

# **TEST REPORT**

FCC Sub6 n25(2) Test for SM-S721B/DS Certification

APPLICANT SAMSUNG Electronics Co., Ltd.

REPORT NO. HCT-RF-2407-FC062

DATE OF ISSUE July 24, 2024

> **Tested by** Jae Mun Do

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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-2407-FC062 DATE OF ISSUE July 24, 2024 Additional Model SM-S721B
Applicant	<b>SAMSUNG Electronics Co., Ltd.</b> 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
Product Name Model Name	Mobile Phone SM-S721B/DS
Date of Test	May 21, 2024 ~ July 24, 2024
FCC ID	A3LSMS721B
Location of Test	■ Permanent Testing Lab □ On Site Testing (Address: 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi- do, 17383 Republic of Korea)
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
Test Standard Used	FCC Rule Part : § 24
Test Results	PASS





# **REVISION HISTORY**

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

Revision No.	Date of Issue	Description
0	July 24, 2024	Initial Release

#### 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

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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

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# **MEASUREMENT REPORT**

# **1. GENERAL INFORMATION**

Applicant Name:	SAMSUNG Electronics Co., Ltd.
Address:	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
FCC ID:	A3LSMS721B
Application Type:	Certification
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§ 24
EUT Type:	Mobile phone
Model(s):	SM-S721B/DS
Additional Model(s)	SM-S721B
SCS(kHz):	15
Bandwidth(MHz):	5, 10, 15, 20
Waveform:	CP-OFDM, DFT-S-OFDM
Modulation:	DFT-S-OFDM: PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM CP-OFDM: QPSK, 16QAM, 64QAM, 256QAM
	1852.5 MHz – 1912.5 MHz (Sub6 n25(2) (5 MHz))
Ty Frequency	1855.0 MHz – 1910.0 MHz (Sub6 n25(2) (10 MHz))
Tx Frequency:	1857.5 MHz – 1907.5 MHz (Sub6 n25(2) (15 MHz))
	1860.0 MHz – 1905.0 MHz (Sub6 n25(2) (20 MHz))
Date(s) of Tests:	May 21, 2024 ~ July 24, 2024
Serial number:	Radiated : R3CX40LGCGM
Sendt number:	Conducted : R3CX503EC4V



## **1.1. MAXIMUM OUTPUT POWER**

# ANT A

Mode	Tx Frequency (MHz)	Emission		EI	EIRP		
(MHz)		Designator	Modulation	Max. Power (W)	Max. Power (dBm)		
		4M53G7D	PI/2 BPSK	0.096	19.82		
		4M53G7D	QPSK	0.094	19.75		
Sub6 n25(2) (5)	1852.5 - 1912.5	4M54W7D	16QAM	0.076	18.78		
		4M54W7D	64QAM	0.054	17.35		
		4M51W7D	256QAM	0.034	15.35		
		9M02G7D	PI/2 BPSK	0.092	19.62		
		9M03G7D	QPSK	0.090	19.56		
Sub6 n25(2) (10)	1855.0 - 1910.0	9M03W7D	16QAM	0.071	18.54		
		8M99W7D	64QAM	0.052	17.14		
		8M98W7D	256QAM	0.033	15.24		
		13M5G7D	PI/2 BPSK	0.090	19.56		
Sub6 n25(2) (15)	1857.5 - 1907.5	13M5G7D	QPSK	0.090	19.55		
		13M5W7D	16QAM	0.072	18.56		
		13M5W7D	64QAM	0.051	17.09		
		13M5W7D	256QAM	0.032	15.10		
		17M9G7D	PI/2 BPSK	0.087	19.42		
Sub6 n25(2) (20)	-	18M0G7D	QPSK	0.087	19.41		
	1860.0 - 1905.0	18M0W7D	16QAM	0.069	18.39		
		17M9W7D	64QAM	0.049	16.93		
		17M9W7D	256QAM	0.032	15.06		



	Α	Ν	Т	F
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Mada	Ty Fraguanay	Emission		EIRP		
Mode (MHz)			Modulation	Max. Power (W)	Max. Power (dBm)	
		4M61G7D	PI/2 BPSK	0.072	18.60	
		4M64G7D	QPSK	0.071	18.54	
Sub6 n25(2) (5)	1852.5 - 1912.5	4M69W7D	16QAM	0.057	17.56	
		4M70W7D	64QAM	0.040	16.05	
		4M67W7D	256QAM	0.026	14.14	
		9M01G7D	PI/2 BPSK	0.076	18.80	
		9M03G7D	QPSK	0.076	18.78	
Sub6 n25(2) (10)	1855.0 - 1910.0	9M01W7D	16QAM	0.060	17.77	
		9M01W7D	64QAM	0.043	16.36	
		8M96W7D	256QAM	0.026	14.18	
		13M5G7D	PI/2 BPSK	0.074	18.68	
	1857.5 - 1907.5	13M5G7D	QPSK	0.073	18.65	
Sub6 n25(2) (15)		13M5W7D	16QAM	0.057	17.57	
		13M5W7D	64QAM	0.041	16.10	
		13M4W7D	256QAM	0.026	14.18	
Sub6 n25(2) (20)		18M3G7D	PI/2 BPSK	0.071	18.53	
	1860.0 - 1905.0	18M1G7D	QPSK	0.070	18.48	
		18M2W7D	16QAM	0.057	17.54	
		18M1W7D	64QAM	0.040	16.07	
		18M2W7D	256QAM	0.026	14.20	





# **2. INTRODUCTION**

#### **2.1. DESCRIPTION OF EUT**

The EUT was a Mobile Phone with GSM/GPRS/EGPRS/UMTS and LTE, Sub 6. It also supports IEEE 802.11 a/b/g/n/ac/ax (20/40/80/160 MHz), Bluetooth(ePA), BT LE(ePA), NFC, WPT, WIFI 6E.

#### 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**, **17383**, **Rep. 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	- N/A (See SAR Report)
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 RADIATED POWER**

#### **Test Overview**

Radiated tests are performed in the Fully-anechoic chamber.

The equipment under test is placed on a non-conductive table 3-meters away from the receive antenna in accordance with ANSI/TIA-603-E-2016 Clause 2.2.17.

#### **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 turntable is rotated through 360 degrees, and the receiving antenna scans in order to determine the level of the maximized emission.
- 2. A half wave dipole is then substituted in place of the EUT. For emissions above 1 GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator and the previously recorded signal was duplicated.

The power is calculated by the following formula;

 $P_{d}$  (dBm) = Pg (dBm) - cable loss (dB) + antenna gain (dB)

Where:  $P_d$  is the dipole equivalent power and  $P_g$  is the generator output power into the substitution antenna.

3. The maximum value is calculated by adding the forward power to the calibrated source plus its appropriate gain value.

These steps are repeated with the receiving antenna in both vertical and horizontal polarization. the difference between the gain of the horn and an isotropic antenna are taken into consideration

- 4. The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning.
- 5. 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.





## **3.3 RADIATED SPURIOUS EMISSIONS**

#### **Test Overview**

Radiated tests are performed in the Fully-anechoic chamber.

Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA-603-E-2016.

#### **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. 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.
- 2. 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

3. For spurious emissions above 1 GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator and the previously recorded signal was duplicated.

The spurious emissions is calculated by the following formula;

Result (dBm) = Pg (dBm) - cable loss (dB) + antenna gain (dBi)

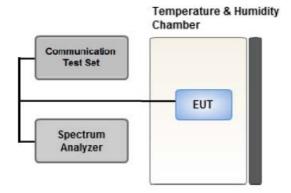
Where:  $\mathsf{P}_{\mathsf{g}}$  is the generator output power into the substitution antenna.

If the fundamental frequency is below 1 GHz, RF output power has been converted to EIRP.

EIRP (dBm) = ERP (dBm) + 2.15



#### **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  $P_{Pk}$ .

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:

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





#### **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  $2 \times to 3 \times the OBW$ .
- 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:

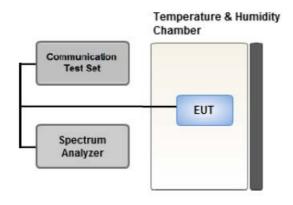
Set  $\geq$  [10 × (number of points in sweep) × (transmission period)] for single sweep

(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.
- 10. 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 EUT Spectrum Analyzer

#### 3.6 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL

#### Test setup

#### **Test Overview**

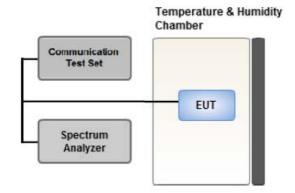
The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. All out of band emissions are measured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

#### **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**

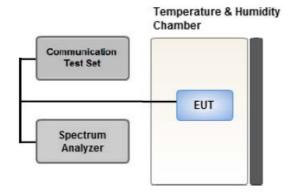
According to FCC 22.917, 24.238, 27.53 specified that power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a 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.

#### **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)

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

(Worst case: DFT-S-OFDM)

- 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: NSA. SA

Worst case: SA

Mode : Stand alone, Stand alone + External accessories (Earphone, AC adapter, etc) Worst case : Stand alone

- All simultaneous transmission scenarios of operation were investigated, and the test results showed no additional significant emissions relative to the least restrictive limit were observed.

Therefore, only the worst case(stand-alone) results were reported.

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

Please refer to the table below.

- In the case of radiated spurious emissions, all bandwidth of operation was investigated and the worst case bandwidth results are reported. (Worst case : 5 MHz (ANT A), 10 MHz (ANT F))
- SM-S721B/DS & additional models were tested and the worst case results are reported.

(Worst case : SM-S721B/DS)

[ ANT A Worst case ]							
Test Description	Modulation	RB size	RB offset	Axis			
	PI/2 BPSK,						
Effective Isotropic Radiated Power	QPSK,						
	16QAM,	See Sec	See Section 8.1				
	64QAM,						
	256QAM						
Radiated Spurious and Harmonic Emissions	PI/2 BPSK	See Sec	ction 8.2	Х			



[ ANT F Worst case ]							
Test Description	Modulation	RB size	RB offset	Axis			
	PI/2 BPSK,						
Effective Isotropic Radiated Power	QPSK,	See Section 9.1		Х			
	16QAM,						
	64QAM,						
	256QAM						
Radiated Spurious and Harmonic Emissions	PI/2 BPSK	See Se	ction 9.2	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.

- SM-S721B/DS & additional models were tested and the worst case results are reported.

(Worst case : SM-S721B/DS)

[ Worst case ]						
Test Description	Modulation	Bandwidth (MHz)	Frequency	RB size	RB offset	
Occupied Bandwidth, Peak-To-Average Ratio	PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM	5, 10, 15, 20	Mid	Full RB	0	
		5	Low	1	0	
	PI/2 BPSK	S	High	1	24	
		10	Low	1	0	
		10	High	1	51	
Band Edge		15	Low	1	0	
Band Luge		15	High	1	78	
		20	Low	1	0	
		20	High	1	105	
		5, 10, 15, 20	Low, High	Full RB	0	
Spurious and Harmonic Emissions at Antenna Terminal	PI/2 BPSK	5, 10, 15, 20	Low, Mid, High	1	1	



# 4. LIST OF TEST EQUIPMENT

Equipment	Model	Manufacture	Serial No.	Due to Calibration	Calibration Interval
Precision Dipole Antenna	UHAP	Schwarzbeck	01273	03/10/2026	Biennial
Precision Dipole Antenna	UHAP	Schwarzbeck	01274	03/10/2026	Biennial
Horn Antenna(1~18 GHz)	BBHA 9120D	Schwarzbeck	02289	02/14/2026	Biennial
Horn Antenna(1~18 GHz)	BBHA 9120D	Schwarzbeck	9120D-1299	04/27/2025	Biennial
Horn Antenna(15~40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170342	09/29/2024	Biennial
Horn Antenna(15~40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170124	03/28/2025	Biennial
Loop Antenna(9 kHz~30 MHz)	FMZB1513	Rohde & Schwarz	1513-175	01/16/2025	Biennial
Bilog Antenna	VULB9160	Schwarzbeck	3150	03/09/2025	Biennial
Hybrid Antenna	VULB9160	Schwarzbeck	760	02/24/2025	Biennial
RF Switching System	FBSR-06B (1G HPF + LNA)	T&M SYSTEM	F3L1	05/14/2025	Annual
<b>RF Switching System</b>	FBSR-06B (3G HPF + LNA)	T&M SYSTEM	F3L2	05/14/2025	Annual
RF Switching System	FBSR-06B (6G HPF + LNA)	T&M SYSTEM	F3L3	05/14/2025	Annual
RF Switching System	FBSR-06B (LNA)	T&M SYSTEM	F3L4	05/14/2025	Annual
Power Amplifier	CBL18265035	CERNEX	22966	11/17/2024	Annual
Power Amplifier	CBL26405040	CERNEX	25956	02/26/2025	Annual
DC Power Supply	E3632A	Hewlett Packard	MY40004427	08/25/2024	Annual
Power Splitter(DC~26.5 GHz)	11667B	Hewlett Packard	11275	02/29/2025	Annual
Chamber	SU-642	ESPEC	93008124	02/19/2025	Annual
Signal Analyzer(10 Hz~26.5 GHz)	N9020A	Agilent	MY51110063	04/04/2025	Annual
ATTENUATOR(20 dB)	8493C	Hewlett Packard	17280	04/17/2025	Annual
Spectrum Analyzer(10 Hz~40 GHz)	FSV40	REOHDE & SCHWARZ	101436	02/13/2025	Annual
Base Station	8960 (E5515C)	Agilent	MY48360800	08/10/2024	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(5 Hz~40.0 GHz)	N9030B	KEYSIGHT	MY55480167	05/17/2025	Annual
4-Way Divider	ZC4PD-K1844+	Mini-Circuits	942907	09/19/2024	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. 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 ( $\pm$ 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, § 24.238(a)	< 43 + 10log10 (P[Watts]) at Band Edge and for all out-of-band emissions	PASS
Conducted Output Power	§ 2.1046	N/A	See Note1
Peak- to- Average Ratio	§ 24.232(d)	< 13 dB	PASS
Frequency stability / variation of ambient temperature	§ 24.235	Emission must remain in band	PASS

#### Note:

1. See SAR Report

2. All conducted tests 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	§ 24.232(c)	< 2 Watts max. EIRP	PASS	
Radiated Spurious and	§ 2.1053,	<43+10log10 (P[Watts]) for	PASS	
Harmonic Emissions	§ 24.238(a)	all out-of band emissions	PA33	

# Note:

1. Radiated tests were tested using 5G Wireless Tester



# 7. SAMPLE CALCULATION

#### 7.1 ERP Sample Calculation

Ch.	Ch./ Freq. Measured		Substitute	Ant. Gain			EF	RP
channel	Freq.(MHz)	Level (dBm)	Level (dBm)	(dBd)	C.L	Pol.	w	dBm
128	824.20	-21.37	38.40	-10.61	0.95	Н	0.483	26.84

#### ERP = Substitute LEVEL(dBm) + Ant. Gain – CL(Cable Loss)

1) The EUT mounted on a non-conductive turntable is 2.5 meter above test site ground level.

2) During the test, the turn table is rotated until the maximum signal is found.

3) Record the field strength meter's level.

- 4) Replace the EUT with dipole/Horn antenna that is connected to a calibrated signal generator.
- 5) Increase the signal generator output till the field strength meter's level is equal to the item (3).
- 6) The signal generator output level with Ant. Gain and cable loss are the rating of effective radiated power.

7.2 EIRP Sample Calculation

Ch.	Ch./ Freq. Measured Substitute Ant. G		Ant. Gain			EI	RP	
channel	Freq.(MHz)	Level (dBm)	Level (dBm)	(dBi)	C.L	Pol.	w	dBm
20175	1,732.50	-15.75	18.45	9.90	1.76	Н	0.456	26.59

#### EIRP = Substitute LEVEL(dBm) + Ant. Gain – CL(Cable Loss)

1) The EUT mounted on a non-conductive turntable is 2.5 meter above test site ground level.

2) During the test, the turn table is rotated until the maximum signal is found.

- 3) Record the field strength meter's level.
- 4) Replace the EUT with dipole/Horn antenna that is connected to a calibrated signal generator.
- 5) Increase the signal generator output till the field strength meter's level is equal to the item (3).
- 6) The signal generator output level with Ant. Gain and cable loss are the rating of equivalent isotropic radiated power.



7.3. 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(ANT A)

# 8.1 EQUIVALENT ISOTROPIC RADIATED POWER

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level	Substitute Level	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB							
	[SCS (kHz)]		(dBm)	(dBm)	(UDI)			w	W	dBm	Size	Offset						
		PI/2 BPSK	-21.62	11.97	10.00	2.15	Н		0.096	19.82								
		QPSK	-21.69	11.90	10.00	2.15	Н		0.094	19.75								
1852.5		16-QAM	-22.66	10.93	10.00	2.15	Н	-	0.076	18.78	1	12						
		64-QAM	-24.09	9.50	10.00	2.15	н	-	0.054	17.35								
		256-QAM	-26.09	7.50	10.00	2.15	н		0.034	15.35								
	_	PI/2 BPSK	-21.81	11.79	10.00	2.21	н		0.091	19.58								
	Sub6 n25(2)/	QPSK	-21.99	11.61	10.00	2.21	н		0.087	19.40	1							
1882.5	5 MHz	16-QAM	-22.91	10.69	10.00	2.21	н	0.051	0.071	18.48		12						
	[15 kHz]	64-QAM	-24.30	9.30	10.00	2.21	н		0.051	17.09								
		256-QAM	-26.37	7.23	10.00	2.21	н		0.032	15.02								
		-	_	_	_	_	-	PI/2 BPSK	-23.75	10.27	10.01	2.11	V		0.066	18.17		
		QPSK	-23.85	10.17	10.01	2.11	V	-	0.064	18.07								
1912.5		16-QAM	-24.68	9.34	10.01	2.11	V		0.053	17.24	1	1						
		64-QAM	-26.30	7.72	10.01	2.11	V	(	0.037	15.62	-							
		256-QAM	-28.18	5.84	10.01	2.11	V		0.024	13.74								

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Freq		Modulation	Measured Level	Substitute Level	Ant. Gain	C.L	Pol	Limit	EI	RP	I	RB			
(MHz)	[SCS (kHz)]	Modulation	(dBm)	(dBm)	(dBi)	C.L	FOL	w	w	dBm	Size	Offset			
		PI/2 BPSK	-21.82	11.77	10.00	2.15	Н		0.092	19.62					
		QPSK	-21.88	11.71	10.00	2.15	Н		0.090	19.56					
1855.0		16-QAM	-22.91	10.68	10.00	2.15	Н		0.071	18.53	1	50			
		64-QAM	-24.30	9.29	10.00	2.15	Н		0.052	0.052	0.052 17	0.052	17.14		
		256-QAM	-26.27	7.32	10.00	2.15	Н		0.033	15.17					
	-	PI/2 BPSK	-21.77	11.83	10.00	2.21	Н		0.092	19.62					
	Sub6 n25(2)/	QPSK	-21.85	11.75	10.00	2.21	Н	< 2.00 0.07	0.090	19.54	-	1			
1882.5	10 MHz	16-QAM	-22.85	10.75	10.00	2.21	Н		0.071	18.54					
	[15 kHz]	64-QAM	-24.28	9.32	10.00	2.21	Н		0.051	17.11					
		256-QAM	-26.15	7.45	10.00	2.21	Н		0.033	15.24					
	-	PI/2 BPSK	-23.67	10.35	10.01	2.11	V		0.067	18.25					
		QPSK	-23.72	10.30	10.01	2.11	V		0.066	18.20					
1910.0		16-QAM	-24.64	9.38	10.01	2.11	V		0.054	17.28	1	25			
		64-QAM	-26.11	7.91	10.01	2.11	V	0.0	0.038	15.81					
	256-QAM	-28.11	5.91	10.01	2.11	V		0.024	13.81						



Freq		Modulation	Measured Level	Substitute Level	Ant. Gain	C.L	Pol	Limit	EI	RP	RB	
(MHz)	[SCS (kHz)]	Modulation	(dBm)	(dBm)	(dBi)	U.L	POL	W	w	dBm	Size	Offset
		PI/2 BPSK	-21.88	11.71	10.00	2.15	н		0.090	19.56		
		QPSK	-21.89	11.70	10.00	2.15	н		0.090	19.55		
1857.5		16-QAM	-22.88	10.71	10.00	2.15	Н		0.072	18.56	1	1
		64-QAM	-24.35	9.24	10.00	2.15	Н	0.	0.051 17.0	17.09		
		256-QAM	-26.34	7.25	10.00	2.15	Н		0.032	15.10		
	-	PI/2 BPSK	-21.96	11.64	10.00	2.21	Н	< 2.00	0.088	19.43		39
	Sub6 n25(2)/	QPSK	-21.97	11.63	10.00	2.21	Н		0.088	19.42		
1882.5	15 MHz	16-QAM	-22.95	10.65	10.00	2.21	Н		0.070 0.051	18.44	1	
	[15 kHz]	64-QAM	-24.36	9.24	10.00	2.21	Н			17.03		
		256-QAM	-26.40	7.20	10.00	2.21	Н		0.03	0.032	14.99	
		PI/2 BPSK	-23.55	10.42	10.01	2.13	V		0.068 18	18.30		
		QPSK	-23.59	10.38	10.01	2.13	V		0.067	18.26		
1907.5		16-QAM	-24.60	9.37	10.01	2.13	V		0.053	17.25	1	39
		64-QAM	-25.99	7.98	10.01	2.13	V		V 0.039	15.86		
	256-QAM	-28.20	5.77	10.01	2.13	V		0.023	13.65			



Freq	Mod/ Bandwidth	Modulation	Measured Level	Substitute Level	Ant. Gain	C.L	Pol	Limit	EI	RP		RB
(MHz)	[SCS (kHz)]		(dBm)	(dBm)	(dBi)			w	W	dBm	Size	Offset
		PI/2 BPSK	-21.85	11.49	10.00	2.17	н		0.086	19.32		
		QPSK	-21.89	11.45	10.00	2.17	н		0.085	19.28		
1860.0		16-QAM	-22.78	10.56	10.00	2.17	Н		0.069	18.39	1	53
		64-QAM	-24.33	9.01	10.00	2.17	Н		0.048	16.84		
		256-QAM	-26.23	7.11	10.00	2.17	н		0.031	14.94		
	-	PI/2 BPSK	-21.97	11.63	10.00	2.21	н		0.087	19.42		53
	Sub6 n25(2)/	QPSK	-21.98	11.62	10.00	2.21	н		0.087	19.41	1	
1882.5	20 MHz	16-QAM	-23.03	10.57	10.00	2.21	н	< 2.00	0.069	18.36		
	[15 kHz]	64-QAM	-24.46	9.14	10.00	2.21	н		0.049	16.93		
		256-QAM	-26.33	7.27	10.00	2.21	н		0.032	15.06		
		PI/2 BPSK	-23.79	10.18	10.01	2.13	V		0.064	18.06		
		QPSK	-23.80	10.17	10.01	2.13	v		0.064	18.05		
1905.0		16-QAM	-24.80	9.17	10.01	2.13	v		0.051	17.05	1	104
		64-QAM	-26.29	7.68	10.01	2.13	v	V 0.03	0.036	15.56		
		256-QAM	-28.26	5.71	10.01	2.13	V		0.023	13.59		



#### **8.2 RADIATED SPURIOUS EMISSIONS**

NR Band:	N25(2)
Bandwidth:	5 MHz
Modulation:	PI/2 BPSK
Distance:	3 meters
SCS:	15 kHz

		Measured	Ant. Gain	Substitute			Result	Limit		RB
Ch	Freq (MHz)	Level (dBm)	(dBi)	Level (dBm)	C.L	Pol	(dBm)	(dBm)	Size	Offset
270500	3,705.00	-45.87	11.40	-46.50	3.09	Н	-38.19	-13.00		
370500	5,557.50	-58.80	11.90	-53.58	3.81	Н	-45.49	-13.00	1	12
(1852.5)	7,410.00	-63.68	10.80	-48.90	4.47	V	-42.57	-13.00		
276500	3,765.00	-46.35	11.30	-46.42	3.09	Н	-38.21	-13.00		
376500	5,647.50	-58.07	11.85	-52.65	3.89	Н	-44.69	-13.00	1	12
(1882.5)	7,530.00	-65.22	11.10	-50.75	4.50	Н	-44.15	-13.00		
202500	3,825.00	-57.71	11.10	-56.81	3.11	Н	-48.82	-13.00		
382500	5,737.50	-62.95	11.70	-56.64	3.87	V	-48.81	-13.00	1	1
(1912.5)	7,650.00	-64.27	11.10	-50.24	4.53	V	-43.67	-13.00		



#### 8.3 PEAK-TO-AVERAGE RATIO

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB )	
			BPSK			4.31	
			QPSK			5.37	
	5 MHz		16-QAM	25		5.94	
	10 MHz		64-QAM			6.11	
			256-QAM			6.39	
			BPSK			4.37	
		Hz	QPSK	50			5.37
			16-QAM			5.98	
			64-QAM			6.12	
Sub6		- 1882.5	256-QAM		0	6.24	
n25(2)		1002.5	BPSK			4.27	
			QPSK			5.31	
	15 MHz		16-QAM	75		5.94	
			64-QAM			6.29	
			256-QAM			6.25	
			BPSK			4.85	
			QPSK			5.30	
	20 MHz		16-QAM	100		5.84	
			64-QAM			6.14	
			256-QAM			6.21	

# Note:

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 52 ~ 71.



#### 8.4 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data ( MHz )
	5 MHz	1882.5	BPSK	25		4.5326
			QPSK			4.5332
			16-QAM			4.5353
			64-QAM			4.5407
			256-QAM			4.5128
	10 MHz		BPSK	50		9.0198
			QPSK			9.0273
			16-QAM			9.0255
Sub6			64-QAM			8.9924
			256-QAM		0	8.9839
n25(2)	15 MHz		BPSK	75		13.471
			QPSK			13.483
			16-QAM			13.520
			64-QAM			13.450
			256-QAM			13.478
	20 MHz		BPSK	100		17.935
			QPSK			17.950
			16-QAM			17.951
			64-QAM			17.925
			256-QAM			17.892

# Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 72 ~ 91.



Band	Band Width (MHz)	Frequency (MHz)	Frequency of Maximum Harmonic (GHz)	Factor (dB)	Measurement Maximum Data (dBm)	Result (dBm)	Limit (dBm)	
		1852.5	3.7902	30.200	-65.086	-34.886		
	5	1882.5	3.7732	30.200	-65.520	-35.320		
Sub6 n25(2)		1912.5	3.7777	30.200	-65.511	-35.311		
	10	1855.0	4.0200	30.200	-65.579	-35.379		
		1882.5	3.7817	30.200	-65.451	-35.251	-13.00	
		1910.0	3.7722	30.200	-65.677	-35.477		
	15	1857.5	3.7762	30.200	-65.596	-35.396		
		1882.5	3.7992	30.200	-65.562	-35.362		
		1907.5	3.7862	30.200	-65.451	-35.251		
	20	1860.0	3.8121	30.200	-65.532	-35.332		
		1882.5	4.9706	30.200	-65.536	-35.336		
		1905.0	3.8007	30.200	-65.826	-35.626		

#### **8.5 CONDUCTED SPURIOUS EMISSIONS**

# Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 92 ~ 115.

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

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

Frequency Range (GHz)	Factor [dB]
0.03 - 1	27.494
1 - 5	30.200
5 - 10	30.815
10 - 15	31.340
15 – 20	31.713
Above 20	32.355

#### 8.6 BAND EDGE

- Plots of the EUT's Band Edge are shown Page 116 ~ 139.



# 8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

BandWidth:	<u>5 MHz</u>
Voltage(100 %):	3.880 VDC
Batt. Endpoint:	3.300 VDC
LIMIT:	Emission must remain in band

Test. Frequncy	Voltage	Temp.	Frequency	Frequency Error	Deviation	ppm
(MHz)	(%)	(°C)	(Hz)	(Hz)	(%)	
	100 %	+20(Ref)	1852 500 002	0.0	0.000 000	0.000
	100 %	-30	1852 500 003	1.2	0.000 000	0.001
	100 %	-20	1852 500 003	1.6	0.000 000	0.001
	100 %	-10	1852 500 003	1.0	0.000 000	0.001
1050 5	100 %	0	1852 500 002	0.8	0.000 000	0.000
1852.5	100 %	+10	1852 500 002	0.2	0.000 000	0.000
	100 %	+30	1852 500 002	0.9	0.000 000	0.000
	100 %	+40	1852 500 003	1.9	0.000 000	0.001
	100 %	+50	1852 500 002	0.8	0.000 000	0.000
	Batt. Endpoint	+20	1852 500 003	1.8	0.000 000	0.001
	100 %	+20(Ref)	1912 499 999	0.0	0.000 000	0.000
	100 %	-30	1912 499 996	-2.2	0.000 000	-0.001
	100 %	-20	1912 499 999	0.0	0.000 000	0.000
	100 %	-10	1912 499 997	-1.4	0.000 000	-0.001
1012 5	100 %	0	1912 499 998	-0.7	0.000 000	0.000
1912.5	100 %	+10	1912 499 998	-0.4	0.000 000	0.000
	100 %	+30	1912 499 997	-1.2	0.000 000	-0.001
	100 %	+40	1912 499 998	-0.9	0.000 000	0.000
	100 %	+50	1912 499 999	0.1	0.000 000	0.000
	Batt. Endpoint	+20	1912 499 998	-0.2	0.000 000	0.000



BandWidth:	<u>10 MHz</u>
Voltage(100 %):	3.880 VDC
Batt. Endpoint:	3.300 VDC
LIMIT:	Emission must remain in band

Test. Frequncy	Voltage	Temp.	Frequency	Frequency Error	Deviation	ppm
(MHz)	(%)	(°C)	(Hz)	(Hz)	(%)	
	100 %	+20(Ref)	1855 000 000	0.0	0.000 000	0.000
	100 %	-30	1855 000 000	0.4	0.000 000	0.000
	100 %	-20	1855 000 000	0.0	0.000 000	0.000
	100 %	-10	1855 000 000	-0.3	0.000 000	0.000
1055.0	100 %	0	1855 000 000	0.1	0.000 000	0.000
1855.0	100 %	+10	1855 000 001	0.6	0.000 000	0.000
	100 %	+30	1854 999 999	-1.1	0.000 000	-0.001
	100 %	+40	1854 999 999	-0.9	0.000 000	0.000
	100 %	+50	1855 000 000	0.1	0.000 000	0.000
	Batt. Endpoint	+20	1855 000 000	0.3	0.000 000	0.000
	100 %	+20(Ref)	1910 000 000	0.0	0.000 000	0.000
	100 %	-30	1909 999 998	-1.3	0.000 000	-0.001
	100 %	-20	1909 999 999	-1.1	0.000 000	-0.001
	100 %	-10	1909 999 998	-1.5	0.000 000	-0.001
1010.0	100 %	0	1909 999 998	-2.1	0.000 000	-0.001
1910.0	100 %	+10	1909 999 999	-0.6	0.000 000	0.000
	100 %	+30	1909 999 998	-1.7	0.000 000	-0.001
	100 %	+40	1909 999 999	-0.5	0.000 000	0.000
	100 %	+50	1909 999 999	-0.8	0.000 000	0.000
	Batt. Endpoint	+20	1909 999 998	-1.7	0.000 000	-0.001



BandWidth:	15 MHz
Voltage(100 %):	3.880 VDC
Batt. Endpoint:	3.300 VDC
LIMIT:	Emission must remain in band

Test. Frequncy	Voltage	Temp.	Frequency	Frequency Error	Deviation	ppm
(MHz)	(%)	(°C)	(Hz)	(Hz)	(%)	
	100 %	+20(Ref)	1857 500 000	0.0	0.000 000	0.000
	100 %	-30	1857 499 999	-1.0	0.000 000	-0.001
	100 %	-20	1857 500 000	-0.3	0.000 000	0.000
	100 %	-10	1857 500 000	-0.1	0.000 000	0.000
10575	100 %	0	1857 500 000	-0.3	0.000 000	0.000
1857.5	100 %	+10	1857 499 999	-0.6	0.000 000	0.000
	100 %	+30	1857 499 999	-1.1	0.000 000	-0.001
	100 %	+40	1857 500 000	0.0	0.000 000	0.000
	100 %	+50	1857 500 000	-0.4	0.000 000	0.000
	Batt. Endpoint	+20	1857 499 999	-0.8	0.000 000	0.000
	100 %	+20(Ref)	1907 500 001	0.0	0.000 000	0.000
	100 %	-30	1907 500 001	0.6	0.000 000	0.000
	100 %	-20	1907 500 001	0.0	0.000 000	0.000
	100 %	-10	1907 500 001	0.5	0.000 000	0.000
1007 5	100 %	0	1907 500 000	-0.5	0.000 000	0.000
1907.5	100 %	+10	1907 500 000	-0.9	0.000 000	0.000
	100 %	+30	1907 499 908	-92.4	-0.000 005	-0.048
	100 %	+40	1907 500 001	0.6	0.000 000	0.000
	100 %	+50	1907 500 000	-0.6	0.000 000	0.000
	Batt. Endpoint	+20	1907 500 001	0.4	0.000 000	0.000



BandWidth:	20 MHz
Voltage(100 %):	3.880 VDC
Batt. Endpoint:	3.300 VDC
LIMIT:	Emission must remain in band

Test. Frequncy	Voltage	Temp.	Frequency	Frequency Error	Deviation	ppm
(MHz)	(%)	(°C)	(Hz)	(Hz)	(%)	
	100 %	+20(Ref)	1859 999 999	0.0	0.000 000	0.000
	100 %	-30	1859 999 999	-0.1	0.000 000	0.000
	100 %	-20	1859 999 999	-0.1	0.000 000	0.000
	100 %	-10	1859 999 999	-0.1	0.000 000	0.000
1000 0	100 %	0	1859 999 999	0.3	0.000 000	0.000
1860.0	100 %	+10	1859 999 999	-0.1	0.000 000	0.000
	100 %	+30	1859 999 999	-0.5	0.000 000	0.000
	100 %	+40	1859 999 999	-0.3	0.000 000	0.000
	100 %	+50	1859 999 999	-0.3	0.000 000	0.000
	Batt. Endpoint	+20	1859 999 999	-0.6	0.000 000	0.000
	100 %	+20(Ref)	1905 000 001	0.0	0.000 000	0.000
	100 %	-30	1905 000 003	2.0	0.000 000	0.001
	100 %	-20	1905 000 003	1.5	0.000 000	0.001
	100 %	-10	1905 000 002	0.7	0.000 000	0.000
1005 0	100 %	0	1905 000 002	0.8	0.000 000	0.000
1905.0	100 %	+10	1905 000 002	0.8	0.000 000	0.000
	100 %	+30	1905 000 003	2.1	0.000 000	0.001
	100 %	+40	1905 000 003	1.5	0.000 000	0.001
	100 %	+50	1905 000 002	0.4	0.000 000	0.000
	Batt. Endpoint	+20	1905 000 002	0.8	0.000 000	0.000



# 9. TEST DATA(ANT F)

### 9.1 EQUIVALENT ISOTROPIC RADIATED POWER

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level	Substitute Level	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
	[SCS (kHz)]		(dBm)	(dBm)	(UDI)			w	W	dBm	Size	Offset
		PI/2 BPSK	-22.88	10.71	10.00	2.15	Н		0.072	18.56	-	
		QPSK	-22.90	10.69	10.00	2.15	Н		0.071	18.54		
1852.5		16-QAM	-23.88	9.71	10.00	2.15	Н	-	0.057	17.56	1	12
		64-QAM	-25.39	8.20	10.00	2.15	Н	-	0.040	16.05		
		256-QAM	-27.30	6.29	10.00	2.15	н		0.026	14.14		
		PI/2 BPSK	-22.95	10.65	10.00	2.21	н		0.070	18.44		
	Sub6 n25(2)/	QPSK	-22.98	10.62	10.00	2.21	н		0.069	18.41		
1882.5	5 MHz	16-QAM	-23.95	9.65	10.00	2.21	н	< 2.00	0.056	17.44	1	1
	[15 kHz]	64-QAM	-25.55	8.05	10.00	2.21	н	-	0.038	15.84		
		256-QAM	-27.46	6.14	10.00	2.21	н		0.025	13.93		
		PI/2 BPSK	-23.32	10.70	10.01	2.11	н		0.072	18.60		
		QPSK	-23.45	10.57	10.01	2.11	н		0.070	18.47		
1912.5		16-QAM	-24.43	9.59	10.01	2.11	Н		0.056	17.49	1	12
		64-QAM	-25.90	8.12	10.01	2.11	н		0.040	16.02		
		256-QAM	-27.80	6.22	10.01	2.11	Н		0.026	14.12		

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Freq	Mod/ Bandwidth	Modulation	Measured Level	Substitute Level	Ant. Gain	C.L	Pol	Limit	EI	RP	RB	
(MHz)	[SCS (kHz)]	Modulation	(dBm)	(dBm)	(dBi)	C.L	100	W	w	dBm	Size	Offset
		PI/2 BPSK	-23.00	10.59	10.00	2.15	Н		0.070	18.44		
		QPSK	-23.03	10.56	10.00	2.15	Н		0.069	18.41		
1855.0		16-QAM	-24.05	9.54	10.00	2.15	Н		0.055	17.39	1	26
		64-QAM	-25.56	8.03	10.00	2.15	Н		0.039	15.88		
		256-QAM	-27.50	6.09	10.00	2.15	Н		0.025	13.94		
		PI/2 BPSK	-22.87	10.73	10.00	2.21	Н		0.071	18.52		
	Sub6 n25(2)/	QPSK	-22.90	10.70	10.00	2.21	Н		0.071	18.49		
1882.5	10 MHz	16-QAM	-23.91	9.69	10.00	2.21	Н	< 2.00	0.056	17.48	1	1
	[15 kHz]	64-QAM	-25.47	8.13	10.00	2.21	Н		0.039	15.92		
		256-QAM	-27.45	6.15	10.00	2.21	Н		0.025	13.94		
		PI/2 BPSK	-23.12	10.90	10.01	2.11	Н		0.076	18.80		
		QPSK	-23.14	10.88	10.01	2.11	Н		0.076	18.78		
1910.0		16-QAM	-24.15	9.87	10.01	2.11	Н		0.060	17.77	1	26
		64-QAM	-25.56	8.46	10.01	2.11	Н		0.043	16.36		
		256-QAM	-27.74	6.28	10.01	2.11	Н		0.026	14.18		



Freq	Mod/ Bandwidth	Modulation	Measured Level	Substitute Level	Ant. Gain	C.L	Pol	Limit	EII	RP	I	RB
(MHz)	[SCS (kHz)]	Modulation	(dBm)	(dBm)	(dBi)	C.L	FUL	w	w	dBm	Size	Offset
		PI/2 BPSK	-22.85	10.74	10.00	2.15	Н		0.072	18.59		
		QPSK	-22.86	10.73	10.00	2.15	Н		0.072	18.58		
1857.5		16-QAM	-24.02	9.57	10.00	2.15	Н		0.055	17.42	1	39
		64-QAM	-25.40	8.19	10.00	2.15	н		0.040	16.04		
		256-QAM	-27.35	6.24	10.00	2.15	Н		0.026	14.09		
	-	PI/2 BPSK	-22.91	10.69	10.00	2.21	н		0.071	18.48		
	Sub6 n25(2)/	QPSK	-22.96	10.64	10.00	2.21	н		0.070	18.43		
1882.5	15 MHz	16-QAM	-24.00	9.60	10.00	2.21	н	< 2.00	0.055	17.39	1	39
	[15 kHz]	64-QAM	-25.35	8.25	10.00	2.21	н		0.040	16.04		
		256-QAM	-27.44	6.16	10.00	2.21	н		0.025	13.95		
		PI/2 BPSK	-23.17	10.80	10.01	2.13	н		0.074	18.68		
		QPSK	-23.20	10.77	10.01	2.13	Н		0.073	18.65		
1907.5		16-QAM	-24.28	9.69	10.01	2.13	н		0.057	17.57	1	39
		64-QAM	-25.75	8.22	10.01	2.13	Н		0.041	16.10		
		256-QAM	-27.67	6.30	10.01	2.13	Н		0.026	14.18		



Freq	Mod/ Bandwidth	Modulation	Measured Level	Substitute Level	Ant. Gain	C.L	Pol	Limit	EI	RP		RB
(MHz)	[SCS (kHz)]		(dBm)	(dBm)	(dBi)			w	W	dBm	Size	Offset
		PI/2 BPSK	-22.64	10.70	10.00	2.17	н		0.071	18.53		
		QPSK	-22.75	10.59	10.00	2.17	Н		0.070	18.42		
1860.0		16-QAM	-23.78	9.56	10.00	2.17	н		0.055	17.39	1	53
		64-QAM	-25.47	7.87	10.00	2.17	Н	-	0.037	15.70		
		256-QAM	-27.29	6.05	10.00	2.17	н	-	0.025	13.88		
	-	PI/2 BPSK	-22.91	10.69	10.00	2.21	н		0.070	18.48		
	Sub6 n25(2)/	QPSK	-23.11	10.49	10.00	2.21	Н	-	0.067	18.28		
1882.5	20 MHz	16-QAM	-24.01	9.59	10.00	2.21	Н	< 2.00	0.055	17.38	1	53
	[15 kHz]	64-QAM	-25.47	8.13	10.00	2.21	н	-	0.039	15.92		
		256-QAM	-27.46	6.14	10.00	2.21	Н		0.025	13.93		
		PI/2 BPSK	-23.36	10.61	10.01	2.13	Н		0.071	18.49		
		QPSK	-23.37	10.60	10.01	2.13	Н	-	0.071	18.48		
1905.0		16-QAM	-24.31	9.66	10.01	2.13	н	-	0.057	17.54	1	1
		64-QAM	-25.78	8.19	10.01	2.13	н		0.040	16.07		
		256-QAM	-27.65	6.32	10.01	2.13	Н		0.026	14.20		



#### 9.2 RADIATED SPURIOUS EMISSIONS

NR Band:	N25(2)
Bandwidth:	<u>10 MHz</u>
Modulation:	PI/2 BPSK
Distance:	3 meters
SCS:	15 kHz

		Measured	Ant. Gain	Substitute		_	Result	Limit		RB
Ch	Freq (MHz)	Level (dBm)	(dBi)	Level (dBm)	C.L	Pol	(dBm)	(dBm)	Size	Offset
271000	3,710.00	-61.93	11.40	-62.31	3.11	V	-54.02	-13.00		
371000	5,565.00	-62.36	11.90	-56.68	3.85	V	-48.63	-13.00	1	26
(1855.0)	7,420.00	-63.89	10.80	-48.95	4.46	V	-42.61	-13.00		
276500	3,765.00	-60.88	11.30	-60.95	3.09	V	-52.74	-13.00		
376500	5,647.50	-63.39	11.85	-57.97	3.89	V	-50.01	-13.00	1	1
(1882.5)	7,530.00	-63.81	11.10	-49.34	4.50	V	-42.74	-13.00		
202000	3,820.00	-61.79	11.10	-60.87	3.10	V	-52.87	-13.00		
382000	5,730.00	-63.16	11.70	-56.85	3.85	v	-49.00	-13.00	1	26
(1910.0)	7,640.00	-65.42	11.20	-51.84	4.53	V	-45.17	-13.00		



### 9.3 PEAK-TO-AVERAGE RATIO

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB )		
			BPSK			5.23		
			QPSK			5.98		
	5 MHz		16-QAM	25		6.61		
			64-QAM	* 		6.55		
			256-QAM			6.48		
			BPSK			5.92		
			QPSK			6.14		
	10 MHz		16-QAM	50		6.71		
			64-QAM	Ť		7.02		
ub6		1002 5	256-QAM		•	6.70		
25(2)		1882.5	1882.5	1882.5	BPSK		0	4.69
			QPSK			5.97		
	15 MHz		16-QAM	75		6.71		
			64-QAM			6.88		
			256-QAM			6.61		
		QP5 16-Q	BPSK	BPSK			6.28	
			QPSK           16-QAM         100           64-QAM         100	QPSK	T		6.40	
	20 MHz			16-QAM	100		6.80	
					6.97			
			256-QAM			6.68		

# Note:

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 141 ~ 160.



### 9.4 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data ( MHz )			
			BPSK			4.6105			
			QPSK	25		4.6402			
	5 MHz		16-QAM			4.6858			
			64-QAM			4.7014			
			256-QAM			4.6737			
			BPSK			9.0076			
			QPSK			9.0245			
	10 MHz		16-QAM	50		9.0067			
			64-QAM			9.0110			
Sub6			256-QAM		•	8.9611			
n25(2)		1882.5	BPSK		0	13.495			
			QPSK			13.493			
	15 MHz		16-QAM	75		13.478			
			64-QAM	64-QAM		13.470			
			256-QAM	-	-	-			13.439
			BPSK			18.249			
			QPSK		-	18.123			
	20 MHz		16-QAM	100		18.146			
		64-QAM	18.115						
			256-QAM			18.196			

# Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 161 ~ 180.



Band	Band Width (MHz)	Frequency (MHz)	Frequency of Maximum Harmonic (GHz)	Factor (dB)	Measurement Maximum Data (dBm)	Result (dBm)	Limit (dBm)	
		1852.5	9.1630	30.815	-70.379	-39.564		
	5	1882.5	9.3779	30.815	-69.145	-38.330		
		1912.5	8.0524	30.815	-69.714	-38.899		
	10	1855.0	8.8923	30.815	-69.291	-38.476		
		1882.5	8.8704	30.815	-69.743	-38.928		
Sub6		1910.0	8.0020	30.815	-69.973	-39.158	-13.00	
n25(2)	15	1857.5	9.9502	30.815	-70.661	-39.846	-13.00	
		1882.5	6.0120	30.815	-70.251	-39.436		
		1907.5	8.0524	30.815	-70.572	-39.757		
		1860.0	3.7877	30.200	-69.789	-39.589		
	20	1882.5	3.7972	30.200	-69.910	-39.710		
		1905.0	4.0464	30.200	-70.319	-40.119		

#### 9.5 CONDUCTED SPURIOUS EMISSIONS

## Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 181 ~ 204.

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

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

Frequency Range (GHz)	Factor [dB]
0.03 - 1	27.494
1 – 5	30.200
5 - 10	30.815
10 - 15	31.340
15 – 20	31.713
Above 20	32.355

### 9.6 BAND EDGE

- Plots of the EUT's Band Edge are shown Page 205 ~ 228.



# 9.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

BandWidth:	<u>5 MHz</u>
Voltage(100 %):	3.880 VDC
Batt. Endpoint:	3.300 VDC
LIMIT:	Emission must remain in band

Test. Frequncy	Voltage	Temp.	Frequency	Frequency Error	Deviation	ppm	
(MHz)	(%)	(°C)	(Hz)	(Hz)	(%)		
(2)	100 %	+20(Ref)	1852 499 999	0.0	0.000 000	0.000	
	100 %	-30	1852 499 999	0.2	0.000 000	0.000	
	100 %	-20	1852 499 999	0.3	0.000 000	0.000	
	100 %	-10	1852 499 999	-0.2	0.000 000	0.000	
1050 5	100 %	0	1852 499 999	-0.4	0.000 000	0.000	
1852.5	100 %	+10	1852 499 998	-0.7	0.000 000	0.000	
	100 %	+30	1852 499 999	0.2	0.000 000	0.000	
	100 %	+40	1852 499 998	-1.0	0.000 000	-0.001	
	100 %	+50	1852 499 998	-1.2	0.000 000	-0.001	
	Batt. Endpoint	+20	1852 499 999	0.2	0.000 000	0.000	
	100 %	+20(Ref)	1912 499 997	0.0	0.000 000	0.000	
	100 %	-30	1912 499 994	-2.7	0.000 000	-0.001	
	100 %	-20	1912 499 995	-2.3	0.000 000	-0.001	
	100 %	-10	1912 499 995	-2.2	0.000 000	-0.001	
1010 5	100 %	0	1912 499 995	-1.7	0.000 000	-0.001	
1912.5	100 %	+10	1912 499 994	-3.1	0.000 000	-0.002	
	100 %	+30	1912 499 994	-2.6	0.000 000	-0.001	
	100 %	+40	1912 499 995	-2.4	0.000 000	-0.001	
	100 %	+50	1912 499 994	-3.0	0.000 000	-0.002	
	Batt. Endpoint	+20	1912 499 995	-1.9	0.000 000	-0.001	

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BandWidth:	<u>10 MHz</u>
Voltage(100 %):	3.880 VDC
Batt. Endpoint:	3.300 VDC
LIMIT:	Emission must remain in band

Test. Frequncy	Voltage	Temp.	Frequency	Frequency Error	Deviation	ppm
(MHz)	(%)	(°C)	(Hz)	(Hz)	(%)	
	100 %	+20(Ref)	1855 000 000	0.0	0.000 000	0.000
	100 %	-30	1855 000 000	0.5	0.000 000	0.000
	100 %	-20	1854 999 999	-0.4	0.000 000	0.000
	100 %	-10	1854 999 999	-0.1	0.000 000	0.000
1055.0	100 %	0	1854 999 999	-0.1	0.000 000	0.000
1855.0	100 %	+10	1854 999 999	-0.9	0.000 000	0.000
	100 %	+30	1855 000 000	0.2	0.000 000	0.000
	100 %	+40	1855 000 000	0.0	0.000 000	0.000
	100 %	+50	1855 000 000	0.5	0.000 000	0.000
	Batt. Endpoint	+20	1855 000 000	0.9	0.000 000	0.000
	100 %	+20(Ref)	1909 999 998	0.0	0.000 000	0.000
	100 %	-30	1909 999 997	-1.4	0.000 000	-0.001
	100 %	-20	1909 999 997	-1.5	0.000 000	-0.001
	100 %	-10	1909 999 998	-0.3	0.000 000	0.000
1010.0	100 %	0	1909 999 998	-0.8	0.000 000	0.000
1910.0	100 %	+10	1909 999 999	0.2	0.000 000	0.000
	100 %	+30	1909 999 998	-0.5	0.000 000	0.000
	100 %	+40	1909 999 998	-0.3	0.000 000	0.000
	100 %	+50	1909 999 998	-0.4	0.000 000	0.000
	Batt. Endpoint	+20	1909 999 998	0.1	0.000 000	0.000



BandWidth:	15 MHz
Voltage(100 %):	3.880 VDC
Batt. Endpoint:	3.300 VDC
LIMIT:	Emission must remain in band

Test. Frequncy	Voltage	Temp.	Frequency	Frequency Error	Deviation	ppm
(MHz)	(%)	(°C)	(Hz)	(Hz)	(%)	
(	100 %	+20(Ref)	1857 499 999	0.0	0.000 000	0.000
	100 %	-30	1857 499 999	-0.2	0.000 000	0.000
	100 %	-20	1857 499 998	-0.8	0.000 000	0.000
	100 %	-10	1857 499 999	-0.8	0.000 000	0.000
10575	100 %	0	1857 499 998	-0.8	0.000 000	0.000
1857.5	100 %	+10	1857 499 999	-0.4	0.000 000	0.000
	100 %	+30	1857 499 998	-1.2	0.000 000	-0.001
	100 %	+40	1857 499 998	-0.9	0.000 000	0.000
	100 %	+50	1857 499 998	-1.5	0.000 000	-0.001
	Batt. Endpoint	+20	1857 499 997	-2.1	0.000 000	-0.001
	100 %	+20(Ref)	1907 500 000	0.0	0.000 000	0.000
	100 %	-30	1907 500 000	-0.1	0.000 000	0.000
	100 %	-20	1907 500 000	0.1	0.000 000	0.000
	100 %	-10	1907 500 000	-0.4	0.000 000	0.000
1007 5	100 %	0	1907 500 001	1.0	0.000 000	0.001
1907.5	100 %	+10	1907 500 000	0.2	0.000 000	0.000
	100 %	+30	1907 500 001	0.3	0.000 000	0.000
	100 %	+40	1907 500 001	0.3	0.000 000	0.000
	100 %	+50	1907 500 000	-0.3	0.000 000	0.000
	Batt. Endpoint	+20	1907 500 001	0.4	0.000 000	0.000



BandWidth:	20 MHz
Voltage(100 %):	3.880 VDC
Batt. Endpoint:	3.300 VDC
LIMIT:	Emission must remain in band

Test. Frequncy	Voltage	Temp.	Frequency	Frequency Error	Deviation	ppm
(MHz)	(%)	(°C)	(Hz)	(Hz)	(%)	
(	100 %	+20(Ref)	1860 000 000	0.0	0.000 000	0.000
	100 %	-30	1860 000 000	0.0	0.000 000	0.000
	100 %	-20	1859 999 999	-0.6	0.000 000	0.000
	100 %	-10	1860 000 000	0.0	0.000 000	0.000
1000 0	100 %	0	1860 000 000	0.3	0.000 000	0.000
1860.0	100 %	+10	1860 000 000	0.0	0.000 000	0.000
	100 %	+30	1859 999 999	-0.5	0.000 000	0.000
	100 %	+40	1860 000 000	-0.1	0.000 000	0.000
	100 %	+50	1860 000 000	-0.1	0.000 000	0.000
	Batt. Endpoint	+20	1860 000 021	21.7	0.000 001	0.012
	100 %	+20(Ref)	1905 000 001	0.0	0.000 000	0.000
	100 %	-30	1905 000 003	1.2	0.000 000	0.001
	100 %	-20	1905 000 003	1.8	0.000 000	0.001
	100 %	-10	1905 000 003	1.3	0.000 000	0.001
1005.0	100 %	0	1905 000 003	1.4	0.000 000	0.001
1905.0	100 %	+10	1905 000 029	27.7	0.000 001	0.015
	100 %	+30	1905 000 002	0.8	0.000 000	0.000
	100 %	+40	1905 000 003	1.9	0.000 000	0.001
	100 %	+50	1905 000 002	0.5	0.000 000	0.000
	Batt. Endpoint	+20	1905 000 003	1.4	0.000 000	0.001





**10. TEST PLOTS(ANT A)** 

The report shall not be (partly) reproduced except in full without approval of the laboratory.



	upling: DC	Input Ζ: 50 Ω Corr CCorr Freq Ref: Int (S)	Atten: 20 dB Preamp: Off	Trig: Free Run #IF Gain: Low	Center Freq. 1.882500000 GHz Counts: 2.00 M/2.00 Mpt Radio Std: None	Center Frequency 1.882500000 GHz	Settings
letrics	•	2 Graph				CF Step 20.000000 MHz	
Average Po	wer	Gaussi	an			Auto Man	
, and a second second	22.53 dBm					Freq Offset	
	49.49 % at 0 dB	10 %				0 Hz	
10.0 %	1.93 dB	r I F					
1.0 %	3.36 dB	1.%		$\langle \rangle$			
0.1 %	4.31 dB						
0.01 %	4.99 dB	0.1 %		$\rightarrow$			
0.001 %	5.48 dB						
0.0001 %	5.92 dB	0.01 %					
	5.99 dB	0.001 %					
Peak	28.52 dBm	E		ι, ·			
		0.0001 % 0.00 dB	5.0000 MHz		20.00	0 dB	Loc

### Sub6 n25(2)\_5 M\_PAR\_Mid\_BPSK\_FullRB



	upling: DC Co	out Ζ: 50 Ω orr CCorr eq Ref: Int (S)	Atten: 20 dB Preamp: Off	Trig: Free Run #IF Gain: Low	Center Freq: 1.882500000 GHz Counts: 2.00 M/2.00 Mpt Radio Std: None	Center Frequency 1.882500000 GHz	Setting
etrics	*	2 Graph	•			CF Step 5.000000 MHz	
Average Pov	ver	Gaussia 100 %	in i			Auto Man	
5	22.05 dBm					Freq Offset	
	48.44 % at 0 dB	10 %				0 Hz	
10.0 %	2.29 dB						
1.0 %	4.27 dB	1%					
0.1 %	5.37 dB						
0.01 %	6.04 dB	0.1 %					
0.001 %	6.42 dB			$\downarrow$			
0.0001 %	6.61 dB	0.01 %					
	6.67 dB	0.001 %					
Peak	28.72 dBm						
		0.0001 % 0.00 dB	.0000 MHz		20.00	D dB	Lo

#### Sub6 n25(2)\_5 M\_PAR\_Mid\_QPSK\_FullRB



	upling: DC Cor		tten: 20 dB reamp: Off	Trig: Free Run #IF Gain: Low	Center Freq: 1.882500000 GHz Counts: 2.00 M/2.00 Mpt Radio Std: None	Center Frequency 1.882500000 GHz	Setting
trics	•	2 Graph Gaussian	•			CF Step 5.000000 MHz Auto	
Average Pov	wer 21.07 dBm	100 %				Man	
	47.02 % at 0 dB	10 %				Freq Offset 0 Hz	
10.0 %	2.75 dB	1%					
1.0 %	4.78 dB	1 78					
0.1 %	5.94 dB						
0.01 %	6.76 dB	0.1 %					
0.001 %	7.23 dB						
0.0001 %	7.44 dB	0.01 %					
Peak	7.48 dB	0.001 %					
Peak	28.55 dBm						
		0.0001 % 0.00 dB Info BW 5.00	000 MHz		20.0	0 dB	Lo

### Sub6 n25(2)\_5 M\_PAR\_Mid\_16QAM\_FullRB



	upling: DC Cor		n: 20 dB amp: Off	Trig: Free Run #IF Gain: Low	Center Freq 1.882500000 GHz Counts: 2.00 M/2.00 Mpt Radio Std: None	Center Frequ 1.88250000	
trics	•	2 Graph	v			CF Step 5.000000 M	Hz
Average Pov	ver	Gaussian				Auto Man	
	20.56 dBm					Freq Offset	
	15.73 % at 0 dB	10 %				0 Hz	
10.0 %	2.81 dB	1%					
1.0 %	4.96 dB	1 76		$\langle   \rangle  $			
0.1 %	6.11 dB			$\mathbf{X}$			
0.01 %	6.77 dB	0.1 %					
0.001 %	7.25 dB						
0.0001 %	7.46 dB	0.01 %					
	7.49 dB	0.001 %					
Peak	28.05 dBm						
		0.0001 % 0.00 dB Info BW 5.000	) MHz		20	.00 dB	L

#### Sub6 n25(2)\_5 M\_PAR\_Mid\_64QAM\_FullRB



	Ipling DC Co	out Z: 50 Ω orr CCorr eq Ref: Int (S)	Atten: 20 dB Preamp: Off	Trig: Free Run #IF Gain: Low	Center Freq: 1.882500000 GHz Counts: 2.00 M/2.00 Mpt Radio Std: None	Center Frequency 1.882500000 GHz	Setting
trics	*	2 Graph	¥			CF Step 5.000000 MHz	
Average Pov	ver	Gaussia 100 %	in i			Auto Man	
	18.58 dBm	1				Freq Offset	
	5.17 % at 0 dB	10 %				0 Hz	
10.0 %	2.84 dB						
1.0 %	5.11 dB	1%					
0.1 %	6.39 dB	F					
0.01 %	7.06 dB	0.1 %					
0.001 %	7.39 dB						
0.0001 %	7.82 dB	0.01 %					
	7.85 dB	0.001 %					
Peak	26.43 dBm						
		0.0001 % 0.00 dB Info BW 5	.0000 MHz		20.0	0 dB	La

#### Sub6 n25(2)\_5 M\_PAR\_Mid\_256QAM\_FullRB



	upling: DC C	put Z: 50 Ω orr CCorr eq Ref: Int (S)	Atten: 20 dB Preamp: Off	Trig: Free Run #IF Gain: Low	Center Freq: 1.882500000 GHz Counts: 2.00 M/2.00 Mpt Radio Std: None	Center Frequency 1.882500000 GHz	Setting
trics		2 Graph	¥			CF Step 5.000000 MHz	
Average Pov	ver	Gaussia 100 %	in i			Auto Man	
	22.49 dBm					Freq Offset	
	48.41 % at 0 dB	10 %				0 Hz	
10.0 %	1.89 dB						
1.0 %	3.59 dB	1%					
0.1 %	4.37 dB						
0.01 %	4.95 dB	0.1 %					
0.001 %	5.35 dB			\			
0.0001 %	5.73 dB	0.01 %					
	5.78 dB	0.001 %					
Peak	28.27 dBm						
		0.0001 % 0.00 dB Info BW 1	0.000 MHz		20.0	0 dB	L

### Sub6 n25(2)\_10 M\_PAR\_Mid\_BPSK\_FullRB



	upling: DC Co	put Ζ: 50 Ω orr CCorr eq Ref: Int (S)	Atten: 20 dB Preamp: Off	Trig: Free Run #IF Gain: Low	Center Freq: 1.882500000 GHz Counts: 2.00 M/2.00 Mpt Radio Std: None	Center Frequency 1.882500000 GHz	Setting
etrics	*	2 Graph	÷			CF Step 10.000000 MHz	
Average Pov	ver	Gaussia	n			Auto Man	
, weitige i ei	22.02 dBm	8				Freq Offset	
	17.57 % at 0 dB	10 %				0 Hz	
10.0 %	2.31 dB						
1.0 %	4.25 dB	1%					
0.1 %	5.37 dB						
0.01 %	6.04 dB	0.1 %					
0.001 %	6.46 dB						
0.0001 %	6.81 dB	0.01 %					
	6.83 dB	0.001 %					
Peak	28.85 dBm						
		0.0001 % 0.00 dB	0.000 MHz		20.00	dB	Lo

#### Sub6 n25(2)\_10 M\_PAR\_Mid\_QPSK\_FullRB



	upling DC Co	ut Ζ: 50 Ω rr CCorr iq Ref: Int (S)	Atten: 20 dB Preamp: Off	Trig: Free Run #IF Gain: Low	Center Freq: 1.882500000 GHz Counts: 2.00 M/2.00 Mpt Radio Std: None	Center Frequency 1.882500000 GHz	Setting
etrics	*	2 Graph	•			CF Step 10.000000 MHz	
Average Pov	ver	Gaussia	in i			Auto Man	
	21.04 dBm					Freq Offset	
4	46.14 % at 0 dB	10 %				0 Hz	
10.0 %	2.83 dB						
1.0 %	4.78 dB	1%					
0.1 %	5.98 dB						
0.01 %	6.65 dB	0.1 %					
0.001 %	7.07 dB						
0.0001 %	7.35 dB	0.01 %					
	7.37 dB	0.001 %					
Peak	28.41 dBm						-
		0.0001 % 0.00 dB Info BW 1	0.000 MHz		20.00	) dB	La

### Sub6 n25(2)\_10 M\_PAR\_Mid\_16QAM\_FullRB



	upling: DC Co	ut Z: 50 Ω rr CCorr q Ref: Int (S)	Atten: 20 dB Preamp: Off	Trig: Free Run #IF Gain: Low	Center Freq: 1.882500000 GHz Counts: 2.00 M/2.00 Mpt Radio Std: None	Center Frequency 1.882500000 GHz	Setting
etrics	¥	2 Graph	¥			CF Step 10.000000 MHz	
Average Pov	ver	Gaussia	in i			Auto Man	
	20.50 dBm					Freq Offset	
4	44.69 % at 0 dB	10 %				0 Hz	
10.0 %	2.95 dB						
1.0 %	5.01 dB	1 %					
0.1 %	6.12 dB						
0.01 %	6.84 dB	0.1 %					
0.001 %	7.27 dB						
0.0001 %	7.46 dB	0.01 %					
	7.52 dB	0.001 %					
Peak	28.02 dBm						
		0.0001 % 0.00 dB Info BW 1	0.000 MHz		20.00	) dB	La

### Sub6 n25(2)\_10 M\_PAR\_Mid\_64QAM\_FullRB



	upling DC Co	out Ζ: 50 Ω orr CCorr eq Ref: Int (S)	Atten: 20 dB Preamp: Off	Trig: Free Run #IF Gain: Low	Center Freq: 1.882500000 GHz Counts: 2.00 M/2.00 Mpt Radio Std: None	Center Frequency 1.882500000 GHz	Setting
trics	•	2 Graph	•			CF Step 10.000000 MHz	
Average Pov	ver	Gaussia 100 %	in IIII			Auto Man	
	18.51 dBm	1				Freq Offset	1
4	4.47 % at 0 dB	10 %				0 Hz	
10.0 %	3.00 dB						
1.0 %	5.04 dB	1%					
0.1 %	6.24 dB	F		X			
0.01 %	6.92 dB	0.1 %					
0.001 %	7.33 dB						
0.0001 %	7.82 dB	0.01 %					
	7.92 dB	0.001 %					
Peak	26.43 dBm						
		0.0001 % 0.00 dB Info BW 1	0.000 MHz		20.0	0 dB	L

### Sub6 n25(2)\_10 M\_PAR\_Mid\_256QAM\_FullRB



	upling: DC Cor	ut Z: 50 Ω Atten: r CCorr Pream q Ref: Int (S)		Gain: Low	Center Freq. 1.882500000 GHz Counts: 2.00 M/2.00 Mpt Radio Std: None	1.882	Frequency 500000 GHz	Setting
trics	•	2 Graph	•			CF Ste 10.00	ep 0000 MHz	
Average Po	wer	Gaussian					uto lan	
	22.51 dBm					Freq C		
3	48.31 % at 0 dB	10 %				0 Hz		
10.0 %	1.85 dB							
1.0 %	3.35 dB	1 %						
0.1 %	4.27 dB							
0.01 %	4.89 dB	0.1 %						
0.001 %	5.36 dB							
0.0001 %	5.72 dB	0.01 %						
	5.77 dB	0.001 %						
Peak	28.28 dBm							
		0.0001 % 0.00 dB Info BW 15.000 N	1Hz		20	0.00 dB		L

### Sub6 n25(2)\_15 M\_PAR\_Mid\_BPSK\_FullRB



	upling: DC Cor		en: 20 dB amp: Off	Trig: Free Run #IF Gain: Low	Center Freq: 1.882500000 GHz Counts: 2.00 M/2.00 Mpt Radio Std: None	Center Frequency 1.882500000 GHz	
trics	•	2 Graph	•			CF Step 15.000000 MHz	
Average Pov	ver	Gaussian				Auto Man	
	22.04 dBm					Freq Offset	
	47.82 % at 0 dB	10 %				0 Hz	
10.0 %	2.28 dB	1%					
1.0 %	4.22 dB						
0.1 %	5.31 dB						
0.01 %	5.98 dB	0.1 %					
0.001 %	6.38 dB						
0.0001 %	6.52 dB	0.01 %					
0	6.53 dB	0.001 %					
Peak	28.57 dBm						
		0.0001 % 0.00 dB Info BW 15.00	) MHz		20.	00 dB	L

### Sub6 n25(2)\_15 M\_PAR\_Mid\_QPSK\_FullRB



	Ipling: DC Co	ut Ζ: 50 Ω rr CCorr iq Ref: Int (S)	Atten: 20 dB Preamp: Off	Trig: Free Run #IF Gain: Low	Center Freq: 1.882500000 GHz Counts: 2.00 M/2.00 Mpt Radio Std: None	Center Frequency 1.882500000 GHz	Setting
trics	•	2 Graph	•			CF Step 15.000000 MHz	
Average Pov	ver	Gaussian				Auto Man	
	21.01 dBm	N.				Freq Offset	
4	6.24 % at 0 dB	10 %				0 Hz	
10.0 %	2.78 dB						
1.0 %	4.80 dB	1 %					
0.1 %	5.94 dB						
0.01 %	6.59 dB	0.1 %					
0.001 %	7.07 dB						
0.0001 %	7.41 dB	0.01 %					
	7.44 dB	0.001 %					
Peak	28.45 dBm						-
		0.0001 % 0.00 dB Info BW 15	000 MHz		20.00	) dB	La

### Sub6 n25(2)\_15 M\_PAR\_Mid\_16QAM\_FullRB



	Ipling DC Co	out Ζ: 50 Ω orr CCorr eq Ref: Int (S)	Atten: 20 dB Preamp: Off	Trig: Free Run #IF Gain: Low	Center Freq: 1.882500000 GHz Counts: 2.00 M/2.00 Mpt Radio Std: None	Center Frequency 1.882500000 GHz	Setting
trics	*	2 Graph	¥			CF Step 15.000000 MHz	
Average Pov	ver	Gaussia 100 %	an in			Auto Man	
	20.52 dBm					Freq Offset	
4	4.82 % at 0 dB	10 %				0 Hz	
10.0 %	2.85 dB						
1.0 %	5.01 dB	1%					
0.1 %	6.29 dB	F					
0.01 %	6.92 dB	0.1 %					
0.001 %	7.49 dB						
0.0001 %	7.77 dB	0.01 %					
	7.91 dB	0.001 %					
Peak	28.43 dBm						-
		0.0001 % 0.00 dB Info BW 1	5.000 MHz		20.00	) dB	Lo

### Sub6 n25(2)\_15 M\_PAR\_Mid\_64QAM\_FullRB



	upling DC Co	out Ζ: 50 Ω orr CCorr eq Ref: Int (S)	Atten: 20 dB Preamp: Off	Trig: Free Run #IF Gain: Low	Center Freq: 1.882500000 GHz Counts: 2.00 M/2.00 Mpt Radio Std: None	Center Frequency 1.882500000 GHz	Setting
trics		2 Graph	¥			CF Step 15.000000 MHz	
Average Pov	ver	Gaussia 100 %	an in			Auto Man	
	18.57 dBm					Freq Offset	
4	4.60 % at 0 dB	10 %				0 Hz	
10.0 %	2.88 dB						
1.0 %	5.02 dB	1%					
0.1 %	6.25 dB	F					
0.01 %	6.93 dB	0.1 %		$\land$			
0.001 %	7.37 dB						
0.0001 %	7.44 dB	0.01 %					
	7.49 dB	0.001 %					
Peak	26.06 dBm						-
		0.0001 % 0.00 dB Info BW 1	5.000 MHz		20.00	) dB	L

### Sub6 n25(2)\_15 M\_PAR\_Mid\_256QAM\_FullRB



	upling: DC Corr		n: 20 dB amp: Off	Trig: Free Run #IF Gain: Low	Center Freq. 1.882500000 GHz Counts: 2.00 M/2 00 Mpt Radio Std: None	Cer 1.8	nter Frequency 882500000 GHz	Setting
trics	•	2 Graph	•				Step .000000 MHz	
Average Pov	wer	Gaussian					Auto Man	
	22.52 dBm					100000	q Offset	
	46.40 % at 0 dB	10 %				01	iz	
10.0 %	1.99 dB							
1.0 %	4.08 dB	1%						
0.1 %	4.85 dB							
0.01 %	5.07 dB	0.1 %		$\langle \rangle$				
0.001 %	5.38 dB							
0.0001 %	5.56 dB	0.01 %						
	5.70 dB	0.001 %						
Peak	28.22 dBm							-
		0.0001 % 0.00 dB Info BW 20.00	) MHz		20	0.00 dB		L

### Sub6 n25(2)\_20 M\_PAR\_Mid\_BPSK\_FullRB



	upling: DC Co	out Z: 50 Ω orr CCorr eq Ref: Int (S)	Atten: 20 dB Preamp: Off	Trig: Free Run #IF Gain: Low	Center Freq: 1.882500000 GHz Counts: 2.00 M/2.00 Mpt Radio Std: None	Center Frequency 1.882500000 GHz	Setting
trics		2 Graph	•			CF Step 20.000000 MHz	
Average Pov	ver	Gaussia	n			Auto Man	
	22.05 dBm	N.				Freq Offset	
	15.75 % at 0 dB	10 %				0 Hz	
10.0 %	2.53 dB						
1.0 %	4.48 dB	1%					
0.1 %	5.30 dB						
0.01 %	5.93 dB	0.1 %					
0.001 %	6.51 dB						
0.0001 %	6.94 dB	0.01 %					
	7.02 dB	0.001 %					
Peak	29.07 dBm						
		0.0001 % 0.00 dB Info BW 2	0.000 MHz		20.00	) dB	L

### Sub6 n25(2)\_20 M\_PAR\_Mid\_QPSK\_FullRB



	upling: DC Co	put Z: 50 Ω orr CCorr eq Ref: Int (S)	Atten: 20 dB Preamp: Off	Trig: Free Run #IF Gain: Low	Center Freq: 1.882500000 GHz Counts: 2.00 M/2.00 Mpt Radio Std: None	Center Frequency 1.882500000 GHz	Setting
etrics		2 Graph	•			CF Step 20.000000 MHz	
A		Gaussia	n			Auto	
Average Pov	21.06 dBm					Man Freq Offset	
	44.11 % at 0 dB	10 %				0 Hz	
10.0 %	3.03 dB	1 %					
1.0 %	4.86 dB						
0.1 %	5.84 dB						
0.01 %	6.48 dB	0.1 %					
0.001 %	6.97 dB						
0.0001 %	7.21 dB	0.01 %					
	7.50 dB	0.001 %					
Peak	28.56 dBm						
		0.0001 % 0.00 dB Info BW 2	0.000 MHz		20.00	dB	La

### Sub6 n25(2)\_20 M\_PAR\_Mid\_16QAM\_FullRB



	upling: DC Cor		en: 20 dB eamp: Off	Trig: Free Run #IF Gain: Low	Center Freq. 1.882500000 GHz Counts: 2.00 M/2 00 Mpt Radio Std: None	1	enter Frequency .882500000 GHz	Setting
trics	•	2 Graph	Ť				F Step 0.000000 MHz	
Average Pov	ver	Gaussian					Auto Man	
	20.54 dBm	$\mathcal{N}$					eq Offset	
	2.74 % at 0 dB	10 %					Hz	
10.0 %	3.16 dB							
1.0 %	5.04 dB	1 %		$\langle   \rangle  $				
0.1 %	6.14 dB			$X \rightarrow X$				
0.01 %	6.94 dB	0.1 %						
0.001 %	7.63 dB							
0.0001 %	7.82 dB	0.01 %						
	7.92 dB	0.001 %						
Peak	28.46 dBm							-
		0.0001 % 0.00 dB Info BW 20.00	0 MHz		20	.00 dB		L

### Sub6 n25(2)\_20 M\_PAR\_Mid\_64QAM\_FullRB



	Ipling: DC Co	ut Ζ: 50 Ω rr CCorr lq Ref: Int (S)	Atten: 20 dB Preamp: Off	Trig: Free Run #IF Gain: Low	Center Freq 1.882500000 GHz Counts: 2.00 M/2.00 Mpt Radio Std: None	Center Frequency 1.882500000 GHz	Setting
trics	•	2 Graph	•			CF Step 20.000000 MHz	
Average Pov	ver	Gaussia	n			Auto Man	
	18.57 dBm	//				Freq Offset	
4	2.37 % at 0 dB	10 %				0 Hz	
10.0 %	3.19 dB						
1.0 %	5.06 dB	1%					
0.1 %	6.21 dB	E					
0.01 %	6.97 dB	0.1 %					
0.001 %	7.53 dB						
0.0001 %	7.62 dB	0.01 %					
	7.63 dB	0.001 %					
Peak	26.20 dBm						
		0.0001 % 0.00 dB	0.000 MHz		20.0	0 dB	La

#### Sub6 n25(2)\_20 M\_PAR\_Mid\_256QAM\_FullRB



Cocupied BW         KEYSIGHT         Input: RF         RL         Align: Auto         PASS	H Input Ζ: 50 Ω Corr CCorr Freq Ref: Int (S) NFE: Off	Atten: 20 dB Preamp: Off	Trig: Free Run Gate: Off #IF Gain: Low	Center Freq: 1.8 Avg Hold: 500/50 Radio Std: None		1.8825	Frequency 500000 GHz	Settings
Graph ▼ Scale/Div 10.0 dB		Ref LvI Offset 27 Ref Value 40.00 (				Span 10.000 CF Ste		
<b>.09</b> 30.0 20.0 10.0		*****	ware and a second s	~~~			000 MHz ito	
0.00 10.0 20.0 30.0 <del>ЦаРјуна, Макарија, 1997, 1997, 1997</del> 40.0 50.0					PEAK	Freq O 0 Hz	122	
enter 1.882500 GHz Res BW 100.00 kHz	;	#Video BW 390.0	00 kHz	Sweep	Span 10 MHz 16.7 ms (1001 pts)			
Metrics	26 MHz		Total Power		31.3 dBm			
Transmit Freq Error x dB Bandwidth	4.140 kł 5.294 Mł		% of OBW Pow x dB	ver	99.00 % -26.00 dB			Local
	<b>?</b> Jun 11, 2024 1:12:11 PM				N – X			

### Sub6 n25(2)\_5 M\_OBW\_Mid\_BPSK\_FullRB



occupied Div	+	-			Frequency	- [ 景
KEYSIGHT       Input: RF         RL       Input: RF         Align: Auto	Input Z: 50 Ω Corr CCorr Freq Ref: Int (S) NFE: Off	Atten: 20 dB Preamp: Off	Trig: Free Run Gate: Off #IF Gain: Low	Center Freq: 1.882500000 GHz Avg Hold: 500/500 Radio Std: None	Center Frequency 1.882500000 GHz	Settings
Graph v cale/Div 10.0 dB	1,000,000	Ref LvI Offset 27 Ref Value 40.00			Span 10.000 MHz	
<b>og</b> 0.0					CF Step 1.000000 MHz	
20.0		a.m. +.e.+	all an affer a star and		Auto Man	
20.0				Townshinster day	PEAK 0 Hz	
40.0 50.0						
enter 1.882500 GHz Res BW 100.00 kHz		#Video BW 390.0	00 kHz	Span 10 Sweep 16.7 ms (100		
Metrics v						
Occupied Bandwidth	32 MHz		Total Power	31.0 dBm		
4.55 Transmit Freq Error	-2.162 kl	Hz	% of OBW Pov			
x dB Bandwidth	5.378 M		x dB	-26.00 dB		Local
	lup 11, 2024					
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# Sub6 n25(2)\_5 M\_OBW\_Mid\_QPSK\_FullRB



pectrum Analyzer 1 Iccupied BW	<b>+</b> Input Ζ: 50 Ω	Atten: 20 dB	Trig: Free Run	Center Freq: 1 882500000 GF	*	Frequency	
L Coupling: DC Align: Auto	Corr CCorr Freq Ref: Int (S)	Preamp: Off	Gate: Off #IF Gain: Low	Avg Hold: 500/500 Radio Std: None	Center	Frequency 500000 GHz	Settings
Graph		Ref LvI Offset 27			Span 10.00	0 MHz	
cale/Div 10.0 dB		Ref Value 40.00	dBm		CF Ste	:D	
<b>og</b> 00.0					1.000	000 MHz	
10.0	faran					uto an	
0.00				and the second s	PEAK 0 Hz	offset	
30.0							
40.0							
enter 1.882500 GHz Res BW 100.00 kHz	↓	#Video BW 390.	00 kHz	Span Sweep 16.7 ms (1	10 MHz 001 pts)		
Metrics v							
Occupied Bandwidth							
	353 MHz		Total Power	30.0 dBm			
Transmit Freq Error x dB Bandwidth	-1.004 k 5.453 M		% of OBW Pov x dB	ver 99.00 % -26.00 dB			Local
	A .lun 11 2024						
うで	<b>?</b> Jun 11, 2024 1:13:13 PM	$\square$ $\square$					

### Sub6 n25(2)\_5 M\_OBW\_Mid\_16QAM\_FullRB



Spectrum Analyzer 1 Occupied BW	+						Frequency	一番
KEYSIGHT Input: RF R L + Align: Auto	Input Z: 50 Ω Corr CCorr Freq Ref: Int (S) NFE: Off	Atten: 20 dB Preamp: Off	Trig: Free Run Gate: Off #IF Gain: Low	Center Freq Avg Hold: 50 Radio Std: N		1.8825	Frequency 00000 GHz	Settings
1 Graph v Scale/Div 10.0 dB		Ref LvI Offset 27				Span 10.000	MHz	
Log 30.0		Ref Value 40.00	JBM			CF Step 1.0000	) 00 MHz	
20.0 10.0 0.00		**********	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	m		Aut Ma		
-10.0				- Andrew	PEA	Freq Of 0 Hz	fset	
-30.0					and the second second			
Center 1.882500 GHz #Res BW 100.00 kHz		#Video BW 390.	00 kHz	 Sw	Span 10 MH eep 16.7 ms (1001 pts			
2 Metrics 🛛 🔻								
Occupied Bandwid								
	5407 MHz		Total Power	_	29.4 dBm			
Transmit Freq Erro x dB Bandwidth	r -7.109 k 5.389 M		% of OBW Pov x dB	ver	99.00 % -26.00 dB			Local
<b>1</b> 5 C	<b>?</b> Jun 11, 2024 1:13:44 PM	$\Theta \triangle$		.:				

### Sub6 n25(2)\_5 M\_OBW\_Mid\_64QAM\_FullRB



Spectrum Analyzer 1 Occupied BW KEYSIGHT Input RF Coupling: DC Align: Auto	H Input Z: 50 Ω Corr CCorr Freq Ref: Int (S) NFE: Off	Atten: 20 dB Preamp: Off	Trig: Free Run Gate: Off #IF Gain: Low	Center Fre Avg Hold: Radio Std:		1.8825	Frequency Frequency 500000 GHz	Settings
1 Graph ▼ Scale/Div 10.0 dB		Ref LvI Offset 27 Ref Value 40.00 o				Span 10.000 CF Ste		
Log 30.0 20.0 10.0						1.0000 Au Ma		
0.00 10.0 20.0 30.0 40.0 50.0					PEAP	Freq O 0 Hz	ffset	
Center 1.882500 GHz #Res BW 100.00 kHz		#Video BW 390.0	00 kHz	s	Span 10 MH weep 16.7 ms (1001 pts			
2 Metrics	28 MHz		Total Power		27.1 dBm			
Transmit Freq Error x dB Bandwidth	5.371 k 5.258 M		% of OBW Pow x dB	ver	99.00 % -26.00 dB			Local
1501	<b>?</b> Jun 11, 2024 1:14:17 PM	$\odot \land$			# 💽 - 🔀			

# Sub6 n25(2)\_5 M\_OBW\_Mid\_256QAM\_FullRB



Spectrum Analyzer 1 Occupied BW	+				Frequency	( 1) 是
R L     Input: RF       Coupling: DC       Align: Auto	Input Z: 50 Ω Corr CCorr Freq Ref: Int (S) NFE: Off	Atten: 20 dB Preamp: Off	Trig: Free Run Gate: Off #IF Gain: Low	Center Freq. 1.882500000 GHz Avg Hold: 500/500 Radio Std: None	2 Center Frequency 1.882500000 GHz	Settings
1 Graph V Scale/Div 10.0 dB	1,000	Ref LvI Offset 27 Ref Value 40.00 c			Span 20.000 MHz CF Step 2.000000 MHz	
20.0	Jummon	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	warmature Part August	m	Auto Man	
10.0 20.0 30.0	~~~			h h	PEAK PEAK	
40.0 -50.0 Center 1.88250 GHz #Res BW 200.00 kHz		#Video BW 820.0	00 kHz	Span 2 Sweep 1.00 ms (10	20 MHz	
2 Metrics				Sweep 1.00 ms (10		
Occupied Bandwidth			Total Power	30.6 dBm		
9.01						
	-195.36 k 10.02 M		% of OBW Pow x dB	er 99.00 % -26.00 dB		Local

### Sub6 n25(2)\_10 M\_OBW\_Mid\_BPSK\_FullRB



Spectrum Analyzer 1 Occupied BW	+						Frequency	- 7 絵
KEYSIGHT RL ↔ Coupling: DC Align: Auto	Input Z: 50 Ω Corr CCorr Freq Ref: Int (S) NFE: Off	Atten: 20 dB Preamp: Off	Trig: Free Run Gate: Off #IF Gain: Low	Center Freq: 1.88 Avg Hold: 500/50 Radio Std: None		provide a second s	Frequency 00000 GHz	Settings
1 Graph 🔻		Ref LvI Offset 27				Span 20.000	MHz	
Scale/Div 10.0 dB		Ref Value 40.00	dBm			CF Step 2.0000		
20.0 10.0 0.00	Juniora	mon	mann	~		Aut Ma		
-10.0 -20.0 -30.0				tumen	PEAK	Freq Off 0 Hz	'set	
-30.0 -40.0 -50.0								
Center 1.88250 GHz #Res BW 200.00 kHz		#Video BW 820.	00 kHz	Sweep	Span 20 MHz 1.00 ms (1001 pts)			
2 Metrics								
9.027	73 MHz		Total Power		30.4 dBm			
Transmit Freq Error x dB Bandwidth	-186.44 kl 10.01 M		% of OBW Pow x dB		99.00 % -26.00 dB			Local
	Jun 11, 2024 1:20:10 PM							

### Sub6 n25(2)\_10 M\_OBW\_Mid\_QPSK\_FullRB



	+					\$	Frequency	
EYSIGHT     Input: RF       Coupling: DC       Align: Auto	Input Z: 50 Ω Corr CCorr Freq Ref: Int (S) NFE: Off	Atten: 20 dB Preamp: Off	Trig: Free Run Gate: Off #IF Gain: Low	Center Freq: 1.8825000 Avg Hold: 500/500 Radio Std: None	00 GHz	1.88250	requency 00000 GHz	Settings
Graph v		Ref LvI Offset 27 Ref Value 40.00				Span 20.000		
.og						CF Step 2.00000	Anno an ann an	
20.0	Jummer	mannen		~		Aut Mai		
10.0 10.0 20.0 30.0	al and a second			hollowar	PEAK	Freq Off 0 Hz	set	
40.0								
enter 1.88250 GHz Res BW 200.00 kHz		#Video BW 820.0	00 kHz	Sweep 1.00 r	Span 20 MHz ns (1001 pts)			
Metrics v								
9.02	55 MHz		Total Power	29.4	iBm			
Transmit Freq Error x dB Bandwidth	-196.46 k 10.11 M		% of OBW Pow x dB	er 99.0 -26.0				Local
	<b>?</b> Jun 11, 2024 1:20:32 PM							

# Sub6 n25(2)\_10 M\_OBW\_Mid\_16QAM\_FullRB



Spectrum Analyzer 1 Cccupied BW	+				Frequ	Jency 🔻 🔛
KEYSIGHT     Input: RF       RL      Coupling: DC       Align: Auto     Align: Auto	Input Z 50 Ω Corr CCorr Freq Ref: Int (S) NFE: Off	Atten: 20 dB Preamp: Off	Trig: Free Run Gate: Off #IF Gain: Low	Center Freq: 1.882500000 GHz Avg Hold: 500/500 Radio Std: None	Center Frequency 1.882500000 GH	
l Graph 🔻		Ref LvI Offset 27			Span 20.000 MHz	
icale/Div 10.0 dB .og 30.0		Ref Value 40.00	dBm		CF Step 2.000000 MHz	
20.0			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~	Auto Man	
0.00 10.0 20.0				and the second s	PEAK 0 Hz	
40.0 50.0						
Center 1.88250 GHz Res BW 200.00 kHz	•	#Video BW 820.	00 kHz	Span 20 Sweep 1.00 ms (1001		
Metrics v						
Occupied Bandwidth 8.99	1 924 MHz		Total Power	28.7 dBm		
Transmit Freq Error x dB Bandwidth	-189.44 k 9.993 M		% of OBW Pow x dB	er 99.00 % -26.00 dB		Local
1 5 6 1	<b>?</b> Jun 11, 2024 1:20:55 PM	$\square$				

# Sub6 n25(2)\_10 M\_OBW\_Mid\_64QAM\_FullRB



Coupled BW     Input: RF       CeysIGHT     Input: RF       Coupling: DC     Align: Auto       V     PASS	Input Z: 50 Ω Corr CCorr Freq Ref: Int (S) NFE: Off	Atten: 20 dB Preamp: Off	Trig: Free Run Gate: Off #IF Gain: Low	Center Freq: 1.882500000 GHz Avg Hold: 500/500 Radio Std: None	Center Frequency 1.882500000 GHz Span	Settings
Graph v cale/Div 10.0 dB		Ref LvI Offset 27 Ref Value 40.00 (			20.000 MHz CF Step 2.000000 MHz	
20.0 10.0 20.0 20.0 20.0					Auto Man Freq Offset 0 Hz	
30.0 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4		#Video BW 820.	00 kHz	Span 20 /	****	
Res BW 200.00 kHz Metrics				Sweep 1.00 ms (1001		
Occupied Bandwidth 8.983	39 MHz		Total Power	26.7 dBm		
Transmit Freq Error x dB Bandwidth	-176.89 kł 9.983 Mł		% of OBW Pow x dB	er 99.00 % -26.00 dB		Loca
	Jun 11, 2024 1:21:17 PM	$\overline{\mathbb{O}}$			<b>*</b>	

### Sub6 n25(2)\_10 M\_OBW\_Mid\_256QAM\_FullRB



Spectrum Analyzer 1 Occupied BW	+				\$	Frequency	- * 影
RL +++ Coupling: DC Align: Auto		Atten: 20 dB Preamp: Off	Trig: Free Run Gate: Off #IF Gain: Low	Center Freq: 1.882500000 GHz Avg[Hold: 500/500 Radio Std: None	procession and a contract of the	Frequency 00000 GHz	Settings
1 Graph T	Ref	LvI Offset 27			Span 30.000	MHz	
Scale/Div 10.0 dB	Re	Value 40.00 d	iBm		CF Ste 3.0000	o 00 MHz	
20.0	Jusanta		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	**	Au Ma		
-10.0	/			PEAK	Freq Ol 0 Hz	fset	
-30.0				harthornation			
Center 1.88250 GHz #Res BW 300.00 kHz	#Vi	deo BW 1.200	0 MHz	Span 30 MHz Sweep 1.00 ms (1001 pts)			
2 Metrics v							
Occupied Bandwidth	1 MHz		Total Power	30.8 dBm			
Transmit Freq Error x dB Bandwidth	-354.23 kHz 14.50 MHz		% of OBW Pow x dB	2 22-0-10-17-0-10-10-1			Local
	1 1100 111 12						Loodi
1 7 C I ?	Jun 11, 2024 1:26:49 PM						

### Sub6 n25(2)\_15 M\_OBW\_Mid\_BPSK\_FullRB



EYSIGHT Input: RF	+ Input Ζ: 50 Ω	Atten: 20 dB	Tria: Free Run	Center Freq: 1.882500000 GHz	*	Frequency	1 2.5
L + Coupling: DC Align: Auto	Corr CCorr Freq Ref: Int (S)	Preamp: Off	Gate: Off #IF Gain: Low	Avg Hold: 500/500 Radio Std: None	Center Fre 1.8825000		Settings
7 PASS Graph V	NFE: Off				Span		
cale/Div 10.0 dB		Ref LvI Offset 27 Ref Value 40.00			30.000 MH	łz	
og 0.0					CF Step 3.000000	MHz	
0.0 0.0 0.0	Jurnaman	manna marina	ng al an den den ser an		Auto Man		
0.0	1			PE	Freq Offset		
0.0							
enter 1.88250 GHz Res BW 300.00 kHz	.	#Video BW 1.200	00 MHz	Span 30 M Sweep 1.00 ms (1001 p			
Metrics v							
Occupied Bandwidth			-				
	83 MHz		Total Power	30.4 dBm			
Transmit Freq Error x dB Bandwidth	-370.05 k 14.64 M		% of OBW Pow x dB	er 99.00 % -26.00 dB			Local
	Jun 11, 2024 1:27:11 PM	2		🔊 — 🔉			

# Sub6 n25(2)\_15 M\_OBW\_Mid\_QPSK\_FullRB



Spectrum Analyzer 1 Occupied BW	+				Frequency	( ) 器
KEYSIGHT Input: RF RL +++ Coupling: DC Align: Auto	Input Z: 50 Ω Corr CCorr Freq Ref: Int (S) NFE: Off	Atten: 20 dB Preamp: Off	Trig: Free Run Gate: Off #IF Gain: Low	Center Freq: 1.882500000 GHz Avg Hold: 500/500 Radio Std: None	Center Frequency 1.882500000 GHz	Settings
1 Graph 🔻		ef LvI Offset 27			Span 30.000 MHz	
Scale/Div 10.0 dB		ef Value 40.00 o	dBm		CF Step 3.000000 MHz	1
20.0	forman	-	าร์างสาราสารการการการการการการการการการการการการกา	~	Auto Man	
0.00 -10.0 -20.0	m /			PEAK	Freq Offset 0 Hz	.
-30.0 -40.0 -50.0						
Center 1.88250 GHz #Res BW 300.00 kHz	#	Video BW 1.200	0 MHz	Span 30 MHz Sweep 1.00 ms (1001 pts		
2 Metrics						
	520 MHz		Total Power	29.4 dBm		
Transmit Freq Error x dB Bandwidth	-359.85 kH 14.66 MH		% of OBW Pow x dB	ver 99.00 % -26.00 dB		Local
<b>1</b> 7 7 <b>1</b>	<b>?</b> Jun 11, 2024 1:27:33 PM					

# Sub6 n25(2)\_15 M\_OBW\_Mid\_16QAM\_FullRB



Spectrum Analyzer 1 Occupied BW	+				Frequency	- 湯
RL +++ Align: Auto	Input Z: 50 Ω Corr CCorr Freq Ref: Int (S) NFE: Off	Atten: 20 dB Preamp: Off	Trig: Free Run Gate: Off #IF Gain: Low	Center Freq: 1.882500000 GHz Avg Hold: 500/500 Radio Std: None	Center Frequency 1.882500000 GHz	Settings
1 Graph v Scale/Div 10.0 dB		Ref LvI Offset 27 Ref Value 40.00 d			Span 30.000 MHz CF Step	
30.0 20.0 10.0 0.00		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	*****	~	3.000000 MHz Auto Man	
-10.0 -20.0 -30.0 -40.0	ved			1 mmmmumhan	Freq Offset 0 Hz	
-50.0 Center 1.88250 GHz #Res BW 300.00 kHz		ŧVideo BW 1.200	0 MHz	Span 30 l Sweep 1.00 ms (1001		
2 Metrics V						
Occupied Bandwidth 13.4	1 450 MHz		Total Power	28.7 dBm		
Transmit Freq Error x dB Bandwidth	-373.10 kł 14.67 Mł		% of OBW Pow x dB	ver 99.00 % -26.00 dB		Local
	<b>?</b> Jun 11, 2024 1:27:55 PM					

### Sub6 n25(2)\_15 M\_OBW\_Mid\_64QAM\_FullRB



Occupied BW         Input: RF           KEYSIGHT         Input: RF           RL         +++         Coupling: DC           Align: Auto         Align: Auto	Input Z: 50 Ω Corr CCorr Freq Ref: Int (S) NFE: Off	Atten: 20 dB Preamp: Off	Trig: Free Run Gate: Off #IF Gain: Low	Center Freq: 1 882500000 GHz Avg Hold: 500/500 Radio Std: None	Center Frequency 1.882500000 GHz Span	Settings
1 Graph v Scale/Div 10.0 dB		Ref LvI Offset 27 Ref Value 40.00 d			30.000 MHz CF Step 3.000000 MHz Auto	
10.0 0.00 -10.0 -20.0 -30.0 -50.0 -50.0	./			PE	Man Freq Offset 0 Hz	
Center 1.88250 GHz #Res BW 300.00 kHz 2 Metrics ¥	1	#Video BW 1.200	0 MHz	Span 30 M Sweep 1.00 ms (1001 p		
Occupied Bandwidth 13.47	78 MHz		Total Power	26.8 dBm		
Transmit Freq Error x dB Bandwidth	-358.58 kł 14.69 Mł		% of OBW Pow x dB	er 99.00 % -26.00 dB		Local
1 7 C 1 '	Jun 11, 2024 1:28:17 PM				1	

### Sub6 n25(2)\_15 M\_OBW\_Mid\_256QAM\_FullRB



	+				\$	Frequency	- 😤
KEYSIGHT     Input: RF       R L     Imput: RF       Align: Auto		Atten: 20 dB Preamp: Off	Trig: Free Run Gate: Off #IF Gain: Low	Center Freq: 1.882500000 GHz Avg Hold: 500/500 Radio Std: None	Cen	ter Frequency 32500000 GHz	Settings
1 Graph v Scale/Div 10.0 dB	Re	f Lvi Offset 27. f Value 40.00 d			Spar 40.0	n 000 MHz	
Log 30.0 20.0	Ke	r value 40.00 d	BIN			00000 MHz	
10.0	france and the track		and a start of the			Auto Man	
-10.0					PEAK 0 H	Offset z	
-30.0							
Center 1.88250 GHz #Res BW 390.00 kHz		deo BW 1.6000	0 MHz	Span 4 Sweep 1.00 ms (100			
2 Metrics 🔹							
Occupied Bandwidth	35 MHz		Total Power	30.8 dBm			
Transmit Freq Error x dB Bandwidth	-552.69 kHz 19.25 MHz		% of OBW Pow x dB				Local
<b>1</b> 7 7 1	<b>?</b> Jun 11, 2024 1:33:50 PM				X		

### Sub6 n25(2)\_20 M\_OBW\_Mid\_BPSK\_FullRB



Spectrum Analyzer 1 Occupied BW	+					\$	Frequency	- 湯
KEYSIGHT       Input: RF         R L       Coupling: DC         Align: Auto       Align: Auto	Input Z: 50 Ω Corr CCorr Freq Ref: Int (S) NFE: Off	Atten: 20 dB Preamp: Off	Trig: Free Run Gate: Off #IF Gain: Low	Center Freq: 1.882500000 Avg Hold: 500/500 Radio Std: None	) GHz	1.8825	Frequency 00000 GHz	Settings
1 Graph		Ref LvI Offset 27				Span 40.000	MHz	
Scale/Div 10.0 dB		Ref Value 40.00 c	1Bm			CF Step 4.0000	o 00 MHz	
20.0	jumonom		anna an guire an guire an	~~~		Au Ma		
-10.0 -20.0 -30.0	and			Lundellinenser	PEAK	Freq Of 0 Hz	fset	
-40.0								
Center 1.88250 GHz #Res BW 390.00 kHz	+	Video BW 1.600	0 MHz	Sweep 1.00 m	pan 40 MHz s (1001 pts)			
2 Metrics 🔹								
Occupied Bandwidth 17.9	50 MHz		Total Power	30.5 dE	3m			
Transmit Freq Error x dB Bandwidth	-557.51 kł 19.24 Mł		% of OBW Pow x dB	ver 99.00 -26.00				Local
<b>まって</b>	<b>?</b> Jun 11, 2024 1:34:12 PM	ÐA						

# Sub6 n25(2)\_20 M\_OBW\_Mid\_QPSK\_FullRB



Spectrum Analyzer 1 Occupied BW	+				Frequency	· · · · · · · · · · · · · · · · · · ·
KEYSIGHT     Input: RF       RL     Coupling: DC       Align: Auto	Input Z: 50 Ω Corr CCorr Freq Ref: Int (S) NFE: Off	Atten: 20 dB Preamp: Off	Trig: Free Run Gate: Off #IF Gain: Low	Center Freq: 1.882500000 GHz Avg Hold: 500/500 Radio Std: None	Center Frequency 1.882500000 GHz Span	Settings
1 Graph 🔻		ef Lvi Offset 27			40.000 MHz	
Scale/Div 10.0 dB		ef Value 40.00 d	iBm		CF Step 4.000000 MHz	.
20.0 10.0 0.00	manusan	an and a start and a start and a start	and the second	n	Auto Man	
-10.0 -20.0 -30.0	nu -			PEAK	Freq Offset 0 Hz	
-40.0						
Center 1.88250 GHz #Res BW 390.00 kHz	#	Video BW 1.600	0 MHz	Span 40 MH Sweep 1.00 ms (1001 pts		
2 Metrics						
17.9	51 MHz		Total Power	29.6 dBm		
Transmit Freq Error x dB Bandwidth	-549.40 kH 19.27 MH		% of OBW Pow x dB	ver 99.00 % -26.00 dB		Local
<b>1</b> 500	<b>?</b> Jun 11, 2024 1:34:34 PM					

# Sub6 n25(2)\_20 M\_OBW\_Mid\_16QAM\_FullRB



Spectrum Analyzer 1 Occupied BW	+				Frequency	- <b>·</b> 🔀
KEYSIGHT       Input: RF         RL       →→       Coupling: DC         Align: Auto       Align: Auto	Input Z: 50 Ω Corr CCorr Freq Ref: Int (S) NFE: Off	Atten: 20 dB Preamp: Off	Trig: Free Run Gate: Off #IF Gain: Low	Center Freq: 1.882500000 GHz Avg Hold: 500/500 Radio Std: None	Center Frequency 1.882500000 GHz	Settings
1 Graph v Scale/Div 10.0 dB	R	ef LvI Offset 27 ef Value 40.00 (			Span 40.000 MHz CF Step 4.000000 MHz	
10.0 0.00 -10.0 -20.0 -30.0 -40.0	een la			an and a second and a second s	Man Freq Offset	
-50.0 Center 1.88250 GHz #Res BW 390.00 kHz 2 Metrics	#	Video BW 1.600	00 MHz	Span 40 M Sweep 1.00 ms (1001 p		
Occupied Bandwidth	25 MHz		Total Power	29.1 dBm		
Transmit Freq Error x dB Bandwidth	-563.01 kH 19.20 MH		% of OBW Pow x dB	ver 99.00 % -26.00 dB		Local
	<b>?</b> Jun 11, 2024 1:34:55 PM				< l	

### Sub6 n25(2)\_20 M\_OBW\_Mid\_64QAM\_FullRB



Spectrum Analyzer 1 Decupied BW KEYSIGHT RL +	Input Z: 50 Ω Corr CCorr Freq Ref: Int (S) NFE: Off	Atten: 20 dB Preamp: Off	Trig: Free Run Gate: Off #IF Gain: Low	Center Freq: 1 Avg Hold: 500 Radio Std: No			Frequency Trequency 00000 GHz	Settings
Oraph         V           Scale/Div 10.0 dB         0           30.0         0           20.0         0	1.001.000.000	Ref LvI Offset 27 Ref Value 40.00 o				Span 40.000 CF Step 4.00000	00 MHz	
10.0 0.00 20.0 30.0 40.0 50.0	mm				PEAK	Freq Off 0 Hz	ī	
Center 1.88250 GHz Res BW 390.00 kHz 2 Metrics		#Video BW 1.600	00 MHz	Swee	Span 40 MHz ep 1.00 ms (1001 pts)			
Occupied Bandwid	tth 7.892 MHz		Total Power		27.0 dBm			
Transmit Freq Erro x dB Bandwidth	or -502.24 k 19.22 M		% of OBW Pow x dB	ver	99.00 % -26.00 dB			Local
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# Sub6 n25(2)\_20 M\_OBW\_Mid\_256QAM\_FullRB





### Sub6 n25(2)\_5 M\_Conducted Spurious(30 M-10 G)\_Low\_BPSK\_1RB





### Sub6 n25(2)\_5 M\_Conducted Spurious(30 M-10 G)\_Mid\_BPSK\_1RB





#### Sub6 n25(2)\_5 M\_Conducted Spurious(30 M-10 G)\_High\_BPSK\_1RB





#### Sub6 n25(2)\_10 M\_Conducted Spurious(30 M-10 G)\_Low\_BPSK\_1RB





### Sub6 n25(2)\_10 M\_Conducted Spurious(30 M-10 G)\_Mid\_BPSK\_1RB





# Sub6 n25(2)\_10 M\_Conducted Spurious(30 M-10 G)\_High\_BPSK\_1RB





### Sub6 n25(2)\_15 M\_Conducted Spurious(30 M-10 G)\_Low\_BPSK\_1RB





# Sub6 n25(2)\_15 M\_Conducted Spurious(30 M-10 G)\_Mid\_BPSK\_1RB





#### Sub6 n25(2)\_15 M\_Conducted Spurious(30 M-10 G)\_High\_BPSK\_1RB





### Sub6 n25(2)\_20 M\_Conducted Spurious(30 M-10 G)\_Low\_BPSK\_1RB





#### Sub6 n25(2)\_20 M\_Conducted Spurious(30 M-10 G)\_Mid\_BPSK\_1RB





# Sub6 n25(2)\_20 M\_Conducted Spurious(30 M-10 G)\_High\_BPSK\_1RB



Spectrum Analyzer Swept SA	1,	F	3		= 34	1997 - 1997 - 19	₽	Frequency	- 1
	out: RF oupling: DC gn: Auto	Input Z: 50 Ω Corr CCorr Freq Ref: Int (S) NFE: Off	#Atten: 0 dB Preamp: Off	PNO: Fast Gate: Off IF Gain: High Sig Track: Off		2 3 4 5 6 WWWWW A A A A A A	Center Fre		Settings
Spectrum	•		Ref Level -20.00	dBm	Mkr1 19.983	50 GHz	Span 10.000000		
.og							Swept Zero S		
40.0							Full Start Freq	Span	
							10.00000	0000 GHz	
							Stop Freq 20.00000	0000 GHz	
70.0						1		TUNE	
30.0						Ring	CF Step 1.000000	000 GHz	
							Auto Man		
							Freq Offse 0 Hz		
tart 10.000 GHz Res BW 1.0 MHz			#Video BW 3.0	MHz	Stop Sweep ~20.4 ms	20.000 GHz (40000 pts)	X Axis Sca Log Lin	le	Local
100	2 2	Jun 11, 2024 1:11:22 PM					Signal Trac (Span Zoorr		

# Sub6 n25(2)\_5 M\_Conducted Spurious(Above10 G)\_Low\_BPSK\_1RB



Spectrum Analy Swept SA	zer 1	+	3				Frequer	cy v 🔀
REYSIGHT	Input: RF Coupling: DC Align: Auto	Input Z: 50 Ω Corr CCorr Freq Ref: Int (S) NFE: Off	#Atten: 0 dB Preamp: Off	PNO: Fast Gate: Off IF Gain: High Sig Track: Off	#Avg Type: Power (F Trig: Free Run	RMS <mark>123456</mark> A WW WW W A A A A A A	Center Frequency 15.000000000 GHz	Settings
1 Spectrum Scale/Div 10 dl	₹ B	1	Ref Level -20.00	dBm		.982 75 GHz 82.128 dBm	Span 10.0000000 GHz Swept Span	
-30.0							Zero Span Full Span	
-40.0							Start Freq 10.00000000 GHz	
-50.0							Stop Freq 20.000000000 GHz	
-70.0							AUTO TUNE	
-80.0						_1	CF Step 1.00000000 GHz	
-90.0							Auto Man	
-110							Freq Offset 0 Hz	
Start 10.000 GH #Res BW 1.0 M			#Video BW 3.0	MHz		Stop 20.000 GHz 4 ms (40000 pts)	X Axis Scale Log Lin	Local
<b>エ</b> り (		Jun 11, 2024 1:15:15 PM	$\mathbb{D}$				Signal Track (Span Zoom)	

# Sub6 n25(2)\_5 M\_Conducted Spurious(Above10 G)\_Mid\_BPSK\_1RB



Spectrum Analyz Swept SA	zer 1	+	-				<b>Ö</b>	Frequency	- <b>1</b> 🎇
	Input: RF Coupling: DC Align: Auto	Input Z: 50 Ω Corr CCorr Freq Ref: Int (S) NFE: Off	#Atten: 0 dB Preamp: Off	PNO: Fast Gate: Off IF Gain: High Sig Track: Off	#Avg Type: Powe Trig: Free Run	ar (RMS <mark>123456</mark> A WW WW W A A A A A A A	Center Free 15.000000		Settings
1 Spectrum Scale/Div 10 dE	¥ 3		Ref Level -20.00	dBm	Mkr1 1	19.201 23 GHz -82.219 dBm	Span 10.000000 Swept	Span	
-30.0							Zero S Full :	ipan Span	
-40.0							Start Freq 10.000000	000 GHz	
-60.0							Stop Freq 20.000000		
80.0						↓1 -rms	CF Step 1.0000000	TUNE	
-100	a shin ann a shin a sa						Auto Man		
							Freq Offset 0 Hz X Axis Scal		Local
Start 10.000 GH #Res BW 1.0 M		Jun 11, 2024	#Video BW 3.0	MHz	Sweep ~2	Stop 20.000 GHz 20.4 ms (40000 pts)	Log Lin Signal Trac		
		1:17:04 PM					(Span Zoom		

# Sub6 n25(2)\_5 M\_Conducted Spurious(Above10 G)\_High\_BPSK\_1RB



Vept SA EYSIGHT Input: RF L ↔ Coupling: DC Align: Auto	Input Z: 50 Ω #Atten: 0 dB Corr CCorr Preamp: Off Freq Ref: Int (S) NFE: Off	PNO: Fast Gate: Off IF Gain: High Sig Track: Off	#Avg Type: Power (RMS 1 2 3 4 5 Trig: Free Run A WWWW A A A A A	15.00000000 GHz	ttings
Spectrum v cale/Div 10 dB	Ref Level -20	0.00 dBm	Mkr1 19.989 00 GF -82.697 dB	10.000000 Of iL	
0.0				Full Span Start Freq 10.00000000 GHz	
0.0				Stop Freq 20.00000000 GHz	
0.0			R.	CF Step 1.00000000 GHz Auto Man	
00 110 art 10.000 GHz	#Video BW	3.0 MHz	Stop 20.000 G	Freq Offset 0 Hz X Axis Scale	Loca

### Sub6 n25(2)\_10 M\_Conducted Spurious(Above10 G)\_Low\_BPSK\_1RB



Spectrum Analy Swept SA	vzer 1	+					Frequen	oy T 🔆
KEYSIGHT RL +→-•	Input: RF Coupling: DC Align: Auto	Input Z: 50 Ω Corr CCorr Freq Ref: Int (S) NFE: Off	#Atten: 0 dB Preamp: Off	PNO: Fast Gate: Off IF Gain: High Sig Track: Off	#Avg Type: Power (RMS123 Trig: Free Run AWW A A A		enter Frequency 15.000000000 GHz	Settings
1 Spectrum Scale/Div 10 d	₹ B		Ref Level -20.00	dBm	Mkr1 19.476 74 -82.302	GHz 1	pan 10.0000000 GHz Swept Span	
						-1	Zero Span Full Span	
40.0 50.0						1	tart Freq 10.000000000 GHz top Freq	
							AUTO TUNE	
30.0			ورور ومعاله از دو معالی	Nearth and the state of the sta			F Step 1.000000000 GHz	
100						E	Auto Man req Offset	
-110	Hz		#Video BW 3.0	MHz	Stop 20.00		) Hz Axis Scale Log	Local
#Res BW 1.0 M		Jun 11, 2024 1:22:14 PM	ÐA		Sweep ~20.4 ms (4000	00 pts)	Ignal Track	

### Sub6 n25(2)\_10 M\_Conducted Spurious(Above10 G)\_Mid\_BPSK\_1RB



Spectrum Analy: Swept SA		+					₽	Frequency	- 1 ※
	Input: RF Coupling: DC Align: Auto	Input Z: 50 Ω Corr CCorr Freq Ref: Int (S) NFE: Off	#Atten: 0 dB Preamp: Off	PNO: Fast Gate: Off IF Gain: High Sig Track: Off	#Avg Type: Power (RM Trig: Free Run	5 1 2 3 4 5 6 A WW WW W A A A A A A A	Researces	equency 00000 GHz	Settings
I Spectrum Scale/Div 10 dl	₹ B		Ref Level -20.00	dBm	Mkr1 19.49 -82	6 49 GHz .485 dBm	Span 10.00000	000 GHz ot Span	
.og 30.0								Span I Span	
40.0 50.0							Start Free 10.0000	l 00000 GHz	
							Stop Fred 20.0000	00000 GHz	
							AUT CF Step	O TUNE	
							1.000000 Auto Man	0000 GHz	
							Freq Offs 0 Hz	et	
tart 10.000 GF Res BW 1.0 M			#Video BW 3.0	MHz	Sto Sweep ~20.4 m	p 20.000 GHz s (40000 pts)	X Axis Sc Log Lin	ale	Local
まし		Jun 11, 2024 1:24:04 PM					Signal Tra (Span Zoo		

# Sub6 n25(2)\_10 M\_Conducted Spurious(Above10 G)\_High\_BPSK\_1RB



Spectrum Analyz Swept SA	zer 1	+					Frequency	- 1 器	
EYSIGHT Input: RF L ++ Coupling: DC Align: Auto		Input Z: 50 Ω Corr CCorr Freq Ref: Int (S) NFE: Off	orr Preamp: Off Gate: Off : Int (S) IF Gain: I		Trig: Free Run A WW WW W		Frequency 000000 GHz	Settings	
I Spectrum Scale/Div 10 dE	3		Ref Level -20.00	dBm	Mkr1 19.536 49 GF -82.725 dB	m Sw	0000 GHz ept Span		
30.0 40.0						F	ro Span 'ull Span		
						Start Fr 10.000 Stop Fr	000000 GHz		
							000000 GHz		
80.0 90.0						CF Step 1.0000	00000 GHz		
100						Freq Of 0 Hz	n		
tart 10.000 GH Res BW 1.0 MI			#Video BW 3.0	MHz	Stop 20.000 G Sweep ~20.4 ms (40000 p	Hz X Axis S	g	Local	
ר <b>ד</b>	2	<b>?</b> Jun 11, 2024 1:26:07 PM				Signal 1 (Span Ze	rack .		

### Sub6 n25(2)\_15 M\_Conducted Spurious(Above10 G)\_Low\_BPSK\_1RB



Spectrum Analy Swept SA	/zer 1	+	-				\$	Frequency	· • 🔀
KEYSIGHT	Input: RF Coupling: DC Align: Auto	Input Z: 50 Ω Corr CCorr Freq Ref: Int (S) NFE: Off	#Atten: 0 dB Preamp: Off	PNO: Fast Gate: Off IF Gain: High Sig Track: Off	#Avg Type: Power (RM Trig: Free Run	ANC 1 2 3 4 5 6 AWWWWW AAAAAA	The second	equency 0000 GHz	Settings
1 Spectrum Scale/Div 10 di	¥ B		Ref Level -20.00	dBm		21 74 GHz 2.596 dBm	Span 10.00000 Swep	00 GHz It Span	
-30.0							Zero Ful	Span Span	
-40.0							Start Freq 10.00000	0000 GHz	
							Stop Freq 20.00000	0000 GHz	
-70.0						<b>↓</b> 1. <sub>19</sub>	AUTO CF Step	DTUNE	
-100	~~~~~	and the second secon					1.000000 Auto Man	000 GHz	
-110							Freq Offse 0 Hz	et	
Start 10.000 GH #Res BW 1.0 M			#Video BW 3.0	MHz		op 20.000 GHz ns (40000 pts)	X Axis Sca Log Lin	ale	Local
<b>ま</b> り (	<b>ا</b> ا	<b>?</b> Jun 11, 2024 1:29:16 PM					Signal Tra (Span Zoor		

### Sub6 n25(2)\_15 M\_Conducted Spurious(Above10 G)\_Mid\_BPSK\_1RB



Spectrum Analy Swept SA		+ Input Z: 50 Ω	#Atten: 0 dB	PNO: Fast	#Avg Type: Power (RMS	2 3 4 5 6		Frequency	عقار
21	Coupling: DC Align: Auto	Corr CCorr Freq Ref: Int (S) NFE: Off	Preamp: Off	Gate: Off IF Gain: High Sig Track: Off	Trig: Free Run		Restances	equency 00000 GHz	Settings
Spectrum cale/Div 10 dl	•		Ref Level -20.00	dBm	Mkr1 19.512	49 GHz 84 dBm	Long bearing	000 GHz	
.og								pt Span Span	
0.0							Fu Start Free	ll Span	
							10.0000	00000 GHz	
							Stop Free 20.0000	4 00000 GHz	
0.0						<b>1</b> .₁s		O TUNE	
							CF Step 1.00000 Auto	0000 GHz	
100							Freq Offs		
							0 Hz		Local
tart 10.000 GF Res BW 1.0 M			#Video BW 3.0	MHz	Stop 2 Sweep ~20.4 ms (	0.000 GHz 40000 pts)	X Axis So Log Lin	ale	LOCA
150		Jun 11, 2024 1:31:05 PM	$\bullet \Delta$				Signal Tr (Span Zoo		

# Sub6 n25(2)\_15 M\_Conducted Spurious(Above10 G)\_High\_BPSK\_1RB



Spectrum Analy Swept SA	zer 1	+			= 344		<b>‡</b>	Frequency	- <b>·</b> 🛞
	Input: RF Coupling: DC Align: Auto	Input Z: 50 Ω Corr CCorr Freq Ref: Int (S) NFE: Off	#Atten: 0 dB Preamp: Off	PNO: Fast Gate: Off IF Gain: High Sig Track: Off		2 3 4 5 6	Center Free 15.000000		Settings
1 Spectrum Scale/Div 10 dB	3		Ref Level -20.00	dBm	Mkr1 19.500 -82.54	74 GHz 49 dBm	Span 10.000000 Swept Zero S	Span	
-30.0							Full Start Freq		
							10.000000 Stop Freq		
							20.000000 AUTO		
-80.0	·					1	CF Step 1.0000000 Auto	00 GHz	
							Man Freq Offset 0 Hz		
Start 10.000 GF #Res BW 1.0 M			#Video BW 3.0	MHz	Stop 2 Sweep ~20.4 ms (4	0.000 GHz 40000 pts)	X Axis Scal Log Lin	•	Local
<b>ま</b> り (		<b>?</b> Jun 11, 2024 1:33:08 PM	€∆				Signal Trac (Span Zoom)		

# Sub6 n25(2)\_20 M\_Conducted Spurious(Above10 G)\_Low\_BPSK\_1RB



Spectrum Analyz Swept SA	er 1	+	-			5-1-5 (C)	\$	Frequency	<ul> <li>▼ S<sup>2</sup></li> </ul>
	nput: RF Coupling: DC Nign: Auto	Input Z: 50 Ω Corr CCorr Freq Ref: Int (S) NFE: Off	#Atten: 0 dB Preamp: Off	PNO: Fast Gate: Off IF Gain: High Sig Track: Off	#Avg Type: Powe Trig: Free Run	er (RMS <mark>123456</mark> A <del>WW WW W</del> A A A A A A A	Center Fre 15.000000		Settings
1 Spectrum Scale/Div 10 dB	*		Ref Level -20.00	dBm	Mkr1 1	19.981 50 GHz -82.615 dBm	Span 10.000000 Swept		
-30.0			ļ.				Zero S		
-40.0							Start Freq 10.000000		
-50.0							Stop Freq 20.000000	000 GHz	
-70.0								TUNE	
-80.0	-					Rock,	CF Step 1.0000000	00 GHz	
-100							Man Freq Offset		
-110							0 Hz X Axis Sca	e	Local
Start 10.000 GH: #Res BW 1.0 MH		Jun 11, 2024 🧹	#Video BW 3.0	MHZ	Sweep ~2	Stop 20.000 GHz 20.4 ms (40000 pts)	Log Lin Signal Trac		
		1:36:15 PM					(Span Zoom		

### Sub6 n25(2)\_20 M\_Conducted Spurious(Above10 G)\_Mid\_BPSK\_1RB