

FCC TEST REPORT

(PART 22)



Applicant:	Sonim Technologies, Inc.
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Manufacturer or Supplier:	Sonim Technologies (Shenzhen) Limited
Address:	2nd Floor, No. 2 Building Phase B, Daqian Industrial park, Longchang Road, 67 District, Baoan, Shenzhen, P. R. China
Product:	Mobile Phone
Brand Name:	Sonim
Model Name:	XP8800
FCC ID:	WYPPG4032
Date of tests:	Jul. 01, 2020 ~ Jul. 08, 2020

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

- ☒ **FCC PART 22, Subpart H** ☒ **FCC Part 2**
☒ **ANSI/TIA/EIA-603-D** ☒ **ANSI C63.26-2015**
☒ **ANSI/TIA/EIA-603-E**

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

Prepared by Alex Chen Engineer / Mobile Department	Approved by Luke Lu Manager / Mobile Department
 Date: Jul. 23, 2020	 Date: Jul. 23, 2020

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF171017C11A	Original release	Dec. 08, 2017
RF200702W001-10	Based on the original report RF171017C11A.add a new charger, update SW version, change the address and add two type numbers	Jul. 23, 2020

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	REMARK
2.1046 22.913 (a)	Effective Radiated Power	N.A	See note 1
2.1055 22.355	Frequency Stability	N.A	See note 1
2.1049 22.917 (b)	Occupied Bandwidth	N.A	See note 1
22.913 (d)	Peak to average ratio*	N.A	See note 1
22.917	Band Edge Measurements	N.A	See note 1
2.1051 22.917	Conducted Spurious Emissions	N.A	See note 1
2.1053 22.917	Radiated Spurious Emissions	Compliance	Meet the requirement of limit.

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

Note:

1. Per the change notice provide by manufactory, the difference is add a new charger and two type numbers, and change the address and SW version, all the change no effect any RF parameter, Therefore only verify the radiated emission and show the verify test data on this report.

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	$\pm 2.06\text{dB}$
Frequency Stability	$\pm 76.97\text{Hz}$
Radiated emissions (30MHz~1GMHz)	$\pm 4.98\text{dB}$
Radiated emissions (1GMHz ~6GMHz)	$\pm 4.70\text{dB}$
Radiated emissions (6GMHz ~18GMHz)	$\pm 4.60\text{dB}$
Radiated emissions (18GMHz ~40GMHz)	$\pm 4.12\text{dB}$
Conducted emissions	$\pm 4.01\text{dB}$
Occupied Channel Bandwidth	$\pm 43.58\text{KHz}$
Band Edge Measurements	$\pm 4.70\text{dB}$
Peak to average ratio	$\pm 0.76\text{dB}$

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. 26,20	Feb. 25,21
EXA Signal Analyzer	KEYSIGHT	N9010A-526	MY54510322	Feb. 26,20	Feb. 25,21
Bilog Antenna	ETS-LINDGREN	3143B	00161965	Feb. 26,20	Feb. 25,21
Horn Antenna (1GHz-18GHz)	ETS-LINDGREN	3117	00168692	Nov. 30, 19	Nov. 29, 20
Horn Antenna (18GHz-40GHz)	N/A	QWH-SL-18-40 -K-SG/QMS-00 361	15433	Nov. 21, 19	Nov. 20, 20
Radio Communication Analyzer	ANRITSU	MT8820C	6201465426	Feb. 26,20	Feb. 25,21
Signal Pre-Amplifier	EMSI	EMC 9135	980249	Jun. 02,20	Jun. 01,21
Signal Pre-Amplifier	EMSI	EMC 012645B	980257	Jun. 02,20	Jun. 01,21
Signal Pre-Amplifier	EMSI	EMC 184045B	980259	Apr. 30,20	Apr. 29,21
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	Euroshieldpn- CT0001143-1216	Feb. 26,20	Feb. 25,21
Test Software	E3	V 9.160323	N/A	N/A	N/A
Test Software	ADT	ADT_Radiated _V7.6.15.9.2	N/A	N/A	N/A
10dB Attenuator	JFW/USA	50HF-010-SM A	1505	Jun. 03,20	Jun. 02,21
Power Meter	Anritsu	ML2495A	1506002	Feb. 26,20	Feb. 25,21
Power Sensor	Anritsu	MA2411B	1339352	Feb. 26,20	Feb. 25,21
Humid & Temp Programmable Tester	Juyi	ITH-120-45-CP -AR	IAA1504-001	Jun. 02,20	Jun. 01,21
MXG Analog Microwave Signal Generator	KEYSIGHT	N5183A	MY50143024	Feb. 26,20	Feb. 25,21
Power Divider	MCLI/USA	PS2-15	24880	N/A	N/A

NOTE: 1. The calibration interval of the above test instruments is 12 months or 24 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

EUT	Mobile Phone	
BRAND NAME	Sonim	
MODEL NAME	XP8800	
TYPE NUMBER	PG4032/PG4033/PG4034/PG4035/PG4012/PG4041/PG4022/PG4011/PG4061	
POWER SUPPLY	5/9Vdc (adapter or host equipment) 3.85Vdc (Li-ion, battery)	
MODULATION TYPE	LTE	QPSK, 16QAM, 64QAM
FREQUENCY RANGE	LTE Band 26 (Channel Bandwidth: 1.4MHz)	824.7MHz ~ 846.6MHz
	LTE Band 26 (Channel Bandwidth: 3MHz)	825.5MHz ~ 847.5MHz
	LTE Band 26 (Channel Bandwidth: 5MHz)	826.5Hz ~ 846.5MHz
	LTE Band 26 (Channel Bandwidth: 10MHz)	829.0MHz ~ 844.0MHz
	LTE Band 26 (Channel Bandwidth: 15MHz)	831.5MHz ~ 841.5MHz
MAX. ERP POWER	LTE Band 26 (Channel Bandwidth: 1.4MHz)	70.15mW
	LTE Band 26 (Channel Bandwidth: 3MHz)	71.61mW
	LTE Band 26 (Channel Bandwidth: 5MHz)	74.99mW
	LTE Band 26 (Channel Bandwidth: 10MHz)	76.74mW
	LTE Band 26 (Channel Bandwidth: 15MHz)	81.47mW
EMISSION DESIGNATOR GGN	LTE Band 26 (Channel Bandwidth: 1.4MHz)	1M09W7D
	LTE Band 26 (Channel Bandwidth: 3MHz)	2M70G7D
	LTE Band 26 (Channel Bandwidth: 5MHz)	4M50W7D
	LTE Band 26 (Channel Bandwidth: 10MHz)	8M98W7D
	LTE Band 26 (Channel Bandwidth: 15MHz)	13M5G7D
ANTENNA TYPE	Fixed Internal antenna with -3dBi gain	
HW VERSION	A	
SW VERSION	8A.0.0-00-10.0.0-00.34.01	
I/O PORTS	Refer to user's manual	



CABLE SUPPLIED	USB cable 1: With shield, detachable, 1.5meter USB cable 2: non-shielded, detachable, 1.0meter
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NOTE:

- For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
- The EUT was powered by the following adapter(original):

ADAPTER 1(original)	
BRAND:	Sonim
MODEL:	S42A02
INPUT:	AC 100-240V, 500mA
OUTPUT:	DC 5V, 1500mA DC 9V, 1500mA DC 12V,1100mA

ADAPTER 2(add)	
BRAND:	Sonim
MODEL:	S84A02
INPUT:	AC 100-240V, 750mA
OUTPUT:	DC 5V, 3000mA DC 9V, 2220mA DC 12V,1670mA

- The EUT matched the following USB cables:

USB CABLE 1	
BRAND:	N/A
MODEL:	N/A
SIGNAL LINE:	1.5 METER

USB CABLE 2	
BRAND:	N/A
MODEL:	N/A
SIGNAL LINE:	1.0 METER

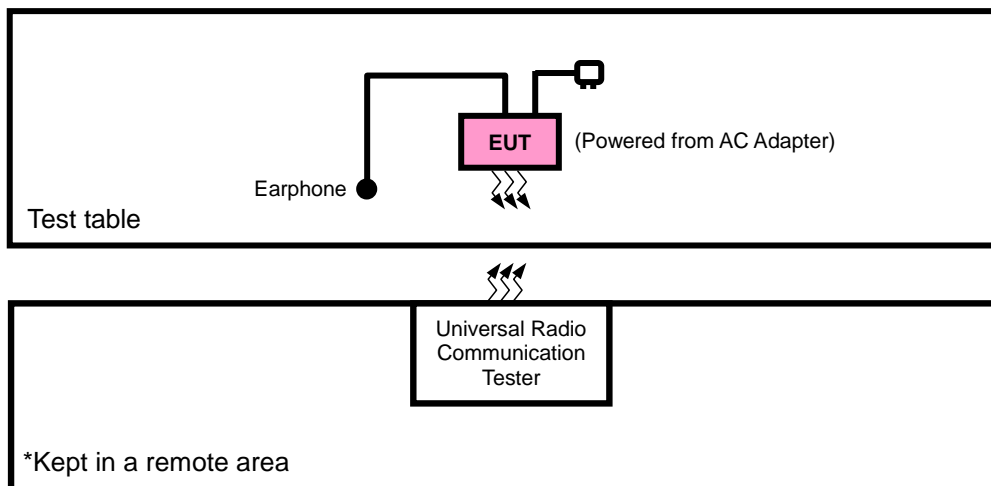
- The EUT incorporates a SISO function. Physically, the EUT provides one completed transmitter and one receiver.

MODULATION MODE	TX FUNCTION
LTE	1TX/1RX diversity

- For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

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	DC source	LONG WEI	PS-6403D	010934269	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	DC Line: Unshielded, Detachable 1.8m

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 GSM /WCDMA/LTE. Following channel(s) was (were) selected for the final test as listed below:

EUT CONFIGURE MODE	DESCRIPTION
A	EUT + Adapter + USB Cable with LTE link
B	EUT + Battery with LTE link

LTE BAND 26 MODE

TEST ITEM	Available Channel	Tested Channel	Channel bandwidth	modulation	mode
RADIATED EMISSION	26797 to 27033	26865	1.4MHz	QPSK	1 RB / 0 RB Offset
	26805 to 27025	26865	3MHz	QPSK	1 RB / 0 RB Offset
	26815 to 27015	26865	5MHz	QPSK	1 RB / 0 RB Offset
	26840 to 26990	26865	10MHz	QPSK	1 RB / 0 RB Offset
	26865 to 26965	26865	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 ITEM	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RADIATED EMISSION	23deg. C, 70%RH	DC 5/9V from adaptor	Jacky

2.5 EUT OPERATING CONDITIONS

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

2.6 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 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 RADIATED EMISSION MEASUREMENT

3.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

3.1.2 TEST PROCEDURES

- a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
- b. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value” of step a. Record the power level of S.G
- c. $\text{EIRP} = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}.$
- d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole,
 $\text{E.R.P power} = \text{E.I.P.R power} - 2.15\text{dBi}.$

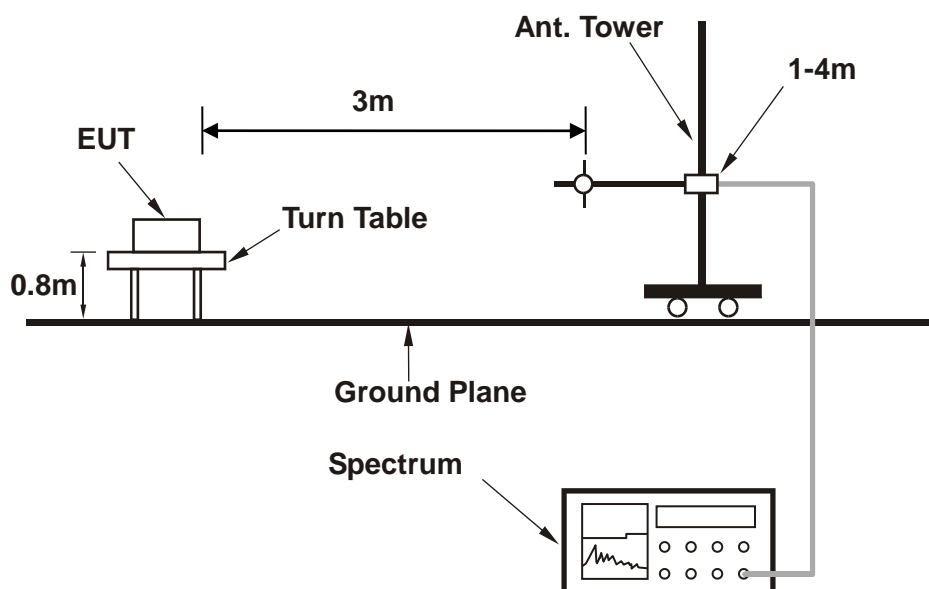
NOTE: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

3.1.3 DEVIATION FROM TEST STANDARD

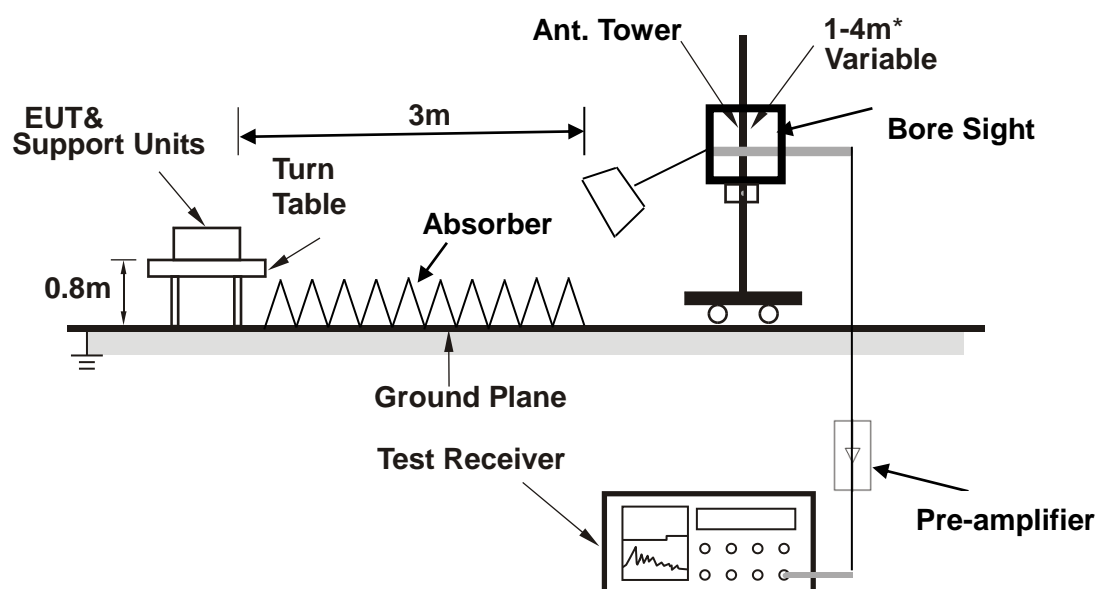
No deviation

3.1.4 TEST SETUP

< 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).

3.1.5 TEST RESULTS

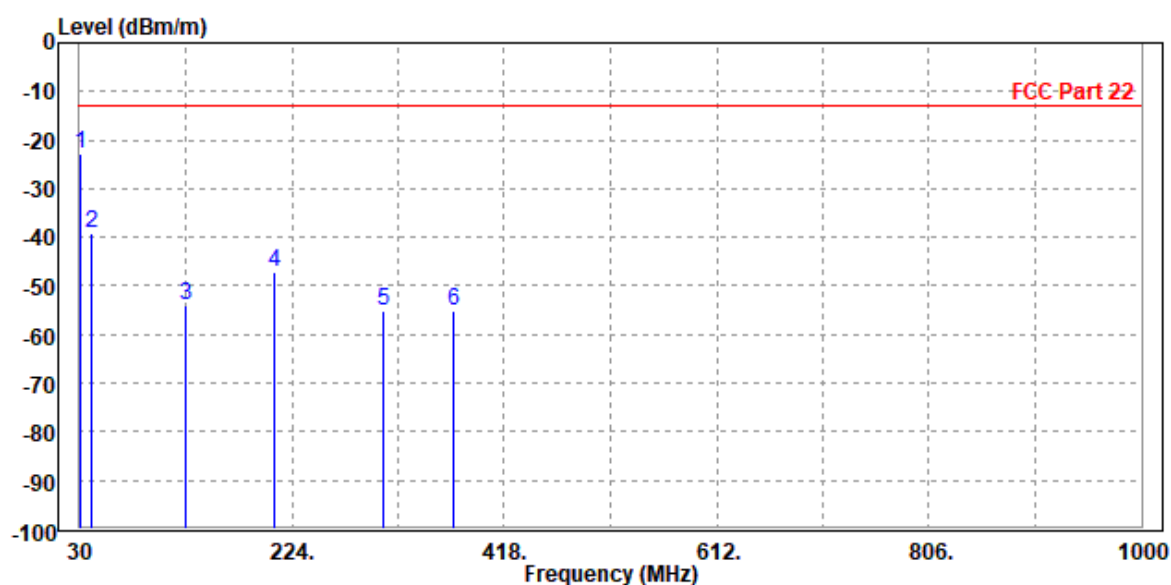
BELOW 1GHz WORST-CASE DATA

30 MHz – 1GHz data:

EDGE 850:

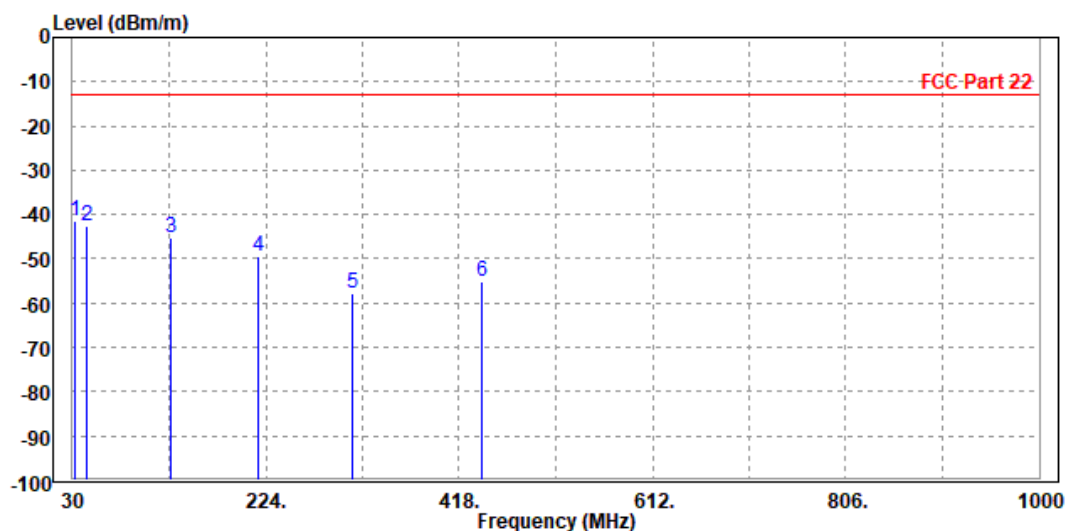
MODE	TX channel 26865	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5/9V from adapter
TESTED BY	Jacky Liu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1 PP	31.260	-22.78	-40.39	-13.00	-9.78	17.61	Peak	Horizontal
2	41.690	-39.10	-49.69	-13.00	-26.10	10.59	Peak	Horizontal
3	126.780	-53.97	-37.99	-13.00	-40.97	-15.98	Peak	Horizontal
4	207.980	-47.27	-30.19	-13.00	-34.27	-17.08	Peak	Horizontal
5	306.740	-55.24	-41.66	-13.00	-42.24	-13.58	Peak	Horizontal
6	372.190	-55.04	-43.65	-13.00	-42.04	-11.39	Peak	Horizontal



MODE	TX channel 26865	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5/9V from adapter
TESTED BY	Jacky Liu		
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	31.774	-41.29	-44.26	-13.00	-28.29	2.97	Peak	Vertical
2	44.260	-42.46	-39.56	-13.00	-29.46	-2.90	Peak	Vertical
3	128.160	-45.27	-33.74	-13.00	-32.27	-11.53	Peak	Vertical
4	216.360	-49.37	-38.45	-13.00	-36.37	-10.92	Peak	Vertical
5	310.260	-57.83	-46.57	-13.00	-44.83	-11.26	Peak	Vertical
6	440.250	-55.03	-45.58	-13.00	-42.03	-9.45	Peak	Vertical





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ABOVE 1GHz DATA

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



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4 PHOTOGRAPHS OF THE TEST CONFIGURATION

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



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

6 APPENDIX A – 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---