

# **TEST REPORT**

FCC LTE B12 Test for TFGMEIBBCD4 Class II Permissive Change

APPLICANT LG Electronics Inc.

REPORT NO. HCT-RF-2406-FC011-R1

DATE OF ISSUE October 7, 2024

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F-TP22-03(Rev.06)

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T E S T R E P O R T	REPORT NO. HCT-RF-2406-FC011-R1 DATE OF ISSUE October 07, 2024 Additional Model TFGMEIBBCD5, TFGMEIBBCD6, TFGMEIBBCD7, TFGMEIBBCD8, TFGMEIBBCD9, TFGMEIBBCDA, TFGMEIBBCDB, TFGMEIBBCD8,
Applicant	<b>LG Electronics Inc.</b> 10, MagokJungang-ro, Gangseo-gu, Seoul 07796, Republic of Korea
Product Name Model Name	GM Onstar Gen12 ROW TFGMEIBBCD4
Date of Test	May 07, 2024 ~ June 19, 2024
Location of Test	■ Permanent Testing Lab □ On Site Testing (Address: 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi- do, Republic of Korea)
FCC ID	BEJTFGMEIBBCD4
FCC Classification	PCS Licensed Transmitter (PCB)
Test Standard Used	FCC Rule Part(s): §27
Test Results	PASS



## **REVISION HISTORY**

The revision history for this test report is shown in table.

Revision No.	Date of Issue	Description	
0	September 26, 2024	Initial Release	
1	October 07, 2024	Added the Note (page 52.)	

#### Notice

#### Content

The measurements shown in this report were made in accordance with the procedures specified in CFR47 section § 2.947. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. HCT CO., LTD. Certifies that no party to this application has subject to a denial of Federal benefits that includes FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998,21 U.S.

C.853(a)

The results shown in this test report only apply to the sample(s), as received, provided by the applicant, unless otherwise stated.

The test results have only been applied with the test methods required by the standard(s).

The laboratory is not accredited for the test results marked \*.

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# **MEASUREMENT REPORT**

# **1. GENERAL INFORMATION**

Applicant Name:	LG Electronics Inc.		
Address:	10, Magok Jungang-ro, Gangseo-gu, Seoul 07796, Republic of Korea		
FCC ID:	BEJTFGMEIBBCD4		
Application Type:	Class II Permissive Change		
FCC Classification:	PCS Licensed Transmitter (PCB)		
FCC Rule Part(s):	§ 27		
EUT Type:	GM Onstar Gen12 ROW		
Model(s):	TFGMEIBBCD4		
	TFGMEIBBCD5,TFGMEIBBCD6,TFGMEIBBCD7,TFGMEIBBCD8,		
Additional Model(s)	TFGMEIBBCD9, TFGMEIBBCDA, TFGMEIBBCDB, TFGMEIBBCDC		
	699.7 MHz – 715.3 MHz (LTE – Band 12 (1.4 MHz))		
	700.5 MHz – 714.5 MHz (LTE – Band 12 (3 MHz))		
Tx Frequency:	701.5 MHz – 713.5 MHz (LTE – Band 12 (5 MHz))		
	704.0 MHz – 711.0 MHz (LTE – Band 12 (10 MHz))		
Date(s) of Tests:	May 07, 2024 ~ June 19, 2024		
	Radiated : EBR36018942K_#30		
Serial number:	Conducted : EBR36018942K_#30		
	UPLINK CARRIER AGGREGATION : EBR36018942K_#14		
External Antenna	ANT5:86531607		
AN 14:86575530			
	DUT4:85608774		



#### **1.1. MAXIMUM OUTPUT POWER**

					RP	EF	RP
Mode	Tx Frequency	Emission		External Antenna		Internal Antenna	
(MHz)	(MHz)	Designator	Modulation	Max.	Max.	Max.	Max.
(11112)	(14112)	Designator		Power	Power	Power	Power
				(W)	(dBm)	(W)	(dBm)
		1M09G7D	QPSK	0.161	22.07	0.853	29.31
ITE Pand 12 (1 A)	699.7 – 715.3	1M09W7D	16 QAM	0.144	21.59	0.755	28.78
LTE – Band12 (1.4)	099.1 - 115.5	1M10W7D	64 QAM	0.097	19.86	0.532	27.26
		1M09W7D	256 QAM	0.057	17.56	0.299	24.76
	700.5 - 714.5	2M70G7D	QPSK	0.169	22.29	0.759	28.80
ITE Pand 12(2)		2M71W7D	16 QAM	0.147	21.66	0.676	28.30
LTE – Band12 (3)		2M72W7D	64 QAM	0.108	20.35	0.500	26.99
		2M71W7D	256 QAM	0.059	17.72	0.276	24.41
		4M50G7D	QPSK	0.163	22.12	0.759	28.80
LTE Dand 12 (E)	701 5 712 5	4M51W7D	16 QAM	0.144	21.59	0.659	28.19
LTE – Band12 (5)	701.5 – 713.5	4M50W7D	64 QAM	0.106	20.24	0.467	26.69
		4M52W7D	256 QAM	0.060	17.75	0.264	24.22
		8M98G7D	QPSK	0.161	22.08	0.759	28.80
	704.0 711.0	8M95W7D	16 QAM	0.146	21.63	0.718	28.56
LTE – Band12 (10)	704.0 – 711.0	8M97W7D	64 QAM	0.110	20.40	0.506	27.04
		9M00W7D	256 QAM	0.058	17.63	0.269	24.29



# **2. INTRODUCTION**

## **2.1. DESCRIPTION OF EUT**

The EUT was a GM Onstar Gen12 ROW with GSM/GPRS/EGPRS/UMTS and LTE, Sub6.

## 2.2. MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

## 2.3. TEST FACILITY

The Fully-anechoic chamber and conducted measurement facility used to collect the radiated data are located at the **74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Republic of Korea** 





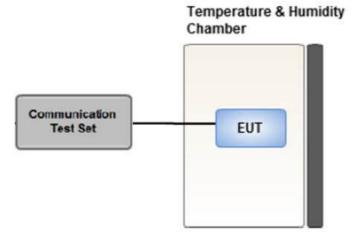
# **3. DESCRIPTION OF TESTS**

## **3.1 TEST PROCEDURE**

Test Description	Test Procedure Used	
Occupied Bandwidth	- KDB 971168 D01 v03r01 – Section 4.3 - ANSI C63.26-2015 – Section 5.4.4	
Band Edge	- KDB 971168 D01 v03r01 – Section 6.0 - ANSI C63.26-2015 – Section 5.7	
Spurious and Harmonic Emissions at Antenna Terminal	- KDB 971168 D01 v03r01 – Section 6.0 - ANSI C63.26-2015 – Section 5.7	
Conducted Output Power	- KDB 971168 D01 v03r01 – Section 5.2	
Frequency stability	- ANSI C63.26-2015 – Section 5.6	
Effective Radiated Power/ Effective Isotropic Radiated Power	- KDB 971168 D01 v03r01 – Section 5.2 & 5.8 - ANSI/TIA-603-E-2016 – Section 2.2.17	
Radiated Spurious and Harmonic Emissions	- KDB 971168 D01 v03r01 – Section 6.2 - ANSI/TIA-603-E-2016 – Section 2.2.12	



## **3.2 CONDUCTED OUTPUT POWER**



## Test setup

#### **Test Overview**

When an average power meter is used to perform RF output power measurements, the fundamental condition that measurements be performed only over durations of active transmissions at maximum output power level applies.

Conducted Output Power was tested in accordance with KDB971168 D01 Power Meas License Digital Systems v03r01, Section 5.2.

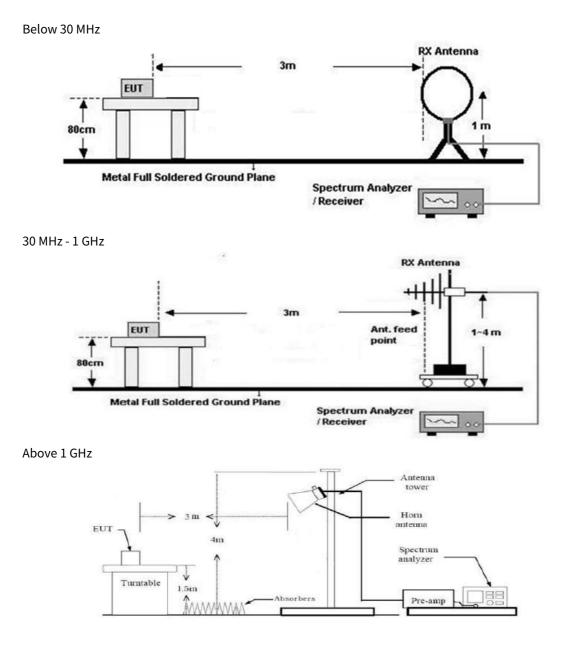


## **3.3 RADIATED TEST**

#### **Test Overview**

Radiated tests are performed in the semi-anechoic chamber. The equipment under test is placed on a non-conductive table on semi-anechoic chamber.

#### **Test Configuration**





## **3.3.1 RADIATED POWER**

#### **Test Settings**

- 1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation.
- 2. RBW = 1 5% of the expected OBW, not to exceed 1 MHz
- 3. VBW  $\geq$  3 x RBW
- 4. Span = 1.5 times the OBW
- 5. No. of sweep points > 2 x span / RBW
- 6. Detector = RMS
- 7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto".
- 8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation.
- 9. Trace mode = trace averaging (RMS) over 100 sweeps
- 10. The trace was allowed to stabilize

#### Test Note

- 1. The EUT is placed on a turntable, which is 0.8 m above ground plane. (Below 1 GHz)
- 2. The EUT is placed on a turntable, which is 1.5 m above ground plane. (Above 1 GHz)
- 3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
- 4. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- 5. EUT is set 3 m away from the receiving antenna, which is varied from 1 m to 4 m to find out the highest emissions.
- 6. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.
- 7. Total(dBµV/m) = Measured Value(dBµV) + Cable Loss(dB) + Antenna Factor(dB/m) + Distance Factor(D.F)
- 8. EIRP (dBm)
  - = Total (dB $\mu$ V/m) + 20 log D  $\,-\,$  104.8 (where D is the measurement distance in meters. D=3)
  - = Total ( $dB\mu V/m$ ) 95.2(dB)
- 9. ERP(dBm) = EIRP(dBm) 2.15(dB)



## **3.3.2 RADIATED SPURIOUS EMISSIONS**

## **Test Settings**

- 1. RBW = 100 kHz for emissions below 1 GHz and 1 MHz for emissions above 1 GHz
- 2. VBW  $\geq$  3 x RBW
- 3. Span = 1.5 times the OBW
- 4. No. of sweep points > 2 x span / RBW
- 5. Detector = Peak
- 6. Trace mode = Max Hold
- 7. The trace was allowed to stabilize
- 8. Test channel : Low/ Middle/ High
- 9. Frequency range : We are performed all frequency to 10<sup>th</sup> harmonics from 9 kHz.

## Test Note

1. The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning.

The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the test data

2. Measurements value show only up to 3 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.

## Below 30 MHz

- 1. The loop antenna was placed at a location 3 m from the EUT
- 2. The EUT is placed on a turntable, which is 0.8 m above ground plane.
- 3. We have done x, y, z planes in EUT and horizontal and vertical polarization and Parallel to the ground plane in detecting antenna.

4. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.

- 5. Distance Correction Factor(0.009 MHz 0.490 MHz) = 40log(3 m/300 m) = 80 dB Measurement Distance : 3 m
- 6. Distance Correction Factor(0.490 MHz 30 MHz) = 40log(3 m/30 m) = -40 dB Measurement Distance : 3 m
- 7. Total = Measured Value + Antenna Factor(A.F) + Cable Loss(C.L) + Distance Factor(D.F)
- 8. EIRP (dBm)
  - = Total ( $dB\mu V/m$ ) + 20 log D 104.8 (where D is the measurement distance in meters. D=3)

```
= Total (dBµV/m) - 95.2(dB)
```

9. ERP(dBm) = EIRP(dBm) - 2.15(dB)



## KDB 414788 OFS and Chamber Correlation Justification

Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

OFS and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

## Below 1 GHz

- 1. The EUT is placed on a turntable, which is 0.8 m above ground plane.
- 2. The Hybrid antenna was placed at a location 3 m from the EUT, which is varied from 1 m to 4 m to find out the highest emissions.
- 3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
- 4. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- 5. Total = Measured Value + Antenna Factor(A.F) + Cable Loss(C.L)
- 7. Total(dB $\mu$ V/m) = Measured Value(dB $\mu$ V) + Cable Loss(dB) + Antenna Factor(dB/m) + Distance Factor(D.F)
- 8. EIRP (dBm)
  - = Total (dB<sub>µ</sub>V/m) + 20 log D 104.8 (where D is the measurement distance in meters. D=3)
  - = Total (dBμV/m) 95.2(dB)
- 9. ERP(dBm) = EIRP(dBm) 2.15(dB)

#### Above 1 GHz

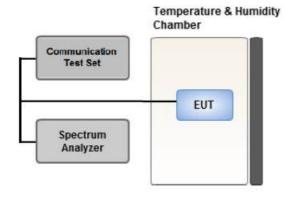
1. The EUT is placed on a turntable, which is 1.5 m above ground plane.

- 2. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
- 3. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- 4. EUT is set 3 m away from the receiving antenna, which is varied from 1 m to 4 m to find out the highest emissions.
- 5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 6. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 7. Total(dBµV/m) = Measured Value(dBµV) + Cable Loss(dB) + Antenna Factor(dB/m) + Distance Factor(D.F)

- 8. EIRP (dBm)
  - = Total (dB $\mu$ V/m) + 20 log D  $\,-\,$  104.8 (where D is the measurement distance in meters. D=3)
  - = Total (dBμV/m) 95.2(dB)



## **3.4 PEAK- TO- AVERAGE RATIO**



#### Test setup

## ① CCDF Procedure for PAPR

- 1. Set resolution/measurement bandwidth  $\geq$  signal's occupied bandwidth;
- 2. Set the number of counts to a value that stabilizes the measured CCDF curve;
- 3. Set the measurement interval as follows:
  - .- for continuous transmissions, set to 1 ms,
  - .- or burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize and set the measurement interval to a time that is less than or equal to the burst duration.
- 4. Record the maximum PAPR level associated with a probability of 0.1 %.



#### ② Alternate Procedure for PAPR

Use one of the procedures presented in 5.2(ANSI C63.26-2015) to measure the total peak power and record as as P  $_{\rm Pk}$ 

Use one of the applicable procedures presented 5.2(ANSI C63.26-2015) to measure the total average power and record as P  $_{\rm Avg}$ . Determine the P.A.R. from:

P.A.R (dB) = P Pk (dBm) - P Avg (dBm) (P Avg = Average Power + Duty cycle Factor)

#### **Test Settings(Peak Power)**

The measurement instrument must have a RBW that is greater than or equal to the OBW of the signal to be measured and a VBW  $\geq$  3 × RBW.

- 1. Set the RBW  $\geq$  OBW.
- 2. Set VBW  $\geq$  3 × RBW.
- 3. Set span  $\geq$  2 × OBW.
- 4. Sweep time  $\geq 10 \times$  (number of points in sweep)  $\times$  (transmission symbol period).
- 5. Detector = peak.
- 6. Trace mode = max hold.
- 7. Allow trace to fully stabilize.
- 8. Use the peak marker function to determine the peak amplitude level.

#### **Test Settings(Average Power)**

- 1. Set span to 2 × to 3 × the OBW.
- 2. Set RBW  $\geq$  OBW.
- 3. Set VBW  $\geq$  3 × RBW.
- 4. Set number of measurement points in sweep  $\geq$  2 × span / RBW.
- 5. Sweep time:

Set  $\geq$  [10 × (number of points in sweep) × (transmission period)] for single sweep (automation-compatible) measurement. The transmission period is the (on + off) time.

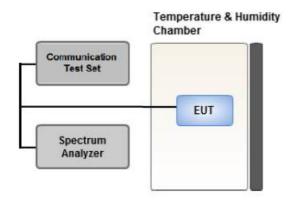
- 6. Detector = power averaging (rms).
- 7. Set sweep trigger to "free run."
- 8. Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple. (To accurately determine the average power over the on and off period of the transmitter, it can be necessary to increase the number of traces to be averaged above 100 or, if using a manually configured sweep time, increase the sweep time.)

9. Use the peak marker function to determine the maximum amplitude level.

 Add [10 log (1/duty cycle)] to the measured maximum power level to compute the average power during continuous transmission. For example, add [10 log (1/0.25)] = 6 dB if the duty cycle is a constant 25 %.



## **3.5 OCCUPIED BANDWIDTH.**



#### Test setup

The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

The EUT makes a call to the communication simulator.

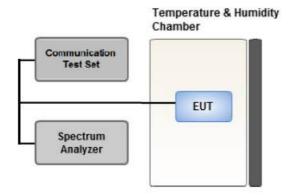
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth

- 1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99 % occupied bandwidth and the 26 dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
- 2. RBW = 1 5 % of the expected OBW
- 3. VBW  $\geq$  3 x RBW
- 4. Detector = Peak
- 5. Trace mode = max hold
- 6. Sweep = auto couple
- 7. The trace was allowed to stabilize
- 8. If necessary, steps 2 7 were repeated after changing the RBW such that it would be within
  - 1 5 % of the 99 % occupied bandwidth observed in Step 7



## 3.6 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL



#### Test setup

#### **Test Overview**

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic.

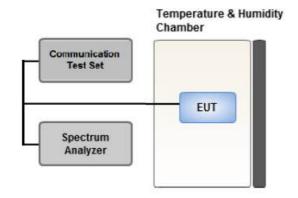
All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

- 1. RBW = 1 MHz
- 2. VBW  $\geq$  3 MHz
- 3. Detector = RMS
- 4. Trace Mode = trace average
- 5. Sweep time = auto
- 6. Number of points in sweep  $\geq$  2 x Span / RBW



## 3.7 BAND EDGE



#### Test setup

#### **Test Overview**

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

- 1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
- 2. Span was set large enough so as to capture all out of band emissions near the band edge
- 3. RBW > 1 % of the emission bandwidth
- 4. VBW > 3 x RBW
- 5. Detector = RMS
- 6. Number of sweep points  $\geq$  2 x Span/RBW
- 7. Trace mode = trace average
- 8. Sweep time = auto couple
- 9. The trace was allowed to stabilize



## **Test Notes**

According to FCC 22.917, 24.238, 27.53 specified that power of any emission outside of The authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

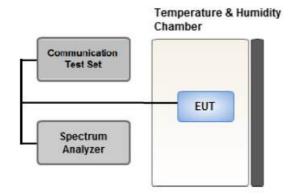
In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

All measurements were done at 2 channels(low and high operational frequency range.) The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

Where Margin < 1 dB the emission level is either corrected by 10 log(1 MHz/ RB) or the emission is integrated over a 1 MHz bandwidth to determine the final result. When using the integration method the integration window is either centered on the emission or, for emissions at the band edge, centered by an offset of 500 kHz from the block edge so that the integration window is the 1 MHz adjacent to the block edge.



# 3.8 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE



#### Test setup

#### **Test Overview**

Frequency stability testing is performed in accordance with the guidelines of ANSI C63.26-2015. The frequency stability of the transmitter is measured by:

1. Temperature:

The temperature is varied from -30 °C to +50 °C in 10 °C increments using an environmental chamber.

- 2. Primary Supply Voltage:
  - .- Unless otherwise specified, vary primary supply voltage from 85 % to 115 % of the nominal value for other than hand carried battery equipment.
  - .- For hand carried, battery powered equipment, reduce the primary ac or dc supply voltage to the battery operating end point, which shall be specified by the manufacturer.

- 1. The carrier frequency of the transmitter is measured at room temperature (20 °C to provide a reference).
- 2. The equipment is turned on in a "standby" condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
- 3. Frequency measurements are made at 10 °C intervals ranging from -30 °C to +50 °C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.





## 3.9 WORST CASE(RADIATED TEST)

- The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning.
- All modes of operation were investigated and the worst case configuration results are reported.
- Mode : Internal Antenna, External Antenna (ANT 5, ANT 4, DUT 4)
- Worst case : Internal Antenna, External Antenna (ANT 5)
- The worst case is reported with the EUT positioning, modulations, and paging service configurations shown in the test data.
- Please refer to the table below.
- In the case of radiated spurious emissions, all bandwidth of operation were investigated and the
  - worst case bandwidth results are reported.
  - (External Antenna Worst case : 3 MHz)
- (Internal Antenna Worst case : 1.4 MHz)
- TFGMEIBBCD4 & additional models were tested and the worst case results are reported. (Worst case : TFGMEIBBCD4)

Test Description	Modulation	RB size	RB offset	Axis
Effective Radiated Power	QPSK, 16 QAM, 64 QAM 256 QAM,	See Sec	tion 8.2.1	Only X
Radiated Spurious and Harmonic Emissions	QPSK	See Sec	tion 8.3.1	Only X

[External Antonna Moret case ]

#### [Internal Antenna Worst case]

Test Description	Modulation	RB size	RB offset	Axis
Effective Radiated Power	QPSK, 16 QAM, 64 QAM, 256 QAM	See Sec	tion 8.2.2	Z
Radiated Spurious and Harmonic Emissions	QPSK	See Sec	tion 8.3.2	Y



# 3.10 WORST CASE(CONDUCTED TEST)

- All modes of operation were investigated and the worst case configuration results are reported.
- TFGMEIBBCD4 & additional models were tested and the worst case results are reported.
- (Worst case : TFGMEIBBCD4)

	[Wor	rst case ]			
Test Description	Modulation	Bandwidth (MHz)	Frequency	RB size	RB offset
Occupied Bandwidth	QPSK, 16 QAM, 64 QAM, 256 QAM	1.4, 3, 5, 10	Mid	Full RB	0
		1.4	Low	1	0
	QPSK	1.4	High	1	5
		3	Low	1	0
			High	1	14
Band Edge		5	Low	1	0
Ballu Euge		5	High	1	24
		10	Low	1	0
		10	High	1	49
		1.4, 3, 5, 10	Low, High	Full RB	0
Spurious and Harmonic Emissions at Antenna Terminal	QPSK	1.4, 3, 5, 10	Low, Mid, High	1	0



4.	LIST	OF '	TEST	FOU	IPMENT
<b></b>				LÁA	

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
Antenna Position Tower	MA4640/800-XP-ET	Innco systems	N/A	N/A	N/A
Turn Table	DS2000-S	Innco systems	N/A	N/A	N/A
Turn Table	Turn Table	Ets	N/A	N/A	N/A
Controller (Antenna mast & Turn Table)	CO3000	Innco systems	CO3000/1542/ 57580623/G	N/A	N/A
Amp & Filter Bank Switch Controller	FBSM-01B	TNM system	TM20090001	N/A	N/A
RF Switch System	TMX0132C	TNM System	TM21100002	N/A	N/A
RF Switch System	FBSR-04C HPF1	TNM System	S5L1	03/12/2025	Annual
RF Switch System	FBSR-04C LNA1	TNM System	S5L4	03/12/2025	Annual
RF Switch System	FBSR-04C HPF2	TNM System	S5L5	03/12/2025	Annual
HIGHPASS FILTER	WHKX10-900-1000- 15000-40SS	WAINWRIGHT INSTRUMENTS	16	07/24/2025	Annual
HIGHPASS FILTER	WHNX6.0/26.5G-6SS	WAINWRIGHT INSTRUMENTS	1	12/11/2024	Annual
Power Amplifier	CBL18265035	CERNEX	22966	11/17/2024	Annual
Power Amplifier	CBL26405040	CERNEX	25956	02/26/2025	Annual
Loop Antenna (9 kHz ~ 30 MHz)	FMZB1513	Schwarzbeck	1513-333	03/07/2026	Biennial
Horn Antenna(1 ~ 18 GHz)	HF907	ROHDE & SCHWARZ	103224	05/07/2026	Biennial
Horn Antenna(15 ~ 40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170342	09/20/2026	Biennial
Bilog Antenna	VULB9160	Schwarzbeck	3150	03/09/2025	Biennial
Hybrid Antenna	VULB9160	Schwarzbeck	760	02/24/2025	Biennial
Trilog Broadband Antenna	VULB 9168	Schwarzbeck	1135	08/19/2026	Biennial
Chamber	SU-642	ESPEC	93008124	02/19/2025	Annual
Power Splitter(DC~26.5 GHz)	11667B	Hewlett Packard	11275	02/19/2025	Annual
DC Power Supply	E3632A	Hewlett Packard	KR01009150	04/18/2025	Annual
4-Way Divider	ZC4PD-K1844+	Mini-Circuits	942907	09/10/2025	Annual
ATTENUATOR(20 dB)	8493C	Hewlett Packard	17280	04/17/2025	Annual
Spectrum Analyzer(10 Hz ~ 40 GHz)	FSV40	ROHDE & SCHWARZ	101510	03/28/2025	Annual
Base Station	8960 (E5515C)	Agilent	MY48360800	08/05/2025	Annual
Wideband Radio Communication Tester	MT8821C	Anritsu Corp.	6262287701	05/16/2025	Annual
Wideband Radio Communication Tester	MT8000A	Anritsu Corp.	6262302511	05/14/2025	Annual
Signal Analyzer (10 Hz ~ 26.5 GHz)	N9020A	Agilent	MY52090906	04/19/2025	Annual
Signal Analyzer (5 Hz ~ 40.0 GHz)	N9030B	KEYSIGHT	MY55480167	05/17/2025	Annual
FCC LTE Mobile Conducted RF Automation Test Software	-	HCT CO., LTD.,	-	-	-

Note: I. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date. 2. Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5 (Version : 2017).



## **5. MEASUREMENT UNCERTAINTY**

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4:2014.

All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95 % level of confidence. The measurement data shown herein meets or exceeds the  $U_{CISPR}$  measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty (±dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.98 (Confidence level about 95 %, <i>k</i> =2)
Radiated Disturbance (9 kHz ~ 30 MHz)	4.36 (Confidence level about 95 %, <i>k</i> =2)
Radiated Disturbance (30 MHz ~ 1 GHz)	5.70 (Confidence level about 95 %, <i>k</i> =2)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.52 (Confidence level about 95 %, <i>k</i> =2)
Radiated Disturbance (18 GHz ~ 40 GHz)	5.66 (Confidence level about 95 %, <i>k</i> =2)
Radiated Disturbance (Above 40 GHz)	5.58 (Confidence level about 95 %, <i>k</i> =2)





# **6. SUMMARY OF TEST RESULTS**

6.1 Test Condition: Conducted Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Occupied Bandwidth	§2.1049	N/A	PASS
Band Edge / Spurious and Harmonic Emissions at Antenna Terminal.	§2.1051, §27.53(g)	< 43 + 10log10 (P[Watts]) at Band Edge and for all out-of-band emissions	PASS
Conducted Output Power	§2.1046	N/A	PASS
Frequency stability / variation of ambient temperature	§2.1055, §27.54	Emission must remain in band	PASS

#### 6.2 Test Condition: Radiated Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Effective Radiated Power	§27.50(c)(10)	< 3 Watts max. ERP	PASS
Radiated Spurious and Harmonic Emissions	§2.1053, §27.53(g)	< 43 + 10log10 (P[Watts]) for all out-of band emissions	PASS



# 7. EMISSION DESIGNATOR

#### **GSM Emission Designator**

Emission Designator = 249KGXW GSM BW = 249 kHz G = Phase Modulation X = Cases not otherwise covered W = Combination (Audio/Data)

#### **EDGE Emission Designator**

Emission Designator = 249KG7W GSM BW = 249 kHz G = Phase Modulation 7 = Quantized/Digital Info W = Combination (Audio/Data)

#### WCDMA Emission Designator

Emission Designator = 4M17F9W WCDMA BW = 4.17 MHz F = Frequency Modulation 9 = Composite Digital Info W = Combination (Audio/Data)

#### **QPSK Modulation**

Emission Designator = 4M48G7D LTE BW = 4.48 MHz G = Phase Modulation 7 = Quantized/Digital Info D = Data transmission; telemetry; telecommand

<u>QAM Modulation</u> Emission Designator = 4M48W7D LTE BW = 4.48 MHz W = Amplitude/Angle Modulated 7 = Quantized/Digital Info D = Data transmission; telemetry; telecommand



## 8. TEST DATA

## 8.1 Conducted Output Power

Bandwidth	Modulation	RB Size	RB Offset	Max.A	Max.Average Power (dBm)					
Danuwiuui	Modulation	RD SIZE	KD Oliset	23017	23095	23173				
				699.7 MHz	707.5 MHz	715.3 MHz				
		1	0	23.71	23.77	23.78				
		1	3	23.81	23.85	23.74				
		1	5	23.75	23.81	23.54				
	QPSK	3	0	23.83	23.86	23.72				
		3	1	23.80	23.89	23.81				
		3	3	23.82	23.76	23.61				
		6	0	22.90	22.93	22.81				
		1	0	23.06	23.09	22.99				
		1	3	23.18	23.01	22.99				
		1	5	23.10	23.09	22.96				
	16 QAM	3	0	23.06	23.07	22.99				
		3	1	23.00	23.03	22.97				
		3	3	23.02	23.06	22.89				
1 4 6411-		6	0	22.03	21.95	21.81				
1.4 MHz		1	0	21.53	22.06	21.39				
		1	3	21.67	22.17	21.15				
		1	5	21.64	21.93	21.03				
	64 QAM	3	0	21.49	22.06	21.23				
		3	1	21.54	22.05	21.11				
		3	3	21.49	22.00	20.91				
		6	0	20.53	20.96	20.08				
		1	0	19.05	19.09	18.94				
		1	3	19.14	19.16	19.05				
		1	5	19.00	19.02	19.06				
	256 QAM	3	0	19.01	19.01	18.94				
		3	1	19.07	19.04	19.00				
		3	3	18.92	19.03	19.03				
		6	0	19.00	19.00	18.93				



				Max.A	verage Power	(dBm)
Bandwidth	Modulation	RB Size	RB Offset	23025	23095	23165
				700.5 MHz	707.5 MHz	714.5 MHz
		1	0	23.89	23.89	23.90
		1	7	7 23.90		23.89
		1	14	23.86	23.87	23.65
	QPSK	8	0	22.94	22.93	22.92
		8	3	22.99	22.99	22.93
		8	7	22.98	22.90	22.92
		15	0	22.95	22.93	23.02
		1	0	23.17	23.15	23.11
		1	7	23.09	23.19	23.34
		1	14	23.07	23.14	23.02
	16 QAM	8	0	22.02 21.96		21.93
		8	3	22.11 22.06		21.97
		8	7	21.99	22.02	22.01
		15	0	22.00	22.04	22.01
3 MHz		1	0	21.64	21.92	21.84
		1	7	21.71	22.06	21.50
		1	14	21.52	22.06	21.05
	64 QAM	8	0	20.57	20.84	20.66
		8	3	20.59	21.02	20.55
		8	7	20.48	20.96	20.20
		15	0	20.50	20.99	20.38
		1	0	19.12	19.22	19.23
		1	7	19.11	19.18	19.25
		1	14	19.06	19.24	19.14
	256 QAM	8	0	19.02	19.05	19.02
		8	3	19.05	19.14	19.04
		8	7	18.99	19.02	19.00
		15	0	19.11	19.07	19.03



				Max.A	verage Power	(dBm)
Bandwidth	Modulation	RB Size	RB Offset	23035	23095	23155
				701.5 MHz	707.5 MHz	713.5 MHz
		1	0	23.90	23.99	23.93
		1	12	23.79	23.89	23.89
		1	24	23.85	23.84	23.69
	QPSK	12	0	23.00	22.98	22.94
		12	6	23.03	22.99	22.92
		12	11	23.01	22.96	22.97
		25	0	22.96	22.98	22.91
		1	0	23.11	23.23	23.07
		1	12	23.07	23.16	23.51
	-	1	24	23.19	23.25	22.98
	16 QAM	12	0	22.01	22.02	22.06
		12	6	22.08	22.15	21.94
		12	11	22.00	22.05	22.08
5.444		25	0	22.08	22.06	21.96
5 MHz		1	0	21.50	21.61	22.12
		1	12	21.48	22.11	21.82
	-	1	24	21.40	22.20	21.21
	64 QAM	12	0	20.43	20.75	21.03
		12	6	20.42	20.92	20.88
		12	11	20.32	21.00	20.55
		25	0	20.29	20.81	20.77
		1	0	19.03	19.13	19.23
		1	12	19.12	19.35	19.15
		1	24	19.19	19.01	19.13
	256 QAM	12	0	19.04	19.12	19.11
		12	6	19.11	19.10	18.98
		12	11	19.07	19.07	19.04
		25	0	19.05	19.03	19.01



				Max.A	Max.Average Power (dBm)					
Bandwidth	Modulation	RB Size	RB Offset	23060	23095	23130				
				704 MHz	707.5 MHz	711 MHz				
		1	0	23.84	23.83	23.86				
		1	24	23.80	23.91	23.96				
		1	49	24.00	23.82	23.75				
	QPSK	25	0	23.05	23.02	23.01				
		25	12	23.04	23.09	23.00				
		25	24	23.04	22.96	22.96				
		50	0	23.03	23.00	23.02				
		1	0	23.37	23.25	23.19				
		1	24	23.14	23.29	23.07				
	16 QAM	1	49	23.23	23.28	23.14				
		25	0	22.06	21.99	22.07				
		25	12	22.10	22.08	22.07				
		25	24	22.03	21.99	22.06				
		50	0	22.07	22.03	22.07				
10 MHz		1	0	21.74	21.95	22.00				
		1	24	21.66	22.21	22.31				
		1	49	22.01	22.15	21.09				
	64 QAM	25	0	20.44	20.47	21.03				
		25	12	20.30	20.76	21.07				
		25	24	20.47	20.99	20.85				
		50	0	20.51	20.89	20.99				
		1	0	19.09	19.17	19.22				
		1	24	19.19	19.30	19.10				
		1	49	19.16	19.28	18.94				
	256 QAM	25	0	19.13	19.12	19.07				
		25	12	19.00	19.06	19.14				
		25	24	19.04	19.03	19.04				
		50	0	19.01	19.09	19.10				





# **8.2 EFFECTIVE RADIATED POWER**

## 8.2.1 External Antenna

Frag	Mod/		Measured	A.F+C.L+D.F	Total		Limit	EF	RP		RB		
Freq (MHz)	Mod/ Bandwidth	Modulation	Level	(dB/m)		Pol	w	w	dBm	Size	Offset		
		QPSK	89.00	28.95	117.95	V				0.115	20.60		
C00 7		16-QAM	88.56	28.95	117.51	V		0.104	20.16		F		
699.7	LTE B12	64-QAM	87.09	28.95	116.04	V	_	0.074	18.69		5		
		256-QAM	84.36	28.95	113.31	V		0.040	15.96				
		QPSK	90.10	28.99	119.09	V		0.149	21.74				
707 F		16-QAM	89.70	28.99	118.69	V	< 2.00	0.136	21.34		2		
707.5	(1.4 MHz)	64-QAM	88.22	28.99	117.21	V	< 3.00	0.097	19.86		3		
		256-QAM	85.55	28.99	114.54	V			17.19				
		QPSK	90.39	29.03	119.42	V		0.161	22.07				
715.0		16-QAM	89.91	29.03	118.94	V		0.144	21.59		2		
715.3		64-QAM	87.85	29.03	116.88	V		0.090	19.53	1	3		
		256-QAM	85.88	29.03	114.91	V		0.057 17	17.56	]			

Freq	Mod/		Measured	A.F+C.L+D.F	Total		Limit	EI	RP	F	RB
(MHz)	Bandwidth	Modulation	Level (dBµV)	(dB/m)	(dBµV/m)	Pol	w	w	dBm	Size	Offset
		QPSK	89.43	28.96	118.39	V		0.127	21.04		
700.5		16-QAM	88.96	28.96	117.92	V		0.114	20.57	1	14
100.5	LTE B12	64-QAM	87.51	28.96	116.47	V	_	0.082	19.12	- 1	14
		256-QAM	84.90	28.96	113.86	V		0.045	16.51		
		QPSK	90.37	28.99	119.36	V		0.159	22.01		14
707 5		16-QAM	89.77	28.99	118.76	V	< 2.00	0.139	21.41		
707.5	(3 MHz)	64-QAM	88.71	28.99	117.70	V	< 3.00	0.108	20.35		
		256-QAM	85.82	28.99	114.81	V		0.056	17.46		
		QPSK	90.60	29.04	119.64	V		0.169	22.29		
714 5		16-QAM	89.97	29.04	119.01	V		0.147	21.66		0
714.5		64-QAM	88.48	29.04	117.52	V		0.104	20.17	1	0
		256-QAM	86.03	29.04	115.07	V		0.059	17.72		



Freq	Mod/		Measured	A.F+C.L+D.F	Total		Limit	Ef	RP		RB
(MHz)	Bandwidth	Modulation		(dBµV/m)	Pol	w	W	dBm	Size	Offset	
		QPSK	89.70	28.99	118.69	V		0.136	21.34		
701 5		16-QAM	89.13	28.99	118.12	V		0.119	20.77	1	24
701.5		64-QAM	87.72	28.99	116.71	V		0.086	19.36	1	24
		256-QAM	85.00	28.99	113.99	V		0.046	16.64		
		QPSK	90.33	28.99	119.32	V		0.158	21.97	- 1	
707 F	LTE B12	16-QAM	89.91	28.99	118.90	V	< 2.00	0.143	21.55		24
707.5	(5 MHz)	64-QAM	88.33	28.99	117.32	V	< 3.00	0.099	19.97		24
		256-QAM	85.79	28.99	114.78	V		0.055	17.43		
		QPSK	90.43	29.04	119.47	V		0.163	22.12		
712 5		16-QAM	89.90	29.04	118.94	V		0.144	21.59		0
713.5		64-QAM	88.55	29.04	117.59	V		0.106	20.24	1	0
		256-QAM	86.06	29.04	115.10	V		0.060	17.75		

	Mad/		Measured	A.F+C.L+D.F	Total		Limit	EF	RP	RB	
Freq (MHz)	Mod/ Bandwidth	Modulation		(dBµV/m)	Pol	w	w	dBm	Size	Offset	
		QPSK	90.26	29.01	119.27	V		0.156	21.92		
704.0		16-QAM	89.85	29.01	118.86	V		0.142	21.51	1	40
704.0		64-QAM	88.16	29.01	117.17	V		0.096	19.82	1	49
		256-QAM	85.70	29.01	114.71	V		0.055	17.36		
	LTE B12	QPSK	90.40	28.99	119.39	V		0.160	22.04		
707 F		16-QAM	89.91	28.99	118.90	V	< 2.00	0.143	21.55	1	40
707.5	(10 MHz)	64-QAM	88.76	28.99	117.75	V	< 3.00	0.110	20.40	L	49
		256-QAM	85.96	28.99	114.95	V		0.058	17.60		
		QPSK	90.40	29.03	119.43	V		0.161	22.08		
711.0		16-QAM	89.95	29.03	118.98	V		0.146		1	25
711.0		64-QAM	88.40	29.03	117.43	V		0.102	20.08	1	25
		256-QAM	85.95	29.03	114.98	V		17.63			



# 8.2.2 Internal Antenna

Freq	Mod/		Measured	A.F+C.L+D.F	Total		Limit	EF	RP		RB
(MHz)	Bandwidth	Modulation	on Level (dB/m) (dBm)	(dBµV/m)	Pol	w	W	dBm	Size	Offset	
		QPSK	97.31	28.95	126.26	Н		0.778	28.91		
699.7	LTE B12	16-QAM	96.49	28.95	125.44	Н		0.644	28.09	1	3
699.7		64-QAM	94.74	28.95	123.69	Н		0.431	26.34		5
		256-QAM	92.62	28.95	121.57	Н		0.264	24.22		
		QPSK	97.67	28.99	126.66	Н		0.853	29.31		
707 5		16-QAM	97.14	28.99	126.13	Н		0.755	28.78	1	0
707.5	(1.4 MHz)	64-QAM	95.62	28.99	124.61	Н	< 3.00	0.532	27.26	1	0
		256-QAM	93.12	28.99	122.11	Н		0.299	24.76		
	-	QPSK	96.25	29.03	125.28	Н		0.621	27.93		
715.0		16-QAM	95.43	29.03	124.46	Н		0.514	27.11		0
715.3		64-QAM	93.30	29.03	122.33	Н		0.315	24.98	1	0
		256-QAM	91.55	29.03	120.58	Н		0.210	23.23		

	Mad/		Measured	A.F+C.L+D.F	Total		Limit	EF	RP		RB		
Freq (MHz)	Mod/ Bandwidth	Modulation		(dBµV/m)	Pol	w	w	dBm	Size	Offset			
			QPSK	96.85	28.96	125.81	н		_	0.701	28.46		
700 5		16-QAM	96.19	28.96	125.15	Н		0.602	27.80	1	0		
700.5		64-QAM	94.29	28.96	123.25	Н		0.389	25.90	1	0		
	LTE B12	256-QAM	92.80	28.96	121.76	Н		0.276	24.41				
		QPSK	97.16	28.99	126.15	Н		0.759	28.80	1			
707 F		16-QAM	96.66	28.99	125.65	Н	< 2.00	0.676	28.30		0		
707.5	(3 MHz)	64-QAM	95.35	28.99	124.34	Н	< 3.00	0.500	26.99	1	0		
		256-QAM	92.46	28.99	121.45	Н		0.257	24.10				
		QPSK	96.28	29.04	125.32	Н		0.626	27.97				
714 5		16-QAM	95.68	29.04	124.72	Н	0.546	27.37		14			
714.5		64-QAM	93.59	29.04	122.63	Н		0.337	25.28	- 1	14		
		256-QAM	91.82	29.04	120.86	Н		0.224	23.51				



Freq (MHz)	Mod/		Measured	A.F+C.L+D.F	Total		Limit	EF	RP		RB
	Bandwidth	Modulation		(dBµV/m)	Pol	w	W	dBm	Size	Offset	
		QPSK	97.16	28.99	126.15	Н		0.759	28.80	-	24
701 5		16-QAM	96.55	28.99	125.54	Н		0.659	28.19		
701.5		64-QAM	94.32	28.99	123.31	Н 0.394	25.96	1	24		
	LTE B12 (5 MHz)	256-QAM	92.56	28.99	121.55	Н		0.263	24.20		
707.5		QPSK	97.15	28.99	126.14	Н		0.659 28.1	28.79	- 1	0
		16-QAM	96.55	28.99	125.54	Н	< 2.00		28.19		
		64-QAM	95.05	28.99	124.04	Н	< 3.00		26.69		
		256-QAM	92.58	28.99	121.57	Н	0.264	24.22			
713.5		QPSK	96.65	29.04	125.69	Н		0.683	28.34	- 1	0
		16-QAM	96.29	29.04	125.33	Н		0.629 0.454	27.98		
		64-QAM	94.88	29.04	123.92	Н			26.57		
		256-QAM	92.10	29.04	121.14	н		0.240	23.79		

Freq (MHz)	Mod/ Bandwidth		Measured Level (dBm)		Total		Limit	ERP		RB	
		Modulation		(dBμV/m)	Pol	w	w	dBm	Size	Offset	
	LTE B12 (10 MHz)	QPSK	97.07	29.01	126.08	Н	-	0.747	28.73	- 1	25
704.0		16-QAM	96.67	29.01	125.68	Н		0.681	28.33		
704.0		64-QAM	95.12	29.01	124.13	Н		0.476	26.78		
		256-QAM	92.30	29.01	121.31	Н		0.249	23.96		
707.5		QPSK	97.16	28.99	126.15	Н		0.759 0.718	28.80	-	0
		16-QAM	96.92	28.99	125.91	Н	< 2.00		28.56		
		64-QAM	95.15	28.99	124.14	Н	< 3.00 0.478	26.79	- 1	0	
		256-QAM	92.65	28.99 121.64 H		0.269	24.29				
711.0		QPSK	97.00	29.03	126.03	Н		0.738	28.68	- 1	0
		16-QAM	96.57	29.03	125.60	Н		0.668 2	28.25		
		64-QAM	95.36	29.03	124.39	Н		0.506	27.04		
		256-QAM	92.33	29.03	121.36	Н		0.252	24.01		



## **8.3 RADIATED SPURIOUS EMISSIONS**

## 8.3.1 External Antenna

MODE:	LTE B12
MODULATION SIGNAL:	<u>3 MHz QPSK</u>
DISTANCE:	3 meters

Ch	Freq (MHz)		-7.0	Total	D.I	Result (dBm)	Limit	RB	
		Level (dBµV)		(dBµV/m)	Pol		(dBm)	Size	Offset
	1 401.00	55.45	-18.07	37.39	V	-57.82	-13.00	1	14
	2 101.50	56.84	-13.36	43.48	V	-51.72	-13.00		
23025 (700.5)	2 802.00	52.47	-11.50	40.97	V	-54.23	-13.00		
	3 502.50	50.82	-8.25	42.57	V	-52.63	-13.00		
	4 203.00	49.98	-5.42	44.56	V	-50.64	-13.00		
	1 415.00	55.71	-17.98	37.73	V	-57.47	-13.00	1	
	2 122.50	57.59	-13.50	44.09	V	-51.11	-13.00		
23095 (707.5)	2 830.00	52.85	-11.43	41.42	V	-53.78	-13.00		14
· · ·	3 537.50	51.73	-7.97	43.76	V	-51.44	-13.00		
	4 245.00	49.91	-5.14	44.77	V	-50.43	-13.00		
	1 429.00	55.45	-17.96	37.49	V	-57.71	-13.00	_	
	2 143.50	55.03	-13.43	41.60	V	-53.60	-13.00		
23165 (714.5)	2 858.00	53.19	-11.29	41.90	V	-53.30	-13.00	1	0
	3 572.50	51.51	-7.82	43.69	V	-51.51	-13.00		
	4 287.00	50.67	-4.92	45.75	V	-49.45	-13.00		



8.3.2 Internal Antenna

MODE:	LTE B12
MODULATION SIGNAL:	1.4 MHz QPSK
DISTANCE:	3 meters

Ch	Freq (MHz)	Measured Level (dBµV)	A.F+C.L+D.F+H.P.F -A.G (dB/m)	Total (dBμV/m)	Pol	Result (dBm)	Limit	RB	
							(dBm)	Size	Offset
	1 399.40	70.82	-18.07	52.76	Н	-42.45	-13.00		
	2 099.10	56.63	-13.36	43.27	V	-51.93	-13.00		
23017 (699.7)	2 798.80	59.33	-11.50	47.83	Н	-47.37	-13.00	1	3
, , , , , , , , , , , , , , , , , , ,	3 498.50	52.16	-8.50	43.66	Н	-51.54	-13.00		
	4 198.20	54.85	-5.05	49.80	V	-45.40	-13.00		
	1 415.00	70.59	-17.98	52.61	Н	-42.59	-13.00	_	
	2 122.50	59.19	-13.50	45.69	V	-49.51	-13.00		
23095 (707.5)	2 830.00	68.31	-11.43	56.88	Н	-38.32	-13.00	1	0
	3 537.50	52.13	-7.97	44.16	Н	-51.04	-13.00	-	
	4 245.00	49.80	-5.14	44.66	Н	-50.54	-13.00		
	1 430.60	71.10	-17.96	53.14	Н	-42.06	-13.00	-	
	2 145.90	69.18	-13.46	55.72	Н	-39.48	-13.00		
23173 (715.3)	2 861.20	58.37	-11.29	47.08	Н	-48.12	-13.00	1	0
	3 576.50	53.02	-7.83	45.19	Н	-50.01	-13.00		
	4 291.80	51.00	-4.92	46.08	V	-49.12	-13.00		



#### 8.4 PEAK-TO-AVERAGE RATIO

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
			QPSK			5.31
	1 4 1411		16-QAM			6.00
	1.4 MHz		64-QAM	6		6.65
			256-QAM			6.73
			QPSK		5.19 5.99 6.60 6.68 0 5.17 5.97 6.57 6.65 5.22	5.19
	3 MHz	- 707.5	16-QAM	15		5.99
			64-QAM			6.60
10			256-QAM			6.68
12			QPSK	25		5.17
			16-QAM			5.97
	5 MHz		64-QAM			6.57
			256-QAM			6.65
			QPSK			5.22
	10.1411		16-QAM	50		5.99
	10 MHz		64-QAM	50		6.54
			256-QAM			6.62

### Note:

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 71 ~ 86.



### 8.5 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
			QPSK			1.0874
	1 4 141		16-QAM			1.0891
	1.4 MHz		64-QAM	6		1.0970
			256-QAM			1.0908
		- 707.5	QPSK	15		2.6966
	3 MHz		16-QAM			2.7091
			64-QAM		_	2.7166
10			256-QAM		0 2.7076 4.4995 4.5080 4.4997	2.7076
12			QPSK	25		4.4995
			16-QAM			4.5080
	5 MHz		64-QAM			4.4997
			256-QAM			4.5218
			QPSK			8.9778
	10.1411		16-QAM	50		8.9472
	10 MHz		64-QAM	50		8.9676
			256-QAM			8.9987

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 55 ~ 70.



Band	Band Width (MHz)	Frequency (MHz)	Frequency of Maximum Harmonic (GHz)	Factor (dB)	Measurement Maximum Data (dBm)	Result (dBm)	Limit (dBm)
		699.7	3.6780	29.976	-67.302	-37.326	
	1.4	707.5	3.6825	29.976	-67.154	-37.178	
		715.3	3.6970	29.976	-67.539	-37.563	
	3	700.5	3.6710	29.976	-67.387	-37.411	
		707.5	3.7139	29.976	-67.252	-37.276	
10		714.5	3.6890	29.976	-67.133	-37.157	12.00
12		701.5	3.7000	29.976	-67.082	-37.106	-13.00
	5	707.5	3.7039	29.976	-66.981	-37.005	
		713.5	3.6850	29.976	-67.195	-37.219	
		704.0	3.7044	29.976	-67.150	-37.174	
	10	707.5	3.7129	29.976	-67.220	-37.244	
		711.0	3.7124	29.976	-67.220	-37.244	

#### **8.6 CONDUCTED SPURIOUS EMISSIONS**

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 87 ~ 98.

2. Conducted Spurious Emissions was Tested QPSK Modulation, Resource Block Size 1 and Resource Block Offset 0

3. Result (dBm) = Measurement Maximum Data (dBm) + Factor (dB)

```
4. Factor (dB) = Cable Loss + Attenuator + Power Splitter
```

Frequency Range (GHz)	Factor [dB]
0.03 - 1	27.270
1-5	29.976
5 - 10	30.591
10 – 15	31.116
15 – 20	31.489
Above 20(26.5)	32.131

#### 8.7 BAND EDGE

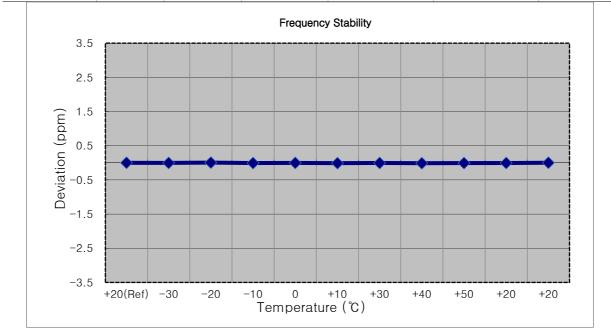
- Plots of the EUT's Band Edge are shown Page 99 ~ 126.



### 8.8 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

MODE:	LTE B12
OPERATING FREQUENCY:	699,700,000 Hz
CHANNEL:	23017 (1.4 MHz)
REFERENCE VOLTAGE:	13.500 VDC
DEVIATION LIMIT:	Emission must remain in band

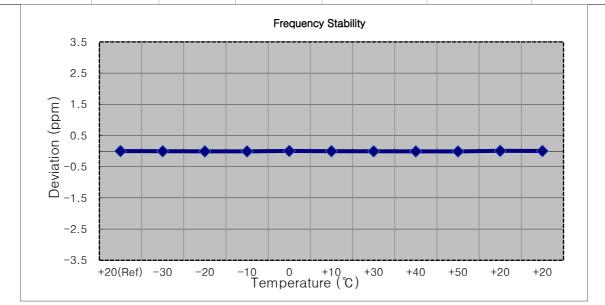
Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	- ppm
100 %		+20(Ref)	699 699 995	0.0	0.000 000	0.000
100 %		-30	699 699 992	-2.3	0.000 000	-0.003
100 %		-20	699 699 999	4.2	0.000 001	0.006
100 %		-10	699 699 989	-5.1	-0.000 001	-0.007
100 %	13.500	0	699 699 992	-2.2	0.000 000	-0.003
100 %		+10	699 699 987	-7.2	-0.000 001	-0.010
100 %		+30	699 699 991	-3.5	-0.000 001	-0.005
100 %		+40	699 699 986	-8.3	-0.000 001	-0.012
100 %		+50	699 699 989	-5.3	-0.000 001	-0.008
85 %	11.475	+20	699 699 990	-4.2	-0.000 001	-0.006
115 %	15.525	+20	699 699 996	1.0	0.000 000	0.001





LTE B12
700,500,000 Hz
23025 (3 MHz)
13.500 VDC
Emission must remain in band

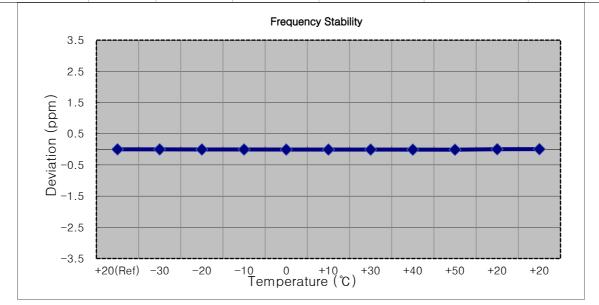
Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	– ppm
100 %		+20(Ref)	700 500 003	0.0	0.000 000	0.000
100 %		-30	700 499 999	-3.1	0.000 000	-0.004
100 %		-20	700 499 997	-6.0	-0.000 001	-0.009
100 %		-10	700 499 997	-6.0	-0.000 001	-0.009
100 %	13.500	0	700 500 005	2.9	0.000 000	0.004
100 %		+10	700 500 000	-2.5	0.000 000	-0.004
100 %		+30	700 499 998	-4.5	-0.000 001	-0.006
100 %		+40	700 499 996	-6.3	-0.000 001	-0.009
100 %		+50	700 499 995	-7.3	-0.000 001	-0.010
85 %	11.475	+20	700 500 008	5.5	0.000 001	0.008
115 %	15.525	+20	700 500 005	2.0	0.000 000	0.003





MODE:	LTE B12
OPERATING FREQUENCY:	701,500,000 Hz
CHANNEL:	<u>23035 (5 MHz)</u>
REFERENCE VOLTAGE:	13.500 VDC
DEVIATION LIMIT:	Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	- ppm
100 %		+20(Ref)	701 499 998	0.0	0.000 000	0.000
100 %		-30	701 499 996	-1.4	0.000 000	-0.002
100 %		-20	701 499 995	-3.3	0.000 000	-0.005
100 %		-10	701 499 994	-3.6	-0.000 001	-0.005
100 %	13.500	0	701 499 993	-5.1	-0.000 001	-0.007
100 %		+10	701 499 993	-5.3	-0.000 001	-0.008
100 %		+30	701 499 992	-5.8	-0.000 001	-0.008
100 %		+40	701 499 991	-6.7	-0.000 001	-0.010
100 %		+50	701 499 990	-8.3	-0.000 001	-0.012
85 %	11.475	+20	701 500 000	2.2	0.000 000	0.003
115 %	15.525	+20	701 500 002	4.1	0.000 001	0.006

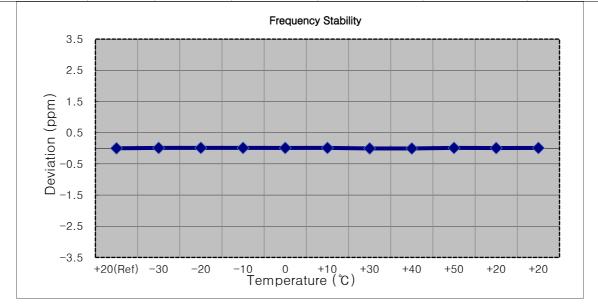


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MODE:	LTE B12
OPERATING FREQUENCY:	704,000,000 Hz
CHANNEL:	23060 (10 MHz)
REFERENCE VOLTAGE:	13.500 VDC
DEVIATION LIMIT:	Emission must remain in band

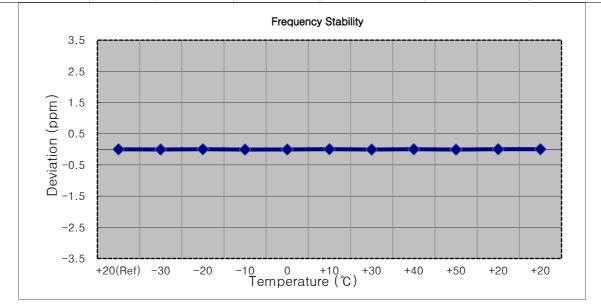
Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	- ppm
100 %		+20(Ref)	704 000 009	0.0	0.000 000	0.000
100 %		-30	704 000 018	8.4	0.000 001	0.012
100 %		-20	704 000 018	9.1	0.000 001	0.013
100 %		-10	704 000 018	8.8	0.000 001	0.012
100 %	13.500	0	704 000 017	7.8	0.000 001	0.011
100 %		+10	704 000 018	8.9	0.000 001	0.013
100 %		+30	704 000 006	-3.4	0.000 000	-0.005
100 %		+40	704 000 005	-3.8	-0.000 001	-0.005
100 %		+50	704 000 018	8.9	0.000 001	0.013
85 %	11.475	+20	704 000 015	5.5	0.000 001	0.008
115 %	15.525	+20	704 000 017	7.5	0.000 001	0.011





MODE:	LTE B12
OPERATING FREQUENCY:	707,500,000 Hz
CHANNEL:	<u>23095 (1.4 MHz)</u>
REFERENCE VOLTAGE:	13.500 VDC
DEVIATION LIMIT:	Emission must remain in band

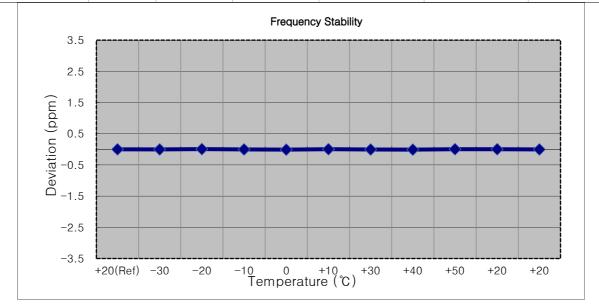
Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	- ppm
100 %		+20(Ref)	707 499 993	0.0	0.000 000	0.000
100 %		-30	707 499 989	-4.2	-0.000 001	-0.006
100 %		-20	707 499 995	2.0	0.000 000	0.003
100 %		-10	707 499 987	-5.8	-0.000 001	-0.008
100 %	13.500	0	707 499 990	-3.4	0.000 000	-0.005
100 %		+10	707 499 996	3.2	0.000 000	0.005
100 %		+30	707 499 988	-5.0	-0.000 001	-0.007
100 %		+40	707 499 996	2.4	0.000 000	0.003
100 %		+50	707 499 987	-6.1	-0.000 001	-0.009
85 %	11.475	+20	707 499 996	3.0	0.000 000	0.004
115 %	15.525	+20	707 499 996	2.4	0.000 000	0.003





MODE:	LTE B12
OPERATING FREQUENCY:	707,500,000 Hz
CHANNEL:	<u>23095 (3 MHz)</u>
REFERENCE VOLTAGE:	13.500 VDC
DEVIATION LIMIT:	Emission must remain in band

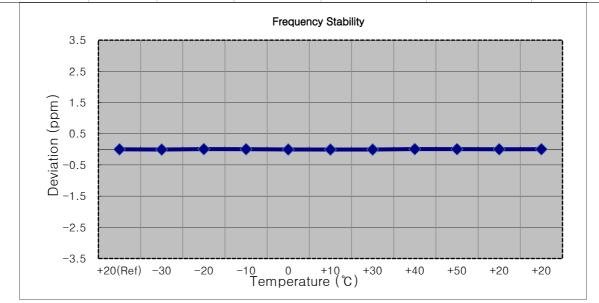
Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	- ppm
100 %		+20(Ref)	707 500 005	0.0	0.000 000	0.000
100 %		-30	707 500 003	-2.3	0.000 000	-0.003
100 %		-20	707 500 010	5.1	0.000 001	0.007
100 %		-10	707 500 003	-2.2	0.000 000	-0.003
100 %	13.500	0	707 499 998	-6.9	-0.000 001	-0.010
100 %		+10	707 500 008	3.1	0.000 000	0.004
100 %		+30	707 500 001	-4.1	-0.000 001	-0.006
100 %		+40	707 499 998	-7.1	-0.000 001	-0.010
100 %		+50	707 500 008	2.7	0.000 000	0.004
85 %	11.475	+20	707 500 007	2.1	0.000 000	0.003
115 %	15.525	+20	707 500 003	-2.4	0.000 000	-0.003





MODE:	LTE B12
OPERATING FREQUENCY:	707,500,000 Hz
CHANNEL:	<u>23095 (5 MHz)</u>
REFERENCE VOLTAGE:	13.500 VDC
DEVIATION LIMIT:	Emission must remain in band

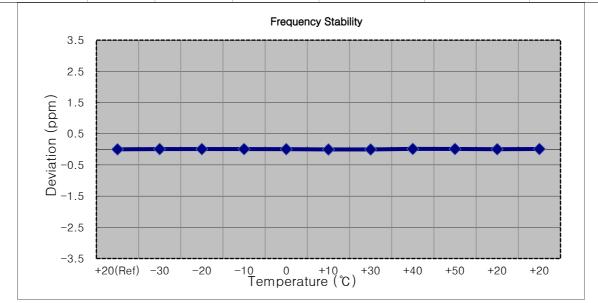
Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	- ppm
100 %		+20(Ref)	707 499 996	0.0	0.000 000	0.000
100 %		-30	707 499 990	-5.4	-0.000 001	-0.008
100 %		-20	707 500 001	4.7	0.000 001	0.007
100 %		-10	707 499 999	2.9	0.000 000	0.004
100 %	13.500	0	707 499 992	-3.7	-0.000 001	-0.005
100 %		+10	707 499 991	-5.1	-0.000 001	-0.007
100 %		+30	707 499 991	-5.0	-0.000 001	-0.007
100 %		+40	707 500 001	5.3	0.000 001	0.007
100 %		+50	707 500 000	4.1	0.000 001	0.006
85 %	11.475	+20	707 499 997	1.5	0.000 000	0.002
115 %	15.525	+20	707 499 998	2.4	0.000 000	0.003





MODE:	LTE B12
OPERATING FREQUENCY:	707,500,000 Hz
CHANNEL:	23095 (10 MHz)
REFERENCE VOLTAGE:	13.500 VDC
DEVIATION LIMIT:	Emission must remain in band

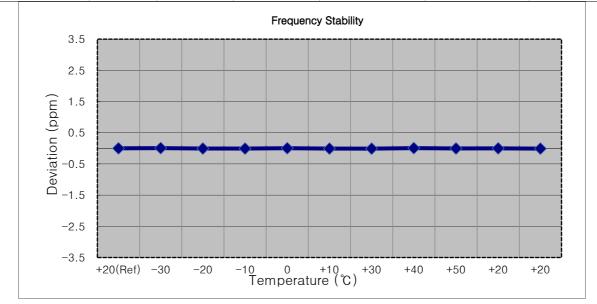
Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	- ppm
100 %		+20(Ref)	707 500 007	0.0	0.000 000	0.000
100 %		-30	707 500 013	5.3	0.000 001	0.007
100 %		-20	707 500 013	6.0	0.000 001	0.008
100 %		-10	707 500 013	5.3	0.000 001	0.007
100 %	13.500	0	707 500 011	4.0	0.000 001	0.006
100 %		+10	707 500 004	-3.2	0.000 000	-0.005
100 %		+30	707 500 004	-3.1	0.000 000	-0.004
100 %		+40	707 500 017	9.7	0.000 001	0.014
100 %		+50	707 500 016	8.1	0.000 001	0.011
85 %	11.475	+20	707 500 010	2.7	0.000 000	0.004
115 %	15.525	+20	707 500 015	7.2	0.000 001	0.010





MODE:	LTE B12
OPERATING FREQUENCY:	715,300,000 Hz
CHANNEL:	<u>23173 (1.4 MHz)</u>
REFERENCE VOLTAGE:	13.500 VDC
DEVIATION LIMIT:	Emission must remain in band

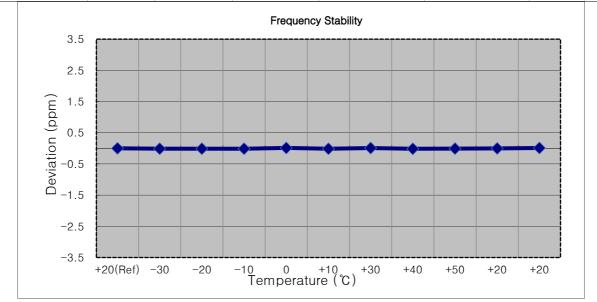
Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	ppm
100 %		+20(Ref)	715 299 993	0.0	0.000 000	0.000
100 %		-30	715 299 998	4.5	0.000 001	0.006
100 %		-20	715 299 988	-4.8	-0.000 001	-0.007
100 %		-10	715 299 987	-5.6	-0.000 001	-0.008
100 %	13.500	0	715 299 995	2.4	0.000 000	0.003
100 %		+10	715 299 987	-6.3	-0.000 001	-0.009
100 %		+30	715 299 986	-7.0	-0.000 001	-0.010
100 %		+40	715 299 997	4.4	0.000 001	0.006
100 %		+50	715 299 990	-3.1	0.000 000	-0.004
85 %	11.475	+20	715 299 992	-1.1	0.000 000	-0.002
115 %	15.525	+20	715 299 987	-6.5	-0.000 001	-0.009





MODE:	LTE B12
OPERATING FREQUENCY:	714,500,000 Hz
CHANNEL:	<u>23165 (3 MHz)</u>
REFERENCE VOLTAGE:	13.500 VDC
DEVIATION LIMIT:	Emission must remain in band

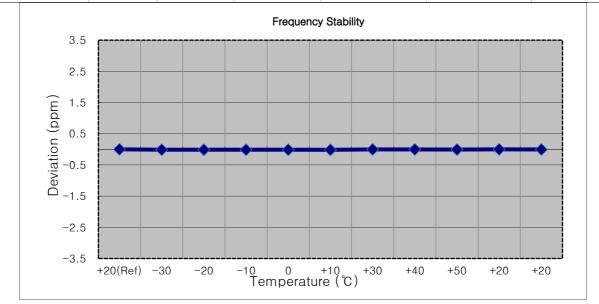
Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	- ppm
100 %		+20(Ref)	714 499 994	0.0	0.000 000	0.000
100 %		-30	714 499 986	-8.7	-0.000 001	-0.012
100 %		-20	714 499 986	-8.8	-0.000 001	-0.012
100 %		-10	714 499 985	-9.6	-0.000 001	-0.013
100 %	13.500	0	714 500 004	9.1	0.000 001	0.013
100 %		+10	714 499 985	-9.7	-0.000 001	-0.014
100 %		+30	714 500 001	6.3	0.000 001	0.009
100 %		+40	714 499 984	-10.6	-0.000 001	-0.015
100 %		+50	714 499 988	-6.4	-0.000 001	-0.009
85 %	11.475	+20	714 499 993	-1.9	0.000 000	-0.003
115 %	15.525	+20	714 500 002	7.6	0.000 001	0.011





MODE:	LTE B12
OPERATING FREQUENCY:	713,500,000 Hz
CHANNEL:	<u>23155 (5 MHz)</u>
REFERENCE VOLTAGE:	13.500 VDC
DEVIATION LIMIT:	Emission must remain in band

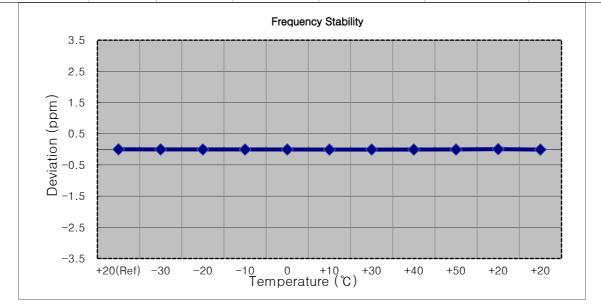
Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	– ppm
100 %		+20(Ref)	713 499 991	0.0	0.000 000	0.000
100 %		-30	713 499 982	-9.2	-0.000 001	-0.013
100 %		-20	713 499 982	-9.3	-0.000 001	-0.013
100 %		-10	713 499 982	-9.1	-0.000 001	-0.013
100 %	13.500	0	713 499 982	-9.3	-0.000 001	-0.013
100 %		+10	713 499 980	-11.8	-0.000 002	-0.017
100 %		+30	713 499 989	-2.2	0.000 000	-0.003
100 %		+40	713 499 988	-2.9	0.000 000	-0.004
100 %		+50	713 499 986	-5.3	-0.000 001	-0.007
85 %	11.475	+20	713 499 991	-0.7	0.000 000	-0.001
115 %	15.525	+20	713 499 988	-3.8	-0.000 001	-0.005





MODE:	LTE B12
OPERATING FREQUENCY:	711,000,000 Hz
CHANNEL:	23130 (10 MHz)
REFERENCE VOLTAGE:	3.880 VDC
DEVIATION LIMIT:	Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	- ppm
100 %		+20(Ref)	710 999 990	0.0	0.000 000	0.000
100 %		-30	710 999 988	-2.1	0.000 000	-0.003
100 %		-20	710 999 987	-3.2	0.000 000	-0.005
100 %		-10	710 999 986	-4.2	-0.000 001	-0.006
100 %	13.500	0	710 999 986	-4.0	-0.000 001	-0.006
100 %		+10	710 999 985	-5.5	-0.000 001	-0.008
100 %		+30	710 999 986	-4.4	-0.000 001	-0.006
100 %		+40	710 999 985	-5.4	-0.000 001	-0.008
100 %		+50	710 999 985	-5.3	-0.000 001	-0.007
85 %	11.475	+20	710 999 994	3.9	0.000 001	0.005
115 %	15.525	+20	710 999 984	-6.6	-0.000 001	-0.009





### 9. TEST DATA(INTERNAL & EXTERNAL)

#### 9.1 UPLINK CARRIER AGGREGATION

#### Test Note

1. All tests were evaluated for the two bands using various combinations of RB size, RB offset, modulation, and channel bandwidth.

2. All modes of operation were investigated and the worst case configuration results are reported in this section.

Mode: 2A-12A, 4A-12A

Worst case : 4A-12A

Please refer to the table below.

3. The worst case is reported with the modulations, RB sizes and offsets.

- (INTERNAL)

4A-12A (PCC - Modulation: BPSK, RB: 1, RB Offset: 3, SCC - Modulation: BPSK, RB: 1, RB Offset: 24) - (EXTERNAL)

4A-12A (PCC - Modulation: BPSK, RB: 1, RB Offset: 0, SCC - Modulation: BPSK, RB: 1, RB Offset: 0)

#### **Radiated Spurious Emissions**

PCC	500	P	cc	SCC		
PCC	PCC SCC BW(MHz)	Channel	BW(MHz)	Channel		
4A	12A	1.4	19957	5	23035	
4A	12A	3	20175	5	23155	

#### 9.1.1 RADIATED SPURIOUS EMISSIONS

Internal 4A(PCC)- 1	L2A(SCC)						
Freq.(MHz)		A.F+C.L+D.F+H.P.F -A.G (dB/m)	Total (dBµV/m)	Pol.	Result (dBm)	Limit (dBm)	Detector
3 421.40	53.39	-7.22	46.17	Н	-49.03	-13.00	Peak
5 132.10	50.86	-3.29	47.57	Н	-47.63	-13.00	Peak
6 842.80	48.20	-0.18	48.02	Н	-47.18	-13.00	Peak
8 553.50	46.38	2.39	48.77	Н	-46.43	-13.00	Peak
10 264.20	45.91	4.86	50.77	Н	-44.43	-13.00	Peak
Freq.(MHz)	Measured Level [dBμV]	A.F+C.L+D.F+H.P.F -A.G (dB/m)	Total (dBμV/m)	Pol.	Result (dBm)	Limit (dBm)	Detector
1 403.00	56.78	-18.07	38.72	Н	-56.49	-13.00	Peak
2 104.50	84.13	-13.34	70.79	Н	-24.41	-13.00	Peak
2 806.00	53.22	-11.52	41.70	Н	-53.50	-13.00	Peak
3 507.50	51.31	-8.21	43.10	Н	-52.10	-13.00	Peak
4 209.00	50.63	-5.44	45.19	Н	-50.01	-13.00	Peak



#### External

4A(PCC)- 12A(SCC)

Freq.(MHz)	Measured Level [dBµV]	A.F+C.L+D.F+H.P.F -A.G (dB/m)	Total (dBμV/m)	Pol.	Result (dBm)	Limit (dBm)	Detector
3 465.00	63.02	-6.18	55.86	V	-39.34	-13.00	Peak
5 197.50	62.77	-2.26	59.48	V	-35.72	-13.00	Peak
6 930.00	47.78	0.99	47.89	V	-47.31	-13.00	Peak
8 662.50	45.84	3.79	48.74	V	-46.46	-13.00	Peak
10 395.00	45.56	5.70	50.38	V	-44.82	-13.00	Peak

Freq.(MHz)	Measured Level [dBµV]	A.F+C.L+D.F+H.P.F -A.G (dB/m)	Total (dBμV/m)	Pol.	Result (dBm)	Limit (dBm)	Detector
1 427.00	69.07	-17.94	51.13	V	-44.07	-13.00	Average
2 140.50	80.52	-13.43	67.09	Н	-28.11	-13.00	Average
2 854.00	53.98	-11.40	42.58	V	-52.62	-13.00	Peak
3 567.50	52.28	-7.85	44.43	V	-50.77	-13.00	Peak
4 281.00	50.66	-5.06	45.60	V	-49.60	-13.00	Peak



Report No. HCT-RF-2406-FC011-R1

### **10. TEST PLOTS**



Agilent Spectrum Analyzer - Occupied BW				1		
M         RF         50 Ω         AC           Center Freq         707.500000 I           PASS	·•••	SENSE:INT Center Freq: 707.500000 M Frig: Free Run Avg Atten: 20 dB	ALIGN AUTO	Radio Std:	1010	Frequency
Ref Offset 27 dB 10 dB/div Ref 40.00 dBn	n					
30.0						Center Freq 707.500000 MHz
10.0	from	man man have	~~~~			
-10.0						
-20 0 -30 0 What and a part of the second	<u></u>		har	manne	~Jatalyna	
-50.0						CF Step 280.000 kHz
Center 707.5 MHz Res BW 27 kHz		#VBW 110 kHz		Span Sweep 3	2.8 MHz 3.667 ms	<u>Auto</u> Man
Occupied Bandwidt	հ 0874 MHz	Total Powe	31.4	4 dBm		Freq Offset 0 Hz
Transmit Freq Error	1.041 kH		99	9.00 %		
x dB Bandwidth	1.228 MH	z xdB	-26.	.00 dB		
MSG			STATU	IS		

# LTE B12\_1.4 M\_OBW\_Mid\_QPSK\_FullRB



Agilent Spectrum Analyzer - Occupied BW						
04 RL RF 50 Ω AC Center Freq 707.500000 N PASS	·•••	SENSE:INT Center Freq: 707.500000 N Trig: Free Run Av #Atten: 20 dB	ALIGN AUTO MHz gjHold: 500/500	Radio Std: M Radio Devic	lone	Frequency
Ref Offset 27 dB 10 dB/div Ref 40.00 dBm Log	·					
30.0						Center Freq 707.500000 MHz
10.0	Jamme	waman	m			
-10.0	/		<u>\</u>			
-20.0 -30.0 0000000000000000000000000000000000			hing	honory	homention	
50.0 Center 707.5 MHz				Span	2.8 MHz	CF Step 280.000 kHz Auto Man
Res BW 27 kHz		#VBW 110 kHz		Sweep 3		Auto Man
Occupied Bandwidt	n 0891 MHz	Total Powe	er 30.	5 dBm		Freq Offset 0 Hz
Transmit Freq Error	1.066 kH	z OBW Powe	r 9!	9.00 %		
x dB Bandwidth	1.238 MH	z x dB	-26	.00 dB		
MSG			STATU	IS		

### LTE B12\_1.4 M\_OBW\_Mid\_16 QAM\_FullRB



Agilent Spectrum Analyzer - Occupied E	W	1			pressentore			6 ×
RL         RF         50 Ω         AC           Center Freq         707.500000         PASS         PASS	enter Freq 707.500000 MHz		SENSE:INT         ALIGN AUTO.           Center Freq: 707.500000 MHz         Trig: Free Run         Avg Hold: 500/500           #Atten: 20 dB         Avg         Avg		Radio Std: None		Frequency	
Ref Offset 27 d 10 dB/div Ref 40.00 dE								
30.0							Cente 707.5000	er Freq 00 MHz
10.0	Amm	mmm	montontomo	1				
10.0	/			1 h				
-20.0 -30.0 Monnah Man Man Man Mar -40.0	N			Man	man	nuhunn		
50.0 Center 707.5 MHz							280.0	F Step
Res BW 27 kHz		#VBW 110	kHz			n 2.8 MHz 3.667 ms	Auto	Man
Occupied Bandwid	ith .0970 MI		Power	29.6	i dBm		Freq	Offset 0 Hz
Transmit Freq Error	5.113	KHZ OBW	Power	99	.00 %			
x dB Bandwidth	1.236 N	1Hz x dB		-26.	00 dB			
MSG				STATU	8			

### LTE B12\_1.4 M\_OBW\_Mid\_64 QAM\_FullRB





Agilent Spectrum Analyzer - Occupied BW		i i	SENSE:INT		ALIGN AUTO	01-05-25 P	Mw 20, 2024	
Center Freq 707.500000		Center Freq: 707.500000 MHz Trig: Free Run Avg Hold: 500/500			Radio Std: None		Frequency	
Ref Offset 27 dB 10 dB/div Ref 40.00 dBr	n							
20.0								Center Free 707.500000 MH
10.0	from	mm	man	mm	1			
0.00					h			
-20.0 -30.0 -40.0	{				him	and the second s	-amazari ana ang	
Center 707.5 MHz Res BW 27 kHz		#\	VBW 110	kHz			1 2.8 MHz 3.667 ms	CF Stej 280.000 kH Auto Mar
Occupied Bandwidt	h 0908 MI	1993	Total F		27.	5 dBm		Freq Offse 0 H
Transmit Freq Error	2.366	kHz	OBW F	ower	99	9.00 %		
x dB Bandwidth	1.226 M	ИНz	x dB		-26	00 dB		
4SG					STATU	s		

### LTE B12\_1.4 M\_OBW\_Mid\_256 QAM\_FullRB





Agilent Spectrum Analyzer - Occupied BW	\		ISE:INT	AI	IGN AUTO	05-49-22	PM May 20, 2024	0 0 2
Center Freq 707.500000	MHz #IFGain:Low	Center Fr	eq: 707.500 Run			Radio Sto	i: None	Frequency
Ref Offset 27 dB 10 dB/div Ref 40.00 dBr								
20.0								Center Fre 707.500000 MH
10.0	mmmm	mann	in man	mm				
0.00								
20.0 30.0 Monthing mark 1.0 m					1	hunnyun	munor	
center 707.5 MHz						Sr	oan 6 MHz	CF Ste 600.000 kH Auto Ma
Res BW 62 kHz		#VB	W 240 k	Hz			1.533 ms	Auto Ma
Occupied Bandwidt 2.	<sup>h</sup> 6966 MI	Ηz	Total P	ower	31.6	ö dBm		Freq Offse 0 H
Transmit Freq Error	7.529	κHz	OBW P	ower	99	9.00 %		
x dB Bandwidth	3.003 N	IHz	x dB		-26.	00 dB		
ISG					STATU	s		

### LTE B12\_3 M\_OBW\_Mid\_QPSK\_FullRB



Agilent Spectrum Analyzer - Occupied B	W				(10-00-00-00-00-00-00-00-00-00-00-00-00-0		0 0 2
RL         RF         50 Ω         AC           Center Freq 707.500000         PASS         PASS	MHz #IFGain:Low	SENSE:INT Center Freq: 707.5 Trig: Free Run #Atten: 20 dB		ALIGN AUTO	Radio Sto		Frequency
Ref Offset 27 dB 10 dB/div Ref 40.00 dB							
20.0							Center Fred 707.500000 MHz
10.0	Jan Marina	un manun	min	my_			
10.0	/			1			
20.0 - 20.0				- La	mmm	mon	
50.0							CF Step 600.000 kH
Center  707.5 MHz #Res BW  62 kHz		#VBW 240	kHz			oan 6 MHz 1.533 ms	<u>Auto</u> Mar
Occupied Bandwid	<sup>th</sup> .7091 MI		Power	30.5	dBm		Freq Offsel 0 Hz
Transmit Freq Error	2.016	KHz OBW	Power	99	.00 %		
x dB Bandwidth	3.015 N	1Hz x dB		-26.0	00 dB		
ISG				STATUS			

# LTE B12\_3 M\_OBW\_Mid\_16 QAM\_FullRB



Agilent Spectrum Analyzer - Occupied BV	1	1.20				100000000			-   # <b> </b>
RL         RF         50 Ω         AC           Center Freq 707.500000         PASS         PASS	MHz #IFGain:Low				ALIGN AUTO	05:47:57 Radio Sto Radio De		Fre	quency
Ref Offset 27 dB 10 dB/div Ref 40.00 dBr Log									_
30.0									enter Freq 500000 MHz
10.0	mon	nhm	mm	hmm					
-10.0	{								
-20.0 -30.0 MAAMMAAM					Υ.	and the second	Anna		
-50.0									CF Step
Center 707.5 MHz #Res BW 62 kHz		#VE	3W 240 k	Hz			oan 6 MHz 1.533 ms	<u>Auto</u>	Man
Occupied Bandwid 2.	<sup>th</sup> 7166 MI	Hz	Total P	ower	29.6	i dBm		F	r <b>eq Offset</b> 0 Hz
Transmit Freq Error	3.044	kHz	OBW P	ower	99	.00 %			
x dB Bandwidth	2.980 N	IHz	x dB		-26.	00 dB			
MSG					STATU	S			

# LTE B12\_3 M\_OBW\_Mid\_64 QAM\_FullRB





Magilent Spectrum Analyzer - Occupied Bi RL RF 50Ω AC Center Freq 707.500000 PASS		Center F			ALIGN AUTO	01:13:02 F Radio Std		Frequency
Ref Offset 27 dE 10 dB/div Ref 40.00 dB					_			
20.0								Center Free 707.500000 MH
0.00	human	ghar ng har	- Maria	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	1			
20.0 30.0 10.0					-	·····	wantaning	
enter 707.5 MHz Res BW 62 kHz		#V	BW 240 k	Hz			an 6 MHz 1.533 ms	CF Ste 600.000 kH Auto Ma
Occupied Bandwid	<sup>th</sup> .7076 M	Hz	Total P	ower	27.5	i dBm		Freq Offse 0 H
Transmit Freq Error x dB Bandwidth	6.390 2.978 N		OBW Po x dB	ower		0.00 % 00 dB		
SG					STATU	3		

### LTE B12\_3 M\_OBW\_Mid\_265 QAM\_FullRB



	m Analyzer - Occupied BW	(					en presentation		
Center Fre	RF 50 Ω AC q 707.500000	MHz #IFGain:Low	Center I			ALIGN AUTO	Radio Sto		Frequency
10 dB/div Log	Ref Offset 27 dB Ref 40.00 dBn	n							
30.0									Center Freq 707.500000 MHz
10.0		mont	rinnorm	un na anna anna anna anna anna anna ann	ᡣᡐᡗᡊ᠆ᢅ᠕᠆	M			
-10.0									
-20.0 -30.0 Marr	mannen					hy	Many	Mann	
-40.0									CF Step
Center 707 #Res BW 1			#V	BW 390 ki	Hz			an 10 MHz eep 1 ms	1.000000 MHz <u>Auto</u> Man
Occupi	ed Bandwidt			Total Po	ower	31.5	i dBm		Freq Offset 0 Hz
		4995 MI							
	t Freq Error	10.258		OBW Po	wer		.00 %		
x dB Bar	ndwidth	4.910 N	IHZ	x dB		-26.	00 dB		
MSG	~					STATU	8		

### LTE B12\_5 M\_OBW\_Mid\_QPSK\_FullRB



Agilent Spectrum Analyzer - Occupied BW	S	1			10000000		
RL         RF         50 Ω         AC           Center Freq         707.500000         AC           PASS         AC         AC         AC	MHz #IFGain:Low	SENSE:INT Center Freq: 707 Trig: Free Run #Atten: 20 dB	.500000 MHz Avg Hold	ALIGN AUTO	Radio Std		Frequency
Ref Offset 27 dB 10 dB/div Ref 40.00 dBn							
20.0							Center Fred 707.500000 MHz
10.0	morn	harmon	mm	m			
10.0							
20.0				L.	mlm	mannon	
40.0							CF Step
Center 707.5 MHz #Res BW 100 kHz		#VBW 39	90 kHz			n 10 MHz ep 1 ms	1.000000 MHz
Occupied Bandwidt			I Power	30.6	dBm		Freq Offset
4.	5080 MI	HZ					
Transmit Freq Error	7.945	kHz OBW	Power	99	.00 %		
x dB Bandwidth	4.913 N	NHZ X dB		-26.	00 dB		
ISG				STATUS	3		

### LTE B12\_5 M\_OBW\_Mid\_16 QAM\_FullRB



Agilent Spectrum Analyzer - Occupied B	W				0.0
RL RF 50 Ω AC Center Freq 707.500000 PASS	MHz #IFGain:Low	SENSE:INT Center Freq: 707.50000 Trig: Free Run #Atten: 20 dB	ALIGN AUTO 00 MHz Avg Hold: 500/500	05:50:02 PM May 2 Radio Std: None Radio Device: B	Frequency
Ref Offset 27 dl 10 dB/div Ref 40.00 dB					
30.0 20.0					Center Free 707.500000 MH
10.0	former	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	mmm		
10.0					
20.0 30.0 ml _ Mm & mb _ mar / M 40.0			- W	in Mannen	why
50.0					CF Ste 1.000000 MH
Center 707.5 MHz Res BW 100 kHz		#VBW 390 kH	Iz	Span 10 Sweep	MHz <u>Auto</u> Mai 1 ms
Occupied Bandwid	ith .4997 MI	Total Po <b>HZ</b>	wer 29.	5 dBm	Freq Offse 0 H
Transmit Freq Error	15.446		wer 9	9.00 %	
x dB Bandwidth	4.952 N	IHz x dB	-26	.00 dB	
SG			STAT	JS	

# LTE B12\_5 M\_OBW\_Mid\_64 QAM\_FullRB





Agilent Spectrum Analyzer - Occupied B	W	SENSE:	INT	ALIGN AUTO	01:20:26 PM May 2	0.2024
Center Freq 707.500000 PASS	MHz #IFGain:Low	Center Freq:	707.500000 MHz an Avg Hold	l: 500/500	Radio Std: None Radio Device: B	Frequency
Ref Offset 27 df 10 dB/div Ref 40.00 dB						
20.0						Center Free 707.500000 MH
0.0	Ammen	manna	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	nn		
	/			have	mmmmmmm	
0.0						
enter 707.5 MHz Res BW 100 kHz		#VBW	390 kHz		Span 10 Sweep	MHz Auto Ma
Occupied Bandwid	ith .5218 M		otal Power	27.6	dBm	Freq Offse 0 F
Transmit Freq Error	19.002	kHz O	BW Power	99.0	00 %	
x dB Bandwidth	4.926 M	/Hz x	dB	-26.00	0 dB	
SG				STATUS		

### LTE B12\_5 M\_OBW\_Mid\_256 QAM\_FullRB





Agilent Spectrum Analyzer - Occupied BV RL RF 50 Ω AC Center Freq 707.500000			ENSE:INT Freg: 707.500		ALIGN AUTO	05:52:33	PM May 20, 2024	Frequency
PASS	#IFGain:Low		ee Run	Avg Hold	500/500	Radio De		
Ref Offset 27 dB 10 dB/div Ref 40.00 dB Log								
30.0 20.0								Center Free 707.500000 MH
10.0	mann	monan	-Balapanenana	monolite	m			
0.00								
20.0	f						1.000	
30.0 Mary market water					~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	manute	mannange	
40.0								CF Step
Center 707.5 MHz			,			Sp	an 20 MHz	2.000000 MH
Res BW 200 kHz		#V	BW 820	KHZ		Sw	eep 1 ms	
Occupied Bandwid	<sup>th</sup> . <b>9778 M</b> I	47	Total P	ower	31	.4 dBm		Freq Offse 0 Hi
O. Transmit Freq Error	36.173		OBW P	ower	9	9.00 %		
x dB Bandwidth	9.736 M	ИHz	x dB		-26	6.00 dB		
SG					STAT			

### LTE B12\_10 M\_OBW\_Mid\_QPSK\_FullRB



Agilent Spectrum Analyzer - Occupied BV	V	1. 2000			1		0 0
Center Freq 707.500000 PASS	MIHz #IFGain:Low		707.500000 MHz an Avg Hol	align auto	Radio Std: Radio Dev		Frequency
Ref Offset 27 dE							
30.0							Center Freq 707.500000 MHz
10.0	purhada mo	hoursession	mmenhanny	m			
-10.0	8			$\mathbb{Z}$			
20.0				- Jun	monte	www.	
40.0							
Center 707.5 MHz						n 20 MHz	CF Step 2.000000 MHz
#Res BW 200 kHz		#VBW	820 kHz			ep 1 ms	<u>Auto</u> Man
Occupied Bandwid	<sup>th</sup> .9472 MI		otal Power	30.5	dBm		Freq Offset 0 Hz
Transmit Freq Error	23.669		BW Power	99	.00 %		
x dB Bandwidth	9.726 M	IHz x	dB	-26.	00 dB		
MSG				STATUS	5		

# LTE B12\_10 M\_OBW\_Mid\_16 QAM\_FullRB



Agilent Spectrum Analyzer - Oc		1.72	and and		1		
Center Freq 707.50	Ω AC 10000 MHZ #IFGain:Low			ALIGN AUTO	Radio Std: Radio Dev		Frequency
Ref Offse 10 dB/div Ref 40.	et 27 dB 00 dBm						
30.0							Center Freq 707.500000 MHz
10.0	rounom	Nelling	winner	m			
10.0				\			
-20.0 -30.0 Marshandanara	Amin			- W	himmon	whoman	
-40.0							CF Step
Center 707.5 MHz #Res BW 200 kHz		#V	BW 820 kHz			n 20 MHz ep 1 ms	2.000000 MHz
Occupied Ban			Total Powe	29.	6 dBm		Freq Offset
	8.9676 N	IHz					UTIZ
Transmit Freq E	rror 23.732	kHz	OBW Power	9	9.00 %		
x dB Bandwidth	9.785	MHz	x dB	-26	.00 dB		
MSG				STATU	IS		

# LTE B12\_10 M\_OBW\_Mid\_64 QAM\_FullRB

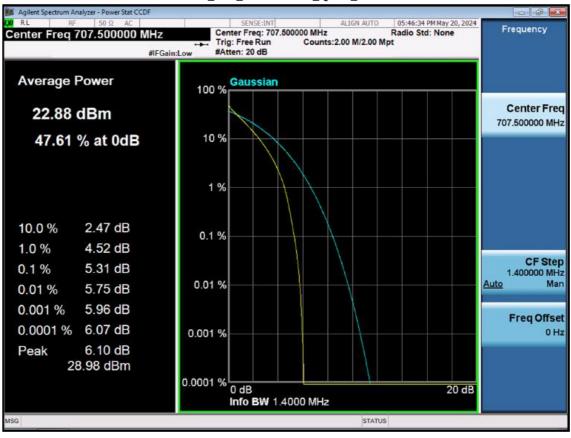




Agilent Spectrum Analyzer - Occupied BW	/	1.2	care tar			0.07.461		0 0 2
Center Freq 707.500000 PASS	MIHz #IFGain:Low	Center			ALIGN AUTO	Radio Std		Frequency
Ref Offset 27 dB 10 dB/div Ref 40.00 dBr								
20.0								Center Free 707.500000 MH
10.0	parmenan	down	MgdMM mggm	-Va-vhr-vi	in the second			
10.0					ł			
20.0 30.0 Winter Man Anna Mar Man					- In-	ynTwAshing	manana	
Senter 707.5 MHz							an 20 MHz	CF Stej 2.000000 MH <u>Auto</u> Mar
Res BW 200 kHz		#V	BW 8201	kHz		Sw	eep 1 ms	
Occupied Bandwide 8.	<sup>th</sup> 9987 MI	Hz	Total P	ower	27.	5 dBm		Freq Offse 0 H
Transmit Freq Error	17.062	kHz	OBW P	ower	9	9.00 %		
x dB Bandwidth	9.779 N	/Hz	x dB		-26	.00 dB		
1SG					STAT	js		

### LTE B12\_10 M\_OBW\_Mid\_256 QAM\_FullRB





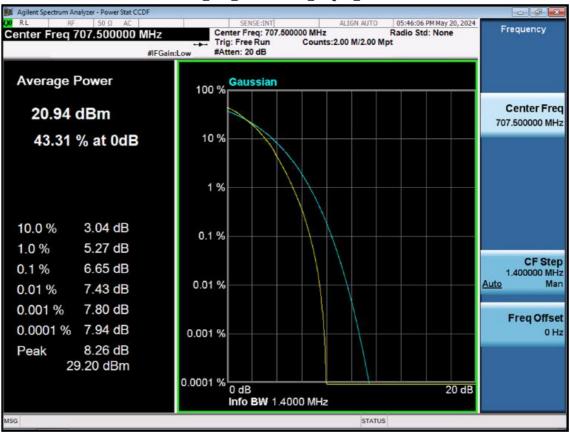
#### 1.4 M\_PAR\_Mid Channel\_QPSK\_FullRB





#### 1.4 M\_PAR\_Mid Channel\_16QAM\_FullRB





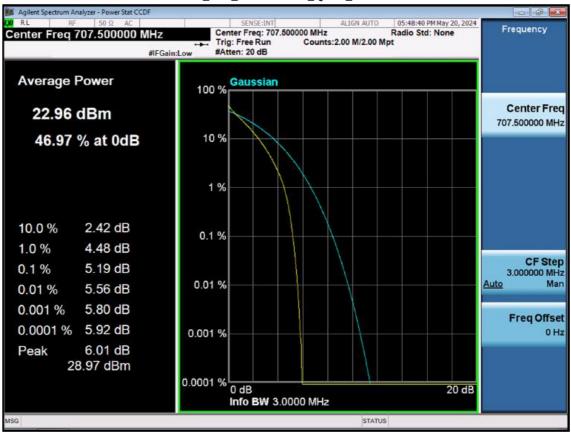
#### 1.4 M\_PAR\_Mid Channel\_64QAM\_FullRB





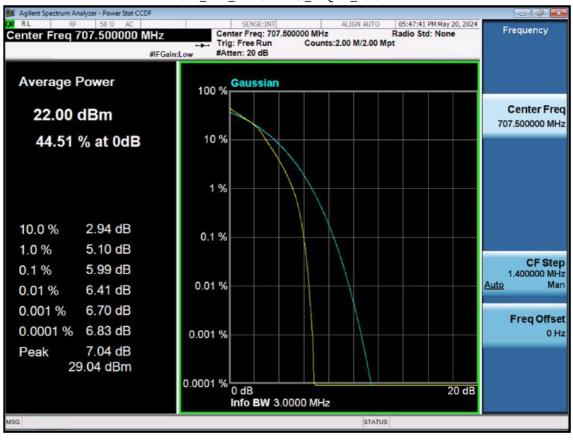
### 1.4 M\_PAR\_Mid Channel\_256QAM\_FullRB





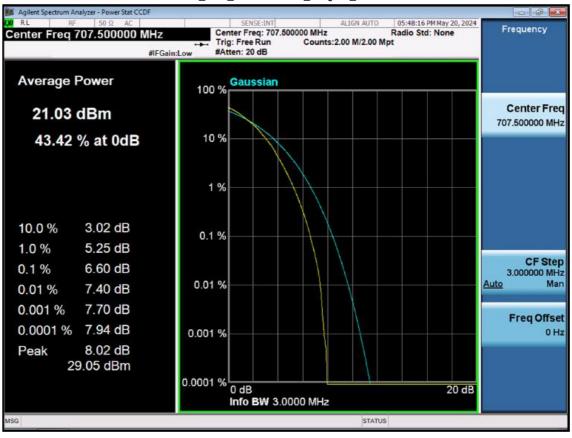
### 3 M\_PAR\_Mid Channel\_QPSK\_FullRB





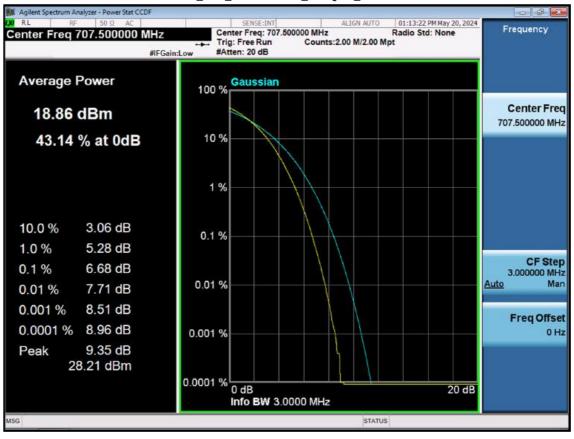
### 3 M\_PAR\_Mid Channel\_16QAM\_FullRB





### 3 M\_PAR\_Mid Channel\_64QAM\_FullRB





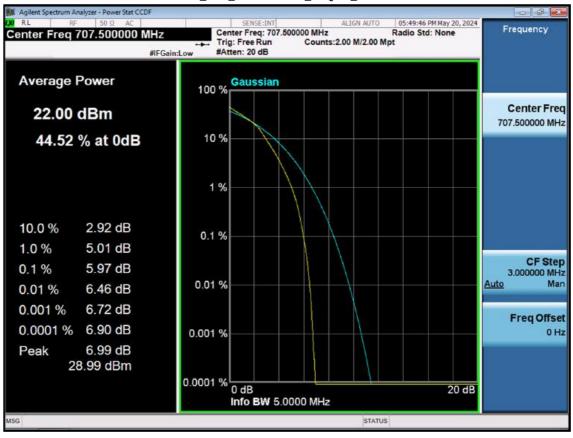
### 3 M\_PAR\_Mid Channel\_256QAM\_FullRB





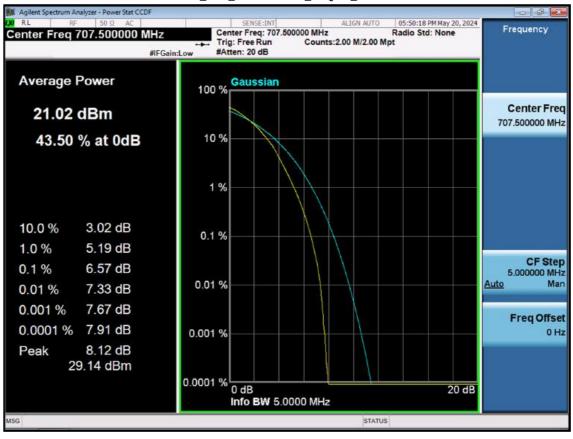
### 5 M\_PAR\_Mid Channel\_QPSK\_FullRB





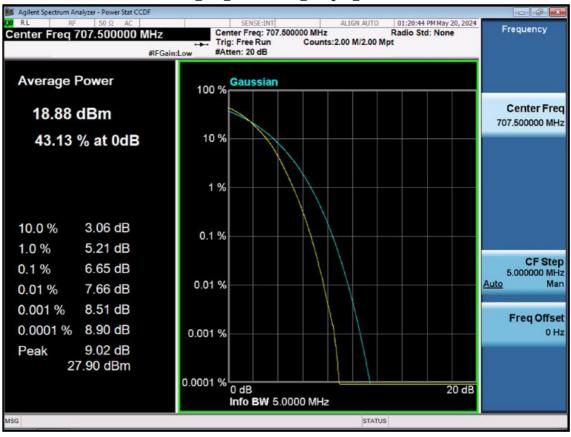
### 5 M\_PAR\_Mid Channel\_16QAM\_FullRB





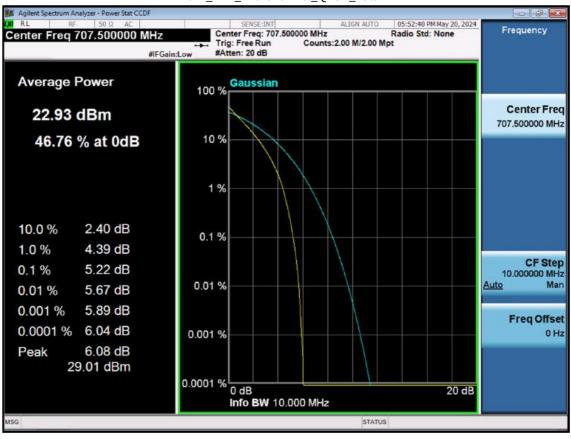
### 5 M\_PAR\_Mid Channel\_64QAM\_FullRB





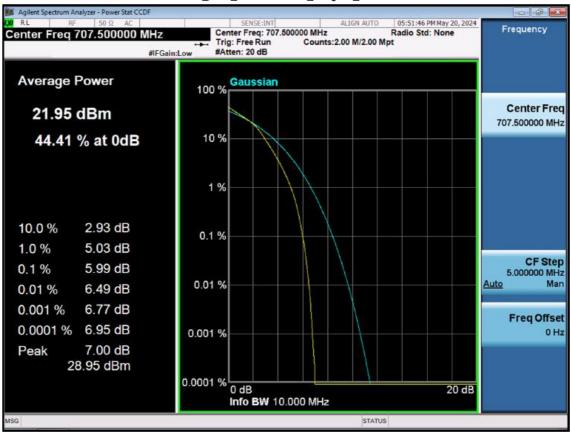
### 5 M\_PAR\_Mid Channel\_256QAM\_FullRB





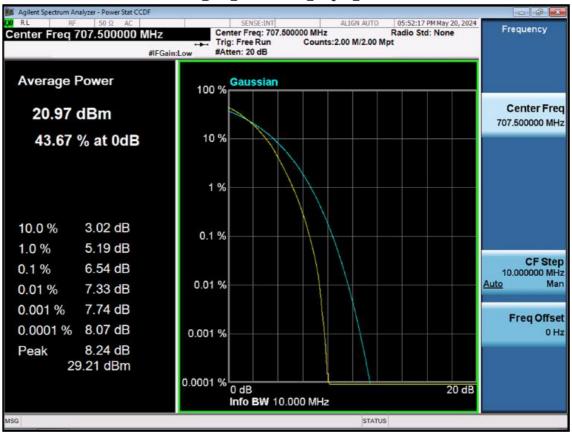
#### 10 M\_PAR\_Mid Channel\_QPSK\_FullRB





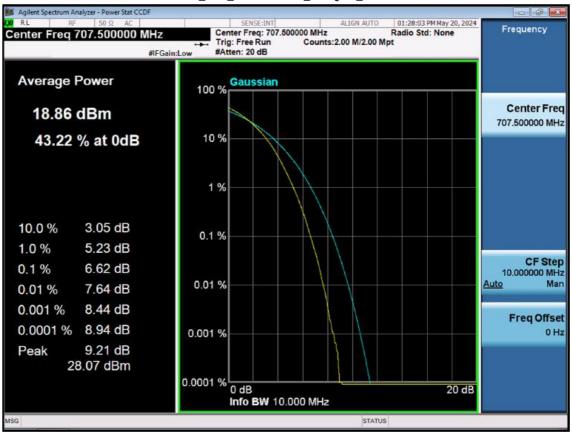
#### 10 M\_PAR\_Mid Channel\_16QAM\_FullRB





### 10 M\_PAR\_Mid Channel\_64QAM\_FullRB





### 10 M\_PAR\_Mid Channel\_256QAM\_FullRB



RL RL	trum Analyzer - Swe RF 50 Ω			I control	the second s			-	
	req 5.01500	00000 G	PNO: Fast ↔	Trig: Free Ru #Atten: 20 dB	#Av	ALIGN AUTO g Type: RMS	01:02:58 PM Ma TRACE TYPE DET		Frequency
0 dB/div	Ref 10.00		Guinest			M	(r1 3.678 0 -67.302	GHz dBm	Auto Tun
0.00	\$ <sup>2</sup>								Center Fre 5.015000000 GH
30.0 40.0 50.0									Start Fre 30.000000 MH
60.0 70.0 60.0	and and the second s		1		~	**************************************	hall <sup>an</sup> trajata <sub>nan</sub> atan <sub>a</sub> galata		Stop Fre 10.00000000 GH
tart 30 N Res BW	1.0 MHz	X	#VBV	V 3.0 MHz	FUNCTION	Sweep 17	Stop 10.00 7.33 ms (2000	01 pts)	CF Ste 997.000000 MH Auto Ma
1 N 1 2 N 1 3 4 5 6	f	3.67	8 0 GHz 0.0 MHz	-67.302 dBm -3.987 dBm	PORCHON	PONCTON NOT	PONCTION V		Freq Offse 0 ⊦
7 8 9 10									
5G	- 101 - 505			m		STATU			

# LTE B12\_1.4 M\_Conducted Spurious(30 M-10 G)\_Low\_QPSK\_1RB



Agilent Spectrum Analyzer - Swept SA					
RL RF 50 Ω AC Center Freq 5.015000000	CHZ	ree Run	ALIGN AUTO	01:06:43 PM May 20, 2024 TRACE 1 2 3 4 5 TYPE A WWWWW DET A A A A A A	Frequency
10 dB/div Ref 10.00 dBm	IFGain:Low #Atten:	20 dB	Mki	1 3.682 5 GHz -67.154 dBm	Auto Tune
Log 0.00 -10.0 -20.0					Center Freq 5.015000000 GHz
-30.0					Start Freq 30.000000 MHz
-60.0 -70.0 -80.0		and any section of the section of th	-	RMS	Stop Fred 10.000000000 GHz
Start 30 MHz #Res BW 1.0 MHz	#VBW 3.0 MH		Sweep 17.	Stop 10.000 GHz 33 ms (20001 pts)	CF Step 997.000000 MHz Auto Mar
2 N 1 F 3 4 5 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	.682 5 GHz -67.154 708.0 MHz -4.733	dBm	FUNCTION WIDTH	FUNCTION VALUE	Freq Offset 0 Hz
6 7 8 9 10 11					
۲ MSG	m		STATUS		

# LTE B12\_1.4 M\_Conducted Spurious(30 M-10 G)\_Mid\_QPSK\_1RB



Agilent Spectrum A						/		- 6 - E
RL RF	50 Ω AC 5.015000000	PNO: Fast -	Trig: Free Run #Atten: 20 dB	#Av	ALIGN AUTO g Type: RMS	01:09:18 PMM TRACE TYPE		Frequency
A AL INSTRUMENT STRUCTURE	f 10.00 dBm	IFGain:Low	#Atten: 20 dB		M	(r1 3.697 ( -67.539	) GHz	Auto Tun
og 0.00 ↓2 10.0 20.0								Center Fre 5.015000000 GH
10.0 10.0 50.0								Start Fre 30.000000 MH
30.0 70.0 30.0	ani en ante de la companya de la com				<u> </u>		RMS	Stop Fre 10.000000000 GF
tart 30 MHz Res BW 1.0 I		#VBV	V 3.0 MHz			Stop 10.00 .33 ms (200	01 pts)	CF Ste 997.000000 MI Auto M
IKR MODE TRC SCL 1 N 1 f 2 N 1 f 3 4 5 6 6	3.6	597 0 GHz 716.4 MHz	-67.539 dBm -4.177 dBm	FUNCTION	FUNCTION WIDTH	FUNCTION	ALUE ×	Freq Offs 01
7 8 9 10 11			m					
G					STATU	S		

# LTE B12\_1.4 M\_Conducted Spurious(30 M-10 G)\_High\_QPSK\_1RB



Agilent Spectrum Analyzer - Swept SA					
Center Freq 5.01500000	O GHz PNO: Fast ↔	, Trig: Free Run	#Avg Type: RMS	01:11:35 PM May 20, 2024 TRACE 2 3 4 5 TYPE A WWWWW DET A A A A A A	Frequency
10 dB/div Ref 10.00 dBm	IFGain:Low	#Atten: 20 dB	Mi	kr1 3.671 0 GHz -67.387 dBm	Auto Tune
-og 0.00 -10.0 -20.0					Center Free 5.015000000 GHz
-30.0					Start Free 30.000000 MHz
-60.0 -70.0 -80.0				RMS	Stop Fred 10.000000000 GHz
Start 30 MHz #Res BW 1.0 MHz	#VBM	∮ 3.0 MHz	Sweep 17	Stop 10.000 GHz 7.33 ms (20001 pts)	CF Step 997.000000 MH Auto Mar
	3.671 0 GHz 700.0 MHz	-67.387 dBm -4.066 dBm	PORCHON		Freq Offse 0 H:
6 7 8 9 10					
ISG		m	STATU	•	

# LTE B12\_3 M\_Conducted Spurious(30 M-10 G)\_Low\_QPSK\_1RB



Agilent Spectrum Analyzer - Swept SA					0 8 2
RL RF 50 Ω AC Center Freq 5.015000000	PNO: Fast	SENSE:INT	#Avg Type: RMS	01:14:10 PM May 20, 2024 TRACE 1 2 3 4 5 TYPE A WWWWW DET A A A A A A A	Frequency
10 dB/div Ref 10.00 dBm	IFGain:Low	#Atten: 20 dB	Mk	r1 3.713 9 GHz -67.252 dBm	Auto Tune
Log 0.00 →20.0					Center Fred 5.015000000 GH:
-30.0					Start Free 30.000000 MH
-60.0 -70.0 -80.0	1			RMS	Stop Free 10.000000000 GH
Start 30 MHz #Res BW 1.0 MHz	#VBW 3			Stop 10.000 GHz .33 ms (20001 pts)	CF Stej 997.000000 MH Auto Mar
2 N 1 f 3 4 5 5		Y FU 67.252 dBm -3.901 dBm	INCTION FUNCTION WIDTH	FUNCTION VALUE	Freq Offset 0 Ha
6 7 8 9 10 11					
1ISG		an .	STATUS	4	

# LTE B12\_3 M\_Conducted Spurious(30 M-10 G)\_Mid\_QPSK\_1RB



ALIGN AUTO #Avg Type: RMS	01:16:44 PM May 20, 2024 TRACE 1 2 3 4 5 TYPE A WWWWW DET A A A A A A	Frequency
Mk	r1 3.689 0 GHz -67.133 dBm	Auto Tune
		Center Fre 5.015000000 GH
		Start Free 30.000000 MH
	RMS	Stop Free 10.000000000 GH
	Stop 10.000 GHz .33 ms (20001 pts)	CF Stej 997.000000 MH Auto Ma
TION FUNCTION WOTH		Freq Offse 0 H
	STATUS	STATUS

### LTE B12\_3 M\_Conducted Spurious(30 M-10 G)\_High\_QPSK\_1RB



Agilent Spectrum Analyzer - Swept SA				0 8 2
RL RF 50 Ω AC Center Freq 5.015000000	PNO: Fast Trig: Free Ri	#Avg Type: RMS	01:19:00 PM May 20, 2024 TRACE 1 2 3 4 5 TYPE A WWWWW DET A A A A A A	Frequency
10 dB/div Ref 10.00 dBm	IFGain:Low #Atten: 20 dl	-	r1 3.700 0 GHz -67.082 dBm	Auto Tune
Log 0.00 -10.0 -20.0				Center Fred 5.015000000 GHz
-30.0				Start Free 30.000000 MH:
-60.0 -70.0 -80.0			PMS	Stop Fred 10.000000000 GH;
Start 30 MHz #Res BW 1.0 MHz	#VBW 3.0 MHz		Stop 10.000 GHz .33 ms (20001 pts)	CF Step 997.000000 MH Auto Mar
MKR MODE TRC SCL X 1 N 1 f 3. 2 N 1 f 3 4 4 5 6	.700 0 GHz -67.082 dBm 700.0 MHz -3.677 dBm		FUNCTION VALUE	Freq Offse 0 Hz
7 8 9 10 11	TT			
ASG		STATUS		

# LTE B12\_5 M\_Conducted Spurious(30 M-10 G)\_Low\_QPSK\_1RB



Agilent Spectrum Analyzer - Swept SA							0 8 2
RL RF 50 Ω AC Center Freq 5.015000000	GHz PNO: Fast ↔	SENSE:INT	#Avg Typ	ALIGN AUTO	01:21:30 PM May TRACE TYPE A		Frequency
10 dB/div Ref 10.00 dBm	IFGain:Low	#Atten: 20 dB		Mk	r1 3.703 9 -66.981	GHz	Auto Tune
-og 0.00 -10.0 -20.0							Center Free 5.015000000 GH
30.0 40.0 50.0							Start Free 30.000000 MH
-60.0 -70.0 -80.0			مىيەبىيە، سىيەبىيە			RMS	Stop Free 10.000000000 GH
Start 30 MHz #Res BW 1.0 MHz	#VBW	3.0 MHz		weep 17	Stop 10.000 .33 ms (2000	1 pts)	CF Stej 997.000000 MH Auto Ma
1 N 1 f 3.	703 9 GHz 706.0 MHz	-66.981 dBm -3.992 dBm			TONOTION		Freq Offse 0 Hi
7 8 9 10 11							
ISG		399 B		STATUS	5		

# LTE B12\_5 M\_Conducted Spurious(30 M-10 G)\_Mid\_QPSK\_1RB



	um Analyzer - Swept SA					/ 100		
Center Fre	RF 50 Ω A eq 5.0150000		SENSE:IN	#Avg Ty	ALIGN AUTO	TRACE	May 20, 2024	Frequency
10 dB/div	Ref 10.00 dBi	IFGain:Low	#Atten: 20 dB		MI	r1 3.685		Auto Tune
0.00	2							Center Free 5.015000000 GHz
-30.0 -40.0 -50.0								Start Free 30.000000 MHz
-60.0 -70.0 -80.0				,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			RMS	Stop Fred 10.000000000 GHz
Start 30 M #Res BW 1	1.0 MHz		V 3.0 MHz			Stop 10.0 .33 ms (20	001 pts)	CF Step 997.000000 MH: Auto Mar
MKR MODE TRO 1 N 1 2 N 1 3 4 5		x 3.685 0 GHz 716.4 MHz	-67.195 dBm -4.428 dBm	FUNCTION F	UNCTION WIDTH	FUNCTION	T VALUE	Freq Offsel 0 Ha
6 7 8 9 10								
1			m			1		
ISG					STATUS	8		

### LTE B12\_5 M\_Conducted Spurious(30 M-10 G)\_High\_QPSK\_1RB



Agilent Spectrum Analyzer - Swept SA					1910	0 0 🕰
RL RF 50 Ω AC Center Freq 5.015000000	GHz	SENSE:IN	#Avg	ALIGN AUTO	01:26:21 PM May 20, 2 TRACE 2 3 4 TYPE A WWW DET A A A A	Frequency
10 dB/div Ref 10.00 dBm	IFGain:Low	#Atten: 20 dB		Mł	r1 3.704 4 Gi -67.150 dB	Auto Tune
-0g 0.00 -10.0 -20.0						Center Free 5.015000000 GH
30.0 40.0 50.0						Start Fre 30.000000 MH
60.0 70.0 60.0						Stop Fre 10.000000000 GH
Start 30 MHz #Res BW 1.0 MHz	#VBW	3.0 MHz	FUNCTION	Sweep 17	Stop 10.000 Gl .33 ms (20001 p	Iz s) 997.000000 MH
1         N         1         f         3.1           2         N         1         f         3           3         4         5         5         6           6         7         7         7         7	704 4 GHz 700.0 MHz	-67.150 dBm -4.203 dBm	FUNCTION	PORCTION WIDTH	FUNCTION VALUE	FreqOffse
8 9 10 11 ssg		TH		STATU	3	-

# LTE B12\_10 M\_Conducted Spurious(30 M-10 G)\_Low\_QPSK\_1RB



Agilent Spectrum Analyzer - Swept SA					
Center Freq 5.01500000	OGHZ PNO: Fast →→	SENSE:INT	ALIGN AUTO #Avg Type: RMS	01:28:47 PM May 20, 2024 TRACE 2 3 4 5 TYPE A WWWWW DET A A A A A A	Frequency
10 dB/div Ref 10.00 dBm	IFGain:Low	#Atten: 20 dB	Mł	cr1 3.712 9 GHz -67.220 dBm	Auto Tune
-10.0					Center Fred 5.015000000 GHz
-30.0					Start Free 30.000000 MH:
-60.0 -70.0 -80.0	······································			RMS	Stop Free 10.000000000 GH:
Start 30 MHz #Res BW 1.0 MHz	#VBW	3.0 MHz		Stop 10.000 GHz 7.33 ms (20001 pts)	CF Step 997.000000 MH Auto Mar
MKR MODE TRC SCL X 1 N 1 f 3 1 f 3 4 6 6	.712 9 GHz 704.0 MHz	-67.220 dBm -4.357 dBm	UNCTION FUNCTION WIDTH	FUNCTION VALUE	Freq Offse 0 Ha
7 8 9 10 11		т		-	
ISG		<u></u>	STATU	s	

# LTE B12\_10 M\_Conducted Spurious(30 M-10 G)\_Mid\_QPSK\_1RB



Agilent Spectrum Analyzer - Swept SA							
Center Freq 5.015000000	PNO: Fast ->	SENSE:IN	#Avg	ALIGN AUTO	01:31:21 PM May TRACE 2 TYPE A W DET A A	3457	Frequency
0 dB/div Ref 10.00 dBm	IFGain:Low	#Atten: 20 dB		M	r1 3.712 4 -67.220 c	GHZ	Auto Tune
• • • • • • • • • • • • • • • • • • •							Center Fre 5.015000000 GH
40.0							Start Free 30.000000 MH
60.0 70.0 80.0				~~~~	19 <sup>29</sup> 1091 1000 1000 1000	RMS	<b>Stop Fre</b> 10.000000000 GH
tart 30 MHz Res BW 1.0 MHz	#VBW	3.0 MHz			Stop 10.000 .33 ms (2000	l pts)	CF Ste 997.000000 MH Auto Ma
MKR         MODE         TRC         SCL         X           1         N         1         f         3           2         N         1         f         3           3         4         4         4           5         5         5         5	.712 4 GHz 715.9 MHz	<sup>¥</sup> -67.220 dBm -4.265 dBm	FUNCTION	FUNCTION WIDTH	FUNCTION VAL		Freq Offse
6 7 7 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9							
36		ш		STATU	1	7	
0				onaros			

# LTE B12\_10 M\_Conducted Spurious(30 M-10 G)\_High\_QPSK\_1RB



	1		1	ctrum Analyzer - Swept SA	
Frequency Auto Tune	01:02:43 PM May 20, 2024 TRACE 2 3 4 5 TYPE A WWWWWW DET A A A A A A	ALIGN AUTO #Avg Type: RMS	Trig: Free Run #Atten: 20 dB	RF 50Ω AC req 698.0000000 MHz PNO:Wide ↔ IFGain:Low	
	1 697.960 MHz -49.643 dBm	Mkr		Ref Offset 27 dB Ref 27.00 dBm	
Center Fre 698.000000 MH					17,0
Start Fre 696.000000 MH					3.00
Stop Fre 700.000000 MH	-13.00 dBm				13.0
CF Ste 400.000 kH Auto Ma	had been and had				13.0
Freq Offs 0 F			1		3.0
	Span 4.000 MHz 1.000 s (1001 pts)	#Sweep	W 300 kHz		53.0 Center 698.000
	1.000 3 (1001 pts)	STATUS	1 300 KHZ	100 KH2 #VDV	SG

# LTE B12\_1.4 M\_Band Edge\_Low\_QPSK\_1RB



	n Analyzer - Swept SA					0 8 23
Center Fred	RF 50 Ω AC q 698.000000 I	MHz PNO: Wide ↔⊷	SENSE:INT	#Avg Type: RMS	01:01:59 PM May 20, 2024 TRACE 1 2 3 4 5 1 TYPE A WWWWW DET A A A A A A	Frequency
0 dB/div	Ref Offset 27 dB Ref 27.00 dBm	IFGain:Low	#Atten: 20 dB	Mk	1 698.000 MHz -36.053 dBm	Auto Tune
17.0						Center Fred 698.000000 MH:
3.00						Start Free 696.000000 MH
13.0					-13.00 dBm	Stop Free 700.000000 MH
33.0		and the second	- and	reporting the south of the south		CF Ster 400.000 kH Auto Mar
53.0	gr - and for a star of the second star of t					Freq Offse 0 H
Center 698.0		#\/B\M	300 kHz	#Sween	Span 4.000 MHz 1.000 s (1001 pts)	
SG	W MILE	#*DV	000 1112	STATUS		

### LTE B12\_1.4 M\_Band Edge\_Low\_QPSK\_FullRB



	- particular and the second second			trum Analyzer - Swept SA	
Frequency	01:02:18 PM May 20, 2024 TRACE 1 2 3 4 5 4 TYPE A WWWWWW	#Avg Type: RMS	SENSE:INT	RF 50 Ω AC req 692.000000 MHz	Center Fi
Auto Tune	r1 696.000 MHz -48.240 dBm	Mk	#Atten: 20 dB	PNO: Wide → IFGain:Low Ref Offset 27 dB Ref 27.00 dBm	10 dB/div
Center Freq 692.000000 MHz					17.0
Start Freq 688.000000 MHz					-3.00
Stop Freq 696.000000 MHz	-13.00 dBm				-13.0
CF Step 800.000 kHz Auto Mar	1				-33.0
Freq Offset 0 Ha			a an		-53.0
	Stop 696.000 MHz				-53.0 Start 688.
	1.000 s (1001 pts)	#Sweep	V 300 kHz	100 KH2 #VBV	#Res BW

### LTE B12\_1.4 M\_Extended Band Edge\_Low\_QPSK\_FullRB



			in the second	rum Analyzer - Swept SA			
Frequency	01:08:44 PM May 20, 2024 TRACE 2 3 4 5 TYPE A WWWWW DET A A A A A A	#Avg Type: RMS	SENSE:INT	RE 50 Ω AC eq 716.050000 MHz	Center Fre		
Auto Tune	716.002 6 MHz -30.693 dBm	Mkr1	#Atten: 20 dB	PNO: Wide →→ IFGain:Low Ref Offset 27 dB dB/div Ref 27.00 dBm			
Center Free 716.050000 MH					17.0		
Start Fre 716.000000 MH					3.00		
Stop Fre 716.100000 MH	+13.00 dBm				23.0		
CF Ste 10.000 kH Auto Ma		าษา ให้ระวัดเราะหางรัสส์ใหร่สำคัญสำคัญสำคร	and at the second of the se	na man ang kana ana ang kang kang kang kang	13.0		
Freq Offs 0 H					3.0		
	p 716.10000 MHz 1.000 s (1001 pts)	Ste #Sweep	100 kHz	00000 MHz 30 KHz #VBW	tart 716.00 Res BW 30		
		STATUS			SG		

### LTE B12\_1.4 M\_Band Edge\_High\_QPSK\_1RB(1)



	100.000			Agilent Spectrum Analyzer - Swept SA
Frequency	01:09:04 PM May 20, 2024 TRACE 1 2 3 4 5 1 TYPE A WWWWW	#Avg Type: RMS	PNO: Wide Trig: Free Run	Center Freq 717.050000 Ν
Auto Tun	716.101 9 MHz -30.481 dBm	Mkr1	IFGain:Low #Atten: 20 dB	Ref Offset 27 dB
Center Fre 717.050000 MH				17.0
Start Fre 716.100000 MH				3.00
Stop Fre 718.000000 MH	-13.00 dBm-			13.0
CF Ste 190.000 kł Auto Ma				13 0 <b>1</b>
Freq Offs 0 F	RMS			53.0
	top 718.0000 MHz 1.000 s (1001 pts)	S #Sweep	#VBW 300 kHz	53 0 Start 716.1000 MHz Res BW 100 kHz
	1	STATUS		SG

### LTE B12\_1.4 M\_Band Edge\_High\_QPSK\_1RB(2)



0 9 2		унсканени						rum Analyzer - Swept SA	
Frequency	56 PM May 20, 2024 TRACE 1 2 3 4 5 4 TYPE A WWWWW DET A A A A A A	TR	ALIGN AUTO pe: RMS	#Avg Ty		Trig: Fre	PNO: Wide ->	RF 50 Ω AC eq 716.000000 M	Center Fi
Auto Tune	6.000 MHz .878 dBm		Mki		UdB	#Atten: 2	IFGain:Low	Ref Offset 27 dB Ref 27.00 dBm	10 dB/div
Center Fred 716.000000 MH:									17.0
Start Free 714.000000 MH									3.00
Stop Free 718.000000 MH	-13.00 dBm.				1				13.0
CF Stej 400.000 kH Auto Ma	RMS	han-andre state fragmants	Wington William and	ang bandharan (ang an an an an	haven			no sport	33.0 <b></b>
Freq Offse 0 H									53.0
	n 4.000 MHz s (1001 pts)	Span	#Sweep			300 kHz	#VBM	6.000 MHz	Center 71
	e (nee i pro)		STATUS			0.000	a den		ISG

### LTE B12\_1.4 M\_Band Edge\_High\_QPSK\_FullRB



0 8 🕰	1.000		11	ctrum Analyzer - Swept SA	
Frequency	01:08:16 PM May 20, 2024 TRACE 1 2 3 4 5 4 TYPE A WWWWW	ALIGN AUTO #Avg Type: RMS	SENSE:INT	RF 58 Ω AC Treq 722.000000 MHz PNO: Wide ↔	Center Fi
Auto Tune	1 718.024 MHz -42.491 dBm	Mki	#Atten: 20 dB	IFGain:Low Ref Offset 27 dB Ref 27.00 dBm	10 dB/div
Center Free 722.000000 MH					17.0
Start Free 718.000000 MH:					3.00
Stop Fred 726.000000 MHz	-13.00 dBm				-13.0 -23.0
CF Step 800.000 kH Auto Mar					-33.0 1 -43.0
Freq Offse 0 H	RMS				53.0
	Stop 726.000 MHz 1.000 s (1001 pts)	#Sweep	€ 300 kHz		Start 718. #Res BW
		STATUS			ISG

### LTE B12\_1.4 M\_Extended Band Edge\_High\_QPSK\_FullRB



	ctrum Analyzer - Swept SA			1	
Center F	RF 50 Ω AC req 698.000000	MHZ PNO: Wide ↔ Trig: Free Run IFGain:Low #Atten: 20 dB	ALIGN AUTO #Avg Type: RMS	01:11:21 PM May 20, 2024 TRACE 1 2 3 4 5 0 TYPE A WWWWWW DET A A A A A A A	Frequency
0 dB/div	Ref Offset 27 dB Ref 27.00 dBm	IPOan.LOW WRiteri 20 CB	Mk	r1 696.728 MHz -44.293 dBm	Auto Tun
17.0				$\gamma$	Center Fre 698.000000 MH
3.00					Start Fre 696.000000 MH
13.0				-13.00 dBm	Stop Fre 700.000000 M⊦
3.0	1			No and a state	CF Ste 400.000 ki <u>Auto</u> Ma
3.0					Freq Offs 01
	98.000 MHz 100 kHz	#VBW 300 kHz	#Sweep	Span 4.000 MHz 1.000 s (1001 pts)	
SG			STATU		L

# LTE B12\_3 M\_Band Edge\_Low\_QPSK\_1RB



				Spectrum Analyzer - Swept SA
Frequency	01:10:37 PM May 20, 2024 TRACE 1 2 3 4 5 TYPE A WWWWW DET A A A A A A	ALIGN AUTO #Avg Type: RMS	- Trig: Free Run	RF 50 Ω AC Freq 698.000000 MHz PNO: Wide
Auto Tun	1 697.840 MHz -37.816 dBm	Mkr	#Atten: 20 dB	Ref Offset 27 dB Ref 27.00 dBm
Center Fre 698.000000 MH	RMS			
Start Fre 696.000000 MH				
Stop Fre 700.000000 MH	-13.00 dBin;			
CF Ste 400.000 kł Auto Ma			1-	An - La marce of a start of the
Freq Offs 0 F				
	Span 4.000 MHz 1.000 s (1001 pts)	#Sweep	( 300 kHz	698.000 MHz W 100 kHz #VBV
		STATUS		

# LTE B12\_3 M\_Band Edge\_Low\_QPSK\_FullRB



0 8 🐱				ctrum Analyzer - Swept SA	
Frequency	01:10:55 PM May 20, 2024 TRACE 1 2 3 4 5 6 TYPE A WWWWWWW	#Avg Type: RMS	SENSE:INT	RF 50 Ω AC req 692.000000 MHz	RL Center Fre
Auto Tune	r1 695.672 MHz -40.662 dBm	Mki	#Atten: 20 dB	PNO: Wide → IFGain:Low Ref Offset 27 dB Ref 27.00 dBm	
Center Freq 692.000000 MHz					17.0
Start Free 688.000000 MH					-3.00
Stop Free 696.000000 MHz	-13.00 dBm				-13.0
CF Stej 800.000 kH Auto Mar	1 RMS				33.0
Freq Offse 0 H			and a second and a second second second	an a fair a that a start and a start and a start and a start a	-53.0
	Stop 696.000 MHz 1.000 s (1001 pts)	#Sween	V 300 kHz		53.0 Start 688.00 #Res BW 1
		STATUS			MSG

# LTE B12\_3 M\_Extended Band Edge\_Low\_QPSK\_FullRB



		1990 - Sec Se							trum Analyzer - S	
Frequency	M May 20, 2024	TRAC	RMS	#Avg Type	ENSE:INT	21.22	Hz	ο Ω AC 050000 M	req 716.0	RL enter F
Auto Tune	0 2 MHz 58 dBm	DE 716.00	Mkr1			#Atten: 2	PNO: Wide ↔ IFGain:Low		Ref Offset Ref 27.0	) dB/div
Center Fre 716.050000 MH										7.0
Start Fre 716.000000 MH										.00
Stop Fre 716.100000 MH	-13.00 dBm					Roman Address of	Nadethilderstandartisters	waterstag	hand a second and a second	3.0 <b>-1</b>
CF Ste 10.000 kł Auto Ma		-Definipromprio	nen seener	in his month of the line	0. 00 (manufactures)					3.0
Freq Offs 0 F										3.0
	0000 MHz	op 716.10	Ste #Sweep		z	100 kHz	#VBM	Iz	00000 MH	tart 716. Res BW

## LTE B12\_3 M\_Band Edge\_High\_QPSK\_1RB(1)



0 8 🕰				trum Analyzer - Swept SA	
Frequency	01:16:31 PM May 20, 2024 TRACE 1 2 3 4 5 TYPE A WWWWW DET A A A A A A	ALIGN AUTO #Avg Type: RMS	Trig: Free Run	RF 50 Ω AC req 717.050000 MHz PN0: Wide ↔	Center Fre
Auto Tune	716.101 9 MHz -23.407 dBm	Mkr1	#Atten: 20 dB	IFGain:Low Ref Offset 27 dB Ref 27.00 dBm	
Center Free 717.050000 MH					17.0
Start Free 716.100000 MH					3.00
Stop Fre 718.000000 MH	-13.00 dBm				13.0
<b>CF Ste</b> 190.000 kH <u>Auto</u> Ma					33.0
Freq Offso 0 H	RMS			Carrier Carrie	53.0
	top 718.0000 MHz 1.000 s (1001 pts)	S #Sween	( 300 kHz		53.0 Start 716.1 #Res BW 1
-		STATUS	Richelt Richeller	1000000 COL.11	ISG

#### LTE B12\_3 M\_Band Edge\_High\_QPSK\_1RB(2)



0 9 🕰				trum Analyzer - Swept SA	
Frequency	01:15:23 PM May 20, 2024 TRACE 1 2 3 4 5 0 TYPE A WWWW DET A A A A A A	ALIGN AUTO #Avg Type: RMS	SENSE:INT Trig: Free Run #Atten: 20 dB	RF 50 Ω AC req 716.000000 MHz PNO: Wide ~	Center F
Auto Tune	1 716.000 MHz -20.574 dBm	Mkr	whiten. 20 0D	IFGain:Low Ref Offset 27 dB Ref 27.00 dBm	10 dB/div
Center Free 716.000000 MH					17.0
Start Free 714.000000 MH					3.00
Stop Free 718.000000 MH	-13.00 dBm;		1		13.0 23.0
CF Stej 400.000 kH Auto Ma	FMS	and a first of the state of the			33.0
Freq Offse 0 H					53.0
	Span 4.000 MHz 1.000 s (1001 pts)	#Sween	W 300 kHz	6.000 MHz 100 kHz #VB	Center 71
		STATUS			ISG

## LTE B12\_3 M\_Band Edge\_High\_QPSK\_FullRB



Agilent Spectrum Analyzer - Swept SA				0 0 0
<sup>27</sup> RL RF 50.Ω AC Center Freq 722.000000	0 MHz	#Avg Type: RMS	01:15:43 PM May 20, 2024 TRACE 1 2 3 4 5 4 TYPE A WWWWWW	Frequency
Ref Offset 27 dB 10 dB/div Ref 27.00 dBm	IFGain:Low #Atten: 20 dB	Mk	cr1 718.000 MHz -36.871 dBm	Auto Tune
17.0				Center Free 722.000000 MH
3.00				Start Free 718.000000 MH
23.0			-13.00 dBm	Stop Fre 726.000000 MH
33 D 1				CF Ste 800.000 kH Auto Ma
53.0			FINE	Freq Offse 0 H
Start 718.000 MHz #Res BW 100 kHz	#VBW 300 kHz	#Sweep	Stop 726.000 MHz	
ISG		STATU	IS	

## LTE B12\_3 M\_Extended Band Edge\_High\_QPSK\_FullRB



0 0 0		i i constante		um Analyzer - Swept SA	
Frequency	01:18:47 PM May 20, 2024 TRACE 2 2 3 4 5 TYPE A WWWWW DET A A A A A A	ALIGN AUTO #Avg Type: RMS	SENSE:INT Trig: Free Run #Atten: 20 dB	RF 50Ω AC eq 698.000000 MHz PNO:Wide ↔ IFGain:Low	Center Fre
Auto Tune	1 697.136 MHz -47.510 dBm	Mkr	WAILEN. 20 GD	Ref Offset 27 dB Ref 27.00 dBm	0 dB/div
Center Free 698.000000 MH	$\frown -$				17.0
Start Fre 696.000000 MH	RMS				3.00
Stop Fre 700.000000 MH	-13.00 dBm				13.0 23.0
CF Ste 400.000 kH Auto Ma	\				33.0 43.0
Freq Offs 0 F		Argument .	annan an a		53.0
	Span 4.000 MHz 1.000 s (1001 pts)	#Sweep	300 kHz		Center 698
		STATUS			SG

## LTE B12\_5 M\_Band Edge\_Low\_QPSK\_1RB



Agilent Spectrum Analyzer - Sw					6 8 2
RL RF 50 enter Freq 698.00	Ω AC 100000 MHz PNO:	SENSE:INT	ALIGN AUTO #Avg Type: RMS	01:18:02 PM May 20, 2024 TRACE 1 2 3 4 5 TYPE A WWWWW DET A A A A A A	Frequency
Ref Offset 2 D dB/div Ref 27.00	IFGain 7 dB		Mk	r1 697.852 MHz -37.979 dBm	Auto Tun
7.0					Center Fre 698.000000 MH
.00				RMS	Start Fre 696.000000 Mi
3.0				-13.00 dBm	Stop Fre 700.000000 Mi
3.0 3.0	and contraction of a second	1			CF Ste 400.000 kl Auto M
3.0					Freq Offs 0
enter 698.000 MHz		#VBW 200 kU3	#5	Span 4.000 MHz	
Res BW 100 kHz		#VBW 300 kHz	statu	1.000 s (1001 pts)	<u>.</u>

## LTE B12\_5 M\_Band Edge\_Low\_QPSK\_FullRB



		Constant Section					trum Analyzer - Sw	
Frequency	1:18:21 PM May 20, 2024 TRACE 1 2 3 4 5 4	ALIGN AUTO pe: RMS	#Avg Ty	SENS	Hz	00000 MH	RF 50 eq 692.00	RL enter Fi
Auto Tune	695.872 MHz -39.188 dBm	Mkr		Atten: 20	PNO: Wide IFGain:Low	F 17 27 dB	Ref Offset 2 Ref 27.00	0 dB/div
Center Freq 692.000000 MHz								og
Start Freq 688.000000 MHz								3.00
Stop Freq 696.000000 MHz	-13.00 dBm.							13.0
CF Step 800.000 kH: Auto Mar		- Andrews and the second						13.0
Freq Offse 0 H:								53.0
	op 696.000 MHz	#Suloon		N 200 KU	#\/5\		000 MHz	
N	000 s (1001 pts)	#Sweep		W 300 kHz	#VBW		TOO KHZ	Res BW

## LTE B12\_5 M\_Extended Band Edge\_Low\_QPSK\_FullRB



		100.0000							trum Analyzer - S	
Frequency	PM May 20, 2024 ACE 1 2 3 4 5 6 YPE A WWWWWW	TRAC	ALIGN AUTO e: RMS	#Avg Typ	SENSE:INT		Hz PNO: Wide ↔	50000 M	req 716.0	Center F
Auto Tune	00 4 MHz 145 dBm	716.00	Mkr1		n: 20 dB	#Atten:	IFGain:Low		Ref Offset	10 dB/div
Center Fre 716.050000 MH										17.0
Start Fre 716.000000 MH										3.00
Stop Fre 716.100000 MH	-13.00 dBm									13.0
CF Ste 10.000 kł Auto Ma	RMS Lings for some of the	ŊĸĸĸĸŶĸĿĸŶſŢĸĸſĿĸ	erfedi na ny kapatang	n fan skirjer fan sen	*****	lander at the second of	and the states of the second second	ant de la	Light-Service of the Service of the	13.0
Freq Offs 01										3.0
	10000 MHz (1001 pts)	op 716.10	Sto #Sweep		(Hz	100 kH	#VBW	z	00000 MH	tart 716.
			STATUS							SG

#### LTE B12\_5 M\_Band Edge\_High\_QPSK\_1RB(1)



			in the second		trum Analyzer - Swept SA	
Frequency	01:23:51 PM May 20, 2024 TRACE 1 2 3 4 5 1 TYPE A WWWW DET A A A A A A	ALIGN AUTO #Avg Type: RMS	SENSE:INT		RF 50 Ω AC req 717.050000	Center Fi
Contraction and Contraction	716.103 8 MHz -29.353 dBm	Mkr1	#Atten: 20 dB	IFGain:Low	Ref Offset 27 dB Ref 27.00 dBm	10 dB/div
Center Fre 717.050000 MH						17.0
Start Fre 716.100000 MH						3.00
Stop Fre 718.000000 MH	-13.00 dBm					13.0 23.0 <b>1</b> —
CF Ste 190.000 kł Auto Ma						13.0
Freq Offs 0 F	RMS		t me and a second	the part of the second s		53.0
	top 718.0000 MHz 1.000 s (1001 pts)	S #Sweep	300 kHz	#VBW	1000 MHz 100 kHz	tart 716.
		STATUS				SG

# LTE B12\_5 M\_Band Edge\_High\_QPSK\_1RB(2)



		100.000				4 - 5		um Analyzer - Swept SA	
Frequency	ACE 1 2 3 4 5 1 YPE A WWWWWW DET A A A A A A	TR	ALIGN AUTO	#Av		100	PNO: Wide ↔	RF 50 Ω AC 2 <b>q 716.000000 N</b>	Center F
Auto Tur	000 MHz 785 dBm	1 716. -27.	Mk				In Galin.Low	Ref Offset 27 dB Ref 27.00 dBm	0 dB/div
Center Fre 716.000000 MH									og
Start Fr 714.000000 M						$\int$			00
Stop Fr 718.000000 M	-13.00 dBm								1.0 1.0
CF St 400.000 k Auto M	RMS	Marines, Columburg La							3.0
Freq Offs 0									.0
	4.000 MHz (1001 pts)	Span 1.000 s	#Sweep		z	300 kHz	#VBW	.000 MHz 00 kHz	enter 71 Res BW
			STATUS						G

#### LTE B12\_5 M\_Band Edge\_High\_QPSK\_FullRB



Agilent Spectrum Analyzer - Swept SA					0 0 0
M RL RF 50 Ω A Center Freq 722.00000	0 MHz	SENSE:INT	#Avg Type: RMS	01:23:03 PM May 20, 2024 TRACE 1 2 3 4 5 4 TYPE A WWWWWW	Frequency
Ref Offset 27 dB	IFGain:Low #Att	en: 20 dB	M	cr1 718.144 MHz -39.581 dBm	Auto Tune
10 dB/div Ref 27.00 dBn				-39.581 GBM	Center Fred 722.000000 MH
3.00					Start Free 718.000000 MH
23.0				-13.00 dBm	Stop Free 726.000000 MH
33.0					CF Step 800.000 kH Auto Mar
53.0				RMS	Freq Offse 0 H
Start 718.000 MHz #Res BW 100 kHz	#VBW 300	KHz	#Sweep	Stop 726.000 MHz 5 1.000 s (1001 pts)	
ISG			STAT		

#### LTE B12\_5 M\_Extended Band Edge\_High\_QPSK\_FullRB



	n Analyzer - Swept SA		1			0 8 🜌
	RF 50 Ω AC q 698.000000	MIHZ PNO: Wide ↔ IFGain:Low	SENSE:INT Trig: Free Run #Atten: 20 dB	ALIGN AL #Avg Type: RMS	TO 01:26:07 PM May 20, 2024 TRACE 1 2 3 4 5 TYPE A WWWWW DET A A A A A A	
	tef Offset 27 dB Ref 27.00 dBm	n oumeon		1.	Mkr1 697.992 MHz -51.739 dBm	Auto Tun
					RMS	Center Fre 698.000000 MH
						Start Fre 696.000000 MH
					-13.00 dbm	Stop Fre 700.000000 MH
						CF Ste 400.000 kł <u>Auto</u> Ma
		and type as a subject to the state of the st	transfilling to grant and the state of the s	Lawrence and the second		Freq Offs 01
er 698.0 BW 10	000 MHz 0 kHz	#VBW	300 kHz	#Swe	Span 4.000 MHz ep 1.000 s (1001 pts)	
					TATUS	

## LTE B12\_10 M\_Band Edge\_Low\_QPSK\_1RB



	ctrum Analyzer - Swept SA					
Center Fi	RF 50 Ω AC req 698.000000	PNO: Wide ->	Trig: Free Run	#Avg Type: RMS	01:25:23 PM May 20, 2024 TRACE 1 2 3 4 5 TYPE A WWWWW DET A A A A A A	Frequency
10 dB/div	Ref Offset 27 dB Ref 27.00 dBm	IFGain:Low	#Atten: 20 dB	M	cr1 697.944 MHz -37.433 dBm	Auto Tun
17.0						Center Fre 698.000000 MH
3.00					RMS	Start Fre 696.000000 MH
13.0					-13.00 dBm	Stop Fre 700.000000 Mi
3.0 3.0	New york of the second of the	yayaya wa Manni wa wa wa wa m	1			CF Ste 400.000 ki <u>Auto</u> M
3.0						Freq Offs 0
	8.000 MHz 100 kHz	#VBV	Ø 300 kHz	#Sweet	Span 4.000 MHz 5 1.000 s (1001 pts)	
SG				STAT		

## LTE B12\_10 M\_Band Edge\_Low\_QPSK\_FullRB



			4	Analyzer - Swept SA	
Frequency	01:25:42 PM May 20, 2024 TRACE 1 2 3 4 5 4 TYPE A WWWWW DET A A A A A A	ALIGN AUTO #Avg Type: RMS	SENSE:INT	RF 58 Ω AC 692.000000 MHz PNO: Wide ↔	Center Fr
Auto Tune	r1 695.952 MHz -39.097 dBm	Mki	#Atten: 20 dB	IFGain:Low of Offset 27 dB of 27.00 dBm	10 dB/div
Center Free 692.000000 MH					17.0
Start Free 688.000000 MH					3.00
Stop Free 696.000000 MH:	-13.03 dBm				-13.0
CF Stej 800.000 kH <u>Auto</u> Ma	Rhannannannannannanna	Mart and a stand of the law is a stand of the			33.0 43.0
Freq Offse 0 H					53.0
	Stop 696.000 MHz 1.000 s (1001 pts)	#Sweep	300 kHz		53.0 Start 688. #Res BW
		STATUS			ISG

## LTE B12\_10 M\_Extended Band Edge\_Low\_QPSK\_FullRB



	trum Analyzer - Swept SA						
Center Fr	RF 50 Ω AC req 716.050000 I	PNO: Wide Trig	SENSE:INT	#Avg Type: R		1248 PM May 20, 2024 TRACE 1 2 3 4 5 TYPE A WWWWW	Frequency
0 dB/div	Ref Offset 27 dB Ref 27.00 dBm	IFGain:Low #Att	en: 20 dB		Wkr1 716. -3	005 7 MHz 7.995 dBm	Auto Tune
17.0							Center Freq 716.050000 MHz
3.60							Start Freq 716.000000 MHz
13.0						+13.00 dBm.	Stop Freq 716.100000 MHz
33.0 43.0	1-	ndersegeng angewent die programme anders werden	1949-AT-Apage-Atrigon of Burger	+ A#3-13-141-14-1-14-1-14-1-14-1-14-1-14-1-		RMS	CF Step 10.000 kHz Auto Man
53.0							Freq Offset 0 Hz
Start 716.	00000 MHz 30 kHz	#VBW 100	kHz	#S	Stop 71 weep 1.000	6.10000 MHz ) s (1001 pts)	
SG					STATUS		

## LTE B12\_10 M\_Band Edge\_High\_QPSK\_1RB(1)



	ctrum Analyzer - Swept SA		and the second			
RL Center Fi	RF 50 Ω AC req 717.050000 I		rig: Free Run	#Avg Type: RMS	01:31:07 PM May 20, 2024 TRACE 2 3 4 5 1 TYPE A WWWAAAWW	Frequency
10 dB/div	Ref Offset 27 dB Ref 27.00 dBm		Atten: 20 dB	Mkr1	TYPE A AAAAA DET AAAAAAA 716.107 6 MHz -38.454 dBm	Auto Tune
17.0						Center Free 717.050000 MH
3.00						Start Free 716.100000 MH
13.0					-13.00 dBm	Stop Fre 718.000000 MH
33.0. 1						CF Ste 190.000 kH Auto Ma
53.0	alon Carroland and an allowed	alterie franzer anterie ater	Not Sugaran Bargan Barna Bar paraste		RMS	Freq Offse 0 H
53.0 Start 716. #Res BW	1000 MHz 100 kHz	#VBW 30	00 kHz	#Sween	Stop 718.0000 MHz	
SG			S MALINI	STATU		

## LTE B12\_10 M\_Band Edge\_High\_QPSK\_1RB(2)



Agilent Spectrum Analyzer - Swept SA				- 1	0 0
Center Freq 716.000000	MIHZ PNO: Wide IFGain:Low	SENSE:INT Trig: Free Run #Atten: 20 dB	ALIGN AUTO #Avg Type: RMS	01:30:01 PM May 20, 2024 TRACE 1 2 3 4 5 TYPE A WWWWW DET A A A A A A	Frequency
Ref Offset 27 dB			Mk	r1 716.008 MHz -35.185 dBm	Auto Tune
17.0					Center Fre 716.000000 MH
3.00					Start Fre 714.000000 MH
13.0				-1 3.00 dBm	Stop Fre 718.000000 MH
13.0		1		RMS	CF Ste 400.000 kH Auto Ma
33.0					Freq Offs 01
Eenter 716.000 MHz Res BW 100 kHz	#VBW	300 kHz	#Sweep	Span 4.000 MHz 1.000 s (1001 pts)	
SG			STATUS		

## LTE B12\_10 M\_Band Edge\_High\_QPSK\_FullRB



Agilent Spectrum Analyzer - Swept Si				
RL RF 50 Ω Center Freq 722.0000	AC SENSE:INT OO MHZ PNO: Wide Trig: Free Run	ALIGN AUTO #Avg Type: RMS	01:30:20 PM May 20, 2024 TRACE 1 2 3 4 5 4 TYPE A WWWWWW	Frequency
Ref Offset 27 dE	IFGain:Low #Atten: 20 dB	M	cr1 718.320 MHz -40.288 dBm	Auto Tune
17.0				Center Free 722.000000 MH
3.00				Start Free 718.000000 MH:
13.0			-13.00 dBm	Stop Free 726.000000 MH
43.0	www.			CF Stej 800.000 kH <u>Auto</u> Ma
53.0			RMS	Freq Offse 0 H
Start 718.000 MHz #Res BW 100 kHz	#VBW 300 kHz	#Sweep	Stop 726.000 MHz	
ISG		STATU	IS	

## LTE B12\_10 M\_Extended Band Edge\_High\_QPSK\_FullRB



### **11. ANNEX A\_ TEST SETUP PHOTO**

Please refer to test setup photo file no. as follows;

No.	Description
1	HCT-RF-2406-FC011-P