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Dates of Tests: June 14~21, 2010  
 Test Report S/N: LR500191006B  
 Test Site : LTA CO., LTD.

## CERTIFICATION OF COMPLIANCE

FCC ID.

YBICOMPACTPLUS

APPLICANT

SmartPayTech INC.

**Classification** : Licensed Portable Transmitter Worn on body (PCT)  
**Manufacturing Description** : Industrial PDA  
**Manufacturer** : SmartPayTech INC.  
**Model name** : SmartCompact Plus  
**Test Device Serial No.:** : Identical prototype  
**FCC Rule Part(s)** : §24(E), §22(H), §2  
**TX Frequency Range** : 824.2 ~ 848.8 MHz (GSM850) / 1850.2 ~ 1909.8 MHz (PCS1900)  
**RX Frequency Range** : 869.2 ~ 893.8 MHz (GSM850) / 1930.2 ~ 1989.8 MHz (PCS1900)  
**Max. RF Output Power** : 1.26 W ERP GSM850 (31.02dBm)  
                                   0.77 W EIRP PCS1900 (28.86dBm)  
**Emission Designators:** : 245KGXD(GSM850) / 245KGXD(PCS1900)  
**Data of issue** : June 21, 2010

This test report is issued under the authority of:

Kyung-Taek LEE, Technical Manager

The test was supervised by:

Hyun-Chae You, Test Engineer

This test result only responds to the tested sample. It is not allowed to copy this report even partly without the allowance of the test laboratory. This report must not be used by the applicant to claim product endorsement by any agency.

NVLAP LAB Code.: 200723-0

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## 1. General information's

### **1-1 Test Performed**

Company name : LTA Co., Ltd.  
 Address : 243, Jubug-ri, Yangji-Myeon, Youngin-Si, Kyunggi-Do, Korea. 449-822  
 Web site : <http://www.ltalab.com>  
 E-mail : [chahn@ltalab.com](mailto:chahn@ltalab.com)  
 Telephone : +82-31-323-6008  
 Facsimile : +82-31-323-6010

Quality control in the testing laboratory is implemented as per ISO/IEC 17025 which is the “General requirements for the competents of calibration and testing laboratory”.

### **1-2 Accredited agencies**

LTA Co., Ltd. is approved to perform EMC testing by the following agencies:

Agency	Country	Accreditation No.	Validity	Reference
NVLAP	U.S.A	200723-0	2010-09-30	ECT accredited Lab.
RRL	KOREA	KR0049	2011-06-20	EMC accredited Lab.
FCC	U.S.A	610755	2011-04-22	FCC filing
VCCI	JAPAN	R2133, C2307	2011-06-21	VCCI registration
IC	CANADA	IC5799	2012-05-14	IC filing

## 2. Information's about test item

### 2-1 Client & Manufacturer

Company name : SmartPayTech INC.  
 Address : 496 Woncheon-dong youngtongu Suwon, kyung ki-do, 442-824, Korea  
 Tel / Fax : Tel. : +82. 31. 211.5596~7/ Fax : 82. 31.217. 8254

### 2-2 Equipment Under Test (EUT)

Classification : Industrial PDA  
 Model name : SmartCompact Plus  
 Serial number : Identification  
 Date of receipt : June 11, 2010  
 EUT condition : Pre-production, not damaged  
 Antenna type / Gain : Dipole antenna (Peak Gain: 0.3dBi)  
 Tx Frequency Range : 824.2 ~ 848.8 MHz (GSM850) / 1850.2 ~ 1909.8 MHz (PCS1900)  
 Rx Frequency Range : 869.2 ~ 893.8 MHz (GSM850) / 1930.2 ~ 1989.8 MHz (PCS1900)  
 RF output power Range : 1.26 W ERP GSM850 (31.02dBm)  
                           0.77 W EIRP PCS1900 (28.86dBm)  
 Frequency Tolerance :  $\pm 0.00025\%$  (2.5ppm)  
 Modulation(s) : GMSK  
 Emission Designators : 245KGXD(GSM850) / 245KGXD(PCS1900)  
 Power Source : Battery Pack: 3.7V (Polymer Lithium Ion Battery )

### 2-3 Tested frequency

	GSM 850		PCS 1900	
	Channel	Frequency (MHz)	Channel	Frequency (MHz)
LOW	128	824.2	512	1850.2
MID	190	836.6	661	1880.0
HIGH	251	848.8	810	1909.8

### 2-4 Ancillary Equipment

Equipment	Model No.	Serial No.	Manufacturer
PC	HP Compaq dx7400	CNG8330J95	HP
MONITOR	HPL1710	CNC816QHF2	HP
Keyboard	SK-8115	68A-04Q6	DELL
Mouse	MO56UOA	F0J00NOL	DELL
PRINTER	STYLUS C65	N/A	EPSON
EARPHONE	N/A	N/A	N/A

### 3. Test Report

#### 3.1 Summary of tests

Parameter	Status
<b>Transmitter Requirements</b>	
Output Power	C
Occupied Bandwidth	C
Field Strength of Spurious Radiation	C
AC Conducted Emissions	C
Spurious Radiation at Antenna Terminal	C
Frequency Stability	C

Note 1: C=Complies    NC=Not Complies    NT=Not Tested    NA=Not Applicable

Note 2: The data in this test report are traceable to the national or international standards.

#### A sample calculation:

COR. F (correction factor)= Antenna factor + Cable loss- Amp.gain- Distance correction

Emission Level= meter reading + COR.F

#### Emission Designator: - GSM850

EMISSION Designator = 245KGXD

GPRS BW = 245KHz

G = Phase Modulation

X = Cases not otherwise covered

D = Data

#### Emission Designator: - PCS1900

EMISSION Designator = 245KGXD

GPRS BW = 245KHz

G = Phase Modulation

X = Cases not otherwise covered

D = Data

### **3.2 DESCRIPTION OF TESTS**

#### **3.2.1 Effective Radiated Power Output**

##### **Effective Radiated Power Output Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:**

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For GSM signals, an average detector is used, with RBW=VBW=3MHz, SPAN=10MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the dipole is measured. The ERP is recorded.

#### **3.2.2 Radiation Spurious and Harmonic Emissions**

##### **Effective Radiated Power Output Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:**

Radiation and harmonic emissions are measured outdoors at our 3-meter test range. The equipment under test is placed on a wooden turntable 3-meters from the receive antenna.

The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer. The Spectrum was investigated from 30MHz to the 10<sup>th</sup> Harmonic of the fundamental. A peak detector is used. With RBW=VBW=1MHz. The value that we could measure was only reported. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive spectrum analyzer reading. This level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

### **3.2.3 Occupied Bandwidth**

The 99% power bandwidth was measured with a calibrated spectrum analyzer.

### **3.2.4 Spurious Emission at Antenna Terminal**

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to 10 GHz.

### **3.2.5 Occupied Bandwidth Emission Limits**

- (a) On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB.
- (b) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges, both upper and lower, as the design permits.

The measurement of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power.

### 3.2.6 Frequency Stability/Temperature Variation

The frequency stability of the transmitter is measured by:

- a) **Temperature** :The temperature is varied from -30°C to + 60°C using an environmental chamber.
- b) **Primary Supply Voltage** :The primary supply voltage is varied from 85% to 115% of the voltage Normally at the input to the device or at the power supply terminals if cables are not normally supplied.

Specification –The minimum frequency stability shall be +/- 0.00025% at any time during normal operation.

Specification — The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within  $\pm 0.00025$ ( $\pm 2.5\text{ppm}$ ) of the center frequency.

#### Time Period and Procedure:

1. The carrier frequency of the transmitter and the individual oscillators is measured at room temperature (25°C to 27 °C to provide a reference)
2. The equipment is subjected to an overnight “soak” at -30°C without any power applied.
3. After the overnight ”soak” at -30°C(usually 14-16 hours),the equipment is turned on in a “standby” condition for one minute before applying power to the transmitter. Measurement of the carrier frequency to the transmitter and the individual oscillators is made within a three minute interval after applying power to the transmitter.
4. Frequency measurements is made at 10°C interval up to room temperature. At least a period of one and one half hour is provided to allow stabilization of the equipment at each temperature level.
5. Again the transmitter carrier frequency and the individual oscillators is measured at room temperature to begin measurement of the upper temperature levels.
6. Frequency were made at 10intervals starting at -30°C up to +60°C allowing at least two hours at each temperature for stabilization. In all measurements the frequency is measured within three minutes after applying power to the transmitter.
7. The artificial load is mounted external to the temperature chamber.

### **3.3 DESCRIPTION OF TESTS**

#### **3.3.1 Output Power**

##### **Measurement Procedure:**

- During the process of testing, the EUT was controlled via Radio Communication tester to ensure max. Power transmission and proper modulation.
- Power output was measured at the RF output terminals when the transmitter is adjusted in accordance with Communication tester (or the tune-up procedure).

##### **Measurement Data:**

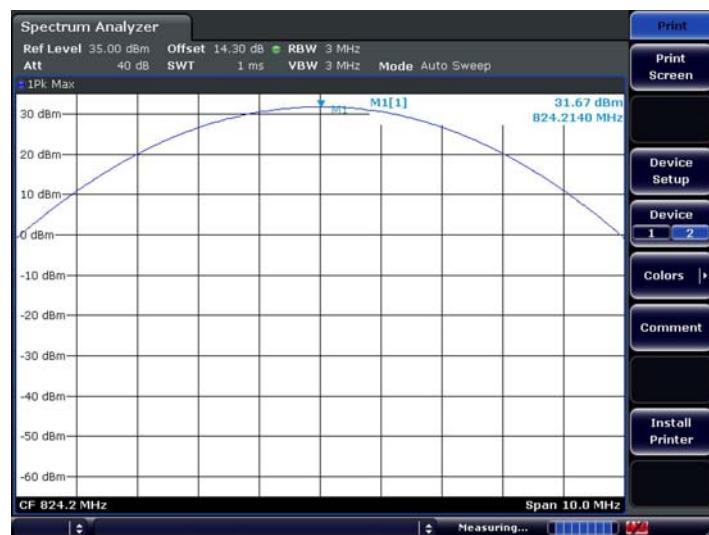
**GSM850**

Channel	Frequency (MHz)	TEST CONDITIONS (dBm)			
		1 Time Slot		2 Time Slot	
		Peak	AV	Peak	AV
128	824.2	<b>31.66</b>	<b>31.63</b>	<b>31.67</b>	<b>31.63</b>
190	836.6	<b>32.13</b>	<b>32.10</b>	<b>32.14</b>	<b>32.11</b>
251	848.8	<b>32.03</b>	<b>31.99</b>	<b>32.05</b>	<b>32.01</b>

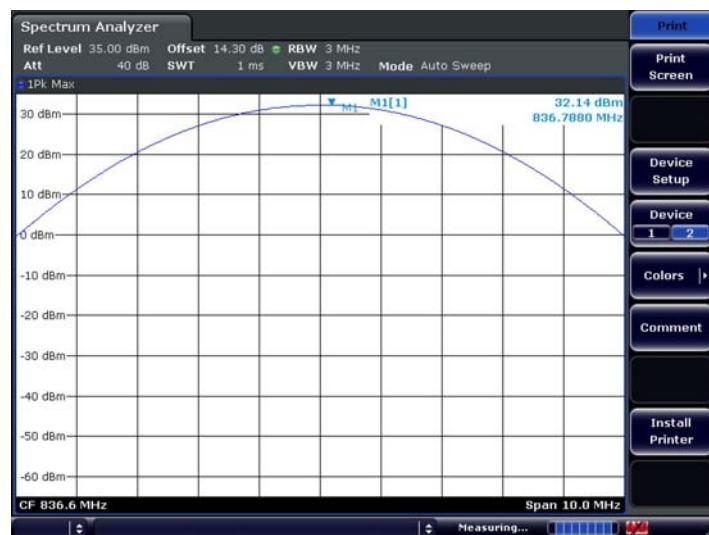
**PCS1900**

Channel	Frequency (MHz)	TEST CONDITIONS (dBm)			
		1 Time Slot		2 Time Slot	
		Peak	AV	Peak	AV
512	1850.2	<b>28.06</b>	<b>28.03</b>	<b>28.07</b>	<b>28.04</b>
661	1880.0	<b>28.03</b>	<b>28.01</b>	<b>28.04</b>	<b>28.01</b>
810	1909.8	<b>28.45</b>	<b>28.42</b>	<b>28.46</b>	<b>28.44</b>

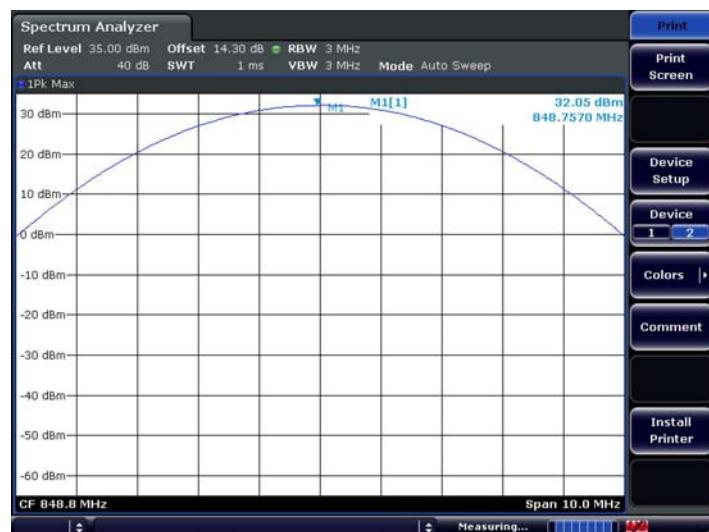
## POWER OUT. GSM850 Ch.128



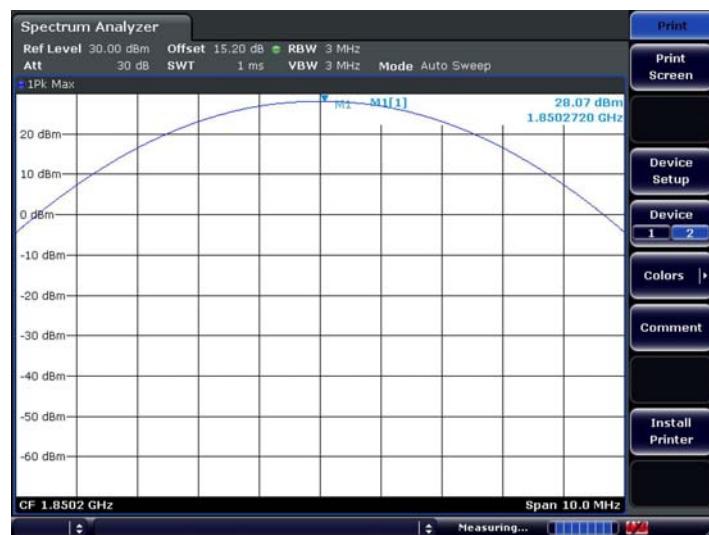
## POWER OUT. GSM850 Ch.190



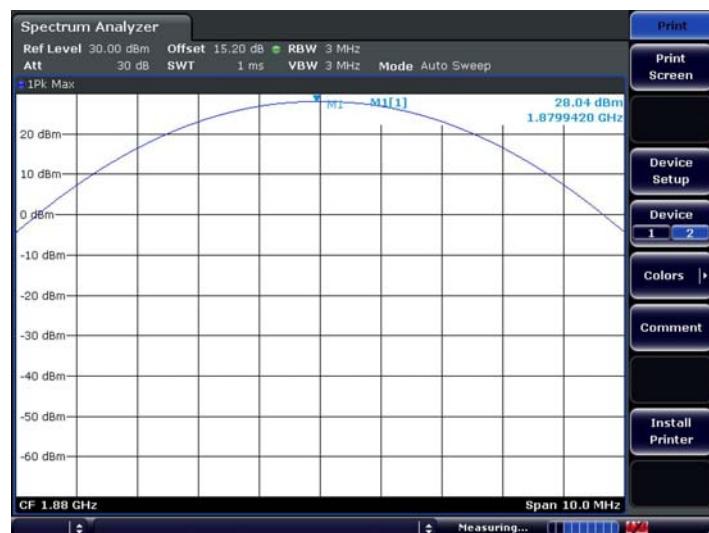
## POWER OUT. GSM850 Ch.251



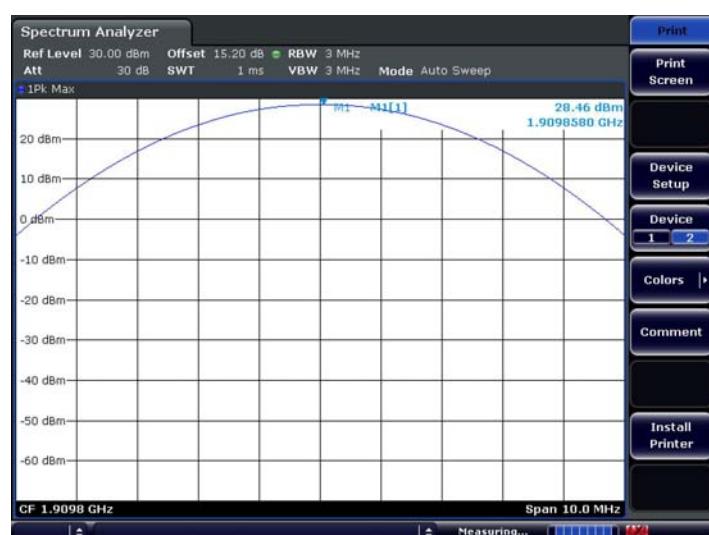
## POWER OUT. PCS1900 Ch.512



## POWER OUT. PCS1900 Ch.661



## POWER OUT. PCS1900 Ch.810



**Effective Radiated Power Output (GSM850)****Measurement Data:****GSM850**

Channel	Frequency (MHz)	TEST CONDITIONS				
		Ref. level (dBm)	Pol. (H/V)	CORR. FACTOR (dB)	ERP (dBm)	ERP (W)
128	824.2	25.18	H	5.1	30.28	1.07
190	836.6	25.92	H	5.1	31.02	1.26
251	848.8	25.73	H	5.1	30.83	1.21

*Note 1:* Radiated measurements at 3 meters by Substitution Method.

*Note 2:* CORR.FACTOR = Antenna+ Cable- Amp. Gain

**Equivalent Isotropic Radiated Power (PCS1900)****Measurement Data:****PCS1900**

Channel	Frequency (MHz)	TEST CONDITIONS				
		Ref. level (dBm)	Pol. (H/V)	CORR. FACTOR (dB)	EIRP (dBm)	EIRP (W)
512	1850.2	19.76	H	9.1	28.86	0.77
661	1880.0	17.25	H	9.1	26.35	0.43
810	1909.8	17.75	H	9.1	26.85	0.48

*Note 1:* Radiated measurements at 3 meters by Substitution Method.

*Note 2:* CORR.FACTOR = Antenna+ Cable- Amp. Gain

### 3.3.2 Field Strength of Harmonics

#### Procedure:

The EUT was placed on a 0.8m high wooden table inside a shielded enclosure. An antenna was placed near the EUT and measurements of frequencies and amplitudes of field strengths were recorded for reference during final measurements. For final radiated testing, measurements were performed in OATS. Measurements were performed with the EUT oriented in 3 orthogonal axis and rotated 360 degrees to determine worst-case orientation for maximum emissions.

The spectrum analyzer is set to:

Center frequency = the worst channel

Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic.

RBW = 100 kHz ( 30MHz ~ 1 GHz)

= 1 MHz (1 GHz ~ 10<sup>th</sup> harmonic )

Span = 100 MHz

Trace = max hold

Peak mode: VBW = 1 MHz

Average mode: VBW = 10Hz

Detector function = Peak & average

Sweep = auto

#### Measurement Data:

→ Refer to the Next page

#### Minimum Standard: FCC Part 15.209(a)

Frequency (MHz)	Limit (uV/m) @ 3m
30 ~ 88	100 **
88 ~ 216	150 **
216 ~ 960	200 **
Above 960	500

\*\* Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88MHz, 174-216MHz or 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

Radiated Emissions – PC+CAM+SCAN

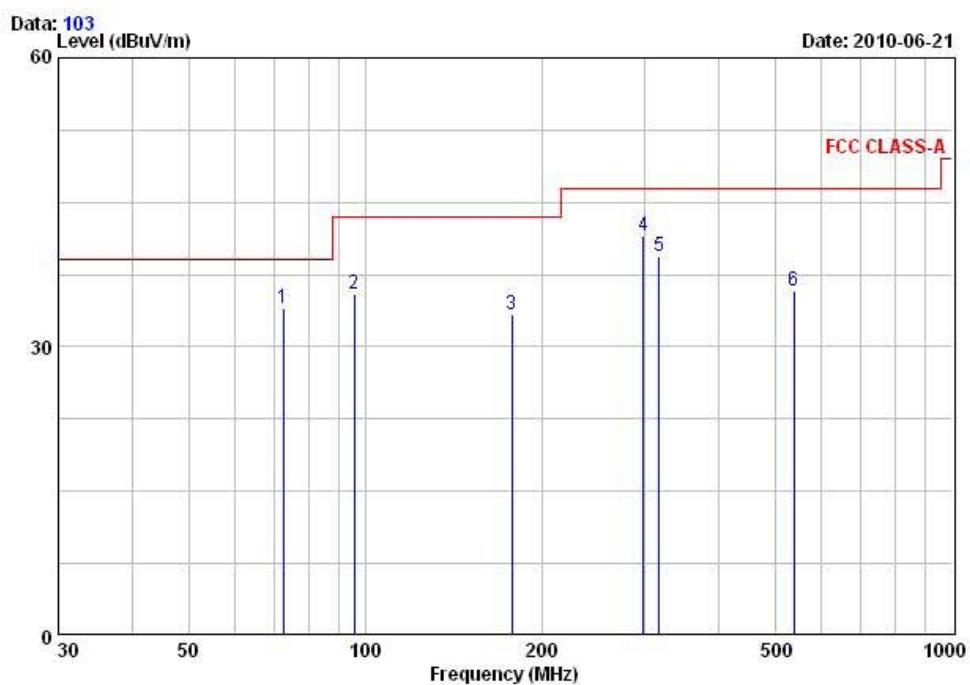
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Tel :+82-31-3236008,9  
Fax :+82-31-3236010

EUT/Model No.: SmartCompact Plus

TEST MODE: PC+CAM+SCAN mode

Temp Humi : 9 / 53

Tested by: LEE.K.H



Freq MHz	Reading dBuV/m	C.F dB/m	Result dBuV/m	Limit QP		Margin dB	Height cm	Angle deg	Polarity
				dBuV/m	dB				
1 72.57	50.20	-16.19	34.01	39.00	4.99	100	28	VERTICAL	
2 95.88	52.00	-16.46	35.54	43.50	7.96	100	165	VERTICAL	
3 177.90	45.10	-11.80	33.30	43.50	10.20	400	32	HORIZONTAL	
4 297.90	50.10	-8.58	41.52	46.40	4.88	400	206	HORIZONTAL	
5 317.38	47.50	-8.16	39.34	46.40	7.06	400	265	HORIZONTAL	
6 537.17	40.10	-4.25	35.85	46.40	10.55	100	23	VERTICAL	

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

Radiated Emissions – GPRS 850

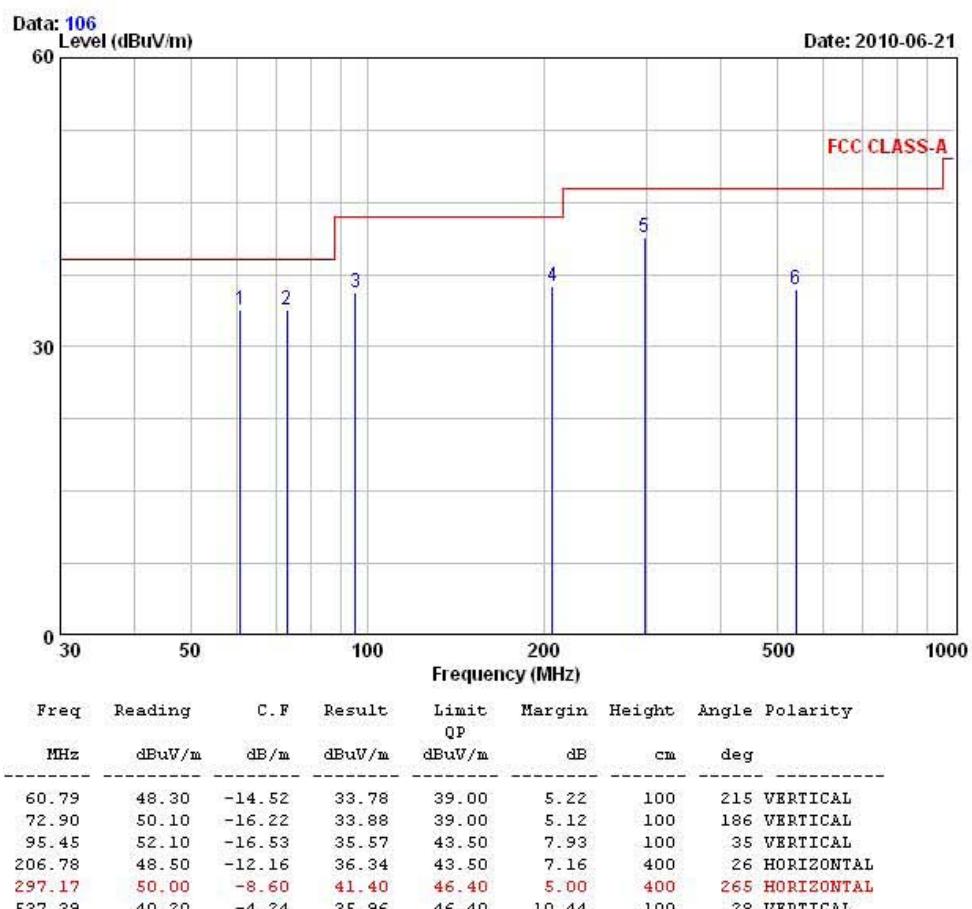
243 Jubug-ri, yangji-Myeon, Youngin-si,  
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Tel :+82-31-3236008,9  
Fax :+82-31-3236010

EUT/Model No.: SmartCompact Plus

TEST MODE: GPRS 850 mode

Temp Humi : 9 / 53

Tested by: LEE.K.H

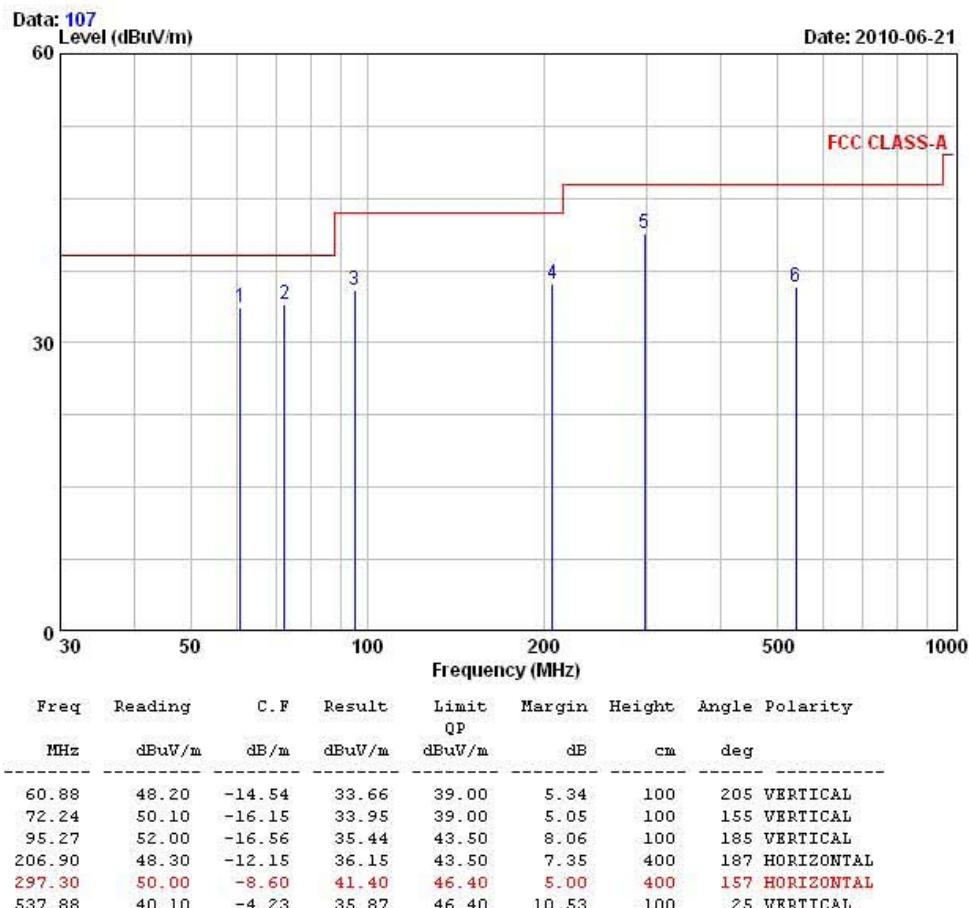


Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

Radiated Emissions – GPRS 1900

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EUT/Model No.: SmartCompact Plus TEST MODE: GPRS 1900 mode  
Temp Humi : 9 / 53 Tested by: LEE.K.H



Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

**3.3.2 Field Strength of spurious Radiation****--- Continue**

OPERATING FREQUENCY : 824.2 MHz

CHANNEL : 128(Low)

MEASURED OUTPUT POWER : 30.28 dBm = 1.07 W

MODULATION : GPRS(Internal)

DISTANCE : 3 meters

LIMIT :  $43 + 10 \log_{10} (W)$  = 43.29 dBc

<b>Freq. (MHz)</b>	<b>LEVEL@ ANTENNA TERMINALS (dBm)</b>	<b>SUBSTITUTE ANTENNA GAIN (dBi)</b>	<b>CORRECT GENERATOR LEVEL (dBm)</b>	<b>POL (H/V)</b>	<b>(dBc)</b>
-	-	-	-	-	-
No emissions were detected are a level greater than 20dB below limit.					
-	-	-	-	-	-

*Note1:* Radiated measurements at 3 meters by Substitution Method.

--- Blank ---

**3.3.2 Field Strength of spurious Radiation****--- Continue**

OPERATING FREQUENCY : 836.6 MHz

CHANNEL : 190(Mid)

MEASURED OUTPUT POWER : 31.02 dBm = 1.26 W

MODULATION : GPRS(Internal)

DISTANCE : 3 meters

LIMIT :  $43 + 10 \log_{10} (W)$  = 44.00 dBc

<b>Freq. (MHz)</b>	<b>LEVEL@ ANTENNA TERMINALS (dBm)</b>	<b>SUBSTITUTE ANTENNA GAIN (dBi)</b>	<b>CORRECT GENERATOR LEVEL (dBm)</b>	<b>POL (H/V)</b>	<b>(dBc)</b>
-	-	-	-	-	-
No emissions were detected are a level greater than 20dB below limit.					
-	-	-	-	-	-

*Note1:* Radiated measurements at 3 meters by Substitution Method.

--- Blank ---

**3.3.2 Field Strength of spurious Radiation****--- Continue**

OPERATING FREQUENCY : 848.8 MHz

CHANNEL : 251(High)

MEASURED OUTPUT POWER : 30.83 dBm = 1.21 W

MODULATION : GPRS(Internal)

DISTANCE : 3 meters

LIMIT :  $43 + 10 \log_{10} (W)$  = 43.83 dBc

<b>Freq. (MHz)</b>	<b>LEVEL@ ANTENNA TERMINALS (dBm)</b>	<b>SUBSTITUTE ANTENNA GAIN (dBi)</b>	<b>CORRECT GENERATOR LEVEL (dBm)</b>	<b>POL (H/V)</b>	<b>(dBc)</b>
-	-	-	-	-	-
No emissions were detected are a level greater than 20dB below limit.					
-	-	-	-	-	-

*Note1:* Radiated measurements at 3 meters by Substitution Method.

--- Blank ---

**3.3.2 Field Strength of spurious Radiation****--- Continue**

OPERATING FREQUENCY : 1850.2 MHz

CHANNEL : 512(Low)

MEASURED OUTPUT POWER : 28.86 dBm = 0.77 W

MODULATION : GPRS(Internal)

DISTANCE : 3 meters

LIMIT :  $43 + 10 \log_{10} (W) = 41.86$  dBc

<b>Freq. (MHz)</b>	<b>LEVEL@ ANTENNA TERMINALS (dBm)</b>	<b>SUBSTITUTE ANTENNA GAIN (dBi)</b>	<b>CORRECT GENERATOR LEVEL (dBm)</b>	<b>POL (H/V)</b>	<b>(dBc)</b>
-	-	-	-	-	-
No emissions were detected are a level greater than 20dB below limit.					
-	-	-	-	-	-

*Note1:* Radiated measurements at 3 meters by Substitution Method.

--- Blank ---

**3.3.2 Field Strength of spurious Radiation****--- Continue**

OPERATING FREQUENCY : 1880.0 MHz

CHANNEL : 661(Mid)

MEASURED OUTPUT POWER : 26.35 dBm = 0.43 W

MODULATION : GPRS(Internal)

DISTANCE : 3 meters

LIMIT :  $43 + 10 \log_{10} (W) = 39.33$  dBc

<b>Freq. (MHz)</b>	<b>LEVEL@ ANTENNA TERMINALS (dBm)</b>	<b>SUBSTITUTE ANTENNA GAIN (dBi)</b>	<b>CORRECT GENERATOR LEVEL (dBm)</b>	<b>POL (H/V)</b>	<b>(dBc)</b>
-	-	-	-	-	-
No emissions were detected are a level greater than 20dB below limit.					
-	-	-	-	-	-

*Note1:* Radiated measurements at 3 meters by Substitution Method.

--- Blank ---

**3.3.2 Field Strength of spurious Radiation****--- Continue**

OPERATING FREQUENCY : 1909.8 MHz

CHANNEL : 810(High)

MEASURED OUTPUT POWER : 26.85 dBm = 0.48 W

MODULATION : GPRS(Internal)

DISTANCE : 3 meters

LIMIT :  $43 + 10 \log_{10} (W)$  = 39.81 dBc

<b>Freq. (MHz)</b>	<b>LEVEL@ ANTENNA TERMINALS (dBm)</b>	<b>SUBSTITUTE ANTENNA GAIN (dBi)</b>	<b>CORRECT GENERATOR LEVEL (dBm)</b>	<b>POL (H/V)</b>	<b>(dBc)</b>
-	-	-	-	-	-
No emissions were detected are a level greater than 20dB below limit.					
-	-	-	-	-	-

*Note1:* Radiated measurements at 3 meters by Substitution Method.

--- Blank ---

### 3.3.3 AC Conducted Emissions

#### Procedure:

The conducted emissions are measured in the shielded room with a spectrum analyzer in peak hold. While the measurement, EUT had its hopping function disabled at the middle channels in line with Section 15.31(m). Emissions closest to the limit are measured in the quasi-peak mode (QP) with the tuned receiver using a bandwidth of 9 kHz. The emissions are maximized further by cable manipulation and Exerciser operation. The highest emissions relative to the limit are listed.

#### Measurement Data: Complies

- See next pages for actual measured spectrum plots.
- No emissions were detected at a level greater than 10dB below limit.

#### Minimum Standard: FCC Part 15.207(a)/EN 55022

Class B

Frequency Range	quasi-peak	Average
0.15 ~ 0.5	66 to 56 *	56 to 46 *
0.5 ~ 5	56	46
5 ~ 30	60	50

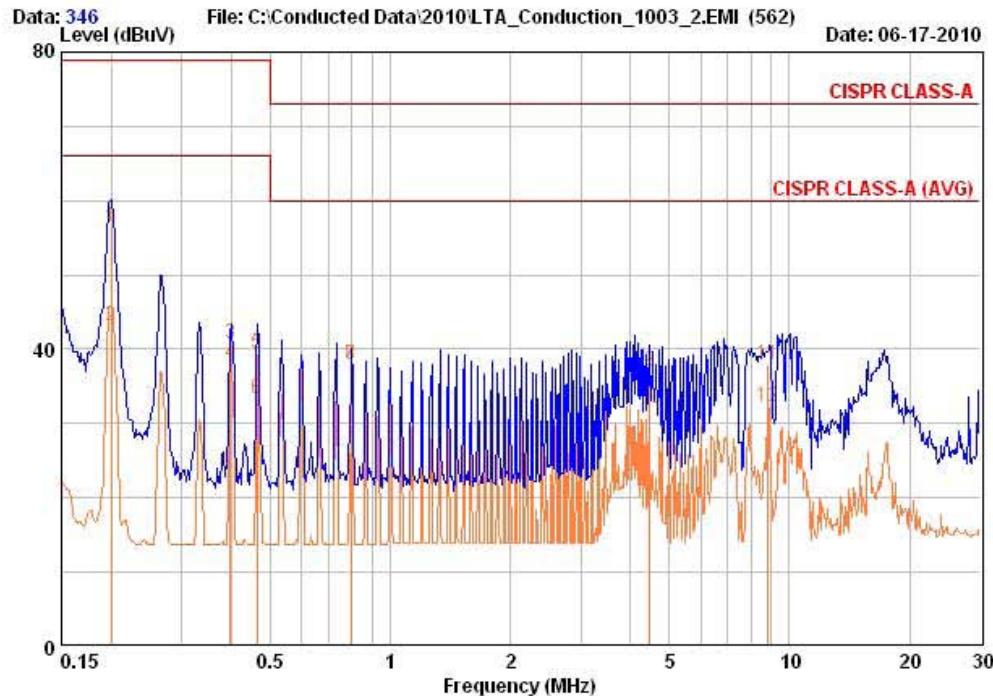
\* Decreases with the logarithm of the frequency

## AC Conducted Emissions – PC+CAM+SCAN – Line



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Fax :+82-31-3236010

EUT / Model No. : SmartCompact Plus Phase : LINE  
-----  
Test Mode : PC+CAM+SCAN mode Test Power : 120 / 60  
Temp./Humi. : 17 / 24 Test Engineer : PARK H W  
-----



Freq MHz	RD QP		RD AV		C. F dB	Result dBuV	Result QP		Result AV		Limit QP	Limit AV	Margin dB	Margin dB
	dBuV	dBuV	dBuV	dBuV			dBuV	dBuV	dBuV	dBuV				
0.200	46.89	33.49	9.65	56.54	56.54	46.14	79.00	66.00	22.46	22.86				
0.397	31.16	28.56	9.67	40.83	40.83	38.23	79.00	66.00	38.17	27.77				
0.464	29.75	23.65	9.67	39.42	39.42	33.32	79.00	66.00	39.58	32.68				
0.796	28.14	28.04	9.78	37.92	37.92	37.82	73.00	60.00	35.08	22.18				
4.465	27.14	22.14	9.91	37.05	37.05	32.05	73.00	60.00	35.95	27.95				
8.860	27.88	22.28	10.08	37.96	37.96	32.36	73.00	60.00	35.04	27.64				

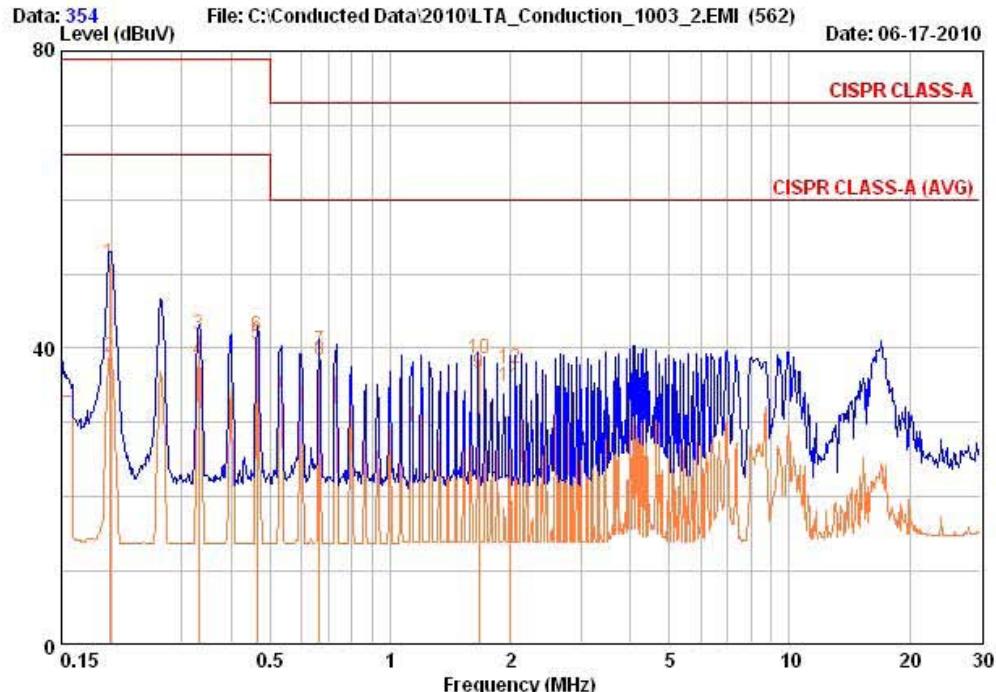
Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

## AC Conducted Emissions – PC+CAM+SCAN – Neutral



243 Jibug-ri, yangji-Myeon, Youngin-si,  
Gyeonggi-do 449-822 Korea  
Tel. +82-31-3236008,9  
Fax. +82-31-3236010

EUT / Model No. : SmartCompact Plus Phase : NEUTRAL  
 Test Mode : PC+CAM+SCAN mode Test Power : 120 / 60  
 Temp./Humi. : 17 / 24 Test Engineer : PARK H W



Freq MHz	RD QP dBuV	RD AV dBuV	C. F dB	Result		Limit		Margin	
				QP dBuV	AV dBuV	QP dBuV	AV dBuV	QP dB	AV dB
0.198	41.79	29.09	9.66	51.45	38.75	79.00	66.00	27.55	27.25
0.331	32.17	28.67	9.66	41.83	38.33	79.00	66.00	37.17	27.67
0.463	31.95	30.95	9.66	41.61	40.61	79.00	66.00	37.39	25.39
0.663	29.84	28.64	9.75	39.59	38.39	73.00	60.00	33.41	21.61
1.664	28.85	26.85	9.81	38.66	36.66	73.00	60.00	34.34	23.34
2.000	27.35	25.05	9.82	37.17	34.87	73.00	60.00	35.83	25.13

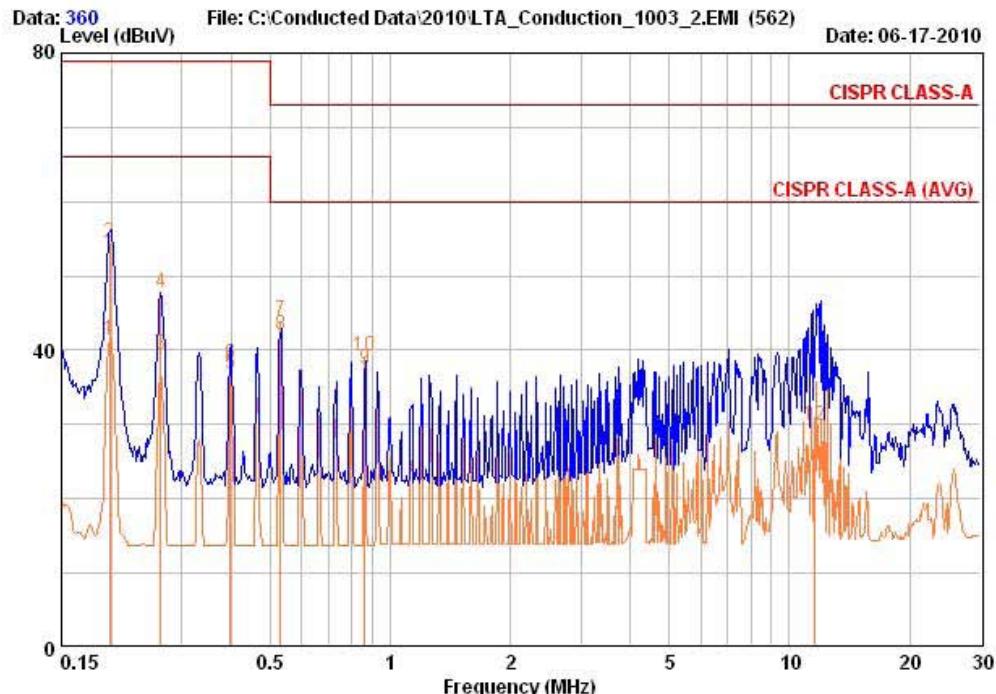
Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

## AC Conducted Emissions – GPRS 850 – Line



243 Jibug-ri, yangji-Myeon, Youngin-si,  
Gyeonggi-do 449-822 Korea  
Tel. +82-31-3236008,9  
Fax. +82-31-3236010

EUT / Model No. : SmartCompact Plus Phase : LINE  
 Test Mode : GPRS 850 mode Test Power : 120 / 60  
 Temp./Humi. : 17 / 24 Test Engineer : PARK H W



Freq MHz	RD QP		RD AV		C. F dB	Result QP		Result AV		Limit QP		Limit AV		Margin dB	Margin dB
	dBuV	dBuV	dBuV	dBuV		dBuV	dBuV	dBuV	dBuV	dBuV	dBuV	dBuV	dBuV		
0.198	44.89	31.69	9.65		54.54	41.34	79.00	66.00	66.00	24.46	24.46				
0.266	38.18	29.88	9.66		47.83	39.53	79.00	66.00	66.00	31.17	31.17				
0.397	28.56	27.16	9.67		38.23	36.83	79.00	66.00	66.00	40.77	40.77				
0.530	34.35	32.35	9.69		44.03	42.03	73.00	60.00	60.00	28.97	28.97				
0.862	29.55	27.75	9.78		39.33	37.53	73.00	60.00	60.00	33.67	33.67				
11.620	19.59	14.19	10.24		29.83	24.43	73.00	60.00	60.00	43.17	43.17				

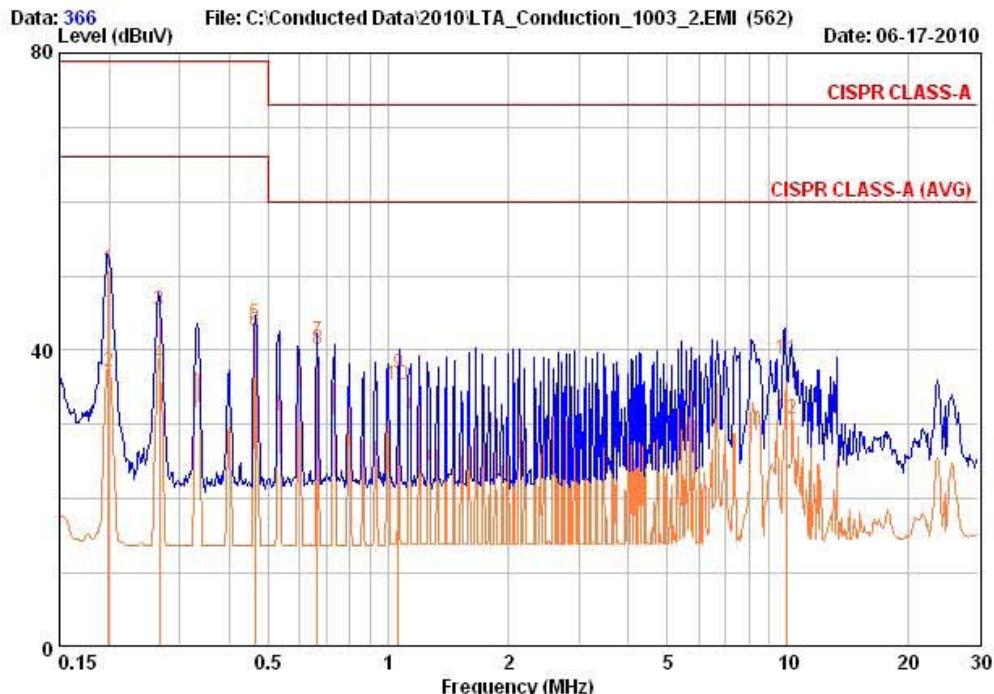
Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

## AC Conducted Emissions – GPRS 850 – Neutral



243 Jibug-ri, yangji-Myeon, Youngin-si,  
Gyeonggi-do 449-822 Korea  
Tel. +82-31-3236008,9  
Fax. +82-31-3236010

EUT / Model No. : SmartCompact Plus Phase : NEUTRAL  
 Test Mode : GPRS 850 mode Test Power : 120 / 60  
 Temp./Humi. : 17 / 24 Test Engineer : PARK H W



Freq MHz	RD QP		RD AV		C. F dB	Result QP		Result AV		Limit QP		Limit AV		Margin dB	Margin dB
	dBuV	dBuV	dBuV	dBuV		dBuV	dBuV	dBuV	dBuV	dBuV	dBuV	dBuV	dBuV		
0.199	41.09	27.39	9.66	50.75	50.75	37.05	79.00	66.00	66.00	28.25	28.25	28.95			
0.267	35.68	28.48	9.66	45.34	45.34	38.14	79.00	66.00	66.00	33.66	33.66	27.86			
0.463	33.85	32.75	9.66	43.51	43.51	42.41	79.00	66.00	66.00	35.49	35.49	23.59			
0.663	31.34	30.34	9.75	41.09	41.09	40.09	73.00	60.00	60.00	31.91	31.91	19.91			
1.061	27.05	25.55	9.78	36.83	36.83	35.33	73.00	60.00	60.00	36.17	36.17	24.67			
9.920	28.68	20.68	10.13	38.80	38.80	30.80	73.00	60.00	60.00	34.20	34.20	29.20			

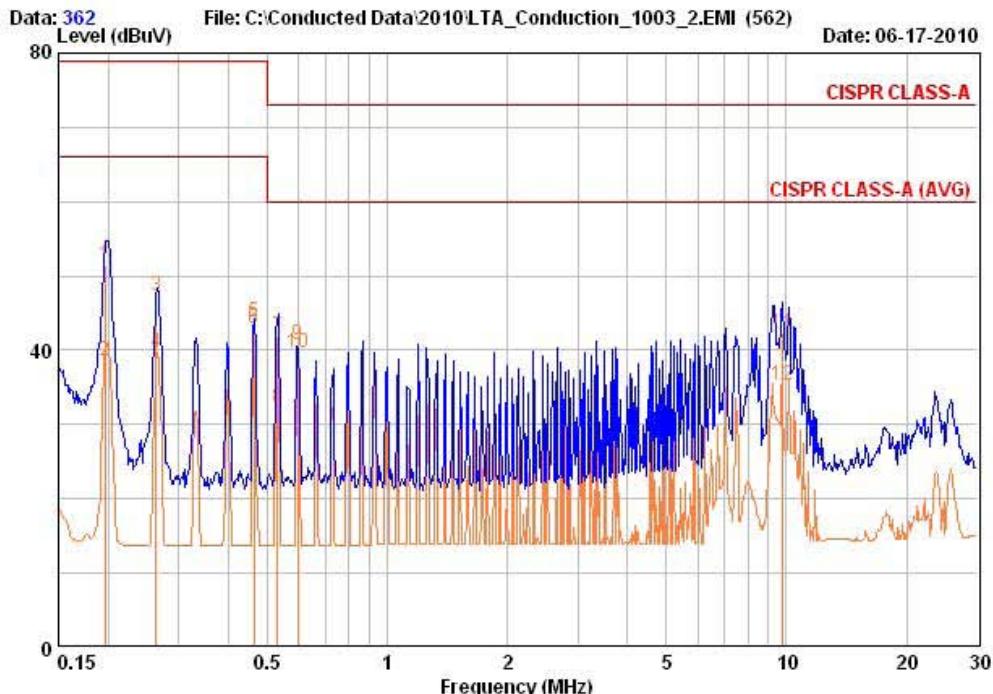
Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

## AC Conducted Emissions – GPRS 1900– Line



243 Jibug-ri, yangji-Myeon, Youngin-si,  
Gyeonggi-do 449-822 Korea  
Tel. +82-31-3236008,9  
Fax. +82-31-3236010

EUT / Model No. : SmartCompact Plus Phase : LINE  
 Test Mode : GPRS 1900 mode Test Power : 120 / 60  
 Temp./Humid. : 17 / 24 Test Engineer : PARK H W



Freq MHz	RD QP		RD AV		C. F dB	Result QP		Result AV		Limit QP		Limit AV		Margin dB	Margin dB
	dBuV	dBuV	dBuV	dBuV		dBuV	dBuV	dBuV	dBuV	dBuV	dBuV	dBuV	dBuV		
0.196	41.69	28.89	9.65	51.34	51.34	38.54	79.00	66.00	66.00	27.66	27.66	27.46	27.46		
0.264	37.68	29.98	9.66	47.33	47.33	39.63	79.00	66.00	66.00	31.67	31.67	26.37	26.37		
0.463	34.05	33.25	9.67	43.72	43.72	42.92	79.00	66.00	66.00	35.28	35.28	23.08	23.08		
0.531	32.15	22.55	9.69	41.83	41.83	32.23	73.00	60.00	60.00	31.17	31.17	27.77	27.77		
0.597	31.04	29.94	9.72	40.76	40.76	39.66	73.00	60.00	60.00	32.24	32.24	20.34	20.34		
9.772	32.17	25.17	10.13	42.30	42.30	35.30	73.00	60.00	60.00	30.70	30.70	24.70	24.70		

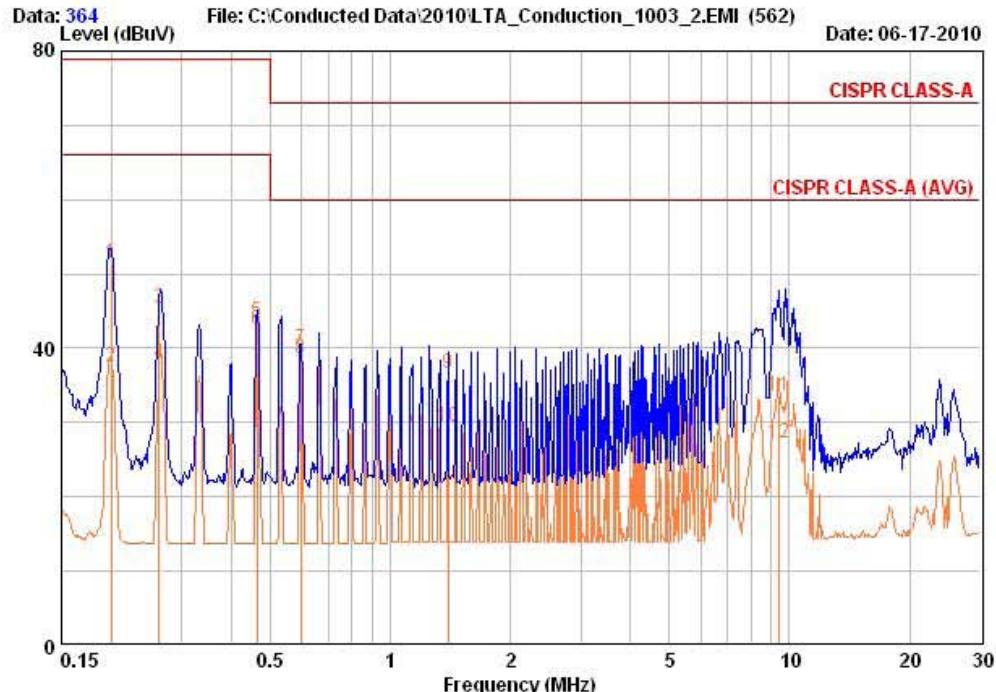
Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

## AC Conducted Emissions – GPRS 1900– Neutral



243 Jibug-ri, yangji-Myeon, Youngin-si,  
Gyeonggi-do 449-822 Korea  
Tel. +82-31-3236008,9  
Fax. +82-31-3236010

EUT / Model No. : SmartCompact Plus Phase : NEUTRAL  
 Test Mode : GPRS 1900 mode Test Power : 120 / 60  
 Temp./Humid. : 17 / 24 Test Engineer : PARK H W



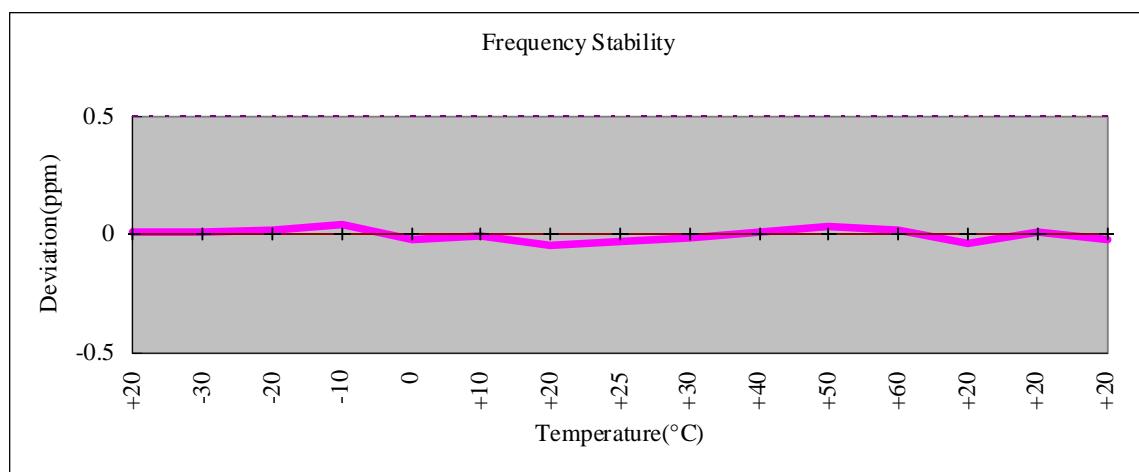
Freq MHz	RD QP		RD AV		C. F dB	Result QP		Result AV		Limit QP		Limit AV		Margin dB	Margin dB
	dBuV	dBuV	dBuV	dBuV		dBuV	dBuV	dBuV	dBuV	dBuV	dBuV	dBuV	dBuV		
0.200	41.69	27.79	9.66	51.35	51.35	37.45	79.00	66.00	66.00	27.65	27.65	28.55	28.55		
0.263	35.78	28.18	9.66	45.44	45.44	37.84	79.00	66.00	66.00	33.56	33.56	28.16	28.16		
0.463	33.85	32.85	9.66	43.51	43.51	42.51	79.00	66.00	66.00	35.49	35.49	23.49	23.49		
0.596	30.14	28.84	9.72	39.86	39.86	38.56	73.00	60.00	60.00	33.14	33.14	21.44	21.44		
1.394	26.85	19.65	9.80	36.65	36.65	29.45	73.00	60.00	60.00	36.35	36.35	30.55	30.55		
9.448	23.37	17.17	10.10	33.48	33.48	27.28	73.00	60.00	60.00	39.52	39.52	32.72	32.72		

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

### 3.3.4 Frequency Stability

OPERATING FREQUENCY : 836,599,958 Hz  
 CHANNEL : 190(Mid)  
 REFERENCE VOLTAGE : 3.7 VDC  
 DEVIATION LIMIT :  $\pm 0.00025$  % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (dB)	FREQ (Hz)	Deviation (%)
100%	3.7	+20(Ref)	836,599,951	0.000001
100%		-30	836,599,964	-0.000001
100%		-20	836,599,975	-0.000002
100%		-10	836,599,996	-0.000005
100%		0	836,599,938	0.000002
100%		+10	836,599,954	0.000000
100%		+20	836,599,917	0.000005
100%		+25	836,599,935	0.000003
100%		+30	836,599,944	0.000002
100%		+40	836,599,967	-0.000001
100%		+50	836,599,985	-0.000003
100%		+60	836,599,976	-0.000002
85%	3.15	+20	836,599,925	0.000004
115%	4.23	+20	836,599,966	-0.000001
BATT.ENDPOINT	3.10	+20	836,599,938	0.000002

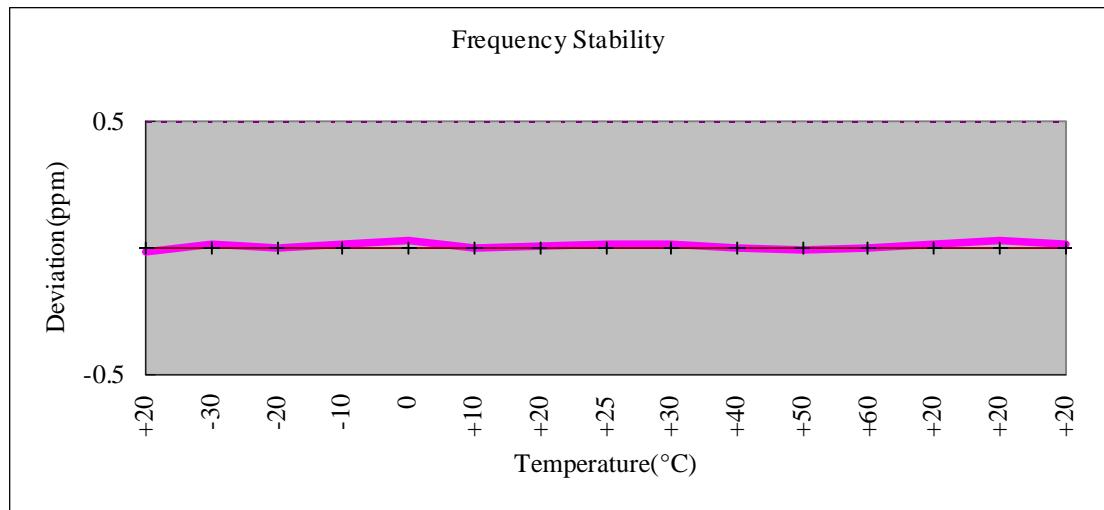


## 3.3.4 Frequency Stability

- Continues

OPERATING FREQUENCY : 1,879,999,934 Hz  
 CHANNEL : 0661(Mid)  
 REFERENCE VOLTAGE : 3.7 VDC  
 DEVIATION LIMIT :  $\pm 0.00025$  % or 2.5 ppm

VOLTAGE (%)	POWER (VAC)	TEMP (dB)	FREQ (Hz)	Deviation (%)
100%	3.7	+20(Ref)	1,879,999,955	-0.000001
100%		-30	1,879,999,967	0.000002
100%		-20	1,879,999,934	0.000000
100%		-10	1,879,999,958	0.000001
100%		0	1,879,999,994	0.000003
100%		+10	1,879,999,935	0.000000
100%		+20	1,879,999,947	0.000001
100%		+25	1,879,999,966	0.000002
100%		+30	1,879,999,957	0.000001
100%		+40	1,879,999,938	0.000000
100%		+50	1,879,999,915	-0.000001
100%		+60	1,879,999,934	0.000000
85%	3.15	+20	1,879,999,957	0.000001
115%	4.23	+20	1,879,999,993	0.000003
BATT.ENDPOINT	3.10	+20	1,879,999,958	0.000001



### **3.4 CONCLUSION**

The data collected shows that the **SmartPayTech INC. Industrial PDA FCC ID : YBICOMPACTPLUS** complies with all the requirements of Parts 2, 22, 24 of the FCC Rules.

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### **3.5 TEST PLOTS**

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## GSM850 99 % Bandwidth Ch. 128



## GSM850 99 % Bandwidth Ch. 190



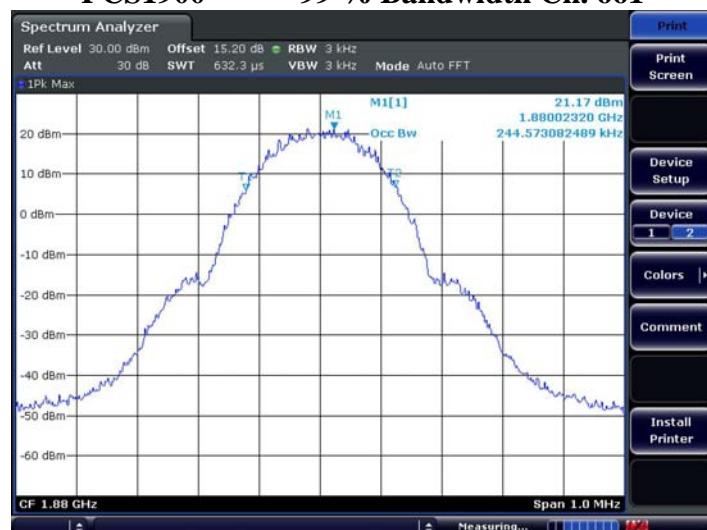
## GSM850 99 % Bandwidth Ch. 251



## PCS1900 99 % Bandwidth Ch. 512



## PCS1900 99 % Bandwidth Ch. 661



## PCS1900 99 % Bandwidth Ch. 810



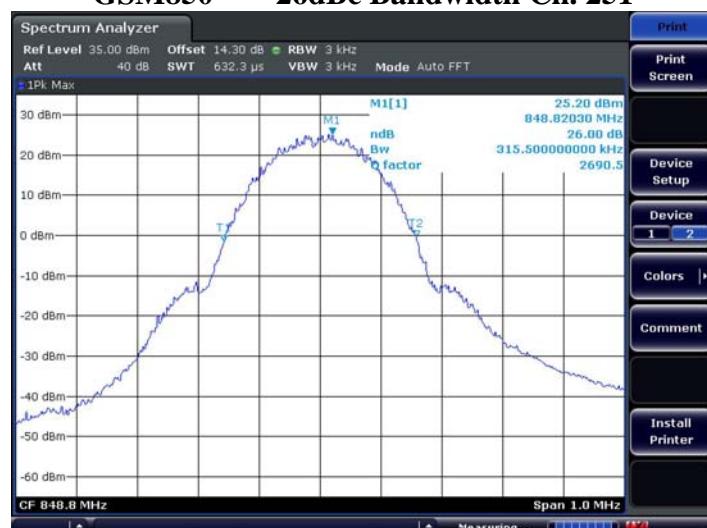
## GSM850 26dBc Bandwidth Ch. 128



## GSM850 26dBc Bandwidth Ch. 190



## GSM850 26dBc Bandwidth Ch. 251



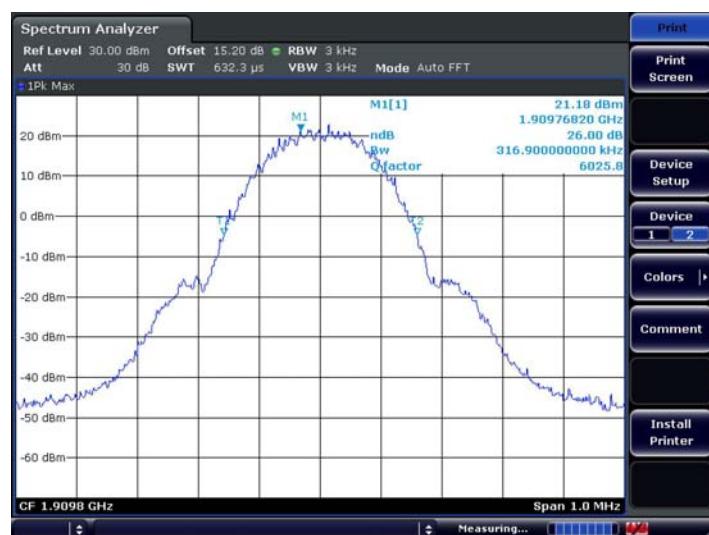
## PCS1900 26dBc Bandwidth Ch. 512



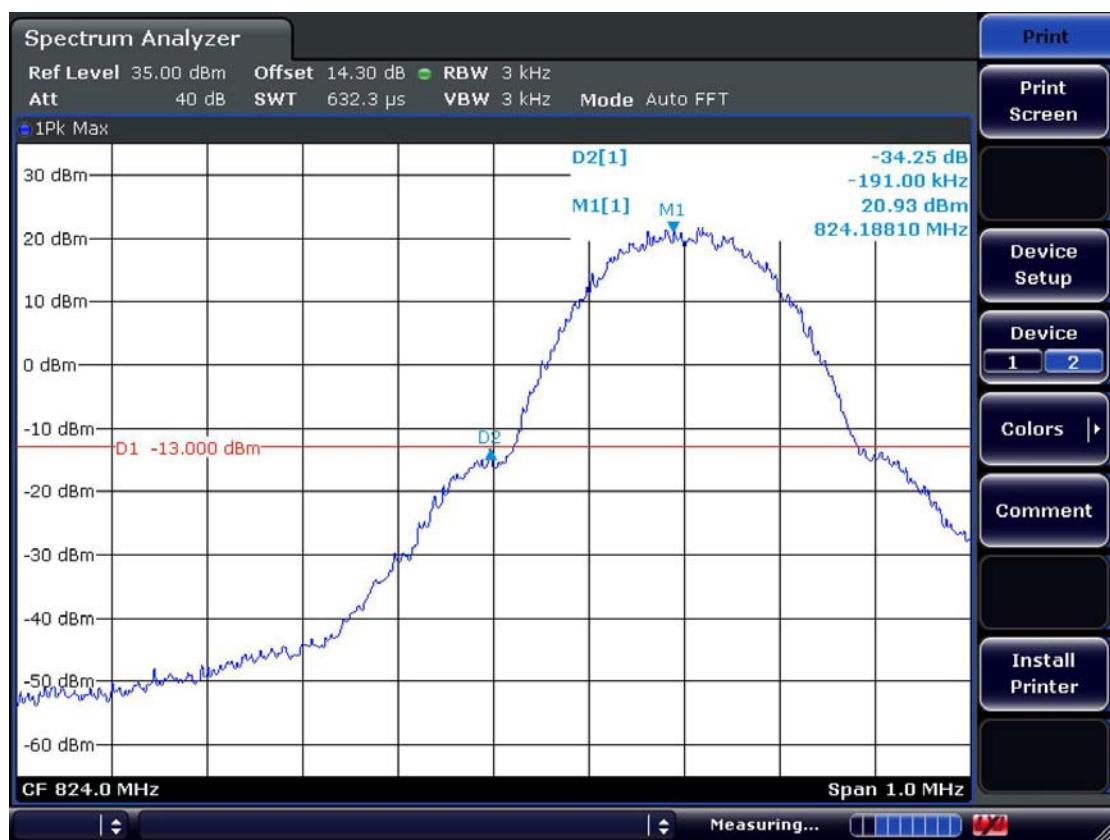
## PCS1900 26dBc Bandwidth Ch. 661



## PCS1900 26dBc Bandwidth Ch. 810



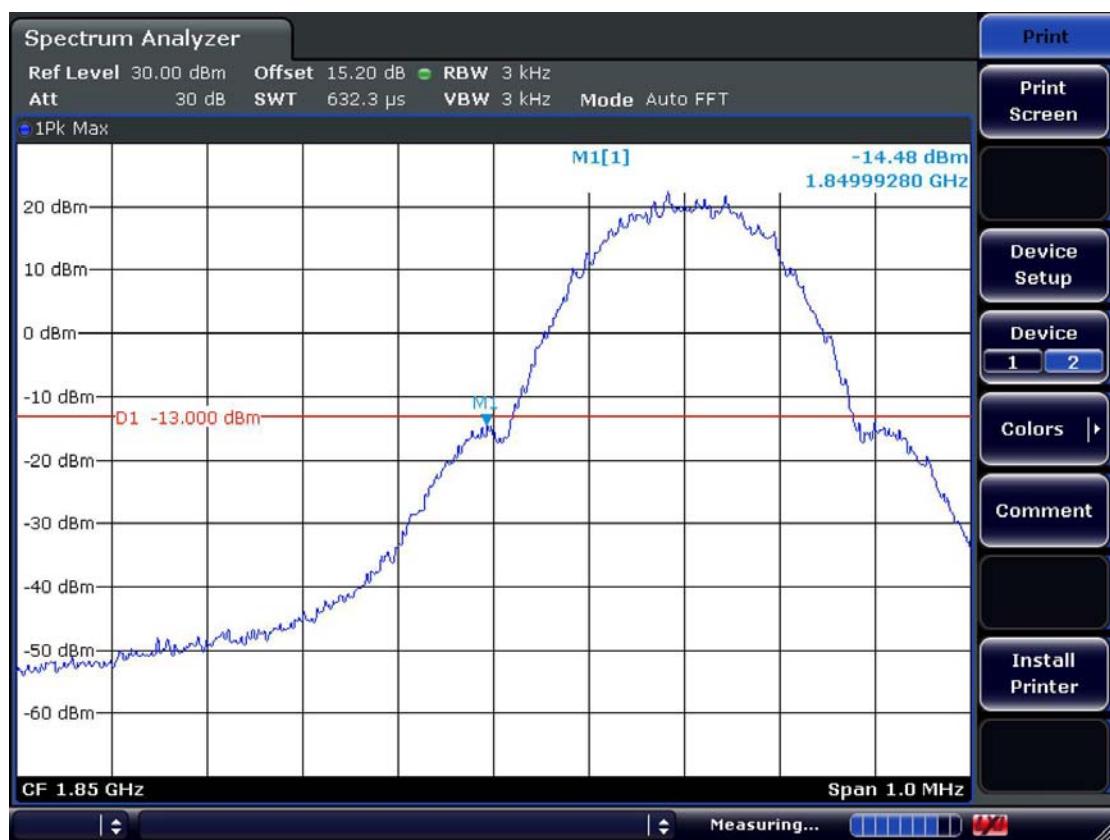
## GSM850 Band Edge Ch. 128



## GSM850 Band Edge Ch. 251



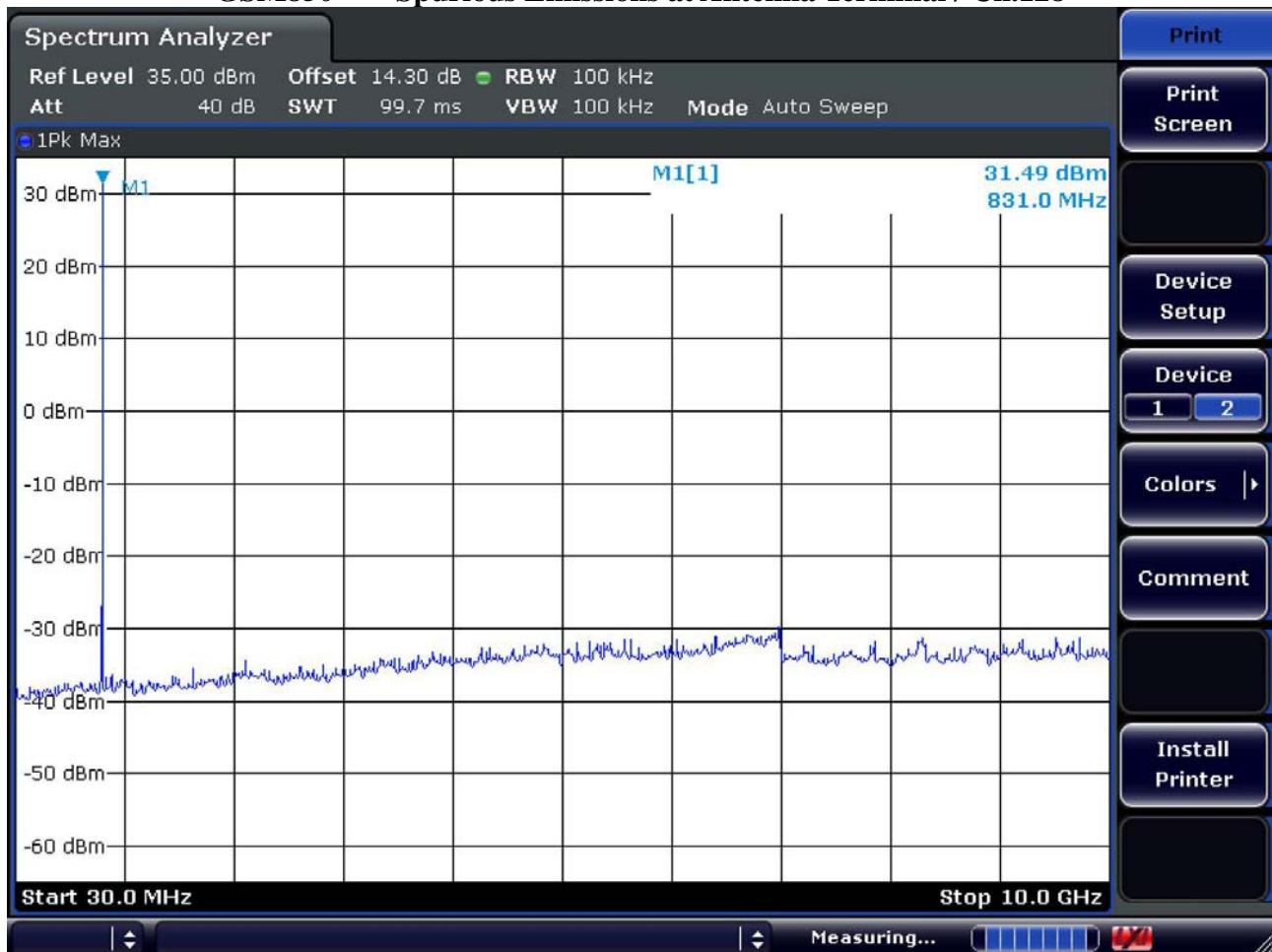
## PCS1900 Band Edge Ch. 512



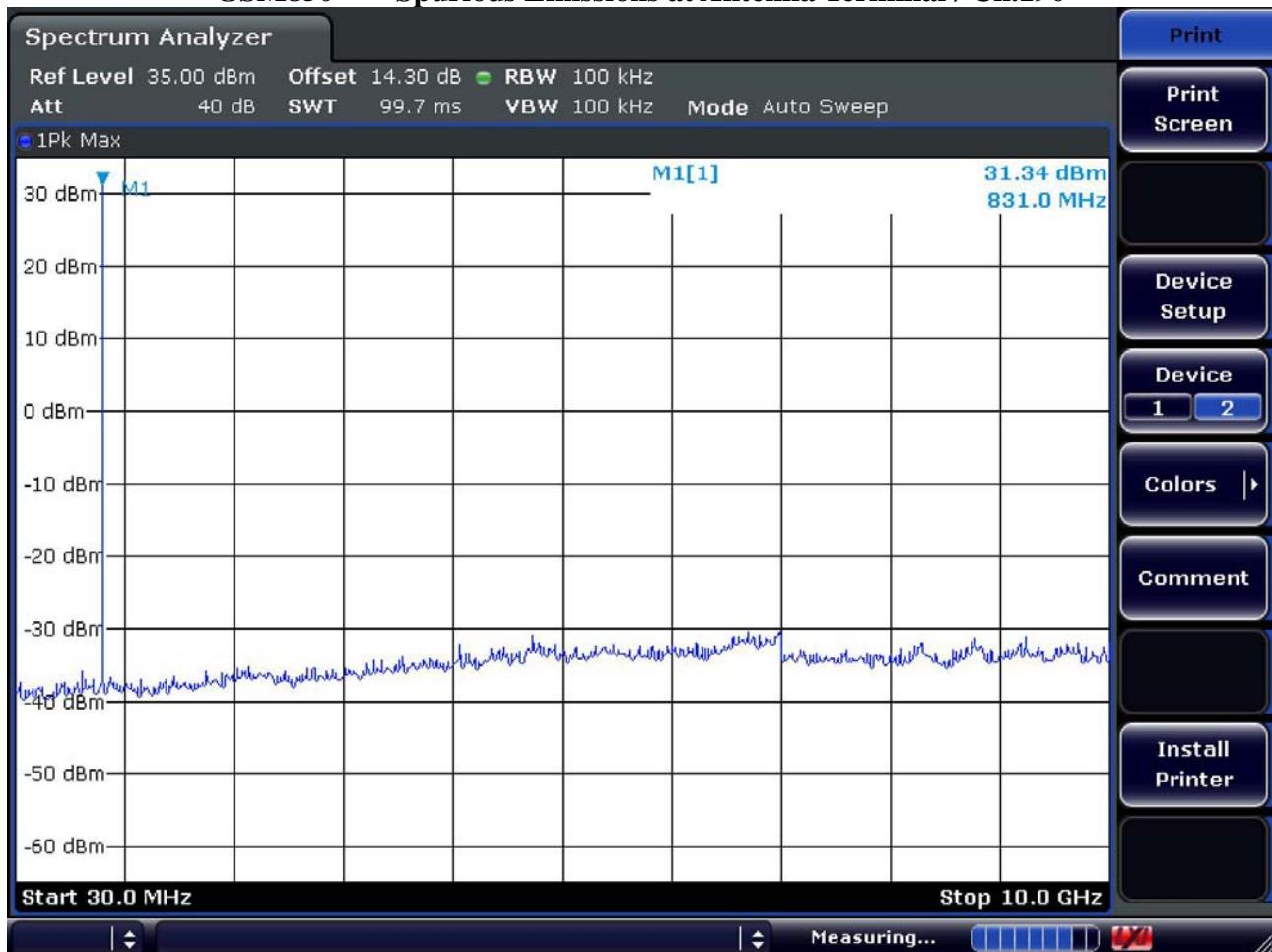
## PCS1900 Band Edge Ch. 810



## GSM850 Spurious Emissions at Antenna Terminal / Ch.128



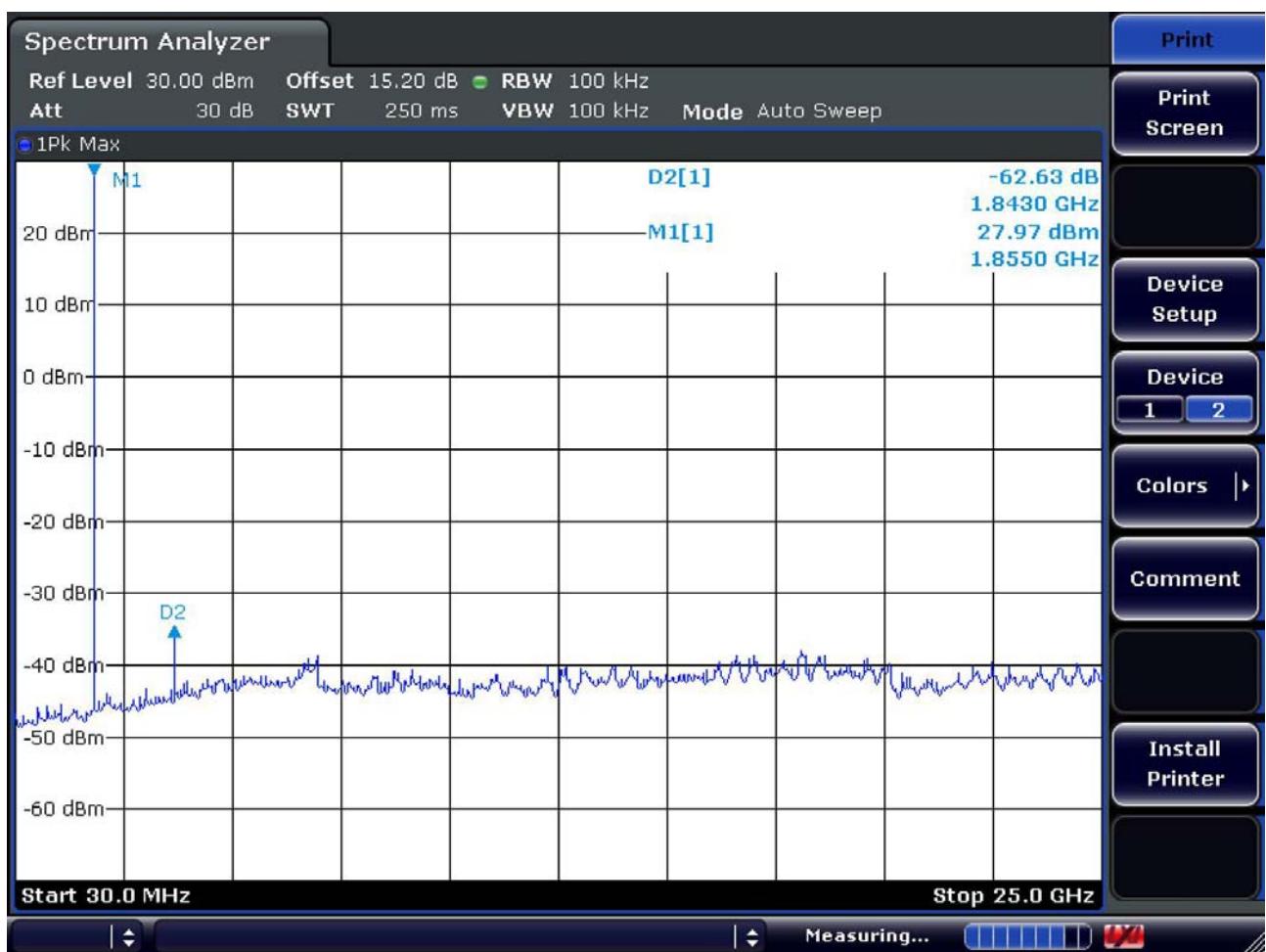
## GSM850 Spurious Emissions at Antenna Terminal / Ch.190



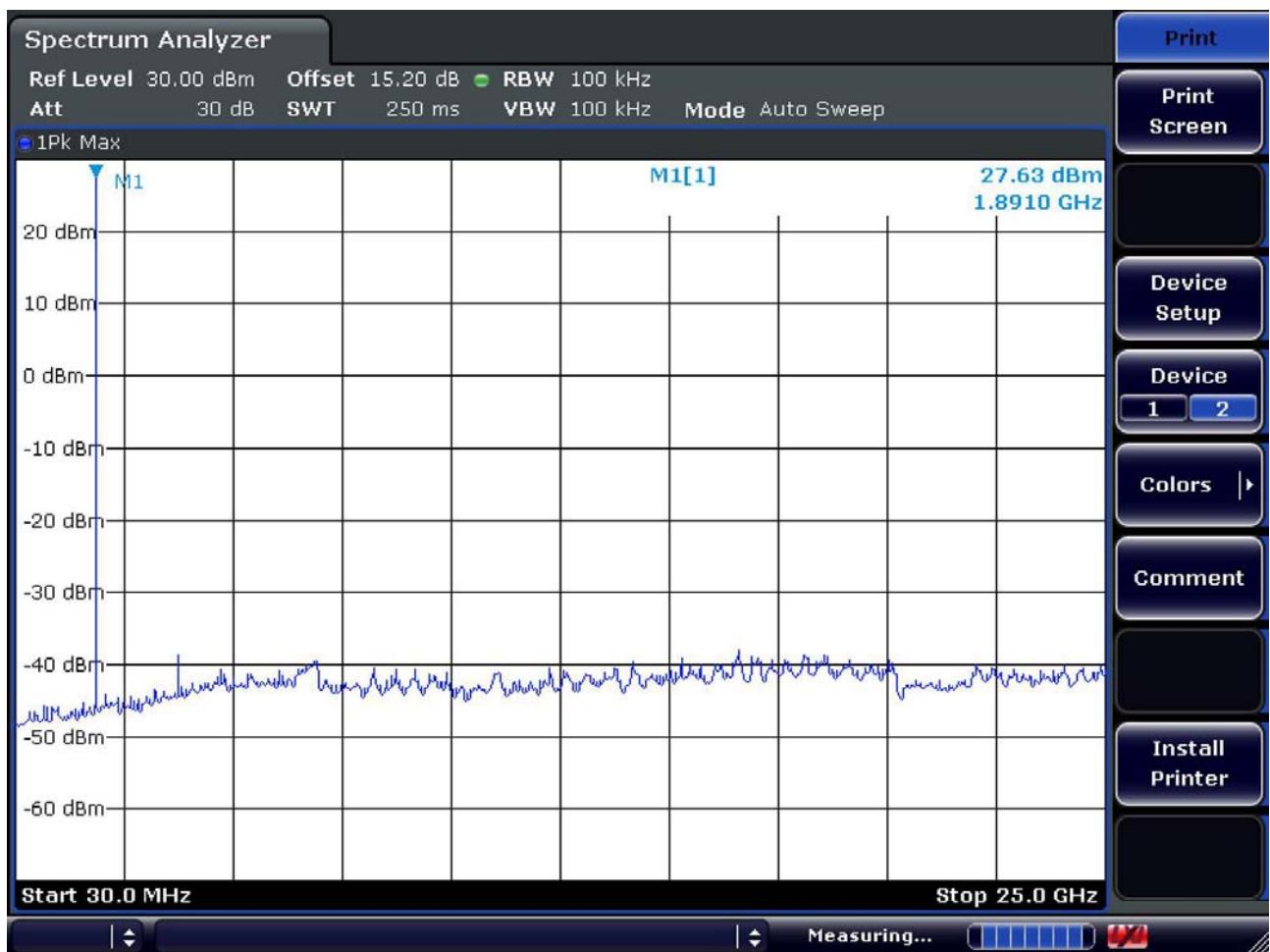
## GSM850 Spurious Emissions at Antenna Terminal / Ch.251



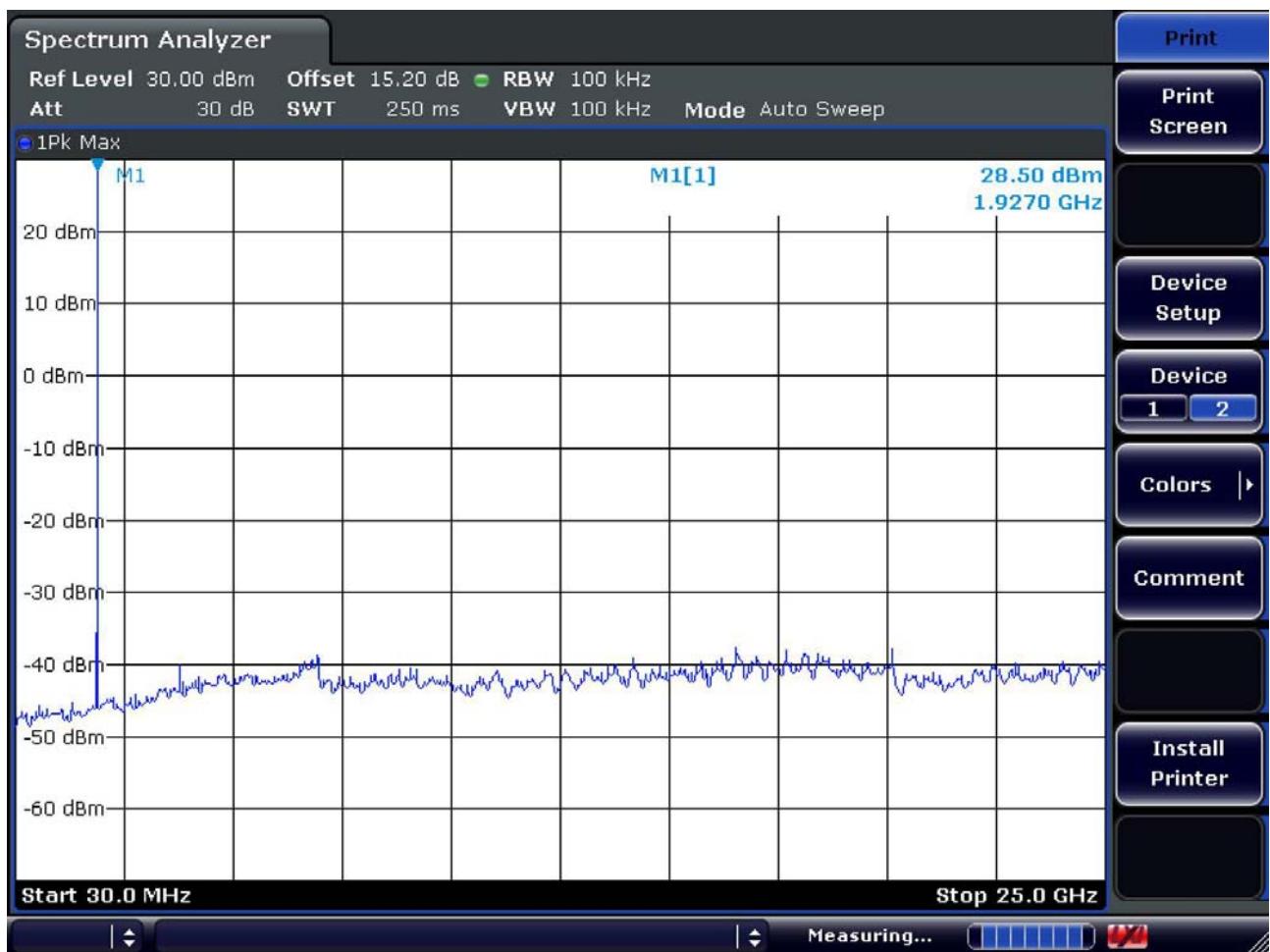
## PCS1900 Spurious Emissions at Antenna Terminal / Ch.512



## PCS1900 Spurious Emissions at Antenna Terminal / Ch.661



## PCS1900 Spurious Emissions at Antenna Terminal / Ch.810



## APPENDIX 1

### TEST EQUIPMENT USED FOR TESTS

	Description	Model No.	Serial No.	Manufacturer	Next Cal. Date
1	Spectrum Analyzer	FSV-30	100757	R&S	Feb-11
2	Spectrum Analyzer	8563E	3425A02505	HP	Mar-11
3	Spectrum Analyzer	8594E	3710A04074	HP	Oct-10
4	Signal Generator	8648C	3623A02597	HP	Mar-11
5	Signal Generator	83711B	US34490456	HP	Mar-11
6	Attenuator (3dB)	8491A	37822	HP	Oct-10
7	Attenuator (10dB)	8491A	63196	HP	Oct-10
8	Attenuator (30dB)	8498A	1801A06689	HP	Oct-10
9	EMI Test Receiver	ESVD	843748/001	R&S	Mar-11
10	Horn Antenna(18 ~ 40GHz)	SAS-574	154	Schwarzbeck	Nov-10
11	Horn Antenna(18 ~ 40GHz)	SAS-574	155	Schwarzbeck	Nov-10
12	RF Amplifier	8447D	2949A02670	HP	Oct-10
13	RF Amplifier	8449B	3008A02126	HP	Mar-11
14	Test Receiver	ESHS10	828404/009	R&S	Mar-11
15	TRILOG Antenna	VULB 9160	9160-3212	SCHWARZBECK	Apr-11
16	Log.-Per. Antenna	VULP 9118	9118 A 401	SCHWARZBECK	Apr-11
17	Biconical Antenna	BBA 9106	VHA 9103-2315	SCHWARZBECK	Apr-11
18	Horn Antenna	3115	00055005	ETS LINDGREN	Mar-11
19	Horn Antenna	BBHA 9120D	9120D122	SCHWARZBECK	Dec-11
20	Dipole Antenna	VHA9103	2116	SCHWARZBECK	Nov-10
21	Dipole Antenna	VHA9103	2117	SCHWARZBECK	Nov-10
22	Dipole Antenna	VHA9105	2261	SCHWARZBECK	Nov-10
23	Dipole Antenna	VHA9105	2262	SCHWARZBECK	Nov-10
24	Hygro-Thermograph	THB-36	0041557-01	ISUZU	Mar-11
25	Splitter (SMA)	ZFSC-2-2500	SF617800326	Mini-Circuits	-
26	RF Switch	MP59B	6200414971	ANRITSU	-
27	Power Divider	11636A	6243	HP	Oct-10
28	DC Power Supply	6622A	3448A03079	HP	Oct-10
29	Frequency Counter	5342A	2826A12411	HP	Mar-11
30	Power Meter	EPM-441A	GB32481702	HP	Mar-11
31	Power Sensor	8481A	2702A64048	HP	Mar-11
32	Audio Analyzer	8903B	3729A18901	HP	Oct-10
33	Modulation Analyzer	8901B	3749A05878	HP	Oct-10
34	TEMP & HUMIDITY Chamber	YJ-500	LTAS06041	Jin Young Tech	Oct-10
35	LOOP-ANTENNA	FMZB 1516	151602/94	SCHWARZBECK	Mar-11
36	Stop Watch	HS-3	601Q09R	CASIO	Mar-11
37	UNIVERSAL RADIO COMMUNICATION TESTER	CMU200	106243	R&S	May-12