RF TEST REPORT

Report No.: 15071014-FCC-R1

Supersede Report No.: N/A

Applicant	Verykool USA Inc
Product Name	Mobile Phone
Model No.	s4512
Serial No.	N/A
Test Standard	FCC Part 22(H):2014 ;FCC Part 24(E):2014; ANSI/TIAC603 D: 2010
Test Date	October 26 to December 03, 2015
Issue Date	December 04, 2015
Test Result	☑ Pass ☐ Fail
Equipment complied with the specification	☑
Equipment did not comply with the specification	☐

Winnie Zhang	David Huang	
Winnie Zhang Test Engineer	David Huang Checked By	

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Test result presented in this test report is applicable to the tested sample only

Issued by:

SIEMIC (SHENZHEN-CHINA) LABORATORIES

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Laboratories Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.

In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

Accreditations for Conformity Assessment

Country/Region	Scope
USA	EMC, RF/Wireless, SAR, Telecom
Canada	EMC, RF/Wireless, SAR, Telecom
Taiwan	EMC, RF, Telecom, SAR, Safety
Hong Kong	RF/Wireless, SAR, Telecom
Australia	EMC, RF, Telecom, SAR, Safety
Korea	EMI, EMS, RF, SAR, Telecom, Safety
Japan	EMI, RF/Wireless, SAR, Telecom
Singapore	EMC, RF, SAR, Telecom
Europe	EMC, RF, SAR, Telecom, Safety

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1. Report Revision History

Report No.	Report Version	Description	Issue Date
15071014-FCC-R1	NONE	Original	December 04, 2015

2. Customer information

Applicant Name	Verykool USA Inc
Applicant Add	3636 Nobel Drive, Suite 325, San Diego, CA 92122 USA
Manufacturer	HUIZHOU QIAOXING ELECTRONICS TECHNOLOGY CO.,LTD
Manufacturer Add	Room 1906 of VIA Building, No.9966 Shennan Avenue, Yuehai Street in Nanshan District, Shenzhen

3. Test site information

Lab performing tests	SIEMIC (Shenzhen-China) LABORATORIES
Lab Address	Zone A, Floor 1, Building 2 Wan Ye Long Technology Park South Side of Zhoushi Road, Bao' an District, Shenzhen, Guangdong China 518108
FCC Test Site No.	718246
IC Test Site No.	4842E-1
Test Software	Radiated Emission Program-To Shenzhen v2.0

4. Equipment under Test (EUT) Information

Description of EUT:	Mobile Phone
Main Model:	s4512
Serial Model:	N/A
Date EUT received:	October 25,2015
Test Date(s):	October 26 to December 03, 2015
Equipment Category：	PCE
Antenna Gain:	GSM850: 1.9dBi PCS1900: 3.9dBi UMTS-FDD Band V: 1.9 dBi UMTS-FDD Band II: 3.9 dBi Bluetooth: 3.1dBi WIFI: 2.9dBi GPS: 1.9dBi
Type of Modulation:	GSM / GPRS: GMSK EGPRS: GMSK UMTS-FDD: QPSK, 16QAM 802.11b/g/n: DSSS, OFDM Bluetooth: GFSK, π /4DQPSK, 8DPSK GPS:BPSK
RF Operating Frequency (ies):	GSM850 TX: 824.2 ~ 848.8 MHz; RX: 869.2 ~ 893.8 MHz PCS1900 TX: 1850.2 ~ 1909.8 MHz; RX: 1930.2 ~ 1989.8 MHz UMTS-FDD Band V TX: 826.4 ~ 846.6 MHz; RX: 871.4 ~ 891.6 MHz UMTS-FDD Band II TX:1852.4 ~ 1907.6 MHz; RX: 1932.4 ~ 1987.6 MHz WIFI:802.11b/g/n(20M): 2412-2462 MHz Bluetooth: 2402-2480 MHz GPS RX:1575.42 MHz

Maximum Conducted AV Power to Antenna:	GSM850: 32.76dBm PCS1900: 31.27dBm UMTS-FDD Band V : 22.98dBm UMTS-FDD Band II : 23.36dBm
ERP/EIRP:	GSM850: 32.28dBm / ERP PCS1900: 32.62dBm / EIRP UMTS-FDD Band V : 22.54dBm / ERP UMTS-FDD Band II : 26.72dBm / EIRP
Number of Channels:	GSM 850: 124CH PCS1900: 299CH UMTS-FDD Band V : 102CH UMTS-FDD Band II : 277CH WIFI :802.11b/g/n(20M): 11CH Bluetooth: 79CH GPS:1CH
Port:	Power Port, Earphone Port, USB Port
Input Power:	Adapter: Model:STC-A515A-Z Input: AC 100-240V; 50/60Hz;300mA Output: DC5.0V;1500mA Battery: Model:Q450 Spec:DC3.8V,1800mAh,6.84Wh Limited charger voltage:4.35V
Trade Name :	verykool
GPRS/EGPRS Multi-slot class	8/10/12
FCC ID:	WA6S4512

5. Test Summary

The product was tested in accordance with the following specifications.

All testing has been performed according to below product classification:

FCC Rules	Description of Test	Result
§ 1.1307; § 2.1093	RF Exposure (SAR)	Compliance
§2.1046; § 22.913(a); § 24.232(c); § 27.50(c.10) ; § 27.50(d.4)	RF Output Power	Compliance
§ 24.232 (d) ; § 27.50(d)	Peak-Average Ratio	Compliance
§ 2.1047	Modulation Characteristics	N/A
§ 2.1049; § 22.905; § 22.917; § 24.238; § 27.53(a.5)	99% & -26 dB Occupied Bandwidth	Compliance
§ 2.1051; § 22.917(a); § 24.238(a); § 27.53(h)	Spurious Emissions at Antenna Terminal	Compliance
§ 2.1053; § 22.917(a); § 24.238(a); § 27.53(h)	Field Strength of Spurious Radiation	Compliance
§ 22.917(a); § 24.238(a); § 27.53(h)	Out of band emission, Band Edge	Compliance
§ 2.1055; § 22.355; § 24.235; § 27.5(h); § 27.54	Frequency stability vs. temperature Frequency stability vs. voltage	Compliance

Note: Testing was performed by configuring EUT to maximum output power status, the declared output power class for different

Measurement Uncertainty

Emissions		
Test Item	**Description**	**Uncertainty**
Band Edge and Radiated Spurious Emissions	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m)	+5.6dB/-4.5dB
-	-	-

6. MEASUREMENTS, EXAMINATION AND DERIVED RESULTS

6.1 RF Exposure (SAR)

Test Result: Pass

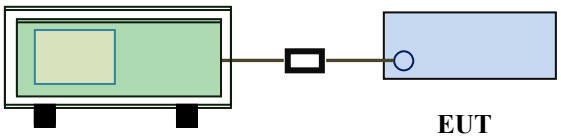
The EUT is a portable device, thus requires SAR evaluation;

Please refer to RF Exposure Evaluation Report: 15071014-FCC-H.

6.2 RF Output Power

Temperature	22℃
Relative Humidity	55%
Atmospheric Pressure	1013mbar
Test date :	November 13, 2015
Tested By :	Winnie Zhang

Requirement(s):

Spec	Item	Requirement	Applicable
§22.913 (a)	a)	ERP:38.45dBm	☑
§24.232 (c)	b)	EIRP:33dBm	☑
§27.50 (c)	c)	EIRP: 30dBm	☑
Test Setup			
Test Procedure	For Conducted Power: - The transmitter output port was connected to base station. - Set EUT at maximum power through base station. - Select lowest, middle, and highest channels for each band and different test mode. For ERP/EIRP: - The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable. - The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis. - The frequency range up to tenth harmonic of the fundamental frequency was investigated. - Remove the EUT and replace it with substitution antenna. A signal		

	generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution. - Spurious emissions in dB = 10 log (TX power in Watts/0.001) – the absolute level - Spurious attenuation limit in dB = 43 + 10 Log10 (power out in Watts.
Remark	
Result	☑ Pass ☐ Fail

Test Data ☑ Yes ☐ N/A

Test Plot ☐ Yes (See below) ☑ N/A

Conducted Power

GSM Mode:

Burst Average Power (dBm);								
Band	GSM850				PCS1900			
Channel	128	190	251	Tune up Power tolerant	512	661	810	Tune up Power tolerant
Frequency (MHz)	824.2	836.6	848.8	/	1850.2	1880	1909.8	/
GSM Voice (1 uplink),GMSK	32.51	32.69	**32.76**	32±1	30.99	30.71	**31.27**	31±1
GPRS Multi-Slot Class 8 (1 uplink),GMSK	32.49	32.67	32.75	32±1	30.97	30.69	31.24	31±1
GPRS Multi-Slot Class 10 (2 uplink) GMSK	30.93	31.08	31.11	31±1	28.79	28.95	29.11	29±1
GPRS Multi-Slot Class 12 (4 uplink) GMSK	27.06	27.15	27.19	29±1	25.16	25.34	25.47	25±1
EGPRS Multi-Slot Class 8 (1 uplink) GMSK MCS1	32.49	32.64	32.73	32±1	30.93	30.66	31.18	31±1
EGPRS Multi-Slot Class 10 (2 uplink) GMSK MCS1	30.9	31.04	31.12	31±1	28.81	28.93	29.07	29±1
EGPRS Multi-Slot Class 12 (4 uplink) GMSK MCS1	27.03	27.11	27.16	27±1	25.17	25.31	25.46	25±1
Remark : GPRS, CS1 coding scheme. EGPRS, MCS1 coding scheme. Multi-Slot Class 8 , Support Max 4 downlink, 1 uplink , 5 working link Multi-Slot Class 10 , Support Max 4 downlink, 2 uplink , 5 working link Multi-Slot Class 12 , Support Max 4 downlink, 4 uplink , 5 working link								

Note: Since GSM mode has higher power, so the test items below were not performed to GPRS and EGPRS mode.

UMTS Mode:

UMTS-FDD Band V

Band/ Time Slot configuration	Channel	Frequency	Average power (dBm)	Tune up Power tolerant
RMC 12.2kbps	4132	826.4	**22.98**	22±1
	4175	835	22.89	22±1
	4233	846.6	22.72	22±1
HSDPA Subtest1	4132	826.4	21.13	22±1
	4175	835	21.18	22±1
	4233	846.6	21.09	22±1
HSDPA Subtest2	4132	826.4	21.05	22±1
	4175	835	21.15	22±1
	4233	846.6	21.13	22±1
HSDPA Subtest3	4132	826.4	21.18	22±1
	4175	835	21.19	22±1
	4233	846.6	21.13	22±1
HSDPA Subtest4	4132	826.4	21.15	22±1
	4175	835	21.18	22±1
	4233	846.6	21.06	22±1
HSUPA Subtest1	4132	826.4	21.18	22±1
	4175	835	21.09	22±1
	4233	846.6	21.03	22±1
HSUPA Subtest2	4132	826.4	21.15	22±1
	4175	835	21.14	22±1
	4233	846.6	21.05	22±1
HSUPA Subtest3	4132	826.4	21.03	22±1
	4175	835	21.08	22±1
	4233	846.6	21.06	22±1
HSUPA Subtest4	4132	826.4	21.12	22±1
	4175	835	21.09	22±1
	4233	846.6	21.13	22±1
HSUPA Subtest5	4132	826.4	21.16	22±1
	4175	835	21.03	22±1
	4233	846.6	21.02	22±1

UMTS-FDD Band II

Band/ Time Slot configuration	Channel	Frequency	Average power (dBm)	Tune up Power tolerant
RMC 12.2kbps	9262	1852.4	23.13	23±1
	9400	1880	23.34	23±1
	9538	1907.6	**23.36**	23±1
HSDPA Subtest1	9262	1852.4	21.69	21.3±1
	9400	1880	21.78	21.3±1
	9538	1907.6	21.72	21.3±1
HSDPA Subtest2	9262	1852.4	21.75	21.3±1
	9400	1880	21.79	21.3±1
	9538	1907.6	21.75	21.3±1
HSDPA Subtest3	9262	1852.4	21.73	21.3±1
	9400	1880	21.76	21.3±1
	9538	1907.6	21.80	21.3±1
HSDPA Subtest4	9262	1852.4	21.79	21.3±1
	9400	1880	21.82	21.3±1
	9538	1907.6	21.83	21.3±1
HSUPA Subtest1	9262	1852.4	21.71	21.3±1
	9400	1880	21.79	21.3±1
	9538	1907.6	21.76	21.3±1
HSUPA Subtest2	9262	1852.4	21.77	21.3±1
	9400	1880	21.78	21.3±1
	9538	1907.6	21.84	21.3±1
HSUPA Subtest3	9262	1852.4	21.82	21.3±1
	9400	1880	21.79	21.3±1
	9538	1907.6	21.81	21.3±1
HSUPA Subtest4	9262	1852.4	21.78	21.3±1
	9400	1880	21.77	21.3±1
	9538	1907.6	21.73	21.3±1
HSUPA Subtest5	9262	1852.4	21.84	21.3±1
	9400	1880	21.75	21.3±1
	9538	1907.6	21.74	21.3±1

ERP & EIRP

ERP for Cellular Band (Part 22H)

Frequency (MHz)	Substituted level (dBm)	Antenna Polarization	Antenna Gain correction (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)
824.2	25.86	V	6.8	0.53	32.13	38.45
824.2	24.61	H	6.8	0.53	30.88	38.45
836.6	25.93	V	6.8	0.53	32.20	38.45
836.6	24.76	H	6.8	0.53	31.03	38.45
848.8	25.91	V	6.9	0.53	**32.28**	38.45
848.8	24.85	H	6.9	0.53	31.22	38.45

EIRP for PCS Band (Part 24E)

Frequency (MHz)	Substituted level (dBm)	Antenna Polarization	Antenna Gain correction (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)
1850.2	25.43	V	7.88	0.85	32.46	33
1850.2	24.79	H	7.88	0.85	31.82	33
1880	25.35	V	7.88	0.85	32.38	33
1880	24.86	H	7.88	0.85	31.89	33
1909.8	25.61	V	7.86	0.85	**32.62**	33
1909.8	24.92	H	7.86	0.85	31.93	33

ERP for UMTS-FDD Band V (Part 22H)

Frequency (MHz)	Substituted level (dBm)	Antenna Polarization	Antenna Gain correction (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)
826.4	16.23	V	6.8	0.53	22.50	38.45
826.4	15.48	H	6.8	0.53	21.75	38.45
835	16.21	V	6.8	0.53	22.48	38.45
835	15.45	H	6.8	0.53	21.72	38.45
846.6	16.17	V	6.9	0.53	**22.54**	38.45
846.6	15.39	H	6.9	0.53	21.76	38.45

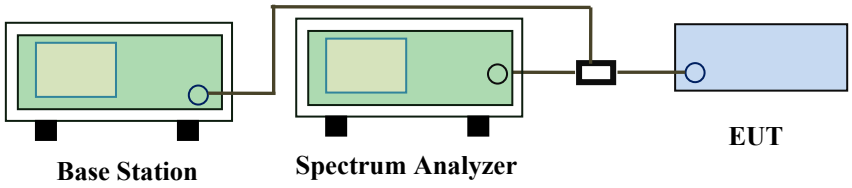
EIRP for UMTS-FDD Band II (Part 24E)

Frequency (MHz)	Substituted level (dBm)	Antenna Polarization	Antenna Gain correction (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)
1852.4	19.24	V	7.88	0.85	26.27	33
1852.4	18.59	H	7.88	0.85	25.62	33
1880	19.33	V	7.88	0.85	26.36	33
1880	18.65	H	7.88	0.85	25.68	33
1907.6	19.71	V	7.86	0.85	**26.72**	33
1907.6	18.68	H	7.86	0.85	25.69	33

6.3 Peak-Average Ratio

Temperature	25℃
Relative Humidity	58%
Atmospheric Pressure	1016mbar
Test date :	November 16, 2015
Tested By :	Winnie Zhang

Requirement(s):

Spec	Item	Requirement	Applicable
§24.232(d) § 27.50(d)	a)	The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.	☑
Test Setup			
Test Procedure	**According with KDB 971168** 1. The signal analyzer' s CCDF measurement profile is enabled 2. Frequency = carrier center frequency 3. Measurement BW > Emission bandwidth of signal 4. The signal analyzer was set to collect one million samples to generate the CCDF curve 5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal " RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the " on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power		
Remark			
Result	☑ Pass ☐ Fail		

Test Data ☑ Yes ☐ N/A

Test Plot ☐ Yes (See below) ☑ N/A

GSM 1900 PK-AV POWER(PART 24E)

Frequency (MHz)	Conducted power(dBm)		Peak-Average Ratio(PAR)
	Peak	Average	
1850.2	31.56	30.99	0.57
1880	31.68	30.71	0.97
1909.8	31.59	31.27	0.32

UMTS-FDD BandII PK-AV POWER(PART 24E)

Frequency (MHz)	Conducted power(dBm)		Peak-Average Ratio(PAR)
	Peak	Average	
1852.4	26.96	23.13	3.83
1880	26.79	23.34	3.45
1907.6	26.54	23.36	3.18

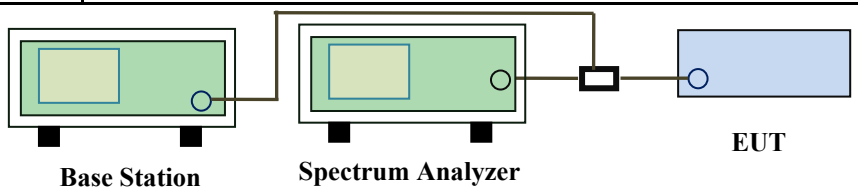
6.4 Modulation Characteristic

According to FCC § 2.1047(d), Part 22H, 24E there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

6.5 Occupied Bandwidth

Temperature	22℃
Relative Humidity	55%
Atmospheric Pressure	1013mbar
Test date :	November 13, 2015
Tested By :	Winnie Zhang

Requirement(s):

Spec	Item	Requirement	Applicable
§2.1049, §22.917, §22.905 §24.238 §27.53(a)	a)	99% Occupied Bandwidth(kHz)	☑
	b)	26 dB Bandwidth(kHz)	☑
Test Setup			
Test Procedure	- The EUT was connected to Spectrum Analyzer and Base Station via power divider. - The 99% and 26 dB occupied bandwidth (BW) of the middle channel for the highest RF powers.		
Remark			
Result	☑ Pass ☐ Fail		

Test Data ☑ Yes ☐ N/A

Test Plot ☑ Yes (See below) ☐ N/A

Cellular Band (Part 22H) result

Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
128	824.2	245.71	318.1
190	836.6	246.09	318.9
251	848.8	248.57	319.6

PCS Band (Part 24E) result

Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
512	1850.2	245.71	319.6
661	1880.0	245.05	314.3
810	1909.8	244.11	319.5

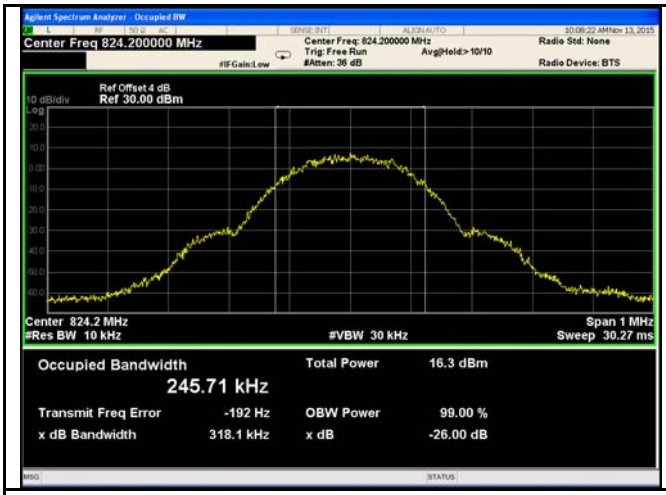
UMTS-FDD Band V (Part 22H)

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
4132	826.4	4.0795	4.676
4175	835.0	4.0939	4.643
4233	846.6	4.0559	4.641

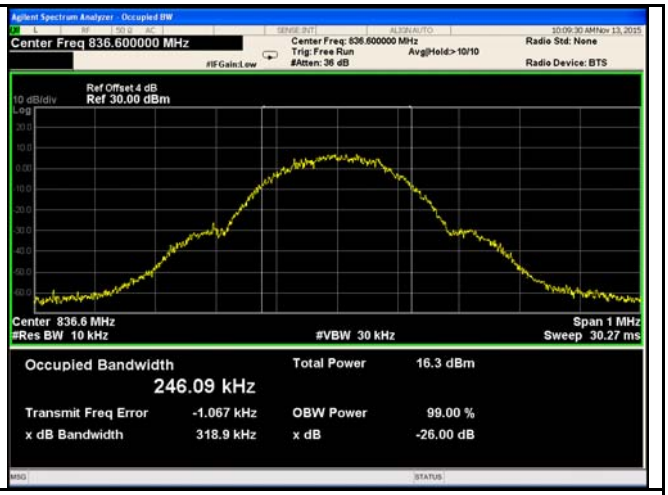
UMTS-FDD Band II (Part 24E)

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
9262	1852.4	4.0903	4.629
9400	1880.0	4.0933	4.652
9538	1907.6	4.0958	4.674

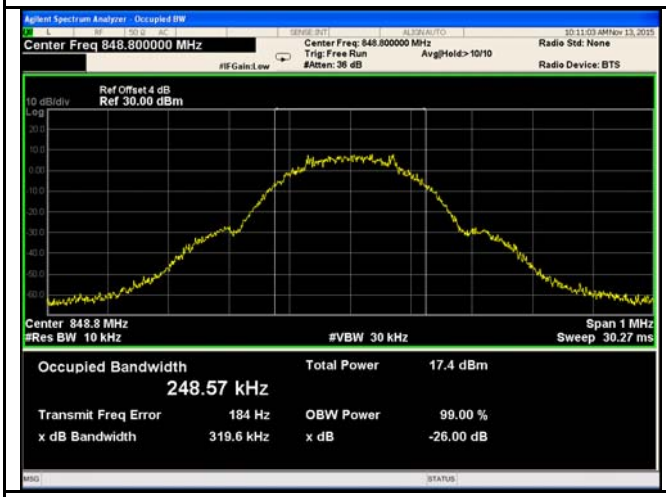
Test Plots



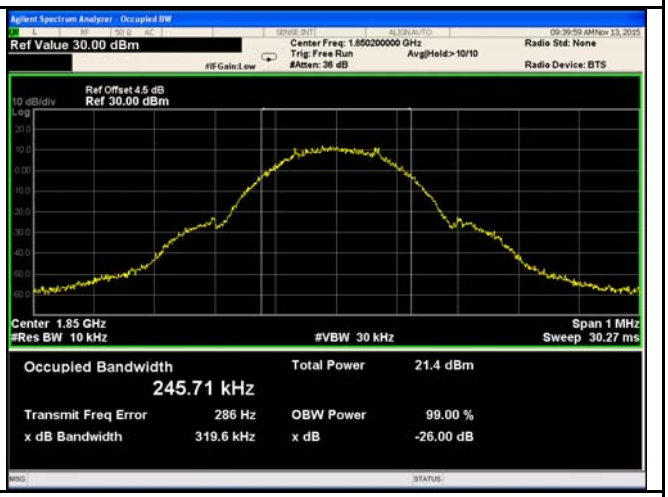
GSM 850 BW - Low CH 824.2MHz



GSM 850 BW - Mid CH 836.6MHz



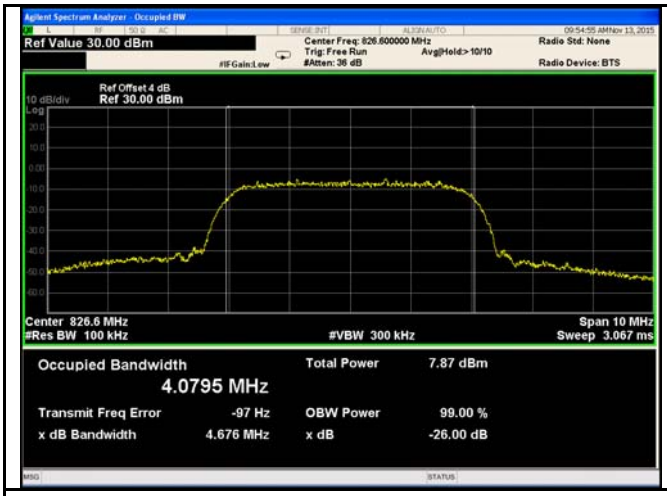
GSM 850 BW - High CH 848.8MHz



PCS 1900 BW - Low CH 1850.2MHz

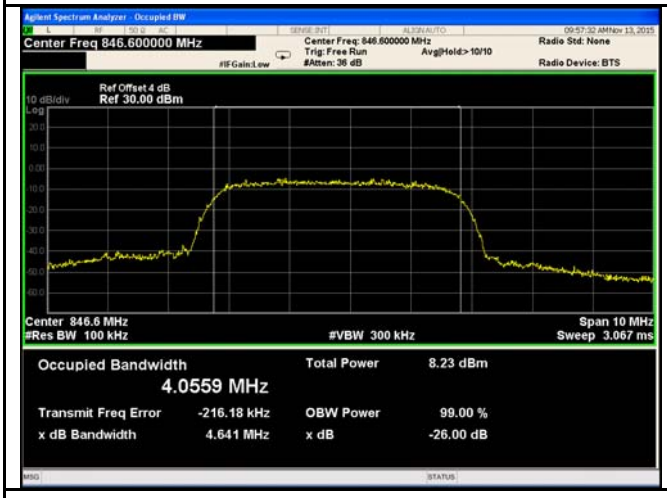
PCS 1900 BW - Mid CH 1880MHz

PCS 1900 BW - High CH 1909.8MHz

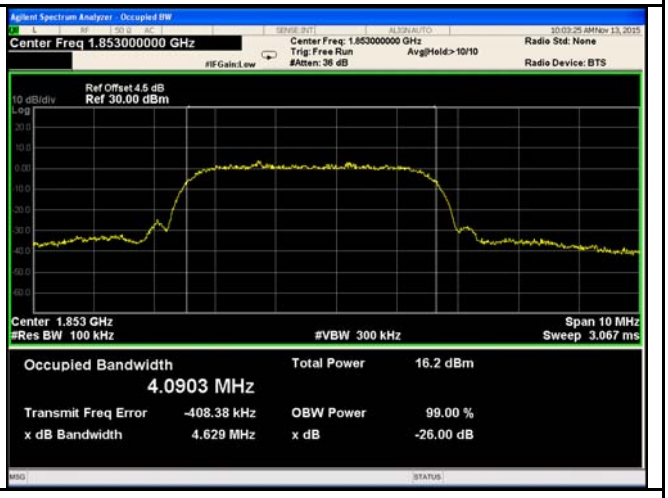


Band V BW - Low CH 826.6 MHz

Band V BW - Mid CH 835.0 MHz

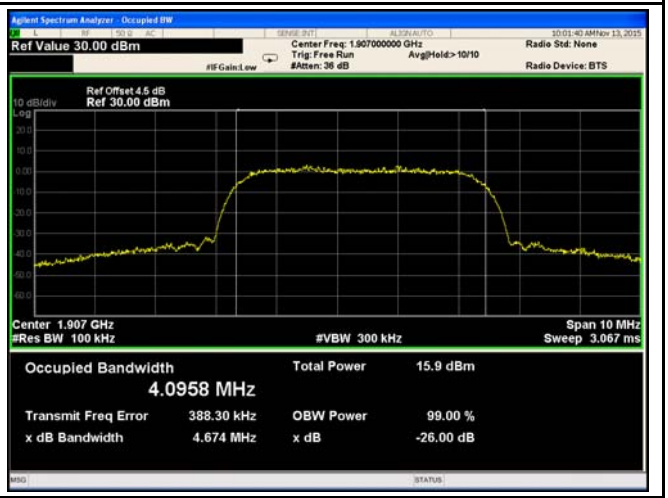


Band V BW - High CH 846.4 MHz



Band II BW - Low CH 1852.4MHz

Band II BW - Mid CH 1880MHz

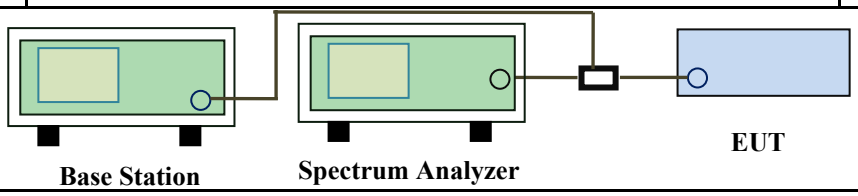


Band II BW - High CH 1907.6MHz

6.6 Spurious Emissions at Antenna Terminals

Temperature	22℃
Relative Humidity	55%
Atmospheric Pressure	1013mbar
Test date :	November 13, 2015
Tested By :	Winnie Zhang

Requirement(s):

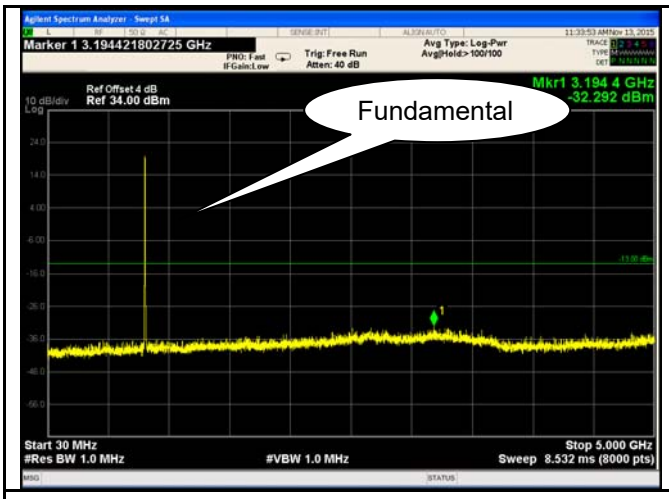
Spec	Item	Requirement	Applicable
§2.1051, §22.917(a)& §24.238(a) § 27.53(h)	a)	The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10 log (P) dB	☑
Test Setup			
Test Procedure	- The EUT was connected to Spectrum Analyzer and Base Station via power divider. - The Band Edges of low and high channels for the highest RF powers were measured. - Setting RBW as roughly BW/100.		
Remark			
Result	☑ Pass ☐ Fail		

Test Data ☑ Yes ☐ N/A

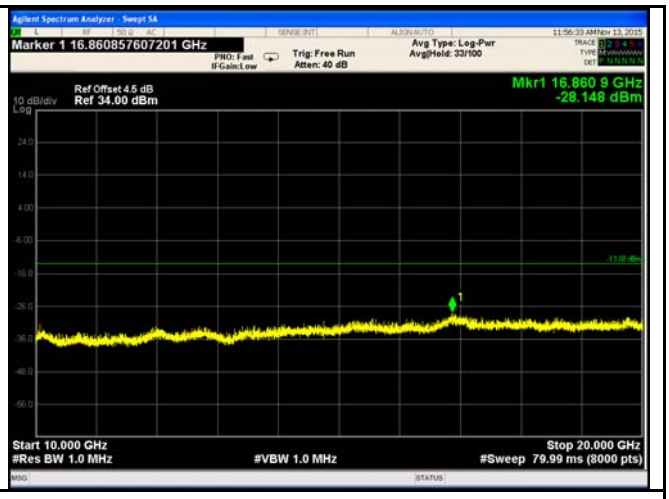
Test Plot ☑ Yes (See below) ☐ N/A

Test Plots

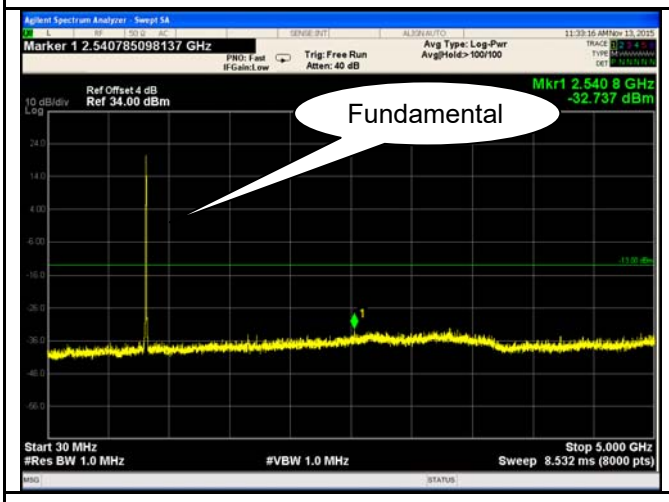
Cellular Band (Part 22H) result



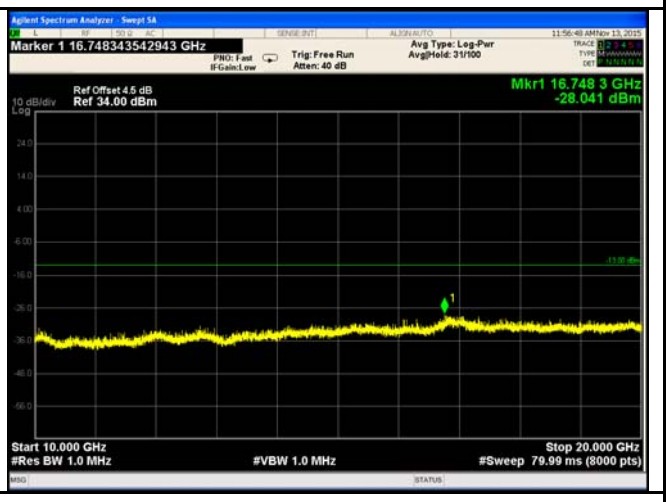
GSM 850 - Low Channel-1



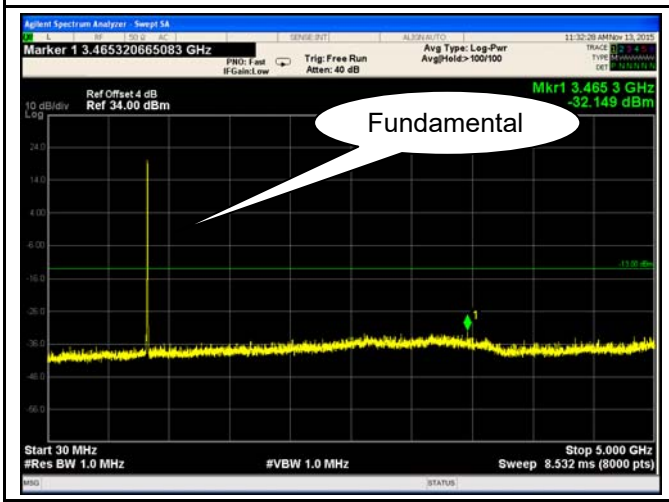
GSM 850 - Low Channel-2



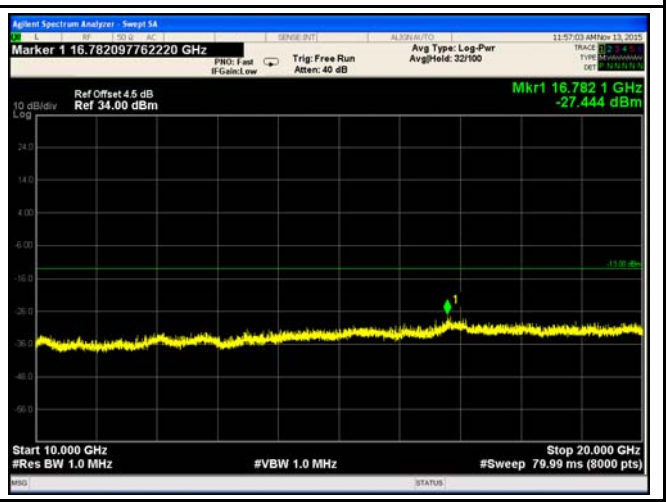
GSM 850 Middle Channel-1



GSM 850 Middle Channel-2

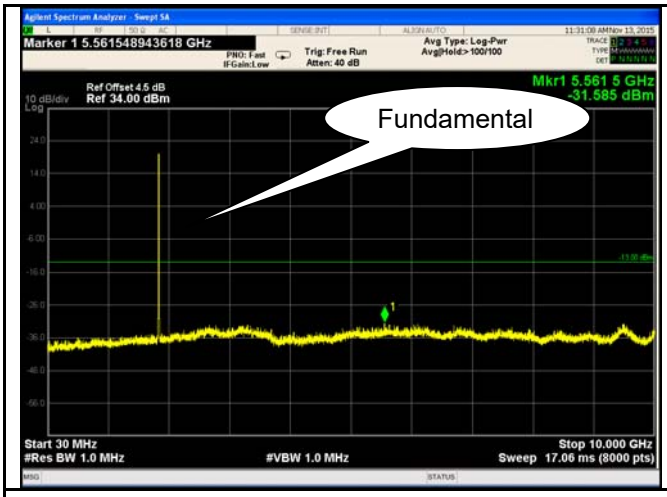


GSM 850 - High Channel-1

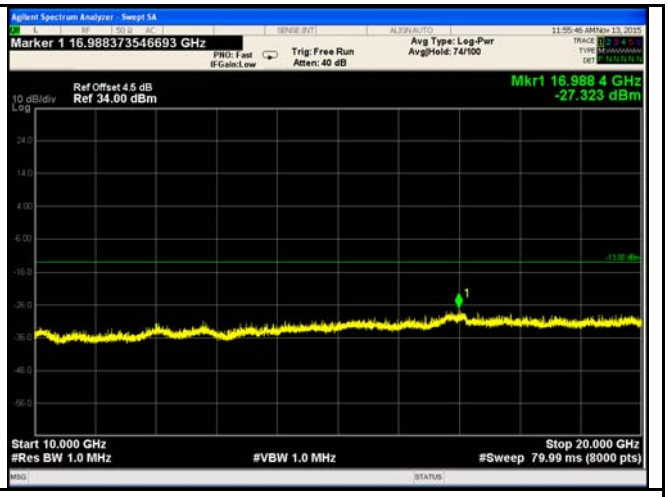


GSM 850 - High Channel-2

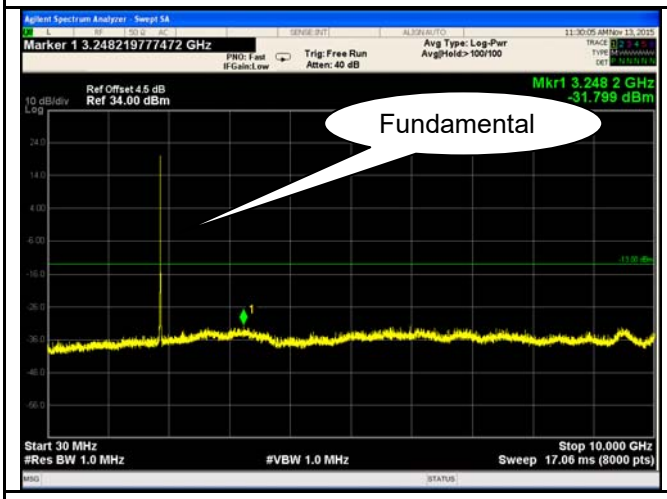
PCS Band (Part24E) result



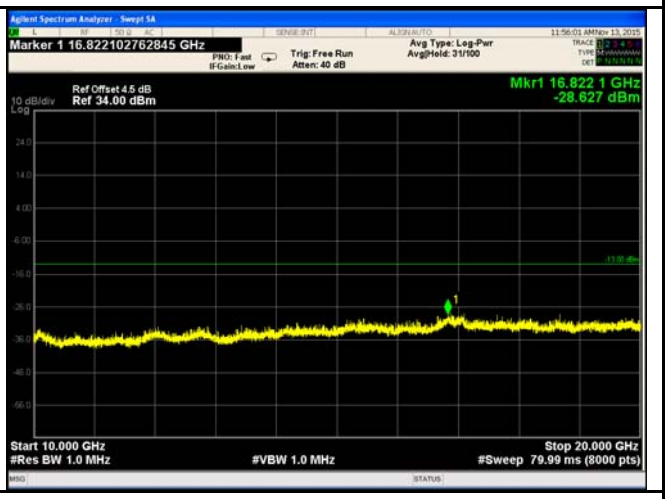
PCS1900 - Low Channel-1



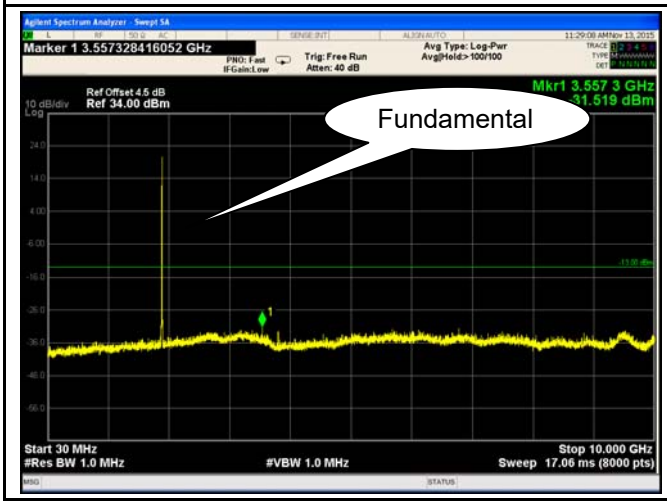
PCS 1900 - Low Channel-2



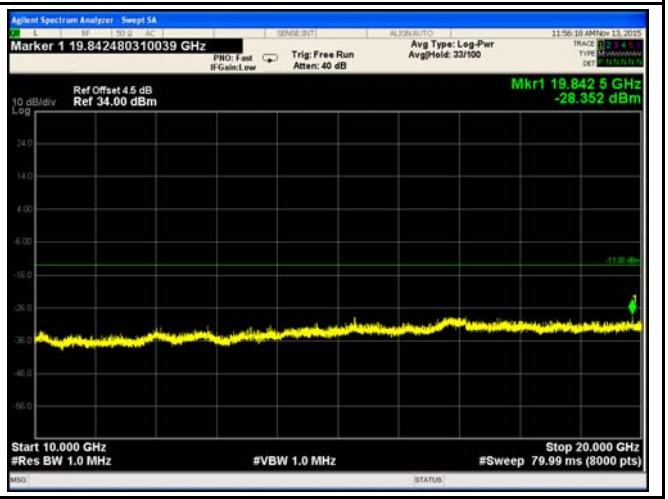
PCS1900 - Middle Channel-1



PCS 1900 - Middle Channel-2

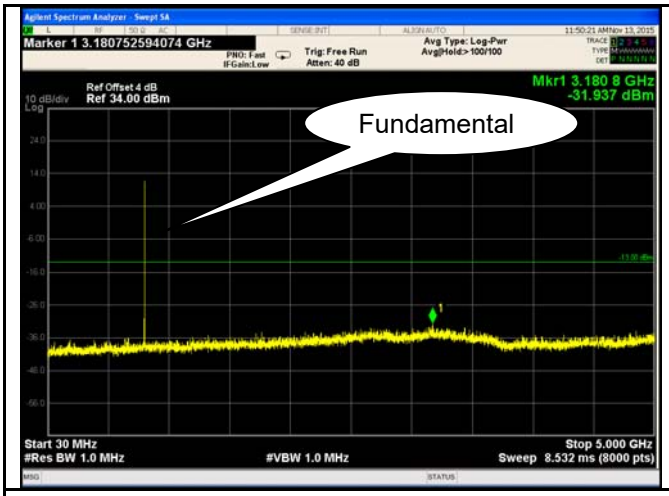


PCS1900 - High Channel-1

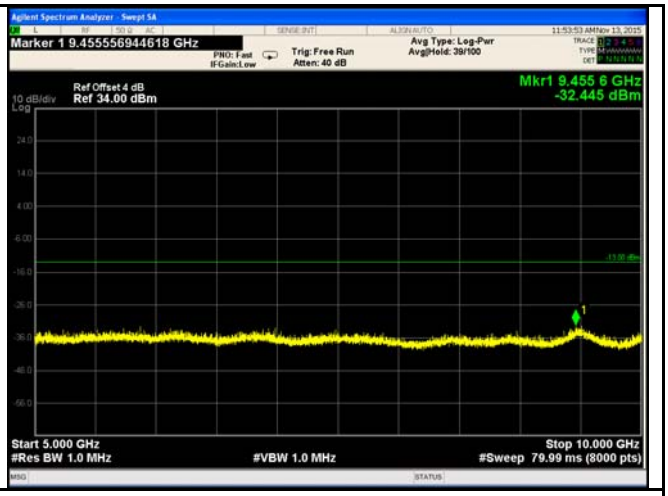


PCS 1900 - High Channel-2

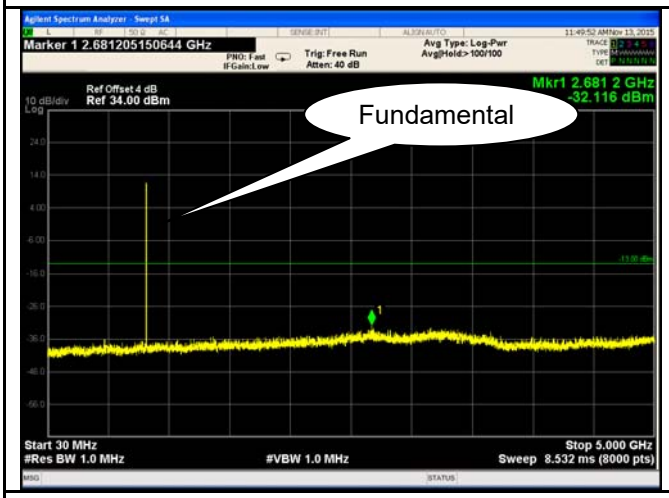
UMTS-FDD Band V (Part 22H)



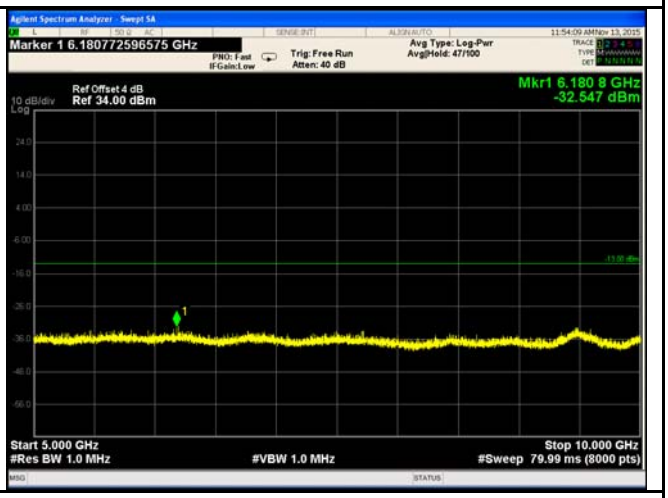
Band V - Low Channel-1



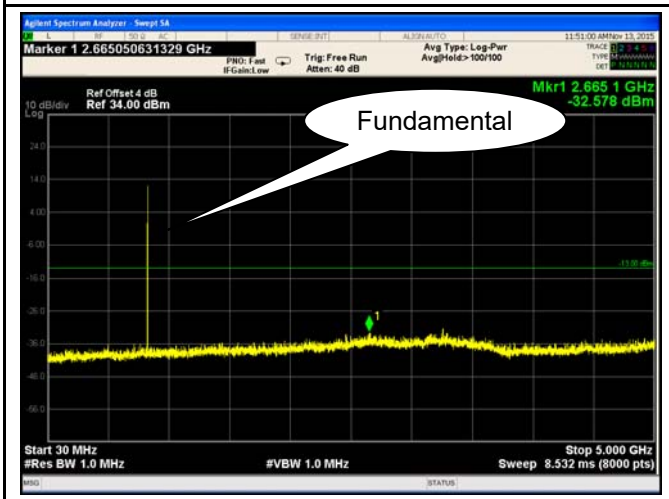
Band V - Low Channel-2



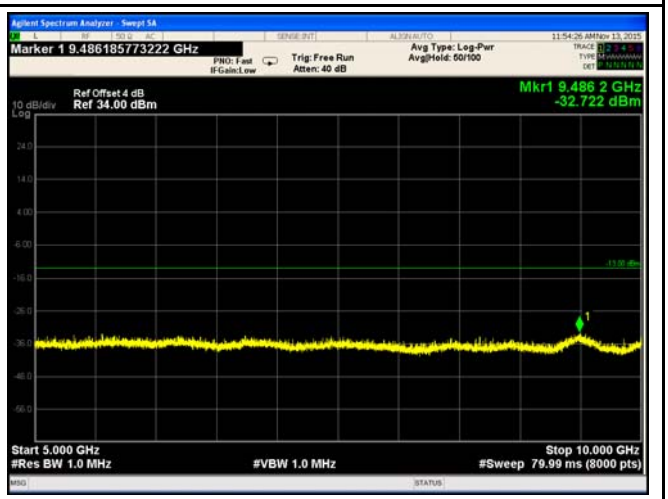
Band V - Middle Channel-1



Band V - Middle Channel-2

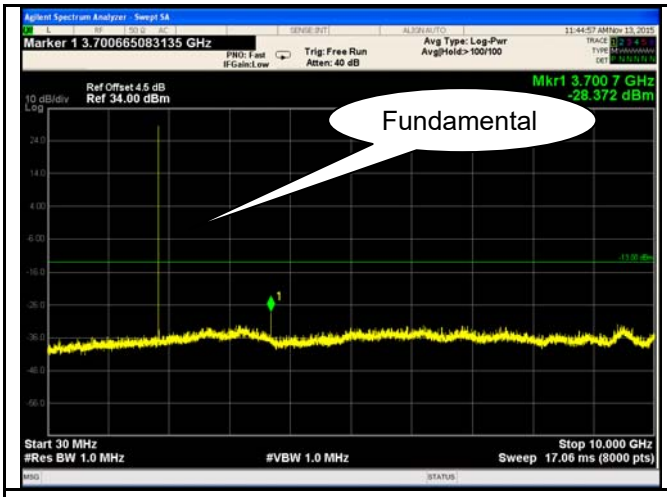


Band V - High Channel-1

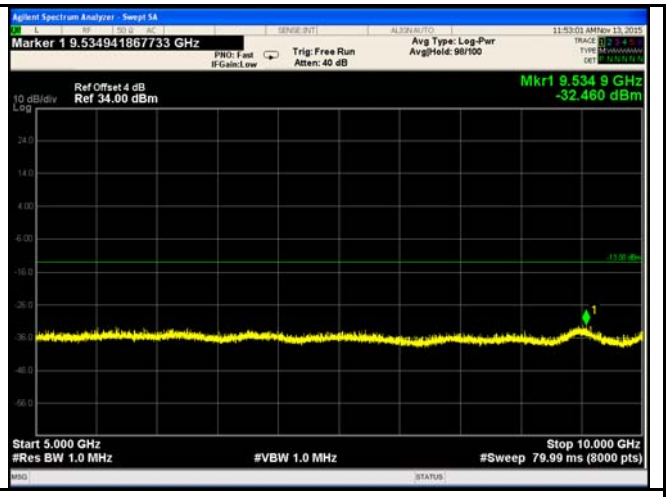


Band V - High Channel-2

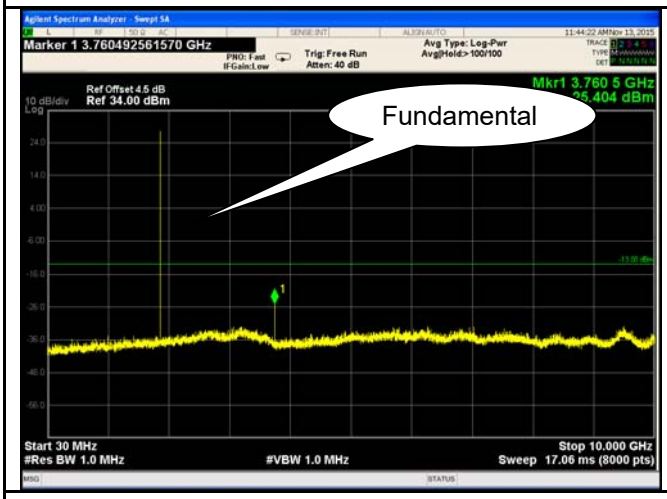
UMTS-FDD Band II (Part 24E)



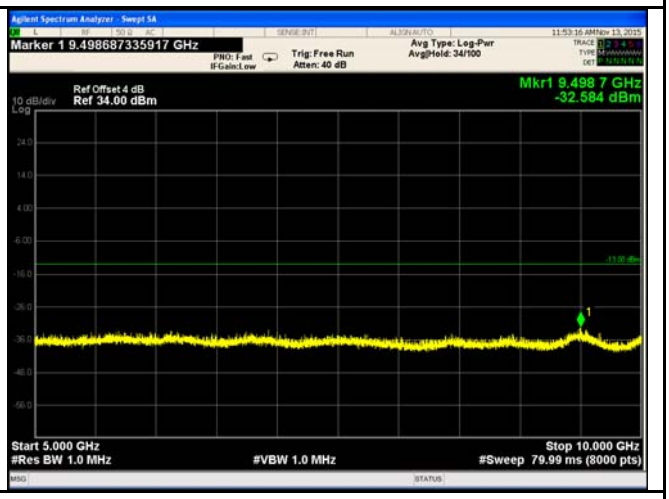
Band II - Low Channel-1



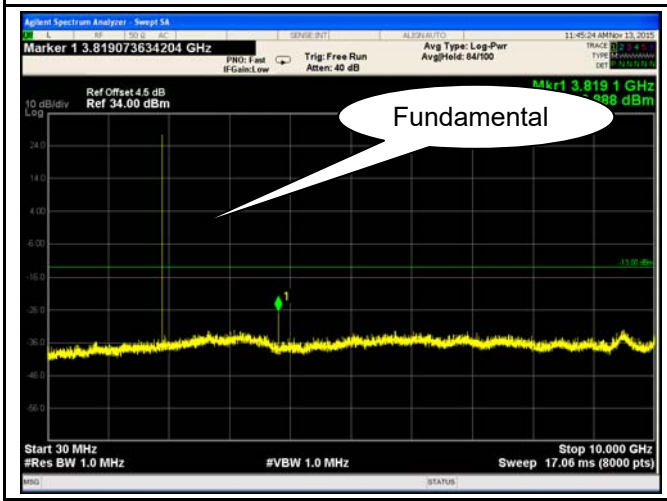
Band II - Low Channel-2



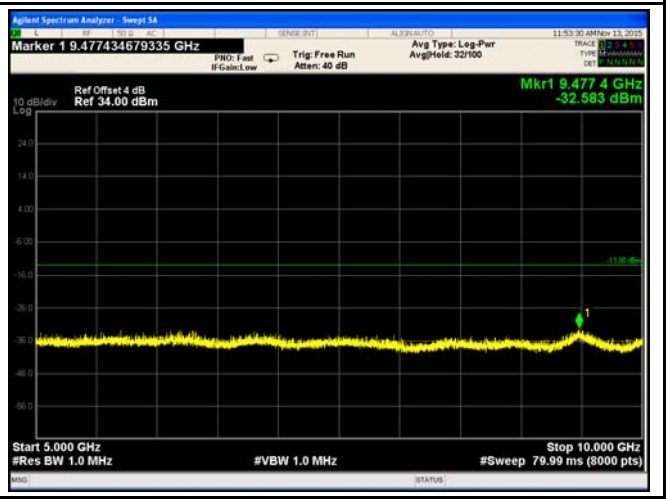
Band II - Middle Channel-1



Band II - Middle Channel-2



Band II - High Channel-1

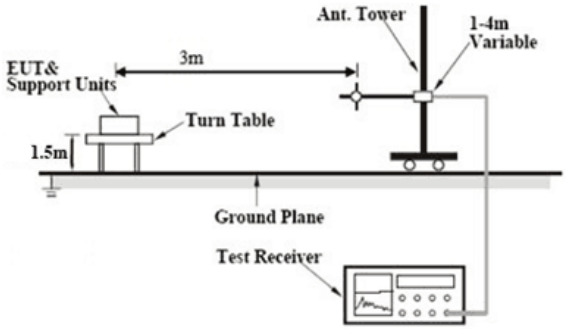


Band II - High Channel-2

6.7 Spurious Radiated Emissions

Temperature	25℃
Relative Humidity	58%
Atmospheric Pressure	1016mbar
Test date :	November 16, 2015
Tested By :	Winnie Zhang

Requirement(s):

Spec	Item	Requirement	Applicable
§2.1053, §22.917 & §24.238 § 27.53(h)	a)	The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.	☑
Test setup			
Test Procedure	1. The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable. 2. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis. 3. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution. Sample Calculation: EUT Field Strength = Raw Amplitude (dBμV/m) – Amplifier Gain (dB) + Antenna Factor (dB) + Cable Loss (dB) + Filter Attenuation (dB, if used)	
Remark			

Result	☑ Pass	☐ Fail

Test Data ☑ Yes ☐ N/A

Test Plot ☐ Yes (See below) ☑ N/A

Cellular Band (Part 22H) result

Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1648.4	-48.22	V	7.95	0.78	-41.05	-13	-28.05
1648.4	-49.67	H	7.95	0.78	-42.50	-13	-29.50
149.5	-48.29	V	1.1	0.19	-47.38	-13	-34.38
213.2	-53.91	H	6.3	0.2	-47.81	-13	-34.81

Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1673.2	-48.27	V	7.95	0.78	-41.10	-13	-28.10
1673.2	-49.53	H	7.95	0.78	-42.36	-13	-29.36
149.8	-48.13	V	1.1	0.19	-47.22	-13	-34.22
213.5	-53.86	H	6.3	0.2	-47.76	-13	-34.76

High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1697.6	-48.15	V	7.95	0.78	-40.98	-13	-27.98
1697.6	-49.49	H	7.95	0.78	-42.32	-13	-29.32
149.3	-48.12	V	1.1	0.19	-47.21	-13	-34.21
213.7	-53.96	H	6.3	0.2	-47.86	-13	-34.86

PCS Band (Part24E) result

Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3700.4	-49.35	V	10.25	2.73	-41.83	-13	-28.83
3700.4	-50.11	H	10.25	2.73	-42.59	-13	-29.59
148.5	-47.82	V	1.1	0.19	-46.91	-13	-33.91
214.9	-52.96	H	6.3	0.2	-46.86	-13	-33.86

Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3760	-49.42	V	10.25	2.73	-41.9	-13	-28.90
3760	-50.09	H	10.25	2.73	-42.57	-13	-29.57
148.2	-47.73	V	1.1	0.19	-46.82	-13	-33.82
214.6	-52.87	H	6.3	0.2	-46.77	-13	-33.77

High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3819.6	-49.53	V	10.36	2.73	-41.9	-13	-28.9
3819.6	-50.18	H	10.36	2.73	-42.55	-13	-29.55
148.3	-47.61	V	1.1	0.19	-46.70	-13	-33.70
214.2	-52.91	H	6.3	0.2	-46.81	-13	-33.81

UMTS-FDD Band V (Part 22H)

Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1652.8	-49.73	V	7.95	0.78	-42.56	-13	-29.56
1652.8	-50.38	H	7.95	0.78	-43.21	-13	-30.21
150.8	-48.11	V	1.1	0.19	-47.2	-13	-34.20
212.3	-53.87	H	6.3	0.2	-47.77	-13	-34.77

Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1670	-49.69	V	7.95	0.78	-42.52	-13	-29.52
1670	-50.26	H	7.95	0.78	-43.09	-13	-30.09
150.3	-48.25	V	1.1	0.19	-47.34	-13	-34.34
212.4	-53.91	H	6.3	0.2	-47.81	-13	-34.81

High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1693.2	-49.72	V	7.95	0.78	-42.55	-13	-29.55
1693.2	-50.18	H	7.95	0.78	-43.01	-13	-30.01
150.9	-48.06	V	1.1	0.19	-47.15	-13	-34.15
212.1	-53.75	H	6.3	0.2	-47.65	-13	-34.65

UMTS-FDD Band II (Part 24E)

Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3704.8	-50.39	V	10.25	2.73	-42.87	-13	-29.87
3704.8	-51.24	H	10.25	2.73	-43.72	-13	-30.72
147.5	-48.95	V	1.1	0.19	-48.04	-13	-35.04
215.9	-54.28	H	6.3	0.2	-48.18	-13	-35.18

Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3760	-50.41	V	10.25	2.73	-42.89	-13	-29.89
3760	-51.13	H	10.25	2.73	-43.61	-13	-30.61
147.3	-48.88	V	1.1	0.19	-47.97	-13	-34.97
215.8	-54.16	H	6.3	0.2	-48.06	-13	-35.06

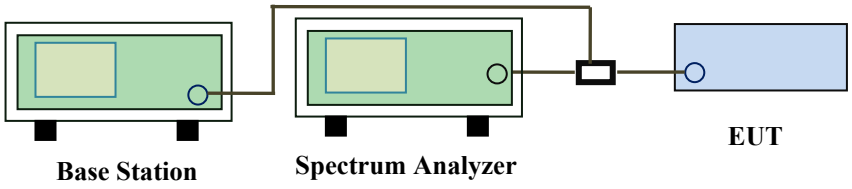
High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3815.2	-50.38	V	10.36	2.73	-42.75	-13	-29.75
3815.2	-51.25	H	10.36	2.73	-43.62	-13	-30.62
147.1	-48.71	V	1.1	0.19	-47.8	-13	-34.80
215.6	-54.29	H	6.3	0.2	-48.19	-13	-35.19

6.8 Band Edge

Temperature	22℃
Relative Humidity	55%
Atmospheric Pressure	1013mbar
Test date :	November 13, 2015
Tested By :	Winnie Zhang

Requirement(s):

Spec	Item	Requirement	Applicable
§22.917(a) §24.238(a) § 27.53(h)	a)	The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.	☑
Test setup			
Procedure	- The EUT was connected to Spectrum Analyzer and Base Station via power divider. - The Band Edges of low and high channels for the highest RF powers were measured. Setting RBW as roughly BW/100.		
Remark			
Result	☑ Pass ☐ Fail		

Test Data ☑ Yes ☐ N/A

Test Plot ☑ Yes (See below) ☐ N/A

Cellular Band (Part 22H)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
823.996	-15.925	-13
849.021	-16.252	-13

PCS Band (Part24E)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1849.997	-15.376	-13
1910.017	-17.361	-13

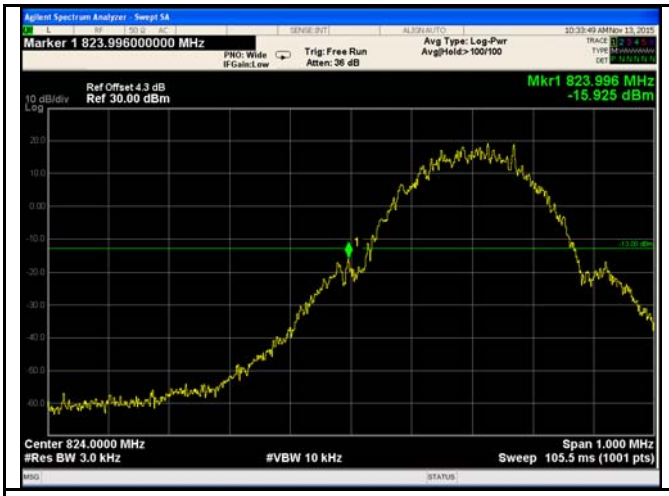
UMTS-FDD Band V (Part 22H)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
823.99	-24.048	-13
849.01	-25.497	-13

UMTS-FDD Band II (Part 24E)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1849.99	-19.866	-13
1910.27	-23.429	-13

Test Plots

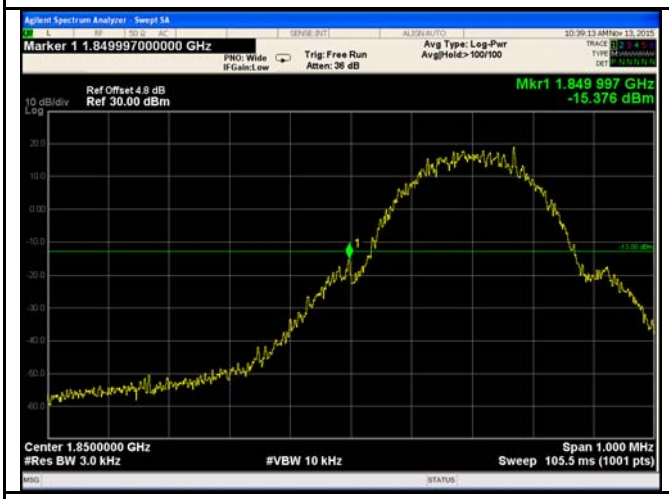


Cellular Band - Low Channel

Note: Offset=Cable loss (4.0) + 10log (3.18/3)=4.0+0.3=4.3dB

Cellular Band - High Channel

Note: Offset=Cable loss (4.0) + 10log (3.19/3)=4.0+0.3=4.3dB

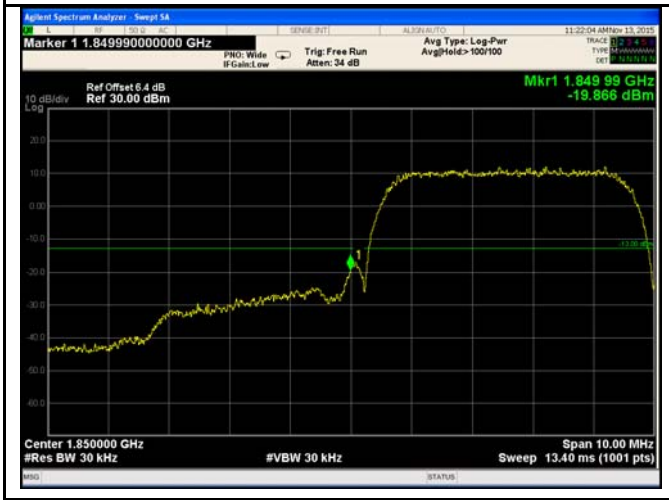


PCS Band - Low Channel

Note: Offset=Cable loss (4.5) + 10log (3.19/3)=4.5+0.3=4.8dB

PCS Band - High Channel

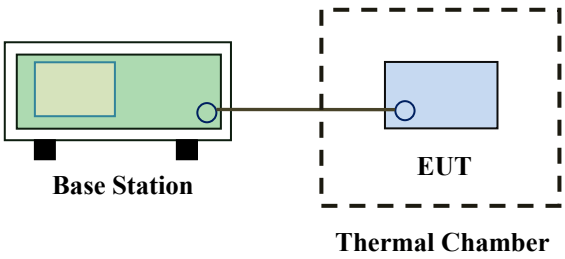
Note: Offset=Cable loss (4.5) + 10log (3.19/3)=4.5+0.3=4.8dB

	
UMTS-FDD Band V - Low Channel	UMTS-FDD Band V - High Channel
Note: Offset=Cable loss (4.0) + 10log (46.76/30)=4.0+1.9=5.9dB	Note: Offset=Cable loss (4.0) + 10log (46.41/30)=4.0+1.9=5.9dB
	
UMTS-FDD Band II - Low Channel	UMTS-FDD Band II - High Channel
Note: Offset=Cable loss (4.5) + 10log (46.29/30)=4.5+1.9=6.4dB	Note: Offset=Cable loss (4.5) + 10log (46.74/30)=4.5+1.9=6.4dB

6.9 Frequency Stability

Temperature	22℃
Relative Humidity	55%
Atmospheric Pressure	1013mbar
Test date :	November 13, 2015
Tested By :	Winnie Zhang

Requirement(s):

<table>
<tr><th>Spec</th><th>Item</th><th>Requirement</th><th>Applicable</th></tr>
<tr><td>§2.1055, §22.355 & §24.235 § 27.5(h); § 27.54</td><td>a)</td><td>According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table below:
Frequency Tolerance for Transmitters in the Public Mobile Services
<table>
<tr><th>Frequency Range (MHz)</th><th>Base, fixed (ppm)</th><th>Mobile ≤ 3 watts (ppm)</th><th>Mobile ≤ 3 watts (ppm)</th></tr>
<tr><td>25 to 50</td><td>20.0</td><td>20.0</td><td>50.0</td></tr>
<tr><td>50 to 450</td><td>5.0</td><td>5.0</td><td>50.0</td></tr>
<tr><td>45 to 512</td><td>2.5</td><td>5.0</td><td>.0</td></tr>
<tr><td>821 to 896</td><td>1.5</td><td>2.5</td><td>2.5</td></tr>
<tr><td>928 to 29.</td><td>5.0</td><td>N/A</td><td>N/A</td></tr>
<tr><td>929 to 960.</td><td>1.5</td><td>N/A</td><td>N/A</td></tr>
<tr><td>2110 to 2220</td><td>10.0</td><td>N/A</td><td>N/A</td></tr>
</table>
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized frequency block.</td><td>☑</td></tr>
<tr><td>Test setup</td><td colspan="3"> 
</td></tr>
</table>

Procedure	A communication link was established between EUT and base station. The frequency error was monitored and measured by base station under variation of ambient temperature and variation of primary supply voltage. Limit: The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5ppm) of the center frequency.
Remark	
Result	☑ Pass ☐ Fail

Test Data ☑ Yes ☐ N/A

Test Plot ☐ Yes (See below) ☑ N/A

Cellular Band (Part 22H) result

Middle Channel, f_o = 836.6 MHz				
Temperature (℃)	Power Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.7	-16	0.0191	2.5
0		-14	0.0167	2.5
10		-15	0.0179	2.5
20		-11	0.0131	2.5
30		-15	0.0179	2.5
40		-17	0.0203	2.5
50		-18	0.0215	2.5
55		-21	0.0251	2.5
25	4.2	-20	0.0239	2.5
	3.5	-19	0.0227	2.5

PCS Band (Part 24E) result

Middle Channel, f_o = 1880 MHz				
Temperature (℃)	Power Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.7	-24	0.0128	2.5
0		-20	0.0106	2.5
10		-16	0.0085	2.5
20		-10	0.0053	2.5
30		-14	0.0074	2.5
40		-18	0.0096	2.5
50		-17	0.0090	2.5
55		-21	0.0112	2.5
25	4.2	-21	0.0112	2.5
	3.5	-24	0.0128	2.5

UMTS-FDD Band V (Part 22H)

Middle Channel, f_o = 835 MHz				
Temperature (℃)	Power Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.7	15	0.0120	2.5
0		13	0.0072	2.5
10		8	0.0060	2.5
20		5	0.0036	2.5
30		6	0.0108	2.5
40		11	0.0096	2.5
50		13	0.0084	2.5
55		15	0.0072	2.5
25	4.2	11	0.0132	2.5
	3.5	13	0.0120	2.5

UMTS-FDD Band II (Part 24E)

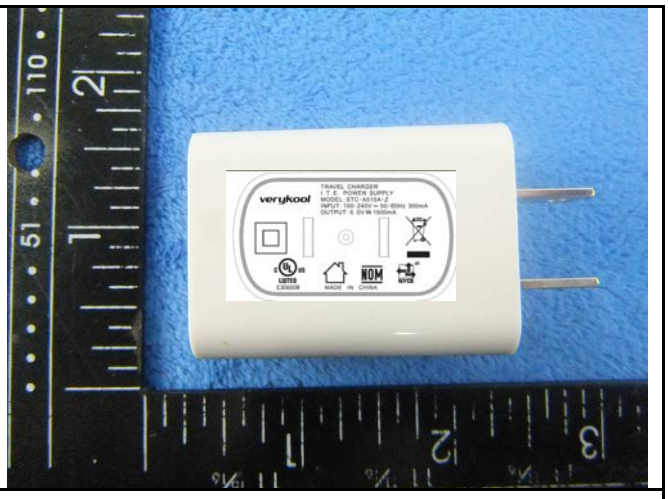
Middle Channel, f_o = 1880 MHz				
Temperature (℃)	Power Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.7	10	0.0016	2.5
0		8	0.0021	2.5
10		6	0.0011	2.5
20		4	0.0016	2.5
30		5	0.0027	2.5
40		7	0.0021	2.5
50		9	0.0032	2.5
55		11	0.0032	2.5
25	4.2	9	0.0037	2.5
	3.5	8	0.0043	2.5

Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Due	In use
RF Conducted Test					
Agilent ESA-E SERIES SPECTRUM ANALYZER	E4407B	MY45108319	09/16/2015	09/15/2016	☑
Power Splitter	1#	1#	09/01/2015	08/31/2016	☑
Universal Radio Communication Tester	CMU200	121393	09/25/2015	09/24/2016	☑
Temperature/Humidity Chamber	UHL-270	001	10/09/2015	10/08/2016	☑
DC Power Supply	E3640A	MY40004013	09/17/2015	09/16/2016	☑
Radiated Emissions					
EMI test receiver	ESL6	100262	09/17/2015	09/16/2016	☑
OPT 010 AMPLIFIER (0.1-1300MHz)	8447E	2727A02430	09/01/2015	08/31/2016	☑
Microwave Preamplifier (1 ~ 26.5GHz)	8449B	3008A02402	03/25/2015	03/24/2016	☑
Bilog Antenna (30MHz~6GHz)	JB6	A110712	09/21/2015	09/20/2016	☑
Bilog Antenna (30MHz~2GHz)	JB1	A112017	09/21/2015	09/20/2016	☑
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71259	09/24/2015	09/23/2016	☑
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71283	09/24/2015	09/23/2016	☑
SYNTHESIZED SIGNAL GENERATOR	8665B	3744A01293	09/17/2015	09/16/2016	☑
Tunable Notch Filter	3NF-800/1000-S	AA4	09/01/2015	08/31/2016	☑
Tunable Notch Filter	3NF-1000/2000-S	AM 4	09/01/2015	08/31/2016	☑

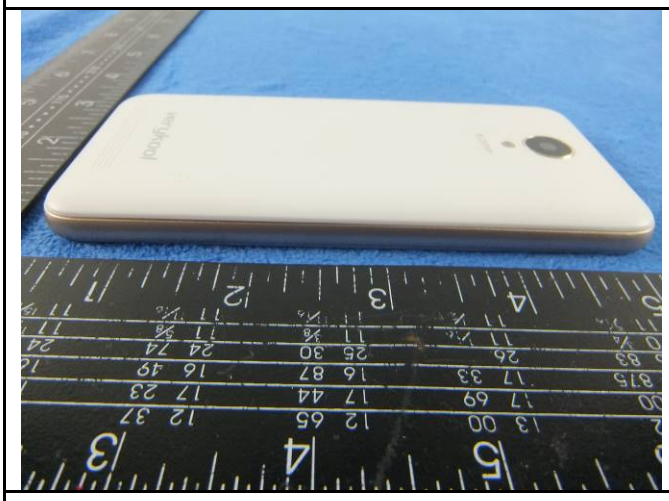
Annex B. EUT And Test Setup Photographs

Annex B.i. Photograph: EUT External Photo

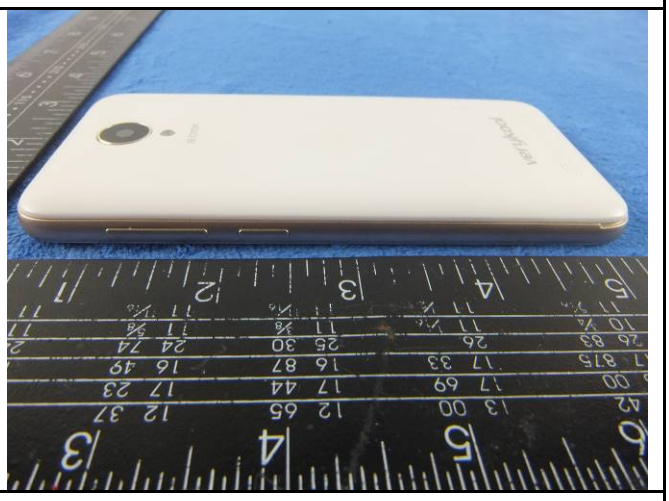
	
Whole Package - Top View	Adapter - Front View
	
EUT - Front View	EUT - Rear View

EUT - Top View

EUT - Bottom View



EUT - Left View



EUT - Right View

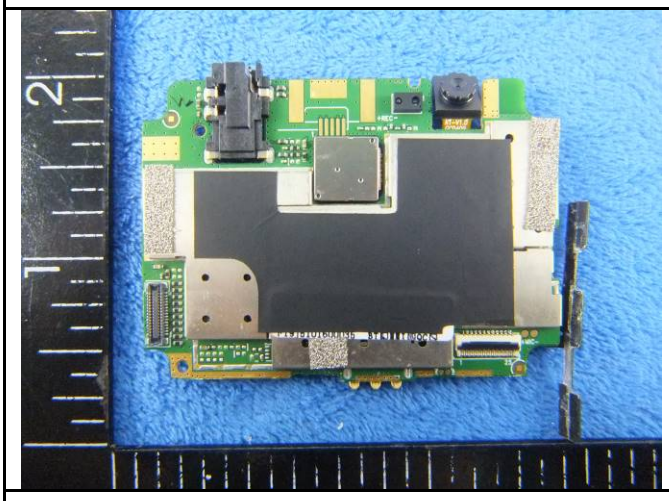
Annex B.ii. Photograph: EUT Internal Photo

Cover Off - Top View 1

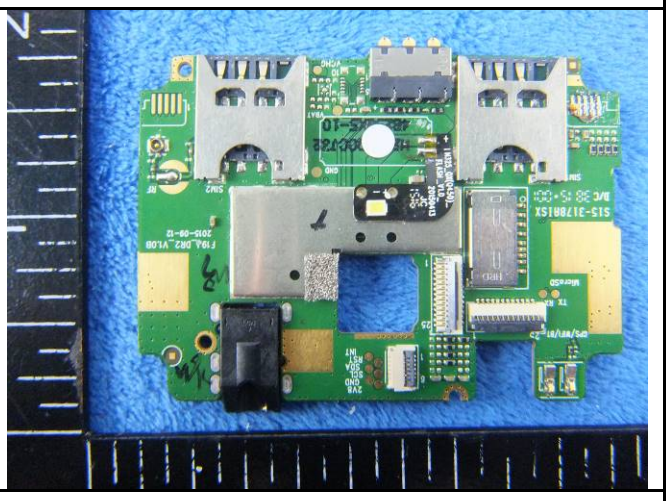
Cover Off - Top View 2

Battery - Top View

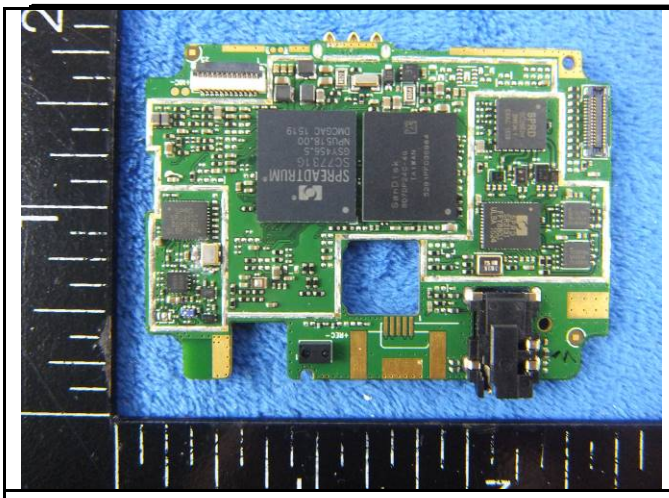
Battery - Bottom View



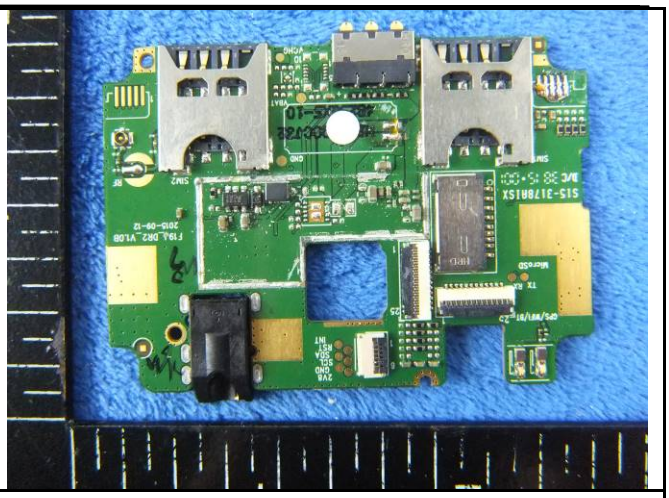
Mainborad With Shielding - Front View



Mainborad With Shielding - Rear View

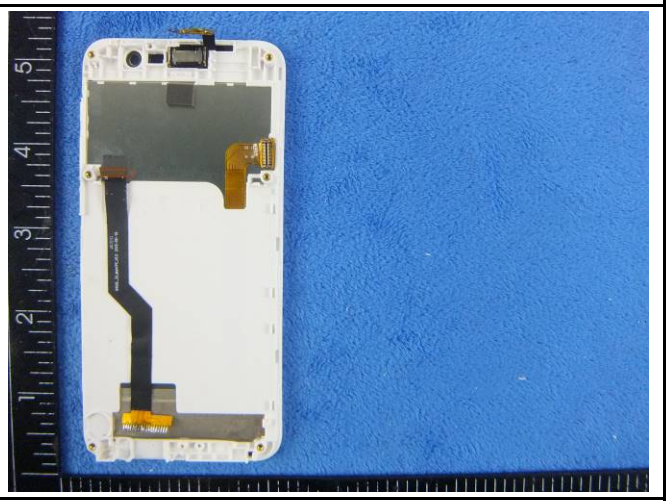


Mainborad Without Shielding - Front View

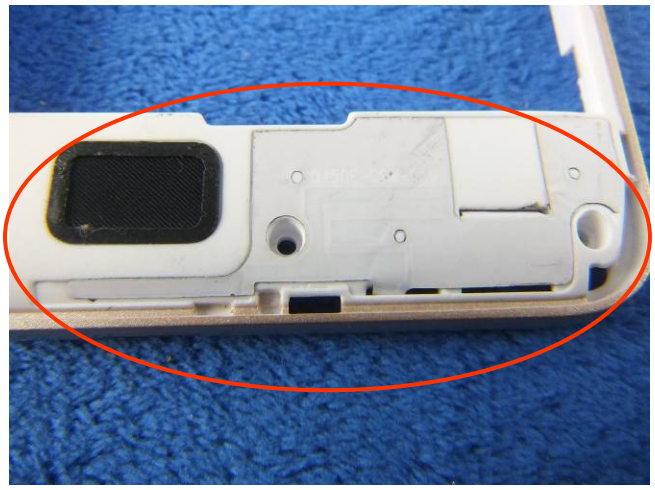


Mainborad Without Shielding - Rear View

LCD – Front View



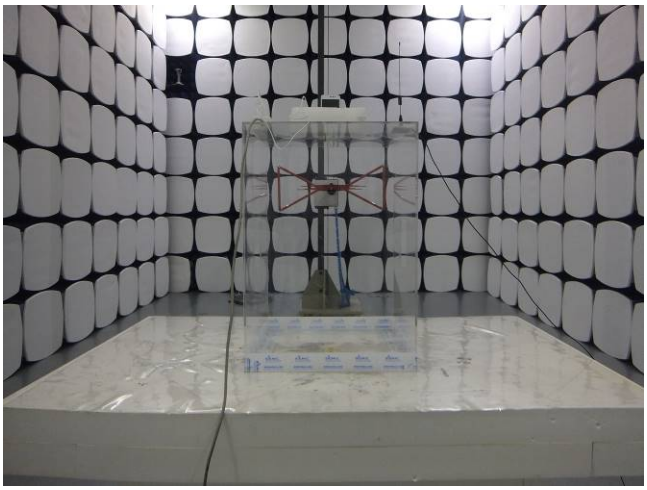
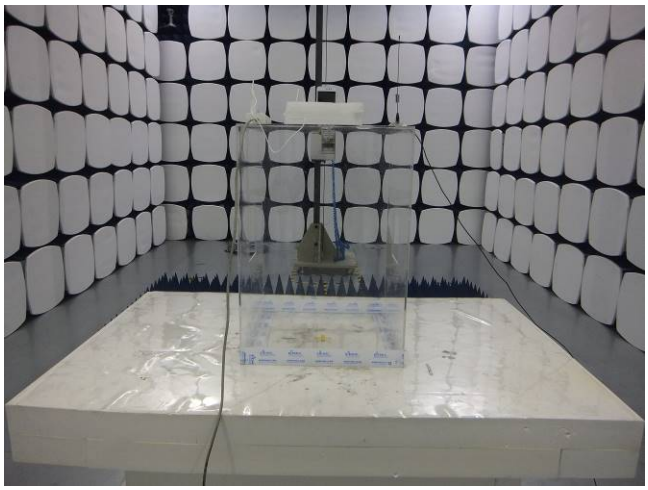
LCD – Rear View



GSM/PCS/UMTS-FDD Antenna View

WIFI/BT/GPS - Antenna View

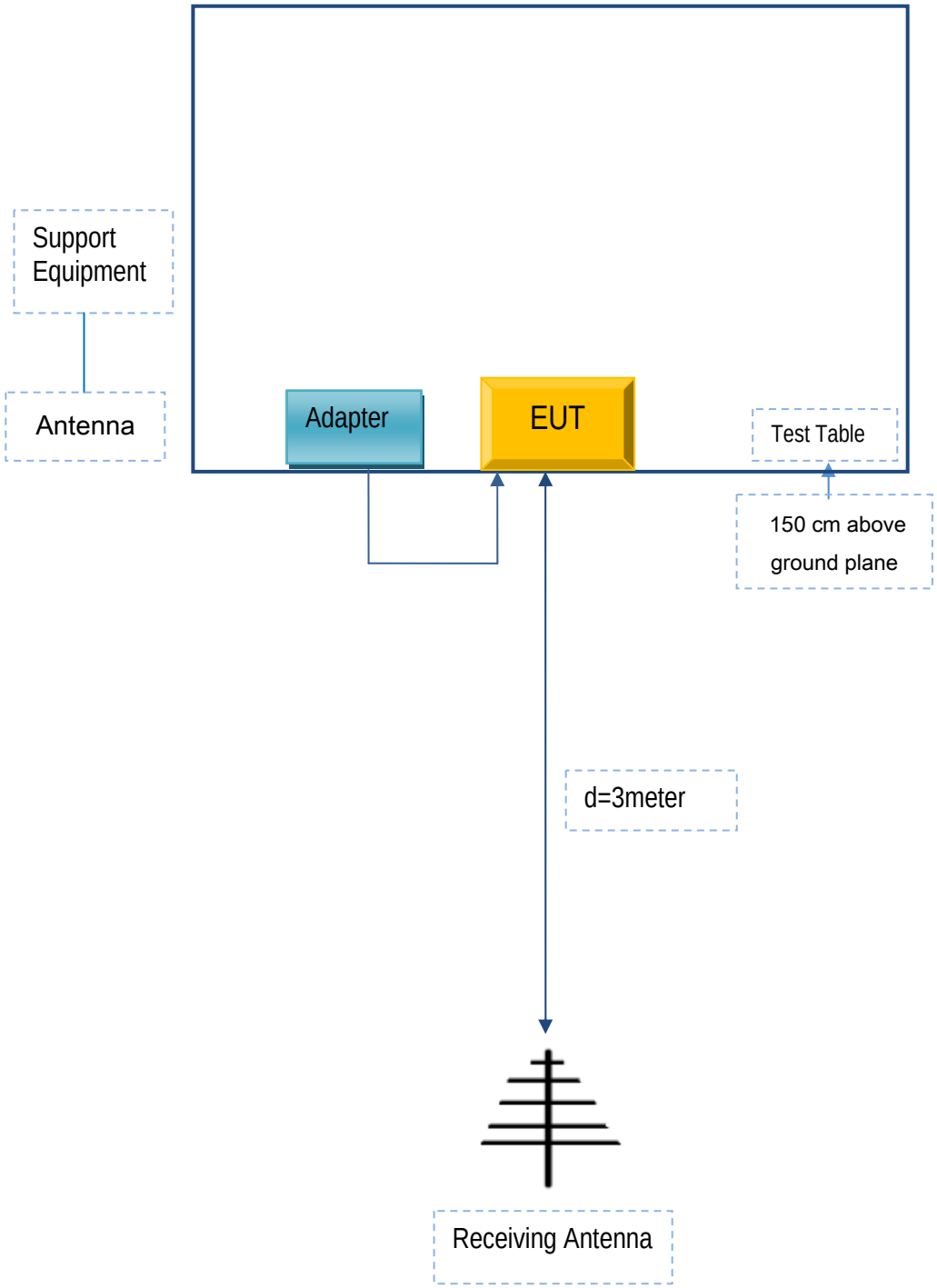
Annex B.iii. Photograph: Test Setup Photo

	
Radiated Spurious Emissions Test Setup Below 1GHz	Radiated Spurious Emissions Test Setup Above 1GHz

Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

Annex C.ii. TEST SET UP BLOCK

Block Configuration Diagram for Radiated Emissions



Annex C. il. SUPPORTING EQUIPMENT DESCRIPTION

The following is a description of supporting equipment and details of cables used with the EUT.

Manufacturer	Equipment Description	Model	Serial No	Calibration Date	Calibration Due Date
Verykool USA Inc	Adapter	STC-A515A-Z	CN13073925	N/A	N/A

Supporting Cable:

Cable type	Shield Type	Ferrite Core	Length	Serial No	Calibration Date	Calibration Due Date
USB Cable	Un-shielding	No	0.8m	MM15071366	N/A	N/A

Annex C.ii. EUT OPERATING CONKITIONS

N/A

Annex D. User Manual / Block Diagram / Schematics / Partlist

Please see attachment

Annex E. DECLARATION OF SIMILARITY

N/A