FCC MEASUREMENT REPORT

CERTIFICATION OF COMPLIANCE
FCC PART 15C CERTIFICATION

PRODUCT	:	**RFID with Finger Printer**
MODEL/TYPE NO	:	**LX007**
FCC ID	:	**OYULX007**
TRADE NAME	:	IDTECK **IDTECK Co., Ltd.**
APPLICANT	:	**5F , Ace Techno Tower B/D, 684-1 Deungchon-Dong, Gangseo-Gu, Seoul 157-030, Korea** **Attn. : Yun, Eun Ju / Senior Engineer**
CLASSIFICATION	:	**DCD Low Power Transmitter Below 1705 kHz**
RULE PART(S)	:	**FCC Part 15 Subpart C**
FCC PROCEDURE	:	**Certification**
DATES OF TEST	:	**April 1, 2008 to May 2, 2008**
DATES OF ISSUE	:	**May 8, 2008**
TEST REPORT No.	:	**BWS-08-RF-0005**
TEST LAB.	:	**BWS TECH Inc.(FCC Registration Number : 553281)**

This RFID with Finger Printer LX007 has been tested in accordance with the measurement procedures specified in ANSI C63.4-2003 and ANSI/TIA-603-B-2002 at the BWS TECH/EMC Test Laboratory and has been shown to be complied with the electromagnetic radiated emission limits specified in FCC Rule Part 15 Subpart C.
I attest to the accuracy of data. All measurement herein was performed by me or were made under my supervision. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them. The results of testing in this report apply to the product/system, which was tested only. Other similar equipment may not necessarily produce the same results due to production tolerance and measurement uncertainties.

May 8, 2008
(Date)

Tested by **CY-Choi**

May 8, 2008
(Date)

Reviewed by **TaeHyun, Nam**

BWS TECH Inc.
www.bws.co.kr
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FCC TEST REPORT

Scope – *Measurement and determination of electromagnetic emission(EME) of radio frequency devices including intentional radiators and/or unintentional radiators for compliance with the technical rules and regulations of the U.S Federal Communications Commission(FCC)*

1. General Information

Applicant

Company Name	IDTECK Co., Ltd.
Company Address	5F , Ace Techno Tower B/D, 684-1 Deungchon-Dong, Gangseo-Gu, Seoul 157-030, Korea
Phone/Fax	Yun, Eun Ju / Senior Engineer / c4452851@idteck.com Tel No. : +82.2.2659.0055 Fax No. : +82.2.2659.0086

Manufacturer

Company Name	IDTECK Co., Ltd.
Company Address	5F , Ace Techno Tower B/D, 684-1 Deungchon-Dong, Gangseo-Gu, Seoul 157-030, Korea
Phone/Fax	Tel No. : +82.2.2659.0055 Fax No. : +82.2.2659.0086

● **EUT Type**	RFID With Finger Printer
● **Model Number**	LX007
● **FCC Identifier**	OYULX007
● **S/N**	ProtoType
● **FCC Rule Part(s)**	Part 15 Subpart C
● **FCC Classification**	DCD : Low Power Transmitter Below 1705 kHz
● **Freq. Range**	125 kHz
● **Channel**	Single Channel
● **Modulation Method**	ASK
● **Test Procedure**	ANSI C63.4-2003 and ANSI/TIA-603-B-2002
● **Dates of Tests**	April 1, 2008 to May 2, 2008
● **Dates of Issue**	May 8, 2008
● **Place of Tests**	BWS TECH Inc.(FCC Registration Number : 553281) #611-1 Maesan-Ri, Mohyeon-Myeon, Yongin-Si, Gyeonggi-Do, 449-853 Korea TEL: +82 31 333 5997 FAX: +82 31 333 0017

2. Description of Test Facility

The measurement for radiated and conducted emission test were conducted at the open area test site of BWS TECH Inc. facility located at #611-1 Maesan-Ri, Mohyeon-Myeon, Yongin-Si, Gyeonggi-Do, 449-853 Korea. The site is constructed in conformance with the requirements of the ANSI C63.4-2003 and CISPR Publication 16. The BWS TECH measurement facility has been filed to the Commission with the FCC for 3 and 10-meter site configurations. Detailed description of test facility was found to be in compliance with the requirements of Section 2.948 FCC Rules according to the ANSI C63.4-2003 and registered to the Federal Communications Commission (Registration Number : 553281).

The measurement procedure described in American National Standard for Method of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz (ANSI C.63.4-2003) was used in determining radiated and conducted emissions from the IDTECK Co., Ltd. RFID With Finger Printer Model : LX007.

3. Product Information

The Equipment Under Test (EUT) is the IDTECK Co., Ltd. RFID with Finger Printer model: LX007 (FCC ID: OYULX007).

The **LX007** is ideal to use for Single Door Access Control and Time & Attendance. The **LX007** has 4 input ports, 2 Form-C relay outputs, 2 TTL outputs, an RS232/RS485 communication port and an optional TCP/IP communication port to meet various customer requirements.

The **LX007** has a built-in Fingerprint Module, a proximity card reader with IDC 26bit Wiegand format and a 24-key keypad (10 numeric keys, 2 control keys and 12 function keys) for a wide range of applications. The **LX007** allows access to the door with any combination of a fingerprint, Proximity Card/PIN and/or password. The **LX007** has 4 external input ports to be connected to an exit button, a motion detector, a door contact sensor and an existing alarm system to prevent unauthorized access.

3.1 DC Voltage and Currents

The DC voltages applied to and DC currents into the several elements of the final radio frequency amplifying stage for normal operation over power range were;

12.0 Volts, 0.650 Ampare

3.2 Emission Designator

Type of Emission : A1D

Necessary Bandwidth and Emission Bandwidth:
Bn = 1.92 kHz

Calculation:

Bound Rate (B) : 9600
Constant Factor(k) : 1

Bn = 2BK

3.3 General Specification

Model			LX007
CPU			32bit ARM9, 8bit and 16bit Microprocessor
Memory	Fingerprint Module	Program Memory	128KByte ROM
		Data Memory	128KByte / 256KByte / 512KByte Flash Memory
	Controller	Program Memory	256KByte ROM
		Data Memory	512KByte Flash Memory
Fingerprint User			1,000/2,000/4,000 Fingerprint Users
Fingerprint Templates Size			800 Bytes for 2 Fingerprint Temperlates
ID User			10,000 / 20,000 Users (Selectable)
Event Buffer			20,000 / 10,000 Event Buffers (Selectable)
Read Range		Passive Type	IDK50 / IMC125 : Up to 2 inches (5Cm) IDC80 / IDC170 : Up to 4 inches (10Cm) IDA150 / IDA200compatible
		Active Type	
Reading Time (Card)			30ms
Verification Time			Less than 1sec.
Identification Time			Less than 2sec.
Power / Current			DC 12V / Max.650mA
External Reader Port			1ea(26bit Wiegand, 4 / 8bit Burst for PIN) for Anti-Pass Back
Communication			RS232 / RS485 (Max.32ch) TCP/IP (Internal LAN Converter Required / Optional)
Baud Rate			19,200bps(recommended) / 9,600bps / 38,400bps / 57,600bps (selectable)
Input Port			4ea(Exit Button, Door Sensor, Aus#1 , Aux#2)
Output Port			2ea(2 FORM-C Relay Output (COM, NO, NC) / DC12V ~ 18V, Rating Max.2A)
			2ea(TTL Output / DC5V, Rating Max.20mA)
LCD			Graphic LCD(128x64 dots) 72.5mmx39.5mm (2.85”x1.56”)Screen
Keypad			24-key keypad with Back Lighting (12 Function Keys included)

Language	LCD Display	English, Spanish, Portugueses (Selectable) Arabic, Chinese, Korean, Japanese (Optional)
	Voice Output	English, Spanish, Portugueses, Arabic, Chinese, Korean, Japanese (Programmable)
LED Indicator		3Array LED indicators (Red, Green and Yellow)
Beeper		Piezo Buzzer
Operating Temperature	Fingerprint Module	-15℃ to +40℃(+5°F to +104°F)
	LCD	0℃ to +50℃(+32°F to +122°F)
	Controller	-15℃ to +70℃(+5°F to +158°F)
	RF Reader	-35℃ to +65℃(-31°F to +149°F)
Operating Humidity		10%to90% relative humidity (non-condensing)
Color / Material		Black, Red, Gray, Silver, Dark Gray, Gold, Black & Gold Combo / Polycarbonate
Dimension (WxHxT)		192mmx160mx45mm (7.56”x6.29”x1.77mm)
Weight		800g(1.76lbs)

Fingerprint Module Specifications

Resolution	500dpi
Capture Image Size	412 x 302 pixels
Extraction Image Size	260 x 300 pixels
Sensing Area	13mm x 15.2mm
Scanner	High Qualit Optical Sensor
FAR(False Acceptance Ratio)	0.001%
FRR(False Reject Ratio)	0.1%
ESD(Electro Static Discharge)	15KV
Verification Time	Less than 1 sec.
Identificaion Time	Less than 2 sec.

4. Summary of Test Results

TEST REQUIREMENTS	FCC Paragraph	Result
Power Line Conducted Emission	§15.207	Pass
Radiated Emission	§15.209	Pass
Occupied Bandwidth	§15.215	Pass

5. TEST DATA

5.1 Power Line Conducted Emission

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 kHz on the 230V AC power and return leads of the EUT according to the methods defined in FCC Part 15.207. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown in section 3.1.5. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position producing maximum conducted emissions.

5.1.1 Test Condition

Frequency Range of Test : 150 kHz to 30 MHz

Test Standard : FCC Part 15.207

5.1.2 Test Standard

Frequency Range (MHz)	Limit (dBuV)	
	Quasi-Peak	Average
0.15 ~ 0.5	66 – 56	56 – 46
0.5 ~ 5	56	46
5 ~ 30	60	50

5.1.3 Test Equipment List

Equipment Type	Model	Manufacture	Serial No	Cal Due Date
TEST RECEIVER	ESPI	ROHDE & SCHWARZ	100012	11. 02. 2008
Conducted Cable	N/A	N/A	N/A	N/A
LISN Multiline	L1-115	Com-power	241018	11. 19. 2008
LISN	NSLK 8127	SCHWARZBECK MESS-ELEKTRONIK	8127-414	12. 11. 2008

5.1.4 Test Result of Power Line Conducted Emission

EUT : LX007

Input Voltage : 230V, 50Hz

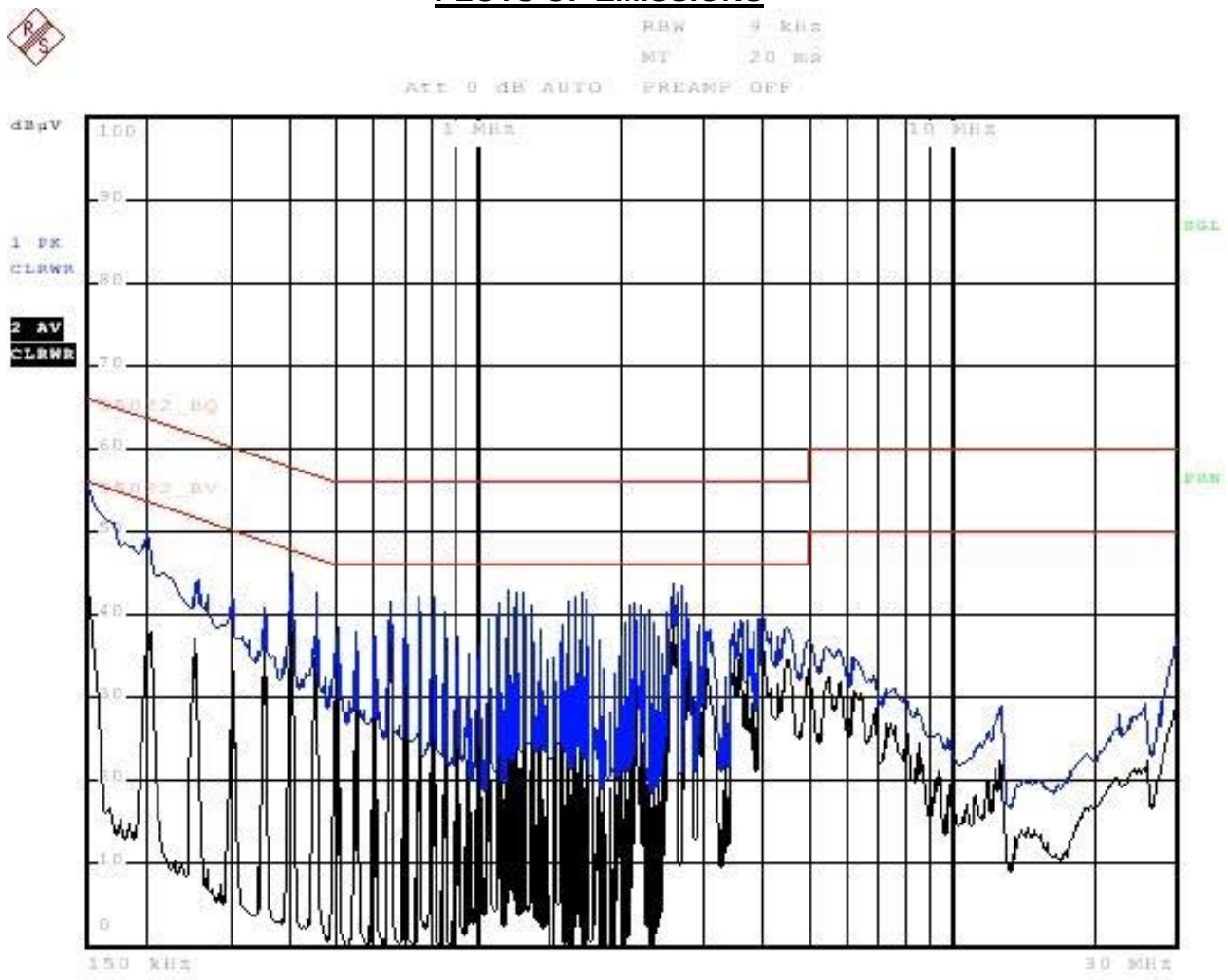
Power Line Conducted Emission Test Results : **PASS**

Test data sheets follow.

Freq [MHz]	Correction		Phase [H/N]	Quasi-Peak Mode				Average Mode			
	AMN	C.L		Limit	Reading	Emission Level	Margin	Limit	Reading	Emission Level	Margin
				[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]
0.150	0.06	0.03	H	66.00	55.61	55.70	10.30	56.00	43.15	43.24	12.76
0.198	0.06	0.03	H	64.70	49.87	49.96	14.74	54.70	37.82	37.91	16.79
0.250	0.07	0.16	N	63.10	45.40	45.63	17.47	53.10	37.42	37.65	15.45
0.350	0.08	0.24	H	60.30	40.69	41.01	19.29	50.30	35.76	36.08	14.22
0.402	0.08	0.26	H	58.90	44.93	45.27	13.63	48.90	40.06	40.40	8.50
0.450	0.07	0.28	H	57.40	42.74	43.09	14.31	47.40	39.95	40.30	7.10
0.702	0.07	0.30	N	56.00	42.89	43.26	12.74	46.00			
1.150	0.04	0.42	H		43.00	43.46	12.54				
1.650	0.03	0.50	H		42.72	43.25	12.75				
2.150	0.03	0.56	H		41.25	41.84	14.16				
2.602	0.03	0.58	H		43.60	44.21	11.79				
5.002	0.05	0.87	H	60.00	36.88	37.80	22.20	50.00			
5.054	0.05	0.87	H		36.70	37.62	22.38				
5.102	0.05	0.87	N		36.50	37.42	22.58				
30.000	0.28	1.68	H		37.30	39.26	20.74				

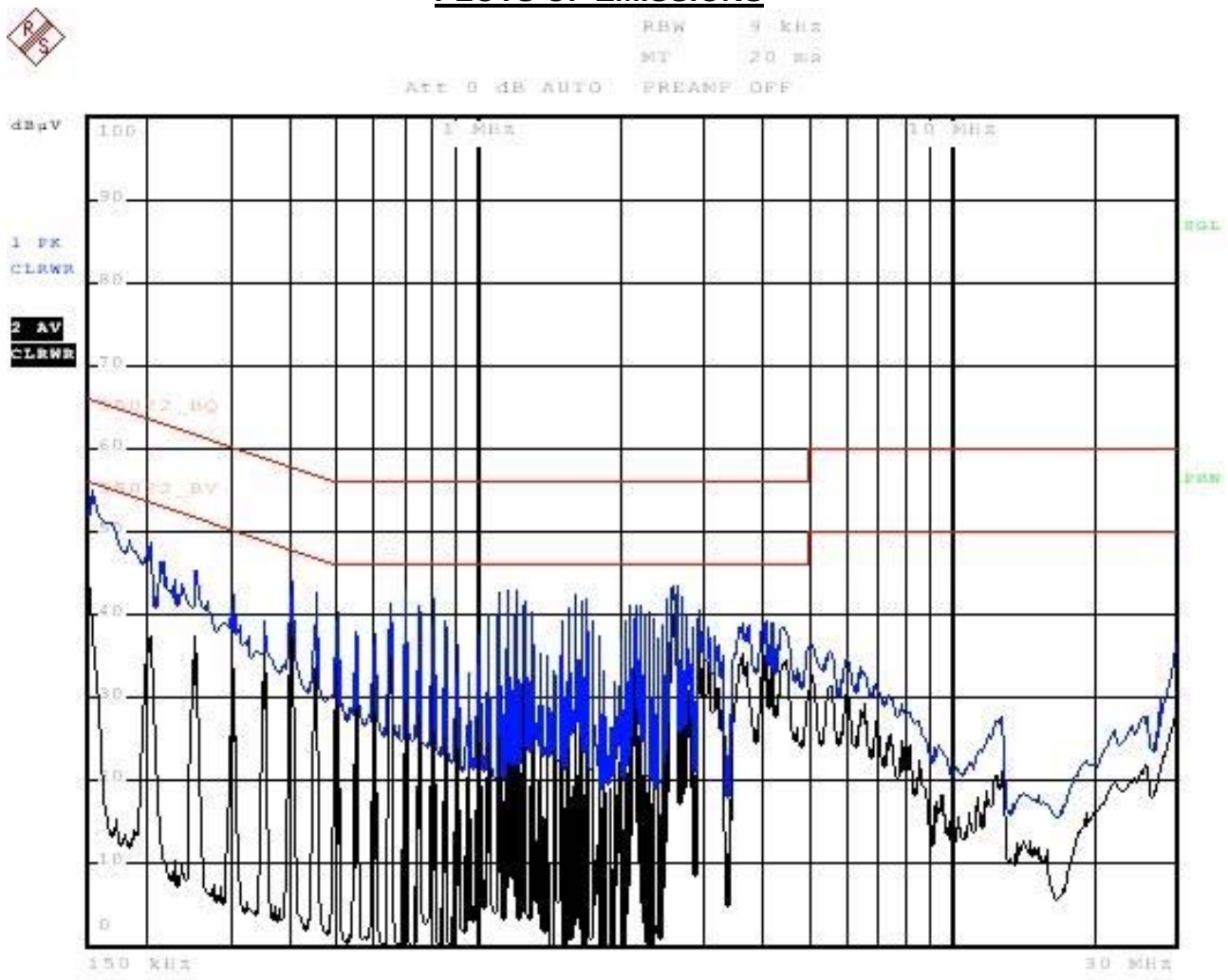
Notes:
1. All modes of operation were investigated and the worst-case emissions are reported.
See the plots in next 2 pages.
2. Line N = (Neutral), Line H = (Hot)
3. Measurement uncertainty estimated at ±1.38 dB.
The measurement uncertainty is given with a confidence of 95.45 % with the coverage factor, k=2

PLOTS OF EMISSIONS



Test Model: LX007
Test Mode: HOT
Classification: FCC Part 15.207

PLOTS OF EMISSIONS



Test Model: LX007
Test Mode: NEUTRAL
Classification: FCC Part 15.207

5.2 Radiated Emission

Radiated emissions form 30 MHz to 1000 MHz were measured with a bandwidth of 120 kHz according to the methods defines in FCC Part 15.209. The EUT was placed on a nonmetallic stand in the open-field site, 0.8 meter above the ground plane. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions.

5.2.1 Test Condition

Frequency Range of Test : 9 kHz to 1 GHz

Test Standard : FCC Part 15.209

5.2.2 Test Standard

Frequency Range (MHz)	Field Strength (uV/m)	Distance (m)
0.009 ~ 0.490	2400 / F	300
0.490 ~ 1.705	24000 / F	30
1.705 ~ 30	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

5.2.3 Test Equipment List

Equipment Type	Model	Manufacture	Serial No	Cal Due Date
Loop Antenna	HFH2-Z2	ROHDE & SCHWARZ	881056/6	08. 22. 2008
Bilog Antenna	VULB 9160	SCHWARZBECK	9160-3122	12. 29. 2008
Open Site Cable	N/A	N/A	N/A	N/A
Antenna Mast	JAC-3	DAIL EMC	N/A	N/A
Antenna Turntable Controller	JAC-2	JAEMC	N/A	N/A
EMI Receiver	ESH3	ROHDE & SCHWARZ	892580/014	12. 29. 2008
EMI Receiver	ESVN30	ROHDE & SCHWARZ	832854/010	07. 13. 2008

5.2.4 Test Result of Radiated Emission (below 30 MHz)

EUT : LX007

Test distance : 3 m

Radiated Emission Test Result : **PASS**

Test data sheets follow.

Radiated Emission Test Data

Frequency [MHz]	Peak Value [dBμV]	Distance Correction [dB]	Limit [μV/m]	Limit [dBμV/m]	Emission Level [dBμV/m]	Margin [dB]
0.022	53.21	-80.00	109.09	40.76	-26.79	67.55
0.037	56.28	-80.00	64.86	36.24	-23.72	59.96
0.053	55.71	-80.00	45.28	33.12	-24.29	57.41
0.069	54.99	-80.00	34.78	30.83	-25.01	55.84
0.084	49.83	-80.00	28.57	29.12	-30.17	59.29
0.125	88.95	-80.00	19.20	25.67	8.95	16.72
0.148	64.47	-80.00	16.22	24.20	-15.53	39.73
0.250	58.65	-80.00	9.60	19.65	-21.35	41.00
0.290	52.92	-80.00	8.28	18.36	-27.08	45.44
0.377	54.91	-80.00	6.37	16.08	-25.09	41.17
0.436	55.72	-80.00	5.50	14.81	-24.28	39.09
0.724	47.47	-40.00	33.15	30.41	7.47	22.94

Notes:
1. Emission Level = Peak value + Distance correction factor
2. Margin value = Emission Level - Limit
3. All other emissions not reported were more than ambient level.
4. Measurement uncertainty estimated at ±4.08 dB.
   The measurement uncertainty is given with a confidence of 95.45 % with the coverage factor, k=2.

5.2.4 Test Result of Radiated Emission (above 30 MHz)

EUT : LX007

Test distance : 3 m

Radiated Emission Test Result : **PASS**

Test data sheets follow.

Radiated Emission Test Data

Frequency [MHz]	Reading [dBμV]	Polarization [*H/**V]	Ant.Factor [dB/m]	Cable Loss [dB]	Limit [dBμV/m]	Emission Level [dBμV/m]	Margin [dB]
32.000	23.33	V	11.90	1.27	40.00	36.50	3.50
48.000	22.90	V	12.24	1.56	40.00	36.70	3.30
82.780	22.11	V	12.00	1.99	43.50	36.10	7.40
120.000	22.20	V	12.31	2.39	43.50	36.90	6.60
125.000	21.10	V	11.96	2.44	46.00	35.50	10.50
127.320	21.22	V	12.11	2.47	46.00	35.80	10.20
150.000	15.08	V	13.22	2.71	46.00	31.00	15.00
157.250	19.41	V	13.41	2.78	46.00	35.60	10.40
175.000	19.07	V	12.39	2.94	46.00	34.40	11.60
200.000	23.43	V	10.12	3.15	46.00	36.70	9.30
225.000	21.05	V	10.42	3.33	46.00	34.80	11.20
240.000	20.80	H	11.27	3.44	46.00	35.50	10.50
250.000	21.06	H	11.83	3.51	46.00	36.40	9.60
275.000	19.79	H	12.58	3.73	46.00	36.10	9.90
300.000	18.11	H	13.41	3.88	46.00	35.40	10.60
325.000	15.18	H	14.01	4.02	46.00	33.20	12.80
350.000	13.95	H	14.60	4.15	46.00	32.70	13.30
375.000	12.96	H	15.20	4.35	46.00	32.50	13.50
600.000	10.13	H	19.89	5.58	46.00	35.60	10.40

Notes:
1. * H : Horizontal polarization , ** V : Vertical polarization
2. Emission Level = Reading + Antenna factor + Cable loss
3. Margin value = Emission Level - Limit
4. All other emissions not reported were more than 25dB below the permitted limit.
5. Measurement uncertainty estimated at ±4.08 dB.
   The measurement uncertainty is given with a confidence of 95.45 % with the coverage factor, k=2.

5.3 Occupied Bandwidth

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio.

5.3.1 Specification

FCC Rules Part 15, Section 15.215

5.3.2 Method of Measurement

ANSI/TIA-603-B-2002 Section 13.1.7

5.3.3 Test Equipment List

Equipment Type	Model	Manufacture	Serial No	Cal Due Date
Spectrum Analyzer	FSP7	ROHDE & SCHWARZ	100001	02. 22. 2009
Power Supply	IPS-30B03DD	INTERACT	42052	08. 28. 2008

5.3.4 Data

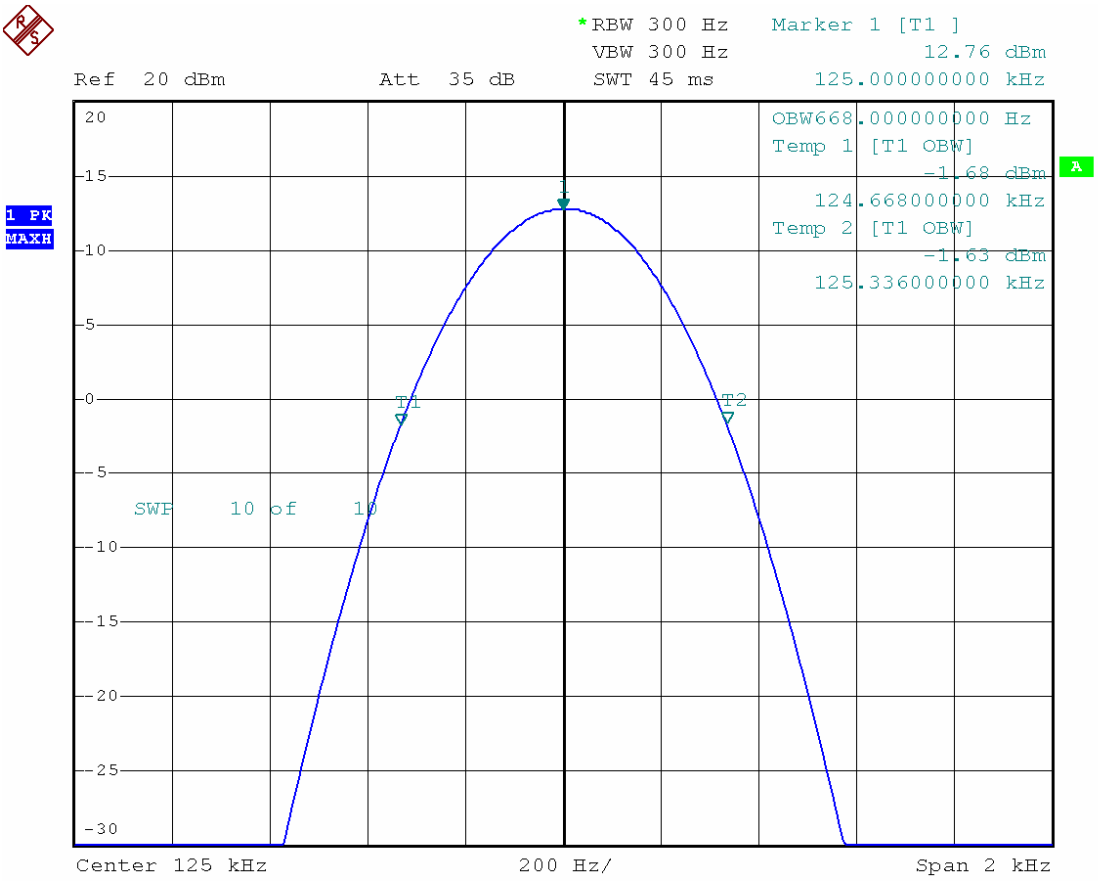
Frequency (MHz)	99% Bandwidth (Hz)	26 dB Bandwidth (Hz)
125 kHz	668	896

Notes:
1. Peak Detector
2. RBW = VBW = 300 Hz

5.3.5 99% Bandwidth

Plot

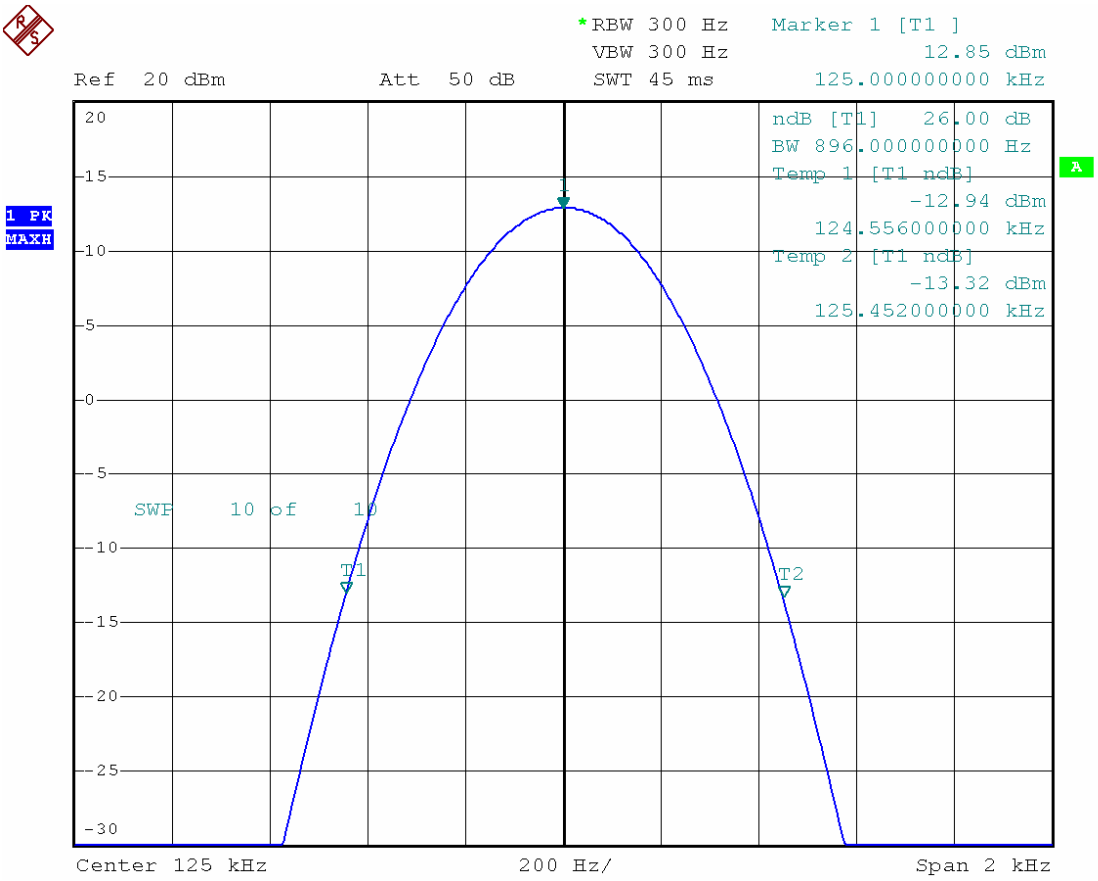
FCC Rules :	Part 15.215
Operating Frequency :	125 kHz
Emission Mask :	99% Bandwidth
Reference Voltage :	12.0 VDC
Bandwidth :	668 Hz



5.3.6 26dB Bandwidth

Plot

FCC Rules :	Part 15.215
Operating Frequency :	125 kHz
Emission Mask :	26dB Bandwidth
Reference Voltage :	12.0 VDC
Bandwidth :	896 Hz



6. TEST EQUIPMENTS LIST

	EQUIPMENT	MODEL	MANUFACTURE	SERIAL NUMBER	Calibration Due date
1	Receiver	ESH3	Rohde & Schwarz	892580/014	12/29/08
2	Receiver	ESVN30	Rohde & Schwarz	832854/010	07/13/08
3	Receiver	ESPI	Rohde & Schwarz	100012	11/02/08
4	Spectrum analyzer	FSP7	Rohde & Schwarz	100001	02/22/09
5	Signal Generator	E4432B	Agilent	US40053157	07/13/08
6	Shield Room (7m x 4m x 3m)	N/A	SJEMC	0004	N/A
7	Turn Table	OSC-30	N/A	BWS-01	N/A
8	Antenna Mast	JAC-3	Dail EMC	N/A	N/A
9	Antenna Turntable Controller	JAC-2	JAEMC	N/A	N/A
10	Loop Antenna	HFH2-Z2	ROHDE & SCHWARZ	881056/6	08/22/08
11	Bilog Antenna	VULB9160	Schwarzbeck	VULB9160-3122	12/29/08
12	Power supply	IPS-30B03DD	Interact	42052	08/28/08
13	LISN Multiline	L1-115	Com-power	241018	11/19/08
14	LISN	NSLK 8127	SCHWARZBECK MESS-ELEKTRONIK	8127-414	12/11/08