



FCC RADIO TEST REPORT

FCC ID : UZ7RM520NGL
Equipment : 5G Sub-6 GHz M.2 Module
Brand Name : ZEBRA
Model Name : RM520N-GL
Applicant : Zebra Technologies Corporation
1 Zebra Plaza, Holtsville, NY 11742
Manufacturer : Quectel Wireless Solutions Co., Ltd.
Building 5, Shanghai Business Park Phase III (Area B), No.
1016 Tianlin Road, Minhang District, Shanghai, China 200233
Standard : FCC 47 CFR Part 2, 96

The product was received on Jan. 09, 2024 and testing was performed from Feb. 06, 2024 to Apr. 12, 2024. We, Sporton International Inc. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA-603-E and has been in compliance with the applicable technical standards.

The test results in this partial report apply exclusively to the tested model / sample. Without written approval from Sporton International Inc. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Louis Wu

Sporton International Inc. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)



Table of Contents

History of this test report..... 3

Summary of Test Result..... 4

1 General Description 5

 1.1 Product Feature of Equipment Under Test 5

 1.2 Product Specification of Equipment Under Test 8

 1.3 Modification of EUT 8

 1.4 Testing Location 9

 1.5 Applied Standards 9

2 Test Configuration of Equipment Under Test 10

 2.1 Test Mode..... 10

 2.2 Connection Diagram of Test System 11

 2.3 Support Unit used in test configuration 11

 2.4 Frequency List of Low/Middle/High Channels..... 11

3 Conducted Test Items..... 12

 3.1 Measuring Instruments..... 12

 3.2 Conducted Output Power 13

 3.3 EIRP 14

4 Radiated Test Items 15

 4.1 Measuring Instruments..... 15

 4.2 Test Setup 15

 4.3 Test Result of Radiated Test..... 16

 4.4 Radiated Spurious Emission 17

5 List of Measuring Equipment..... 18

6 Measurement Uncertainty 19

Appendix A. Test Results of Conducted Test

Appendix B. Test Results of Radiated Test

Appendix C. Test Setup Photographs



History of this test report

Report No.	Version	Description	Issue Date
FG3D2501E	01	Initial issue of report	Apr. 18, 2024
FG3D2501E	02	Revise Product Feature This report is an updated version, replacing the report issued on Apr. 18, 2024.	Apr. 22, 2024



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.2	§2.1046	Conducted Output Power	Reporting only	-
-	§96.41	Peak-to-Average Ratio	-	See Note
3.3	§96.41	Effective Isotropic Radiated Power and EIRP PSD	Pass	-
-	§2.1049 §96.41	Occupied Bandwidth	-	See Note
-	§2.1051 §96.41	Conducted Band Edge Measurement	-	See Note
-	§2.1051 §96.41	Conducted Spurious Emission	-	See Note
-	§2.1055	Frequency Stability for Temperature & Voltage	-	See Note
4.4	§2.1051 §96.41	Radiated Spurious Emission	Pass	9.43 dB under the limit at 14725.00 MHz

Remark:

- For host device, Radiated Spurious Emission and Equivalent Isotropic Radiated Power are verified and complies with the limit in this test report.
- For host device, the Conducted Output Power is no difference after compared to module (Model: RM520N-GL)
- Testing was conducted on the EUT to compare its antenna gain, which was found to be higher than reported by the module in specific frequency bands. This testing encompassed evaluations of conducted power, ERP/EIRP, and RSE.

Conformity Assessment Condition:

- The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacturer who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
- The measurement uncertainty please refer to each test result in the section "Measurement Uncertainty".

Disclaimer:

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

Reviewed by: Wei Chen

Report Producer: Ming Chen



1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature	
Equipment	5G Sub-6 GHz M.2 Module
Brand Name	ZEBRA
Model Name	RM520N-GL
FCC ID	UZ7RM520NGL
Installed into host	Equipment Name: Industrial Fixed RFID Reader Brand Name: ZEBRA Model Name: FXR9011 FCC ID: UZ7FXR9001
Sample 1	FXR90110-400000-WR 4 port (BT/WiFi/RFID/WWAN/GPS)
Sample 2	FXR90111-400000-WR 4+1 port (BT/WiFi/RFID/WWAN/GPS)
Sample 3	FXR90110-800000-WR 8 port (BT/WiFi/RFID/WWAN/GPS)
EUT supports Radios application	WCDMA/HSPA/LTE/5G NR/GNSS
HW Version	DV1
SW Version	0.4.18-90
MFD	26DEC23
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer.

Supported Unit Used in Test Configuration and System for Host				
Cable, 3-way USB Splitter	Brand Name	ZEBRA	Model Name	ADP-USB0010-M12
Cable, USB-C Host, 5ft.	Brand Name	ZEBRA	Model Name	CBL-USBCHST015-M12
Cable, USB-C Host, 15ft.	Brand Name	ZEBRA	Model Name	CBL-USBCHST035-M12
Cable, USB-C Client, 5ft.	Brand Name	ZEBRA	Model Name	CBL-USBCCLT015-M12
Cable, USB-C Client, 15ft.	Brand Name	ZEBRA	Model Name	CBL-USBCCLT035-M12
Cable, USB-A Client, 5ft.	Brand Name	ZEBRA	Model Name	CBL-USBACL015-M12
Cable, USB-A Client, 15ft.	Brand Name	ZEBRA	Model Name	CBL-USBACL035-M12
Cable, GPIO	Brand Name	ZEBRA	Model Name	CBL-GP0050-M12M12A
Cable, 12V (Cigarette Lighter) Power Adapter, 3.5 meter	Brand Name	ZEBRA	Model Name	CBL-PWRD035-M12CL
Cable, DC Power Cord (Flying Leads), 3.5m	Brand Name	ZEBRA	Model Name	CBL-PWRD035-M1200
Cable, DC Power Cord (Flying Leads), 10m	Brand Name	ZEBRA	Model Name	CBL-PWRD100-M1200
Cable, Power Supply Output Adapter, 3.5m	Brand Name	ZEBRA	Model Name	CBL-PWRD035-M12M12
Cable, Power Supply Output Adapter, 10m	Brand Name	ZEBRA	Model Name	CBL-PWRD100-M12M12



Supported Unit Used in Test Configuration and System for Host				
Cable, DC-DC Power Supply Input	Brand Name	ZEBRA	Model Name	CBL-PWRD150-M12M00
Cable, AC-DC Power Supply Input (Flying Leads)	Brand Name	ZEBRA	Model Name	CBL-PWRA150-M1200
Cable, AC-DC Power Supply Input (IEC plug)	Brand Name	ZEBRA	Model Name	CBL-PWRA035-M12IEC
CBL: RF, N STR PLUG TO RP-TNC STR PLUG ON LMR-240, 68", IP67 Sealed	Brand Name	ZEBRA	Model Name	CBLRD-3B4000680R
CBL: RF, N STR PLUG TO RP-TNC STR PLUG ON LMR-240, 180", IP67 Sealed	Brand Name	ZEBRA	Model Name	CBLRD-3B4001800R
CBL: RF, N STR PLUG TO RP-TNC STR PLUG ON LMR-240, 240", IP67 Sealed	Brand Name	ZEBRA	Model Name	CBLRD-3B4002400R
CBL: RF, N STR PLUG TO RP-TNC STR PLUG ON LMR-240, 360", IP67 Sealed	Brand Name	ZEBRA	Model Name	CBLRD-3B4003600R
CBL: RF, N STR PLUG TO RP-TNC STR PLUG ON LMR-240, 68", IP67 Sealed	Brand Name	ZEBRA	Model Name	CBLRD-1B4000680R
CBL: RF, N STR PLUG TO RP-TNC STR PLUG ON LMR-240, 180", IP67 Sealed	Brand Name	ZEBRA	Model Name	CBLRD-1B4001800R
CBL: RF, N STR PLUG TO RP-TNC STR PLUG ON LMR-240, 240", IP67 Sealed	Brand Name	ZEBRA	Model Name	CBLRD-1B4002400R
CBL: RF, N STR PLUG TO RP-TNC STR PLUG ON LMR-240, 360", IP67 Sealed	Brand Name	ZEBRA	Model Name	CBLRD-1B4003600R
CHIMERA ETHERNET CABLE 5M	Brand Name	ZEBRA	Model Name	CBL-ENT00500-M1200
CHIMERA ETHERNET CABLE 15M	Brand Name	ZEBRA	Model Name	CBL-ENT01500-M1200
Outdoor AC-DC PSU	Brand Name	ZEBRA	Model Name	PWR-BGA24V90W0WW (Spec PD-007875-01)
Forklift DC-DC PSU	Brand Name	ZEBRA	Model Name	PWR-BGA24V90W1WW (Spec PD-007876-01)
Indoor AC-DC PSU	Brand Name	ZEBRA	Model Name	PWR-BGA24V78W3WW (Spec PD-007877-01)
PoE adaptor	Brand Name	ZEBRA	Model Name	PD-9001GR/AT/AC



Supported Unit Used in Test Configuration and System for Host			
External RFID Antenna	Brand Name	ZEBRA	Model Name AN480
External RFID Antenna	Brand Name	ZEBRA	Model Name AN650
External RFID Antenna	Brand Name	ZEBRA	Model Name SR5502
External RFID Antenna	Brand Name	ZEBRA	Model Name AN510
External RFID Antenna	Brand Name	ZEBRA	Model Name AN520
External RFID Antenna	Brand Name	ZEBRA	Model Name AN610
External RFID Antenna	Brand Name	ZEBRA	Model Name AN620
External RFID Antenna	Brand Name	ZEBRA	Model Name AN720
External RFID Antenna	Brand Name	ZEBRA	Model Name AN440
External RFID Antenna	Brand Name	ZEBRA	Model Name SP5504
BT/WLAN_External Antenna	Brand Name	Amphenol	Model Name ST0228-30-502-A
BT/WLAN_External Antenna	Brand Name	Amphenol	Model Name ZB511A-02-001-C
AN650 Antenna cable(5ft/1524mm)	Brand Name	ZEBRA	Model Name CBLRD-1C4000600R
AN650 Antenna cable(20ft/6096mm)	Brand Name	ZEBRA	Model Name CBLRD-1C4002400R
AN650 Antenna cable(15ft/4572mm)	Brand Name	ZEBRA	Model Name CBLRD-1C4001800R
AN650 Antenna cable(30ft/9144mm)	Brand Name	ZEBRA	Model Name CBLRD-1C4003600R
AN650 Antenna cable(10ft/3048mm)	Brand Name	ZEBRA	Model Name CBLRD-1C4001200R
WWAN_External Antenna	Brand Name	Quectel	Model Name YB0007BA

Support band and evaluated information	
Supported band	n48,
Evaluated and Tested band	n48,

TDD band Power Class			
	PC3	PC2	
N48	V		



1.2 Product Specification of Equipment Under Test

Product Specification is subject to this standard	
Tx Frequency	3552 MHz ~ 3694.98 MHz
Rx Frequency	3552 MHz ~ 3694.98 MHz
Bandwidth	10 MHz / 20 MHz / 40 MHz
Maximum Output Power to Antenna	17.63 dBm
Antenna Type for Host	Omni-directional Antenna
Antenna Gain for Host	<Ant. 2>: 2.00 dBi
Type of Modulation	QPSK / 16QAM / 64QAM / 256QAM

Remark: The above EUT's information was declared by manufacturer. Please refer to Disclaimer in report summary.

1.3 Modification of EUT

No modifications are made to the EUT during all test items.



1.4 Testing Location

Test Site	Sporton International Inc. EMC & Wireless Communications Laboratory
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978
Test Site No.	Sporton Site No. TH03-HY
Test Engineer	Hank Chen
Temperature (°C)	22.2~28.7
Relative Humidity (%)	49.3~57.6

Test Site	Sporton International Inc. Wensan Laboratory.
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	Sporton Site No. 03CH21-HY (TAF Code: 3786)
Test Engineer	Jack Cheng, Ray Lung and Sky Chang
Temperature (°C)	18~26
Relative Humidity (%)	50~70
Remark	The Radiated Spurious Emission test item subcontracted to Sporton International Inc. Wensan Laboratory.

Note: The test site complies with ANSI C63.4 2014 requirement.

FCC Designation No.: TW1190 and TW3786

1.5 Applied Standards

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

- ♦ ANSI C63.26-2015
- ♦ ANSI / TIA-603-E
- ♦ FCC 47 CFR Part 2, 96
- ♦ FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- ♦ FCC KDB 940660 D01 Part 96 CBRS Eqpt v03
- ♦ FCC KDB 412172 D01 Determining ERP and EIRP v01r01
- ♦ FCC KDB 414788 D01 Radiated Test Site v01r01
- ♦ FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.
3. The TAF code is not including all the FCC KDB listed without accreditation.



2 Test Configuration of Equipment Under Test

2.1 Test Mode

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas. License Digital Systems v03r01 with maximum output power.

For radiated measurement, the measured emission level of the EUT was maximized by rotating the EUT on a turntable, adjusting the orientation of the EUT and EUT antenna in two config (Ant. Degree 0 and Ant. Degree 90), and adjusting the measurement antenna orientation, following C63.26 exploratory test procedures and only the worst case emissions were reported in this report.

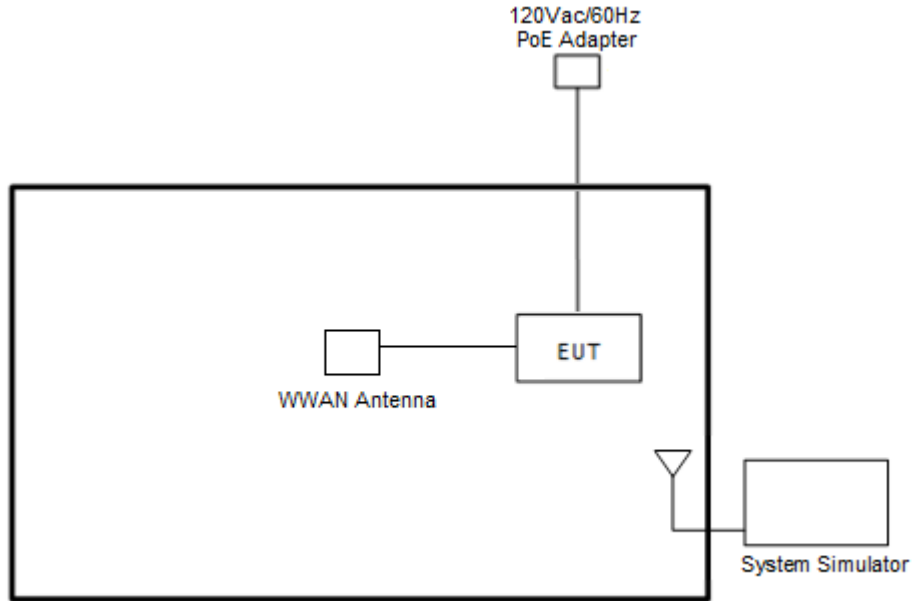
Modulation Type	Modulation	Modulation Type	Modulation
A	DFT-s-OFDM pi/2 BPSK	N/A	N/A
B	DFT-s-OFDM QPSK	F	CP-OFDM QPSK
C	DFT-s-OFDM 16QAM	G	CP-OFDM 16QAM
D	DFT-s-OFDM 64QAM	H	CP-OFDM 64QAM
E	DFT-s-OFDM 256QAM	I	CP-OFDM 256QAM

Test Item	Modulation Type	Bandwidth	RB Size	Channel
Conducted Power	A, B, C, D, E	All	1, Half, Full	L, M, H
EIRP	A, B, C, D, E	All	1, Half, Full	L, M, H
RSE	A	20MHz	Inner 1RB	L, M, H

Remark:

1. Evaluated all the transmitter signal and reporting worst-case configuration among all modulation types.
2. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst-case emissions are reported.
3. Output Conducted Power was spot checks Original models worse case Modulation

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration

Item	Equipment	Brand Name	Model No.	FCC ID	Data Cable	Power Cord
1.	5G Wireless Test Platform	Anritsu	MT8000A	N/A	N/A	Unshielded, 1.8 m

2.4 Frequency List of Low/Middle/High Channels

NR Band n48 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
40	Channel	638000	641666	645332
	Frequency	3570.0	3624.99	3679.98
30	Channel	637668	641666	645666
	Frequency	3565.02	3624.99	3684.99
20	Channel	637334	641666	646000
	Frequency	3560.01	3624.99	3690.0
10	Channel	637000	641666	646332
	Frequency	3555.0	3624.99	3694.98

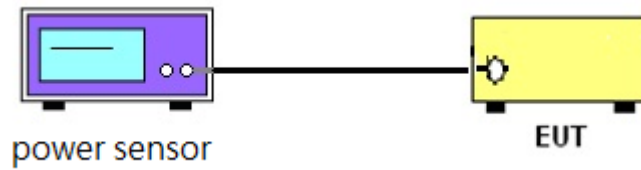
3 Conducted Test Items

3.1 Measuring Instruments

See list of measuring instruments of this test report.

3.1.1 Test Setup

3.1.2 Conducted Output Power



3.1.3 Test Result of Conducted Test

Please refer to Appendix A.



3.2 Conducted Output Power

3.2.1 Description of the Conducted Output Power Measurement

A power sensor was used to establish communication with the EUT. Its parameters were set to force the EUT transmitting at maximum output power. The measured power in the radio frequency on the transmitter output terminals shall be reported.

3.2.2 Test Procedures

1. The transmitter output port was connected to the power sensor.
 2. Set EUT at maximum power.
 3. Select lowest, middle, and highest channels for each band and different modulation.
 4. Measure and record the power level from the power sensor
 5. The measure-and-sum technique is used for measuring in-band transmit power of a device.
- Total power is the sum of the conducted power levels measured at the various output ports.



3.3 EIRP

3.3.1 Description of the EIRP Measurement

The EIRP of category A CBSD must not exceed 30 dBm / 10 megahertz.

The EIRP PSD of category A CBSD must not exceed 20 dBm / 1 megahertz.

The testing follows ANSI C63.26-2015 Section 5.2.5.5

According to KDB 412172 D01 Power Approach,

$EIRP = P_T + G_T - LC$, where

P_T = transmitter output power in dBm

G_T = gain of the transmitting antenna in dBi

LC = signal attenuation in the connecting cable between the transmitter and antenna in dB

Device	Maximum EIRP (dBm/10 MHz)	Maximum PSD (dBm/MHz)
Category A CBSD	30	20

3.3.2 Test Procedures

1. The testing follows procedure in Section 5.2 of ANSI C63.26-2015 and KDB 940660 D01 Part 96 CBRS Eqpt v03 Section 3.2(b)(2) and 3.2(b)(3)
2. Determine the EIRP by adding the effective antenna gain to the measured average conducted power level.
3. For MIMO measurement, the KDB 662911 E)2)c) is used as following:
Measure and add $10 \log(NANT)$ dB, where NANT is the number of outputs. With this technique, spectrum measurements are performed at each output of the device, but rather than summing the spectra or the spectral peaks across the outputs, the quantity $10 \log(NANT)$ dB is added to each spectrum value before comparing to the emission limit.

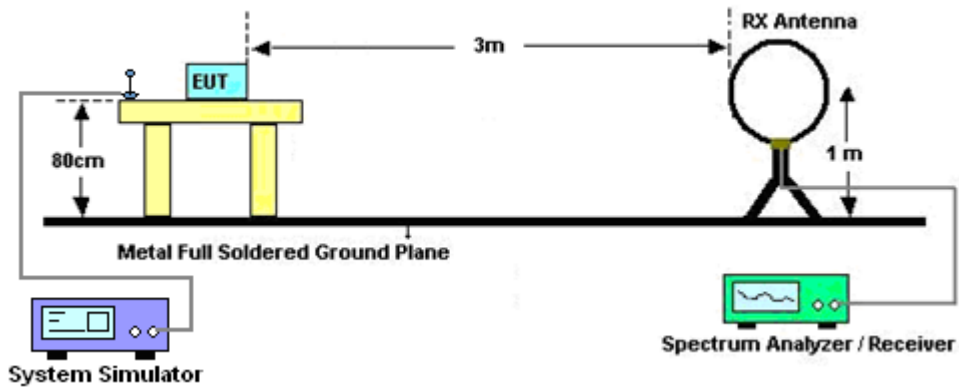
4 Radiated Test Items

4.1 Measuring Instruments

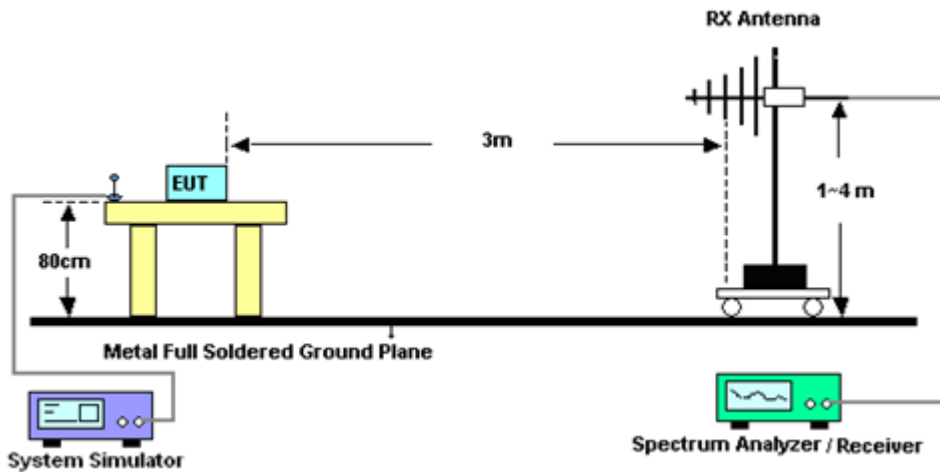
See list of measuring instruments of this test report.

4.2 Test Setup

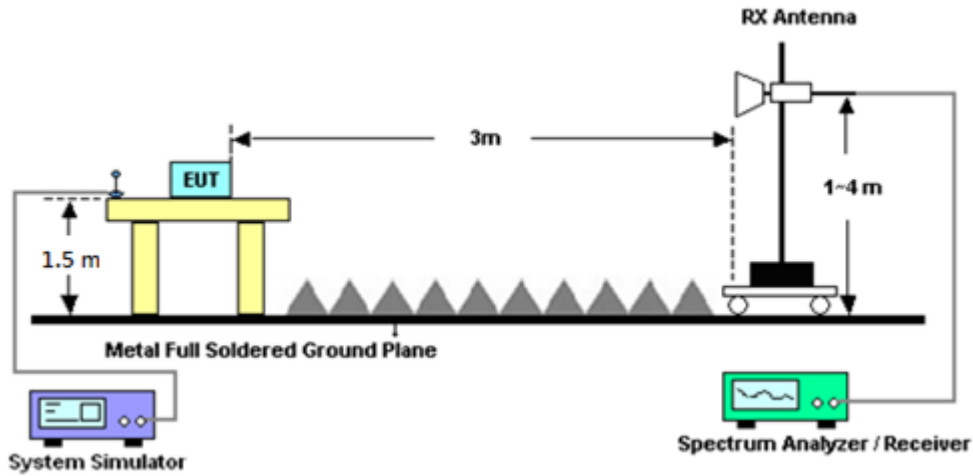
For radiated emissions below 30MHz



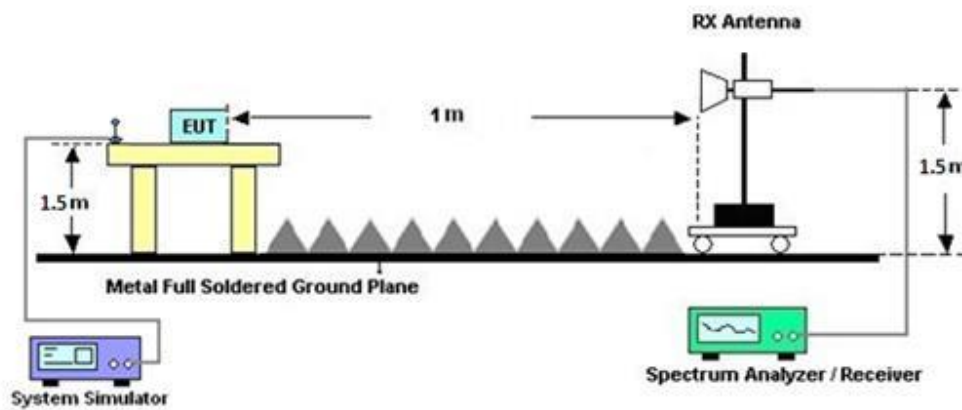
For radiated emissions from 30MHz to 1GHz



For radiated emissions from 1GHz to 18GHz



For radiated emissions above 18GHz



4.3 Test Result of Radiated Test

Please refer to Appendix B.

Note:

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

There is adequate comparison measurement of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result came out very similar.



4.4 Radiated Spurious Emission

4.4.1 Description of Radiated Spurious Emission Measurement

The radiated spurious emission was measured by substitution method according to ANSI / TIA-603-E. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least -40dBm / MHz .

The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

4.4.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 7 and ANSI C63.26-2015 section 5.5.4 Radiated measurement using the field strength method

1. The EUT was placed on a turntable with 0.8 meter height for frequency below 1GHz and 1.5 meter height for frequency above 1GHz respectively above ground.
2. The EUT was set 3 meters from the receiving antenna mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between 1m to 4m to search the maximum spurious emission for both horizontal and vertical polarizations.
5. During the measurement, the system simulator parameters were set to force the EUT transmitting at maximum output power.
6. To convert spectrum reading E(dBuV/m) to EIRP(dBm)
 $EIRP(dBm) = Level (dBuV/m) + 20\log(d) - 104.77$, where d is the distance at which field strength limit is specified in the rules.
7. $Field\ Strength\ Level\ (dBm) = Spectrum\ Reading\ (dBm) + Antenna\ Factor + Cable\ Loss + Read\ Level - Preamp\ Factor.$
8. $ERP\ (dBm) = EIRP\ (dBm) - 2.15$
9. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.



5 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Hygrometer	Testo	608-H1	34852481	NA	Sep. 14, 2023	Feb. 06, 2024~ Apr. 12, 2024	Sep. 13, 2024	Conducted (TH03-HY)
Base Station (Measure)	Anritsu	MT8821C	6262116725	LTE FDD/TDD LTE-3CC DLCA/2CC ULCA	Oct. 25, 2023	Feb. 06, 2024~ Apr. 12, 2024	Oct. 24, 2024	Conducted (TH03-HY)
Radio Communication Test Station	Anritsu	MT8000A	6272337370	N/A	Nov. 14, 2023	Feb. 06, 2024~ Apr. 12, 2024	Nov. 14, 2024	Conducted (TH03-HY)
LOOP Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Sep. 12, 2023	Feb. 08, 2024~ Mar. 14, 2024	Sep. 11, 2024	Radiation (03CH21-HY)
Bilog Antenna	TESEQ & WOKEN	CBL 6111D & 00802N1D-06	63303 & 001	30MHz~1GHz	Oct. 15, 2023	Feb. 08, 2024~ Mar. 14, 2024	Oct. 14, 2024	Radiation (03CH21-HY)
Double Ridged Guide Horn Antenna	RFSPIN	DRH18-E	LE2C03A18EN	1GHz~18GHz	Jul. 12, 2023	Feb. 08, 2024~ Mar. 14, 2024	Jul. 11, 2024	Radiation (03CH21-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA 9170	1223	18GHz~40GHz	Jul. 10, 2023	Feb. 08, 2024~ Mar. 14, 2024	Jul. 09, 2024	Radiation (03CH21-HY)
Amplifier	SONOMA	310N	421580	30MHz~1GHz	Jul. 15, 2023	Feb. 08, 2024~ Mar. 14, 2024	Jul. 14, 2024	Radiation (03CH21-HY)
Amplifier	EMEC	EM01G18GA	060876	1GHz~18GHz	Sep. 28, 2023	Feb. 08, 2024~ Mar. 14, 2024	Sep. 27, 2024	Radiation (03CH21-HY)
Preamplifier	EMEC	EM18G40G	060871	18GHz~40GHz	Aug. 30, 2023	Feb. 08, 2024~ Mar. 14, 2024	Aug. 29, 2024	Radiation (03CH21-HY)
Spectrum Analyzer	Keysight	N9010B	MY62170358	10Hz~44GHz	Aug. 28, 2023	Feb. 08, 2024~ Mar. 14, 2024	Aug. 27, 2024	Radiation (03CH21-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	803951/2	9K~30M	Mar. 07, 2023	Feb. 08, 2024~ Mar. 14, 2024	Mar. 06, 2024	Radiation (03CH21-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	803951/2	9K~30M	Mar. 06, 2024	Feb. 08, 2024~ Mar. 14, 2024	Mar. 05, 2025	Radiation (03CH21-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	804397/2,8046 12/2,804614/2	30MHz~40GHz	Oct. 24, 2023	Feb. 08, 2024~ Mar. 14, 2024	Oct. 23, 2024	Radiation (03CH21-HY)
Hygrometer	TECPEL	DTM-303A	TP211568	N/A	Oct. 30, 2023	Feb. 08, 2024~ Mar. 14, 2024	Oct. 29, 2024	Radiation (03CH21-HY)
Controller	EMEC	EM 1000	N/A	Control Turn table & Ant Mast	N/A	Feb. 08, 2024~ Mar. 14, 2024	N/A	Radiation (03CH21-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1~4m	N/A	Feb. 08, 2024~ Mar. 14, 2024	N/A	Radiation (03CH21-HY)
Turn Table	EMEC	TT 2000	N/A	0~360 Degree	N/A	Feb. 08, 2024~ Mar. 14, 2024	N/A	Radiation (03CH21-HY)
Software	Audix	E3 6.2009-8-24	RK-001053	N/A	N/A	Feb. 08, 2024~ Mar. 14, 2024	N/A	Radiation (03CH21-HY)



6 Measurement Uncertainty

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.04 dB
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.33 dB
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Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.68 dB
-------------------------------------------------------------------------	---------



Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power) and ERP/EIRP

NR n48 Maximum Average Power [dBm] (GT - LC = 2 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP(W)
10	1	1	PI/2 BPSK	17.38	17.28	17.19	19.41	0.0873
10	1	22		17.26	17.24	17.21		
10	12	6		17.36	17.32	17.28		
10	1	0		16.84	16.75	16.77		
10	1	23		16.71	16.71	16.68		
10	24	0		16.91	16.80	16.81		
10	1	1	QPSK	17.36	17.31	17.26	18.5	0.0708
10	1	22		17.29	17.25	17.23		
10	12	6		17.41	17.32	17.28		
10	1	0		16.38	16.26	16.28		
10	1	23		16.21	16.20	16.24		
10	24	0		16.37	16.31	16.30		
10	1	1	16-QAM	16.50	16.37	16.44	18.5	0.0708
10	1	1	64-QAM	14.84	14.74	14.75		
10	1	1	256-QAM	12.80	12.68	12.68		
Limit	EIRP < 23dBm/10MHz			Result			Pass	

Total EIRP power is less than partial EIRP limit 23 dBm/10MHz.



NR n48 Maximum Average Power [dBm] (GT - LC = 2 dB)										
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP(W)		
20	1	1	PI/2 BPSK	17.59	17.38	17.34	19.6	0.0912		
20	1	49		17.43	17.42	17.30				
20	25	12		17.54	17.47	17.41				
20	1	0		17.05	16.98	16.84				
20	1	50		16.92	16.83	16.83				
20	50	0		17.04	16.94	16.91				
20	1	1	QPSK	17.60	17.42	17.25			18.69	0.074
20	1	49		17.46	17.40	17.25				
20	25	12		17.51	17.46	17.41				
20	1	0		16.55	16.47	16.32				
20	1	50		16.43	16.35	16.33				
20	50	0		16.54	16.43	16.38				
20	1	1	16-QAM	16.69	16.51	16.46	18.69	0.074		
20	1	1	64-QAM	15.04	14.85	14.90				
20	1	1	256-QAM	13.04	12.91	12.77				
Limit	EIRP < 23dBm/10MHz			Result			Pass			

Total EIRP power is less than partial EIRP limit 23 dBm/10MHz.

NR n48 Maximum Average Power [dBm] (GT - LC = 2 dB)										
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP(W)		
30	1	1	PI/2 BPSK	17.62	17.62	17.46	19.63	0.0918		
30	1	76		17.32	17.42	17.39				
30	36	18		17.48	17.52	17.51				
30	1	0		17.12	17.09	16.93				
30	1	77		16.83	16.95	16.90				
30	75	0		16.97	17.00	17.07				
30	1	1	QPSK	17.61	17.63	17.58			18.6	0.0724
30	1	76		17.30	17.45	17.37				
30	36	18		17.49	17.53	17.57				
30	1	0		16.60	16.60	16.50				
30	1	77		16.27	16.44	16.39				
30	75	0		16.48	16.50	16.51				
30	1	1	16-QAM	16.60	16.57	16.41	18.6	0.0724		
30	1	1	64-QAM	14.93	14.97	14.82				
30	1	1	256-QAM	13.08	13.02	12.89				
Limit	EIRP < 23dBm/10MHz			Result			Pass			

Total EIRP power is less than partial EIRP limit 23 dBm/10MHz.



NR n48 Maximum Average Power [dBm] (GT - LC = 2 dB)										
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP(W)		
40	1	1	PI/2 BPSK	17.59	17.58	17.43	19.59	0.091		
40	1	104		17.35	17.45	17.40				
40	50	25		17.52	17.51	17.55				
40	1	0		17.06	17.06	16.93				
40	1	105		16.85	16.96	16.95				
40	100	0		16.92	16.99	17.02				
40	1	1	QPSK	17.56	17.59	17.45			18.71	0.0743
40	1	104		17.37	17.45	17.44				
40	50	25		17.48	17.50	17.51				
40	1	0		16.56	16.59	16.41				
40	1	105		16.37	16.45	16.42				
40	100	0		16.50	16.48	16.52				
40	1	1	16-QAM	16.71	16.69	16.52	18.71	0.0743		
40	1	1	64-QAM	15.06	15.07	14.90				
40	1	1	256-QAM	13.08	13.01	12.82				
Limit	EIRP < 23dBm/10MHz			Result			Pass			

Total EIRP power is less than partial EIRP limit 23 dBm/10MHz.



Appendix B. Test Results of Radiated Test

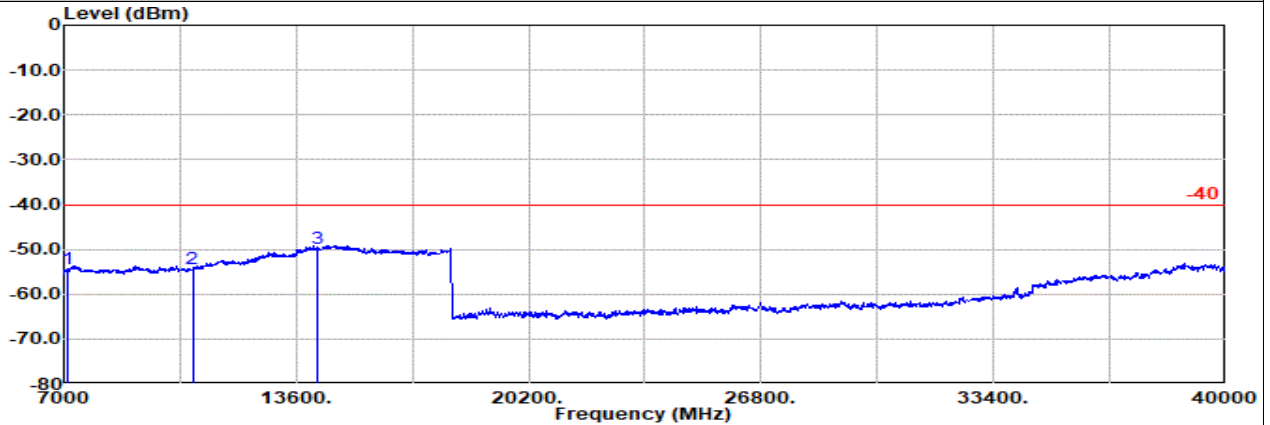
Mode	Part	Band	Ch	Freq (MHz)	Level (dBm)	Det	Ant Factor (dB)	Amp\Cbl (dB)	Filter (dB)	EIRPCF (dB)	Reading (dBuV)	Limit (dBm)	Margin (dB)	PoI	Ant
2	Part 96	NR SA n48	H	14725	-49.43	RMS	41.65	-23.00	0.42	-95.23	26.73	-40.00	-9.43	H	Tx2



Tx2

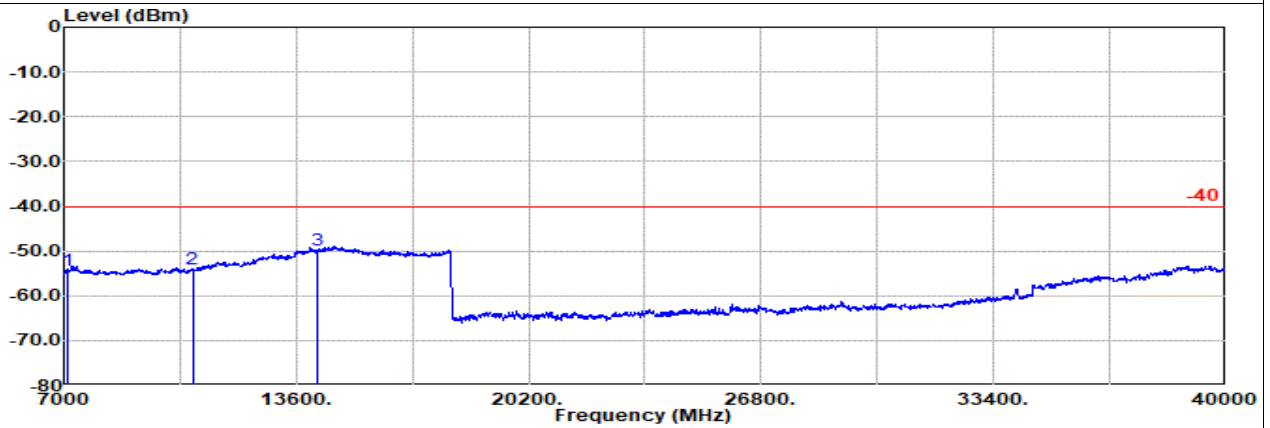
Part 96 Mode 2
NR SA n48 20M Ch637334 1RB1 BPSK

L



Site : 03CH21-HY
 Condition: -40 3m DRH18-E_LE2C03A18EN_230712 Horizontal
 : SA n48 20M Ch637334 1RB1 BPSK

1	MHz	Level dBm	Detector	Ant Amp\Cb Filter		EIRPCF	Readin g	Limit	Margin	Pol	
				Factor	1						dB
1	7103.00	-54.39	RMS	36.41	-21.43	1.19	-95.23	24.67	-40.00	-14.39	Horizontal
2	10654.00	-54.28	RMS	37.50	-21.68	0.44	-95.23	24.69	-40.00	-14.28	Horizontal
3	14205.00	-49.77	RMS	41.00	-22.35	0.41	-95.23	26.40	-40.00	-9.77	Horizontal



Site : 03CH21-HY
 Condition: -40 3m DRH18-E_LE2C03A18EN_230712 Vertical
 : SA n48 20M Ch637334 1RB1 BPSK

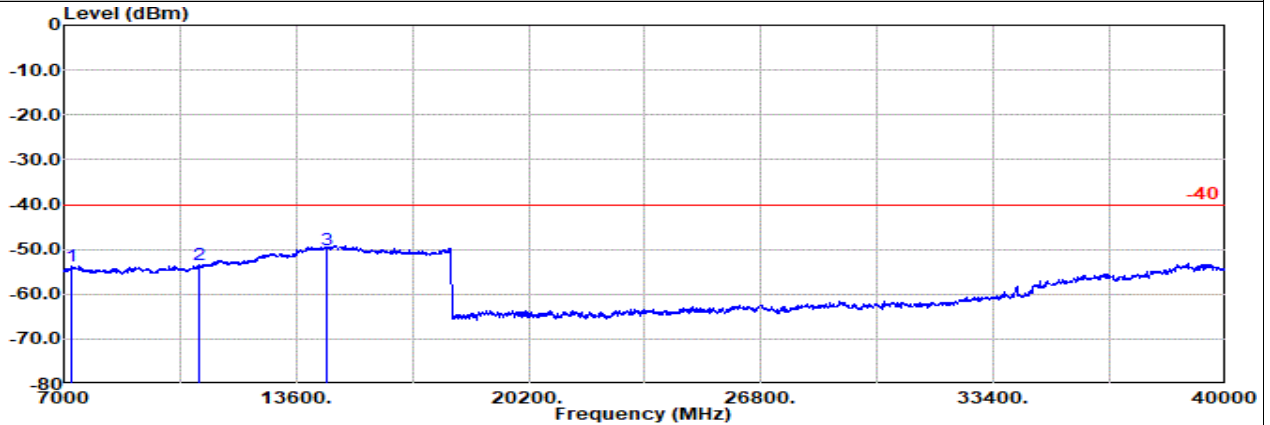
1	MHz	Level dBm	Detector	Ant Amp\Cb Filter		EIRPCF	Readin g	Limit	Margin	Pol	
				Factor	1						dB
1	7103.00	-54.34	RMS	36.41	-21.43	1.19	-95.23	24.72	-40.00	-14.34	Vertical
2	10654.00	-54.16	RMS	37.50	-21.68	0.44	-95.23	24.81	-40.00	-14.16	Vertical
3	14205.00	-49.74	RMS	41.00	-22.35	0.41	-95.23	26.43	-40.00	-9.74	Vertical



Tx2

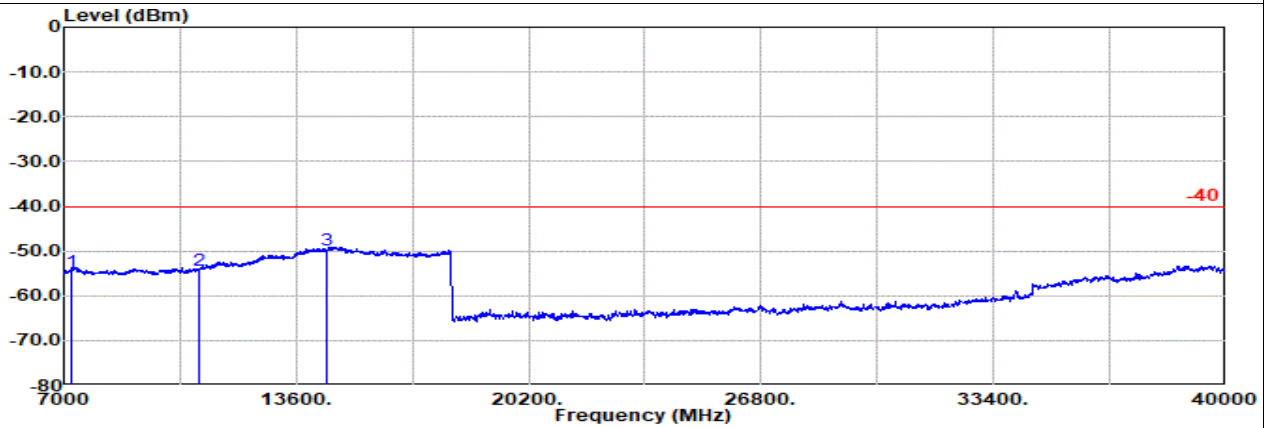
Part 96 Mode 2
NR SA n48 20M Ch641666 1RB1 BPSK

M



Site : 03CH21-HY
 Condition: -40 3m DRH18-E_LE2C03A18EN_230712 Horizontal
 : SA n48 20M Ch641666 1RB1 BPSK

1	2	3	Freq MHz	Level dBm	Detector	Ant Amp\Cb Filter		EIRPCF	Readin g	Limit dBm	Margin dB	Pol	
						Factor	1						
			7233.00	-53.77	RMS	36.87	-21.34	1.13	-95.23	24.80	-40.00	-13.77	Horizontal
			10849.00	-53.47	RMS	37.50	-21.65	0.44	-95.23	25.47	-40.00	-13.47	Horizontal
			14465.00	-49.97	RMS	41.16	-22.73	0.42	-95.23	26.41	-40.00	-9.97	Horizontal



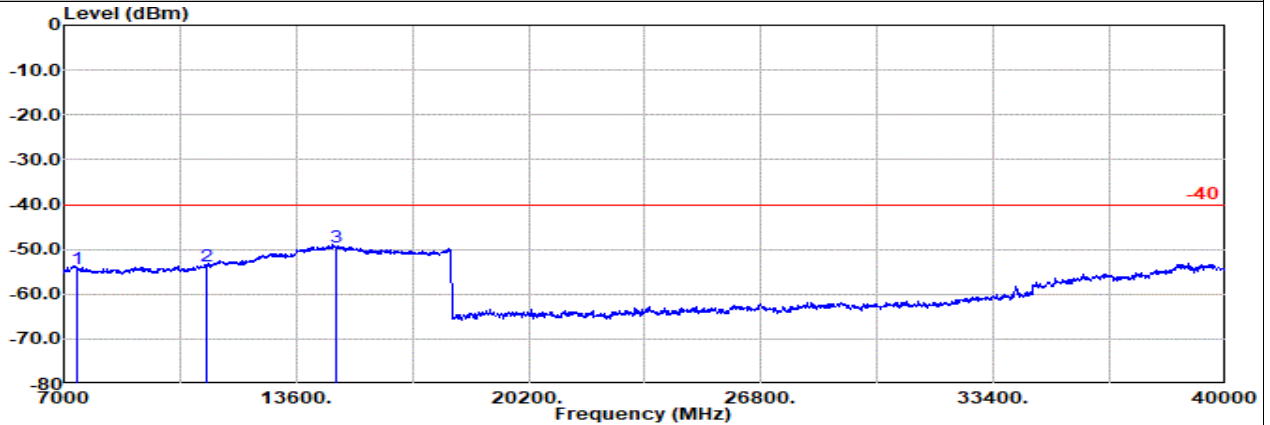
Site : 03CH21-HY
 Condition: -40 3m DRH18-E_LE2C03A18EN_230712 Vertical
 : SA n48 20M Ch641666 1RB1 BPSK

1	2	3	Freq MHz	Level dBm	Detector	Ant Amp\Cb Filter		EIRPCF	Readin g	Limit dBm	Margin dB	Pol	
						Factor	1						
			7233.00	-54.50	RMS	36.87	-21.34	1.13	-95.23	24.07	-40.00	-14.50	Vertical
			10849.00	-54.32	RMS	37.50	-21.65	0.44	-95.23	24.62	-40.00	-14.32	Vertical
			14465.00	-49.85	RMS	41.16	-22.73	0.42	-95.23	26.53	-40.00	-9.85	Vertical



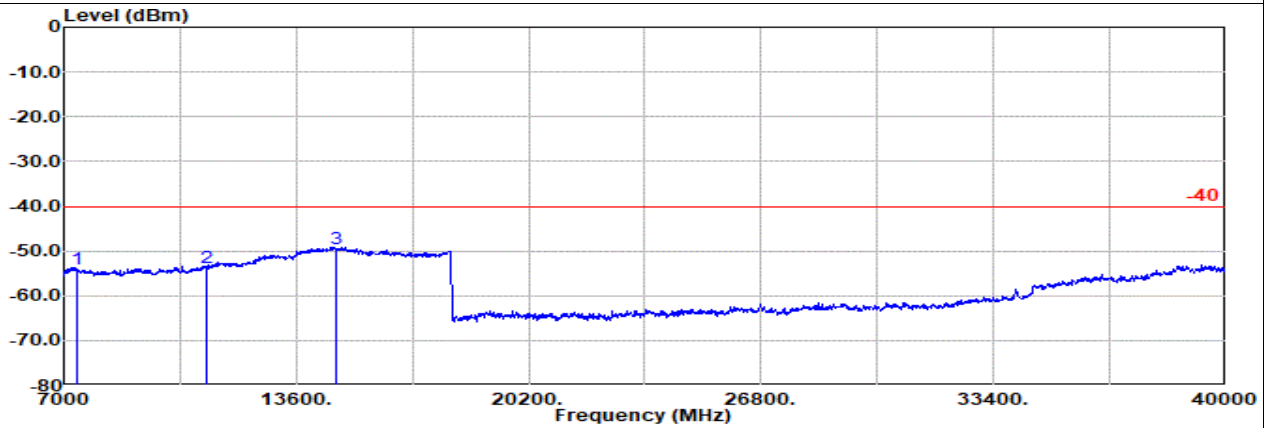
Tx2

Part 96 Mode 2
NR SA n48 20M Ch646000 1RB1 BPSK
H



Site : 03CH21-HY
Condition: -40 3m DRH18-E_LE2C03A18EN_230712 Horizontal
: SA n48 20M Ch646000 1RB1 BPSK

1	2	3	Freq MHz	Level dBm	Detector	Ant Amp\Cb Filter		EIRPCF	Readin g	Limit dBm	Margin dB	Pol
						Factor	1					

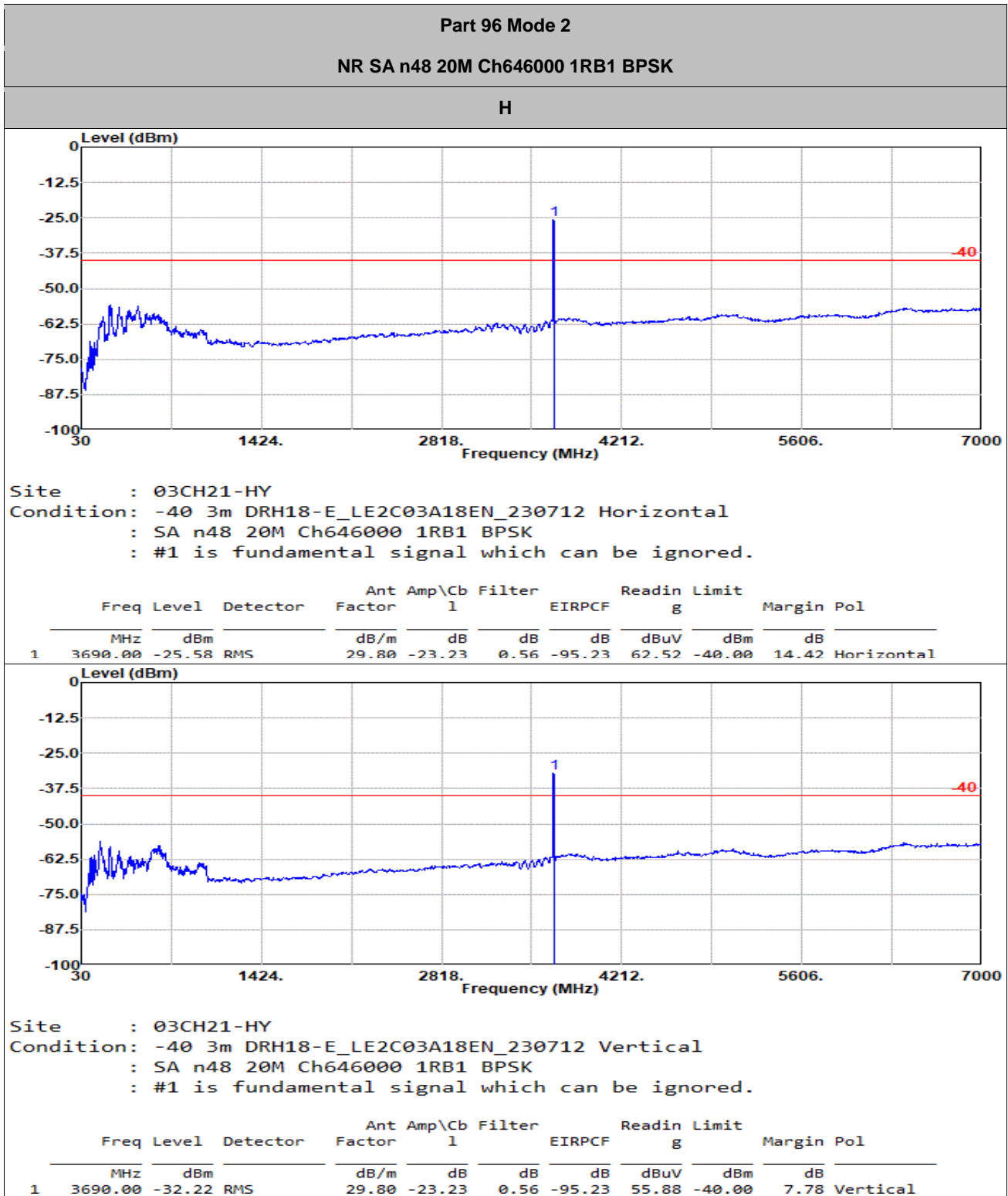


Site : 03CH21-HY
Condition: -40 3m DRH18-E_LE2C03A18EN_230712 Vertical
: SA n48 20M Ch646000 1RB1 BPSK

1	2	3	Freq MHz	Level dBm	Detector	Ant Amp\Cb Filter		EIRPCF	Readin g	Limit dBm	Margin dB	Pol
						Factor	1					



Tx2



Remark: #1 is fundamental signal which can be ignored.