

# **TEST REPORT**

FCC Sub6 n38 Test for TFGMEIBBCD4 Class II Permissive Change

APPLICANT LG Electronics Inc.

REPORT NO. HCT-RF-2409-FC013-R1

DATE OF ISSUE October 7, 2024

> **Tested by** Jung Ki Lim

Ar

Technical Manager Jong Seok Lee

HCT CO., LTD. Bongjai Huh Bongjai Huh 7 CEO

F-TP22-03(Rev.06)

The report shall not be (partly) reproduced except in full without approval of the laboratory. HCT CO., LTD. 2-6, 73, 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Republic of Korea Tel. +82 31 645 6300 Fax. +82 31 645 6401

1/60



HCT CO.,LTD. 2-6, 73, 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Republic of Korea Tel. +82 31 645 6300 Fax. +82 31 645 6401

T E S T R E P O R T	REPORT NO. HCT-RF-2409-FC013-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 Gen38 ROW TFGMEIBBCD4
Date of Test	May 07, 2024 ~ September 26, 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 21.)

# 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 \*.

Information provided by the applicant is marked \*\*.

Test results provided by external providers are marked \*\*\*.

When confirmation of authenticity of this test report is required, please contact www.hct.co.kr

The test results in this test report are not associated with the ((KS Q) ISO/IEC 17025) accreditation by KOLAS (Korea Laboratory Accreditation Scheme) / A2LA (American Association for Laboratory Accreditation) that are under the ILAC (International Laboratory Accreditation Cooperation) Mutual Recognition Agreement (MRA).



# CONTENTS

1. GENERAL INFORMATION	
1.1. MAXIMUM OUTPUT POWER	6
2. INTRODUCTION	7
2.1. DESCRIPTION OF EUT	7
2.2. MEASURING INSTRUMENT CALIBRATION	7
2.3. TEST FACILITY	
3. DESCRIPTION OF TESTS	8
3.1 TEST PROCEDURE	8
3.2 CONDUCTED OUTPUT POWER	9
3.3 RADIATED TEST	10
3.3.1 RADIATED POWER	
3.3.2 RADIATED SPURIOUS EMISSIONS	12
3.4 PEAK- TO- AVERAGE RATIO	14
3.5 OCCUPIED BANDWIDTH	
3.6 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL	17
3.7 BAND EDGE	18
3.8 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE	20
3.9 WORST CASE(RADIATED TEST)	21
3.10 WORST CASE(CONDUCTED TEST)	22
4. LIST OF TEST EQUIPMENT	23
5. MEASUREMENT UNCERTAINTY	
6. SUMMARY OF TEST RESULTS	26
7. EMISSION DESIGNATOR	27
8. TEST DATA	
8.1 Conducted Output Power	28
8.2 EQUIVALENT ISOTROPIC RADIATED POWER	29
8.2.1 External Antenna	29
8.2.2 Internal Antenna	30
8.3 RADIATED SPURIOUS EMISSIONS	31
8.3.1 External Antenna	31
8.3.2 Internal Antenna	32
8.4 PEAK-TO-AVERAGE RATIO	33
8.5 OCCUPIED BANDWIDTH	
8.6 CONDUCTED SPURIOUS EMISSIONS	35
8.7 CHANNEL EDGE	36
8.8 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE	37
9. TEST PLOTS	
10. ANNEX A_ TEST SETUP PHOTO	60



# **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 Gen38 ROW
Model(s):	TFGMEIBBCD4
Additional Model(s)	TFGMEIBBCD5,TFGMEIBBCD6,TFGMEIBBCD7,TFGMEIBBCD8,
	TFGMEIBBCD9, TFGMEIBBCDA, TFGMEIBBCDB, TFGMEIBBCDC
SCS(kHz):	30
Bandwidth(MHz):	20
Waveform:	CP-OFDM, DFT-S-OFDM
Modulation:	DFT-S-OFDM: PI/2 BPSK, QPSK, 16 QAM, 64 QAM, 256 QAM
	CP-OFDM: QPSK, 16 QAM, 64 QAM, 256 QAM
Tx Frequency:	2580 MHz – 2610 MHz (Sub6 n38 (20 MHz))
Date(s) of Tests:	May 07, 2024 ~ September 26, 2024
Serial number:	Radiated : EBR36018942k_#108
Senat number:	Conducted : EBR42280003K_#104
External Antenna	ANT5:86531607
Information	ANT4:86575530
mormation	DUT4:85608774



# **1.1. MAXIMUM OUTPUT POWER**

Mode		Fraissian		EIRP External Antenna		EIRP Internal Antenna	
(MHz)	Tx Frequency (MHz)	Emission Designator	Modulation				Max. Power (dBm)
Sub6 n38 (20)		18M0G7D	PI/2 BPSK	0.298	24.74	1.159	30.64
	2580 – 2610	18M0G7D	QPSK	0.296	24.72	1.140	30.57
		18M0W7D	16 QAM	0.237	23.75	0.910	29.59
		17M9W7D	64 QAM	0.167	22.23	0.646	28.10
		17M9W7D	256 QAM	0.104	20.19	0.409	26.12



# **2. INTRODUCTION**

# **2.1. DESCRIPTION OF EUT**

The EUT was a GM Onstar Gen38 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** 





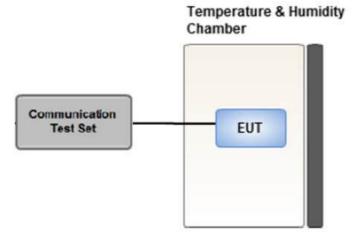
# **3. DESCRIPTION OF TESTS**

# **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
Channel 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
Peak- to- Average Ratio	- KDB 971168 D01 v03r01 – Section 5.7 - ANSI C63.26-2015 – Section 5.2.3.4
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.

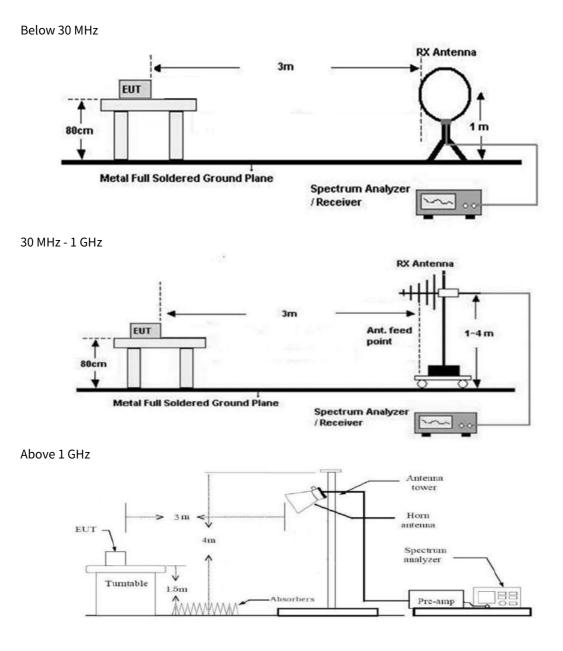


# **3.3 RADIATED TEST**

#### **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**



F-TP22-03 (Rev. 06)



#### **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 (dBµV/m) 95.2(dB)
- 9. EIRP(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 (dB $\mu$ V/m) - 95.2(dB)

9. EIRP(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  $(dB_{\mu}V/m)$  + 20 log D 104.8 (where D is the measurement distance in meters. D=3)
  - = Total ( $dB\mu V/m$ ) 95.2(dB)
- 9. EIRP(dBm) = EIRP(dBm) 2.15(dB)

#### Above 1 GHz

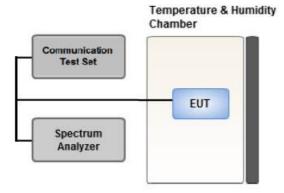
1. The EUT is placed on a turntable, which is 1.5 m above ground plane.

- 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

#### **Test Settings**

- 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  $\mathsf{P}_{\mathsf{Pk}}.$ 

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

 $P.A.R_{(dB)} = P_{Pk}_{(dBm)} - P_{Avg(dBm)} (P_{Avg} = Average Power + Duty cycle Factor)$ 

F-TP22-03 (Rev. 06)



#### **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  $\geq 3 \times$  RBW.

- 1. Set the RBW  $\geq$  OBW.
- 2. Set VBW  $\geq$  3 × RBW.
- 3. Set span  $\geq 2 \times OBW$ .
- 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  $\geq 2 \times \text{span} / \text{RBW}$ .
- 5. Sweep time:

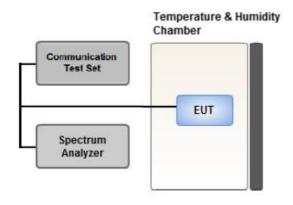
Set  $\geq$  [10 × (number of points in sweep) × (transmission period)] for single sweep

(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

# Test Settings

- 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



# Communication Test Set

# 3.6 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL

Spectrum Analyzer

#### Test setup

#### **Test Overview**

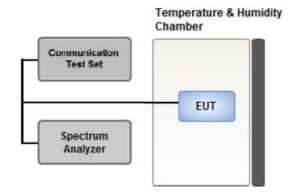
The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. All out of band emissions are measured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

#### **Test Settings**

- 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  $\geq 2 \times \text{Span} / \text{RBW}$



# **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.

#### **Test Settings**

- 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  $\geq 2 \times \text{Span/RBW}$
- 7. Trace mode = trace average
- 8. Sweep time = auto couple
- 9. The trace was allowed to stabilize



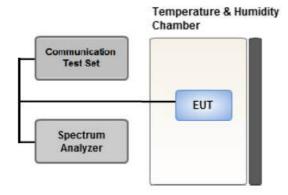
#### **Test Notes**

- 1. The attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge,
- 2. 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge.
- 3. 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge.
- 4. The attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz.
- 5. 55 + 10 log (P) dB at or below 2490.5 MHz.
- 6. X is the greater of 6MHz or the actual emission bandwidth
- 7. 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.

# **Test Settings**

- 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 : SA, NSA
- Worst case : SA

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.
- TFGMEIBBCD4 & additional models were tested and the worst case results are reported. (Worst case : TFGMEIBBCD4)
- Radiated Spurious emissions are measured while operating in EN-DC mode with Sub 6 NR carrier as well as an LTE carrier (anchor).

All EN-DC mode of operation (=anchor) were investigated and the test results were measured No Peak Found.

The test results which are attenuated more than 20 dB below the permissible value, so it was not reported.

[External Antenna Worst case ]							
Test Description	Modulation	RB size	RB offset	Axis			
Equivalent Isotropic Radiated Power	PI/2 BPSK, QPSK, 16 QAM, 64 QAM, 256 QAM	See Sec	tion 8.2.1	Only X			
Radiated Spurious and Harmonic Emissions	PI/2 BPSK	See Sec	tion 8.3.1	Only X			

#### [Internal Antenna Worst case]

Test Description	Modulation	RB size	RB offset	Axis	
	PI/2 BPSK,				
Equivalent Isotropic Radiated Power	QPSK,				
	16 QAM,	See Section 8.2.2		Z	
	64 QAM,				
	256 QAM				
Radiated Spurious and Harmonic Emissions	PI/2 BPSK	See Sec	tion 8.3.2	Y	



# 3.10 WORST CASE(CONDUCTED TEST)

- Waveform : All Waveform of operation were investigated and the worst case configuration results are reported.

(Worst case: DFT-S-OFDM)

- Modulation : All Modulation of operation were investigated and the worst case configuration results are reported.

(Worst case: PI/2 BPSK)

- All modes of operation were investigated and the worst case configuration results are reported. Mode: NSA, SA

Worst case: SA

- All RB sizes, offsets of operation were investigated and the worst case configuration results are reported.

Please refer to the table below.

- TFGMEIBBCD4 & additional models were tested and the worst case results are reported.

(Worst case : TFGMEIBBCD4)

[ Worst case ]						
Test Description	Modulation	Bandwidth (MHz)	Frequency	RB size	RB offset	
Occupied Bandwidth Peak- to- Average Ratio	PI/2 BPSK, QPSK, 16 QAM, 64 QAM, 256 QAM	20	Mid	Full RB	0	
			Low	1	0	
			High	1	50	
Channel Edge	PI/2 BPSK	20	Low, Mid, High	Full RB	0	
Spurious and Harmonic Emissions at Antenna Terminal	PI/2 BPSK	20	Low, Mid, High	1	1	





4.	LIST	OF	TEST	EOU	IPME	ΕΝΤ
		•		-~~		

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	CO3000/1251/4 8920320/P	N/A	N/A	
Amp & Filter Bank Switch Controller	FBSM-01B	TNM system	TM20090002	N/A	N/A	
<b>RF Switch System</b>	TMX0132C	TNM System	TM21100002	N/A	N/A	
RF Switch System	FBSR-04C(3G HPF+LNA)	TNM System	S4L1	04/11/2025	Annual	
<b>RF Switch System</b>	FBSR-04C(LNA)	TNM System	S4L4	04/11/2025	Annual	
<b>RF Switch System</b>	FBSR-04C(Thru)	TNM System	S4L6	04/11/2025	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)	BBHA 9120	Schwarzbeck	937	02/13/2025	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	895	08/28/2026	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	Agilent	MY40010147	08/06/2025	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	REOHDE & SCHWARZ	101733	09/19/2025	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 GENERATOR (100 kHz ~ 40 GHz)	SMB100A	REOHDE & SCHWARZ	177633	07/26/2025	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:

1. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.

2. Espectially, 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. §27.53(m		<ul> <li>&lt; 40 + 10log10 (P[Watts]) at Channel edges</li> <li>&lt; 43 + 10log10 (P[Watts]) between 5 and X MHz from Channel edges</li> <li>&lt; 55 + 10log10 (P[Watts]) beyond X MHz beyond from Channel edges</li> <li>&lt; 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz</li> </ul>	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

Note:

1. Conducted test were tested using 5G Wireless Tester.

#### 6.2 Test Condition : Radiated Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Equivalent Isotropic Radiated Power	§27.50(h)(2)	< 2 Watts max. EIRP	PASS
Radiated Spurious and Harmonic Emissions	§2.1053, §27.53(m)(4)	< 55 + 10log10 (P[Watts])	PASS

Note:

1. Radiateded tests were tested using 5G Wireless Tester.



# 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

F-TP22-03 (Rev. 06)

Page 27 of 60



# 8. TEST DATA

# 8.1 Conducted Output Power

Bandwidth	SCS(kHz)	OFDM	Modulation	RB	RB Offset	Max.Average Power (dBm)			
Danuwiutii	3C3(KHZ)		Modulation	Size		501204	518598	535998	
						2506.02 MHz	2592.99 MHz	2679.99 MHz	
				1	1	24.87	24.84	24.54	
				1	26	24.64	24.50	24.22	
				1	49	24.76	24.67	24.41	
			pi/2 BPSK	25	0	24.25	24.22	24.07	
				25	13	24.71	24.58	24.45	
				25	26	24.18	24.04	23.91	
				50	0	24.21	24.14	23.97	
				1	1	24.85	24.79	24.54	
20 MHz	20	DFT-s		1	26	24.55	24.39	24.34	
20 MHZ	30			1	49	24.76	24.74	24.58	
			QPSK	25	0	23.79	23.69	23.59	
				25	13	24.70	24.57	24.48	
				25	26	23.67	23.58	23.57	
				50	0	23.71	23.63	23.48	
			16QAM	1	1	23.89	23.83	23.46	
			64QAM	1	1	22.32	22.05	22.08	
			256QAM	1	1	20.45	20.18	20.13	
		СР	QPSK	1	1	23.23	23.13	22.96	



# 8.2 EQUIVALENT ISOTROPIC RADIATED POWER

# 8.2.1 External Antenna

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level	A.F+C.L+D.F	Total	Pol.	Limit	t EIRP		RB	
	[SCS (kHz)]		(dBµV)	(dB/m)	(dBµV/m)		W	W	dBm	Size	Offset
		PI/2 BPSK	85.53	32.93	118.46	v		0.212	23.26		
2580.000		QPSK	85.44	32.93	118.37	v		0.207	23.17	27 1 71 67 72 52 58 1 09	
		16-QAM	84.54	32.93	117.47	v		0.169	22.27		1
		64-QAM	82.98	32.93	115.91	v		0.118	20.71		
	Sub6 n38/ 20 MHz	256-QAM	80.94	32.93	113.87	v		0.074	18.67		
		PI/2 BPSK	85.79	33.13	118.92	v		0.236	23.72		1
		QPSK	85.59	33.13	118.72	v		0.225	23.52		
2595.000		16-QAM	84.65	33.13	117.78	v	< 2.00	0.181	22.58		
	[30 kHz]	64-QAM	83.16	33.13	116.29	v		0.129	21.09		
		256-QAM	81.19	33.13	114.32	v		0.082	19.12		
		PI/2 BPSK	86.94	33.00	119.94	v		0.298	24.74		
		QPSK	86.92	33.00	119.92	v		0.296	24.72		
2610.000		16-QAM	85.95	33.00	118.95	V		0.237	23.75	1	1
		64-QAM	84.43	33.00	117.43	V		0.167	22.23	_	
		256-QAM	82.39	33.00	115.39	V		0.104	20.19		



# 8.2.2 Internal Antenna

Freq	Mod/ Bandwidth	Modulation	Measured Level	A.F+C.L+D.F	Total	Pol.	Limit	EIRP		RB	
(MHz)	[SCS (kHz)]		(dBµV)	(dB/m)	(dBµV/m)		W	W	dBm	Size	Offset
		PI/2 BPSK	92.91	32.93	125.84	v		1.159	30.64		
		QPSK	92.84	32.93	125.77	v		1.140	30.57	1	
2580.000		16-QAM	91.85	32.93	124.78	۷		0.908	29.58		49
		64-QAM	90.37	32.93	123.30	۷		0.646	28.10		
	Sub6 n38/ 20 MHz	256-QAM	88.25	32.93	121.18	۷		0.396	25.98		
		PI/2 BPSK	92.58	33.13	125.71	۷		1.125	30.51		49
		QPSK	92.49	33.13	125.62	۷		1.102	30.42		
2595.000		16-QAM	91.57	33.13	124.70	۷	< 2.00	0.891	29.50		
	[30 kHz]	64-QAM	90.05	33.13	123.18	۷		0.628	27.98		
		256-QAM	87.99	33.13	121.12	۷		0.391	25.92		
		PI/2 BPSK	92.82	33.00	125.82	۷		1.153	30.62		
		QPSK	92.77	33.00	125.77	۷		1.140	30.57		
2610.000		16-QAM	91.79	33.00	124.79	V	_	29.59	1	1	
		64-QAM	90.24	33.00	123.24	V		0.637	28.04		
		256-QAM	88.32	33.00	121.32	۷		0.409	26.12		



# **8.3 RADIATED SPURIOUS EMISSIONS**

#### 8.3.1 External Antenna

NR Band:	<u>N38</u>
Bandwidth:	20 MHz
Modulation:	PI/2 BPSK
Distance:	3 meters
SCS:	30 kHz

Ch	MeasuredA.F+C.L+D.F+Freq (MHz)LevelH.P.F-A.G(dB::))(dB::)(dB::)		Total (dBμV/m)	Pol.	Result (dBm)	Limit (dBm)	RB		
		<u>(dBμV)</u>	<u>(dB/m)</u>					Size	Offset
516000	5 160.00	61.73	-1.41	60.32	V	-34.88	-25.00		
	7 740.00	51.91	5.15	57.06	V	-38.14	-25.00	1	1
(2580.00)	10 320.00	46.88	11.16	58.04	V	-37.16	-25.00		
519000	5 190.00	62.66	-1.17	61.49	V	-33.71	-25.00		
	7 785.00	52.93	4.62	57.55	V	-37.65	-25.00	1	1
(2595.00)	10 380.00	47.64	10.98	58.62	V	-36.58	-25.00		
522000	5 220.00	63.72	-2.50	61.22	V	-33.98	-25.00		
522000	7 830.00	52.25	5.55	57.80	V	-37.40	-25.00	1	1
(2610.00)	10 440.00	46.86	11.02	57.88	V	-37.32	-25.00		



# 8.3.2 Internal Antenna

NR Band:	N38
Bandwidth:	20 MHz
Modulation:	PI/2 BPSK
Distance:	3 meters
SCS:	<u>30 kHz</u>

Ch	Freq (MHz)	Measured Level	A.F+C.L+D.F+ H.P.F-A.G	Total (dBμV/m)	Pol.	Result (dBm)	Limit (dBm)	RB	
		<u>(dBμV)</u>	<u>(dB/m)</u>					Size	Offset
F1C000	5 160.00	63.54	-1.41	62.13	Н	-33.07	-25.00		
516000	7 740.00	51.46	5.15	56.61	Н	-38.59	-25.00	1	49
(2580.00)	10 320.00	46.48	11.16	57.64	Н	-37.56	-25.00		
519000	5 190.00	66.01	-1.17	64.84	Н	-30.36	-25.00		
	7 785.00	51.56	4.62	56.18	н	-39.02	-25.00	1	49
(2595.00)	10 380.00	45.88	10.98	56.86	V	-38.34	-25.00		
500000	5 220.00	65.37	-2.50	62.87	Н	-32.33	-25.00		
522000	7 830.00	52.21	5.55	57.76	Н	-37.44	-25.00	1	1
(2610.00)	10 440.00	45.71	11.02	56.73	Н	-38.47	-25.00		





# 8.4 PEAK-TO-AVERAGE RATIO

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB )
			BPSK		0	3.97
			QPSK			4.65
Sub6 n38	20 MHz	2595.00	16-QAM	25		5.67
			64-QAM			6.17
			256-QAM			6.70

# Note:

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 39 ~ 43.



# 8.5 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data ( MHz )
			BPSK	25	0	17.957
			QPSK			17.934
Sub6 n38	20 MHz	2595.00	16-QAM			17.957
			64-QAM			17.934
			256-QAM			17.935

# Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 44 ~ 48.



# **8.6 CONDUCTED SPURIOUS EMISSIONS**

Band	Band Width (MHz)	Frequenc y (MHz)	Frequency of Maximum Harmonic (GHz)	Factor (dB)	Measurement Maximum Data (dBm)	Result (dBm)	Limit (dBm)
Sub6 n38	20	2580.000	4.0345	37.190	-80.202	-43.012	
		2595.000	9.6770	37.805	-80.797	-42.992	-25.00
		2610.000	6.0080	37.805	-79.935	-42.130	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 49 ~ 54.

2. Duty Cycle factor already applied on the factor.



Factor(dB) = Duty Cycle factor + Cable Loss + Ext. Attenuator + Power Splitter
 Result(dBm) = Reading + Factor

#### 3. Factor(dB)

Frequency Range (GHz)	Factor [dB]		
0.03 - 1	34.484		
1 – 5	37.190		
5 - 10	37.805		
10 - 15	38.330		
15 - 20	38.703		
Above 20	39.345		





# 8.7 CHANNEL EDGE

- Plots of the EUT's CHANNEL EDGE are shown Page 55  $\sim$  59.



## 8.8 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

20 MHz

Voltage(100 %):

Deviation Limit:

13.500 VDC Emission must remain in band

Test. Frequncy (MHz)	Voltage (%)	Temp. (°C)	Frequency (Hz)	Frequ Error
	100%	+20(Ref)	2579 999 992	0.
	100%	-30	2579 999 959	-32
	100%	-20	2579 999 980	-11
	100%	-10	2579 999 980	-11
	100%	0	2579 999 955	-36

Test. Frequncy (MHz)	Voltage (%)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
	100%	+20(Ref)	2579 999 992	0.0	0.000 000	0.000
	100%	-30	2579 999 959	-32.4	-0.000 001	-0.013
	100%	-20	2579 999 980	-11.9	0.000 000	-0.005
	100%	-10	2579 999 980	-11.8	0.000 000	-0.005
	100%	0	2579 999 955	-36.9	-0.000 001	-0.014
2580.000	100%	+10	2579 999 976	-16.3	-0.000 001	-0.006
	100%	+30	2579 999 975	-16.8	-0.000 001	-0.007
	100%	+40	2579 999 975	-16.9	-0.000 001	-0.007
	100%	+50	2579 999 974	-18.0	-0.000 001	-0.007
	85%	+20	2579 999 934	-25.1	-0.000 001	-0.010
	115%	+20	2579 999 970	-21.4	-0.000 001	-0.008
	100%	+20(Ref)	2609 999 985	0.0	0.000 000	0.000
	100%	-30	2609 999 969	-16.1	-0.000 001	-0.006
	100%	-20	2609 999 971	-14.3	-0.000 001	-0.005
	100%	-10	2609 999 969	-16.0	-0.000 001	-0.006
	100%	0	2609 999 969	-16.7	-0.000 001	-0.006
2610.000	100%	+10	2609 999 971	-14.9	-0.000 001	-0.006
	100%	+30	2609 999 970	-15.8	-0.000 001	-0.006
	100%	+40	2609 999 970	-15.4	-0.000 001	-0.006
	100%	+50	2609 999 970	-15.9	-0.000 001	-0.006
	85%	+20	2609 999 955	-14.0	-0.000 001	-0.005
	115%	+20	2609 999 976	-9.0	0.000 000	-0.003



Report No. HCT-RF-2409-FC013-R1

## 9. TEST PLOTS



	upling DC Con	t Z 50 Ω Atten: 10 c CCorr Preamp: C Ref: Int (S)		Center Freq. 2.595000000 GHz Counts: 2.00 M/2.00 Mpt Radio Std: None	Center Frequency 2.595000000 GHz	Setting
itnes		2 Graph Gaussian	S.		CF Step 5.000000 MHz	
Average Pov	wer	100 %			Man	
	23.99 dBm 47.72 % at 0 dB	10 %			Freq Offset 0 Hz	
10.0 %	1.93 dB					
1.0 %	3.56 dB	1%				
0.1 %	3.97 dB					
0.01 %	4.20 dB	0.1 %				
0.001 %	4.32 dB					
0.0001 %	4.41 dB	0.01 %				
Peak	4.45 dB	0.001 %				
Peak	28.44 dBm					
		0.000 % 0.00 dB Info BW 20.000 MHz		20.00	dB	LO

#### NR38\_20 M\_PAR\_Mid\_BPSK\_FullRB



	upling DC Corr	it Z: 50 Ω Atten. r CCorr Pream a Ref. Int (S)		Center Freq: 2.595000000 GHz Counts: 2.00 M/2.00 Mpt Radio Std: None	Center Frequency 2.595000000 GHz	Setting
atrics	•	2 Graph Gaussian			CF Step 20.000000 MHz	
Average Pov	ver	100.%			Man	
	23.47 dBm 46.86 % at 0 dB	10 %			Freq Offset 0 Hz	
10.0 %	2.40 dB					
1.0 %	4.22 dB	1 %				
0.1 %	4.65 dB					
0.01 %	4.81 dB	0.1 %	$=$ $\land$			
0.001 %	4.91 dB					
0.0001 %	5.05 dB	0.01 %		X		
Peak	5.11 dB	0.001 %				
ГСак	28.58 dBm					
		0.0001 % 0.00 dB Info BW 20.000 M	AHz	20.	00 dB	Lo

### NR38\_20 M\_PAR\_Mid\_QPSK\_FullRB



	ipling DC Corr	t Z 50 Ω Atten CCorr Pream Ref. Int (S)	10 dB Trig. RF Burst IP: Off #IF Gain: Low	Center Freq. 2.595000000 GHz Counts: 2.00 M/2.00 Mpt Radio Std: None	Center Frequency 2.595000000 GHz	Setting
atrics	•	2 Graph Gaussian			CF Step 20.000000 MHz Auto	
Average Pov	ver 22.48 dBm	100 %			Man	
4	15.00 % at 0 dB	10 %			Freq Offset 0 Hz	
10.0 %	2.90 dB					
1.0 %	4.98 dB	1%				
0.1 %	5.67 dB					
0.01 %	5.87 dB	0.1 %				
0.001 %	6.00 dB					
0.0001 %	6.14 dB	0.01 %		X		
Deets	6.18 dB	0.001 %				
Peak	28.66 dBm					
		0.0001 % 0.00 dB Info BW 20.000 M	MHz	20.	00 dB	Lo

### NR38\_20 M\_PAR\_Mid\_16QAM\_FullRB



	upling DC Con	ut Z 50 Ω Atten: 10 r CCorr Preamp: 0 g Ref. Int (S)		Center Freq. 2.595000000 GHz Counts: 2.00 M/2.00 Mpt Radio Std: None	Center Frequency 2.595000000 GHz	Setting
atrics	•	2 Graph			CF Step 20.000000 MHz	1
Average Pov	ver	Gaussian			Auto Man	
4	21.97 dBm 44.31 % at 0 dB	10 %			Freq Offset 0 Hz	i
10.0 %	2.97 dB					
1.0 %	5.21 dB	1,%				
0.1 %	6.17 dB					
0.01 %	6.41 dB	0.1 %				
0.001 %	6.55 dB					
0.0001 %	6.68 dB	0.01 %				
	6.70 dB	0.001 %				
Peak	28.67 dBm					
		0.0001 % 0.00 dB Info BW 20.000 MHz	z	20.00	dB	LO

### NR38\_20 M\_PAR\_Mid\_64QAM\_FullRB



	upling DC Corr	t Z 50 Ω Atten CCorr Pream Ref. Int (S)		Center Freq. 2.595000000 GHz Counts: 2.00 M/2.00 Mpt Radio Std: None	Center Frequency 2.595000000 GHz	Setting
itnes	Ŧ	2 Graph			CF Step 20.000000 MHz	
Average Pov	ver	Gaussian			Auto Man	
	19.97 dBm 44.15 % at 0 dB	10 %			Freq Offset 0 Hz	
10.0 %	2.97 dB	1%				
1.0 %	5.21 dB					
0.1 %	6.70 dB					
0.01 %	7.69 dB	0.1 %				
0.001 %	8.12 dB					
0.0001 %	8.54 dB	0.01 %		X		
Peak	8.64 dB	0.001 %				
Peak	28.61 dBm					
		0.0001 % 0.00 dB Info BW 20.000 M	IHz	20.0	00 dB	Lo

#### NR38\_20 M\_PAR\_Mid\_256QAM\_FullRB





Frequency 🔹 🛃							+	ter 1	pectrum Analy ccupied BW
ter Frequency Settings	0/300	Center Freq: 2.59 Avg/Hold: 500/50 Radio Std: None	Free Run Off iain: Low	Gat	Atten: 10 dB Preamp: Off	Z 50 Ω CCorr Ref. Int (S) Adaptive	Corr ( Freq	nput. RF Coupling: DC Nign: Auto	EYSIGHT
.000 MHz					Ref LvI Offset Ref Value 40.(	R		18	Graph cale/Div 10.0
Step 000000 MHz									og 0 0
Auto Man			and the second se		An within sequences.	and the second			0.0
q Offset iz	PEAK Pr	Marine Marin					wp	Andrew Amerikanski	10.0 10.0 20.0 <b>per and only</b> 10.0
									10.0 50.0
	Span 40 MHz eep 50.0 ms (1001 pts)	#Sweep		6000 MHz	#Video BW 1.	#			enter 2.59500 Res BW 390.0
								*	Metrics
	33.3 dBm		l Power	1442			1 957 MHz	ed Bandwidth	Occup
	Port Informative Mail		f OBW Pow	10.075	H7	-211.38 kH		nit Freq Error	Trans
	99,00 %								

## NR38\_20 M\_OBW\_Mid\_BPSK\_FullRB





pectrum Ana occupied BW		+	Z 50 D	Atten: 10 dB	Trin Free Due	Contor From	- 2 50500000	ou-	۵	Frequency	• 🛃
	Coupling DC Align: Auto	Corr C Freq I		Preamp: Off	Trig: Free Run Gate: Off #IF Gain: Low	Avg Hold: 5 Radio Std: 1		anz	-	requency 10000 GHz	Settings
Graph		NFE.	F	Ref LvI Offset 28					Span 40.000	MHz	
cale/Div 10	.0 dB			Ref Value 40.00	dBm	TI			CF Step 4.00000	0 MHz	
20.0		ſ	una una una mun		**************************************				Auti Mar		
	mater annihistration of the state of the sta	not party				think	<sup>สามอร</sup> ักษณ์เสรารู้ประหูปร	PEAK	Freq Off 0 Hz	set	
40.0											
enter 2.595 Res BW 390				Video BW 1.600	00 MHz	#Sv	Spa veep 50.0 ms	an 40 MHz (1001 pts)			
Metrics	*										
Occ	upied Bandwidth	34 MHz			Total Power		00 0 JB-	23			
Tra	nsmit Freq Error	34 MHZ	-213.82 kH	in i	% of OBW Pov		32.9 dBn 99.00 %				
	Bandwidth		20.17 M		x dB	ver	-26.00 d				Loca
জন্ম। মেহম।		? Sep	15, 2024 08:45 AM	$\square$			: 😽 -				

#### NR38\_20 M\_OBW\_Mid\_QPSK\_FullRB



PASS       NFE Adaptive         Graph       Ref LvI Offset 28.47 dB         cale/Div 10.0 dB       Ref Value 40.00 dBm         O       Ref Value 40.00 dBm         O       Main         O       Freq Offset         O       Main         Freq Offset       Human         PASS       #Video BW 1.6000 MHz         Span       Span         O       Hz	
Open set in the	
Allo Min Min Min Min Min Min Min Min	
0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	
enter 2.59500 GHz #Video BW 1.6000 MHz Span 40 MHz	
Res BW 390.00 kHz #Sweep 50.0 ms (1001 pts)	
Metrics 🔹	
Occupied Bandwidth 17.957 MHz Total Power 32.1 dBm	
Transmit Freq Error         -217.38 kHz         % of OBW Power         99.00 %           x dB Bandwidth         19.71 MHz         x dB         -26.00 dB	Lo

#### NR38\_20 M\_OBW\_Mid\_16QAM\_FullRB



Graph       Ref LvI Offset 28.47 dB       Span         Cale/Div 10.0 dB       Ref Value 40.00 dBm       CF Step         000       Image: Comparison of the second	EYSIGHT Input F Couplin Align: A	n <mark>g DC Cor</mark> Nuto Fre	ut Z: 50 Ω r CCorr q Ref: Int (S) E. Adaptive	Atten: 10 dB Preamp: Off	Trig: Free Run Gate: Off #IF Gain: Low	Center Freq Avg[Hold: 5 Radio Std: 1		2.5950	Frequency 00000 GHz	Settings
Auto Man Freq Offset 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Graph	•						40.000		
Auto Man PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN PEAN P	0.0							and the second second		
PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR PEAR			from an alter and		***************					
Adetrics T Occupied Bandwidth	0.0 0 propage and up 1/2 for a 1/2	Astronometry and the				WHENY	PER Manuels Martifical Carstron Martin	Freq Of 0 Hz	fset	
Res BW 390.00 kHz     #Sweep 50.0 ms (1001 pts)       Metrics     *       Occupied Bandwidth										
Occupied Bandwidth			#	Video BW 1.600	00 MHz	#Sv				
	Metrics	*								
17.854 MHZ Total Power 31.6 dBm	Occupied Bar		1000		Total David		21.6 -10			
Transmit Freg Error -217.42 kHz % of OBW Power 99.00 %	Transmit Free			z	000000000000000000000000000000000000000	ver				-
x dB Bandwidth 19.71 MHz x dB -26.00 dB	x dB Bandwid	đth	19.71 MH	IZ	x dB		-26.00 dB			Loc

#### NR38\_20 M\_OBW\_Mid\_64QAM\_FullRB



Spectrum Analyzer 1  Occupied BW	+					0	Frequency	1 2
KEYSIGHT Input RF RL ↔ Coupling DC Align: Auto PASS	Input Z: 50 Ω Corr CCorr Freq Ref: Int (S) NFE: Adaptive	Atten: 10 dB Preamp: Off	Trig: Free Run Gate: Off #IF Gain: Low	Center Freq Avg Hold: 50 Radio Std: 1		- All and a second seco	Frequency 00000 GHz	Settings
t Graph		Ref LvI Offset 28				Span 40.000	MHz	
cale/Div 10.0 dB		Ref Value 40.00	dBm			CF Step 4.0000		1
20.0	Janman		and the stand of the standards where			Aut Ma		
10.0 10.0 10.0 11144/10/11/14/07/11/14/07/11/11/11/11/11/11/11/11/11/11/11/11/11	cypt liped			- Miller	PEAK	Freq Of 0 Hz	'set	
40.0 50.0 Center 2.59500 GHz Res BW 390.00 kHz		#Video BW 1.60	00 MHz	#Sw	Span 40 MH; veep 50.0 ms (1001 pts			
Metrics <b>v</b>								
Occupied Bandwidth 17.9	35 MHz		Total Power		29.6 dBm			
Transmit Freq Error x dB Bandwidth	-209.34 ki 20.24 M		% of OBW Pow x dB	ver	99.00 % -26.00 dB			Loca
		Hz	x dB					Lo

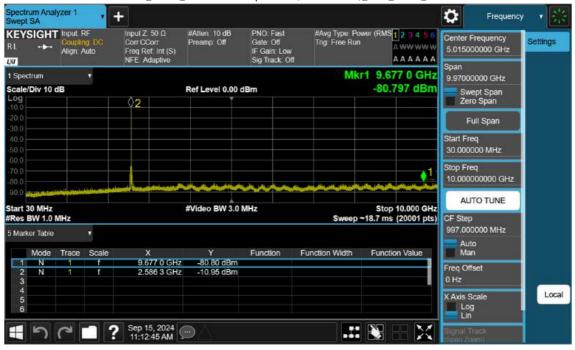
#### NR38\_20 M\_OBW\_Mid\_256QAM\_FullRB





#### NR38\_20 M\_Conducted Spurious(30 M-10 G)\_Low\_BPSK\_1RB





### NR38\_20 M\_Conducted Spurious(30 M-10 G)\_Mid\_BPSK\_FullRB





#### NR38\_20 M\_Conducted Spurious(30 M-10 G)\_High\_BPSK\_1RB



Coupling DC Corr C Align: Auto Freq F	Z 50 Ω #Atten: 0 dB Corr Preamp: Off Ref: Int (S) Adaptive	PNO:Fast Gate:Off IFGain:High Sig:Track:Off	#Avg Type: Power (RMS 1 2 3 4 Trig: Free Run A WW V A A A A	18.500000000 GHz	Settings
spectrum v sale/Div 10 dB	Ref Level -20.0	0 dBm	Mkr1 26.651 9 0 -84.568 d		
				Full Span	
0.0				Start Freq 10.000000000 GHz	
0.0				Stop Freq 27.000000000 GHz	
				AUTO TUNE	
0.0 0.0 00				CF Step 1.700000000 GHz Auto Man	
10				Freq Offset 0 Hz	
art 10.000 GHz tes BW 1.0 MHz	#Video BW 3.0	MHz	Stop 27.000 Sweep ~32.1 ms (40000		Loc

## NR38\_20 M\_Conducted Spurious(Above10 G)\_Low\_BPSK\_1RB



L +++ Coupling DC Corr Align: Auto Fred	t Z 50 Ω #Atten 0 dB CCorr Preamp: Off Ref. Int (S) . Adaptive	PNO Fast Gate: Off IF Gain: High Sig Track: Off	#Avg Type: Power (RMS 1 2 3 Trig: Free Run A www A A A	18.500000000 GHz	Settings
Spectrum • cale/Div 10 dB	Ref Level -20.0	0 dBm	Mkr1 26.596 7 -85.210 (		
0.0				Fuli Span Start Freq	
0.0				10.000000000 GHz Stop Freq	
0.0				27.000000000 GHz	
				AUTO TUNE CF Step 1.70000000 GHz	
				Auto Man	
				Freq Offset 0 Hz X Axis Scale	Loc
art 10.000 GHz les BW 1.0 MHz	#Video BW 3.0	MHz	Stop 27.00 Sweep ~32.1 ms (4000	0 GHz Log	

## NR38\_20 M\_Conducted Spurious(Above10 G)\_Mid\_BPSK\_1RB



L Coupling DC Corr Align Auto Freq	t Z 50 Ω #Atten 0 dB CCorr Preamp: Off Ref. Int (S) . Adaptive	PNO Fast Gate Off IF Gain: High Sig Track Off	#Avg Type: Power (RMS 1 2 3 4 Trig: Free Run A www A A A A	18.500000000 GHz	Settings
Spectrum T cale/Div 10 dB	Ref Level -20.00	) dBm	Mkr1 26.594 1 G -85.193 dl		
				Full Span	
0.0				Start Freq 10.000000000 GHz	
0.0				Stop Freq 27.000000000 GHz	
				AUTO TUNE	
			and supervised and the second states and the	CF Step 1.700000000 GHz Auto Man	
10				Freq Offset 0 Hz	
art 10.000 GHz es BW 1.0 MHz	#Video BW 3.0	MHz	Stop 27.000 Sweep ~32.1 ms (40000		Loca

# NR38\_20 M\_Conducted Spurious(Above10 G)\_High\_BPSK\_1RB



L	Input. RF Coupling: DC Align: Auto	Input Z: 50 Ω Corr CCorr Freq Ref. Int (S) NFE. Adaptive	Atten: 10 dB Preamp: Off	Trig: Free Run Gate: Off IF Gain: Low	Avg Ho	Freq: 2.58000 ld: 100.00% of 5td: None		- Contraction of the local data	Frequency 00000 GHz	Settings
Graph	, , , , , , , , , , , , , , , , , , ,	HFL.7Wapave	Ref LvI Offset 35. Ref Value 30.0 dB					CF Step 8.0000	00 MHz	
.og								Ma Ma	n	
10.0								Freq Of 0 Hz	set	
10.0			1		·					
30.0			May of							
40,0 50.0	man and a state of the state of	and the second s	PMMM W	Mannah -						
60.0				THIM	- Phyloritania	The Parlow sector 1.404 marries				
isp Center 2.	58000 GHz	Chan De	et: Average, #Offs	Det: Average			oan 80.000 MHz 101 pts			
		Power								
? Table	Ţ	22.83 dBm /	20 MHz							
		I.	Lower	Erec (Ha)	dDes	Upper	Erec (Ha)			
Start Freq	Stop Freq	Integ BW d	Lower Bm ∆Limit(dB)	Freg (Hz) -10.01 M	dBm -63.44	∆Limit(dB)	Freq (Hz)			
2 Table Start Freq 10.00 MHz 11.00 MHz		Integ BW d 30.00 kHz -	Lower Bm &Limit(dB) 25.94 (-15.94)	Freq (Hz) -10.01 M -11.00 M	dBm -63.44 -50.45	∆Limit(dB) (-53.44)	10.01 M			
Start Freq 10.00 MHz	Stop Freq 11.00 MHz	Integ BW d 30.00 kHz	Lower Bm &Limit(dB) 25.94 (-15.94)	-10.01 M	-63.44	∆Limit(dB)				
Start Freq 10.00 MHz 11.00 MHz	Stop Freq 11.00 MHz 15.00 MHz	Integ BW d 30.00 kHz -4 1.000 MHz -4 1.000 MHz -4	Lower Bm &Limit(dB) 25.94 (-15.94) 26.71 (-16.71)	-10.01 M -11.00 M	-63.44 -50.45	∆Limit(dB) (-53.44) (-40.45)	10.01 M 11.16 M			Loc
Start Freq 10.00 MHz 11.00 MHz 15.00 MHz	Stop Freq 11.00 MHz 15.00 MHz 30.00 MHz	Integ BW d 30.00 kHz -4 1.000 MHz -4 1.000 MHz -4	Lower Bm &Limit(dB) 25.94 (-15.94) 26.71 (-16.71) 38.87 (-25.87)	-10.01 M -11.00 M -15.23 M	-63.44 -50.45 -51.40	ΔLimit(dB) (-53.44) (-40.45) (-38.40)	10.01 M 11.16 M 15.00 M			Loo

## NR38\_20 M\_Channel Edge\_Low\_BPSK\_1RB



L	Input RF Coupling DC Align: Auto	Input Z 50 D Corr CCorr Freq Ref. Int (			Trig: Free Run Gate: Off IF Gain: Low	Avg Ho	Freq: 2.58000 kd: 100.00% o Std: None		- Contraction of the local data	Frequency 00000 GHz	Settings
Graph cale/Div 10 dl	7	NFE. Adaptivo	Ref Lvi C Ref Valu						CF Step 8.00000 Auto	00 MHz 0	
			mm		200000				Mar Freq Off 0 Hz		
	al menu					~~		~~~			
sp Center 2.	58000 GHz	Chan	Det: Avera	je, #Offs	Det: Average			oan 80.000 MHz 01 pts			
	58000 GHz	Chan Power 24.06 dBrr		ge, #Offs	: Det: Average						
Table		Power 24.06 dBm	1/20 MHz	Lower		dBm	20 Upper	01 pts			
		Power	1/20 MHz	Lower Imit(dB)	Freq (Hz)	dBm -29.31	20 Upper ΔLimit(dB)	01 pts Freq (Hz)			
	T Stop Freq	Power 24.06 dBm Integ BW	1/20 MHz dBm کا	Lower	Freq (Hz)		20 Upper	01 pts			
Table Start Freq 10.00 MHz	Stop Freq 11.00 MHz	Power 24.06 dBm Integ BW 430.0 kHz	1 / 20 MHz dBm ۵۱ -25.42	Lower imit(dB) (-15.42)	Freq (Hz) -10.00 M	-29.31	Upper ∆Limit(dB) (-19.31)	01 pts Freq (Hz) 10.02 M			
Table Start Freq 10.00 MHz 11.00 MHz 15.00 MHz 30.00 MHz	Stop Freq 11.00 MHz 15.00 MHz 30.00 MHz 40.00 MHz	Power 24.06 dBm Integ BW 430.0 kHz 1.000 MHz 1.000 MHz 1.000 MHz	dBm Δl -25.42 -26.49	Lower Imit(dB) (-15.42) (-16.49)	Freq (Hz) -10.00 M -13.06 M	-29.31 -28.55	Upper ∆Limit(dB) (-19.31) (-18.55)	01 pts Freq (Hz) 10.02 M 11.02 M			Lo
Table Start Freq 10.00 MHz 11.00 MHz 15.00 MHz	Stop Freq 11.00 MHz 15.00 MHz 30.00 MHz	Power 24.06 dBm Integ BW 430.0 kHz 1.000 MHz 1.000 MHz	dBm ۵۱ -25.42 -26.49 -26.48	Lower Imit(dB) (-15.42) (-16.49) (-13.48)	Freq (Hz) -10.00 M -13.06 M -18.08 M	-29.31 -28.55 -29.47	Upper ∆Limit(dB) (-19.31) (-18.55) (-16.47)	Freq (Hz) 10.02 M 11.02 M 17.55 M			Lo

## NR38\_20 M\_Channel Edge\_Low\_BPSK\_FullRB



	Input. RF Coupling: DC Align: Auto	Input Z 50 Ω Corr CCorr Freq Ref. Int ( NFE. Adaptive	Prea S)	t: 10 dB mp: Off	Trig. Free Run Gate: Off IF Gain: Low	Avg Ho	Freq: 2.59500 kd: 100.00% of Std: None		- Contraction of the local data	Frequency 00000 GHz	Settings
Graph cale/Div 10 di			Ref Lv	I Offset 35. lue 30.0 dB					CF Step 8.0000 Aut	00 MHz	
og								Relative Limit	Ma		
20 0 10.0			ma		mm				Freq Of 0 Hz	fset	
0.0						-L		Absolute Limit			
0.0			-		h			Spectrum			
10.0			- ( <b>**</b> *				Jan Marin				
isp Center 2.5	59500 GHz	Chan	Det: Ave	rage, #Offs	Det: Average			oan 80.000 MHz 01 pts			
				t i							
Table	ž	Power 23.98 dBn		3							
Table	,			Lower			Upper				
Start Freq	Stop Freq	23.98 dBn Integ BW	1 / 20 MHz dBm	Lower ∆Limit(dB)	Freq (Hz)	dBm	∆Limit(dB)	Freq (Hz)			
Start Freq 10.00 MHz	Stop Freq 11.00 MHz	23.98 dBn Integ BW 430.0 kHz	1 / 20 MHz dBm -26.71	Lower ∆Limit(dB) (-16.71)	-10.02 M	-30.45	∆Limit(dB) (-20.45)	10.02 M			
10.00 MHz 11.00 MHz	Stop Freq 11.00 MHz 15.00 MHz	23.98 dBn Integ BW 430.0 kHz 1.000 MHz	dBm -26.71 -27.88	Lower ΔLimit(dB) (-16.71) (-17.88)	-10.02 M -11.00 M	-30.45 -29.49	∆Limit(dB) (-20.45) (-19.49)	10.02 M 11.04 M			
Start Freq 10.00 MHz 11.00 MHz 15.00 MHz	Stop Freq 11.00 MHz 15.00 MHz 30.00 MHz	23.98 dBn Integ BW 430.0 kHz 1.000 MHz 1.000 MHz	dBm -26.71 -27.88 -28.70	Lower ∆Limit(dB) (-16.71) (-17.88) (-15.70)	-10.02 M -11.00 M -17.55 M	-30.45 -29.49 -30.82	∆Limit(dB) (-20.45) (-19.49) (-17.82)	10.02 M 11.04 M 22.20 M			
Start Freq 10.00 MHz 11.00 MHz 15.00 MHz 30.00 MHz	Stop Freq 11.00 MHz 15.00 MHz 30.00 MHz 40.00 MHz	23.98 dBn Integ BW 430.0 kHz 1.000 MHz 1.000 MHz 1.000 MHz	dBm -26.71 -27.88	Lower ΔLimit(dB) (-16.71) (-17.88) (-15.70) (-9.32)	-10.02 M -11.00 M	-30.45 -29.49	ΔLimit(dB) (-20.45) (-19.49) (-17.82) (-9.90)	10.02 M 11.04 M			Loc
Start Freq 10.00 MHz 11.00 MHz 15.00 MHz	Stop Freq 11.00 MHz 15.00 MHz 30.00 MHz	23.98 dBn Integ BW 430.0 kHz 1.000 MHz 1.000 MHz	dBm -26.71 -27.88 -28.70	Lower ∆Limit(dB) (-16.71) (-17.88) (-15.70)	-10.02 M -11.00 M -17.55 M	-30.45 -29.49 -30.82	∆Limit(dB) (-20.45) (-19.49) (-17.82)	10.02 M 11.04 M 22.20 M			Loc

## NR38\_20 M\_Channel Edge\_Mid\_BPSK\_FullRB



	Input. RF Coupling: DC Align: Auto	Input Z 50 Ω Corr CCorr Freq Ref. Int ( NFE. Adaptive	Prei S)	n. 10 dB amp: Off	Trig. Free Run Gate: Off IF Gain: Low	Avg Ho	Freq. 2.61000 kd. 100.00% of Std: None		- Contraction of the local data in the	Frequency 00000 GHz	Settings
Graph cale/Div 10 di	,		Ref L	vi Offset 35. alue 30.0 dB					CF Step 8.00000 Auto	00 MHz	
og								Relative Limit	Mar		
0.0									Freq Off 0 Hz	set	
10.0								Absolute Limit			
40.0 50.0			- A.	where where		manuto		Spectrum			
60.0	ile statiliter territoria angel 11	Manager 1	L alas					Anothin manufactures			
ion Contor 2 6	61000 GHz	Chan	Det: Ave	rage, #Offs	Det: Average		Sp	an 80.000 MHz			
isp Genter 2.0							20	01 pts			
	7	Power 23.83 dBn		z			20	01 pts			
Table		Power 23.83 dBn		z Lower			20 Upper	01 pts			
Table Start Freq	T Stop Freq	Power 23.83 dBn Integ BW	n / 20 MH dBm	Lower ∆Limit(dB)	Freq (Hz)	dBm	Upper ∆Limit(dB)	Freq (Hz)			
Table Start Freq 10.00 MHz	T Stop Freq 11.00 MHz	Power 23.83 dBn Integ BW 30.00 kHz	dBm -62.42	Lower ∆Limit(dB) (-52.42)	-10.20 M	-29.20	Upper ∆Limit(dB) (-19.20)	Freq (Hz) 10.02 M			
Table Start Freq 10.00 MHz 11.00 MHz	Stop Freq 11.00 MHz 15.00 MHz	Power 23.83 dBn Integ BW 30.00 kHz 1.000 MHz	dBm -62.42 -48.68	Lower ∆Limit(dB) (-52.42) (-38.68)	-10.20 M -11.62 M	-29.20 -27.13	Upper ∆Limit(dB) (-19.20) (-17.13)	Freq (Hz) 10.02 M 11.02 M			
Table Start Freq 10.00 MHz 11.00 MHz 15.00 MHz	Stop Freq 11.00 MHz 15.00 MHz 30.00 MHz	Power 23.83 dBn Integ BW 30.00 kHz 1.000 MHz 1.000 MHz	dBm -62.42 -48.68 -49.54	Lower ΔLimit(dB) (-52.42) (-38.68) (-36.54)	-10.20 M -11.62 M -17.63 M	-29.20 -27.13 -38.98	Upper ∆Limit(dB) (-19.20) (-17.13) (-25.98)	Freq (Hz) 10.02 M 11.02 M 15.15 M			
Table Start Freq 10.00 MHz 11.00 MHz 15.00 MHz 30.00 MHz	Stop Freq 11.00 MHz 15.00 MHz 30.00 MHz 40.00 MHz	Power 23.83 dBn Integ BW 30.00 kHz 1.000 MHz 1.000 MHz 1.000 MHz	dBm -62.42 -48.68 -49.54 -53.56	Lower ∆Limit(dB) (-52.42) (-38.68) (-36.54) (-28.56)	-10.20 M -11.62 M -17.63 M -30.90 M	-29.20 -27.13 -38.98 -49.34	Upper ∆Limit(dB) (-19.20) (-17.13) (-25.98) (-24.34)	Freq (Hz) 10.02 M 11.02 M			Lo
P Table Start Freq 10.00 MHz 11.00 MHz 15.00 MHz	Stop Freq 11.00 MHz 15.00 MHz 30.00 MHz	Power 23.83 dBn Integ BW 30.00 kHz 1.000 MHz 1.000 MHz	dBm -62.42 -48.68 -49.54	Lower ΔLimit(dB) (-52.42) (-38.68) (-36.54)	-10.20 M -11.62 M -17.63 M	-29.20 -27.13 -38.98	Upper ∆Limit(dB) (-19.20) (-17.13) (-25.98)	Freq (Hz) 10.02 M 11.02 M 15.15 M			Lœ

## NR38\_20 M\_Channel Edge\_High\_BPSK\_1RB



1	Input. RF Coupling DC Align: Auto	Input Z 50 Ω Corr CCorr Freq Ref. Int ( NFE, Adaptiv	Prea (S)	n: 10 dB amp: Off	Trig: Free Run Gate: Off IF Gain: Low	Avg Ho	Freq: 2.61000 kd: 100.00% of Std: None		2.6100	Frequency 00000 GHz	Settings
Graph cale/Div 10 dl			Ref Lv	I Offset 35. Ilue 30.0 dB						00 MHz	
og			Ner ve	iue 50.0 uu				Relative Limit	Au Ma		
20 0 10.0 0.00			m	www	mm				Freq Of 0 Hz	Tset.	
10.0			4					Absolute Limit	-		
30.0			~/					Spectrum			
40.0	- mart					ALC: NO	And the second s	A A A A A A A A A A A A A A A A A A A			
40.0											
50.0											
50.0	61000 GHz	Chan	Det: Ave	rage, #Offs	Det: Average			oan 80.000 MHz 01 pts			
50.0 50.0 isp Center 2.0	31000 GHz T	Chan Powe 23.86 dBr	r		Det: Average						
50.0 isp Center 2.4 Table	,	Powe 23.86 dBr	r n / 20 MH.	z Lower			20 Upper	01 pts			
50.0 isp Center 2.0 Table Start Freq	T Stop Freq	Powe 23.86 dBr Integ BW	r m / 20 MH. dBm	z Lower ∆Limit(dB)	Freq (Hz)	dBm	20 Upper ∆Limit(dB)	01 pts Freq (Hz)			
50.0 50.0 Stap Center 2.0 Table Start Freq 10.00 MHz	T Stop Freq 11.00 MHz	Powe 23.86 dBr Integ BW 430.0 kHz	r m / 20 MH, dBm -26.68	z Lower ∆Limit(dB) (-16.68)	Freq (Hz) -10.02 M	-30.45	Upper ΔLimit(dB) (-20.45)	01 pts Freq (Hz) 10.06 M			
Start Freq 10.00 MHz 11.00 MHz	Stop Freq 11.00 MHz 15.00 MHz	Powe 23.86 dBr Integ BW 430.0 kHz 1.000 MHz	r m / 20 MH. dBm -26.68 -28.00	z Lower ALimit(dB) (-16.68) (-18.00)	Freq (Hz) -10.02 M -12.62 M	-30.45 -27.81	20 Upper ∆Limit(dB) (-20.45) (-17.81)	01 pts Freq (Hz) 10.06 M 12.10 M			
Start Freq 10.00 MHz 11.00 MHz 15.00 MHz	Stop Freq 11.00 MHz 15.00 MHz 30.00 MHz	Powe 23.86 dBr Integ BW 430.0 kHz 1.000 MHz 1.000 MHz	r n / 20 MH. -26.68 -28.00 -27.61	z ∆Limit(dB) (-16.68) (-18.00) (-14.61)	Freq (Hz) -10.02 M -12.62 M -18.60 M	-30.45 -27.81 -27.69	Upper ∆Limit(dB) (-20.45) (-17.81) (-14.69)	01 pts Freq (Hz) 10.06 M 12.10 M 18.23 M			
Start Freq           10.00 MHz           11.00 MHz           30.00 MHz           30.00 MHz	T Stop Freq 11.00 MHz 15.00 MHz 30.00 MHz 40.00 MHz	Powe 23.86 dBr Integ BW 430.0 kHz 1.000 MHz 1.000 MHz 1.000 MHz	r n / 20 MH, -26.68 -28.00 -27.61 -32.09	Z ∆Limit(dB) (-16.68) (-18.00) (-14.61) (-7.09)	Freq (Hz) -10.02 M -12.62 M	-30.45 -27.81 -27.69 -31.43	Upper ΔLimit(dB) (-20.45) (-17.81) (-14.69) (-6.43)	01 pts Freq (Hz) 10.06 M 12.10 M			Lou
Start Freq 10:00 MHz 11:00 MHz 10:00 MHz 15:00 MHz	Stop Freq 11.00 MHz 15.00 MHz 30.00 MHz	Powe 23.86 dBr Integ BW 430.0 kHz 1.000 MHz 1.000 MHz	r n / 20 MH. -26.68 -28.00 -27.61	z ∆Limit(dB) (-16.68) (-18.00) (-14.61)	Freq (Hz) -10.02 M -12.62 M -18.60 M	-30.45 -27.81 -27.69	Upper ∆Limit(dB) (-20.45) (-17.81) (-14.69) (-6.43)	01 pts Freq (Hz) 10.06 M 12.10 M 18.23 M			Lo

## NR38\_20 M\_Channel Edge\_High\_BPSK\_FullRB



# 10. ANNEX A\_ TEST SETUP PHOTO

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

No.	Description
1	HCT-RF-2409-FC013-P