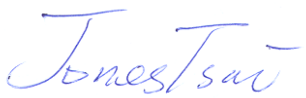
RF Exposure Evaluation Report

APPLICANT	**:**	**Option nv**
EQUIPMENT	**:**	**GTM679W**
BRAND NAME	**:**	**Option**
MODEL NAME	**:**	**MO6792**
FCC ID	**:**	**NCMOMO6792**
FILING TYPE	**:**	**Certification**
STANDARD	**:**	**OET Bulletin 65 Supplement C (Edition 01-01)**

We, SPORTON INTERNATIONAL INC., would like to declare that the device has been evaluated in accordance with FCC OET Bulletin 65 Supplement C (Edition 01-01), and pass the limit. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by:



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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA310215	Rev. 01	Initial issue of report	Jan. 23, 2013
FA310215	Rev. 02	Analyze the allowable maximum antenna gain.	Jan. 31, 2013

1. Administration Data

1.1. Testing Laboratory

Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978

1.2. Applicant

Company Name	Option NV
Address	Gaston Geenslaan 14, 3001 Leuven, Belgium

1.3. Manufacturer

Company Name	Option nv
Address	Gaston Geenslaan 14, 3001 Leuven, Belgium

2. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	GTM679W
Brand Name	Option
Model Name	MO6792
FCC ID	NCMOMO6792
IMEI Code	004401441430500
Tx Frequency	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 CDMA2000 BC0: 824.70 MHz ~ 848.31 MHz CDMA2000 BC1: 1851.25 MHz ~ 1908.75 MHz WLAN2.4G: 2412 MHz ~ 2462 MHz
Antenna Type	WWAN: Dipole Antenna WLAN: Dipole Antenna
HW Version	3.1
SW Version	2.2.10.0
Uplink Modulation	GSM / GPRS: GMSK EDGE: GMSK / 8PSK WCDMA (Rel 99): QPSK HSDPA (Rel 6): QPSK HSUPA (Rel 6): QPSK 802.11b: DSSS (BPSK / QPSK / CCK) 802.11g/n: OFDM (BPSK / QPSK / 16QAM / 64QAM)
EUT Stage	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. RF Exposure Limit Introduction

The FCC categorizes the RF exposure limit based on the intended usage of the device and the user's awareness and ability to exercise control over his or her exposure. This is a consumer product to be used in the home, hence this device was evaluated by mobile device with general population/uncontrolled exposure condition. The definition of these category are shown as follows:

▪ **Mobile Devices:**

A mobile device is defined as a transmitting device designed to be used in other than fixed locations and to be generally used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitters' radiating structures and the body of the user or nearby persons. Transmitters designed to be used by consumers or workers that can be easily re-located are considered mobile devices if they meet the 20 centimeter separation requirement. The FCC rules for evaluating mobile devices for RF compliance are found in 47 CFR 2.1091.

▪ **General Population/Uncontrolled Exposure:**

The general population / uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity. Warning labels placed on low-power consumer devices such as cellular telephones are not considered sufficient to allow the device to be considered under the occupational/controlled category and the general population/uncontrolled exposure limits apply to these devices.

Per OET Bulletin 65, the power density limit for General Population/Uncontrolled Exposure summary here:

Table: Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Power Density (S) (mW/cm2)
0.3–1.34	*(100)
1.34–30	*(180/f^2)
30–300	0.2
300–1500	f/1500
1500–100,000	1.0

f = frequency in MHz

* = Plane-wave equivalent power density

4. Conducted RF Output Power (Unit: dBm)

<GSM Conducted Power>

Band GSM850		Burst Average Power (dBm)			Frame-Average Power (dBm)		
Channel		128	189	251	128	189	251
Frequency		824.2	836.4	848.8	824.2	836.4	848.8
GSM (GMSK, 1 Tx slot)		31.80	31.70	31.57	22.80	22.70	22.57
GPRS (GMSK, 1 Tx slot) – CS1		31.81	31.72	31.60	22.81	22.72	22.60
GPRS (GMSK, 2 Tx slots) – CS1		31.32	31.17	31.09	25.32	25.17	25.09
GPRS (GMSK, 3 Tx slots) – CS1		29.57	29.31	29.23	25.31	25.05	24.97
GPRS (GMSK, 4 Tx slots) – CS1		28.17	28.11	28.02	25.17	25.11	25.02
EDGE (GMSK, 1 Tx slot) – MCS1		31.80	31.72	31.60	22.80	22.72	22.60
EDGE (GMSK, 2 Tx slots) – MCS1		31.30	31.15	31.07	25.30	25.15	25.07
EDGE (GMSK, 3 Tx slots) – MCS1		29.56	29.30	29.21	25.30	25.04	24.95
EDGE (GMSK, 4 Tx slots) – MCS1		28.16	28.10	27.91	25.16	25.10	24.91
EDGE (8PSK, 1 Tx slot) – MCS5		26.86	26.79	26.76	17.86	17.79	17.76
EDGE (8PSK, 2 Tx slots) – MCS5		25.75	25.67	25.64	19.75	19.67	19.64
EDGE (8PSK, 3 Tx slots) – MCS5		23.94	23.88	23.84	19.68	19.62	19.58
EDGE (8PSK, 4 Tx slots) – MCS5		22.92	22.85	22.80	19.92	19.85	19.80
DTM 5	GSM (GMSK, 1 Tx slot)	31.31	31.16	31.06	25.28	25.13	25.04
	GPRS (GMSK, 1 Tx slot) – CS1	31.30	31.15	31.06			
DTM 9	GSM (GMSK, 1 Tx slot)	31.31	31.15	31.06	25.28	25.12	25.03
	GPRS (GMSK, 1 Tx slot) – CS1	31.29	31.13	31.04			
DTM 11	GSM (GMSK, 1 Tx slot)	29.54	29.28	29.21	25.27	25.01	24.94
	GPRS (GMSK, 2 Tx slots) – CS1	29.53	29.26	29.20			
DTM 5	GSM (GMSK, 1 Tx slot)	31.32	31.18	31.09	23.36	23.23	23.15
	EDGE (8PSK, 1 Tx slot) – MCS5	25.77	25.69	25.65			
DTM 9	GSM (GMSK, 1 Tx slot)	31.32	31.19	31.10	23.36	23.24	23.16
	EDGE (8PSK, 1 Tx slot) – MCS5	25.78	25.70	25.67			
DTM 11	GSM (GMSK, 1 Tx slot)	29.54	29.27	29.22	22.42	22.23	22.18
	EDGE (8PSK, 2 Tx slots) – MCS5	23.95	23.90	23.85			

Remark: The source-based time-averaged power is linearly scaled the maximum burst averaged power based on 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
Frame-averaged power = Maximum burst averaged power (3 Tx Slots) - 4.26 dB
Frame-averaged power = Maximum burst averaged power (4 Tx Slots) - 3 dB

Band GSM1900		Burst Average Power (dBm)			Frame-Average Power (dBm)		
Channel		512	661	810	512	661	810
Frequency		1850.2	1880	1909.8	1850.2	1880	1909.8
GSM (GMSK, 1 Tx slot)		28.77	28.60	28.62	19.77	19.60	19.62
GPRS (GMSK, 1 Tx slot) – CS1		28.80	28.63	28.64	19.80	19.63	19.64
GPRS (GMSK, 2 Tx slots) – CS1		28.64	28.48	28.55	22.64	22.48	22.55
GPRS (GMSK, 3 Tx slots) – CS1		26.62	26.38	26.44	22.36	22.12	22.18
GPRS (GMSK, 4 Tx slots) – CS1		25.12	25.03	25.02	22.12	22.03	22.02
EDGE (GMSK, 1 Tx slot) – MCS1		28.78	28.60	28.61	19.78	19.60	19.61
EDGE (GMSK, 2 Tx slots) – MCS1		28.63	28.47	28.54	22.63	22.47	22.54
EDGE (GMSK, 3 Tx slots) – MCS1		26.60	26.37	26.42	22.34	22.11	22.16
EDGE (GMSK, 4 Tx slots) – MCS1		25.13	25.02	25.03	22.13	22.02	22.03
EDGE (8PSK, 1 Tx slot) – MCS5		25.16	25.04	25.10	16.16	16.04	16.10
EDGE (8PSK, 2 Tx slots) – MCS5		24.12	23.91	24.04	18.12	17.91	18.04
EDGE (8PSK, 3 Tx slots) – MCS5		22.23	22.05	22.19	17.97	17.79	17.93
EDGE (8PSK, 4 Tx slots) – MCS5		20.89	20.73	20.85	17.89	17.73	17.85
DTM 5	GSM (GMSK, 1 Tx slot)	28.62	28.45	28.52	22.59	22.42	22.49
	GPRS (GMSK, 1 Tx slot) – CS1	28.61	28.44	28.51			
DTM 9	GSM (GMSK, 1 Tx slot)	28.61	28.45	28.52	22.59	22.42	22.49
	GPRS (GMSK, 1 Tx slot) – CS1	28.61	28.44	28.51			
DTM 11	GSM (GMSK, 1 Tx slot)	26.59	26.31	26.41	22.33	22.04	22.14
	GPRS (GMSK, 2 Tx slots) – CS1	26.59	26.29	26.39			
DTM 5	GSM (GMSK, 1 Tx slot)	28.63	28.47	28.53	20.89	20.72	20.78
	EDGE (8PSK, 1 Tx slot) – MCS5	24.01	23.84	23.89			
DTM 9	GSM (GMSK, 1 Tx slot)	28.64	28.47	28.52	20.90	20.72	20.78
	EDGE (8PSK, 1 Tx slot) – MCS5	24.02	23.84	23.91			
DTM 11	GSM (GMSK, 1 Tx slot)	26.60	26.14	26.46	19.91	19.61	19.80
	EDGE (8PSK, 2 Tx slots) – MCS5	22.14	22.05	22.07			

Remark: The source-based time-averaged power is linearly scaled the maximum burst averaged power based on 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
Frame-averaged power = Maximum burst averaged power (3 Tx Slots) - 4.26 dB
Frame-averaged power = Maximum burst averaged power (4 Tx Slots) - 3 dB

<WCDMA Conducted Power >

The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification. A summary of these settings are illustrated below:

WCDMA Setup Configuration:

a. The EUT was connected to Base Station referred to the drawing of Setup Configuration.
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting
   i. Data rates: Varied from RMC 12.2Kbps
   ii. RMC Test Loop = Loop Mode 1
   iii. Power Ctrl Mode = All Up bits
d. The transmitted maximum output power was recorded.

HSDPA Setup Configuration:

a. The EUT was connected to Base Station referred to the drawing of Setup Configuration.
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting:
   i. Set Gain Factors (β_c and β_d) and parameters were set according to each
   ii. Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
   iii. Set RMC 12.2Kbps + HSDPA mode.
   iv. Set Cell Power = -86 dBm
   v. Set HS-DSCH Configuration Type to FRC (H-set 1, QPSK)
   vi. Select HSDPA Uplink Parameters
   vii. Set Delta ACK, Delta NACK and Delta CQI = 8
   viii. Set Ack-Nack Repetition Factor to 3
   ix. Set CQI Feedback Cycle (k) to 4 ms
   x. Set CQI Repetition Factor to 2
   xi. Power Ctrl Mode = All Up bits
d. The transmitted maximum output power was recorded.

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH

Sub-test	β_c	β_d	β_d *(SF)*	β_c/β_d	β_{HS} *(Note1, Note 2)*	CM (dB) *(Note 3)*	MPR (dB) *(Note 3)*
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 *(Note 4)*	15/15 *(Note 4)*	64	12/15 *(Note 4)*	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c .

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and Δ_{NACK} = 30/15 with β_{hs} = 30/15 * β_c , and Δ_{CQI} = 24/15 with β_{hs} = 24/15 * β_c .

Note 3: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 11/15 and β_d = 15/15.

Setup Configuration

HSUPA Setup Configuration:

a. The EUT was connected to Base Station referred to the drawing of Setup Configuration.
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting * :
   i. Call Configs = 5.2B, 5.9B, 5.10B, and 5.13.2B with QPSK
   ii. Set the Gain Factors (β_c and β_d) and parameters (AG Index) were set according to each specific sub-test in the following table, C11.1.3, quoted from the TS 34.121
   iii. Set Cell Power = -86 dBm
   iv. Set Channel Type = 12.2k + HSPA
   v. Set UE Target Power
   vi. Power Ctrl Mode= Alternating bits
   vii. Set and observe the E-TFCI
   viii. Confirm that E-TFCI is equal to the target E-TFCI of 75 for sub-test 1, and other subtest's E-TFCI
d. The transmitted maximum output power was recorded.

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (Note 5) (Note 6)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 6)	E-TFCI
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/225	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	$\beta_{ed}1$: 47/15 $\beta_{ed}2$: 47/15	4 4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15 (Note 4)	15/15 (Note 4)	64	15/15 (Note 4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c .
Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.
Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 10/15 and β_d = 15/15.
Note 4: For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 14/15 and β_d = 15/15.
Note 5: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.
Note 6: β_{ed} can not be set directly, it is set by Absolute Grant Value.

Setup Configuration

Band		WCDMA V			WCDMA II		
Channel		4132	4182	4233	9262	9400	9538
Frequency		826.4	836.4	846.6	1852.4	1880	1907.6
3GPP Rel 99	AMR 12.2k	22.10	22.03	22.05	23.29	23.19	23.13
3GPP Rel 99	RMC 12.2k	22.17	22.07	22.08	23.37	23.28	23.16
3GPP Rel 6	HSDPA Subtest-1	22.16	22.03	22.07	23.35	23.27	23.12
3GPP Rel 6	HSDPA Subtest-2	22.15	21.98	22.08	23.31	23.27	23.12
3GPP Rel 6	HSDPA Subtest-3	21.84	21.64	21.65	22.91	22.95	22.62
3GPP Rel 6	HSDPA Subtest-4	21.78	21.64	21.70	22.96	22.90	22.62
3GPP Rel 6	HSUPA Subtest-1	21.84	21.56	21.80	22.75	22.75	22.61
3GPP Rel 6	HSUPA Subtest-2	20.75	20.51	20.66	21.85	21.82	21.81
3GPP Rel 6	HSUPA Subtest-3	21.04	20.60	20.78	22.05	21.96	21.92
3GPP Rel 6	HSUPA Subtest-4	20.76	20.56	20.71	21.95	21.81	21.78
3GPP Rel 6	HSUPA Subtest-5	22.07	22.02	22.04	23.35	23.26	23.13

MPR result							
3GPP		WCDMA V			WCDMA II		
0	HSDPA Subtest-1	0.00	0.00	0.00	0.00	0.00	0.00
0	HSDPA Subtest-2	0.01	0.05	-0.01	0.04	0.00	0.00
≦0.5	HSDPA Subtest-3	0.32	0.39	0.42	0.44	0.32	0.50
≦0.5	HSDPA Subtest-4	0.38	0.39	0.37	0.39	0.37	0.50
≦0	HSUPA Subtest-1	0.23	0.46	0.24	0.60	0.51	0.52
≦2	HSUPA Subtest-2	1.32	1.51	1.38	1.50	1.44	1.32
≦1	HSUPA Subtest-3	1.03	1.42	1.26	1.30	1.30	1.21
≦2	HSUPA Subtest-4	1.31	1.46	1.33	1.40	1.45	1.35
≦0	HSUPA Subtest-5	0.00	0.00	0.00	0.00	0.00	0.00

Band	CDMA2000 BC0			CDMA2000 BC1		
Channel	1013	384	777	25	600	1175
Frequency	824.7	836.52	848.31	1851.25	1880	1908.75
1xRTT RC1 SO55	24.80	24.52	24.30	24.33	24.18	24.03
1xRTT RC3 SO55	24.86	24.65	24.36	24.35	24.20	24.05
1xRTT RC3 SO32(+ F-SCH)	24.79	24.51	24.29	24.32	24.15	24.02
1xRTT RC3 SO32(+SCH)	24.78	24.50	24.28	24.29	24.13	24.03
1xEVDO RTAP 153.6	24.84	24.58	24.34	24.32	24.22	24.04
1xEVDO RETAP 4096	24.79	24.51	24.28	24.29	24.15	24.01

<WLAN 2.4GHz Conducted Power>

WLAN 2.4GHz 802.11b Average Power (dBm)						
Power vs. Channel			Power vs. Data Rate			
Channel	Frequency (MHz)	Data Rate (bps)	Channel	Data Rate (bps)		
		1M		2M	5.5M	11M
CH 01	2412	10.76	CH 06	11.33	11.35	11.31
CH 06	2437	**11.48**				
CH 11	2462	10.83				

WLAN 2.4GHz 802.11g Average Power (dBm)									
Power vs. Channel			Power vs. Data Rate						
Channel	Frequency (MHz)	Data Rate (bps)	Channel	Data Rate (bps)					
		6M		9M	12M	18M	24M	36M	48M	54M
CH 01	2412	8.17	CH 06	10.99	10.99	10.98	10.99	10.98	11.00	11.01
CH 06	2437	**11.02**								
CH 11	2462	9.48								

WLAN 2.4GHz 802.11n (BW 20MHz) Average Power (dBm)									
Power vs. Channel			Power vs. Data Rate						
Channel	Frequency (MHz)	MCS Index	Channel	MCS Index					
		MCS0		MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 01	2412	6.67	CH 06	10.92	10.93	10.90	10.94	9.04	9.01	8.67
CH 06	2437	**11.02**								
CH 11	2462	8.27								

WLAN 2.4GHz 802.11n (BW 40MHz) Average Power (dBm)									
Power vs. Channel			Power vs. Data Rate						
Channel	Frequency (MHz)	MCS Index	Channel	MCS Index					
		MCS0		MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 03	2422	7.72	CH 06	9.32	9.31	8.75	8.66	5.29	5.30	5.32
CH 06	2437	**9.33**								
CH 09	2452	8.44								

5. Radio Frequency Radiation Exposure Evaluation

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:

$$S = \frac{PG}{4\pi R^2}$$

Where:
S = Power Density
P = Maximum Rated Output Power at Antenna Terminals.
G = Gain of Transmit Antenna (linear gain)
R = Distance from Transmitting Antenna (i.e., 20 cm for this product)

For this device, the calculation is as follows:

WWAN Operating frequency ≤ 1.5GHz

Function	Freq. (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	Source-Based Time-Average Power (dBm)	Source-Based Time-Average Power (mW)	Source-Based Time-Average EIRP (mW)	Source-Based Time-Average ERP (mW)	Calculated RF Exposure (mW/cm^2)	Limit (mW/cm^2)
GSM 850 (1 Tx slot)	824.20	9.90	9.77	24.00	251.19	2454.71	1496.24	0.49	0.55
GPRS 850 (1 Tx slot)	824.20	9.90	9.77	24.00	251.19	2454.71	1496.24	0.49	0.55
GPRS 850 (2 Tx slots)	824.20	6.90	4.90	27.00	501.19	2454.71	1496.24	0.49	0.55
GPRS 850 (3 Tx slots)	824.20	7.10	5.13	26.74	472.06	2421.03	1475.71	0.48	0.55
GPRS 850 (4 Tx slots)	824.20	6.90	4.90	27.00	501.19	2454.71	1496.24	0.49	0.55
WCDMA Band 5	826.40	9.90	9.77	24.00	251.19	2454.71	1496.24	0.49	0.55
CDMA2000 BC0	824.70	7.90	6.17	26.00	398.11	2454.71	1496.24	0.49	0.55

Note: Per part 2.1091(C), device with ERP< 1.5W can be excluded from routine RF exposure evaluation.

Function	Freq. (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	Burst-Average Power (dBm)	Burst-Average Power (mW)	Burst-Average EIRP (mW)	Burst-Average ERP (mW)	Limit ERP (mW)
GSM 850 (1 Tx slot)	824.20	7.60	5.75	33.00	1995.26	11481.54	6998.42	7000
GPRS 850 (1 Tx slot)	824.20	7.60	5.75	33.00	1995.26	11481.54	6998.42	7000
GPRS 850 (2 Tx slots)	824.20	7.60	5.75	33.00	1995.26	11481.54	6998.42	7000
GPRS 850 (3 Tx slots)	824.20	9.60	9.12	31.00	1258.93	11481.54	6998.42	7000
GPRS 850 (4 Tx slots)	824.20	10.60	11.48	30.00	1000.00	11481.54	6998.42	7000
WCDMA Band 5	826.40	16.60	45.71	24.00	251.19	11481.54	6998.42	7000
CDMA2000 BC0	824.70	14.60	28.84	26.00	398.11	11481.54	6998.42	7000

Note: ERP power limit according to part 22.913(a) is 7 W.

WWAN Operating frequency > 1.5GHz

Function	Frequency (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	Source-Based Time-Average Power (dBm)	Source-Based Time-Average Power (mW)	Source-Based Time-Average EIRP (mW)	Calculated RF Exposure (mW/cm^2)	Limit (mW/cm^2)
GSM 1900 (1 Tx slot)	1850.20	13.70	23.44	21.00	125.89	2951.21	0.59	1.00
GPRS 1900 (1 Tx slot)	1850.20	13.70	23.44	21.00	125.89	2951.21	0.59	1.00
GPRS 1900 (2 Tx slots)	1850.20	10.70	11.75	24.00	251.19	2951.21	0.59	1.00
GPRS 1900 (3 Tx slots)	1850.20	11.00	12.59	23.74	236.59	2978.52	0.59	1.00
GPRS 1900 (4 Tx slots)	1850.20	10.70	11.75	24.00	251.19	2951.21	0.59	1.00
WCDMA Band 2	1852.40	9.70	9.33	25.00	316.23	2951.21	0.59	1.00
CDMA2000 BC1	1851.25	8.70	7.41	26.00	398.11	2951.21	0.59	1.00

Note: Per part 2.1091(C), device with ERP< 1.5W can be excluded from routine RF exposure evaluation.

Function	Frequency (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	Burst-Average Power (dBm)	Burst -Average Power (mW)	Burst -Average EIRP (mW)	Limit ERP (mW)
GSM 1900 (1 Tx slot)	1850.20	3.00	2.00	30.00	1000.00	1995.26	2000
GPRS 1900 (1 Tx slot)	1850.20	3.00	2.00	30.00	1000.00	1995.26	2000
GPRS 1900 (2 Tx slots)	1850.20	3.00	2.00	30.00	1000.00	1995.26	2000
GPRS 1900 (3 Tx slots)	1850.20	5.00	3.16	28.00	630.96	1995.26	2000
GPRS 1900 (4 Tx slots)	1850.20	6.00	3.98	27.00	501.19	1995.26	2000
WCDMA Band 2	1852.40	8.00	6.31	25.00	316.23	1995.26	2000
CDMA2000 BC1	1851.25	7.00	5.01	26.00	398.11	1995.26	2000

Note: EIRP power limit according to part 24.232(c) is 2 W.

WLAN Operating Frequency > 1.5GHz

Function	Freq. (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	Source-Based Time-Average Power (dBm)	Source-Based Time-Average Power (mW)	Source-Based Time-Average EIRP (mW)	Calculated RF Exposure (mW/cm^2)	Limit (mW/cm^2)
WiFi 2.4G 802.11b	2437.00	15.20	33.11	12.00	15.85	524.81	0.10	1.00
WiFi 2.4G 802.11g	2437.00	15.20	33.11	12.00	15.85	524.81	0.10	1.00
WiFi 2.4G 802.11n-HT20	2437.00	15.20	33.11	12.00	15.85	524.81	0.10	1.00
WiFi 2.4G 802.11n-HT40	2452.00	17.20	52.48	10.00	10.00	524.81	0.10	1.00

Note:

1. Per part 2.1091(C), device with ERP < 1.5W can be excluded from routine RF exposure evaluation.
2. The allowable gain of WLAN MPE is limited due to simultaneous transmission consideration.
3. The allowable gain of WLAN to meet part 15.247 limit is detailed in part 15C test report.

For Simultaneous Transmission Consideration

Simultaneous Transmission Band	WWAN Max. Power Density (mW/cm^2)	WLAN Max. Power Density (mW/cm^2)	WWAN Freq. Dependent MPE Limits (mW/cm^2)	WLAN Freq. Dependent MPE Limits (mW/cm^2)	Sum of the MPE Ratios	MPE Ratio Limit
850MHz + 2.4GHz	0.49	0.10	0.55	1.00	0.99	1
1900MHz + 2.4GHz	0.59	0.10	1.00	1.00	0.69	1

Conclusion:

<For GSM850 Band>

The maximum rated source-based time-averaged power is 27 dBm

MPE limit for uncontrolled exposure is 0.55 mW/cm^2.

Antenna gain to comply with MPE limits is 6.9 dBi

The maximum rated burst output power is 33 dBm

ERP power limit according to part 22.913(a) is 7 W.

Antenna gain to comply with ERP limits is 7.6 dBi

<For WCDMA Band V>

The maximum rated source-based time-averaged power is 24 dBm

MPE limit for uncontrolled exposure is 0.55 mW/cm^2.

Antenna gain to comply with MPE limits is 9.9 dBi

The maximum rated burst output power is 24 dBm

ERP power limit according to part 22.913(a) is 7 W.

Antenna gain to comply with ERP limits is 16.6 dBi

<For CDMA2000 BC0>

The maximum rated source-based time-averaged power is 26 dBm

MPE limit for uncontrolled exposure is 0.55 mW/cm^2.

Antenna gain to comply with MPE limits is 7.9 dBi

The maximum rated burst output power is 26 dBm

ERP power limit according to part 22.913(a) is 7 W.

Antenna gain to comply with ERP limits is 14.6 dBi

The antenna gain should be smaller than 6.9 dBi, to meet part 22.913(a) ERP limit and to meet part 2.1091 exclusion threshold of routine RF exposure evaluation

<For GSM1900 Band>

The maximum rated source-based time-averaged power is 24 dBm

MPE limit for uncontrolled exposure is 1.00 mW/cm^2.

Antenna gain to comply with MPE limits is 10.7 dBi

The maximum rated burst output power is 30 dBm

EIRP power limit according to part 24.232(c) is 2 W.

Antenna gain to comply with EIRP limits is 3.0 dBi

<For WCDMA Band II>

The maximum rated source-based time-averaged power is 25 dBm

MPE limit for uncontrolled exposure is 1.00 mW/cm^2.

Antenna gain to comply with MPE limits is 9.7 dBi

The maximum rated burst output power is 25 dBm

EIRP power limit according to part 24.232(c) is 2 W.

Antenna gain to comply with EIRP limits is 8.0 dBi

<For CDMA2000 BC1>

The maximum rated source-based time-averaged power is 26 dBm

MPE limit for uncontrolled exposure is 1.00 mW/cm^2.

Antenna gain to comply with MPE limits is 8.7 dBi

The maximum rated burst output power is 26 dBm

EIRP power limit according to part 24.232(c) is 2 W.

Antenna gain to comply with EIRP limits is 7.0 dBi

The antenna gain should be smaller than 3.0 dBi, to meet part 24.232(c) ERP limit and to meet part 2.1091 exclusion threshold of routine RF exposure evaluation

<For WIFI 2.4GHz>

The maximum rated source-based time-averaged power is 12 dBm

MPE limit for uncontrolled exposure is 1.00 mW/cm^2.

Antenna gain to comply with MPE limits is 15.2 dBi

Antenna gain to comply with part 15.247 limits is 2.9 dBi

The antenna gain should be smaller than 2.9 dBi, to meet part 15.247 limit and to meet part 2.1091 exclusion threshold of routine RF exposure evaluation

Per part 2.1091(c), EUT source-based time-averaged ERP < 1.5W for RF operating frequency ≤ 1.5GHz, EUT source-based time-averaged EIRP < 3W for RF operating frequency > 1.5GHz, routine evaluation of MPE is not required; MPE calculation is sufficient to show compliance. The MPE calculation results indicate that the EUT complies with the RF exposure limit of FCC OET Bulletin 65 Supplement C (Edition 01-01).