



Ke Mei Ou Lab Corp.

2013-2016, 20th Floor, Business Center, JiahuiXin Cheng, No 3027,
Shen Nan Road, Fu Tian, Shen Zhen, Guang Dong, P. R. China
Tel: + 86 755 83642690 Fax: + 86 755 83297077
www.kmolab.com

FCC ID TEST REPORT

Under
47 CFR FCC Part 2 & 47 CFR FCC Part 22(H)
☒PCB_PCS Licensed Transmitter

Prepared for:
Moochies Technologies LTD
159 Wardour Street, London, W1F 8WH, UK

FCC ID: 2AW9Z-MW12
EUT: Kids 4G Smartwatch Phone
Model: MW12

July 17, 2020 Issue Date:
Original Report Report Type:
 Test Engineer: Jacky Huang
 Review By: Apollo Liu / Manager

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Report Revision History

Report #	Version	Description	Issued Date
KSZ2020032301J01	Rev.01	Initial issue of report	July 17, 2020

1. General Information

1.1 Notes

The test results of this report relate exclusively to the test item specified in 1.6. The KMO Lab does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the KMO Lab.

1.2 Testing Laboratory

Test Firm Name:	Ke Mei Ou Lab Co., Ltd.
Test Firm Address:	2013-2016, 20th Floor, Business Center, Jiahui Xin Cheng, No 3027, Shen Nan Road, Fu Tian, Shen Zhen, Guang Dong, P. R. China
FCC Designation Number:	CN1532
Test Firm Registration Number:	344480
Internet:	www.kmolab.com
Email:	kmo@kmolab.com
ANSI-ASQ National Accreditation Board/ACLASS ISO/IEC 17025 Accredited Lab for telecommunication standards. The Registration Number is AT-1532. The testing quality system meets with ISO/IEC-17025 requirements, This approval results is accepted by MRA of ILAC.	

1.3 Details of Applicant

Name	Moochies Technologies LTD
Address	159 Wardour Street, London, W1F 8WH, UK

1.4 Application Details

Date of Receipt of Application	: March 23, 2020
Date of Receipt of Test Item	: May 11, 2020
Date of Test	: May 11 ~ July 17, 2020

1.5 Details of Manufacturer

Name	Moochies Technologies LTD
Address	159 Wardour Street, London, W1F 8WH, UK

1.6 Test Item

EUT Feature				
EUT Description:	Kids 4G Smartwatch Phone			
Brand Name:	Moochies			
Model Name:	MW12			
EUT RF Technology:	☒ GSM	Band	UL(MHz)	DL(MHz)
		☒ GSM 850	824 ~ 849	869 ~ 894
	☐ CDMA	Band	UL(MHz)	DL(MHz)
		☐ CDMA BC0	824 ~ 849	869 ~ 894
	☒ WCDMA	Band	UL(MHz)	DL(MHz)
		☒ WCDMA Band V	824 ~ 849	869 ~ 894
	☒ LTE	Band	UL(MHz)	DL(MHz)
		☒ LTE Band 5	824 ~ 849	869 ~ 894
☐ LTE Band 26		824 ~ 849	869 ~ 894	
	☐ CA-5B	824 ~ 849	869 ~ 894	
Antenna	☒ Internal 0.5dBi->GSM; 0.5dBi->WCDMA Band V 0.5dBi->LTE Band 5		☐ External dBi	
Test Mode(s):	☒ GSM 850 ☒ WCDMA Band V		☒ LTE Band 5	☐ LTE Band 26 ☐ CA-5B
Test Modulation:	☒ GSM->GMSK,8PSK ☒ WCDMA-> BPSK, QPSK,16QAM		☒ LTE->QPSK,16QAM,64QAM	
GPRS Multislot Class	12		EGPRS Multislot Class	12
HSDPA UE Category	14		HSUPA UE Category	6
LTE Category	19			
HW Version:	G4H-MB			
SW Version:	G4P_EMMC_240_5M_COMMON_OVERSEA_20190919_17.19.00			
EUT Stage:	☒ Identical Prototype ☐ Production			

Power Supply	Vmin: 3.6Vdc	Vnom : 3.8Vdc	Vmax: 4.2Vdc
Operating Temperature	Tmin: -10 °C	Tnom: 25 °C	Tmax: 45 °C
Note: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.			

EUT Operational Condition	☐ AC
	☒ DC → ☒ From Battery → ☐ External AC adapter ☐ POE

Specification of Accessory				
☒ Battery	Brand Name	N/A	Model Name	663032V
	Power Rating	3.7V, 700mAh, 2.59Wh		

Maximum ERP/EIRP Power & Frequency Tolerance & Emission Designator							
FCC Rule	RF Technology	Type of Modulation	Band (MHz)	Output Watts(W)	Frequency Tolerance(ppm)	Emission Designator	
☒ 22H	GSM850 GSM	GMSK	824.2 - 848.8	1.4488	0.0213	248KGXW	
☒ 22H	GSM850 EDGE Cass 8	8PSK	824.2 - 848.8	1.4322	0.0226	240KG7W	
☒ 22H	WCDMA Band V RMC 12.2Kbps	BPSK	826.4 – 846.6	0.1309	0.0248	4M16F9W	
☒ FCC Rule 22H							
LTE Band 5		QPSK			16QAM		
BW (MHz)	Band (MHz)	Output Watts(W)	Frequency Tolerance (ppm)	Emission Designator	Output Watts(W)	Frequency Tolerance (ppm)	Emission Designator
1.4	824.7 ~ 848.3	0.1567	-	1M10G7D	0.1324	-	1M10W7D
3	825.5 ~ 847.5	0.1563	-	2M70G7D	0.1291	-	2M70W7D
5	826.5 ~ 846.5	0.1563	0.0239	4M54G7D	0.1259	-	4M54W7D
10	829.0 ~ 844.0	0.1560	-	9M00G7D	0.1236	-	9M00W7D
LTE Band 5		64QAM			-		
BW (MHz)	Band (MHz)	Output Watts(W)	Frequency Tolerance (ppm)	Emission Designator	-	-	-
1.4	824.7 ~ 848.3	0.0942	-	1M11G7D	-	-	
3	825.5 ~ 847.5	0.0914	-	2M70G7D	-	-	
5	826.5 ~ 846.5	0.0920	-	4M52G7D	-	-	
10	829.0 ~ 844.0	0.0984	-	9M00G7D	-	-	

1. 7 Applicable Standards

Applicable Standards
According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards: FCC CFR47 Part 2 (2018) FCC CFR 47 Part 22H (2018) ANSI C63.26 (2015) KDB 971168 D01 Power Meas License Digital Systems v03r01
Note: All test items were verified and recorded according to the standards and without any deviation during the test.

2. Technical Test

2.1 Summary of Test Results

The EUT has been tested according to the following specifications:

FCC Rule	Test Type	Limit	Result	Notes
§2.1046	Conducted Output Power	N/A	PASS	Complies
§22.913(d)/ KDB 971168 D01(5.7)	Peak-to-Average Ratio	< 13 dB	PASS	Complies
§22.913(a)(5)	Effective Radiated Power	< 7 Watts	PASS	Complies
§2.1049 §22.917(a)	Occupied Bandwidth	N/A	PASS	Complies
§2.1051 §22.917(a)	Band Edge Measurement	< 43+10log ₁₀ (P[Watts])	PASS	Complies
§2.1051 §22.917(a)	Conducted Spurious Emission	< 43+10log ₁₀ (P[Watts])	PASS	Complies
§2.1053 §22.917(a)	Field Strength of Spurious Radiation	< 43+10log ₁₀ (P[Watts])	PASS	Complies
§2.1055 §22.355	Frequency Stability for Temperature & Voltage	< 2.5 ppm	PASS	Complies
Note: a. All test items were verified and recorded according to the standards and without any deviation during the test. b. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.				

2.2 EUT Modification

No modification by test lab.

2. 4 Test Configuration

EUT Operation Test Setup			
☒ One SIM card slot only		☐ More than one SIM card slot, each one should be applied throughout the compliance test respectively, and however, only the worst case (SIM 1) will be recorded in this report.	
Radiated measurements are performed by rotating the EUT in three different orthogonal test planes. EUT stand-up position (Z axis), lie-down position (X, Y axis). Receiver antenna polarization (horizontal and vertical), the worst emission was found in position (Z axis, horizontal polarization) and the worst case was recorded.			
All mode and data rates and positions were investigated. Subsequently, only the worst mode emissions are reported. The following testing in GSM/WCDMA/LTE is set based on the maximum RF Output Power. Test modes are chosen to be reported as the worst mode configuration below:			
Test Item	Modes/Modulation		
	☒ GSM 850 Bandwidth: 0.2 MHz	☒ WCDMA Band V Bandwidth: 5 MHz	☐ CDMA BC0 Bandwidth: 1.23MHz
RF power output	GSM GPRS EGPRS	RMC HSDPA/HSUPA DC-HSDPA/HSPA+	CDMA
Effective Radiated Power	GSM GPRS(1Tx slot) EGPRS(1Tx slot)	RMC 12.2Kbps Link	CDMA
Occupied Bandwidth	GSM GPRS(1Tx slot) EGPRS(1Tx slot)	RMC 12.2Kbps Link	CDMA
Band Edge Compliance	GSM GPRS(1Tx slot) EGPRS(1Tx slot)	RMC 12.2Kbps Link	CDMA
Peak-to-Average Ratio	GSM GPRS(1Tx slot) EGPRS(1Tx slot)	RMC 12.2Kbps Link	CDMA
Frequency Stability	GSM GPRS(1Tx slot) EGPRS(1Tx slot)	RMC 12.2Kbps Link	CDMA
Conducted Spurious Emission	GSM	RMC 12.2Kbps Link	CDMA
Radiates Spurious Emission	GSM	RMC 12.2Kbps Link	CDMA

Test Items	LTE Band	Bandwidth (MHz)					Modulation		RB#			Test Channel		
		1.4	3	5	10	15	QPSK	16QAM	1	Half	Full	L	M	H
Max. Output Power	☒ 5	√	√	√	√	-	√	√	√	√	√	√	√	√
	☐ 26	√	√	√	√	√	√	√	√	√	√	√	√	√
ERP/EIRP	☒ 5	√	√	√	√	-	√	√	√	√	√	√	√	√
	☐ 26	√	√	√	√	√	√	√	√	√	√	√	√	√
26dB and 99% Bandwidth	☒ 5	√	√	√	√	-	√	√	-	-	√	-	√	-
	☐ 26	√	√	√	√	√	√	√	-	-	√	-	√	-
Conducted Band Edge	☒ 5	√	√	√	√	-	√	√	√	-	√	-	-	√
	☐ 26	√	√	√	√	√	√	√	√	-	√	-	-	√
Peak-to-Average Ratio	☒ 5	√	√	√	√	-	√	√	-	-	-	√	√	√
	☐ 26	√	√	√	√	√	√	√	-	-	-	√	√	√
Frequency Stability	☒ 5	√	√	√	√	-	√	√	√	√	√	√	√	√
	☐ 26	√	√	√	√	√	√	√	√	√	√	√	√	√
Conducted Spurious Emission	☒ 5	√	√	√	√	-	√	-	√	-	-	√	√	√
	☐ 26	√	√	√	√	√	√	-	√	-	-	√	√	√
Radiated Spurious Emission	☒ 5	√	-	√	√	-	√	-	√	-	-	-	√	-
	☐ 26	√	-	√	-	√	√	-	√	-	-	-	√	-

Note:

- The mark "√" means that this configuration is chosen for testing.
- The mark "-" means that this configuration is not testing.

3. Technical Characteristics Test

3.1 Conducted Output Power

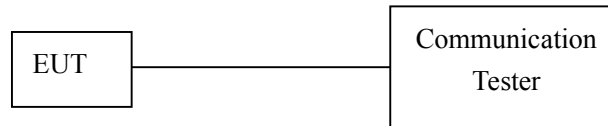
3.1.1 Test Equipment

Please refer to section 6 this report.

3.1.2 Test Procedure

The EUT, which is powered by the Battery, During the process of the testing, The EUT is controlled by the Base Station Simulator to ensure max power transmission and proper modulation. The loss between RF output port of the EUT and the input port of the tester has been taken into consideration.

3.1.3 Test Setup



3.1.4 Limit

According to FCC 2.1046, FCC 22.913(a) Mobile station are limited to 7W; FCC 24.232(b) Mobile stations are limited to 2W eirp peak power, 3GPP Power limitation for HSDPA and HSUPA

3.1.5 RF Output Power Test Result

Refer to Appendix_PCB_FCC 22

3.2 ERP / EIRP Measurement

3.2.1 Test Equipment

Please refer to section 6 this report.

3.2.2 Test Procedure

The testing follows FCC KDB 971168 v03r01 Section 5.8 and ANSI C63.26 (2015).

- Connect the equipment as illustrated. Mount the equipment with the manufacturer specified antenna in a vertical orientation on a manufacturer specified mounting surface located on a non-conducting rotating platform of a RF anechoic chamber (preferred) or a standard radiation site.
- Key the transmitter, then rotate the EUT 360° azimuthally and record spectrum analyzer power level (LVL) measurements at angular increments that are sufficiently small to permit resolution of all peaks. If a standard radiation test site is used, raise and lower the test antenna to obtain a maximum reading at each angular increment. (Note: several batteries may be needed to offset the effect of battery voltage droop, which should not exceed 5% of the manufactured specified battery voltage during transmission).
- Replace the transmitter under test with a vertically polarized half-wave dipole (or an antenna whose gain is known relative to an ideal half-wave dipole). The center of the antenna should be at the same location as the center of the antenna under test.
- Connect the antenna to a signal generator with a known output power and record the path loss (in dB) as LOSS. If a standard radiation test site is used, raise and lower the test antenna to obtain a maximum reading. $LOSS = \text{Generator Output Power (dBm)} - \text{Analyzer reading (dBm)}$
- Determine the effective radiated output power at each angular position from the readings in steps b) and d) using the following equation: $ERP \text{ (dBm)} = LVL \text{ (dBm)} + LOSS \text{ (dB)}$
- The maximum ERP is the maximum value determined in the preceding step.
- When calculating ERP, in addition to knowing the antenna radiation and matching characteristics, it is necessary to know the loss values of all elements (e.g. transmission line attenuation, mismatches, filters, combiners) interposed between the point where transmitter output power is measured, and the point where power is applied to the antenna. ERP can then be calculated as follows:

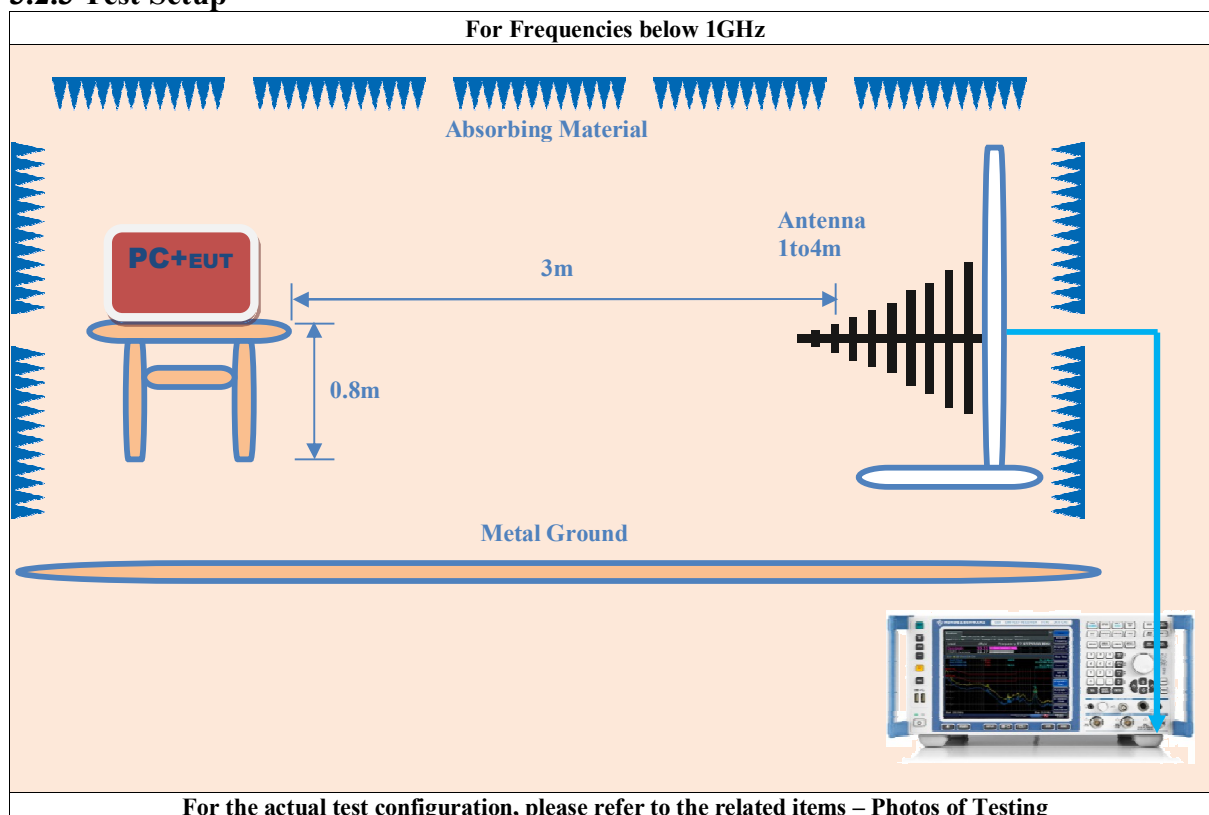
$$EIRP \text{ (dBm)} = \text{Output Power (dBm)} - \text{Losses (dB)} + \text{Antenna Gain (dBi)}$$

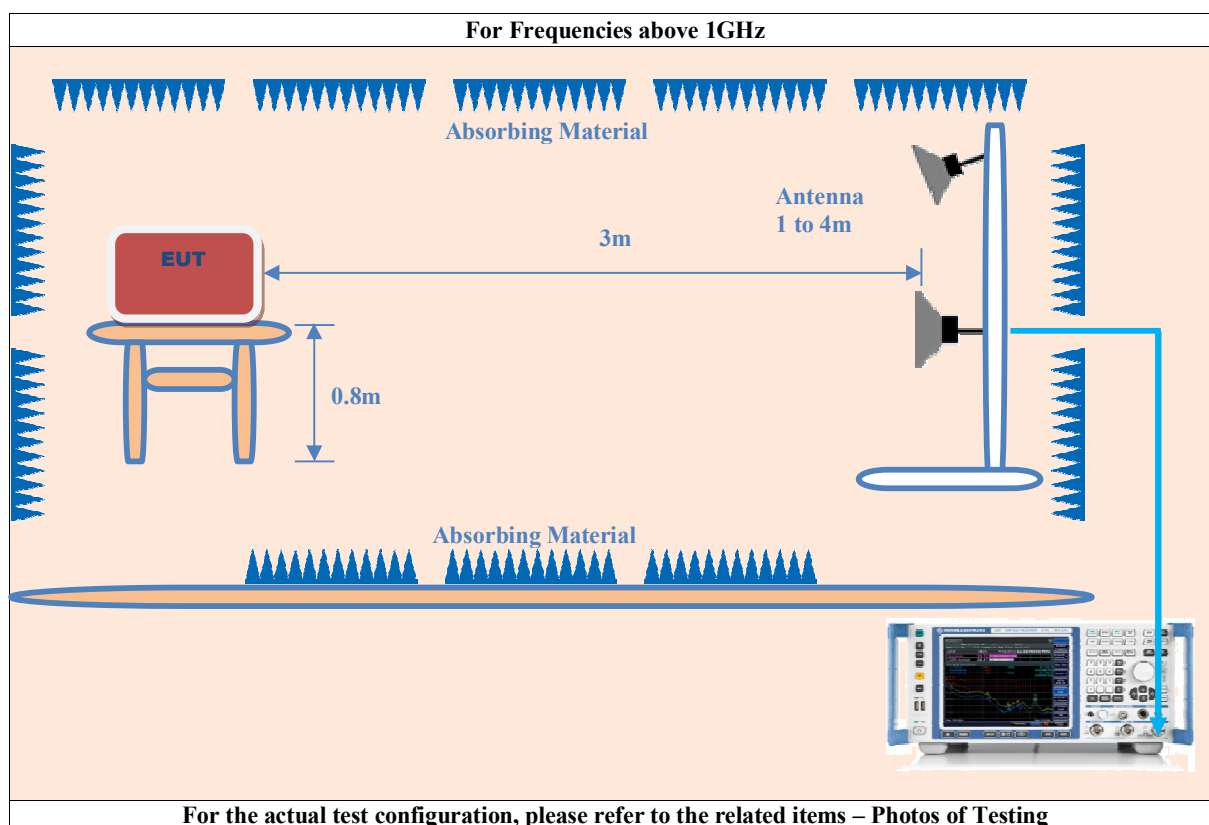
where: dBd refers to gain relative to an ideal dipole.

$$EIRP \text{ (dBm)} = ERP \text{ (dBm)} + 2.15 \text{ (dB)}$$

The RB allocation refers to section 5.1, using the maximum output power configuration.

3.2.3 Test Setup





3.3.4 Limit

According to FCC 2.1046, FCC 22.913(a) Mobile station are limited to 7W; FCC 24.232(b) Mobile stations are limited to 2W eirp peak power.

According to IC RSS-133 §6.4; The peak e.i.r.p. for transmitters operating in the band 1850-1910 MHz shall not exceed the limits 2W which given in SRSP-510.

According to issue 2 of RSS 132, section 4.4. The transmitter output power shall not exceed the limits given in SRSP-503.

3.3.5 Test Result

Refer to Appendix_PCB_FCC 22

3.3 99% Occupied Bandwidth and 26dB Bandwidth Measurement

3.3.1 Test Equipment

Please refer to section 6 this report.

3.3.2 Test Procedure

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The occupied bandwidth is measured using spectrum analyzer.

RBW is set to 3kHz, VBW is set to 10kHz for GSM 850,

RBW is set to 51kHz, VBW is set to 160kHz for WCDMA Band V,

RBW is set to 51 kHz, VBW is set to 160 kHz for LTE Band 5/26(1.4MHz),

RBW is set to 100 kHz, VBW is set to 300 kHz for LTE Band 5 (3MHz/5MHz),

RBW is set to 300 kHz, VBW is set to 1 MHz for LTE Band 5 (10MHz),

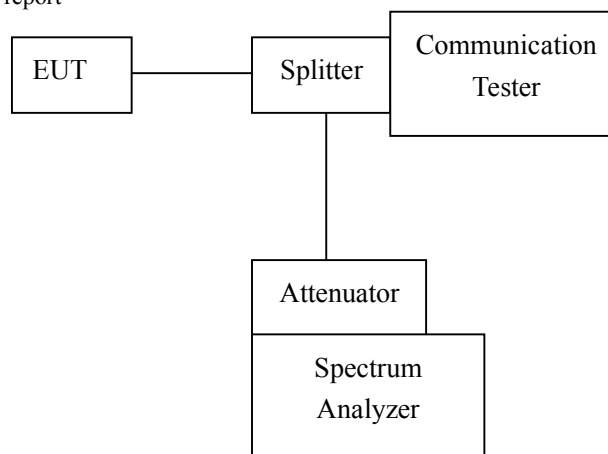
RBW is set to 100 kHz, VBW is set to 300 kHz for LTE Band 26 (3MHz/5MHz),

RBW is set to 300 kHz, VBW is set to 1 MHz for LTE Band 26 (10MHz/15MHz).

99% power and -26dBc occupied bandwidths are recorded.

3.3.3 Test Setup

Same as section 2.4.1 of this report



3.3.4 Limit

According to FCC 2.1053, FCC 22.917(a) & 24.238(a)

According to IC RSS-Gen Issue 3 §4.6.1

According to IC RSS-133 §2.3

3.3.5 Occupied Bandwidth Test Result

Refer to Appendix_PCB_FCC 22

3.4 Band Edge Measurement

3.4.1 Test Equipment

Please refer to section 6 this report.

3.4.2 Test Procedure

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The band edge of the lowest and highest channels were measured. The average detector is used.

RBW is set to 3kHz, VBW is set to 10kHz for GSM 850,

RBW is set to 51kHz, VBW is set to 160kHz for WCDMA Band V,

RBW is set to 15 kHz, VBW is set to 51 kHz for LTE Band 5/26 (1.4MHz),

RBW is set to 30 kHz, VBW is set to 100 kHz for LTE Band 5/26 (3MHz),

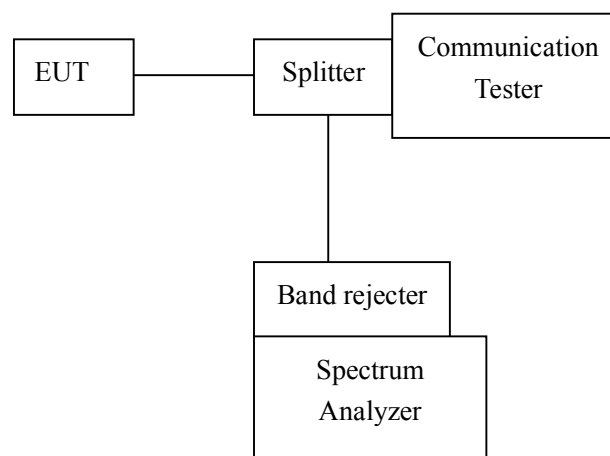
RBW is set to 51 kHz, VBW is set to 160 kHz for LTE Band 5/26 (5MHz),

RBW is set to 100 kHz, VBW is set to 300 kHz for LTE Band 5/26 (10MHz),

RBW is set to 150 kHz, VBW is set to 510kHz for LTE Band 26 (15MHz).

3.4.3 Test Setup

Band Edge



3.4.4 Limit

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB.

Limit	-13 dBm
-------	---------

3.4.5 Conducted Band Edge Test Result

Refer to Appendix_PCB_FCC 22

3.5 Peak-to-Average Ratio

3.5.1 Test Equipment

Please refer to section 6 this report.

3.5.2 Test Procedure

Here the lowest, middle and highest channels are selected to perform testing to verify the peak-to-average ratio. Test procedures:

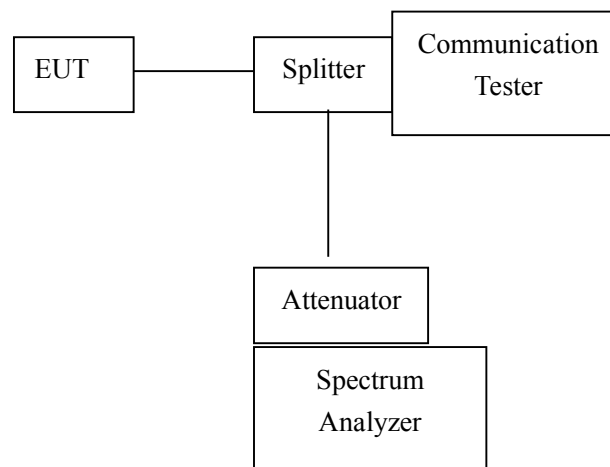
A. For GSM operating mode:

- Set RBW=1MHz, VBW=3MHz, Peak detector on spectrum analyzer for first trace.
- Set the RBW = 1MHz, VBW = 3MHz, RMS detector on spectrum analyzer for second trace.
- The wanted burst signal is triggered by spectrum analyzer, and measured respectively the peak level and Mean level without burst-off time, after system simulator has synchronized with the spectrum analyzer.

B. For UMTS operating mode:

- Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
- The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1%.
- Record the deviation as Peak to Average Ratio.

3.5.3 Test Setup



3.5.4 Limit

According to the Sec. 22.913(d), The peak-to-average ratio (PAR) of the transmission must not exceed 13 dB.

3.5.5 Peak-to-Average Ratio Test Result

Refer to Appendix_PCB_FCC 22

3.6 Frequency Stability

3.6.1 Test Equipment

Please refer to section 6 this report.

3.6.2 Test Procedure

Frequency Stability (Temperature Variation)

The temperature inside the climate chamber is varied from -30°C to +55°C in 10°C step size,

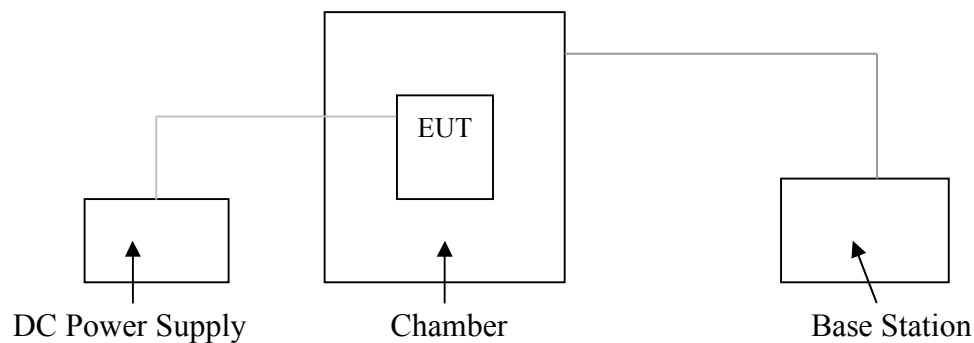
- (1) With all power removed, the temperature was decreased to 0°C and permitted to stabilize for three hours.
- (2) Measure the carrier frequency with the test equipment in a “call mode”. These measurements should be made within 1 minute of powering up the mobile station, to prevent significant self warming.
- (3) Repeat the above measurements at 10°C increments from -30°C to +55°. Allow at least 1.5 hours at each temperature, un-powered, before making measurements.

Frequency Stability (Voltage Variation)

The frequency stability shall be measured with variation of primary supply voltage as follows:

- (1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.
- (2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery-operating end point which shall be specified by the manufacturer.

3.6.3 Test Setup



3.6.4 Limit

According to FCC §2.1055(a) (1)

Frequency Tolerance: +/-2.5ppm for 850MHz band; +/-2.5ppm for 1900MHz band

According to RSS-133 §6.3, RSS-132 §4.3

The carrier frequency shall not depart from the reference frequency in excess of ±2.5 ppm for mobile stations

3.6.5 Frequency Stability Test Result

Refer to Appendix_PCB_FCC 22

3.7 Conducted Spurious Emission Measurement

3.7.1 Test Equipment

Please refer to section 6 this report.

3.7.2 Test Procedure

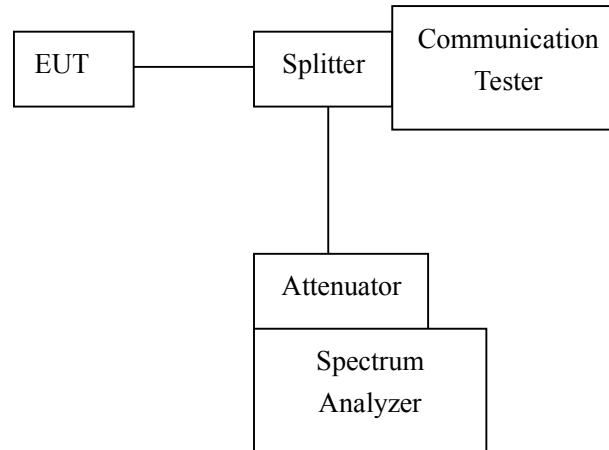
The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The measurement is carried out using a spectrum analyzer. The spectrum analyzer scans from 9kHz to the 10th harmonic of the carrier.

The peak detector is used. RBW are set to 100 kHz and VBW are set to 300 kHz for below 1G, RBW are set to 1MHz and VBW are set to 3MHz for above 1G, Sweep is set to ATUO.

The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

3.7.3 Test Setup

Out of band emission



3.7.4 Limit

Rule Part 22.917(a) specifies that “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.

Limit	-13 dBm
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3.7.5 Conducted Spurious Emission Test Result

Refer to Appendix_PCB_FCC 22

3. 8 Radiated Spurious Emission

3.8.1 Test Equipment

Please refer to section 6 this report.

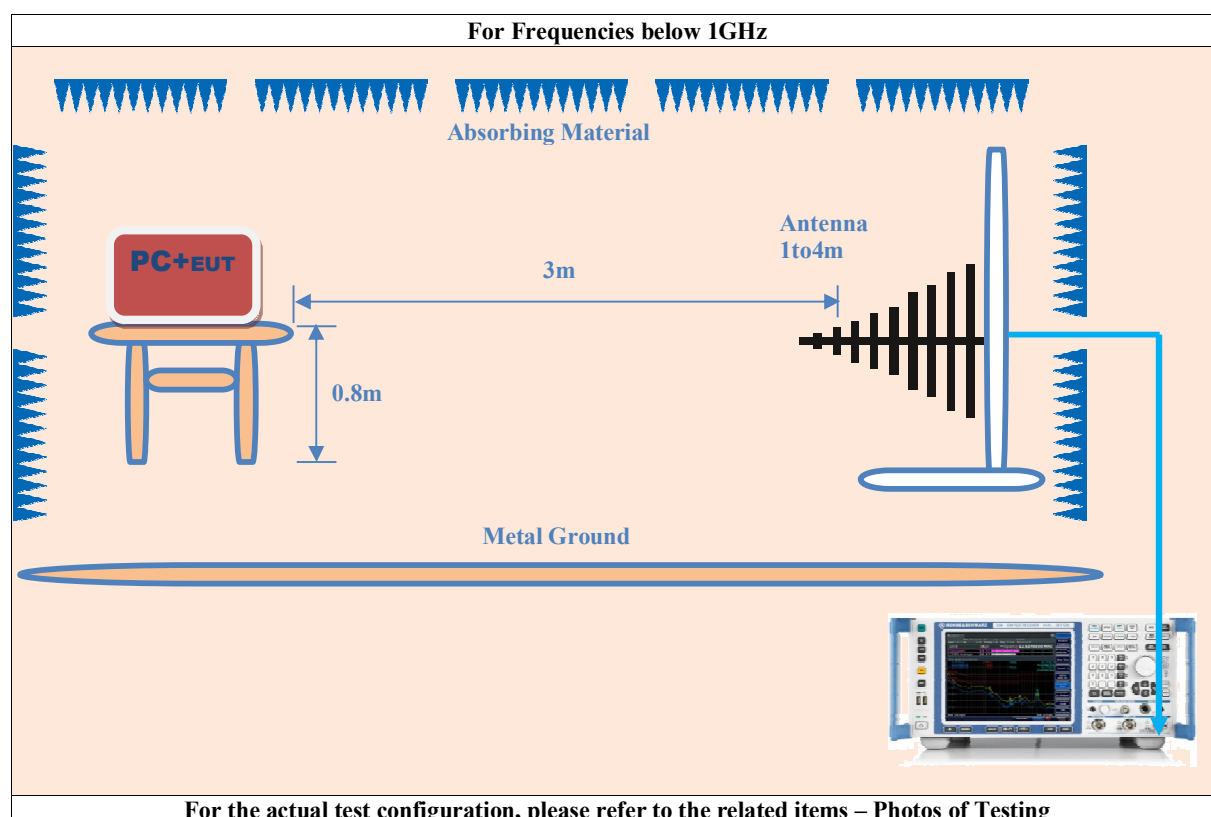
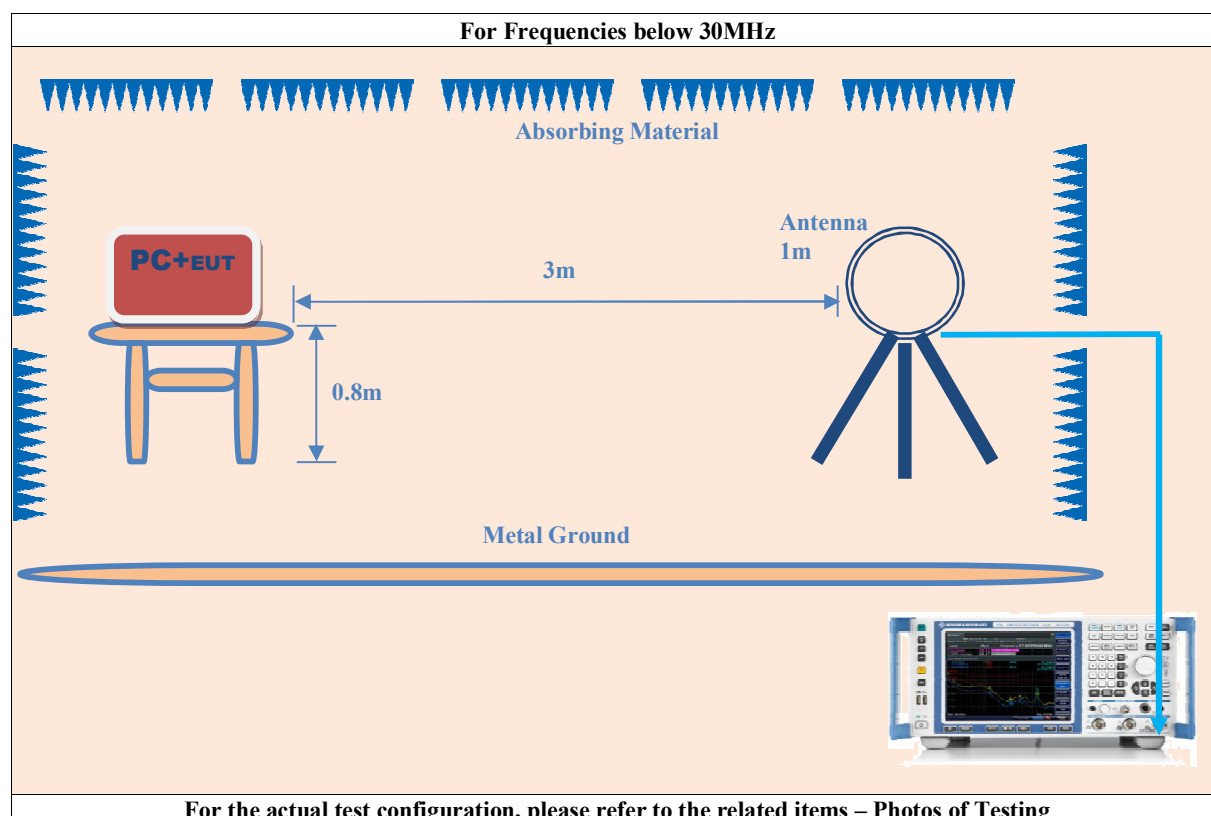
3.8.2 Test Procedure

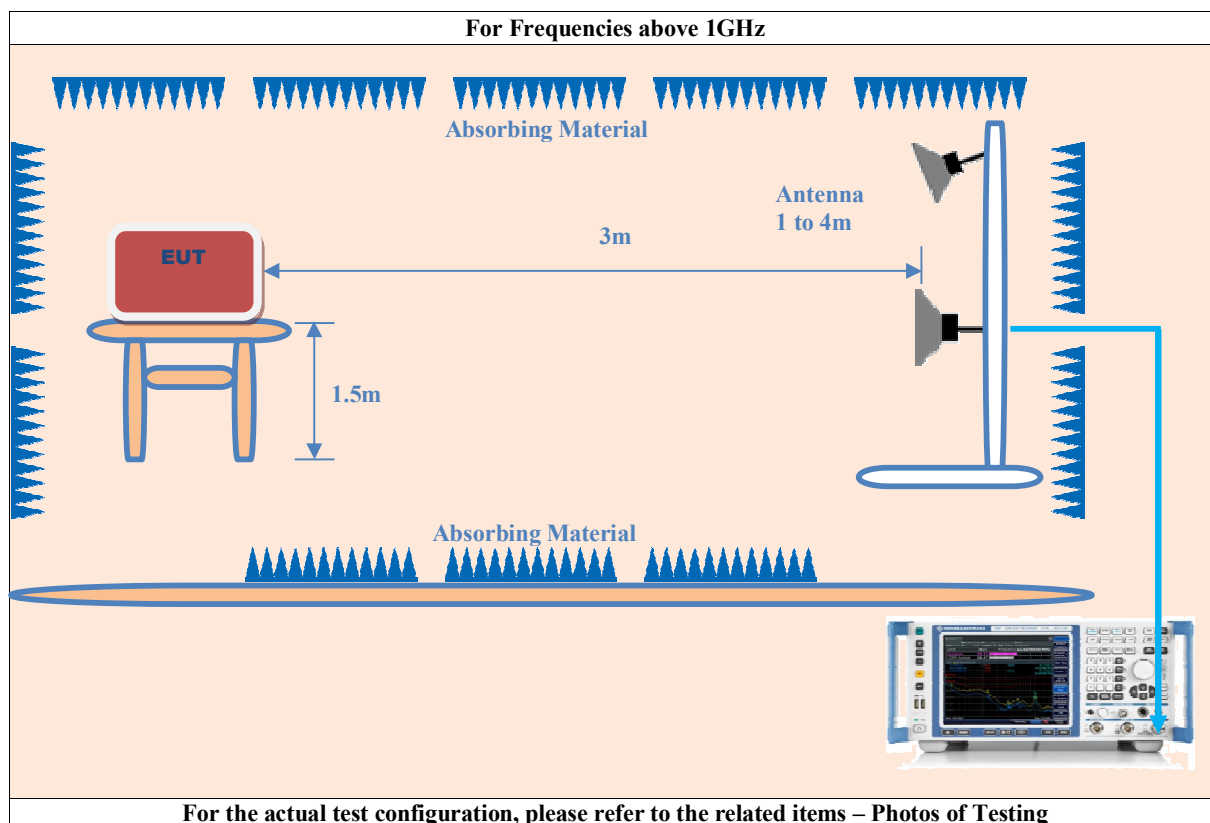
1. The testing follows FCC KDB 971168 v03r01 Section 5.8 and ANSI C63.26 (2015).
2. Below 1GHz: The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H). Above 1GHz: (Note: the FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 2, 2014.) The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).
3. A loop antenna, A log-periodic antenna or horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
4. The EUT is then put into continuously transmitting mode at its maximum power level during the test.
Set Test Receiver or Spectrum RBW=200Hz,VBW=600Hz for 9kHz150kHz , RBW=10kHz, VBW=30kHz 150kHz-30MHz , RBW=100kHz,VBW=300kHz for 30MHz to 1GHz and RBW=1MHz, VBW=3MHz for above 1GHz, And the maximum value of the receiver should be recorded as (Pr).
5. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
6. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (Pcl) ,the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.
7. The measurement results are obtained as described below:
$$\text{Power(EIRP)} = \text{PMea} - \text{PAg} - \text{Pcl} + \text{Ga}$$

The measurement results are amend as described below:
$$\text{Power(EIRP)} = \text{PMea} - \text{Pcl} + \text{Ga}$$
8. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole, $\text{ERP} = \text{EIRP} - 2.15\text{dBi}$.

The modulation mode and RB allocation refer to section 2.2, using the maximum output power Configuration.

3.8.3 Test Setup





3.8.4 Limit

Rule Part 22.917(a) specifies that “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.

Limit	-13 dBm
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3.8.5 Radiated Spurious Emission Test Result

Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the emissions below the noise floor will not be recorded in the report.

Refer to Appendix_PCB_FCC 22

4. Photos of Testing

4.1 EUT Test Photographs

Please refer to Exhibits _External Test Setup Photos

4. 2 EUT Detailed Photographs

Please refer to Exhibits _External Photos & Internal Photos

5. FCC ID Label

Please refer to Exhibits _ ID Label & Location Info

6. Test Equipment

The following test equipment were used during the radiated & conducted emission test:

Equipment/ Facilities	Manufacturer	Model #	Serial No.	Cal/Char Date	Due Date
Turntable	Innco systems GmbH	CT-0801	N/A	NCR	NCR
Antenna Tower	Innco systems GmbH	MA-4640-XP-ET	N/A	NCR	NCR
Controller	Innco systems GmbH	CO3000	955/38850716L	NCR	NCR
Pre-Amplifier	Agilent	87405C	MY47010722	Dec.6, 2019	Dec.6, 2021
EMI Test Receiver	Rohde & Schwarz	ESR7	101091	Nov.21, 2018	Nov.21, 2020
Spectrum Analyzer	Rohde & Schwarz	FSP40	100273	Dec.14, 2019	Dec.14, 2021
Vector Signal Generator	Rohde & Schwarz	SMU200A	101824	Dec.13, 2017	Dec.13, 2020
Signal Generator	Rohde & Schwarz	SMB100A	177847	Dec.13, 2017	Dec.13, 2020
Power Meter	Rohde & Schwarz	OSP-B157	KMO-HK015	Dec.13, 2017	Dec.13, 2020
Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	124004	Jan. 14, 2020	Jan. 14, 2023
Regulatory Test System 30 MHz to 40 GHz	Rohde & Schwarz	TS8997	KMO-HK015	Dec.13, 2017	Dec.13, 2020
Trilog-Super Broadband Antenna	SCHWARZBECK	VULB9161	9161-4079	Nov.27, 2018	Nov.27, 2021
Broad-Band Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-565	Nov.29, 2018	Nov.29, 2021
AMN	Rohde & Schwarz	ESH3-Z5	100197	Dec.25, 2017	Dec.25, 2020
AMN	CYBERTEK	EM5040A	E115040054	Nov.21, 2018	Nov.21, 2021
KMO Shielded Room	KMO	KMO-001	N/A	NCR	NCR
Coaxial Cable with N-Connectors	SCHWARZBECK	AK9515H	95549	Sep.18, 2019	Sep.18, 2021
3m Anechoic Chamber	KMO	KMO-3AC	N/A	Dec.23, 2019	Dec.23, 2021
Temperature Chamber	TABAI	PSL-4GTW	N/A	Feb.10, 2019	Feb.10, 2021

-----End of Report -----

AppendixA: RF Output Power Test Result

Test Result

GSM850 Band		Conducted Power(dBm)		
		Channel 128	Channel 190	Channel 251
		824.2 (MHz)	836.6 (MHz)	848.8 (MHz)
GSM	GSM	32.92	33.26	33.25
GPRS/EGPRS (GMSK)	1TXslot	32.92	33.21	33.21
	2TXslots	32.60	32.87	32.80
	3TXslots	32.18	32.43	32.80
	4TXslots	31.82	32.10	32.00
GPRS/EGPRS	1TXslot	26.10	26.30	26.15
	2TXslots	25.74	25.91	25.87
	3TXslots	25.33	25.54	25.49
	4TXslots	24.99	25.16	25.15

WCDMA Band V		Conducted Power(dBm)		
		Channel 4132	Channel 4183	Channel 4233
		826.4(MHz)	836.6(MHz)	846.6(MHz)
RMC	12.2k	22.76	22.82	22.74
HSDPA	Sub - Test 1	22.53	22.58	22.55
	Sub - Test 2	22.47	22.35	22.26
	Sub - Test 3	21.91	21.85	21.97
	Sub - Test 4	21.60	21.65	21.52
HSUPA	Sub - Test 1	22.64	22.60	22.68
	Sub - Test 2	22.48	22.21	22.28
	Sub - Test 3	21.80	21.98	21.70
	Sub - Test 4	21.59	21.70	21.63
	Sub - Test 5	21.31	21.33	21.25
DC-HSDPA	Sub - Test 1	-	-	-
	Sub - Test 2	-	-	-
	Sub - Test 3	-	-	-
	Sub - Test 4	-	-	-
HSPA+	16QAM	22.55	22.66	22.62

LTE Band 5				Conducted Power(dBm)		
BW	Modulation	RB size	RB offset	Channel 20407	Channel 20525	Channel 20643
				824.7(MHz)	836.5(MHz)	848.3(MHz)
1.4MHz	QPSK	1	0	23.52	23.38	23.32
		1	2	23.58	23.31	23.38
		1	5	23.55	23.34	23.32
		3	0	23.60	23.34	23.37
		3	2	23.59	23.42	23.34
		3	3	23.52	23.34	23.31
		6	0	22.41	22.55	22.29
	16QAM	1	0	22.63	22.87	22.69
		1	2	22.65	22.82	22.61
		1	5	22.61	22.84	22.67
		3	0	22.65	22.85	22.64
		3	2	22.63	22.89	22.63
		3	3	22.67	22.91	22.68
		6	0	21.37	21.33	21.40
	64QAM	1	0	21.16	21.37	21.08
		1	2	21.17	21.39	21.05
		1	5	21.18	21.35	21.06
		3	0	21.13	21.30	21.04
		3	2	21.14	21.31	21.06
		3	3	21.19	21.38	21.03
		6	0	20.35	20.49	20.13
3MHz		RB size	RB offset	Channel 20415	Channel 20525	Channel 20635
				825.5(MHz)	836.5(MHz)	847.5(MHz)
	QPSK	1	0	23.45	23.59	23.36
		1	7	23.47	23.53	23.35
		1	14	23.41	23.53	22.38
		8	0	22.53	22.34	22.59
		8	4	22.52	22.31	22.32
		8	7	22.53	22.39	22.38
		15	0	22.52	22.41	22.41
	16QAM	1	0	22.64	22.48	22.71
		1	7	22.65	22.47	22.76
		1	14	22.64	22.47	22.75
		8	0	21.50	21.33	21.30
		8	4	21.55	21.33	21.38
		8	7	21.54	21.35	21.39
		15	0	21.56	21.38	21.39
	64QAM	1	0	21.26	21.15	21.15
		1	7	21.25	21.12	21.10
		1	14	21.20	21.19	21.12
		8	0	20.38	20.29	20.28
		8	4	20.39	20.25	20.25
		8	7	20.37	20.27	20.23
		15	0	20.31	20.23	20.29

BW	Modulation	RB size	RB offset	Channel 20425	Channel 20525	Channel 20625
				826.5(MHz)	836.5(MHz)	846.5(MHz)
5MHz	QPSK	1	0	23.59	23.39	23.39
		1	13	23.53	23.38	23.35
		1	24	23.59	23.35	23.39
		12	0	22.54	22.46	22.30
		12	6	22.54	22.42	22.34
		12	13	22.57	22.46	22.46
		25	0	22.50	22.45	22.52
	16QAM	1	0	22.62	22.58	22.65
		1	13	22.60	22.52	22.60
		1	24	22.59	22.58	22.64
		12	0	21.57	21.46	21.43
		12	6	21.52	21.49	21.48
		12	13	21.53	21.46	21.49
		25	0	21.47	21.41	21.41
	64QAM	1	0	21.26	21.29	21.22
		1	13	21.27	21.23	21.22
		1	24	21.25	21.32	21.20
		12	0	20.39	20.36	20.29
		12	6	20.32	20.32	20.23
		12	13	20.35	20.33	20.23
		25	0	20.31	20.39	20.35
BW	Modulation	RB size	RB offset	Channel 20450	Channel 20525	Channel 20600
				829(MHz)	836.5(MHz)	844(MHz)
10MHz	QPSK	1	0	23.55	23.49	23.38
		1	25	23.58	23.46	23.39
		1	49	23.50	23.48	23.36
		25	0	22.54	22.47	22.42
		25	13	22.51	22.51	22.41
		25	25	22.59	22.48	22.48
		50	0	22.52	22.57	22.44
	16QAM	1	0	22.59	22.57	22.50
		1	25	22.56	22.56	22.53
		1	49	22.57	22.58	22.52
		25	0	21.30	21.41	21.35
		25	13	21.34	21.47	21.39
		25	25	21.26	21.48	21.40
		50	0	21.29	21.47	21.46
	64QAM	1	0	21.31	21.58	21.44
		1	25	21.39	21.52	21.49
		1	49	21.23	21.50	21.46
		25	0	20.03	20.28	20.26
		25	13	20.07	20.22	20.20
		25	25	20.09	20.21	20.24
		50	0	20.04	20.26	20.18

AppendixB: ERP / EIRP Measurement

Test Result

Mode	Channel	Frequency	Polarization	ERP (dBm)	Limit (dBm)	Result
GSM 850	Low	824.2	Horizontal	31.27	38.45	Pass
	Mid	836.6	Horizontal	31.61	38.45	Pass
	High	848.8	Horizontal	31.60	38.45	Pass
GPRS 850	Low	824.2	Horizontal	31.27	38.45	Pass
	Mid	836.6	Horizontal	31.56	38.45	Pass
	High	848.8	Horizontal	31.56	38.45	Pass
EGPRS 850	Low	824.2	Horizontal	24.45	38.45	Pass
	Mid	836.6	Horizontal	24.65	38.45	Pass
	High	848.8	Horizontal	24.50	38.45	Pass
WCDMA Band V	Low	826.4	Horizontal	21.11	38.45	Pass
	Mid	836.6	Horizontal	21.17	38.45	Pass
	High	846.6	Horizontal	21.09	38.45	Pass

LTE Band 5						
Bandwidth	Channel	Frequency	Polarization	ERP (dBm)	Limit (dBm)	Result
1.4 MHz (QPSK)	Low	824.7	Horizontal	21.95	38.45	Pass
	Mid	836.5	Horizontal	21.69	38.45	Pass
	High	848.3	Horizontal	21.72	38.45	Pass
3 MHz (QPSK)	Low	825.5	Horizontal	21.80	38.45	Pass
	Mid	836.5	Horizontal	21.94	38.45	Pass
	High	847.5	Horizontal	21.71	38.45	Pass
5 MHz (QPSK)	Low	826.5	Horizontal	21.94	38.45	Pass
	Mid	836.5	Horizontal	21.74	38.45	Pass
	High	846.5	Horizontal	21.74	38.45	Pass
10 MHz (QPSK)	Low	829	Horizontal	21.93	38.45	Pass
	Mid	836.5	Horizontal	21.81	38.45	Pass
	High	844	Horizontal	21.74	38.45	Pass
1.4 MHz (16QAM)	Low	824.7	Horizontal	20.98	38.45	Pass
	Mid	836.5	Horizontal	21.22	38.45	Pass
	High	848.3	Horizontal	21.04	38.45	Pass
3 MHz (16QAM)	Low	825.5	Horizontal	21.00	38.45	Pass
	Mid	836.5	Horizontal	20.82	38.45	Pass
	High	847.5	Horizontal	21.11	38.45	Pass
5 MHz (16QAM)	Low	826.5	Horizontal	20.97	38.45	Pass
	Mid	836.5	Horizontal	20.93	38.45	Pass
	High	846.5	Horizontal	21.00	38.45	Pass
10 MHz (16QAM)	Low	829	Horizontal	20.94	38.45	Pass
	Mid	836.5	Horizontal	20.92	38.45	Pass
	High	844	Horizontal	20.85	38.45	Pass
1.4 MHz (64QAM)	Low	824.7	Horizontal	19.52	38.45	Pass
	Mid	836.5	Horizontal	19.74	38.45	Pass
	High	848.3	Horizontal	19.40	38.45	Pass
3 MHz (64QAM)	Low	825.5	Horizontal	19.61	38.45	Pass
	Mid	836.5	Horizontal	19.50	38.45	Pass
	High	847.5	Horizontal	19.50	38.45	Pass
5 MHz (64QAM)	Low	826.5	Horizontal	19.61	38.45	Pass
	Mid	836.5	Horizontal	19.64	38.45	Pass
	High	846.5	Horizontal	19.57	38.45	Pass
10 MHz (64QAM)	Low	829	Horizontal	19.66	38.45	Pass
	Mid	836.5	Horizontal	19.93	38.45	Pass
	High	844	Horizontal	19.79	38.45	Pass

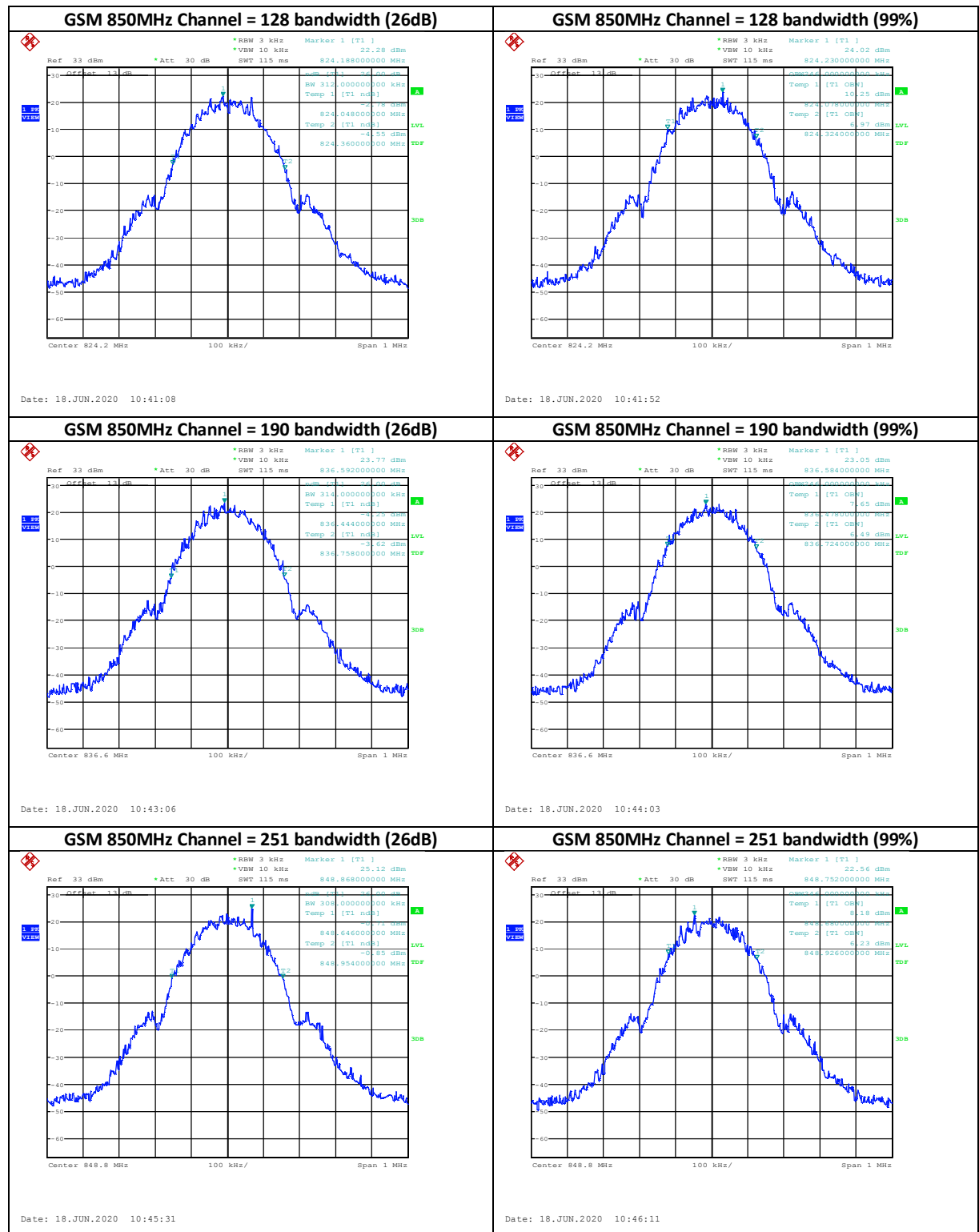
AppendixC: 99% Occupied Bandwidth and 26dB Bandwidth Measurement

Test Result

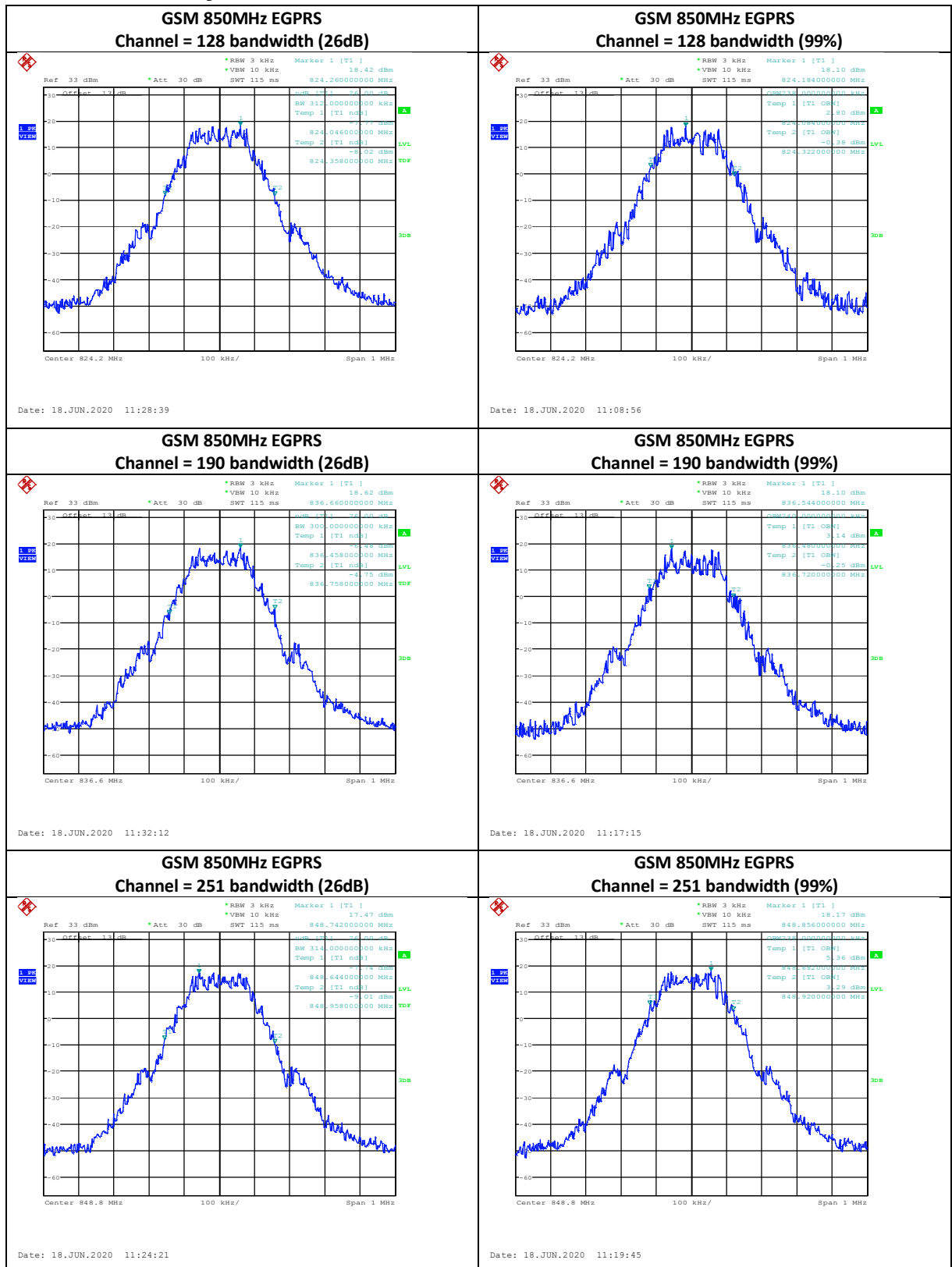
Band	Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
GSM 850MHz (GSM)	128	824.2	312 kHz	246 kHz
	190	836.6	314 kHz	246 kHz
	251	848.8	308 kHz	246 kHz
GPRS 850MHz (GMSK)	128	824.2	318 kHz	244 kHz
	190	836.6	316 kHz	248 kHz
	251	848.8	318 kHz	244 kHz
EGPRS 850 (8-PSK)	128	824.2	312 kHz	238 kHz
	190	836.6	300 kHz	240 kHz
	251	848.8	314 kHz	238 kHz
WCDMA Band V (RMC)	4132	826.4	4.70 MHz	4.14 MHz
	4183	836.6	4.72 MHz	4.16 MHz
	4233	846.6	4.70 MHz	4.14 MHz

LTE Band 5						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
100%	QPSK	1.4	20407	824.7	1.266	1.098
			20525	836.5	1.272	1.104
			20643	848.3	1.272	1.104
		3	20415	825.5	2.964	2.700
			20525	836.5	2.976	2.688
			20635	847.5	3.000	2.688
		5	20425	826.5	5.000	4.540
			20525	836.5	5.000	4.540
			20625	846.5	4.960	4.500
		10	20450	829	9.800	8.960
			20525	836.5	9.840	9.000
			20600	844	9.760	8.960
	16QAM	1.4	20407	824.7	1.260	1.092
			20525	836.5	1.260	1.092
			20643	848.3	1.242	1.098
		3	20415	825.5	2.988	2.700
			20525	836.5	2.988	2.700
			20635	847.5	3.000	2.700
		5	20425	826.5	4.960	4.500
			20525	836.5	4.980	4.540
			20625	846.5	4.960	4.500
		10	20450	829	9.720	8.960
			20525	836.5	9.840	9.000
			20600	844	9.680	8.960
	64QAM	1.4	20407	824.7	1.272	1.110
			20525	836.5	1.272	1.092
			20643	848.3	1.308	1.104
		3	20415	825.5	2.976	2.700
			20525	836.5	3.024	2.688
			20635	847.5	3.012	2.688
		5	20425	826.5	5.020	4.500
			20525	836.5	4.940	4.500
			20625	846.5	4.940	4.520
		10	20450	829	9.680	8.960
			20525	836.5	9.840	9.000
			20600	844	9.560	8.960

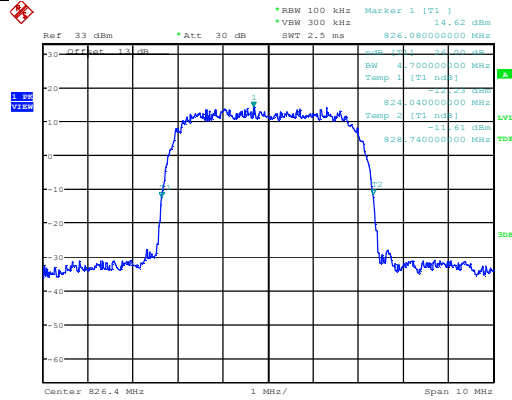
Test Graphs





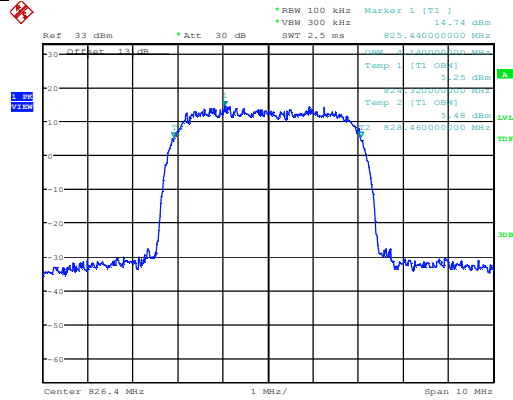


WCDMA 850MHz Channel = 4132 bandwidth (26dB)



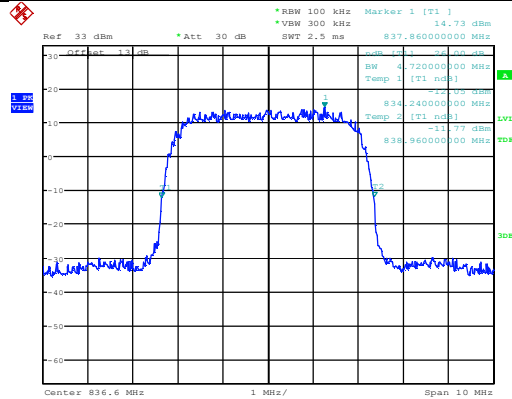
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WCDMA 850MHz Channel = 4132 bandwidth (99%)



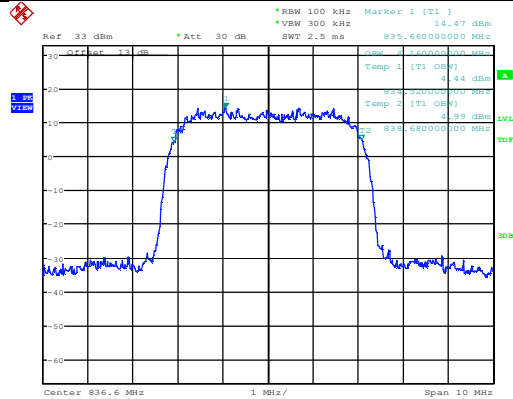
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WCDMA 850MHz Channel = 4183 bandwidth (26dB)



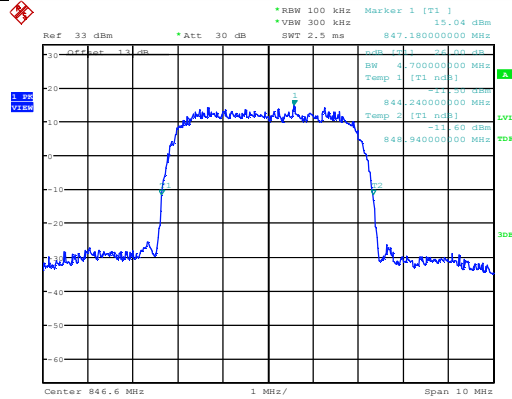
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WCDMA 850MHz Channel = 4183 bandwidth (99%)



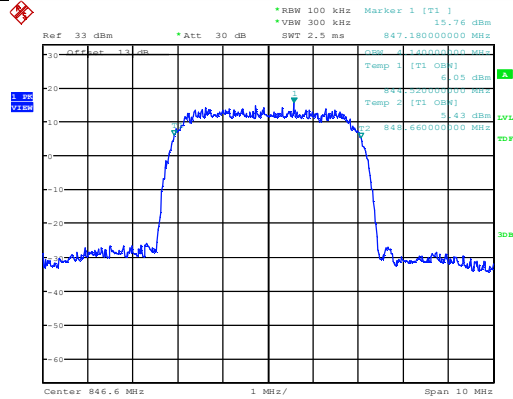
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WCDMA 850MHz Channel = 4233 bandwidth (26dB)

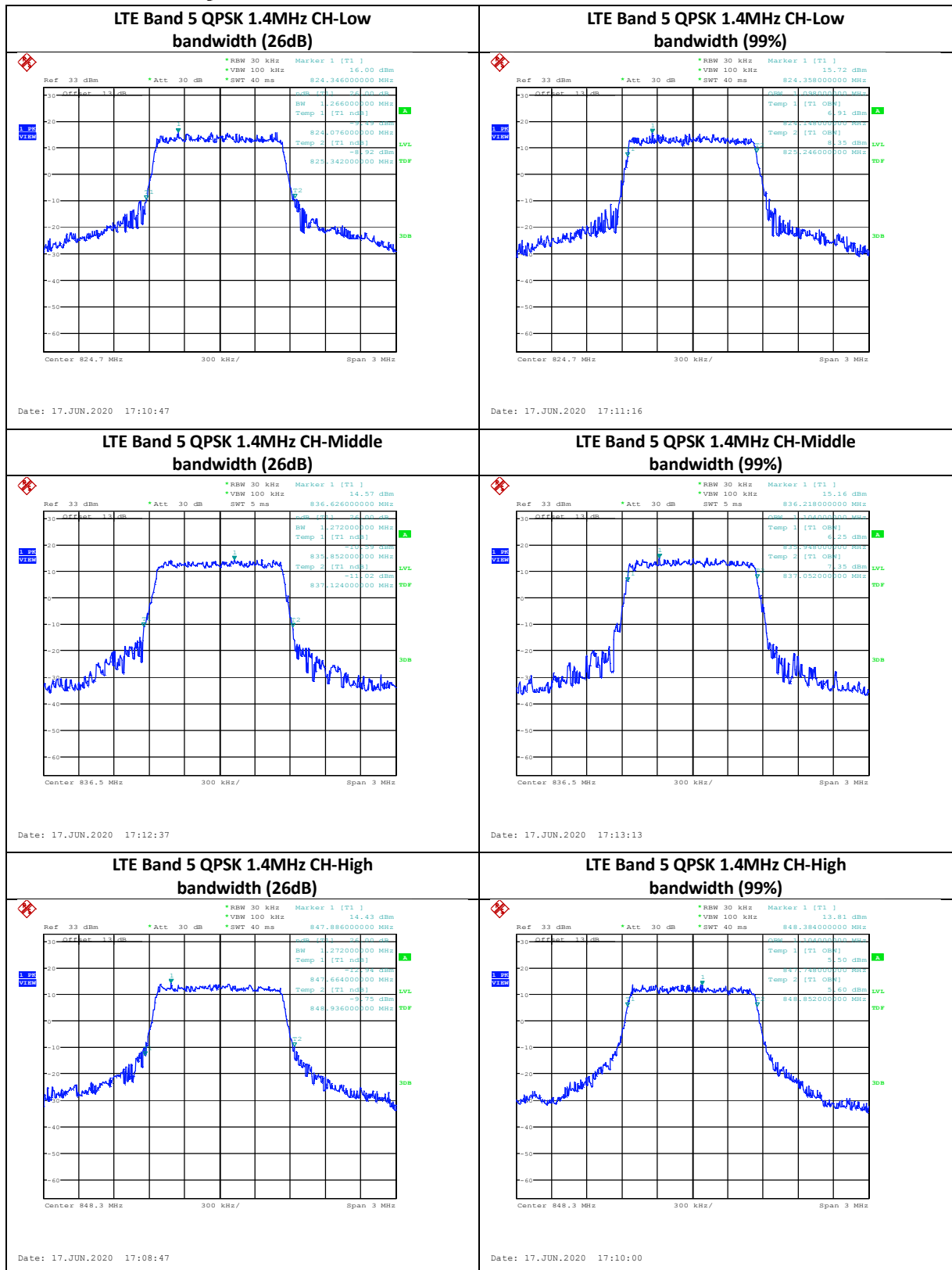


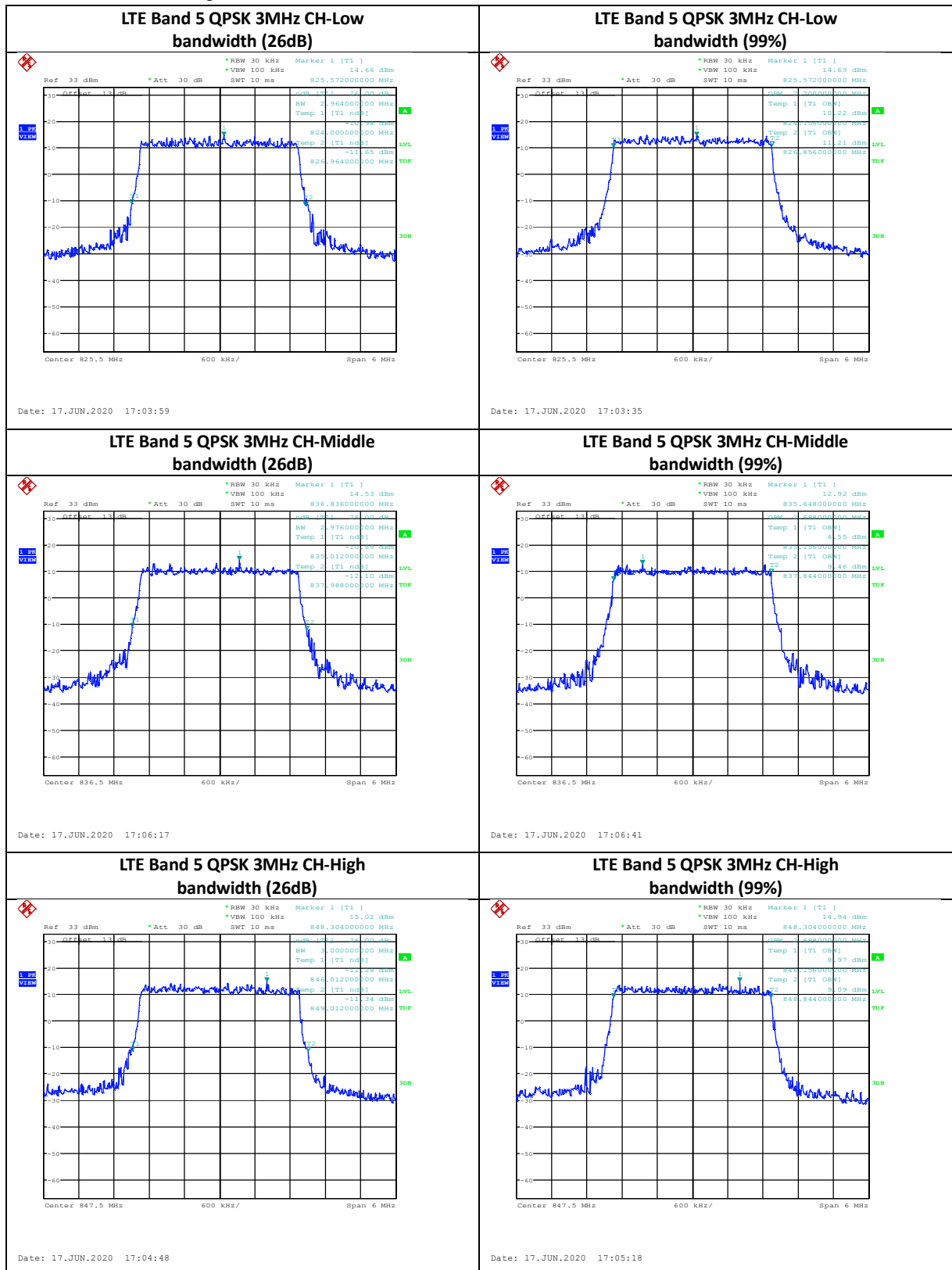
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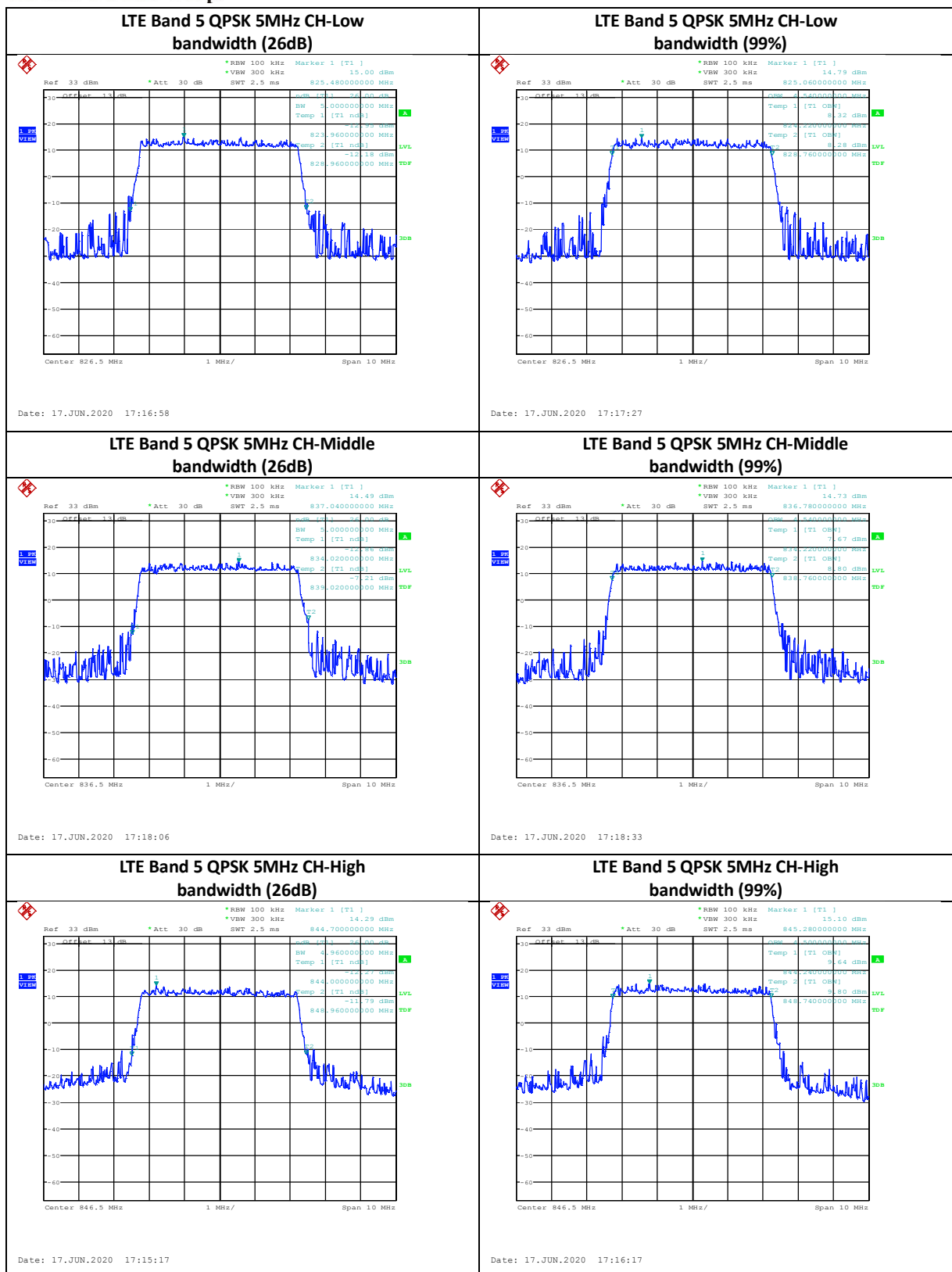
WCDMA 850MHz Channel = 4233 bandwidth (99%)



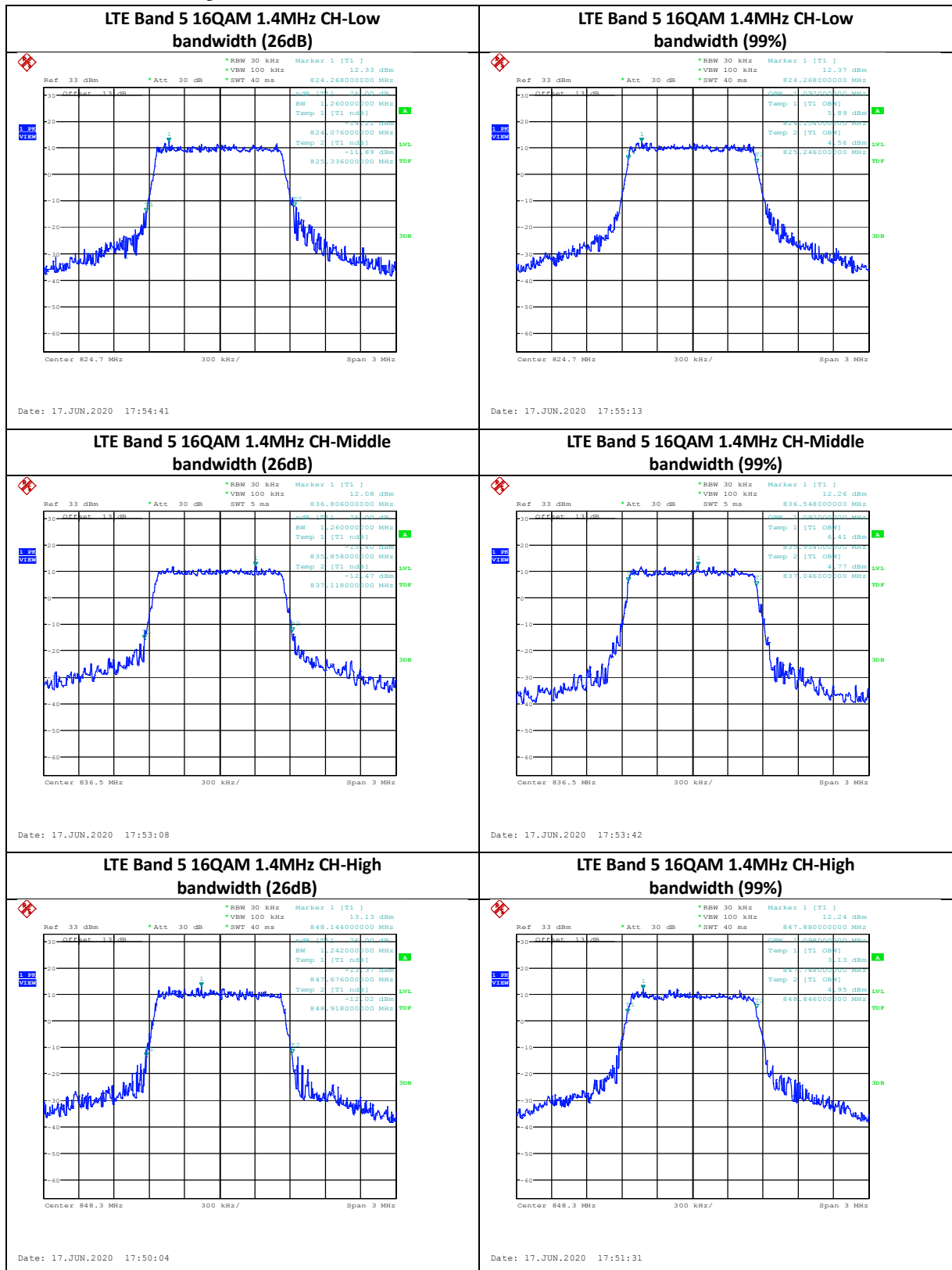
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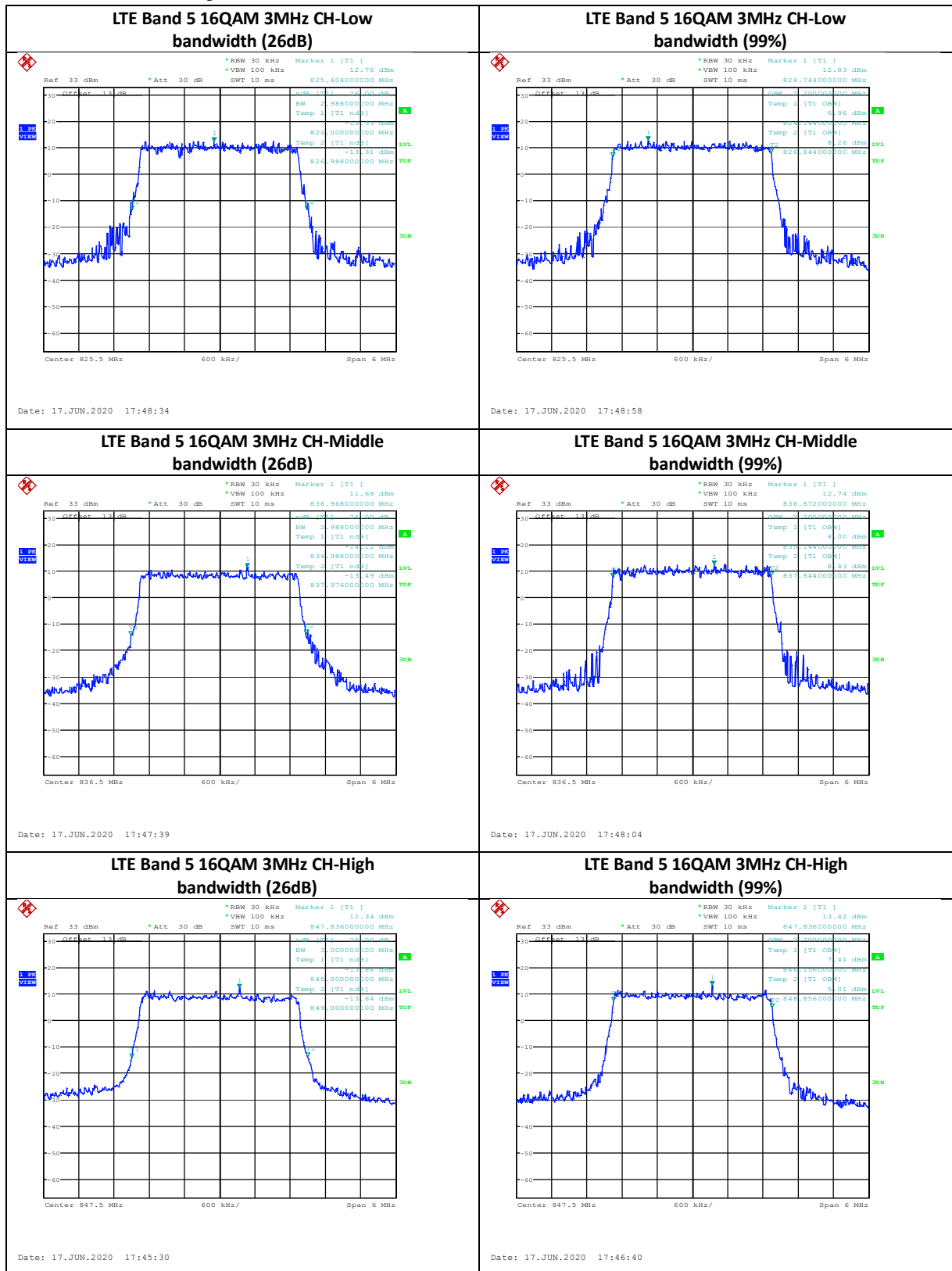


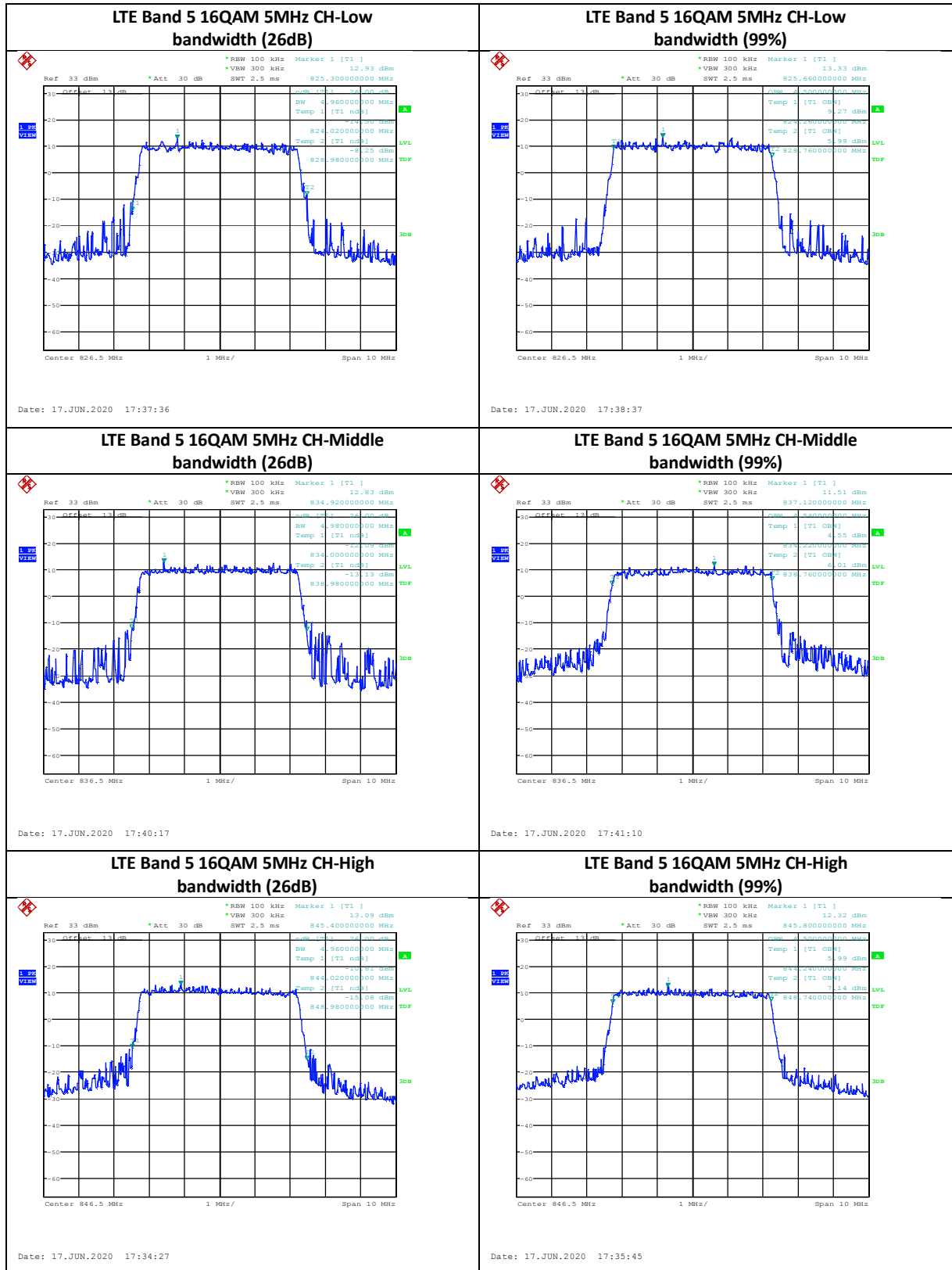


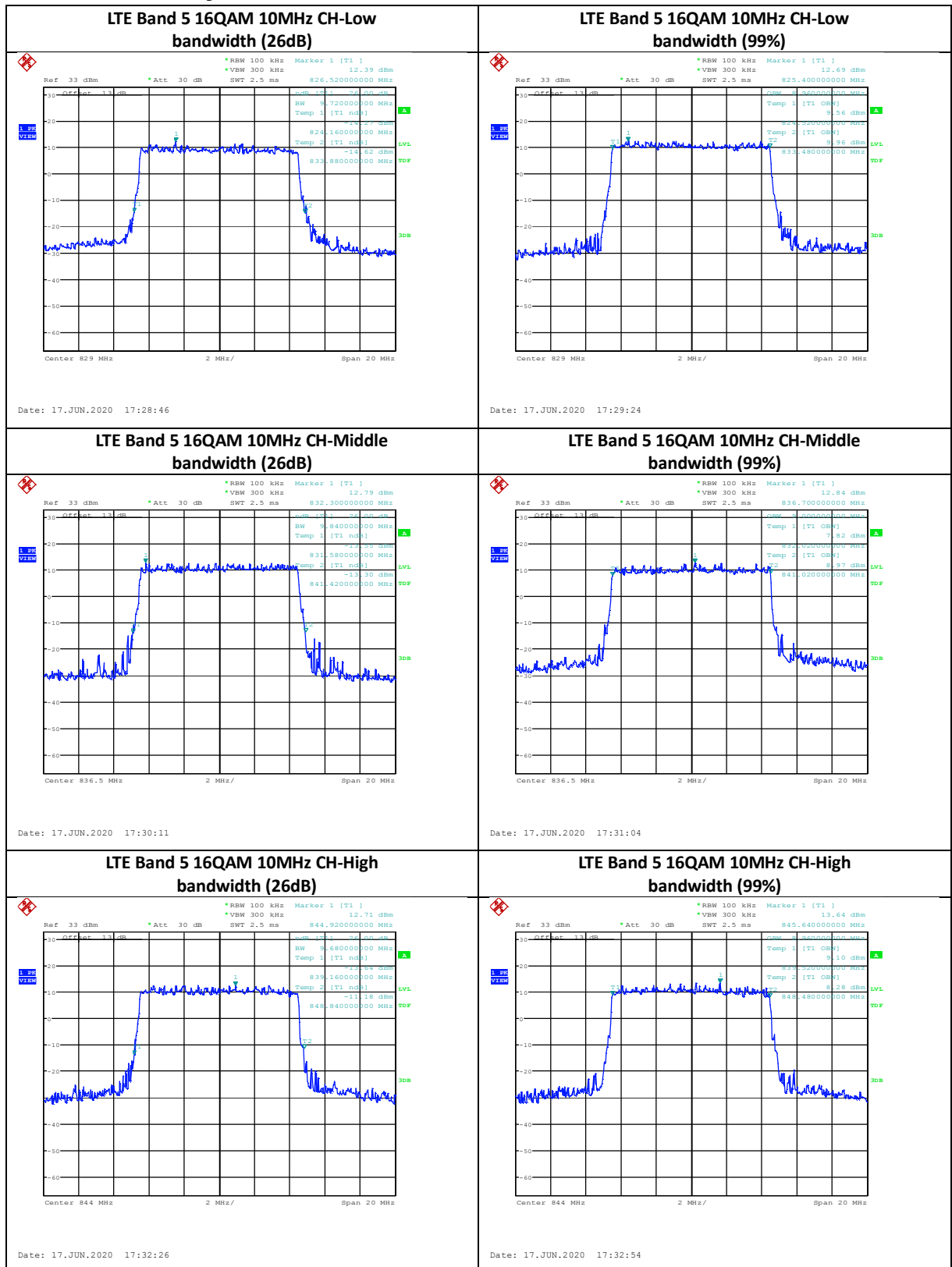


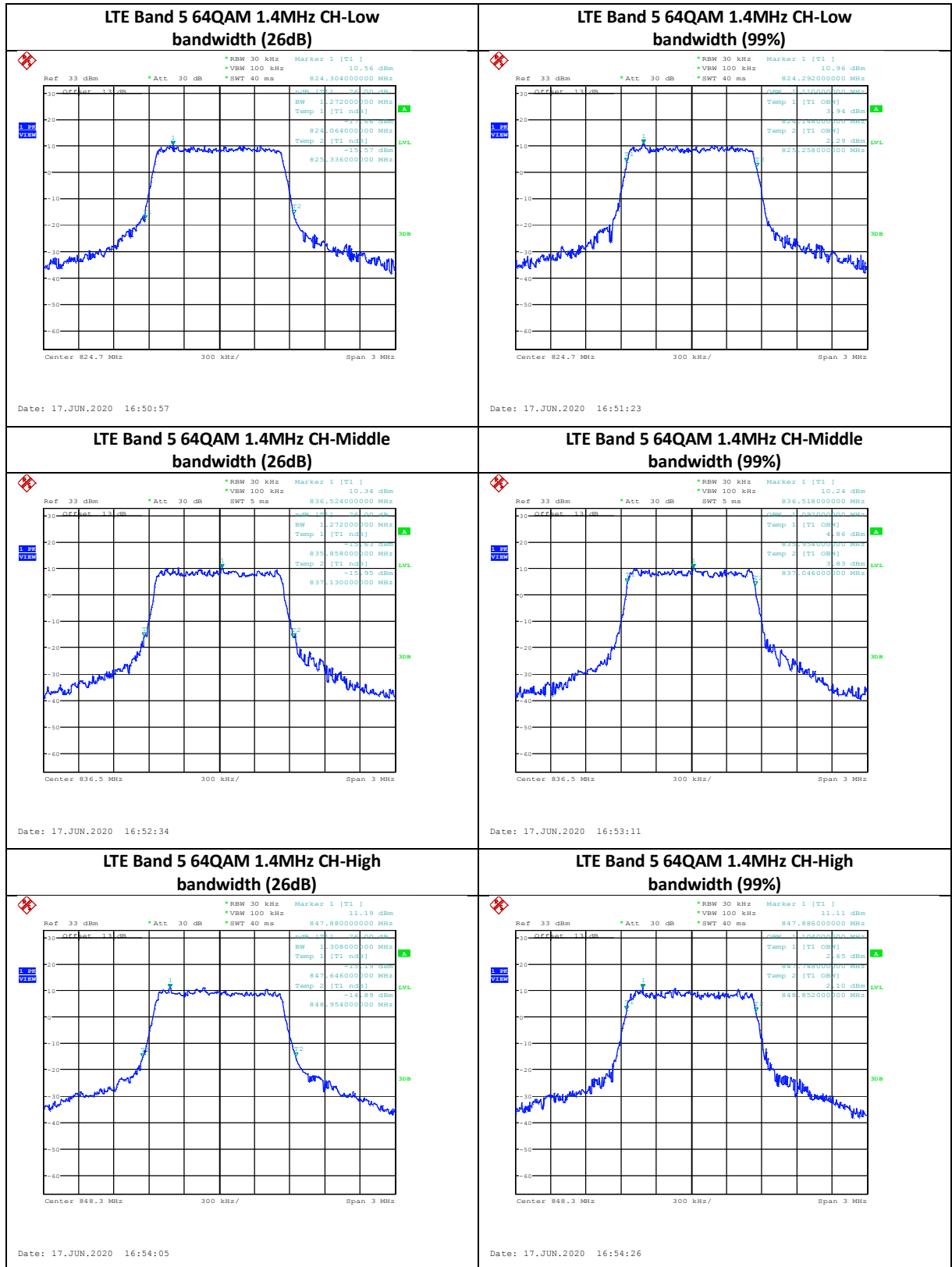


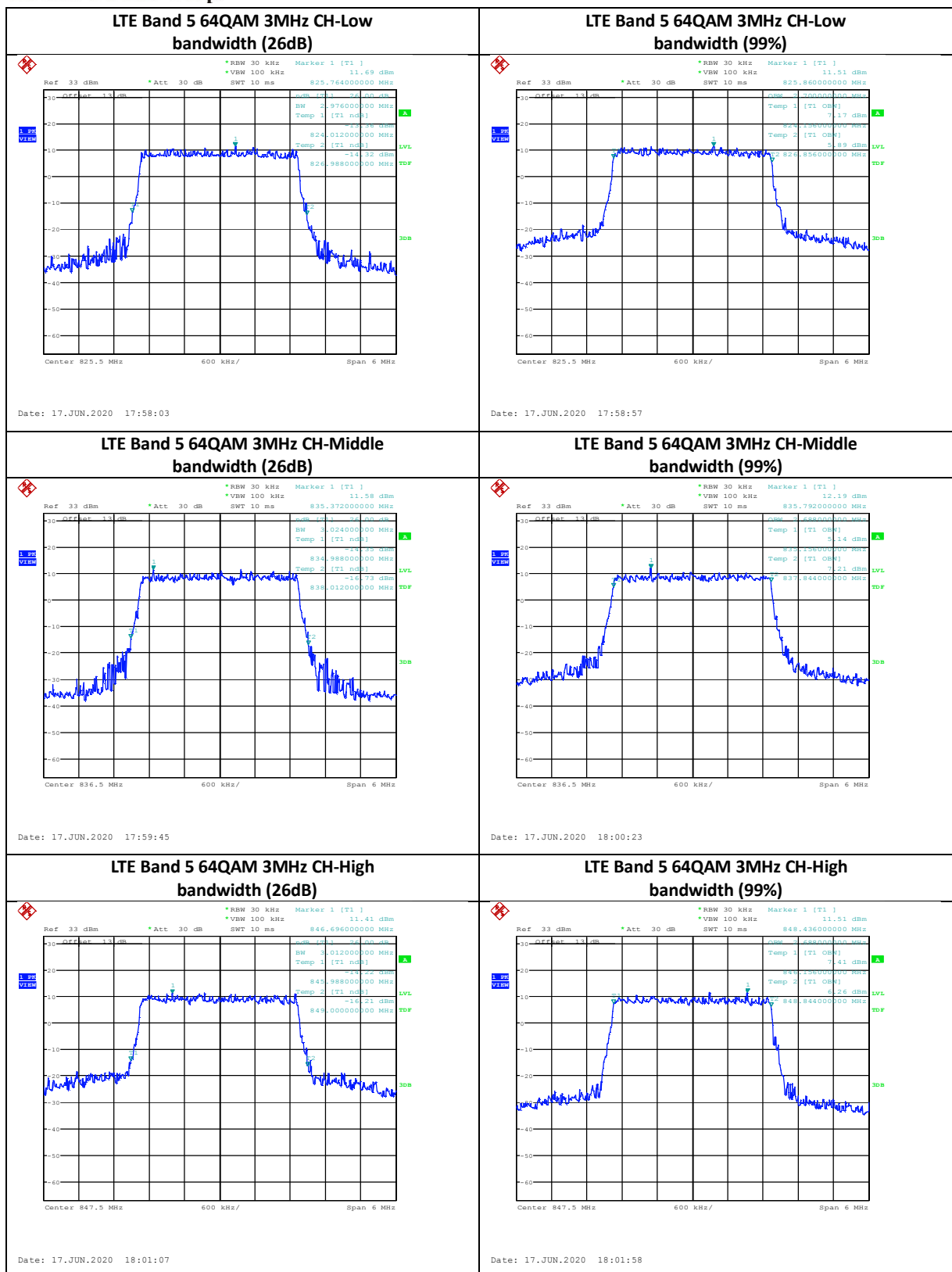


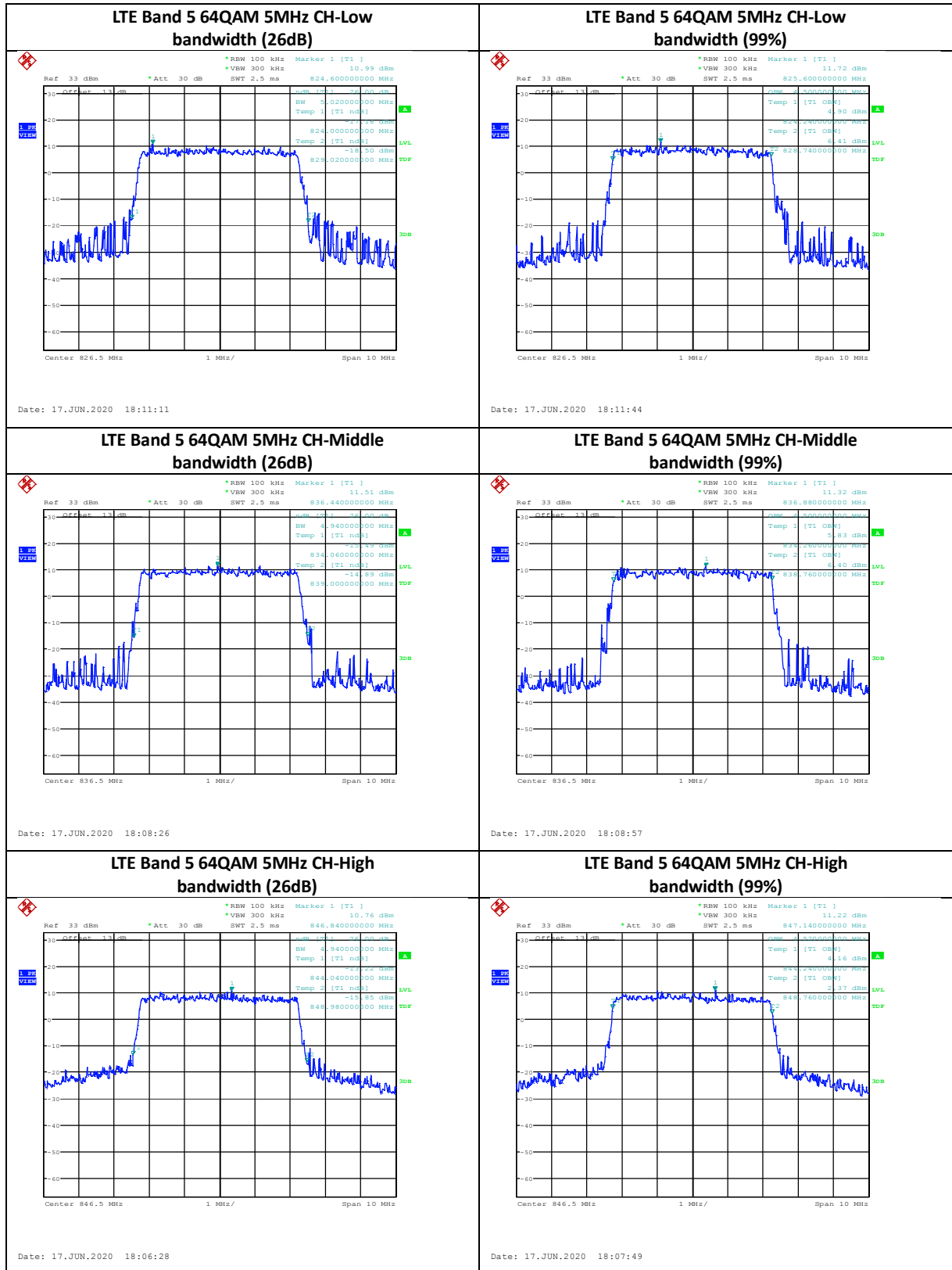


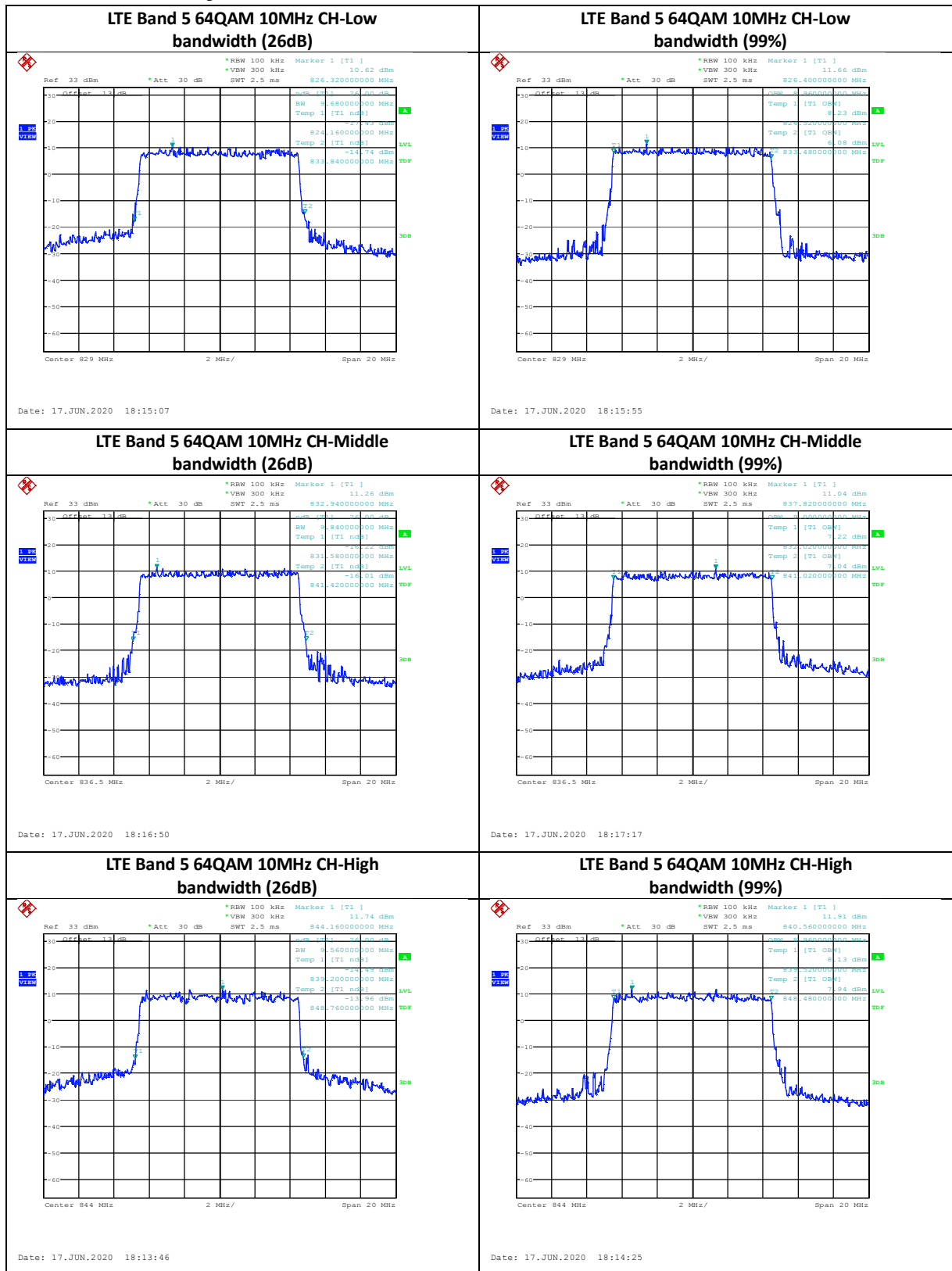






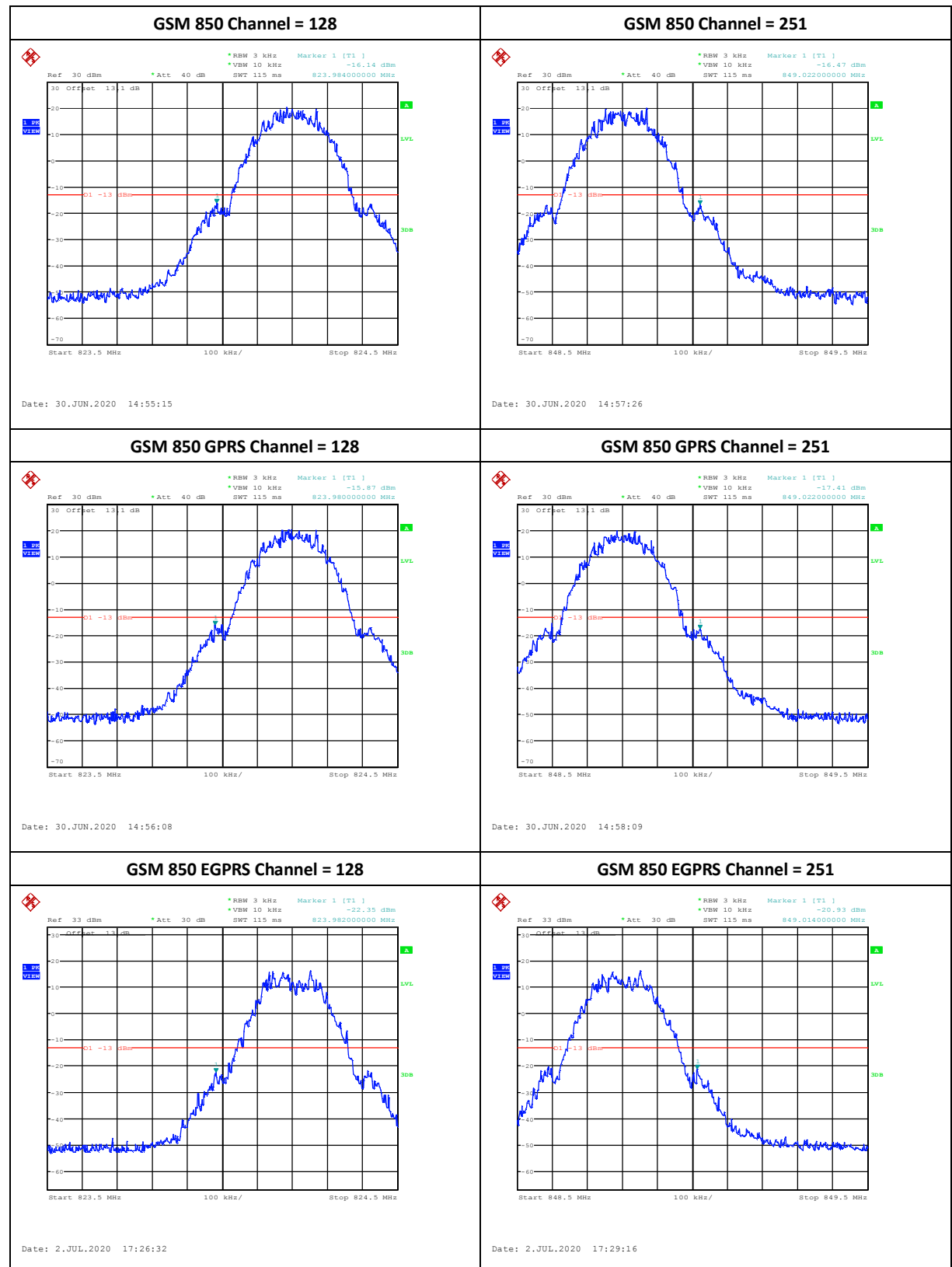


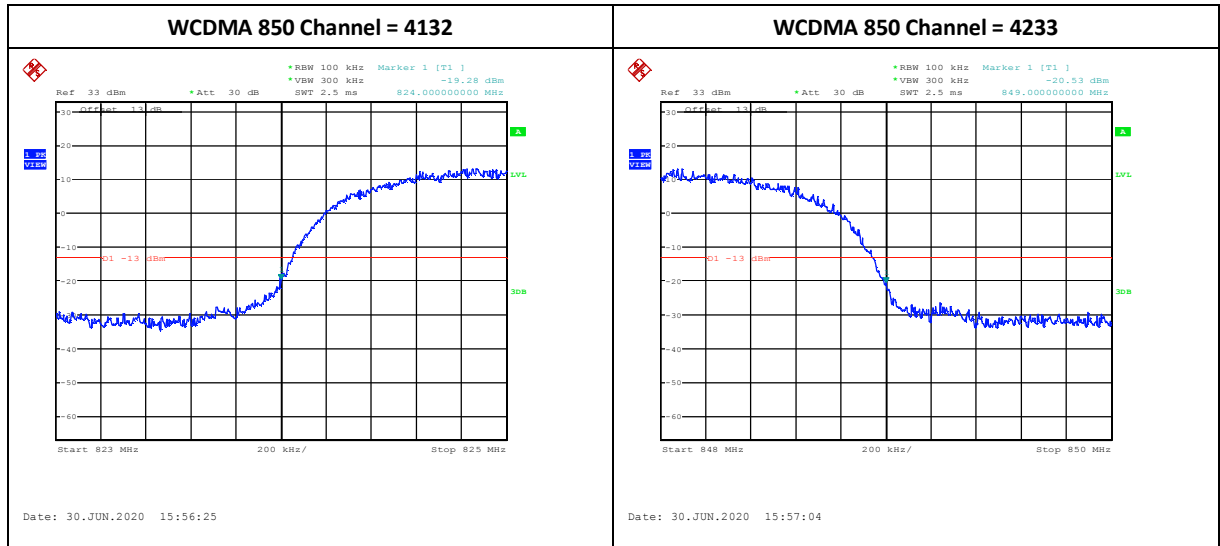


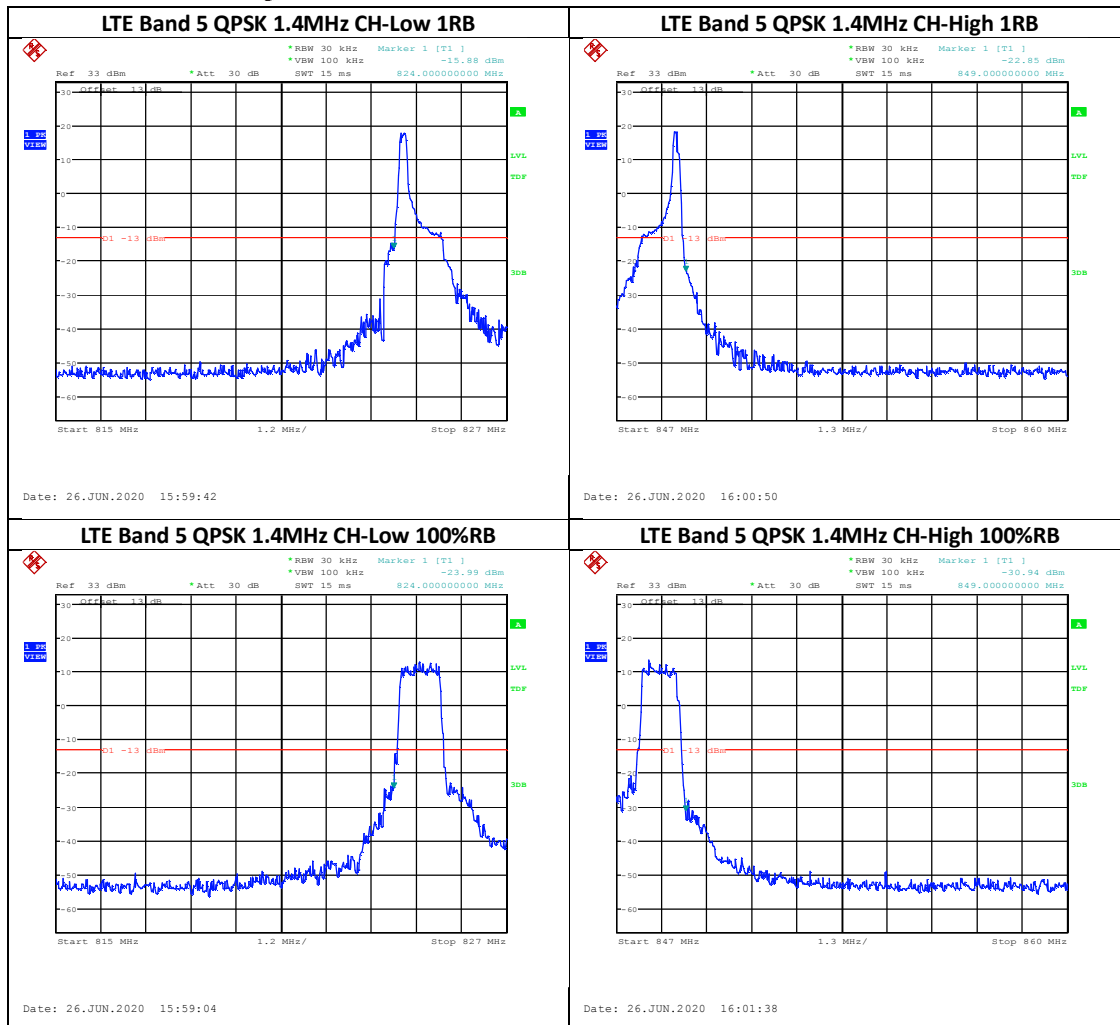


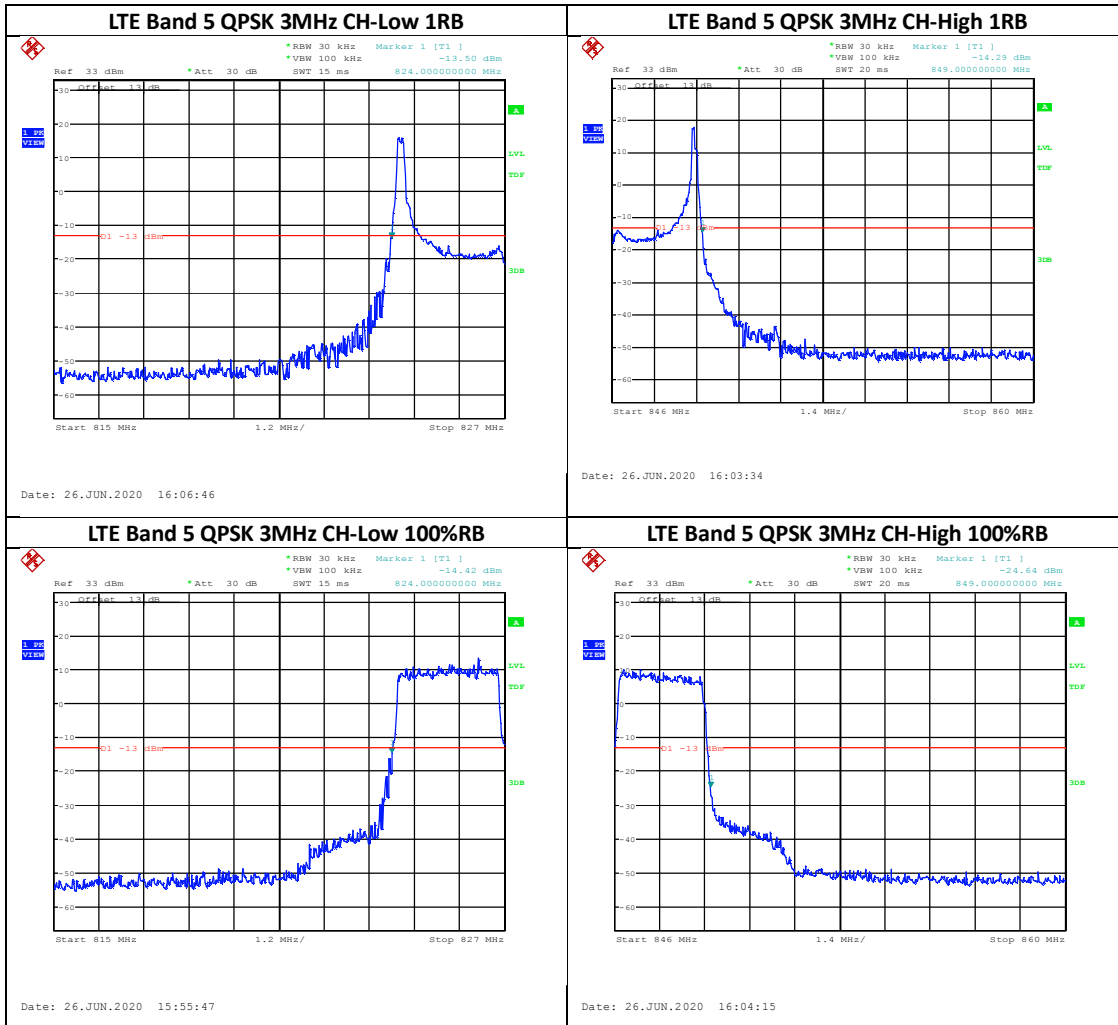
AppendixD: Band Edge Measurement

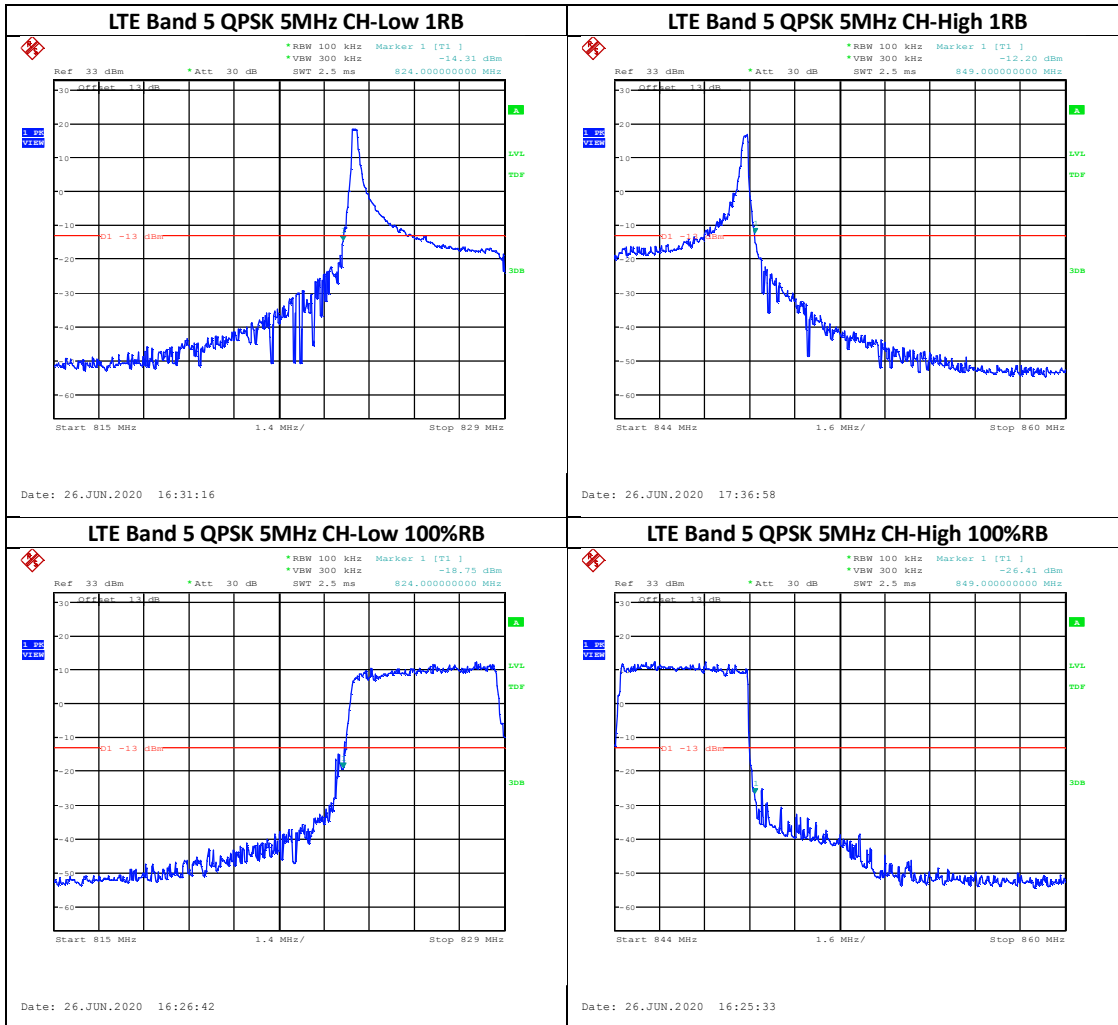
Test Result

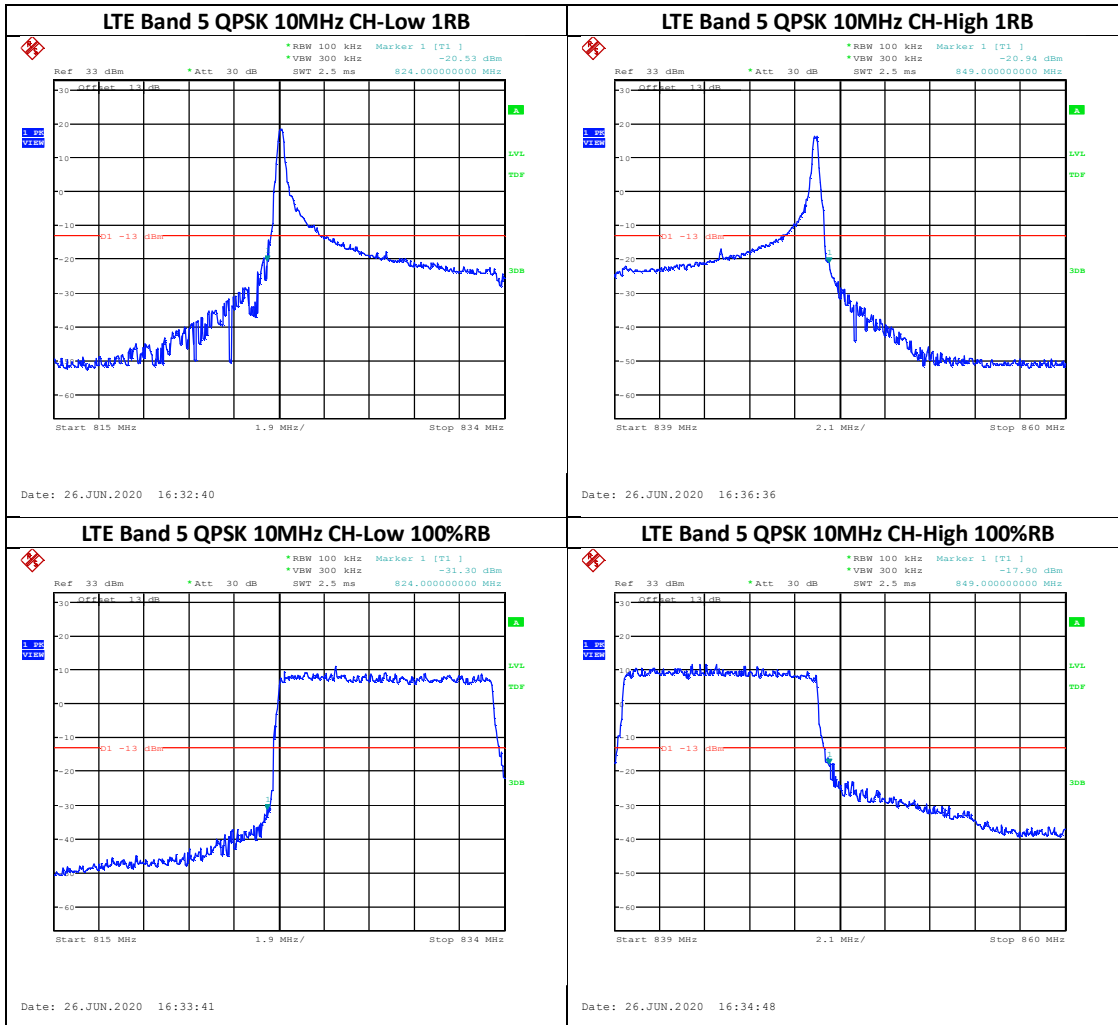


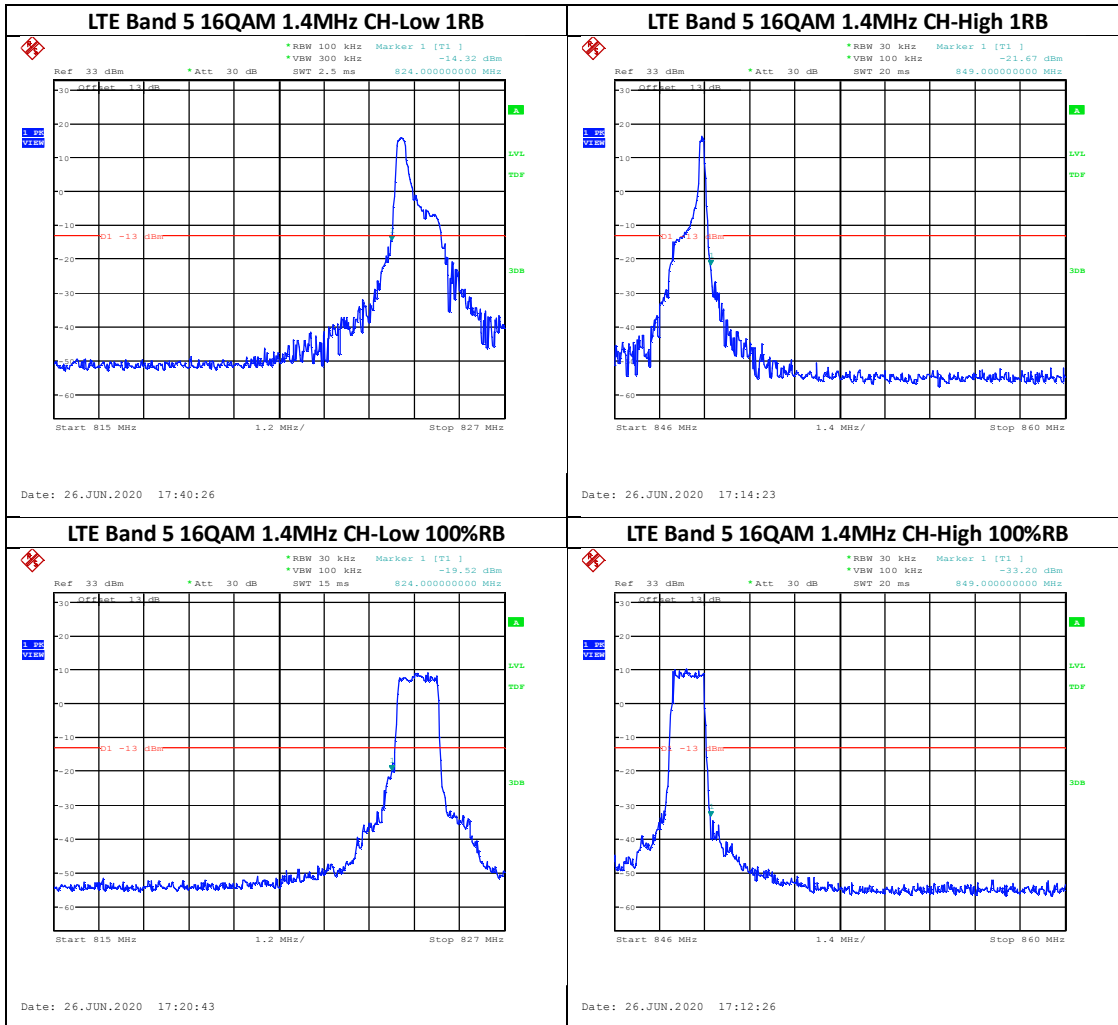


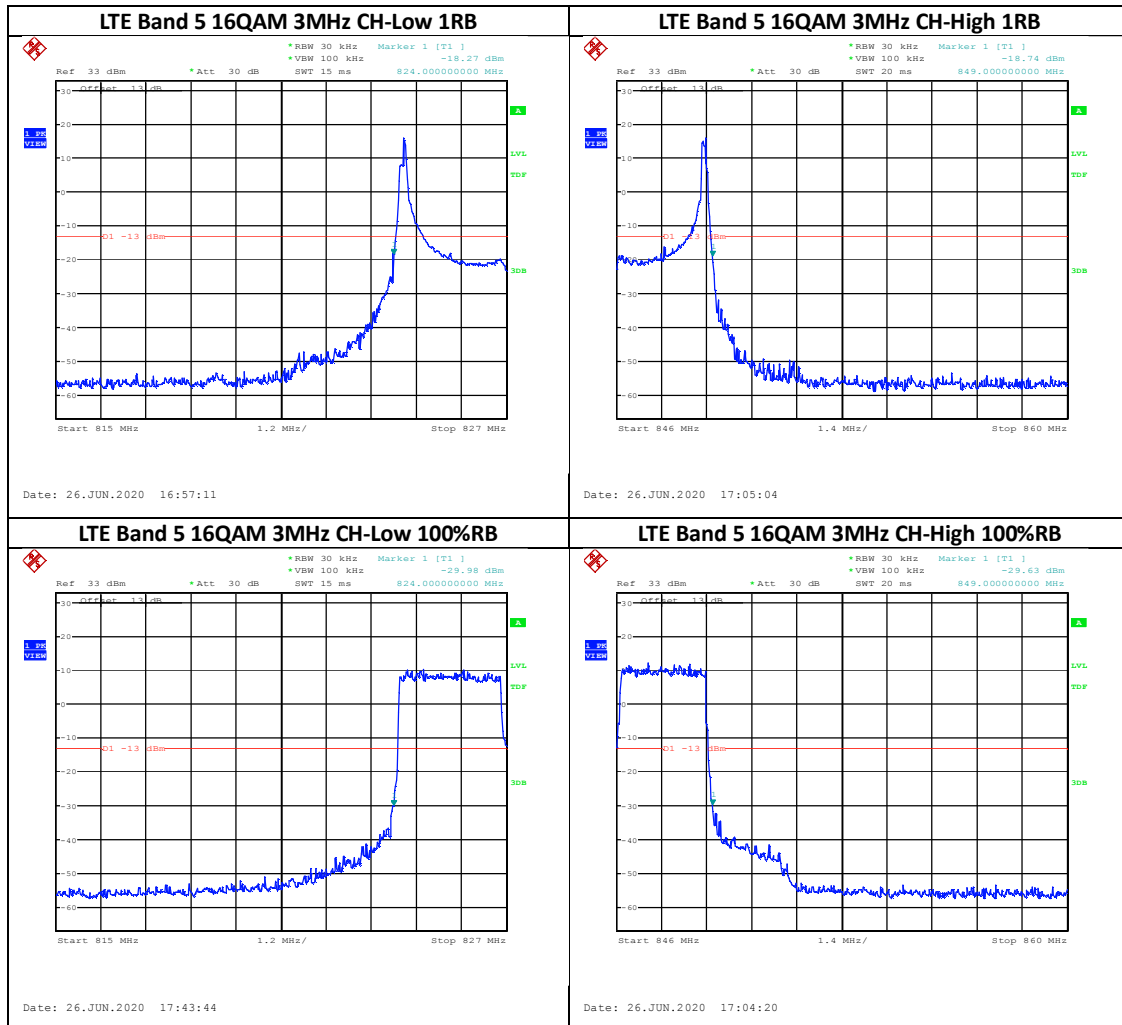


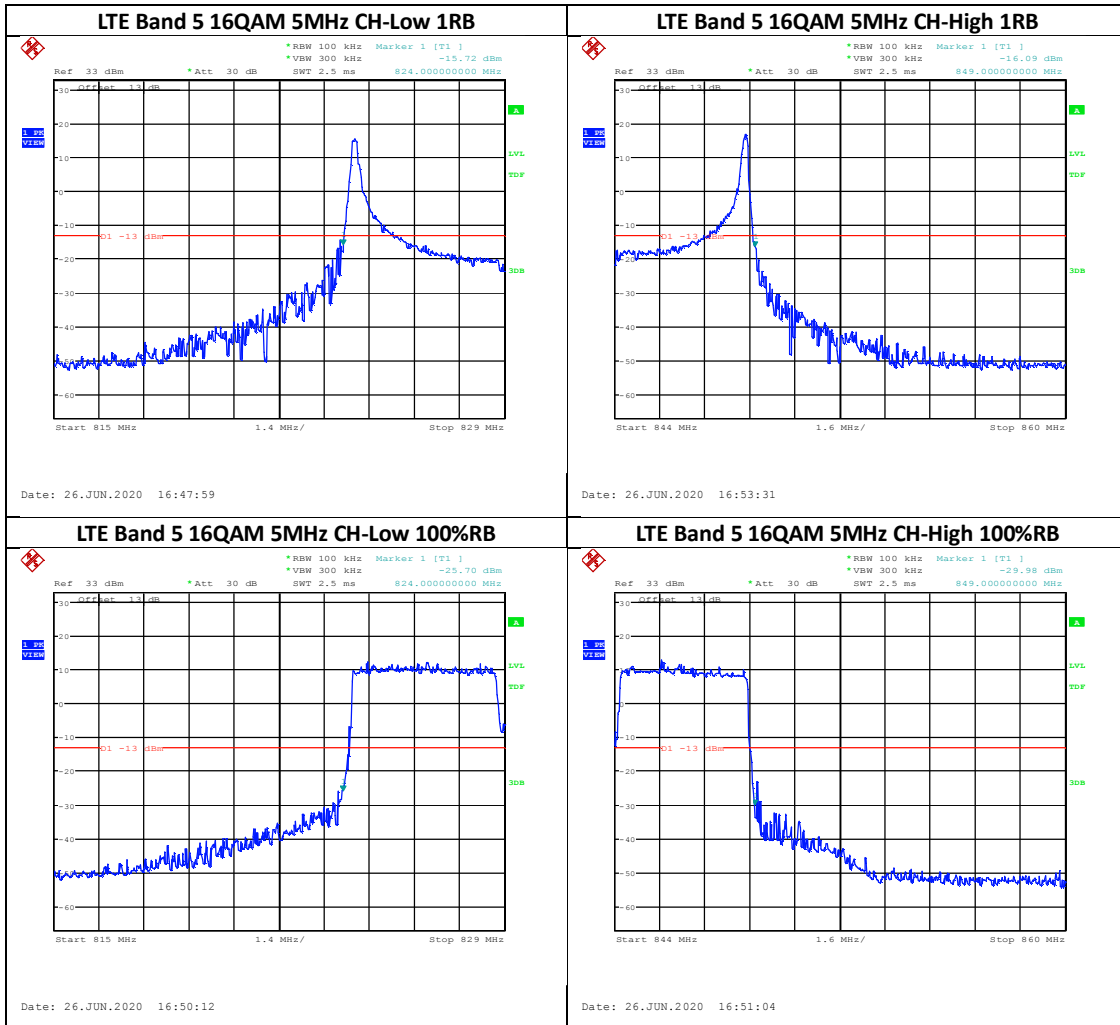


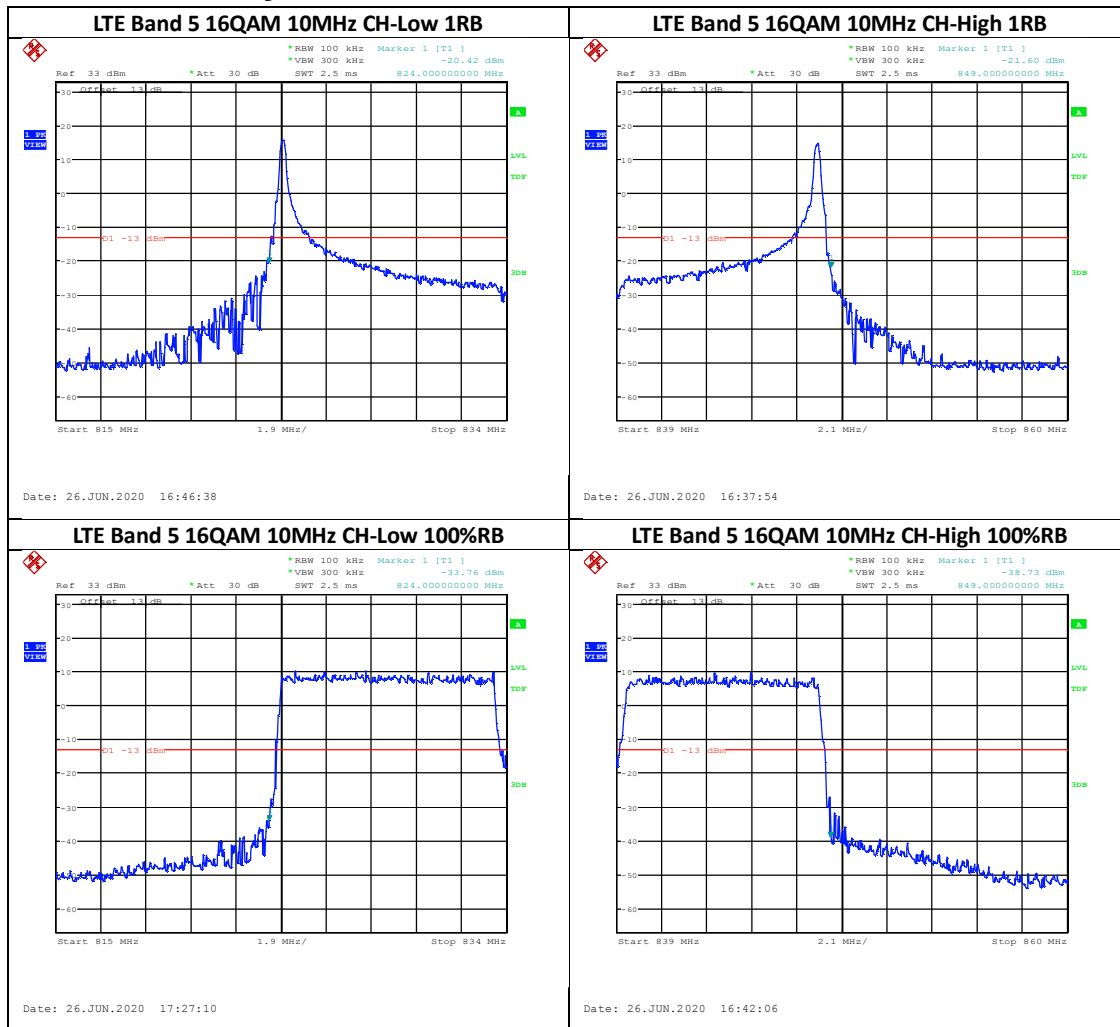


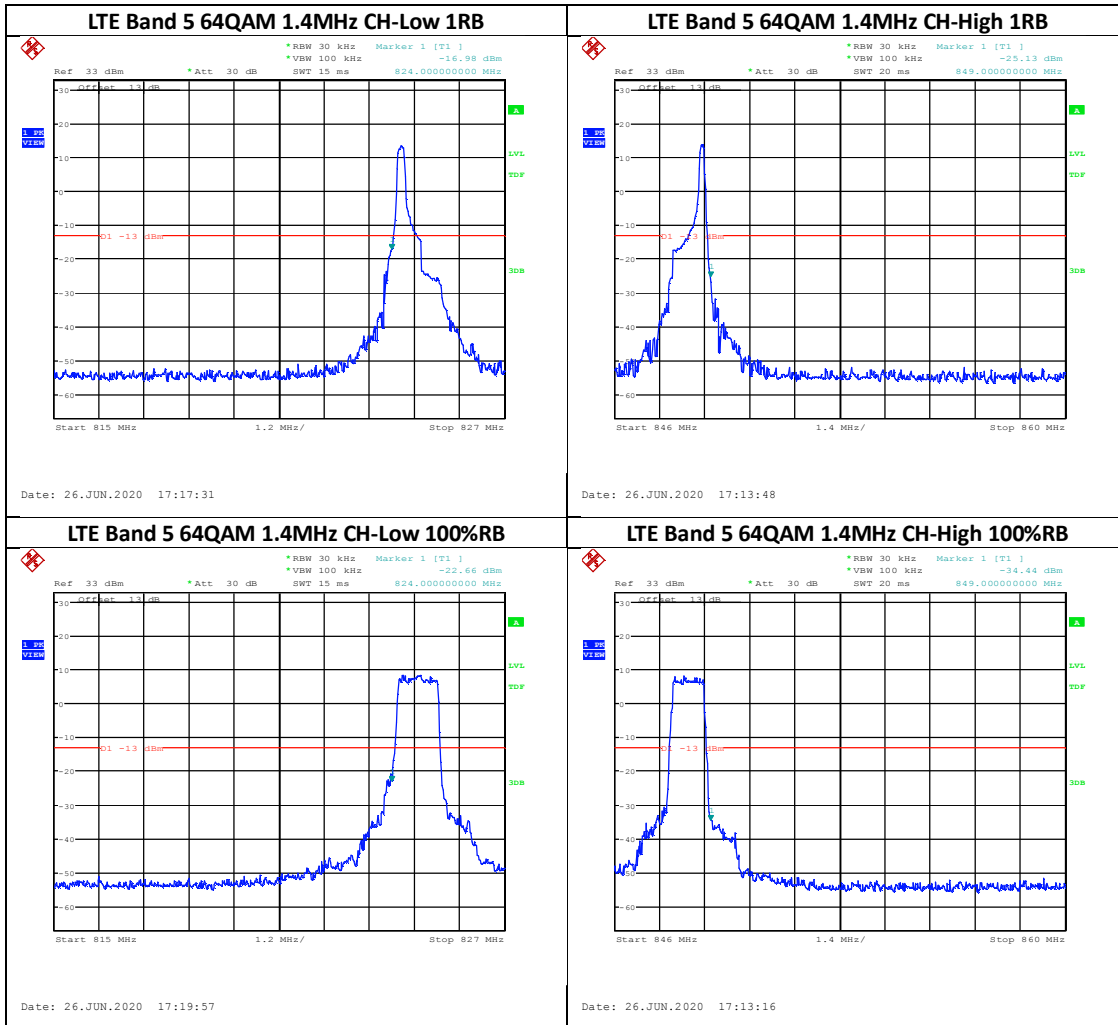


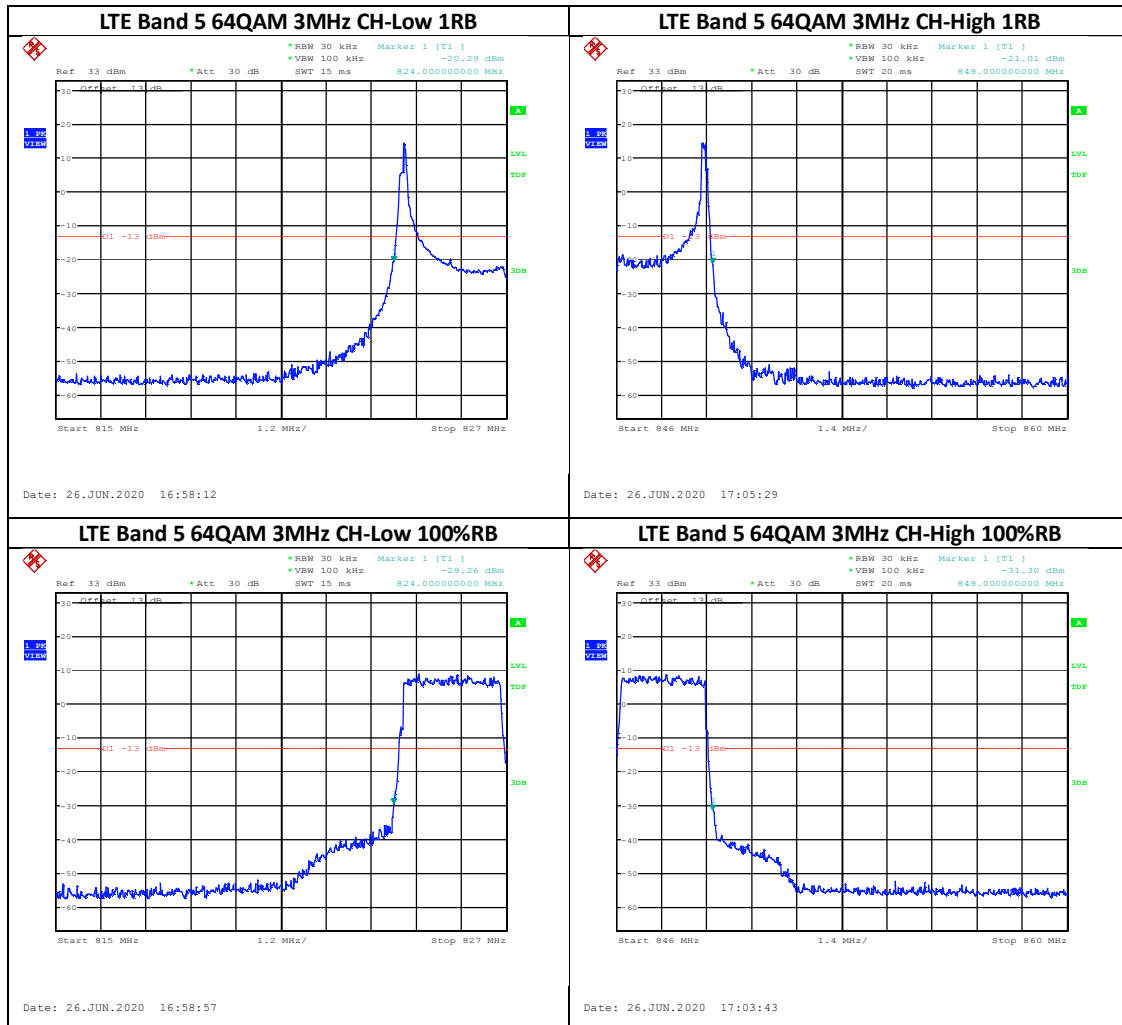


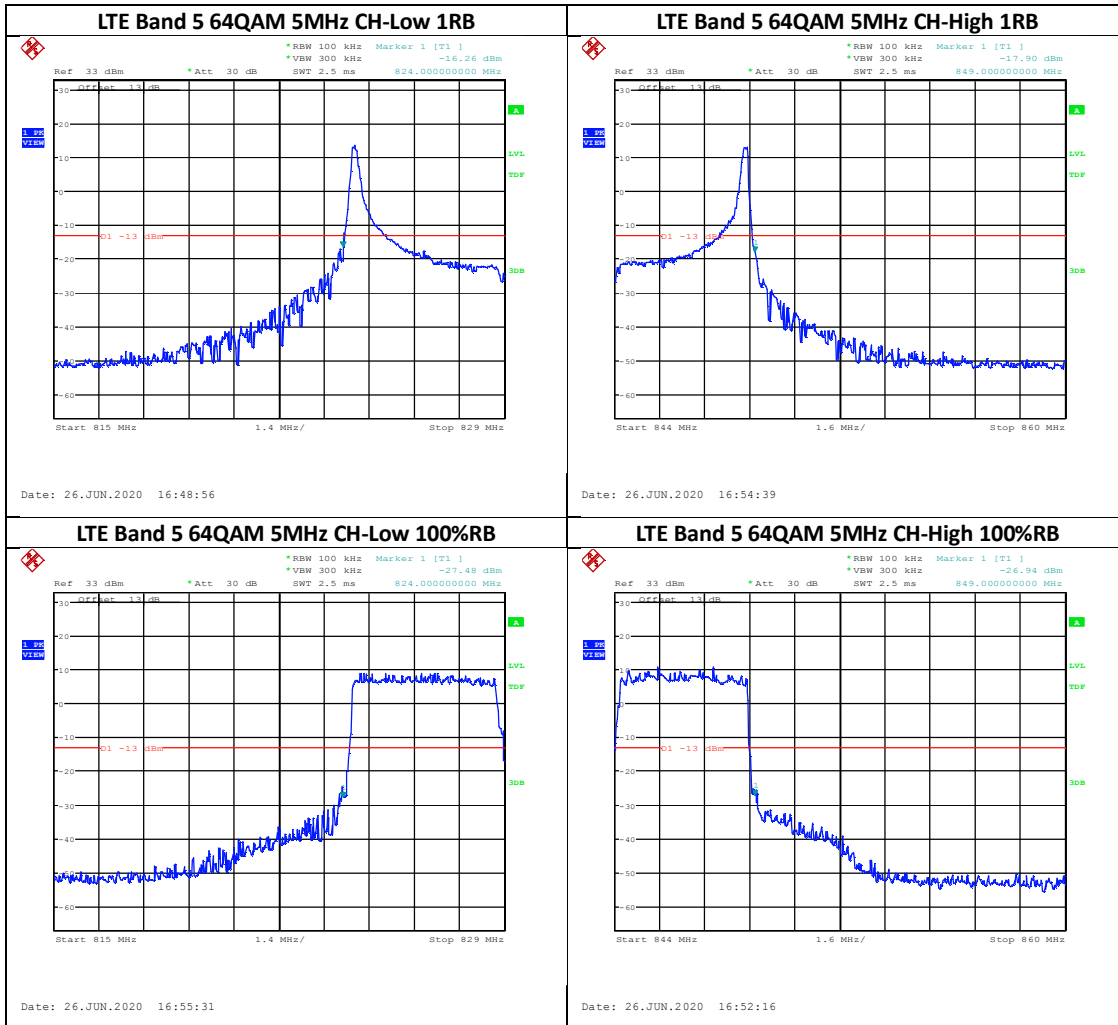


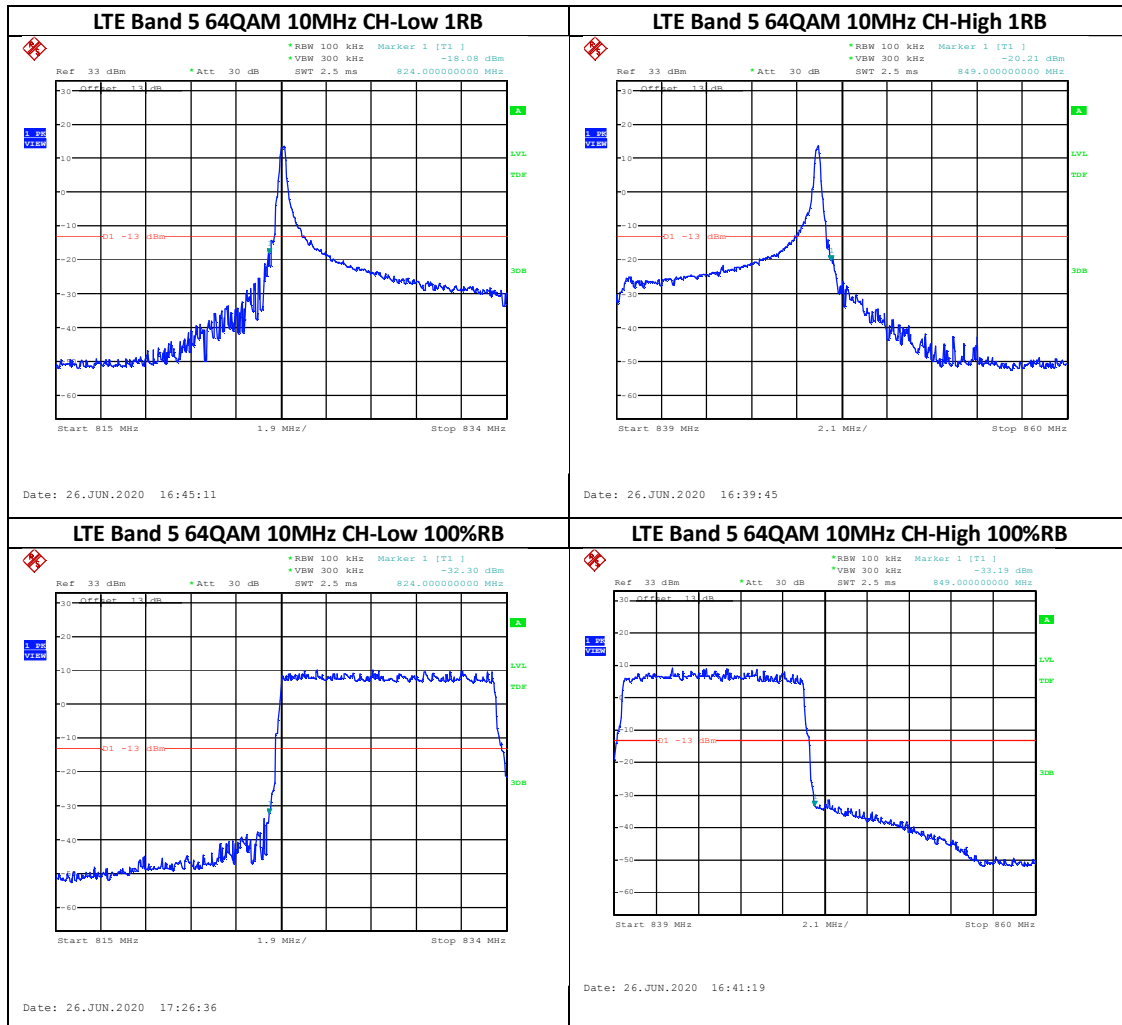












AppendixE: Peak-to-Average Ratio**Test Result**

Band	Channel	Peak-to-Average Ratio(dB)	Limit(dB)	Verdict
GSM 850MHz (GSM)	128	7.56	13	PASS
	190	7.65	13	PASS
	251	7.68	13	PASS
GPRS 850MHz (GMSK)	128	7.56	13	PASS
	190	7.64	13	PASS
	251	7.64	13	PASS
EGPRS 850 (8-PSK)	128	10.08	13	PASS
	190	10.12	13	PASS
	251	10.12	13	PASS
WCDMA Band V (RMC)	4132	3.04	13	PASS
	4183	3.24	13	PASS
	4233	3.00	13	PASS

LTE Band 5							
Modulation	Bandwidth (MHz)	RB	Channel	Frequency (MHz)	Peak-to-Average Ratio(dB)	Limit(dB)	Verdict
QPSK	20	1RB	20450	829	-	13	PASS
			20525	836.5	5.04	13	PASS
			20600	844	-	13	PASS
		100%RB	20450	829	-	13	PASS
			20525	836.5	5.40	13	PASS
			20600	844	-	13	PASS
16QAM	20	1RB	20450	829	-	13	PASS
			20525	836.5	5.80	13	PASS
			20600	844	-	13	PASS
		100%RB	20450	829	-	13	PASS
			20525	836.5	6.24	13	PASS
			20600	844	-	13	PASS
64QAM	20	1RB	20450	829	-	13	PASS
			20525	836.5	6.84	13	PASS
			20600	844	-	13	PASS
		100%RB	20450	829	-	13	PASS
			20525	836.5	7.28	13	PASS
			20600	844	-	13	PASS

AppendixF: Frequency Stability

Test Result

GSM850						
Condition		Frequency Error (Hz)		Frequency Stability (ppm)		Verdict
Temperature	Voltage	GMSK	8PSK	GMSK	8PSK	
25℃	Normal	6.35	6.85	0.00759	0.00819	PASS
55℃		8.26	9.38	0.00987	0.01121	PASS
50℃		6.33	8.88	0.00757	0.01061	PASS
40℃		17.85	15.33	0.02134	0.01832	PASS
30℃		11.28	18.87	0.01348	0.02256	PASS
20℃		14.85	17.98	0.01775	0.02149	PASS
10℃		5.85	15.87	0.00699	0.01897	PASS
0℃		8.57	3.62	0.01024	0.00433	PASS
-10℃		15.75	4.78	0.01883	0.00571	PASS
-20℃		16.34	17.42	0.01953	0.02082	PASS
-30℃		4.68	14.79	0.00559	0.01768	PASS
25℃	LV	5.98	16.82	0.00715	0.02011	PASS
	HV	15.79	10.43	0.01887	0.01247	PASS

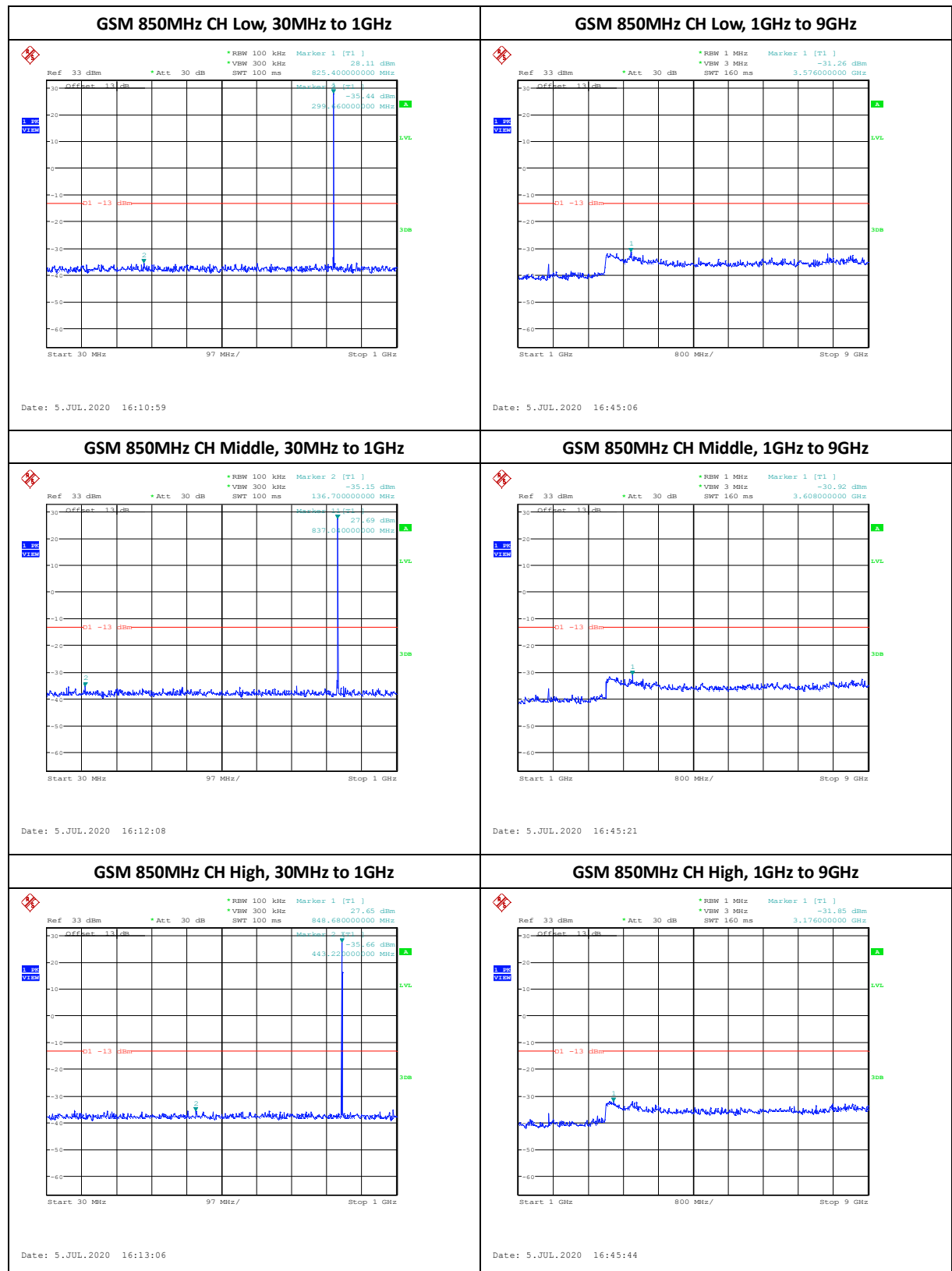
WCDMA Band 5						
Condition		Frequency Error (Hz)		Frequency Stability (ppm)		Verdict
Temperature	Voltage	QPSK	BPSK	QPSK	BPSK	
25℃	Normal	9.69	18.25	0.01158	0.02181	PASS
55℃		8.98	14.23	0.01073	0.01701	PASS
50℃		9.63	14.65	0.01151	0.01751	PASS
40℃		14.85	3.87	0.01775	0.00463	PASS
30℃		6.38	15.82	0.00763	0.01891	PASS
20℃		9.56	10.53	0.01143	0.01259	PASS
10℃		3.96	17.23	0.00473	0.02060	PASS
0℃		16.24	4.85	0.01941	0.00580	PASS
-10℃		5.63	8.59	0.00673	0.01027	PASS
-20℃		18.26	16.74	0.02183	0.02001	PASS
-30℃		16.85	15.26	0.02014	0.01824	PASS
25℃	LV	8.63	9.26	0.01032	0.01107	PASS
	HV	10.24	20.74	0.01224	0.02479	PASS

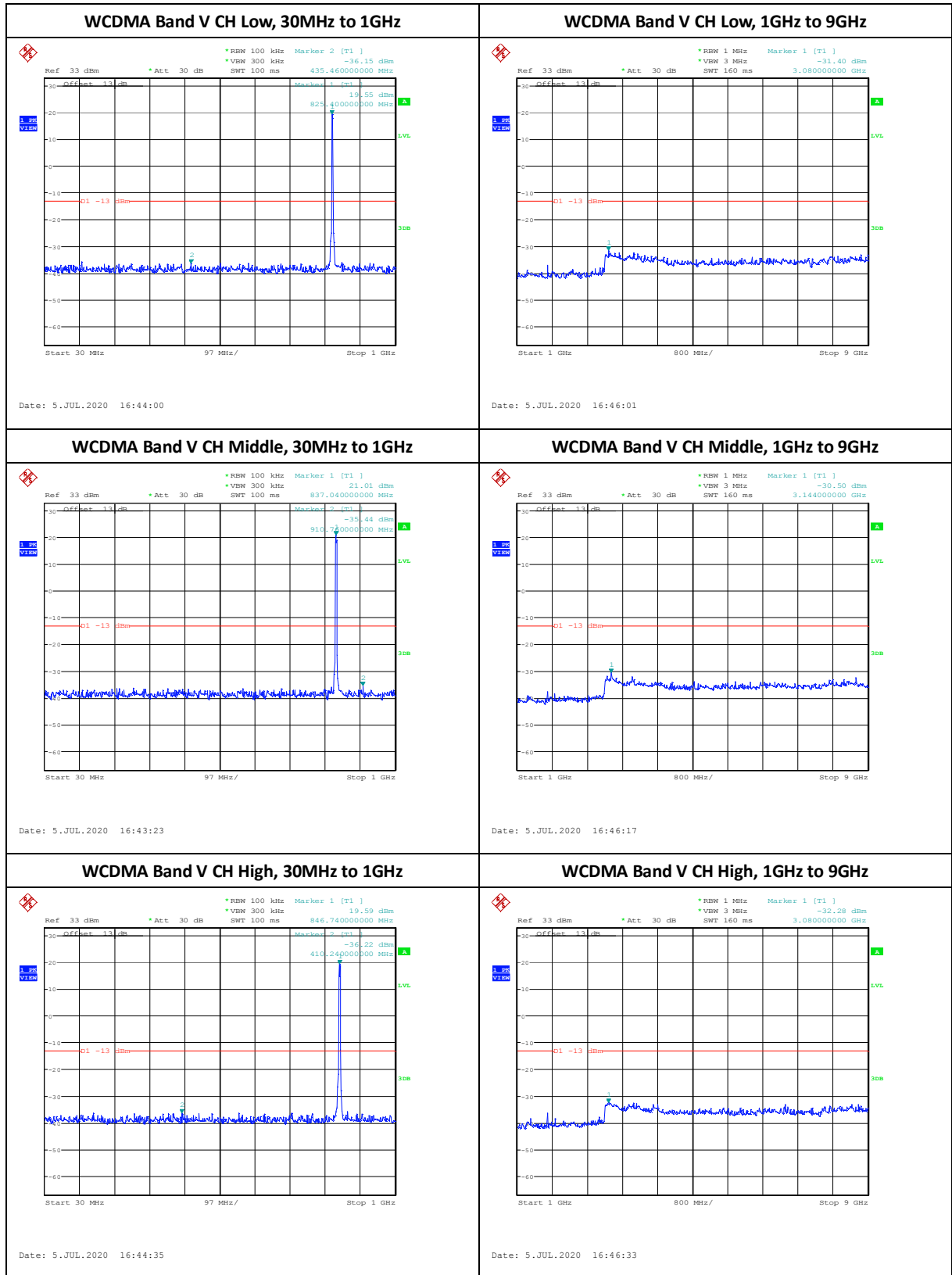
LTE Band 5(BANDWIDTH, 1.4MHz)								
Condition		Frequency Error (Hz)			Frequency Stability (ppm)			Verdict
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
25℃	Normal	14.83	5.01	18.28	0.01773	0.00599	0.02185	PASS
55℃		3.44	10.34	11.46	0.00411	0.01236	0.01370	PASS
50℃		19.08	3.08	12.44	0.02281	0.00368	0.01487	PASS
40℃		4.64	14.03	3.58	0.00555	0.01677	0.00428	PASS
30℃		14.08	13.10	13.77	0.01683	0.01566	0.01646	PASS
20℃		5.45	15.54	16.62	0.00652	0.01858	0.01987	PASS
10℃		18.87	19.07	3.05	0.02256	0.02280	0.00365	PASS
0℃		12.26	3.14	11.07	0.01466	0.00375	0.01323	PASS
-10℃		9.53	15.25	14.47	0.01139	0.01823	0.01730	PASS
-20℃		2.36	3.37	12.85	0.00282	0.00403	0.01536	PASS
-30℃		17.25	4.28	10.29	0.02062	0.00512	0.01230	PASS
25℃	LV	3.85	19.54	8.87	0.00460	0.02336	0.01060	PASS
	HV	7.57	13.73	19.68	0.00905	0.01641	0.02353	PASS
LTE Band 5(BANDWIDTH, 3MHz)								
Condition		Frequency Error (Hz)			Frequency Stability (ppm)			Verdict
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
25℃	Normal	14.28	12.83	4.20	0.01707	0.01534	0.00502	PASS
55℃		4.93	5.54	16.12	0.00589	0.00662	0.01927	PASS
50℃		13.19	5.85	10.43	0.01577	0.00699	0.01247	PASS
40℃		13.28	2.54	6.76	0.01588	0.00304	0.00808	PASS
30℃		3.25	3.72	18.03	0.00389	0.00445	0.02155	PASS
20℃		14.13	13.42	11.67	0.01689	0.01604	0.01395	PASS
10℃		3.26	4.09	9.30	0.00390	0.00489	0.01112	PASS
0℃		16.63	17.61	5.38	0.01988	0.02105	0.00643	PASS
-10℃		9.74	3.42	10.15	0.01164	0.00409	0.01213	PASS
-20℃		11.84	2.26	15.42	0.01415	0.00270	0.01843	PASS
-30℃		7.93	7.90	14.21	0.00948	0.00944	0.01699	PASS
25℃	LV	14.26	2.18	9.65	0.01705	0.00261	0.01154	PASS
	HV	8.04	9.48	8.63	0.00961	0.01133	0.01032	PASS
LTE Band 5(BANDWIDTH, 5MHz)								
Condition		Frequency Error (Hz)			Frequency Stability (ppm)			Verdict
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
25℃	Normal	12.96	19.06	14.20	0.01549	0.02279	0.01698	PASS
55℃		16.13	5.39	7.17	0.01928	0.00644	0.00857	PASS
50℃		14.66	7.69	19.99	0.01753	0.00919	0.02390	PASS
40℃		18.09	14.11	5.49	0.02163	0.01687	0.00656	PASS
30℃		17.43	2.57	8.72	0.02084	0.00307	0.01042	PASS
20℃		14.44	4.46	9.10	0.01726	0.00533	0.01088	PASS
10℃		3.39	8.20	9.32	0.00405	0.00980	0.01114	PASS
0℃		17.52	8.36	14.95	0.02094	0.00999	0.01787	PASS
-10℃		15.14	18.59	16.19	0.01810	0.02222	0.01935	PASS
-20℃		19.86	7.11	11.56	0.02374	0.00850	0.01382	PASS
-30℃		19.66	10.42	2.54	0.02350	0.01246	0.00304	PASS
25℃	LV	4.86	16.16	6.22	0.00581	0.01932	0.00744	PASS
	HV	11.69	14.22	12.93	0.01397	0.01700	0.01546	PASS

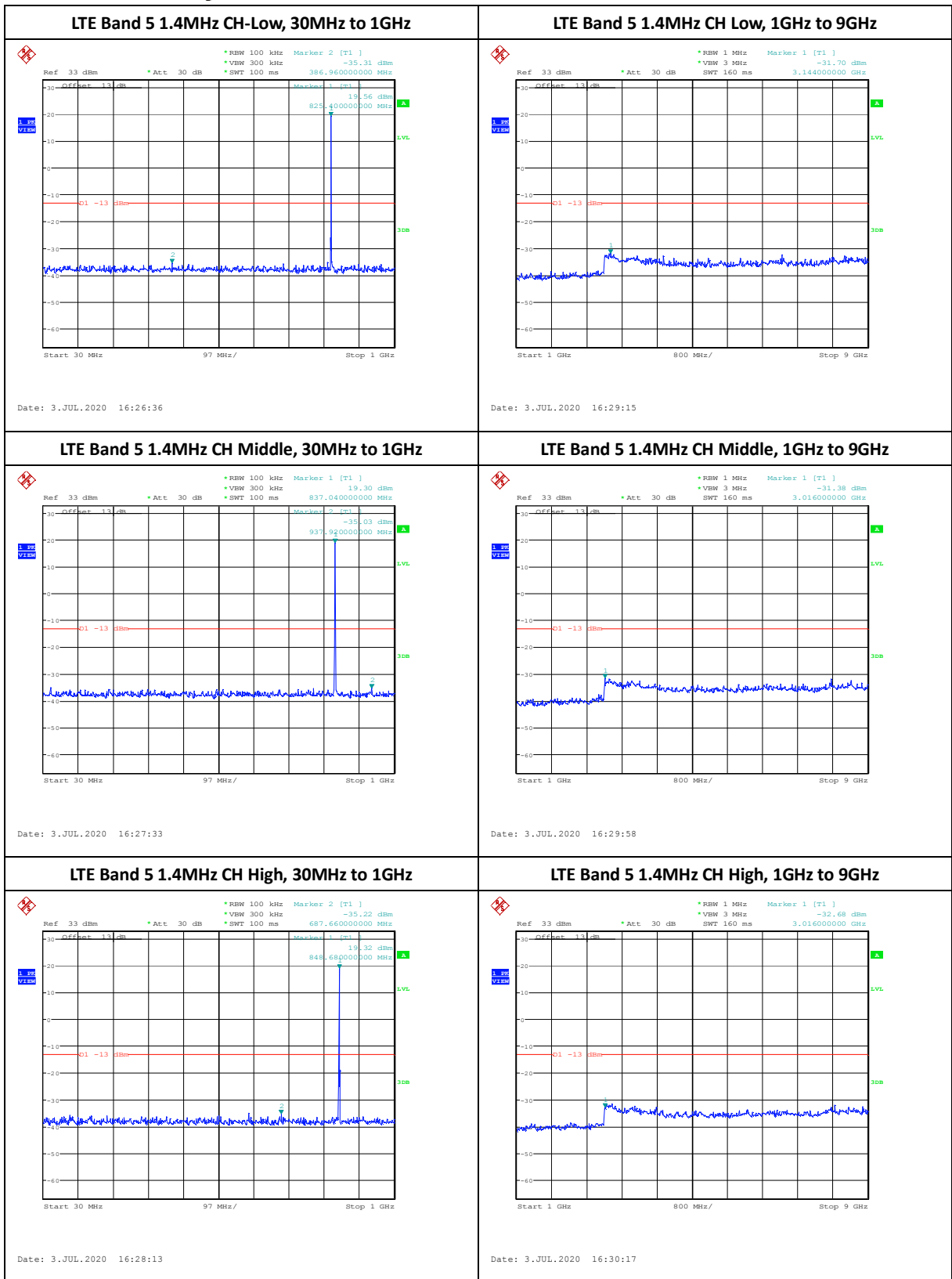
LTE Band 5(BANDWIDTH, 10MHz)								
Condition		Frequency Error (Hz)			Frequency Stability (ppm)			Verdict
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
25℃	Normal	9.52	8.55	7.89	0.01138	0.01022	0.00943	PASS
55℃		17.60	18.76	2.52	0.02104	0.02243	0.00301	PASS
50℃		5.12	8.04	19.16	0.00612	0.00961	0.02290	PASS
40℃		5.26	2.41	7.96	0.00629	0.00288	0.00952	PASS
30℃		4.72	18.22	18.18	0.00564	0.02178	0.02173	PASS
20℃		12.62	5.20	18.65	0.01509	0.00622	0.02230	PASS
10℃		15.83	5.40	6.70	0.01892	0.00646	0.00801	PASS
0℃		9.82	13.78	11.22	0.01174	0.01647	0.01341	PASS
-10℃		12.97	4.69	19.63	0.01551	0.00561	0.02347	PASS
-20℃		5.01	19.06	14.58	0.00599	0.02279	0.01743	PASS
-30℃		4.68	7.17	4.35	0.00559	0.00857	0.00520	PASS
25℃	LV	8.03	10.86	5.22	0.00960	0.01298	0.00624	PASS
	HV	7.23	14.66	12.67	0.00864	0.01753	0.01515	PASS

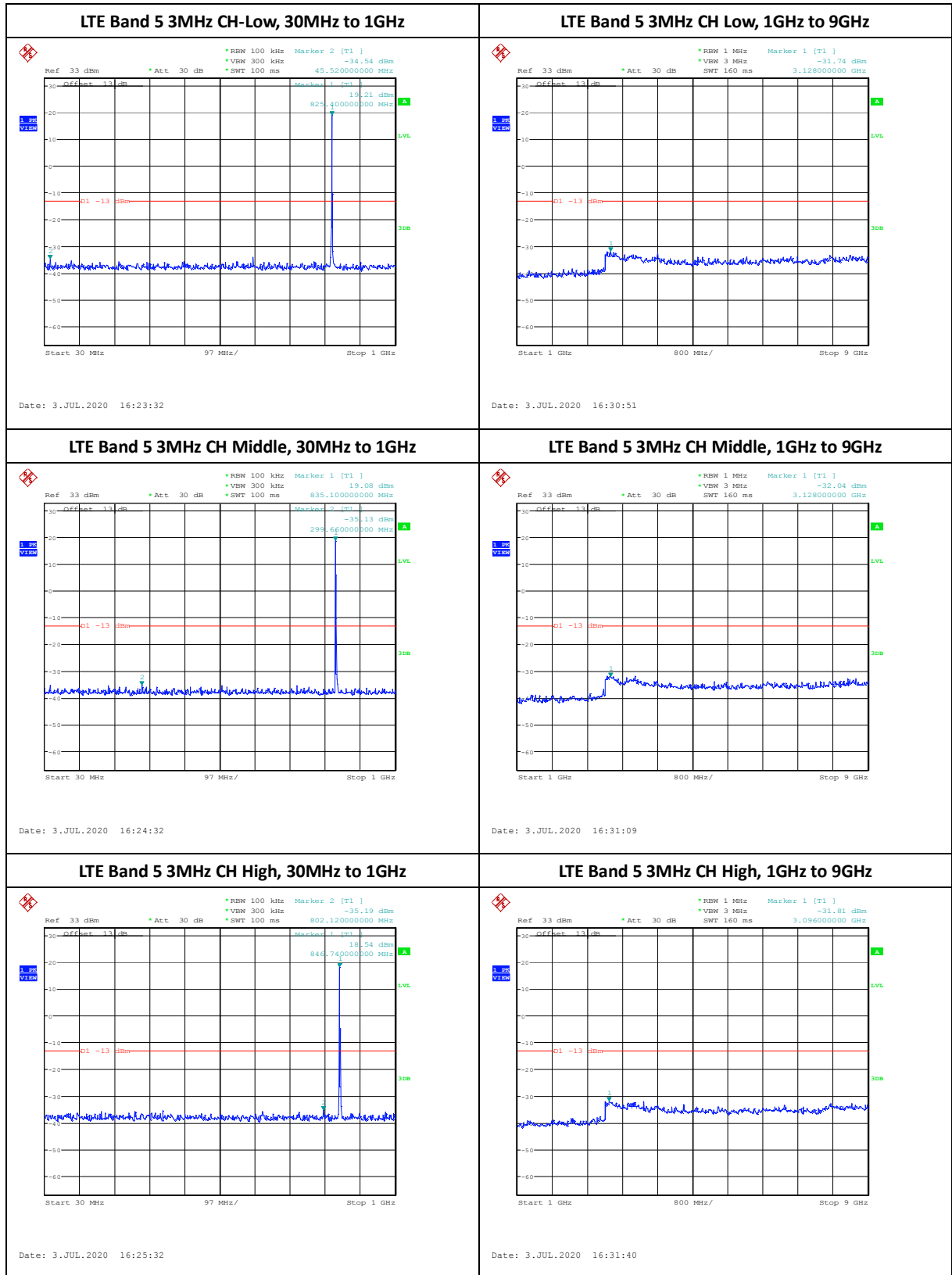
AppendixG: Conducted Spurious Emission Measurement

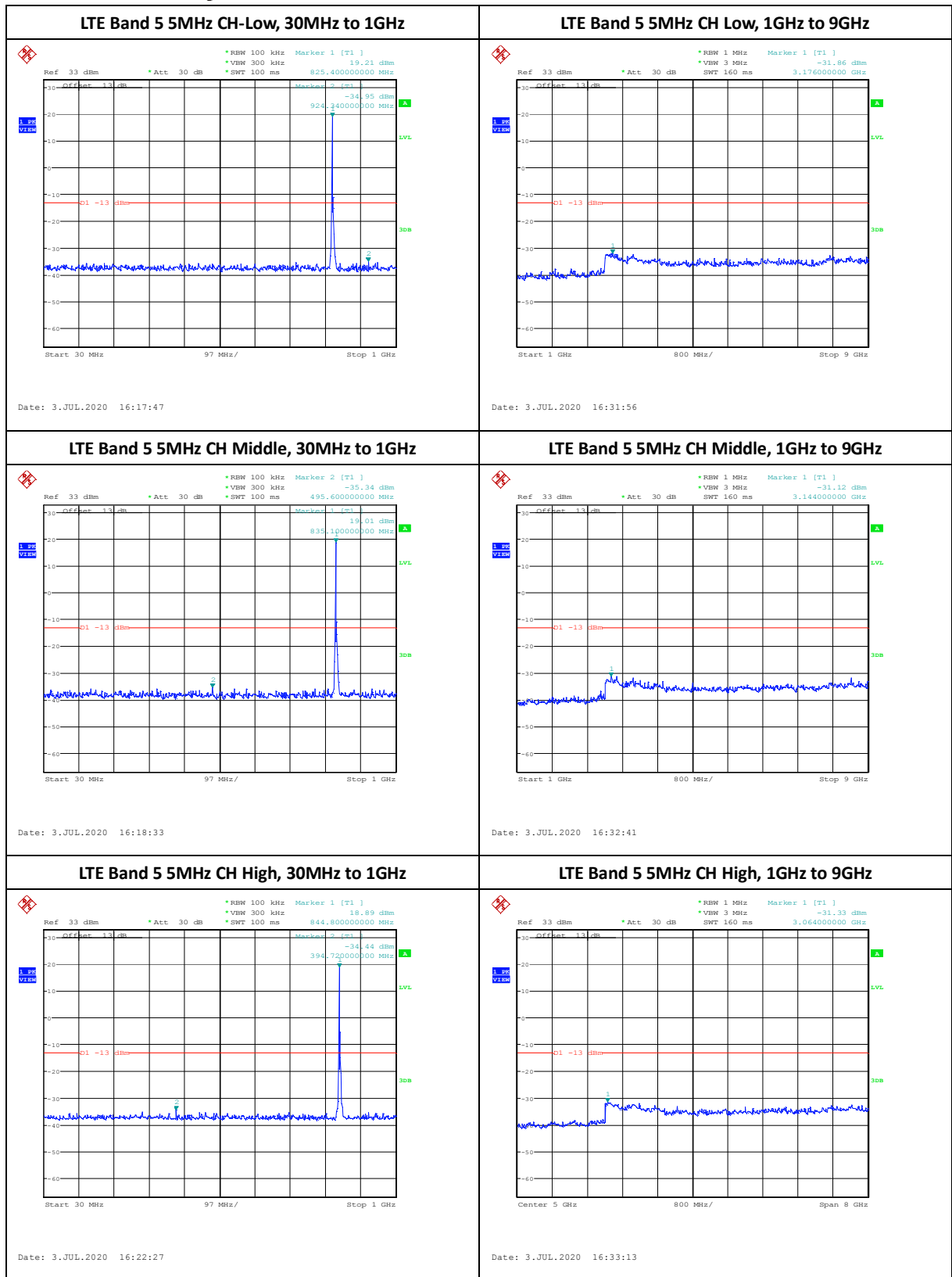
Test Result

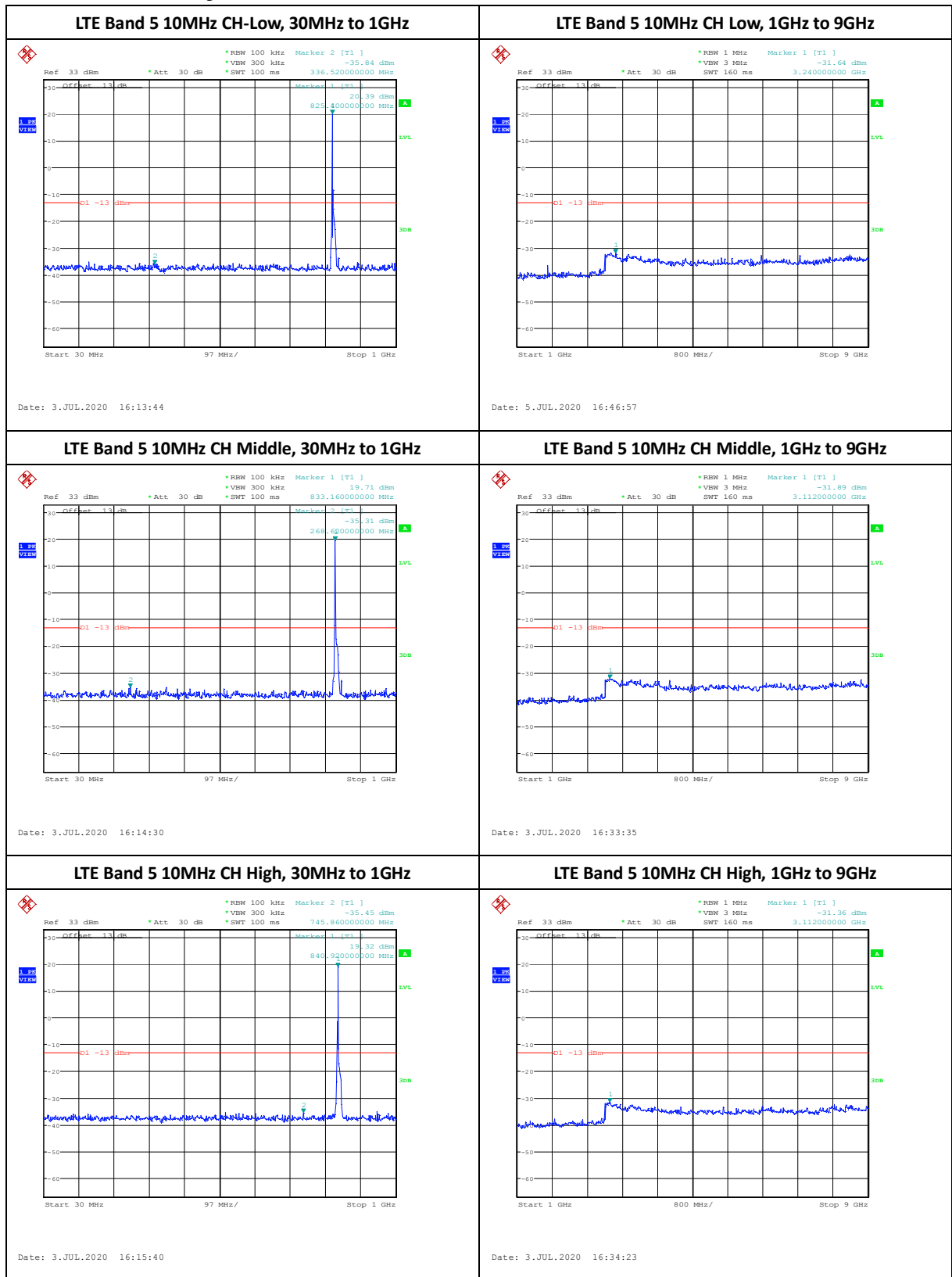












AppendixH: Radiated Spurious Emission

Test Result

GSM 850 CH-Middle						
Frequency (MHz)	Read Level (dBm)	Factor (dB)	Emission (dBm)	Horiz./ Vert.	Limit (dBm)	Margin (dB)
1673.000	-60.29	7.21	-55.23	Horiz./	-13.00	-42.23
2498.000	-61.68	8.21	-55.62	Horiz./	-13.00	-42.62
3346.000	-60.12	7.70	-54.57	Horiz./	-13.00	-41.57
4183.000	-60.34	3.56	-58.93	Horiz./	-13.00	-45.93
5020.000	-59.23	2.32	-59.06	Horiz./	-13.00	-46.06
5856.000	-60.23	2.32	-60.06	Horiz./	-13.00	-47.06
6693.000	-57.29	2.32	-57.12	Horiz./	-13.00	-44.12
7529.000	-55.82	2.32	-55.65	Horiz./	-13.00	-42.65
8366.000	-53.68	-0.73	-56.56	Horiz./	-13.00	-43.56
Note:						
a. The other Spurious RF Radiated emissions level is no more than noise floor.						
b. The worst emission was found in the antenna is Horizontal position.						

WCDMA Band V CH-Middle						
Frequency (MHz)	Read Level (dBm)	Factor (dB)	Emission (dBm)	Horiz./ Vert.	Limit (dBm)	Margin (dB)
1673.000	-67.26	7.21	-62.20	Horiz./	-13.00	-49.20
2510.000	-63.28	8.16	-57.27	Horiz./	-13.00	-44.27
3346.000	-64.22	7.70	-58.67	Horiz./	-13.00	-45.67
4183.000	-60.21	3.56	-58.80	Horiz./	-13.00	-45.80
5020.000	-58.26	2.32	-58.09	Horiz./	-13.00	-45.09
5856.000	-60.87	2.32	-60.70	Horiz./	-13.00	-47.70
6693.000	-54.63	2.32	-54.46	Horiz./	-13.00	-41.46
7529.000	-55.24	2.32	-55.07	Horiz./	-13.00	-42.07
8366.000	-54.33	-0.73	-57.21	Horiz./	-13.00	-44.21
Note:						
a. The other Spurious RF Radiated emissions level is no more than noise floor.						
b. The worst emission was found in the antenna is Horizontal position.						

LTE Band 5 1.4MHz CH-Middle						
Frequency (MHz)	Read Level (dBm)	Factor (dB)	Emission (dBm)	Horiz./ Vert.	Limit (dBm)	Margin (dB)
1670.300	-65.29	7.21	-60.23	Horiz./	-13.00	-47.23
2509.500	-64.68	8.16	-58.67	Horiz./	-13.00	-45.67
3346.000	-64.12	7.70	-58.57	Horiz./	-13.00	-45.57
4182.500	-62.34	3.56	-60.93	Horiz./	-13.00	-47.93
5019.000	-61.23	2.32	-61.06	Horiz./	-13.00	-48.06
5855.500	-60.23	2.32	-60.06	Horiz./	-13.00	-47.06
6692.000	-57.29	2.32	-57.12	Horiz./	-13.00	-44.12
7528.500	-55.39	2.32	-55.22	Horiz./	-13.00	-42.22
8365.000	-56.54	-0.73	-59.42	Horiz./	-13.00	-46.42
Note:						
a. The other Spurious RF Radiated emissions level is no more than noise floor.						
b. The worst emission was found in the antenna is Horizontal position.						

LTE Band 5 3MHz CH-Middle						
Frequency (MHz)	Read Level (dBm)	Factor (dB)	Emission (dBm)	Horiz./ Vert.	Limit (dBm)	Margin (dB)
1670.300	-67.26	7.21	-62.20	Horiz./	-13.00	-49.20
2509.500	-63.28	8.16	-57.27	Horiz./	-13.00	-44.27
3346.000	-64.22	7.70	-58.67	Horiz./	-13.00	-45.67
4182.500	-60.21	3.56	-58.80	Horiz./	-13.00	-45.80
5019.000	-58.26	2.32	-58.09	Horiz./	-13.00	-45.09
5855.500	-60.87	2.32	-60.70	Horiz./	-13.00	-47.70
6692.000	-59.63	2.32	-59.46	Horiz./	-13.00	-46.46
7528.500	-55.24	2.32	-55.07	Horiz./	-13.00	-42.07
8365.000	-54.33	-0.73	-57.21	Horiz./	-13.00	-44.21
Note:						
a. The other Spurious RF Radiated emissions level is no more than noise floor.						
b. The worst emission was found in the antenna is Horizontal position.						

LTE Band 5 10MHz CH-Middle						
Frequency (MHz)	Read Level (dBm)	Factor (dB)	Emission (dBm)	Horiz./ Vert.	Limit (dBm)	Margin (dB)
1670.300	-70.26	7.21	-65.20	Horiz./	-13.00	-52.20
2509.500	-64.03	8.16	-58.02	Horiz./	-13.00	-45.02
3346.000	-62.54	7.70	-56.99	Horiz./	-13.00	-43.99
4182.500	-60.68	3.56	-59.27	Horiz./	-13.00	-46.27
5019.000	-60.86	2.32	-60.69	Horiz./	-13.00	-47.69
5855.500	-60.01	2.32	-59.84	Horiz./	-13.00	-46.84
6692.000	-60.38	2.32	-60.21	Horiz./	-13.00	-47.21
7528.500	-56.62	2.32	-56.45	Horiz./	-13.00	-43.45
8365.000	-55.33	-0.73	-58.21	Horiz./	-13.00	-45.21
Note:						
a. The other Spurious RF Radiated emissions level is no more than noise floor.						
b. The worst emission was found in the antenna is Horizontal position.						