# RF TEST REPORT



Report No.: 15071175-FCC-R1
Supersede Report No.: N/A

Applicant	NEG TECHNOLOGY CO., LIMITED				
Product Name	Mobile Phone				
Model No.	S3000D				
Serial No.	N/A				
Test Standard	FCC Part 2	2(H):2014 ;F	FCC Part 24(E):2	014; ANSI/TIAC603 D: 2010	
Test Date	December	05 to Decem	ber 16, 2015		
Issue Date	December 2	December 21, 2015			
Test Result	Pass	Pass Fail			
Equipment compl	Equipment complied with the specification				
Equipment did not comply with the specification					
Winnie . Zhang		David	Huang		
Winnie Zhang Test Engineer			d Huang cked 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.



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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
15071175-FCC-R1	NONE	Original	December 16, 2015
15071175-FCC-R1	V1	Adding supporting Equipment  Description	December 21, 2015

# 2. Customer information

Applicant Name	NEG TECHNOLOGY CO., LIMITED	
Applicant Add	Rm 1406, Block B, Jinsejiari, Jingtian south road, Futian district, Shenzhen, China	
Manufacturer	NEG TECHNOLOGY CO., LIMITED	
Manufacturer Add	Rm 1406, Block B, Jinsejiari, Jingtian south road, Futian district, Shenzhen, China	

# 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: S3000D

Serial Model: N/A

Date EUT received: December 04, 2015

Test Date(s): December 05 to December 16, 2015

Equipment Category : PCE

GSM850: 0.8 dBi

PCS1900: 1 dBi

UMTS-FDD Band V: 1 dBi

Antenna Gain: UMTS-FDD Band II: 1 dBi

Bluetooth/BLE: 1 dBi

WIFI: 1 dBi GPS:1 dBi

GSM / GPRS: GMSK EGPRS: GMSK, 8PSK

UMTS-FDD: QPSK, 16QAM

Type of Modulation: 802.11b/g/n: DSSS, OFDM

Bluetooth: GFSK, π /4DQPSK, 8DPSK

BLE: GFSK GPS:BPSK

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

WIFI:802.11b/g/n(20M): 2412-2462 MHz WIFI:802.11n(40M): 2422-2452 MHz

Bluetooth& BLE: 2402-2480 MHz

GPS RX:1575.42 MHz



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GSM850: 32.33 dBm

Maximum Conducted PCS1900: 29.75 dBm

AV Power to Antenna: UMTS-FDD Band V: 23.74 dBm

UMTS-FDD Band II: 22.57 dBm

GSM850: 31.09 dBm / ERP

PCS1900: 30.53 dBm / EIRP

ERP/EIRP: UMTS-FDD Band V : 22.55 dBm / ERP

UMTS-FDD Band II: 23.52 dBm / EIRP

GSM 850: 124CH PCS1900: 299CH

UMTS-FDD Band V : 102CH

UMTS-FDD Band II: 277CH

Number of Channels: WIFI:802.11b/g/n(20M): 11CH

WIFI:802.11n(40M): 7CH

Bluetooth: 79CH

BLE: 40CH GPS:1CH

Port: Power Port, Earphone Port, USB Port

Adapter:

Model: S3000D

Input: AC 100-240V; 50/60Hz;150mA

Output: DC 5.0V,500mA

Input Power: Battery:

Dattery.

Model: S3000D

Standard: 3.7V,1100mAh,4.07Wh

Limited charge voltage:4.2V

Trade Name : OWN

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

FCC ID: 2AAZ8-S3000D



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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);	RF Output Power	Compliance	
§ 24.232 (d) ;	Peak-Average Ratio	Compliance	
§ 2.1049; § 22.905; § 22.917;	000/ 9, 26 dB Occupied Bandwidth	0	
§ 24.238;	99% & -26 dB Occupied Bandwidth	Compliance	
§ 2.1051; § 22.917(a);	Courieus Emissions et Antonno Torreirol	Camplianas	
§ 24.238(a);	Spurious Emissions at Antenna Terminal	Compliance	
§ 2.1053; § 22.917(a);	Field Chronath of Courieus Dadieties	Compliance	
§ 24.238(a);	Field Strength of Spurious Radiation	Compliance	
§ 22.917(a); § 24.238(a);	Out of band emission, Band Edge	Compliance	
\$ 2.4055, \$ 22.255, \$ 24.225,	Frequency stability vs. temperature	Compliance	
§ 2.1055; § 22.355; § 24.235;	Frequency stability vs. voltage		

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: 15071175-FCC-H.



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# 6.2 RF Output Power

Temperature	23°C
Relative Humidity	56%
Atmospheric Pressure	1014mbar
Test date :	December 14, 2015
Tested By:	Winnie Zhang

### Requirement(s):

Spec	Item	Requirement	Applicable			
§22.913 (a)	a)	ERP:38.45dBm				
§24.232 (c)	b)	EIRP:33dBm				
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 be different test mode. For ERP/EIRP:  The transmitter was placed on a wooden turntable, and transmitting into a non-radiating load which was also platurntable.  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 order 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 fundate frequency was investigated.  Remove the EUT and replace it with substitution antentice.	d it was aced on the f 3 meters er to identify at was mental			



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	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	□ <sub>N/A</sub>					
Test Plot Yes	(See below) N/A					



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### **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	1
GSM Voice (1 uplink),GMSK	32.33	32.26	32.23	32±1	29.75	29.21	28.73	29.5±1
GPRS Multi-Slot Class 8 (1 uplink),GMSK	32.32	32.24	32.20	32±1	28.72	29.20	29.73	29.5±1
GPRS Multi-Slot Class 10 (2 uplink) GMSK	31.51	31.44	31.46	31±1	27.69	28.45	29.31	28.5±1
GPRS Multi-Slot Class 12 (4 uplink) GMSK	28.31	28.41	28.23	29±1	24.41	25.26	26.21	25.3±1
EGPRS Multi-Slot Class 8 (1 uplink) GMSK MCS1	32.29	32.23	32.19	32±1	28.85	29.19	29.71	29.5±1
EGPRS Multi-Slot Class 10 (2 uplink) GMSK MCS1	31.47	31.43	31.41	31±1	27.68	28.43	28.97	28.5±1
EGPRS Multi-Slot Class 12 (4 uplink) GMSK MCS1	28.23	28.16	28.07	28±1	24.40	25.24	26.20	25.3±1
EGPRS Multi-Slot Class 8 (1 uplink) 8PSK MCS5	26.86	26.93	26.90	26.5±1	24.17	24.79	25.21	25±1
EGPRS Multi-Slot Class 10 (2 uplink) 8PSK MCS5	25.91	25.63	25.66	25.5±1	22.91	23.47	23.98	23.5±1
EGPRS Multi-Slot Class 12 (4 uplink) 8PSK MCS5	23.54	23.42	23.37	23±1	21.79	22.93	22.98	22.5±1



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#### Remark:

GPRS, CS1 coding scheme.

EGPRS, MCS1 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	Ohamal	F	Average power	Tune up
configuration	Channel	Frequency	(dBm)	Power tolerant
DMO	4132	826.4	23.63	23±1
RMC	4175	835	23.74	23±1
12.2kbps	4233	846.6	23.66	23±1
LICDDA	4132	826.4	22.56	22±1
HSDPA Subtest1	4175	835	22.53	22±1
Sublest i	4233	846.6	22.51	22±1
LICDDA	4132	826.4	22.52	22±1
HSDPA Subtest2	4175	835	22.54	22±1
Sublesiz	4233	846.6	22.57	22±1
LICDDA	4132	826.4	22.53	22±1
HSDPA Subtest3	4175	835	22.62	22±1
Sublesis	4233	846.6	22.61	22±1
HSDPA	4132	826.4	22.61	22±1
Subtest4	4175	835	22.59	22±1
Sublesia	4233	846.6	22.61	22±1
HSUPA	4132	826.4	22.53	22±1
Subtest1	4175	835	22.58	22±1
Sublest i	4233	846.6	22.56	22±1
HSUPA	4132	826.4	22.54	22±1
Subtest2	4175	835	22.63	22±1
Sublesiz	4233	846.6	22.56	22±1
LICLIDA	4132	826.4	22.61	22±1
HSUPA Subtest3	4175	835	22.54	22±1
Sublesis	4233	846.6	22.53	22±1
HOUDA	4132	826.4	22.64	22±1
HSUPA Subtoat4	4175	835	22.62	22±1
Subtest4	4233	846.6	22.63	22±1
LICUIDA	4132	826.4	22.54	21.3±1
HSUPA Subtost5	4175	835	22.57	21.3±1
Subtest5	4233	846.6	22.55	21.3±1



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# **UMTS-FDD Band II**

Band/ Time Slot configuration	Channel	Frequency	Average power (dBm)	Tune up Power tolerant
DMC	9262	1852.4	21.93	22±1
RMC	9400	1880	22.57	22±1
12.2kbps	9538	1907.6	22.57	22±1
HCDDA	9262	1852.4	20.63	21.3±1
HSDPA Subtest1	9400	1880	20.62	21.3±1
Sublest I	9538	1907.6	20.68	21.3±1
HODDA	9262	1852.4	20.61	21.3±1
HSDPA	9400	1880	20.52	21.3±1
Subtest2	9538	1907.6	20.56	21.3±1
HODDA	9262	1852.4	20.63	21.3±1
HSDPA	9400	1880	20.64	21.3±1
Subtest3	9538	1907.6	20.61	21.3±1
HODDA	9262	1852.4	20.68	21.3±1
HSDPA	9400	1880	20.69	21.3±1
Subtest4	9538	1907.6	20.59	21.3±1
HOUDA	9262	1852.4	20.63	21.3±1
HSUPA	9400	1880	20.57	21.3±1
Subtest1	9538	1907.6	20.61	21.3±1
HOURA	9262	1852.4	20.55	21.3±1
HSUPA	9400	1880	20.56	21.3±1
Subtest2	9538	1907.6	20.53	21.3±1
LICLIDA	9262	1852.4	20.68	21.3±1
HSUPA	9400	1880	20.59	21.3±1
Subtest3	9538	1907.6	20.54	21.3±1
LICUIDA	9262	1852.4	20.56	21.3±1
HSUPA Subtost4	9400	1880	20.64	21.3±1
Subtest4	9538	1907.6	20.63	21.3±1
LICUIDA	9262	1852.4	20.57	21.3±1
HSUPA Subtost5	9400	1880	20.55	21.3±1
Subtest5	9538	1907.6	20.64	21.3±1



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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	24.76	V	6.8	0.53	31.03	38.45
824.2	23.21	Н	6.8	0.53	29.48	38.45
836.6	24.68	V	6.8	0.53	30.95	38.45
836.6	23.15	Н	6.8	0.53	29.42	38.45
848.8	24.72	V	6.9	0.53	31.09	38.45
848.8	23.29	Н	6.9	0.53	29.66	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	23.15	V	7.88	0.85	30.18	33
1850.2	21.68	Н	7.88	0.85	28.71	33
1880	23.46	V	7.88	0.85	30.49	33
1880	21.85	Н	7.88	0.85	28.88	33
1909.8	23.52	V	7.86	0.85	30.53	33
1909.8	21.97	Н	7.86	0.85	28.98	33



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### 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	16.24	V	6.8	0.53	22.51	38.45
826.4	14.79	Н	6.8	0.53	21.06	38.45
835	16.28	V	6.8	0.53	22.55	38.45
835	14.83	Н	6.8	0.53	21.10	38.45
846.6	16.18	V	6.9	0.53	22.55	38.45
846.6	14.74	Н	6.9	0.53	21.11	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	16.49	V	7.88	0.85	23.52	33
1852.4	15.13	Н	7.88	0.85	22.16	33
1880	16.45	V	7.88	0.85	23.48	33
1880	15.08	Н	7.88	0.85	22.11	33
1907.6	16.38	V	7.86	0.85	23.39	33
1907.6	15.12	Н	7.86	0.85	22.13	33



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# 6.3 Peak-Average Ratio

Temperature	23°C
Relative Humidity	56%
Atmospheric Pressure	1014mbar
Test date :	December 14, 2015
Tested By :	Winnie Zhang

#### Requirement(s):

Requirement(s)			
Spec	Item	Requirement	Applicable
§24.232(d)	a)	The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.	V
Test Setup	B	EUT Spectrum Analyzer	
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	<b>▼</b> Pa	ss Fail	

Test Data Yes		□ <sub>N/A</sub>
Test Plot	Yes (See below)	✓ <sub>N/A</sub>



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# GSM 1900 PK-AV POWER(PART 24E)

Frequency	Conducted power(dBm)		Peak-Average
(MHz)	Peak	Average	Ratio(PAR)
1850.2	30.23	28.73	1.50
1880	30.57	29.21	1.36
1909.8	31.13	29.75	1.38

### UMTS-FDD Band II PK-AV POWER(PART 24E)

Frequency	Conducted power(dBm)		Peak-Average
(MHz)	Peak	Average	Ratio(PAR)
1852.4	24.26	21.93	2.33
1880	24.26	22.57	1.69
1907.6	24.31	22.57	1.74



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# 6.4 Occupied Bandwidth

Temperature	23°C
Relative Humidity	56%
Atmospheric Pressure	1014mbar
Test date :	December 14, 2015
Tested By :	Winnie Zhang

### Requirement(s):

Spec	Item Requirement		Applicable
§2.1049,	a)	99% Occupied Bandwidth(kHz)	<u> </u>
§22.917,			
§22.905	b)	26 dB Bandwidth(kHz)	<b>V</b>
§24.238			
Test Setup	B	EUT Spectrum Analyzer	
	-	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 midd	dle channel
		for the highest RF powers.	
Remark			
Result	Pa	rss Fail	

Test Data Yes		□ <sub>N/A</sub>
Test Plot	Yes (See below)	□ <sub>N/A</sub>



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### Cellular Band (Part 22H) result

Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
128	824.2	283.86	352.6
190	836.6	288.87	348.5
251	848.8	289.89	352.1

### PCS Band (Part 24E) result

Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
512	1850.2	286.18	359.9
661	1880.0	284.47	359.1
810	1909.8	283.95	352.6

### UMTS-FDD Band V (Part 22H)

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
4132	826.4	4.4962	7.079
4175	835.0	4.5514	7.059
4233	846.6	4.5045	7.067

# UMTS-FDD Band II (Part 24E)

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
9262	1852.4	4.3604	4.863
9400	1880.0	4.3508	4.815
9538	1907.6	4.3316	4.796



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#### **Test Plots**





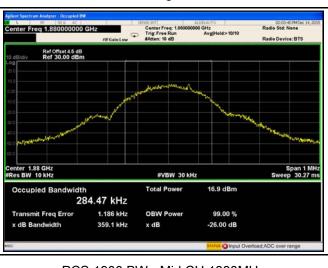
GSM 850 BW - Low CH 824.2MHz



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



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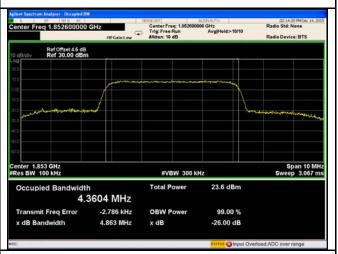




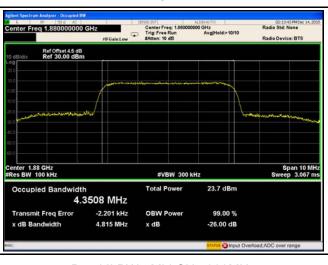
Band V BW - Low CH 826.6 MHz



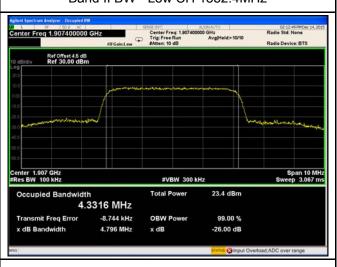
Band V BW - Mid CH 835.0 MHz



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



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# 6.5 Spurious Emissions at Antenna Terminals

Temperature	23°C
Relative Humidity	56%
Atmospheric Pressure	1014mbar
Test date :	December 14, 2015
Tested By:	Winnie Zhang

#### Requirement(s):

Requirement(s):			
Spec	Item	Requirement	Applicable
§2.1051,		The power of any emission outside of the authorized	
§22.917(a)&	۵)	operating frequency ranges must be lower than the	
§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 Bas via power divider.  The Band Edges of low and high channels for the highest powers were measured.  Setting RBW as roughly BW/100.	
Remark			
Result	<b>☑</b> Pa	ss Fail	

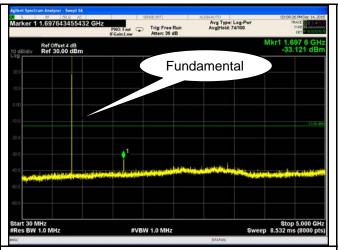
Test Data	Yes	□ <sub>N/A</sub>
Test Plot	Yes (See below)	□ <sub>N/A</sub>



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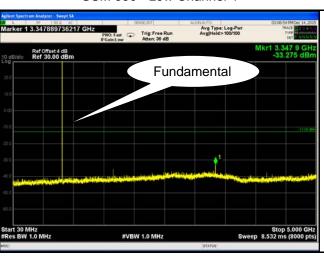
#### **Test Plots**

### Cellular Band (Part 22H) result

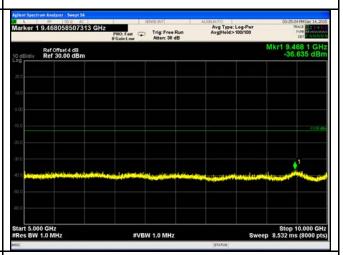




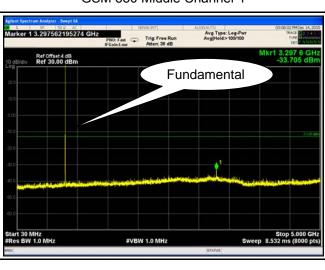
GSM 850 - Low Channel-1



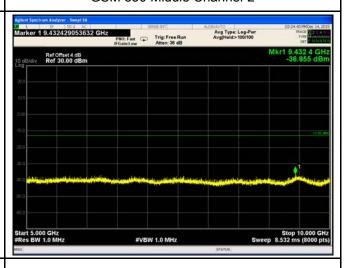
GSM 850 - Low Channel-2



GSM 850 Middle Channel-1



GSM 850 Middle Channel-2



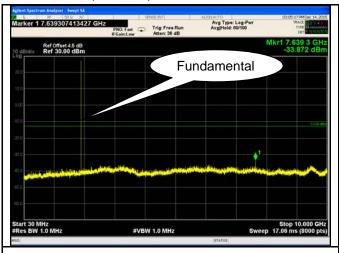
GSM 850 - High Channel-1

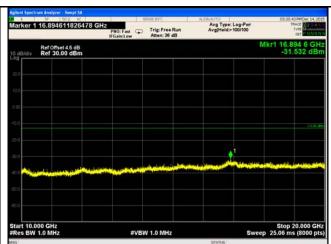
GSM 850 - High Channel-2



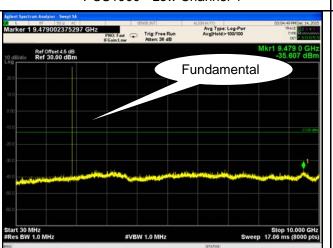
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#### PCS Band (Part24E) result

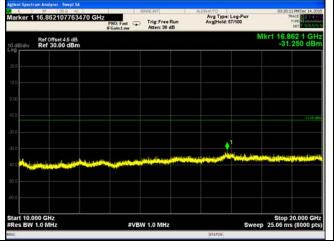




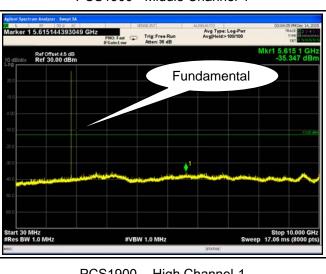
PCS1900 - Low Channel-1



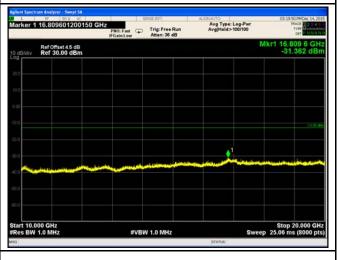
PCS 1900 - Low Channel-2



PCS1900 - Middle Channel-1



PCS 1900 - Middle Channel-2



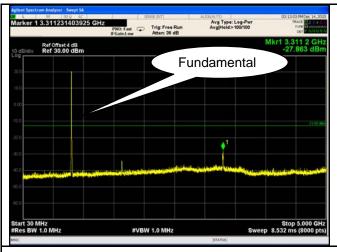
PCS1900 - High Channel-1

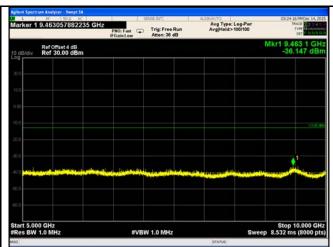
PCS 1900 - High Channel-2



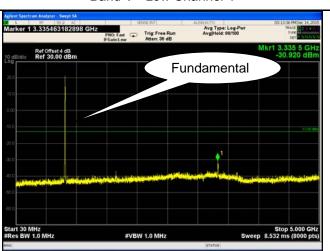
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#### UMTS-FDD Band V (Part 22H)





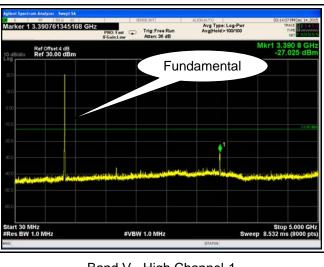
Band V - Low Channel-1



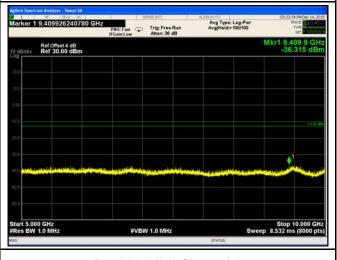
Band V - Low Channel-2



Band V - Middle Channel-1



Band V - Middle Channel-2



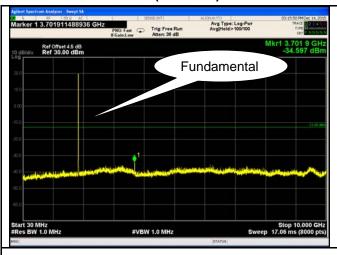
Band V - High Channel-1

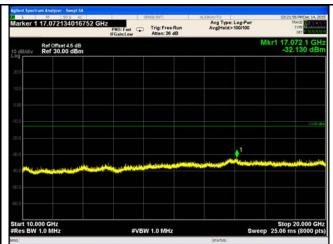
Band V - High Channel-2



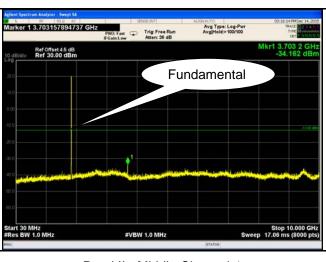
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#### UMTS-FDD Band II (Part 24E)





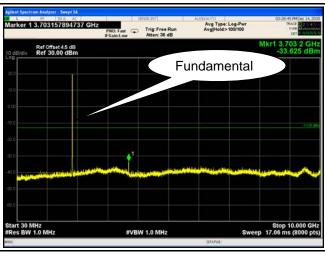
Band II - Low Channel-1



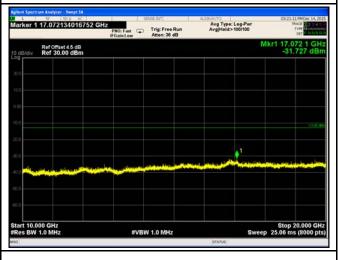
Band II - Low Channel-2



Band II - Middle Channel-1



Band II - Middle Channel-2



Band II - High Channel-1

Band II - High Channel-2



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# 6.6 Spurious Radiated Emissions

Temperature	23°C
Relative Humidity	56%
Atmospheric Pressure	1014mbar
Test date :	December 14, 2015
Tested By :	Winnie Zhang

#### Requirement(s):

Requirement(s):									
Spec	Item	Requirement	Applicable						
§2.1053, §22.917 & §24.238	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	Supp	Ant. Tower  Support Units  Turn Table  Ground Plane  Test Receiver							
Test Procedure	<ol> <li>The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.</li> <li>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.</li> <li>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)     </li> </ol>								



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Remark				
Result	Pass	Fail		

Test Data Yes

Test Plot Yes (See below) N/A



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### 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	-44.23	V	7.95	0.78	-37.06	-13	-24.06
1648.4	-44.95	Н	7.95	0.78	-37.78	-13	-24.78
125.7	-41.56	V	-1.6	0.17	-43.33	-13	-30.33
348.1	-50.12	Н	6.5	0.27	-43.89	-13	-30.89

#### 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	-44.18	V	7.95	0.78	-37.01	-13	-24.01
1673.2	-44.86	Н	7.95	0.78	-37.69	-13	-24.69
125.3	-41.42	V	-1.6	0.17	-43.19	-13	-30.19
348.5	-50.09	Н	6.5	0.27	-43.86	-13	-30.86

#### 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	-44.13	V	7.95	0.78	-36.96	-13	-23.96
1697.6	-44.92	Н	7.95	0.78	-37.75	-13	-24.75
125.9	-41.37	V	-1.6	0.17	-43.14	-13	-30.14
348.3	-50.16	Н	6.5	0.27	-43.93	-13	-30.93

- 1, The testing has been conformed to 10\*848.8MHz=8,488MHz
- 2, All other emissions more than 30 dB below the limit



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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	-45.23	V	10.25	2.73	-37.71	-13	-24.71
3700.4	-45.76	Н	10.25	2.73	-38.24	-13	-25.24
126.1	-41.25	V	-1.6	0.17	-43.02	-13	-30.02
347.9	-50.41	Н	6.5	0.27	-44.18	-13	-31.18

#### 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	-45.18	V	10.25	2.73	-37.66	-13	-24.66
3760	-45.65	Н	10.25	2.73	-38.13	-13	-25.13
126.5	-41.39	V	-1.6	0.17	-43.16	-13	-30.16
347.8	-50.33	Н	6.5	0.27	-44.1	-13	-31.1

### 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	-45.21	V	10.36	2.73	-37.58	-13	-24.58
3819.6	-45.57	Н	10.36	2.73	-37.94	-13	-24.94
126.8	-41.34	٧	-1.6	0.17	-43.11	-13	-30.11
347.2	-50.49	Н	6.5	0.27	-44.26	-13	-31.26

- 1, The testing has been conformed to 10\*1909.8MHz=19,098MHz
- 2, All other emissions more than 30 dB below the limit



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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	-45.19	V	7.95	0.78	-38.02	-13	-25.02
1652.8	-45.63	Η	7.95	0.78	-38.46	-13	-25.46
125.2	-41.55	V	-1.6	0.17	-43.32	-13	-30.32
348.5	-50.71	Н	6.5	0.27	-44.48	-13	-31.48

#### Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1670	-45.29	V	7.95	0.78	-38.12	-13	-25.12
1670	-45.73	Н	7.95	0.78	-38.56	-13	-25.56
125.6	-41.42	V	-1.6	0.17	-43.19	-13	-30.19
348.3	-50.86	Н	6.5	0.27	-44.63	-13	-31.63

### 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	-45.37	V	7.95	0.78	-38.2	-13	-25.20
1693.2	-45.62	Н	7.95	0.78	-38.45	-13	-25.45
125.8	-41.54	V	-1.6	0.17	-43.31	-13	-30.31
348.1	-50.91	Н	6.5	0.27	-44.68	-13	-31.68

- 1, The testing has been conformed to 10\*846.6MHz=8,466MHz 2, All other emissions more than 30 dB below the limit



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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	-45.82	V	10.25	2.73	-38.3	-13	-25.30
3704.8	-46.37	Н	10.25	2.73	-38.85	-13	-25.85
126.7	-41.56	V	-1.6	0.17	-43.33	-13	-30.33
347.3	-50.62	Н	6.5	0.27	-44.39	-13	-31.39

#### 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	-45.73	V	10.25	2.73	-38.21	-13	-25.21
3760	-46.41	Н	10.25	2.73	-38.89	-13	-25.89
126.9	-41.48	V	-1.6	0.17	-43.25	-13	-30.25
348.2	-50.52	Н	6.5	0.27	-44.29	-13	-31.29

### 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	-45.68	V	10.36	2.73	-38.05	-13	-25.05
3815.2	-46.31	Н	10.36	2.73	-38.68	-13	-25.68
126.4	-41.55	V	-1.6	0.17	-43.32	-13	-30.32
348.8	-50.89	Н	6.5	0.27	-44.66	-13	-31.66

- 1, The testing has been conformed to 10\*1907.6MHz=19,076MHz
- 2, All other emissions more than 30 dB below the limit



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# 6.7 Band Edge

Temperature	23°C
Relative Humidity	56%
Atmospheric Pressure	1014mbar
Test date :	December 14, 2015
Tested By :	Winnie Zhang

### Requirement(s):

Spec	Item	Requirement	Applicable
§22.917(a) §24.238(a)	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		Base Station Spectrum Analyzer EUT	
Procedure	-	The EUT was connected to Spectrum Analyzer and Base S power divider.  The Band Edges of low and high channels for the highest R were measured. Setting RBW as roughly BW/100.	
Remark			
Result	<b>☑</b> Pa	ss Fail	_

Test Data	Yes	□ <sub>N/A</sub>
Test Plot	Yes (See below)	□ <sub>N/A</sub>



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### Cellular Band (Part 22H) result

Frequency (MHz)	Emission (dBm)	Limit (dBm)
823.997	-15.050	-13
849.017	-17.283	-13

### PCS Band (Part24E) result

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1849.983	-17.235	-13
1910.016	-17.782	-13

### UMTS-FDD Band V (Part 22H)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
823.94	-27.658	-13
849.02	-24.220	-13

# UMTS-FDD Band II (Part 24E)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1849.91	-25.404	-13
1910.05	-24.322	-13



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#### **Test Plots**





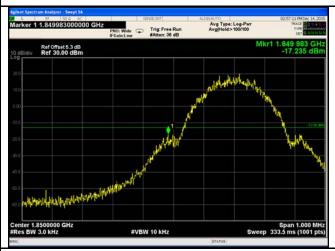
Cellular Band - Low Channel

Cellular Band - High Channel

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

Note: Offset=Cable loss (4.0) + 10log (3.52/3)=4.0+0.7=4.7dB

(3.52/3)=4.0+0.7=4.7dB





PCS Band - Low Channel

PCS Band - High Channel

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

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

(3.59/3)=4.5+0.8=5.3dB

(3.52/3)=4.5+0.7=5.2dB



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UMTS-FDD Band V - Low Channel

UMTS-FDD Band V - High Channel

Note: Offset=Cable loss (4.0) + 10log (70.79/30)=4.0+3.7=7.7 dB

Note: Offset=Cable loss (4.0) + 10log (70.67/30)=4.0+3.7=7.7 dB





UMTS-FDD Band II - Low Channel

UMTS-FDD Band II - High Channel

Note: Offset=Cable loss (4.5) + 10log (48.63/30)=4.5+2.1=6.6 dB

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

(47.96/30)=4.5+2.0=6.5 dB



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# 6.8 Frequency Stability

Temperature	23°C
Relative Humidity	56%
Atmospheric Pressure	1014mbar
Test date :	December 14, 2015
Tested By :	Winnie Zhang

#### Requirement(s):

Spec	Item	Requirement Applicable			Applicable	
§2.1055, §22.355 & §24.235	a)	According to §22.3 the Public Mobile Stolerances given in Frequency Toleran Services  Frequency Range (MHz) 25 to 50 50 to 450 45 to 512 821 to 896 928 to 29. 929 to 960. 2110 to 2220 According to §24.2 ensure that the fun	Base, fixed (ppm) 20.0 5.0 2.5 1.5 5.0 1.5 10.0 35, the frequ	mitters in the Publishment was well as the maintained was writtens in the Publishment was marked as a second was a second	ic Mobile  Mobile ≤ 3 watts (ppm) 50.0 50.0 .0 2.5 N/A N/A N/A Il be sufficient to	
		frequency block.				
Test setup	Base Station EUT  Thermal Chamber					



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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	□ <sub>N/A</sub>
Test Plot	Yes (See below)	<b>▽</b> N/A



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## Cellular Band (Part 22H) result

	Middle Channel, f₀ = 836.6 MHz				
Temperature (°C)	Power Supplied (V <sub>DC</sub> )	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	
-10		23	0.0275	2.5	
0		22	0.0263	2.5	
10	3.7	24	0.0287	2.5	
20		23	0.0275	2.5	
30		15	0.0179	2.5	
40		15	0.0179	2.5	
50		15	0.0179	2.5	
55		28	0.0335	2.5	
25	4.2	18	0.0215	2.5	
25	3.5	25	0.0299	2.5	

#### PCS Band (Part 24E) result

. 30 24	1 00 Bana (1 art 2+2) 100art				
	Middle Channel, f₀ = 1880 MHz				
Temperature (°C)	Power Supplied (V <sub>DC</sub> )	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	
-10		23	0.0122	2.5	
0		24	0.0128	2.5	
10	3.7	15	0.0080	2.5	
20		15	0.0080	2.5	
30		19	0.0101	2.5	
40		20	0.0106	2.5	
50		25	0.0133	2.5	
55		25	0.0133	2.5	
)E	4.2	21	0.0112	2.5	
25	3.5	24	0.0128	2.5	



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#### UMTS-FDD Band V (Part 22H)

Middle Channel, f₀ = 835 MHz					
Temperature (°C)	Power Supplied (V <sub>DC</sub> )	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	
-10		19	0.0228	2.5	
0	3.7	18	0.0216	2.5	
10		15	0.0180	2.5	
20		16	0.0192	2.5	
30		12	0.0144	2.5	
40		13	0.0156	2.5	
50		17	0.0204	2.5	
55		17	0.0204	2.5	
25	4.2	18	0.0216	2.5	
	3.5	21	0.0251	2.5	

### UMTS-FDD Band II (Part 24E)

Middle Channel, f₀ = 1880 MHz					
Temperature (°C)	Power Supplied (V <sub>DC</sub> )	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	
-10		16	0.0085	2.5	
0	3.7	14	0.0074	2.5	
10		10	0.0053	2.5	
20		8	0.0043	2.5	
30		10	0.0053	2.5	
40		11	0.0059	2.5	
50		12	0.0064	2.5	
55		13	0.0069	2.5	
25	4.2	12	0.0064	2.5	
	3.5	13	0.0069	2.5	



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# 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	<b>\</b>
Power Splitter	1#	1#	09/01/2015	08/31/2016	~
Universal Radio Communication Tester	CMU200	121393	09/25/2015	09/24/2016	<b>&gt;</b>
Temperature/Humidity Chamber	UHL-270	001	10/09/2015	10/08/2016	<u>&lt;</u>
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	<u>&lt;</u>
Microwave Preamplifier (1 ~ 26.5GHz)	8449B	3008A02402	03/25/2015	03/24/2016	<b>Y</b>
Bilog Antenna (30MHz~6GHz)	JB6	A110712	09/21/2015	09/20/2016	<b>\</b>
Bilog Antenna (30MHz~2GHz)	JB1	A112017	09/21/2015	09/20/2016	<u>&lt;</u>
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71259	09/24/2015	09/23/2016	<b>(</b>
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71283	09/24/2015	09/23/2016	<b>(</b>
SYNTHESIZED SIGNAL GENERATOR	8665B	3744A01293	09/17/2015	09/16/2016	<b>\</b>
Tunable Notch Filter	3NF- 800/1000-S	AA4	09/01/2015	08/31/2016	<b>&gt;</b>
Tunable Notch Filter	3NF- 1000/2000-S	AM 4	09/01/2015	08/31/2016	<b>V</b>



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## Annex B. EUT And Test Setup Photographs

#### Annex B.i. Photograph: EUT External Photo





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2/1. L1 3/1. L

EUT - Top View

**EUT - Bottom View** 



EUT - Left View



**EUT - Right View** 



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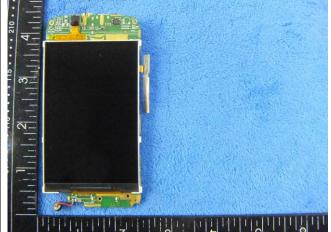
#### Annex B.ii. Photograph: EUT Internal Photo





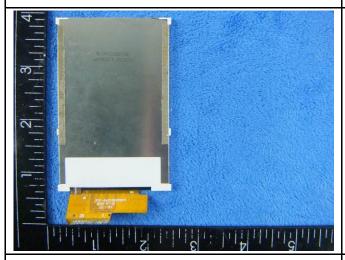
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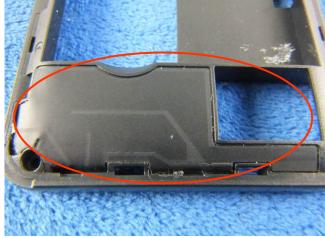




Mainbard - Rear View

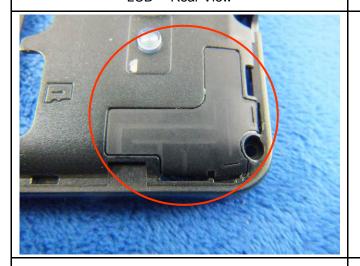
LCD - Front View





LCD - Rear View

GSM/PCS/UMTS-FDD Antenna View

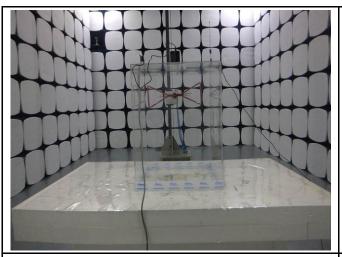


WIFI/BT/BLE/GPS - Antenna View

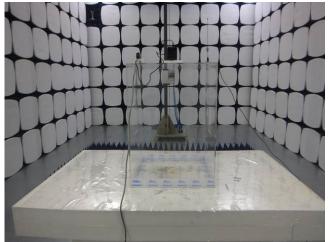


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### Annex B.iii. Photograph: Test Setup Photo



Radiated Spurious Emissions Test Setup Below 1GHz



Radiated Spurious Emissions Test Setup Above 1GHz

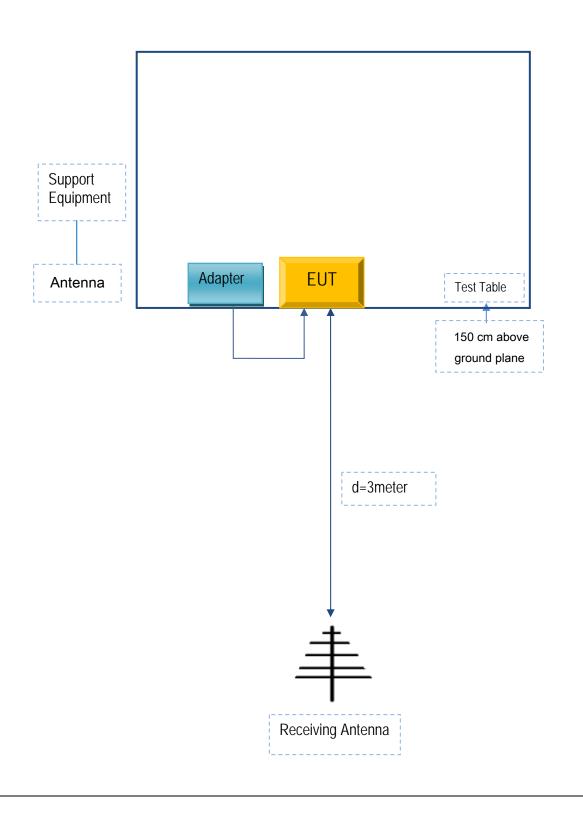


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# Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

### 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	Serial No	Calibration Due Date
NEG TECHNOLOGY	Adapter	S3000D	N/A	CN157421800	N/A
CO., LIMITED	•				

#### Supporting Cable:

Cable type	Shield Type	Ferrite Core	Length	Serial No	Calibration Date	Calibration Due Date
USB Cable	Un-shielding	No	0.8m	XY1472851311	N/A	N/A



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### Annex C.ii. EUT OPERATING CONKITIONS

N/A



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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