TEST REPORT

APPLICANT	:	Mitsui Bussan Electronics Ltd.
PRODUCT NAME	:	Mobile Digital Video Recorder
MODEL NAME	:	DV429CGW4
BRAND NAME	:	N/A
FCC ID	:	2AS4L-DV429CGW4
STANDARD(S)	:	47 CFR Part 22 Subpart H 47 CFR Part 24 Subpart E 47 CFR Part 27 Subpart L
RECEIPT DATE	:	2019-04-16
TEST DATE	:	2019-04-18 to 2019-05-06
ISSUE DATE	:	2019-05-07

Edited by: Zhao Zetian
ZhaoZetian (Rapporteur)

Approved by: Peng Huarui
Peng Huarui (Supervisor)

DIRECTORY

Change History		
Version	**Date**	**Reason for change**
1	2019-05-07	Initail Version

1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	Mitsui Bussan Electronics Ltd.
Applicant Address:	Shiba Park Building, A-10F, 4-1, Shibakoen 2-chome, Minato-ku, Tokyo 105-0011, Japan
Manufacturer:	STONKAM CO., LTD
ManufacturerAddress:	Floor 5, Building #3, Huangzhou Industrial Park, Chebei Road, Tianhe District, 510660 Guangzhou, China

1.2. Equipment Under Test (EUT) Description

Product Name:	Mobile Digital Video Recorder
Serial No:	(N/A, marked #1 by test site)
Hardware Version:	V1.1
Software Version:	V1.0.0
Modulation Type:	GSM/GPRS Mode with GMSK Modulation EDGE Mode with 8PSK Modulation WCDMA Mode with QPSK Modulation HSDPA Mode with QPSK Modulation HSUPA Mode with QPSK Modulation HSPA+ Mode with QPSK Modulation
Operating Frequency Range:	**GSM 850MHz:** Tx: 824.20 - 848.80MHz Rx: 869.20 - 893.80MHz **GSM 1900MHz:** Tx: 1850.20 - 1909.80MHz Rx: 1930.20 - 1989.80MHz **WCDMA Band V** Tx: 826.4 - 846.6MHz Rx: 871.4 - 891.6MHz **WCDMA Band II** Tx: 1852.4 - 1907.6MHz Rx: 1932.4 - 1987.6MHz

Antenna Type:	PIFA Antenna	
Antenna Gain:	GSM 850:	-3.67 dBi
	GSM1900:	-2.4 dBi
	WCDMA Band V:	-3.67 dBi
	WCDMA Band II:	-2.4 dBi

Note 1: The transmitter (Tx) frequency arrangement of the Cellular 850MHz band used by the EUT can be represented with the formula F(n)=824.2+0.2*(n-128), 128<=n<=251; the lowest, middle, highest channel numbers (ARFCHs) used and tested in this report are separately 128 (824.2MHz), 190(836.6MHz) and 251 (848.8MHz).

Note 2: The transmitter (Tx) frequency arrangement of the PCS 1900MHz band used by the EUT can be represented with the formula F(n)=1850.2+0.2*(n-512), 512<=n<=810; the lowest, middle and highest channel numbers (ARFCHs) used and tested in this report are separately 512 (1850.2MHz), 661 (1880.0MHz) and 810 (1909.8MHz).

Note 3: The transmitter (Tx) frequency arrangement of the WCDMA Band V used by the EUT can be represented with the formula F(n)=826.4+0.2*(n-4132), 4132<=n<=4233; the lowest, middle and highest channel numbers (ARFCHs) used and tested in this report are separately 4132 (826.4MHz), 4182(836.4MHz) and 4233 (846.6MHz).

Note 4: The transmitter (Tx) frequency arrangement of the WCDMA Band II used by the EUT can be represented with the formula F(n)=1852.4+0.2*(n-9262), 9262<=n<=9538; the lowest, middle and highest channel numbers (ARFCHs) used and tested in this report are separately 9262 (1852.4MHz), 9400 (1880MHz) and 9538 (1907.6MHz).

Note 5: The transmitter (Tx) frequency arrangement of the WCDMA 1700MHz band used by the EUT can be represented with the formula F(n)=1712.4+0.2*(n-1312), 1312<=n<=1513; the lowest, middle and highest channel numbers (ARFCHs) used and tested in this report are separately 1312 (1712.4MHz), 1413 (1732.6MHz) and 1513 (1752.6MHz).

Note 6: All modes and data rates were considered and evaluated respectively by performing full test. Test modes are chosen to be reported as the worst case below:
GPRS mode and EDGE mode for GSM 850;
GPRS mode and EDGE mode for GSM 1900;
WCDMA mode for WCDMA band V;
WCDMA mode for WCDMA band II;
WCDMA mode for WCDMA band IV;

Note 7: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

1.3. Maximum ERP/EIRP and Emission Designator

System	Maximum ERP/EIRP (W)	Emission Designator
GPRS850	0.473	244KGXW
EDGE850	0.146	244KG7W
GPRS1900	0.502	243KGXW
EDGE1900	0.208	241KG7W
WCDMA Band V	0.026	4M17F9W
WCDMA Band II	0.112	4M18F9W

1.4. Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 2, Part 22, Part 24 and Part 27 for the EUT FCC ID Certification:

No	Identity	Document Title
1	47 CFR Part 2(10-1-12 Edition)	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
2	47 CFR Part 22(10-1-12 Edition)	Public Mobile Services
3	47 CFR Part 24(10-1-12 Edition)	Personal Communications Services
4	47 CFR Part 27(10-1-12 Edition)	Miscellaneous Wireless Communications Services

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Test Date	Test Engineer	Result
1	2.1046	Conducted RF Output Power	May05, 2019	Gao Mingzhou	PASS
2	24.232(d),27.50(d)	Peak -Average Ratio	Apr23&24, 2019	Gao Mingzhou	PASS
3	2.1049	99% Occupied Bandwidth	Apr22&24, 2019	Gao Mingzhou	PASS
4	2.1055,22.355, 24.235, 27.54	Frequency Stability	May05, 2019	Gao Mingzhou	PASS
5	2.1051,22.917(a),24.238(a), 27.53(h)	Conducted Out of Band Emissions	Apr22&27, 2019	Gao Mingzhou	PASS
6	2.1051,22.917(a),24.238(a), 27.53(h)	Band Edge	Apr22&24, 2019	Gao Mingzhou	PASS
7	22.913(a),24.232(a)	Transmitter Radiated Power (EIPR/ERP)	May05, 2019	Zheng Fengjian	PASS
8	2.1051,22.917(a),24.238(a), 27.53(h)	Radiated Out of Band Emissions	May06, 2019	Zheng Fengjian	PASS

Note 1: The tests were performed according to the method of measurements prescribed in KDB 971168 D01 V03R01 (Oct 27, 2017)and ANSI/TIA-603-E-2016.

Note 2: The path loss during the RF test is calibrated to correct the results by the offset setting in the test equipments. The ref offset 26.5dB contains two parts that cable loss 16.5dB and Attenuator 10dB.

1.5. Environmental Conditions

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

Temperature (°C):	15 - 35
Relative Humidity (%):	30 -60
Atmospheric Pressure (kPa):	86-106

2. 47 CFR Part 2, Part 22H , 24E&27L Requirements

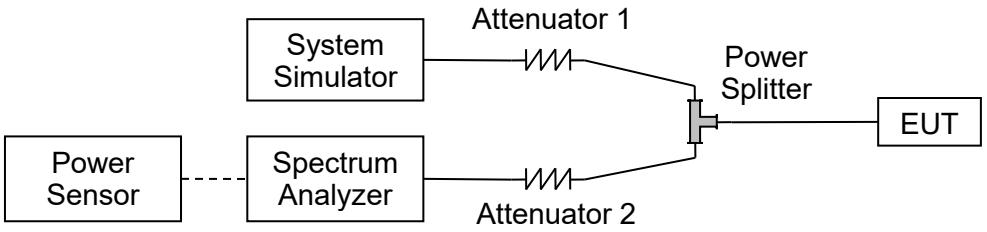
2.1. Conducted RF Output Power

2.1.1. Requirement

According to FCC section 2.1046(a), for transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in FCC section 2.1033(c)(8).

2.1.2. Test Description

Test Setup:



The EUTis coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power i.e. Power Control Level (PCL) = 5 and Power Class = 4. A call is established between the EUT and the SS.

2.1.3. Test Results

GSM850	Average Power (dBm)		
TX Channel	**128**	**190**	**251**
Frequency (MHz)	**824.2**	**836.6**	**848.8**
GPRS 1 Tx slot	32.57	32.35	32.31
GPRS 2 Tx slots	32.51	32.30	32.25
GPRS 3 Tx slots	32.42	32.23	32.17
GPRS 4 Tx slots	32.26	32.10	32.03
EDGE 1 Tx slot	27.45	26.89	26.65
EDGE 2 Tx slots	27.30	26.76	26.57
EDGE 3 Tx slots	27.11	26.52	26.26
EDGE 4 Tx slots	26.91	26.37	26.03

GSM1900	Average Power (dBm)		
TX Channel	**512**	**661**	**810**
Frequency (MHz)	**1850.2**	**1880**	**1909.8**
GPRS 1 Tx slot	30.68	30.64	30.47
GPRS 2 Tx slots	30.65	30.65	30.42
GPRS 3 Tx slots	30.52	30.54	30.31
GPRS 4 Tx slots	30.38	30.36	30.04
EDGE 1 Tx slot	26.85	26.77	26.42
EDGE 2 Tx slots	26.75	26.73	26.42
EDGE 3 Tx slots	26.62	26.57	26.25
EDGE 4 Tx slots	26.53	26.54	26.20

WCDMA Band V	Average Power (dBm)		
TX Channel	**4132**	**4182**	**4233**
Frequency (MHz)	**826.4**	**836.4**	**846.6**
RMC 12.2Kbps	24.32	24.91	24.45
HSDPA Subtest-1	23.53	23.67	23.64
HSDPA Subtest-2	23.96	24.02	23.89
HSDPA Subtest-3	23.25	23.49	23.38
HSDPA Subtest-4	23.50	23.57	23.51
HSUPA Subtest-1	22.79	22.47	22.55
HSUPA Subtest-2	21.05	21.04	21.16
HSUPA Subtest-3	21.02	21.55	21.66
HSUPA Subtest-4	21.64	22.19	22.27
HSUPA Subtest-5	22.31	22.09	22.14

WCDMA Band II	Average Power (dBm)		
TX Channel	**9262**	**9400**	**9538**
Frequency (MHz)	**1852.4**	**1880.0**	**1907.6**
RMC 12.2Kbps	22.23	22.38	22.39
HSDPA Subtest-1	21.87	22.21	22.04
HSDPA Subtest-2	21.85	22.14	22.04
HSDPA Subtest-3	21.34	21.63	21.53
HSDPA Subtest-4	21.31	21.66	21.54
HSUPA Subtest-1	21.48	21.84	21.72
HSUPA Subtest-2	19.46	19.81	19.75
HSUPA Subtest-3	20.51	20.85	20.72
HSUPA Subtest-4	19.49	19.83	19.71
HSUPA Subtest-5	21.48	21.82	21.71

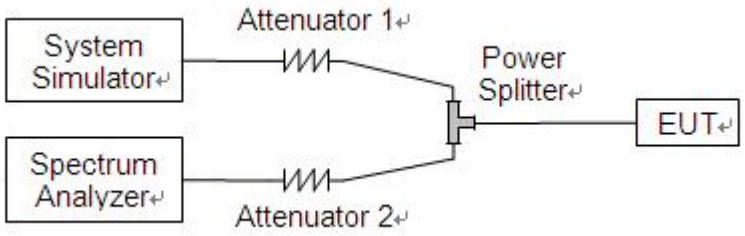
2.2. Peak to Average Ratio

2.2.1. Requirement

According to FCC 24.232(d) the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

2.2.2. Test Description

Test Setup:



The EUTis coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power i.e. Power Control Level (PCL) = 5 and Power Class = 4. A call is established between the EUT and the SS.

2.2.3. Test procedure

1 .For GSM/EDGE operating mode:

a. Set RBW=1MHz, VBW=3MHz, peak detector in spectrum analyzer.
b. Set EUT in maximum output power, and triggered the bust signal.
c. Measured respectively the peak level and mean level, and the deviation was recorded as Peak to Average ratio.

2.For UMTS operating mode:

a. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
b. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1%.

2.2.4. Test Result

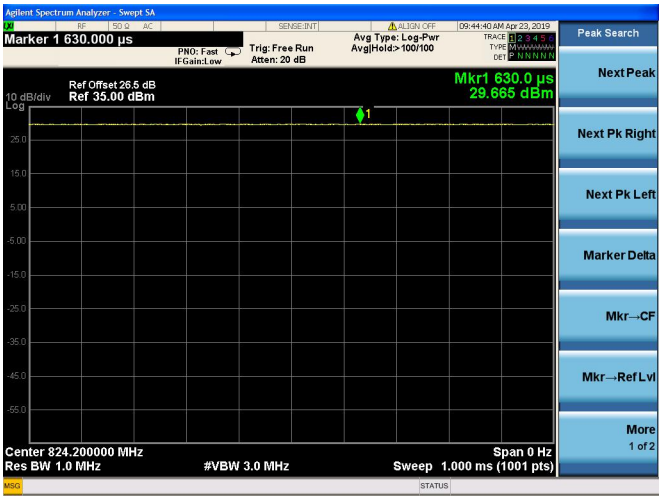
The lowest, middle and highest channels are selected to perform testing to verify the conducted RF output peak power of the Module.

A. Test Verdict:

Band	Channel	Frequency (MHz)	Peak to Average ratio dB	Limit dB	Verdict
GPRS850 MHz	128	824.2	0.07	13	PASS
	190	836.6	0.125		PASS
	251	848.8	0.043		PASS
GPRS 1900MHz	512	1850.2	0.033		PASS
	661	1880.0	0.069		PASS
	810	1909.8	0.013		PASS
EDGE850 MHz	128	824.2	0.121		PASS
	190	836.6	0.021		PASS
	251	848.8	0.022		PASS
EDGE 1900MHz	512	1850.2	0.016		PASS
	661	1880.0	0.184		PASS
	810	1909.8	0.106		PASS

Band	Channel	Frequency (MHz)	Peak to Average ratio dB	Limit dB	Verdict
WCDMA Band V	4132	826.4	3.06	13	PASS
	4182	836.4	3.03		PASS
	4233	846.6	3.08		PASS
WCDMA Band II	9262	1852.4	3.02		PASS
	9400	1880.0	3.25		PASS
	9538	1907.6	3.12		PASS

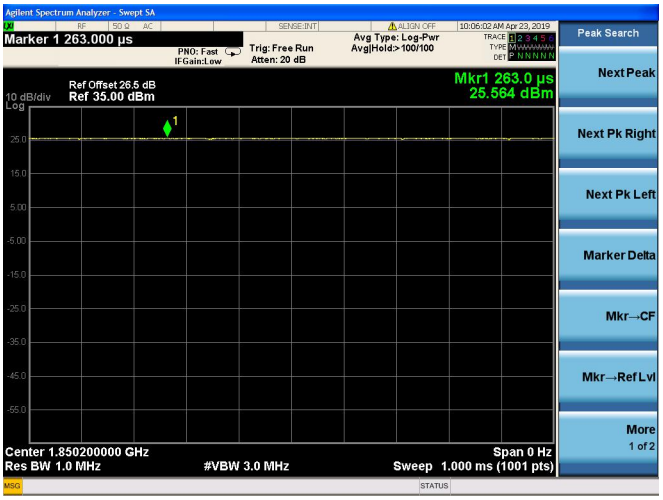
GPRS 850MHz CH128 824.2MHz

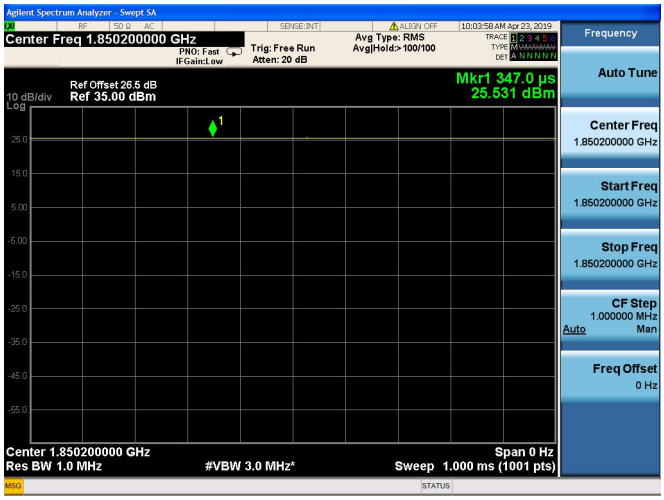


GPRS 850MHz CH190 836.6MHz

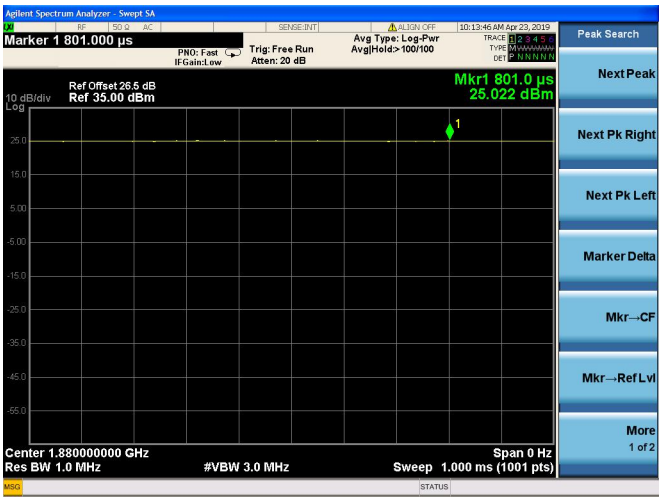
GPRS 850MHz CH251 848.8MHz

GPRS 1900MHz CH512 1850.2MHz



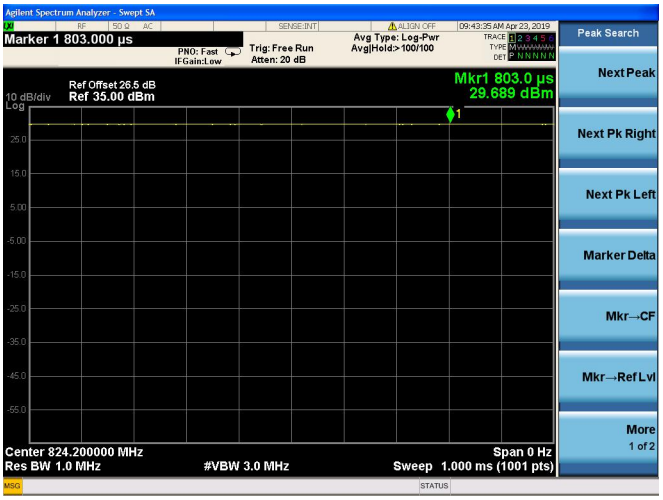


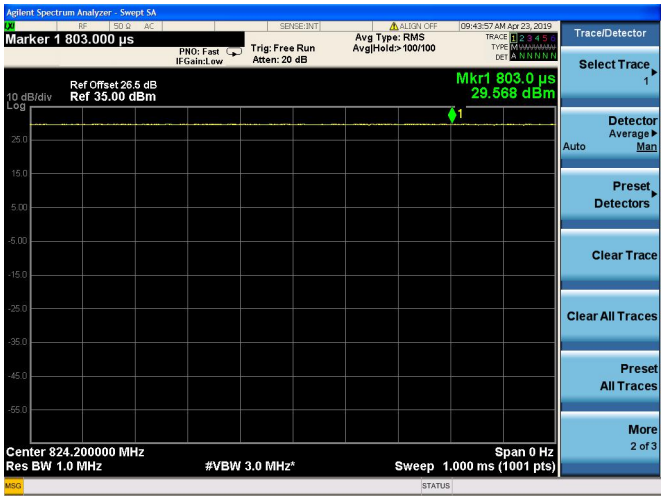
GPRS 1900MHz CH661 1880.0MHz



GPRS 1900MHz CH810 1909.8MHz

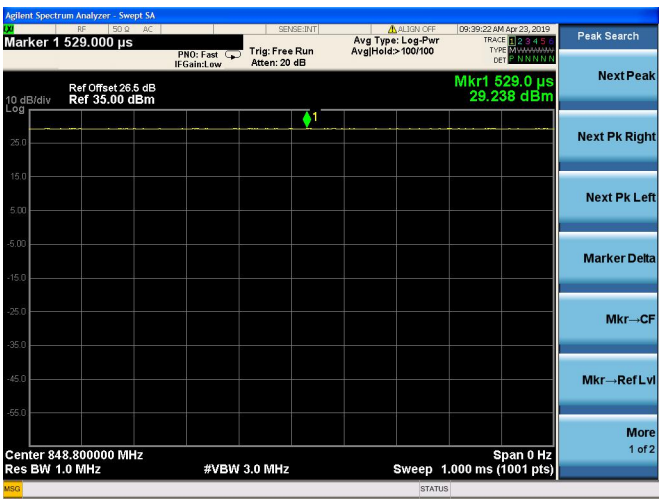
EDGE 850MHz CH128 824.2MHz

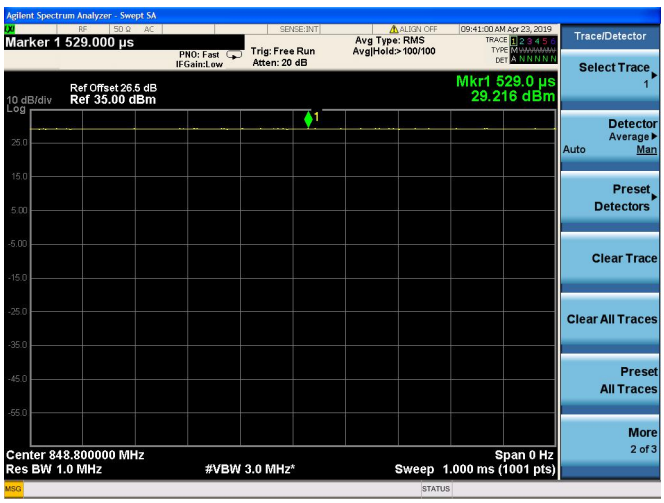




EDGE 850MHz CH190 836.6MHz

EDGE 850MHz CH251 848.8MHz



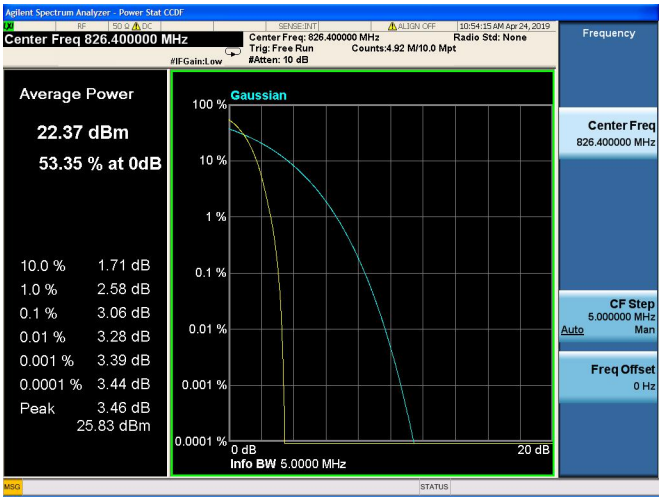


EDGE 1900MHz CH512 1850.2MHz

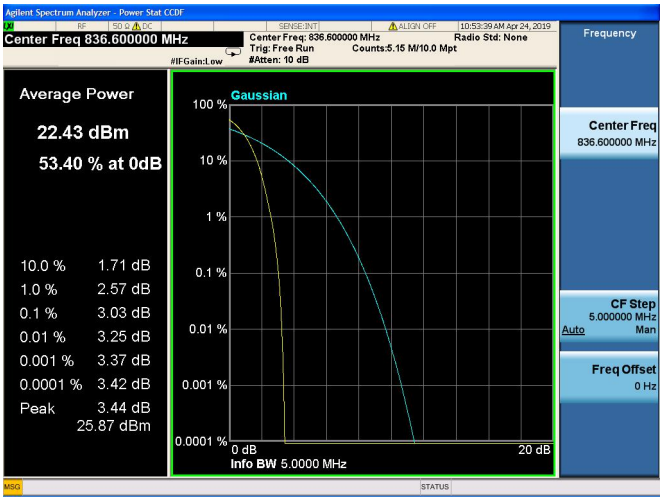
EDGE 1900MHz CH661 1880.0MHz

EDGE 1900MHz CH810 1909.8MHz

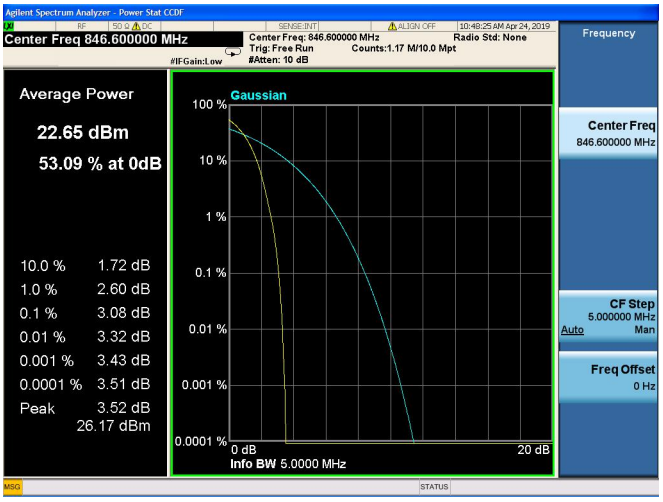
WCDMA Band V CH4132 826.4MHz



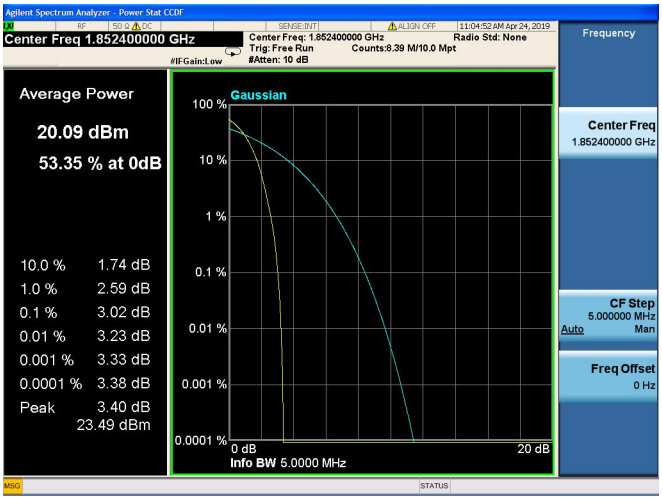
WCDMA Band V CH4182 836.4MHz



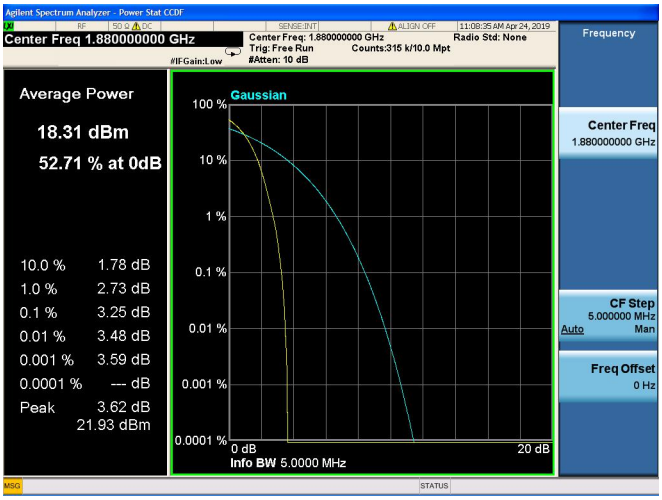
WCDMA Band V CH4233 846.6MHz



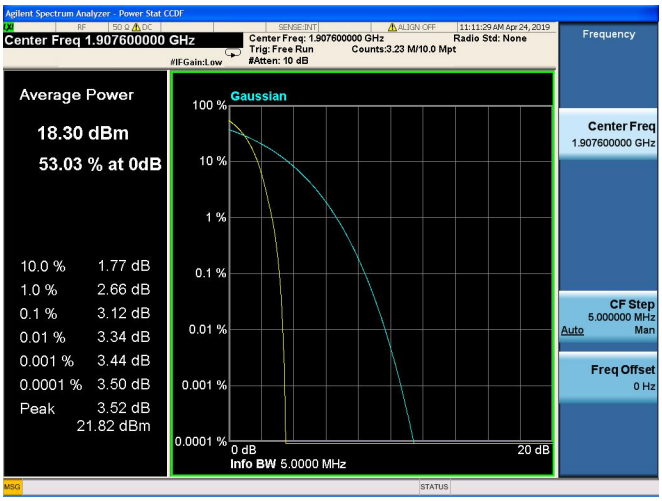
WCDMA Band II CH9262 1852.4MHz



WCDMA Band II CH9400 1880.0MHz



WCDMA Band II CH9538 1907.6MHz



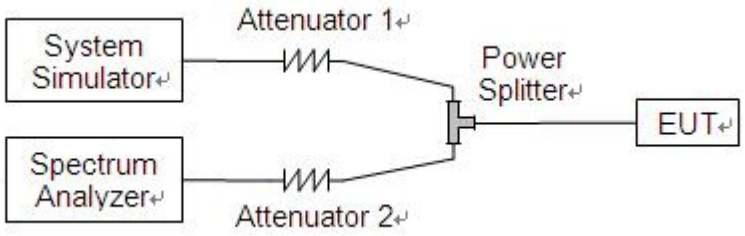
2.3. 99% Occupied Bandwidth

2.3.1. Requirement

According to FCC section 2.1049, the occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission.Occupied bandwidth is also known as the 99% emission bandwidth.

2.3.2. Test Description

Test Setup:



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2.3.3. Test Result

The lowest, middle and highest channels are selected to perform testing to record the 99% occupied bandwidth.

GSM Test Verdict:

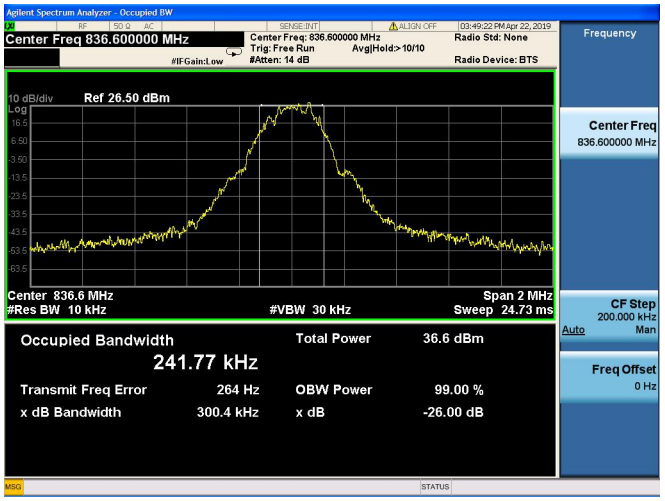
Band	Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26dB Bandwidth (kHz)
GPRS850 MHz	128	824.2	243.80	300.4
	190	836.6	241.77	300.4
	251	848.8	243.08	310.3
GPRS 1900MHz	512	1850.2	239.46	312.1
	661	1880.0	243.38	316.3
	810	1909.8	240.41	304.6
EDGE 850MHz	128	824.2	240.63	304.4
	190	836.6	240.67	304.5
	251	848.8	243.68	313.3
EDGE 1900MHz	512	1850.2	240.56	300.3
	661	1880.0	237.32	309.3
	810	1909.8	240.63	304.4

WCDMA Test Verdict:

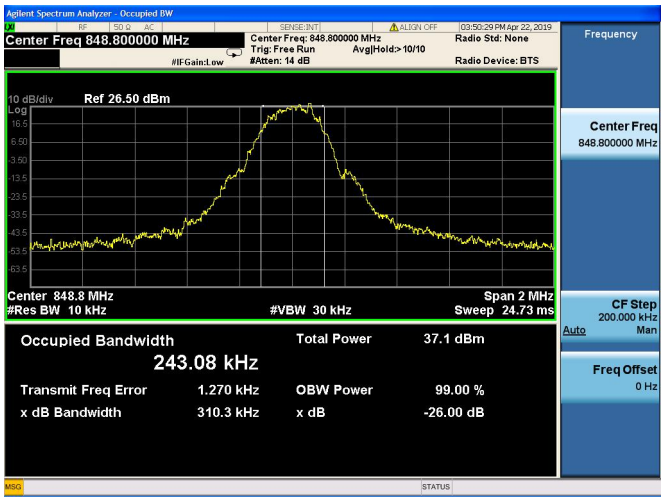
Band	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)
WCDMA Band V	4132	826.4	4.166	4.674
	4182	836.4	4.172	4.665
	4233	846.6	4.158	4.670
WCDMA Band II	9262	1852.4	4.163	4.666
	9400	1880.0	4.179	4.638
	9538	1907.6	4.171	4.665

GPRS 850MHz CH128 824.2MHz

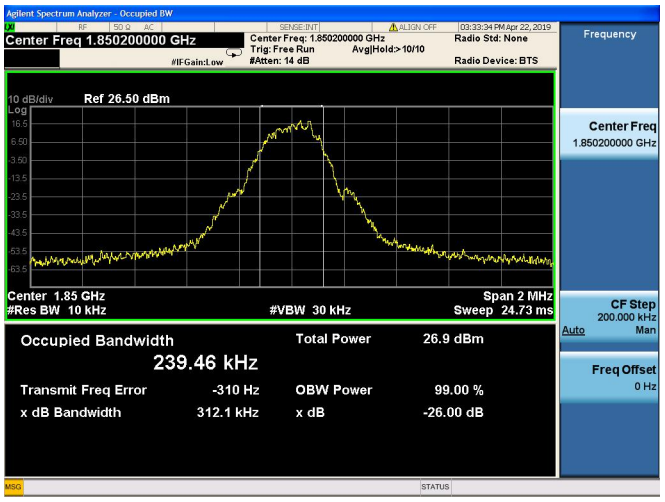
GPRS 850MHz CH190 836.6MHz



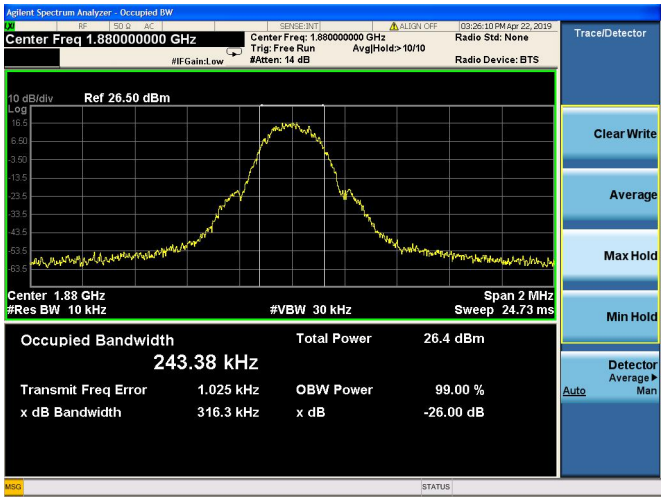
GPRS 850MHz CH251 848.8MHz



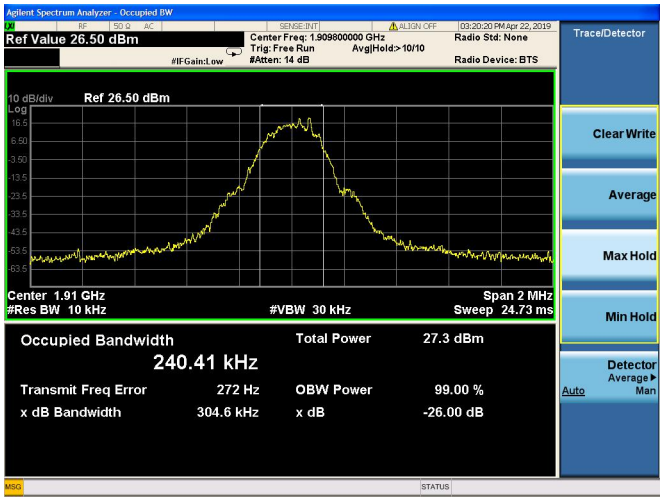
GPRS 1900MHz CH512 1850.2MHz



GPRS 1900MHz CH661 1880.0MHz



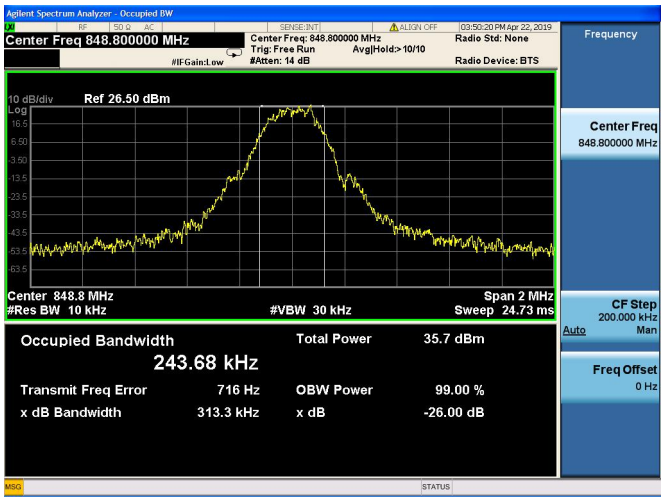
GPRS 1900MHz CH810 1909.8MHz



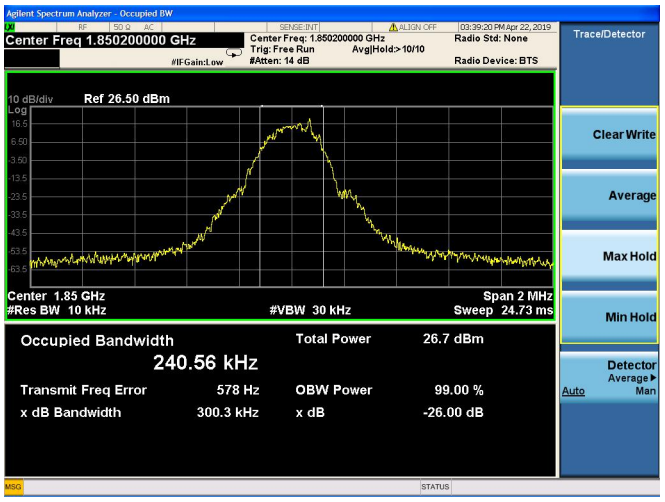
EDGE 850MHz CH128 824.2MHz

EDGE 850MHz CH190 836.6MHz

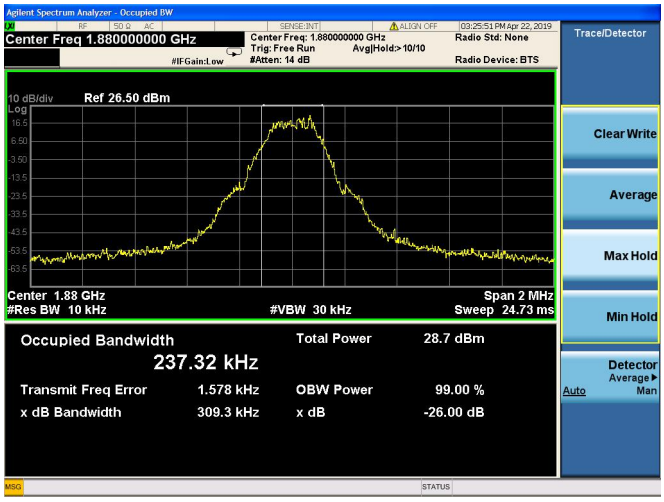
EDGE 850MHz CH251 848.8MHz



EDGE 1900MHz CH512 1850.2MHz



EDGE 1900MHzCH661 1880.0MHz



EDGE 1900MHzCH810 1909.8MHz