Test Report

FCC ID: 2APBP-CS10

Date of issue: Apr. 10, 2018

Report Number:	MTi180416E039
Sample Description:	Smart POS Payment Terminal
Model(s):	CS10, CS10A, CS10B, CS10C, CS10D, CS10E, CS10F, CS11, CS12, CS13
Applicant:	Ciontek Technology Corp.
Address:	B501, Chanxueyan Building Wuhan University, No.6 Of Yuexing 2nd Road, Nanshan District, Shenzhen
Date of Test:	Mar. 23, 2018 to Apr. 10, 2018

Shenzhen Microtest Co., Ltd.
http://www.mtitest.com

Tel:(86-755)88850135 Fax: (86-755) 88850136 http://www.mtitest.com E-mail: mti@51mti.com
Address: No.102A & 302A, East Block, Hengfang Industrial Park, Xingye Road, Xixiang, Bao'an District, Shenzhen, Guangdong, China

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Test Result Certification

Applicant's name:	Ciontek Technology Corp.
Address:	B501, Chanxueyan Building Wuhan University, No.6 Of Yuexing 2nd Road, Nanshan District, Shenzhen
Manufacture's Name:	Ciontek Technology Corp.
Address:	B501, Chanxueyan Building Wuhan University, No.6 Of Yuexing 2nd Road, Nanshan District, Shenzhen
Product name:	Smart POS Payment Terminal
Trademark:	Ciontek
Model name:	CS10, CS10A, CS10B, CS10C, CS10D, CS10E, CS10F, CS11, CS12, CS13
Standards:	FCC Part 22 Subpart H FCC Part 24 Subpart E FCC Part 27
Test Procedure:	FCC Part 2 ANSI TIA-603-D: 2010 KDB 971168 D01 v02r02

This device described above has been tested by Shenzhen Microtest Co., Ltd. and the test results show that the equipment under test (EUT) compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

Tested by:	Demi Mu	Apr. 10, 2018
Reviewed by:	Blue Zheng	Apr. 10, 2018
Approved by:	Smith Chen	Apr. 10, 2018

1 General description

1.1 Feature of equipment under test (EUT)

Product name:	Smart POS Payment Terminal
Trade Name	Ciontek
Model Name:	CS10, CS10A, CS10B, CS10C, CS10D, CS10E, CS10F, CS11, CS12, CS13
Model Difference	All the models above are identical in interior structure, electrical circuits and components; just the color. fingerprint module and scanner module is different. The model CS10 has been tested for the worst case.
Frequency range:	GSM 850: TX: 824.2 MHz – 848.8 MHz GSM 1900: TX: 1850.2 MHz – 1909.8 MHz WCDMA/HSDPA/HSUPA: Band 2: TX: 1850 - 1910 MHz Band 4: TX: 1710 - 1755 MHz Band 5: TX: 824 - 849 MHz
Modulation type:	GSM 850/1900: GMSK for GSM/GPRS 8PSK for EGPRS WCDMA B2/4/5: WCDMA for QPSK HSDPA/HSUPA for QPSK and 16QAM
Power Class	GSM 850: 5 / GPRS 850:3 / EGPRS 850: E2 GSM 1900:0 / GPRS 1900:3 / EGPRS 1900: E2 WCDMA/HSDPA/HSUPA Band 2: 3 WCDMA/HSDPA/HSUPA Band 4: 3 WCDMA/HSDPA/HSUPA Band 5: 3
Multislot Class	GPRS/EGPRS: 12
Antenna Type	Integral Antenna
Antenna Gain	GSM/GPRS 850 gain:-2.17 dBi GSM/GPRS 1900 gain:-1.42 dBi WCDMA Band 2 gain:-1.97 dBi WCDMA Band 4 gain:-2.16 dBi WCDMA Band 5 gain:-2.17 dBi
Hardware Version	CS10_V3.0
Software Version	A26_V3.17_171103US
Power Supply:	DC 5V From adapter
Battery:	DC 7.4V/2600mA

Adapter information:	Model:GKYPG0200050 US2 Input: 100-240V 50/60Hz 0.5A Output: 5V 2A

1.2 Test frequency channel

Frequency Band	Frequency	Channel	Frequency(MHz)
GSM 850	Low	128	824.2
	Middle	190	836.6
	High	251	848.8
GSM 1900	Low	512	1850.2
	Middle	661	1880
	High	810	1909.8
WCDMA Band II	Low	9262	1852.4
	Middle	9400	1880
	High	9538	1907.6
WCDMA Band IV	Low	1312	1712.4
	Middle	1450	1740.0
	High	1513	1752.6
WCDMA Band V	Low	4132	826.4
	Middle	4183	836.6
	High	4233	846.6

1.3 EUT operation mode

During testing, RF test program provided by the manufacture to control the Tx operation followed the test requirement. The EUT is configured to transmit continuously (duty cycle > 98 %) at the maximum power control level.

1.4 Test conditions

During the measurement the environmental conditions were within the listed ranges:

- Temperature: 20ºC~30ºC
- Humidity: 30%~70%
- Atmospheric pressure: 98kPa~101kPa

1.5 Testing site

Test Site	Shenzhen Microtest Co., Ltd.
Test Site Location	No.102A & 302A, East Block, Hengfang Industrial Park, Xingye Road, Xixiang, Bao'an District, Shenzhen, Guangdong, China
FCC Registration No.:	448573

1.6 Ancillary equipment list

Equipment	Model	S/N	Manufacturer	Certificate type
/	/	/	/	/

1.7 Measurement uncertainty

Measurement Uncertainty for a Level of Confidence of 95 %, U=2xUc(y)

RF frequency	1 x 10-7
RF power, conducted	± 1 dB
Conducted emission(150kHz~30MHz)	± 2.5 dB
Radiated emission(30MHz~1GHz)	± 4.2 dB
Radiated emission (above 1GHz)	± 4.3 dB
Temperature	±1 degree
Humidity	± 5 %

2 Summary of Test Result

Item	FCC Part No.	Description of Test	Result
1	2.1046, 22.913(a); 24.232(c) 27.50(d) (4)	Maximum output power	Pass
2	2.1046, 22.913(a); 24.232(c) 27.50(d)(5)	Peak to average power radio(PAPR)	Pass
3	2.1046, 22.913(a); 24.232(c) 27.50(d)(4)	Transmitter Radiated Power (EIRP/ERP)	Pass
4	2.1049; 22.917(b); 24.238(b) 27.53(h)	Occupied Bandwidth	Pass
5	2.1051; 22.917(a); 24.238(a) 27.53(h)	Conducted spurious emissions	Pass
6	2.1051; 22.917(b); 24.238(b) 27.53(h)	Spurious emissions at band edge	Pass
7	2.1053; 22.917(a); 24.238(a) 27.53(h)	Radiated spurious emissions	Pass
8	2.1055; 22.355; 24.235 27.54	Frequency Stability	Pass

3 Test facilities and accreditations

3.1 Test laboratory

Test Laboratory	Shenzhen Microtest Co., Ltd
Location	No.102A & 302A, East Block, Hengfang Industrial Park, Xingye Road, Xixiang, Bao'an District, Shenzhen, Guangdong, China
FCC Registration No.:	FCC Registration No.: 448573

3.2 Environmental conditions

Temperature:	20ºC~30ºC
Humidity	30%~70%
Atmospheric pressure	98kPa~101kPa

3.3 Measurement uncertainty

Measurement Uncertainty for a Level of Confidence of 95 %, U=2xUc(y)

RF frequency	1 x 10-7
RF power, conducted	± 1 dB
Conducted emission(150kHz~30MHz)	± 2.5 dB
Radiated emission(30MHz~1GHz)	± 4.2 dB
Radiated emission (above 1GHz)	± 4.3 dB
Temperature	±1 degree
Humidity	± 5 %

3.4 Test software

Software Name	Manufacturer	Model	Version
RF Test System	Farad	LZ-RF	Lz_Rf 3A3

4 List of test equipment

Equipment No.	Equipment Name	Manufacturer	Model	Serial No.	Calibration date	Due date
MTI-E001	Spectrum Analyzer	Agilent	E4407B	MY41441082	2017/09/18	2018/09/17
MTI-E002	CMU 200 universal radio communication tester	Rohde&schwarz	CMU 200	114587	2017/09/18	2018/09/17
MTI-E004	EMI Test Receiver	Rohde&schwarz	ESPI	1000314	2017/09/18	2018/09/17
MTI-E006	Broadband antenna	schwarabeck	VULB9163	872	2017/09/18	2018/09/17
MTI-E007	Horn antenna	schwarabeck	BBHA9120D	1201	2017/09/18	2018/09/17
MTI-E014	amplifier	America	8447D	3113A06150	2017/09/18	2018/09/17
MTI-E015	Conduction Immunity Signal Generator	Schloder	CDG6000	126A1343/2015	2017/09/18	2018/09/17
MTI-E016	Coupled decoupling network	Schloder	CDA M2/M3	A2210332/2015	2017/09/18	2018/09/17
MTI-E032	Comprehensive test instrument	Rohde&schwarz	CMW500	124192	2017/09/13	2018/09/12
MTI-E034	amplifier	Agilent	8449B	3008A02400	2017/08/22	2018/08/21
MTI-E040	Spectrum analyzer	Agilent	N9020A	MY49100060	2017/09/05	2018/09/04
MTI-E041	Signal generator	Agilent	N5182A	MY49060455	2017/09/23	2018/09/22
MTI-E042	Analog signal generator	Agilent	E4421B	GB40051240	2017/09/23	2018/09/22
MTI-E043	Power probe	Dare Instruments	RPR3006W	16I00054SNO16	2017/09/29	2018/09/28
MTI-E047	10dB attenuator	Mini-Circuits	UNAT-10+	15542	2017/09/24	2018/09/23
MTI-E049	spectrum analyzer	Rohde&schwarz	FSP-38	100019	2017/09/18	2018/09/17
MTI-E050	PSG Signal generator	Agilent	E8257D	MY46520873	2017/09/24	2018/09/23
MTI-E051	Active Loop Antenna 9kHz - 30MHz	Schwarzbeek	FMZB 1519 B	00044	2017/09/26	2018/09/25
MTI-E052	18-40GHz amplifier	Chengdu step Micro Technology	ZLNA-18-40G-21	1608001	2017/09/18	2018/09/17
MTI-E053	15-40G Antenna	Schwarzbeek	BBHA9170	BBHA9170582	2017/09/18	2018/09/17

Note: the calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

5 Test Result

5.1 Maximum output power and peak to average ratio

5.1.1 Limit

For FCC 22.913: The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

For FCC 24.234: Mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13dB.

For FCC 27.50(d):Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.

5.1.2 Test method

For Conducted output power:

1.Use a universal radio communication tester, the output power of EUT was measured at the antenna terminal. The path loss was calibrated and entered as an offset into the test equipment.

2. The EUT was configured to transmit on maximum power by the radio communication tester.

3. Measured the peak and average powers.

For EIRP & ERP:

1.In many cases, the RF output power limits for licensed digital transmission devices is specified in terms of effective radiated power (ERP) or equivalent isotropic radiated power (EIRP). Typically, ERP is specified when the operating frequency is less than or equal to 1 GHz and EIRP is specified when the operating frequency is greater than 1 GHz. Both are determined by adding the transmit antenna gain to the conducted RF output power with the primary difference between the two being that when determining the ERP, the transmit antenna gain is referenced to a dipole antenna (i.e., dBd) whereas when determining the EIRP, the transmit antenna gain is referenced to an isotropic antenna (dBi).

2.The relevant equation for determining the ERP or EIRP from the conducted RF output power measured using the guidance provided above is:

$ERP/EIRP = P_{Meas} + GT - LC$

where:

ERP/EIRP = effective or equivalent radiated power, respectively (expressed in the same units as P_{Meas}, typically dBW or dBm);

PMeas = measured transmitter output power or PSD, in dBm or dBW;

GT = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);

dBd (ERP)=dBi (EIRP) -2.15 dB

LC = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

For devices utilizing multiple antennas, KDB 662911 provides guidance for determining the effective array transmit antenna gain term to be used in the above equation.

5.1.3 Test Result

For Conducted output power:

Output Power for GSM850

Mode	Frequency(MHz)	Maximum Burst average Power
GSM850	824.2	32.60
	836.6	32.40
	848.8	32.20
GPRS850 (1 Slot)	824.2	32.57
	836.6	32.39
	848.8	32.17
GPRS850 (2 Slot)	824.2	31.54
	836.6	31.38
	848.8	31.17
GPRS850 (3 Slot)	824.2	29.70
	836.6	29.50
	848.8	29.31
GPRS850 (4 Slot)	824.2	28.62
	836.6	28.47
	848.8	28.22
GPRS850 (4 Slot)	824.2	26.42
	836.6	26.16
	848.8	25.88
EGPRS850 (1 Slot)	824.2	26.42
	836.6	26.16
	848.8	25.88
EGPRS850 (2 Slot)	824.2	25.17
	836.6	24.93
	848.8	24.61
EGPRS850 (3 Slot)	824.2	23.26
	836.6	22.83
	848.8	22.53
EGPRS850 (4 Slot)	824.2	21.74
	836.6	21.76
	848.8	21.16

Output Power for PCS1900

Mode	Frequency(MHz)	Maximum conducted Power
GSM1900	1850.2	29.60
	1880	29.20
	1909.8	28.90
GPRS1900 (1 Slot)	1850.2	29.53
	1880	29.17
	1909.8	28.89
GPRS1900 (2 Slot)	1850.2	28.48
	1880	28.08
	1909.8	27.84
GPRS1900 (3 Slot)	1850.2	26.96
	1880	26.55
	1909.8	26.29
GPRS1900 (4 Slot)	1850.2	25.87
	1880	25.53
	1909.8	25.67
EGPRS1900 (1 Slot)	1850.2	25.47
	1880	24.99
	1909.8	24.37
EGPRS1900 (2 Slot)	1850.2	23.84
	1880	23.38
	1909.8	22.79
EGPRS1900 (3 Slot)	1850.2	21.67
	1880	21.08
	1909.8	20.37
EGPRS1900 (4 Slot)	1850.2	20.16
	1880	19.79
	1909.8	19.07

Output Power for WCDMA BAND II

Mode	Frequency(MHz)	Maximum Average Output Power
WCDMA 1900 RMC	1852.4	22.42
	1880	22.50
	1907.6	22.50
WCDMA 1900 AMR	1852.4	22.38
	1880	22.49
	1907.6	22.50
HSDPA Subtest 1	1852.4	22.34
	1880	22.43
	1907.6	22.46
HSDPA Subtest 2	1852.4	22.28
	1880	22.42
	1907.6	22.39
HSDPA Subtest 3	1852.4	22.21
	1880	22.36
	1907.6	22.37
HSDPA Subtest 4	1852.4	22.13
	1880	22.35
	1907.6	22.32
HSUPA Subtest 1	1852.4	22.09
	1880	22.31
	1907.6	22.25
HSUPA Subtest 2	1852.4	22.04
	1880	22.25
	1907.6	22.19
HSUPA Subtest 3	1852.4	21.98
	1880	22.19
	1907.6	22.13
HSUPA Subtest 4	1852.4	21.92
	1880	22.14
	1907.6	22.06
HSUPA Subtest 5	1852.4	21.90
	1880	22.05
	1907.6	22.00

Output Power for WCDMA BAND IV

Mode	Frequency(MHz)	Maximum Average Output Power
WCDMA 1700 RMC	1712.4	22.32
	1732.6	22.41
	1752.6	22.28
WCDMA 1700 AMR	1712.4	22.27
	1732.6	22.36
	1752.6	22.24
HSDPA Subtest 1	1712.4	22.19
	1732.6	22.31
	1752.6	22.21
HSDPA Subtest 2	1712.4	22.16
	1732.6	22.25
	1752.6	22.21
HSDPA Subtest 3	1712.4	22.14
	1732.6	22.18
	1752.6	22.21
HSDPA Subtest 4	1712.4	22.12
	1732.6	22.16
	1752.6	22.17
HSUPA Subtest 1	1712.4	22.03
	1732.6	22.09
	1752.6	22.10
HSUPA Subtest 2	1712.4	21.99
	1732.6	22.03
	1752.6	22.08
HSUPA Subtest 3	1712.4	21.95
	1732.6	21.98
	1752.6	22.02
HSUPA Subtest 4	1712.4	21.91
	1732.6	21.90
	1752.6	21.98
HSUPA Subtest 5	1712.4	21.83
	1732.6	21.89
	1752.6	21.95

Output Power for WCDMA BAND V

Mode	Frequency(MHz)	Maximum Average Output Power
WCDMA 850 RMC	826.4	22.43
	836.6	23.06
	846.6	23.05
WCDMA 850 AMR	826.4	22.40
	836.6	23.03
	846.6	23.01
HSDPA Subtest 1	826.4	22.38
	836.6	22.96
	846.6	23.00
HSDPA Subtest 2	826.4	22.34
	836.6	22.90
	846.6	22.97
HSDPA Subtest 3	826.4	22.30
	836.6	22.88
	846.6	22.92
HSDPA Subtest 4	826.4	22.23
	836.6	22.84
	846.6	22.88
HSUPA Subtest 1	826.4	22.18
	836.6	22.80
	846.6	22.87
HSUPA Subtest 2	826.4	22.14
	836.6	22.78
	846.6	22.84
HSUPA Subtest 3	826.4	22.07
	836.6	22.74
	846.6	22.81
HSUPA Subtest 4	826.4	22.07
	836.6	22.72
	846.6	22.73
HSUPA Subtest 5	826.4	22.02
	836.6	22.65
	846.6	22.71

For EIRP & ERP:

For GSM 850

Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	ERP (dBm)
Low	V	22.02	1.33	7.53	28.22
Middle	V	22.18	1.4	7.48	28.26
High	H	22.14	1.39	7.57	28.32

For EGPRS850

Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	ERP (dBm)
Low	V	16.53	1.33	7.53	22.73
Middle	V	16.63	1.4	7.48	22.71
High	H	16.47	1.39	7.57	22.65

For GSM 1900

Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)
Low	V	18.16	2.33	10.05	25.88
Middle	V	18.09	2.37	10.24	25.96
High	H	18.04	2.39	10.32	25.97

For EGPRS1900

Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)
Low	V	14.53	2.33	10.05	22.25
Middle	V	14.61	2.37	10.24	22.48
High	H	14.49	2.39	10.32	22.42

For WCDMA II

Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)
Low	V	11.28	2.41	10.48	19.35
Middle	H	11.31	2.39	10.41	19.33
High	H	11.28	2.47	10.42	19.23

For WCDMA VI

Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)
Low	V	9.14	2.03	10.19	17.30
Middle	H	9.17	2.06	10.18	17.29
High	H	9.21	2.09	10.14	17.27

For WCDMA V

Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	ERP (dBm)
Low	V	13.55	1.51	7.52	19.56
Middle	H	13.52	1.58	7.52	19.46
High	H	13.62	1.54	7.51	19.59

5.2 Peak to average power ratio(PAPR)

5.2.1 Limit

Measurement of the ERP of Cellular base transmitters and repeaters must be made using an average power measurement technique. The peak-to-average ratio (PAR) of the transmission must not exceed 13 dB.

5.2.2 Test method

According to KDB 971168 D01 v02r02 section 5.7.2, using the alternate procedure to measurement PAPR, the test procedure as below:

(1) Setting the SA as below and measurement the total peak power

a) Set the RBW ≥ OBW.
b) Set VBW ≥ 3 × RBW.
c) Set span ≥ 2 × RBW .
d) Sweep time = auto couple.
e) Detector = peak.
f) Ensure that the number of measurement points ≥ span/RBW.
g) Trace mode = max hold.
h) Allow trace to fully stabilize.
i) Use the peak marker function to determine the peak amplitude level.

(2) Record the total peak power as P_{Pk}

(3) Setting the SA as below and measurement the total average power.

a) Set span to at least 1.5 times the OBW.
b) Set RBW = 1-5% of the OBW, not to exceed 1 MHz.
c) Set VBW ≥ 3 × RBW.
d) Set number of points in sweep ≥ 2 × span / RBW.
e) Sweep time = auto-couple.
f) Detector = RMS (power averaging).
g) If the EUT can be configured to transmit continuously (i.e., burst duty cycle ≥ 98%), then set the trigger to free run.
h) If the EUT cannot be configured to transmit continuously (i.e., burst duty cycle < 98 %), then use a sweep trigger with the level set to enable triggering only on full power bursts and configure the EUT to transmit at full power for the entire duration of each sweep. Ensure that the sweep time is less than or equal to the transmission burst duration.
i) Trace average at least 100 traces in power averaging (i.e., RMS) mode.
j) Compute the power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function, with the band limits set equal to the OBW band edges. If the instrument does not have a band power function, then sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.

(4) Record the total peak power as $P_{Avg.}$

(5) Determine the PAPR from:

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

5.2.3 Test Result

Note: PAPR (dB) = P_{Pk} (dBm) - P_{Avg} (dBm)

Mode	Channel	P_{Pk} (dBm)	P_{Avg} (dBm)	PAPR (dB)	Limit (dBm)	Result
GSM850	190	32.8	32.6	0.2	13	Pass
GSM1900	661	29.71	29.6	0.11	13	Pass
WCDMA Band II	4183	24.61	22.5	2.11	13	Pass
WCDMA Band IV	1450	24.52	22.41	2.11	13	Pass
WCDMA Band V	9400	25.26	23.06	2.2	13	Pass

5.3 Occupied bandwidth

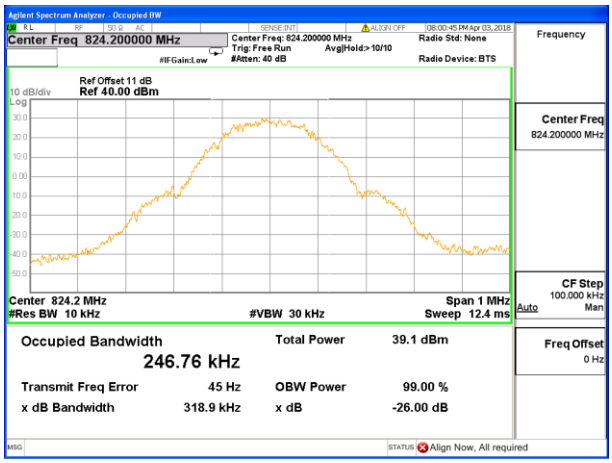
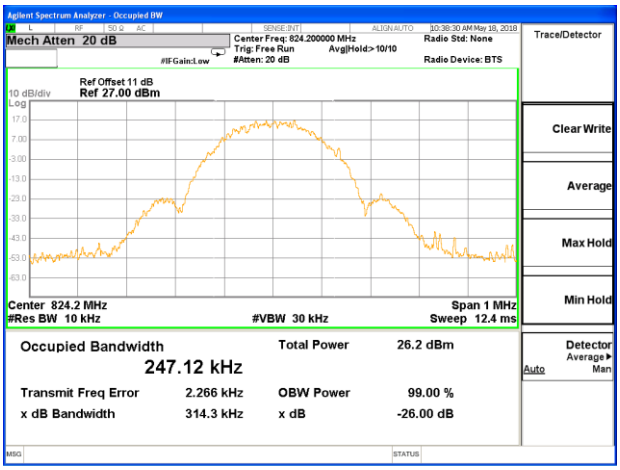
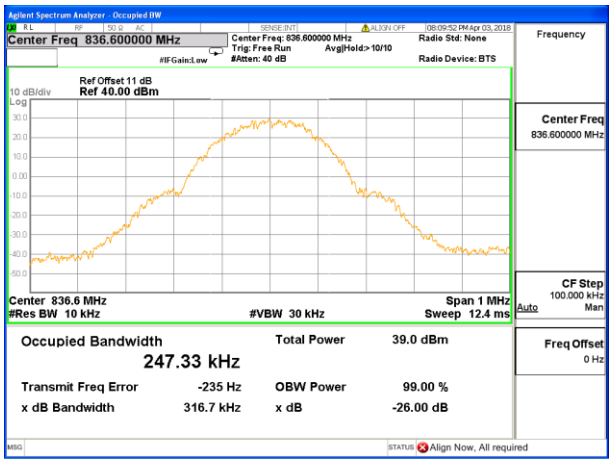
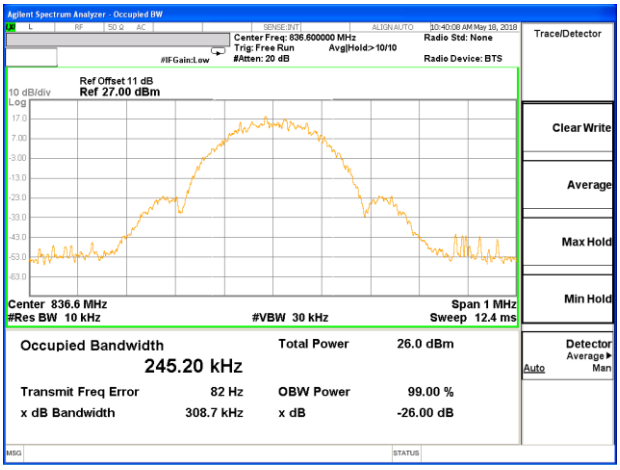
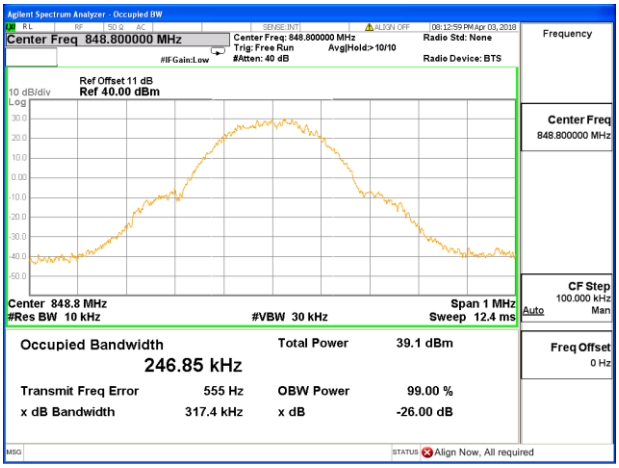
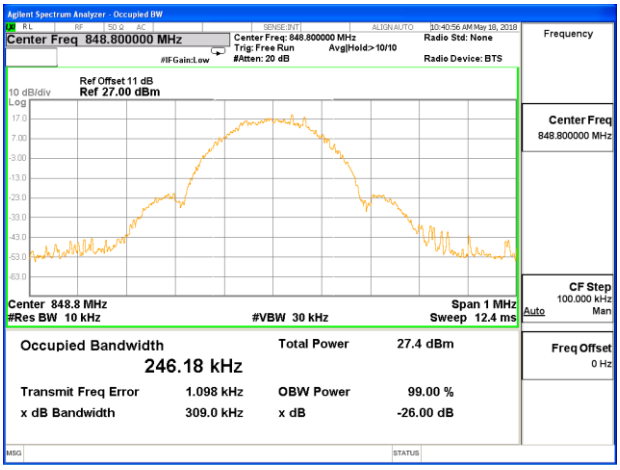
5.3.1 Test method

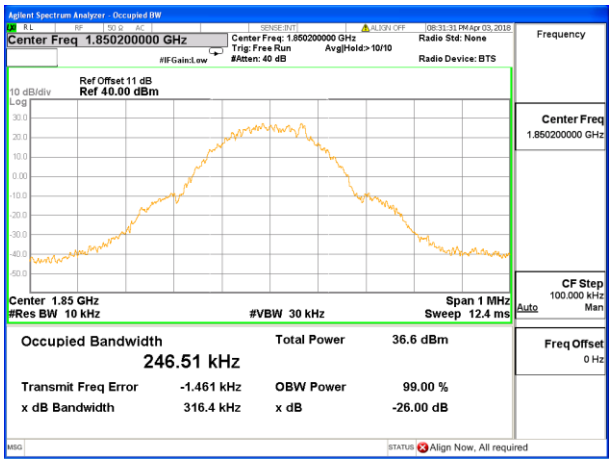
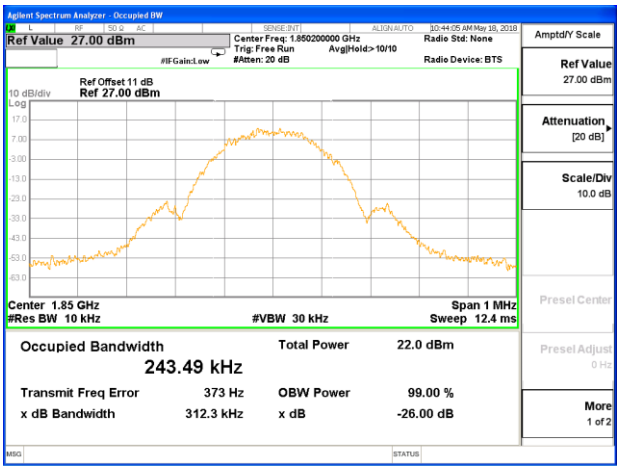
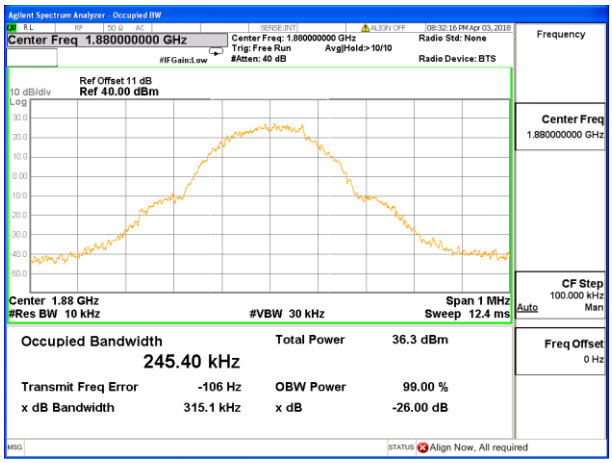
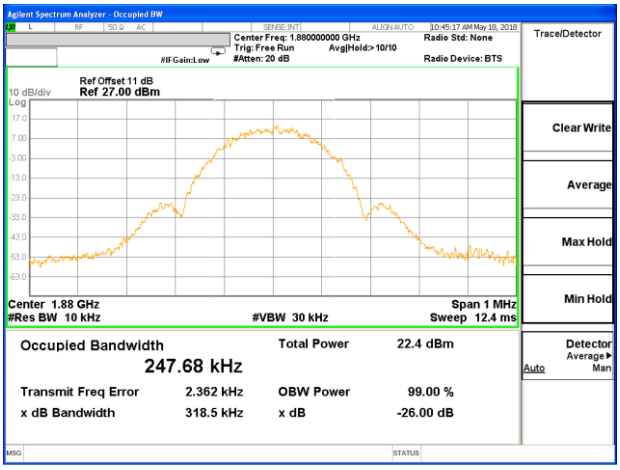
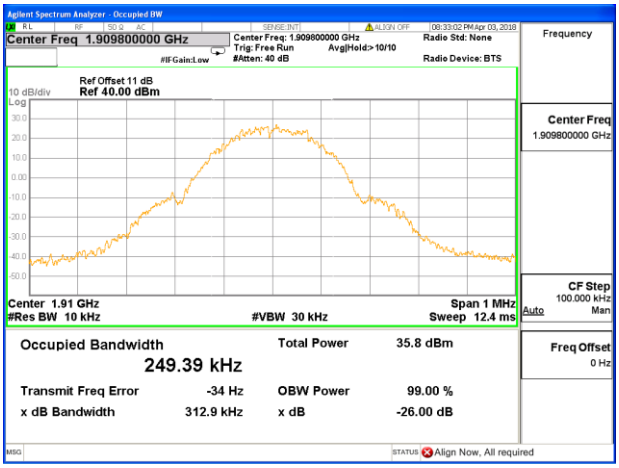
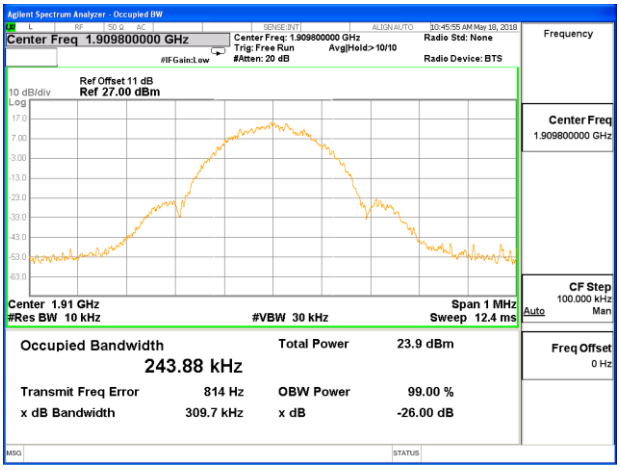
1. The EUT was directly connected to the spectrum analyzer and Base station via power splitter as show in the block diagram above.
2. The resolution bandwidth of the Spectrum Analyzer is set to at least 1% of the occupied bandwidth.
3. The low, middle and the high channels are selected to perform tests respectively.
4. Set the frequency range of the Spectrum Analyzer suitably to capture the waveform; search peak; make a line whose value is 26dB lower than the peak; mark two points which the line intersected the waveform at; finally record the delta of the two points as the occupied bandwidth and the plot.
5. Set the Spectrum Analyzer Occupied bandwidth function to measure the 99% occupied bandwidth.

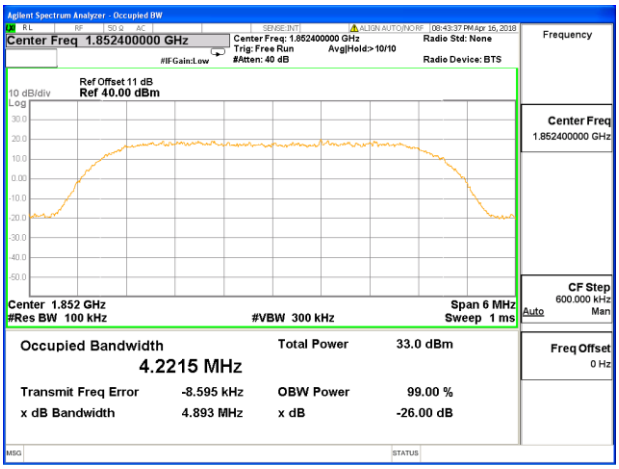
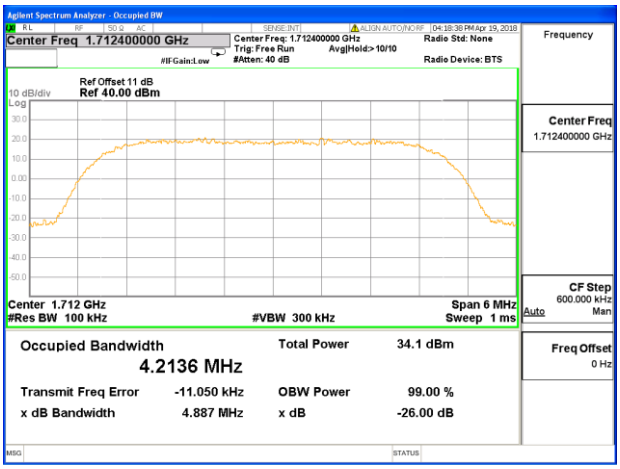
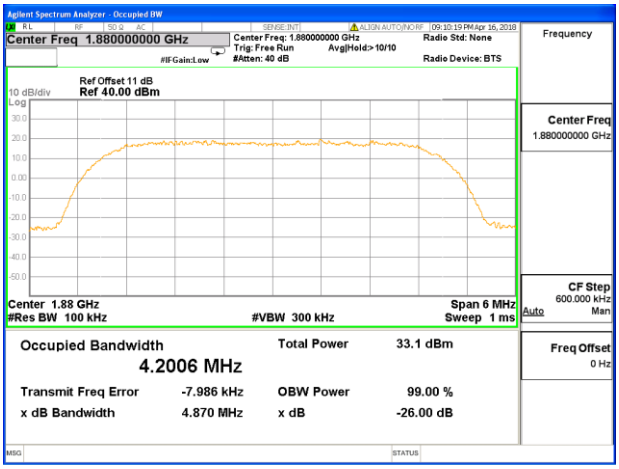
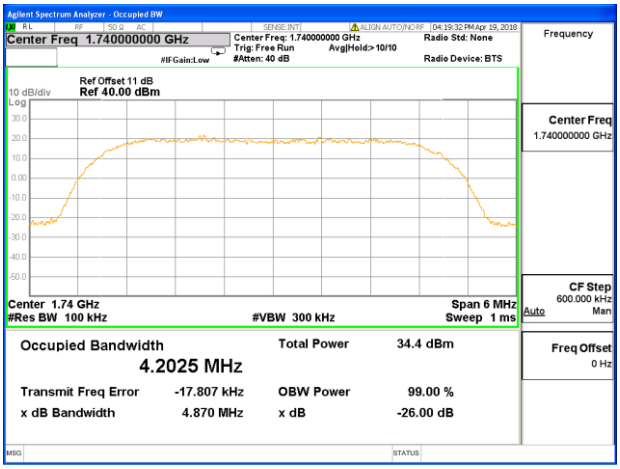
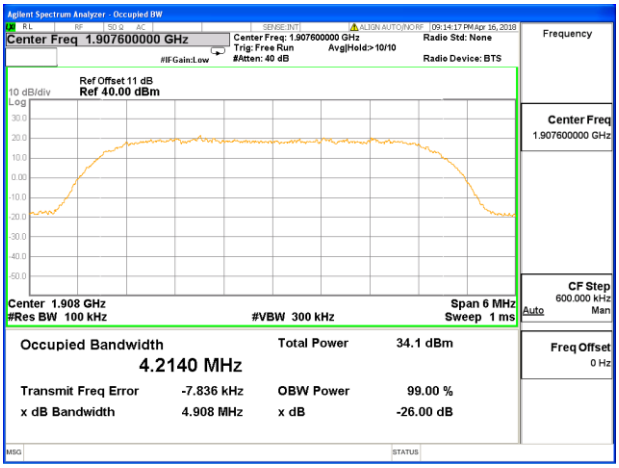
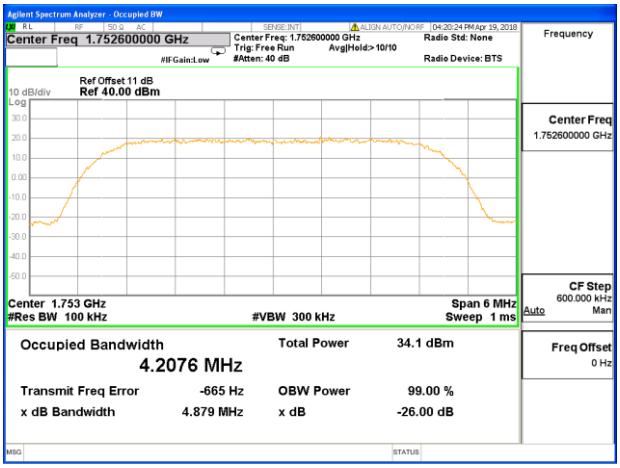
5.3.2 **Test result**

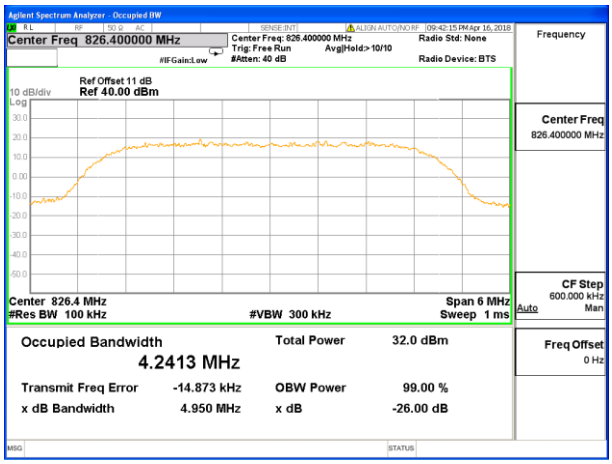
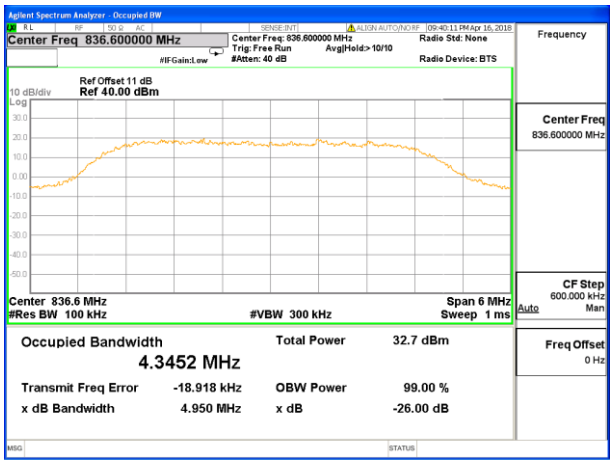
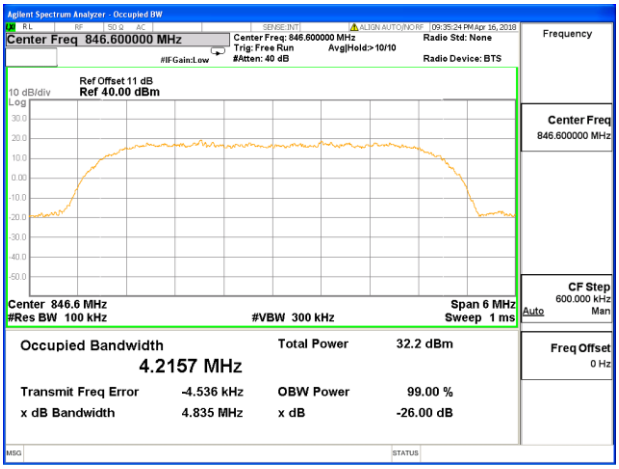
Channel	Channel Frequency (MHz)	26dB emission bandwidth (MHz)	99% occupied bandwidth (MHz)
GSM 850			
128	824.2	0.319	0.247
190	836.6	0.317	0.247
251	848.8	0.317	0.247
EDGE 850			
128	824.2	0.314	0.247
190	836.6	0.309	0.245
251	848.8	0.309	0.246
GSM 1900			
512	1850.2	0.316	0.247
661	1880	0.315	0.245
810	1909.8	0.313	0.249
EDGE 1900			
512	1850.2	0.312	0.243
661	1880	0.319	0.248
810	1909.8	0.310	0.244
WCDMA Band II			
9262	1852.4	4.893	4.2215
9400	1880	4.870	4.2006
9538	1907.6	4.908	4.2140
WCDMA Band VI			
1312	1712.4	4.214	4.887
1450	1740.0	4.202	4.870
1513	1752.6	4.208	4.879

WCDMA Band V			
4132	826.4	4.950	4.241
4183	836.4	4.950	4.345
4233	846.6	4.835	4.216

GSM 850 – 824.2MHz	EDGE 850 – 824.2MHz
	
GSM 850 – 836.6MHz	EDGE 850 – 836.6MHz
	
GSM 850 –848.8MHz	EDGE 850 –848.8MHz
	

GSM 1900 - 1850MHz	EDGE 1900 - 1850MHz
	
GSM 1900 - 1880MHz	**EDGE 1900 - 1880MHz**
	
GSM 1900 - 1909.8MHz	**EDGE 1900 - 1909.8MHz**
	

WCDMA Band II – 1852.4MHz	WCDMA Band IV –1712.4MHz
	
WCDMA Band II - 1880MHz	WCDMA Band IV –1740.0MHz
	
WCDMA Band II – 1907.6MHz	WCDMA Band IV –1752.6MHz
	

WCDMA Band V – 826.4MHz	WCDMA Band V –836.6MHz
	
WCDMA Band V –846.6MHz	
	

5.4 Conducted spurious emissions

5.4.1 Limits

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+10log (P) dB

5.4.2 Test method

1, The EUT was directly connected to the spectrum analyzer and Base station via power splitter as show in the block diagram above.

2, Spectrum Setting:

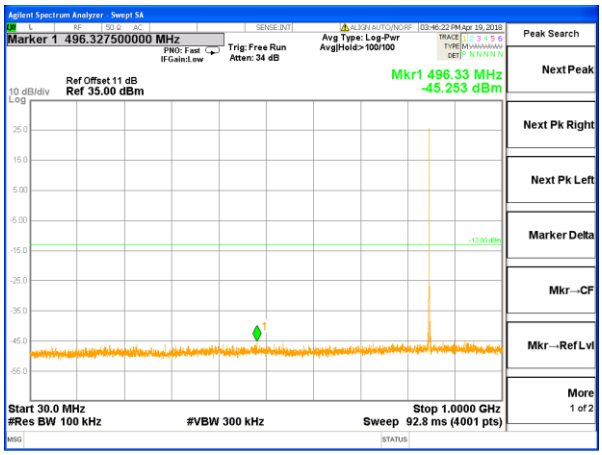
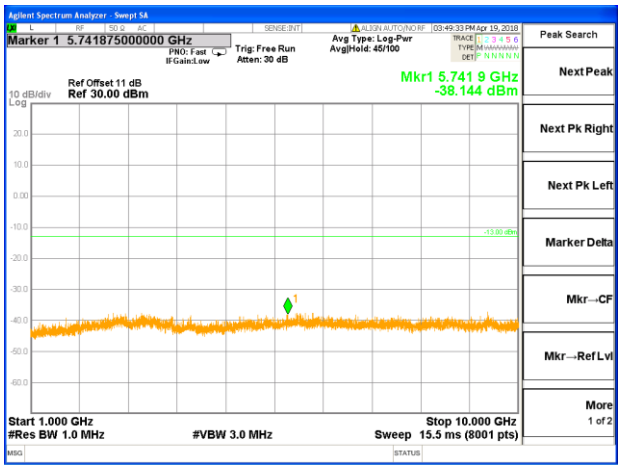
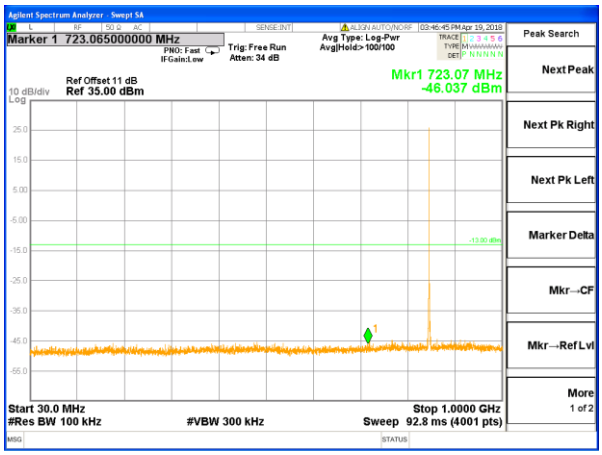
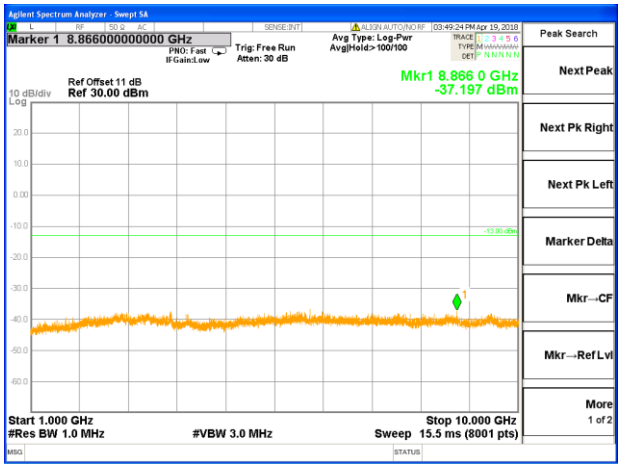
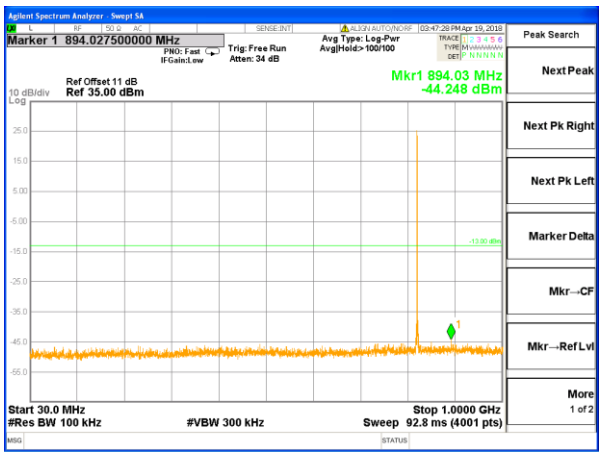
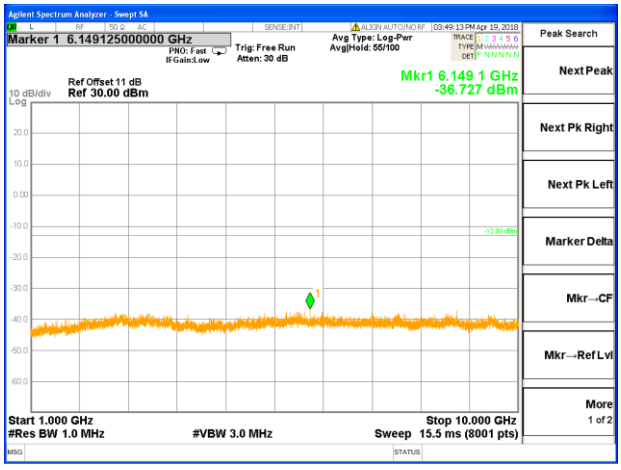
Frequency bellow 1 GHz: RBW=100 kHz, VBW=300 kHz.

Frequency above 1 GHz: RBW=1 MHz, VBW=3 MHz.

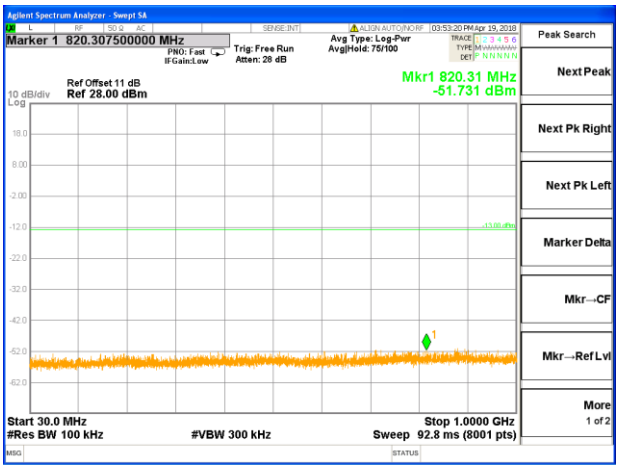
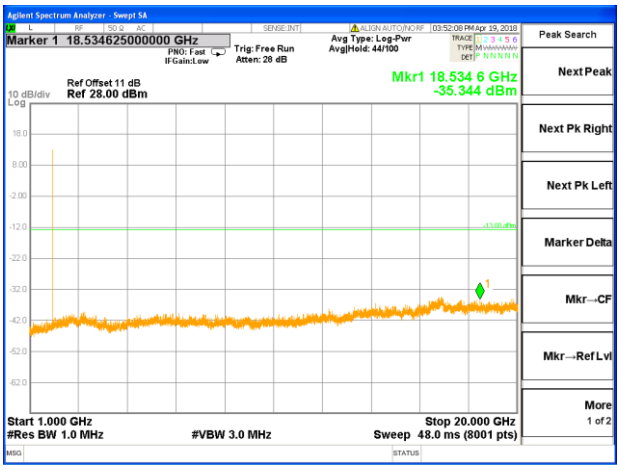
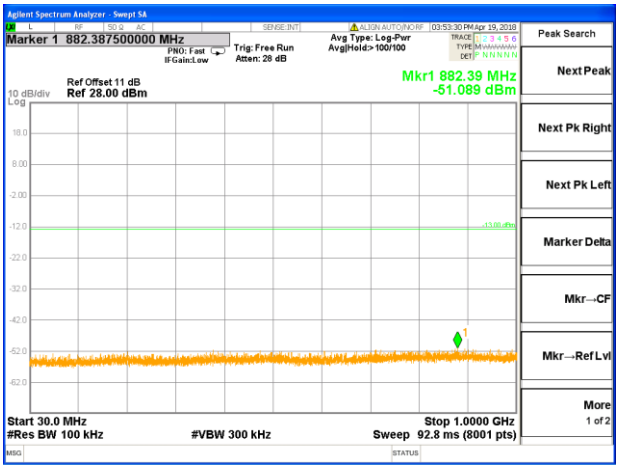
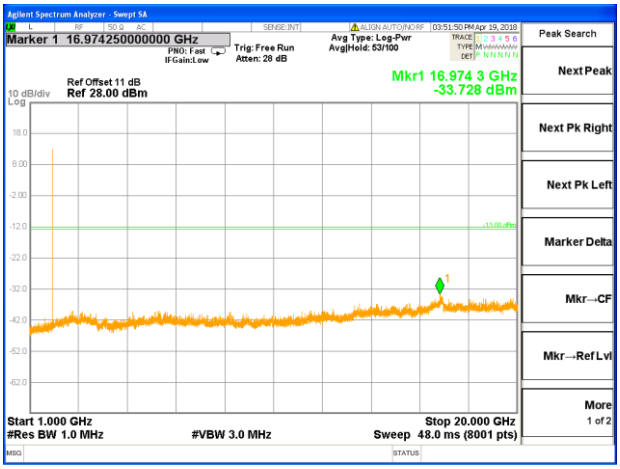
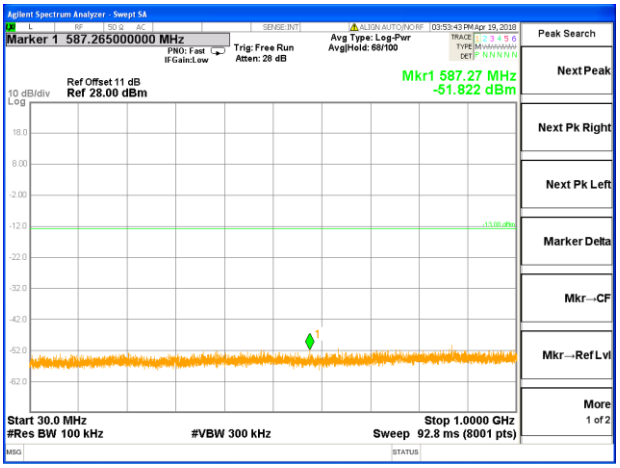
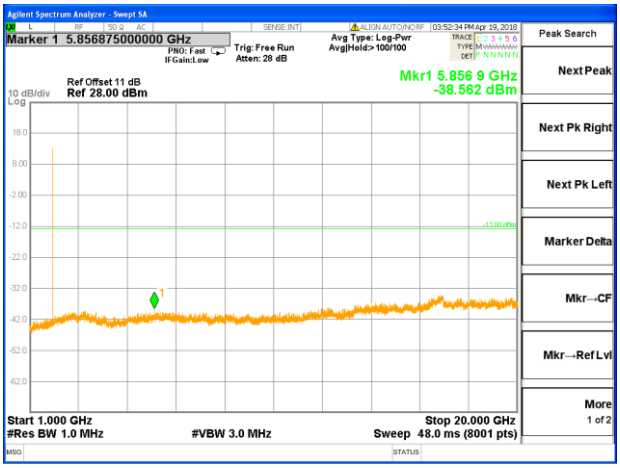
3, The low, middle and high channels of each band and mode's spurious emissions for 30 MHz to 10th Harmonic were measured by Spectrum analyzer.

5.4.3 Test result

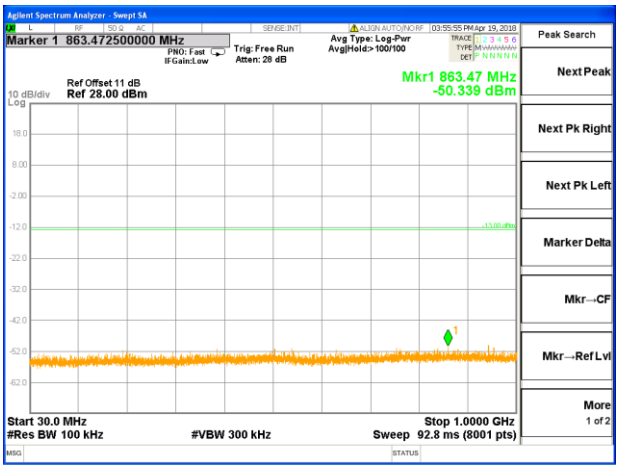
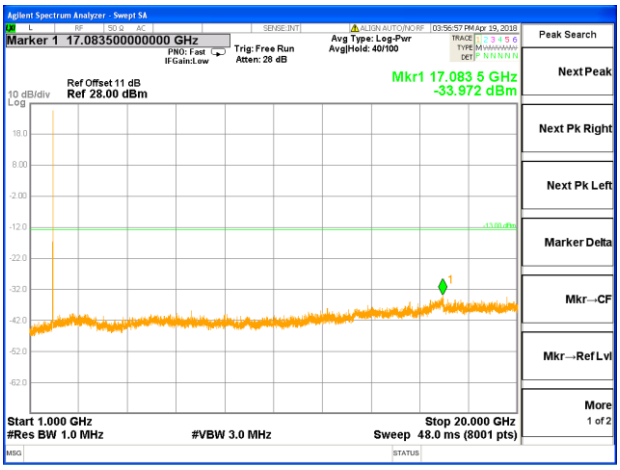
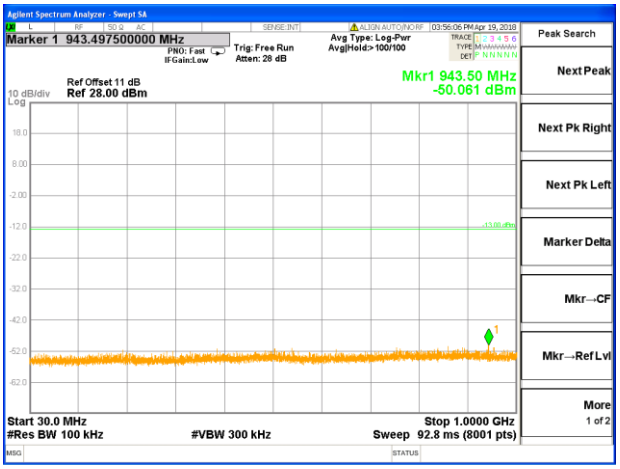
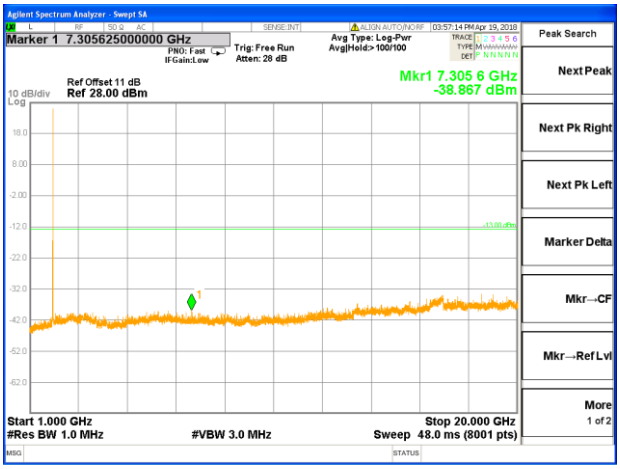
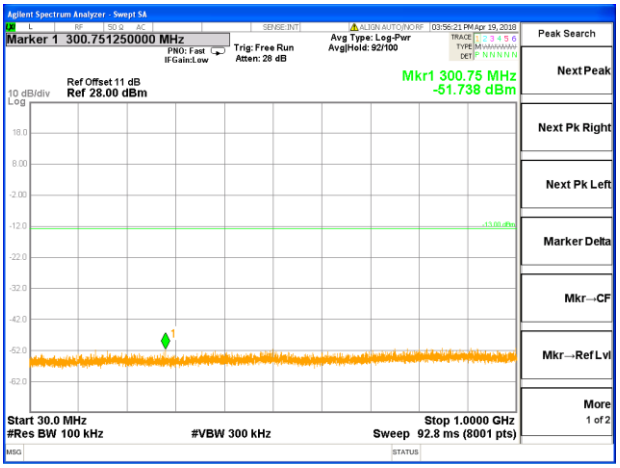
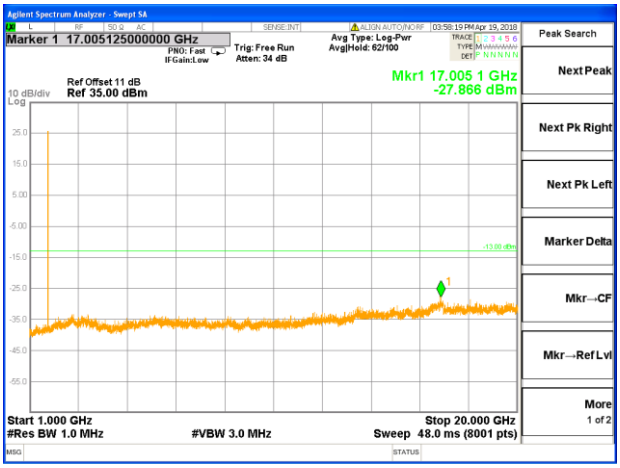
GSM 850

Low Channel – 30MHz-1GHz	Low Channel –1GHz - 10GHz
	
Middle Channel–30MHz-1GHz	**Middle Channel–1GHz - 10GHz**
	
High Channel–30MHz-1GHz	**High Channel–1GHz - 10GHz**
	

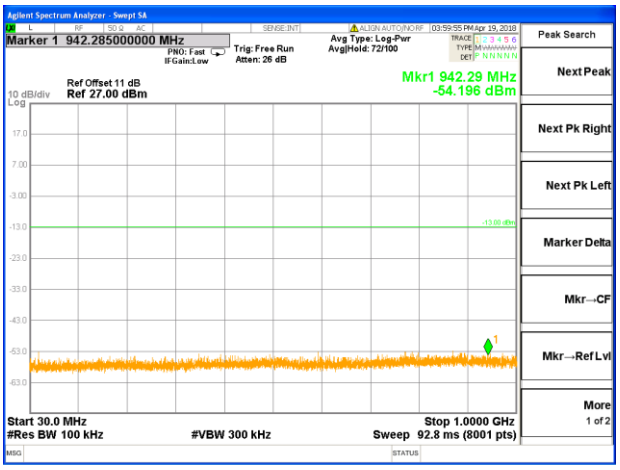
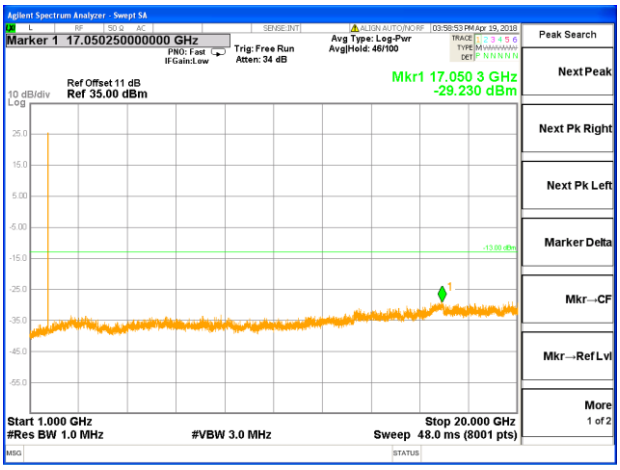
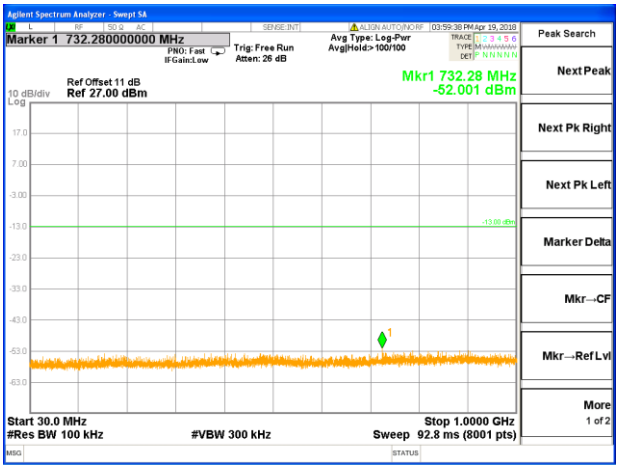
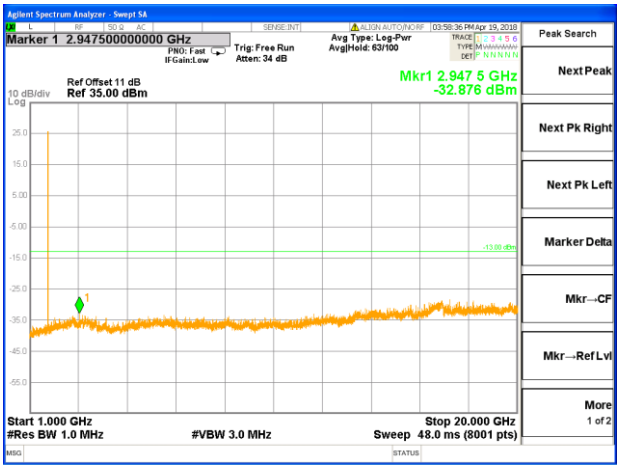
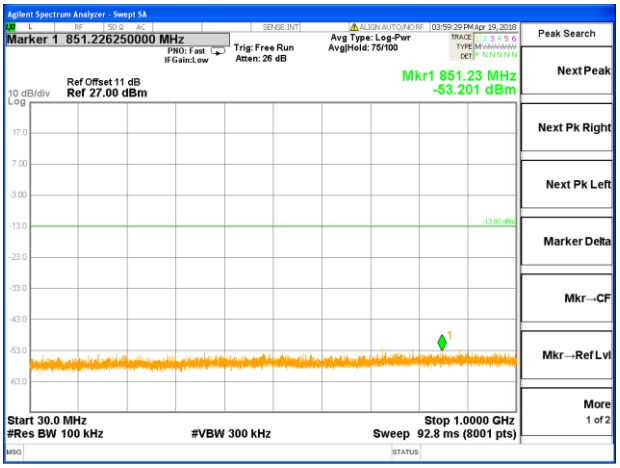
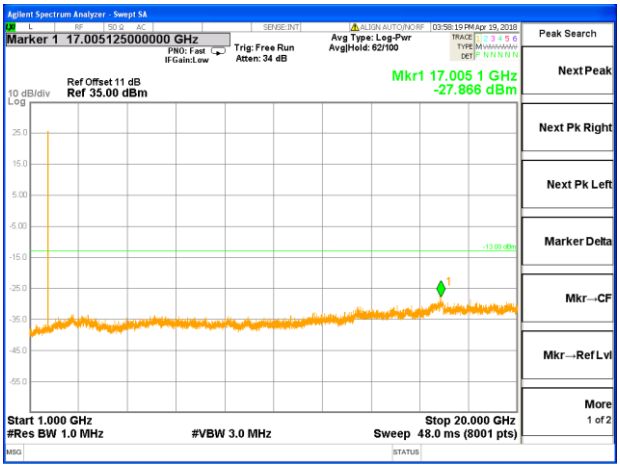
GSM 1900

Low Channel – 30MHz-1GHz	Low Channel –1GHz - 20GHz
	
Middle Channel– 30MHz-1GHz	**Middle Channel–1GHz - 20GHz**
	
High Channel– 30MHz-1GHz	**High Channel–1GHz - 20GHz**
	

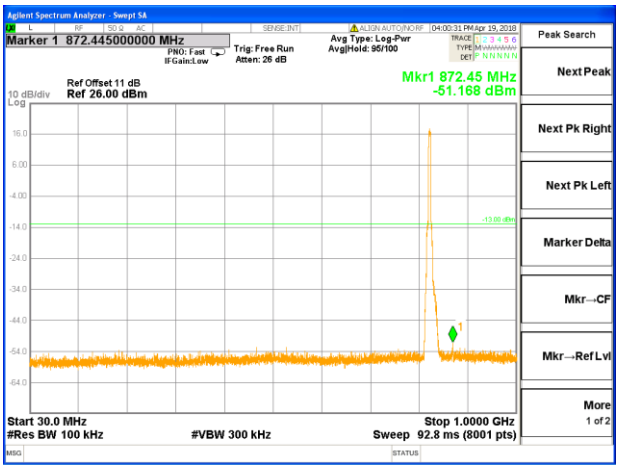
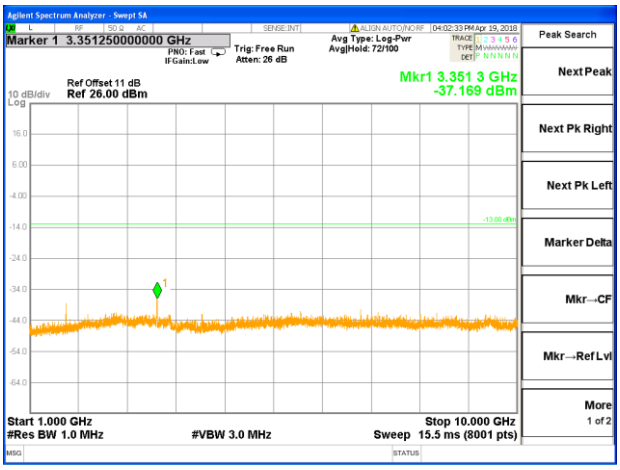
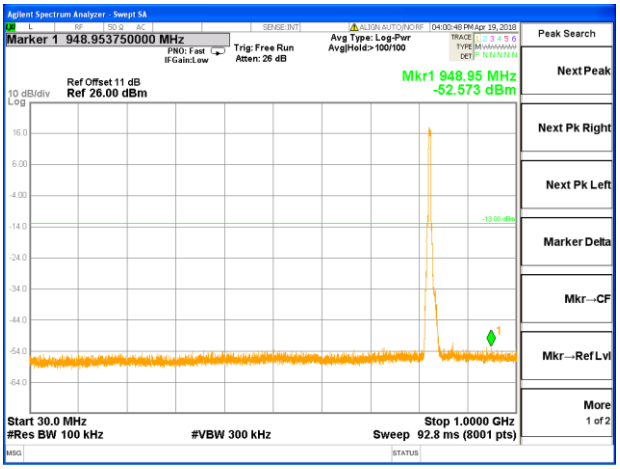
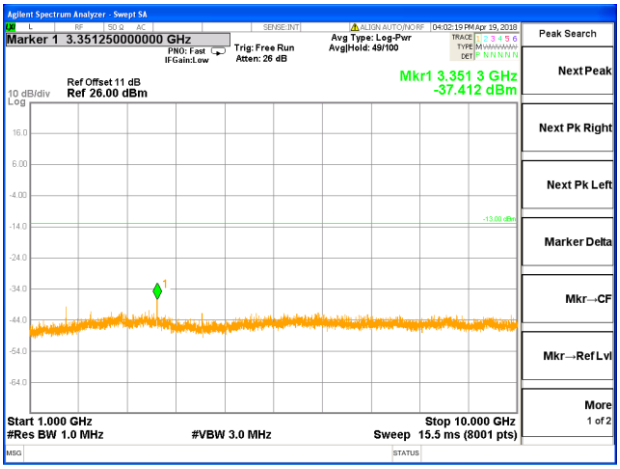
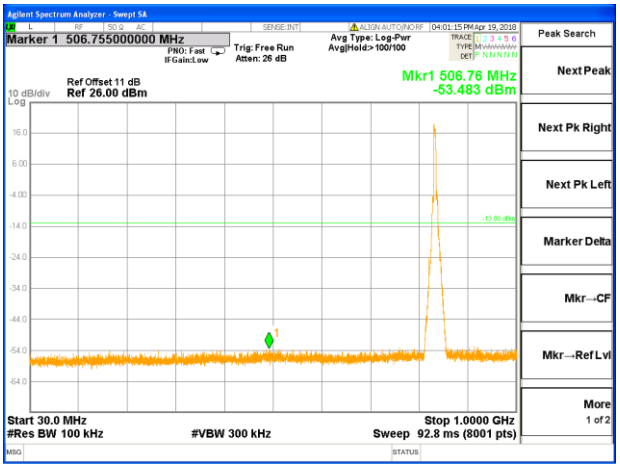
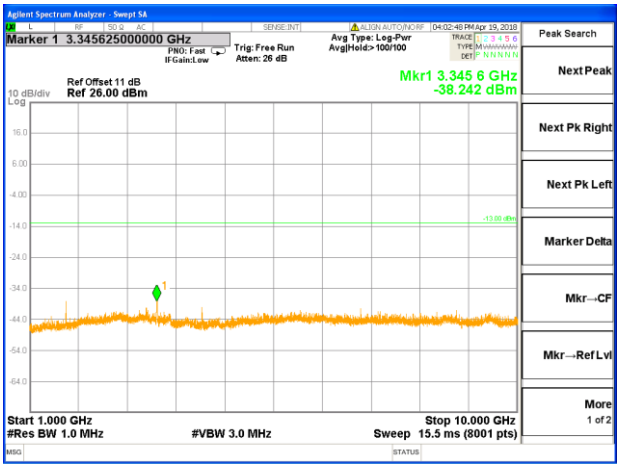
WCDMA Band II

Low Channel – 30MHz-1GHz	Low Channel –1GHz - 20GHz
	
Middle Channel– 30MHz-1GHz	**Middle Channel–1GHz - 20GHz**
	
High Channel– 30MHz-1GHz	**High Channel–1GHz - 20GHz**
	

WCDMA Band IV

Low Channel – 30MHz-1GHz	Low Channel –1GHz - 10GHz
	
Middle Channel–30MHz-1GHz	**Middle Channel–1GHz - 10GHz**
	
High Channel–30MHz-1GHz	**High Channel–1GHz - 10GHz**
	

WCDMA Band V

Low Channel – 30MHz-1GHz	Low Channel –1GHz - 10GHz
	
Middle Channel–30MHz-1GHz	**Middle Channel–1GHz - 10GHz**
	
High Channel–30MHz-1GHz	**High Channel–1GHz - 10GHz**
	

5.5 Band edge

5.5.1 Limits

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+10log (P) dB, for all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm

5.5.2 Test method

1. The EUT was directly connected to the spectrum analyzer and Base station via power splitter as show in the block diagram above.
2. Spectrum Setting:

For GSM system:

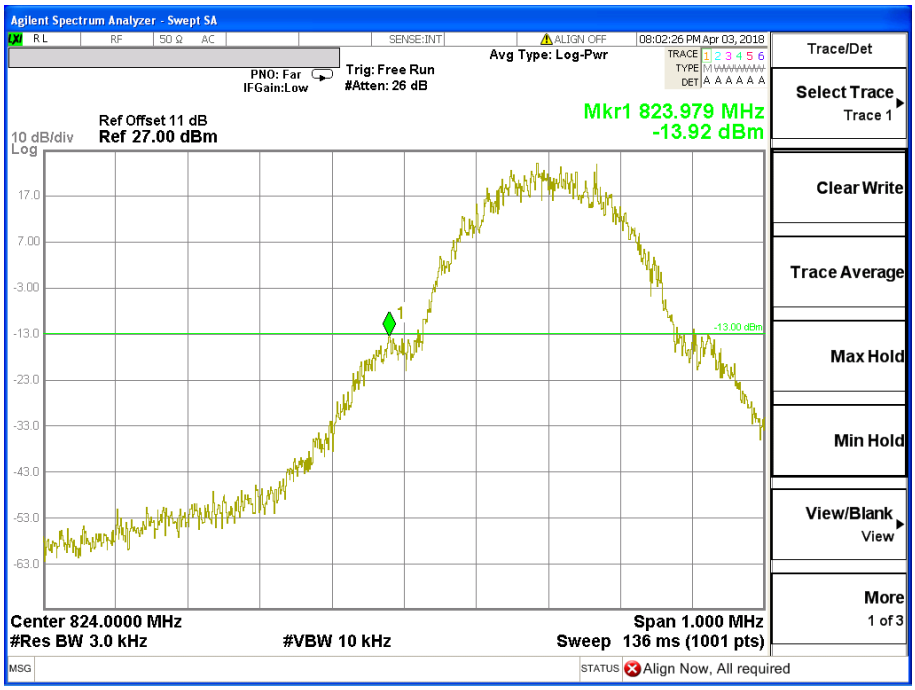
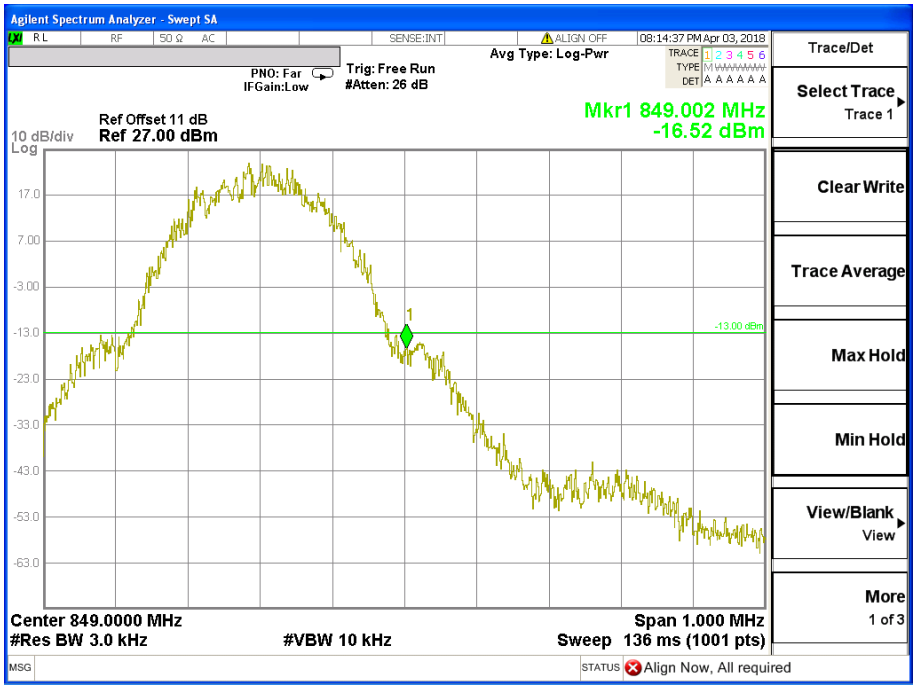
RBW=3 kHz
VBW=10 kHz
Span 1 MHz
Detector: Peak Mode

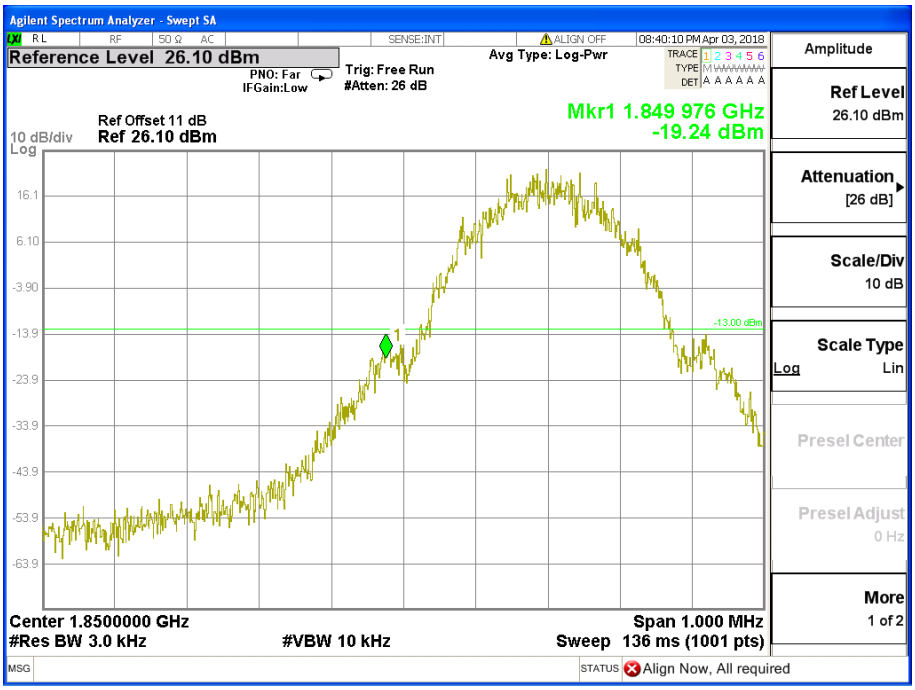
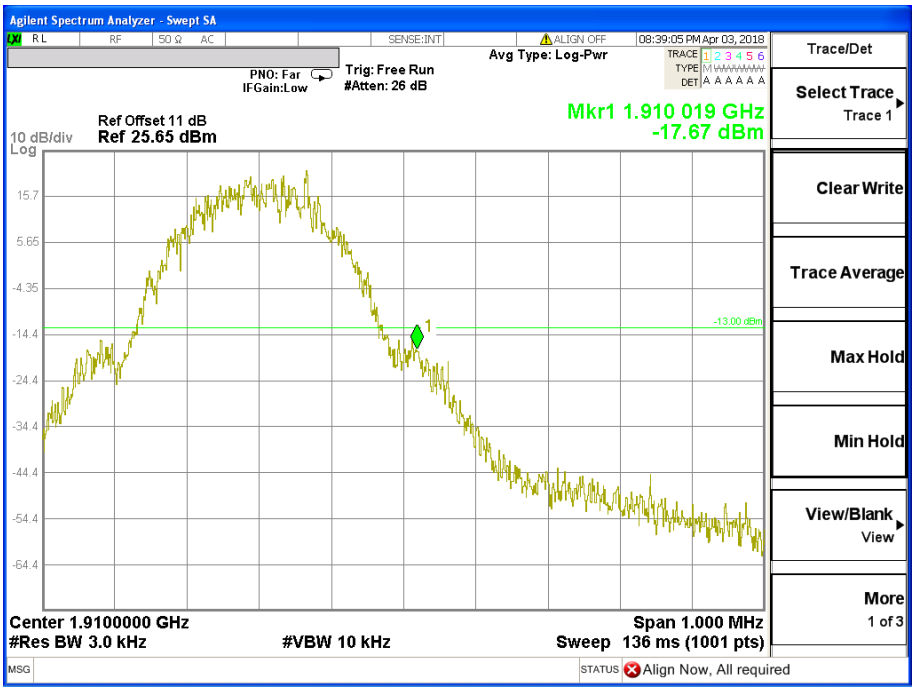
For WCDMA:

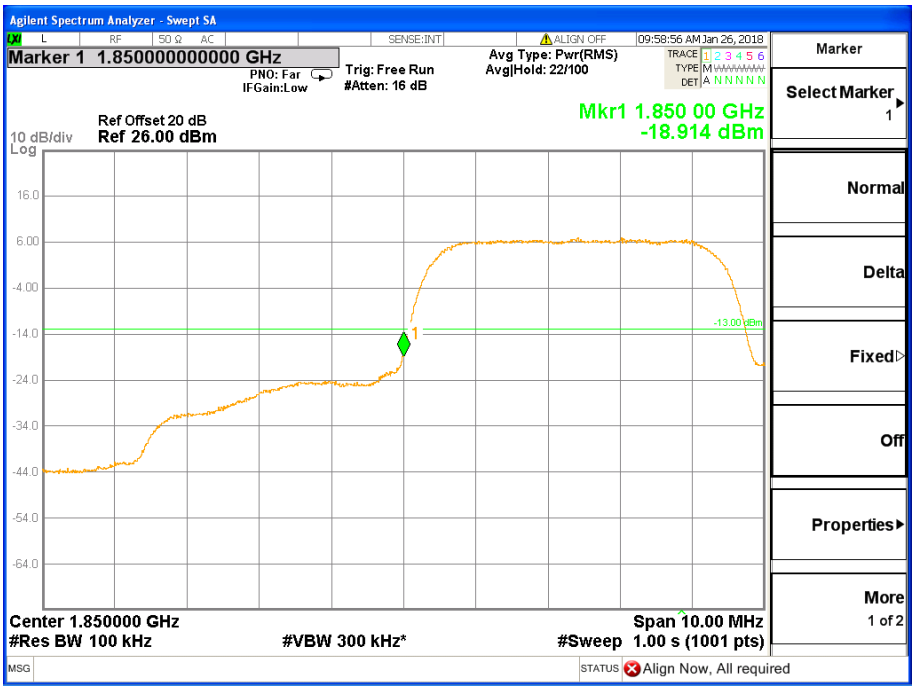
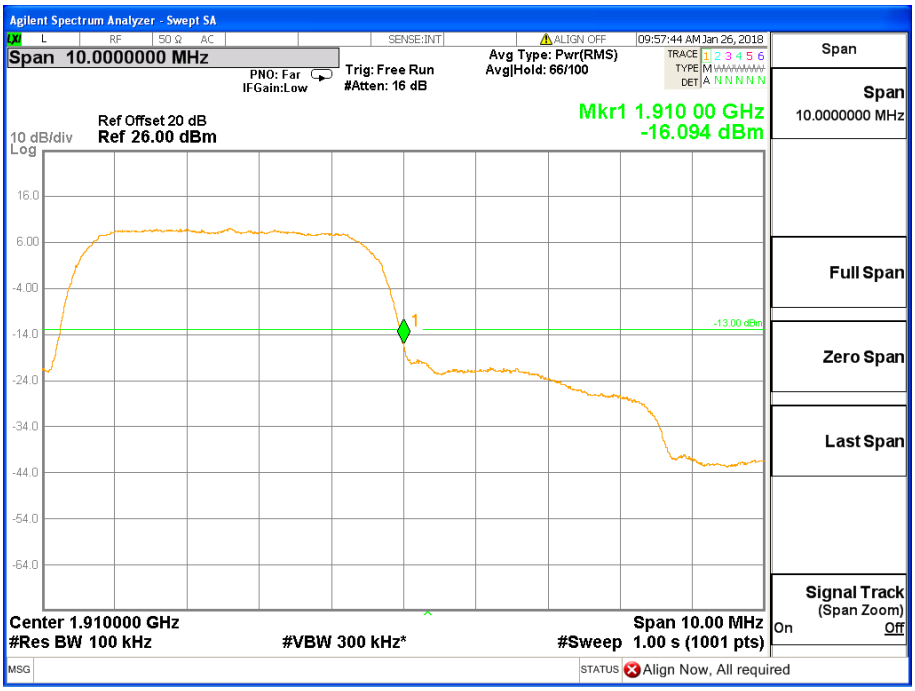
RBW=100 kHz
VBW=300 kHz
Span 5 MHz
Detector: Peak Mode

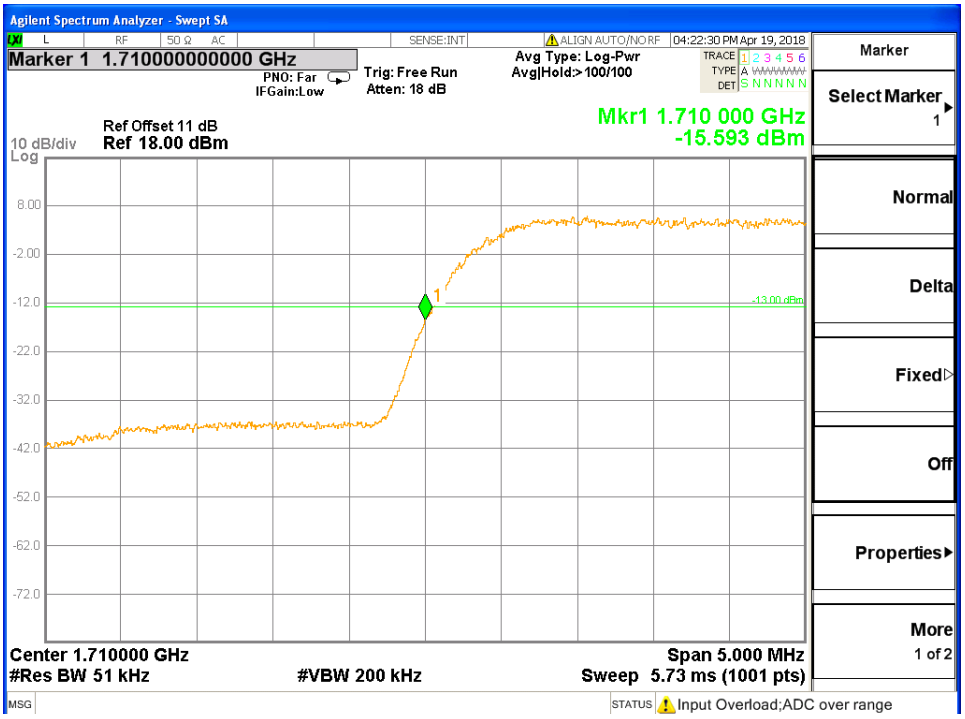
3. The band edges of low and high channels for the highest RF powers were measured.

5.5.3 Test result

GSM 850 – Left band

GSM 850 – Right band


GSM 1900 – Left band

GSM 1900 – Right band


WCDMA Band II – Left band

WCDMA Band II – Right band


WCDMA Band VI – Left band

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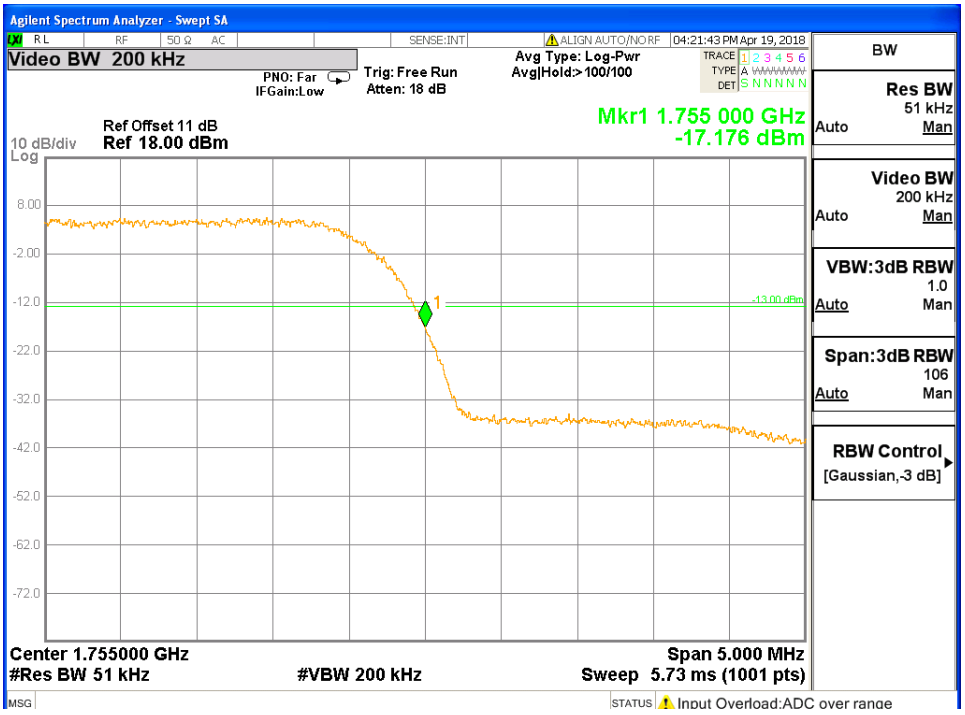
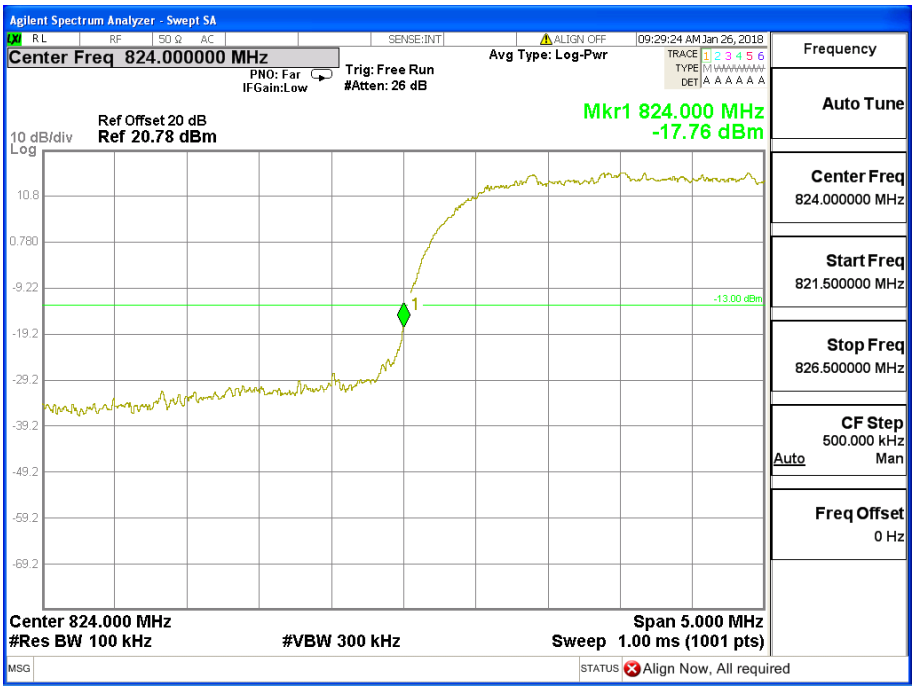
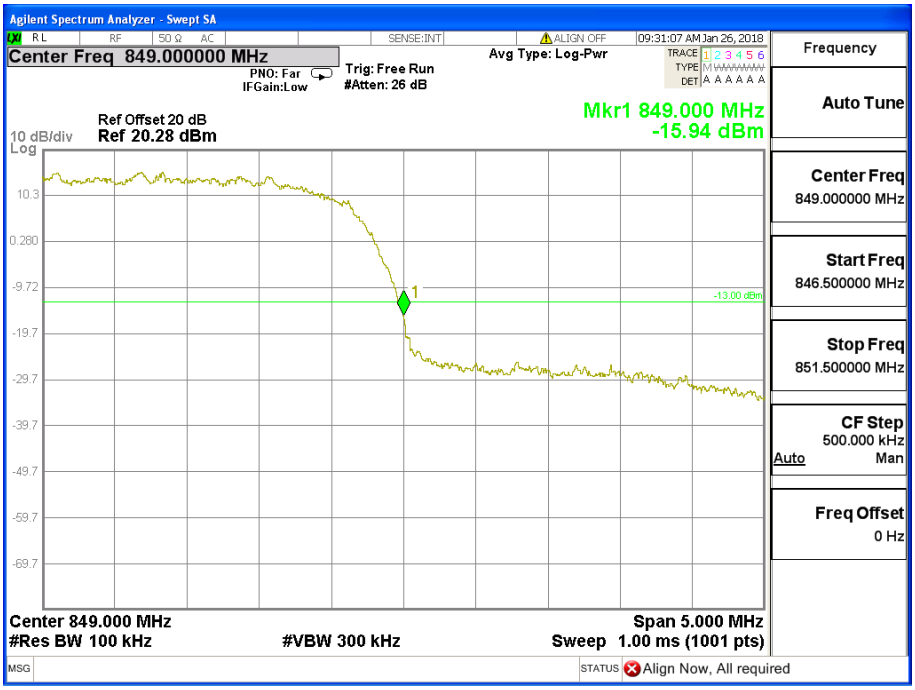


WCDMA Band V – Left band

WCDMA Band V – Right band


5.6 Radiated spurious emission

5.6.1 Limit

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+10log (P) dB

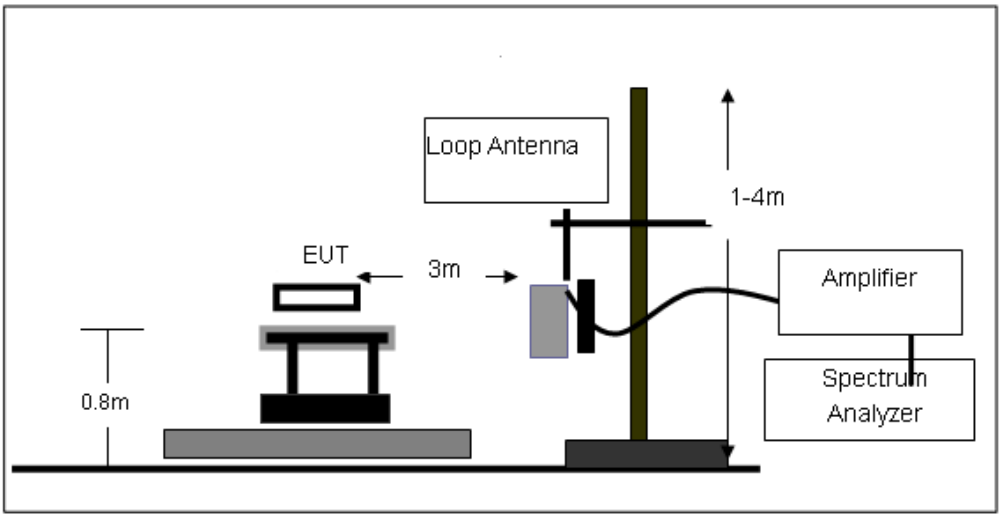
5.6.2 Test method

1. The test system setup as show in the block diagram above.
2. The EUT was placed on an non-conductive rotating platform in an anechoic chamber. The radiated spurious emissions from 30MHz to 10th harmonious of fundamental frequency were measured at 3 m with a test antenna and a spectrum analyzer with RBW=1 MHz, VBW=1 MHz, peak detector settings.
3. During the measurement, the EUT was enforced in maximum power and linked with a base station. All the spurious emissions at 3m were measured by rotation of the turntable and the test antenna raised and lowered over a range from 1 to 4 meters in both horizontally and vertically polarized orientations.
4. When found the maximum level of emissions from the EUT. 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.

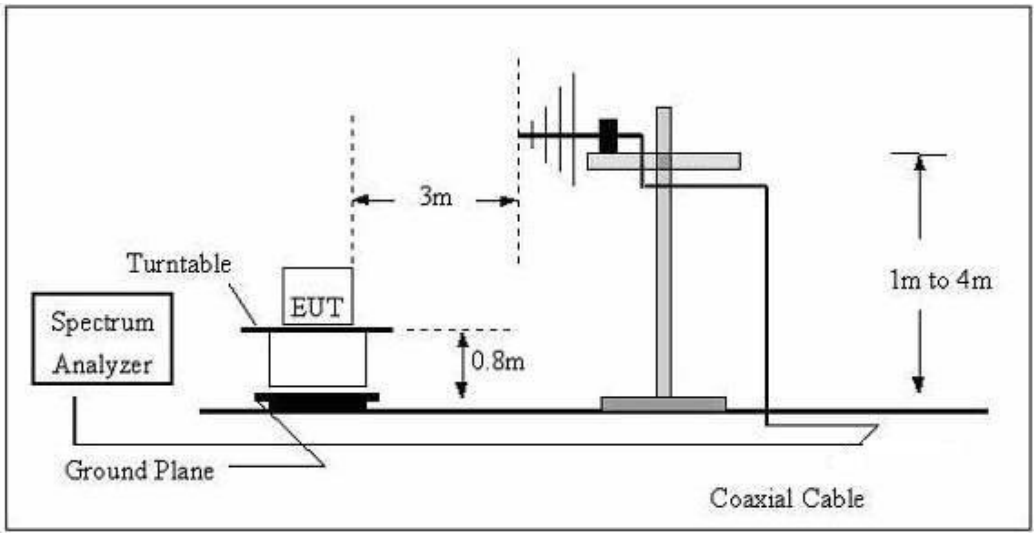
Spurious emissions in dB=10 log(TX power in Watts/0.001)-the absolute level
Spurious attenuation limit in dB=43+10 log(power out in Watts).

5.6.3 Test setup

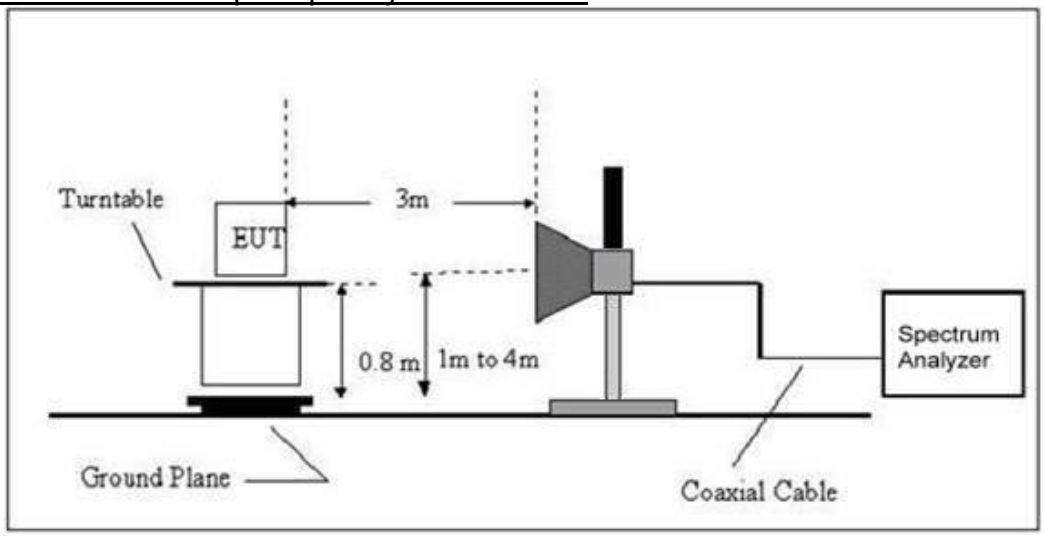
Radiated emission test-up frequency below 30MHz



Radiated emission test-up frequency 30MHz~1GHz



Radiated emission test-up frequency above 1GHz



5.6.4 Test Result

Note: All the configuration was tested and only the worse case was reported

For GSM850(30MHz – 9GHz)

Low Channel

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H)
1	84.7779	-70.05	20.34	-49.71	-13	-36.71	Horizontal
2	105.2457	-68.34	22.89	-45.45	-13	-32.45	Horizontal
3	251.9109	-70.45	24.8	-45.65	-13	-32.65	Horizontal
4	4174.349	-51.65	8.56	-43.09	-13	-30.09	Horizontal
5	5815.631	-52.28	4.55	-47.73	-13	-34.73	Horizontal
6	7366.734	-52.63	10.08	-42.55	-13	-29.55	Horizontal

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (V)
1	72.9242	-70.63	22.04	-48.59	-13	35.59	Vertical
2	220.0622	-69.44	24.5	-44.94	-13	31.94	Vertical
3	356.6096	-70.68	27.9	-42.78	-13	29.78	Vertical
4	6014.028	-50.24	3.3	-46.94	-13	28.76	Vertical
5	7492.986	-50.47	8.71	-41.76	-13	27.37	Vertical
6	8016.032	-50.3	9.93	-40.37	-13	28.65	Vertical

Middle Channel

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H)
1	144.4551	-71.2	19.85	-51.35	-13	-38.35	Horizontal
2	220.9138	-70.16	23.83	-46.33	-13	-33.33	Horizontal
3	249.0092	-68.35	24.71	-43.64	-13	-30.64	Horizontal
4	6068.136	-51.57	5.4	-46.17	-13	-33.17	Horizontal
5	7420.842	-50.76	10.16	-40.6	-13	-27.6	Horizontal
6	8791.583	-52.03	10.05	-41.98	-13	-28.98	Horizontal

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (V)
1	136.8524	-73.44	21.36	-52.08	-13	-39.08	Vertical
2	192.2403	-72.97	24.05	-48.92	-13	-35.92	Vertical
3	275.3100	-72.94	26.34	-46.6	-13	-33.6	Vertical
4	6428.858	-50.09	5.36	-44.73	-13	-31.73	Vertical
5	7402.806	-49.96	8.51	-41.45	-13	-28.45	Vertical
6	8106.212	-49.97	9.79	-40.18	-13	-27.18	Vertical

Hihg Channel

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H)
1	65.9577	-70.67	22.52	-48.15	-13	-35.15	Horizontal
2	136.325	-71.25	19.76	-51.49	-13	-38.49	Horizontal
3	166.6437	-70.05	20.41	-49.64	-13	-36.64	Horizontal
4	5905.812	-51.9	4.83	-47.07	-13	-34.07	Horizontal
5	6681.363	-51.22	8.01	-43.21	-13	-30.21	Horizontal
6	8160.321	-52.28	11.26	-41.02	-13	-28.02	Horizontal

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (V)
1	177.9512	-74.89	22.81	-52.08	-13	-39.08	Vertical
2	212.5451	-72.81	24.24	-48.57	-13	-35.57	Vertical
3	262.8427	-71.26	24.54	-46.72	-13	-33.72	Vertical
4	6086.172	-48.51	3.66	-44.85	-13	-31.85	Vertical
5	7384.77	-50.28	8.48	-41.8	-13	-28.8	Vertical
6	7835.671	-49.75	9.53	-40.22	-13	-27.22	Vertical

For GSM1900(30MHz – 20GHz)

Low Channel

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H)
1	128.1129	-65.99	11.76	-54.23	-13	41.23	Horizontal
2	277.0935	-65.26	16.13	-49.13	-13	36.13	Horizontal
3	410.3824	-64.97	19.5	-45.47	-13	32.47	Horizontal
4	603.5392	-64.09	21.6	-42.49	-13	29.49	Horizontal
5	15178.357	-52.17	4.26	-47.91	-13	34.91	Horizontal
6	17054.108	-61.23	8.17	-53.06	-13	40.06	Horizontal

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (V)
1	100.2286	-64.8	14.67	-50.13	-13	37.13	Vertical
2	148.441	-64.79	12.37	-52.42	-13	39.42	Vertical
3	478.8455	-62.75	20.86	-41.89	-13	28.89	Vertical
4	14953.908	-59.25	16.17	-43.08	-13	30.08	Vertical
5	16509.018	-61.46	6.49	-54.97	-13	41.97	Vertical
6	17775.551	-59.08	12.85	-46.23	-13	33.23	Vertical

Middle Channel

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H)
1	52.9453	-63.45	16.15	-47.3	-13	34.3	Horizontal
2	105.2717	-64.06	14.64	-49.42	-13	36.42	Horizontal
3	120.2766	-65.36	13.91	-51.45	-13	38.45	Horizontal
4	13623.246	-59.47	16.01	-43.46	-13	30.46	Horizontal
5	14168.337	-58.82	17.22	-41.6	-13	28.6	Horizontal
6	14472.946	-57.38	16.66	-40.72	-13	27.72	Horizontal

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (V)
1	35.2511	-64.49	16.01	-48.48	-13	35.48	Vertical
2	53.3179	-64.58	16.1	-48.48	-13	35.48	Vertical
3	116.132	-65.28	13.6	-51.68	-13	38.68	Vertical
4	212.2694	-64.02	14.34	-49.68	-13	36.68	Vertical
5	15002.004	-47.35	4.71	-42.64	-13	29.64	Vertical
6	17246.493	-60.7	9.63	-51.07	-13	38.07	Vertical

Hihg Channel

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H)
1	38.3462	-64.56	15.78	-48.78	-13	35.78	Horizontal
2	89.5899	-65.57	12.93	-52.64	-13	39.64	Horizontal
3	134.5592	-63.16	11.28	-51.88	-13	38.88	Horizontal
4	14969.94	-59.2	16.62	-42.58	-13	29.58	Horizontal
5	15835.671	-59.26	2.66	-56.6	-13	43.6	Horizontal
6	16605.21	-59.68	5.41	-54.27	-13	41.27	Horizontal

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (V)
1	88.9637	-65.06	12.77	-52.29	-13	39.29	Vertical
2	126.3285	-66.28	13.03	-53.25	-13	40.25	Vertical
3	210.786	-65.44	15.3	-50.14	-13	37.14	Vertical
4	13446.894	-60.42	15.32	-45.1	-13	32.1	Vertical
5	14232.465	-59.3	17.11	-42.19	-13	29.19	Vertical
6	14905.812	-58.81	16.21	-42.6	-13	29.6	Vertical

For WCDMA IV(30MHz – 18GHz)

Low Channel

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H)
1	114.5146	-64.14	13.86	-50.28	-13	37.28	Horizontal
2	168.4138	-64.26	11.47	-52.79	-13	39.79	Horizontal
3	407.5144	-64.27	19.44	-44.83	-13	31.83	Horizontal
4	148.441	-64.35	12.37	-51.98	-13	38.98	Horizontal
5	247.6819	-64.24	15.41	-48.83	-13	35.83	Horizontal
6	297.2241	-64	17.61	-46.39	-13	33.39	Horizontal

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (V)
1	85.298	-64.6	11.91	-52.69	-13	39.69	Vertical
2	99.5279	-64.28	14.59	-49.69	-13	36.69	Vertical
3	114.5146	-64.14	13.86	-50.28	-13	37.28	Vertical
4	12308.617	-65.49	13	-52.49	-13	39.49	Vertical
5	13158.317	-65.19	14.31	-50.88	-13	37.88	Vertical
6	14232.465	-59.3	17.11	-42.19	-13	29.19	Vertical

Middle Channel

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H)
1	382.5879	-64.52	18.83	-45.69	-13	32.69	Horizontal
2	629.4772	-62.03	21.88	-40.15	-13	27.15	Horizontal
3	925.7563	-61.65	25.69	-35.96	-13	22.96	Horizontal
4	12869.739	-65.02	13.64	-51.38	-13	38.38	Horizontal
5	13975.952	-60.09	17.44	-42.65	-13	29.65	Horizontal
6	14232.465	-59.3	17.11	-42.19	-13	29.19	Horizontal

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (V)
1	277.0935	-65.26	16.13	-49.13	-13	36.13	Vertical
2	410.3824	-64.97	19.5	-45.47	-13	32.47	Vertical
3	603.5392	-64.09	21.6	-42.49	-13	29.49	Vertical
4	13446.894	-60.42	15.32	-45.1	-13	32.1	Vertical
5	13975.952	-60.09	17.44	-42.65	-13	29.65	Vertical
6	14905.812	-58.81	16.21	-42.6	-13	29.6	Vertical

Hihg Channel

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H)
1	369.4045	-64.11	18.49	-45.62	-13	32.62	Horizontal
2	459.1143	-63.71	20.47	-43.24	-13	30.24	Horizontal
3	656.5300	-62.21	22.16	-40.05	-13	27.05	Horizontal
4	10641.283	-63.81	11.48	-52.33	-13	39.33	Horizontal
5	11571.142	-63.05	12.26	-50.79	-13	37.79	Horizontal
6	11907.816	-65.07	12.43	-52.64	-13	39.64	Horizontal

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (V)
1	57.1914	-65.5	15.5	-50	-13	37	Vertical
2	100.2286	-64.8	14.67	-50.13	-13	37.13	Vertical
3	148.4410	-64.79	12.37	-52.42	-13	39.42	Vertical
4	14569.138	-59.8	16.65	-43.15	-13	30.15	Vertical
5	15178.357	-52.17	4.26	-47.91	-13	34.91	Vertical
6	17054.108	-61.23	8.17	-53.06	-13	40.06	Vertical

For WCDMA V(30MHz – 9GHz)

Low Channel

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H)
1	147.8415	-70.86	20.01	-50.85	-13	37.85	Horizontal
2	197.5079	-69.35	22.77	-46.58	-13	33.58	Horizontal
3	267.9673	-71.05	25.2	-45.85	-13	32.85	Horizontal
4	3963.928	-51.4	9.41	-41.99	-13	-28.99	Horizontal
5	6416.834	-51.08	6.81	-44.27	-13	-31.27	Horizontal
6	8052.104	-51.35	11.58	-39.77	-13	-26.77	Horizontal

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (V)
1	159.0973	-70.72	21.83	-48.89	-13	35.89	Vertical
2	246.141	-71.58	24.44	-47.14	-13	34.14	Vertical
3	280.6778	-71.52	26.49	-45.03	-13	32.03	Vertical
4	3997.996	-47.83	6.18	-41.65	-13	-28.65	Vertical
5	7098.196	-50.18	7.84	-42.34	-13	-29.34	Vertical
6	7949.900	-49.81	9.82	-39.99	-13	-26.99	Vertical

Middle Channel

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H)
1	331.3803	-71.75	26.88	-44.87	-13	31.87	Horizontal
2	386.7354	-71.39	28.39	-43	-13	30	Horizontal
3	430.8984	-71.43	29.41	-42.02	-13	29.02	Horizontal
4	3963.928	-47.8	6.05	-41.75	-13	-28.75	Horizontal
5	6655.311	-50.78	6.3	-44.48	-13	-31.48	Horizontal
6	8018.036	-49.8	9.92	-39.88	-13	-26.88	Horizontal

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (V)
1	95.5598	-69.9	23.35	-46.55	-13	33.55	Vertical
2	229.6121	-71.48	23.88	-47.6	-13	34.6	Vertical
3	251.9109	-70.91	24.45	-46.46	-13	33.46	Vertical
4	3997.996	-51.27	9.66	-41.61	-13	-28.61	Vertical
5	6348.697	-50.96	6.54	-44.42	-13	-31.42	Vertical
6	8018.036	-52.56	11.69	-40.87	-13	-27.87	Vertical

Hihg Channel

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (H)
1	134.7547	-71.85	19.82	-52.03	-13	39.03	Horizontal
2	178.6397	-70.72	20.04	-50.68	-13	37.68	Horizontal
3	239.5762	-72.33	24.42	-47.91	-13	34.91	Horizontal
4	4032.064	-50.8	9.47	-41.33	-13	-28.33	Horizontal
5	5565.13	-49.25	3.76	-45.49	-13	-32.49	Horizontal
6	7711.423	-52.02	10.89	-41.13	-13	-28.13	Horizontal

No.	Frequency (MHz)	Meter Reading (dBuV)	Factor dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Polar (V)
1	143.8984	-73.43	21.33	-52.1	-13	-39.1	Vertical
2	312.7296	-70.22	26.49	-43.73	-13	-30.73	Vertical
3	435.9197	-73.23	30.22	-43.01	-13	-30.01	Vertical
4	3997.996	-48.07	6.18	-41.89	-13	-28.89	Vertical
5	6621.243	-50	6.16	-43.84	-13	-30.84	Vertical
6	8052.104	-49.52	9.86	-39.66	-13	-26.66	Vertical

5.7 Frequency stability

5.7.1 Limit

For FCC part 22.355: the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances 2.5ppm for mobile ≤ 3W condition.

For FCC part 24.235: The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

For FCC part 24.54: The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

5.7.2 Test method

Test Procedures for Temperature Variation:

1, The EUT was set up in the thermal chamber and connected with the base station.
2, With power off, the temperature was decreased to -30℃ and the EUT was stabilized for three hours. Power was applied and the maximum change in frequency was recorded within one minute.
3, With power off, the temperature was raised in 10℃ set up to 50℃ and the EUT was stabilized for three hours. Power was applied and the maximum change in frequency was recorded within one minute.
4, measure the carrier frequency error.

Test Procedures for Voltage Variation:

1, The EUT was placed in a temperature chamber at 25±5℃ and connected with the base station.
2, Reduce the primary supply voltage to the battery operating end point.
3, measure the carrier frequency error.

5.7.3 Test Result

Band	Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)
GSM 850	6.66	25	0.0299
	7.40	19	0.0227
	8.14	34	0.0406

Band	Temperature (℃)	Frequency Error (Hz)	Frequency Error (ppm)
GSM 850	-30	33	0.0394
	-20	29	0.0347
	-10	24	0.0287
	0	34	0.0406
	10	31	0.0371
	20	49	0.0586
	30	41	0.0490
	40	29	0.0347
	50	35	0.0418

Band	Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)
GSM 1900	6.66	36	0.0191
	7.40	30	0.0160
	8.14	27	0.0144

Band	Temperature (℃)	Frequency Error (Hz)	Frequency Error (ppm)
GSM 1900	-30	28	0.0149
	-20	27	0.0144
	-10	35	0.0186
	0	36	0.0191
	10	30	0.0160
	20	26	0.0138
	30	41	0.0218
	40	38	0.0202
	50	39	0.0207

Band	Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)
WCDMA Band 2	6.66	26	0.0138
	7.40	42	0.0223
	8.14	39	0.0207

Band	Temperature (℃)	Frequency Error (Hz)	Frequency Error (ppm)
WCDMA Band 2	-30	37	0.0197
	-20	15	0.0080
	-10	34	0.0181
	0	29	0.0154
	10	30	0.0160
	20	36	0.0191
	30	22	0.0117
	40	28	0.0149
	50	21	0.0112

Band	Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)
WCDMA Band 4	6.66	15.28	0.009
	7.40	20.91	0.012
	8.14	19.33	0.011

Band	Temperature (℃)	Frequency Error (Hz)	Frequency Error (ppm)
WCDMA Band 4	-30	16.52	0.009
	-20	19.20	0.011
	-10	14.64	0.008
	0	19.79	0.011
	10	25.87	0.015
	20	19.07	0.011
	30	15.93	0.009
	40	16.28	0.009
	50	13.94	0.008

Band	Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)
WCDMA Band 5	6.66	30	0.0359
	7.40	36	0.0430
	8.14	26	0.0311

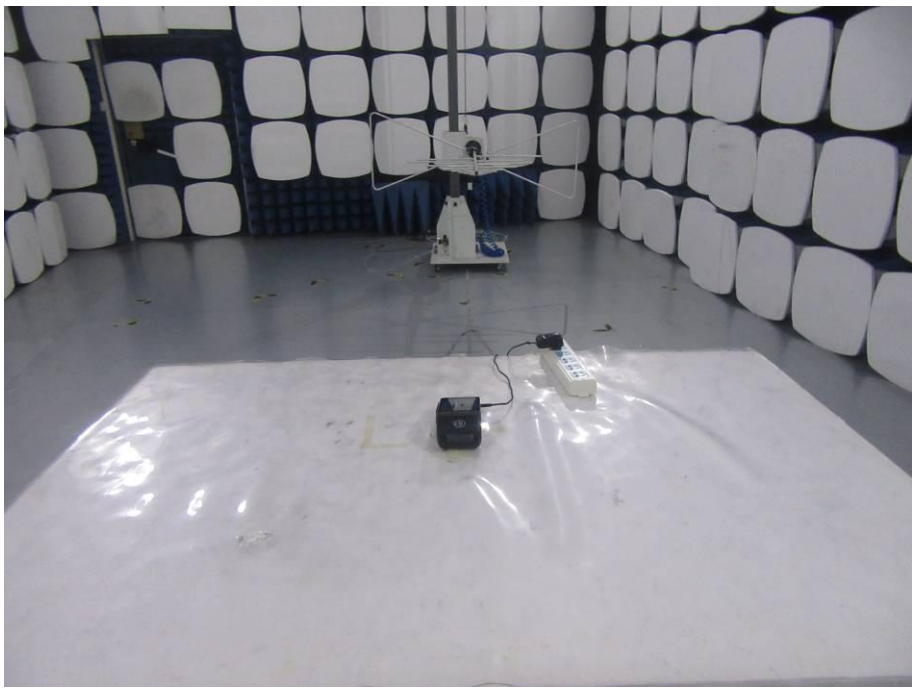
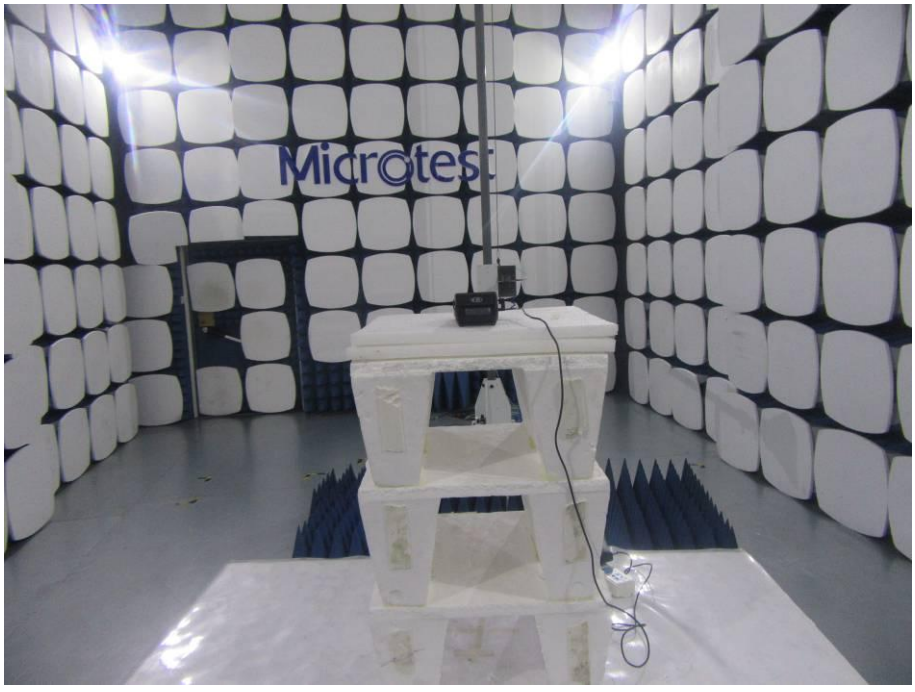
Band	Temperature (℃)	Frequency Error (Hz)	Frequency Error (ppm)
WCDMA Band 5	-30	33	0.0395
	-20	31	0.0371
	-10	25	0.0299
	0	36	0.0430

	10	24	0.0287
	20	18	0.0215
	30	26	0.0311
	40	32	0.0383
	50	34	0.0407

Note:

1. Normal Voltage = 7.4V; Battery End Point (BEP) = 6.66V; Maximum Voltage =8.14V

Photographs of the Test Setup

Radiated emission



Conducted emission


----END OF REPORT----