RADIO TEST REPORT

Test Report No. : 13760837H-B-R1

Applicant	:	**Panasonic Corporation of North America**
Type of EUT	:	**Radio Module** **(Tested inside of Panasonic Personal Computer FZ-G2)**
Model Number of EUT	:	**WW21A**
FCC ID	:	**ACJ9TGWW21A**
FCC Classification		**Citizens Band End User Devices (CBE)**
Test regulation	:	**FCC Part 96: 2018**
Test Result	:	**Complied (Refer to SECTION 3)** * RF Output Power (Conducted Output Power / Equivalent Isotropic Radiated Power (EIRP)) and Spurious Emission (Radiated) tests only

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the limits of the above regulation.
4. The test results in this test report are traceable to the national or international standards.
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6. This test report covers Radio technical requirements.
   It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
7. The all test items in this test report are conducted by UL Japan, Inc. Ise EMC Lab.
8. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan, Inc. has been accredited.
9. The information provided from the customer for this report is identified in Section 1.

Date of test: October 20 to November 6, 2021

Representative test engineer:
Konegawa Nachi
Engineer

Approved by:
Takayuki Shimada
Leader

CERTIFICATE 5107.02

☐ The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan, Inc.
☒ There is no testing item of "Non-accreditation".

REVISION HISTORY

Original Test Report No.: 13760837H-B

Revision	Test report No.	Date	Page revised	Contents
- (Original)	13760837H-B	November 18, 2021	-	-
1	13760837H-B-R1	December 13, 2021	P7	Added note to Section 3.2: "*The tests other than the above were conducted in the original module report."

Reference: Abbreviations (Including words undescribed in this report)

A2LA	The American Association for Laboratory Accreditation
AC	Alternating Current
AFH	Adaptive Frequency Hopping
AM	Amplitude Modulation
Amp, AMP	Amplifier
ANSI	American National Standards Institute
Ant, ANT	Antenna
AP	Access Point
ASK	Amplitude Shift Keying
Atten., ATT	Attenuator
AV	Average
BPSK	Binary Phase-Shift Keying
BR	Bluetooth Basic Rate
BT	Bluetooth
BT LE	Bluetooth Low Energy
BW	BandWidth
Cal Int	Calibration Interval
CCK	Complementary Code Keying
Ch., CH	Channel
CISPR	Comite International Special des Perturbations Radioelectriques
CW	Continuous Wave
DBPSK	Differential BPSK
DC	Direct Current
D-factor	Distance factor
DFS	Dynamic Frequency Selection
DQPSK	Differential QPSK
DSSS	Direct Sequence Spread Spectrum
EDR	Enhanced Data Rate
EIRP, e.i.r.p.	Equivalent Isotropically Radiated Power
EMC	ElectroMagnetic Compatibility
EMI	ElectroMagnetic Interference
EN	European Norm
ERP, e.r.p.	Effective Radiated Power
EU	European Union
EUT	Equipment Under Test
Fac.	Factor
FCC	Federal Communications Commission
FHSS	Frequency Hopping Spread Spectrum
FM	Frequency Modulation
Freq.	Frequency
FSK	Frequency Shift Keying
GFSK	Gaussian Frequency-Shift Keying
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
Hori.	Horizontal
ICES	Interference-Causing Equipment Standard
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
IF	Intermediate Frequency
ILAC	International Laboratory Accreditation Conference
ISED	Innovation, Science and Economic Development Canada
ISO	International Organization for Standardization
JAB	Japan Accreditation Board
LAN	Local Area Network
LIMS	Laboratory Information Management System
MCS	Modulation and Coding Scheme
MRA	Mutual Recognition Arrangement
N/A	Not Applicable
NIST	National Institute of Standards and Technology
NS	No signal detect.
NSA	Normalized Site Attenuation
NVLAP	National Voluntary Laboratory Accreditation Program
OBW	Occupied Band Width
OFDM	Orthogonal Frequency Division Multiplexing
P/M	Power meter
PCB	Printed Circuit Board
PER	Packet Error Rate
PHY	Physical Layer
PK	Peak
PN	Pseudo random Noise
PRBS	Pseudo-Random Bit Sequence
PSD	Power Spectral Density
QAM	Quadrature Amplitude Modulation
QP	Quasi-Peak
QPSK	Quadri-Phase Shift Keying
RBW	Resolution Band Width
RDS	Radio Data System
RE	Radio Equipment
RF	Radio Frequency
RMS	Root Mean Square
RSS	Radio Standards Specifications
Rx	Receiving
SA, S/A	Spectrum Analyzer
SG	Signal Generator
SVSWR	Site-Voltage Standing Wave Ratio
TR	Test Receiver
Tx	Transmitting
VBW	Video BandWidth
Vert.	Vertical
WLAN	Wireless LAN

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SECTION 1: Customer information

Company Name	:	Panasonic Corporation of North America
Address	:	Two Riverfront Plaza, 9th Floor Newark, NEW JERSEY, 07102-5940, USA
Telephone Number	:	+1-201-348-7760
Facsimile Number	:	+1-201-348-7760
Contact Person	:	Ben Botros

The information provided from the customer is as follows;
- Applicant, Type of EUT, Model Number of EUT, FCC ID on the cover and other relevant pages
- Operating/Test Mode(s) (Mode(s)) on all the relevant pages
- SECTION 1: Customer information
- SECTION 2: Equipment under test (EUT) other than the Receipt Date
- SECTION 4: Operation of EUT during testing

* The laboratory is exempted from liability of any test results affected from the above information in SECTION 2 and 4.

SECTION 2: Equipment under test (EUT)

2.1 Identification of EUT

Type	:	Radio Module
Model Number	:	WW21A
Serial Number	:	Refer to SECTION 4.2
Rating	:	DC 3.0 V to 3.6 V
Receipt Date	:	March 30, 2021
Condition	:	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification	:	No Modification by the test lab.

2.2 Product Description

Model: WW21A (referred to as the EUT in this report) is a Radio Module.

Radio Specification

Radio Module (Tested inside of Panasonic Tablet PC FZ-G2) Model : WW21A (FCC ID ACJ9TGWW21A / ISED certification number 216H-CFWW21A)				
Wireless technologies	Dup.	Band		Mode
WCDMA	FDD	2		UMTS Rel. 99 (Data) HSDPA (Rel. 5)
	FDD	4		HSUPA (Rel. 6), HSPA+ (Rel. 7), DC-HSDPA (Rel. 8)
	FDD	5		
LTE	FDD	2		QPSK, 16QAM, 64AQM, 256QAM
	FDD	4		
	FDD	5		Downlink MIMO Support: Yes(2x2, 4x4)
*B42: not used in US (FCC)	FDD	7		Supported band : B2, B4, B7, B25, B38, B41, B42, B48, B66
	FDD	12		
*B48: not used in	FDD	13		Uplink MIMO Support: No
Canada(ISED)	FDD	14		Uplink transmission is limited to a single output stream.
	FDD	17		
	FDD	25		
	FDD	26		
	FDD(RX only)	29		
	TDD	38		
	TDD	41		
	TDD	42		
	TDD(Rx only)	46		
	TDD	48		
	FDD	66		
	FDD	71		
LTE CA	Downlink			Uplink *B42: not used in US (FCC) / B48: not used in Canada(ISED)
	Maximum 7 carriers			Maximum 2 carriers Supported combination: <Inrta-band contiguous> 7C, 41C, 42C, 48C <Inter-band> Not supported
5G NR (FR1)	FDD	15 kHz	n2	Pi/2 BPSK (DFT-s-OFDM),
	FDD	15 kHz	n5	QPSK (CP-OFDM/DFT-s-OFDM),
*n77, n78: not used in US	TDD	15 kHz	n41	16QAM (CP-OFDM/DFT-s-OFDM),
(FCC)	FDD	15 kHz	n66	64QAM (CP-OFDM/DFT-s-OFDM),
	FDD	15 kHz	n71	256QAM (CP-OFDM/DFT-s-OFDM)
	TDD	30 kHz	n77	Downlink MIMO Support: Yes(2x2, 4x4)
	TDD	30 kHz	n78	Supported band : n2, n41, n66, n77, n78
	-	-	-	Uplink MIMO Support: No
	-	-	-	Uplink transmission is limited to a single output stream.
EN-DC(LTE-FR1 Sub6)	Supported combination			*n77, n78: not used in US (FCC)
(NSA mode only)	LTE Anchor Bands for NR band n2			LTE Band 5/12/13
	LTE Anchor Bands for NR band n5			LTE Band 2/7/66
	LTE Anchor Bands for NR band n41			LTE Band 2/25/26/66
	LTE Anchor Bands for NR band n66			LTE Band 5/12/13/14/71
	LTE Anchor Bands for NR band n71			LTE Band 2/7/66
	LTE Anchor Bands for NR band n77*			LTE Band 41
	LTE Anchor Bands for NR band n78*			LTE Band 2/5/7/12/38/66

Wireless module (Tested inside of Panasonic Tablet PC FZ-G2) Model : WL20B (FCC ID ACJ9TGWL20B / ISED certification Number 216H-CFWL20B)				
Wireless technologies	Dup.	Band		Mode
WLAN	TDD	2.4GHz	2412-2472	802.11b
			for US	802.11g
			2412-2462	802.11n(20,40)
			for Canada	802.11ax(20,40)
	TDD	5GHz	5180-5240	802.11a
			5260-5320	802.11n(20,40)
			5500-5720	802.11ac(20,40.80.160)
			5745-5825	802.11ax(20,40.80.160)
Bluetooth	TDD	2.4GHz	2402-2480	BR/EDR/LE

*This test report applies to LTE Band 48 part only.

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 96 final revised on December 7, 2018
Title : FCC 47CFR PART 96 CITIZENS BROADBAND RADIO SERVICE

3.2 Procedures and results

Item	Test Specification & Procedure	Remarks	Deviation	Worst margin	Results
RF Output Power (Conducted Output Power / Equivalent Isotropic Radiated Power (EIRP))	FCC 2.1046 FCC 96.41(b)	Conducted	N/A	-	Complied a)
Spurious Emission (Radiated)	FCC 2.1053 FCC 96.41(e)	Radiated	N/A	5.3 dB 10652.980 MHz Vertical, PK	Complied b)

Note: UL Japan's EMI Work Procedures No. 13-EM-W0420
*These tests were also referred to:
ANSI/C63.26:2015, ANSI/TIA-603-E-2016., KDB 971168 D01, KDB 971168 D02 and KDB 940660 D01

*These tests were performed without any deviations from test procedure except for additions or exclusions.
*The tests other than the above were conducted in the original module report.

a) Refer to APPENDIX 1 (RF Output Power (Conducted))
b) Refer to APPENDIX 1 (Spurious Emission (Radiated))

3.3 Addition to standard

No addition, exclusion nor deviation has been made from the standard.

3.4 Uncertainty

There is no applicable rule of uncertainty in this applied standard. Therefore, the results are derived depending on whether or not laboratory uncertainty is applied.

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor k=2.

Ise EMC Lab.

Antenna Terminal test

Test Item	Uncertainty (+/-)
20 dB Bandwidth / 99 % Occupied Bandwidth	0.96 %
Maximum Peak Output Power / Average Output Power	1.4 dB
Carrier Frequency Separation	0.42 %
Dwell time / Burst rate	0.10 %
Conducted Spurious Emission	2.6 dB

Radiated emission

Measurement distance	Frequency range	Uncertainty (+/-)
3 m	9 kHz to 30 MHz	3.3 dB
10 m		3.2 dB
3 m	30 MHz to 200 MHz (Horizontal)	4.8 dB
	(Vertical)	5.0 dB
	200 MHz to 1000 MHz (Horizontal)	5.2 dB
	(Vertical)	6.3 dB
10 m	30 MHz to 200 MHz (Horizontal)	4.8 dB
	(Vertical)	4.8 dB
	200 MHz to 1000 MHz (Horizontal)	5.0 dB
	(Vertical)	5.0 dB
3 m	1 GHz to 6 GHz	4.9 dB
	6 GHz to 18 GHz	5.2 dB
1 m	10 GHz to 26.5 GHz	5.5 dB
	26.5 GHz to 40 GHz	5.5 dB
10 m	1 GHz to 18 GHz	5.2 dB

3.5 Test Location

UL Japan, Inc. Ise EMC Lab.
*A2LA Certificate Number: 5107.02 / FCC Test Firm Registration Number: 884919
ISED Lab Company Number: 2973C / CAB identifier: JP0002
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone: +81 596 24 8999, Facsimile: +81 596 24 8124

Test site	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms	Maximum measurement distance
No.1 semi-anechoic chamber	19.2 x 11.2 x 7.7	7.0 x 6.0	No.1 Power source room	10 m
No.2 semi-anechoic chamber	7.5 x 5.8 x 5.2	4.0 x 4.0	-	3 m
No.3 semi-anechoic chamber	12.0 x 8.5 x 5.9	6.8 x 5.75	No.3 Preparation room	3 m
No.3 shielded room	4.0 x 6.0 x 2.7	N/A	-	-
No.4 semi-anechoic chamber	12.0 x 8.5 x 5.9	6.8 x 5.75	No.4 Preparation room	3 m
No.4 shielded room	4.0 x 6.0 x 2.7	N/A	-	-
No.5 semi-anechoic chamber	6.0 x 6.0 x 3.9	6.0 x 6.0	-	-
No.5 measurement room	6.4 x 6.4 x 3.0	6.4 x 6.4	-	-
No.6 shielded room	4.0 x 4.5 x 2.7	4.0 x 4.5	-	-
No.6 measurement room	4.75 x 5.4 x 3.0	4.75 x 4.15	-	-
No.7 shielded room	4.7 x 7.5 x 2.7	4.7 x 7.5	-	-
No.8 measurement room	3.1 x 5.0 x 2.7	3.1 x 5.0	-	-
No.9 measurement room	8.8 x 4.6 x 2.8	2.4 x 2.4	-	-
No.10 shielded room	3.8 x 2.8 x 2.8	3.8 x 2.8	-	-
No.11 measurement room	4.0 x 3.4 x 2.5	N/A	-	-
No.12 measurement room	2.6 x 3.4 x 2.5	N/A	-	-

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 x 2.0 m for No.1, No.2, No.3, and No.4 semi-anechoic chambers and No.3 and No.4 shielded rooms.

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

SECTION 4: Operation of EUT during testing

4.1 Operating Mode(s)

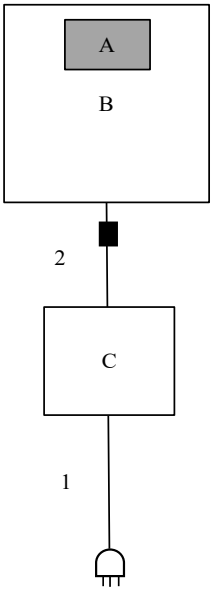
<LTE Band 48>

Test Item	Operating mode	Power Control	Bandwidth	Tested frequency	RB Config.	Modulation
RF output Power (Conducted)	Transmitting	MAX	20 MHz	3560 MHz 3625 MHz 3690 MHz	1RB 50RB 100RB	QPSK 16QAM 64QAM 256QAM
			15 MHz	3557.5 MHz 3625 MHz 3692.5 MHz	1RB 36RB 75RB	
			10 MHz	3555 MHz 3625 MHz 3695 MHz	1RB 25RB 50RB	
			5 MHz	3552.5 MHz 3625 MHz 3697.5 MHz	1RB 12RB 25RB	
Spurious Emission (Radiated) *1)	Transmitting	MAX	20 MHz	3560 MHz 3625 MHz 3690 MHz	1RB	16QAM

*1) The maximum output power mode and maximum bandwidth mode were confirmed and the result of the maximum output power mode was reported. (There was no significant difference in spurious levels in both modes)

*Power of the EUT was set by the software as follows;
Power settings: All up bits
Software: 02.08.01.00
*This setting of software is the worst case.
Any conditions under the normal use do not exceed the condition of setting.
In addition, end users cannot change the settings of the output power of the product.

4.2 Configuration and peripherals



AC 120 V / 60 Hz

* Cabling and setup(s) were taken into consideration and test data was taken under worse case conditions.

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Radio Module	WW21A	*1)	Panasonic Corporation	EUT
B	Personal Computer	FZ-G2	1DTSA00031 *2) 1DTSA00056 *3)	Panasonic Corporation	-
C	AC Adaptor	CF-AA5713A M7	5713AM7212004358WB	Panasonic Corporation	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	AC Cable	2.0	Unshielded	Unshielded	-
2	DC Cable	1.5	Unshielded	Unshielded	-

*1) This item is controlled with B: Personal Computer.
*2) Used for RF Output Power (Conducted Output Power / Equivalent Isotropic Radiated Power (EIRP)) test
*3) Used for Spurious Emission (Radiated) test

SECTION 5: RF Output Power

Test Procedure
All measurements are performed as RMS average measurements while the EUT is operating at maximum power, and at the appropriate frequencies.

[Conducted: Conducted Output Power]
The RF output power (conducted) was measured with a Radio Communication Tester at the antenna port.
All modes of operation (modulation and data rate) were investigated and the worst case powers/emissions are reported with the modulation, RB sizes and offsets, and channel bandwidth configurations.
For bandwidths greater than 10 MHz (15 MHz and 20 MHz), Power of RB100 % configuration was corrected to /10 MHz.

§ 96.41(b) Power limits.
The maximum effective isotropic radiated power (EIRP) of any End User Device must comply with the limits shown in the table below:

Device	Maximum EIRP (dBm/10 megahertz)	Maximum PSD (dBm/MHz)
End User Device	23	n/a

Sample calculations
Below1GHz: dBm[erp] = Reading[dBm] + Ant gain[dBd]
Above 1GHz: dBm[eirp] = Reading[dBm] + Ant gain[dBi]
(reading includes the losses such as cable or attenuator or combiners etc.)

Sample calculations: dBm = Reading[dBm]
(reading includes the losses such as cable or attenuator or combiners etc.)

Test data : APPENDIX
Test result : Pass

SECTION 6: Spurious Emission (Radiated)

[Radiated: Spurious Emission]
[For below 1 GHz]
EUT was placed on a urethane platform of nominal size, 0.5 m by 1.0 m, raised 0.8 m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

[For above 1 GHz]
EUT was placed on a urethane platform of nominal size, 0.5 m by 0.5 m, raised 1.5 m above the conducting ground plane.
The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with absorbent materials lined on a ground plane.

The height of the measuring antenna varied between 1 m and 4 m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength.
Test antenna was aimed at the EUT for receiving the maximum signal and always kept within the illumination area of the 3 dB beam width of the antenna.
The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer.

Test Antennas are used as below;

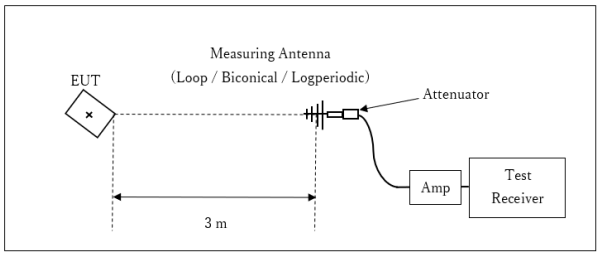
Frequency	Below 30 MHz	30 MHz to 200 MHz	200 MHz to 1 GHz	Above 1 GHz
Antenna Type	Loop	Biconical	Logperiodic	Horn

- The carrier level and noise levels were confirmed at each position of X, Y and Z axes of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

Setting of the spectrum analyzer: below 1 GHz RBW 100 kHz VBW 300 kHz above 1 GHz RBW 1 MHz VBW 3 MHz

Figure 1: Test Setup

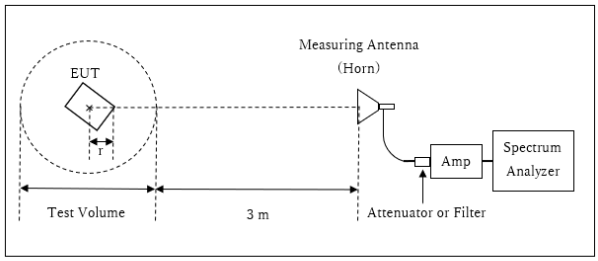
Below 1 GHz



× : Center of turn table

Test Distance: 3 m

1 GHz - 10 GHz

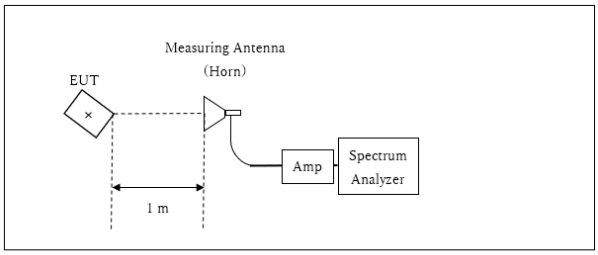


r : Radius of an outer periphery of EUT
× : Center of turn table

Distance Factor: 20 x log (3.6 m / 3.0 m) = 1.58 dB
* Test Distance: (3 + SVSWR Volume /2) - r = 3.6 m

SVSWR Volume : 1.5 m
(SVSWR Volume has been calibrated based on CISPR 16-1-4.)
r = 0.15 m

10 GHz – 26.5 GHz



× : Center of turn table

Distance Factor: 20 x log (1.0 m / 3.0 m) = -9.5 dB
*Test Distance: 1 m

The test results and limit are rounded off to one decimal place, so some differences might be observed.

Measurement range : 30 MHz - 26.5 GHz
Test data : APPENDIX
Test result : Pass

APPENDIX 1: Test data

Worst configuration mode check for LTE Band 48

Report No.	13760837H
Test place	Ise EMC Lab.
Measurement Room	No.10
Date	November 5, 2021
Temperature / Humidity	24 deg. C / 51 % RH
Engineer	Yutaka Yoshida
Mode	LTE Band 48, 20 MHz band

Band						Burst Pwr Avg (dBm)	Timed Pwr Avg (dBm)
48						UL Ch #	
BW (MHz)	Modu-lation	UL RB Allocation	UL RB Start	Uplink/Downlink Configuration	Special Subframe	55990	
						Freq(MHz)	
						3625	
20	QPSK	1	49	0	0	9.70	7.47
					7	9.46	7.26
20	QPSK	1	49	1	0	11.30	7.41
					7	11.25	7.27
20	QPSK	1	49	2	0	14.20	7.24
					7	14.00	7.04
20	QPSK	1	49	3	0	12.83	7.64
					7	12.65	7.47
20	QPSK	1	49	4	0	14.40	7.46
					7	14.17	7.27
20	QPSK	1	49	5	0	**17.31**	7.26
					7	17.04	7.05
20	QPSK	1	49	6	0	10.40	7.45
					7	10.33	7.32

Cyclic prefix _= Extended

*Difference between worst configuration mode check data and formal test result is due to the different test condition.

RF Output Power

Report No. 13760837H
Test place Ise EMC Lab.
Shielded Room No.10
Date November 5, 2021
Temperature / Humidity 24 deg. C / 51 % RH
Engineer Yutaka Yoshida
Mode LTE Band 48 20 MHz, U/D config 5, SSF 0, CP Extended

BW (MHz)	UL Ch #	Freq. (MHz)	Modu-lation	UL RB Allocation	UL RB Start	Conducted Pwr Avg (dBm)	Ant.Gain (dBi)	EIRP (dBm/10MHz)	EIRP Limit (dBm/10MHz)	Margin (dB)
20	55340 Low	3560	QPSK	1	0	17.12	2.38	19.50	23.00	3.50
				1	49	17.11	2.38	19.49	23.00	3.51
				1	99	17.13	2.38	19.51	23.00	3.49
				50	0	17.32	2.38	19.70	23.00	3.30
				50	24	17.28	2.38	19.66	23.00	3.34
				50	50	17.29	2.38	19.67	23.00	3.33
				100	0	14.11	2.38	16.49	23.00	6.51
			16QAM	1	0	17.47	2.38	19.85	23.00	3.15
				1	49	17.39	2.38	19.77	23.00	3.23
				1	99	17.49	2.38	19.87	23.00	3.13
				50	0	17.35	2.38	19.73	23.00	3.27
				50	24	17.23	2.38	19.61	23.00	3.39
				50	50	17.21	2.38	19.59	23.00	3.41
				100	0	14.28	2.38	16.66	23.00	6.34
			64QAM	1	0	17.56	2.38	19.94	23.00	3.06
				1	49	17.52	2.38	19.90	23.00	3.10
				1	99	17.51	2.38	19.89	23.00	3.11
				50	0	16.21	2.38	18.59	23.00	4.41
				50	24	16.37	2.38	18.75	23.00	4.25
				50	50	16.43	2.38	18.81	23.00	4.19
				100	0	13.30	2.38	15.68	23.00	7.32
			256QAM	1	0	16.44	2.38	18.82	23.00	4.18
				1	49	16.53	2.38	18.91	23.00	4.09
				1	99	16.88	2.38	19.26	23.00	3.74
				50	0	16.20	2.38	18.58	23.00	4.42
				50	24	16.32	2.38	18.70	23.00	4.30
				50	50	16.42	2.38	18.80	23.00	4.20
				100	0	13.30	2.38	15.68	23.00	7.32
	55990 Mid	3625	QPSK	1	0	17.22	2.38	19.60	23.00	3.40
				1	49	17.15	2.38	19.53	23.00	3.47
				1	99	17.17	2.38	19.55	23.00	3.45
				50	0	17.34	2.38	19.72	23.00	3.28
				50	24	17.39	2.38	19.77	23.00	3.23
				50	50	17.31	2.38	19.69	23.00	3.31
				100	0	14.18	2.38	16.56	23.00	6.44
			16QAM	1	0	17.63	2.38	20.01	23.00	2.99
				1	49	17.59	2.38	19.97	23.00	3.03
				1	99	17.64	2.38	20.02	23.00	2.98
				50	0	17.32	2.38	19.70	23.00	3.30
				50	24	17.36	2.38	19.74	23.00	3.26
				50	50	17.30	2.38	19.68	23.00	3.32
				100	0	14.35	2.38	16.73	23.00	6.27
			64QAM	1	0	17.68	2.38	20.06	23.00	2.94
				1	49	17.60	2.38	19.98	23.00	3.02
				1	99	17.64	2.38	20.02	23.00	2.98
				50	0	16.77	2.38	19.15	23.00	3.85
				50	24	16.95	2.38	19.33	23.00	3.67
				50	50	17.13	2.38	19.51	23.00	3.49
				100	0	13.92	2.38	16.30	23.00	6.70
			256QAM	1	0	17.01	2.38	19.39	23.00	3.61
				1	49	17.20	2.38	19.58	23.00	3.42
				1	99	17.54	2.38	19.92	23.00	3.08
				50	0	16.75	2.38	19.13	23.00	3.87
				50	24	16.89	2.38	19.27	23.00	3.73
				50	50	17.06	2.38	19.44	23.00	3.56
				100	0	13.82	2.38	16.20	23.00	6.80

RF Output Power

Report No.	13760837H
Test place	Ise EMC Lab.
Shielded Room	No.10
Date	November 5, 2021
Temperature / Humidity	24 deg. C / 51 % RH
Engineer	Yutaka Yoshida
Mode	LTE Band 48 20 MHz, U/D config 5, SSF 0, CP Extended

BW (MHz)	UL Ch #	Freq. (MHz)	Modu-lation	UL RB Allocation	UL RB Start	Conducted Pwr Avg (dBm)	Ant.Gain (dBi)	EIRP (dBm/10MHz)	EIRP Limit (dBm/10MHz)	Margin (dB)
20	56640 High	3690	QPSK	1	0	17.35	2.38	19.73	23.00	3.27
				1	49	17.34	2.38	19.72	23.00	3.28
				1	99	17.29	2.38	19.67	23.00	3.33
				50	0	17.56	2.38	19.94	23.00	3.06
				50	24	17.57	2.38	19.95	23.00	3.05
				50	50	17.55	2.38	19.93	23.00	3.07
				100	0	14.31	2.38	16.69	23.00	6.31
			16QAM	1	0	17.67	2.38	20.05	23.00	2.95
				1	49	17.57	2.38	19.95	23.00	3.05
				1	99	17.71	2.38	20.09	23.00	2.91
				50	0	17.54	2.38	19.92	23.00	3.08
				50	24	17.54	2.38	19.92	23.00	3.08
				50	50	17.51	2.38	19.89	23.00	3.11
				100	0	14.56	2.38	16.94	23.00	6.06
			64QAM	1	0	17.78	2.38	20.16	23.00	2.84
				1	49	17.80	2.38	20.18	23.00	2.82
				1	99	17.73	2.38	20.11	23.00	2.89
				50	0	16.75	2.38	19.13	23.00	3.87
				50	24	16.86	2.38	19.24	23.00	3.76
				50	50	16.88	2.38	19.26	23.00	3.74
				100	0	13.78	2.38	16.16	23.00	6.84
			256QAM	1	0	17.03	2.38	19.41	23.00	3.59
				1	49	17.00	2.38	19.38	23.00	3.62
				1	99	17.22	2.38	19.60	23.00	3.40
				50	0	16.72	2.38	19.10	23.00	3.90
				50	24	16.85	2.38	19.23	23.00	3.77
				50	50	16.75	2.38	19.13	23.00	3.87
				100	0	13.67	2.38	16.05	23.00	6.95

RF Output Power

Report No.	13760837H
Test place	Ise EMC Lab.
Shielded Room	No.10
Date	November 5, 2021
Temperature / Humidity	24 deg. C / 51 % RH
Engineer	Yutaka Yoshida
Mode	LTE Band 48 15 MHz, U/D config 5, SSF 0, CP Extended

BW (MHz)	UL Ch #	Freq. (MHz)	Modu-lation	UL RB Allocation	UL RB Start	Conducted Pwr Avg (dBm)	Ant.Gain (dBi)	EIRP (dBm/10MHz)	EIRP Limit (dBm/10MHz)	Margin (dB)
15	55315 Low	3557.5	QPSK	1	0	17.21	2.38	19.59	23.00	3.41
				1	37	17.13	2.38	19.51	23.00	3.49
				1	74	17.23	2.38	19.61	23.00	3.39
				36	0	17.35	2.38	19.73	23.00	3.27
				36	19	17.31	2.38	19.69	23.00	3.31
				36	39	17.23	2.38	19.61	23.00	3.39
				75	0	15.40	2.38	17.78	23.00	5.22
			16QAM	1	0	17.25	2.38	19.63	23.00	3.37
				1	37	17.17	2.38	19.55	23.00	3.45
				1	74	17.31	2.38	19.69	23.00	3.31
				36	0	17.34	2.38	19.72	23.00	3.28
				36	19	17.33	2.38	19.71	23.00	3.29
				36	39	17.21	2.38	19.59	23.00	3.41
				75	0	15.56	2.38	17.94	23.00	5.06
			64QAM	1	0	17.35	2.38	19.73	23.00	3.27
				1	37	17.25	2.38	19.63	23.00	3.37
				1	74	17.49	2.38	19.87	23.00	3.13
				36	0	16.22	2.38	18.60	23.00	4.40
				36	19	16.19	2.38	18.57	23.00	4.43
				36	39	16.38	2.38	18.76	23.00	4.24
				75	0	14.52	2.38	16.90	23.00	6.10
			256QAM	1	0	16.05	2.38	18.43	23.00	4.57
				1	37	16.02	2.38	18.40	23.00	4.60
				1	74	16.30	2.38	18.68	23.00	4.32
				36	0	16.18	2.38	18.56	23.00	4.44
				36	19	16.24	2.38	18.62	23.00	4.38
				36	39	16.36	2.38	18.74	23.00	4.26
				75	0	14.52	2.38	16.90	23.00	6.10
	55990 Mid	3625	QPSK	1	0	17.18	2.38	19.56	23.00	3.44
				1	37	17.06	2.38	19.44	23.00	3.56
				1	74	17.23	2.38	19.61	23.00	3.39
				36	0	17.33	2.38	19.71	23.00	3.29
				36	19	17.35	2.38	19.73	23.00	3.27
				36	39	17.28	2.38	19.66	23.00	3.34
				75	0	15.43	2.38	17.81	23.00	5.19
			16QAM	1	0	17.23	2.38	19.61	23.00	3.39
				1	37	17.20	2.38	19.58	23.00	3.42
				1	74	17.54	2.38	19.92	23.00	3.08
				36	0	17.30	2.38	19.68	23.00	3.32
				36	19	17.37	2.38	19.75	23.00	3.25
				36	39	17.31	2.38	19.69	23.00	3.31
				75	0	15.60	2.38	17.98	23.00	5.02
			64QAM	1	0	17.43	2.38	19.81	23.00	3.19
				1	37	17.32	2.38	19.70	23.00	3.30
				1	74	17.47	2.38	19.85	23.00	3.15
				36	0	16.73	2.38	19.11	23.00	3.89
				36	19	16.74	2.38	19.12	23.00	3.88
				36	39	17.09	2.38	19.47	23.00	3.53
				75	0	15.12	2.38	17.50	23.00	5.50
			256QAM	1	0	16.65	2.38	19.03	23.00	3.97
				1	37	16.53	2.38	18.91	23.00	4.09
				1	74	17.07	2.38	19.45	23.00	3.55
				36	0	16.73	2.38	19.11	23.00	3.89
				36	19	16.78	2.38	19.16	23.00	3.84
				36	39	17.00	2.38	19.38	23.00	3.62
				75	0	15.00	2.38	17.38	23.00	5.62

RF Output Power

Report No.	13760837H
Test place	Ise EMC Lab.
Shielded Room	No.10
Date	November 5, 2021
Temperature / Humidity	24 deg. C / 51 % RH
Engineer	Yutaka Yoshida
Mode	LTE Band 48 15 MHz, U/D config 5, SSF 0, CP Extended

BW (MHz)	UL Ch #	Freq. (MHz)	Modu-lation	UL RB Allocation	UL RB Start	Conducted Pwr Avg (dBm)	Ant.Gain (dBi)	EIRP (dBm/10MHz)	EIRP Limit (dBm/10MHz)	Margin (dB)
15	56665 High	3692.5	QPSK	1	0	17.40	2.38	19.78	23.00	3.22
				1	37	17.30	2.38	19.68	23.00	3.32
				1	74	17.39	2.38	19.77	23.00	3.23
				36	0	17.57	2.38	19.95	23.00	3.05
				36	19	17.53	2.38	19.91	23.00	3.09
				36	39	17.49	2.38	19.87	23.00	3.13
				75	0	15.63	2.38	18.01	23.00	4.99
			16QAM	1	0	17.72	2.38	20.10	23.00	2.90
				1	37	17.70	2.38	20.08	23.00	2.92
				1	74	17.88	2.38	20.26	23.00	2.74
				36	0	17.55	2.38	19.93	23.00	3.07
				36	19	17.56	2.38	19.94	23.00	3.06
				36	39	17.45	2.38	19.83	23.00	3.17
				75	0	15.76	2.38	18.14	23.00	4.86
			64QAM	1	0	17.87	2.38	20.25	23.00	2.75
				1	37	17.74	2.38	20.12	23.00	2.88
				1	74	17.89	2.38	20.27	23.00	2.73
				36	0	16.64	2.38	19.02	23.00	3.98
				36	19	16.70	2.38	19.08	23.00	3.92
				36	39	16.75	2.38	19.13	23.00	3.87
				75	0	14.89	2.38	17.27	23.00	5.73
			256QAM	1	0	16.43	2.38	18.81	23.00	4.19
				1	37	16.23	2.38	18.61	23.00	4.39
				1	74	16.64	2.38	19.02	23.00	3.98
				36	0	16.67	2.38	19.05	23.00	3.95
				36	19	16.60	2.38	18.98	23.00	4.02
				36	39	16.76	2.38	19.14	23.00	3.86
				75	0	14.96	2.38	17.34	23.00	5.66

RF Output Power

Report No. 13760837H
Test place Ise EMC Lab.
Shielded Room No.10
Date November 5, 2021
Temperature / Humidity 24 deg. C / 51 % RH
Engineer Yutaka Yoshida
Mode LTE Band 48 10 MHz, U/D config 5, SSF 0, CP Extended

BW (MHz)	UL Ch #	Freq. (MHz)	Modu-lation	UL RB Allocation	UL RB Start	Conducted Pwr Avg (dBm)	Ant.Gain (dBi)	EIRP (dBm/10MHz)	EIRP Limit (dBm/10MHz)	Margin (dB)
10	55290 Low	3555	QPSK	1	0	17.33	2.38	19.71	23.00	3.29
				1	24	17.25	2.38	19.63	23.00	3.37
				1	49	17.34	2.38	19.72	23.00	3.28
				25	0	17.43	2.38	19.81	23.00	3.19
				25	12	17.36	2.38	19.74	23.00	3.26
				25	25	17.38	2.38	19.76	23.00	3.24
				50	0	17.27	2.38	19.65	23.00	3.35
			16QAM	1	0	17.77	2.38	20.15	23.00	2.85
				1	24	17.69	2.38	20.07	23.00	2.93
				1	49	17.75	2.38	20.13	23.00	2.87
				25	0	17.50	2.38	19.88	23.00	3.12
				25	12	17.44	2.38	19.82	23.00	3.18
				25	25	17.36	2.38	19.74	23.00	3.26
				50	0	17.33	2.38	19.71	23.00	3.29
			64QAM	1	0	17.42	2.38	19.80	23.00	3.20
				1	24	17.49	2.38	19.87	23.00	3.13
				1	49	17.55	2.38	19.93	23.00	3.07
				25	0	16.23	2.38	18.61	23.00	4.39
				25	12	16.30	2.38	18.68	23.00	4.32
				25	25	16.32	2.38	18.70	23.00	4.30
				50	0	16.26	2.38	18.64	23.00	4.36
			256QAM	1	0	16.08	2.38	18.46	23.00	4.54
				1	24	16.06	2.38	18.44	23.00	4.56
				1	49	16.15	2.38	18.53	23.00	4.47
				25	0	16.19	2.38	18.57	23.00	4.43
				25	12	16.25	2.38	18.63	23.00	4.37
				25	25	16.30	2.38	18.68	23.00	4.32
				50	0	16.28	2.38	18.66	23.00	4.34
	55990 Mid	3625	QPSK	1	0	17.29	2.38	19.67	23.00	3.33
				1	24	17.25	2.38	19.63	23.00	3.37
				1	49	17.30	2.38	19.68	23.00	3.32
				25	0	17.43	2.38	19.81	23.00	3.19
				25	12	17.40	2.38	19.78	23.00	3.22
				25	25	17.35	2.38	19.73	23.00	3.27
				50	0	17.23	2.38	19.61	23.00	3.39
			16QAM	1	0	17.36	2.38	19.74	23.00	3.26
				1	24	17.52	2.38	19.90	23.00	3.10
				1	49	17.65	2.38	20.03	23.00	2.97
				25	0	17.36	2.38	19.74	23.00	3.26
				25	12	17.42	2.38	19.80	23.00	3.20
				25	25	17.36	2.38	19.74	23.00	3.26
				50	0	17.46	2.38	19.84	23.00	3.16
			64QAM	1	0	17.56	2.38	19.94	23.00	3.06
				1	24	17.61	2.38	19.99	23.00	3.01
				1	49	17.52	2.38	19.90	23.00	3.10
				25	0	16.85	2.38	19.23	23.00	3.77
				25	12	16.93	2.38	19.31	23.00	3.69
				25	25	16.96	2.38	19.34	23.00	3.66
				50	0	16.89	2.38	19.27	23.00	3.73
			256QAM	1	0	16.58	2.38	18.96	23.00	4.04
				1	24	16.66	2.38	19.04	23.00	3.96
				1	49	16.89	2.38	19.27	23.00	3.73
				25	0	16.83	2.38	19.21	23.00	3.79
				25	12	16.88	2.38	19.26	23.00	3.74
				25	25	16.93	2.38	19.31	23.00	3.69
				50	0	16.92	2.38	19.30	23.00	3.70

RF Output Power

Report No.	13760837H
Test place	Ise EMC Lab.
Shielded Room	No.10
Date	November 5, 2021
Temperature / Humidity	24 deg. C / 51 % RH
Engineer	Yutaka Yoshida
Mode	LTE Band 48 10 MHz, U/D config 5, SSF 0, CP Extended

BW (MHz)	UL Ch #	Freq. (MHz)	Modu-lation	UL RB Allocation	UL RB Start	Conducted Pwr Avg (dBm)	Ant.Gain (dBi)	EIRP (dBm/10MHz)	EIRP Limit (dBm/10MHz)	Margin (dB)
10	56690 High	3695	QPSK	1	0	17.54	2.38	19.92	23.00	3.08
				1	24	17.40	2.38	19.78	23.00	3.22
				1	49	17.52	2.38	19.90	23.00	3.10
				25	0	17.66	2.38	20.04	23.00	2.96
				25	12	17.64	2.38	20.02	23.00	2.98
				25	25	17.59	2.38	19.97	23.00	3.03
				50	0	17.50	2.38	19.88	23.00	3.12
			16QAM	1	0	17.55	2.38	19.93	23.00	3.07
				1	24	17.44	2.38	19.82	23.00	3.18
				1	49	17.61	2.38	19.99	23.00	3.01
				25	0	17.60	2.38	19.98	23.00	3.02
				25	12	17.63	2.38	20.01	23.00	2.99
				25	25	17.61	2.38	19.99	23.00	3.01
				50	0	17.65	2.38	20.03	23.00	2.97
			64QAM	1	0	17.68	2.38	20.06	23.00	2.94
				1	24	17.69	2.38	20.07	23.00	2.93
				1	49	17.72	2.38	20.10	23.00	2.90
				25	0	16.66	2.38	19.04	23.00	3.96
				25	12	16.78	2.38	19.16	23.00	3.84
				25	25	16.80	2.38	19.18	23.00	3.82
				50	0	16.73	2.38	19.11	23.00	3.89
			256QAM	1	0	16.48	2.38	18.86	23.00	4.14
				1	24	16.52	2.38	18.90	23.00	4.10
				1	49	16.63	2.38	19.01	23.00	3.99
				25	0	16.70	2.38	19.08	23.00	3.92
				25	12	16.74	2.38	19.12	23.00	3.88
				25	25	16.76	2.38	19.14	23.00	3.86
				50	0	16.73	2.38	19.11	23.00	3.89

RF Output Power

Report No.	13760837H
Test place	Ise EMC Lab.
Shielded Room	No.10
Date	November 5, 2021
Temperature / Humidity	24 deg. C / 51 % RH
Engineer	Yutaka Yoshida
Mode	LTE Band 48 5 MHz, U/D config 5, SSF 0, CP Extended

BW (MHz)	UL Ch #	Freq. (MHz)	Modu-lation	UL RB Allocation	UL RB Start	Conducted Pwr Avg (dBm)	Ant.Gain (dBi)	EIRP (dBm/10MHz)	EIRP Limit (dBm/10MHz)	Margin (dB)
5	55265 Low	3552.5	QPSK	1	0	17.38	2.38	19.76	23.00	3.24
				1	12	17.23	2.38	19.61	23.00	3.39
				1	24	17.37	2.38	19.75	23.00	3.25
				12	0	17.42	2.38	19.80	23.00	3.20
				12	6	17.36	2.38	19.74	23.00	3.26
				12	13	17.38	2.38	19.76	23.00	3.24
				25	0	17.35	2.38	19.73	23.00	3.27
			16QAM	1	0	17.67	2.38	20.05	23.00	2.95
				1	12	17.50	2.38	19.88	23.00	3.12
				1	24	17.68	2.38	20.06	23.00	2.94
				12	0	17.45	2.38	19.83	23.00	3.17
				12	6	17.41	2.38	19.79	23.00	3.21
				12	13	17.41	2.38	19.79	23.00	3.21
				25	0	17.41	2.38	19.79	23.00	3.21
			64QAM	1	0	17.25	2.38	19.63	23.00	3.37
				1	12	17.27	2.38	19.65	23.00	3.35
				1	24	17.36	2.38	19.74	23.00	3.26
				12	0	16.24	2.38	18.62	23.00	4.38
				12	6	16.29	2.38	18.67	23.00	4.33
				12	13	16.30	2.38	18.68	23.00	4.32
				25	0	16.25	2.38	18.63	23.00	4.37
			256QAM	1	0	16.21	2.38	18.59	23.00	4.41
				1	12	16.24	2.38	18.62	23.00	4.38
				1	24	16.32	2.38	18.70	23.00	4.30
				12	0	16.21	2.38	18.59	23.00	4.41
				12	6	16.26	2.38	18.64	23.00	4.36
				12	13	16.26	2.38	18.64	23.00	4.36
				25	0	16.16	2.38	18.54	23.00	4.46
	55990 Mid	3625	QPSK	1	0	17.33	2.38	19.71	23.00	3.29
				1	12	17.25	2.38	19.63	23.00	3.37
				1	24	17.40	2.38	19.78	23.00	3.22
				12	0	17.43	2.38	19.81	23.00	3.19
				12	6	17.39	2.38	19.77	23.00	3.23
				12	13	17.45	2.38	19.83	23.00	3.17
				25	0	17.33	2.38	19.71	23.00	3.29
			16QAM	1	0	17.64	2.38	20.02	23.00	2.98
				1	12	17.66	2.38	20.04	23.00	2.96
				1	24	17.89	2.38	20.27	23.00	2.73
				12	0	17.41	2.38	19.79	23.00	3.21
				12	6	17.37	2.38	19.75	23.00	3.25
				12	13	17.41	2.38	19.79	23.00	3.21
				25	0	17.45	2.38	19.83	23.00	3.17
			64QAM	1	0	17.59	2.38	19.97	23.00	3.03
				1	12	17.48	2.38	19.86	23.00	3.14
				1	24	17.57	2.38	19.95	23.00	3.05
				12	0	16.94	2.38	19.32	23.00	3.68
				12	6	17.00	2.38	19.38	23.00	3.62
				12	13	16.92	2.38	19.30	23.00	3.70
				25	0	16.79	2.38	19.17	23.00	3.83
			256QAM	1	0	16.74	2.38	19.12	23.00	3.88
				1	12	16.78	2.38	19.16	23.00	3.84
				1	24	16.95	2.38	19.33	23.00	3.67
				12	0	16.73	2.38	19.11	23.00	3.89
				12	6	16.80	2.38	19.18	23.00	3.82
				12	13	16.82	2.38	19.20	23.00	3.80
				25	0	16.73	2.38	19.11	23.00	3.89

RF Output Power

Report No. 13760837H
Test place Ise EMC Lab.
Shielded Room No.10
Date November 5, 2021
Temperature / Humidity 24 deg. C / 51 % RH
Engineer Yutaka Yoshida
Mode LTE Band 48 5 MHz, U/D config 5, SSF 0, CP Extended

BW (MHz)	UL Ch #	Freq. (MHz)	Modu-lation	UL RB Allocation	UL RB Start	Conducted Pwr Avg (dBm)	Ant.Gain (dBi)	EIRP (dBm/10MHz)	EIRP Limit (dBm/10MHz)	Margin (dB)
5	56715 High	3697.5	QPSK	1	0	17.54	2.38	19.92	23.00	3.08
				1	12	17.44	2.38	19.82	23.00	3.18
				1	24	17.60	2.38	19.98	23.00	3.02
				12	0	17.63	2.38	20.01	23.00	2.99
				12	6	17.62	2.38	20.00	23.00	3.00
				12	13	17.64	2.38	20.02	23.00	2.98
				25	0	17.52	2.38	19.90	23.00	3.10
			16QAM	1	0	17.80	2.38	20.18	23.00	2.82
				1	12	17.69	2.38	20.07	23.00	2.93
				1	24	17.83	2.38	20.21	23.00	2.79
				12	0	17.59	2.38	19.97	23.00	3.03
				12	6	17.63	2.38	20.01	23.00	2.99
				12	13	17.62	2.38	20.00	23.00	3.00
				25	0	17.62	2.38	20.00	23.00	3.00
			64QAM	1	0	17.69	2.38	20.07	23.00	2.93
				1	12	17.67	2.38	20.05	23.00	2.95
				1	24	17.76	2.38	20.14	23.00	2.86
				12	0	16.72	2.38	19.10	23.00	3.90
				12	6	16.77	2.38	19.15	23.00	3.85
				12	13	16.76	2.38	19.14	23.00	3.86
				25	0	16.67	2.38	19.05	23.00	3.95
			256QAM	1	0	16.62	2.38	19.00	23.00	4.00
				1	12	16.64	2.38	19.02	23.00	3.98
				1	24	16.70	2.38	19.08	23.00	3.92
				12	0	16.61	2.38	18.99	23.00	4.01
				12	6	16.66	2.38	19.04	23.00	3.96
				12	13	16.65	2.38	19.03	23.00	3.97
				25	0	16.61	2.38	18.99	23.00	4.01

Spurious Emission (Radiated)

Report No.	13760837H	
Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.2	No.3
Date	October 20, 2021	November 6, 2021
Temperature / Humidity	23 deg. C / 46 % RH	22 deg. C / 50 % RH
Engineer	Nachi Konegawa	Hiroki Numata
	(Below 1 GHz)	(Above 1 GHz)
Mode	LTE Band 48 20 MHz 16QAM	55340ch 3560 MHz 1RB Start0

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Distance [m]	EIRP [dBm]	ERP [dBm]	Limit [dBm]	Margin [dB]	Remark
Hori.	40.484	PK	29.9	14.8	6.9	28.5	23.1	3.0	-72.2	-74.3	-40.0	34.3	Floor noise
Hori.	53.137	PK	29.8	10.2	7.0	28.4	18.5	3.0	-76.7	-78.9	-40.0	38.9	Floor noise
Hori.	114.224	PK	29.5	12.2	7.6	28.3	21.1	3.0	-74.2	-76.4	-40.0	36.4	Floor noise
Hori.	227.110	PK	35.5	12.3	8.3	27.8	28.4	3.0	-66.8	-69.0	-40.0	29.0	
Hori.	471.352	PK	29.9	17.4	9.7	28.9	28.1	3.0	-67.2	-69.3	-40.0	29.3	Floor noise
Hori.	746.763	PK	29.4	20.4	10.7	29.1	31.3	3.0	-64.0	-66.1	-40.0	26.1	Floor noise
Hori.	7120.000	PK	35.9	35.8	9.3	35.3	45.7	3.0	-49.5	-51.7	-40.0	11.7	Floor noise
Hori.	10652.980	PK	48.1	39.7	7.2	35.5	59.5	1.0	-45.3	-47.5	-40.0	7.5	
Hori.	14240.000	PK	33.8	41.1	8.6	34.0	49.5	1.0	-55.3	-57.5	-40.0	17.5	Floor noise
Vert.	40.484	PK	34.2	14.8	6.9	28.5	27.4	3.0	-67.8	-70.0	-40.0	30.0	
Vert.	53.137	PK	36.2	10.2	7.0	28.4	25.0	3.0	-70.3	-72.4	-40.0	32.4	
Vert.	114.224	PK	33.5	12.2	7.6	28.3	25.0	3.0	-70.3	-72.4	-40.0	32.4	
Vert.	229.360	PK	40.9	12.4	8.4	27.8	33.9	3.0	-61.4	-63.5	-40.0	23.5	
Vert.	471.352	PK	29.9	17.4	9.7	28.9	28.0	3.0	-67.2	-69.4	-40.0	29.4	Floor noise
Vert.	746.763	PK	29.3	20.4	10.7	29.1	31.3	3.0	-64.0	-66.2	-40.0	26.2	Floor noise
Vert.	7120.000	PK	35.9	35.8	9.3	35.3	45.7	3.0	-49.6	-51.8	-40.0	11.8	Floor noise
Vert.	10652.980	PK	50.3	39.7	7.2	35.5	61.6	1.0	-43.2	-45.3	-40.0	5.3	
Vert.	14240.000	PK	33.4	41.1	8.6	34.0	49.1	1.0	-55.7	-57.9	-40.0	17.9	Floor noise

Result (E) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

EIRP = E + 20*log(D) -104.8

ERP =EIRP -2.15

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.6 m / 3.0 m) = 1.59 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Spurious Emission (Radiated)

Report No.	13760837H	
Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.2	No.3
Date	October 20, 2021	November 6, 2021
Temperature / Humidity	23 deg. C / 46 % RH	22 deg. C / 50 % RH
Engineer	Nachi Konegawa	Hiroki Numata
	(Below 1 GHz)	(Above 1 GHz)
Mode	LTE Band 48 20 MHz 16QAM	55990ch 3625 MHz 1RB Start0

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Distance [m]	EIRP [dBm]	ERP [dBm]	Limit [dBm]	Margin [dB]	Remark
Hori.	40.283	PK	29.7	14.9	6.8	28.5	22.9	3.0	-72.3	-74.5	-40.0	34.5	Floor noise
Hori.	52.602	PK	29.7	10.4	7.0	28.4	18.6	3.0	-76.6	-78.8	-40.0	38.8	Floor noise
Hori.	102.367	PK	29.9	10.6	7.5	28.3	19.7	3.0	-75.5	-77.7	-40.0	37.7	Floor noise
Hori.	249.858	PK	33.8	12.3	8.5	27.7	26.9	3.0	-68.4	-70.5	-40.0	30.5	
Hori.	455.067	PK	29.8	16.9	9.6	28.8	27.6	3.0	-67.7	-69.8	-40.0	29.8	Floor noise
Hori.	753.772	PK	29.5	20.4	10.7	29.1	31.4	3.0	-63.8	-66.0	-40.0	26.0	Floor noise
Hori.	7232.477	PK	41.8	36.1	9.2	35.3	51.8	3.0	-43.5	-45.6	-40.0	5.6	
Hori.	10846.650	PK	49.2	39.9	7.3	35.4	61.0	1.0	-43.8	-45.9	-40.0	5.9	
Hori.	14500.000	PK	33.4	40.6	8.8	34.4	48.5	1.0	-56.4	-58.5	-40.0	18.5	Floor noise
Vert.	40.283	PK	35.0	14.9	6.8	28.5	28.3	3.0	-67.0	-69.1	-40.0	29.1	
Vert.	52.602	PK	35.7	10.4	7.0	28.4	24.6	3.0	-70.6	-72.8	-40.0	32.8	
Vert.	102.367	PK	34.1	10.6	7.5	28.3	23.9	3.0	-71.4	-73.5	-40.0	33.5	
Vert.	230.042	PK	41.4	12.4	8.4	27.8	34.4	3.0	-60.9	-63.0	-40.0	23.0	
Vert.	455.067	PK	29.4	16.9	9.6	28.8	27.2	3.0	-68.1	-70.2	-40.0	30.2	Floor noise
Vert.	753.772	PK	29.2	20.4	10.7	29.1	31.2	3.0	-64.1	-66.2	-40.0	26.2	Floor noise
Vert.	7232.477	PK	41.2	36.1	9.2	35.3	51.2	3.0	-44.1	-46.2	-40.0	6.2	
Vert.	10846.650	PK	47.4	39.9	7.3	35.4	59.3	1.0	-45.6	-47.7	-40.0	7.7	
Vert.	14500.000	PK	33.5	40.6	8.8	34.4	48.5	1.0	-56.3	-58.4	-40.0	18.4	Floor noise

Result (E) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

EIRP = E + 20*log(D) -104.8

ERP =EIRP -2.15

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.6 m / 3.0 m) = 1.59 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Spurious Emission (Radiated)

Report No.	13760837H	
Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.2	No.3
Date	October 20, 2021	November 6, 2021
Temperature / Humidity	23 deg. C / 46 % RH	22 deg. C / 50 % RH
Engineer	Nachi Konegawa	Hiroki Numata
	(Below 1 GHz)	(Above 1 GHz)
Mode	LTE Band 48 20 MHz 16QAM	56640ch 3690 MHz 1RB Start0

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Distance [m]	EIRP [dBm]	ERP [dBm]	Limit [dBm]	Margin [dB]	Remark
Hori.	42.275	PK	28.7	14.2	6.9	28.5	21.3	3.0	-74.0	-76.1	-40.0	36.1	Floor noise
Hori.	52.250	PK	28.9	10.5	7.0	28.4	17.9	3.0	-77.3	-79.5	-40.0	39.5	Floor noise
Hori.	101.829	PK	29.9	10.6	7.5	28.3	19.6	3.0	-75.6	-77.8	-40.0	37.8	Floor noise
Hori.	263.517	PK	34.1	13.1	8.6	27.7	28.1	3.0	-67.2	-69.3	-40.0	29.3	
Hori.	445.430	PK	29.0	16.7	9.6	28.7	26.5	3.0	-68.7	-70.9	-40.0	30.9	Floor noise
Hori.	754.092	PK	28.6	20.4	10.7	29.1	30.6	3.0	-64.7	-66.8	-40.0	26.8	Floor noise
Hori.	7380.000	PK	35.8	36.3	9.2	35.4	46.0	3.0	-49.3	-51.5	-40.0	11.5	Floor noise
Hori.	11040.980	PK	45.0	39.8	7.3	35.2	56.9	1.0	-47.9	-50.1	-40.0	10.1	
Hori.	14760.000	PK	33.3	40.3	8.9	34.7	47.8	1.0	-57.0	-59.2	-40.0	19.2	Floor noise
Vert.	42.275	PK	35.3	14.2	6.9	28.5	27.9	3.0	-67.4	-69.5	-40.0	29.5	
Vert.	52.250	PK	36.0	10.5	7.0	28.4	25.1	3.0	-70.2	-72.3	-40.0	32.3	
Vert.	101.829	PK	35.6	10.6	7.5	28.3	25.4	3.0	-69.9	-72.1	-40.0	32.1	
Vert.	222.102	PK	41.7	12.2	8.3	27.8	34.5	3.0	-60.8	-62.9	-40.0	22.9	
Vert.	445.430	PK	28.6	16.7	9.6	28.7	26.1	3.0	-69.1	-71.3	-40.0	31.3	Floor noise
Vert.	754.092	PK	28.6	20.4	10.7	29.1	30.5	3.0	-64.7	-66.9	-40.0	26.9	Floor noise
Vert.	7380.000	PK	35.5	36.3	9.2	35.4	45.7	3.0	-49.6	-51.8	-40.0	11.8	Floor noise
Vert.	11040.980	PK	41.1	39.8	7.3	35.2	53.0	1.0	-51.8	-53.9	-40.0	13.9	
Vert.	14760.000	PK	33.4	40.3	8.9	34.7	47.9	1.0	-56.9	-59.1	-40.0	19.1	Floor noise

Result (E) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

EIRP = E + 20*log(D) -104.8

ERP =EIRP -2.15

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.6 m / 3.0 m) = 1.59 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

APPENDIX 2: Test instruments

Test equipment (1/2)

Test Item	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
RE	MAEC-02	142004	AC2_Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	05/26/2020	24
RE	MOS-41	192300	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	0013	12/06/2020	12
RE	MMM-01	141542	Digital Tester	Fluke Corporation	FLUKE 26-3	78030611	08/10/2021	12
RE	MJM-27	142228	Measure	KOMELON	KMC-36	-	-	-
RE	COTS-MEMI-02	178648	EMI measurement program	TSJ (Techno Science Japan)	TEPTO-DV	-	-	-
RE	MAEC-02-SVSWR	142006	AC2_Semi Anechoic Chamber(SVSWR)	TDK	Semi Anechoic Chamber 3m	DA-06902	04/09/2021	24
RE	MHA-02	141503	Horn Antenna 18-26.5GHz	EMCO	3160-09	1265	06/28/2021	12
RE	MSA-04	141885	Spectrum Analyzer	Keysight Technologies Inc	E4448A	US44300523	11/09/2020	12
RE	MHA-29	141517	Horn Antenna 26.5-40GHz	ETS-Lindgren	3160-10	152399	08/27/2021	12
RE	MCC-224	160324	Coaxial Cable	Huber+Suhner	SUCOFLEX 102A	MY009/2A	11/17/2020	12
RE	MPA-22	141588	Pre Amplifier	MITEQ, Inc	AMF-6F-2600400-33-8P / AMF-4F-2600400-33-8P	1871355 /1871328	09/30/2021	12
RE	MAT-07	141203	Attenuator(6dB)	Weinschel Corp	2	BK7970	11/13/2020	12
RE	MBA-08	141427	Biconical Antenna	Schwarzbeck Mess-Elektronik OHG	VHA9103B+BBA9106	08031	07/10/2021	12
RE	MCC-12	141317	Coaxial Cable	UL Japan Inc.	-	-	09/06/2021	12
RE	MLA-21	141265	Logperiodic Antenna (200-1000MHz)	Schwarzbeck Mess-Elektronik OHG	VUSLP9111B	9111B-190	07/10/2021	12
RE	MPA-24	141594	Pre Amplifier	Keysight Technologies Inc	8447D	2944A10150	02/18/2021	12
RE	MAEC-03	142008	AC3_Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	05/22/2020	24
RE	MOS-13	141554	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	1301	01/15/2021	12
RE	MMM-08	141532	DIGITAL HiTESTER	HIOKI E.E. CORPORATION	3805	51201197	01/07/2021	12
RE	MJM-16	142183	Measure	KOMELON	KMC-36	-	-	-
RE	COTS-MEMI-02	178648	EMI measurement program	TSJ (Techno Science Japan)	TEPTO-DV	-	-	-
RE	MAEC-03-SVSWR	142013	AC3_Semi Anechoic Chamber(SVSWR)	TDK	Semi Anechoic Chamber 3m	DA-10005	04/01/2021	24
RE	MHA-21	141508	Horn Antenna 1-18GHz	Schwarzbeck Mess-Elektronik OHG	BBHA9120D	557	05/10/2021	12
RE	MPA-01	141576	Pre Amplifier	Keysight Technologies Inc	8449B	3008A01671	02/18/2021	12
RE	MCC-231	177964	Microwave Cable	Junkosha INC.	MMX221	1901S329(1m)/ 1902S579(5m)	03/04/2021	12
RE	MHA-16	141513	Horn Antenna 15-40GHz	Schwarzbeck Mess-Elektronik OHG	BBHA9170	BBHA9170306	06/07/2021	12
RE	MCC-177	141226	Microwave Cable	Junkosha	MMX221-00500DMSDMS	1502S304	03/01/2021	12
RE	MHF-22	141293	High Pass Filter 7-20GHz	TOKIMEC	TF37NCCB	602	02/18/2021	12

Test equipment (2/2)

Test Item	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
RE	MSA-03	141884	Spectrum Analyzer	Keysight Technologies Inc	E4448A	MY44020357	03/10/2021	12
RE	MHA-29	141517	Horn Antenna 26.5-40GHz	ETS-Lindgren	3160-10	152399	08/27/2021	12
RE	MPM-22	168708	Power Meter	Boonton Electronics	RTP5006	10449	04/06/2021	12
RE	MCC-224	160324	Coaxial Cable	Huber+Suhner	SUCOFLEX 102A	MY009/2A	11/17/2020	12
RE	MAT-95	142314	Attenuator	Pasternack Enterprises	PE7390-6	D/C 1504	06/09/2021	12
RE	MBA-03	141424	Biconical Antenna	Schwarzbeck Mess-Elektronik OHG	VHA9103+BBA9106	1915	08/21/2021	12
RE	MCC-51	141323	Coaxial cable	UL Japan	-	-	07/19/2021	12
RE	MLA-22	141266	Logperiodic Antenna(200-1000MHz)	Schwarzbeck Mess-Elektronik OHG	VUSLP9111B	9111B-191	08/21/2021	12
RE	MPA-14	141583	Pre Amplifier	SONOMA INSTRUMENT	310	260833	02/18/2021	12
AT	MURC-10	171763	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	165750	2021/6/15	12
AT	MHDC-30	196147	Directional Coupler	Agilent Technologies	87300B	MY39500119	2021/4/21	12
AT	MPM-12	141830	Power Meter	Anritsu Corporation	ML2495A	825002	2021/05/19	12
AT	MPSE-17	141366	Power sensor	Anritsu Corporation	MA2411B	738285	2021/05/19	12
AT	MAT-86	88581	Attenuator	Weinschel Associates	56200213	WA56-20	2021/05/14	12
AT	MOS-33	196147	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	-	2021/7/8	12

***Hyphens for Last Calibration Date and Cal Int (month) are instruments that Calibration is not required (e.g. software), or instruments checked in advance before use.**

The expiration date of the calibration is the end of the expired month.
As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

Test item: RE: Radiated Emission test
AT: Conducted Output Power test

APPENDIX 3: Photographs of test setup

Spurious Emission (Radiated)
(Below 1 GHz)

Photo 1

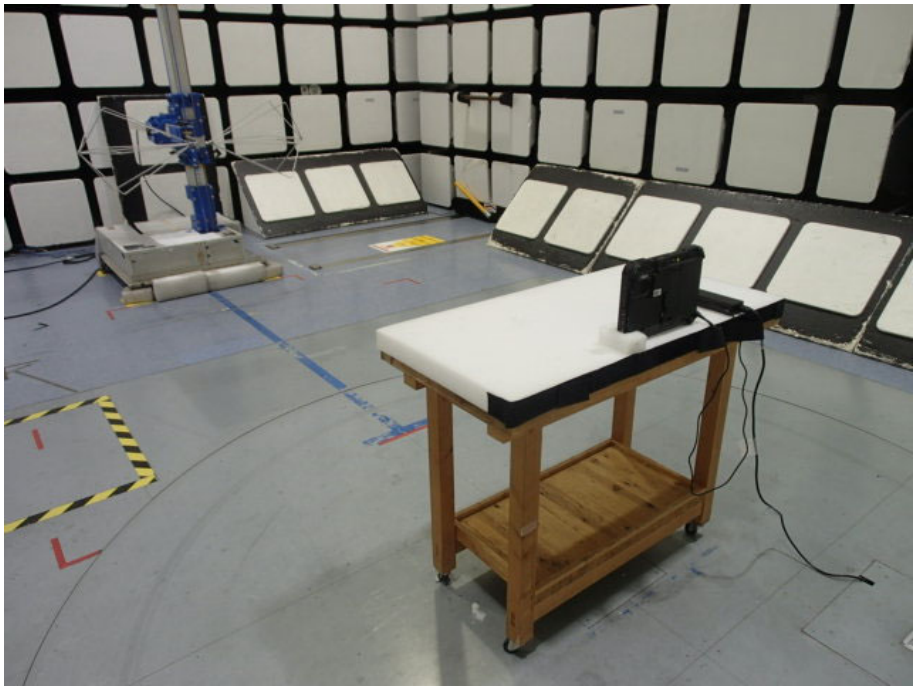


Photo 2

Spurious Emission (Radiated)
(Above 1 GHz)

Photo 1

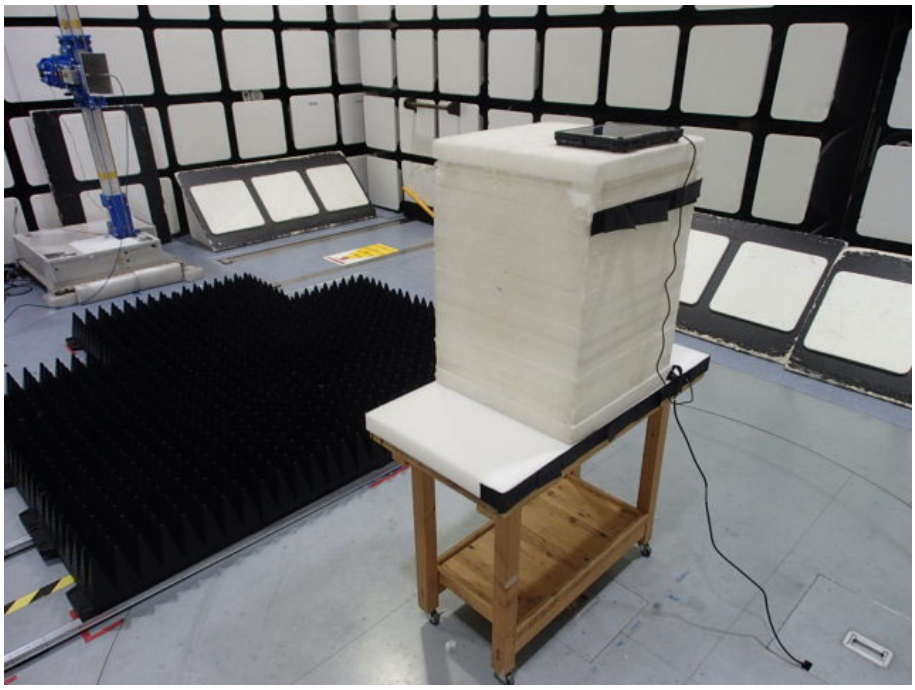


Photo 2

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Worst Case Position

Below 1 GHz (Horizontal: Y-axis/ Vertical: Y-axis)
Above 1 GHz (Horizontal: X-axis/ Vertical: X-axis)

X-axis

Y-axis

Z-axis

RF Output Power

Photo 1

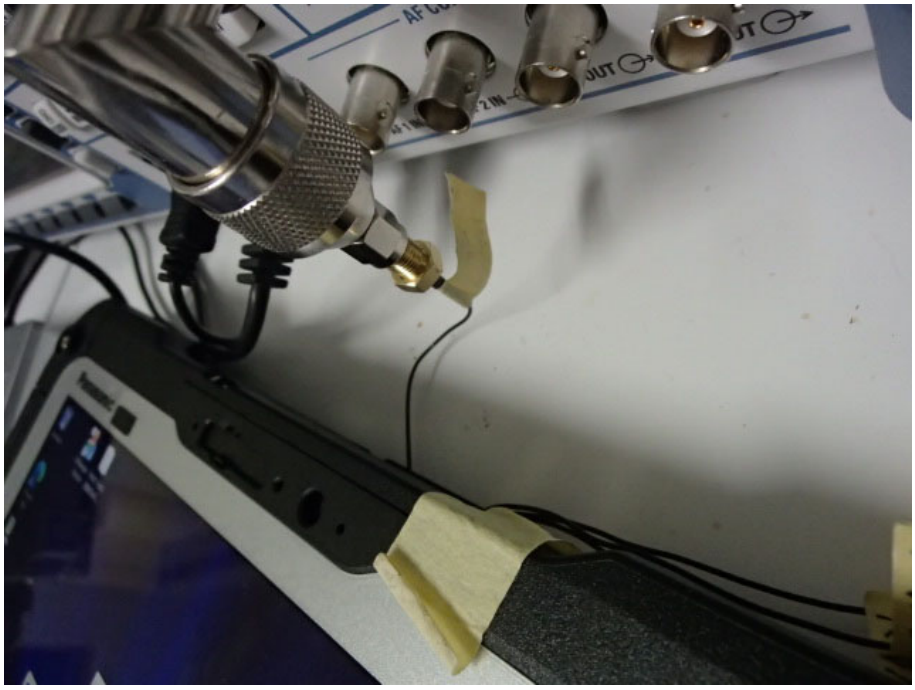

Photo 2

End of Report