RF TEST REPORT



Report No.: 15070379-FCC-R1

Applicant	Verykool USA Inc		
Product Name	Mobile phone		
Model No.	R28		
Serial No.	N/A		
Took Otomdond	FCC Part 22(H), FCC Part 24(E), FCC Part 27: 2014; ANSI/TIAC603		
Test Standard	D: 2010		
Test Date	May 25 to June 15, 2015		
Issue Date	June 15, 2015		
Test Result	Pass Fail		
Equipment complied with the specification			
Equipment did not comply with the specification			
Winnie Zhang Chris You			
Winnie Zh	ang Chris You		
Test Engir	neer Checked By		
	<u> </u>		

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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.



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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
15070379-FCC-R1	NONE	Original	June 15, 2015

2. Customer information

Applicant Name	Verykool USA Inc
Applicant Add	3636 Nobel Drive, Suite 325, San Diego, CA 92122 USA
Manufacturer	MOBIWIRE MOBILES (NINGBO) CO.,LTD
Manufacturer Add	No.999,Dacheng East Road,Fenghua City,Zhejiang

3. Test site information

Lab performing tests	SIEMIC (Shenzhen-China) LABORATORIES
	Zone A, Floor 1, Building 2 Wan Ye Long Technology Park
Lab Address	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



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4. Equipment under Test (EUT) Information

Description of EUT: Mobile phone

Main Model: R28

Serial Model: N/A

Date EUT received: May 25, 2015

Test Date(s): May 25 to June 15, 2015

Equipment Category : PCE

Type of Modulation:

GSM850: 2.5dBi

PCS1900: 1.0dBi

UMTS-FDD Band V: 2.5dBi
Antenna Gain:

UMTS-FDD Band II: 1.0dBi

UMTS-FDD Band IV: 2.0dBi

Bluetooth: 2.0dBi

GSM / GPRS: GMSK

EGPRS: GMSK, 8PSK

UMTS-FDD: QPSK

Bluetooth: GFSK, π /4DQPSK, 8DPSK

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;

RF Operating Frequency (ies):

RX: 1932.4 ~ 1987.6 MHz

UMTS-FDD Band IV TX :1712.4 ~ 1752.6 MHz;

RX: 2112.4 ~ 2152.6 MHz

Bluetooth: 2402-2480 MHz



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GSM850: 32.37dBm

PCS1900: 30.25dBm

Maximum Conducted

AV Power to Antenna:

UMTS-FDD Band V : 23.49 dBm

UMTS-FDD Band II: 24.12dBm

UMTS-FDD Band IV: 24.09dBm

GSM850: 25.25dBm / EIRP

PCS1900: 23.00dBm / EIRP

ERP/EIRP: UMTS-FDD Band V : 22.00dBm / EIRP

UMTS-FDD Band II: 20.77dBm / EIRP UMTS-FDD Band IV: 19.35dBm / EIRP

GSM 850: 124CH PCS1900: 299CH

UMTS-FDD Band V : 102CH Number of Channels:

UMTS-FDD Band II: 277CH UMTS-FDD Band IV: 202CH

Bluetooth: 79CH

Port: Power Port, Earphone Port, USB Port

Battery:

Model: 178088746

Spec: 3.7V 1400mAh 5.18Wh

Input Power: Adapter:

Model: A31-500550

Input: 100-240V~ 50/60Hz 0.2A

Output: 5.0V 550mA

Trade Name : Verykool

GPRS/EGPRS Multi-slot class 8/10/12

FCC ID: WA6R28



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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);	DE Output Dower	Compliance	
§ 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	Compliance	
§ 2.1049; § 22.905; § 22.917;	000/ 9 26 dB Ossumind Bandwidth	Compliance	
§ 24.238; § 27.53(a.5)	99% & -26 dB Occupied Bandwidth	Compliance	
§ 2.1051; § 22.917(a);	Courier Conincione of Antonino Torrigol	Camplianas	
§ 24.238(a); § 27.53(h)	Spurious Emissions at Antenna Terminal	Compliance	
§ 2.1053; § 22.917(a);	Field Chromath of Countries Dedication	Camplianas	
§ 24.238(a); § 27.53(h)	Field Strength of Spurious Radiation	Compliance	
§ 22.917(a); § 24.238(a);	Out of hand aminaing Band Edge	Camplianas	
§ 27.53(h)	Out of band emission, Band Edge	Compliance	
§ 2.1055; § 22.355; § 24.235;	Frequency stability vs. temperature	Compliance	
§ 27.5(h); § 27.54	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		
-	-	-		



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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: 15070379-FCC-H.



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6.2 RF Output Power

Temperature	23°C
Relative Humidity	58%
Atmospheric Pressure	1004mbar
Test date :	June 04,2015
Tested By:	Winnie Zhang

Requirement(s):

Requirement(s):						
Spec	Item	Requirement Applicabl				
§22.913 (a)	a)	RP:38.45dBm				
§24.232 (c)	b)	IRP:33dBm				
§27.50 (c)	c)	EIRP: 30dBm	~			
Test Setup	EUT Base Station					
Test Procedure	-	The transmitter output port was connected to base state Set EUT at maximum power through base station. Select lowest, middle, and highest channels for each to different test mode. For ERP/EIRP: The transmitter was placed on a wooden turntable, and transmitting into a non-radiating load which was also plate turntable. The measurement antenna was placed at a distance of from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in ord the maximum level of emissions from the EUT. The test performed by placing the EUT on 3-orthogonal axis. The frequency range up to tenth harmonic of the fundating frequency was investigated.	d it was laced on the f 3 meters ler to identify st was			



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	- 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			
Test Data Yes	N/A			
Test Plot Yes	(See below) N/A			



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Conducted Power

GSM Mode:

Burst Average Power (dBm);									
Band		GSM850				GSM1900			
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	1	
GSM Voice (1 uplink),GMSK	32.37	32.34	32.33	32±1	30.25	30.18	30.05	30±1	
GPRS Multi-Slot Class 8 (1 uplink),GMSK	32.35	32.33	32.31	32±1	30.23	30.14	30.03	30±1	
GPRS Multi-Slot Class 10 (2 uplink) GMSK	31.49	31.44	31.41	31±1	29.3	29.19	29.14	29±2	
GPRS Multi-Slot Class 12 (4 uplink) GMSK (4 uplink),GMSK	29.16	29.08	29.03	29±1	26.75	26.61	26.53	26±1	
EGPRS Multi-Slot Class 8 (1 uplink) 8PSK MCS5	32.33	32.32	32.27	32±1	30.21	30.13	30.01	30±1	
EGPRS Multi-Slot Class 10 (2 uplink) 8PSK MCS5	31.48	31.42	31.4	31±1	29.26	29.16	29.13	29±1	
EGPRS Multi-Slot Class 12 (4 uplink) 8PSK MCS5	29.07	28.94	28.89	29±1	27.43	27.21	27.09	27±1	

Remark:

GPRS, CS1 coding scheme.

EGPRS, MCS5 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.



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UMTS Mode:

UMTS-FDD Band V

Band/ Time Slot	Channel	Frequency	Average power
configuration	Charine	rrequericy	(dBm)
RMC	4132	826.4	23.45
12.2kbps	4175	835.0	23.39
12.28005	4233	846.6	23.37
ЦСППА	4132	826.4	23.47
HSDPA Subtest1	4175	835.0	23.36
Sublest I	4233	846.6	23.38
HCDDA	4132	826.4	23.41
HSDPA Subtest2	4175	835.0	23.34
Sublesiz	4233	846.6	23.31
HCDDA	4132	826.4	23.42
HSDPA Subtest3	4175	835.0	23.38
Sublesis	4233	846.6	23.34
HCDDA	4132	826.4	23.49
HSDPA Subtest4	4175	835.0	23.36
Sublesi4	4233	846.6	23.33
LICLIDA	4132	826.4	23.48
HSUPA Subtest1	4175	835.0	23.32
Sublest I	4233	846.6	23.31
LICLIDA	4132	826.4	23.45
HSUPA Subtest2	4175	835.0	23.34
Sublesiz	4233	846.6	23.37
LICLIDA	4132	826.4	23.44
HSUPA Subtest3	4175	835.0	23.29
Sublesis	4233	846.6	23.34
HCLIDA	4132	826.4	23.42
HSUPA	4175	835.0	23.37
Subtest4	4233	846.6	23.32
HOUBA	4132	826.4	23.35
HSUPA Subtoat5	4175	835.0	23.30
Subtest5	4233	846.6	23.28



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UMTS-FDD Band II

Band/ Time Slot configuration	Channel	Frequency	Average power (dBm)
D140	9262	1852.4	24.07
RMC	9400	1880.0	24.01
12.2kbps	9538	9538 1907.6	
HODDA	9262	1852.4	23.99
HSDPA	9400	1880.0	24.02
Subtest1	9538	1907.6	24.07
LIODDA	9262	1852.4	24.05
HSDPA Subtost?	9400	1880.0	24.04
Subtest2	9538	1907.6	23.96
HODDA	9262	1852.4	24.05
HSDPA	9400	1880.0	23.96
Subtest3	9538	1907.6	24.06
HODDA	9262	1852.4	24.12
HSDPA	9400	1880.0	23.94
Subtest4	9538	1907.6	24.12
HOURA	9262	1852.4	23.93
HSUPA	9400	1880.0	23.85
Subtest1	9538	1907.6	24.04
HOURA	9262	1852.4	23.84
HSUPA	9400	1880.0	24.03
Subtest2	9538	1907.6	23.79
HOURA	9262	1852.4	24.04
HSUPA	9400	1880.0	24.09
Subtest3	9538	1907.6	23.99
LIQUEA	9262	1852.4	23.86
HSUPA	9400	1880.0	23.97
Subtest4	9538	1907.6	23.91
1101124	9262	1852.4	24.11
HSUPA	9400	1880.0	24.09
Subtest5	9538	1907.6	23.96



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UMTS-FDD Band IV

Band/ Time Slot configuration	Channel	Frequency	Average power (dBm)
D140	1313	1712.6	23.97
RMC	1413	1732.6	23.87
12.2kbps	1512	1752.4	23.94
LICDDA	1313	1712.6	23.87
HSDPA Subtest1	1413	1732.6	23.68
Sublest	1512	1752.4	23.74
LICDDA	1313	1712.6	23.85
HSDPA Subtest2	1413	1732.6	23.94
Sublesiz	1512	1752.4	23.86
LICDDA	1313	1712.6	24.05
HSDPA Subtest3	1413	1732.6	23.76
Sublesis	1512	1752.4	24.06
LICDDA	1313	1712.6	24.12
HSDPA Subtest4	1413	1732.6	23.84
Sublesi4	1512	1752.4	24.21
LICLIDA	1313	1712.6	23.93
HSUPA Subtest1	1413	1732.6	23.85
Sublest	1512	1752.4	22.04
LICLIDA	1313	1712.6	23.74
HSUPA Subtest2	1413	1732.6	24.03
Sublesiz	1512	1752.4	23.79
LICLIDA	1313	1712.6	23.4
HSUPA Subtest3	1413	1732.6	24.09
Sublesis	1512	1752.4	23.99
Heliby	1313	1712.6	23.86
HSUPA Subtest4	1413	1732.6	23.97
วนมเ ย ่งเ4	1512	1752.4	23.91
<u> ПСПВА</u>	1313	1712.6	23.69
HSUPA Subtest5	1413	1732.6	23.59
Jubicala	1512	1752.4	23.76



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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	18.75	V	6.8	0.53	25.02	38.45
824.2	16.21	Н	6.8	0.53	22.48	38.45
836.6	18.93	V	6.8	0.53	25.2	38.45
836.6	16.37	Н	6.8	0.53	22.64	38.45
848.8	18.88	V	6.9	0.53	25.25	38.45
848.8	16.45	Н	6.9	0.53	22.82	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	15.97	V	7.88	0.85	23	33
1850.2	14.52	Н	7.88	0.85	21.55	33
1880	15.84	V	7.88	0.85	22.87	33
1880	14.45	Н	7.88	0.85	21.48	33
1909.8	15.77	V	7.86	0.85	22.78	33
1909.8	14.39	Н	7.86	0.85	21.4	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	15.73	V	6.8	0.53	22	38.45
826.4	14.52	Н	6.8	0.53	20.79	38.45
835	15.68	V	6.8	0.53	21.95	38.45
835	14.43	Н	6.8	0.53	20.7	38.45
846.6	15.59	V	6.9	0.53	21.96	38.45
846.6	14.35	Н	6.9	0.53	20.72	38.45



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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	13.74	V	7.88	0.85	20.77	33
1852.4	12.18	Н	7.88	0.85	19.21	33
1880	13.59	V	7.88	0.85	20.62	33
1880	12.05	Н	7.88	0.85	19.08	33
1907.6	13.61	V	7.86	0.85	20.62	33
1907.6	12.25	Н	7.86	0.85	19.26	33

EIRP for UMTS-FDD Band IV (Part 27)

Frequency (MHz)	Substituted level (dBm)	Antenna Polarization	Antenna Gain correction (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)
1712.4	12.41	V	7.76	0.82	19.35	30
1712.4	11.25	Н	7.76	0.82	18.19	30
1740	12.37	V	7.76	0.82	19.31	30
1740	11.19	Н	7.76	0.82	18.13	30
1752.6	12.31	V	7.74	0.82	19.23	30
1752.6	11.08	Н	7.74	0.82	18	30

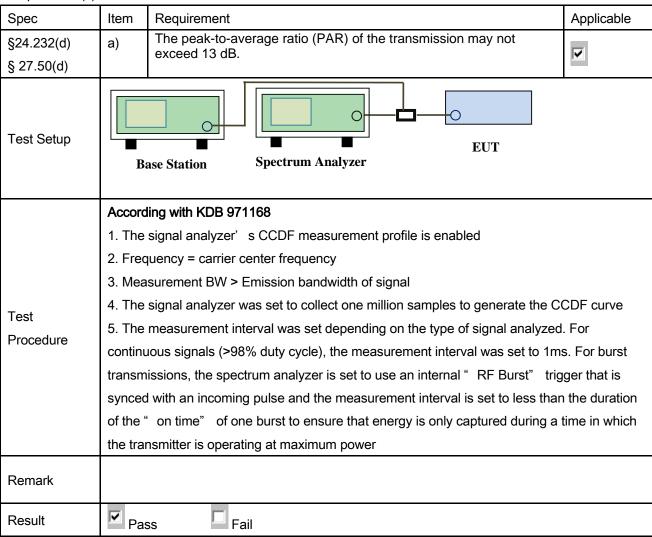


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6.3 Peak-Average Ratio

Temperature	23°C
Relative Humidity	58%
Atmospheric Pressure	1004mbar
Test date :	June 04,2015
Tested By :	Winnie Zhang

Requirement(s):



Test Data	Yes	□ _{N/A}
Test Plot	Yes (See below)	✓ _{N/A}



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PCS1900

Frequency	Conducted power(dBm)		Peak-Average
(MHz)	Peak	Average	Ratio(PAR)
1850.2	30.37	30.25	0.12
1880	30.26	30.18	0.08
1909.8	30.24	30.05	0.19

WCDMA1900

Frequency	Conducted power(dBm)		Peak-Average
(MHz)	Peak Average		Ratio(PAR)
1852.4	26.74	24.07	2.67
1880	27.19	24.01	3.18
1907.6	26.89	24.09	2.8

WCDMA1700

Frequency	Conducted power(dBm)		Peak-Average
(MHz)	Peak	Average	Ratio(PAR)
1712.6	27.38	23.97	3.41
1732.6	26.41	23.87	2.54
1752.4	27.38	23.94	3.44



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6.4 Modulation Characteristic

According to FCC § 2.1047(d), Part 22H, 24E& Part 27 there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.



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6.5 Occupied Bandwidth

Temperature	23°C
Relative Humidity	58%
Atmospheric Pressure	1004mbar
Test date :	June 04, 2015
Tested By :	Winnie Zhang

Requirement(s):

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

Test Data	Yes	□ _{N/A}
Test Plot	Yes (See below)	□ _{N/A}



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Cellular Band (Part 22H) result

Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)	
128	824.2	245.4226	319.968	
190	836.6	246.2518	316.786	
251	848.8	242.9112	322.707	

PCS Band (Part 24E) result

Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)	
512	1850.2	246.8933	317.260	
661	1880.0	247.2547	310.433	
810	1909.8	246.5068	319.090	

UMTS-FDD Band V (Part 22H)

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)	
4132	826.4	4.1383	4.697	
4175	835.0 4.1692 4.707		4.707	
4233	846.6	4.1498	4.673	

UMTS-FDD Band II (Part 24E)

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)	
9262	1852.4	4.1752	4.702	
9400	1880.0 4.1551		4.703	
9538	1907.6	4.1857	4.734	

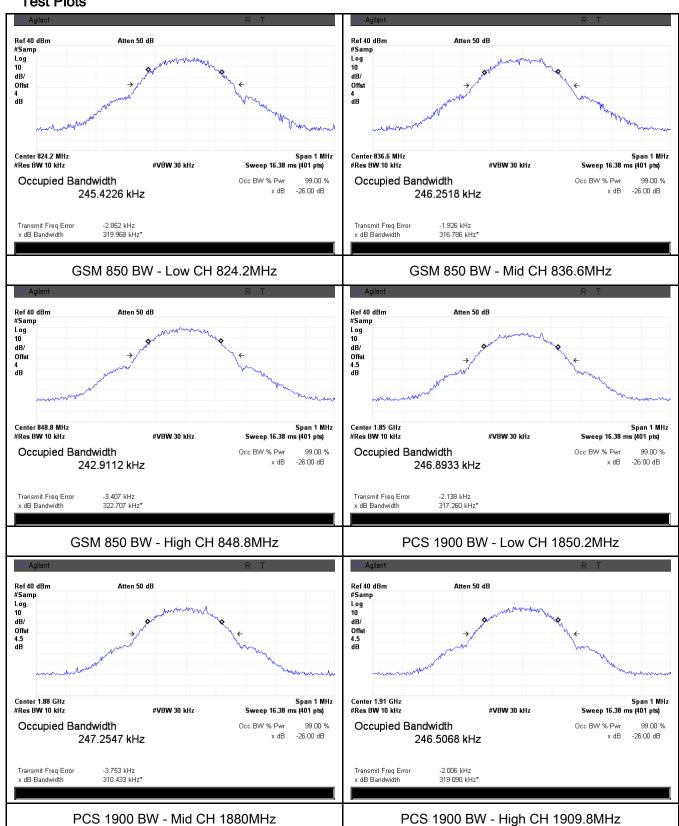
UMTS-FDD Band IV (Part 27)

Channel	Frequency	99% Occupied	26 dB Bandwidth	
	(MHz)	Bandwidth (MHz)	(MHz)	
1313	1712.4	4.1721	4.664	
1413	1732.6	4.2130	4.772	
1512	1752.6	4.1614	4.671	



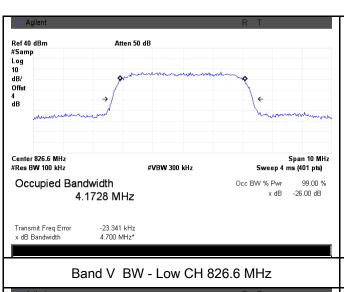
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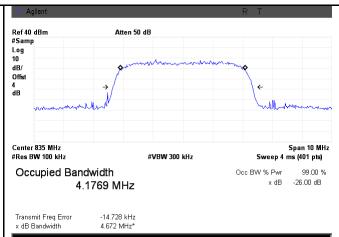
Test Plots

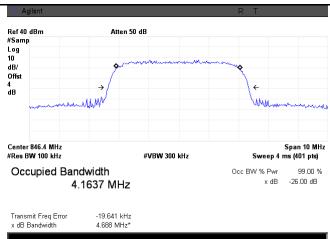




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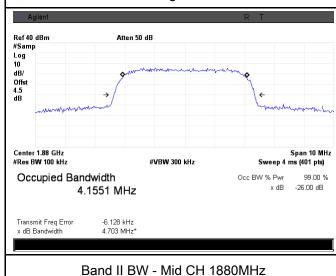


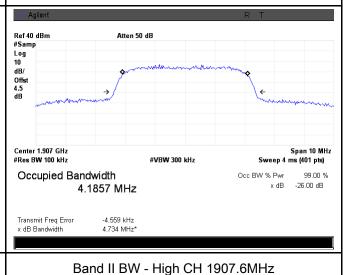


#Samp Log 10 dB/ Offst 4.5 dB Center 1.852 GHz #Res BW 100 kHz Span 10 MHz #VBW 300 kHz Sweep 4 ms (401 pts) Occupied Bandwidth 99.00 % Occ BW % Pwr -26.00 dB x dB 4.1752 MHz 186.841 kHz Transmit Freq Error x dB Bandwidth 4.702 MHz*

Band V BW - Mid CH 835.0 MHz

Band V BW - High CH 846.4 MHz

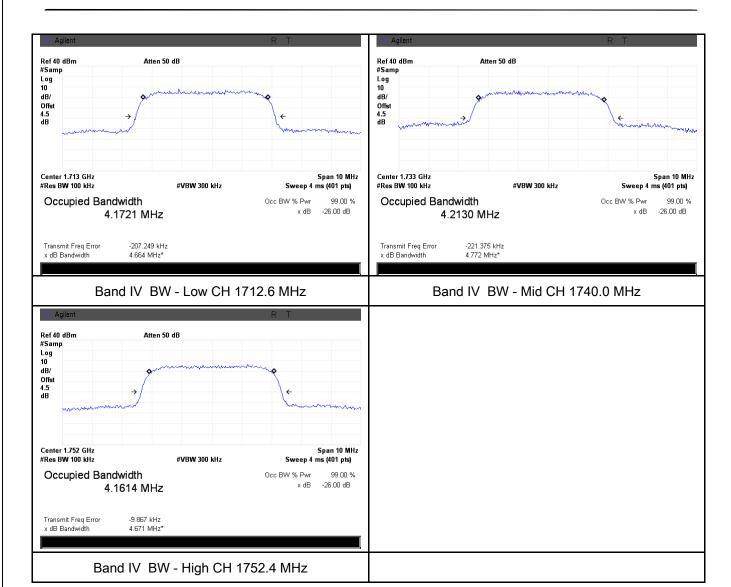




Band II BW - Low CH 1852.4MHz



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6.6 Spurious Emissions at Antenna Terminals

Temperature	23°C
Relative Humidity	58%
Atmospheric Pressure	1004mbar
Test date :	June 04, 2015
Tested By :	Winnie Zhang

Requirement(s):

Spec	Item	Requirement	Applicable	
§2.1051,		The power of any emission outside of the authorized		
§22.917(a)&	2)	operating frequency ranges must be lower than the	V	
§24.238(a)	a)	transmitter power (P) by a factor of at least 43 + 10 log		
§ 27.53(h)		(P) dB		
Test Setup		Base Station Spectrum Analyzer		
Test Procedure	-	The EUT was connected to Spectrum Analyzer and Basevia power divider. The Band Edges of low and high channels for the highest powers were measured. Setting RBW as roughly BW/100.		
Remark				
Result	▼ Pa	ss Fail		

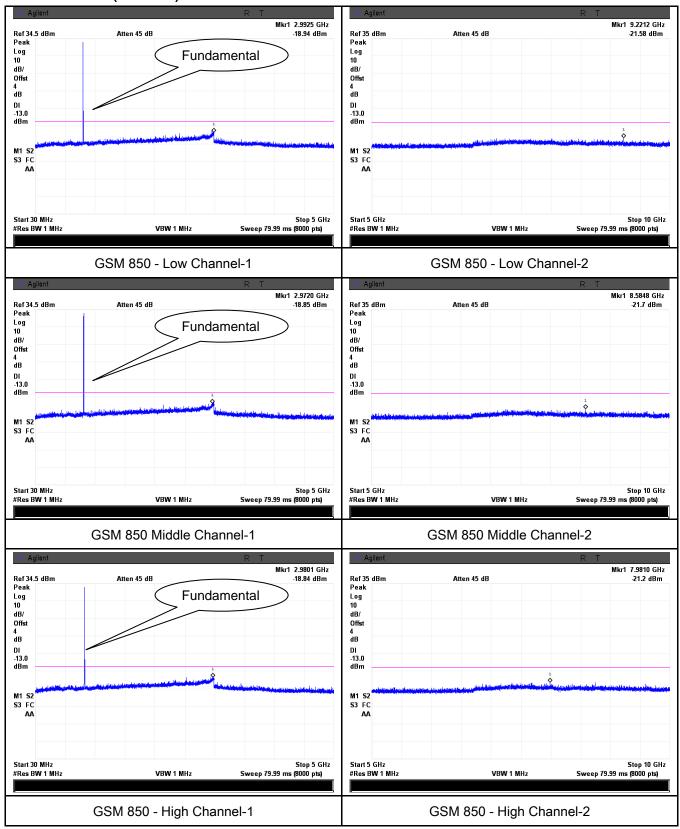
Test Data	Yes	□ _{N/A}
Test Plot	Yes (See below)	□ _{N/A}



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Test Plots

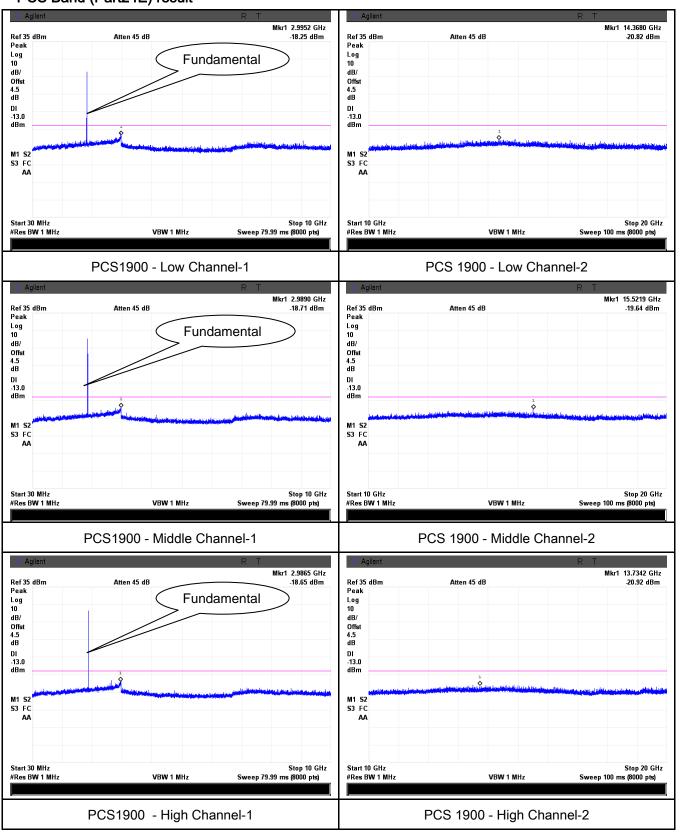
Cellular Band (Part 22H) result





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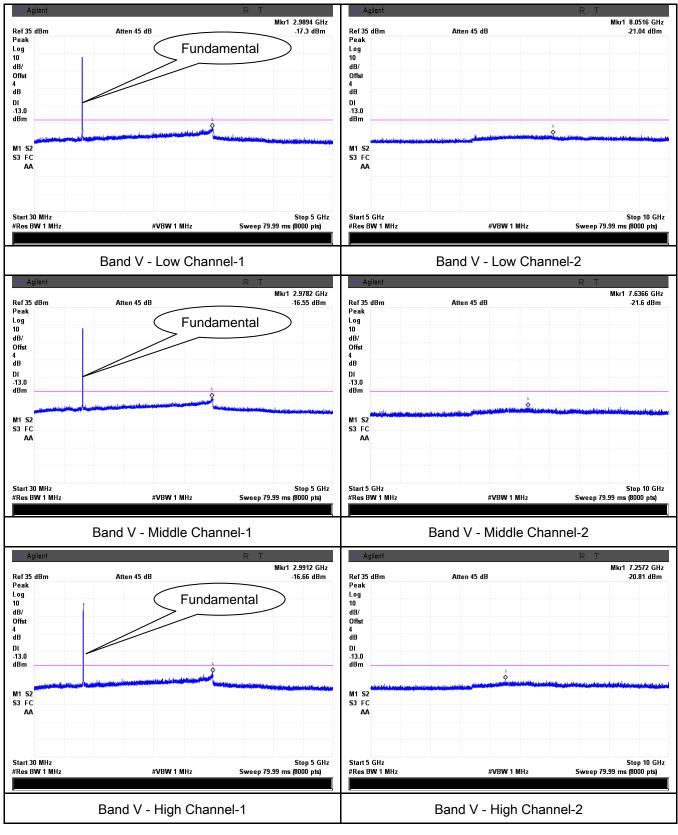
PCS Band (Part24E) result





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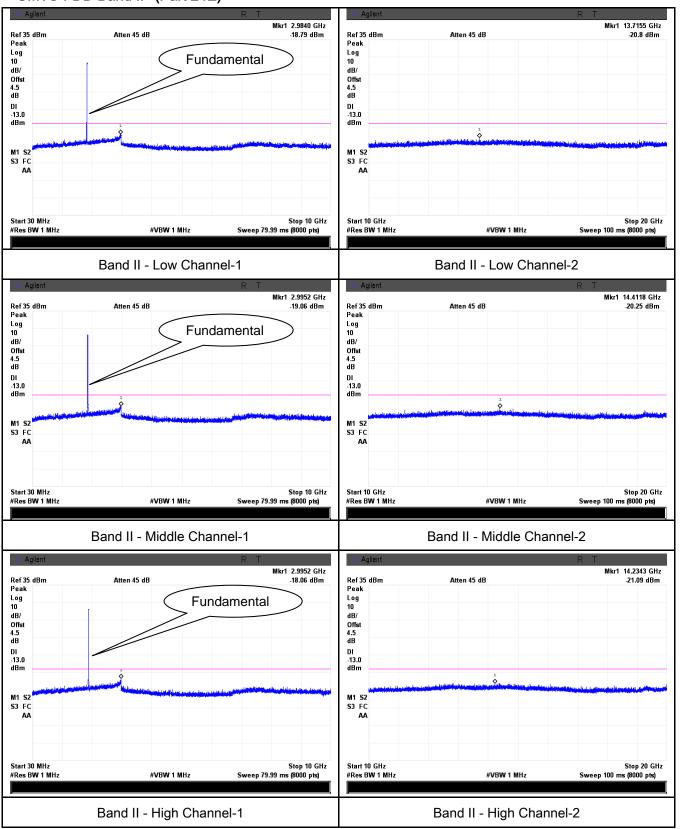
UMTS-FDD Band V (Part 22H)





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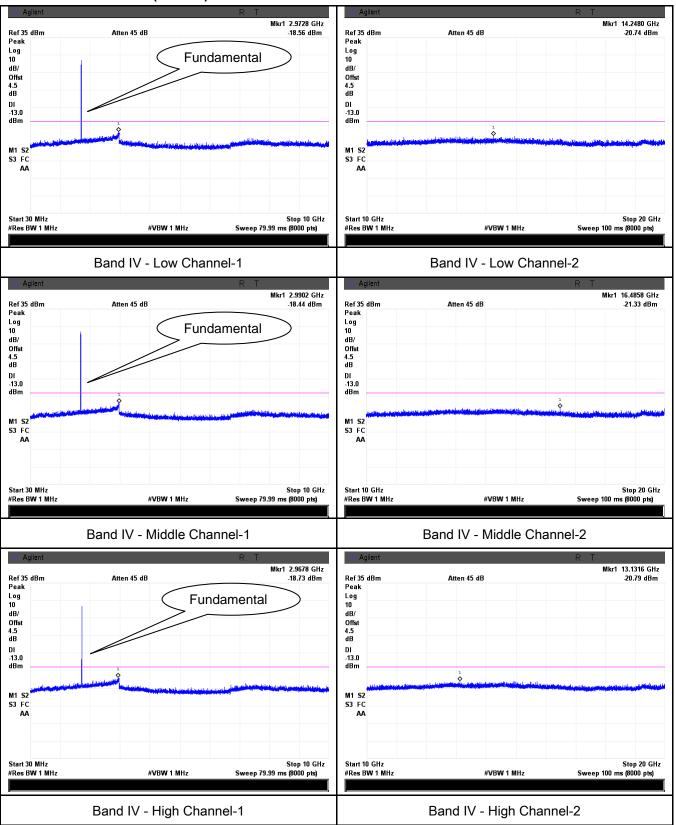
UMTS-FDD Band II (Part 24E)





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UMTS-FDD Band IV (Part 27)





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6.7 Spurious Radiated Emissions

Temperature	25°C
Relative Humidity	53%
Atmospheric Pressure	1011mbar
Test date :	June 11, 2015
Tested By:	Winnie Zhang

Requirement(s):

Spec	Item	Requirement Applicable			
§2.1053, §22.917 & §24.238 § 27.53(h)	a)	>			
Test setup	Ant. Tower Support Units Turn Table Ground Plane Test Receiver				
Test Procedure	 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. 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					



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Result	Pass	Fail	

Test Data Yes

Test Plot Yes (See below)

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	-44.27	V	7.95	0.78	-37.1	-13	-24.1
1648.4	-45.63	Н	7.95	0.78	-38.46	-13	-25.46
295.9	-47.22	V	0.6	0.18	-46.8	-13	-33.8
587.6	-53.98	Н	7	0.43	-47.41	-13	-34.41

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	-43.94	٧	7.95	0.78	-36.77	-13	-23.77
1673.2	-45.51	Н	7.95	0.78	-38.34	-13	-25.34
296.2	-47.15	V	0.6	0.18	-46.73	-13	-33.73
588.1	-53.33	Н	7	0.43	-46.76	-13	-33.76

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1697.6	-43.81	V	7.95	0.78	-36.64	-13	-23.64
1697.6	-45.05	Н	7.95	0.78	-37.88	-13	-24.88
295.7	-47.34	V	0.6	0.18	-46.92	-13	-33.92
586.9	-54.28	Н	7	0.43	-47.71	-13	-34.71



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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	-44.06	V	10.25	2.73	-36.54	-13	-23.54
3700.4	-45.18	Н	10.25	2.73	-37.66	-13	-24.66
296.4	-47.25	V	0.6	0.18	-46.83	-13	-33.83
589.1	-53.86	Н	7	0.43	-47.29	-13	-34.29

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	-44.12	V	10.25	2.73	-36.6	-13	-23.6
3760	-45.22	Н	10.25	2.73	-37.7	-13	-24.7
296.7	-46.99	V	0.6	0.18	-46.57	-13	-33.57
587.4	-53.74	Н	7	0.43	-47.17	-13	-34.17

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3819.6	-43.87	٧	10.36	2.73	-36.24	-13	-23.24
3819.6	-44.92	Н	10.36	2.73	-37.29	-13	-24.29
296.3	-47.16	V	0.6	0.18	-46.74	-13	-33.74
586.4	-53.64	Н	7	0.43	-47.07	-13	-34.07



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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	-43.61	V	7.95	0.78	-36.44	-13	-23.44
1652.8	-45.01	Н	7.95	0.78	-37.84	-13	-24.84
297.2	-47.24	V	0.6	0.18	-46.82	-13	-33.82
588.3	-53.48	Н	7	0.43	-46.91	-13	-33.91

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	-43.59	V	7.95	0.78	-36.42	-13	-23.42
1670	-45.27	Н	7.95	0.78	-38.1	-13	-25.1
296.3	-46.93	V	0.6	0.18	-46.51	-13	-33.51
589.1	-54.08	Н	7	0.43	-47.51	-13	-34.51

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1693.2	-43.61	٧	7.95	0.78	-36.44	-13	-23.44
1693.2	-45.17	Н	7.95	0.78	-38	-13	-25
297.4	-45.93	V	0.6	0.18	-45.51	-13	-32.51
588.6	-53.84	Н	7	0.43	-47.27	-13	-34.27



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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	-44.06	V	10.25	2.73	-36.54	-13	-23.54
3704.8	-45.67	Н	10.25	2.73	-38.15	-13	-25.15
297.3	-46.27	V	0.6	0.18	-45.85	-13	-32.85
586.6	-52.94	Н	7	0.43	-46.37	-13	-33.37

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	-43.83	٧	10.25	2.73	-36.31	-13	-23.31
3760	-46.22	Н	10.25	2.73	-38.7	-13	-25.7
296.8	-46.35	V	0.6	0.18	-45.93	-13	-32.93
588.4	-52.75	Н	7	0.43	-46.18	-13	-33.18

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3815.2	-43.59	V	10.36	2.73	-35.96	-13	-22.96
3815.2	-46.44	Н	10.36	2.73	-38.81	-13	-25.81
298.6	-46.72	٧	0.6	0.18	-46.3	-13	-33.3
587.3	-53.06	Н	7	0.43	-46.49	-13	-33.49



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UMTS-FDD Band IV (Part 27)

Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3424.8	-44.26	٧	10.07	2.52	-36.71	-13	-23.71
3424.8	-45.61	Н	10.07	2.52	-38.06	-13	-25.06
296.5	-47.28	V	0.6	0.18	-46.86	-13	-33.86
588.4	-54.05	Н	7	0.43	-47.48	-13	-34.48

Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3480	-44.31	V	10.09	2.52	-36.74	-13	-23.74
3480	-45.59	Н	10.09	2.52	-38.02	-13	-25.02
297.2	-47.34	V	0.6	0.18	-46.92	-13	-33.92
587.9	-54.14	Н	7	0.43	-47.57	-13	-34.57

High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3505.2	-44.26	V	10.09	2.52	-36.69	-13	-23.69
3505.2	-45.27	Η	10.09	2.52	-37.7	-13	-24.7
298.6	-47.42	V	0.6	0.18	-47	-13	-34
589.3	-54.06	Н	7	0.43	-47.49	-13	-34.49



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6.8 Band Edge

Temperature	23°C
Relative Humidity	58%
Atmospheric Pressure	1004mbar
Test date :	June 04, 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.	V		
Test setup		Base Station Spectrum Analyzer EUT			
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	☑ Pa	ss Fail			

Test Data	Yes	□ _{N/A}
Test Plot	Yes (See below)	□ _{N/A}



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Cellular Band (Part 22H) result

Frequency (MHz)	Emission (dBm)	Limit (dBm)
823.9775	-15.24	-13
849.0200	-14.09	-13

PCS Band (Part24E) result

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1850.0000	-28.58	-13
1910.0200	-23.13	-13

UMTS-FDD Band V (Part 22H)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
823.9775	-21.63	-13
849.0200	-24.25	-13

UMTS-FDD Band II (Part 24E)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1850.0000	-25.43	-13
1910.0200	-18.72	-13

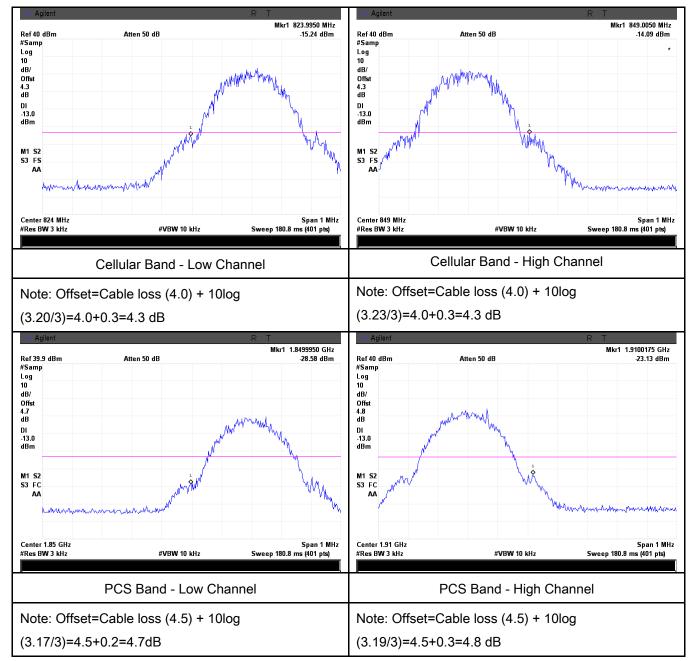
UMTS-FDD Band IV (Part 27)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1710.0000	-19.38	-13
1755.0000	-20.83	-13



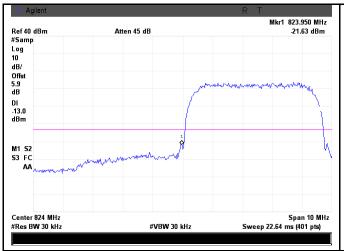
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Test Plots





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UMTS-FDD Band V - Low Channel

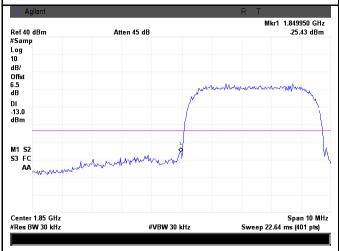
UMTS-FDD Band V - High Channel

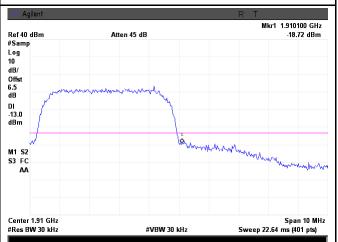
Note: Offset=Cable loss (4.0) + 10log

Note: Offset=Cable loss (4.0) + 10log

(46.97/30)=4.0+1.9=5.9 dB

(46.73/30)=4.0+1.9=5.9 dB





UMTS-FDD Band II - Low Channel

UMTS-FDD Band II - High Channel

Note: Offset=Cable loss (4.5) + 10log

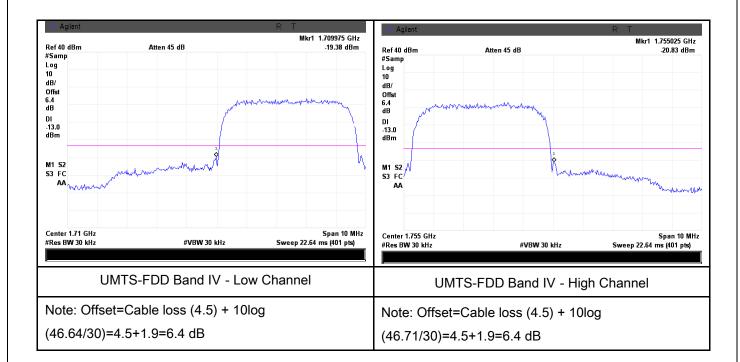
Note: Offset=Cable loss (4.5) + 10log

(47.02/30)=4.5+2.0=6.5 dB

(47.34/30)=4.5+2.0=6.5 dB



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6.9 Frequency Stability

Temperature	23°C
Relative Humidity	58%
Atmospheric Pressure	1004mbar
Test date :	June 04, 2015
Tested By :	Winnie Zhang

Requirement(s):

Spec	Item	Requirement				Applicable
		According to §22.3 the Public Mobile S tolerances given in Frequency Toleran Services	Services mus Table below	et be maintained w	ithin the	
§2.1055,		Frequency Range	Base, fixed	Mobile ≤ 3 watts	Mobile ≤ 3 watts	
§22.355 &		(MHz)	(ppm)	(ppm)	(ppm)	
§24.235	a)	25 to 50	20.0	20.0	50.0	~
§ 27.5(h);		50 to 450	5.0	5.0	50.0	
§ 27.54		450 to 512	2.5	5.0	5.0	
3 27.01		821 to 896	1.5	2.5	2.5	
		928 to 29	5.0	N/A	N/A	
		929 to 960.	1.5	N/A	N/A	
		2110 to 2220	10.0	N/A	N/A	
		According to §24.2	35, the frequ	ency stability sha	ll be sufficient to	
		ensure that the fun	damental en	nissions stay withi	n the authorized	
		frequency block.				
Test setup	Base Station EUT					
				Thermal Cham	lber	



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	A communication link was established between EUT and base station. The
	frequency error was monitored and measured by base station under variation
Procedure	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}



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Cellular Band (Part 22H) result

	Middle Channel, f _o = 836.6 MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	
-10		11	0.0131	2.5	
0	3.7	9	0.0108	2.5	
10		8	0.0096	2.5	
20		5	0.0060	2.5	
30		9	0.0108	2.5	
40		11	0.0131	2.5	
50		13	0.0155	2.5	
55		15	0.0179	2.5	
25	4.2	7	0.0084	2.5	
25	3.5	9	0.0108	2.5	

PCS Band (Part 22H) result

	1 00 Bana (1 art 2211) 100ait				
	Middle Channel, f _o = 1880 MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	
-10		11	0.0059	2.5	
0		9	0.0048	2.5	
10	3.7	7	0.0037	2.5	
20		5	0.0027	2.5	
30		6	0.0032	2.5	
40		9	0.0048	2.5	
50		11	0.0059	2.5	
55		14	0.0074	2.5	
25	4.2	10	0.0053	2.5	
25	3.5	8	0.0043	2.5	



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UMTS-FDD Band V (Part 22H)

	Middle Channel, f₀ = 835 MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	
-10		-11	0.0132	2.5	
0		-9	0.0108	2.5	
10	3.7	-7	0.0084	2.5	
20		-4	0.0048	2.5	
30		-6	0.0072	2.5	
40		-8	0.0096	2.5	
50		-10	0.0120	2.5	
55		-13	0.0156	2.5	
25	4.2	-11	0.0132	2.5	
25	3.5	-10	0.0120	2.5	

UMTS-FDD Band II (Part 24E)

	Middle Channel, f₀ = 1880 MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	
-10		13	0.0069	2.5	
0		9	0.0048	2.5	
10	3.7	6	0.0032	2.5	
20		4	0.0021	2.5	
30		5	0.0027	2.5	
40		7	0.0037	2.5	
50		12	0.0064	2.5	
55		15	0.0080	2.5	
25	4.2	7	0.0037	2.5	
25	3.5	8	0.0043	2.5	



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UMTS-FDD Band IV (Part 27)

	Middle Channel, f₀ = 1880 MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	
-10		11	0.0059	2.5	
0		9	0.0048	2.5	
10	3.7	6	0.0032	2.5	
20		5	0.0027	2.5	
30		7	0.0037	2.5	
40		8	0.0043	2.5	
50		11	0.0059	2.5	
55		14	0.0074	2.5	
25	4.2	8	0.0043	2.5	
25	3.5	10	0.0053	2.5	



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Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Due	In use
RF Conducted Test		l			
Agilent ESA-E SERIES SPECTRUM ANALYZER	E4407B	MY45108319	09/17/2014	09/16/2015	<u>\</u>
Power Splitter	1#	1#	09/02/2014	09/01/2015	~
Universal Radio Communication Tester	CMU200	121393	09/26/2014	09/25/2015	<u><</u>
Temperature/Humidity Chamber	UHL-270	001	10/10/2014	10/09/2015	<u><</u>
DC Power Supply	E3640A	MY40004013	09/18/2014	09/17/2015	~
Radiated Emissions					
EMI test receiver	ESL6	100262	09/18/2014	09/17/2015	<
OPT 010 AMPLIFIER (0.1-1300MHz)	8447E	2727A02430	09/02/2014	09/01/2015	(
Microwave Preamplifier (1 ~ 26.5GHz)	8449B	3008A02402	10/04/2015	10/04/2016	\
Bilog Antenna (30MHz~6GHz)	JB6	A110712	09/22/2014	09/21/2015	<u><</u>
Bilog Antenna (30MHz~2GHz)	JB1	A112017	09/22/2014	09/21/2015	(
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71259	09/25/2014	09/24/2015	•
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71283	09/25/2014	09/24/2015	V
SYNTHESIZED SIGNAL GENERATOR	8665B	3744A01293	09/18/2014	09/17/2015	<u><</u>
Tunable Notch Filter	3NF- 800/1000-S	AA4	09/02/2014	09/01/2015	\
Tunable Notch Filter	3NF- 1000/2000-S	AM 4	09/02/2014	09/01/2015	Y



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Annex B. EUT And Test Setup Photographs

Annex B.i. Photograph: EUT External Photo



LISTED

E456731

I.T.E power supply
Made in China

IDM

Wee

To a supply
Made in China

To a supply
Ma

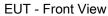
verykool 🗠

Model:A31-500550 Input:100-240V~ 50/60Hz 0.2A Output:5.0V=550mA

Whole Package - Top View

Adapter - Front View







EUT - Rear View



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EUT - Top View



EUT - Bottom View



EUT - Left View

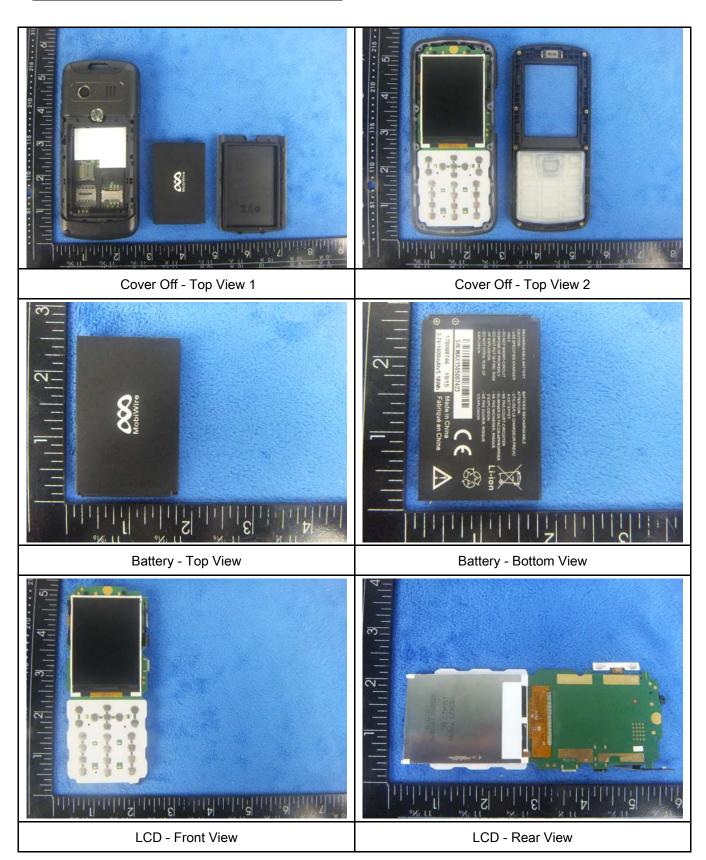


EUT - Right View



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Annex B.ii. Photograph: EUT Internal Photo

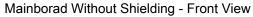


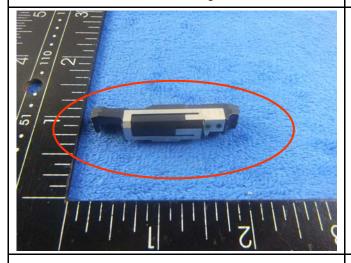


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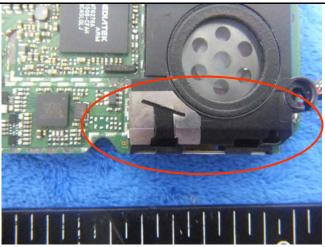


Mainborad With Shielding - Front View









BT Antenna View



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Annex B.iii. Photograph: Test Setup Photo



Radiated Spurious Emissions Test Setup Below 1GHz



Radiated Spurious Emissions Test Setup Above 1GHz

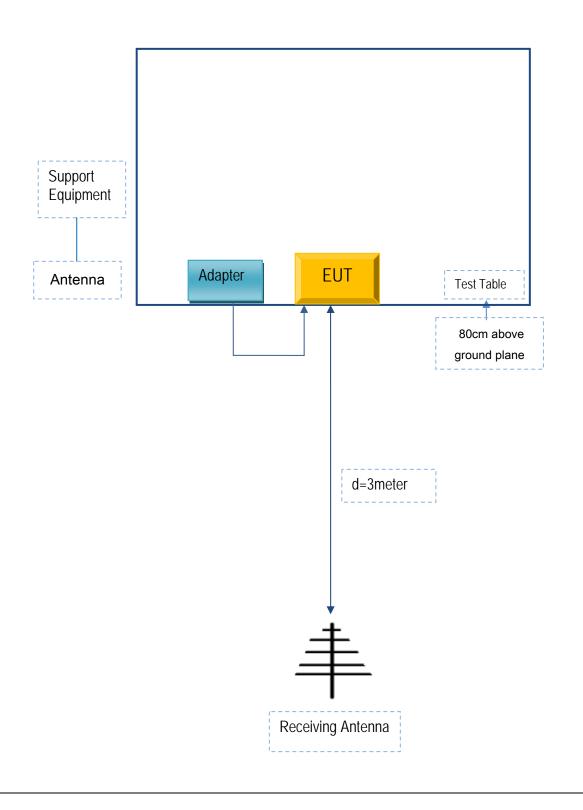


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Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

Annex C.ii. TEST SET UP BLOCK

Block Configuration Diagram for Radiated Emissions





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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	Calibration Date	Calibration Due Date
N/A	N/A	N/A	N/A	N/A



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Annex C.ii. EUT OPERATING CONKITIONS

The following is the description of how the EUT is exercised during testing.

Test	Description Of Operation
Emissions Testing	The EUT was communicating with base station and set to work at maximum output power.
Others Testing	The EUT was communicating with base station and set to work at maximum output power.



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

Please see attachment



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Annex E. DECLARATION OF SIMILARITY

N/A