

RF EXPOSURE REPORT

Product: LTE Cellular Router

Model Name: CDS-9010

FCC ID: 2AJLF-CDS-9010

Applicant: DataRemote Incorporated

Address: 18001 Old Cutler Rd. Suite 600, Miami, FL 33157

Manufacturer: DataRemote Incorporated

Address: 18001 Old Cutler Rd. Suite 600, Miami, FL 33157

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Issued Date: Apr. 30, 2019

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
SA190322W001	Original release	Apr. 30, 2019

1 CERTIFICATION

PRODUCT: LTE Cellular Router
BRAND NAME: DataRemote
MODEL NAME: CDS-9010
APPLICANT: DataRemote Incorporated
TESTED: Mar. 23, 2019 ~ Apr. 28, 2019
TEST SAMPLE: Production Unit
STANDARDS: FCC Part 2 (Section 2.1091)
FCC OET Bulletin 65, Supplement C (01-01)
KDB 447498 D01 General RF Exposure Guidance v06
IEEE C95.1

The above equipment has been tested by **BV 7Layers Communications Technology (Shenzhen) Co. Ltd** and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : Alex, **DATE:** Apr. 30, 2019
(Alex Chen/ Engineer)

APPROVED BY : Luke Lu, **DATE:** Apr. 30, 2019
(Luke Lu / Manager)

2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT	LTE Cellular Router	
MODEL NAME	CDS-9010	
NOMINAL VOLTAGE	12.0Vdc (adapter or host equipment) 7.3Vdc (Li-ion, battery)	
OPERATING TEMPERATURE RANGE	-5 ~ 50°C	
MODULATION TYPE	WLAN	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
	WCDMA	BPSK/QPSK
	LTE	QPSK, 16QAM
OPERATING FREQUENCY	WLAN	2412 ~ 2462MHz for 11b/g/n(HT20) 2422 ~ 2452MHz for 11n(HT40) 5180 ~ 5240MHz, 5745 ~ 5825MHz for 11a/n(HT20)/n(HT40)/ac(HT80)
	WCDMA	1852.4MHz ~ 1907.6MHz (For WCDMA II) 1712.4 MHz ~ 1752.6 MHz(For WCDMA IV) 826.4MHz ~ 846.6MHz (For WCDMA V)
	LTE	1850.7MHz ~ 1909.3MHz (For LTE Band 2) 1710.7MHz ~ 1754.3MHz (For LTE Band 4) 824.7MHz ~ 848.3MHz (For LTE Band 5) 699.7MHz ~ 715.3MHz (For LTE Band 12) 779.5MHz ~ 784.5MHz (For LTE Band 13) 790.5MHz ~ 795.5MHz (For LTE Band 14) 1710.7MHz ~ 1779.3MHz (For LTE Band 66) 665.5MHz ~ 695.5MHz (For LTE Band 71)
ANTENNA TYPE	WLAN: PCB Antenna WWAN: Fixed External Antenna	
ANTENNA GAIN	4.63dBi for WIFI 2.4G 5.08dBi for WIFI 5G 1.8dBi for WCDMA II / LTE 2 0.7dBi for WCDMA IV / LTE 4 / LTE 66 -0.5dBi for WCDMA V / LTE 5 -1.1dBi for LTE 12 / LTE 71 -0.1dBi for LTE 13 -1dBi for LTE 14	
HW VERSION	V1.1	
SW VERSION	V3.10	
I/O PORTS	Refer to user's manual	

CABLE SUPPLIED	N/A
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NOTE:

- For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
- The EUT was powered by the following adapter:

ADAPTER	
BRAND:	SHENZHEN GONGJIN ELECTRONICS CO.,LTD Electronic Limited
MODEL:	S24B72-120A200-C4
INPUT:	AC 100-240V, 800mA
OUTPUT:	DC 12V, 2000mA

- The EUT matched the following Ethernet Cable and Telephone Cables:

ETHERNET CABLE	
BRAND:	Shenzhen Eternity Ju Electronic Co., Ltd
MODEL:	RJ45-8P8C
SIGNAL LINE:	1500±20mm

TELEPHONE CABLE 1	
BRAND:	Shenzhen Eternity Ju Electronic Co., Ltd
MODEL:	RJ11-6P2C
SIGNAL LINE:	1500±20mm

TELEPHONE CABLE 2	
BRAND:	Shenzhen Eternity Ju Electronic Co., Ltd
MODEL:	RJ11-6P2C
SIGNAL LINE:	1500±20mm

- For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

3 RF EXPOSURE

3.1 LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

FREQUENCY RANGE (MHz)	ELECTRIC FIELD STRENGTH (V/m)	MAGNETIC FIELD STRENGTH (A/m)	POWER DENSITY (mW/cm ²)	AVERAGE TIME (minutes)
LIMITS FOR GENERAL POPULATION / UNCONTROLLED EXPOSURE				
300-1500	...	...	F/1500	30
1500-100,000	...	...	1.0	30

F = Frequency in MHz

3.2 MPE CALCULATION FORMULA

$$P_d = (P_{out} * G) / (4 * \pi * r^2)$$

where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

3.3 CLASSIFICATION

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. So, this device is classified as **Mobile Device**.

3.4 CONDUCTED POWER

WIFI 2.4G

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	PASS/FAIL
1	2412	16.04	N/A
6	2437	16.00	N/A
11	2462	15.96	N/A

802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	PASS/FAIL
1	2412	10.75	N/A
6	2437	16.14	N/A
11	2462	10.65	N/A

802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (dBm)	PASS/FAIL
		CHAIN 0	CHAIN 1		
1	2412	10.70	10.86	13.79	N/A
6	2437	16.21	16.16	19.20	N/A
11	2462	9.15	9.13	12.15	N/A

802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (dBm)	PASS/FAIL
		CHAIN 0	CHAIN 1		
3	2422	16.35	16.02	19.20	N/A
6	2437	16.22	16.22	19.23	N/A
9	2452	14.39	14.41	17.41	N/A

WIFI 5G

802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	PASS/FAIL
36	5180	16.28	N/A
40	5200	16.19	N/A
48	5240	16.30	N/A
149	5745	16.40	N/A
157	5785	16.34	N/A
165	5825	16.18	N/A

802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (dBm)	PASS/FAIL
		CHAIN 0	CHAIN 1		
36	5180	16.10	16.10	19.11	N/A
40	5200	16.07	16.00	19.05	N/A
48	5240	16.22	16.01	19.13	N/A
149	5745	16.15	16.19	19.31	N/A
157	5785	16.13	16.32	19.34	N/A
165	5825	16.04	16.10	19.15	N/A

802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (dBm)	PASS/FAIL
		CHAIN 0	CHAIN 1		
38	5190	6.80	6.62	9.72	N/A
46	5230	12.26	12.10	15.19	N/A
151	5755	16.36	16.09	19.24	N/A
159	5795	16.39	16.22	19.32	N/A

802.11ac (80MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (dBm)	PASS/FAIL
		CHAIN 0	CHAIN 1		
42	5210	6.18	6.89	9.56	N/A
155	5775	16.20	16.12	19.17	N/A

Band	WCDMA II			WCDMA IV		
Channel	9262	9400	9538	1312	1413	1513
Frequency (MHz)	1852.4	1880.0	1907.6	1712.4	1732.6	1752.6
RMC 12.2K	22.84	22.99	23.01	22.36	22.64	22.68
HSPA						
HSDPA Subtest-1	22.76	22.91	22.93	22.28	22.56	22.60
HSDPA Subtest-2	22.69	22.84	22.86	22.21	22.49	22.53
HSDPA Subtest-3	22.34	22.49	22.51	21.86	22.14	22.18
HSDPA Subtest-4	22.25	22.40	22.42	21.77	22.05	22.09
HSUPA Subtest-1	22.54	22.69	22.71	22.06	22.34	22.38
HSUPA Subtest-2	20.73	20.88	20.90	20.25	20.53	20.57
HSUPA Subtest-3	21.62	21.77	21.79	21.14	21.42	21.46
HSUPA Subtest-4	20.55	20.70	20.72	20.07	20.35	20.39
HSUPA Subtest-5	22.63	22.78	22.80	22.15	22.43	22.47

Band	WCDMA V		
Channel	4132	4182	4233
Frequency (MHz)	826.4	836.4	846.6
RMC 12.2K	23.21	23.19	23.11
HSPA			
HSDPA Subtest-1	23.13	23.11	23.03
HSDPA Subtest-2	23.06	23.04	22.96
HSDPA Subtest-3	22.71	22.69	22.61
HSDPA Subtest-4	22.62	22.60	22.52
HSUPA Subtest-1	22.91	22.89	22.81
HSUPA Subtest-2	21.10	21.08	21.00
HSUPA Subtest-3	21.99	21.97	21.89
HSUPA Subtest-4	20.92	20.90	20.82
HSUPA Subtest-5	23.00	22.98	22.90

LTE BAND 2

BW	Modulation	RB Size	RB Offset	Low CH 18607	Mid CH 18900	High CH 19193	3GPP MPR (dB)
				Frequency 1850.7 MHz	Frequency 1880 MHz	Frequency 1909.3 MHz	
1.4MHz	QPSK	1	0	23.11	23.16	23.03	0
		1	2	23.02	23.07	22.94	0
		1	5	22.86	22.91	22.78	0
		3	0	21.89	21.94	21.81	0
		3	1	21.78	21.83	21.70	0
		3	3	21.69	21.74	21.61	0
		6	0	21.75	21.80	21.67	1
	16QAM	1	0	21.66	21.71	21.58	1
		1	2	21.74	21.79	21.66	1
		1	5	21.61	21.66	21.53	1
		3	0	20.86	20.91	20.78	1
		3	1	20.82	20.87	20.74	1
		3	3	20.74	20.79	20.66	1
		6	0	20.81	20.86	20.73	2
BW	Modulation	RB Size	RB Offset	Low CH 18615	Mid CH 18900	High CH 19185	3GPP MPR (dB)
				Frequency 1851.5 MHz	Frequency 1880 MHz	Frequency 1908.5 MHz	
3 MHz	QPSK	1	0	23.14	23.19	23.06	0
		1	7	23.05	23.10	22.97	0
		1	14	22.89	22.94	22.81	0
		8	0	21.90	21.95	21.82	1
		8	3	21.79	21.84	21.71	1
		8	7	21.70	21.75	21.62	1
		15	0	21.76	21.81	21.68	1
	16QAM	1	0	21.69	21.74	21.61	1
		1	7	21.77	21.82	21.69	1
		1	14	21.64	21.69	21.56	1
		8	0	20.88	20.93	20.80	2
		8	3	20.84	20.89	20.76	2
		8	7	20.76	20.81	20.68	2
		15	0	20.83	20.88	20.75	2

BW	Modulation	RB Size	RB Offset	Low CH 18625	Mid CH 18900	High CH 19175	3GPP MPR (dB)
				Frequency 1852.5 MHz	Frequency 1880 MHz	Frequency 1907.5 MHz	
5 MHz	QPSK	1	0	23.17	23.22	23.09	0
		1	12	23.08	23.13	23.00	0
		1	24	22.92	22.97	22.84	0
		12	0	21.93	21.98	21.85	1
		12	6	21.82	21.87	21.74	1
		12	13	21.73	21.78	21.65	1
		25	0	21.79	21.84	21.71	1
	16QAM	1	0	21.72	21.77	21.64	1
		1	12	21.80	21.85	21.72	1
		1	24	21.67	21.72	21.59	1
		12	0	20.91	20.96	20.83	2
		12	6	20.87	20.92	20.79	2
		12	13	20.79	20.84	20.71	2
		25	0	20.86	20.91	20.78	2
BW	Modulation	RB Size	RB Offset	Low CH 18650	Mid CH 18900	High CH 19150	3GPP MPR (dB)
				Frequency 1855 MHz	Frequency 1880 MHz	Frequency 1905 MHz	
10 MHz	QPSK	1	0	23.19	23.24	23.11	0
		1	24	23.10	23.15	23.02	0
		1	49	22.94	22.99	22.86	0
		25	0	21.95	22.00	21.87	1
		25	12	21.84	21.89	21.76	1
		25	25	21.75	21.80	21.67	1
		50	0	21.81	21.86	21.73	1
	16QAM	1	0	21.74	21.79	21.66	1
		1	24	21.82	21.87	21.74	1
		1	49	21.69	21.74	21.61	1
		25	0	20.93	20.98	20.85	2
		25	12	20.89	20.94	20.81	2
		25	25	20.81	20.86	20.73	2
		50	0	20.88	20.93	20.80	2

BW	Modulation	RB Size	RB Offset	Low CH 18675	Mid CH 18900	High CH 19125	3GPP MPR (dB)
				Frequency 1857.5 MHz	Frequency 1880 MHz	Frequency 1902.5 MHz	
15 MHz	QPSK	1	0	23.22	23.27	23.14	0
		1	37	23.13	23.18	23.05	0
		1	74	22.97	23.02	22.89	0
		36	0	21.98	22.03	21.90	1
		36	19	21.87	21.92	21.79	1
		36	39	21.78	21.83	21.70	1
		75	0	21.84	21.89	21.76	1
	16QAM	1	0	21.77	21.82	21.69	1
		1	37	21.85	21.90	21.77	1
		1	74	21.72	21.77	21.64	1
		36	0	20.96	21.01	20.88	2
		36	19	20.92	20.97	20.84	2
		36	39	20.84	20.89	20.76	2
		75	0	20.91	20.96	20.83	2
BW	Modulation	RB Size	RB Offset	Low CH 18700	Mid CH 18900	High CH 19100	3GPP MPR (dB)
				Frequency 1860 MHz	Frequency 1880 MHz	Frequency 1900 MHz	
20MHz	QPSK	1	0	23.27	23.32	23.19	0
		1	50	23.18	23.23	23.10	0
		1	99	23.02	23.07	22.94	0
		50	0	22.03	22.08	21.95	1
		50	25	21.92	21.97	21.84	1
		50	50	21.83	21.88	21.75	1
		100	0	21.89	21.94	21.81	1
	16QAM	1	0	21.82	21.87	21.74	1
		1	50	21.90	21.95	21.82	1
		1	99	21.77	21.82	21.69	1
		50	0	21.01	21.06	20.93	2
		50	25	20.97	21.02	20.89	2
		50	50	20.89	20.94	20.81	2
		100	0	20.96	21.01	20.88	2

LTE BAND 4

BW	Modulation	RB Size	RB Offset	Low CH 19957	Mid CH 20175	High CH 20393	MPR
				Frequency 1710.7 MHz	Frequency 1732.5 MHz	Frequency 1754.3 MHz	
1.4MHz	QPSK	1	0	22.42	22.50	22.74	0
		1	2	22.49	22.57	22.81	0
		1	5	22.36	22.44	22.68	0
		3	0	21.19	21.27	21.51	0
		3	1	21.33	21.41	21.65	0
		3	3	21.24	21.32	21.56	0
		6	0	21.21	21.29	21.53	1
	16QAM	1	0	21.28	21.36	21.60	1
		1	2	21.17	21.25	21.49	1
		1	5	21.11	21.19	21.43	1
		3	0	20.37	20.45	20.69	1
		3	1	20.51	20.59	20.83	1
		3	3	20.40	20.48	20.72	1
		6	0	20.44	20.52	20.76	2
BW	Modulation	RB Size	RB Offset	Low CH 19965	Mid CH 20175	High CH 20385	MPR
				Frequency 1711.5 MHz	Frequency 1732.5 MHz	Frequency 1753.5 MHz	
3 MHz	QPSK	1	0	22.43	22.51	22.75	0
		1	7	22.50	22.58	22.82	0
		1	14	22.37	22.45	22.69	0
		8	0	21.21	21.29	21.53	1
		8	3	21.35	21.43	21.67	1
		8	7	21.26	21.34	21.58	1
		15	0	21.23	21.31	21.55	1
	16QAM	1	0	21.29	21.37	21.61	1
		1	7	21.18	21.26	21.50	1
		1	14	21.12	21.20	21.44	1
		8	0	20.38	20.46	20.70	2
		8	3	20.52	20.60	20.84	2
		8	7	20.41	20.49	20.73	2
		15	0	20.45	20.53	20.77	2

BW	Modulation	RB Size	RB Offset	Low CH 19975	Mid CH 20175	High CH 20375	MPR
				Frequency 1712.5 MHz	Frequency 1732.5 MHz	Frequency 1752.5 MHz	
5 MHz	QPSK	1	0	22.46	22.54	22.78	0
		1	12	22.53	22.61	22.85	0
		1	24	22.40	22.48	22.72	0
		12	0	21.24	21.32	21.56	1
		12	6	21.38	21.46	21.70	1
		12	13	21.29	21.37	21.61	1
		25	0	21.26	21.34	21.58	1
	16QAM	1	0	21.32	21.40	21.64	1
		1	12	21.21	21.29	21.53	1
		1	24	21.15	21.23	21.47	1
		12	0	20.41	20.49	20.73	2
		12	6	20.55	20.63	20.87	2
		12	13	20.44	20.52	20.76	2
		25	0	20.48	20.56	20.80	2
BW	Modulation	RB Size	RB Offset	Low CH 20000	Mid CH 20175	High CH 20350	MPR
				Frequency 1715 MHz	Frequency 1732.5 MHz	Frequency 1750 MHz	
10 MHz	QPSK	1	0	22.50	22.58	22.82	0
		1	24	22.57	22.65	22.89	0
		1	49	22.44	22.52	22.76	0
		25	0	21.28	21.36	21.60	1
		25	12	21.42	21.50	21.74	1
		25	25	21.33	21.41	21.65	1
		50	0	21.30	21.38	21.62	1
	16QAM	1	0	21.36	21.44	21.68	1
		1	24	21.25	21.33	21.57	1
		1	49	21.19	21.27	21.51	1
		25	0	20.45	20.53	20.77	2
		25	12	20.59	20.67	20.91	2
		25	25	20.48	20.56	20.80	2
		50	0	20.52	20.60	20.84	2

BW	Modulation	RB Size	RB Offset	Low CH 20025	Mid CH 20175	High CH 20325	MPR
				Frequency 1717.5 MHz	Frequency 1732.5 MHz	Frequency 1747.5 MHz	
15 MHz	QPSK	1	0	22.56	22.64	22.88	0
		1	37	22.63	22.71	22.95	0
		1	74	22.50	22.58	22.82	0
		36	0	21.34	21.42	21.66	1
		36	19	21.48	21.56	21.80	1
		36	39	21.39	21.47	21.71	1
		75	0	21.36	21.44	21.68	1
	16QAM	1	0	21.42	21.50	21.74	1
		1	37	21.31	21.39	21.63	1
		1	74	21.25	21.33	21.57	1
		36	0	20.51	20.59	20.83	2
		36	19	20.65	20.73	20.97	2
		36	39	20.54	20.62	20.86	2
		75	0	20.58	20.66	20.90	2
BW	Modulation	RB Size	RB Offset	Low CH 20050	Mid CH 20175	High CH 20300	MPR
				Frequency 1720 MHz	Frequency 1732.5 MHz	Frequency 1745 MHz	
20MHz	QPSK	1	0	22.59	22.67	22.91	0
		1	50	22.66	22.74	22.98	0
		1	99	22.53	22.61	22.85	0
		50	0	21.37	21.45	21.69	1
		50	25	21.51	21.59	21.83	1
		50	50	21.42	21.50	21.74	1
		100	0	21.39	21.47	21.71	1
	16QAM	1	0	21.45	21.53	21.77	1
		1	50	21.34	21.42	21.66	1
		1	99	21.28	21.36	21.60	1
		50	0	20.54	20.62	20.86	2
		50	25	20.68	20.76	21.00	2
		50	50	20.57	20.65	20.89	2
		100	0	20.61	20.69	20.93	2

LTE BAND 5

Band/BW	Modulation	RB Size	RB Offset	Low CH 20407	Mid CH 20525	High CH 20643	3GPP MPR (dB)
				Frequency 824.7 MHz	Frequency 836.5 MHz	Frequency 848.3 MHz	
5/1.4	QPSK	1	0	23.48	23.53	23.70	0
		1	2	23.66	23.71	23.88	0
		1	5	23.57	23.62	23.79	0
		3	0	22.42	22.47	22.64	0
		3	1	22.47	22.52	22.69	0
		3	3	22.40	22.45	22.62	0
		6	0	22.46	22.51	22.68	1
	16QAM	1	0	22.14	22.19	22.36	1
		1	2	22.10	22.15	22.32	1
		1	5	22.17	22.22	22.39	1
		3	0	21.37	21.42	21.59	1
		3	1	21.50	21.55	21.72	1
		3	3	21.39	21.44	21.61	1
		6	0	21.36	21.41	21.58	2
Band/BW	Modulation	RB Size	RB Offset	Low CH 20415	Mid CH 20525	High CH 20635	3GPP MPR (dB)
				Frequency 825.5 MHz	Frequency 836.5 MHz	Frequency 847.5 MHz	
5/3	QPSK	1	0	23.52	23.57	23.74	0
		1	7	23.70	23.75	23.92	0
		1	14	23.61	23.66	23.83	0
		8	0	22.44	22.49	22.66	1
		8	3	22.49	22.54	22.71	1
		8	7	22.42	22.47	22.64	1
		15	0	22.48	22.53	22.70	1
	16QAM	1	0	22.18	22.23	22.40	1
		1	7	22.14	22.19	22.36	1
		1	14	22.21	22.26	22.43	1
		8	0	21.38	21.43	21.60	2
		8	3	21.51	21.56	21.73	2
		8	7	21.40	21.45	21.62	2
		15	0	21.37	21.42	21.59	2

Band/BW	Modulation	RB Size	RB Offset	Low CH 20425	Mid CH 20525	High CH 20625	3GPP MPR (dB)
				Frequency 826.5 MHz	Frequency 836.5 MHz	Frequency 846.5 MHz	
5/5	QPSK	1	0	23.58	23.63	23.80	0
		1	12	23.76	23.81	23.98	0
		1	24	23.67	23.72	23.89	0
		12	0	22.50	22.55	22.72	1
		12	6	22.55	22.60	22.77	1
		12	13	22.48	22.53	22.70	1
		25	0	22.54	22.59	22.76	1
	16QAM	1	0	22.24	22.29	22.46	1
		1	12	22.20	22.25	22.42	1
		1	24	22.27	22.32	22.49	1
		12	0	21.44	21.49	21.66	2
		12	6	21.57	21.62	21.79	2
		12	13	21.46	21.51	21.68	2
		25	0	21.43	21.48	21.65	2
Band/BW	Modulation	RB Size	RB Offset	Low CH 20450	Mid CH 20525	High CH 20600	3GPP MPR (dB)
				Frequency 829 MHz	Frequency 836.5 MHz	Frequency 844 MHz	
5/10	QPSK	1	0	23.61	23.66	23.83	0
		1	24	23.79	23.84	24.01	0
		1	49	23.70	23.75	23.92	0
		25	0	22.53	22.58	22.75	1
		25	12	22.58	22.63	22.80	1
		25	25	22.51	22.56	22.73	1
		50	0	22.57	22.62	22.79	1
	16QAM	1	0	22.27	22.32	22.49	1
		1	24	22.23	22.28	22.45	1
		1	49	22.30	22.35	22.52	1
		25	0	21.47	21.52	21.69	2
		25	12	21.60	21.65	21.82	2
		25	25	21.49	21.54	21.71	2
		50	0	21.46	21.51	21.68	2

LTE BAND 12

BW	Modulation	RB Size	RB Offset	Low CH 23017	Mid CH 23095	High CH 23173	MPR
				Frequency 699.7 MHz	Frequency 707.5 MHz	Frequency 715.3 MHz	
1.4 MHz	QPSK	1	0	23.22	23.14	23.28	0
		1	2	23.43	23.35	23.49	0
		1	5	23.29	23.21	23.35	0
		3	0	22.34	22.26	22.40	0
		3	1	22.42	22.34	22.48	0
		3	3	22.29	22.21	22.35	0
		6	0	22.33	22.25	22.39	1
	16QAM	1	0	21.93	21.85	21.99	1
		1	2	22.23	22.15	22.29	1
		1	5	22.14	22.06	22.20	1
		3	0	21.21	21.13	21.27	1
		3	1	21.27	21.19	21.33	1
		3	3	21.25	21.17	21.31	1
		6	0	21.22	21.14	21.28	2
BW	Modulation	RB Size	RB Offset	Low CH 23025	Mid CH 23095	High CH 23165	MPR
				Frequency 700.5 MHz	Frequency 707.5 MHz	Frequency 714.5 MHz	
3 MHz	QPSK	1	0	23.26	23.18	23.32	0
		1	7	23.47	23.39	23.53	0
		1	14	23.33	23.25	23.39	0
		8	0	22.36	22.28	22.42	1
		8	3	22.44	22.36	22.50	1
		8	7	22.31	22.23	22.37	1
		15	0	22.35	22.27	22.41	1
	16QAM	1	0	21.97	21.89	22.03	1
		1	7	22.27	22.19	22.33	1
		1	14	22.18	22.10	22.24	1
		8	0	21.25	21.17	21.31	2
		8	3	21.31	21.23	21.37	2
		8	7	21.29	21.21	21.35	2
		15	0	21.26	21.18	21.32	2

BW	Modulation	RB Size	RB Offset	Low CH 23035	Mid CH 23095	High CH 23155	MPR
				Frequency 701.5 MHz	Frequency 707.5 MHz	Frequency 713.5 MHz	
5 MHz	QPSK	1	0	23.32	23.24	23.38	0
		1	12	23.53	23.45	23.59	0
		1	24	23.39	23.31	23.45	0
		12	0	22.42	22.34	22.48	1
		12	6	22.50	22.42	22.56	1
		12	13	22.37	22.29	22.43	1
		25	0	22.41	22.33	22.47	1
	16QAM	1	0	22.03	21.95	22.09	1
		1	12	22.33	22.25	22.39	1
		1	24	22.24	22.16	22.30	1
		12	0	21.31	21.23	21.37	2
		12	6	21.37	21.29	21.43	2
		12	13	21.35	21.27	21.41	2
		25	0	21.32	21.24	21.38	2
BW	Modulation	RB Size	RB Offset	Low CH 23060	Mid CH 23095	High CH 23130	MPR
				Frequency 704 MHz	Frequency 707.5 MHz	Frequency 711 MHz	
10 MHz	QPSK	1	0	23.35	23.27	23.41	0
		1	24	23.56	23.48	23.62	0
		1	49	23.42	23.34	23.48	0
		25	0	22.45	22.37	22.51	1
		25	12	22.53	22.45	22.59	1
		25	25	22.40	22.32	22.46	1
		50	0	22.44	22.36	22.50	1
	16QAM	1	0	22.06	21.98	22.12	1
		1	24	22.36	22.28	22.42	1
		1	49	22.27	22.19	22.33	1
		25	0	21.34	21.26	21.40	2
		25	12	21.40	21.32	21.46	2
		25	25	21.38	21.30	21.44	2
		50	0	21.35	21.27	21.41	2

LTE BAND 13

BW	Modulation	RB Size	RB Offset	Low CH 23205	Mid CH 23230	High CH 23255	MPR
				Frequency 779.5 MHz	Frequency 782.0 MHz	Frequency 784.5 MHz	
5 MHz	QPSK	1	0	22.73	23.62	22.86	0
		1	12	22.80	23.69	22.93	0
		1	24	22.65	23.54	22.78	0
		12	0	21.72	22.61	21.85	1
		12	6	21.79	22.68	21.92	1
		12	13	21.76	22.65	21.89	1
		25	0	21.73	22.62	21.86	1
	16QAM	1	0	21.54	22.43	21.67	1
		1	12	21.67	22.56	21.80	1
		1	24	21.51	22.40	21.64	1
		12	0	20.67	21.56	20.80	2
		12	6	20.76	21.65	20.89	2
		12	13	20.79	21.68	20.92	2
		25	0	20.73	21.62	20.86	2
BW	Modulation	RB Size	RB Offset	CH	CH 23230	CH	MPR
				Frequency MHz	Frequency 782.0 MHz	Frequency MHz	
10 MHz	QPSK	1	0	-	23.65	-	0
		1	24	-	23.72	-	0
		1	49	-	23.57	-	0
		25	0	-	22.64	-	1
		25	12	-	22.71	-	1
		25	25	-	22.68	-	1
		50	0	-	22.65	-	1
	16QAM	1	0	-	22.46	-	1
		1	24	-	22.59	-	1
		1	49	-	22.43	-	1
		25	0	-	21.59	-	2
		25	12	-	21.68	-	2
		25	25	-	21.71	-	2
		50	0	-	21.65	-	2

LTE BAND 14

BW	Modulation	RB Size	RB Offset	Low CH 23305	Mid CH 23330	High CH 23355	MPR
				Frequency 790.5 MHz	Frequency 793 MHz	Frequency 795.5 MHz	
5 MHz	QPSK	1	0	23.05	23.53	23.07	0
		1	12	23.24	23.72	23.26	0
		1	24	23.11	23.59	23.13	0
		12	0	22.17	22.65	22.19	1
		12	6	22.22	22.70	22.24	1
		12	13	22.14	22.62	22.16	1
		25	0	22.20	22.68	22.22	1
	16QAM	1	0	21.91	22.39	21.93	1
		1	12	22.13	22.61	22.15	1
		1	24	22.04	22.52	22.06	1
		12	0	21.00	21.48	21.02	2
		12	6	21.24	21.72	21.26	2
		12	13	21.15	21.63	21.17	2
		25	0	21.18	21.66	21.20	2
BW	Modulation	RB Size	RB Offset	CH	CH 23330	CH	MPR
				Frequency MHz	Frequency 793 MHz	Frequency MHz	
10 MHz	QPSK	1	0	-	23.56	-	0
		1	24	-	23.75	-	0
		1	49	-	23.62	-	0
		25	0	-	22.68	-	1
		25	12	-	22.73	-	1
		25	25	-	22.65	-	1
		50	0	-	22.71	-	1
	16QAM	1	0	-	22.42	-	1
		1	24	-	22.64	-	1
		1	49	-	22.55	-	1
		25	0	-	21.51	-	2
		25	12	-	21.75	-	2
		25	25	-	21.66	-	2
		50	0	-	21.69	-	2

LTE BAND 66

BW	Modulation	RB Size	RB Offset	Low CH 131979	Mid CH 132322	High CH 132665	MPR
				Frequency 1710.7 MHz	Frequency 1745 MHz	Frequency 1779.3 MHz	
1.4MHz	QPSK	1	0	22.67	22.88	23.02	0
		1	2	22.74	22.95	23.09	0
		1	5	22.59	22.80	22.94	0
		3	0	22.66	22.87	23.01	0
		3	1	22.73	22.94	23.08	0
		3	3	22.58	22.79	22.93	0
		6	0	21.58	21.79	21.93	1
	16QAM	1	0	21.55	21.76	21.90	1
		1	2	21.67	21.88	22.02	1
		1	5	21.50	21.71	21.85	1
		3	0	21.53	21.74	21.88	1
		3	1	21.65	21.86	22.00	1
		3	3	21.48	21.69	21.83	1
		6	0	20.54	20.75	20.89	2
BW	Modulation	RB Size	RB Offset	Low CH 131987	Mid CH 132322	High CH 132657	MPR
				Frequency 1711.5 MHz	Frequency 1745 MHz	Frequency 1778.5 MHz	
3 MHz	QPSK	1	0	22.70	22.91	23.05	0
		1	7	22.77	22.98	23.12	0
		1	14	22.62	22.83	22.97	0
		8	0	21.67	21.88	22.02	1
		8	3	21.73	21.94	22.08	1
		8	7	21.65	21.86	22.00	1
		15	0	21.61	21.82	21.96	1
	16QAM	1	0	21.58	21.79	21.93	1
		1	7	21.70	21.91	22.05	1
		1	14	21.53	21.74	21.88	1
		8	0	20.60	20.81	20.95	2
		8	3	20.69	20.90	21.04	2
		8	7	20.61	20.82	20.96	2
		15	0	20.57	20.78	20.92	2

BW	Modulation	RB Size	RB Offset	Low CH 131997	Mid CH 132322	High CH 132647	MPR
				Frequency 1712.5 MHz	Frequency 1745 MHz	Frequency 1777.5 MHz	
5 MHz	QPSK	1	0	22.73	22.94	23.08	0
		1	12	22.80	23.01	23.15	0
		1	24	22.65	22.86	23.00	0
		12	0	21.70	21.91	22.05	1
		12	6	21.76	21.97	22.11	1
		12	13	21.68	21.89	22.03	1
		25	0	21.64	21.85	21.99	1
	16QAM	1	0	21.61	21.82	21.96	1
		1	12	21.73	21.94	22.08	1
		1	24	21.56	21.77	21.91	1
		12	0	20.63	20.84	20.98	2
		12	6	20.72	20.93	21.07	2
		12	13	20.64	20.85	20.99	2
		25	0	20.60	20.81	20.95	2
BW	Modulation	RB Size	RB Offset	Low CH 132022	Mid CH 132322	High CH 132622	MPR
				Frequency 1715 MHz	Frequency 1745 MHz	Frequency 1775 MHz	
10 MHz	QPSK	1	0	22.75	22.96	23.10	0
		1	24	22.82	23.03	23.17	0
		1	49	22.67	22.88	23.02	0
		25	0	21.72	21.93	22.07	1
		25	12	21.78	21.99	22.13	1
		25	25	21.70	21.91	22.05	1
		50	0	21.66	21.87	22.01	1
	16QAM	1	0	21.63	21.84	21.98	1
		1	24	21.75	21.96	22.10	1
		1	49	21.58	21.79	21.93	1
		25	0	20.65	20.86	21.00	2
		25	12	20.74	20.95	21.09	2
		25	25	20.66	20.87	21.01	2
		50	0	20.62	20.83	20.97	2

BW	Modulation	RB Size	RB Offset	Low CH 132047	Mid CH 132322	High CH 132597	MPR
				Frequency 1717.5 MHz	Frequency 1745 MHz	Frequency 1772.5 MHz	
15 MHz	QPSK	1	0	22.78	22.99	23.13	0
		1	37	22.85	23.06	23.20	0
		1	74	22.70	22.91	23.05	0
		36	0	21.75	21.96	22.10	1
		36	19	21.81	22.02	22.16	1
		36	39	21.73	21.94	22.08	1
		75	0	21.69	21.90	22.04	1
	16QAM	1	0	21.66	21.87	22.01	1
		1	37	21.78	21.99	22.13	1
		1	74	21.61	21.82	21.96	1
		36	0	20.68	20.89	21.03	2
		36	19	20.77	20.98	21.12	2
		36	39	20.69	20.90	21.04	2
		75	0	20.65	20.86	21.00	2
BW	Modulation	RB Size	RB Offset	Low CH 132072	Mid CH 132322	High CH 132572	MPR
				Frequency 1720 MHz	Frequency 1745 MHz	Frequency 1770 MHz	
20 MHz	QPSK	1	0	22.83	23.04	23.18	0
		1	50	22.90	23.11	23.25	0
		1	99	22.75	22.96	23.10	0
		50	0	21.80	22.01	22.15	1
		50	25	21.86	22.07	22.21	1
		50	50	21.78	21.99	22.13	1
		100	0	21.74	21.95	22.09	1
	16QAM	1	0	21.71	21.92	22.06	1
		1	50	21.83	22.04	22.18	1
		1	99	21.66	21.87	22.01	1
		50	0	20.73	20.94	21.08	2
		50	25	20.82	21.03	21.17	2
		50	50	20.74	20.95	21.09	2
		100	0	20.70	20.91	21.05	2

LTE BAND 71

BW	Modulation	RB Size	RB Offset	Low CH 133147	Mid CH 133297	High CH 133447	MPR
				Frequency 665.5 MHz	Frequency 680.5 MHz	Frequency 695.5 MHz	
5 MHz	QPSK	1	0	22.85	22.95	22.88	0
		1	12	22.69	22.79	22.72	0
		1	24	22.56	22.66	22.59	0
		12	0	21.72	21.82	21.75	1
		12	6	21.59	21.69	21.62	1
		12	13	21.55	21.65	21.58	1
		25	0	21.48	21.58	21.51	1
	16QAM	1	0	21.94	22.04	21.97	1
		1	12	21.88	21.98	21.91	1
		1	24	21.83	21.93	21.86	1
		12	0	20.73	20.83	20.76	2
		12	6	20.61	20.71	20.64	2
		12	13	20.59	20.69	20.62	2
		25	0	20.62	20.72	20.65	2
BW	Modulation	RB Size	RB Offset	Low CH 133172	Mid CH 133297	High CH 133442	MPR
				Frequency 668 MHz	Frequency 680.5 MHz	Frequency 693 MHz	
10 MHz	QPSK	1	0	22.87	22.97	22.90	0
		1	24	22.71	22.81	22.74	0
		1	49	22.58	22.68	22.61	0
		25	0	21.74	21.84	21.77	1
		25	12	21.61	21.71	21.64	1
		25	25	21.57	21.67	21.60	1
		50	0	21.50	21.60	21.53	1
	16QAM	1	0	21.96	22.06	21.99	1
		1	24	21.90	22.00	21.93	1
		1	49	21.85	21.95	21.88	1
		25	0	20.75	20.85	20.78	2
		25	12	20.63	20.73	20.66	2
		25	25	20.61	20.71	20.64	2
		50	0	20.64	20.74	20.67	2

BW	Modulation	RB Size	RB Offset	Low CH 133197	Mid CH 133297	High CH 133397	MPR
				Frequency 670.5 MHz	Frequency 680.5 MHz	Frequency 690.5 MHz	
15 MHz	QPSK	1	0	22.90	23.00	22.93	0
		1	37	22.74	22.84	22.77	0
		1	74	22.61	22.71	22.64	0
		36	0	21.77	21.87	21.80	1
		36	19	21.64	21.74	21.67	1
		36	39	21.60	21.70	21.63	1
		75	0	21.53	21.63	21.56	1
	16QAM	1	0	21.99	22.09	22.02	1
		1	37	21.93	22.03	21.96	1
		1	74	21.88	21.98	21.91	1
		36	0	20.78	20.88	20.81	2
		36	19	20.66	20.76	20.69	2
		36	39	20.64	20.74	20.67	2
		75	0	20.67	20.77	20.70	2
BW	Modulation	RB Size	RB Offset	Low CH 133222	Mid CH 133322	High CH 133372	MPR
				Frequency 673 MHz	Frequency 683 MHz	Frequency 688 MHz	
20 MHz	QPSK	1	0	22.95	23.05	22.98	0
		1	50	22.79	22.89	22.82	0
		1	99	22.66	22.76	22.69	0
		50	0	21.82	21.92	21.85	1
		50	25	21.69	21.79	21.72	1
		50	50	21.65	21.75	21.68	1
		100	0	21.58	21.68	21.61	1
	16QAM	1	0	22.04	22.14	22.07	1
		1	50	21.98	22.08	22.01	1
		1	99	21.93	22.03	21.96	1
		50	0	20.83	20.93	20.86	2
		50	25	20.71	20.81	20.74	2
		50	50	20.69	20.79	20.72	2
		100	0	20.72	20.82	20.75	2

3.5 CALCULATION RESULT OF MAXIMUM CONDUCTED POWER

TUNE-UP POWER TABLE

Band	Frequency (MHz)	Operating Mode	Tune-Up Power And Tolerance (dBm)
WIFI 2.4G	2437	11n(40MHz)	19.0 ± 0.5
WIFI 5G B1	5240	11n(20MHz)	19.0 ± 0.5
WIFI 5G B4	5785	11n(20MHz)	19.0 ± 0.5
WCDMA II	1907.6	RMC12.2K	23.0 ± 0.5
WCDMA IV	1752.6	RMC12.2K	22.5 ± 0.5
WCDMA V	826.4	RMC12.2K	23.0 ± 0.5
LTE 2	1880	QPSK	23.0 ± 0.5
LTE 4	1745	QPSK	23.0 ± 0.5
LTE 5	844	QPSK	24.0 ± 0.5
LTE 12	711	QPSK	23.5 ± 0.5
LTE 13	782	QPSK	23.5 ± 0.5
LTE 14	793	QPSK	23.5 ± 0.5
LTE 66	1770	QPSK	23.0 ± 0.5
LTE 71	683	QPSK	23.0 ± 0.5

WIFI

Band	Frequency (MHz)	Operating Mode	Directional Gain (dBi)	Tune-up Power (dBm)	E.I.R.P Power (mW)	Power Density (mW/cm ²)	limit (mW/cm ²)	PASS / FAIL
WIFI 2.4G	2437	11n(40MHz)	7.64	19.5	517.607	0.103	1.00	PASS
WIFI 5G B1	5240	11n(20MHz)	8.09	19.5	574.116	0.114	1.00	PASS
WIFI 5G B4	5785	11n(20MHz)	8.09	19.5	574.116	0.114	1.00	PASS

WIFI 2.4G: $N_{ANT} = 2$, Directional gain = $G_{ANT} + 10 \log(N_{ANT})$ dBi=7.64dBi

WIFI 5G B1: $N_{ANT} = 2$, Directional gain = $G_{ANT} + 10 \log(N_{ANT})$ dBi=8.09dBi

WIFI 5G B4: $N_{ANT} = 2$, Directional gain = $G_{ANT} + 10 \log(N_{ANT})$ dBi=8.09dBi

WCDMA

Band	Frequency (MHz)	Operating Mode	Antenna Gain (dBi)	Tune-up Power (dBm)	E.I.R.P Power (mW)	Power Density (mW/cm ²)	limit (mW/cm ²)	PASS / FAIL
WCDMA II	1907.6	RMC12.2K	1.8	23.5	338.844	0.067	1.00	PASS
WCDMA IV	1752.6	RMC12.2K	0.7	23.0	234.423	0.047	1.00	PASS
WCDMA V	826.4	RMC12.2K	-0.5	23.5	199.526	0.040	0.55	PASS

LTE

Band	Frequency (MHz)	Operating Mode	Antenna Gain (dBi)	Tune-up Power (dBm)	E.I.R.P Power (mW)	Power Density (mW/cm ²)	limit (mW/cm ²)	PASS / FAIL
LTE 2	1880	QPSK	1.8	23.5	338.844	0.067	1.00	PASS
LTE 4	1745	QPSK	0.7	23.5	263.027	0.052	1.00	PASS
LTE 5	844	QPSK	-0.5	24.5	251.189	0.050	0.56	PASS
LTE 12	711	QPSK	-1.1	24.0	194.984	0.039	0.47	PASS
LTE 13	782	QPSK	-0.1	24.0	245.471	0.049	0.52	PASS
LTE 14	793	QPSK	-1	24.0	199.526	0.040	0.53	PASS
LTE 66	1770	QPSK	0.7	23.5	263.027	0.052	1.00	PASS
LTE 71	683	QPSK	-1.1	23.5	173.780	0.035	0.46	PASS

3.6 CONCLUSION OF SIMULTANEOUS TRANSMITTER

Both of the WLAN and WWAN can transmit simultaneously, the formula of calculated the MPE is:

$$\text{WLAN (MAX}_{\text{CPD}}/\text{MAX}_{\text{LPD}}) + \text{WWAN (MAX}_{\text{CPD}}/\text{MAX}_{\text{LPD}}) < 1$$

CPD = Calculation power density

LPD = Limit of power density

Simultaneous Transmitter Calculation as below:

Band	Frequency (MHz)	Power Density (mW/cm ²)	limit (mW/cm ²)	Power Density / Limit	Σ (Power Density / Limit)	MPE Limit	PASS / FAIL
WIFI 5G B1	5240	0.114	1.00	0.114	0.181	1.00	PASS
LTE 2	1880	0.067	1.00	0.067			

--END--