



# RF TEST REPORT

**Applicant** Smawave Technology Co. ,Ltd  
**FCC ID** 2AU8HSRM310  
**Product** Outdoor CPE  
**Brand** Smawave  
**Model** SRM310, SRT011  
**Report No.** R2109A0783-R4  
**Issue Date** November 29, 2021

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 2 (2020)/ FCC CFR47 Part 27C (2020)**. 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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Approved by: Kai Xu

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## Summary of Measurement Results

Number	Test Case	Clause in FCC rules	Verdict
1	RF Power Output and Effective Isotropic Radiated Power	2.1046 /27.50(k)(3)	PASS
2	Occupied Bandwidth	2.1049	PASS
3	Band Edge Compliance	27.53(n)	PASS
4	Peak-to-Average Power Ratio	27.50(k) (4)/KDB971168 D01(5.7)	PASS
5	Frequency Stability	2.1055 / 27.54	PASS
6	Spurious Emissions at Antenna Terminals	2.1051 /27.53(n)	PASS
7	Radiates Spurious Emission	2.1053 /27.53(n)	PASS

Date of Testing: November 25, 2021 and November 26, 2021

Date of Sample Received: September 2, 2021

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.

All indications of Pass/Fail in this report are opinions expressed by TA Technology (Shanghai) Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.



# 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.

## 1.2. Test facility

### **FCC (Designation number: CN1179, Test Firm Registration Number: 446626)**

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

### **A2LA (Certificate Number: 3857.01)**

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

## 1.3 Testing Location

Company: TA Technology (Shanghai) Co., Ltd.  
Address: No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China  
City: Shanghai  
Post code: 201201  
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Website: <http://www.ta-shanghai.com>  
E-mail: [xukai@ta-shanghai.com](mailto:xukai@ta-shanghai.com)

## 2 General Description of Equipment under Test

### 2.1 Applicant and Manufacturer Information

Applicant	Smawave Technology Co. ,Ltd
Applicant address	3/F, Building 8, 1001 North Qinzhou Road, Xuhui District, Shanghai, China
Manufacturer	Smawave Technology Co. ,Ltd
Manufacturer address	3/F, Building 8, 1001 North Qinzhou Road, Xuhui District, Shanghai, China

### 2.2 General information

EUT Description			
Model	SRM310, SRT011		
SN	R2109A0783/S01		
Hardware Version	V1.0		
Software Version	MG56_BYPASS		
Power Supply	External power supply		
Antenna Type	Dipole Antenna		
Antenna Gain	8dBi		
Test Mode(s)	LTE Band 42		
Test Modulation	QPSK, 16QAM, 64QAM		
LTE Category	6		
Maximum Conducted Power(dBm)	dBm		
Maximum EIRP(dBm/10MHz)	dBm		
Rated Power Supply Voltage	24V		
Operating Voltage	Minimum: 19V    Maximum: 30V		
Operating Temperature	Lowest: -30°C    Highest: +70°C		
Testing Temperature	Lowest: -30°C    Highest: +70°C		
Operating Frequency Range(s)	Mode	Tx (MHz)	Rx (MHz)
	LTE Band 42	3450 ~ 3550	3450 ~ 3550
Note: 1. The EUT is sent from the applicant to TA and the information of the EUT is declared by the applicant.			



### 3 Applied Standards

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

**Test standards:**

**FCC CFR47 Part 27C (2020)**

**FCC CFR47 Part 2 (2020)**

**Reference standard:**

**ANSI C63.26 (2015)**

**KDB 971168 D01 Power Meas License Digital Systems v03r01**

## 4 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, horizontal 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 42:

Test items	Bandwidth (MHz)				Modulation		RB			Test Channel		
	5	10	15	20	QPSK	16QAM/ 64QAM	1	50%	100%	L	M	H
RF Power Output and Effective Isotropic Radiated Power	O	O	O	O	O	O	O	O	O	O	O	O
Occupied Bandwidth	O	O	O	O	O	O	-	-	O	O	O	O
Band Edge Compliance	O	O	O	O	O	O	O	-	O	O	-	O
Peak-to-Average Power Ratio	O	O	O	O	O	O	-	-	O	O	O	O
Frequency Stability	O	O	O	O	O	O	O	-	-	-	O	-
Spurious Emissions at Antenna Terminals	O	O	O	O	O	-	O	-	-	O	O	O
Radiates Spurious Emission	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.											

## 5 Test Case Results

### 5.1 RF Power Output and Effective Isotropic Radiated Power

#### 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 was connected to the Base Station Simulator with a known loss. The EUT is controlled by the Base Station Simulator test set to ensure max power transmission with proper modulation.

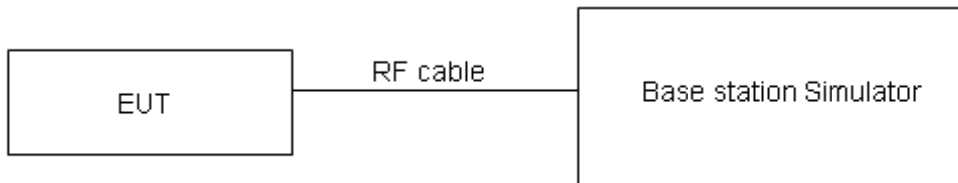
ERP can then be calculated as follows:

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

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

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

#### Test Setup



#### Limits

No specific RF power output requirements in part 2.1046.

Rule Part 27.50(k) (3) Mobile devices are limited to 1 Watt (30 dBm) EIRP. Mobile devices operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.

Part 27.50(k) (3) Limit	$\leq 1 \text{ W (30 dBm)}$
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#### Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 2$ ,  $U=0.4 \text{ dB}$  for RF power output,  $k = 2$ ,  $U= 1.19 \text{ dB}$  for ERP/EIRP.





## Test Results

BAND	Bandwidth	Modulation	Channel	RB Configuration	Maximum Output Power (dBm)	EIRP (dBm)
Band42	5M	QPSK	42115	1RB#0	20.23	28.23
Band42	5M	QPSK		1RB#13	19.93	27.93
Band42	5M	QPSK		1RB#24	20.12	28.12
Band42	5M	QPSK		12RB#0	20.06	28.06
Band42	5M	QPSK		12RB#6	20.10	28.10
Band42	5M	QPSK		12RB#13	20.04	28.04
Band42	5M	QPSK		25RB#0	19.98	27.98
Band42	5M	QPSK	42590	1RB#0	20.05	28.05
Band42	5M	QPSK		1RB#13	19.67	27.67
Band42	5M	QPSK		1RB#24	20.47	28.47
Band42	5M	QPSK		12RB#0	19.81	27.81
Band42	5M	QPSK		12RB#6	19.88	27.88
Band42	5M	QPSK		12RB#13	19.90	27.90
Band42	5M	QPSK		25RB#0	19.80	27.80
Band42	5M	QPSK	43065	1RB#0	21.03	29.03
Band42	5M	QPSK		1RB#13	20.76	28.76
Band42	5M	QPSK		1RB#24	20.95	28.95
Band42	5M	QPSK		12RB#0	20.81	28.81
Band42	5M	QPSK		12RB#6	20.73	28.73
Band42	5M	QPSK		12RB#13	20.75	28.75
Band42	5M	QPSK		25RB#0	20.80	28.80
Band42	5M	16QAM	42115	1RB#0	20.53	28.53
Band42	5M	16QAM		1RB#13	20.23	28.23
Band42	5M	16QAM		1RB#24	19.80	27.80
Band42	5M	16QAM		12RB#0	20.16	28.16
Band42	5M	16QAM		12RB#6	20.19	28.19
Band42	5M	16QAM		12RB#13	20.10	28.10
Band42	5M	16QAM		25RB#0	20.07	28.07
Band42	5M	16QAM	42590	1RB#0	20.27	28.27
Band42	5M	16QAM		1RB#13	19.95	27.95
Band42	5M	16QAM		1RB#24	20.76	28.76
Band42	5M	16QAM		12RB#0	19.82	27.82
Band42	5M	16QAM		12RB#6	19.98	27.98
Band42	5M	16QAM		12RB#13	19.95	27.95
Band42	5M	16QAM		25RB#0	19.80	27.80
Band42	5M	16QAM	43065	1RB#0	21.10	29.10
Band42	5M	16QAM		1RB#13	20.83	28.83
Band42	5M	16QAM		1RB#24	20.95	28.95



Band42	5M	16QAM		12RB#0	20.81	28.81
Band42	5M	16QAM		12RB#6	20.81	28.81
Band42	5M	16QAM		12RB#13	20.76	28.76
Band42	5M	16QAM		25RB#0	20.83	28.83
Band42	5M	64QAM	42115	1RB#0	19.98	27.98
Band42	5M	64QAM		1RB#13	19.69	27.69
Band42	5M	64QAM		1RB#24	19.86	27.86
Band42	5M	64QAM		12RB#0	19.56	27.56
Band42	5M	64QAM		12RB#6	19.60	27.60
Band42	5M	64QAM		12RB#13	19.52	27.52
Band42	5M	64QAM		25RB#0	19.51	27.51
Band42	5M	64QAM				
Band42	5M	64QAM	42590	1RB#0	19.22	27.22
Band42	5M	64QAM		1RB#13	18.88	26.88
Band42	5M	64QAM		1RB#24	19.70	27.70
Band42	5M	64QAM		12RB#0	19.31	27.31
Band42	5M	64QAM		12RB#6	19.38	27.38
Band42	5M	64QAM		12RB#13	19.45	27.45
Band42	5M	64QAM		25RB#0	19.28	27.28
Band42	5M	64QAM	43065	1RB#0	20.58	28.58
Band42	5M	64QAM		1RB#13	20.30	28.30
Band42	5M	64QAM		1RB#24	20.44	28.44
Band42	5M	64QAM		12RB#0	20.29	28.29
Band42	5M	64QAM		12RB#6	20.36	28.36
Band42	5M	64QAM		12RB#13	20.23	28.23
Band42	5M	64QAM		25RB#0	20.31	28.31
Band42	10M	QPSK	42140	1RB#0	20.25	28.25
Band42	10M	QPSK		1RB#25	19.96	27.96
Band42	10M	QPSK		1RB#49	20.14	28.14
Band42	10M	QPSK		25RB#0	20.09	28.09
Band42	10M	QPSK		25RB#13	20.13	28.13
Band42	10M	QPSK		25RB#25	20.06	28.06
Band42	10M	QPSK		50RB#0	20.06	28.06
Band42	10M	QPSK	42590	1RB#0	20.06	28.06
Band42	10M	QPSK		1RB#25	19.72	27.72
Band42	10M	QPSK		1RB#49	20.51	28.51
Band42	10M	QPSK		25RB#0	19.86	27.86
Band42	10M	QPSK		25RB#13	19.93	27.93
Band42	10M	QPSK		25RB#25	19.94	27.94
Band42	10M	QPSK		50RB#0	19.82	27.82
Band42	10M	QPSK	43040	1RB#0	21.06	29.06
Band42	10M	QPSK		1RB#25	20.80	28.80
Band42	10M	QPSK		1RB#49	20.98	28.98
Band42	10M	QPSK		25RB#0	20.85	28.85



Band42	10M	QPSK		25RB#13	20.77	28.77	
Band42	10M	QPSK		25RB#25	20.80	28.80	
Band42	10M	QPSK		50RB#0	20.84	28.84	
Band42	10M	16QAM	42140	1RB#0	20.55	28.55	
Band42	10M	16QAM		1RB#25	20.26	28.26	
Band42	10M	16QAM		1RB#49	19.83	27.83	
Band42	10M	16QAM		25RB#0	20.19	28.19	
Band42	10M	16QAM		25RB#13	20.21	28.21	
Band42	10M	16QAM		25RB#25	20.13	28.13	
Band42	10M	16QAM		50RB#0	20.10	28.10	
Band42	10M	16QAM		42590	1RB#0	20.30	28.30
Band42	10M	16QAM			1RB#25	19.99	27.99
Band42	10M	16QAM			1RB#49	20.78	28.78
Band42	10M	16QAM	25RB#0		19.87	27.87	
Band42	10M	16QAM	25RB#13		20.02	28.02	
Band42	10M	16QAM	25RB#25		20.00	28.00	
Band42	10M	16QAM	50RB#0		19.85	27.85	
Band42	10M	16QAM	43040	1RB#0	21.12	29.12	
Band42	10M	16QAM		1RB#25	20.86	28.86	
Band42	10M	16QAM		1RB#49	20.98	28.98	
Band42	10M	16QAM		25RB#0	20.85	28.85	
Band42	10M	16QAM		25RB#13	20.84	28.84	
Band42	10M	16QAM		25RB#25	20.80	28.80	
Band42	10M	16QAM		50RB#0	20.87	28.87	
Band42	10M	64QAM	42140	1RB#0	20.00	28.00	
Band42	10M	64QAM		1RB#25	19.72	27.72	
Band42	10M	64QAM		1RB#49	19.89	27.89	
Band42	10M	64QAM		25RB#0	19.59	27.59	
Band42	10M	64QAM		25RB#13	19.62	27.62	
Band42	10M	64QAM		25RB#25	19.55	27.55	
Band42	10M	64QAM		50RB#0	19.54	27.54	
Band42	10M	64QAM	42590	1RB#0	19.25	27.25	
Band42	10M	64QAM		1RB#25	18.92	26.92	
Band42	10M	64QAM		1RB#49	19.72	27.72	
Band42	10M	64QAM		25RB#0	19.36	27.36	
Band42	10M	64QAM		25RB#13	19.42	27.42	
Band42	10M	64QAM		25RB#25	19.50	27.50	
Band42	10M	64QAM		50RB#0	19.33	27.33	
Band42	10M	64QAM	43040	1RB#0	20.60	28.60	
Band42	10M	64QAM		1RB#25	20.33	28.33	
Band42	10M	64QAM		1RB#49	20.47	28.47	
Band42	10M	64QAM		25RB#0	20.33	28.33	
Band42	10M	64QAM		25RB#13	20.39	28.39	



Band42	10M	64QAM		25RB#25	20.27	28.27
Band42	10M	64QAM		50RB#0	20.35	28.35
Band42	15M	QPSK	42165	1RB#0	20.24	28.24
Band42	15M	QPSK		1RB#38	19.94	27.94
Band42	15M	QPSK		1RB#74	20.11	28.11
Band42	15M	QPSK		36RB#0	20.07	28.07
Band42	15M	QPSK		36RB#18	20.10	28.10
Band42	15M	QPSK		36RB#39	20.03	28.03
Band42	15M	QPSK		75RB#0	20.04	28.04
Band42	15M	QPSK		42590	1RB#0	20.02
Band42	15M	QPSK	1RB#38		19.71	27.71
Band42	15M	QPSK	1RB#74		20.46	28.46
Band42	15M	QPSK	36RB#0		19.82	27.82
Band42	15M	QPSK	36RB#18		19.88	27.88
Band42	15M	QPSK	36RB#39		19.91	27.91
Band42	15M	QPSK	75RB#0		19.78	27.78
Band42	15M	QPSK	43015		1RB#0	21.04
Band42	15M	QPSK		1RB#38	20.77	28.77
Band42	15M	QPSK		1RB#74	20.94	28.94
Band42	15M	QPSK		36RB#0	20.82	28.82
Band42	15M	QPSK		36RB#18	20.73	28.73
Band42	15M	QPSK		36RB#39	20.76	28.76
Band42	15M	QPSK		75RB#0	20.79	28.79
Band42	15M	16QAM		42165	1RB#0	20.50
Band42	15M	16QAM	1RB#38		20.24	28.24
Band42	15M	16QAM	1RB#74		19.80	27.80
Band42	15M	16QAM	36RB#0		20.16	28.16
Band42	15M	16QAM	36RB#18		20.18	28.18
Band42	15M	16QAM	36RB#39		20.11	28.11
Band42	15M	16QAM	75RB#0		20.07	28.07
Band42	15M	16QAM	42590		1RB#0	20.28
Band42	15M	16QAM		1RB#38	19.96	27.96
Band42	15M	16QAM		1RB#74	20.74	28.74
Band42	15M	16QAM		36RB#0	19.85	27.85
Band42	15M	16QAM		36RB#18	19.97	27.97
Band42	15M	16QAM		36RB#39	19.96	27.96
Band42	15M	16QAM		75RB#0	19.80	27.80
Band42	15M	16QAM		43015	1RB#0	21.10
Band42	15M	16QAM	1RB#38		20.84	28.84
Band42	15M	16QAM	1RB#74		20.95	28.95
Band42	15M	16QAM	36RB#0		20.82	28.82
Band42	15M	16QAM	36RB#18		20.80	28.80
Band42	15M	16QAM	36RB#39		20.77	28.77



Band42	15M	16QAM	42165	75RB#0	20.83	28.83
Band42	15M	64QAM		1RB#0	19.95	27.95
Band42	15M	64QAM		1RB#38	19.70	27.70
Band42	15M	64QAM		1RB#74	19.86	27.86
Band42	15M	64QAM		36RB#0	19.56	27.56
Band42	15M	64QAM		36RB#18	19.59	27.59
Band42	15M	64QAM		36RB#39	19.53	27.53
Band42	15M	64QAM		75RB#0	19.51	27.51
Band42	15M	64QAM	42590	1RB#0	19.23	27.23
Band42	15M	64QAM		1RB#38	18.89	26.89
Band42	15M	64QAM		1RB#74	19.68	27.68
Band42	15M	64QAM		36RB#0	19.34	27.34
Band42	15M	64QAM		36RB#18	19.37	27.37
Band42	15M	64QAM		36RB#39	19.46	27.46
Band42	15M	64QAM		75RB#0	19.28	27.28
Band42	15M	64QAM	43015	1RB#0	20.58	28.58
Band42	15M	64QAM		1RB#38	20.31	28.31
Band42	15M	64QAM		1RB#74	20.44	28.44
Band42	15M	64QAM		36RB#0	20.30	28.30
Band42	15M	64QAM		36RB#18	20.35	28.35
Band42	15M	64QAM		36RB#39	20.24	28.24
Band42	15M	64QAM		75RB#0	20.31	28.31
Band42	20M	QPSK	42190	1RB#0	20.21	28.21
Band42	20M	QPSK		1RB#50	19.93	27.93
Band42	20M	QPSK		1RB#99	20.09	28.09
Band42	20M	QPSK		50RB#0	20.04	28.04
Band42	20M	QPSK		50RB#25	20.08	28.08
Band42	20M	QPSK		50RB#50	20.00	28.00
Band42	20M	QPSK		100RB#0	20.01	28.01
Band42	20M	QPSK	42590	1RB#0	19.98	27.98
Band42	20M	QPSK		1RB#50	19.67	27.67
Band42	20M	QPSK		1RB#99	20.45	28.45
Band42	20M	QPSK		50RB#0	19.77	27.77
Band42	20M	QPSK		50RB#25	19.84	27.84
Band42	20M	QPSK		50RB#50	19.86	27.86
Band42	20M	QPSK		100RB#0	19.73	27.73
Band42	20M	QPSK	42990	1RB#0	21.01	29.01
Band42	20M	QPSK		1RB#50	20.75	28.75
Band42	20M	QPSK		1RB#99	20.91	28.91
Band42	20M	QPSK		50RB#0	20.78	28.78
Band42	20M	QPSK		50RB#25	20.70	28.70
Band42	20M	QPSK		50RB#50	20.72	28.72
Band42	20M	QPSK		100RB#0	20.75	28.75



Band42	20M	16QAM	42190	1RB#0	20.48	28.48
Band42	20M	16QAM		1RB#50	20.20	28.20
Band42	20M	16QAM		1RB#99	19.78	27.78
Band42	20M	16QAM		50RB#0	20.13	28.13
Band42	20M	16QAM		50RB#25	20.15	28.15
Band42	20M	16QAM		50RB#50	20.08	28.08
Band42	20M	16QAM		100RB#0	20.05	28.05
Band42	20M	16QAM	42590	1RB#0	20.24	28.24
Band42	20M	16QAM		1RB#50	19.94	27.94
Band42	20M	16QAM		1RB#99	20.71	28.71
Band42	20M	16QAM		50RB#0	19.81	27.81
Band42	20M	16QAM		50RB#25	19.95	27.95
Band42	20M	16QAM		50RB#50	19.91	27.91
Band42	20M	16QAM		100RB#0	19.76	27.76
Band42	20M	16QAM	42990	1RB#0	21.05	29.05
Band42	20M	16QAM		1RB#50	20.80	28.80
Band42	20M	16QAM		1RB#99	20.93	28.93
Band42	20M	16QAM		50RB#0	20.79	28.79
Band42	20M	16QAM		50RB#25	20.77	28.77
Band42	20M	16QAM		50RB#50	20.73	28.73
Band42	20M	16QAM		100RB#0	20.80	28.80
Band42	20M	64QAM	42190	1RB#0	19.93	27.93
Band42	20M	64QAM		1RB#50	19.66	27.66
Band42	20M	64QAM		1RB#99	19.84	27.84
Band42	20M	64QAM		50RB#0	19.53	27.53
Band42	20M	64QAM		50RB#25	19.56	27.56
Band42	20M	64QAM		50RB#50	19.50	27.50
Band42	20M	64QAM		100RB#0	19.49	27.49
Band42	20M	64QAM	42590	1RB#0	19.19	27.19
Band42	20M	64QAM		1RB#50	18.87	26.87
Band42	20M	64QAM		1RB#99	19.65	27.65
Band42	20M	64QAM		50RB#0	19.30	27.30
Band42	20M	64QAM		50RB#25	19.35	27.35
Band42	20M	64QAM		50RB#50	19.41	27.41
Band42	20M	64QAM		100RB#0	19.24	27.24
Band42	20M	64QAM	42990	1RB#0	20.53	28.53
Band42	20M	64QAM		1RB#50	20.27	28.27
Band42	20M	64QAM		1RB#99	20.42	28.42
Band42	20M	64QAM		50RB#0	20.27	28.27
Band42	20M	64QAM		50RB#25	20.32	28.32
Band42	20M	64QAM		50RB#50	20.20	28.20
Band42	20M	64QAM		100RB#0	20.28	28.28

## 5.2 Occupied Bandwidth

### Ambient condition

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

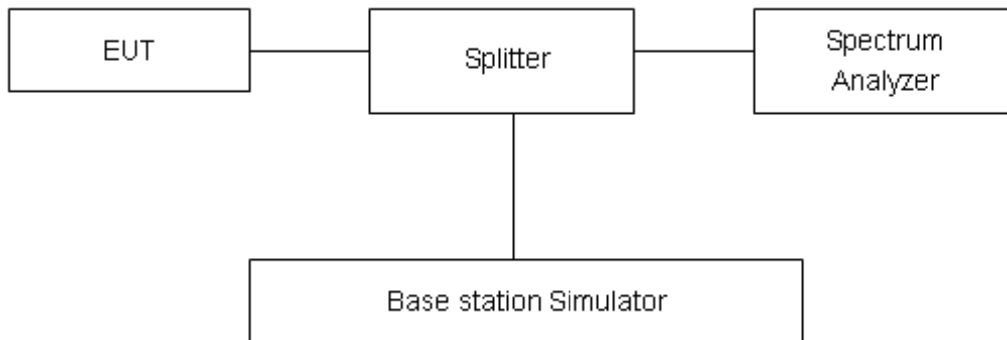
### Method of Measurement

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  $\geq 1\%EBW$ , VBW is set to 3x RBW.

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 42						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
100%	QPSK	5	42115	3452.5	4.536	5.377
			42590	3500	4.561	5.915
			43065	3547.5	4.539	5.335
		10	42140	3455	9.008	10.370
			42590	3500	9.014	11.390
			43040	3545	9.008	11.080
		15	42165	3457.5	13.481	14.750
			42590	3500	13.471	15.610
			43015	3542.5	13.515	16.060
		20	42190	3460	17.916	20.820
			42590	3500	17.946	19.740
			42990	3540	17.987	19.160
	16QAM	5	42115	3452.5	4.536	5.307
			42590	3500	4.520	5.366
			43065	3547.5	4.529	5.347
		10	42140	3455	8.977	9.977
			42590	3500	8.998	9.919
			43040	3545	8.998	9.906
		15	42165	3457.5	13.484	16.390
			42590	3500	13.501	15.170
			43015	3542.5	13.468	15.080
		20	42190	3460	17.945	20.250
			42590	3500	17.935	19.220
			42990	3540	17.930	19.510
	64QAM	5	42115	3452.5	4.527	5.519
			42590	3500	4.542	5.238
			43065	3547.5	4.530	5.263
		10	42140	3455	9.011	10.040
			42590	3500	9.002	10.130
			43040	3545	8.977	10.270
15		42165	3457.5	13.481	15.700	
		42590	3500	13.513	15.700	
		43015	3542.5	13.486	16.020	
20		42190	3460	17.955	19.240	
		42590	3500	17.926	19.330	
		42990	3540	17.904	19.640	





LTE Band 42 QPSK 5MHz CH-Low



LTE Band 42 QPSK 10MHz CH-Low



LTE Band 42 QPSK 5MHz CH-Middle



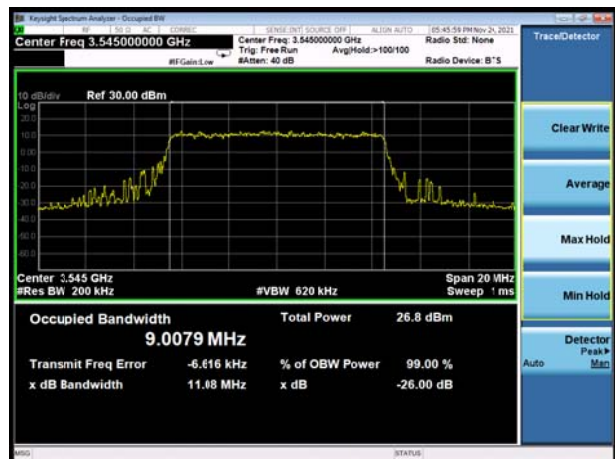
LTE Band 42 QPSK 10MHz CH-Middle



LTE Band 42 QPSK 5MHz CH-High



LTE Band 42 QPSK 10MHz CH-High





### LTE Band 42 QPSK 15MHz CH-Low



### LTE Band 42 QPSK 20MHz CH-Low



### LTE Band 42 QPSK 15MHz CH-Middle



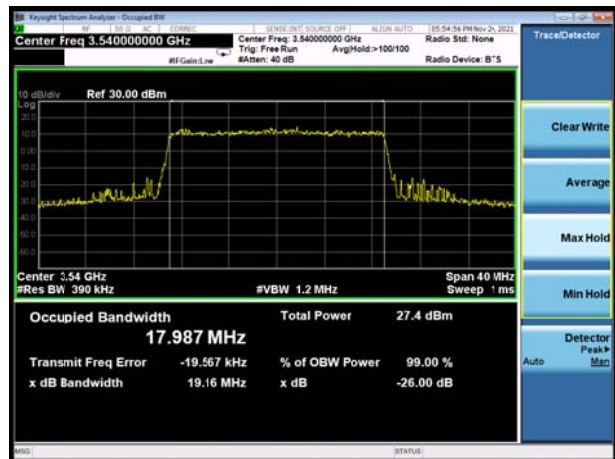
### LTE Band 42 QPSK 20MHz CH-Middle



### LTE Band 42 QPSK 15MHz CH-High



### LTE Band 42 QPSK 20MHz CH-High





### LTE Band 42 16QAM 5MHz CH-Low



### LTE Band 42 16QAM 10MHz CH-Low



### LTE Band 42 16QAM 5MHz CH-Middle



### LTE Band 42 16QAM 10MHz CH-Middle



### LTE Band 42 16QAM 5MHz CH-High



### LTE Band 42 16QAM 10MHz CH-High





### LTE Band 42 16QAM 15MHz CH-Low



### LTE Band 42 16QAM 20MHz CH-Low



### LTE Band 42 16QAM 15MHz CH-Middle



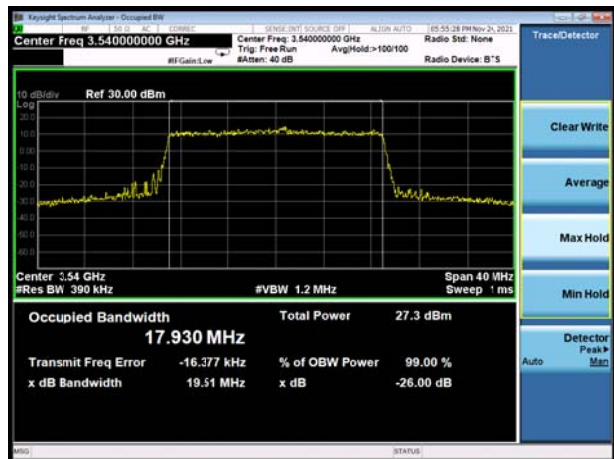
### LTE Band 42 16QAM 20MHz CH-Middle



### LTE Band 42 16QAM 15MHz CH-High



### LTE Band 42 16QAM 20MHz CH-High





### LTE Band 42 64QAM 5MHz CH-Low



### LTE Band 42 64QAM 10MHz CH-Low



### LTE Band 42 64QAM 5MHz CH-Middle



### LTE Band 42 64QAM 10MHz CH-Middle



### LTE Band 42 64QAM 5MHz CH-High



### LTE Band 42 64QAM 10MHz CH-High





### LTE Band 42 64QAM 15MHz CH-Low



### LTE Band 42 64QAM 20MHz CH-Low



### LTE Band 42 64QAM 15MHz CH-Middle



### LTE Band 42 64QAM 20MHz CH-Middle



### LTE Band 42 64QAM 15MHz CH-High



### LTE Band 42 64QAM 20MHz CH-High



### 5.3 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 D01 v03r01 Section 6.0

The EUT was connected to spectrum analyzer and system simulator via a power divider.

The band edges of low and high channels for the highest RF powers were measured.

RBW is set to  $\geq 1\%EBW$ , VBW is set to 3x RBW.

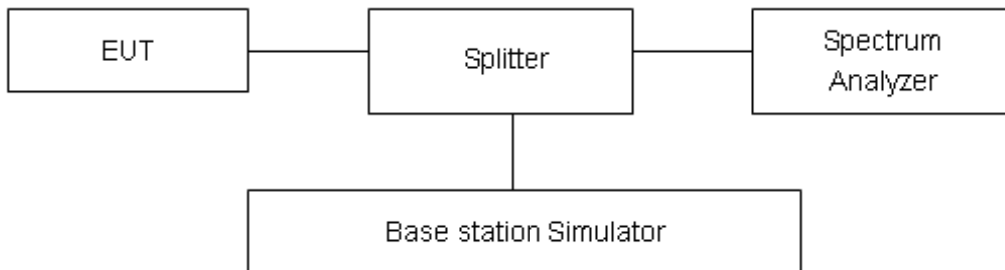
on spectrum analyzer.

Set spectrum analyzer with RMS detector.

The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

Checked that all the results comply with the emission limit line.

#### Test Setup



#### Limits

Rule Part 27.53(n) For mobile operations in the 3450-3550 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed -13 dBm/MHz. Compliance with this paragraph (n)(2) is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed, but limited to a maximum of 200 kHz. In the bands between 1 and 5 MHz removed from the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be 500 kHz. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.



## Measurement Uncertainty

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

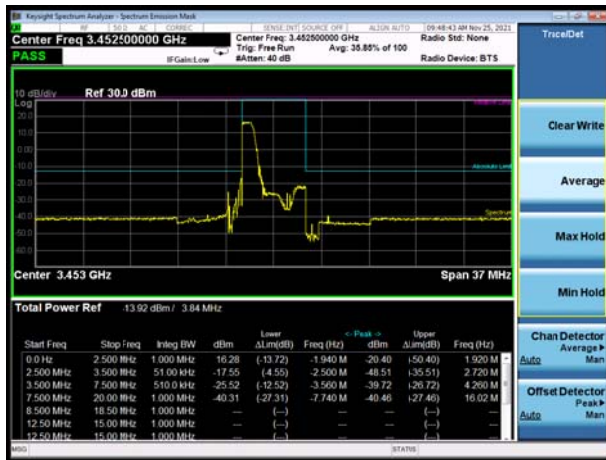




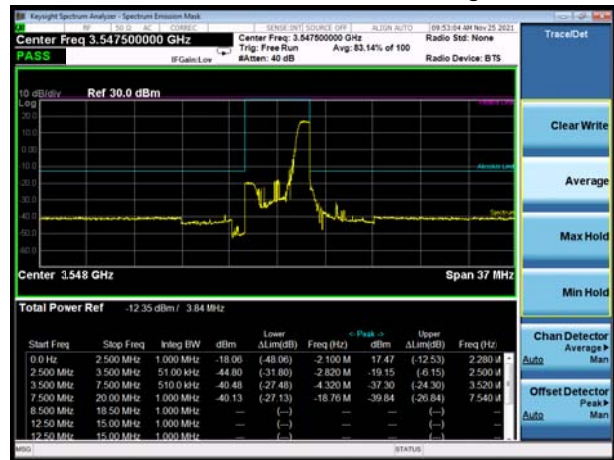
### Test Result

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

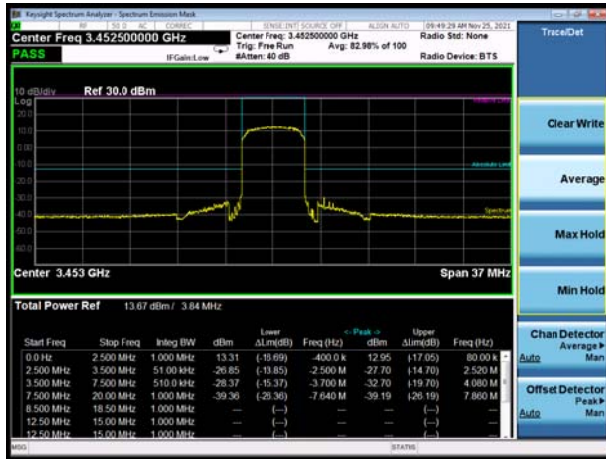
LTE Band 42 QPSK 5MHz CH-Low, 1 RB



LTE Band 42 QPSK 5MHz CH-High, 1 RB



LTE Band 42 QPSK 5MHz CH-Low, 100%RB



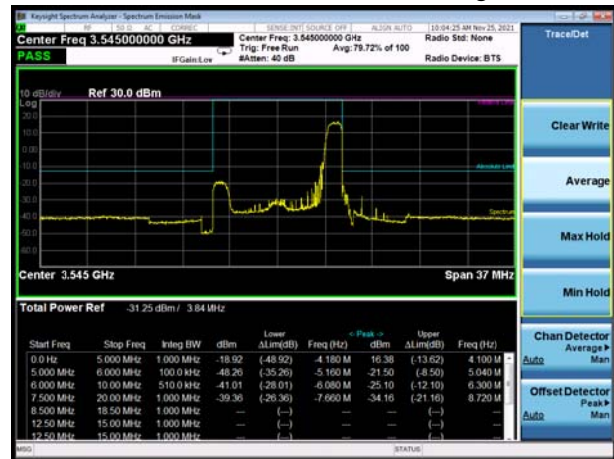
LTE Band 42 QPSK 5MHz CH-High, 100%RB



LTE Band 42 QPSK 10MHz CH-Low, 1 RB

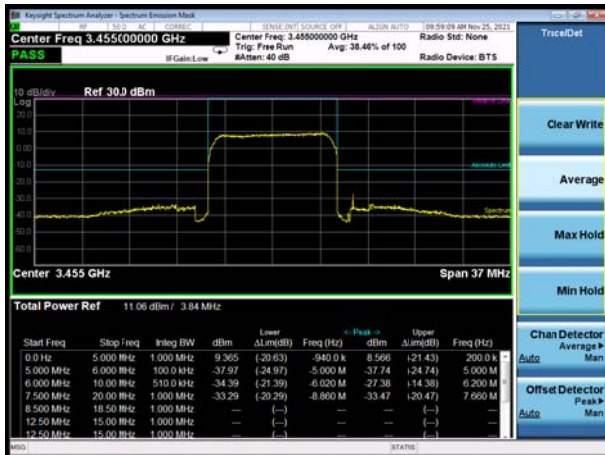


LTE Band 42 QPSK 10MHz CH-High, 1 RB

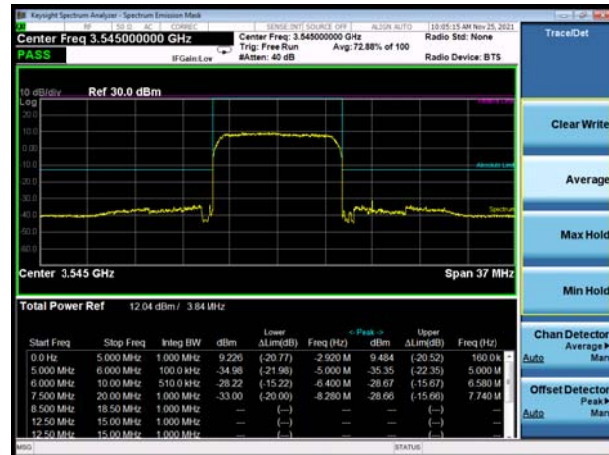




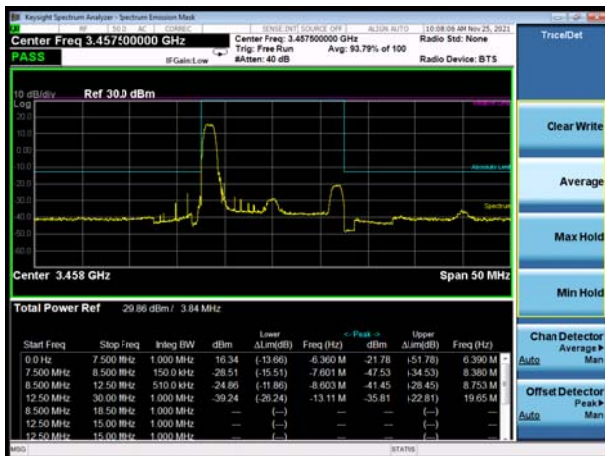
LTE Band 42 QPSK 10MHz CH-Low, 100%RB



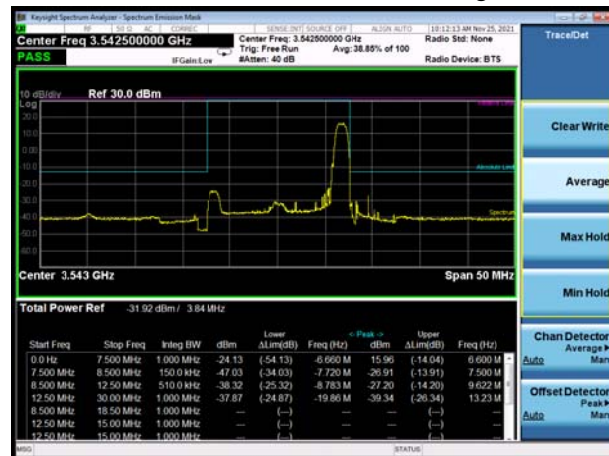
LTE Band 42 QPSK 10MHz CH-High, 100%RB



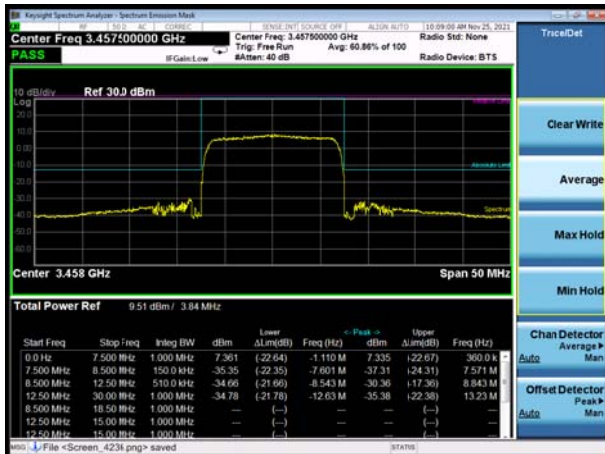
LTE Band 42 QPSK 15MHz CH-Low, 1 RB



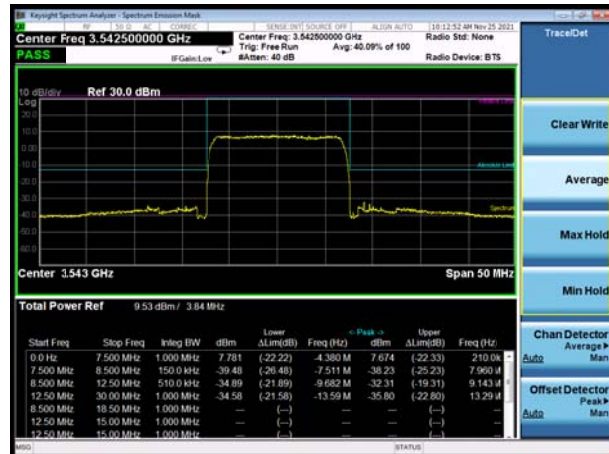
LTE Band 42 QPSK 15MHz CH-High, 1 RB



LTE Band 42 QPSK 15MHz CH-Low, 100%RB

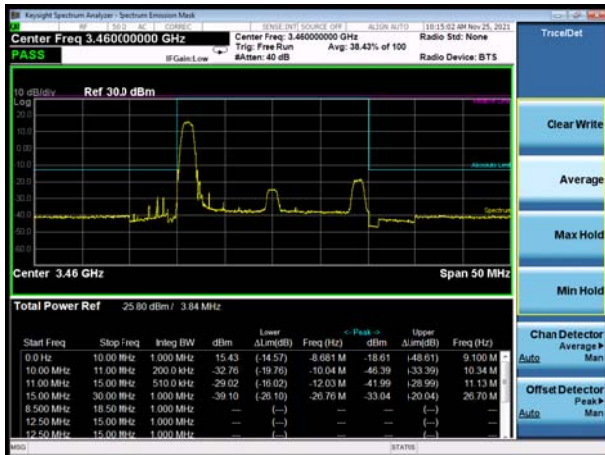


LTE Band 42 QPSK 15MHz CH-High, 100%RB

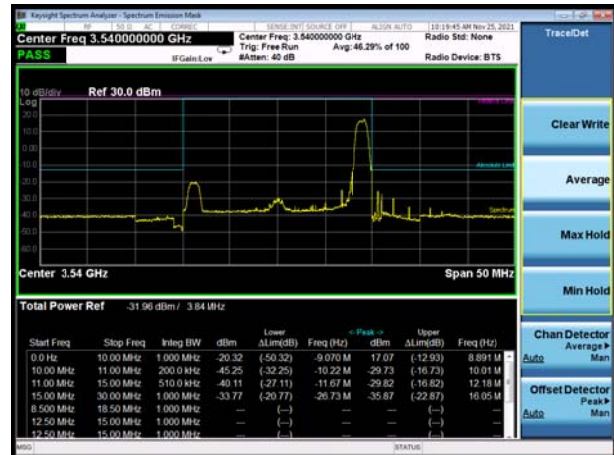




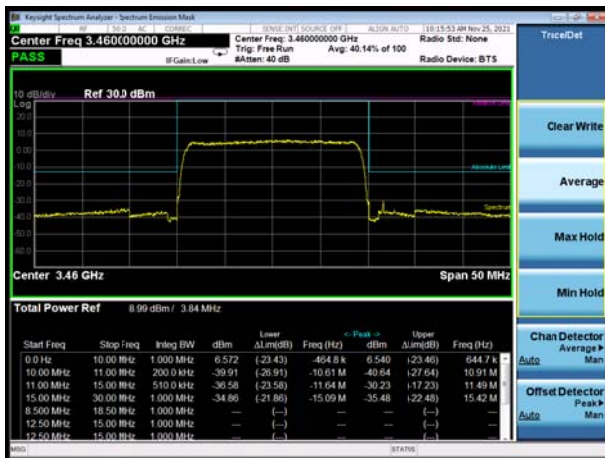
LTE Band 42 QPSK 20MHz CH-Low, 1 RB



LTE Band 42 QPSK 20MHz CH-High, 1 RB



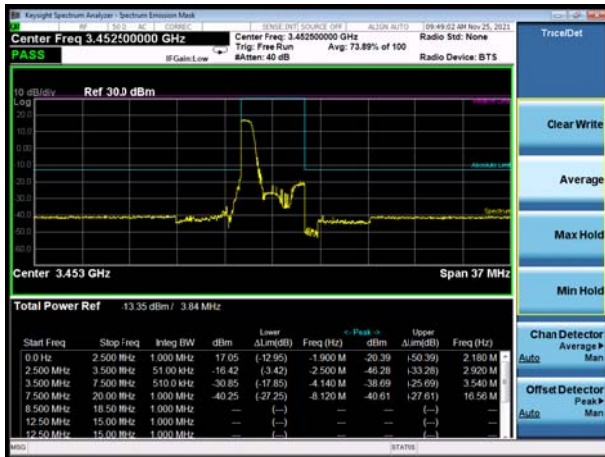
LTE Band 42 QPSK 20MHz CH-Low, 100%RB



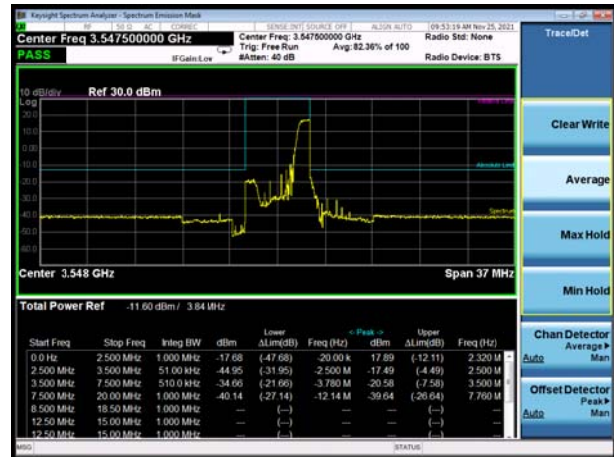
LTE Band 42 QPSK 20MHz CH-High, 100%RB



LTE Band 42 16QAM 5MHz CH-Low, 1 RB

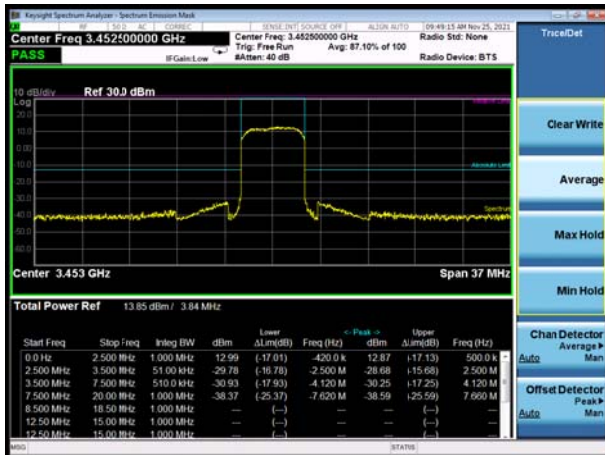


LTE Band 42 16QAM 5MHz CH-High, 1 RB





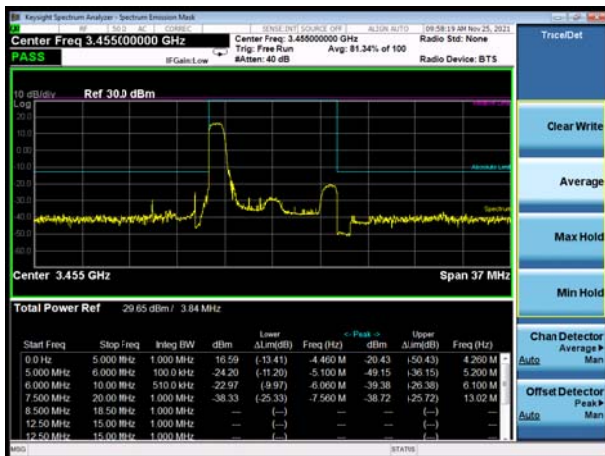
LTE Band 42 16QAM 5MHz CH-Low, 100%RB



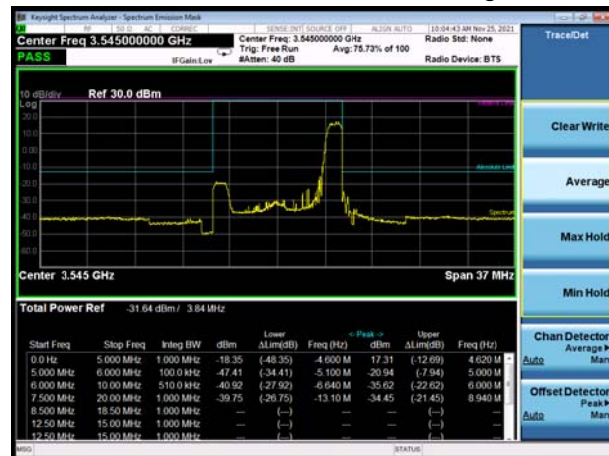
LTE Band 42 16QAM 5MHz CH-High, 100%RB



LTE Band 42 16QAM 10MHz CH-Low, 1 RB



LTE Band 42 16QAM 10MHz CH-High, 1 RB



LTE Band 42 16QAM 10MHz CH-Low, 100%RB



LTE Band 42 16QAM 10MHz CH-High, 100%RB

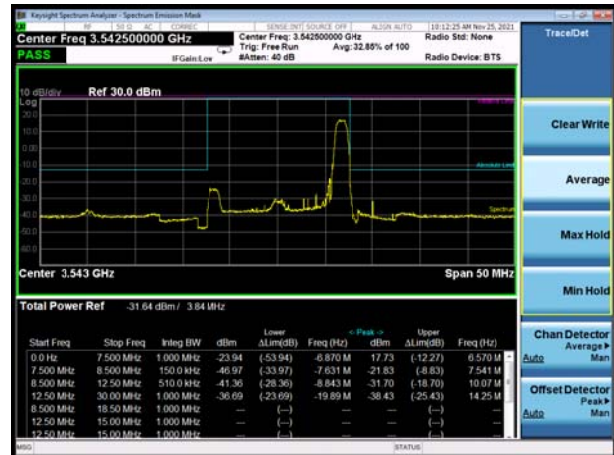




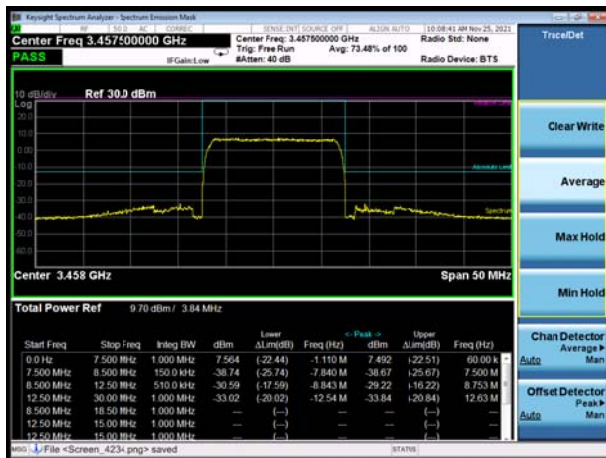
LTE Band 42 16QAM 15MHz CH-Low, 1 RB



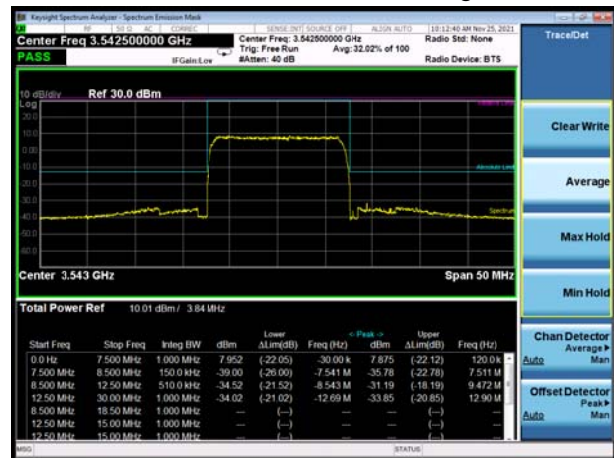
LTE Band 42 16QAM 15MHz CH-High, 1 RB



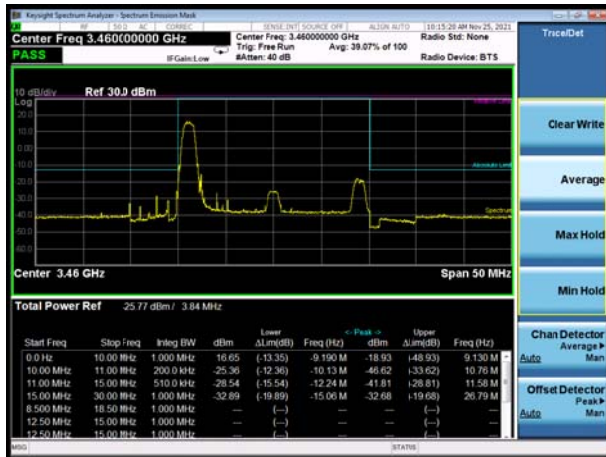
LTE Band 42 16QAM 15MHz CH-Low, 100%RB



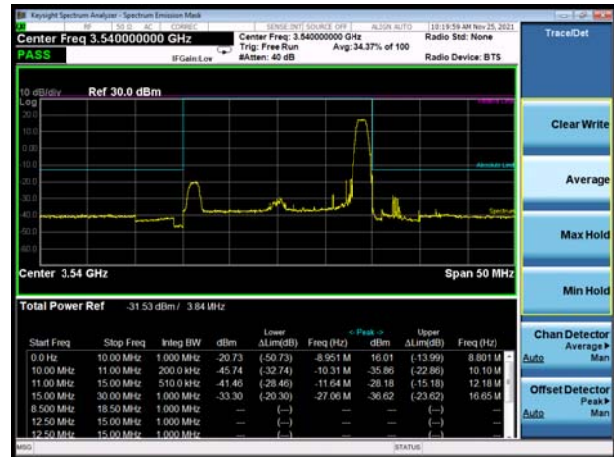
LTE Band 42 16QAM 15MHz CH-High, 100%RB



LTE Band 42 16QAM 20MHz CH-Low, RB 1

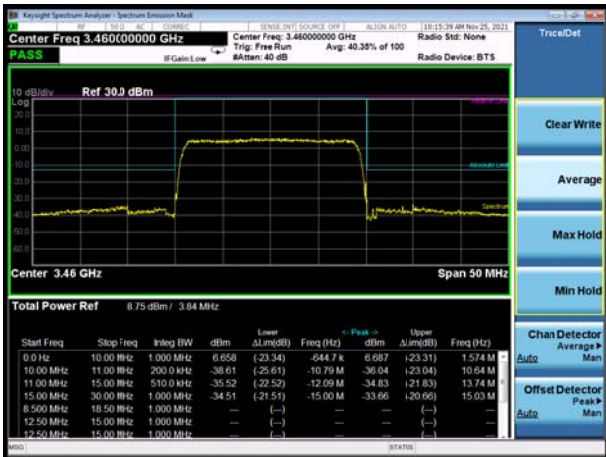


LTE Band 42 16QAM 20MHz CH-High, RB 1

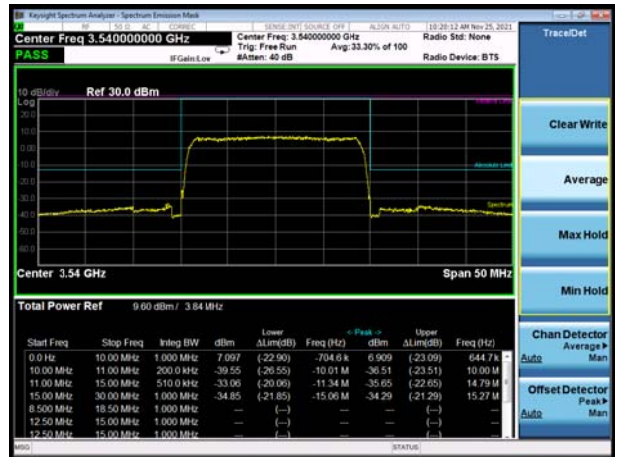




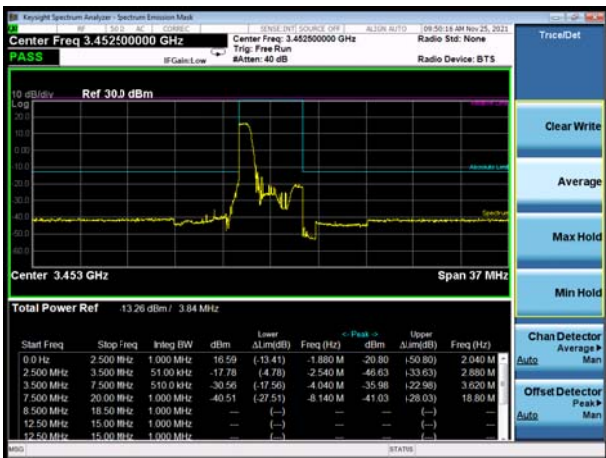
LTE Band 42 16QAM 20MHz CH-Low, 100%RB



LTE Band 42 16QAM 20MHz CH-High, 100%RB



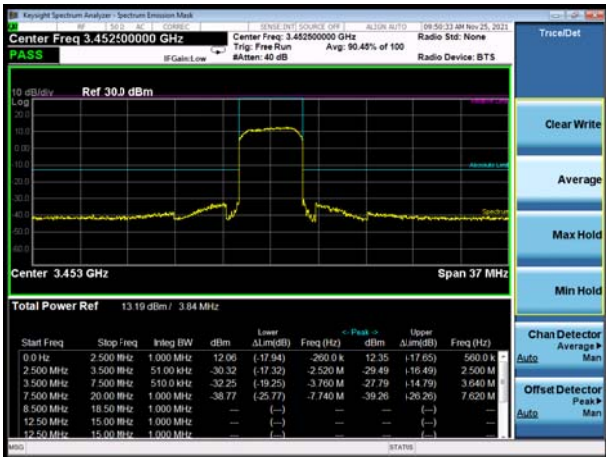
LTE Band 42 64QAM 5MHz CH-Low, 1 RB



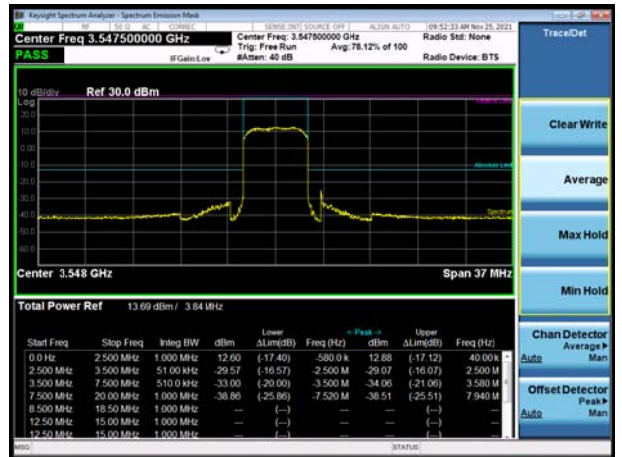
LTE Band 42 64QAM 5MHz CH-High, 1 RB



LTE Band 42 64QAM 5MHz CH-Low, 100%RB



LTE Band 42 64QAM 5MHz CH-High, 100%RB

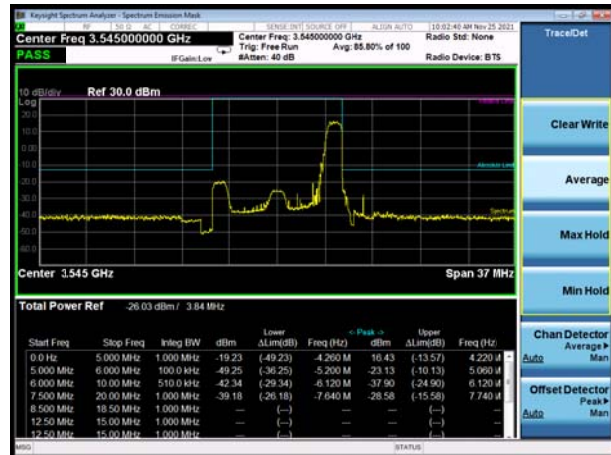




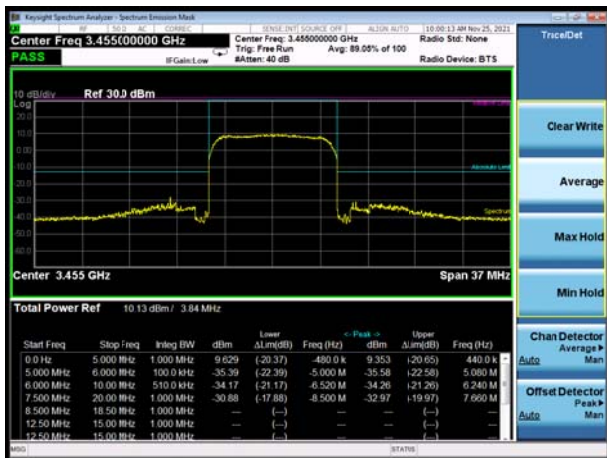
LTE Band 42 64QAM 10MHz CH-Low, 1 RB



LTE Band 42 64QAM 10MHz CH-High, 1 RB



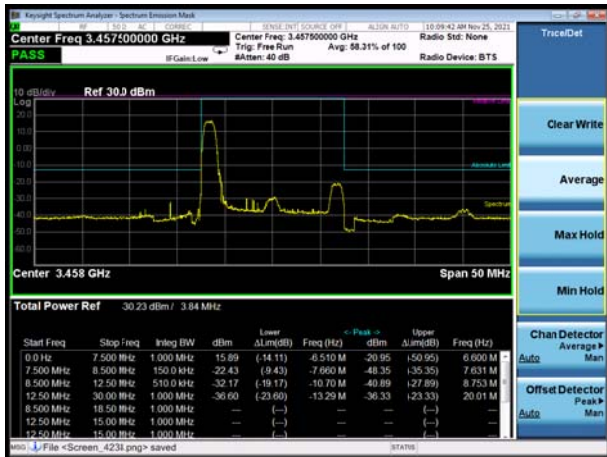
LTE Band 42 64QAM 10MHz CH-Low, 100%RB



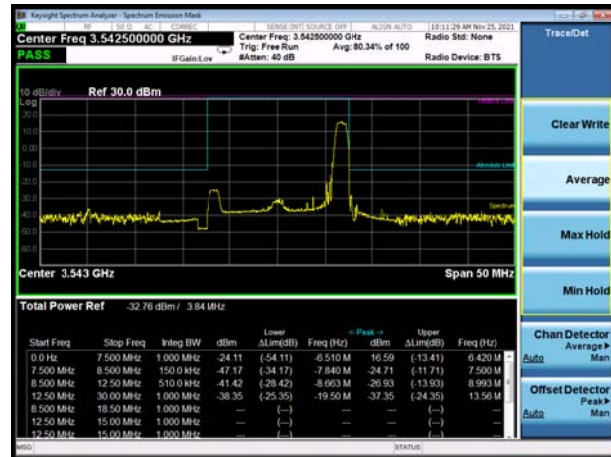
LTE Band 42 64QAM 10MHz CH-High, 100%RB



LTE Band 42 64QAM 15MHz CH-Low, 1 RB



LTE Band 42 64QAM 15MHz CH-High, 1 RB

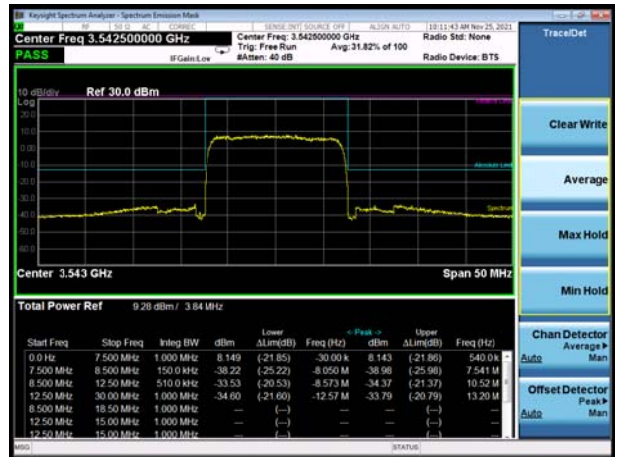




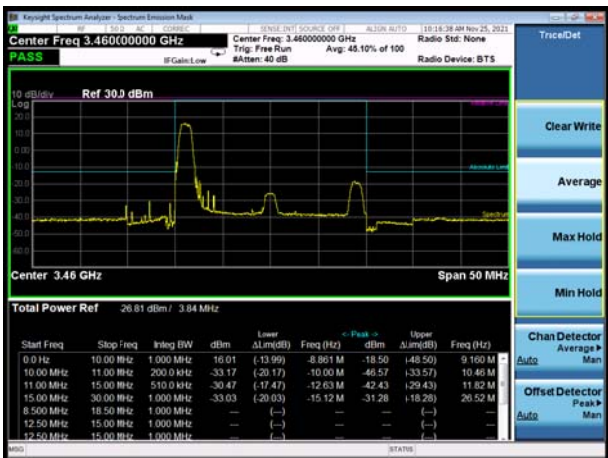
LTE Band 42 64QAM 15MHz CH-Low, 100%RB



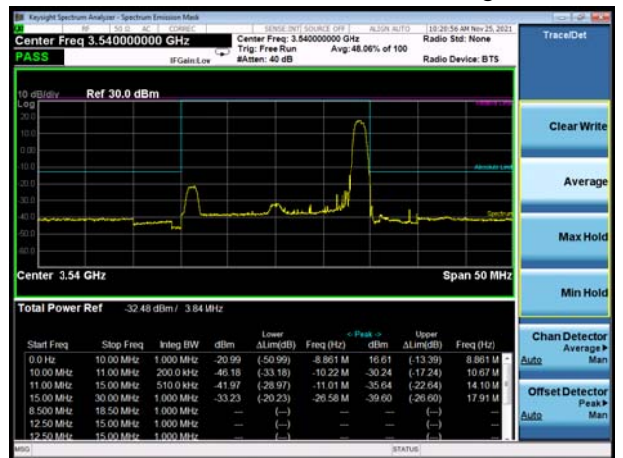
LTE Band 42 64QAM 15MHz CH-High, 100%RB



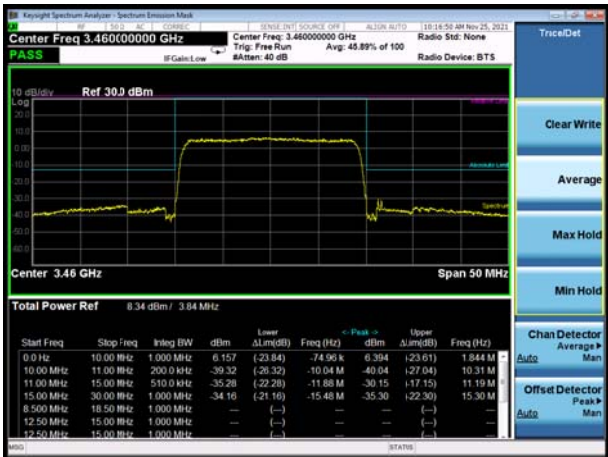
LTE Band 42 64QAM 20MHz CH-Low, 1 RB



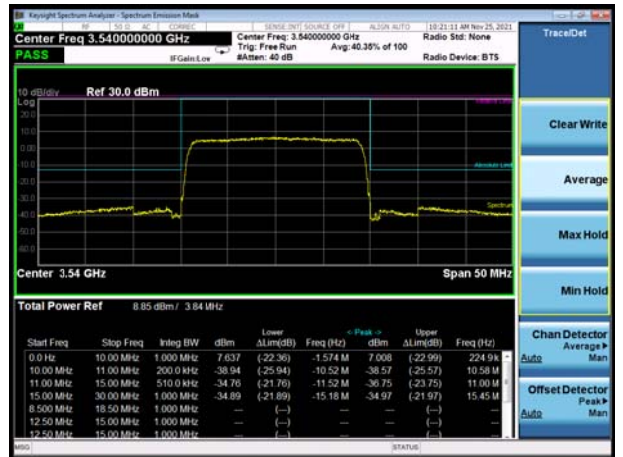
LTE Band 42 64QAM 20MHz CH-High, 1 RB



LTE Band 42 64QAM 20MHz CH-Low, 100%RB



LTE Band 42 64QAM 20MHz CH-High, 100%RB





### 5.4 Peak-to-Average Power Ratio (PAPR)

#### Ambient condition

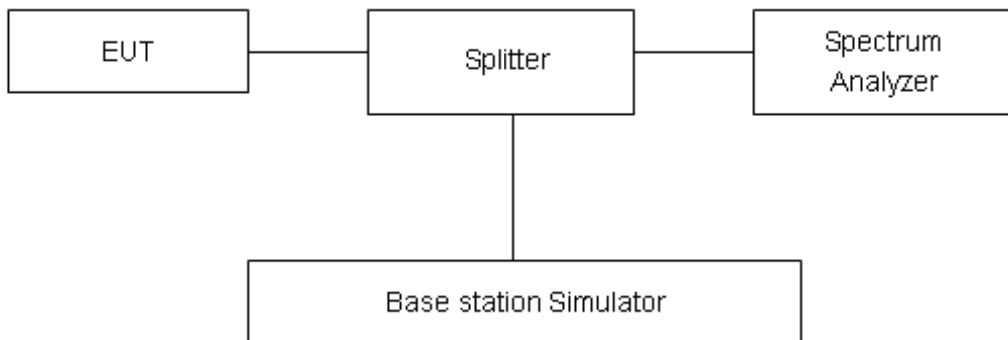
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

#### 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:

$$PAPR (dB) = PPK (dBm) - PAvg (dBm).$$

#### Test Setup



#### Limits

Rule Part 27.50(k)(4) 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.

#### 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 Band 42								
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
QPSK	5	42115	3452.5	23.80	14.22	9.58	≤13	PASS
		42590	3500	23.14	13.68	9.46	≤13	PASS
		43065	3547.5	24.03	14.24	9.79	≤13	PASS
	10	42140	3455	23.85	14.30	9.55	≤13	PASS
		42590	3500	23.17	13.06	10.11	≤13	PASS
		43040	3545	24.37	14.50	9.87	≤13	PASS
	15	42165	3457.5	24.13	13.95	10.18	≤13	PASS
		42590	3500	23.53	13.82	9.71	≤13	PASS
		43015	3542.5	24.62	14.97	9.65	≤13	PASS
	20	42190	3460	23.92	14.71	9.21	≤13	PASS
		42590	3500	23.47	13.88	9.59	≤13	PASS
		42990	3540	24.52	15.06	9.46	≤13	PASS
16QAM	5	42115	3452.5	24.34	13.86	10.48	≤13	PASS
		42590	3500	23.78	13.49	10.29	≤13	PASS
		43065	3547.5	24.96	14.80	10.16	≤13	PASS
	10	42140	3455	24.56	14.41	10.15	≤13	PASS
		42590	3500	24.08	13.74	10.34	≤13	PASS
		43040	3545	25.19	15.01	10.18	≤13	PASS
	15	42165	3457.5	24.70	14.01	10.69	≤13	PASS
		42590	3500	24.04	13.59	10.45	≤13	PASS
		43015	3542.5	25.14	14.82	10.32	≤13	PASS
	20	42190	3460	24.68	14.53	10.15	≤13	PASS
		42590	3500	24.22	13.99	10.23	≤13	PASS
		42990	3540	25.35	15.44	9.91	≤13	PASS
64QAM	5	42115	3452.5	24.14	13.47	10.67	≤13	PASS
		42590	3500	23.47	13.10	10.37	≤13	PASS
		43065	3547.5	24.40	13.42	10.98	≤13	PASS
	10	42140	3455	24.16	13.82	10.34	≤13	PASS
		42590	3500	23.69	13.34	10.35	≤13	PASS
		43040	3545	24.70	14.33	10.37	≤13	PASS
	15	42165	3457.5	24.10	13.58	10.52	≤13	PASS
		42590	3500	23.69	13.95	9.74	≤13	PASS
		43015	3542.5	24.72	14.33	10.39	≤13	PASS
	20	42190	3460	24.31	14.14	10.17	≤13	PASS
		42590	3500	23.70	13.64	10.06	≤13	PASS
		42990	3540	24.82	14.89	9.93	≤13	PASS

## 5.5 Frequency Stability

### Ambient condition

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

### Method of Measurement

#### Frequency Stability (Temperature Variation)

The temperature inside the climate chamber is varied from -30°C to +70°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 -30°C to +70°C. Allow at least 1.5 hours at each temperature, un-powered, before making measurements.

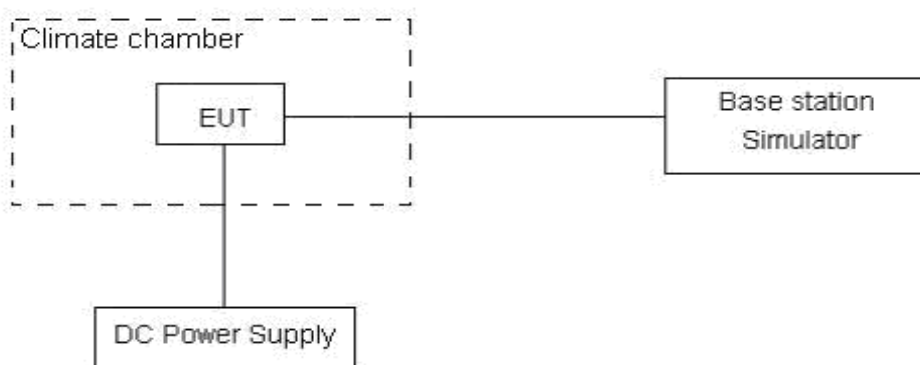
#### Frequency Stability (Voltage Variation)

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

**Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced 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 19 V and 30V, with a nominal voltage of 24V.

### Test setup



### Limits

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

### 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

LTE Band 42								
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	5MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25°C)	Normal	14.00	1.00	3.00	0.00400	0.00029	0.00086	PASS
Extreme (70°C)		14.00	15.00	14.00	0.00400	0.00429	0.00400	PASS
Extreme (60°C)		17.00	9.00	9.00	0.00486	0.00257	0.00257	PASS
Extreme (50°C)		2.00	13.00	6.00	0.00057	0.00371	0.00171	PASS
Extreme (40°C)		7.00	17.00	8.00	0.00200	0.00486	0.00229	PASS
Extreme (30°C)		16.00	5.00	14.00	0.00457	0.00143	0.00400	PASS
Extreme (20°C)		5.00	3.00	6.00	0.00143	0.00086	0.00171	PASS
Extreme (10°C)		1.00	11.00	16.00	0.00029	0.00314	0.00457	PASS
Extreme (0°C)		13.00	10.00	17.00	0.00371	0.00286	0.00486	PASS
Extreme (-10°C)		3.00	11.00	7.00	0.00086	0.00314	0.00200	PASS
Extreme (-20°C)		5.00	16.00	12.00	0.00143	0.00457	0.00343	PASS
Extreme (-30°C)		5.00	11.00	3.00	0.00143	0.00314	0.00086	PASS
25°C		LV	6.00	3.00	11.00	0.00171	0.00086	0.00314
	HV	13.00	6.00	15.00	0.00371	0.00171	0.00429	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	10MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25°C)	Normal	9.00	12.00	12.00	0.00257	0.00343	0.00343	PASS
Extreme (70°C)		13.00	15.00	16.00	0.00371	0.00429	0.00457	PASS
Extreme (60°C)		1.00	13.00	15.00	0.00029	0.00371	0.00429	PASS
Extreme (50°C)		1.00	17.00	9.00	0.00029	0.00486	0.00257	PASS
Extreme (40°C)		14.00	16.00	14.00	0.00400	0.00457	0.00400	PASS
Extreme (30°C)		16.00	13.00	9.00	0.00457	0.00371	0.00257	PASS
Extreme (20°C)		7.00	4.00	4.00	0.00200	0.00114	0.00114	PASS
Extreme (10°C)		10.00	15.00	11.00	0.00286	0.00429	0.00314	PASS
Extreme (0°C)		17.00	14.00	14.00	0.00486	0.00400	0.00400	PASS
Extreme (-10°C)		5.00	8.00	17.00	0.00143	0.00229	0.00486	PASS
Extreme (-20°C)		1.00	9.00	2.00	0.00029	0.00257	0.00057	PASS
Extreme (-30°C)		2.00	2.00	14.00	0.00057	0.00057	0.00400	PASS
25°C		LV	15.00	15.00	11.00	0.00429	0.00429	0.00314
	HV	9.00	6.00	9.00	0.00257	0.00171	0.00257	PASS



Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	15MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25°C)	Normal	15.00	17.00	9.00	0.00429	0.00486	0.00257	PASS
Extreme (70°C)		6.00	5.00	8.00	0.00171	0.00143	0.00229	PASS
Extreme (60°C)		13.00	14.00	15.00	0.00371	0.00400	0.00429	PASS
Extreme (50°C)		8.00	16.00	6.00	0.00229	0.00457	0.00171	PASS
Extreme (40°C)		5.00	2.00	1.00	0.00143	0.00057	0.00029	PASS
Extreme (30°C)		7.00	14.00	4.00	0.00200	0.00400	0.00114	PASS
Extreme (20°C)		4.00	11.00	3.00	0.00114	0.00314	0.00086	PASS
Extreme (10°C)		9.00	14.00	10.00	0.00257	0.00400	0.00286	PASS
Extreme (0°C)		2.00	1.00	4.00	0.00057	0.00029	0.00114	PASS
Extreme (-10°C)		2.00	8.00	12.00	0.00057	0.00229	0.00343	PASS
Extreme (-20°C)		9.00	10.00	4.00	0.00257	0.00286	0.00114	PASS
Extreme (-30°C)		8.00	6.00	5.00	0.00229	0.00171	0.00143	PASS
25°C	LV	10.00	13.00	8.00	0.00286	0.00371	0.00229	PASS
	HV	2.00	12.00	8.00	0.00057	0.00343	0.00229	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	20MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25°C)	Normal	14.00	12.00	2.00	0.00400	0.00343	0.00057	PASS
Extreme (70°C)		4.00	3.00	4.00	0.00114	0.00086	0.00114	PASS
Extreme (60°C)		8.00	17.00	14.00	0.00229	0.00486	0.00400	PASS
Extreme (50°C)		14.00	13.00	13.00	0.00400	0.00371	0.00371	PASS
Extreme (40°C)		4.00	5.00	5.00	0.00114	0.00143	0.00143	PASS
Extreme (30°C)		5.00	13.00	5.00	0.00143	0.00371	0.00143	PASS
Extreme (20°C)		7.00	14.00	2.00	0.00200	0.00400	0.00057	PASS
Extreme (10°C)		7.00	10.00	2.00	0.00200	0.00286	0.00057	PASS
Extreme (0°C)		16.00	6.00	6.00	0.00457	0.00171	0.00171	PASS
Extreme (-10°C)		10.00	1.00	6.00	0.00286	0.00029	0.00171	PASS
Extreme (-20°C)		7.00	6.00	17.00	0.00200	0.00171	0.00486	PASS
Extreme (-30°C)		7.00	14.00	14.00	0.00200	0.00400	0.00400	PASS
25°C	LV	12.00	17.00	12.00	0.00343	0.00486	0.00343	PASS
	HV	7.00	7.00	13.00	0.00200	0.00200	0.00371	PASS

## 5.6 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 9kHz to the 10th harmonic of the carrier. The peak detector is used.

RBW is set to 100kHz, VBW is set to 300kHz for 30MHz~1GHz

RBW is set to 1MHz, VBW is set to 3MHz for above 1GHz, Sweep is set to ATUO.

RBW is set to 1 kHz (0.009MHz~ 0.15 MHz),

RBW is set to 10 kHz (0.15 MHz~ 30 MHz)

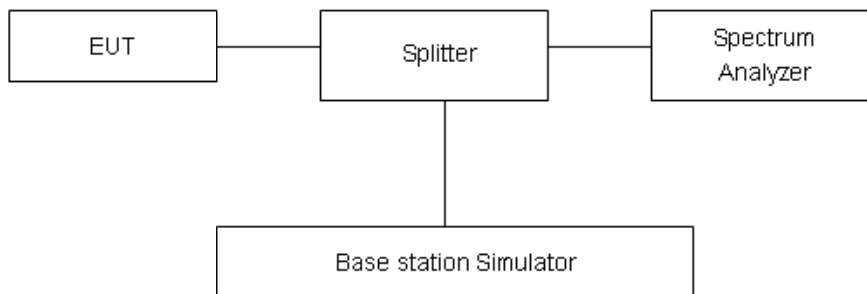
RBW is set to 100 kHz (30MHz~1000 MHz)

RBW is set to 1000 kHz (above 1000MHz)

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

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

### Test setup



### Limits

Rule Part 27.53(n) For mobile operations in the 3450-3550 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed –13 dBm/MHz. Compliance with this paragraph (n)(2) is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed, but limited to a maximum of 200 kHz. In the bands between 1 and 5 MHz removed from the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be 500 kHz. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are



attenuated at least 26 dB below the transmitter power.

Part 27.53(n) Limit	-13 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  $k = 1.96$ .

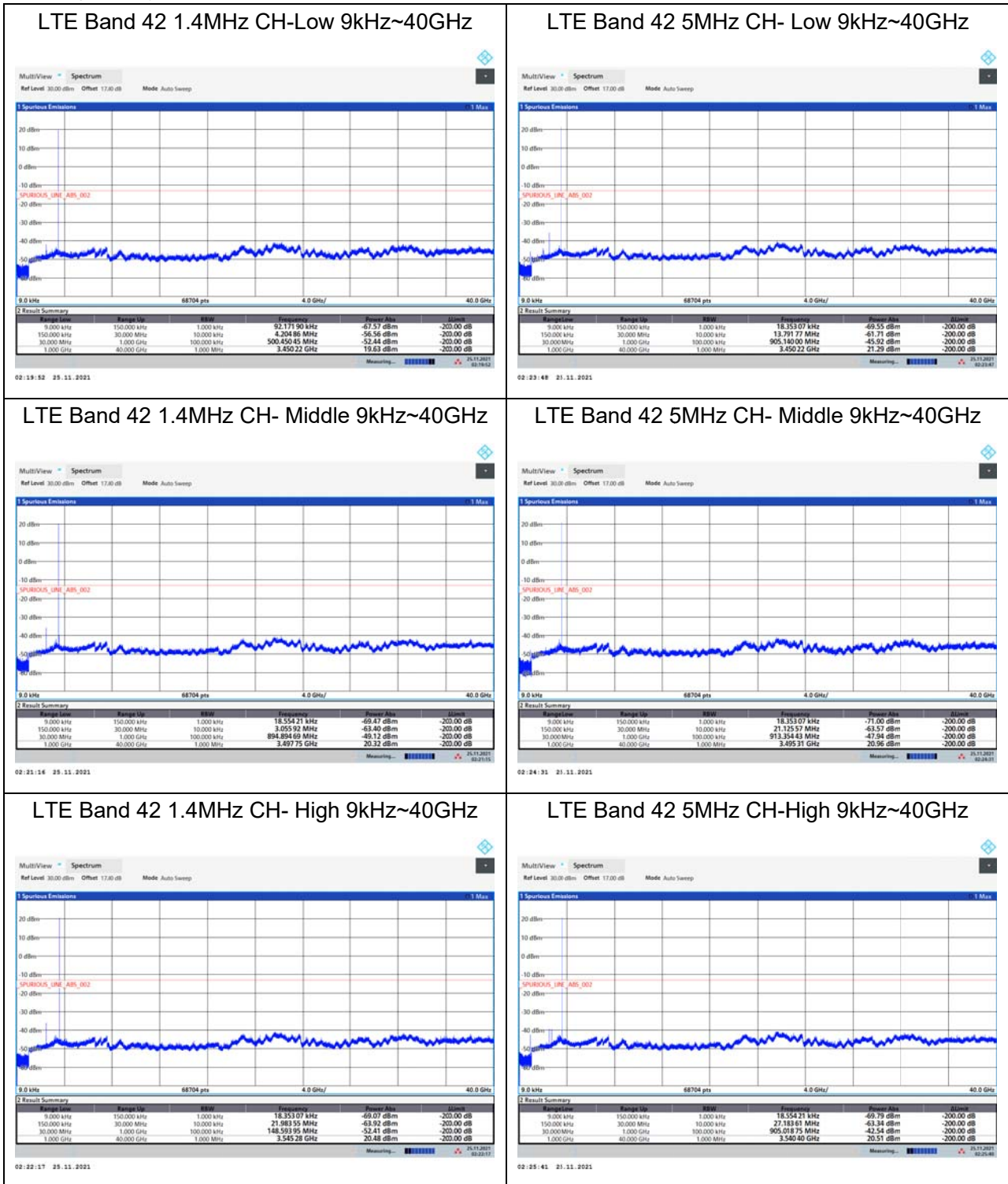
Frequency	Uncertainty
9kHz-1GHz	0.684 dB
1GHz-40GHz	1.407 dB



### Test Result

Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the emissions more than 20 dB below the limit are not reported.

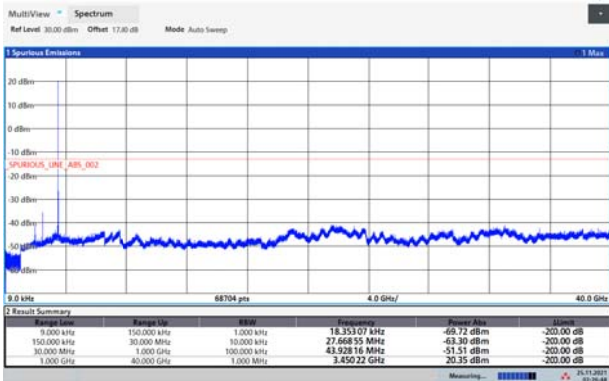
The signal beyond the limit is carrier.





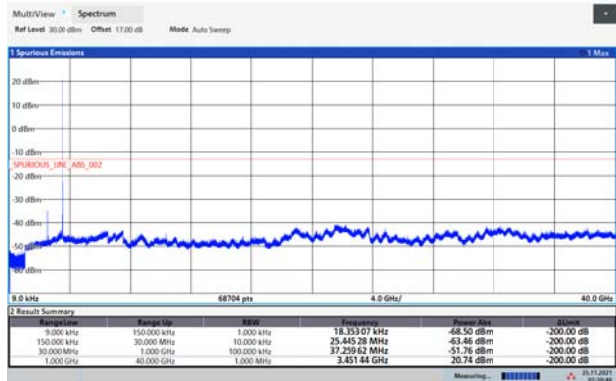


### LTE Band 42 15MHz CH- Low 9kHz~40GHz



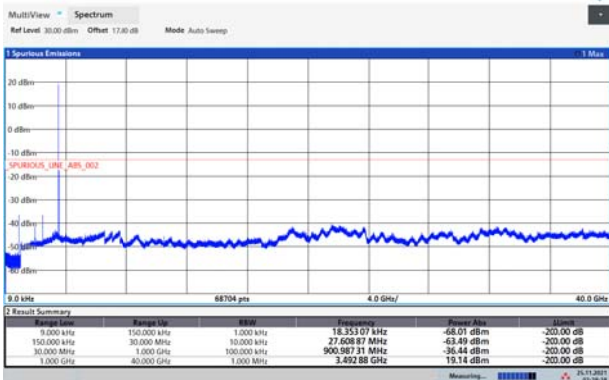
02:24:48 25.11.2021

### LTE Band 42 20MHz CH-Low 9kHz~40GHz



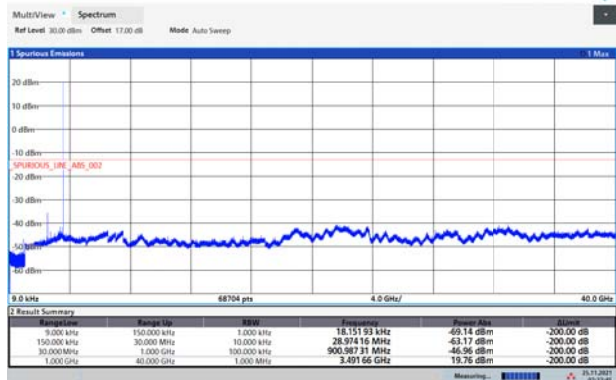
02:30:47 25.11.2021

### LTE Band 42 15MHz CH- Middle 9kHz~40GHz



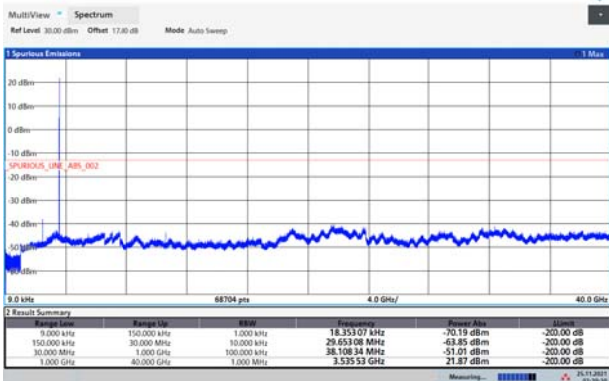
02:28:39 25.11.2021

### LTE Band 42 20MHz CH- Middle 9kHz~40GHz



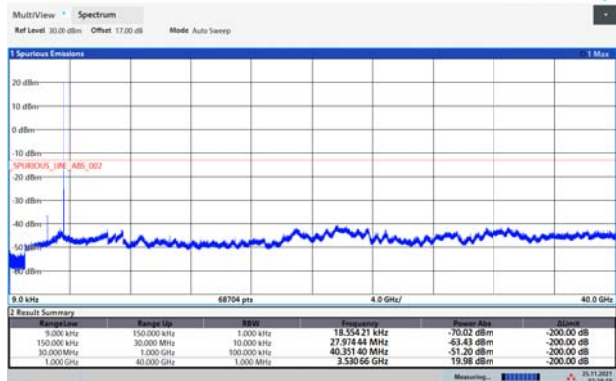
02:32:46 25.11.2021

### LTE Band 42 15MHz CH-High 9kHz~40GHz



02:29:31 25.11.2021

### LTE Band 42 20MHz CH- High 9kHz~40GHz



02:34:11 25.11.2021

## 5.7 Radiates Spurious Emission

### Ambient condition

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

### Method of Measurement

- The testing follows FCC KDB 971168 D01 v03r01 Section 5.8 and ANSI C63.26 (2015).
- 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).
- 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.
- The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum 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).
- 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.
- 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.
- The measurement results are obtained as described below:  

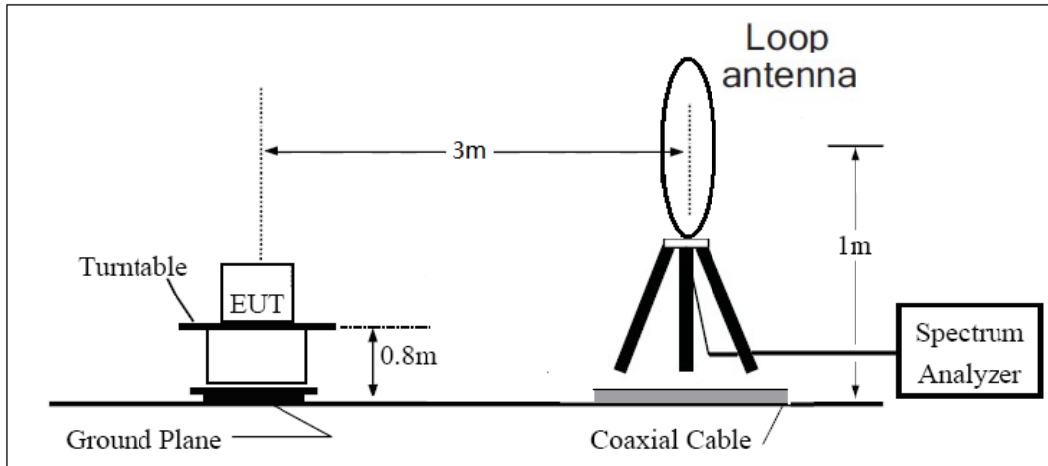
$$\text{Power(EIRP)} = \text{PMea} - \text{PAg} - \text{Pcl} + \text{Ga}$$
 The measurement results are amend as described below:  

$$\text{Power(EIRP)} = \text{PMea} - \text{Pcl} + \text{Ga}$$
- This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dB) and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole,  $\text{ERP} = \text{EIRP} - 2.15\text{dB}$ .

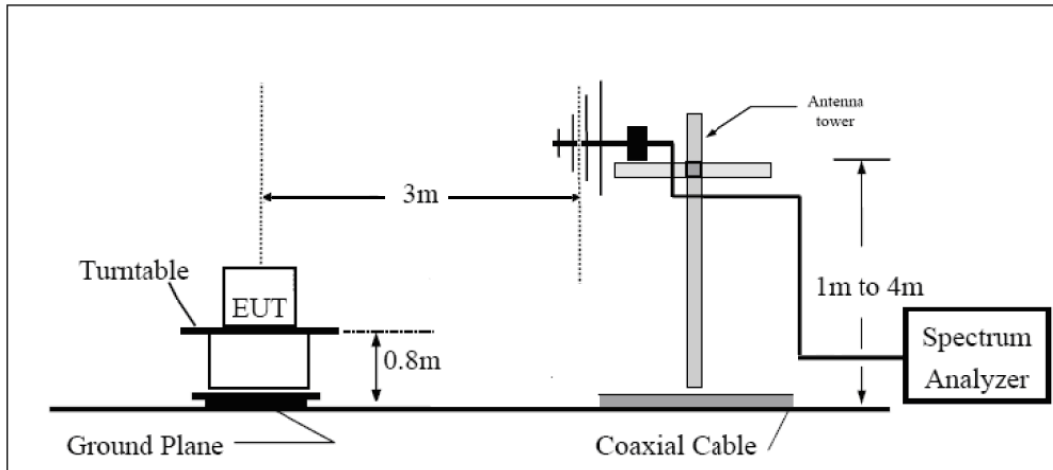
The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

**Test setup**

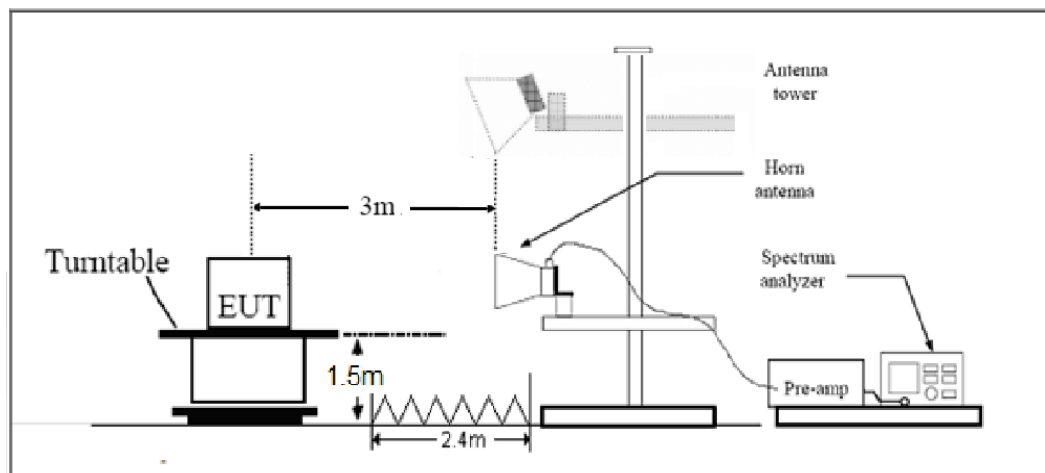
**9KHz ~ 30MHz**



**30MHz ~ 1GHz**



**Above 1GHz**



Note: Area side:2.4mX3.6m



**Limits**

Rule Part 27.53(n) For mobile operations in the 3450-3550 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed -13 dBm/MHz. Compliance with this paragraph (n)(2) is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed, but limited to a maximum of 200 kHz. In the bands between 1 and 5 MHz removed from the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be 500 kHz. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

Part 27.53(n) Limit	-13 dBm
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**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**

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.

LTE Band 42 QPSK 5MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	6995.40	-46.72	2.6	10.15	Horizontal	-39.17	-13.00	26.17	315
3	10493.20	-44.47	2.4	11.35	Horizontal	-35.52	-13.00	22.52	0
4	14000.00	-49.17	4.5	10.85	Horizontal	-42.82	-13.00	29.82	90
5	17500.00	-50.33	5.1	11.35	Horizontal	-44.08	-13.00	31.08	135
6	21737.28	-	-	-	-	-	-	-	-
7	25360.16	-	-	-	-	-	-	-	-
8	28983.04	-	-	-	-	-	-	-	-
9	32605.92	-	-	-	-	-	-	-	-
10	36228.80	-	-	-	-	-	-	-	-

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 Horizontal position.

LTE Band 42 QPSK 10MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	6991.00	-48.04	2.6	10.15	Horizontal	-40.49	-13.00	27.49	90
3	10486.20	-45.83	2.4	11.35	Horizontal	-36.88	-13.00	23.88	0
4	14000.00	-49.00	4.5	10.85	Horizontal	-42.65	-13.00	29.65	0
5	17500.00	-50.37	5.1	11.35	Horizontal	-44.12	-13.00	31.12	45
6	21737.28	-	-	-	-	-	-	-	-
7	25360.16	-	-	-	-	-	-	-	-
8	28983.04	-	-	-	-	-	-	-	-
9	32605.92	-	-	-	-	-	-	-	-
10	36228.80	-	-	-	-	-	-	-	-

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 Horizontal position.



LTE Band 42 QPSK 20MHz CH-Middle, RB 1

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	6981.40	-50.95	2.6	10.15	Horizontal	-43.40	-13.00	30.40	180
3	10473.00	-42.89	2.4	11.35	Horizontal	-33.94	-13.00	20.94	225
4	14000.00	-50.59	4.5	10.85	Horizontal	-44.24	-13.00	31.24	45
5	17500.00	-50.28	5.1	11.35	Horizontal	-44.03	-13.00	31.03	180
6	21696.78	-	-	-	-	-	-	-	-
7	25312.91	-	-	-	-	-	-	-	-
8	28929.04	-	-	-	-	-	-	-	-
9	32545.17	-	-	-	-	-	-	-	-
10	36161.30	-	-	-	-	-	-	-	-



## 6 Main Test Instruments

Name	Manufacturer	Type	Serial Number	Calibration Date	Expiration Date
Base Station Simulator	R&S	CMW500	113824	2021-05-15	2022-05-14
Climate Chamber	Weiss	VT4002	582261194500 10	2021-05-15	2022-05-14
Power Splitter	Hua Xiang	SHX-GF2-2-13	10120101	/	/
Spectrum Analyzer	Key sight	N9010A	MY50210259	2021-05-15	2022-05-14
Signal Analyzer	R&S	FSV3030	101411	2020-12-13	2021-12-12
Loop Antenna	SCHWARZBECK	FMZB1519	1519-047	2020-04-02	2023-04-01
TRILOG Broadband Antenna	SCHWARZBECK	VULB 9163	391	2019-12-16	2022-12-15
Horn Antenna	R&S	HF907	102723	2020-08-11	2023-08-10
Horn Antenna	ETS-Lindgren	3160-09	00102643	2021-10-10	2024-10-09
Horn Antenna	STEATITE	QSH-SL-26-40-K-15	16779	2019-12-24	2022-12-23
Signal generator	R&S	SMB 100A	102594	2021-05-15	2022-05-14
Climatic Chamber	ESPEC	SU-242	93000506	2020-12-13	2021-12-12
MOB COMMS DC SUPPLY	Keysight	66319D	MY43004105	2021-06-09	2021-12-08
RF Cable	Agilent	SMA 15cm	0001	2021-06-09	2021-12-08
Software	R&S	EMC32	9.26.0	/	/

\*\*\*\*\*END OF REPORT \*\*\*\*\*



## ANNEX A: The EUT Appearance

The EUT Appearance are submitted separately.





## ANNEX B: Test Setup Photos

The Test Setup Photos are submitted separately.