FCC TEST REPORT

(PART 27)

Applicant:	Continental Automotive Systems, Inc.
Address:	21440 W Lake Cook Rd., Deer Park, IL 60010, USA

Manufacturer or Supplier:	Continental Automotive Systems, Inc.
Address:	21440 W Lake Cook Rd., Deer Park, IL 60010, USA
Product:	Module
Brand Name:	Continental
Model Name:	FE5NAR110, FE5NAR111
FCC ID:	LHJ-FE5NAR110
Date of tests:	May. 01, 2024 ~ Jun. 17, 2024

The tests have been carried out according to the requirements of the following standard:

☒ **FCC Part 27** ☒ **ANSI/TIA/EIA-603-D**
☒ **FCC Part 2** ☒ **ANSI/TIA/EIA-603-E** ☒ **ANSI C63.26-2015**

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Prepared by Simon Wang Engineer / Mobile Department	Approved by Luke Lu Manager / Mobile Department
Simon Wang Date: Jun. 17, 2024	Luke Lu Date: Jun. 17, 2024

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
W7L-240430W002RF05	Original release	Jun. 17, 2024

1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 27 & PART 2		
STANDARD SECTION	**TEST TYPE AND LIMIT**	**RESULT**
§2.1046	Conducted Output Power	Compliance
§27.50(d)(4)	Equivalent Isotropically Radiated Power (Band 4) (Band 66)	Compliance
§2.1055 §27.54	Frequency Stability	Compliance
§2.1049	Occupied Bandwidth	Compliance
§2.1051 §27.53(h)	Conducted Band Edge Measurements (Band 4) (Band 66)	Compliance
§2.1051 §27.53(h)	Conducted Spurious Emissions (Band 4) (Band 66)	Compliance
§2.1053 §27.53(h)	Radiated Spurious Emissions (Band 4) (Band 66)	Compliance
§27.50(d)(5)	Peak to average ratio	Compliance

NOTE:
The worst-case scenario for all measurements is based on an engineering evaluation made on different modulations. Then, QPSK and 16QAM were observed as the worst mode to LTE bands respectively and set for all conducted and radiated. Output power measurements were measured on QPSK, 16QAM, 64QAM modulations, and tests other than output power are performed only in worse-case QPSK and 16QAM modulations.

1.1 MEASREMENT 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	UNCERTAINTY
Frequency Stability	±76.97Hz
Radiated emissions (9KHz~30MHz)	±2.68dB
Radiated emissions & Radiated Power (30MHz~1GHz)	±4.98dB
Radiated emissions & Radiated Power (1GHz ~6GHz)	±4.70dB
Radiated emissions (6GHz ~18GHz)	±4.60dB
Radiated emissions (18GHz ~40GHz)	±4.12dB
Conducted emissions	±4.01dB
Occupied Channel Bandwidth	±43.58KHz
Conducted Output power	±2.06dB
Band Edge Measurements	±4.70dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

1.2 TEST SITE AND INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
MXE EMI Receiver	KEYSIGHT	N9038A-544	MY54450026	Mar. 28,24	Mar. 27,25
EXA Signal Analyzer	KEYSIGHT	N9010A-544	MY54510355	May.10,23	May.09,24
EXA Signal Analyzer	KEYSIGHT	N9010A-544	MY54510355	May.09,24	May.08,25
Loop Antenna	Schwarzbeck	FMZB 1519B	00173	Sep.03,23	Sep.02,24
Bilog Antenna	ETS-LINDGREN	3143B	00161965	Feb. 18,24	Feb. 17,25
Horn Antenna	ETS-LINDGREN	3117	00168692	Feb. 18,24	Feb. 17,25
Horn Antenna (18GHz-40GHz)	N/A	QWH-SL-18-40-K-SG/QMS-00361	15433	Sep.04, 23	Sep.03, 24
Radio Communication Analyzer	ANRITSU	MT8820C	6201465426	Feb. 14,24	Feb. 13,25
Signal Pre-Amplifier	EMSI	EMC 9135	980249	May. 06,23	May. 05,24
Signal Pre-Amplifier	EMSI	EMC 9135	980249	May. 05,24	May. 04,25
Signal Pre-Amplifier	EMSI	EMC 012645B	980257	May.10,23	May.09,24
Signal Pre-Amplifier	EMSI	EMC 012645B	980257	May.09,24	May.08,25
Signal Pre-Amplifier	EMSI	EMC 184045B	980259	Feb. 17,24	Feb.16,25
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	Euroshieldpn-CT0001143-1216	Nov. 14,23	Nov. 13,26
Test Software	E3	V 9.160323	N/A	N/A	N/A
Test Software	JS1120	3.1.36	N/A	N/A	N/A
10dB Attenuator	JFW/USA	50HF-010-SMA	50HF-010-SMA	May. 06,23	May. 05,24
10dB Attenuator	JFW/USA	50HF-010-SMA	50HF-010-SMA	May. 05,24	May. 04,25
Power Meter	Anritsu	ML2495A	1506002	Feb. 14,24	Feb. 13,25
Power Sensor	Anritsu	MA2411B	1339352	Feb. 14,24	Feb. 13,25
Temperature Chamber	ESPEC	SH-242	93000855	May. 06,23	May. 05,24
Temperature Chamber	ESPEC	SH-242	93000855	May. 05,24	May. 04,25
MXG Analog Microvave Signal Generator	KEYSIGHT	N5183A	MY50143024	Feb. 14,24	Feb. 13,25
Base station R&S CMW500	Rohde&Schwarz	CMW500	153085	May.10,23	May.09,24
Base station R&S CMW500	Rohde&Schwarz	CMW500	153085	May.09,24	May.08,25
DC Source	Kikusui/JP	PMX18-5A	N/A	Aug. 11,23	Aug. 10,24

NOTE: 1. The calibration interval of the above test instruments is 12/ 36 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

2. The test was performed in 3m Semi-anechoic Chamber and RF Oven Room.

3. The horn antenna is used only for the measurement of emission frequency above 1GHz if tested.

4. The FCC Site Registration No. is 525120; The Designation No. is CN1171.

2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Module	
BRAND NAME	Continental	
MODEL NAME	FE5NAR110, FE5NAR111	
NOMINAL VOLTAGE	DC4.0V	
MODULATION TECHNOLOGY	**LTE**	QPSK, 16QAM, 64QAM
FREQUENCY RANGE	**LTE Band 4 Channel Bandwidth: 1.4MHz**	1710.7MHz ~ 1754.3MHz
	LTE Band 4 Channel Bandwidth: 3MHz	1711.5MHz ~ 1753.5MHz
	LTE Band 4 Channel Bandwidth: 5MHz	1712.5MHz ~ 1752.5MHz
	LTE Band 4 Channel Bandwidth: 10MHz	1715MHz ~ 1750MHz
	LTE Band 4 Channel Bandwidth: 15MHz	1717.5MHz ~ 1747.5 MHz
	LTE Band 4 Channel Bandwidth: 20MHz	1720MHz ~ 1745MHz

FREQUENCY RANGE	**LTE Band 66 Channel Bandwidth: 1.4MHz**	1710.7MHz ~ 1779.3MHz
	LTE Band 66 Channel Bandwidth: 3MHz	1711.5MHz ~ 1778.5MHz
	LTE Band 66 Channel Bandwidth: 5MHz	1712.5MHz ~ 1777.5MHz
	LTE Band 66 Channel Bandwidth: 10MHz	1715MHz ~ 1775MHz
	LTE Band 66 Channel Bandwidth: 15MHz	1717.5MHz ~ 1772.5MHz
	LTE Band 66 Channel Bandwidth: 20MHz	1720MHz ~ 1770MHz
MAX. EIRP POWER	**LTE Band 4 Channel Bandwidth: 1.4MHz**	348.34mW
	LTE Band 4 Channel Bandwidth: 3MHz	325.84mW
	LTE Band 4 Channel Bandwidth: 5MHz	328.1mW
	LTE Band 4 Channel Bandwidth: 10MHz	321.37mW
	LTE Band 4 Channel Bandwidth: 15MHz	329.61mW
	LTE Band 4 Channel Bandwidth: 20MHz	331.89mW
	LTE Band 66 Channel Bandwidth: 1.4MHz	352.37mW
	LTE Band 66 Channel Bandwidth: 3MHz	351.56mW
	LTE Band 66 Channel Bandwidth: 5MHz	349.14mW
	LTE Band 66 Channel Bandwidth: 10MHz	349.95mW
	LTE Band 66 Channel Bandwidth: 15MHz	344.35mW
	LTE Band 66 Channel Bandwidth: 20MHz	354.81mW

EMISSION DESIGNATOR	**LTE Band 66 Channel Bandwidth: 1.4MHz**	QPSK: 1M09G7D
		16QAM: 1M10W7D
	LTE Band 66 Channel Bandwidth: 3MHz	QPSK: 2M70G7D
		16QAM: 2M70W7D
	LTE Band 66 Channel Bandwidth: 5MHz	QPSK: 4M51G7D
		16QAM: 4M51W7D
	LTE Band 66 Channel Bandwidth: 10MHz	QPSK: 8M98G7D
		16QAM: 8M97W7D
	LTE Band 66 Channel Bandwidth: 15MHz	QPSK: 13M5G7D
		16QAM: 13M5W7D
	LTE Band 66 Channel Bandwidth: 20MHz	QPSK: 18M0G7D
		16QAM: 18M0W7D
ANTENNA TYPE	Monopole Antenna with 1.93dBi gain for LTE B4/B66	
HW VERSION	P2.0	
SW VERSION	MODEM_GM_C3_3.0.2.24	
I/O PORTS	Refer to user's manual	
CABLE SUPPLIED	N/A	
EXTREME TEMPERATURE	-40-85 ℃	
EXTREME VOLTAGE	3.8V - 4.2V	

NOTE:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. The EUT incorporates a SISO function. Physically, the EUT provides one completed transmitters

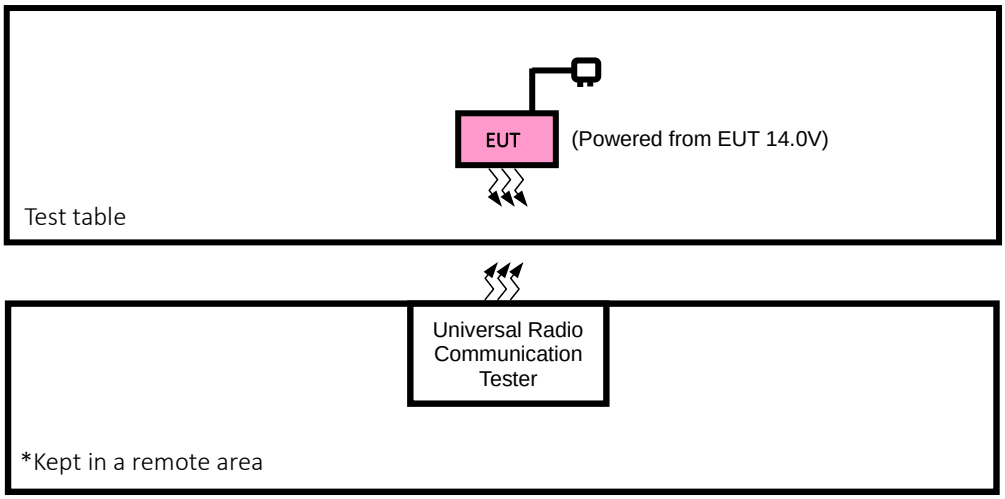
MODULATION MODE	TX FUNCTION
LTE	1TX

3. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.
4. Antenna gain and EUT conducted cable loss are provided by the customer, and the laboratory will record the results based on these items that involve these two parameters.
5. According to the information provided by the manufacturer, The difference between FE5NAR110, FE5NAR111 is as follows:

Sample	HVIN/PMN	5G Bands NSA	5G Bands SA	SA UL MIMO	LTE Bands	UMTS	GNSS
1	FE5NAR110	n2, n5, n66, n77	n25, n41, n66, n71, n77	n41, n77, n78	2, 4, 5, 7, 12, 13, 14, 28A, 28B, 29Rx, 30Rx, 66, 71	2, 4, 5	L1, L5
2	FE5NAR111	n2, n5, n66, n77	n25, n41, n66, n71, n77	n41, n77, n78	2, 4, 5, 7, 12, 13, 14, 28A, 28B, 29Rx, 30Rx, 66, 71	2, 4, 5	L1

2.2 CONFIGURATION OF SYSTEM UNDER TEST

FOR RADIATION EMISSION TEST



2.3 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.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	N/A	N/A	N/A	N/A	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	USB cable: Unshielded, Detachable 1.0m

2.4 TEST ITEM AND TEST CONFIGURATION

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 on Y-plane for EIRP and X-axis for radiated emission. Following channel(s) was (were) selected for the final test as listed below:

EUT CONFIGURE MODE	DESCRIPTION
A	EUT + DC Source with LTE link

LTE BAND 4 MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
A	EIRP	19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		19965 to 20385	19965, 20175, 20385	3MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset

Note: 1.This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

2. LTE Band 4 are covered by LTE Band 66, Because it is a subset of LTE Band 66 with the same output power and supported bandwidths, So the conducted test data and RSE test data please refer to LTE Band 66

LTE BAND 66 MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
A	EIRP	131979 to 132665	131979,132322,132665	1.4MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		131987 to 132657	131987,132322,132657	3MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		131997 to 132647	131997,132322,132647	5MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		132022 to 132622	132022,132322,132622	10MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		132047 to 132597	132047,132322,132597	15MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		132072 to 132572	132072,132322,132572	20MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
B	FREQUENCY STABILITY	132022 to 132622	132022,132322,132622	10MHz	QPSK, 16QAM	50 RB / 0 RB Offset
A	OCCUPIED BANDWIDTH	131979 to 132665	131979,132322,132665	1.4MHz	QPSK, 16QAM	6 RB / 0 RB Offset
		131987 to 132657	131987,132322,132657	3MHz	QPSK, 16QAM	15 RB / 0 RB Offset
		131997 to 132647	131997,132322,132647	5MHz	QPSK, 16QAM	25 RB / 0 RB Offset
		132022 to 132622	132022,132322,132622	10MHz	QPSK, 16QAM	50 RB / 0 RB Offset
		132047 to 132597	132047,132322,132597	15MHz	QPSK, 16QAM	75 RB / 0 RB Offset
		132072 to 132572	132072,132322,132572	20MHz	QPSK, 16QAM	100 RB / 0 RB Offset
A	PEAK TO AVERAGE RATIO	132072 to 132572	132072, 132572	20MHz	QPSK, 16QAM	1 RB / 0 RB Offset 100 RB / 0 RB Offset
A	BAND EDGE	131979 to 132322	131979	1.4MHz	QPSK, 16QAM	1 RB / 0 RB Offset
						6 RB / 0 RB Offset
			132322	1.4MHz	QPSK, 16QAM	1 RB / 5 RB Offset
						6 RB / 0 RB Offset
		131987 to 132657	131987	3MHz	QPSK, 16QAM	1 RB / 0 RB Offset
						15 RB / 0 RB Offset
			132657	3MHz	QPSK, 16QAM	1 RB / 14 RB Offset
						15 RB / 0 RB Offset
		131997 to 132647	131997	5MHz	QPSK, 16QAM	1 RB / 0 RB Offset
						25 RB / 0 RB Offset
			132647	5MHz	QPSK, 16QAM	1 RB / 24 RB Offset
						25 RB / 0 RB Offset
		132022 to 132622	132022	10MHz	QPSK, 16QAM	1 RB / 0 RB Offset
						50 RB / 0 RB Offset
			132622	10MHz	QPSK, 16QAM	1 RB / 49 RB Offset
						50 RB / 0 RB Offset
		132047 to 132597	132047	15MHz	QPSK, 16QAM	1 RB / 0 RB Offset
						75 RB / 0 RB Offset
			132597	15MHz	QPSK, 16QAM	1 RB / 74 RB Offset
						75 RB / 0 RB Offset
		132072 to 132572	132072	20MHz	QPSK, 16QAM	1 RB / 0 RB Offset
						100 RB / 0 RB Offset
			132572	20MHz	QPSK, 16QAM	1 RB / 99 RB Offset

						100 RB / 0 RB Offset
A	CONDUCTED EMISSION	131979 to 132665	131979,132322,132665	1.4MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		131987 to 132657	131987,132322,132657	3MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		131997 to 132647	131997,132322,132647	5MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		132022 to 132622	132022,132322,132622	10MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		132047 to 132597	132047,132322,132597	15MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		132072 to 132572	132072,132322,132572	20MHz	QPSK, 16QAM	1 RB / 0 RB Offset
A	RADIATED EMISSION	131979 to 132665	132322	1.4MHz	QPSK	1 RB / 0 RB Offset
		131987 to 132657	132322	3MHz	QPSK	1 RB / 0 RB Offset
		131997 to 132647	132322	5MHz	QPSK	1 RB / 0 RB Offset
		132022 to 132622	132322	10MHz	QPSK	1 RB / 0 RB Offset
		132047 to 132597	132047,132322,132597	15MHz	QPSK	1 RB / 0 RB Offset
		132072 to 132572	132322	20MHz	QPSK	1 RB / 0 RB Offset

Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

TEST CONDITION:

TEST ITEM	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
ERP&EIRP	23deg. C, 70%RH	DC 14.0V	Jace Hu
FREQUENCY STABILITY	23deg. C, 70%RH	DC 3.8V/4V/4.2V	James Fu
OCCUPIED BANDWIDTH	23deg. C, 70%RH	DC 4.0V	James Fu
BAND EDGE	23deg. C, 70%RH	DC 4.0V	James Fu
CONDUCTED EMISSION	23deg. C, 70%RH	DC 4.0V	James Fu
RADIATED EMISSION	23deg. C, 70%RH	DC 14.0V	Jace Hu
PEAK TO AVERAGE RATIO	23deg. C, 70%RH	DC 4.0V	James Fu

2.5 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC 47 CFR Part 2

FCC 47 CFR Part 27

KDB 971168 D01 Power Meas License Digital Systems v03r01

ANSI/TIA/EIA-603-D

ANSI/TIA/EIA-603-E

ANSI C63.26-2015

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

3 TEST TYPES AND RESULTS

3.1 OUTPUT POWER MEASUREMENT

3.1.1 LIMITS OF OUTPUT POWER MEASUREMENT

The radiated peak output power shall be according to the specific rule Part 27.50(h)(2) that “User stations are limited to 2 watts” and 27.50(i) specific that “Peak transmit power must be measure over any interval of continuous transmission using instrumentation calibration in terms of rms-equivalent voltage.”

According to the specific rule 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

3.1.2 TEST PROCEDURES

EIRP MEASUREMENT:

Per KDB 971168 D01 Power Meas License Digital Systems v03r01 or subclause 5.2.5.5 of ANSI C63.26-2015, the relevant equation for determing the ERP or EIRP from the conducted RF output power measured using the guidance provided above is:

ERP or EIRP = $P_{Meas} + G_T – L_C$

Where:

ERP or EIRP = effective radiated power or equivalent isotropically radiated power, respectively (expressed in the same units as P_{Meas}, typically dBW or dBm);

P_{Meas} = measured transmitter output power or PSD, in dBm or dBW;

G_T = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);

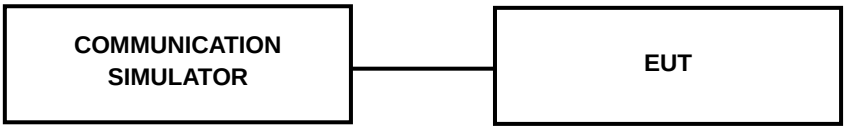
L_C = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

CONDUCTED POWER MEASUREMENT:

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

3.1.3 TEST SETUP

CONDUCTED POWER MEASUREMENT:



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

3.1.4 TEST RESULTS

CONDUCTED OUTPUT POWER (dBm)

LTE Band 4

LTE Band 4						
BW	Modulation	RB Size	RB Offset	Low	Mid	High
		Channel		20050	20175	20300
		Frequency (MHz)		1720	1732.5	1745
20M	QPSK	1	0	23.13	23.06	22.98
		1	50	**23.28**	23.14	23.24
		1	99	23.01	22.91	22.91
		50	0	22.35	22.29	22.33
		50	25	22.51	22.42	22.39
		50	50	22.32	22.24	22.31
		100	0	22.40	22.32	22.38
	16QAM	1	0	22.37	22.37	22.42
		1	50	22.51	22.46	22.54
		1	99	22.35	22.23	22.27
		50	0	21.33	21.18	21.26
		50	25	21.45	21.36	21.48
		50	50	21.31	21.28	21.41
		100	0	21.35	21.36	21.33
	64QAM	1	0	21.29	21.22	21.27
		1	50	21.41	21.35	21.41
		1	99	21.15	21.13	21.15
		50	0	20.27	20.29	20.22
		50	25	20.38	20.35	20.38
		50	50	20.32	20.34	20.39
		100	0	20.35	20.29	20.33

BW	Modulation	Channel		20025	20175	20325
		Frequency (MHz)		1717.5	1732.5	1747.5
15M	QPSK	1	0	23.09	23.02	22.88
		1	37	23.25	23.09	23.13
		1	74	22.86	22.79	22.82
		36	0	22.33	22.22	22.23
		36	19	22.38	22.30	22.27
		36	39	22.30	22.16	22.25
		75	0	22.29	22.19	22.37
	16QAM	1	0	22.28	22.32	22.36
		1	37	22.47	22.32	22.47
		1	74	22.27	22.15	22.23
		36	0	21.25	21.12	21.11
		36	19	21.36	21.23	21.47
		36	39	21.27	21.16	21.32
		75	0	21.34	21.28	21.30
	64QAM	1	0	21.21	21.13	21.17
		1	37	21.35	21.29	21.32
		1	74	21.03	21.05	21.11
		36	0	20.16	20.23	20.16
		36	19	20.28	20.20	20.37
		36	39	20.19	20.25	20.24
		75	0	20.31	20.19	20.21

BW	Modulation	Channel		20000	20175	20350
		Frequency (MHz)		1715	1732.5	1750
10M	QPSK	1	0	23.05	22.91	22.86
		1	24	23.14	23.03	23.10
		1	49	22.94	22.78	22.81
		25	0	22.22	22.19	22.25
		25	12	22.48	22.41	22.26
		25	25	22.21	22.10	22.28
		50	0	22.34	22.21	22.31
	16QAM	1	0	22.30	22.32	22.30
		1	24	22.39	22.31	22.53
		1	49	22.30	22.17	22.20
		25	0	21.30	21.05	21.20
		25	12	21.44	21.30	21.37
		25	25	21.16	21.26	21.28
		50	0	21.34	21.29	21.28
	64QAM	1	0	21.20	21.15	21.24
		1	24	21.31	21.21	21.39
		1	49	21.13	21.12	21.14
		25	0	20.23	20.22	20.18
		25	12	20.28	20.24	20.30
		25	25	20.28	20.20	20.26
		50	0	20.20	20.23	20.28

BW	Modulation	Channel		19975	20175	20375
		Frequency (MHz)		1712.5	1732.5	1752.5
5M	QPSK	1	0	23.10	22.93	22.97
		1	12	23.23	23.02	23.22
		1	24	22.98	22.84	22.82
		12	0	22.23	22.28	22.24
		12	6	22.44	22.36	22.26
		12	13	22.19	22.10	22.21
		25	0	22.37	22.29	22.35
	16QAM	1	0	22.29	22.24	22.39
		1	12	22.38	22.32	22.46
		1	24	22.34	22.11	22.15
		12	0	21.20	21.16	21.11
		12	6	21.40	21.34	21.43
		12	13	21.30	21.25	21.34
		25	0	21.22	21.32	21.25
	64QAM	1	0	21.22	21.17	21.26
		1	12	21.27	21.26	21.36
		1	24	21.13	21.05	21.00
		12	0	20.12	20.23	20.15
		12	6	20.35	20.25	20.35
		12	13	20.22	20.29	20.38
		25	0	20.28	20.19	20.32

BW	Modulation	Channel		19965	20175	20385
		Frequency (MHz)		1711.5	1732.5	1753.5
3M	QPSK	1	0	23.02	23.04	22.94
		1	7	23.19	23.07	23.20
		1	14	22.89	22.76	22.82
		8	0	22.29	22.28	22.21
		8	3	22.39	22.40	22.28
		8	7	22.30	22.22	22.19
		15	0	22.34	22.22	22.28
	16QAM	1	0	22.29	22.36	22.41
		1	7	22.43	22.38	22.50
		1	14	22.31	22.11	22.21
		8	0	21.23	21.06	21.15
		8	3	21.30	21.25	21.40
		8	7	21.27	21.24	21.27
		15	0	21.27	21.28	21.24
	64QAM	1	0	21.18	21.20	21.13
		1	7	21.26	21.27	21.34
		1	14	21.12	20.99	21.10
		8	0	20.20	20.23	20.14
		8	3	20.30	20.25	20.24
		8	7	20.24	20.27	20.34
		15	0	20.32	20.27	20.20

BW	Modulation	Channel		19957	20175	20393
		Frequency (MHz)		1710.7	1732.5	1754.3
1.4M	QPSK	1	0	23.03	23.04	22.97
		1	2	23.27	22.99	23.09
		1	5	22.92	22.79	22.79
		3	0	23.21	23.15	23.23
		3	1	23.49	23.31	23.27
		3	3	23.30	23.15	23.25
		6	0	22.30	22.18	22.27
	16QAM	1	0	22.30	22.34	22.39
		1	2	22.39	22.31	22.44
		1	5	22.21	22.13	22.25
		3	0	22.30	22.08	22.22
		3	1	22.38	22.25	22.33
		3	3	22.24	22.18	22.37
		6	0	21.32	21.30	21.27
	64QAM	1	0	21.19	21.11	21.25
		1	2	21.40	21.20	21.27
		1	5	21.13	21.10	21.04
		3	0	21.14	21.17	21.10
		3	1	21.28	21.30	21.34
		3	3	21.17	21.21	21.38
		6	0	20.25	20.21	20.28

LTE Band 66

LTE Band 66						
BW	Modulation	RB Size	RB Offset	Low	Mid	High
		Channel		132072	132322	132572
		Frequency (MHz)		1720	1745	1770
20M	QPSK	1	0	23.12	23.07	**23.57**
		1	50	23.13	23.06	23.47
		1	99	22.91	22.88	23.31
		50	0	22.17	22.14	22.55
		50	25	22.31	22.25	22.60
		50	50	22.17	22.03	22.47
		100	0	22.29	22.12	22.50
	16QAM	1	0	22.60	22.52	22.95
		1	50	22.45	22.43	22.79
		1	99	22.40	22.31	22.66
		50	0	21.17	21.24	21.54
		50	25	21.26	21.29	21.63
		50	50	21.08	21.13	21.48
		100	0	21.24	21.20	21.54
	64QAM	1	0	21.37	21.37	21.82
		1	50	21.44	21.39	21.68
		1	99	21.32	21.26	21.64
		50	0	20.20	20.18	20.49
		50	25	20.38	20.26	20.70
		50	50	20.16	20.11	20.58
		100	0	20.29	20.27	20.61

BW	Modulation	Channel		132047	132322	132597
		Frequency (MHz)		1717.5	1745	1772.5
15M	QPSK	1	0	22.99	22.94	23.43
		1	37	22.99	23.03	23.44
		1	74	22.89	22.85	23.26
		36	0	22.15	22.03	22.42
		36	19	22.22	22.18	22.46
		36	39	22.10	21.96	22.34
		75	0	22.24	21.98	22.44
	16QAM	1	0	22.49	22.40	22.93
		1	37	22.42	22.36	22.64
		1	74	22.36	22.18	22.52
		36	0	21.14	21.12	21.49
		36	19	21.17	21.18	21.55
		36	39	21.03	20.99	21.33
		75	0	21.11	21.07	21.43
	64QAM	1	0	21.32	21.30	21.70
		1	37	21.37	21.36	21.53
		1	74	21.31	21.13	21.50
		36	0	20.11	20.08	20.36
		36	19	20.34	20.25	20.66
		36	39	20.01	20.07	20.54
		75	0	20.14	20.13	20.50

BW	Modulation	Channel		132022	132322	132622
		Frequency (MHz)		1715	1745	1775
10M	QPSK	1	0	23.09	23.02	23.51
		1	24	23.00	23.02	23.40
		1	49	22.87	22.84	23.22
		25	0	22.09	22.06	22.44
		25	12	22.25	22.16	22.49
		25	25	22.09	21.99	22.32
		50	0	22.14	22.00	22.46
	16QAM	1	0	22.51	22.40	22.89
		1	24	22.33	22.39	22.67
		1	49	22.30	22.28	22.57
		25	0	21.12	21.09	21.48
		25	12	21.15	21.14	21.51
		25	25	21.04	21.06	21.36
		50	0	21.12	21.16	21.46
	64QAM	1	0	21.30	21.35	21.68
		1	24	21.32	21.27	21.54
		1	49	21.24	21.24	21.55
		25	0	20.09	20.05	20.45
		25	12	20.33	20.12	20.66
		25	25	20.10	20.07	20.54
		50	0	20.20	20.13	20.52

BW	Modulation	Channel		131997	132322	132647
		Frequency (MHz)		1712.5	1745	1777.5
5M	QPSK	1	0	23.09	22.92	23.50
		1	12	22.99	22.92	23.45
		1	24	22.90	22.84	23.21
		12	0	22.09	22.00	22.41
		12	6	22.16	22.21	22.55
		12	13	22.09	21.97	22.38
		25	0	22.14	22.09	22.43
	16QAM	1	0	22.59	22.47	22.82
		1	12	22.42	22.30	22.73
		1	24	22.31	22.17	22.54
		12	0	21.12	21.18	21.39
		12	6	21.19	21.24	21.52
		12	13	20.95	20.99	21.37
		25	0	21.11	21.18	21.41
	64QAM	1	0	21.30	21.36	21.67
		1	12	21.39	21.27	21.53
		1	24	21.20	21.24	21.57
		12	0	20.12	20.05	20.47
		12	6	20.37	20.23	20.57
		12	13	20.12	20.06	20.51
		25	0	20.14	20.24	20.52

BW	Modulation	Channel		131987	132322	132657
		Frequency (MHz)		1711.5	1745	1778.5
3M	QPSK	1	0	23.10	23.04	23.53
		1	7	22.98	22.98	23.41
		1	14	22.79	22.81	23.22
		8	0	22.05	22.06	22.41
		8	3	22.26	22.22	22.49
		8	7	22.08	21.96	22.38
		15	0	22.17	22.09	22.47
	16QAM	1	0	22.52	22.45	22.82
		1	7	22.41	22.36	22.65
		1	14	22.33	22.21	22.64
		8	0	21.07	21.10	21.41
		8	3	21.16	21.22	21.57
		8	7	20.97	21.02	21.44
		15	0	21.10	21.16	21.51
	64QAM	1	0	21.35	21.22	21.72
		1	7	21.36	21.25	21.67
		1	14	21.29	21.16	21.63
		8	0	20.09	20.03	20.41
		8	3	20.36	20.22	20.59
		8	7	20.06	19.99	20.50
		15	0	20.19	20.15	20.52

BW	Modulation	Channel		131979	132322	132665
		Frequency (MHz)		1710.7	1745	1779.3
1.4M	QPSK	1	0	23.03	23.00	23.45
		1	2	23.10	22.93	23.37
		1	5	22.80	22.74	23.21
		3	0	23.06	23.04	23.54
		3	1	23.18	23.24	23.45
		3	3	23.16	23.01	23.40
		6	0	22.28	21.98	22.37
	16QAM	1	0	22.52	22.51	22.84
		1	2	22.31	22.29	22.65
		1	5	22.25	22.25	22.54
		3	0	22.05	22.19	22.42
		3	1	22.18	22.26	22.50
		3	3	22.07	21.99	22.39
		6	0	21.10	21.15	21.45
	64QAM	1	0	21.26	21.25	21.67
		1	2	21.30	21.38	21.58
		1	5	21.23	21.14	21.53
		3	0	21.10	21.12	21.35
		3	1	21.34	21.25	21.65
		3	3	21.02	21.04	21.54
		6	0	20.17	20.22	20.47

EIRP
LTE BAND 4

LTE B4 1.4M QPSK						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	EIRP (dBm)	EIRP (mW)	Lmit (W)
19957	1710.7	23.49	1.93	25.42	348.34	1
20175	1732.5	23.31	1.93	25.24	334.2	1
20393	1754.3	23.27	1.93	25.2	331.13	1

LTE B4 1.4M 16QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	EIRP (dBm)	EIRP (mW)	Lmit (W)
19957	1710.7	22.39	1.93	24.32	270.4	1
20175	1732.5	22.34	1.93	24.27	267.3	1
20393	1754.3	22.44	1.93	24.37	273.53	1

LTE B4 1.4M 64QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	EIRP (dBm)	EIRP (mW)	Lmit (W)
19957	1710.7	21.4	1.93	23.33	215.28	1
20175	1732.5	21.3	1.93	23.23	210.38	1
20393	1754.3	21.38	1.93	23.31	214.29	1

LTE B4 3M QPSK						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	EIRP (dBm)	EIRP (mW)	Lmit (W)
19965	1711.5	23.19	1.93	25.12	325.09	1
20175	1732.5	23.07	1.93	25	316.23	1
20385	1753.5	23.2	1.93	25.13	325.84	1

LTE B4 3M 16QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	EIRP (dBm)	EIRP (mW)	Lmit (W)
19965	1711.5	22.43	1.93	24.36	272.9	1
20175	1732.5	22.43	1.93	24.36	272.9	1
20385	1753.5	22.31	1.93	24.24	265.46	1

LTE B4 3M 64QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	EIRP (dBm)	EIRP (mW)	Lmit (W)
19965	1711.5	21.26	1.93	23.19	208.45	1
20175	1732.5	21.27	1.93	23.2	208.93	1
20385	1753.5	21.34	1.93	23.27	212.32	1

LTE B4 5M QPSK						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	EIRP (dBm)	EIRP (mW)	Lmit (W)
19975	1712.5	23.23	1.93	25.16	328.1	1
20175	1732.5	23.02	1.93	24.95	312.61	1
20375	1752.5	23.22	1.93	25.15	327.34	1

LTE B4 5M 16QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	EIRP (dBm)	EIRP (mW)	Lmit (W)
19975	1712.5	22.38	1.93	24.31	269.77	1
20175	1732.5	22.32	1.93	24.25	266.07	1
20375	1752.5	22.46	1.93	24.39	274.79	1

LTE B4 5M 64QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	EIRP (dBm)	EIRP (mW)	Lmit (W)
19975	1712.5	21.27	1.93	23.2	208.93	1
20175	1732.5	21.26	1.93	23.19	208.45	1
20375	1752.5	21.36	1.93	23.29	213.3	1

LTE B4 10M QPSK						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	EIRP (dBm)	EIRP (mW)	Lmit (W)
20000	1715	23.14	1.93	25.07	321.37	1
20175	1732.5	23.03	1.93	24.96	313.33	1
20350	1750	23.1	1.93	25.03	318.42	1

LTE B4 10M 16QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	EIRP (dBm)	EIRP (mW)	Lmit (W)
20000	1715	22.39	1.93	24.32	270.4	1
20175	1732.5	22.32	1.93	24.25	266.07	1
20350	1750	22.53	1.93	24.46	279.25	1

LTE B4 10M 64QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	EIRP (dBm)	EIRP (mW)	Lmit (W)
20000	1715	21.31	1.93	23.24	210.86	1
20175	1732.5	21.21	1.93	23.14	206.06	1
20350	1750	21.39	1.93	23.32	214.78	1

LTE B4 15M QPSK						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	EIRP (dBm)	EIRP (mW)	Lmit (W)
20025	1717.5	23.25	1.93	25.18	329.61	1
20175	1732.5	23.09	1.93	25.02	317.69	1
20325	1747.5	23.13	1.93	25.06	320.63	1

LTE B4 15M 16QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	EIRP (dBm)	EIRP (mW)	Lmit (W)
20025	1717.5	22.47	1.93	24.4	275.42	1
20175	1732.5	22.32	1.93	24.25	266.07	1
20325	1747.5	22.47	1.93	24.4	275.42	1

LTE B4 15M 64QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	EIRP (dBm)	EIRP (mW)	Lmit (W)
20025	1717.5	21.35	1.93	23.28	212.81	1
20175	1732.5	21.29	1.93	23.22	209.89	1
20325	1747.5	21.32	1.93	23.25	211.35	1

LTE B4 20M QPSK						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	EIRP (dBm)	EIRP (mW)	Lmit (W)
20050	1720	23.28	1.93	25.21	331.89	1
20175	1732.5	23.14	1.93	25.07	321.37	1
20300	1745	23.24	1.93	25.17	328.85	1

LTE B4 20M 16QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	EIRP (dBm)	EIRP (mW)	Lmit (W)
20050	1720	22.51	1.93	24.44	277.97	1
20175	1732.5	22.46	1.93	24.39	274.79	1
20300	1745	22.54	1.93	24.47	279.9	1

LTE B4 20M 64QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	EIRP (dBm)	EIRP (mW)	Lmit (W)
20050	1720	21.41	1.93	23.34	215.77	1
20175	1732.5	21.35	1.93	23.28	212.81	1
20300	1745	21.41	1.93	23.34	215.77	1

REMARKS: EIRP Output Power (dBm) = EIRP (dBm) -2.15(dB).

LTE BAND 66

LTE B66 1.4M QPSK						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	EIRP (dBm)	EIRP (mW)	Lmit (W)
131979	1710.7	23.18	1.93	25.11	324.34	1
132322	1745	23.24	1.93	25.17	328.85	1
132665	1779.3	23.54	1.93	25.47	352.37	1

LTE B66 1.4M 16QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	EIRP (dBm)	EIRP (mW)	Lmit (W)
131979	1710.7	22.52	1.93	24.45	278.61	1
132322	1745	22.51	1.93	24.44	277.97	1
132665	1779.3	22.84	1.93	24.77	299.92	1

LTE B66 1.4M 64QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	EIRP (dBm)	EIRP (mW)	Lmit (W)
131979	1710.7	21.34	1.93	23.27	212.32	1
132322	1745	21.38	1.93	23.31	214.29	1
132665	1779.3	21.67	1.93	23.6	229.09	1

LTE B66 3M QPSK						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	EIRP (dBm)	EIRP (mW)	Lmit (W)
131987	1711.5	23.1	1.93	25.03	318.42	1
132322	1745	23.04	1.93	24.97	314.05	1
132657	1778.5	23.53	1.93	25.46	351.56	1

LTE B66 3M 16QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	EIRP (dBm)	EIRP (mW)	Lmit (W)
131987	1711.5	22.52	1.93	24.45	278.61	1
132322	1745	22.45	1.93	24.38	274.16	1
132657	1778.5	22.82	1.93	24.75	298.54	1

LTE B66 3M 64QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	EIRP (dBm)	EIRP (mW)	Lmit (W)
131987	1711.5	21.36	1.93	23.29	213.3	1
132322	1745	21.25	1.93	23.18	207.97	1
132657	1778.5	21.72	1.93	23.65	231.74	1

LTE B66 5M QPSK						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	EIRP (dBm)	EIRP (mW)	Lmit (W)
131997	1712.5	23.09	1.93	25.02	317.69	1
132322	1745	22.92	1.93	24.85	305.49	1
132647	1777.5	23.5	1.93	25.43	349.14	1

LTE B66 5M 16QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	EIRP (dBm)	EIRP (mW)	Lmit (W)
131997	1712.5	22.59	1.93	24.52	283.14	1
132322	1745	22.47	1.93	24.4	275.42	1
132647	1777.5	22.82	1.93	24.75	298.54	1

LTE B66 5M 64QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	EIRP (dBm)	EIRP (mW)	Lmit (W)
131997	1712.5	21.39	1.93	23.32	214.78	1
132322	1745	21.36	1.93	23.29	213.3	1
132647	1777.5	21.67	1.93	23.6	229.09	1

LTE B66 10M QPSK						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	EIRP (dBm)	EIRP (mW)	Lmit (W)
132022	1715	23.09	1.93	25.02	317.69	1
132322	1745	23.02	1.93	24.95	312.61	1
132622	1775	23.51	1.93	25.44	349.95	1

LTE B66 10M 16QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	EIRP (dBm)	EIRP (mW)	Lmit (W)
132022	1715	22.51	1.93	24.44	277.97	1
132322	1745	22.4	1.93	24.33	271.02	1
132622	1775	22.89	1.93	24.82	303.39	1

LTE B66 10M 64QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	EIRP (dBm)	EIRP (mW)	Lmit (W)
132022	1715	21.32	1.93	23.25	211.35	1
132322	1745	21.35	1.93	23.28	212.81	1
132622	1775	21.68	1.93	23.61	229.61	1

LTE B66 15M QPSK						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	EIRP (dBm)	EIRP (mW)	Lmit (W)
132047	1717.5	22.99	1.93	24.92	310.46	1
132322	1745	23.03	1.93	24.96	313.33	1
132597	1772.5	23.44	1.93	25.37	344.35	1

LTE B66 15M 16QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	EIRP (dBm)	EIRP (mW)	Lmit (W)
132047	1717.5	22.49	1.93	24.42	276.69	1
132322	1745	22.4	1.93	24.33	271.02	1
132597	1772.5	22.93	1.93	24.86	306.2	1

LTE B66 15M 64QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	EIRP (dBm)	EIRP (mW)	Lmit (W)
132047	1717.5	21.37	1.93	23.3	213.8	1
132322	1745	21.36	1.93	23.29	213.3	1
132597	1772.5	21.7	1.93	23.63	230.67	1

LTE B66 20M QPSK						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	EIRP (dBm)	EIRP (mW)	Lmit (W)
132072	1720	23.13	1.93	25.06	320.63	1
132322	1745	23.07	1.93	25	316.23	1
132572	1770	23.57	1.93	25.5	354.81	1

LTE B66 20M 16QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	EIRP (dBm)	EIRP (mW)	Lmit (W)
132072	1720	22.6	1.93	24.53	283.79	1
132322	1745	22.52	1.93	24.45	278.61	1
132572	1770	22.95	1.93	24.88	307.61	1

LTE B66 20M 64QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	Gain (dBi)	EIRP (dBm)	EIRP (mW)	Lmit (W)
132072	1720	21.44	1.93	23.37	217.27	1
132322	1745	21.39	1.93	23.32	214.78	1
132572	1770	21.82	1.93	23.75	237.14	1

REMARKS: EIRP Output Power (dBm) = EIRP (dBm) -2.15(dB).

3.2 FREQUENCY STABILITY MEASUREMENT

3.2.1 LIMITS OF FREQUENCY STABILIITY MEASUREMENT

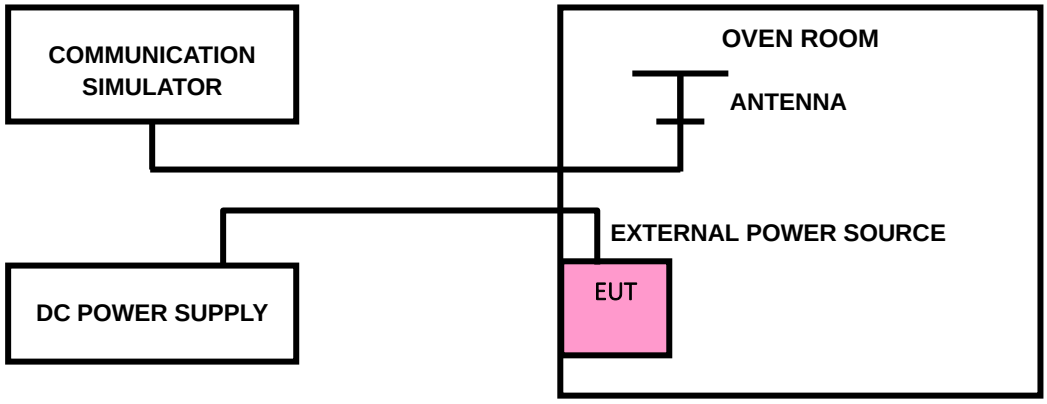
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

3.2.2 TEST PROCEDURE

a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
b. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
c. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ±0.5℃ during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

NOTE: The frequency error was recorded frequency error from the communication simulator.

3.2.3 TEST SETUP



3.2.4 TEST RESULTS

Please Refer to Appendix E Of this test report.

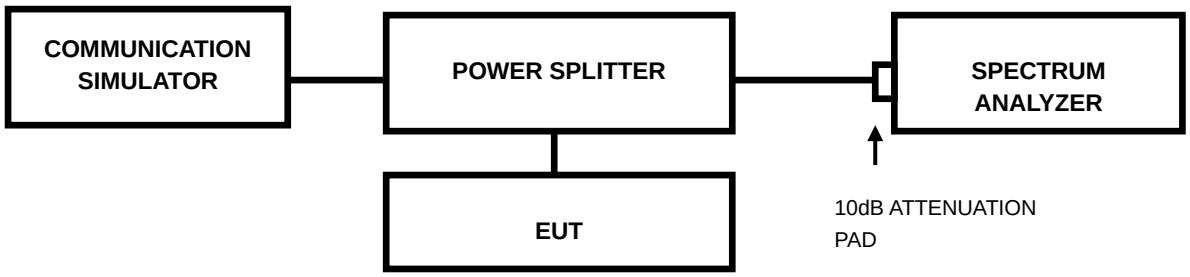
Note: VL = Low voltage(3.8V); VN/NV = Normal voltage(4V); VH = High voltage(4.2V);
NT = Normal temperature (25℃)

3.3 OCCUPIED BANDWIDTH MEASUREMENT

3.3.1 LIMITS OF OCCUPIED BANDWIDTH MEASUREMENT

The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 %of the total mean power of a given emission.

3.3.2 TEST SETUP



3.3.3 TEST PROCEDURES

a. The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
b. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

3.3.4 TEST RESULTS

Please Refer to Appendix E Of this test report.

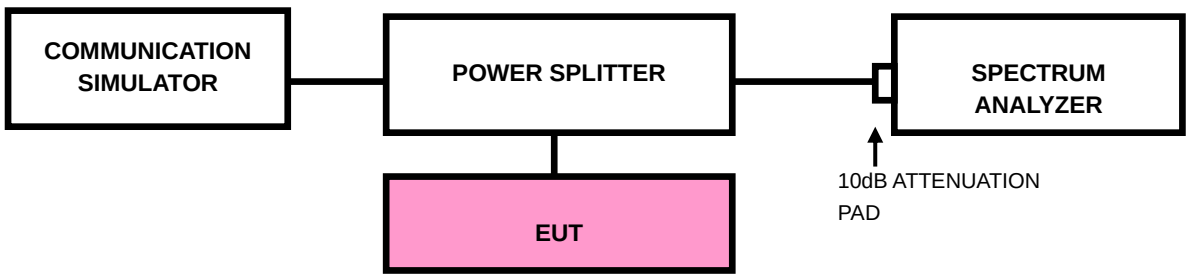
3.4 BAND EDGE MEASUREMENT

3.4.1 LIMITS OF BAND EDGE MEASUREMENT

According to FCC Part 27.53(h) specified that For operations in the 1710-1755 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

According to FCC Part 27.53(m)(4) specified that For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees. For mobile digital stations, in the 1 megahertz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed.

3.4.2 TEST SETUP



3.4.3 TEST PROCEDURES

a) Connect the transmitter to the spectrum analyzer via coaxial cable while ensuring proper impedance matching.

b) Tune the analyzer to the nominal center frequency of the emission bandwidth (EBW).

c) Set the resolution bandwidth (RBW) ≧ 1% EBW in the 1MHz band immediately outside and adjacent to the band edge.

d) Beyond the 1MHz band from the band edge, RBW=1MHz was used.

e) Set the video bandwidth (VBW) to ≧3 x RBW.

f) Select the average power (RMS) display detector.

g) Set the number of measurement points to ≧ 1001.

h) Use auto-coupled sweep time.

i) Perform the measurement over an interval of time when the transmission is continuous and at its maximum power level.

j) The RF fundamental frequency should be excluded against the limit line in the operating frequency band and use RBW is 10KHz or 100KHz.

k) Record the max trace plot into the test report.

3.4.4 TEST RESULTS

Please Refer to Appendix E Of this test report.

3.5 CONDUCTED SPURIOUS EMISSIONS

3.5.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. The emission limit equal to –13dBm.

For: Band41

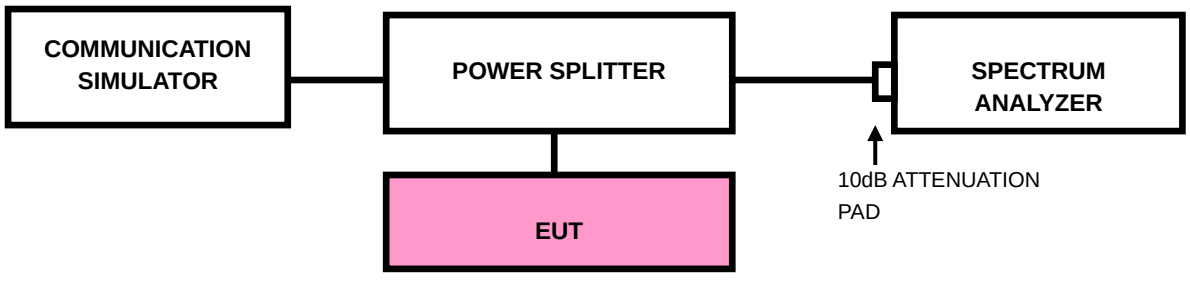
The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 55 +10 log10(P) dB. The limit of emission is equal to -25dBm.

3.5.2 TEST PROCEDURE

a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.

b. Measuring frequency range is from 9kHz up to a frequency including its 10th harmonic. 10dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.

3.5.3 TEST SETUP



3.5.4 TEST RESULTS

NOTE：The 9K~30MHz amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required in the report.

Please Refer to Appendix E Of this test report.

3.6 RADIATED EMISSION MEASUREMENT

3.6.1 LIMITS OF RADIATED EMISSION MEASUREMENT

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. The emission limit equal to –13dBm.

3.6.2 TEST PROCEDURES

a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m 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 substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value “ of step a. Record the power level of S.G.
c. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.
d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power - 2.15dBi.

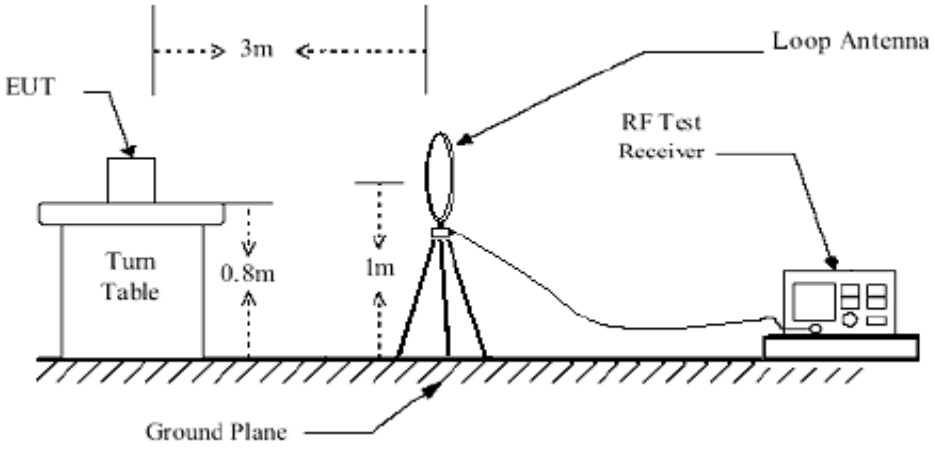
NOTE: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

3.6.3 DEVIATION FROM TEST STANDARD

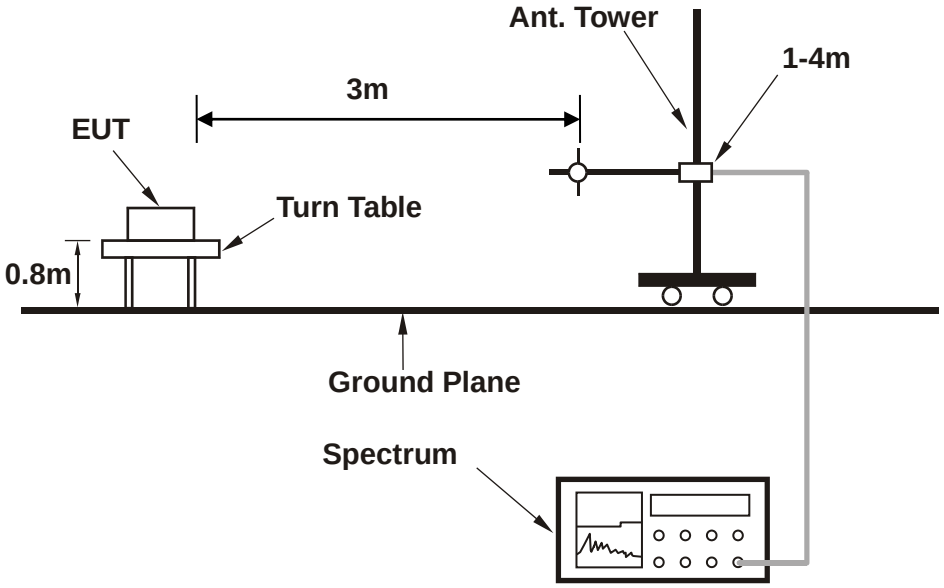
No deviation

3.6.4 TEST SETUP

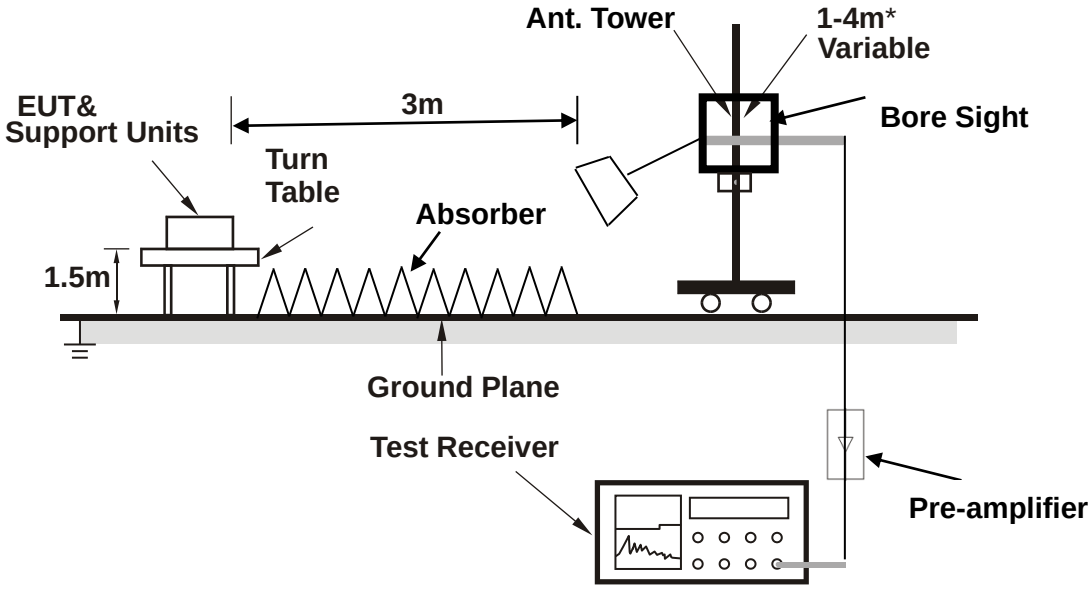
< Frequency Range below 30MHz >



< Frequency Range 30MHz~1GHz >



<Frequency Range above 1GHz>



Note: Above 1G is a directional antenna depends on the EUT height and the antenna 3dB beamwidth both, refer to section 7.3 of CISPR 16-2-3.

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

3.6.5 TEST RESULTS

NOTE： The 9K~30MHz amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required in the report.

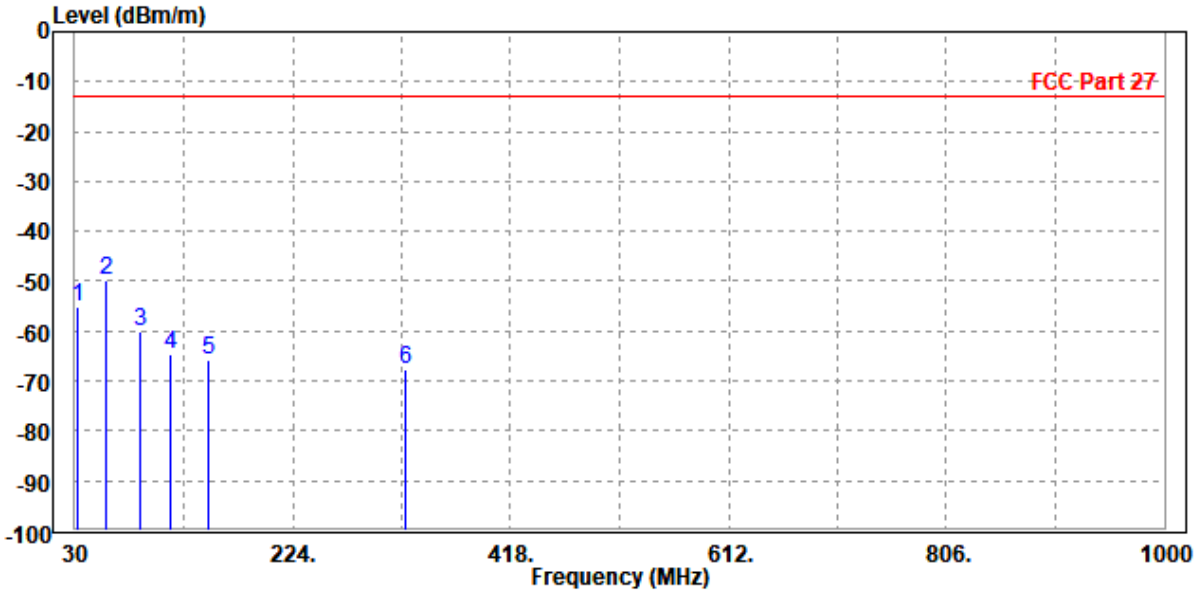
BELOW 1GHz WORST-CASE DATA

30 MHz – 1GHz data:

LTE Band 66
CHANNEL BANDWIDTH: 10MHz / QPSK

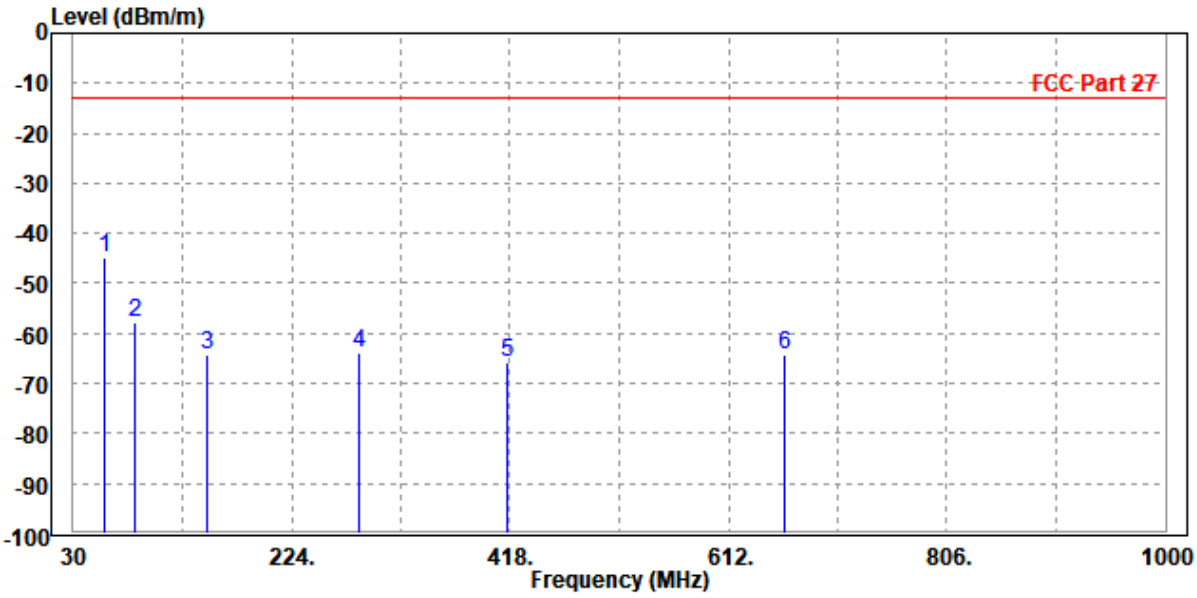
MODE	TX channel 132322	**FREQUENCY RANGE**	Below 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	DC 14V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	31.940	-55.26	-52.22	-13.00	-42.26	-3.04	Peak	Horizontal
2 PP	58.130	-49.63	-37.41	-13.00	-36.63	-12.22	Peak	Horizontal
3	88.200	-59.93	-47.20	-13.00	-46.93	-12.73	Peak	Horizontal
4	115.360	-64.45	-49.37	-13.00	-51.45	-15.08	Peak	Horizontal
5	148.340	-65.61	-51.19	-13.00	-52.61	-14.42	Peak	Horizontal
6	324.880	-67.64	-59.31	-13.00	-54.64	-8.33	Peak	Horizontal



MODE	TX channel 132322	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 14V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1 PP	58.130	-44.88	-26.20	-13.00	-31.88	-18.68	Peak	Vertical
2	85.290	-57.91	-39.78	-13.00	-44.91	-18.13	Peak	Vertical
3	148.340	-64.39	-50.86	-13.00	-51.39	-13.53	Peak	Vertical
4	284.140	-64.06	-60.55	-13.00	-51.06	-3.51	Peak	Vertical
5	415.090	-65.78	-61.47	-13.00	-52.78	-4.31	Peak	Vertical
6	661.470	-64.37	-64.03	-13.00	-51.37	-0.34	Peak	Vertical



ABOVE 1GHz

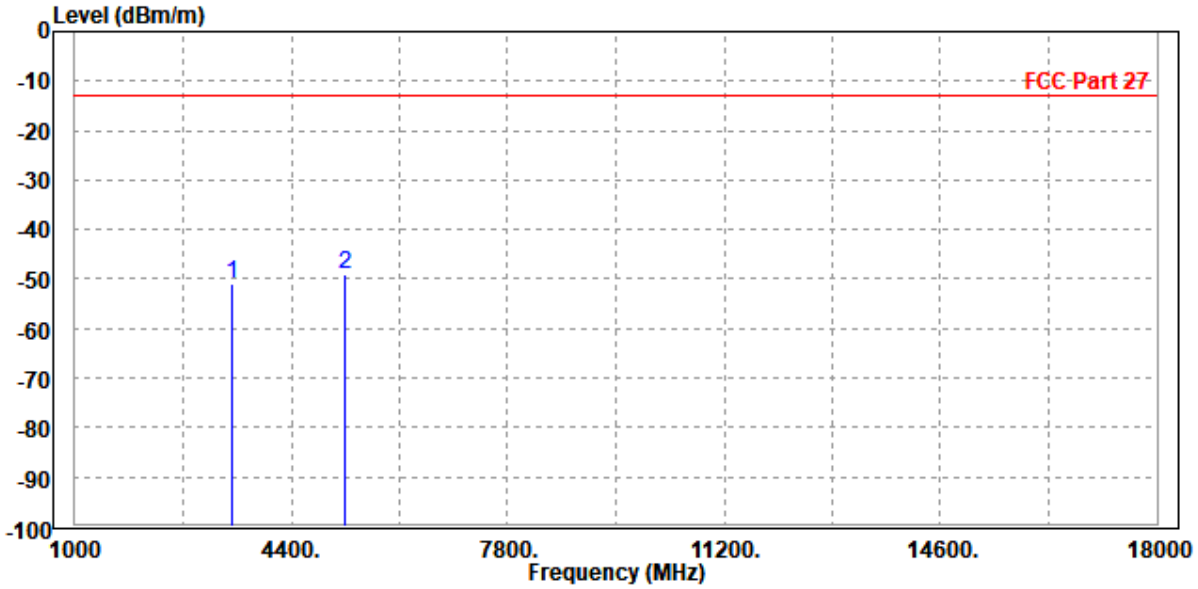
Note: For higher frequency, the emission is too low to be detected.

LTE B66

CHANNEL BANDWIDTH: 1.4MHz / QPSK

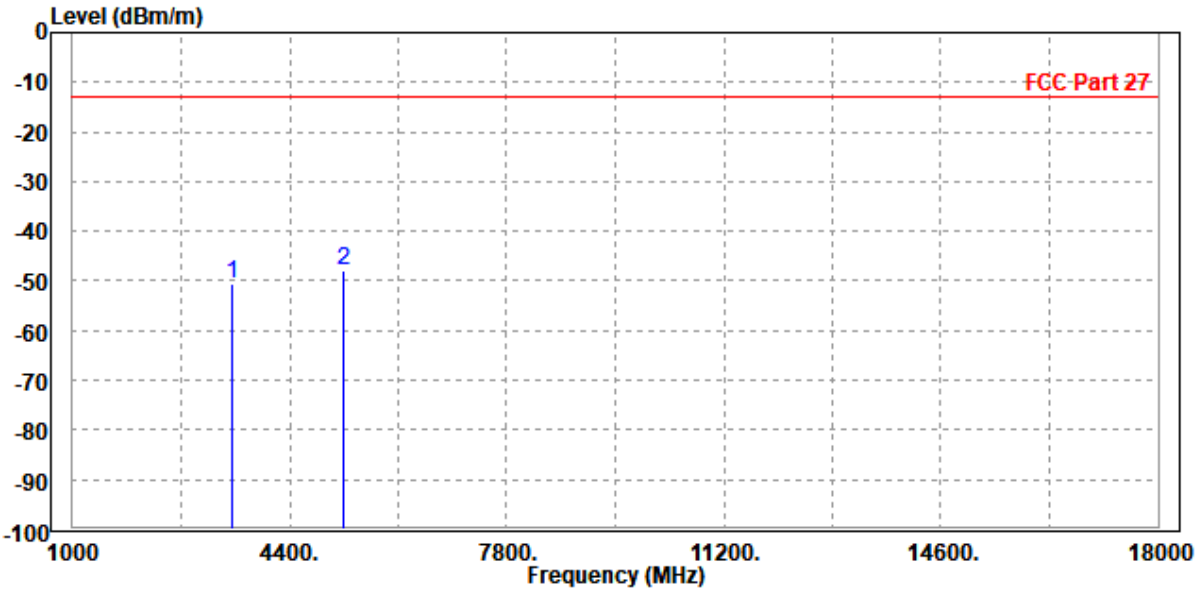
MODE	TX channel 132322	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	DC 14V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3482.000	-51.01	-59.56	-13.00	-38.01	8.55	Peak	Horizontal
2 PP	5235.000	-49.11	-60.52	-13.00	-36.11	11.41	Peak	Horizontal



MODE	TX channel 132322	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 14V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

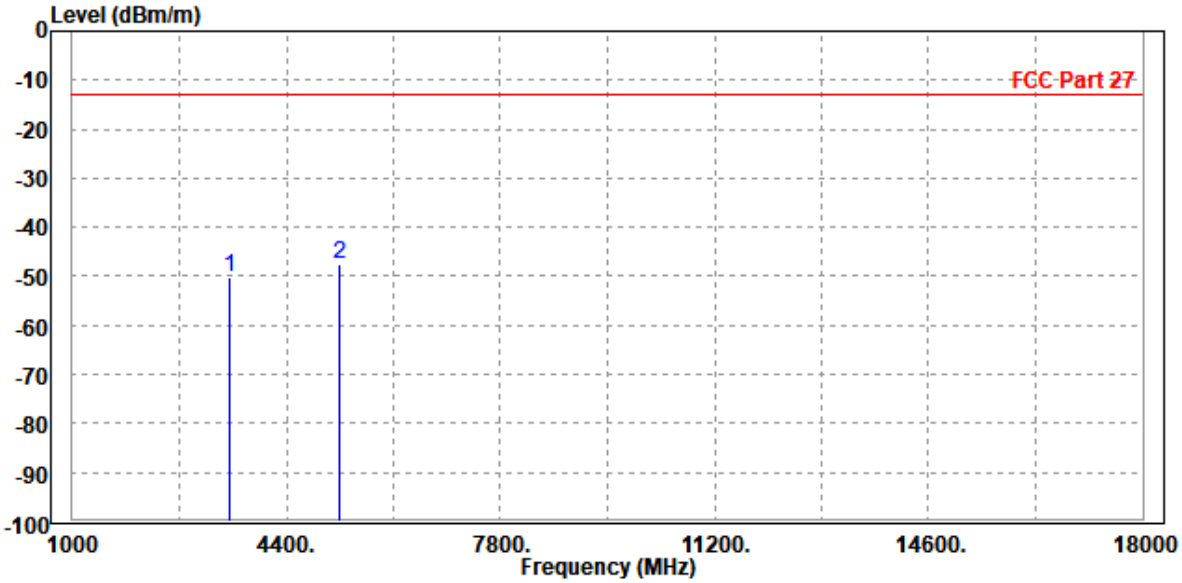
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3490.000	-50.52	-59.16	-13.00	-37.52	8.64	Peak	Vertical
2 PP	5233.000	-48.03	-59.85	-13.00	-35.03	11.82	Peak	Vertical



CHANNEL BANDWIDTH: 3MHz / QPSK

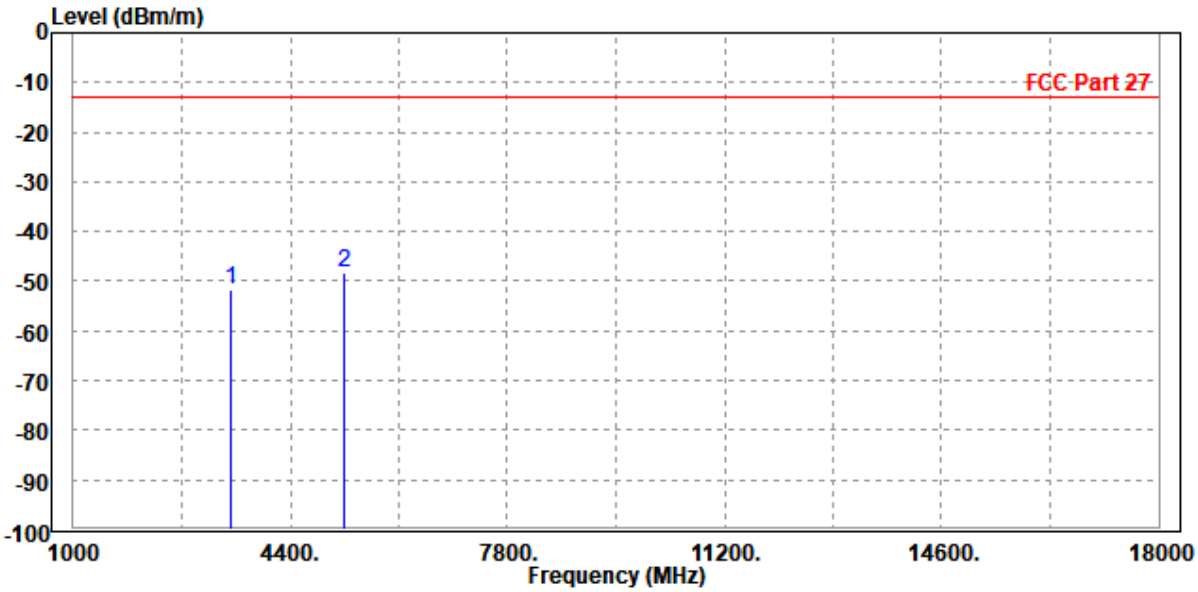
MODE	TX channel 132322	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	DC 14V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3490.000	-50.20	-58.75	-13.00	-37.20	8.55	Peak	Horizontal
2 PP	5233.000	-47.70	-59.10	-13.00	-34.70	11.40	Peak	Horizontal



MODE	TX channel 132322	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 14V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

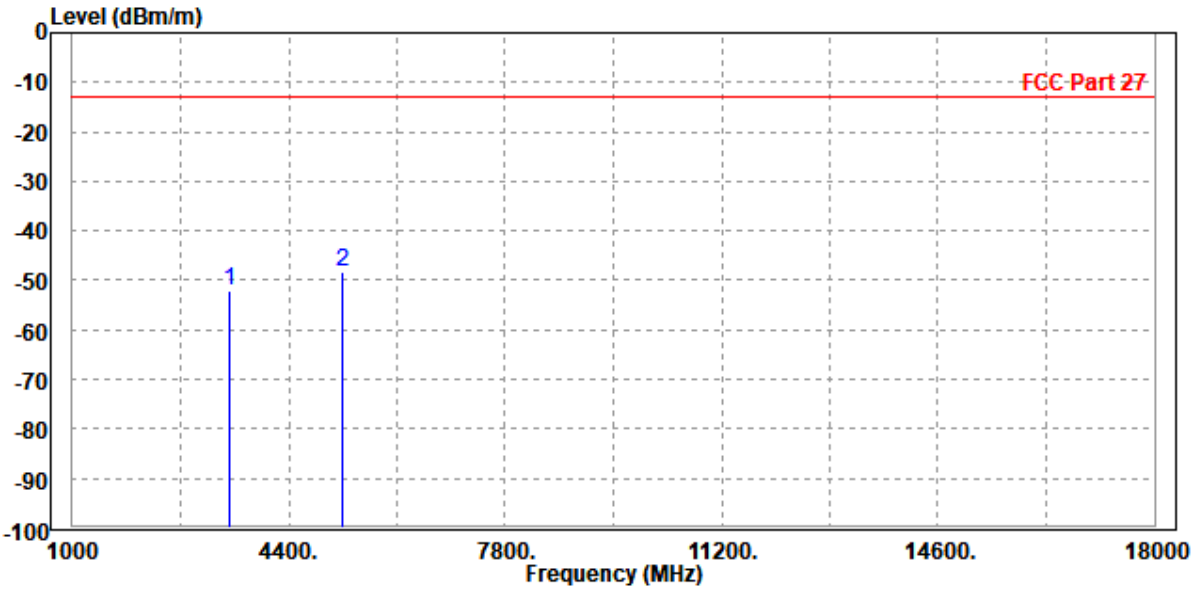
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3482.000	-51.54	-60.19	-13.00	-38.54	8.65	Peak	Vertical
2 PP	5235.000	-48.43	-60.26	-13.00	-35.43	11.83	Peak	Vertical



CHANNEL BANDWIDTH: 5MHz / QPSK

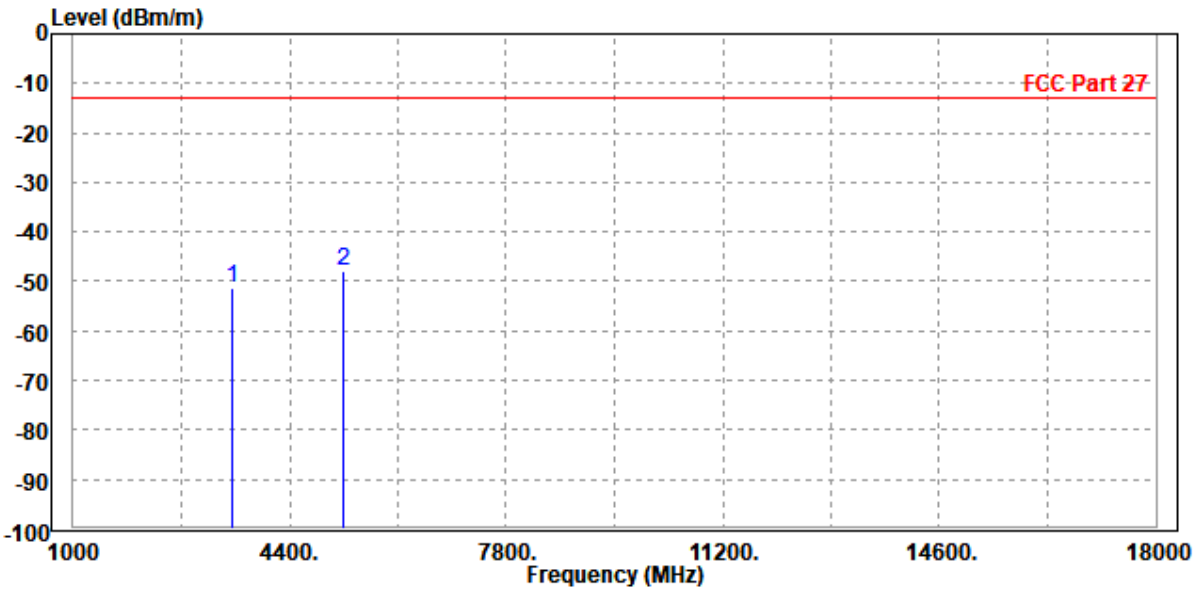
MODE	TX channel 132322	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	DC 14V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3482.000	-52.26	-60.81	-13.00	-39.26	8.55	Peak	Horizontal
2 PP	5235.000	-48.27	-59.68	-13.00	-35.27	11.41	Peak	Horizontal



MODE	TX channel 132322	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 14V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

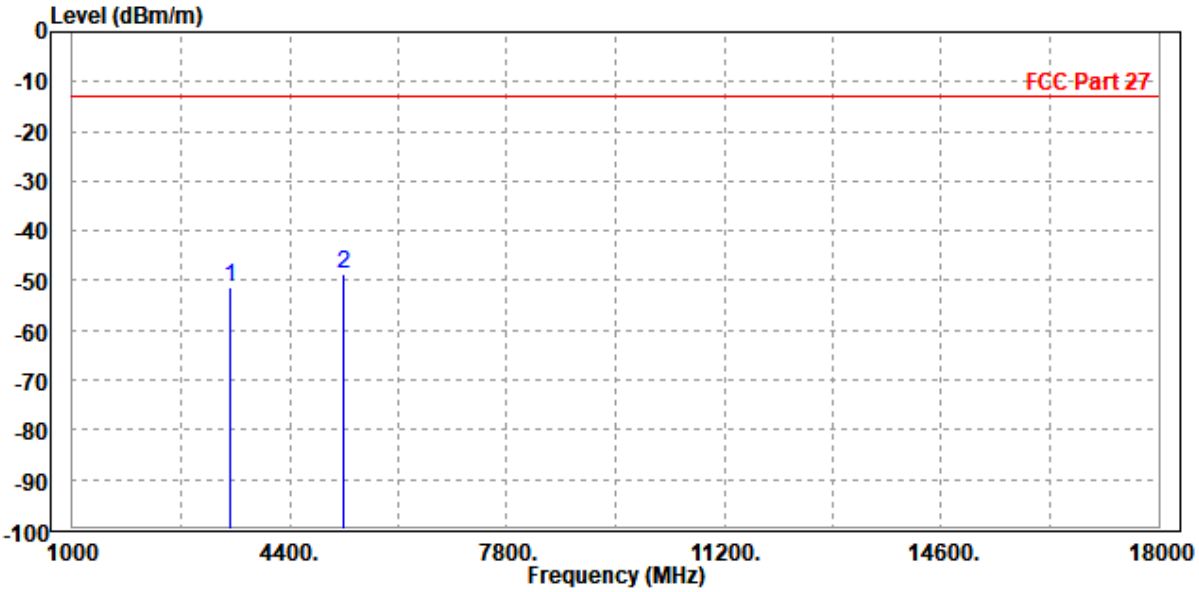
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3490.000	-51.32	-59.96	-13.00	-38.32	8.64	Peak	Vertical
2 PP	5233.000	-47.94	-59.76	-13.00	-34.94	11.82	Peak	Vertical



CHANNEL BANDWIDTH: 10MHz / QPSK

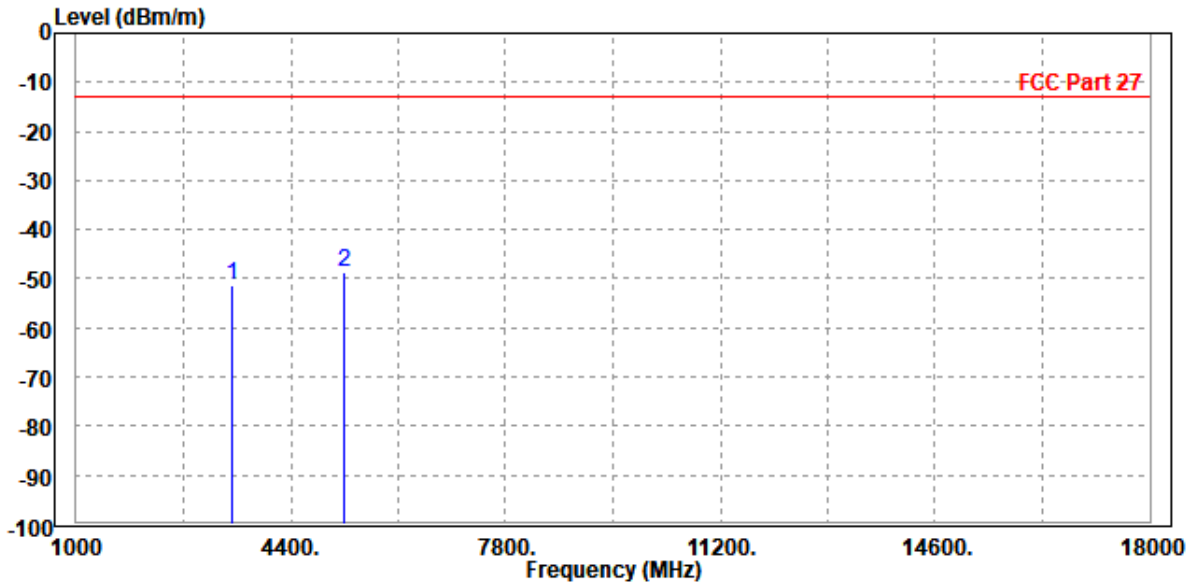
MODE	TX channel 132322	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	DC 14V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

		Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
		MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1		3482.000	-51.38	-60.03	-13.00	-38.38	8.65	Peak	Horizontal
2	PP	5235.000	-48.79	-60.62	-13.00	-35.79	11.83	Peak	Horizontal



MODE	TX channel 132322	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 14V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

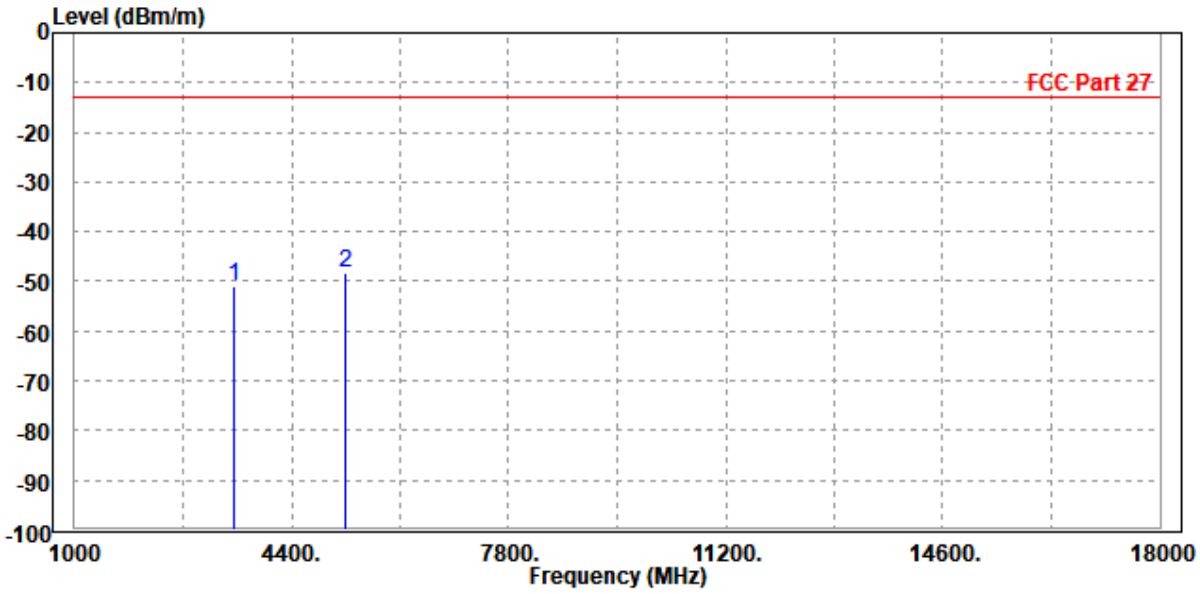
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3482.000	-51.38	-60.03	-13.00	-38.38	8.65	Peak	Vertical
2 PP	5235.000	-48.79	-60.62	-13.00	-35.79	11.83	Peak	Vertical



CHANNEL BANDWIDTH: 15MHz / QPSK

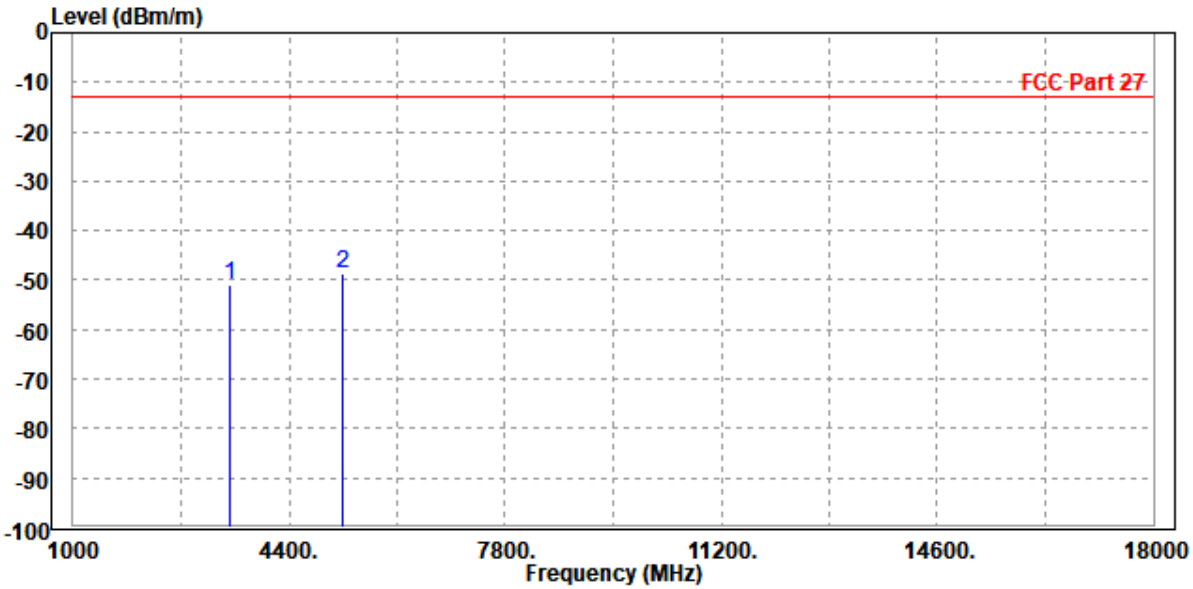
MODE	TX channel 132322	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	DC 14V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3490.000	-50.81	-59.36	-13.00	-37.81	8.55	Peak	Horizontal
2 PP	5233.000	-48.43	-59.83	-13.00	-35.43	11.40	Peak	Horizontal



MODE	TX channel 132322	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 14V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3482.000	-50.91	-59.56	-13.00	-37.91	8.65	Peak	Vertical
2 PP	5235.000	-48.62	-60.45	-13.00	-35.62	11.83	Peak	Vertical

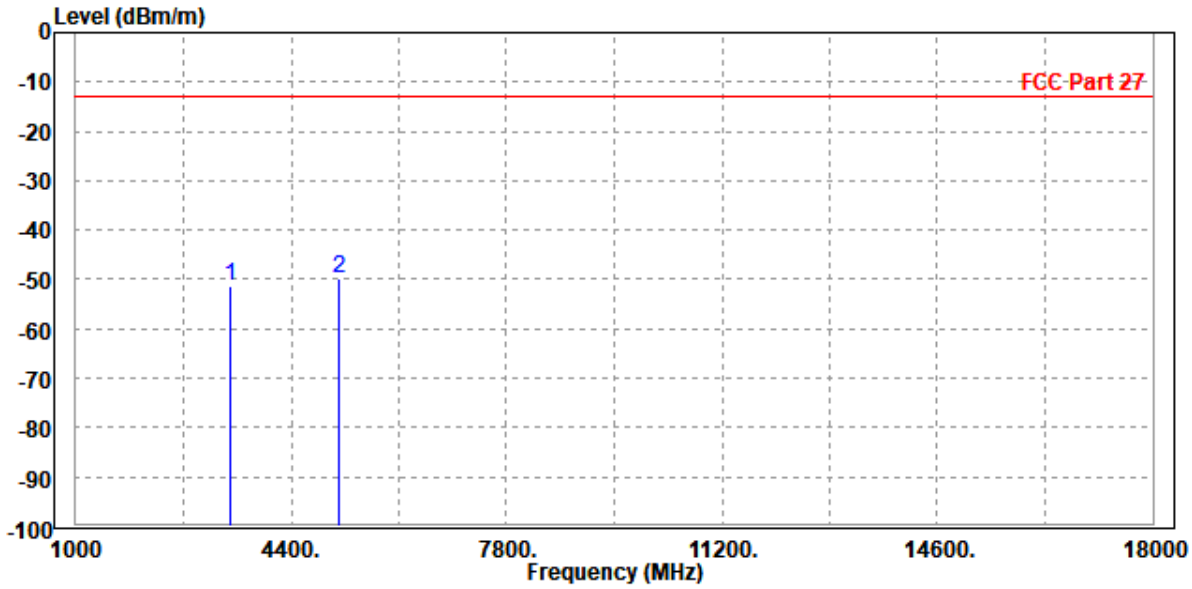


CHANNEL BANDWIDTH: 20MHz / QPSK

CH132072

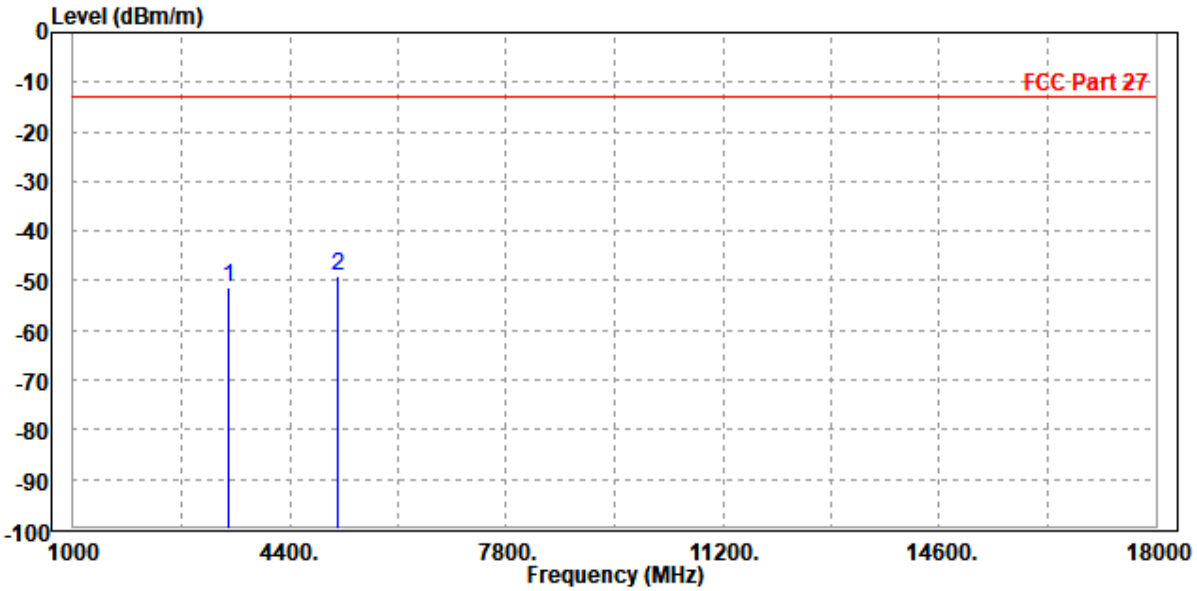
MODE	TX channel 132072	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	DC 14V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3440.000	-51.48	-60.00	-13.00	-38.48	8.52	Peak	Horizontal
2 PP	5165.000	-49.78	-61.08	-13.00	-36.78	11.30	Peak	Horizontal



MODE	TX channel 132072	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 14V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

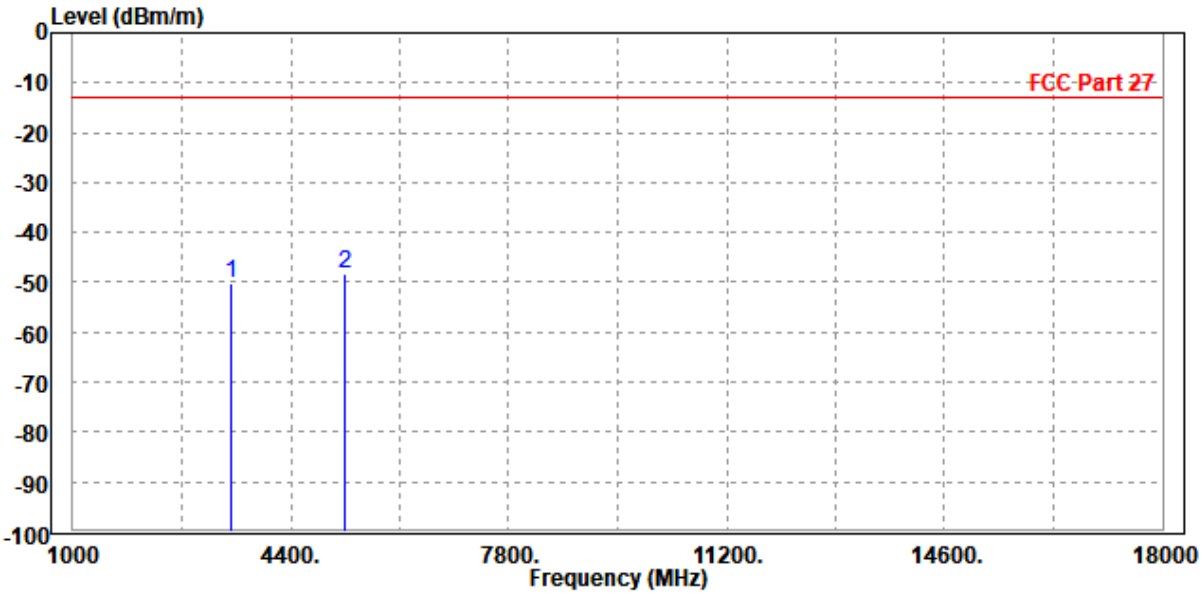
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3448.000	-51.45	-60.11	-13.00	-38.45	8.66	Peak	Vertical
2 PP	5160.000	-49.07	-60.75	-13.00	-36.07	11.68	Peak	Vertical



CH132322

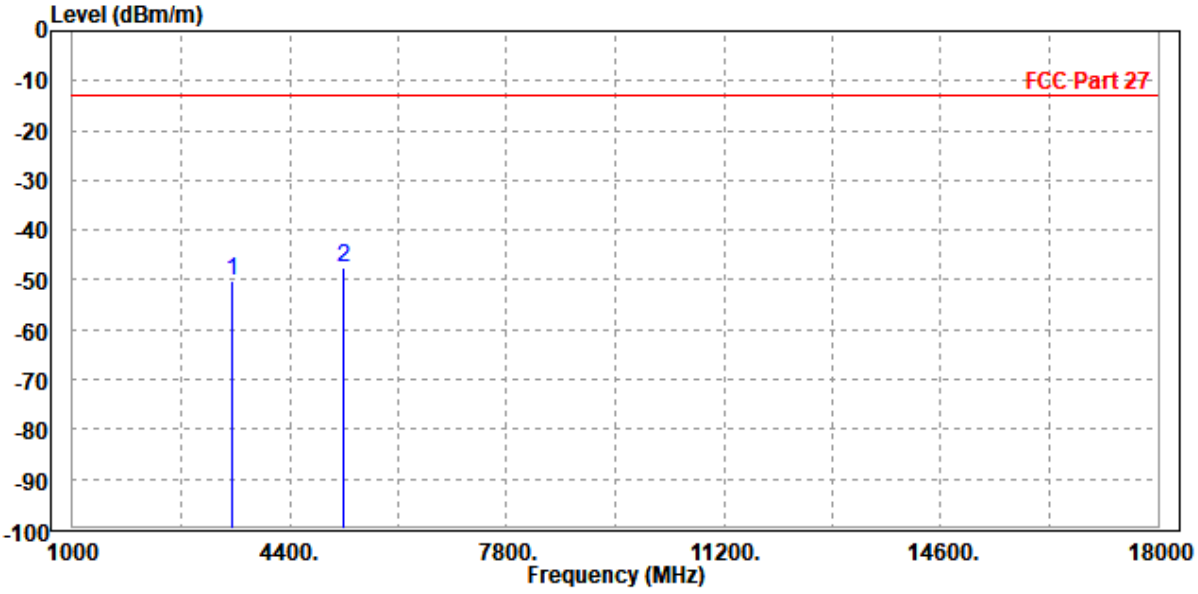
MODE	TX channel 132322	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	DC 14V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3482.000	-50.23	-58.78	-13.00	-37.23	8.55	Peak	Horizontal
2 PP	5235.000	-48.34	-59.75	-13.00	-35.34	11.41	Peak	Horizontal



MODE	TX channel 132322	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 14V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

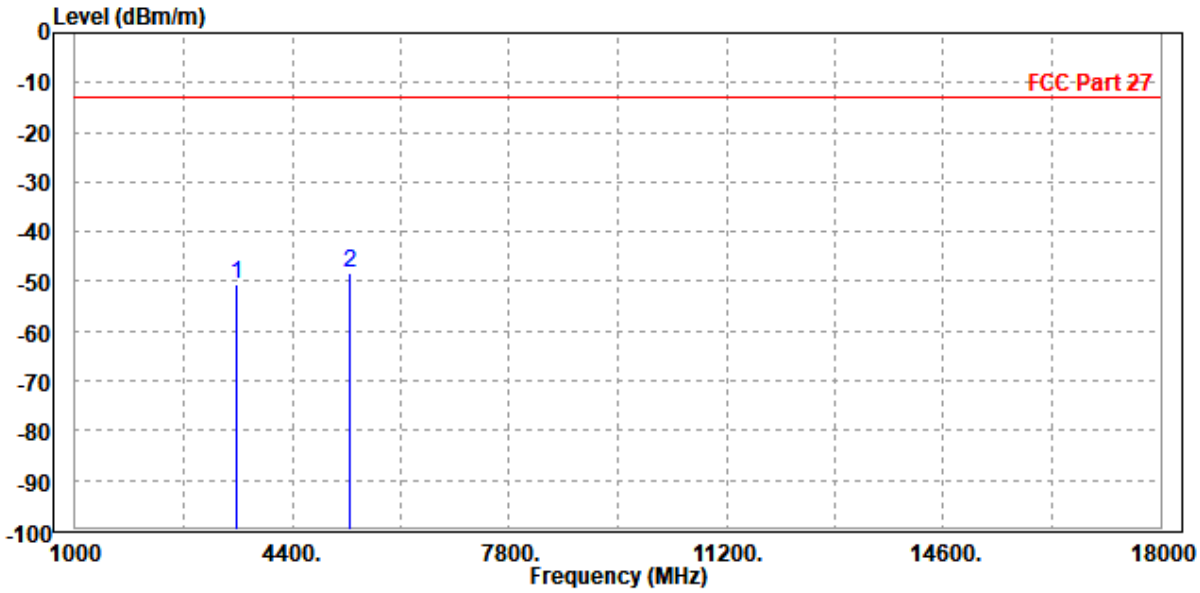
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3490.000	-50.01	-58.65	-13.00	-37.01	8.64	Peak	Vertical
2 PP	5233.000	-47.65	-59.47	-13.00	-34.65	11.82	Peak	Vertical



CH132572

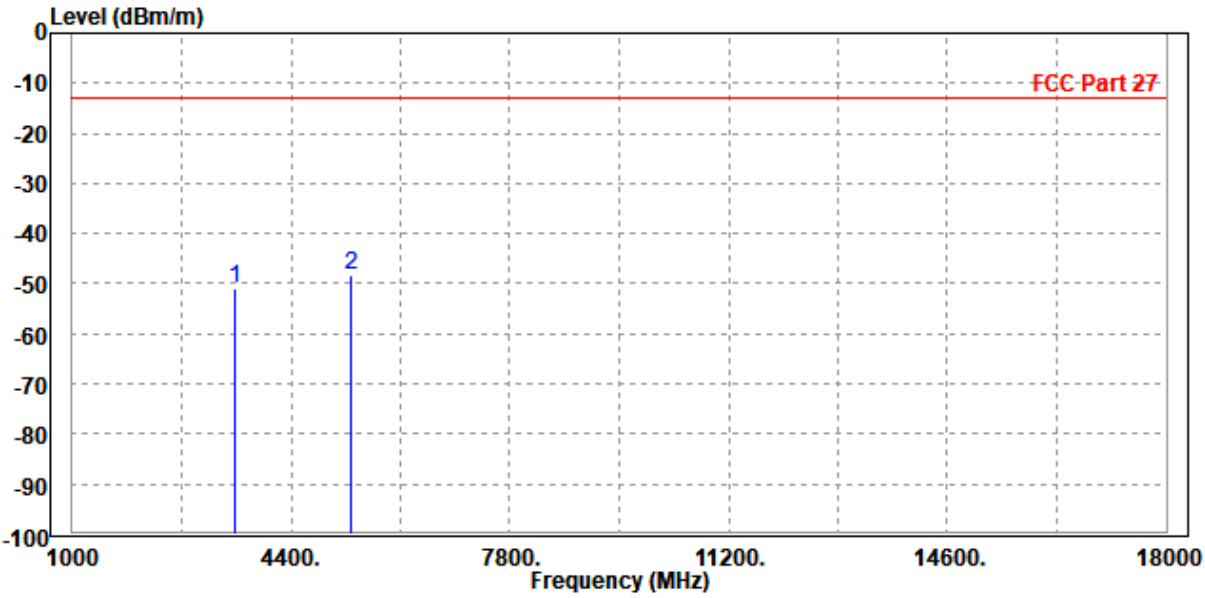
MODE	TX channel 132572	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 14V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3533.000	-50.38	-58.91	-13.00	-37.38	8.53	Peak	Horizontal
2 PP	5310.000	-48.33	-59.85	-13.00	-35.33	11.52	Peak	Horizontal



MODE	TX channel 132572	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 14V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3540.000	-51.11	-59.75	-13.00	-38.11	8.64	Peak	Vertical
2 PP	5318.000	-48.20	-60.19	-13.00	-35.20	11.99	Peak	Vertical

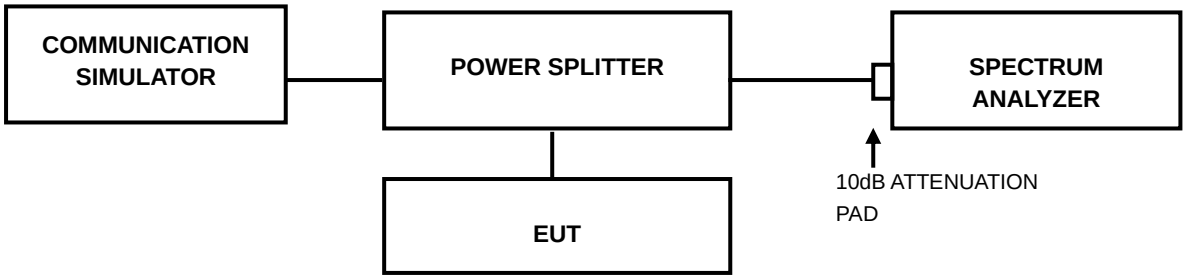


3.7 PEAK TO AVERAGE RATIO

3.7.1 LIMITS OF PEAK TO AVERAGE RATIO MEASUREMENT

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

3.7.2 TEST SETUP



3.7.3 TEST PROCEDURES

1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1%.

3.7.4 TEST RESULTS

Please Refer to Appendix E Of this test report.

4 INFORMATION ON THE TESTING LABORATORIES

We, BV 7LAYERS COMMUNICATIONS TECHNOLOGY (SHENZHEN) CO. LTD., were founded in 2015 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are 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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Email: customerservice.sw@cn.bureauveritas.com
Web Site: www.adt.com.tw

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

5 MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

--END--