

## FCC Test Report

### (PART 22)

**Report No.:** RF170808C08-7

**FCC ID:** VQK-F01K

**Test Model:** F-01K

**Received Date:** Aug. 08, 2017

**Test Date:** Sep. 20, 2017 ~ Sep. 28, 2017

**Issued Date:** Oct. 06, 2017

**Applicant:** FUJITSU CONNECTED TECHNOLOGIES Ltd.

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**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

**Lab Address:** No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan  
(R.O.C.)

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### Release Control Record

Issue No.	Description	Date Issued
RF170808C08-7	Original Release	Oct. 06, 2017

## 1 Certificate of Conformity

**Product:** Smart Phone

**Brand:** FUJITSU

**Test Model:** F-01K

**Sample Status:** Identical Prototype

**Applicant:** FUJITSU CONNECTED TECHNOLOGIES Ltd.

**Test Date:** Sep. 20, 2017 ~ Sep. 28, 2017

**Standards:** FCC Part 22, Subpart H

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

**Prepared by :** Rona Chen, **Date:** Oct. 06, 2017

Rona Chen / Specialist

**Approved by :** David Huang, **Date:** Oct. 06, 2017

David Huang / Project Engineer

## 2 Summary of Test Results

Applied Standard: FCC Part 22 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 22.913 (a)	Effective Radiated Power	Pass	Meet the requirement of limit.
---	Peak to Average Ratio	Pass	Meet the requirement of limit.
2.1055 22.355	Frequency Stability	Pass	Meet the requirement of limit.
2.1049	Occupied Bandwidth	Pass	Meet the requirement of limit.
22.917	Band Edge Measurements	Pass	Meet the requirement of limit.
2.1051 22.917	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 22.917	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -31.07 dB at 2509.20 MHz.

### 2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expended Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150 kHz ~ 30 MHz	2.44 dB
Radiated Emissions up to 1 GHz	30 MHz ~ 200 MHz	2.0153 dB
	200 MHz ~ 1000 MHz	2.0224 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	1.0121 dB
	18 GHz ~ 40 GHz	1.1508 dB

## 2.2 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver Agilent Technologies	N9038A	MY52260177	Jul. 05, 2017	Jul. 04, 2018
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Dec. 13, 2016	Dec. 12, 2017
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Dec. 16, 2016	Dec. 15, 2017
HORN Antenna ETS-Lindgren	3117	00143293	Dec. 29, 2016	Dec. 28, 2017
Double Ridge Guide Horn Antenna EMCO	3115	5619	Dec. 27, 2016	Dec. 26, 2017
BILOG Antenna SCHWARZBECK	VULB 9168	9168-153	Dec. 13, 2016	Dec. 12, 2017
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Dec. 14, 2016	Dec. 13, 2017
Fixed Attenuator Mini-Circuits	BW-N10W5+	NA	Jul. 07, 2017	Jul. 06, 2018
Loop Antenna	HLA 6121	45745	May 19, 2017	May 18, 2018
MXG Vector signal generator Agilent	N5182B	MY53050430	Oct. 19, 2016	Oct. 18, 2017
Preamplifier Agilent	310N	187226	Jun. 23, 2017	Jun. 22, 2018
Preamplifier Agilent	83017A	MY39501357	Jun. 23, 2017	Jun. 22, 2018
Power Meter Anritsu	ML2495A	1012010	Aug. 15, 2017	Aug. 14, 2018
Power Sensor Anritsu	MA2411B	1315050	Aug. 15, 2017	Aug. 14, 2018
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(R FC-SMS-100-SM S-120+RFC-SMS -100-SMS-400)	Jun. 23, 2017	Jun. 22, 2018
RF signal cable ETS-LINDGREN	8D-FB	Cable-CH1-02(R FC-SMS-100-SM S-24)	Jun. 23, 2017	Jun. 22, 2018
Software BV ADT	E3 8.130425b	NA	NA	NA
Antenna Tower MF	NA	NA	NA	NA
Turn Table MF	NA	NA	NA	NA
Antenna Tower & Turn Table Controller MF	MF-7802	NA	NA	NA
Communications Tester-Wireless Agilent	8960 Series 10	MY53201073	Jun. 28, 2017	Jun. 27, 2019
Radio Communication Analyzer Anritsu	MT8820C	6201168830	Oct. 31, 2016	Oct. 30, 2017

- Note:
1. The calibration interval of the above test instruments is 12 / 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
  2. The test was performed in HsinTien Chamber 1.
  3. The horn antenna and preamplifier (model: 83017A) are used only for the measurement of emission frequency above 1 GHz if tested.
  4. The FCC Designation Number is TW0011. The number will be varied with the Lab location and scope as attached.
  5. The IC Site Registration No. is IC7450I-1.

### 3 General Information

#### 3.1 General Description of EUT

<b>Product</b>	Smart Phone	
<b>Brand</b>	FUJITSU	
<b>Test Model</b>	F-01K	
<b>Status of EUT</b>	Identical Prototype	
<b>Power Supply Rating</b>	5.0 Vdc (adapter or host equipment) 3.75 Vdc (Li-ion battery)	
<b>Modulation Type</b>	GSM/GPRS	GMSK
	WCDMA	QPSK
	LTE	QPSK, 16QAM
<b>Frequency Range</b>	GSM/GPRS	824.2 ~ 848.8 MHz
	WCDMA	826.4 ~ 846.6 MHz
	LTE 5 (Channel Bandwidth: 1.4 MHz)	824.7 ~ 848.3 MHz
	LTE 5 (Channel Bandwidth: 3 MHz)	825.5 ~ 847.5 MHz
	LTE 5 (Channel Bandwidth: 5 MHz)	826.5 ~ 846.5 MHz
	LTE 5 (Channel Bandwidth: 10 MHz)	829 ~ 844 MHz
<b>Max. ERP Power</b>	GSM/GPRS	325.24 mW
	WCDMA	49.64 mW
	LTE 5 (Channel Bandwidth: 1.4 MHz)	40.76 mW
	LTE 5 (Channel Bandwidth: 3 MHz)	41.06 mW
	LTE 5 (Channel Bandwidth: 5 MHz)	40.36 mW
	LTE 5 (Channel Bandwidth: 10 MHz)	41.57 mW
<b>Emission Designator</b>	GSM/GPRS	247KGXW
	WCDMA	4M16F9W
	LTE 5 (Channel Bandwidth: 1.4 MHz)	1M09W7D
	LTE 5 (Channel Bandwidth: 3 MHz)	2M70G7D
	LTE 5 (Channel Bandwidth: 5 MHz)	4M50W7D
	LTE 5 (Channel Bandwidth: 10 MHz)	8M98W7D
<b>Antenna Type</b>	$\lambda / 4$ Monopole Antenna	
<b>Accessory Device</b>	Refer to Note as below	
<b>Data Cable Supplied</b>	Refer to Note as below	

Note:

1. The EUT contains following accessory devices.

<b>Product</b>	<b>Brand</b>	<b>Model</b>	<b>Description</b>
Battery	FUJITSU CONNECTED TECHNOLOGIES Ltd.	CA54310-0067	3.75 Vdc, 2850 mAh

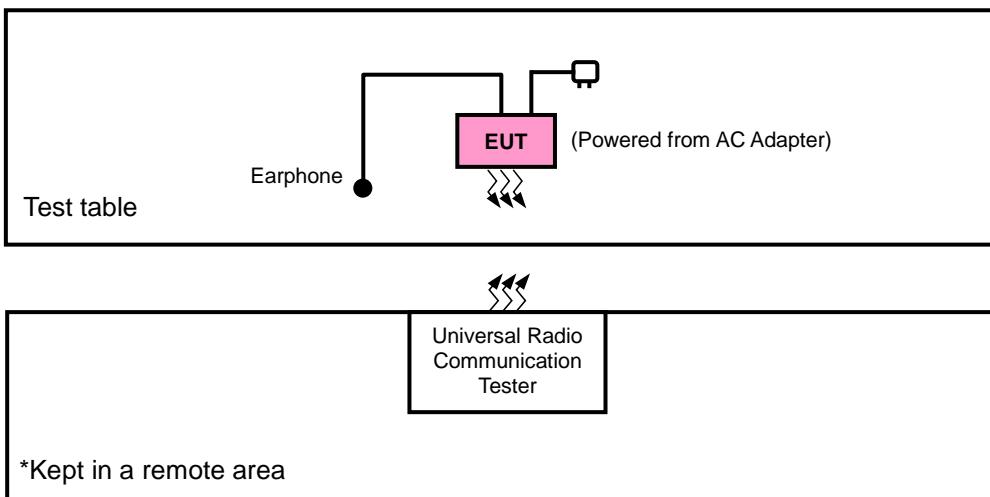
2. The EUT uses following adapter which provided by client as support unit.

<b>Product</b>	<b>Brand</b>	<b>Model</b>	<b>Description</b>
Adapter	NTT docomo	AC Adapter 06	I/P: 100-240Vac, 0.8A, O/P: 5.0Vdc, 3.0A

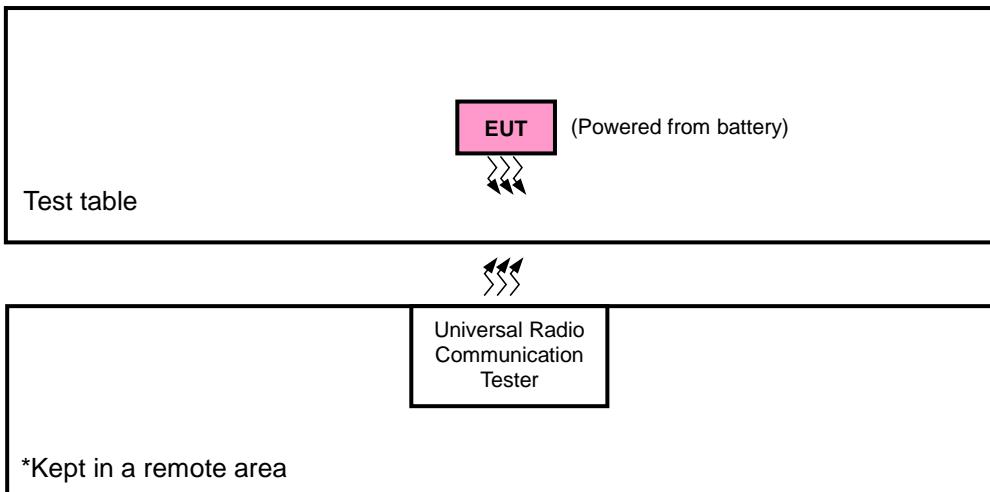
3. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

### 3.2 Configuration of System under Test

#### <Radiated Emission Test>



#### <E.R.P. Test>



#### 3.2.1 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Product	Brand	Model No.	Serial No.	FCC ID
1.	Earphone	N/A	N/A	N/A	N/A

No.	Signal Cable Description Of The Above Support Units
1.	N/A

Note:

1. All power cords of the above support units are non-shielded (1.8m).

### 3.3 Test Mode Applicability and Tested Channel Detail

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis, and antenna ports.

The worst case was found when positioned as the table below. Following channel(s) was (were) selected for the final test as listed below:

<b>Band</b>	<b>ERP</b>	<b>Radiated Emission</b>
<b>GSM</b>	Z-plane	Z-axis
<b>WCDMA</b>	Z-plane	Z-axis
<b>LTE Band 5</b>	Z-plane	Z-axis

#### GSM

<b>EUT Configure Mode</b>	<b>Test Item</b>	<b>Available Channel</b>	<b>Tested Channel</b>	<b>Mode</b>
-	ERP	128 to 251	128, 189, 251	GSM
-	Frequency Stability	128 to 251	128, 251	GSM
-	Occupied Bandwidth	128 to 251	128, 189, 251	GSM
-	Band Edge	128 to 251	128, 251	GSM
-	Peak to Average Ratio	128 to 251	128, 189, 251	GSM
-	Conducted Emission	128 to 251	128, 189, 251	GSM
-	Radiated Emission	128 to 251	128, 189, 251	GSM

#### WCDMA

<b>EUT Configure Mode</b>	<b>Test Item</b>	<b>Available Channel</b>	<b>Tested Channel</b>	<b>Mode</b>
-	ERP	4132 to 4233	4132, 4182, 4233	WCDMA
-	Frequency Stability	4132 to 4233	4132, 4233	WCDMA
-	Occupied Bandwidth	4132 to 4233	4132, 4182, 4233	WCDMA
-	Band Edge	4132 to 4233	4132, 4233	WCDMA
-	Peak to Average Ratio	4132 to 4233	4132, 4182, 4233	WCDMA
-	Conducted Emission	4132 to 4233	4132, 4182, 4233	WCDMA
-	Radiated Emission	4132 to 4233	4132, 4182, 4233	WCDMA

**LTE Band 5**

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	ERP	20407 to 20643	20407, 20525, 20643	1.4 MHz	QPSK, 16QAM	1 RB / 2 RB Offset
		20415 to 20635	20415, 20525, 20635	3 MHz	QPSK, 16QAM	1 RB / 7 RB Offset
		20425 to 20625	20425, 20525, 20625	5 MHz	QPSK, 16QAM	1 RB / 12 RB Offset
		20450 to 20600	20450, 20525, 20600	10 MHz	QPSK, 16QAM	1 RB / 24 RB Offset
-	Frequency Stability	20407 to 20643	20407, 20643	1.4 MHz	QPSK	1 RB / 2 RB Offset
		20415 to 20635	20415, 20635	3 MHz	QPSK	1 RB / 7 RB Offset
		20425 to 20625	20425, 20625	5 MHz	QPSK	1 RB / 12 RB Offset
		20450 to 20600	20450, 20600	10 MHz	QPSK	1 RB / 24 RB Offset
-	Occupied Bandwidth	20407 to 20643	20407, 20525, 20643	1.4 MHz	QPSK, 16QAM	6 RB / 0 RB Offset
		20415 to 20635	20415, 20525, 20635	3 MHz	QPSK, 16QAM	15 RB / 0 RB Offset
		20425 to 20625	20425, 20525, 20625	5 MHz	QPSK, 16QAM	25 RB / 0 RB Offset
		20450 to 20600	20450, 20525, 20600	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset
-	Band Edge	20407 to 20643	20407	1.4MHz	QPSK	1 RB / 0 RB Offset
			20643	1.4MHz		6 RB / 0 RB Offset
		20415 to 20635	20415	3 MHz	QPSK	1 RB / 5 RB Offset
			20635	3 MHz		15 RB / 0 RB Offset
		20425 to 20625	20425	5 MHz	QPSK	1 RB / 14 RB Offset
			20625	5 MHz		25 RB / 0 RB Offset
		20450 to 20600	20450	10 MHz	QPSK	1 RB / 24 RB Offset
			20600	10 MHz		25 RB / 0 RB Offset
						1 RB / 0 RB Offset
						50 RB / 0 RB Offset
						1 RB / 49 RB Offset
						50 RB / 0 RB Offset
-	Peak to Average Ratio	20407 to 20643	20407, 20525, 20643	1.4 MHz	QPSK, 16QAM	6 RB / 0 RB Offset
		20415 to 20635	20415, 20525, 20635	3 MHz	QPSK, 16QAM	15 RB / 0 RB Offset
		20425 to 20625	20425, 20525, 20625	5 MHz	QPSK, 16QAM	25 RB / 0 RB Offset
		20450 to 20600	20450, 20525, 20600	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset
-	Conducted Emission	20407 to 20643	20407, 20525, 20643	1.4 MHz	QPSK	1 RB / 2 RB Offset
		20415 to 20635	20415, 20525, 20635	3 MHz	QPSK	1 RB / 7 RB Offset
		20425 to 20625	20425, 20525, 20625	5 MHz	QPSK	1 RB / 12 RB Offset
		20450 to 20600	20450, 20525, 20600	10 MHz	QPSK	1 RB / 24 RB Offset
-	Radiated Emission	20450 to 20600	20450, 20525, 20600	10 MHz	QPSK	1 RB / 0 RB Offset

**Note:** This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

**Test Condition:**

Test Item	Environmental Conditions	Input Power	Tested By
ERP	25 deg. C, 65 % RH	3.75 Vdc	Carlos Chen
Frequency Stability	25 deg. C, 65 % RH	3.75 Vdc	Carlos Chen
Occupied Bandwidth	25 deg. C, 65 % RH	3.75 Vdc	Carlos Chen
Band Edge	25 deg. C, 65 % RH	3.75 Vdc	Carlos Chen
Peak to Average Ratio	25 deg. C, 65 % RH	3.75 Vdc	Carlos Chen
Conducted Emission	25 deg. C, 65 % RH	3.75 Vdc	Carlos Chen
Radiated Emission	25 deg. C, 65 % RH	120 Vac, 60 Hz	Harry Hsueh

### **3.4 EUT Operating Conditions**

The EUT makes a call to the communication simulator. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency.

### **3.5 General Description of Applied Standards**

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**FCC 47 CFR Part 2**

**FCC 47 CFR Part 22**

**KDB 971168 D01 Power Meas License Digital Systems v02r02**

**ANSI/TIA/EIA-603-D 2010**

**Note:** All test items have been performed and recorded as per the above standards.

## 4 Test Types and Results

### 4.1 Output Power Measurement

#### 4.1.1 Limits of Output Power Measurement

Mobile / Portable station are limited to 7 watts e.r.p.

#### 4.1.2 Test Procedures

##### EIRP / ERP Measurement:

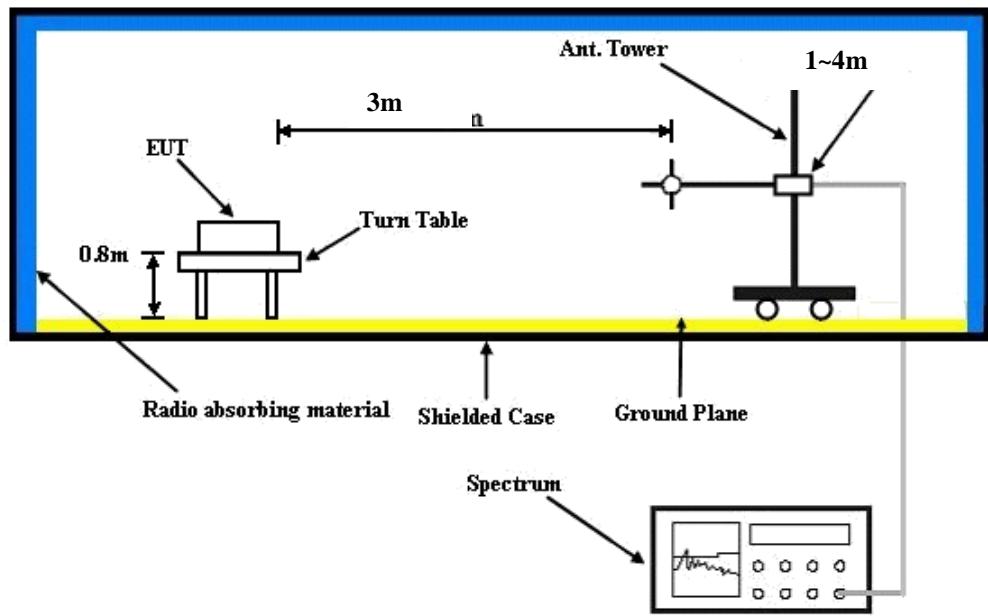
- a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 1 MHz for GSM, GPRS & EDGE mode.
- b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1 m to 4 m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
- c. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a tx cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value” of step b. Record the power level of S.G.
- d.  $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}$ . E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power - 2.15 dBi.

##### Conducted Power Measurement:

The EUT was set up for the maximum power with GSM, GPRS, and EDGE link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

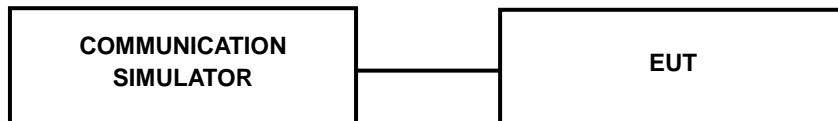
#### 4.1.3 Test Setup

##### EIRP / ERP Measurement:



For the actual test configuration, please refer to the attached file (Test Setup Photo).

##### Conducted Power Measurement:



#### 4.1.4 Test Results

##### Conducted Output Power (dBm)

<b>Band</b>	<b>GSM850</b>		
<b>Channel</b>	<b>128</b>	<b>189</b>	<b>251</b>
<b>Frequency (MHz)</b>	<b>824.2</b>	<b>836.4</b>	<b>848.8</b>
<b>GSM (GMSK, 1Tx-slot)</b>	32.60	32.41	32.65
<b>GPRS (GMSK, 1Tx-slot)</b>	32.54	32.40	32.60
<b>GPRS (GMSK, 2Tx-slot)</b>	29.26	29.16	29.42
<b>GPRS (GMSK, 3Tx-slot)</b>	27.13	27.00	27.27
<b>GPRS (GMSK, 4Tx-slot)</b>	<b>25.99</b>	25.68	25.87
<b>DTM (GMSK, 2Tx-slot)</b>	29.19	29.06	29.29
<b>DTM (GMSK, 3Tx-slot)</b>	27.02	26.92	27.15

<b>Band</b>	<b>WCDMA V</b>		
<b>Channel</b>	<b>4132</b>	<b>4182</b>	<b>4233</b>
<b>Frequency (MHz)</b>	<b>826.4</b>	<b>836.4</b>	<b>846.6</b>
<b>RMC 12.2K</b>	23.47	23.56	<b>23.58</b>
<b>HSDPA Subtest-1</b>	22.44	22.53	22.55
<b>HSDPA Subtest-2</b>	22.42	22.51	22.53
<b>HSDPA Subtest-3</b>	21.96	22.05	22.07
<b>HSDPA Subtest-4</b>	21.94	22.03	22.05
<b>HSUPA Subtest-1</b>	22.49	22.58	22.60
<b>HSUPA Subtest-2</b>	20.47	20.56	20.58
<b>HSUPA Subtest-3</b>	21.52	21.61	21.63
<b>HSUPA Subtest-4</b>	20.46	20.55	20.57
<b>HSUPA Subtest-5</b>	22.53	22.62	22.64

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 20407	Mid Ch 20525	High Ch 20643		Low Ch 20407	Mid Ch 20525	High Ch 20643	
			824.7 MHz	836.5 MHz	848.3 MHz		824.7 MHz	836.5 MHz	848.3 MHz	
5 / 1.4M	1	0	22.91	22.97	23.02	0	21.84	21.90	21.95	1
	1	2	22.89	22.95	23.00	0	21.82	21.88	21.93	1
	1	5	22.84	22.90	22.95	0	21.77	21.83	21.88	1
	3	0	22.74	22.80	22.85	0	21.67	21.73	21.78	1
	3	1	22.72	22.78	22.83	0	21.65	21.71	21.76	1
	3	3	22.68	22.74	22.79	0	21.61	21.67	21.72	1
	6	0	21.99	22.05	22.10	1	20.92	20.98	21.03	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 20415	Mid Ch 20525	High Ch 20635		Low Ch 20415	Mid Ch 20525	High Ch 20635	
			825.5 MHz	836.5 MHz	847.5 MHz		825.5 MHz	836.5 MHz	847.5 MHz	
5 / 3M	1	0	23.02	23.08	23.13	0	21.95	22.01	22.06	1
	1	7	23.00	23.06	23.11	0	21.93	21.99	22.04	1
	1	14	22.95	23.01	23.06	0	21.88	21.94	21.99	1
	8	0	22.13	22.19	22.24	1	21.06	21.12	21.17	2
	8	3	22.11	22.17	22.22	1	21.04	21.10	21.15	2
	8	7	22.07	22.13	22.18	1	21.00	21.06	21.11	2
	15	0	22.10	22.16	22.21	1	21.03	21.09	21.14	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 20425	Mid Ch 20525	High Ch 20625		Low Ch 20425	Mid Ch 20525	High Ch 20625	
			826.5 MHz	836.5 MHz	846.5 MHz		826.5 MHz	836.5 MHz	846.5 MHz	
5 / 5M	1	0	23.10	23.16	23.21	0	22.03	22.09	22.14	1
	1	12	23.08	23.14	23.19	0	22.01	22.07	22.12	1
	1	24	23.03	23.09	23.14	0	21.96	22.02	22.07	1
	12	0	22.21	22.27	22.32	1	21.14	21.20	21.25	2
	12	6	22.19	22.25	22.30	1	21.12	21.18	21.23	2
	12	13	22.15	22.21	22.26	1	21.08	21.14	21.19	2
	25	0	22.18	22.24	22.29	1	21.11	21.17	21.22	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 20450	Mid Ch 20525	High Ch 20600		Low Ch 20450	Mid Ch 20525	High Ch 20600	
			829.0 MHz	836.5 MHz	844.0 MHz		829.0 MHz	836.5 MHz	844.0 MHz	
5 / 10M	1	0	23.22	23.28	23.33	0	22.15	22.21	22.26	1
	1	24	23.20	23.26	23.31	0	22.13	22.19	22.24	1
	1	49	23.15	23.21	23.26	0	22.08	22.14	22.19	1
	25	0	22.33	22.39	22.44	1	21.26	21.32	21.37	2
	25	12	22.31	22.37	22.42	1	21.24	21.30	21.35	2
	25	25	22.27	22.33	22.38	1	21.20	21.26	21.31	2
	50	0	22.30	22.36	22.41	1	21.23	21.29	21.34	2

**ERP Power (dBm)**

GSM							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
Z	128	824.2	-4.00	31.208	25.06	320.48	H
	189	836.4	-4.10	31.3	25.05	319.89	
	251	848.8	-3.95	31.222	25.12	<b>325.24</b>	
	128	824.2	-7.29	31.504	22.06	160.84	V
	189	836.4	-6.92	31.117	22.05	160.21	
	251	848.8	-7.64	31.922	22.13	163.38	

**WCDMA**

Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
Z	4132	826.4	-12.10	31.208	16.96	<b>49.64</b>	H
	4182	836.4	-13.08	31.3	16.07	40.46	
	4233	846.6	-13.01	31.222	16.06	40.38	
	4132	826.4	-16.32	31.504	13.03	20.11	V
	4182	836.4	-15.82	31.117	13.15	20.64	
	4233	846.6	-16.69	31.922	13.08	20.33	

**LTE Band 5**
**Channel Bandwidth: 1.4 MHz / QPSK**

Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
Z	20407	824.7	-12.97	31.208	16.09	40.63	H
	20525	836.5	-13.08	31.3	16.07	40.46	
	20643	848.3	-12.97	31.222	16.10	<b>40.76</b>	
	20407	824.7	-16.32	31.504	13.03	20.11	V
	20525	836.5	-15.96	31.117	13.01	19.98	
	20643	848.3	-16.62	31.922	13.15	20.66	

**Channel Bandwidth: 1.4 MHz / 16QAM**

Z	20407	824.7	-14.06	31.208	15.00	31.61	H
	20525	836.5	-14.02	31.3	15.13	32.58	
	20643	848.3	-13.96	31.222	15.11	32.45	
	20407	824.7	-17.32	31.504	12.03	15.97	V
	20525	836.5	-16.92	31.117	12.05	16.02	
	20643	848.3	-17.72	31.922	12.05	16.04	

LTE Band 5							
Channel Bandwidth: 3 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
Z	20415	825.5	-12.98	31.208	16.08	40.53	H
	20525	836.5	-13.02	31.3	16.13	<b>41.06</b>	
	20635	847.5	-13.01	31.222	16.06	40.38	
	20415	825.5	-16.32	31.504	13.03	20.11	V
	20525	836.5	-15.89	31.117	13.08	20.31	
	20635	847.5	-16.72	31.922	13.05	20.19	
Channel Bandwidth: 3 MHz / 16QAM							
Z	20415	825.5	-13.98	31.208	15.08	32.20	H
	20525	836.5	-14.02	31.3	15.13	32.58	
	20635	847.5	-14.00	31.222	15.07	32.15	
	20415	825.5	-17.34	31.504	12.01	15.90	V
	20525	836.5	-16.90	31.117	12.07	16.10	
	20635	847.5	-17.60	31.922	12.17	16.49	

LTE Band 5							
Channel Bandwidth: 5 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
Z	20425	826.5	-13.01	31.208	16.05	40.25	H
	20525	836.5	-13.09	31.3	16.06	<b>40.36</b>	
	20625	846.5	-13.03	31.222	16.04	40.20	
	20425	826.5	-16.30	31.504	13.05	20.20	V
	20525	836.5	-15.92	31.117	13.05	20.17	
	20625	846.5	-16.67	31.922	13.10	20.43	
Channel Bandwidth: 5 MHz / 16QAM							
Z	20425	826.5	-14.01	31.208	15.05	31.97	H
	20525	836.5	-14.06	31.3	15.09	32.28	
	20625	846.5	-14.05	31.222	15.02	31.78	
	20425	826.5	-17.33	31.504	12.02	15.94	V
	20525	836.5	-16.95	31.117	12.02	15.91	
	20625	846.5	-17.60	31.922	12.17	16.49	

LTE Band 5							
Channel Bandwidth: 10 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
Z	20450	829.0	-12.87	31.208	16.19	<b>41.57</b>	H
	20525	836.5	-13.05	31.3	16.10	40.74	
	20600	844.0	-13.02	31.222	16.05	40.29	
	20450	829.0	-16.32	31.504	13.03	20.11	V
	20525	836.5	-15.97	31.117	13.00	19.94	
	20600	844.0	-16.64	31.922	13.13	20.57	
Channel Bandwidth: 10 MHz / 16QAM							
Z	20450	829.0	-13.95	31.208	15.11	32.42	H
	20525	836.5	-13.87	31.3	15.28	33.73	
	20600	844.0	-13.95	31.222	15.12	32.52	
	20450	829.0	-17.30	31.504	12.05	16.05	V
	20525	836.5	-16.92	31.117	12.05	16.02	
	20600	844.0	-17.65	31.922	12.12	16.30	

## 4.2 Frequency Stability Measurement

### 4.2.1 Limits of Frequency Stability Measurement

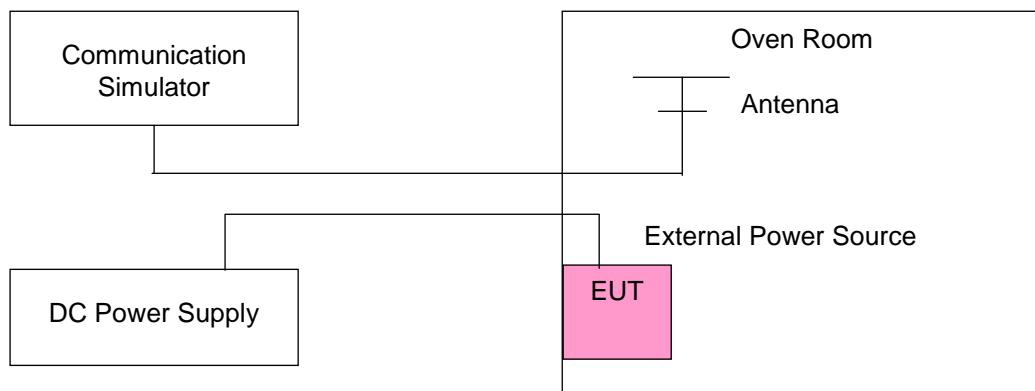
1.5 ppm is for base and fixed station. 2.5 ppm is for mobile station.

### 4.2.2 Test Procedure

- a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
- b. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
- c. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the  $\pm 0.5^{\circ}\text{C}$  during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

**NOTE:** The frequency error was recorded frequency error from the communication simulator.

### 4.2.3 Test Setup



#### 4.2.4 Test Results

##### Frequency Error vs. Voltage

Voltage (Volts)	GSM				Limit (ppm)	
	Low Channel		High Channel			
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)		
3.9	824.200002	0.002	848.800002	0.003	2.5	
3.51	824.200002	0.003	848.800002	0.002	2.5	
4.29	824.200002	0.003	848.800000	0.000	2.5	

**Note:** The applicant defined the normal working voltage of the battery is from 3.51 Vdc to 4.29 Vdc.

##### Frequency Error vs. Temperature

Temp. (°C)	GSM				Limit (ppm)	
	Low Channel		High Channel			
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)		
-30	824.200002	0.003	848.800001	0.001	2.5	
-20	824.200003	0.003	848.800003	0.003	2.5	
-10	824.200004	0.004	848.800000	0.000	2.5	
0	824.200003	0.004	848.800004	0.004	2.5	
10	824.200003	0.004	848.800003	0.004	2.5	
20	824.200000	-0.001	848.799998	-0.002	2.5	
30	824.199998	-0.003	848.799998	-0.003	2.5	
40	824.199999	-0.001	848.799998	-0.002	2.5	
50	824.199997	-0.004	848.799999	-0.001	2.5	
55	824.199996	-0.004	848.800000	0.000	2.5	

## Frequency Error vs. Voltage

Voltage (Volts)	WCDMA				Limit (ppm)	
	Low Channel		High Channel			
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)		
3.9	826.400002	0.002	846.600002	0.003	2.5	
3.51	826.400002	0.002	846.600003	0.003	2.5	
4.29	826.400002	0.003	846.600000	0.000	2.5	

**Note:** The applicant defined the normal working voltage of the battery is from 3.51 Vdc to 4.29 Vdc.

## Frequency Error vs. Temperature

Temp. (°C)	WCDMA				Limit (ppm)	
	Low Channel		High Channel			
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)		
-30	826.400001	0.001	846.600000	0.000	2.5	
-20	826.400000	0.000	846.600003	0.003	2.5	
-10	826.400004	0.005	846.600002	0.003	2.5	
0	826.400002	0.002	846.600000	0.000	2.5	
10	826.400002	0.003	846.600003	0.004	2.5	
20	826.399999	-0.002	846.599998	-0.002	2.5	
30	826.399998	-0.003	846.599999	-0.001	2.5	
40	826.399996	-0.005	846.599998	-0.002	2.5	
50	826.399998	-0.003	846.599997	-0.004	2.5	
55	826.399998	-0.002	846.599999	-0.002	2.5	

## Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 5				Limit (ppm)	
	Channel Bandwidth: 1.4 MHz					
	Low Channel		High Channel			
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)		
3.9	824.700003	0.003	848.300001	0.002	2.5	
3.51	824.700000	0.000	848.300002	0.002	2.5	
4.29	824.700001	0.002	848.300000	0.000	2.5	

**Note:** The applicant defined the normal working voltage of the battery is from 3.51 Vdc to 4.29 Vdc.

## Frequency Error vs. Temperature

Temp. (°C)	LTE Band 5				Limit (ppm)	
	Channel Bandwidth: 1.4 MHz					
	Low Channel		High Channel			
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)		
-30	824.700002	0.002	848.300003	0.004	2.5	
-20	824.700000	0.000	848.300002	0.003	2.5	
-10	824.700002	0.003	848.300003	0.003	2.5	
0	824.700004	0.004	848.300001	0.001	2.5	
10	824.700002	0.002	848.300003	0.003	2.5	
20	824.699996	-0.005	848.299998	-0.003	2.5	
30	824.699999	-0.001	848.299996	-0.004	2.5	
40	824.699998	-0.003	848.299999	-0.002	2.5	
50	824.699999	-0.002	848.299999	-0.001	2.5	
55	824.699996	-0.005	848.299999	-0.001	2.5	

## Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 5				Limit (ppm)	
	Channel Bandwidth: 3 MHz					
	Low Channel		High Channel			
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)		
3.9	825.500002	0.002	847.500000	0.000	2.5	
3.51	825.500000	0.000	847.500003	0.003	2.5	
4.29	825.500001	0.001	847.500000	0.000	2.5	

**Note:** The applicant defined the normal working voltage of the battery is from 3.51 Vdc to 4.29 Vdc.

## Frequency Error vs. Temperature

Temp. (°C)	LTE Band 5				Limit (ppm)	
	Channel Bandwidth: 3 MHz					
	Low Channel		High Channel			
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)		
-30	825.500004	0.004	847.500002	0.002	2.5	
-20	825.500001	0.001	847.500003	0.004	2.5	
-10	825.500001	0.001	847.500003	0.003	2.5	
0	825.500001	0.001	847.500003	0.003	2.5	
10	825.500002	0.003	847.500003	0.004	2.5	
20	825.500000	0.000	847.499996	-0.004	2.5	
30	825.499998	-0.003	847.499999	-0.001	2.5	
40	825.499997	-0.004	847.499998	-0.002	2.5	
50	825.499999	-0.001	847.499997	-0.003	2.5	
55	825.499996	-0.005	847.500000	0.000	2.5	

## Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 5				Limit (ppm)	
	Channel Bandwidth: 5 MHz					
	Low Channel		High Channel			
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)		
3.9	826.500001	0.002	846.500002	0.002	2.5	
3.51	826.500001	0.001	846.500002	0.003	2.5	
4.29	826.500001	0.001	846.500002	0.002	2.5	

**Note:** The applicant defined the normal working voltage of the battery is from 3.51 Vdc to 4.29 Vdc.

## Frequency Error vs. Temperature

Temp. (°C)	LTE Band 5				Limit (ppm)	
	Channel Bandwidth: 5 MHz					
	Low Channel		High Channel			
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)		
-30	826.500003	0.003	846.500003	0.004	2.5	
-20	826.500004	0.004	846.500003	0.004	2.5	
-10	826.500001	0.001	846.500002	0.002	2.5	
0	826.500000	0.000	846.500000	0.000	2.5	
10	826.500002	0.003	846.500000	0.000	2.5	
20	826.499996	-0.005	846.499999	-0.001	2.5	
30	826.499998	-0.002	846.500000	0.000	2.5	
40	826.499997	-0.003	846.499998	-0.002	2.5	
50	826.499997	-0.004	846.499996	-0.005	2.5	
55	826.499998	-0.003	846.499999	-0.001	2.5	

## Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 5				Limit (ppm)	
	Channel Bandwidth: 10 MHz					
	Low Channel		High Channel			
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)		
3.9	829.000002	0.003	844.000002	0.003	2.5	
3.51	829.000003	0.003	844.000003	0.003	2.5	
4.29	829.000003	0.003	844.000000	0.000	2.5	

**Note:** The applicant defined the normal working voltage of the battery is from 3.51 Vdc to 4.29 Vdc.

## Frequency Error vs. Temperature

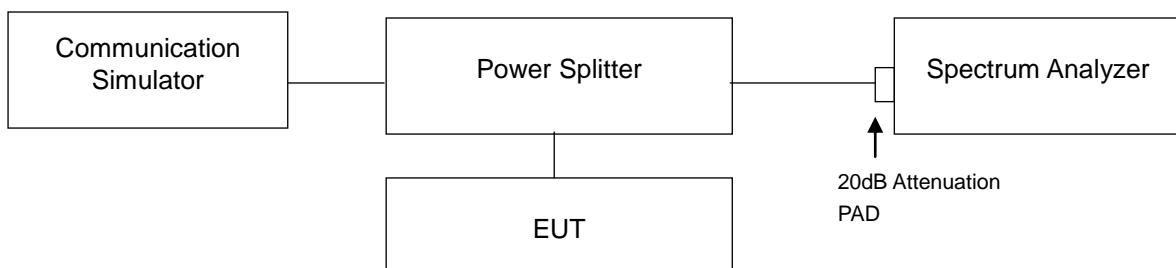
Temp. (°C)	LTE Band 5				Limit (ppm)	
	Channel Bandwidth: 10 MHz					
	Low Channel		High Channel			
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)		
-30	829.000000	0.000	844.000003	0.003	2.5	
-20	829.000002	0.002	844.000000	0.000	2.5	
-10	829.000002	0.003	844.000001	0.001	2.5	
0	829.000002	0.002	844.000003	0.004	2.5	
10	829.000003	0.004	844.000002	0.003	2.5	
20	828.999998	-0.002	843.999997	-0.003	2.5	
30	828.999998	-0.003	843.999997	-0.004	2.5	
40	828.999997	-0.004	843.999997	-0.003	2.5	
50	828.999999	-0.002	843.999998	-0.002	2.5	
55	828.999997	-0.003	843.999996	-0.005	2.5	

### 4.3 Occupied Bandwidth Measurement

#### 4.3.1 Test Procedure

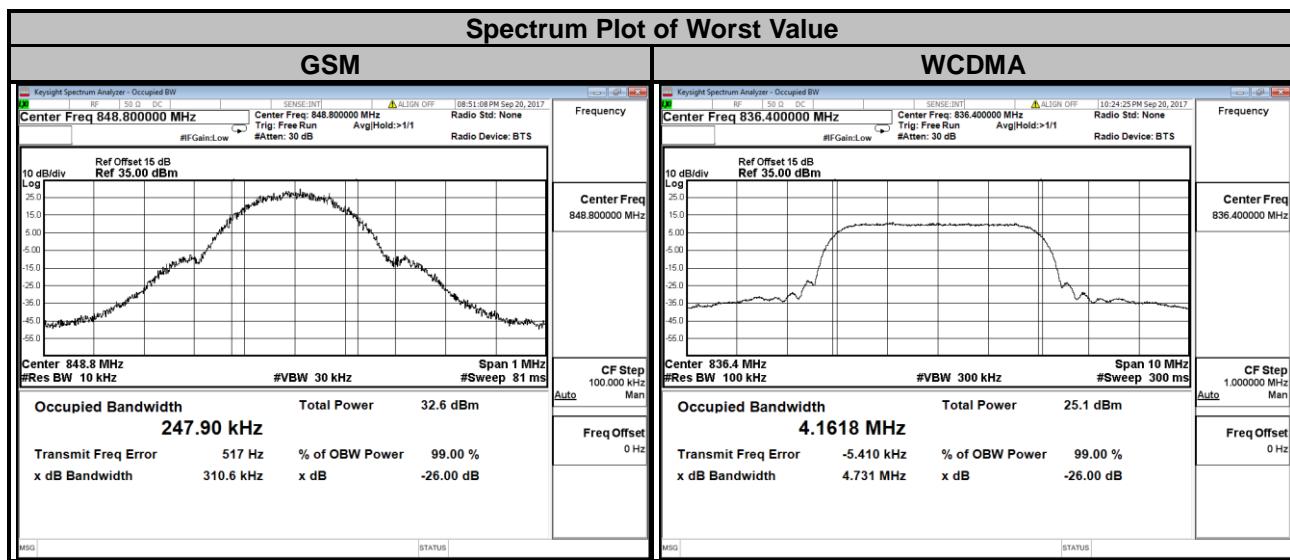
The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

#### 4.3.2 Test Setup

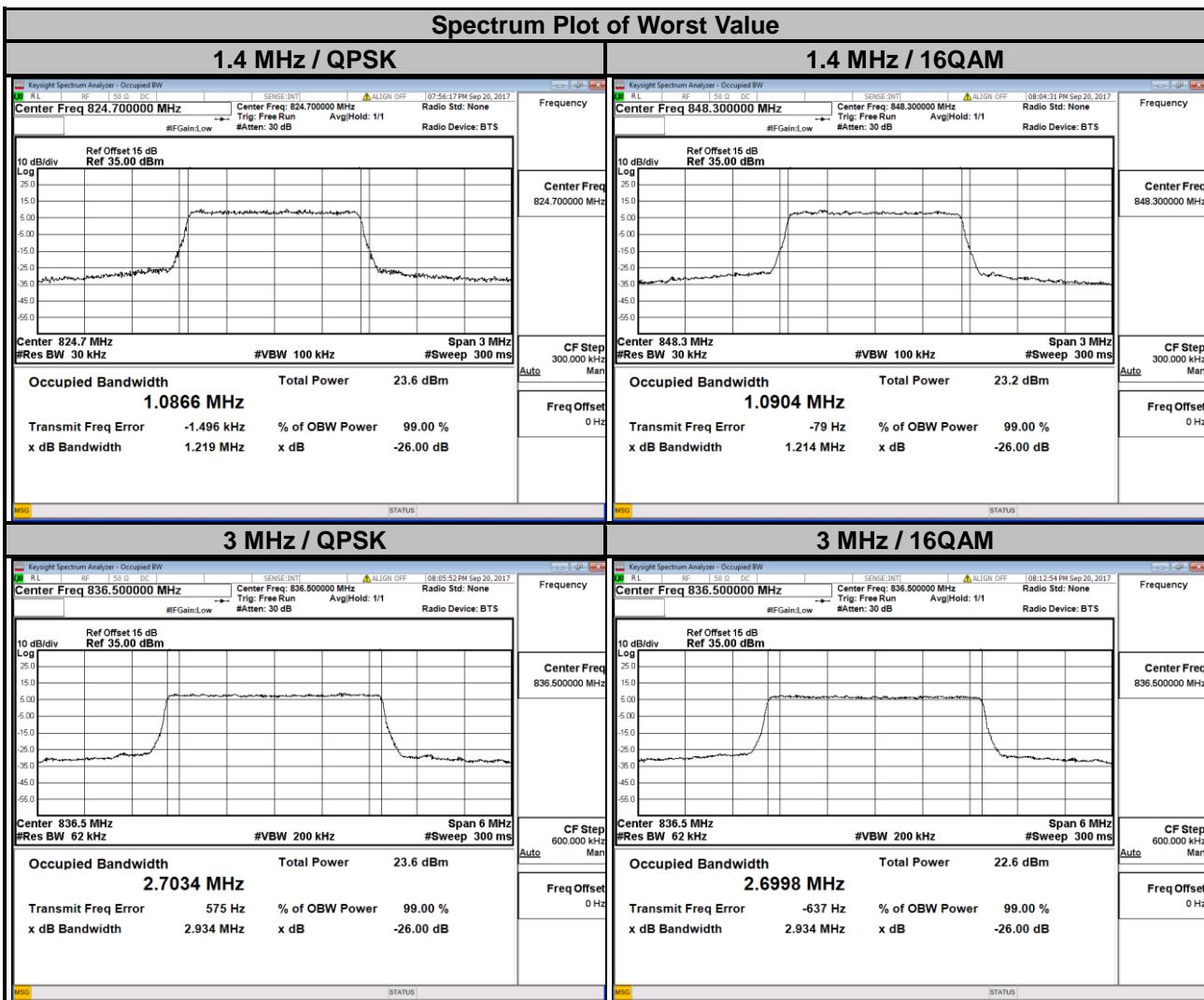


### 4.3.3 Test Result

Channel	Frequency (MHz)	99 % Occupied Bandwidth (kHz)	Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)
		GSM			WCDMA
128	824.2	245.74	4132	826.4	4.16
189	836.4	246.08	4182	836.4	4.16
251	848.8	247.90	4233	846.6	4.15



LTE Band 5							
Channel Bandwidth: 1.4 MHz				Channel Bandwidth: 3 MHz			
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
20407	824.7	1.09	1.09	20415	825.5	2.70	2.70
20525	836.5	1.09	1.09	20525	836.5	2.70	2.70
20643	848.3	1.08	1.09	20635	847.5	2.70	2.70

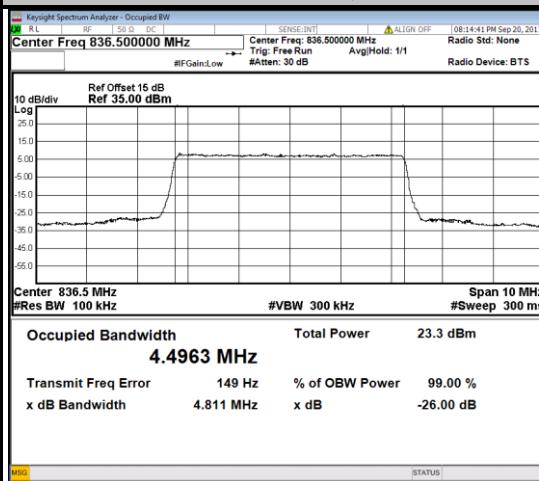


### LTE Band 5

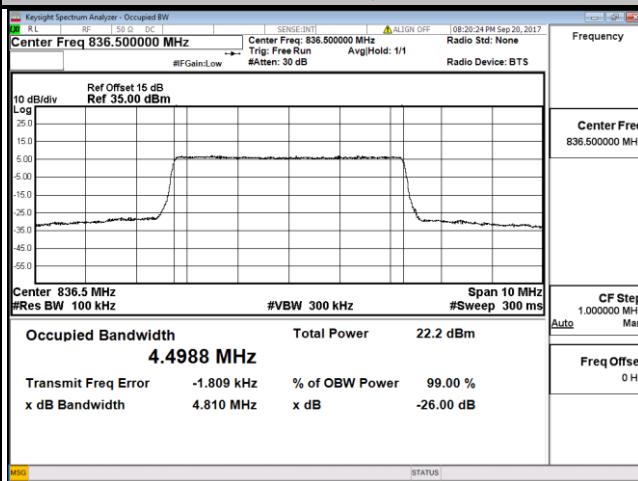
Channel Bandwidth: 5 MHz				Channel Bandwidth: 10 MHz			
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
20425	826.5	4.49	4.50	20450	829.0	8.96	8.96
20525	836.5	4.50	4.50	20525	836.5	8.98	8.98
20625	846.5	4.49	4.49	20600	844.0	8.96	8.96

### Spectrum Plot of Worst Value

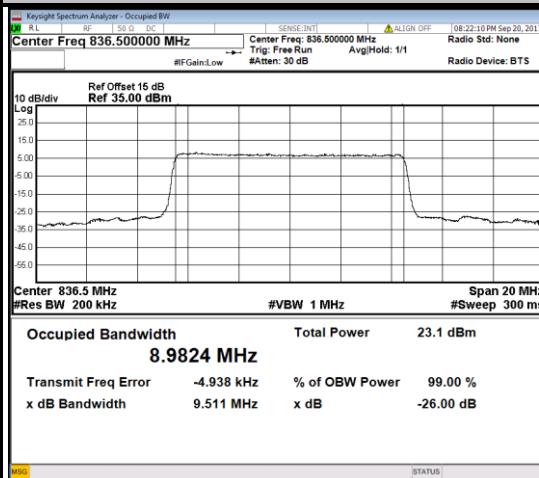
#### 5 MHz / QPSK



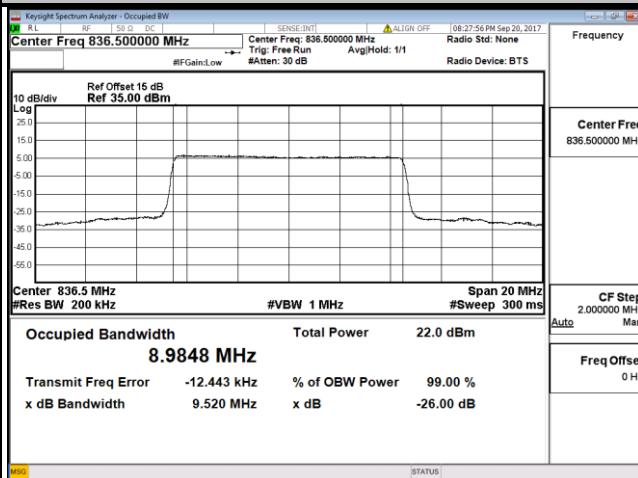
#### 5 MHz / 16QAM



#### 10 MHz / QPSK



#### 10 MHz / 16QAM

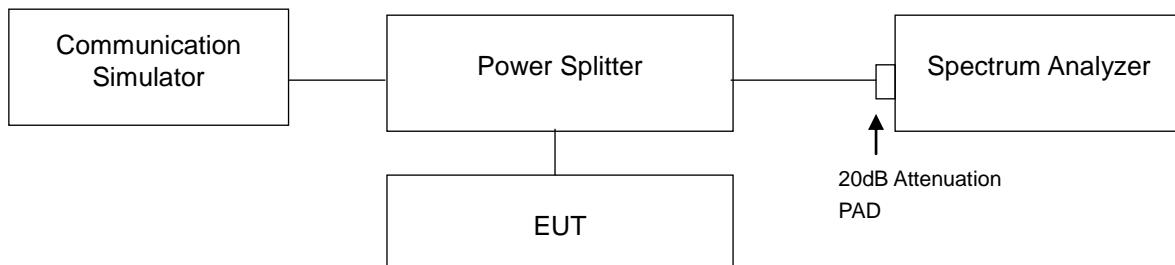


## 4.4 Band Edge Measurement

### 4.4.1 Limits of Band Edge Measurement

Power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

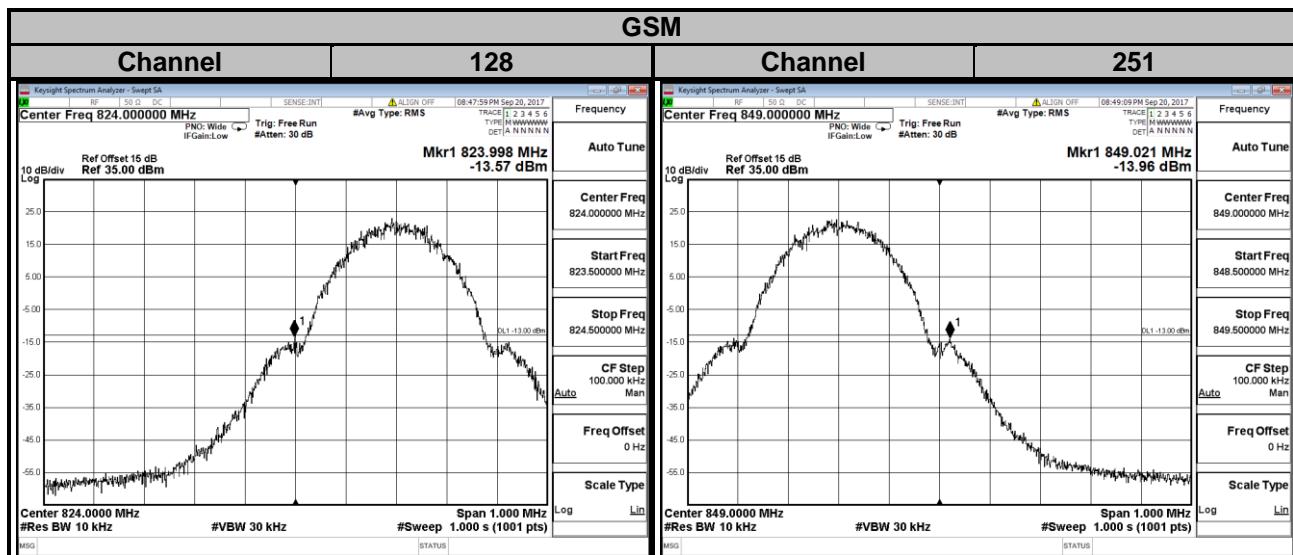
### 4.4.2 Test Setup

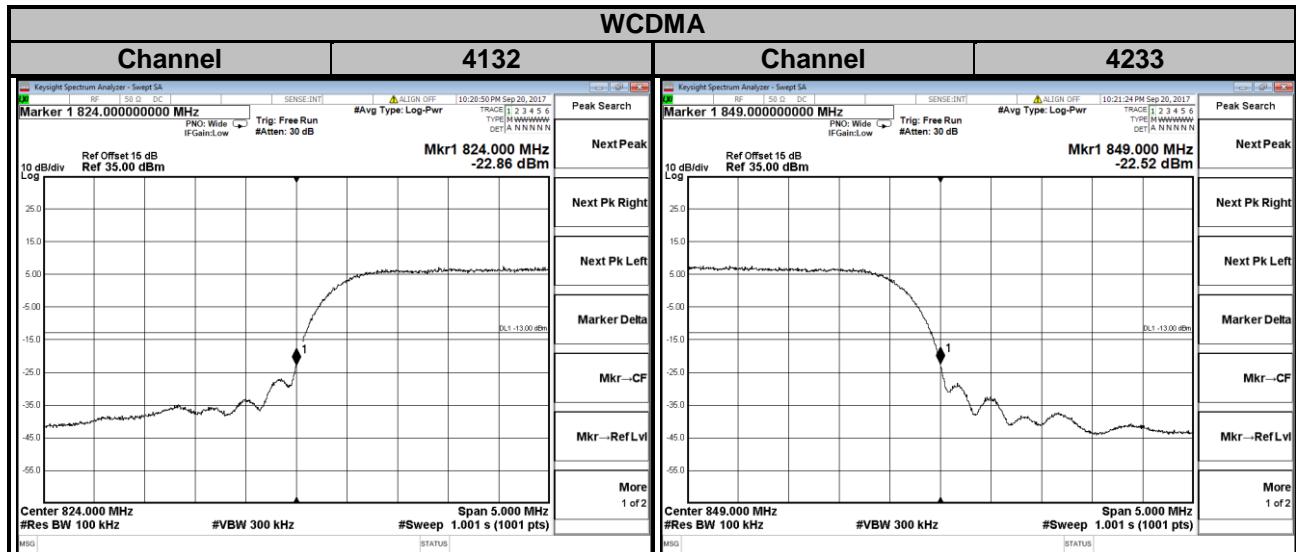


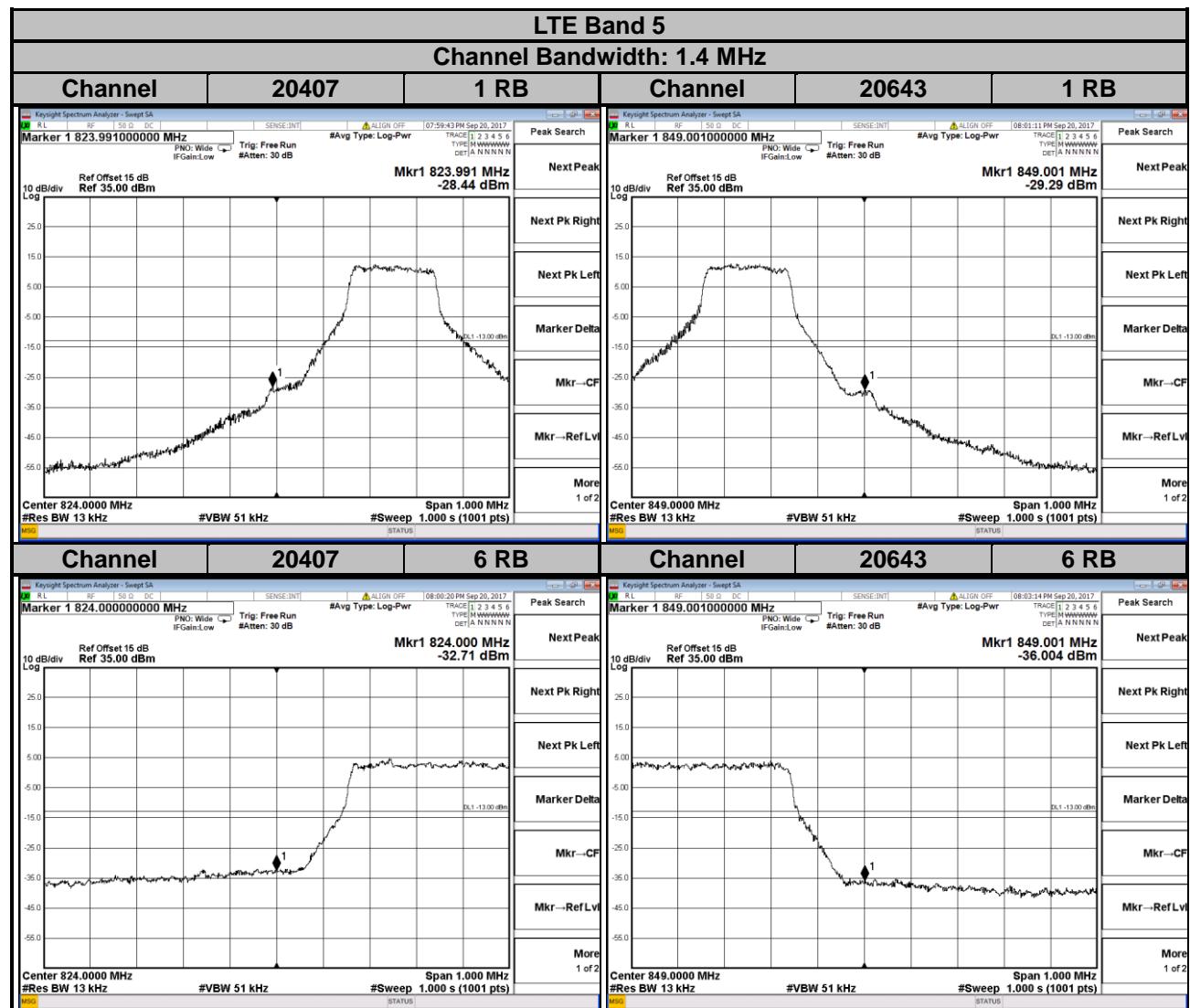
### 4.4.3 Test Procedures

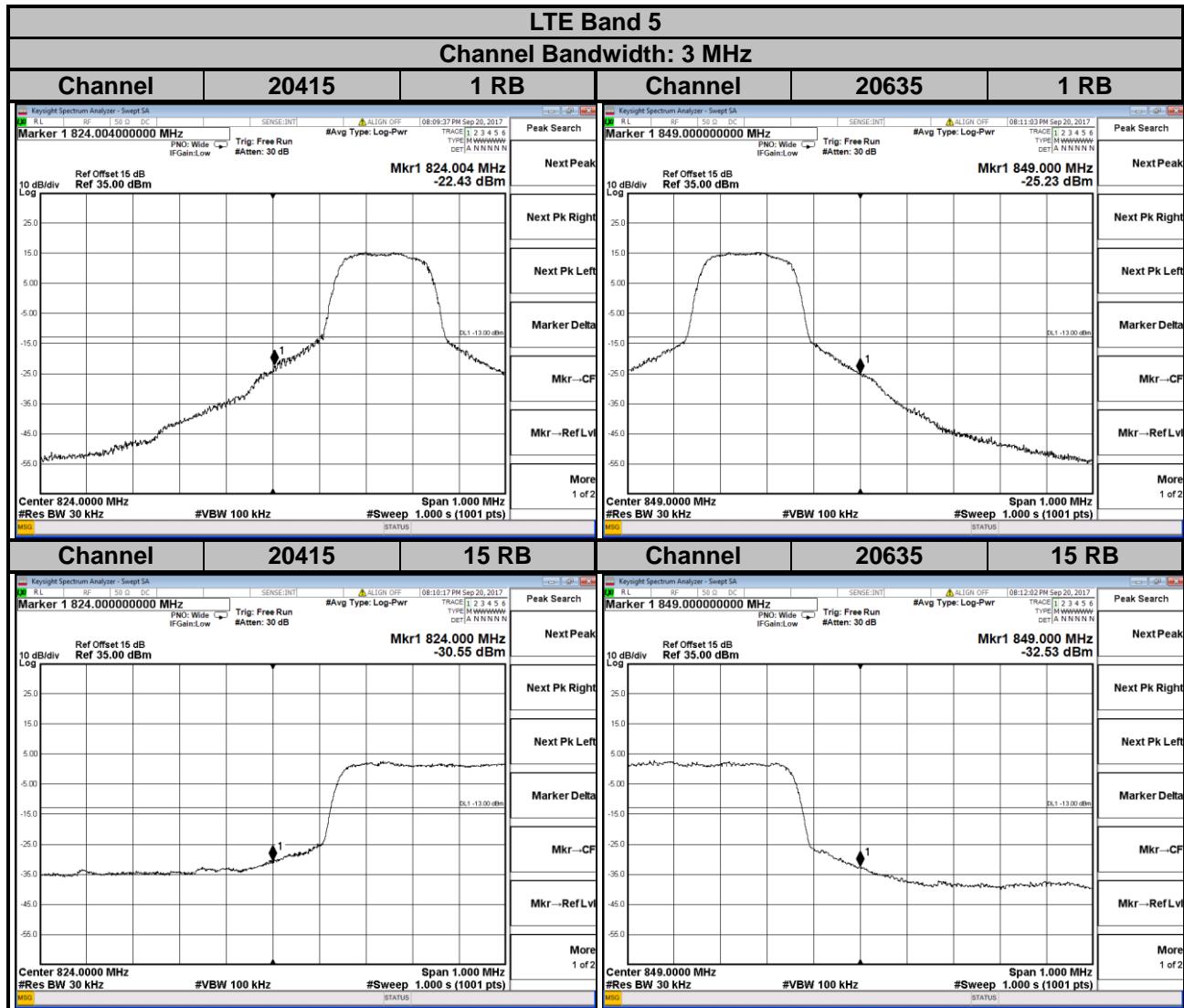
- All measurements were done at low and high operational frequency range.
- The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 10 kHz and VB of the spectrum is 30 kHz (GSM/GPRS).
- The center frequency of spectrum is the band edge frequency and span is 5 MHz. RB of the spectrum is 100 kHz and VB of the spectrum is 300 kHz (WCDMA).
- The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 13 kHz and VB of the spectrum is 51 kHz (LTE Bandwidth 1.4 MHz).
- The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 30 kHz and VB of the spectrum is 100 kHz (LTE Bandwidth 3 MHz).
- The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 100 kHz and VB of the spectrum is 300 kHz (LTE Bandwidth 5 MHz/10 MHz).
- Record the max trace plot into the test report.

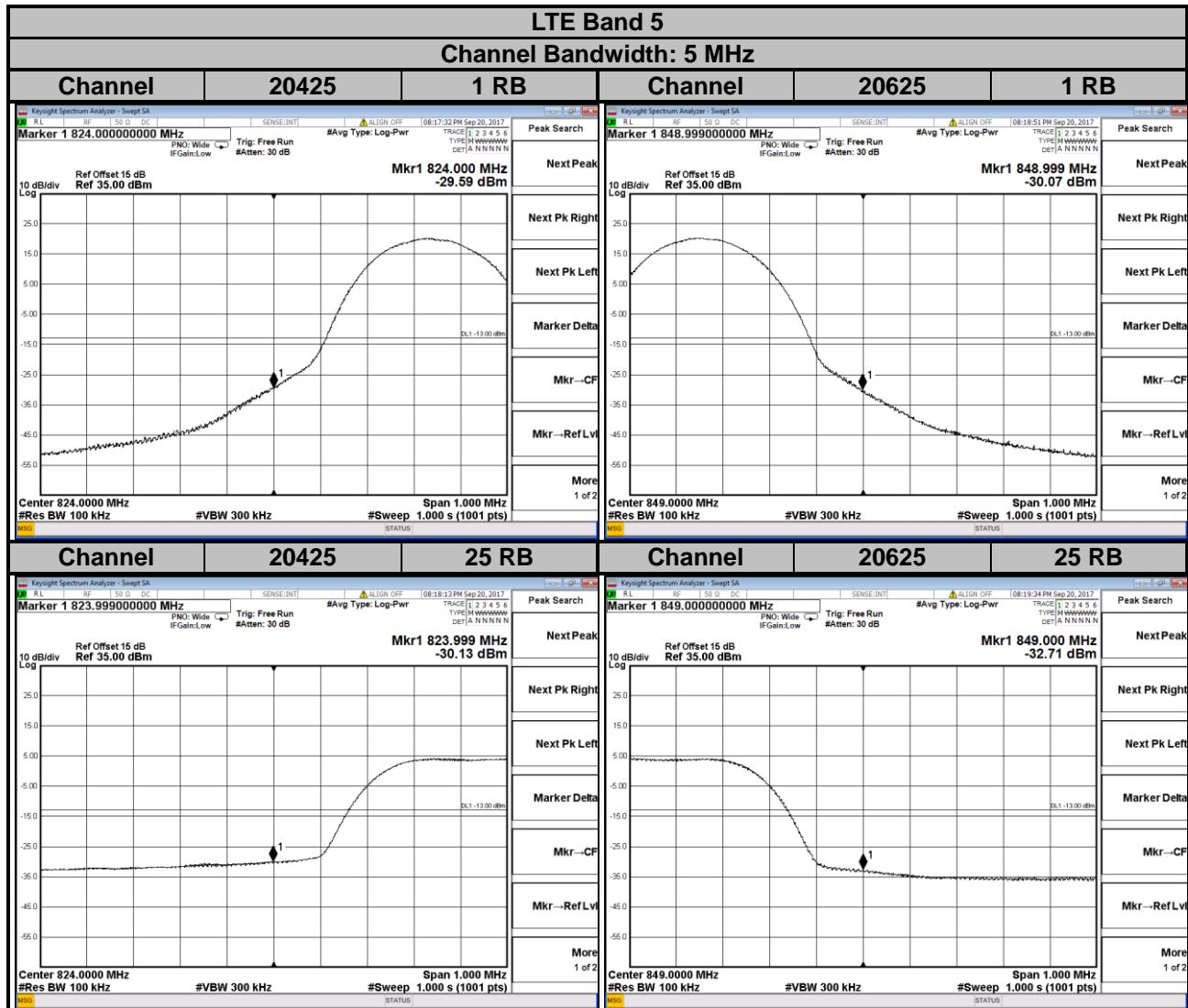
#### 4.4.4 Test Results

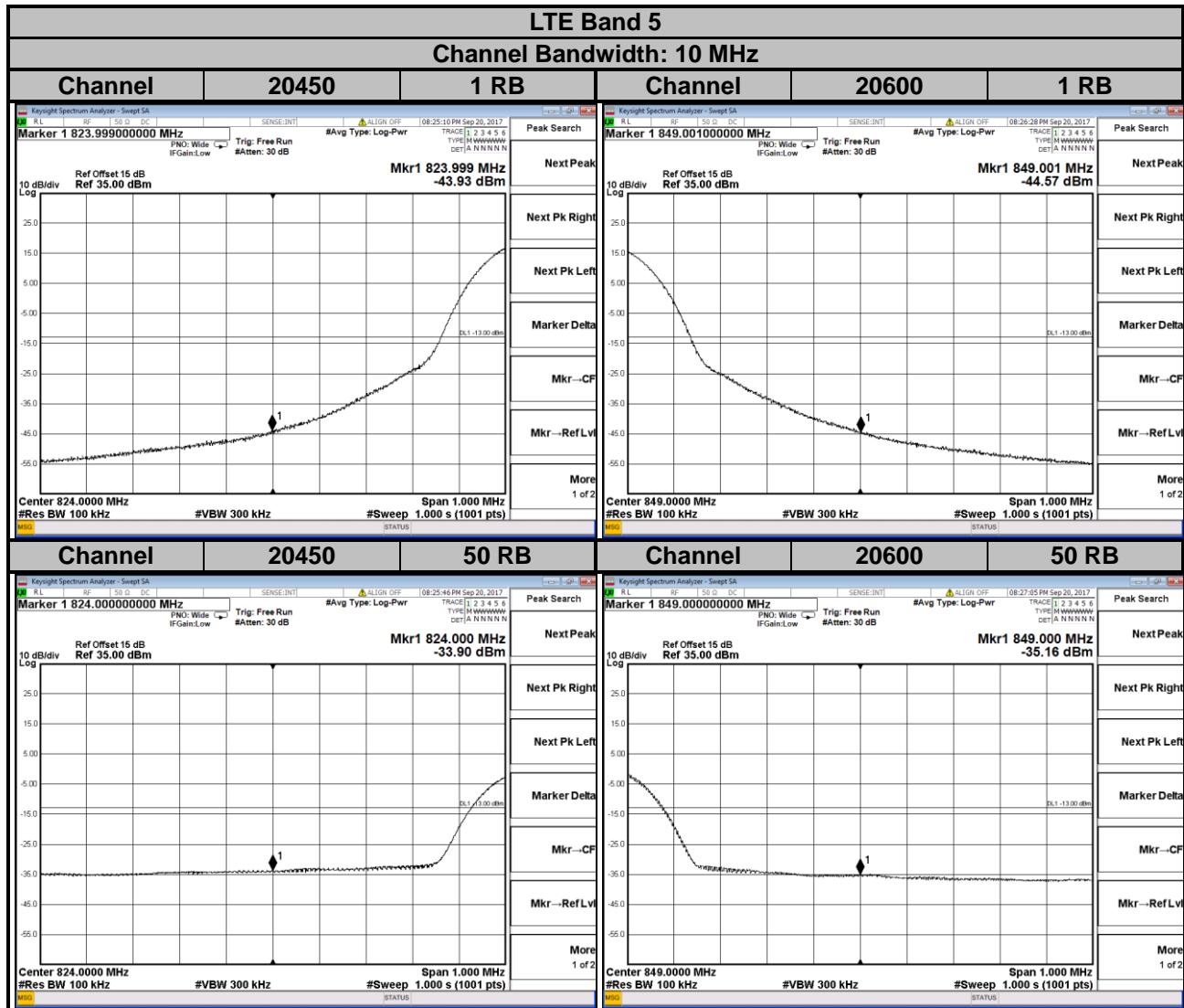










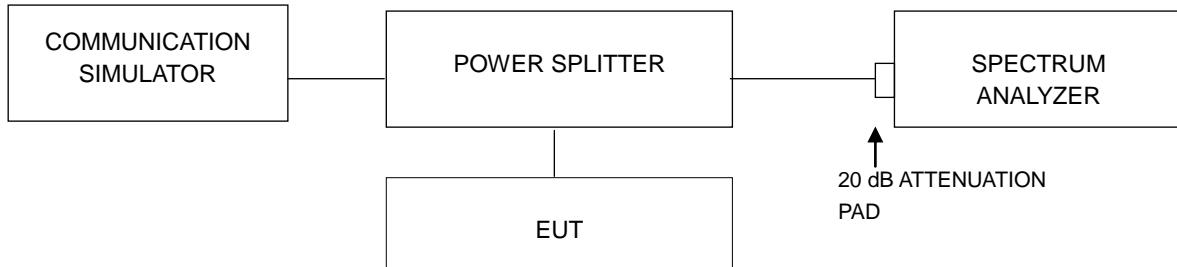


## 4.5 Peak to Average Ratio

### 4.5.1 Limits of Peak to Average Ratio Measurement

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB.

### 4.5.2 Test Setup

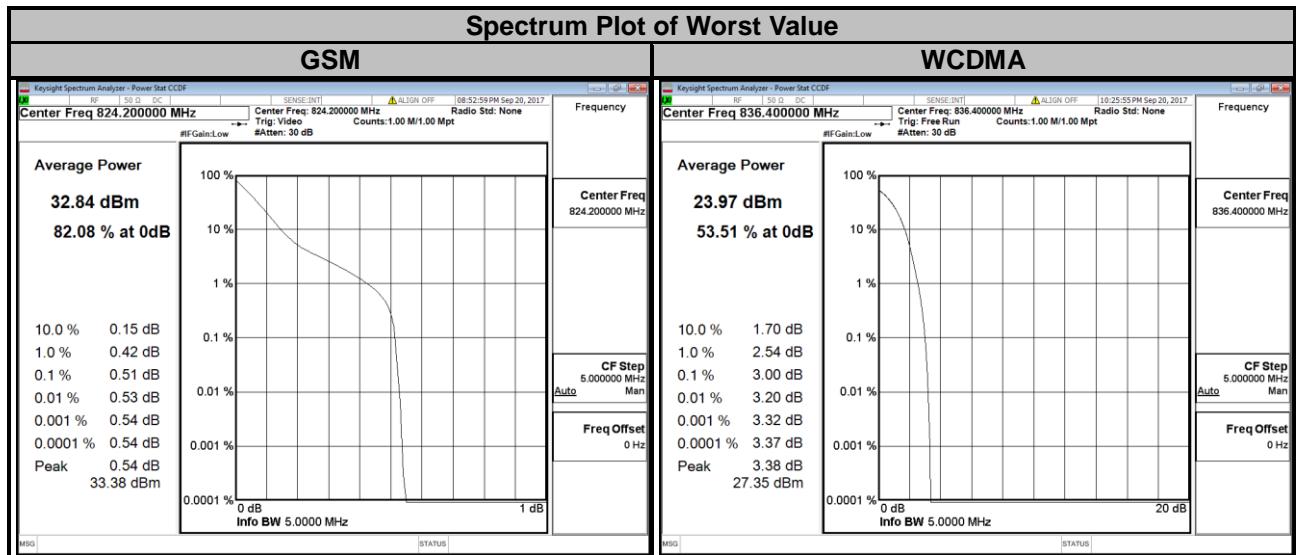


### 4.5.3 Test Procedures

1. Set resolution/measurement bandwidth  $\geq$  signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1 %.

#### 4.5.4 Test Results

Channel	Frequency (MHz)	Peak to Average Ratio (dB)	Channel	Frequency (MHz)	Peak to Average Ratio (dB)
		GSM			WCDMA
128	824.2	0.51	4132	826.4	2.93
189	836.4	0.49	4182	836.4	3.00
251	848.8	0.50	4233	846.6	2.84

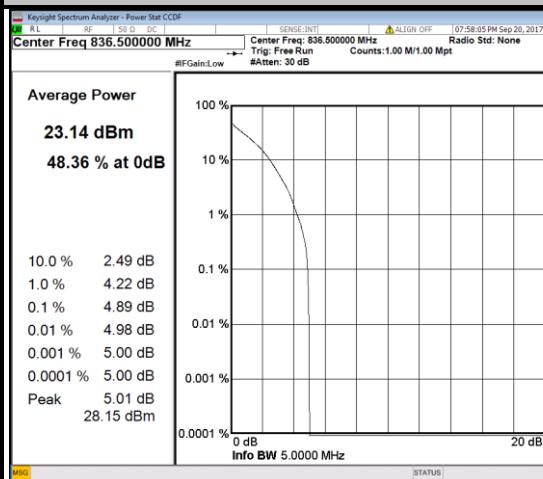


## LTE Band 5

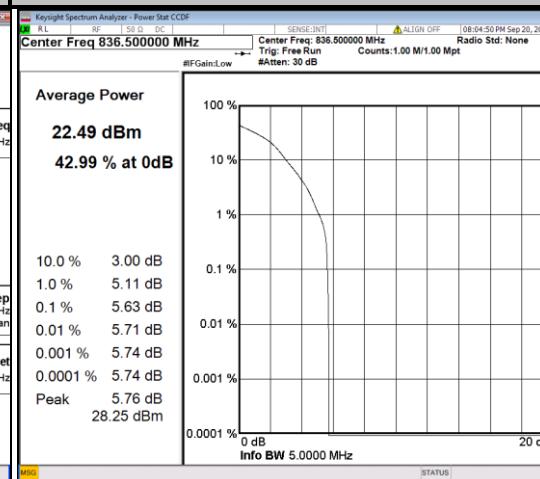
Channel Bandwidth: 1.4 MHz				Channel Bandwidth: 3 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
20407	824.7	4.71	5.57	20415	825.5	4.66	5.43
20525	836.5	4.89	5.63	20525	836.5	4.85	5.64
20643	848.3	4.50	5.33	20635	847.5	4.41	5.17

### Spectrum Plot of Worst Value

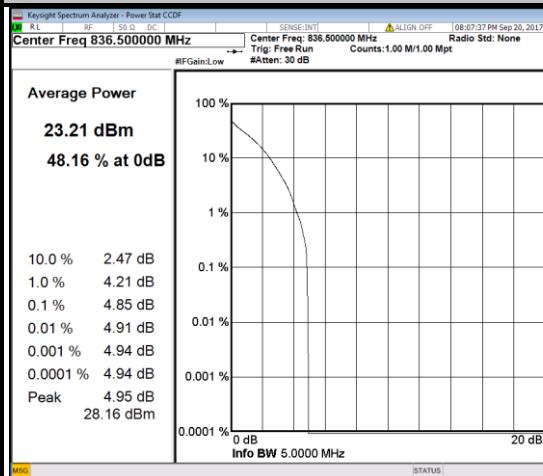
#### 1.4 MHz / QPSK



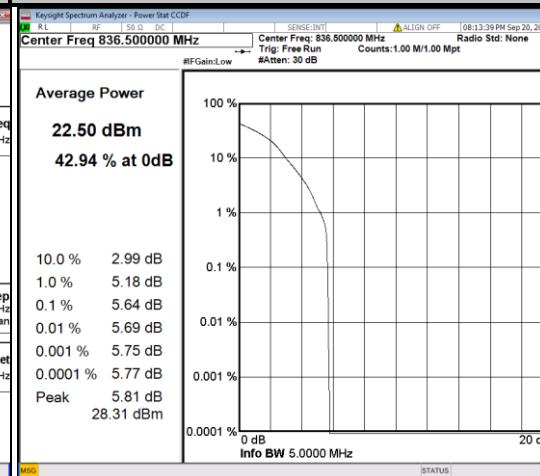
#### 1.4 MHz / 16QAM



#### 3 MHz / QPSK



#### 3 MHz / 16QAM

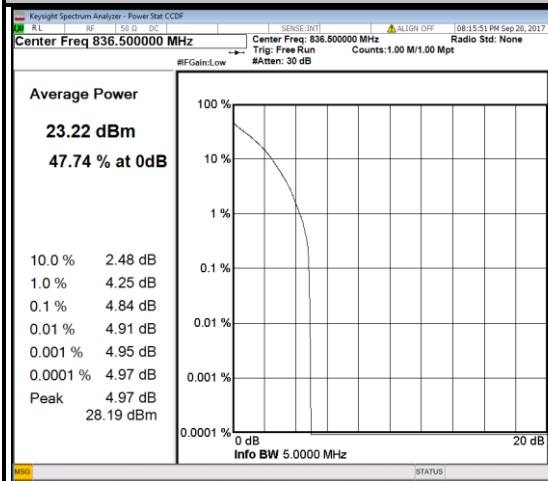


### LTE Band 5

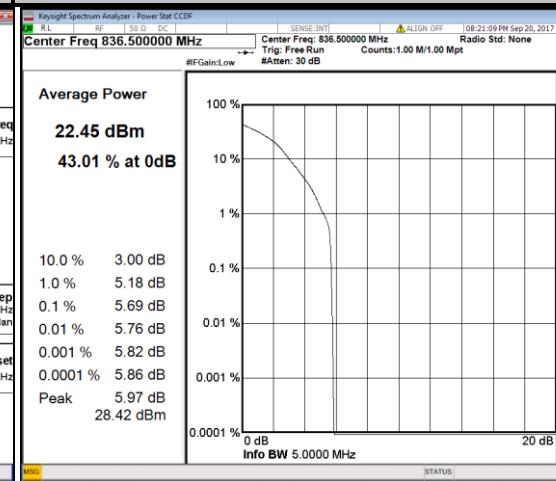
Channel Bandwidth: 5 MHz				Channel Bandwidth: 10 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
20425	826.5	4.66	5.41	20450	829.0	4.62	5.42
20525	836.5	4.84	5.69	20525	836.5	4.77	5.53
20625	846.5	4.26	5.06	20600	844.0	4.51	5.35

### Spectrum Plot of Worst Value

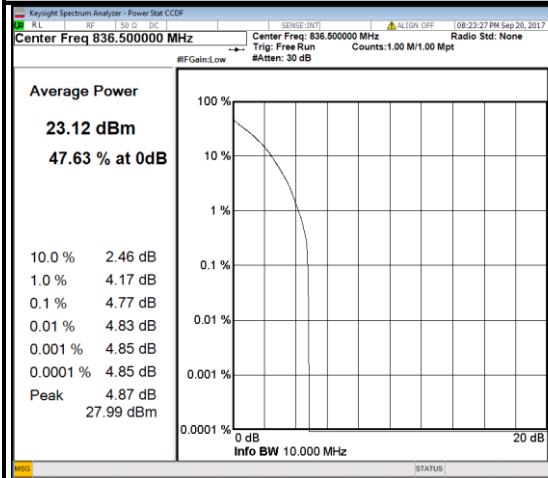
#### 5 MHz / QPSK



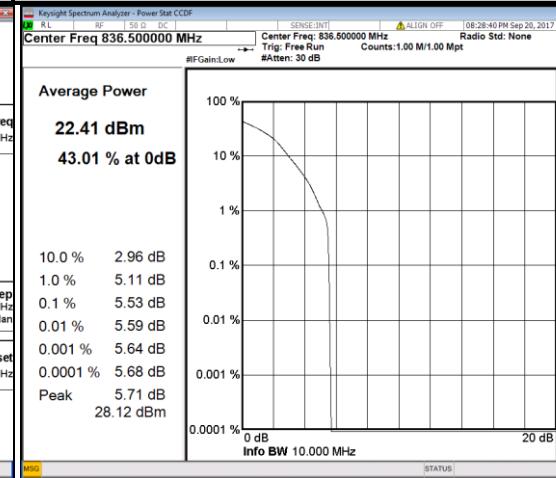
#### 5 MHz / 16QAM



#### 10 MHz / QPSK



#### 10 MHz / 16QAM

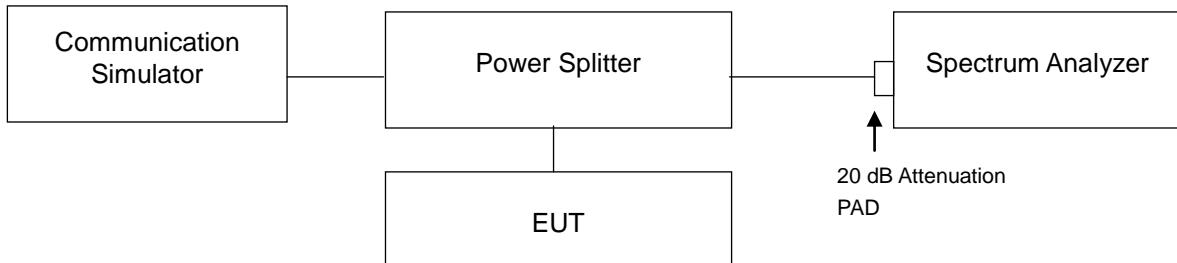


## 4.6 Conducted Spurious Emissions

### 4.6.1 Limits of Conducted Spurious Emissions Measurement

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. The emission limit equal to  $-13$  dBm.

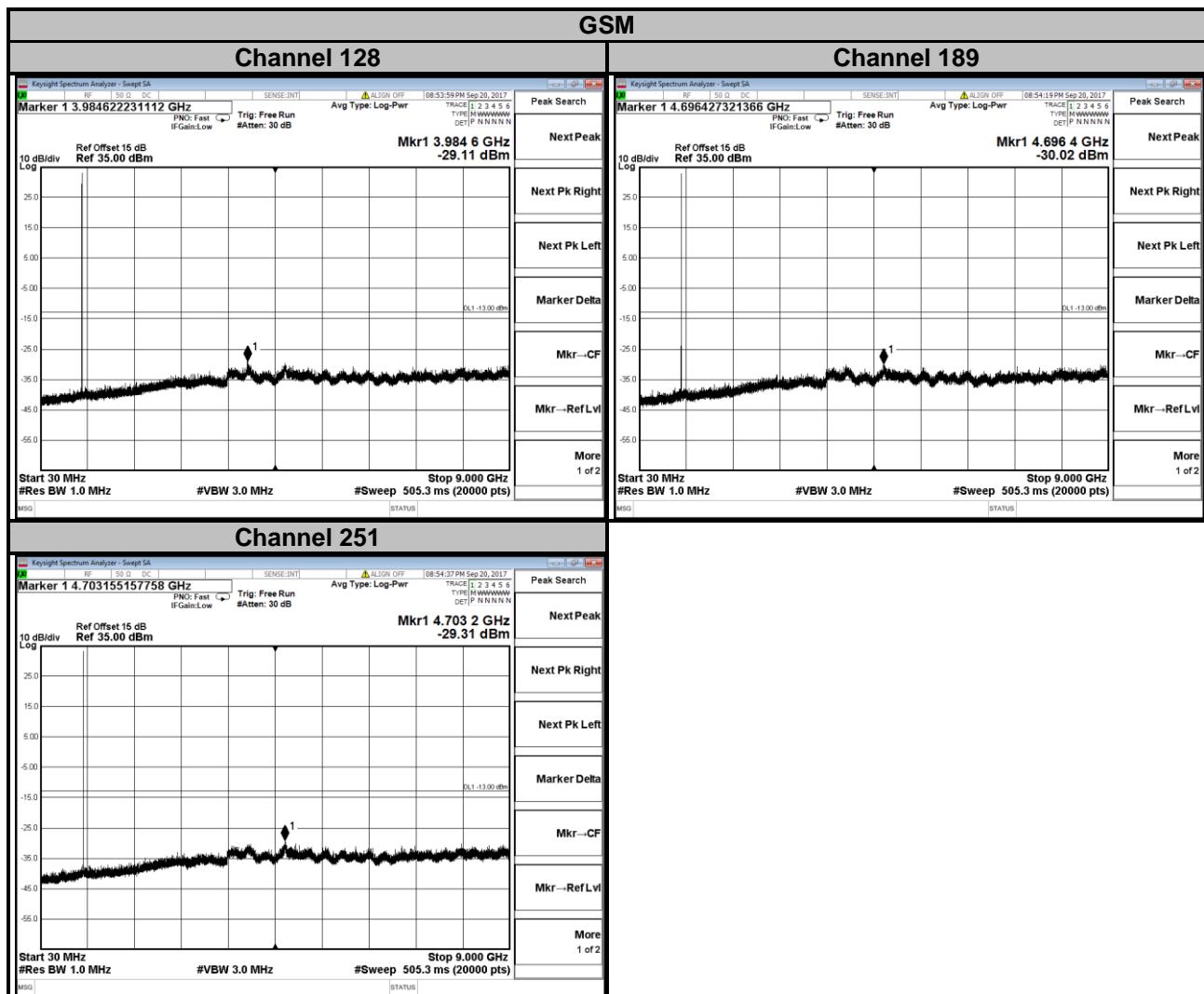
### 4.6.2 Test Setup

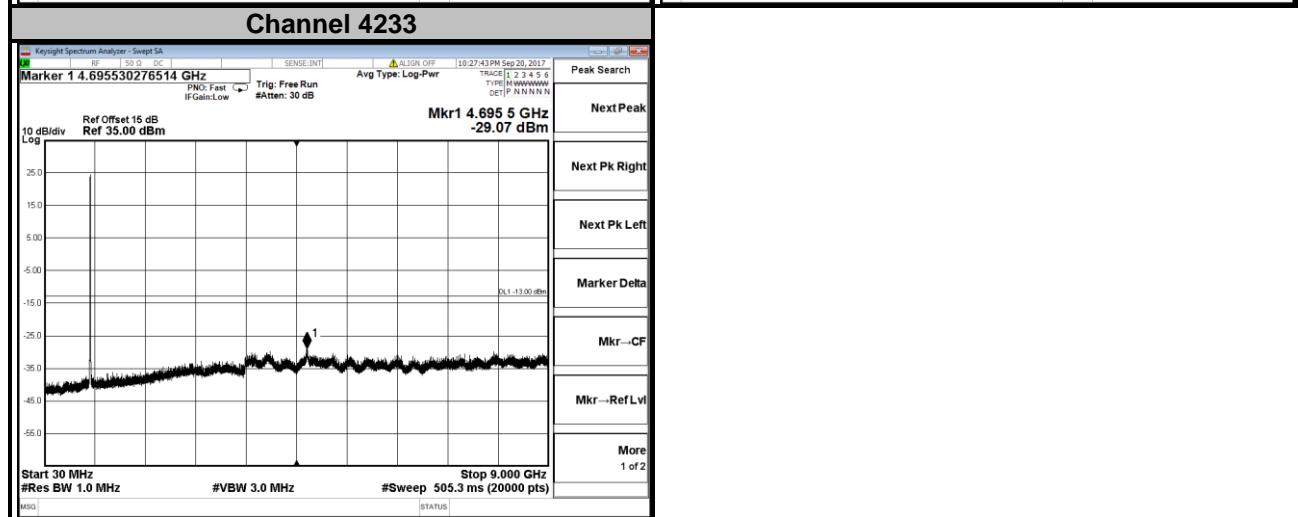
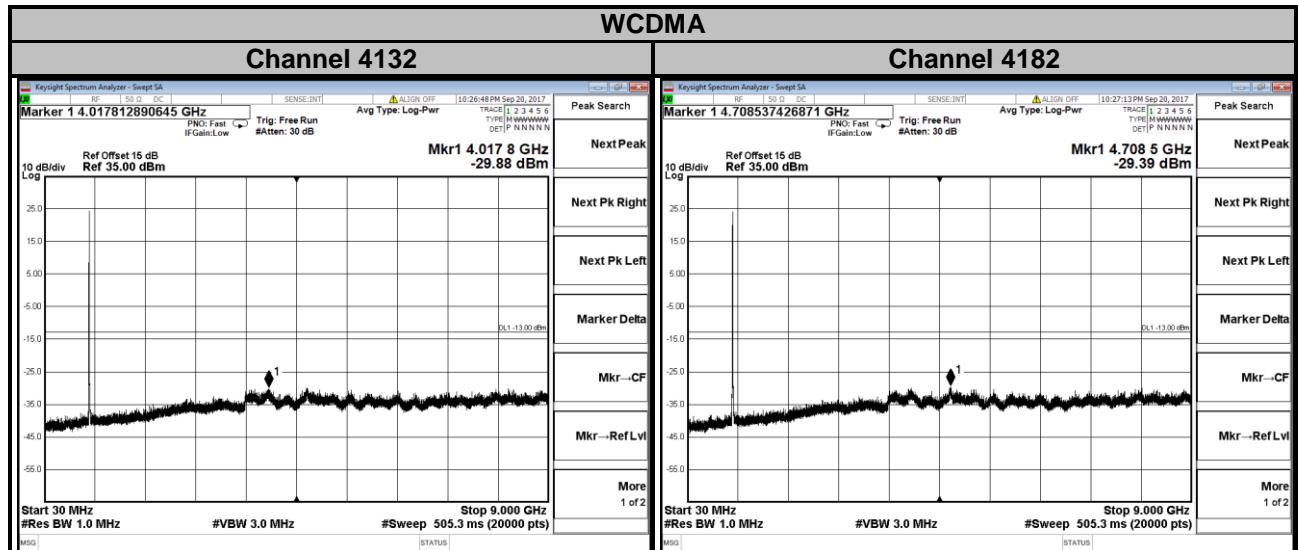


### 4.6.3 Test Procedure

- The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
- Measuring frequency range is from 9 kHz to 9 GHz. 20 dB attenuation pad is connected with spectrum. RBW=1 MHz and VBW=3 MHz is used for conducted emission measurement.

#### 4.6.4 Test Results

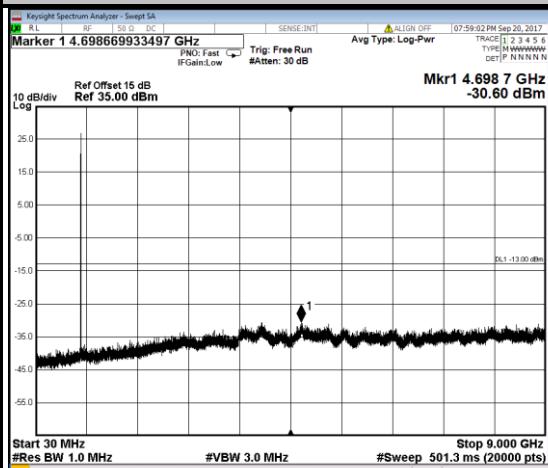




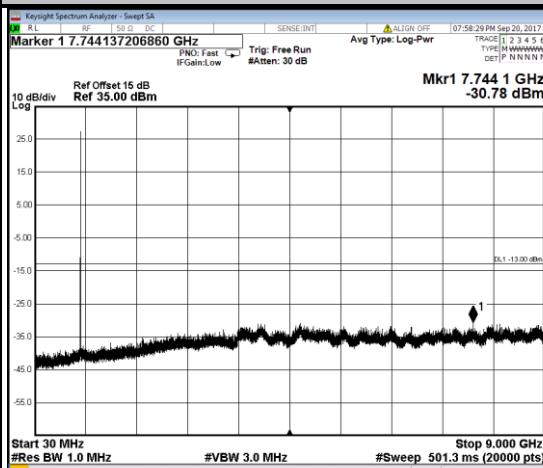
### LTE Band 5

Channel Bandwidth: 1.4 MHz

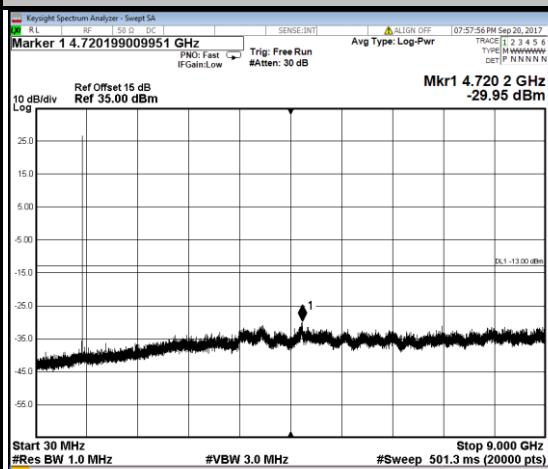
#### Channel 20407

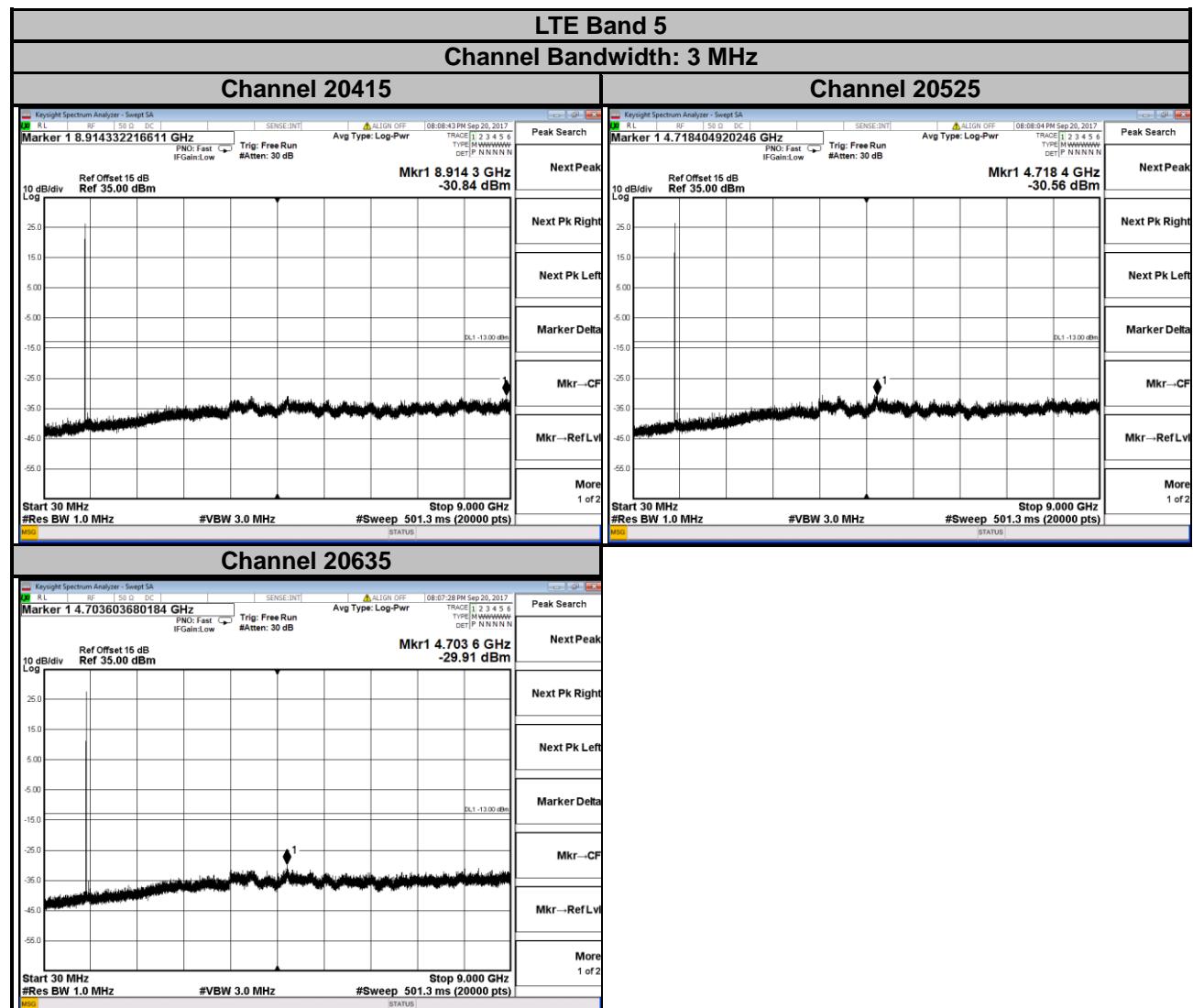


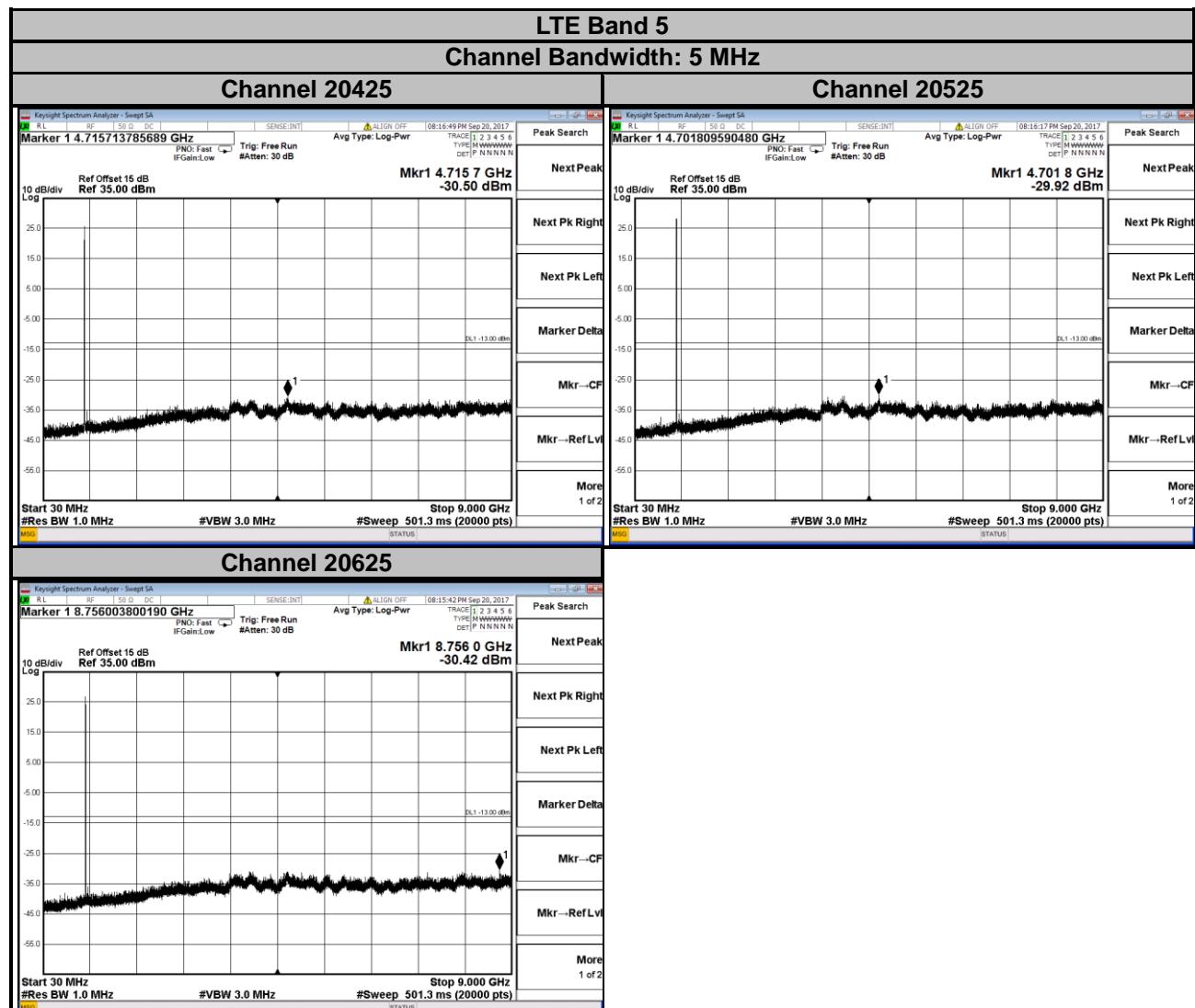
#### Channel 20525



#### Channel 20643





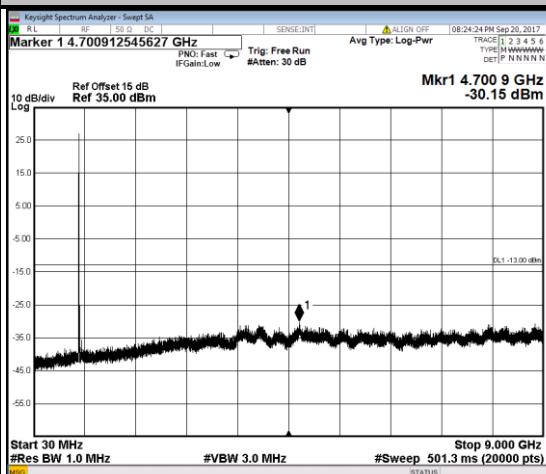




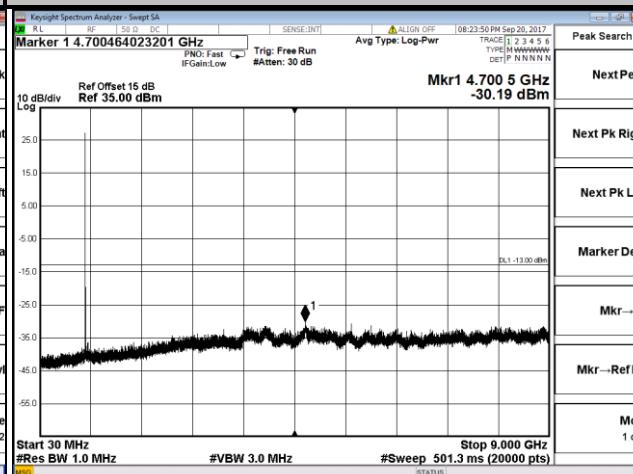
LTE Band 5

**Channel Bandwidth: 10 MHz**

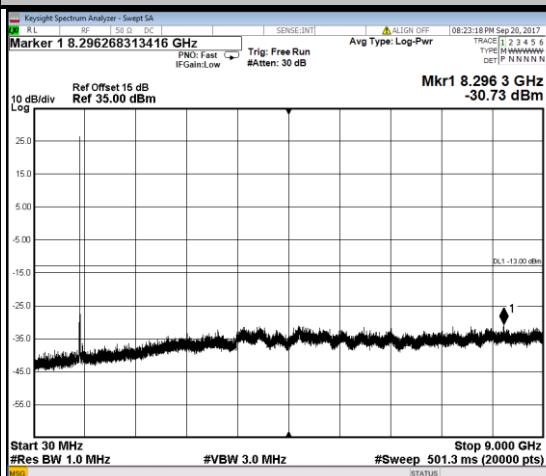
Channel 20450



Channel 20525



Channel 20600



## 4.7 Radiated Emission Measurement

### 4.7.1 Limits of Radiated Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. The emission limit is equal to -13 dBm.

### 4.7.2 Test Procedure

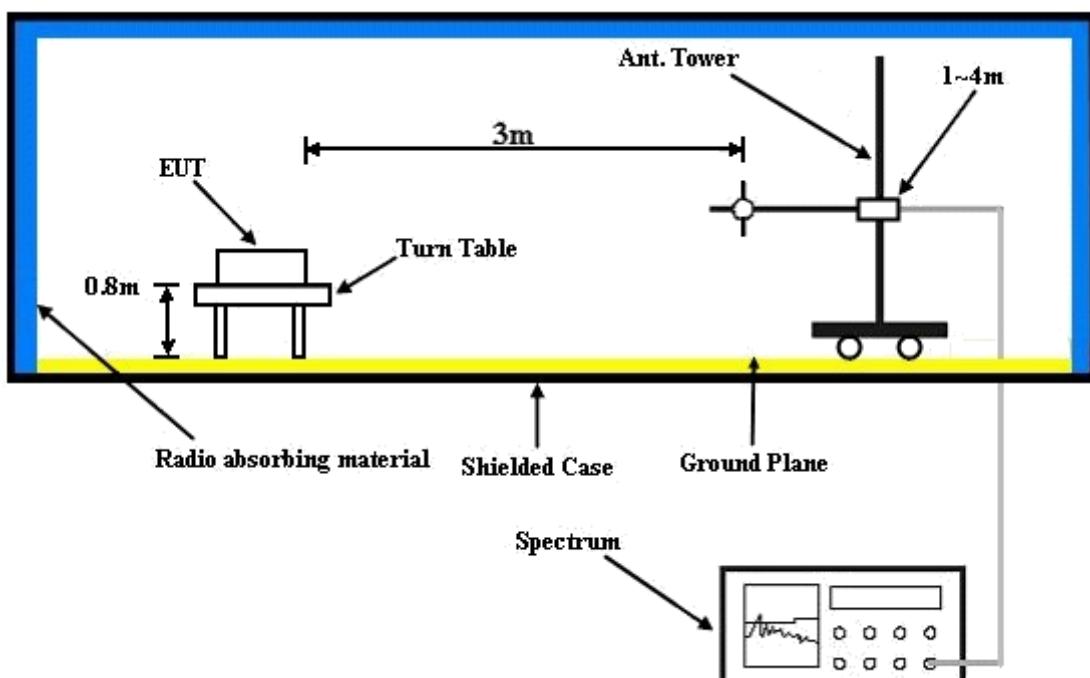
- a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1 m to 4 m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
- b. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value” of step a. Record the power level of S.G
- c. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.
- d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.R.P power - 2.15 dBi.

**NOTE:** The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz/3 MHz.

### 4.7.3 Deviation from Test Standard

No deviation.

### 4.7.4 Test Setup



For the actual test configuration, please refer to the attached file (Test Setup Photo).

## 4.7.5 Test Results

GSM:

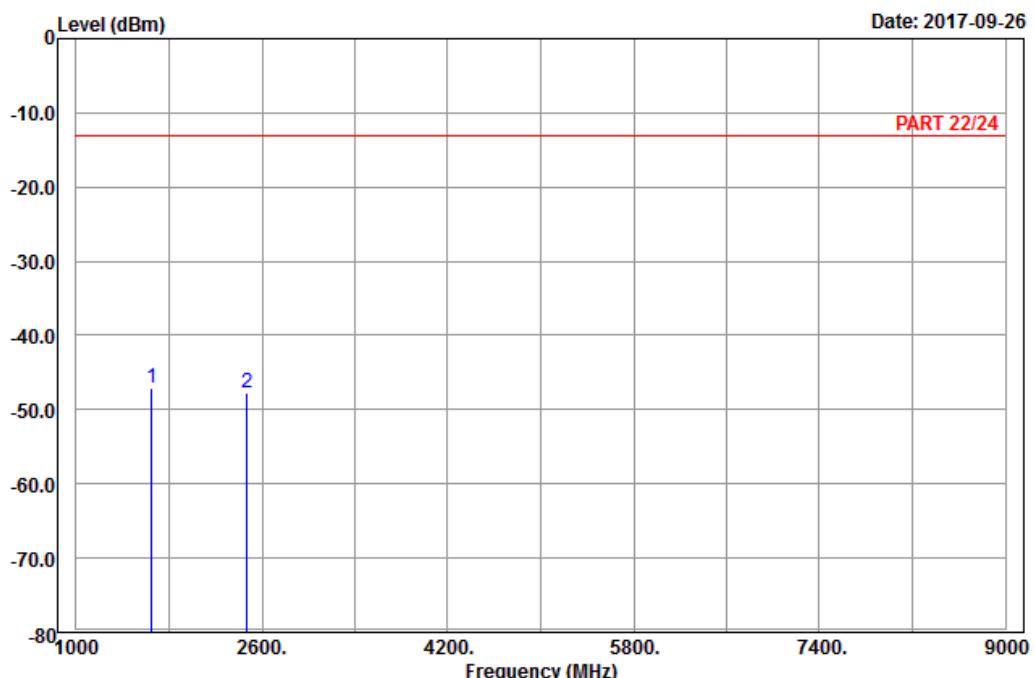
Low Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 5



Site : 966 chamber 1

Condition: PART 22/24 Horizontal

Remark : GSM 850\_Link\_CH128

Tested by: Harry Hsueh

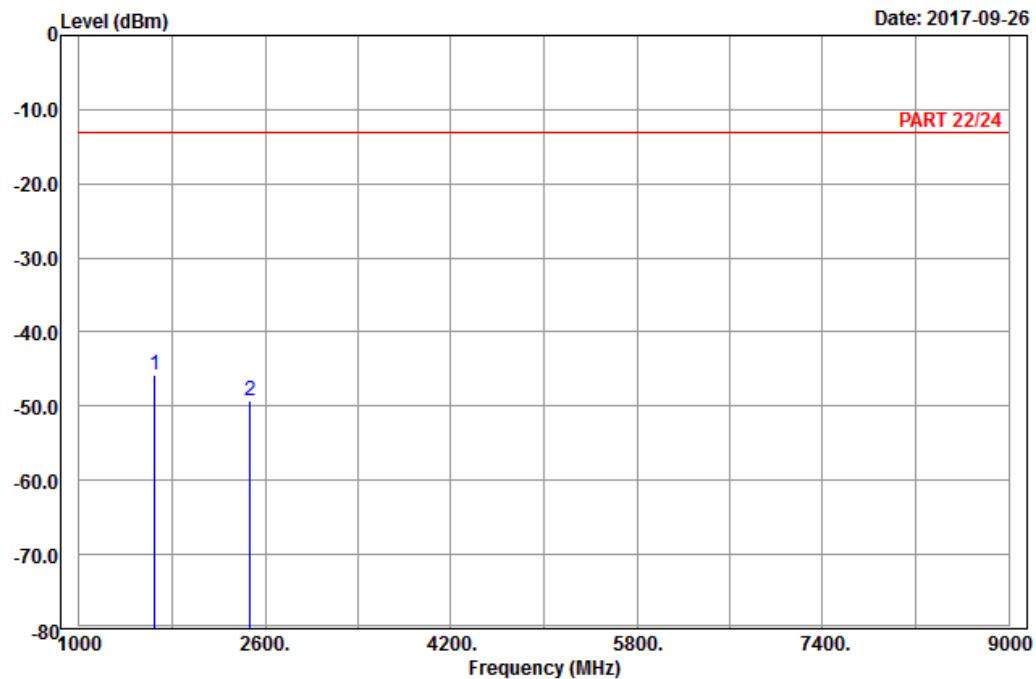
Freq	Level	Read	Limit	Over	Factor	Remark
		Line	Limit	Factor		
MHz	dBm	dBm	dBm	dB		
1 pp	1648.40	-47.14	-54.87	-13.00	-34.14	7.73 Peak
2	2472.60	-47.65	-58.68	-13.00	-34.65	11.03 Peak



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A D T

Data: 6



Site : 966 chamber 1  
Condition: PART 22/24 Vertical  
Remark : GSM 850\_Link\_CH128  
Tested by: Harry Hsueh

Freq		Read	Limit	Over	Factor	Remark
		Level	Level	Line		
	MHz	dBm	dBm	dBm	dB	
1 pp	1648.40	-45.77	-53.50	-13.00	-32.77	7.73 Peak
2	2472.60	-49.29	-60.32	-13.00	-36.29	11.03 Peak

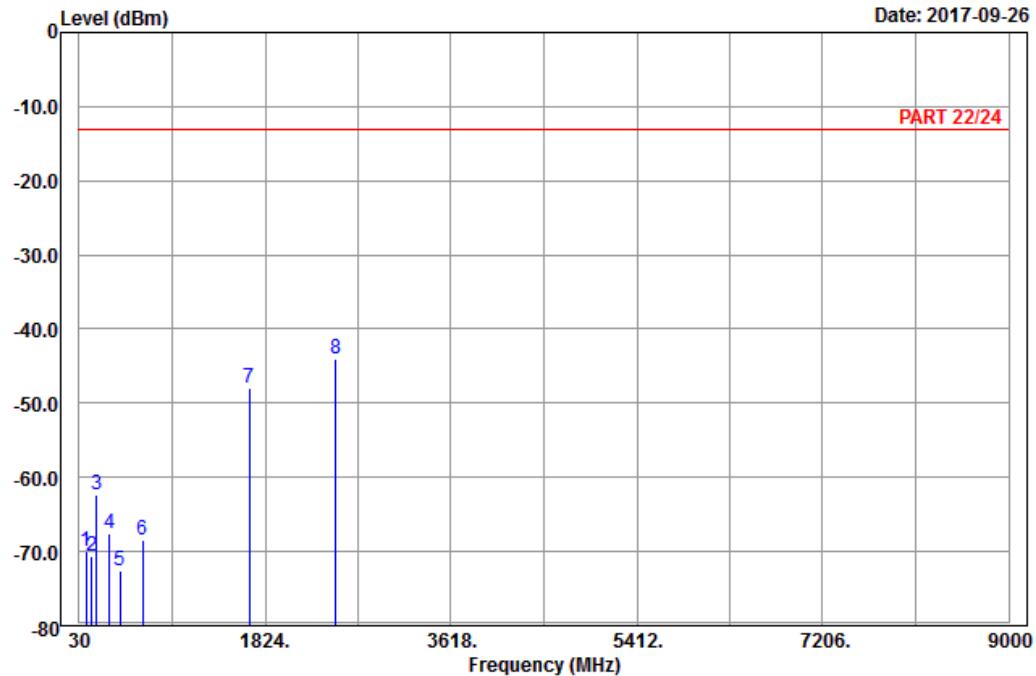
## Middle Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9



Site : 966 chamber 1  
 Condition: PART 22/24 Horizontal  
 Remark : GSM 850\_Link\_CH189  
 Tested by: Harry Hsueh

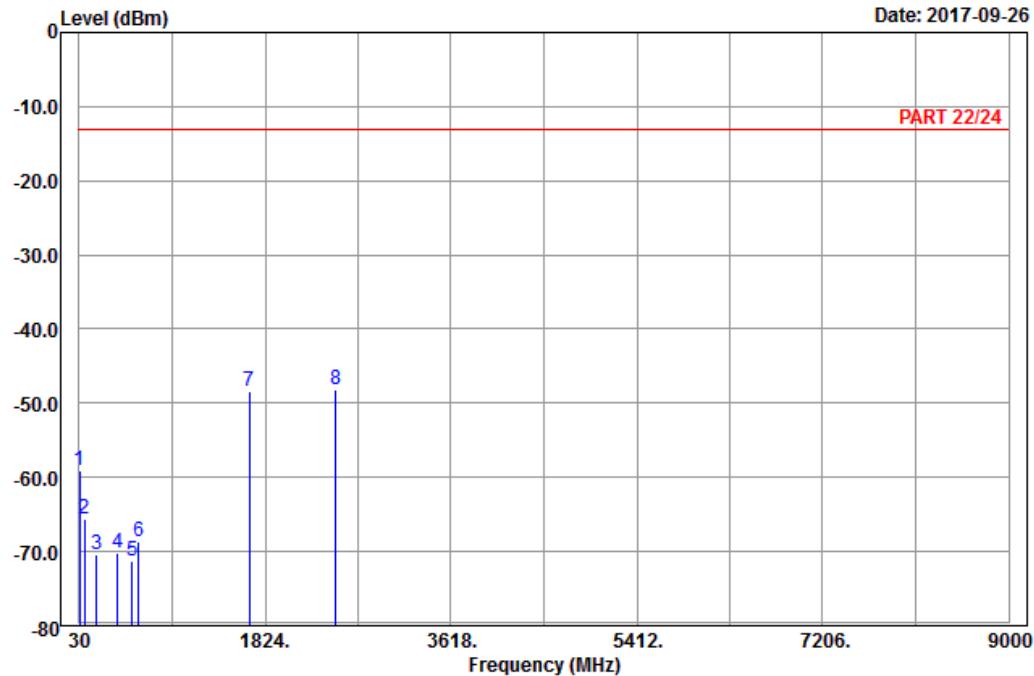
	Freq	Read Level	Limit Level	Over Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB		
1	93.18	-69.91	-59.40	-13.00	-56.91	-10.51	Peak
2	154.74	-70.61	-62.80	-13.00	-57.61	-7.81	Peak
3	194.16	-62.42	-56.51	-13.00	-49.42	-5.91	Peak
4	323.80	-67.57	-61.89	-13.00	-54.57	-5.68	Peak
5	422.50	-72.65	-69.40	-13.00	-59.65	-3.25	Peak
6	644.40	-68.39	-68.32	-13.00	-55.39	-0.07	Peak
7	1672.80	-48.04	-55.95	-13.00	-35.04	7.91	Peak
8 pp	2509.20	-44.07	-55.35	-13.00	-31.07	11.28	Peak



**Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch**

**A D T**

**Data: 10**



Site : 966 chamber 1  
 Condition: PART 22/24 Vertical  
 Remark : GSM 850\_Link\_CH189  
 Tested by: Harry Hsueh

	Read Freq	Limit Level	Over Line	Limit	Over Factor	Remark
	MHz	dBm	dBm	dBm	dB	
1	34.86	-59.16	-48.06	-13.00	-46.16	-11.10 Peak
2	82.92	-65.58	-54.14	-13.00	-52.58	-11.44 Peak
3	197.13	-70.36	-64.31	-13.00	-57.36	-6.05 Peak
4	403.60	-70.26	-67.43	-13.00	-57.26	-2.83 Peak
5	538.70	-71.26	-68.75	-13.00	-58.26	-2.51 Peak
6	603.80	-68.68	-69.06	-13.00	-55.68	0.38 Peak
7	1672.80	-48.32	-56.23	-13.00	-35.32	7.91 Peak
8 pp	2509.20	-48.27	-59.55	-13.00	-35.27	11.28 Peak

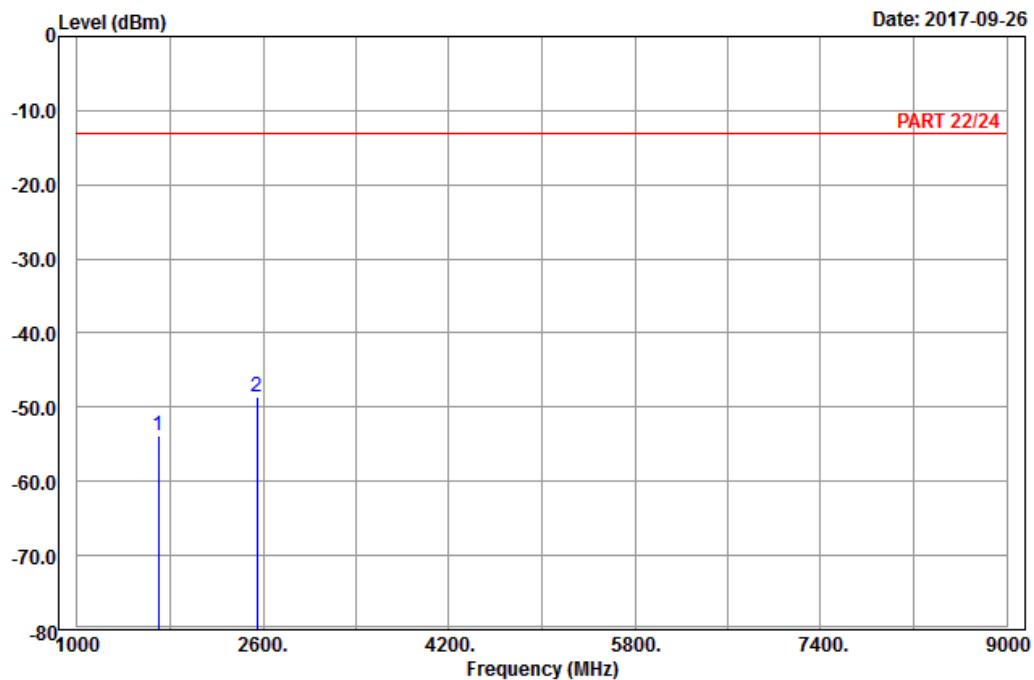
## High Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 5



Site : 966 chamber 1  
Condition: PART 22/24 Horizontal  
Remark : GSM 850\_Link\_CH251  
Tested by: Harry Hsueh

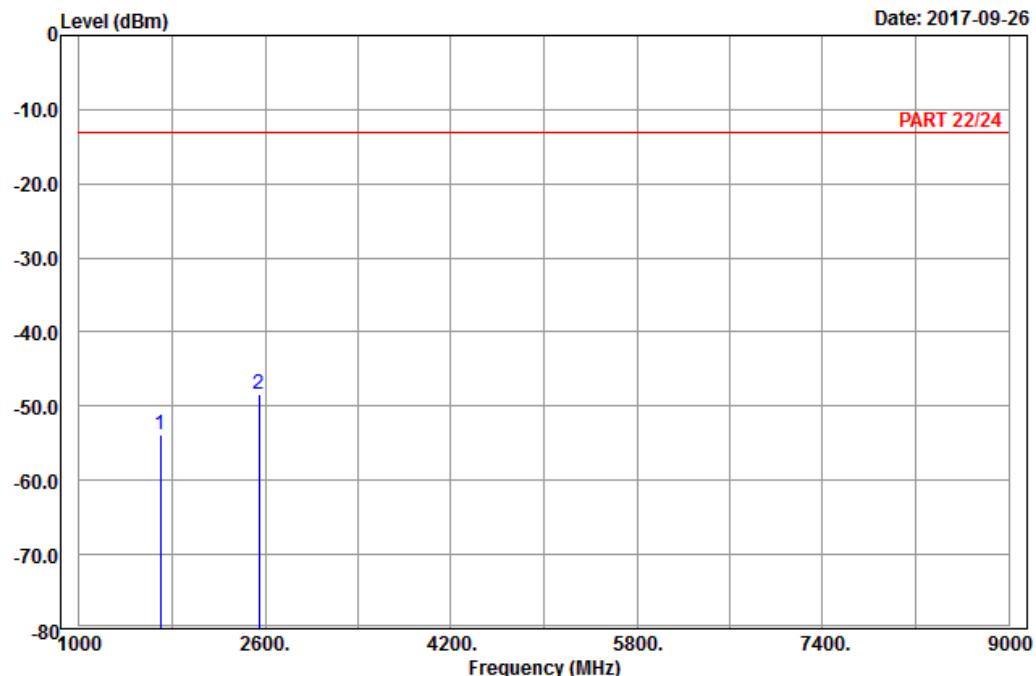
	Freq	Read Level	Limit Level	Over Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB		
1	1697.60	-53.93	-62.07	-13.00	-40.93	8.14	Peak
2 pp	2546.40	-48.67	-60.14	-13.00	-35.67	11.47	Peak



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A D T

Data: 6



Site : 966 chamber 1  
Condition: PART 22/24 Vertical  
Remark : GSM 850\_Link\_CH251  
Tested by: Harry Hsueh

Freq	Level	Limit	Read	Limit	Over	Factor	Remark
			Line	Line	dB		
MHz	dBm	dBm	dBm	dB	dB		
1	1697.60	-53.94	-62.08	-13.00	-40.94	8.14	Peak
2 pp	2546.40	-48.37	-59.84	-13.00	-35.37	11.47	Peak

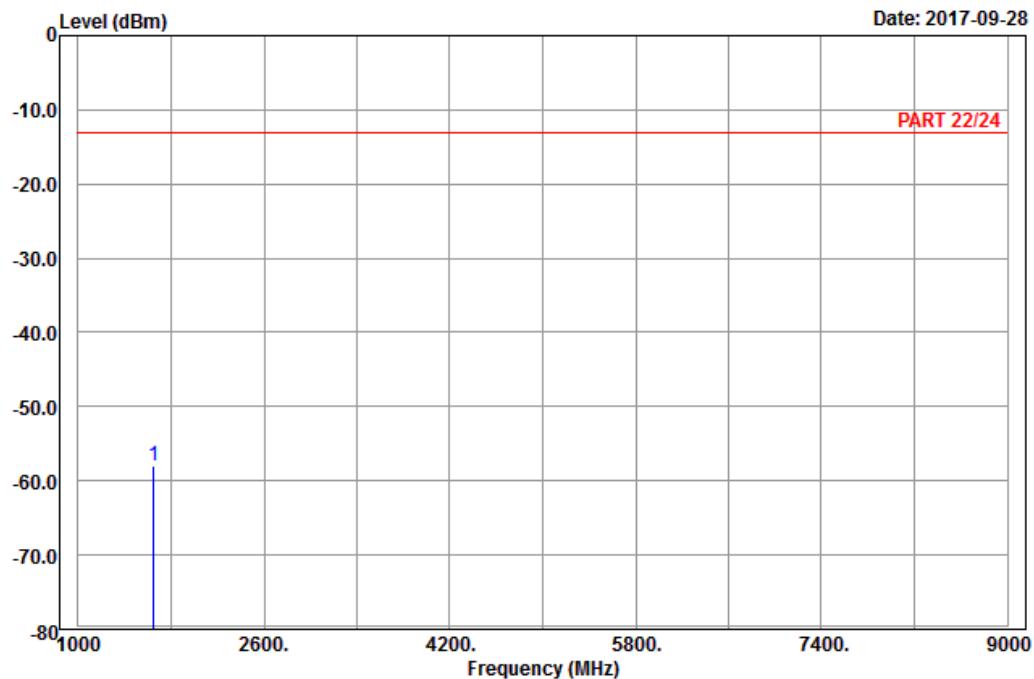
WCDMA:  
Low Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 5



Site : 966 chamber 1  
Condition: PART 22/24 Horizontal  
Remark : Band V\_Link\_CH4132  
Tested by: Harry Hsueh

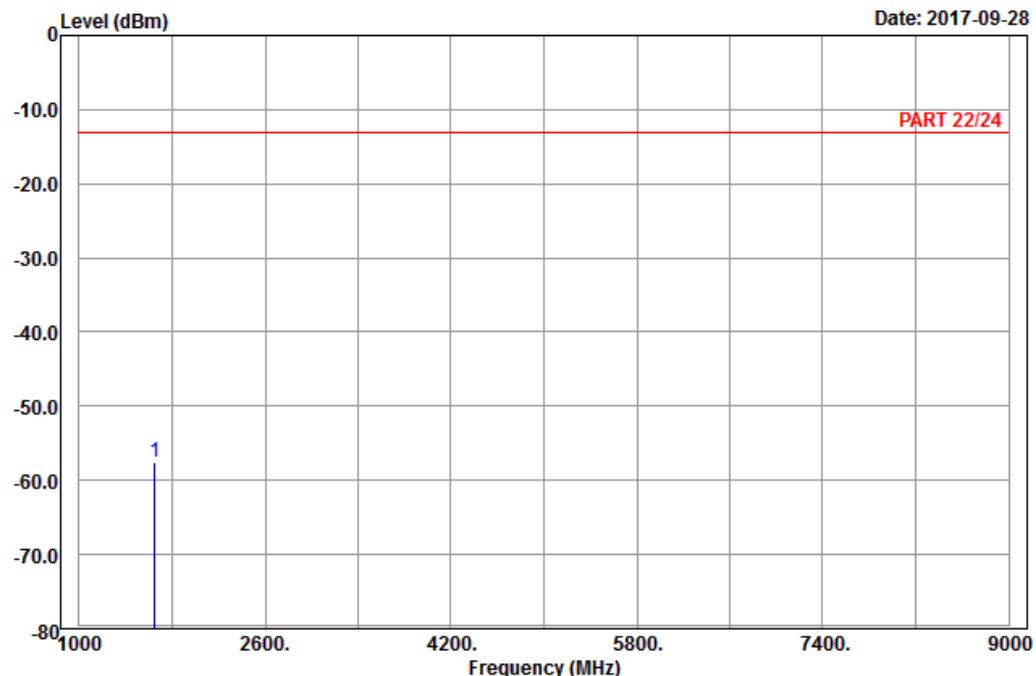
Freq	Level	Read	Limit	Over	Factor	Remark
		Level	Line	Limit		
MHz	dBm	dBm	dBm	dB	dB	
1 pp	1652.80	-57.93	-65.66	-13.00	-44.93	7.73 Peak



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A D T

Data: 6



Site : 966 chamber 1  
Condition: PART 22/24 Vertical  
Remark : Band V\_Link\_CH4132  
Tested by: Harry Hsueh

Freq	Level	Read	Limit	Over	Factor	Remark
		MHz	dBm	dBm	Line	Limit
1 pp	1652.80	-57.55	-65.28	-13.00	-44.55	7.73 Peak

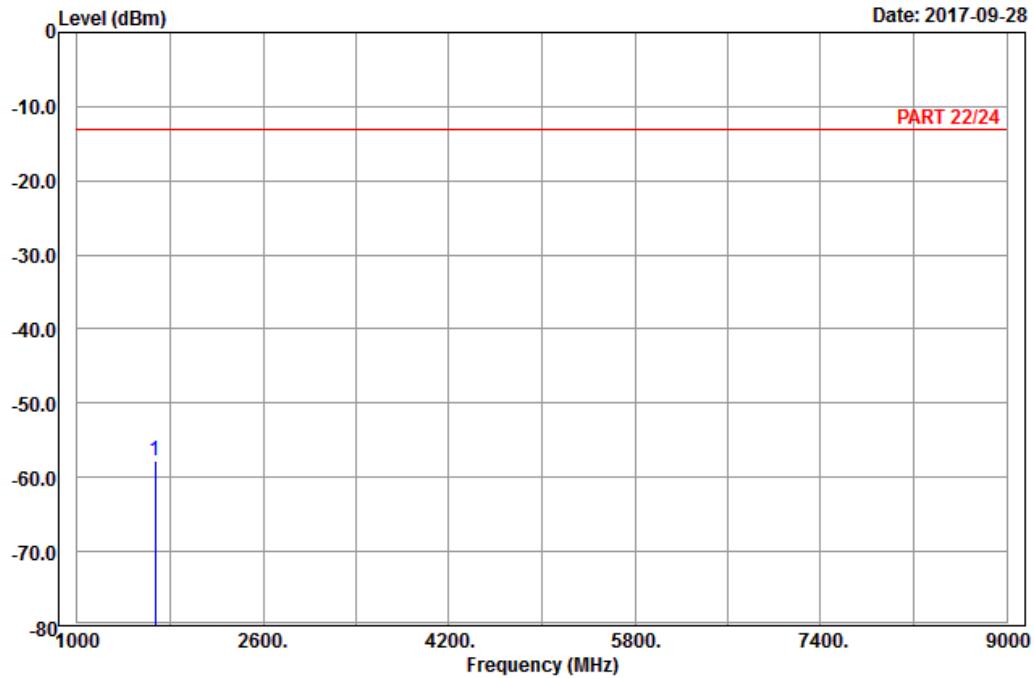
## Middle Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 5



Site : 966 chamber 1  
Condition: PART 22/24 Horizontal  
Remark : Band V\_Link\_CH4182  
Tested by: Harry Hsueh

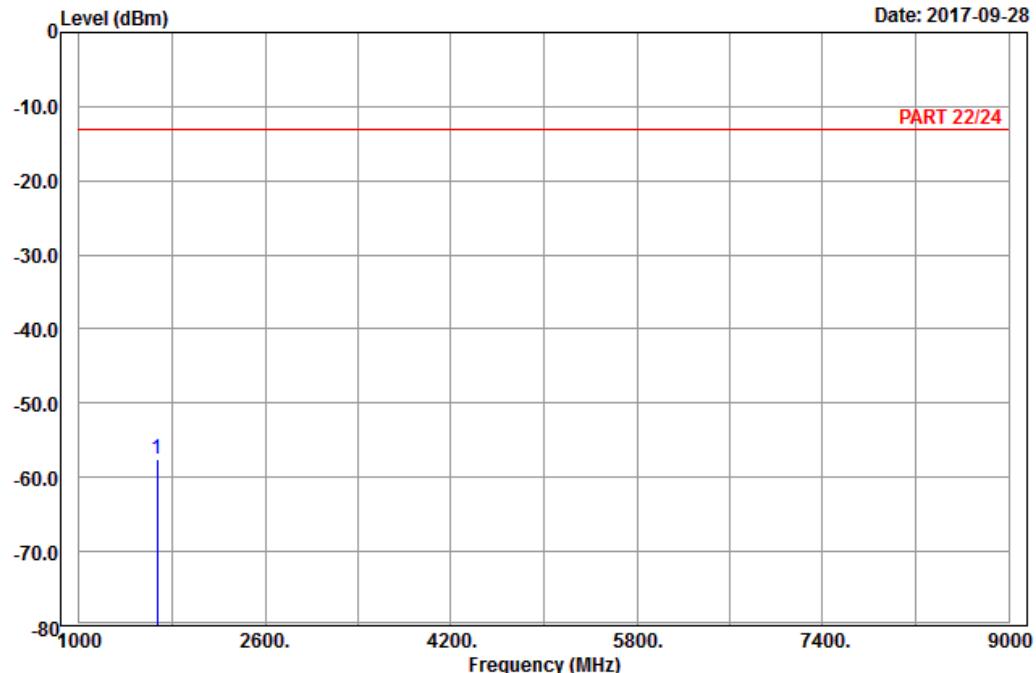
Freq	Read Level	Limit Level	Over Line	Over Limit	Factor	Remark
1 pp 1672.80	-57.71	-65.62	-13.00	-44.71	7.91	Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 6



Site : 966 chamber 1  
Condition: PART 22/24 Vertical  
Remark : Band V\_Link\_CH4182  
Tested by: Harry Hsueh

Freq	Level	Limit	Over			Remark
			Line	Factor	dB	
MHz	dBm	dBm	dBm	dB	dB	
1 pp	1672.80	-57.62	-65.53	-13.00	-44.62	7.91 Peak

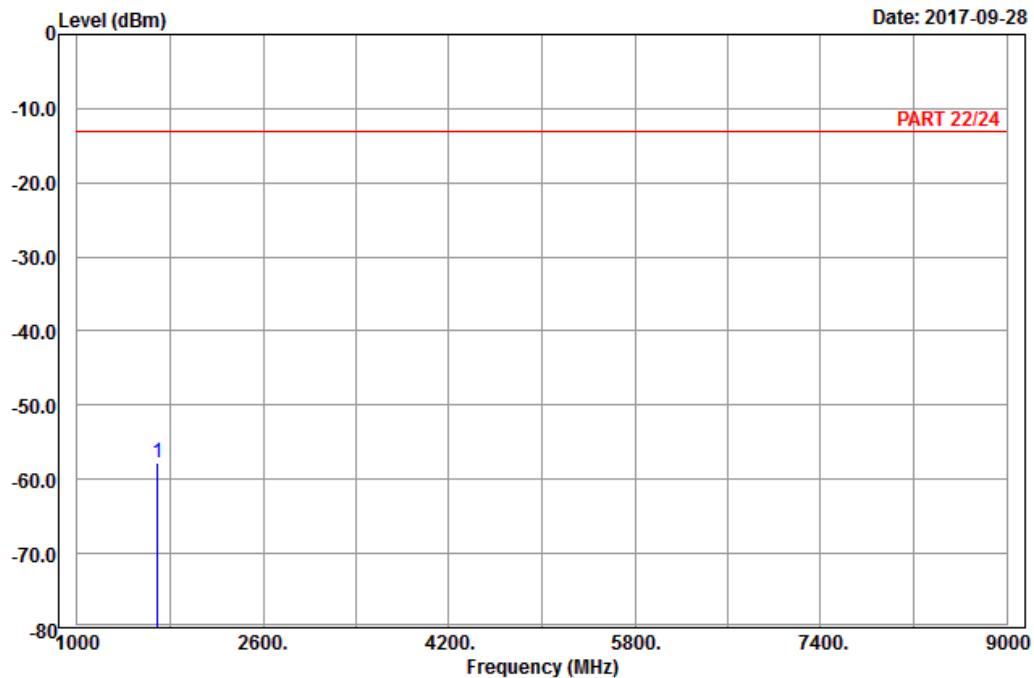
## High Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 5



Site : 966 chamber 1  
Condition: PART 22/24 Horizontal  
Remark : Band V\_Link\_CH4233  
Tested by: Harry Hsueh

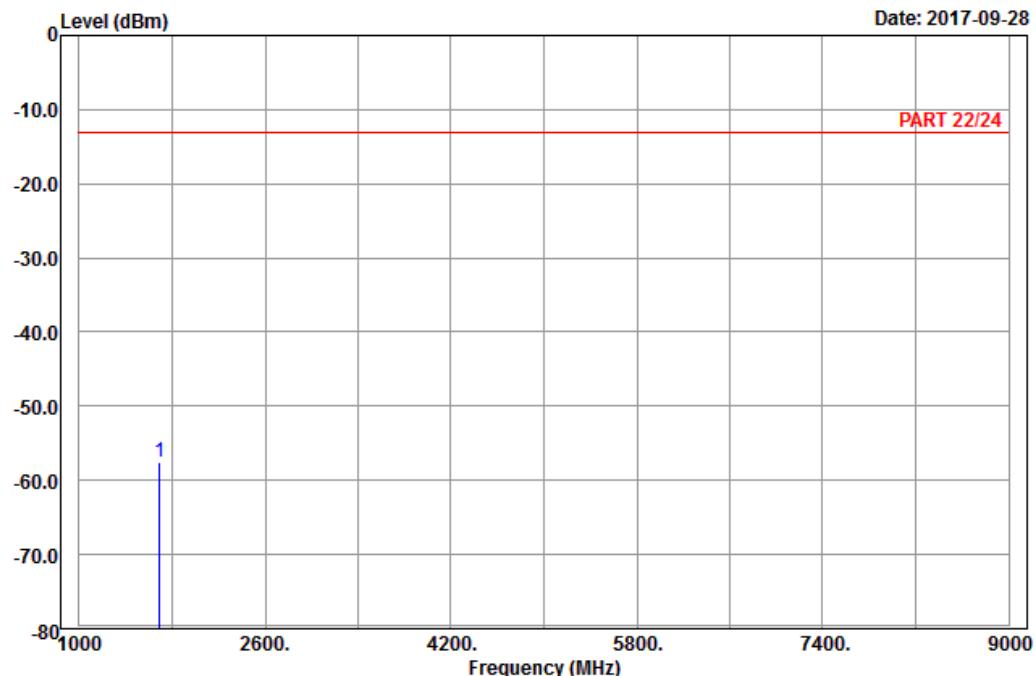
Freq	Read Level	Limit Level	Over Line	Over Limit	Factor	Remark
1 pp	1693.20	-57.82	-65.96	-13.00	-44.82	8.14 Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 6



Site : 966 chamber 1  
Condition: PART 22/24 Vertical  
Remark : Band V\_Link\_CH4233  
Tested by: Harry Hsueh

Freq	Level	Read	Limit	Over	Factor	Remark
		Level	Line	Limit		
MHz	dBm	dBm	dBm	dB	dB	
1 pp	1693.20	-57.62	-65.76	-13.00	-44.62	8.14 Peak

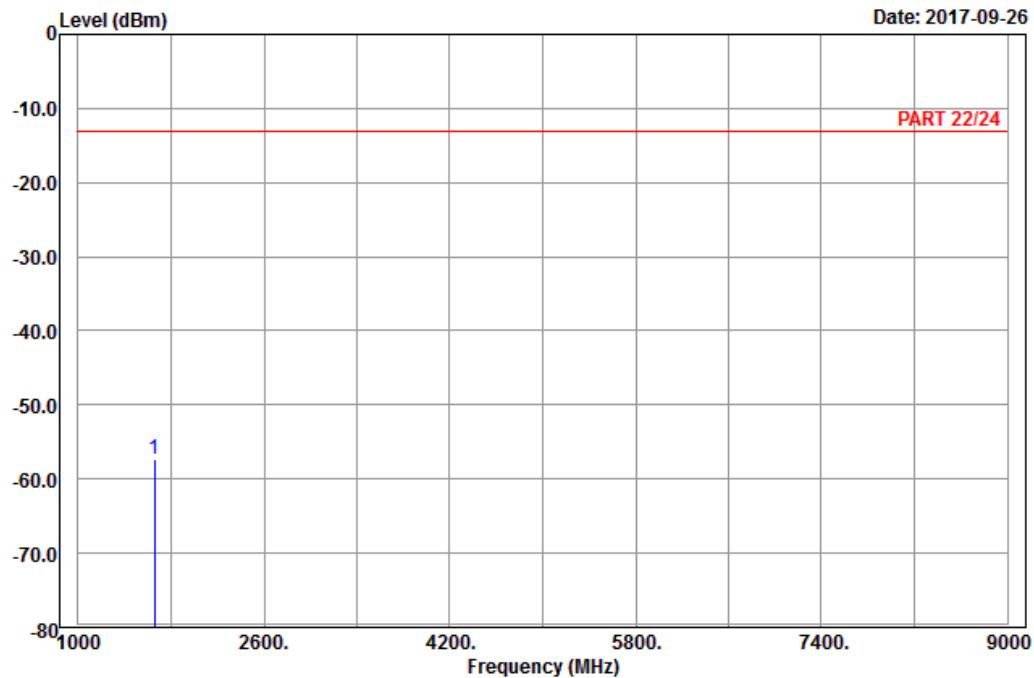
**LTE Band 5**  
**Channel Bandwidth: 10 MHz / QPSK**  
**Low Channel**



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

**Data: 5**



Site : 966 chamber 1  
 Condition: PART 22/24 Horizontal  
 Remark : LTE\_Band 5\_Link\_CH20450  
 Tested by: Harry Hsueh

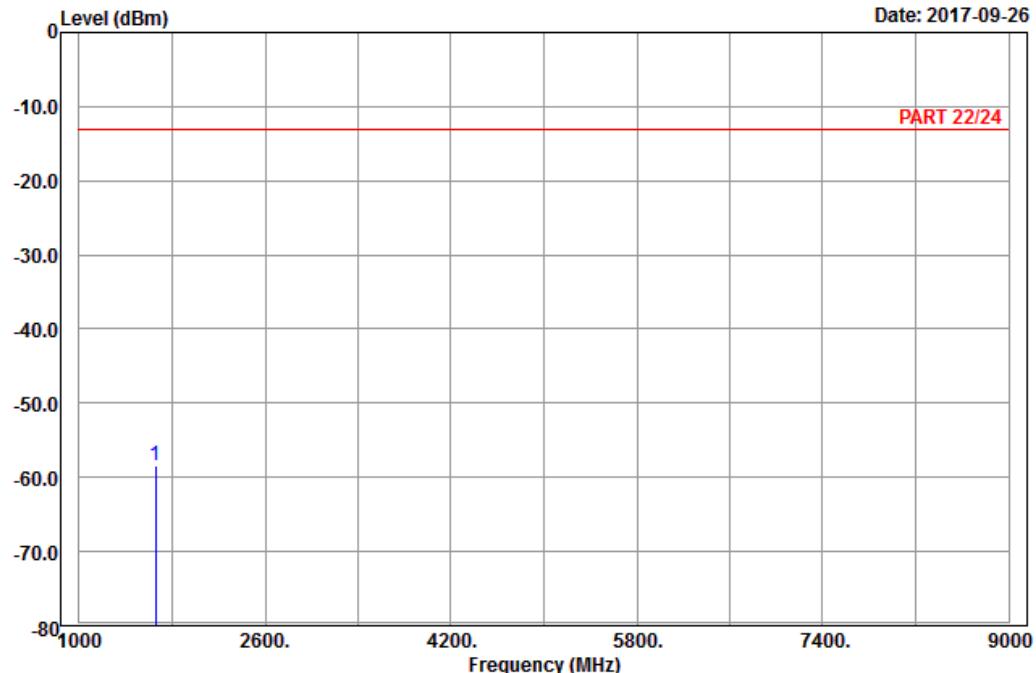
Freq	Read	Limit	Over	Factor	Remark
	Level	Level	Line		
MHz	dBm	dBm	dBm	dB	dB
1 pp	1658.00	-57.37	-65.28	-13.00	-44.37
				7.91	Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 6



Site : 966 chamber 1

Condition: PART 22/24 Vertical

Remark : LTE\_Band 5\_Link\_CH20450

Tested by: Harry Hsueh

Freq	Level	Read	Limit	Over	Factor	Remark
		MHz	dBm	dBm	Line	dB
1 pp	1658.00	-58.36	-66.27	-13.00	-45.36	7.91 Peak

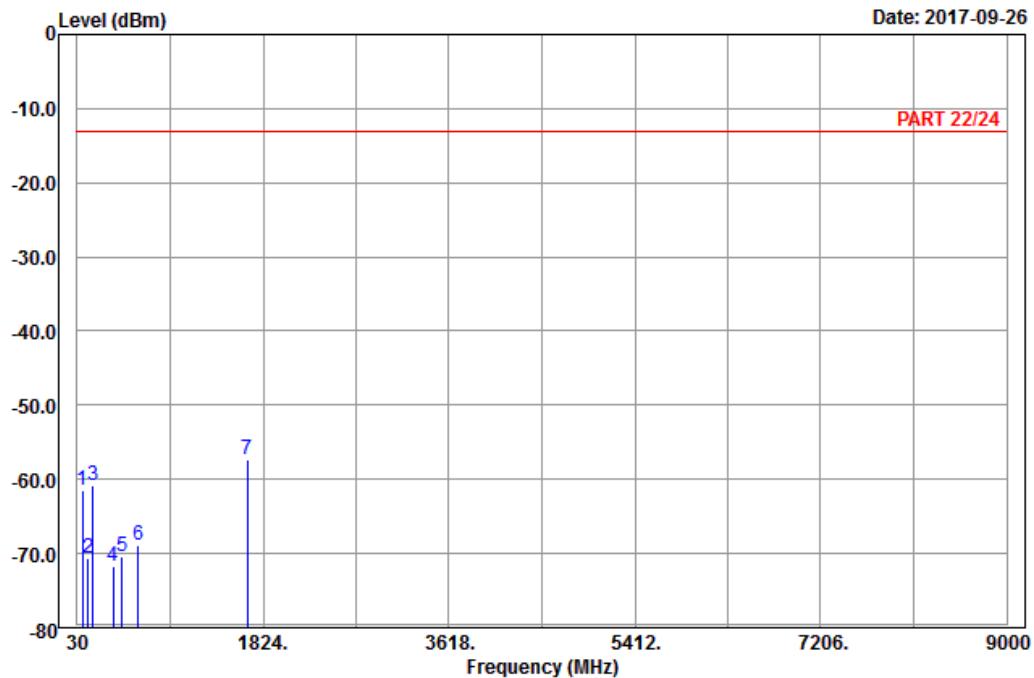
## Middle Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9



Site : 966 chamber 1

Condition: PART 22/24 Horizontal

Remark : LTE\_Band 5\_Link\_CH20525

Tested by: Harry Hsueh

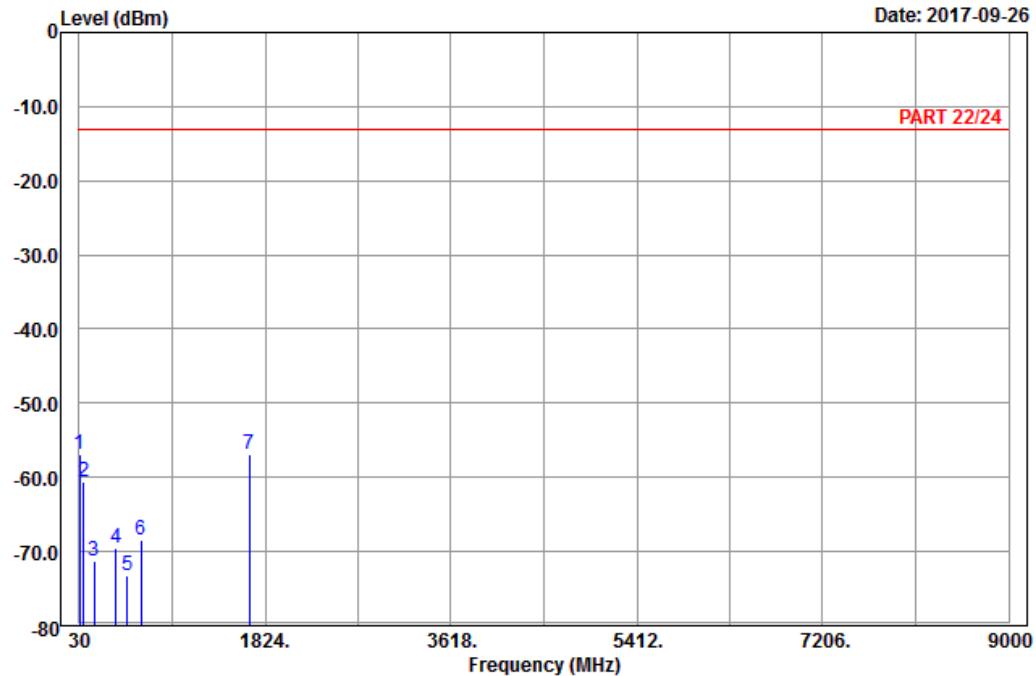
	Freq	Read Level	Limit Level	Over Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB		
1	81.84	-61.52	-49.86	-13.00	-48.52	-11.66	Peak
2	133.41	-70.69	-63.03	-13.00	-57.69	-7.66	Peak
3	179.85	-60.82	-55.14	-13.00	-47.82	-5.68	Peak
4	374.20	-71.63	-67.55	-13.00	-58.63	-4.08	Peak
5	461.00	-70.40	-66.25	-13.00	-57.40	-4.15	Peak
6	617.80	-68.91	-69.14	-13.00	-55.91	0.23	Peak
7 pp	1673.00	-57.42	-65.33	-13.00	-44.42	7.91	Peak



**Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch**

**A D T**

**Data: 10**



**Site : 966 chamber 1**

**Condition: PART 22/24 Vertical**

**Remark : LTE\_Band 5\_Link\_CH20525**

**Tested by: Harry Hsueh**

Freq	Read Level	Limit Level	Read	Limit	Over	Remark
			Line	Line	Factor	
MHz	dBm	dBm	dBm	dB	dB	
1 pp	33.78	-56.87	-45.89	-13.00	-43.87	-10.98 Peak
2	76.71	-60.70	-48.60	-13.00	-47.70	-12.10 Peak
3	176.07	-71.27	-65.28	-13.00	-58.27	-5.99 Peak
4	381.90	-69.54	-65.87	-13.00	-56.54	-3.67 Peak
5	491.80	-73.22	-68.19	-13.00	-60.22	-5.03 Peak
6	630.40	-68.42	-68.51	-13.00	-55.42	0.09 Peak
7	1673.00	-56.88	-64.79	-13.00	-43.88	7.91 Peak

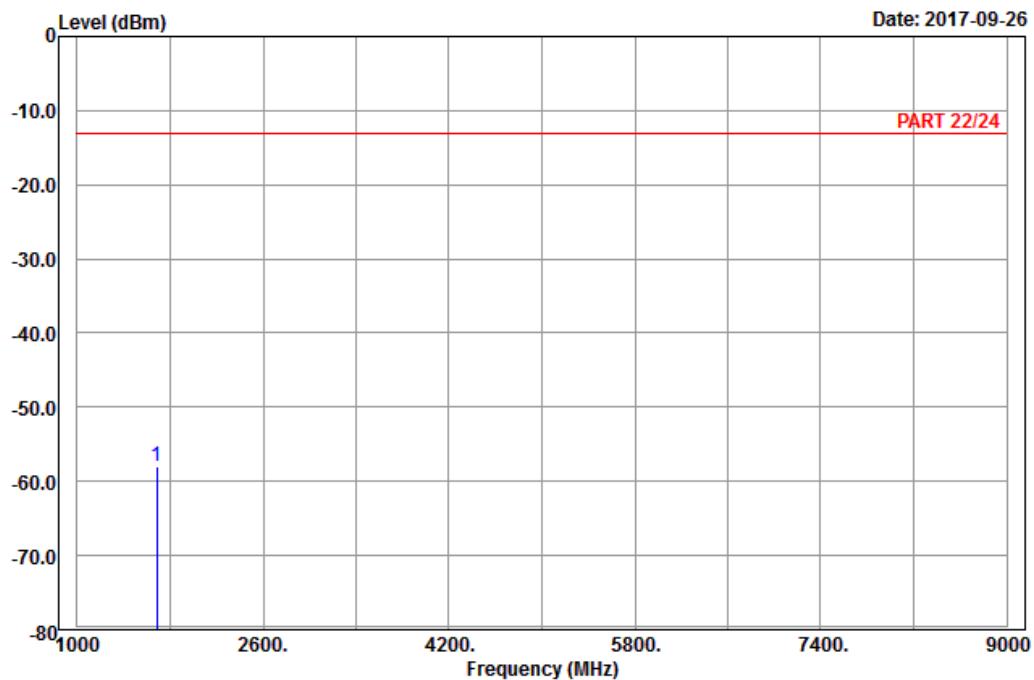
## High Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 5



Site : 966 chamber 1

Condition: PART 22/24 Horizontal

Remark : LTE\_Band 5\_Link\_CH20450

Tested by: Harry Hsueh

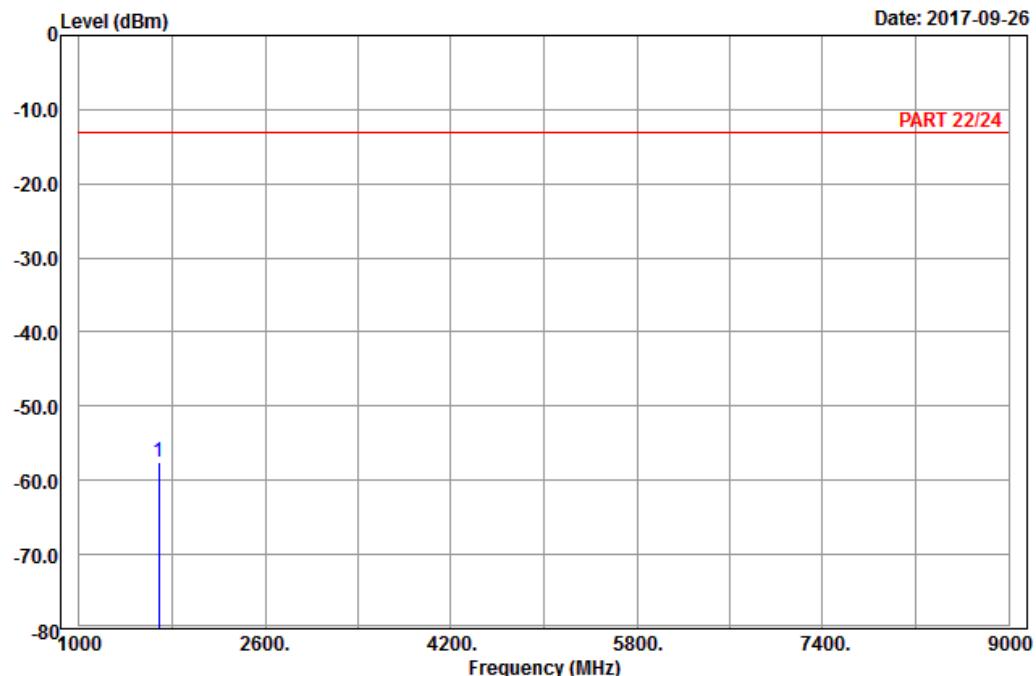
Freq	Read Level	Limit Level	Over Line	Over Limit	Factor	Remark
1 pp 1688.00	-57.99	-66.01	-13.00	-44.99	8.02	Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 6



Site : 966 chamber 1

Condition: PART 22/24 Vertical

Remark : LTE\_Band 5\_Link\_CH20450

Tested by: Harry Hsueh

Freq	Level	Read	Limit	Over	Factor	Remark
		Level	Line	Limit		
MHz	dBm	dBm	dBm	dB	dB	
1 pp	1688.00	-57.54	-65.56	-13.00	-44.54	8.02 Peak

## 5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

## Appendix – Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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Web Site: [www.bureauveritas-adt.com](http://www.bureauveritas-adt.com)

The address and road map of all our labs can be found in our web site also.

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