



FCC RADIO TEST REPORT

FCC ID : LHJ-LNAD
Equipment : LHJ-LNAD
Brand Name : Continental
Model Name : LNAD, LNADV
Applicant : Continental Automotive Systems, Inc.
21440 W Lake Cook Rd., Deer Park, IL
60010, USA
Manufacturer : Continental Automotive Systems, Inc.
21440 W Lake Cook Rd., Deer Park, IL
60010, USA
Standard : FCC 47 CFR Part 2, 22(H), 24(E), 27

The product was received on Feb. 01, 2024 and testing was performed from Feb. 19, 2024 to Feb. 21, 2024. We, Sporton International Inc. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA-603-E and has been in compliance with the applicable technical standards.

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

Louis Wu

Approved by: Louis Wu

Sporton International Inc. EMC & Wireless Communications Laboratory

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)



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History of this test report

Report No.	Version	Description	Issue Date
FG420209B	01	Initial issue of report	Mar. 01, 2024



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.2	§2.1046	Conducted Output Power	Reporting only	-
	§22.913 (a)(5)	Effective Radiated Power (Band 5)	Pass	
	§27.50 (c)(10)	Effective Radiated Power (Band 17)		
	§24.232 (c)	Equivalent Isotropic Radiated Power (Band 2)		
	§27.50 (d)(4)	Equivalent Isotropic Radiated Power (Band 4)		
4.2	§2.1053 §22.917 (a) §24.238 (a) §27.53 (g) §27.53 (h)	Radiated Spurious Emission (Band 2) (Band 4) (Band 5) (Band 17)	Pass	26.79 dB under the limit at 5251.00 MHz

Note:

1. This partial report differs from FCC ID: LHJ-LNAD report as it tests for the replacement of the end-of-life (EOL) RF front-end switch with a pin-to-pin compatible replacement part, which is declared by the customer.
2. The test configurations are specified by the manufacturer.

Conformity Assessment Condition:

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

Disclaimer:

1. The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.
2. The purpose of different model name is that LNAD does not support voice function and LNADV support.

Reviewed by: Yun Huang**Report Producer: Lucy Wu**



1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature	
Equipment	LHJ-LNAD
Brand Name	Continental
Model Name	LNAD, LNADV
FCC ID	LHJ-LNAD
Installed into the Host	Equipment name: LNAD Brand name: Continental Model name: LNAD
EUT supports Radios application	WCDMA/HSPA/LTE/GNSS
EUT Stage	Identical Prototype

Support Band and Evaluated Information	
Supported Band	B2, B4, B5, B17
Evaluated and Tested Band	B2, B4, B5, B17

TDD Band Power Class		
	PC3	PC2
B2	V	-
B4	V	-
B5	V	-
B17	V	-

1.2 Product Specification of Equipment Under Test

Product Specification is subject to this standard	
Tx Frequency	LTE Band 2: 1850.7 MHz ~ 1909.3 MHz LTE Band 4: 1710.7 MHz ~ 1754.3 MHz LTE Band 5: 824.7 MHz ~ 848.3 MHz LTE Band 17: 706.5 MHz ~ 713.5 MHz
Rx Frequency	LTE Band 2: 1930.7 MHz ~ 1989.3 MHz LTE Band 4: 2110.7 MHz ~ 2154.3 MHz LTE Band 5: 869.7 MHz ~ 893.3 MHz LTE Band 17: 736.5 MHz ~ 743.5 MHz
Bandwidth	LTE Band 2: 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz LTE Band 4: 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz LTE Band 5: 1.4MHz / 3MHz / 5MHz / 10MHz LTE Band 17: 5MHz / 10MHz
Maximum Output Power to Antenna	LTE Band 2 : 22.39 dBm LTE Band 4 : 22.01 dBm LTE Band 5 : 22.22 dBm LTE Band 17 : 23.16 dBm
Antenna Type	Dipole Antenna
Antenna Gain	LTE Band 2 : 1.52 dBi LTE Band 4 : 0.68 dBi LTE Band 5 : 0.82 dBi LTE Band 17 : 0.62 dBi
Type of Modulation	QPSK / 16QAM

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

1.3 Modification of EUT

No modifications made to the EUT during the testing.



1.4 Testing Location

Test Site	Sporton International Inc. EMC & Wireless Communications Laboratory
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978
Test Site No.	Sporton Site No. TH03-HY
Test Engineer	Cotty Hsu
Temperature (°C)	22.1~22.8
Relative Humidity (%)	53.2~55.3

Test Site	Sporton International Inc. Wensan Laboratory
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	Sporton Site No. 03CH15-HY (TAF Code: 3786)
Test Engineer	Danel Lee, Quentin Liu and Bigshow Wang
Temperature (°C)	21.4~22.8
Relative Humidity (%)	48~59
Remark	The Radiated Spurious Emission test item subcontracted to Sporton International Inc. Wensan Laboratory.

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

FCC Designation No.: TW1190 and TW3786

1.5 Applicable Standards

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

- ♦ ANSI C63.26-2015
- ♦ ANSI / TIA-603-E
- ♦ FCC 47 CFR Part 2, 22(H), 24(E), 27
- ♦ FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- ♦ FCC KDB 412172 D01 Determining ERP and EIRP v01r01
- ♦ FCC KDB 414788 D01 Radiated Test Site v01r01.

Remark:

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

2 Test Configuration of Equipment Under Test

2.1 Test Mode

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

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

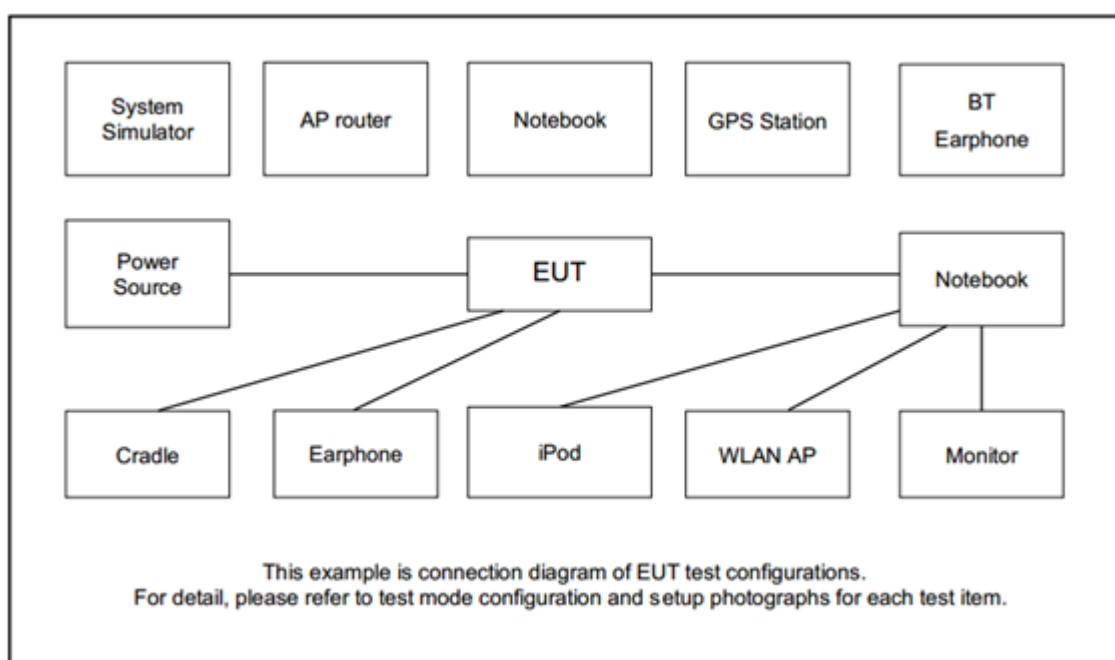
Modulation Type	Modulation
A	QPSK
B	16QAM

Test Item	Modulation Type	Bandwidth	RB Size	Channel
Conducted Power	A, B	All	1, Half, Full	L, M, H
EIRP	A, B	All	1, Half, Full	L, M, H
RSE	A	10 MHz or less	1RB	L, M, H

Remark:

1. Evaluated all the transmitter signal and reporting worst-case configuration among all modulation types.
2. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst-case emissions are reported.
3. All the tests were performed with LNADV.

2.2 Connection Diagram of Test System





2.3 Support Unit used in test configuration and system

Item	Equipment	Brand Name	Model No.	FCC ID	Data Cable	Power Cord
1.	WWAN Antenna	LARSEN	SPDA24700/2700	N/A	N/A	N/A
2.	System Simulator	Anritsu	MT8821C	N/A	N/A	N/A

2.4 Frequency List of Low/Middle/High Channels

LTE Band 2 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	18700	18900	19100
	Frequency	1860	1880	1900
15	Channel	18675	18900	19125
	Frequency	1857.5	1880	1902.5
10	Channel	18650	18900	19150
	Frequency	1855	1880	1905
5	Channel	18625	18900	19175
	Frequency	1852.5	1880	1907.5
3	Channel	18615	18900	19185
	Frequency	1851.5	1880	1908.5
1.4	Channel	18607	18900	19193
	Frequency	1850.7	1880	1909.3

LTE Band 4 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	20050	20175	20300
	Frequency	1720	1732.5	1745
15	Channel	20025	20175	20325
	Frequency	1717.5	1732.5	1747.5
10	Channel	20000	20175	20350
	Frequency	1715	1732.5	1750
5	Channel	19975	20175	20375
	Frequency	1712.5	1732.5	1752.5
3	Channel	19965	20175	20385
	Frequency	1711.5	1732.5	1753.5
1.4	Channel	19957	20175	20393
	Frequency	1710.7	1732.5	1754.3



LTE Band 5 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
10	Channel	20450	20525	20600
	Frequency	829	836.5	844
5	Channel	20425	20525	20625
	Frequency	826.5	836.5	846.5
3	Channel	20415	20525	20635
	Frequency	825.5	836.5	847.5
1.4	Channel	20407	20525	20643
	Frequency	824.7	836.5	848.3

LTE Band 17 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
10	Channel	23780	23790	23800
	Frequency	709	710	711
5	Channel	23755	23790	23825
	Frequency	706.5	710	713.5

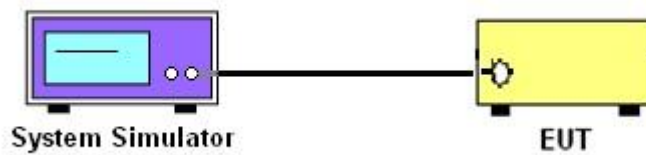
3 Conducted Test Items

3.1 Measuring Instruments

See list of measuring instruments of this test report.

3.1.1 Test Setup

3.1.2 Conducted Output Power



3.1.3 Test Result of Conducted Test

Please refer to Appendix A.



3.2 Conducted Output Power and ERP/EIRP

3.2.1 Description of the Conducted Output Power Measurement and ERP/EIRP Measurement

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

The ERP of mobile transmitters must not exceed 7 Watts for LTE Band 5

The ERP of mobile transmitters must not exceed 3 Watts for LTE Band 17

The EIRP of mobile transmitters must not exceed 2 Watts for LTE Band 2

The EIRP of mobile transmitters must not exceed 1 Watts for LTE Band 4

According to KDB 412172 D01 Power Approach,

$EIRP = P_T + G_T - L_C$, $ERP = EIRP - 2.15$, where

P_T = transmitter output power in dBm

G_T = gain of the transmitting antenna in dBi

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

3.2.2 Test Procedures

1. The transmitter output port was connected to the system simulator.
2. Set EUT at maximum power through the system simulator.
3. Select lowest, middle, and highest channels for each band and different modulation.
4. Measure and record the power level from the system simulator.

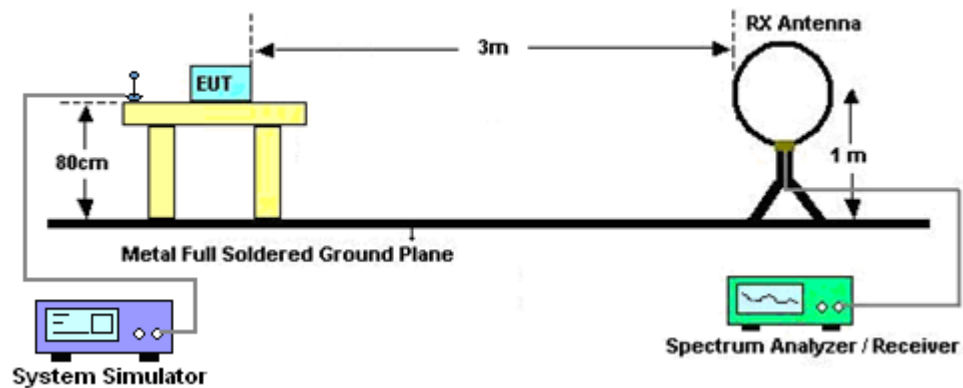
4 Radiated Test Items

4.1 Measuring Instruments

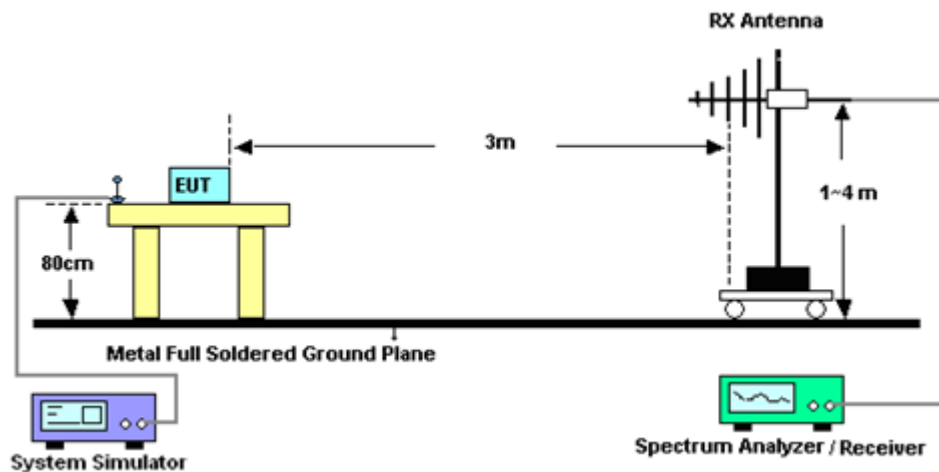
See list of measuring instruments of this test report.

4.1.1 Test Setup

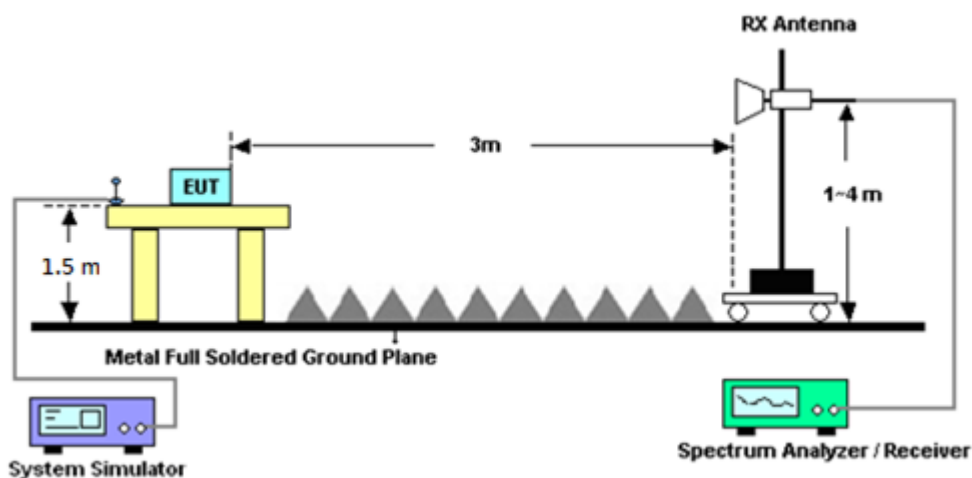
For radiated test below 30MHz



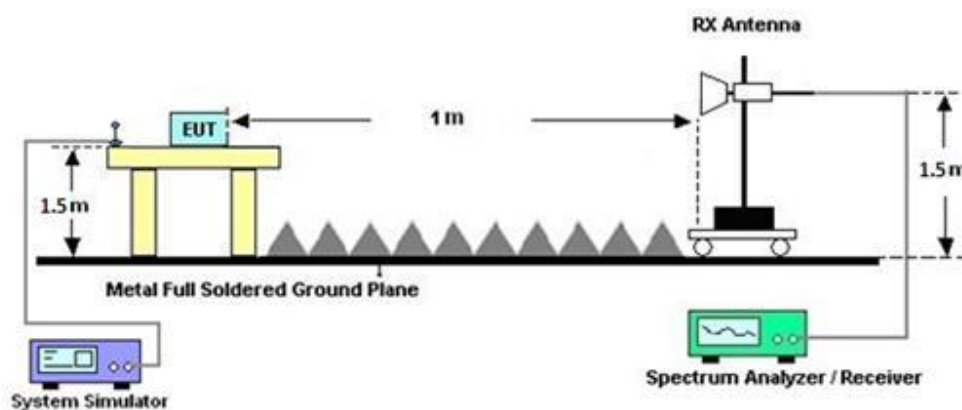
For radiated test from 30MHz to 1GHz



For radiated test from 1GHz to 18GHz



For radiated test above 18GHz



4.1.2 Test Result of Radiated Test

Please refer to Appendix B.

Note:

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

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



4.2 Radiated Spurious Emission Measurement

4.2.1 Description of Radiated Spurious Emission Measurement

The radiated spurious emission was measured by substitution method according to ANSI / TIA-603-E.

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB.

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

4.2.2 Test Procedures

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

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

The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)



5 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Sep. 12, 2023	Feb. 19, 2024~ Feb. 20, 2024	Sep. 11, 2024	Radiation (03CH15-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00802N1D01N-06	47020 & 06	30MHz~1GHz	Oct. 07, 2023	Feb. 19, 2024~ Feb. 20, 2024	Oct. 06, 2024	Radiation (03CH15-HY)
Horn Antenna	SCHWARZB ECK	BBHA 9120 D	9120D-02294	1GHz~18GHz	Jun. 30, 2023	Feb. 19, 2024~ Feb. 20, 2024	Jun. 29, 2024	Radiation (03CH15-HY)
SHF-EHF Horn Antenna	SCHWARZB ECK	BBHA 9170	00993	18GHz~40GHz	Nov. 24, 2023	Feb. 19, 2024~ Feb. 20, 2024	Nov. 23, 2024	Radiation (03CH15-HY)
Amplifier	SONOMA	310N	363440	9kHz~1GHz	Dec. 25, 2023	Feb. 19, 2024~ Feb. 20, 2024	Dec. 24, 2024	Radiation (03CH15-HY)
Preamplifier	EMEC	EM1G18G	060812	1GHz~18GHz	Dec. 25, 2023	Feb. 19, 2024~ Feb. 20, 2024	Dec. 24, 2024	Radiation (03CH15-HY)
Preamplifier	EM Electronics	EM01G18G	060802	1GHz~18GHz	Mar. 03, 2023	Feb. 19, 2024~ Feb. 20, 2024	Mar. 02, 2024	Radiation (03CH15-HY)
Preamplifier	EMEC	EM18G40G	060801	18GHz~40GHz	Jun. 27, 2023	Feb. 19, 2024~ Feb. 20, 2024	Jun. 26, 2024	Radiation (03CH15-HY)
Spectrum Analyzer	Keysight	N9010B	MY60241058	10Hz~44GHz	Jul. 06, 2023	Feb. 19, 2024~ Feb. 20, 2024	Jul. 05, 2024	Radiation (03CH15-HY)
Antenna Mast	ChainTek	MBS-520-1	N/A	1m~4m	N/A	Feb. 19, 2024~ Feb. 20, 2024	N/A	Radiation (03CH15-HY)
Turn Table	ChainTek	T-200-S-1	N/A	0~360 Degree	N/A	Feb. 19, 2024~ Feb. 20, 2024	N/A	Radiation (03CH15-HY)
Software	Audix	E3 6.2009-8-24(k5)	RK-000451	N/A	N/A	Feb. 19, 2024~ Feb. 20, 2024	N/A	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104, 102E	MY582185/4, 519228/2,803 950/2	30MHz~18G	Jun. 13, 2023	Feb. 19, 2024~ Feb. 20, 2024	Jun. 12, 2024	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	804011/2,804 012/2	18-40G	Jan. 02, 2024	Feb. 19, 2024~ Feb. 20, 2024	Jan. 01, 2025	Radiation (03CH15-HY)
Filter	Wainwright	WHKX12-1080-12 00-15000-60ST	SN5	1.2GHz High Pass Filter	Jun. 14, 2023	Feb. 19, 2024~ Feb. 20, 2024	Jun. 13, 2024	Radiation (03CH15-HY)
Filter	Wainwright	WHKX12-2700-30 00-18000-60ST	SN4	3GHz High Pass Filter	Jun. 14, 2023	Feb. 19, 2024~ Feb. 20, 2024	Jun. 13, 2024	Radiation (03CH15-HY)
Radio Communication Analyzer	Anritsu	MT8821C	6262025353	LTE FDD/TDD LTE-2CC DLCA/ULCA	Oct. 03, 2023	Feb. 21, 2024	Oct. 02, 2024	Conducted (TH03-HY)
Thermal Chamber	ESPEC	SH-641	92013720	-40℃ ~90℃	Sep. 04, 2023	Feb. 21, 2024	Sep. 03, 2024	Conducted (TH03-HY)
DC Power Supply	GW Instek	GPP-2323	GES906037	0V~64V ; 0A~6A	Nov. 28, 2023	Feb. 21, 2024	Nov. 27, 2024	Conducted (TH03-HY)
Coupler	Warison	20dB 25W SMA Directional Coupler	#B	1-18GHz	Jan. 08, 2024	Feb. 21, 2024	Jan. 07, 2025	Conducted (TH03-HY)
Spectrum Analyzer	Rohde & Schwarz	FSV40	101905	10Hz~40GHz	Jul. 14, 2023	Feb. 21, 2024	Jul. 13, 2024	Conducted (TH03-HY)



6 Measurement Uncertainty

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.02 dB
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.57 dB
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Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.97 dB
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Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power & ERP/EIRP)

LTE Band 2 Maximum Average Power [dBm] (GT - LC = 1.52 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP (W)
20	1	0	QPSK	22.06	21.84	21.96	23.91	0.2460
20	1	49		22.13	21.82	22.14		
20	1	99		21.99	22.03	22.39		
20	50	0		20.78	20.70	20.96		
20	50	24		20.74	20.55	20.99		
20	50	50		20.80	20.59	21.11		
20	100	0		20.84	20.75	21.07		
20	1	0	16-QAM	21.27	21.30	21.14	22.83	0.1919
20	1	49		20.91	20.85	21.31		
20	1	99		20.61	20.60	21.25		
20	50	0		19.93	19.64	19.92		
20	50	24		19.85	19.81	19.95		
20	50	50		19.87	19.63	20.12		
20	100	0		19.82	19.70	20.06		
Limit	EIRP < 2W			Result			Pass	

LTE Band 2 Maximum Average Power [dBm] (GT - LC = 1.52 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP (W)
15	1	0	QPSK	22.01	21.74	21.88	23.90	0.2455
15	1	37		22.09	21.75	22.09		
15	1	74		21.96	21.95	22.38		
15	36	0		20.75	20.70	20.89		
15	36	20		20.72	20.54	20.94		
15	36	39		20.79	20.56	21.01		
15	75	0		20.75	20.72	21.02		
15	1	0	16-QAM	21.26	21.24	21.09	22.78	0.1897
15	1	37		20.90	20.81	21.25		
15	1	74		20.51	20.54	21.15		
15	36	0		19.91	19.55	19.83		
15	36	20		19.79	19.81	19.85		
15	36	39		19.78	19.60	20.02		
15	75	0		19.79	19.66	20.05		
Limit	EIRP < 2W			Result			Pass	



LTE Band 2 Maximum Average Power [dBm] (GT - LC = 1.52 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP (W)
10	1	0	QPSK	21.98	21.79	21.93	23.86	0.2432
10	1	25		22.08	21.74	22.12		
10	1	49		21.94	21.94	22.34		
10	25	0		20.73	20.62	20.92		
10	25	12		20.66	20.52	20.91		
10	25	25		20.80	20.53	21.11		
10	50	0		20.77	20.69	21.03		
10	1	0	16-QAM	21.23	21.20	21.05	22.78	0.1897
10	1	25		20.91	20.78	21.26		
10	1	49		20.60	20.56	21.20		
10	25	0		19.89	19.60	19.85		
10	25	12		19.78	19.76	19.86		
10	25	25		19.79	19.59	20.11		
10	50	0		19.82	19.66	19.98		
Limit	EIRP < 2W			Result			Pass	

LTE Band 2 Maximum Average Power [dBm] (GT - LC = 1.52 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP (W)
5	1	0	QPSK	22.06	21.84	21.90	23.82	0.2410
5	1	12		22.05	21.72	22.14		
5	1	24		21.91	21.93	22.30		
5	12	0		20.73	20.60	20.92		
5	12	7		20.73	20.52	20.98		
5	12	13		20.76	20.54	21.06		
5	25	0		20.79	20.71	21.01		
5	1	0	16-QAM	21.24	21.22	21.07	22.78	0.1897
5	1	12		20.87	20.75	21.26		
5	1	24		20.59	20.55	21.16		
5	12	0		19.91	19.60	19.84		
5	12	7		19.83	19.75	19.88		
5	12	13		19.81	19.56	20.05		
5	25	0		19.80	19.67	20.00		
Limit	EIRP < 2W			Result			Pass	



LTE Band 2 Maximum Average Power [dBm] (GT - LC = 1.52 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP (W)
3	1	0	QPSK	21.96	21.82	21.88	23.89	0.2449
3	1	8		22.08	21.79	22.10		
3	1	14		21.94	22.01	22.37		
3	8	0		20.68	20.67	20.89		
3	8	4		20.69	20.45	20.95		
3	8	7		20.75	20.50	21.06		
3	15	0		20.81	20.75	21.06		
3	1	0	16-QAM	21.19	21.21	21.04	22.83	0.1919
3	1	8		20.81	20.78	21.31		
3	1	14		20.56	20.54	21.22		
3	8	0		19.87	19.63	19.83		
3	8	4		19.85	19.76	19.94		
3	8	7		19.83	19.54	20.11		
3	15	0		19.78	19.64	20.03		
Limit	EIRP < 2W			Result			Pass	

LTE Band 2 Maximum Average Power [dBm] (GT - LC = 1.52 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP (W)
1.4	1	0	QPSK	22.03	21.77	21.95	23.81	0.2404
1.4	1	3		22.12	21.76	22.05		
1.4	1	5		21.92	22.01	22.29		
1.4	3	0		20.76	20.63	20.92		
1.4	3	1		20.68	20.46	20.95		
1.4	3	3		20.80	20.53	21.05		
1.4	6	0		20.76	20.67	21.07		
1.4	1	0	16-QAM	21.24	21.24	21.10	22.76	0.1888
1.4	1	3		20.84	20.81	21.22		
1.4	1	5		20.52	20.51	21.22		
1.4	3	0		19.85	19.62	19.83		
1.4	3	1		19.81	19.80	19.92		
1.4	3	3		19.79	19.63	20.03		
1.4	6	0		19.72	19.66	20.03		
Limit	EIRP < 2W			Result			Pass	



LTE Band 4 Maximum Average Power [dBm] (GT - LC = 0.68 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP (W)
20	1	0	QPSK	21.18	21.32	21.72	22.60	0.1820
20	1	49		21.47	21.60	21.81		
20	1	99		21.42	21.74	21.92		
20	50	0		20.21	20.29	20.50		
20	50	24		20.16	20.32	20.59		
20	50	50		20.22	20.45	20.64		
20	100	0		20.13	20.40	20.60		
20	1	0	16-QAM	20.00	20.44	20.91	21.59	0.1442
20	1	49		20.67	20.35	20.67		
20	1	99		20.14	20.85	20.70		
20	50	0		19.13	19.35	19.60		
20	50	24		19.20	19.31	19.49		
20	50	50		19.22	19.42	19.63		
20	100	0		19.18	19.49	19.59		
Limit	EIRP < 1W			Result			Pass	

LTE Band 4 Maximum Average Power [dBm] (GT - LC = 0.68 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP (W)
15	1	0	QPSK	21.19	21.45	21.74	22.52	0.1786
15	1	37		21.40	21.63	21.84		
15	1	74		21.41	21.65	21.83		
15	36	0		20.25	20.29	20.63		
15	36	20		20.11	20.43	20.63		
15	36	39		20.26	20.42	20.74		
15	75	0		20.14	20.39	20.65		
15	1	0	16-QAM	20.34	20.01	20.62	21.54	0.1426
15	1	37		20.35	20.45	20.78		
15	1	74		20.45	20.54	20.86		
15	36	0		19.28	19.33	19.68		
15	36	20		19.17	19.52	19.67		
15	36	39		19.21	19.56	19.61		
15	75	0		19.21	19.45	19.62		
Limit	EIRP < 1W			Result			Pass	



LTE Band 4 Maximum Average Power [dBm] (GT - LC = 0.68 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP (W)
10	1	0	QPSK	21.18	21.52	21.92	22.60	0.1820
10	1	25		21.33	21.63	21.88		
10	1	49		21.29	21.58	21.76		
10	25	0		20.18	20.42	20.78		
10	25	12		20.15	20.46	20.74		
10	25	25		20.25	20.45	20.79		
10	50	0		20.26	20.28	20.70		
10	1	0	16-QAM	20.02	20.87	20.78	21.76	0.1500
10	1	25		20.53	20.79	20.83		
10	1	49		20.41	20.93	21.08		
10	25	0		19.13	19.33	19.74		
10	25	12		19.21	19.42	19.73		
10	25	25		19.20	19.49	19.81		
10	50	0		19.14	19.31	19.69		
Limit	EIRP < 1W			Result			Pass	

LTE Band 4 Maximum Average Power [dBm] (GT - LC = 0.68 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP (W)
5	1	0	QPSK	21.04	21.41	21.92	22.65	0.1841
5	1	12		21.22	21.55	21.97		
5	1	24		21.32	21.60	21.95		
5	12	0		20.29	20.54	20.86		
5	12	7		20.25	20.56	20.84		
5	12	13		20.23	20.56	20.91		
5	25	0		20.14	20.41	20.73		
5	1	0	16-QAM	20.14	20.47	20.98	21.66	0.1466
5	1	12		20.20	20.46	20.93		
5	1	24		20.34	20.68	20.86		
5	12	0		19.28	19.49	19.92		
5	12	7		19.23	19.67	19.96		
5	12	13		19.22	19.71	19.80		
5	25	0		19.10	19.55	19.86		
Limit	EIRP < 1W			Result			Pass	



LTE Band 4 Maximum Average Power [dBm] (GT - LC = 0.68 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP (W)
3	1	0	QPSK	21.15	21.51	21.84	22.69	0.1858
3	1	8		21.37	21.65	21.69		
3	1	14		21.26	21.62	22.01		
3	8	0		20.17	20.59	20.93		
3	8	4		20.33	20.56	20.92		
3	8	7		20.34	20.56	20.79		
3	15	0		20.27	20.48	20.88		
3	1	0	16-QAM	20.13	20.38	21.12	21.80	0.1514
3	1	8		20.22	20.86	21.06		
3	1	14		20.21	20.29	20.66		
3	8	0		19.12	19.54	19.84		
3	8	4		19.18	19.56	19.95		
3	8	7		19.19	19.58	19.85		
3	15	0		19.27	19.49	19.91		
Limit	EIRP < 1W			Result			Pass	

LTE Band 4 Maximum Average Power [dBm] (GT - LC = 0.68 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP (W)
1.4	1	0	QPSK	21.22	21.57	21.82	22.51	0.1782
1.4	1	3		21.25	21.59	21.76		
1.4	1	5		21.26	21.63	21.79		
1.4	3	0		21.20	21.63	21.83		
1.4	3	1		21.21	21.60	21.81		
1.4	3	3		21.17	21.57	21.81		
1.4	6	0		20.18	20.56	20.86		
1.4	1	0	16-QAM	20.42	20.50	20.51	21.74	0.1493
1.4	1	3		20.05	20.81	20.75		
1.4	1	5		20.45	20.83	21.06		
1.4	3	0		20.34	20.57	20.91		
1.4	3	1		20.02	20.75	20.77		
1.4	3	3		20.21	20.71	20.96		
1.4	6	0		19.30	19.65	19.95		
Limit	EIRP < 1W			Result			Pass	



LTE Band 5 Maximum Average Power [dBm] (GT - LC = 0.82 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	ERP (dBm)	ERP (W)
10	1	0	QPSK	22.11	22.22	21.91	20.89	0.1227
10	1	25		22.15	21.76	21.88		
10	1	49		21.88	21.97	21.78		
10	25	0		21.09	21.00	20.87		
10	25	12		21.06	20.90	20.81		
10	25	25		21.01	21.00	20.65		
10	50	0		20.96	20.88	20.68		
10	1	0	16-QAM	20.95	21.11	21.27	19.94	0.0986
10	1	25		21.12	21.14	20.80		
10	1	49		20.70	20.97	21.09		
10	25	0		20.01	19.98	19.79		
10	25	12		19.96	20.03	19.62		
10	25	25		20.01	19.97	19.57		
10	50	0		19.90	19.93	19.70		
Limit	ERP < 7W			Result			Pass	

LTE Band 5 Maximum Average Power [dBm] (GT - LC = 0.82 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	ERP (dBm)	ERP (W)
5	1	0	QPSK	22.03	22.13	21.88	20.80	0.1202
5	1	12		22.12	21.73	21.83		
5	1	24		21.81	21.88	21.78		
5	12	0		21.06	20.97	20.77		
5	12	7		21.02	20.89	20.75		
5	12	13		20.94	20.94	20.65		
5	25	0		20.94	20.83	20.68		
5	1	0	16-QAM	20.93	21.01	21.19	19.86	0.0968
5	1	12		21.04	21.12	20.76		
5	1	24		20.69	20.88	21.05		
5	12	0		19.95	19.88	19.69		
5	12	7		19.91	19.99	19.53		
5	12	13		19.99	19.96	19.53		
5	25	0		19.82	19.93	19.67		
Limit	ERP < 7W			Result			Pass	



LTE Band 5 Maximum Average Power [dBm] (GT - LC = 0.82 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	ERP (dBm)	ERP (W)
3	1	0	QPSK	22.09	22.12	21.90	20.81	0.1205
3	1	8		22.14	21.70	21.85		
3	1	14		21.87	21.91	21.70		
3	8	0		21.05	20.96	20.84		
3	8	4		21.04	20.81	20.71		
3	8	7		20.92	20.94	20.64		
3	15	0		20.96	20.88	20.59		
3	1	0	16-QAM	20.92	21.03	21.17	19.84	0.0964
3	1	8		21.12	21.12	20.78		
3	1	14		20.60	20.91	21.04		
3	8	0		19.96	19.97	19.75		
3	8	4		19.87	20.03	19.52		
3	8	7		19.99	19.97	19.54		
3	15	0		19.90	19.85	19.65		
Limit	ERP < 7W			Result			Pass	

LTE Band 5 Maximum Average Power [dBm] (GT - LC = 0.82 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	ERP (dBm)	ERP (W)
1.4	1	0	QPSK	22.07	22.15	21.83	20.82	0.1208
1.4	1	3		22.06	21.67	21.83		
1.4	1	5		21.85	21.87	21.70		
1.4	3	0		21.03	20.95	20.85		
1.4	3	1		21.01	20.81	20.78		
1.4	3	3		20.92	20.97	20.55		
1.4	6	0		20.91	20.83	20.59		
1.4	1	0	16-QAM	20.95	21.10	21.25	19.92	0.0982
1.4	1	3		21.10	21.11	20.74		
1.4	1	5		20.62	20.95	21.04		
1.4	3	0		19.91	19.94	19.72		
1.4	3	1		19.92	20.00	19.61		
1.4	3	3		19.97	19.87	19.55		
1.4	6	0		19.82	19.87	19.61		
Limit	ERP < 7W			Result			Pass	



LTE Band 17 Maximum Average Power [dBm] (GT - LC = 0.62 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	ERP (dBm)	ERP (W)
10	1	0	QPSK	22.86	22.90	22.84	21.63	0.1455
10	1	25		23.06	22.99	23.16		
10	1	49		23.08	22.96	22.95		
10	25	0		21.91	22.03	22.11		
10	25	12		22.07	22.00	21.94		
10	25	25		21.91	21.92	21.86		
10	50	0		21.88	21.81	21.73		
10	1	0	16-QAM	21.88	21.72	22.44	20.91	0.1233
10	1	25		22.03	21.80	22.32		
10	1	49		22.13	21.87	21.86		
10	25	0		20.81	20.94	21.02		
10	25	12		20.98	20.95	20.95		
10	25	25		20.97	20.97	20.91		
10	50	0		20.90	20.83	20.82		
Limit	ERP < 3W			Result			Pass	

LTE Band 17 Maximum Average Power [dBm] (GT - LC = 0.62 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	ERP (dBm)	ERP (W)
5	1	0	QPSK	22.31	22.34	22.30	21.08	0.1282
5	1	12		22.56	22.48	22.61		
5	1	24		22.57	22.45	22.45		
5	12	0		21.34	21.50	21.57		
5	12	7		21.57	21.41	21.42		
5	12	13		21.36	21.35	21.32		
5	25	0		21.36	21.37	21.31		
5	1	0	16-QAM	21.35	21.30	21.90	20.37	0.1089
5	1	12		21.43	21.30	21.78		
5	1	24		21.59	21.30	21.36		
5	12	0		20.30	20.42	20.51		
5	12	7		20.40	20.39	20.39		
5	12	13		20.42	20.44	20.31		
5	25	0		20.39	20.35	20.34		
Limit	ERP < 3W			Result			Pass	



Appendix B. Test Results of Radiated Test

B1. Summary of each worse mode

Mode	Part	Band	Ch	Freq (MHz)	Level (dBm)	Det	Ant Factor (dB/m)	Ampl Cbl (dB)	Filter (dB)	EIRP CF (dB)	Reading (dBuV)	Limit (dBm)	Margin (dB)	Pol	Ant
1	Part 22H	LTE B5	M	4171	-50.59	RMS	30.84	-29.51	0.37	-95.23	42.94	-13.00	-37.59	V	Main
2	Part 24E	LTE B2	H	5730	-41.70	RMS	33.68	-27.77	0.37	-95.23	47.25	-13.00	-28.70	V	Main
3	Part 27H	LTE B17	L	2113	-55.42	RMS	27.35	-31.54	0.41	-95.23	43.59	-13.00	-42.42	H	Main
4	Part 27L	LTE B4	H	5251	-39.79	RMS	32.90	-28.22	0.50	-95.23	50.26	-13.00	-26.79	V	Main

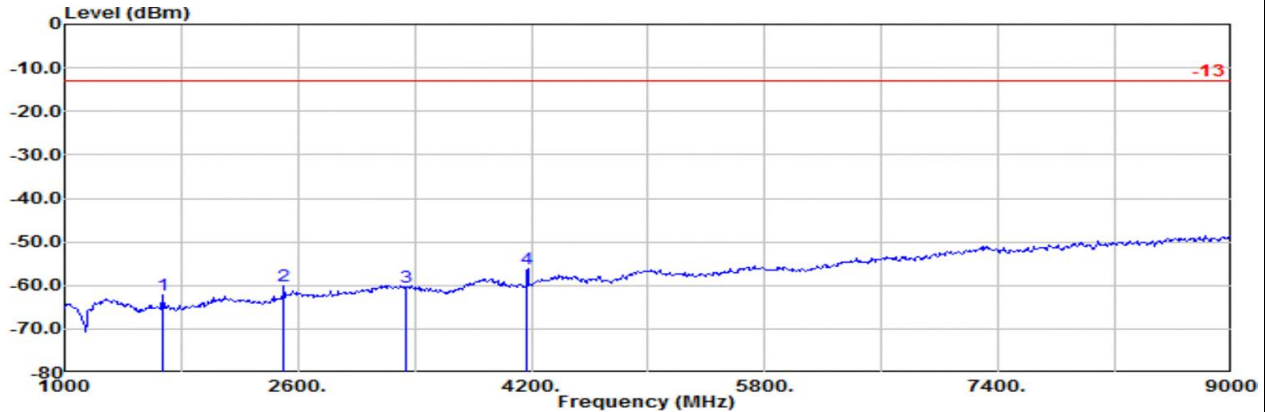


Main

Part 22H Mode 1

LTE B5 5M Ch20525 1RB0 QPSK

M

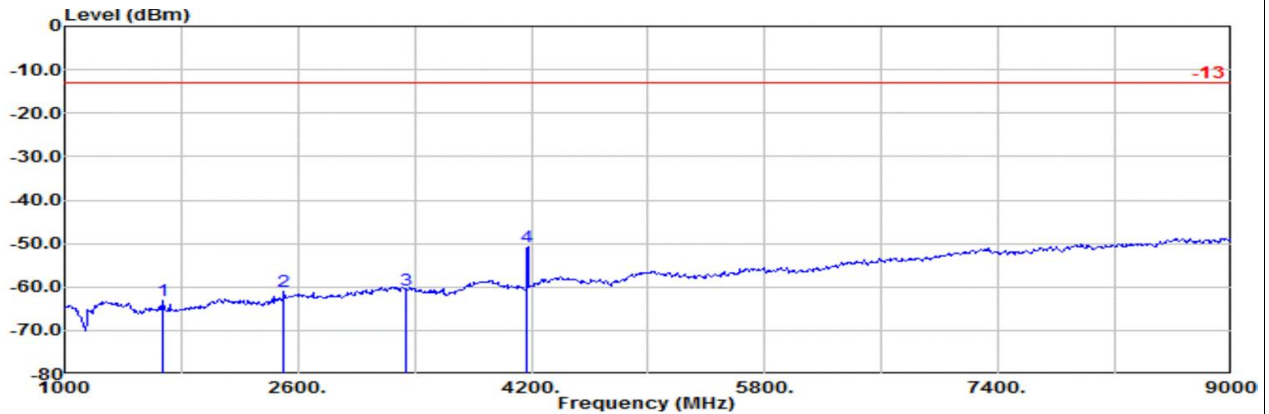


Site : 03CH15-HY

Condition: -13 3m BBHA 9120 D_9120D-02294 Horizontal

: LTE Band 5 5M Ch20525 1RB0 QPSK

	Freq	Level	Detector	Ant Factor	Amp\Cb 1	Filter	EIRPCF	Readin g	Limit	Margin	Pol
	MHz	dBm		dB/m	dB	dB	dB	dBuV	dBm	dB	
1	1668.00	-62.25	RMS	25.33	-32.20	0.62	-95.23	39.23	-13.00	-49.25	Horizontal
2	2503.00	-59.99	RMS	27.81	-31.03	0.44	-95.23	38.02	-13.00	-46.99	Horizontal
3	3337.00	-60.46	RMS	29.67	-30.08	0.36	-95.23	34.82	-13.00	-47.46	Horizontal
4	4171.00	-56.02	RMS	30.84	-29.51	0.37	-95.23	37.51	-13.00	-43.02	Horizontal



Site : 03CH15-HY

Condition: -13 3m BBHA 9120 D_9120D-02294 Vertical

: LTE Band 5 5M Ch20525 1RB0 QPSK

	Freq	Level	Detector	Ant Factor	Amp\Cb 1	Filter	EIRPCF	Readin g	Limit	Margin	Pol
	MHz	dBm		dB/m	dB	dB	dB	dBuV	dBm	dB	
1	1668.00	-62.99	RMS	25.33	-32.20	0.62	-95.23	38.49	-13.00	-49.99	Vertical
2	2503.00	-61.08	RMS	27.81	-31.03	0.44	-95.23	36.93	-13.00	-48.08	Vertical
3	3337.00	-60.57	RMS	29.67	-30.08	0.36	-95.23	34.71	-13.00	-47.57	Vertical
4	4171.00	-50.59	RMS	30.84	-29.51	0.37	-95.23	42.94	-13.00	-37.59	Vertical

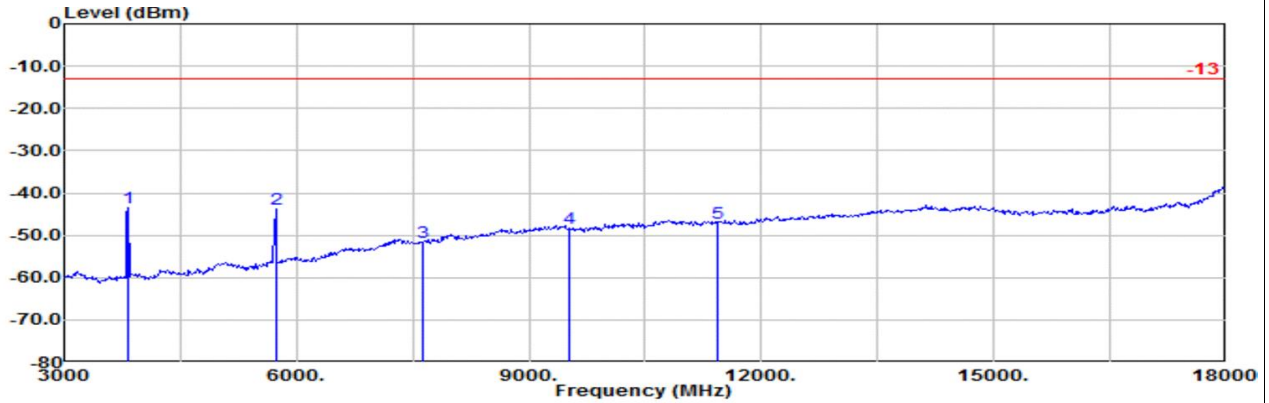


Main

Part 24E Mode 2

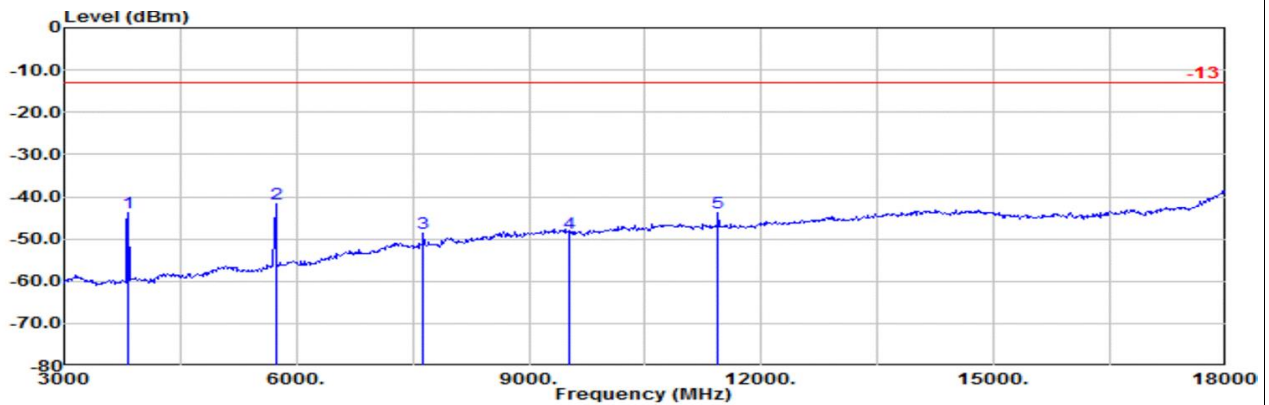
LTE B2 5M Ch19175 1RB0 QPSK

H



Site : 03CH15-HY
Condition: -13 3m BBHA 9120 D_9120D-02294 Horizontal
: LTE Band 2 5M Ch19175 1RB0 QPSK

	Freq	Level	Detector	Ant Factor	Amp\Cb	Filter	EIRPCF	Readin	Limit	Margin	Pol
	MHz	dBm			dB	dB	dB	dBuV	dBm	dB	
1	3825.00	-43.47	RMS	30.55	-29.81	0.72	-95.23	0.00	-13.00	-30.47	Horizontal
2	5730.00	-43.63	RMS	33.68	-27.77	0.37	-95.23	45.32	-13.00	-30.63	Horizontal
3	7635.00	-51.51	RMS	36.17	-26.16	0.60	-95.23	33.11	-13.00	-38.51	Horizontal
4	9526.00	-48.35	RMS	38.45	-25.60	0.38	-95.23	33.65	-13.00	-35.35	Horizontal
5	11445.00	-46.95	RMS	38.90	-24.63	0.44	-95.23	33.57	-13.00	-33.95	Horizontal



Site : 03CH15-HY
Condition: -13 3m BBHA 9120 D_9120D-02294 Vertical
: LTE Band 2 5M Ch19175 1RB0 QPSK

	Freq	Level	Detector	Ant Factor	Amp\Cb	Filter	EIRPCF	Readin	Limit	Margin	Pol
	MHz	dBm			dB	dB	dB	dBuV	dBm	dB	
1	3825.00	-43.63	RMS	30.55	-29.81	0.72	-95.23	50.14	-13.00	-30.63	Vertical
2	5730.00	-41.70	RMS	33.68	-27.77	0.37	-95.23	47.25	-13.00	-28.70	Vertical
3	7635.00	-48.61	RMS	36.17	-26.16	0.60	-95.23	36.01	-13.00	-35.61	Vertical
4	9526.00	-48.46	RMS	38.45	-25.60	0.38	-95.23	33.54	-13.00	-35.46	Vertical
5	11445.00	-43.87	RMS	38.90	-24.63	0.44	-95.23	36.65	-13.00	-30.87	Vertical

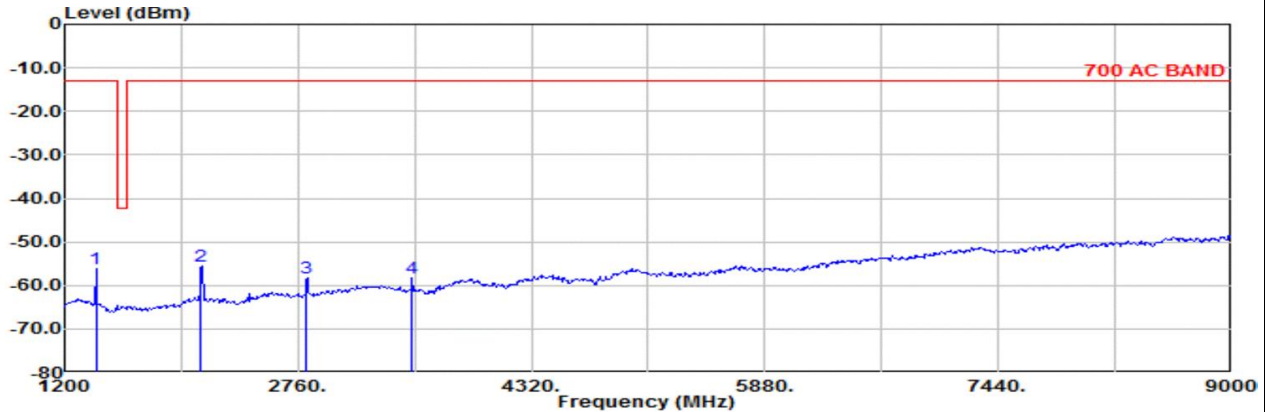


Main

Part 27H Mode 3

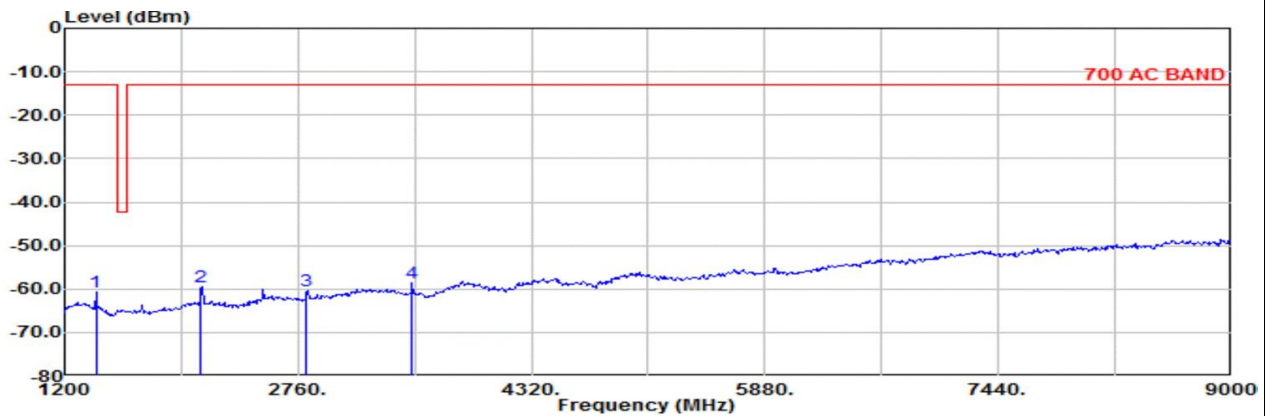
LTE B17 5M Ch23755 1RB0 QPSK

L



Site : 03CH15-HY
Condition: 700 AC BAND 3m BBHA 9120 D_9120D-02294 Horizontal
Mode : LTE Band 17 5M Ch23755 1RB0 QPSK

	Freq	Level	Detector	Ant Factor	Amp\Cb Factor	Filter	EIRPCF	Readin g	Limit	Margin	Pol
	MHz	dBm		dB/m	dB	dB	dB	dBuV	dBm	dB	
1	1408.00	-56.02	RMS	25.97	-32.67	0.89	-95.23	45.02	-13.00	-43.02	Horizontal
2	2113.00	-55.42	RMS	27.35	-31.54	0.41	-95.23	43.59	-13.00	-42.42	Horizontal
3	2817.00	-58.12	RMS	28.53	-30.63	0.33	-95.23	38.88	-13.00	-45.12	Horizontal
4	3521.00	-58.13	RMS	29.44	-29.94	0.30	-95.23	37.30	-13.00	-45.13	Horizontal



Site : 03CH15-HY
Condition: 700 AC BAND 3m BBHA 9120 D_9120D-02294 Vertical
Mode : LTE Band 17 5M Ch23755 1RB0 QPSK

	Freq	Level	Detector	Ant Factor	Amp\Cb Factor	Filter	EIRPCF	Readin g	Limit	Margin	Pol
	MHz	dBm		dB/m	dB	dB	dB	dBuV	dBm	dB	
1	1408.00	-60.69	RMS	25.97	-32.67	0.89	-95.23	40.35	-13.00	-47.69	Vertical
2	2113.00	-59.47	RMS	27.35	-31.54	0.41	-95.23	39.54	-13.00	-46.47	Vertical
3	2817.00	-60.26	RMS	28.53	-30.63	0.33	-95.23	36.74	-13.00	-47.26	Vertical
4	3521.00	-58.55	RMS	29.44	-29.94	0.30	-95.23	36.88	-13.00	-45.55	Vertical

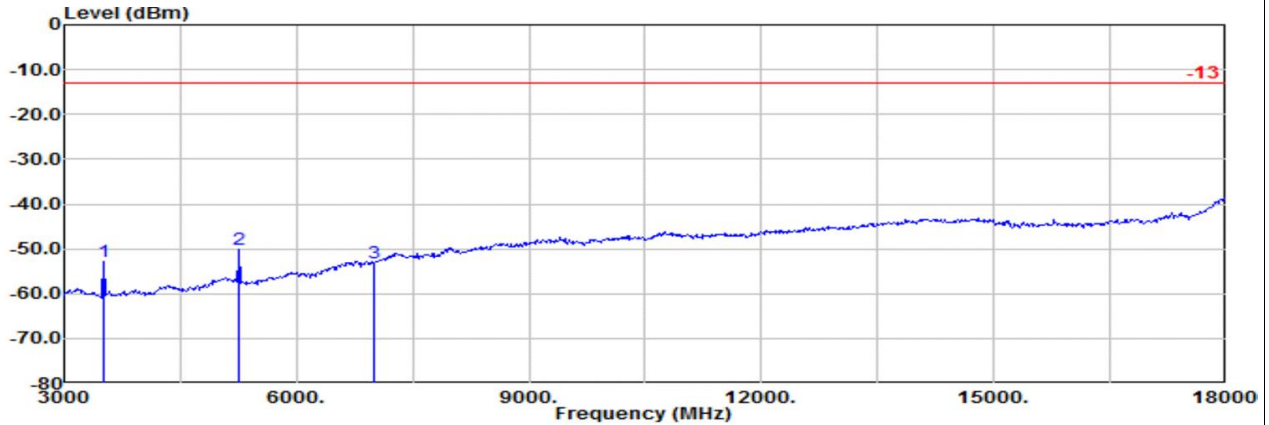


Main

Part 27L Mode 4

LTE B4 5M Ch20375 1RB0 QPSK

H

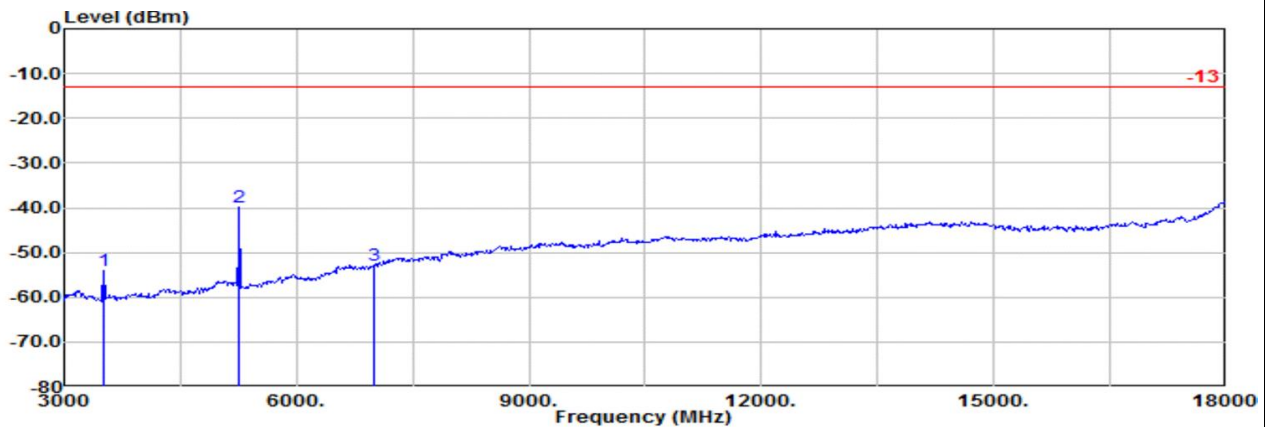


Site : 03CH15-HY

Condition: -13 3m BBHA 9120 D_9120D-02294 Horizontal

Mode : LTE Band 4 5M Ch20375 1RB0 QPSK

	Freq MHz	Level dBm	Detector	Ant Amp\Cb Filter				EIRPCF	Readin g	Limit dBm	Margin dB	Pol
				Factor	dB/m	dB	dB					
1	3500.00	-52.72	RMS	29.40	-29.94	1.07	-95.23	0.00	-13.00	-39.72	Horizontal	
2	5251.00	-49.97	RMS	32.90	-28.22	0.50	-95.23	40.08	-13.00	-36.97	Horizontal	
3	7001.00	-53.25	RMS	35.71	-26.64	0.42	-95.23	32.49	-13.00	-40.25	Horizontal	



Site : 03CH15-HY

Condition: -13 3m BBHA 9120 D_9120D-02294 Vertical

Mode : LTE Band 4 5M Ch20375 1RB0 QPSK

	Freq MHz	Level dBm	Detector	Ant Amp\Cb Filter				EIRPCF	Readin g	Limit dBm	Margin dB	Pol
				Factor	dB/m	dB	dB					
1	3500.00	-53.89	RMS	29.40	-29.94	1.07	-95.23	40.82	-13.00	-40.89	Vertical	
2	5251.00	-39.79	RMS	32.90	-28.22	0.50	-95.23	50.26	-13.00	-26.79	Vertical	
3	7001.00	-52.83	RMS	35.71	-26.64	0.42	-95.23	32.91	-13.00	-39.83	Vertical	

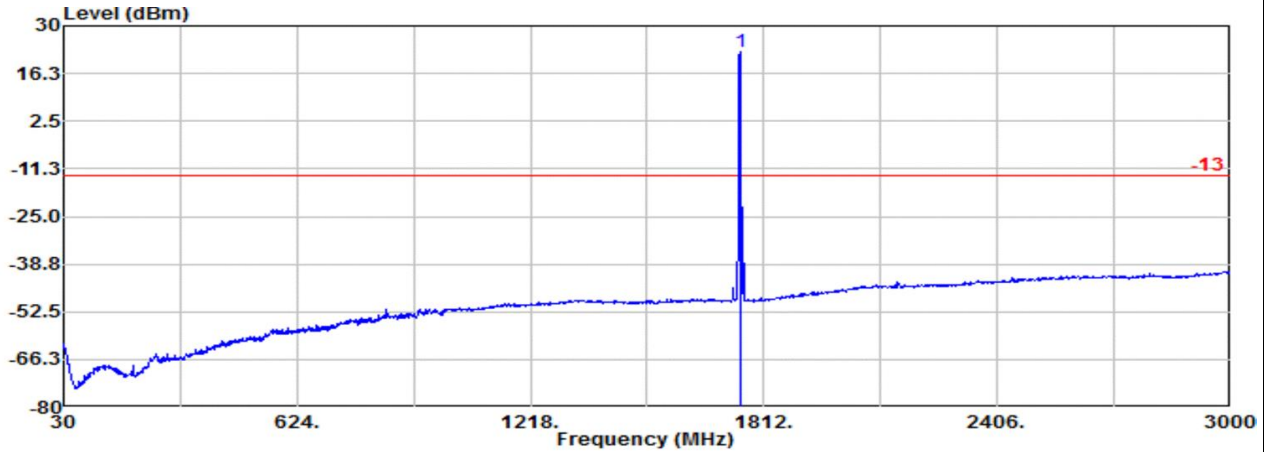


Main

Part 27L Mode 4

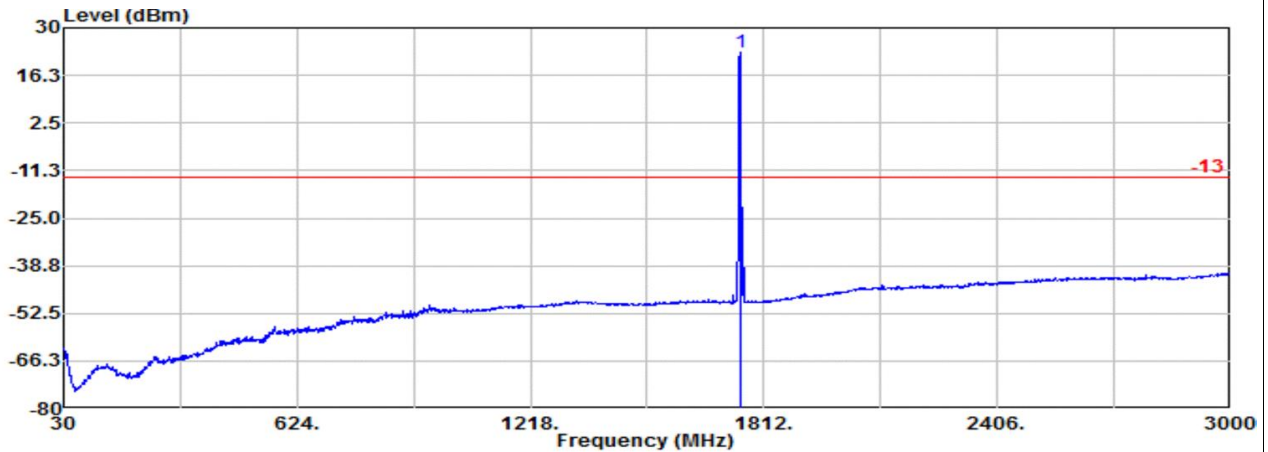
LTE B4 5M Ch20375 1RB0 QPSK

H



Site : 03CH15-HY
Condition: -13 3m BBHA 9120 D_9120D-02294 Horizontal
Mode : LTE Band 4 5M Ch20375 1RB0 QPSK

	Freq	Level	Detector	Ant Factor	Amp\Cb	Filter	EIRPCF	Readin	Limit	Margin	Pol
	MHz	dBm		dB/m	dB	dB	dB	dBuV	dBm	dB	
1	1752.00	22.73	RMS	24.90	4.80	0.00	-95.23	88.26	-13.00	35.73	Horizontal



Site : 03CH15-HY
Condition: -13 3m BBHA 9120 D_9120D-02294 Vertical
Mode : LTE Band 4 5M Ch20375 1RB0 QPSK

	Freq	Level	Detector	Ant Factor	Amp\Cb	Filter	EIRPCF	Readin	Limit	Margin	Pol
	MHz	dBm		dB/m	dB	dB		dBuV	dBm		
1	1752.00	22.89	RMS	24.90	4.80	0.00	-95.23	88.42	-13.00	35.89	Vertical

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