

FCC TEST REPORT

(PART 27)

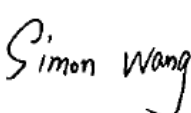
Applicant:	Micron Electronics LLC.
Address:	1001 Yamato Road, Suite 400, Boca Raton, FL 33431, USA

Manufacturer or Supplier:	Micron Electronics LLC.
Address:	1001 Yamato Road, Suite 400, Boca Raton, FL 33431, USA
Product:	Tracker
Brand Name:	Prime
Model Name:	CK106
FCC ID:	ZKQ-CK106
Date of tests:	Feb. 16, 2023 ~ Mar. 06, 2023

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
 Date: Mar. 06, 2023	 Date: Mar. 06, 2023

This report is governed by, and incorporates by reference, the Conditions of Testing as posted at the date of issuance of this report at <http://www.bureauveritas.com/home/about-us/our-business/cps/about-us/terms-conditions/> and is intended for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. Measurement uncertainty is only provided upon request for accredited tests. Statements of conformity are based on simple acceptance criteria without taking measurement uncertainty into account, unless otherwise requested in writing. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence or if you require measurement uncertainty; provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents.

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Test Report No.: W7L-230216W001RF03

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
W7L-230216W001RF03	Original release	Mar. 06, 2023

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 TEST LAB*
§2.1046	Conducted Output Power	Compliance
§27.50(b)(10) §27.50(c)(10)	Effective Radiated Power (Band 12) (Band 13)	Compliance
§27.50(d)(4)	Equivalent Isotropically Radiated Power (Band 4)	Compliance
§2.1055 §27.54	Frequency Stability	See Note
§2.1049	Occupied Bandwidth	See Note
§2.1051 §27.53(h) §27.53(c)(2)(4) §27.53(g)	Conducted Band Edge Measurements (Band 4) (Band 12) (Band 13)	See Note
§2.1051 §27.53(h) §27.53(c)(2)(4) §27.53(g)	Conducted Spurious Emissions (Band 4) (Band 12) (Band 13)	See Note
§2.1053 §27.53(h) §27.53(c)(2)(4) §27.53(g)	Radiated Spurious Emissions (Band 4) (Band 12) (Band 13)	Compliance
§27.50(k)(4)	Peak to average ratio	See Note

NOTE: Refer to Module report I22W00076-CAT-M RF-FCC_Rev2/ I22W00076-NB-IoT RF-FCC-Rev2, FCC ID: 2AK9D-L710G.

1.1 MEASUREMENT UNCERTAINTY

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

MEASUREMENT	UNCERTAINTY
Frequency Stability	$\pm 76.97\text{Hz}$
Radiated emissions (9KHz~30MHz)	$\pm 2.68\text{dB}$
Radiated emissions & Radiated Power (30MHz~1GHz)	$\pm 4.98\text{dB}$
Radiated emissions & Radiated Power (1GHz ~6GHz)	$\pm 4.70\text{dB}$
Radiated emissions (6GHz ~18GHz)	$\pm 4.60\text{dB}$
Radiated emissions (18GHz ~40GHz)	$\pm 4.12\text{dB}$
Conducted emissions	$\pm 4.01\text{dB}$
Occupied Channel Bandwidth	$\pm 43.58\text{KHz}$
Conducted Output power	$\pm 2.06\text{dB}$
Band Edge Measurements	$\pm 4.70\text{dB}$

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	Feb. 18,22	Feb. 17,23
MXE EMI Receiver	KEYSIGHT	N9038A-544	MY54450026	Feb. 17,23	Feb. 16,24
EXA Signal Analyzer	KEYSIGHT	N9010A-544	MY54510355	May.15,22	May.14,23
Loop Antenna	Schwarzbeck	FMZB 1519B	00173	Sep.03,22	Sep.02,23
Bilog Antenna	ETS-LINDGRE N	3143B	00161965	Mar. 06,22	Mar. 05,23
Bilog Antenna	ETS-LINDGRE N	3143B	00161965	Mar. 05,23	Mar. 04,24
Horn Antenna	ETS-LINDGRE N	3117	00168692	Mar. 06,22	Mar. 05,23
Horn Antenna	ETS-LINDGRE N	3117	00168692	Mar. 05,23	Mar. 04,24
Horn Antenna (18GHz-40GHz)	N/A	QWH-SL-18-40-K- SG/QMS-00361	15433	Sep.04, 22	Sep.03, 23
Radio Communication Analyzer	ANRITSU	MT8820C	6201465426	Feb. 14,23	Feb. 13,24
Signal Pre-Amplifier	EMSI	EMC 9135	980249	May.12,22	May.11,23
Signal Pre-Amplifier	EMSI	EMC 012645B	980257	May.12,22	May.11,23
Signal Pre-Amplifier	EMSI	EMC 184045B	980259	Feb. 18,23	Feb.17,24
Signal Pre-Amplifier	EMSI	EMC 184045B	980259	Feb. 17,23	Feb.16,24
3m Semi-anechoic Chamber	ETS-LINDGRE N	9m*6m*6m	Euroshieldpn- CT0001143-121 6	May. 19,20	May. 18,23
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	1505	May. 07,22	May. 06,23
Power Meter	Anritsu	ML2495A	1506002	Feb. 14,23	Feb. 13,24
Power Sensor	Anritsu	MA2411B	1339352	May. 07,22	May. 06,23
Temperature Chamber	ESPEC	SH-242	93000855	May. 12,22	May. 11,23
MXG Analog Microvave Signal Generator	KEYSIGHT	N5183A	MY50143024	Feb. 14,23	Feb. 13,24
Base station R&S CMW500	Rohde&Schwa rz	CMW500	153085	May.12,22	May.11,23
DC Source	Kikusui/JP	PMX18-5A	N/A	Aug. 12,22	Aug. 11,23

- NOTE:**
1. The calibration interval of the above test instruments is 12 months or 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	Tracker		
BRAND NAME	Prime		
MODEL NAME	CK106		
NOMINAL VOLTAGE	12Vdc (DC Source) 3.8Vdc (Li-ion, battery)		
MODULATION TECHNOLOGY	LTE CAT-M1/NB-IOT		QPSK, 16QAM, BPSK
FREQUENCY RANGE	LTE CAT-M1	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
		LTE Band 12 Channel Bandwidth: 1.4MHz	699.7MHz ~ 715.3MHz
		LTE Band 12 Channel Bandwidth: 3MHz	700.5MHz ~ 714.5MHz
		LTE Band 12 Channel Bandwidth: 5MHz	701.5MHz ~ 713.5MHz
		LTE Band 12 Channel Bandwidth: 10MHz	704MHz ~ 711MHz
		LTE Band 13 Channel Bandwidth: 5MHz	779.5MHz ~ 784.5MHz
		LTE Band 13 Channel Bandwidth: 10MHz	782MHz

FREQUENCY RANGE	LTE NB-IOT	LTE Band 4 (SUB-CARRIER SPEACING: 3.75KHz)	1710.2MHz ~ 1754.8MHz
		LTE Band 4 (SUB-CARRIER SPEACING: 15KHz)	1710.2MHz ~ 1754.8MHz
		LTE Band 12 (SUB-CARRIER SPEACING: 3.75KHz)	699.2MHz ~ 715.8MHz
		LTE Band 12 (SUB-CARRIER SPEACING: 15KHz)	699.2MHz ~ 715.8MHz
		LTE Band 13 (SUB-CARRIER SPEACING: 3.75KHz)	777.2MHz ~ 786.8MHz
		LTE Band 13 (SUB-CARRIER SPEACING: 15KHz)	777.2MHz ~ 786.8MHz
MAX. EIRP POWER	LTE CAT-M1	LTE Band 4 Channel Bandwidth: 1.4MHz	44.26mW
		LTE Band 4 Channel Bandwidth: 3MHz	42.95mW
		LTE Band 4 Channel Bandwidth: 5MHz	44.57mW
		LTE Band 4 Channel Bandwidth: 10MHz	44.26mW
		LTE Band 4 Channel Bandwidth: 15MHz	44.57mW
		LTE Band 4 Channel Bandwidth: 20MHz	44.77mW
		LTE Band 12 Channel Bandwidth: 1.4MHz	29.72mW
		LTE Band 12 Channel Bandwidth: 3MHz	29.72mW
		LTE Band 12 Channel Bandwidth: 5MHz	29.92mW



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VERITAS**

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MAX. EIRP POWER	LTE CAT-M1	LTE Band 12 Channel Bandwidth: 10MHz	30.06mW
		LTE Band 13 Channel Bandwidth: 5MHz	4.72mW
		LTE Band 13 Channel Bandwidth: 10MHz	4.74mW
	LTE NB-IOT	LTE Band 4 (SUB-CARRIER SPEACING: 3.75KHz)	48.53mW
		LTE Band 4 (SUB-CARRIER SPEACING: 15KHz)	41.88mW
		LTE Band 12 (SUB-CARRIER SPEACING: 3.75KHz)	30.06mW
		LTE Band 12 (SUB-CARRIER SPEACING: 15KHz)	21.98mW
		LTE Band 13 (SUB-CARRIER SPEACING: 3.75KHz)	4.48mW
		LTE Band 13 (SUB-CARRIER SPEACING: 15KHz)	4.27mW
EMISSION DESIGNATOR	LTE CAT-M1	LTE Band 4 Channel Bandwidth: 1.4MHz	QPSK: 1M08G7D
			16QAM: 913KW7D
			64QAM: /
		LTE Band 4 Channel Bandwidth: 3MHz	QPSK: 1M10G7D
			16QAM: 933KW7D
			64QAM: /
		LTE Band 4 Channel Bandwidth: 5MHz	QPSK: 1M13G7D
			16QAM: 994KW7D
			64QAM: /
		LTE Band 4 Channel Bandwidth: 10MHz	QPSK: 1M12G7D
			16QAM: 1M13W7D
			64QAM: /
		LTE Band 4 Channel Bandwidth: 15MHz	QPSK: 1M16G7D
			16QAM: 1M12W7D
			64QAM: /



**BUREAU
VERITAS**

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EMISSION DESIGNATOR	LTE CAT-M1	LTE Band 4 Channel Bandwidth: 20MHz	QPSK: 1M16G7D
			16QAM: 1M09W7D
			64QAM: /
		LTE Band 12 Channel Bandwidth: 1.4MHz	QPSK: 1M09G7D
			16QAM: 924KW7D
			64QAM: /
		LTE Band 12 Channel Bandwidth: 3MHz	QPSK: 1M08G7D
			16QAM: 915KW7D
			64QAM: /
		LTE Band 12 Channel Bandwidth: 5MHz	QPSK: 1M09G7D
			16QAM: 923KW7D
			64QAM: /
		LTE Band 12 Channel Bandwidth: 10MHz	QPSK: 1M09G7D
			16QAM: 933KW7D
			64QAM: /
	LTE NB-IOT	LTE Band 13 Channel Bandwidth: 5MHz	QPSK: 1M12G7D
			16QAM: 954KW7D
			64QAM: /
		LTE Band 13 Channel Bandwidth: 10MHz	QPSK: 1M11G7D
			16QAM: 976KW7D
			64QAM: /
		LTE Band 4 (SUB-CARRIER SPEACING: 3.75KHz)	BPSK: 84K0G7D
			QPSK: 100KG7D
		LTE Band 4 (SUB-CARRIER SPEACING: 15KHz)	BPSK: 129KG7D
			QPSK: 187KG7D
		LTE Band 12 (SUB-CARRIER SPEACING: 3.75KHz)	BPSK: 75K0G7D
			QPSK: 91K1G7D
		LTE Band 12 (SUB-CARRIER SPEACING: 15KHz)	BPSK: 127KG7D
			QPSK: 186KG7D
		LTE Band 13 (SUB-CARRIER SPEACING: 3.75KHz)	BPSK: 73K8G7D
			QPSK: 92K4G7D



**BUREAU
VERITAS**

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EMISSION DESIGNATOR	LTE NB-IOT	LTE Band 13 (SUB-CARRIER SPEACING: 15KHz)	BPSK: 126KG7D
			QPSK: 188KG7D
ANTENNA TYPE	FPC Antenna with -4dBi gain for LTE4 FPC Antenna with -4dBi gain for LTE12 FPC Antenna with -12dBi gain for LTE13		
HW VERSION	CK106_MB_V2_PCBA		
SW VERSION	CK106V02.01B02PTCRB		
I/O PORTS	Refer to user's manual		
CABLE SUPPLIED	DC cable1: non-shielded cable, with w/o ferrite core, 0.23meter DC cable2: non-shielded cable, with w/o ferrite core, 0.23meter		
EXTREME TEMPERATURE	-30-85 °C		
EXTREME VOLTAGE	3.6V - 4.2V		

NOTE:

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

MODULATION MODE	TX FUNCTION
LTE	1TX/1RX

- For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.
- Sample 1 and Sample 2 Difference description

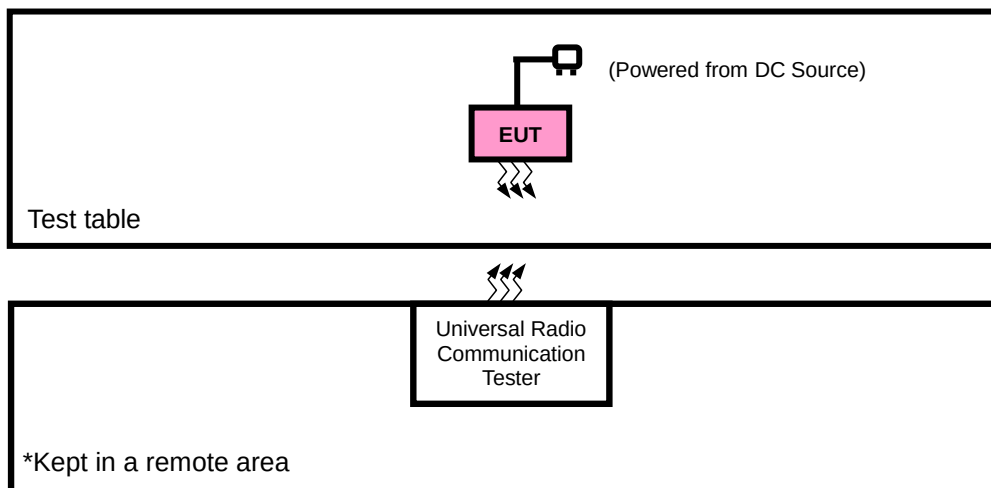
The difference between 2 line and 3 line of CK106 is that there is an open drain output interface. This function can be used to power up other devices such as relay. The schematic diagram is the same. It's just that there is one more line at the end.

List of Accessory:

ACCESSORIES	BRAND	MANUFACTURER	MODEL	SPECIFICATION
Battery	N/A	ZHONGSHAN ZHONGWANDE NEW ENERGY TECHNOLOGY Co., LTD	N/A	Capacity: 3.8Vdc, 130mAh
DC cable 1	N/A	SHANGHAI WUYANG ELECTRONIC TECHNOLOGY CO., LTD	N/A	Signal Line,0.23meter
DC cable 2	N/A	SHANGHAI WUYANG ELECTRONIC TECHNOLOGY CO., LTD	N/A	Signal Line,0.23meter

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	DC source	Kikusui/JP	PMX18-5A	N/A	N/A
2	DC source	Kikusui/JP	PMX18-5A	N/A	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	DC Line: Unshielded, Detachable 0.23m

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 CAT-M1

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	1 RB / 0 RB Offset
		19965 to 20385	19965, 20175, 20385	3MHz	QPSK,16QAM	1 RB / 0 RB Offset
		19975 to 20375	19975, 20175, 20375	5MHz	QPSK,16QAM	1 RB / 0 RB Offset
		20000 to 20350	20000, 20175, 20350	10MHz	QPSK,16QAM	1 RB / 0 RB Offset
		20025 to 20325	20025, 20175, 20325	15MHz	QPSK,16QAM	1 RB / 0 RB Offset
		20050 to 20300	20050, 20175, 20300	20MHz	QPSK,16QAM	1 RB / 0 RB Offset
A	RADIATED EMISSION	19957 to 20393	20175	1.4MHz	QPSK,16QAM	1 RB / 0 RB Offset
		19965 to 20385	20175	3MHz	QPSK	1 RB / 0 RB Offset
		19975 to 20375	20175	5MHz	QPSK	1 RB / 0 RB Offset
		20000 to 20350	20000, 20175, 20350	10MHz	QPSK	1 RB / 0 RB Offset
		20025 to 20325	20175	15MHz	QPSK	1 RB / 0 RB Offset
		20050 to 20300	20175	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.

LTE BAND 12 MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
A	ERP	23017 to 23173	23017, 23095, 23173	1.4MHz	QPSK,16QAM	1 RB / 0 RB Offset
		23025 to 23165	23025, 23095, 23165	3MHz	QPSK,16QAM	1 RB / 0 RB Offset
		23035 to 23155	23035, 23095, 23155	5MHz	QPSK,16QAM	1 RB / 0 RB Offset
		23060 to 23130	23060, 23095, 23130	10MHz	QPSK,16QAM	1 RB / 0 RB Offset
A	RADIATED EMISSION	23017 to 23173	23095	1.4MHz	QPSK	1 RB / 0 RB Offset
		23025 to 23165	23095	3MHz	QPSK	1 RB / 0 RB Offset
		23035 to 23155	23035, 23095, 23155	5MHz	QPSK	1 RB / 0 RB Offset
		23060 to 23130	23095	10MHz	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.

LTE BAND 13 MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
A	ERP	23205 to 23255	23205, 23230, 23255	5MHz	QPSK,16QAM	1 RB / 0 RB Offset
		23230	23230	10MHz	QPSK,16QAM	1 RB / 0 RB Offset
A	RADIATED EMISSION	23205 to 23255	23205, 23230, 23255	5MHz	QPSK	1 RB / 0 RB Offset
		23230	23230	10MHz	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.

LTE NB-IOT

LTE BAND 4 MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	SUBCARRIER SPACING	MODULATION	MODE
A	EIRP	19952 to 20398	19952, 20175, 20398	3.75KHz	BPSK,QPSK	1 RB / 0 RB Offset
		19952 to 20398	19952, 20175, 20398	15KHz	BPSK,QPSK	1 RB / 0 RB Offset
A	RADIATED EMISSION	19952 to 20398	19952, 20175, 20398	3.75KHz	QPSK	1 RB / 0 RB Offset
		19952 to 20398	20175	15KHz	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.

LTE BAND 12 MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	SUBCARRIER SPACING	MODULATION	MODE
A	ERP	23012 to 23178	23012, 23095, 23178	3.75KHz	BPSK,QPSK	1 RB / 0 RB Offset
		23012 to 23178	23012, 23095, 23178	15KHz	BPSK,QPSK	1 RB / 0 RB Offset
A	RADIATED EMISSION	23012 to 23178	23012, 23095, 23178	3.75KHz	QPSK	1 RB / 0 RB Offset
		23012 to 23178	23095	15KHz	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.

LTE BAND 13 MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	SUBCARRIER SPACING	MODULATION	MODE
A	ERP	23182 to 23278	23182, 23230, 23278	3.75KHz	BPSK,QPSK	1 RB / 0 RB Offset
		23182 to 23278	23182, 23230, 23278	15KHz	BPSK,QPSK	1 RB / 0 RB Offset
A	RADIATED EMISSION	23182 to 23278	23182, 23230, 23278	3.75KHz	QPSK	1 RB / 0 RB Offset
		23182 to 23278	23230	15KHz	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.



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TEST CONDITION:

TEST ITEM	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
ERP&EIRP	23deg. C, 70%RH	DC 12V By DC Source	Jace Hu
RADIATED EMISSION	23deg. C, 70%RH	DC 12V By DC Source	Jace Hu



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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.”

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

According to the specific rule Part 27.50 (k)(3) Mobile devices are limited to 1Watt (30 dBm) EIRP, Mobile devices operating inl these bands must employ a means for limiting power to the minimum necessary for successful communications

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:

$$\text{ERP or EIRP} = P_{\text{Meas}} + G_{\text{T}} - L_{\text{C}}$$

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

AVERAGE CONDUCTED OUTPUT POWER (dBm)

LTE CAT-M1

LTE Band 4

Band/BW	Modulation	RB Size	RB Offset	Low CH 19957	Mid CH 20175	High CH 20393
				Frequency 1710.7 MHz	Frequency 1732.5 MHz	Frequency 1754.3 MHz
4/ 1.4	QPSK	1	0	19.89	19.94	20.00
		1	5	19.77	19.84	19.90
		3	0	19.92	20.01	20.05
		3	3	19.81	19.84	19.92
		6	0	19.93	19.99	20.03
	16QAM	1	0	20.30	20.36	20.46
		1	5	20.23	20.30	20.40
		3	0	20.22	20.25	20.41
		3	3	20.18	20.22	20.24
		5	0	20.12	20.28	20.29

Band/BW	Modulation	RB Size	RB Offset	Low CH 19965	Mid CH 20175	High CH 20385
				Frequency 1711.5 MHz	Frequency 1732.5 MHz	Frequency 1753.5 MHz
4/ 3	QPSK	1	0	19.84	19.93	19.97
		1	5	19.73	19.85	19.90
		3	0	19.89	19.98	20.05
		3	3	19.78	19.91	19.96
		6	0	19.89	20.00	20.01
	16QAM	1	0	20.33	20.35	20.50
		1	5	20.17	20.34	20.37
		3	0	20.21	20.25	20.40
		3	3	20.21	20.25	20.21
		5	0	20.13	20.22	20.28

Band/BW	Modulation	RB Size	RB Offset	Low CH 19975	Mid CH 20175	High CH 20375
				Frequency 1712.5 MHz	Frequency 1732.5 MHz	Frequency 1752.5 MHz
4/ 5	QPSK	1	0	19.85	19.92	20.01
		1	5	19.76	19.85	19.87
		3	0	19.87	20.01	20.08
		3	3	19.79	19.87	19.96
		6	0	19.86	20.03	20.00
	16QAM	1	0	20.33	20.35	20.49
		1	5	20.17	20.32	20.34
		3	0	20.21	20.26	20.37
		3	3	20.15	20.22	20.27
		5	0	20.10	20.28	20.28

Band/BW	Modulation	RB Size	RB Offset	Low CH 20000	Mid CH 20175	High CH 20350
				Frequency 1715 MHz	Frequency 1732.5 MHz	Frequency 1750 MHz
4/ 10	QPSK	1	0	19.82	19.96	19.97
		1	5	19.77	19.84	19.90
		3	0	19.92	20.01	20.05
		3	3	19.79	19.84	19.92
		6	0	19.91	19.99	20.03
	16QAM	1	0	20.33	20.36	20.46
		1	5	20.19	20.30	20.40
		3	0	20.25	20.25	20.41
		3	3	20.14	20.23	20.24
		5	0	20.15	20.24	20.32

Band/BW	Modulation	RB Size	RB Offset	Low CH 20025	Mid CH 20175	High CH 20325
				Frequency 1717.5 MHz	Frequency 1732.5 MHz	Frequency 1747.5 MHz
4/ 15	QPSK	1	0	19.86	19.97	19.96
		1	5	19.78	19.89	19.88
		3	0	19.85	19.96	20.11
		3	3	19.85	19.88	19.95
		6	0	19.91	20.04	19.99
	16QAM	1	0	20.31	20.38	20.49
		1	5	20.19	20.36	20.39
		3	0	20.24	20.27	20.40
		3	3	20.21	20.22	20.21
		5	0	20.12	20.27	20.30

Band/BW	Modulation	RB Size	RB Offset	Low CH 20050	Mid CH 20175	High CH 20300
				Frequency 1720 MHz	Frequency 1732.5 MHz	Frequency 1745 MHz
4/ 20	QPSK	1	0	19.90	20.00	20.02
		1	5	19.80	19.90	19.92
		3	0	19.93	20.03	20.13
		3	3	19.86	19.92	19.98
		6	0	19.94	20.05	20.05
	16QAM	1	0	20.35	20.43	20.51
		1	5	20.25	20.38	20.42
		3	0	20.27	20.33	20.42
		3	3	20.22	20.27	20.29
		5	0	20.18	20.30	20.34

LTE Band 12

Band/BW	Modulation	RB Size	RB Offset	Low CH 23017	Mid CH 23095	High CH 23173
				Frequency 699.7 MHz	Frequency 707.5 MHz	Frequency 715.3 MHz
12/ 1.4	QPSK	1	0	20.82	20.82	20.62
		1	5	20.66	20.55	20.44
		3	0	20.84	20.88	20.57
		3	3	20.77	20.71	20.56
		6	0	19.75	19.72	19.52
	16QAM	1	0	20.84	20.82	20.66
		1	5	20.63	20.61	20.43
		3	0	20.86	20.85	20.67
		3	3	20.81	20.80	20.62
		5	0	20.79	20.80	20.58

Band/BW	Modulation	RB Size	RB Offset	Low CH 23025	Mid CH 23095	High CH 23165
				Frequency 700.5 MHz	Frequency 707.5 MHz	Frequency 714.5 MHz
12/ 3	QPSK	1	0	20.84	20.84	20.61
		1	5	20.62	20.56	20.44
		3	0	20.77	20.88	20.59
		3	3	20.74	20.78	20.60
		6	0	19.72	19.73	19.46
	16QAM	1	0	20.81	20.88	20.69
		1	5	20.60	20.64	20.41
		3	0	20.88	20.87	20.66
		3	3	20.83	20.78	20.62
		5	0	20.79	20.74	20.61

Band/BW	Modulation	RB Size	RB Offset	Low CH 23035	Mid CH 23095	High CH 23155
				Frequency 701.5 MHz	Frequency 707.5 MHz	Frequency 713.5 MHz
12/ 5	QPSK	1	0	20.85	20.79	20.62
		1	5	20.67	20.53	20.44
		3	0	20.77	20.89	20.60
		3	3	20.78	20.74	20.61
		6	0	19.70	19.76	19.49
	16QAM	1	0	20.82	20.84	20.69
		1	5	20.57	20.67	20.40
		3	0	20.85	20.91	20.62
		3	3	20.78	20.80	20.65
		5	0	20.79	20.75	20.58

Band/BW	Modulation	RB Size	RB Offset	Low CH 23060	Mid CH 23095	High CH 23130
				Frequency 704 MHz	Frequency 707.5 MHz	Frequency 711 MHz
12/ 10	QPSK	1	0	20.90	20.86	20.67
		1	5	20.69	20.61	20.46
		3	0	20.85	20.90	20.65
		3	3	20.82	20.79	20.62
		6	0	19.76	19.78	19.54
	16QAM	1	0	20.89	20.89	20.71
		1	5	20.65	20.69	20.45
		3	0	20.91	20.93	20.68
		3	3	20.85	20.85	20.67
		5	0	20.85	20.82	20.63



**BUREAU
VERITAS**

Test Report No.: W7L-230216W001RF03

LTE Band 13

Band/BW	Modulation	RB Size	RB Offset	Low CH 23205	Mid CH 23230	High CH 23255
				Frequency 779.5 MHz	Frequency 782.0 MHz	Frequency 784.5 MHz
13/ 5	QPSK	1	0	20.75	20.79	20.78
		1	5	20.61	20.55	20.62
		3	0	20.89	20.84	20.86
		3	3	20.61	20.59	20.65
		6	0	19.92	19.91	19.85
	16QAM	1	0	20.63	20.62	20.64
		1	5	20.46	20.43	20.47
		3	0	20.82	20.76	20.83
		3	3	20.57	20.61	20.60
		5	0	20.86	20.80	20.87

Band/BW	Modulation	RB Size	RB Offset	/	Mid CH 23230	/
				/	Frequency 782.0 MHz	/
13/ 10	QPSK	1	0	/	20.83	/
		1	5	/	20.63	/
		3	0	/	20.91	/
		3	3	/	20.67	/
		6	0	/	19.93	/
	16QAM	1	0	/	20.70	/
		1	5	/	20.49	/
		3	0	/	20.84	/
		3	3	/	20.65	/
		5	0	/	20.88	/

LTE NB-IOT

LTE Band 4

Band/Su b-carrier Speacing (KHz)	Modulation	RB Siz e	RB Offset	Low CH 19952	Mid CH 20175	High CH 20398
				Frequency 1710.2 MHz	Frequency 1732.5 MHz	Frequency 1754.8 MHz
4/ 3.75	BPSK	1	0	20.52	20.51	20.82
		1	47	20.42	20.43	20.82
	QPSK	1	0	20.54	20.51	20.86
		1	47	19.49	19.51	19.80

Band/Su b-carrier Speacing (KHz)	Modulation	RB Siz e	RB Offset	Low CH 19952	Mid CH 20175	High CH 20398
				Frequency 1710.2 MHz	Frequency 1732.5 MHz	Frequency 1754.8 MHz
4/ 15	BPSK	1	0	19.86	19.85	20.22
		1	11	19.81	19.85	20.18
	QPSK	1	0	19.82	19.76	20.17
		1	11	19.74	19.78	20.11
		12	0	17.53	17.50	17.88

LTE Band 12

Band/Su b-carrier Speacing (KHz)	Modulation	RB Siz e	RB Offset	Low CH 23012	Mid CH 23095	High CH 23178
				Frequency 699.2 MHz	Frequency 707.5 MHz	Frequency 715.8 MHz
12/ 3.75	BPSK	1	0	20.76	20.64	20.72
		1	47	20.90	20.74	20.78
	QPSK	1	0	20.92	20.81	20.79
		1	47	20.93	20.79	20.85

Band/Su b-carrier Speacing (KHz)	Modulation	RB Siz e	RB Offset	Low CH 23012	Mid CH 23095	High CH 23178
				Frequency 699.2 MHz	Frequency 707.5 MHz	Frequency 715.8 MHz
12/ 15	BPSK	1	0	19.50	19.41	19.43
		1	11	19.50	19.31	19.41
	QPSK	1	0	19.57	19.48	19.50
		1	11	19.50	19.34	19.41
		12	0	18.77	18.60	18.60

LTE Band 13

Band/Su b-carrier Speacing (KHz)	Modulation	RB Siz e	RB Offset	Low CH 23182	Mid CH 23230	High CH 23278
				Frequency 777.2 MHz	Frequency 782.0 MHz	Frequency 786.8 MHz
13/ 3.75	BPSK	1	0	20.62	20.64	20.53
		1	47	20.59	20.63	20.55
	QPSK	1	0	20.61	20.66	20.61
		1	47	20.54	20.61	20.52

Band/Su b-carrier Speacing (KHz)	Modulation	RB Siz e	RB Offset	Low CH 23182	Mid CH 23230	High CH 23278
				Frequency 777.2 MHz	Frequency 782.0 MHz	Frequency 786.8 MHz
13/ 15	BPSK	1	0	20.31	20.34	20.28
		1	11	20.19	20.28	20.16
	QPSK	1	0	20.41	20.45	20.37
		1	11	20.27	20.29	20.19
		12	0	18.41	18.48	18.39

EIRP

LTE CAT-M1

LTE BAND 4

CHANNEL BANDWIDTH: 1.4MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
19957	1710.7	19.93	-4	15.93	39.17	1
20175	1732.5	20.01	-4	16.01	39.9	1
20393	1754.3	20.05	-4	16.05	40.27	1

CHANNEL BANDWIDTH: 1.4MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
19957	1710.7	20.3	-4	16.3	42.66	1
20175	1732.5	20.36	-4	16.36	43.25	1
20393	1754.3	20.46	-4	16.46	44.26	1

CHANNEL BANDWIDTH: 3MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
19965	1711.5	19.89	-4	15.89	38.82	1
20175	1732.5	20	-4	16	39.81	1
20385	1753.5	20.05	-4	16.05	40.27	1

CHANNEL BANDWIDTH: 3MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
19965	1711.5	20.33	-4	16.33	42.95	1
20175	1732.5	20.21	-4	16.21	41.78	1
20385	1753.5	20.21	-4	16.21	41.78	1

CHANNEL BANDWIDTH: 5MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
19975	1712.5	19.87	-4	15.87	38.64	1
20175	1732.5	20.03	-4	16.03	40.09	1
20375	1752.5	20.08	-4	16.08	40.55	1

CHANNEL BANDWIDTH: 5MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
19975	1712.5	20.33	-4	16.33	42.95	1
20175	1732.5	20.35	-4	16.35	43.15	1
20375	1752.5	20.49	-4	16.49	44.57	1

CHANNEL BANDWIDTH: 10MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20000	1715	19.92	-4	15.92	39.08	1
20175	1732.5	20.01	-4	16.01	39.9	1
20350	1750	20.05	-4	16.05	40.27	1

CHANNEL BANDWIDTH: 10MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20000	1715	20.33	-4	16.33	42.95	1
20175	1732.5	20.36	-4	16.36	43.25	1
20350	1750	20.46	-4	16.46	44.26	1

CHANNEL BANDWIDTH: 15MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20025	1717.5	19.91	-4	15.91	38.99	1
20175	1732.5	20.04	-4	16.04	40.18	1
20325	1747.5	20.11	-4	16.11	40.83	1

CHANNEL BANDWIDTH: 15MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20025	1717.5	20.31	-4	16.31	42.76	1
20175	1732.5	20.38	-4	16.38	43.45	1
20325	1747.5	20.49	-4	16.49	44.57	1

CHANNEL BANDWIDTH: 20MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20050	1720	19.94	-4	15.94	39.26	1
20175	1732.5	20.05	-4	16.05	40.27	1
20300	1745	20.13	-4	16.13	41.02	1

CHANNEL BANDWIDTH: 20MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20050	1720	20.35	-4	16.35	43.15	1
20175	1732.5	20.43	-4	16.43	43.95	1
20300	1745	20.51	-4	16.51	44.77	1

LTE BAND 12

CHANNEL BANDWIDTH: 1.4MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23017	699.7	20.84	-4	14.69	29.44	3
23095	707.5	20.88	-4	14.73	29.72	3
23173	715.3	20.62	-4	14.47	27.99	3

CHANNEL BANDWIDTH: 1.4MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23017	699.7	20.86	-4	14.71	29.58	3
23095	707.5	20.85	-4	14.7	29.51	3
23173	715.3	20.67	-4	14.52	28.31	3

CHANNEL BANDWIDTH: 3MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23025	700.5	20.84	-4	14.69	29.44	3
23095	707.5	20.88	-4	14.73	29.72	3
23165	714.5	20.61	-4	14.46	27.93	3

CHANNEL BANDWIDTH: 3MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23025	700.5	20.88	-4	14.73	29.72	3
23095	707.5	20.88	-4	14.73	29.72	3
23165	714.5	20.69	-4	14.54	28.44	3

CHANNEL BANDWIDTH: 5MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23035	701.5	20.85	-4	14.7	29.51	3
23095	707.5	20.89	-4	14.74	29.79	3
23155	713.5	20.62	-4	14.47	27.99	3

CHANNEL BANDWIDTH: 5MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23035	701.5	20.85	-4	14.7	29.51	3
23095	707.5	20.91	-4	14.76	29.92	3
23155	713.5	20.69	-4	14.54	28.44	3

CHANNEL BANDWIDTH: 10MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23060	704	20.9	-4	14.75	29.85	3
23095	707.5	20.9	-4	14.75	29.85	3
23130	711	20.67	-4	14.52	28.31	3

CHANNEL BANDWIDTH: 10MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23060	704	20.91	-4	14.76	29.92	3
23095	707.5	20.93	-4	14.78	30.06	3
23130	711	20.71	-4	14.56	28.58	3

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



**BUREAU
VERITAS**

Test Report No.: W7L-230216W001RF03

LTE BAND 13

CHANNEL BANDWIDTH: 5MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23205	779.5	20.89	-12	6.74	4.72	3
23230	782	20.84	-12	6.69	4.67	3
23255	784.5	20.86	-12	6.71	4.69	3

CHANNEL BANDWIDTH: 5MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23205	779.5	20.86	-12	6.71	4.69	3
23230	782	20.8	-12	6.65	4.62	3
23255	784.5	20.87	-12	6.72	4.7	3

CHANNEL BANDWIDTH: 10MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
-	-	-	-	-	-	-
23230	782	20.91	-12	6.76	4.74	3
-	-	-	-	-	-	-

CHANNEL BANDWIDTH: 10MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
-	-	-	-	-	-	-
23230	782	20.88	-12	6.73	4.71	3
-	-	-	-	-	-	-

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

LTE NB-IOT

LTE BAND 4

SUBCARRIER SPACING: 3.75KHz BPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
19952	1710.2	20.52	-4	16.52	44.87	1
20175	1732.5	20.51	-4	16.51	44.77	1
20398	1754.8	20.82	-4	16.82	48.08	1

SUBCARRIER SPACING: 3.75KHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
19952	1710.2	20.54	-4	16.54	45.08	1
20175	1732.5	20.51	-4	16.51	44.77	1
20398	1754.8	20.86	-4	16.86	48.53	1

SUBCARRIER SPACING: 15KHz BPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
19952	1710.2	19.86	-4	15.86	38.55	1
20175	1732.5	19.85	-4	15.85	38.46	1
20398	1754.8	20.22	-4	16.22	41.88	1

SUBCARRIER SPACING: 15KHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
19952	1710.2	19.82	-4	15.82	38.19	1
20175	1732.5	19.78	-4	15.78	37.84	1
20398	1754.8	20.17	-4	16.17	41.4	1

LTE BAND 12

SUBCARRIER SPACING: 3.75KHz BPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23012	699.2	20.9	-4	14.75	29.85	3
23095	707.5	20.74	-4	14.59	28.77	3
23178	715.8	20.78	-4	14.63	29.04	3

SUBCARRIER SPACING: 3.75KHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23012	699.2	20.93	-4	14.78	30.06	3
23095	707.5	20.81	-4	14.66	29.24	3
23178	715.8	20.85	-4	14.7	29.51	3

SUBCARRIER SPACING: 15KHz BPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23012	699.2	19.5	-4	13.35	21.63	3
23095	707.5	19.41	-4	13.26	21.18	3
23178	715.8	19.43	-4	13.28	21.28	3

SUBCARRIER SPACING: 15KHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23012	699.2	19.57	-4	13.42	21.98	3
23095	707.5	19.48	-4	13.33	21.53	3
23178	715.8	19.5	-4	13.35	21.63	3

LTE BAND 13

SUBCARRIER SPACING: 3.75KHz BPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23182	777.2	20.62	-12	6.47	4.44	3
23230	782.0	20.64	-12	6.49	4.46	3
23278	786.8	20.53	-12	6.38	4.35	3

SUBCARRIER SPACING: 3.75KHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23182	777.2	20.61	-12	6.46	4.43	3
23230	782.0	20.66	-12	6.51	4.48	3
23278	786.8	20.61	-12	6.46	4.43	3

SUBCARRIER SPACING: 15KHz BPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23182	777.2	20.31	-12	6.16	4.13	3
23230	782.0	20.34	-12	6.19	4.16	3
23278	786.8	20.28	-12	6.13	4.1	3

SUBCARRIER SPACING: 15KHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23182	777.2	20.41	-12	6.26	4.23	3
23230	782.0	20.45	-12	6.3	4.27	3
23278	786.8	20.37	-12	6.22	4.19	3

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

3.2 FREQUENCY STABILITY MEASUREMENT

3.2.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

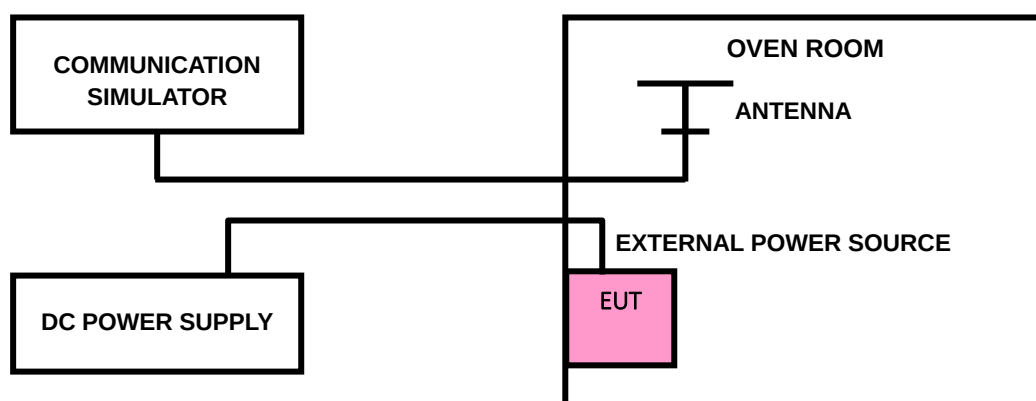
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

3.2.2 TEST PROCEDURE

- 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.
- 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.
- The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the $\pm 0.5^{\circ}\text{C}$ 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





Test Report No.: W7L-230216W001RF03

3.2.4 TEST RESULTS

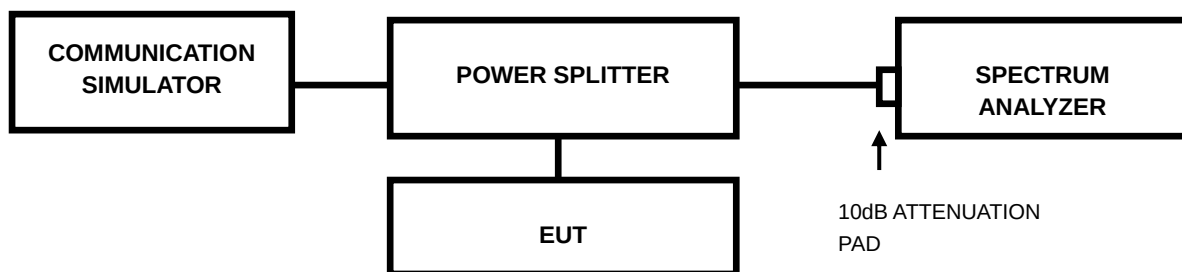
Please Refer to Module report I22W00076-CAT-M RF-FCC_Rev2/
I22W00076-NB-IoT RF-FCC-Rev2.

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

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



Test Report No.: W7L-230216W001RF03

3.3.4 TEST RESULTS

Please Refer to Module report I22W00076-CAT-M RF-FCC_Rev2/
I22W00076-NB-IoT RF-FCC-Rev2.

3.4 BAND EDGE MEASUREMENT

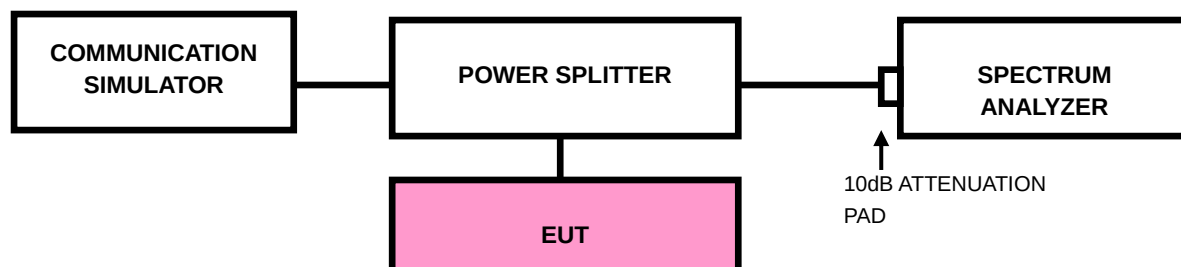
3.4.1 LIMITS OF BAND EDGE MEASUREMENT

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 than $43 + 10 \log (P)$ 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.

According to FCC Part 27.53 (n)(2) For mobile operations in the 3450-3550 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed -13 dBm/MHz. Compliance with this paragraph is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. 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, but limited to a maximum of 200 kHz. In the bands between 1 and 5 MHz removed from the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be 500 kHz.

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) $\geq 1\%$ 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 $\geq 3 \times$ 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.



Test Report No.: W7L-230216W001RF03

3.4.4 TEST RESULTS

Please Refer to Module report I22W00076-CAT-M RF-FCC_Rev2/
I22W00076-NB-IoT RF-FCC-Rev2.

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 .

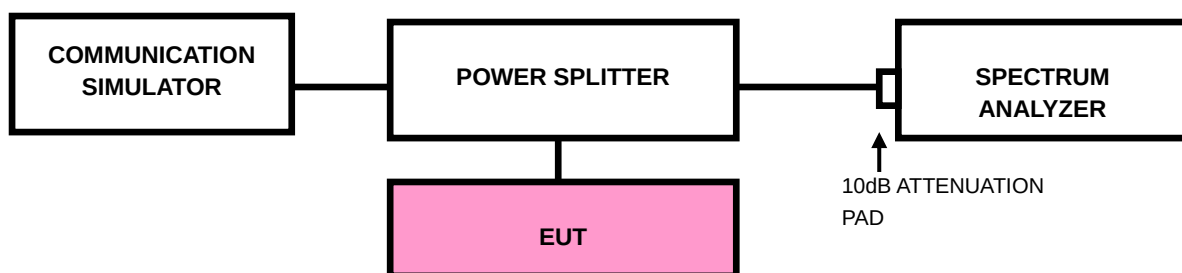
For: LTE Band7/Band41

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $55 + 10 \log_{10}(P)$ 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





Test Report No.: W7L-230216W001RF03

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 Module report I22W00076-CAT-M RF-FCC_Rev2/
I22W00076-NB-IoT RF-FCC-Rev2.

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 .

For: LTE Band7/ Band41

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

3.6.2 TEST PROCEDURES

- 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.
- 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.
- $\text{EIRP} = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}$.
- E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole,
 $\text{E.R.P power} = \text{E.I.P.R power} - 2.15\text{dBi}$.

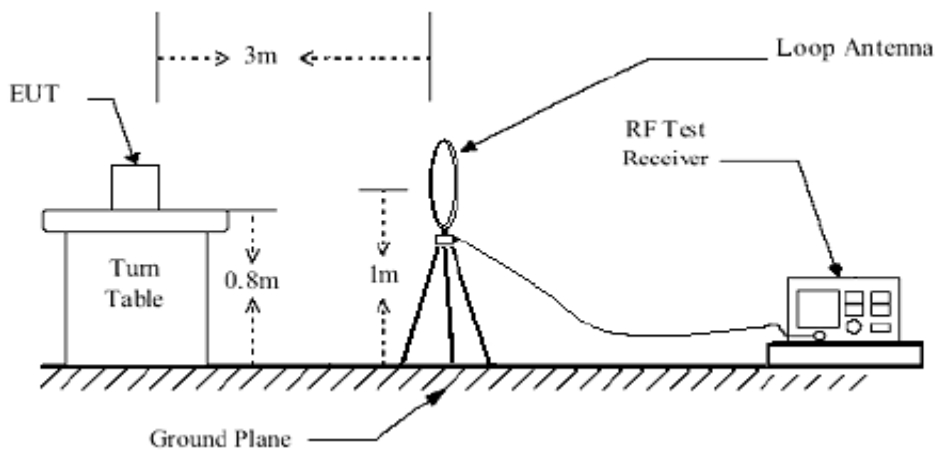
NOTE: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

3.6.3 DEVIATION FROM TEST STANDARD

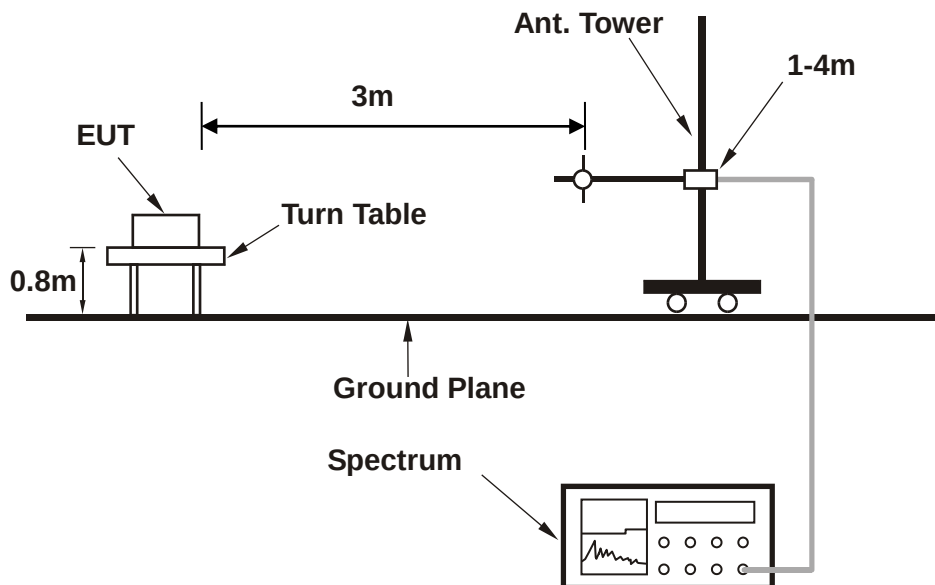
No deviation

3.6.4 TEST SETUP

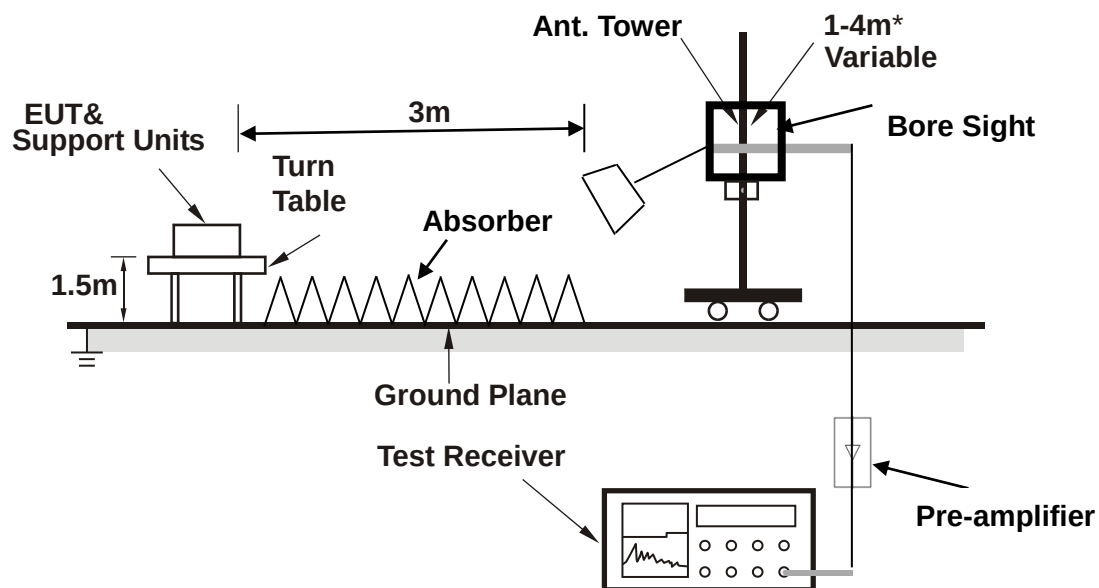
< Frequency Range below 30MHz >



< 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.

LTE CAT-M1

BELOW 1GHz WORST-CASE DATA

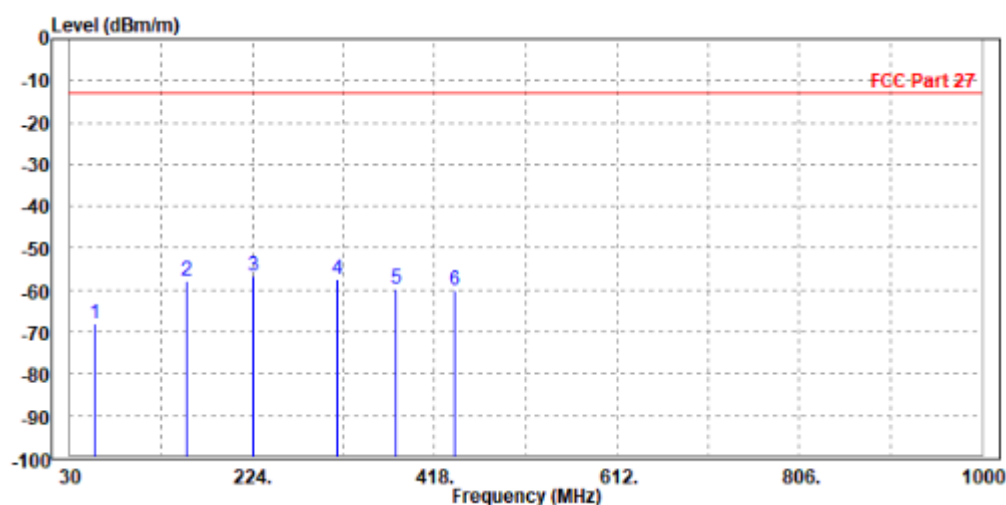
30 MHz – 1GHz data:

LTE Band 13

CHANNEL BANDWIDTH: 5MHz / QPSK

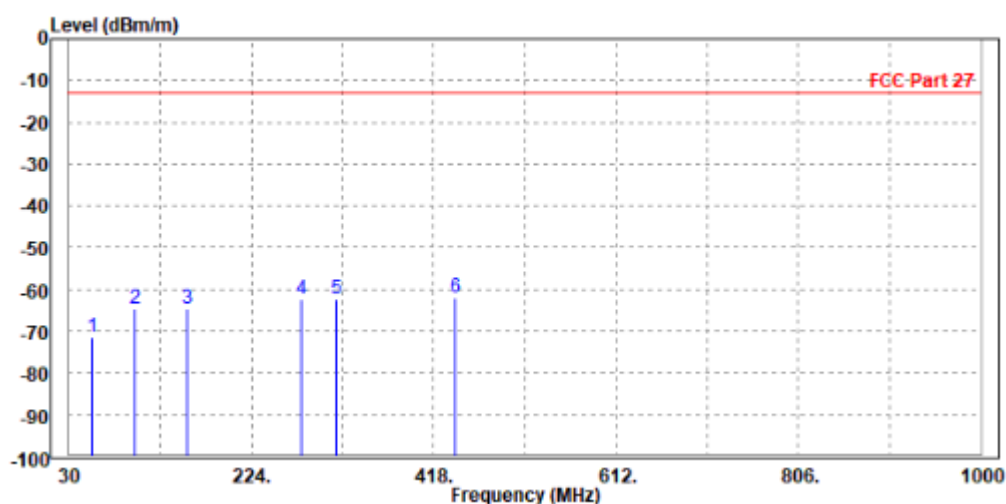
MODE	TX channel 20175	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	56.190	-67.92	-49.84	-13.00	-54.92	-18.08	Peak	Horizontal
2	154.160	-57.85	-40.10	-13.00	-44.85	-17.75	Peak	Horizontal
3 PP	224.970	-56.70	-42.26	-13.00	-43.70	-14.44	Peak	Horizontal
4	314.210	-57.26	-45.14	-13.00	-44.26	-12.12	Peak	Horizontal
5	377.260	-59.51	-48.93	-13.00	-46.51	-10.58	Peak	Horizontal
6	438.370	-59.96	-50.62	-13.00	-46.96	-9.34	Peak	Horizontal



MODE	TX channel 20175	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
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	54.250	-71.57	-46.98	-13.00	-58.57	-24.59	Peak	Vertical
2	99.840	-64.48	-57.97	-13.00	-51.48	-6.51	Peak	Vertical
3	155.130	-64.69	-47.20	-13.00	-51.69	-17.49	Peak	Vertical
4	276.380	-62.54	-50.41	-13.00	-49.54	-12.13	Peak	Vertical
5	314.210	-62.44	-51.88	-13.00	-49.44	-10.56	Peak	Vertical
6 PP	440.310	-61.99	-53.36	-13.00	-48.99	-8.63	Peak	Vertical





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Test Report No.: W7L-230216W001RF03

ABOVE 1GHz

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

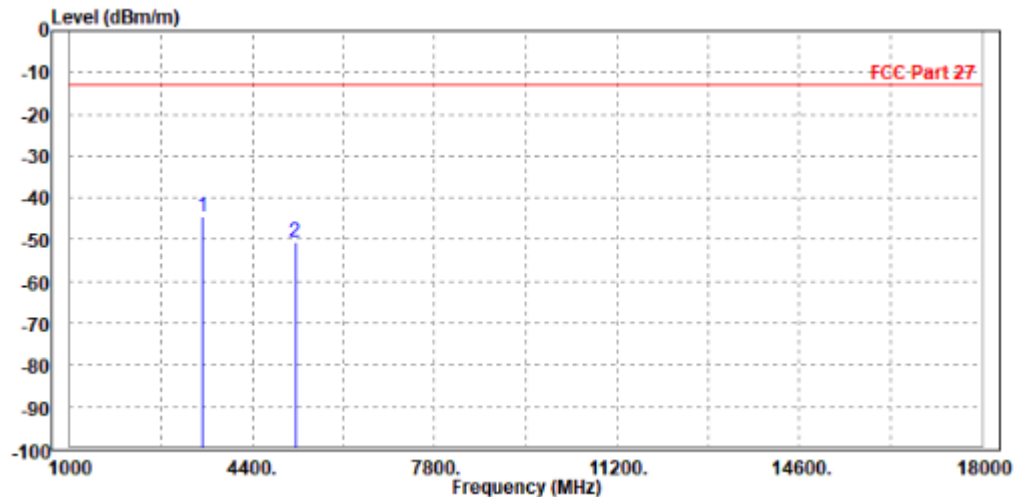
WORST-CASE DATA

LTE Band 4

CHANNEL BANDWIDTH: 1.4MHz / QPSK

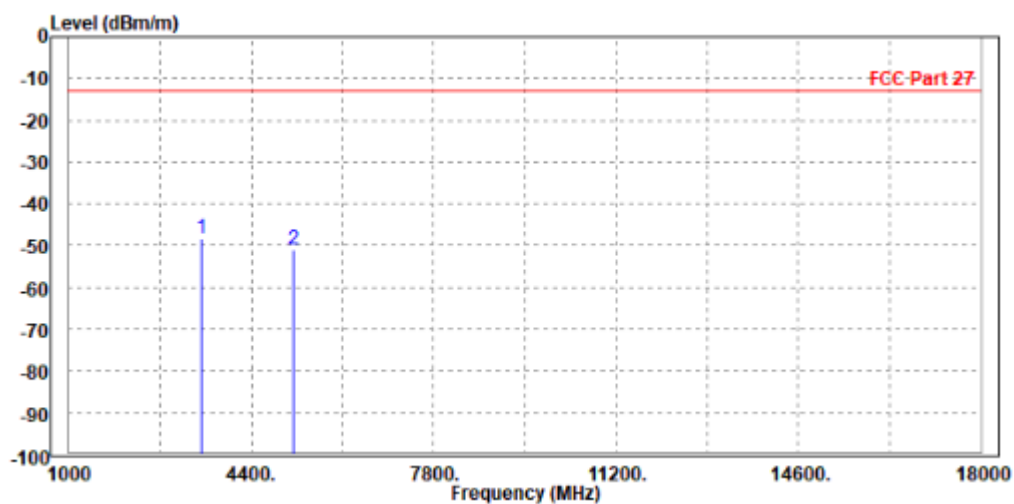
MODE	TX channel 20175	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

		Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
		MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP	3465.000	-44.37	-51.64	-13.00	-31.37	7.27	Peak	Horizontal
2		5199.000	-50.47	-60.47	-13.00	-37.47	10.00	Peak	Horizontal



MODE	TX channel 20175	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
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	3465.000	-48.21	-55.47	-13.00	-35.21	7.26	Peak	Vertical
2	5197.500	-50.99	-61.44	-13.00	-37.99	10.45	Peak	Vertical





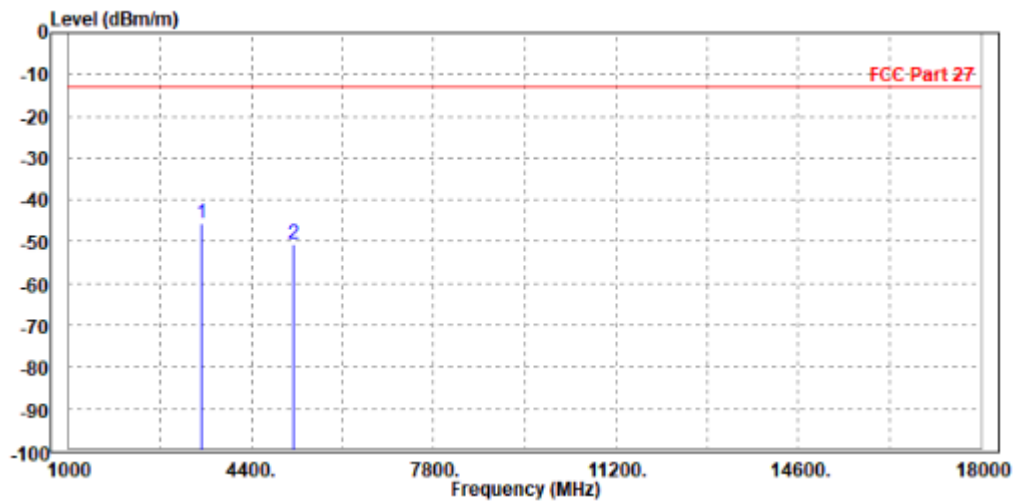
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Test Report No.: W7L-230216W001RF03

CHANNEL BANDWIDTH: 3MHz / QPSK

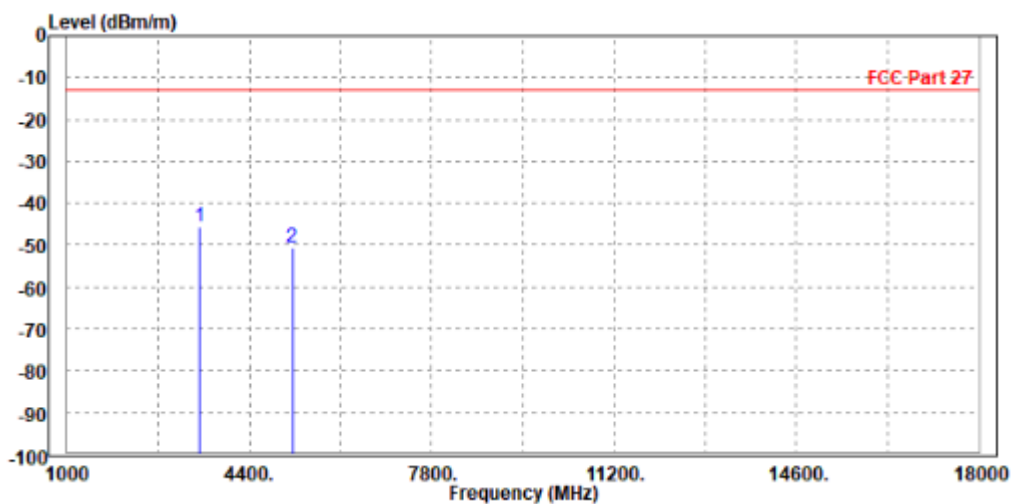
MODE	TX channel 20175	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

		Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
		MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP	3465.000	-45.54	-52.81	-13.00	-32.54	7.27	Peak	Horizontal
2		5197.500	-50.40	-60.40	-13.00	-37.40	10.00	Peak	Horizontal



MODE	TX channel 20175	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
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	3465.000	-45.60	-52.86	-13.00	-32.60	7.26	Peak	Vertical
2		5199.000	-50.39	-60.84	-13.00	-37.39	10.45	Peak	Vertical





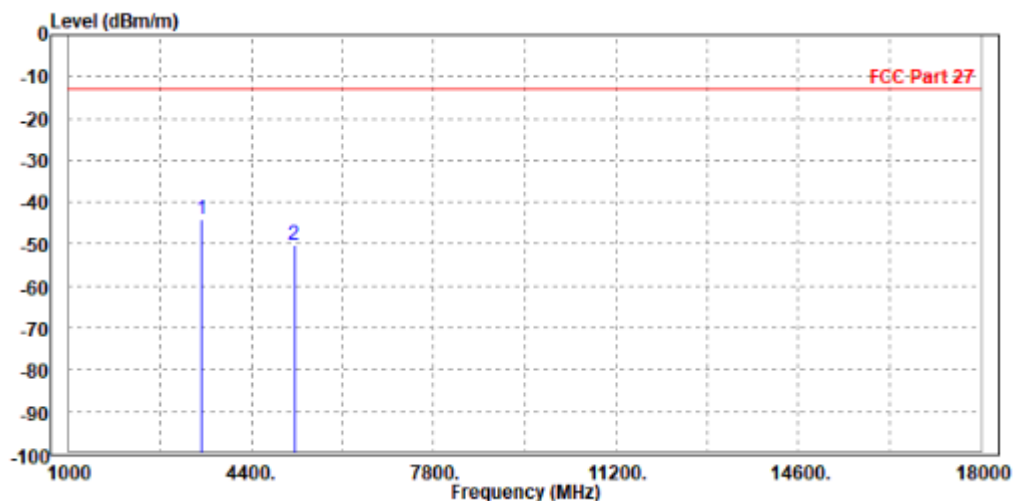
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Test Report No.: W7L-230216W001RF03

CHANNEL BANDWIDTH: 5MHz / QPSK

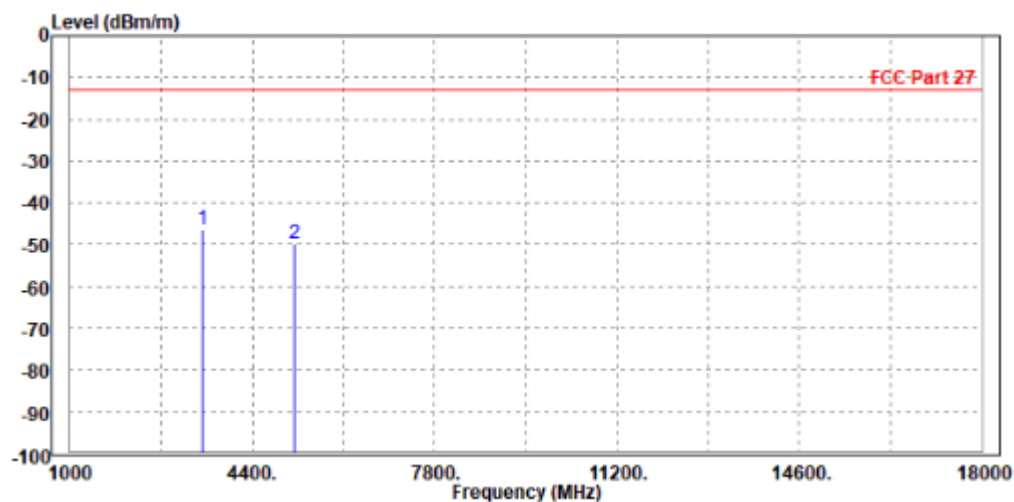
MODE	TX channel 20175	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

		Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
		MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP	3465.000	-43.94	-51.21	-13.00	-30.94	7.27	Peak	Horizontal
2		5199.000	-50.33	-60.33	-13.00	-37.33	10.00	Peak	Horizontal



MODE	TX channel 20175	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
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	3465.000	-46.33	-53.59	-13.00	-33.33	7.26	Peak	Vertical
2		5197.500	-49.85	-60.30	-13.00	-36.85	10.45	Peak	Vertical





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VERITAS**

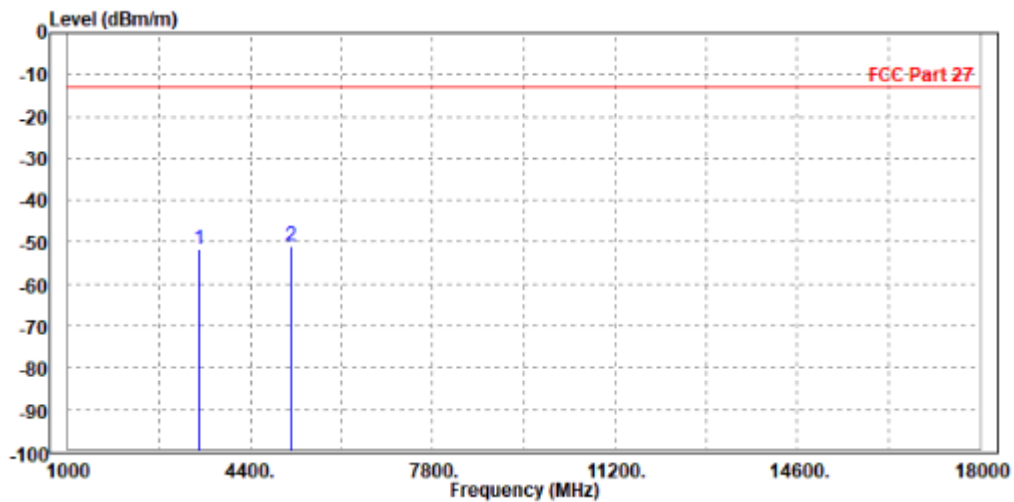
Test Report No.: W7L-230216W001RF03

CHANNEL BANDWIDTH: 10MHz / QPSK

CH20000

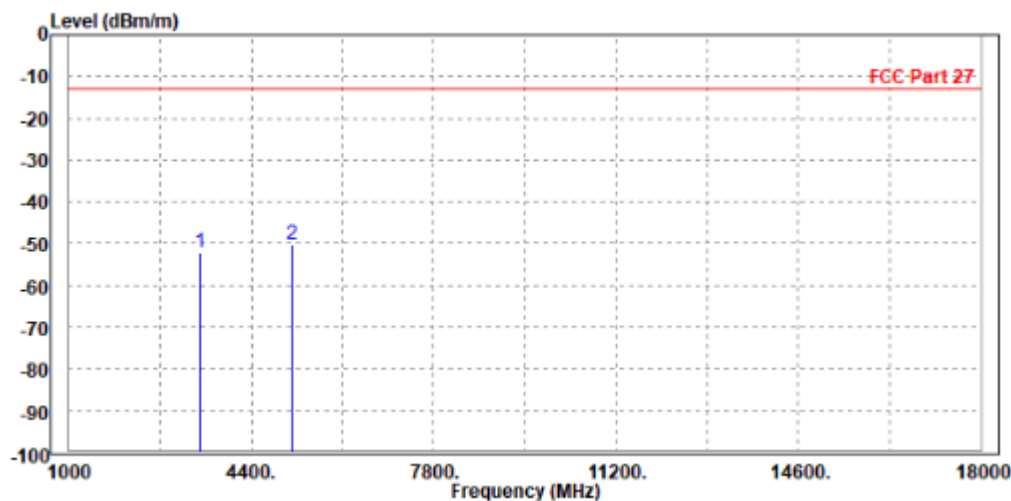
MODE	TX channel 20000	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3431.000	-51.77	-59.00	-13.00	-38.77	7.23	Peak	Horizontal
2	PP 5145.000	-51.09	-61.01	-13.00	-38.09	9.92	Peak	Horizontal



MODE	TX channel 20000	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
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	3430.000	-52.09	-59.30	-13.00	-39.09	7.21	Peak	Vertical
2 PP	5148.000	-50.13	-60.53	-13.00	-37.13	10.40	Peak	Vertical





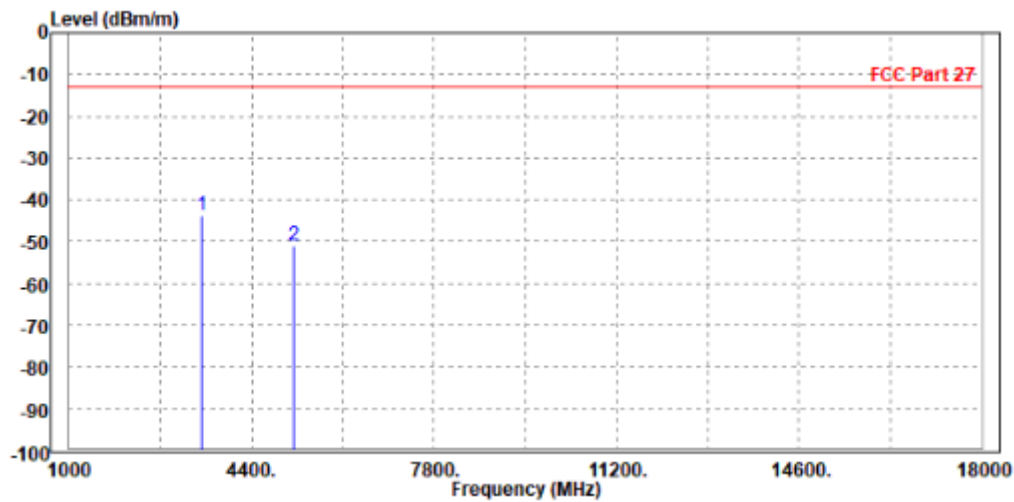
BUREAU
VERITAS

Test Report No.: W7L-230216W001RF03

CH20175

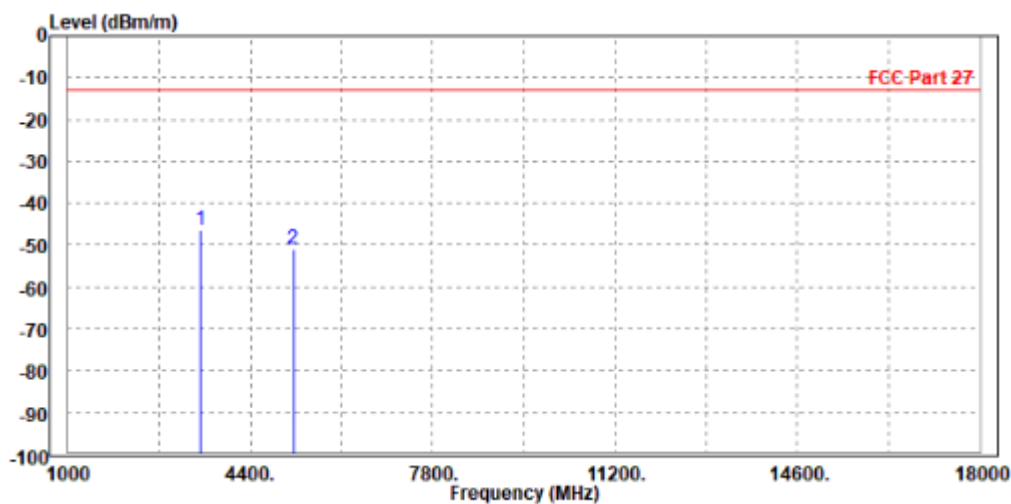
MODE	TX channel 20175	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP 3465.000	-43.77	-51.04	-13.00	-30.77	7.27	Peak	Horizontal
2	5197.500	-50.94	-60.94	-13.00	-37.94	10.00	Peak	Horizontal



MODE	TX channel 20175	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
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	3465.000	-46.51	-53.77	-13.00	-33.51	7.26	Peak	Vertical
2		5199.000	-50.79	-61.24	-13.00	-37.79	10.45	Peak	Vertical





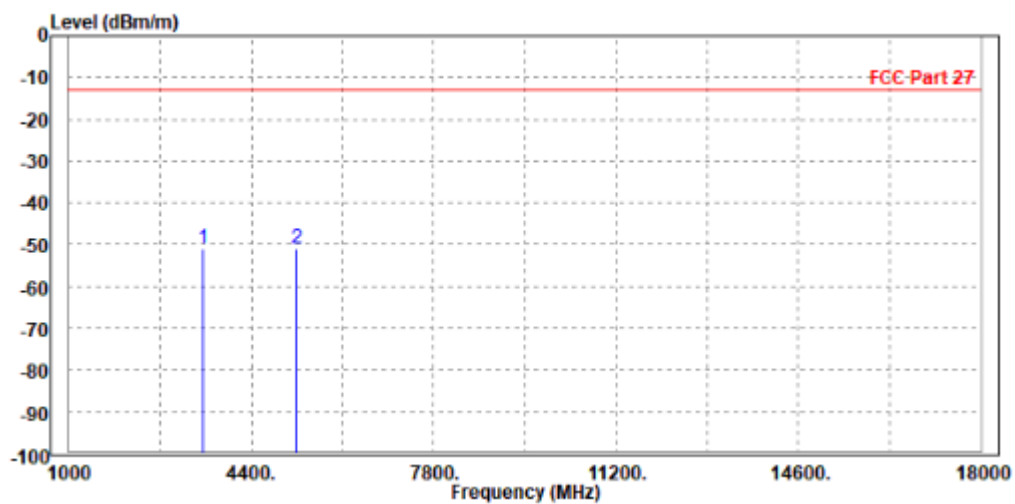
BUREAU
VERITAS

Test Report No.: W7L-230216W001RF03

CH20350

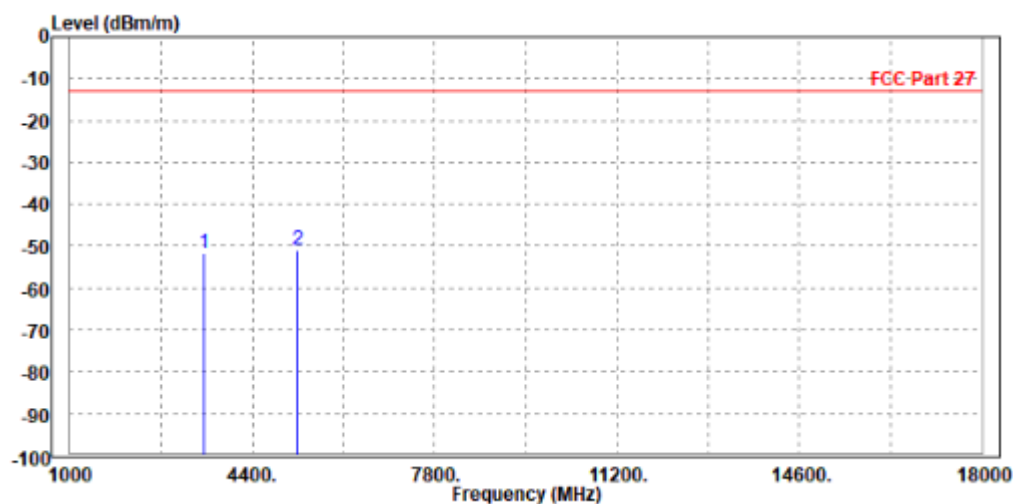
MODE	TX channel 20350	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

		Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
		MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP	3500.000	-50.77	-58.09	-13.00	-37.77	7.32	Peak	Horizontal
2		5250.000	-50.86	-60.94	-13.00	-37.86	10.08	Peak	Horizontal



MODE	TX channel 20350	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
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	3499.000	-51.82	-59.14	-13.00	-38.82	7.32	Peak	Vertical
2 PP	5250.000	-50.80	-61.30	-13.00	-37.80	10.50	Peak	Vertical





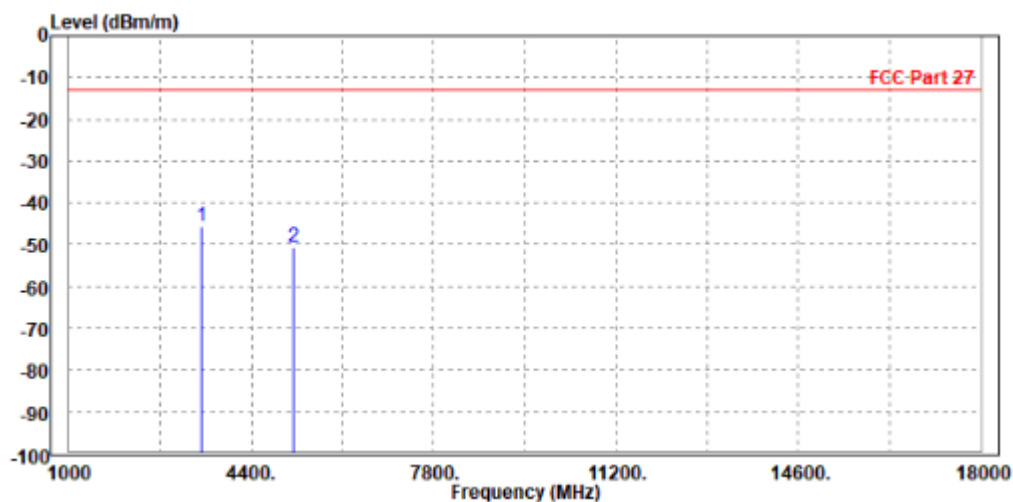
**BUREAU
VERITAS**

Test Report No.: W7L-230216W001RF03

CHANNEL BANDWIDTH: 15MHz / QPSK

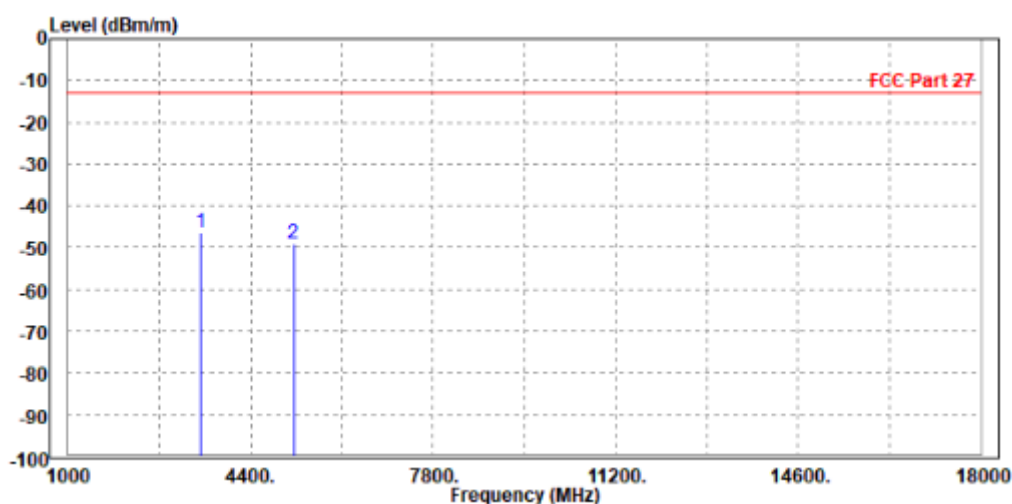
MODE	TX channel 20175	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

		Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
		MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP	3465.000	-45.51	-52.78	-13.00	-32.51	7.27	Peak	Horizontal
2		5197.500	-50.41	-60.41	-13.00	-37.41	10.00	Peak	Horizontal



MODE	TX channel 20175	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
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	3465.000	-46.41	-53.67	-13.00	-33.41	7.26	Peak	Vertical
2	5199.000	-49.22	-59.67	-13.00	-36.22	10.45	Peak	Vertical





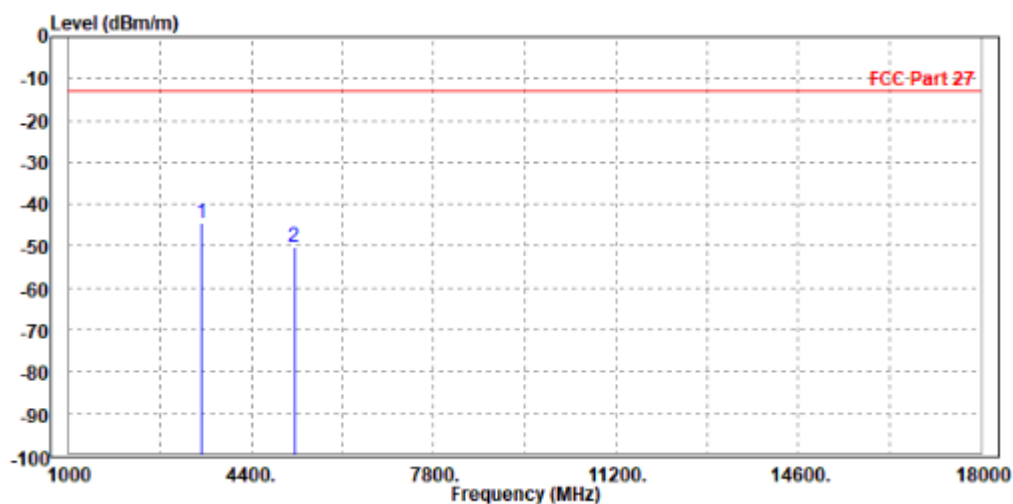
**BUREAU
VERITAS**

Test Report No.: W7L-230216W001RF03

CHANNEL BANDWIDTH: 20MHz / QPSK

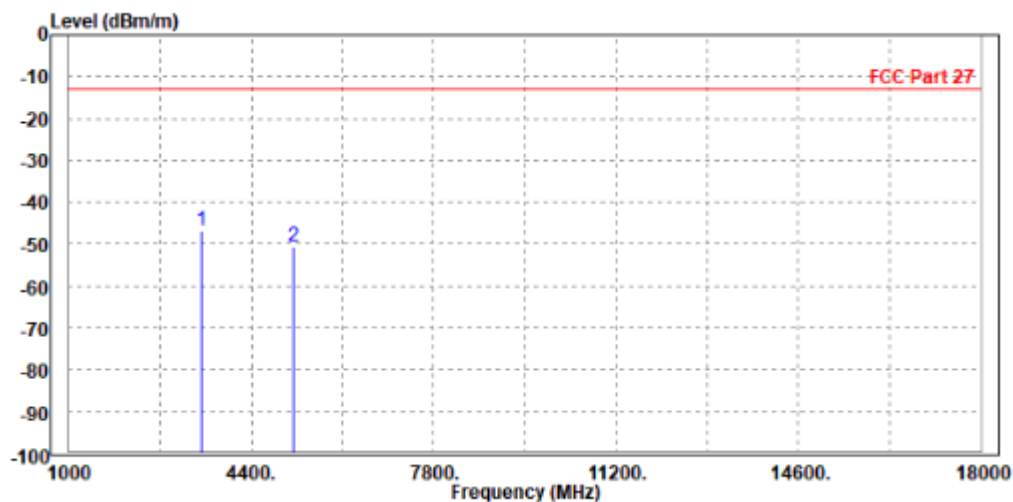
MODE	TX channel 20175	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

		Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
		MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP	3465.000	-44.62	-51.89	-13.00	-31.62	7.27	Peak	Horizontal
2		5199.000	-50.35	-60.35	-13.00	-37.35	10.00	Peak	Horizontal



MODE	TX channel 20175	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
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	3465.000	-46.67	-53.93	-13.00	-33.67	7.26	Peak	Vertical
2		5197.500	-50.63	-61.08	-13.00	-37.63	10.45	Peak	Vertical

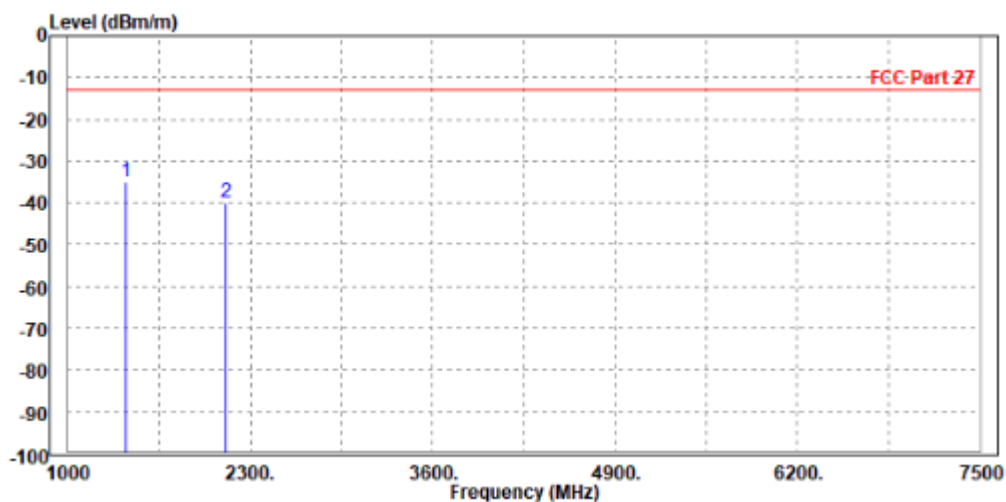


LTE BAND 12

CHANNEL BANDWIDTH: 1.4MHz / QPSK

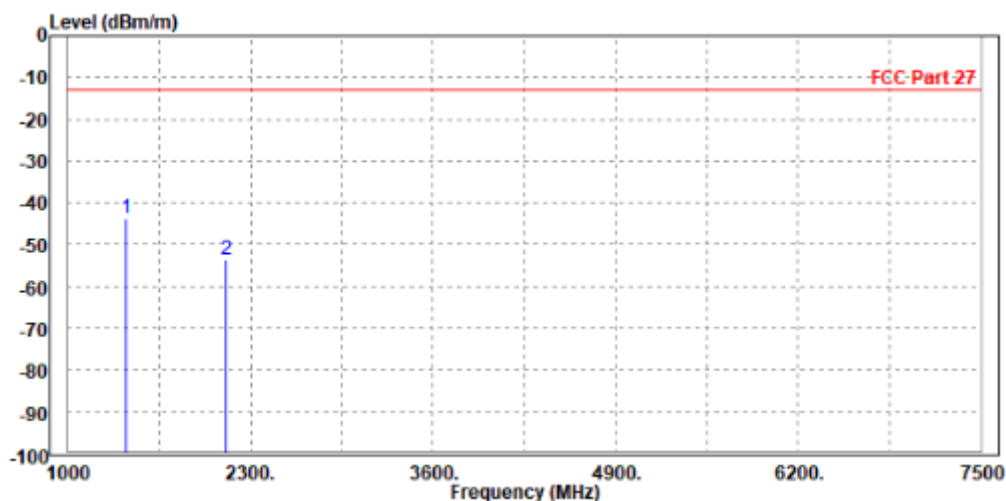
MODE	TX channel 23095	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1 PP	1415.000	-34.93	-34.28	-13.00	-21.93	-0.65	Peak	Horizontal
2	2124.500	-40.05	-44.12	-13.00	-27.05	4.07	Peak	Horizontal



MODE	TX channel 23095	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
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	1416.000	-43.69	-43.29	-13.00	-30.69	-0.40	Peak	Vertical
2		2122.500	-53.63	-57.55	-13.00	-40.63	3.92	Peak	Vertical





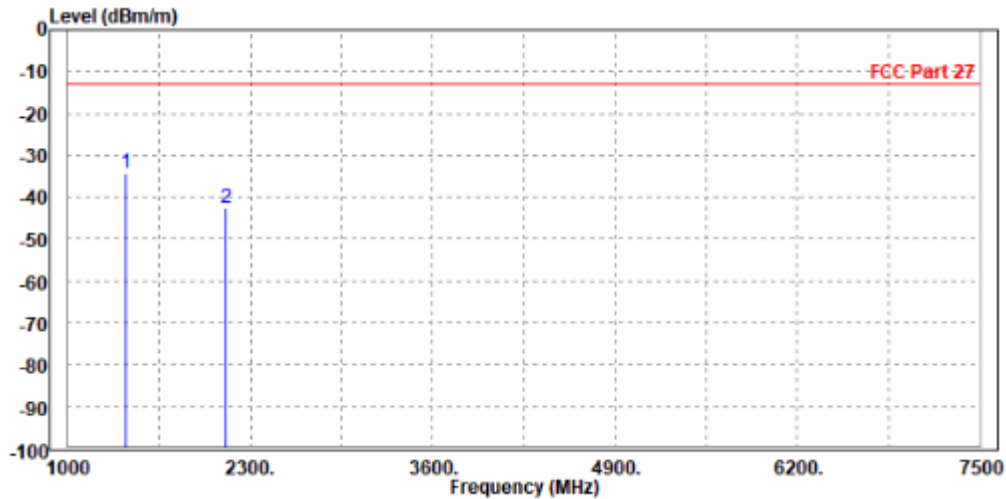
**BUREAU
VERITAS**

Test Report No.: W7L-230216W001RF03

CHANNEL BANDWIDTH: 3MHz / QPSK

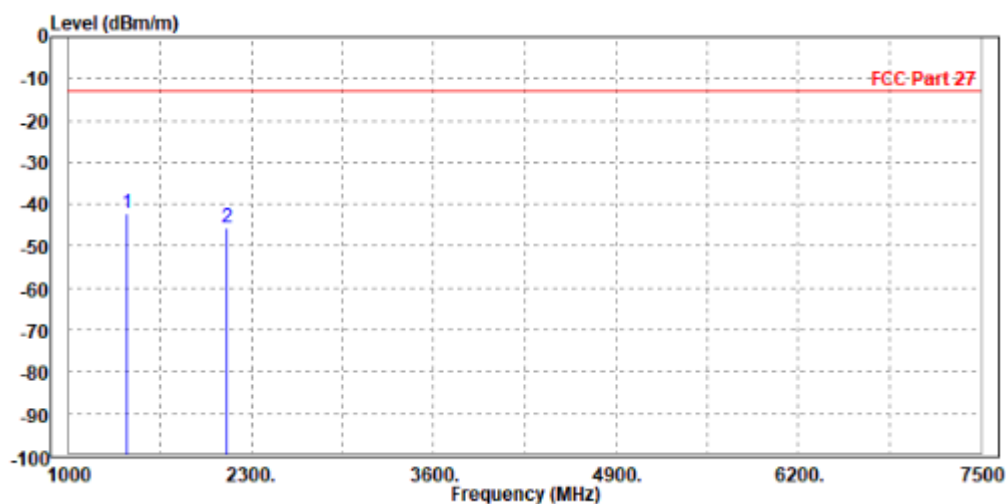
MODE	TX channel 23095	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

		Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
		MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP	1416.000	-34.08	-33.44	-13.00	-21.08	-0.64	Peak	Horizontal
2		2122.500	-42.49	-46.55	-13.00	-29.49	4.06	Peak	Horizontal



MODE	TX channel 23095	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
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	1415.000	-42.07	-41.66	-13.00	-29.07	-0.41	Peak	Vertical
2		2124.500	-45.81	-49.73	-13.00	-32.81	3.92	Peak	Vertical

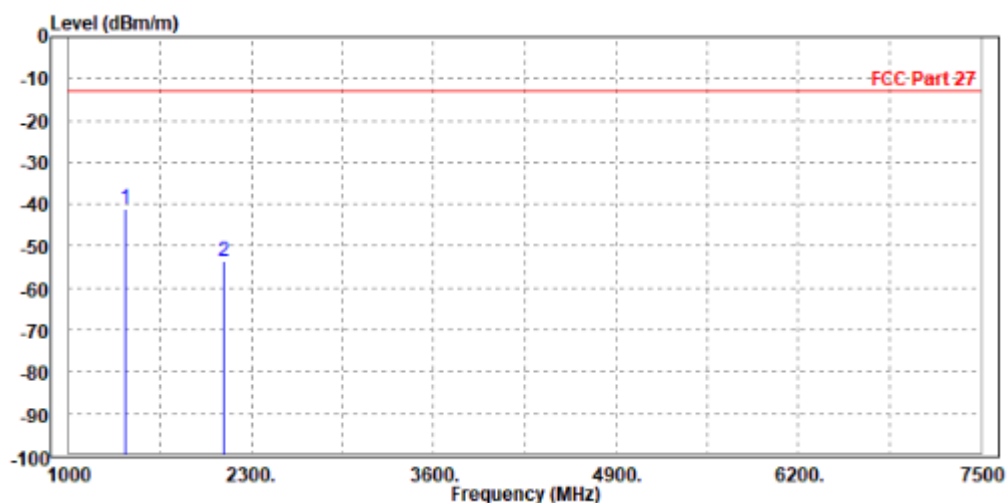


CHANNEL BANDWIDTH: 5MHz / QPSK

CH23035

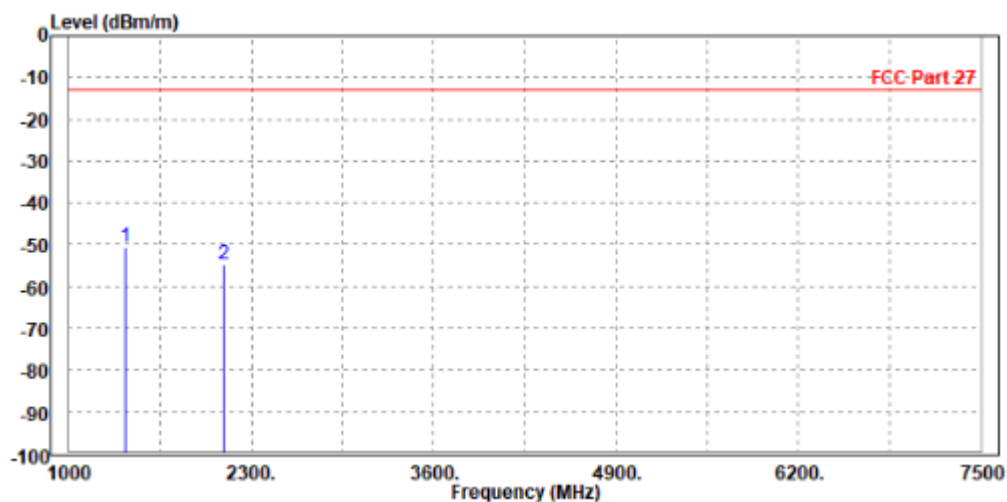
MODE	TX channel 23035	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

		Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
		MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP	1403.000	-41.25	-40.57	-13.00	-28.25	-0.68	Peak	Horizontal
2		2104.500	-53.50	-57.50	-13.00	-40.50	4.00	Peak	Horizontal



MODE	TX channel 23035	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
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 1403.000	-50.60	-50.14	-13.00	-37.60	-0.46	Peak	Vertical
2	2105.000	-54.58	-58.45	-13.00	-41.58	3.87	Peak	Vertical





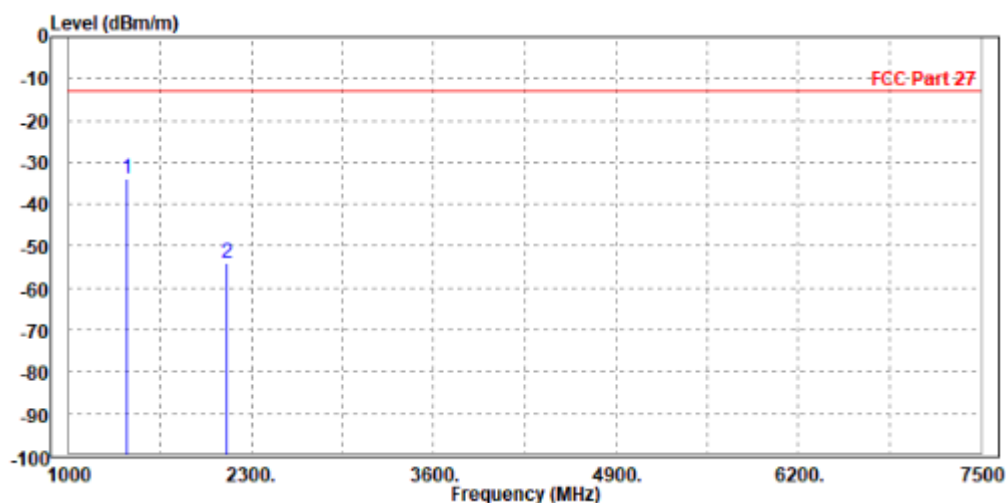
**BUREAU
VERITAS**

Test Report No.: W7L-230216W001RF03

CH23095

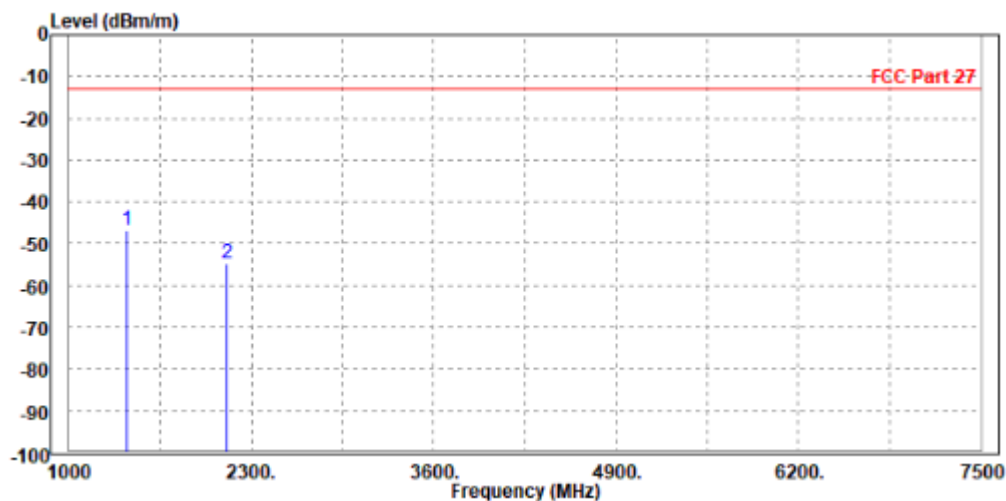
MODE	TX channel 23095	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1 PP	1415.000	-33.83	-33.18	-13.00	-20.83	-0.65	Peak	Horizontal
2	2124.500	-53.90	-57.97	-13.00	-40.90	4.07	Peak	Horizontal



MODE	TX channel 23095	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

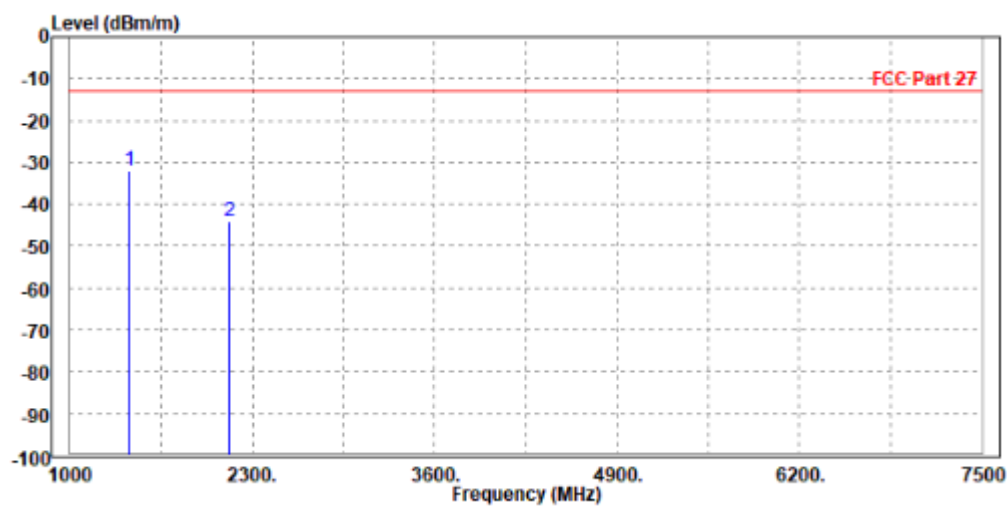
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1 PP	1416.000	-46.66	-46.26	-13.00	-33.66	-0.40	Peak	Vertical
2	2122.500	-54.57	-58.49	-13.00	-41.57	3.92	Peak	Vertical



CH23155

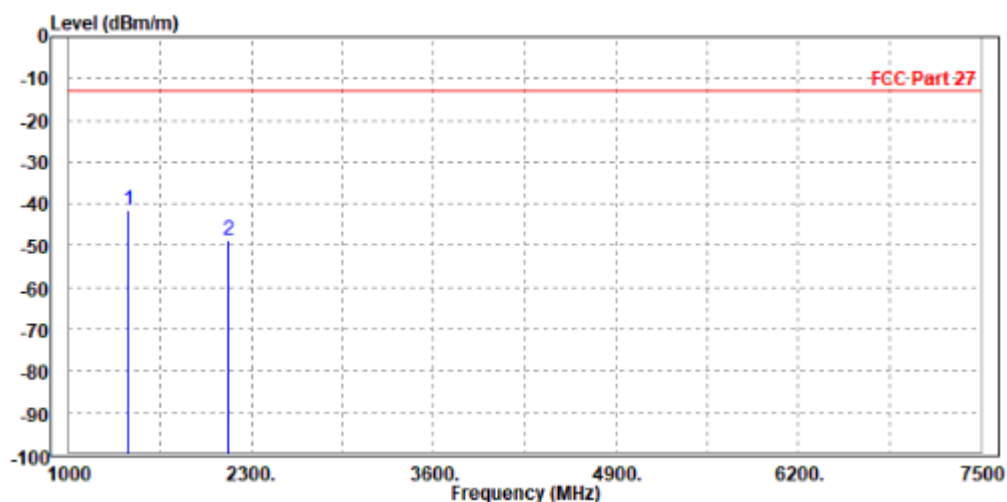
MODE	TX channel 23155	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

		Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
		MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP	1427.000	-31.82	-31.21	-13.00	-18.82	-0.61	Peak	Horizontal
2		2137.500	-43.93	-48.05	-13.00	-30.93	4.12	Peak	Horizontal



MODE	TX channel 23155	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

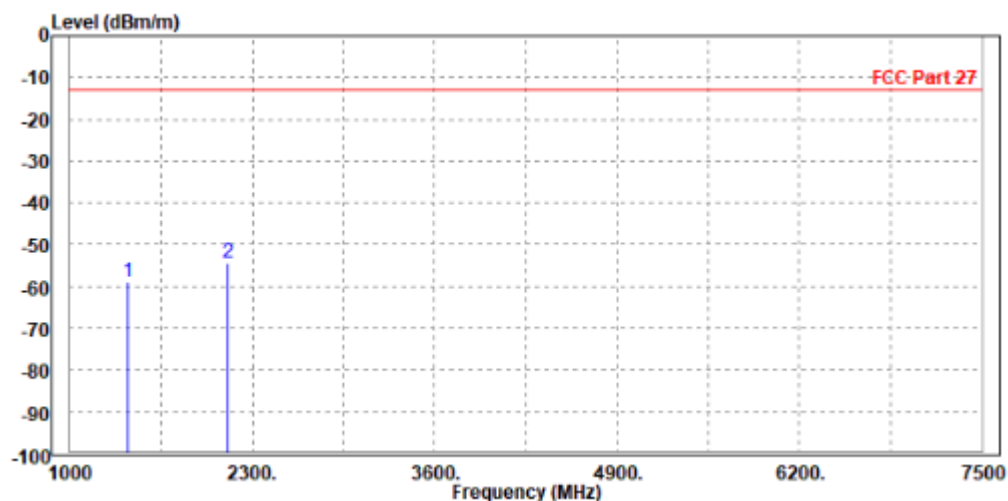
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1 PP	1429.000	-41.54	-41.19	-13.00	-28.54	-0.35	Peak	Vertical
2	2140.500	-48.54	-52.51	-13.00	-35.54	3.97	Peak	Vertical



CHANNEL BANDWIDTH: 10MHz / QPSK

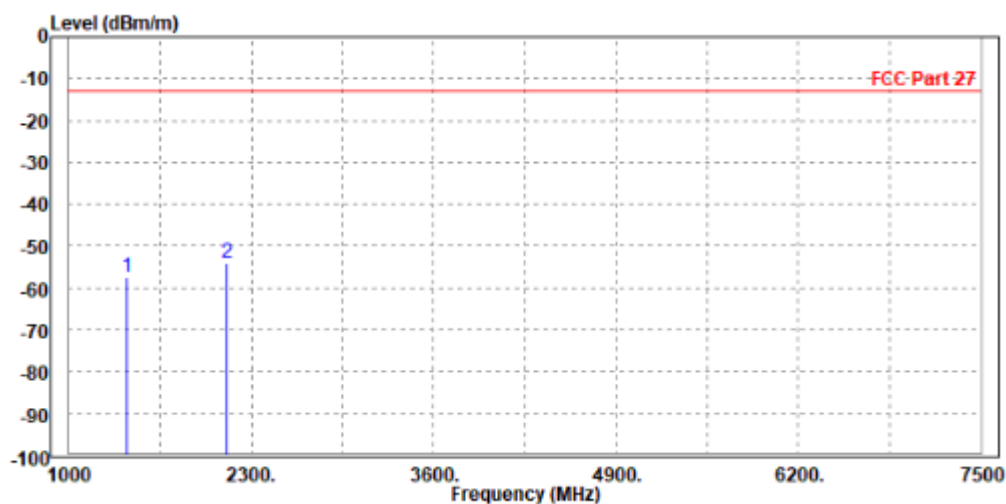
MODE	TX channel 23095	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1416.000	-58.78	-58.14	-13.00	-45.78	-0.64	Peak	Horizontal
2 PP	2122.500	-54.19	-58.25	-13.00	-41.19	4.06	Peak	Horizontal



MODE	TX channel 23095	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
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	1415.000	-57.44	-57.03	-13.00	-44.44	-0.41	Peak	Vertical
2 PP	2124.500	-53.92	-57.84	-13.00	-40.92	3.92	Peak	Vertical



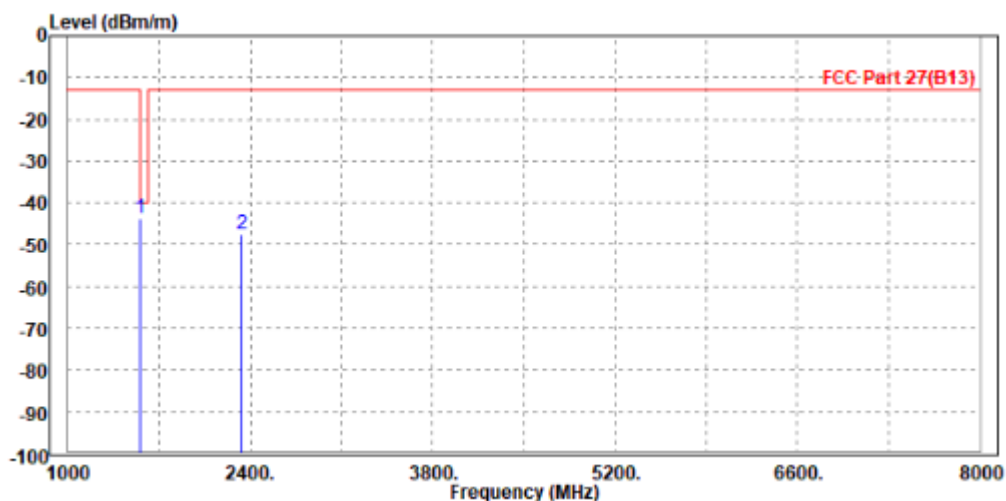
LTE B13

CHANNEL BANDWIDTH: 5MHz / QPSK

CH23205

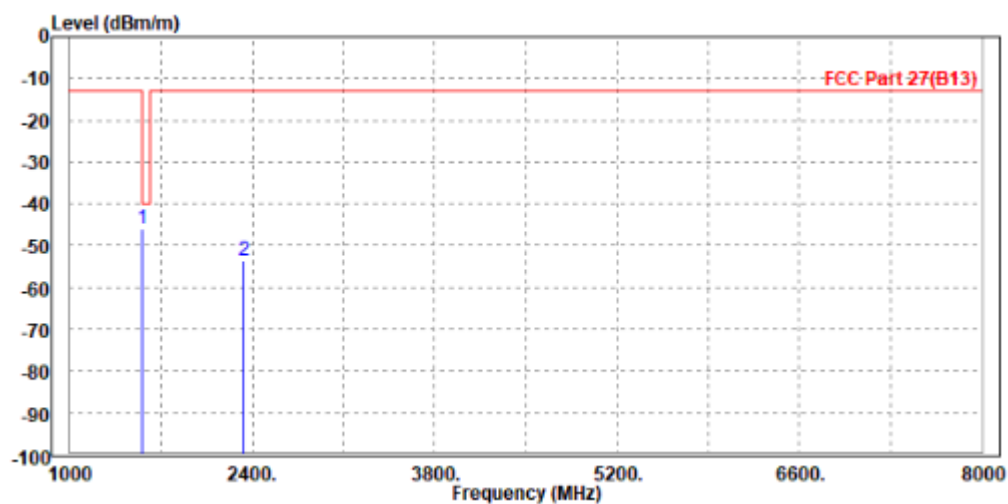
MODE	TX channel 23205	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

		Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
		MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP	1560.000	-43.75	-43.81	-40.00	-3.75	0.06	Peak	Horizontal
2		2338.500	-47.42	-52.27	-13.00	-34.42	4.85	Peak	Horizontal



MODE	TX channel 23205	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
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	1559.000	-45.84	-46.23	-40.00	-5.84	0.39	Peak	Vertical
2		2337.000	-53.44	-57.94	-13.00	-40.44	4.50	Peak	Vertical





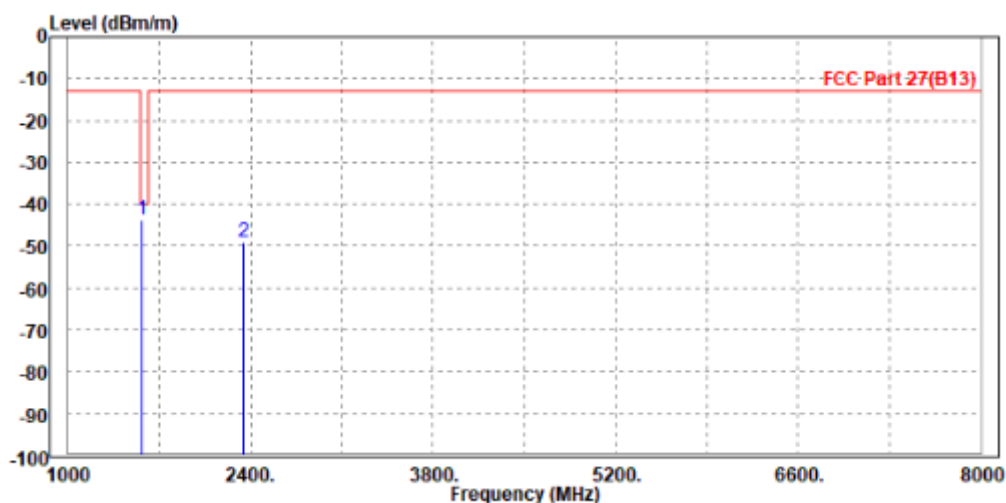
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Test Report No.: W7L-230216W001RF03

CH23230

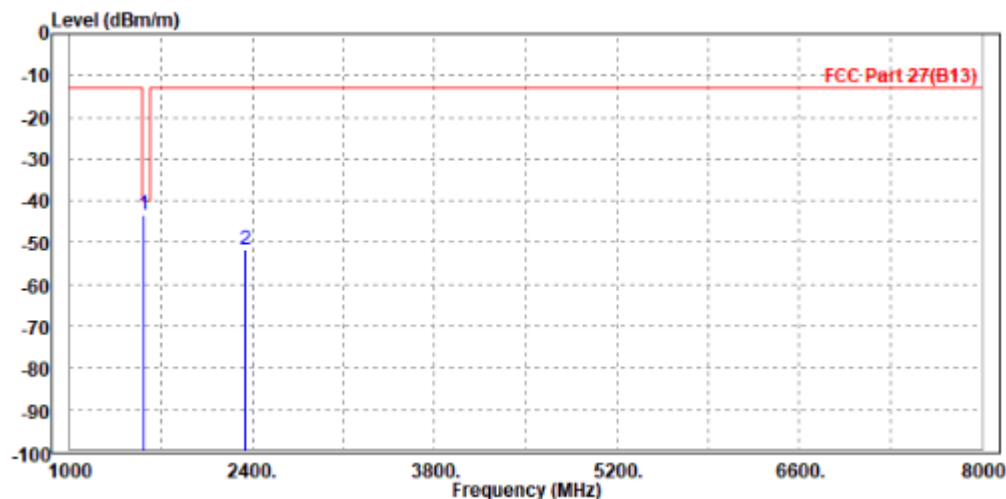
MODE	TX channel 23230	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

		Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
		MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP	1564.000	-43.68	-43.78	-40.00	-3.68	0.10	Peak	Horizontal
2		2344.000	-48.99	-53.86	-13.00	-35.99	4.87	Peak	Horizontal



MODE	TX channel 23230	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
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	1567.000	-43.38	-43.83	-40.00	-3.38	0.45	Peak	Vertical
2		2346.000	-51.84	-56.36	-13.00	-38.84	4.52	Peak	Vertical





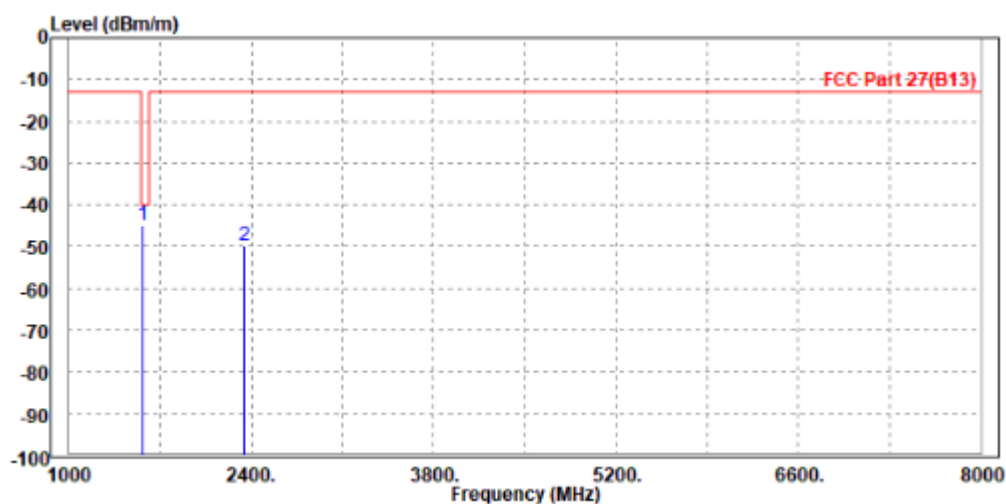
**BUREAU
VERITAS**

Test Report No.: W7L-230216W001RF03

CH23255

MODE	TX channel 23255	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
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	PP	1569.000	-44.80	-44.94	-40.00	-4.80	0.14	Peak	Horizontal
2		2351.000	-49.84	-54.74	-13.00	-36.84	4.90	Peak	Horizontal

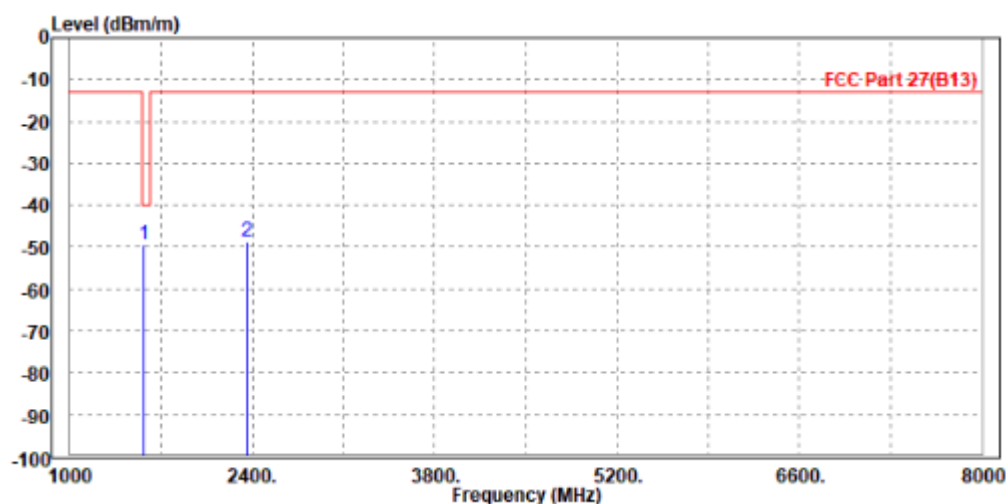




Test Report No.: W7L-230216W001RF03

MODE	TX channel 23255	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

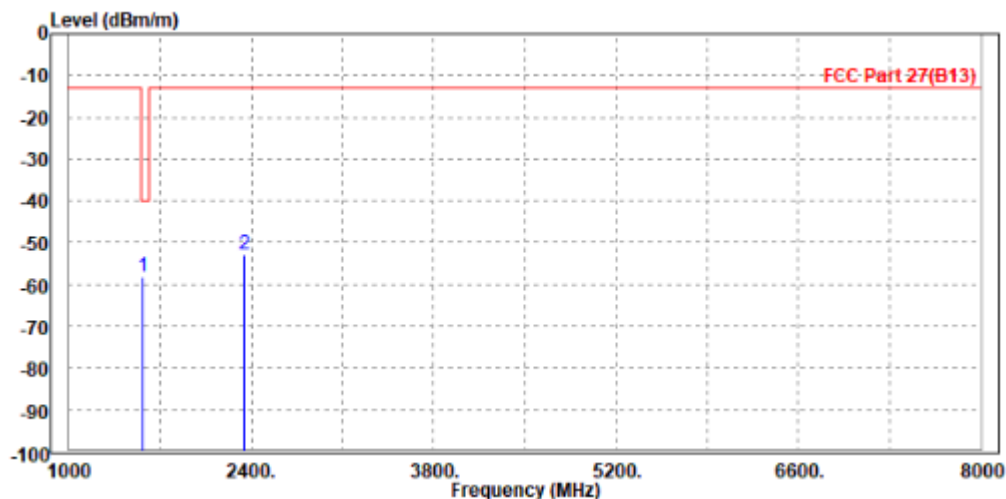
		Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
		MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP	1567.000	-49.38	-49.83	-40.00	-9.38	0.45	Peak	Vertical
2		2353.500	-48.49	-53.03	-13.00	-35.49	4.54	Peak	Vertical



CHANNEL BANDWIDTH: 10MHz /QPSK

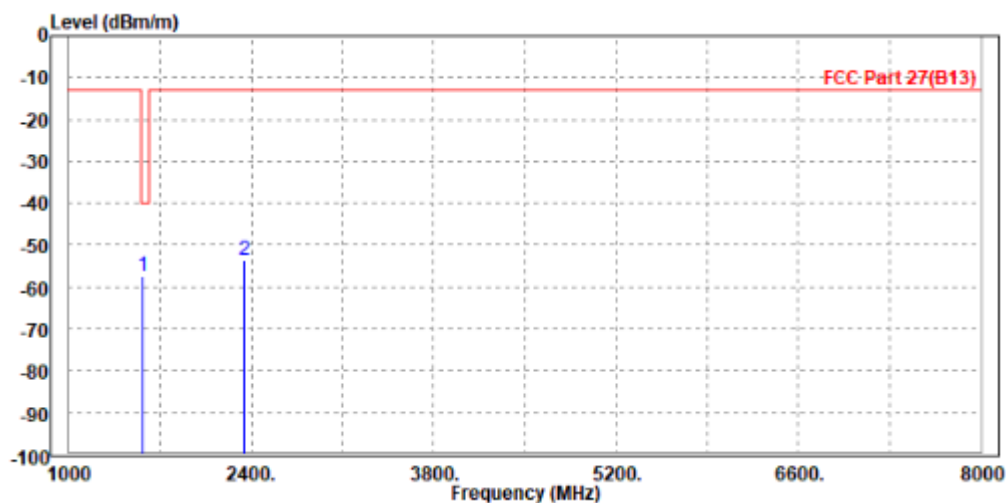
MODE	TX channel 23230	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1 PP	1567.000	-58.17	-58.29	-40.00	-18.17	0.12	Peak	Horizontal
2	2346.000	-53.01	-57.89	-13.00	-40.01	4.88	Peak	Horizontal



MODE	TX channel 23230	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
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 1564.000	-57.24	-57.67	-40.00	-17.24	0.43	Peak	Vertical
2	2344.000	-53.74	-58.26	-13.00	-40.74	4.52	Peak	Vertical



LTE NB-IOT

BELOW 1GHz WORST-CASE DATA

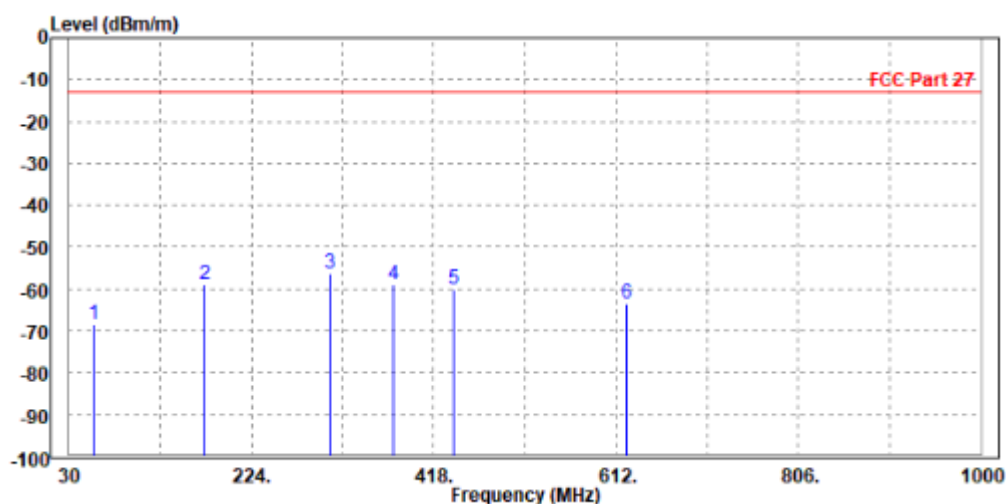
30 MHz – 1GHz data:

LTE Band 13

SUBCARRIER SPACING: 3.75KHz / QPSK

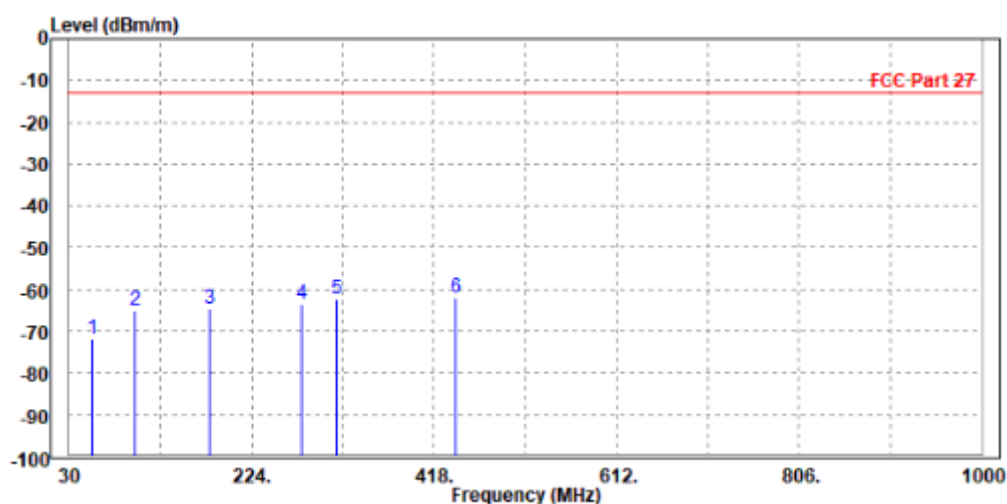
MODE	TX channel 23230	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	56.190	-68.52	-50.44	-13.00	-55.52	-18.08	Peak	Horizontal
2	174.530	-59.12	-41.97	-13.00	-46.12	-17.15	Peak	Horizontal
3 PP	307.420	-56.32	-44.04	-13.00	-43.32	-12.28	Peak	Horizontal
4	374.350	-59.03	-48.38	-13.00	-46.03	-10.65	Peak	Horizontal
5	438.370	-60.01	-50.67	-13.00	-47.01	-9.34	Peak	Horizontal
6	622.670	-63.38	-59.13	-13.00	-50.38	-4.25	Peak	Horizontal



MODE	TX channel 23230	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
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	54.250	-71.95	-47.36	-13.00	-58.95	-24.59	Peak	Vertical
2	100.810	-64.85	-58.15	-13.00	-51.85	-6.70	Peak	Vertical
3	179.380	-64.63	-45.95	-13.00	-51.63	-18.68	Peak	Vertical
4	276.380	-63.51	-51.38	-13.00	-50.51	-12.13	Peak	Vertical
5	314.210	-62.17	-51.61	-13.00	-49.17	-10.56	Peak	Vertical
6 PP	440.310	-61.90	-53.27	-13.00	-48.90	-8.63	Peak	Vertical





**BUREAU
VERITAS**

Test Report No.: W7L-230216W001RF03

ABOVE 1GHz

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

WORST-CASE DATA

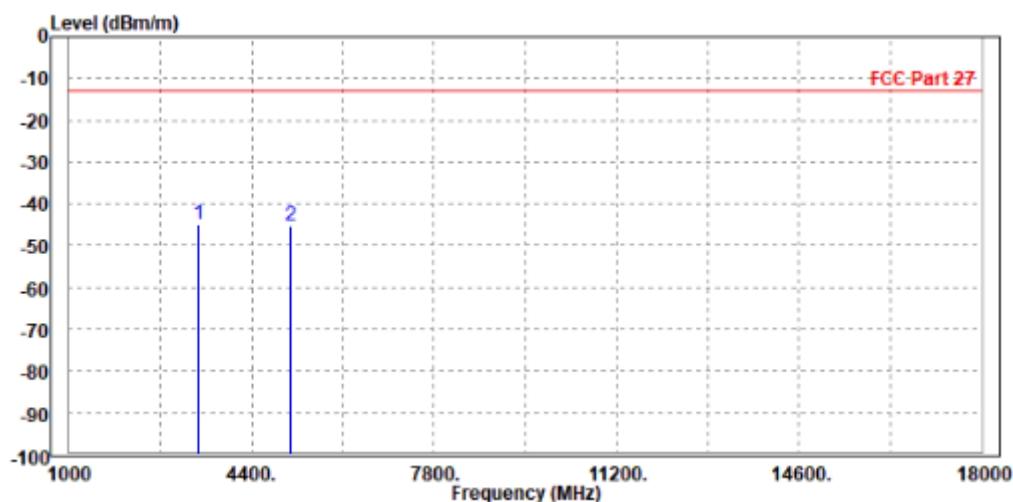
LTE Band 4

SUBCARRIER SPACING: 3.75KHz /QPSK

CH19952

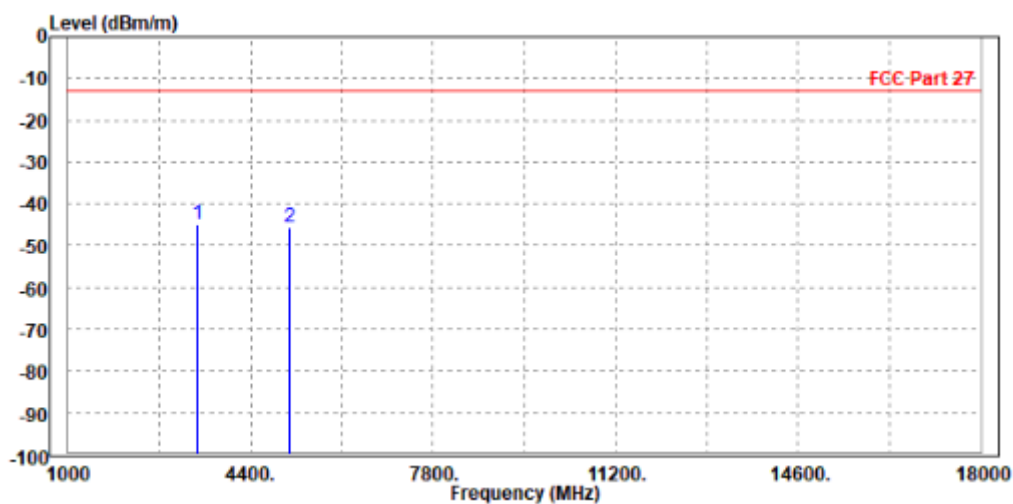
MODE	TX channel 19952	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1 PP	3414.000	-44.86	-52.06	-13.00	-31.86	7.20	Peak	Horizontal
2	5130.300	-45.22	-55.11	-13.00	-32.22	9.89	Peak	Horizontal



MODE	TX channel 19952	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
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	3414.000	-44.78	-51.96	-13.00	-31.78	7.18	Peak	Vertical
2	5131.000	-45.57	-55.96	-13.00	-32.57	10.39	Peak	Vertical





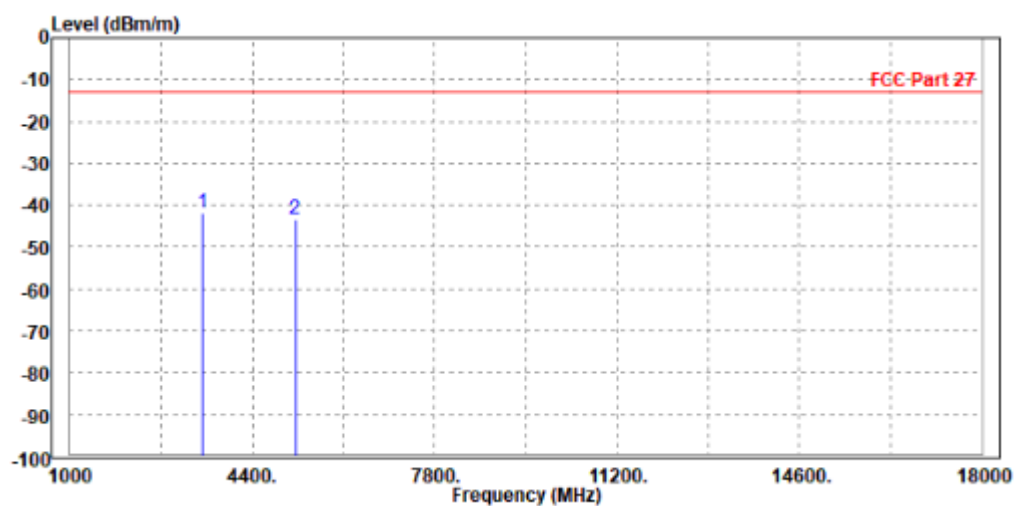
**BUREAU
VERITAS**

Test Report No.: W7L-230216W001RF03

CH20175

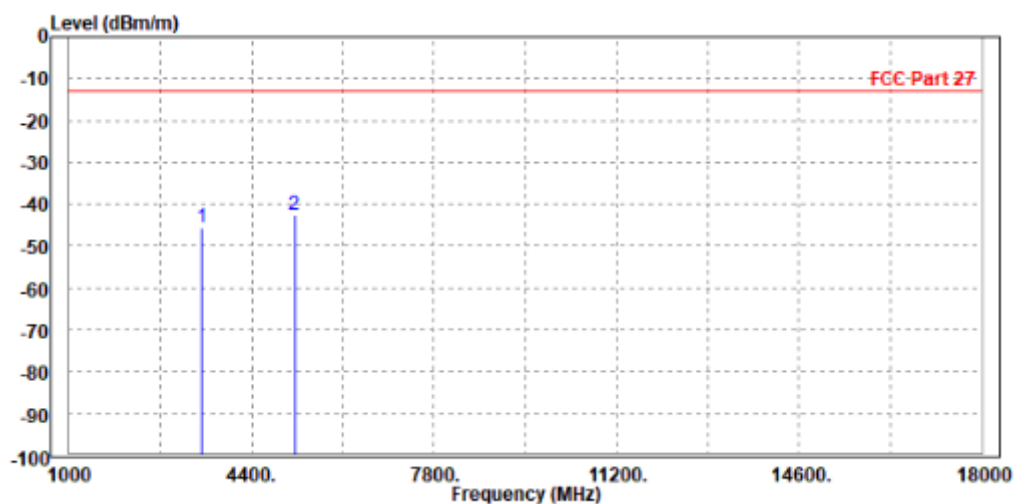
MODE	TX channel 20175	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

		Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
		MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP	3465.000	-41.86	-49.13	-13.00	-28.86	7.27	Peak	Horizontal
2		5199.000	-43.40	-53.40	-13.00	-30.40	10.00	Peak	Horizontal



MODE	TX channel 20175	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
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	3465.000	-45.66	-52.92	-13.00	-32.66	7.26	Peak	Vertical
2 PP	5199.000	-42.71	-53.16	-13.00	-29.71	10.45	Peak	Vertical





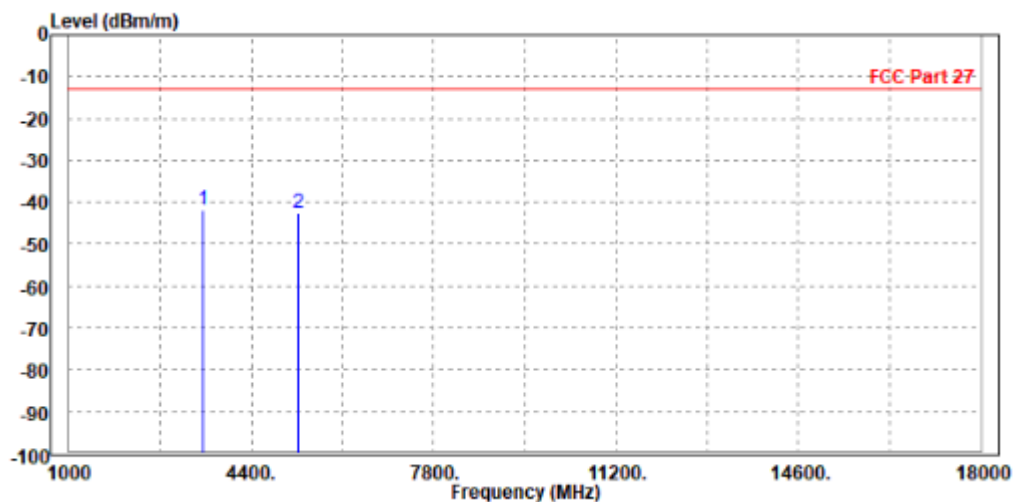
BUREAU
VERITAS

Test Report No.: W7L-230216W001RF03

CH20398

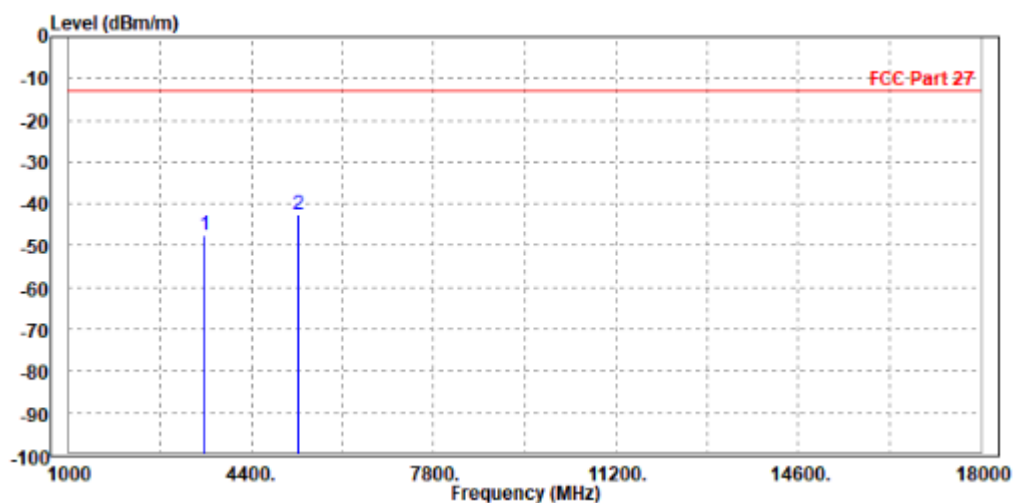
MODE	TX channel 20398	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

		Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
		MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP	3509.800	-41.65	-49.00	-13.00	-28.65	7.35	Peak	Horizontal
2		5267.000	-42.50	-52.61	-13.00	-29.50	10.11	Peak	Horizontal



MODE	TX channel 20398	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
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	3516.000	-47.70	-55.04	-13.00	-34.70	7.34	Peak	Vertical
2 PP	5264.700	-42.46	-52.97	-13.00	-29.46	10.51	Peak	Vertical





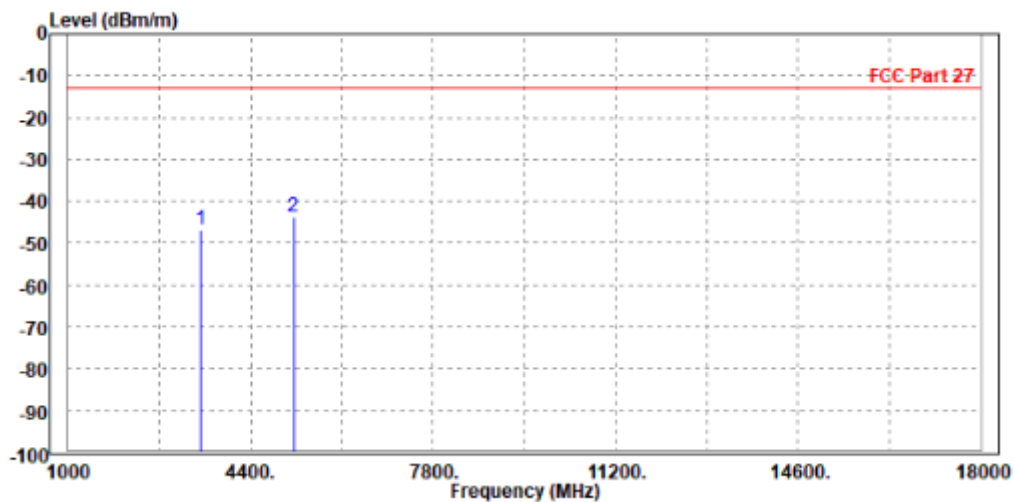
**BUREAU
VERITAS**

Test Report No.: W7L-230216W001RF03

SUBCARRIER SPACING: 15KHz / QPSK

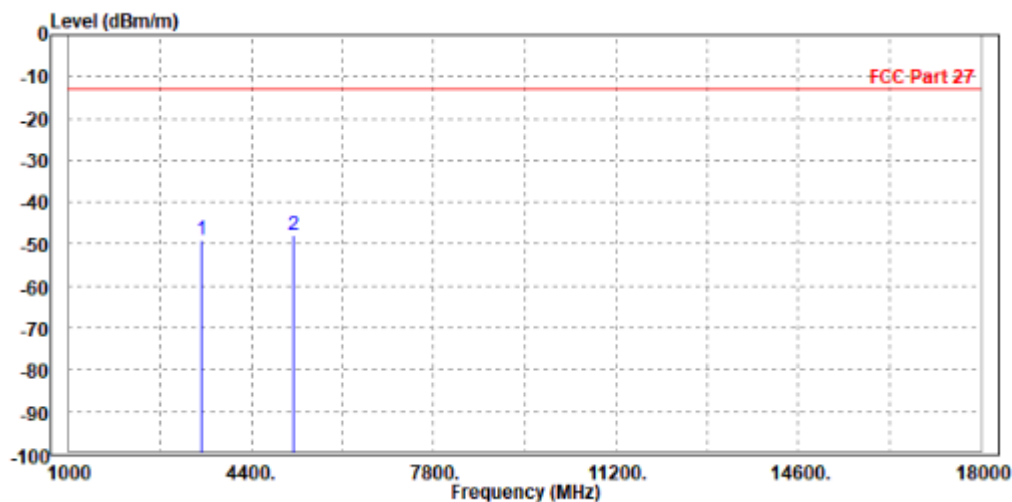
MODE	TX channel 20175	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3465.000	-46.66	-53.93	-13.00	-33.66	7.27	Peak	Horizontal
2 PP	5199.000	-43.80	-53.80	-13.00	-30.80	10.00	Peak	Horizontal



MODE	TX channel 20175	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
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	3465.000	-48.91	-56.17	-13.00	-35.91	7.26	Peak	Vertical
2 PP	5197.500	-47.94	-58.39	-13.00	-34.94	10.45	Peak	Vertical



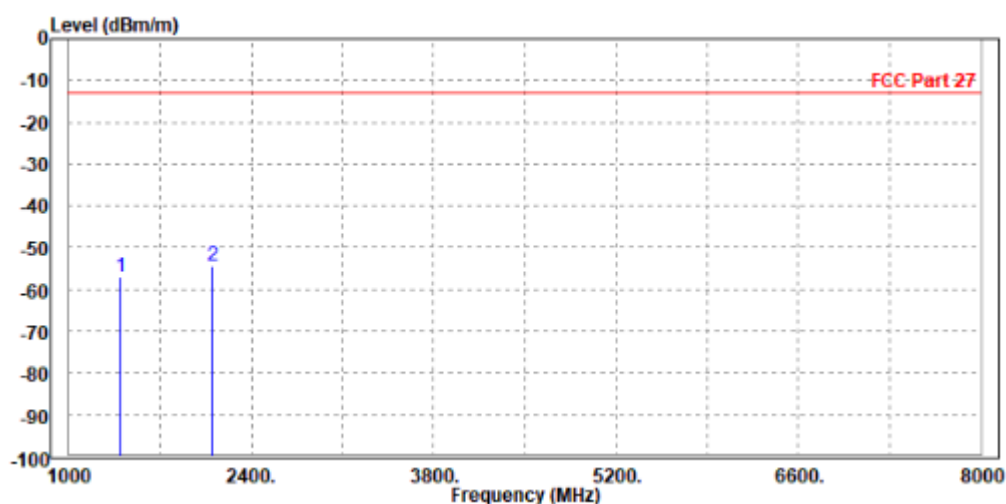
LTE BAND 12

SUBCARRIER SPACING: 3.75KHz / QPSK

CH23012

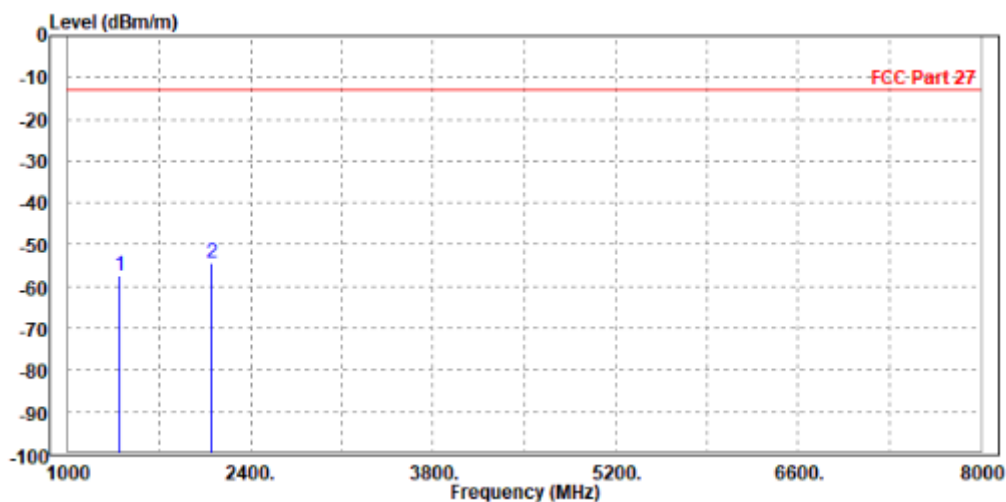
MODE	TX channel 23012	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1399.000	-57.12	-56.43	-13.00	-44.12	-0.69	Peak	Horizontal
2 PP	2097.300	-54.42	-58.39	-13.00	-41.42	3.97	Peak	Horizontal



MODE	TX channel 23012	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
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	1398.200	-57.43	-56.95	-13.00	-44.43	-0.48	Peak	Vertical
2 PP	2099.000	-54.54	-58.39	-13.00	-41.54	3.85	Peak	Vertical





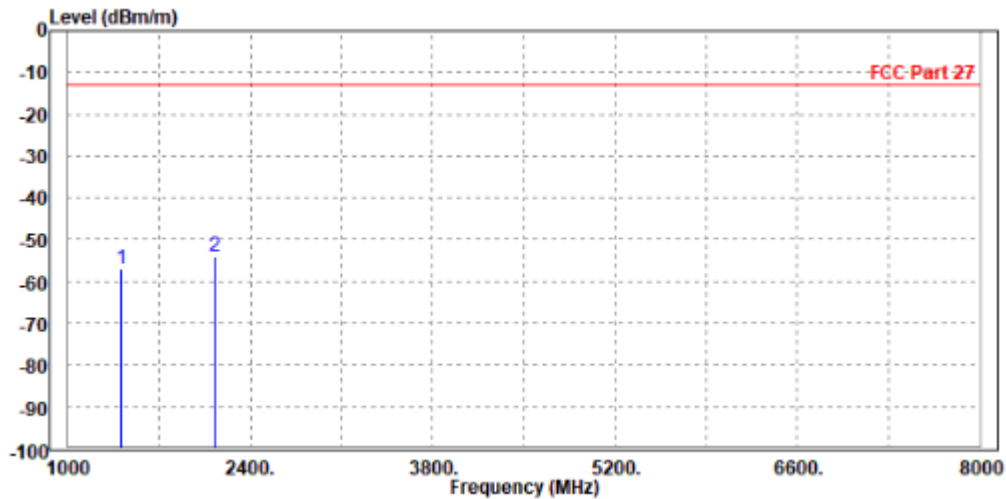
**BUREAU
VERITAS**

Test Report No.: W7L-230216W001RF03

CH23095

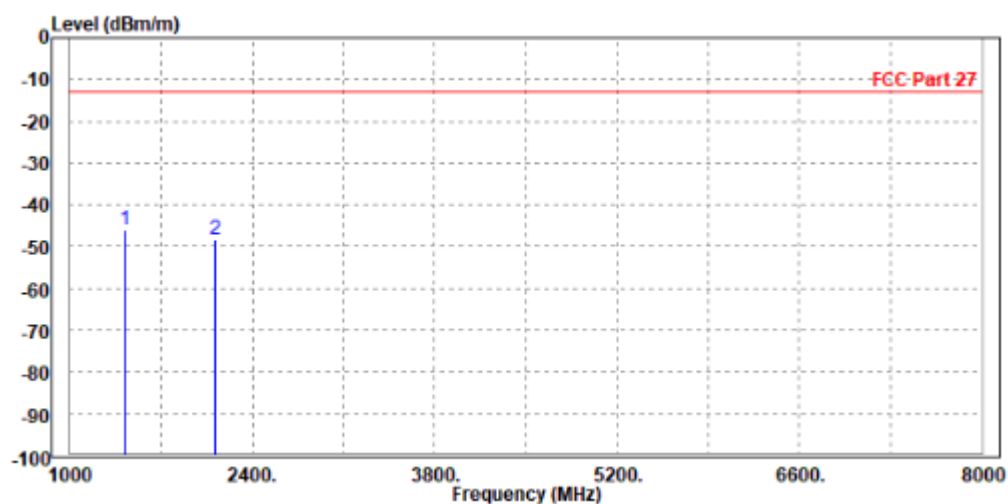
MODE	TX channel 23095	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1413.000	-56.97	-56.32	-13.00	-43.97	-0.65	Peak	Horizontal
2 PP	2122.500	-54.15	-58.21	-13.00	-41.15	4.06	Peak	Horizontal



MODE	TX channel 23095	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

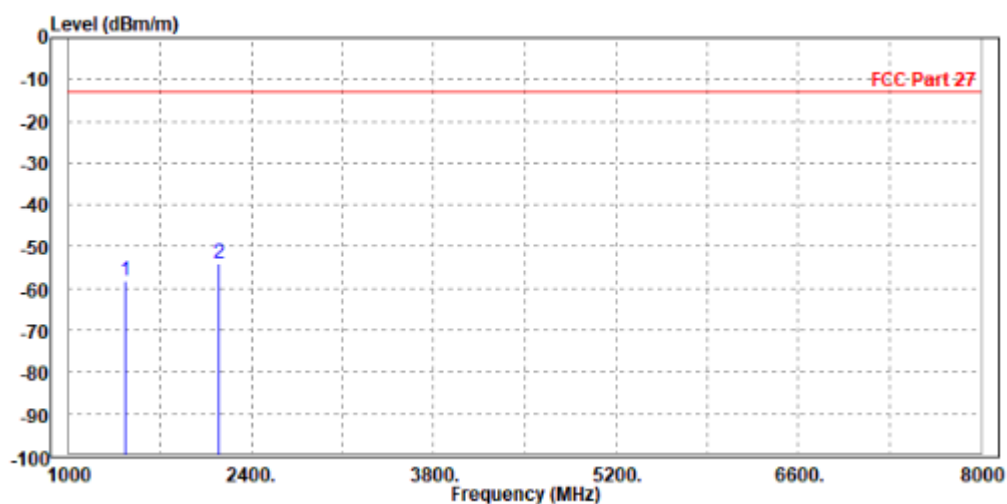
		Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
		MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP	1415.000	-46.16	-45.75	-13.00	-33.16	-0.41	Peak	Vertical
2		2120.000	-48.31	-52.22	-13.00	-35.31	3.91	Peak	Vertical



CH23178

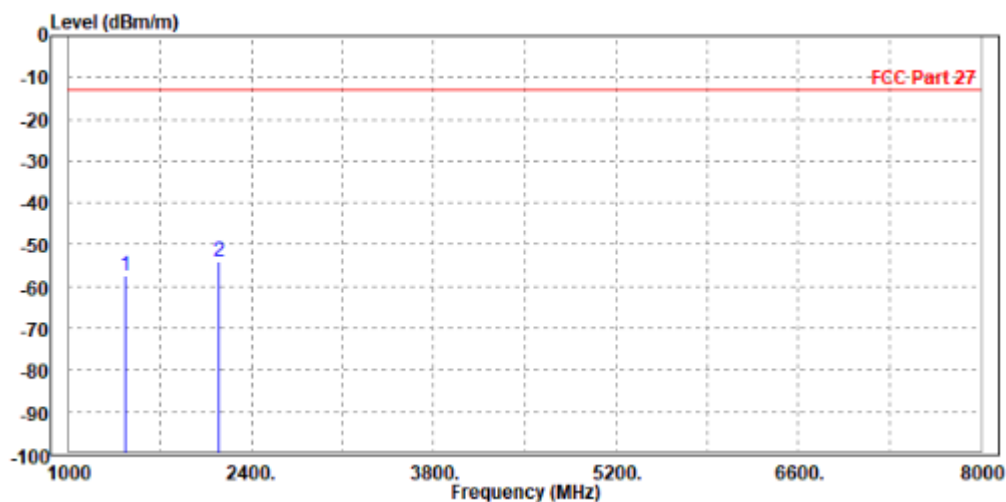
MODE	TX channel 23178	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1431.800	-58.35	-57.75	-13.00	-45.35	-0.60	Peak	Horizontal
2 PP	2148.000	-53.90	-58.06	-13.00	-40.90	4.16	Peak	Horizontal



MODE	TX channel 23178	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

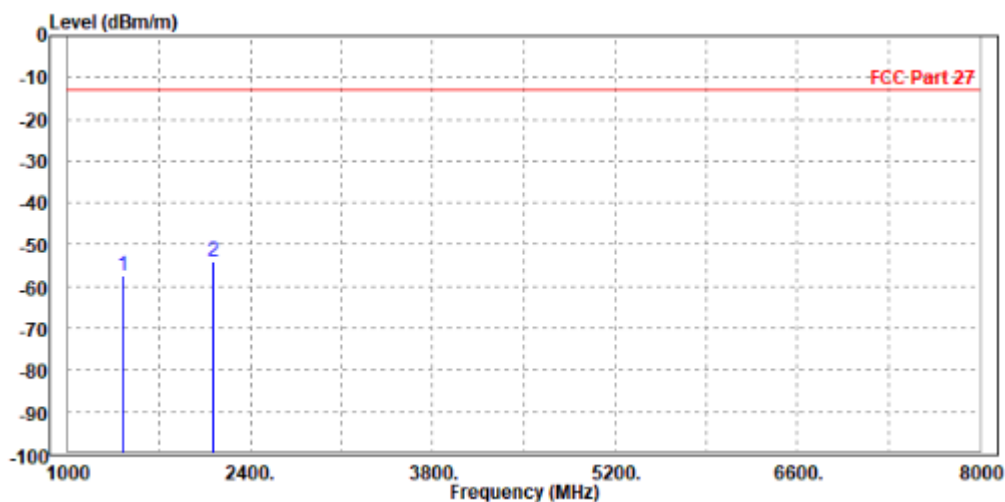
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1431.800	-57.27	-56.94	-13.00	-44.27	-0.33	Peak	Vertical
2 PP	2147.700	-54.14	-58.12	-13.00	-41.14	3.98	Peak	Vertical



SUBCARRIER SPACING: 15KHz / QPSK

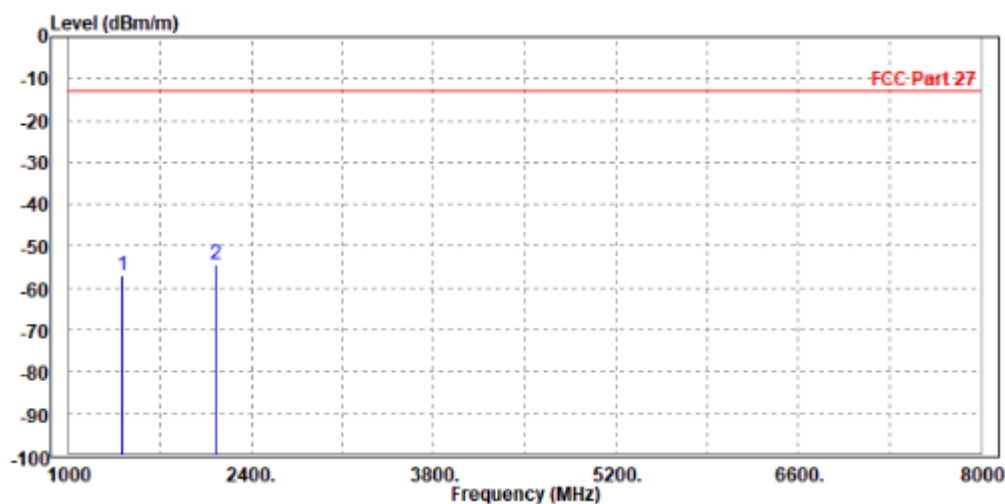
MODE	TX channel 23095	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1415.000	-57.47	-56.82	-13.00	-44.47	-0.65	Peak	Horizontal
2 PP	2120.000	-53.91	-57.97	-13.00	-40.91	4.06	Peak	Horizontal



MODE	TX channel 23095	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
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	1413.000	-56.89	-56.47	-13.00	-43.89	-0.42	Peak	Vertical
2 PP	2122.500	-54.25	-58.17	-13.00	-41.25	3.92	Peak	Vertical



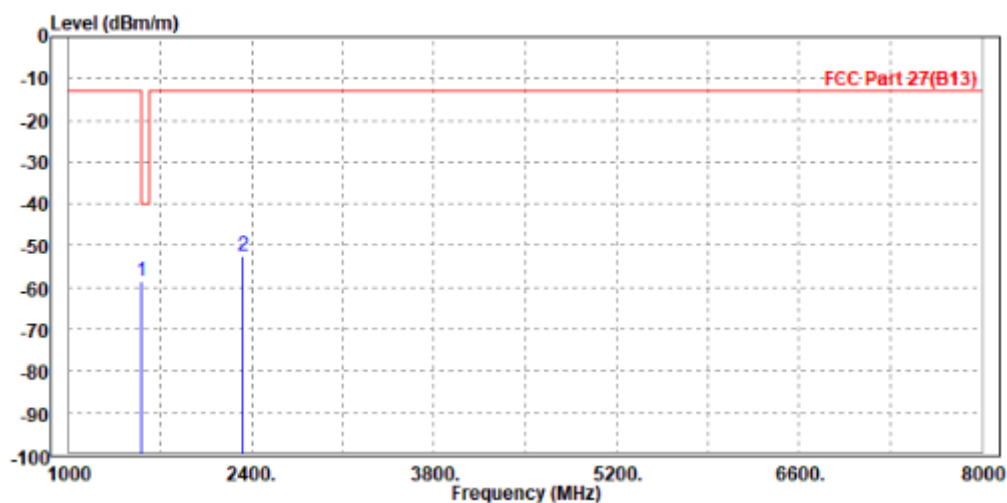
LTE B13

SUBCARRIER SPACING: 3.75KHz / QPSK

CH23182

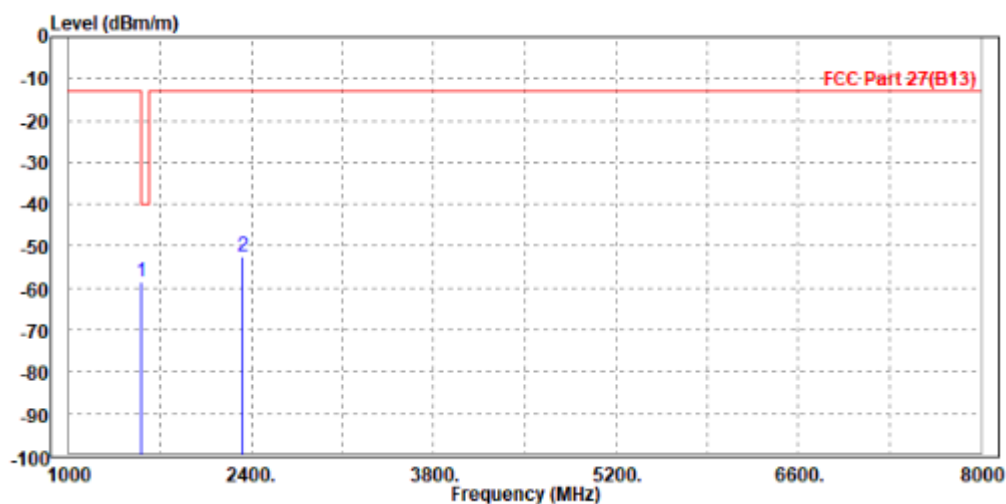
MODE	TX channel 23182	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1553.000	-58.45	-58.46	-13.00	-45.45	0.01	Peak	Horizontal
2 PP	2330.000	-52.62	-57.44	-13.00	-39.62	4.82	Peak	Horizontal



MODE	TX channel 23182	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

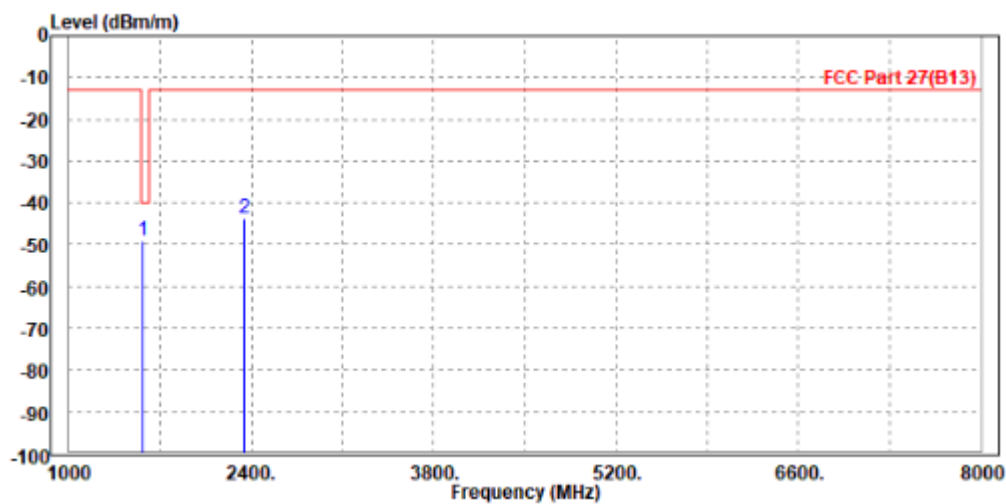
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1553.000	-58.45	-58.46	-13.00	-45.45	0.01	Peak	Horizontal
2 PP	2330.000	-52.62	-57.44	-13.00	-39.62	4.82	Peak	Horizontal



CH23230

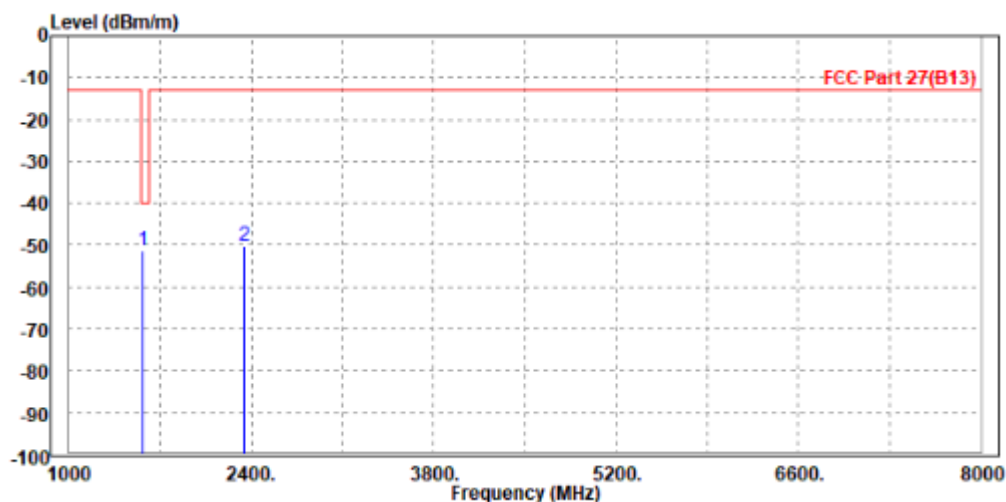
MODE	TX channel 23230	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1 PP	1567.000	-49.23	-49.35	-40.00	-9.23	0.12	Peak	Horizontal
2	2346.000	-43.70	-48.58	-13.00	-30.70	4.88	Peak	Horizontal



MODE	TX channel 23230	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

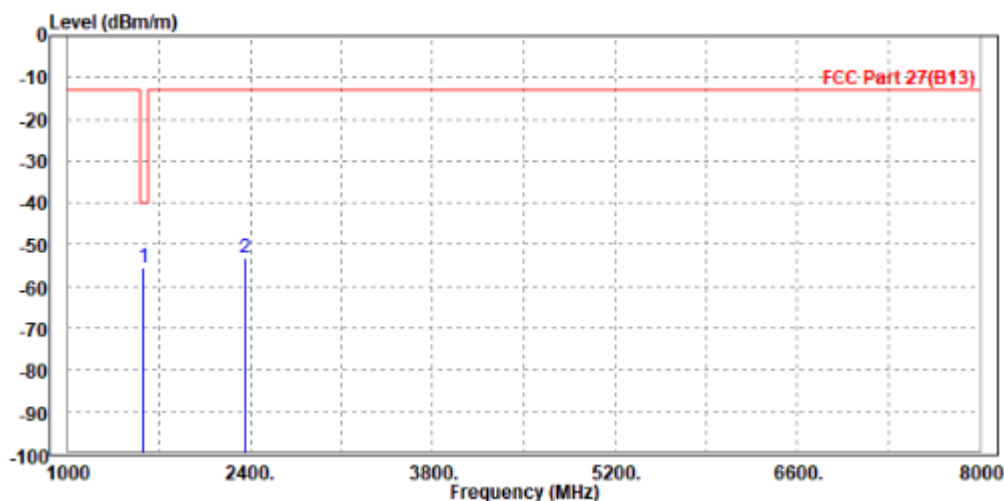
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1 PP	1564.000	-51.51	-51.94	-40.00	-11.51	0.43	Peak	Vertical
2	2344.000	-50.27	-54.79	-13.00	-37.27	4.52	Peak	Vertical



CH23278

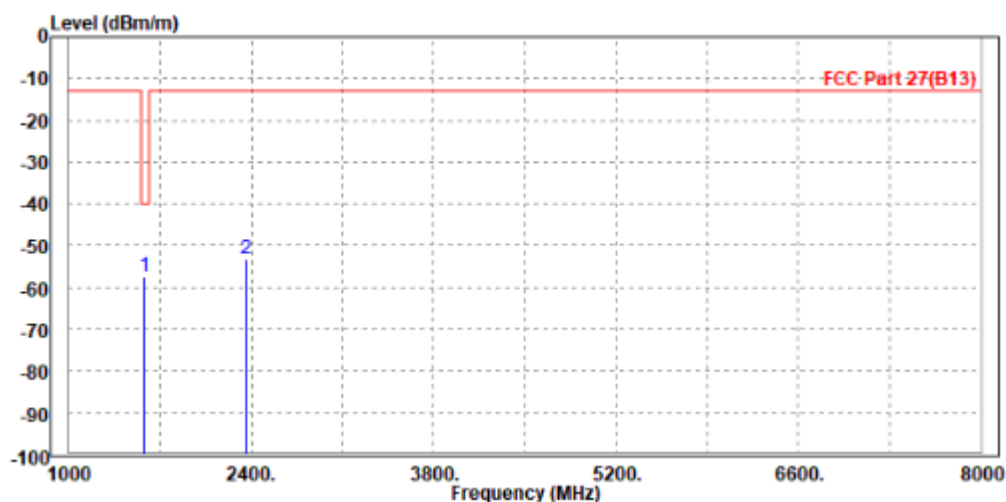
MODE	TX channel 23278	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

		Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
		MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP	1574.000	-55.64	-55.82	-40.00	-15.64	0.18	Peak	Horizontal
2		2360.700	-53.35	-58.28	-13.00	-40.35	4.93	Peak	Horizontal



MODE	TX channel 23278	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

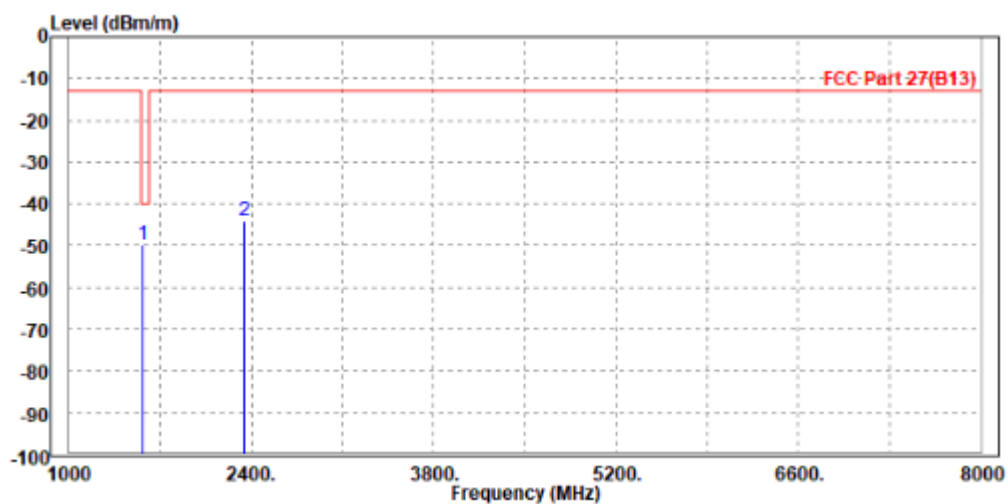
		Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
		MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP	1574.000	-57.45	-57.95	-40.00	-17.45	0.50	Peak	Vertical
2		2360.700	-53.42	-57.98	-13.00	-40.42	4.56	Peak	Vertical



SUBCARRIER SPACING: 15KHz / QPSK

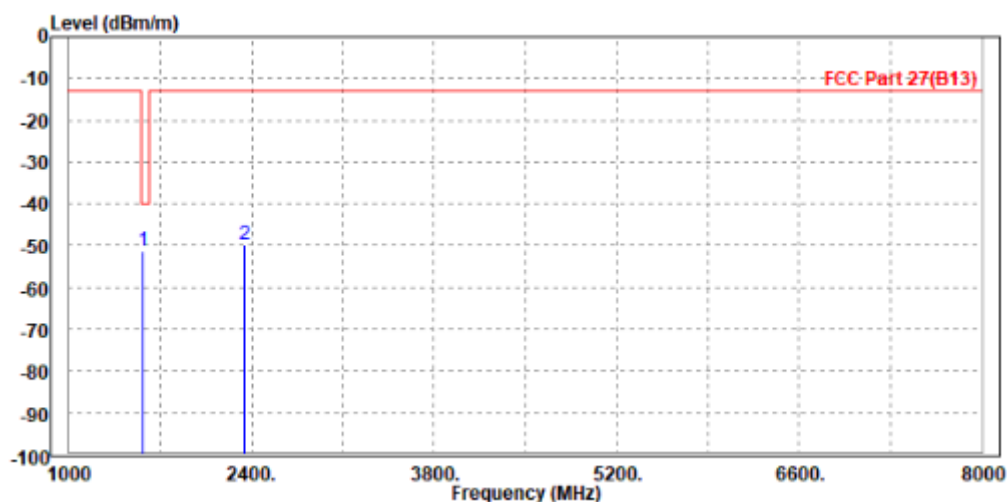
MODE	TX channel 23230	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1 PP	1567.000	-49.69	-49.81	-40.00	-9.69	0.12	Peak	Horizontal
2	2344.000	-44.18	-49.05	-13.00	-31.18	4.87	Peak	Horizontal



MODE	TX channel 23230	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC12V
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	1567.000	-51.20	-51.65	-40.00	-11.20	0.45	Peak	Vertical
2	2346.000	-49.86	-54.38	-13.00	-36.86	4.52	Peak	Vertical

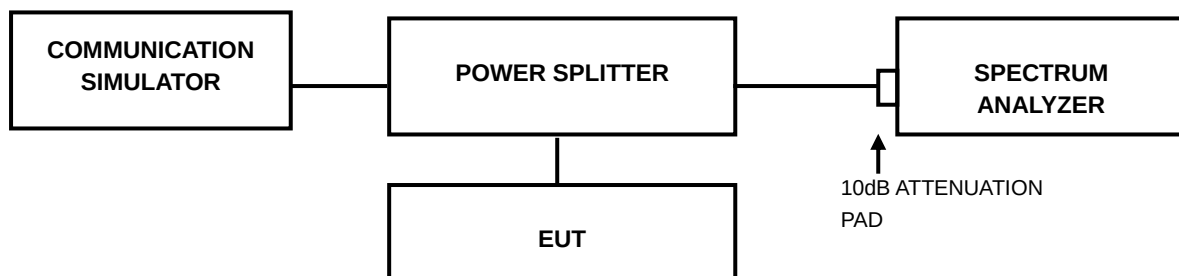


3.7 PEAK TO AVERAGE RATIO

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 $\geq$ 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%.



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3.7.4 TEST RESULTS

Please Refer to Module report I22W00076-CAT-M RF-FCC_Rev2/
I22W00076-NB-IoT RF-FCC-Rev2.



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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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Web Site: www.adt.com.tw

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



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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.

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