

Mike Kuo

From: Mike Kuo
Sent: Monday, November 06, 2006 2:37 PM
To: 'SUN-HEE KIM (HCT)'
Cc: kentkim (HCT America); khpark (HCT)
Subject: FCC Audit - Pantech & Curitel Communications, Inc., FCC ID:PP4PN-E330, Assessment No:AN06T5778

Hi Sun-Hee and Mr. Park :

CCS Certification Division has finished the sample request measurement made on above equipment that you provided. Below are the findings and compare to your measurement:

A. Measurement made by HCT, reported on Oct.27, 2006

- Base Station Simulator: E5515C
- Power Meter(C) Model: E4416A
Manufacture: Agilent
- Power Sensor(C) Model: E9327A
Manufacture: Agilent
- Power Meter setting: CDMA2000 Mode/ RBW: default condition/ VBW: High)

CONDUCTED POWER

Mode	CDMA 800 (ch 383)		CDMA 1900 (ch 600)	
	Peak (dBm)	Average (dBm)	Peak (dBm)	Average (dBm)
RC1, SO2, Full Rate	27.95	24.96	27.55	24.84
RC1, SO55, Full Rate	27.92	24.95	27.54	24.89
RC2, SO9, Full Rate	27.92	24.94	27.52	24.84
RC2, SO55, Full Rate	27.90	24.93	27.54	24.82
RC3, SO2, Full Rate	27.91	24.97	27.80	24.73
RC3, SO55, Full Rate	27.92	24.98	27.70	24.71
RC4, SO2, Full Rate	27.79	24.93	27.34	24.70
RC4, SO55, Full Rate	27.87	24.98	27.37	24.82
RC5, SO9, Full Rate	27.87	24.98	27.32	24.83
RC5, SO55, Full Rate	27.83	24.96	27.30	24.80
RC3, SO32, (+ F-SCH) Full Rate	27.84	24.98	27.38	24.73
RC3, SO32, (+ SCH) Full Rate	27.82	24.98	27.30	24.78

Above measurement are difference than those measurement made by HCT on Oct.11 as reported below:

Equipment list;

- Base Station Simulator: E5515C
- Power Meter(C) Model: E4416A
Manufacture: Agilent
- Power Sensor(C) Model: E9327A
Manufacture: Agilent

CONDUCTED POWER

Mode	CDMA 800 (ch 383)		CDMA 1900 (ch 600)	
	Peak (dBm)	Average	Peak (dBm)	Average

		(dBm)		(dBm)
RC1, SO2, Full Rate	27.6	24.9	27.4	24.8
RC1, SO55, Full Rate	27.5	24.9	27.5	24.8
RC2, SO9, Full Rate	27.5	24.9	27.5	24.9
RC2, SO55, Full Rate	27.4	24.9	27.6	24.8
RC3, SO2, Full Rate	27.5	24.8	27.6	24.9
RC3, SO55, Full Rate	27.6	24.9	27.6	24.9
RC4, SO2, Full Rate	27.5	24.9	27.5	24.9
RC4, SO55, Full Rate	27.6	24.9	27.5	24.9
RC5, SO9, Full Rate	27.5	24.9	27.4	24.8
RC5, SO55, Full Rate	27.4	24.9	27.4	24.8
RC3, SO32, (+ F-SCH) Full Rate	27.5	24.9	27.5	24.8
RC3, SO32, (+ SCH) Full Rate	27.5	24.9	27.4	24.9

By comparing to Oct.27 and Oct.11 test data reported by HCT, Oct.27 was measured with Directional Coupler, Oct. 11 was measured with power divider. The differences between these measurement as indicated by HCT are :

" It seems that the battery charging rate and aging time have a effect on the test result (Peak Power).

Previous data (Oct. 27) : We used the full charged battery without aging time.

Current data (Oct.11) : We used the full charged battery with enough aging time."

B. Measurement made by CCS certification division on Nov. 06 are reported below:

TEST EQUIPMENT LIST				
Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
Peak / Average Power Sensor	Agilent	E9327A	US40440755	12/2/2007
Peak Power Meter	Agilent / HP	E4416A	GB41291160	12/2/2007
Directional Coupler	Amplifier Research	DC7144A, 0.8-4.2GHz	305089	N.C.R.
Wireless Communications Test Set	Agilent	E5515C	91029	9/20/2008

Mode	CDMA 800 (ch 383)		CDMA 1900 (ch 600)	
	Peak (dBm)	Average (dBm)	Peak (dBm)	Average (dBm)
RC1, SO2, Full Rate	29.00	24.90	27.95	24.36
RC1, SO55, Full Rate	29.00	24.88	28.00	24.36
RC2, SO9, Full Rate	28.97	24.88	27.95	24.35
RC2, SO55, Full Rate	28.94	24.86	28.00	24.37
RC3, SO2, Full Rate	28.72	24.85	27.78	24.35
RC3, SO55, Full Rate	28.72	24.83	27.78	24.35
RC4, SO2, Full Rate	28.75	24.82	27.50	24.35
RC4, SO55, Full Rate	28.70	24.80	27.50	24.36
RC5, SO9, Full Rate	28.75	24.85	27.46	24.32
RC5, SO55, Full Rate	28.80	24.88	27.46	24.32
RC3, SO32, (+ F-SCH) Full Rate	28.75	24.90	27.80	24.37
RC3, SO32, (+ SCH) Full Rate	28.73	24.85	27.76	24.35

C. There are big differences in term of peak output power for Cellular Band by comparing to HCT and CCS test result. This difference may be resulting the aging period before the measurement and may be due to differences in term of measured test sample.

Conclusion :

1. In the future applications for FCC equipment authorization, HCT needs to document the aging requirements in the test

report. If the device requires to be aging for certain period of time based upon the manufacturer tune up procedure, the test report must be clearly documented.

2. HCT needs to observe and follow the FCC 3G review guideline before making the measurement. As documented in this application, RC3/SO55 is not the worst case in term of HAC E/H field measurement. Per FCC 3G review guideline, if sub-set of tests were selected during the final compliance measurement, the test lab must be documented the preliminary test result by providing the peak and average output power measurement for various RC/SO. When performing the HAC E/H measurement, FCC allows the justification for selecting sub-set of test mode by using PEAK output power. The test lab allows to only test the highest PEAK output power during final compliance tests. For SAR measurement, FCC allows to use AVERAGE output power as the factor in selecting sub-set of test mode.

3. HCT needs to use directional coupler when external call box is required to establish the connections during the output power measurement, Directional Coupler is required (Power Divider is not recommended).

4. By comparing the highest peak output power measured by HCT and CCS, the worst case in term of peak output power is RC1/SO2 in Cellular Band and RC2/SO55 or RC3/SO2 in PCS band. RC3/SO55 has lower peak output power in cellular and PCS band but the differences are within 0.5 dB. Due to there is only 0.5 dB difference, you do not need to redo HAC measurement on RC1/SO2 (cellular band) and RC2/SO55 or RC3/SO2 (PCS band). In the future application, please make sure to document the preliminary test data, preliminary test procedures, aging requirements, test equipment list and rational in selecting the sub-set of test mode for final compliance tests.

Best Regards

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