EMI TEST REPORT

Test Report No. : 25HE0238-HO-1-1

Applicant	:	**Honda Lock Mfg. Co., Ltd.**
Type of Equipment	:	**Immobilizer system**
Model No.	:	**HLIS-1**
Test standard	:	**FCC Part 15 Subpart C Section 15.209: 2005**
FCC ID	:	**MLBHLIS-1**
Test Result	:	**Complied**

1. This test report shall not be reproduced in full or partial, without the written approval of UL Apex Co., Ltd.
2. The results in this report apply only to the sample tested.
3. This equipment is in compliance with above regulation. We hereby certify that the data contain a true representation of the EMC profile.
4. The test results in this report are traceable to the national or international standards.

Date of test: May 11 and 12, 2005

Tested by: Yutaka Yoshida
EMC Service

Approved by : Naoki Sakamoto
Group Leader of
EMC Service

UL Apex Co., Ltd.
Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
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SECTION 1: Client information

Company Name : Honda Lock Mfg. Co., Ltd.
Address : 535-14 Oaza-Ishizue, Takanezawamachi, Shioya-Gun, Tochigi, 329-1225 Japan
Telephone Number : +81-28-680-1661
Facsimile Number : +81-28-680-1045
Contact Person : Kazumi Inomata

SECTION 2: Equipment under test (E.U.T.)

2.1 Identification of E.U.T.

Type of Equipment : Immobilizer system
Model No. : HLIS-1
Serial No. : 0001
Country of Manufacture : Japan
Receipt Date of Sample : May 9, 2005
Condition of EUT : Production prototype
(Not for Sale: This sample is equivalent to mass-produced items.)

2.2 Product Description

Model No: HLIS-1 (referred to as the EUT in this report) is the Immobilizer system.

Clock frequency	CPU: 4MHz
Feature of EUT	The Immobilizer system bidirectionally communicates between Immobilizer Unit and Txp, judges if the Txp is appropriately registered to be combined with the unit, and if it is appropriate, the unit sends signal to allow to start engine to other units.

Equipment Type	Transmitter	Receiver
Frequency of Operation	125kHz	
Bandwidth & Channel spacing	N/A	-
Type of Modulation	ASK	-
Antenna Type	Loop antenna	
Mode of Operation	Simplex	-
Method of frequency generation	Ceramic resonator	Crystal
ITU code	K1D	-
Power Supply (Inner)	DC 5.0V (from Car Batery DC12V)	

FCC 15.31 (e)
The power supply of this EUT is transformed to DC5.0V and provides stable voltage (DC5.0V) constantly to Radio part. Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement
It is impossible for end users to replace the antenna, because the antenna is mounted inside of the EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203.

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part15 Subpart C : 2005
Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.209 Radiated emission limits, general requirements : 2005

3.2 Procedures and results

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin *0)	Result
1	Electric Field Strength of Fundamental Emission	ANSI C63.4:2003	FCC Section 15.209	Radiated	N/A	36.8dB 0.125MHz 0 deg, AV	Complied
2	Electric Field Strength of Spurious Emission	ANSI C63.4:2003	FCC Section 15.209	Radiated	N/A	10.1dB 204.829MHz, Horizontal, QP	Complied
3	-26dB bandwidth	ANSI C63.4:2003	ANSI C63.4 13.1.7	Radiated	N/A	Reference data	N/A
4	Conducted Emission	ANSI C63.4:2003	FCC Section 15.207	AC Mains *1)	N/A	N/A	N/A

Note: UL Apex's EMI Work procedures No. QPM05
*0) The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.
*1) This test is not applicable since the EUT does not have AC power port.
Uncertainty:
Spurious Emission (Radiated)
The measurement uncertainty (with a 95% confidence level) for this test using Biconical antenna is ±4.5dB(3m)/ ±4.7dB(10m).
The measurement uncertainty (with a 95% confidence level) for this test using Logperiodic antenna is ±5.2dB(3m)/ ±3.8dB(10m).
The measurement uncertainty (with a 95% confidence level) for this test using Horn antenna is ±6.6dB.
Other test except Conducted Emission and Spurious Emission (Radiated)
The measurement uncertainty (with a 95% confidence level) for this test is ±3.0dB.
These tests were performed without any deviations from test procedure except for additions or exclusions.

3.3 Addition to standards

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	99% Occupied bandwidth	RSS-210(issue 5): 2001 + Amendment:2002 + Amendment2:2003 + Amendment3:2004 + Amendment4: 2004	RSS-210(issue 5): 2001 + Amendment:2002 + Amendment2:2003 + Amendment3:2004 + Amendment4: 2004	Radiated	N/A	N/A	N/A
2	-20dB Bandwidth	ANSI C63.4:2003	ANSI C63.4 13	Radiated	N/A	N/A	N/A

3.4 Test Location

UL Apex Co., Ltd. Head Office EMC Lab. *NVLAP Lab. code: 200572-0
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116 Facsimile : +81 596 24 8124

	FCC Registration Number	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms
No.1 semi-anechoic chamber	313583	IC4247	19.2 x 11.2 x 7.7m	7.0 x 6.0m	Preparation room
No.2 semi-anechoic chamber	846015	IC4247-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 shielded room	-	-	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.4 measurement room	-	-	3.1 x 5.0 x 2.7m	N/A	-

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 x 2.0m for No.1 and No.2 semi-anechoic and No.3 shielded room.

3.5 Test set up, Test instruments and Data of EMI

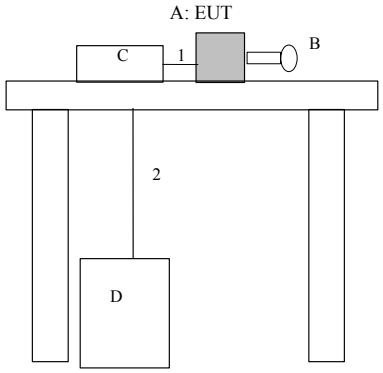
Refer to APPENDIX 1 to 3.

SECTION 4: Operation of E.U.T. during testing

4.1 Operating Modes

The mode is used : Transmitting mode

4.2 Configuration and peripherals



* Cabling was taken into consideration and test data was taken under worse case conditions.

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	FCC ID
A	Immobilizer system	HLIS-1	0001	Honda Lock Mfg. Co., Ltd.	MLBHLIS-1 (EUT)
B	Transponder key	-	-	Honda Lock Mfg. Co., Ltd.	-
C	Checker	-	-	Honda Lock Mfg. Co., Ltd.	-
D	Car Battery	40B19L	A030402	YUASA	-

List of cables used

No.	Name	Length (m)	Shield	Backshell Material
1	DC Power Cable	0.25	N	Polyvinyl chloride
2	DC Power Cable	1.0	N	Polyvinyl chloride

SECTION 5: Radiated emission (Fundamental and Spurious Emission)

Test Procedure
The Radiated Electric Field Strength intensity has been measured on No.1 semi anechoic chamber with a ground plane and at a distance of 3m.

Frequency : From 9kHz to 30MHz at distance 10m
The EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.
The measurements were performed for each antenna angle 0deg. , 45deg. and 90deg.

Frequency : From 30MHz to 1GHz at distance 3m
The measuring antenna height varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.
The measurements were performed for both vertical and horizontal antenna polarization.

Measurements were performed with a QP, PK, and AV detector.
The radiated emission measurements were made with the following detector function of the test receiver.

	From 9kHz to 90kHz and From 110kHz to 150kHz	From 90kHz to 110kHz	From 150kHz to 490kHz	From 490kHz to 30MHz	From 30MHz to 1GHz
Detector Type	PK/AV	QP	PK/AV	QP	QP
IF Bandwidth	200Hz	200Hz	9kHz	9kHz	120kHz

- The carrier level and noise levels were confirmed at each position of X, Y, and Z axes of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

* Part 15 Section 15.31 (f)(2) (9kHz-30MHz)
[Limit at 10m]=[Limit at 300m]-40 x log (10[m]/300[m])
[Limit at 10m]=[Limit at 30m]-40 x log (10[m]/30[m])

Test data : APPENDIX 3
Test result : Pass

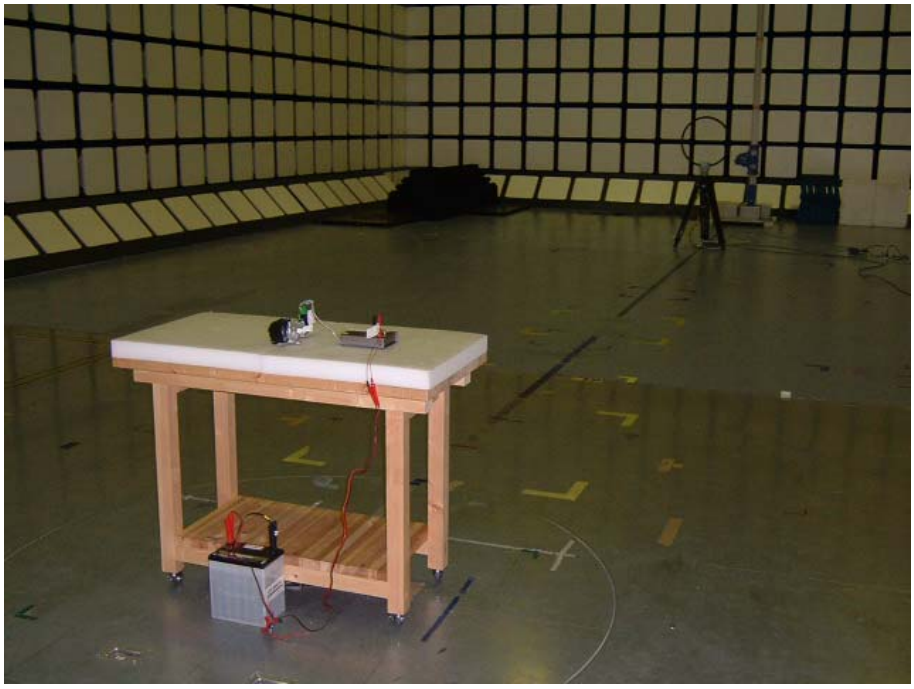
Date: May 11 and 12, 2005 Test engineer: Yutaka Yoshida

APPENDIX 1: Photographs of test setup

Radiated Emission

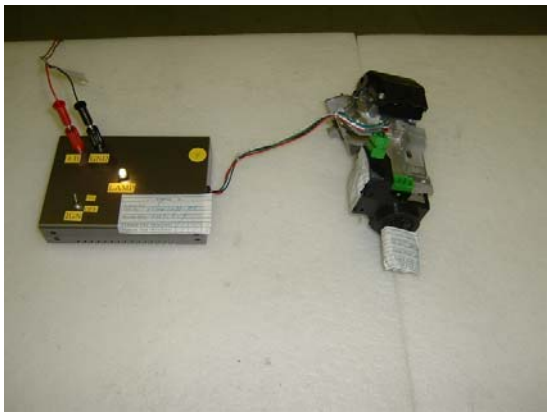
Front

Rear

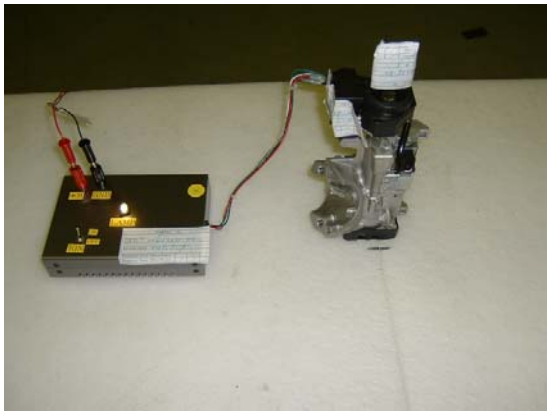


Worst Case Position (X-axis:Horizontal / X-axis:Vertical)

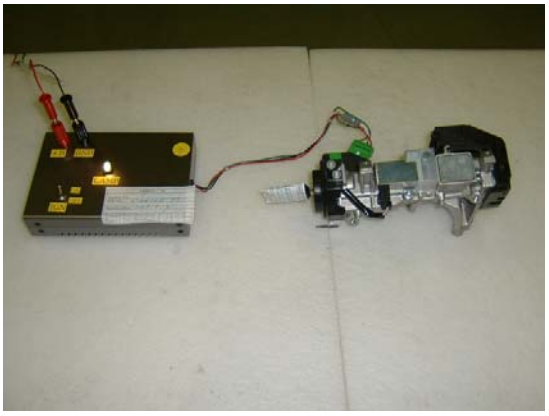
X-axis



Y-axis



Z-axis



APPENDIX 2:Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
MAEC-01	Anechoic Chamber	TDK	Semi Anechoic Chamber 10m	RE	2004/11/13 * 12
MTR-01	Test Receiver	Rohde & Schwarz	ESI40	RE	2004/11/12 * 12
MCC-03	Coaxial Cable	Fujikura/Suhner/Agilent/TSJ	-	RE	2004/12/24 * 12
MCC-07	coaxial cable	-	-	RE	2004/09/07 * 12
MCC-08	coaxial cable	-	-	RE	2004/09/07 * 12
MLPA-02	Loop Antenna	Rohde & Schwarz	HFH2-Z2	RE	2004/12/10 * 12
MCC-01	Coaxial Cable 0.1-3000MHz	Suhner/storm/Agilent/TSJ	-	RE	2004/12/19 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	RE	2004/12/16 * 12
MPA-04	Pre Amplifier	Agilent	8447D	RE	2004/05/25 * 12
MBA-01	Biconical Antenna	Schwarzbeck	BBA9106	RE	2004/10/14 * 12
MLA-01	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2004/10/14 * 12

All equipment is calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

Test Item:

RE: Radiated emission

APPENDIX 3: Data of EMI test

Radiated Spurious Emission
DATA OF SPURIOUS EMISSIONS(9kHz to 30MHz)

UL Apex Co., Ltd.
Head Office EMC Lab. No.1 Semi Anechoic Chamber

Company	: Honda Lock Mfg. Co., Ltd.	REPORT NO	: 25HE0238-HO
Equipment	: Immobilizer system	REGULATION	: Fcc Part15 Subpart C 15.209
Model	: HLIS-1	TEST DISTANCE	: 10m
Sample No.	: 0001	DATE	: May 11,2005
Power	: DC 12.0V	TEMPERATURE	: 24deg.C
Mode	: Continuous Transmitting mode	HUMIDITY	: 37%
		ENGINEER	: Yutaka Yoshida

PK DETECT (RBW: 200Hz / 9KHz)

No.	FREQ	T/R READING			ANT	AMP	CABLE	RESULT			Limit *2	MARGIN		
		0deg *1	45deg	90deg	Factor	GAIN	LOSS	0deg	45deg	90deg	PK	0deg	45deg	90deg
	[MHz]	[dBuV]			[dB/m]	[dB]	[dB]	[dBuV/m]			[dBuV/m]	[dB]		
Test distance 10meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS														
1	0.021	37.6	33.1	29.7	19.6	14.1	1.0	44.1	39.6	36.2	120.2	76.1	80.6	84.0
2	0.042	41.0	40.3	32.8	19.7	22.5	0.9	39.1	38.4	30.9	114.2	75.1	75.8	83.3
3	0.117	51.3	50.4	48.9	19.7	26.3	0.7	45.4	44.5	43.0	105.3	59.9	60.8	62.3
4	0.125	58.4	57.2	56.3	19.7	26.6	0.7	52.2	51.0	50.1	104.8	52.6	53.8	54.7

AV DETECT (RBW: 200Hz / 9KHz)

No.	FREQ	T/R READING			ANT	AMP	CABLE	RESULT			Limit *2	MARGIN		
		0deg *1	45deg	90deg	Factor	GAIN	LOSS	0deg	45deg	90deg	AV	0deg	45deg	90deg
	[MHz]	[dBuV]			[dB/m]	[dB]	[dB]	[dBuV/m]			[dBuV/m]	[dB]		
Test distance 10meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS														
1	0.021	27.7	23.3	20.1	19.6	14.1	1.0	34.2	29.8	26.6	100.2	66.0	70.4	73.6
2	0.042	32.2	30.0	23.9	19.7	22.5	0.9	30.3	28.1	22.0	94.2	63.9	66.1	72.2
3	0.117	40.6	40.3	39.8	19.7	26.3	0.7	34.7	34.4	33.9	85.3	50.6	50.9	51.4
4	0.125	54.2	53.8	53.1	19.7	26.6	0.7	48.0	47.6	46.9	84.8	36.8	37.2	37.9

QP DETECT (RBW: 9KHz)

No.	FREQ	T/R READING			ANT	AMP	CABLE	RESULT			Limit *2	MARGIN		
		0deg *1	45deg	90deg	Factor	GAIN	LOSS	0deg	45deg	90deg	QP	0deg	45deg	90deg
	[MHz]	[dBuV]			[dB/m]	[dB]	[dB]	[dBuV/m]			[dBuV/m]	[dB]		
Test distance 10meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS														
6	0.500	34.5	34.6	34.6	19.7	27.6	0.5	27.1	27.2	27.2	52.7	25.6	25.5	25.5
7	0.625	34.0	34.0	34.0	19.7	27.9	0.6	26.4	26.4	26.4	50.8	24.4	24.4	24.4
8	0.750	33.5	33.6	33.6	19.6	28.1	0.7	25.7	25.8	25.8	49.2	23.5	23.4	23.4
9	0.875	33.4	33.3	33.3	19.6	28.0	0.6	25.6	25.5	25.5	47.8	22.2	22.3	22.3
10	1.000	33.1	33.3	33.1	19.6	28.1	0.6	25.2	25.4	25.2	46.7	21.5	21.3	21.5
11	1.125	33.1	32.9	33.0	19.6	28.1	0.6	25.2	25.0	25.1	45.7	20.5	20.7	20.6
12	1.250	32.9	32.7	32.9	19.6	28.1	0.6	25.0	24.8	25.0	44.8	19.8	20.0	19.8

*1 It is angle of Received Antenna
*2 The Limit is include below the Distance Factor
Test Distance 10m Distance Factor(Dfac) f = 9kHz - 490kHz : 40log(300/10) = 59.1
f = 490kHz - 30MHz : 40log(30/10) = 19.1
*Except for the above table : All other spurious emissions were less than 20dB for the limit.

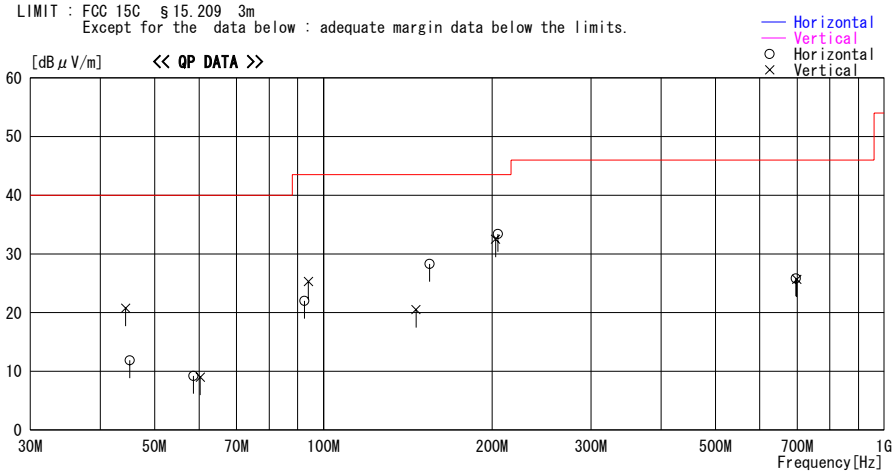
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2005/05/12 01:56:08

Applicant	: Honda Lock Mfg. Co., Ltd.	Report No.	: 25HE0238-HO
Kind of EUT	: Immobilizer system	Power	: DC12.0V
Model No.	: HLIS-1	Temp℃/Humi%	: 24deg.C / 37%
Serial No.	: 0001	Operator	: Yutaka Yoshida

Mode / Remarks : Continuous Transmitting

LIMIT : FCC 15C §15.209 3m
Except for the data below : adequate margin data below the limits.

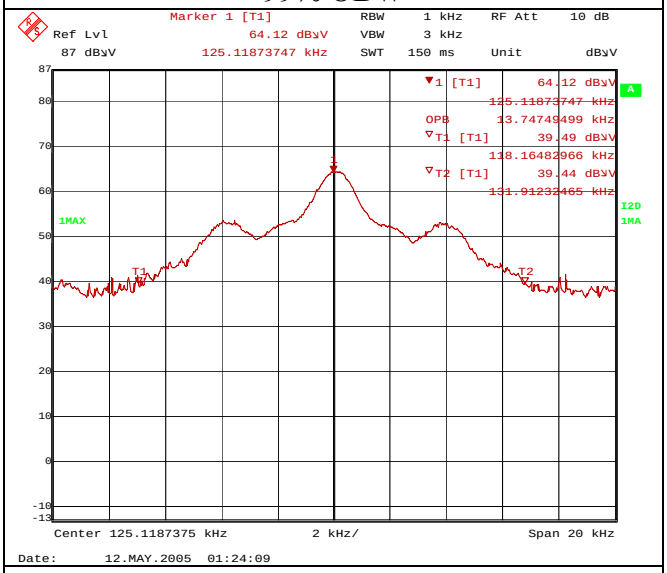


No.	FREQ [MHz]	READING QP [dBμV]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dBμV/m]	LIMIT [dBμV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal ------										
1	45.150	21.2	11.7	7.2	28.2	11.9	40.0	28.1	303	0
2	58.677	21.0	8.6	7.4	27.8	9.2	40.0	30.8	100	360
3	92.525	32.9	8.8	7.9	27.6	22.0	43.5	21.5	316	168
4	154.730	31.6	15.4	8.7	27.4	28.3	43.5	15.2	199	172
5	204.829	34.2	17.1	9.3	27.2	33.4	43.5	10.1	147	203
6	695.594	21.7	20.8	12.2	28.9	25.8	46.0	20.2	100	360
----- Vertical ------										
7	44.379	29.8	12.0	7.2	28.2	20.8	40.0	19.3	100	360
8	60.301	21.1	8.4	7.4	27.9	9.0	40.0	31.0	100	134
9	94.038	35.9	9.1	7.8	27.5	25.3	43.5	18.2	100	360
10	146.273	24.8	14.8	8.6	27.7	20.5	43.5	23.0	172	108
11	202.836	33.3	17.1	9.2	27.1	32.5	43.5	11.0	100	344
12	698.400	21.6	20.8	12.2	28.9	25.7	46.0	20.3	100	0

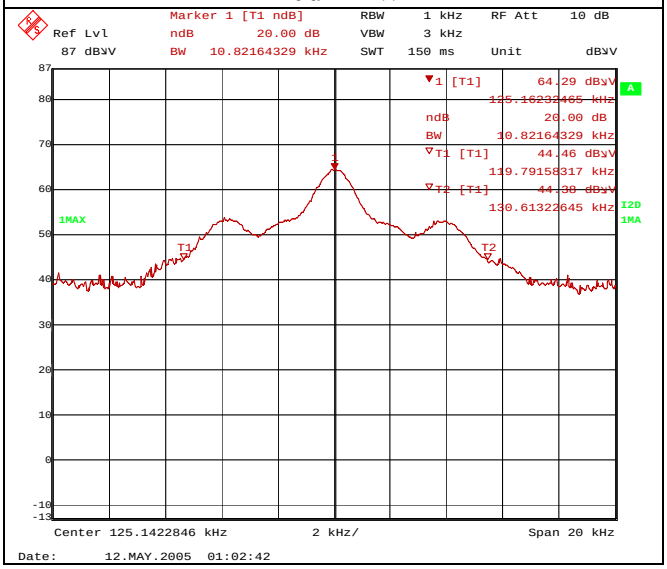
CHART:WITH FACTOR ANT TYPE : -30MHz LOOP,30-300MHz BICONICAL,300MHz-1000MHz LOGPERIODIC,1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - AMP.GAIN Page:

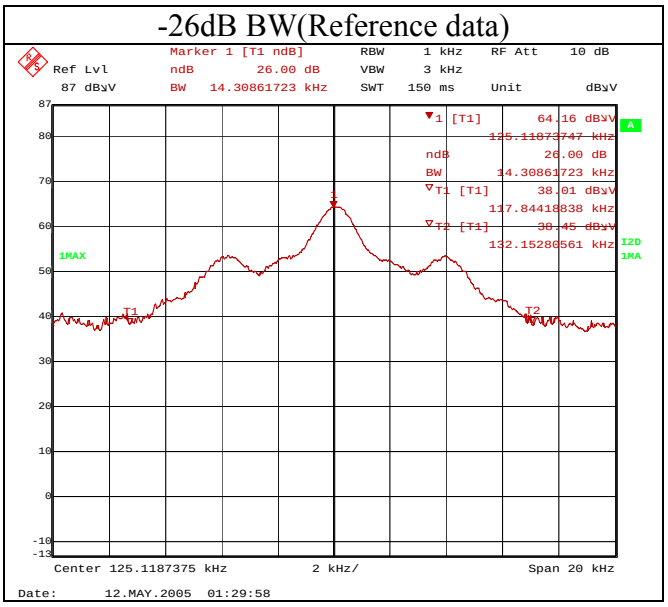
99%Occupied bandwidth and -20dB bandwidth

99% OBW



-20dB BW




-26dB BW(Reference data)
Marker 1 [T1 ndB]
Ref Lvl
87 dBµV
ndB 26.00 dB
BW 14.30861723 kHz
RBW 1 kHz
VBW 3 kHz
SWT 150 ms
RF Att 10 dB
Unit dBµV
1 [T1] 64.16 dBµV
125.11873747 kHz
ndB 26.00 dB
BW 14.30861723 kHz
T1 [T1] 38.01 dBµV
117.84418838 kHz
T2 [T1] 38.45 dBµV
132.15280561 kHz
1MAX
T1
T2
Center 125.1187375 kHz
2 kHz/
Span 20 kHz
Date: 12.MAY.2005 01:29:58