

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT INDUSTRY CANADA RSS-210

OF

Product Name: POS terminal

Brand Name: ingenico

Model Name: iWP250

Model Differences: N/A

FCC ID: XKBIWP250

IC: 2586D-IWP250

Report No.: EH/2009/30032

Issue Date: Jul. 28, 2009

FCC Rule Part: §15.225

IC Rule Part: RSS-210 issue 7:2007, Annex 2 A2.6

Prepared for: INGENICO
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Guilherand-Granges France

Prepared by: SGS Taiwan Ltd.
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Zone, Taipei County, Taiwan



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VERIFICATION OF COMPLIANCE

Applicant: INGENICO
1 rue Claude Chappe BP346 Guilhaerand-Granges France

Product Name: POS terminal

FCC ID: XKBIWP250

IC: 2586D-IWP250

Brand Name: ingenico

Model No.: iWP250

Model Difference: N/A

File Number: EH/2009/30032

Date of Test: Jul. 17, 2009 ~ Jul. 27, 2009

Date of EUT Received: Mar. 27, 2009

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2003) and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.407 and RSS-210 issue 7: 2007 Annex 2 A2.6

The test results of this report relate only to the tested sample identified in this report

Test By:

Jason Wu

Date:

Jul. 28, 2009

Jason Wu / Asst. Supervisor

Prepared By:

Gigi yeh

Date:

Jul. 28, 2009

Gigi Yeh / Clerk

Approved By

Jim Chang

Date:

Jul. 28, 2009

Jim Chang / Supervisor

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Version

Version No.	Date	Description
00	Jul. 28, 2009	Initial creation of document

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1 GENERAL INFORMATION

1.1 Product Description

General:

Product Name:	POS terminal	
Brand Name:	ingenico	
Model Name:	IWP250	
Model Difference:	N/A	
Power Supply	24Vdc by AC/DC power adapter	
	Adapter:	Model: EA11002B, Supplier: EDAC

GSM / DCS:

Cellular Phone Standards Frequency Range and Power	Operation Band	Frequency Range	Rated Power
	GSM/EDGE 850, class10	850,	824 MHz– 849MHz
DCS/EDGE class10	1900,	1850MHz – 1910MHz	30dBm
Final Amplifier Voltage and Current Information		DC voltage (V)	DC current (mA)
	GSM 850, class10	24Vdc	325
	DCS1900, class10	24Vdc	310
	DEGE 850	24Vdc	315
	EDGE 1900	24Vdc	305
Antenna Designation:	PIFA Antenna / -2.3 dBi.		
Type of Emission	300KGXW		
IMEI	354060011204555		

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WLAN:

Frequency Range:	2412 – 2462 MHz
Channel number:	11 channels
Max. Output Power:	802.11 b: 16.61 dBm (Peak) 802.11 g: 16.54 dBm (Peak)
Modulation Technology:	DSSS, OFDM
Modulation type:	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Transition Rate:	802.11 b: 1/2/5.5/11 Mbps; 802.11 g: 6/9/12/18/24/36/48/54 Mbps
Antenna Designation:	PIFA Antenna / -3.6dBi.

The EUT is compliance with IEEE 802.11 b/g Standard.

Bluetooth:

Bluetooth Version	<input type="checkbox"/> V1.1 (GFSK) <input type="checkbox"/> V1.2 (GFSK) <input type="checkbox"/> V2.0 (GFSK) <input type="checkbox"/> V2.0 + EDR (GFSK + /4DQPSK + 8DPSK) <input checked="" type="checkbox"/> V2.1 + EDR (GFSK + /4DQPSK + 8DPSK)
Frequency Range	2402 – 2480MHz
Channel number	79 channels max.
Rated Power	1.93 dBm (Peak)
Modulation type	Frequency Hopping Spread Spectrum
Antenna Designation	PIFA Antenna / -3.9dBi.

The EUT is compliance with Bluetooth 2.1 Standard.

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RFID:

Operating Frequency	13.56MHz
Transmit Power	< 123dBuV/m at 3m.
Number of Channels	1
Operating Mode	Point-to-Point
Antenna Type	A permanent fixed antenna, which is built-In, designed as an indispensable part of the EUT.
Module Type	ASK

The EUT is compliance with RFID Standard.

This report applies for RFID.

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1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: XKBIWP250** filing to comply with Section 15.407 of the FCC Part 15, Subpart E Rules and **IC: 2589D-IWP250** filing to comply with Industry Canada RSS-210 issue 7: 2007 Annex 2. The composite system (digital device) is compliance with Subpart B is authorized under a DoC procedure..

1.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (2003) and RSS-Gen: 2007.. Radiated testing was performed at an antenna to EUT distance 3 meters.

1.4 Test Facility

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei Country, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003. FCC Registration Number are: 990257 and 236194, Canada Registration Number: 4620A-1.

The 10 m Open Area Test Sites located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 29, Pau-Tou-Tsuo Valley Chia-Pau Tsuen, Linkou Hsiang, Taipei county, which is constructed and calibrated to meet the CISPR 22/EN 55022 requirements. SGS Site No. 1(3 &10 meters) and FCC Registration Number: 94644.

1.5 Special Accessories

Not available for this EUT intended for grant.

1.6 Equipment Modifications

Not available for this EUT intended for grant.

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2 System Test Configuration

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The Transmitter was operated in the normal operating mode. the Tx frequency was fixed which was for the purpose of the measurements.

2.3 Test Procedure

2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 7 and 13 of ANSI C63.4-2003. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and average detector mode.

2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter(EUT) was rotated through three orthogonal axes according to the requirements in Section 8 and 13 of ANSI C63.4-2003.

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2.4 Limitation

(1) Conducted Emission

According to section 15.207(a) Conducted Emission Limits is as following.

Frequency range MHz	Limits dB (uV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Note

- The lower limit shall apply at the transition frequencies
- The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

(2) Radiated Emission

- The field strength of any emission within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.
- Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.
- Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.
- The field strength of any emissions appearing outside of the 13.110-14.010 MHz shall not exceed the general radiated emission limits in section 15.209(Intentional Radiators general limit).as below.

Frequency (MHz)	Field strength $\mu\text{V/m}$	Distance (m)	Field strength at 3m $\text{dB}\mu\text{V/m}$
1.705-30	30	30	69.54
30-88	100	3	40
88-216	150	3	43.5
216-960	200	3	46
Above 960	500	3	54

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- Remark:
1. Emission level in dBuV/m=20 log (uV/m)
 2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
 3. Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of ξ 15.205 & RSS210 2.2.7
 4. Emission spurious frequency which appearing within the Restricted Bands specified in provision of ξ 15.205 & RSS210 2.2.7, then the general radiated emission limits in ξ 15.209 & RSS210 2.2.7

(3) Frequency Tolerance

The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency over a temperature variation of 5 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

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2.5 Configuration of Tested System

Fig. 2-1 Configuration of Tested System

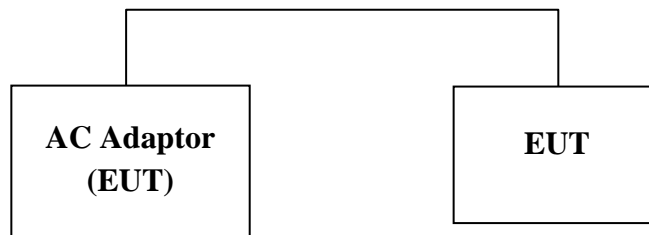


Table 2-1 Equipment Used in Tested System

Equipment	Mfr/Brand	Model/ Type No.	FCC ID	Series No.
Adaptor	EDAC	EA11002B	N/A	N/A

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3 Summary of Test Results

FCC Rules	Description Of Test	Result
§15.207 & RSS-Gen §7.2.2	Conducted Emission	Compliant
§15.225 (a), (d) & RSS210 2.2.7	Radiated Emission	Compliant
§15.225 (e) & RSS210 Annex 2 A2.6	Frequency Stability	Compliant

4 Description of test modes

The EUT stay in continuous transmitting mode. The frequency 13.56 MHz is chosen for radiated emission testing.

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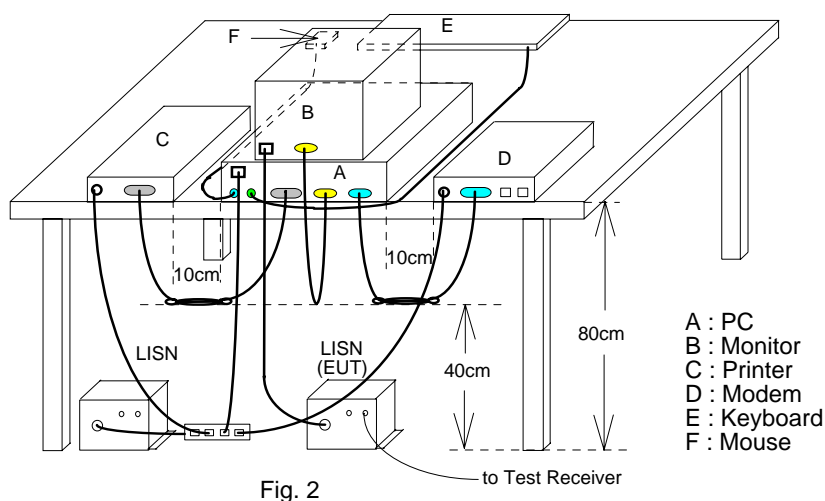
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5 Conducted Emissions Test

5.1 Measurement Procedure:

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

5.2 Test SET-UP (Block Diagram of Configuration)



5.3 Measurement Equipment Used:

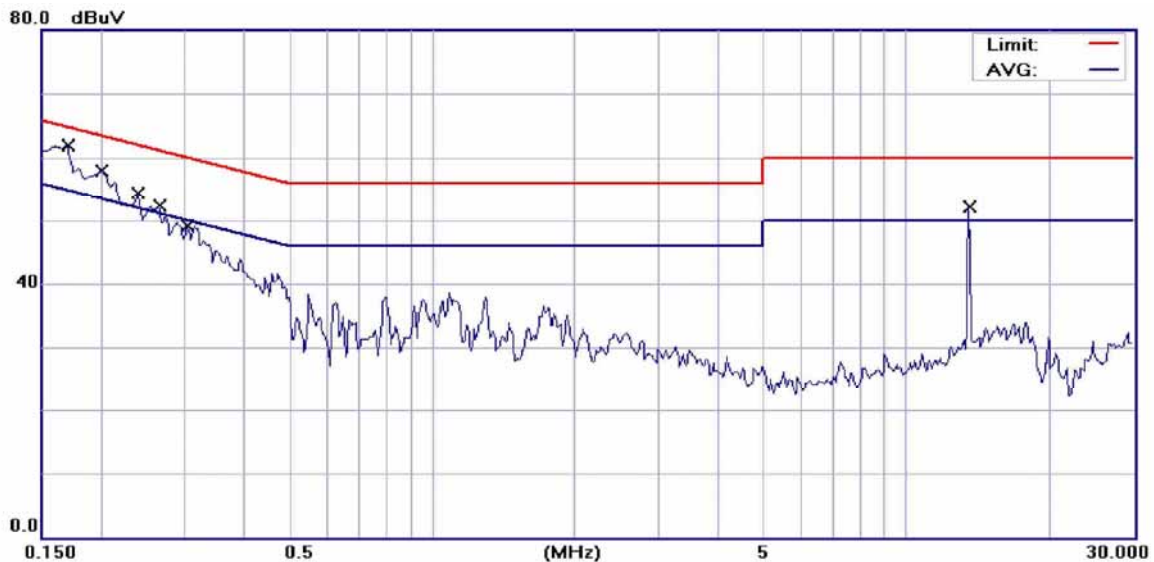
Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EMI Test Receiver	R&S	ESCS30	828985/004	09/16/2008	09/15/2009
LISN	Rolf-Heine	NNB-2/16Z	99012	04/28/2009	04/27/2010
LISN	FCC	FCC-LISN-50/250-25-2-01	04034	04/28/2009	04/27/2010
Coaxial Cables	N/A	WK CE Cable	N/A	10/30/2008	10/29/2009

5.4 Measurement Result:

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peak.

AC POWER LINE CONDUCTED EMISSION TEST DATA

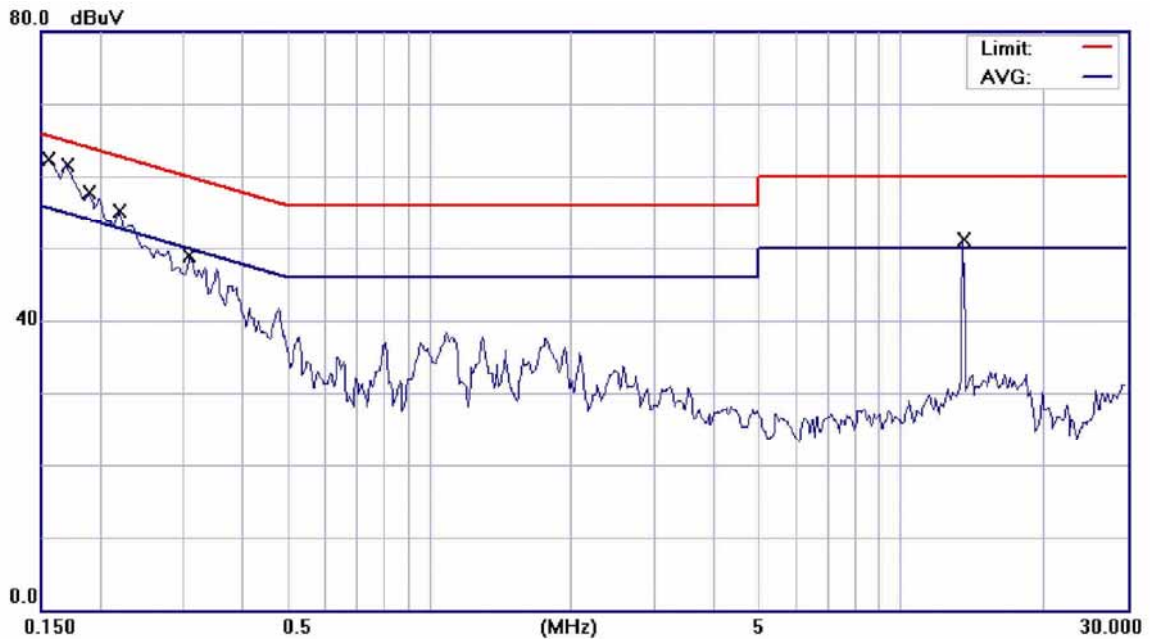
Operation Mode:	RFID Operation Mode			Test Date:	Jul. 20, 2009
Temperature:	23 °C	Humidity:	60 %	Test By:	Jason



Site: SGS CONDUCTED #1 Phase: **L1** Temperature: 23 °C
 Limit: CISPR22/11/EN55022 Class B Power: AC 120V/60Hz Humidity: 60 %
 EUT: POS terminal Distance: Air Pressure: hpa
 M/N: M82-250
 Note: NFC Operation mode

No.	Mk.	Freq. MHz	Reading Level dBuV	Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	*	0.1694	53.69	0.15	53.84	64.99	-11.15	QP	
2		0.1694	38.81	0.15	38.96	54.99	-16.03	AVG	
3		0.1997	50.04	0.12	50.16	63.62	-13.46	QP	
4		0.1997	30.06	0.12	30.18	53.62	-23.44	AVG	
5		0.2393	45.92	0.11	46.03	62.12	-16.09	QP	
6		0.2393	23.95	0.11	24.06	52.12	-28.06	AVG	
7		0.2643	43.83	0.11	43.94	61.30	-17.36	QP	
8		0.2643	22.18	0.11	22.29	51.30	-29.01	AVG	
9		0.3040	40.84	0.10	40.94	60.13	-19.19	QP	
10		0.3040	29.84	0.10	29.94	50.13	-20.19	AVG	
11		13.5554	25.96	0.41	26.37	60.00	-33.63	QP	
12		13.5554	20.34	0.41	20.75	50.00	-29.25	AVG	

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Site SGS CONDUCTED #1	Phase: N	Temperature: 23 °C
Limit: CISPR22/11/EN55022 Class B	Power: AC 120V/60Hz	Humidity: 60 %
EUT: POS terminal	Distance:	Air Pressure: hpa
M/N: M82-250		
Note: NFC Operation mode		

No.	Mk.	Freq.	Reading Level	Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1	*	0.1548	54.50	0.19	54.69	65.74	-11.05	QP	
2		0.1548	39.63	0.19	39.82	55.74	-15.92	AVG	
3		0.1695	52.44	0.17	52.61	64.98	-12.37	QP	
4		0.1695	38.03	0.17	38.20	54.98	-16.78	AVG	
5		0.1894	50.12	0.15	50.27	64.06	-13.79	QP	
6		0.1894	29.48	0.15	29.63	54.06	-24.43	AVG	
7		0.2195	46.72	0.14	46.86	62.84	-15.98	QP	
8		0.2195	26.98	0.14	27.12	52.84	-25.72	AVG	
9		0.3095	39.87	0.12	39.99	59.98	-19.99	QP	
10		0.3095	31.20	0.12	31.32	49.98	-18.66	AVG	
11		13.5353	25.08	0.43	25.51	60.00	-34.49	QP	
12		13.5353	19.06	0.43	19.49	50.00	-30.51	AVG	

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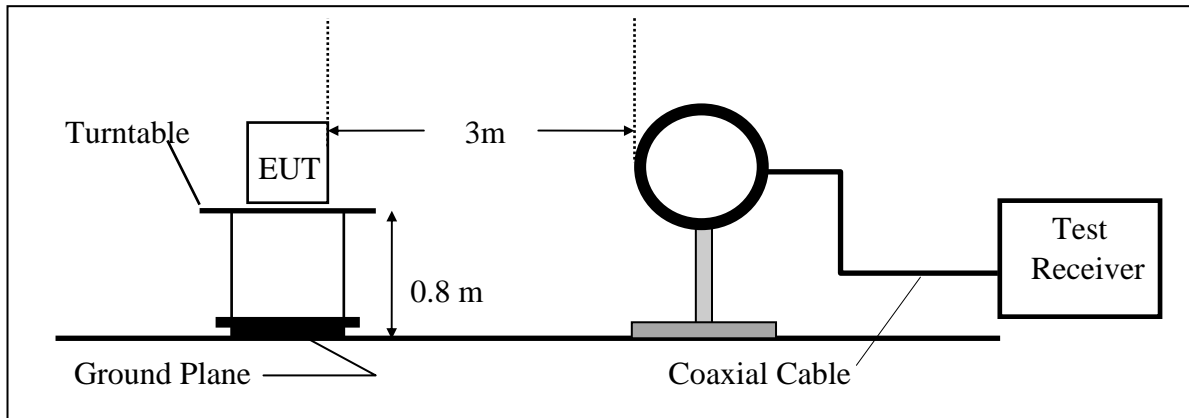
6 Radiated Emission Test

6.1 Measurement Procedure

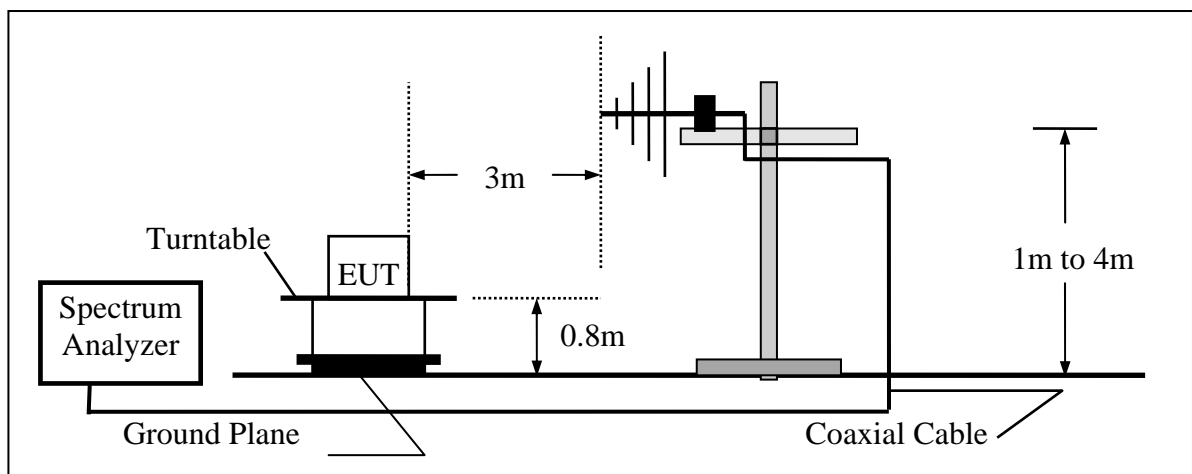
1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measured were complete.

6.2 Test SET-UP (Block Diagram of Configuration)

(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency Below 1000MHz



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6.3 Measurement Equipment Used:

966 Chamber					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	R&S	FSP 40	100034	02/22/2009	02/21/2010
Bilog Antenna	SCHWAZBECK	VULB9160	9160-3136	11/15/2008	11/14/2009
Loop antenna	MESSTEC	FLA30	03/10086	06/06/2009	06/05/2011
Pre-Amplifier	Agilent	8447D	1937A02834	11/30/2008	11/29/2009
Pre-Amplifier	Agilent	8449B	3008A01973	01/05/2009	01/04/2010
Turn Table	HD	DT420	N/A	N.C.R	N.C.R
Antenna Tower	HD	MA240-N	240/657	N.C.R	N.C.R
Controller	HD	HD100	N/A	N.C.R	N.C.R
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-10M	10m	01/05/2009	01/04/2010
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	01/05/2009	01/04/2010

6.4 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

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6.5 Measurement Result

Operation Mode: Transmitting Mode
Fundamental Frequency: 13.56 MHz
Temperature : 25 °C
Humidity : 65 %

Test Date : Jul. 20, 2009
Test By: Jason
Pol: Vertical

Freq. (MHz)	Ant.Pol. H/V	Detector		Factor (dB)	Actual FS (dBuV/m)	Limit@3m (dBuV/m)	Safe Margin (dB)	Note
		Mode (PK/AV/QP)	Reading (dBuV)					
13.56	V	Peak	68.93	-5.30	63.63	123.99	-60.36	F
27.12	V	Peak	--					
40.68	V	Peak	--					
54.24	V	Peak	--					
67.80	V	Peak	--					
81.36	V	Peak	--					
94.92	V	Peak	--					
108.48	V	Peak	--					
122.04	V	Peak	54.39	-14.56	39.83	69.54	-29.71	H
135.60	V	Peak	--					
51.34	V	Peak	49.72	-14.19	35.53	40.00	-4.47	E
119.24	V	Peak	55.32	-15.32	40.00	43.50	-3.50	E
208.48	V	Peak	55.63	-15.32	40.31	43.50	-3.19	E
363.68	V	Peak	50.30	-11.27	39.03	46.00	-6.97	E
405.39	V	Peak	52.11	-9.86	42.25	46.00	-3.75	E
611.03	V	Peak	47.27	-5.79	41.48	46.00	-4.52	E
669.23	V	Peak	45.97	-5.03	40.94	46.00	-5.06	E

Remark :

- (1) Measuring frequencies from 25 MHz to the 1GHz.
- (2) Radiated emissions measured in frequency range from 25 MHz to 1000MHz were made with an instrument using Peak detector mode.
- (3) "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.
- (4) Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) The IF bandwidth of SPA between 25MHz to 30MHz was 10KHz; 30MHz to 1GHz was 100KHz.

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Operation Mode: Transmitting Mode
Fundamental Frequency: 13.56 MHz
Temperature : 25 °C
Humidity : 65 %

Test Date : Jul. 20, 2009
Test By: Jason
Pol: Horizontal

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/AV/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit@3m (dBuV/m)	Safe Margin (dB)	Note
13.56	H	Peak	83.23	-5.30	77.93	123.99	-46.06	F
27.12	H	Peak	--					
40.68	H	Peak	--					
54.24	H	Peak	52.41	-14.19	38.22	40.00	-1.78	H
67.80	H	Peak	--					
81.36	H	Peak	--					
94.92	H	Peak	--					
108.48	H	Peak	--					
122.04	H	Peak	--					
135.60	H	Peak	--					
187.23	H	Peak	56.13	-14.78	41.35	43.50	-2.15	E
208.48	H	Peak	56.86	-15.32	41.54	43.50	-1.96	E
264.74	H	Peak	58.28	-13.59	44.69	46.00	-1.31	E
405.39	H	Peak	54.51	-9.86	44.65	46.00	-1.35	E
419.94	H	Peak	53.74	-9.39	44.35	46.00	-1.65	E
557.68	H	Peak	50.38	-7.41	42.97	46.00	-3.03	E
606.18	H	Peak	50.51	-5.88	44.63	46.00	-1.37	E

Remark :

- (1) Measuring frequencies from 25 MHz to the 1GHz.
- (2) Radiated emissions measured in frequency range from 25 MHz to 1000MHz were made with an instrument using Peak detector mode.
- (3) "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.
- (4) Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) The IF bandwidth of SPA between 25MHz to 30MHz was 10KHz; 30MHz to 1GHz was 100KHz.

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Operation Mode: RX Mode
Fundamental Frequency: 13.56 MHz
Temperature : 25 °C
Humidity : 65 %

Test Date : Jul. 20, 2009
Test By: Jason
Pol: Vertical

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/AV/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit@3m (dBuV/m)	Safe Margin (dB)	Note
119.24	V	Peak	53.86	-15.32	38.54	43.50	-4.96	E
177.44	V	Peak	48.20	-14.38	33.82	43.50	-9.68	E
216.24	V	Peak	50.79	-15.05	35.74	46.00	-10.26	E
358.83	V	Peak	47.97	-11.43	36.54	46.00	-9.46	E
424.79	V	Peak	44.51	-9.27	35.24	46.00	-10.76	E
550.89	V	Peak	44.93	-7.62	37.31	46.00	-8.69	E
606.18	V	Peak	46.56	-5.88	40.68	46.00	-5.32	E
676.99	V	Peak	46.10	-4.98	41.12	46.00	-4.88	E

Remark :

- (1) Measuring frequencies from 25 MHz to the 1GHz.
- (2) Radiated emissions measured in frequency range from 25 MHz to 1000MHz were made with an instrument using Peak detector mode.
- (3) "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.
- (4) Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) The IF bandwidth of SPA between 25MHz to 30MHz was 10KHz; 30MHz to 1GHz was 100KHz.

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Operation Mode: RX Mode
Fundamental Frequency: 13.56 MHz
Temperature : 25 °C
Humidity : 65 %

Test Date : Jul. 20, 2009
Test By: Jason
Pol: Horizontal

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/AV/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit@3m (dBuV/m)	Safe Margin (dB)	Note
38.73	H	Peak	47.51	-13.84	33.67	40.00	-6.33	E
119.24	H	Peak	52.55	-15.32	37.23	43.50	-6.27	E
216.24	H	Peak	51.87	-15.05	36.82	46.00	-9.18	E
255.04	H	Peak	51.69	-13.69	38.00	46.00	-8.00	E
412.18	H	Peak	46.73	-9.59	37.14	46.00	-8.86	E
552.83	H	Peak	49.14	-7.56	41.58	46.00	-4.42	E
609.09	H	Peak	50.91	-5.83	45.08	46.00	-0.92	E
674.08	H	Peak	47.22	-4.97	42.25	46.00	-3.75	E

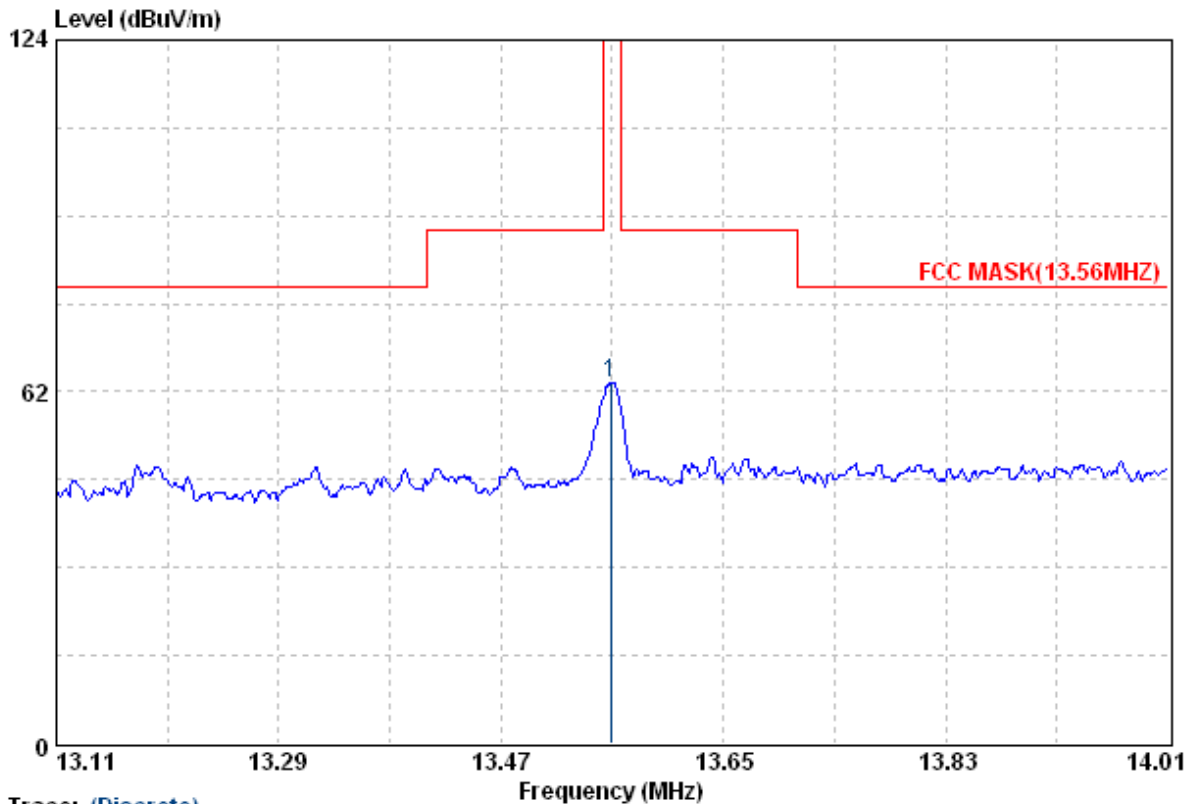
Remark :

- (1) Measuring frequencies from 25 MHz to the 1GHz.
- (2) Radiated emissions measured in frequency range from 25 MHz to 1000MHz were made with an instrument using Peak detector mode.
- (3) "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.
- (4) Data of measurement within this frequency range shown "- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) The IF bandwidth of SPA between 25MHz to 30MHz was 10KHz; 30MHz to 1GHz was 100KHz.

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Radiated Mask



Trace: (Discrete)

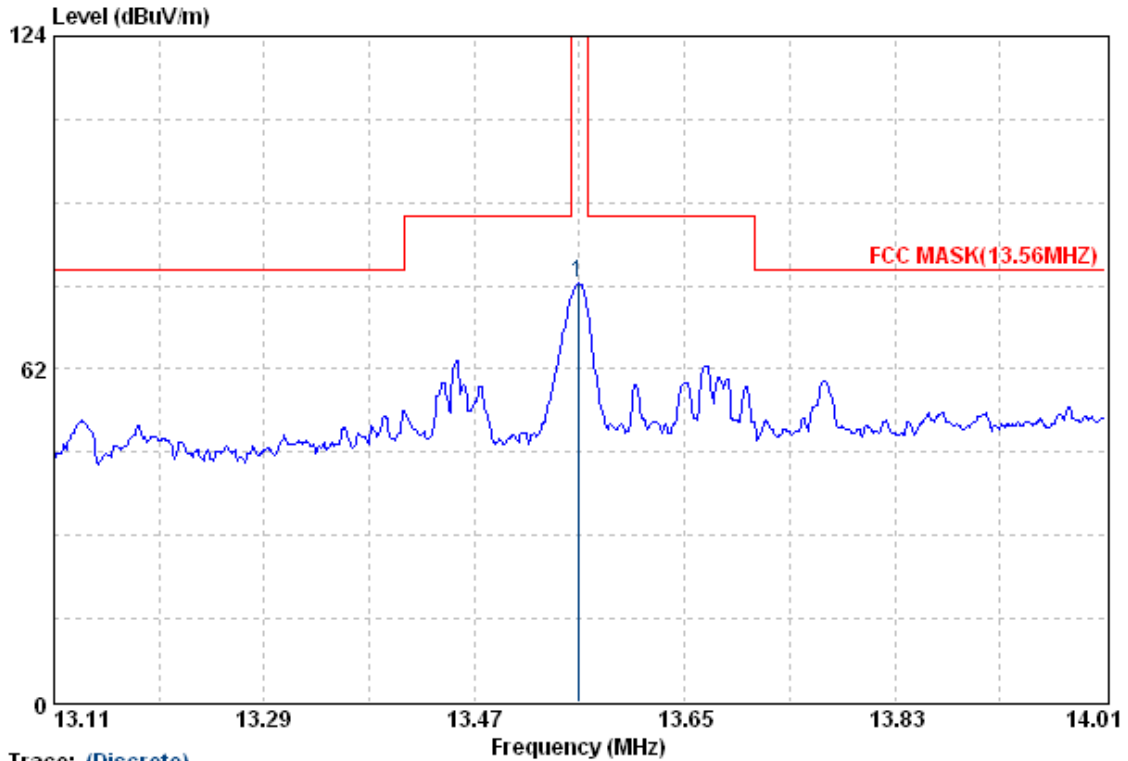
Site : RF SITE
 Condition : FCC MASK(13.56MHZ) 3m FLA30 VERTICAL
 Project No. : EH/2009/30032
 Applicant : INGENICO
 EUT Description : POS Terminal
 EUT Model : M82-250
 Test Mode : H Plan//TX Mode
 Temp./Humid. : 25/65
 Operator : Jason

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1 @	13.56	68.93	-5.30	63.63	124.00	-60.37	Peak

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Radiated Mask



Trace: (Discrete)

Site : RF SITE
Condition : FCC MASK(13.56MHz) 3m FLA30 HORIZONTAL
Project No. : EH/2009/30032
Applicant : INGENICO
EUT Description : POS Terminal
EUT Model : M82-250
Test Mode : H Plan//TX Mode
Temp./Humid. : 25/65
Operator : Jason

	Read		Limit	Over	
Freq	Level	Factor	Level	Line	Limit
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB
1 @	13.56	83.23	-5.30	77.93	124.00 -46.07 Peak

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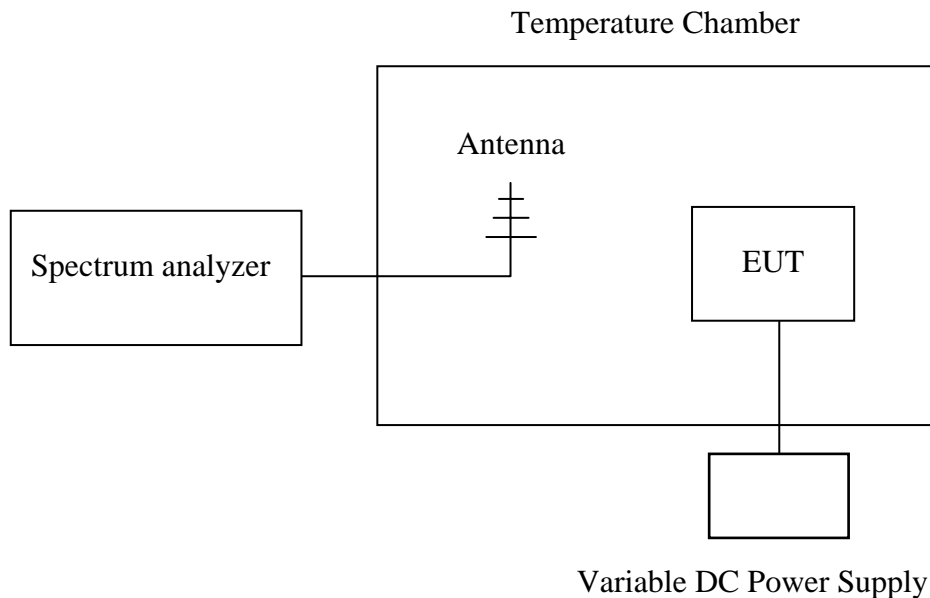
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7 Frequency Tolerance

7.1 Measurement Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set EUT as normal operation
3. Set SPA Center Frequency = fundamental frequency, RBW, VBW= 10kHz, Span =100kHz.
4. Set SPA Max hold. Mark peak, -26dB.

7.2 Test SET-UP (Block Diagram of Configuration)



7.3 Measurement Equipment Used:

Same as 6.2 Radiated Emission Measurement.

7.4 Measurement Results

Refer to attached data chart.

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A. Temperature Variation

Power Supply	Environment	Frequency	Delta (Hz)	Limit (KHz)
Vdc	Temperature (°C)	(MHz)		
24	5	13.560486	-30.00	+/- 1.356
24	10	13.560462	-6.00	+/- 1.356
24	20	13.560456	0.00	+/- 1.356
24	30	13.560526	-70.00	+/- 1.356
24	40	13.560513	-57.00	+/- 1.356
24	50	13.560509	-53.00	+/- 1.356

B. Supply Voltage Variation

Power Supply	Environment	Frequency	Delta (Hz)	Limit (KHz)
Vdc	Temperature (°C)	(MHz)		
27.6	20	13.560513	-57.00	+/- 1.356
24	20	13.560456	0.00	+/- 1.356
20.4	20	13.560501	-45.00	+/- 1.356

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8. 99% OCCUPIED BANDWIDTH MEASUREMENT

8.1 Test Set-up:

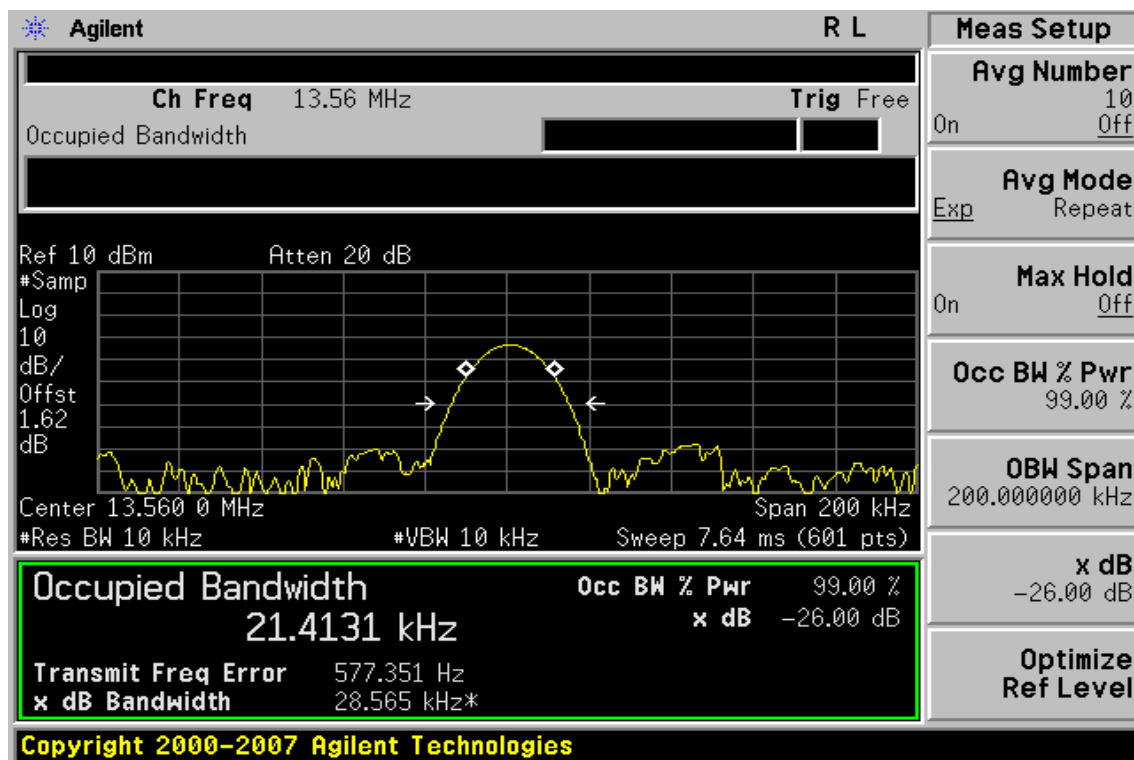
Refer to section 6.2 in this report

8.2 Measurement Procedure:

The EUT's output RF connector was connected with a short cable to the spectrum analyzer, RBW (10KHz) was set to about 1% of emission BW, VBW= 3 times RBW(10KHz), -26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.

8.3 Measurement Equipment Used:

Refer to section 6.3 in this report



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