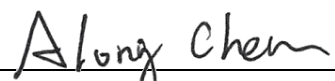


FCC Test Report

FCC ID : MXF-WLTMS11043H
Equipment : LTE Cat6 TD-LTE CPE
Model No. : WLTMS-110-HGA
Brand Name : Gemtek
Multiple Listing : Refer to item 1.1.1 for more details.
Applicant : Gemtek Technology Co., Ltd.
Address : No. 15-1 Zhonghua Road, Hsinchu Industrial
Park, Hukou, Hsinchu, Taiwan, 30352.
Standard : 47 CFR FCC Part 90 Subpart Z
Received Date : Apr. 16, 2019
Tested Date : Apr. 20 ~ Apr. 23, 2019

We, International Certification Corp., would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It may be duplicated completely for legal use with the approval of the applicant. It shall not be reproduced except in full without the written approval of our laboratory.

Reviewed by:


Along Chen / Assistant Manager

Approved by:

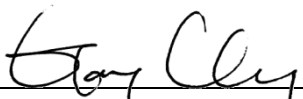

Gary Chang / Manager



Table of Contents

1	GENERAL DESCRIPTION	5
1.1	Information.....	5
1.2	Local Support Equipment List	7
1.3	Test Setup Chart	7
1.4	The Equipment List	8
1.5	Test Standards	9
1.6	Deviation from Test Standard and Measurement Procedure.....	9
1.7	Measurement Uncertainty	9
2	TEST CONFIGURATION	10
2.1	Testing Condition and Location Information.....	10
2.2	The Worst Test Modes and Channel Details	10
3	TEST RESULTS.....	11
3.1	Equivalent Isotropically Radiated Power and Peak EIRP Power Density	11
3.2	Radiated Emissions.....	16
3.3	Conducted Emissions.....	21
3.4	Emission Mask	24
3.5	26dBc and Occupied Bandwidth	27
3.6	Frequency Stability.....	30
4	TEST LABORATORY INFORMATION	32

Release Record

Report No.	Version	Description	Issued Date
FL941601	Rev. 01	Initial issue	May 06, 2019

Summary of Test Results

FCC Rules	Test Items	Measured	Result
2.1046 / 90.1321	Equivalent Isotropically Radiated Power	Maximum EIRP: 14.093 W	Pass
2.1046 / 90.1321	Peak EIRP Power Density	Meet the requirement of limit	Pass
2.1053 / 90.1323	Radiated Emissions	Meet the requirement of limit	Pass
2.1051 / 90.1323	Conducted Emissions	Meet the requirement of limit	Pass
90.210	Emission Mask	Meet the requirement of limit	Pass
2.1049(h) / 90.1323	26dBc Bandwidth	Meet the requirement of limit	Pass
2.1055 / 90.213	Frequency Stability	Meet the requirement of limit	Pass

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared values of gain for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of the gain.

1 General Description

1.1 Information

1.1.1 Product Details

The following models are provided to this EUT.

Brand Name	Model Name	Product Name	Description
Gemtek	WLTMS-110-HGA	LTE Cat6 TD-LTE CPE	with 19dBi antenna
	WLTMS-110		with 15.43dBi antenna
BLINQ	FWC-110HG-35	WLTMS-110-HGA-B42-B43-48	with 19dBi antenna
	FWC-110-35	WLTMS-110-B42-B43-48	with 15.43dBi antenna
✦ All models are electrically identical, different model names are for marketing purpose. ✦ The above models, model WLTMS-110-HGA was selected as a representative one for the final test and only its data was recorded in this report.			

1.1.2 Specification of the Equipment under Test (EUT)

Operating Frequency	Channel Bandwidth: 10MHz: 3655 MHz ~ 3695 MHz Channel Bandwidth: 20MHz: 3660 MHz ~ 3690 MHz
Modulation Type	QPSK, 16QAM (Uplink) QPSK, 16QAM, 64QAM (Downlink)
Duplex Mode	TDD
UE Category	Cat. 5 / Cat. 6
Release	11

1.1.3 Maximum EIRP & Emission Designator

Channel Bandwidth	Modulation	Maximum EIRP (W)	Emission Designator
10MHz	QPSK	7.534	8M97G7D
10MHz	16QAM	7.447	8M96W7D
20MHz	QPSK	14.093	18M0G7D
20MHz	16QAM	13.996	17M9W7D

1.1.4 Antenna Details

Ant. No.	Type	Connector	Gain (dBi)	Remarks
1	Panel	UFL	19	---
2	Panel	UFL	15.43	---

Note: Ant.1 with highest gain was chosen for final test.

1.1.5 EUT Operational Condition

Power Supply Type	56Vdc from POE		
Operational Climatic	☒ Tnom (20°C)	☒ Tmax (55°C)	☒ Tmin (-40°C)

1.1.6 Accessories

Accessories		
No.	Equipment	Description
1	POE 1	Brand: Gospell Model: G0720-560-027 Power Rating: I/P: 100-240Vac, 50/60Hz, 0.75A Max O/P: 56Vdc, 0.27A Power Line: 0.72m shielded without core
2	POE 2	Brand: SHENZHEN FRECOM Model: PGOC24D01-560027 Power Rating: I/P: 100-240Vac, 50/60Hz, 0.7A Max O/P: 56Vdc, 0.27A Power Line: 0.72m shielded without core
3	Core (x1)	---

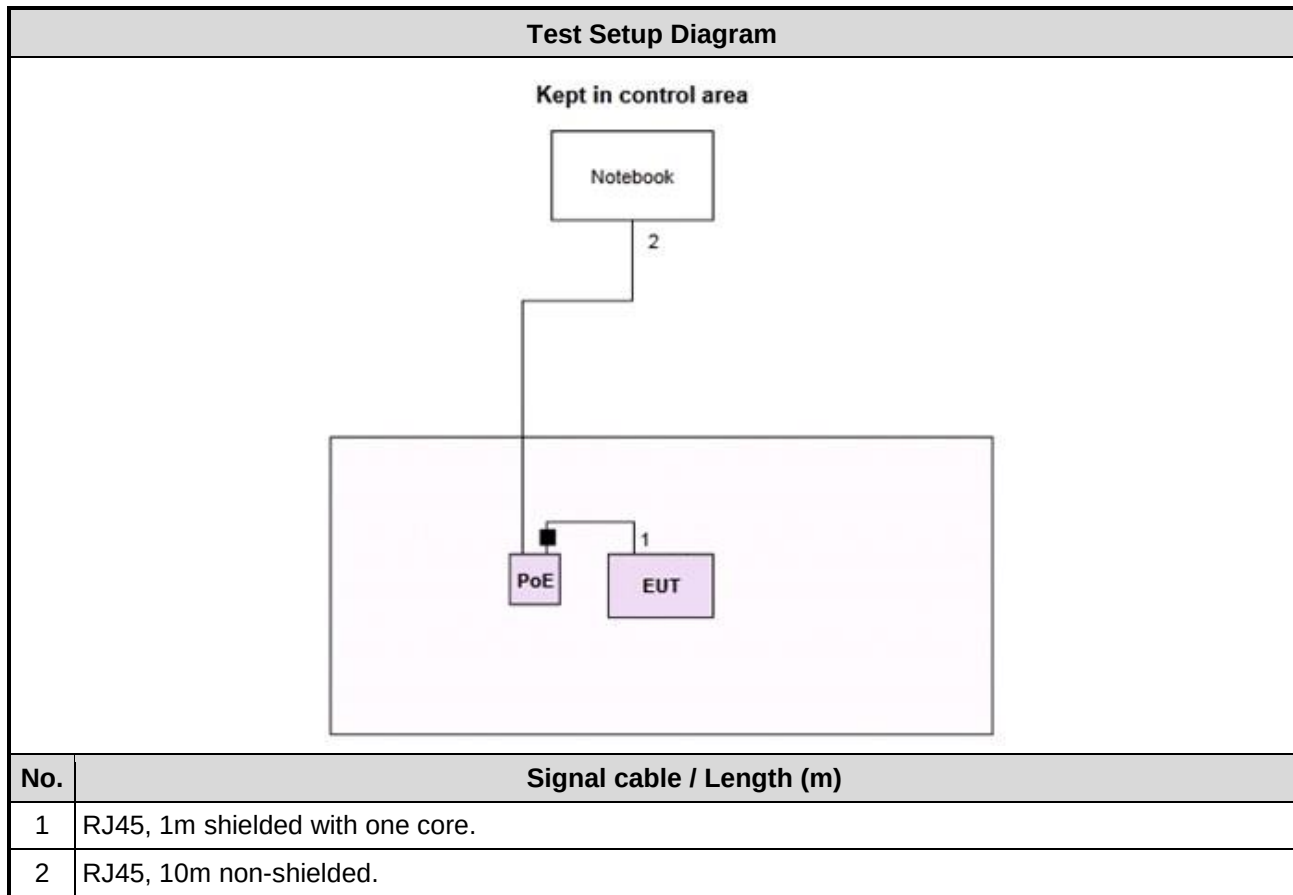
1.1.7 Operating Channel List

Channel Bandwidth (MHz)	Channel	Frequency (MHz)
10	44140	3655
10	44340	3675
10	44540	3695
20	44190	3660
20	44340	3675
20	44490	3690

1.2 Local Support Equipment List

Support Equipment List					
No.	Equipment	Brand	Model	FCC ID	Remarks
1	Notebook	DELL	Latitude E5420	DoC	---

1.3 Test Setup Chart



1.4 The Equipment List

Test Item	Radiated Emission				
Test Site	966 chamber1 / (03CH01-WS)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101498	Dec. 27, 2018	Dec. 26, 2019
Receiver	R&S	ESR3	101658	Dec. 11, 2018	Dec. 10, 2019
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Jul. 18, 2018	Jul. 17, 2019
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Dec. 18, 2018	Dec. 17, 2019
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Nov. 15, 2018	Nov. 14, 2019
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 09, 2018	Nov. 08, 2019
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Oct. 08, 2018	Oct. 07, 2019
Preamplifier	EMC	EMC02325	980225	Jul. 20, 2018	Jul. 19, 2019
Preamplifier	Agilent	83017A	MY39501308	Oct. 04, 2018	Oct. 03, 2019
Preamplifier	EMC	EMC184045B	980192	Aug. 09, 2018	Aug. 08, 2019
RF Cable	EMC	EMC104-SM-SM-80 00	181106	Oct. 08, 2018	Oct. 07, 2019
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16019/4	Oct. 08, 2018	Oct. 07, 2019
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16014/4	Oct. 08, 2018	Oct. 07, 2019
LF cable 1M	EMC	EMCCFD400-NM-N M-1000	160502	Oct. 08, 2018	Oct. 07, 2019
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-001	Oct. 08, 2018	Oct. 07, 2019
LF cable 10M	Woken	CFD400NL-LW	CFD400NL-002	Oct. 08, 2018	Oct. 07, 2019
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	RF Conducted				
Test Site	(TH01-WS)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101063	Apr. 17, 2019	Apr. 16, 2020
Spectrum Analyzer	R&S	FSV40	101499	Jan. 07, 2019	Jan. 06, 2020
Signal Generator	R&S	SMB100A	175727	Dec. 24, 2018	Dec. 23, 2019
TEMP&HUMIDITY CHAMBER	GIANT FORCE	GCT-225-40-SP-SD	MAF1212-002	Dec. 05, 2018	Dec. 04, 2019
Power Meter	Anritsu	ML2495A	1241002	Oct. 09, 2018	Oct. 08, 2019
Power Sensor	Anritsu	MA2411B	1207366	Oct. 09, 2018	Oct. 08, 2019
AC POWER SOURCE	APC	AFC-500W	F312060012	Nov. 29, 2018	Nov. 28, 2019
Measurement Software	Sporton	Sporton_1	1.3.30	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

1.5 Test Standards

According to the specification of EUT, the EUT must comply with following standards.

ANSI C63.4-2014

ANSI C63.26-2015

FCC KDB 971168 D01 Power Meas License Digital Systems v03r01

FCC KDB 412172 D01 Determining ERP and EIRP v01r01

1.6 Deviation from Test Standard and Measurement Procedure

None

1.7 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor ($k=2$)).

Measurement Uncertainty	
Parameters	Uncertainty
Bandwidth	± 34.130 Hz
Conducted power	± 0.808 dB
Frequency error	$\pm 1 \times 10^{-9}$
Conducted emission	± 2.715 dB
Radiated emission ≤ 1 GHz	± 3.41 dB
Radiated emission > 1 GHz	± 4.59 dB
Temperature	± 0.4 °C

2 Test Configuration

2.1 Testing Condition and Location Information

Test Item	Test Site	Ambient Condition	Tested By
RF Conducted	TH01-WS	22°C / 63%	Felix Sung
Radiated Emissions	03CH01-WS	24°C / 64%	Aska Huang

- FCC Designation No.: TW2732
- FCC site registration No.: 181692
- ISSED#: 10807A
- CAB identifier: TW2732

2.2 The Worst Test Modes and Channel Details

Test item	Channel Bandwidth	Modulation	Test channel (MHz)
Equivalent Isotropically Radiated Power Peak EIRP Power Density	10MHz 20MHz	QPSK / 16QAM QPSK / 16QAM	3655 / 3675 / 3695 3660 / 3675 / 3690
Radiated Emission ≤ 1GHz	10MHz 20MHz	QPSK QPSK	3695 3690
Radiated Emission > 1GHz	10MHz 20MHz	QPSK QPSK	3655 / 3675 / 3695 3660 / 3675 / 3690
Conducted Emissions Emission Mask 26dBc Bandwidth	10MHz 20MHz	QPSK / 16QAM QPSK / 16QAM	3655 / 3675 / 3695 3660 / 3675 / 3690
Frequency Stability	---	Un-modulation	3675
NOTE: 1. POE 1 and POE 2 had been pretested and found that POE 1 was the worst case and was selected for final testing (POE1: Gossell ; POE2: SHENZHEN FRECOM).			

3 Test Results

3.1 Equivalent Isotropically Radiated Power and Peak EIRP Power Density

3.1.1 Limit of Equivalent Isotropically Radiated Power and Peak EIRP Power Density

Base and fixed stations are limited to 25 watts/25 MHz equivalent isotropically radiated power (EIRP), the peak EIRP power density shall not exceed 1 Watt in any one-mega hertz slice of spectrum.

Mobile and portable stations are limited to 1 watt/25 MHz EIRP. The peak EIRP density shall not exceed 40 milli watts in any one-megahertz slice of spectrum.

3.1.2 Test Procedures

For EIRP

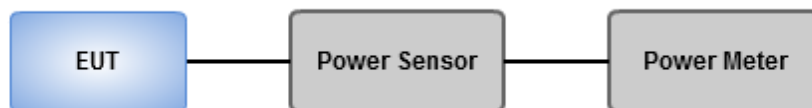
1. Connect the DUT transmitter output to the spectrum analyzer via coaxial cable while ensuring proper impedance matching.
2. Tune the analyzer to the nominal center frequency of the emission bandwidth.
3. Set the span to twice the nominal EBW (span = 2 x EBW).
4. Set the resolution bandwidth (RBW) to approximately 1% of EBW.
5. Set the video bandwidth (VBW) to $\geq 3 \times \text{RBW}$.
6. Select the average power (RMS) display detector.
7. Set the number of measurement points to ≥ 1001 .
8. Use auto-coupled sweep time.
9. Perform measurement over an interval of time when the transmission is continuous and at its maximum power level.
10. Utilize trace averaging over 100 traces in the power averaging.
11. Use the Channel Power function to determine the integrated power over the full EBW.
12. Record the band power level.
13. Adjust the recorded level by applying appropriate correction factors for the measurement set-up.
14. Determine the EIRP by adding the effective antenna gain to the adjusted power level.

For Peak EIRP Power Density

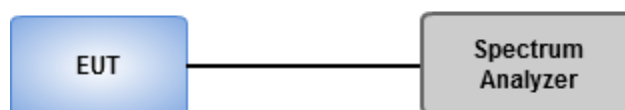
1. Connect the transmitter to the spectrum analyzer via coaxial cable (i.e., conducted measurement) while ensuring proper impedance matching.
2. Tune the analyzer to the nominal center frequency of the emission bandwidth.
3. Set the span to twice the nominal EBW (span = 2 x EBW).
4. Set the resolution bandwidth (RBW) to 1 MHz.
5. Set the video bandwidth (VBW) to 3 MHz
6. Select the average power (RMS) display detector.
7. Set the number of measurement points to ≥ 1001 .
8. Use auto-coupled sweep time.
9. Perform the measurement over an interval of time when the transmission is continuous and at its maximum power level.
10. Utilize trace averaging over 100 traces in the power averaging.
11. Find the maximum trace amplitude (peak search) and record.
12. Adjust the recorded level by applying appropriate correction factors for the measurement set-up.
13. Determine the EIRP by adding the effective antenna gain to the adjusted power level.

3.1.3 Test Setup

Conducted Power



Power Density



3.1.4 Test Result of EIRP

Channel Bandwidth: 10MHz- QPSK

Channel	Channel Frequency (MHz)	Conducted Output Power (dBm)	Max. Ant. Gain(dBi)	EIRP (dBm)	EIRP (W)	LIMIT (W)
44140	3655	19.61	19	38.61	7.261	10
44340	3675	19.72	19	38.72	7.447	10
44540	3695	19.77	19	38.77	7.534	10

Channel Bandwidth: 10MHz- 16QAM

Channel	Channel Frequency (MHz)	Conducted Output Power (dBm)	Max. Ant. Gain(dBi)	EIRP (dBm)	EIRP (W)	LIMIT (W)
44140	3655	19.55	19	38.55	7.161	10
44340	3675	19.65	19	38.65	7.328	10
44540	3695	19.72	19	38.72	7.447	10

Channel Bandwidth: 20MHz- QPSK

Channel	Channel Frequency (MHz)	Conducted Output Power (dBm)	Max. Ant. Gain(dBi)	EIRP (dBm)	EIRP (W)	LIMIT (W)
44190	3660	22.43	19	41.43	13.9	20
44340	3675	22.46	19	41.46	13.996	20
44490	3690	22.49	19	41.49	14.093	20

Channel Bandwidth: 20MHz- 16QAM

Channel	Channel Frequency (MHz)	Conducted Output Power (dBm)	Max. Ant. Gain(dBi)	EIRP (dBm)	EIRP (W)	LIMIT (W)
44190	3660	22.39	19	41.39	13.772	20
44340	3675	22.40	19	41.40	13.804	20
44490	3690	22.46	19	41.46	13.996	20

3.1.5 Test Result of Peak EIRP Density

Channel Bandwidth: 10MHz- QPSK

Channel	Channel Frequency (MHz)	Conducted Power Density (dBm/MHz)	Max. Ant. Gain(dBi)	EIRP Peak Density (dBm/MHz)	EIRP Peak Density (W/MHz)	LIMIT (W/MHz)
44140	3655	10.651	19	29.651	0.923	1
44340	3675	10.835	19	29.835	0.963	1
44540	3695	10.863	19	29.863	0.969	1

Channel Bandwidth: 10MHz- 16QAM

Channel	Channel Frequency (MHz)	Conducted Power Density (dBm/MHz)	Max. Ant. Gain(dBi)	EIRP Peak Density (dBm/MHz)	EIRP Peak Density (W/MHz)	LIMIT (W/MHz)
44140	3655	10.647	19	29.647	0.922	1
44340	3675	10.867	19	29.867	0.970	1
44540	3695	10.88	19	29.880	0.973	1

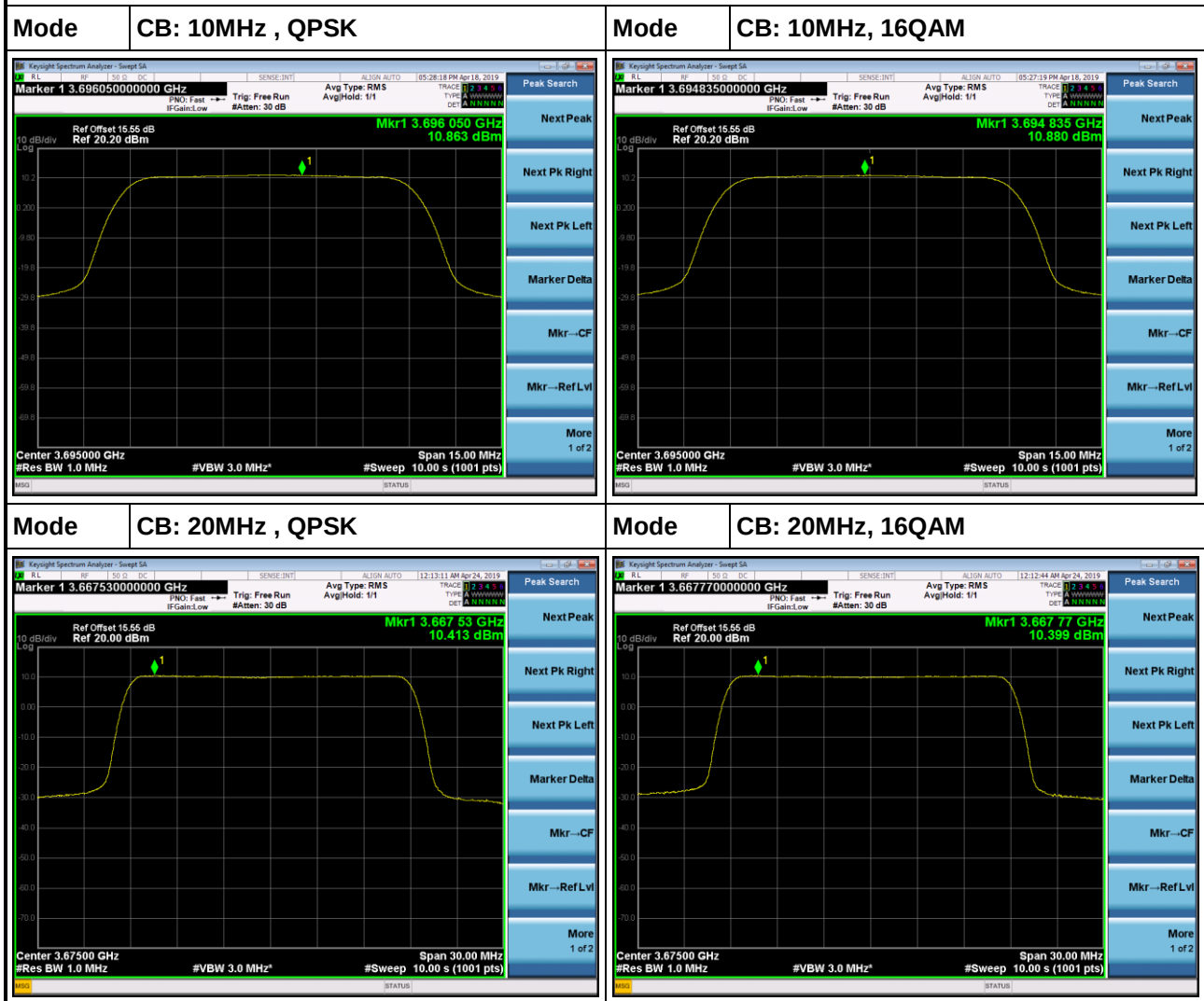
Channel Bandwidth: 20MHz- QPSK

Channel	Channel Frequency (MHz)	Conducted Power Density (dBm/MHz)	Max. Ant. Gain(dBi)	EIRP Peak Density (dBm/MHz)	EIRP Peak Density (W/MHz)	LIMIT (W/MHz)
44190	3660	9.911	19	28.911	0.778	1
44340	3675	10.413	19	29.413	0.874	1
44490	3690	10.318	19	29.318	0.855	1

Channel Bandwidth: 20MHz- 16QAM

Channel	Channel Frequency (MHz)	Conducted Power Density (dBm/MHz)	Max. Ant. Gain(dBi)	EIRP Peak Density (dBm/MHz)	EIRP Peak Density (W/MHz)	LIMIT (W/MHz)
44190	3660	10.396	19	29.396	0.870	1
44340	3675	10.399	19	29.399	0.871	1
44490	3690	10.374	19	29.374	0.866	1

Worst Plots



3.2 Radiated Emissions

3.2.1 Limit of Radiated Emissions

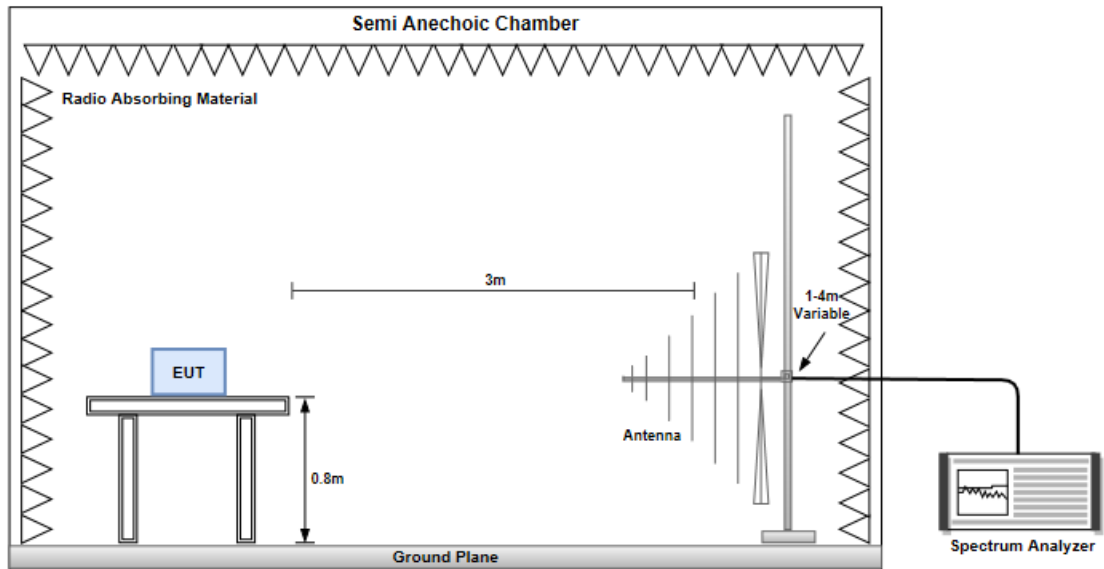
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB equal to -13dBm.

3.2.2 Test Procedures

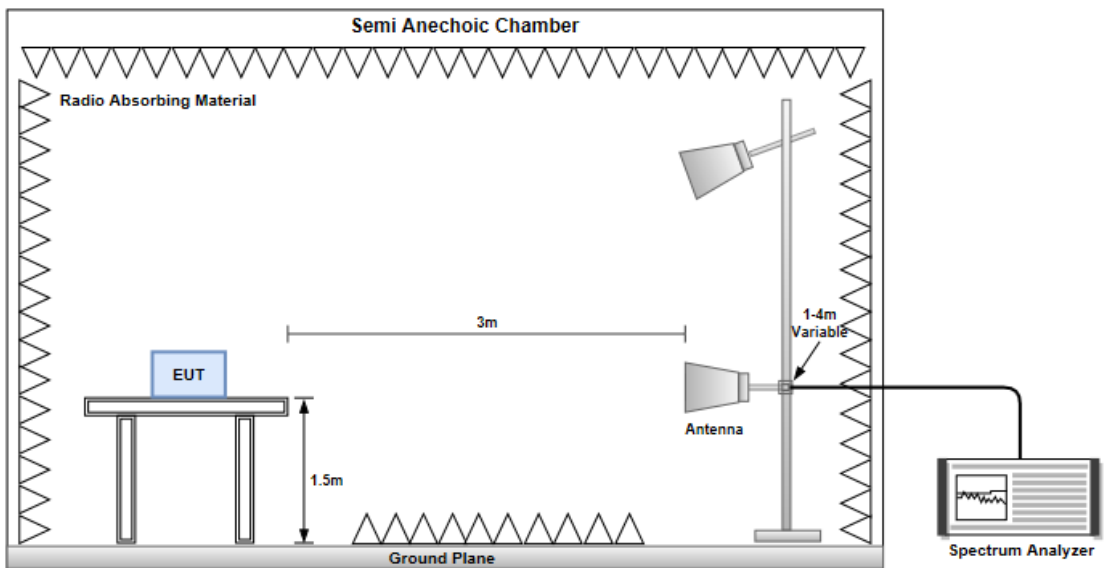
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. For emissions testing at or below 1 GHz, the table height is 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height is 1.5 m.
2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.
4. After finding the max radiated emission, substitution method will be used for getting effective radiated power. EUT will be removed and substitution antenna will be placed at same position. Signal generator will output CW signal to substitution antenna through a RF cable. Rotate turntable and move antenna to find maximum radiated emission. Adjust output power of signal generator to let the maximum radiated emission is same as step 3. Record the output power level.
5. $E.I.R.P = \text{output power of step 4} + \text{gain of substitution antenna} - \text{cable loss of RF cable}.$

3.2.3 Test Setup

Radiated Emissions below 1 GHz



Radiated Emissions above 1 GHz



3.2.4 Test Result of Radiated Emissions below 1GHz

Mode	LTE Band 43, QPSK, CB: 10MHz, 50RB, Offset 0, Channel:44540						
Frequency (MHz)	Antenna Polarity	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
30.55	H	-60.53	-13.00	-47.53	-70.08	-41.21	-19.32
93.47	H	-59.35	-13.00	-46.35	-58.00	-54.47	-4.88
190.43	H	-61.80	-13.00	-48.80	-59.23	-59.54	-2.26
296.55	H	-59.35	-13.00	-46.35	-57.78	-58.17	-1.18
337.53	H	-50.04	-13.00	-37.04	-50.86	-48.87	-1.17
525.58	H	-60.15	-13.00	-47.15	-63.41	-58.67	-1.48
30.00	V	-56.55	-13.00	-43.55	-57.51	-37.10	-19.45
62.11	V	-54.56	-13.00	-41.56	-54.70	-41.44	-13.12
91.52	V	-55.66	-13.00	-42.66	-55.91	-50.85	-4.81
160.77	V	-57.53	-13.00	-44.53	-60.38	-51.89	-5.64
330.45	V	-57.52	-13.00	-44.52	-59.08	-56.35	-1.17
525.93	V	-57.63	-13.00	-44.63	-62.86	-56.15	-1.48

Mode	LTE Band 43, QPSK, CB: 20MHz, 100RB, Offset 0, Channel:44490						
Frequency (MHz)	Antenna Polarity	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
30.43	H	-60.55	-13.00	-47.55	-70.14	-41.20	-19.35
93.44	H	-59.75	-13.00	-46.75	-58.40	-54.87	-4.88
189.53	H	-60.47	-13.00	-47.47	-58.05	-58.11	-2.36
288.93	H	-59.24	-13.00	-46.24	-57.41	-58.07	-1.17
337.63	H	-48.56	-13.00	-35.56	-49.39	-47.39	-1.17
525.16	H	-58.63	-13.00	-45.63	-61.88	-57.15	-1.48
30.27	V	-55.67	-13.00	-42.67	-56.35	-36.28	-19.39
33.41	V	-57.56	-13.00	-44.56	-54.93	-38.93	-18.63
62.44	V	-53.65	-13.00	-40.65	-53.84	-40.64	-13.01
90.28	V	-54.68	-13.00	-41.68	-54.85	-49.91	-4.77
162.43	V	-55.52	-13.00	-42.52	-58.37	-50.08	-5.44
525.61	V	-58.63	-13.00	-45.63	-63.84	-57.15	-1.48

3.2.5 Test Result of Radiated Emissions above 1GHz

Mode	LTE Band 43, QPSK, CB: 10MHz, 50RB, Offset 0, Channel:44140						
Frequency (MHz)	Antenna Polarity	E.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
7310.00	H	-52.89	-13.00	-39.89	-72.68	-56.38	3.49
10965.00	H	-50.52	-13.00	-37.52	-72.91	-51.03	0.51
14620.00	H	-49.05	-13.00	-36.05	-72.56	-49.06	0.01
7310.00	V	-51.69	-13.00	-38.69	-72.33	-55.18	3.49
10965.00	V	-50.67	-13.00	-37.67	-72.98	-51.18	0.51
14620.00	V	-46.76	-13.00	-33.76	-72.83	-46.77	0.01
Mode	LTE Band 43, QPSK, CB: 10MHz, 50RB, Offset 0, Channel:44340						
Frequency (MHz)	Antenna Polarity	E.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
7350.00	H	-52.66	-13.00	-39.66	-72.45	-55.97	3.31
11025.00	H	-50.22	-13.00	-37.22	-72.61	-50.68	0.46
14700.00	H	-48.83	-13.00	-35.83	-72.44	-48.99	0.16
7350.00	V	-52.08	-13.00	-39.08	-72.55	-55.39	3.31
11025.00	V	-50.02	-13.00	-37.02	-72.43	-50.48	0.46
14700.00	V	-46.09	-13.00	-33.09	-72.38	-46.25	0.16
Mode	LTE Band 43, QPSK, CB: 10MHz, 50RB, Offset 0, Channel:44540						
Frequency (MHz)	Antenna Polarity	E.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
7390.00	H	-52.61	-13.00	-39.61	-72.42	-55.74	3.13
11085.00	H	-49.87	-13.00	-36.87	-72.34	-50.30	0.43
14780.00	H	-48.68	-13.00	-35.68	-72.39	-48.96	0.28
7390.00	V	-52.13	-13.00	-39.13	-72.44	-55.26	3.13
11085.00	V	-50.43	-13.00	-37.43	-72.93	-50.86	0.43
14780.00	V	-46.10	-13.00	-33.10	-72.61	-46.38	0.28

Mode	LTE Band 43, QPSK, CB: 20MHz, 100RB, Offset 0, Channel:44190						
Frequency (MHz)	Antenna Polarity	E.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
7320.00	H	-51.53	-13.00	-38.53	-71.32	-54.97	3.44
10980.00	H	-48.67	-13.00	-35.67	-71.05	-49.16	0.49
14640.00	H	-47.58	-13.00	-34.58	-71.12	-47.65	0.07
7320.00	V	-50.63	-13.00	-37.63	-71.23	-54.07	3.44
10980.00	V	-49.21	-13.00	-36.21	-71.54	-49.70	0.49
14640.00	V	-45.31	-13.00	-32.31	-71.44	-45.38	0.07
Mode	LTE Band 43, QPSK, CB: 20MHz, 100RB, Offset 0, Channel:44340						
Frequency (MHz)	Antenna Polarity	E.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
7350.00	H	-51.05	-13.00	-38.05	-70.84	-54.36	3.31
11025.00	H	-49.03	-13.00	-36.03	-71.42	-49.49	0.46
14700.00	H	-46.96	-13.00	-33.96	-70.57	-47.12	0.16
7350.00	V	-48.97	-13.00	-35.97	-69.44	-52.28	3.31
11025.00	V	-48.64	-13.00	-35.64	-71.05	-49.10	0.46
14700.00	V	-45.09	-13.00	-32.09	-71.38	-45.25	0.16
Mode	LTE Band 43, QPSK, CB: 20MHz, 100RB, Offset 0, Channel:44490						
Frequency (MHz)	Antenna Polarity	E.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
7380.00	H	-49.45	-13.00	-36.45	-69.25	-52.63	3.18
11070.00	H	-47.29	-13.00	-34.29	-69.75	-47.73	0.44
14760.00	H	-47.14	-13.00	-34.14	-70.82	-47.39	0.25
7380.00	V	-48.33	-13.00	-35.33	-68.68	-51.51	3.18
11070.00	V	-49.45	-13.00	-36.45	-71.93	-49.89	0.44
14760.00	V	-44.93	-13.00	-31.93	-71.38	-45.18	0.25

3.3 Conducted Emissions

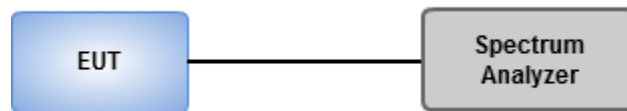
3.3.1 Limit of Conducted Emissions

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 equal to -13dBm.

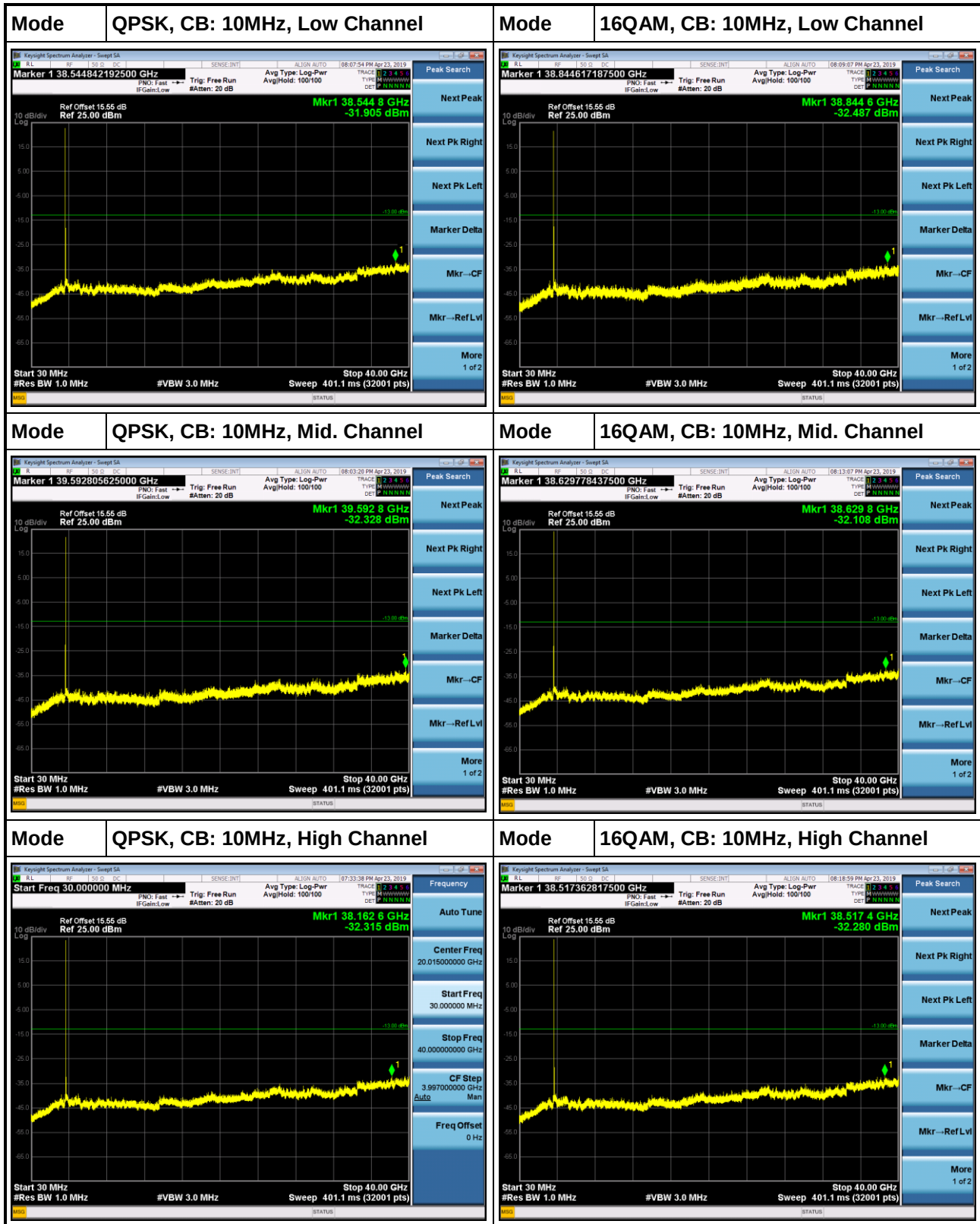
3.3.2 Test Procedures

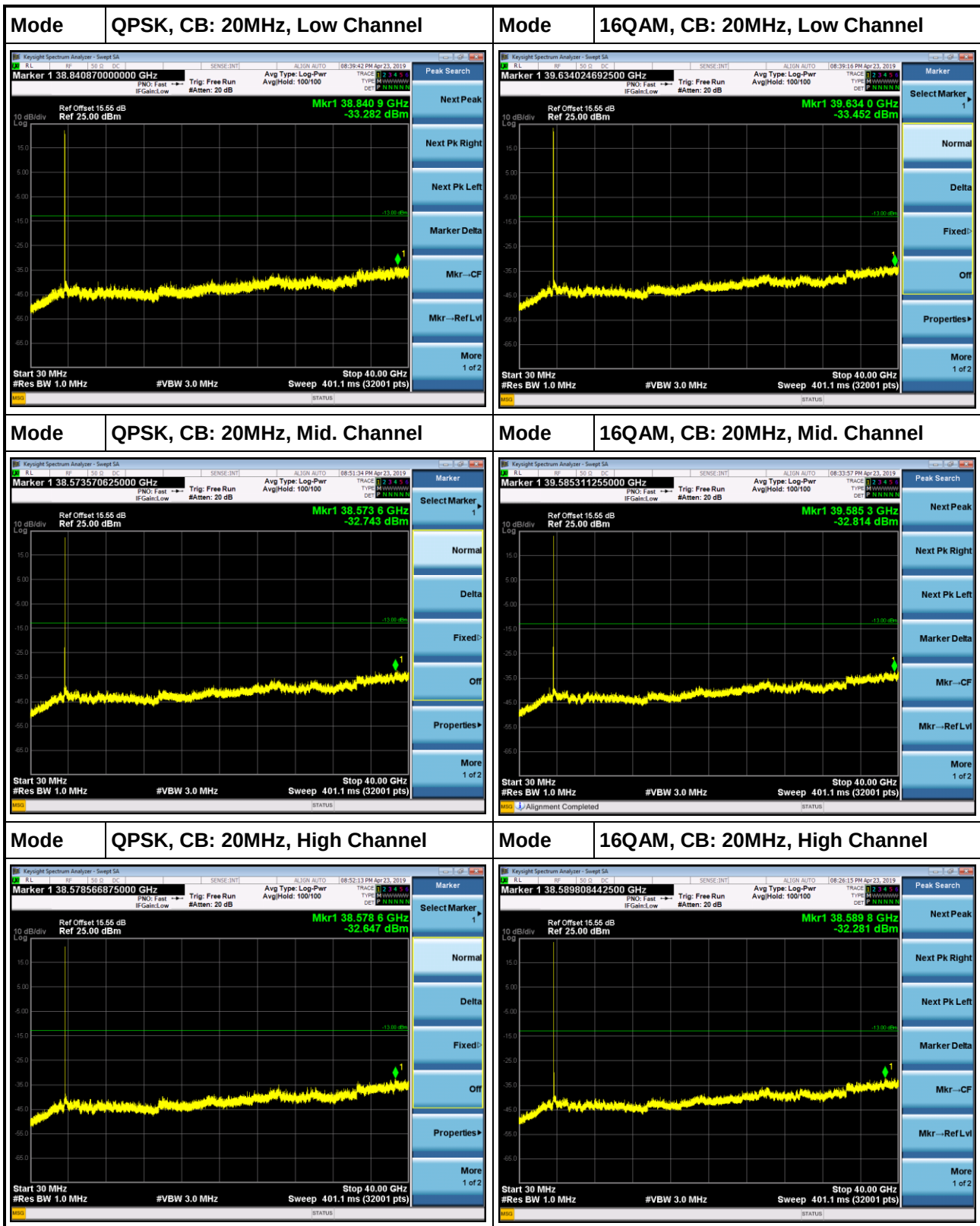
1. Lowest, middle and highest operating channels are tested for this item.
2. Scan frequency range is from 30MHz~40GHz.
3. Set RBW = 1MHz, VBW = 3MHz, detector = RMS, sweep time = auto.
4. Record the max trace value and capture the test plot of each sub frequency band.

3.3.3 Test Setup



3.3.4 Test Result of Conducted Emissions





3.4 Emission Mask

3.4.1 Limit of Emission Mask

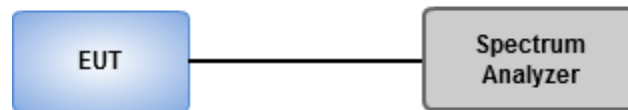
The power of any emission must be attenuated below the unmodulated carrier power (P) as follows.

- (1) On any frequency removed from the assigned frequency by more than 50 percent, but not more than 100 percent of the authorized bandwidth: At least 25 dB.
- (2) On any frequency removed from the assigned frequency by more than 100 percent, but not more than 250 percent of the authorized bandwidth: At least 35 dB.
- (3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least $43 + 10 \log (P)$ dB.

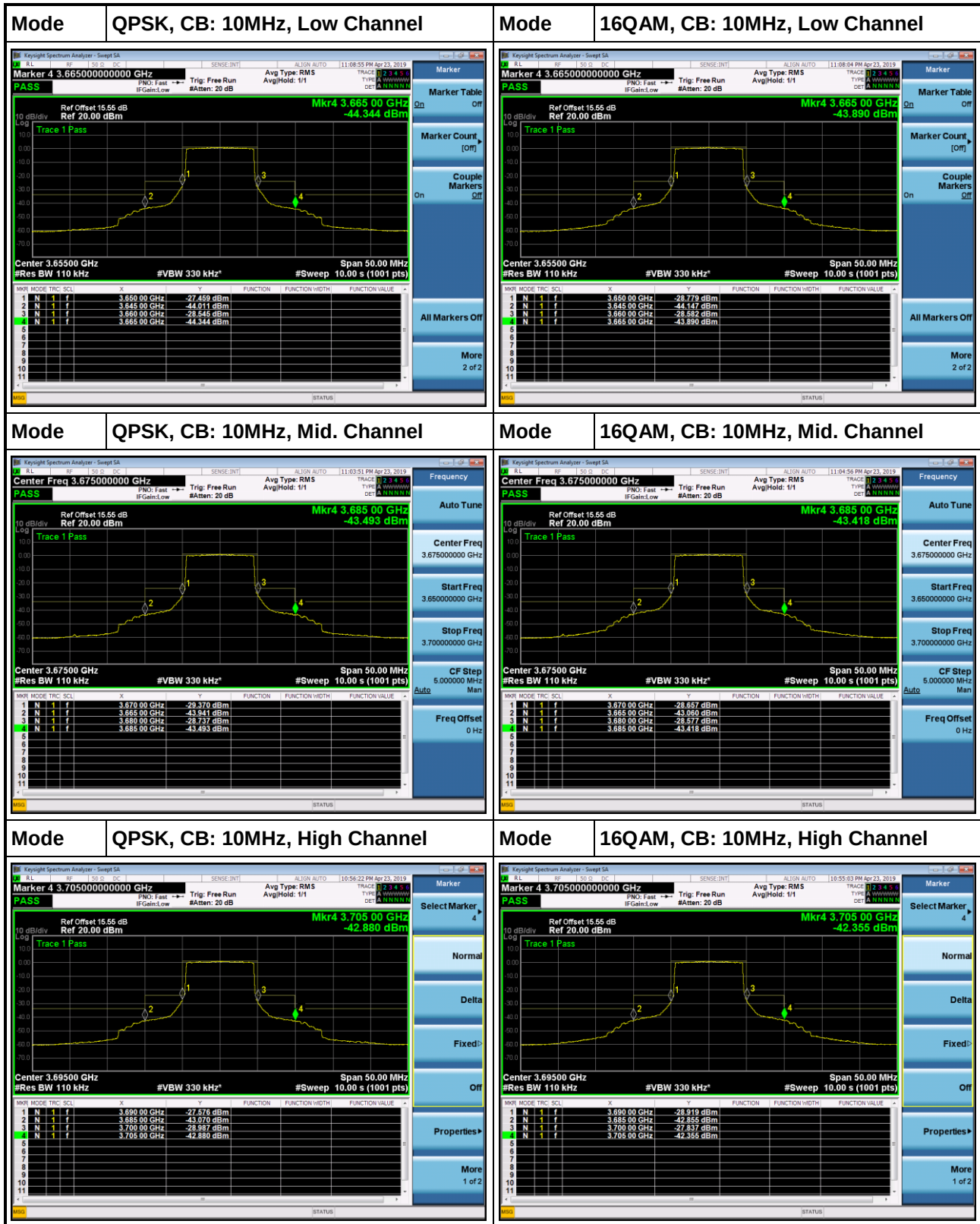
3.4.2 Test Procedures

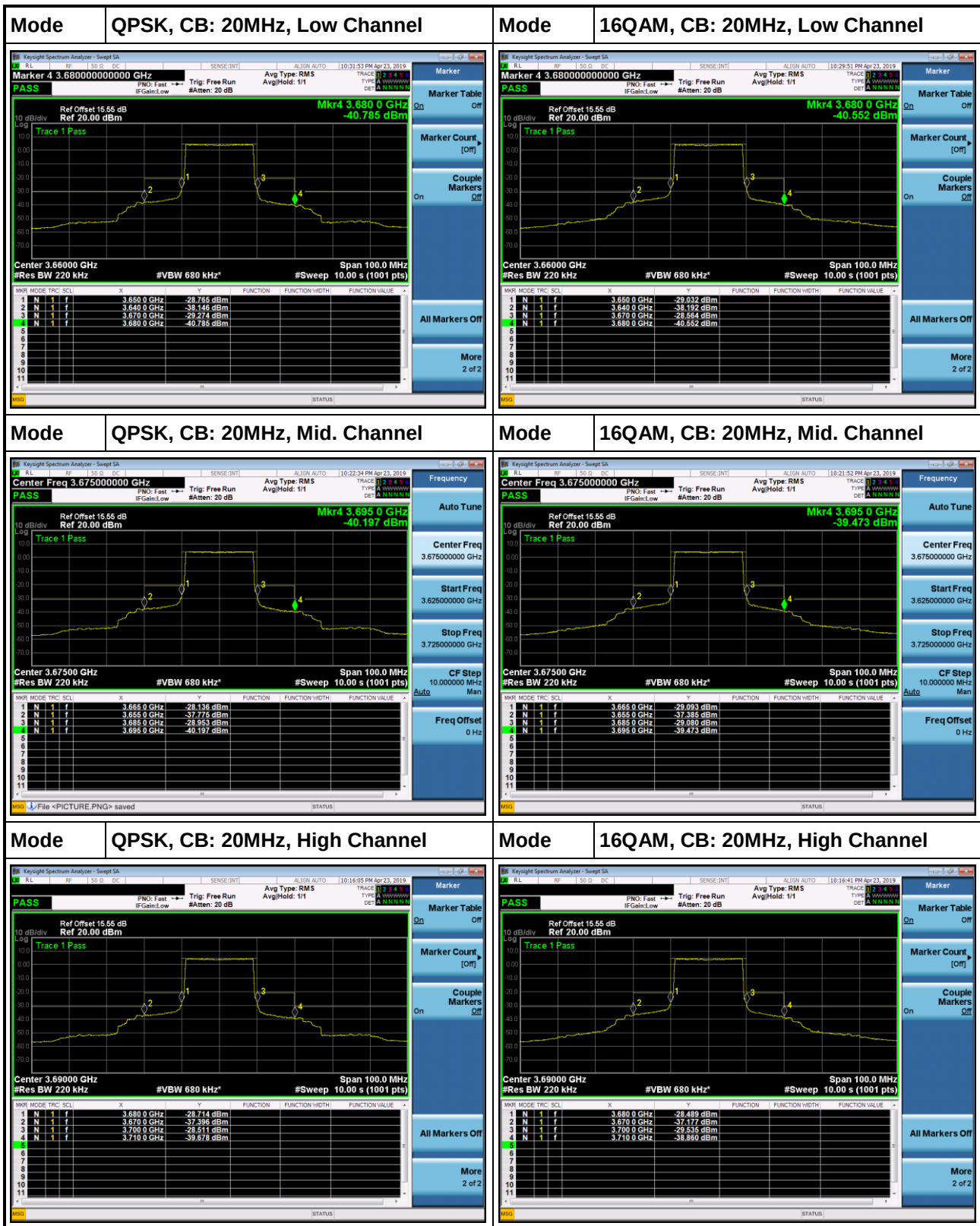
1. Set RBW=1% of 26dBc bandwidth, VBW=3 X RBW, detector=RMS, Sweep time = Auto.
2. Set EUT to transmit modulation signal to spectrum analyzer and confirm that the signal complies the limit or not.
3. Record the max trace value and capture the test plot.

3.4.3 Test Setup



3.4.4 Test Result of Emission Mask



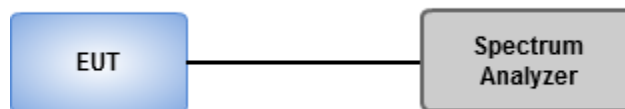


3.5 26dBc and Occupied Bandwidth

3.5.1 Test Procedures

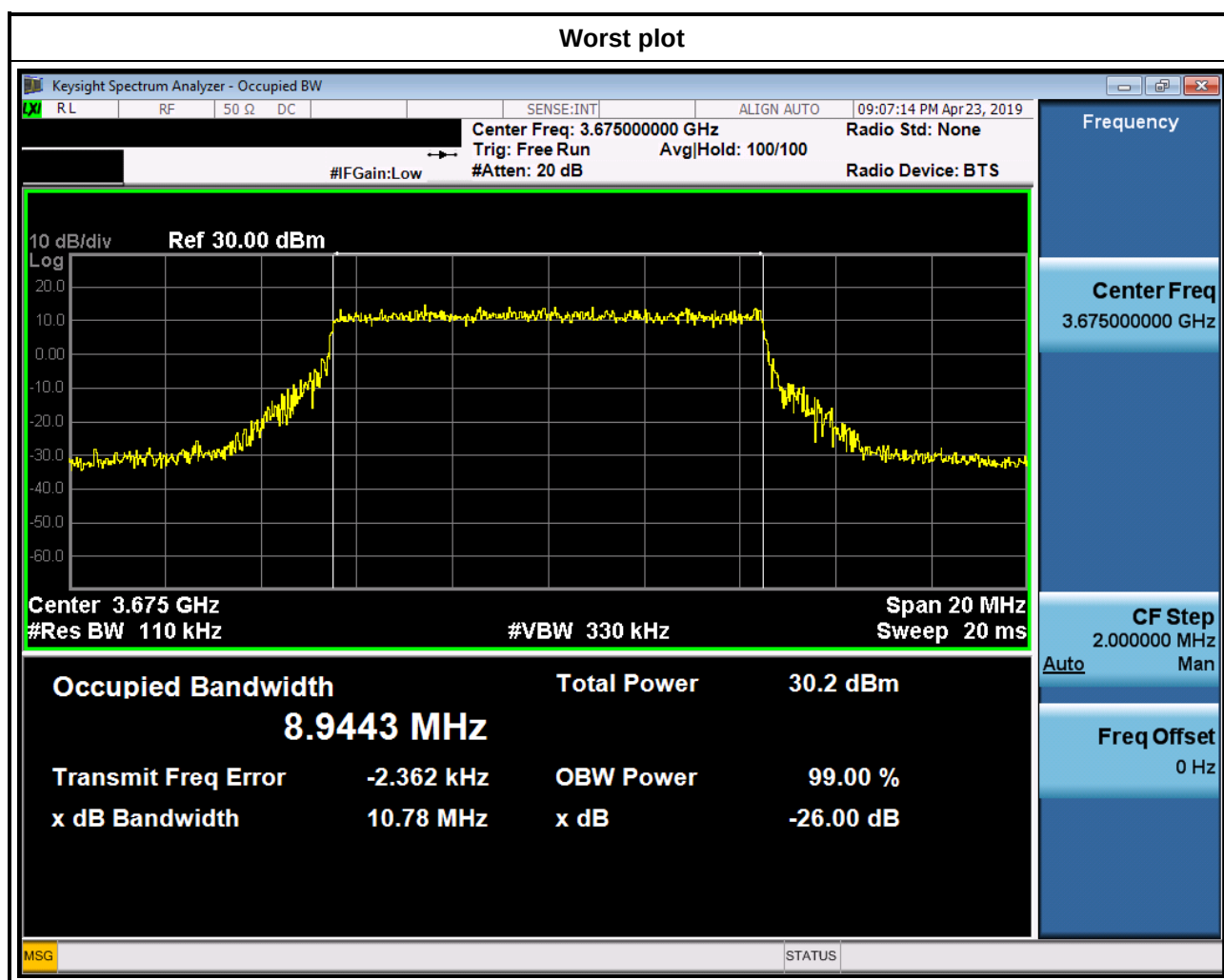
1. Set resolution bandwidth (RBW) = 1 % to 5 % of OBW, Video bandwidth= 3 X RBW
2. Detector = Peak, Trace mode = max hold.
3. Sweep = auto couple, Allow the trace to stabilize.
4. Using 26dBc and occupied bandwidth measurement function of spectrum analyzer to measure 26dBc and occupied bandwidth.

3.5.2 Test Setup

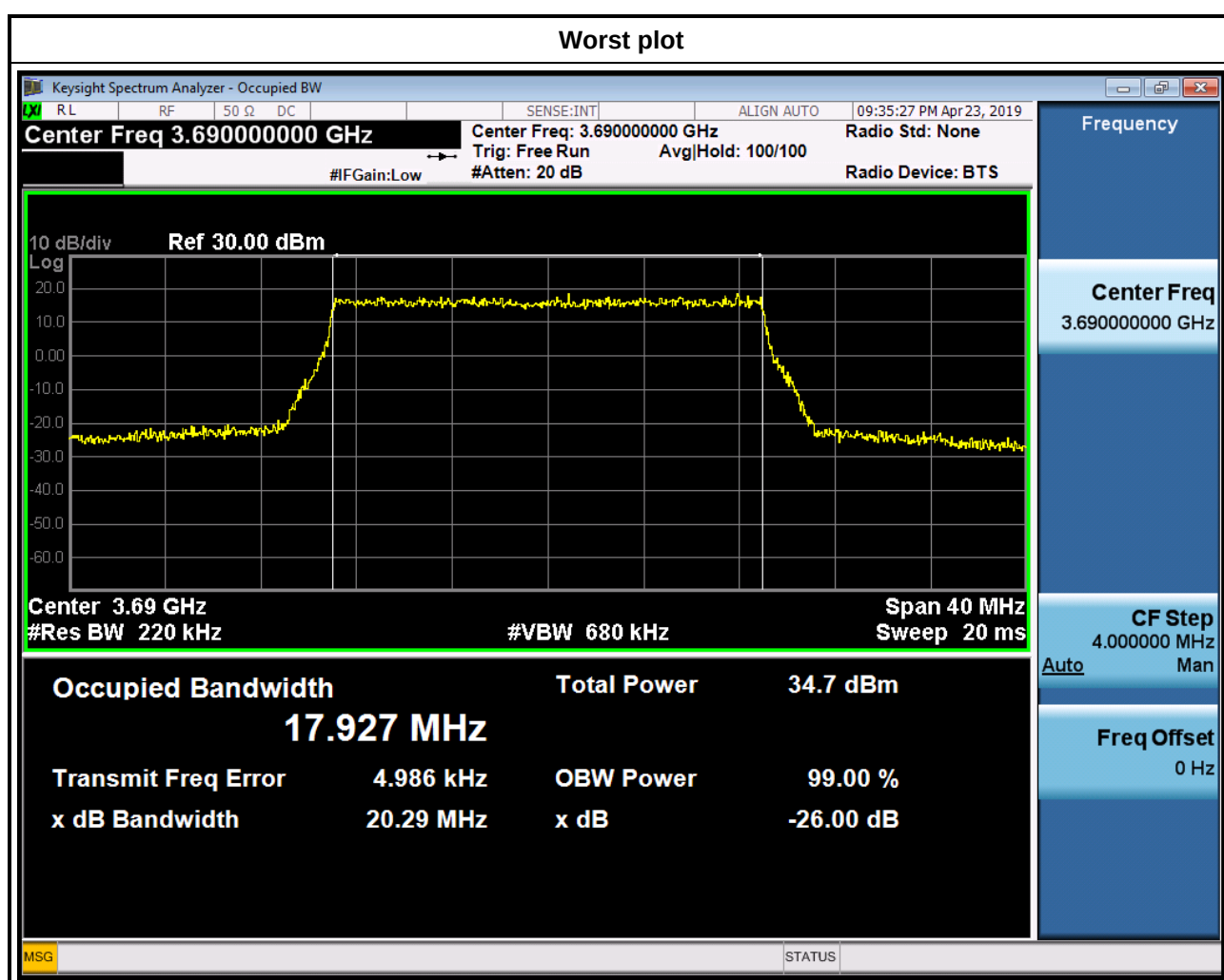


3.5.3 Test Result of 26dBc Bandwidth

Mode	Modulation	Channel	Frequency (MHz)	26dB BW (MHz)	Occupied Bandwidth (MHz)
LTE-BW 10MHz	QPSK	44140	3655	10.70	8.9656
LTE-BW 10MHz	QPSK	44340	3675	10.78	8.9443
LTE-BW 10MHz	QPSK	44540	3695	10.53	8.9428
LTE-BW 10MHz	16QAM	44140	3655	10.77	8.9579
LTE-BW 10MHz	16QAM	44340	3675	10.48	8.9424
LTE-BW 10MHz	16QAM	44140	3695	10.73	8.9427



Mode	Modulation	Channel	Frequency (MHz)	26dB BW (MHz)	Occupied Bandwidth (MHz)
LTE-BW 20MHz	QPSK	44190	3660	20.03	17.908
LTE-BW 20MHz	QPSK	44340	3675	20.23	17.95
LTE-BW 20MHz	QPSK	44490	3690	20.29	17.927
LTE-BW 20MHz	16QAM	44190	3660	20.24	17.92
LTE-BW 20MHz	16QAM	44340	3675	20.03	17.881
LTE-BW 20MHz	16QAM	44190	3690	20.18	17.92



3.6 Frequency Stability

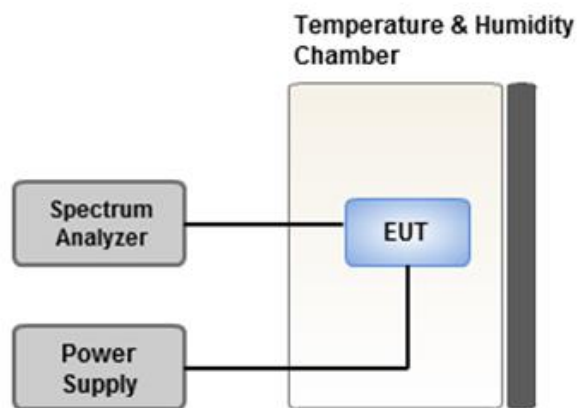
3.6.1 Limit of Frequency Stability

The frequency stability shall be less +/- 2.5ppm.

3.6.2 Test Procedures

1. EUT was placed at temperature chamber and connected to an external power supply.
2. Temperature and voltage condition shall be tested to confirm frequency stability.
3. Temperature range is from -40 ~ 50°C and voltage range is from lowest to highest working voltage.
4. Tem Link up EUT and simulator. Confirm frequency drift value of simulator and record it.

3.6.3 Test Setup



3.6.4 Test Result of Frequency Stability

BW 10MHz, Frequency: 3675 MHz		Frequency Drift (ppm)	
Temperature (°C)	Frequency Error (ppm)	Limit (ppm)	
T20°CVmax	0.002	2.5	
T20°CVmin	0.003	2.5	
T55°CVnom	0.006	2.5	
T50°CVnom	0.006	2.5	
T40°CVnom	0.008	2.5	
T30°CVnom	0.006	2.5	
T20°CVnom	0.004	2.5	
T10°CVnom	0.001	2.5	
T0°CVnom	-0.002	2.5	
T-10°CVnom	-0.003	2.5	
T-20°CVnom	-0.006	2.5	
T-30°CVnom	-0.004	2.5	
T-40°CVnom	-0.006	2.5	
Vnom [Vac]: 120		Vmax [Vac]: 138	Vmin [Vac]: 102
Tnom [°C]: 20		Tmax [°C]: 55	Tmin [°C]: -40

BW 20MHz, Frequency: 3675 MHz		Frequency Drift (ppm)	
Temperature (°C)	Frequency Error (ppm)	Limit (ppm)	
T20°CVmax	0.003	2.5	
T20°CVmin	0.002	2.5	
T55°CVnom	0.005	2.5	
T50°CVnom	0.005	2.5	
T40°CVnom	0.007	2.5	
T30°CVnom	0.005	2.5	
T20°CVnom	0.003	2.5	
T10°CVnom	0.002	2.5	
T0°CVnom	-0.001	2.5	
T-10°CVnom	-0.004	2.5	
T-20°CVnom	-0.002	2.5	
T-30°CVnom	-0.003	2.5	
T-40°CVnom	-0.005	2.5	
Vnom [Vac]: 120		Vmax [Vac]: 138	Vmin [Vac]: 102
Tnom [°C]: 20		Tmax [°C]: 55	Tmin [°C]: -40

4 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corp (EMC and Wireless Communication Laboratory), it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan District. Location map can be found on our website <http://www.icertifi.com.tw>.

Linkou

Tel: 886-2-2601-1640

No. 30-2, Ding Fwu Tsuen, Lin
Kou District, New Taipei City,
Taiwan, R.O.C.

Kwei Shan

Tel: 886-3-271-8666

No. 3-1, Lane 6, Wen San 3rd St.,
Kwei Shan District, Tao Yuan City
333, Taiwan, R.O.C.

Kwei Shan Site II

Tel: 886-3-271-8640

No. 14-1, Lane 19, Wen San 3rd
St., Kwei Shan District, Tao Yuan
City 333, Taiwan, R.O.C..

If you have any suggestion, please feel free to contact us as below information

Tel: 886-3-271-8666

Fax: 886-3-318-0155

Email: ICC_Service@icertifi.com.tw

==END==