



# RF Exposure Evaluation Report

APPLICANT : ZTE CORPORATION  
EQUIPMENT : 4G Wireless Router  
BRAND NAME : ZTE  
MODEL NAME : MF253  
FCC ID : SRQMF253  
STANDARD : 47 CFR Part 2.1091

We, SPORTON INTERNATIONAL (KUNSHAN) INC., would like to declare that the device has been evaluated in accordance with 47 CFR Part 2.1091, and pass the limit. Without written approval of SPORTON INTERNATIONAL (KUNSHAN) INC., the test report shall not be reproduced except in full.

Reviewed by: Eric Huang / Deputy Manager

Approved by: Jones Tsai / Manager

**SPORTON INTERNATIONAL (KUNSHAN) INC.**  
**No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C.**



**Table of Contents**

**1. ADMINISTRATION DATA ..... 4**

    1.1. Testing Laboratory ..... 4

    1.2. Applicant ..... 4

    1.3. Manufacturer ..... 4

**2. DESCRIPTION OF EQUIPMENT UNDER TEST (EUT) ..... 5**

**3. MAXIMUM RF AVERAGE OUTPUT POWER AMONG PRODUCTION UNITS ..... 6**

**4. CONDUCTED RF OUTPUT POWER (UNIT: DBM)..... 9**

**5. RF EXPOSURE LIMIT INTRODUCTION ..... 13**

**6. RADIO FREQUENCY RADIATION EXPOSURE EVALUATION ..... 14**

    6.1. Standalone Power Density Calculations ..... 14

    6.2. Collocated Power Density Calculations..... 14





**1. Administration Data**

**1.1. Testing Laboratory**

<b>Test Site</b>	SPORTON INTERNATIONAL (KUNSHAN) INC.
<b>Test Site Location</b>	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C. TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958

**1.2. Applicant**

<b>Company Name</b>	ZTE CORPORATION
<b>Address</b>	ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

**1.3. Manufacturer**

<b>Company Name</b>	ZTE CORPORATION
<b>Address</b>	ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

## 2. Description of Equipment Under Test (EUT)

Product Feature & Specification				
<b>EUT Type</b>	4G Wireless Router			
<b>Brand Name</b>	ZTE			
<b>Model Name</b>	MF253			
<b>FCC ID</b>	SRQMF253			
<b>Wireless Technology and Frequency Range</b>	GSM850 : 824.2 MHz ~ 848.8 MHz GSM1900 : 1850.2 MHz ~ 1909.8MHz WCDMA Band V : 826.4 MHz ~ 846.6 MHz WCDMA Band II : 1852.4 MHz ~ 1907.6 MHz LTE Band 4 : 1710.7 MHz ~ 1754.3 MHz 802.11b/g/n: 2412 MHz ~ 2462 MHz			
<b>Mode</b>	<ul style="list-style-type: none"> <li>• GPRS: GMSK</li> <li>• RMC 12.2Kbps Rel 99</li> <li>• HSDPA Rel 8, Cat 24</li> <li>• HSUPA Rel 6, Cat 6</li> <li>• HSPA+ Rel 7, Cat 14</li> <li>• DC-HSDPA Rel 8 Cat 24</li> <li>• LTE: QPSK, 16QAM</li> <li>• 802.11b/g/n HT20/HT40</li> </ul>			
<b>Antenna Type</b>	WWAN: Monopole Antenna WLAN: PCB Antenna			
<b>Antenna Function for Transmitter</b>		Chain Port 0	Chain Port 1	Chain Port 0 + Chain Port 1
	802.11 b	V	V	-
	802.11 g	V	V	-
	802.11 n	V	V	V
<b>HW Version</b>	d68A			
<b>SW Version</b>	EN_ZTE_MF253V1.0.0B05			
<b>EUT Stage</b>	Identical Prototype			

**Remark:** The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.



**3. Maximum RF average output power among production units**

Mode	GSM 850	GSM 1900
	Average power(dBm)	
GPRS (GMSK, 1 Tx slot)	32.5	29.5
GPRS (GMSK, 2 Tx slots)	30.5	28

Maximum Target Power for Production Unit (dBm)		
Mode / Band	WCDMA Band V	WCDMA Band II
RMC 12.2K	23.5	22.5
HSDPA Subtest-1	22.5	21
HSDPA Subtest-2	21.5	21
HSDPA Subtest-3	21.5	21
HSDPA Subtest-4	21.5	21
DC-HSDPA Subtest-1	22	21
DC-HSDPA Subtest-2	21.5	21
DC-HSDPA Subtest-3	21.5	21
DC-HSDPA Subtest-4	21.5	21
HSUPA Subtest-1	21.5	21.5
HSUPA Subtest-2	20.5	21
HSUPA Subtest-3	20	21
HSUPA Subtest-4	21	21.5
HSUPA Subtest-5	21.5	22
HSPA+ (16QAM) Subtest-1	21.5	22



LTE Band 4				
average power(dBm)				
Modulation	BW (MHz)	RB size	Target MPR	Target Power
QPSK	20	≤ 18	0	22
QPSK	20	> 18	1	21
16QAM	20	≤ 18	1	21
16QAM	20	> 18	2	20
QPSK	15	≤ 16	0	22
QPSK	15	> 16	1	21
16QAM	15	≤ 16	1	21
16QAM	15	> 16	2	20
QPSK	10	≤ 12	0	22
QPSK	10	> 12	1	21
16QAM	10	≤ 12	1	21
16QAM	10	> 12	2	20
QPSK	5	≤ 8	0	22
QPSK	5	> 8	1	21
16QAM	5	≤ 8	1	21
16QAM	5	> 8	2	20
QPSK	3	≤ 4	0	22
QPSK	3	> 4	1	21
16QAM	3	≤ 4	1	21
16QAM	3	> 4	2	20
QPSK	1.4	≤ 5	0	22
QPSK	1.4	> 5	1	21
16QAM	1.4	≤ 5	1	21
16QAM	1.4	> 5	2	20

**Remark:**

1. By design, maximum LTE RF power of smaller supported bandwidth does not exceed the RF power of largest supported bandwidth; the information is included in "tune-up procedure" exhibit
2. LTE MPR implementation is the same for normal mode.

Average Power (dBm)				
Mode / Band	WLAN 2.4 GHz Band IEEE 802.11			
	11b	11g	11n-HT20	11n-HT40
Chain Port 0	15	14.5	14	12.5
Chain Port 1	15	15	14	12
Chain Port 0+1			14.5	13



**The table below summarized necessary items addressed in KDB 941225 D05 v02.**

FCC ID		SRQMF253																																																
EUT		4G Wireless Router																																																
Operating Frequency Range of each LTE transmission band		1710.7 MHz ~ 1754.3 MHz																																																
Channel Bandwidth		1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz																																																
Transmission (H, M, L) channel numbers and frequencies in each LTE band																																																		
LTE Band 4																																																		
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz																																							
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)																																						
L	19957	1710.7	19965	1711.5	19975	1712.5	20000	1715	20025	1717.5	20050	1720																																						
M	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5																																						
H	20393	1754.3	20385	1753.5	20375	1752.5	20350	1750	20325	1747.5	20300	1745																																						
E category, uplink modulations used		Category 3, QPSK, and 16QAM																																																
LTE transmitter and antenna implementation (standalone or sharing hardware components / antennas )		A primary antenna is used for LTE and other wireless interfaces (GSM/WCDMA) for transmitting and receiving. LTE and other wireless interfaces (GSM/WCDMA) share the same antenna, and cannot transmit simultaneously. A 2nd antenna is used for LTE and other wireless interfaces (GSM/WCDMA) for receiving only.																																																
LTE Voice / Data requirements		Data only																																																
LTE MPR permanently built-in by design		Yes, per 3GPP TS 36.101 v11.0.0 <b>Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3</b> <table border="1" style="margin-left: 20px;"> <thead> <tr> <th rowspan="2">Modulation</th> <th colspan="6">Channel bandwidth / Transmission bandwidth (RB)</th> <th rowspan="2">MPR (dB)</th> </tr> <tr> <th>1.4 MHz</th> <th>3.0 MHz</th> <th>5 MHz</th> <th>10 MHz</th> <th>15 MHz</th> <th>20 MHz</th> </tr> </thead> <tbody> <tr> <td>QPSK</td> <td>&gt; 5</td> <td>&gt; 4</td> <td>&gt; 8</td> <td>&gt; 12</td> <td>&gt; 16</td> <td>&gt; 18</td> <td>≤ 1</td> </tr> <tr> <td>16 QAM</td> <td>≤ 5</td> <td>≤ 4</td> <td>≤ 8</td> <td>≤ 12</td> <td>≤ 16</td> <td>≤ 18</td> <td>≤ 1</td> </tr> <tr> <td>16 QAM</td> <td>&gt; 5</td> <td>&gt; 4</td> <td>&gt; 8</td> <td>&gt; 12</td> <td>&gt; 16</td> <td>&gt; 18</td> <td>≤ 2</td> </tr> </tbody> </table>											Modulation	Channel bandwidth / Transmission bandwidth (RB)						MPR (dB)	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1	16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1	16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2
Modulation	Channel bandwidth / Transmission bandwidth (RB)						MPR (dB)																																											
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz																																												
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1																																											
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1																																											
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2																																											
LTE A-MPR		In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing.																																																
Base station simulator used for Testing		Anritsu MT8820C																																																



**4. Conducted RF Output Power (Unit: dBm)**

**<GSM Conducted Power>**

Band GSM850		Burst Average Power (dBm)			Frame-Average Power (dBm)		
TX Channel		128	189	251	128	189	251
Frequency (MHz)		824.2	836.4	848.8	824.2	836.4	848.8
GPRS (GMSK, 1 Tx slot) – CS1		<b>32.07</b>	31.45	31.39	23.07	22.45	22.39
GPRS (GMSK, 2 Tx slots) – CS1		30.28	30.20	30.13	<b>24.28</b>	24.20	24.13
Band GSM1900		Burst Average Power (dBm)			Frame-Average Power (dBm)		
TX Channel		512	661	810	512	661	810
Frequency (MHz)		1850.2	1880	1909.8	1850.2	1880	1909.8
GPRS (GMSK, 1 Tx slot) – CS1		29.17	29.02	<b>29.27</b>	20.17	20.02	20.27
GPRS (GMSK, 2 Tx slots) – CS1		27.63	27.54	27.88	21.63	21.54	<b>21.88</b>

Remark: The frame-averaged power is linearly scaled the maximum burst averaged power over 8 time slots.

The calculated method are shown as below:

Frame-averaged power = Maximum burst averaged power (1 Tx Slot) - 9 dB

Frame-averaged power = Maximum burst averaged power (2 Tx Slots) - 6 dB

**<WCDMA Conducted Power>**

Band			WCDMA Band V			WCDMA Band II		
TX Channel			4132	4182	4233	9262	9400	9538
Frequency (MHz)			826.4	836.4	846.6	1852.4	1880	1907.6
3GPP MPR (dB)	3GPP Rel 99	RMC 12.2Kbps	<b>23.05</b>	22.94	22.97	<b>21.99</b>	21.96	21.50
0	3GPP Rel 6	HSDPA Subtest-1	22.06	21.91	22.02	20.60	20.45	20.21
0	3GPP Rel 6	HSDPA Subtest-2	21.48	21.29	21.35	20.69	20.52	20.24
0.5	3GPP Rel 6	HSDPA Subtest-3	21.46	21.33	21.42	20.66	20.49	20.15
0.5	3GPP Rel 6	HSDPA Subtest-4	21.47	21.30	21.39	20.61	20.45	20.17
0	3GPP Rel 8	DC-HSDPA Subtest-1	21.91	21.73	21.83	20.52	20.41	20.16
0	3GPP Rel 8	DC-HSDPA Subtest-2	21.39	21.21	21.24	20.48	20.35	20.12
0.5	3GPP Rel 8	DC-HSDPA Subtest-3	21.42	21.16	21.31	20.42	20.32	20.09
0.5	3GPP Rel 8	DC-HSDPA Subtest-4	21.40	21.16	21.21	20.40	20.31	20.05
0	3GPP Rel 6	HSUPA Subtest-1	21.14	20.53	20.93	21.42	21.00	21.03
2	3GPP Rel 6	HSUPA Subtest-2	19.78	20.08	19.73	20.58	20.40	20.49
1	3GPP Rel 6	HSUPA Subtest-3	19.44	19.65	19.32	20.53	19.88	20.31
2	3GPP Rel 6	HSUPA Subtest-4	20.03	20.12	20.67	21.33	20.80	20.61
0	3GPP Rel 6	HSUPA Subtest-5	21.17	21.04	21.20	21.88	21.86	21.67
2.5	3GPP Rel 7	HSPA+ (16QAM) Subtest-1	21.15	21.07	21.23	21.83	21.85	21.65



**<LTE Band 4 Conducted Power>**

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Target MPR (dB)
Channel				20050	20175	20300	
Frequency (MHz)				1720	1732.5	1745	
20	QPSK	1	0	21.47	21.19	21.13	0
20	QPSK	1	49	21.25	21.13	21.30	
20	QPSK	1	99	20.86	21.18	21.04	
20	QPSK	50	0	20.02	19.76	20.15	1
20	QPSK	50	24	19.90	19.76	20.17	
20	QPSK	50	49	19.77	19.89	20.07	
20	QPSK	100	0	19.93	19.84	20.14	1
20	16QAM	1	0	20.54	20.37	20.05	
20	16QAM	1	49	20.33	20.06	20.64	
20	16QAM	1	99	20.14	20.17	20.00	1
20	16QAM	50	0	18.99	18.72	19.10	
20	16QAM	50	24	18.83	18.77	19.10	
20	16QAM	50	49	18.92	18.96	19.03	2
20	16QAM	100	0	18.92	18.94	19.05	
Channel				20025	20175	20325	
Frequency (MHz)				1717.5	1732.5	1747.5	
15	QPSK	1	0	21.45	21.19	21.34	0
15	QPSK	1	37	21.22	21.12	21.29	
15	QPSK	1	74	21.05	21.26	20.97	
15	QPSK	36	0	20.17	19.89	20.28	1
15	QPSK	36	18	19.98	19.91	20.17	
15	QPSK	36	37	19.94	19.99	19.99	
15	QPSK	75	0	19.99	19.87	20.08	1
15	16QAM	1	0	20.39	20.35	20.18	
15	16QAM	1	37	20.04	20.18	20.13	
15	16QAM	1	74	20.13	20.49	20.31	1
15	16QAM	36	0	19.19	18.74	19.33	
15	16QAM	36	18	19.02	18.83	19.14	
15	16QAM	36	37	18.88	19.01	19.09	2
15	16QAM	36	74	19.02	18.83	19.14	
15	16QAM	75	0	19.00	18.75	19.03	
Channel				20000	20175	20350	Target MPR (dB)
Frequency (MHz)				1715	1732.5	1750	
10	QPSK	1	0	21.45	21.00	21.24	0
10	QPSK	1	24	21.00	21.09	21.34	
10	QPSK	1	49	21.05	21.14	20.74	
10	QPSK	25	0	20.12	19.85	20.14	1
10	QPSK	25	12	20.05	19.94	20.17	
10	QPSK	25	24	19.98	19.94	19.92	
10	QPSK	50	0	19.94	19.82	19.89	1
10	16QAM	1	0	20.67	20.19	20.27	
10	16QAM	1	24	20.09	20.31	20.08	
10	16QAM	1	49	20.00	20.34	19.80	1
10	16QAM	25	0	19.12	18.82	19.07	
10	16QAM	25	12	18.95	18.82	19.11	
10	16QAM	25	24	18.99	18.99	18.83	2
10	16QAM	25	49	18.99	18.99	18.83	
10	16QAM	50	0	18.98	18.90	18.99	



**RF Exposure Evaluation Report**

**Report No. : FA3D3106**

Channel				19975	20175	20375	Target MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5	
5	QPSK	1	0	21.38	21.02	21.20	0
5	QPSK	1	12	21.21	20.91	20.97	
5	QPSK	1	24	21.21	21.04	20.66	
5	QPSK	12	0	20.38	20.02	20.18	1
5	QPSK	12	6	20.31	20.03	20.06	
5	QPSK	12	11	20.26	19.96	19.91	
5	QPSK	25	0	20.13	19.96	19.92	
5	16QAM	1	0	20.00	19.88	20.56	1
5	16QAM	1	12	20.12	19.73	20.31	
5	16QAM	1	24	20.45	19.64	20.04	
5	16QAM	12	0	19.36	19.02	19.16	2
5	16QAM	12	6	19.37	19.00	19.04	
5	16QAM	12	11	19.32	18.88	19.11	
5	16QAM	25	0	19.10	18.85	18.95	
Channel				19965	20175	20385	Target MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5	
3	QPSK	1	0	21.51	20.99	20.79	0
3	QPSK	1	7	21.39	20.90	20.91	
3	QPSK	1	14	21.36	21.01	20.54	
3	QPSK	8	0	20.33	20.09	19.80	1
3	QPSK	8	4	20.34	20.10	19.96	
3	QPSK	8	7	20.33	20.06	19.85	
3	QPSK	15	0	20.23	20.12	19.78	
3	16QAM	1	0	20.48	20.01	20.07	1
3	16QAM	1	7	20.57	19.93	19.67	
3	16QAM	1	14	20.20	19.67	19.77	
3	16QAM	8	0	19.27	18.95	18.93	2
3	16QAM	8	4	19.38	18.99	18.99	
3	16QAM	8	7	19.40	18.91	18.87	
3	16QAM	15	0	19.42	19.04	18.88	
Channel				19957	20175	20393	Target MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3	
1.4	QPSK	1	0	21.34	20.97	20.69	0
1.4	QPSK	1	2	21.23	21.06	20.70	
1.4	QPSK	1	5	21.26	21.01	20.59	
1.4	QPSK	3	0	21.25	21.04	20.58	
1.4	QPSK	3	1	21.25	21.03	20.63	
1.4	QPSK	3	2	21.22	21.05	20.52	
1.4	QPSK	6	0	20.35	20.09	19.64	1
1.4	16QAM	1	0	20.08	20.17	19.71	1
1.4	16QAM	1	2	20.36	20.07	20.12	
1.4	16QAM	1	5	20.45	19.80	19.97	
1.4	16QAM	3	0	20.07	20.07	19.83	
1.4	16QAM	3	1	20.40	20.04	19.51	
1.4	16QAM	3	2	20.25	20.05	19.89	
1.4	16QAM	6	0	19.40	19.09	18.79	2



<WLAN 2.4GHz Band Conducted Power>

802.11b Average Power (dBm)						
Channel	Frequency (MHz)	Chain Port	Data Rate (bps)			
			1M bps	2M bps	5.5M bps	11M bps
CH 01	2412	0	14.89	14.59	14.63	14.85
CH 06	2437	0	14.96	14.73	14.84	14.94
CH 11	2462	0	12.68	12.43	12.55	12.52
CH 01	2412	1	14.72	14.54	14.58	14.59
CH 06	2437	1	14.02	13.72	13.75	13.95
CH 11	2462	1	12.55	12.57	12.52	12.75

802.11g Average Power (dBm)										
Channel	Frequency (MHz)	Chain Port	Data Rate (bps)							
			6M bps	9M bps	12M bps	18M bps	24M bps	36M bps	48M bps	54M bps
CH 01	2412	0	12.97	13.69	13.75	13.97	13.96	13.98	14.14	14.11
CH 06	2437	0	13.46	13.84	13.84	13.96	13.97	14.01	14.12	14.15
CH 11	2462	0	11.58	11.94	11.92	12.13	12.06	12.10	12.28	12.23
CH 01	2412	1	13.72	13.78	13.81	14.01	14.25	14.07	14.46	14.50
CH 06	2437	1	13.12	12.97	13.36	13.44	13.60	13.41	13.60	13.64
CH 11	2462	1	11.83	12.10	12.07	12.11	12.24	12.25	12.57	12.45

WLAN 2.4GHz Band 802.11n-HT20 Average Power (dBm)										
Channel	Frequency (MHz)	Chain Port	MCS Index							
			MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 01	2412	0	13.71	12.81	13.18	13.31	13.45	13.44	13.29	13.60
CH 06	2437	0	13.08	13.10	13.36	13.38	13.52	13.37	13.25	13.43
CH 11	2462	0	11.18	10.93	11.35	11.38	11.47	11.50	11.65	11.85
CH 01	2412	1	13.16	13.51	13.60	13.74	13.80	13.71	13.74	13.94
CH 06	2437	1	12.44	12.69	12.90	13.03	13.04	13.02	13.19	13.09
CH 11	2462	1	11.21	11.50	11.52	11.61	11.71	11.77	11.82	11.95
Channel	Frequency (MHz)	Chain Port	MCS Index							
			MCS8	MCS9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15
CH 01	2412	0+1(0)	10.30	10.48	10.53	10.65	10.80	11.05	10.96	11.15
		0+1(1)	10.20	10.56	10.77	11.18	11.07	11.15	11.08	11.22
		0+1	13.26	13.53	13.66	13.93	13.95	14.11	14.03	14.19
CH 06	2437	0+1(0)	10.08	10.59	10.72	10.94	11.05	11.25	11.01	11.06
		0+1(1)	9.86	9.96	10.06	10.56	10.50	10.58	10.85	10.67
		0+1	12.98	13.30	13.41	13.77	13.79	13.94	13.94	13.88
CH 11	2462	0+1(0)	8.11	8.37	8.53	8.62	8.91	9.25	8.98	9.18
		0+1(1)	8.31	8.50	8.68	9.27	9.04	9.16	9.09	9.16
		0+1	11.22	11.44	11.62	11.97	11.99	12.21	12.04	12.18

WLAN 2.4GHz Band 802.11n-HT40 Average Power (dBm)										
Channel	Frequency (MHz)	Chain Port	MCS Index							
			MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 03	2422	0	12.11	11.77	11.69	11.65	11.54	11.13	11.93	11.98
CH 06	2437	0	11.13	11.53	11.53	11.45	11.35	11.12	11.76	11.78
CH 09	2452	0	10.30	10.61	10.75	10.88	10.59	10.23	11.05	10.99
CH 03	2422	1	11.30	11.39	11.60	11.57	11.42	11.20	11.94	11.95
CH 06	2437	1	10.65	11.14	11.05	11.19	11.00	10.72	11.33	11.42
CH 09	2452	1	10.12	10.36	10.31	10.25	9.95	10.10	10.56	10.45
Channel	Frequency (MHz)	Chain Port	MCS Index							
			MCS8	MCS9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15
CH 03	2422	0+1(0)	8.31	8.99	9.09	9.25	9.32	9.36	9.44	9.68
		0+1(1)	9.07	9.41	9.61	9.98	9.83	9.82	9.81	9.76
		0+1	11.72	12.22	12.37	12.64	12.59	12.61	12.64	12.73
CH 06	2437	0+1(0)	8.19	8.86	9.13	9.14	9.22	9.28	9.32	9.36
		0+1(1)	8.05	8.60	8.78	9.24	9.15	9.29	9.49	9.63
		0+1	11.13	11.74	11.97	12.20	12.19	12.30	12.42	12.51
CH 09	2452	0+1(0)	7.21	7.76	7.92	8.27	8.44	8.43	8.54	8.65
		0+1(1)	7.14	7.66	7.96	8.36	8.24	8.42	8.46	8.71
		0+1	10.19	10.72	10.95	11.32	11.35	11.44	11.51	11.69



5. RF Exposure Limit Introduction

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

Table with 5 columns: Frequency range (MHz), Electric field strength (V/m), Magnetic field strength (A/m), Power density (mW/cm²), Averaging time (minutes). It is divided into two sections: (A) Limits for Occupational/Controlled Exposures and (B) Limits for General Population/Uncontrolled Exposure.

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

S = PG / (4πR²)

Where:

- S = Power Density
P = Output Power at Antenna Terminals
G = Gain of Transmit Antenna (linear gain)
R = Distance from Transmitting Antenna

## 6. Radio Frequency Radiation Exposure Evaluation

### 6.1. Standalone Power Density Calculations

Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum ERP/EIRP (W)	Maximum output power Limit (W)	Average EIRP (mW)	Power Density at 20cm (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
GPRS 850 (1 Tx slot)	824.2	2.0	32.5	1.72	7.0	354.81	0.07	0.55
GPRS 1900 (1 Tx slot)	1850.2	2.9	29.5	1.74	2.0	218.78	0.04	1.00
WCDMA Band V	826.4	2.0	23.5	0.22	7.0	354.81	0.07	0.55
WCDMA Band II	1852.4	2.9	22.5	0.35	2.0	346.74	0.07	1.00
LTE Band 4	1710.7	2.9	22.0	0.31	1.0	309.03	0.06	1.00
WLAN2.4GHz 802.11b Chain Port 0	2412.0	2.9	15.0	0.06	1.0	61.66	0.01	1.00
WLAN2.4GHz 802.11g Chain Port 0	2412.0	2.9	14.5	0.05	1.0	54.95	0.01	1.00
WLAN2.4GHz 802.11n-HT20 Chain Port 0	2412.0	2.9	14.0	0.05	1.0	48.98	0.01	1.00
WLAN2.4GHz 802.11n-HT40 Chain Port 0	2422.0	2.9	12.5	0.03	1.0	34.67	0.01	1.00
WLAN2.4GHz 802.11b Chain Port 1	2412.0	2.5	15.0	0.06	1.0	56.23	0.01	1.00
WLAN2.4GHz 802.11g Chain Port 1	2412.0	2.5	15.0	0.06	1.0	56.23	0.01	1.00
WLAN2.4GHz 802.11n-HT20 Chain Port 1	2412.0	2.5	14.0	0.04	1.0	44.67	0.01	1.00
WLAN2.4GHz 802.11n-HT40 Chain Port 1	2422.0	2.5	12.0	0.03	1.0	28.18	0.01	1.00
WLAN2.4GHz 802.11n-HT20 Chain Port 0+1	2412.0	2.7	14.5	0.05	1.0	52.48	0.01	1.00
WLAN2.4GHz 802.11n-HT40 Chain Port 0+1	2422.0	2.7	13.0	0.04	1.0	37.15	0.01	1.00

**Note:** For conservativeness, the lowest uplink frequency of each band is used to determine the MPE limit of that band.

### 6.2. Collocated Power Density Calculations

**Note:**

1. This MPE analysis is applicable to any collocated transmitters with transmit power for WLAN is less than or equal to 15dBm.
2. A maximum antenna gain of 2.9 dBi for WLAN has been assumed for all collocated antennas.

Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum ERP/EIRP (W)	Average EIRP (mW)	Power Density at 20cm (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	Power Density / Limit
GPRS 850 (1 Tx slot)	824.2	2.0	32.5	1.72	354.81	0.07	0.55	0.13
GPRS 1900 (1 Tx slot)	1850.2	2.9	29.5	1.74	218.78	0.04	1.00	0.04
WCDMA Band V	826.4	2.0	23.5	0.22	354.81	0.07	0.55	0.13
WCDMA Band II	1852.4	2.9	22.5	0.35	346.74	0.07	1.00	0.07
LTE Band 4	1710.7	2.9	22.0	0.31	309.03	0.06	1.00	0.06
WLAN2.4GHz Band	2412.0	2.9	15.0	0.06	61.66	0.01	1.00	0.01

Mode	Frequency (MHz)	EIRP (dBm)	Calculated Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	WLAN Power Density / Limit	WWAN Power Density / Limit	Σ (Power Density / Limit) of WWAN+WLAN
WLAN2.4GHz Band Chain Port 0	2412 ~ 2462	15.0	0.01	1	0.01	0.13	0.14

**Note:**

1. For collocation analysis, GPRS850, GPRS1900, WCDMA Band V, WCDMA Band II, LTE Band 4 is chosen for summation due to the highest (power density/limit) among all WWAN wireless modes.
2. Σ (Power Density / Limit): This is a summation of [(power density for each transmitter/antenna included in the simultaneous transmission) / (corresponding MPE limit)], for WWAN + WLAN.

### Conclusion:

According to 47 CFR §2.1091, the RF exposure analysis concludes that the RF Exposure is FCC compliant.