FCC Test Report

(PART 22)

Report No.:	RF150115C08
FCC ID:	S8WTTD
Test Model:	TTD
Received Date:	Jan. 15, 2015
Test Date:	Jan. 27 ~ Feb. 06, 2015
Issued Date:	Feb. 10, 2015
Applicant:	Whistle Labs, Inc
Address:	3180 18th Street, Suite 102, San Francisco, CA 94110
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan, R.O.C.
Test Location:	No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

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Release Control Record

Issue No.	Description	Date Issued
RF150115C08	Original release	Feb. 10, 2015

1 Certificate of Conformity

Product:	Tagg Tracking Device
Brand:	Tagg
Test Model:	TTD
Sample Status:	Engineering sample
Applicant:	Whistle Labs, Inc
Test Date:	Jan. 27 ~ Feb. 06, 2015
Standards:	FCC Part 22, Subpart H

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by : Celine Chou , **Date:** Feb. 10, 2015

Celine Chou / Specialist

Approved by : , **Date:** Feb. 10, 2015

Dylan Chiou / Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 22 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 22.913 (a)	Effective radiated power	Pass	Meet the requirement of limit.
---	Peak To Average Ratio	Pass	Meet the requirement of limit.
2.1055 22.355	Frequency Stability	Pass	Meet the requirement of limit.
2.1049	Occupied Bandwidth	Pass	Meet the requirement of limit.
22.917	Band Edge Measurements	Pass	Meet the requirement of limit.
2.1051 22.917	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 22.917	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -20.51dB at 1649.40MHz.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expended Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.44 dB
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	3.59 dB
	200MHz ~1000MHz	3.60 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Oct. 06, 2014	Oct. 05, 2015
Spectrum Analyzer ROHDE & SCHWARZ	FSU 43	100115	Dec. 18, 2014	Dec. 17, 2015
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Feb. 26, 2014	Feb. 25, 2015
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-404	Jan. 05, 2014	Jan. 04, 2015
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Feb. 17, 2014	Feb. 16, 2015
Preamplifier Agilent	8449B	3008A01961	Oct. 18, 2014	Oct. 17, 2015
Preamplifier Agilent	8447D	2944A10738	Oct. 18, 2014	Oct. 17, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309220/4	Aug. 09, 2014	Aug. 08, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250724/4	Aug. 09, 2014	Aug. 08, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	295012/4	Aug. 09, 2014	Aug. 08, 2015
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	019303	NA	NA
Turn Table BV ADT	TT100.	TT93021704	NA	NA
Turn Table Controller BV ADT	SC100.	SC93021704	NA	NA
Mini-Circuits Power Splitter	ZN2PD-9G	NA	Apr. 25, 2014	Apr. 24, 2015
JFW 20dB attenuation	50HF-020-SMA	NA	NA	NA

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The test was performed in HwaYa Chamber 4.

3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.

4. The FCC Site Registration No. is 460141.

5. The IC Site Registration No. is IC 7450F-4.

3 General Information

3.1 General Description of EUT

Product	Tagg Tracking Device
Brand	Tagg
Test Model	TTD
Status of EUT	Engineering sample
Power Supply Rating	3.7Vdc (Battery) 5Vdc (Adapter)
Modulation Type	QPSK, OQPSK, HPSK
Operating Frequency	824.7MHz ~ 848.31MHz
Max. ERP Power	238.781mW (23.78dBm)
Antenna Type	PIFA antenna with -1.28dBi gain
Antenna Connector	UFL
Accessory Device	Refer to Note for more details
Data Cable Supplied	Refer to Note for more details

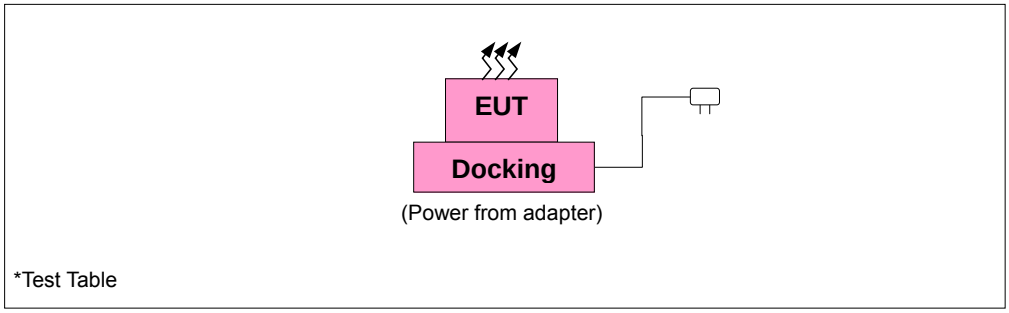
Note:

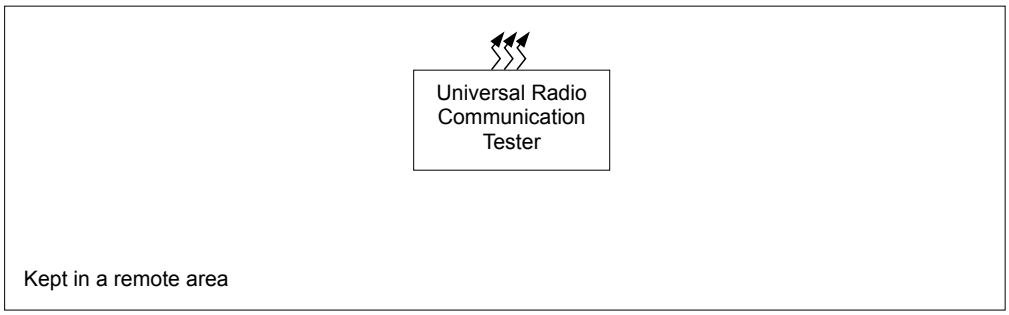
1. The EUT contains following accessory devices and data cable.

Item	Brand	Model or P/N	Specification
Adapter	HOIOTO	ADS-5MA-06A 05050GPCU	I/P: 100-240Vac, 50/60Hz, 0.3A O/P: 5Vdc, 1.0A
Battery	GLOSO	BT-3004-03-1R	3.7Vdc, 400mAh
USB cable	N/A	N/A	0.95m shielded cable without core
Tagg Beacon Charger	Tagg	TBC	-

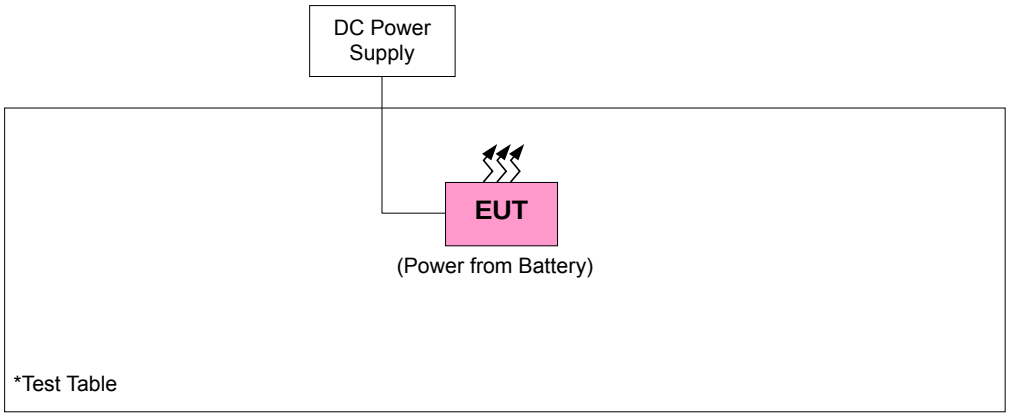
3.2 Configuration of System Under Test

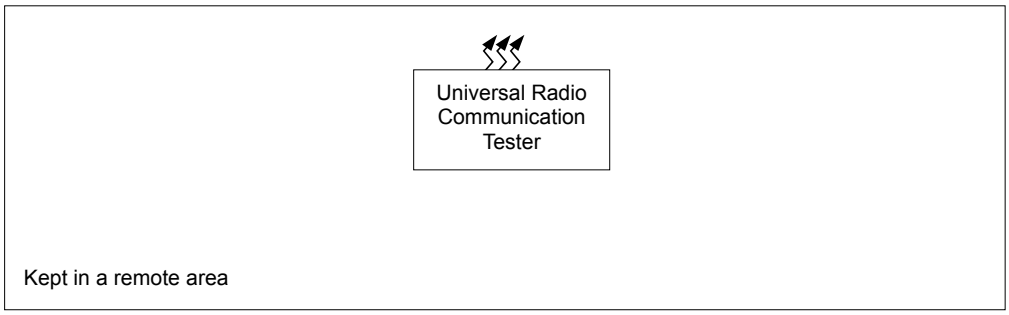
Test Mode A





Test Mode B





3.2.1 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.

No.	Product	Brand	Model No.	Serial No.	FCC ID
1	Universal Radio Communication Tester	R&S	CMU200	123112	NA
2	DC Power supply	TOPWARD	6603D	802001	NA

NO.	Signal Cable Description Of The Above Support Units
1	NA
2	1.8m power cable x 2

Note:
1. All power cords of the above support units are non shielded (1.8m).
2. Item 1 acted as a communication partner to transfer data.
3. Item 2 was placed under test table.

3.3 Test Mode Applicability and Tested Channel Detail

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports
The worst case was found when positioned on X-plane. Following channel(s) was (were) selected for the final test as listed below:

Test results are presented in the report as below.

Test Mode	Test Condition
A	Power from adapter
B	Power from battery

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
B	ERP	1013 to 777	1013, 384, 777	CDMA
B	Frequency Stability	1013 to 777	384	CDMA
B	Occupied Bandwidth	1013 to 777	1013, 384, 777	CDMA, EVDO
B	Band Edge	1013 to 777	1013, 777	CDMA, EVDO
B	Peak To Average Ratio	1013 to 777	1013, 384, 777	CDMA, EVDO
B	Conducted Emission	1013 to 777	1013, 384, 777	CDMA, EVDO
A, B	Radiated Emission Below 1GHz	1013 to 777	1013	CDMA
B	Radiated Emission Above 1GHz	1013 to 777	1013, 384, 777	CDMA

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
ERP	25deg. C, 65%RH	3.8Vdc	Chris Lin
Frequency Stability	24deg. C, 64%RH	3.8Vdc	Match Tsui
Occupied Bandwidth	24deg. C, 64%RH	3.8Vdc	Match Tsui
Band Edge	24deg. C, 64%RH	3.8Vdc	Match Tsui
Peak To Average Ratio	24deg. C, 64%RH	3.8Vdc	Match Tsui
Conducted Emission	24deg. C, 64%RH	3.8Vdc	Match Tsui
Radiated Emission	25deg. C, 65%RH	3.8Vdc 120Vac, 60Hz	Chris Lin

3.4 EUT Operating Conditions

The EUT makes a call to the communication simulator. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency

3.5 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC 47 CFR Part 2

FCC 47 CFR Part 22

KDB 971168 D01 Power Meas License Digital Systems v02r01

ANSI/TIA/EIA-603-C 2004

All test items have been performed and recorded as per the above standards.

NOTE: The EUT has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

Mobile / Portable station are limited to 7 watts e.r.p.

4.1.2 Test Procedures

EIRP / ERP Measurement:

a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 5MHz for CDMA mode.

b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.

c. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a tx cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value“ of step b. Record the power level of S.G

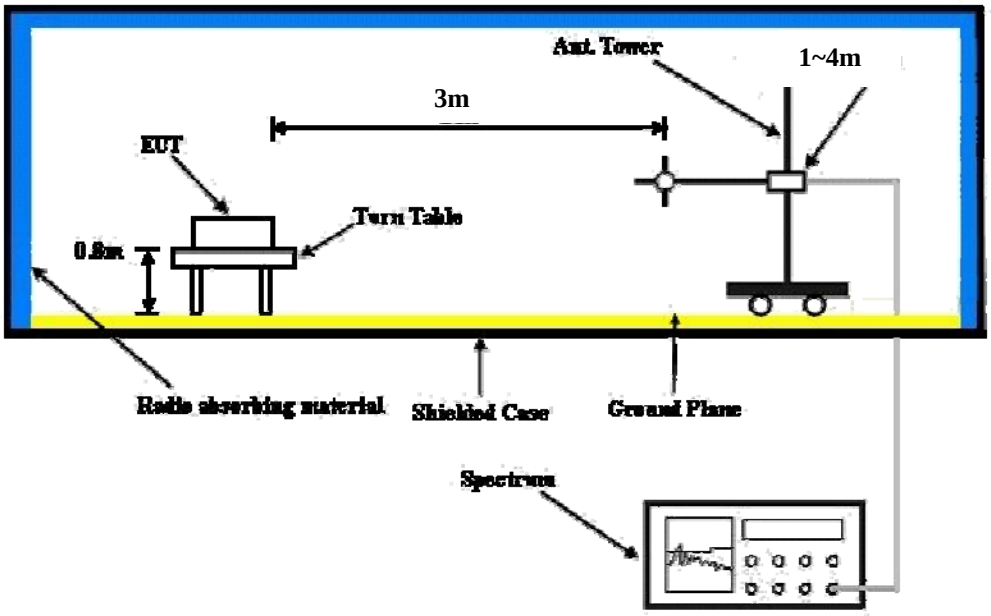
d. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.R.P power - 2.15dBi.

Conducted Power Measurement:

The EUT was set up for the maximum power with CDMA link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

4.1.3 Test Setup

EIRP / ERP MEASUREMENT:



For the actual test configuration, please refer to the attached file (Test Setup Photo).

CONDUCTED POWER MEASUREMENT:

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.4 Test Results

CONDUCTED OUTPUT POWER (dBm)

Band	CDMA2000 BC0		
Channel	1013	384	777
Frequency (MHz)	824.7	836.52	848.31
RC1+SO55	23.45	23.47	**23.56**
RC3+SO55	23.37	23.39	23.48
RC3+SO32(+ F-SCH)	23.36	23.38	23.47
RC3+SO32(+SCH)	23.34	23.36	23.45

ERP Power (dBm)

MODE		TX channel 1013					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	**824.70**	**-7.40**	**23.76**	**0.02**	**23.78**	**38.45**	**-14.67**
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	824.70	-9.68	22.20	0.02	22.22	38.45	-16.23

MODE		TX channel 384					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	836.52	-7.83	23.20	0.29	23.49	38.45	-14.96
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	836.52	-10.57	21.12	0.29	21.41	38.45	-17.04

MODE		TX channel 777					
Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	848.31	-7.69	22.77	0.50	23.27	38.45	-15.18
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	848.31	-10.52	20.78	0.50	21.28	38.45	-17.17

NOTE: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

4.2 Frequency Stability Measurement

4.2.1 Limits of Frequency Stabiliity Measurement

1.5 ppm is for base and fixed station. 2.5 ppm is for mobile station.

4.2.2 Test Procedure

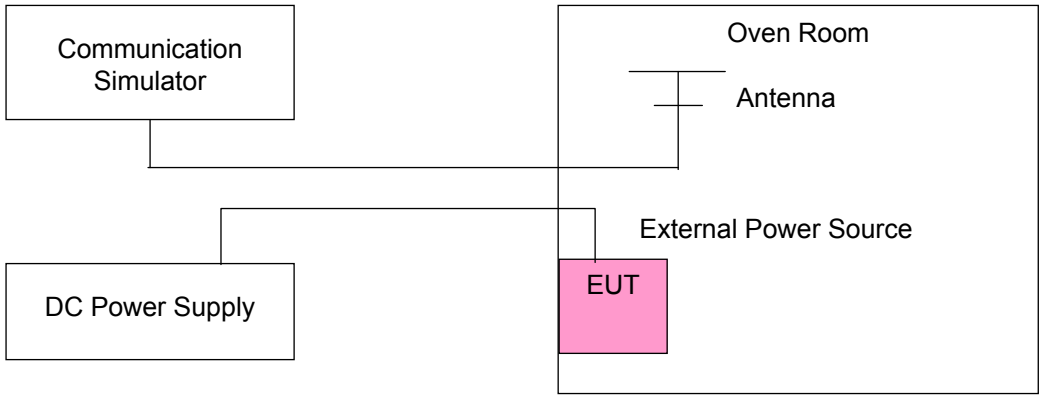
a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.

b. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.

c. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ±0.5 ℃ during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

NOTE: The frequency error was recorded frequency error from the communication simulator.

4.2.3 Test Setup



4.2.4 Test Results

Frequency Error vs. Voltage

Voltage (Volts)	Frequency Error (ppm)	Limit (ppm)
4.18	-0.014	2.5
3.80	-0.011	2.5
3.42	-0.013	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 3.42Vdc to 4.18Vdc.

Frequency Error vs. Temperature.

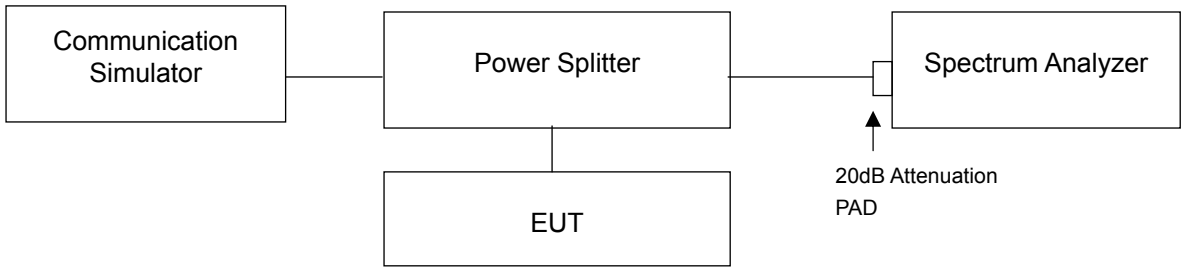
TEMP. (℃)	Frequency Error (ppm)	Limit (ppm)
60	-0.035	2.5
50	-0.037	2.5
40	-0.023	2.5
30	-0.019	2.5
20	-0.011	2.5
10	-0.023	2.5
0	-0.030	2.5
-10	-0.035	2.5
-20	-0.038	2.5

4.3 Occupied Bandwidth Measurement

4.3.1 Test Procedure

The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

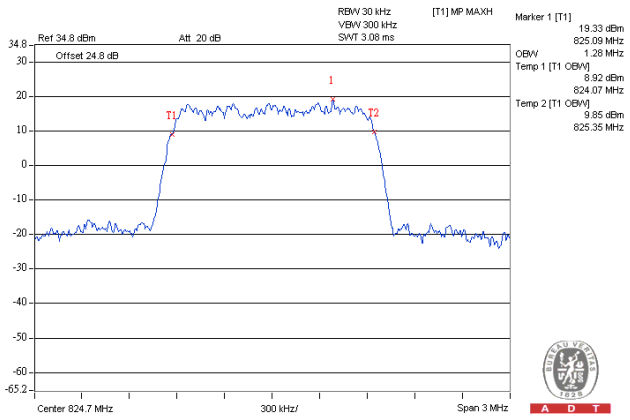
4.3.2 Test Setup

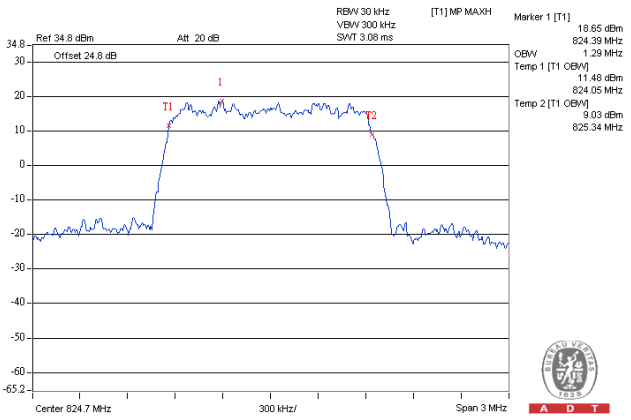


4.3.3 Test Result

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		CDMA	EVDO
1013	824.70	1.28	1.29
384	836.52	1.28	1.28
777	848.31	1.28	1.29

Spectrum Plot Of Worst Value	
CDMA	EVDO



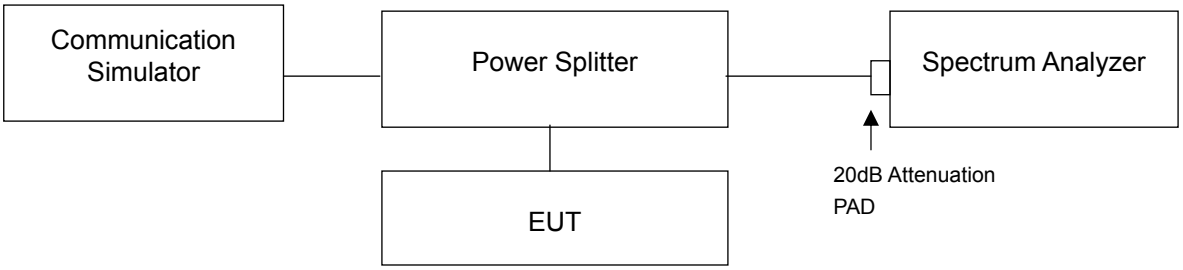


4.4 Band Edge Measurement

4.4.1 Limits of Band Edge Measurement

Power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

4.4.2 Test Setup



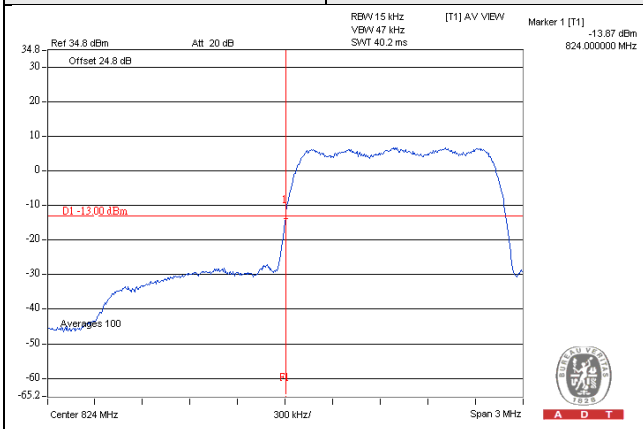
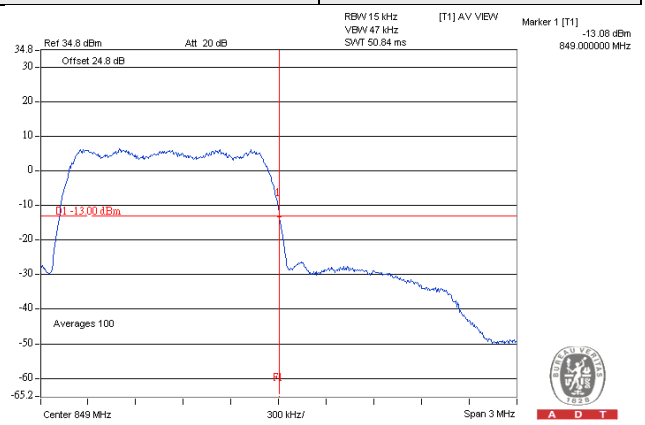
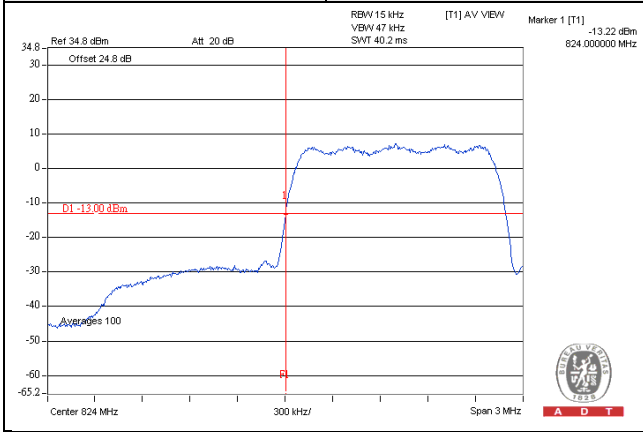
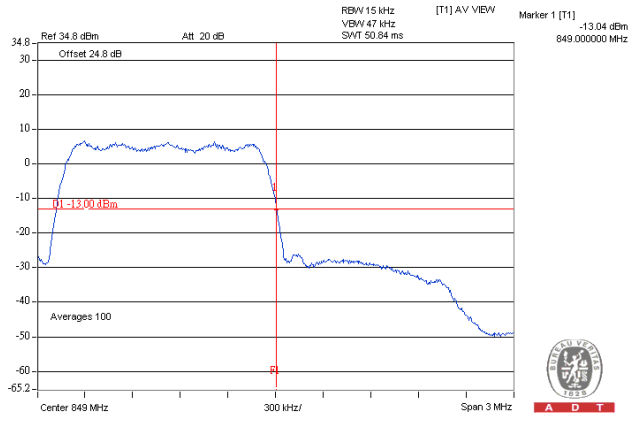
4.4.3 Test Procedures

a. All measurements were done at low and high operational frequency range.

b. The center frequency of spectrum is the band edge frequency and span is 3MHz. RB of the spectrum is 15kHz and VB of the spectrum is 47kHz.

c. Record the max trace plot into the test report.

4.4.4 Test Results

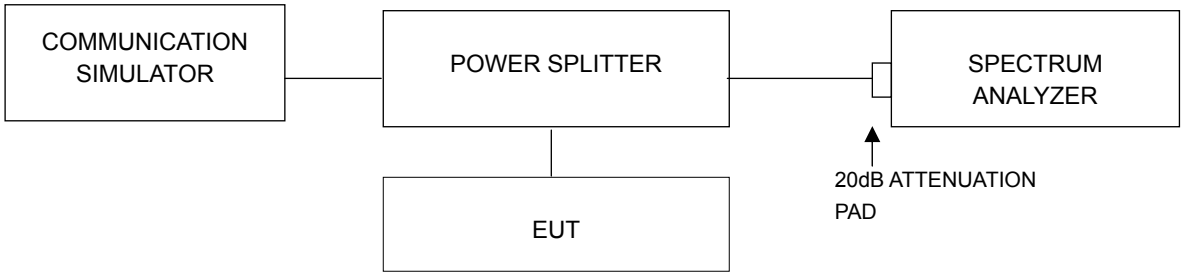
CDMA			
Channel	1013	Channel	777
			
EVDO			
Channel	1013	Channel	777
			

4.5 Peak To Average Ratio

4.5.1 Limits of Peak To Average Ratio Measurement

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

4.5.2 Test Setup



4.5.3 Test Procedures

1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;

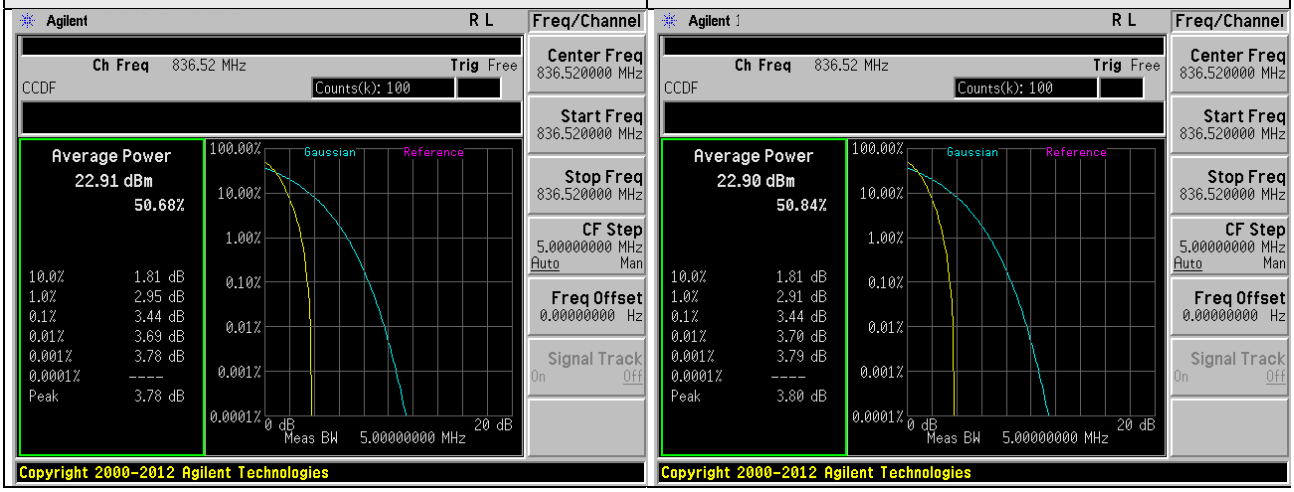
2. Set the number of counts to a value that stabilizes the measured CCDF curve;

3. Record the maximum PAPR level associated with a probability of 0.1%.

4.5.4 Test Results

Channel	Frequency (MHz)	Peak To Average Ratio (dB)	
		CDMA	EVDO
1013	824.70	3.21	3.16
384	836.52	3.44	3.44
777	848.31	2.84	2.82

Spectrum Plot Of Worst Value	
CDMA	EVDO

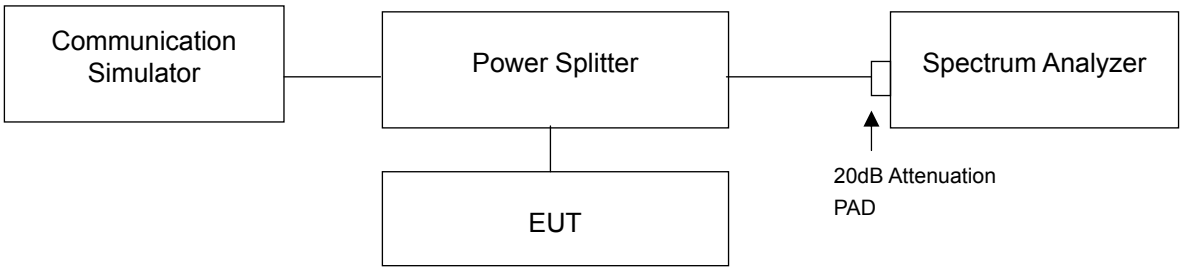


4.6 Conducted Spurious Emissions

4.6.1 Limits of Conducted Spurious Emissions Measurement

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. The emission limit equal to –13dBm.

4.6.2 Test Setup

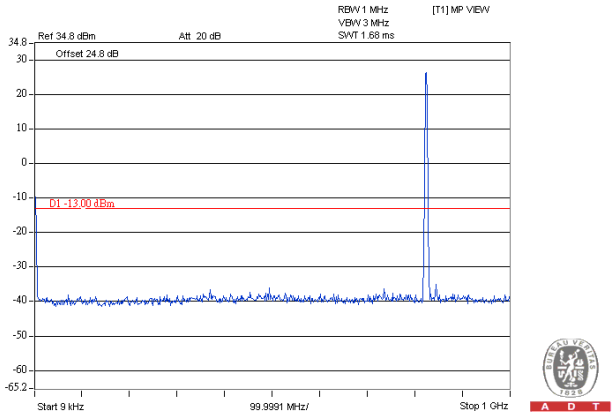
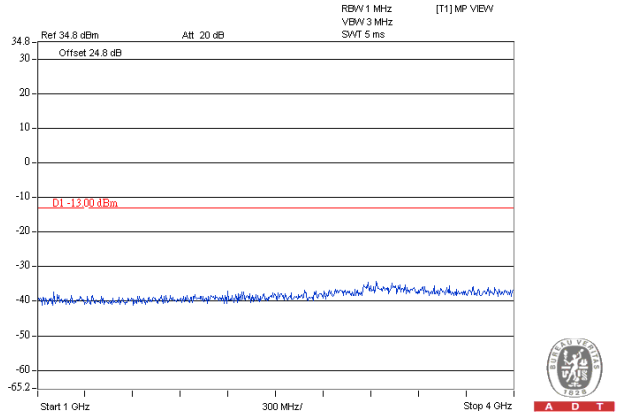
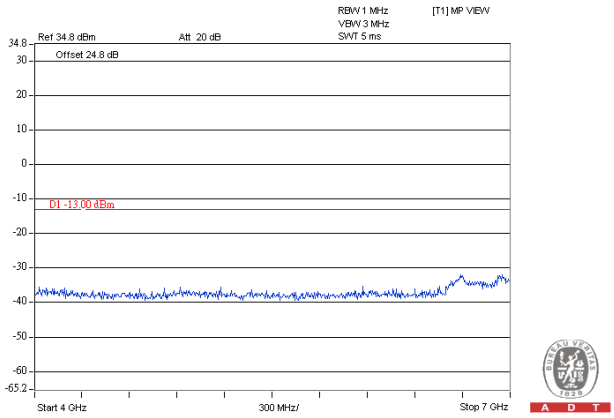
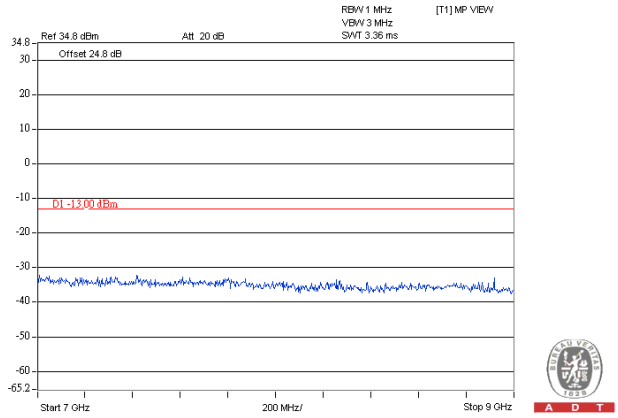


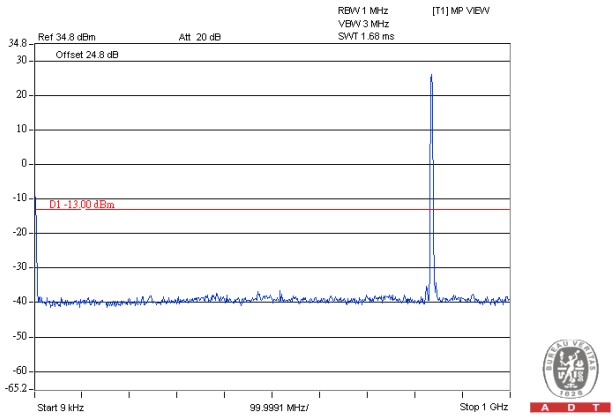
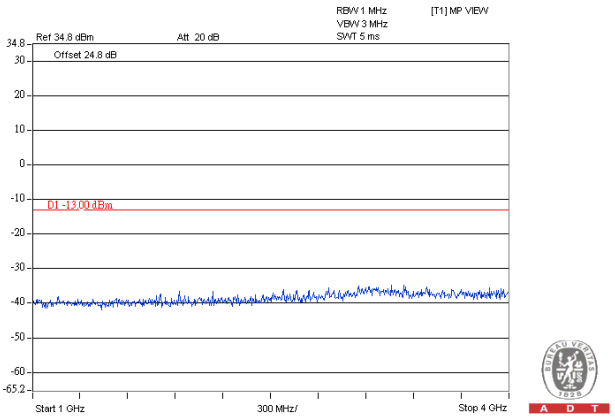
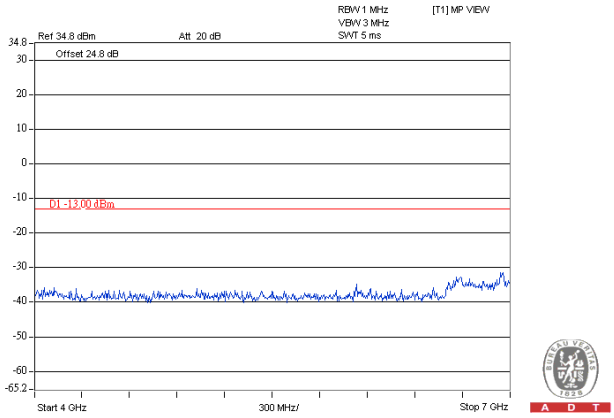
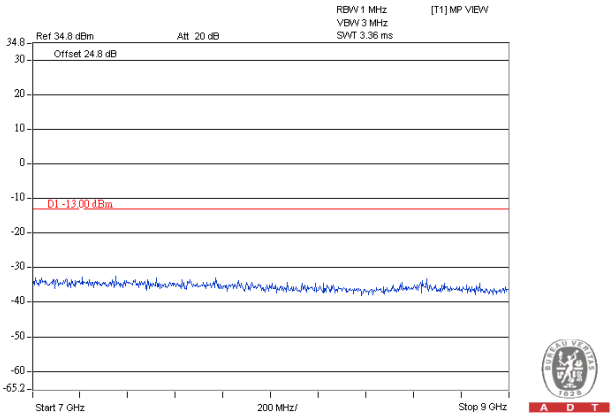
4.6.3 Test Procedure

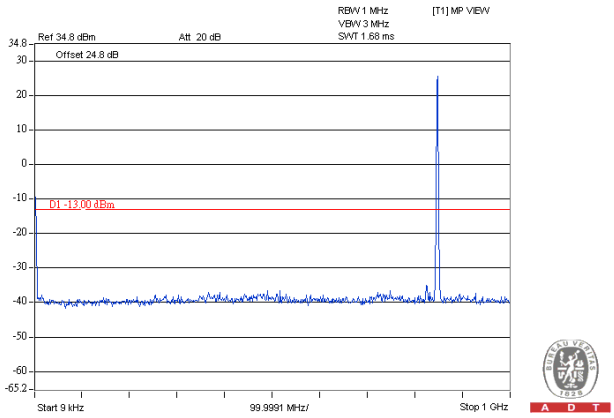
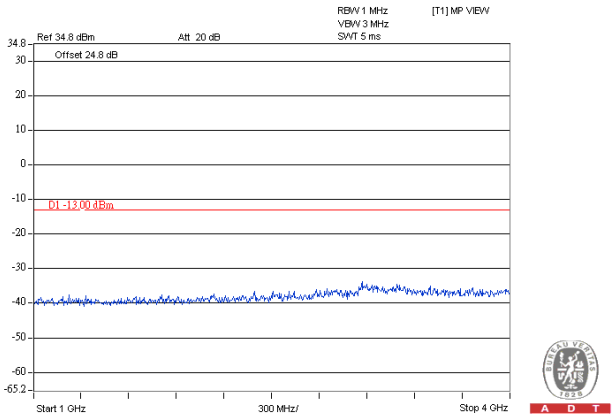
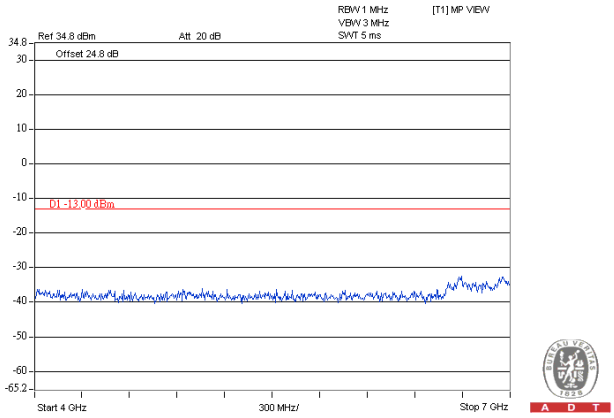
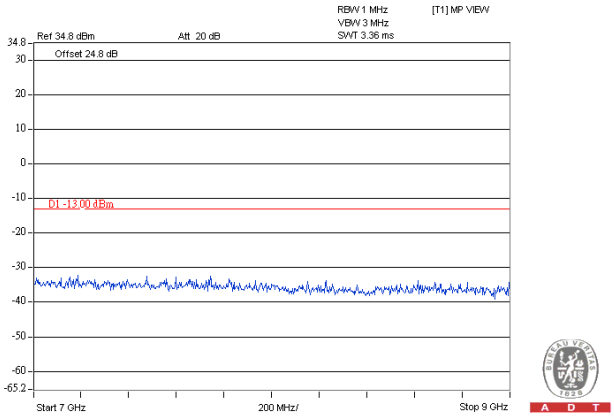
a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.

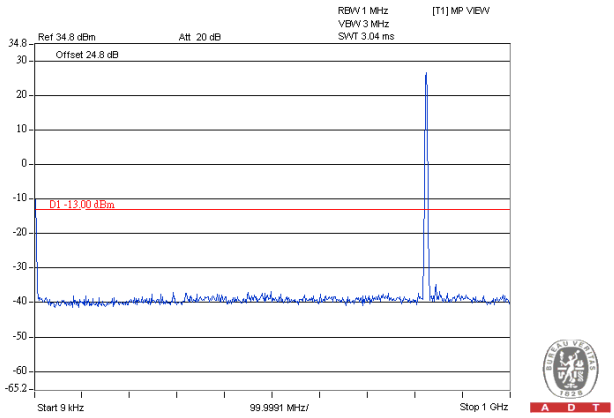
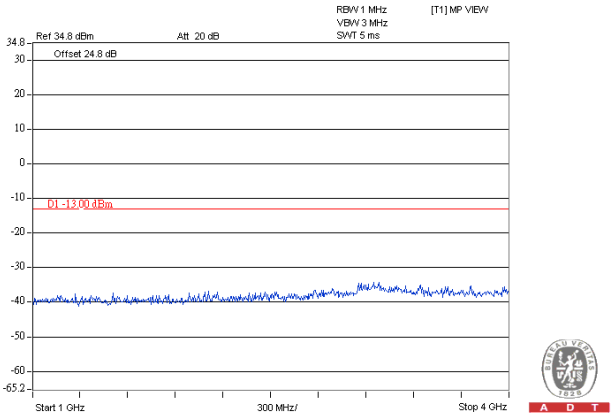
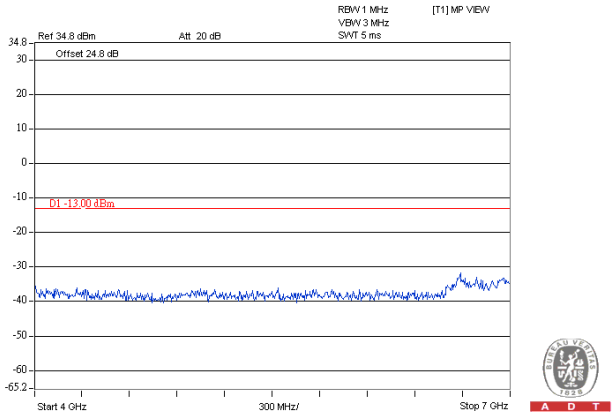
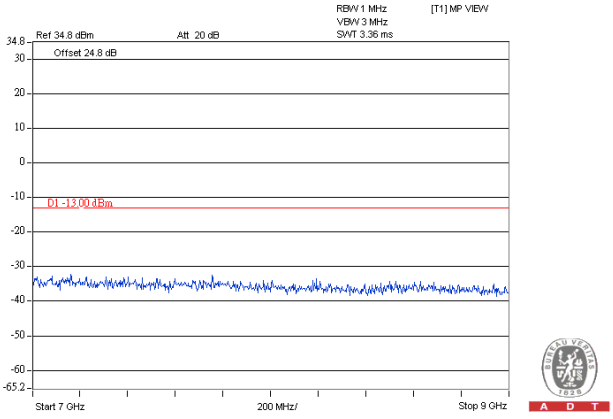
b. Measuring frequency range is from 9 kHz to 9GHz. 20dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.

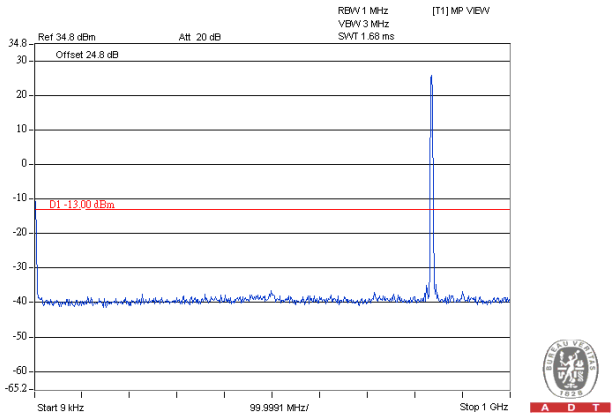
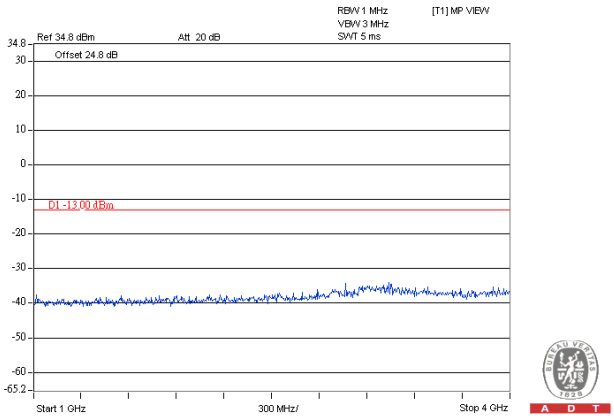
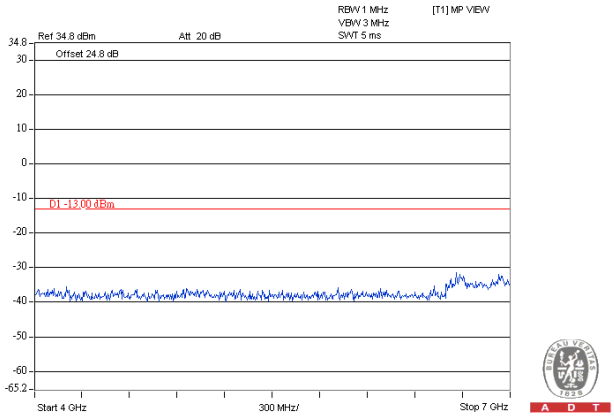
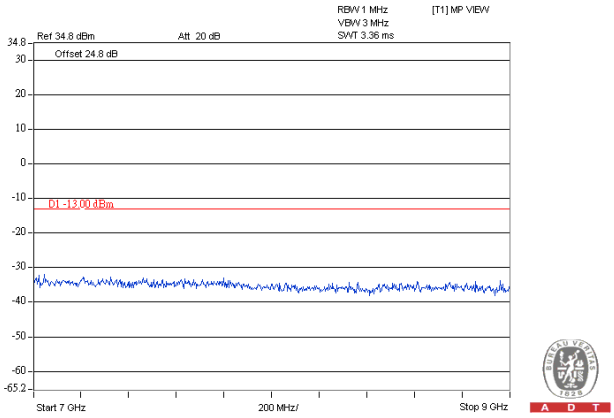
4.6.4 Test Results

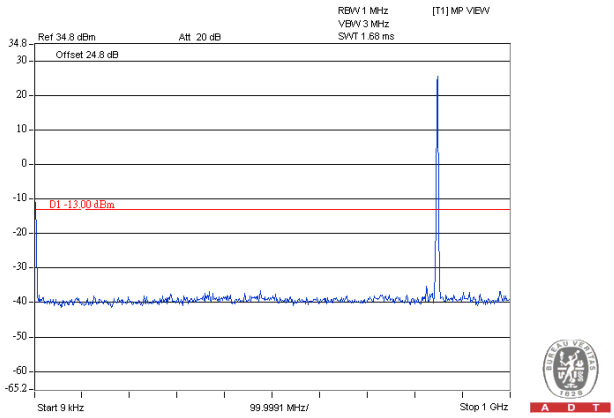
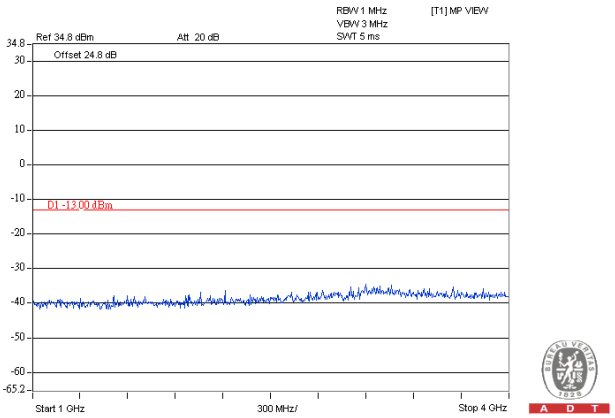
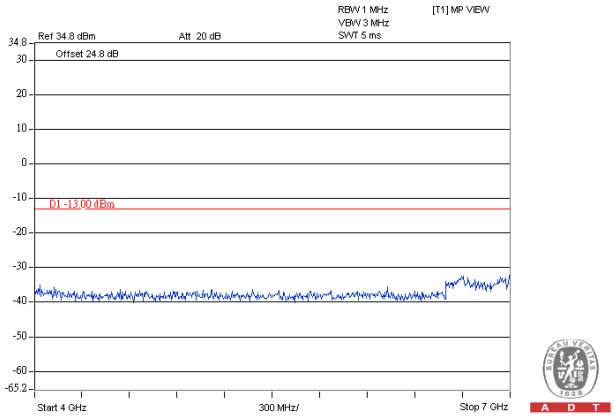
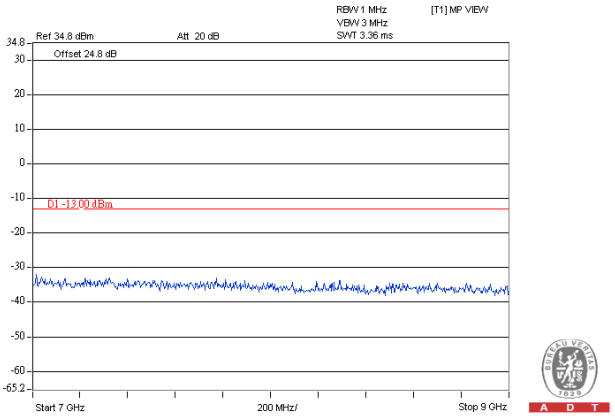
CDMA	
Channel 1013	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~4GHz
	
Frequency Range : 4GHz~7GHz	Frequency Range : 7GHz~9GHz
	

CDMA	
Channel 384	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~4GHz
	
Frequency Range : 4GHz~7GHz	Frequency Range : 7GHz~9GHz
	

CDMA	
Channel 777	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~4GHz
	
Frequency Range : 4GHz~7GHz	Frequency Range : 7GHz~9GHz
	

EVDO	
Channel 1013	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~4GHz
	
Frequency Range : 4GHz~7GHz	Frequency Range : 7GHz~9GHz
	

EVDO	
Channel 384	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~4GHz
	
Frequency Range : 4GHz~7GHz	Frequency Range : 7GHz~9GHz
	

EVDO	
Channel 777	
Frequency Range : 9kHz~1GHz	Frequency Range : 1GHz~4GHz
	
Frequency Range : 4GHz~7GHz	Frequency Range : 7GHz~9GHz
	

4.7 Radiated Emission Measurement

4.7.1 Limits of Radiated Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. The emission limit equal to –13dBm.

4.7.2 Test Procedure

a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.

b. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value “ of step a. Record the power level of S.G

c. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.

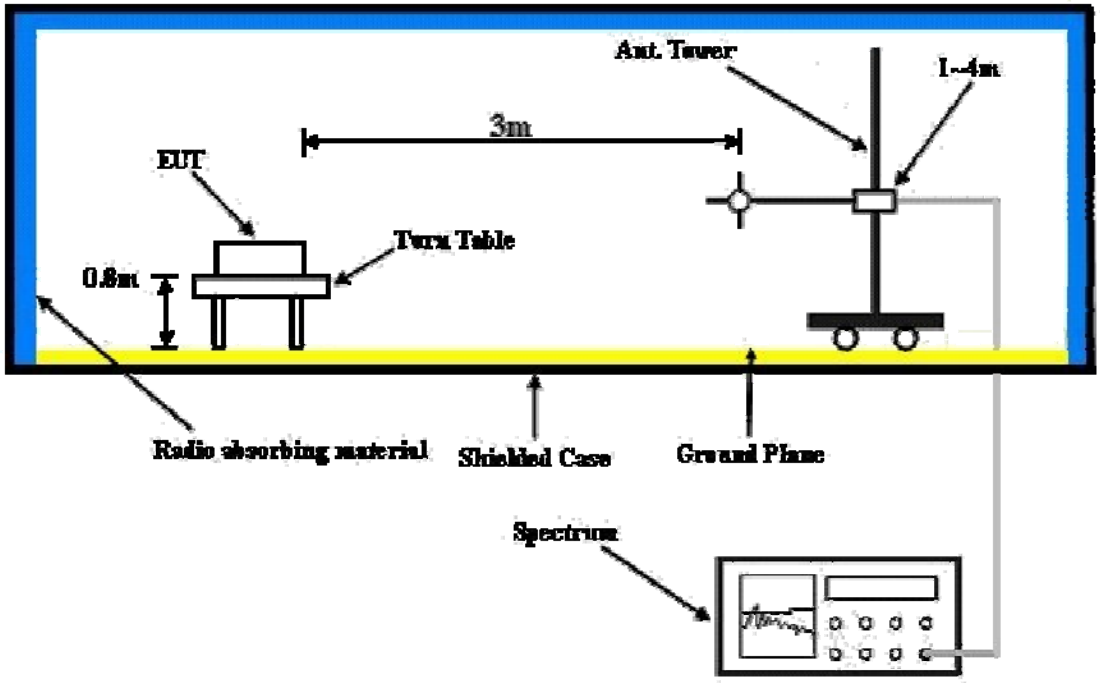
d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.R.P power - 2.15dBi.

NOTE: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

4.7.3 Deviation from Test Standard

No deviation.

4.7.4 Test Setup



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.7.5 Test Results

Below 1GHz

Mode	TX channel 1013	Frequency Range	Below 1000 MHz
Environmental Conditions	25deg. C, 65%RH	Input Power	120Vac, 60Hz
Tested By	Chris Lin	Test Mode	A

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	41.64	-59.54	-48.12	-10.62	-58.74	-13.00	-45.74
2	90.14	-54.70	-65.48	1.13	-64.35	-13.00	-51.35
3	189.08	-51.54	-66.43	4.08	-62.35	-13.00	-49.35
4	359.80	-62.70	-72.80	5.22	-67.58	-13.00	-54.58
5	763.32	-60.75	-63.11	4.48	-58.63	-13.00	-45.63
6	953.44	-60.61	-59.47	3.90	-55.57	-13.00	-42.57
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	41.64	-45.37	-43.64	-10.62	-54.26	-13.00	-41.26
2	82.38	-51.64	-56.83	-0.98	-57.81	-13.00	-44.81
3	181.32	-57.73	-64.52	3.08	-61.44	-13.00	-48.44
4	276.38	-61.53	-66.59	5.25	-61.34	-13.00	-48.34
5	604.24	-66.84	-69.67	4.46	-65.21	-13.00	-52.21
6	835.10	-62.45	-62.11	3.98	-58.13	-13.00	-45.13

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 1013	Frequency Range	Below 1000 MHz
Environmental Conditions	25deg. C, 65%RH	Input Power	3.8Vdc
Tested By	Chris Lin	Test Mode	B

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	39.70	-56.35	-45.28	-10.93	-56.21	-13.00	-43.21
2	144.46	-54.74	-61.91	-0.25	-62.16	-13.00	-49.16
3	313.24	-61.65	-73.41	5.15	-68.26	-13.00	-55.26
4	586.78	-63.53	-70.07	4.50	-65.57	-13.00	-52.57
5	792.42	-65.98	-66.81	4.12	-62.69	-13.00	-49.69
6	937.92	-63.36	-62.31	3.92	-58.39	-13.00	-45.39
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	37.76	-51.24	-50.68	-11.18	-61.86	-13.00	-48.86
2	142.52	-58.17	-63.11	-0.28	-63.39	-13.00	-50.39
3	359.80	-58.19	-66.74	5.22	-61.52	-13.00	-48.52
4	547.98	-60.61	-66.23	4.65	-61.58	-13.00	-48.58
5	792.42	-64.72	-64.70	4.12	-60.58	-13.00	-47.58
6	937.92	-61.76	-59.03	3.92	-55.11	-13.00	-42.11

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Above 1GHz

Mode	TX channel 1013	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 65%RH	Input Power	3.8Vdc
Tested By	Chris Lin		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1649.40	-41.92	-45.17	5.49	-39.68	-13.00	-26.68
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	**1649.40**	**-37.89**	**-39.00**	**5.49**	**-33.51**	**-13.00**	**-20.51**

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 384	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 65%RH	Input Power	3.8Vdc
Tested By	Chris Lin		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1673.04	-45.73	-48.78	5.54	-43.24	-13.00	-30.24
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1673.04	-41.18	-41.99	5.54	-36.45	-13.00	-23.45

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

Mode	TX channel 777	Frequency Range	Above 1000MHz
Environmental Conditions	25deg. C, 65%RH	Input Power	3.8Vdc
Tested By	Chris Lin		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1696.62	-47.06	-49.90	5.59	-44.31	-13.00	-31.31
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1696.62	-43.14	-43.66	5.59	-38.07	-13.00	-25.07

Remarks:
1. Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

Appendix – Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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The address and road map of all our labs can be found in our web site also.

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