RF MEASUREMENT REPORT

FCC ID:	XMR2023EM160RGL
Applicant:	Quectel Wireless Solutions Co., Ltd
Product:	LTE-A Cat 16 M.2 Module
Model No.:	EM160R-GL
Brand Name:	QUECTEL
FCC Rule(s):	Part 2, 22 (H), 24 (E), 27, 90(R), 90(S)
Result:	Complies
Received Date:	2024-01-05
Test Date:	2024-01-11 ~ 2024-01-18

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.

Revision History

Report No.	Version	Description	Issue Date	Note
2401RSU007-U1	V01	Initial Report	2024-01-30	Valid

Note: This report is prepared for FCC Class II permissive supplement to FCC ID: XMR2023EM160RGL adding new antenna and updating the tune-up power.

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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

☒	**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:	☐R-20025	☐G-20034	☐C-20020	☐T-20020
		☐R-20141	☐G-20134	☐C-20103	☐T-20104
☐	**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		
☐	**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: 3261				
	FCC: 291082, TW3261		ISED: TW3261		

1.4. Product Information

Product Name	LTE-A Cat 16 M.2 Module
Model No.	EM160R-GL
Brand Name	Quectel
IMEI	865361050122902 (Conducted) 865361050122894 (Radiated)
3GPP Specification	WCDMA Band II/IV/V LTE Band 2, 4, 5, 7, 12, 13, 14, 25, 26, 30, 38, 41, 42, 43, 48, 66
Temperature Operating Range	-25 ~ 75 °C
Power Supply Rating	3.1 ~ 4.4Vdc, typical 3.7Vdc
Remark: The information of EUT was provided by the manufacturer, and the accuracy of the information shall be the responsibility of the manufacturer.	

1.5. Radio Specification under Testing

UTRA Specification	
TX Frequency Range	WCDMA Band II: 1850 ~ 1910MHz, WCDMA Band IV: 1710 ~ 1755MHz WCDMA Band V: 824 ~ 849MHz
RX Frequency Range	WCDMA Band II: 1930 ~ 1990MHz, WCDMA Band IV: 2110 ~ 2155MHz WCDMA Band V: 869 ~ 894MHz
E-UTRA Specification	
TX Frequency Range	LTE Band 2: 1850 ~ 1910MHz, LTE Band 4: 1710 ~ 1755MHz LTE Band 5: 824 ~ 849MHz, LTE Band 7: 2500 ~ 2570MHz LTE Band 12: 699 ~ 716MHz, LTE Band 13: 777 ~ 787MHz LTE Band 14: 788 ~ 798MHz, LTE Band 25: 1850 ~ 1915MHz LTE Band 26: 814 ~ 849MHz, LTE Band 30: 2305 ~ 2315MHz LTE Band 38: 2570 ~ 2620MHz, LTE Band 41: 2496 ~ 2690MHz LTE Band 66: 1710 ~ 1780MHz
RX Frequency Range	LTE Band 2: 1930 ~ 1990MHz, LTE Band 4: 2110 ~ 2155MHz LTE Band 5: 869 ~ 894MHz, LTE Band 7: 2620 ~ 2690MHz LTE Band 12: 729 ~ 746MHz, LTE Band 13: 746 ~ 756MHz LTE Band 14: 758 ~ 768MHz, LTE Band 25: 1930 ~ 1995MHz LTE Band 26: 859 ~ 894MHz, LTE Band 30: 2350 ~ 2360MHz LTE Band 38: 2570 ~ 2620MHz, LTE Band 41: 2496 ~ 2690MHz LTE Band 66: 2110 ~ 2200MHz
HPUE Band	Band 41
Modulation	UL up to 64QAM & DL up to 256QAM

1.6. Description of Available Antennas

Technology	Frequency Range (MHz)	Antenna Type	Model	Max Peak Gain (dBi)
WCDMA & LTE Band 2	1850 ~ 1910	PIFA	Y0QUE00ABAA	3.87
WCDMA & LTE Band 4	1710 ~ 1755		Y0QUE00ABAA	3.91
WCDMA & LTE Band 5	824 ~ 849		Y0QUE00ABBA	3.32
LTE Band 7	2500 ~ 2570		Y0QUE00ABBA	3.16
LTE Band 12	699 ~ 716		Y0QUE00ABDA	3.19
LTE Band 13	777 ~ 787		Y0QUE00ABBA	3.28
LTE Band 14	788 ~ 798		Y0QUE00ABBA	3.25
LTE Band 25	1850 ~ 1915		Y0QUE00ABAA	3.87
LTE Band 26	814 ~ 849		Y0QUE00ABBA	3.32
LTE Band 30	2305 ~ 2315		Y0QUE00ABCA	0.98
LTE Band 38	2570 ~ 2620		Y0QUE00ABBA	3.07
LTE Band 41	2496 ~ 2690		Y0QUE00ABBA	3.16
LTE Band 66	1710 ~ 1780		Y0QUE00ABAA	3.91

Note 1: All antenna information (Antenna type and Peak Gain) is provided by the manufacturer.

Note 2: The typical antennas used to calculate the ERP (EIRP).

1.7. Max EIRP

Technology	Frequency Band (MHz)	Max Conducted Power (dBm)	Antenna Gain (dBi)	Max EIRP/ERP (dBm)	Limit (dBm)
WCDMA Band 2	1850 ~ 1910	24.13	3.87	28.00	33.01
WCDMA Band 4	1710 ~ 1755	24.26	3.91	28.17	30.00
WCDMA Band 5	824 ~ 849	24.94	3.32	28.26	38.45
LTE Band 2	1850 ~ 1910	23.98	3.87	27.85	33.01
LTE Band 4	1710 ~ 1755	23.74	3.91	27.65	30.00
LTE Band 5	824 ~ 849	24.14	3.32	27.46	38.45
LTE Band 7	2500 ~ 2570	24.39	3.16	27.55	33.01
LTE Band 12	699 ~ 716	24.24	3.19	27.43	34.77
LTE Band 13	777 ~ 787	24.42	3.28	27.70	34.77
LTE Band 14	788 ~ 798	23.63	3.25	26.88	34.77
LTE Band 25	1850 ~ 1915	23.98	3.87	27.85	33.01
LTE Band 26	814 ~ 849	23.92	3.32	27.24	50.00
LTE Band 30	2305 ~ 2315	22.72	0.98	23.70	23.98
LTE Band 38	2570 ~ 2620	24.43	3.07	27.50	33.01
LTE Band 41	2496 ~ 2690	25.92	3.16	29.08	33.01
LTE Band 66	1710 ~ 1780	23.74	3.91	27.65	30.00
Note: The Max conducted power extracted from the FCC certificate from FCC ID “XMR2023EM160RGL” certificate dated on 2023-07-18.					

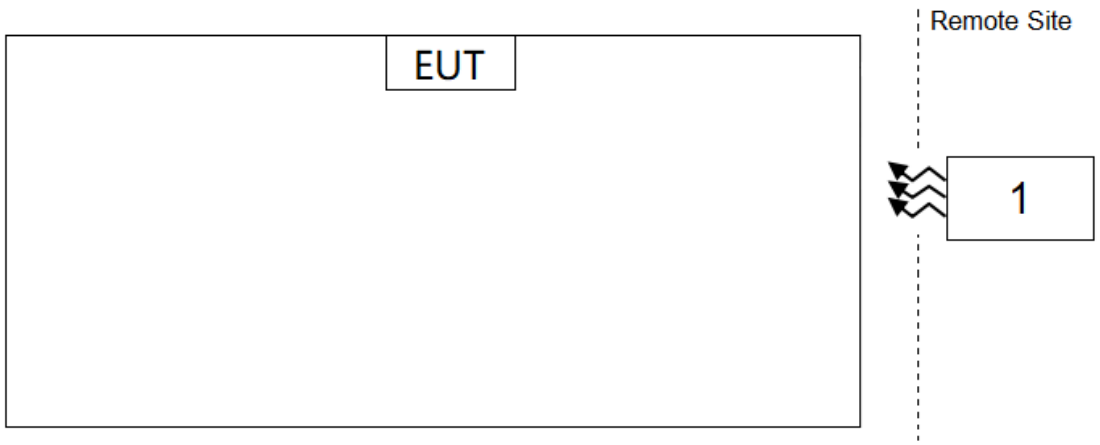
1.8. Test Methodology

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 2, Part 22, Part 24, Part 27, Part 90
- 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

2. Test Configuration

2.1. Test System Connection Diagram



Product		Manufacturer	Model No.
1	Wideband Radio Communication Tester	R&S	CMW 500

2.2. Test Environment Condition

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

3. Measuring Instrument

Instrument	Manufacturer	Model No.	Asset No.	Cali. Interval	Cali. Due Date	Test Site
Communication Tester	R&S	CMW500	MRTSUE06243	1 year	2024-09-27	SIP-SR1
Thermohygrometer	testo	622	MRTSUE06629	1 year	2024-12-21	SIP-SR1
Communication Tester	R&S	CMW500	MRTSUE06881	1 year	2024-05-23	SIP-SR1
Signal Analyzer	Keysight	N9010B	MRTSUE06559	1 year	2024-12-17	SIP-SR1
DC POWER MODULE	Keysight	N6743B	MRTSUE06905	N/A	N/A	SIP-SR1
DC POWER MODULE	Keysight	N6743B	MRTSUE06906	N/A	N/A	SIP-SR1
Signal Analyzer	Keysight	N9021B	MRTSUE06915	1 year	2024-12-17	SIP-SR1
Temperature Chamber	BAOYT	BYG-80CL	MRTSUE06932	1 year	2024-02-12	SIP-SR1
Shielding Room	MIX-BEP	SIP-SR1	MRTSUE06948	N/A	N/A	SIP-SR1
Directional Coupler	MVE	MVE4816-10	MRTSUE11117	1 year	2024-08-24	SIP
TRILOG Antenna	Schwarzbeck	VULB 9162	MRTSUE06022	1 year	2024-05-15	WZ-AC2
Radio Communication Analyzer	Anritsu	MT8821C	MRTSUE06960	1 year	2024-07-06	WZ-SR6
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2024-09-17	WZ-AC2
EMI Test Receiver	Agilent	N9038A	MRTSUE06125	1 year	2024-05-23	WZ-AC2
Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06171	1 year	2024-10-11	WZ-AC2
Preamplifier	Schwarzbeck	BBV 9718	MRTSUE06176	1 year	2024-05-07	WZ-AC2
Anechoic Chamber	RIKEN	WZ-AC2	MRTSUE06213	1 year	2024-04-20	WZ-AC2
Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06597	1 year	2024-11-04	WZ-AC2
Preamplifier	EMCI	EMC184045SE	MRTSUE06640	1 year	2025-01-11	WZ-AC2
Preamplifier	EMCI	EMC051845SE	MRTSUE06987	1 year	2024-09-07	WZ-AC2
Thermohygrometer	testo	608-H1	MRTSUE11038	1 year	2024-10-25	WZ-AC2
Thermohygrometer	testo	608-H1	MRTSUE11263	1 year	2024-11-07	WZ-AC2
Directional Coupler	MVE	MVE4912-10	MRTSUE07051	1 year	2024-08-23	WZ
Attenuator	MVE	MVE2365	MRTSUE07070	1 year	2024-11-27	WZ

Software	Version	Function
EMI Software	V3.0.0	EMI Test Software
Controller_MF 7802	2.03C	RE Antenna & Turntable

4. Decision Rules and Measurement Uncertainty

4.1. Decision Rules

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4: 2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

4.2. 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
The maximum measurement uncertainty is evaluated as: Coaxial: 9kHz~30MHz: 2.59dB Coplanar: 9kHz~30MHz: 2.60dB Horizontal: 30MHz~200MHz: 3.85dB 200MHz~1GHz: 4.36dB 1GHz~40GHz: 4.98dB Vertical: 30MHz~200MHz: 4.06dB 200MHz~1GHz: 5.28dB 1GHz~40GHz: 4.91dB
Output Power
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 0.66dB

5. Test Result

5.1. Summary

FCC Part Section(s)	Test Description	Test Condition	Test Result
27.50(a)(3)	Equivalent Isotropic Radiated Power Density	Conducted	Pass
2.1051, 22.917(a), 24.238(a) 27.53(a)(4) (c) (f) (g) (h) (m)(4) 90.543(e)(3) (f), 90.691(a)	Spurious Emissions	Radiated	Pass

Notes:

1) 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.
2) All supported modulation types were evaluated. The worst-case emission of modulation was selected. Therefore, the Radiated Spurious Emission were presented the worst-case in the test report.
3) For radiated emission tests, every axis (X, Y, Z) was also verified. The test results shown in the following sections represent the worst-case emissions.
4) LTE Band 25 (1850 ~ 1915 MHz) overlaps the entire frequency range of LTE Band 2 (1850 ~ 1910 MHz). Therefore, test data provided in this report covers Band 2 as well as Band 25.
   LTE Band 66 (1710 ~ 1780 MHz) overlaps the entire frequency range of LTE Band 4 (1710 ~ 1755 MHz). Therefore, test data provided in this report covers Band 4 as well as Band 66.
   LTE Band 41 (2496 ~ 2690 MHz) overlaps the entire frequency range of LTE Band 38 (2570 ~ 2620 MHz). Therefore, test data provided in this report covers Band 38 as well as Band 41.
   LTE band 26 transmit frequency for part 90 rule is 814 ~ 824MHz and part 22 rule is 824 ~ 849MHz. ERP over 15MHz bandwidth complies the ERP limit line of part 22 rule, therefore ERP of the partial frequency spectrum which falls within part 22 also complies.

5.2. Equivalent Isotropically Radiated Power Measurement

5.2.1. Test Limit

For mobile and portable stations transmitting in the 2305-2315 MHz band or the 2350-2360 MHz band, the average EIRP must not exceed 50milliwatts within any 1 megahertz of authorized bandwidth, except that for mobile and portable stations compliant with 3GPP LTE standards or another advanced mobile broadband protocol that avoids concentrating energy at the edge of the operating band the average EIRP must not exceed 250 milliwatts within any 5 megahertz of authorized bandwidth but may exceed 50 milliwatts within any 1 megahertz of authorized bandwidth.

5.2.2. Test Procedure

ANSI C63.26-2015 - Section 5.2.4.4.2 &5.2.5.5

5.2.3. Test Setting

When the fundamental condition for average power measurements cannot be realized (i.e., the EUT cannot be configured to transmit at full-power on a continuous basis (i.e., duty cycle < 98%) and the instrumentation cannot be configured to measure only during active full-power transmissions), then the following procedure can be used if the EUT duty cycle is constant (i.e., duty cycle variations are less than or equal to ±2%).

a) Set span to 2 × to 3 × the OBW.

b) Set RBW = 1% to 5% of the OBW.

c) Set VBW ≥ 3 × RBW.

d) Set number of measurement points in sweep ≥ 2 × span / RBW.

e) Sweep time:

1) Set = auto-couple, or

2) Set ≥ [10 × (number of points in sweep) × (transmission symbol period)] for single sweep (automation-compatible) measurement.

f) Detector = power averaging (rms).

g) Set sweep trigger to “free run.”

h) Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple. To accurately determine the average power over the on and off time of the transmitter, it can be necessary to increase the number of traces to be averaged above 100, or if using a manually configured sweep time, increase the sweep time.

i) Using the marker function to identify the maximum PSD.

j) Add 10 log (1/duty cycle) to the measured power level to compute the average power during continuous transmission. For example, add [10 log (1/0.25)] = 6 dB if the duty cycle is a constant 25%.

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

ERP or EIRP = PMeas + GT (1)

where

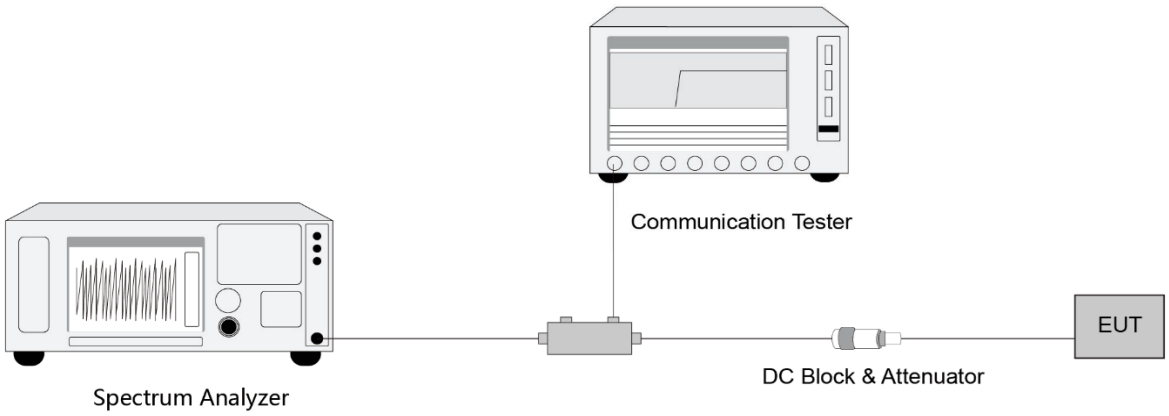
ERP or EIRP effective radiated power or equivalent isotropically radiated power, respectively (expressed in the same units as PMeas, e.g., dBm or dBW)

PMeas measured transmitter output power or PSD, in dBm or dBW

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

For devices utilizing multiple antennas, see 6.4 for guidance with respect to determining the effective array transmit antenna gain term to be used in the above equation.

5.2.4. Test Setup



5.2.5. Test Result

Refer to Appendix A.1.

5.3. Radiated Spurious Emissions Measurement

5.3.1. Test Limit

The power of any emission outside of theauthorized operating frequency ranges must be attenuated below the transmitting power (P) by a factorof at least 43 + 10 log(P) dB. The emission limit equal to -13dBm.

For operations in the 746-758 MHz, 775-788 MHz, 758-775 MHz and 788-805 MHz and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz (-40dBm/MHz) equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW (-50dBm) EIRP for discrete emissions of less than 700 Hz bandwidth.

For Band 7, 38/41, the powerof any emission outside of theauthorized operating frequency ranges must be attenuated below the transmitting power (P) by a factorof at least 55 + 10 log(P) dB. The emission limit equal to -25dBm.

E (dBμV/m) = EIRP (dBm) - 20 log D + 104.8; where D is the measurement distance in meters. The emission limit equal to 82.3dBμV/m or 70.3dBμV/m or 55.3dBμV/m.

5.3.2. Test Procedure

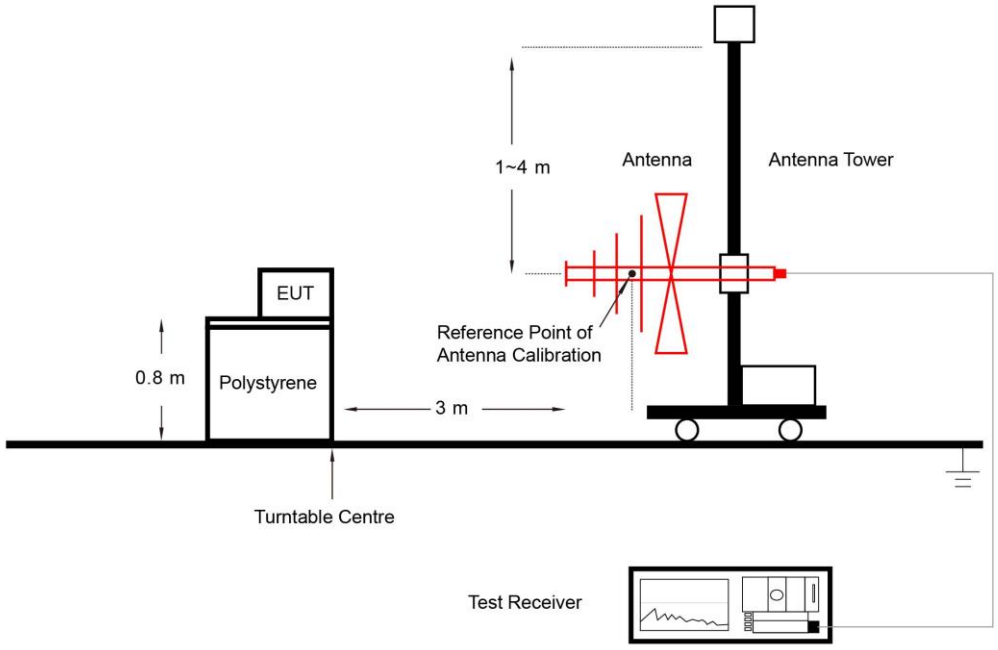
ANSI C63.26-2015 - Section 5.2.7 & 5.5

5.3.3. Test Setting

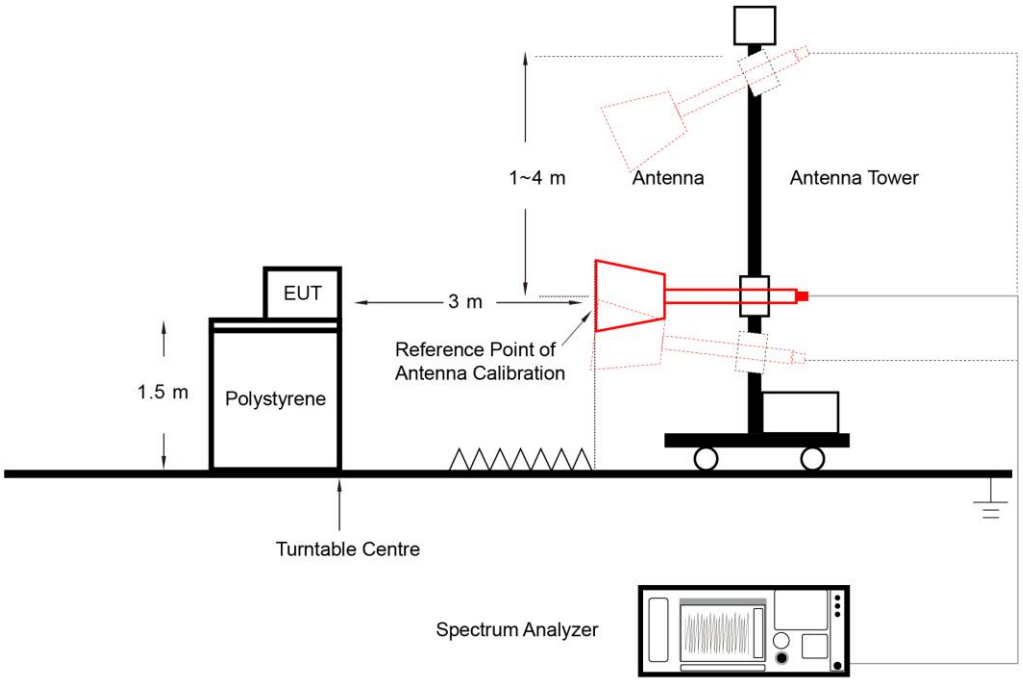
1. RBW = 1MHz
2. VBW ≥ 3*RBW
3. Sweep time ≥ 10 × (number of points in sweep) × (transmission symbol period)
4. Detector = Peak
5. Trace mode = max hold
6. The trace was allowed to stabilize

5.3.4. Test Setup

Below 1GHz Test Setup:



Above 1GHz Test Setup:



5.3.5. Test Result

Refer to Appendix A.2.

Appendix A - Test Result

A.1 Equivalent Isotropically Radiated Power Test Result

Test Site	SIP-SR1	Test Engineer	Yoniter Yang
Test Date	2024-01-18	Test Band	Band 30

Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Power Density (dBm/5MHz)	EIRP Density (dBm/5MHz)	Limit (dBm /5MHz)
QPSK						
2307.5	5	1	0	22.19	23.17	< 23.98
2310.0				22.45	23.43	< 23.98
2312.5				22.31	23.29	< 23.98
2307.5	5	1	12	22.57	23.55	< 23.98
2310.0				22.51	23.49	< 23.98
2312.5				22.65	23.63	< 23.98
2307.5	5	1	24	22.37	23.35	< 23.98
2310.0				22.56	23.54	< 23.98
2312.5				22.52	23.50	< 23.98
2307.5	5	25	0	21.53	22.51	< 23.98
2310.0				21.58	22.56	< 23.98
2312.5				21.54	22.52	< 23.98
2310.0	10	1	0	22.52	23.50	< 23.98
2310.0			24	22.54	23.52	< 23.98
2310.0			49	22.72	23.70	< 23.98
2310.0		50	0	19.30	20.28	< 23.98
Note: The EIRP Density (dBm/5MHz) = Power Density (dBm/5MHz) + Antenna Gain (dBi)						

Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Power Density (dBm/5MHz)	EIRP Density (dBm/5MHz)	Limit (dBm /5MHz)
16QAM						
2307.5	5	1	0	21.70	22.68	< 23.98
2310.0				21.43	22.41	< 23.98
2312.5				21.57	22.55	< 23.98
2307.5	5	1	12	21.67	22.65	< 23.98
2310.0				21.85	22.83	< 23.98
2312.5				21.83	22.81	< 23.98
2307.5	5	1	24	21.69	22.67	< 23.98
2310.0				21.67	22.65	< 23.98
2312.5				21.40	22.38	< 23.98
2307.5	5	25	0	20.60	21.58	< 23.98
2310.0				20.59	21.57	< 23.98
2312.5				20.65	21.63	< 23.98
2310.0	10	1	0	21.60	22.58	< 23.98
2310.0			24	21.41	22.39	< 23.98
2310.0			49	21.76	22.74	< 23.98
2310.0		50	0	18.26	19.24	< 23.98
Note: The EIRP Density (dBm/5MHz) = Power Density (dBm/5MHz) + Antenna Gain (dBi)						

Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Power Density (dBm/5MHz)	EIRP Density (dBm/5MHz)	Limit (dBm /5MHz)
64QAM						
2307.5	5	1	0	20.20	21.18	< 23.98
2310.0				20.40	21.38	< 23.98
2312.5				20.80	21.78	< 23.98
2307.5	5	1	12	20.67	21.65	< 23.98
2310.0				20.88	21.86	< 23.98
2312.5				20.45	21.43	< 23.98
2307.5	5	1	24	20.56	21.54	< 23.98
2310.0				20.64	21.62	< 23.98
2312.5				20.12	21.10	< 23.98
2307.5	5	25	0	19.63	20.61	< 23.98
2310.0				19.67	20.65	< 23.98
2312.5				19.61	20.59	< 23.98
2310.0	10	1	0	20.79	21.77	< 23.98
2310.0			24	20.80	21.78	< 23.98
2310.0			49	20.99	21.97	< 23.98
2310.0		50	0	17.26	18.24	< 23.98
Note: The EIRP Density (dBm/5MHz) = Power Density (dBm/5MHz) + Antenna Gain (dBi)						

Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Power (dBm)	EIRP (dBm)	Limit (dBm)
QPSK						
2307.5	5	1	0	21.89	22.87	N/A
2310.0				21.94	22.92	N/A
2312.5				21.92	22.90	N/A
2307.5	5	1	12	22.06	23.04	N/A
2310.0				22.03	23.01	N/A
2312.5				22.05	23.03	N/A
2307.5	5	1	24	21.98	22.96	N/A
2310.0				21.93	22.91	N/A
2312.5				21.95	22.93	N/A
2307.5	5	25	0	20.97	21.95	N/A
2310.0				21.05	22.03	N/A
2312.5				21.01	21.99	N/A
2310.0	10	1	0	21.83	22.81	N/A
2310.0			24	21.82	22.80	N/A
2310.0			49	22.01	22.99	N/A
2310.0		50	0	21.01	21.99	N/A
Note: The EIRP (dBm) = Power (dBm) + Antenna Gain (dBi)						

Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Power (dBm)	EIRP (dBm)	Limit (dBm)
16QAM						
2307.5	5	1	0	21.14	22.12	N/A
2310.0				21.00	21.98	N/A
2312.5				21.01	21.99	N/A
2307.5	5	1	12	21.30	22.28	N/A
2310.0				21.02	22.00	N/A
2312.5				21.15	22.13	N/A
2307.5	5	1	24	21.14	22.12	N/A
2310.0				20.93	21.91	N/A
2312.5				21.06	22.04	N/A
2307.5	5	25	0	19.95	20.93	N/A
2310.0				20.00	20.98	N/A
2312.5				20.11	21.09	N/A
2310.0	10	1	0	20.85	21.83	N/A
2310.0			24	20.82	21.80	N/A
2310.0			49	21.03	22.01	N/A
2310.0		50	0	20.00	20.98	N/A
Note: The EIRP (dBm) = Power (dBm) + Antenna Gain (dBi)						

Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Power (dBm)	EIRP (dBm)	Limit (dBm)
64QAM						
2307.5	5	1	0	20.55	21.53	N/A
2310.0				19.95	20.93	N/A
2312.5				20.30	21.28	N/A
2307.5	5	1	12	20.74	21.72	N/A
2310.0				20.01	20.99	N/A
2312.5				20.46	21.44	N/A
2307.5	5	1	24	20.56	21.54	N/A
2310.0				19.90	20.88	N/A
2312.5				20.04	21.02	N/A
2307.5	5	25	0	18.96	19.94	N/A
2310.0				18.95	19.93	N/A
2312.5				19.10	20.08	N/A
2310.0	10	1	0	20.23	21.21	N/A
2310.0			24	20.14	21.12	N/A
2310.0			49	20.32	21.30	N/A
2310.0		50	0	18.99	19.97	N/A
Note: The EIRP (dBm) = Power (dBm) + Antenna Gain (dBi)						

A.2 Radiated Spurious Emissions Test Result

Test Site	WZ-AC2	Test Engineer	Dick Shen
Test Date	2024-01-11 ~ 2024-01-17	Test Band	WCDMA Band II, QPSK

Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
Middle Channel							
45.030	0.9	20.3	21.2	82.3	-61.1	Quasi-peak	Horizontal
305.965	5.2	21.1	26.3	82.3	-56.0	Quasi-peak	Horizontal
38.700	16.5	18.6	35.1	82.3	-47.2	Quasi-peak	Vertical
843.830	1.0	31.3	32.3	82.3	-50.0	Quasi-peak	Vertical
7485.500	32.3	12.0	44.3	82.3	-38.0	Peak	Horizontal
11557.000	32.0	17.9	49.9	82.3	-32.4	Peak	Horizontal
7409.000	32.0	11.7	43.7	82.3	-38.6	Peak	Vertical
14455.500	31.6	20.3	51.9	82.3	-30.4	Peak	Vertical

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

Test Site	WZ-AC2	Test Engineer	Dick Shen
Test Date	2024-01-11 ~ 2024-01-17	Test Band	WCDMA Band IV, QPSK

Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
Middle Channel							
48.300	1.3	20.6	21.9	82.3	-60.4	Quasi-peak	Horizontal
312.800	5.8	21.3	27.1	82.3	-55.2	Quasi-peak	Horizontal
41.600	15.6	19.6	35.2	82.3	-47.1	Quasi-peak	Vertical
753.000	1.3	29.2	30.5	82.3	-51.8	Quasi-peak	Vertical
10486.000	32.9	15.4	48.3	82.3	-34.0	Peak	Horizontal
14914.500	32.0	19.5	51.5	82.3	-30.8	Peak	Horizontal
7060.500	31.8	11.1	42.9	82.3	-39.4	Peak	Vertical
15008.000	32.2	19.4	51.6	82.3	-30.7	Peak	Vertical

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

Test Site	WZ-AC2	Test Engineer	Dick Shen
Test Date	2024-01-11 ~ 2024-01-17	Test Band	WCDMA Band V, QPSK

Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
Middle Channel							
44.060	0.5	20.2	20.7	82.3	-61.6	Quasi-peak	Horizontal
311.700	4.6	21.3	25.9	82.3	-56.4	Quasi-peak	Horizontal
40.185	3.3	19.2	22.5	82.3	-59.8	Quasi-peak	Vertical
386.500	1.2	23.1	24.3	82.3	-58.0	Quasi-peak	Vertical
1348.500	42.7	-5.0	37.8	82.3	-44.5	Peak	Horizontal
11531.500	32.2	17.3	49.6	82.3	-32.7	Peak	Horizontal
2113.500	36.7	-2.8	34.0	82.3	-48.3	Peak	Vertical
10129.000	33.1	14.2	47.3	82.3	-35.0	Peak	Vertical

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

Test Site	WZ-AC2	Test Engineer	Dick Shen
Test Date	2024-01-11 ~ 2024-01-17	Test Band	LTE Band 2/25, 1RB, QPSK

Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
Middle Channel							
55.300	1.5	20.1	21.6	82.3	-60.7	Quasi-peak	Horizontal
991.270	1.6	32.3	33.9	82.3	-48.4	Quasi-peak	Horizontal
39.215	15.4	18.8	34.2	82.3	-48.1	Quasi-peak	Vertical
869.050	1.2	31.0	32.2	82.3	-50.1	Quasi-peak	Vertical
5097.000	34.3	3.5	37.8	82.3	-44.5	Peak	Horizontal
14277.000	31.7	19.8	51.5	82.3	-30.8	Peak	Horizontal
5539.000	36.3	3.3	39.6	82.3	-42.7	Peak	Vertical
14812.500	31.9	19.4	51.3	82.3	-31.0	Peak	Vertical

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

Test Site	WZ-AC2	Test Engineer	Dick Shen
Test Date	2024-01-11 ~ 2024-01-17	Test Band	LTE Band 4/66, 1RB, QPSK

Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
Middle Channel							
53.280	2.2	20.3	22.5	82.3	-59.8	Quasi-peak	Horizontal
825.885	1.4	30.9	32.3	82.3	-50.0	Quasi-peak	Horizontal
39.215	15.2	18.8	34.0	82.3	-48.3	Quasi-peak	Vertical
744.890	1.6	29.4	31.0	82.3	-51.3	Quasi-peak	Vertical
7069.000	32.8	11.1	43.9	82.3	-38.4	Peak	Horizontal
14999.500	32.9	19.2	52.1	82.3	-30.2	Peak	Horizontal
7460.000	32.0	12.2	44.2	82.3	-38.1	Peak	Vertical
10469.000	34.2	15.3	49.5	82.3	-32.8	Peak	Vertical

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

Test Site	WZ-AC2	Test Engineer	Dick Shen
Test Date	2024-01-11 ~ 2024-01-17	Test Band	LTE Band 5, 1RB, QPSK

Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
Middle Channel							
53.800	1.3	20.3	21.6	82.3	-60.7	Quasi-peak	Horizontal
313.800	3.9	21.3	25.2	82.3	-57.1	Quasi-peak	Horizontal
45.520	3.2	20.4	23.6	82.3	-58.7	Quasi-peak	Vertical
389.400	1.3	23.2	24.5	82.3	-57.8	Quasi-peak	Vertical
1238.000	47.3	-5.4	41.9	82.3	-40.4	Peak	Horizontal
7196.500	32.9	11.3	44.1	82.3	-38.2	Peak	Horizontal
1357.000	43.4	-5.0	38.4	82.3	-43.9	Peak	Vertical
4179.000	40.7	0.9	41.7	82.3	-40.6	Peak	Vertical

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

Test Site	WZ-AC2	Test Engineer	Dick Shen
Test Date	2024-01-11 ~ 2024-01-17	Test Band	LTE Band 7, 1RB, QPSK

Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
Middle Channel							
48.915	2.3	20.6	22.9	70.3	-47.4	Quasi-peak	Horizontal
293.840	6.8	20.9	27.7	70.3	-42.6	Quasi-peak	Horizontal
41.600	18.3	19.6	37.9	70.3	-32.4	Quasi-peak	Vertical
848.200	1.3	31.3	32.6	70.3	-37.7	Quasi-peak	Vertical
7596.000	39.3	11.4	50.7	70.3	-19.6	Peak	Horizontal
14039.000	31.5	19.9	51.5	70.3	-18.8	Peak	Horizontal
5063.000	39.2	3.5	42.7	70.3	-27.6	Peak	Vertical
7596.000	48.8	11.4	60.2	70.3	-10.1	Peak	Vertical

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

Test Site	WZ-AC2	Test Engineer	Dick Shen
Test Date	2024-01-11 ~ 2024-01-17	Test Band	LTE Band 12, 1RB, QPSK

Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
Middle Channel							
47.460	0.5	20.5	21.0	82.3	-61.3	Quasi-peak	Horizontal
291.900	7.2	20.9	28.1	82.3	-54.2	Quasi-peak	Horizontal
44.550	4.6	20.3	24.9	82.3	-57.4	Quasi-peak	Vertical
353.010	1.3	22.6	23.9	82.3	-58.4	Quasi-peak	Vertical
1340.000	47.4	-4.9	42.5	82.3	-39.8	Peak	Horizontal
9933.500	34.3	13.8	48.1	82.3	-34.2	Peak	Horizontal
1357.000	41.9	-5.0	36.9	82.3	-45.4	Peak	Vertical
14923.000	32.0	19.7	51.7	82.3	-30.6	Peak	Vertical

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

Test Site	WZ-AC2	Test Engineer	Dick Shen
Test Date	2024-01-11 ~ 2024-01-17	Test Band	LTE Band 13, 1RB, QPSK

Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
Middle Channel							
44.060	1.3	20.2	21.5	82.3	-60.8	Quasi-peak	Horizontal
304.100	5.9	21.1	27.0	82.3	-55.3	Quasi-peak	Horizontal
45.100	3.9	20.3	24.2	82.3	-58.1	Quasi-peak	Vertical
472.900	3.3	24.7	28.0	82.3	-54.3	Quasi-peak	Vertical
1238.000	48.3	-5.4	43.0	82.3	-39.3	Peak	Horizontal
1561.000	45.2	-5.5	39.7	55.3	-15.6	Peak	Horizontal
1357.000	44.0	-5.0	39.0	82.3	-43.3	Peak	Vertical
1561.000	48.0	-5.3	42.7	55.3	-12.6	Peak	Vertical

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

Test Site	WZ-AC2	Test Engineer	Dick Shen
Test Date	2024-01-11 ~ 2024-01-17	Test Band	LTE Band 14, 1RB, QPSK

Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
Middle Channel							
211.390	7.9	14.9	22.7	82.3	-59.6	Quasi-peak	Horizontal
284.140	11.1	18.2	29.3	82.3	-53.0	Quasi-peak	Horizontal
142.035	3.1	17.9	20.9	82.3	-61.4	Quasi-peak	Vertical
296.750	3.8	18.4	22.3	82.3	-60.0	Quasi-peak	Vertical
1348.500	46.6	-5.0	41.6	82.3	-40.7	Peak	Horizontal
1578.000	48.4	-5.4	43.0	55.3	-12.3	Peak	Horizontal
1297.500	42.7	-5.0	37.7	82.3	-44.6	Peak	Vertical
1578.000	50.7	-5.4	45.3	55.3	-10.0	Peak	Vertical

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

Test Site	WZ-AC2	Test Engineer	Dick Shen
Test Date	2024-01-11 ~ 2024-01-17	Test Band	LTE Band 26, 1RB, QPSK

Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
Middle Channel							
50.370	0.6	20.5	21.1	82.3	-61.2	Quasi-peak	Horizontal
346.220	5.3	22.7	28.0	82.3	-54.3	Quasi-peak	Horizontal
45.400	6.5	20.4	26.9	82.3	-55.4	Quasi-peak	Vertical
511.120	1.3	25.4	26.7	82.3	-55.6	Quasi-peak	Vertical
1348.500	47.8	-5.0	42.9	82.3	-39.4	Peak	Horizontal
9245.000	32.1	14.0	46.1	82.3	-36.2	Peak	Horizontal
1357.000	42.7	-5.0	37.7	82.3	-44.6	Peak	Vertical
4094.000	43.5	0.6	44.0	82.3	-38.3	Peak	Vertical

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

Test Site	WZ-AC2	Test Engineer	Dick Shen
Test Date	2024-01-11 ~ 2024-01-17	Test Band	LTE Band 30, 1RB, QPSK

Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
Middle Channel							
42.125	1.3	19.7	21.0	55.3	-34.3	Quasi-peak	Horizontal
441.765	11.3	24.0	35.3	55.3	-20.0	Quasi-peak	Horizontal
41.155	10.3	19.5	29.8	55.3	-25.5	Quasi-peak	Vertical
440.310	5.2	24.0	29.2	55.3	-26.1	Quasi-peak	Vertical
6924.500	40.1	9.2	49.3	55.3	-6.0	Peak	Horizontal
10809.000	31.9	16.5	48.4	55.3	-6.9	Peak	Horizontal
6924.500	42.8	9.2	52.0	55.3	-3.3	Average	Vertical
11650.500	31.2	17.8	49.0	55.3	-6.3	Peak	Vertical

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

Test Site	WZ-AC2	Test Engineer	Dick Shen
Test Date	2024-01-11 ~ 2024-01-17	Test Band	LTE Band 41_HPUE 1RB, QPSK

Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
Middle Channel							
44.550	0.8	20.3	21.1	70.3	-49.2	Quasi-peak	Horizontal
830.100	2.9	30.9	33.8	70.3	-36.5	Quasi-peak	Horizontal
44.550	15.6	20.3	35.9	70.3	-34.4	Quasi-peak	Vertical
604.720	1.2	27.5	28.7	70.3	-41.6	Quasi-peak	Vertical
7774.500	39.3	11.1	50.4	70.3	-19.9	Peak	Horizontal
14073.000	31.3	19.6	50.8	70.3	-19.5	Peak	Horizontal
7774.500	50.7	11.1	61.8	70.3	-8.5	Peak	Vertical
12951.000	35.9	17.3	53.2	70.3	-17.1	Peak	Vertical

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

Appendix B - Test Setup Photograph

Refer to “2401RSU007-UT” file.

Appendix C - EUT Photograph

Refer to “2401RSU007-UE” file.

The End