FCC TEST REPORT

Report No: STS1503015F01

Issued for

Eclipse Software Systems, LLC

8201 W 20th Street – Greeley, CO 80634

Product Name:	RapidLog ELD 200
Brand Name:	RapidLog
Model No.:	200
Series Model:	N/A
FCC ID:	2ADUX-ELD200
Test Standard:	FCC Part 2,22,24

Shenzhen STS Test Services Co., Ltd.
1/F, Building B, Zhuoke Science Park, Chongqing Road, Fuyong, Baoan District, Shenzhen, China
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TEST RESULT CERTIFICATION

Applicant's name	Eclipse Software Systems, LLC
Address	8201 W 20th Street – Greeley, CO 80634
Manufacture's Name	Shenzhen Unistrong Science & Technology Co., Ltd.
Address	No.4, Zhengcheng 2nd Rd., Xintian Village, Fuyong Town, Bao'an District, Shenzhen, China

Product description

Product name	RapidLog ELD 200
Band name	RapidLog
Model and/or type reference	200
Standards	FCC Part 2,22,24
Test procedure	ANSI C63.4-2009

This device described above has been tested by STS, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test	
Date of performance of tests	01 Mar. 2015 ~15 July 2015
Date of Issue	16 July 2015
Test Result	Pass

Testing Engineer : (Hakim Hou)

Report writing : (Sunny zheng)

Authorized Signatory : (Bovey Yang)

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1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

Item Description		FCC Rules	Result
Output Power	Conducted Output Power	2.1046/22.913(a) (2) / 24.232 (c)	Pass
	Radiated Output Power		
Peak-to-Average Ratio	Peak-to-Average Ratio	24.232(d)	Pass
Spurious Emission	Conducted Spurious Emission	2.1051/2.1053/22.917(a)/24.238(a)	Pass
	Radiated Spurious Emission		
Mains Conducted Emission		15.107 / 15.207	Pass
Frequency Stability		2.1055/22.355 /24.235	Pass
Occupied Bandwidth		2.1049 (h)(i)	Pass
Emission Bandwidth		22.917(a)/24.238(a)	Pass
Band Edge		2.1051/22.917(a)/24.238(a)	Pass

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

1.1 TEST FACILITY

Shenzhen STS Test Services Co., Ltd.
Add.: 1/F, Building 2, Zhuoke Science Park, Chongqing Road, Fuyong, Baoan District, Shenzhen, China.
FCC Registration No.: 842334

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement y ± U，where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2，providing a level of confidence of approximately 95 %。

No.	Item	Uncertainty
1	Conducted Emission Test	±1.38dB
2	RF power,conducted	±0.16dB
3	Spurious emissions,conducted	±0.21dB
4	All emissions,radiated(<1G)	±4.68dB
5	All emissions,radiated(>1G)	±4.89dB
6	Temperature	±0.5°C
7	Humidity	±2%

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	RapidLog ELD 200
Trade Name	RapidLog
Model Name	200
Serial Model	N/A
Model Difference	N/A
Rating Voltage	DC 12V
Hardware version number	E9616_V1.3
Software versioning number	V2.8

I/O Port of EUT			
I/O Port Type	**Q'TY**	**Cable**	**Tested with**
DC INPUT PORT	1	0.8m, unshielded	1
USB PORT	2	0.8m, unshielded	1

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

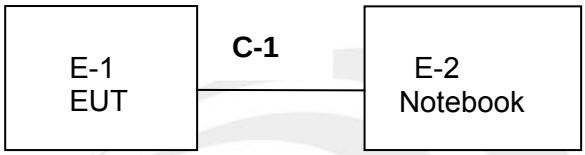
2.2 DESCRIPTION OF TEST MODES

During the testing, the EUT was controlled via Rhode & Schwarz Digital Radio Communication Tester (CMU 200/ AGILENT 8960) to ensure max power transmission and proper modulation. Three channels (The top channel, the middle channel and the bottom channel) were chosen for testing on both CDMA2000 BC0 and CDMA2000 BC1 frequency band.

***Note: CDMA 2000 BC0/ CDMA2000 1xEV-DO, CDMA 2000 BC1/ CDMA2000 1xEV-DO mode have been tested during the test.

The worst condition was recorded in the test report if no other modes test data.

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



2.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	RapidLog ELD 200	RapidLog	200	N/A	EUT
E-2	Notebook	Lenovo	B460	WB03928113	accessories

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	0.5m	

Note:

(1) The support equipment was authorized by Declaration of Confirmation.
(2) For detachable type I/O cable should be specified the length in cm in『Length』column.
(3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.

2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Radiation Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
Universal Radio Communication Tester	R&S	CMU200	112012	2014.10.25	2015.10.24
Bilog Antenna	TESEQ	CBL6111D	34678	2014.10.25	2015.10.24
Test Cable	N/A	R-01	N/A	2014.10.25	2015.10.24
Test Cable	N/A	R-02	N/A	2014.10.25	2015.10.24
EMI Test Receiver	R&S	ESCI	101427	2014.10.25	2015.10.24
Antenna Mast	EM	SC100_1	N/A	N/A	N/A
Turn Table	EM	SC100	060531	N/A	N/A
50Ω Switch	Anritsu Corp	MP59B	6200983705	2015.07.06	2016.07.05
Spectrum Analyzer	Aglient	E4407B	MY50140340	2014.10.25	2015.10.24
Horn Antenna	Schwarbeck	BBHA 9120D	9120D-963	2014.10.25	2015.10.24
Pre-Amplifier	DASY 5	NO. WL-42W	9638	2014.10.25	2015.10.24

Conduction Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
EMI Test Receiver	R&S	ESPI	102086	2014.10.25	2015.10.24
LISN	R&S	ENV216	101242	2014.10.25	2015.10.24
LISN	EMCO	3810/2NM	000-23625	2014.10.25	2015.10.24
Absorbing clamp	R&S	MDS-21	100668	2014.10.27	2015.10.26
Temperature & Humitidy Chamber	Mieo	HH660	N/A	2014.10.27	2015.10.26
Conduction Cable	EM	C01	N/A	2014.10.25	2015.10.24
Clamp Cable	EM	C02	N/A	2014.10.25	2015.10.24

3. OUTPUT POWER

3.1 CONDUCTED OUTPUT POWER

3.1.1 measurement method

The EUT was setup for the max output power with pseudo random data modulation. Power was measured with Spectrum Analyzer. The measurements were performed on all modes (CDMA 2000 BC0/ CDMA2000 1xEV-DO, CDMA 2000 BC1/ CDMA2000 1xEV-DO) at 3 typical channels (the Top Channel, the Middle Channel and the Bottom Channel) for each band.

3.1.2 Measurement Result

Conducted Output Power Limits for CDMA 2000 BC0		
Mode	**Nominal Peak Power**	**Tolerance(dB)**
CDMA2000	**24 dBm (0.25W)**	**- 2**
Conducted Output Power Limits for CDMA 2000 BC1		
Mode	**Nominal Peak Power**	**Tolerance(dB)**
CDMA2000	**24 dBm (0.25W)**	**- 2**

CDMA 2000 BC0/ CDMA2000 1xEV-DO

Mode	Channel	Frequency (MHz)	Reference power	Peak Power	Tolerance	Avg.Burst Power
1xRTT RC1 SO55	1013	824.7	24	23.56	-0.44	22.22
	384	836.52	24	**23.76**	-0.24	22.29
	777	848.31	24	23.61	-0.39	22.23
1xRTT RC3 SO55	1013	824.7	24	23.45	-0.55	22.17
	384	836.52	24	23.52	-0.48	22.19
	777	848.31	24	23.51	-0.49	22.14
1xRTT RC3 SO32(+ F-SCH)	1013	824.7	24	23.47	-0.53	22.12
	384	836.52	24	23.23	-0.77	22.11
	777	848.31	24	23.46	-0.54	22.14
1xRTT RC3 SO32(+SCH)	1013	824.7	24	23.38	-0.62	22.16
	384	836.52	24	23.44	-0.56	22.15
	777	848.31	24	23.35	-0.65	22.18
1xEV-DO RTAP 153.6K	1013	824.7	24	23.33	-0.67	22.19
	384	836.52	24	23.41	-0.59	22.12
	777	848.31	24	23.45	-0.55	22.16
1xEV-DO RETAP 4096K	1013	824.7	24	23.56	-0.44	22.22
	384	836.52	24	23.76	-0.24	22.29
	777	848.31	24	23.61	-0.39	22.23

CDMA 2000 BC1/ CDMA2000 1xEV-DO

Mode	Channel	Frequency (MHz)	Reference power	Peak Power	Tolerance	Avg.Burst Power
1xRTT RC1 SO55	25	1851.25	24	**23.69**	-0.31	22.27
	600	1880	24	23.58	-0.42	22.18
	1175	1908.75	24	23.54	-0.46	22.17
1xRTT RC3 SO55	25	1851.25	24	23.43	-0.57	22.19
	600	1880	24	23.47	-0.53	22.16
	1175	1908.75	24	23.41	-0.59	22.15
1xRTT RC3 SO32(+ F-SCH)	25	1851.25	24	23.35	-0.65	22.08
	600	1880	24	23.39	-0.61	22.09
	1175	1908.75	24	23.41	-0.59	22.11
1xRTT RC3 SO32(+SCH)	25	1851.25	24	23.44	-0.56	22.15
	600	1880	24	23.47	-0.53	22.18
	1175	1908.75	24	23.42	-0.58	22.13
1xEV-DO RTAP 153.6K	25	1851.25	24	23.39	-0.61	22.17
	600	1880	24	23.45	-0.55	22.18
	1175	1908.75	24	23.32	-0.68	22.13
1xEV-DO RETAP 4096K	25	1851.25	24	23.69	-0.31	22.27
	600	1880	24	23.58	-0.42	22.18
	1175	1908.75	24	23.54	-0.46	22.17

According to 3GPP 25.101 sub-clause 6.2.2 , the maximum output power is allowed to be reduced by following the table.

Table 6.1aA: UE maximum output power with HS-DPCCH and E-DCH

UE Transmit Channel Configuration	CM(db)	MPR(db)
For all combinations of ,DPDCH,DPCCH HS-DPDCH,E-DPDCH and E-DPCCH	0≤ CM≤3.5	MAX(CM-1,0)
Note: CM=1 for β_c/β_d=12/15, β_{hs}/β_c=24/15.For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.		

The device supports MPR to solve linearity issues (ACLR or SEM) due to the higher peak-to average ratios (PAR) of the HSUPA signal. This prevents saturating the full range of the TX DAC inside of device and provides a reduced power output to the RF transceiver chip according to the Cubic Metric (a function of the combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH).

When E-DPDCH channels are present the beta gains on those channels are reduced firsts to try to get the power under the allowed limit. If the beta gains are lowered as far as possible, then a hard limiting is applied at the maximum allowed level.

The SW currently recalculates the cubic metric every time the beta gains on the E-DPDCH are reduced. The cubic metric will likely get lower each time this is done .However, there is no reported reduction of maximum output power in the 1xRTT RC3 mode since the device also provides a compensate for the power back-off by increasing the gain of TX_AGC in the transceiver (PA) device.

The end effect is that the DUT output power is identical to the case where there is no MPR in the device.

3.2 RADIATED OUTPUT POWER

3.2.1 measurement method

1 The measurements procedures specified in TIA-603C-2004 were applied.

2 In an anechoic antenna test chamber, a half-wave dipole antenna for the frequency band of interest is placed at the reference centre of the chamber. An RF Signal source for the frequency band of interest is connected to the dipole with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A known (measured) power (Pin) is applied to the input of the dipole, and the power received (Pr) at the chamber's probe antenna is recorded. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and a spectrum analyzer with RBW= 100 KHz, VBW= 300 KHz, RMS detector settings per section 4.0 of KDB 971168 D01.

3 The substitution method is used. Substitution values at each frequency are measured before and saved to the test software. A "reference path loss" is established as ARpl=Pin + 2.15 - Pr. The ARpl is the attenuation of “reference path loss”, and including the gain of receive antenna, the cable loss and the air loss. The measurement results are obtained as described below: Power=PMea+ARpl

4 The EUT is substituted for the dipole at the reference centre of the chamber and a scan is performed to obtain the radiation pattern.

5 From the radiation pattern, the co-ordinates where the maximum antenna gain occurs are identified.

6 The EUT is then put into continuously transmitting mode at its maximum power level.

7 Power mode measurements are performed with the receiving antenna placed at the coordinates determined in Step 3 to determine the output power as defined in Rule 24.232 (b) and (c). The "reference path loss" from Step1 is added to this result.

8 This value is EIRP since the measurement is calibrated using a half-wave dipole antenna of known gain (2.15 dBi) and known input power (Pin).

9 ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dBi.

3.2.2 PROVISIONS APPLICABLE

This is the test for the maximum radiated power from the EUT. Rule Part 24.232(b) specifies, “Mobile/portable stations are limited to 2 watts e.i.r.p. Peak power” and 24.232(c) specifies that "Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.” Rule Part 22.913(a) specifies “Maximum ERP. The effective radiated power (ERP) of base transmitters and cellular repeaters must not exceed 500 Watts. The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.”

Mode	Nominal Peak Power
CDMA 2000 BC0	<=38.45 dBm (7W)
CDMA 2000 BC1	<=33 dBm (2W)

3.2.3 Measurement Result

Radiated Power (ERP) for CDMA2000 BC0 1xRTT_RC3+SO32				
Mode	**Frequency**	**Result**		**Conclusion**
		Max. Peak ERP (dBm)	**Polarization Of Max. ERP**	
CDMA2000 BC0	824.70	22.62	Horizontal	**Pass**
	836.52	**22.83**	Horizontal	**Pass**
	848.31	22.77	Horizontal	**Pass**

Radiated Power (E.I.R.P) for CDMA2000 BC1 1xRTT_RC3+SO32				
Mode	**Frequency**	**Result**		**Conclusion**
		Max. Peak E.I.R.P.(dBm)	**Polarization Of Max. E.I.R.P.**	
CDMA2000 BC1	1851.25	22.12	Horizontal	**Pass**
	1880.0	22.17	Horizontal	**Pass**
	1908.75	**22.43**	Horizontal	**Pass**

Note: Above is worst mode data.

3.3. PEAK-TO-AVERAGE RATIO

3.3.1 MEASUREMENT METHOD

1. The following steps outline the procedure used to measure the Peak-to-Average Ratio from the EUT.
2. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
3. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
4. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.

3.3.2 PROVISIONS APPLICABLE

This is the test for the Peak-to-Average Ratio from the EUT.

Power Complementary Cumulative Distribution Function (CCDF) curves provide a means for characterizing the power peaks of a digitally modulated signal on a statistical basis. A CCDF curve depicts the probability of the peak signal amplitude exceeding the average power level. Most contemporary measurement instrumentation include the capability to produce CCDF curves for an input signal provided that the instrument's resolution bandwidth can be set wide enough to accommodate the entire input signal bandwidth. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

3.3.3 Measurement Result

Modes	CDMA2000 BC1 CDMA 2000 1xRT		
Channel	25	600	1175
	(Low)	(Mid)	(High)
Frequency (MHz)	1851.25	1880.0	1980.75
Peak-To-Average Ratio (dB)	**1.42**	**1.4**	**1.37**

4. SPURIOUS EMISSION

4.1 CONDUCTED SPURIOUS EMISSION

4.1.1 measurement method

The following steps outline the procedure used to measure the conducted emissions from the EUT.

1, Determine frequency range for measurements: From CFR 2.1057 the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency. For the equipment of CDMA2000 BC1, this equates to a frequency range of 30 MHz to 19.1 GHz, data taken from 30 MHz to 20 GHz. For CDMA2000 BC0,data taken from 30 MHz to 9 GHz.

2, Determine EUT transmit frequencies: the following typical channels were chosen to conducted emissions testing.

Typical Channels for testing of CDMA2000 BC0	
Channel	Frequency (MHz)
1013	824.70
384	836.52
777	848.31

Typical Channels for testing of CDMA2000 BC1	
Channel	Frequency (MHz)
25	1851.25
600	1880.0
1175	1908.75

4.1.2 PROVISIONS APPLICABLE

On any frequency outside frequency band of 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. For all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm.

4.1.3 Measurement Result

PLEASE REFER TO: APPENDIX I TEST PLOTS FOR CONDUCTED SPURIOUS EMISSION

Note: 1. Below 30MHZ no Spurious found and The GSM modes is the worst condition.

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

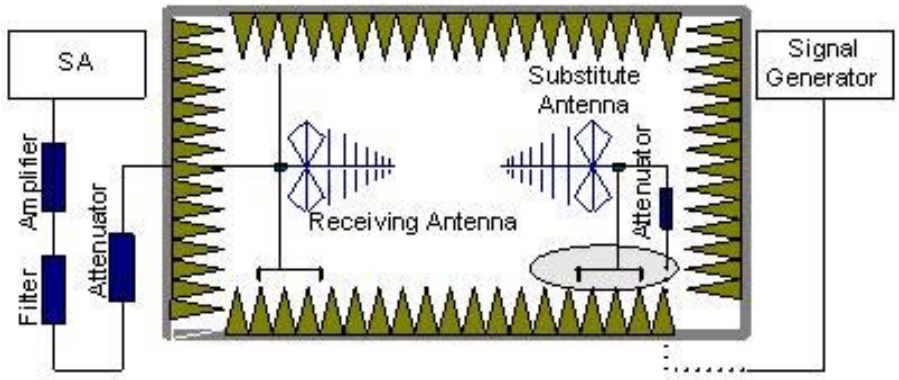
4.2 RADIATED SPURIOUS EMISSION

4.2.1 measurement method

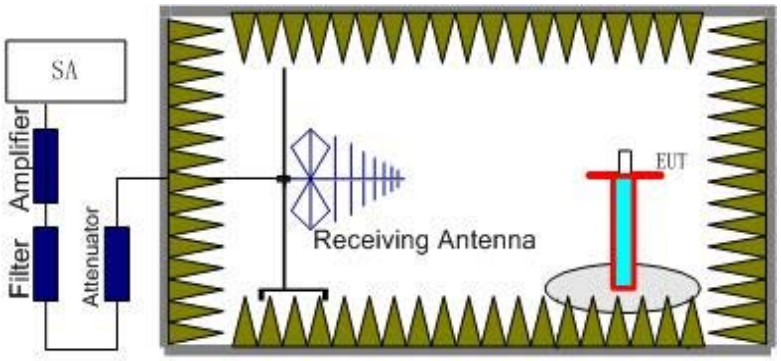
The measurements procedures specified in TIA-603C-2004 were used for testing. The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment. The resolution bandwidth is set 1MHz as outlined in Part 24.238. The measurements were performed on all modes(CDMA 2000 BC0/ CDMA2000 1xEV-DO, CDMA 2000 BC1/ CDMA2000 1xEV-DO) at 3 typical channels(the Top Channel, the Middle Channel and the Bottom Channel) for each band.

The procedure of radiated spurious emissions is as follows:

a) Pre-calibration With pre-calibration method, the Radiated Spurious Emissions(RSE) is calculated as, RSE=Rx（dBuV）+CL（dB）+SA（dB）+Gain（dBi）-107（dBuV to dBm）The SA is calibrated using following setup.



b) EUT was placed on a 0.8 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the test item for emission measurements. The height of receiving antenna is 0.8m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the test item and adjusting the receiving antenna polarization. The radiated emission measurements of all non-harmonic and harmonics of the transmit frequency through the 10th harmonic were measured with peak detector and 1MHz bandwidth.



Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the CDMA2000 BC1 band (1851.25 MHz, 1880 MHz and 1908.75 MHz), CDMA2000 BC0 band (824.7MHz, 836.52MHz, 848.31 MHz). It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of any band into any of the other blocks.

The substitution method is used. Substitution values at each frequency are measured before and saved to the test software. A "reference path loss" is established and the A_{Rpl} is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss and the air loss. The measurement results are obtained as described below: $Power=P_{Mea}+A_{Rpl}$

4.2.2 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:

4.2.3 Measurement Result

CDMA2000 BC0 1xRTT_RC3+SO32:

The Worst Test Results for Channel 251/848.8 MHz					
Frequency(MHz)	**Power(dBm)**	**ARpl (dBm)**	**PMea(dBm)**	**Limit（dBm）**	**Polarity**
1685.23	-38.78	-2.25	-41.03	-13.00	**Horizontal**
2456.12	-40.29	-3.03	-43.32	-13.00	**Vertical**
3645.78	-41.86	-1.87	-43.73	-13.00	**Vertical**
4536.58	-41.27	8.52	-32.75	-13.00	**Horizontal**

CDMA2000 BC1 1xRTT_RC3+SO32:

The Worst Test Results for Channel 810/1909.8MHz					
Frequency(MHz)	**Power(dBm)**	**ARpl (dBm)**	**PMea(dBm)**	**Limit（dBm）**	**Polarity**
1429.36	-41.73	-2.26	-43.99	-13.00	**Vertical**
2563.47	-41.26	-3.12	-44.38	-13.00	**Vertical**
3645.26	-42.47	-1.74	-44.21	-13.00	**Horizontal**
4563.56	-42.61	8.74	-33.87	-13.00	**Vertical**
5689.25	-43.44	17.89	-25.55	-13.00	**Horizontal**

Note: Below 30MHZ no Spurious found and The CDMA2000 modes is the worst condition.

5. MAINS CONDUCTED EMISSION

5.1 MEASUREMENT METHOD

The measurement procedure specified in ANSI C63.4-2009 was used for testing. Conducted Emission was measured with travel charger.

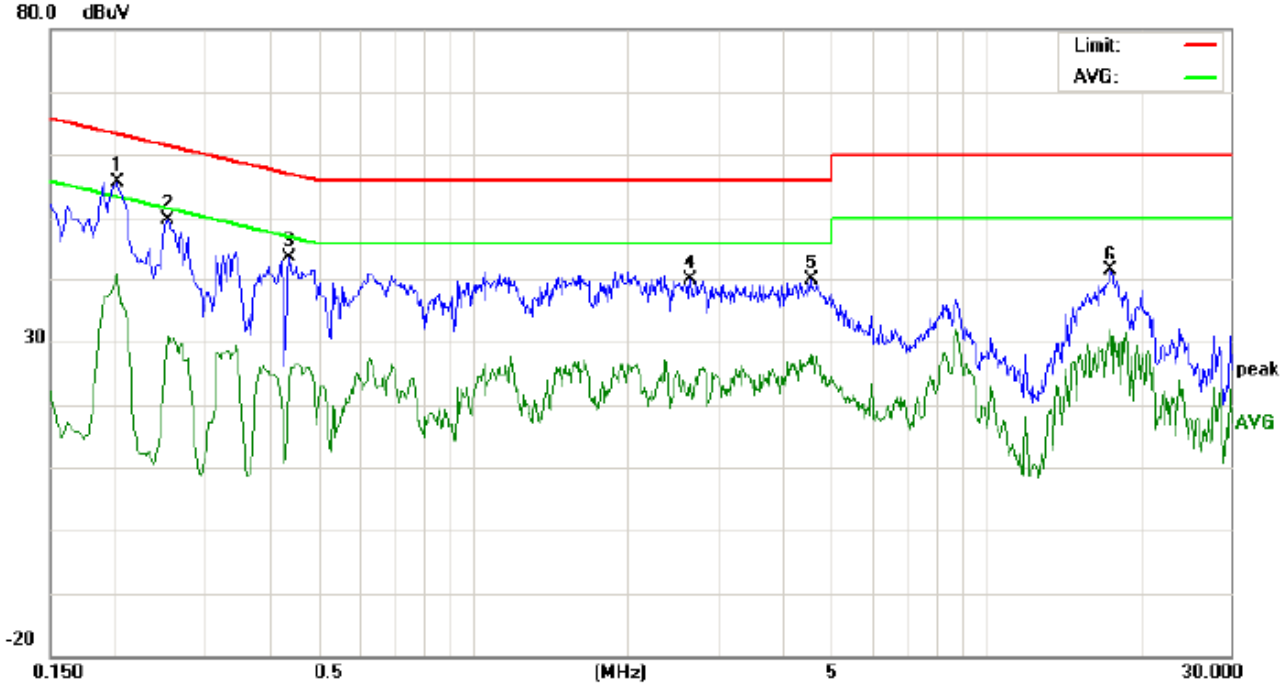
5.2 PROVISIONS APPLICABLE

Frequency of Emission (MHz)	Conducted Limit(dBuV)	
	Quasi-Peak	Average
0.15 – 0.5	66 to 56 *	56 to 46 *
0.5 – 5	56	46
5 – 30	60	50
*Decreases with the logarithm of the frequency. *The lower limit shall apply at the transition frequency.		

Note: The CDMA BC0 mode is the worst condition and the test result as following:

5.3 MEASUREMENT RESULT

LINE CONDUCTED EMISSION - L



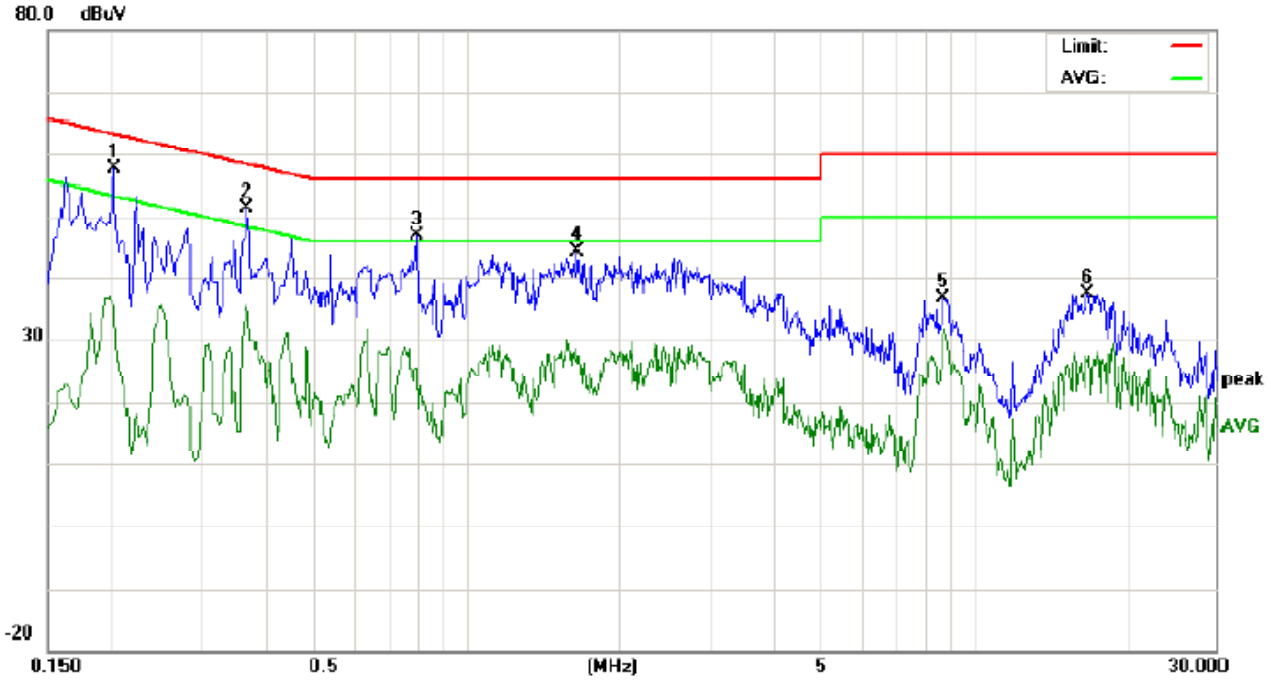
Site: Conduction
Limit: FCC Class B Conduction(QP)
EUT: RapidLog ELD 200
M/N: 200
Mode: Call
Note:

Phase: *L1*
Power:

Temperature: 26
Humidity: 60 %

No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG	dB	Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.2020	45.40		30.57	10.22	55.62		40.79	63.52	53.52	-7.90	-12.73	P	
2	0.2540	39.27		20.59	10.27	49.54		30.86	61.62	51.62	-12.08	-20.76	P	
3	0.4380	33.18		12.93	10.36	43.54		23.29	57.10	47.10	-13.56	-23.81	P	
4	2.6579	29.44		12.84	10.47	39.91		23.31	56.00	46.00	-16.09	-22.69	P	
5	4.5698	29.58		16.15	10.21	39.79		26.36	56.00	46.00	-16.21	-19.64	P	
6	17.5379	31.16		21.76	10.12	41.28		31.88	60.00	50.00	-18.72	-18.12	P	

LINE CONDUCTED EMISSION - N



Site: Conduction
Limit: FCC Class B Conduction(QP)
EUT: RapidLog ELD 200
M/N: 200
Mode: Call
Note:

Phase: N
Power:

Temperature: 26
Humidity: 60 %

No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG	dB	Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.2020	47.49		25.16	10.22	57.71		35.38	63.52	53.52	-5.81	-18.14	P	
2	0.3699	40.96		25.03	10.32	51.28		35.35	58.50	48.50	-7.22	-13.15	P	
3	0.7980	36.70		15.08	10.28	46.98		25.36	56.00	46.00	-9.02	-20.64	P	
4	1.6578	34.09		18.24	10.33	44.42		28.57	56.00	46.00	-11.58	-17.43	P	
5	8.6937	26.32		19.90	10.29	36.61		30.19	60.00	50.00	-23.39	-19.81	P	
6	16.7698	27.35		16.37	10.13	37.48		26.50	60.00	50.00	-22.52	-23.50	P	

Note: The CDMA 2000 BC0 mode is the worst condition.

6. FREQUENCY STABILITY

6.1 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℃.

3 , With the EUT, powered via nominal voltage, connected to the CMU200 and in a simulated call on channel 600 for CDMA 2000 BC 1, channel 384 for CDMA 2000 BC0 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℃ increments from -10℃ to +50℃. 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℃ increments from +50℃ to -10℃. 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.

6.2 PROVISIONS APPLICABLE

6.2.1 For Hand carried battery powered equipment

According to the JTC standard 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 6.3VDC and 8.5VDC, with a nominal voltage of 7.4VDC. 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.

6.2.2 For equipment powered by primary supply voltage

According to the JTC standard 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.

6.3 MEASUREMENT RESULT (WORST)

Frequency Error Against Voltage for CDMA2000 BC0 1xRTT_RC3+SO32		
Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
3.4	32	0.038
3.7	29	0.035
4.2	28	0.033

Frequency Error Against Temperature for CDMA2000 BC0 1xRTT_RC3+SO32		
temperature(℃)	Frequency error(Hz)	Frequency error(ppm)
-10	29	0.035
0	25	0.030
10	26	0.031
20	27	0.032
30	25	0.030
40	29	0.035
50	26	0.031

Note: The EUT doesn't work below -10℃

Frequency Error Against Voltage for CDMA2000 BC1 1xRTT_RC3+SO32		
Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
3.4	33	0.018
3.7	36	0.019
4.2	34	0.018

Frequency Error Against Temperature for CDMA2000 BC1 1xRTT_RC3+SO32		
temperature(℃)	Frequency error(Hz)	Frequency error(ppm)
-10	35	0.019
0	33	0.018
10	31	0.016
20	29	0.015
30	27	0.014
40	34	0.018
50	31	0.016

Note: The EUT doesn't work below -10℃

7. OCCUPIED BANDWIDTH

7.1 MEASUREMENT METHOD

The test set up and general procedure is similar to conducted peak output power test. Only different for setting the measurement configuration of the measuring instrument of Spectrum Analyzer.

7.2 PROVISIONS APPLICABLE

The emission bandwidth is defined as two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power

7.3 MEASUREMENT RESULT

Occupied Bandwidth (99%) for CDMA2000 BC0 1xRTT_RC3+SO32		
Mode	Frequency(MHz)	Occupied Bandwidth (99%)(MHz)
Low Channel	824.70	1.275
Middle Channel	836.52	1.281
High Channel	848.31	1.278

Occupied Bandwidth (99%) for CDMA2000 BC1 1xRTT_RC3+SO32		
Mode	Frequency(MHz)	Occupied Bandwidth (99%)(MHz)
Low Channel	1851.25	1.284
Middle Channel	1880.0	1.291
High Channel	1908.75	1.317

8. EMISSION BANDWIDTH

8.1 MEASUREMENT METHOD

The test set up and general procedure is similar to conducted peak output power test. Only different for setting the measurement configuration of the measuring instrument of Spectrum Analyzer.

8.2 PROVISIONS APPLICABLE

The emission bandwidth is defined as two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power

8.3 MEASUREMENT RESULT

Emission Bandwidth (-26dBc) for CDMA2000 BC0 1xRTT_RC3+SO32		
Mode	Frequency(MHz)	Emission Bandwidth (-26dBc)(MHz)
Low Channel	824.70	1.422
Middle Channel	836.52	1.433
High Channel	848.31	1.433

Emission Bandwidth (-26dBc) for CDMA2000 BC1 1xRTT_RC3+SO32		
Mode	Frequency(MHz)	Emission Bandwidth (-26dBc)(MHz)
Low Channel	1851.25	1.441
Middle Channel	1880.0	1.441
High Channel	1908.75	1.446

9. BAND EDGE

9.1 MEASUREMENT METHOD

The test set up and general procedure is similar to conducted peak output power test. Only different for setting the measurement configuration of the measuring instrument of Spectrum Analyzer.

9.2 PROVISIONS APPLICABLE

As Specified in FCC rules of 22.917(a) and 24.238(a)

9.3 MEASUREMENT RESULT

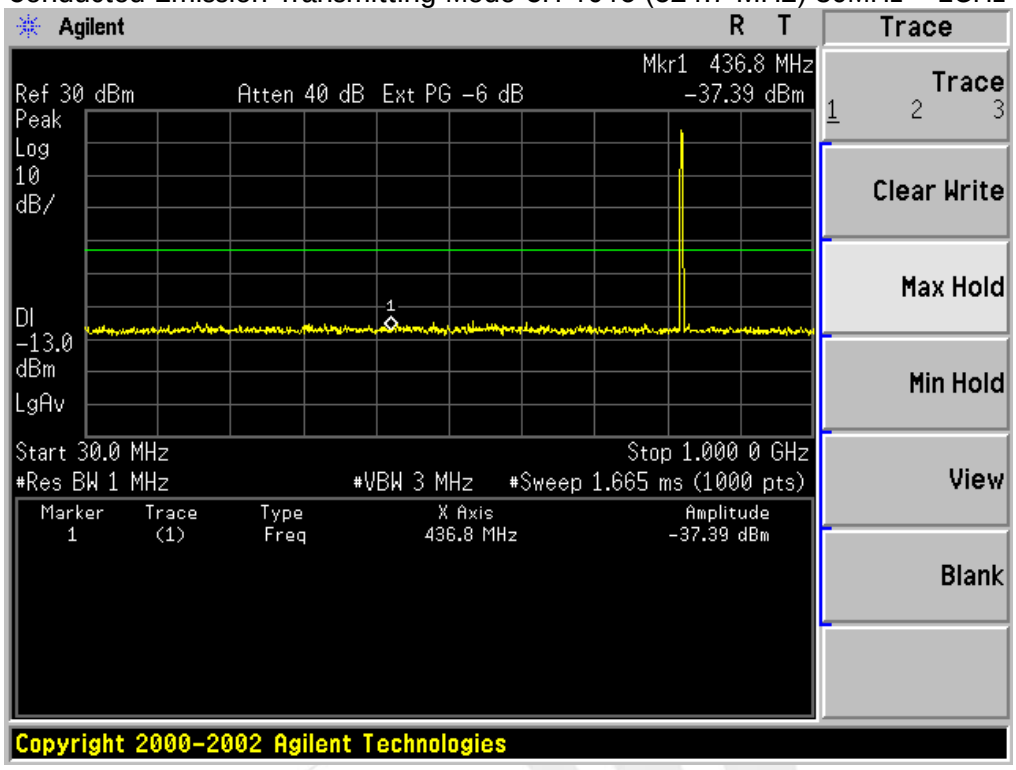
Please refers to Appendix III for compliance test plots for band edges

APPENDIX A

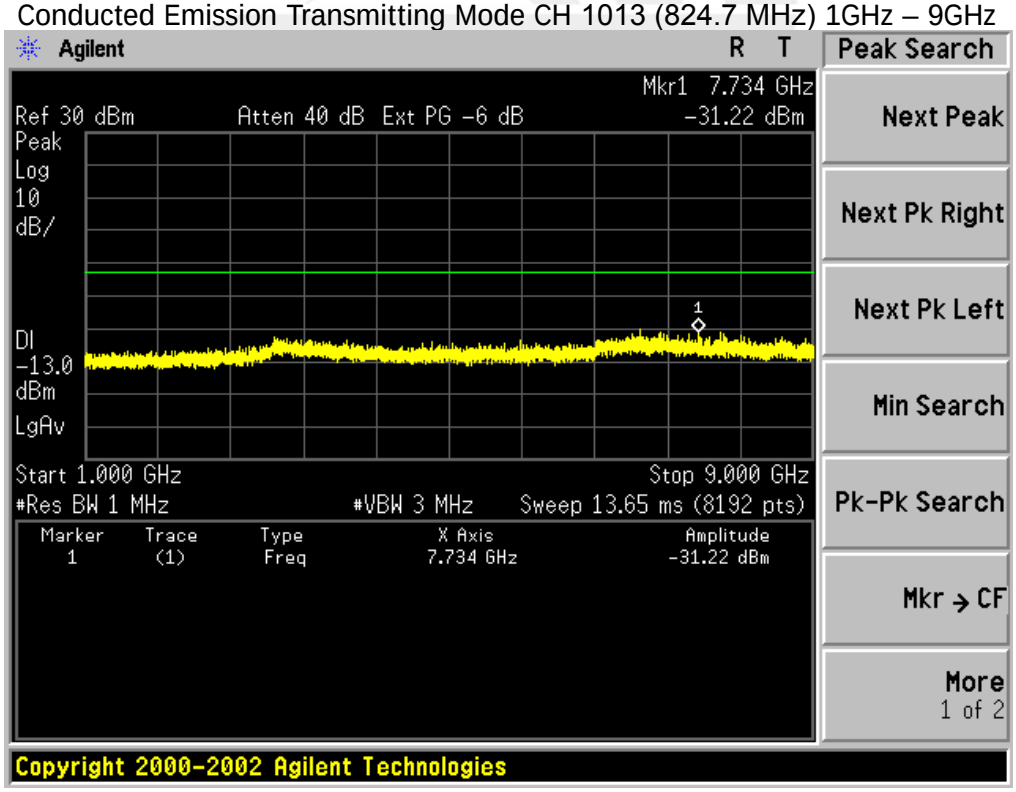
TEST PLOTS FOR CONDUCTED SPURIOUS EMISSION

CONDUCTED EMISSION IN CDMA2000 BC0 1xRTT_RC3+SO32

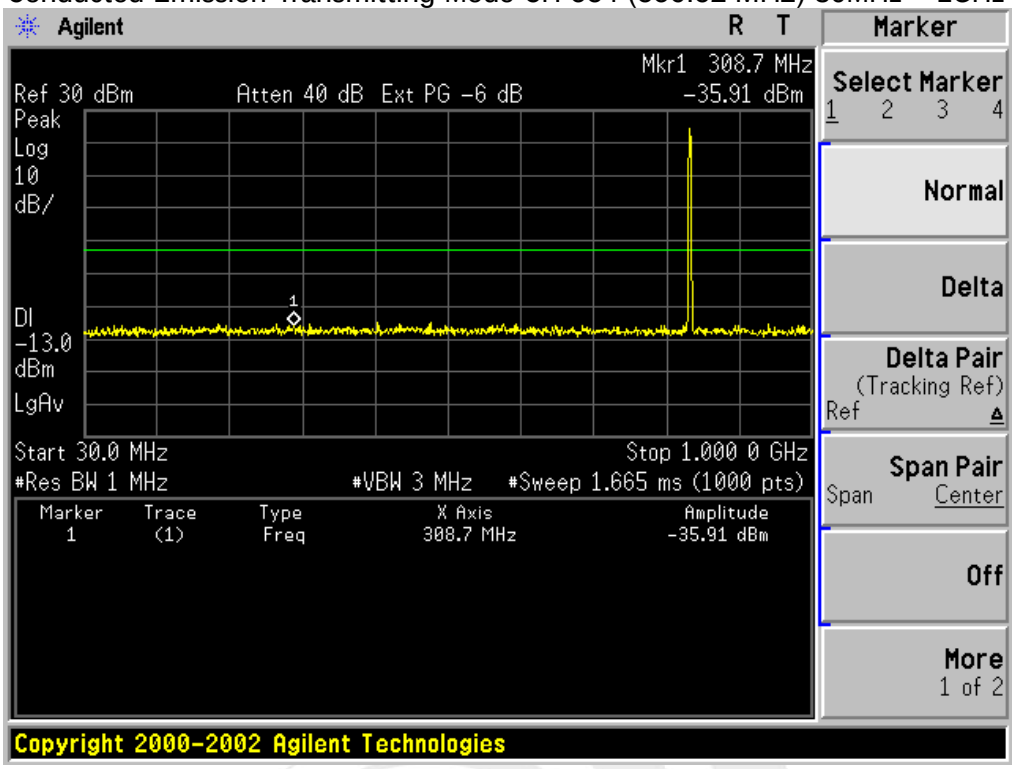
Conducted Emission Transmitting Mode CH 1013 (824.7 MHz) 30MHz – 1GHz



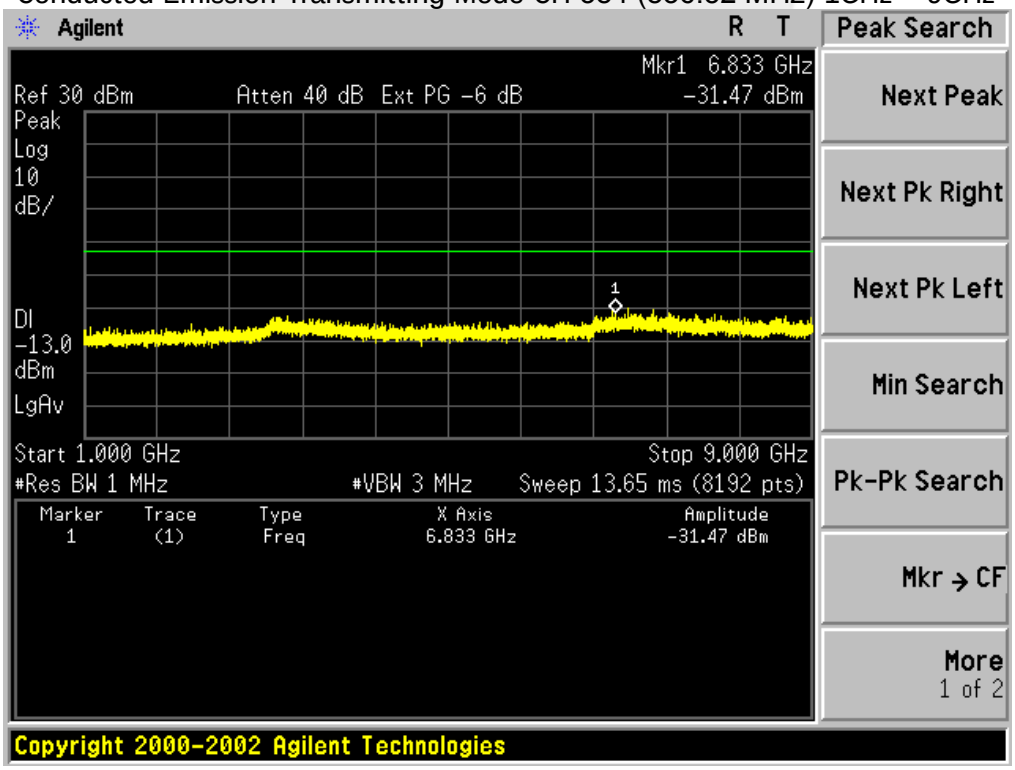
Conducted Emission Transmitting Mode CH 1013 (824.7 MHz) 1GHz – 9GHz



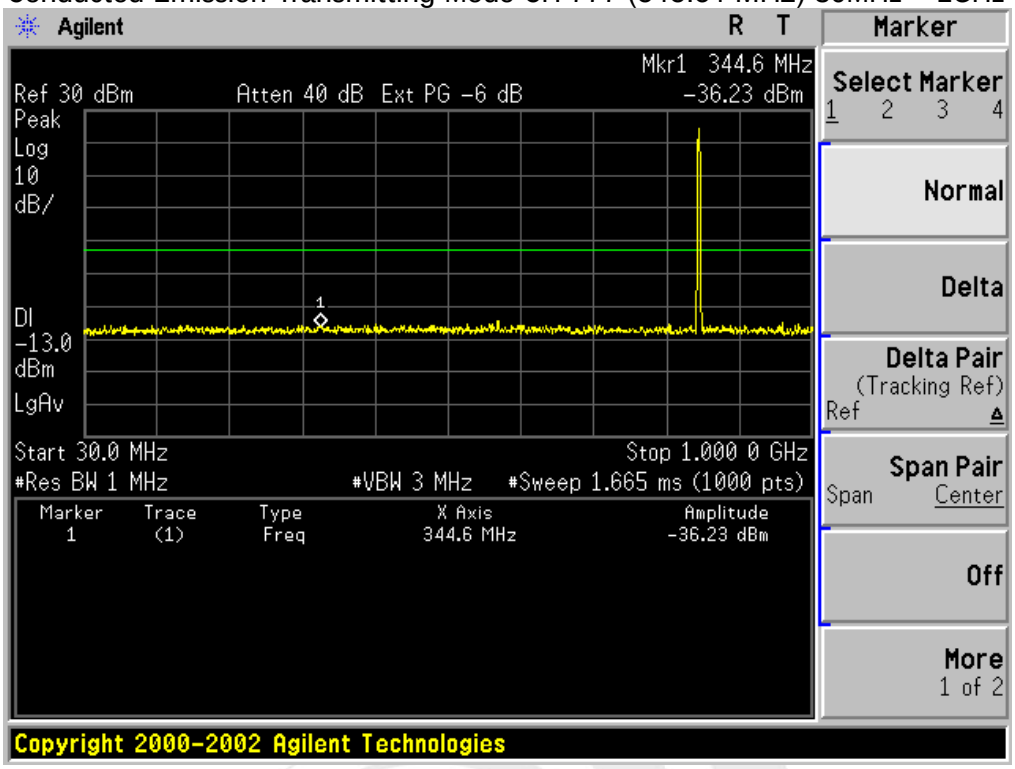
Conducted Emission Transmitting Mode CH 384 (836.52 MHz) 30MHz – 1GHz



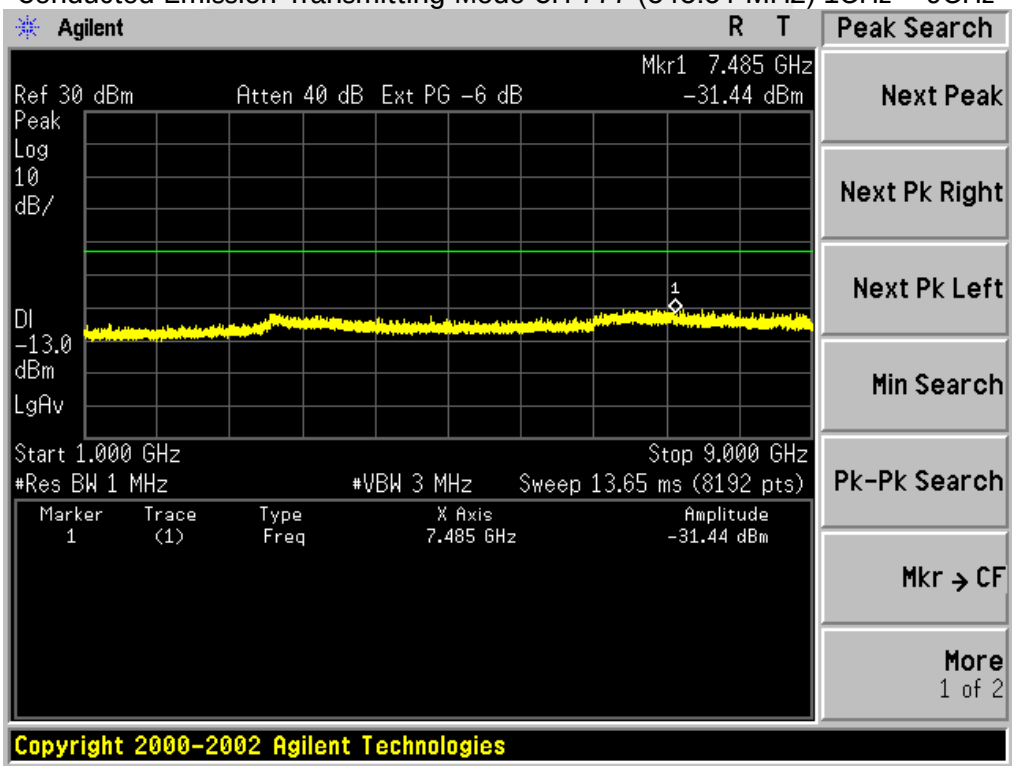
Conducted Emission Transmitting Mode CH 384 (836.52 MHz) 1GHz – 9GHz



Conducted Emission Transmitting Mode CH 777 (848.31 MHz) 30MHz – 1GHz

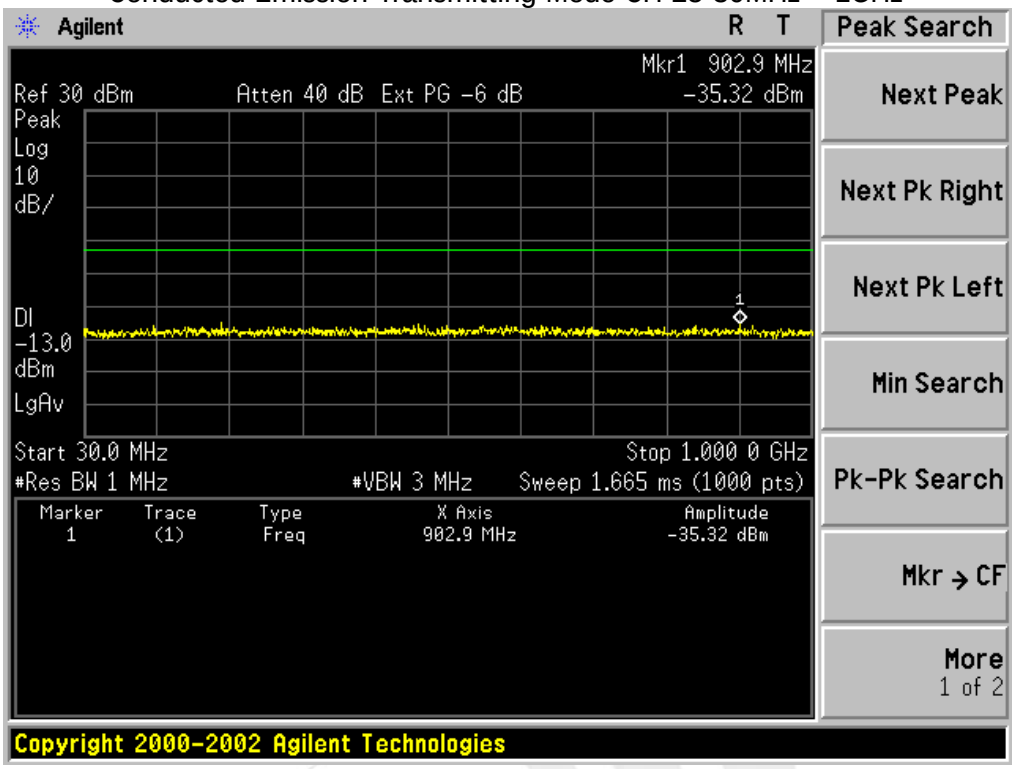


Conducted Emission Transmitting Mode CH 777 (848.31 MHz) 1GHz – 9GHz

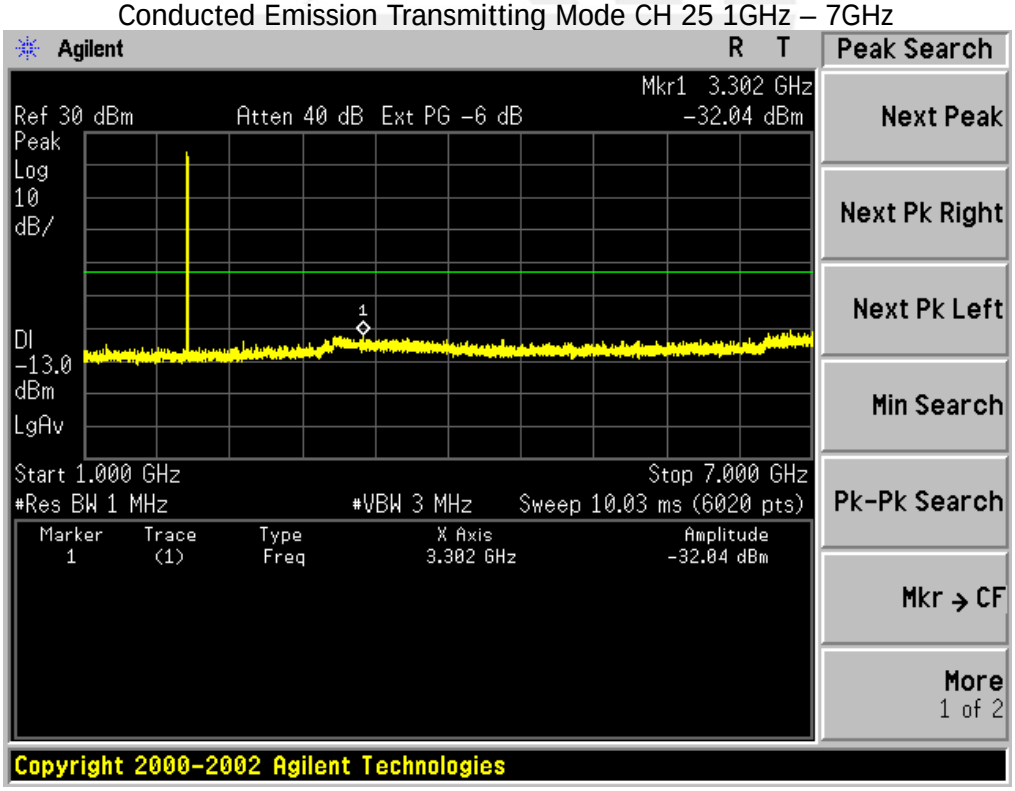


CONDUCTED EMISSION IN CDMA2000 BC1 1xRTT_RC3+SO32

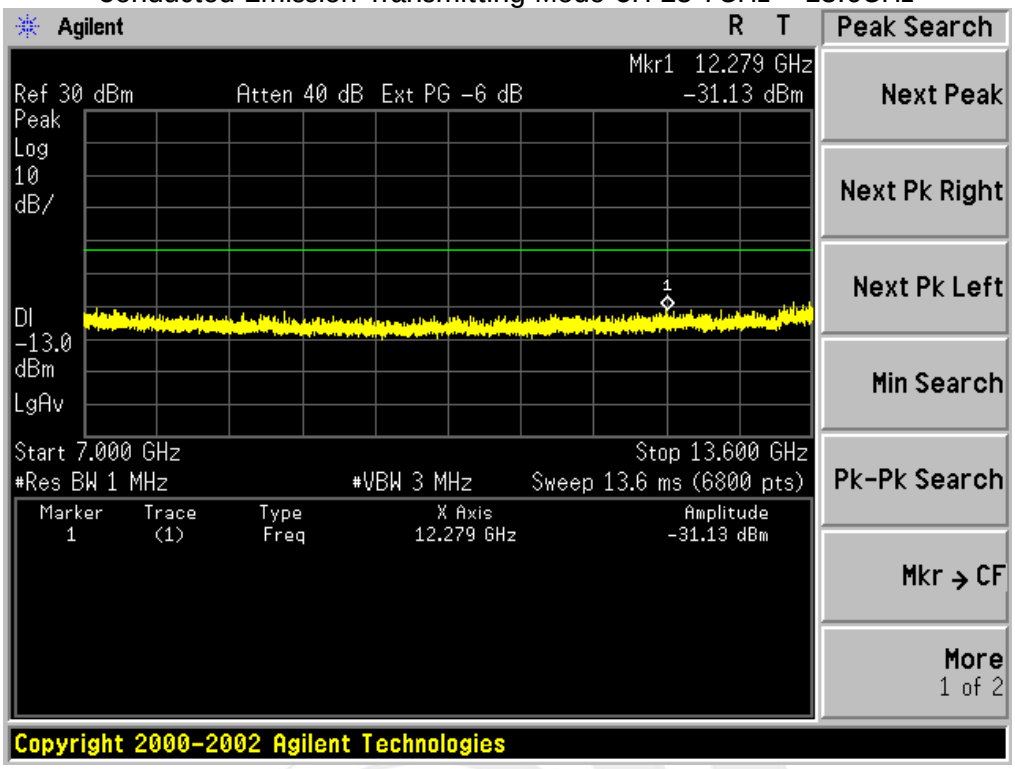
Conducted Emission Transmitting Mode CH 25 30MHz – 1GHz



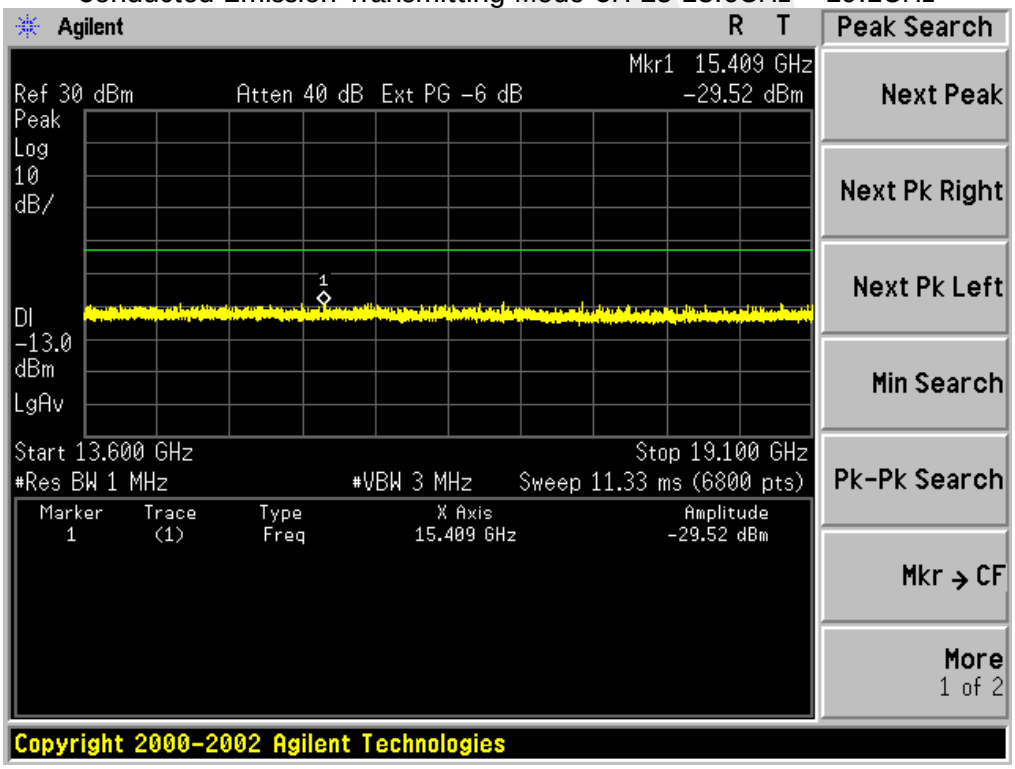
Conducted Emission Transmitting Mode CH 25 1GHz – 7GHz



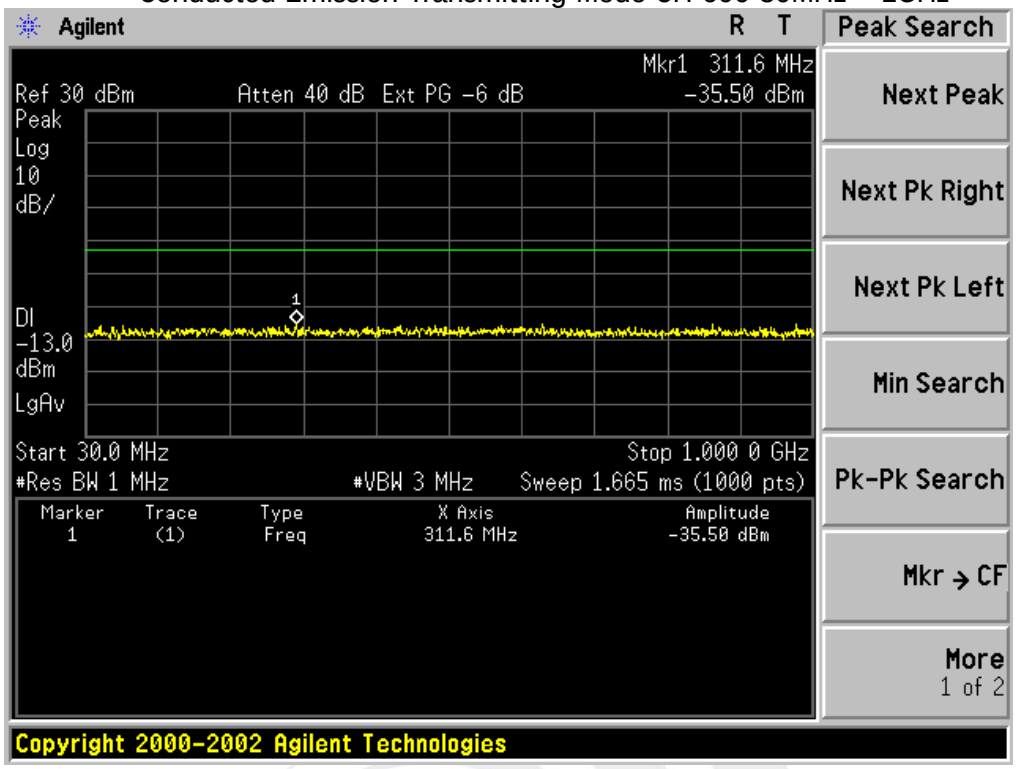
Conducted Emission Transmitting Mode CH 25 7GHz – 13.6GHz



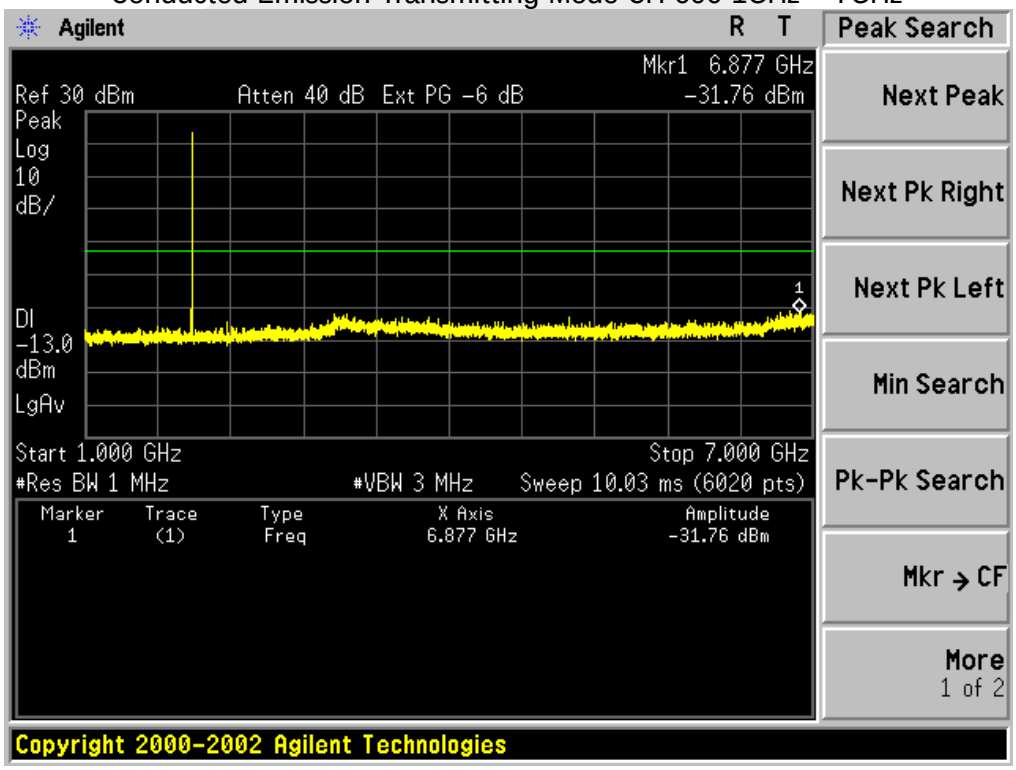
Conducted Emission Transmitting Mode CH 25 13.6GHz – 19.1GHz



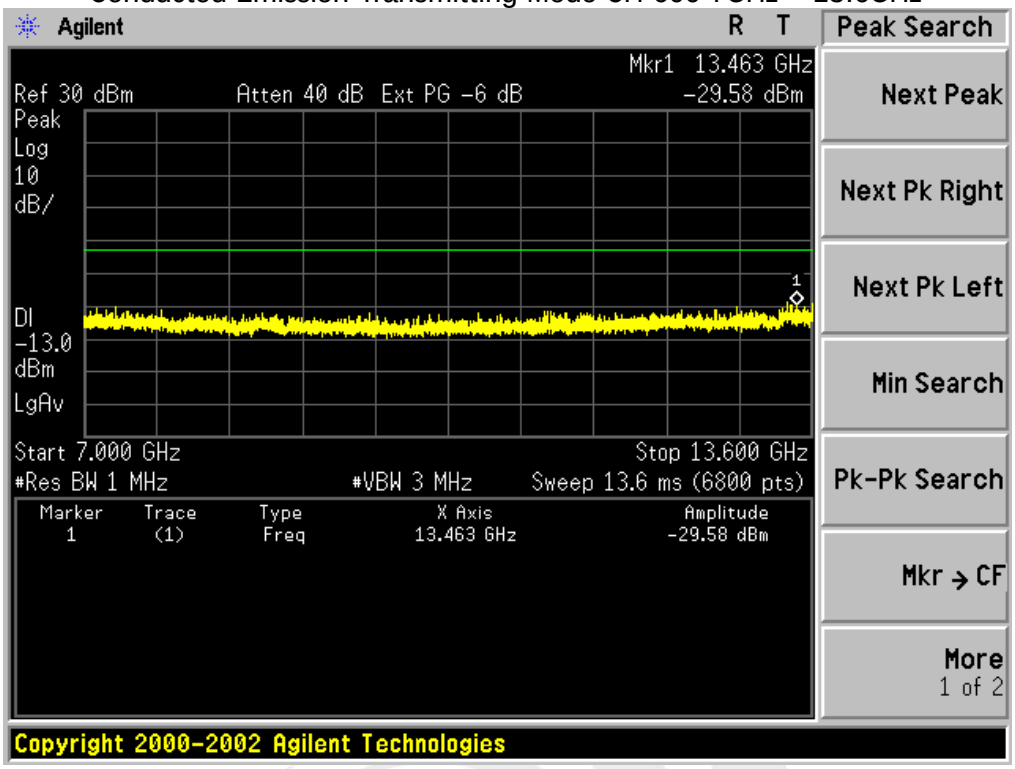
Conducted Emission Transmitting Mode CH 600 30MHz – 1GHz



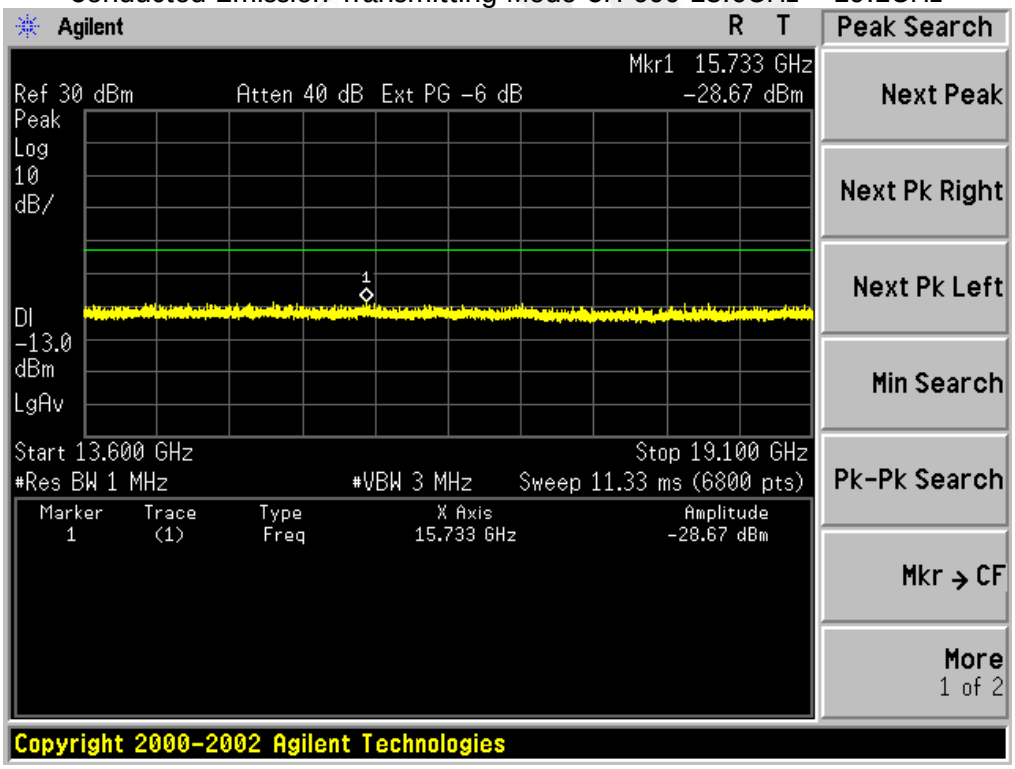
Conducted Emission Transmitting Mode CH 600 1GHz – 7GHz



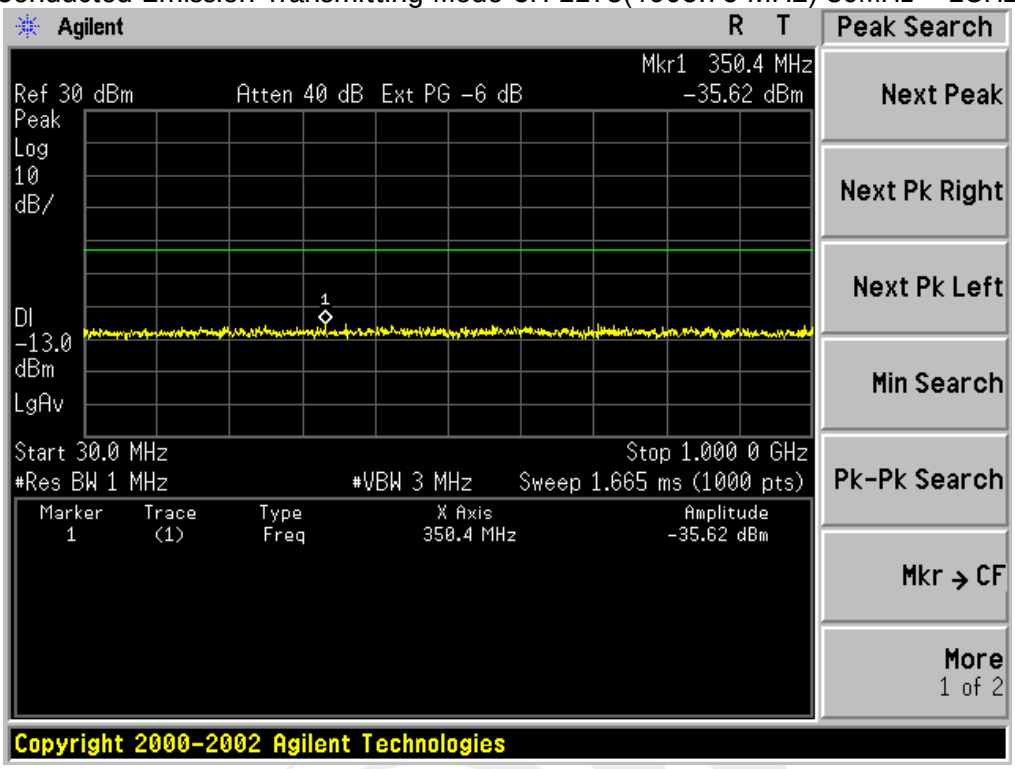
Conducted Emission Transmitting Mode CH 600 7GHz – 13.6GHz



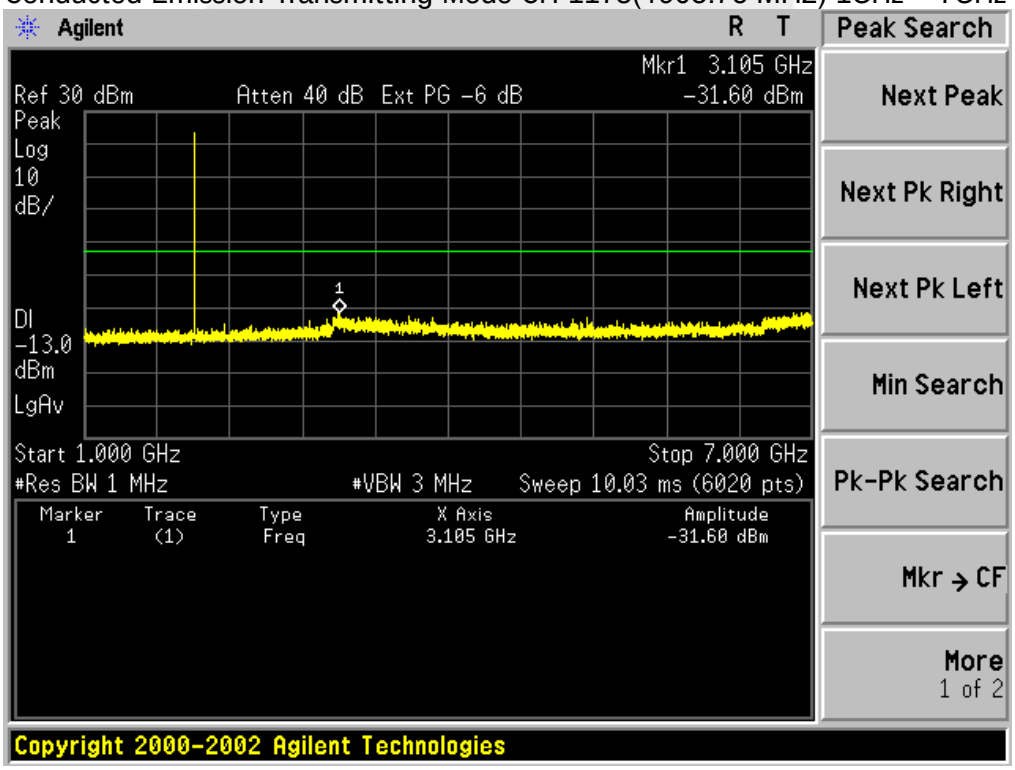
Conducted Emission Transmitting Mode CH 600 13.6GHz – 19.1GHz



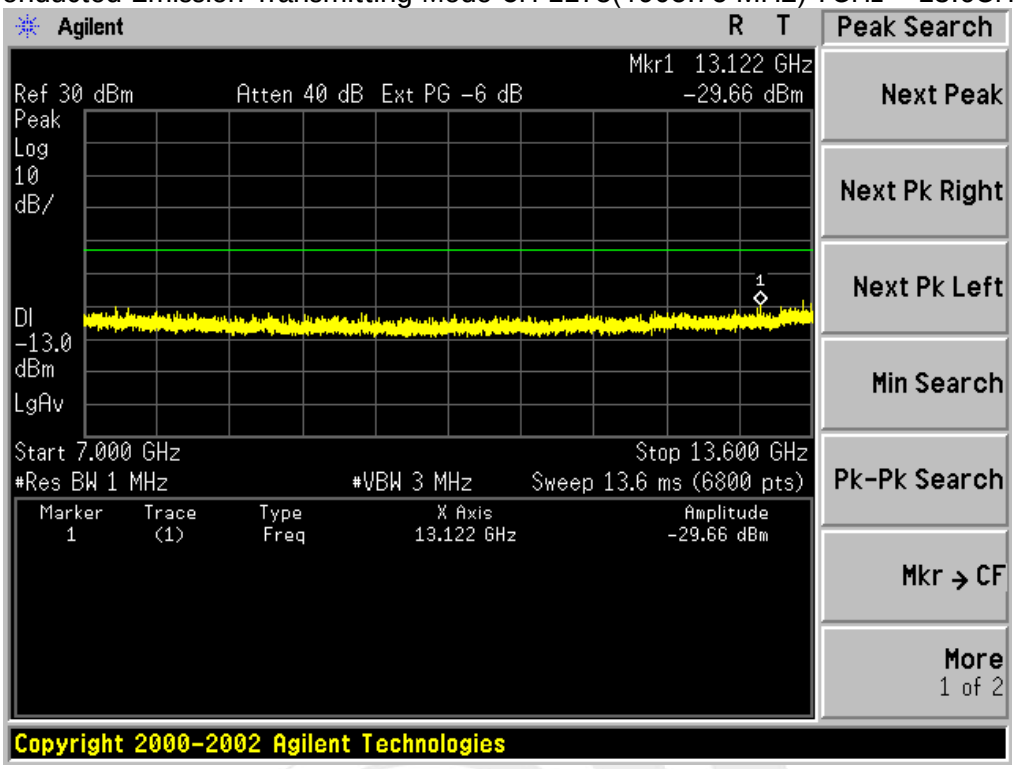
Conducted Emission Transmitting Mode CH 1175(1908.75 MHz) 30MHz – 1GHz



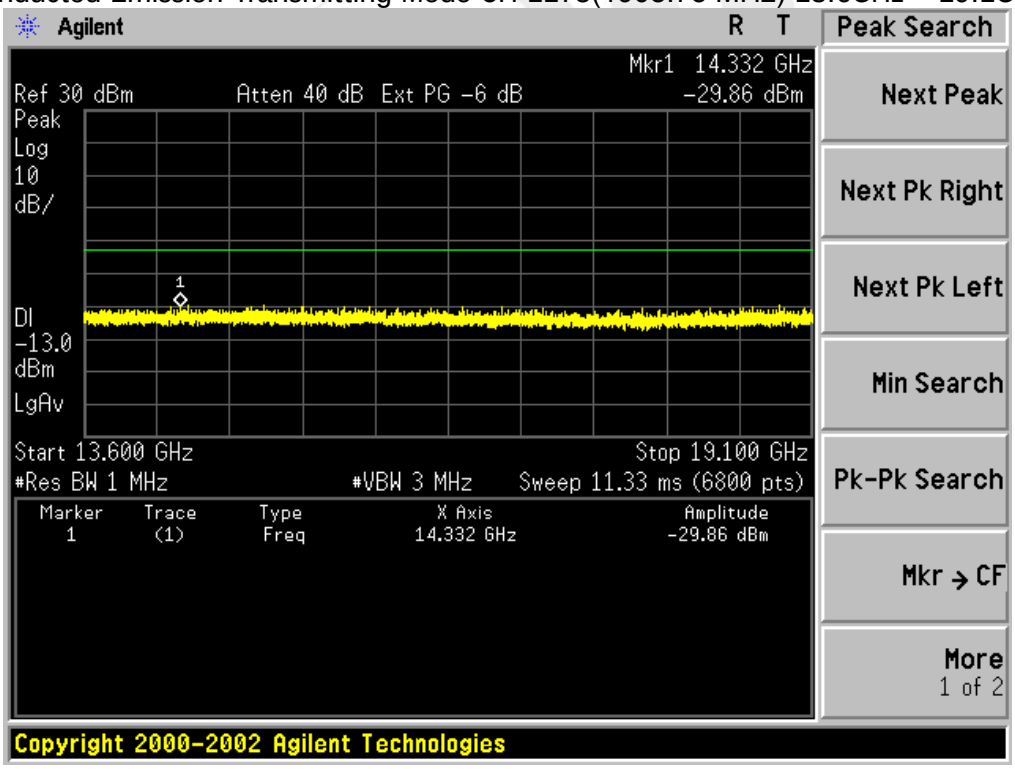
Conducted Emission Transmitting Mode CH 1175(1908.75 MHz) 1GHz – 7GHz



Conducted Emission Transmitting Mode CH 1175(1908.75 MHz) 7GHz – 13.6GHz



Conducted Emission Transmitting Mode CH 1175(1908.75 MHz) 13.6GHz – 19.1GHz



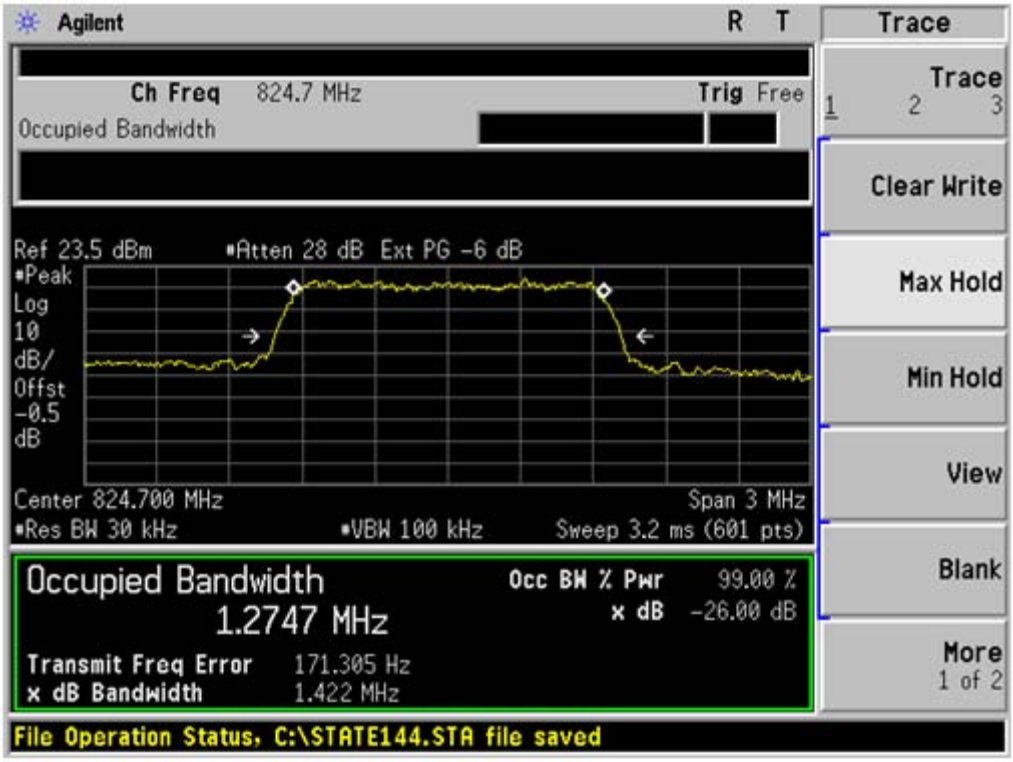
APPENDIX B

TEST PLOTS FOR OCCUPIED BANDWIDTH (99%)

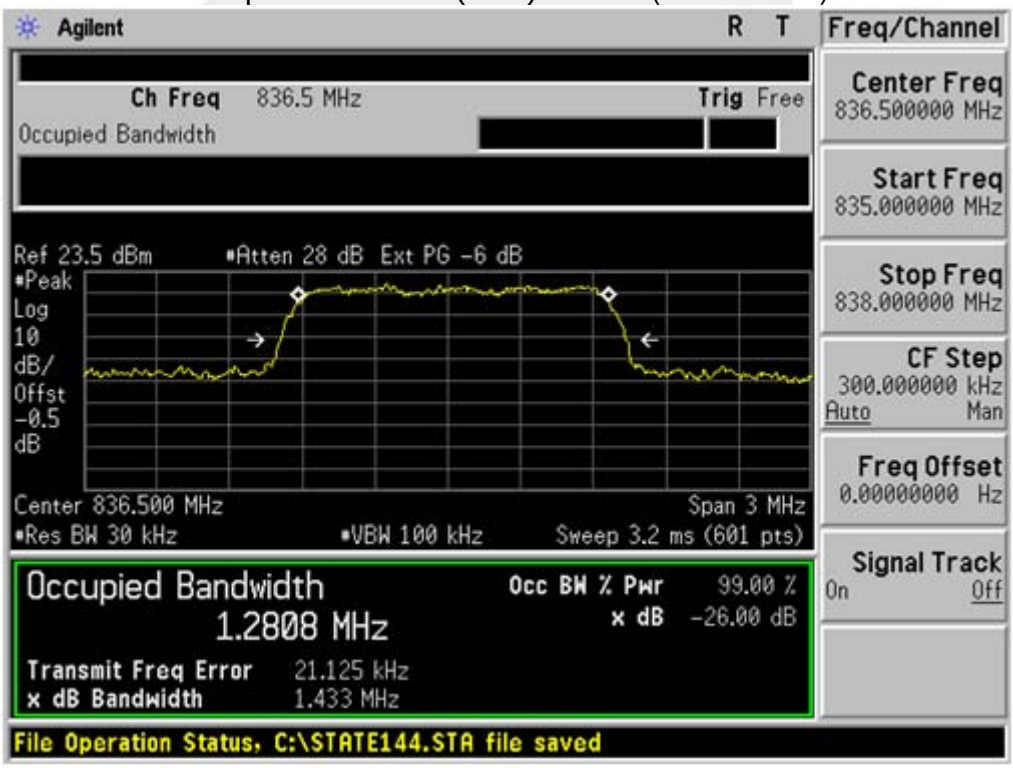
EMISSION BANDWIDTH (-26dBC)

CDMA2000 BC0 1xRTT_RC3+SO32

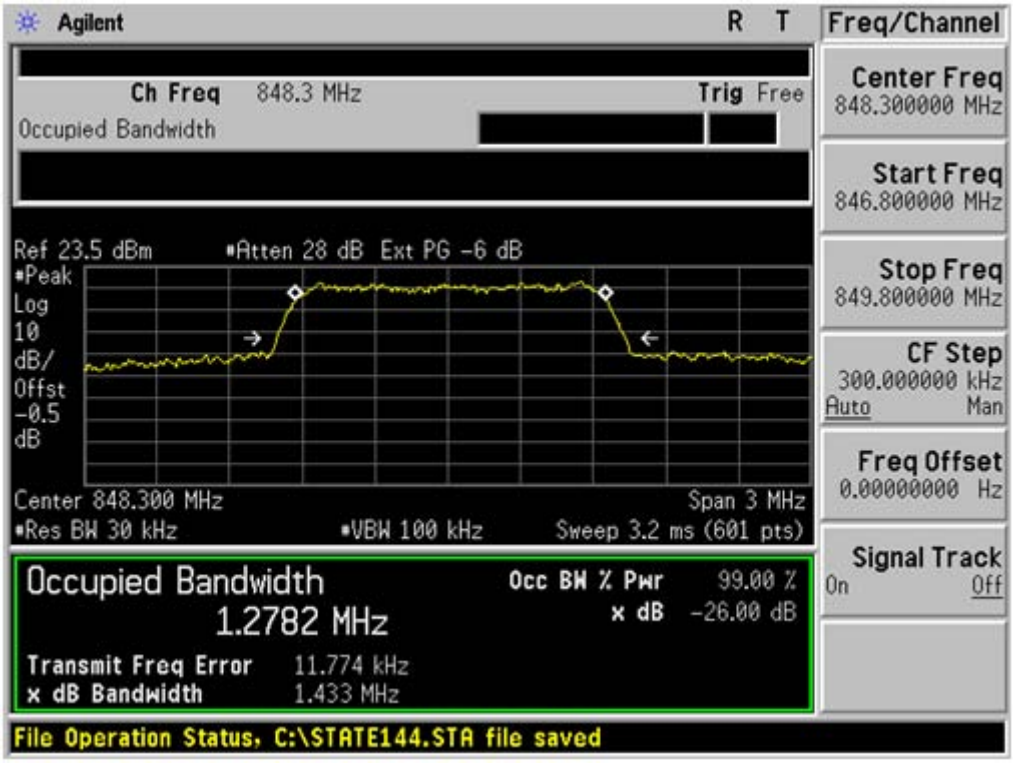
Occupied Bandwidth (99%) CH 1013 (824.7 MHz)



Occupied Bandwidth (99%) CH 384 (836.52 MHz)

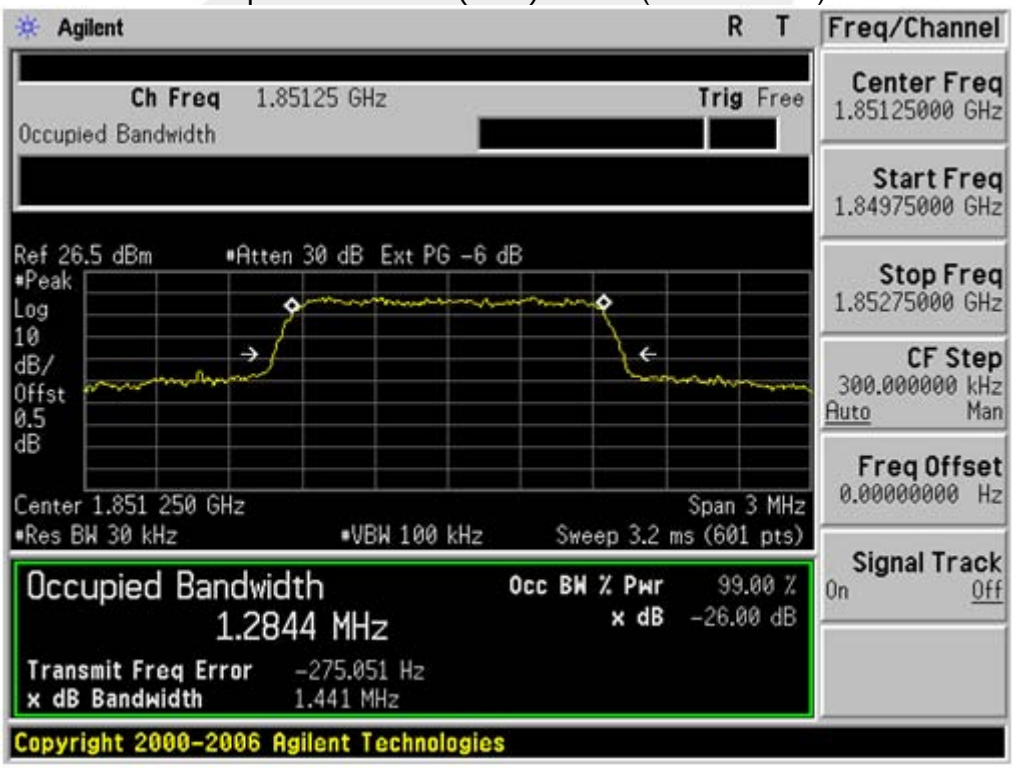


Occupied Bandwidth (99%) CH 777 (848.31 MHz)

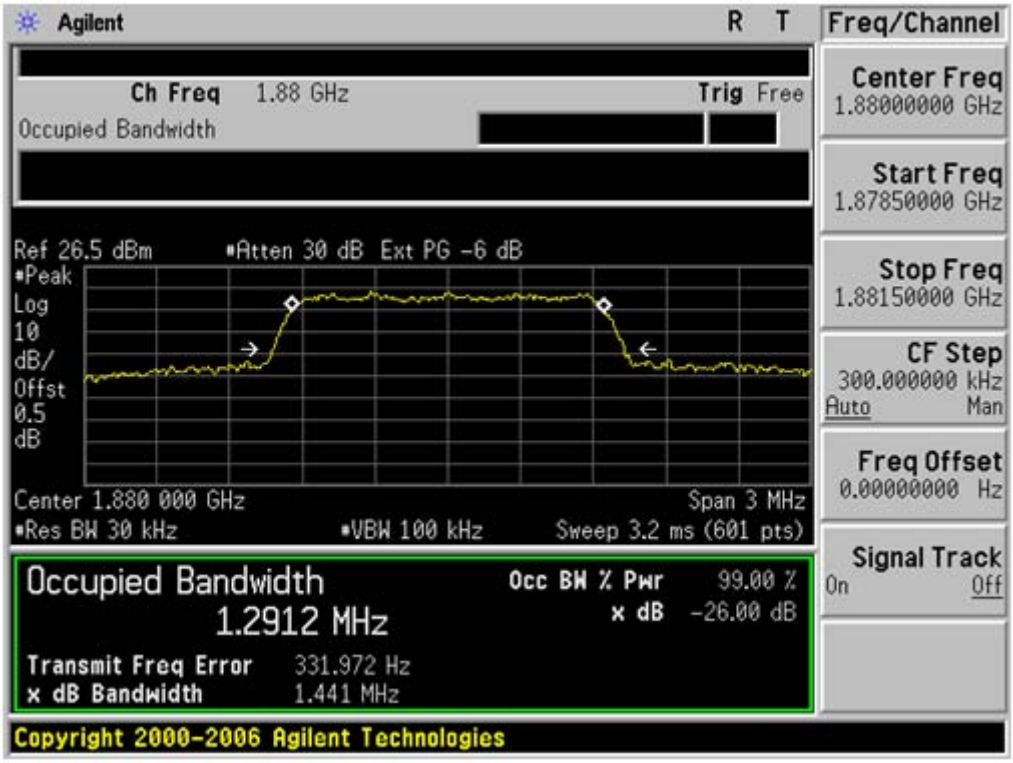


CDMA2000 BC1 1xRTT_RC3+SO32

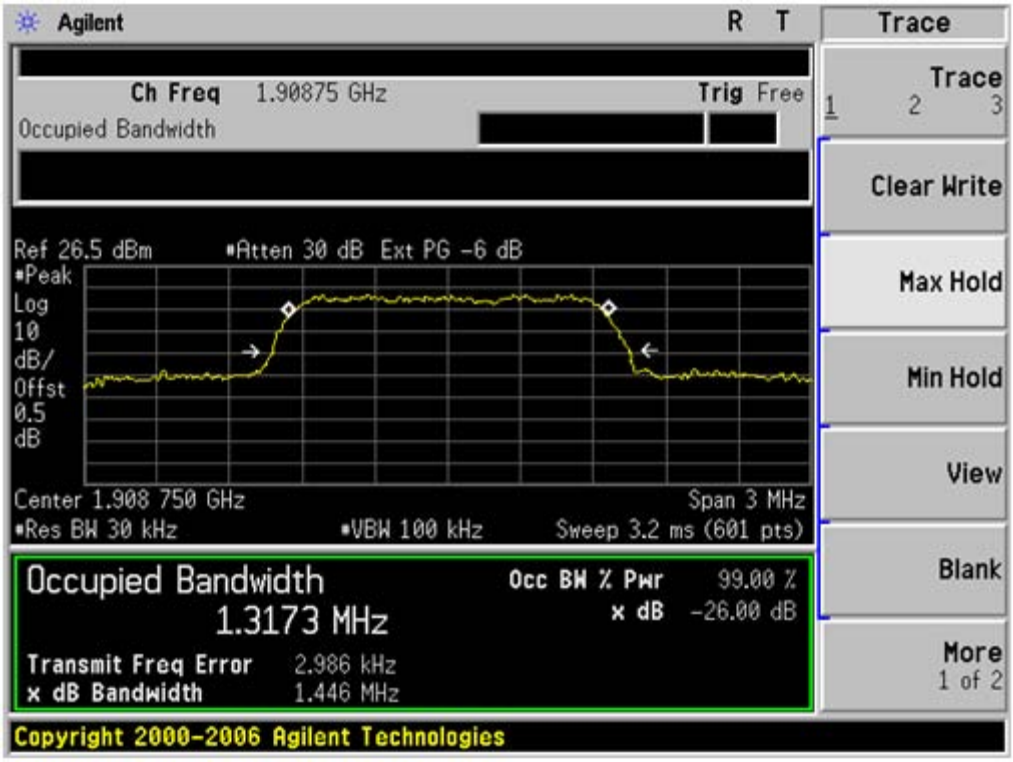
Occupied Bandwidth (99%) CH 25 (1851.25MHz)



Occupied Bandwidth (99%) CH 600 (1880.0 MHz)



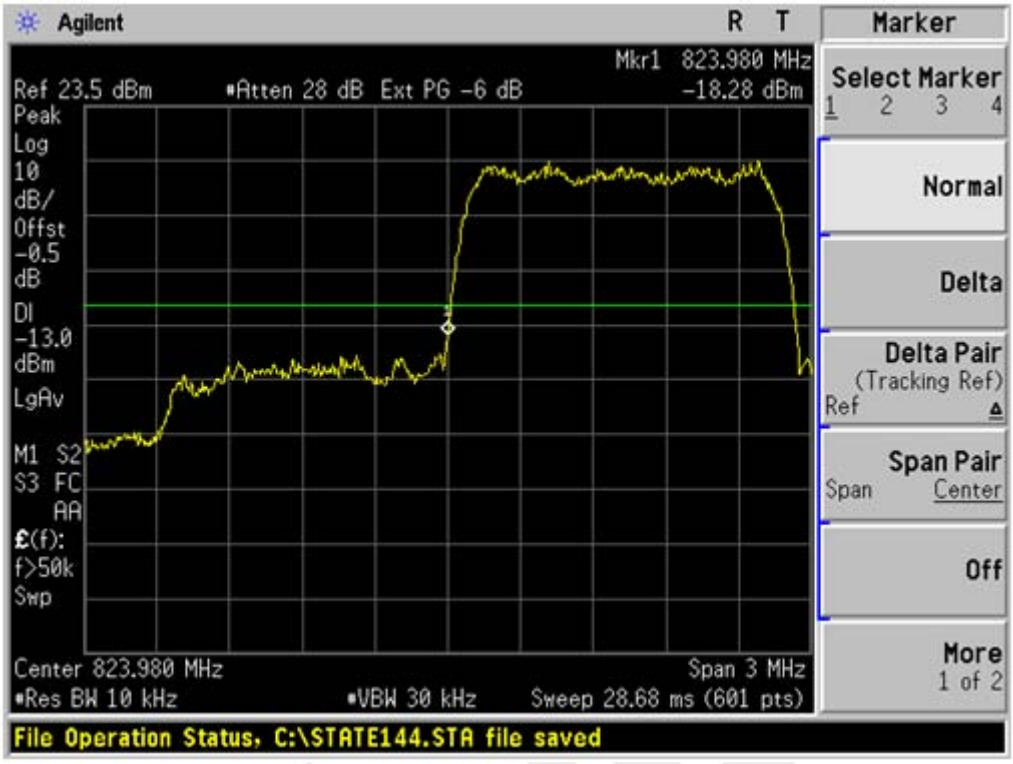
Occupied Bandwidth (99%) CH 1175 (1908.75 MHz)



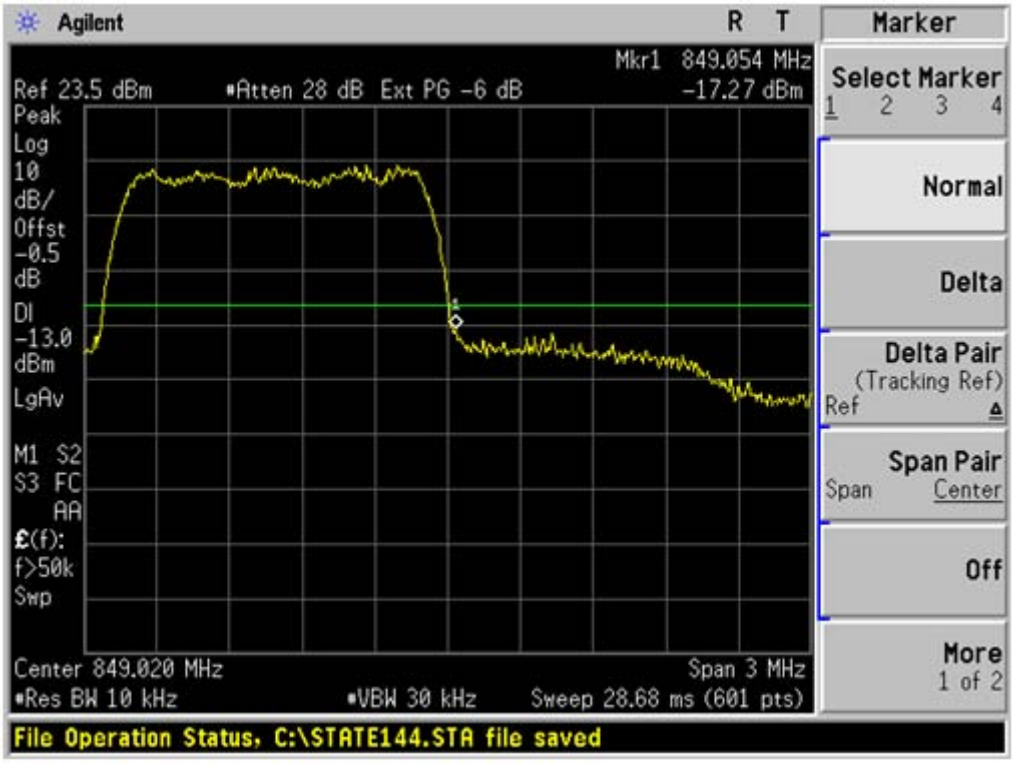
APPENDIX C

TEST PLOTS FOR BAND EDGES

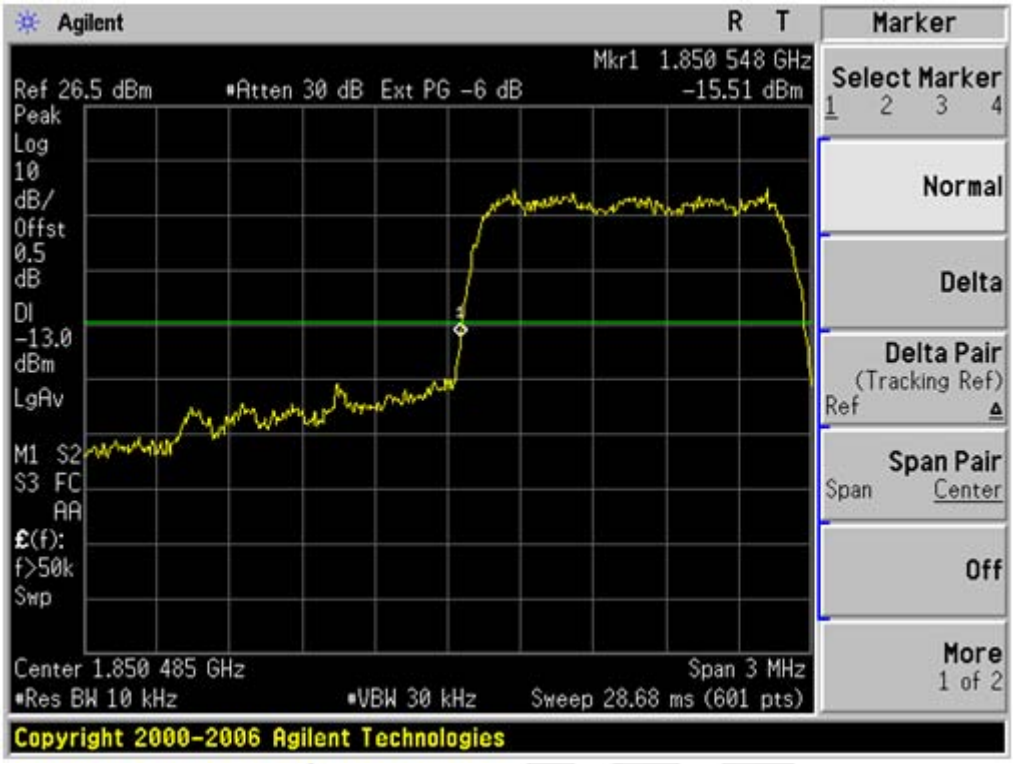
CDMA2000 BC0 1xRTT_RC3+SO32
Low Band Edge CH 1013 (824.7 MHz)



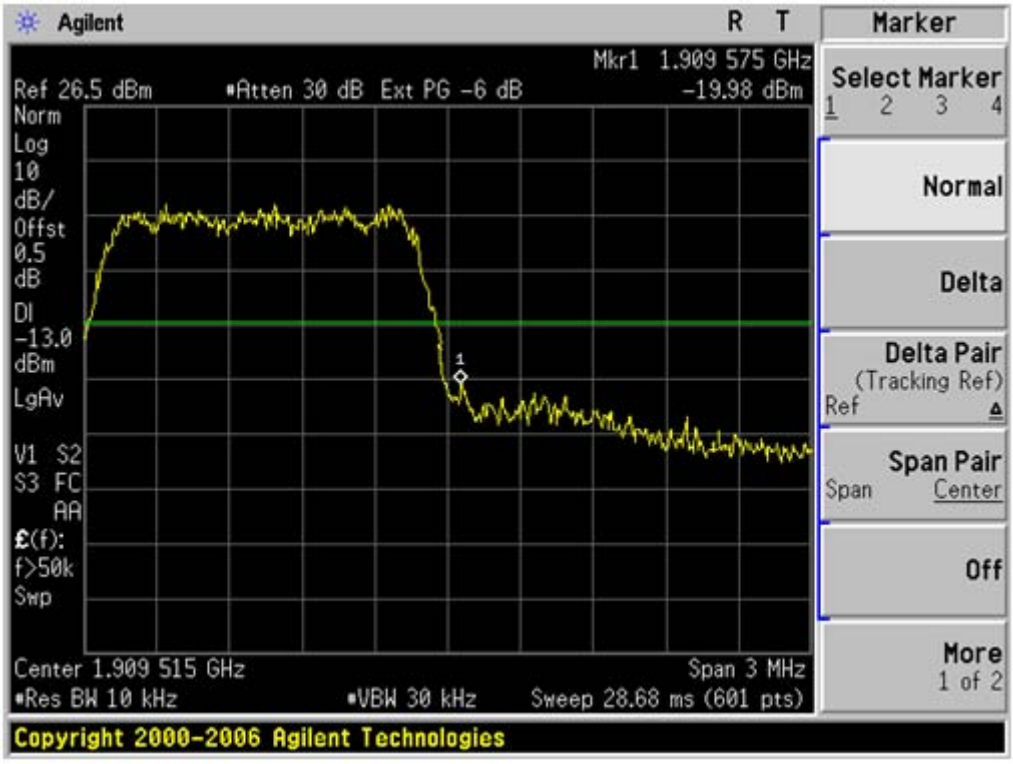
High Band Edge CH 777 (848.31 MHz)



CDMA2000 BC1 1xRTT_RC3+SO32
Low Band Edge BAND CH 25 (1851.25 MHz)



High Band Edge CH 1175 (1908.75 MHz)

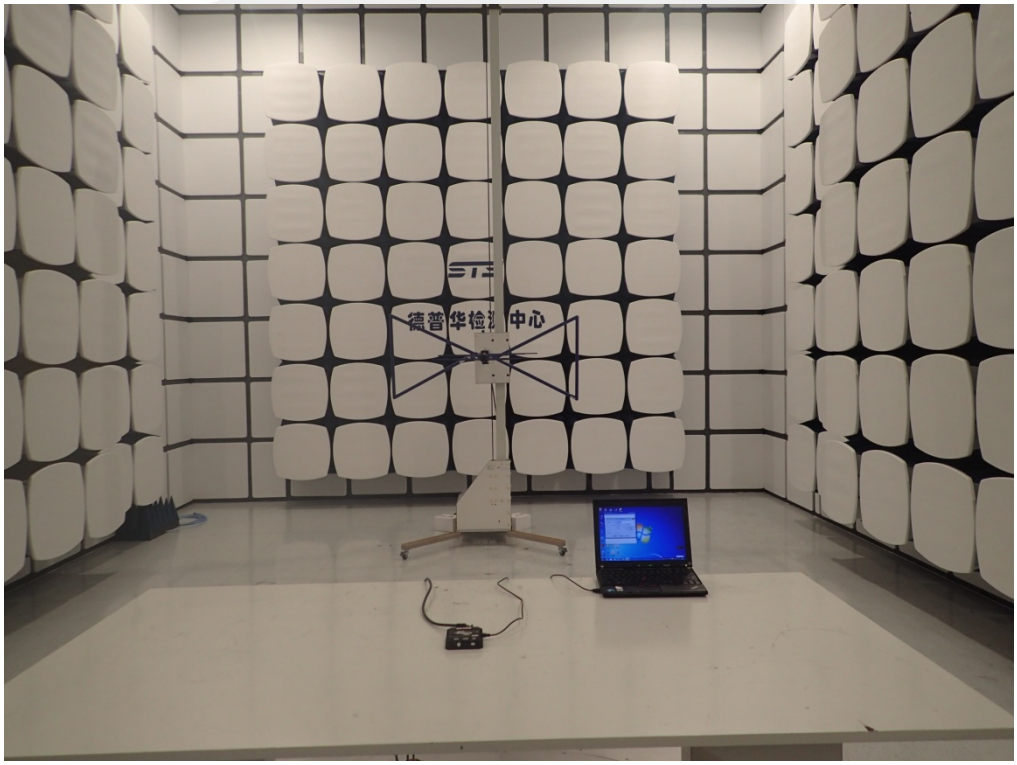


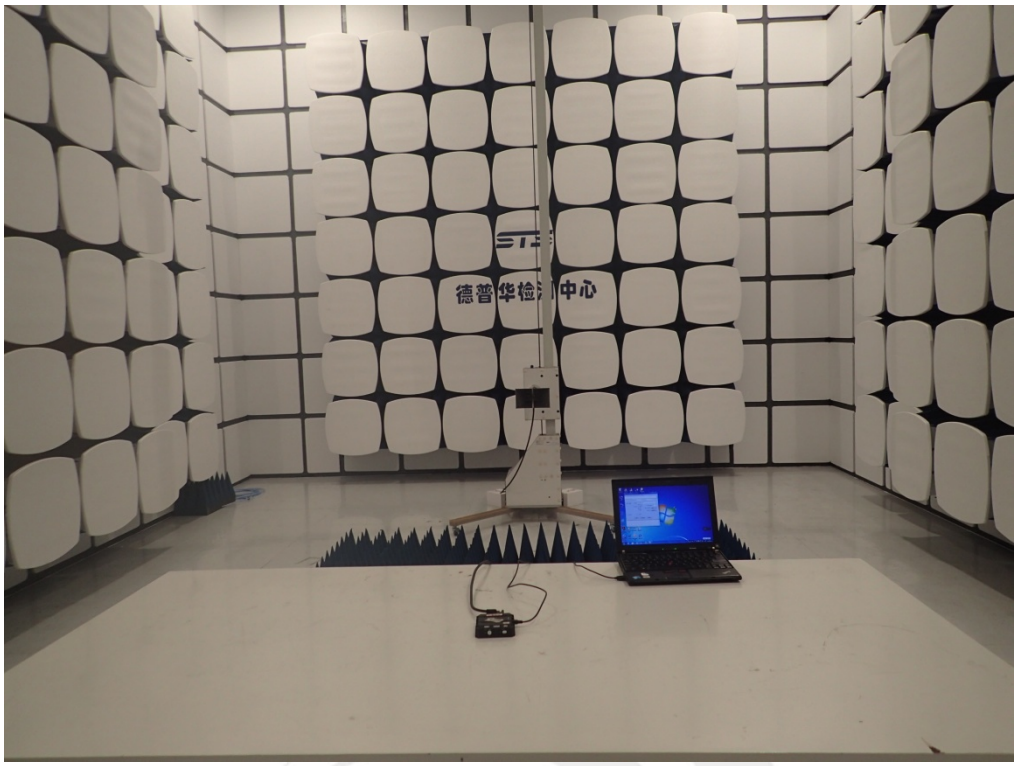
APPENDIX D

PHOTOGRAPHS OF TEST SETUP

CONDUCTED EMISSION

RADIATED SPURIOUS EMISSION

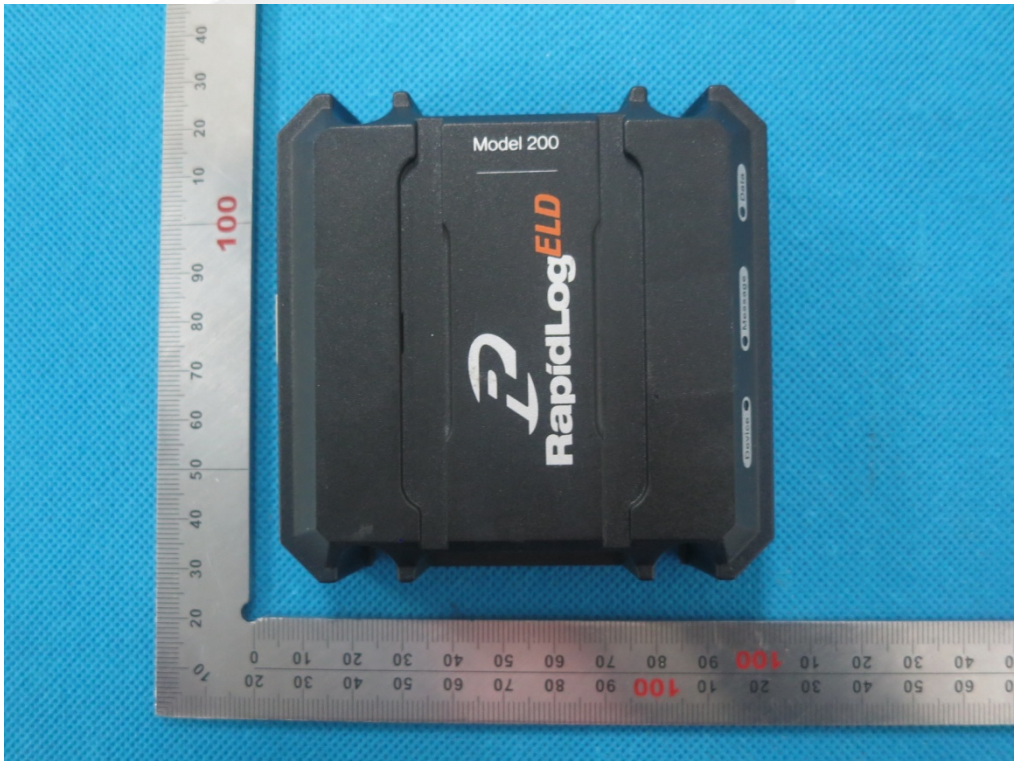




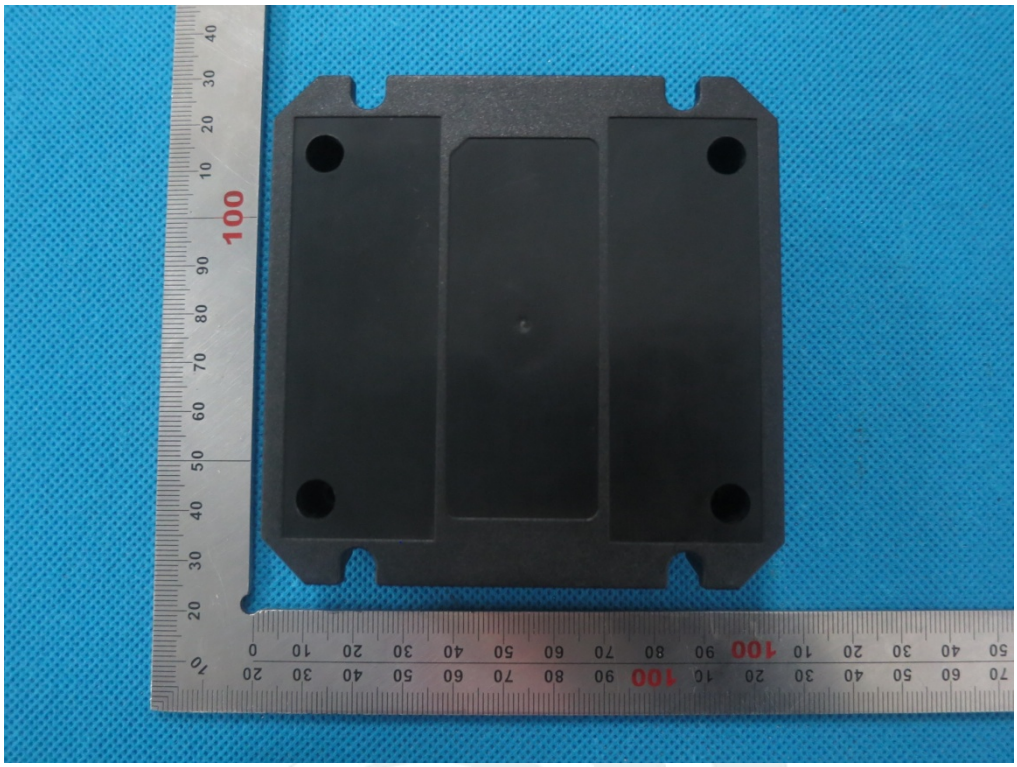
APPENDIX E
PHOTOGRAPHS OF EUT

TOTAL VIEW OF EUT

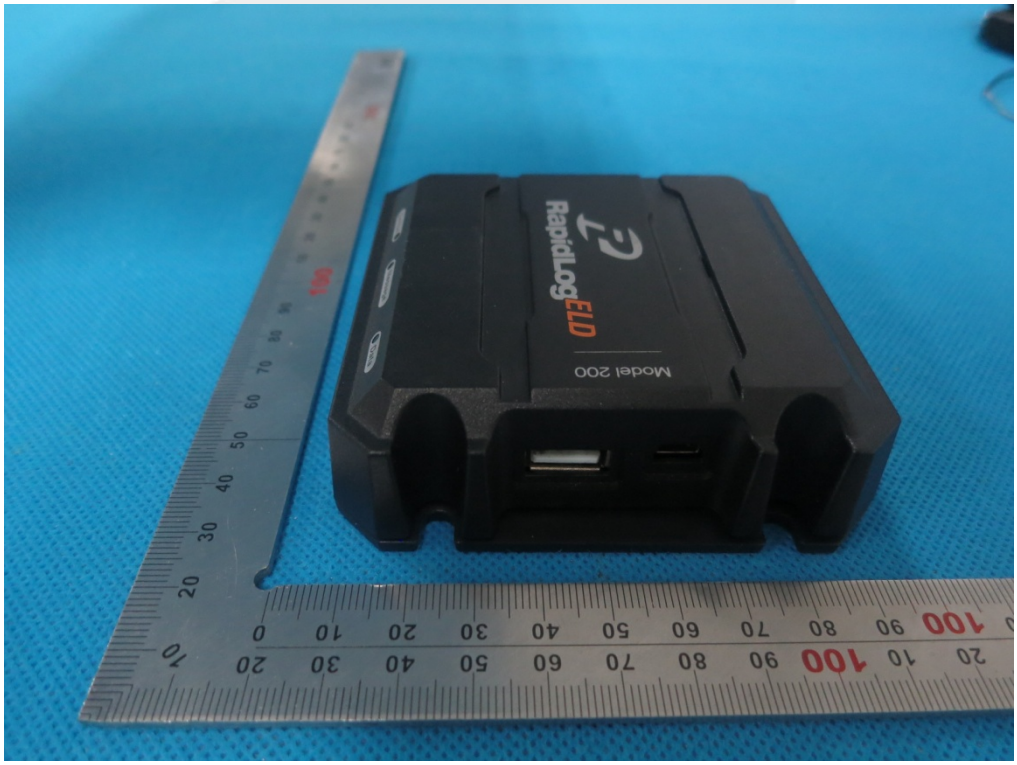
TOP VIEW OF EUT



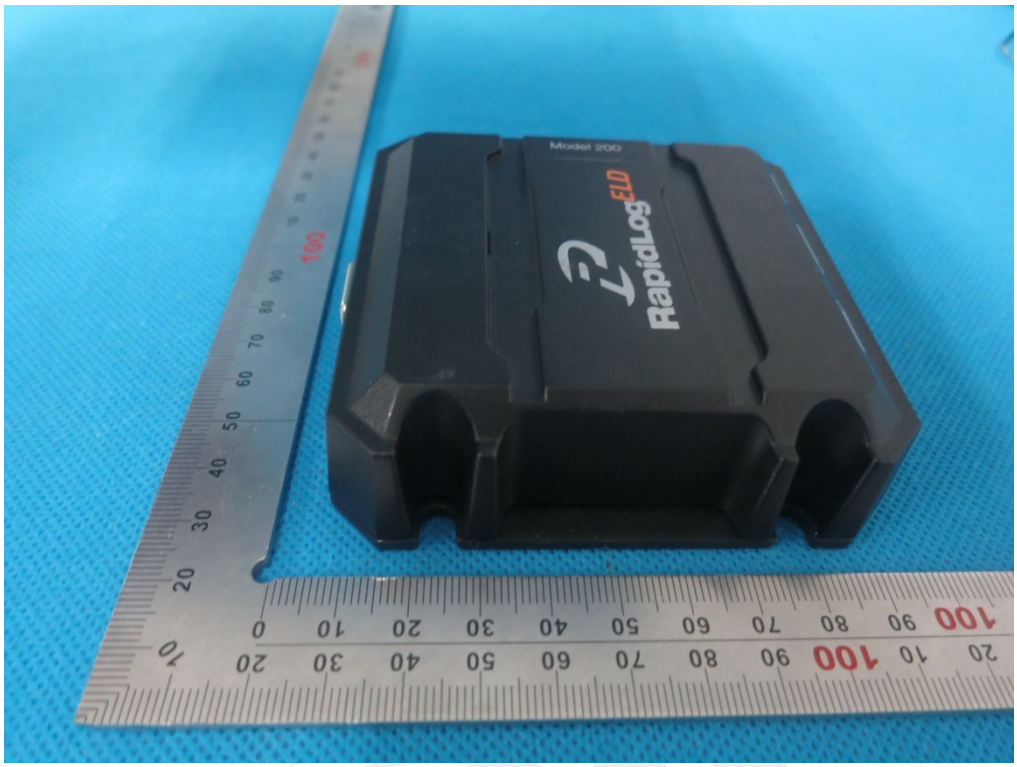
BOTTOM VIEW OF EUT



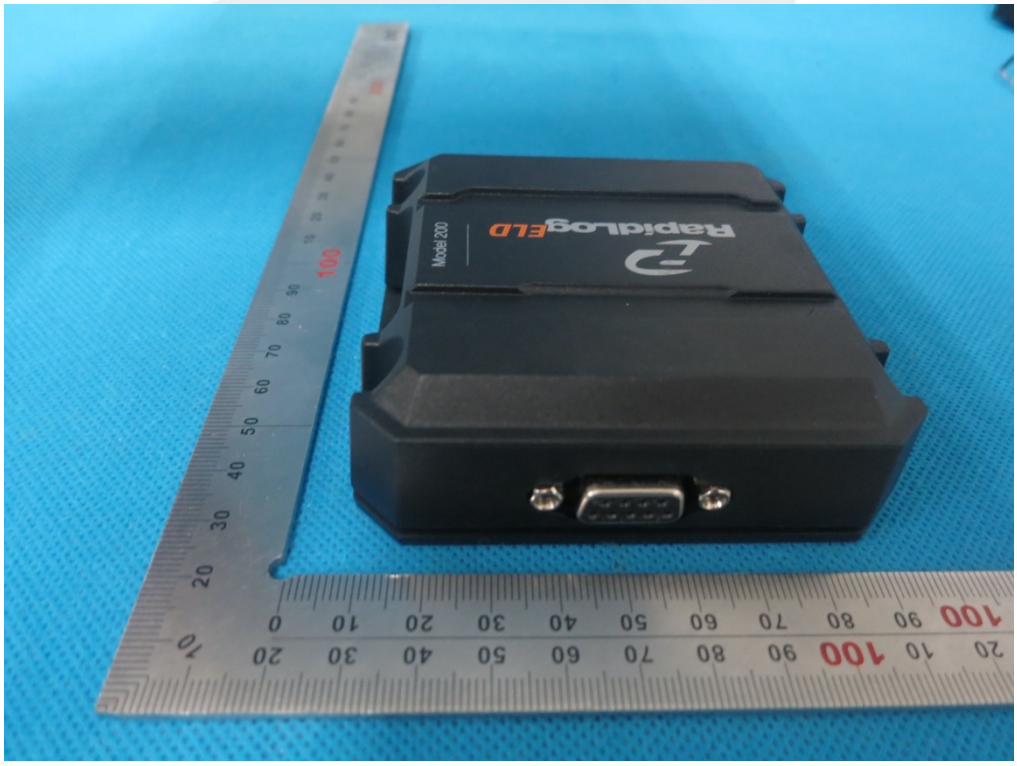
FRONT VIEW OF EUT



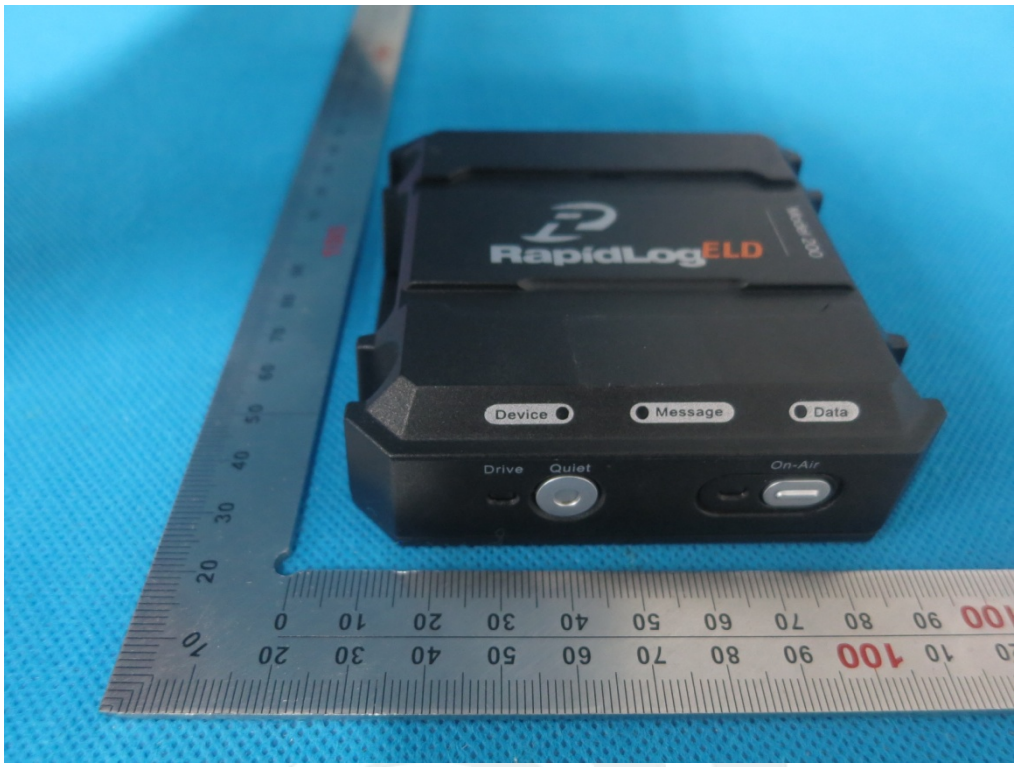
BACK VIEW OF EUT



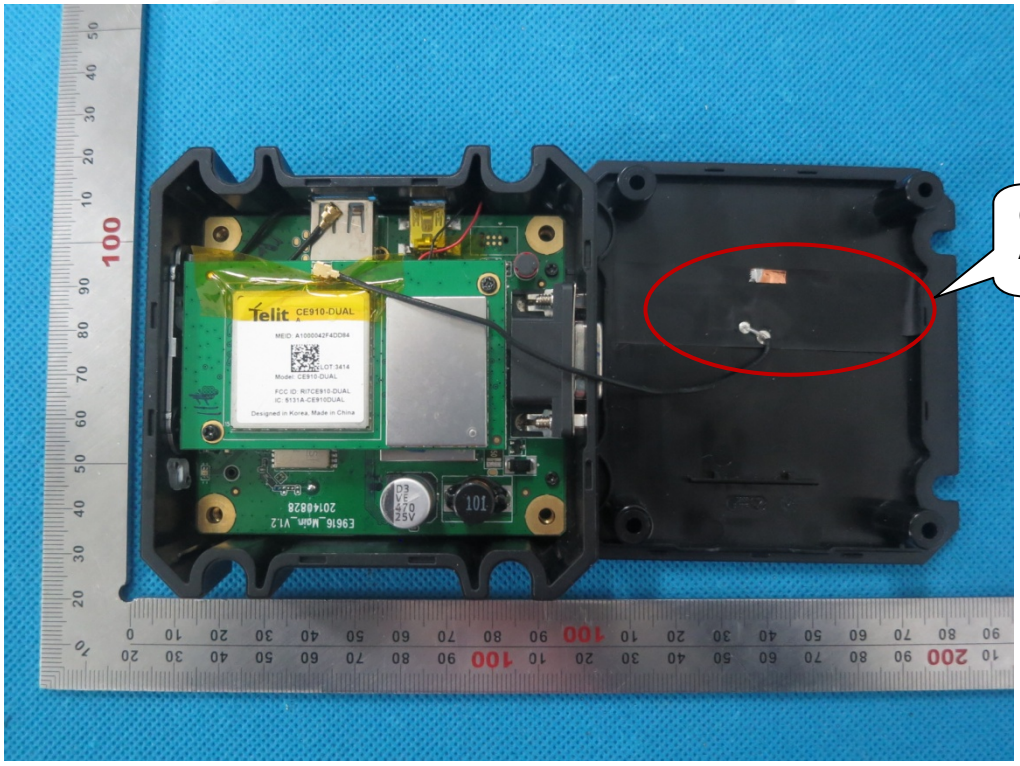
LEFT VIEW OF EUT



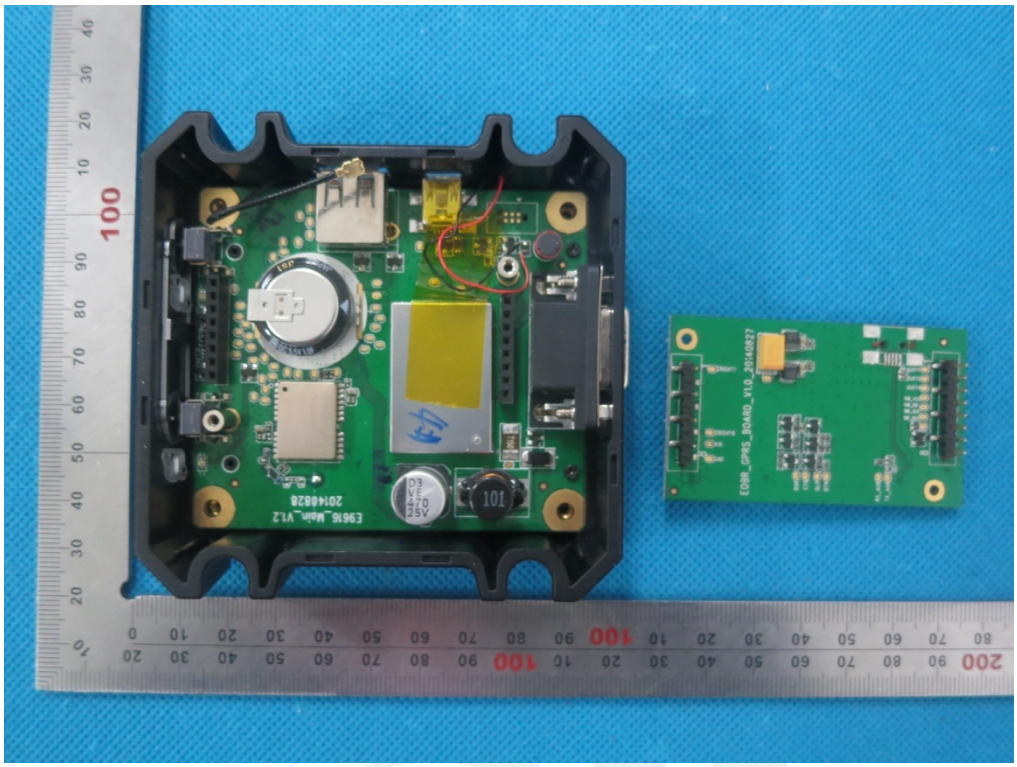
RIGHT VIEW OF EUT



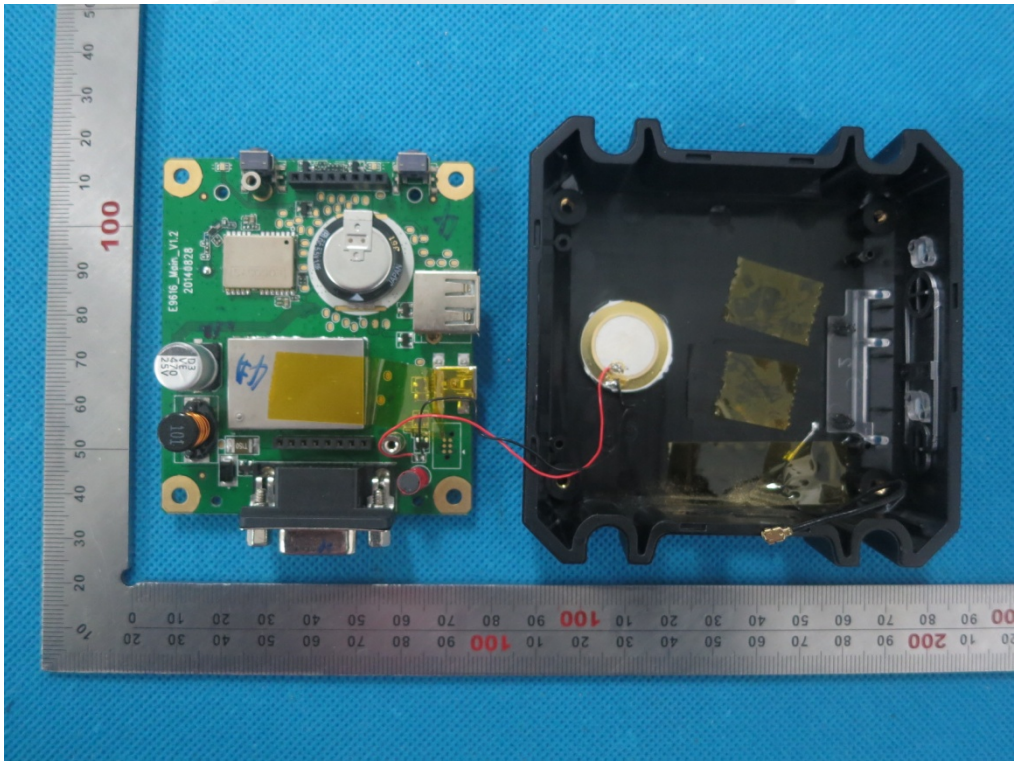
OPEN VIEW OF EUT-1



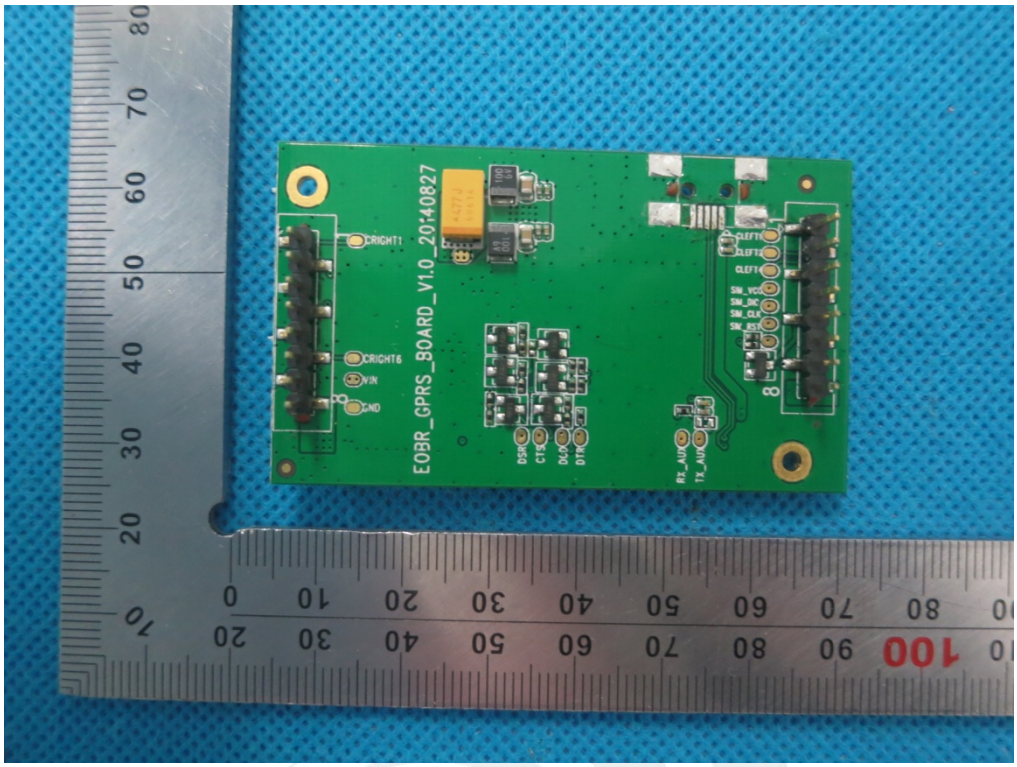
OPEN VIEW OF EUT-2



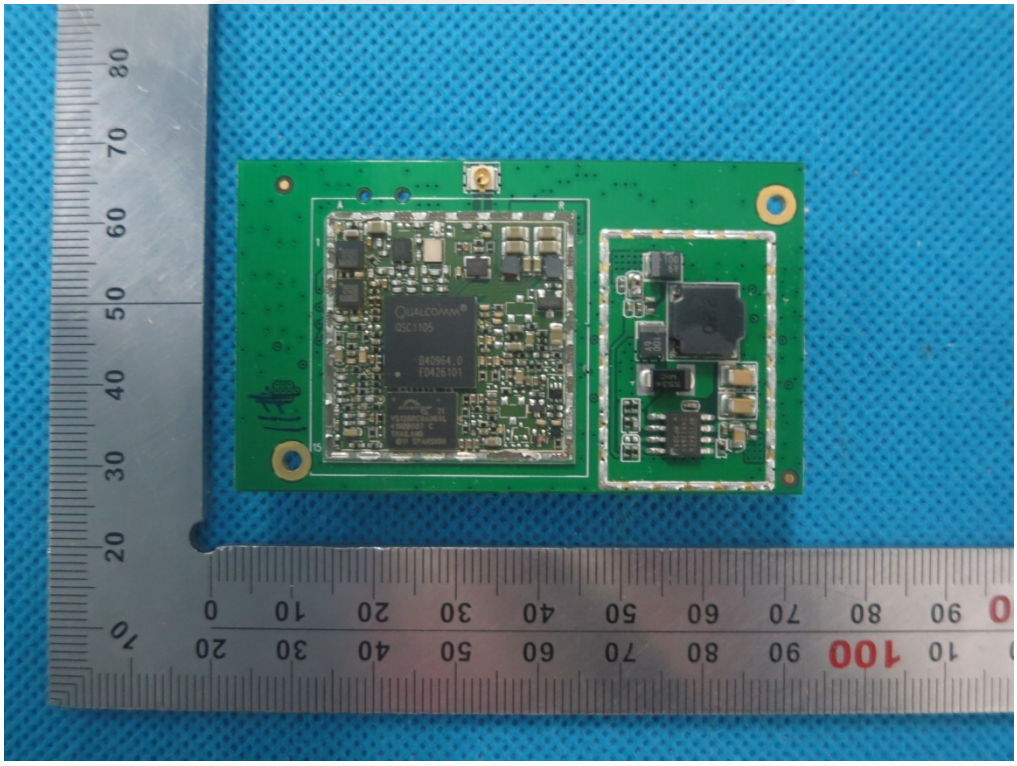
OPEN VIEW OF EUT-3



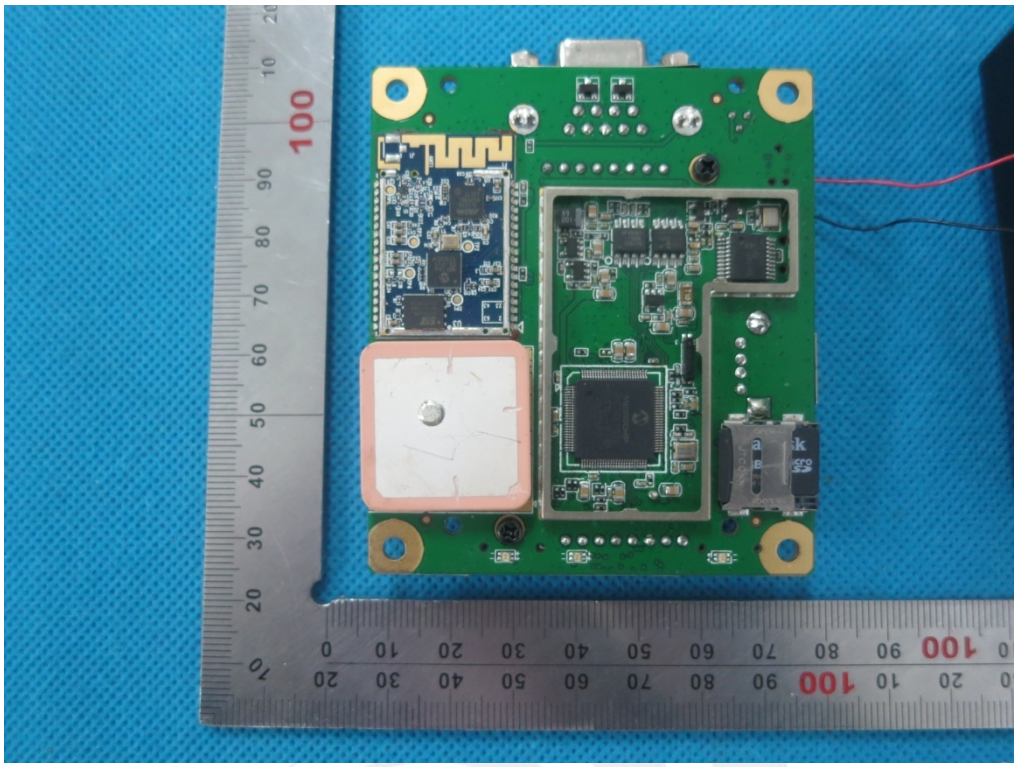
INTERNAL VIEW OF EUT-1



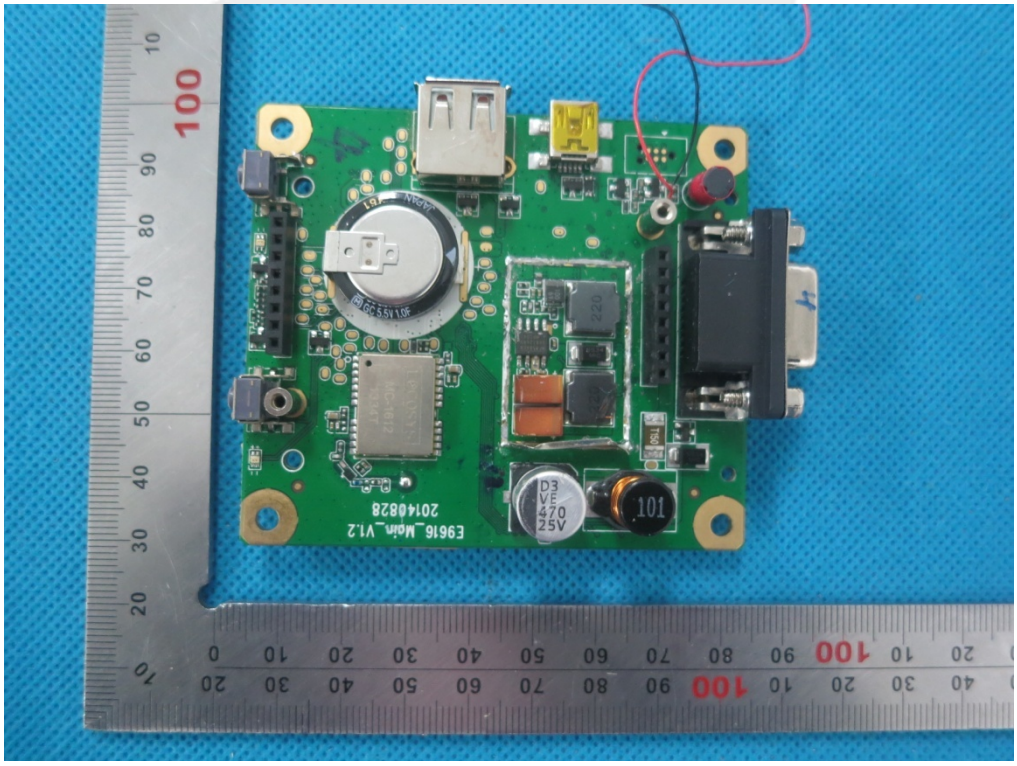
INTERNAL VIEW OF EUT-2



INTERNAL VIEW OF EUT-3



INTERNAL VIEW OF EUT-4



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