

# FCC TEST REPORT (PART 24)

- **REPORT NO.:** RF150727C28-5
  - MODEL NO.: GT7820 & GT7810 & GT7800 & GT78
    - FCC ID: 2ACC5-GT78
    - **RECEIVED:** Jul. 27, 2015
      - TESTED: Jul. 29, 2015 ~ Jul. 31, 2015
      - **ISSUED:** Aug. 13, 2015
- APPLICANT: AMobile Intelligent Corp.
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- **ISSUED BY:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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- **TEST LOCATION:** No. 19, Hwa Ya 2nd Rd, Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 333, Taiwan, R.O.C.

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# **RELEASE CONTROL RECORD**

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF150727C28-5	Original release	Aug. 13, 2015



# 1 CERTIFICATION

PRODUCT:Rugged Android TabletMODEL:GT7820 & GT7810 & GT7800 & GT78BRAND:AmobileAPPLICANT:AMobile Intelligent Corp.TESTED:Jul. 29, 2015 ~ Jul. 31, 2015TEST SAMPLE:Identical PrototypeSTANDARDS:FCC Part 24, Subpart E

The above equipment (model: GT7820 & GT7810 & GT7800 & GT78) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch,** 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	:	Gina	Lin	, DATE :	Aug. 13, 2015
		Gina Liu / S	Specialist		
APPROVED BY	:	Kay	Wu	, DATE : _	Aug. 13, 2015
		Kay Wu / S	upervisor		



# 2 SUMMARY OF TEST RESULTS

	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	PASS	Meet the requirement of limit.		
2.1049 24.238(b)	Occupied Bandwidth	PASS	Meet the requirement of limit.		
24.232(d)	Peak to average ratio	PASS	Meet the requirement of limit.		
24.238(b)	Band Edge Measurements	PASS	Meet the requirement of limit.		
2.1051 24.238	Conducted Spurious Emissions	PASS	Meet the requirement of limit.		
2.1053 24.238	Radiated Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -13.44dB at 9400.00MHz.		

The EUT has been tested according to the following specifications:

### 2.1 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	2.44 dB
	30MHz ~ 200MHz	2.93 dB
Dedicted emissions	200MHz ~1000MHz	2.95 dB
Radiated emissions	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

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



### 2.2 TEST SITE AND INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Spectrum Analyzer Agilent Technologies			May 19, 2015	May 18, 2016
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Dec. 10, 2014	Dec. 09, 2015
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Feb. 04, 2015	Feb. 04, 2016
HORN Antenna SCHWARZBECK	3117	00143293	Aug. 28, 2014	Aug. 27, 2015
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Aug. 27, 2014	Aug. 26, 2015
Preamplifier EMCI	EMC 012645	980115	Dec. 12, 2014	Dec. 11, 2015
Preamplifier EMCI	EMC 184045	980116	Jan. 09, 2015	Jan. 08, 2016
Preamplifier EMCI	EMC 330H	980112	Dec. 25, 2014	Dec. 24, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309219/4 2950114	Oct. 18, 2014	Oct. 17, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250130/4	Oct. 18, 2014	Oct. 17, 2015
RF signal cable Worken	RG-213	NA	Nov. 07, 2014	Nov. 06, 2015
Software BV ADT	E3 6.120103	NA	NA	NA
Antenna Tower MF	MFA-440H	NA	NA	NA
Turn Table MF	MFT-201SS	NA	NA	NA
Antenna Tower &Turn Table Controller MF	MF-7802	NA	NA	NA
Radio Communication Analyzer	MT8820C	6201240432	Jul. 06, 2015	Jul. 05, 2017

**NOTE:** 1. The calibration interval of the above test instruments is 12 / 24 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The test was performed in HwaYa Chamber 10.

3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.

4. The FCC Site Registration No. is 690701.

5. The IC Site Registration No. is IC 7450F-10.



# **3 GENERAL INFORMATION**

# 3.1 GENERAL DESCRIPTION OF EUT

EUT	Rugged Android Tablet		
MODEL NO.	GT7820 & GT7810 & GT7800 & GT78		
POWER SUPPLY	5.0Vdc (adapter or host equipment) 3.8Vdc (battery)		
MODULATION TYPE	GSM/GPRS	GMSK	
MODULATION TIPE	WCDMA	BPSK	
FREQUENCY RANGE	GSM/GPRS/EDGE	1850.2MHz ~ 1909.8MHz	
FREQUENCY RANGE	WCDMA	1852.4MHz ~ 1907.6MHz	
	GSM	762.08mW	
MAX. EIRP POWER	WCDMA	146.32mW	
EMISSION	GSM	245KGXW	
DESIGNATOR	WCDMA	4M17F9W	
ANTENNA TYPE	Fixed Internal Antenna		
I/O PORTS	Refer to users' manual		
DATA CABLE	Refer to NOTE as below		
ACCESSORY DEVICES	Refer to NOTE as below		

#### NOTE:

1. All models are listed as below.

BRAND	MODEL	DIFFERENCE		
	GT78	EUT without barcode		
Amehile	GT7800	EUT without barcode		
Amobile	GT7810	EUT with 1D barcode		
	GT7820	EUT with 2D barcode		

GT78 and GT7800 are electrically identical, different model names are for marketing purpose.

#### 2. Test Configurations are listed as below.

Sample	MODEL
А	GT7800
В	GT7810
С	GT7820



ITEM	BRAND	MODEL	SPECIFICATION
Battery	JAPON	TP0750B01	3.8Vdc, 6200mAh
Earphone	HETONG	PY-1312602-09KB02	1.2m
USB Cable	miki	YXT-64-MK5P-1M	0.98m
LCD Panel	K&D	KD079D1-35NA-A1	7.8 Inch
Photo Camera	SEASONS	SPV6B9298	
Video Camera	Wdson	WDS1NA44W552	
WWAN Module	MTK	MT6166	
WLAN Module	MTK	MT6627	
CPU	MTK	MT8382	1.3GHZ
MainBoard	miki	P6128	
EMMC	N/A	NCEFES78-08G	8GB
bar code scanner (2D)	opticon	MDI-3100	
bar code scanner (1D)	opticon	MDC-100	

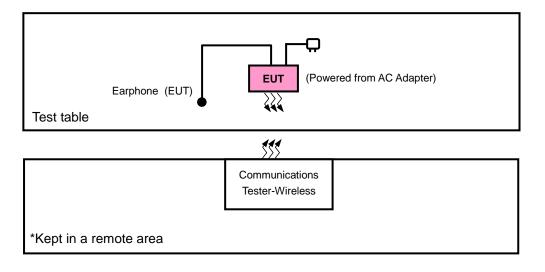
3. The EUT contains following accessory devices.

4. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

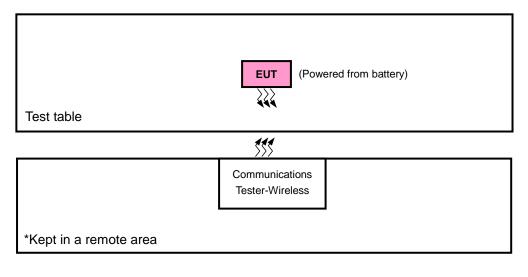


# 3.2 CONFIGURATION OF SYSTEM UNDER TEST

#### FOR RADIATION EMISSION TEST



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





### 3.3 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	Communications Tester-Wireless	Agilent	8960 Series 10	MY53201073	NA
2	Adapter	AMIGO	AMS135-0502000FU	N/A	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	ΝΑ
2	1.5m shielded cable w/o core

#### NOTE:

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

2. Item 1 as a communication partner to transfer data.

### 3.4 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 was found and listed as below table. Following channel(s) was (were) selected for the final test as listed below:

EUT CONFIGURE MODE	DESCRIPTION	EIRP	RADIATED EMISSION
A	GT7820	Z-plane	X-axis
В	GT7800	Z-plane	Z-axis
С	GT7810	Z-plane	Z-axis

#### **GSM MODE**

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
А	EIRP	512 to 810	512, 661, 810	GSM
А	FREQUENCY STABILITY	512 to 810	661	GSM
А	OCCUPIED BANDWIDTH	512 to 810	512, 661, 810	GSM
А	PEAK TO AVERAGE RATIO	512 to 810	512, 661, 810	GSM
А	BAND EDGE	512 to 810	512, 810	GSM
А	CONDUCTED EMISSION	512 to 810	661	GSM
A, B, C	RADIATED EMISSION	512 to 810	661	GSM



#### WCDMA MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
А	EIRP	9262 to 9538	9262, 9400, 9538	WCDMA
А	FREQUENCY STABILITY	9262 to 9538	9400	WCDMA
А	OCCUPIED BANDWIDTH	9262 to 9538	9262, 9400, 9538	WCDMA
А	PEAK TO AVERAGE RATIO	9262 to 9538	9262, 9400, 9538	WCDMA
А	BAND EDGE	9262 to 9538	9262, 9538	WCDMA
А	CONDUCTED EMISSION	9262 to 9538	9400	WCDMA
A	RADIATED EMISSION	9262 to 9538	9400	WCDMA

### **TEST CONDITION:**

Test Item	Environmental Conditions	Input Power	Tested by
ERP	26deg. C, 58%RH	3.8Vdc	Carlos Chen
FREQUENCY STABILITY	26deg. C, 58%RH	3.8Vdc	Carlos Chen
OCCUPIED BANDWIDTH	26deg. C, 58%RH	3.8Vdc	Carlos Chen
PEAK TO AVERAGE RATIO	26deg. C, 58%RH	3.8Vdc	Carlos Chen
BAND EDGE	26deg. C, 58%RH	3.8Vdc	Carlos Chen
CONDUCTED EMISSION	26deg. C, 58%RH	3.8Vdc	Carlos Chen
RADIATED EMISSION	25deg. C, 65%RH	120Vac, 60Hz	Charles Hsiao



# 3.5 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

# 3.6 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 ANSI/TIA/EIA-603-C 2004

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



# 4 TEST TYPES AND RESULTS

### 4.1 OUTPUT POWER MEASUREMENT

#### 4.1.1 LIMITS OF OUTPUT POWER MEASUREMENT

Mobile and portable stations are limited to 2 watts EIRP.

#### 4.1.2 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 & EDGE, 5MHz for CDMA & WCDMA, 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 = Output power level of S.G TX cable loss + Antenna gain of substitution horn.

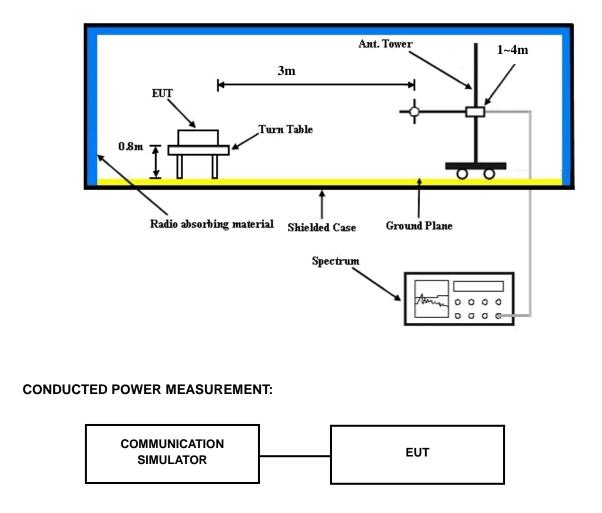
#### CONDUCTED POWER MEASUREMENT:

The EUT was set up for the maximum power with GSM, GPRS, EDGE & WCDMA & LTE 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.



#### 4.1.3 TEST SETUP

#### **EIRP / ERP MEASUREMENT:**





#### 4.1.4 TEST RESULTS

### CONDUCTED OUTPUT POWER (dBm)

Band	GSM1900			
Channel	512	661	810	
Frequency (MHz)	1850.2	1880.0	1909.8	
GSM (1 Uplink)	28.94	28.82	28.72	
GPRS 8 (GMSK, 1 slot)	28.92	28.80	28.70	
GPRS 10 (GMSK, 2 slot)	28.21	28.09	27.99	
GPRS 11 (GMSK, 3 slot)	26.43	26.31	26.21	
GPRS 12 (GMSK, 4 slot)	25.30	25.18	25.08	

Band	WCDMA II				
Channel	9262	9400	9538		
Frequency (MHz)	1852.4	1880.0	1907.6		
RMC 12.2K	22.29	22.25	22.30		
HSDPA Subtest-1	21.31	21.27	21.32		
HSDPA Subtest-2	21.32	21.28	31.33		
HSDPA Subtest-3	20.89	20.85	20.90		
HSDPA Subtest-4	20.87	20.83	20.88		
HSUPA Subtest-1	19.37	19.33	19.38		
HSUPA Subtest-2	19.36	19.32	19.37		
HSUPA Subtest-3	20.36	20.32	20.37		
HSUPA Subtest-4	19.88	19.84	19.89		
HSUPA Subtest-5	21.29	21.25	21.30		



#### EIRP POWER (dBm)

	GSM						
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
	512	1850.2	-19.58	44.70	25.12	325.09	Н
	661	1880.0	-18.73	44.70	25.97	395.37	Н
z	810	1909.8	-19.56	44.57	25.01	317.18	Н
2	512	1850.2	-15.92	44.27	28.35	683.91	V
	661	1880.0	-16.05	44.87	28.82	762.08	V
	810	1909.8	-15.83	44.61	28.78	755.61	V

	WCDMA						
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
	9262	1852.4	-25.99	44.70	18.71	74.30	Н
	9400	1880.0	-26.14	44.70	18.56	71.78	н
z	9538	1907.6	-25.59	44.57	18.98	79.12	Н
2	9262	1852.4	-23.09	44.27	21.18	131.22	V
	9400	1880.0	-23.79	44.87	21.08	128.23	V
	9538	1907.6	-22.96	44.61	21.65	146.32	V



# 4.2 FREQUENCY STABILITY MEASUREMENT

#### 4.2.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

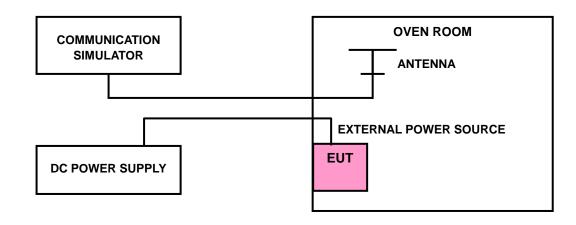
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

#### 4.2.2 TEST PROCEDURE

- a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
- b. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
- c. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the  $\pm 0.5^{\circ}$ C during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

NOTE: The frequency error was recorded frequency error from the communication simulator.

#### 4.2.3 TEST SETUP





#### 4.2.4 TEST RESULTS

#### FREQUENCY ERROR vs. VOLTAGE

	FREQUENCY	ERROR (ppm)	
VOLTAGE (Volts)	GSM	WCDMA	LIMIT (ppm)
3.8	0.000	0.001	2.5
3.6	0.001	0.000	2.5
4.35	0.001	0.001	2.5

**NOTE:** The applicant defined the normal working voltage of the battery is from 3.6Vdc to 4.35Vdc.

#### FREQUENCY ERROR vs. TEMPERATURE

	FREQUENCY	ERROR (ppm)	
<b>ТЕМР. (</b> °С)	GSM	WCDMA	LIMIT (ppm)
-30	0.001	0.000	2.5
-20	0.000	0.002	2.5
-10	0.000	0.001	2.5
0	0.001	0.000	2.5
10	0.001	0.001	2.5
20	-0.002	-0.001	2.5
30	-0.001	-0.001	2.5
40	-0.001	0.000	2.5
50	-0.001	-0.001	2.5

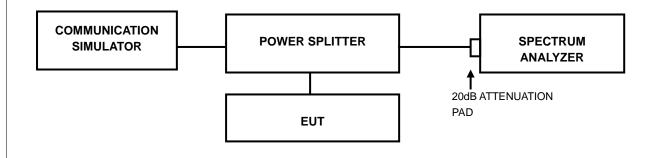


# 4.3 OCCUPIED BANDWIDTH MEASUREMENT

#### 4.3.1 TEST PROCEDURES

The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

#### 4.3.2 TEST SETUP





#### 4.3.3 TEST RESULTS

CHANNEL	FREQUENCY	99% OCCUPIED BANDWIDTH (kHz)			99% OCCUPIED BANDWIDTH (MHz)
		GSM			WCDMA
512	1850.2	245.08	9262	1852.4	4.17
661	1880.0	245.29	9400	1880.0	4.17
810	1909.8	242.58	9538	1907.6	4.17
CHANNEL	FREQUENCY	26dB BANDWIDTH (kHz)	CHANNEL	FREQUENCY	26dB BANDWIDTH (MHz)
		GSM			WCDMA
512	1850.2	314.70	9262	1852.4	4.70
661	1880.0	304.10	9400	1880.0	4.71
810	1909.8	319.30	9538	1907.6	4.70

SPECTRUM	I PLOT	OF WORST VALUE
GSM		WCDMA
Center Freq 1.88000000 GHz Freaktwick Berger 1.80000000 GHz Breaktwick Berger 1.8000000 GHz Breaktwick Berger 1.8000000 GHz Breaktwick Berger 1.8000000 GHz Breaktwick Berger 1.80000000 GHz Breaktwick Berger 1.8000000 GHz Breaktwick Berger 1.80000000 GHz Breaktwick Berger 1.8000000 GHz Breaktwick Berger 1.8000000 GHz Breaktwick Berger 1.80000000 GHz Breaktwick Berger 1.800000000 GHz Breaktwick Berger 1.80000000 GHz Breaktwick Berger 1.80000000 GHz Breaktwick Berger	Erequency	Adjuint Spectrum Analyzer - Droughed BW ETECE BRT ALLISICE South Spectrum Analyzer - Droughed BW Frequency   Center Freq 1.880000000 GHz Greater Freq 1.880000000 GHz Greater Freq 1.880000000 GHz Radie Std: None Radie Std: None   If GainLaw Freq 1.80000000 GHz Greater Freq 1.80000000 GHz Radie Std: None Radie Std: None   10 dBiddir If GainLaw Artight Std: None Radie Std: None Center Freq 1.000000 GHz Center Freq 1.000000 GHz Center Freq 1.0000000 GHz Center Freq 1.0000000 GHz Center Freq 1.000000 GHz Center Freq 1.0000000 GHz Center Freq 1.000000000000000000000000000000000000
Center 1.88 GHz #VBW 30 kHz \$Span 1 MHz Res BW 10 kHz #VBW 30 kHz #Sweep 8Hm	CF Step 100.000 kHz Auto Man	Center 1.88 GHz CF Step CF Step   Res BW 100 KHz #VBW 300 kHz Span 10 MHz Man
Occupied Bandwidth Total Power 33.1 dBm 245.29 kHz	Freq Offset 0 Hz	Occupied Bandwidth Total Power 23.3 dBm FreqOffset 4.1727 MHz OHz
Transmit Freq Error 252 Hz OBW Power 99.00 % x dB Bandwidth 304.1 kHz x dB -26.00 dB		Transmit Freq Error -6.270 KHz OBW Power 99.00 % x dB Bandwidth 4.705 MHz x dB -26.00 dB
MSG STATUS		MSG STATUS

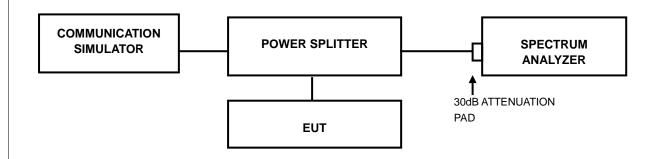


# 4.4 PEAK TO AVERAGE RATIO

#### 4.4.1 LIMITS OF PEAK TO AVERAGE RATIO MEASUREMENT

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB.

#### 4.4.2 TEST SETUP



#### 4.4.3 TEST PROCEDURES

- 1. Set resolution/measurement bandwidth  $\geq$  signal's occupied bandwidth;
- 2. Set the number of counts to a value that stabilizes the measured CCDF curve;
- 3. Record the maximum PAPR level associated with a probability of 0.1%.



#### 4.4.4 TEST RESULTS

CHANNEL	FREQUENCY	PEAK TO AVERAGE RATIO (dB)	CHANNEL	FREQUENCY	PEAK TO AVERAGE RATIO (dB)			
	(MHz)	GSM		(MHz)	WCDMA			
512	1850.2	0.09	9262	1852.4	3.07			
661	1880.0	0.09	9400	1880.0	2.82			
810	1909.8	0.09	9538	1907.6	2.80			

	SPECTR	UM PLOT	OF WORST VALUE									
	GSM		WCDMA									
Adlent Spectrum Analyzer - Power Stat CCDF DE RF 300 DC Center Freq 1.850200000 GH2 #IFGi Average Power	Z Center Freq: 1.85020000 GHz Radio Std: None Trig: Video Counts: 1.00 M/1.00 Mpt Anten: 30 dB		Agient Spectrum Analyzer : Occupied DW Strate Spectrum Analyzer : Occupied DW Frequency									
29.21 dBm 97.65 % at 0dB	100 %	Center Freq 1.850200000 GHz										
10.0 % 0.07 dB 1.0 % 0.08 dB 0.1 % 0.09 dB 0.01 % 0.09 dB	0.1 %	CF Step 5.000000 MHz Auto Man	Center 1.852 GHz Span 10 MHz									
0.001 % 0.09 dB 0.001 % 0.09 dB 0.0001 % 0.09 dB Peak 0.09 dB 29.30 dBm	0.001 %	Freq Offset	#Res BW 100 kHz #VBW 300 kHz #Sweep 300 ms   t Occupied Bandwidth Total Power 23.3 dBm Freq Off									
0.0001 % 0 dB 1 dB Info BW 5.0000 MHz		1 dB	x dB Bandwidth 4.696 MHz x dB -26.00 dB									

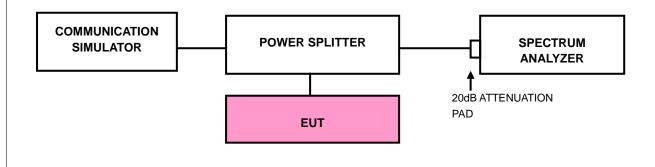


### 4.5 BAND EDGE MEASUREMENT

#### 4.5.1 LIMITS OF BAND EDGE MEASUREMENT

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. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

#### 4.5.2 TEST SETUP

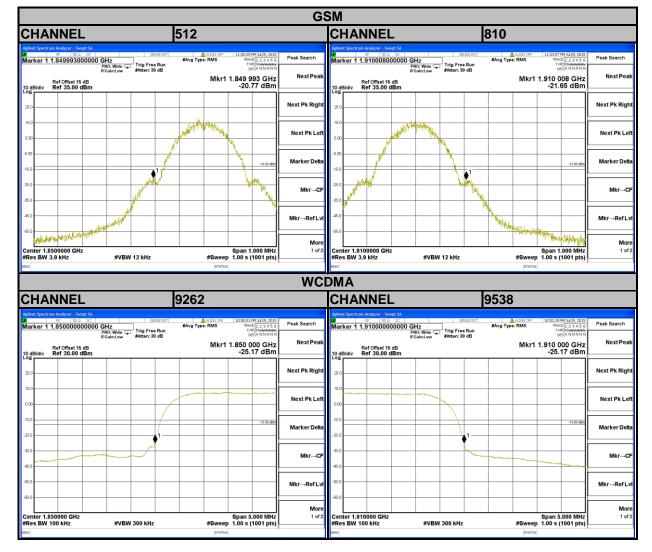


#### 4.5.3 TEST PROCEDURES

- a. All measurements were done at low and high operational frequency range.
- b. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 3kHz and VB of the spectrum is 10kHz (GSM/GPRS/EDGE).
- c. The center frequency of spectrum is the band edge frequency and span is 5MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (WCDMA/LTE).
- d. Record the max trace plot into the test report.



#### 4.5.4 TEST RESULTS





# 4.6 CONDUCTED SPURIOUS EMISSIONS

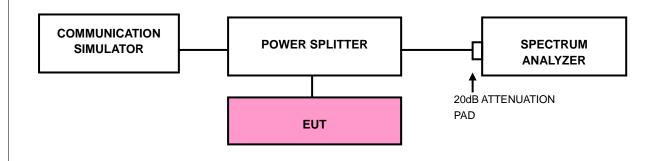
#### 4.6.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

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 is equal to -13 dBm.

#### 4.6.2 TEST PROCEDURE

- a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
- b. Measuring frequency range is from 30 MHz to 19.1GHz. 10dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.

#### 4.6.3 TEST SETUP



#### 4.6.4 TEST RESULTS

GSM CHANNEL 661						WCDMA CHANNEL 9400												
																	Agilent Spectrum Analyzer - Sw	
Marker 1 3.8584939	24696 GHz			#Avg Type: RMS TRACE 12 3 24 5 6 TYPE MWWWWWW OET P N N N N		Peak Search	Marker 1 8.983812690635 GHz PN0: Fast C							ALIGN OFF 10:56:05 PM 3/129, 2 #Avg Type: RMS TRACE[1234 TYPE[Mwww DET]PNNN		E 1 2 3 4 5 6	Peak Search	
Ref Offset 15 dB 0 dB/div Ref 35.00 dBm		В	oer/۹ NNNN Mkr1 3.858 5 GHz -29.55 dBm		NextPeak	Ref Offset 15 dB 10 dB/div Ref 35.00 dBm								Mkr1 8.983 8 GHz -30.52 dBm			NextPea	
og 25.0						Next Pk Right	25.0											Next Pk Rig
5.00						Next Pk Left	15.0 —											Next Pk L
15.00					-13.00 dBm	Marker Delta	-5.00										-13.00 dBm	Marker De
25.0						Mkr→CF	-25.0					1						Mkr→
45.0						Mkr→RefLvi	-45.0											Mkr→RefL
65.0 Start 30 MHz Res BW 1.0 MHz		3W 3.0 MHz		Swaan 60	Stop 19.100 GHz	More 1 of 2	-55.0 Start 3		14.7		#\/D14	2.0 MHz			tween 60	Stop 19. 05.3 ms (20		<b>Mo</b> 1 o
#Res BW 1.0 MHz #VBW 3.0 MHz #Sweep 505.3 ms (20000 pts)												Sweep SU		oooo pts)				



# 4.7 RADIATED EMISSION MEASUREMENT

#### 4.7.1 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 is equal to -13dBm.

#### 4.7.2 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. EIRP = Output power level of S.G TX cable loss + Antenna gain of substitution horn.
- d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.R.P power 2.15dBi.

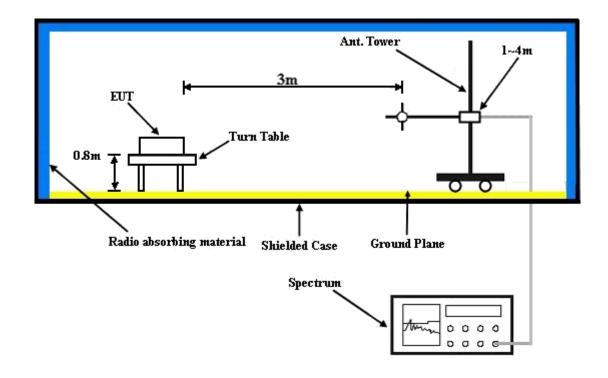
NOTE: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

#### 4.7.3 DEVIATION FROM TEST STANDARD

No deviation



#### 4.7.4 TEST SETUP



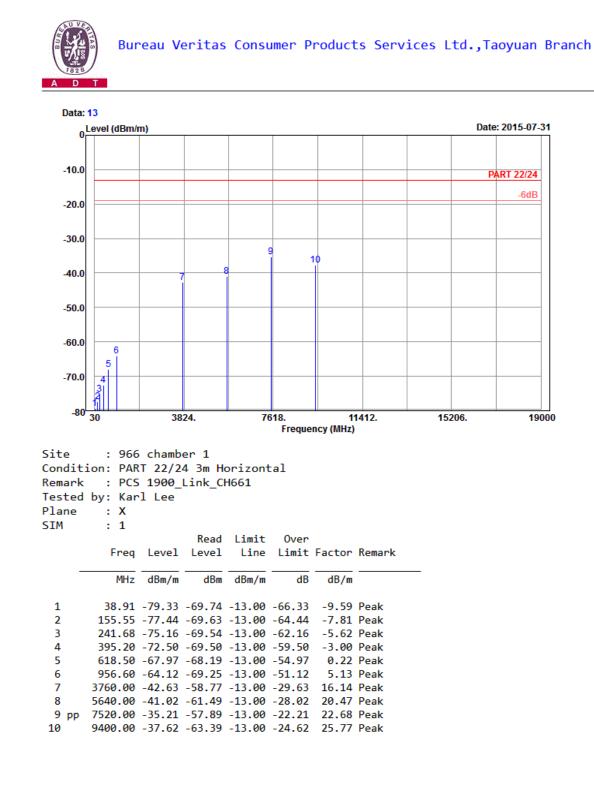
For the actual test configuration, please refer to the attached file (Test Setup Photo).



#### 4.7.5 TEST RESULTS

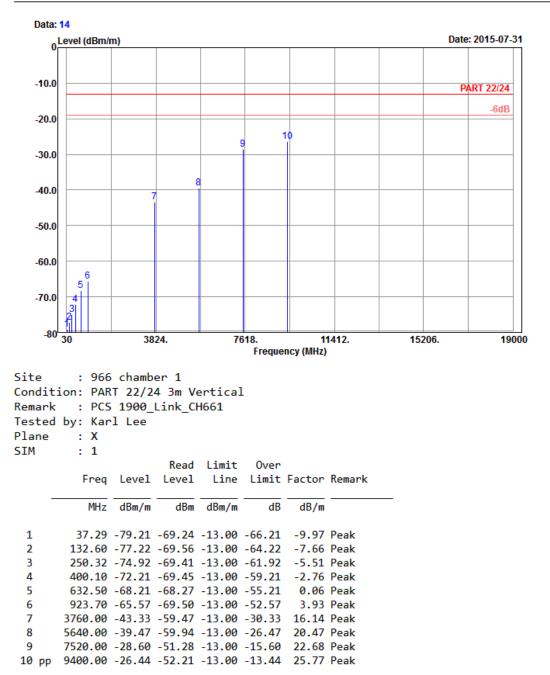
#### GSM:

**MODE A** 



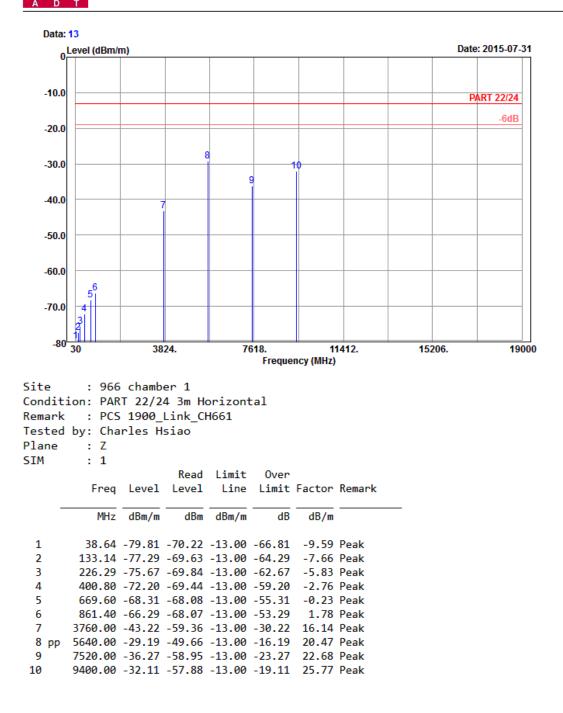






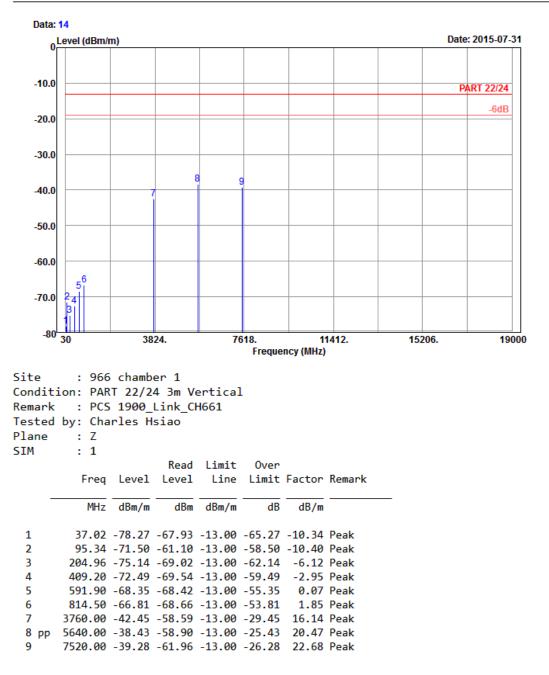


#### **MODE B**



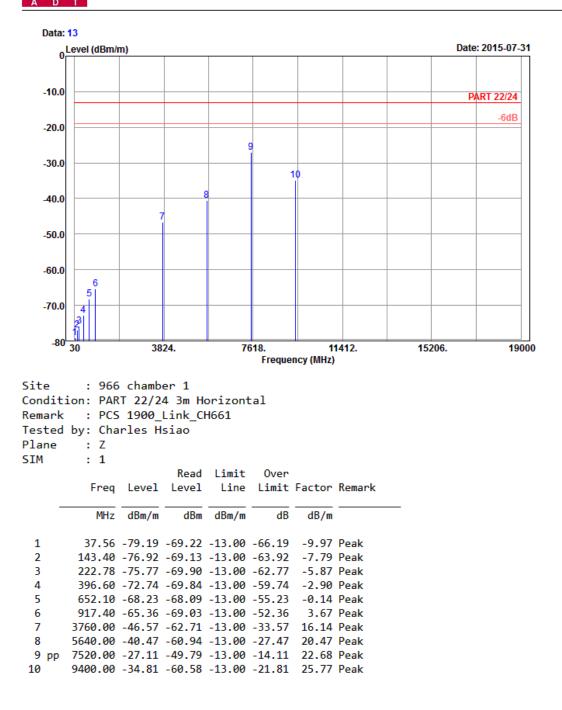






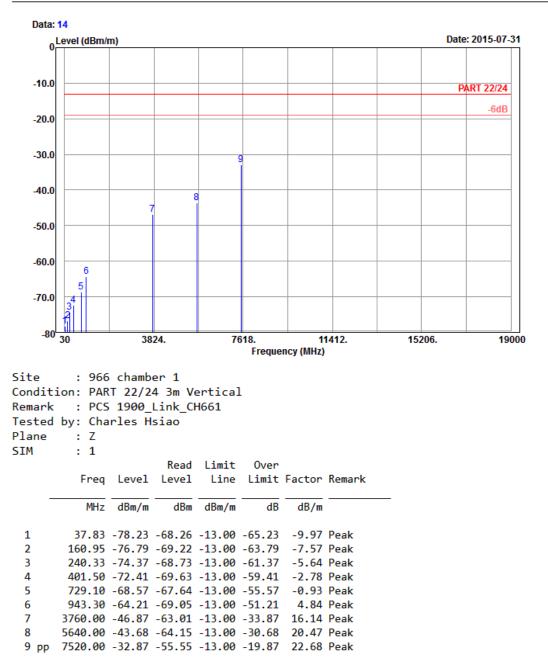


#### **MODE C**



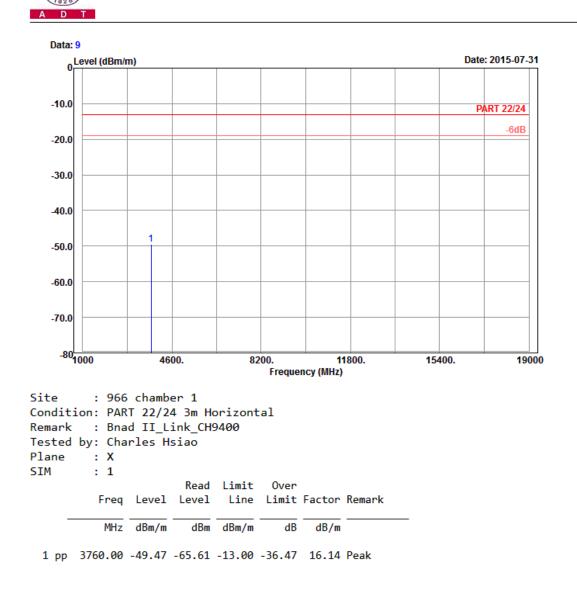








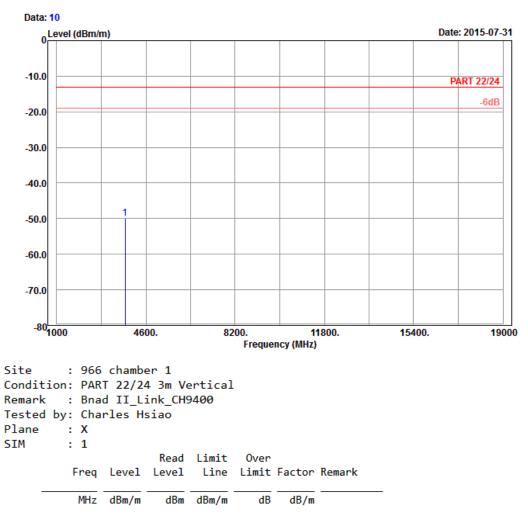
# WCDMA: MODE A







Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch



1 pp 3760.00 -49.90 -66.04 -13.00 -36.90 16.14 Peak



# **5 PHOTOGRAPHS OF THE TEST CONFIGURATION**

Please refer to the attached file (Test Setup Photo).



# 6 INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 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:

Linko EMC/RF Lab: Tel: 886-2-26052180 Fax: 886-2-26051924 Hsin Chu EMC/RF/Telecom Lab: Tel: 886-3-5935343 Fax: 886-3-5935342

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Email: <u>service.adt@tw.bureauveritas.com</u> Web Site: <u>www.bureauveritas-adt.com</u>

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



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

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

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