

FCC TEST REPORT

Product Name: Tekion Connected Car Device
Trade Mark: N/A
Model No.: CCD1
Add. Model No.: N/A
Report Number: 2210202230RFM-1
Test Standards: FCC 47 CFR Part 22
FCC 47 CFR Part 24
FCC 47 CFR Part 27
FCC 47 CFR Part 90
FCC ID: 2APD6TEKCCD002
Test Result: PASS
Date of Issue: May 19, 2023

Prepared for:

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Prepared by:

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Version

Version No.	Date	Description
V1.0	May 19, 2023	Original



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1. GENERAL INFORMATION

1.1 CLIENT INFORMATION

Applicant:	Saravanabhavan Chandrasekaran
Address of Applicant:	Qmax Systems India Pvt. Ltd. , 795, Trunk Road, Poonamallee, Chennai-600056
Manufacturer:	Saravanabhavan Chandrasekaran
Address of Manufacturer:	Qmax Systems India Pvt. Ltd. , 795, Trunk Road, Poonamallee, Chennai-600056
Factory:	Qmax Systems India Pvt. Ltd.
Address of Factory:	795, Qmax Systems India Pvt. Ltd. Trunk Road Poonamallee Chennai-600056

1.2 EUT INFORMATION

1.2.1 General Description of EUT

Product Name:	Tekion Connected Car Device		
Model No.:	CCD1		
Add. Model No.:	N/A		
Trade Mark:	N/A		
DUT Stage:	Production Unit		
EUT Supports Function: (Provided by the customer)	E-UTRA Bands:	FDD Band 2/ Band 4/ Band 5/ Band 12/ Band 13/ Band 25/ Band 26	
	2.4 GHz ISM Band:	IEEE 802.11b/g/n	
		Bluetooth 5.0	
	5 GHz U-NII Bands:	5 150 MHz to 5 250 MHz	IEEE 802.11a/n/ac
		5 725 MHz to 5 850 MHz	IEEE 802.11a/n/ac
	RNSS Bands:	1559 MHz to 1610 MHz	GPS/ GNSS/ GLONASS/ BDS
Software Version:	0.43 (Provided by the customer)		
Hardware Version:	1.0 (Provided by the customer)		
Sample Received Date:	October 9, 2022		
Sample Tested Date:	April 18, 2023 to May 12, 2023		
Remark: The above EUT's information was provided by customer. Please refer to the specifications or user's manual for more detailed description.			

1.2.2 Description of Accessories

Battery	
Model No.:	103450-2000mAh
Battery Type:	Lithium-ion Rechargeable Battery
Rated Voltage:	3.7 Vdc
Limited Charge Voltage:	4.2 Vdc
Rated Capacity:	2000 mAh

1.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD

Support Networks:	LTE	
Type of Modulation:	LTE Band 2/4/5/12/13/25/26:	QPSK, 16QAM
Antenna Type: (Provided by the customer)	FPCB Antenna	
Antenna Gain: (Provided by the customer)	LTE Band 2:	2 dBi
	LTE Band 4:	2 dBi
	LTE Band 5:	2 dBi
	LTE Band 12:	2 dBi
	LTE Band 13:	2 dBi
	LTE Band 25:	2 dBi
	LTE Band 26:	2 dBi
IEMI:	868050044438634	
Normal Test Voltage:	3.7 Vdc	
Extreme Test Voltage:	3.3 to 4.2Vdc	
Extreme Test Temperature:	+5 °C to +65 °C	

Summary of Results:								
Bands	BW	Modulation	Frequency Range	Max RF Output Power (dBm)		ERP/EIRP	99% BW	Emission Designator
	(MHz)		(MHz)	Conducted (Average)	ERP/EIRP (Average)	(W)	(MHz)	
2	1.4	QPSK	1850.7-1909.3	11.53	13.53	0.023	1.08	1M08G7D
		16QAM		10.83	12.83	0.019	1.08	1M00W7D
	3	QPSK	1851.5-1908.5	11.66	13.66	0.023	2.69	2M69G7D
		16QAM		11.00	13.00	0.020	2.68	2M68W7D
	5	QPSK	1852.5-1907.5	11.44	13.44	0.022	4.46	4M46G7D
		16QAM		10.35	12.35	0.017	4.47	4M47W7D
	10	QPSK	1855.0-1905.0	11.65	13.65	0.023	8.95	8M95G7D
		16QAM		11.26	13.26	0.021	8.95	8M95W7D
	15	QPSK	1857.5-1902.5	11.46	13.46	0.022	13.41	13M4G7D
		16QAM		11.29	13.29	0.021	13.41	13M4W7D
	20	QPSK	1860.0-1900.0	11.68	13.68	0.023	17.93	17M9G7D
		16QAM		10.94	12.94	0.020	17.95	18M0W7D

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Summary of Results:								
Bands	BW	Modulation	Frequency Range	Max RF Output Power (dBm)		ERP/EIRP	99% BW	Emission Designator
	(MHz)		(MHz)	Conducted (Average)	ERP/EIRP (Average)	(W)	(MHz)	
4	1.4	QPSK	1710.7-1754.3	14.58	16.58	0.045	1.08	1M08G7D
		16QAM		13.53	15.53	0.036	1.08	1M08W7D
	3	QPSK	1711.5-1753.5	14.58	16.58	0.045	2.69	2M69G7D
		16QAM		14.38	16.38	0.043	2.68	2M68W7D
	5	QPSK	1712.5-1752.5	14.29	16.29	0.043	4.46	4M46G7D
		16QAM		13.47	15.47	0.035	4.47	4M47W7D
	10	QPSK	1715-1750	14.43	16.43	0.044	8.95	8M95G7D
		16QAM		13.99	15.99	0.040	8.95	8M95W7D
	15	QPSK	1717.5-1747.5	14.43	16.43	0.044	13.41	13M4G7D
		16QAM		13.87	15.87	0.039	13.41	13M4W7D
5	1.4	QPSK	824.7-848.3	13.87	13.72	0.024	1.08	1M08G7D
		16QAM		13.14	12.99	0.020	1.08	1M08W7D
	3	QPSK	825.5-847.5	13.89	13.74	0.024	2.69	2M69G7D
		16QAM		13.18	13.03	0.020	2.69	2M69W7D
	5	QPSK	826.5-846.5	13.93	13.78	0.024	4.47	4M47G7D
		16QAM		13.04	12.89	0.019	4.46	4M46W7D
	10	QPSK	829-844	13.94	13.79	0.024	8.95	8M95G7D
		16QAM		13.35	13.20	0.021	8.94	8M94W7D
12	1.4	QPSK	699.7-715.3	14.79	14.64	0.029	1.08	1M08G7D
		16QAM		14.25	14.10	0.026	1.08	1M08W7D
	3	QPSK	700.5-714.5	14.78	14.63	0.029	2.68	2M68G7D
		16QAM		14.24	14.09	0.026	2.68	2M68W7D
	5	QPSK	701.5-713.5	14.69	14.54	0.028	4.47	4M47G7D
		16QAM		13.91	13.76	0.024	4.48	4M48W7D
	10	QPSK	704-711	14.83	14.68	0.029	8.96	8M96G7D
		16QAM		14.48	14.33	0.027	8.95	8M95W7D
13	5	QPSK	779.5-784.5	18.88	18.73	0.075	4.49	4M49G7D
		16QAM		18.17	18.02	0.063	4.46	4M46W7D
	10	QPSK	782-782	18.94	18.79	0.076	8.93	8M93G7D
		16QAM		17.60	17.45	0.056	8.97	8M97W7D

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Summary of Results:								
Bands	BW	Modulation	Frequency Range	Max RF Output Power (dBm)		EIRP	99% BW	Emission Designator
	(MHz)		(MHz)	Conducted (Average)	ERP/EIRP (Average)	(W)	(MHz)	
25	1.4	QPSK	1850.7-1914.3	9.57	11.57	0.014	1.08	1M08G7D
		16QAM		9.04	11.04	0.013	1.08	1M08W7D
	3	QPSK	1851.5-1913.5	9.86	11.86	0.015	2.68	2M68G7D
		16QAM		9.08	11.08	0.013	2.68	2M68W7D
	5	QPSK	1852.5-1912.5	9.56	11.56	0.014	4.48	4M48G7D
		16QAM		9.13	11.13	0.013	4.47	4M47W7D
	10	QPSK	1855.0-1910.0	9.89	11.89	0.015	8.97	8M97G7D
		16QAM		9.23	11.23	0.013	8.97	8M97W7D
	15	QPSK	1857.5-1907.5	9.49	11.49	0.014	13.41	13M4G7D
		16QAM		9.43	11.43	0.014	13.42	13M4W7D
	20	QPSK	1860.0-1905.0	10.05	12.05	0.016	17.87	17M9G7D
		16QAM		9.23	11.23	0.013	17.91	17M9W7D
26	1.4	QPSK	824.7-848.3	17.23	17.08	0.051	1.08	1M08G7D
		16QAM		16.78	16.63	0.046	1.08	1M08W7D
	3	QPSK	825.5-847.5	17.23	17.08	0.051	2.68	2M68G7D
		16QAM		16.80	16.65	0.046	2.67	2M67W7D
	5	QPSK	826.5-846.5	17.14	16.99	0.050	4.47	4M47G7D
		16QAM		16.39	16.24	0.042	4.46	4M46W7D
	10	QPSK	829-844	17.26	17.11	0.051	8.95	8M95G7D
		16QAM		17.04	16.89	0.049	8.94	8M94W7D
	15	QPSK	831.5-841.5	17.48	17.33	0.054	13.43	13M4G7D
		16QAM		17.17	17.02	0.050	13.41	13M4W7D
26 (Part 90S)	1.4	QPSK	814.7-823.3	17.30	17.15	0.052	1.08	1M08G7D
		16QAM		17.10	16.95	0.050	1.08	1M08W7D
	3	QPSK	815.5-822.5	17.36	17.21	0.053	2.68	2M68G7D
		16QAM		17.14	16.99	0.050	2.67	2M67W7D
	5	QPSK	816.5-821.5	17.22	17.07	0.051	4.47	4M47G7D
		16QAM		16.45	16.30	0.043	4.46	4M46W7D
	10	QPSK	819	17.26	17.11	0.051	8.92	8M92G7D
		16QAM		17.10	16.95	0.050	8.94	8M94W7D
	15	QPSK	821.5	17.26	17.11	0.051	13.40	13M4G7D
		16QAM		16.22	16.07	0.040	13.42	13M4W7D

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1.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested with associated equipment below.

1) Support Equipment

Description	Manufacturer	Model No.	Serial Number	Supplied by
Notebook	Lenovo	E450	SL10G10780	UnionTrust
Mouse	DELL	MS111	CN-011D3V-738	UnionTrust

2) Support Cable

Cable No.	Description	Connector	Length	Supplied by
1	Antenna Cable	SMA	0.30 Meter	UnionTrust

1.5 TEST LOCATION

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1.6 TEST FACILITY

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L9069

The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable under the ISO/IEC 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories.

A2LA-Lab Certificate No.: 4312.01

Shenzhen UnionTrust Quality and Technology Co., Ltd. has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

ISED Wireless Device Testing Laboratories

CAB identifier: CN0032

FCC Accredited Lab.

Designation Number: CN1194

Test Firm Registration Number: 259480

1.7 DEVIATION FROM STANDARDS

None.

1.8 ABNORMALITIES FROM STANDARD CONDITIONS

None.

1.9 OTHER INFORMATION REQUESTED BY THE CUSTOMER

None.

1.10 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

No.	Item	Measurement Uncertainty
1	Conducted Output Power	±0.7 dB
2	99%&26dB Bandwidth	±1.86 %
3	Emission Mask	±2.7 dBm
4	Spurious emissions at antenna terminals	±2.7 dBm
5	Field strength of spurious radiation	30 MHz-1 GHz: ±4.9 dB 1 GHz-18 GHz: ±4.8 dB 18 GHz-40 GHz: ±5.1 dB
6	Frequency stability	±6.5 x 10 ⁻⁸
7	Humidity	±3.9 %
8	Temperature	±0.62 °C
9	DC Voltages	±0.68 %

2. TEST SUMMARY

FCC 47 CFR Part 24 Test Cases (Band 2 & Band 25)			
Test Item	Test Requirement	Test Method	Result
Equivalent Isotropic Radiated Power (EIRP)	FCC 47 CFR Part 2.1046(a) & FCC 47 CFR Part 24.232(c)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Conducted Output Power	FCC 47 CFR Part 2.1046(a) & FCC 47 CFR Part 24.232(c)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Peak-to-average ratio	FCC 47 CFR Part 24.232(d)	KDB 971168 D01v03r01	PASS
99%&26dB Bandwidth	FCC 47 CFR Part 2.1049(h) & FCC 47 CFR Part 24.238(b)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Band Edge at antenna terminals	FCC 47 CFR Part 2.1051 & FCC 47 CFR Part 24.238(a)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Spurious emissions at antenna terminals	FCC 47 CFR Part 2.1051 & FCC 47 CFR Part 24.238(a)(b)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Field strength of spurious radiation	FCC 47 CFR Part 2.1053 & FCC 47 CFR Part 24.238(a)(b)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Frequency stability	FCC 47 CFR Part 2.1055 & FCC 47 CFR Part 24.235	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS

FCC 47 CFR Part 27 Test Cases (LTE Band 4)			
Test Item	Test Requirement	Test Method	Result
Equivalent Isotropic Radiated Power (EIRP)	FCC 47 CFR Part 2.1046(a) & FCC 47 CFR Part 27.50(d)(4)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Conducted Output Power	FCC 47 CFR Part 2.1046(a) & FCC 47 CFR Part 27.50(d)(4)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Peak-to-average ratio	FCC 47 CFR Part 27.50(d)(5)	KDB 971168 D01v03r01	PASS
99%&26dB Bandwidth	FCC 47 CFR Part 2.1049(h) & FCC 47 CFR Part 27.53(h)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Band Edge at antenna terminals	FCC 47 CFR Part 27.53(h)(1)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Spurious emissions at antenna terminals	FCC 47 CFR Part 2.1051 & FCC 47 CFR Part 27.53(h)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Field strength of spurious radiation	FCC 47 CFR Part 2.1053 & FCC 47 CFR Part 27.53(h)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Frequency stability	FCC 47 CFR Part 2.1055 & FCC 47 CFR Part 27.54	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS

FCC 47 CFR Part 22 Test Cases (Band 5 & Band 26)			
Test Item	Test Requirement	Test Method	Result
Effective Radiated Power (ERP)	FCC 47 CFR Part 2.1046(a) & FCC 47 CFR Part 22.913(a)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Conducted Output Power	FCC 47 CFR Part 2.1046(a) & FCC 47 CFR Part 22.913(a)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Peak-to-average ratio	FCC 47 CFR Part 22.913(a)	KDB 971168 D01v03r01	PASS
99%&26dB Bandwidth	FCC 47 CFR Part 2.1049(h)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Band Edge at antenna terminals	FCC 47 CFR Part 2.1051 & FCC 47 CFR Part 22.917(a)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Spurious emissions at antenna terminals	FCC 47 CFR Part 2.1051 & FCC 47 CFR Part 22.917(a)(b)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS

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Field strength of spurious radiation	FCC 47 CFR Part 2.1053 & FCC 47 CFR Part 22.917(a)(b)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Frequency stability	FCC 47 CFR Part 2.1055 & FCC 47 CFR Part 22.355	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS

FCC 47 CFR Part 27 Test Cases (LTE Band 12)			
Test Item	Test Requirement	Test Method	Result
Effective Radiated Power (ERP)	FCC 47 CFR Part 2.1046(a) & FCC 47 CFR Part 27.50(c)(10)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Conducted Output Power	FCC 47 CFR Part 2.1046(a) & FCC 47 CFR Part 27.50(c)(10)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Peak-to-average ratio	FCC 47 CFR Part 27.50(d)(5)	KDB 971168 D01v03r01	PASS
99%&26dB Bandwidth	FCC 47 CFR Part 2.1049(h) & FCC 47 CFR Part 27.53(g)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Band Edge at antenna terminals	FCC 47 CFR Part 27.53(g)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Spurious emissions at antenna terminals	FCC 47 CFR Part 2.1051 & FCC 47 CFR Part 27.53(g)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Field strength of spurious radiation	FCC 47 CFR Part 2.1053 & FCC 47 CFR Part 27.53(g)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Frequency stability	FCC 47 CFR Part 2.1055 & FCC 47 CFR Part 27.54	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS

FCC 47 CFR Part 27 Test Cases (LTE Band 13)			
Test Item	Test Requirement	Test Method	Result
Effective Radiated Power (ERP)	FCC 47 CFR Part 2.1046(a) & FCC 47 CFR Part 27.50(b)(10)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Conducted Output Power	FCC 47 CFR Part 2.1046(a) & FCC 47 CFR Part 27.50(b)(10)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Peak-to-average ratio	FCC 47 CFR Part 27.50(d)(5)	KDB 971168 D01v03r01	PASS
99%&26dB Bandwidth	FCC 47 CFR Part 2.1049(h)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Band Edge at antenna terminals	FCC 47 CFR Part 27.53	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Spurious emissions at antenna terminals	FCC 47 CFR Part 2.1051 & FCC 47 CFR Part 27.53	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Field strength of spurious radiation	FCC 47 CFR Part 2.1053 & FCC 47 CFR Part 27.53	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Frequency stability	FCC 47 CFR Part 2.1055 & FCC 47 CFR Part 27.54	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS

FCC 47 CFR Part 90 Test Cases (LTE Band 26)			
Test Item	Test Requirement	Test Method	Result
Effective Radiated Power (ERP)	FCC 47 CFR Part 2.1046 & FCC 47 CFR Part 90.635	ANSI/TIA-603-E-2016 & KDB 971168 D01v03r01	PASS
Conducted Output Power	FCC 47 CFR Part 2.1046(a) & FCC 47 CFR Part 90.635	ANSI/TIA-603-E-2016 & KDB 971168 D01v03r01	PASS
Peak-to-average ratio	N/A	ANSI/TIA-603-E-2016 & KDB 971168 D01v03r01	PASS
99%&26dB Bandwidth	FCC 47 CFR Part 2.1049(h)	ANSI/TIA-603-E-2016 & KDB 971168 D01v03r01	PASS

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Emission Mask	FCC 47 CFR Part 2.1051 & FCC 47 CFR Part 90.691	ANSI/TIA-603-E-2016 & KDB 971168 D01v03r01	PASS
Spurious emissions at antenna terminals	FCC 47 CFR Part 2.1051 & FCC 47 CFR Part 90.691	ANSI/TIA-603-E-2016 & KDB 971168 D01v03r01	PASS
Field strength of spurious radiation	FCC 47 CFR Part 2.1053 & FCC 47 CFR Part 90.691	ANSI/TIA-603-E-2016 & KDB 971168 D01v03r01	PASS
Frequency stability	FCC 47 CFR Part 2.1055 & FCC 47 CFR Part 90.213	ANSI/TIA-603-E-2016 & KDB 971168 D01v03r01	PASS

Disclaimer and Explanations:

The declared of product specification and data (e.g. antenna gain, RF specification, etc) for EUT presented in the report are provided by the customer, and the customer takes all the responsibilities for the accuracy of product specification.

3. EQUIPMENT LIST

Radiated Emission Test Equipment List						
Used	Equipment	Manufacturer	Model No.	Serial Number	Cal. date	Cal. Due date
☒	3M Chamber & Accessory Equipment	ETS-LINDGREN	3M	Euroshiedpn-CT001270-1317	22-Jan-2021	21-Jan-2024
☒	Receiver	R&S	ESIB26	100114	5-Nov-2021	4-Nov-2022
☒	Broadband Antenna	ETS-LINDGREN	3142E	00201566	11-Nov-2021	10-Nov-2023
☒	6dB Attenuator	Talent	RA6A5-N-18	18103001	11-Nov-2021	10-Nov-2023
☒	Preamplifier	HP	8447F	2805A02960	5-Nov-2021	4-Nov-2022
☒	Horn Antenna (Pre-amplifier)	ETS-LINDGREN	3117-PA	00201874	17-Apr-2022	16-Apr-2024
☒	Pre-amplifier	ETS-LINDGREN	00118385	00201874	6-Nov-2021	5-Nov-2022
☒	Horn Antenna (Pre-amplifier)	ETS-LINDGREN	3116C-PA	00202652	14-Nov-2020	13-Nov-2022
☒	Pre-amplifier	ETS-LINDGREN	00118384	00202652	17-Nov-2020	16-Nov-2022
☒	Multi device Controller	ETS-LINDGREN	7006-001	00160105	N/A	N/A
☒	Test Software	Audix	e3	Software Version: 9.160323		

RF Conducted Test Equipment List						
Used	Equipment	Manufacturer	Model No.	Serial Number	Cal. date	Cal. Due date
☒	EXA Signal Analyzer	KEYSIGHT	N9010B	MY62060155	02-Jun-2022	01-Jun-2023
☒	DC Source	Agilent	66319B	MY43000795	01-Nov-2022	31-Oct-2023
☒	Temp & Humidity chamber	Votisch	VT4002	58566133290020	14-Apr-2023	13-Apr-2024
☒	Wideband Radio Communication Tester	R&S	CMW500	120932	14-Apr-2023	13-Apr-2024
☒	Test Software	WCS	WCS-FCC	Software Version: 23.02.042601		

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4. TEST CONFIGURATION

4.1 ENVIRONMENTAL CONDITIONS FOR TESTING

4.1.1 Normal or Extreme Test Conditions

Test Environment	Selected Values During Tests		
Test Condition	Ambient		
	Temperature (°C)	Voltage (V)	Relative Humidity (%)
TN/VN	+15 to +35	3.7	20 to 75
TL/VL	+5	3.3	20 to 75
TH/VL	+65	3.3	20 to 75
TL/VH	+5	4.2	20 to 75
TH/VH	+65	4.2	20 to 75

Remark:

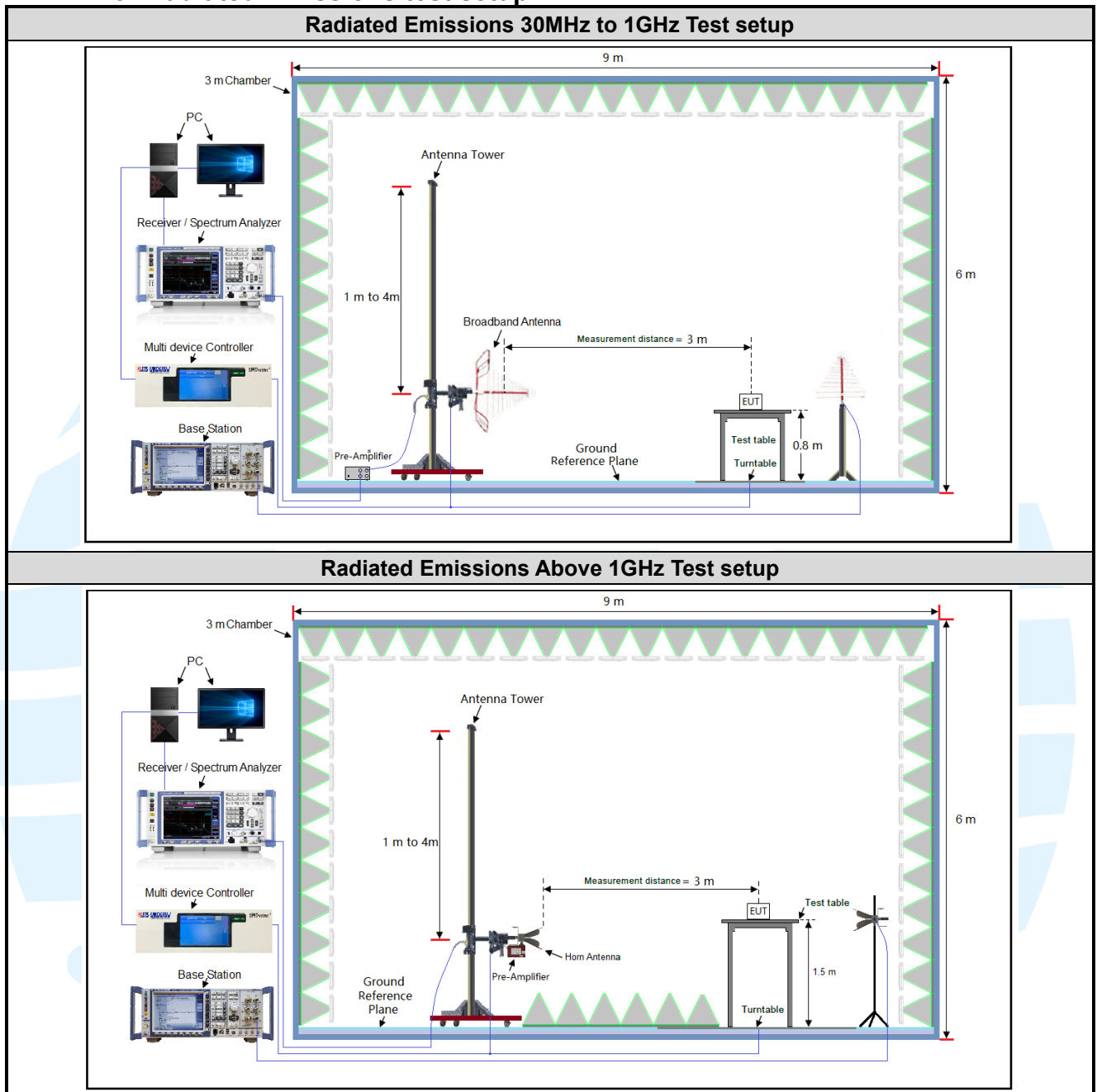
- The EUT just work in such extreme temperature of +5 °C to +65 °C and the extreme voltage of 3.3 V to 4.2 V, so here the EUT is tested in the temperature of +5 °C to +65 °C and the voltage of 3.3 V to 4.2 V.
- VN: Normal Voltage; TN: Normal Temperature;
TL: Low Extreme Test Temperature; TH: High Extreme Test Temperature;
VL: Low Extreme Test Voltage; VH: High Extreme Test Voltage.

4.1.2 Record of Normal Environment and Test Sample

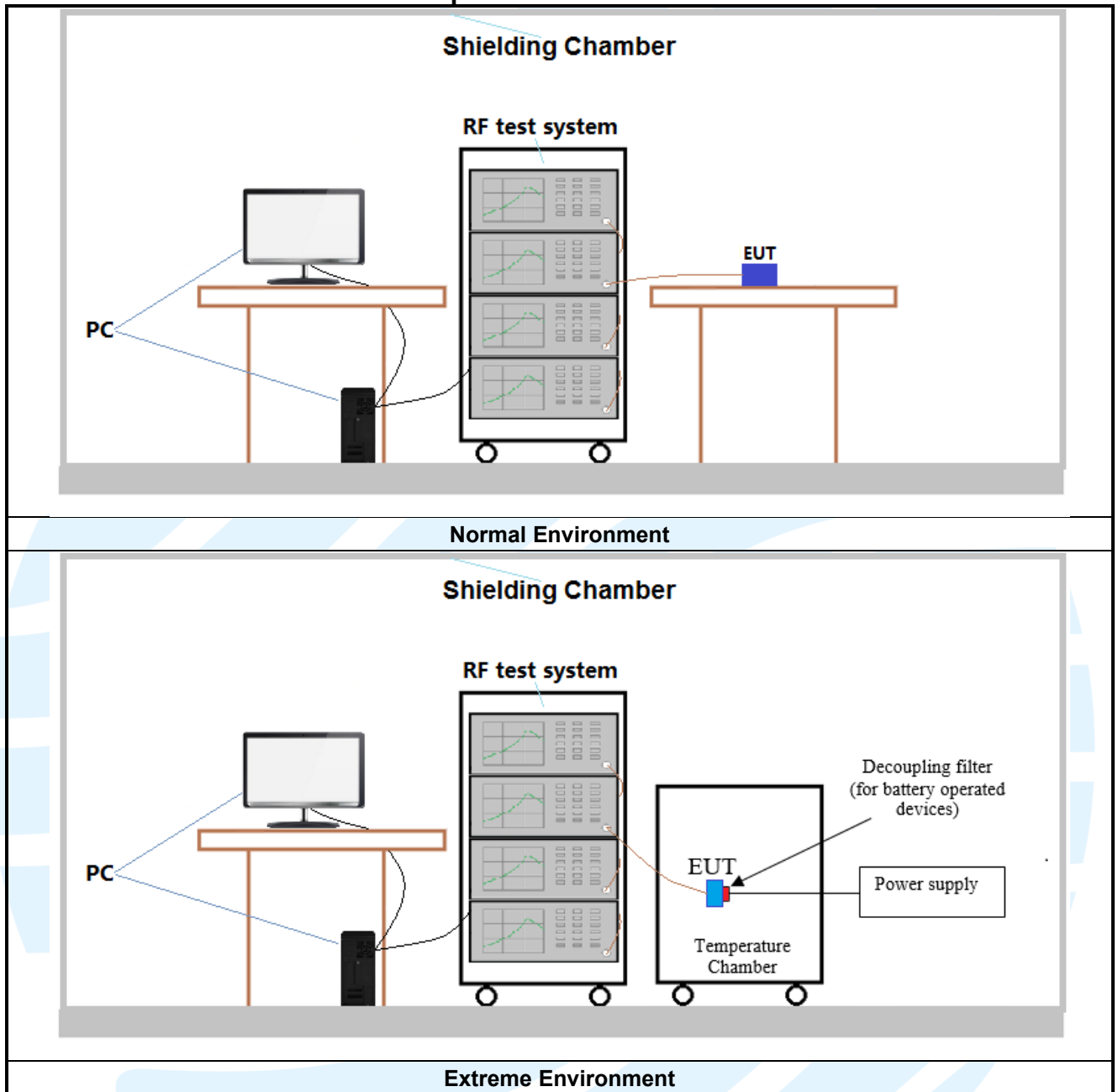
Test Item	Temp. (°C)	Relative Humidity (%)	Pressure (kPa)	Sample No.	Tested by
Conducted Output Power	22.6	55	98.8	S20221009615-ZJA02/2	Rain Wang
Peak-to-average ratio					
99%&26dB Bandwidth					
Band Edge at antenna terminals					
Spurious emissions at antenna terminals	23.5	56.2	99.7	S20221009615-ZJA02/2	Fire Hou
Field strength of spurious radiation					
Frequency stability	22.6	55	98.8	S20221009615-ZJA02/2	Rain Wang

4.2 TEST SETUP

4.2.1 For Radiated Emissions test setup



4.2.2 For Conducted RF test setup



4.3 TEST CHANNELS

Band	Test Frequency ID	Bandwidth (MHz)	Number [UL]	Frequency of Uplink (MHz)
LTE Band 2 TX: 1850-1910MHz	Low Range	1.4	18607	1850.7
		3	18615	1851.5
		5	18625	1852.5
		10	18650	1855
		15	18675	1857.5
		20	18700	1860
	Middle Range	1.4/3/5/10/15/20	18900	1880
	High Range	1.4	19193	1909.3
		3	19185	1908.5
		5	19175	1907.5
		10	19150	1905
		15	19125	1902.5
		20	19100	1900
LTE Band 4 TX: 1710-1755MHz	Low Range	1.4	19957	1710.7
		3	19965	1711.5
		5	19975	1712.5
		10	20000	1715
		15	20025	1717.5
		20	20050	1720
	Middle Range	1.4/3/5/10/ 15/20	20175	1732.5
	High Range	1.4	20393	1754.3
		3	20385	1753.5
		5	20375	1752.5
		10	20350	1750
		15	20325	1747.5
		20	20300	1745
LTE band 5 TX: 824-849MHz	Low Range	1.4	20407	824.7
		3	20415	825.5
		5	20425	826.5
		10	20450	829
	Middle Range	1.4/3/5/10	20525	836.5
	High Range	1.4	20643	848.3
		3	20635	847.5
		5	20625	846.5
		10	20600	844
LTE Band 12 TX: 699-716MHz	Low Range	1.4	23017	699.7
		3	23025	700.5
		5	23035	701.5
		10	23060	704
	Middle Range	1.4/3/5/10	23095	707.5
	High Range	1.4	23173	715.3
		3	23165	714.5
		5	23155	713.5

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		10	23130	711
LTE Band 13 TX: 777-787MHz	Low Range	5	23205	779.5
		10	23230	782
	Middle Range	5/10	23230	782
	High Range	5	23255	784.5
		10	23230	782
LTE Band 25 TX: 1850-1915MHz	Low Range	1.4	26047	1850.7
		3	26055	1851.5
		5	26065	1852.5
		10	26090	1855
		15	26115	1857.5
		20	26140	1860
	Middle Range	1.4/3/5/10/15/20	26340	1880
	High Range	1.4	26683	1914.3
		3	26675	1913.5
		5	26665	1912.5
		10	26640	1910
		15	26615	1907.5
		20	26590	1905
LTE band 26 TX:824-849MHz	Low Range	1.4	26797	824.7
		3	26805	825.5
		5	26815	826.5
		10	26840	829
		15	26865	831.5
	Middle Range	1.4/3/5/10/15	26915	836.5
	High Range	1.4	27033	848.3
		3	27025	847.5
		5	27015	846.5
		10	26990	844
		15	26965	841.5
LTE band 26 TX: 814-824MHz	Low Range	1.4	26697	814.7
		3	26705	815.5
		5	26715	816.5
		10	/	/
		15	/	/
	Middle Range	1.4/3/5/10	26740	819
	High Range	1.4	26783	823.3
		3	26775	822.5
		5	26765	821.5
		10	/	/
		15	/	/

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4.4 SYSTEM TEST CONFIGURATION

For emissions testing, the equipment under test (EUT) setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, radiated emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario. It was powered by a 3.7V battery. Only the worst case data were recorded in this test report.

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, X/Y/Z axis, and antenna ports.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000MHz. The resolution is 1 MHz or greater for frequencies above 1000MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

Radiated emission measurement were performed from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

4.5 PRE-SCAN

Pre-scan under all rate at lowest middle and highest channel, find the transmitter power as below.

4.5.1 LTE Band 2

LTE Band 2 Maximum Average Power (dBm)										
Modulation	RB		Test Channel			RB		Test Channel		
	Size	Offset	Low	Mid	High	Size	Offset	Low	Mid	High
Channel Bandwidth: 1.4 MHz						Channel Bandwidth: 3 MHz				
QPSK	1	0	9.37	11.01	11.28	1	0	11.42	11.00	11.66
	1	2	11.53	11.01	11.32	1	7	11.33	10.80	11.58
	1	5	11.24	11.35	11.21	1	14	11.44	11.02	11.45
	3	0	11.20	11.10	11.37	8	0	10.04	9.92	10.47
	3	1	11.16	11.21	11.42	8	3	10.25	10.17	10.51
	3	3	11.16	10.97	11.43	8	7	10.14	10.13	10.52
	6	0	10.25	10.10	10.31	15	0	10.05	10.15	10.56
16QAM	1	0	9.87	9.72	10.67	1	0	9.80	10.42	10.78
	1	2	10.16	10.27	10.83	1	7	9.66	10.42	11.00
	1	5	10.08	10.01	10.66	1	14	9.96	10.65	10.77
	3	0	10.06	10.05	10.07	8	0	9.20	9.23	9.45
	3	1	10.16	9.92	10.61	8	3	9.14	9.17	9.37
	3	3	10.20	9.69	10.68	8	7	9.27	9.36	9.24
	6	0	9.11	9.07	9.71	15	0	9.08	9.06	9.45
Channel Bandwidth: 5 MHz						Channel Bandwidth: 10 MHz				
QPSK	1	0	11.05	11.06	11.39	1	0	11.16	11.23	11.25
	1	12	11.19	11.01	11.44	1	24	11.44	11.35	11.65
	1	24	11.40	11.03	11.29	1	49	11.39	11.19	11.35
	12	0	9.99	9.98	10.45	25	0	10.14	9.98	10.44
	12	6	10.33	10.03	10.34	25	12	10.29	10.13	10.46
	12	13	10.25	10.13	10.34	25	25	10.37	10.13	10.54
	25	0	10.23	10.03	10.37	50	0	10.19	10.02	10.79
16QAM	1	0	9.71	10.32	9.97	1	0	9.82	10.46	11.18
	1	12	9.71	10.32	10.17	1	24	9.93	11.26	11.26
	1	24	9.81	10.35	9.87	1	49	10.80	10.78	10.99
	12	0	9.02	8.86	9.40	25	0	9.56	9.19	9.58
	12	6	9.05	9.26	9.46	25	12	9.45	9.08	9.74
	12	13	9.19	9.03	9.55	25	25	9.63	9.15	9.67
	25	0	9.12	8.90	9.57	50	0	9.57	8.84	9.46
Channel Bandwidth: 15 MHz						Channel Bandwidth: 20 MHz				
QPSK	1	0	11.15	11.05	11.44	1	0	11.50	10.74	11.29
	1	37	11.16	11.10	11.46	1	50	11.68	10.95	11.50
	1	74	11.20	11.29	11.45	1	99	10.74	10.87	11.24
	37	0	10.43	9.97	10.52	50	0	10.36	10.25	10.39
	37	19	10.32	9.99	10.67	50	25	10.25	10.27	10.35
	37	39	10.30	10.16	10.65	50	50	10.15	10.34	10.55
	75	0	10.22	10.03	10.59	100	0	10.15	10.20	10.41
16QAM	1	0	10.77	10.76	10.94	1	0	10.18	10.33	10.26
	1	37	11.29	10.43	10.86	1	50	10.29	10.63	10.49
	1	74	10.60	10.80	11.15	1	99	10.00	10.94	10.07
	37	0	10.26	10.35	10.04	50	0	10.03	10.57	9.92
	37	19	10.26	10.35	10.04	50	25	10.12	10.49	9.92
	37	39	10.26	10.35	10.04	50	50	10.19	10.57	9.92
	75	0	10.26	10.35	10.04	100	0	9.81	10.44	9.92

4.5.2 LTE Band 4

LTE Band 4 Maximum Average Power (dBm)										
Modulation	RB		Test Channel			RB		Test Channel		
	Size	Offset	Low	Mid	High	Size	Offset	Low	Mid	High
Channel Bandwidth: 1.4 MHz						Channel Bandwidth: 3 MHz				
QPSK	1	0	14.56	14.03	13.77	1	0	14.58	14.10	13.93
	1	2	14.53	14.11	14.02	1	7	14.44	14.24	13.95
	1	5	14.58	13.89	13.86	1	14	14.19	14.13	14.01
	3	0	14.24	13.98	13.91	8	0	13.40	13.25	12.86
	3	1	14.28	14.16	13.88	8	3	13.39	13.20	12.79
	3	3	14.25	14.02	13.81	8	7	13.38	13.23	12.88
	6	0	13.27	13.02	12.69	15	0	13.42	13.14	12.95
16QAM	1	0	13.31	12.92	12.92	1	0	14.38	13.30	13.14
	1	2	13.51	13.53	13.38	1	7	13.66	13.19	12.96
	1	5	13.38	13.28	13.04	1	14	13.74	13.36	13.10
	3	0	13.28	12.86	12.66	8	0	12.92	11.92	11.62
	3	1	13.42	13.21	12.80	8	3	12.74	12.16	11.96
	3	3	13.36	13.26	12.53	8	7	12.64	12.66	11.82
	6	0	12.20	12.30	11.89	15	0	12.48	12.26	11.70
Channel Bandwidth: 5 MHz						Channel Bandwidth: 10 MHz				
QPSK	1	0	14.29	14.24	13.86	1	0	14.36	14.27	14.06
	1	12	14.21	14.20	13.84	1	24	14.43	14.30	14.05
	1	24	14.28	14.06	14.08	1	49	14.21	14.26	14.12
	12	0	13.38	13.03	12.94	25	0	13.47	13.02	12.97
	12	6	13.31	13.06	12.88	25	12	13.37	13.08	13.05
	12	13	13.21	13.07	12.94	25	25	13.33	13.14	12.90
	25	0	13.27	13.05	12.94	50	0	13.47	13.01	12.96
16QAM	1	0	13.47	13.11	13.01	1	0	13.99	13.41	13.64
	1	12	13.10	13.03	12.96	1	24	13.96	13.59	13.40
	1	24	13.07	13.41	12.89	1	49	13.33	13.22	13.34
	12	0	12.19	12.01	11.76	25	0	12.42	12.10	12.03
	12	6	12.34	12.17	11.92	25	12	12.19	12.21	12.08
	12	13	12.12	12.04	11.65	25	25	12.31	12.22	11.80
	25	0	12.27	12.05	11.94	50	0	11.90	11.95	11.90
Channel Bandwidth: 15 MHz						Channel Bandwidth: 20 MHz				
QPSK	1	0	14.43	14.36	14.15	1	0	14.59	14.24	13.96
	1	37	14.37	14.12	14.00	1	50	14.36	14.26	14.33
	1	74	14.18	14.07	13.92	1	99	14.47	14.26	13.85
	37	0	13.48	13.08	13.25	50	0	13.45	13.45	13.23
	37	19	13.41	13.13	12.97	50	25	13.34	13.34	13.14
	37	39	13.31	13.10	12.97	50	50	13.48	13.48	13.05
	75	0	13.39	13.06	13.03	100	0	13.43	13.43	13.24
16QAM	1	0	13.87	13.84	13.44	1	0	13.21	13.29	13.59
	1	37	13.76	13.68	13.32	1	50	13.79	13.13	13.88
	1	74	13.66	13.51	13.37	1	99	13.18	13.13	12.82
	37	0	13.16	13.01	12.60	50	0	12.92	12.73	13.04
	37	19	13.11	12.72	12.92	50	25	12.85	12.95	12.70
	37	39	13.02	12.91	12.83	50	50	13.21	12.91	12.83
	75	0	12.74	12.64	12.81	100	0	12.70	12.64	12.64

4.5.3 LTE Band 5

LTE Band 5 Maximum Average Power (dBm)										
Modulation	RB		Test Channel			RB		Test Channel		
	Size	Offset	Low	Mid	High	Size	Offset	Low	Mid	High
Channel Bandwidth: 1.4 MHz						Channel Bandwidth: 3 MHz				
QPSK	1	0	13.64	13.59	13.40	1	0	13.76	13.84	13.82
	1	2	13.82	13.77	13.55	1	7	13.84	13.80	13.86
	1	5	13.65	13.67	13.35	1	14	13.70	13.60	13.89
	3	0	13.54	13.72	13.43	8	0	12.93	12.60	12.81
	3	1	13.76	13.87	13.48	8	3	12.86	12.69	12.73
	3	3	13.70	13.79	13.47	8	7	12.92	12.62	12.72
16QAM	6	0	12.73	12.80	12.57	15	0	12.91	12.65	12.80
	1	0	12.48	12.90	12.60	1	0	13.12	12.79	13.18
	1	2	12.77	13.14	12.96	1	7	13.14	12.89	13.11
	1	5	12.63	13.12	12.53	1	14	12.95	12.76	13.12
	3	0	12.55	12.91	12.86	8	0	12.00	11.60	12.14
	3	1	13.04	12.61	12.72	8	3	11.99	11.64	11.96
QPSK	3	3	13.09	12.66	12.62	8	7	11.99	11.54	12.03
	6	0	11.81	11.76	11.79	15	0	11.90	11.47	11.81
Channel Bandwidth: 5 MHz						Channel Bandwidth: 10 MHz				
QPSK	1	0	13.64	13.74	13.72	1	0	13.68	13.70	13.40
	1	12	13.79	13.66	13.60	1	24	13.78	13.71	13.83
	1	24	13.93	13.40	13.48	1	49	13.94	13.62	13.34
	12	0	12.82	12.63	12.76	25	0	12.48	12.75	12.55
	12	6	12.80	12.89	12.71	25	12	12.49	12.64	12.63
	12	13	12.72	12.86	12.57	25	25	12.59	12.71	12.74
16QAM	25	0	12.74	12.82	12.67	50	0	12.49	12.88	12.72
	1	0	12.17	12.25	12.78	1	0	13.10	13.23	12.46
	1	12	12.26	11.94	12.89	1	24	13.10	13.35	13.00
	1	24	12.25	11.83	13.04	1	49	13.24	12.96	12.57
	12	0	11.91	11.70	11.62	25	0	11.65	11.71	11.67
	12	6	11.79	11.94	11.74	25	12	11.69	11.79	11.62
QPSK	12	13	11.73	11.76	11.66	25	25	11.56	11.66	11.71
	25	0	11.81	11.87	11.62	50	0	11.46	11.54	11.55

4.5.4 LTE Band 12

LTE Band 12 Maximum Average Power (dBm)										
Modulation	RB		Test Channel			RB		Test Channel		
	Size	Offset	Low	Mid	High	Size	Offset	Low	Mid	High
Channel Bandwidth: 1.4 MHz						Channel Bandwidth: 3 MHz				
QPSK	1	0	14.62	14.48	14.59	1	0	14.57	14.42	14.78
	1	2	14.79	14.60	14.72	1	7	14.51	14.71	14.76
	1	5	14.69	14.54	14.65	1	14	14.43	14.54	14.74
	3	0	14.52	14.23	14.50	8	0	13.65	13.52	13.63
	3	1	14.71	14.55	14.66	8	3	13.54	13.52	13.61
	3	3	14.63	14.52	14.65	8	7	13.46	13.52	13.60
	6	0	13.56	13.45	13.56	15	0	13.57	13.42	13.48
16QAM	1	0	13.59	13.77	13.76	1	0	13.98	13.82	14.24
	1	2	13.36	13.77	14.25	1	7	13.79	13.79	14.17
	1	5	13.58	13.78	13.98	1	14	13.89	13.58	14.22
	3	0	13.81	13.63	13.36	8	0	12.70	12.33	12.48
	3	1	13.57	13.76	13.49	8	3	12.29	12.64	12.71
	3	3	13.43	13.09	13.64	8	7	12.36	12.41	12.82
	6	0	12.57	12.57	12.59	15	0	12.64	12.41	12.58
Channel Bandwidth: 5 MHz						Channel Bandwidth: 10 MHz				
QPSK	1	0	14.41	14.38	14.62	1	0	14.64	14.15	14.40
	1	12	14.32	14.43	14.69	1	24	14.69	14.50	14.81
	1	24	14.46	14.48	14.55	1	49	14.83	14.30	14.49
	12	0	13.50	13.35	13.56	25	0	13.38	13.43	13.52
	12	6	13.44	13.45	13.70	25	12	13.39	13.35	13.44
	12	13	13.43	13.46	13.46	25	25	13.63	13.31	13.40
	25	0	13.48	13.37	13.39	50	0	13.50	13.25	13.51
16QAM	1	0	13.22	13.56	13.16	1	0	13.43	13.83	13.82
	1	12	13.17	13.91	13.03	1	24	13.41	14.48	13.88
	1	24	12.81	13.76	13.35	1	49	13.51	13.79	13.90
	12	0	12.31	12.40	12.46	25	0	12.14	12.49	12.57
	12	6	12.17	12.54	12.68	25	12	12.51	12.78	12.51
	12	13	12.45	12.42	12.40	25	25	12.64	12.58	12.57
	25	0	12.21	12.36	12.50	50	0	12.52	12.28	12.33

4.5.5 LTE Band 13

LTE Band 13 Maximum Average Power (dBm)										
Modulation	RB		Test Channel			RB		Test Channel		
	Size	Offset	Low	Mid	High	Size	Offset	Low	Mid	High
Channel Bandwidth: 5 MHz						Channel Bandwidth: 10 MHz				
QPSK	1	0	18.88	18.45	18.57	1	0	/	18.94	/
	1	12	18.73	18.85	18.75	1	24	/	18.82	/
	1	24	18.71	18.52	18.77	1	49	/	18.69	/
	12	0	18.03	17.67	17.80	25	0	/	17.69	/
	12	6	17.78	17.72	17.83	25	12	/	17.77	/
	12	13	17.76	17.78	17.69	25	25	/	17.84	/
	25	0	17.88	17.65	17.61	50	0	/	17.74	/
16QAM	1	0	17.73	17.70	17.37	1	0	/	17.47	/
	1	12	17.42	17.87	17.50	1	24	/	17.60	/
	1	24	17.42	18.17	17.45	1	49	/	17.58	/
	12	0	16.94	16.55	16.87	25	0	/	16.84	/
	12	6	16.94	16.85	16.83	25	12	/	16.97	/
	12	13	16.78	16.62	16.62	25	25	/	16.89	/
	25	0	16.96	16.80	16.62	50	0	/	16.15	/

4.5.6 LTE Band 25

LTE Band 25 Maximum Average Power (dBm)										
Modulation	RB		Test Channel			RB		Test Channel		
	Size	Offset	Low	Mid	High	Size	Offset	Low	Mid	High
Channel Bandwidth: 1.4 MHz						Channel Bandwidth: 3 MHz				
QPSK	1	0	9.42	8.80	9.56	1	0	9.32	9.01	9.64
	1	2	9.32	8.95	9.57	1	7	9.13	9.25	9.86
	1	5	9.31	8.80	9.37	1	14	9.31	9.22	9.51
	3	0	8.96	8.90	9.57	8	0	8.27	7.93	8.67
	3	1	9.15	8.87	9.41	8	3	8.36	8.10	8.63
	3	3	9.15	8.90	9.43	8	7	8.35	8.11	8.50
	6	0	8.01	8.00	8.47	15	0	8.28	8.04	8.61
16QAM	1	0	8.03	8.52	8.73	1	0	8.57	8.27	9.08
	1	2	8.19	8.39	8.84	1	7	8.48	8.57	8.68
	1	5	8.11	8.17	9.04	1	14	8.69	8.70	9.03
	3	0	8.15	7.63	8.58	8	0	7.36	6.77	7.45
	3	1	8.19	8.15	8.04	8	3	7.20	7.10	7.60
	3	3	7.66	7.91	8.35	8	7	7.44	6.78	7.26
	6	0	7.10	7.13	7.51	15	0	7.28	7.37	7.38
Channel Bandwidth: 5 MHz						Channel Bandwidth: 10 MHz				
QPSK	1	0	9.11	8.76	9.45	1	0	9.17	8.97	9.37
	1	12	9.28	8.91	9.38	1	24	9.60	9.18	9.44
	1	24	9.07	9.01	9.56	1	49	9.13	9.24	9.89
	12	0	8.18	7.87	8.62	25	0	8.25	7.97	8.54
	12	6	8.33	8.03	8.51	25	12	8.33	8.01	8.45
	12	13	8.31	8.00	8.57	25	25	8.31	8.16	8.61
	25	0	8.09	7.91	8.52	50	0	8.26	7.97	8.49
16QAM	1	0	7.74	8.06	8.57	1	0	8.77	8.23	8.63
	1	12	7.63	8.25	8.31	1	24	8.97	9.15	9.23
	1	24	7.80	8.23	9.13	1	49	9.18	9.16	9.21
	12	0	7.12	6.78	7.42	25	0	7.13	6.95	7.43
	12	6	7.20	6.99	7.55	25	12	7.22	7.16	7.54
	12	13	7.16	6.80	7.29	25	25	7.31	7.27	7.40
	25	0	7.18	6.69	7.43	50	0	7.28	6.90	7.31
Channel Bandwidth: 15 MHz						Channel Bandwidth: 20 MHz				
QPSK	1	0	9.21	8.97	9.24	1	0	9.90	8.70	9.00
	1	37	9.11	8.99	9.49	1	50	10.05	9.08	9.48
	1	74	9.08	8.93	9.49	1	99	9.75	9.12	9.42
	37	0	8.27	7.94	8.41	50	0	9.00	7.81	8.25
	37	19	8.32	7.97	8.62	50	25	9.07	7.96	8.24
	37	39	8.10	8.19	8.54	50	50	9.08	8.32	8.35
	75	0	8.05	7.80	8.40	100	0	8.03	8.11	8.20
16QAM	1	0	8.72	7.90	8.87	1	0	8.78	8.22	8.03
	1	37	8.97	8.58	9.43	1	50	9.23	8.71	8.29
	1	74	9.03	8.98	9.00	1	99	8.80	9.00	8.04
	37	0	7.94	7.90	9.18	50	0	7.56	8.22	8.10
	37	19	7.97	7.90	8.33	50	25	7.61	8.21	8.10
	37	39	7.94	7.80	8.33	50	50	7.78	8.10	8.05
	75	0	7.97	7.80	7.22	100	0	7.28	8.03	8.05

4.5.7 LTE Band 26

LTE Band 26 Maximum Average Power (dBm)										
Modulation	RB		Test Channel			RB		Test Channel		
	Size	Offset	Low	Mid	High	Size	Offset	Low	Mid	High
Channel Bandwidth: 1.4 MHz						Channel Bandwidth: 3 MHz				
QPSK	1	0	16.92	16.75	16.95	1	0	16.98	16.94	17.20
	1	2	17.23	17.14	16.96	1	7	16.97	17.00	17.04
	1	5	16.89	16.66	17.20	1	14	17.23	16.95	17.10
	3	0	16.83	16.77	17.03	8	0	16.09	16.13	16.16
	3	1	17.16	17.11	17.00	8	3	16.39	15.89	16.07
	3	3	16.98	17.17	16.82	8	7	16.17	16.02	16.19
	6	0	16.28	16.11	16.14	15	0	16.06	15.98	15.92
16QAM	1	0	15.85	16.31	16.78	1	0	16.34	15.92	16.59
	1	2	16.41	16.74	16.51	1	7	16.51	15.94	16.80
	1	5	16.15	16.15	16.32	1	14	16.48	15.92	16.61
	3	0	16.11	15.68	15.76	8	0	15.38	14.82	15.24
	3	1	16.14	16.03	15.57	8	3	15.11	14.84	15.61
	3	3	16.28	15.68	16.00	8	7	15.70	14.66	15.91
	6	0	14.97	14.78	15.26	15	0	15.18	14.79	15.16
Channel Bandwidth: 5 MHz						Channel Bandwidth: 10 MHz				
QPSK	1	0	16.93	17.14	16.84	1	0	16.74	16.84	17.08
	1	12	16.84	16.69	16.97	1	24	16.92	17.10	17.12
	1	24	16.88	16.80	16.84	1	49	17.26	17.06	17.12
	12	0	16.06	16.16	15.96	25	0	15.91	16.03	15.95
	12	6	16.40	15.70	16.09	25	12	16.22	16.02	16.02
	12	13	16.27	16.17	15.69	25	25	15.96	16.20	15.94
	25	0	15.87	15.74	16.06	50	0	16.27	16.19	16.21
16QAM	1	0	15.84	16.39	15.36	1	0	16.70	16.54	16.82
	1	12	15.78	15.88	15.55	1	24	16.69	16.75	16.45
	1	24	15.24	15.87	15.67	1	49	17.04	16.94	17.04
	12	0	15.05	14.65	15.06	25	0	15.02	15.00	14.90
	12	6	15.27	14.78	15.05	25	12	15.18	15.10	14.94
	12	13	14.89	14.80	14.75	25	25	15.13	15.13	15.21
	25	0	15.21	15.05	15.08	50	0	14.83	14.85	14.83
Channel Bandwidth: 15 MHz										
QPSK	1	0	17.19	17.05	17.20					
	1	12	17.48	17.25	17.30					
	1	24	17.20	17.06	17.32					
	12	0	16.13	15.99	16.31					
	12	6	16.07	15.93	16.36					
	12	13	16.02	15.88	16.38					
	25	0	15.99	15.85	16.43					
16QAM	1	0	16.39	16.27	16.93					
	1	12	16.46	16.34	16.86					
	1	24	16.50	16.38	17.17					
	12	0	16.22	16.10	15.35					
	12	6	16.28	16.16	15.41					
	12	13	16.06	15.94	15.36					
	25	0	16.03	15.91	15.02					

4.5.8 LTE Band 26 (Part 90S)

LTE Band 26 Maximum Average Power (dBm)										
Modulation	RB		Test Channel			RB		Test Channel		
	Size	Offset	Low	Mid	High	Size	Offset	Low	Mid	High
Channel Bandwidth: 1.4 MHz						Channel Bandwidth: 3 MHz				
QPSK	1	0	17.20	17.05	17.17	1	0	17.08	17.20	17.28
	1	2	17.27	17.20	17.14	1	7	17.25	17.16	17.30
	1	5	17.25	16.92	17.26	1	14	17.31	17.29	17.36
	3	0	17.15	17.09	17.19	8	0	16.35	16.17	16.46
	3	1	17.30	17.19	17.08	8	3	16.43	16.13	16.41
	3	3	17.22	17.19	17.12	8	7	16.45	16.16	16.41
	6	0	16.32	16.13	16.22	15	0	16.42	16.02	16.28
16QAM	1	0	16.25	16.43	17.04	1	0	16.60	16.04	16.63
	1	2	16.65	17.10	16.55	1	7	16.55	16.32	17.14
	1	5	16.35	16.53	16.62	1	14	16.78	16.24	16.83
	3	0	16.41	15.96	16.02	8	0	15.52	14.86	15.50
	3	1	16.22	16.23	15.93	8	3	15.37	15.18	15.77
	3	3	16.28	15.92	16.10	8	7	15.78	15.04	15.99
	6	0	15.23	15.10	15.26	15	0	15.28	14.93	15.32
Channel Bandwidth: 5 MHz						Channel Bandwidth: 10 MHz				
QPSK	1	0	16.97	17.22	17.00	1	0	/	17.14	/
	1	12	17.12	16.95	17.13	1	24	/	17.24	/
	1	24	17.20	17.18	17.12	1	49	/	17.26	/
	12	0	16.30	16.16	16.26	25	0	/	16.25	/
	12	6	16.40	16.06	16.19	25	12	/	16.30	/
	12	13	16.33	16.21	16.09	25	25	/	16.32	/
	25	0	16.25	16.14	16.10	50	0	/	16.37	/
16QAM	1	0	15.94	16.45	15.74	1	0	/	16.86	/
	1	12	15.78	16.22	15.71	1	24	/	16.79	/
	1	24	15.56	16.19	15.73	1	49	/	17.10	/
	12	0	15.27	14.95	15.26	25	0	/	15.28	/
	12	6	15.39	15.06	15.29	25	12	/	15.34	/
	12	13	15.15	15.10	15.03	25	25	/	15.29	/
	25	0	15.21	15.17	15.28	50	0	/	14.95	/
Channel Bandwidth: 15 MHz										
QPSK	1	0	16.99	/	/					
	1	37	17.14	/	/					
	1	74	16.84	/	/					
	37	0	15.77	/	/					
	37	19	15.91	/	/					
	37	39	16.00	/	/					
	75	0	15.89	/	/					
16QAM	1	0	16.05	/	/					
	1	37	16.42	/	/					
	1	74	16.34	/	/					
	37	0	16.14	/	/					
	37	19	16.24	/	/					
	37	39	16.04	/	/					
	75	0	15.89	/	/					

5. RADIO TECHNICAL REQUIREMENTS SPECIFICATION

5.1 REFERENCE DOCUMENTS FOR TESTING

No.	Identity	Document Title
1	FCC 47 CFR Part 2	Frequency allocations and radio treaty matters; general rules and regulations
2	FCC 47 CFR Part 22	Public Mobile Services
3	FCC 47 CFR Part 27	Miscellaneous Wireless Communications Services
4	FCC 47 CFR Part 24	Personal Communications Services
5	FCC 47 CFR Part 90	Private Land Mobile Radio Services
6	ANSI C63.26-2015	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services
7	KDB 971168 D01	KDB 971168 D01 Power Meas License Digital Systems v03r01
8	KDB 412172 D01 Determining ERP and EIRP v01r01	Guidelines for determining the effective radiated power (ERP) and isotropically radiated power (EIRP) of an RF transmitting system

5.2 ERP OR EIRP

Test Requirement: FCC 47 CFR Part 2.1046(a)
LTE Band 2 & LTE Band 25: FCC 47 CFR Part 24.232(c)
LTE Band 4: FCC 47 CFR Part 27.50(d)(4)
LTE Band 5 & LTE Band 26: FCC 47 CFR Part 22.913(a)
LTE Band 12: FCC 47 CFR Part 27.50(c)(10)
LTE Band 13: FCC 47 CFR Part 27.50(b)(10)
LTE Band 26: FCC 47 CFR Part 90.635

Test Method: KDB 971168 D01v03r01 Section 5.6 & ANSI C63.26-2015

Limit:

FCC 47 CFR Part 22.913(a):

The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

FCC 47 CFR Part 24.232(c):

Mobile and portable stations are limited to 2 watts EIRP.

FCC 47 CFR Part 27.50(d)(4):

Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.

FCC 47 CFR Part 27.50(c)(10):

Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

FCC 47 CFR Part 27.50(b)(10):

Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP.

FCC 47 CFR Part 90.635:

(a) The effective radiated power and antenna height for base stations may not exceed 1 kilowatt (30 dBw) and 304 m. (1,000 ft.) above average terrain (AAT), respectively, or the equivalent thereof as determined from the Table. These are maximum values, and applicants will be required to justify power levels and antenna heights requested.

(b) The maximum output power of the transmitter for mobile stations is 100 watts (20 dBw).

Table—Equivalent Power and Antenna Heights for Base Stations in the 851–869 MHz and 935–940 MHz Bands Which Have a Requirement for a 32 km (20 mi) Service Area Radius

Antenna height (ATT) meters (feet)	Effective radiated power (watts) ^{1 2 4}
Above 1,372 (4,500)	65
Above 1,220 (4,000) to 1,372 (4,500)	70
Above 1,067 (3,500) to 1,220 (4,000)	75
Above 915 (3,000) to 1,067 (3,500)	100
Above 763 (2,500) to 915 (3,000)	140
Above 610 (2,000) to 763 (2,500)	200
Above 458 (1,500) to 610 (2,000)	350
Above 305 (1,000) to 458 (1,500)	600
Up to 305 (1,000)	³ 1,000

1. Power is given in terms of effective radiated power (ERP).
2. Applicants in the Los Angeles, CA, area who demonstrate a need to serve both the downtown and fringe areas will be permitted to utilize an ERP of 1 kw at the following mountaintop sites: Santiago Park, Sierra Peak, Mount Lukens, and Mount Wilson.
3. Stations with antennas below 305 m (1,000 ft) (AAT) will be restricted to a maximum power of 1 kw (ERP).
4. Licensees in San Diego, CA, will be permitted to utilize an ERP of 500 watts at the following mountaintop sites: Palomar, Otay, Woodson and Miguel.

Test Procedure:

According to KDB 412172 D01 Power Approach,

1. **ERP or EIRP = $P_T + G_T - L_C$**
2. **ERP = EIRP -2.15**

where

3. P_T = transmitter output power, expressed in dBW, dBm, or PSD;
4. G_T = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);
5. L_C = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

Test Setup: Refer to section 4.2.1 for details.

Instruments Used: Refer to section 3 for details

Test Mode: Link mode

Test Results: Pass

Test Data: See table below

Note: The maximum ERP/EIRP is calculated from max output power and antenna gain, the antenna gain provided by the customer, and the customer takes all the responsibilities for the accuracy of antenna gain.

5.2.1 LTE Band 2

LTE Band 2 Maximum EIRP (dBm)					
Channel	QPSK; RB:1	16QAM; RB:1	64QAM; RB:1	Limit (dBm)	Result
Channel Bandwidth: 1.4MHz					
Lowest	13.53	12.20	/	33.01	Pass
Middle	13.35	12.27	/	33.01	Pass
Highest	13.43	12.83	/	33.01	Pass
Channel Bandwidth: 3MHz					
Lowest	13.44	11.96	/	33.01	Pass
Middle	13.02	12.65	/	33.01	Pass
Highest	13.66	13.00	/	33.01	Pass
Channel Bandwidth: 5MHz					
Lowest	13.40	11.81	/	33.01	Pass
Middle	13.06	12.35	/	33.01	Pass
Highest	13.44	12.17	/	33.01	Pass
Channel Bandwidth: 10MHz					
Lowest	13.44	12.80	/	33.01	Pass
Middle	13.35	13.26	/	33.01	Pass
Highest	13.65	13.26	/	33.01	Pass
Channel Bandwidth: 15MHz					
Lowest	13.20	13.29	/	33.01	Pass
Middle	13.29	12.80	/	33.01	Pass
Highest	13.46	13.15	/	33.01	Pass
Channel Bandwidth: 20MHz					
Lowest	13.68	12.29	/	33.01	Pass
Middle	12.95	12.94	/	33.01	Pass
Highest	13.50	12.49	/	33.01	Pass

5.2.2 LTE Band 4

LTE Band 4 Maximum EIRP (dBm)					
Channel	QPSK; RB:1	16QAM; RB:1	64QAM; RB:1	Limit (dBm)	Result
Channel Bandwidth: 1.4MHz					
Lowest	16.58	15.51	/	30.00	Pass
Middle	16.16	15.53	/	30.00	Pass
Highest	16.02	15.38	/	30.00	Pass
Channel Bandwidth: 3MHz					
Lowest	16.58	16.38	/	30.00	Pass
Middle	16.24	15.36	/	30.00	Pass
Highest	16.01	15.14	/	30.00	Pass
Channel Bandwidth: 5MHz					
Lowest	16.29	15.47	/	30.00	Pass
Middle	16.24	15.41	/	30.00	Pass
Highest	16.08	15.01	/	30.00	Pass
Channel Bandwidth: 10MHz					
Lowest	16.43	15.99	/	30.00	Pass
Middle	16.30	15.59	/	30.00	Pass
Highest	16.12	15.64	/	30.00	Pass
Channel Bandwidth: 15MHz					
Lowest	16.43	15.87	/	30.00	Pass
Middle	16.36	15.84	/	30.00	Pass
Highest	16.15	15.44	/	30.00	Pass
Channel Bandwidth: 20MHz					
Lowest	16.59	15.79	/	30.00	Pass
Middle	16.26	15.29	/	30.00	Pass
Highest	16.33	15.88	/	30.00	Pass

5.2.3 LTE Band 5

LTE Band 5 Maximum ERP (dBm)					
Channel	QPSK; RB:1	16QAM; RB:1	64QAM; RB:1	Limit (dBm)	Result
Channel Bandwidth: 1.4MHz					
Lowest	13.67	12.94	/	38.45	Pass
Middle	13.72	12.99	/	38.45	Pass
Highest	13.40	12.81	/	38.45	Pass
Channel Bandwidth: 3MHz					
Lowest	13.69	12.99	/	38.45	Pass
Middle	13.69	12.74	/	38.45	Pass
Highest	13.74	13.03	/	38.45	Pass
Channel Bandwidth: 5MHz					
Lowest	13.78	12.11	/	38.45	Pass
Middle	13.59	12.10	/	38.45	Pass
Highest	13.57	12.89	/	38.45	Pass
Channel Bandwidth: 10MHz					
Lowest	13.79	13.09	/	38.45	Pass
Middle	13.56	13.20	/	38.45	Pass
Highest	13.68	12.85	/	38.45	Pass

5.2.4 LTE Band 12

LTE Band 12 Maximum ERP (dBm)					
Channel	QPSK; RB:1	16QAM; RB:1	64QAM; RB:1	Limit (dBm)	Result
Channel Bandwidth: 1.4MHz					
Lowest	14.64	13.66	/	34.77	Pass
Middle	14.45	13.63	/	34.77	Pass
Highest	14.57	14.10	/	34.77	Pass
Channel Bandwidth: 3MHz					
Lowest	14.42	13.83	/	34.77	Pass
Middle	14.56	13.67	/	34.77	Pass
Highest	14.63	14.09	/	34.77	Pass
Channel Bandwidth: 5MHz					
Lowest	14.31	13.07	/	34.77	Pass
Middle	14.33	13.76	/	34.77	Pass
Highest	14.54	13.20	/	34.77	Pass
Channel Bandwidth: 10MHz					
Lowest	14.68	13.36	/	34.77	Pass
Middle	14.35	14.33	/	34.77	Pass
Highest	14.66	13.75	/	34.77	Pass

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5.2.5 LTE Band 13

LTE Band 13 Maximum ERP (dBm)					
Channel	QPSK; RB:1	16QAM; RB:1	64QAM; RB:1	Limit (dBm)	Result
Channel Bandwidth: 5MHz					
Lowest	18.73	17.58	/	34.77	Pass
Middle	18.70	18.02	/	34.77	Pass
Highest	18.62	17.35	/	34.77	Pass
Channel Bandwidth: 10MHz					
Lowest	/	/	/	34.77	Pass
Middle	18.79	17.45	/	34.77	Pass
Highest	/	/	/	34.77	Pass

5.2.6 LTE Band 25

LTE Band 25 Maximum EIRP (dBm)					
Channel	QPSK; RB:1	16QAM; RB:1	64QAM; RB:1	Limit (dBm)	Result
Channel Bandwidth: 1.4MHz					
Lowest	11.42	10.19	/	33.01	Pass
Middle	10.95	10.52	/	33.01	Pass
Highest	11.57	11.04	/	33.01	Pass
Channel Bandwidth: 3MHz					
Lowest	11.32	10.69	/	33.01	Pass
Middle	11.25	10.70	/	33.01	Pass
Highest	11.86	11.08	/	33.01	Pass
Channel Bandwidth: 5MHz					
Lowest	11.28	9.80	/	33.01	Pass
Middle	11.01	10.25	/	33.01	Pass
Highest	11.56	11.13	/	33.01	Pass
Channel Bandwidth: 10MHz					
Lowest	11.60	11.18	/	33.01	Pass
Middle	11.24	11.16	/	33.01	Pass
Highest	11.89	11.23	/	33.01	Pass
Channel Bandwidth: 15MHz					
Lowest	11.21	11.03	/	33.01	Pass
Middle	10.99	10.98	/	33.01	Pass
Highest	11.49	11.43	/	33.01	Pass
Channel Bandwidth: 20MHz					
Lowest	12.05	11.23	/	33.01	Pass
Middle	11.12	11.00	/	33.01	Pass
Highest	11.48	10.29	/	33.01	Pass

5.2.7 LTE Band 26

LTE Band 26 Maximum ERP (dBm)					
Channel	QPSK; RB:1	16QAM; RB:1	64QAM; RB:1	Limit (dBm)	Result
Channel Bandwidth: 1.4MHz					
Lowest	17.08	16.26	/	38.45	Pass
Middle	17.02	16.59	/	38.45	Pass
Highest	17.05	16.63	/	38.45	Pass
Channel Bandwidth: 3MHz					
Lowest	17.08	16.36	/	38.45	Pass
Middle	16.85	15.79	/	38.45	Pass
Highest	17.05	16.65	/	38.45	Pass
Channel Bandwidth: 5MHz					
Lowest	16.78	15.69	/	38.45	Pass
Middle	16.99	16.24	/	38.45	Pass
Highest	16.82	15.52	/	38.45	Pass
Channel Bandwidth: 10MHz					
Lowest	17.11	16.89	/	38.45	Pass
Middle	16.95	16.79	/	38.45	Pass
Highest	16.97	16.89	/	38.45	Pass
Channel Bandwidth: 15MHz					
Lowest	17.33	16.35	/	38.45	Pass
Middle	17.10	16.23	/	38.45	Pass
Highest	17.17	17.02	/	38.45	Pass

5.2.8 LTE Band 26 (Part 90S)

LTE Band 26 Maximum ERP (dBm)					
Channel	QPSK; RB:1	16QAM; RB:1	64QAM; RB:1	Limit (dBm)	Result
Channel Bandwidth: 1.4MHz					
Lowest	17.15	16.50	/	50	Pass
Middle	17.05	16.95	/	50	Pass
Highest	17.11	16.89	/	50	Pass
Channel Bandwidth: 3MHz					
Lowest	17.16	16.63	/	50	Pass
Middle	17.14	16.17	/	50	Pass
Highest	17.21	16.99	/	50	Pass
Channel Bandwidth: 5MHz					
Lowest	17.05	15.79	/	50	Pass
Middle	17.07	16.30	/	50	Pass
Highest	16.98	15.59	/	50	Pass
Channel Bandwidth: 10MHz					
Middle	17.11	16.95	/	50	Pass
Channel Bandwidth: 15MHz					
Lowest	17.11	16.07	/	50	Pass

5.3 CONDUCTED OUTPUT POWER

FCC 47 CFR Part 2.1046(a)

LTE Band 2 & LTE Band 25: FCC 47 CFR Part 24.232(c)

LTE Band 4: FCC 47 CFR Part 27.50(d)(4)

Test Requirement: **LTE Band 5 & LTE Band 26:** FCC 47 CFR Part 22.913(a)

LTE Band 12: FCC 47 CFR Part 27.50(c)(10)

LTE Band 13: FCC 47 CFR Part 27.50(b)(10)

LTE Band 26: FCC 47 CFR Part 90.635

Test Method: KDB 971168 D01v03r01 & ANSI C63.26-2015

Limit:

FCC 47 CFR Part 22.913(a):

The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

FCC 47 CFR Part 24.232(c):

Mobile and portable stations are limited to 2 watts EIRP.

FCC 47 CFR Part 27.50(d)(4):

Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.

FCC 47 CFR Part 27.50(c)(10):

Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

FCC 47 CFR Part 27.50(b)(10):

Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP.

FCC 47 CFR Part 90.635:

(a) The effective radiated power and antenna height for base stations may not exceed 1 kilowatt (30 dBw) and 304 m. (1,000 ft.) above average terrain (AAT), respectively, or the equivalent thereof as determined from the Table. These are maximum values, and applicants will be required to justify power levels and antenna heights requested.

(b) The maximum output power of the transmitter for mobile stations is 100 watts (20 dBw).

Table—Equivalent Power and Antenna Heights for Base Stations in the 851–869 MHz and 935–940 MHz Bands Which Have a Requirement for a 32 km (20 mi) Service Area Radius

Antenna height (ATT) meters (feet)	Effective radiated power (watts) ^{1 2 4}
Above 1,372 (4,500)	65
Above 1,220 (4,000) to 1,372 (4,500)	70
Above 1,067 (3,500) to 1,220 (4,000)	75
Above 915 (3,000) to 1,067 (3,500)	100
Above 763 (2,500) to 915 (3,000)	140
Above 610 (2,000) to 763 (2,500)	200
Above 458 (1,500) to 610 (2,000)	350
Above 305 (1,000) to 458 (1,500)	600
Up to 305 (1,000)	31,000

- Power is given in terms of effective radiated power (ERP).
- Applicants in the Los Angeles, CA, area who demonstrate a need to serve both the downtown and fringe areas will be permitted to utilize an ERP of 1 kw at the following mountaintop sites: Santiago Park, Sierra Peak, Mount Lukens, and Mount Wilson.
- Stations with antennas below 305 m (1,000 ft) (AAT) will be restricted to a maximum power of 1 kw

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(ERP).

4. Licensees in San Diego, CA, will be permitted to utilize an ERP of 500 watts at the following mountaintop sites: Palomar, Otay, Woodson and Miguel.

Test Procedure:

The EUT was set up for the maximum power with LTE link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

Test Setup: Refer to section 4.2.2 for details.

Instruments Used: Refer to section 3 for details

Test Mode: Link mode

Test Results: Pass

Test Data: [The full result refer to section 4.5 for details.](#)

5.4 PEAK-TO-AVERAGE RATIO

Test Requirement: LTE Band 2 & LTE Band 25: FCC 47 CFR Part 24.232(d)
 LTE Band 4: FCC 47 CFR Part 27.50(d)(5)
 LTE Band 5 & LTE Band 26: FCC 47 CFR Part 22.913(a)
 LTE Band 12: FCC 47 CFR Part 27.50(d)(5)
 LTE Band 13: FCC 47 CFR Part 27.50(d)(5)

Test Method: KDB 971168 D01v03r01 Section 5.7

Limit: In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB

Test Procedure:
 The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer.

- Set resolution/measurement bandwidth $\geq$ signal's occupied bandwidth
- Set the number of counts to a value that stabilizes the measured CCDF curve
- Record the maximum PAPR level associated with a probability of 0.1 %

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

Test Setup: Refer to section 4.2.2 for details.

Instruments Used: Refer to section 3 for details

Test Mode: Link mode

Test Results: Pass

Test Data: See table below

5.4.1 LTE Band 2

Band	Bandwidth (MHz)	Channel	Freq (MHz)	Modulation	RB	Result (dB)	Limit (dB)	Verdict
2	20.0	18700	1860.0	QPSK	100@0	5.63	13	PASS
2	20.0	18700	1860.0	16QAM	100@0	6.30	13	PASS
2	20.0	18900	1880.0	QPSK	100@0	5.53	13	PASS
2	20.0	18900	1880.0	16QAM	100@0	6.23	13	PASS
2	20.0	19100	1900.0	QPSK	100@0	5.54	13	PASS
2	20.0	19100	1900.0	16QAM	100@0	6.22	13	PASS
2	15.0	18675	1857.5	QPSK	75@0	5.39	13	PASS
2	15.0	18675	1857.5	16QAM	75@0	6.12	13	PASS
2	15.0	18900	1880.0	QPSK	75@0	5.31	13	PASS
2	15.0	18900	1880.0	16QAM	75@0	6.10	13	PASS
2	15.0	19125	1902.5	QPSK	75@0	5.31	13	PASS
2	15.0	19125	1902.5	16QAM	75@0	6.09	13	PASS
2	10.0	18650	1855.0	QPSK	50@0	5.55	13	PASS
2	10.0	18650	1855.0	16QAM	50@0	6.25	13	PASS
2	10.0	18900	1880.0	QPSK	50@0	5.46	13	PASS
2	10.0	18900	1880.0	16QAM	50@0	6.19	13	PASS
2	10.0	19150	1905.0	QPSK	50@0	5.49	13	PASS
2	10.0	19150	1905.0	16QAM	50@0	6.23	13	PASS
2	5.0	18625	1852.5	QPSK	25@0	5.47	13	PASS
2	5.0	18625	1852.5	16QAM	25@0	6.11	13	PASS
2	5.0	18900	1880.0	QPSK	25@0	5.45	13	PASS
2	5.0	18900	1880.0	16QAM	25@0	6.14	13	PASS
2	5.0	19175	1907.5	QPSK	25@0	5.36	13	PASS
2	5.0	19175	1907.5	16QAM	25@0	6.04	13	PASS
2	3.0	18615	1851.5	QPSK	15@0	5.45	13	PASS
2	3.0	18615	1851.5	16QAM	15@0	6.18	13	PASS
2	3.0	18900	1880.0	QPSK	15@0	5.33	13	PASS
2	3.0	18900	1880.0	16QAM	15@0	6.14	13	PASS
2	3.0	19185	1908.5	QPSK	15@0	5.38	13	PASS
2	3.0	19185	1908.5	16QAM	15@0	6.07	13	PASS
2	1.4	18607	1850.7	QPSK	6@0	5.37	13	PASS
2	1.4	18607	1850.7	16QAM	6@0	6.01	13	PASS
2	1.4	18900	1880.0	QPSK	6@0	5.34	13	PASS
2	1.4	18900	1880.0	16QAM	6@0	6.10	13	PASS
2	1.4	19193	1909.3	QPSK	6@0	5.23	13	PASS
2	1.4	19193	1909.3	16QAM	6@0	5.91	13	PASS

Test Graphs

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B2_20M QPSK 100@0 CH 18700



B2_20M 16QAM 100@0 CH 18700



B2_20M QPSK 100@0 CH 18900



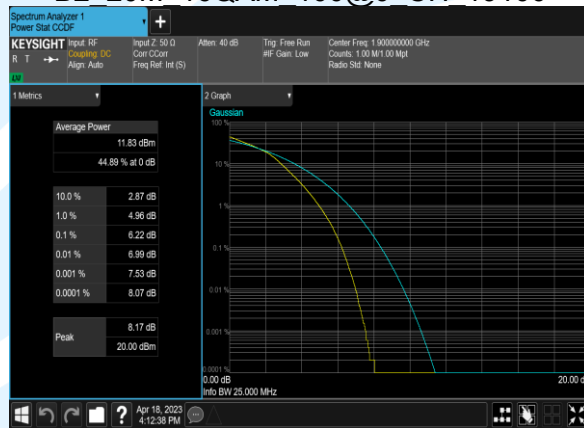
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B2_15M QPSK 75@0 CH 18675



B2_15M 16QAM 75@0 CH 18675



B2 15M QPSK 75@0 CH 18900



B2 15M 16QAM 75@0 CH 18900



B2 15M QPSK 75@0 CH 19125



B2 15M 16QAM 75@0 CH 19125



B2 10M QPSK 50@0 CH 18650



B2 10M 16QAM 50@0 CH 18650



B2 10M QPSK 50@0 CH 18900



B2 10M 16QAM 50@0 CH 18900



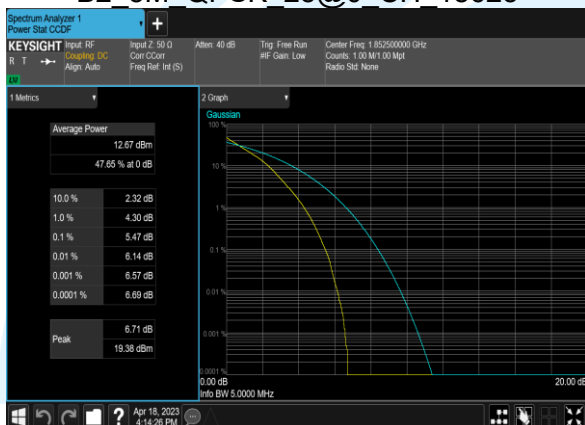
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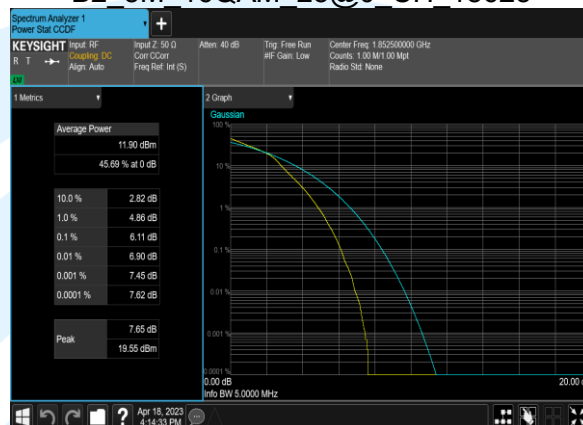
B2 10M 16QAM 50@0 CH 19150



B2 5M QPSK 25@0 CH 18625



B2 5M 16QAM 25@0 CH 18625



B2 5M QPSK 25@0 CH 18900



B2 5M 16QAM 25@0 CH 18900



B2 5M QPSK 25@0 CH 19175



B2 5M 16QAM 25@0 CH 19175

