

# VARIANT FCC TEST REPORT

## (PART 24)



Applicant:	FIH International Co., Ltd.
Address:	No.18, Tongji zhonglu, Beijing Economic & Technological Development Area

Manufacturer or Supplier:	HMD Global Oy
Address:	Karaportti 2 02610 Espoo FINLAND
Product:	GSM/WCDMA/LTE Mobile Phone
Brand Name:	Nokia
Model Name:	TA-1074
FCC ID:	2AJOTTA-1074
Date of tests:	Jun. 05, 2018 ~ Jun. 25, 2018

The tests have been carried out according to the requirements of the following standard:

- ☒ **FCC PART 24, Subpart E**
☒ **ANSI C63.26-2015**  
☒ **ANSI/TIA/EIA-603-D**
☒ **ANSI/TIA/EIA-603-E**

**CONCLUSION:** The submitted sample was found to COMPLY with the test requirement

Prepared by Roger Li Engineer / Mobile Department	Approved by Sam Tung Manager / Mobile Department
	
Date: Aug. 03, 2018	Date: Aug. 03, 2018

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Test Report No.: RF180604W006-11

## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF180604W006-11	Original release	Aug. 03, 2018



## 1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 24 & Part 2			
STANDARD SECTION	TEST TYPE	RESULT	REMARK
2.1046 24.232	Equivalent Isotropic Radiated Power	PASS	Meet the requirement of limit.
2.1055 24.235	Frequency Stability	N/A	N/A
2.1049 24.238(b)	Occupied Bandwidth	N/A	N/A
24.232(d)	Peak to average ratio	N/A	N/A
24.238(b)	Band Edge Measurements	N/A	N/A
2.1051 24.238	Conducted Spurious Emissions	N/A	N/A
2.1053 24.238	Radiated Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -18.33dB at 36.00MHz.

### 1.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz~30MHz	2.66dB
Radiated emissions	9KHz ~ 30MHz	2.68dB
	30MHz ~ 1GHz	3.26dB
	1GHz ~ 18GHz	4.48dB
	18GHz ~ 40GHz	4.12dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



## 1.2 TEST SITE AND INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
MXE EMI Receiver	KEYSIGHT	N9038A-544	MY54450026	Mar. 16,18	Mar. 15,19
EXA Signal Analyzer	KEYSIGHT	N9010A-526	MY54510322	Jun. 28,17	Jun. 27,18
Bilog Antenna 1	ETS-LINDGREN	3143B	00161964	Nov. 26,16	Nov. 25,18
Bilog Antenna 2	ETS-LINDGREN	3143B	00161965	Nov. 26,16	Nov. 25,18
Horn Antenna 1	ETS-LINDGREN	3117	00168728	Nov. 26,16	Nov. 25,18
Horn Antenna 2	ETS-LINDGREN	3117	00168692	Nov. 26,16	Nov. 25,18
Loop antenna	Daze	ZN30900A	0708	Nov. 20,17	Nov. 19,18
Horn Antenna (18GHz-40GHz)	N/A	QWH-SL-18-40 -K-SG/QMS-00 361	15433	Dec. 16,16	Dec. 15,18
Radio Communication Analyzer	ANRITSU	MT8820C	6201465426	Mar. 02,18	Mar. 01,19
Signal Pre-Amplifier	EMSI	EMC 9135	980249	Jul. 24,17	Jul. 23,18
Signal Pre-Amplifier	EMSI	EMC 012645B	980257	Jul. 24,17	Jul. 23,18
Signal Pre-Amplifier	EMSI	EMC 184045B	980259	Jul. 24,17	Jul. 23,18
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	Euroshieldpn- CT0001143-1216	Apr. 21,18	Apr. 20,19
Test Software	E3	V 9.160323	N/A	N/A	N/A
Test Software	ADT	ADT_Radiated _V7.6.15.9.2	N/A	N/A	N/A
10dB Attenuator	JFW/USA	50HF-010-SM A	1505	Jul. 24,17	Jul. 23,18
Power Meter	Anritsu	ML2495A	1506002	Mar. 02,18	Mar. 01,19
Power Sensor	Anritsu	MA2411B	1339352	Mar. 16,18	Mar. 15,19
Humid & Temp Programmable Tester	Juyi	ITH-120-45-CP -AR	IAA1504-001	Jul. 18,17	Jul. 17,18
MXG Analog Microwave Signal Generator	KEYSIGHT	N5183A	MY50143024	Mar. 13,18	Mar. 12,19

**NOTE:** 1. The calibration interval of the above test instruments is 12 months or 24 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

2. The test was performed in 3m Semi-anechoic Chamber and RF Oven Room.

3. The horn antenna is used only for the measurement of emission frequency above 1GHz if tested.

4. The FCC Site Registration No. is 525120.



## 2 GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	GSM/WCDMA/LTE Mobile Phone	
<b>BRAND NAME</b>	Nokia	
<b>MODEL NAME</b>	TA-1074	
<b>POWER SUPPLY</b>	5.0Vdc (adapter or host equipment) 3.9Vdc (Li-ion, battery)	
<b>MODULATION TYPE</b>	<b>GSM, GPRS:</b> GMSK <b>EDGE:</b> GMSK, 8PSK <b>WCDMA :</b> BPSK <b>LTE Band 2:</b> QPSK, 16QAM	
<b>FREQUENCY RANGE</b>	<b>GSM, GPRS, EDGE</b>	1850.2MHz ~ 1909.8MHz
	<b>WCDMA</b>	1852.4MHz ~ 1907.6MHz
	<b>LTE Band 2</b> <b>Channel Bandwidth: 1.4MHz</b>	1850.7MHz ~ 1909.3MHz
	<b>LTE Band 2</b> <b>Channel Bandwidth: 3MHz</b>	1851.5MHz ~ 1908.5MHz
	<b>LTE Band 2</b> <b>Channel Bandwidth: 5MHz</b>	1852.5MHz ~ 1907.5MHz
	<b>LTE Band 2</b> <b>Channel Bandwidth: 10MHz</b>	1855.0MHz ~ 1905.0MHz
	<b>LTE Band 2</b> <b>Channel Bandwidth: 15MHz</b>	1857.5MHz ~ 1902.5MHz
	<b>LTE Band 2</b> <b>Channel Bandwidth: 20MHz</b>	1860.0MHz ~ 1900.0MHz
<b>MAX. EIRP POWER</b>	<b>GSM</b>	1202mW
	<b>EDGE</b>	514mW
	<b>WCDMA</b>	389mW
	<b>LTE Band 2</b> <b>Channel Bandwidth: 3MHz</b>	280mW
<b>ANTENNA TYPE</b>	Fixed Internal Antenna with 3.17dBi gain	
<b>HW VERSION</b>	HW0359	
<b>SW VERSION</b>	000C_0_34A	
<b>I/O PORTS</b>	Refer to user's manual	
<b>CABLE SUPPLIED</b>	USB cable: non-shielded, detachable, 1.0m Earphone cable: non-shielded, detachable, 1.5m	

**NOTE:**

- For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
- The test data include in this report is copied from the original report RF180604W006-4. The differences compared with original report changing model name & FCC ID and disable one SIM card.

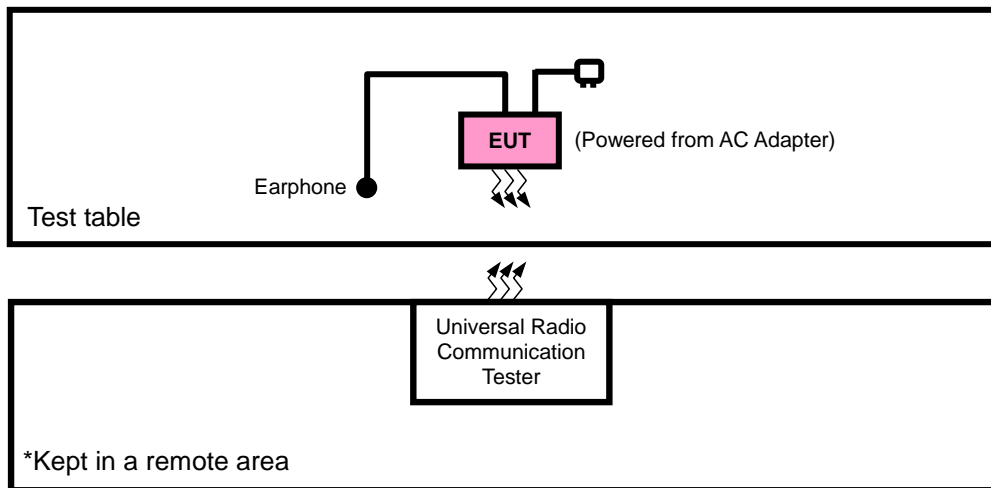
**List of Accessories:**

ACCESSORIES	BRAND	MANUFACTURER	MODEL	SPECIFICATION
Adapter 1	Salcomp	Salcomp (Shenzhen) Co., Ltd.	FC0202	I/P: 100-240Vac, 150mA O/P: 5Vdc, 1000mA
Adapter 2	Aohai	DONGGUAN AOHA TECHNOLOGY CO., LTD.	AD-5WU	I/P: 100-240Vac, 150mA O/P: 5Vdc, 1000mA
Battery	SCUD	SCUD (Fujian) Electronics CO., Ltd.	HE336	Rating: 3.85Vdc, 2900mAh
Earphone 1	Nokia	FIT	WH-108	1.5m non-shielded cable w/o core
Earphone 2	Nokia	OBO	WH-108	1.5m non-shielded cable w/o core
USB Cable	Nokia	FIH	CA-190CD	1.0m non-shielded cable w/o core

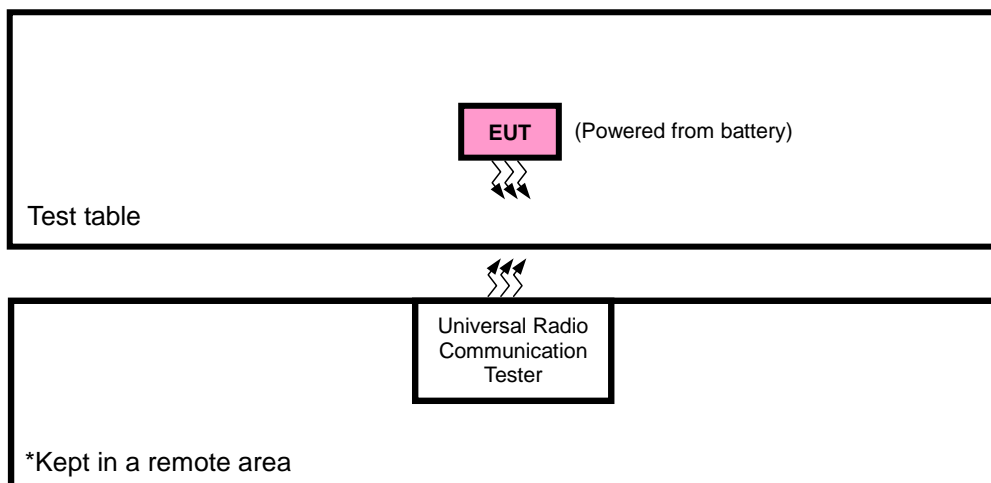


## 2.2 CONFIGURATION OF SYSTEM UNDER TEST

### FOR RADIATION EMISSION TEST



### FOR CONDUCTED & E.I.R.P. TEST







## 2.3 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	DC source	LONG WEI	PS-6403D	010934269	N/A
2	PC	HP	A6608CN	3CR83825X3	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	DC Line: Unshielded, Detachable 1.0m
2	AC Line: Unshielded, Detachable 1.5m

**NOTE:**

1. All power cords of the above support units are non shielded (1.8m).

## 2.4 TEST ITEM AND TEST CONFIGURATION

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports

The worst case in EIRP and radiated emission was found when positioned on X-plane for GSM/EDGE/WCDMA/ LTE. Following channel(s) was (were) selected for the final test as listed below:

EUT CONFIGURE MODE	DESCRIPTION
A	EUT + Adapter + USB Cable + Earphone with GSM ,WCDMA or LTE link
B	EUT + Battery with GSM ,WCDMA or LTE link

### GSM MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
B	EIRP	512 to 810	512, 661, 810	GSM, EDGE
A	RADIATED EMISSION	512 to 810	512, 661, 810	GSM, EDGE

**WCDMA MODE**

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
B	EIRP	9262 to 9538	9262, 9400, 9538	WCDMA
A	RADIATED EMISSION	9262 to 9538	9262, 9400, 9538	WCDMA

**LTE BAND 2**

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
B	EIRP	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK,16QAM	1 RB / 0 RB Offset
		18615 to 19185	18615, 18900, 19185	3MHz	QPSK,16QAM	1 RB / 0 RB Offset
		18625 to 19175	18625, 18900, 19175	5MHz	QPSK,16QAM	1 RB / 0 RB Offset
		18650 to 19150	18650, 18900, 19150	10MHz	QPSK,16QAM	1 RB / 0 RB Offset
		18675 to 19125	18675, 18900, 19125	15MHz	QPSK,16QAM	1 RB / 0 RB Offset
		18700 to 19100	18700, 18900, 19100	20MHz	QPSK,16QAM	1 RB / 0 RB Offset
A	RADIATED EMISSION	18607 to 19193	18900	1.4MHz	QPSK	1 RB / 0 RB Offset
		18615 to 19185	18900	3MHz	QPSK	1 RB / 0 RB Offset
		18625 to 19175	18900	5MHz	QPSK	1 RB / 0 RB Offset
		18650 to 19150	18650, 18900, 19150	10MHz	QPSK	1 RB / 0 RB Offset
		18675 to 19125	18900	15MHz	QPSK	1 RB / 0 RB Offset
		18700 to 19100	18900	20MHz	QPSK	1 RB / 0 RB Offset

**TEST CONDITION:**

TEST ITEM	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
EIRP	25deg. C, 57%RH	3.9Vdc from Battery	Vincent
RADIATED EMISSION	23deg. C, 70%RH	5Vdc from adapter	Vincent



## **2.5 EUT OPERATING CONDITIONS**

The EUT makes a call to the communication simulator. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency

## **2.6 GENERAL DESCRIPTION OF APPLIED STANDARDS**

The EUT is a RF product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**FCC 47 CFR Part 2**

**FCC 47 CFR Part 24**

**KDB 971168 D01 Power Meas License Digital Systems v03**

**ANSI/TIA/EIA-603-D**

**ANSI/TIA/EIA-603-E**

**ANSI C63.26-2015**

**NOTE:** All test items have been performed and recorded as per the above standards.



### 3 TEST TYPES AND RESULTS

#### 3.1 OUTPUT POWER MEASUREMENT

##### 3.1.1 LIMITS OF OUTPUT POWER MEASUREMENT

Mobile and portable stations are limited to 2 watts EIRP.

##### 3.1.2 TEST PROCEDURES

###### **EIRP MEASUREMENT:**

- a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 1MHz for GSM & GPRS, 5MHz for WCDMA mode and 10MHz for LTE mode.
- b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- c. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a tx cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value " of step b. Record the power level of S.G
- d.  $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}.$

###### **CONDUCTED POWER MEASUREMENT:**

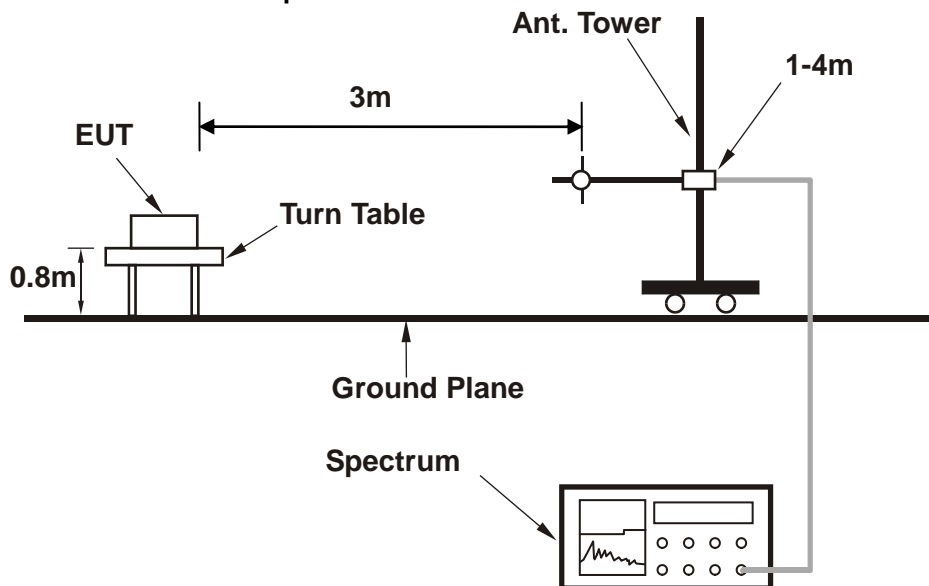
The EUT was set up for the maximum power with GSM, GPRS, EDGE & WCDMA link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.



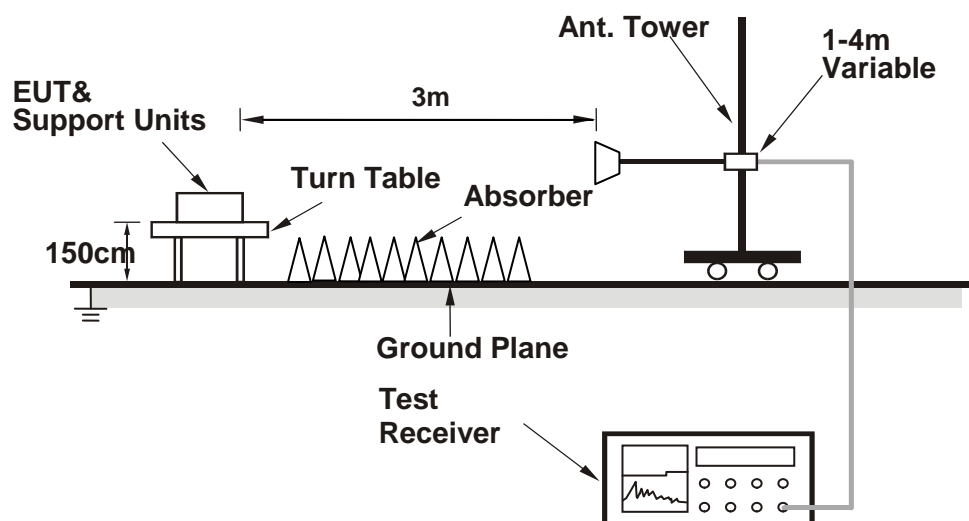
### 3.1.3 TEST SETUP

#### EIRP / ERP Measurement:

<Radiated Emission below or equal 1 GHz>

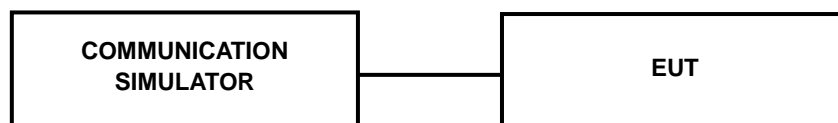


<Radiated Emission above 1 GHz>



For the actual test configuration, please refer to the attached file (Test Setup Photo).

#### CONDUCTED POWER MEASUREMENT:





### 3.1.4 TEST RESULTS

#### CONDUCTED OUTPUT POWER (dBm)

Band	GSM1900		
Channel	512	661	810
Frequency (MHz)	1850.2	1880.0	1909.8
GSM	29.21	29.07	28.88
GPRS 8	29.20	29.06	28.87
GPRS 10	26.42	26.28	26.09
GPRS 11	24.96	24.82	24.63
GPRS 12	23.67	23.53	23.34
EDGE 8 (MCS9)	24.46	24.32	24.13
EDGE 10 (MCS9)	21.64	21.50	21.31
EDGE 11 (MCS9)	20.52	20.38	20.19
EDGE 12 (MCS9)	19.28	19.14	18.95

Band	WCDMA II		
Channel	9262	9400	9538
Frequency (MHz)	1852.4	1880.0	1907.6
RMC 12.2K	23.30	23.23	23.34
HSPA			
HSDPA Subtest-1	22.33	22.26	22.37
HSDPA Subtest-2	22.21	22.14	22.25
HSDPA Subtest-3	21.72	21.65	21.76
HSDPA Subtest-4	21.64	21.57	21.68
HSUPA Subtest-1	22.26	22.19	22.30
HSUPA Subtest-2	20.27	20.20	20.31
HSUPA Subtest-3	21.26	21.19	21.30
HSUPA Subtest-4	20.32	20.25	20.36
HSUPA Subtest-5	22.23	22.16	22.27



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	22.10	22.08	22.04	0
		1	2	21.94	21.92	21.88	0
		1	5	21.90	21.88	21.84	0
		3	0	22.09	22.07	22.03	0
		3	1	21.93	21.91	21.87	0
		3	3	21.89	21.87	21.83	0
		6	0	21.00	20.98	20.94	1
	16QAM	1	0	20.88	20.86	20.82	1
		1	2	20.86	20.84	20.80	1
		1	5	20.85	20.83	20.79	1
		3	0	20.86	20.84	20.80	1
		3	1	20.84	20.82	20.78	1
		3	3	20.83	20.81	20.77	1
		6	0	19.95	19.93	19.89	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	22.13	22.11	22.07	0
		1	7	21.97	21.95	21.91	0
		1	14	21.93	21.91	21.87	0
		8	0	21.10	21.08	21.04	1
		8	3	20.96	20.94	20.90	1
		8	7	20.92	20.90	20.86	1
		15	0	21.03	21.01	20.97	1
	16QAM	1	0	20.91	20.89	20.85	1
		1	7	20.89	20.87	20.83	1
		1	14	20.88	20.86	20.82	1
		8	0	20.08	20.06	20.02	2
		8	3	20.04	20.02	19.98	2
		8	7	20.03	20.01	19.97	2
		15	0	19.98	19.96	19.92	2



LTE Band 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	22.16	22.14	22.10	0
		1	12	22.00	21.98	21.94	0
		1	24	21.96	21.94	21.90	0
		12	0	21.13	21.11	21.07	1
		12	6	20.99	20.97	20.93	1
		12	13	20.95	20.93	20.89	1
		25	0	21.06	21.04	21.00	1
	16QAM	1	0	20.94	20.92	20.88	1
		1	12	20.92	20.90	20.86	1
		1	24	20.91	20.89	20.85	1
		12	0	20.11	20.09	20.05	2
		12	6	20.07	20.05	20.01	2
		12	13	20.06	20.04	20.00	2
		25	0	20.01	19.99	19.95	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	22.18	22.16	22.12	0
		1	24	22.02	22.00	21.96	0
		1	49	21.98	21.96	21.92	0
		25	0	21.15	21.13	21.09	1
		25	12	21.01	20.99	20.95	1
		25	25	20.97	20.95	20.91	1
		50	0	21.08	21.06	21.02	1
	16QAM	1	0	20.96	20.94	20.90	1
		1	24	20.94	20.92	20.88	1
		1	49	20.93	20.91	20.87	1
		25	0	20.13	20.11	20.07	2
		25	12	20.09	20.07	20.03	2
		25	25	20.08	20.06	20.02	2
		50	0	20.03	20.01	19.97	2





LTE Band 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	22.21	22.19	22.15	0
		1	37	22.05	22.03	21.99	0
		1	74	22.01	21.99	21.95	0
		36	0	21.18	21.16	21.12	1
		36	19	21.04	21.02	20.98	1
		36	39	21.00	20.98	20.94	1
		75	0	21.11	21.09	21.05	1
	16QAM	1	0	20.99	20.97	20.93	1
		1	37	20.97	20.95	20.91	1
		1	74	20.96	20.94	20.90	1
		36	0	20.16	20.14	20.10	2
		36	19	20.12	20.10	20.06	2
		36	39	20.11	20.09	20.05	2
		75	0	20.06	20.04	20.00	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	22.26	22.24	22.20	0
		1	50	22.10	22.08	22.04	0
		1	99	22.06	22.04	22.00	0
		50	0	21.23	21.21	21.17	1
		50	25	21.09	21.07	21.03	1
		50	50	21.05	21.03	20.99	1
		100	0	21.16	21.14	21.10	1
	16QAM	1	0	21.04	21.02	20.98	1
		1	50	21.02	21.00	20.96	1
		1	99	21.01	20.99	20.95	1
		50	0	20.21	20.19	20.15	2
		50	25	20.17	20.15	20.11	2
		50	50	20.16	20.14	20.10	2
		100	0	20.11	20.09	20.05	2

**EIRP POWER (dBm)****GSM**

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
512	1850.2	-13.98	43.83	29.85	966.05	H
661	1880.0	-12.86	43.57	30.71	1177.61	H
810	1909.8	-13.77	44.57	30.80	<b>1202.26</b>	H
512	1850.2	-26.74	46.39	19.65	92.26	V
661	1880.0	-26.89	47.10	20.21	104.91	V
810	1909.8	-25.23	45.98	20.75	118.74	V

**REMARKS:** 1. EIRP Output Power (dBm) = SPA LVL (dBm) + Correction Factor (dB).  
2. Correction factor (dB) = Free Space Loss + Antenna Factor + Cable Loss

**EDGE**

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
512	1850.2	-16.72	43.83	27.11	<b>514.04</b>	H
661	1880.0	-16.54	43.57	27.03	504.66	H
810	1909.8	-17.88	44.57	26.69	466.66	H
512	1850.2	-28.45	46.39	17.94	62.20	V
661	1880.0	-27.93	47.10	19.17	82.53	V
810	1909.8	-27.65	45.98	18.32	67.97	V

**REMARKS:** 1. EIRP Output Power (dBm) = SPA LVL (dBm) + Correction Factor (dB).  
2. Correction factor (dB) = Free Space Loss + Antenna Factor + Cable Loss

**WCDMA**

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
9262	1852.4	-18.63	43.83	25.20	331.13	H
9400	1880.0	-17.67	43.57	25.90	<b>389.05</b>	H
9538	1907.6	-18.70	44.57	25.87	386.37	H
9262	1852.4	-26.75	46.39	19.64	91.98	V
9400	1880.0	-26.63	47.10	20.47	111.33	V
9538	1907.6	-27.53	45.98	18.44	69.89	V

**REMARKS:** 1. EIRP Output Power (dBm) = SPA LVL (dBm) + Correction Factor (dB).  
2. Correction factor (dB) = Free Space Loss + Antenna Factor + Cable Loss



## LTE BAND 2

## CHANNEL BANDWIDTH: 3MHz QPSK

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18615	1851.5	-20.12	43.82	23.70	234.53	H	2
18900	1880.0	-20.03	43.57	23.54	225.94	H	2
19185	1908.5	-19.90	44.38	24.48	<b>280.29</b>	H	2
18615	1851.5	-26.61	46.45	19.84	96.41	V	2
18900	1880.0	-27.48	47.07	19.59	90.99	V	2
19185	1908.5	-25.80	45.88	20.08	101.86	V	2

**REMARKS:** 1. EIRP Output Power (dBm) = SPA LVL (dBm) + Correction Factor (dB).

2. Correction factor (dB) = Free Space Loss + Antenna Factor + Cable Loss

## 3.2 RADIATED EMISSION MEASUREMENT

### 3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. The emission limit equal to  $-13\text{dBm}$ .

### 3.2.2 TEST PROCEDURES

- a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- b. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value" of step a. Record the power level of S.G
- c.  $\text{EIRP} = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}.$

**NOTE:** The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

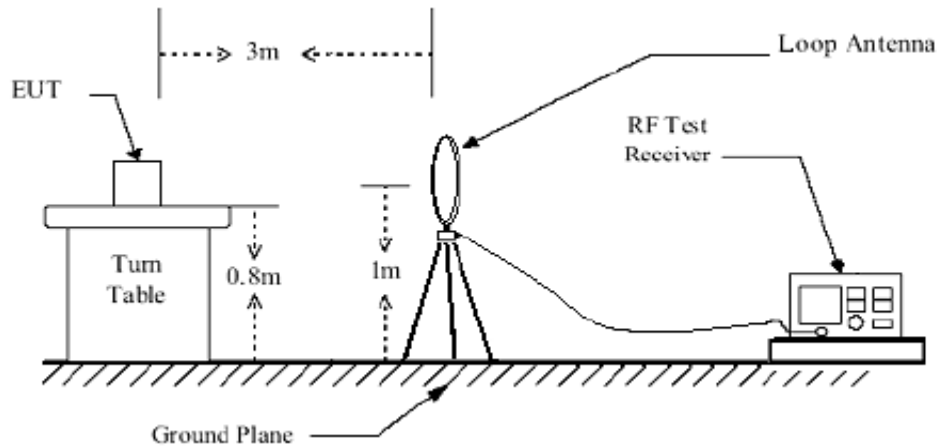
### 3.2.3 DEVIATION FROM TEST STANDARD

No deviation

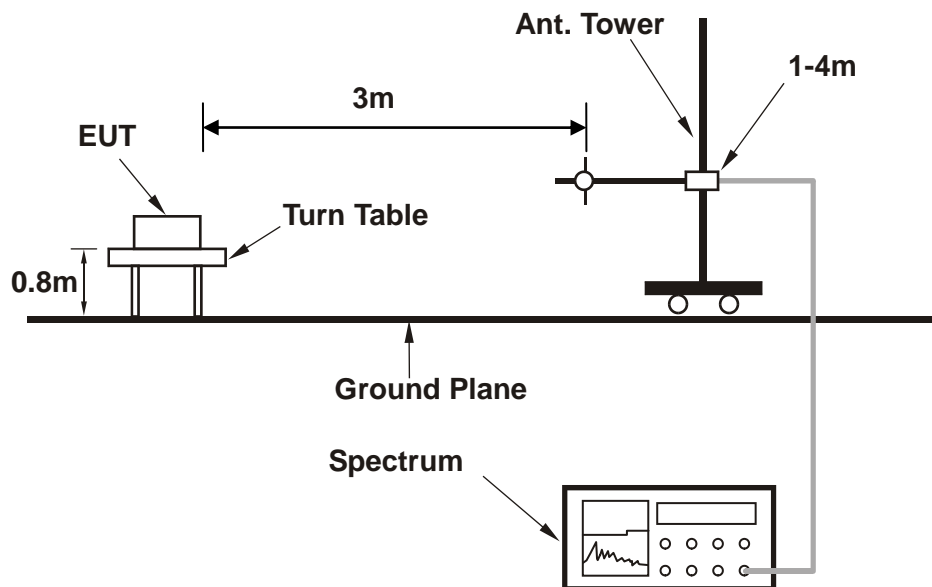


### 3.2.4 TEST SETUP

#### <Below 30MHz>

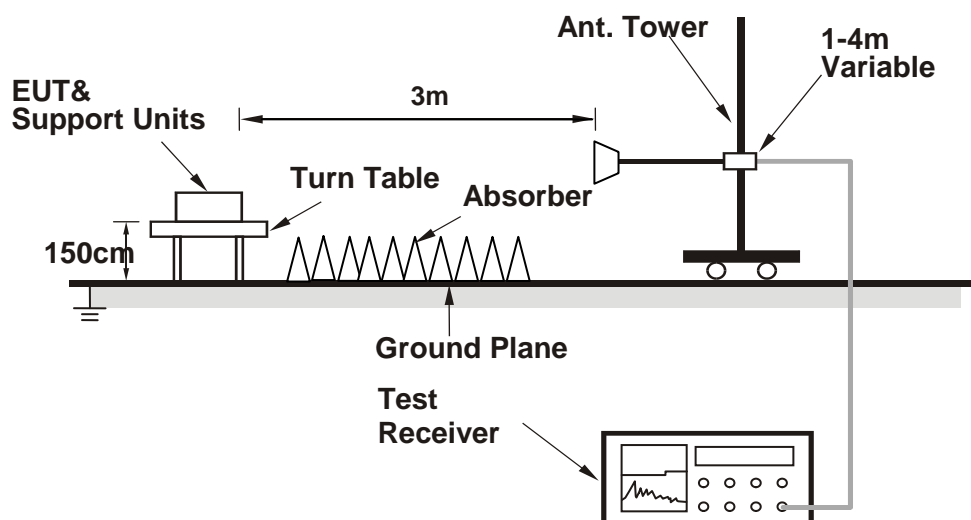


#### < Frequency Range 30MHz~1GHz >





< Frequency Range above 1GHz >



For the actual test configuration, please refer to the attached file (Test Setup Photo).



### 3.2.5 TEST RESULTS

#### BELOW 1GHz WORST-CASE DATA

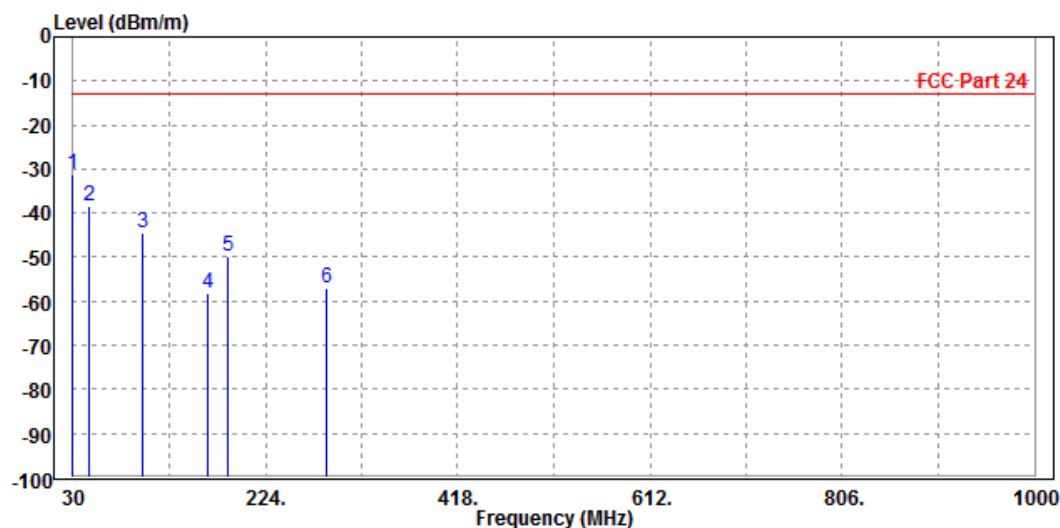
**9 KHz – 30 MHz data:** the amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required in the report.

**30 MHz – 1GHz data:**

**PCS 1900:**

MODE	TX channel 661	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Vincent		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

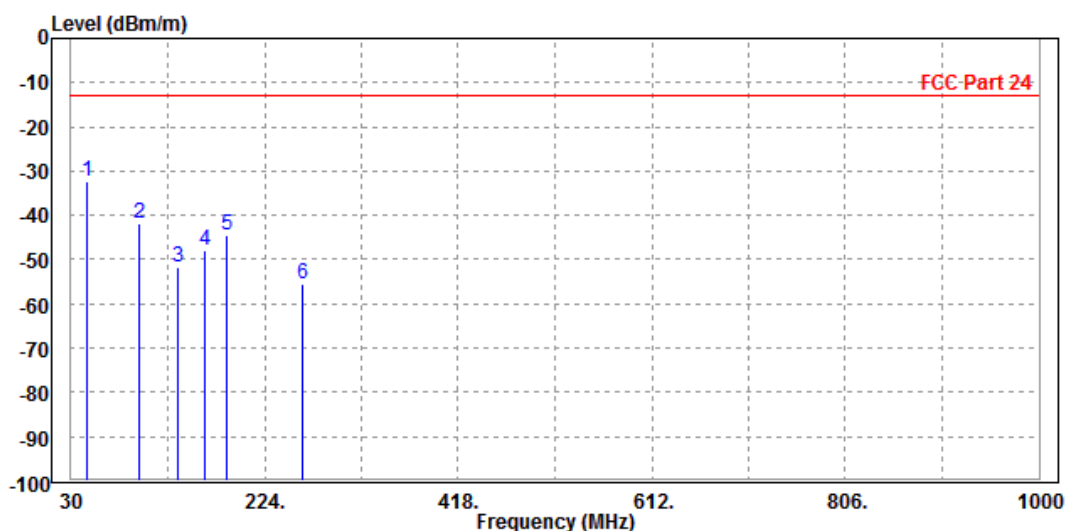
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1 PP	30.000	-31.33	-50.67	-13.00	-18.33	19.34	Peak	Horizontal
2	46.490	-38.27	-44.61	-13.00	-25.27	6.34	Peak	Horizontal
3	100.810	-44.57	-33.25	-13.00	-31.57	-11.32	Peak	Horizontal
4	165.800	-58.15	-39.89	-13.00	-45.15	-18.26	Peak	Horizontal
5	186.170	-49.90	-32.30	-13.00	-36.90	-17.60	Peak	Horizontal
6	285.110	-57.11	-42.57	-13.00	-44.11	-14.54	Peak	Horizontal





MODE	TX channel 661	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Vincent		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

		Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
		MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP	46.490	-32.21	-28.57	-13.00	-19.21	-3.64	Peak	Vertical
2		97.900	-41.89	-31.25	-13.00	-28.89	-10.64	Peak	Vertical
3		137.670	-51.77	-36.95	-13.00	-38.77	-14.82	Peak	Vertical
4		164.830	-47.77	-33.01	-13.00	-34.77	-14.76	Peak	Vertical
5		186.170	-44.57	-32.18	-13.00	-31.57	-12.39	Peak	Vertical
6		261.830	-55.56	-44.09	-13.00	-42.56	-11.47	Peak	Vertical







## ABOVE 1GHz DATA

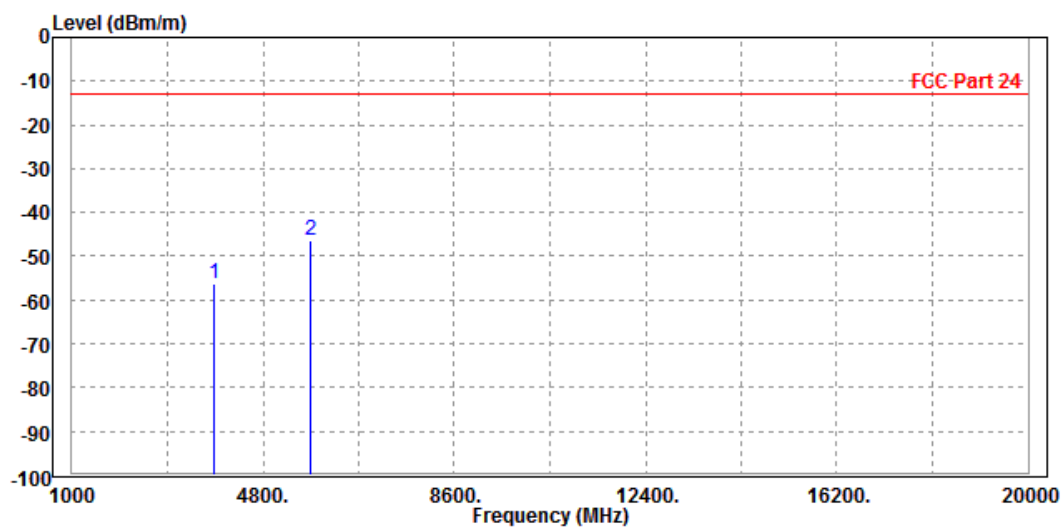
**Note:** For higher frequency, the emission is too low to be detected.

### PCS 1900:

### CH 512

MODE	TX channel 512	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Vincent		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

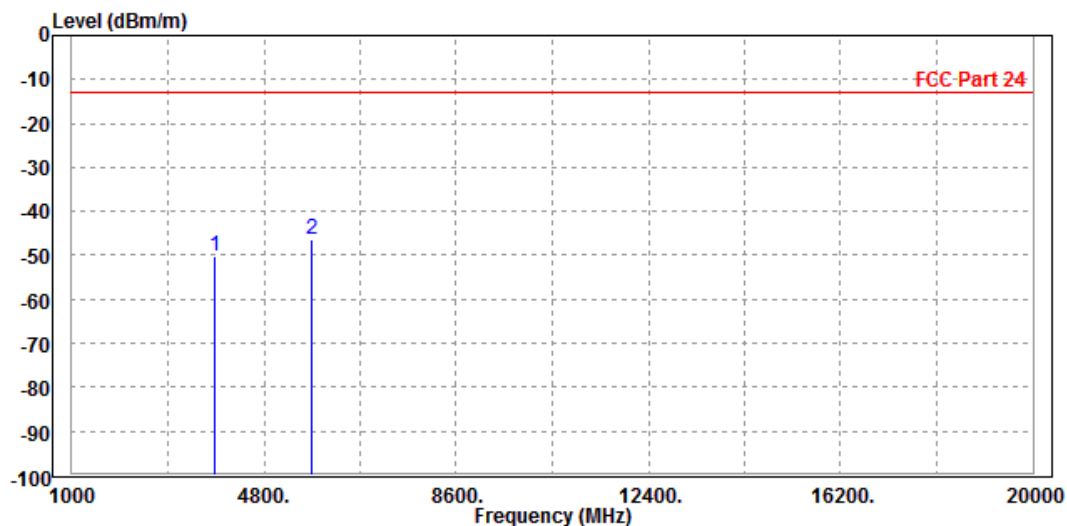
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3819.000	-56.17	-59.87	-13.00	-43.17	3.70	Peak	Horizontal
2 PP	5729.000	-46.22	-55.44	-13.00	-33.22	9.22	Peak	Horizontal





MODE	TX channel 512	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Vincent		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3812.000	-50.20	-54.34	-13.00	-37.20	4.14	Peak	Vertical
2 PP	5729.000	-46.27	-54.71	-13.00	-33.27	8.44	Peak	Vertical



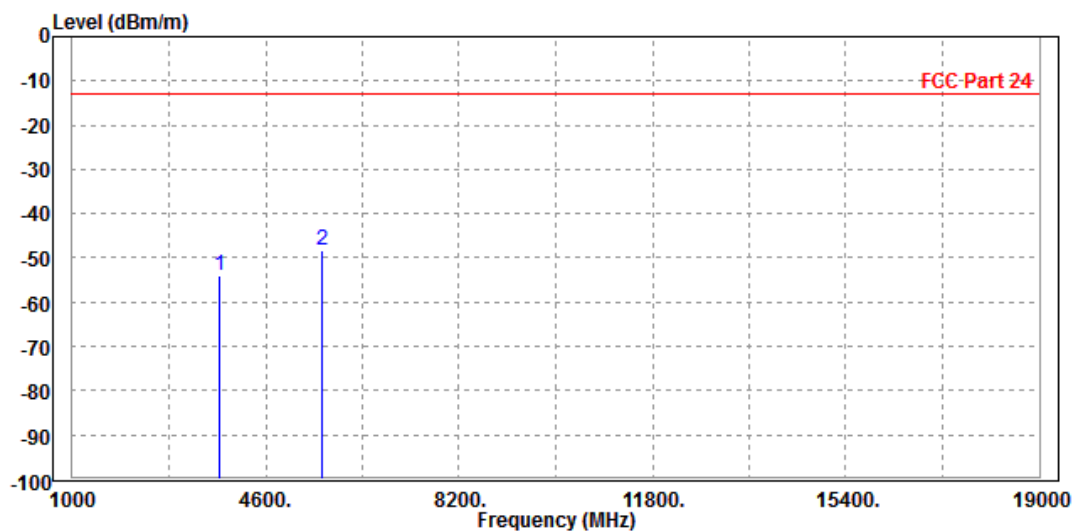


EDGE 1900:

CH 661

MODE	TX channel 661	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Vincent		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

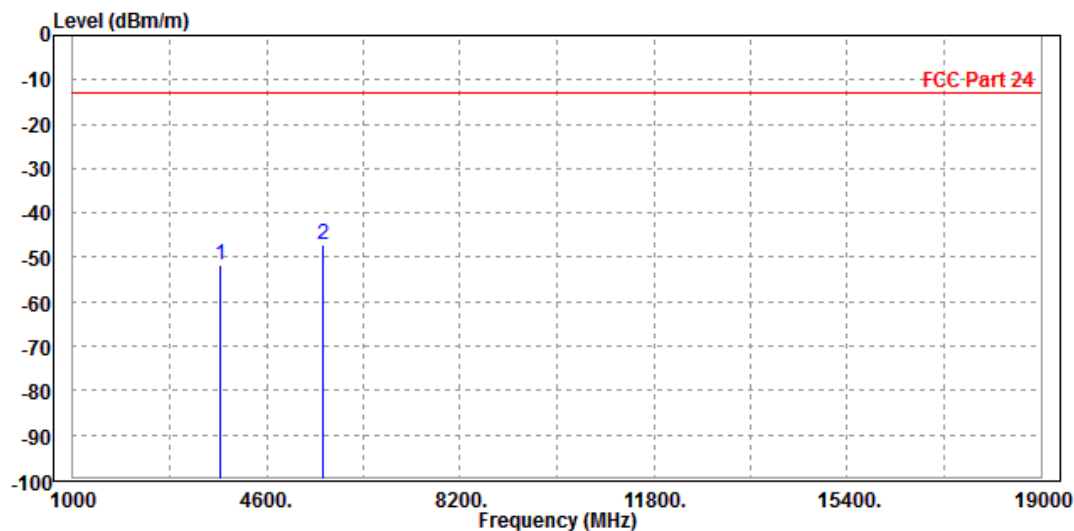
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3754.000	-54.13	-57.51	-13.00	-41.13	3.38	Peak	Horizontal
2 PP	5640.000	-48.20	-57.32	-13.00	-35.20	9.12	Peak	Horizontal





MODE	TX channel 661	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Vincent		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3754.000	-51.70	-55.55	-13.00	-38.70	3.85	Peak	Vertical
2 PP	5640.000	-47.10	-55.36	-13.00	-34.10	8.26	Peak	Vertical



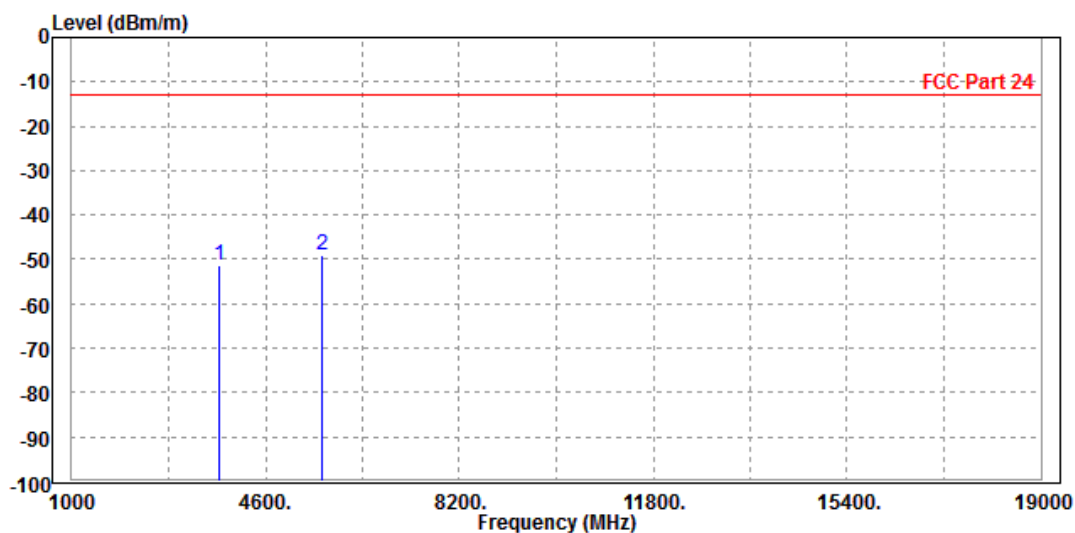


**WCDMA Band II**

**CH 9400**

MODE	TX channel 9400	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Vincent		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

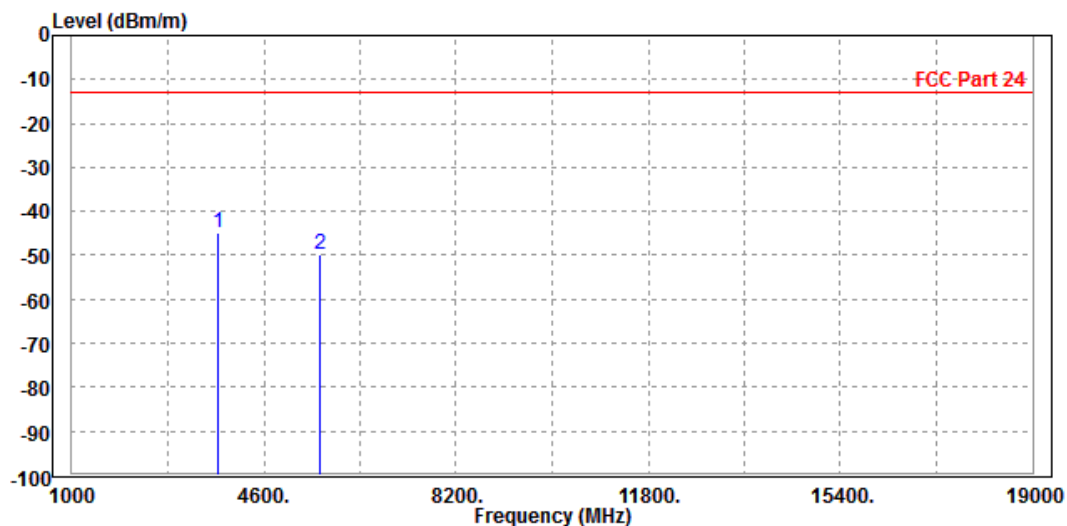
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3754.000	-51.35	-54.73	-13.00	-38.35	3.38	Peak	Horizontal
2 PP	5640.000	-49.10	-58.22	-13.00	-36.10	9.12	Peak	Horizontal





MODE	TX channel 9400	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Vincent		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

		Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
		MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP	3754.000	-45.03	-48.88	-13.00	-32.03	3.85	Peak	Vertical
2		5640.000	-49.67	-57.93	-13.00	-36.67	8.26	Peak	Vertical





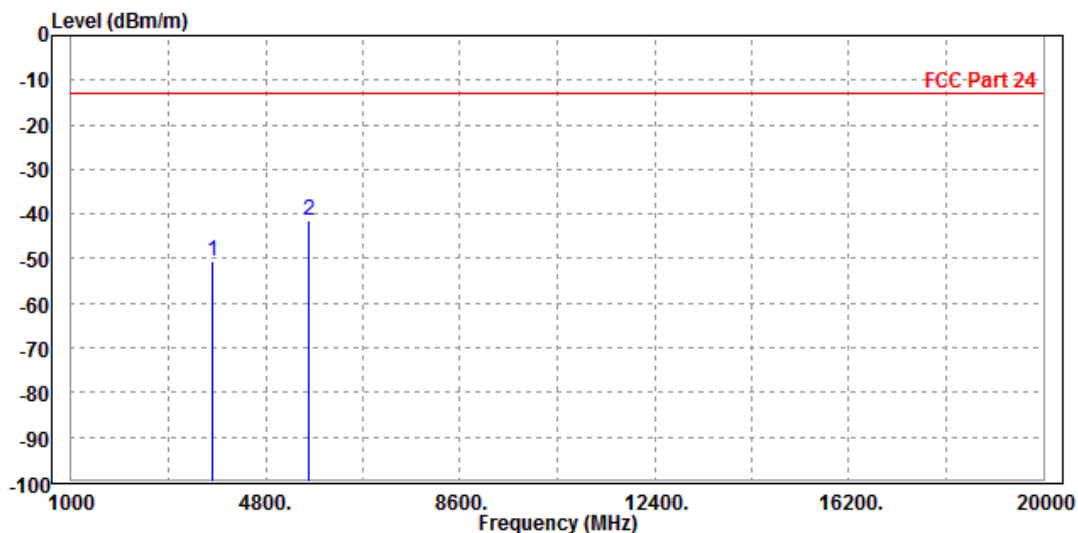
LTE Band 2

CHANNEL BANDWIDTH: 10MHz / QPSK

CH 18900

MODE	TX channel 18900	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Vincent		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

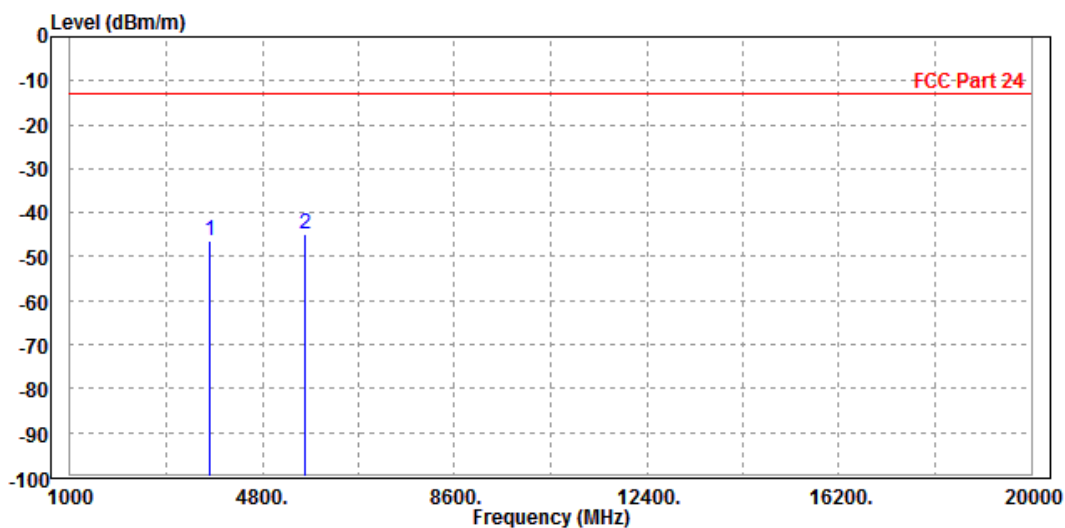
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3755.000	-50.70	-54.09	-13.00	-37.70	3.39	Peak	Horizontal
2 PP	5640.000	-41.46	-50.58	-13.00	-28.46	9.12	Peak	Horizontal





MODE	TX channel 18900	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Vincent		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3755.000	-46.45	-50.30	-13.00	-33.45	3.85	Peak	Vertical
2 PP	5640.000	-44.77	-53.03	-13.00	-31.77	8.26	Peak	Vertical







Test Report No.: RF180604W006-11

## 4 INFORMATION ON THE TESTING LABORATORIES

We, BV 7LAYERS COMMUNICATIONS TECHNOLOGY (SHENZHEN) CO. LTD., were founded in 2015 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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Web Site: [www.adt.com.tw](http://www.adt.com.tw)

The address and road map of all our labs can be found in our web site also.



## **5 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB**

No any modifications are made to the EUT by the lab during the test.

**---END---**