



TEST REPORT

No. I19D00117-EMC01

For

Client : Micronet

Production : A9 PCBA module

Model Name : A9

Brand Name: TREQ

FCC ID: U8O-A9

IC ID: 12186A-A9

Hardware Version: C801_V1.00_PCB

Software Version: SC_10.2.0.0

Issued date: 2019-09-11

NOTE

1. The test results in this test report relate only to the devices specified in this report.
2. This report shall not be reproduced except in full without the written approval of East China Institute of Telecommunications
3. The measurement uncertainty is not taken into account when deciding conformity, and the results of measurement (or the average of measurement results) are directly used as the criterion for the stating conformity.

Test Laboratory:

East China Institute of Telecommunications

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Revision Version

Report Number	Revision	Date	Memo
I19D00117-EMC01	00	2019-09-11	Initial creation of test report

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1. Test Laboratory

1.1. Testing Location

Company Name:	ECIT Shanghai, East China Institute of Telecommunications
Address:	7-8F, G Area, No. 668, Beijing East Road, Huangpu District, Shanghai, P. R. China
Postal Code:	200001
Telephone:	(+86)-021-63843300
Fax:	(+86)-021-63843301
FCC registration No:	958356

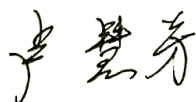
1.2. Testing Environment

Normal Temperature:	15-35℃
Relative Humidity:	30-60% RH
Supply Voltage	DC 3.7V by Battery

1.3. Project data

Project Leader:	Zhou Yan
Testing Start Date:	2019-07-29
Testing End Date:	2019-09-10

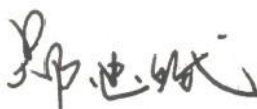
1.4. Signature



Lu Huifang
(Prepared this test report)



You Jinjun
(Reviewed this test report)



Zheng Zhongbin
(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name	Micronet
Address	1865 West 2100 South, Suite 2 Salt Lake City, Utah 84119 United States
Telephone	+1-801-990-8700
Postcode	84119

2.2. Manufacturer Information

Company Name	Micronet
Address	1865 West 2100 South, Suite 2 Salt Lake City, Utah 84119 United States
Telephone	+1-801-990-8700
Postcode	84119

3. Equipment under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

EUT Description	A9 PCBA module
Model name	A9
GSM Frequency Band	GSM850/GSM900/GSM1800/GSM1900
UMTS Frequency Band	WCDMA Band I / II / IV / V / VIII
LTE Frequency Band	LTE1/2/3/4/5/7/8/12/13/17/20/28
Additional Communication Function	BT4.2;WIFI 802.11a,b,g,n,ac;GPS;GLONASS;

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version	Date of receipt
N19	861263030015070	C801_V1.00_PCB	SC_10.2.0.0	2019-07-23

*EUT ID: is used to identify the test sample in the lab internally.

3.3. Internal Identification of AE used during the test

AE ID*	Description	Model	SN / Remark
PA01	PAD	NA	NA
BA01	Battery	HWE 30100100-20 T4	Rating:3.7V 6600mAh 24.42Wh
EQ01	Antenna	NA	NA
EQ03	Antenna	NA	NA
ES01	Antenna	NA	NA
EC02	Antenna	NA	NA
AE1	RF Cable	NA	NA
AE2	RF Cable	NA	NA
AE3	RF Cable	NA	NA

*AE ID: is used to identify the test sample in the lab internally.

*The AE were provided by the lab.

*This product is a PCB board. For the convenience of testing, the customer provides PAD and Battery, which is matched together for testing.

4. Reference Documents

4.1 Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC Part 15, Subpart B	Radio frequency devices	2019/6/21
ANSI C63.4	Method of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2014
ICES-003	Information Technology Equipment(Including Digital Apparatus)-Limits and Methods of Measurement	2016

5. Test Results

5.1 Summary of Test Results

Items	Test List	Clause in FCC rules	Verdict
1	Radiated Emission	15.109(a)	Pass
2	AC Conducted Emission	15.107(a)	NA

Note: This project EUT is PCB board, which is powered by battery DC 3.7V. NA section is not applicable

5.2 Statements

The A9 supporting GSM/WCDMA/LTE.etc, manufactured by Micronet is a new product for testing. ECIT only performed test cases which identified with Pass/Fail/Inc result in section 5.1.

ECIT has verified that the compliance of the tested device specified in section 3 of this test report is successfully evaluated according to the procedure and test methods as defined in type certification requirement listed in section 4 of this test report.

6. Test Equipment Utilized

6.1 Radiated Emission Equipment list

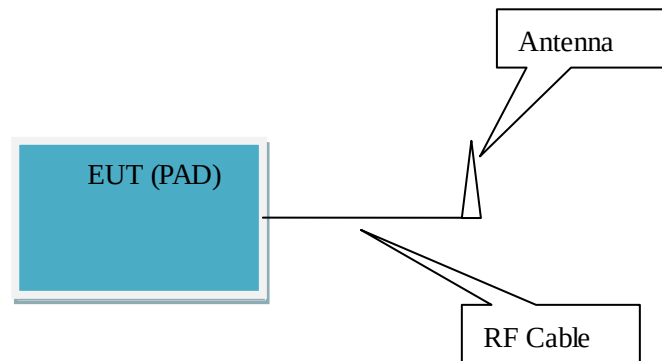
Item	Instrument Name	Type	Serial Number	Manufacturer	Cal. Date	Cal. interval
1	Universal Radio Communication Tester	CMU200	123126	R&S	2019-05-10	1 year
2	Universal Radio Communication Tester	CMW500	104178	R&S	2019-05-10	1 year
3	Test Receiver	ESU40	100307	R&S	2019-05-10	1 year
4	Trilog Antenna	VULB9163	VULB9163-515	Schwarzbeck	2017-02-25	3 years
5	Double Ridged Guide	ETS-3117	00135885	ETS	2017-01-11	3 years
6	EMI Test Software	EMC32 V9.15	NA	R&S	NA	NA
7	Vector signal generator	SMBV100 A	257904	R&S	2019-03-06	1 year
8	GPS Simulator	GSS 4200	1182	SPIRENT	2018-12-17	1 year

7. System Configuration during Test

7.1 Test Mode

Test Item	Function Type
Radiated Emission	Mode 1: GSM1900 receiver +PA01+BA01<Figure 1> Mode 2: WCDMA band 2 receiver +PA01+BA01<Figure 1> Mode 3: LTE band 2 receiver +PA01+BA01<Figure 1> Mode 4: GPS mode <Figure 1> Mode 5: GLONASS mode <Figure 1>
Remark: 1. All test modes and band are performed, After laboratory verification, GSM1900 /WCDMA band 2 / LTE band 2 receiver is the worst mode of receiving part. only the worst cases test data are recorded in this report. 2. EUT and GPS simulator (GSS4200) connection is established. 3. EUT and Vector signal generator (SMBV100A) connection is established.	

7.2 Connection Diagram of Test System



<Figure 1> Mode 1-5

8. Measurement Results

Only the worst test result was shown in this report.

8.1 Radiated Emission 30MHz-18GHz

Method of Measurement

For 30MHz -1000MHz, the EUT was placed on the top of a rotating 0.8m table above the ground at a semi-anechoic chamber. The distance between the EUT and the received antenna was 3 meters. The table was rotated 360 degree and the received antenna mounted on a variable-height antenna tower was varied from 1m to 4m to find the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna were set during the measurement. Tested in accordance with the procedures of ANSI C63.4-2014, section 8.3.

For 1000MHz-18000MHz, The maximal emission value was acquired by adjusting the antenna height, The table was rotated 360 degree to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna were set during the measurement.

Limits for Radiated Emission at a measuring distance of 3m

Frequency Range (MHz)	Quasi-Peak (dBuV/m)
30-88	40
88-216	43.5
216-960	46
Above 960	54

Frequency Range (MHz)	Peak (dBuV/m)	Average (dBuV/m)
Above 1000	74	54

Test conditions

Frequency Range (MHz)	RBW/VBW	Sweep Time (s)
30-1000	120kHz/300kHz	Auto
1000-18000	1MHz/3MHz	Auto

Uncertainty Measurement

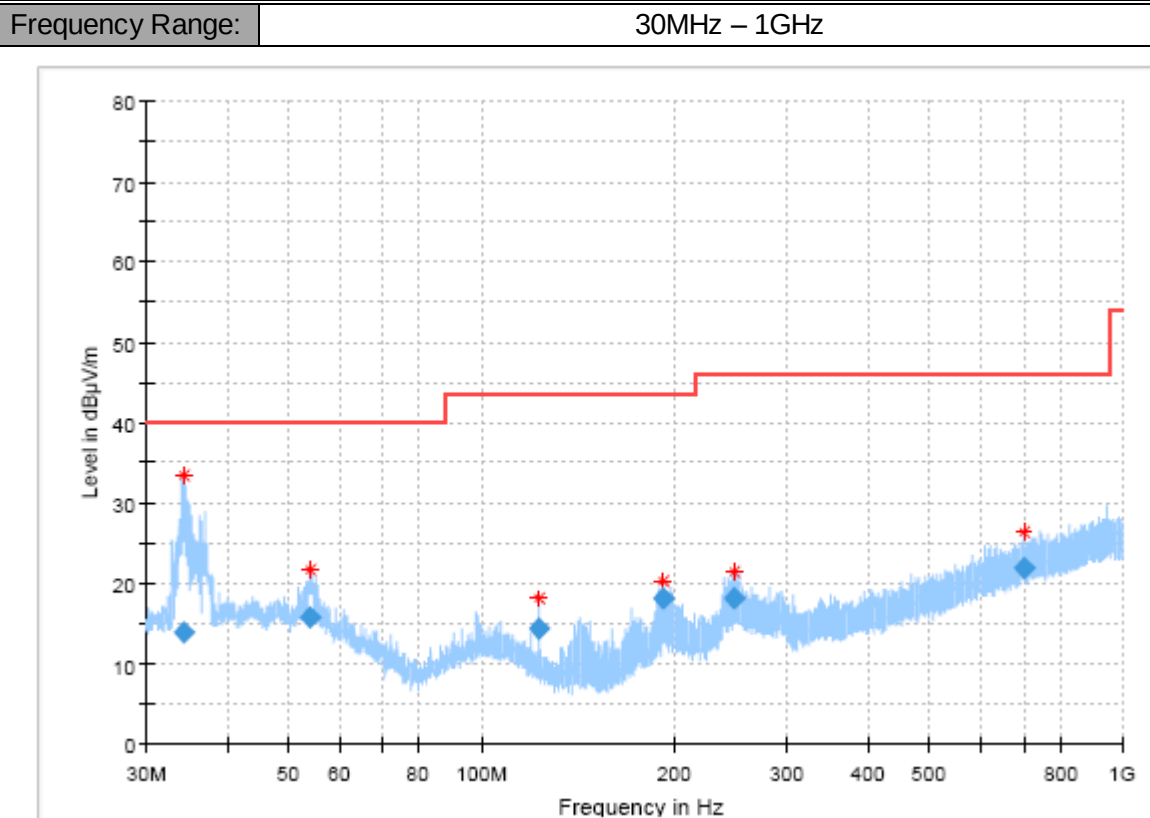
The measurement uncertainty (30MHz-1000MHz) is 4.98 dB (k=2).

The measurement uncertainty (1000MHz-18000MHz) is 5.06 dB (k=2).

Test Results

Sweep the whole frequency band through the range from 30MHz to the 5th harmonic of the carrier, the Emissions in the frequency band 18GHz-40GHz is more than 20dB below the limit are not report.

Mode 1: GSM1900 receiver +PA01+BA01<Figure 1>

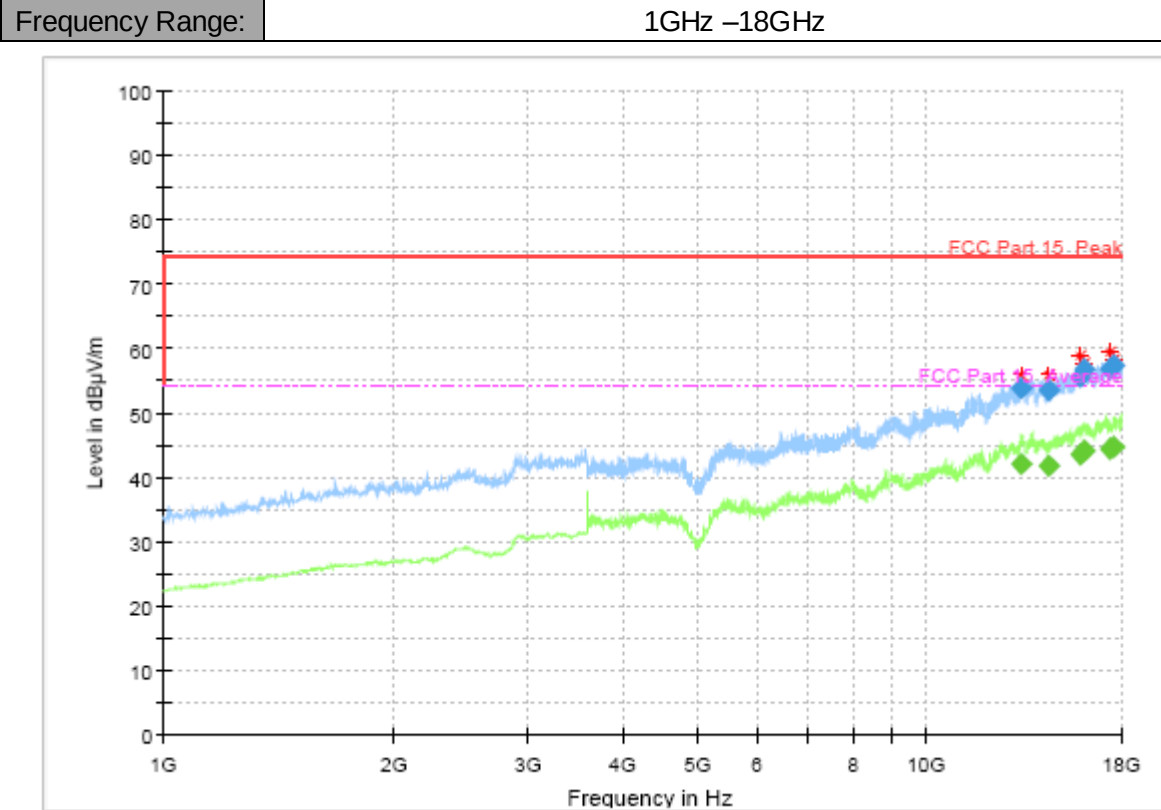


Frequency (MHz)	QuasiPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
34.420333	13.98	40.00	26.02	1000.0	120.000	100.0	V	47.0	-27.3
53.919000	15.84	40.00	24.16	1000.0	120.000	106.0	V	224.0	-25.8
122.861333	14.40	43.50	29.10	1000.0	120.000	180.0	H	163.0	-29.4
191.659000	18.21	43.50	25.29	1000.0	120.000	175.0	V	103.0	-28.3
247.645000	18.17	46.00	27.83	1000.0	120.000	175.0	V	119.0	-26.9
699.671000	21.96	46.00	24.04	1000.0	120.000	226.0	V	240.0	-17.4

Note:

- 1.Emission level(QP)=Raw value by receiver + Corr(Antenna factor + cable loss - preamplifier gain)
- 2.The raw value is used to calculate by software which is not shown in the sheet.
- 3.Margin=limit value – emission level.

Mode 1: GSM1900 receiver +PA01+BA01<Figure 1>



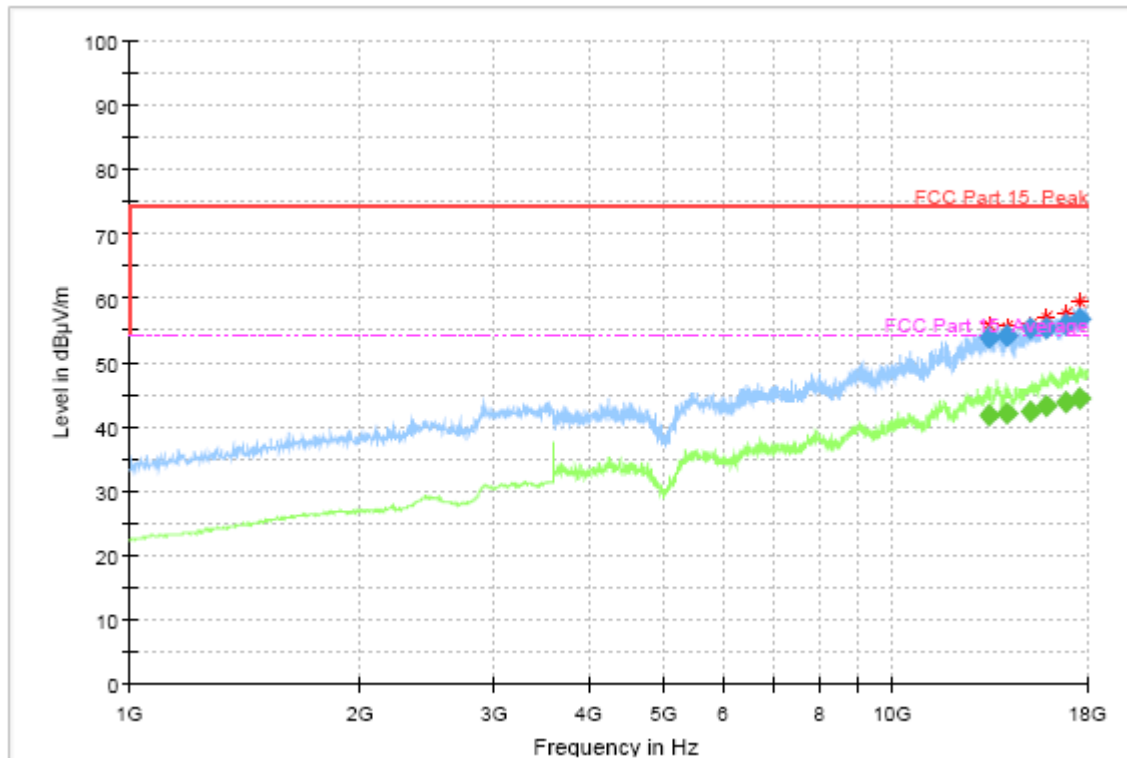
Final Result

Frequency (MHz)	MaxPeak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Meas. Time	Bandwidth (Hz)	Height (m)	Polarization	Azimuth (°)	Corr. (dB)
13310.400000	53.80	---	74.00	20.20	100.0	1000.00	100.0	H	244.0	18.1
13310.400000	---	41.99	54.00	12.01	100.0	1000.00	100.0	H	244.0	18.1
14485.000000	---	41.74	54.00	12.26	100.0	1000.00	200.0	H	295.0	19.1
14485.000000	53.54	---	74.00	20.46	100.0	1000.00	200.0	H	295.0	19.1
15925.400000	---	43.41	54.00	10.59	100.0	1000.00	200.0	H	316.0	22.0
15925.400000	55.49	---	74.00	18.51	100.0	1000.00	200.0	H	316.0	22.0
16063.000000	---	44.25	54.00	9.75	100.0	1000.00	100.0	H	181.0	22.5
16063.000000	56.79	---	74.00	17.21	100.0	1000.00	100.0	H	181.0	22.5
17330.800000	---	44.46	54.00	9.54	100.0	1000.00	100.0	H	338.0	24.1
17330.800000	56.87	---	74.00	17.13	100.0	1000.00	100.0	H	338.0	24.1
17541.600000	57.45	---	74.00	16.55	100.0	1000.00	100.0	H	306.0	24.6
17541.600000	---	44.56	54.00	9.44	100.0	1000.00	100.0	H	306.0	24.6

Note:

- 1.Emission level(peak or average)=Raw value by receiver + Corr(Antenna factor+ cable loss - preamplifier gain)
- 2.The raw value is used to calculate by software which is not shown in the sheet.
- 3.Margin=limit value – emission level.

Frequency Range: 1GHz –18GHz



Final Result

Frequency (MHz)	MaxPeak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Meas. Time	Bandwidth	Height	Polarization	Azimuth	Corr. (dB)
13389.800000	53.77	---	74.00	20.23	100.0	1000.00	200.0	V	213.0	17.9
13389.800000	---	41.85	54.00	12.15	100.0	1000.00	200.0	V	213.0	17.9
14121.600000	---	42.00	54.00	12.00	100.0	1000.00	100.0	V	140.0	19.3
14121.600000	54.01	---	74.00	19.99	100.0	1000.00	100.0	V	140.0	19.3
15167.200000	55.23	---	74.00	18.77	100.0	1000.00	100.0	V	58.0	20.7
15167.200000	---	42.28	54.00	11.72	100.0	1000.00	100.0	V	58.0	20.7
15881.000000	55.36	---	74.00	18.64	100.0	1000.00	100.0	V	79.0	21.9
15881.000000	---	43.26	54.00	10.74	100.0	1000.00	100.0	V	79.0	21.9
16860.400000	---	43.95	54.00	10.05	100.0	1000.00	200.0	V	160.0	23.3
16860.400000	55.78	---	74.00	18.22	100.0	1000.00	200.0	V	160.0	23.3
17588.000000	56.70	---	74.00	17.30	100.0	1000.00	200.0	V	0.0	24.6
17588.000000	---	44.49	54.00	9.51	100.0	1000.00	200.0	V	0.0	24.6

Note:

- 1.Emission level(peak or average)=Raw value by receiver + Corr(Antenna factor+ cable loss - preamplifier gain)
- 2.The raw value is used to calculate by software which is not shown in the sheet.
- 3.Margin=limit value – emission level.

Annex A Accreditation Certificate

Accredited Laboratory

A2LA has accredited

EAST CHINA INSTITUTE OF TELECOMMUNICATIONS
Shanghai, People's Republic of China

for technical competence in the field of
Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).



Presented this 6th day of May 2019.



Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 3682.01
Valid to February 28, 2021

For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.

*****END OF REPORT*****