

TEST REPORT

For

Monitoring receiver

In conformity with

FCC CFR 47 Part15 Subpart B (Certification)

Model: 35GR

FCC ID: DF335GR

Test Item: Scanning receiver

Report No: RY1204Z20R1

Issue Date: 20 April, 2012

Prepared for

ApexRadio, Inc.
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Prepared by

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Table of contents

1	General information.....	3
1.1	Product description	3
1.2	Test(s) performed/ Summary of test result	3
1.3	Test facility	4
1.4	Measurement uncertainty.....	4
1.5	Summary of test results.....	5
1.6	Setup of equipment under test (EUT)	5
1.6.1	Test configuration of EUT	5
1.6.2	Operating condition:	5
1.6.3	Setup diagram of tested system:.....	6
1.7	Equipment modifications	6
1.8	Deviation from the standard	6
2	Test procedure and result.....	7
2.1	Radiated Emissions.....	7
2.2	AC power line conducted emissions.....	9
2.3	Antenna power conduction	11
3	Test setup photographs	13
3.1	Radiated emissions	13
3.2	AC power line conducted emissions.....	14
3.3	Antenna power conduction	14
4	List of utilized test equipment/ calibration	15

History

Report No.	Date	Revisions	Issued By
RY1204Z20R1	20 April, 2012	Initial Issue	K. Ohnishi

1 General information

1.1 Product description

Test item : Scanning receiver
Manufacturer : Nissho Electronics, Ltd.
Address : 1-17-18, Shimomaruko, Ohta-ku, Tokyo Japan
Model : 35GR
FCC ID : DF335GR
Serial numbers : 000506
Receiving frequency range : 10 kHz - 3600MHz
Highest frequency generated : 2856.0 MHz
Receipt date of EUT : 7 March, 2012
Nominal power source voltages : DC 13.5V

1.2 Test(s) performed/ Summary of test result

Test specification(s) : FCC CFR 47. Part 15 (October 1, 2010)
Test method(s) : ANSI C63.4: 2003
Test(s) started : 7 March, 2012
Test(s) completed : 19 April, 2012
Purpose of test(s) : Certification for FCC

Summary of test result : Complied

Note: The above judgment is only based on the measurement data and it does not include the measurement uncertainty. Accordingly, the statement below is applied to the test result.
The EUT complies with the limit required in the standard in case that the margin is not less than the measurement uncertainty in the Laboratory.
Compliance of the EUT is more probable than non-compliance is case that the margin is less than the measurement uncertainty in the Laboratory.

Test engineer

: 
K. Ohnishi
EMC testing Department

Reviewer

: 
T. Ikegami
Manager
EMC testing Department

1.3 Test facility

The Federal Communications Commission has reviewed the technical characteristics of the test facilities at RF Technologies Ltd., located in 472, Nippa-cho, Kohoku-ku, Yokohama, 223-0057, Japan, and has found these test facilities to be in compliance with the requirements of 47 CFR Part 15, section 2.948, per October 1, 2010. The description of the test facilities has been filed under registration number 319924 at the Office of the Federal Communications Commission. The facility has been added to the list of laboratories performing these test services for the public on a fee basis.

The list of all public test facilities is available on the Internet at <http://www.fcc.gov>.

Registered by Voluntary Control Council for Interference by Information Technology Equipment (VCCI)

Each registered facility number is as follows;

Test site (Semi-Anechoic chamber 3m) R-2393, G-110

Test site (Shielded room) C-2617, T-1671

Registered by Industry Canada (IC): The registered facility number is as follows;

Test site No. 1 (Semi-Anechoic chamber 3m): 6974A-1

Accredited by **National Voluntary Laboratory Accreditation Program** (NVLAP) for the emission tests stated in the scope of the certificate under Certificate Number 200780-0

This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.



NVLAP LAB CODE 200780-0

1.4 Measurement uncertainty

The treatment of uncertainty is based on the general matters on the definition of uncertainty in “Guide to the expression of uncertainty in measurement (GUM)” published by ISO. The Lab’s uncertainty is determined by referring UKAS Publication LAB34: 2002 “The Expression of Uncertainty in EMC Testing” and CISPR16-4-2: 2003 “Uncertainty in EMC Measurements”.

The uncertainty of the measurement result in the level of confidence of approximately 95% (k=2) is as follows;

Conducted emission: ± 1.9 dB (10 kHz – 30 MHz)

RF Conducted emission: ± 0.9 dB (30 MHz – 26 GHz)

Radiated emission (30 MHz - 1000 MHz): ± 5.9 dB

Radiated emission (above 1000 MHz): ± 5.8 dB

1.5 Summary of test results

Requirement of;	Section in FCC	Result	Section in this report
1.5.1 Radiated emissions	15.109	Complied	2.1
1.5.2 AC power line conducted emissions	15.107	Complied	2.2
1.5.3 Antenna power conduction	15.111	Complied	2.3
1.5.4 FCC 2.1033(10), 15.121 requirements	2.1033(10), 15.121	Complied	- (Note)

Note: Please refer to the statement of manufacturer.

1.6 Setup of equipment under test (EUT)

1.6.1 Test configuration of EUT

Equipment(s) under test:

	Item	Manufacturer	Model No.	Serial No.
A	Monitoring receiver	Nissho Electronics, Ltd.	35GR	000506
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

Support Equipment(s):

	Item	Manufacturer	Model No.	Serial No.
B	Logperiodic Antenna	SCHWARZBECK	USLP 9143	338
C	PC	HP	AR5B95	CNP027047P
-	-	-	-	-
-	-	-	-	-

Connected cable(s):

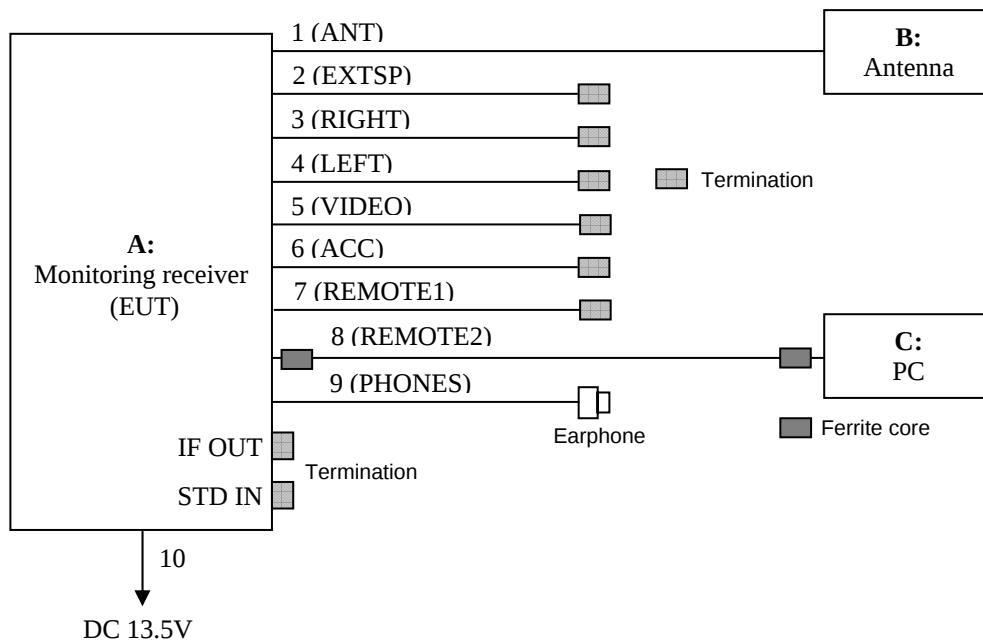
No.	Item	Identification (Manu.e.t.c)	Shielded YES / NO	Ferrite Core YES / NO	Connector Type Shielded YES / NO	Length (m)
1	Antenna cable	-	Yes	No	Yes	1.5
2	External speaker cable	-	No	No	Yes	1.5
3	Audio cable (RIGHT)	-	No	No	Yes	1.4
4	Audio cable (LEFT)	-	No	No	Yes	1.4
5	Video cable	-	No	No	Yes	1.5
6	Accessory cable	-	No	No	Yes	1.5
7	Serial cable for RS-232C	-	No	No	Yes	2.0
8	USB cable	-	Yes	Yes	Yes	2.1
9	Earphone cable	-	No	No	No	3.0
10	DC cable	-	No	No	No	1.5

1.6.2 Operating condition:

Operating mode:

Receiving mode (10 kHz/ 1800MHz / 3600MHz)

1.6.3 Setup diagram of tested system:



1.7 Equipment modifications

No modifications have been made to the equipment in order to achieve compliance with the applicable standards described in clause 1.2.

1.8 Deviation from the standard

No deviations from the standards described in clause 1.2.

2 Test procedure and result

2.1 Radiated Emissions

Reference Standard

Part15.109

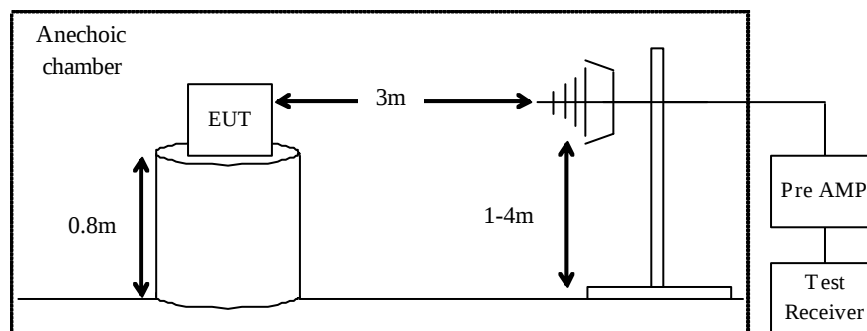
Test Conditions

Date: 19 April, 2012
Ambient Temperature: 21 degC
Relative humidity: 47 %

Test Method

- EUT is charged by wireless charger.
- Radiated spurious emission is received by receive antenna.
- Turn table is rotated 360deg.
- Maximum level of each spurious is measured by Test receiver.
- RBW of spectrum analyzer is set to 100 kHz for 30 - 1000MHz, or 1MHz for above 1000MHz.
- Level is measured with QP detect for 30 - 1000MHz, or AVE detector for above 1000MHz.

Test Setup



Limit

Frequency [MHz]	Distance [m]	Field strength [uV/m]	Field strength [dBuV/m]
30 - 88	3	100	40.0
88 - 216	3	150	43.5
216 - 960	3	200	46.0
above 960	3	500	53.9

Test equipment used (refer to List of utilized test equipment)

AC01	BI01	CL11	CL24	CL28	DH01	LA05	PR03	PR11
TR06								

Test Result

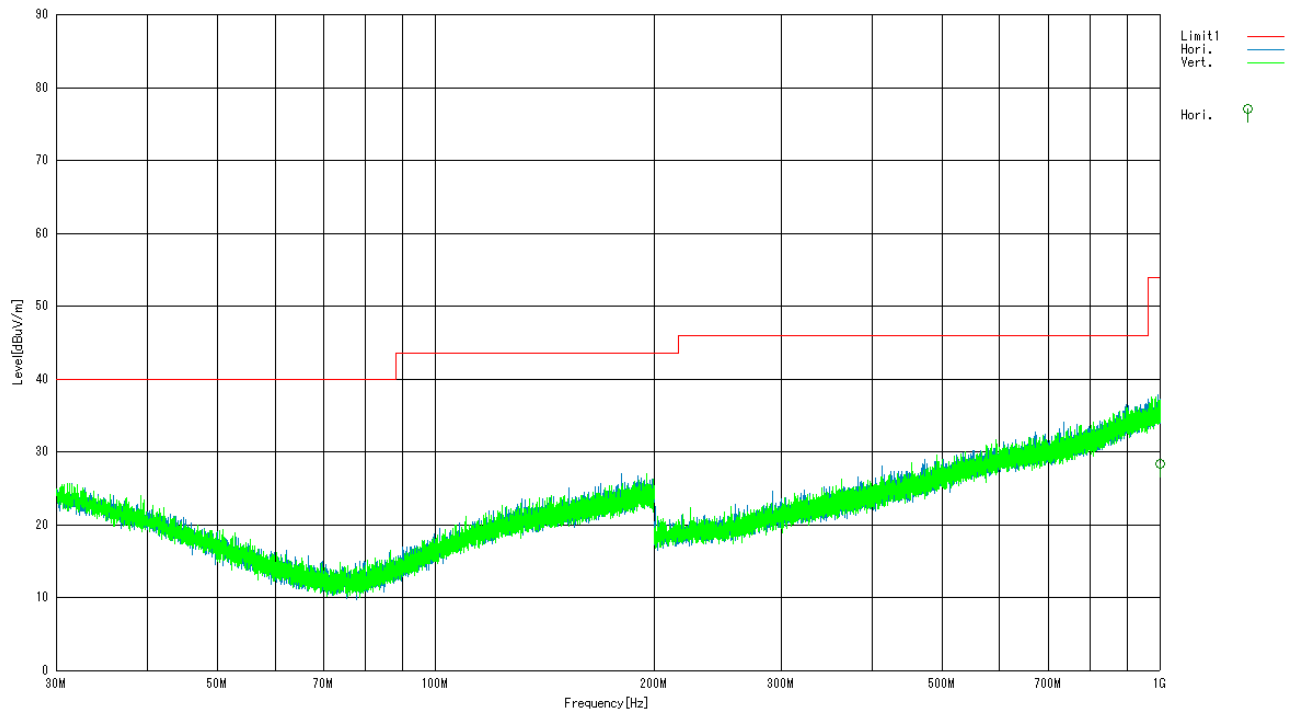
The EUT met the requirements of the standard for this test.

Test Data (30-1000MHz)

Operating mode: Receiving mode (Worst configuration)
Measurement distance: 3 m

There is no spurious emission. (Floor noise data is below)

No.	Frequency [MHz]	Reading [dBuV]	Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Antenna Polarization
1	1000.000	20.8	22.3	13.6	28.3	28.4	53.9	25.5	Hori.



Test Data (above 1000MHz)

Operating mode: Receiving mode (Worst configuration: 3600MHz)
Measurement distance: 3 m

No.	Frequency [MHz]	Reading		C.F. [dB]	Result		Limit		Margin		Polarization
		Peak [dBuV]	Ave [dBuV]		Peak [dBuV]	Ave [dBuV]	Peak [dBuV]	Ave [dBuV]	Peak [dB]	Ave [dB]	
1	2856.000	47.3	38.1	-3.5	43.8	34.6	73.9	53.9	30.1	19.3	Hori.
2	2856.000	48.3	40.8	-3.5	44.8	37.3	73.9	53.9	29.1	16.6	Vert.
3	15000.000	45.1	31.6	14.9	60.0	46.5	73.9	53.9	13.9	7.4	Hori.

2.2 AC power line conducted emissions

Reference Standard

Part15.107

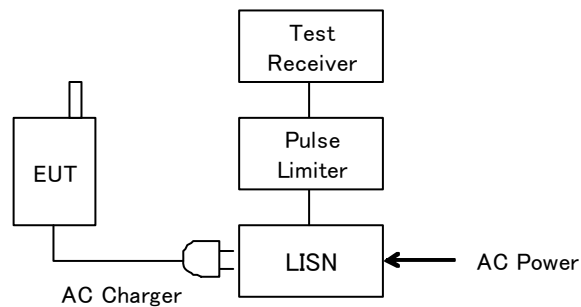
Test Conditions

Date: 7 March, 2012
Ambient Temperature: 18 degC
Relative humidity: 55 %
Test Voltage: AC 120 V / 60Hz

Test Method

- EUT is charged by wireless charger.
- AC power is supplied to AC charger through LISN.
- AC charger is connected to EUT.
- AC Power Line emission is measured by EMI receiver.
Both Va/Vb line are measured emission level.

Test Setup



Limit

Frequency [MHz]	Limit QP [dBuV]	Limit AV [dBuV]
0.15 - 0.5	66 - 56	56 - 46
0.5 - 5	56	46
5 - 30	60	50

Test equipment used (refer to List of utilized test equipment)

CL18	LN05	TR09
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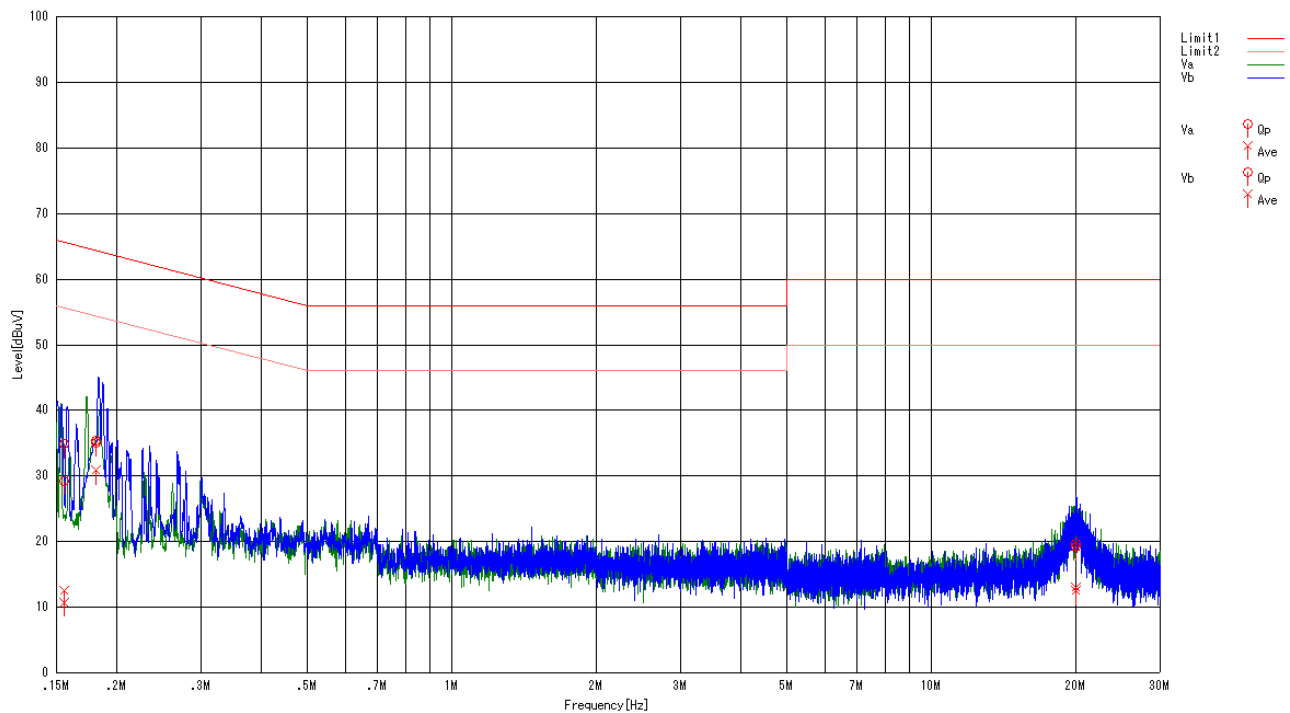
Test Result

The EUT met the requirements of the standard for this test

Test Data

Operating mode: Receiving mode (Worst configuration)

No.	Frequency [MHz]	Reading		C.F. [dB]	Result		Limit		Margin		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]	
1	0.155	24.7	2.3	10.1	34.8	12.4	65.7	55.7	30.9	43.3	Vb
2	0.155	19.1	0.6	10.1	29.2	10.7	65.7	55.7	36.5	45.0	Va
3	0.181	25.2	20.7	10.1	35.3	30.8	64.4	54.4	29.1	23.6	Vb
4	0.181	25.0	20.7	10.1	35.1	30.8	64.4	54.4	29.3	23.6	Va
5	19.970	9.2	2.5	10.4	19.6	12.9	60.0	50.0	40.4	37.1	Va
6	20.010	8.8	2.0	10.4	19.2	12.4	60.0	50.0	40.8	37.6	Vb

Graphical Data

2.3 Antenna power conduction

Reference Standard

Part15.111

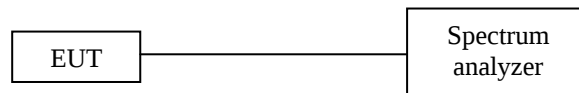
Test Conditions

Date: 19 April, 2012
Ambient Temperature: 21 degC
Relative humidity: 47 %
Test Voltage: DC 13.5 V

Test Method

- a) EUT is connected to spectrum analyzer.
- b) Resolution band width of spectrum analyzer is set to 1MHz (above 1GHz) or 100 kHz (below1GHz).

Test Setup



Limit

Not exceed 2nW

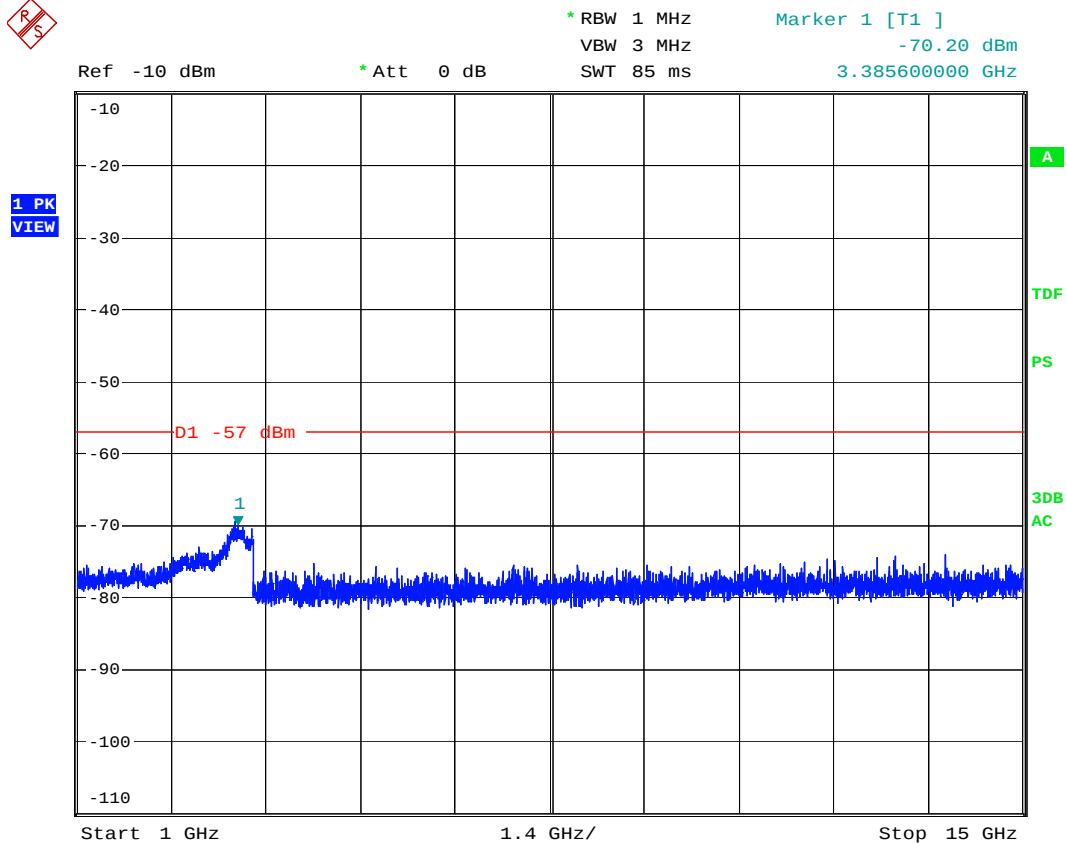
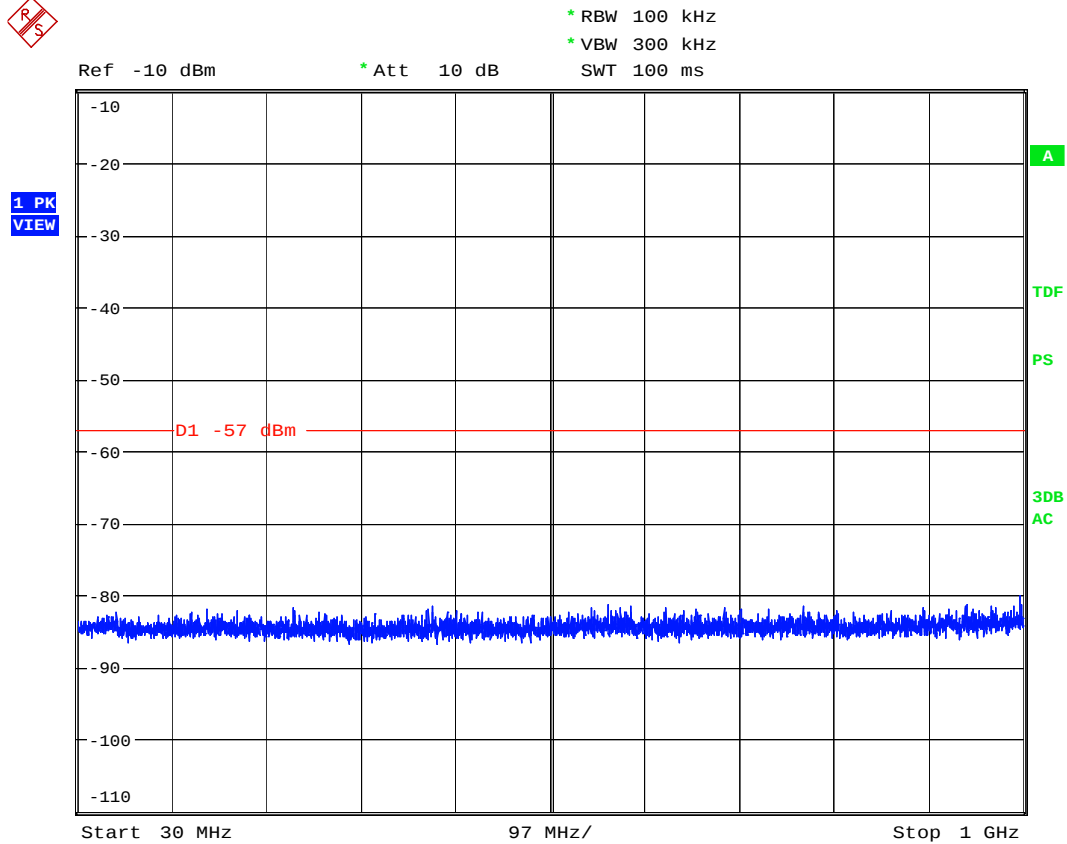
Test equipment used (refer to List of utilized test equipment)

CL28	TR06
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Test Result

The EUT met the requirements of the standard for this test

Test Data (Worst configuration: Receiving mode 3600MHz)



4 List of utilized test equipment/ calibration

RFT ID No.	Kind of Equipment and Precision	Manufacturer	Model No.	Serial Number	Calibration Date	Calibrated until
AC01(EM)	Anechoic Chamber (1st test room)	JSE	203397C	-	2011/04/23	2012/04/30
BI01	Biconical Antenna	SCHWARZBECK	VHA9103 & BBA9106	2359	2012/03/12	2013/03/31
CL11	Antenna Cable for RE	RFT	-	-	2011/10/27	2012/10/31
CL18	Antenna Cable for CE	RFT	-	-	2011/05/13	2012/05/31
CL24	RF Cable 5.0m	SUHNER	SUCOFLEX104PE	48775	2011/06/17	2012/06/30
CL28	RF Cable 1.0m	SUHNER	SUCOFLEX104PE	75769	2011/08/08	2012/08/31
DH01	DRG Horn Antenna	A.H. Systems	SAS-571	785	2012/01/27	2014/01/31
LA05	Logperiodic Antenna	SCHWARZBECK	VUSLP9111B	070	2012/03/12	2013/03/31
LN05	LISN	Kyoritsu	KNW-407F	8-1773-2	2011/05/31	2012/05/31
PR03	Pre. Amplifier	Anritsu	MH648A	M41984	2011/05/12	2012/05/31
PR12	Pre. Amplifier (1-26G)	Agilent Technologies	8449B	3008A02513	2012/01/24	2013/01/31
TR06	Test Receiver (F/W : 3.93 SP2)	Rohde & Schwarz	ESU26	100002	2011/09/16	2012/09/30
TR09	Test Receiver (F/W : 4.43 SP3)	Rohde & Schwarz	ESU8	100386	2012/01/10	2013/01/31

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.