



RF TEST REPORT

Applicant Bullitt Group
FCC ID ZL5B40E
Product Mobile Phone
Brand CAT
Model B40
Report No. R2101A0004-R1V2
Issue Date March 31, 2021

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 2 (2019)/ FCC CFR 47 Part 22H (2019)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

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TABLE OF CONTENT

1. Test Laboratory	5
1.1. Notes of the Test Report	5
1.2. Test facility	5
1.3. Testing Location	5
2. General Description of Equipment under Test	6
2.1. Applicant and Manufacturer Information	6
2.2. General Information	6
3. Applied Standards	8
4. Test Configuration	9
5. Test Case Results	10
5.1. RF Power Output and Effective Radiated Power	10
5.2. Occupied Bandwidth	12
5.3. Band Edge Compliance	16
5.4. Peak-to-Average Power Ratio (PAPR)	19
5.5. Frequency Stability	21
5.6. Spurious Emissions at Antenna Terminals	23
5.7. Radiates Spurious Emission	26
6. Main Test Instruments	30
ANNEX A: The EUT Appearance	31
ANNEX B: Test Setup Photos	32



Version	Revision description	Issue Date
Rev.0	Initial issue of report.	March 17, 2021
Rev.1	Update information.	March 19, 2021
Rev.2	Update description in Page 9.	March 31, 2021
Note: This revised report (Report No. R2101A0004-R1V2) supersedes and replaces the previously issued report (Report No. R2101A0004-R1V1). Please discard or destroy the previously issued report and dispose of it accordingly.		



Summary of measurement results

No.	Test Case	Clause in FCC rules	Verdict
1	RF Power Output and Effective Radiated Power	2.1046 22.913(a)(5)	PASS
2	Occupied Bandwidth	2.1049	PASS
3	Band Edge Compliance	2.1051 / 22.917(a)	PASS
4	Peak-to-Average Power Ratio	22.913(d)/ KDB 971168 D01(5.7)	PASS
5	Frequency Stability	2.1055 / 22.355	PASS
6	Spurious Emissions at Antenna Terminals	2.1051 / 22.917(a)	PASS
7	Radiates Spurious Emission	2.1053 / 22.917 (a)	PASS
Date of Testing: January 11, 2021 ~ February 19, 2021			
Date of Sample Received: January 4, 2021			
Note: All indications of Pass/Fail in this report are opinions expressed by TA Technology (Shanghai) Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.			



1. Test Laboratory

1.1. Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

1.2. Test facility

FCC (Designation number: CN1179, Test Firm Registration Number: 446626)

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform measurements.

A2LA (Certificate Number: 3857.01)

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform measurement.

1.3. Testing Location

Company: TA Technology (Shanghai) Co., Ltd.
Address: No.145, Jintang Rd, Tangzhen Industry Park, Pudong
City: Shanghai
Post code: 201201
Country: P. R. China
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Website: <http://www.ta-shanghai.com>
E-mail: xukai@ta-shanghai.com

2. General Description of Equipment under Test

2.1. Applicant and Manufacturer Information

Applicant	Bullitt Group
Applicant address	One Valpy, Valpy Street, Reading, Berkshire, RG1 1AR, United Kingdom
Manufacturer	Bullitt Mobile Limited
Manufacturer address	One Valpy, Valpy Street, Reading, Berkshire, RG1 1AR, United Kingdom

2.2. General Information

EUT Description			
Model	B40		
IMEI	IMEI 1:351743660016965 IMEI 2:351743660016973		
Hardware Version	V00		
Radio Version	Dual SIM: LTE_D03140.10_B40 Single SIM: LTE_S03140.10_B40		
Power Supply	Battery / AC adapter		
Antenna Type	PIFA Antenna		
Antenna Gain	-1.5 dBi		
Test Mode(s)	GSM 850; WCDMA Band V		
Test Modulation	(GSM/GPRS)GMSK, (EGPRS) GMSK/ 8PSK; (WCDMA) BPSK, QPSK;		
GPRS Multislot Class	12		
EGPRS Multislot Class	12		
HSDPA UE Category	14		
HSUPA UE Category	6		
Maximum E.R.P.	GSM 850:	28.88dBm	
	WCDMA Band V:	18.96dBm	
Rated Power Supply Voltage	3.8V		
Extreme Voltage	Minimum: 3.23V	Maximum: 4.37V	
Extreme Temperature	Lowest: -30°C	Highest: +55°C	
Operating Voltage	Minimum: 3.6V	Maximum: 4.35V	
Operating Temperature	Lowest: -25°C	Highest: +55°C	
Operating Frequency Range(s)	Band	Tx (MHz)	Rx (MHz)
	GSM850	824 ~ 849	869 ~ 894
	WCDMA Band V	824 ~ 849	869 ~ 894
EUT Accessory			



Battery	Manufacturer: NINGBO VEKEN BATTERY CO., LTD Model: 178205511
Earphone	Manufacturer: JIU JIANG JUWEI ELECTRONICS CO.,LTD Model: JWEP1192-M01H
USB Cable	Manufacturer: SHENZHEN FKY-QY HARDWARE ELECTRONIC CO.,LTD Model: MO36B2000100
Note: 1. The EUT is sent from the applicant to TA and the information of the EUT is declared by the applicant.	

Difference Configuration Statement				
Configuration	Configuration 1		Configuration 2	
	Dual card slots	Single card slot	Dual card slots	Single card slot
Memory	DOS DS35M1GA-IB		ESMT F50D1G41LB-83YG2ME	
LCD	Sanlong CT024TN01 (CTC glass)		HLT HTB040WB085 (HSD glass)	
Antibacterial	No		Yes	
Radio Version	LTE_D03140.10_ B40	LTE_S03140.10_ B40	LTE_D03140.10_ B40	LTE_S03140.10_ B40
SIM Card Slot	SIM 1, SIM 2	SIM 1 (SIM 2 slot closed)	SIM 1, SIM 2	SIM 1 (SIM 2 slot closed)
Others	The same		The same	
Customer declared that the difference between the four EUT is only the Memory, LCD, Antibacterial, Radio Version and the quantity of SIM Card Slot. There are more than one Configure, each one should be applied throughout the compliance test respectively, however, only the worst case (Configure 1, Dual card slots) will be recorded in this report.				



3. Applied Standards

According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test standards:

FCC CFR 47 Part 22H (2019)

ANSI C63.26 (2015)

Reference standard:

FCC CFR47 Part 2 (2019)

KDB 971168 D01 Power Meas License Digital Systems v03r01

4. Test Configuration

There is more than one SIM card slot, each one should be applied throughout the compliance test respectively, and however, only the worst case (SIM 1) will be recorded in this report.

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes. EUT stand-up position (Z axis), lie-down position (X, Y axis). Receiver antenna polarization (horizontal and vertical), the worst emission was found in position (X axis, horizontal polarization) and the worst case was recorded.

All mode and data rates and positions and modulations were investigated.

Subsequently, only the worst case emissions are reported.

The following testing in GSM/WCDMA is set based on the maximum RF Output Power.

Test modes are chosen to be reported as the worst case configuration below:

Test items	Modes/Modulation	
	GSM 850	WCDMA Band V
RF Power Output and Effective Radiated power	GSM GPRS EGPRS	RMC HSDPA/HSUPA
Occupied Bandwidth	GSM GPRS(1Tx slot) EGPRS(1Tx slot)	RMC
Band Edge Compliance	GSM GPRS(1Tx slot) EGPRS(1Tx slot)	RMC
Peak-to-Average Power Ratio	GSM GPRS(1Tx slot) EGPRS(1Tx slot)	RMC
Frequency Stability	GSM GPRS(1Tx slot) EGPRS(1Tx slot)	RMC
Spurious Emissions at Antenna Terminals	GSM	RMC
Radiates Spurious Emission	GSM (CH-Middle)	RMC (CH-Middle)

5. Test Case Results

5.1. RF Power Output and Effective Radiated Power

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

During the process of the testing, The EUT was connected to the Base Station Simulator with a known loss. The EUT is controlled by the Base Station Simulator test set to ensure max power transmission with proper modulation.

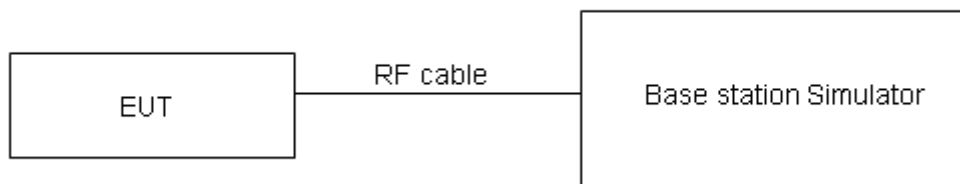
ERP can then be calculated as follows:

$EIRP \text{ (dBm)} = \text{Output Power (dBm)} - \text{Losses (dB)} + \text{Antenna Gain (dBi)}$

where:dBd refers to gain relative to an ideal dipole.

$EIRP \text{ (dBm)} = ERP \text{ (dBm)} + 2.15 \text{ (dB)}$.

Test Setup



Limits

No specific RF power output requirements in part 2.1046.

Rule Part 22.913(a)(5) specifies that "Mobile/portable stations are limited to 7 watts ERP".

Limit	$\leq 7 \text{ W}$ (38.45 dBm)
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Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 0.4 \text{ dB}$ for RF power output, $k = 2$, $U = 1.19 \text{ dB}$ for ERP.

Test Results

GSM 850		Maximum Output Power (dBm)			ERP (dBm)		
		Channel 128	Channel 190	Channel 251	Channel 128	Channel 190	Channel 251
		824.2 (MHz)	836.6 (MHz)	848.8 (MHz)	824.2 (MHz)	836.6 (MHz)	848.8 (MHz)
GSM(GMSK)	Results	32.40	32.47	32.53	28.75	28.82	28.88
GPRS (GMSK)	1TXslot	32.34	32.36	32.45	28.69	28.71	28.80
	2TXslots	30.31	30.28	30.24	26.66	26.63	26.59
	3TXslots	28.62	28.63	28.63	24.97	24.98	24.98
	4TXslots	26.34	26.41	26.43	22.69	22.76	22.78
EGPRS (8PSK)	1TXslot	27.02	26.71	26.45	23.37	23.06	22.80
	2TXslots	25.29	25.57	25.21	21.64	21.92	21.56
	3TXslots	23.15	23.34	22.86	19.50	19.69	19.21
	4TXslots	20.87	21.08	20.59	17.22	17.43	16.94

WCDMA Band V		Maximum Output Power (dBm)			ERP (dBm)		
		Channel 4132	Channel 4183	Channel 4233	Channel 4132	Channel 4183	Channel 4233
		826.4 (MHz)	836.6 (MHz)	846.6 (MHz)	826.4 (MHz)	836.6 (MHz)	846.6 (MHz)
RMC		22.18	22.61	22.06	18.53	18.96	18.41
HSDPA	Sub - Test 1	21.60	22.03	21.48	17.95	18.38	17.83
	Sub - Test 2	21.59	22.02	21.47	17.94	18.37	17.82
	Sub - Test 3	21.08	21.51	20.96	17.43	17.86	17.31
	Sub - Test 4	21.07	21.50	20.95	17.42	17.85	17.30
HSUPA	Sub - Test 1	20.56	20.99	20.44	16.91	17.34	16.79
	Sub - Test 2	18.55	18.98	18.43	14.90	15.33	14.78
	Sub - Test 3	19.53	19.97	19.42	15.88	16.32	15.77
	Sub - Test 4	18.52	18.96	18.41	14.87	15.31	14.76
	Sub - Test 5	22.01	22.45	21.90	18.36	18.80	18.25

5.2. Occupied Bandwidth

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

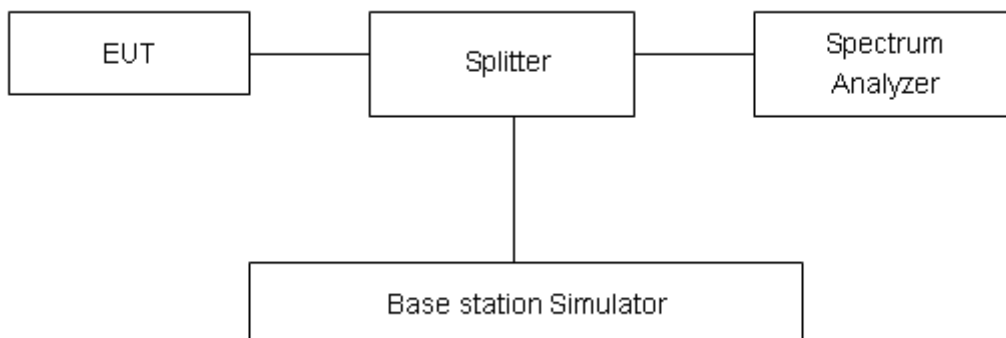
The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The occupied bandwidth is measured using spectrum analyzer.

RBW is set to 6.2kHz, VBW is set to 18kHz for GSM 850,

RBW is set to 51kHz, VBW is set to 160kHz for WCDMA Band V,

99% power and -26dBc occupied bandwidths are recorded. Spectrum analyzer plots are included on the following pages.

Test Setup



Limits

No specific occupied bandwidth requirements in part 2.1049.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 624\text{Hz}$.

Test Result

Mode	Channel	Frequency (MHz)	99% Power Bandwidth (MHz)	-26dBc Bandwidth(MHz)
GSM 850 (GMSK)	128	824.2	0.24114	0.3094
	190	836.6	0.24764	0.3134
	251	848.8	0.24406	0.3081
GPRS 850 (GMSK)	128	824.2	0.24216	0.3094
	190	836.6	0.24479	0.3123
	251	848.8	0.24334	0.3087
EGPRS 850 (8PSK)	128	824.2	0.24697	0.3122
	190	836.6	0.24885	0.3264
	251	848.8	0.24527	0.3170
WCDMA Band V (RMC)	4132	826.4	4.14210	4.6390
	4183	836.6	4.14770	4.6330
	4233	846.6	4.14490	4.6690

GSM 850 CH-Low



GSM 850 GPRS CH-Low



GSM 850 CH-Middle



GSM 850 GPRS CH-Middle



GSM 850 CH-High



GSM 850 GPRS CH-High

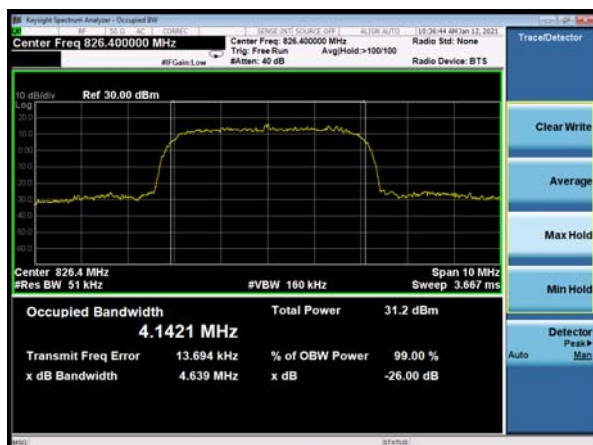




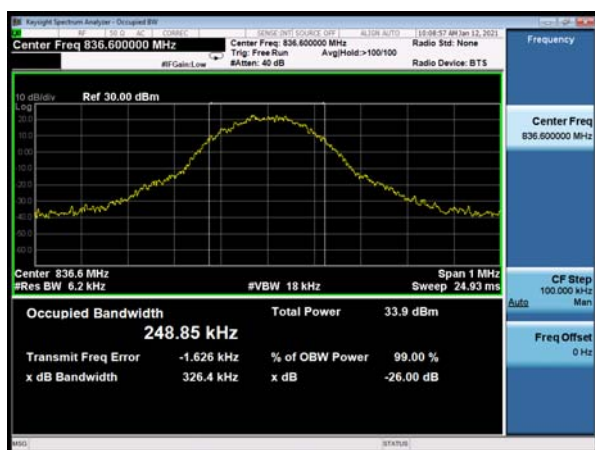
GSM 850 EGPRS CH-Low



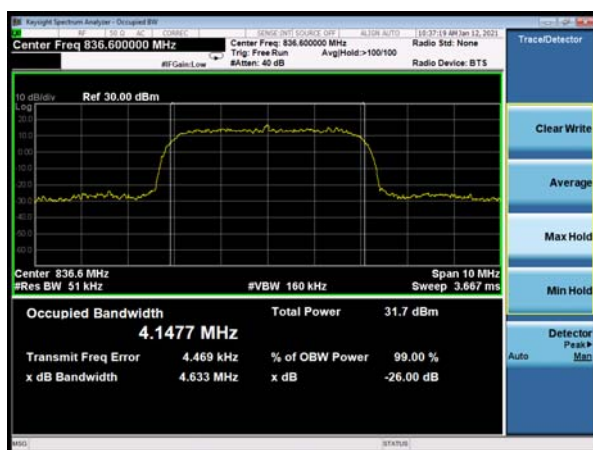
WCDMA Band V CH-Low



GSM 850 EGPRS CH-Middle



WCDMA Band V CH-Middle



GSM 850 EGPRS CH-High



WCDMA Band V CH-High



5.3. Band Edge Compliance

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

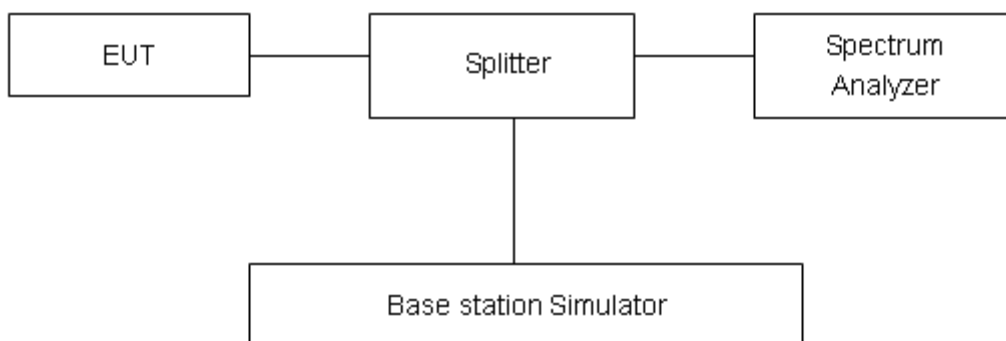
The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The band edge of the lowest and highest channels were measured. The average detector is used.

RBW is set to 6.2kHz,VBW is set to 18kHz for GSM 850

RBW is set to 51kHz,VBW is set to 160kHz for WCDMA Band V,

Spectrum analyzer plots are included on the following pages.

Test Setup



Limits

Rule Part 22.917(a) specifies that “The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.”

Limit	-13 dBm
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Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$, $U=0.684$ dB.

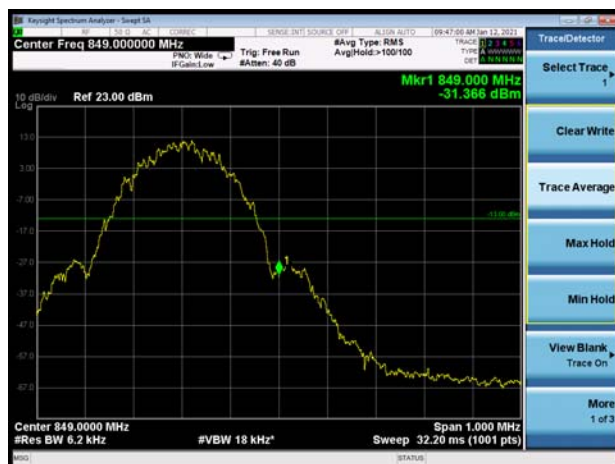


Test Result:

GSM 850 CH-Low



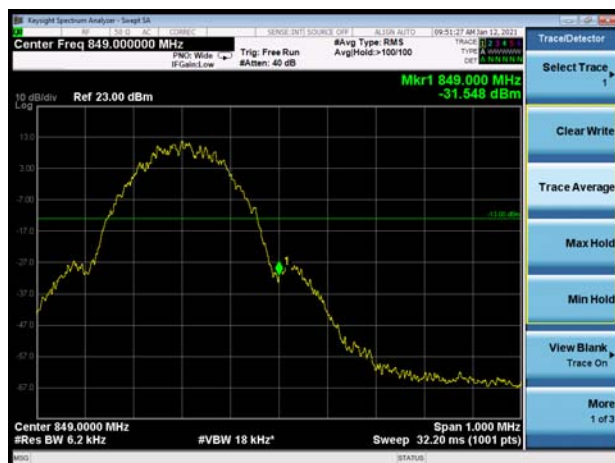
GSM 850 CH-High



GSM 850 GPRS CH-Low



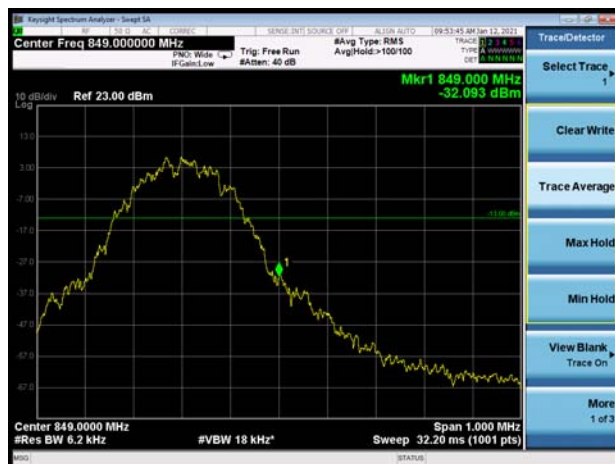
GSM 850 GPRS CH-High



GSM 850 EGPRS CH-Low



GSM 850 EGPRS CH-High





WCDMA Band V CH-Low



WCDMA Band V CH-High



5.4. Peak-to-Average Power Ratio (PAPR)

Ambient condition

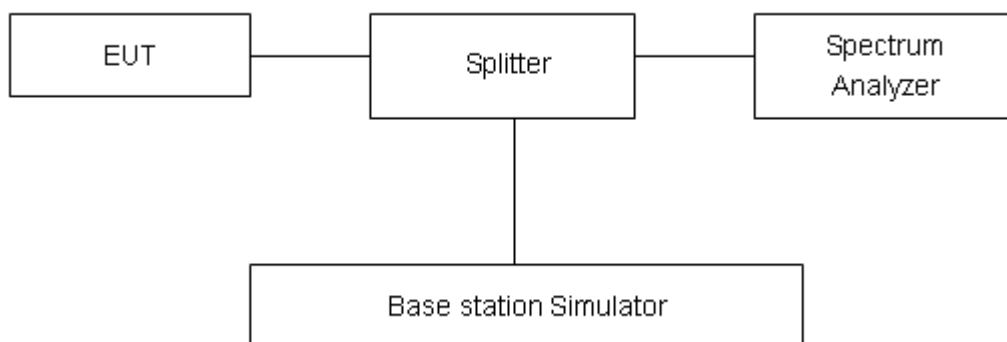
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

Measure the total peak power and record as P_{Pk} . And measure the total average power and record as P_{Avg} . Both the peak and average power levels must be expressed in the same logarithmic units (e.g., dBm). Determine the PAPR from:

$$PAPR (dB) = P_{Pk} (dBm) - P_{Avg} (dBm).$$

Test Setup



Limits

According to the Sec. 22.913(d), The peak-to-average ratio (PAR) of the transmission must not exceed 13 dB.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 0.4$ dB.

Test Results

Mode	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
GSM 850 (GMSK)	128	824.2	33.66	32.40	1.26	≤13	PASS
	190	836.6	33.81	32.47	1.34	≤13	PASS
	251	848.8	33.77	32.53	1.24	≤13	PASS
GPRS 850 (GMSK)	128	824.2	33.62	32.34	1.28	≤13	PASS
	190	836.6	33.71	32.36	1.35	≤13	PASS
	251	848.8	33.84	32.45	1.39	≤13	PASS
EGPRS 850 (8PSK)	128	824.2	28.86	27.02	1.84	≤13	PASS
	190	836.6	28.47	26.71	1.76	≤13	PASS
	251	848.8	28.30	26.45	1.85	≤13	PASS
WCDMA Band V (RMC)	4132	826.4	25.05	22.00	3.05	≤13	PASS
	4183	836.6	25.52	22.44	3.08	≤13	PASS
	4233	846.6	24.86	21.82	3.04	≤13	PASS

5.5. Frequency Stability

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

Frequency Stability (Temperature Variation)

The temperature inside the climate chamber is varied from -30°C to +55°C in 10°C step size,

(1) With all power removed, the temperature was decreased to 0°C and permitted to stabilize for three hours.

(2) Measure the carrier frequency with the test equipment in a “call mode”. These measurements should be made within 1 minute of powering up the mobile station, to prevent significant self warming.

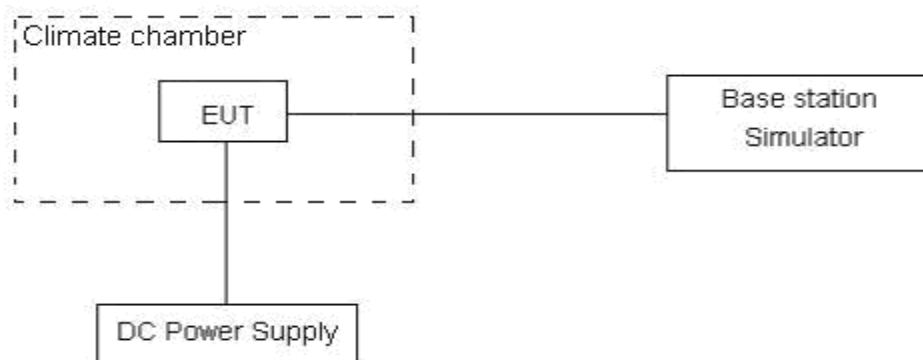
(3) Repeat the above measurements at 10°C increments from -30°C to +55°C. Allow at least 1.5 hours at each temperature, un-powered, before making measurements. Frequency Stability (Voltage Variation)

The frequency stability shall be measured with variation of primary supply voltage as follows:

Primary Supply Voltage: The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

This transceiver is specified to operate with an input voltage of between 3.23V and 4.37V, with a nominal voltage of 3.8V.

Test setup



Limits

According to the Sec. 22.355, the frequency stability of the carrier shall be accurate to within 2.5 ppm of the received frequency for mobile stations.

Limits	≤ 2.5 ppm
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Measurement Uncertainty

The assessed measurement uncertainty to ensure 99.75% confidence level for the normal distribution is with the coverage factor $k = 3$, $U = 0.01\text{ppm}$.

Test Result

GSM850						
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
condition	Voltage	GMSK	8PSK	GMSK	8PSK	
Normal (25℃)	Normal	14.70	5.15	0.00782	0.00274	PASS
Extreme (55℃)		7.16	4.80	0.00381	0.00255	PASS
Extreme (50℃)		7.17	1.36	0.00381	0.00072	PASS
Extreme (40℃)		3.31	8.52	0.00176	0.00453	PASS
Extreme (30℃)		7.17	13.18	0.00381	0.00701	PASS
Extreme (20℃)		14.48	7.85	0.00770	0.00418	PASS
Extreme (10℃)		10.00	5.75	0.00532	0.00306	PASS
Extreme (0℃)		14.84	14.68	0.00789	0.00781	PASS
Extreme (-10℃)		1.18	1.31	0.00063	0.00069	PASS
Extreme (-20℃)		13.15	7.46	0.00700	0.00397	PASS
Extreme (-30℃)		14.65	17.23	0.00779	0.00917	PASS
25℃	LV	9.63	7.17	0.00512	0.00382	PASS
	HV	14.70	16.59	0.00782	0.00882	PASS

WCDMA Band V						
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
Temperature	Voltage	BPSK	QPSK	BPSK	QPSK	
Normal (25℃)	Normal	12.43	8.19	0.00661	0.00436	PASS
Extreme (55℃)		1.92	3.26	0.00102	0.00173	PASS
Extreme (50℃)		3.00	3.77	0.00160	0.00200	PASS
Extreme (40℃)		16.31	5.23	0.00868	0.00278	PASS
Extreme (30℃)		1.54	16.74	0.00082	0.00890	PASS
Extreme (20℃)		10.58	17.28	0.00563	0.00919	PASS
Extreme (10℃)		15.86	3.48	0.00844	0.00185	PASS
Extreme (0℃)		14.54	14.85	0.00774	0.00790	PASS
Extreme (-10℃)		6.94	15.94	0.00369	0.00848	PASS
Extreme (-20℃)		5.81	16.59	0.00309	0.00883	PASS
Extreme (-30℃)		8.51	6.31	0.00453	0.00336	PASS
25℃	LV	6.53	9.93	0.00347	0.00528	PASS
	HV	5.62	6.11	0.00299	0.00325	PASS

5.6. Spurious Emissions at Antenna Terminals

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The measurement is carried out using a spectrum analyzer. The spectrum analyzer scans from 9kHz to the 10th harmonic of the carrier.

The peak detector is used.

RBW is set to 1 kHz (0.009MHz~ 0.15 MHz),

RBW is set to 10 kHz (0.15 MHz~ 30 MHz),

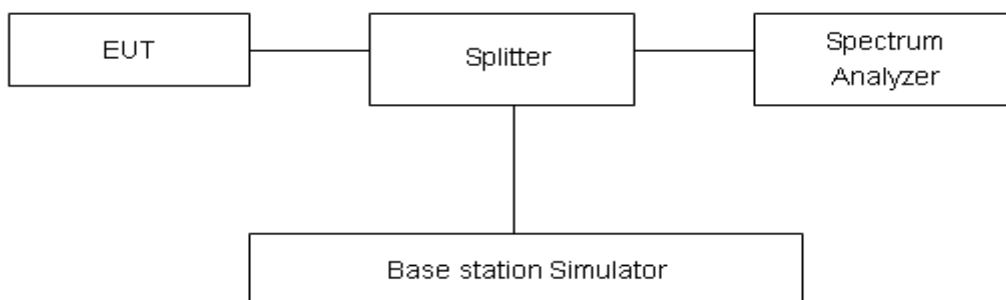
RBW is set to 100 kHz (30MHz~1000 MHz),

RBW is set to 1000 kHz (above 1000MHz),

Sweep is set to ATUO.

The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

Test setup



Limits

Rule Part 22.917(a) specifies that “The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.”

Limit	-13 dBm
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Measurement Uncertainty

The assessed measurement uncertainty to ensure 99.75% confidence level for the normal distribution is with the coverage factor $k = 1.96$.

Frequency	Uncertainty
9kHz-1GHz	0.684 dB
1GHz-18GHz	1.407 dB



Test Result

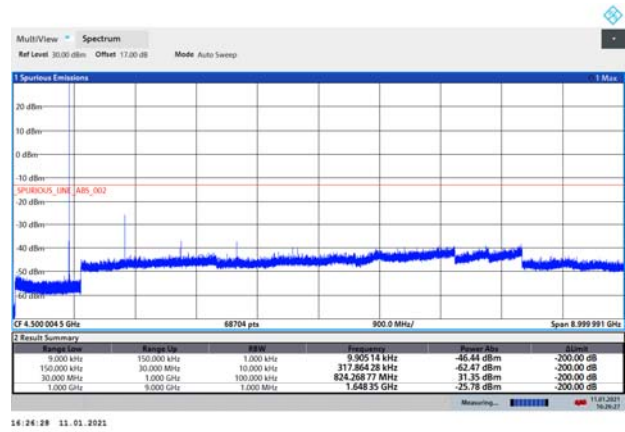
Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the emissions more than 20 dB below the limit are not reported.

The signal beyond the limit is carrier.

GSM 850 CH-Low 9kHz ~ 9GHz



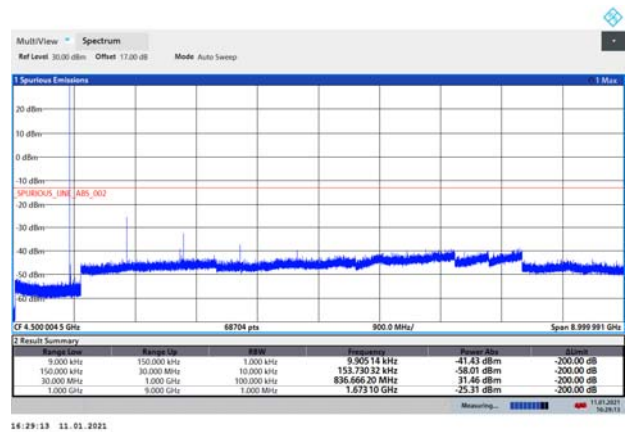
GPRS 850 CH-Low 9kHz ~ 9GHz



GSM 850 CH-Middle 9kHz ~ 9GHz



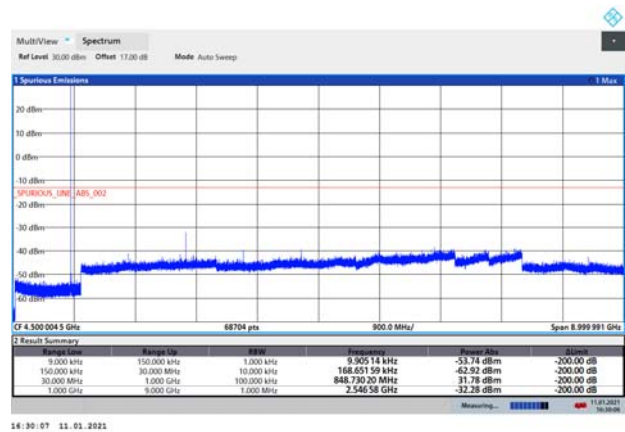
GPRS 850 CH-Middle 9kHz ~ 9GHz



GSM 850 CH-High 9kHz ~ 9GHz

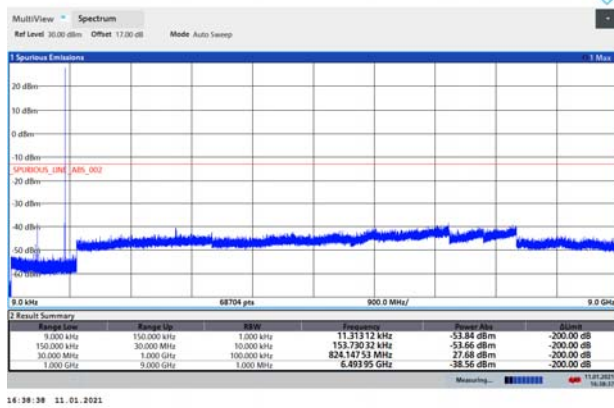


GPRS 850 CH-High 9kHz ~ 9GHz

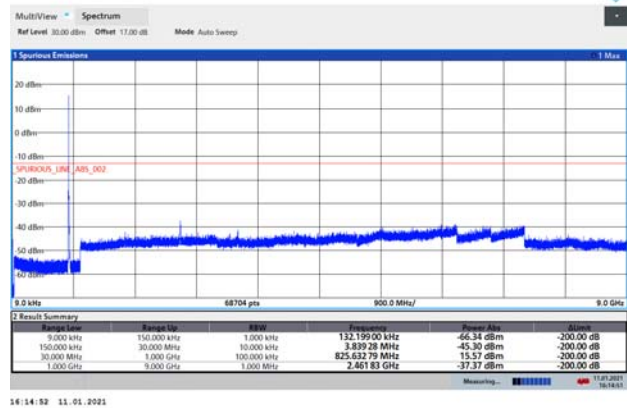




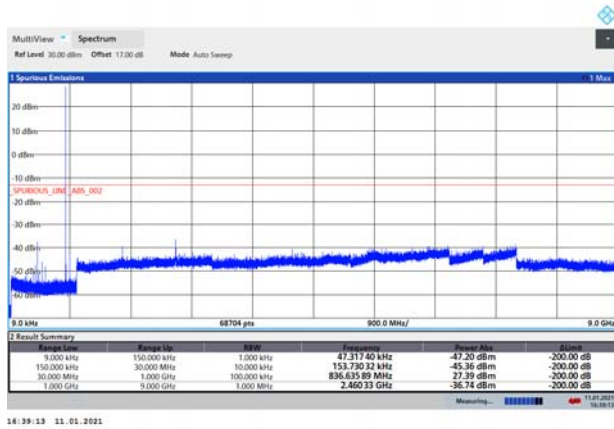
EGPRS 850 CH-Low 9kHz ~ 9GHz



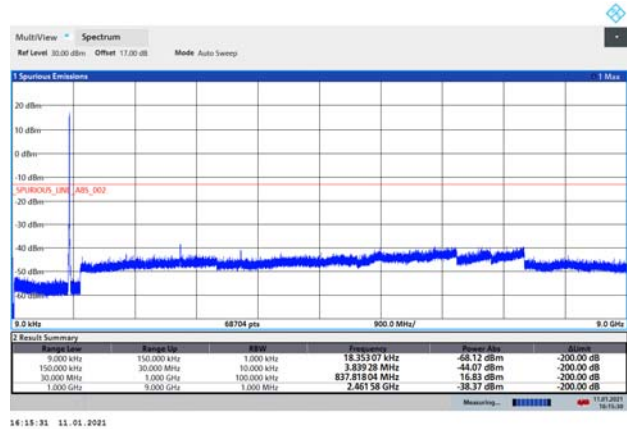
WCDMA BAND V CH-Low 9kHz ~ 9GHz



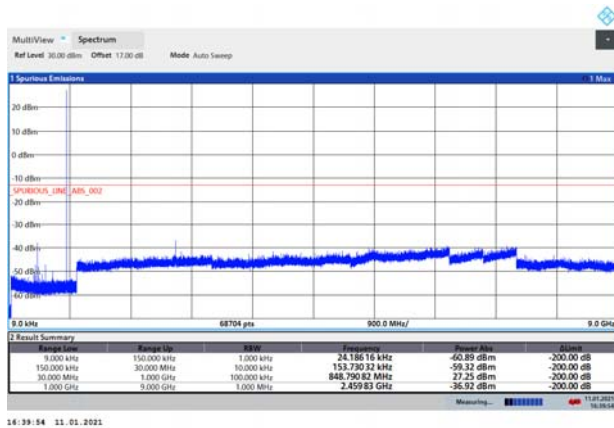
EGPRS 850 CH-Middle 9kHz ~ 9GHz



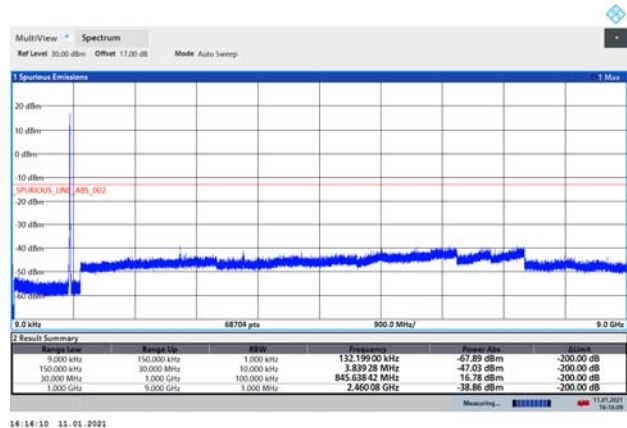
WCDMA BAND V CH-Middle 9kHz ~ 9GHz



EGPRS 850 CH-High 9kHz ~ 9GHz



WCDMA BAND V CH-High 9kHz ~ 9GHz



5.7. Radiates Spurious Emission

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

1. The testing follows FCC KDB 971168 v03r01 Section 5.8 and ANSI C63.26 (2015).
2. Below 1GHz: The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H). Above 1GHz: (Note: the FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 2, 2014.) The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).
3. A loop antenna, A log-periodic antenna or horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
4. The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=200Hz,VBW=600Hz for 9kHz-150kHz , RBW=10kHz, VBW=30kHz 150kHz-30MHz , RBW=100kHz,VBW=300kHz for 30MHz to 1GHz and RBW=1MHz, VBW=3MHz for above 1GHz, And the maximum value of the receiver should be recorded as (Pr).
5. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
6. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (Pcl) ,the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAG) should be recorded after test.
7. The measurement results are obtained as described below:

$$\text{Power(EIRP)} = \text{PMea} - \text{PAG} - \text{Pcl} + \text{Ga}$$
The measurement results are amend as described below:

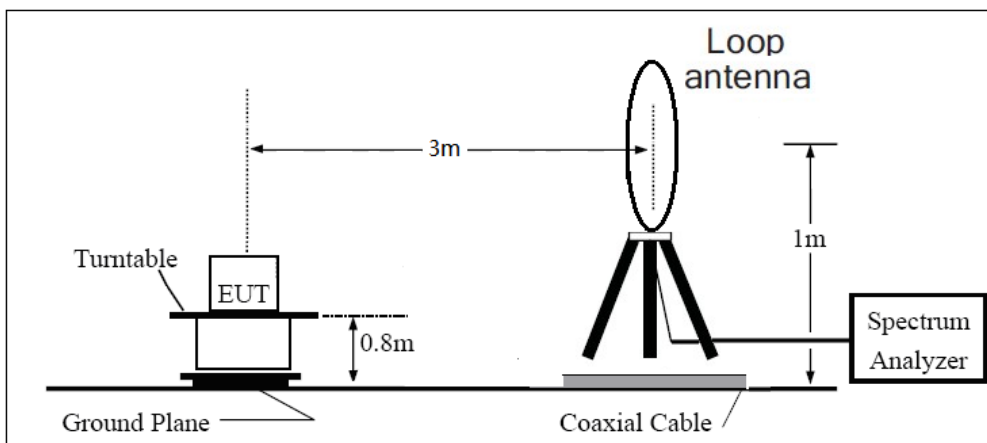
$$\text{Power(EIRP)} = \text{PMea} - \text{Pcl} + \text{Ga}$$
8. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi)

and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole, $ERP = EIRP - 2.15\text{dBi}$.

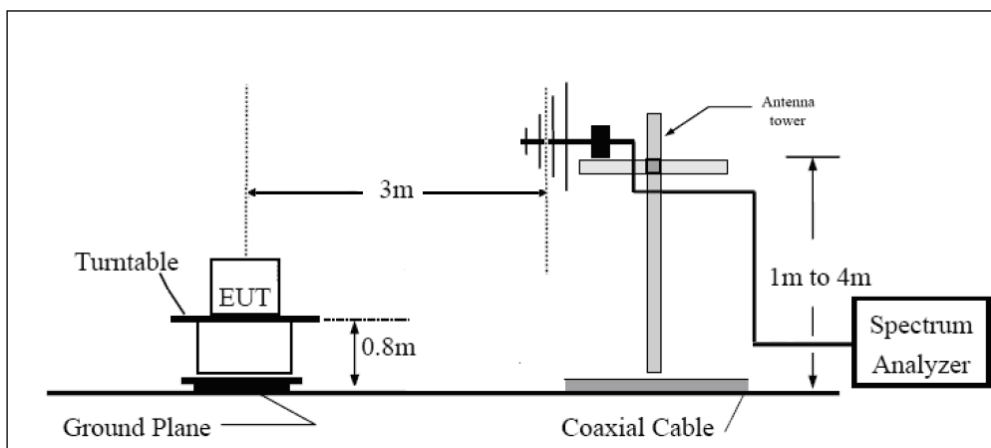
The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

Test setup

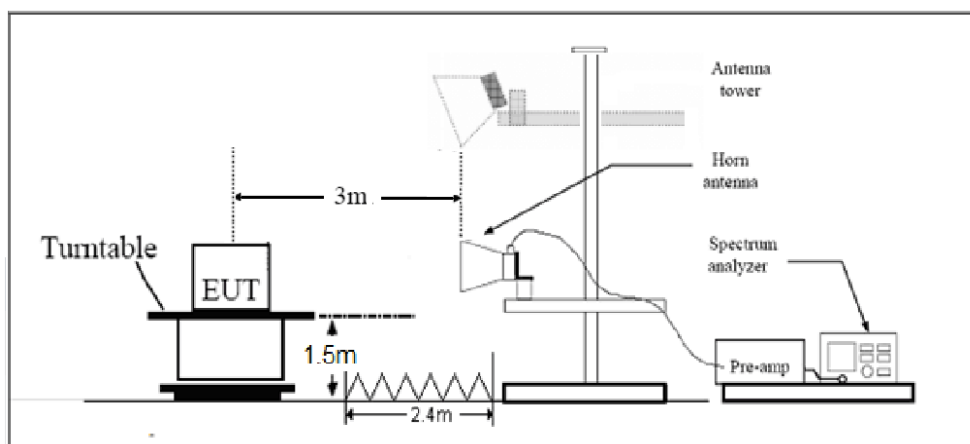
9KHz ~ 30MHz



30MHz ~ 1GHz



Above 1GHz



Note: Area side: 2.4mX3.6m



Limits

Rule Part 22.917(a) specifies that “The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.”

Limit	-13 dBm
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Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$, $U = 3.55$ dB.

Test Result

Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the emissions below the noise floor will not be recorded in the report.

GSM 850 CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1673.88	-45.69	1.70	8.70	Horizontal	-40.84	-13.00	27.84	45
3	2509.69	-48.32	2.30	12.00	Horizontal	-40.77	-13.00	27.77	135
4	3346.40	-55.32	2.70	12.70	Horizontal	-47.47	-13.00	34.47	225
5	4183.00	-43.37	3.00	12.50	Horizontal	-36.02	-13.00	23.02	45
6	5019.60	-54.43	3.40	12.50	Horizontal	-47.48	-13.00	34.48	90
7	5856.20	-55.51	3.40	12.80	Horizontal	-48.26	-13.00	35.26	45
8	6692.80	-57.65	4.10	11.50	Horizontal	-52.40	-13.00	39.40	135
9	7529.40	-54.82	4.20	12.20	Horizontal	-48.97	-13.00	35.97	45
10	8366.00	-54.21	4.30	12.50	Horizontal	-48.16	-13.00	35.16	180

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2.The worst emission was found in the antenna is Horizontal position.

WCDMA Band V CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1673.20	-66.78	1.70	8.70	Horizontal	-61.93	-13.00	48.93	135
3	2509.80	-63.12	2.30	12.00	Horizontal	-55.57	-13.00	42.57	270
4	3346.40	-53.83	2.70	12.70	Horizontal	-45.98	-13.00	32.98	45
5	4183.00	-62.50	3.00	12.50	Horizontal	-55.15	-13.00	42.15	315
6	5019.60	-57.81	3.40	12.50	Horizontal	-50.86	-13.00	37.86	45
7	5856.20	-59.11	3.40	12.80	Horizontal	-51.86	-13.00	38.86	135
8	6692.80	-56.96	4.10	11.50	Horizontal	-51.71	-13.00	38.71	315
9	7529.40	-54.08	4.20	12.20	Horizontal	-48.23	-13.00	35.23	270
10	8366.00	-53.33	4.30	12.50	Horizontal	-47.28	-13.00	34.28	45

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.
2.The worst emission was found in the antenna is Horizontal position.

6. Main Test Instruments

Name	Manufacturer	Type	Serial Number	Calibration Date	Expiration Date
Power Splitter	Hua Xiang	SHX-GF2-2-13	10120101	/	/
Spectrum Analyzer	Key sight	N9010A	MY50210259	2020-05-18	2021-05-17
Universal Radio Communication Tester	Key sight	E5515C	MY48367192	2020-05-27	2021-05-26
Signal Analyzer	R&S	FSV30	100815	2020-12-13	2021-12-12
Loop Antenna	SCHWARZBECK	FMZB1519	1519-047	2020-04-02	2023-04-01
TRILOG Broadband Antenna	SCHWARZBECK	VULB 9163	391	2019-12-16	2021-12-15
Horn Antenna	R&S	HF907	102723	2018-08-11	2021-08-10
Horn Antenna	ETS-Lindgren	3160-09	00102643	2018-06-20	2021-06-19
Signal generator	R&S	SMB 100A	102594	2020-05-18	2021-05-17
Climatic Chamber	ESPEC	SU-242	93000506	2020-12-13	2021-12-12
Preamplifier	R&S	SCU18	102327	2020-05-18	2021-05-17
MOB COMMS DC SUPPLY	Keysight	66319D	MY43004105	2020-05-18	2021-05-17
RF Cable	Agilent	SMA 15cm	0001	2020-12-10	2021-06-09
Software	R&S	EMC32	9.26.0	/	/

*****END OF REPORT *****



ANNEX A: The EUT Appearance

The EUT Appearance are submitted separately.



ANNEX B: Test Setup Photos

The Test Setup Photos are submitted separately.