FCC Test Report
(Part 96 – LTE Band 48)

Report No.:	RFBEDV-WTW-P23030565-2
FCC ID:	G95RG525FNA
Model No.:	RG525FNA
Received Date:	2023/3/16
Test Date:	2023/4/18 ~ 2023/5/23
Issued Date:	2023/7/27
Applicant:	Vantiva USA LLC
Address:	4855 Peachtree Industrial Blvd. Suite 200 Norcross, Georgia 30092
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
Test Location:	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, Taiwan
FCC Registration / Designation Number:	788550 / TW0003

Testing Laboratory
2021

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Release Control Record

Issue No.	Description	Date Issued
RFBEDV-WTW-P23030565-2	Original release	2023/7/27

1 Certificate of Conformity

Product:	Module
Brand:	Vantiva
Test Model:	RG525FNA
Sample Status:	Engineering sample
Applicant:	Vantiva USA LLC
Test Date:	2023/4/18 ~ 2023/5/23
Standards:	47 CFR FCC Part 96

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

Prepared by : Pettie Chen , **Date:** 2023/7/27

Pettie Chen / Senior Specialist

Approved by : Jeremy Lin , **Date:** 2023/7/27

Jeremy Lin / Project Engineer

2 Summary of Test Results

47 CFR FCC Part 96			
FCC Clause	Test Item	Result	Remarks
2.1046 96.41(b)	Maximum Peak Output Power	Pass	Meet the requirement of limit.
2.1046 96.41(b)	Maximum Power Spectral Density	NA	Refer to Note
96.41(g)	Peak to Average Ration	NA	Refer to Note
2.1049	Emission Bandwidth	NA	Refer to Note
2.1055	Frequency Stability	NA	Refer to Note
2.1051 96.41(e)	Conducted Spurious Emissions	NA	Refer to Note
2.1053 96.41(e)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -1.06dB at 7250.00MHz.

Note:

1. This report is issued as a supplementary report. Therefore, only test item of Maximum Peak Output Power and Radiated Spurious Emissions were performed for this report. Other testing data please refer to MRT Technology (Suzhou) Co., Ltd report no.: 2211RSU034-U5 for module (Brand: Quectel, Model: RG525F-NA). The EUT has disabled the LTE Bands 42, 43 & LTE CA mode/HUPE in the LTE Bands 42, 43 by software.
2. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	2.93 dB
	200MHz ~1000MHz	2.95 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Module				
Brand	Vantiva				
Test Model	RG525FNA				
Sample Status	Engineering sample				
Power Supply Rating	Refer to Note				
Modulation Type	QPSK, 16QAM, 64QAM, 256QAM				
Operating Frequency	LTE Band 48 (Channel Bandwidth 5MHz)	3552.5 ~ 3697.5 MHz			
	LTE Band 48 (Channel Bandwidth 10MHz)	3555.0 ~ 3695.0 MHz			
	LTE Band 48 (Channel Bandwidth 15MHz)	3557.5 ~ 3692.5 MHz			
	LTE Band 48 (Channel Bandwidth 20MHz)	3560.0 ~ 3690.0 MHz			
Max. EIRP Power		QPSK	16QAM	64QAM	256QAM
	LTE Band 48 (Channel Bandwidth 5MHz)	115.611mW (20.63dBm/ 10MHz)	87.297mW (19.41dBm/ 10MHz)	58.345mW (17.66dBm/ 10MHz)	36.559mW (15.63dBm/ 10MHz)
	LTE Band 48 (Channel Bandwidth 10MHz)	113.763mW (20.56dBm/ 10MHz)	78.163mW (18.93dBm/ 10MHz)	62.230mW (17.94dBm/ 10MHz)	36.058mW (15.57dBm/ 10MHz)
	LTE Band 48 (Channel Bandwidth 15MHz)	105.439mW (20.23dBm/ 15MHz)	80.353mW (19.05dBm/ 15MHz)	65.313mW (18.15dBm/ 15MHz)	33.806mW (15.29dBm/ 15MHz)
	LTE Band 48 (Channel Bandwidth 20MHz)	106.660mW (20.28dBm/ 20MHz)	76.384mW (18.83dBm/ 20MHz)	65.313mW (18.15dBm/ 20MHz)	34.594mW (15.39dBm/ 20MHz)
Antenna Type	Refer to Note as below				
Antenna Connector	Refer to Note as below				
Accessory Device	Adapter				
Cable Supplied	NA				

Note:

1. The antenna information is listed as below.

Antenna Type	Antenna Connector	Antenna Gain (dBi)	Frequency Range
PCB	Ipex(MHF)	Ant. 0: 4.47dBi Ant. 3: 4.85dBi	3550MHz - 3700 MHz

* Detail antenna specification please refer to antenna datasheet and/or antenna measurement report.

2. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

3. The EUT is authorized for use in specific End-product. Please refer to below for more details.

Item	Brand	Model
WIFI Gateway	Vantiva	MGA5331

4. The adapter for the End-product.

AC Adapter		
Brand	Model	Specification
HONOR	ADS-42FI-12 12042EPCU-L	AC Input: 100-120V~ 50/60Hz 1.2A max. DC Output: 12VDC, 3.5A, 42W DC Output Cable: 1.5m, Non-Shielded

3.2 Test Mode Applicability and Tested Channel Detail

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports. The worst case was found when positioned as the table below. Following channel(s) was (were) selected for the final test as listed below:

Band	Radiated Emission
LTE Band 48	X-axis

LTE Band 48

Test Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	Maximum Output Power	55265 to 56715	55265 (3552.50 MHz) 55990 (3625.00 MHz) 56715 (3697.50 MHz)	5 MHz	QPSK / 16QAM / 64QAM / 256QAM	1RB
		55290 to 56690	55290 (3555.00 MHz) 55990 (3625.00 MHz) 56690 (3695.00 MHz)	10 MHz	QPSK / 16QAM / 64QAM / 256QAM	1RB
		55315 to 56665	55315 (3557.50 MHz) 55990 (3625.00 MHz) 56665 (3692.50 MHz)	15 MHz	QPSK / 16QAM / 64QAM / 256QAM	1RB
		55340 to 56640	55340 (3560.00 MHz) 55990 (3625.00 MHz) 56640 (3690.00 MHz)	20 MHz	QPSK / 16QAM / 64QAM / 256QAM	1RB
-	Radiated Emission Below 1GHz	55340 to 56640	55990 (3625.00 MHz)	20 MHz	QPSK	1RB
-	Radiated Emission Above 1GHz	55265 to 56715	55265 (3552.50 MHz) 55990 (3625.00 MHz) 56715 (3697.50 MHz)	5 MHz	QPSK	1RB
		55340 to 56640	55340 (3560.00 MHz) 55990 (3625.00 MHz) 56640 (3690.00 MHz)	20 MHz	QPSK	1RB

Note:
1. For radiated emission below 1GHz, select the worst radiated emission channel (above 1GHz) for final testing.
2. The output power for QPSK, 16QAM, 64QAM and 256QAM, measured value of QPSK is higher than 16QAM / 64QAM / 256QAM mode. Therefore, the other test items were performed under QPSK mode only.

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
Maximum Output Power	21deg. C, 76%RH	120Vac, 60Hz	Adair Peng
Radiated Emission	23deg. C, 66%RH 21deg. C, 76%RH	120Vac, 60Hz	Titan Hsu Rex Wang

3.3 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

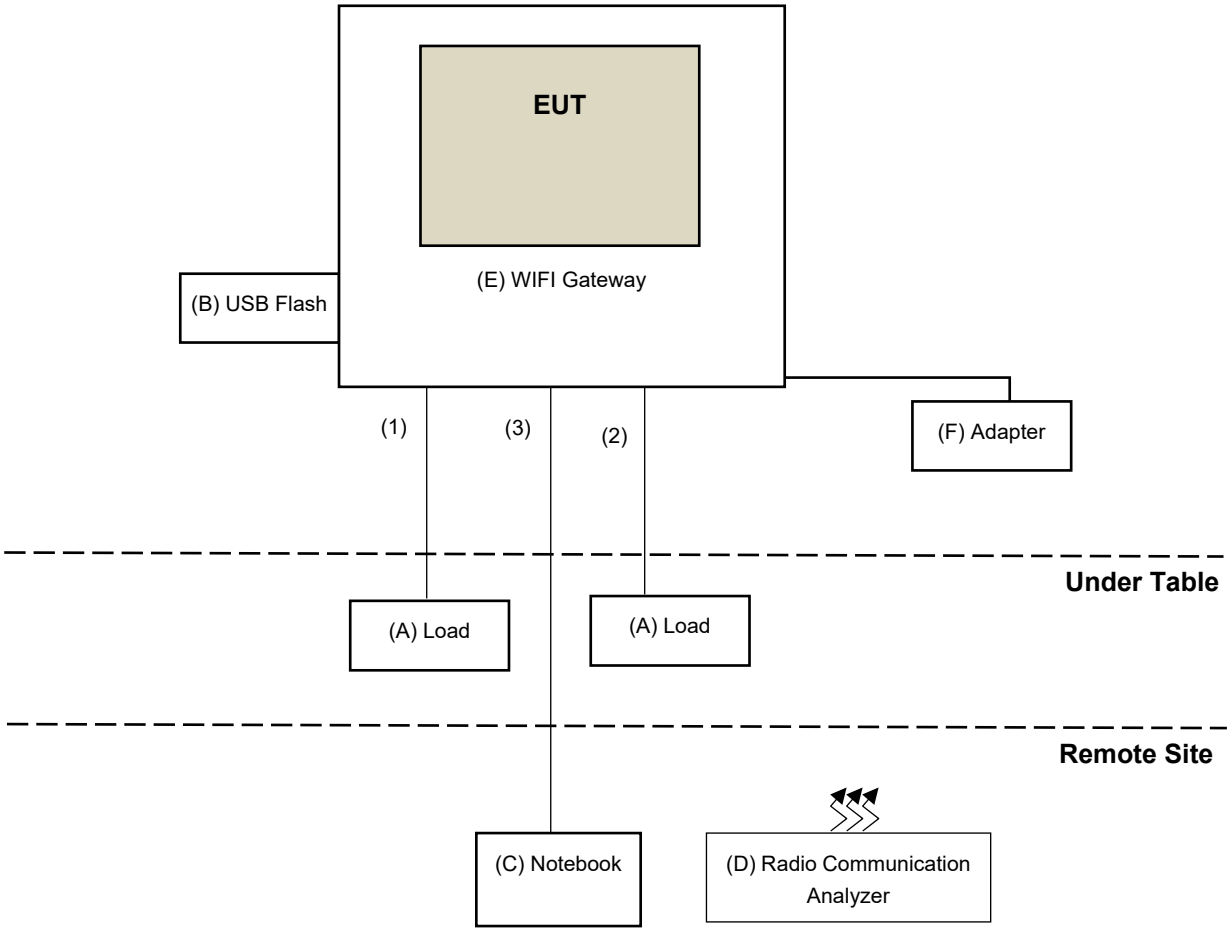
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Load*2	N/A	N/A	N/A	N/A	Provided by Lab
B.	USB Flash	SanDisk	SDDDC3-032G	N/A	N/A	Provided by Lab
C.	Notebook	Lenovo	X250ALT5	PC06HPSE	N/A	Provided by Lab
D.	Radio Communication Analyzer	Anritsu	MT8821C	6272278310	NA	-
E.	WIFI Gateway	Vantiva	MGA5331	NA	NA	Provided by applicant
F.	Adapter	HONOR	ADS-42FI-12 12042EPCU-L	NA	NA	Provided by applicant

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item C, D acted as communication partners to transfer data.

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1	RJ11 Cable	1	1.5	NO	0	Provided by Lab
2	RJ45 Cable	4	1.5	NO	0	Provided by Lab
3	RJ45 Cable	1	10	NO	0	Provided by Lab

3.3.1 Configuration of System under Test



3.4 General Description of Applied Standards and References

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test standard:

FCC 47 CFR Part 2

FCC 47 CFR Part 96

ANSI/TIA/EIA-603-E-2016

ANSI 63.26-2015

All test items have been performed and recorded as per the above standards.

References Test Guidance:

KDB 971168 D01 Power Meas License Digital Systems v03r01

KDB 940660 D01 Part 96 CBRS Eqpt v03

All test items have been performed as a reference to the above KDB test guidance.

4 Test Types and Results

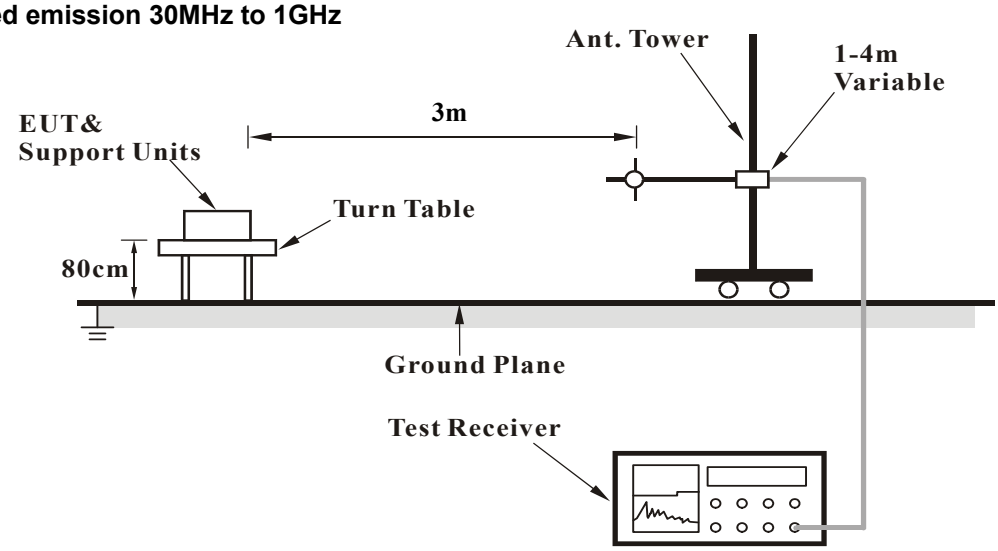
4.1 Maximum Output Power Measurement

4.1.1 Limits of Maximum Output Power Measurement

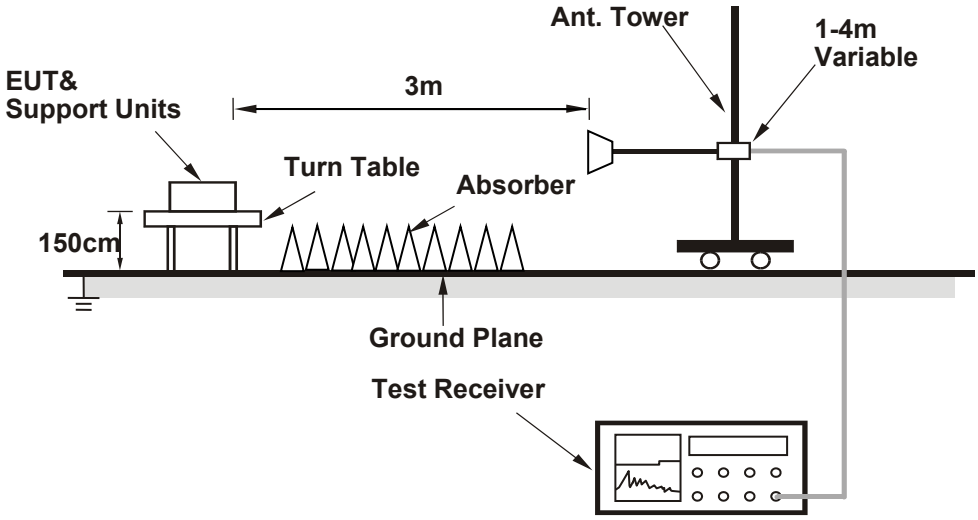
Device		Maximum EIRP (dBm/10 MHz)
☒	End User Device	23
☐	Category A CBSD	30
☐	Category B CBSD	47

4.1.2 Test Setup

For radiated emission 30MHz to 1GHz



For radiated emission above 1GHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.3 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	NA	NA	NA
Antenna Tower &Turn BV ADT	AT100	AT93021705	NA	NA
Turn Table BV ADT	TT100	TT93021705	NA	NA
Turn Table Controller BV ADT	SC100	SC93021705	NA	NA
MXE EMI Receiver KEYSIGHT	N9038A	MY51210129	Mar. 24, 2023	Mar. 23, 2024
Signal & Spectrum Analyzer R&S	FSW43	101867	Dec. 30, 2022	Dec. 29, 2023
Preamplifier Agilent	8447D	2944A10628	Oct. 01, 2022	Sep. 30, 2023
Bi_Log Antenna Schwarbeck	VULB 9168	9168-160	Oct. 20, 2022	Oct. 19, 2023
RF Coaxial Cable WOKEN	8D-FB	Cable-CH9-01	May 14, 2022	May 13, 2023
			May 07, 2023	May 06, 2024
Horn Antenna Schwarzbeck	9120D	9120D-1169	Nov. 13, 2022	Nov. 12, 2023
Preamplifier Agilent	8449B	3008A02367	Feb. 15, 2023	Feb. 14, 2024
RF Coaxial Cable HUBER+SUHNER&EMCI	SUCOFLEX 104& EMC104-SM-SM8000	CABLE-CH9-02 (248780+171006)	Jan. 7, 2023	Jan. 6, 2024
RF Coaxial Cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-(250 795/4)	Jan. 7, 2023	Jan. 6, 2024
Notch Filter MICRO-TRONICS	BRM50716	060	Jan. 11, 2023	Jan. 10, 2024
Notch Filter MICRO-TRONICS	BRM17690	004	Jan. 11, 2023	Jan. 10, 2024
Boresight antenna tower fixture BV	BAF-02	5	NA	NA
Preamplifier EMCI	EMC 184045	980116	Oct. 1, 2022	Sep. 30, 2023
Horn Antenna Schwarzbeck	BBHA 9170	9170-480	Nov. 13, 2022	Nov. 12, 2023
Horn Antenna Schwarzbeck	BBHA 9170	BBHA9170243	Nov. 13, 2022	Nov. 12, 2023
RF Coaxial Cable EMCI	EMC102-KM-KM-3000	150929	Jul. 9, 2022	Jul. 8, 2023
RF Coaxial Cable EMCI	EMC102-KM-KM-600	150928	Jul. 9, 2022	Jul. 8, 2023
Boresight antenna tower fixture BV	BAF-02	5	NA	NA
Radio Communication Analyzer Anritsu	MT8821C	6272278310	Jun. 22, 2022	Jun. 21, 2023

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HY - 966 chamber 4.

4.1.4 Test Procedures

a. Set span to at least 1.5 times the OBW.
b. Set RBW = 1-5% of the OBW, not to exceed 1 MHz.
c. Set VBW ≥ 3 × RBW.
d. Set number of points in sweep ≥ 2 × span / RBW.
e. Sweep time = auto-couple.
f. Detector = RMS (power averaging).
g. If the EUT can be configured to transmit continuously (i.e., burst duty cycle ≥ 98%), then set the trigger to free run.
h. If the EUT cannot be configured to transmit continuously (i.e., burst duty cycle < 98 %), then use a sweep trigger with the level set to enable triggering only on full power bursts and configure the EUT to transmit at full power for the entire duration of each sweep. Ensure that the sweep time is less than or equal to the transmission burst duration.
i. Trace average at least 100 traces in power averaging (i.e., RMS) mode.
j. Compute the power by integrating the spectrum across the OBW of the signal using the instrument's band or channel power measurement function, with the band/channel limits set equal to the OBW band edges. If the instrument does not have a band or channel power function, then sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.
k. For per 10MHz method, channel power integrating bandwidth 10MHz is used for bandwidth 5M, 10M, 15M and 20M. For full power method, channel power integrating bandwidth 10MHz is used for bandwidth 5M, 10M, integrating bandwidth 15MHz is used for bandwidth 15M, integrating bandwidth 20MHz is used for bandwidth 20M.
l. In the semi-anechoic chamber, EUT placed on the 0.8 m (below or equal 1 GHz) and/or 1.5 m (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.
m. EIRP (dBm) = E (dBμV/m) + 20log(D) − 104.8 ; where D is the measurement distance (in the far field region) in m.
n. Measurement method refers to ANSI C63.26 section 5.2.7 & 5.2.4.

4.1.5 Deviation from Test Standard

No deviation.

4.1.6 EUT Operating Conditions

The EUT is configured by emulator to set data modulation and maximum power using WWAN technology. Set the EUT to transmit under low, middle and high channel and record the power level shown on spectrum analyzer.

4.1.7 Test Results

EIRP Power (dBm/10MHz)

Modulation Type: QPSK

LTE Band 48, Channel Bandwidth 5MHz

Mode		TX channel 55265, 55990, 56715						
Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Freq. (MHz)	EIRP (dBm/10MHz)	Limit (dBm/10MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3552.50	17.51	23.00	-5.49	1.01 H	134	77.31	-59.80
2	3625.00	18.33	23.00	-4.67	1.12 H	135	77.92	-59.59
3	3697.50	17.67	23.00	-5.33	1.15 H	134	77.00	-59.33
Antenna Polarity & Test Distance : Vertical at 3m								
No	Freq. (MHz)	EIRP (dBm/10MHz)	Limit (dBm/10MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3552.50	20.25	23.00	-2.75	1.31 V	70	80.05	-59.80
2	3625.00	20.63	23.00	-2.37	1.27 V	70	80.22	-59.59
3	3697.50	20.39	23.00	-2.61	1.26 V	72	79.72	-59.33

Remarks:

1. EIRP(dBm/10MHz) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8
3. Margin value = EIRP – Limit value.
4. The other EIRP levels were very low against the limit.

LTE Band 48, Channel Bandwidth 10MHz

Mode		TX channel 55290, 55990, 56690						
Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Freq. (MHz)	EIRP (dBm/10MHz)	Limit (dBm/10MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3555.00	17.51	23.00	-5.49	1.12 H	133	77.30	-59.79
2	3625.00	18.23	23.00	-4.77	1.07 H	132	77.82	-59.59
3	3695.00	18.25	23.00	-4.75	1.14 H	131	77.60	-59.35
Antenna Polarity & Test Distance : Vertical at 3m								
No	Freq. (MHz)	EIRP (dBm/10MHz)	Limit (dBm/10MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3555.00	20.56	23.00	-2.44	1.30 V	70	80.35	-59.79
2	3625.00	20.16	23.00	-2.84	1.33 V	73	79.75	-59.59
3	3695.00	20.18	23.00	-2.82	1.34 V	69	79.53	-59.35

Remarks:

1. EIRP(dBm/10MHz) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8
3. Margin value = EIRP – Limit value.
4. The other EIRP levels were very low against the limit.

LTE Band 48, Channel Bandwidth 15MHz

Mode	TX channel 55315, 55990, 56665

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm/10MHz)	Limit (dBm/10MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3557.50	17.33	23.00	-5.67	1.15 H	135	77.11	-59.78
2	3625.00	17.79	23.00	-5.21	1.07 H	137	77.38	-59.59
3	3692.50	17.91	23.00	-5.09	1.11 H	137	77.26	-59.35
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	EIRP (dBm/10MHz)	Limit (dBm/10MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3557.50	20.02	23.00	-2.98	1.33 V	72	79.80	-59.78
2	3625.00	20.12	23.00	-2.88	1.34 V	68	79.71	-59.59
3	3692.50	20.05	23.00	-2.95	1.37 V	72	79.40	-59.35

Remarks:

1. EIRP(dBm/15MHz) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8
3. Margin value = EIRP – Limit value.
4. The other EIRP levels were very low against the limit.

LTE Band 48, Channel Bandwidth 20MHz

Mode	TX channel 55340, 55990, 56640

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm/10MHz)	Limit (dBm/10MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3560.00	17.77	23.00	-5.23	1.14 H	134	77.55	-59.78
2	3625.00	17.65	23.00	-5.35	1.07 H	132	77.24	-59.59
3	3690.00	17.99	23.00	-5.01	1.09 H	131	77.36	-59.37
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	EIRP (dBm/10MHz)	Limit (dBm/10MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3560.00	20.15	23.00	-2.85	1.35 V	77	79.93	-59.78
2	3625.00	20.25	23.00	-2.75	1.36 V	66	79.84	-59.59
3	3690.00	20.11	23.00	-2.89	1.35 V	70	79.48	-59.37

Remarks:

1. EIRP(dBm/20MHz) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8
3. Margin value = EIRP – Limit value.
4. The other EIRP levels were very low against the limit.

Modulation Type: 16QAM

LTE Band 48, Channel Bandwidth 5MHz

Mode		TX channel 55265, 55990, 56715						
Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Freq. (MHz)	EIRP (dBm/10MHz)	Limit (dBm/10MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3552.50	17.02	23.00	-5.98	1.14 H	136	76.82	-59.80
2	3625.00	16.75	23.00	-6.25	1.07 H	135	76.34	-59.59
3	3697.50	16.68	23.00	-6.32	1.08 H	132	76.01	-59.33
Antenna Polarity & Test Distance : Vertical at 3m								
No	Freq. (MHz)	EIRP (dBm/10MHz)	Limit (dBm/10MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3552.50	19.41	23.00	-3.59	1.32 V	72	79.21	-59.80
2	3625.00	19.01	23.00	-3.99	1.27 V	73	78.60	-59.59
3	3697.50	18.82	23.00	-4.18	1.32 V	71	78.15	-59.33

Remarks:

1. EIRP(dBm/10MHz) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8
3. Margin value = EIRP – Limit value.
4. The other EIRP levels were very low against the limit.

LTE Band 48, Channel Bandwidth 10MHz

Mode		TX channel 55290, 55990, 56690						
Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Freq. (MHz)	EIRP (dBm/10MHz)	Limit (dBm/10MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3555.00	17.05	23.00	-5.95	1.09 H	135	76.84	-59.79
2	3625.00	17.52	23.00	-5.48	1.15 H	133	77.11	-59.59
3	3695.00	17.25	23.00	-5.75	1.06 H	131	76.60	-59.35
Antenna Polarity & Test Distance : Vertical at 3m								
No	Freq. (MHz)	EIRP (dBm/10MHz)	Limit (dBm/10MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3555.00	18.93	23.00	-4.07	1.31 V	73	78.72	-59.79
2	3625.00	18.91	23.00	-4.09	1.27 V	70	78.50	-59.59
3	3695.00	18.87	23.00	-4.13	1.29 V	73	78.22	-59.35

Remarks:

1. EIRP(dBm/10MHz) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8
3. Margin value = EIRP – Limit value.
4. The other EIRP levels were very low against the limit.

LTE Band 48, Channel Bandwidth 15MHz

Mode	TX channel 55315, 55990, 56665

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm/10MHz)	Limit (dBm/10MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3557.50	16.65	23.00	-6.35	1.12 H	134	76.43	-59.78
2	3625.00	16.75	23.00	-6.25	1.07 H	134	76.34	-59.59
3	3692.50	16.73	23.00	-6.27	1.16 H	134	76.08	-59.35
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	EIRP (dBm/10MHz)	Limit (dBm/10MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3557.50	18.57	23.00	-4.43	1.34 V	68	78.35	-59.78
2	3625.00	18.66	23.00	-4.34	1.26 V	68	78.25	-59.59
3	3692.50	18.82	23.00	-4.18	1.33 V	68	78.17	-59.35

Remarks:

1. EIRP(dBm/15MHz) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8
3. Margin value = EIRP – Limit value.
4. The other EIRP levels were very low against the limit.

LTE Band 48, Channel Bandwidth 20MHz

Mode	TX channel 55340, 55990, 56640

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm/10MHz)	Limit (dBm/10MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3560.00	17.01	23.00	-5.99	1.08 H	136	76.79	-59.78
2	3625.00	16.75	23.00	-6.25	1.15 H	134	76.34	-59.59
3	3690.00	16.74	23.00	-6.26	1.10 H	134	76.11	-59.37
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	EIRP (dBm/10MHz)	Limit (dBm/10MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3560.00	18.63	23.00	-4.37	1.29 V	69	78.41	-59.78
2	3625.00	18.43	23.00	-4.57	1.36 V	73	78.02	-59.59
3	3690.00	18.22	23.00	-4.78	1.30 V	71	77.59	-59.37

Remarks:

1. EIRP(dBm/20MHz) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8
3. Margin value = EIRP – Limit value.
4. The other EIRP levels were very low against the limit.

Modulation Type: 64QAM

LTE Band 48, Channel Bandwidth 5MHz

Mode		TX channel 55265, 55990, 56715						
Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Freq. (MHz)	EIRP (dBm/10MHz)	Limit (dBm/10MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3552.50	16.26	23.00	-6.74	1.13 H	137	76.06	-59.80
2	3625.00	16.08	23.00	-6.92	1.11 H	134	75.67	-59.59
3	3697.50	16.09	23.00	-6.91	1.07 H	136	75.42	-59.33
Antenna Polarity & Test Distance : Vertical at 3m								
No	Freq. (MHz)	EIRP (dBm/10MHz)	Limit (dBm/10MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3552.50	17.59	23.00	-5.41	1.36 V	73	77.39	-59.80
2	3625.00	17.66	23.00	-5.34	1.35 V	73	77.25	-59.59
3	3697.50	17.59	23.00	-5.41	1.26 V	72	76.92	-59.33

Remarks:

1. EIRP(dBm/10MHz) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8
3. Margin value = EIRP – Limit value.
4. The other EIRP levels were very low against the limit.

LTE Band 48, Channel Bandwidth 10MHz

Mode		TX channel 55290, 55990, 56690						
Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Freq. (MHz)	EIRP (dBm/10MHz)	Limit (dBm/10MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3555.00	16.03	23.00	-6.97	1.09 H	134	75.82	-59.79
2	3625.00	16.15	23.00	-6.85	1.11 H	133	75.74	-59.59
3	3695.00	16.22	23.00	-6.78	1.09 H	131	75.57	-59.35
Antenna Polarity & Test Distance : Vertical at 3m								
No	Freq. (MHz)	EIRP (dBm/10MHz)	Limit (dBm/10MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3555.00	17.92	23.00	-5.08	1.35 V	70	77.71	-59.79
2	3625.00	17.94	23.00	-5.06	1.37 V	70	77.53	-59.59
3	3695.00	17.77	23.00	-5.23	1.27 V	68	77.12	-59.35

Remarks:

1. EIRP(dBm/10MHz) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8
3. Margin value = EIRP – Limit value.
4. The other EIRP levels were very low against the limit.

LTE Band 48, Channel Bandwidth 15MHz

Mode	TX channel 55315, 55990, 56665

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm/10MHz)	Limit (dBm/10MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3557.50	15.67	23.00	-7.33	1.10 H	134	75.45	-59.78
2	3625.00	15.87	23.00	-7.13	1.07 H	131	75.46	-59.59
3	3692.50	15.76	23.00	-7.24	1.13 H	138	75.11	-59.35
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	EIRP (dBm/10MHz)	Limit (dBm/10MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3557.50	17.62	23.00	-5.38	1.30 V	70	77.40	-59.78
2	3625.00	17.66	23.00	-5.34	1.34 V	67	77.25	-59.59
3	3692.50	17.98	23.00	-5.02	1.27 V	67	77.33	-59.35

Remarks:

1. EIRP(dBm/15MHz) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8
3. Margin value = EIRP – Limit value.
4. The other EIRP levels were very low against the limit.

LTE Band 48, Channel Bandwidth 20MHz

Mode	TX channel 55340, 55990, 56640

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm/10MHz)	Limit (dBm/10MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3560.00	16.02	23.00	-6.98	1.12 H	134	75.80	-59.78
2	3625.00	15.88	23.00	-7.12	1.16 H	135	75.47	-59.59
3	3690.00	15.98	23.00	-7.02	1.10 H	135	75.35	-59.37
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	EIRP (dBm/10MHz)	Limit (dBm/10MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3560.00	17.66	23.00	-5.34	1.31 V	69	77.44	-59.78
2	3625.00	17.76	23.00	-5.24	1.33 V	68	77.35	-59.59
3	3690.00	17.99	23.00	-5.01	1.32 V	71	77.36	-59.37

Remarks:

1. EIRP(dBm/20MHz) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8
3. Margin value = EIRP – Limit value.
4. The other EIRP levels were very low against the limit.

Modulation Type: 256QAM

LTE Band 48, Channel Bandwidth 5MHz

Mode		TX channel 55265, 55990, 56715						
Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Freq. (MHz)	EIRP (dBm/10MHz)	Limit (dBm/10MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3552.50	14.90	23.00	-8.10	1.10 H	133	74.70	-59.80
2	3625.00	15.10	23.00	-7.90	1.10 H	138	74.69	-59.59
3	3697.50	14.95	23.00	-8.05	1.12 H	134	74.28	-59.33
Antenna Polarity & Test Distance : Vertical at 3m								
No	Freq. (MHz)	EIRP (dBm/10MHz)	Limit (dBm/10MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3552.50	15.60	23.00	-7.40	1.30 V	77	75.40	-59.80
2	3625.00	15.63	23.00	-7.37	1.31 V	69	75.22	-59.59
3	3697.50	15.59	23.00	-7.41	1.26 V	70	74.92	-59.33

Remarks:

1. EIRP(dBm/10MHz) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8
3. Margin value = EIRP – Limit value.
4. The other EIRP levels were very low against the limit.

LTE Band 48, Channel Bandwidth 10MHz

Mode		TX channel 55290, 55990, 56690						
Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Freq. (MHz)	EIRP (dBm/10MHz)	Limit (dBm/10MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3555.00	14.98	23.00	-8.02	1.15 H	133	74.77	-59.79
2	3625.00	14.88	23.00	-8.12	1.10 H	129	74.47	-59.59
3	3695.00	15.08	23.00	-7.92	1.00 H	130	74.43	-59.35
Antenna Polarity & Test Distance : Vertical at 3m								
No	Freq. (MHz)	EIRP (dBm/10MHz)	Limit (dBm/10MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3555.00	15.56	23.00	-7.44	1.33 V	69	75.35	-59.79
2	3625.00	15.57	23.00	-7.43	1.32 V	66	75.16	-59.59
3	3695.00	15.48	23.00	-7.52	1.39 V	75	74.83	-59.35

Remarks:

1. EIRP(dBm/10MHz) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8
3. Margin value = EIRP – Limit value.
4. The other EIRP levels were very low against the limit.

LTE Band 48, Channel Bandwidth 15MHz

Mode	TX channel 55315, 55990, 56665

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm/10MHz)	Limit (dBm/10MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3557.50	13.88	23.00	-9.12	1.11 H	132	73.66	-59.78
2	3625.00	13.23	23.00	-9.77	1.16 H	136	72.82	-59.59
3	3692.50	13.25	23.00	-9.75	1.16 H	137	72.60	-59.35
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	EIRP (dBm/10MHz)	Limit (dBm/10MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3557.50	14.28	23.00	-8.72	1.33 V	73	74.06	-59.78
2	3625.00	14.33	23.00	-8.67	1.28 V	69	73.92	-59.59
3	3692.50	14.13	23.00	-8.87	1.30 V	67	73.48	-59.35

Remarks:

1. EIRP(dBm/15MHz) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8
3. Margin value = EIRP – Limit value.
4. The other EIRP levels were very low against the limit.

LTE Band 48, Channel Bandwidth 20MHz

Mode	TX channel 55340, 55990, 56640

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm/10MHz)	Limit (dBm/10MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3560.00	14.21	23.00	-8.79	1.09 H	134	73.99	-59.78
2	3625.00	14.15	23.00	-8.85	1.07 H	135	73.74	-59.59
3	3690.00	13.94	23.00	-9.06	1.09 H	133	73.31	-59.37
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	EIRP (dBm/10MHz)	Limit (dBm/10MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3560.00	14.65	23.00	-8.35	1.28 V	69	74.43	-59.78
2	3625.00	14.88	23.00	-8.12	1.31 V	70	74.47	-59.59
3	3690.00	14.91	23.00	-8.09	1.29 V	72	74.28	-59.37

Remarks:

1. EIRP(dBm/20MHz) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8
3. Margin value = EIRP – Limit value.
4. The other EIRP levels were very low against the limit.

Spectrum Plot of Worst Value	
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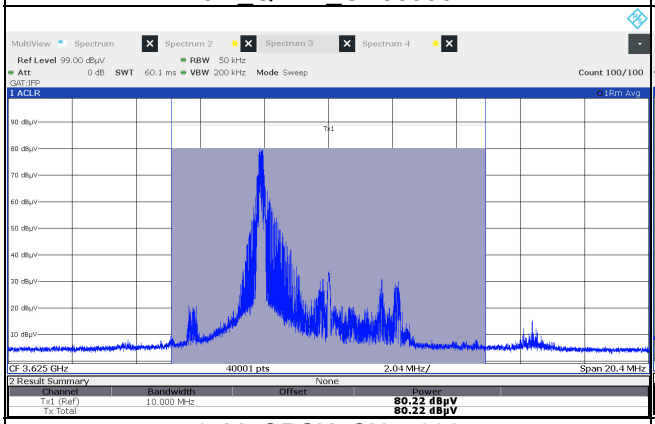	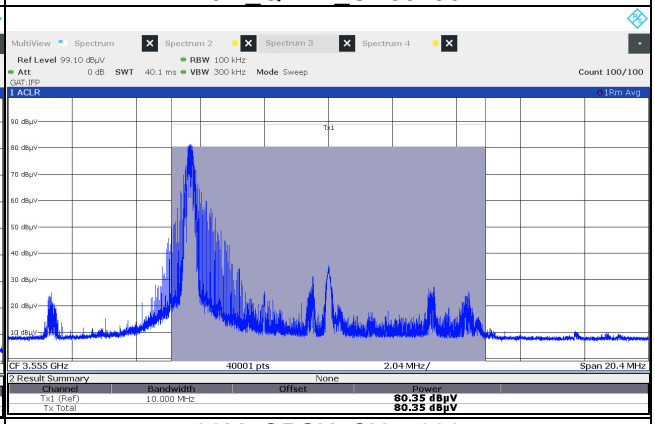
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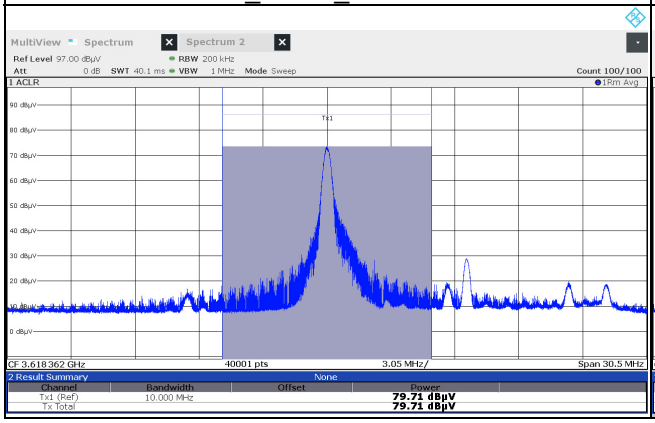
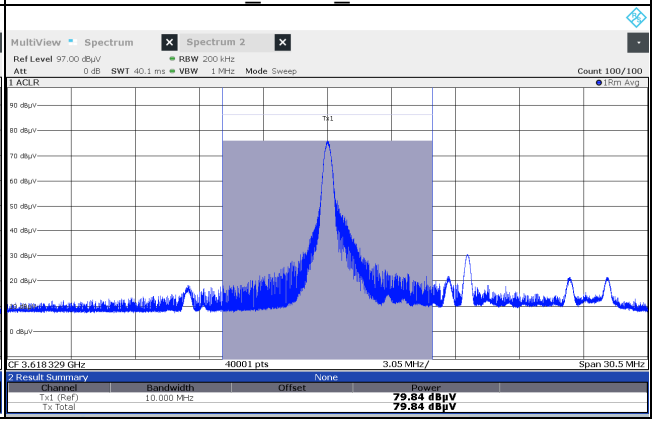
	

EIRP Full Power (dBm/15MHz or dBm/20MHz)

Modulation Type: QPSK

LTE Band 48, Channel Bandwidth 5MHz and Channel Bandwidth 10MHz full power test data, please refer to Channel Bandwidth 5MHz and Channel Bandwidth 10MHz per 10MHz power.

LTE Band 48, Channel Bandwidth 15MHz

Mode		TX channel 55315, 55990, 56665						
Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Freq. (MHz)	EIRP (dBm/15MHz)	Limit (dBm/15MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3557.50	17.59	23.00	-5.41	1.15 H	135	77.37	-59.78
2	3625.00	17.93	23.00	-5.07	1.07 H	137	77.52	-59.59
3	3692.50	18.11	23.00	-4.89	1.11 H	137	77.46	-59.35
Antenna Polarity & Test Distance : Vertical at 3m								
No	Freq. (MHz)	EIRP (dBm/15MHz)	Limit (dBm/15MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3557.50	20.15	23.00	-2.85	1.33 V	72	79.93	-59.78
2	3625.00	20.22	23.00	-2.78	1.34 V	68	79.81	-59.59
3	3692.50	20.23	23.00	-2.77	1.37 V	72	79.58	-59.35

Remarks:

1. EIRP(dBm/10MHz) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8
3. Margin value = EIRP – Limit value.
4. The other EIRP levels were very low against the limit.

LTE Band 48, Channel Bandwidth 20MHz

Mode		TX channel 55340, 55990, 56640						
Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Freq. (MHz)	EIRP (dBm/20MHz)	Limit (dBm/20MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3560.00	17.80	23.00	-5.20	1.15 H	135	77.58	-59.78
2	3625.00	17.82	23.00	-5.18	1.11 H	133	77.41	-59.59
3	3690.00	18.12	23.00	-4.88	1.10 H	130	77.49	-59.37
Antenna Polarity & Test Distance : Vertical at 3m								
No	Freq. (MHz)	EIRP (dBm/20MHz)	Limit (dBm/20MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3560.00	20.23	23.00	-2.77	1.15 V	70	80.01	-59.78
2	3625.00	20.28	23.00	-2.72	1.15 V	77	79.87	-59.59
3	3690.00	20.26	23.00	-2.74	1.11 V	66	79.63	-59.37

Remarks:

1. EIRP(dBm/10MHz) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8
3. Margin value = EIRP – Limit value.
4. The other EIRP levels were very low against the limit.

Modulation Type: 16QAM

LTE Band 48, Channel Bandwidth 5MHz and Channel Bandwidth 10MHz full power test data, please refer to Channel Bandwidth 5MHz and Channel Bandwidth 10MHz per 10MHz power.

LTE Band 48, Channel Bandwidth 15MHz

Mode		TX channel 55315, 55990, 56665						
Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Freq. (MHz)	EIRP (dBm/15MHz)	Limit (dBm/15MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3557.50	16.88	23.00	-6.12	1.12 H	134	76.66	-59.78
2	3625.00	17.05	23.00	-5.95	1.07 H	134	76.64	-59.59
3	3692.50	16.93	23.00	-6.07	1.16 H	134	76.28	-59.35
Antenna Polarity & Test Distance : Vertical at 3m								
No	Freq. (MHz)	EIRP (dBm/15MHz)	Limit (dBm/15MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3557.50	18.78	23.00	-4.22	1.34 V	68	78.56	-59.78
2	3625.00	18.82	23.00	-4.18	1.26 V	68	78.41	-59.59
3	3692.50	19.05	23.00	-3.95	1.33 V	68	78.40	-59.35

Remarks:

1. EIRP(dBm/10MHz) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8
3. Margin value = EIRP – Limit value.
4. The other EIRP levels were very low against the limit.

LTE Band 48, Channel Bandwidth 20MHz

Mode		TX channel 55340, 55990, 56640						
Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Freq. (MHz)	EIRP (dBm/20MHz)	Limit (dBm/20MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3560.00	17.25	23.00	-5.75	1.08 H	136	77.03	-59.78
2	3625.00	16.98	23.00	-6.02	1.15 H	134	76.57	-59.59
3	3690.00	17.05	23.00	-5.95	1.10 H	134	76.42	-59.37
Antenna Polarity & Test Distance : Vertical at 3m								
No	Freq. (MHz)	EIRP (dBm/20MHz)	Limit (dBm/20MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3560.00	18.83	23.00	-4.17	1.32 V	72	78.61	-59.78
2	3625.00	18.57	23.00	-4.43	1.27 V	73	78.16	-59.59
3	3690.00	18.27	23.00	-4.73	1.32 V	71	77.64	-59.37

Remarks:

1. EIRP(dBm/10MHz) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8
3. Margin value = EIRP – Limit value.
4. The other EIRP levels were very low against the limit.

Modulation Type: 64QAM

LTE Band 48, Channel Bandwidth 5MHz and Channel Bandwidth 10MHz full power test data, please refer to Channel Bandwidth 5MHz and Channel Bandwidth 10MHz per 10MHz power.

LTE Band 48, Channel Bandwidth 15MHz

Mode		TX channel 55315, 55990, 56665						
Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Freq. (MHz)	EIRP (dBm/15MHz)	Limit (dBm/15MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3557.50	15.87	23.00	-7.13	1.10 H	134	75.65	-59.78
2	3625.00	16.08	23.00	-6.92	1.07 H	131	75.67	-59.59
3	3692.50	15.95	23.00	-7.05	1.13 H	138	75.30	-59.35
Antenna Polarity & Test Distance : Vertical at 3m								
No	Freq. (MHz)	EIRP (dBm/15MHz)	Limit (dBm/15MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3557.50	17.86	23.00	-5.14	1.30 V	70	77.64	-59.78
2	3625.00	17.88	23.00	-5.12	1.34 V	67	77.47	-59.59
3	3692.50	18.15	23.00	-4.85	1.27 V	67	77.50	-59.35

Remarks:

1. EIRP(dBm/10MHz) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8
3. Margin value = EIRP – Limit value.
4. The other EIRP levels were very low against the limit.

LTE Band 48, Channel Bandwidth 20MHz

Mode		TX channel 55340, 55990, 56640						
Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Freq. (MHz)	EIRP (dBm/20MHz)	Limit (dBm/20MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3560.00	16.28	23.00	-6.72	1.12 H	134	76.06	-59.78
2	3625.00	16.01	23.00	-6.99	1.16 H	135	75.60	-59.59
3	3690.00	16.11	23.00	-6.89	1.10 H	135	75.48	-59.37
Antenna Polarity & Test Distance : Vertical at 3m								
No	Freq. (MHz)	EIRP (dBm/20MHz)	Limit (dBm/20MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3560.00	17.89	23.00	-5.11	1.31 V	69	77.67	-59.78
2	3625.00	17.96	23.00	-5.04	1.33 V	68	77.55	-59.59
3	3690.00	18.15	23.00	-4.85	1.32 V	71	77.52	-59.37

Remarks:

1. EIRP(dBm/10MHz) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8
3. Margin value = EIRP – Limit value.
4. The other EIRP levels were very low against the limit.

Modulation Type: 256QAM

LTE Band 48, Channel Bandwidth 5MHz and Channel Bandwidth 10MHz full power test data, please refer to Channel Bandwidth 5MHz and Channel Bandwidth 10MHz per 10MHz power.

LTE Band 48, Channel Bandwidth 15MHz

Mode		TX channel 55315, 55990, 56665						
Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Freq. (MHz)	EIRP (dBm/15MHz)	Limit (dBm/15MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3557.50	15.12	23.00	-7.88	1.11 H	132	74.90	-59.78
2	3625.00	15.03	23.00	-7.97	1.16 H	136	74.62	-59.59
3	3692.50	14.98	23.00	-8.02	1.16 H	137	74.33	-59.35
Antenna Polarity & Test Distance : Vertical at 3m								
No	Freq. (MHz)	EIRP (dBm/15MHz)	Limit (dBm/15MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3557.50	15.27	23.00	-7.73	1.33 V	73	75.05	-59.78
2	3625.00	15.29	23.00	-7.71	1.28 V	69	74.88	-59.59
3	3692.50	15.11	23.00	-7.89	1.30 V	67	74.46	-59.35

Remarks:

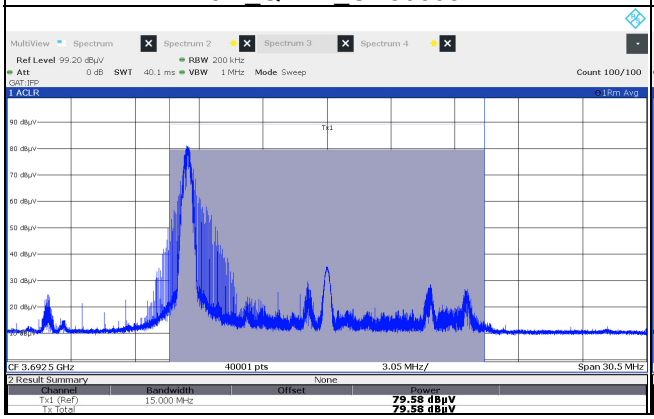
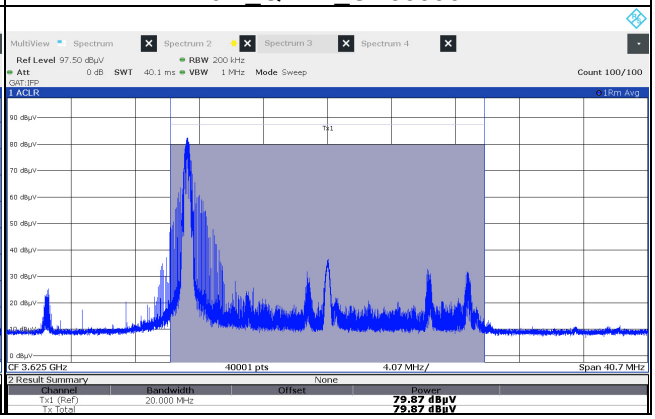
1. EIRP(dBm/10MHz) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8
3. Margin value = EIRP – Limit value.
4. The other EIRP levels were very low against the limit.

LTE Band 48, Channel Bandwidth 20MHz

Mode		TX channel 55340, 55990, 56640						
Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Freq. (MHz)	EIRP (dBm/20MHz)	Limit (dBm/20MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3560.00	15.18	23.00	-7.82	1.09 H	134	74.96	-59.78
2	3625.00	14.98	23.00	-8.02	1.07 H	135	74.57	-59.59
3	3690.00	14.96	23.00	-8.04	1.09 H	133	74.33	-59.37
Antenna Polarity & Test Distance : Vertical at 3m								
No	Freq. (MHz)	EIRP (dBm/20MHz)	Limit (dBm/20MHz)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3560.00	15.34	23.00	-7.66	1.28 V	69	75.12	-59.78
2	3625.00	15.39	23.00	-7.61	1.31 V	70	74.98	-59.59
3	3690.00	15.23	23.00	-7.77	1.29 V	72	74.60	-59.37

Remarks:

1. EIRP(dBm/10MHz) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8
3. Margin value = EIRP – Limit value.
4. The other EIRP levels were very low against the limit.

Spectrum Plot of Worst Value	
15M_QPSK_CH56665	20M_QPSK_CH55990
	

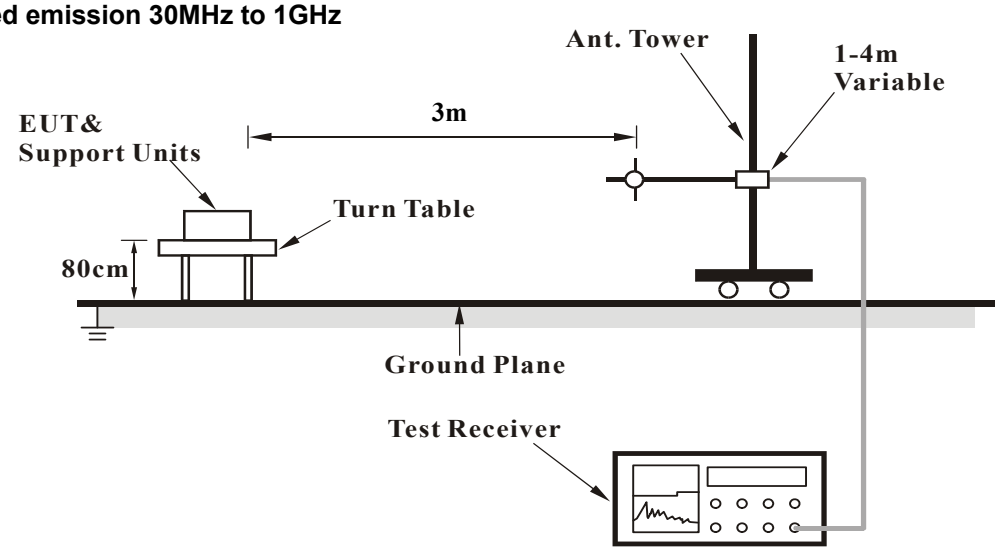
4.2 Radiated Emission Measurement

4.2.1 Limits of Radiated Emission Measurement

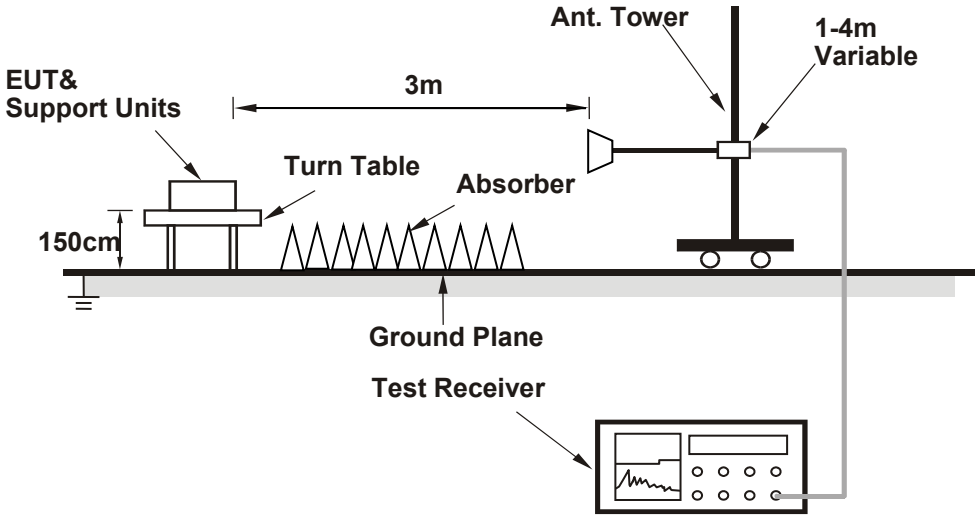
The power of any emissions below 3530 MHz or above 3720 MHz shall not exceed −40dBm/MHz.

4.2.2 Test Set Up

For radiated emission 30MHz to 1GHz



For radiated emission above 1GHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.3 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	NA	NA	NA
Antenna Tower &Turn BV ADT	AT100	AT93021705	NA	NA
Turn Table BV ADT	TT100	TT93021705	NA	NA
Turn Table Controller BV ADT	SC100	SC93021705	NA	NA
MXE EMI Receiver KEYSIGHT	N9038A	MY51210129	Mar. 24, 2023	Mar. 23, 2024
Signal & Spectrum Analyzer R&S	FSW43	101867	Dec. 30, 2022	Dec. 29, 2023
Loop Antenna TESEQ	HLA 6121	45745	Jul. 27, 2022	Jul. 26, 2023
Preamplifier Agilent	8447D	2944A10628	Oct. 01, 2022	Sep. 30, 2023
Bi_Log Antenna Schwarbeck	VULB 9168	9168-160	Oct. 20, 2022	Oct. 19, 2023
RF Coaxial Cable WOKEN	8D-FB	Cable-CH9-01	May 14, 2022 May 07, 2023	May 13, 2023 May 06, 2024
Horn Antenna Schwarzbeck	9120D	9120D-1169	Nov. 13, 2022	Nov. 12, 2023
Preamplifier Agilent	8449B	3008A02367	Feb. 15, 2023	Feb. 14, 2024
RF Coaxial Cable HUBER+SUHNER&EMCI	SUCOFLEX 104& EMC104-SM-SM8000	CABLE-CH9-02 (248780+171006)	Jan. 7, 2023	Jan. 6, 2024
RF Coaxial Cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-(250 795/4)	Jan. 7, 2023	Jan. 6, 2024
Notch Filter MICRO-TRONICS	BRM50716	060	Jan. 11, 2023	Jan. 10, 2024
Notch Filter MICRO-TRONICS	BRM17690	004	Jan. 11, 2023	Jan. 10, 2024
Boresight antenna tower fixture BV	BAF-02	5	NA	NA
Preamplifier EMCI	EMC 184045	980116	Oct. 1, 2022	Sep. 30, 2023
Horn Antenna Schwarzbeck	BBHA 9170	9170-480	Nov. 13, 2022	Nov. 12, 2023
Horn Antenna Schwarzbeck	BBHA 9170	BBHA9170243	Nov. 13, 2022	Nov. 12, 2023
RF Coaxial Cable EMCI	EMC102-KM-KM-3000	150929	Jul. 9, 2022	Jul. 8, 2023
RF Coaxial Cable EMCI	EMC102-KM-KM-600	150928	Jul. 9, 2022	Jul. 8, 2023
Boresight antenna tower fixture BV	BAF-02	5	NA	NA
Radio Communication Analyzer Anritsu	MT8821C	6272278310	Jun. 22, 2022	Jun. 21, 2023

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HY - 966 chamber 4.

4.2.4 Test Procedures

a. In the semi-anechoic chamber, EUT placed on the 0.8m(below or equal 1GHz) and/or 1.5m(above 1GHz) 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 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.

b. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

c. Perform a field strength measurement and record the worse read value, is the field strength value via a spectrum reading obtained corrected for antenna factor, cable loss and pre-amplifier factor and then mathematically convert the measured field strength level to EIRP/ERP level.

d. Following C63.26 section 5.5 and 5.2.7
   - EIRP (dBm) = E (dBμV/m) + 20log(D) - 104.8; where D is the measurement distance (in the far field region) in m.
   - ERP (dBm) = E (dBμV/m) + 20log(D) - 104.8 - 2.15; where D is the measurement distance (in the far field region) in m.

Note:
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz. Set detector = average.
2. The emission levels were against the limit of frequency range 9 kHz ~ 30 MHz:
   The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

4.2.5 Deviation from Test Standard

No deviation.

4.2.6 EUT Operating Conditions

Refer to section 4.1.6.

4.2.7 Test Results

Below 1GHz Data

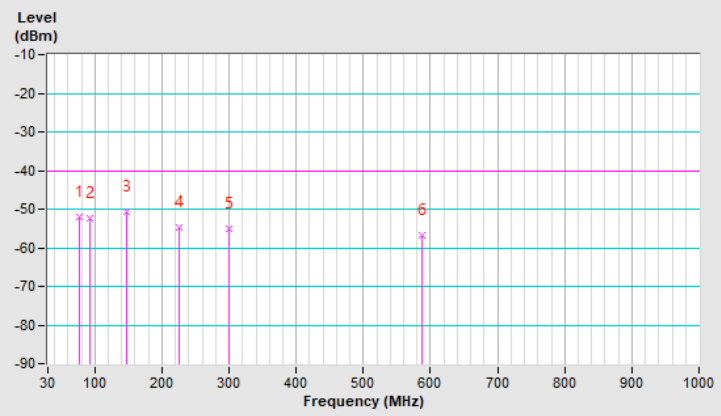
LTE Band 48, Channel Bandwidth 20MHz

Mode	TX channel 55990 (3625.00 MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	23deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Titan Hsu		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	76.39	-52.01	-40.00	-12.01	1.49 H	341	55.34	-107.35
2	93.26	-52.23	-40.00	-12.23	1.00 H	21	57.27	-109.50
3	146.68	-50.53	-40.00	-10.53	1.49 H	89	53.35	-103.88
4	225.41	-54.76	-40.00	-14.76	1.00 H	255	51.82	-106.58
5	299.91	-55.08	-40.00	-15.08	1.00 H	111	47.55	-102.63
6	586.70	-56.91	-40.00	-16.91	1.00 H	310	40.55	-97.46

Remarks:

1. EIRP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8
3. Margin value = EIRP – Limit value.
4. The other EIRP levels were very low against the limit.

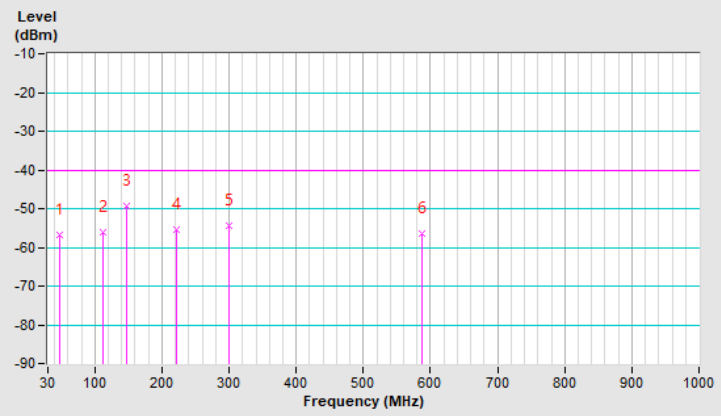


Mode	TX channel 55990 (3625.00 MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	23deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Titan Hsu		

Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	48.28	-56.63	-40.00	-16.63	1.01 V	14	47.50	-104.13
2	112.94	-56.25	-40.00	-16.25	1.01 V	353	50.65	-106.90
3	146.68	-49.46	-40.00	-9.46	1.01 V	27	54.42	-103.88
4	222.59	-55.40	-40.00	-15.40	1.01 V	12	51.14	-106.54
5	299.91	-54.46	-40.00	-14.46	1.50 V	285	48.17	-102.63
6	588.10	-56.58	-40.00	-16.58	1.01 V	252	40.84	-97.42

Remarks:

1. EIRP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8
3. Margin value = EIRP – Limit value.
4. The other EIRP levels were very low against the limit.



Above 1GHz

LTE Band 48, Channel Bandwidth 5MHz

Mode	TX channel 55265 (3552.50 MHz)	Frequency Range	1GHz ~ 40GHz
Environmental Conditions	21deg. C, 76%RH	Input Power	120Vac, 60Hz
Tested By	Rex Wang		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	7105.00	-42.41	-40.00	-2.41	1.63 H	224	42.58	-84.99
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	7105.00	-41.74	-40.00	-1.74	2.27 V	190	43.25	-84.99

Remarks:

1. EIRP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8
3. Margin value = EIRP – Limit value.
4. The other EIRP levels were very low against the limit.

Mode	TX channel 55990 (3625.00MHz)	Frequency Range	1GHz ~ 40GHz
Environmental Conditions	21deg. C, 76%RH	Input Power	120Vac, 60Hz
Tested By	Rex Wang		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	7250.00	-41.25	-40.00	-1.25	1.58 H	224	43.26	-84.51
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	7250.00	-41.17	-40.00	-1.17	2.32 V	186	43.34	-84.51

Remarks:

1. EIRP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8
3. Margin value = EIRP – Limit value.
4. The other EIRP levels were very low against the limit.

Mode	TX channel 56715 (3697.50 MHz)	Frequency Range	1GHz ~ 40GHz
Environmental Conditions	21deg. C, 76%RH	Input Power	120Vac, 60Hz
Tested By	Rex Wang		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	7395.00	-42.01	-40.00	-2.01	1.66 H	221	42.46	-84.47
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	7395.00	-41.35	-40.00	-1.35	2.27 V	193	43.12	-84.47

Remarks:

1. EIRP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8
3. Margin value = EIRP – Limit value.
4. The other EIRP levels were very low against the limit.

LTE Band 48, Channel Bandwidth 20MHz

Mode	TX channel 55340 (3560.00 MHz)	Frequency Range	1GHz ~ 40GHz
Environmental Conditions	21deg. C, 76%RH	Input Power	120Vac, 60Hz
Tested By	Rex Wang		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	7120.00	-42.60	-40.00	-2.60	1.63 H	224	42.38	-84.98
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	7120.00	-42.09	-40.00	-2.09	2.28 V	186	42.89	-84.98

Remarks:

1. EIRP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8
3. Margin value = EIRP – Limit value.
4. The other EIRP levels were very low against the limit.

Mode	TX channel 55990 (3625.00MHz)	Frequency Range	1GHz ~ 40GHz
Environmental Conditions	21deg. C, 76%RH	Input Power	120Vac, 60Hz
Tested By	Rex Wang		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	7250.00	-41.23	-40.00	-1.23	1.55 H	226	43.28	-84.51
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	**7250.00**	**-41.06**	**-40.00**	**-1.06**	**2.34 V**	**192**	**43.45**	**-84.51**

Remarks:

1. EIRP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8
3. Margin value = EIRP – Limit value.
4. The other EIRP levels were very low against the limit.

Mode	TX channel 56640 (3690.00 MHz)	Frequency Range	1GHz ~ 40GHz
Environmental Conditions	21deg. C, 76%RH	Input Power	120Vac, 60Hz
Tested By	Rex Wang		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	7380.00	-41.94	-40.00	-1.94	1.57 H	222	42.55	-84.49
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	7380.00	-41.66	-40.00	-1.66	2.32 V	188	42.83	-84.49

Remarks:

1. EIRP(dBm) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + 20log(D) – 104.8
3. Margin value = EIRP – Limit value.
4. The other EIRP levels were very low against the limit.

5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

Appendix – Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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The address and road map of all our labs can be found in our web site also.

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