°C and rated supply voltage are summarized in the following tables.

TABLE 11.7.3 FREQUENCY DERIVATION FOR CDMA CARRIER AT 1962.5MHZ AT +20°C AND 100% V_{norm}

Stabilized Temp. (°C)	Δ*f* 85% V_{norm} (Hz)	Δ*f* 115% V_{norm} (Hz)
20 44	.8	49.58

TABLE 11.7.4 FREQUENCY DERIVATION FOR LTE CARRIER AT 1992.5MHZ AT +20°C AND 100% V_{norm}

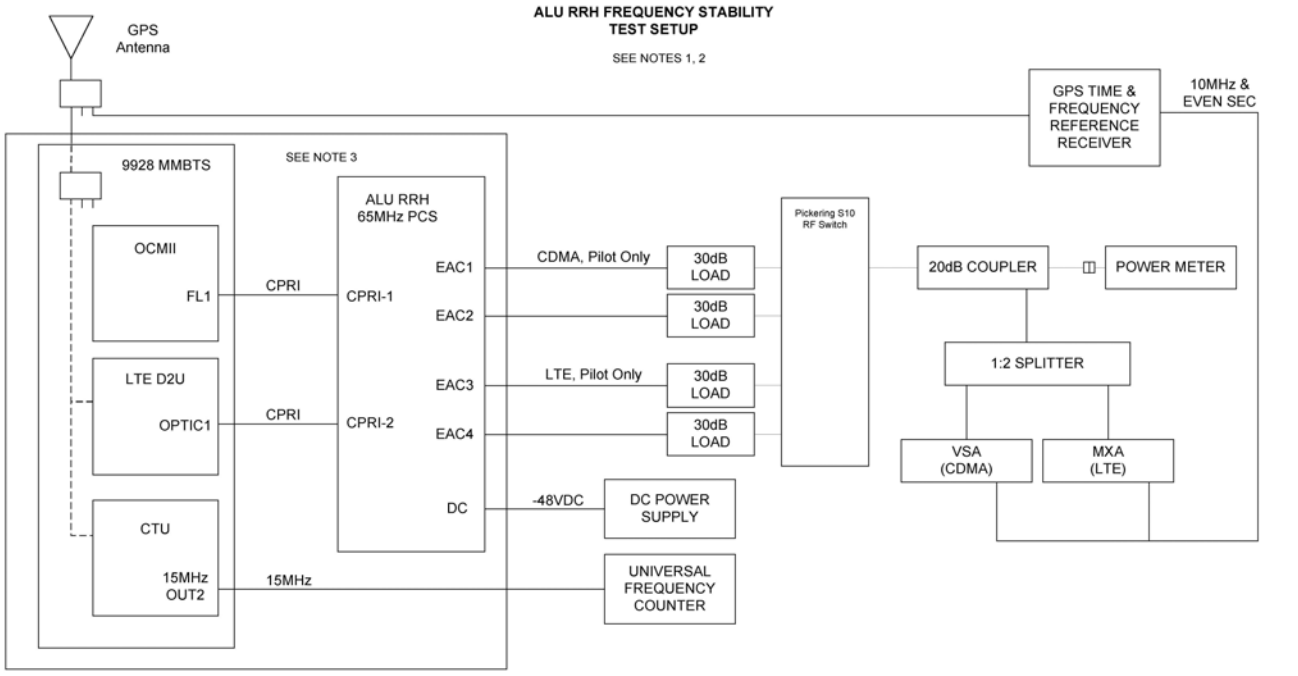
Stabilized Temp. (°C)	Δf 85% V_{norm} (Hz)	Δf 115% V_{norm} (Hz)
20 0.	82	-2.6

All the measurement equipment was calibrated in accordance with ISO 9001 process. The test set-up diagram is given in the Figure 11.7.1

Results:

The maximum frequency drifts at the antenna terminal of the PCS 4x45W RRH at the 1962.5MHz CDMA carrier frequency and 1992.5MHz LTE carrier frequency due to temperature and supply voltage changes are below ±0.05ppm requirement. The Alcatel-Lucent CDMA-LTE PCS 4x45W RRH with 9928 MMBTS BBU demonstrated full compliance with the Rules of the Commission.

FIGURE 11.7.1 SET-UP FOR MEASUREMENT OF FREQUENCY STABILITY



Notes:
1. 15MHz deviation measurement consists of reading the last digit (10E-7) on frequency counter and recording result.
2. Transmit carrier deviation measurement consists of reading the frequency error on VSA (CDMA) and MXA (LTE) and recording result.
3. Hardware within the dotted line were located inside GCPL thermal chamber.

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SUBEXHIBIT 11.8

Section 2.947 LISTING OF TEST EQUIPMENT USED

Equipment	Manufacturer	Model	Serial No.	Calibrated Date	Due Cal. Date
Power Meter	Agilent	E4418B	MY45101723	3/10/2012	3/10/2013
Power Sensor	HP	ECP-E18A	US37182129	10/05/2011	10/05/2012
Power Meter	HP	437B	3125U21137	9/29/2011	9/29/2012
Power Sensor	HP	8481A	US37294629	8/31/2011	8/31/2012
EMI Test Receiver (20Hz to 40 GHz)	Rohde & Schwarz	ESIB40	100044	4/4/2011	4/4/2012
EMI Test Receiver (20Hz to 40 GHz)	Rohde & Schwarz	ESIB40	100121	9/14/2011	9/14/2012
Signal Analyzer, MXA, l 20Hz-26.5GHz	Agilent N	9020A	MY48011791	4/27/2011	4/27/2012
VSA Transmitter Tester	Agilent	E4406A	US40061191	5/19/2011	5/19/2012
MXA A	gilent	N9020A	MY50200375	3/02/2012	3/02/2013
Temperature Logger	Yokogawa	MV2000	S5JC04069	2/24/2012	2/24/2013
Spectrum Analyzer 9kHz-22GHz	Hewlett-Packard 8	593E	3911A04009	9/22/2011	9/22/2012
Attenuator 5dB (5W)	Weinschel	2-6	BX3438	1/23/2012	1/23/2013
Attenuator (100 W)	Weinschel	48-30-33, E961	AY8323	N/A	N/A
Attenuator (150W)	Weinschel	66-20-34, E 815	BW7320	N/A	N/A
Directional Coupler	HP	772D, E371	2839A01006	N/A	N/A
Directional Coupler	HP	778D, E962	18300	N/A	N/A
Bilogical Antenna 25-2000MHz	A.H. Systems	SAS-521-2	410	9/22/2011	9/22/2012
Double Ridged Horn Ant. 1-18GHz	ETS Lindgren	3117	00135198	7/20/2011	7/20/2012
Double Ridged Horn Ant. 18-40GHz	ETS Test Systems	3116 2	539	12/5/2011	12/5/2012
Active Rod & Field Antenna 30Hz-50MHz	ETS Test Systems	3301B 4	356	12/2/2011	12/2/2012
Loop Antenna 10kHz-30MHz	EMCO 65	12	8901-1050	3/15/2012	4/15/2013
Pre-amplifier 1-26.5GHz	Hewlett-Packard	8449B	3008A00426	7/14/2011	7/14/2012
Pre-amplifier 9kHz-1GHz	Sonoma Instrument Co.	310N 18	6747	7/26/2011	7/26/2012
Universal Counter	Agilent	53131A	MY40003545	10/06/2011	10/06/2012
GPS Time and Frequency Reference Receiver	HP 5	8503A	3710A00940	N/A	N/A