



FCC C2PC Test Report

FCC Part 27 F&L

Product Name : LTE Module
Model No. : EIGR-C3&EIGR-C3X
FCC ID : 2AU57EIGR-C3

Applicant : Contemporary Control Systems, Inc.
Address : 2431 Curtiss Street Downers Grove,
Illinois United States

Date of Receipt : Nov. 14, 2019
Test Date : Nov. 15, 2019 ~ Dec. 05, 2019
Issued Date : Jan. 14, 2020
Report No. : 19B2081R-HP-US-P07V01
Report Version : V1.1

The test results presented in this report relate only to the object tested.

The measurement result is considered in conformance with the requirement if it is within the prescribed limit, It is not necessary to account the uncertainty associated with the measurement result, unless the specification, standard or customer have special requirements

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Test Report Certification

Issued Date : Jan. 14, 2020

Report No. :19B2081R-HP-US-P07V01



Product Name : LTE Module
Applicant : Contemporary Control Systems, Inc.
Address : 2431 Curtiss Street Downers Grove,
Illinois United States
Manufacturer : Contemporary Control Systems, Inc.
Address : 2431 Curtiss Street Downers Grove,
Illinois United States
Model No. : EIGR-C3&EIGR-C3X
FCC ID : 2AU57EIGR-C3
EUT Voltage : DC 24V
Test Voltage : DC 24V
Brand Name : CTRLINK
Applicable Standard : FCC CFR Title 47 Part 2,
FCC Part 27 Subpart L&F
TIA/EIA 603-E 2016
KDB971168 D01 v03r01
ANSI 63.26: 2015
Test Result : Complied
Performed Location : DEKRA Testing and Certification (Suzhou) Co., Ltd.
No.99 Hongye Rd., Suzhou Industrial Park, Suzhou,215006,
Jiangsu,China
TEL:+86-512-6251-5088 / FAX:+86-512-6251-5098
FCC Designation Number: CN1199

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History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
19B2081R-HP-US-P07V01	V1.0	Initial Issued Report	Dec. 06, 2019
19B2081R-HP-US-P07V01	V1.1	1. Modified product name 2. P4, modified original report number	Jan. 14, 2020

Note: This report is based on Report No. R1806A0295-R2, due to the RF module is the same, only evaluated power and radiated spurious emission.

1. General Information

1.1. EUT Description

Product Name	LTE Module
Model No.	EIGR-C3&EIGR-C3X
EUT Voltage	DC 24V
4G	
Support Band	LTE Band 4/13
Uplink	Band 4: 1710~1755MHz Band 13: 777~787MHz
Downlink	Band 4: 2110~2155MHz Band 13: 746~756MHz
Type of modulation	QPSK, 16QAM
Antenna Type	Dipole
Antenna Gain	Band 4: 3.51dBi for 1Y001J, 3.75dBi for 2H032C Band 13: 1.51dBi for 1Y001J, 4.47dBi for 2H032C

Note1: Model EIGR-C3 and EIGR-C3X are the same except CPU operating temperature range, we have evaluated both models, and shown in the report is the worst data.

Note2: The EUT has two antennas, model 1Y001J and 2H032C.

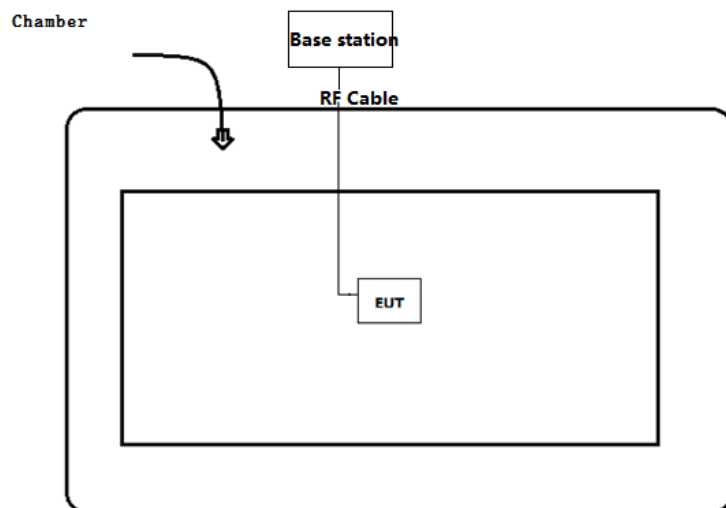
1.2. Mode of Operation

We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

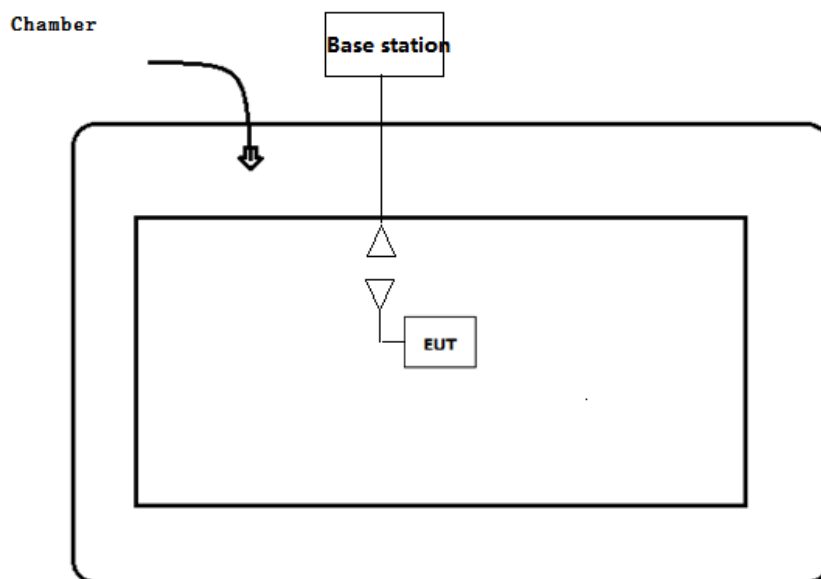
Test Mode
Mode 1 :LTE Band 4 Link
Mode 2 :LTE Band 13 Link
Note 1: Regards to the frequency band operation: the lowest, middle and highest frequency of channel were selected to perform the test, then shown on this report. For the LTE band, we also evaluate the each channel of bandwidth, RB offset and modulation, we will choose the worst case shown on this report.

1.3. Configuration of Tested System

Test setup Diagram- Conducted Emission Test



Test setup Diagram- Radiated Emission Test



1.4. EUT Exercise Software

1	Setup the EUT and simulators as shown on above.
2	Turn on the power of all equipment.
3	EUT Communicate with CMW500, then select channel to test.

2. Summary Technical Test

2.1. Limit and Test Result

LTE Band 4			
FCC Part 27 Subpart L			
Test Item	FCC Reference section	FCC Limit	Result
Maximum Output Power	§2.1046 §27.50	<1 Watts	Pass
Radiated Spurious Emission	§2.1053 §27.53	<-13dBm	Pass

LTE Band 13			
FCC Part 27 Subpart F			
Test Item	FCC Reference section	FCC Limit	Result
Maximum Output Power	§2.1046 §27.50	<3 Watts	Pass
Radiated Spurious Emission	§2.1053 §27.53	Out of the band 1559-1610MHz<-13dBm In the band 1559-1610MHz<-40dBm	Pass

2.2. Channel list

LTE Band 4

BW [MHz]	RB Offset	Low Ch. / Freq.	Mid Ch. / Freq.	High Ch. / Freq.
20	Channel	20050	20175	20300
20	Frequency	1720	1732.5	1745
15	Channel	20025	20175	20325
15	Frequency	1717.5	1732.5	1747.5
10	Channel	20000	20175	20350
10	Frequency	1715	1732.5	1750
5	Channel	19975	20175	20375
5	Frequency	1712.5	1732.5	1752.5
3	Channel	19965	20175	20385
3	Frequency	1711.5	1732.5	1753.5
1.4	Channel	19957	20175	20393
1.4	Frequency	1710.7	1732.5	1754.5

LTE Band 13

BW [MHz]	RB Offset	Low Ch. / Freq.	Mid Ch. / Freq.	High Ch. / Freq.
10	Channel	N/A	23230	N/A
10	Frequency	N/A	782	N/A
5	Channel	23205	23230	23255
5	Frequency	779.5	782	784.5

2.3. Test Environment

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	23
Humidity (%RH)	25-75	52
Barometric pressure (mbar)	860-1060	950-1000

2.4. Measurement Uncertainty

Items	Uncertainty
Maximum Output Power	±1.2 dB
Equivalent Isotropic Radiated Power	±3.2 dB
Field Strength of Spurious Radiation	±3.2 dB

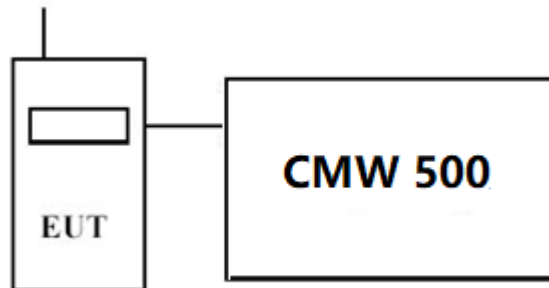
3. Maximum Output Power and Effective Isotropic Radiated Power Measurement

3.1. Test Equipment

Maximum Output Power and Effective Isotropic Radiated Power Measurement / AC-5				
Instrument	Manufacturer	Type No.	Serial No	Cali. Due Date
Wideband Radio Communication Tester	R&S	CMW 500	1201.0002K50-158243-jb	2020.08.29
Temperature/Humidity Meter	Zhicheng	ZC1-2	TR7-TH	2020.08.20

3.2. Test Setup

Maximum Output Power and Effective Isotropic Radiated Power Measurement:



3.3. Test Procedure

Test Method for conducted power

- The RF output of the transmitter was connected to base station simulator.
- Set EUT at maximum average power by base station simulator.
- Measure lowest, middle, and highest channels for each bandwidth and different modulation.

3.4. Test Result

Band	Bandwidth	Modulation	Channel	RB Configuration	Conducted Power(dBm)	EIRP(dBm)		Verdict
						Antenna 1Y001J	Antenna 2H032C	
Band4	1.4MHz	QPSK	19957	1RB#0	22.76	26.27	26.51	PASS
Band4	1.4MHz	QPSK	19957	1RB#2	23.06	26.57	26.81	PASS
Band4	1.4MHz	QPSK	19957	1RB#5	23.00	26.51	26.75	PASS
Band4	1.4MHz	QPSK	19957	3RB#0	22.90	26.41	26.65	PASS
Band4	1.4MHz	QPSK	19957	3RB#2	22.85	26.36	26.60	PASS
Band4	1.4MHz	QPSK	19957	3RB#3	23.01	26.52	26.76	PASS
Band4	1.4MHz	QPSK	19957	6RB#0	21.87	25.38	25.62	PASS
Band4	1.4MHz	QPSK	20175	1RB#0	23.35	26.86	27.10	PASS
Band4	1.4MHz	QPSK	20175	1RB#2	23.27	26.78	27.02	PASS
Band4	1.4MHz	QPSK	20175	1RB#5	23.25	26.76	27.00	PASS
Band4	1.4MHz	QPSK	20175	3RB#0	23.13	26.64	26.88	PASS
Band4	1.4MHz	QPSK	20175	3RB#2	23.02	26.53	26.77	PASS
Band4	1.4MHz	QPSK	20175	3RB#3	23.24	26.75	26.99	PASS
Band4	1.4MHz	QPSK	20175	6RB#0	22.27	25.78	26.02	PASS
Band4	1.4MHz	QPSK	20393	1RB#0	22.99	26.50	26.74	PASS
Band4	1.4MHz	QPSK	20393	1RB#2	23.39	26.90	27.14	PASS
Band4	1.4MHz	QPSK	20393	1RB#5	22.97	26.48	26.72	PASS
Band4	1.4MHz	QPSK	20393	3RB#0	22.76	26.27	26.51	PASS
Band4	1.4MHz	QPSK	20393	3RB#2	22.76	26.27	26.51	PASS
Band4	1.4MHz	QPSK	20393	3RB#3	22.78	26.29	26.53	PASS
Band4	1.4MHz	QPSK	20393	6RB#0	21.90	25.41	25.65	PASS
Band4	1.4MHz	16QAM	19957	1RB#0	21.84	25.35	25.59	PASS
Band4	1.4MHz	16QAM	19957	1RB#2	21.97	25.48	25.72	PASS
Band4	1.4MHz	16QAM	19957	1RB#5	22.35	25.86	26.10	PASS
Band4	1.4MHz	16QAM	20175	1RB#0	22.34	25.85	26.09	PASS
Band4	1.4MHz	16QAM	20175	1RB#2	22.33	25.84	26.08	PASS
Band4	1.4MHz	16QAM	20175	1RB#5	22.13	25.64	25.88	PASS
Band4	1.4MHz	16QAM	20393	1RB#0	22.60	26.11	26.35	PASS
Band4	1.4MHz	16QAM	20393	1RB#2	22.57	26.08	26.32	PASS
Band4	1.4MHz	16QAM	20393	1RB#5	22.66	26.17	26.41	PASS
Band4	3MHz	QPSK	19965	1RB#0	22.81	26.32	26.56	PASS
Band4	3MHz	QPSK	19965	1RB#7	22.90	26.41	26.65	PASS

Band4	3MHz	QPSK	19965	1RB#14	23.30	26.81	27.05	PASS
Band4	3MHz	QPSK	19965	8RB#0	21.85	25.36	25.60	PASS
Band4	3MHz	QPSK	19965	8RB#4	21.97	25.48	25.72	PASS
Band4	3MHz	QPSK	19965	8RB#7	22.01	25.52	25.76	PASS
Band4	3MHz	QPSK	19965	15RB#0	21.90	25.41	25.65	PASS
Band4	3MHz	QPSK	20175	1RB#0	23.01	26.52	26.76	PASS
Band4	3MHz	QPSK	20175	1RB#7	22.97	26.48	26.72	PASS
Band4	3MHz	QPSK	20175	1RB#14	22.94	26.45	26.69	PASS
Band4	3MHz	QPSK	20175	8RB#0	22.15	25.66	25.90	PASS
Band4	3MHz	QPSK	20175	8RB#4	22.12	25.63	25.87	PASS
Band4	3MHz	QPSK	20175	8RB#7	22.11	25.62	25.86	PASS
Band4	3MHz	QPSK	20175	15RB#0	22.12	25.63	25.87	PASS
Band4	3MHz	QPSK	20385	1RB#0	23.18	26.69	26.93	PASS
Band4	3MHz	QPSK	20385	1RB#7	23.17	26.68	26.92	PASS
Band4	3MHz	QPSK	20385	1RB#14	23.14	26.65	26.89	PASS
Band4	3MHz	QPSK	20385	8RB#0	21.89	25.40	25.64	PASS
Band4	3MHz	QPSK	20385	8RB#4	21.88	25.39	25.63	PASS
Band4	3MHz	QPSK	20385	8RB#7	21.88	25.39	25.63	PASS
Band4	3MHz	QPSK	20385	15RB#0	21.93	25.44	25.68	PASS
Band4	3MHz	16QAM	19965	1RB#0	21.87	25.38	25.62	PASS
Band4	3MHz	16QAM	19965	1RB#7	22.00	25.51	25.75	PASS
Band4	3MHz	16QAM	19965	1RB#14	22.37	25.88	26.12	PASS
Band4	3MHz	16QAM	20175	1RB#0	22.48	25.99	26.23	PASS
Band4	3MHz	16QAM	20175	1RB#7	22.64	26.15	26.39	PASS
Band4	3MHz	16QAM	20175	1RB#14	22.54	26.05	26.29	PASS
Band4	3MHz	16QAM	20385	1RB#0	22.63	26.14	26.38	PASS
Band4	3MHz	16QAM	20385	1RB#7	22.61	26.12	26.36	PASS
Band4	3MHz	16QAM	20385	1RB#14	22.69	26.20	26.44	PASS
Band4	5MHz	QPSK	19975	1RB#0	22.78	26.29	26.53	PASS
Band4	5MHz	QPSK	19975	1RB#13	22.88	26.39	26.63	PASS
Band4	5MHz	QPSK	19975	1RB#24	23.27	26.78	27.02	PASS
Band4	5MHz	QPSK	19975	12RB#0	21.82	25.33	25.57	PASS
Band4	5MHz	QPSK	19975	12RB#6	21.95	25.46	25.70	PASS
Band4	5MHz	QPSK	19975	12RB#13	21.99	25.50	25.74	PASS
Band4	5MHz	QPSK	19975	25RB#0	21.88	25.39	25.63	PASS
Band4	5MHz	QPSK	20175	1RB#0	22.99	26.50	26.74	PASS
Band4	5MHz	QPSK	20175	1RB#13	22.93	26.44	26.68	PASS

Band4	5MHz	QPSK	20175	1RB#24	22.89	26.40	26.64	PASS
Band4	5MHz	QPSK	20175	12RB#0	22.10	25.61	25.85	PASS
Band4	5MHz	QPSK	20175	12RB#6	22.08	25.59	25.83	PASS
Band4	5MHz	QPSK	20175	12RB#13	22.09	25.60	25.84	PASS
Band4	5MHz	QPSK	20175	25RB#0	22.11	25.62	25.86	PASS
Band4	5MHz	QPSK	20375	1RB#0	23.14	26.65	26.89	PASS
Band4	5MHz	QPSK	20375	1RB#13	23.14	26.65	26.89	PASS
Band4	5MHz	QPSK	20375	1RB#24	23.10	26.61	26.85	PASS
Band4	5MHz	QPSK	20375	12RB#0	21.85	25.36	25.60	PASS
Band4	5MHz	QPSK	20375	12RB#6	21.83	25.34	25.58	PASS
Band4	5MHz	QPSK	20375	12RB#13	21.84	25.35	25.59	PASS
Band4	5MHz	QPSK	20375	25RB#0	21.91	25.42	25.66	PASS
Band4	5MHz	16QAM	19975	1RB#0	21.84	25.35	25.59	PASS
Band4	5MHz	16QAM	19975	1RB#13	21.97	25.48	25.72	PASS
Band4	5MHz	16QAM	19975	1RB#24	22.34	25.85	26.09	PASS
Band4	5MHz	16QAM	20175	1RB#0	22.44	25.95	26.19	PASS
Band4	5MHz	16QAM	20175	1RB#13	22.62	26.13	26.37	PASS
Band4	5MHz	16QAM	20175	1RB#24	22.52	26.03	26.27	PASS
Band4	5MHz	16QAM	20375	1RB#0	22.60	26.11	26.35	PASS
Band4	5MHz	16QAM	20375	1RB#13	22.58	26.09	26.33	PASS
Band4	5MHz	16QAM	20375	1RB#24	22.65	26.16	26.40	PASS
Band4	10MHz	QPSK	20000	1RB#0	22.80	26.31	26.55	PASS
Band4	10MHz	QPSK	20000	1RB#25	22.91	26.42	26.66	PASS
Band4	10MHz	QPSK	20000	1RB#49	23.29	26.80	27.04	PASS
Band4	10MHz	QPSK	20000	25RB#0	21.85	25.36	25.60	PASS
Band4	10MHz	QPSK	20000	25RB#13	21.98	25.49	25.73	PASS
Band4	10MHz	QPSK	20000	25RB#25	22.01	25.52	25.76	PASS
Band4	10MHz	QPSK	20000	50RB#0	21.96	25.47	25.71	PASS
Band4	10MHz	QPSK	20175	1RB#0	23.00	26.51	26.75	PASS
Band4	10MHz	QPSK	20175	1RB#25	22.98	26.49	26.73	PASS
Band4	10MHz	QPSK	20175	1RB#49	22.93	26.44	26.68	PASS
Band4	10MHz	QPSK	20175	25RB#0	22.15	25.66	25.90	PASS
Band4	10MHz	QPSK	20175	25RB#13	22.13	25.64	25.88	PASS
Band4	10MHz	QPSK	20175	25RB#25	22.13	25.64	25.88	PASS
Band4	10MHz	QPSK	20175	50RB#0	22.13	25.64	25.88	PASS
Band4	10MHz	QPSK	20350	1RB#0	23.17	26.68	26.92	PASS
Band4	10MHz	QPSK	20350	1RB#25	23.18	26.69	26.93	PASS

Band4	10MHz	QPSK	20350	1RB#49	23.13	26.64	26.88	PASS
Band4	10MHz	QPSK	20350	25RB#0	21.89	25.40	25.64	PASS
Band4	10MHz	QPSK	20350	25RB#13	21.87	25.38	25.62	PASS
Band4	10MHz	QPSK	20350	25RB#25	21.89	25.40	25.64	PASS
Band4	10MHz	QPSK	20350	50RB#0	21.95	25.46	25.70	PASS
Band4	10MHz	16QAM	20000	1RB#0	21.86	25.37	25.61	PASS
Band4	10MHz	16QAM	20000	1RB#25	22.00	25.51	25.75	PASS
Band4	10MHz	16QAM	20000	1RB#49	22.37	25.88	26.12	PASS
Band4	10MHz	16QAM	20175	1RB#0	22.47	25.98	26.22	PASS
Band4	10MHz	16QAM	20175	1RB#25	22.66	26.17	26.41	PASS
Band4	10MHz	16QAM	20175	1RB#49	22.54	26.05	26.29	PASS
Band4	10MHz	16QAM	20350	1RB#0	22.62	26.13	26.37	PASS
Band4	10MHz	16QAM	20350	1RB#25	22.61	26.12	26.36	PASS
Band4	10MHz	16QAM	20350	1RB#49	22.68	26.19	26.43	PASS
Band4	15MHz	QPSK	20025	1RB#0	22.79	26.30	26.54	PASS
Band4	15MHz	QPSK	20025	1RB#38	22.89	26.40	26.64	PASS
Band4	15MHz	QPSK	20025	1RB#74	23.26	26.77	27.01	PASS
Band4	15MHz	QPSK	20025	36RB#0	21.83	25.34	25.58	PASS
Band4	15MHz	QPSK	20025	36RB#18	21.95	25.46	25.70	PASS
Band4	15MHz	QPSK	20025	36RB#39	21.98	25.49	25.73	PASS
Band4	15MHz	QPSK	20025	75RB#0	21.94	25.45	25.69	PASS
Band4	15MHz	QPSK	20175	1RB#0	22.96	26.47	26.71	PASS
Band4	15MHz	QPSK	20175	1RB#38	22.97	26.48	26.72	PASS
Band4	15MHz	QPSK	20175	1RB#74	22.88	26.39	26.63	PASS
Band4	15MHz	QPSK	20175	36RB#0	22.11	25.62	25.86	PASS
Band4	15MHz	QPSK	20175	36RB#18	22.08	25.59	25.83	PASS
Band4	15MHz	QPSK	20175	36RB#39	22.10	25.61	25.85	PASS
Band4	15MHz	QPSK	20175	75RB#0	22.09	25.60	25.84	PASS
Band4	15MHz	QPSK	20325	1RB#0	23.15	26.66	26.90	PASS
Band4	15MHz	QPSK	20325	1RB#38	23.15	26.66	26.90	PASS
Band4	15MHz	QPSK	20325	1RB#74	23.09	26.60	26.84	PASS
Band4	15MHz	QPSK	20325	36RB#0	21.86	25.37	25.61	PASS
Band4	15MHz	QPSK	20325	36RB#18	21.83	25.34	25.58	PASS
Band4	15MHz	QPSK	20325	36RB#39	21.85	25.36	25.60	PASS
Band4	15MHz	QPSK	20325	75RB#0	21.90	25.41	25.65	PASS
Band4	15MHz	16QAM	20025	1RB#0	21.81	25.32	25.56	PASS
Band4	15MHz	16QAM	20025	1RB#38	21.98	25.49	25.73	PASS

Band4	15MHz	16QAM	20025	1RB#74	22.34	25.85	26.09	PASS
Band4	15MHz	16QAM	20175	1RB#0	22.45	25.96	26.20	PASS
Band4	15MHz	16QAM	20175	1RB#38	22.63	26.14	26.38	PASS
Band4	15MHz	16QAM	20175	1RB#74	22.50	26.01	26.25	PASS
Band4	15MHz	16QAM	20325	1RB#0	22.60	26.11	26.35	PASS
Band4	15MHz	16QAM	20325	1RB#38	22.59	26.10	26.34	PASS
Band4	15MHz	16QAM	20325	1RB#74	22.65	26.16	26.40	PASS
Band4	20MHz	QPSK	20050	1RB#0	22.76	26.27	26.51	PASS
Band4	20MHz	QPSK	20050	1RB#50	22.88	26.39	26.63	PASS
Band4	20MHz	QPSK	20050	1RB#99	23.24	26.75	26.99	PASS
Band4	20MHz	QPSK	20050	50RB#0	21.80	25.31	25.55	PASS
Band4	20MHz	QPSK	20050	50RB#25	21.93	25.44	25.68	PASS
Band4	20MHz	QPSK	20050	50RB#50	21.95	25.46	25.70	PASS
Band4	20MHz	QPSK	20050	100RB#0	21.91	25.42	25.66	PASS
Band4	20MHz	QPSK	20175	1RB#0	22.92	26.43	26.67	PASS
Band4	20MHz	QPSK	20175	1RB#50	22.93	26.44	26.68	PASS
Band4	20MHz	QPSK	20175	1RB#99	22.87	26.38	26.62	PASS
Band4	20MHz	QPSK	20175	50RB#0	22.06	25.57	25.81	PASS
Band4	20MHz	QPSK	20175	50RB#25	22.04	25.55	25.79	PASS
Band4	20MHz	QPSK	20175	50RB#50	22.05	25.56	25.80	PASS
Band4	20MHz	QPSK	20175	100RB#0	22.04	25.55	25.79	PASS
Band4	20MHz	QPSK	20300	1RB#0	23.12	26.63	26.87	PASS
Band4	20MHz	QPSK	20300	1RB#50	23.13	26.64	26.88	PASS
Band4	20MHz	QPSK	20300	1RB#99	23.06	26.57	26.81	PASS
Band4	20MHz	QPSK	20300	50RB#0	21.82	25.33	25.57	PASS
Band4	20MHz	QPSK	20300	50RB#25	21.80	25.31	25.55	PASS
Band4	20MHz	QPSK	20300	50RB#50	21.81	25.32	25.56	PASS
Band4	20MHz	QPSK	20300	100RB#0	21.86	25.37	25.61	PASS
Band4	20MHz	16QAM	20050	1RB#0	21.79	25.30	25.54	PASS
Band4	20MHz	16QAM	20050	1RB#50	21.94	25.45	25.69	PASS
Band4	20MHz	16QAM	20050	1RB#99	22.32	25.83	26.07	PASS
Band4	20MHz	16QAM	20175	1RB#0	22.41	25.92	26.16	PASS
Band4	20MHz	16QAM	20175	1RB#50	22.61	26.12	26.36	PASS
Band4	20MHz	16QAM	20175	1RB#99	22.47	25.98	26.22	PASS
Band4	20MHz	16QAM	20300	1RB#0	22.55	26.06	26.30	PASS
Band4	20MHz	16QAM	20300	1RB#50	22.55	26.06	26.30	PASS
Band4	20MHz	16QAM	20300	1RB#99	22.63	26.14	26.38	PASS

Band	Bandwidth	Modulation	Channel	RB Configuration	Conducted Power(dBm)	ERP(dBm)		Verdict
						Antenna 1Y001J	Antenna 2H032C	
Band13	5MHz	QPSK	23205	1RB#0	23.09	24.60	27.56	PASS
Band13	5MHz	QPSK	23205	1RB#13	23.11	24.62	27.58	PASS
Band13	5MHz	QPSK	23205	1RB#24	23.10	24.61	27.57	PASS
Band13	5MHz	QPSK	23205	12RB#0	22.19	23.70	26.66	PASS
Band13	5MHz	QPSK	23205	12RB#6	22.22	23.73	26.69	PASS
Band13	5MHz	QPSK	23205	12RB#13	22.23	23.74	26.70	PASS
Band13	5MHz	QPSK	23205	25RB#0	22.24	23.75	26.71	PASS
Band13	5MHz	QPSK	23230	1RB#0	23.05	24.56	27.52	PASS
Band13	5MHz	QPSK	23230	1RB#13	23.01	24.52	27.48	PASS
Band13	5MHz	QPSK	23230	1RB#24	23.32	24.83	27.79	PASS
Band13	5MHz	QPSK	23230	12RB#0	22.26	23.77	26.73	PASS
Band13	5MHz	QPSK	23230	12RB#6	22.24	23.75	26.71	PASS
Band13	5MHz	QPSK	23230	12RB#13	22.27	23.78	26.74	PASS
Band13	5MHz	QPSK	23230	25RB#0	22.23	23.74	26.70	PASS
Band13	5MHz	QPSK	23255	1RB#0	23.13	24.64	27.60	PASS
Band13	5MHz	QPSK	23255	1RB#13	23.28	24.79	27.75	PASS
Band13	5MHz	QPSK	23255	1RB#24	23.32	24.83	27.79	PASS
Band13	5MHz	QPSK	23255	12RB#0	22.22	23.73	26.69	PASS
Band13	5MHz	QPSK	23255	12RB#6	22.21	23.72	26.68	PASS
Band13	5MHz	QPSK	23255	12RB#13	22.24	23.75	26.71	PASS
Band13	5MHz	QPSK	23255	25RB#0	22.39	23.90	26.86	PASS
Band13	5MHz	16QAM	23205	1RB#0	22.52	24.03	26.99	PASS
Band13	5MHz	16QAM	23205	1RB#13	22.39	23.90	26.86	PASS
Band13	5MHz	16QAM	23205	1RB#24	22.46	23.97	26.93	PASS
Band13	5MHz	16QAM	23230	1RB#0	21.69	23.20	26.16	PASS
Band13	5MHz	16QAM	23230	1RB#13	21.75	23.26	26.22	PASS
Band13	5MHz	16QAM	23230	1RB#24	21.81	23.32	26.28	PASS
Band13	5MHz	16QAM	23255	1RB#0	21.69	23.20	26.16	PASS
Band13	5MHz	16QAM	23255	1RB#13	21.95	23.46	26.42	PASS
Band13	5MHz	16QAM	23255	1RB#24	22.01	23.52	26.48	PASS
Band13	10MHz	QPSK	23230	1RB#0	23.07	24.58	27.54	PASS
Band13	10MHz	QPSK	23230	1RB#25	23.30	24.81	27.77	PASS
Band13	10MHz	QPSK	23230	1RB#49	23.33	24.84	27.80	PASS

Band13	10MHz	QPSK	23230	25RB#0	22.22	23.73	26.69	PASS
Band13	10MHz	QPSK	23230	25RB#13	22.28	23.79	26.75	PASS
Band13	10MHz	QPSK	23230	25RB#25	22.38	23.89	26.85	PASS
Band13	10MHz	QPSK	23230	50RB#0	22.27	23.78	26.74	PASS
Band13	10MHz	16QAM	23230	1RB#0	22.55	24.06	27.02	PASS
Band13	10MHz	16QAM	23230	1RB#25	22.25	23.76	26.72	PASS
Band13	10MHz	16QAM	23230	1RB#49	22.35	23.86	26.82	PASS

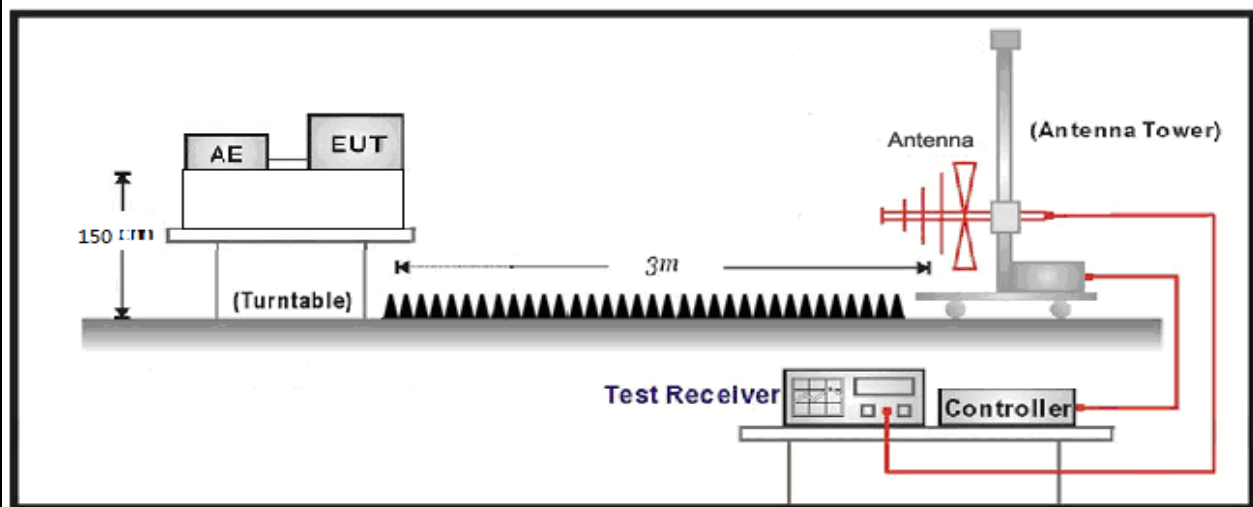
4. Radiated Spurious Emission

4.1. Test Equipment

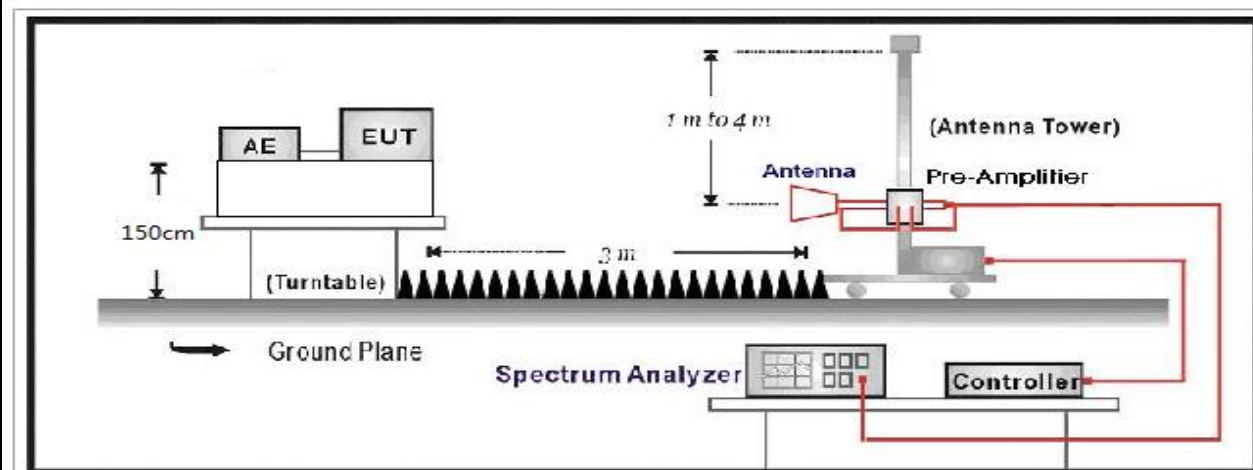
Spurious Emission / AC-5				
Instrument	Manufacturer	Type No.	Serial No	Cali. Due Date
Signal analyzer	R&S	FSV	104212	2020.02.22
Wideband Radio Communication Tester	R&S	CMW 500	1201.0002K50-158243-jb	2020.08.29
PSG Analog Signal Generator	Agilent	E8257D	MY44321116	2020.09.27
Preamplifier	Chengyi	EMC184045SE	980263	2020.06.12
Bilog Antenna	Teseq GmbH	CBL6112D	27611	2020.09.22
Half Wave Tuned Dipole Antenna	COM-POWER	AD-100	40138	2020.02.26
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	737	2020.01.26
DRG Horn	ETS-Lindgren	3117	00167055	2020.05.24
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC5-TH	2020.09.01

4.2. Test Setup

Radiated Measurement (Below 1G):



Radiated Measurement (Above 1G):



4.3. Test Procedure

Test Method for conducted power

- The RF output of the transmitter was connected to base station simulator.
- The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.
The path loss was compensated to the results for each measurement.
- Set EUT at maximum average power by base station simulator.
- Measure lowest, middle, and highest channels for each bandwidth and different modulation.

Test For Effective Isotropic Radiated Power Measurement:

- a) The EUT was placed on a turntable with 1.5 meter height in a fully anechoic chamber.
- b) The EUT was set at 3 meters from the receiving antenna, which was mounted on the antenna tower
- c) LTE operating modes: use channel power function to test
- d) The table was rotated 360 degrees to determine the position of the highest radiated power.
- e) The height of the receiving antenna is adjusted to look for the maximum EIRP.
- f) The maximum EIRP shall be record.
- g) A dipole antenna was substituted in place of the EUT and was driven by a signal generator.
- h) The conducted power at the terminal of the dipole antenna is measured.
- i) Repeat step c) to step h) to get the maximum EIRP of the substitution antenna.
- j) $EIRP = P_s + E_t - E_s + G_s = P_s + R_t - R_s + G_s$.
- k) P_s (dBm): Input power to substitution antenna
- l) G_s (dBi or dBd): Substitution antenna Gain.
- m) $E_t = R_t + AF$
- n) $E_s = R_s + AF$
- o) AF (dB/m): Receive antenna factor
- p) R_t : The highest received signal in spectrum analyzer for EUT.
- q) R_s : The highest received signal in spectrum analyzer for substitution antenna.

4.4. Test Result

Product	LTE Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode1: LTE Band 4 Link QPSK/16QAM 1.4MHz		
Date of Test	2019/12/03	Test Site	AC5

Antenna: 1Y001J

Frequency (MHz)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)
Mid Channel 20175 (1732.5MHz) QPSK BW1.4MHz 1RB							
3465.00	V	-60.24	3.27	11.30	-52.21	-13.00	-39.21
5197.50	V	-63.52	4.16	13.20	-54.48	-13.00	-41.48
3465.00	H	-61.49	3.27	11.30	-53.46	-13.00	-40.46
5197.50	H	-63.83	4.16	13.20	-54.79	-13.00	-41.79
Note 1: We have evaluated all bandwidth and channels by modulation of QPSK and 16QAM, shown in the report are worst data.							
Note 2: We also evaluate frequency range 30MHz-1GHz, but the test trace is same as the ambient noise, therefor no data appear in the report.							

Antenna: 2H032C

Frequency (MHz)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)
Mid Channel 20175 (1732.5MHz) QPSK BW1.4MHz 1RB							
3465.00	V	-60.47	3.27	11.30	-52.44	-13.00	-39.44
5197.50	V	-63.63	4.16	13.20	-54.59	-13.00	-41.59
3465.00	H	-60.81	3.27	11.30	-52.78	-13.00	-39.78
5197.50	H	-63.93	4.16	13.20	-54.89	-13.00	-41.89
Note 1: We have evaluated all bandwidth and channels by modulation of QPSK and 16QAM, shown in the report are worst data.							
Note 2: We also evaluate frequency range 30MHz-1GHz, but the test trace is same as the ambient noise, therefor no data appear in the report.							

Product	LTE Module		
Test Item	Radiated Spurious Emission		
Test Mode	Mode2: LTE Band 13 Link QPSK/16QAM 5MHz		
Date of Test	2019/12/03	Test Site	AC-5

Antenna: 1Y001J

Frequency (MHz)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)
Mid Channel 23230 (782MHz) QPSK BW5MHz 1RB							
1564.00	V	-65.78	2.28	8.20	-59.86	-40.00	-19.86
2346.00	V	-65.86	2.65	11.20	-57.31	-13.00	-44.31
1564.00	H	-66.32	2.28	8.20	-60.40	-40.00	-20.40
2346.00	H	-65.89	2.65	11.20	-57.34	-13.00	-44.34
Note 1: We have evaluated all bandwidth and channels by modulation of QPSK and 16QAM, shown in the report are worst data.							
Note 2: We also evaluate frequency range 30MHz-1GHz, but the test trace is same as the ambient noise, therefor no data appear in the report.							

Antenna: 2H032C

Frequency (MHz)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)
Mid Channel 23230 (782MHz) QPSK BW5MHz 1RB							
1564.00	V	-65.37	2.28	8.20	-59.45	-40.00	-19.45
2346.00	V	-65.83	2.65	11.20	-57.28	-13.00	-44.28
1564.00	H	-66.03	2.28	8.20	-60.11	-40.00	-20.11
2346.00	H	-66.22	2.65	11.20	-57.67	-13.00	-44.67
Note 1: We have evaluated all bandwidth and channels by modulation of QPSK and 16QAM, shown in the report are worst data.							
Note 2: We also evaluate frequency range 30MHz-1GHz, but the test trace is same as the ambient noise, therefor no data appear in the report.							

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