



中国认可
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检测
TESTING
CNAS L2264

RF TEST REPORT

Applicant ZTE CORPORATION

FCC ID SRQ-ZTU31

Product LTE/WCDMA/GSM (GPRS)
Multi-Mode Digital Mobile Phone

Model ZTU31/ZTE Blade V770/Blade V770

Report No. RXC1611-0258RF03

Issue Date January 18, 2017

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 2 (2016)/ FCC CFR47 Part 27C (2016)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

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Summary of Measurement Results

Number	Test Case	Clause in FCC rules	Verdict
1	RF power output	2.1046	PASS
2	Effective Isotropic Radiated power	27.50(d)(4)/ 27.50(c)(10)/ 27.50(h)(2)	PASS
3	Occupied Bandwidth	2.1049	PASS
4	Band Edge Compliance	27.53(h)/ 27.53(g)/ 27.53(m)	PASS
5	Peak-to-Average Power Ratio	27.50(d)/KDB971168 D01(5.7)	PASS
6	Frequency Stability	2.1055 / 27.54	PASS
7	Spurious Emissions at Antenna Terminals	2.1051 / 27.53(h) / 27.53(g) / 27.53(m)	PASS
8	Radiates Spurious Emission	2.1053 /27.53(h) / 27.53(g) / 27.53(m)	PASS
Date of Testing: November 21, 2016 ~ December 16, 2016			
Note: PASS: The EUT complies with the essential requirements in the standard. FAIL: The EUT does not comply with the essential requirements in the standard.			

1 Test Laboratory

1.1 Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein .Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above. This report must not be used by the client to claim product certification, approval, or endorsement by CNAS or any government agencies.

1.2 Test facility

CNAS (accreditation number: L2264)

TA Technology (Shanghai) Co., Ltd. has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS).

FCC (recognition number is 428261)

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

IC (recognition number is 8510A)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Canada to perform electromagnetic emission measurement.

A2LA (Certificate Number: 3857.01)

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

1.3 Testing Location

Company: TA Technology (Shanghai) Co., Ltd.
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2 General Description of Equipment under Test

Client Information

Applicant	ZTE CORPORATION
Applicant address	ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R. China
Manufacturer	ZTE CORPORATION
Manufacturer address	ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R. China

General information

EUT Description			
Model Number:	ZTU31/ZTE Blade V770/Blade V770		
IMEI:	863682030001706		
Hardware Version:	uu9A		
Software Version:	KDDI_JP_BV770_V1.0		
Power Supply:	Battery/AC adapter		
Antenna Type:	Internal Antenna		
Test Mode(s):	LTE Band 41;		
Maximum E.I.R.P./ E.R.P.	LTE Band 41: 23.53dBm		
Rated Power Supply Voltage:	3.7V		
Extreme Voltage:	Minimum: 3.5V Maximum: 4.2V		
Extreme Temperature:	Lowest: -10°C Highest: +55°C		
Operating Frequency Range(s)	Mode	Tx (MHz)	Rx (MHz)
	LTE Band 41	2552.5 ~ 2655	2552.5 ~ 2655
EUT Accessory			
Battery	Manufacturer: SCUD (Fujian) Electronics Co., Ltd Model: Li3925T44P8h786035		
USB Cable	100cm Cable, Shielded		
Note: 1. The information of the EUT is declared by the manufacturer. Please refer to the specifications or user manual for details.			



2.1 Applied Standards

According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test standards

FCC CFR47 Part 2 (2016)

FCC CFR47 Part 27C (2016)

ANSI/TIA-603-D (2010)

KDB 971168 D01 Power Meas License Digital Systems v02r02

3 Test Configuration

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, vertical polarization) and the worst case was recorded.

All mode and data rates and positions and RB size and modulations were investigated.

Subsequently, only the worst case emissions are reported.

The following testing in LTE is set based on the maximum RF Output Power.

The following testing in different Bandwidth is set to detail in the following table:

Test modes are chosen to be reported as the worst case configuration below for LTE Band 41:

Test items	Modes	Bandwidth (MHz)					Modulation		RB			Test Channel		
		3	5	10	15	20	QPSK	16QAM	1	50%	100%	L	M	H
RF power output	LTE 41	O	O	O	O	O	O	O	O	O	O	O	O	O
Effective Isotropic Radiated power	LTE 41	O	O	O	O	O	O	O	-	-	O	O	O	O
Occupied Bandwidth	LTE 41	O	O	O	O	O	O	O	-	-	O	O	O	O
Band Edge Compliance	LTE 41	O	O	O	O	O	O	O	O	-	O	O	-	O
Peak-to-Average Power Ratio	LTE 41	O	O	O	O	O	O	O	-	-	O	O	O	O
Frequency Stability	LTE 41	O	O	O	O	O	O	O	-	-	O	-	O	-
Spurious Emissions at Antenna Terminals	LTE 41	O	O	O	O	O	O	-	O	-	-	O	O	O
Radiates Spurious Emission	LTE 41	O	O	O	O	O	O	-	O	-	-	O	O	O
Note	1. The mark "O" means that this configuration is chosen for testing. 2. The mark "-" means that this configuration is not testing.													

4 Test Information

4.1 RF Power Output

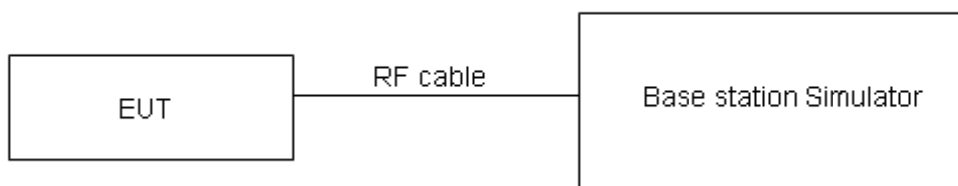
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

During the process of the testing, The EUT is controlled by the Base Station Simulator to ensure max power transmission and proper modulation.

Test Setup



The loss between RF output port of the EUT and the input port of the tester has been taken into consideration.

Limits

No specific RF power output requirements in part 2.1046.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U=0.4$ dB.

Test Results

LTE TDD Band 41				AV Conducted Power(dBm)		
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				40240/2555	40728/2603.8	41215/2652.5
5MHz	QPSK	1	0	22.05	22.63	22.03
		1	13	23.43	23.48	22.54
		1	24	23.42	22.65	22.11
		12	0	22.28	22.80	22.03
		12	6	22.49	22.64	22.31
		12	13	22.73	22.60	22.76
		25	0	22.30	22.75	22.21
	16QAM	1	0	21.39	21.78	21.39
		1	13	22.41	22.21	21.95
		1	24	22.21	21.89	21.40
		12	0	21.42	21.64	21.38
		12	6	21.84	21.73	21.77
		12	13	21.76	21.64	21.65
		25	0	21.60	21.68	21.54
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				40265/2557.5	40728/2603.8	41185/2650
10MHz	QPSK	1	0	22.07	22.64	22.06
		1	25	23.46	23.53	22.58
		1	49	23.44	22.69	22.14
		25	0	22.31	22.85	22.07
		25	13	22.52	22.69	22.35
		25	25	22.75	22.64	22.81
		50	0	22.38	22.77	22.25
	16QAM	1	0	21.41	21.81	21.41
		1	25	22.44	22.25	21.98
		1	49	22.24	21.91	21.43
		25	0	21.45	21.69	21.42
		25	13	21.86	21.77	21.80
		25	25	21.79	21.69	21.69
		50	0	21.63	21.73	21.58
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				40290/2560	40728/2603.8	41165/2647.5
15MHz	QPSK	1	0	22.06	22.60	22.04
		1	38	23.44	23.52	22.55
		1	74	23.41	22.64	22.10



		36	0	22.29	22.81	22.04
		36	18	22.49	22.64	22.31
		36	39	22.72	22.61	22.77
		75	0	22.36	22.73	22.20
	16QAM	1	0	21.36	21.79	21.39
		1	38	22.42	22.22	21.96
		1	74	22.21	21.87	21.40
		36	0	21.42	21.67	21.39
		36	18	21.83	21.72	21.76
		36	39	21.77	21.65	21.66
		75	0	21.60	21.68	21.54
Bandwidth	Modulation	RB size	RB offset	Channel/Frequency (MHz)		
				40315/2562.5	40728/2603.8	41140/2645
20MHz	QPSK	1	0	22.03	22.56	22.01
		1	50	23.43	23.48	22.53
		1	99	23.39	22.63	22.07
		50	0	22.26	22.76	22.00
		50	25	22.47	22.60	22.28
		50	50	22.69	22.56	22.73
		100	0	22.33	22.68	22.16
	16QAM	1	0	21.34	21.75	21.34
		1	50	22.38	22.20	21.92
		1	99	22.19	21.84	21.38
		50	0	21.39	21.63	21.36
		50	25	21.80	21.70	21.73
		50	50	21.74	21.60	21.62
		100	0	21.58	21.64	21.51

4.2 Effective Isotropic Radiated Power

Ambient condition

Temperature	Relative humidity
21°C ~25°C	40%~60%

Methods of Measurement

The measurement procedures in TIA- 603-D are used.

1. The EUT was placed on a turntable with 1.5 meter height in a fully anechoic chamber.
2. The EUT was set at 3 meters from the receiving antenna, which was mounted on the antennatower.
3. UMTS operating modes: Set RBW= 100 KHz, VBW= 300 KHz, RMS detector over frame, and use channel power option with bandwidth=5MHz, per section 4.0 of KDB 971168 D01.
4. The table was rotated 360 degrees to determine the position of the highest radiated power.
5. The height of the receiving antenna is adjusted to look for the maximum ERP/EIRP.
6. Taking the record of maximum ERP/EIRP.
7. A dipole antenna was substituted in place of the EUT and was driven by a signal generator.
8. The conducted power at the terminal of the dipole antenna is measured.
9. Repeat step 3 to step 5 to get the maximum ERP/EIRP of the substitution antenna.
10. $ERP/EIRP = P_s + E_t - E_s + G_s = P_s + R_t - R_s + G_s$

P_s (dBm) : Input power to substitution antenna.

G_s (dBi or dBd) : Substitution antenna Gain.

$E_t = R_t + AF$

$E_s = R_s + AF$

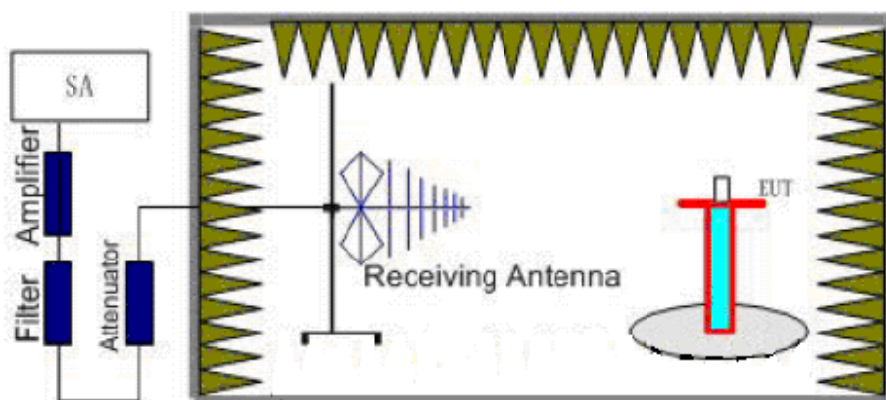
AF (dB/m) : Receive antenna factor

R_t : The highest received signal in spectrum analyzer for EUT.

R_s : The highest received signal in spectrum analyzer for substitution antenna.

$EIRP = E.R.P + 2.15$

Test Setup



Limits

Rule Part 27.50(d) (4) specifies that “Fixed, mobile and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP”,

Rule Part 27.50(c) (10) specifies that “Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP”

Rule Part 27.50(h) (2) specifies that “Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.”

Part 27.50(d)(4)Limit (EIRP)	$\leq 1 \text{ W}$ (30 dBm)
Part 27.50(c)(10)Limit (ERP)	$\leq 3 \text{ W}$ (34.77 dBm)
Part 27.50(h)(2) Limit (EIRP)	$\leq 2 \text{ W}$ (33 dBm)

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 1.19 \text{ dB}$

Test Results

LTE Band 41								
Band width	Frequency (MHz)	Ant Pot (H/V)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	EIRP (dBm)	Conclusion
5MHz (QPSK)	2555	H	-39.93	-61.07	0.00	1.80	22.94	Pass
	2603.8	H	-41.28	-62.08	0.00	1.85	22.65	Pass
	2652.5	H	-44.40	-63.61	0.00	2.00	21.21	Pass
	2555	V	-37.98	-60.85	0.00	1.80	24.67	Pass
	2603.8	V	-39.08	-62.08	0.00	1.85	24.85	Pass
	2652.5	V	-43.35	-64.28	0.00	2.00	22.93	Pass
5MHz (16QAM)	2555	H	-40.51	-61.07	0.00	1.80	22.36	Pass
	2603.8	H	-41.80	-62.08	0.00	1.85	22.13	Pass
	2652.5	H	-44.92	-63.61	0.00	2.00	20.69	Pass
	2555	V	-38.59	-60.85	0.00	1.80	24.06	Pass
	2603.8	V	-39.57	-62.08	0.00	1.85	24.36	Pass
	2652.5	V	-43.89	-64.28	0.00	2.00	22.39	Pass
10MHz (QPSK)	2557.5	H	-40.18	-61.08	0.00	1.81	22.71	Pass
	2603.8	H	-39.74	-62.08	0.00	1.85	24.19	Pass
	2650	H	-45.55	-63.56	0.00	1.99	20.00	Pass
	2557.5	V	-37.91	-60.90	0.00	1.81	24.80	Pass
	2603.8	V	-39.19	-62.08	0.00	1.85	24.74	Pass
	2650	V	-46.27	-64.37	0.00	1.99	20.09	Pass
10MHz (16QAM)	2557.5	H	-40.66	-61.08	0.00	1.81	22.23	Pass
	2603.8	H	-40.28	-62.08	0.00	1.85	23.65	Pass
	2650	H	-46.03	-63.56	0.00	1.99	19.52	Pass
	2557.5	V	-38.45	-60.90	0.00	1.81	24.26	Pass
	2603.8	V	-39.72	-62.08	0.00	1.85	24.21	Pass
	2650	V	-46.61	-64.37	0.00	1.99	19.75	Pass
15MHz (QPSK)	2560	H	-39.71	-61.13	0.00	1.82	23.24	Pass
	2603.8	H	-41.09	-62.08	0.00	1.85	22.84	Pass
	2647.5	H	-45.61	-63.50	0.00	2.00	19.89	Pass
	2560	V	-39.38	-60.93	0.00	1.82	23.37	Pass
	2603.8	V	-40.06	-62.08	0.00	1.85	23.87	Pass
	2647.5	V	-45.98	-64.41	0.00	2.00	20.43	Pass
15MHz (16QAM)	2560	H	-40.24	-61.13	0.00	1.82	22.71	Pass
	2603.8	H	-41.57	-62.08	0.00	1.85	22.36	Pass
	2647.5	H	-46.15	-63.50	0.00	2.00	19.35	Pass
	2560	V	-39.89	-60.93	0.00	1.82	22.86	Pass
	2603.8	V	-40.61	-62.08	0.00	1.85	23.32	Pass
	2647.5	V	-46.46	-64.41	0.00	2.00	19.95	Pass
20MHz (QPSK)	2562.5	H	-39.72	-61.14	0.00	1.81	23.23	Pass
	2603.8	H	-41.05	-62.08	0.00	1.85	22.88	Pass



	2645	H	-43.44	-63.56	0.00	1.80	21.92	Pass
	2562.5	V	-38.51	-60.93	0.00	1.81	24.23	Pass
	2603.8	V	-41.04	-62.08	0.00	1.85	22.89	Pass
	2645	V	-43.83	-64.34	0.00	1.80	22.31	Pass
20MHz (16QAM)	2562.5	H	-40.12	-61.14	0.00	1.81	22.83	Pass
	2603.8	H	-41.67	-62.08	0.00	1.85	22.26	Pass
	2645	H	-44.17	-63.56	0.00	1.80	21.19	Pass
	2562.5	V	-38.96	-60.93	0.00	1.81	23.78	Pass
	2603.8	V	-41.74	-62.08	0.00	1.85	22.19	Pass
	2645	V	-44.18	-64.34	0.00	1.80	21.96	Pass

Note: 1. EIRP= E.R.P+2.15

4.3 Occupied Bandwidth

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

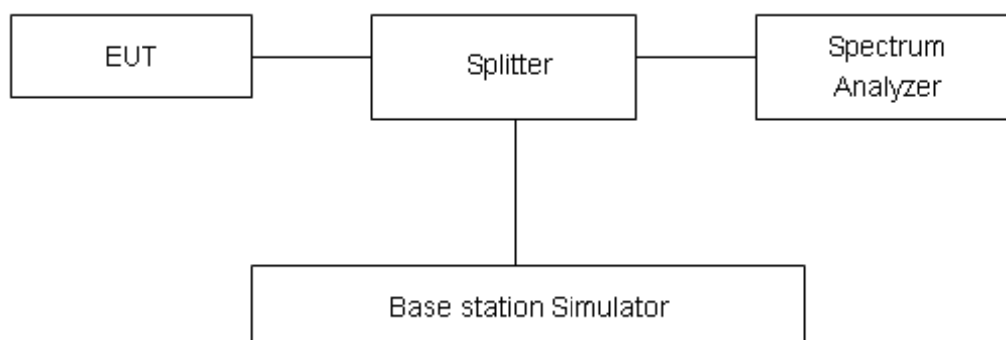
The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The occupied bandwidth is measured using spectrum analyzer.

RBW is set to 100 kHz, VBW is set to 300 kHz for LTE Band 41 (5MHz).

RBW is set to 300 kHz, VBW is set to 1MHz for LTE Band 41 (10MHz/15MHz/20MHz).

99% power and -26dBc occupied bandwidths are recorded. Spectrum analyzer plots are included on the following pages.

Test Setup



Limits

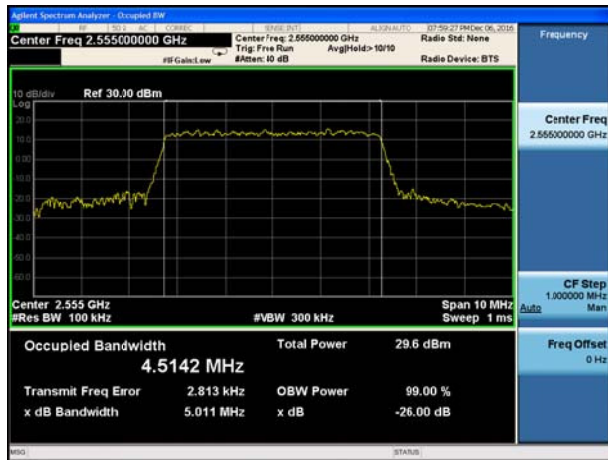
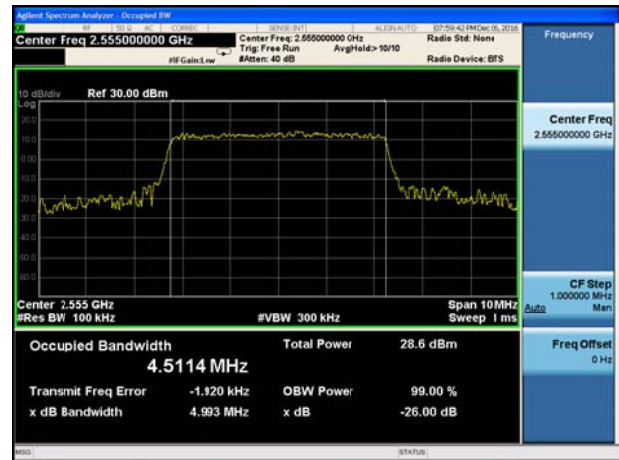
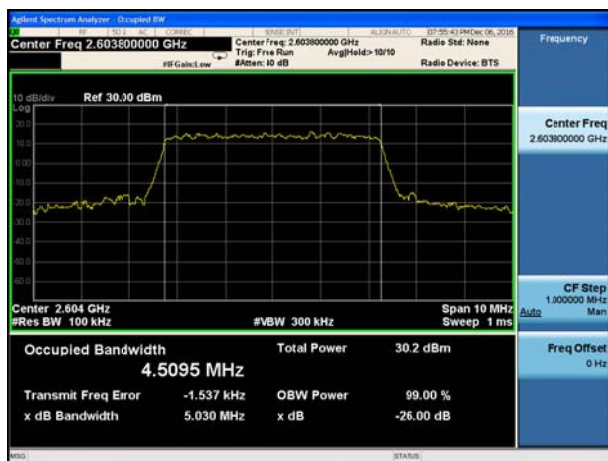
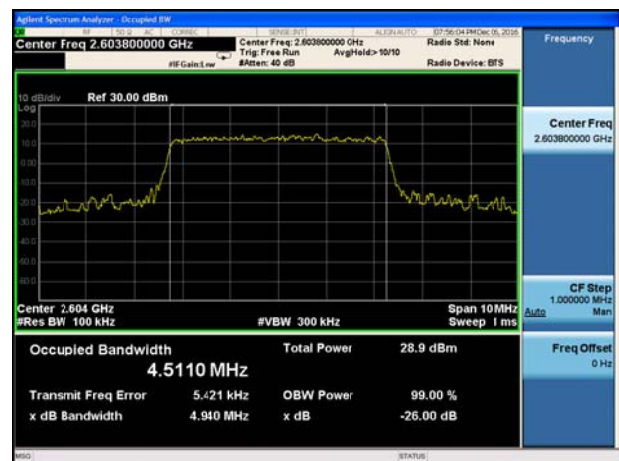
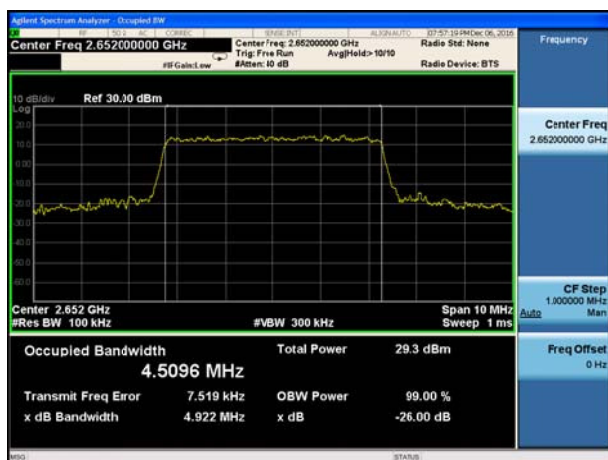
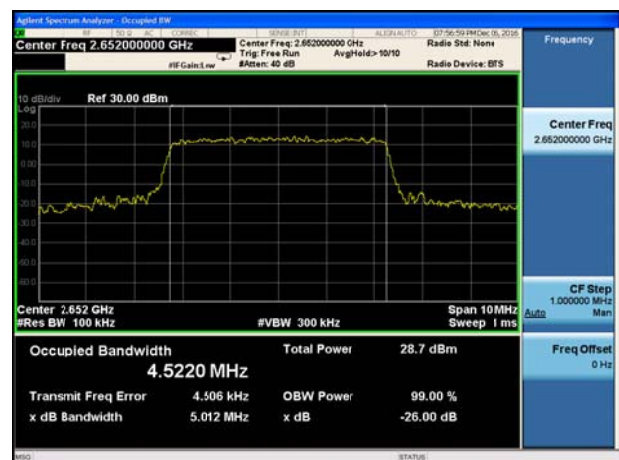
No specific occupied bandwidth requirements in part 2.1049.

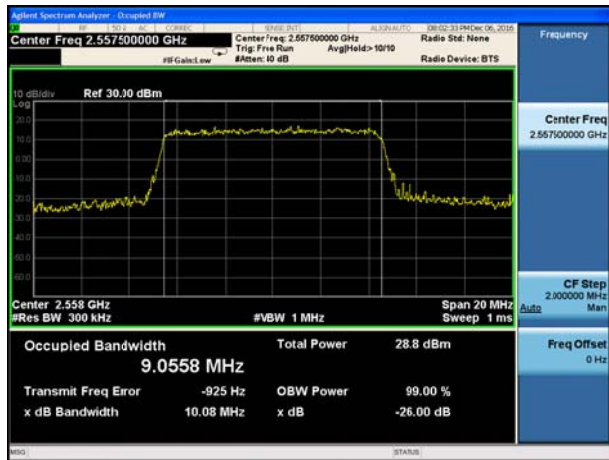
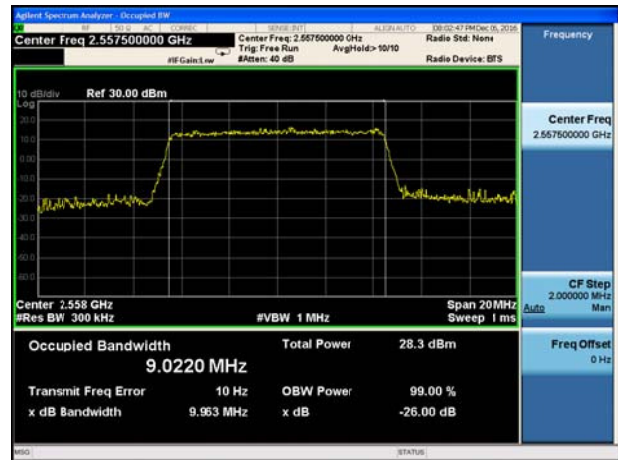
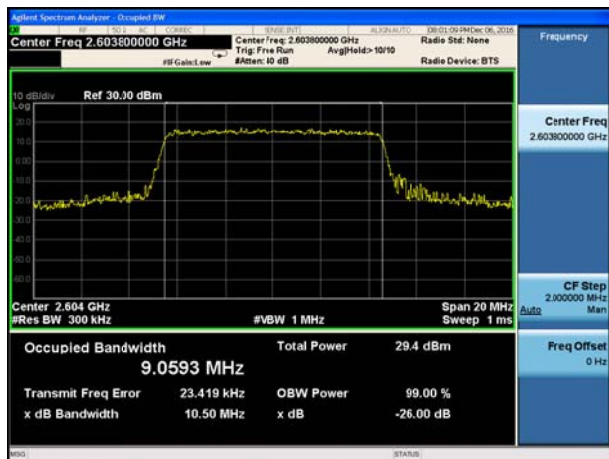
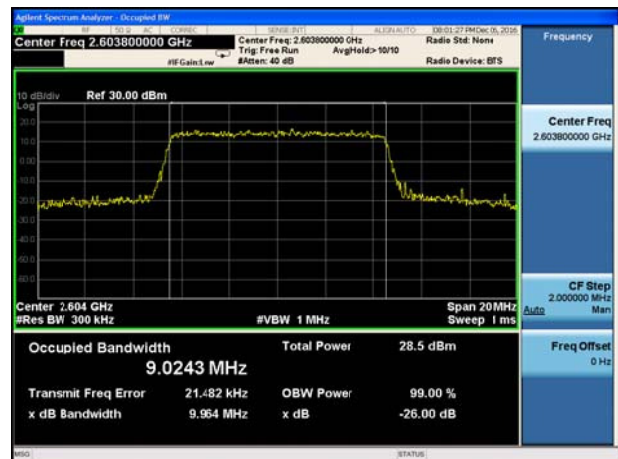
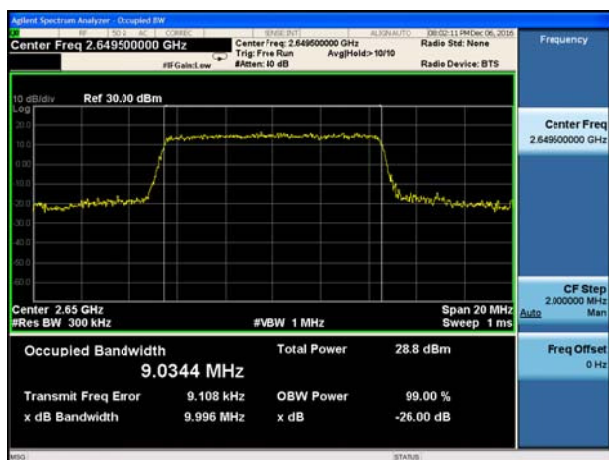
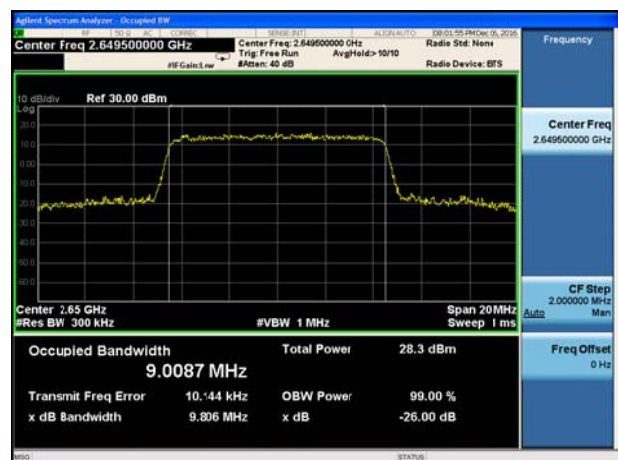
Measurement Uncertainty

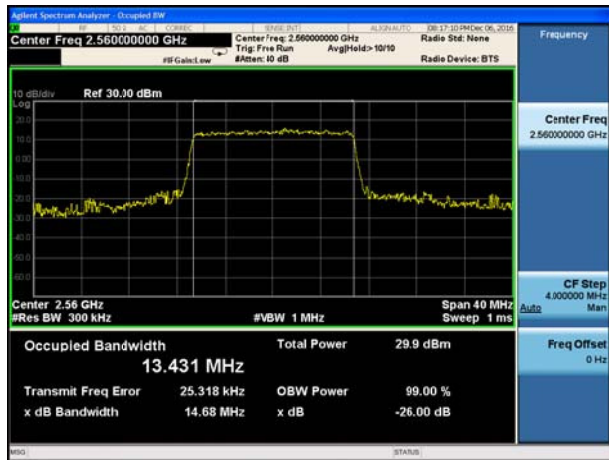
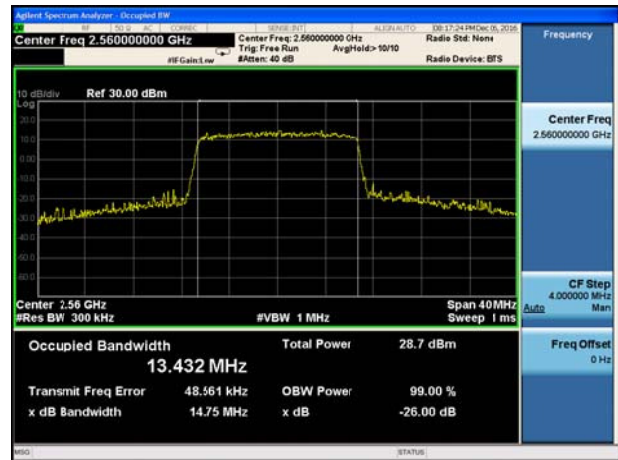
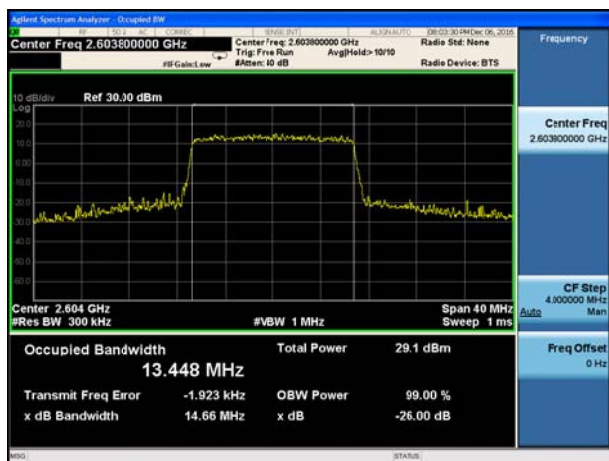
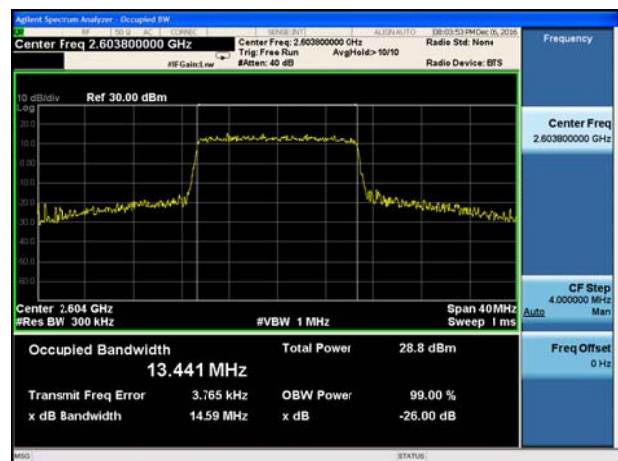
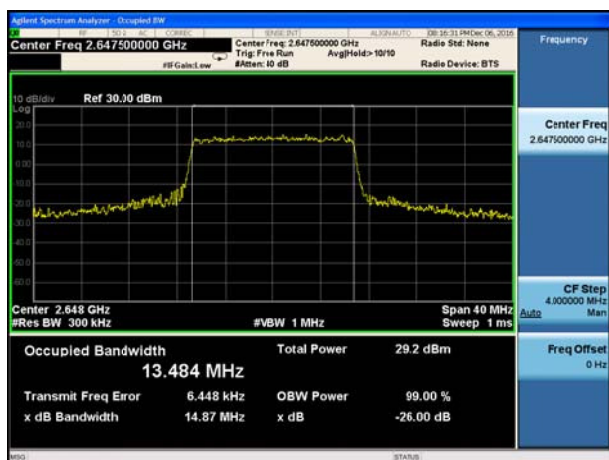
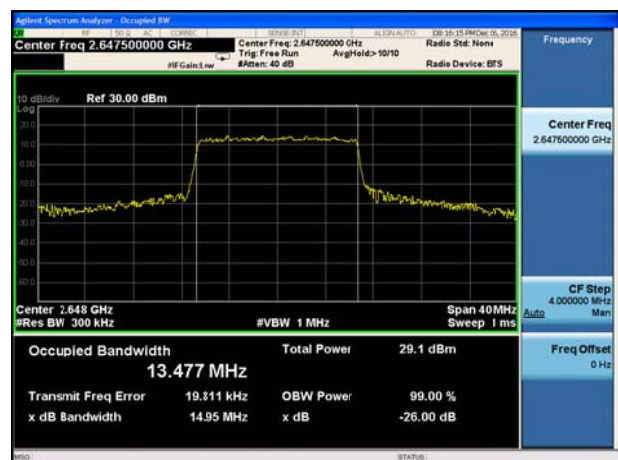
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U=624\text{Hz}$.

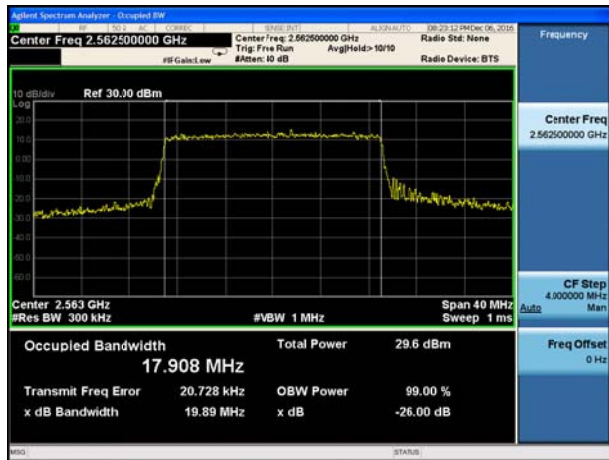
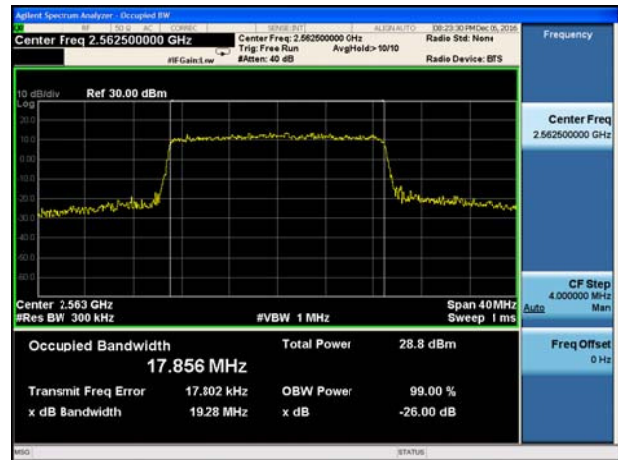
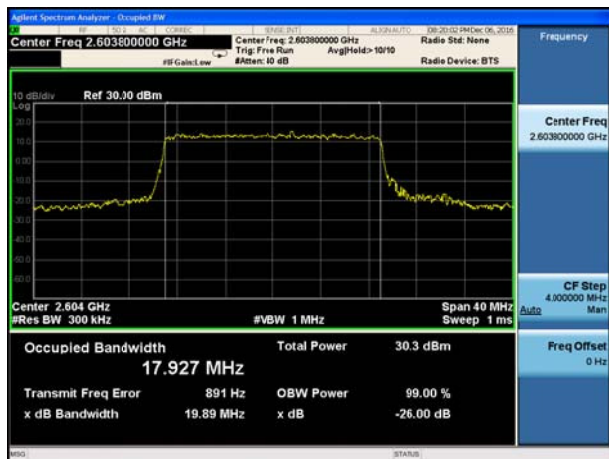
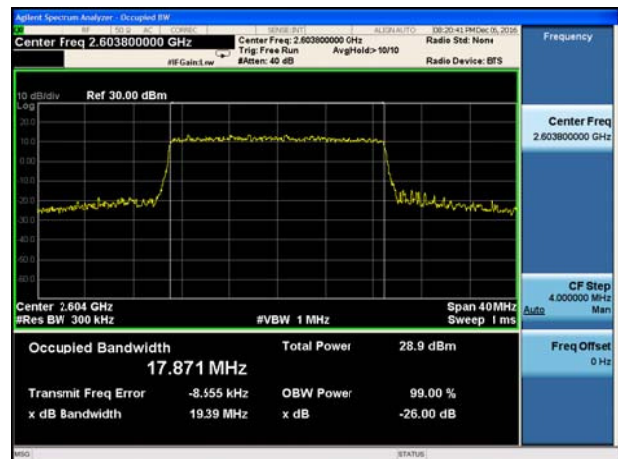
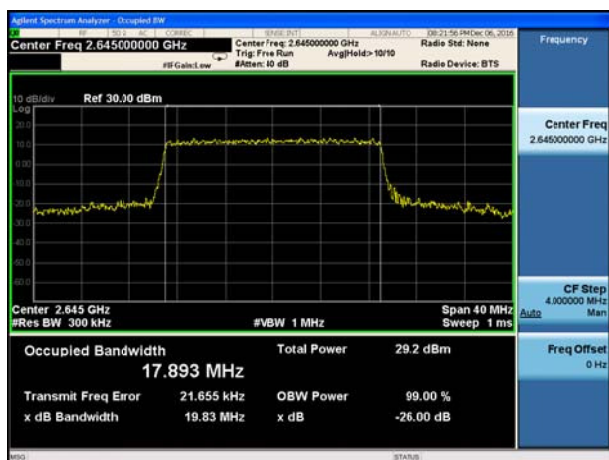
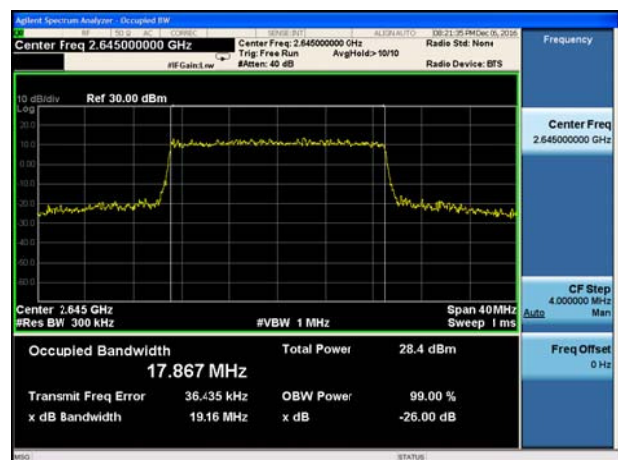
Test Result

LTE Band 41						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
100%	QPSK	5	40240	2555	4.5142	5.011
			40728	2603.8	4.5095	5.030
			41215	2652.5	4.5096	4.922
		10	40265	2557.5	9.0558	10.08
			40728	2603.8	9.0593	10.50
			41185	2650	9.0344	9.996
		15	40290	2560	13.431	14.68
			40728	2603.8	13.448	14.66
			41165	2647.5	13.484	14.87
		20	40315	2562.5	17.908	19.89
			40728	2603.8	17.927	19.89
			41140	2645	17.893	19.83
	16QAM	5	40240	2555	4.5114	4.993
			40728	2603.8	4.5110	4.940
			41215	2652.5	4.5220	5.012
		10	40265	2557.5	9.0220	9.963
			40728	2603.8	9.0243	9.964
			41185	2650	9.0087	9.806
		15	40290	2560	13.432	14.75
			40728	2603.8	13.441	14.59
			41165	2647.5	13.477	14.95
		20	40315	2562.5	17.856	19.28
			40728	2603.8	17.871	19.39
			41140	2645	17.867	19.16

LTE Band 41 QPSK Bandwidth = 5MHz
CH40240 Occupied BandwidthLTE Band 41 16QAM Bandwidth = 5MHz
CH40240 Occupied BandwidthLTE Band 41 QPSK Bandwidth = 5MHz
CH40728 Occupied BandwidthLTE Band 41 16QAM Bandwidth = 5MHz
CH40728 Occupied BandwidthLTE Band 41 QPSK Bandwidth = 5MHz
CH41215 Occupied BandwidthLTE Band 41 16QAM Bandwidth = 5MHz
CH41215 Occupied Bandwidth

LTE Band 41 QPSK Bandwidth = 10MHz
CH40265 Occupied BandwidthLTE Band 41 16QAM Bandwidth = 10MHz
CH40265 Occupied BandwidthLTE Band 41 QPSK Bandwidth = 10MHz
CH40728 Occupied BandwidthLTE Band 41 16QAM Bandwidth = 10MHz
CH40728 Occupied BandwidthLTE Band 41 QPSK Bandwidth = 10MHz
CH41185 Occupied BandwidthLTE Band 41 16QAM Bandwidth = 10MHz
CH41185 Occupied Bandwidth

LTE Band 41 QPSK Bandwidth = 15MHz
CH40290 Occupied BandwidthLTE Band 41 16QAM Bandwidth = 15MHz
CH40290 Occupied BandwidthLTE Band 41 QPSK Bandwidth = 15MHz
CH40728 Occupied BandwidthLTE Band 41 16QAM Bandwidth = 15MHz
CH40728 Occupied BandwidthLTE Band 41 QPSK Bandwidth = 15MHz
CH41165 Occupied BandwidthLTE Band 41 16QAM Bandwidth = 15MHz
CH41165 Occupied Bandwidth

LTE Band 41 QPSK Bandwidth = 20MHz
CH40315 Occupied BandwidthLTE Band 41 16QAM Bandwidth = 20MHz
CH40315 Occupied BandwidthLTE Band 41 QPSK Bandwidth = 20MHz
CH40728 Occupied BandwidthLTE Band 41 16QAM Bandwidth = 20MHz
CH40728 Occupied BandwidthLTE Band 41 QPSK Bandwidth = 20MHz
CH41140 Occupied BandwidthLTE Band 41 16QAM Bandwidth = 20MHz
CH41140 Occupied Bandwidth

4.4 Band Edge Compliance

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

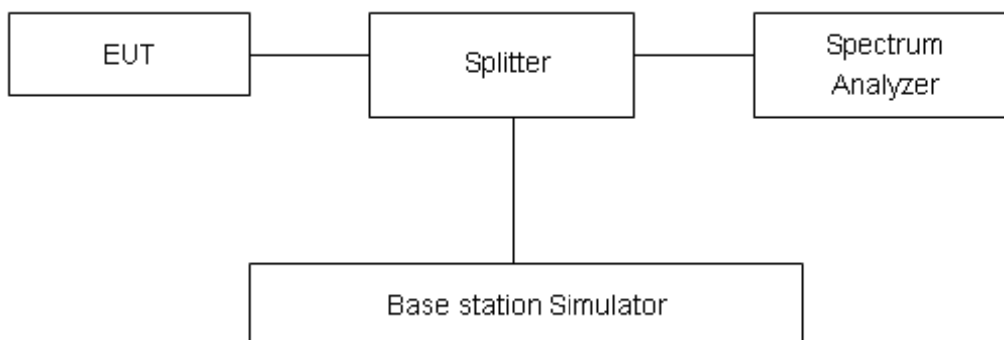
Method of Measurement

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 testing follows KDB 971168 v02r02 Section 6.0

- 1.The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The band edges of low and high channels for the highest RF powers were measured.
3. For LTE Band 41 Set RBW $\geq$ 1% EBW in the 1MHz band immediately outside and adjacent to the band edge. Beyond the 1 MHz band from the band edge, RBW=1MHz was used.
4. Set spectrum analyzer with RMS detector.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
6. Checked that all the results comply with the emission limit line.

Test Setup



Limits

Rule Part 27.53(h)/ specifies that “ for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10} (P)$ dB”

Part 27.53(g) specifies that “ For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log_{10} (P)$ dB.”

Part 27.53(m) (4)/ specifies that “for BRS and EBS stations.

For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log (P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(4) of this section. In addition, the attenuation factor shall not be less that $43 + 10 \log (P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log (P)$ dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

Example:

The limit line is derived from $43 + 10 \log (P)$ dB below the transmitter power P(Watts)

$$= P(W) - [43 + 10 \log(P)] \text{ (dB)}$$

$$= [30 + 10 \log (P)] \text{ (dBm)} - [43 + 10 \log(P)] \text{ (dB)} = -13 \text{ dBm.}$$

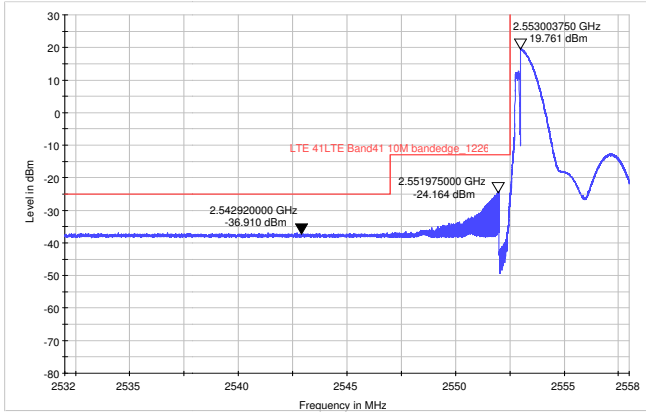
Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$, $U=0.684 \text{ dB}$.

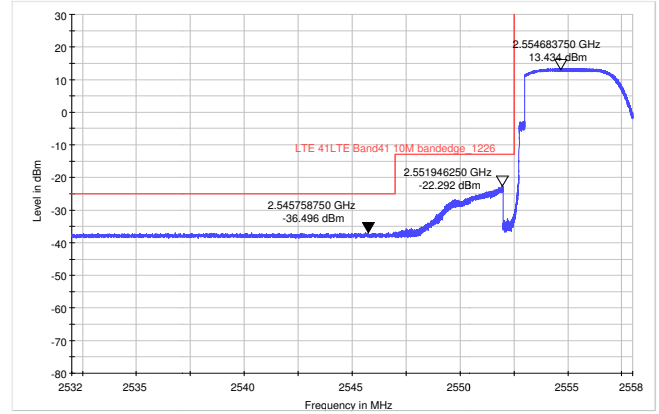
Test Result

All the test traces in the plots shows the test results clearly.

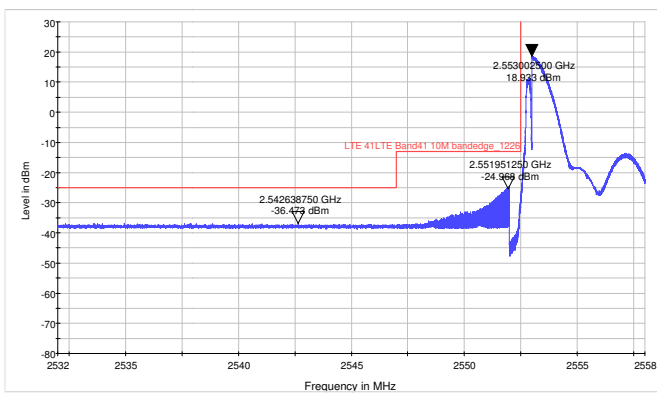
LTE Band 41 QPSK Bandwidth = 5MHz CH40240, RB 1



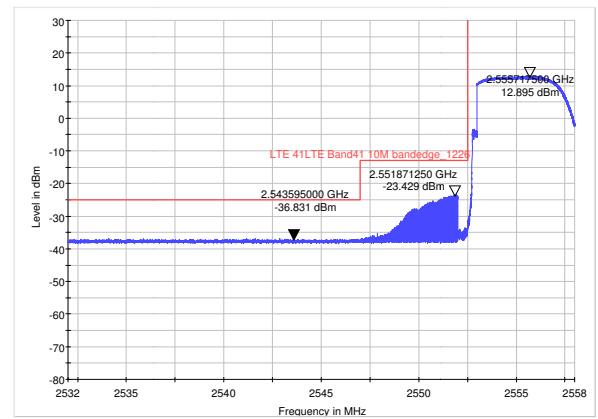
LTE Band 41 QPSK Bandwidth = 5MHz CH40240, RB 25



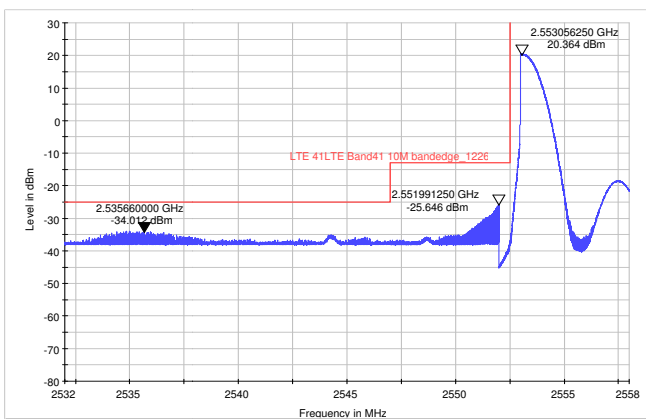
LTE Band 41 16QAM Bandwidth = 5MHz CH40240, RB 1



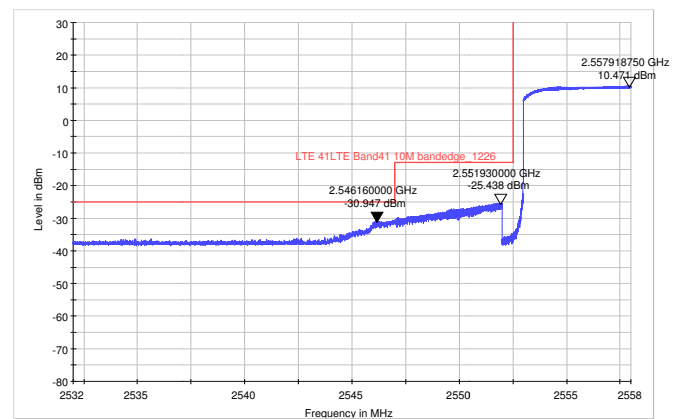
LTE Band 41 16QAM Bandwidth = 5MHz CH40240, RB 25



LTE Band 41 QPSK Bandwidth = 10MHz CH40265, RB 1

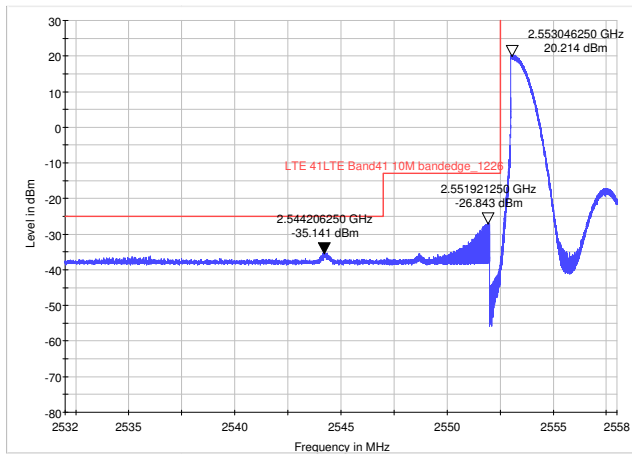


LTE Band 41 QPSK Bandwidth = 10MHz CH40265, RB 50

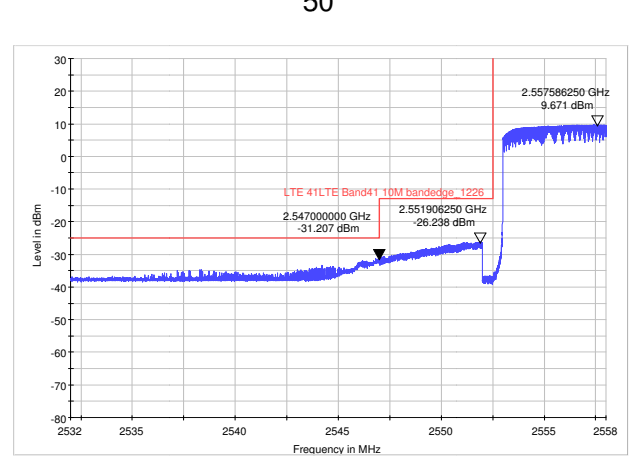




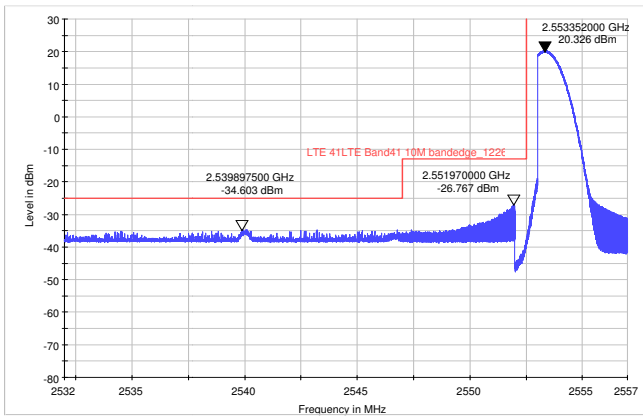
LTE Band 41 16QAM Bandwidth = 10MHz CH40265, RB 1



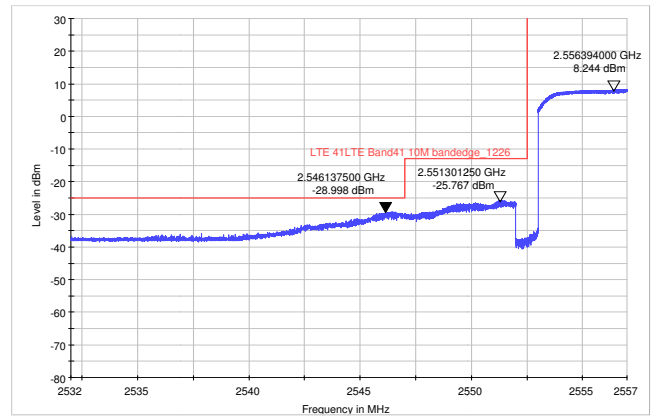
LTE Band 41 16QAM Bandwidth = 10MHz CH40265, RB 50



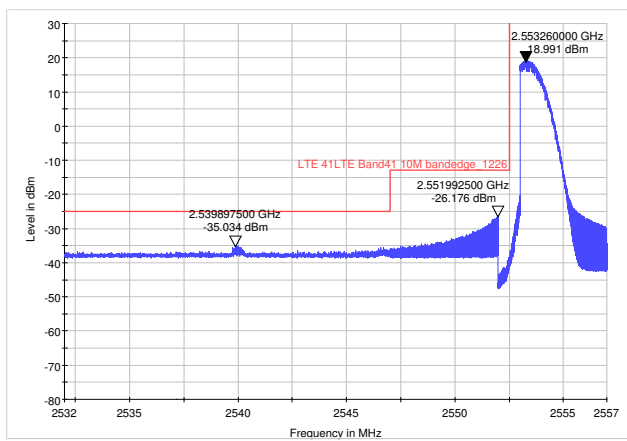
LTE Band 41 QPSK Bandwidth = 15MHz CH40290, RB 1



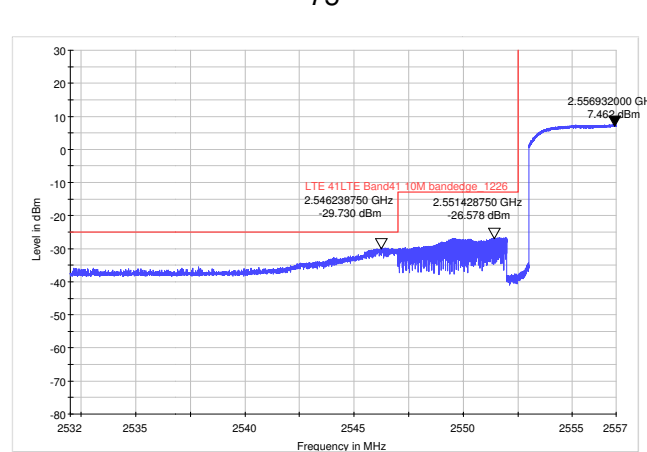
LTE Band 41 QPSK Bandwidth = 15MHz CH40290, RB 75



LTE Band 41 16QAM Bandwidth = 15MHz CH40290, RB 1

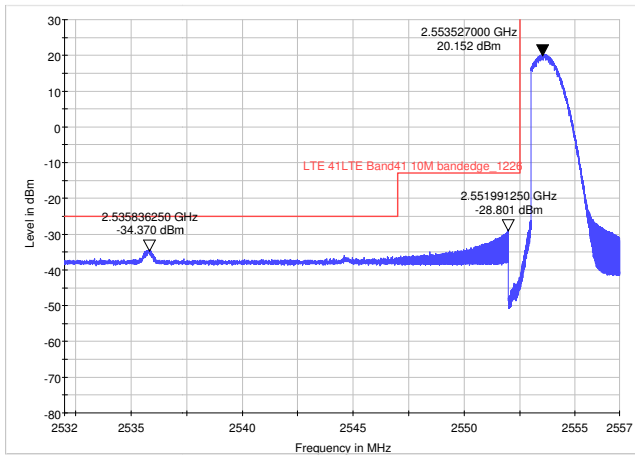


LTE Band 41 16QAM Bandwidth = 15MHz CH40290, RB 75

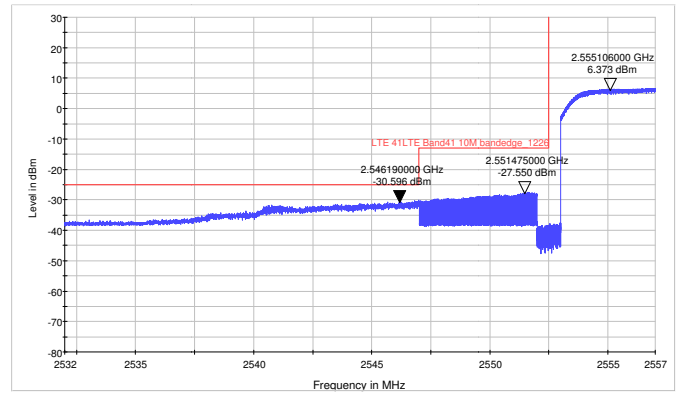




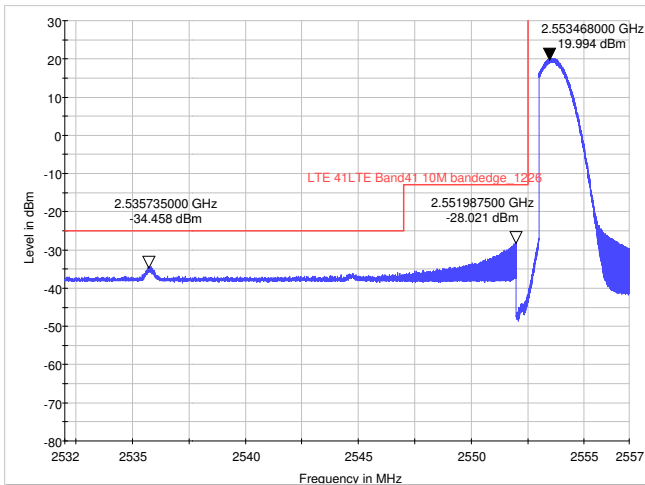
LTE Band 41 QPSK Bandwidth = 20MHz CH40315, RB 1



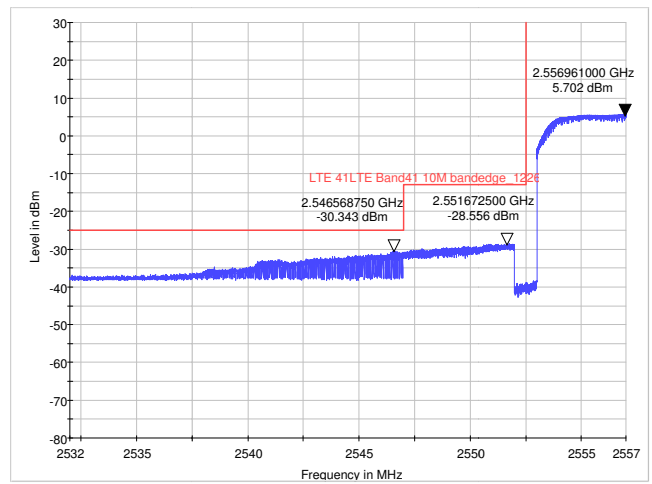
LTE Band 41 QPSK Bandwidth = 20MHz CH40315, RB 100



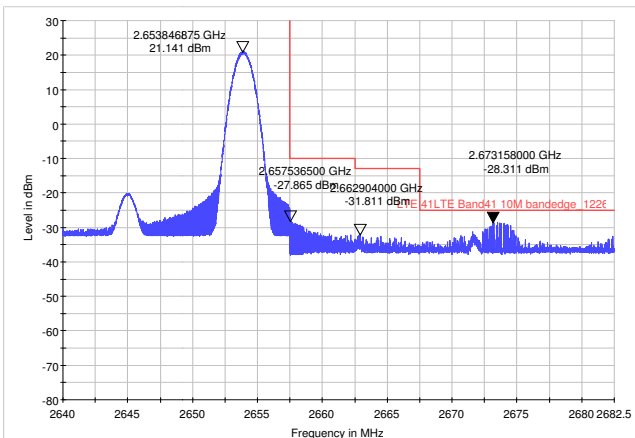
LTE Band 41 16QAM Bandwidth=20MHz CH40315, RB 1



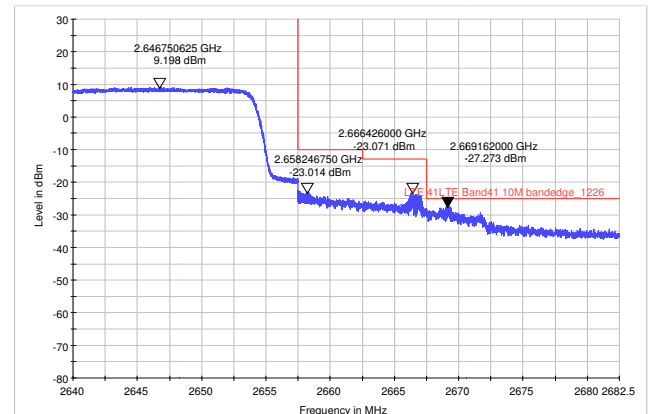
LTE Band 41 16QAM Bandwidth = 20MHz CH40315, RB 100



LTE Band 41 QPSK Bandwidth = 20MHz CH41140, RB 1

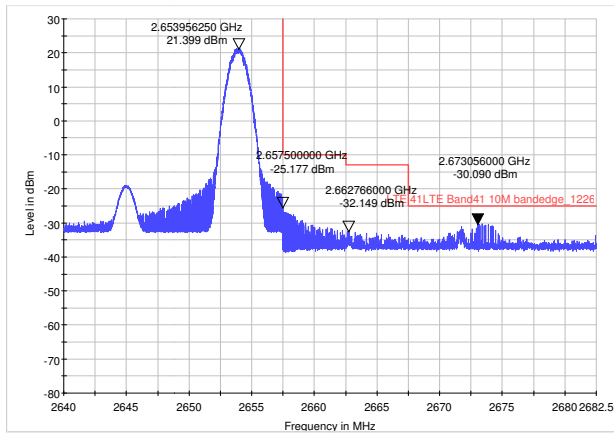


LTE Band 41 QPSK Bandwidth = 20MHz CH41140, RB 100

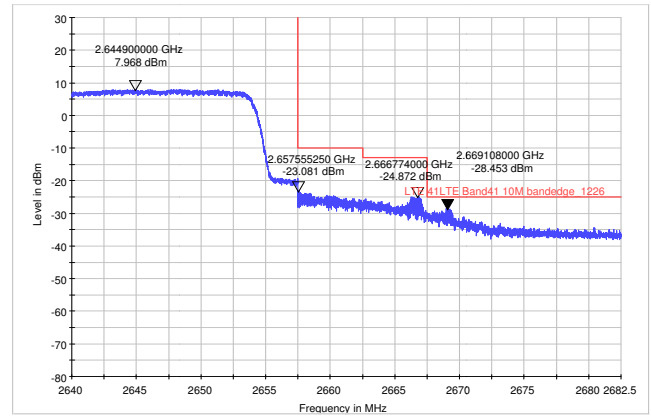




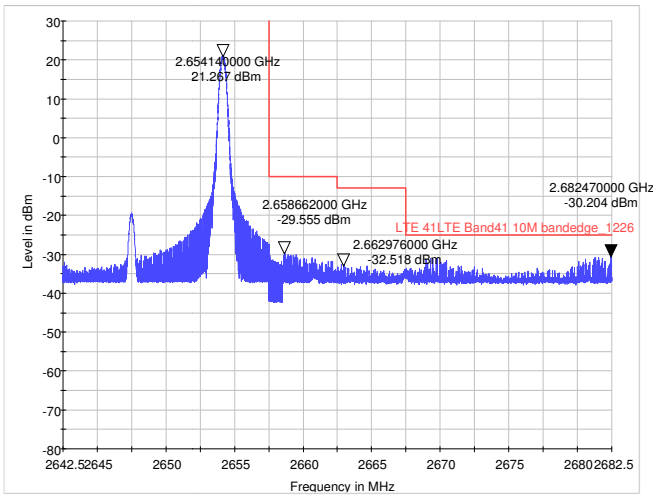
LTE Band 41 16QAM Bandwidth = 20MHz CH41140, RB 1



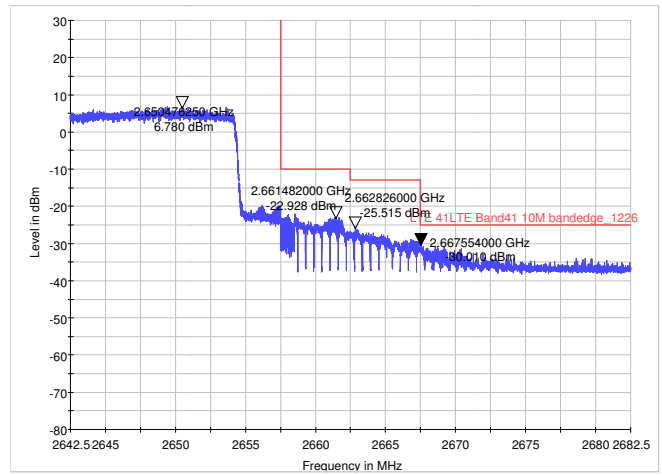
LTE Band 41 16QAM Bandwidth = 20MHz CH41140, RB 100



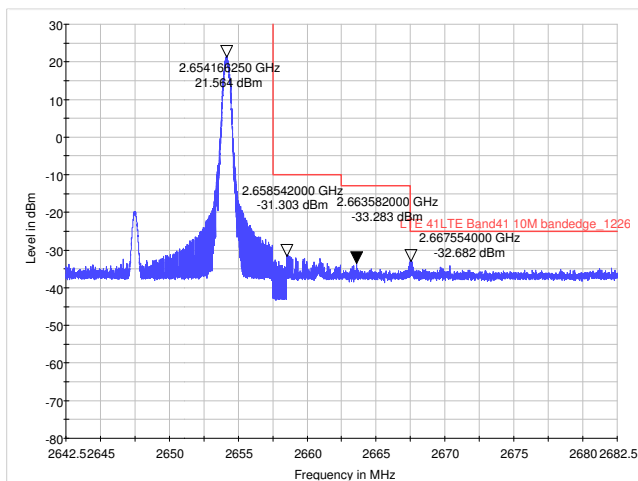
LTE Band 41 QPSK Bandwidth = 15MHz CH41165, RB 1



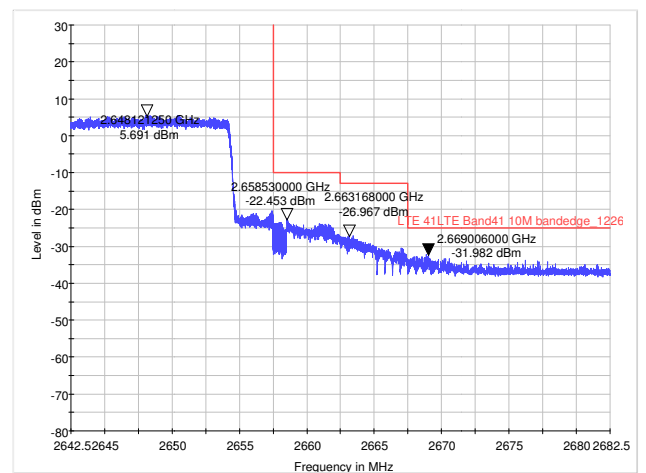
LTE Band 41 QPSK Bandwidth = 15MHz CH41165, RB 75



LTE Band 41 16QAM Bandwidth = 15MHz CH41165, RB 1

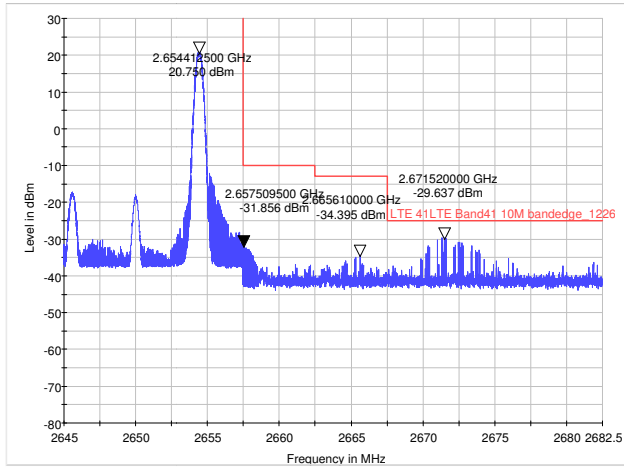


LTE Band 41 16QAM Bandwidth = 15MHz CH41165, RB 75

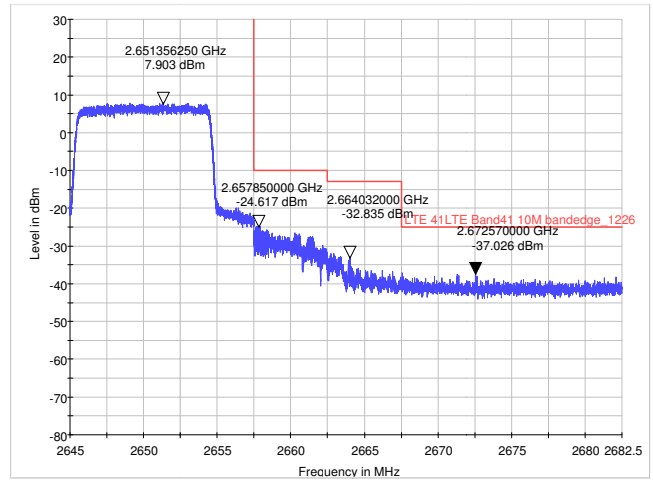




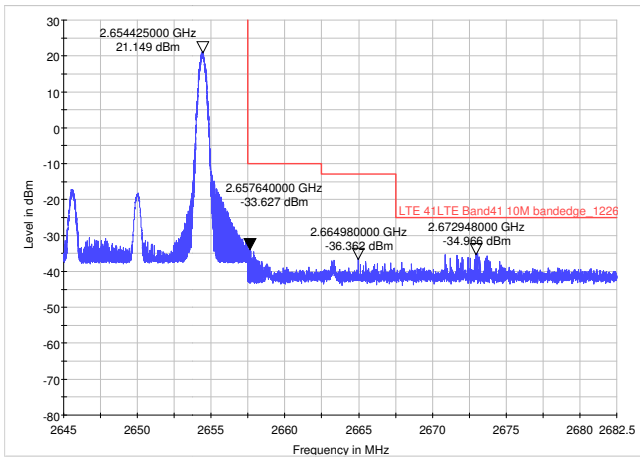
LTE Band 41 QPSK Bandwidth = 10MHz CH41190, RB 1



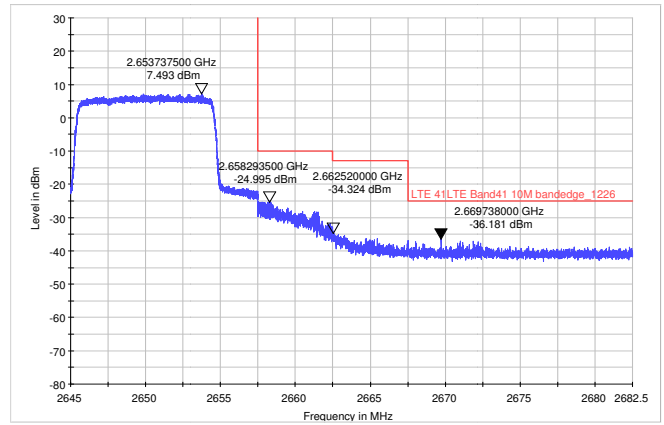
LTE Band 41 QPSK Bandwidth = 10MHz CH41190, RB 50



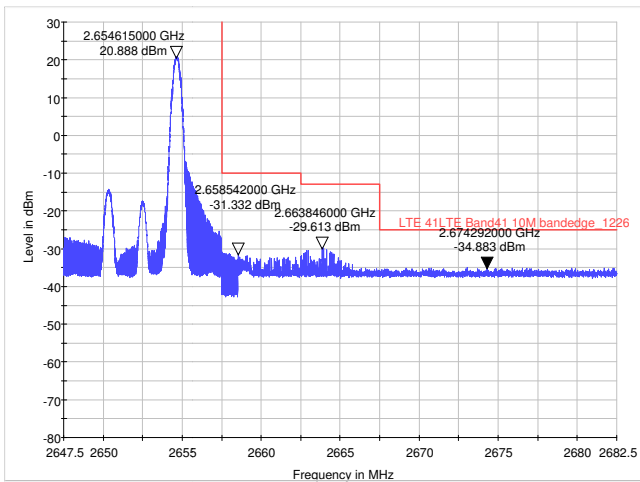
LTE Band 41 16QAM Bandwidth = 10MHz CH41190, RB 1



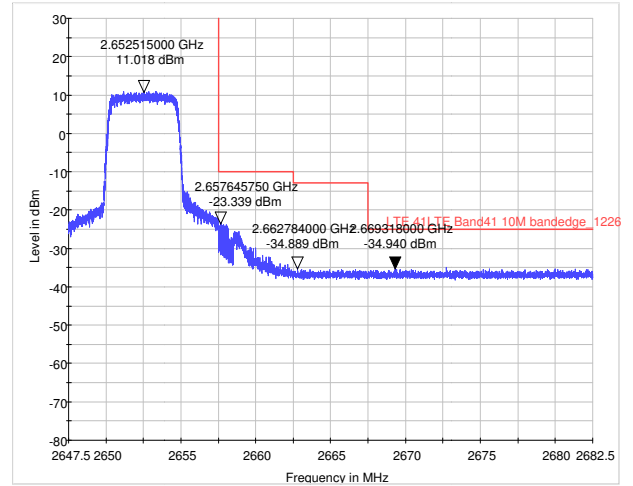
LTE Band 41 16QAM Bandwidth = 10MHz CH41190, RB 50



LTE Band 41 QPSK Bandwidth = 5MHz CH41215, RB 1



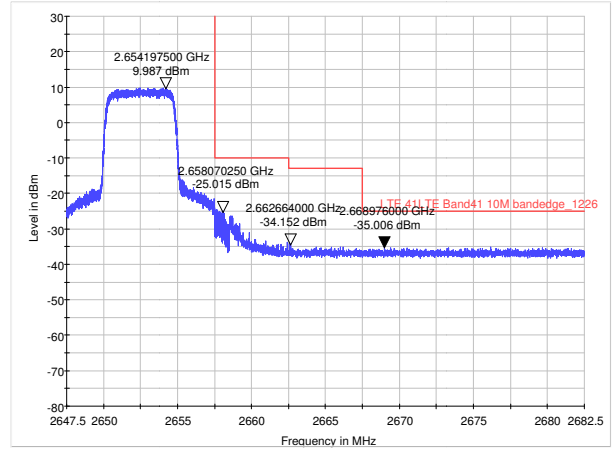
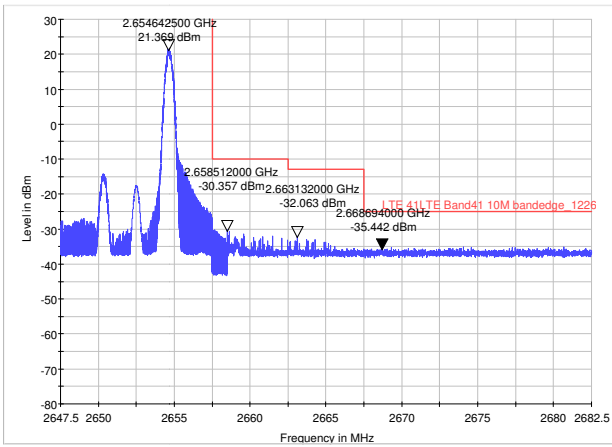
LTE Band 41 QPSK Bandwidth = 5MHz CH41215, RB 25





LTE Band 41 16QAM Bandwidth = 5MHz CH41215, RB 1

LTE Band 41 16QAM Bandwidth =5MHz CH41215, RB 25



4.5 Peak-to-Average Power Ratio (PAPR)

Ambient condition

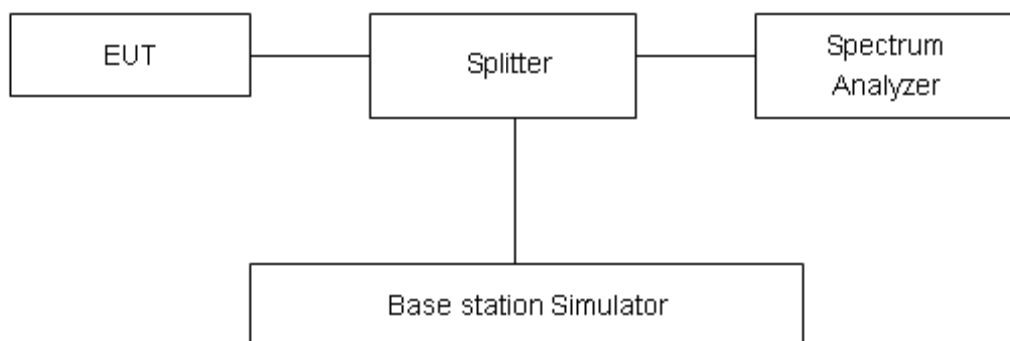
Temperature	Relative humidity
21°C ~25°C	40%~60%

Methods of Measurement

Measure the total peak power and record as PPk. And measure the total average power and record as PAvg. Both the peak and average power levels must be expressed in the same logarithmic units (e.g., dBm). Determine the PAPR from:

$$\text{PAPR (dB)} = \text{PPk (dBm)} - \text{PAvg (dBm)}.$$

Test Setup



Limits

Equipment employed must be authorized in accordance with the provisions of 24.51. Power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (d)(6) of this section. 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.in Part27.50(d).

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for thenormal distribution is with the coverage factor $k = 2$, $U = 0.4$ dB.

Test Results

LTE Band 41							
Modulation	Bandwidth ((MHz))	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Conclusion
QPSK	5	40240	2555	31.24	22.36	8.88	PASS
		40728	2603.8	30.16	22.68	7.48	PASS
		41215	2652.5	31.25	22.31	8.94	PASS
	10	40265	2557.5	30.87	22.33	8.54	PASS
		40728	2603.8	29.80	22.65	7.15	PASS
		41185	2650	30.91	22.28	8.63	PASS
	15	40290	2560	31.74	22.25	9.49	PASS
		40728	2603.8	30.41	22.66	7.75	PASS
		41165	2647.5	31.59	22.23	9.36	PASS
	20	40315	2562.5	31.75	22.36	9.39	PASS
		40728	2603.8	30.02	22.71	7.31	PASS
		41140	2645	31.08	22.19	8.89	PASS
16QAM	5	40240	2555	31.29	21.61	9.68	PASS
		40728	2603.8	29.86	21.64	8.22	PASS
		41215	2652.5	31.39	21.66	9.73	PASS
	10	40265	2557.5	32.68	21.58	11.10	PASS
		40728	2603.8	30.41	21.61	8.80	PASS
		41185	2650	31.69	21.63	10.06	PASS
	15	40290	2560	31.16	21.50	9.66	PASS
		40728	2603.8	30.02	21.62	8.40	PASS
		41165	2647.5	31.26	21.58	9.68	PASS
	20	40315	2562.5	31.47	21.61	9.86	PASS
		40728	2603.8	29.81	21.67	8.14	PASS
		41140	2645	32.16	21.54	10.62	PASS

4.6 Frequency Stability

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

1. Frequency Stability (Temperature Variation)

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

(1) With all power removed, the temperature was decreased to -10°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 -10°C to +55°C. Allow at least 1.5 hours at each temperature, un-powered, before making measurements.

2. Frequency Stability (Voltage Variation)

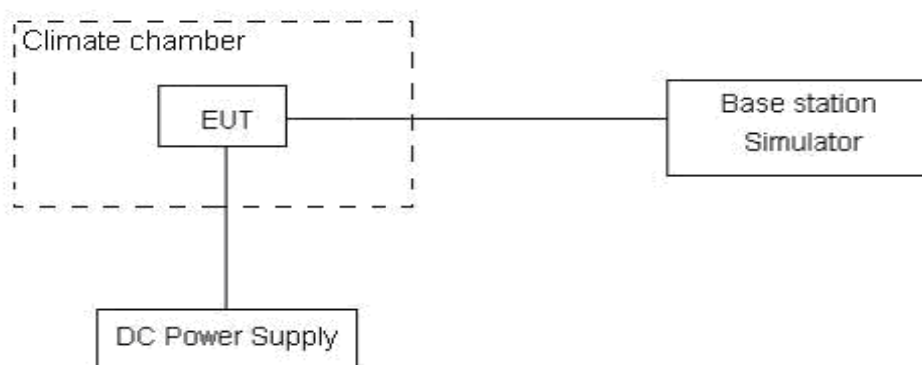
The frequency stability shall be measured with variation of primary supply voltage as follows:

(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.

This transceiver is specified to operate with an input voltage of between 3.5 V and 4.2 V, with a nominal voltage of 3.7V.

Test setup



Limits

No specific frequency stability requirements in part 27.54

Measurement Uncertainty

The assessed measurement uncertainty to ensure 99.75% confidence level for the normal distribution is with the coverage factor $k = 3$, $U=0.01\text{ppm}$.

Test Result

Bandwidth	Test status	LTE Band 41 Channel 40728 Test Results (ppm)		
		QPSK	16QAM	Conclusion
5MHz	50°C/3.7 V	0.00118	0.00206	PASS
	40°C/3.7 V	-0.00216	0.00029	PASS
	30°C/3.7 V	-0.00302	0.00035	PASS
	20°C/3.7 V	-0.00163	0.00195	PASS
	10°C/3.7 V	-0.00344	0.00072	PASS
	0°C/3.7 V	0.00009	0.00245	PASS
	-10°C/3.7 V	-0.00257	-0.00022	PASS
	-20°C/3.7 V	-0.00323	0.00083	PASS
	-30°C/3.7 V	-0.00180	0.00181	PASS
	20°C/4.2 V	-0.00367	0.00090	PASS
	20°C/3.5 V	-0.00198	0.00174	PASS
10MHz	50°C/3.7 V	-0.00137	0.00207	PASS
	40°C/3.7 V	-0.00213	0.00032	PASS
	30°C/3.7 V	-0.00468	0.00123	PASS
	20°C/3.7 V	-0.00249	0.00073	PASS
	10°C/3.7 V	-0.00305	0.00019	PASS
	0°C/3.7 V	-0.00097	-0.00008	PASS
	-10°C/3.7 V	-0.00152	-0.00034	PASS
	-20°C/3.7 V	-0.00115	0.00632	PASS
	-30°C/3.7 V	-0.00072	0.00660	PASS
	20°C/4.2 V	-0.00096	0.00701	PASS
	20°C/3.5 V	0.00781	0.00663	PASS
15MHz	50°C/3.7 V	0.00883	0.00716	PASS
	40°C/3.7 V	0.00900	0.00539	PASS
	30°C/3.7 V	0.01116	0.00789	PASS
	20°C/3.7 V	0.00871	0.00754	PASS
	10°C/3.7 V	0.00810	-0.00228	PASS
	0°C/3.7 V	0.00933	-0.00354	PASS
	-10°C/3.7 V	0.00899	-0.00146	PASS
	-20°C/3.7 V	0.00512	-0.00189	PASS
	-30°C/3.7 V	0.00207	0.00096	PASS
	20°C/4.2 V	0.00247	0.00093	PASS
	20°C/3.5 V	0.00117	0.00213	PASS
20MHz	50°C/3.7 V	0.00024	0.00230	PASS
	40°C/3.7 V	0.00043	0.00217	PASS
	30°C/3.7 V	0.00037	0.00085	PASS



	20°C/3.7 V	-0.00057	-0.00037	PASS
	10°C/3.7 V	0.00094	0.00058	PASS
	0°C/3.7 V	0.00070	0.00020	PASS
	-10°C/3.7 V	-0.00034	-0.00117	PASS
	-20°C/3.7 V	0.00035	0.00059	PASS
	-30°C/3.7 V	0.00044	-0.00008	PASS
	20°C/4.2 V	-0.00152	-0.00034	PASS
	20°C/3.5 V	-0.00115	0.00632	PASS

4.7 Spurious Emissions at Antenna Terminals

Ambient condition

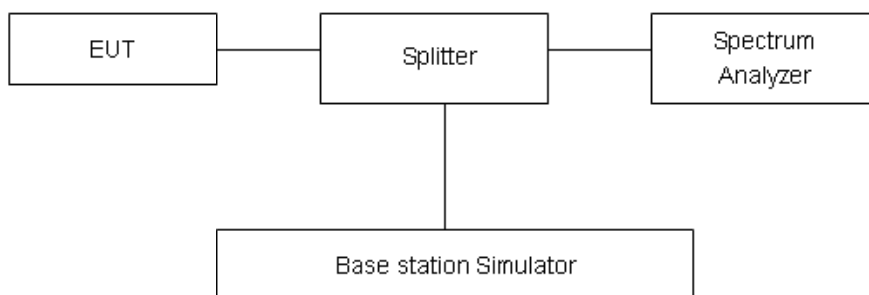
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

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 30MHz to the 10th harmonic of the carrier. The peak detector is used. RBW and VBW are set to 100 kHz for the carrier frequency, or RBW and VBW are set to 1MHz (other frequency), Sweep is set to ATUO.

Of those disturbances below (limit – 20 dB), the mark is not required for the EUT.

Test setup



Limits

LTE -4/12 Rule Part 27.53(h) specifies that “the power of any emission outside a licensee’s frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB.”

LTE -41 Rule Part 27.53(m) $55 + 10 \log(P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(4) of this section.

LTE -41 Limit	-25 dBm
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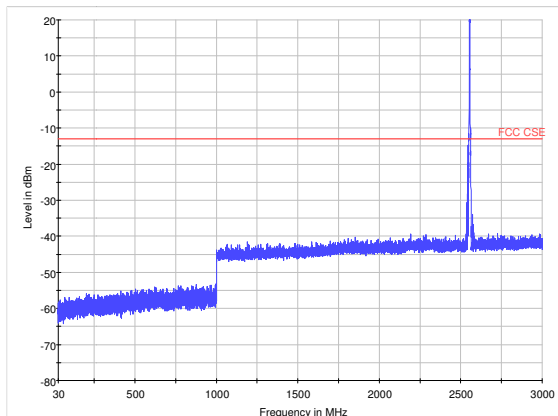
Measurement Uncertainty

The assessed measurement uncertainty to ensure 99.75% confidence level for the normal distribution is with the coverage factor $k = 1.96$.

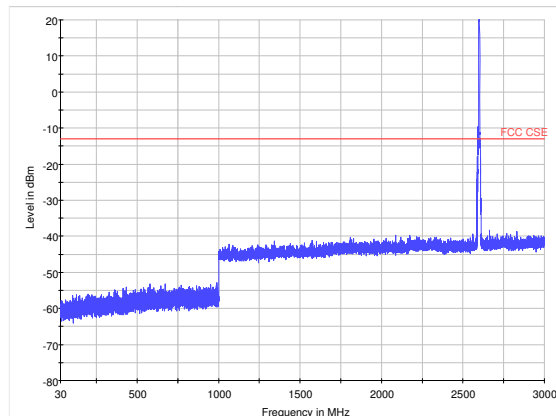
Frequency	Uncertainty
100kHz-2GHz	0.684 dB
2GHz-12.75GHz	1.407 dB

Test Result: PASS

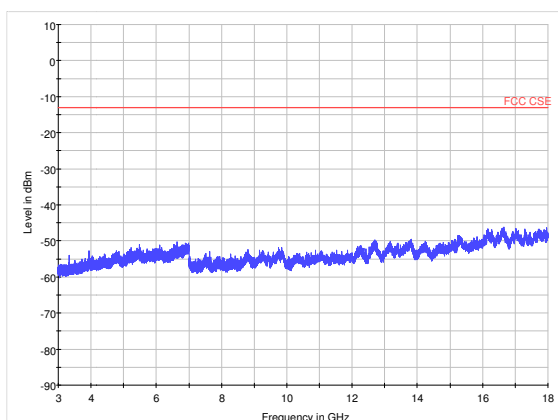
If disturbances were found more than 20dB below limit line, the mark is not required for the EUT.
The signal beyond the limit is carrier in the following plots.



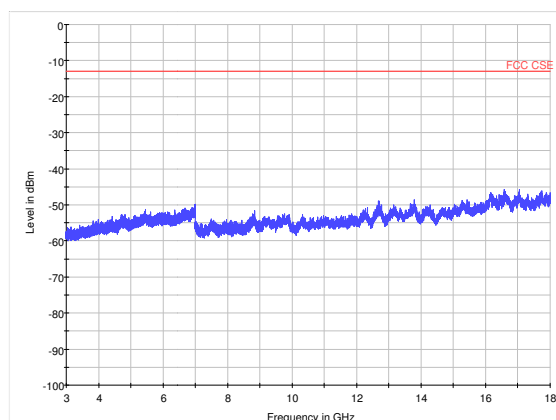
LTE Band 41 5MHz CH40240 30MHz~3GHz



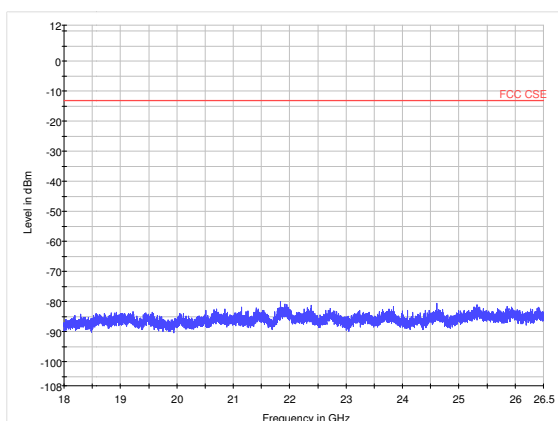
LTE Band 41 5MHz CH40728 30MHz~3GHz



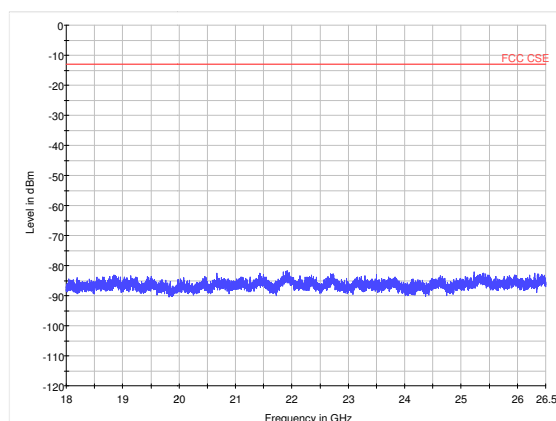
LTE Band 5MHz CH40240 3GHz~18GHz



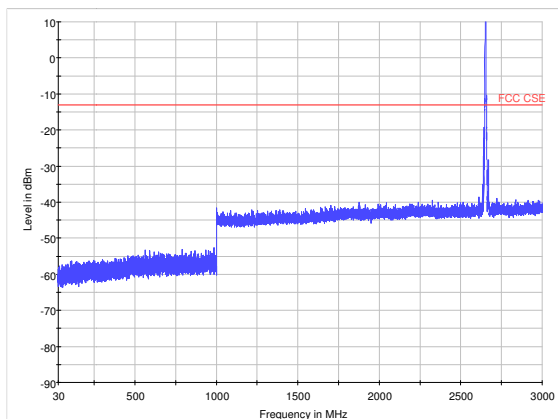
LTE Band 41 5MHz CH40728 3GHz~18GHz



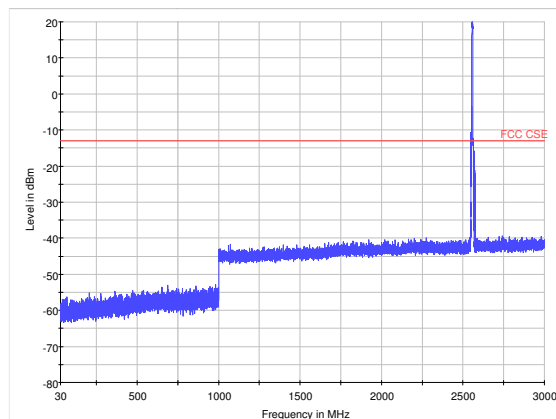
LTE Band 41 5MHz CH40240 18GHz~26.5GHz



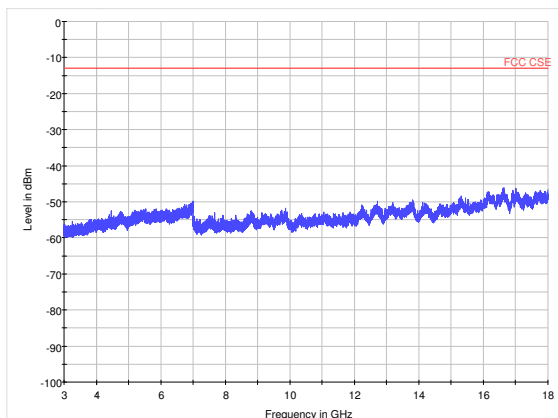
LTE Band 41 5MHz CH40728 18GHz~26.5GHz



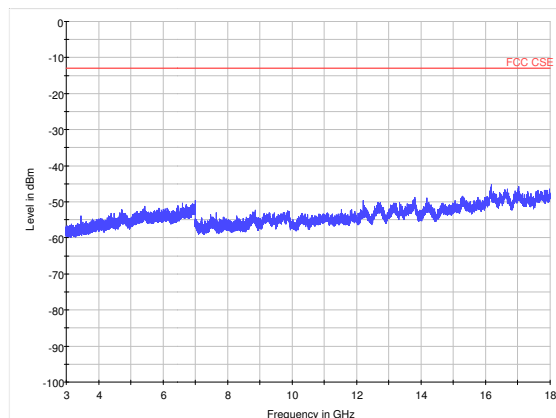
LTE Band 41 5MHz CH41215 30MHz~3GHz



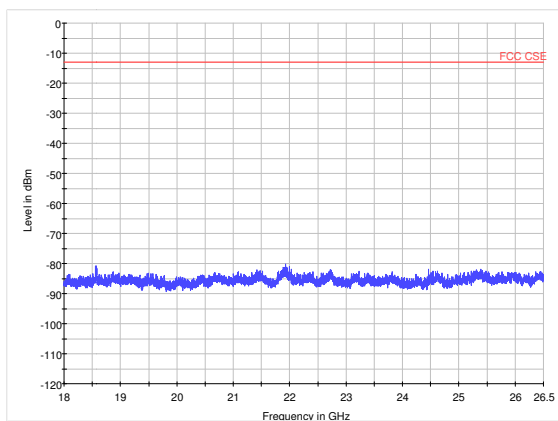
LTE Band 41 10MHz CH40265 30MHz~3GHz



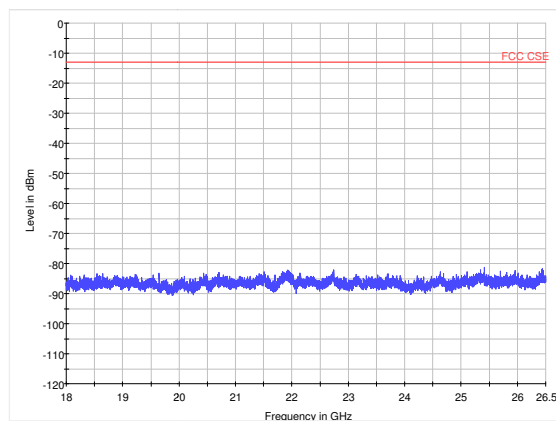
LTE Band 41 5MHz CH41215 3GHz~18GHz



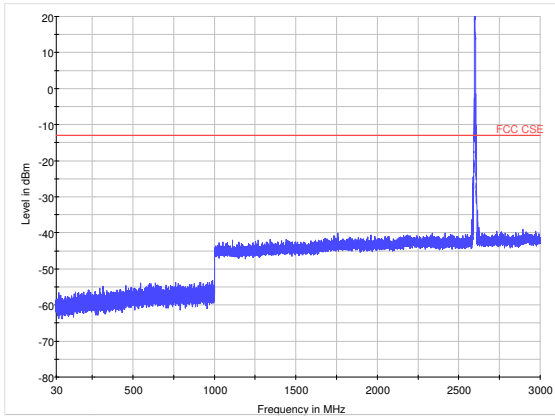
LTE Band 41 10MHz CH40265 3GHz~18GHz



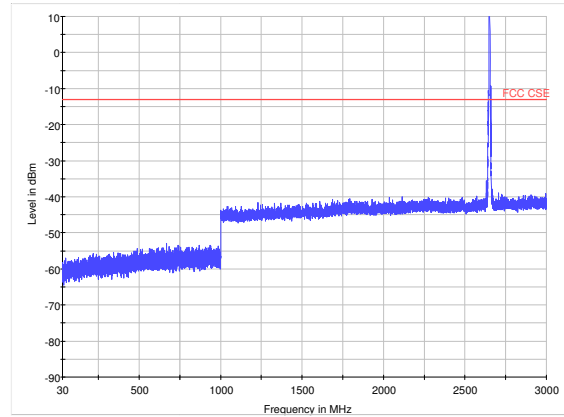
LTE Band 41 5MHz CH41215 18GHz~26.5GHz



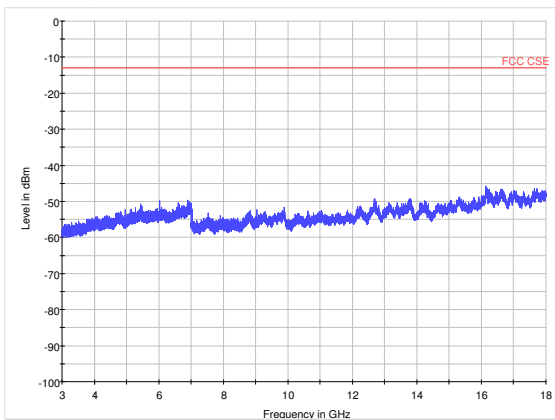
LTE Band 41 10MHz CH40265 18GHz~26.5GHz



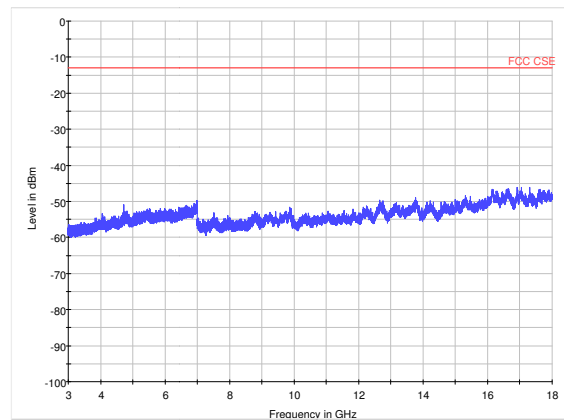
LTE Band 41 10MHz CH40728 30MHz~3GHz



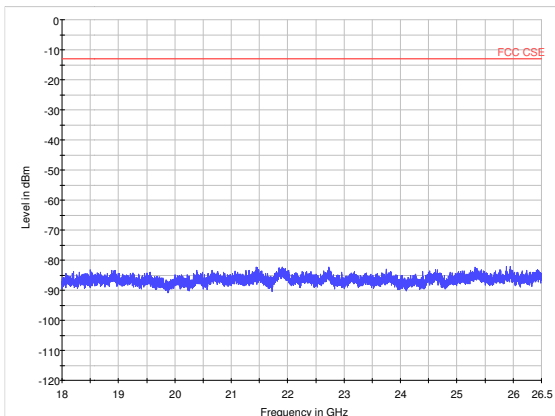
LTE Band 41 10MHz CH41185 30MHz~3GHz



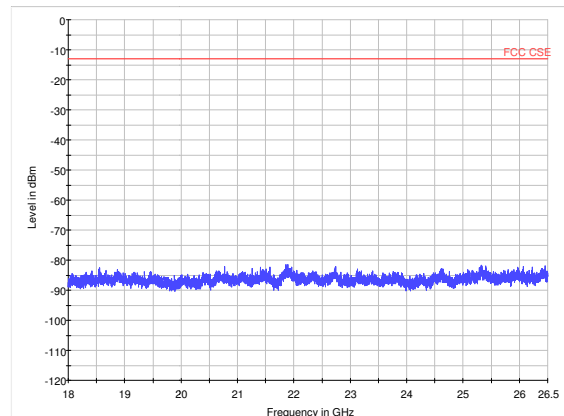
LTE Band 41 10MHz CH40728 3GHz~18GHz



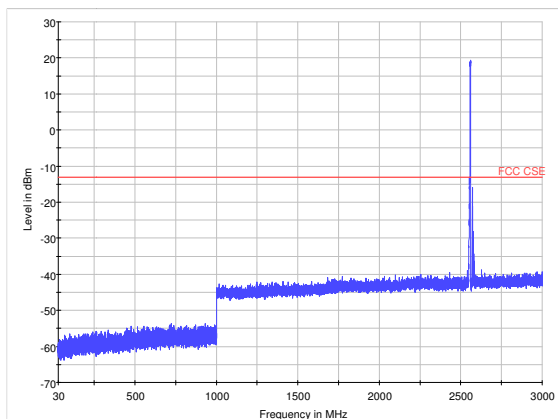
LTE Band 41 10MHz CH41185 3GHz~18GHz



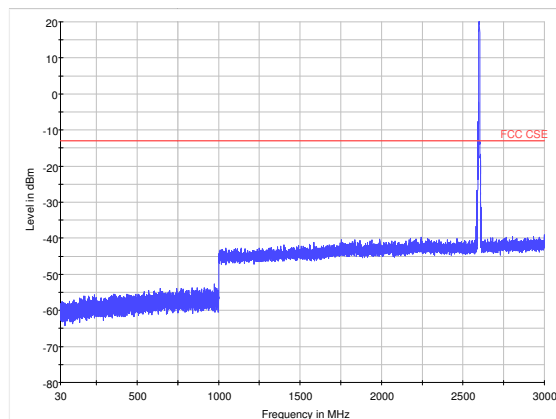
LTE Band 41 10MHz CH40728 18GHz~26.5GHz



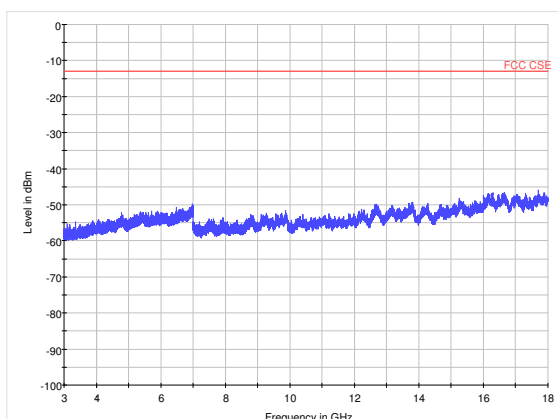
LTE Band 41 10MHz CH41185 18GHz~26.5GHz



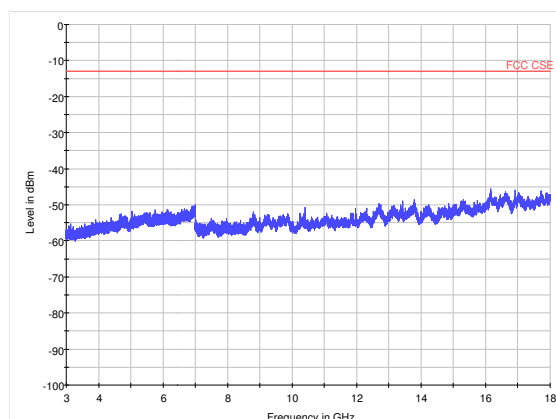
LTE Band 41 15MHz CH40290 30MHz~3GHz



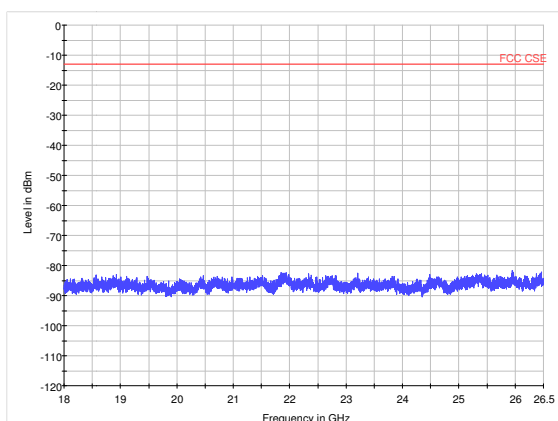
LTE Band 41 15MHz CH40728 30MHz~3GHz



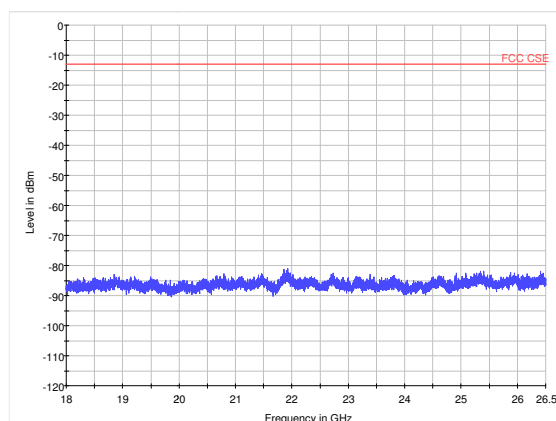
LTE Band 41 15MHz CH40290 3GHz~18GHz



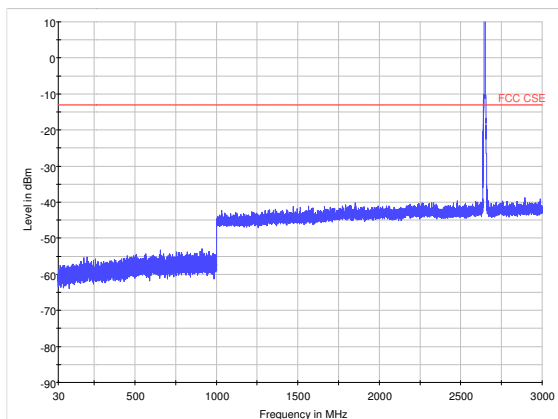
LTE Band 41 15MHz CH40728 3GHz~18GHz



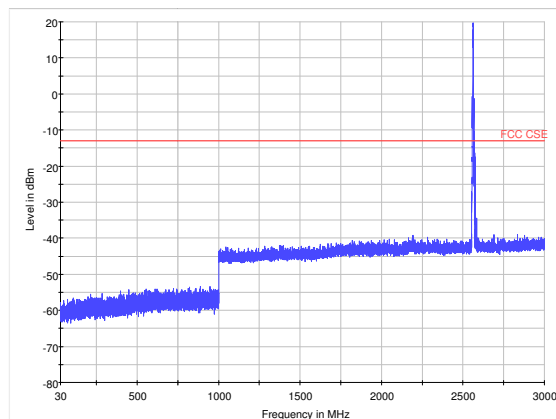
LTE Band 41 15MHz CH40290 18GHz~26.5GHz



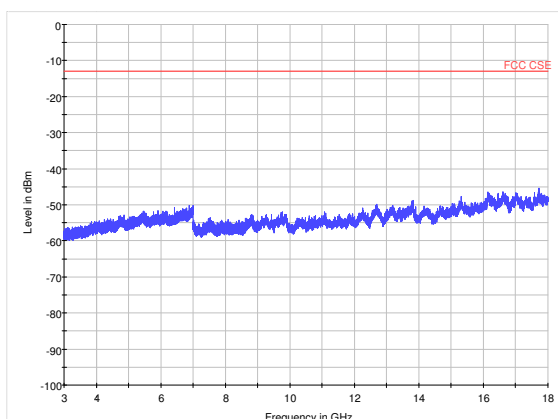
LTE Band 41 15MHz CH40728 18GHz~26.5GHz



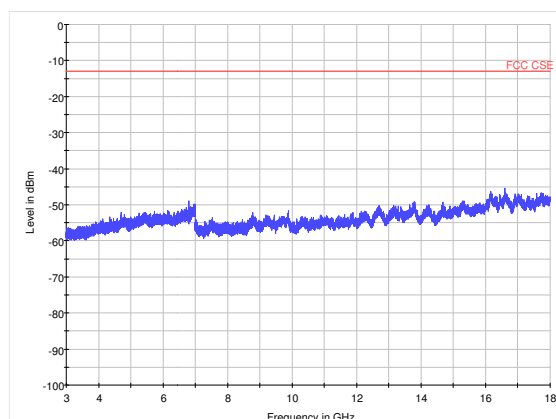
LTE Band 41 15MHz CH41165 30MHz~3GHz



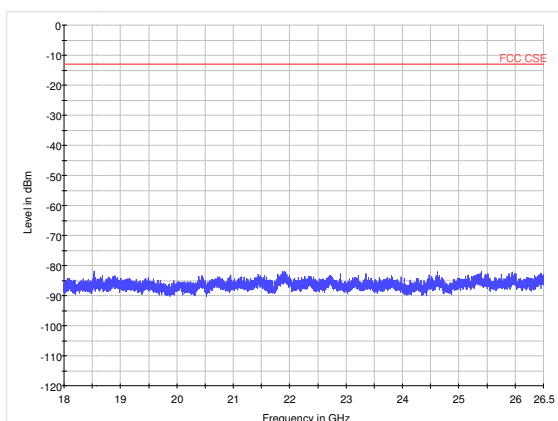
LTE Band 41 20MHz CH40315 30MHz~3GHz



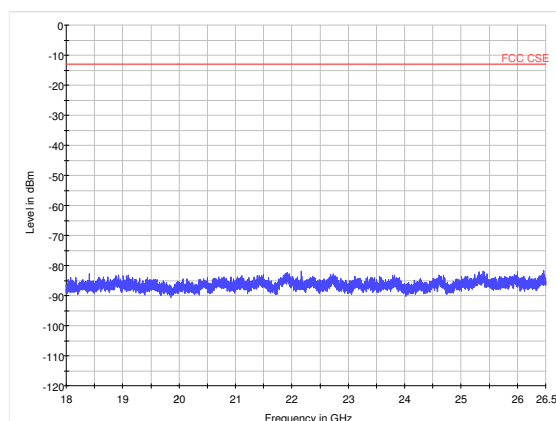
LTE Band 41 15MHz CH41165 3GHz~18GHz



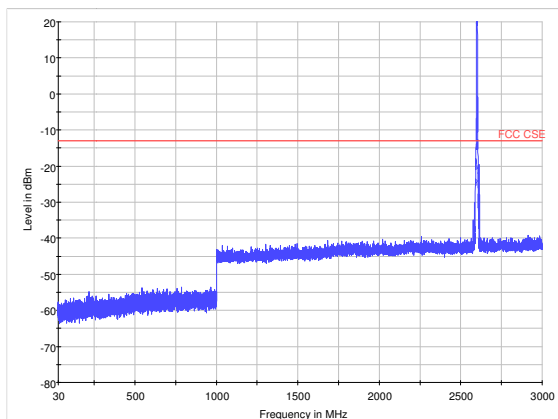
LTE Band 41 20MHz CH40315 3GHz~18GHz



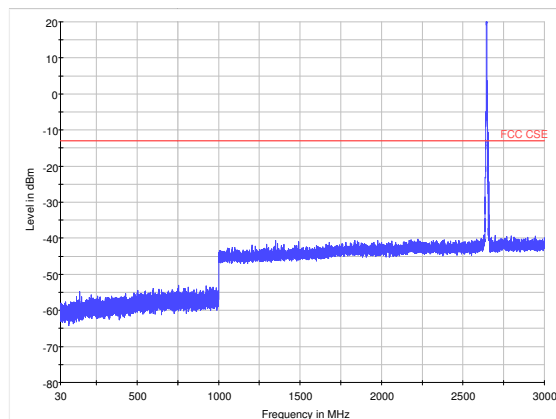
LTE Band 41 15MHz CH41165 18GHz~26.5GHz



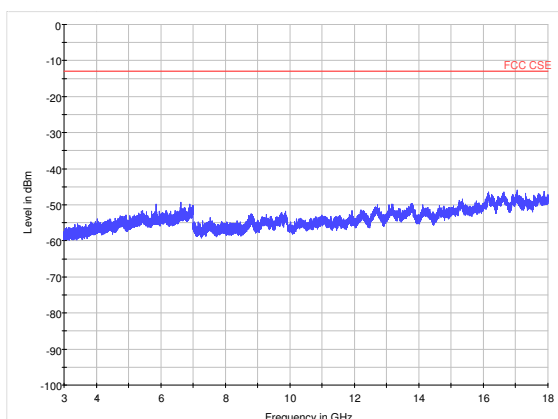
LTE Band 41 20MHz CH40315 18GHz~26.5GHz



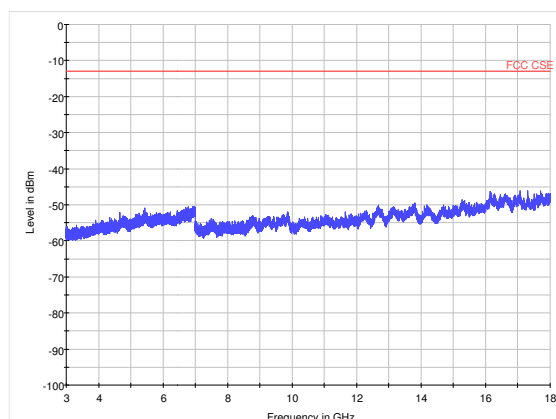
LTE Band 41 20MHz CH40728 30MHz~3GHz



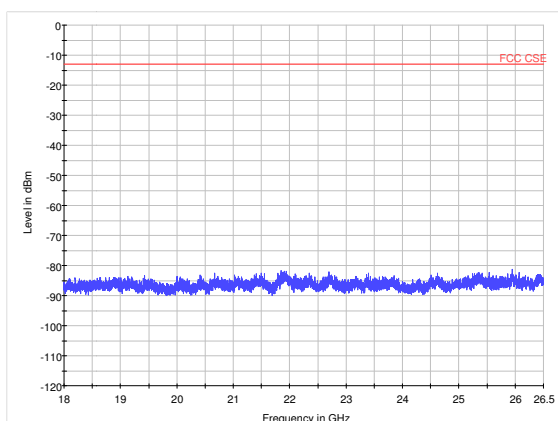
LTE Band 41 20MHz CH41140 30MHz~3GHz



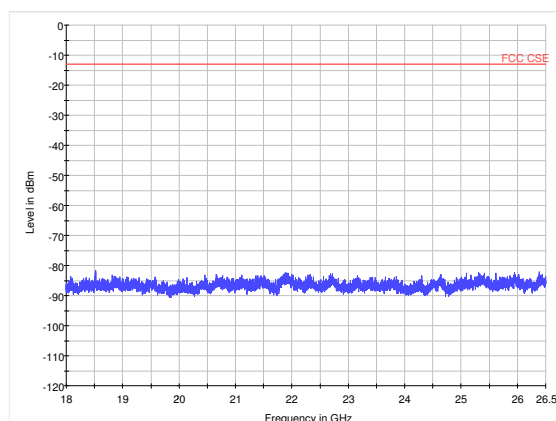
LTE Band 41 20MHz CH40728 3GHz~18GHz



LTE Band 41 20MHz CH41140 3GHz~18GHz



LTE Band 41 20MHz CH40728 18GHz~26.5GHz



LTE Band 41 20MHz CH41140 18GHz~26.5GHz

4.8 Radiates Spurious Emission

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The measurements procedures in TIA -603-D are used.

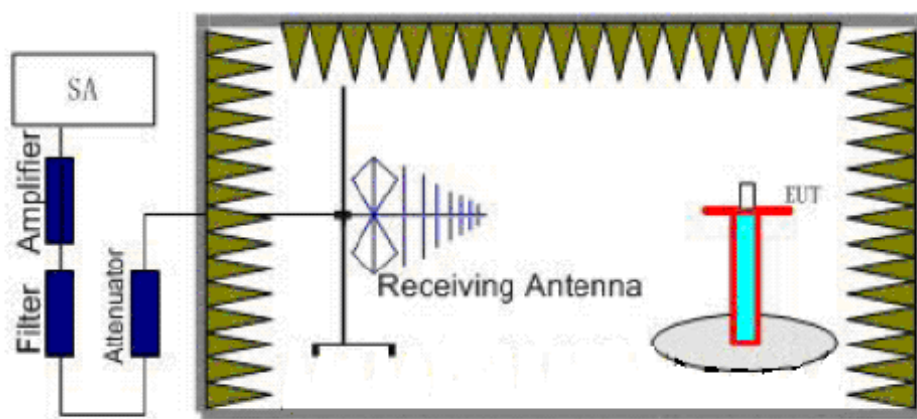
The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment.

The emissions less than 20 dB below the permissible value are reported.

The procedure of Radiates Spurious Emission is as follows:

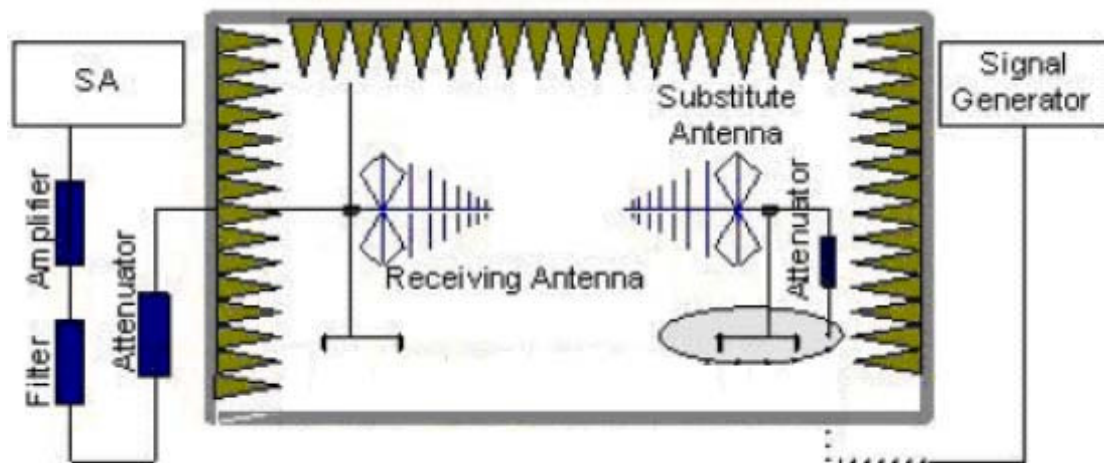
Step 1:

The measurement is carried out in the semi-anechoic chamber. EUT was placed on a 1.5 meters high non-conductive table at a 3 meters test distance from the test receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT. A radio link shall be established between EUT and Tester. The output power of the cell signal of the tester will be decreased until the output power of the EUT reach a maximum value. A peak detector is used while RBW and VBW are both set to 1MHz. During the measurement, the highest emission was recorded from analyzer power level (LVL) from the 360 degrees rotation of the turntable and the test antenna moved up and down over a range from 1 to 4 meters in both horizontally and vertically polarized orientations. The test setup refers to figure below.



Step 2:

A dipole antenna shall be substituted in place of the EUT. The antenna will be driven by a signal generator with a adjustable S.G. applied through a Tx cable. Adjust the level of the signal generator output until the value of the receiver reach the previously recorded analyzer power level (LVL). Then The E.R.P. /E.I.R.P. of the EUT can be calculated through the level of the signal generator, Tx cable loss and the gain of the substitution antenna. The test setup refers to figure below.



E.R.P (peak power) =S.G. - Tx Cable loss + Substitution antenna gain – 2.15.
EIRP= E.R.P+2.15

The field strength of spurious emission was measured in the following position: 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, vertical polarization) and the worst case was recorded.

Limits

LTE -4/12 Rule Part 27.53(h) specifies that “the power of any emission outside a licensee’s frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB.”

LTE -41 Rule Part 27.53(m) $55 + 10 \log (P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(4) of this section.

LTE -4/12 Limit	-13 dBm
LTE -41 Limit	-25 dBm

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = \pm 1.96$, $U = \pm 3.55$ dB.

Test Result

LTE Band 41 QPSK Bandwidth = 5MHz CH40240, RB 1

Harmonic	CH39675 Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	5110.0	-47.55	2.00	9.15	Vertical	-40.4	-25	15.4	0
3	7665.0	-51.05	2.50	11.35	Vertical	-42.2	-25	17.2	90
4	10220.0	-47.95	4.20	12.05	Vertical	-40.1	-25	15.1	135
5	12775.0	-45.45	5.20	12.85	Vertical	-37.8	-25	12.8	270
6	15330.0	-42.73	5.50	14.23	Vertical	-34.0	-25	9.0	225
7	17885.0	-44.25	5.70	14.15	Vertical	-35.8	-25	10.8	135
8	20440.0	-42.46	6.30	13.76	Vertical	-35.0	-25	10.0	225
9	22995.0	-41.85	6.80	14.05	Vertical	-34.6	-25	9.6	135
10	25550.0	-42.94	6.90	14.84	Vertical	-35.0	-25	10.0	0

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is vertical position.

LTE Band 41 QPSK Bandwidth = 5MHz CH40728, RB 1

Harmonic	CH40728 Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	5200.0	-48.55	2.00	9.15	Vertical	-41.4	-25	16.4	45
3	7800.0	-48.85	2.50	11.35	Vertical	-40.0	-25	15.0	90
4	10400.0	-48.25	4.20	12.05	Vertical	-40.4	-25	15.4	225
5	13000.0	-45.95	5.20	12.85	Vertical	-38.3	-25	13.3	90
6	15600.0	-45.53	5.50	14.23	Vertical	-36.8	-25	11.8	135
7	18200.0	-44.65	5.70	14.15	Vertical	-36.2	-25	11.2	225
8	20800.0	-42.66	6.30	13.76	Vertical	-35.2	-25	10.2	225
9	23400.0	-42.35	6.80	14.05	Vertical	-35.1	-25	10.1	90
10	26000.0	-42.14	6.90	14.84	Vertical	-34.2	-25	9.2	45

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is vertical position.

LTE Band 41 QPSK Bandwidth = 5MHz CH41215, RB 1

Harmonic	CH41565 Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	5125.0	-46.25	2.00	9.15	Vertical	-39.1	-25	14.1	225
3	7687.5	-42.55	2.50	11.35	Vertical	-33.7	-25	8.7	90
4	10250.0	-46.65	4.20	12.05	Vertical	-38.8	-25	13.8	45
5	12812.5	-45.45	5.20	12.85	Vertical	-37.8	-25	12.8	135
6	15375.0	-44.23	5.50	14.23	Vertical	-35.5	-25	10.5	0
7	17937.5	-43.55	5.70	14.15	Vertical	-35.1	-25	10.1	90
8	20500.0	-42.46	6.30	13.76	Vertical	-35.0	-25	10.0	135
9	23062.5	-41.75	6.80	14.05	Vertical	-34.5	-25	9.5	270
10	25625.0	-42.14	6.90	14.84	Vertical	-34.2	-25	9.2	225

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is vertical position.

LTE Band 41 QPSK Bandwidth = 10MHz CH40265, RB 1

Harmonic	CH39700 Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	5115.0	-46.35	2.00	9.15	Vertical	-39.2	-25	14.2	135
3	7672.5	-43.05	2.50	11.35	Vertical	-34.2	-25	9.2	225
4	10230.0	-44.15	4.20	12.05	Vertical	-36.3	-25	11.3	135
5	12787.5	-43.25	5.20	12.85	Vertical	-35.6	-25	10.6	0
6	15345.0	-45.63	5.50	14.23	Vertical	-36.9	-25	11.9	45
7	17902.5	-44.55	5.70	14.15	Vertical	-36.1	-25	11.1	90
8	20460.0	-43.06	6.30	13.76	Vertical	-35.6	-25	10.6	225
9	23017.5	-42.45	6.80	14.05	Vertical	-35.2	-25	10.2	90
10	25575.0	-41.04	6.90	14.84	Vertical	-33.1	-25	8.1	135

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is vertical position.



LTE Band 41 QPSK Bandwidth = 10MHz CH40728, RB 1

Harmonic	CH40728 Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	5200.0	-48.35	2.00	9.15	Vertical	-41.2	-25	16.2	225
3	7800.0	-48.25	2.50	11.35	Vertical	-39.4	-25	14.4	225
4	10400.0	-45.05	4.20	12.05	Vertical	-37.2	-25	12.2	90
5	13000.0	-43.15	5.20	12.85	Vertical	-35.5	-25	10.5	45
6	15600.0	-45.23	5.50	14.23	Vertical	-36.5	-25	11.5	225
7	18200.0	-44.65	5.70	14.15	Vertical	-36.2	-25	11.2	90
8	20800.0	-43.36	6.30	13.76	Vertical	-35.9	-25	10.9	90
9	23400.0	-42.65	6.80	14.05	Vertical	-35.4	-25	10.4	45
10	26000.0	-43.14	6.90	14.84	Vertical	-35.2	-25	10.2	135

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is vertical position.

LTE Band 41 QPSK Bandwidth = 10MHz CH41185, RB 1

Harmonic	CH41540 Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	5300.0	-45.85	2.00	10.15	Vertical	-37.7	-25	12.7	0
3	7950.0	-42.45	2.50	11.35	Vertical	-33.6	-25	8.6	90
4	10600.0	-43.15	4.20	12.05	Vertical	-35.3	-25	10.3	135
5	13250.0	-46.15	5.20	14.85	Vertical	-36.5	-25	11.5	270
6	15900.0	-45.13	5.50	13.23	Vertical	-37.4	-25	12.4	225
7	18550.0	-42.55	5.70	12.15	Vertical	-36.1	-25	11.1	135
8	21200.0	-43.06	6.30	13.76	Vertical	-35.6	-25	10.6	225
9	23850.0	-42.65	6.80	14.05	Vertical	-35.4	-25	10.4	135
10	26500.0	-42.14	6.90	14.84	Vertical	-34.2	-25	9.2	0

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is vertical position.

LTE Band 41 QPSK Bandwidth = 15MHz CH40290, RB 1

Harmonic	CH39725 Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	5120.0	-47.65	2.00	10.15	Vertical	-39.5	-25	14.5	45
3	7680.0	-43.55	2.50	11.35	Vertical	-34.7	-25	9.7	90
4	10240.0	-45.95	4.20	12.05	Vertical	-38.1	-25	13.1	225
5	12800.0	-46.35	5.20	14.85	Vertical	-36.7	-25	11.7	90
6	15360.0	-43.63	5.50	13.23	Vertical	-35.9	-25	10.9	135
7	17920.0	-42.45	5.70	12.15	Vertical	-36.0	-25	11.0	225
8	20480.0	-41.76	6.30	13.76	Vertical	-34.3	-25	9.3	225
9	23040.0	-40.55	6.80	14.05	Vertical	-33.3	-25	8.3	90
10	25600.0	-41.54	6.90	14.84	Vertical	-33.6	-25	8.6	45

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is vertical position.

LTE Band 41 QPSK Bandwidth = 15MHz CH40728, RB 1

Harmonic	CH40728 Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	5200.0	-53.75	2.00	10.15	Vertical	-45.6	-25	20.6	225
3	7800.0	-52.35	2.50	11.35	Vertical	-43.5	-25	18.5	90
4	10400.0	-48.45	4.20	12.05	Vertical	-40.6	-25	15.6	45
5	13000.0	-46.65	5.20	14.85	Vertical	-37.0	-25	12.0	135
6	15600.0	-45.33	5.50	13.23	Vertical	-37.6	-25	12.6	0
7	18200.0	-42.05	5.70	12.15	Vertical	-35.6	-25	10.6	90
8	20800.0	-42.66	6.30	13.76	Vertical	-35.2	-25	10.2	135
9	23400.0	-42.35	6.80	14.05	Vertical	-35.1	-25	10.1	270
10	26000.0	-42.44	6.90	14.84	Vertical	-34.5	-25	9.5	225

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is vertical position.

LTE Band 41 QPSK Bandwidth = 15MHz CH41165, RB 1

Harmonic	CH20325 Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	5295.0	-50.35	2.00	10.15	Vertical	-42.2	-25	17.2	135
3	7942.5	-43.15	2.50	11.35	Vertical	-34.3	-25	9.3	225
4	10590.0	-45.05	4.20	12.05	Vertical	-37.2	-25	12.2	135
5	13237.5	-45.35	5.20	14.85	Vertical	-35.7	-25	10.7	0
6	15885.0	-43.63	5.50	13.23	Vertical	-35.9	-25	10.9	45
7	18532.5	-40.95	5.70	12.15	Vertical	-34.5	-25	9.5	90
8	21180.0	-40.96	6.30	13.76	Vertical	-33.5	-25	8.5	225
9	23827.5	-40.45	6.80	14.05	Vertical	-33.2	-25	8.2	90
10	26475.0	-40.94	6.90	14.84	Vertical	-33.0	-25	8.0	135

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is vertical position.

LTE Band 41 QPSK Bandwidth = 20MHz CH40315, RB 1

Harmonic	CH39750 Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	5125.0	-50.15	2.00	10.15	Vertical	-42.0	-25	17.0	225
3	7687.5	-43.65	2.50	11.35	Vertical	-34.8	-25	9.8	225
4	10250.0	-46.65	4.20	12.05	Vertical	-38.8	-25	13.8	90
5	12812.5	-47.05	5.20	14.85	Vertical	-37.4	-25	12.4	45
6	15375.0	-44.13	5.50	13.23	Vertical	-36.4	-25	11.4	225
7	17937.5	-41.45	5.70	12.15	Vertical	-35.0	-25	10.0	90
8	20500.0	-41.96	6.30	13.76	Vertical	-34.5	-25	9.5	45
9	23062.5	-41.35	6.80	14.05	Vertical	-34.1	-25	9.1	135
10	25625.0	-41.44	6.90	14.84	Vertical	-33.5	-25	8.5	0

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is vertical position.

LTE Band 41 QPSK Bandwidth = 20MHz CH40728, RB 1

Harmonic	CH40728 Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	5200.0	-48.75	2.00	10.15	Vertical	-40.6	-25	15.6	90
3	7800.0	-48.25	2.50	11.35	Vertical	-39.4	-25	14.4	135
4	10400.0	-46.85	4.20	12.05	Vertical	-39.0	-25	14.0	270
5	13000.0	-45.75	5.20	14.85	Vertical	-36.1	-25	11.1	225
6	15600.0	-43.53	5.50	13.23	Vertical	-35.8	-25	10.8	135
7	18200.0	-41.85	5.70	12.15	Vertical	-35.4	-25	10.4	225
8	20800.0	-42.56	6.30	13.76	Vertical	-35.1	-25	10.1	135
9	23400.0	-41.75	6.80	14.05	Vertical	-34.5	-25	9.5	0
10	26000.0	-42.94	6.90	14.84	Vertical	-35.0	-25	10.0	45

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is vertical position.

LTE Band 41 QPSK Bandwidth = 20MHz CH41140, RB 1

Harmonic	CH41490 Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	5290.0	-51.05	2.00	10.15	Vertical	-42.9	-25	17.9	90
3	7935.0	-45.25	2.50	11.35	Vertical	-36.4	-25	11.4	225
4	10580.0	-45.55	4.20	12.05	Vertical	-37.7	-25	12.7	90
5	13225.0	-45.15	5.20	14.85	Vertical	-35.5	-25	10.5	135
6	15870.0	-43.53	5.50	13.23	Vertical	-35.8	-25	10.8	225
7	18515.0	-41.55	5.70	12.15	Vertical	-35.1	-25	10.1	225
8	21160.0	-42.06	6.30	13.76	Vertical	-34.6	-25	9.6	90
9	23805.0	-40.45	6.80	14.05	Vertical	-33.2	-25	8.2	45
10	26450.0	-40.94	6.90	14.84	Vertical	-33.0	-25	8.0	90

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is vertical position.

5 Main Test Instruments

Name	Type	Manufacturer	Serial Number	Calibration Date	Expiration Time
Base Station Simulator	CMW500	R&S	113645	2016-05-21	2017-05-20
Power Splitter	SHX-GF2-2-13	Hua Xiang	10120101	NA	NA
Universal Radio Communication Tester	E5515C	Agilent	MY48367192	2016-05-21	2017-05-20
Spectrum Analyzer	N9010A	Agilent	MY47191109	2016-05-21	2017-05-20
Signal Analyzer	FSV30	R&S	100815	2015-12-17	2016-12-16
Signal generator	SMB 100A	R&S	102594	2016-05-22	2017-05-21
Signal generator	SMR27	R&S	100365	2016-05-22	2017-05-21
EMI Test Receiver	ESCI	R&S	100948	2016-06-01	2017-05-31
Trilog Antenna	VUBL 9163	SCHWARZBECK	9163-201	2014-12-06	2017-12-05
Trilog Antenna	VUBL 9163	SCHWARZBECK	9163-391	2014-12-06	2017-12-05
Horn Antenna	HF907	R&S	100126	2014-12-06	2017-12-05
Horn Antenna	HF907	R&S	100125	2014-12-06	2017-12-05
Horn Antenna	3160-09	ETS-Lindgren	00102643	2015-01-30	2018-01-29
Horn Antenna	3160-09	ETS-Lindgren	00102644	2014-12-06	2017-12-05
Climatic Chamber	PT-30B	Re Ce	20101891	2016-07-17	2017-07-16
RF Cable	SMA 15cm	Agilent	0001	2016-10-06	2017-01-05

ANNEX A: EUT Appearance and Test Setup

A.1 EUT Appearance



Front Side

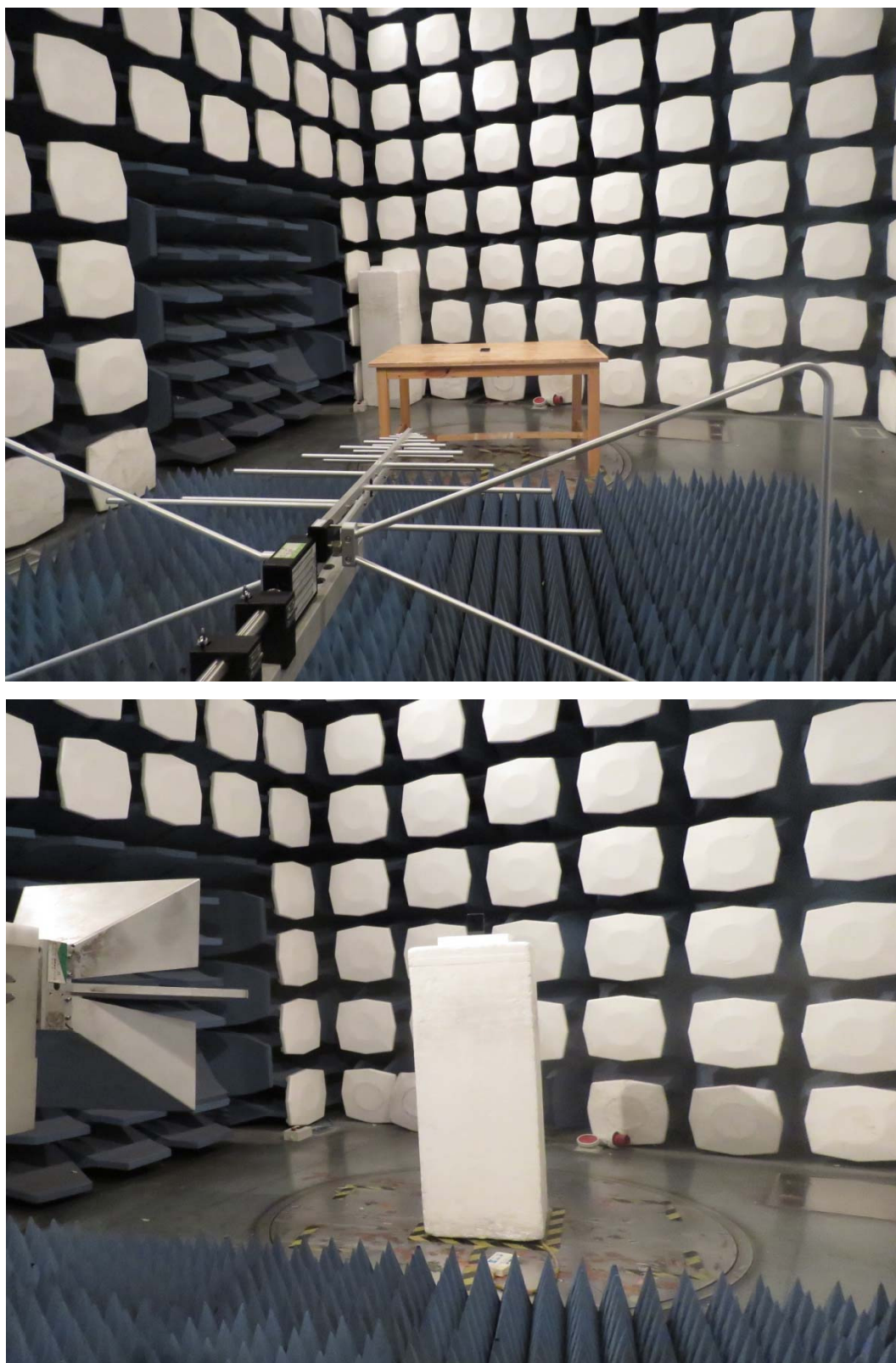


Back Side

a: EUT

Picture 1 EUT and Accessory

A.2 Test Setup



Picture 2: Radiated Spurious Emissions Test setup