

EMC

TEST REPORT

Report No. : TS10020018-EME
Model No. : C5630, C5626
Issued Date : Mar. 12, 2010

Applicant: Fanstel Corporation, Taipei
10F-10, No. 79, Sec.1, Hsin-Tai-Wu Rd., Hsi-Chih, Taipei
Hsien 221, Taiwan

Test Method/ Standard: 47 CFR FCC Part 15.249 & ANSI C63.4 2003

Test By: Intertek Testing Services Taiwan Ltd.
No. 11, Lane 275, Ko-Nan 1 Street, Chia-Tung Li,
Shiang-Shan District, Hsinchu City, Taiwan

It may be duplicated completely for legal use with the allowance of the applicant. It shall not be reproduced except in full, without the written approval of Intertek Laboratory. The test result(s) in this report only applies to the tested sample(s).

The test report was prepared by: Sign on File
Shirla Hsiao / Officer

These measurements were taken by: Sign on File
Rex Liao / Engineer

The test report was reviewed by:

Name Leon Cheng
Title Engineer



Table of Contents

Summary of Tests	3
1. General information.....	4
1.1 Identification of the EUT.....	4
1.2 Additional information about the EUT	5
1.3 Antenna description	5
2. Test specifications.....	6
2.1 Test standard	6
2.2 Operation mode	6
2.3 Test equipment.....	7
3. Radiated emission test	8
3.1 Operating environment	8
3.2 Test setup & procedure	8
3.3 Emission limit.....	9
3.3.1 Fundamental and harmonics emission limits	9
3.3.2 General radiated emission limits	9
3.4 Radiated spurious emission test data	10
3.4.1 Measurement results: frequencies equal to or less than 1 GHz.....	10
3.4.2 Measurement results: frequency above 1GHz.....	12
3.4.3 Measurement results: Fundamental emission.....	18
4. Radiated emission on the band edge FCC 15.209.....	21
5. Conducted emission test FCC 15.207	24
5.1 Operating environment.....	24
5.2 Test setup & procedure	24
5.3 Emission limit.....	24
5.4 Uncertainty of Conducted Emission.....	25
5.5 Conducted emission data FCC 15.207	26
6. Calculation of Average Factor	28



Summary of Tests

Test	Reference	Results
Radiated Emission test	15.249(a), (c), (d), 15.209	Pass
Emission on the Band Edge	15.209	Pass
Conducted Emission of AC Power	15.207	Pass
Calculation of Average Factor	15.35	Pass



1. General information

1.1 Identification of the EUT

Product:	2.4GHz Cordless Phone
Model No.:	C5630
FCC ID.:	X8WC562630
Frequency Range:	2416MHz ~ 2471MHz
Channel Number:	12 channels
Frequency of Each Channel:	2416 MHz + 5k MHz; k=0~11
Type of Modulation:	ASK
Rated Power:	Handset: DC 3.6 V from NI-MH rechargeable battery Base unit: DC 9 V from adapter model: DV-9300S I/P Voltage: 120 Vac, 60 Hz
Power Cord:	N/A
Data Cable:	N/A
Sample Received:	Feb. 01, 2010
Test Date(s):	Feb. 03, 2010~ Mar 03, 2010
Note 1:	This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.
Note 2:	When determining the test conclusion, the Measurement Uncertainty of test has been considered.

1.2 Additional information about the EUT

The main function of 2.4GHz Cordless Phone is to send the 2.4GHz RF signals.

The customer confirmed the model, C5626, is identical to model C5630 (EUT), and the difference is different color enclosures only.

For more detail features, please refer to User's manual as file name "Installation guide.pdf"

1.3 Antenna description

The EUT uses a permanently connected antenna.

Antenna Type : Dipole antenna

2. Test specifications

2.1 Test standard

The EUT was performed according to the procedures in FCC Part 15 Subpart C Paragraph 15.249 for non-spread spectrum devices.

The test of radiated measurements according to FCC Part15 Section 15.33(a) had been conducted and the field strength of this frequency band was all meet limit requirement, thus we evaluate the EUT pass the specified test.

2.2 Operation mode

The EUT was continuously transmit during the test.

For the signal from base unit, we found the maximum electromagnetic field was occurred with stand after verification of the maximum output power. The final test was executed under this condition and recorded in this report individually.

For the signal from handset is maximized through rotation and placement in the three orthogonal axes.



X axis



Y axis



Z axis

After verifying three axes, we found the maximum electromagnetic field was occurred at X axis. The final test data was executed under this configuration.

The EUT configuration please refer to the “Spurious set-up photo.pdf”.

2.3 Test equipment

Equipment	Brand	Frequency range	Model No.
EMI Test Receiver	Rohde & Schwarz	9kHz~2.75GHz	ESCS 30
EMI Test Receiver	Rohde & Schwarz	20Hz~26.5GHz	ESMI
Spectrum Analyzer	Rohde & Schwarz	9kHz~30GHz	FSP 30
Spectrum Analyzer	Rohde & Schwarz	20Hz~40GHz	FSEK 30
Horn Antenna	EMCO	1GHz~18GHz	3115
Horn Antenna	SCHWARZBECK	14GHz~40GHz	BBHA 9170
Bilog Antenna	SCHWARZBECK	25MHz~1.7GHz	VULB 9160
Turn Table	HDGmbH	N/A	DS 420S
Antenna Tower	HDGmbH	N/A	MA 240
Pre-Amplifier	MITER	100MHz~26.5GHz	919981
LISN	Rohde & Schwarz	9KHz~30MHz	ESH3-Z5

Note: The above equipments are within the valid calibration period.

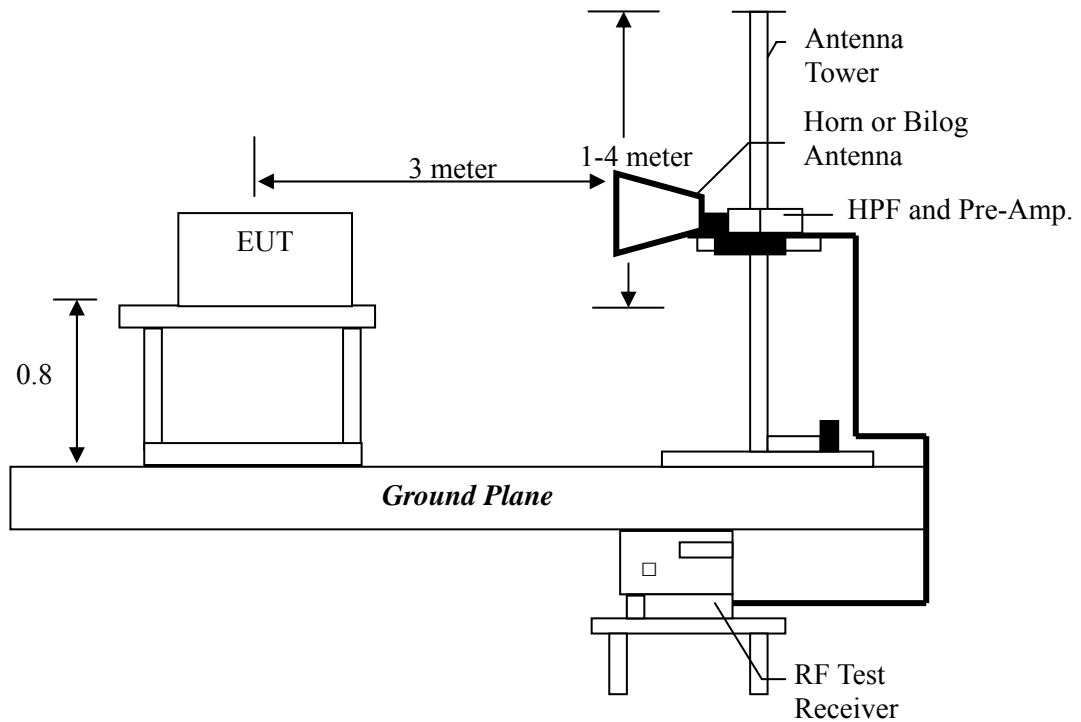
3. Radiated emission test

3.1 Operating environment

Temperature: 22 °C
 Relative Humidity: 56 %
 Atmospheric Pressure 1023 hPa

3.2 Test setup & procedure

The Diagram below shows the test setup, which is utilized to make these measurements.



The signal is maximized through rotation and placement in the three orthogonal axes.

Radiated emissions were investigated cover the frequency range from 30MHz to 1000MHz using a receiver RBW of 120kHz record QP reading, and the frequency over 1GHz using a spectrum analyzer RBW of 1MHz and 10Hz VBW record Average reading. (15.209 paragraph), the Peak reading (1MHz RBW/VBW) recorded also on the report. The EUT for testing is arranged on a wooden turntable. If some peripherals apply to the EUT, the peripherals will be connected to EUT and the whole system. During the test, all cables were arranged to produce worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meters and down to 1 meter.

The measurement for radiated emission will be done at the distance of three meters unless the signal level is too low to measure at that distance. In the case of the reading under noise floor, a pre-amplifier is used and/or the test is conducted at a closer distance. And then all readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance.

The EUT configuration please refer to the “Spurious set-up photo.pdf”.

3.3 Emission limit

3.3.1 Fundamental and harmonics emission limits

Frequency (MHz)	Field Strength of Fundamental		Field Strength of Harmonics	
	(mV/m@3m)	(dBuV/m@3m)	(uV/m@3m)	(dBuV/m@3m)
2400-2483.5	50	94	500	54

3.3.2 General radiated emission limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

Frequency MHz	15.209 Limits (dB μ V/m@3m)
30-88	40
88-216	43.5
216-960	46
Above 960	54

Remark:

1. In the above table, the tighter limit applies at the band edges.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system

Measurement uncertainty was calculated in accordance with TR 100 028-1.

Parameter	Uncertainty
Radiated Emission	± 5.10 dB
Conducted Emission	± 2.786 dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level using a coverage factor of k=2.

3.4 Radiated spurious emission test data

3.4.1 Measurement results: frequencies equal to or less than 1 GHz

The test was performed on EUT under continuously transmitting mode. Low, middle and high channels were verified. The worst case occurred Tx at low channel.

EUT : C5630
 Test Unit : Base Unit with stand
 Worst Case : Tx at low channel

Polarization (circle)	Frequency (MHz)	Detector	Corr. Factor (dB/m)	Reading (dBuV)	Calculated dBuV/m	Limit (dBuV/m)	Margin (dB)
Vertical	527.61	QP	19.46	13.44	32.90	46.00	-13.10
Vertical	544.10	QP	19.46	15.12	34.58	46.00	-11.42
Vertical	559.62	QP	19.53	19.00	38.53	46.00	-7.47
Vertical	576.11	QP	20.71	14.66	35.37	46.00	-10.63
Vertical	591.63	QP	20.71	13.46	34.17	46.00	-11.83
Vertical	623.64	QP	20.75	12.47	33.22	46.00	-12.78
Horizontal	527.61	QP	19.65	19.53	39.18	46.00	-6.82
Horizontal	544.10	QP	19.65	22.13	41.78	46.00	-4.22
Horizontal	559.62	QP	19.72	24.85	44.57	46.00	-1.43
Horizontal	576.11	QP	20.84	22.60	43.43	46.00	-2.57
Horizontal	591.63	QP	20.84	19.32	40.15	46.00	-5.85
Horizontal	623.64	QP	20.88	17.59	38.46	46.00	-7.54

Remark:

1. Corr. Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Corr. Factor

EUT : C5630
 Test Unit : Handset
 Worst Case : Tx at low channel in X axis

Polarization (circle)	Frequency (MHz)	Detector	Corr. Factor (dB/m)	Reading (dBuV)	Calculated dBuV/m	Limit (dBuV/m)	Margin (dB)
Vertical	410.24	QP	16.47	9.55	26.02	46.00	-19.98
Vertical	431.58	QP	17.64	9.58	27.22	46.00	-18.78
Vertical	463.59	QP	17.68	10.07	27.75	46.00	-18.25
Vertical	477.17	QP	18.43	9.39	27.81	46.00	-18.19
Vertical	807.94	QP	23.29	9.88	33.17	46.00	-12.83
Vertical	932.10	QP	25.13	9.80	34.92	46.00	-11.08
Horizontal	320.03	QP	14.32	13.02	27.33	46.00	-18.67
Horizontal	352.04	QP	15.48	14.95	30.42	46.00	-15.58
Horizontal	448.07	QP	18.12	14.61	32.73	46.00	-13.27
Horizontal	608.12	QP	20.88	12.26	33.13	46.00	-12.87
Horizontal	655.65	QP	21.52	11.68	33.19	46.00	-12.81
Horizontal	880.69	QP	24.62	10.19	34.80	46.00	-11.20

Remark:

1. Corr. Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Corr. Factor

3.4.2 Measurement results: frequency above 1GHz

EUT : C5630
 Test Unit : Base Unit with stand
 Test Condition : Tx at low channel

Frequency (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Average Factor (dB)	Corrected Reading (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4832.00	PK	V	35.10	38.54	62.35	-	65.79	74.00	-8.21
4832.00	AV	V	35.10	38.54	62.35	-23.50	42.29	54.00	-11.71
7248.00	PK	V	33.00	44.60	47.83	-	59.43	74.00	-14.57
7248.00	AV	V	33.00	44.60	47.83	-23.50	35.93	54.00	-18.07
9664.00	PK	V	32.70	49.30	48.34	-	64.94	74.00	-9.06
9664.00	AV	V	32.70	49.30	48.34	-23.50	41.44	54.00	-12.56
12080.00	PK	V	31.60	50.87	45.13	-	64.40	74.00	-9.60
12080.00	AV	V	31.60	50.87	45.13	-23.50	40.90	54.00	-13.10
4832.00	PK	H	35.10	38.54	61.90	-	65.34	74.00	-8.66
4832.00	AV	H	35.10	38.54	61.90	-23.50	41.84	54.00	-12.16
7248.00	PK	H	33.00	44.60	47.41	-	59.01	74.00	-14.99
7248.00	AV	H	33.00	44.60	47.41	-23.50	35.51	54.00	-18.49
9664.00	PK	H	32.70	49.30	48.55	-	65.15	74.00	-8.85
9664.00	AV	H	32.70	49.30	48.55	-23.50	41.65	54.00	-12.35
12080.00	PK	H	31.60	50.87	38.59	-	57.86	74.00	-16.14
12080.00	AV	H	31.60	50.87	38.59	-23.50	34.36	54.00	-19.64

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1 GHz to 25 GHz. The data value listed above which is higher than the system noise floor.

EUT : C5630
 Test Unit : Base Unit with stand
 Test Condition : Tx at middle channel

Frequency (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Average Factor (dB)	Corrected Reading (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4882.00	PK	V	35.10	38.54	62.10	-	65.54	74.00	-8.46
4882.00	AV	V	35.10	38.54	62.10	-23.50	42.04	54.00	-11.96
7323.00	PK	V	33.00	44.60	46.21	-	57.81	74.00	-16.19
7323.00	AV	V	33.00	44.60	46.21	-23.50	34.31	54.00	-19.69
9764.00	PK	V	32.70	49.30	53.08	-	69.68	74.00	-4.32
9764.00	AV	V	32.70	49.30	53.08	-23.50	46.18	54.00	-7.82
12205.00	PK	V	31.60	50.87	33.84	-	53.11	74.00	-20.89
12205.00	AV	V	31.60	50.87	33.84	-23.50	29.61	54.00	-24.39
4882.00	PK	H	35.10	38.54	57.27	-	60.71	74.00	-13.29
4882.00	AV	H	35.10	38.54	57.27	-23.50	37.21	54.00	-16.79
7323.00	PK	H	33.00	44.60	38.82	-	50.42	74.00	-23.58
7323.00	AV	H	33.00	44.60	38.82	-23.50	26.92	54.00	-27.08
9764.00	PK	H	32.70	49.30	47.40	-	64.00	74.00	-10.00
9764.00	AV	H	32.70	49.30	47.40	-23.50	40.50	54.00	-13.50

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1 GHz to 25 GHz. The data value listed above which is higher than the system noise floor.

EUT : C5630
 Test Unit : Base Unit with stand
 Test Condition : Tx at high channel

Frequency (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBUV)	Average Factor (dB)	Corrected Reading (dBUV/m)	Limit @ 3 m (dBUV/m)	Margin (dB)
4942.00	PK	V	35.10	38.54	61.24	-	64.68	74.00	-9.32
4942.00	AV	V	35.10	38.54	61.24	-23.50	41.18	54.00	-12.82
7413.00	PK	V	33.00	44.60	39.72	-	51.32	74.00	-22.68
7413.00	AV	V	33.00	44.60	39.72	-23.50	27.82	54.00	-26.18
9884.00	PK	V	32.70	49.30	43.18	-	59.78	74.00	-14.22
9884.00	AV	V	32.70	49.30	43.18	-23.50	36.28	54.00	-17.72
4942.00	PK	H	35.10	38.54	61.08	-	64.52	74.00	-9.48
4942.00	AV	H	35.10	38.54	61.08	-23.50	41.02	54.00	-12.98
7413.00	PK	H	33.00	44.60	40.21	-	51.81	74.00	-22.19
7413.00	AV	H	33.00	44.60	40.21	-23.50	28.31	54.00	-25.69
9884.00	PK	H	32.70	49.30	41.97	-	58.57	74.00	-15.43
9884.00	AV	H	32.70	49.30	41.97	-23.50	35.07	54.00	-18.93

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1 GHz to 25 GHz. The data value listed above which is higher than the system noise floor.

EUT : C5630
 Test Unit : Handset
 Test Condition : Tx at low channel

Frequency (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Average Factor (dB)	Corrected Reading (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4832.00	PK	V	35.10	38.54	52.82	-	56.26	74.00	-17.74
4832.00	AV	V	35.10	38.54	52.82	-23.50	32.76	54.00	-21.24
7248.00	PK	V	33.00	44.60	36.46	-	48.06	74.00	-25.94
7248.00	AV	V	33.00	44.60	36.46	-23.50	24.56	54.00	-29.44
9664.00	PK	V	32.70	49.30	44.33	-	60.93	74.00	-13.07
9664.00	AV	V	32.70	49.30	44.33	-23.50	37.43	54.00	-16.57
4832.00	PK	H	35.10	38.54	53.13	-	56.57	74.00	-17.43
4832.00	AV	H	35.10	38.54	53.13	-23.50	33.07	54.00	-20.93
7248.00	PK	H	33.00	44.60	35.43	-	47.03	74.00	-26.97
7248.00	AV	H	33.00	44.60	35.43	-23.50	23.53	54.00	-30.47
9664.00	PK	H	32.70	49.30	39.86	-	56.46	74.00	-17.54
9664.00	AV	H	32.70	49.30	39.86	-23.50	32.96	54.00	-21.04

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1 GHz to 25 GHz. The data value listed above which is higher than the system noise floor.

EUT : C5630
 Test Unit : Handset
 Test Condition : Tx at middle channel

Frequency (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBUV)	Average Factor (dB)	Corrected Reading (dBUV/m)	Limit @ 3 m (dBUV/m)	Margin (dB)
4882.00	PK	V	35.10	38.54	60.48	-	63.92	74.00	-10.08
4882.00	AV	V	35.10	38.54	60.48	-23.50	40.42	54.00	-13.58
7323.00	PK	V	33.00	44.60	51.95	-	63.55	74.00	-10.45
7323.00	AV	V	33.00	44.60	51.95	-23.50	40.05	54.00	-13.95
9764.00	PK	V	32.70	49.30	39.01	-	55.61	74.00	-18.39
9764.00	AV	V	32.70	49.30	39.01	-23.50	32.11	54.00	-21.89
12205.00	PK	V	31.60	50.87	42.21	-	61.48	74.00	-12.52
12205.00	AV	V	31.60	50.87	42.21	-23.50	37.98	54.00	-16.02
4882.00	PK	H	35.10	38.54	60.90	-	64.34	74.00	-9.66
4882.00	AV	H	35.10	38.54	60.90	-23.50	40.84	54.00	-13.16
7323.00	PK	H	33.00	44.60	52.40	-	64.00	74.00	-10.00
7323.00	AV	H	33.00	44.60	52.40	-23.50	40.50	54.00	-13.50
9764.00	PK	H	32.70	49.30	40.86	-	57.46	74.00	-16.54
9764.00	AV	H	32.70	49.30	40.86	-23.50	33.96	54.00	-20.04

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1 GHz to 25 GHz. The data value listed above which is higher than the system noise floor.

EUT : C5630
 Test Unit : Handset
 Test Condition : Tx at high channel

Frequency (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Average Factor (dB)	Corrected Reading (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4942.00	PK	V	35.10	38.54	53.94		57.38	74.00	-16.62
4942.00	AV	V	35.10	38.54	53.94	-23.50	33.88	54.00	-20.12
7413.00	PK	V	33.00	44.60	49.54		61.14	74.00	-12.86
7413.00	AV	V	33.00	44.60	49.54	-23.50	37.64	54.00	-16.36
9884.00	PK	V	32.70	49.30	43.75		60.35	74.00	-13.65
9884.00	AV	V	32.70	49.30	43.75	-23.50	36.85	54.00	-17.15
12355.00	PK	V	31.60	50.87	38.83		58.10	74.00	-15.90
12355.00	AV	V	31.60	50.87	38.83	-23.50	34.60	54.00	-19.40
4942.00	PK	H	35.10	38.54	56.64		60.08	74.00	-13.92
4942.00	AV	H	35.10	38.54	56.64	-23.50	36.58	54.00	-17.42
7413.00	PK	H	33.00	44.60	49.57		61.17	74.00	-12.83
7413.00	AV	H	33.00	44.60	49.57	-23.50	37.67	54.00	-16.33
9884.00	PK	H	32.70	49.30	34.31		50.91	74.00	-23.09
9884.00	AV	H	32.70	49.30	34.31	-23.50	27.41	54.00	-26.59

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1 GHz to 25 GHz. The data value listed above which is higher than the system noise floor.

3.4.3 Measurement results: Fundamental emission

EUT : C5630
 Test Unit : Base Unit with stand
 Test Condition : Tx at low channel

Frequency (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Average Factor (dB)	Corrected Reading (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
2416.00	PK	H	32.86	68.73	-	101.59	113.98	-12.39
2416.00	AV	H	32.86	68.73	-23.5	78.09	93.98	-15.89

Remark:
 1. Correction Factor = Antenna Factor + Cable Loss
 2. Corrected Level = Reading + Correction Factor

EUT : C5630
 Test Unit : Base Unit with stand
 Test Condition : Tx at middle channel

Frequency (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Average Factor (dB)	Corrected Reading (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
2441.00	PK	H	32.95	66.93	-	99.88	113.98	-14.10
2441.00	AV	H	32.95	66.93	-23.5	76.38	93.98	-17.60

Remark:
 1. Correction Factor = Antenna Factor + Cable Loss
 2. Corrected Level = Reading + Correction Factor

EUT : C5630
 Test Unit : Base Unit with stand
 Test Condition : Tx at high channel

Frequency (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Average Factor (dB)	Corrected Reading (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
2471.00	PK	H	33.06	65.86	-	98.92	113.98	-15.06
2471.00	AV	H	33.06	65.86	-23.5	75.42	93.98	-18.56

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor

EUT : C5630
 Test Unit : Handset
 Test Condition : Tx at low channel

Frequency (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Average Factor (dB)	Corrected Reading (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
2416.00	PK	H	32.86	75.45	-	108.31	113.98	-5.67
2416.00	AV	H	32.86	75.45	-23.50	84.81	93.98	-9.17

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor

EUT : C5630
 Test Unit : Handset
 Test Condition : Tx at middle channel

Frequency (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Average Factor (dB)	Corrected Reading (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
2441.00	PK	H	32.95	71.28	-	104.23	113.98	-9.75
2441.00	AV	H	32.95	71.28	-23.50	80.73	93.98	-13.25

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor

EUT : C5630
 Test Unit : Handset
 Test Condition : Tx at high channel

Frequency (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Average Factor (dB)	Corrected Reading (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
2471.00	PK	H	33.06	67.59	-	100.65	113.98	-13.33
2471.00	AV	H	33.06	67.59	-23.50	77.15	93.98	-16.83

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor

4. Radiated emission on the band edge FCC 15.209

Method of Measurement:

Reference FCC document: KDB558074, ANSI C63.4

The frequency range from 30 MHz to 1000 MHz using Bilog Antenna.
 The frequency range over 1 GHz using Horn Antenna.

Radiated emissions were investigated cover the frequency range from 30 MHz to 1000 MHz using a receiver RBW of 120 kHz record QP reading, and the frequency over 1 GHz using a spectrum analyzer RBW of 1 MHz and 10 Hz VBW record Average reading. (15.209 paragraph), the Peak reading (1 MHz RBW/VBW) recorded also on the report.

Test Unit : Base Unit with stand

Channel	Measurement Freq.Band (MHz)	Detector	Average Factor (dB)	The Max. Field Strength in Restrict Band (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
0 (lowest)	2310-2390	PK	-	60.87	74	-13.13
0 (lowest)	2310-2390	AV	-23.5	37.37	54	-16.63
11 (highest)	2483.5-2500	PK	-	64.72	74	-9.28
11 (highest)	2483.5-2500	AV	-23.5	41.22	54	-12.78

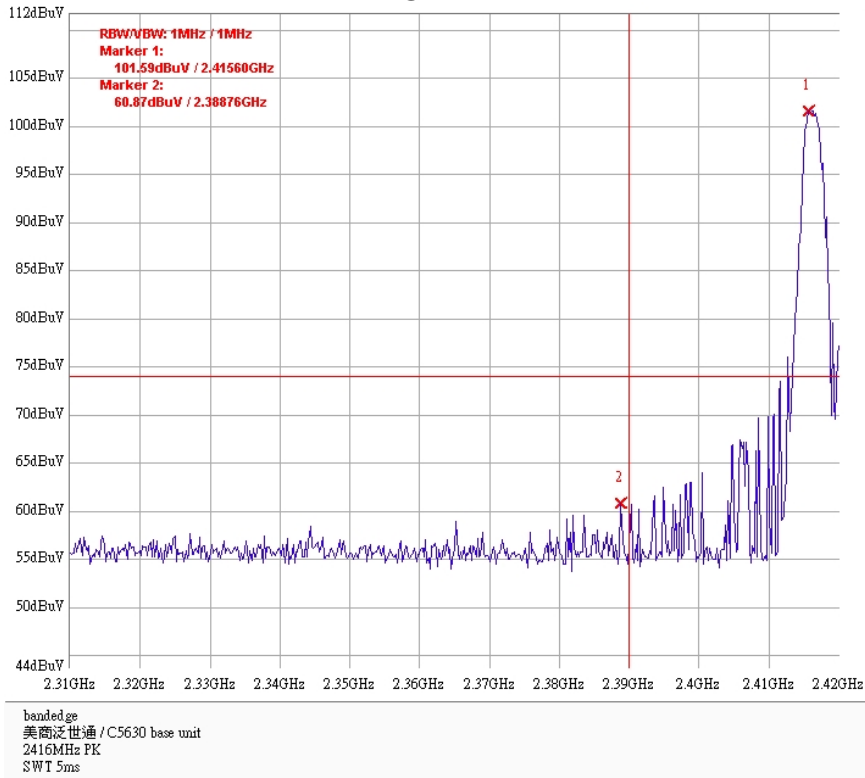
Test Unit : Handset

Channel	Measurement Freq.Band (MHz)	Detector	Average Factor (dB)	The Max. Field Strength in Restrict Band (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
0 (lowest)	2310-2390	PK	-	66.82	74	-7.18
0 (lowest)	2310-2390	AV	-23.5	43.32	54	-10.68
11 (highest)	2483.5-2500	PK	-	64.24	74	-9.76
11 (highest)	2483.5-2500	AV	-23.5	40.74	54	-13.26

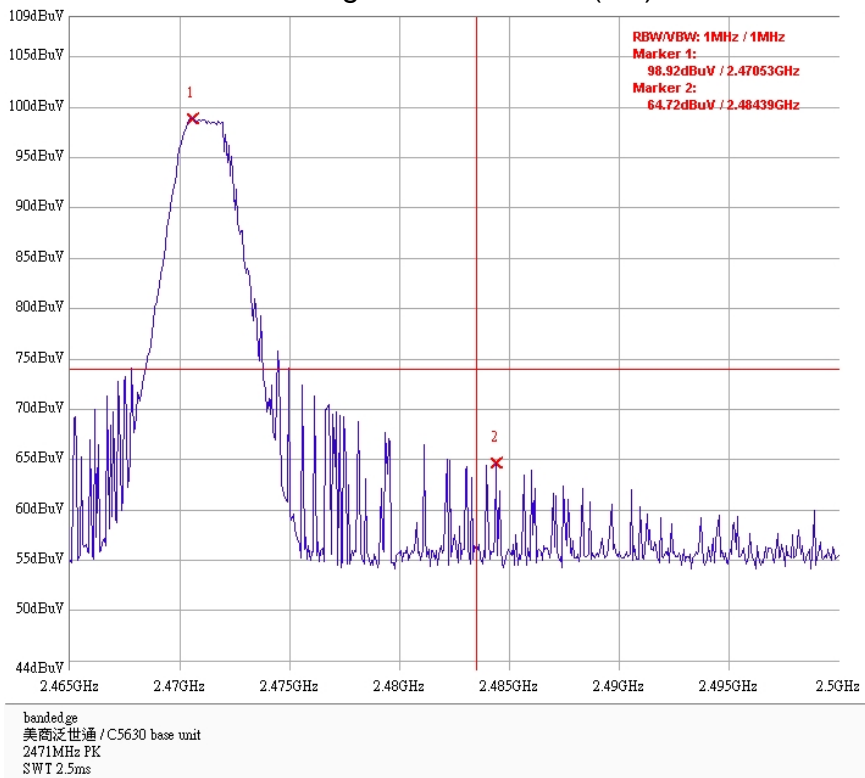
Please see the plots below.

Test Unit : Base Unit with stand

Band Edge @ channel 0 (PK)

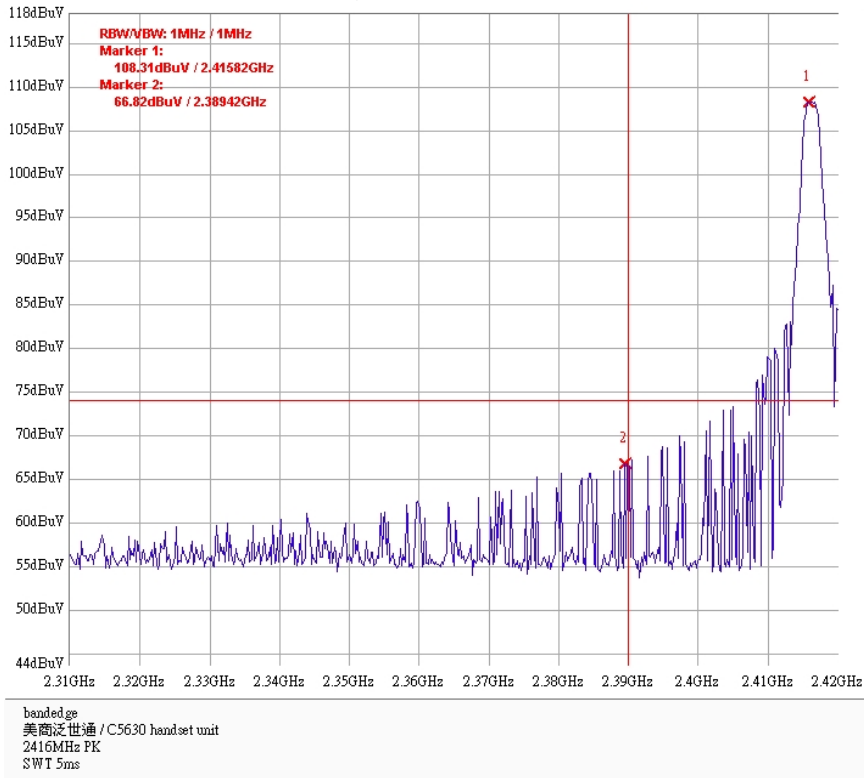


Band Edge @ channel 11 (PK)

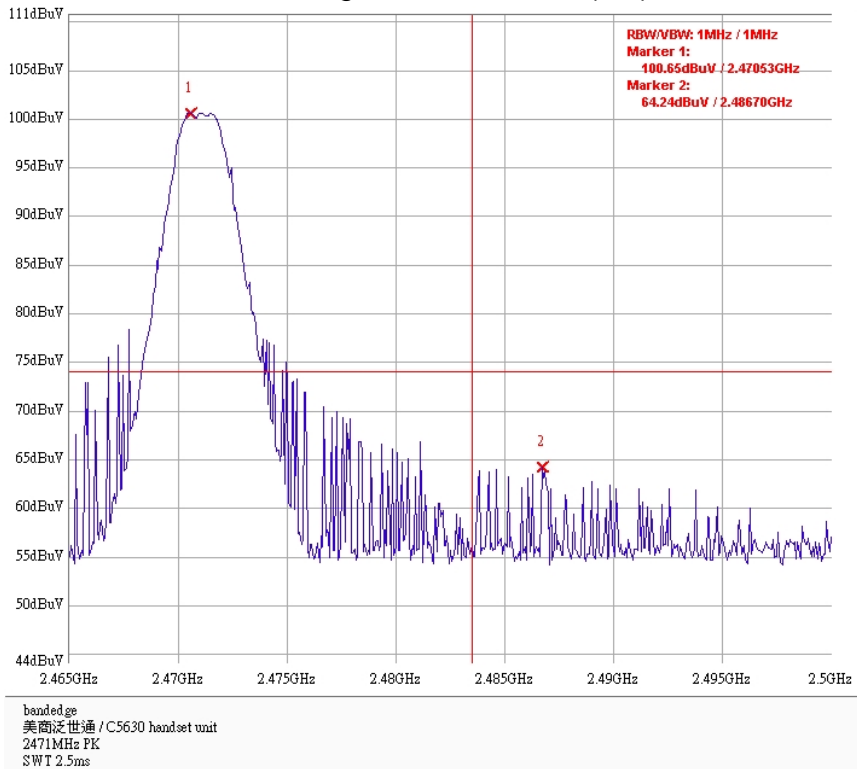


Test Unit : Handset

Band Edge @ channel 0 (PK)



Band Edge @ channel 11 (PK)

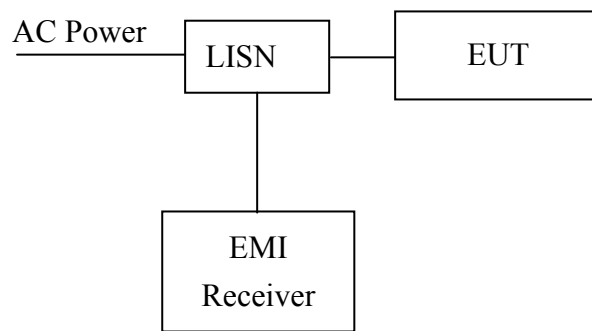


5. Conducted emission test FCC 15.207

5.1 Operating environment

Temperature: 22 °C
 Relative Humidity: 53 %
 Atmospheric Pressure 1023 hPa

5.2 Test setup & procedure



The EUT are connected to the main power through a line impedance stabilization network (LISN). This provides a 50 ohm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination.

Both sides (Line and Neutral) of AC line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4/1992 on conducted measurement.

The bandwidth of the field strength meter (R & S Test Receiver ESCS 30) is set at 9kHz.

The EUT configuration please refer to the “Conducted set-up photo.pdf”.

5.3 Emission limit

Freq. (MHz)	Conducted Limit (dBuV)	
	Q.P.	Ave.
0.15~0.50	66 – 56*	56 – 46*
0.50~5.00	56	46
5.00~30.0	60	50

*Decreases with the logarithm of the frequency.



5.4 Uncertainty of Conducted Emission

Expanded uncertainty (k=2) of conducted emission measurement is ± 3.786 dB.

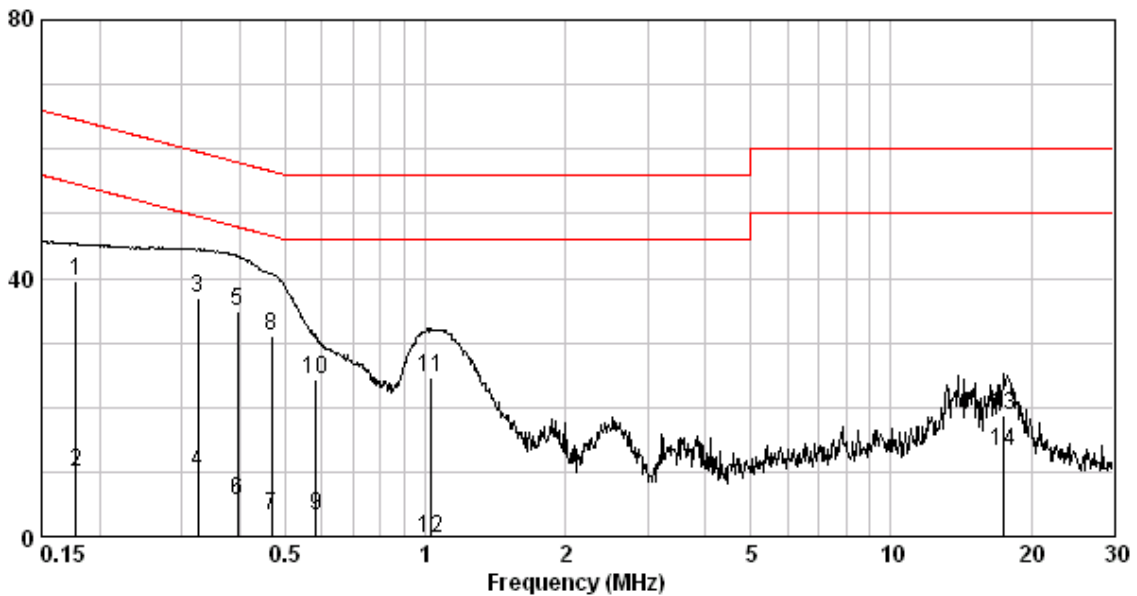
5.5 Conducted emission data FCC 15.207

Phase: Line
 Model No.: C5630
 Test Condition: Standby mode

Frequency (MHz)	Corr. Factor (dB)	Level Qp (dBuV)	Limit Qp (dBuV)	Level Rv (dBuV)	Limit Rv (dBuV)	Margin (dB)	
						Qp	Rv
0.178	0.18	39.47	64.59	10.07	54.59	-25.12	-44.52
0.325	0.19	36.97	59.57	10.01	49.57	-22.61	-39.57
0.396	0.19	34.89	57.95	5.45	47.95	-23.06	-42.50
0.469	0.19	30.97	56.54	3.17	46.54	-25.57	-43.37
0.582	0.19	24.28	56.00	3.19	46.00	-31.72	-42.81
1.027	0.20	24.53	56.00	-0.34	46.00	-31.47	-46.34
17.383	1.66	18.75	60.00	13.05	50.00	-41.25	-36.95

Remark:

1. Correction Factor (dB)= LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Level (dBuV) – Limit (dBuV)

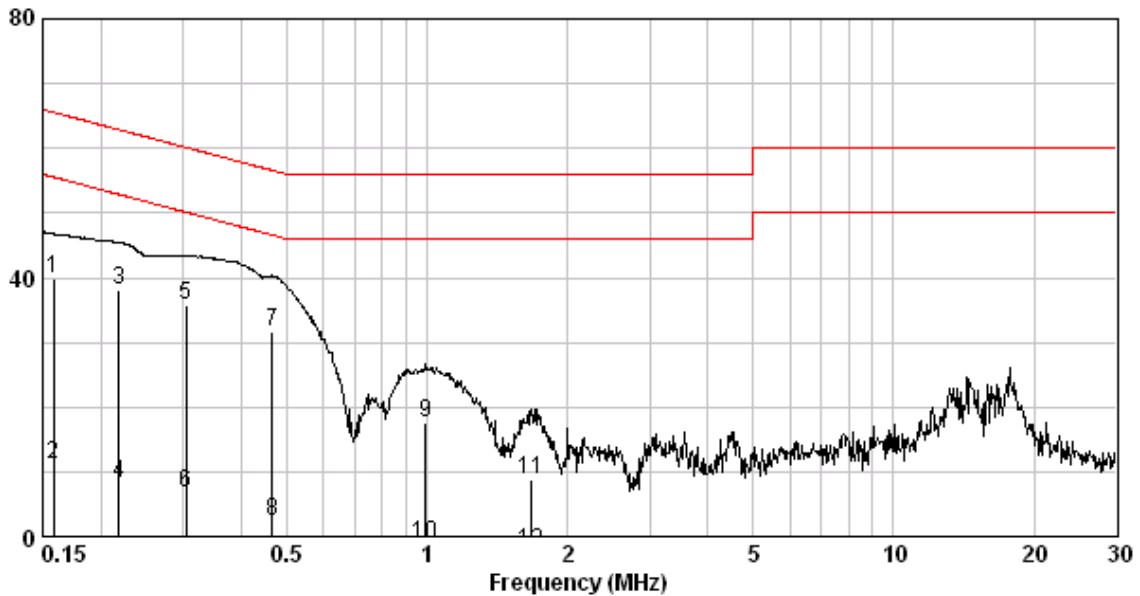


Phase: Neutral
 Model No.: C5630
 Test Condition: Standby mode

Frequency (MHz)	Corr. Factor (dB)	Level Qp (dBuV)	Limit Qp (dBuV)	Level Av (dBuV)	Limit Av (dBuV)	Margin (dB)	
						Qp	Av
0.158	0.27	39.81	65.56	11.18	55.56	-25.75	-44.38
0.219	0.27	38.05	62.88	8.24	52.88	-24.82	-44.63
0.305	0.28	35.81	60.10	6.63	50.10	-24.30	-43.48
0.466	0.28	31.52	56.58	2.39	46.58	-25.06	-44.19
0.994	0.29	17.46	56.00	-1.19	46.00	-38.54	-47.19
1.671	0.38	8.71	56.00	-2.30	46.00	-47.29	-48.30

Remark:

1. Correction Factor (dB)= LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Level (dBuV) – Limit (dBuV)



6. Calculation of Average Factor

The specification for output field strengths in accordance with the FCC rules specify measurements with an average detector. During testing, a spectrum analyzer incorporating a peak detector was used. Therefore, a reduction factor can be applied to the resultant peak signal level and compared to the limit for measurement instrumentation incorporating an average detector.

The time period over which the duty cycle is measured in 100 ms or the repetition cycle, whichever is a shorter time frame. The duty cycle is measured by placing the spectrum analyzer in zero span mode at 100 resolution bandwidth.

The duty cycles of handset and base unit are exactly the same.

Duty cycle correction factor in dB = $20\log(\text{on-time}/100\text{ms})$

The duty cycle is simply the on-time divided by the period:

The number of pulses in each period (19) multiplied by the duration of each pulses (0.352ms) = 6.688ms

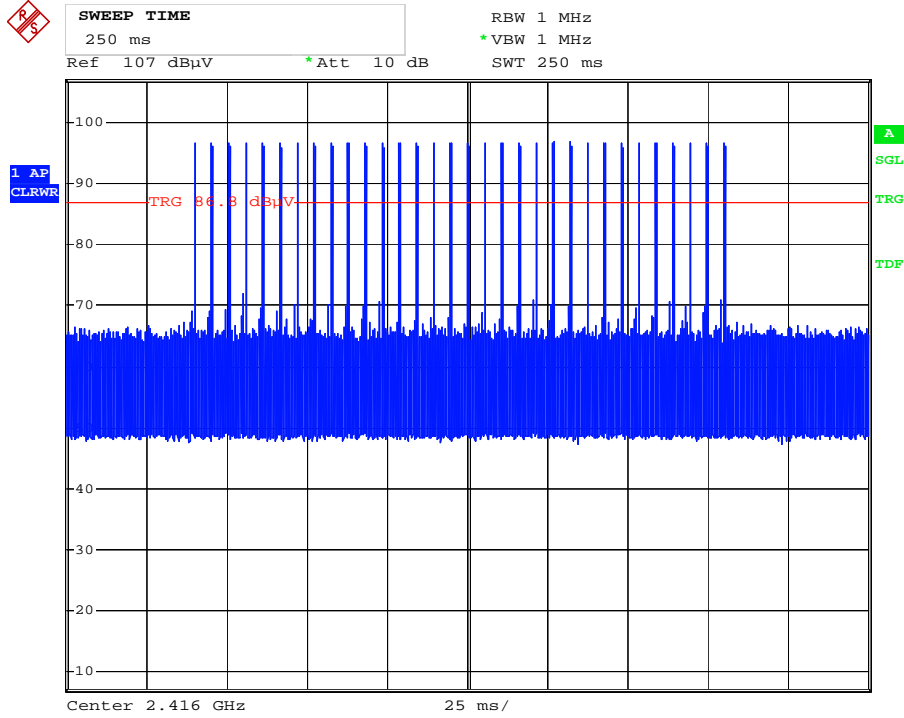
Duty Cycle = $6.688\text{ms} / 100\text{ms} = 0.06688$

Therefore, the duty cycle correction factor will be $20 \log_{10}(0.0668) = -23.5 \text{ dB}$

Please see the plot below.

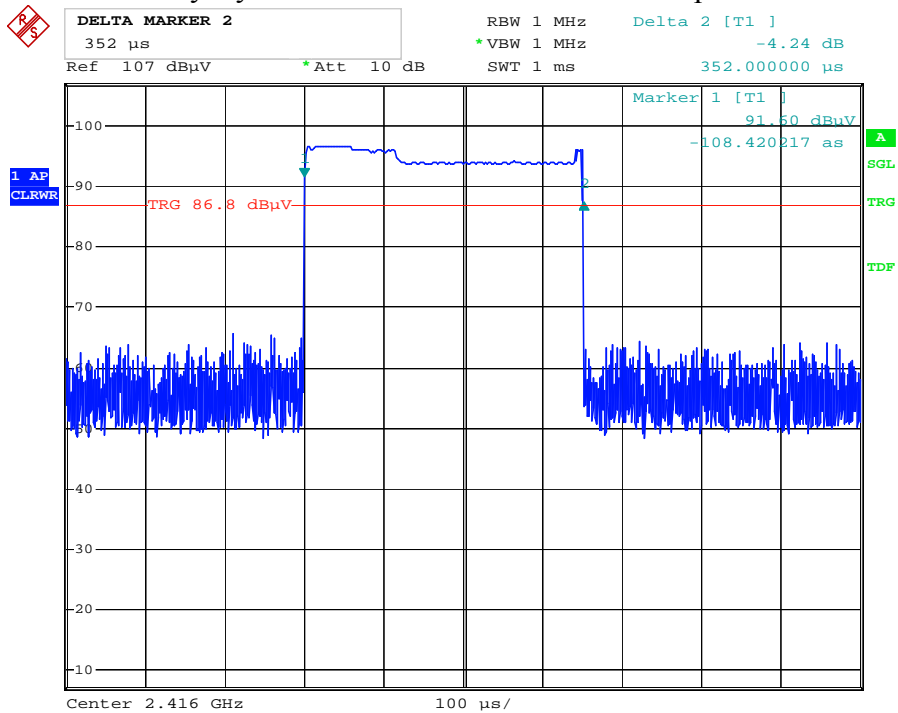
Test Unit : Base Unit with stand

Duty Cycle at low channel: number of pulse



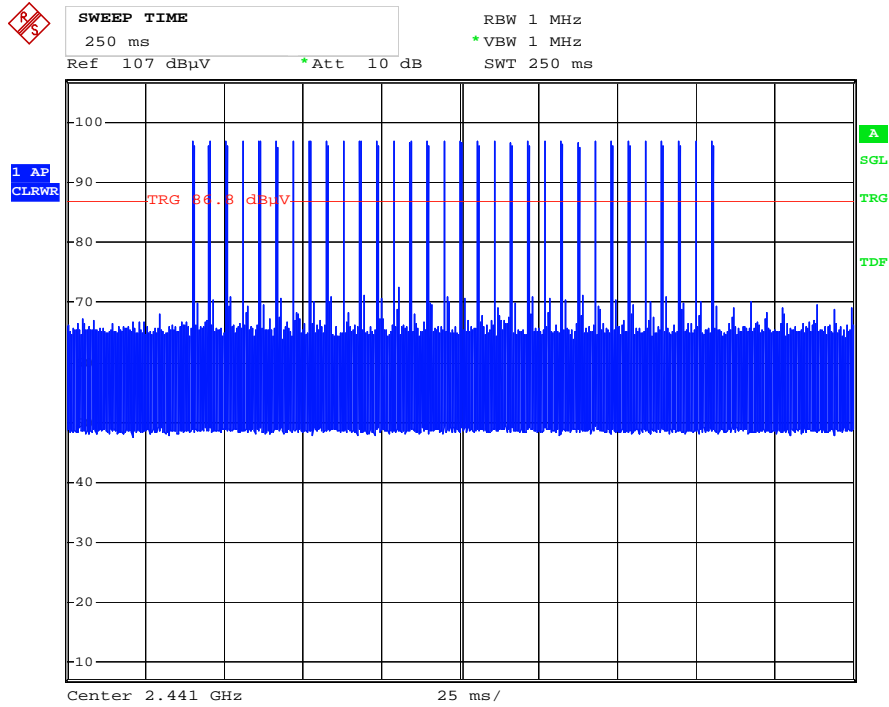
Date: 3.MAR.2010 11:56:08

Duty Cycle at low channel: on time of one pulse



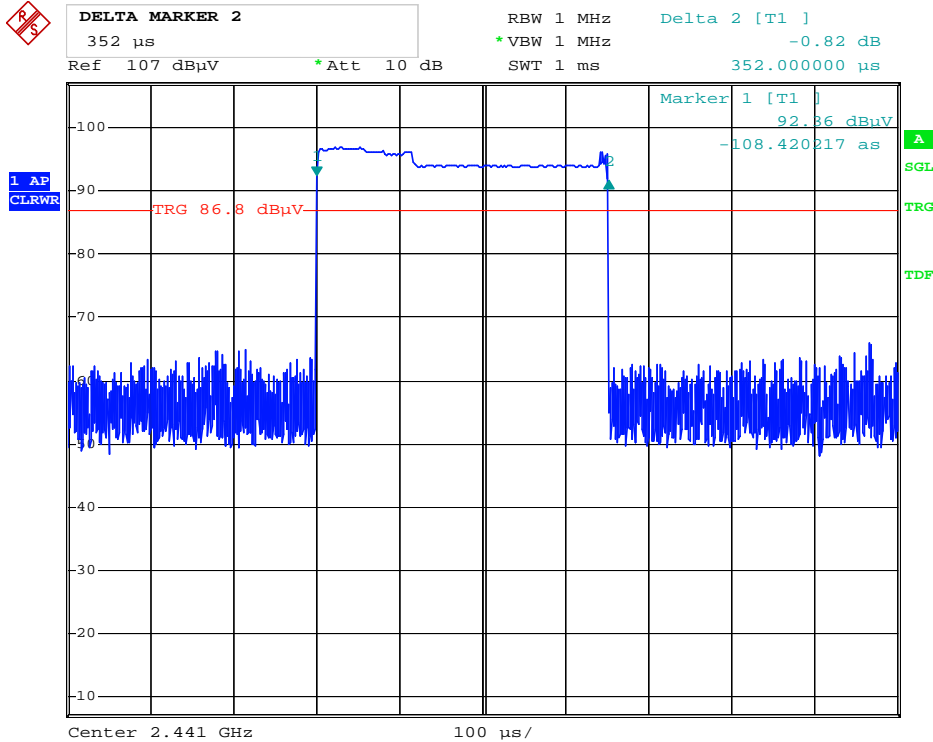
Date: 3.MAR.2010 11:59:45

Duty Cycle at middle channel: number of pulse



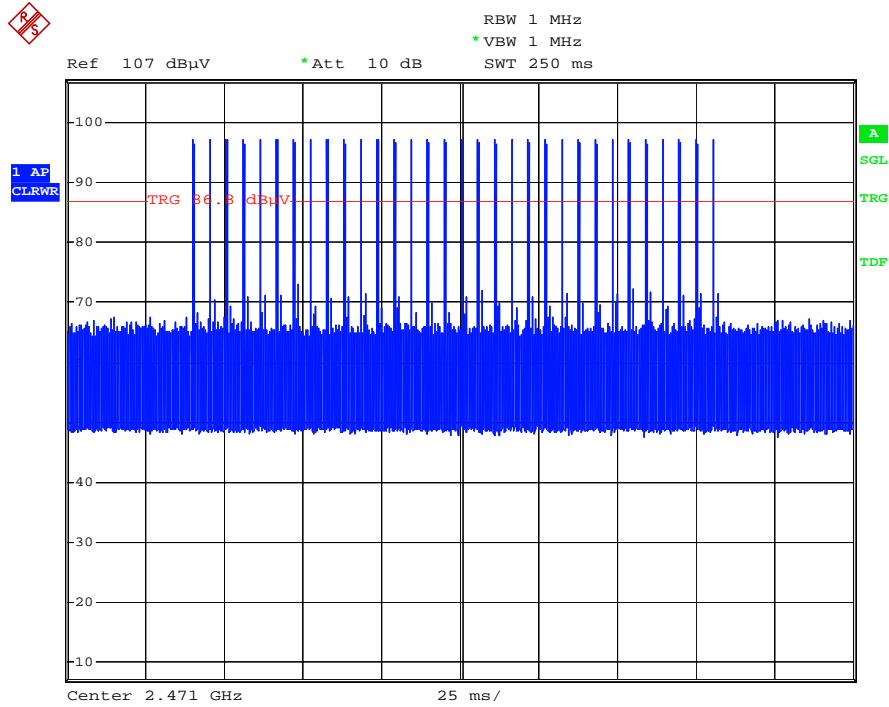
Date: 3.MAR.2010 12:02:36

Duty Cycle at middle channel: on time of one pulse



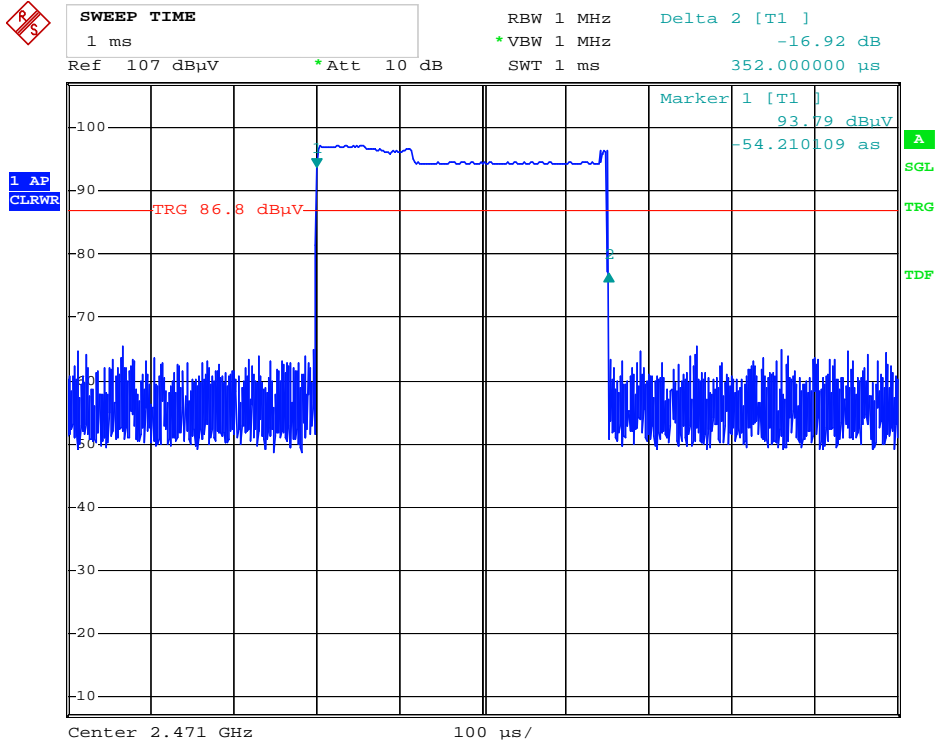
Date: 3.MAR.2010 12:01:17

Duty Cycle at high channel: number of pulse



Date: 3.MAR.2010 12:05:22

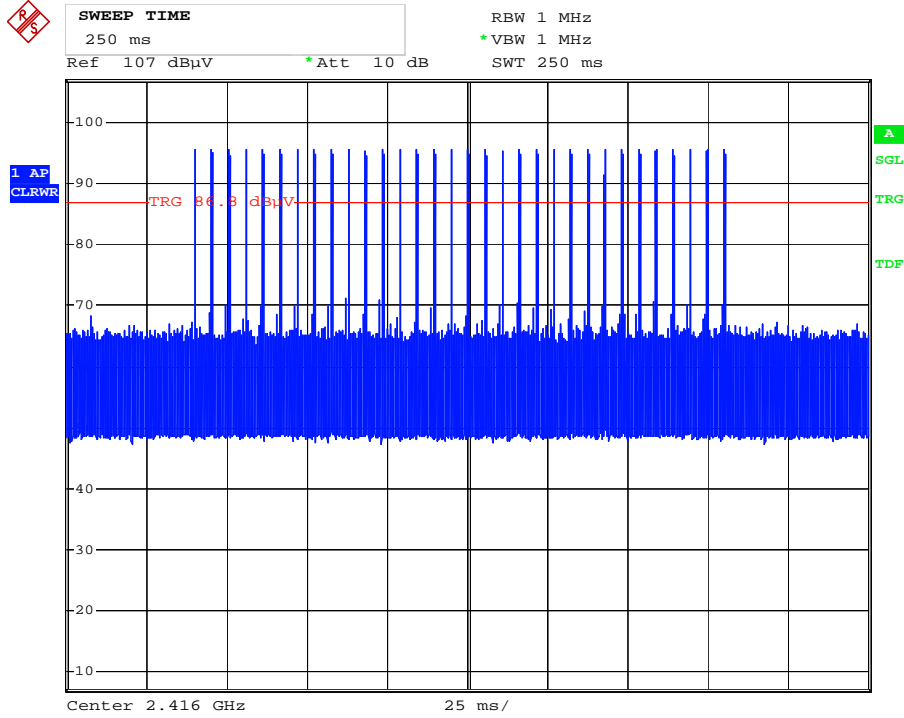
Duty Cycle at high channel: on time of one pulse



Date: 3.MAR.2010 12:08:34

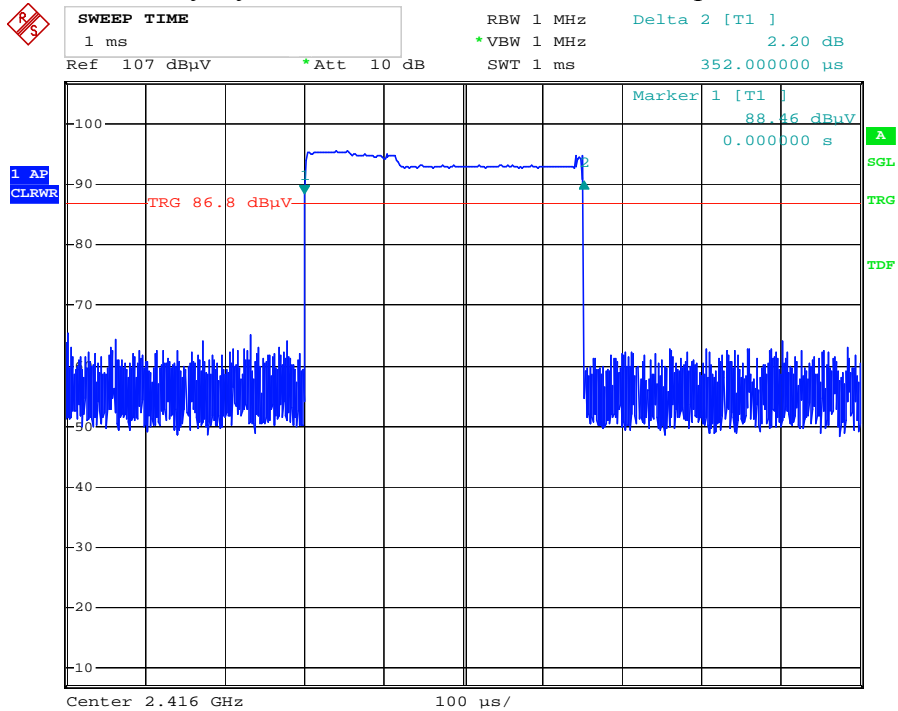
Test Unit : Handset

Duty Cycle at low channel: number of pulse



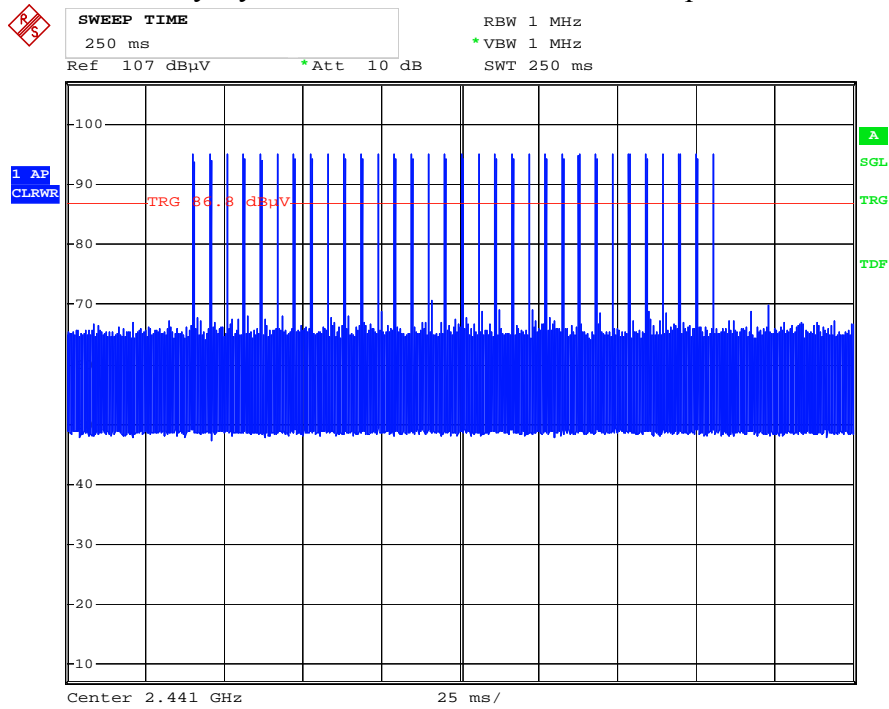
Date: 3.MAR.2010 12:21:13

Duty Cycle at low channel: on time of one pulse



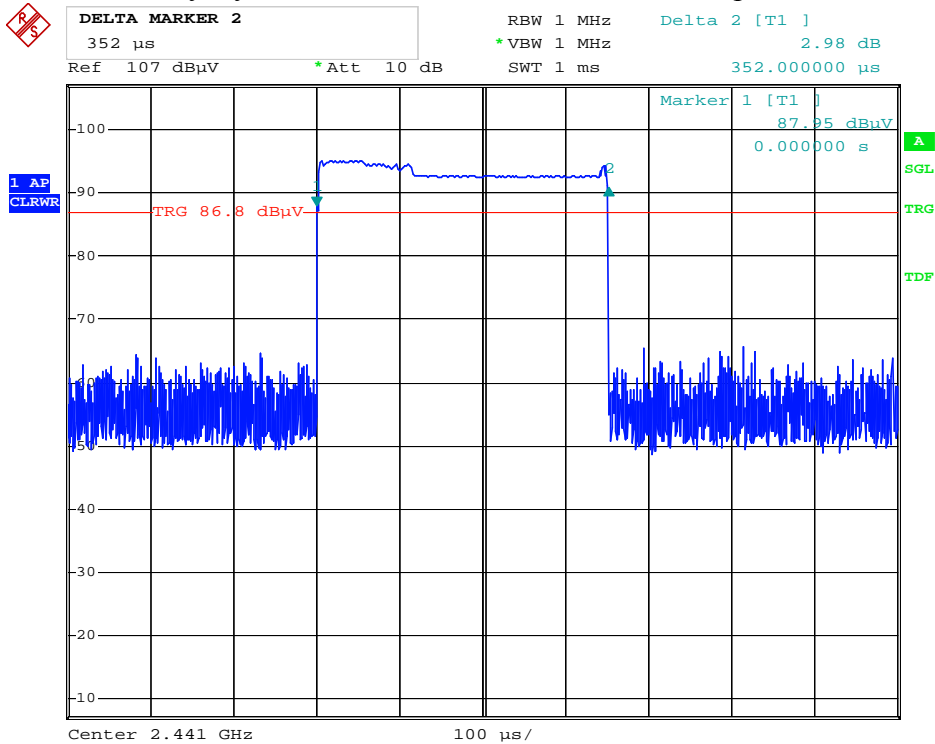
Date: 3.MAR.2010 12:20:00

Duty Cycle at middle channel: number of pulse



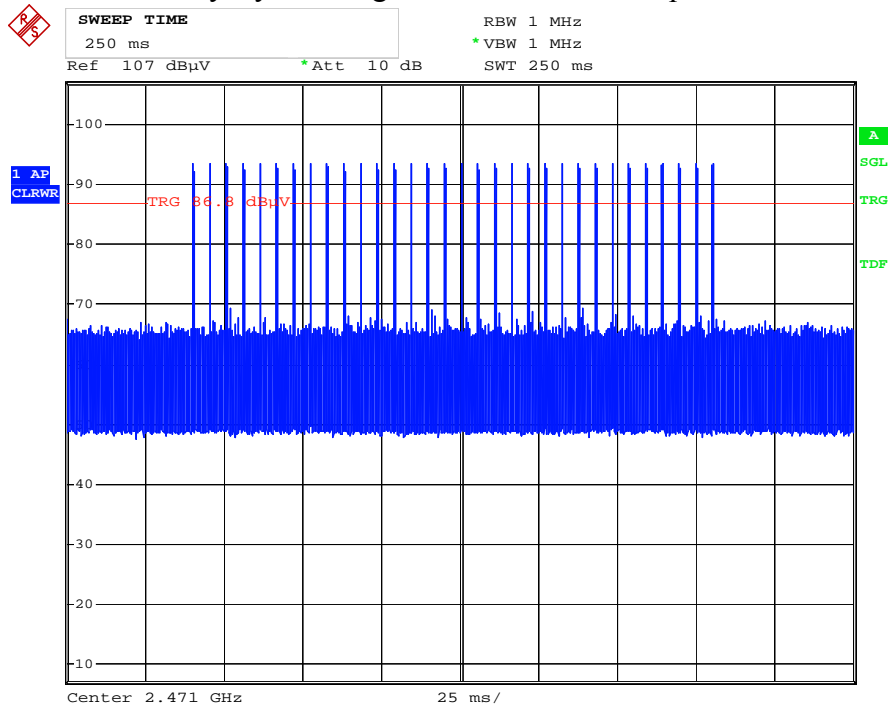
Date: 3.MAR.2010 12:21:54

Duty Cycle at middle channel: on time of one pulse



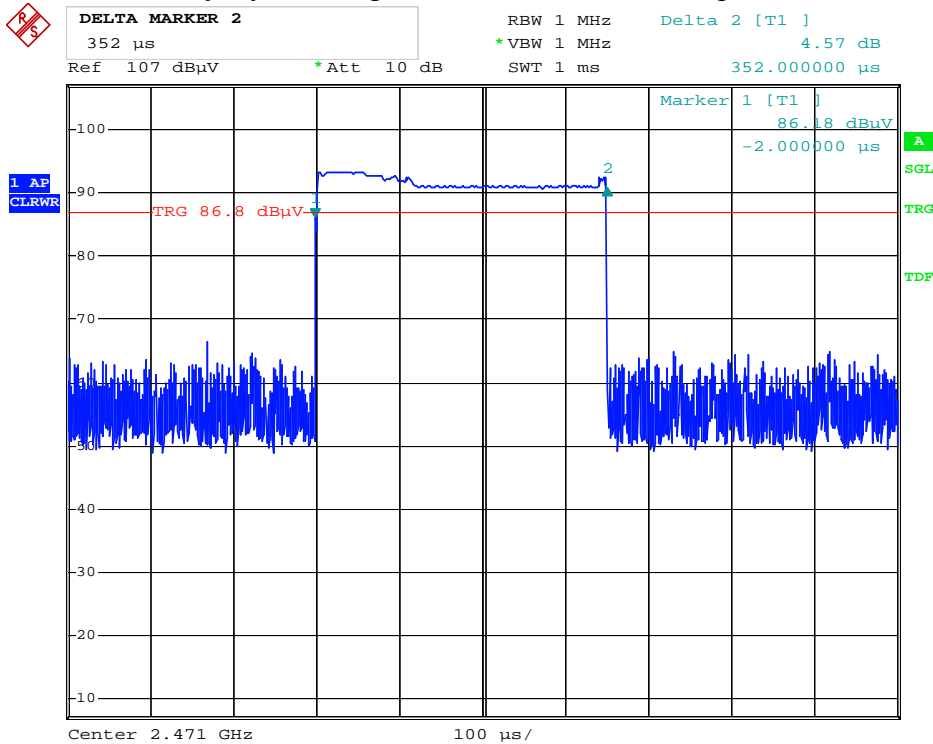
Date: 3.MAR.2010 12:19:34

Duty Cycle at high channel: number of pulse



Date: 3.MAR.2010 12:16:48

Duty Cycle at high channel: on time of one pulse



Date: 3.MAR.2010 12:19:01