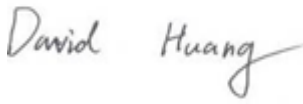


RF TEST REPORT



Report No.: 18070040-FCC-R1

Supersede Report No.: N/A

Applicant	ZTE Corporation	
Product Name	LTE/WCDMA/GSM(EDGE、GPRS) USB modem	
Model No.	MF833V	
Serial No.	N/A	
Test Standard	FCC Part 22(H):2016 ;FCC Part 24(E):2016; FCC Part 27:2016; ANSI/TIA-603-D: 2010	
Test Date	January 12 to February 01, 2018	
Issue Date	February 2, 2018	
Test Result	☒ Pass ☐ Fail	
Equipment complied with the specification	☒	
Equipment did not comply with the specification	☐	
		
Aaron Liang Test Engineer	David Huang Checked By	
This test report may be reproduced in full only Test result presented in this test report is applicable to the tested sample only		

Issued by:

SIEMIC (SHENZHEN-CHINA) LABORATORIES

Zone A, Floor 1, Building 2 Wan Ye Long Technology Park

South Side of Zhoushi Road, Bao' an District, Shenzhen, Guangdong China 518108

Phone: +86 0755 2601 4629801 Email: China@siemic.com.cn

Laboratories Introduction

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



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

Accreditations for Conformity Assessment

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

Test Report	18070040-FCC-R1
Page	3 of 94

This page has been left blank intentionally.

CONTENTS

1. REPORT REVISION HISTORY	5
2. CUSTOMER INFORMATION.....	5
3. TEST SITE INFORMATION	5
4. EQUIPMENT UNDER TEST (EUT) INFORMATION	6
5. TEST SUMMARY	9
6. MEASUREMENTS, EXAMINATION AND DERIVED RESULTS.....	10
6.1 RF EXPOSURE (SAR)	10
6.2 RF OUTPUT POWER.....	11
6.3 PEAK-AVERAGE RATIO	22
6.4 OCCUPIED BANDWIDTH	26
6.5 SPURIOUS EMISSIONS AT ANTENNA TERMINALS	40
6.6 SPURIOUS RADIATED EMISSIONS.....	54
6.7 BAND EDGE	61
6.8 FREQUENCY STABILITY.....	74
ANNEX A. TEST INSTRUMENT	79
ANNEX B. EUT AND TEST SETUP PHOTOGRAPHS.....	81
ANNEX C. TEST SETUP AND SUPPORTING EQUIPMENT.....	90
ANNEX C.II. EUT OPERATING CONKITIONS	92
ANNEX D. USER MANUAL / BLOCK DIAGRAM / SCHEMATICS / PARTLIST	93
ANNEX E. DECLARATION OF SIMILARITY	94

1. Report Revision History

Report No.	Report Version	Description	Issue Date
18070040-FCC-R1	NONE	Original	February 2, 2018

2. Customer information

Applicant Name	ZTE Corporation
Applicant Add	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China
Manufacturer	ZTE Corporation
Manufacturer Add	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

3. Test site information

Test Lab A:

Lab performing tests	SIEMIC (Shenzhen-China) LABORATORIES
Lab Address	Zone A, Floor 1, Building 2 Wan Ye Long Technology Park South Side of Zhoushi Road, Bao' an District, Shenzhen, Guangdong China 518108
FCC Test Site No.	535293
IC Test Site No.	4842E-1
Test Software	Radiated Emission Program-To Shenzhen v2.0

Test Lab B:

Lab performing tests	SIEMIC (Nanjing-China) Laboratories
Lab Address	2-1 Longcang Avenue Yuhua Economic and Technology Development Park, Nanjing, China
FCC Test Site No.	694825
IC Test Site No.	4842B-1
Test Software	EZ_EMG(ver.lcp-03A1)

Note: We just perform Radiated Spurious Emission above 18GHz in the test Lab. B.

4. Equipment under Test (EUT) Information

Description of EUT: LTE/WCDMA/GSM(EDGE、GPRS) USB modem

Main Model: MF833V

Serial Model: N/A

Date EUT received: January 11, 2018

Test Date(s): January 12 to February 01, 2018

Equipment Category : PCT

	GSM850: 0.45dBi
	PCS1900: 1.68dBi
	UMTS-FDD Band V: 0.45dBi
	UMTS-FDD Band IV: 1.49dBi
	UMTS-FDD Band II: 1.68dBi
Antenna Gain:	LTE Band II: 1.69dBi
	LTE Band IV: 1.49dBi
	LTE Band V: 0.45dBi
	LTE Band VII: 1.76dBi
	LTE Band XII: 0.84dBi
	LTE Band XVII: 0.84dBi

Antenna Type: Internal antenna

Type of Modulation:	GSM / GPRS: GMSK
	EGPRS: GMSK, 8PSK
	UMTS-FDD: QPSK
	LTE Band: QPSK, 16QAM

RF Operating Frequency (ies): GSM850 TX: 824.2 ~ 848.8 MHz; RX: 869.2 ~ 893.8 MHz
PCS1900 TX: 1850.2 ~ 1909.8 MHz; RX: 1930.2 ~ 1989.8 MHz
UMTS-FDD Band V TX: 826.4 ~ 846.6 MHz; RX: 871.4 ~ 891.6 MHz
UMTS-FDD Band IV TX: 1712.4 ~ 1752.6 MHz;
RX : 2112.4 ~ 2152.6 MHz
UMTS-FDD Band II TX: 1852.4 ~ 1907.6 MHz;
RX: 1932.4 ~ 1987.6 MHz

LTE Band II TX: 1850.7 ~ 1909.3MHz; RX : 1930.7 ~ 1989.3 MHz
 LTE Band IV TX: 1710.7 ~ 1754.3 MHz; RX : 2110.7~ 2154.3 MHz
 LTE Band V TX: 824.7~ 848.3 MHz; RX : 869.7 ~ 893.3MHz
 LTE Band VII TX: 2502.5 ~ 2567.5 MHz; RX : 2622.5 ~ 2687.5 MHz
 LTE Band XII TX:699.7 ~ 715.3 MHz; RX : 729.7~ 745.3MHz
 LTE Band XVII TX: 706.5 ~ 713.5 MHz; RX : 736.5 ~ 743.5 MHz

GPRS:GSM850: 32.13 dBm

PCS1900: 30.21 dBm

EGPRS(MCS1):GSM850: 32.27 dBm

PCS1900: 30.01 dBm

EGPRS(MCS5):GSM850: 25.78 dBm

PCS1900: 25.95 dBm

Maximum Conducted

RMC:UMTS-FDD Band V: 23.46 dBm

AV Power to Antenna:

UMTS-FDD Band II: 21.88 dBm

UMTS-FDD Band IV: 20.02 dBm

HSDPA:UMTS-FDD Band V: 22.88 dBm

UMTS-FDD Band II: 21.62 dBm

UMTS-FDD Band IV: 19.48 dBm

HSUPA:UMTS-FDD Band V: 22.86 dBm

UMTS-FDD Band II: 21.60 dBm

UMTS-FDD Band IV:19.42 dBm

GPRS:GSM850: 30.43 dBm / ERP

PCS1900: 29.69 dBm / EIRP

EGPRS(MCS5):GSM850: 24.08 dBm / ERP

PCS1900: 27.63 dBm / EIRP

RMC:UMTS-FDD Band V: 21.76 dBm / ERP

UMTS-FDD Band II: 25.26 dBm / EIRP

ERP/EIRP:

UMTS-FDD Band IV: 21.51 dBm / EIRP

HSDPA:UMTS-FDD Band V: 21.18 dBm / ERP

UMTS-FDD Band II: 24.65 dBm / EIRP

UMTS-FDD Band IV: 20.79 dBm / EIRP

HSUPA:UMTS-FDD Band V: 21.12 dBm / ERP

UMTS-FDD Band II: 24.54 dBm / EIRP

UMTS-FDD Band IV: 20.91 dBm / EIRP

Number of Channels: GSM 850: 124CH
PCS1900: 299CH
UMTS-FDD Band V: 102CH
UMTS-FDD Band IV: 202CH
UMTS-FDD Band II: 277CH

Port: USB Port

Power Supply: 5V

Trade Name : ZTE

GPRS/EGPRS Multi-slot class 8/10

FCC ID: SRQ-MF833V

5. Test Summary

The product was tested in accordance with the following specifications.

All testing has been performed according to below product classification:

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

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

Measurement Uncertainty

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

6. MEASUREMENTS, EXAMINATION AND DERIVED RESULTS

6.1 RF Exposure (SAR)

Test Result: Pass

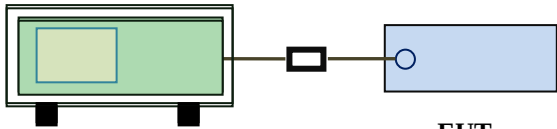
The EUT is a portable device, thus requires SAR evaluation;
Please refer to RF Exposure Evaluation Report: 18070040-FCC-H.

6.2 RF Output Power

Temperature	24 °C
Relative Humidity	54%
Atmospheric Pressure	1020mbar
Test date :	January 29, 2018
Tested By :	Aaron Liang

Requirement(s):

Spec	Item	Requirement	Applicable
§22.913 (a)	a)	ERP:38.45dBm	☒
§24.232 (c)	b)	EIRP:33dBm	☒
§27.50 (c)	c)	EIRP: 30dBm	☒

Test Setup	 Base Station EUT
------------	---

Test Procedure	For Conducted Power: - The transmitter output port was connected to base station. - Set EUT at maximum power through base station. - Select lowest, middle, and highest channels for each band and different test mode. For ERP/EIRP: According with KDB 971168 v02r02 - The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable. - The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis. - The frequency range up to tenth harmonic of the fundamental
----------------	---

	frequency was investigated. - Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution. - Spurious emissions in dB = $10 \log (\text{TX power in Watts}/0.001)$ – the absolute level - Spurious attenuation limit in dB = $43 + 10 \text{ Log}_{10} (\text{power out in Watts})$.
Remark	
Result	☒ Pass ☐ Fail

Test Data ☒ Yes ☐ N/A
 Test Plot ☐ Yes (See below) ☒ N/A

Conducted Power

GSM Mode:

Burst Average Power (dBm);								
Band	GSM850				PCS1900			
Channel	128	190	251	Tune up Power tolerant	512	661	810	Tune up Power tolerant
Frequency (MHz)	824.2	836.6	848.8	/	1850.2	1880	1909.8	/
GPRS Multi-Slot Class 8 (1 uplink),GMSK	32.13	32.11	32.13	32±1	30.21	30.2	30.19	30±1
GPRS Multi-Slot Class 10 (2 uplink),GMSK	30.24	30.21	30.18	30±1	29.52	29.47	29.44	29±1
EGPRS Multi-Slot Class 8 (1 uplink) GMSK MCS1	32.27	32.21	32.21	32±1	30.01	30	29.99	30±1
EGPRS Multi-Slot Class 10 (2 uplink) GMSK MCS1	29.89	29.72	29.68	30±1	28.72	28.71	28.67	28±1
EGPRS Multi-Slot Class 8 (1 uplink),8PSK MCS5	25.78	25.72	25.68	25±1	25.95	25.75	25.6	25±1
EGPRS Multi-Slot Class 10 (2 uplink),8PSK MCS5	24.36	24.31	24.3	24±1	23.18	22.97	22.9	23±1

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

UMTS Mode:

UMTS-FDD Band V

Band/ Time Slot configuration	Channel	Frequency	Average power (dBm)	Tune up Power tolerant
RMC 12.2kbps	4132	826.4	23.46	23±1
	4175	835	23.44	23±1
	4233	846.6	23.42	23±1
HSDPA Subtest1	4132	826.4	22.72	22±1
	4175	835	22.83	22±1
	4233	846.6	22.69	22±1
HSDPA Subtest2	4132	826.4	22.81	22±1
	4175	835	22.87	22±1
	4233	846.6	22.87	22±1
HSDPA Subtest3	4132	826.4	22.8	22±1
	4175	835	22.67	22±1
	4233	846.6	22.71	22±1
HSDPA Subtest4	4132	826.4	22.88	22±1
	4175	835	22.69	22±1
	4233	846.6	22.75	22±1
HSUPA Subtest1	4132	826.4	22.82	22±1
	4175	835	22.8	22±1
	4233	846.6	22.65	22±1
HSUPA Subtest2	4132	826.4	22.59	22±1
	4175	835	22.72	22±1
	4233	846.6	22.6	22±1
HSUPA Subtest3	4132	826.4	22.81	22±1
	4175	835	22.74	22±1
	4233	846.6	22.72	22±1
HSUPA Subtest4	4132	826.4	22.51	22±1
	4175	835	22.66	22±1
	4233	846.6	22.72	22±1
HSUPA Subtest5	4132	826.4	22.86	22±1
	4175	835	22.83	22±1
	4233	846.6	22.81	22±1

UMTS-FDD Band II

Band/ Time Slot configuration	Channel	Frequency	Average power (dBm)	Tune up Power tolerant
RMC 12.2kbps	9262	1852.4	21.83	21±1
	9400	1880	21.63	21±1
	9538	1907.6	21.88	21±1
HSDPA Subtest1	9262	1852.4	21.34	21±1
	9400	1880	21.5	21±1
	9538	1907.6	21.49	21±1
HSDPA Subtest2	9262	1852.4	21.45	21±1
	9400	1880	21.62	21±1
	9538	1907.6	21.55	21±1
HSDPA Subtest3	9262	1852.4	21.45	21±1
	9400	1880	21.52	21±1
	9538	1907.6	21.48	21±1
HSDPA Subtest4	9262	1852.4	21.53	21±1
	9400	1880	21.6	21±1
	9538	1907.6	21.52	21±1
HSUPA Subtest1	9262	1852.4	21.46	21±1
	9400	1880	21.45	21±1
	9538	1907.6	21.55	21±1
HSUPA Subtest2	9262	1852.4	21.28	21±1
	9400	1880	21.26	21±1
	9538	1907.6	21.45	21±1
HSUPA Subtest3	9262	1852.4	21.5	21±1
	9400	1880	21.38	21±1
	9538	1907.6	21.48	21±1
HSUPA Subtest4	9262	1852.4	21.11	21±1
	9400	1880	21.33	21±1
	9538	1907.6	21.23	21±1
HSUPA Subtest5	9262	1852.4	21.54	21±1
	9400	1880	21.6	21±1
	9538	1907.6	21.46	21±1

UMTS-FDD Band IV

Band/ Time Slot configuration	Channel	Frequency	Average power (dBm)	Tune up Power tolerant
RMC 12.2kbps	1313	1712.6	19.45	20±1
	1413	1732.6	19.46	20±1
	1512	1752.4	20.02	20±1
HSDPA Subtest1	1313	1712.6	18.66	19±1
	1413	1732.6	18.77	19±1
	1512	1752.4	19.3	19±1
HSDPA Subtest2	1313	1712.6	18.9	19±1
	1413	1732.6	18.93	19±1
	1512	1752.4	19.48	19±1
HSDPA Subtest3	1313	1712.6	18.72	19±1
	1413	1732.6	18.81	19±1
	1512	1752.4	19.41	19±1
HSDPA Subtest4	1313	1712.6	18.82	19±1
	1413	1732.6	18.76	19±1
	1512	1752.4	19.32	19±1
HSUPA Subtest1	1313	1712.6	18.82	19±1
	1413	1732.6	18.66	19±1
	1512	1752.4	19.42	19±1
HSUPA Subtest2	1313	1712.6	18.6	19±1
	1413	1732.6	18.66	19±1
	1512	1752.4	19.24	19±1
HSUPA Subtest3	1313	1712.6	18.69	19±1
	1413	1732.6	18.75	19±1
	1512	1752.4	19.41	19±1
HSUPA Subtest4	1313	1712.6	18.47	19±1
	1413	1732.6	18.61	19±1
	1512	1752.4	19.05	19±1
HSUPA Subtest5	1313	1712.6	18.86	19±1
	1413	1732.6	18.71	19±1
	1512	1752.4	19.39	19±1

ERP & EIRP

GPRS:

ERP for Cellular Band (Part 22H)

Frequency (MHz)	Antenna Polarization (H/V)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
824.2	V	30.43	38.45	-8.02
824.2	H	29.5	38.45	-8.95
836.6	V	30.41	38.45	-8.04
836.6	H	29.03	38.45	-9.42
848.8	V	30.43	38.45	-8.02
848.8	H	29.2	38.45	-9.25

EIRP for PCS Band (Part 24E)

Frequency (MHz)	Antenna Polarization (H/V)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
1850.2	V	29.69	33	-3.31
1850.2	H	28.13	33	-4.87
1880	V	29.68	33	-3.32
1880	H	28.89	33	-4.11
1909.8	V	29.67	33	-3.33
1909.8	H	28.78	33	-4.22

EGPRS (MCS5):

ERP for Cellular Band (Part 22H)

Frequency (MHz)	Antenna Polarization (H/V)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
824.2	V	24.08	38.45	-14.37
824.2	H	22.99	38.45	-15.46
836.6	V	24.02	38.45	-14.43
836.6	H	22.84	38.45	-15.61
848.8	V	23.98	38.45	-14.47
848.8	H	23.13	38.45	-15.32

EIRP for PCS Band (Part 24E)

Frequency (MHz)	Antenna Polarization (H/V)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
1850.2	V	27.63	33	-5.37
1850.2	H	25.99	33	-7.01
1880	V	27.43	33	-5.57
1880	H	26.35	33	-6.65
1909.8	V	27.28	33	-5.72
1909.8	H	25.38	33	-7.62

RMC

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

Frequency (MHz)	Antenna Polarization (H/V)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
826.4	V	21.76	38.45	-16.69
826.4	H	20.89	38.45	-17.56
835	V	21.74	38.45	-16.71
835	H	20.27	38.45	-18.18
846.6	V	21.72	38.45	-16.73
846.6	H	20.76	38.45	-17.69

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

Frequency (MHz)	Antenna Polarization (H/V)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
1852.4	V	25.22	33	-7.78
1852.4	H	23.27	33	-9.73
1880	V	25.25	33	-7.75
1880	H	24.28	33	-8.72
1907.6	V	25.26	33	-7.74
1907.6	H	23.41	33	-9.59

EIRP for UMTS-FDD Band IV (Part 27H)

Frequency (MHz)	Antenna Polarization (H/V)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
1712.4	V	20.94	30	-9.06
1712.4	H	19.98	30	-10.02
1740	V	20.95	30	-9.05
1740	H	19.64	30	-10.36
1752.6	V	21.51	30	-8.49
1752.6	H	20.74	30	-9.26

HSDPA

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

Frequency (MHz)	Antenna Polarization (H/V)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
826.4	V	21.18	38.45	-17.27
826.4	H	19.93	38.45	-18.52
835	V	21.17	38.45	-17.28
835	H	20.01	38.45	-18.44
846.6	V	21.17	38.45	-17.28
846.6	H	19.82	38.45	-18.63

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

Frequency (MHz)	Antenna Polarization (H/V)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
1852.4	V	24.51	33	-8.49
1852.4	H	23.64	33	-9.36
1880	V	24.51	33	-8.49
1880	H	23.41	33	-9.59
1907.6	V	24.65	33	-8.35
1907.6	H	22.85	33	-10.15

EIRP for UMTS-FDD Band IV (Part 27H)

Frequency (MHz)	Antenna Polarization (H/V)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
1712.4	V	20.15	30	-9.85
1712.4	H	18.87	30	-11.13
1740	V	20.26	30	-9.74
1740	H	18.81	30	-11.19
1752.6	V	20.79	30	-9.21
1752.6	H	19.67	30	-10.33

HSUPA

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

Frequency (MHz)	Antenna Polarization (H/V)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
826.4	V	21.12	38.45	-17.33
826.4	H	19.95	38.45	-18.5
835	V	21.12	38.45	-17.33
835	H	19.71	38.45	-18.74
846.6	V	20.95	38.45	-17.5
846.6	H	20.07	38.45	-18.38

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

Frequency (MHz)	Antenna Polarization (H/V)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
1852.4	V	24.54	33	-8.46
1852.4	H	22.95	33	-10.05
1880	V	24.54	33	-8.46
1880	H	22.81	33	-10.19
1907.6	V	24.53	33	-8.47
1907.6	H	23.5	33	-9.5

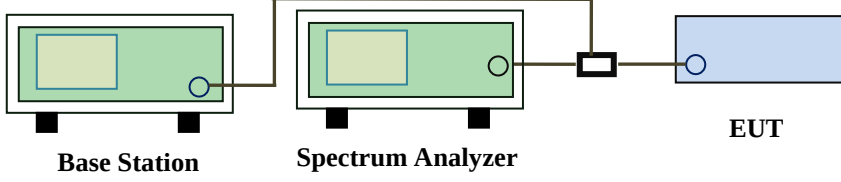
EIRP for UMTS-FDD Band IV (Part 27H)

Frequency (MHz)	Antenna Polarization (H/V)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
1712.4	V	20.31	30	-9.69
1712.4	H	19.56	30	-10.44
1740	V	20.31	30	-9.69
1740	H	19.05	30	-10.95
1752.6	V	20.91	30	-9.09
1752.6	H	19.36	30	-10.64

6.3 Peak-Average Ratio

Temperature	24 °C
Relative Humidity	54%
Atmospheric Pressure	1020mbar
Test date :	January 29, 2018
Tested By :	Aaron Liang

Requirement(s):

Spec	Item	Requirement	Applicable
§24.232(d) § 27.50(d)	a)	The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.	☒
Test Setup	 Base Station Spectrum Analyzer EUT		
Test Procedure	According with KDB 971168 v02r02 5.7.2 Alternate procedure for PAPR 5.1.2 Peak power measurements with a peak power meter The total peak output power may be measured using a broadband peak RF power meter. The power meter must have a video bandwidth that is greater than or equal to the emission bandwidth and utilize a fast-responding diode detector. 5.2.3 Average power measurement with average power meter As an alternative to the use of a spectrum/signal analyzer or EMI receiver to perform a measurement of the total in-band average output power, a wideband RF average power meter with a thermocouple detector or equivalent can be used under certain conditions If the EUT can be configured to transmit continuously (i.e., the burst duty cycle $\geq 98\%$) and at all times the EUT is transmitting at its maximum output		

	power level, then a conventional wide-band RF power meter can be used. If the EUT cannot be configured to transmit continuously (i.e., the burst duty cycle < 98%), then there are two options for the use of an average power meter. First, a gated average power meter can be used to perform the measurement if the gating parameters can be adjusted such that the power is measured only over active transmission bursts at maximum output power levels. A conventional average power meter can also be used if the measured burst duty cycle is constant (i.e., duty cycle variations are less than ± 2 percent) by performing the measurement over the on/off burst cycles and then correcting (increasing) the measured level by a factor equal to $10\log(1/\text{duty cycle})$
Remark	
Result	☒ Pass ☐ Fail

Test Data ☒ Yes ☐ N/A
 Test Plot ☐ Yes (See below) ☒ N/A

GPRS 1900 PK-AV POWER (PART 24E)

Frequency (MHz)	Conducted power(dBm)		Peak-Average Ratio(PAR)
	Peak	Average	
1850.2	31.22	30.21	1.01
1880	31.14	30.2	0.94
1909.8	31.23	30.19	1.04

EGPRS (MSC5) 1900 PK-AV POWER (PART 24E)

Frequency (MHz)	Conducted power(dBm)		Peak-Average Ratio(PAR)
	Peak	Average	
1850.2	26.65	25.72	0.93
1880	26.71	25.69	1.02
1909.8	26.52	25.65	0.87

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

Frequency (MHz)	Conducted power(dBm)		Peak-Average Ratio(PAR)
	Peak	Average	
1852.4	24.52	23.53	0.99
1880	24.62	23.56	1.06
1907.6	24.51	23.57	0.94

UMTS-FDD Band IV PK-AV POWER (PART 27H)

Frequency (MHz)	Conducted power(dBm)		Peak-Average Ratio(PAR)
	Peak	Average	
1712.6	20.39	19.45	0.94
1732.6	20.48	19.46	1.02
1752.4	21.04	20.02	1.02

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

Frequency (MHz)	Conducted power(dBm)		Peak-Average Ratio(PAR)
	Peak	Average	
1852.4	23.76	22.85	0.91
1880	23.72	22.94	0.78
1907.6	23.69	22.84	0.85

UMTS-FDD Band IV PK-AV POWER (PART 27H)

Frequency (MHz)	Conducted power(dBm)		Peak-Average Ratio(PAR)
	Peak	Average	
1712.6	19.65	18.82	0.83
1732.6	19.34	18.66	0.68
1752.4	20.19	19.42	0.77

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

Frequency (MHz)	Conducted power(dBm)		Peak-Average Ratio(PAR)
	Peak	Average	
1852.4	23.62	22.82	0.8
1880	23.65	22.89	0.76
1907.6	23.78	22.96	0.82

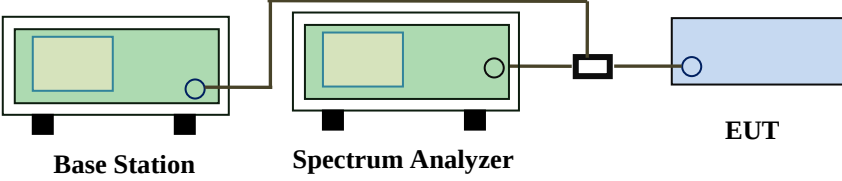
UMTS-FDD Band IV PK-AV POWER (PART 27H)

Frequency (MHz)	Conducted power(dBm)		Peak-Average Ratio(PAR)
	Peak	Average	
1712.6	19.36	18.66	0.7
1732.6	19.52	18.77	0.75
1752.4	20.02	19.3	0.72

6.4 Occupied Bandwidth

Temperature	25 °C
Relative Humidity	53%
Atmospheric Pressure	1005mbar
Test date :	February 01, 2018
Tested By :	Aaron Liang

Requirement(s):

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

Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

GPRS:

Cellular Band (Part 22H) result

Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
128	824.2	243.25	313.8
190	836.6	245.73	312.2
251	848.8	244.16	311.5

PCS Band (Part 24E) result

Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
512	1850.2	242.87	312.9
661	1880.0	242.53	314.7
810	1909.8	243.85	316.0

EGPRS (MCS 5):

Cellular Band (Part 22H) result

Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
128	824.2	242.32	316.7
190	836.6	244.73	318.6
251	848.8	243.77	316.2

PCS Band (Part 24E) result

Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
512	1850.2	240.92	313.9
661	1880.0	245.85	316.8
810	1909.8	246.34	317.8

RMC:

UMTS-FDD Band V (Part 22H)

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
4132	826.6	4.1380	4.695
4175	835.0	4.1251	4.687
4233	846.4	4.1407	4.717

UMTS-FDD Band II (Part 24E)

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
9262	1852.4	4.1481	4.743
9400	1880.0	4.1395	4.709
9538	1907.6	4.1587	4.775

UMTS-FDD Band IV (Part 27)

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
1313	1713	4.1322	4.679
1413	1733	4.1312	4.685
1512	1752	4.1382	4.713

HSDPA:

UMTS-FDD Band V (Part 22H)

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
4132	826.6	4.1387	4.724
4175	835.0	4.1249	4.681
4233	846.6	4.1477	4.722

UMTS-FDD Band II (Part 24E)

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
9262	1852.4	4.1542	4.730
9400	1880.0	4.1464	4.710
9538	1907.6	4.1475	4.749

UMTS-FDD Band IV (Part 27)

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
1313	1713	4.1295	4.696
1413	1733	4.1395	4.693
1512	1752	4.1198	4.702

HSUPA:

UMTS-FDD Band V (Part 22H)

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
4132	826.4	4.1328	4.701
4175	835.0	4.1426	4.701
4233	846.6	4.1334	4.702

UMTS-FDD Band II (Part 24E)

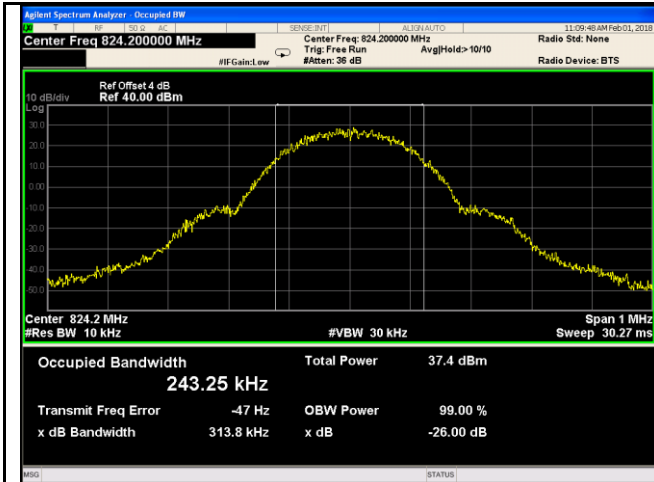
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
9262	1852.4	4.1464	4.758
9400	1880.0	4.1350	4.715
9538	1907.6	4.1434	4.753

UMTS-FDD Band IV (Part 27)

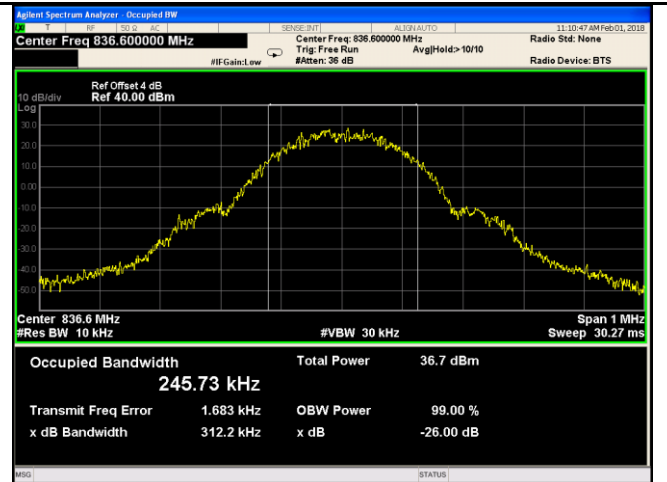
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
1313	1713	4.1345	4.706
1413	1733	4.1242	4.720
1512	1752	4.1187	4.710

Test Plots

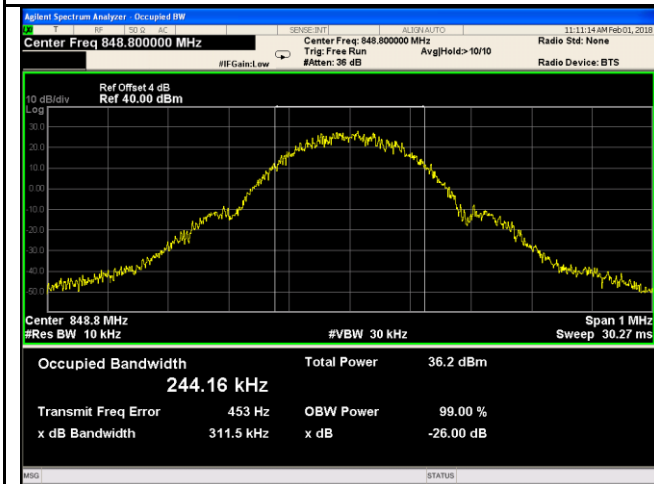
GPRS:



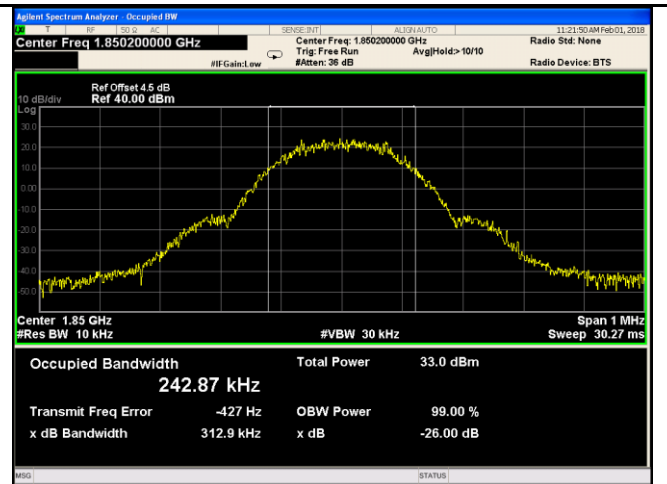
GSM 850 BW - Low CH 824.2MHz



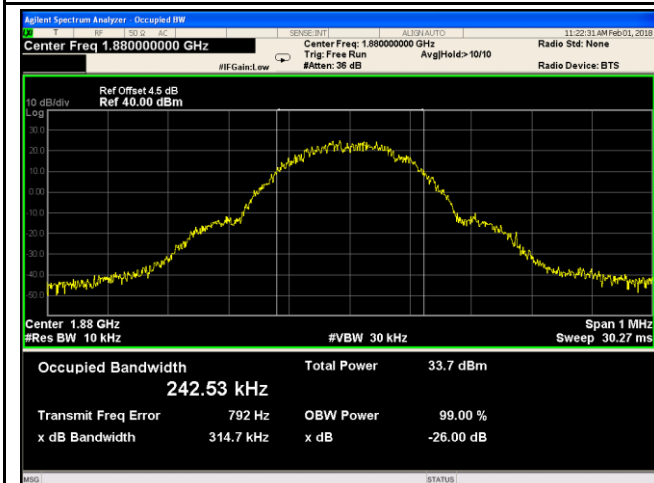
GSM 850 BW - Mid CH 836.6MHz



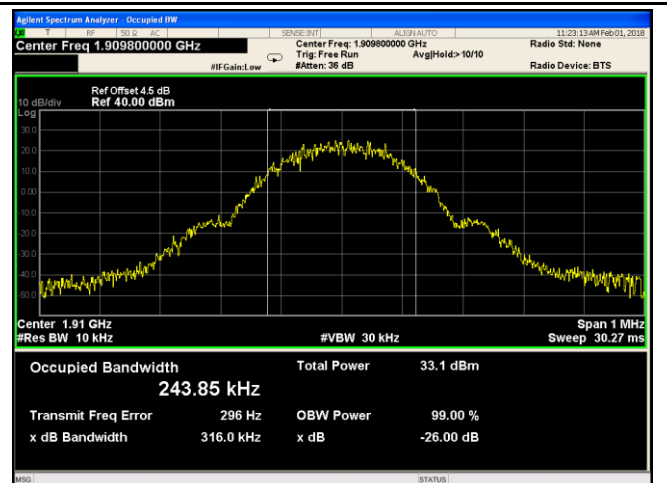
GSM 850 BW - High CH 848.8MHz



PCS 1900 BW - Low CH 1850.2MHz

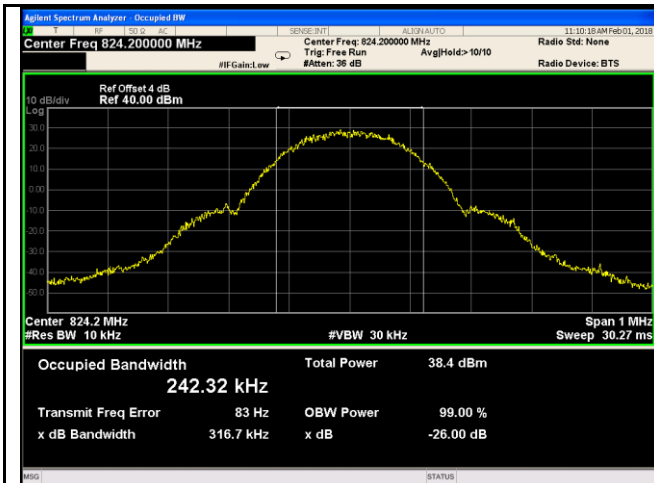


PCS 1900 BW - Mid CH 1880MHz

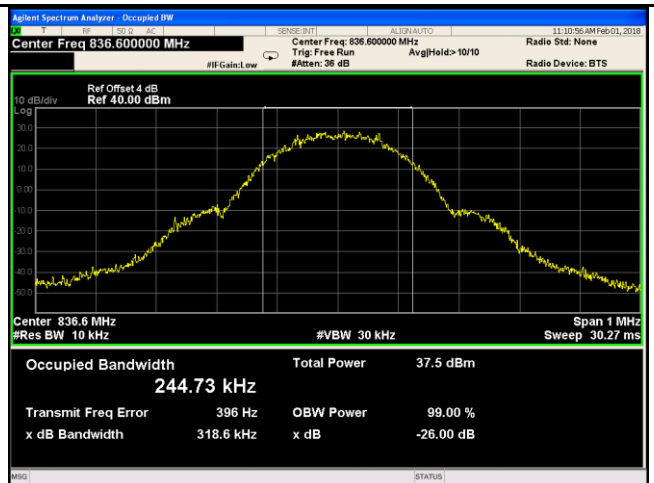


PCS 1900 BW - High CH 1910MHz

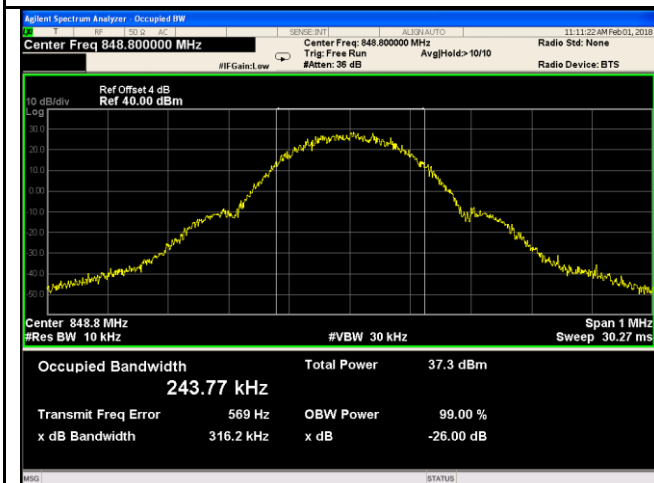
EGPRS:



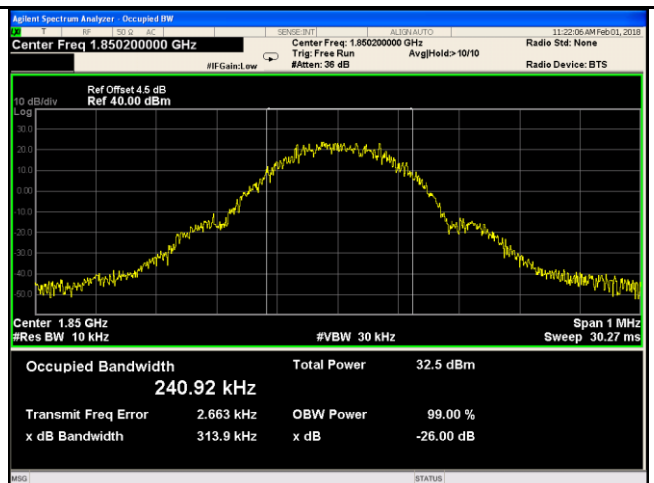
GSM 850 BW - Low CH 824.2MHz



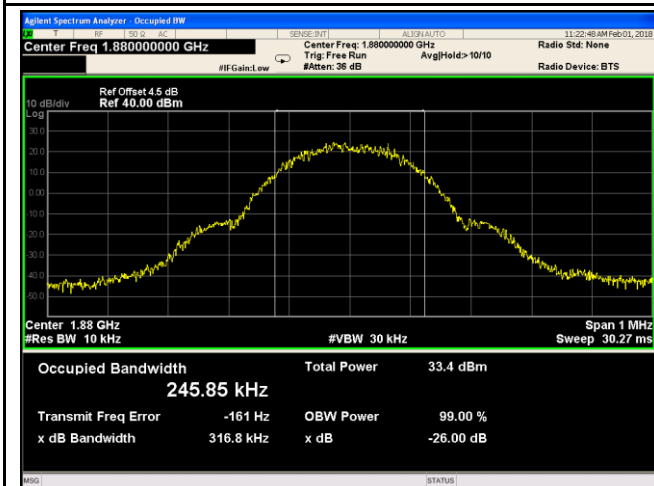
GSM 850 BW - Mid CH 836.6MHz



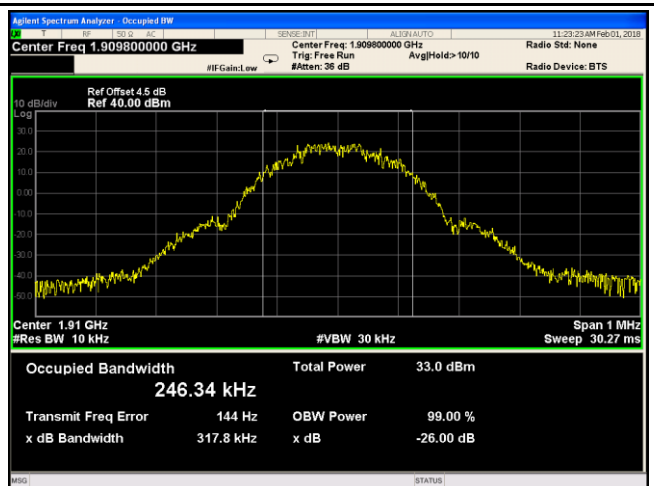
GSM 850 BW - High CH 848.8MHz



PCS 1900 BW - Low CH 1850.2MHz

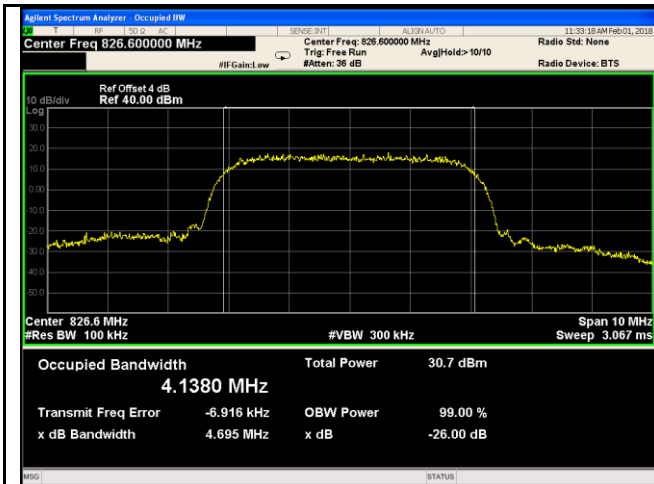


PCS 1900 BW - Mid CH 1880MHz

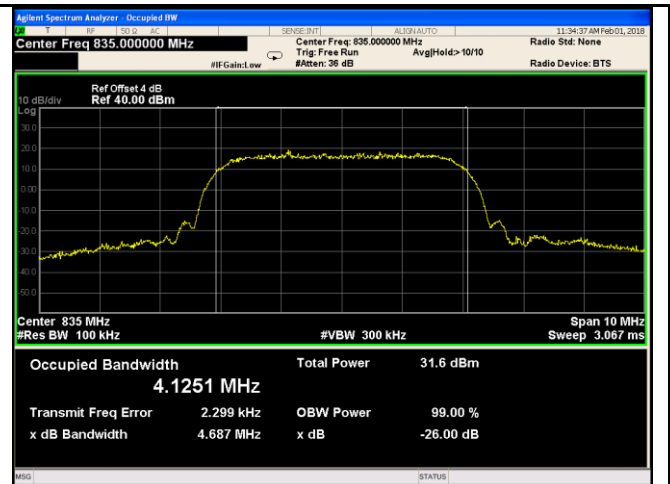


PCS 1900 BW - High CH 1910MHz

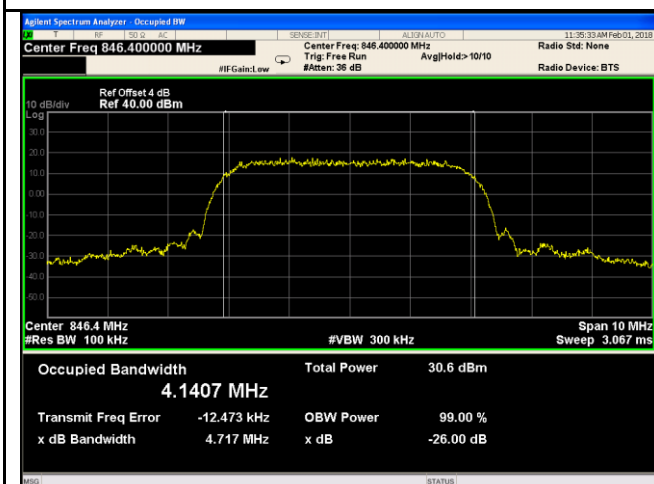
RMC:



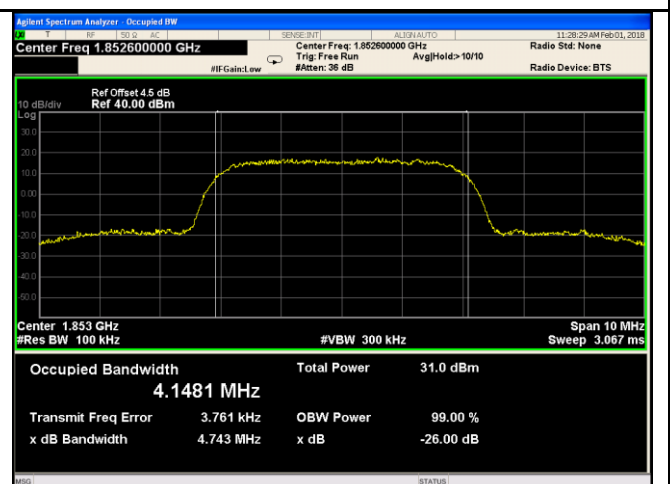
Band V BW - Low CH 826.6 MHz



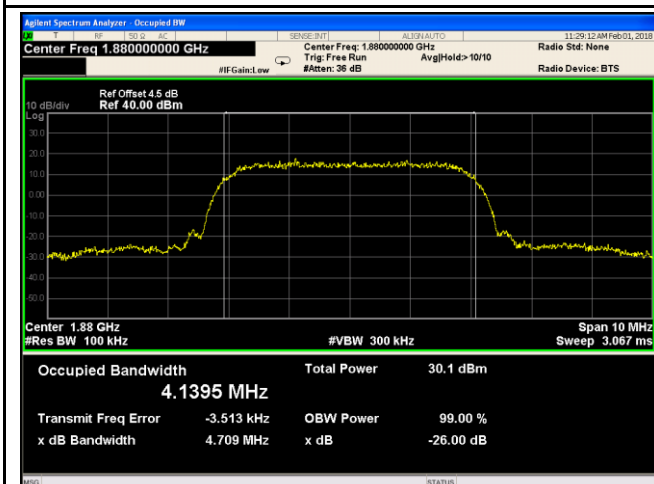
Band V BW - Mid CH 835.0 MHz



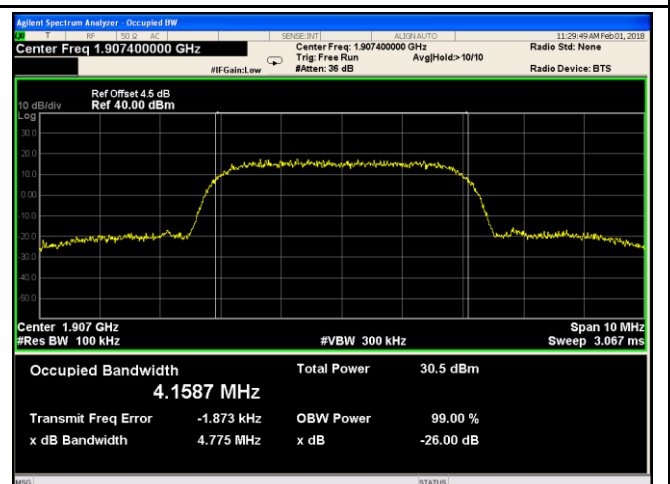
Band V BW - High CH 846.6 MHz



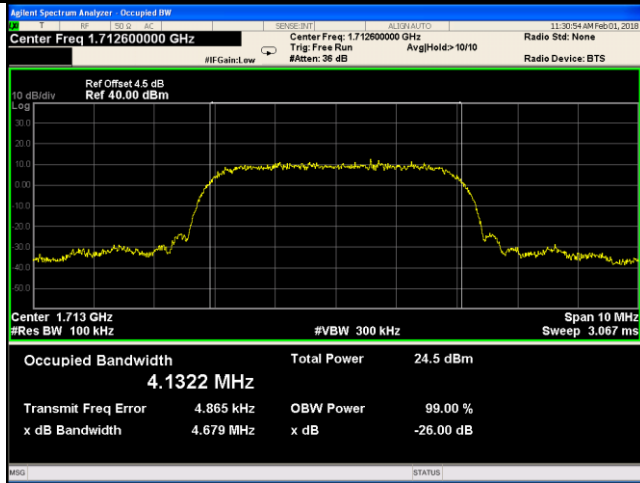
Band II BW - Low CH 1853MHz



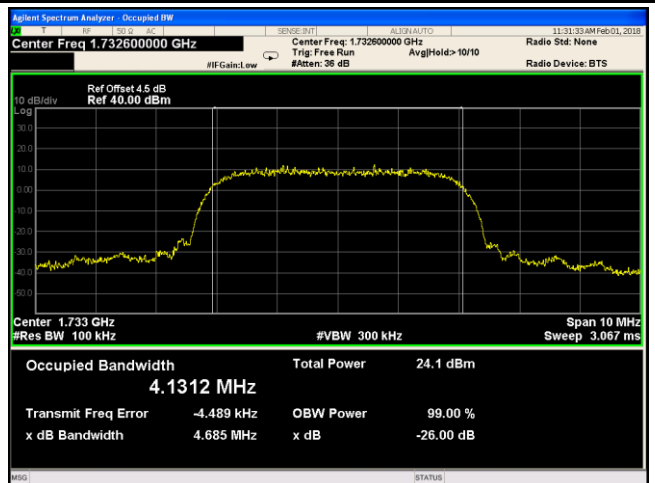
Band II BW - Mid CH 1880MHz



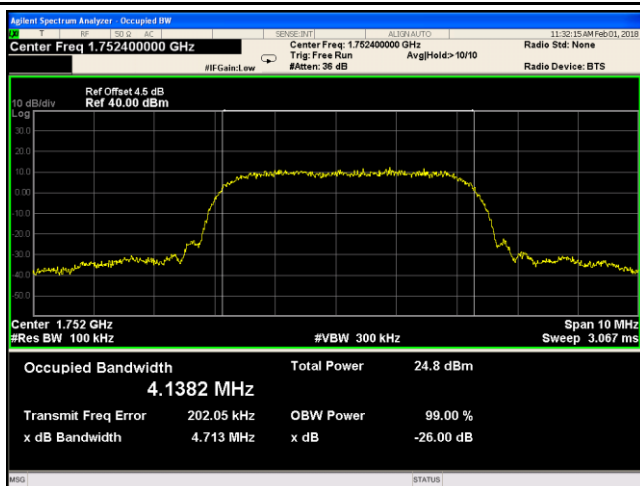
Band II BW - High CH 1907MHz



Band IV BW - Low CH 1713MHz

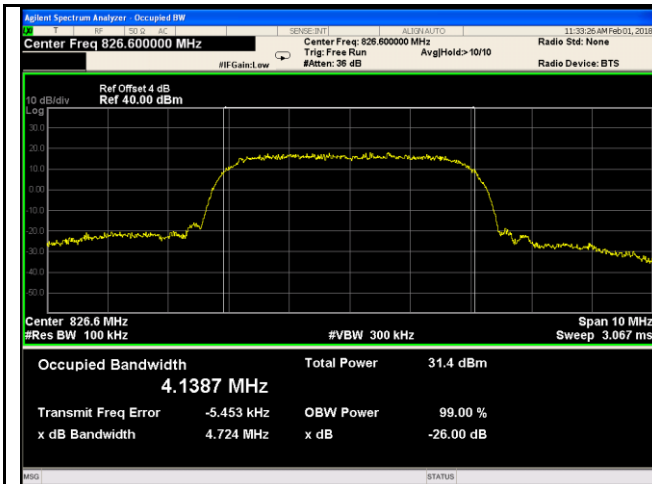


Band IVBW - Mid CH 1733MHz

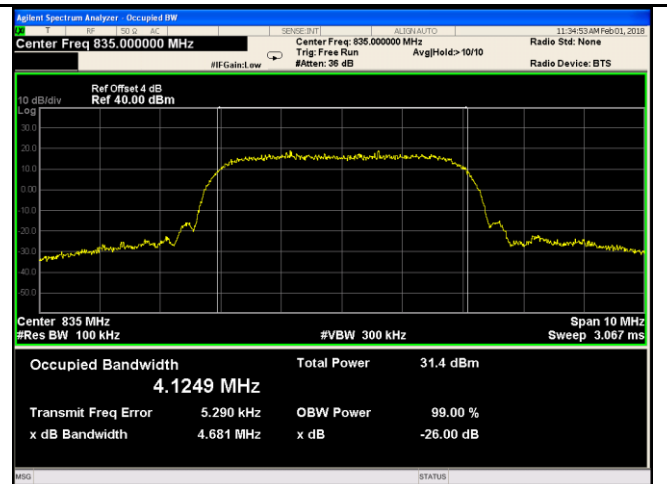


Band IV BW - High CH 1752MHz

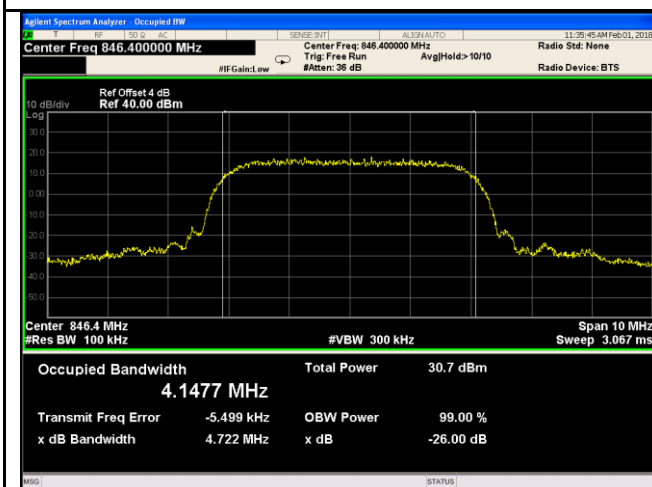
HSDPA:



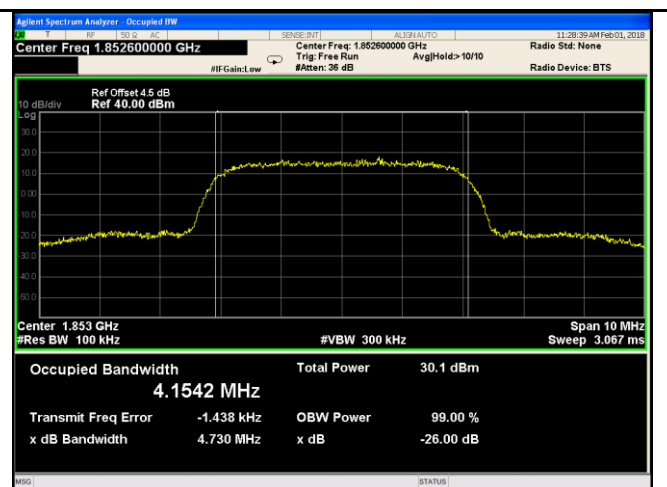
Band V BW - Low CH 826.6 MHz



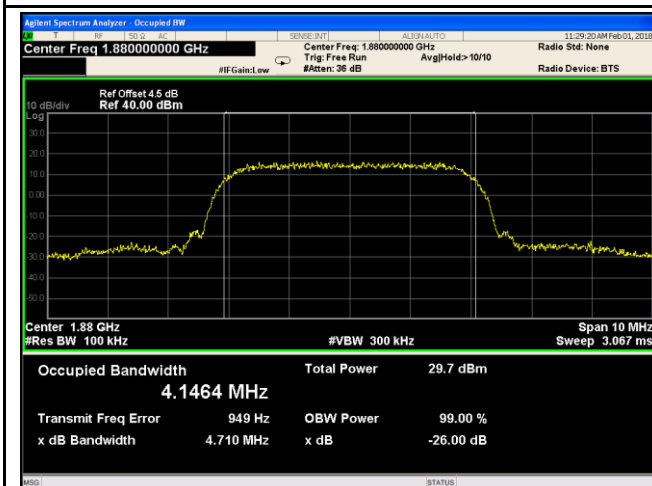
Band V BW - Mid CH 835.0 MHz



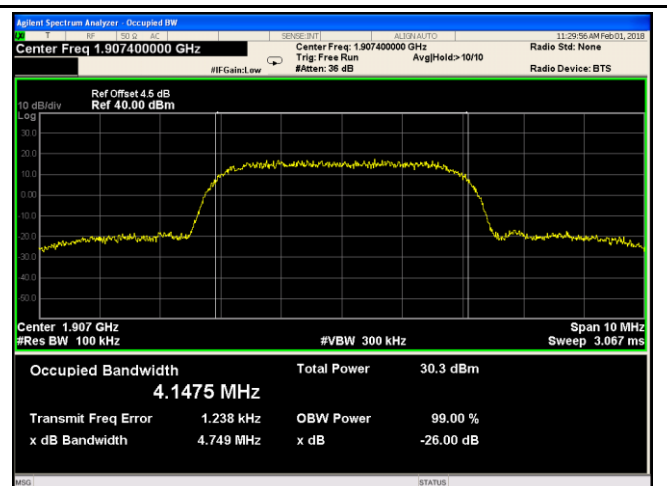
Band V BW - High CH 846.4 MHz



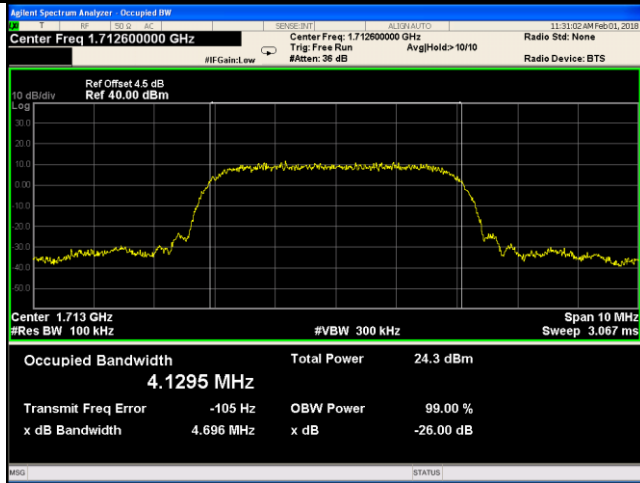
Band II BW - Low CH 1852.4 MHz



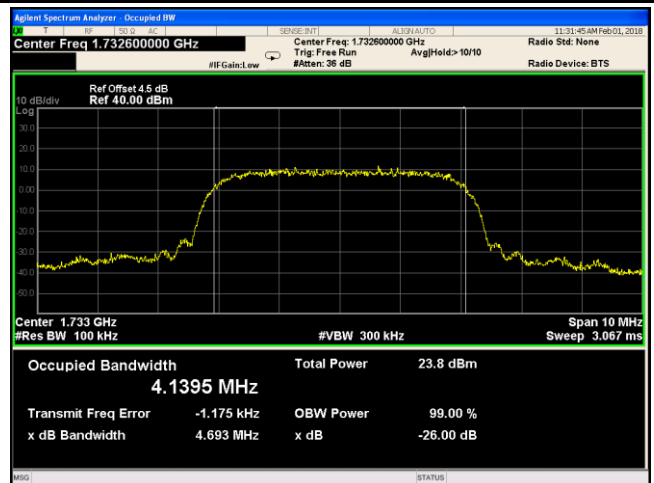
Band II BW - Mid CH 1880 MHz



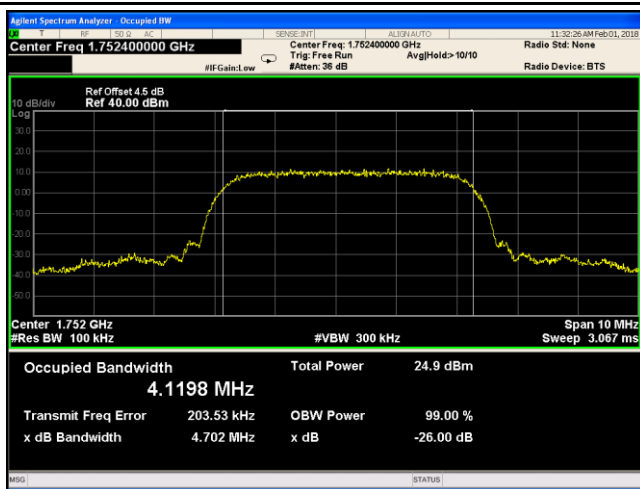
Band II BW - High CH 1907 MHz



Band IV BW - Low CH 1713MHz

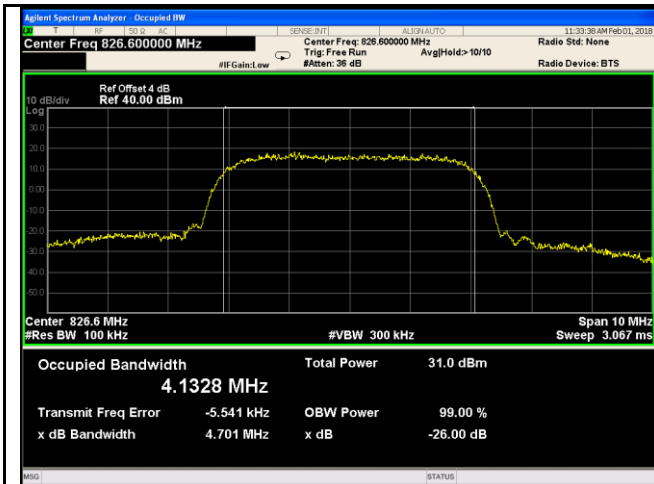


Band IVBW - Mid CH 1733MHz

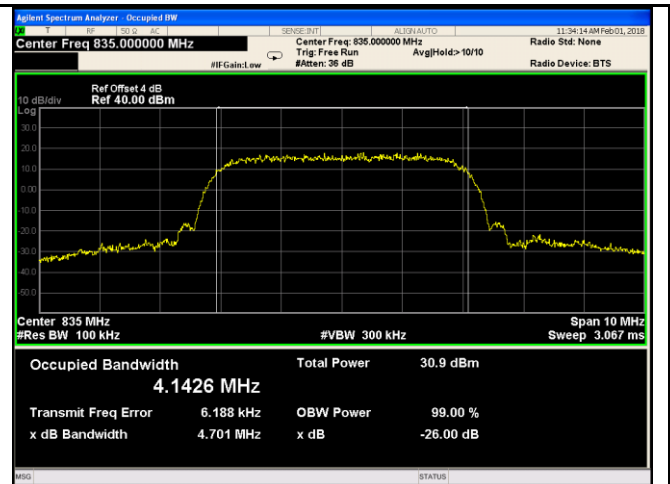


Band IV BW - High CH 1752MHz

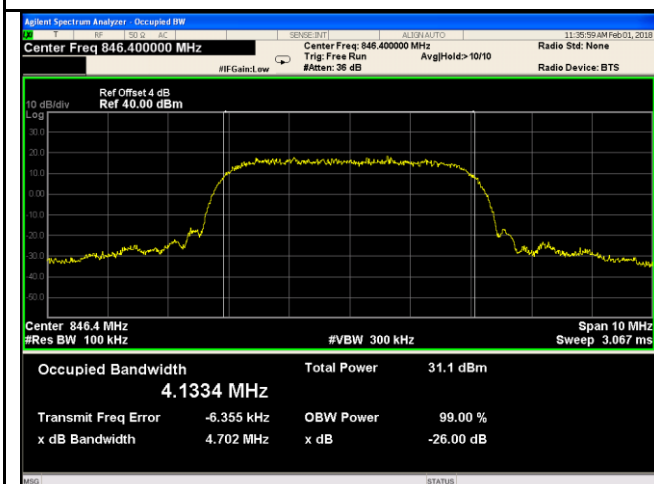
HSUPA:



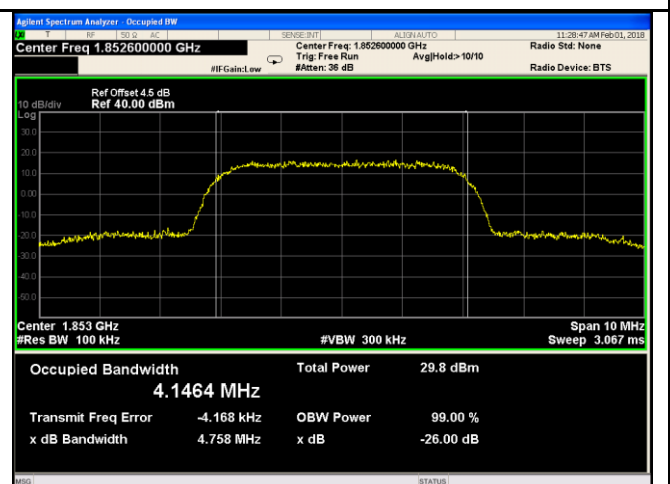
Band V BW - Low CH 826.6 MHz



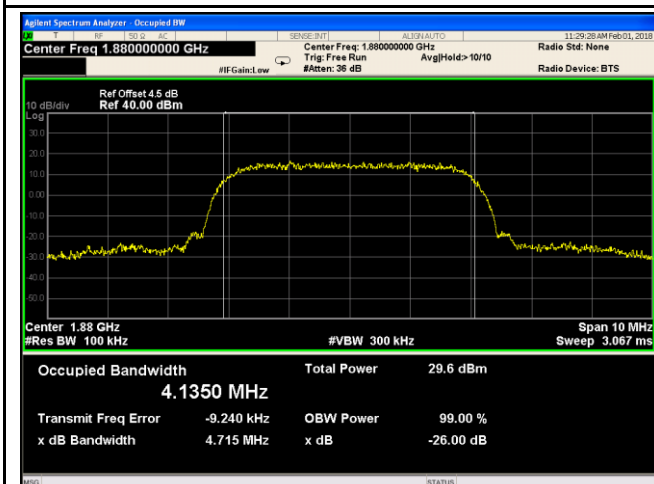
Band V BW - Mid CH 835.0 MHz



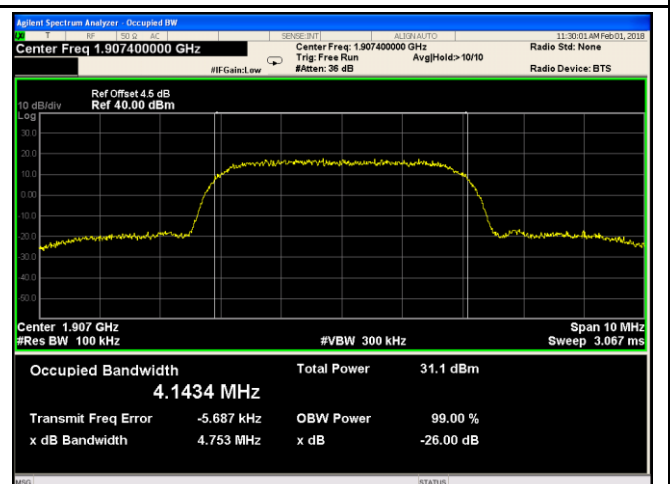
Band V BW - High CH 846.4 MHz



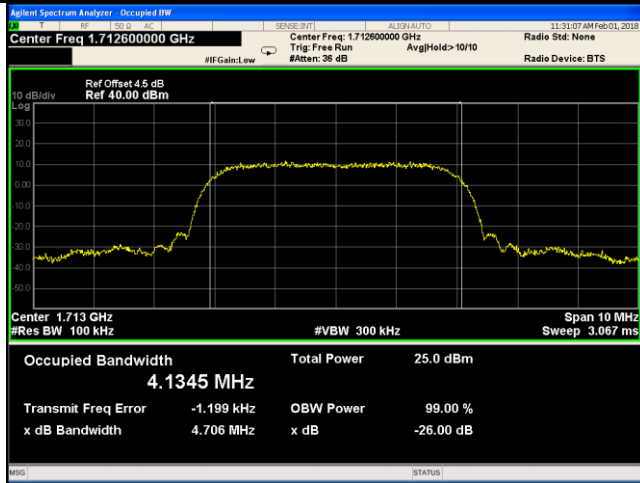
Band II BW - Low CH 1853MHz



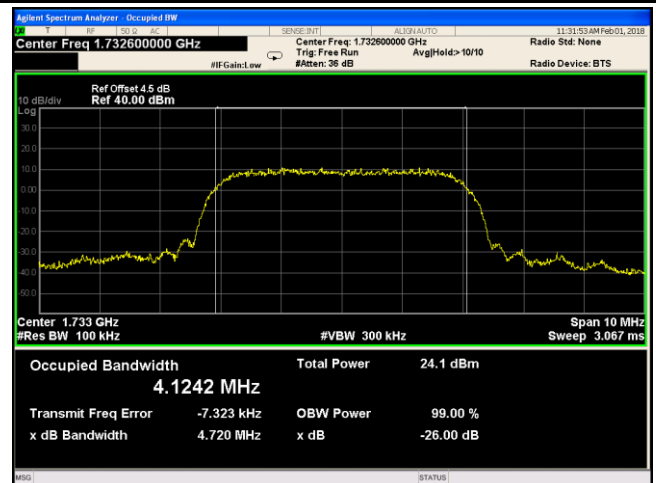
Band II BW - Mid CH 1880MHz



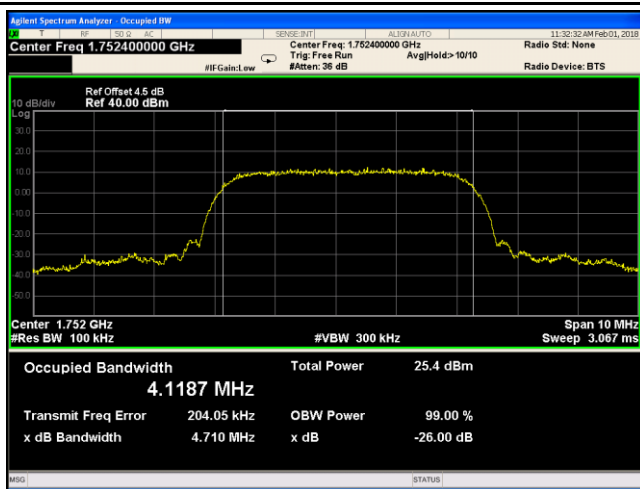
Band II BW - High CH 1907MHz



Band IV BW - Low CH 1713MHz



Band IVBW - Mid CH 1733MHz

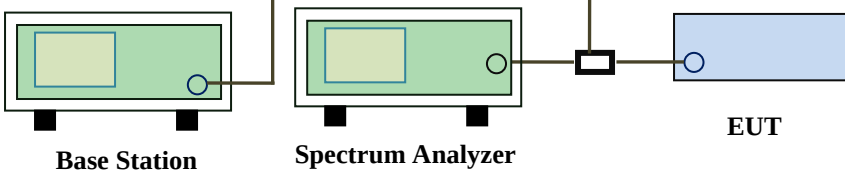


Band IV BW - High CH 1752MHz

6.5 Spurious Emissions at Antenna Terminals

Temperature	25 °C
Relative Humidity	53%
Atmospheric Pressure	1005mbar
Test date :	February 01, 2018
Tested By :	Aaron Liang

Requirement(s):

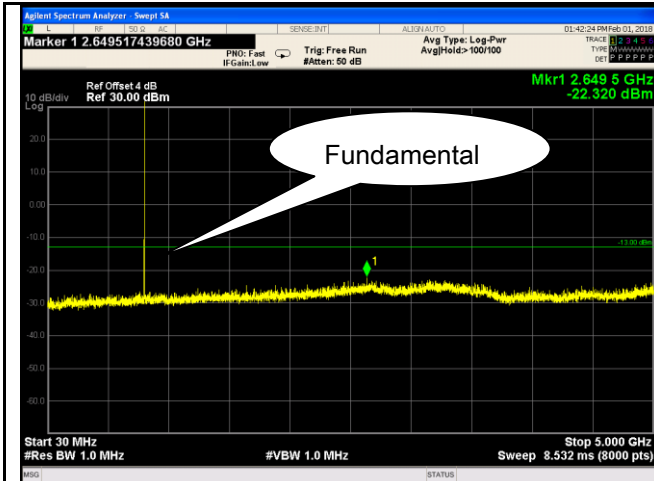
Spec	Item	Requirement	Applicable
§2.1051, §22.917(a)& §24.238(a) § 27.53(h)	a)	The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB	☒
Test Setup			
Test Procedure	- The EUT was connected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

Test Data ☒ Yes ☐ N/A
 Test Plot ☒ Yes (See below) ☐ N/A

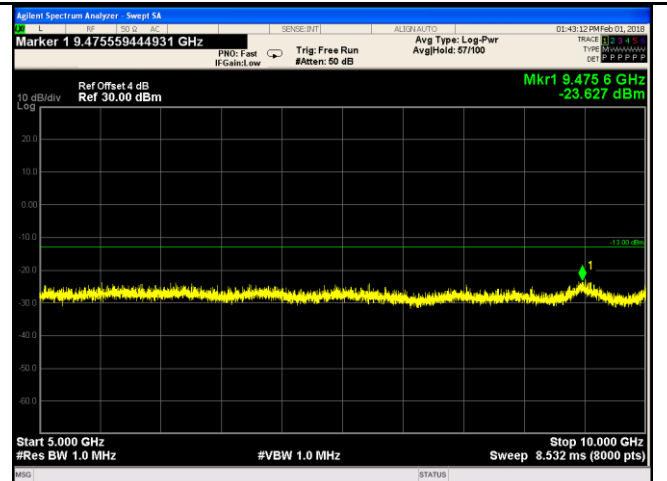
Test Plots

GPRS:

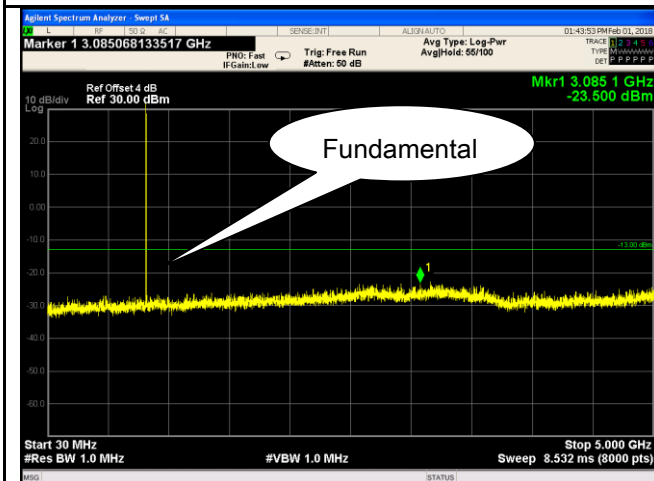
Cellular Band (Part 22H) result



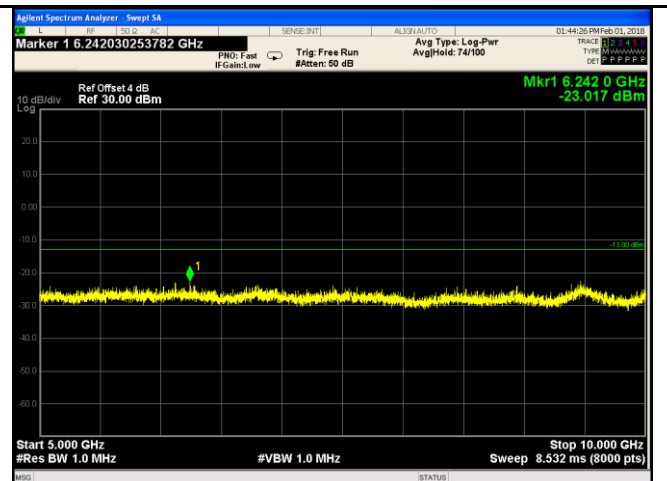
GSM 850 - Low Channel-1



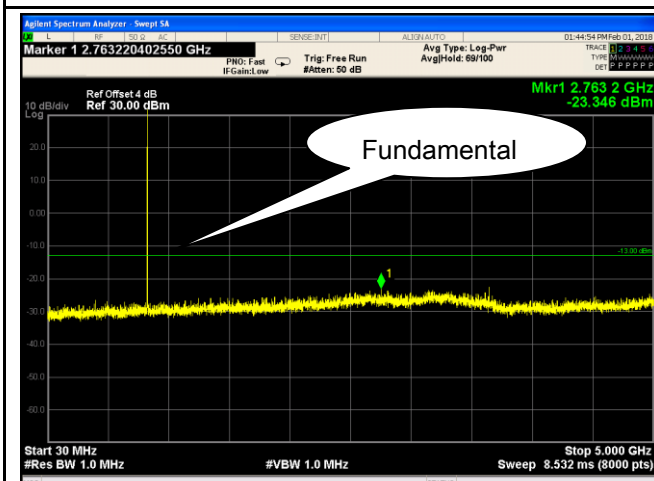
GSM 850 - Low Channel-2



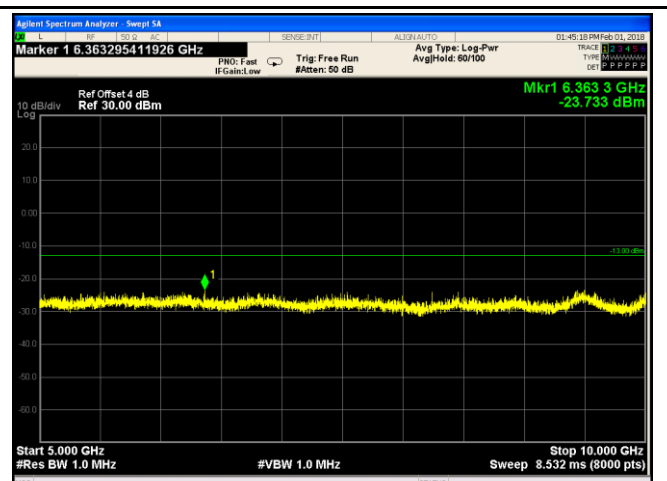
GSM 850 Middle Channel-1



GSM 850 Middle Channel-2

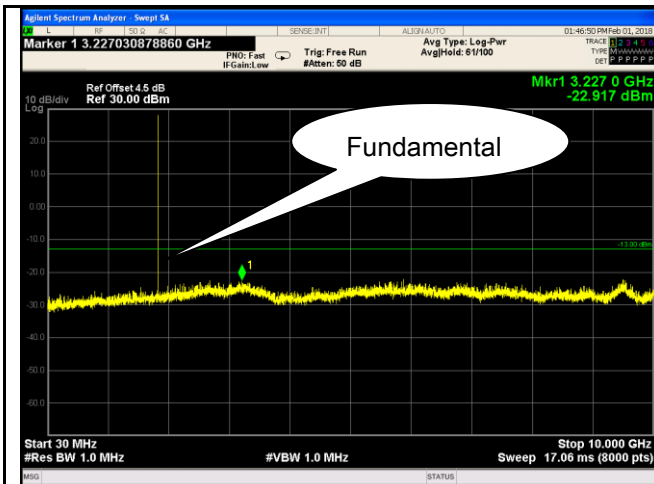


GSM 850 - High Channel-1

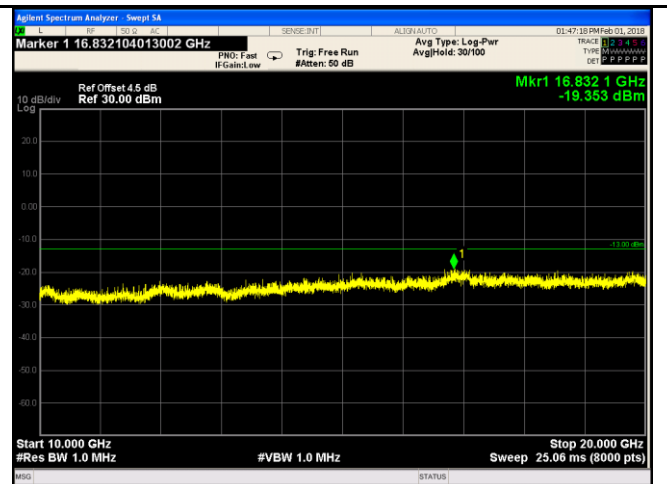


GSM 850 - High Channel-2

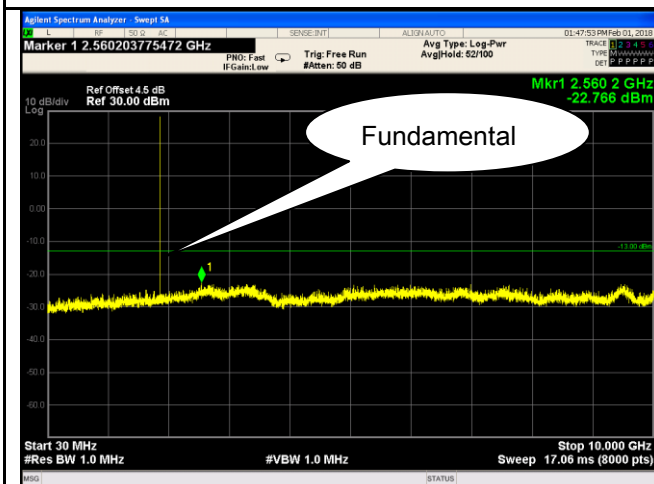
PCS Band (Part24E) result



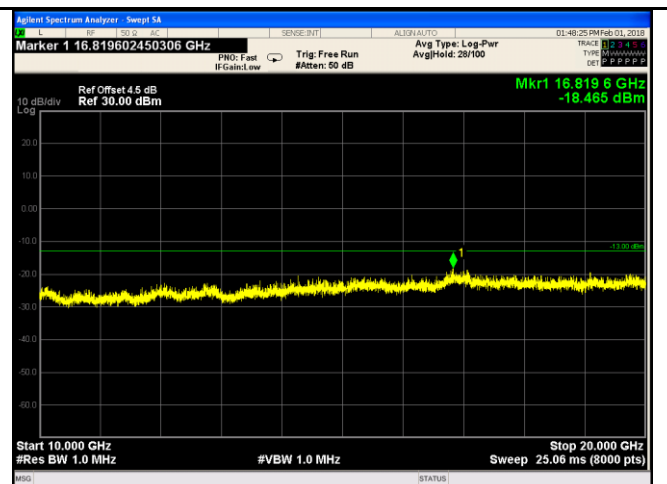
PCS1900 - Low Channel-1



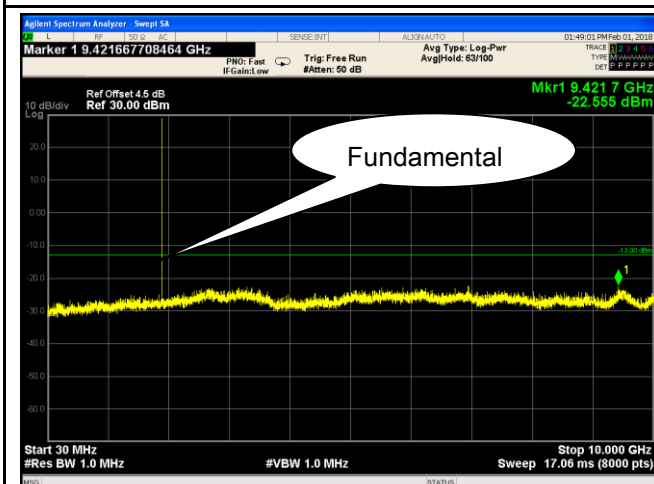
PCS 1900 - Low Channel-2



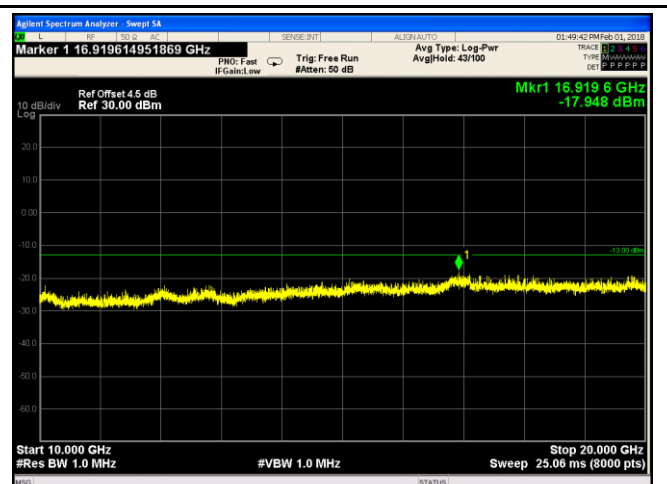
PCS1900 - Middle Channel-1



PCS 1900 - Middle Channel-2



PCS1900 - High Channel-1



PCS 1900 - High Channel-2