

## FCC Test Report

### (PART 22)

**Report No.:** RF150727C10

**FCC ID:** NM82PQ9300

**Test Model:** 2PQ9300

**Received Date:** Jul. 27, 2015

**Test Date:** Jul. 29, 2015 ~ Sep. 02, 2015

**Issued Date:** Sep. 17, 2015

**Applicant:** HTC Corporation

**Address:** 1F, 6-3 Baoqiang Road, Xindian City, Taipei County 231, Taiwan

**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 )

**Test Location:** No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan  
Hsien 333, Taiwan, R.O.C.



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### Release Control Record

Issue No.	Description	Date Issued
RF150727C10	Original Release	Sep. 17, 2015



**1 Certificate of Conformity**

**Product:** Smartphone  
**Brand:** HTC  
**Test Model:** 2PQ9300  
**Sample Status:** Identical Prototype  
**Applicant:** HTC Corporation  
**Test Date:** Jul. 29, 2015 ~ Sep. 02, 2015  
**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 :** Ivonne Wu , **Date:** Sep. 17, 2015  
Ivonne Wu / Supervisor

**Approved by :** Kay Wu , **Date:** Sep. 17, 2015  
Kay Wu / Supervisor

## 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 -23.97dB at 2509.50MHz.

### 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	Expanded Uncertainty (k=2) ( $\pm$ )
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.44 dB
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	2.0153 dB
	200MHz ~1000MHz	2.0224 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	1.0121 dB
	18GHz ~ 40GHz	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	N9038A	MY51210203	Jan. 21, 2015	Jan. 21, 2016
Spectrum Analyzer Agilent	N9010A	MY52220314	Sep. 03, 2015	Sep. 02, 2016
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Dec. 10, 2014	Dec. 09, 2015
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Feb. 04, 2015	Feb. 04, 2016
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-969	Feb. 09, 2015	Feb. 09, 2016
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Feb. 04, 2015	Feb. 04, 2016
Preamplifier EMCI	EMC 012645	980115	Dec. 12, 2014	Dec. 11, 2015
Preamplifier EMCI	EMC 184045	980116	Jan. 09, 2015	Jan. 08, 2016
Preamplifier EMCI	EMC 330H	980112	Dec. 27, 2014	Dec. 26, 2015
Power Meter Anritsu	ML2495A	1232002	Sep. 17, 2014	Sep. 16, 2015
Power Sensor Anritsu	MA2411B	1207325	Sep. 17, 2014	Sep. 16, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309219/4 2950114	Oct. 18, 2014	Oct. 17, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250130/4	Oct. 18, 2014	Oct. 17, 2015
RF Coaxial Cable Worken	8D-FB	Cable-Ch10-01	Nov. 07, 2014	Nov. 06, 2015
Software BV ADT	E3 6.120103	NA	NA	NA
Antenna Tower MF	MFA-440H	NA	NA	NA
Turn Table MF	MFT-201SS	NA	NA	NA
Antenna Tower & Turn Table Controller MF	MF-7802	NA	NA	NA
Communications Tester-Wireless Agilent	8960 Series 10	MY53201073	Jul. 03, 2015	Jul. 02, 2017
Radio Communication Analyzer Anritsu	MT8820C	6201240432	Jul. 06, 2015	Jul. 05, 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 HwaYa Chamber 10.
3. The horn antenna and preamplifier (model: EMC 184045) are used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 690701.
5. The IC Site Registration No. is IC7450F-10.



### 3 General Information

#### 3.1 General Description of EUT

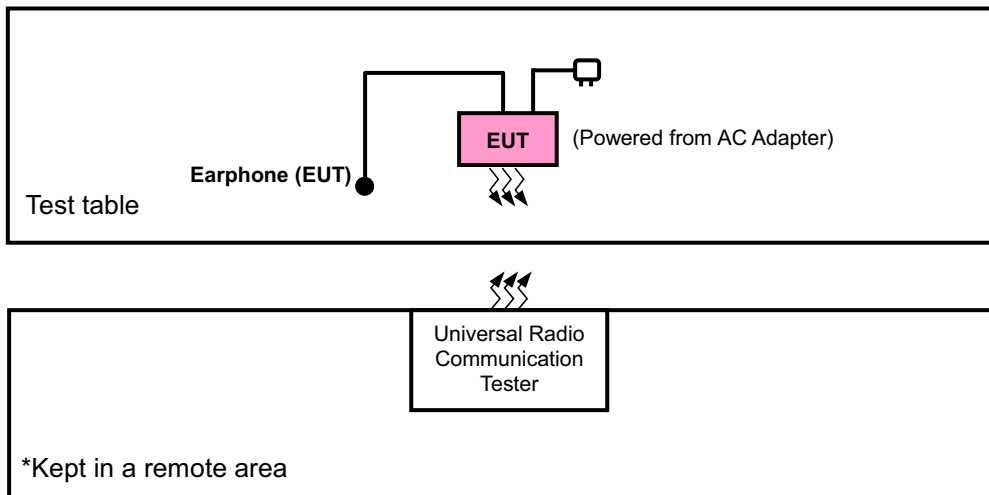
Product	Smartphone	
Brand	HTC	
Test Model	2PQ9300	
Status of EUT	Identical Prototype	
Power Supply Rating	5.0Vdc (adapter or host equipment) 3.85Vdc (Li-ion battery)	
Modulation Type	CDMA	QPSK, OPQKS, HPSK
	LTE	QPSK, 16QAM
Frequency Range	CDMA	824.7 ~ 848.31 MHz
	LTE 5 (Channel Bandwidth: 1.4MHz)	824.7 ~ 848.3 MHz
	LTE 5 (Channel Bandwidth: 3MHz)	825.5 ~ 847.5 MHz
	LTE 5 (Channel Bandwidth: 5MHz)	826.5 ~ 846.5 MHz
	LTE 5 (Channel Bandwidth: 10MHz)	829 ~ 844 MHz
	LTE 26 (Channel Bandwidth: 1.4MHz)	824.7 ~ 848.3 MHz
	LTE 26 (Channel Bandwidth: 3MHz)	825.5 ~ 847.5 MHz
	LTE 26 (Channel Bandwidth: 5MHz)	826.5 ~ 846.5 MHz
	LTE 26 (Channel Bandwidth: 10MHz)	829 ~ 844 MHz
	LTE 26 (Channel Bandwidth: 15MHz)	831.5 ~ 841.5 MHz
Max. ERP Power	CDMA	56.10mW
	LTE 5 (Channel Bandwidth: 1.4MHz)	37.84mW
	LTE 5 (Channel Bandwidth: 3MHz)	40.83mW
	LTE 5 (Channel Bandwidth: 5MHz)	37.76mW
	LTE 5 (Channel Bandwidth: 10MHz)	38.28mW
	LTE 26 (Channel Bandwidth: 1.4MHz)	26.79mW
	LTE 26 (Channel Bandwidth: 3MHz)	29.99mW
	LTE 26 (Channel Bandwidth: 5MHz)	31.19mW
	LTE 26 (Channel Bandwidth: 10MHz)	30.13mW
Emission Designator	CDMA	1M27F9W
	LTE 5 (Channel Bandwidth: 1.4MHz)	1M09G7D
	LTE 5 (Channel Bandwidth: 3MHz)	2M70W7D
	LTE 5 (Channel Bandwidth: 5MHz)	4M49G7D
	LTE 5 (Channel Bandwidth: 10MHz)	8M96W7D
	LTE 26 (Channel Bandwidth: 1.4MHz)	1M09W7D
	LTE 26 (Channel Bandwidth: 3MHz)	2M70W7D
	LTE 26 (Channel Bandwidth: 5MHz)	4M49G7D
	LTE 26 (Channel Bandwidth: 10MHz)	8M96G7D
LTE 26 (Channel Bandwidth: 15MHz)	13M4G7D	
Antenna Type	Fixed Internal Antenna	
Accessory Device	Refer to Note as below	
Data Cable Supplied	Refer to Note as below	

Note:

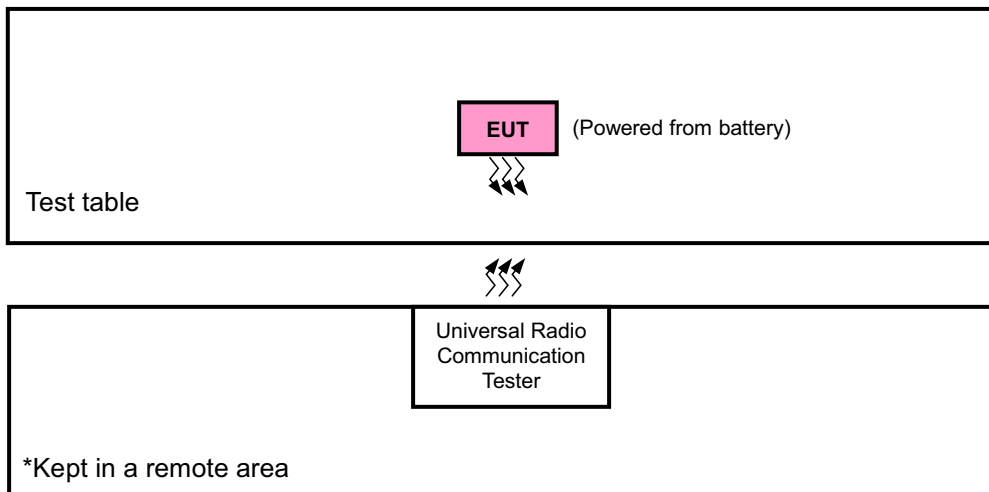
1. The EUT's accessories list refers to Ext. Pho.
2. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

### 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.



### 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:

Band	ERP	Radiated Emission
CDMA	X-plane	X-axis
LTE Band 5	X-plane	X-axis
LTE Band 26	X-plane	X-axis

#### CDMA MODE

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
-	ERP	1013 to 777	1013, 384, 777	1xRTT
-	Frequency Stability	1013 to 777	384	1xRTT
-	Occupied Bandwidth	1013 to 777	1013, 384, 777	1xRTT
-	Band Edge	1013 to 777	1013, 777	1xRTT
-	Peak to Average Ratio	1013 to 777	1013, 384, 777	1xRTT
-	Condcudeted Emission	1013 to 777	384	1xRTT
-	Radiated Emission	1013 to 777	384	1xRTT



**LTE BAND 5 MODE**

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode		
-	ERP	20407 to 20643	20407, 20525, 20643	1.4MHz	QPSK, 16QAM	1 RB / 2 RB Offset		
		20415 to 20635	20415, 20525, 20635	3MHz	QPSK, 16QAM	1 RB / 7 RB Offset		
		20425 to 20625	20425, 20525, 20625	5MHz	QPSK, 16QAM	1 RB / 12 RB Offset		
		20450 to 20600	20450, 20525, 20600	10MHz	QPSK, 16QAM	1 RB / 24 RB Offset		
-	Frequency Stability	20407 to 20643	20525	1.4MHz	QPSK	1 RB / 2 RB Offset		
		20415 to 20635	20525	3MHz	QPSK	1 RB / 7 RB Offset		
		20425 to 20625	20525	5MHz	QPSK	1 RB / 12 RB Offset		
		20450 to 20600	20525	10MHz	QPSK	1 RB / 24 RB Offset		
-	Occupied Bandwidth	20407 to 20643	20407, 20525, 20643	1.4MHz	QPSK, 16QAM	6 RB / 0 RB Offset		
		20415 to 20635	20415, 20525, 20635	3MHz	QPSK, 16QAM	15 RB / 0 RB Offset		
		20425 to 20625	20425, 20525, 20625	5MHz	QPSK, 16QAM	25 RB / 0 RB Offset		
		20450 to 20600	20450, 20525, 20600	10MHz	QPSK, 16QAM	50 RB / 0 RB Offset		
-	Band Edge	20407 to 20643	20407	1.4MHz	QPSK	1 RB / 0 RB Offset 6 RB / 0 RB Offset		
			20643	1.4MHz	QPSK	1 RB / 5 RB Offset 6 RB / 0 RB Offset		
		20415 to 20635	20415	3MHz	QPSK	1 RB / 0 RB Offset 15 RB / 0 RB Offset		
			20635	3MHz	QPSK	1 RB / 14 RB Offset 15 RB / 0 RB Offset		
		20425 to 20626	20425	5MHz	QPSK	1 RB / 0 RB Offset 25 RB / 0 RB Offset		
			20600	5MHz	QPSK	1 RB / 24 RB Offset 25 RB / 0 RB Offset		
		20450 to 20600	20450	10MHz	QPSK	1 RB / 0 RB Offset 50 RB / 0 RB Offset		
			20600	10MHz	QPSK	1 RB / 49 RB Offset 50 RB / 0 RB Offset		
		-	Peak To Average Ratio	20407 to 20643	20407, 20525, 20643	1.4MHz	QPSK, 16QAM	1 RB / 2 RB Offset
				20415 to 20635	20415, 20525, 20635	3MHz	QPSK, 16QAM	1 RB / 7 RB Offset
				20425 to 20625	20425, 20525, 20625	5MHz	QPSK, 16QAM	1 RB / 12 RB Offset
				20450 to 20600	20450, 20525, 20600	10MHz	QPSK, 16QAM	1 RB / 24 RB Offset
-	Conducted Emission	20407 to 20643	20525	1.4MHz	QPSK	1 RB / 2 RB Offset		
		20415 to 20635	20525	3MHz	QPSK	1 RB / 7 RB Offset		
		20425 to 20625	20525	5MHz	QPSK	1 RB / 12 RB Offset		
		20450 to 20600	20525	10MHz	QPSK	1 RB / 24 RB Offset		
-	Radiated Emission	20450 to 20600	20525	10MHz	QPSK	1 RB / 24 RB Offset		

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



**LTE BAND 26 MODE**

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode		
-	ERP	26797 to 27033	26797, 26915, 27033	1.4MHz	QPSK, 16QAM	1 RB / 2 RB Offset		
		26805 to 27025	26805, 26915, 27025	3MHz	QPSK, 16QAM	1 RB / 7 RB Offset		
		26815 to 27015	26815, 26915, 27015	5MHz	QPSK, 16QAM	1 RB / 12 RB Offset		
		26840 to 26990	26840, 26915, 26990	10MHz	QPSK, 16QAM	1 RB / 24 RB Offset		
		26865 to 26965	26865, 26915, 26965	15MHz	QPSK, 16QAM	1 RB / 37 RB Offset		
-	Frequency Stability	26797 to 27033	26915	1.4MHz	QPSK	1 RB / 2 RB Offset		
		26805 to 27025	26915	3MHz	QPSK	1 RB / 7 RB Offset		
		26815 to 27015	26915	5MHz	QPSK	1 RB / 12 RB Offset		
		26840 to 26990	26915	10MHz	QPSK	1 RB / 24 RB Offset		
		26865 to 26965	26915	15MHz	QPSK	1 RB / 37 RB Offset		
-	Occupied Bandwidth	26797 to 27033	26797, 26915, 27033	1.4MHz	QPSK, 16QAM	1 RB / 0 RB Offset		
		26805 to 27025	26805, 26915, 27025	3MHz	QPSK, 16QAM	15 RB / 0 RB Offset		
		26815 to 27015	26815, 26915, 27015	5MHz	QPSK, 16QAM	25 RB / 0 RB Offset		
		26840 to 26990	26840, 26915, 26990	10MHz	QPSK, 16QAM	50 RB / 0 RB Offset		
		26865 to 26965	26865, 26915, 26965	15MHz	QPSK, 16QAM	75 RB / 0 RB Offset		
-	Band Edge	26797 to 27033	26797	1.4MHz	QPSK	1 RB / 0 RB Offset 6 RB / 0 RB Offset		
			27033	1.4MHz	QPSK	1 RB / 5 RB Offset 6 RB / 0 RB Offset		
		26805 to 27025	26805	3MHz	QPSK	1 RB / 0 RB Offset 15 RB / 0 RB Offset		
			27025	3MHz	QPSK	1 RB / 14 RB Offset 15 RB / 0 RB Offset		
		26815 to 27015	26815	5MHz	QPSK	1 RB / 0 RB Offset 25 RB / 0 RB Offset		
			27015	5MHz	QPSK	1 RB / 24 RB Offset 25 RB / 0 RB Offset		
		26840 to 26990	26840	10MHz	QPSK	1 RB / 0 RB Offset 50 RB / 0 RB Offset		
			26990	10MHz	QPSK	1 RB / 49 RB Offset 50 RB / 0 RB Offset		
		26865 to 26965	26865	15MHz	QPSK	1 RB / 0 RB Offset 75 RB / 0 RB Offset		
			26965	15MHz	QPSK	1 RB / 74 RB Offset 75 RB / 0 RB Offset		
		-	Peak to Average Ratio	26797 to 27033	26797, 26915, 27033	1.4MHz	QPSK, 16QAM	1 RB / 0 RB Offset
				26805 to 27025	26805, 26915, 27025	3MHz	QPSK, 16QAM	15 RB / 0 RB Offset
				26815 to 27015	26815, 26915, 27015	5MHz	QPSK, 16QAM	25 RB / 0 RB Offset
				26840 to 26990	26840, 26915, 26990	10MHz	QPSK, 16QAM	50 RB / 0 RB Offset
26865 to 26965	26865, 26915, 26965			15MHz	QPSK, 16QAM	1 RB / 37 RB Offset		
-	Conducted Emission	26797 to 27033	26915	1.4MHz	QPSK	1 RB / 0 RB Offset		
		26805 to 27025	26915	3MHz	QPSK	15 RB / 0 RB Offset		
		26815 to 27015	26915	5MHz	QPSK	25 RB / 0 RB Offset		
		26840 to 26990	26915	10MHz	QPSK	1 RB / 0 RB Offset		
		26865 to 26965	26915	15MHz	QPSK	1 RB / 37 RB Offset		
-	Radiated Emission	26865 to 26965	26915	15MHz	QPSK	1 RB / 37 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	25deg. C, 65%RH	3.85Vdc	Anson Lin
Frequency Stability	25deg. C, 65%RH	3.85Vdc	Howard Kao
Occupied Bandwidth	25deg. C, 65%RH	3.85Vdc	Howard Kao
Band Edge	25deg. C, 65%RH	3.85Vdc	Howard Kao
Peak to Average Ratio	25deg. C, 65%RH	3.85Vdc	Howard Kao
Conducuted Emission	25deg. C, 65%RH	3.85Vdc	Howard Kao
Radiated Emission	25deg. C, 65%RH	120Vac, 60Hz	Anson Lin

**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**

**ANSI/TIA/EIA-603-C 2004**

**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:**

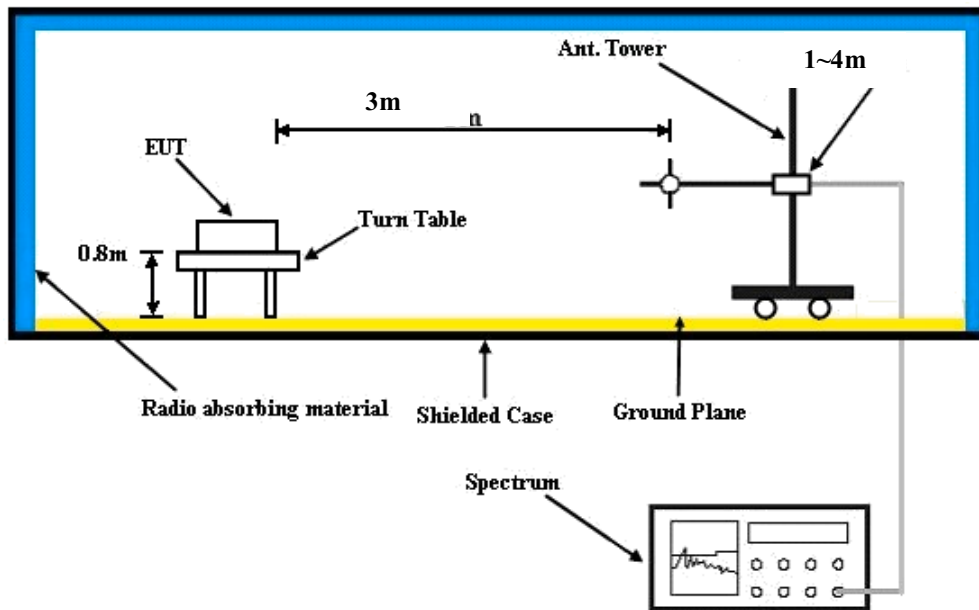
- a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 5MHz for CDMA, and 10MHz for LTE mode.
- b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m 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,  $E.R.P \text{ power} = E.I.P.R \text{ power} - 2.15\text{dBi}$ .

##### **Conducted Power Measurement:**

The EUT was set up for the maximum power with CDMA, and LTE 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.

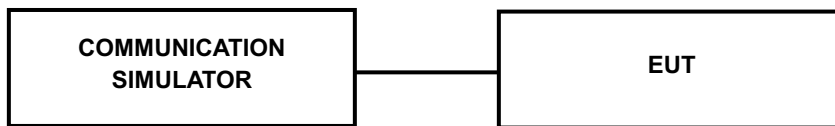
### 4.1.3 Test Setup

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)**

Band	CDMA		
Channel	1013	384	777
Frequency (MHz)	824.70	836.52	848.31
RC1+SO55	24.12	24.11	24.19
RC3+SO55	24.14	24.13	24.21
RC3+SO32(+ F-SCH)	24.10	24.09	24.17
RC3+SO32(+SCH)	24.05	24.04	24.12
RTAP 153.6	24.09	24.08	24.16
RETAP 4096	24.06	24.05	24.13

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	22.24	21.97	21.92	0	21.16	20.89	20.84	1
	1	2	22.79	22.52	22.47	0	21.71	21.44	21.39	1
	1	5	22.34	22.07	22.02	0	21.26	20.99	20.94	1
	3	0	21.41	21.14	21.09	0	20.33	20.06	20.01	1
	3	1	21.49	21.22	21.17	0	20.41	20.14	20.09	1
	3	3	21.35	21.08	21.03	0	20.27	20.00	19.95	1
	6	0	21.43	21.16	21.11	1	20.347	20.077	20.027	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	22.31	22.04	21.99	0	21.23	20.96	20.91	1
	1	7	22.86	22.59	22.54	0	21.78	21.51	21.46	1
	1	14	22.41	22.14	22.09	0	21.33	21.06	21.01	1
	8	0	21.48	21.21	21.16	1	20.40	20.13	20.08	2
	8	3	21.56	21.29	21.24	1	20.48	20.21	20.16	2
	8	7	21.42	21.15	21.10	1	20.34	20.07	20.02	2
	15	0	21.50	21.23	21.18	1	20.42	20.15	20.10	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	22.39	22.12	22.07	0	21.31	21.04	20.99	1
	1	12	22.94	22.67	22.62	0	21.86	21.59	21.54	1
	1	24	22.49	22.22	22.17	0	21.41	21.14	21.09	1
	12	0	21.56	21.29	21.24	1	20.48	20.21	20.16	2
	12	6	21.64	21.37	21.32	1	20.56	20.29	20.24	2
	12	13	21.50	21.23	21.18	1	20.42	20.15	20.10	2
	25	0	21.58	21.31	21.26	1	20.50	20.23	20.18	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	22.47	22.20	22.15	0	21.39	21.12	21.07	1
	1	24	23.02	22.75	22.70	0	21.94	21.67	21.62	1
	1	49	22.57	22.30	22.25	0	21.49	21.22	21.17	1
	25	0	21.64	21.37	21.32	1	20.56	20.29	20.24	2
	25	12	21.72	21.45	21.40	1	20.64	20.37	20.32	2
	25	25	21.58	21.31	21.26	1	20.50	20.23	20.18	2
	50	0	21.66	21.39	21.34	1	20.58	20.31	20.26	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 26797	Mid Ch 26915	High Ch 27033		Low Ch 26797	Mid Ch 26915	High Ch 27033	
			824.7 MHz	836.5 MHz	848.3 MHz		824.7 MHz	836.5 MHz	848.3 MHz	
26 / 1.4M	1	0	21.82	21.84	21.86	0	20.81	20.83	20.85	1
	1	2	22.73	22.75	22.77	0	21.72	21.74	21.76	1
	1	5	21.73	21.75	21.77	0	20.72	20.74	20.76	1
	3	0	21.03	21.05	21.07	0	20.02	20.04	20.06	1
	3	1	21.00	21.02	21.04	0	19.99	20.01	20.03	1
	3	3	20.87	20.89	20.91	0	19.86	19.88	19.90	1
	6	0	20.95	20.97	20.99	1	19.94	19.96	19.98	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 26805	Mid Ch 26915	High Ch 27025		Low Ch 26805	Mid Ch 26915	High Ch 27025	
			825.5 MHz	836.5 MHz	847.5 MHz		825.5 MHz	836.5 MHz	847.5 MHz	
26 / 3M	1	0	21.80	21.84	21.95	0	20.79	20.83	20.94	1
	1	7	22.71	22.75	22.86	0	21.70	21.74	21.85	1
	1	14	21.71	21.75	21.86	0	20.70	20.74	20.85	1
	8	0	21.01	21.05	21.16	1	20.00	20.04	20.15	2
	8	3	20.98	21.02	21.13	1	19.97	20.01	20.12	2
	8	7	20.85	21.02	21.00	1	19.84	19.88	19.99	2
	15	0	20.93	21.07	21.08	1	19.92	19.96	20.07	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 26815	Mid Ch 26915	High Ch 27015		Low Ch 26815	Mid Ch 26915	High Ch 27015	
			826.5 MHz	836.5 MHz	846.5 MHz		826.5 MHz	836.5 MHz	846.5 MHz	
26 / 5M	1	0	22.01	22.04	22.02	0	21.00	21.03	21.01	1
	1	12	22.92	22.95	22.93	0	21.91	21.94	21.92	1
	1	24	21.92	21.95	21.93	0	20.91	20.94	20.92	1
	12	0	21.22	21.25	21.23	1	20.21	20.24	20.22	2
	12	6	21.19	21.22	21.20	1	20.18	20.21	20.19	2
	12	13	21.06	21.09	21.07	1	20.05	20.08	20.06	2
	25	0	21.14	21.17	21.15	1	20.13	20.16	20.14	2





Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 26840	Mid Ch 26915	High Ch 26990		Low Ch 26840	Mid Ch 26915	High Ch 26990	
			829.0 MHz	836.5 MHz	844.0 MHz		829.0 MHz	836.5 MHz	844.0 MHz	
26 / 10M	1	0	22.13	22.08	22.11	0	21.12	21.07	21.10	1
	1	24	23.04	22.99	23.02	0	22.03	21.98	22.01	1
	1	49	22.04	21.99	22.02	0	21.03	20.98	21.01	1
	25	0	21.34	21.29	21.32	1	20.33	20.28	20.31	2
	25	12	21.31	21.26	21.29	1	20.30	20.25	20.28	2
	25	25	21.18	21.13	21.16	1	20.17	20.12	20.15	2
	50	0	21.26	21.21	21.24	1	20.25	20.20	20.23	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 26865	Mid Ch 26915	High Ch 26965		Low Ch 26865	Mid Ch 26915	High Ch 26965	
			831.5 MHz	836.5 MHz	841.5 MHz		831.5 MHz	836.5 MHz	841.5 MHz	
26 / 15M	1	0	22.20	22.14	22.18	0	21.35	21.13	21.17	1
	1	37	23.11	23.05	23.09	0	22.26	22.04	22.08	1
	1	74	22.11	22.05	22.09	0	21.26	21.04	21.08	1
	36	0	21.41	21.35	21.39	1	20.56	20.34	20.38	2
	36	19	21.38	21.32	21.36	1	20.53	20.31	20.35	2
	36	39	21.25	21.19	21.23	1	20.40	20.18	20.22	2
	75	0	21.33	21.27	21.31	1	20.48	20.26	20.30	2



**ERP POWER (dBm)**

CDMA							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)	Polarization (H/V)
X	1013	824.7	-13.18	32.62	17.29	53.58	H
	384	836.52	-13.32	32.52	17.05	50.70	
	777	848.31	-13.01	32.65	17.49	56.10	
	1013	824.7	-25.57	32.76	5.04	3.19	V
	384	836.52	-25.84	32.39	4.40	2.75	
	777	848.31	-25.35	32.54	5.04	3.19	

LTE Band 5							
Channel Bandwidth: 1.4MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)	Polarization (H/V)
X	20407	824.7	-15.13	32.62	15.34	34.20	H
	20525	836.5	-14.59	32.52	15.78	37.84	
	20643	848.3	-15.60	32.65	14.90	30.90	
	20407	824.7	-25.09	32.76	5.52	3.56	V
	20525	836.5	-24.95	32.39	5.29	3.38	
	20643	848.3	-24.93	32.54	5.46	3.52	

LTE Band 5							
Channel Bandwidth: 1.4MHz / 16QAM							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)	Polarization (H/V)
X	20407	824.7	-15.98	32.62	14.49	28.12	H
	20525	836.5	-15.76	32.52	14.61	28.91	
	20643	848.3	-16.36	32.65	14.14	25.94	
	20407	824.7	-26.93	32.76	3.68	2.33	V
	20525	836.5	-26.25	32.39	3.99	2.51	
	20643	848.3	-26.49	32.54	3.90	2.45	



LTE Band 5							
Channel Bandwidth: 3MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)	Polarization (H/V)
X	20415	825.5	-15.31	32.62	15.16	32.81	H
	20525	836.5	-14.26	32.52	16.11	40.83	
	20635	847.5	-14.57	32.65	15.93	39.17	
	20415	825.5	-25.25	32.76	5.36	3.44	V
	20525	836.5	-24.69	32.39	5.55	3.59	
	20635	847.5	-24.38	32.54	6.01	3.99	

LTE Band 5							
Channel Bandwidth: 3MHz / 16QAM							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)	Polarization (H/V)
X	20415	825.5	-16.06	32.62	14.41	27.61	H
	20525	836.5	-15.67	32.52	14.70	29.51	
	20635	847.5	-15.58	32.65	14.92	31.05	
	20415	825.5	-27.00	32.76	3.61	2.30	V
	20525	836.5	-26.29	32.39	3.95	2.48	
	20635	847.5	-27.28	32.54	3.11	2.05	

LTE Band 5							
Channel Bandwidth: 5MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)	Polarization (H/V)
X	20425	826.5	-15.78	32.62	14.69	29.44	H
	20525	836.5	-14.60	32.52	15.77	37.76	
	20625	846.5	-15.48	32.65	15.02	31.77	
	20425	826.5	-25.70	32.76	4.91	3.10	V
	20525	836.5	-25.08	32.39	5.16	3.28	
	20625	846.5	-25.76	32.54	4.63	2.90	



LTE Band 5							
Channel Bandwidth: 5MHz / 16QAM							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)	Polarization (H/V)
X	20425	826.5	-16.78	32.62	13.69	23.39	H
	20525	836.5	-16.93	32.52	13.44	22.08	
	20625	846.5	-16.88	32.65	13.62	23.01	
	20425	826.5	-26.42	32.76	4.19	2.62	V
	20525	836.5	-26.13	32.39	4.11	2.58	
	20625	846.5	-26.46	32.54	3.93	2.47	

LTE Band 5							
Channel Bandwidth: 10MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)	Polarization (H/V)
X	20450	829.0	-14.64	32.62	15.83	38.28	H
	20525	836.5	-14.65	32.52	15.72	37.33	
	20600	844.0	-15.01	32.65	15.49	35.40	
	20450	829.0	-25.27	32.76	5.34	3.42	V
	20525	836.5	-25.15	32.39	5.09	3.23	
	20600	844.0	-25.61	32.54	4.78	3.01	

LTE Band 5							
Channel Bandwidth: 10MHz / 16QAM							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)	Polarization (H/V)
X	20450	829.0	-15.55	32.62	14.92	31.05	H
	20525	836.5	-15.49	32.52	14.88	30.76	
	20600	844.0	-15.76	32.65	14.74	29.79	
	20450	829.0	-26.15	32.76	4.46	2.79	V
	20525	836.5	-25.99	32.39	4.25	2.66	
	20600	844.0	-26.35	32.54	4.04	2.54	



A O T

LTE Band 26							
Channel Bandwidth: 1.4MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)	Polarization (H/V)
X	26797	824.7	-16.41	32.62	14.06	25.47	H
	26915	836.5	-16.09	32.52	14.28	26.79	
	27033	848.3	-16.58	32.65	13.92	24.66	
	26797	824.7	-26.99	32.76	3.62	2.30	V
	26915	836.5	-26.24	32.39	4.00	2.51	
	27033	848.3	-26.56	32.54	3.83	2.42	

LTE Band 26							
Channel Bandwidth: 1.4MHz / 16QAM							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)	Polarization (H/V)
X	26797	824.7	-17.36	32.62	13.11	20.46	H
	26915	836.5	-16.52	32.52	13.85	24.27	
	27033	848.3	-17.37	32.65	13.13	20.56	
	26797	824.7	-27.90	32.76	2.71	1.87	V
	26915	836.5	-27.66	32.39	2.58	1.81	
	27033	848.3	-28.34	32.54	2.05	1.60	

LTE Band 26							
Channel Bandwidth: 3MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)	Polarization (H/V)
X	26805	825.5	-15.70	32.62	14.77	29.99	H
	26915	836.5	-15.73	32.52	14.64	29.11	
	27025	847.5	-15.99	32.65	14.51	28.25	
	26805	825.5	-26.71	32.76	3.90	2.45	V
	26915	836.5	-26.88	32.39	3.36	2.17	
	27025	847.5	-26.92	32.54	3.47	2.22	



LTE Band 26							
Channel Bandwidth: 3MHz / 16QAM							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)	Polarization (H/V)
X	26805	825.5	-16.61	32.62	13.86	24.32	H
	26915	836.5	-16.63	32.52	13.74	23.66	
	27025	847.5	-16.76	32.65	13.74	23.66	
	26805	825.5	-27.67	32.76	2.94	1.97	V
	26915	836.5	-27.33	32.39	2.91	1.95	
	27025	847.5	-27.69	32.54	2.70	1.86	

LTE Band 26							
Channel Bandwidth: 5MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)	Polarization (H/V)
X	26815	826.5	-15.79	32.62	14.68	29.38	H
	26915	836.5	-16.17	32.52	14.20	26.30	
	27015	846.5	-15.56	32.65	14.94	31.19	
	26815	826.5	-25.90	32.76	4.71	2.96	V
	26919	836.5	-25.51	32.39	4.73	2.97	
	27015	846.5	-26.30	32.54	4.09	2.56	

LTE Band 26							
Channel Bandwidth: 5MHz / 16QAM							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)	Polarization (H/V)
X	26815	826.5	-16.73	32.62	13.74	23.66	H
	26915	836.5	-16.56	32.52	13.81	24.04	
	27015	846.5	-17.38	32.65	13.12	20.51	
	26815	826.5	-27.94	32.76	2.67	1.85	V
	26919	836.5	-26.67	32.39	3.57	2.28	
	27015	846.5	-27.37	32.54	3.02	2.00	



LTE Band 26							
Channel Bandwidth: 10MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)	Polarization (H/V)
X	26840	829.0	-16.21	32.62	14.26	26.67	H
	26915	836.5	-15.58	32.52	14.79	30.13	
	26990	844.0	-16.19	32.65	14.31	26.98	
	26840	829.0	-25.17	32.76	5.44	3.50	V
	26919	836.5	-25.12	32.39	5.12	3.25	
	26990	844.0	-25.70	32.54	4.69	2.94	

LTE Band 26							
Channel Bandwidth: 10MHz / 16QAM							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)	Polarization (H/V)
X	26840	829.0	-17.14	32.62	13.33	21.53	H
	26915	836.5	-16.50	32.52	13.87	24.38	
	26990	844.0	-16.94	32.65	13.56	22.70	
	26840	829.0	-27.09	32.76	3.52	2.25	V
	26919	836.5	-27.10	32.39	3.14	2.06	
	26990	844.0	-27.45	32.54	2.94	1.97	

LTE Band 26							
Channel Bandwidth: 15MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)	Polarization (H/V)
X	26865	831.5	-15.57	32.62	14.90	30.90	H
	26915	836.5	-15.44	32.52	14.93	31.12	
	26965	841.5	-15.88	32.65	14.62	28.97	
	26865	831.5	-25.48	32.76	5.13	3.26	V
	26915	836.5	-25.24	32.39	5.00	3.16	
	26965	841.5	-25.74	32.54	4.65	2.92	



LTE Band 26							
Channel Bandwidth: 15MHz / 16QAM							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)	Polarization (H/V)
X	26865	831.5	-16.78	32.62	13.69	23.39	H
	26915	836.5	-16.40	32.52	13.97	24.95	
	26965	841.5	-16.72	32.65	13.78	23.88	
	26865	831.5	-26.89	32.76	3.72	2.36	V
	26915	836.5	-26.69	32.39	3.55	2.26	
	26965	841.5	-26.57	32.54	3.82	2.41	



## 4.2 Frequency Stability Measurement

### 4.2.1 Limits of Frequency Stability Measurement

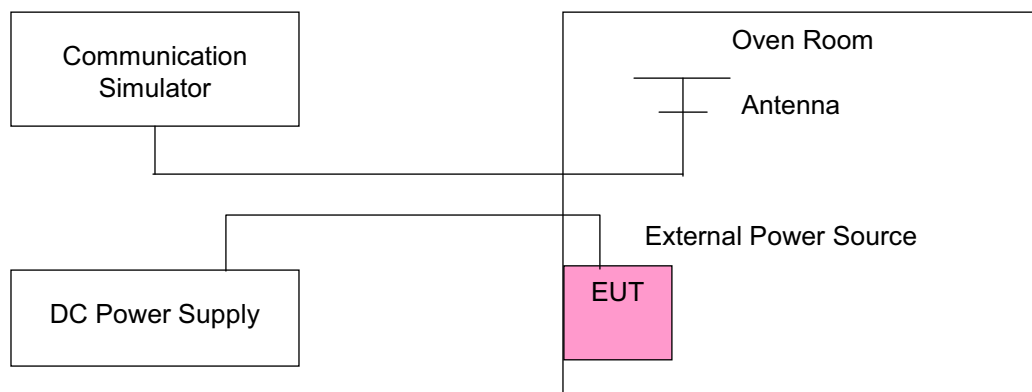
1.5 ppm is for base and fixed station. 2.5 ppm is for mobile station.

### 4.2.2 Test Procedure

- 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.
- 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.
- The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the  $\pm 0.5$  °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)	Frequency Error (ppm)										Limit (ppm)
	CDMA	LTE Band 5				LTE Band 26					
		1.4MHz	3MHz	5MHz	10MHz	1.4MHz	3MHz	5MHz	10MHz	15MHz	
3.85	-0.010	0.0022	0.0016	0.0025	0.0035	0.0018	0.0015	0.0026	0.0025	0.0001	2.5
3.6	0.019	0.0028	0.0004	0.0032	0.0012	0.0030	0.0009	0.0032	0.0041	0.0029	2.5
4.4	-0.013	0.0032	0.0012	0.0008	0.0007	0.0007	0.0016	0.0006	0.0044	0.0028	2.5

**NOTE:** The applicant defined the normal working voltage of the battery is from 3.6Vdc to 4.4Vdc.

##### Frequency Error vs. Temperature

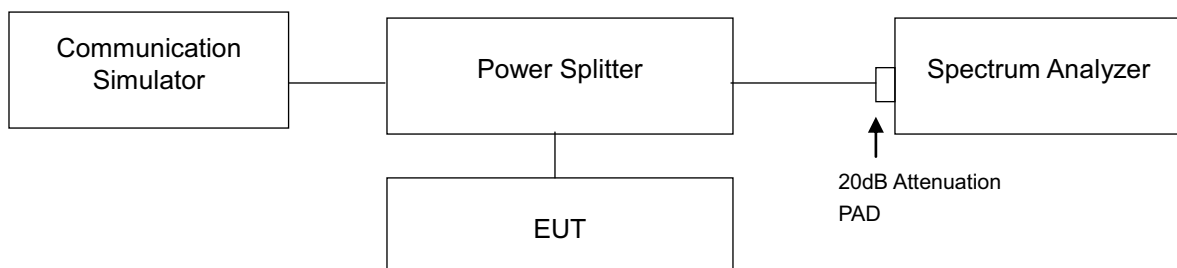
Temp. (°C)	Frequency Error (ppm)										Limit (ppm)
	CDMA	LTE Band 5				LTE Band 26					
		1.4MHz	3MHz	5MHz	10MHz	1.4MHz	3MHz	5MHz	10MHz	15MHz	
-30	0.001	0.0001	0.0007	0.0020	0.0040	0.0038	0.0023	0.0022	0.0027	0.0040	2.5
-20	0.023	0.0017	0.0020	0.0002	0.0020	0.0005	0.0040	0.0002	0.0026	0.0005	2.5
-10	-0.001	0.0016	0.0014	0.0022	0.0011	0.0009	0.0035	0.0019	0.0044	0.0041	2.5
0	-0.025	0.0010	0.0044	0.0024	0.0026	0.0012	0.0006	0.0029	0.0002	0.0003	2.5
10	-0.024	0.0032	0.0039	0.0005	0.0018	0.0011	0.0027	0.0020	0.0032	0.0032	2.5
20	-0.023	-0.0012	-0.0040	-0.0003	-0.0023	-0.0002	-0.0017	-0.0045	-0.0011	-0.0008	2.5
30	-0.013	-0.0017	-0.0026	-0.0030	-0.0019	-0.0005	-0.0001	-0.0004	-0.0036	-0.0026	2.5
40	0.002	-0.0035	-0.0016	-0.0015	-0.0035	-0.0027	-0.0012	-0.0033	-0.0043	-0.0047	2.5
50	-0.013	-0.0029	-0.0042	-0.0047	-0.0022	-0.0033	-0.0038	-0.0009	-0.0020	-0.0030	2.5
60	0.005	-0.0029	-0.0001	-0.0047	-0.0015	-0.0012	-0.0033	-0.0029	-0.0003	-0.0038	2.5

### 4.3 Occupied Bandwidth Measurement

#### 4.3.1 Test Procedure

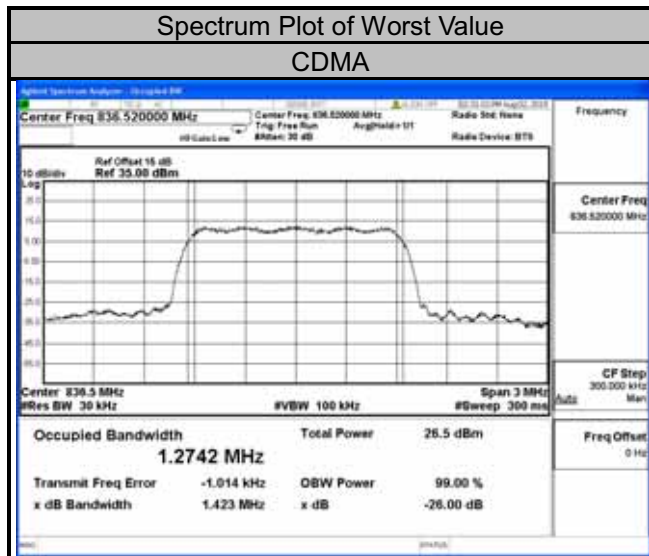
The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function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

#### 4.3.2 Test Setup



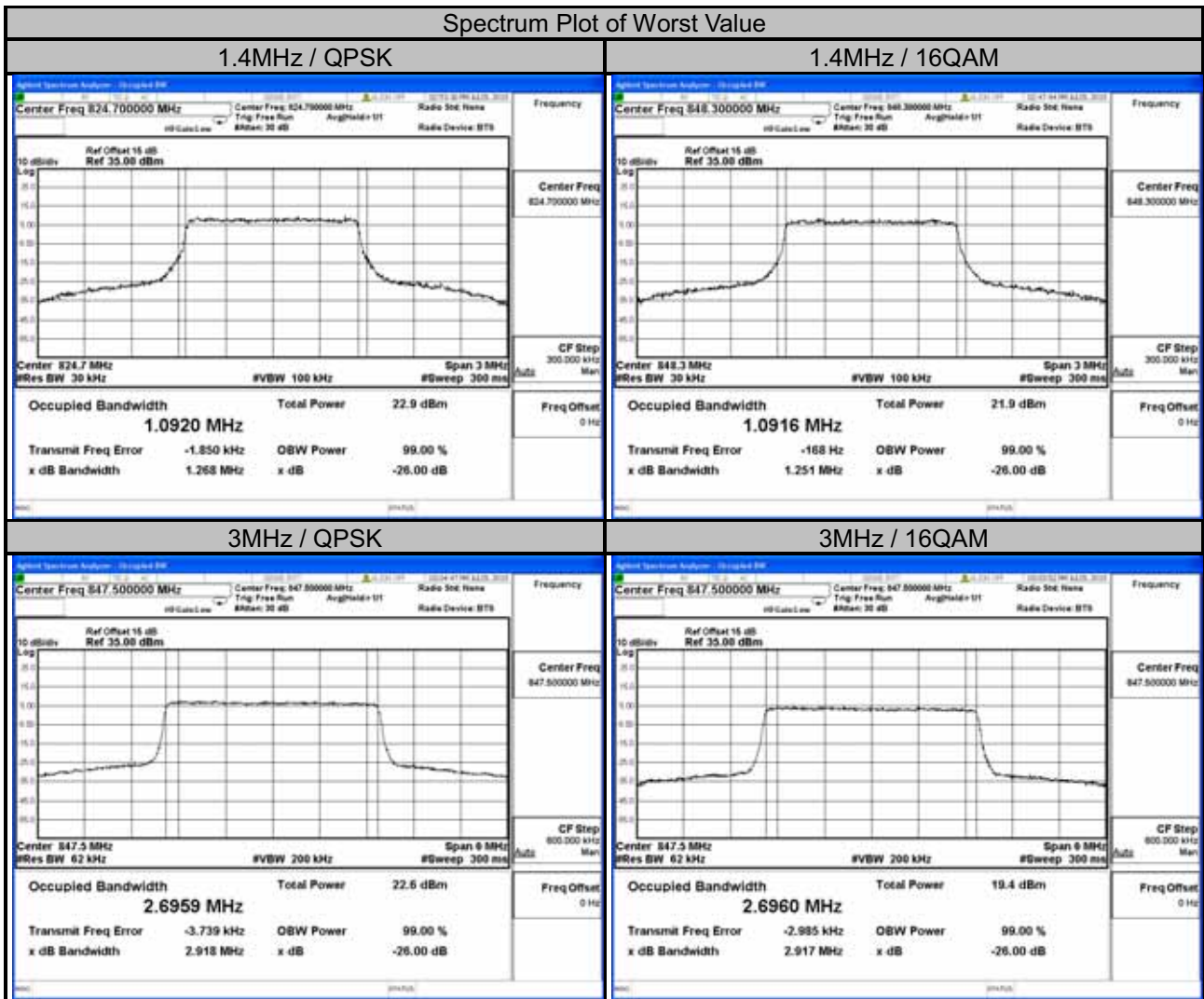
### 4.3.3 Test Result

Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)
		CDMA
1013	824.70	1.2713
384	836.52	1.2742
777	848.31	1.2738



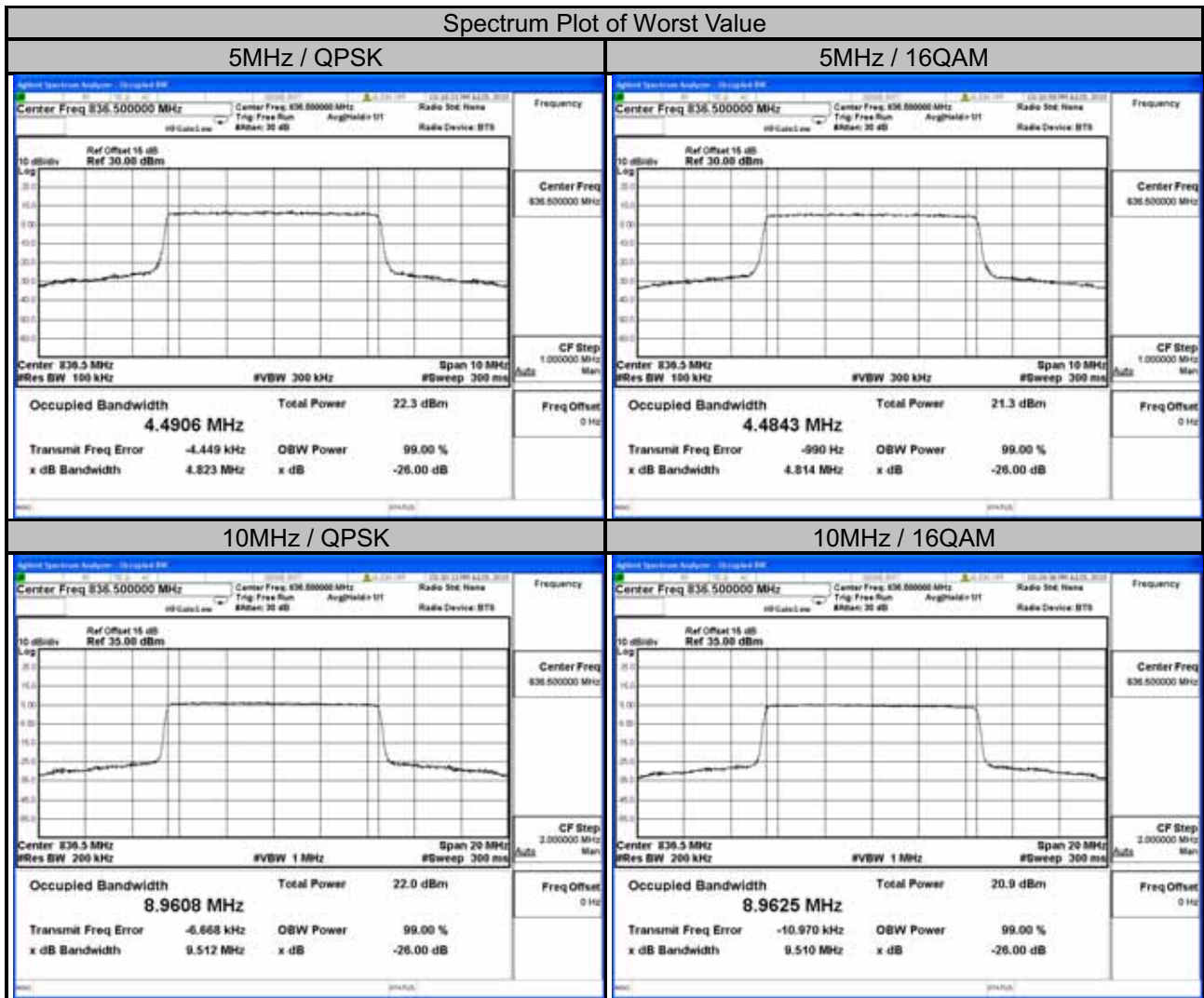


LTE Band 5							
Channel Bandwidth: 1.4MHz				Channel Bandwidth: 3MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
20407	824.7	1.0920	1.0908	20415	825.5	2.6950	2.6955
20525	836.5	1.0920	1.0889	20525	836.5	2.6957	2.6941
20643	848.3	1.0916	1.0916	20635	847.5	2.6959	2.6960



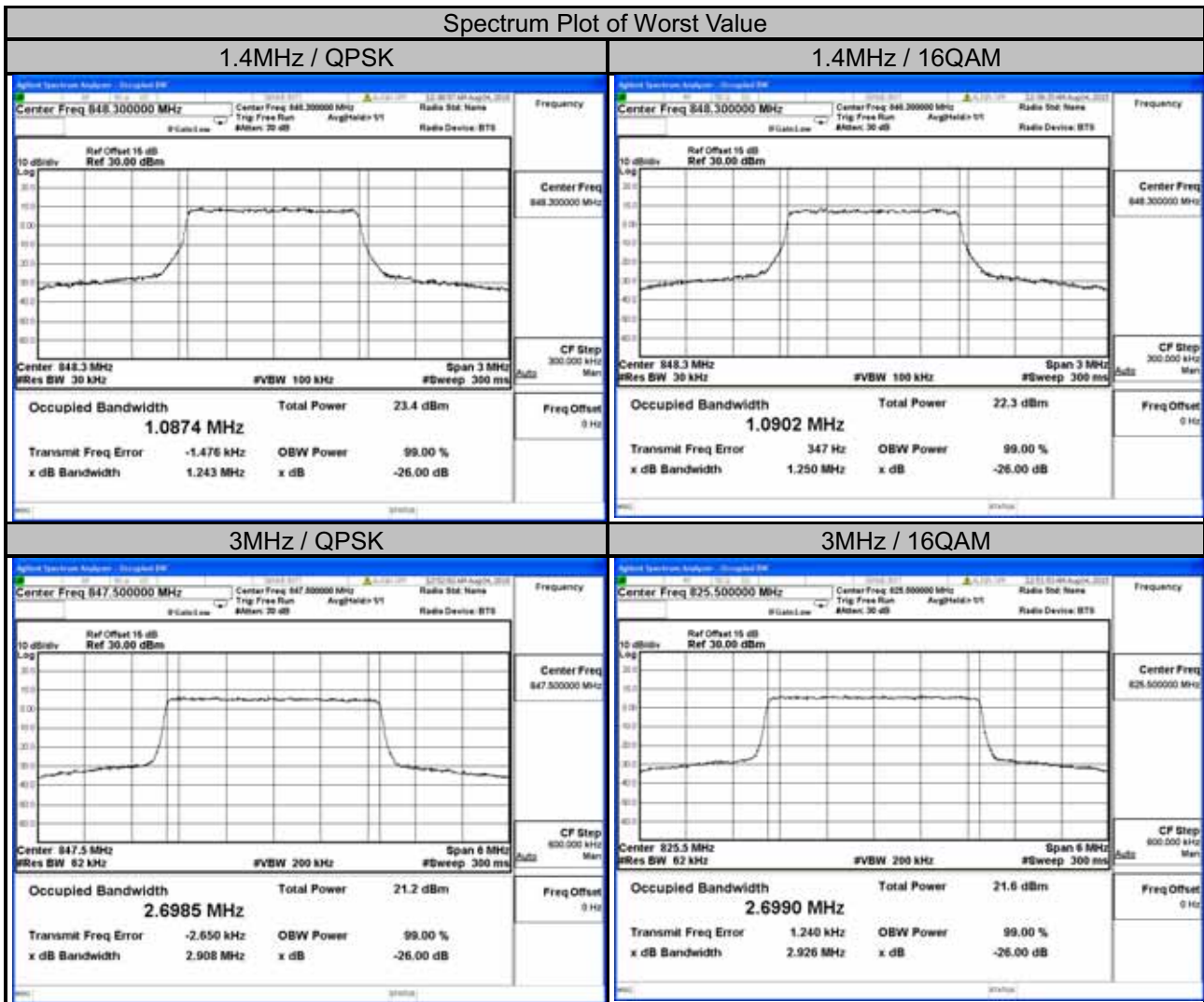


LTE Band 5							
Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
20425	826.5	4.4902	4.4832	20450	829.0	8.9550	8.9560
20525	836.5	4.4906	4.4843	20525	836.5	8.9608	8.9625
20625	846.5	4.4864	4.4814	20600	844.0	8.9435	8.9367





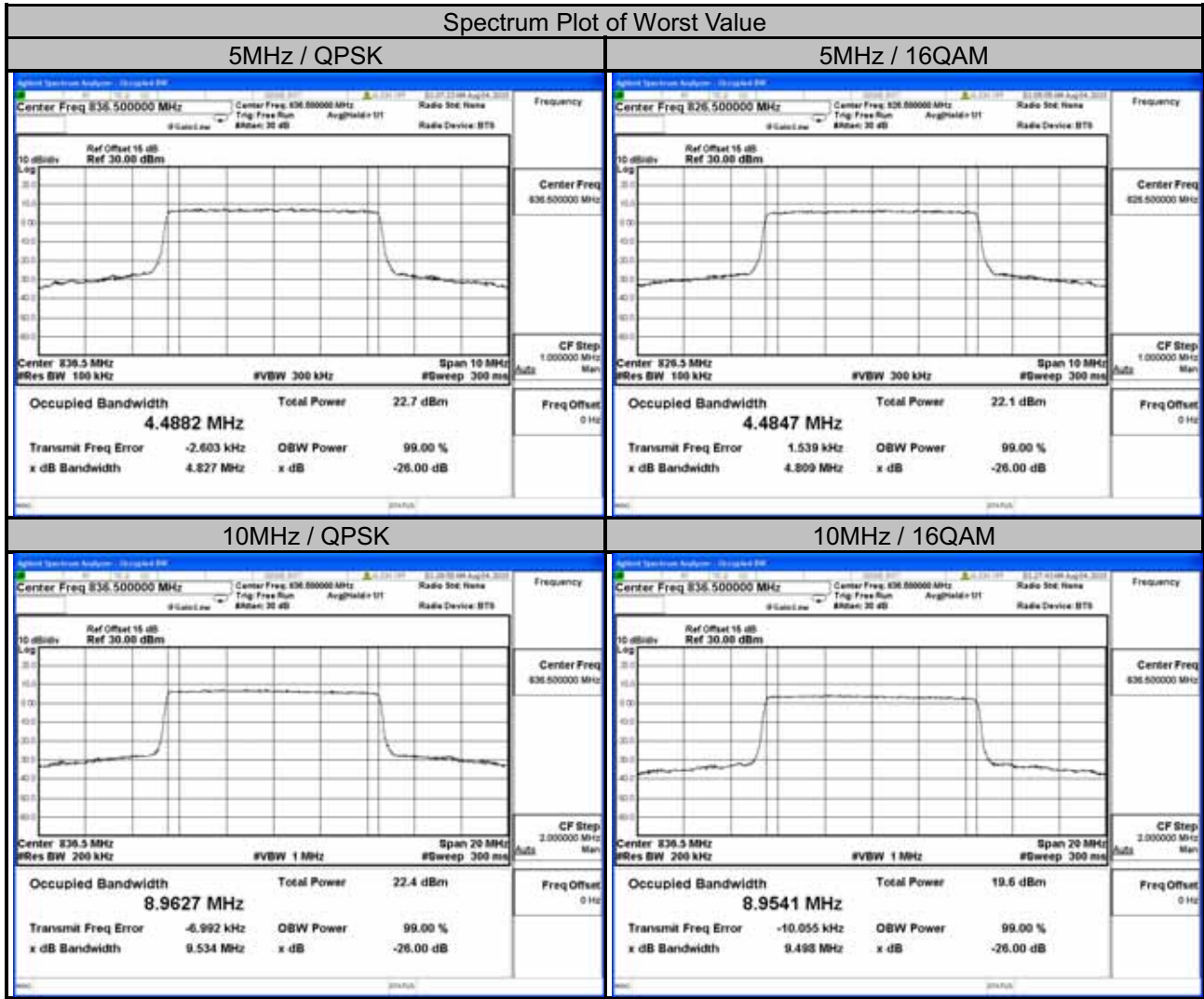
LTE Band 26							
Channel Bandwidth: 1.4MHz				Channel Bandwidth: 3MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
26797	824.7	1.0874	1.0899	26805	825.5	2.6965	2.6990
26915	836.5	1.0862	1.0889	26915	836.5	2.6967	2.6949
27033	848.3	1.0874	1.0902	27025	847.5	2.6985	2.6966







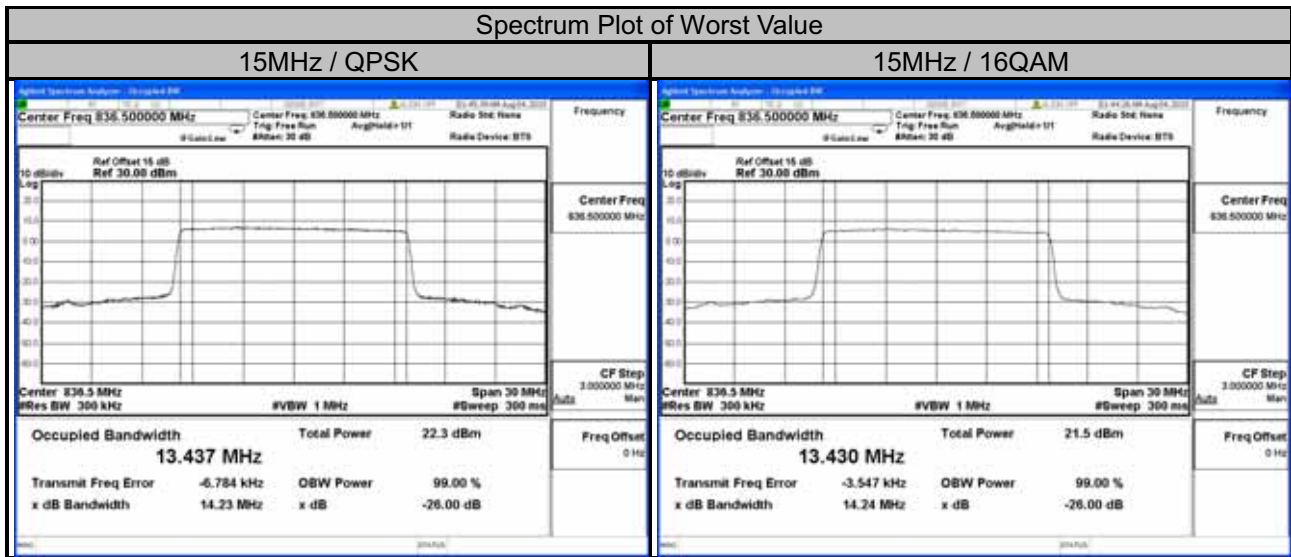
LTE Band 26							
Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
26815	826.5	4.4869	4.4847	26840	829.0	8.9540	8.9539
26915	836.5	4.4882	4.4835	26915	836.5	8.9627	8.9541
27015	846.5	4.4836	4.4840	26990	844.0	8.9455	8.9418







LTE Band 26			
Channel Bandwidth: 15MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
26865	831.5	13.416	13.402
26915	836.5	13.437	13.430
26965	841.5	13.420	13.409

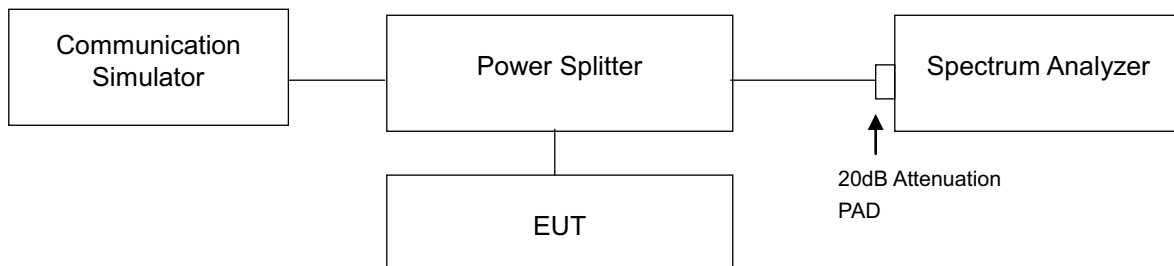


## 4.4 Band Edge Measurement

### 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



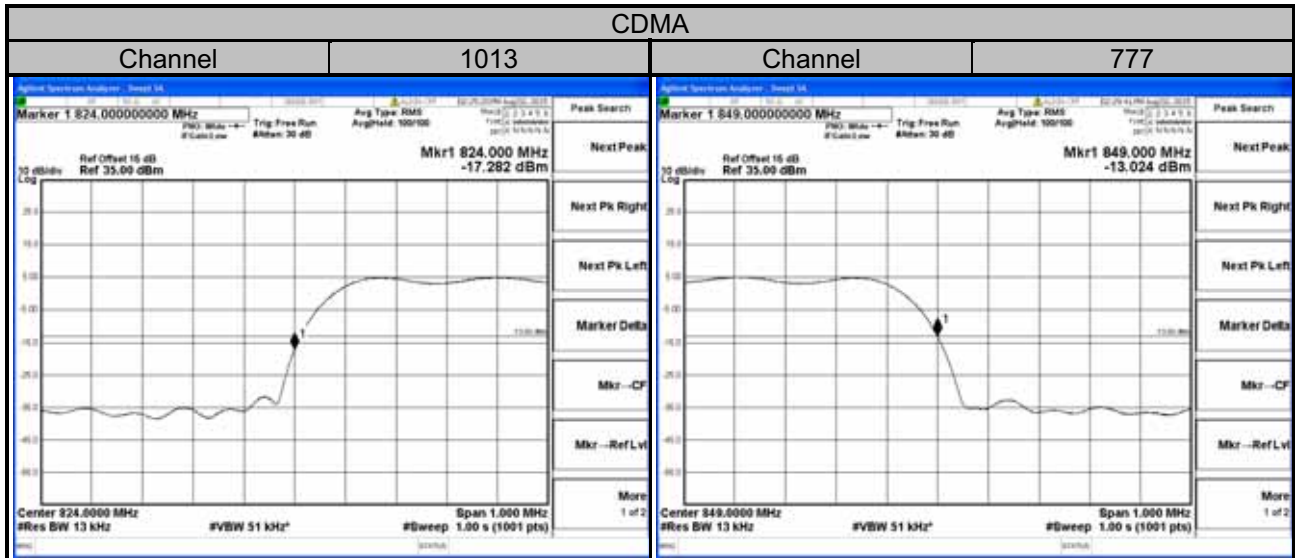
### 4.4.3 Test Procedures

- All measurements were done at low and high operational frequency range.
- The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 13kHz and VB of the spectrum is 51kHz (CDMA / LTE Bandwidth 1.4MHz).
- The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 30kHz and VB of the spectrum is 100kHz (LTE Bandwidth 3MHz).
- The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (LTE Bandwidth 5MHz/10MHz).
- The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 150kHz and VB of the spectrum is 470kHz (LTE Bandwidth 15MHz).
- Record the max trace plot into the test report.



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### 4.4.4 Test Results

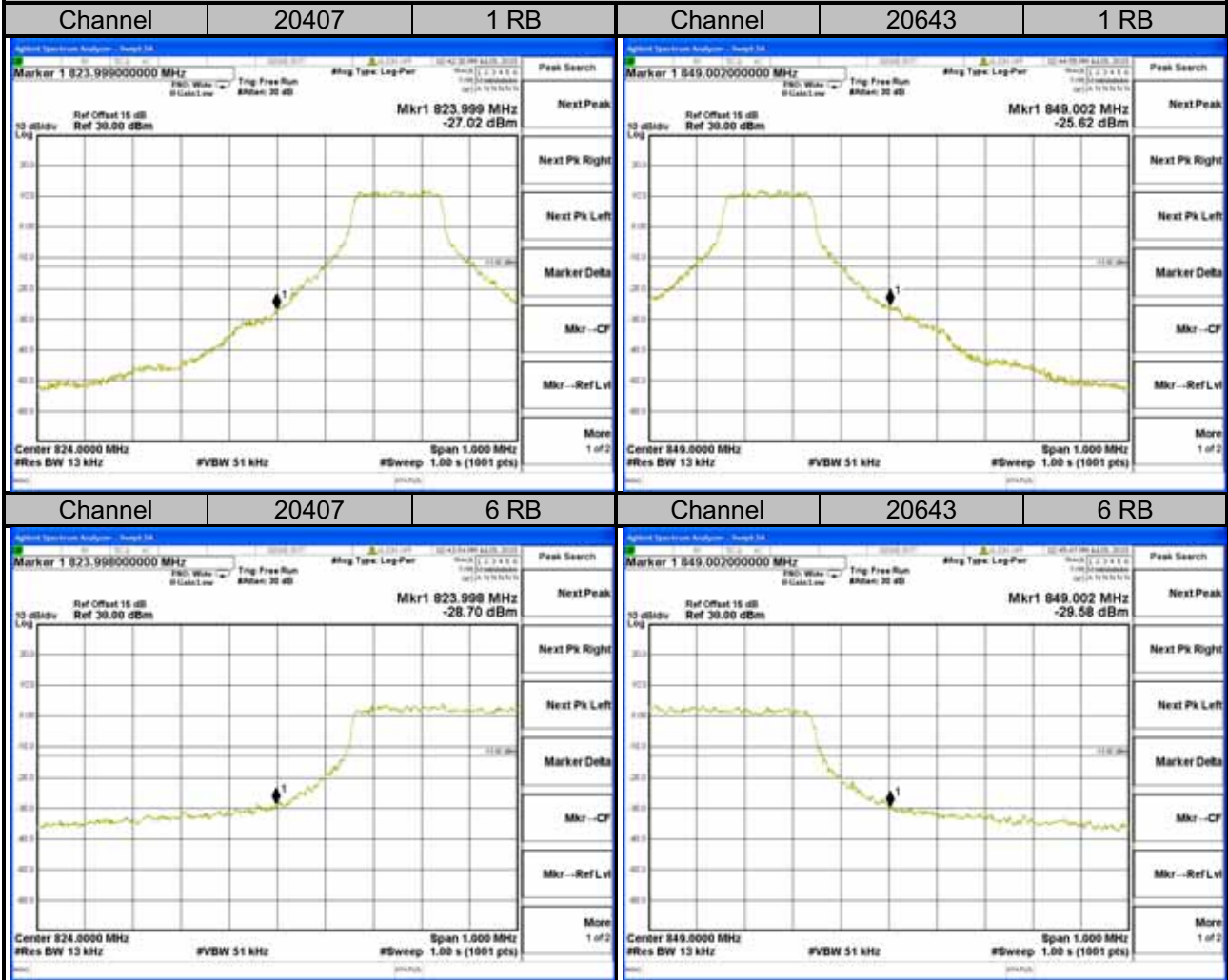




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LTE Band 5

Channel Bandwidth: 1.4MHz

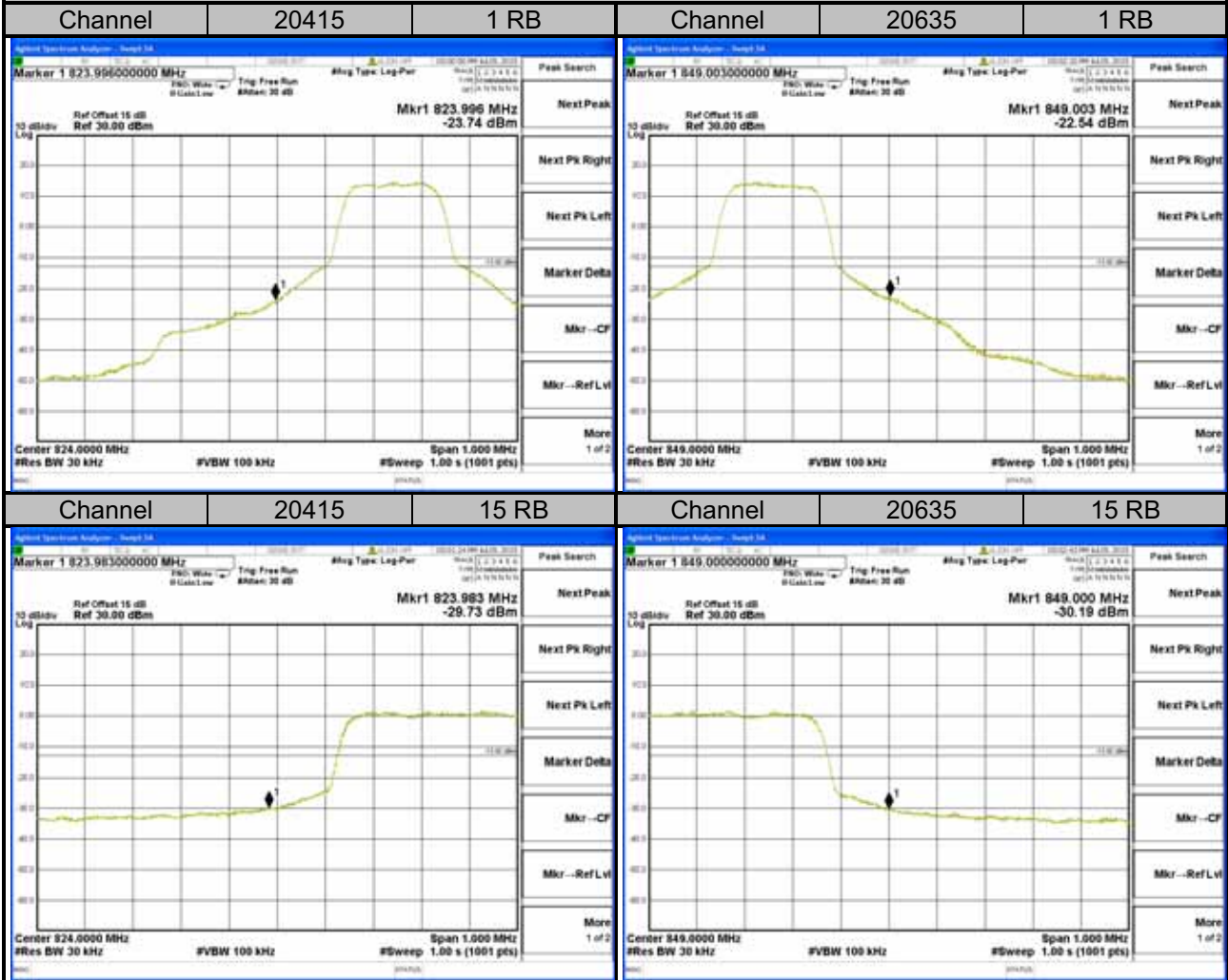




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LTE Band 5

Channel Bandwidth: 3MHz

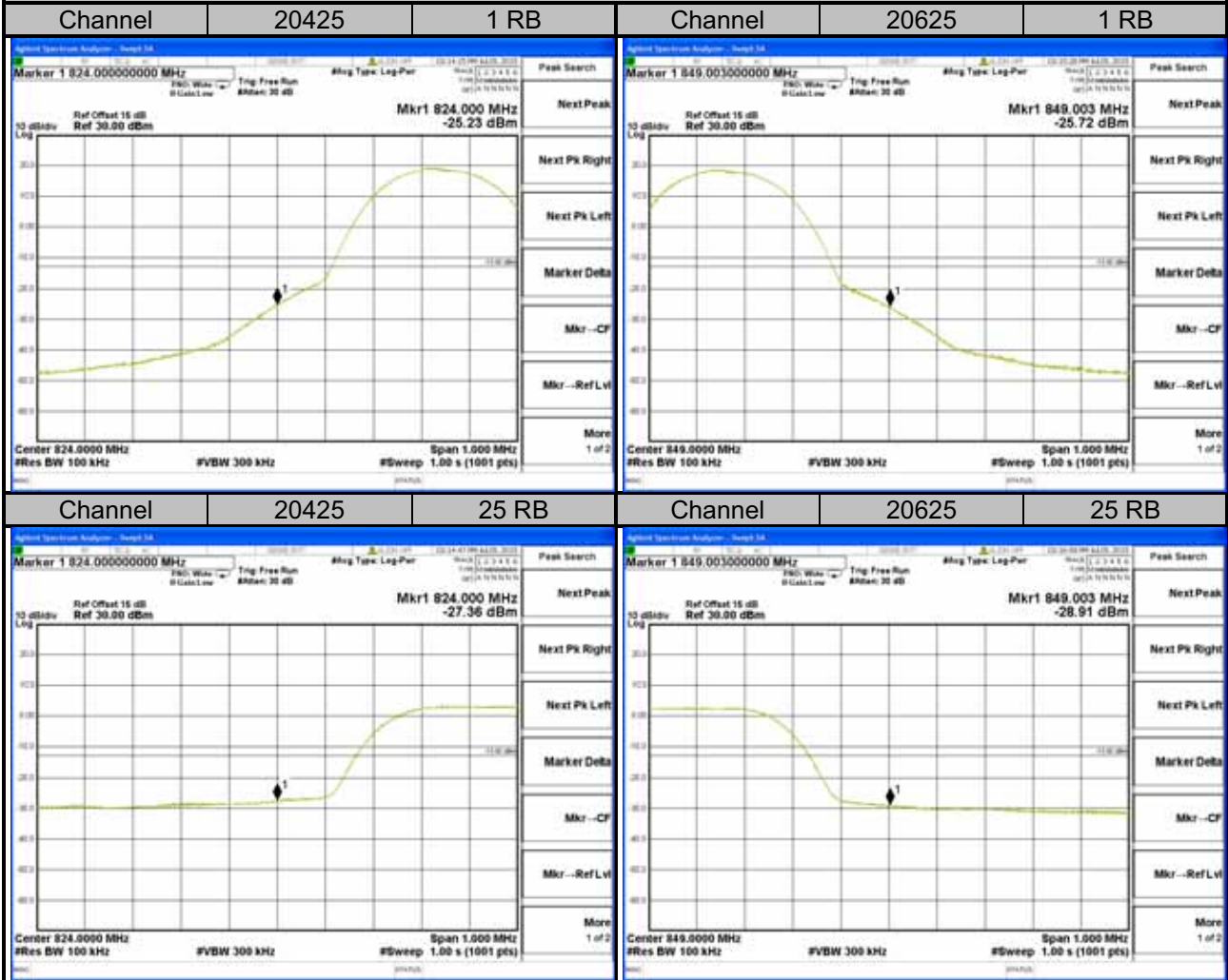




A O T

LTE Band 5

Channel Bandwidth: 5MHz

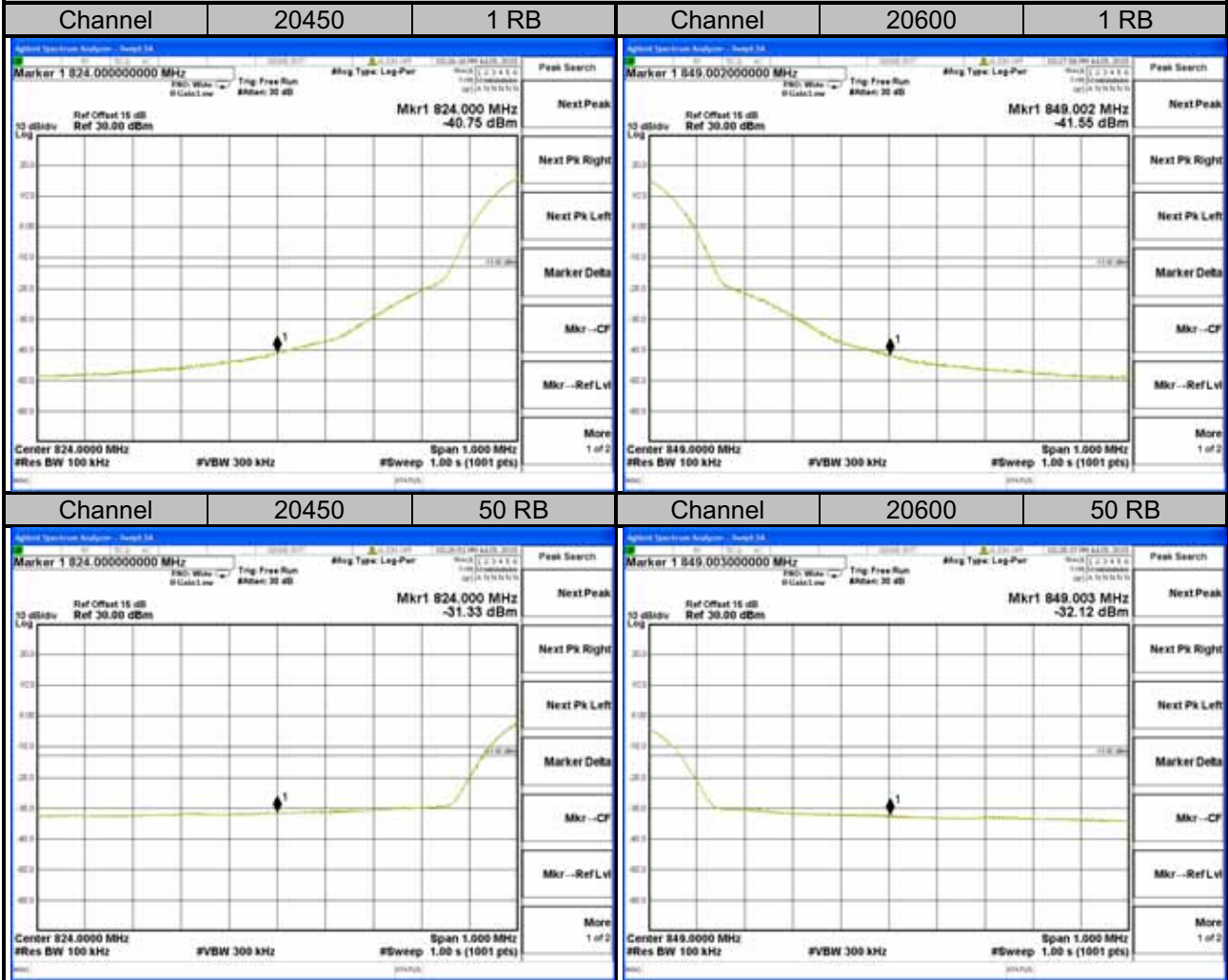




A O T

LTE Band 5

Channel Bandwidth: 10MHz



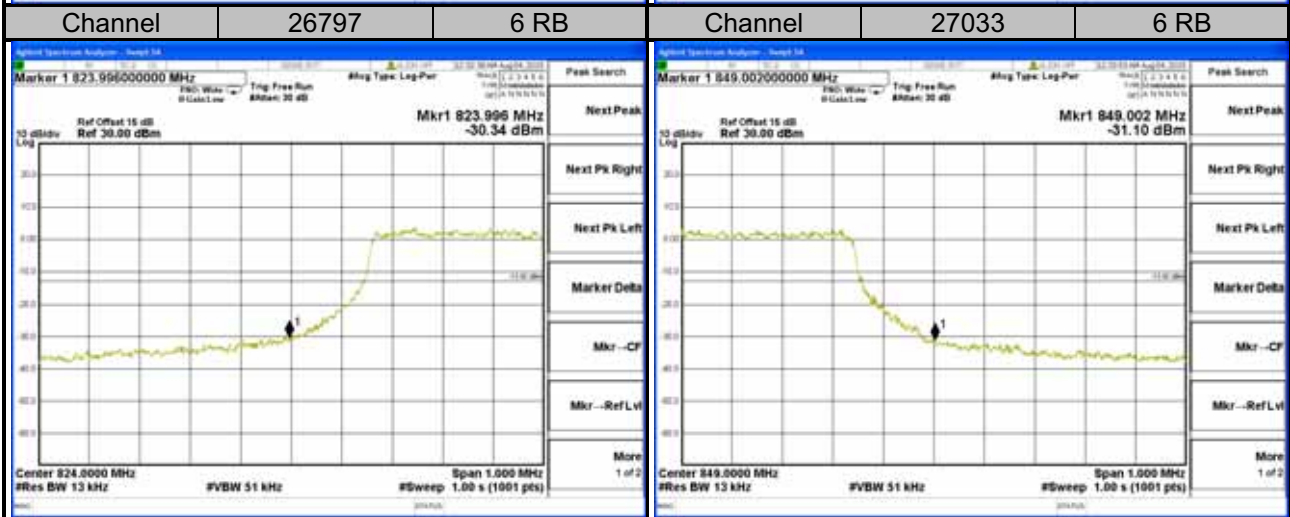
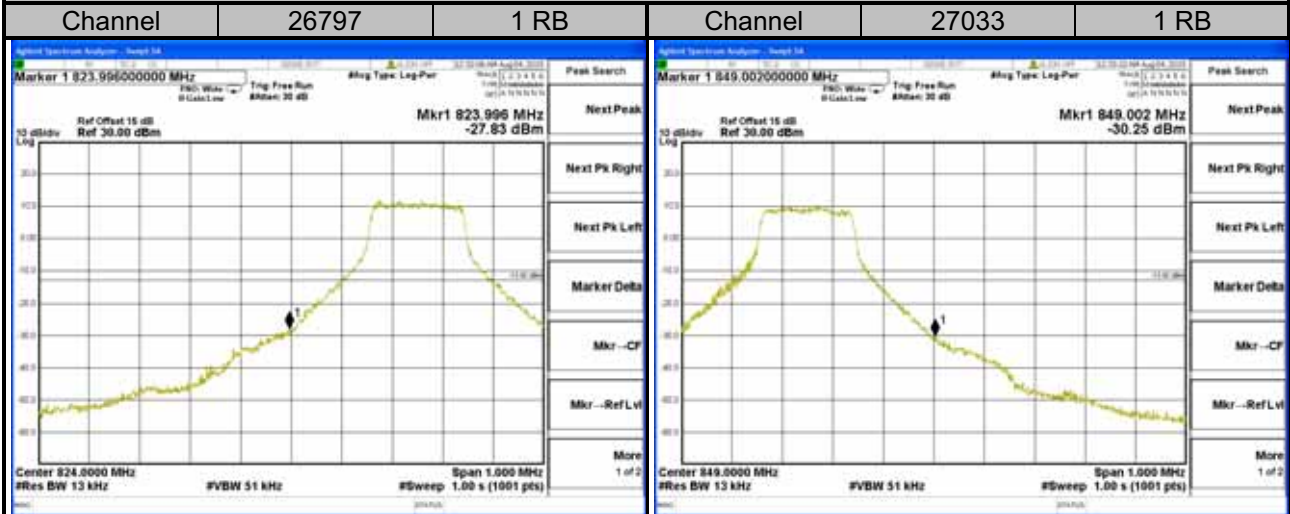




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LTE Band 26

Channel Bandwidth: 1.4MHz



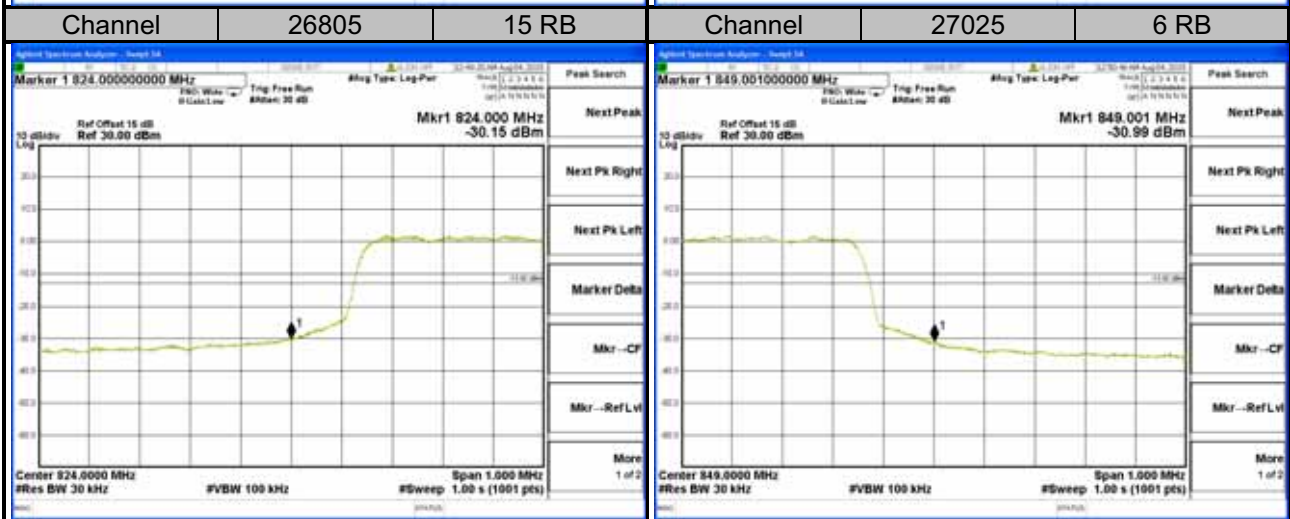
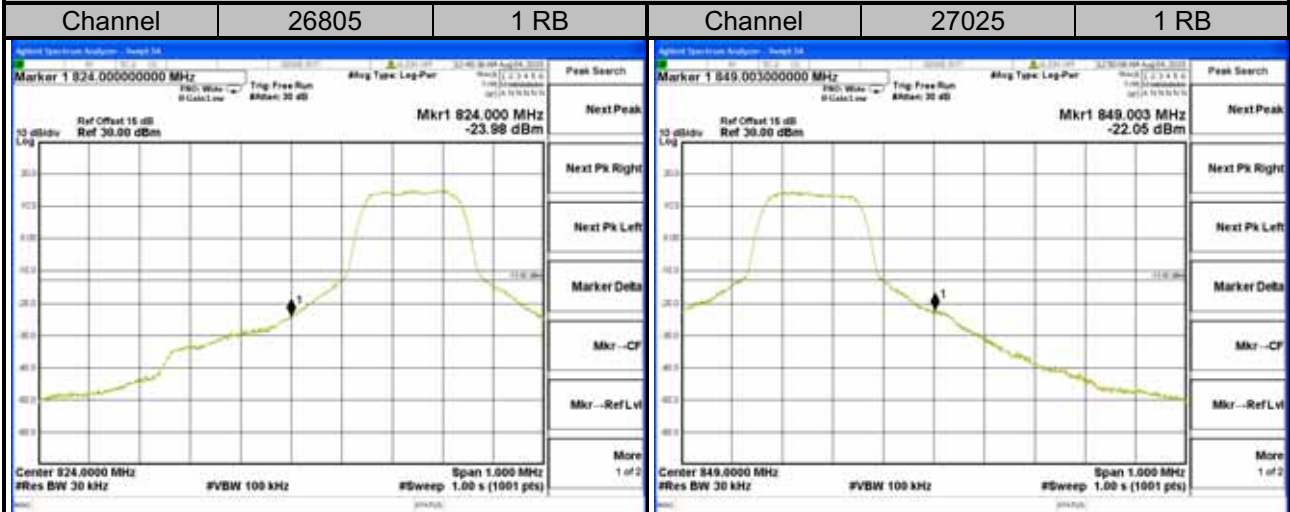




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LTE Band 26

Channel Bandwidth: 3MHz

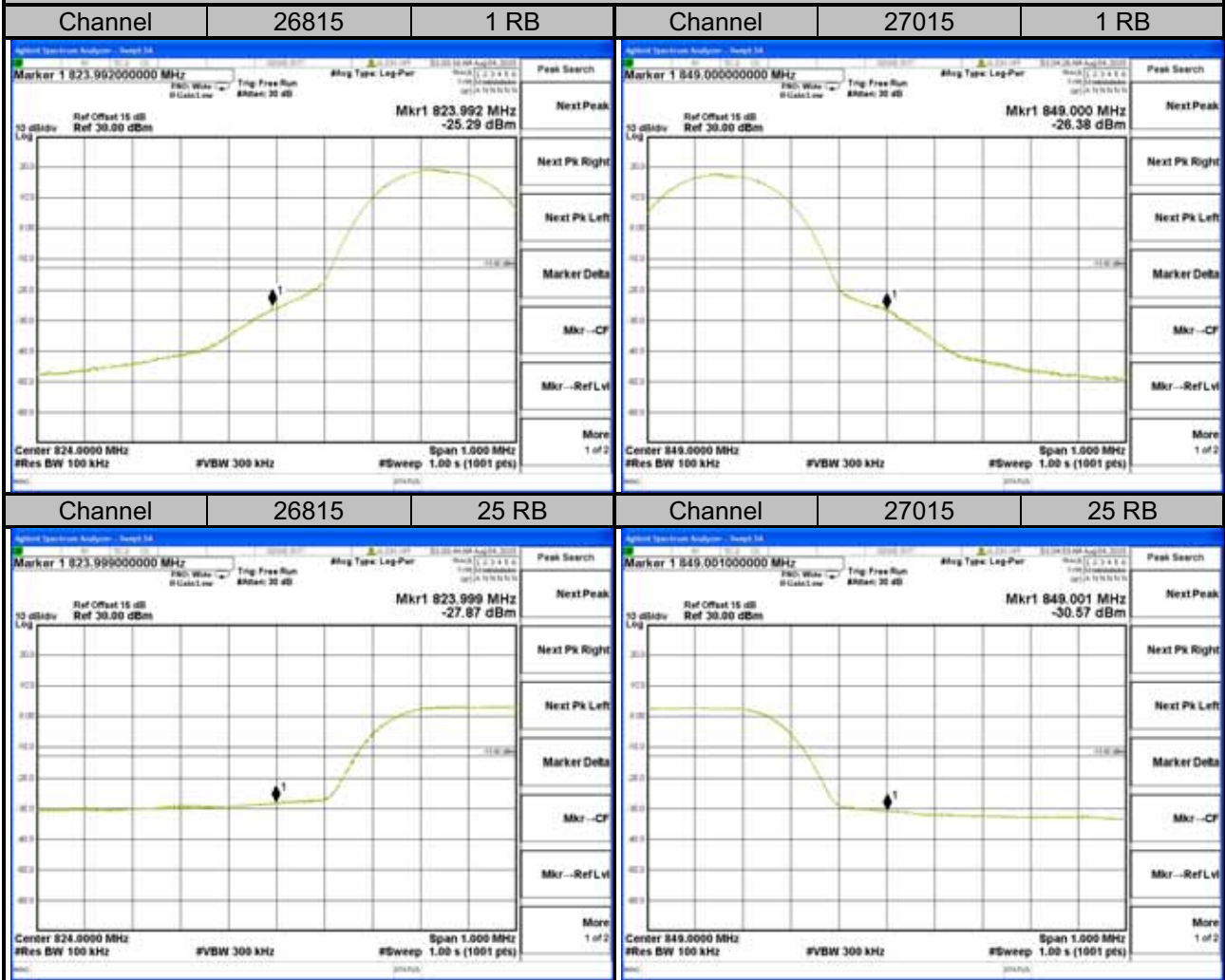




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### LTE Band 26

Channel Bandwidth: 5MHz

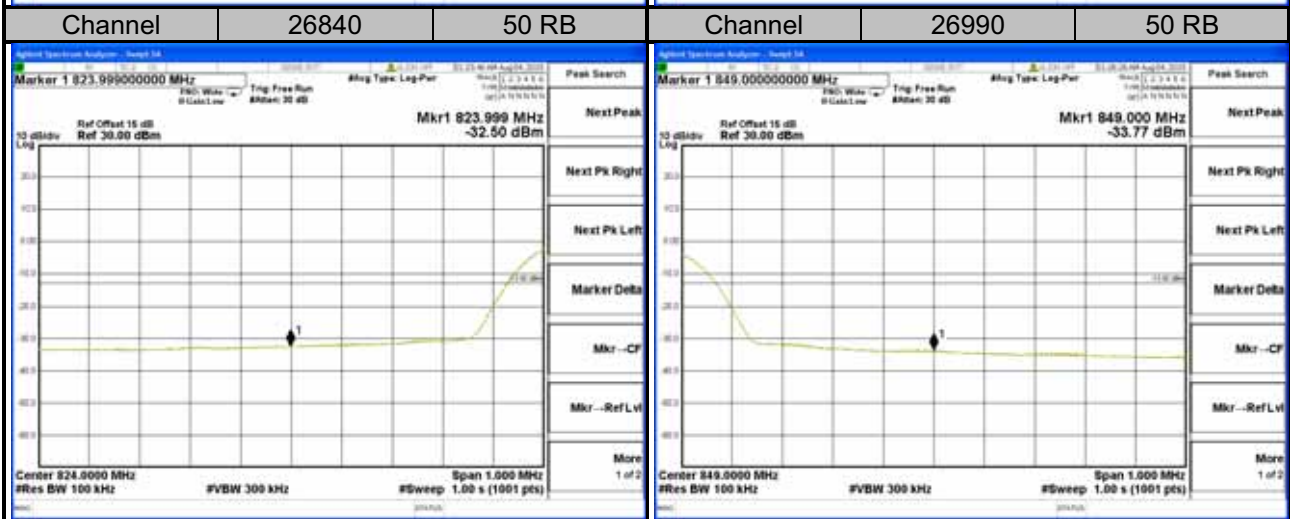
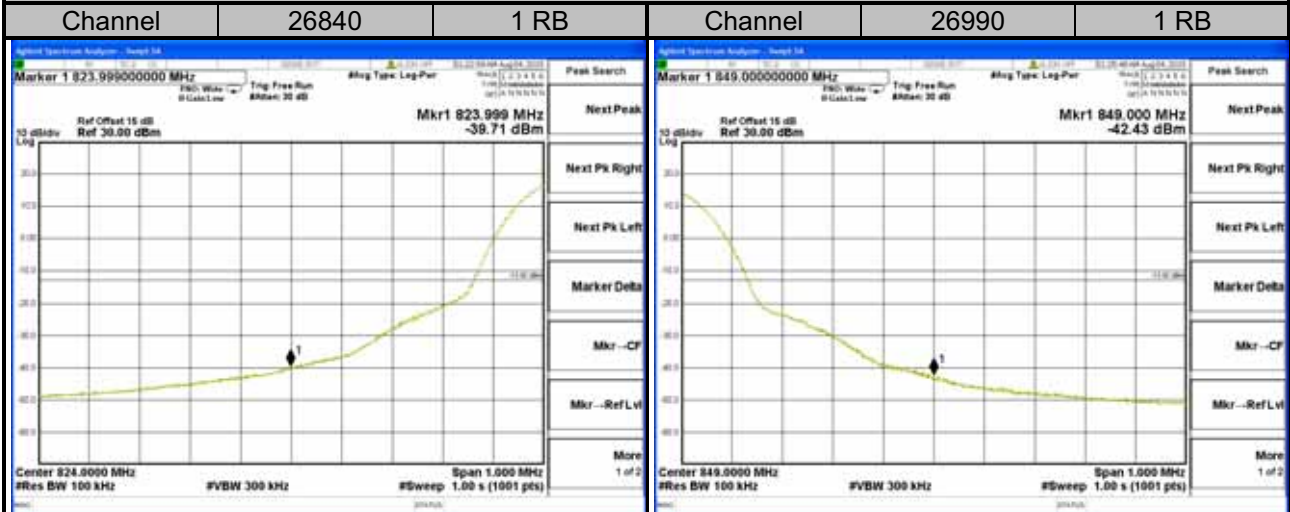




A O T

LTE Band 26

Channel Bandwidth: 10MHz

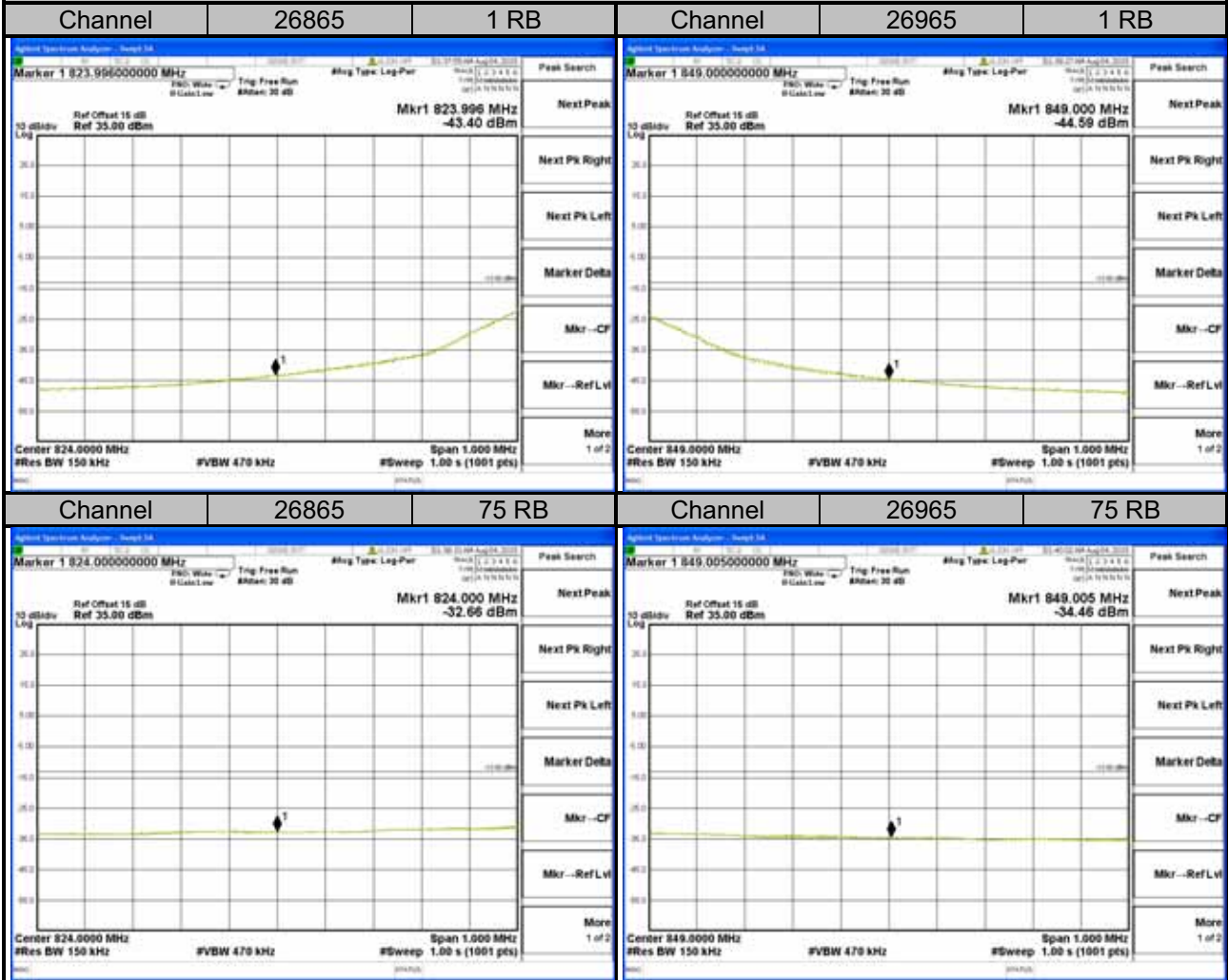




A O T

LTE Band 26

Channel Bandwidth: 15MHz

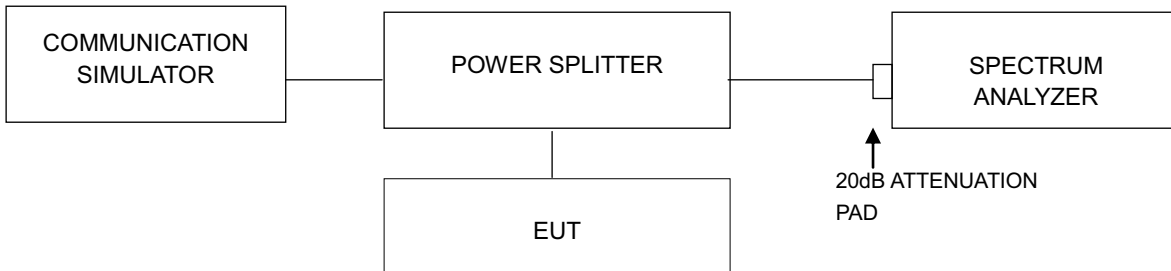


### 4.5 Peak To Average Ratio

#### 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

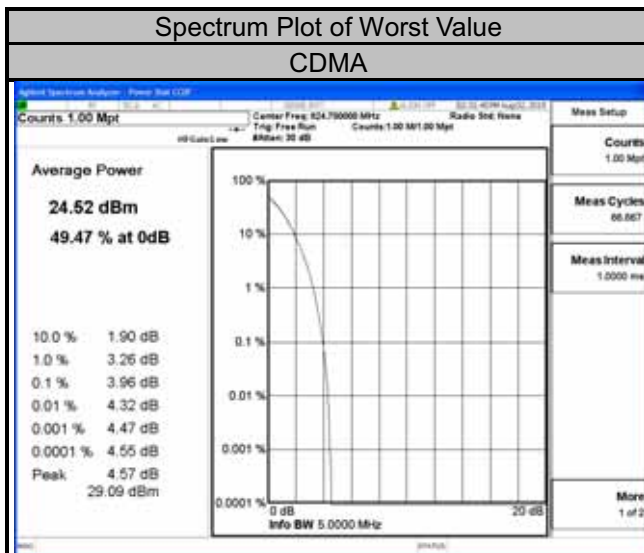


#### 4.5.3 Test Procedures

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

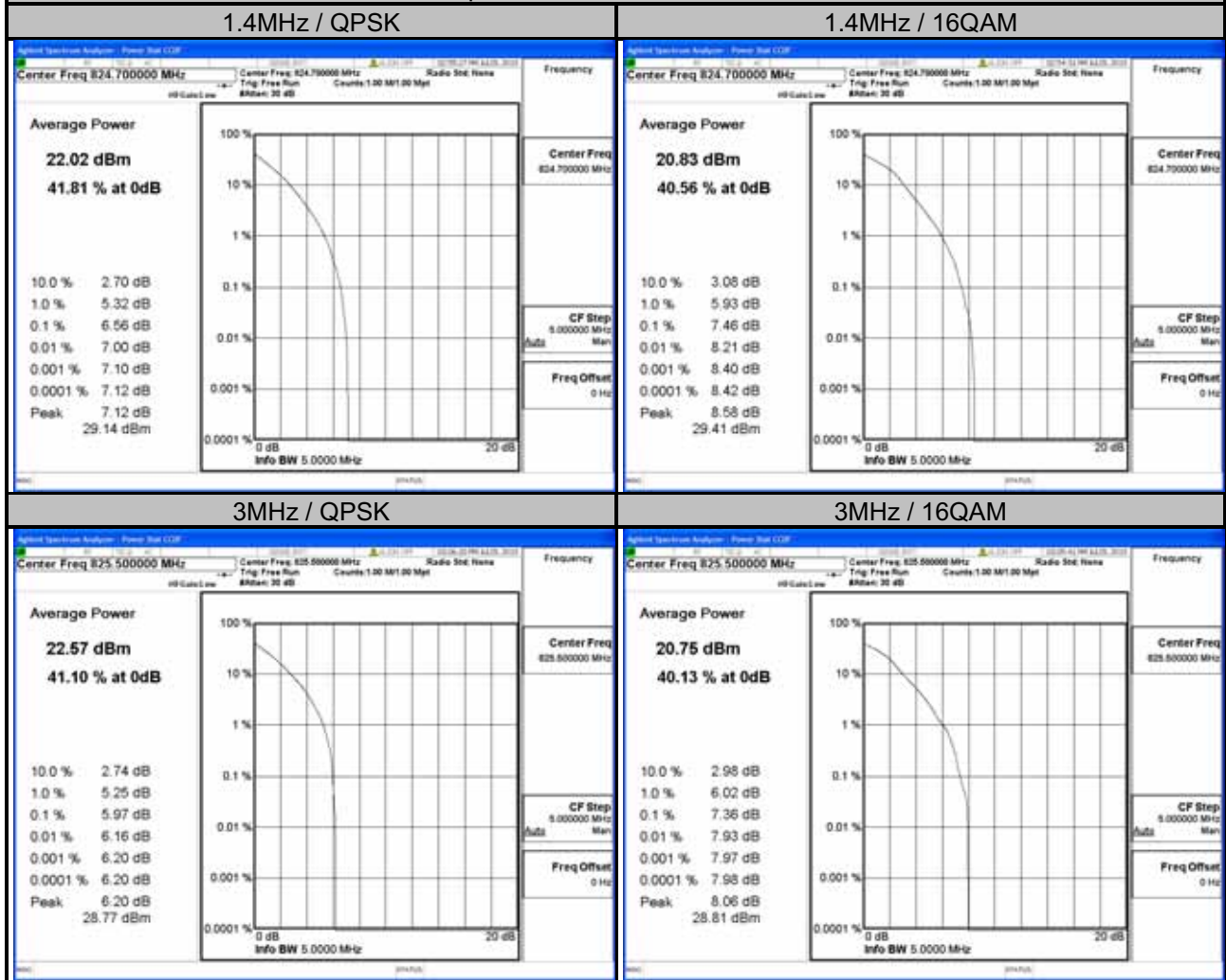
Channel	Frequency (MHz)	Peak to Average Ratio (dB)
		CDMA
1013	824.70	3.96
384	836.52	3.73
777	848.31	3.17





LTE Band 5							
Channel Bandwidth: 1.4MHz				Channel Bandwidth: 3MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
20407	824.7	6.56	7.46	20415	825.5	5.97	7.36
20525	836.5	6.46	7.42	20525	836.5	5.76	7.31
20643	848.3	5.74	6.73	20635	847.5	4.90	6.63

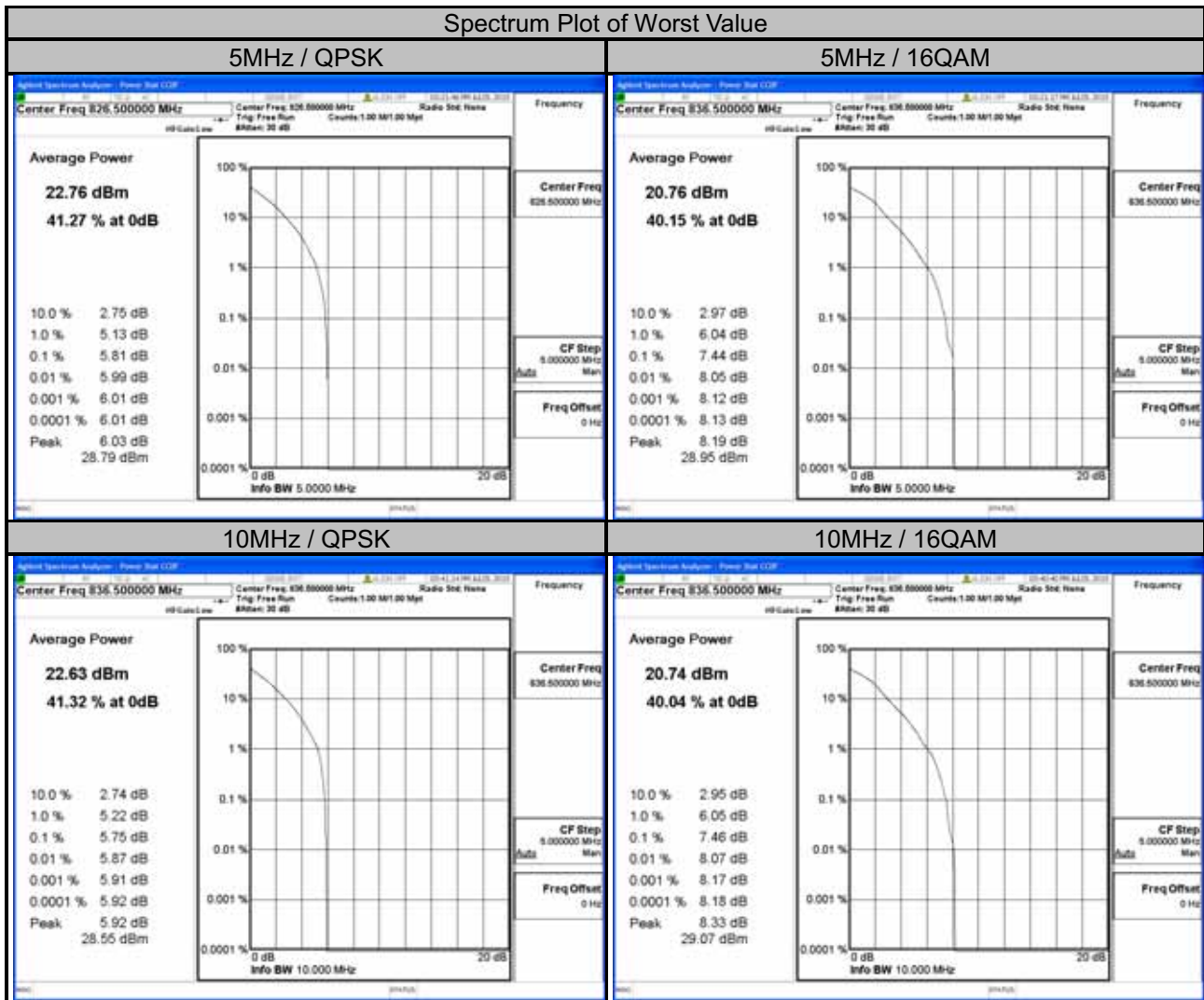
Spectrum Plot of Worst Value





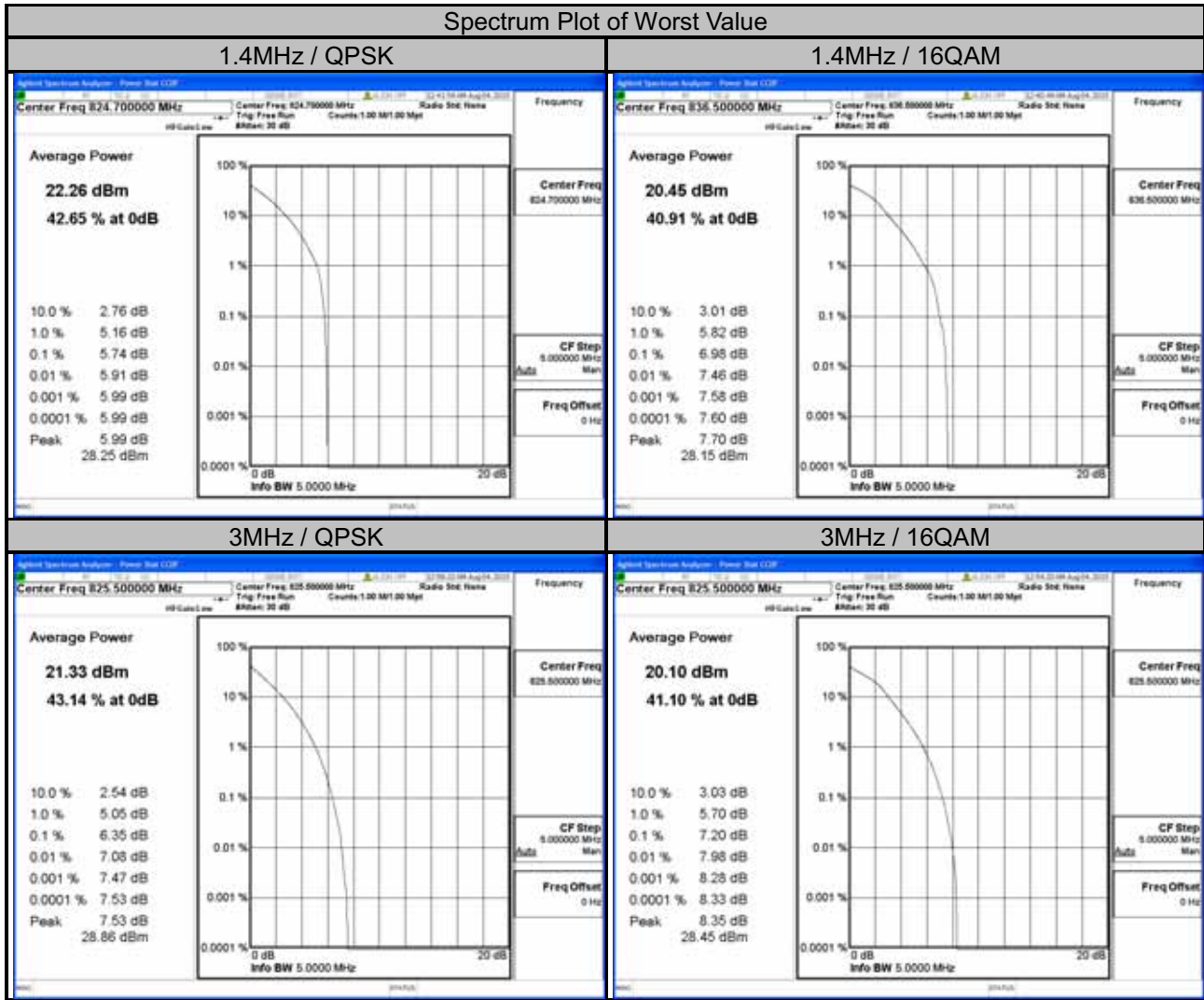


LTE Band 5							
Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
20425	826.5	5.81	7.38	20450	829.0	5.70	7.09
20525	836.5	5.79	7.44	20525	836.5	5.75	7.46
20625	846.5	5.03	6.58	20600	844.0	5.42	7.11





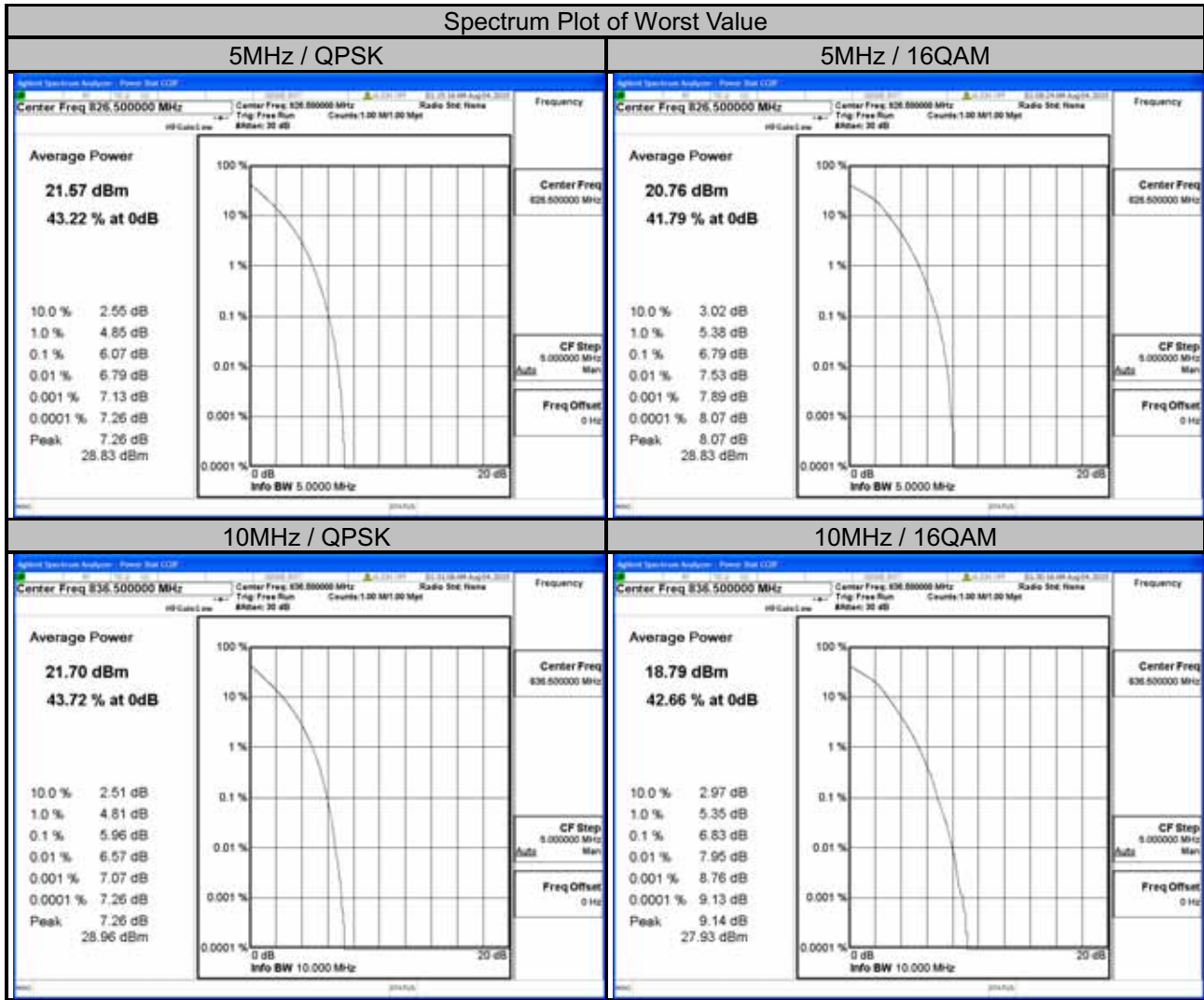
LTE Band 26							
Channel Bandwidth: 1.4MHz				Channel Bandwidth: 3MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
26797	824.7	5.74	6.89	26805	825.5	6.35	7.20
26915	836.5	5.58	6.98	26915	836.5	6.27	7.08
27033	848.3	4.29	6.78	27025	847.5	6.05	6.91







LTE Band 26							
Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
26815	826.5	6.07	6.79	26840	829.0	5.93	6.64
26915	836.5	5.97	6.66	26915	836.5	5.96	6.83
27015	846.5	5.70	6.46	26990	844.0	5.72	6.53



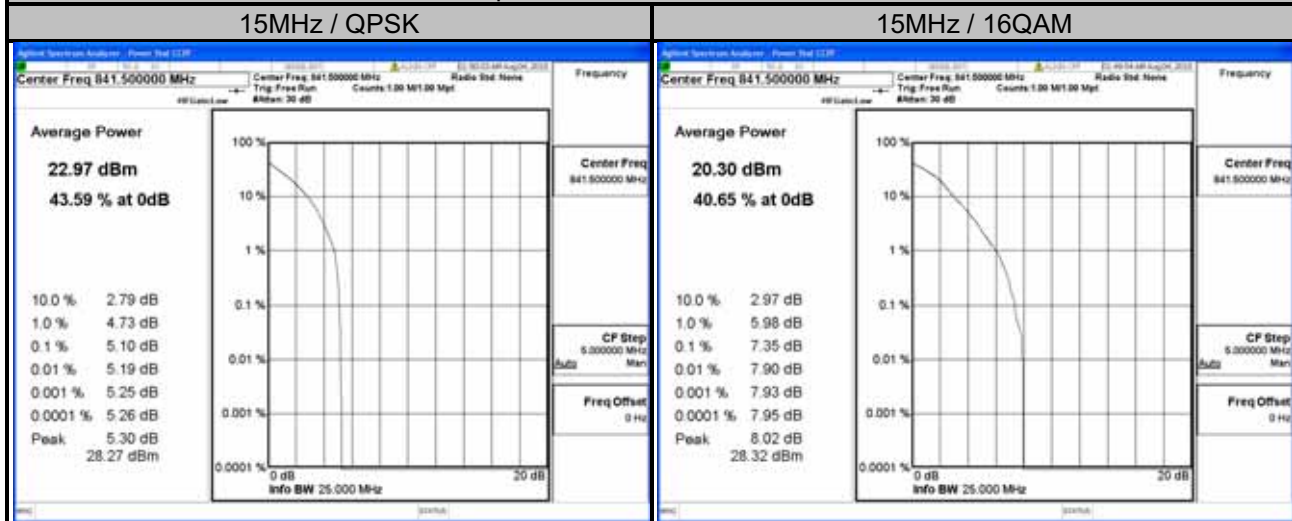


LTE Band 26

Channel Bandwidth: 15MHz

Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM
26865	831.5	5.03	7.18
26915	836.5	5.03	7.28
26965	841.5	5.10	7.35

Spectrum Plot of Worst Value

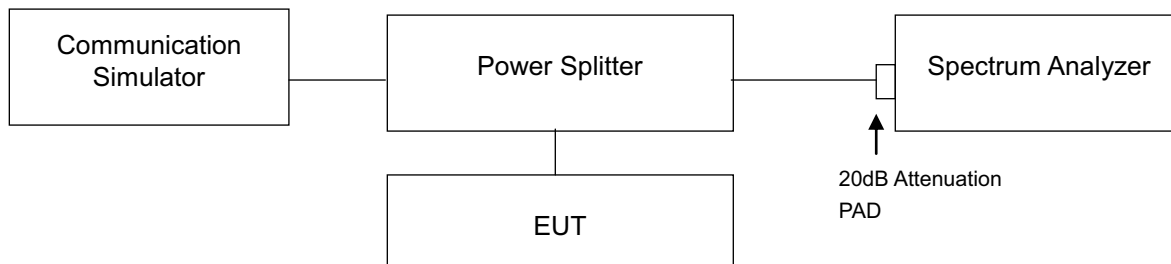


## 4.6 Conducted Spurious Emissions

### 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  $-13\text{dBm}$ .

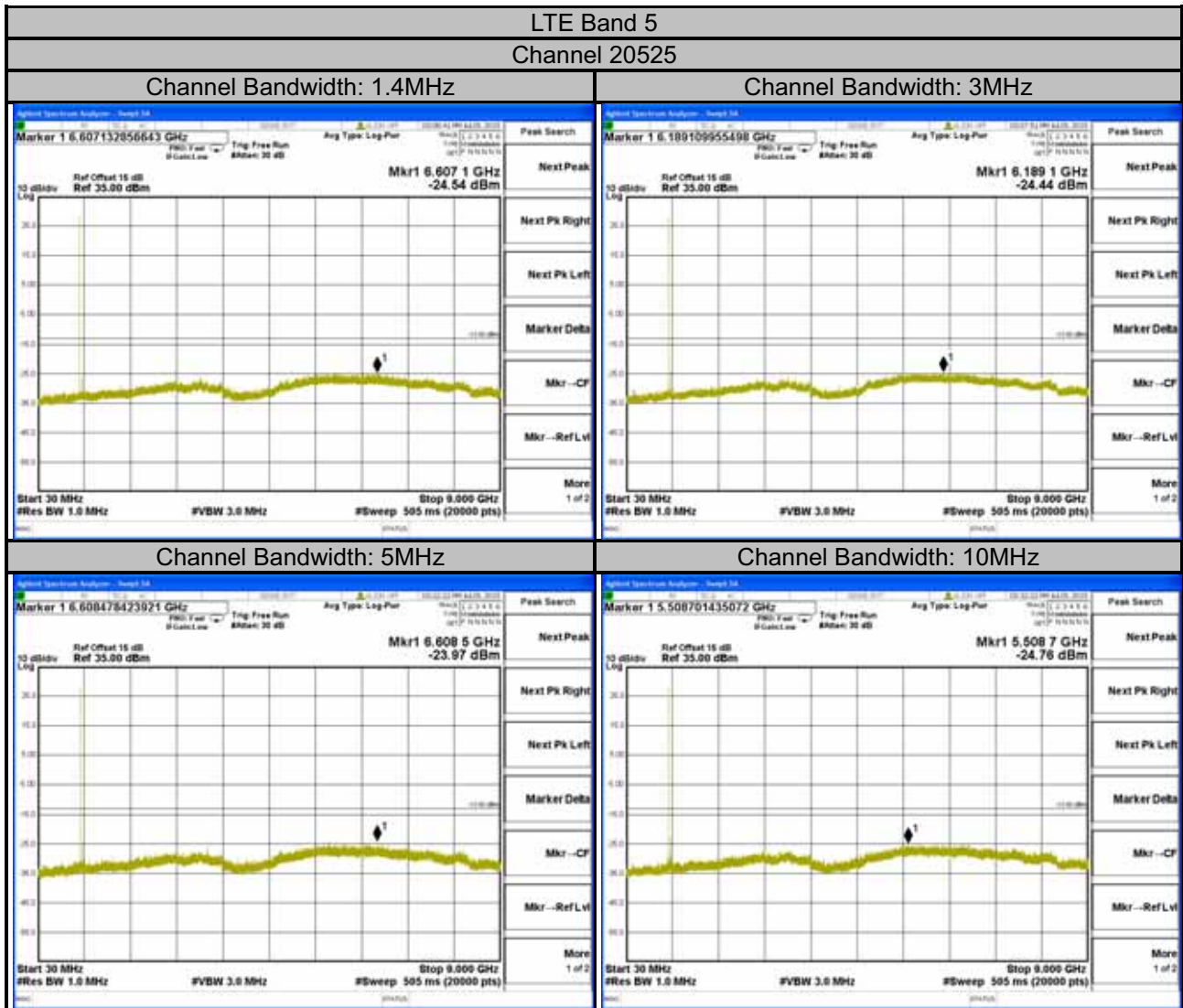
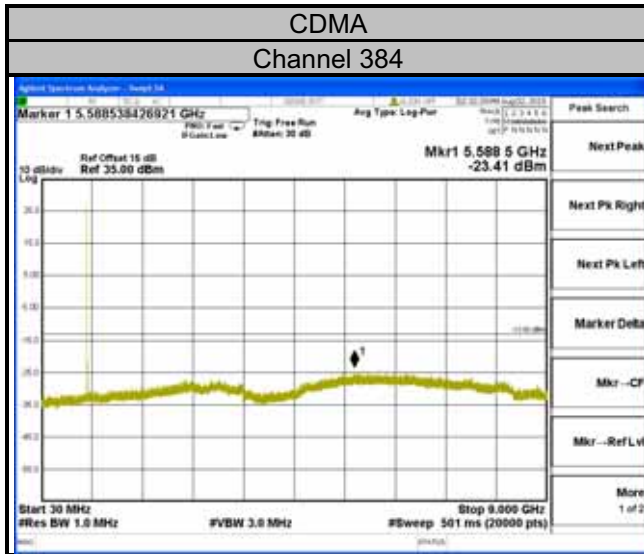
### 4.6.2 Test Setup



### 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 9GHz. 20dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.

### 4.6.4 Test Results

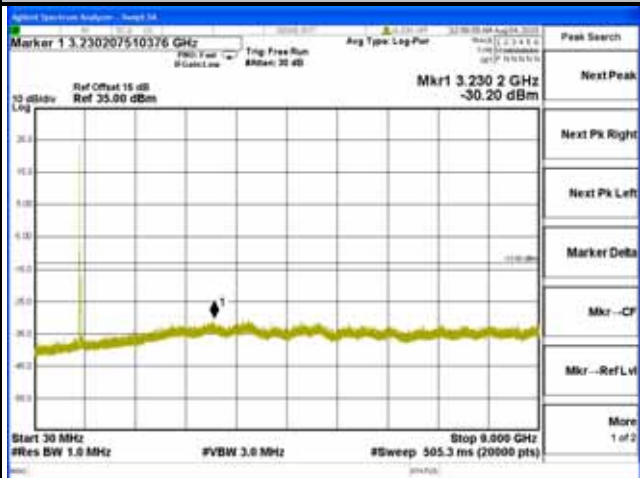
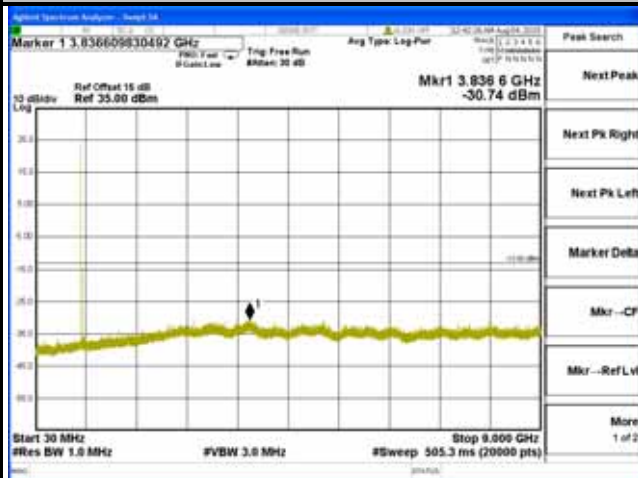




LTE Band 26  
Channel 26915

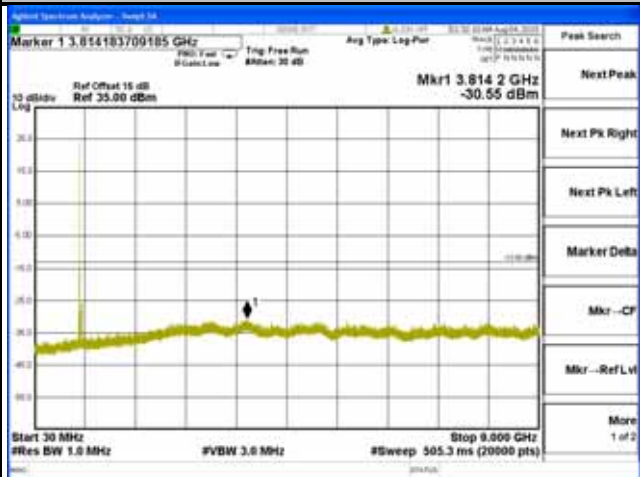
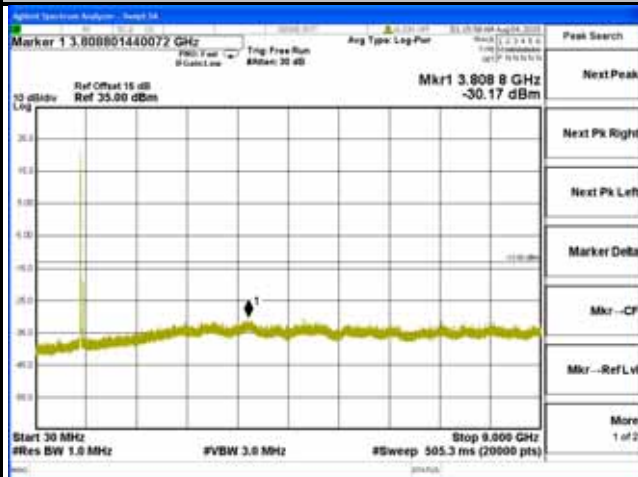
Channel Bandwidth: 1.4MHz

Channel Bandwidth: 3MHz

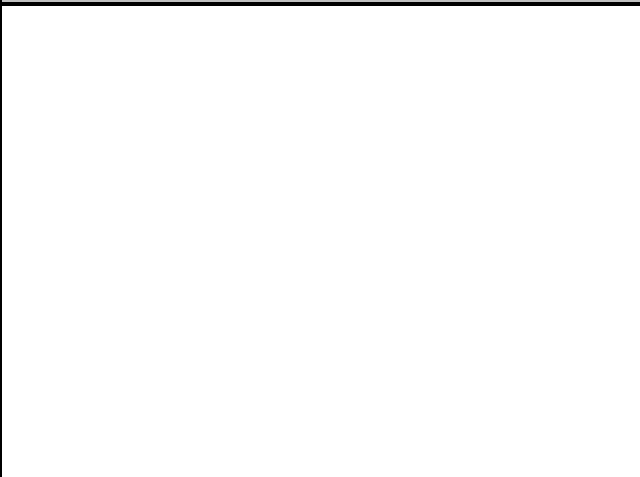


Channel Bandwidth: 5MHz

Channel Bandwidth: 10MHz



Channel Bandwidth: 15MHz



## 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 equal to  $-13\text{dBm}$ .

### 4.7.2 Test Procedure

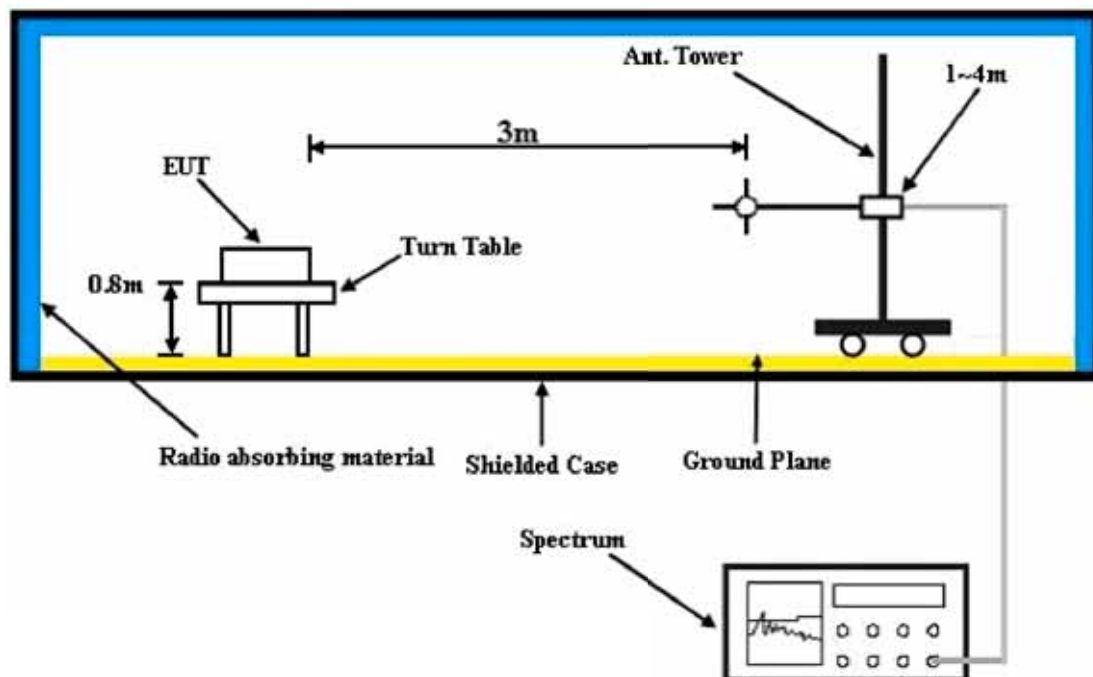
- Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- 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
- $\text{EIRP} = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}$ .
- E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole,  $\text{E.R.P power} = \text{E.I.P.R power} - 2.15\text{dBi}$ .

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

### 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

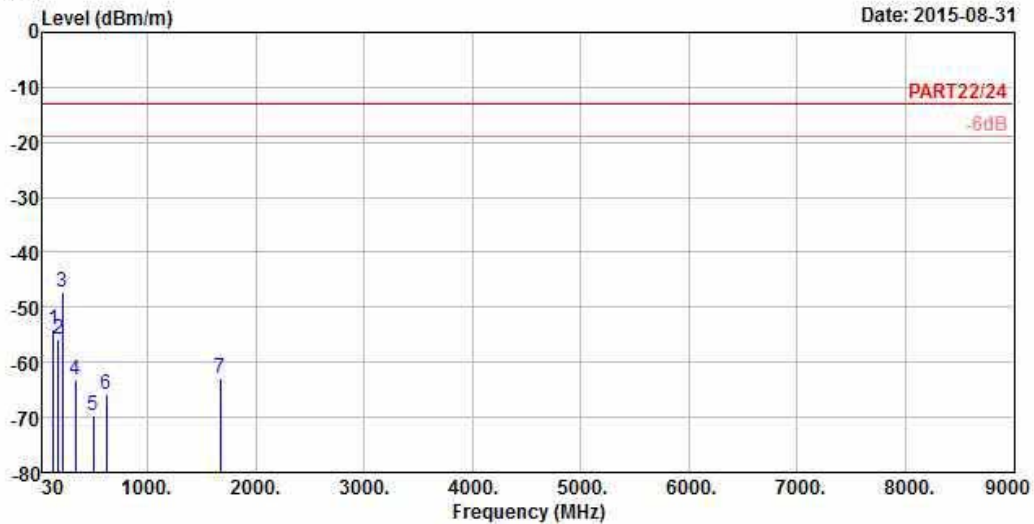
CDMA:



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Data: 7



Site : 966 Chamber 5  
 Condition: PART22/24 3m HORIZONTAL  
 Remark : CDMA 2000 BC 0 Link  
 Tested by: Anson Lin  
 Plane : X

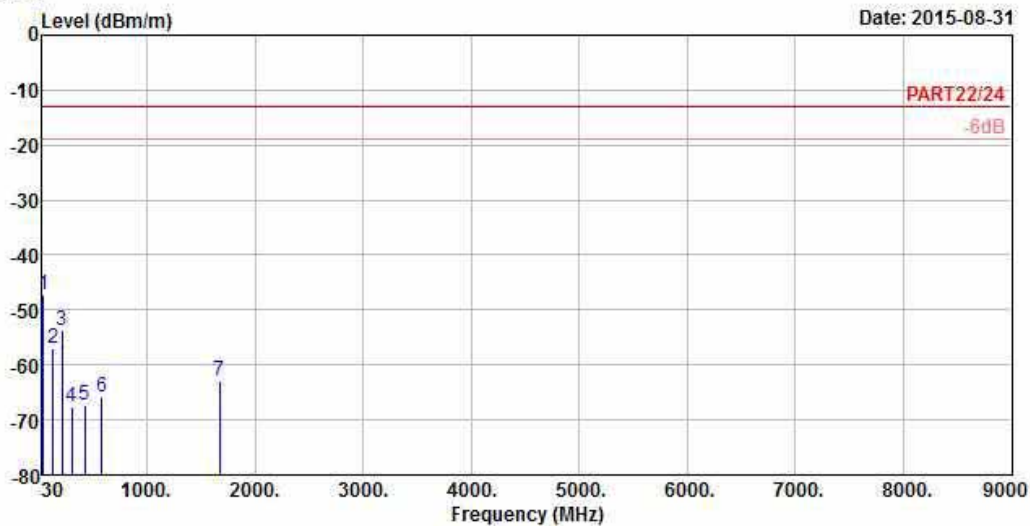
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1	128.28	-54.07	-45.15	-13.00	-41.07	-8.92	Peak
2	178.50	-55.73	-48.67	-13.00	-42.73	-7.06	Peak
3 pp	213.60	-47.09	-39.62	-13.00	-34.09	-7.47	Peak
4	333.60	-63.07	-56.58	-13.00	-50.07	-6.49	Peak
5	500.90	-69.74	-65.13	-13.00	-56.74	-4.61	Peak
6	620.60	-65.89	-65.08	-13.00	-52.89	-0.81	Peak
7	1673.04	-62.78	-48.10	-13.00	-49.78	-14.68	Peak



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Data: 8



Site : 966 Chamber 5  
 Condition: PART22/24 3m VERTICAL  
 Remark : CDMA 2000 BC 0 Link  
 Tested by: Anson Lin  
 Plane : X

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1	pp	42.15	-47.12	-46.18	-13.00	-34.12	-0.94 Peak
2		128.55	-57.07	-48.26	-13.00	-44.07	-8.81 Peak
3		215.76	-53.83	-46.47	-13.00	-40.83	-7.36 Peak
4		304.20	-67.58	-60.64	-13.00	-54.58	-6.94 Peak
5		423.90	-67.35	-61.59	-13.00	-54.35	-5.76 Peak
6		584.20	-65.76	-64.32	-13.00	-52.76	-1.44 Peak
7		1673.04	-62.89	-48.21	-13.00	-49.89	-14.68 Peak



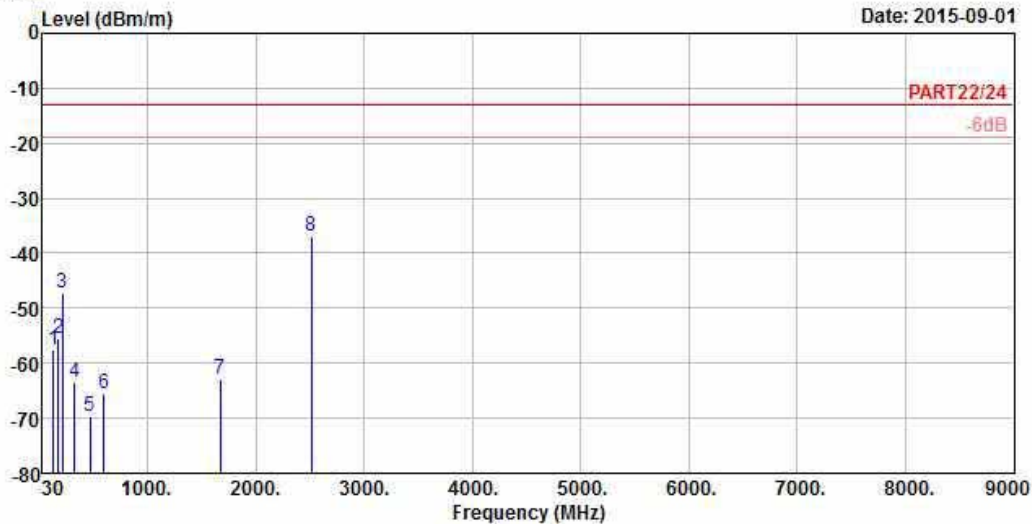
LTE Band 5  
Channel Bandwidth: 10MHz / QPSK



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Data: 9



Site : 966 Chamber 5  
Condition: PART22/24 3m HORIZONTAL  
Remark : LTE Band 5\_QPSK\_10M\_(1,24)  
Tested by: Anson Lin  
Plane : X

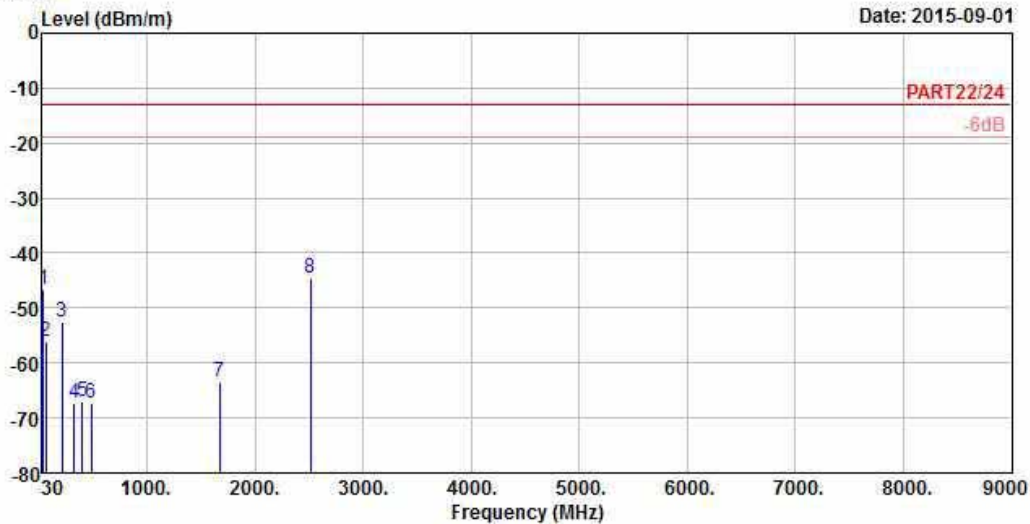
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1	128.28	-57.71	-48.79	-13.00	-44.71	-8.92	Peak
2	176.34	-55.64	-48.92	-13.00	-42.64	-6.72	Peak
3	213.87	-47.35	-39.91	-13.00	-34.35	-7.44	Peak
4	323.80	-63.43	-56.79	-13.00	-50.43	-6.64	Peak
5	470.10	-69.79	-64.62	-13.00	-56.79	-5.17	Peak
6	596.80	-65.51	-64.60	-13.00	-52.51	-0.91	Peak
7	1673.00	-62.90	-48.22	-13.00	-49.90	-14.68	Peak
8 pp	2509.50	-36.97	-26.06	-13.00	-23.97	-10.91	Peak



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Data: 10



Site : 966 Chamber 5  
 Condition: PART22/24 3m VERTICAL  
 Remark : LTE Band 5\_QPSK\_10M\_(1,24)  
 Tested by: Anson Lin  
 Plane : X

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1	41.07	-46.75	-46.87	-13.00	-33.75	0.12	Peak
2	65.37	-55.96	-47.93	-13.00	-42.96	-8.03	Peak
3	214.68	-52.61	-45.17	-13.00	-39.61	-7.44	Peak
4	321.70	-67.35	-60.68	-13.00	-54.35	-6.67	Peak
5	402.90	-66.97	-61.04	-13.00	-53.97	-5.93	Peak
6	486.90	-67.32	-62.46	-13.00	-54.32	-4.86	Peak
7	1673.00	-63.44	-48.76	-13.00	-50.44	-14.68	Peak
8 pp	2509.50	-44.64	-33.73	-13.00	-31.64	-10.91	Peak

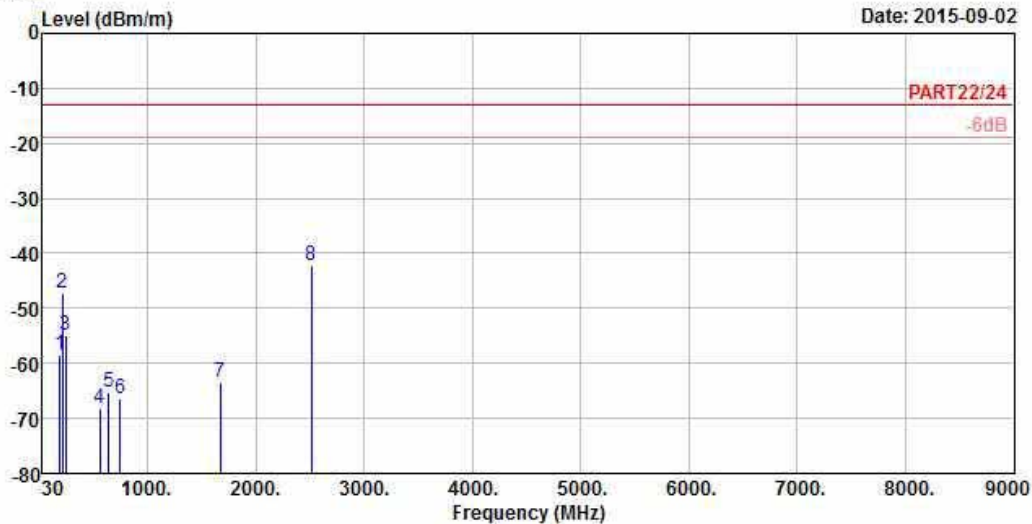
LTE Band 26  
Channel Bandwidth: 15MHz / QPSK



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

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Data: 9



Site : 966 Chamber 5  
Condition: PART22/24 3m HORIZONTAL  
Remark : LTE Band 26\_QPSK\_15M\_(1,37)  
Tested by: Anson Lin  
Plane : X

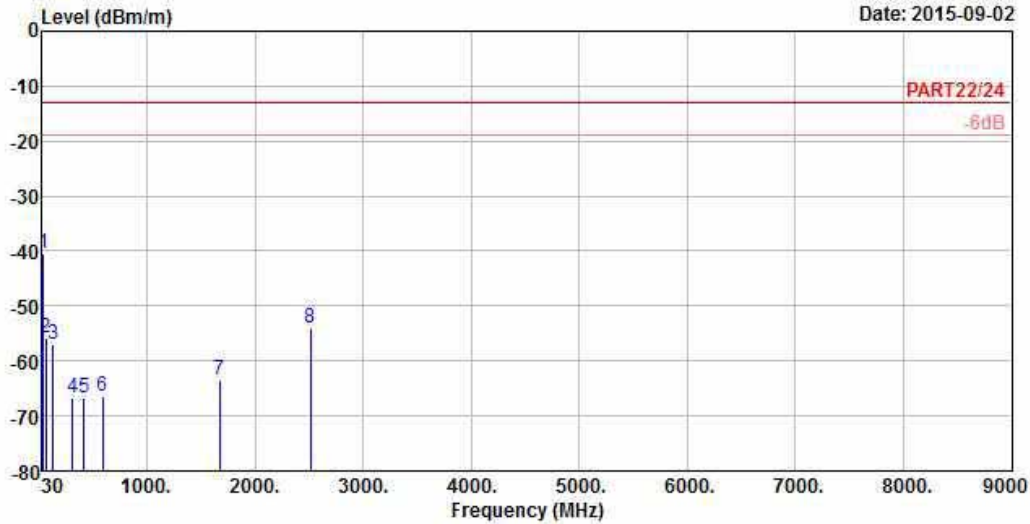
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1	188.49	-58.56	-51.41	-13.00	-45.56	-7.15	Peak
2	213.87	-47.35	-39.91	-13.00	-34.35	-7.44	Peak
3	240.33	-54.85	-48.47	-13.00	-41.85	-6.38	Peak
4	559.00	-68.27	-65.78	-13.00	-55.27	-2.49	Peak
5	640.20	-65.17	-64.31	-13.00	-52.17	-0.86	Peak
6	745.90	-66.33	-67.13	-13.00	-53.33	0.80	Peak
7	1673.00	-63.60	-48.92	-13.00	-50.60	-14.68	Peak
8 pp	2509.50	-42.10	-31.19	-13.00	-29.10	-10.91	Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

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Data: 10



Site : 966 Chamber 5  
 Condition: PART22/24 3m VERTICAL  
 Remark : LTE Band 26\_QPSK\_15M\_(1,37)  
 Tested by: Anson Lin  
 Plane : X

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1 pp	41.88	-40.54	-40.13	-13.00	-27.54	-0.41	Peak
2	62.40	-55.72	-47.91	-13.00	-42.72	-7.81	Peak
3	127.47	-57.04	-48.00	-13.00	-44.04	-9.04	Peak
4	310.50	-66.85	-60.00	-13.00	-53.85	-6.85	Peak
5	416.90	-66.79	-60.98	-13.00	-53.79	-5.81	Peak
6	586.30	-66.32	-65.00	-13.00	-53.32	-1.32	Peak
7	1673.00	-63.50	-48.82	-13.00	-50.50	-14.68	Peak
8	2509.50	-53.93	-43.02	-13.00	-40.93	-10.91	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:

### **Linko EMC/RF Lab**

Tel: 886-2-26052180

Fax: 886-2-26051924

### **Hsin Chu EMC/RF Lab/Telecom Lab**

Tel: 886-3-5935343

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### **Hwa Ya EMC/RF/Safety**

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Fax: 886-3-3270892

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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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