



FCC TEST REPORT (PART 22)

Applicant:	Borqs BeiJing Ltd.
Address:	Tower A, Building B23, Universal Business Park, No. 10 Jiuxianqiao Road, Chaoyang District Beijing, 100015 China

Manufacturer or Supplier:	Borqs BeiJing Ltd.
Address:	Tower A, Building B23, Universal Business Park, No. 10 Jiuxianqiao Road, Chaoyang District Beijing, 100015 China
Product:	SKYBOX
Brand Name:	SkyCentrics
Model Name:	MA01-WBNA (Low Voltage with LTE), MA01-EP-WBNA (High Voltage with LTE)
FCC ID:	2ABDK-MA01
Date of tests:	Nov. 27, 2023 ~ Dec. 05, 2023

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

☐ FCC PART 22, Subpart H

FCC Part 2

MANSI C63.26-2015

◯ ANSI/TIA/EIA-603-E

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

Prepared by Chao Wu	
Engineer / Mobile Department	

Approved by Peibo Sun Manager / Mobile Department

Chao Wu

Date: Dec. 05, 2023

Date: Dec. 05, 2023

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Huarui 7Layers High Technology (Suzhou) Co., Ltd Tower N, Innovation Center, 88 Zhuyi Road, High-tech District, Suzhou City, Anhui Province

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
W7L-231123W001RF01	Original release	Dec. 05, 2023



1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 22 & Part 2			
STANDARD SECTION	TEST TYPE	RESULT	LAB
§2.1046	Conducted Output Power	Compliance	Α
§22.913 (a)(5)	Effective Radiated Power	Compliance	Α
§2.1055 §22.355	Frequency Stability	See Note	-
§2.1049	Occupied Bandwidth	See Note	-
§22.913 (d)	Peak to average ratio*	See Note	-
§22.917(a)	Band Edge Measurements	See Note	-
§2.1051 §22.917(a)	Conducted Spurious Emissions	See Note	-
§2.1053 §22.917(a)	Radiated Spurious Emissions	Compliance	Α

^{*} Refer to KDB 971168 D01 Power Meas License Digital Systems v03r01.

Note: please refer to the module report R2006A0379-R1/R4 (FCC-ID: XMR202008EG91NAXD).

Test Lab Information Reference:

Lab A:

Huarui 7Layers High Technology (Suzhou) Co., Ltd.

Lab Address:

Tower N, Innovation Center, 88 Zhuyi Road, High-tech District, Suzhou City, Anhui Province

Accredited Test Lab Cert 6613.01

The FCC Site Registration No. is 434559; The Designation No. is CN1325.



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
Maximum Peak Output Power	±2.06dB
Radiated emissions (9KHz~30MHz)	±2.68dB
Radiated emissions (30MHz~1GHz)	±4.98dB
Radiated emissions (1GHz ~6GHz)	±4.70dB
Radiated emissions (6GHz ~18GHz)	±4.60dB
Radiated emissions (18GHz ~40GHz)	±4.12dB

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. 28,23	Mar. 27,24
EXA Signal Analyzer	KEYSIGHT	N9010A-544	MY54510355	May.10,23	May.09,24
Loop Antenna	Schwarzbeck	FMZB 1519B	00173	Sep.02,23	Sep.01,24
Bilog Antenna	ETS-LINDGRE N	3143B	00161965	Feb. 18,23	Feb. 17,24
Horn Antenna	ETS-LINDGRE N	3117	00168692	Feb. 18,23	Feb. 17,24
Horn Antenna (18GHz-40GHz)	N/A	QWH-SL-18-40-K- SG/QMS-00361	15433	Sep.03, 23	Sep.02, 24
Radio Communication Analyzer	ANRITSU	MT8820C	6201465426	Feb. 14,23	Feb. 13,24
Signal Pre-Amplifier	EMSI	EMC 9135	980249	May. 06,23	May. 05,24
Signal Pre-Amplifier	EMSI	EMC 012645B	980257	May.10,23	May.09,24
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. 22, 23	May. 21,26
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
Power Meter	Anritsu	ML2495A	1506002	Feb. 14,23	Feb. 13,24
Power Sensor	Anritsu	MA2411B	1339352	Feb. 14,23	Feb. 13,24
Temperature Chamber	ESPEC	SH-242	93000855	May. 06,23	May. 05,24
MXG Analog Microwave Signal Generator	KEYSIGHT	N5183A	MY50143024	Feb. 14,23	Feb. 13,24
Base station R&S CMW500	Rohde&Schwa rz	CMW500	153085	May.10,23	May.09,24
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 months or 36 months, and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.



2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT	SKYBOX		
BRAND NAME	SkyCentrics		
MODEL NAME	MA01-WBNA (Low Voltage with LTE), MA01-EP-WBNA (High Voltage with LTE)		
NOMINAL VOLTAGE	24Vac (MA01-WBNA) 120Vac (MA01-EP-WBNA)		
MODULATION TYPE	LTE	QPSK, 16QAM	
	LTE Band 5 (Channel Bandwidth: 1.4MHz)	824.7MHz ~ 848.3MHz	
	LTE Band 5 (Channel Bandwidth: 3MHz)	825.5MHz ~ 847.5MHz	
	LTE Band 5 (Channel Bandwidth: 5MHz)	826.5MHz ~ 846.5MHz	
	LTE Band 5 (Channel Bandwidth: 10MHz)	829MHz ~ 844MHz	
FREQUENCY RANGE	LTE Band 26 (Channel Bandwidth: 1.4MHz)	824.7MHz ~ 848.3MHz	
	LTE Band 26 (Channel Bandwidth: 3MHz)	825.5MHz ~ 847.5MHz	
	LTE Band 26 (Channel Bandwidth: 5MHz)	826.5MHz ~ 846.5MHz	
	LTE Band 26 (Channel Bandwidth: 10MHz)	829MHz ~ 844MHz	
	LTE Band 26 (Channel Bandwidth: 15MHz)	831.5MHz ~ 841.5MHz	
	LTE Band 5 (Channel Bandwidth: 1.4MHz)	52.12mW	
	LTE Band 5 (Channel Bandwidth: 3MHz)	52.72mW	
	LTE Band 5 (Channel Bandwidth: 5MHz)	53.33mW	
MAX. ERP POWER	LTE Band 5 (Channel Bandwidth: 10MHz)	53.58mW	
	LTE Band 26 (Channel Bandwidth: 1.4MHz)	55.46mW	
	LTE Band 26 (Channel Bandwidth: 3MHz)	54.33mW	
	LTE Band 26 (Channel Bandwidth: 5MHz)	55.08mW	
	LTE Band 26 (Channel Bandwidth: 10MHz)	55.34mW	

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VERITAS			
	LTE Band 26 (Channel Bandwidth: 15MHz)	55.59mW	
	LTE Band 5 (Channel Bandwidth: 1.4MHz)	QPSK: 1M12G7D	
		16QAM: 326KW7D	
		64QAM: /	
		QPSK: 2M76G7D	
	LTE Band 5 (Channel Bandwidth: 3MHz)	16QAM: 408KW7D	
	(Chamer Bandwidth: Swiftz)	64QAM: /	
		QPSK: 4M54G7D	
	LTE Band 5 (Channel Bandwidth: 5MHz)	16QAM: 491KW7D	
	,	64QAM: /	
		QPSK: 9M02G7D	
	LTE Band 5 (Channel Bandwidth: 10MHz)	16QAM: 877KW7D	
	(Chainer Bandwidth: 10MHz)	64QAM: /	
EMISSION		QPSK: 1M10G7D	
DESIGNATORGOGN	LTE Band 26 (Channel Bandwidth: 1.4MHz)	16QAM: 1M10W7D	
	(Chamler Bandwidth: 1.4Minz)	64QAM: /	
	LTE D 100	QPSK: 2M71G7D	
	LTE Band 26 (Channel Bandwidth: 3MHz)	16QAM: 2M71W7D	
		64QAM: /	
		QPSK: 4M51G7D	
	LTE Band 26 (Channel Bandwidth: 5MHz)	16QAM: 4M51W7D	
		64QAM: /	
		QPSK: 8M98G7D	
	LTE Band 26 (Channel Bandwidth: 10MHz)	16QAM: 4M74W7D	
		64QAM: /	
		QPSK: 13M4G7D	
	LTE Band 26 (Channel Bandwidth: 15MHz)	16QAM: 1M11W7D	
	(Chamer Bandwidth, 13MHz)	64QAM: /	
ANTENNA TYPE	Internal Antenna with -3.94 dBi gain for LTE B5/26		
HW VERSION	DVT		
SW VERSION	fft_PICO_KITE_20230828		
I/O PORTS	Refer to user's manual		
CABLE SUPPLIED	Power cable: non-shielded cable,	with w/o ferrite core, 1.8 meter	
EXTREME TEMPERATURE	-20-50 °C		



EXTREME VOLTAGE	110V - 240V (MA01-EP-WBNA)
EXTREME VOLTAGE	18V - 30V (MA01-WBNA)

NOTE:

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

MODULATION MODE	TX FUNCTION
LTE	1TX/1RX

- 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. The difference of MA01-WBNA and MA01-EP-WBNA is as follows:

No	Model	Difference Description				
1	MA01-EP-WBNA	High Voltage: 120 VAC through Power Entry Module				
2	MA01-WBNA	Low Voltage: 24 VAC through terminal block header				

The main test model is MA01-EP-WBNA, and MA01-WBNA verified the worst-case mode of MA01-EP-WBNA. Only the data of MA01-EP-WBNA was reported in the report, because of its worse data.

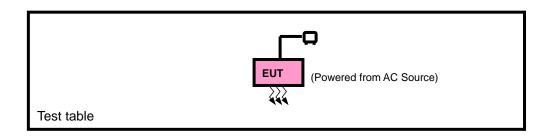
List of Accessory:

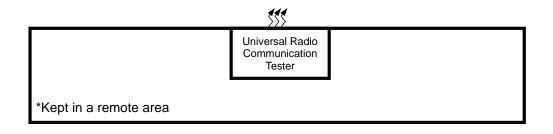
ACCESSORIES	BRAND	MODEL	SPECIFICATION
Power cable	YuanSong	YS-301+SVT18/ 3CBK+ YS-302	1.8M



2.2 CONFIGURATION OF SYSTEM UNDER TEST

FOR RADIATION EMISSION







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	AC power supply	N/A	JS-AC2410	N/A	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	N/A

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 in ERP and radiated emission was found when positioned on X-plane for LTE. Following channel(s) was (were) selected for the final test as listed below:

EUT CONFIGURE MODE	DESCRIPTION
Α	EUT + Adapter with LTE link



LTE BAND 5 MODE

EUT CONFIGURE MODE	TEST ITEM	Available Channel	Tested Channel	Channel bandwidth	modulation	mode
		20407 to 20643	20407, 20525, 20643	1.4MHz	QPSK,16QAM	1 RB / 0 RB Offset
A	ERP	20415 to 20635	20415, 20525, 20635	3MHz	QPSK,16QAM	1 RB / 0 RB Offset
A		20425 to 20625	20425, 20525, 20625	5MHz	QPSK,16QAM	1 RB / 0 RB Offset
		20450 to 20600	20450, 20525, 20600	10MHz	QPSK,16QAM	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. For the radiated emission test, LTE Band 5 are covered by LTE Band 26, Because it is a subset of LTE Band 26 with the same output power and supported bandwidths, So the test data please refer to LTE Band 26.

LTE BAND 26 MODE

EUT CONFIGURE MODE	TEST ITEM	Available Channel	Tested Channel	Channel bandwidth	modulation	mode
		26797 to 27033	26797, 26915, 27033	1.4MHz	QPSK,16QAM	1 RB / 0 RB Offset
		26805 to 27025	26805, 26915, 27025	3MHz	QPSK,16QAM	1 RB / 0 RB Offset
А	ERP	26815 to 27015	26815, 26915, 27015	5MHz	QPSK,16QAM	1 RB / 0 RB Offset
		26840 to 26990	26840, 26915, 26990	10MHz	QPSK,16QAM	1 RB / 0 RB Offset
		26865 to 26965	26865, 26915, 26965	15MHz	QPSK,16QAM	1 RB / 0 RB Offset
	RADIATED EMISSION	26797 to 27033	26915	1.4MHz	QPSK	1 RB / 0 RB Offset
		26805 to 27025	26915	3MHz	QPSK	1 RB / 0 RB Offset
А		26815 to 27015	26815, 26915, 27015	5MHz	QPSK	1 RB / 0 RB Offset
		26840 to 26990	26915	10MHz	QPSK	1 RB / 0 RB Offset
		26865 to 26965	26915	15MHz	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	25deg. C, 70%RH	AC 120V	Jace Hu
RADIATED EMISSION	25deg. C, 70%RH	AC 120V	Jace Hu

2.5 EUT OPERATING CONDITIONS

The EUT makes a call to the communication simulator. The communication simulator station system controlled an EUT to export maximum output power under transmission mode and specific channel frequency.



2.6 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is an 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 22
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

Mobile / Portable station are limited to 7 watts E.R.P.

3.1.2 TEST PROCEDURES

EIRP / ERP 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 determining 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 isotopically 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);

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

CONDUCTED POWER MEASUREMENT:

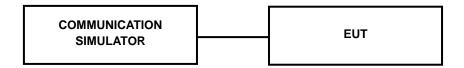
The EUT was set up for the maximum power with WCDMA link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.



3.1.3 TEST SETUP

EIRP / ERP Measurement:

CONDUCTED POWER MEASUREMENT:



3.1.4 TEST RESULTS

CONDUCTED OUTPUT POWER (dBm)

LTE Band 5

Band/BW	Modulation	RB	RB	Low CH 20407	Mid CH 20525	High CH 20643
	Woddiation	Size	Offset	Frequency 824.7 MHz	Frequency 836.5 MHz	Frequency 848.3 MHz
		1	0	23.11	23.14	23.25
		1	2	23.07	22.97	23.26
		1	5	22.84	22.84	23.12
	QPSK	3	0	22.83	22.70	22.98
		3	1	22.56	22.61	22.74
		3	3	22.73	22.77	23.04
E/A A		6	0	21.72	21.81	21.92
5/ 1.4	16QAM	1	0	21.74	21.76	22.05
		1	2	21.77	21.74	21.84
		1	5	21.80	21.75	22.02
		3	0	22.04	22.06	22.15
		3	1	22.07	22.02	22.27
		3	3	22.36	22.30	22.43
		6	0	20.87	20.76	21.15



Band/BW	Modulation	RB Size	RB Offset	Low CH 20415 Frequency 825.5 MHz	Mid CH 20525 Frequency 836.5 MHz	High CH 20635 Frequency 847.5 MHz
		1	0	23.16	23.08	23.31
		1	7	23.05	23.04	23.16
		1	14	22.94	22.94	22.99
	QPSK	8	0	22.08	21.93	22.07
		8	3	21.78	21.78	22.01
		8	7	21.93	21.96	22.25
5/ 3		15	0	21.74	21.82	21.94
5/ 3		1	0	21.79	21.83	21.93
		1	7	21.77	21.61	21.94
		1	14	21.70	21.74	21.90
	16QAM	8	0	21.85	21.87	21.92
		8	3	21.94	21.91	22.15
		8	7	22.17	22.13	22.17
		15	0	20.77	20.77	21.03

Band/BW	Modulation	RB	RB	Low CH 20425	Mid CH 20525	High CH 20625
	Woddiation	Size	Offset	Frequency 826.5 MHz	Frequency 836.5 MHz	Frequency 846.5 MHz
		1	0	23.21	23.06	23.36
		1	12	23.09	22.98	23.21
		1	24	22.87	22.86	23.08
	QPSK	12	0	21.99	21.96	22.17
		12	6	21.84	21.75	21.96
		12	13	22.06	21.91	22.21
F/ F		25	0	21.68	21.83	21.93
5/ 5		1	0	21.75	21.81	21.93
		1	12	21.83	21.72	21.91
		1	24	21.75	21.73	21.89
	16QAM	12	0	21.80	21.86	21.93
		12	6	21.94	21.90	22.15
		12	13	22.18	21.99	22.13
		25	0	20.82	20.74	21.11



Band/BW	Modulation	RB Size	RB Offset	Low CH 20450 Frequency	Mid CH 20525 Frequency	High CH 20600 Frequency
				829 MHz	836.5 MHz	844 MHz
		1	0	23.25	23.21	23.38
		1	24	23.14	23.09	23.31
		1	49	22.96	22.98	23.13
	QPSK	25	0	22.10	22.02	22.21
		25	12	21.90	21.89	22.05
		25	25	22.08	21.98	22.29
5/ 10		50	0	21.83	21.88	22.04
3/ 10		1	0	21.82	21.89	22.08
		1	24	21.86	21.75	21.95
		1	49	21.84	21.83	22.03
	16QAM	12	0	21.92	21.92	22.05
		12	17	21.96	21.94	22.17
		12	36	22.20	22.14	22.28
		27	0	20.91	20.87	21.16



LTE BAND 26

Band/BW	Modulation	RB	RB	Low CH 26797	Mid CH 26915	High CH 27033
Barra/BVV	Wodalation	Size	Offset	Frequency 824.7 MHz	Frequency 836.5 MHz	Frequency 848.3 MHz
		1	0	23.20	23.11	23.53
		1	2	23.18	23.06	23.34
		1	5	23.05	23.07	23.18
	QPSK	3	0	22.71	22.66	22.86
		3	1	22.57	22.61	22.92
		3	3	22.70	22.54	23.00
26/ 1.4		6	0	21.82	21.84	22.12
20/ 1.4		1	0	21.81	21.72	22.01
		1	2	21.91	21.80	22.10
		1	5	21.81	21.70	21.86
	16QAM	3	0	22.29	22.17	22.71
		3	1	22.27	22.25	22.50
		3	3	22.40	22.38	22.62
		6	0	21.15	21.08	21.28

Band/BW	Modulation	RB	RB Offset	Low CH 26805	Mid CH 26915	High CH 27025
Barra, BVV	Wodalation	Size		Frequency 825.5 MHz	Frequency 836.5 MHz	Frequency 847.5 MHz
		1	0	23.28	23.23	23.44
		1	7	23.20	23.08	23.42
		1	14	23.10	22.97	23.15
	QPSK	8	0	22.12	21.99	22.15
		8	3	21.99	21.84	22.25
		8	7	21.98	21.88	22.28
26/3		15	0	21.89	21.81	22.19
20/3		1	0	21.91	21.73	22.14
		1	7	21.81	21.70	22.09
		1	14	21.74	21.58	21.99
	16QAM	8	0	22.05	21.87	22.42
		8	3	21.91	21.94	22.15
		8	7	22.08	22.14	22.21
		15	0	21.11	21.03	21.21



Band/BW	Modulation	RB	RB Offset	Low CH 26815	Mid CH 26915	High CH 27015
Barra/BVV	Woddiation	Size		Frequency 826.5 MHz	Frequency 836.5 MHz	Frequency 846.5 MHz
		1	0	23.25	23.22	23.50
		1	12	23.23	23.06	23.31
		1	24	23.06	23.02	23.19
	QPSK	12	0	21.98	21.96	22.08
		12	6	21.92	21.93	22.15
		12	13	22.00	21.93	22.26
26/5		25	0	21.93	21.71	22.06
20/ 3		1	0	21.89	21.74	22.09
		1	12	21.91	21.74	22.02
		1	24	21.77	21.70	21.88
	16QAM	12	0	21.99	21.92	22.36
		12	6	21.99	21.81	22.25
		12	13	22.09	22.13	22.23
		25	0	21.18	20.94	21.24

Band/BW	Modulation	RB Size	RB Offset	Low CH 26840	Mid CH 26915	High CH 26990
		Size		Frequency 829 MHz	Frequency 836.5 MHz	Frequency 844 MHz
		1	0	23.24	23.12	23.52
		1	24	23.11	23.09	23.35
		1	49	23.06	22.98	23.19
	QPSK	25	0	22.10	22.01	22.12
		25	12	21.86	21.94	22.22
		25	25	22.08	21.95	22.31
		50	0	21.87	21.80	22.08
26/10		1	0	21.90	21.76	22.00
		1	24	21.81	21.76	22.09
		1	49	21.74	21.70	21.86
	16QAM	12	0	22.02	21.97	22.37
		12	17	22.02	21.88	22.26
		12	36	22.12	22.08	22.20
		27	0	21.17	21.06	21.33



Band/BW	Modulation	RB	RB	Low CH 26865	Mid CH 26915	High CH 26965
Dana/DVV	Woddiation	Size	Offset	Frequency 831.5 MHz	Frequency 836.5 MHz	Frequency 841.5 MHz
		1	0	23.31	23.25	23.54
		1	37	23.24	23.15	23.45
		1	74	23.16	23.09	23.25
	QPSK	36	0	22.13	22.06	22.20
		36	19	22.00	21.99	22.26
		36	39	22.12	21.99	22.37
00/45		75	0	21.97	21.86	22.20
26/ 15		1	0	21.93	21.84	22.15
		1	37	21.93	21.81	22.14
		1	74	21.87	21.73	22.00
	16QAM	12	0	22.12	22.00	22.45
		12	30	22.05	21.96	22.29
		12	61	22.17	22.15	22.33
		27	0	21.20	21.09	21.34



ERP POWER (dBm) LTE BAND 5

CHANNEL BANDWIDTH: 1.4MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20407	824.7	23.11	-3.94	17.02	50.35	7
20525	836.5	23.14	-3.94	17.05	50.7	7
20643	848.3	23.26	-3.94	17.17	52.12	7

CHANNEL BANDWIDTH: 1.4MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20407	824.7	22.36	-3.94	16.27	42.36	7
20525	836.5	22.3	-3.94	16.21	41.78	7
20643	848.3	22.43	-3.94	16.34	43.05	7

CHANNEL BANDWIDTH: 3MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20415	825.5	23.16	-3.94	17.07	50.93	7
20525	836.5	23.08	-3.94	16.99	50	7
20635	847.5	23.31	-3.94	17.22	52.72	7

CHANNEL BANDWIDTH: 3MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20415	825.5	22.17	-3.94	16.08	40.55	7
20525	836.5	22.13	-3.94	16.04	40.18	7
20635	847.5	22.17	-3.94	16.08	40.55	7



CHANNEL BANDWIDTH: 5MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20425	826.5	23.21	-3.94	17.12	51.52	7
20525	836.5	23.06	-3.94	16.97	49.77	7
20625	846.5	23.36	-3.94	17.27	53.33	7

CHANNEL BANDWIDTH: 5MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20425	826.5	22.18	-3.94	16.09	40.64	7
20525	836.5	21.99	-3.94	15.9	38.9	7
20625	846.5	22.15	-3.94	16.06	40.36	7

CHANNEL BANDWIDTH: 10MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20450	829.0	23.25	-3.94	17.16	52	7
20525	836.5	23.21	-3.94	17.12	51.52	7
20600	844.0	23.38	-3.94	17.29	53.58	7

CHANNEL BANDWIDTH: 10MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20450	829.0	22.2	-3.94	16.11	40.83	7
20525	836.5	22.14	-3.94	16.05	40.27	7
20600	844.0	22.28	-3.94	16.19	41.59	7

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



LTE BAND 26

CHANNEL BANDWIDTH: 1.4MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26797	824.7	23.2	-3.94	17.11	51.4	7
26915	836.5	23.11	-3.94	17.02	50.35	7
27033	848.3	23.53	-3.94	17.44	55.46	7

CHANNEL BANDWIDTH: 1.4MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26797	824.7	22.4	-3.94	16.31	42.76	7
26915	836.5	22.38	-3.94	16.29	42.56	7
27033	848.3	22.71	-3.94	16.62	45.92	7

CHANNEL BANDWIDTH: 3MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26805	825.5	23.28	-3.94	17.19	52.36	7
26915	836.5	23.23	-3.94	17.14	51.76	7
27025	847.5	23.44	-3.94	17.35	54.33	7

CHANNEL BANDWIDTH: 3MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26805	825.5	22.08	-3.94	15.99	39.72	7
26915	836.5	22.14	-3.94	16.05	40.27	7
27025	847.5	22.42	-3.94	16.33	42.95	7



CHANNEL BANDWIDTH: 5MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26815	826.5	23.25	-3.94	17.16	52	7
26915	836.5	23.22	-3.94	17.13	51.64	7
27015	846.5	23.5	-3.94	17.41	55.08	7

CHANNEL BANDWIDTH: 5MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26815	826.5	22.09	-3.94	16	39.81	7
26915	836.5	22.13	-3.94	16.04	40.18	7
27015	846.5	22.36	-3.94	16.27	42.36	7

CHANNEL BANDWIDTH: 10MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26840	829	23.24	-3.94	17.15	51.88	7
26915	836.5	23.12	-3.94	17.03	50.47	7
26990	844	23.52	-3.94	17.43	55.34	7

CHANNEL BANDWIDTH: 10MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26840	829	22.12	-3.94	16.03	40.09	7
26915	836.5	22.08	-3.94	15.99	39.72	7
26990	844	22.37	-3.94	16.28	42.46	7



CHANNEL BANDWIDTH: 15MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26865	831.5	23.31	-3.94	17.22	52.72	7
26915	836.5	23.25	-3.94	17.16	52	7
26965	841.5	23.54	-3.94	17.45	55.59	7

CHANNEL BANDWIDTH: 15MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26865	831.5	22.17	-3.94	16.08	40.55	7
26915	836.5	22.15	-3.94	16.06	40.36	7
26965	841.5	22.45	-3.94	16.36	43.25	7

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



3.2 RADIATED EMISSION MEASUREMENT

3.2.1 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 is equal to -13dBm.

3.2.2 TEST PROCEDURES

- a. The substitute 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 exports the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved the 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 from 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 and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

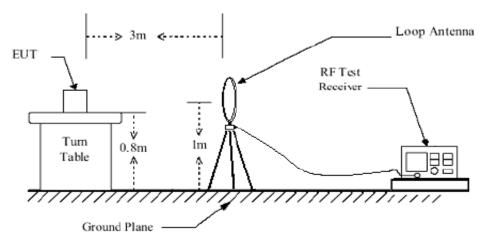
3.2.3 DEVIATION FROM TEST STANDARD

No deviation

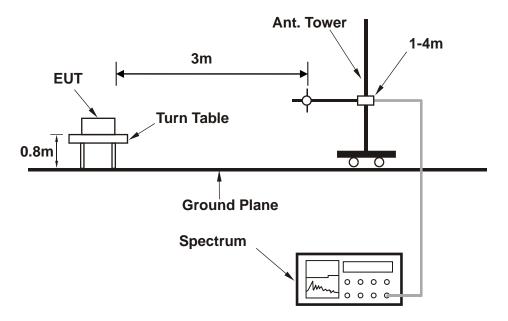


3.2.4 TEST SETUP

< Frequency Range below 30MHz >

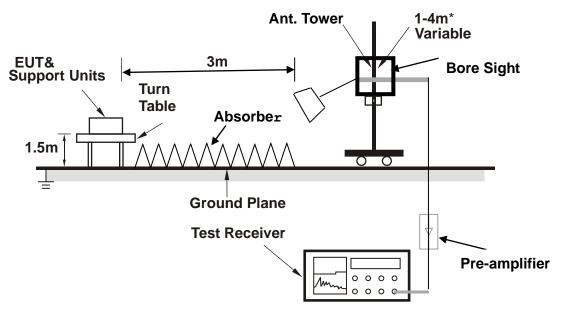


< Frequency Range 30MHz~1GHz >





<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).



3.2.5 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

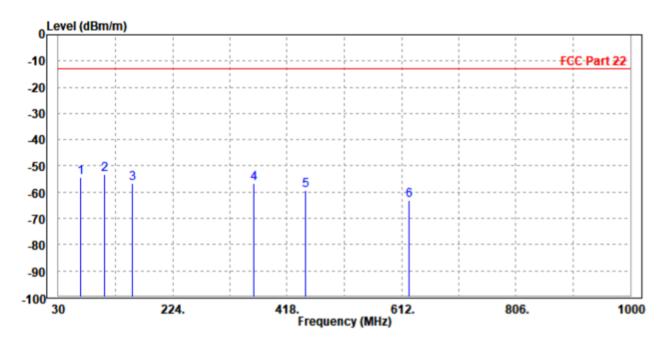
30 MHz - 1GHz data:

LTE Band 26:

CHANNEL BANDWIDTH: 5MHz / QPSK

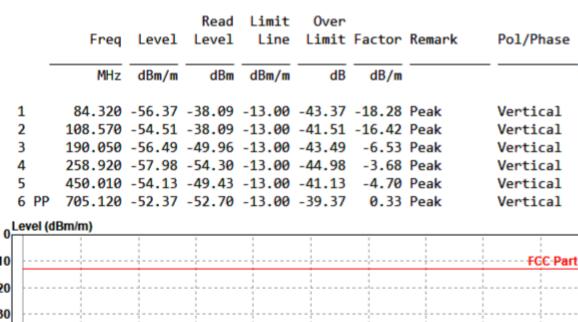
MODE	TX channel 26915	FREQUENCY RANGE	Below 1000MHz			
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ			
TESTED BY	Jace Hu					
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M						

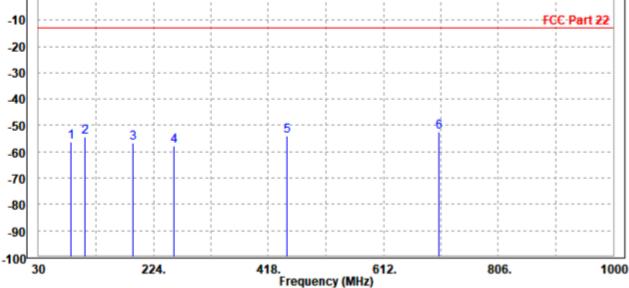
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	67.830	-54.32	-42.05	-13.00	-41.32	-12.27	Peak	Horizontal
2 PP	108.570	-53.09	-38.94	-13.00	-40.09	-14.15	Peak	Horizontal
3	156.100	-56.61	-41.70	-13.00	-43.61	-14.91	Peak	Horizontal
4	361.740	-56.51	-48.86	-13.00	-43.51	-7.65	Peak	Horizontal
5	450.010	-59.39	-53.43	-13.00	-46.39	-5.96	Peak	Horizontal
6	624.610	-63.03	-60.77	-13.00	-50.03	-2.26	Peak	Horizontal





MODE	TX channel 26915	FREQUENCY RANGE	Below 1000MHz			
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ			
TESTED BY	Jace Hu					
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M						







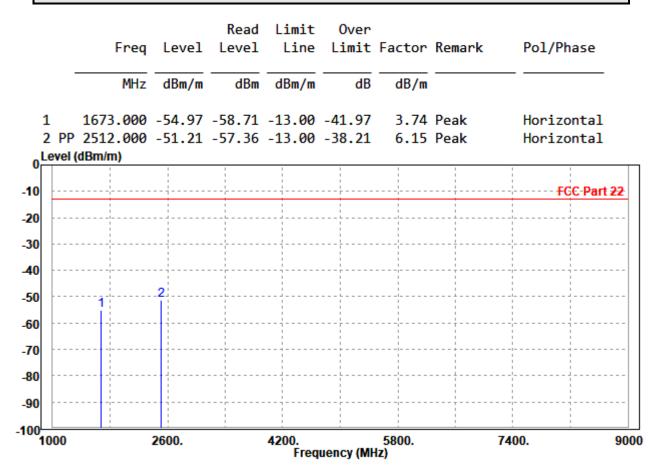
ABOVE 1GHz DATA

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

LTE Band 26:

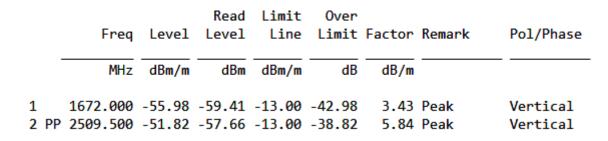
CHANNEL BANDWIDTH: 1.4MHz/QPSK

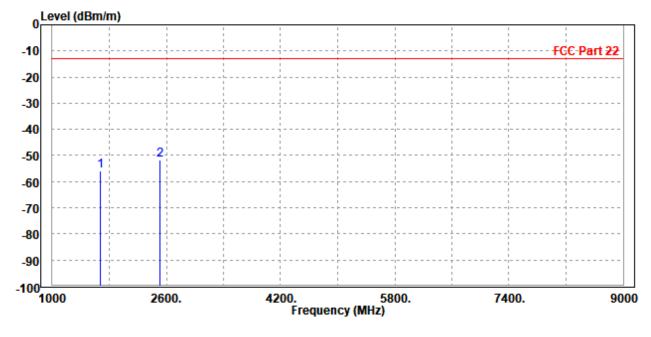
MODE	TX channel 26915	FREQUENCY RANGE	Above 1000MHz			
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ			
TESTED BY	Jace Hu					
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M						





MODE	TX channel 26915	FREQUENCY RANGE	Above 1000MHz			
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH INPUT POWER		AC 120V/60HZ			
TESTED BY	Jace Hu					
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M						



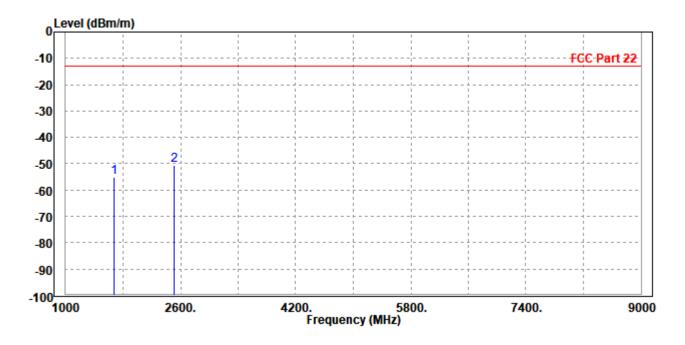




CHANNEL BANDWIDTH: 3MHz / QPSK

MODE	TX channel 26915	FREQUENCY RANGE	Above 1000MHz			
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ			
TESTED BY	Jace Hu					
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M						

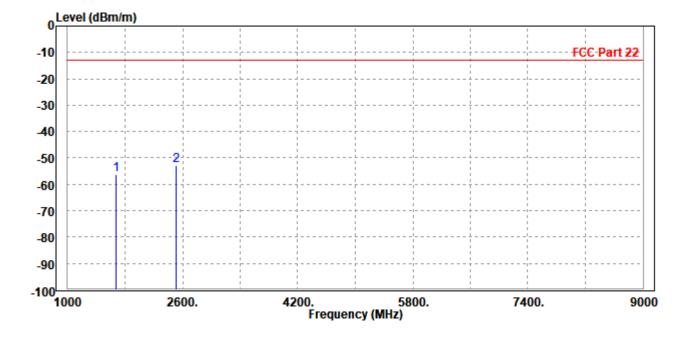
		Freq	Level		Limit Line		Factor	Remark	Pol/Phase
	-	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1		1672.000 2509.500							Horizontal Horizontal





MODE	TX channel 26915	FREQUENCY RANGE	Above 1000MHz				
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ				
TESTED BY	Jace Hu						
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							

	Freq	Level		Limit Line		Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		·
1 2 PP	1673.000 2512.000							Vertical Vertical

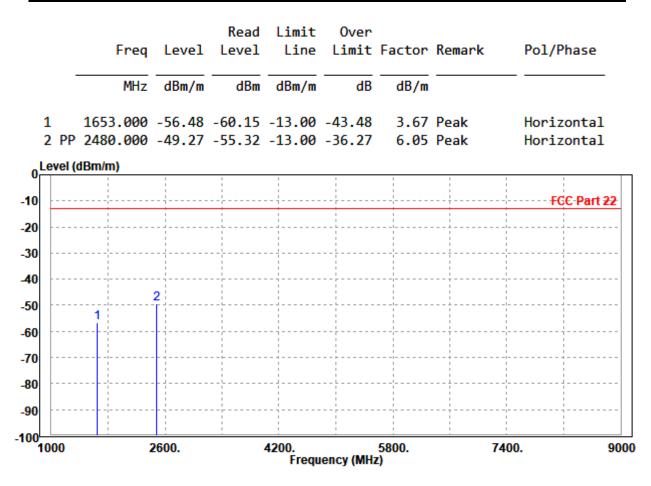




CHANNEL BANDWIDTH: 5MHz/QPSK

CH 26815

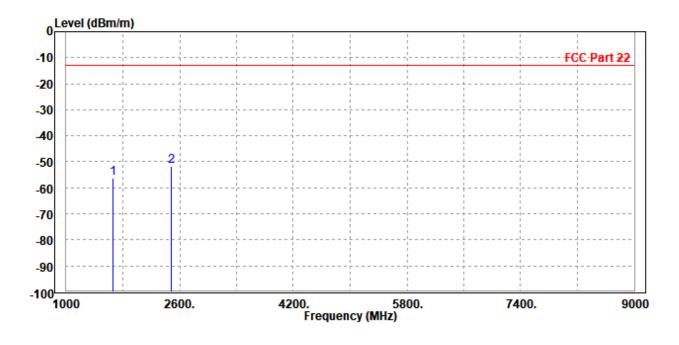
MODE	TX channel 26815	FREQUENCY RANGE	Above 1000MHz			
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ			
TESTED BY	Jace Hu					
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M						





MODE	TX channel 26815	FREQUENCY RANGE	Above 1000MHz					
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ					
TESTED BY	Jace Hu	Jace Hu						
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								

		Freq	Level		Limit Line		Factor	Remark	Pol/Phase
	-	MHz	dBm/m	dBm	dBm/m	dB	dB/m		_
1 2		1656.000 2480.000							Vertical Vertical

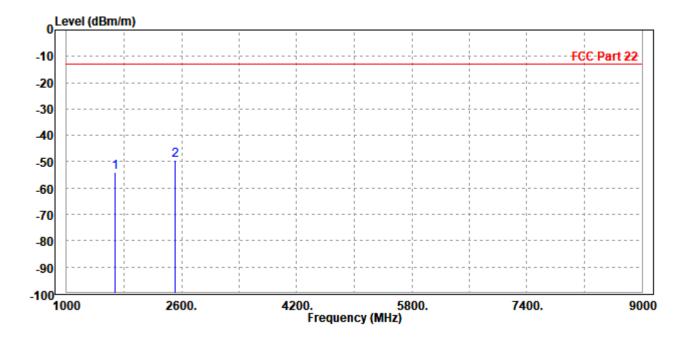




CH 26915

MODE	TX channel 26915	FREQUENCY RANGE	Above 1000MHz					
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ					
TESTED BY	Jace Hu	Jace Hu						
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								

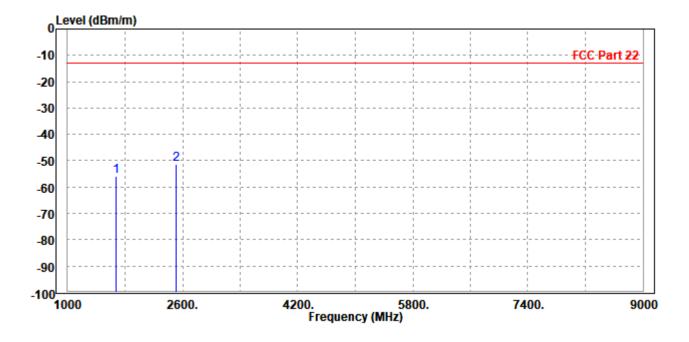
		Freq	Level		Limit Line		Factor	Remark	Pol/Phase
	-	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP	1673.000 2512.000							Horizontal Horizontal





MODE	TX channel 26915	TX channel 26915 FREQUENCY RANGE					
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ				
TESTED BY	Jace Hu	Jace Hu					
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							

	Freq	Level		Limit Line		Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1 2 PP	1672.000 2509.500							Vertical Vertical

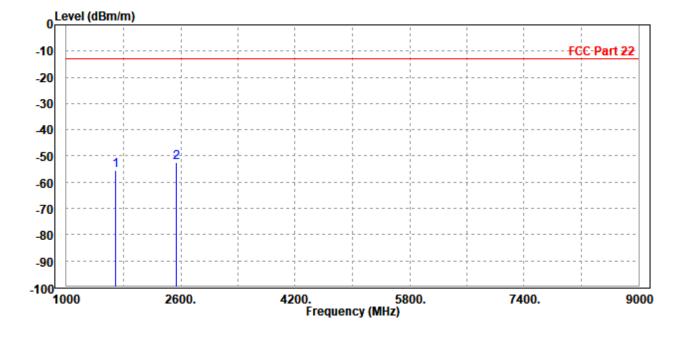




CH 27015

MODE	TX channel 27015	FREQUENCY RANGE	Above 1000MHz					
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	23deg. C, 70%RH INPUT POWER						
TESTED BY	Jace Hu	Jace Hu						
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								

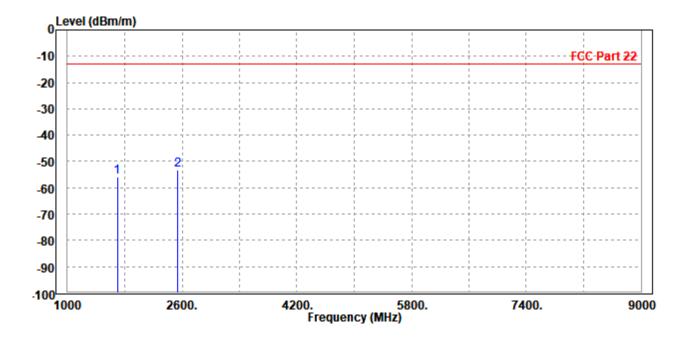
	Freq	Level		Limit Line		Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1 2 F	1693.000 PP 2536.000							Horizontal Horizontal





MODE	TX channel 27015	nel 27015 FREQUENCY RANGE						
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ					
TESTED BY	Jace Hu	Jace Hu						
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								

		Freq	Level		Limit Line		Factor	Remark	Pol/Phase
	-	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1 2		1696.000 2539.500							Vertical Vertical

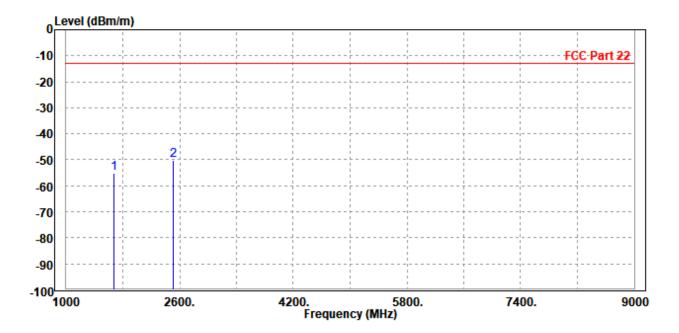




CHANNEL BANDWIDTH: 10MHz / QPSK

MODE	TX channel 26915	channel 26915 FREQUENCY RANGE					
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	0%RH INPUT POWER					
TESTED BY	Jace Hu	Jace Hu					
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							

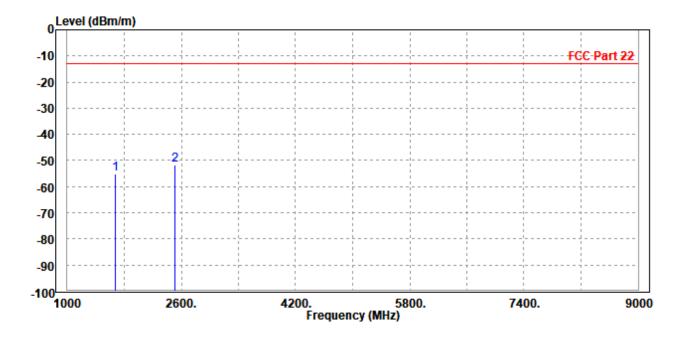
		Freq	Level		Limit Line		Factor	Remark	Pol/Phase
	-	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1		1673.000 2512.000							Horizontal Horizontal





MODE	TX channel 26915	FREQUENCY RANGE	Above 1000MHz			
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ			
TESTED BY	Jace Hu					
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M						

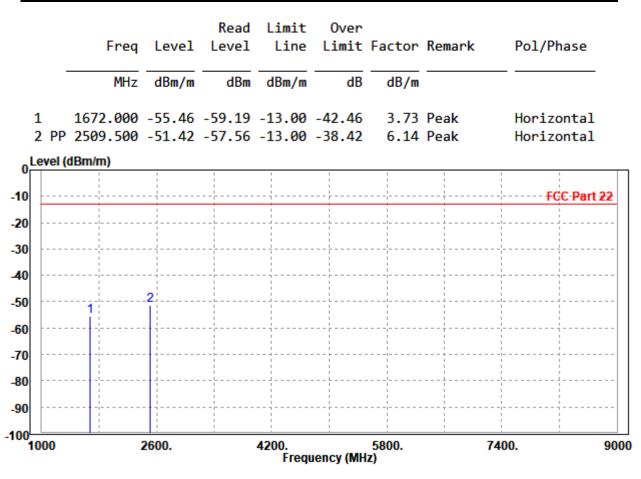
	Freq	Level		Limit Line		Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1 2 P	1672.000 P 2509.500							Vertical Vertical





CHANNEL BANDWIDTH: 15MHz/QPSK

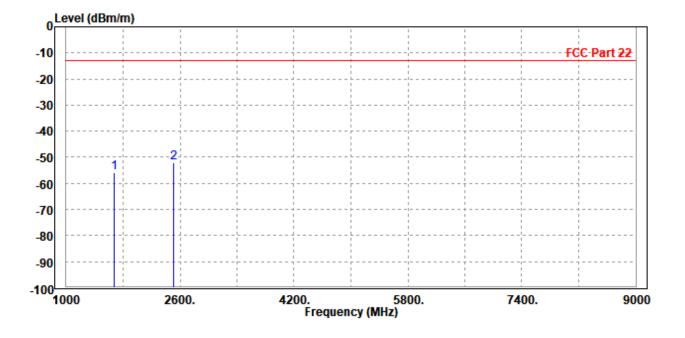
MODE	TX channel 26915	FREQUENCY RANGE	Above 1000MHz			
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ			
TESTED BY	Jace Hu					
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M						





MODE	TX channel 26915	FREQUENCY RANGE	Above 1000MHz			
ENVIRONMENTAL CONDITIONS	123ded C 70%RH		AC 120V/60HZ			
TESTED BY	Jace Hu					
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M						

	Freq	Level		Limit Line		Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1 2 PP	1673.000 2512.000							Vertical Vertical





4 PHOTOGRAPHS OF THE TEST CONFIGURATION

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



5 INFORMATION ON THE TESTING LABORATORIES

We, **Huarui 7layers High Technology (Suzhou) Co., Ltd.** were founded in 2020 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:

Suzhou EMC/RF Lab:

Tel: +86 (0557) 368 1008



6 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--