

RF MEASUREMENT REPORT

FCC ID: XMR202111EG915ULA
Application: Quectel Wireless Solutions Company Limited
Product: LTE Module
Model No.: EG915U-LA
Brand Name: Quectel
FCC Classification: PCS Licensed Transmitter (PCB)
FCC Rule Part(s): Part 22 (H), 24 (E)
Result: Complies
Test Date: April 18 ~ 26, 2022

Reviewed By:

Sunny Sun

Approved By:

Robin Wu



The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.26-2015. Test results reported herein relate only to the item(s) tested.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date	Note
2204RSU026-U1	Rev. 01	Initial Report	05-13-2022	Valid

Note: This report is supplement to FCC ID "XMR202111EG915ULA" updating PCB laminated structure change and related data

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1. GENERAL INFORMATION

1.1. Applicant

Quectel Wireless Solutions Company Limited
 Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai,
 China 200233

1.2. Manufacturer

Quectel Wireless Solutions Company Limited
 Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai,
 China 200233

1.3. Testing Facility

<input checked="" type="checkbox"/>	Test Site – MRT Suzhou Laboratory
	Laboratory Location (Suzhou - Wuzhong) D8 Building, No.2 Tian’edang Rd., Wuzhong Economic Development Zone, Suzhou, China
	Laboratory Location (Suzhou - SIP) 4b Building, Liando U Valley, No.200 Xingpu Rd., Shengpu Town, Suzhou Industrial Park, China
	Laboratory Accreditations
	A2LA: 3628.01 CNAS: L10551
	FCC: CN1166 ISED: CN0001
	VCCI: <input type="checkbox"/> R-20025 <input type="checkbox"/> G-20034 <input type="checkbox"/> C-20020 <input type="checkbox"/> T-20020
	<input type="checkbox"/> R-20141 <input type="checkbox"/> G-20134 <input type="checkbox"/> C-20103 <input type="checkbox"/> T-20104
<input type="checkbox"/>	Test Site – MRT Shenzhen Laboratory
	Laboratory Location (Shenzhen) 1G, Building A, Junxiangda Building, Zhongshanyuan Road West, Nanshan District, Shenzhen, China
	Laboratory Accreditations
	A2LA: 3628.02 CNAS: L10551
	FCC: CN1284 ISED: CN0105
<input type="checkbox"/>	Test Site – MRT Taiwan Laboratory
	Laboratory Location (Taiwan) No. 38, Fuxing 2nd Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)
	Laboratory Accreditations
	TAF: L3261-190725
	FCC: 291082, TW3261 ISED: TW3261

1.4. Product Information

Product Name	LTE Module
Model No.	EG915U-LA
Brand Name	Quectel
IMEI	865413050018992
Operating Temperature	-35 ~ 75 °C
Power Type	3.3 ~ 4.3Vdc, typical 3.8Vdc
Bluetooth Specification	V4.2 single mode for BR/EDR
Wi-Fi Specification	802.11b scan mode
GSM Band	GSM 850, PCS 1900
E-UTRA Band	Band 2, 4, 5, 7, 66

Note: The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

1.5. Radio Specification under Test

Tx Frequency Range	GSM 850: 824 ~ 849MHz, PCS 1900: 1850 ~ 1910MHz
Rx Frequency Range	GSM850: 869 ~ 894MHz, PCS1900: 1930 ~ 1990MHz,
Modulation	GSMK

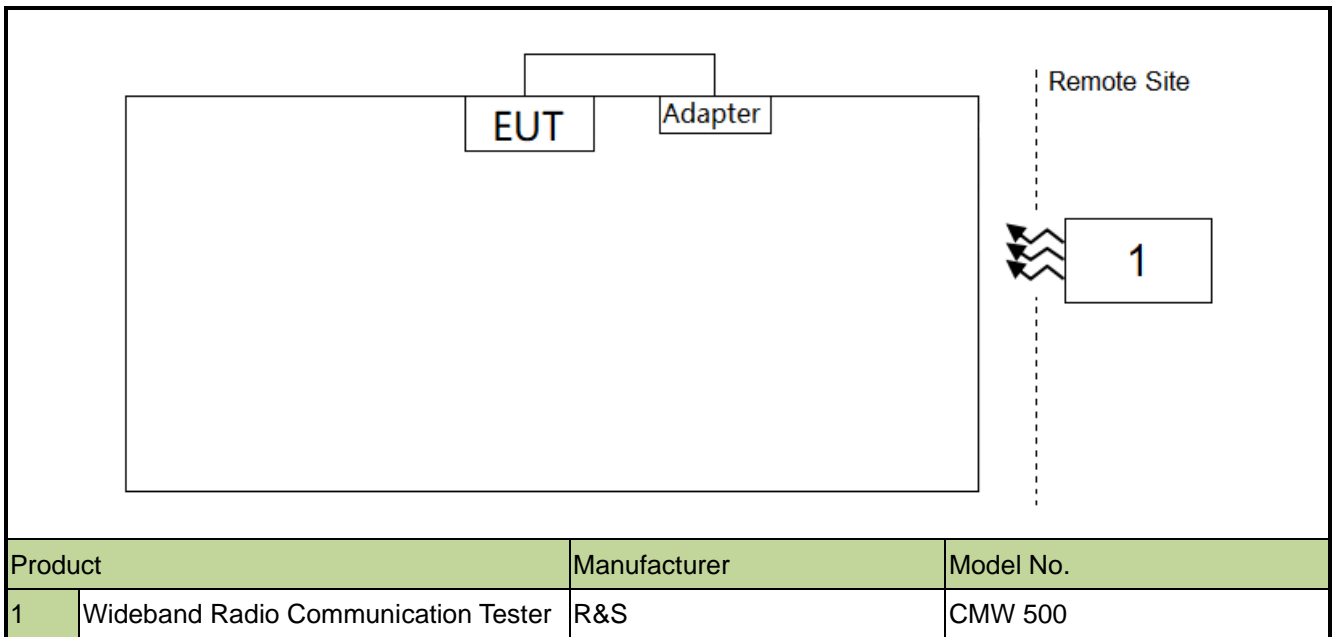
Note: For other features of this EUT, test report will be issued separately.

1.6. Test Methodology

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ANSI C63.26:2015
- FCC CFR 47 Part 22, Part 24
- FCC KDB 971168 D01 v03r01: Power Meas License Digital Systems
- FCC KDB 971168 D02 v02r01: Misc Rev Approv License Devices
- FCC KDB 412172 D01 v01r01: Determining ERP and EIRP

1.7. Configuration of Tested System



1.8. Test Environment Condition

Ambient Temperature	15 ~ 35°C
Relative Humidity	20% ~ 75%RH

2. TEST EQUIPMENT CALIBRATION DATE

Instrument	Manufacturer	Model No.	Asset No.	Last Cali. Date	Cali. Due Date	Test Site
TRILOG Antenna	Schwarzbeck	VULB 9162	MRTSUE06022	1 year	2022/5/24	WZ-AC2
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2022/10/28	WZ-AC2
Communication Tester	R&S	CMW500	MRTSUE06108	1 year	2023/4/6	WZ-SR3
EMI Test Receiver	Agilent	N9038A	MRTSUE06125	1 year	2022/6/24	WZ-AC2
Thermohygrometer	Mingle	ETH529	MRTSUE06170	1 year	2022/12/1	WZ-AC2
Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06171	1 year	2022/10/21	WZ-AC2
Preamplifier	Schwarzbeck	BBV 9718	MRTSUE06176	1 year	2022/11/12	WZ-AC2
Anechoic Chamber	RIKEN	WZ-AC2	MRTSUE06213	1 year	2022/4/20	WZ-AC2
Anechoic Chamber	RIKEN	WZ-AC2	MRTSUE06213	1 year	2023/4/21	WZ-AC2
Horn Antenna	ETS	3117	MRTSUE06257	1 year	2022/9/25	WZ-AC2
Thermohygrometer	testo	608-H1	MRTSUE06362	1 year	2023/2/15	WZ-SR6
Shielding Room	HUAMING	WZ-SR6	MRTSUE06443	/	/	WZ-SR6
Signal Analyzer	Keysight	N9020B	MRTSUE06583	1 year	2022/10/10	WZ-SR6
Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06597	1 year	2022/12/1	WZ-AC2
Signal Generator	Keysight	N5173B	MRTSUE06606	1 year	2022/11/29	WZ-SR6
Preamplifier	EMCI	EMC184045SE	MRTSUE06640	1 year	2023/1/13	WZ-AC2
5G Wireless Test Platform	Keysight	E7515B	MRTSUE06942	1 year	2023/3/3	WZ-SR6
Radio Communication Analyzer	Anritsu	MT8821C	MRTSUE06960	1 year	2022/7/1	WZ-SR6
Radio Communication Test Station	Anritsu	MT8000A	MRTSUE06961	1 year	2022/7/1	WZ-SR6
Preamplifier	EMCI	EMC051845SE	MRTSUE06987	1 year	2022/9/9	WZ-AC2
Thermohygrometer	testo	Testo 608-H1	MRTSUE11038	1 year	2022/11/11	WZ-AC2

Software	Version	Function
EMI Software	V3	EMI Test Software

3. MEASUREMENT UNCERTAINTY

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

Radiated Spurious Emissions
Measurement Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): Horizontal: 9kHz ~ 300MHz: 5.04dB 300MHz ~ 1GHz: 4.95dB 1GHz ~ 40GHz: 6.40dB Vertical: 9kHz ~ 300MHz: 5.24dB 300MHz ~ 1GHz: 6.03dB 1GHz ~ 40GHz: 6.40dB
Output Power
Measuring Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): 1.13dB

4. TEST RESULT

4.1. Summary

FCC Part Section(s)	Test Description	Test Condition	Verdict
22.913(a)(5)	Equivalent Radiated Power	Conducted	Pass
24.232(c)	Equivalent Isotropic Radiated Power		Pass
2.1053, 22.917(a) 24.238(a)	Spurious Emission	Radiated	Pass

Remark: The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.

4.2. Equivalent Isotropically Radiated Power Measurement

4.2.1. Test Limit

PCS 1900:

Mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

GSM 850:

The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

4.2.2. Test Procedure

ANSI C63.26-2015 - Section 5.2

4.2.3. Test Setting

Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter.

The relevant equation for determining the maximum ERP or EIRP from the measured RF output power is given in Equation (1) as follows:

$$\text{ERP or EIRP} = P_{\text{Meas}} + G_T$$

where

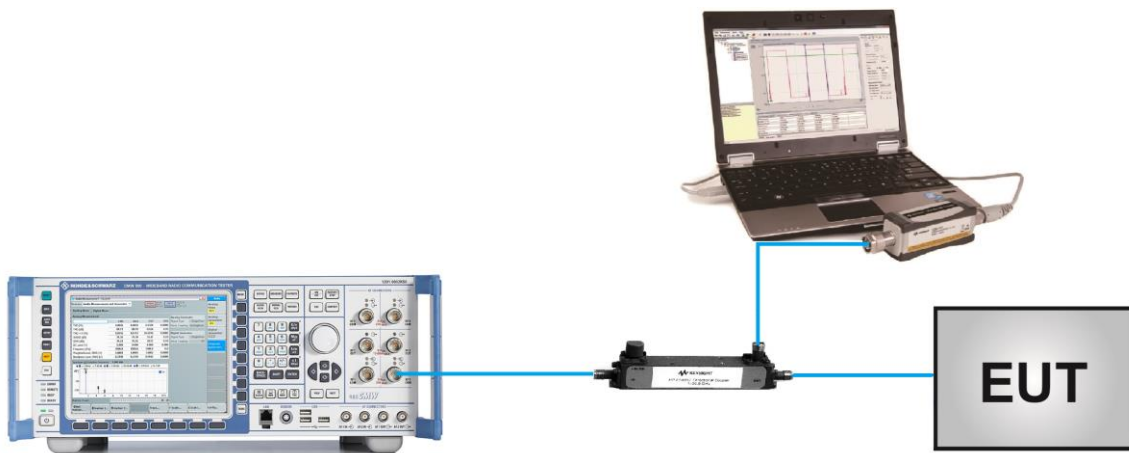
ERP or EIRP effective radiated power or equivalent isotropically radiated power, respectively (expressed in the same units as P_{Meas} , e.g., dBm or dBW)

P_{Meas} measured transmitter output power or PSD, in dBm or dBW

G_T gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP)

$$\text{ERP} = \text{EIRP} - 2.15$$

4.2.4. Test Setup



4.2.5. Test Result

Refer to Appendix A.1.

4.3. Radiated Spurious Emission Measurement

4.3.1. Test Limit

Out of band emissions: The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. The emission limit equal to -13dBm.

E (dB μ V/m) = EIRP (dBm) - 20 log D + 104.8; where D is the measurement distance in meters. The emission limit equal to 82.3dB μ V/m.

4.3.2. Test Procedure

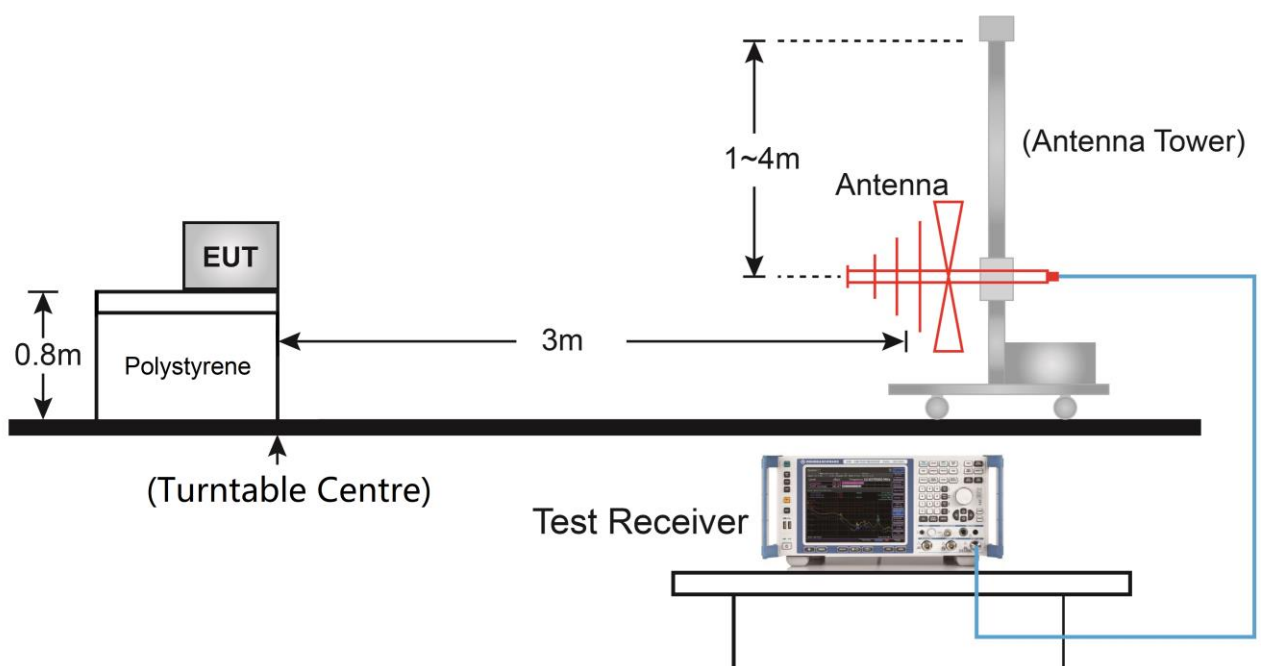
ANSI C63.26-2015 - Section 5.2.7 & 5.5

4.3.3. Test Setting

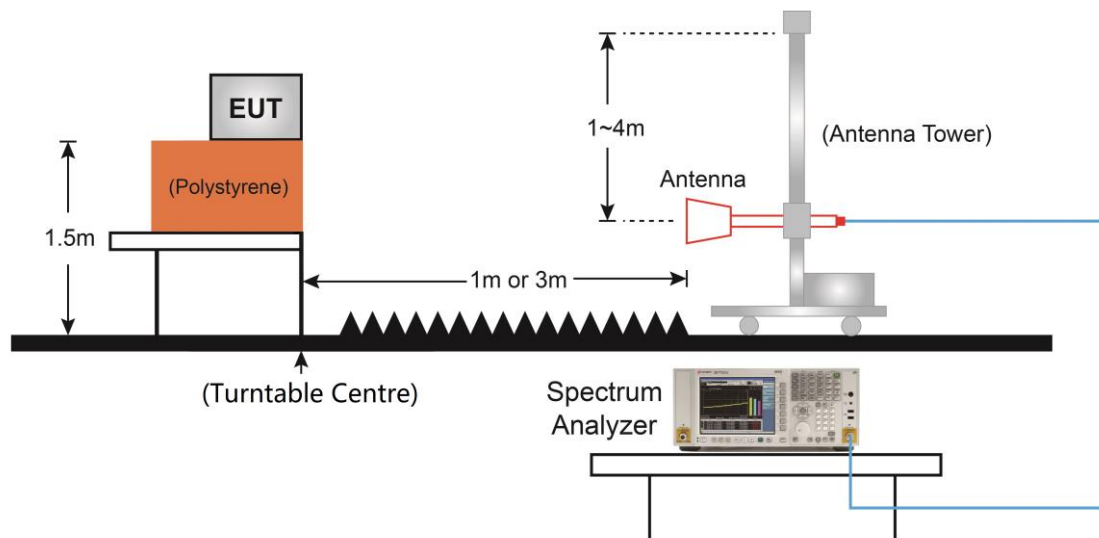
1. RBW = 1MHz
2. VBW \geq 3*RBW
3. Sweep time \geq 10 \times (number of points in sweep) \times (transmission symbol period)
4. Detector = Peak
5. Trace mode = max hold
6. The trace was allowed to stabilize

4.3.4. Test Setup

Below 1GHz Test Setup:



Above 1GHz Test Setup:



4.3.5. Test Result

Refer to Appendix A.2.

Appendix A - Test Result

A.1 Equivalent Isotropically Radiated Power Test Result

Test Site	WZ-SR6	Test Engineer	Caitlin Chen
Test Band	GSM 850	Test Date	2022/04/18

Mode	Slot	Conducted Power (dBm)			Antenna Gain (dBi)	ERP (dBm)		
		GSM 850 Channel				GSM 850 Channel		
		128	189	251		128	189	251
GPRS	1	32.42	32.44	32.25	2.53	32.80	32.82	32.63
	2	30.61	30.65	30.52	2.53	30.99	31.03	30.90
	3	28.51	28.47	28.45	2.53	28.89	28.85	28.83
	4	26.31	26.43	26.39	2.53	26.69	26.81	26.77
Limit	38.45dBm							

Note: The ERP (dBm) = Output Power (dBm) + Antenna Gain (dBi) - 2.15

Test Site	WZ-SR6	Test Engineer	Caitlin Chen
Test Band	PCS 1900	Test Date	2022/04/18

Mode	Slot	Conducted Power (dBm)			Antenna Gain (dBi)	EIRP (dBm)		
		PCS 1900 Channel				PCS 1900 Channel		
		512	661	810		512	661	810
GPRS	1	29.28	29.27	29.06	1.59	30.87	30.86	30.65
	2	27.31	27.44	27.25	1.59	28.90	29.03	28.84
	3	25.21	25.32	25.19	1.59	26.80	26.91	26.78
	4	23.20	23.32	23.20	1.59	24.79	24.91	24.79
Limit	33.01dBm							

Note: The EIRP (dBm) = Output Power (dBm) + Antenna Gain (dBi)

A.2 Radiated Spurious Emissions Test Result

Test Site	WZ-AC2	Test Engineer	Bob Zhang
Test Band	GSM 850	Test Date	2022/04/23 ~ 2022/ 04/26

Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
Low Channel							
128.46	8.57	16.02	24.59	82.30	-57.71	Peak	Horizontal
466.99	6.00	24.54	30.54	82.30	-51.76	Peak	Horizontal
43.10	16.81	20.28	37.09	82.30	-45.21	Peak	Vertical
157.07	19.46	15.69	35.15	82.30	-47.15	Peak	Vertical
1646.00	56.46	-6.63	49.83	82.30	-32.47	Peak	Horizontal
9202.50	36.97	11.47	48.44	82.30	-33.86	Peak	Horizontal
1646.00	60.72	-6.63	54.09	82.30	-28.21	Peak	Vertical
3295.00	47.72	-0.99	46.73	82.30	-35.57	Peak	Vertical
Middle Channel							
143.98	10.50	15.23	25.73	82.30	-56.57	Peak	Horizontal
468.44	5.04	24.60	29.64	82.30	-52.66	Peak	Horizontal
40.67	14.28	19.64	33.92	82.30	-48.38	Peak	Vertical
155.62	20.46	15.59	36.05	82.30	-46.25	Peak	Vertical
3346.00	59.50	-2.04	57.46	82.30	-24.84	Peak	Horizontal
4179.00	45.73	1.51	47.24	82.30	-35.06	Peak	Horizontal
3346.00	61.80	-2.04	59.76	82.30	-22.54	Peak	Vertical
4179.00	56.19	1.51	57.70	82.30	-24.60	Peak	Vertical
High Channel							
158.04	10.62	15.76	26.38	82.30	-55.92	Peak	Horizontal
468.44	5.53	24.60	30.13	82.30	-52.17	Peak	Horizontal
58.62	13.81	19.77	33.58	82.30	-48.72	Peak	Vertical
156.10	20.27	15.63	35.90	82.30	-46.40	Peak	Horizontal
3397.00	59.43	-1.75	57.68	82.30	-24.62	Peak	Horizontal
4247.00	45.95	1.83	47.78	82.30	-34.52	Peak	Vertical
3397.00	60.91	-1.75	59.16	82.30	-23.14	Peak	Vertical
4247.00	57.84	1.83	59.67	82.30	-22.63	Peak	Horizontal
Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB).							

Test Site	WZ-AC2	Test Engineer	Bob Zhang
Test Band	PCS 1900	Test Date	2022/04/23 ~ 2022/ 04/26

Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
Low Channel							
146.89	13.29	15.25	28.54	82.30	-53.76	Peak	Horizontal
586.78	3.34	27.16	30.50	82.30	-51.80	Peak	Horizontal
148.34	12.92	15.26	28.18	82.30	-54.12	Peak	Vertical
696.39	4.31	28.56	32.87	82.30	-49.43	Peak	Vertical
3703.00	54.95	-0.23	54.72	82.30	-27.58	Peak	Horizontal
5547.50	44.83	4.47	49.30	82.30	-33.00	Peak	Horizontal
3703.00	56.00	-0.23	55.77	82.30	-26.53	Peak	Vertical
5547.50	55.16	4.47	59.63	82.30	-22.67	Peak	Vertical
Middle Channel							
147.37	11.88	15.25	27.13	82.30	-55.17	Peak	Horizontal
738.59	2.29	29.19	31.48	82.30	-50.82	Peak	Horizontal
43.58	19.91	20.41	40.32	82.30	-41.98	Peak	Vertical
146.40	11.91	15.25	27.16	82.30	-55.14	Peak	Vertical
3762.50	52.65	-0.15	52.50	82.30	-29.80	Peak	Horizontal
5641.00	41.57	4.96	46.53	82.30	-35.77	Peak	Horizontal
3762.50	54.57	-0.15	54.42	82.30	-27.88	Peak	Vertical
5641.00	51.93	4.96	56.89	82.30	-25.41	Peak	Vertical
High Channel							
146.40	12.34	15.25	27.59	82.30	-54.71	Peak	Horizontal
600.36	1.76	27.34	29.10	82.30	-53.20	Peak	Horizontal
41.64	19.60	19.90	39.50	82.30	-42.80	Peak	Vertical
145.92	12.32	15.24	27.56	82.30	-54.74	Peak	Vertical
3822.00	53.55	0.69	54.24	82.30	-28.06	Peak	Horizontal
8199.50	37.27	9.28	46.55	82.30	-35.75	Peak	Horizontal
3822.00	54.47	0.69	55.16	82.30	-27.14	Peak	Vertical
5726.00	45.37	4.73	50.10	82.30	-32.20	Peak	Vertical

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB).

Appendix B - Test Setup Photograph

Refer to "2204RSU026-UT" file.

Appendix C - EUT Photograph

Refer to "2204RSU026-UE" file.