



# Test Report

Product Name	U-NET Series
Model No.	AD132-1, AN149-1
FCC ID.	FU5TR002

Applicant	EVERSPRING INDUSTRY CO., LTD
Address	7th fl. 609 Wan Shou Road Sec. 1, Kweishan, Taoyuan Hsien 333, Taiwan, R.O.C.

Date of Receipt	Mar. 04, 2009
Issued Date	Mar. 31, 2009
Report No.	093086R-RFUSP07V01
Report Version	V1.0

The Test Results relate only to the samples tested.

The test report shall not be reproduced except in full without the written approval of Quietek Corporation.


This report must not be used to claim product endorsement by NVLAP any agency of the U.S. Government

# Test Report Certification

Issued Date: Mar. 31, 2009

Report No. : 093086R-RFUSP07V01



Product Name	U-NET Series	
Applicant	EVERSPRING INDUSTRY CO., LTD	
Address	7th fl. 609 Wan Shou Road Sec. 1, Kweishan, Taoyuan Hsien 333, Taiwan, R.O.C.	
Manufacturer	Dong-Guan Li Yuan Electronics Co., Ltd	
Model No.	AD132-1, AN149-1	
FCC ID.	FU5TR002	
Rated Voltage	AC 120V/60Hz	
Working Voltage	AC 120V/60Hz	
Trade Name	EVERSPRING	
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2008	
	ANSI C63.4: 2003	
Test Result	Complied	 <small>NVLAP Lab Code: 200533-0</small>

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 (Senior Adm. Specialist / Genie Chang)



Tested By : Dino Chen  
 (Engineer / Dino Chen)

Approved By : Vincent Lin  
 (Manager / Vincent Lin)



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# 1. GENERAL INFORMATION

## 1.1. EUT Description

Product Name	U-NET Series
Trade Name	EVERSPRING
FCC ID.	FU5TR002
Model No.	AD132-1, AN149-1
Frequency Range	923MHz
Type of Modulation	FSK
Number of Channels	1
Channel Control	Auto
Antenna Type	Monopole
Antenna Gain	Refer to the table "Antenna List"

### Antenna List

No.	Manufacturer	Part No.	Peak Gain
1	EVERSPRING	N/A	0.73dBi for 923MHz

Center Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 1:	923MHz				

Note:

- The EUT is a U-NET Series with a built-in Z-Wave transceiver module.
- The different of the each model is shown as below:
 

Model Number	Description
AD132-1	TRIAC CIRCUIT and ZERO DETECT CIRCUIT
AN149-1	RELAY CIRCUIT
- These tests are conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.249.
- Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
- The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

EMI Test Mode	Mode 1: Transmitter
---------------	---------------------

## 1.2. Operation Description

The EUT is a U-NET Series with a built-in Z-Wave transceiver module. The EUT operation frequency is 923MHz. The signals modulated by FSK are transmitted from the Monopole Antenna of the EUT.

Together with the patented Z-Wave Protocol the Z-Wave Module delivers a complete highly reliable RF communication solution. The Z-Wave Protocol uses Flood Detector, Temperature/Humidity Detector, illumination Sensor and sophisticated Routing to assure reliable full home coverage.

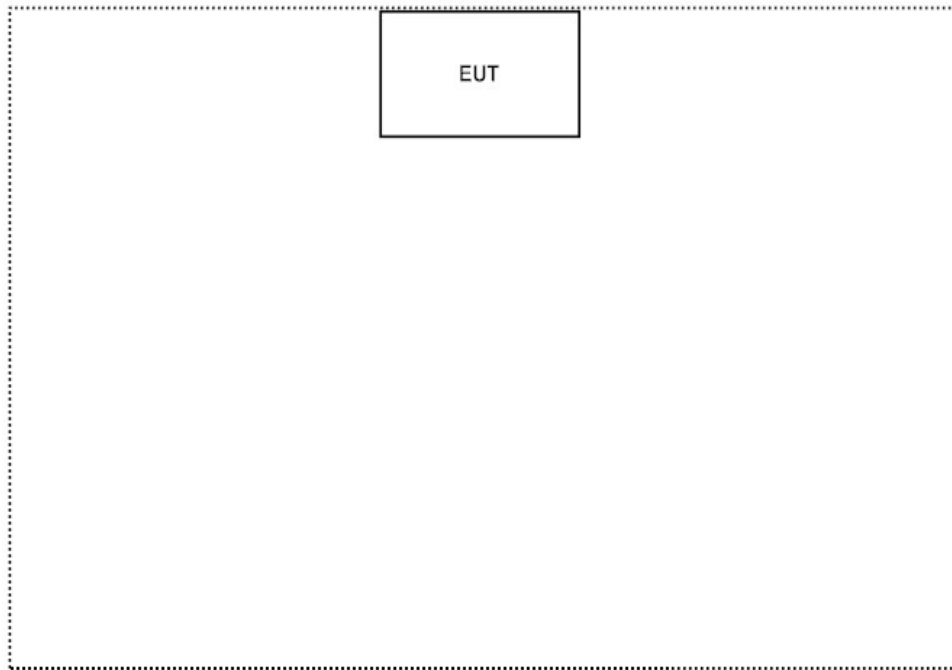
**1.3. Tested System Details**

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product	Manufacturer	Model No.	Serial No.	Power Cord
N/A				

Signal Cable Type	Signal cable Description
N/A	

**1.4. Configuration of Test System**



**1.5. EUT Exercise Software**

- (1) Setup the EUT as shown in section 1.4.
- (2) Open the EUT power.
- (3) Starts the continuous transmit.
- (4) Verify that the EUT works correctly.

**1.6. Test Facility**

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	50-65
Barometric pressure (mbar)	860-1060	950-1000

The related certificate for our laboratories about the test site and management system can be downloaded from Quietek Corporation’s Web Site : <http://tw.quietek.com/modules/myalbum/>  
 The address and introduction of Quietek Corporation’s laboratories can be founded in our Web site : <http://www.quietek.com/>

Site Description: File on  
 Federal Communications Commission  
 FCC Engineering Laboratory  
 7435 Oakland Mills Road  
 Columbia, MD 21046  
 Registration Number: 92195



Accreditation on NVLAP  
 NVLAP Lab Code: 200533-0



Site Name: Quietek Corporation

Site Address: No. 5-22, Ruei-Shu Valley, Ruei-Ping Tsuen,  
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FCC Accreditation Number: TW1014



## 2. Conducted Emission

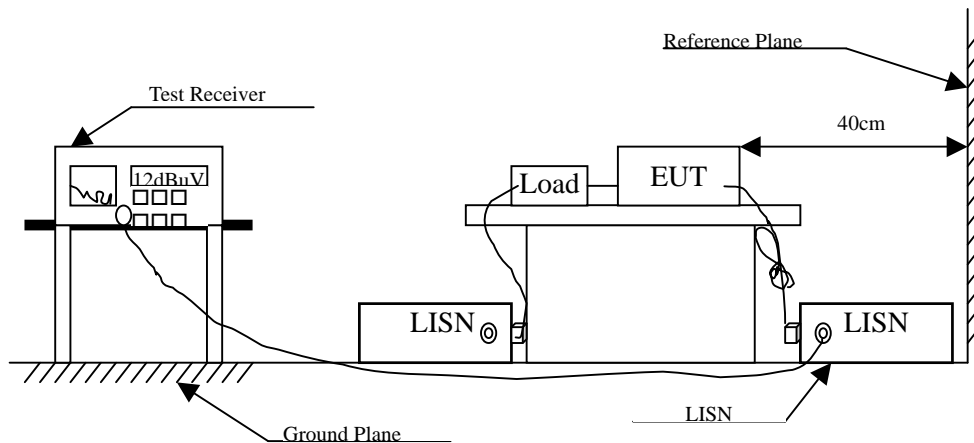
### 2.1. Test Equipment

The following test equipment are used during the conducted emission test:

Item	Instrument	Manufacturer	Type No./Serial No	Last Cal.	Remark
1	Test Receiver	R & S	ESCS 30/825442/17	May, 2008	
2	L.I.S.N.	R & S	ESH3-Z5/825016/6	May, 2008	EUT
3	L.I.S.N.	Kyoritsu	KNW-407/8-1420-3	May, 2008	Peripherals
4	Pulse Limiter	R & S	ESH3-Z2	May, 2008	
5	No.1 Shielded Room			N/A	

Note: All instruments are calibrated every one year.

### 2.2. Test Setup



### 2.3. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dBuV) Limit		
Frequency MHz	Limits	
	QP	AV
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

Remarks: In the above table, the tighter limit applies at the band edges.



## 2.4. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2003 on conducted measurement.

Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

## 2.5. Uncertainty

± 2.26 dB

## 2.6. Test Result of Conducted Emission

Product : U-NET Series  
 Test Item : Conducted Emission Test  
 Power Line : Line 1  
 Test Mode : Mode 1: Transmitter(AD132-1)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV	Margin dB	Limit dBuV
<b>Line 1</b>					
<b>Quasi-Peak</b>					
0.365	9.821	30.650	40.471	-19.386	59.857
0.732	9.830	26.090	35.920	-20.080	56.000
1.099	9.830	21.670	31.500	-24.500	56.000
1.466	9.840	20.370	30.210	-25.790	56.000
2.201	9.850	17.470	27.320	-28.680	56.000
21.013	10.200	3.550	13.750	-46.250	60.000
<b>Average</b>					
0.365	9.821	28.600	38.421	-11.436	49.857
0.732	9.830	24.000	33.830	-12.170	46.000
1.099	9.830	20.310	30.140	-15.860	46.000
1.466	9.840	19.130	28.970	-17.030	46.000
2.201	9.850	15.770	25.620	-20.380	46.000
21.013	10.200	1.460	11.660	-38.340	50.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. "■" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : U-NET Series  
 Test Item : Conducted Emission Test  
 Power Line : Line 2  
 Test Mode : Mode 1: Transmitter(AD132-1)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV	Margin dB	Limit dBuV
<b>Line 2</b>					
<b>Quasi-Peak</b>					
0.365	9.841	30.580	40.421	-19.436	59.857
0.728	9.830	22.190	32.020	-23.980	56.000
1.099	9.830	21.050	30.880	-25.120	56.000
1.466	9.840	19.300	29.140	-26.860	56.000
2.197	9.850	16.050	25.900	-30.100	56.000
7.334	9.900	3.210	13.110	-46.890	60.000
<b>Average</b>					
0.365	9.841	29.240	39.081	-10.776	49.857
0.728	9.830	18.580	28.410	-17.590	46.000
1.099	9.830	20.100	29.930	-16.070	46.000
1.466	9.840	18.330	28.170	-17.830	46.000
2.197	9.850	14.500	24.350	-21.650	46.000
7.334	9.900	1.750	11.650	-38.350	50.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. "■" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : U-NET Series  
 Test Item : Conducted Emission Test  
 Power Line : Line 1  
 Test Mode : Mode 1: Transmitter(AN149-1)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV	Margin dB	Limit dBuV
<b>Line 1</b>					
<b>Quasi-Peak</b>					
0.365	9.650	30.100	39.750	-20.107	59.857
0.732	9.635	24.970	34.605	-21.395	56.000
0.939	9.670	25.440	35.110	-20.890	56.000
1.470	9.670	17.920	27.590	-28.410	56.000
2.201	9.680	15.260	24.940	-31.060	56.000
2.564	9.690	11.390	21.080	-34.920	56.000
<b>Average</b>					
0.365	9.650	28.510	38.160	-11.697	49.857
0.732	9.635	23.160	32.795	-13.205	46.000
0.939	9.670	19.970	29.640	-16.360	46.000
1.470	9.670	15.840	25.510	-20.490	46.000
2.201	9.680	13.970	23.650	-22.350	46.000
2.564	9.690	9.790	19.480	-26.520	46.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. "■" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : U-NET Series  
 Test Item : Conducted Emission Test  
 Power Line : Line 2  
 Test Mode : Mode 1: Transmitter(AN149-1)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV	Margin dB	Limit dBuV
<b>Line 2</b>					
<b>Quasi-Peak</b>					
0.365	9.651	30.100	39.751	-20.106	59.857
0.732	9.655	24.790	34.445	-21.555	56.000
0.935	9.670	22.750	32.420	-23.580	56.000
1.099	9.670	20.660	30.330	-25.670	56.000
1.466	9.670	19.140	28.810	-27.190	56.000
2.564	9.690	11.390	21.080	-34.920	56.000
<b>Average</b>					
0.365	9.651	28.850	38.501	-11.356	49.857
0.732	9.655	23.160	32.815	-13.185	46.000
0.935	9.670	19.060	28.730	-17.270	46.000
1.099	9.670	19.160	28.830	-17.170	46.000
1.466	9.670	18.750	28.420	-17.580	46.000
2.564	9.690	10.050	19.740	-26.260	46.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. "■" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

### 3. Radiated Emission

#### 3.1. Test Equipment

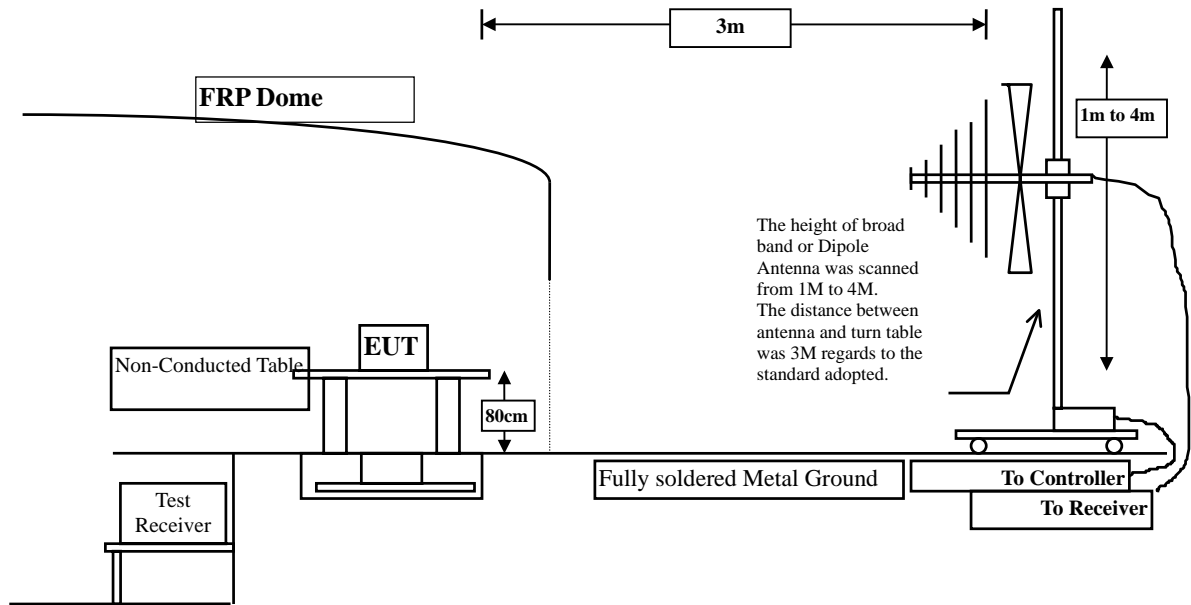
The following test equipment are used during the radiated emission test:

Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
<input type="checkbox"/> Site # 1		Test Receiver	R & S	ESVS 10 / 834468/003	May, 2008
		Spectrum Analyzer	Advantest	R3162/ 00803480	May, 2008
		Pre-Amplifier	Advantest	BB525C/ 3307A01812	May, 2008
		Bilog Antenna	SCHAFFNER	CBL6112B / 2697	Sep., 2008
<input type="checkbox"/> Site # 2		Test Receiver	R & S	ESCS 30 / 836858 / 022	May, 2008
		Spectrum Analyzer	Advantest	R3162 / 100803466	May, 2008
		Pre-Amplifier	Advantest	BB525C/3307A01814	May, 2008
		Bilog Antenna	SCHAFFNER	CBL6112B / 2705	May, 2008
		Horn Antenna	ETS	3115 / 0005-6160	Sep., 2008
		Pre-Amplifier	QTK	QTK-AMP-01/ 0001	May, 2008
<input checked="" type="checkbox"/> Site # 3	X	Test Receiver	R & S	ESI 26 / 838786/004	May, 2008
	X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2008
	X	Bilog Antenna	SCHAFFNER	CBL6112B / 2697	May, 2008
	X	Horn Antenna	Schwarzbeck	BBHA9120D / 305, 306	July, 2008
	X	Horn Antenna	Schwarzbeck	BBHA9170 / 208, 209	July, 2008
	X	Pre-Amplifier	QTK	QTK-AMP-01 / 0001	July, 2008
	X	Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2008
	X	Pre-Amplifier	HP	8449B / 3008A01123	July, 2008

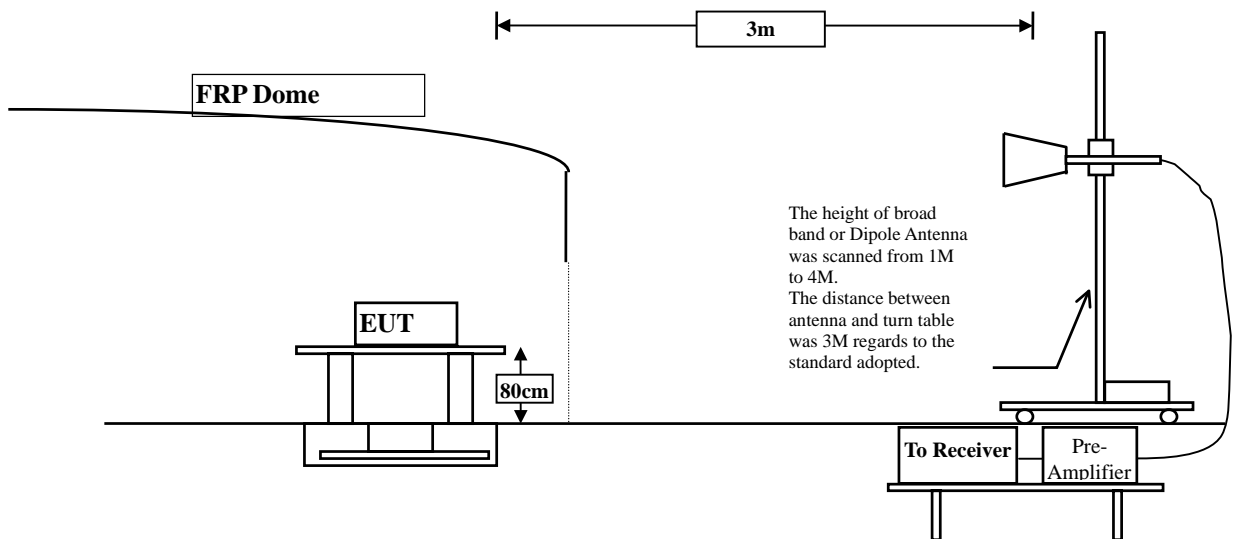
- Note:
1. All equipments are calibrated every one year.
  2. Test equipments marked by "X" are used to measure the final test results.

### 3.2. Test Setup

Below 1GHz



Above 1GHz



### 3.3. Limits

➤ **Fundamental and Harmonics Emission Limits**

<b>FCC Part 15 Subpart C Paragraph 15.249 Limits</b>				
Frequency MHz	Field Strength of Fundamental		Field Strength of Harmonics	
	(mV/m @3m)	(dBuV/m @3m)	(uV/m @3m)	(dBuV/m @3m)
902-928	50	94	500	54
2400-2483.5	50	94	500	54
5725-5875	50	94	500	54

- Remarks :
1. RF Voltage (dBuV/m) = 20 log RF Voltage (uV/m)
  2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

➤ **General Radiated Emission Limits**

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

<b>FCC Part 15 Subpart C Paragraph 15.209 Limits</b>		
Frequency MHz	uV/m @3m	dBuV/m@3m
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

- Remarks :
1. RF Voltage (dBuV/m) = 20 log RF Voltage (uV/m)
  2. In the Above Table, the tighter limit applies at the band edges.
  3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.



### 3.4. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4: 2003 on radiated measurement.

The resolution bandwidth below 1GHz setting on the field strength meter is 120 kHz and above 1GHz is 1MHz.

Radiated emission measurements below 1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna.

The worst radiated emission is measured on the Final Measurement.

The measurement frequency range form 30MHz - 10th Harmonic of fundamental was investigated.

### 3.5. Uncertainty

± 3.9 dB above 1GHz

± 3.8 dB below 1GHz

### 3.6. Test Result of Radiated Emission

Product : U-NET Series  
 Test Item : Fundamental Radiated Emission  
 Test Site : No.3OATS  
 Test Mode : Mode 1: Transmitter (AD132-1)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal Peak Detector:</b>					
923.000	5.816	81.980	87.796	-26.204	114.000

**Horizontal  
Average Detector:**

--

Note:

1. Measurement Level = Reading Level + Correct Factor.
2. Correct Factor = Antenna Factor + Cable Loss – PreAMP.

Product : U-NET Series  
 Test Item : Fundamental Radiated Emission  
 Test Site : No.3OATS  
 Test Mode : Mode 1: Transmitter (AD132-1)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Vertical Peak Detector:</b>					
923.000	5.053	88.780	93.833	-20.167	114.000

**Vertical  
Average Detector:**

--

Note:

1. Measurement Level = Reading Level + Correct Factor.
2. Correct Factor = Antenna Factor + Cable Loss – PreAMP.

Product : U-NET Series  
 Test Item : Fundamental Radiated Emission  
 Test Site : No.3OATS  
 Test Mode : Mode 1: Transmitter (AN149-1)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal Peak Detector:</b>					
923.000	5.816	85.970	91.786	-22.214	114.000

**Horizontal  
Average Detector:**

--

Note:

1. Measurement Level = Reading Level + Correct Factor.
2. Correct Factor = Antenna Factor + Cable Loss – PreAMP.

Product : U-NET Series  
 Test Item : Fundamental Radiated Emission  
 Test Site : No.3OATS  
 Test Mode : Mode 1: Transmitter (AN149-1)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Vertical Peak Detector:</b>					
923.000	5.053	84.350	89.403	-24.597	114.000

**Vertical  
Average Detector:**

--

Note:

1. Measurement Level = Reading Level + Correct Factor.
2. Correct Factor = Antenna Factor + Cable Loss – PreAMP.

Product : U-NET Series  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (AD132-1)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
1846.000	-9.263	53.710	44.447	-29.553	74.000
2769.000	-5.999	43.610	37.611	-36.389	74.000
3692.000	-4.685	55.850	51.165	-22.835	74.000
4615.000	-1.898	45.360	43.463	-30.537	74.000
5538.000	-0.266	52.120	51.854	-22.146	74.000
6461.000	0.270	43.200	43.470	-30.530	74.000
7384.000	4.005	43.380	47.385	-26.615	74.000
8307.000	4.260	42.120	46.380	-27.620	74.000
9230.000	5.574	40.640	46.213	-27.787	74.000

**Average  
Detector:**

--

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “\*”, means this data is the too weak instrument of signal is unable to test.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : U-NET Series  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (AD132-1)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Vertical</b>					
<b>Peak Detector:</b>					
1846.000	-9.263	53.450	44.187	-29.813	74.000
2769.000	-5.999	43.730	37.731	-36.269	74.000
3692.000	-4.685	56.780	52.095	-21.905	74.000
4615.000	-1.898	44.860	42.963	-31.037	74.000
5538.000	-0.266	53.750	53.484	-20.516	74.000
6461.000	0.270	45.520	45.790	-28.210	74.000
7384.000	4.005	44.280	48.285	-25.715	74.000
8307.000	4.260	42.220	46.480	-27.520	74.000
9230.000	5.574	41.900	47.473	-26.527	74.000
<b>Average Detector:</b>					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the too weak instrument of signal is unable to test.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : U-NET Series  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (AN149-1)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
1846.000	-9.263	56.970	47.707	-26.293	74.000
2769.000	-5.999	44.840	38.841	-35.159	74.000
3692.000	-4.685	48.350	43.665	-30.335	74.000
4615.000	-1.898	45.670	43.773	-30.227	74.000
5538.000	-0.266	49.580	49.314	-24.686	74.000
6461.000	0.270	43.090	43.360	-30.640	74.000
7384.000	4.005	45.100	49.105	-24.895	74.000
8307.000	4.260	42.260	46.520	-27.480	74.000
9230.000	5.574	42.000	47.573	-26.427	74.000
<b>Average Detector:</b>					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “\*”, means this data is too weak instrument of signal is unable to test.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.



Product : U-NET Series  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (AN149-1)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Vertical</b>					
<b>Peak Detector:</b>					
1846.000	-9.263	54.030	44.767	-29.233	74.000
2769.000	-5.999	44.910	38.911	-35.089	74.000
3692.000	-4.685	51.900	47.215	-26.785	74.000
4615.000	-1.898	45.500	43.603	-30.397	74.000
5538.000	-0.266	52.930	52.664	-21.336	74.000
6461.000	0.270	43.600	43.870	-30.130	74.000
7384.000	4.005	45.100	49.105	-24.895	74.000
8307.000	4.260	42.780	47.040	-26.960	74.000
9230.000	5.574	43.080	48.653	-25.347	74.000
<b>Average Detector:</b>					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the too weak instrument of signal is unable to test.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : U-NET Series  
 Test Item : General Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (AD132-1)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
<b>Horizontal</b>					
175.500	-9.940	28.865	18.925	-24.575	43.500
400.540	0.868	21.132	22.000	-24.000	46.000
472.320	2.770	25.289	28.059	-17.941	46.000
606.180	3.970	22.851	26.821	-19.179	46.000
769.140	4.899	21.791	26.690	-19.310	46.000
858.380	6.380	20.816	27.196	-18.804	46.000
<b>Vertical</b>					
175.500	-1.990	24.298	22.308	-21.192	43.500
227.880	-6.308	27.144	20.837	-25.163	46.000
472.320	-3.670	23.904	20.234	-25.766	46.000
606.180	2.020	20.751	22.771	-23.229	46.000
747.800	1.457	24.556	26.013	-19.987	46.000
840.920	1.990	22.169	24.159	-21.841	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. "■" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : U-NET Series  
 Test Item : General Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (AN149-1)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
<b>Horizontal</b>					
400.540	0.868	22.007	22.875	-23.125	46.000
472.320	2.770	24.748	27.518	-18.482	46.000
544.100	4.180	20.896	25.076	-20.924	46.000
652.740	1.744	23.710	25.454	-20.546	46.000
747.800	3.707	24.485	28.192	-17.808	46.000
835.100	5.840	25.477	31.317	-14.683	46.000
<b>Vertical</b>					
227.880	-6.308	27.860	21.553	-24.447	46.000
381.140	0.722	20.953	21.675	-24.325	46.000
472.320	-3.670	24.193	20.523	-25.477	46.000
685.720	2.088	21.272	23.360	-22.640	46.000
747.800	1.457	24.743	26.200	-19.800	46.000
835.100	1.110	22.120	23.230	-22.770	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. "■" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

## 4. Band Edge

### 4.1. Test Equipment

The following test equipments are used during the band edge tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Test Receiver	R & S	ESI 26 / 838786/004	May, 2008
X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2008
X	Bilog Antenna	SCHAFFNER	CBL6112B / 2697	May, 2008
X	Horn Antenna	Schwarzbeck	BBHA9120D / 305, 306	July, 2008
X	Horn Antenna	Schwarzbeck	BBHA9170 / 208, 209	July, 2008
X	Pre-Amplifier	QTK	QTK-AMP-01 / 0001	July, 2008
X	Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2008
X	Pre-Amplifier	HP	8449B / 3008A01123	July, 2008

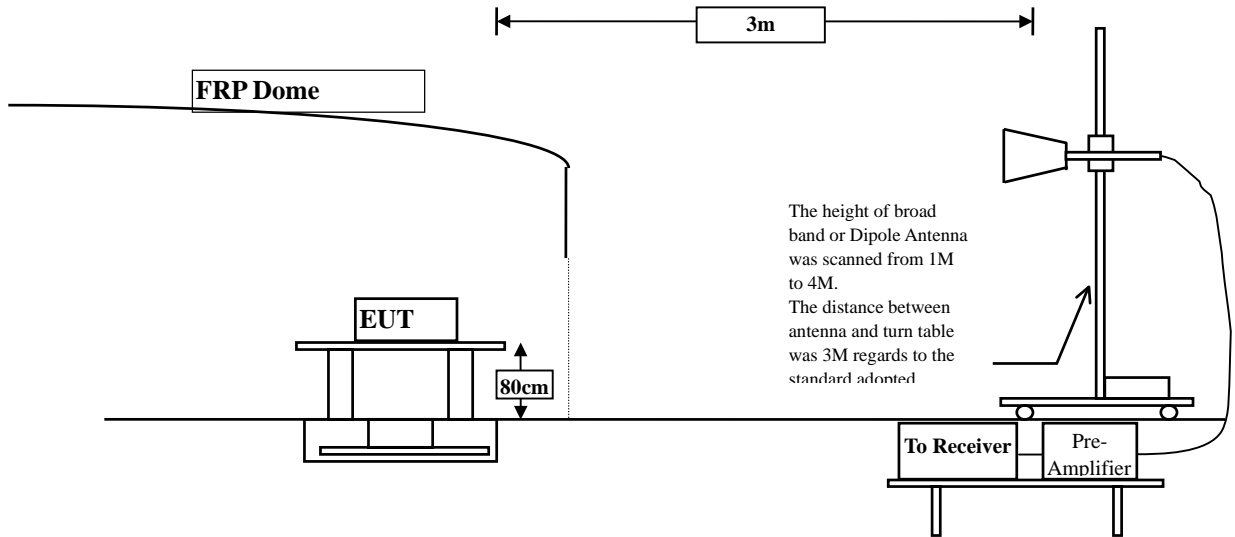
OATS No.3

- Note:
1. All equipments are calibrated every one year.
  2. The test equipments marked by "X" are used to measure the final test results.

**4.2. Test Setup**

**RF Radiated Measurement:**

Above 1GHz



**4.3. Limit**

Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

#### 4.4. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4:2003 on radiated measurement.

The bandwidth below 1GHz setting on the field strength meter (R&S Test Receiver ESCS 30 )is 120 kHz, above 1GHz are 1 MHz.

#### 4.5. Uncertainty

Conducted is  $\pm 1.27$  dB

Radiated is  $\pm 3.9$  dB.

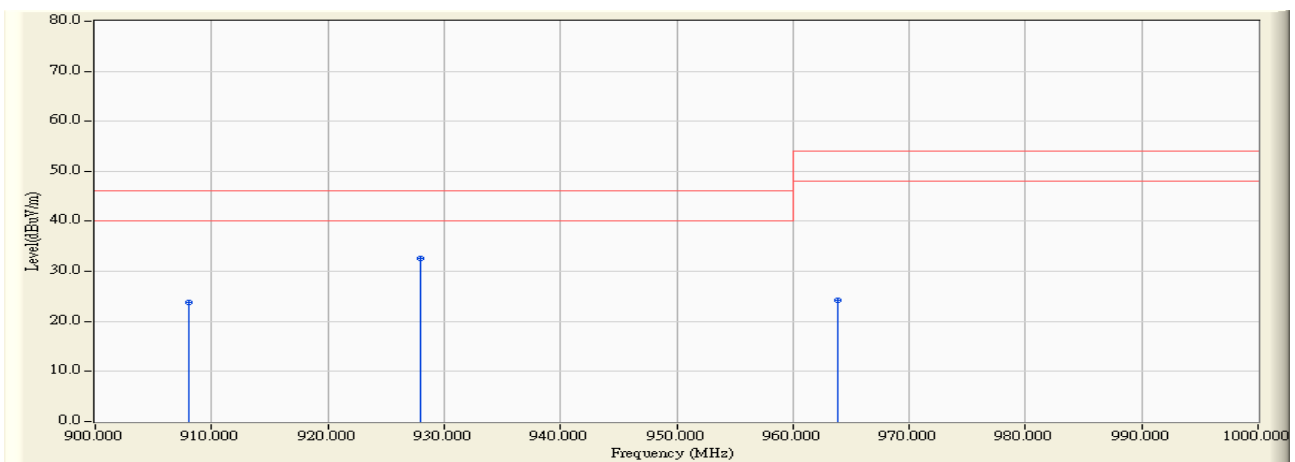
#### 4.6. Test Result of Band Edge

Product : U-NET Series  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (AD132-1)

#### RF Radiated Measurement (Horizontal):

No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Quasi-Peak Limit (dBuV/m)	Result
01(Quasi-Peak)	908.000	4.228	19.480	23.708	54.000	Pass
02(Quasi-Peak)	928.000	4.622	27.950	32.571	54.000	Pass
03(Quasi-Peak)	963.800	5.237	18.960	24.197	54.000	Pass

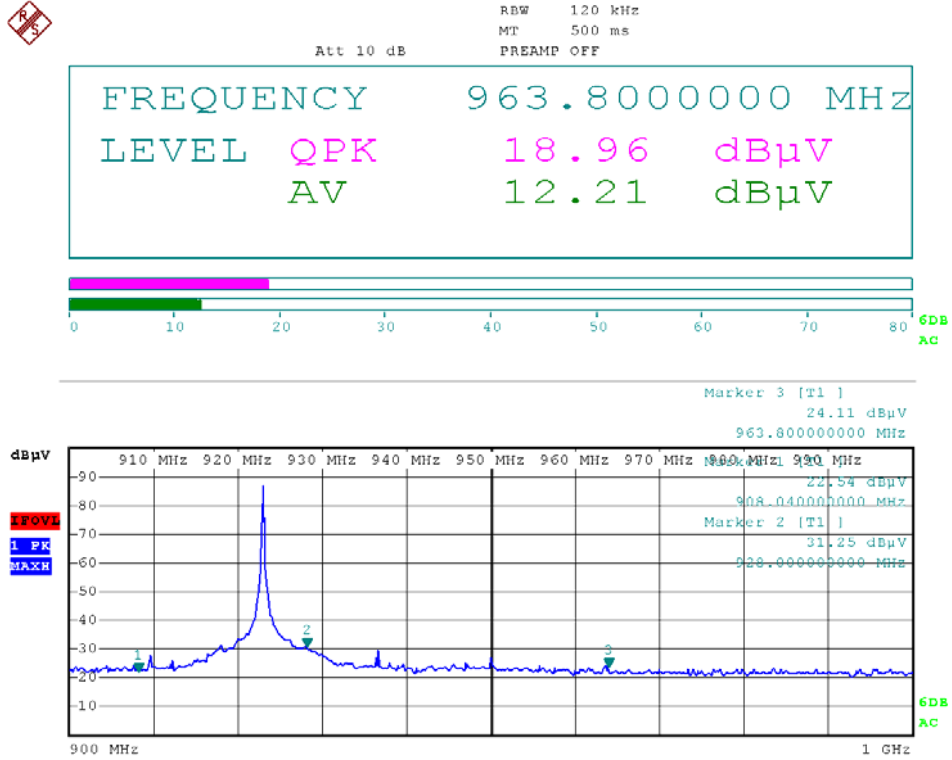
**Figure Channel 01: Horizontal (Quasi-Peak)**



Note:

1. Quasi-Peak measurements: RBW=100kHz,VBW=1MHz,Sweep: Auto.
2. “ \* ”, means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

### Figure receiver sweep- Horizontal



Date: 26.MAR.2009 04:00:03

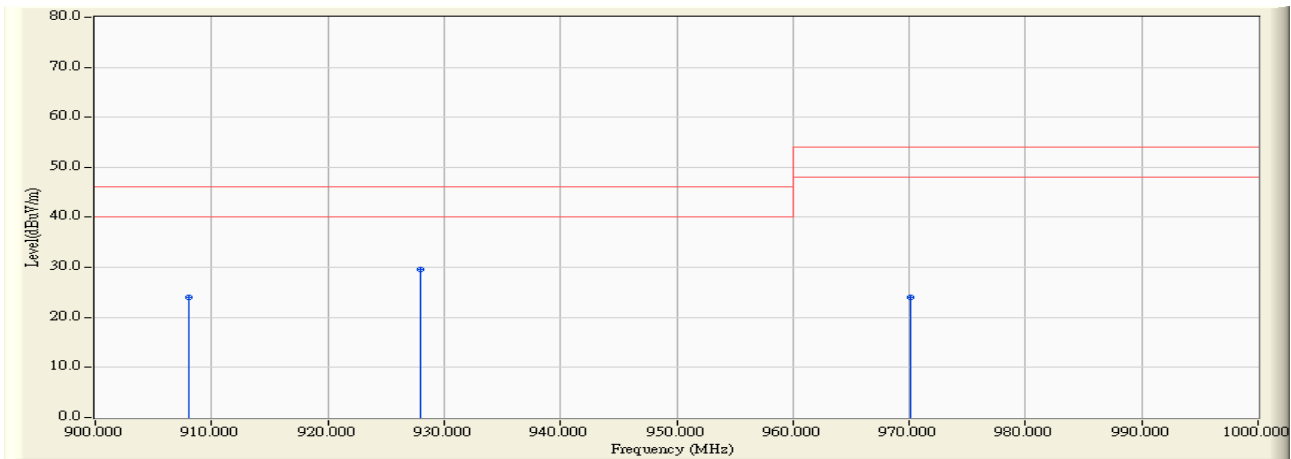


Product : U-NET Series  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (AD132-1)

**RF Radiated Measurement (Vertical):**

No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Quasi-Peak Limit (dBuV/m)	Result
01(Quasi-Peak)	908.000	5.338	18.600	23.938	54.000	Pass
02(Quasi-Peak)	928.000	5.602	24.040	29.641	54.000	Pass
03(Quasi-Peak)	970.160	5.992	18.040	24.032	54.000	Pass

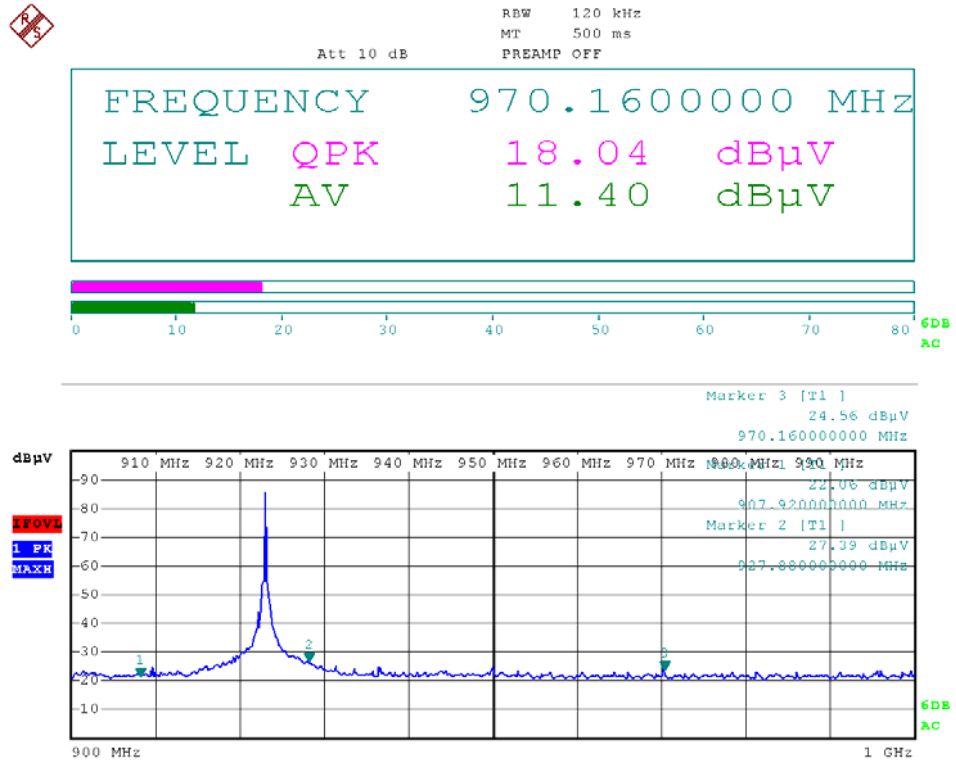
**Figure Channel 01: Vertical (Quasi-Peak)**



**Note:**

1. Quasi-Peak measurements: RBW=100kHz,VBW=1MHz,Sweep: Auto.
2. “ \* ”, means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Figure receiver sweep-Vertical



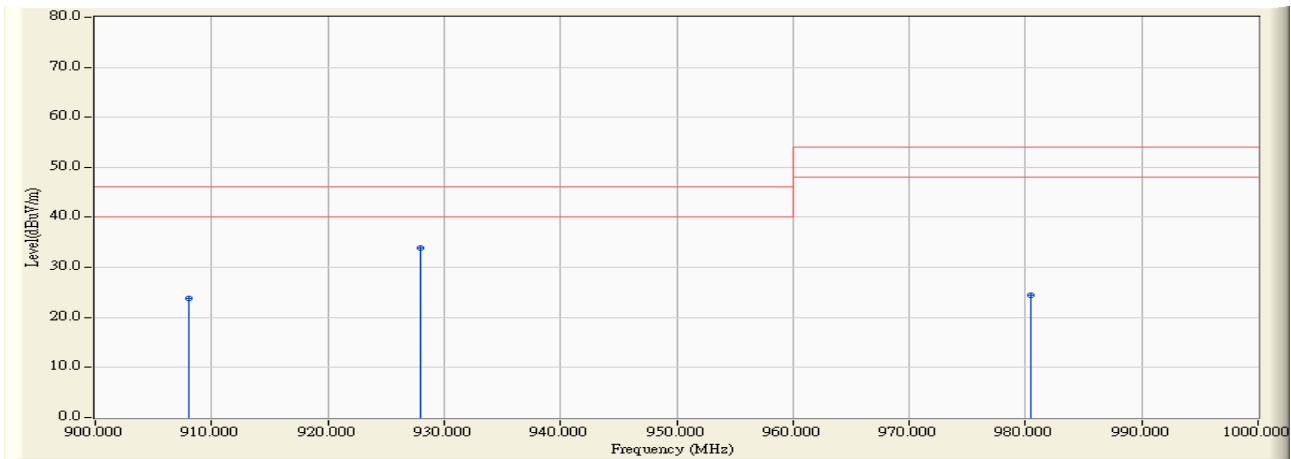
Date: 26.MAR.2009 04:02:39

Product : U-NET Series  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (AN149-1)

**RF Radiated Measurement (Horizontal):**

No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Quasi-Peak Limit (dBuV/m)	Result
01(Quasi-Peak)	908.000	4.228	19.510	23.738	46.020	Pass
02(Quasi-Peak)	928.000	4.622	29.220	33.841	46.020	Pass
03(Quasi-Peak)	980.480	5.419	18.940	24.359	53.970	Pass

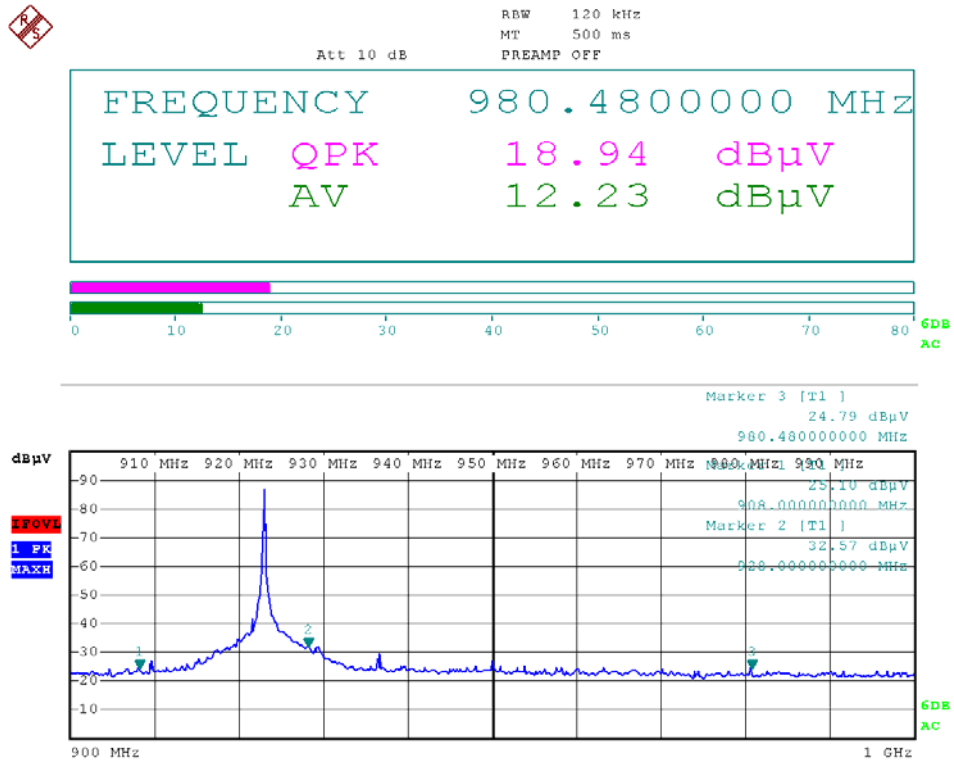
**Figure Channel 01: Horizontal (Quasi-Peak)**



Note:

1. Quasi-Peak measurements: RBW=100kHz,VBW=1MHz,Sweep: Auto.
2. “ \* ”, means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

### Figure receiver sweep- Horizontal



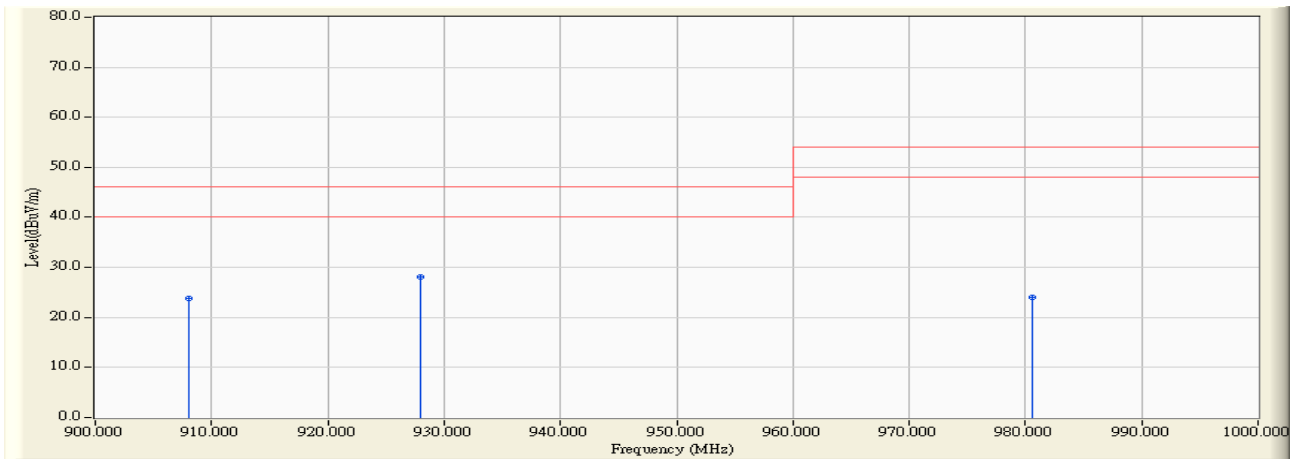
Date: 26.MAR.2009 04:06:52

Product : U-NET Series  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter (AN149-1)

**RF Radiated Measurement (Vertical):**

No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Quasi-Peak Limit (dBuV/m)	Result
01(Quasi-Peak)	908.000	5.338	18.370	23.708	46.020	Pass
02(Quasi-Peak)	928.000	5.602	22.550	28.151	46.020	Pass
03(Quasi-Peak)	980.600	6.041	17.980	24.021	53.970	Pass

**Figure Channel 01: Vertical (Quasi-Peak)**



**Note:**

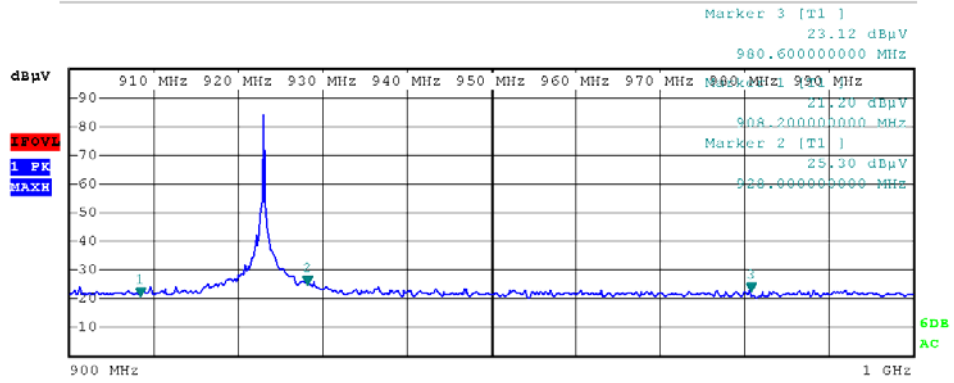
1. Quasi-Peak measurements: RBW=100kHz,VBW=1MHz,Sweep: Auto.
2. “ \* ”, means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

### Figure receiver sweep-Vertical



Att 10 dB RBW 120 kHz  
 MT 500 ms  
 PREAMP OFF

FREQUENCY	980.6000000 MHz		
LEVEL	QPK	17.98	dBµV
	AV	11.27	dBµV



Date: 26.MAR.2009 04:08:41

## **5. EMI Reduction Method During Compliance Testing**

No modification was made during testing.