

## RF Test Report

Applicant : Getac Technology Corporation

Product Name : 5G NR Module

Trade Name : Telit

Model Number : FN990A28

Applicable Standard : FCC 47 CFR PART 96  
ANSI C63.26 2015

Received Date : Apr. 29, 2024

Test Period : Apr. 29, 2024

Issued Date : May 06, 2024

### Issued by

Eurofins E&E Wireless Taiwan Co., Ltd.  
No. 140-1, Changan Street, Bade District,  
Taoyuan City 334025, Taiwan (R.O.C.)  
Tel : +886-3-2710188 / Fax : +886-3-2710190



Taiwan Accreditation Foundation accreditation number: 1330  
Frequency Range: 9 kHz to 40 GHz  
Bade test site :  
Test Firm Registration Number: 226252  
Test Firm Designation Number: TW0010  
Wugu test site :  
Test Firm Registration Number: 191812  
Test Firm Designation Number: TW0034

### Note:

- 1.The test results are valid only for samples provided by customers and under the test conditions described in this report.
- 2.This report shall not be reproduced except in full, without the written approval of Eurofins E&E Wireless Taiwan Co., Ltd.
- 3.The relevant information is provided by customers in this test report. According to the correctness, appropriateness or completeness of the information provided by the customer, if there is any doubt or error in the information which affects the validity of the test results, the laboratory does not take the responsibility.

**Revision History**

Rev.	Issued Date	Description	Revised by
00	May 06, 2024	Initial Issue	Snow Wang

## Verification of Compliance

Applicant : Getac Technology Corporation

Product Name : 5G NR Module

Trade Name : Telit

Model Number : FN990A28

FCC ID : QYLFN990ZX8

Applicable Standard : FCC 47 CFR PART 96  
 ANSI C63.26 2015

Test Result : Complied

Performing Lab. : Eurofins E&E Wireless Taiwan Co., Ltd.  
 No. 140-1, Changan Street, Bade District,  
 Taoyuan City 334025, Taiwan (R.O.C.)  
 Tel : +886-3-2710188 / Fax : +886-3-2710190



Taiwan Accreditation Foundation accreditation number: 1330

Eurofins E&E Wireless Taiwan Co., Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by Eurofins E&E Wireless Taiwan Co., Ltd. based on interpretations and/or observations of test results. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Approved By : \_\_\_\_\_

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### Appendix A. Test Setup Photographs

# 1 General Information

## 1.1. Summary of Test Result

§2.1046	Description	Result
§96.41(b)	Conducted Output Average Power	N/A (Note 2)
§2.1055	Equivalent Isotropic Radiated Power / Equivalent Radiated Power	N/A (Note 1)
§2.1049	Frequency Stability	N/A (Note 1)
§96.41(g)	Emission Bandwidth & Occupied Bandwidth	N/A (Note 1)
§2.1051 §96.41(e)	Peak to average power ratio	N/A (Note 1)
§2.1051 §96.41(e)	Band Edge	N/A (Note 1)
§2.1053 §96.41(e)	Conducted Spurious Emissions	N/A (Note 1)
§2.1046	Radiated Spurious Emissions	Pass (Note 2)

Note 1: No need for verification.

Note 2: Due to software update, the n48 power has been reduced, and the Conducted Output Average Power and Radiated Spurious Emissions need to be re-measured.

Decision Rule

- Uncertainty is not included.
- Uncertainty is included.

## 1.2. Testing Location

Lab Name: Eurofins E&E Wireless Taiwan Co., Ltd.

Site Address:  No. 140-1, Changan Street, Bade District, Taoyuan City 334025, Taiwan (R.O.C.)

Site Address:  No. 2, Wuquan 5th Rd. Wugu Dist., New Taipei City, Taiwan (R.O.C.)

### 1.3. Measurement Uncertainty

Parameter	Uncertainty			
	96601-BD	96603-BD	96602-WG	96603-WG
Radiated Emission	6.3 dB	6.3 dB	6.3 dB	6.3 dB

### 1.4. Test Site Environment

Items	Required (IEC 68-1)	Interval(*)
Temperature (°C)	15-35	20-30
Humidity (%RH)	25-75	45-75

(\*)The measurement ambient temperature is within this range.

## 2 EUT Description

The product specifications of the EUT presented in the report are declared by the manufacturer who shall take full responsibility for the authenticity.

Applicant	Getac Technology Corporation 5F., Building A, No. 209, Sec. 1, Nangang Rd., Nangang Dist., Taipei City, 115018, Taiwan
Product Name	5G NR Module
Trade Name	Telit
Model Number	FN990A28
FCC ID	QYLFN990ZX8
IMEI No.	352382410000133
Operate Temp. Range	-10 ~ +50 °C
EUT Power Rating	DC 12 V, 3 A

5G NR	
Operation Band (NR):	<input type="checkbox"/> n2 <input type="checkbox"/> n5 <input type="checkbox"/> n7 <input type="checkbox"/> n12
	<input type="checkbox"/> n25 <input type="checkbox"/> n26 <input type="checkbox"/> n14 <input type="checkbox"/> n30
	<input type="checkbox"/> n38 <input type="checkbox"/> n40 <input type="checkbox"/> n41 <input checked="" type="checkbox"/> n48
	<input type="checkbox"/> n66 <input type="checkbox"/> n70 <input type="checkbox"/> n71 <input type="checkbox"/> n77
	<input type="checkbox"/> n78 <input type="checkbox"/> n79
Support type:	<input checked="" type="checkbox"/> Standalone <input checked="" type="checkbox"/> EN-DC
	<input checked="" type="checkbox"/> CA-UL <input checked="" type="checkbox"/> CA-DL <input type="checkbox"/> MIMO-UL
Modulation type:	<input checked="" type="checkbox"/> DFT-s-OFDM                      PI/2-BPSK, QPSK, 16QAM, 64QAM, 256QAM
	<input checked="" type="checkbox"/> CP-OFDM                      QPSK, 16QAM, 64QAM, 256QAM
Power Class:	<input checked="" type="checkbox"/> Class 3 <input type="checkbox"/> Class 2 ()

EUT Modify Description :

Modify Description:

C2PC

reduce n48 power because of software update

After the verification of Output Power and worst cast of Transmitter Radiated Emissions, all test data can be referred to the original report.

## 2.1. Product Specification of Equipment Under Test

Main Antenna:

Band	Antenna Type	Gain (dBi)	Note
n48	PIFA Antenna	2.66	---

Channel Bandwidth:

5G FR1 Bands																
Bands	Support Power Class	Support Mode	Support / Non supportive	SCS (kHz)	Channel bandwidth (MHz)											
					5	10	15	20	25	30	40	50	60	70	80	90
n48	3	SA&NSA	Support	30	X	V	X	V	X	X	V	X	X	X	X	X



## 2.2. Mode of Operation

Eurofins has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

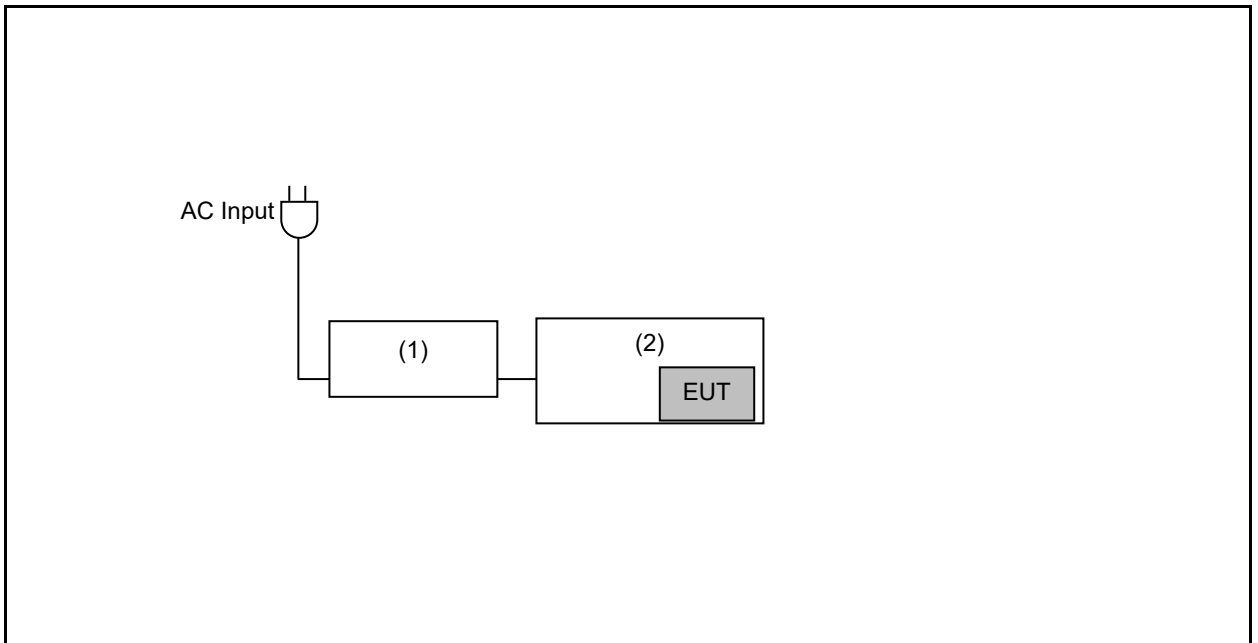
Test Mode
n48

Note: Radiated Spurious Emissions Only worst case scenarios are shown.

## 2.3. EUT Test Step

1	Setup the EUT shown on "Configuration of Test System Details".
2	Turn on the power of all equipment.
3	EUT run test program test.

## 2.4. Configuration of Test System Details



Devices Description					
	Product	Manufacturer	Model Number	Serial Number	Power Cord
(1)	Adapter	FSP	FSP065-D3MR3C	---	---
(2)	Tablet	Getac	ZX80	---	---

## 2.5. Test Instruments

For Radiated Emissions  
 Test Period: Apr. 29, 2024  
 Testing Engineer: Jason Yeh

Radiation test sites		Semi Anechoic Room 96603-WG				
Use	Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
<input checked="" type="checkbox"/>	LOOP Antenna (9 kHz~30 MHz)	Schwarzbeck Mess-Elektronik	FMZB 1513-60	00031	Feb. 23, 2024	1 year
<input checked="" type="checkbox"/>	Trilog Broadband Antenna (30 kHz~1 GHz)	Schwarzbeck Mess-Elektronik	VULB9168	1276	Feb. 02, 2024	1 year
<input checked="" type="checkbox"/>	Broadband Horn Antenna (1 GHz~18 GHz)	RF SPIN	DRH18-E	210307A18ES	Dec. 15, 2023	1 year
<input checked="" type="checkbox"/>	Broadband Horn Antenna (15 GHz~40 GHz)	Schwarzbeck Mess-Elektronik	BBHA9170	1133	Jan. 18, 2024	1 year
<input checked="" type="checkbox"/>	Spectrum Analyzer (2 Hz~50 GHz)	KEYSIGHT	N9030B	MY57153537	Apr. 18, 2023	1 year
<input checked="" type="checkbox"/>	Radio Communication Analyzer	Anritsu	MT8000A	6272524702	Sep. 06, 2023	1 year
<input checked="" type="checkbox"/>	Pre-Amplifier	EMCI	EMC001330	980859	Nov. 29, 2023	1 year
<input checked="" type="checkbox"/>	Pre-Amplifier	EMCI	EMC118A45SE	980818	Dec. 15, 2023	1 year
<input checked="" type="checkbox"/>	Pre-Amplifier	EMCI	EMC184045SE	980861	Dec. 21, 2023	1 year
<input checked="" type="checkbox"/>	Coaxial Cable (10 kHz~3000 MHz)	EMCI	EMCCFD400-NM-NM-2000	211009	Dec. 28, 2023	1 year
<input checked="" type="checkbox"/>	Coaxial Cable (10 kHz~3000 MHz)	EMCI	EMCCFD400-NM-NM-2000	211010	Dec. 28, 2023	1 year
<input checked="" type="checkbox"/>	Coaxial Cable (10 kHz~3000 MHz)	EMCI	EMCCFD400-NM-NM-6000	211018	Dec. 28, 2023	1 year
<input checked="" type="checkbox"/>	Coaxial Cable (1 GHz~18 GHz)	EMCI	EMC104-SM-SM-1000	211029	Dec. 28, 2023	1 year
<input checked="" type="checkbox"/>	Coaxial Cable (1 GHz~18 GHz)	EMCI	EMC104-SM-SM-2000	211033	Dec. 28, 2023	1 year
<input checked="" type="checkbox"/>	Coaxial Cable (1 GHz~18 GHz)	EMCI	EMC104-SM-SM-8000	211038	Dec. 28, 2023	1 year
<input checked="" type="checkbox"/>	Coaxial Cable (18 GHz~40 GHz)	EMCI	EMC101G-KM-KM-600	211211	Dec. 28, 2023	1 year
<input checked="" type="checkbox"/>	Coaxial Cable (18 GHz~40 GHz)	EMCI	EMC101G-KM-KM-2000	211210	Dec. 28, 2023	1 year
<input checked="" type="checkbox"/>	Coaxial Cable (18 GHz~40 GHz)	EMCI	EMC101G-KM-KM-6000	211209	Dec. 28, 2023	1 year
<input checked="" type="checkbox"/>	Highpass Filter	Warison	WFIL-H6000-26500F	WR4BBFWC4B1	Nov. 13, 2023	1 year
<input checked="" type="checkbox"/>	Software	R_RAM	V1.3	N/A	N.C.R.	---

Note: N.C.R. = No Calibration Request

### 3 Measurement Procedure

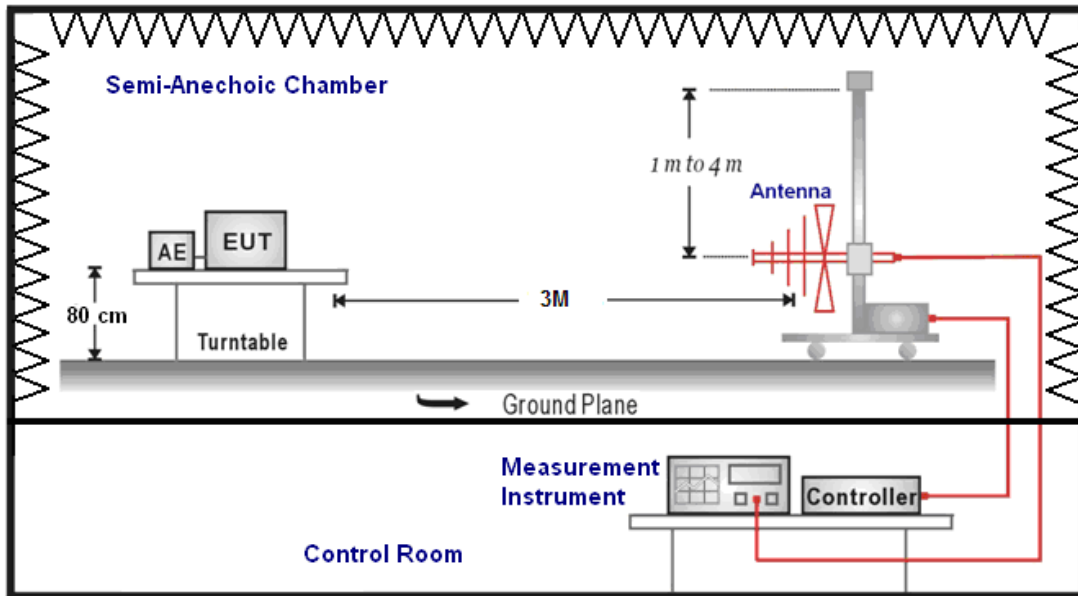
#### 3.1. Radiated Emission Test

■ **Limit**

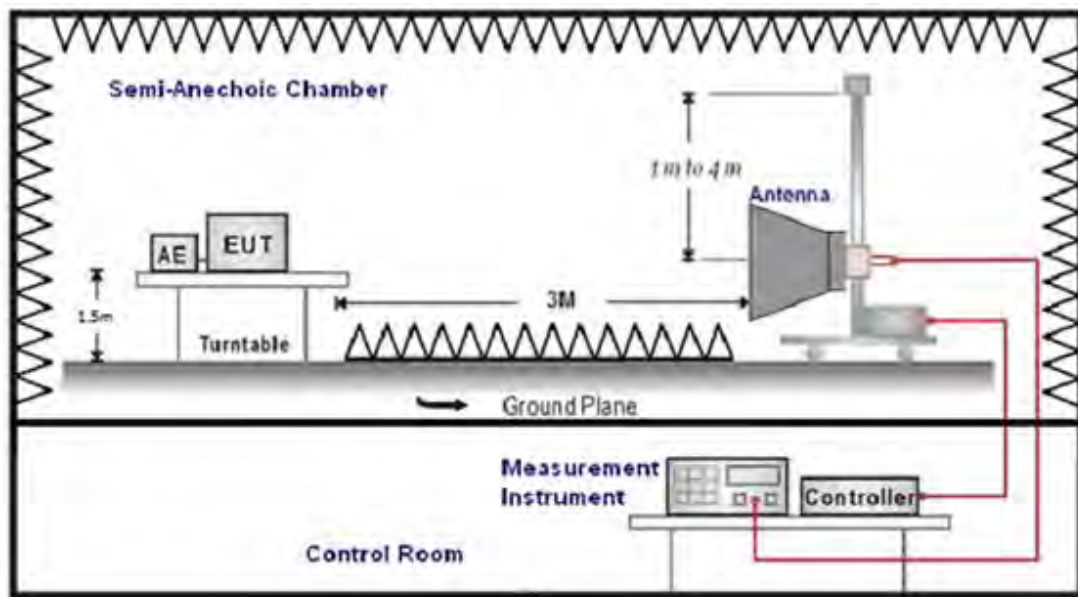
The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log_{10}(P)$  dB. The limit of emission equal to -13 dBm.

■ **Setup**

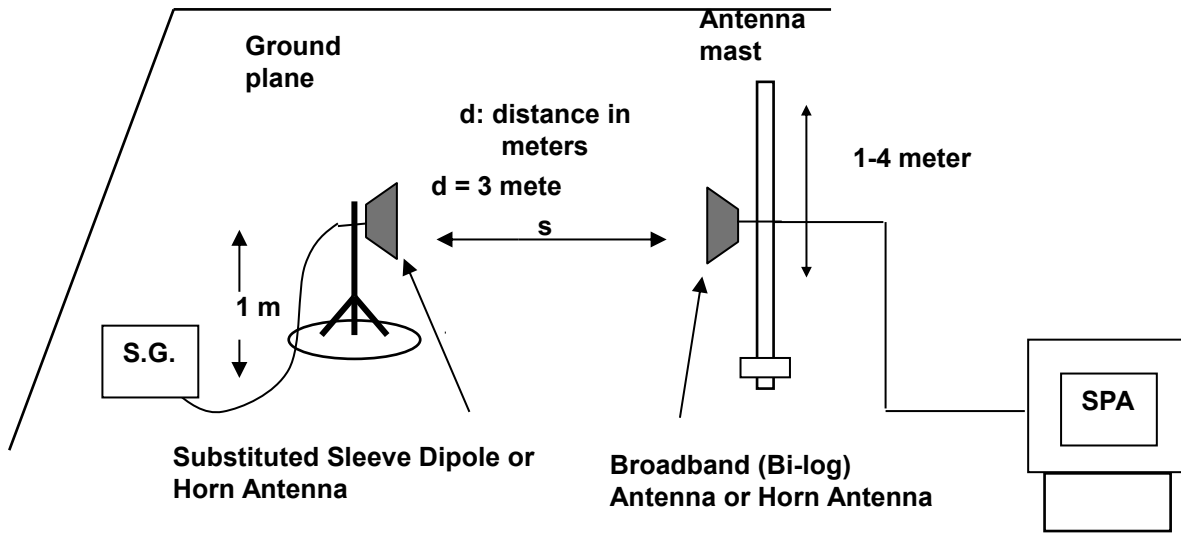
Below 1 GHz



Above 1 GHz



For Substituted Method Test Set-UP



■ Test Procedure

- a. The EUT was set up for the maximum power with WWAN link data modulation. The power was measured with Spectrum Analyzer. All measurements were done at 3 channels (low, middle and high operational frequency range).
- b. Radiation Emission measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m (1.5 m for above 1 GHz) height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1 m to 4 m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
- c. The substitution antenna (Note:1 & 2) is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value” of step a. Record the power level of S.G.
- d. E.I.R.P. = Output power level of S.G - TX cable loss + Antenna gain of substitution horn
- e. E.R.P. = E.I.R.P- 2.15 dB
- f. Measurement range 9 kHz - 10 th Harmonic

Note: 1. Below 1 GHz Substituted Method Test : Sleeve dipole antenna to Bi-Log Antenna

2. Above 1 GHz Substituted Method Test : Horn antenna to Horn Antenna

## 4 Test Results

### 4.1. Conducted Output Average Power

NR n48 Maximum Average Power [dBm] (Gain=2.66 dB)								
Maximum Average Power (dBm)				MAX EIRP Power (dBm)	Modulation	Bandwidth	# of Resource Blocks	Resource Block Offset
638000	640444	642888	645332	Channel				
3570	3606.66	3643.32	3679.98	Freq. (MHz)				
19.32	19.26	19.36	19.31	22.05	DFT-S $\pi/2$ BPSK	40MHz	1	1
19.14	19.20	19.25	19.06		DFT-S $\pi/2$ BPSK	40MHz	1	104
19.27	19.22	19.29	19.20		DFT-S $\pi/2$ BPSK	40MHz	50	28
18.77	18.56	18.81	18.74		DFT-S $\pi/2$ BPSK	40MHz	50	56
18.31	18.06	18.35	18.26		DFT-S $\pi/2$ BPSK	40MHz	100	0
19.36	19.38	19.39	19.32		DFT-S QPSK	40MHz	1	1
19.33	19.14	19.15	19.31		DFT-S QPSK	40MHz	1	104
19.34	19.18	19.36	19.32		DFT-S QPSK	40MHz	50	28
18.43	18.29	18.10	18.36		DFT-S QPSK	40MHz	50	56
18.24	18.25	18.01	18.21		DFT-S QPSK	40MHz	100	0

Total EIRP power is less than partial EIRP Limit 23 dBm/40MHz.  
 EIRP (dBm)=Max Output Power (dBm) + Antenna Gain (dBi)

NR n48 Maximum Average Power [dBm] (Gain=2.66 dB)								
Maximum Average Power (dBm)				MAX EIRP Power (dBm)	Modulation	Bandwidth	# of Resource Blocks	Resource Block Offset
637334	640220	643114	646000	Channel				
3560.01	3603.3	3646.71	3690	Freq. (MHz)				
19.35	19.19	19.34	19.33	22.02	DFT-S $\pi/2$ BPSK	20MHz	1	1
19.09	19.19	19.18	18.96		DFT-S $\pi/2$ BPSK	20MHz	1	26
19.13	19.11	19.17	19.04		DFT-S $\pi/2$ BPSK	20MHz	1	49
18.74	18.59	18.69	18.67		DFT-S $\pi/2$ BPSK	20MHz	25	0
19.19	19.16	19.22	19.19		DFT-S $\pi/2$ BPSK	20MHz	25	13
18.71	18.48	18.74	18.70		DFT-S $\pi/2$ BPSK	20MHz	25	26
18.26	17.98	18.31	18.16		DFT-S $\pi/2$ BPSK	20MHz	50	0
19.36	19.28	19.28	19.10		DFT-S QPSK	20MHz	1	1
19.32	19.09	19.22	19.18		DFT-S QPSK	20MHz	1	26
19.27	19.12	19.05	19.26		DFT-S QPSK	20MHz	1	49
18.29	18.23	18.25	18.30		DFT-S QPSK	20MHz	25	0
19.25	19.15	19.33	19.25		DFT-S QPSK	20MHz	25	13
18.34	18.22	18.02	18.29		DFT-S QPSK	20MHz	25	26
18.24	18.16	17.91	18.14		DFT-S QPSK	20MHz	50	0

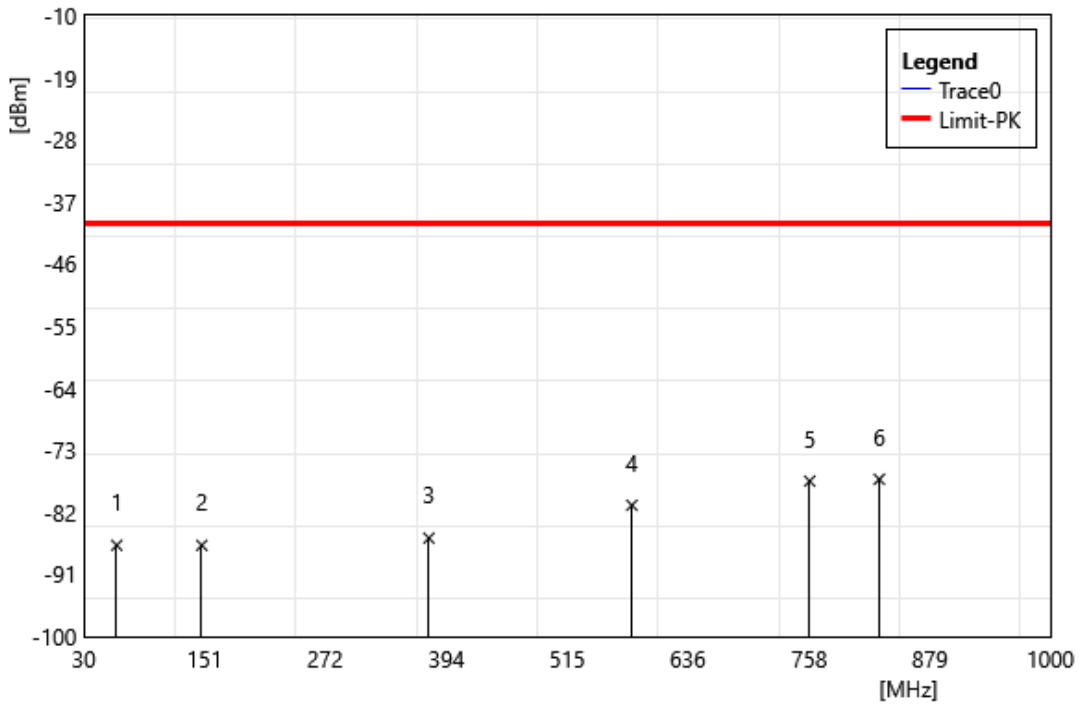
Total EIRP power is less than partial EIRP Limit 23 dBm/20MHz.  
 EIRP (dBm)=Max Output Power (dBm) + Antenna Gain (dBi)

NR n48 Maximum Average Power [dBm] (Gain=2.66 dB)								
Maximum Average Power (dBm)				MAX EIRP Power (dBm)	Modulation	Bandwidth	# of Resource Blocks	Resource Block Offset
637000	640110	643222	646332	Channel				
3555	3601.65	3648.33	3694.98	Freq. (MHz)				
19.37	19.20	19.28	19.33	22.03	DFT-S π/2 BPSK	10MHz	1	1
19.09	19.11	19.19	19.01		DFT-S π/2 BPSK	10MHz	1	11
19.11	19.18	19.18	19.00		DFT-S π/2 BPSK	10MHz	1	22
18.71	18.64	18.70	18.76		DFT-S π/2 BPSK	10MHz	12	0
19.18	19.20	19.24	19.15		DFT-S π/2 BPSK	10MHz	12	6
18.75	18.54	18.72	18.68		DFT-S π/2 BPSK	10MHz	12	12
18.21	17.98	18.26	18.18		DFT-S π/2 BPSK	10MHz	24	0
19.24	19.32	19.33	19.25		DFT-S QPSK	10MHz	1	1
19.33	19.19	19.15	19.22		DFT-S QPSK	10MHz	1	11
19.24	19.09	19.13	19.25		DFT-S QPSK	10MHz	1	22
18.38	18.23	18.30	18.32		DFT-S QPSK	10MHz	12	0
19.31	19.09	19.32	19.28		DFT-S QPSK	10MHz	12	6
18.37	18.22	18.00	18.33		DFT-S QPSK	10MHz	12	12
18.19	18.21	17.93	18.19		DFT-S QPSK	10MHz	24	0

Total EIRP power is less than partial EIRP Limit 23 dBm/10MHz.  
 EIRP (dBm)=Max Output Power (dBm) + Antenna Gain (dBi)

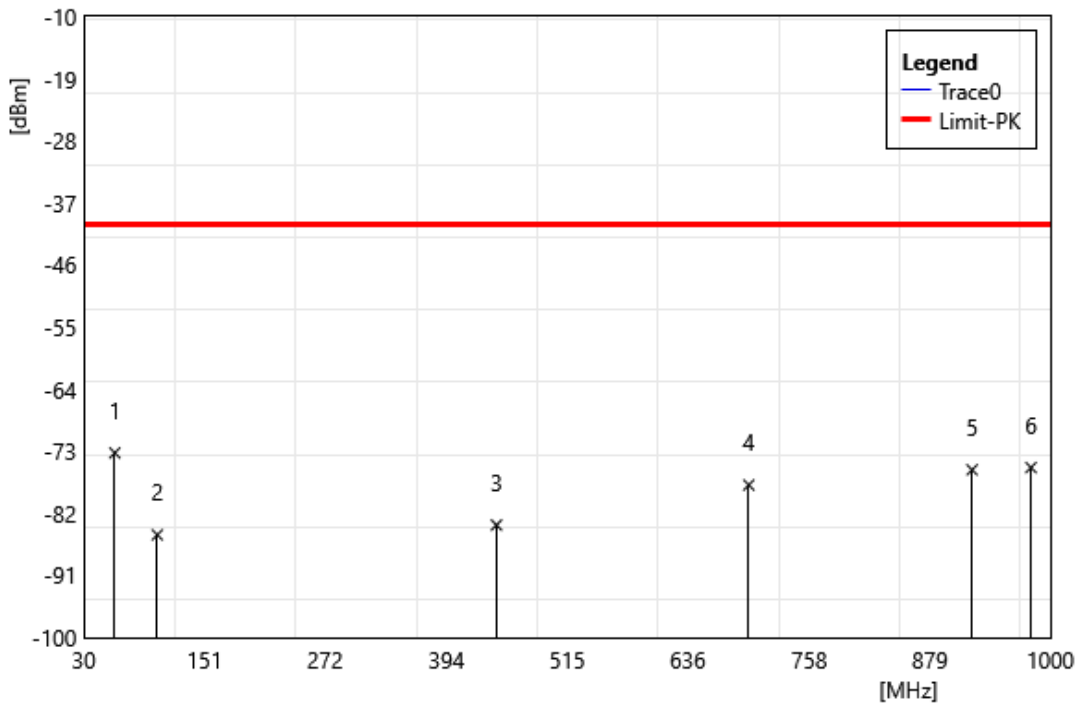
### 4.2. Radiated Emission

Test Site:	96603-WG	Standard:	Part 96
Test Mode:	n48 SA 30k QPSK BW:40M		
	3643.32 MHz		
Polarization:	Horizontal		
Remark:			



ID	Frequency MHz	Reading dBm	Correct Factor dB/m	Result dBm	Limit dBm	Margin dB	Remark
1	62.98	-73.99	-12.78	-86.77	-40.00	-46.77	PEAK
2	148.34	-74.53	-12.25	-86.78	-40.00	-46.78	PEAK
3	376.29	-75.98	-9.74	-85.73	-40.00	-45.73	PEAK
4	579.99	-75.29	-5.69	-80.98	-40.00	-40.98	PEAK
5	758.47	-74.99	-2.48	-77.47	-40.00	-37.47	PEAK
6	828.31	-75.26	-1.95	-77.21	-40.00	-37.21	PEAK

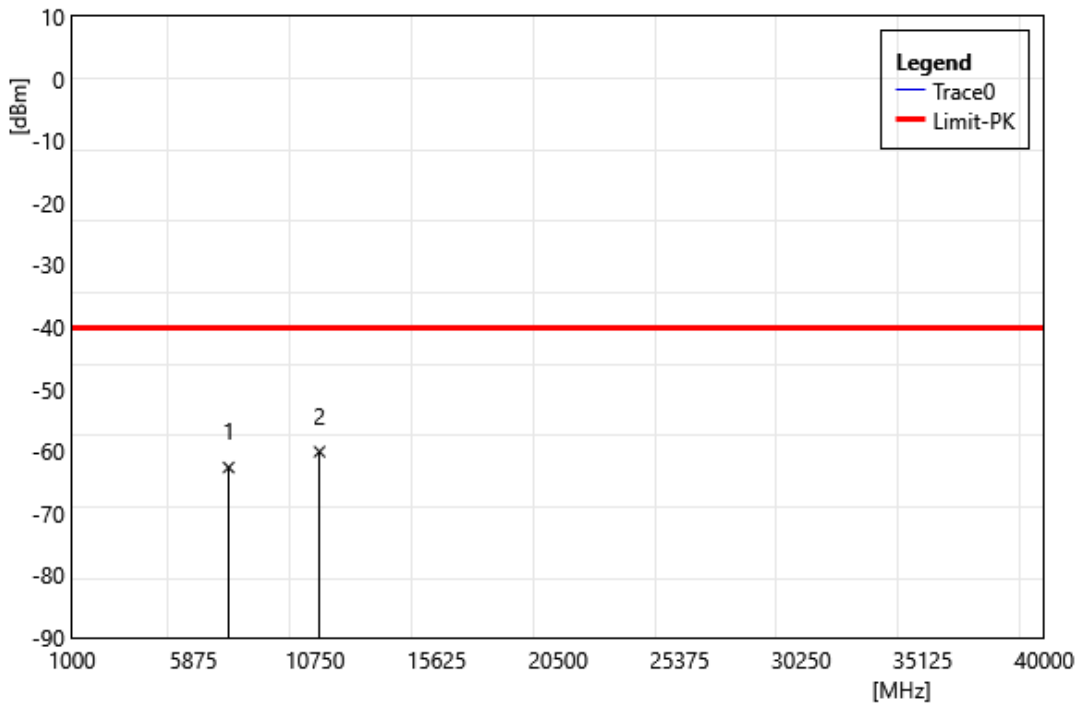
Test Site:	96603-WG	Standard:	Part 96
Test Mode:	n48 SA 30k QPSK BW:40M		
	3643.32 MHz		
Polarization:	Vertical		
Remark:			



ID	Frequency MHz	Reading dBm	Correct Factor dB/m	Result dBm	Limit dBm	Margin dB	Remark
1	61.04	-60.86	-12.38	-73.24	-40.00	-33.24	PEAK
2	103.72	-68.89	-16.22	-85.11	-40.00	-45.11	PEAK
3	444.19	-75.85	-7.84	-83.69	-40.00	-43.69	PEAK
4	697.36	-74.34	-3.55	-77.90	-40.00	-37.90	PEAK
5	921.43	-75.81	0.13	-75.68	-40.00	-35.68	PEAK
6	980.60	-75.75	0.39	-75.36	-40.00	-35.36	PEAK

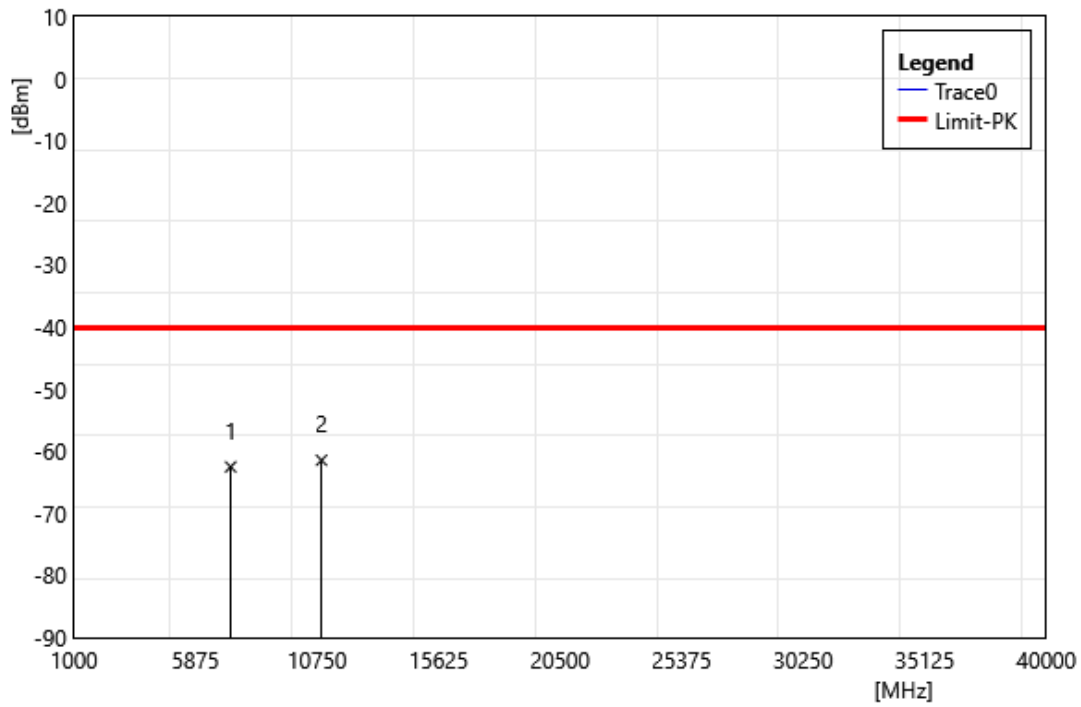


Test Site:	96603-WG	Standard:	Part 96
Test Mode:	n48 SA 30k QPSK BW:40M		
	3643.32 MHz		
Polarization:	Horizontal		
Remark:			



ID	Frequency MHz	Reading dBm	Correct Factor dB/m	Result dBm	Limit dBm	Margin dB	Remark
1	7286.64	-68.90	6.29	-62.61	-40.00	-22.61	PEAK
2	10929.96	-66.89	6.82	-60.07	-40.00	-20.07	PEAK

Test Site:	96603-WG	Standard:	Part 96
Test Mode:	n48 SA 30k QPSK BW:40M		
	3643.32 MHz		
Polarization:	Vertical		
Remark:			



ID	Frequency MHz	Reading dBm	Correct Factor dB/m	Result dBm	Limit dBm	Margin dB	Remark
1	7286.64	-68.80	6.29	-62.51	-40.00	-22.51	PEAK
2	10929.96	-68.26	6.82	-61.44	-40.00	-21.44	PEAK

--- END---