



TEST REPORT

No. I18D00094-EMC01

For

Client : Gemalto M2M GmbH

Production: EHS5-US

Model Name : EHS5-US R4

Hardware Version: B2.1

Software Version: 04.000

FCC ID: QIPEHS5-USR4

IC ID: 7830A-EHS5USR4

Issued date: 2019-01-14

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of ECIT Shanghai.

Test Laboratory:

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Revision Version

Report Number	Revision	Date	Memo
I18D00094-EMC01	00	2019-01-14	Initial creation of test report

CONTENTS

1. TEST LABORATORY	5
1.1. TESTING LOCATION	5
1.2. TESTING ENVIRONMENT	5
1.3. PROJECT DATA	5
1.4. SIGNATURE	5
2. CLIENT INFORMATION	6
2.1. APPLICANT INFORMATION	6
2.2. MANUFACTURER INFORMATION	6
3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE)	7
3.1. ABOUT EUT	7
3.2. INTERNAL IDENTIFICATION OF EUT USED DURING THE TEST	7
3.3. INTERNAL IDENTIFICATION OF AE USED DURING THE TEST	7
4. REFERENCE DOCUMENTS	8
4.1. REFERENCE DOCUMENTS FOR TESTING	8
5. TEST RESULTS	9
5.1. SUMMARY OF TEST RESULTS	9
5.2. STATEMENTS	9
6. TEST EQUIPMENTS UTILIZED	10
6.1 RADIATED EMISSION EQUIPMENTS LIST	10
6.2 AC CONDUCTED EMISSION EQUIPMENTS LIST	10
7. SYSTEM CONFIGURATION DURING TEST	11
7.1 TEST MODE	11
7.2 CONNECTION DIAGRAM OF TEST SYSTEM	11
8. MEASUREMENT RESULTS	12
8.1 RADIATED EMISSION 30MHZ-18GHZ	12

8.2 AC CONDUCTED EMISSION.....	16
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1. Test Laboratory

1.1. Testing Location

Company Name: ECIT Shanghai, East China Institute of Telecommunications
Address: 7F, G Area, No. 668, Beijing East Road, Huangpu District, Shanghai,
P. R. China
Postal Code: 200001
Telephone: 86-21-63843300
Fax: 86-21-63843301
FCC registration No: 958356

1.2. Testing Environment

Normal Temperature: 15-35°C
Relative Humidity: 30-60%RH

1.3. Project data

Project Leader: Zhou Yan
Testing Start Date: 2018-05-29
Testing End Date: 2018-08-16

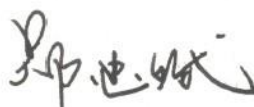
1.4. Signature



QinYabin
(Prepared this test report)



You Jinjun
(Reviewed this test report)



Zheng Zhongbin
Director of the laboratory
(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name: Gemalto M2M GmbH
Address: Gemalto M2M GmbH, Werinherstrasse 81 81541 München,
Germany
Tel: 861059378342
Postcode: 13629

2.2. Manufacturer Information

Company Name: Gemalto M2M GmbH
Address: Gemalto M2M GmbH, Werinherstrasse 81 81541 München,
Germany
Tel: 861059378342
Postcode: 13629

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

3.1. About EUT

ProductName	EHS5-US
Model name	EHS5-US R4
GSM Frequency Band	GSM850/GSM1900
UMTS Frequency Band	WCDMA Band II / V

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version	Date of receipt
N03	NA	B2.1	04.000	2018-05-09

*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
CA01	Adapter	SO24AMV1200200	NA
EA01	Antenna	NA	NA
S01	PCB board	NA	NA

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

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	10-1-10 Edition
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)	Pass

5.2. Statements

The EHS5-US R4, manufactured by Gemalto M2M GmbH 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 Equipments Utilized

6.1 Radiated Emission Equipments list

No.	Name	Type	Series Number	Producer	Cal. Date	Cal. interval
1	Universal Radio Communication	CMU200	123126	R&S	2018-05-11	1 Year
2	Test Receiver	ESU40	100307	R&S	2018-05-11	1 Year
3	Trilog Antenna	VULB9163	VULB9163-515	Schwarzbeck	2017-02-25	3 Year
4	Double Ridged Guide	ETS-3117	00135885	ETS	2017-01-11	3 Year
5	EMI Test Software	EMC32 V9.15	NA	R&S	NA	NA

6.2 AC Conducted Emission Equipments list

No.	Name	Type	Series Number	Producer	Cal. Date	Cal. interval
1	Universal Radio	CMU200	123123	R&S	2018-05-11	1 Year
2	Test Receiver	ESCI	101235	R&S	2018-05-11	1 Year
3	2-Line V-Network	ENV216	101380	R&S	2018-05-11	1 Year
4	EMI Test Software	EMC32 V9.12	NA	R&S	NA	NA

7. System Configuration during Test

7.1 Test Mode

Test Item	Function Type
Radiated emission	Mode 1:Charge mode + CA01<Figure 1>
AC Conducted emission	Mode 1:Charge mode + CA01<Figure 1>

7.2 Connection Diagram of Test System



<Figure 1>

8. Measurement Results

Only the worst test result was shown in this report.

8.1 Radiated Emission 30MHz-18GHz

Method of Measurement

For 30-1000MHz, the EUT was placed on the top of a rotating 0.8-m 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 1000-18000MHz, 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 5.48 dB (k=2).

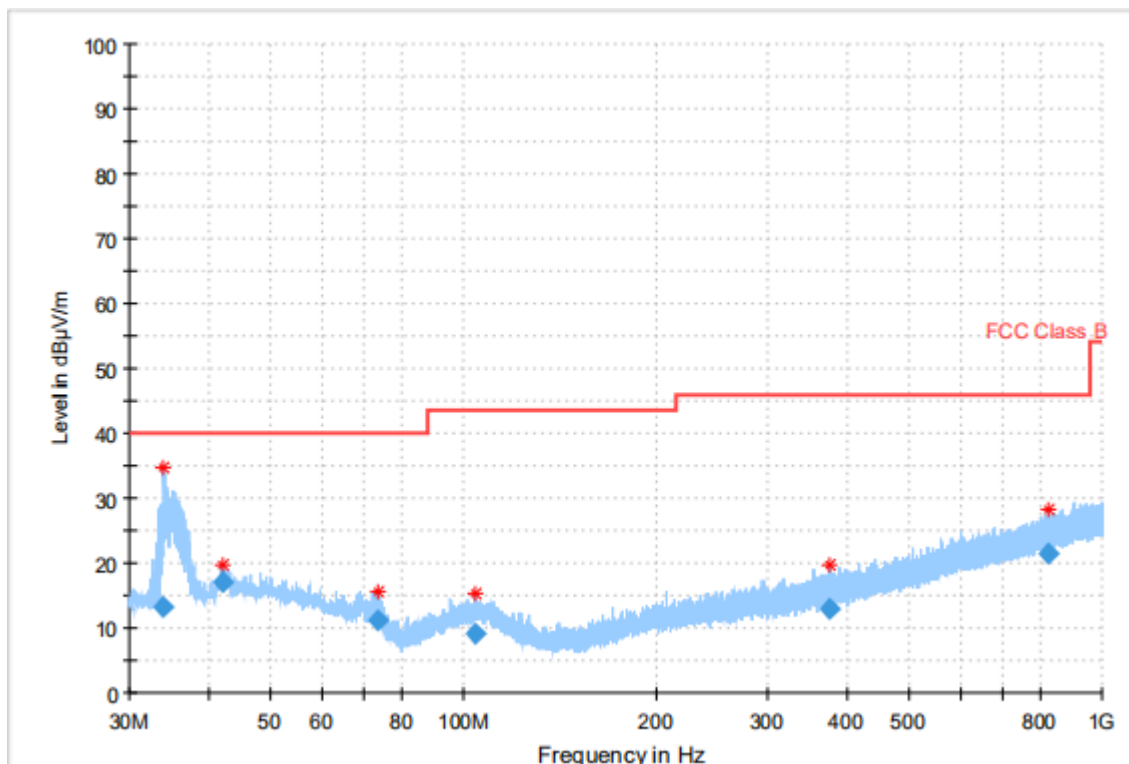
The measurement uncertainty (1000MHz-18000MHz) is 5.20 dB (k=2).

Test Results

Mode 1: Charge mode + CA01<Figure 1>

Frequency Range:

30MHz – 1GHz



Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
33.905845	13.37	40.00	26.63	1000.0	120.000	100.0	V	117.0	-22.0
41.989867	17.06	40.00	22.94	1000.0	120.000	100.0	V	21.0	-20.6
73.268384	11.03	40.00	28.97	1000.0	120.000	181.0	V	6.0	-25.8
104.458883	9.01	43.50	34.49	1000.0	120.000	197.0	H	-30.0	-23.5
375.048051	12.97	46.00	33.03	1000.0	120.000	106.0	V	204.0	-20.1
825.157832	21.55	46.00	24.45	1000.0	120.000	100.0	H	68.0	-10.8

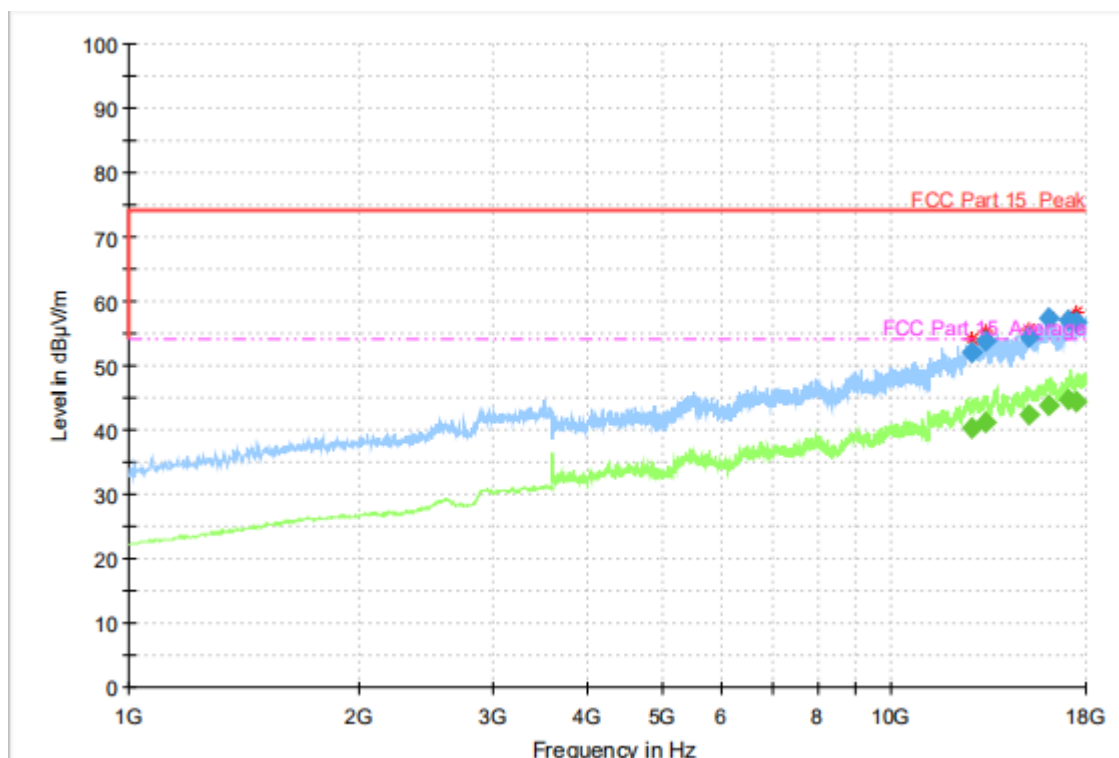
Note:

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

Mode 1: Charge mode + CA04+BA04<Figure1>

Frequency Range:

1GHz –18GHz



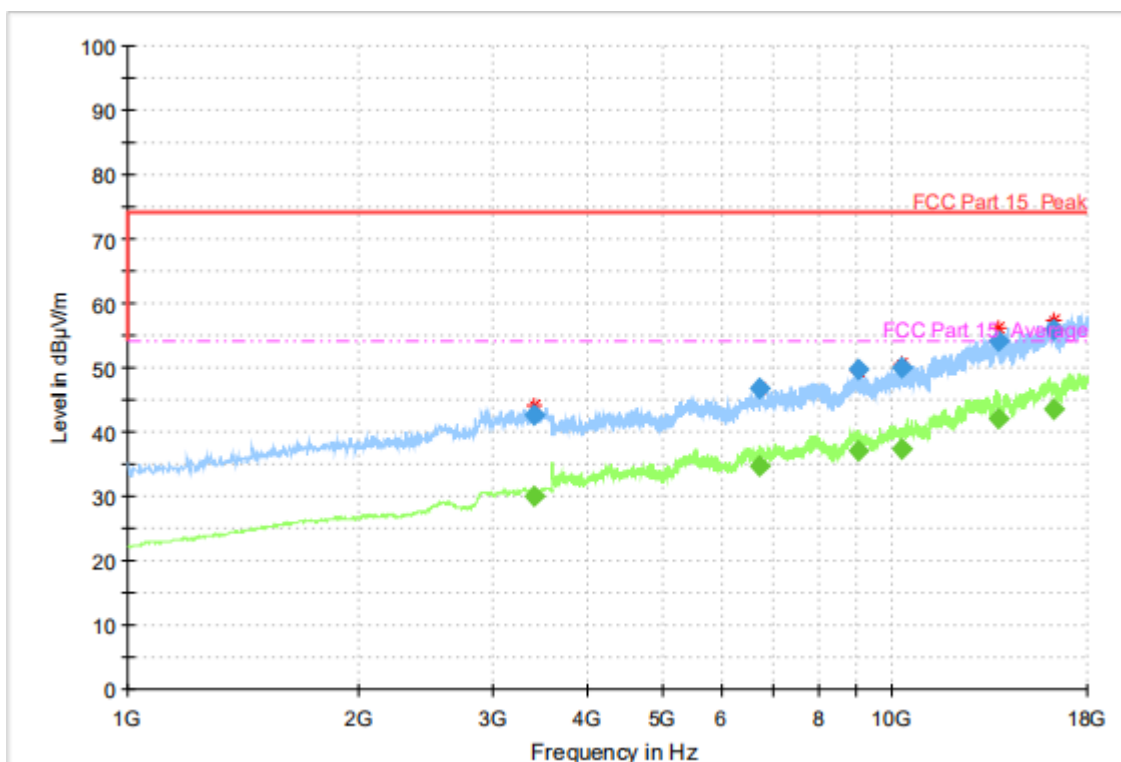
Vertical

Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin	Meas. Time	Bandwidth	Height (cm)	Po l	Azimu th	Corr. (dB)
12733.800000	51.98	---	74.00	22.02	100.0	1000.000	200.0	V	61.0	16.8
12733.800000	---	40.20	54.00	13.80	100.0	1000.000	200.0	V	61.0	16.8
13253.400000	53.76	---	74.00	20.24	100.0	1000.000	100.0	V	42.0	18.1
13253.400000	---	41.08	54.00	12.92	100.0	1000.000	100.0	V	42.0	18.1
15131.200000	---	42.21	54.00	11.79	100.0	1000.000	100.0	V	0.0	20.6
15131.200000	54.41	---	74.00	19.59	100.0	1000.000	100.0	V	0.0	20.6
16035.800000	---	43.90	54.00	10.10	100.0	1000.000	100.0	V	0.0	22.5
16035.800000	57.33	---	74.00	16.67	100.0	1000.000	100.0	V	0.0	22.5
17014.000000	---	44.80	54.00	9.20	100.0	1000.000	100.0	V	100.0	23.8
17014.000000	57.00	---	74.00	17.00	100.0	1000.000	100.0	V	100.0	23.8
17507.400000	---	44.50	54.00	9.50	100.0	1000.000	200.0	V	131.0	24.5
17507.400000	56.65	---	74.00	17.35	100.0	1000.000	200.0	V	131.0	24.5

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.



Horizontal

Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time	Bandwidth h	Heigh t	Po l	Azimuth (deg)	Corr. (dB)
3414.400000	---	30.05	54.00	23.95	100.0	1000.000	100.0	H	291.0	-0.4
3414.400000	42.53	---	74.00	31.47	100.0	1000.000	100.0	H	291.0	-0.4
6695.000000	46.64	---	74.00	27.36	100.0	1000.000	100.0	H	0.0	6.6
6695.000000	---	34.57	54.00	19.43	100.0	1000.000	100.0	H	0.0	6.6
9010.600000	---	37.00	54.00	17.00	100.0	1000.000	200.0	H	235.0	10.3
9010.600000	49.75	---	74.00	24.25	100.0	1000.000	200.0	H	235.0	10.3
10278.600000	---	37.35	54.00	16.65	100.0	1000.000	200.0	H	235.0	12.2
10278.600000	49.99	---	74.00	24.01	100.0	1000.000	200.0	H	235.0	12.2
13739.000000	54.09	---	74.00	19.91	100.0	1000.000	200.0	H	339.0	18.8
13739.000000	---	42.10	54.00	11.90	100.0	1000.000	200.0	H	339.0	18.8
16266.400000	---	43.49	54.00	10.51	100.0	1000.000	200.0	H	84.0	22.5
16266.400000	55.74	---	74.00	18.26	100.0	1000.000	200.0	H	84.0	22.5

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.

8.2 AC Conducted Emission

Method of Measurement

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies with the band 150 kHz to 30MHz shall not exceed the limits. Both lines of the power mains connected to the EUT were checked for maximum conducted interference. Tested in accordance with the procedures of ANSI C63.4-2014, section 7.3

Limit of Conducted Emission

Frequency Range (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency

Test Condition in Charging Mode

Voltage (V)	Frequency (Hz)	RBW	Sweep Time (s)
120	60	9 kHz	Auto

Uncertainty Measurement

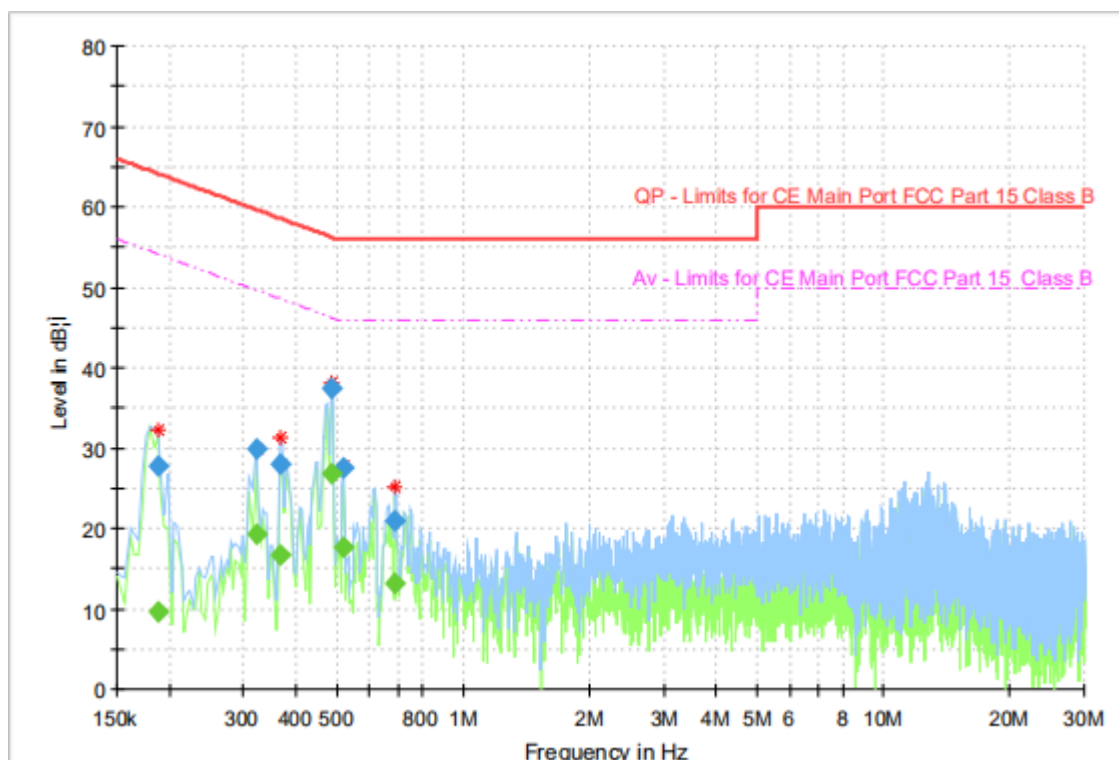
The measurement uncertainty is 3.68dB (k=2).

Test Results

Mode 1: Charge mode + CA01<Figure1>

Frequency Range:

150kHz – 30MHz



Frequency (MHz)	QuasiPeak (dBμ V)	Average (dBμ V)	Limit (dBμ V)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.187312	27.70	---	64.15	36.45	1000.0	9.000	N	ON	9.7
0.187312	---	9.70	54.15	44.45	1000.0	9.000	N	ON	9.7
0.321638	29.98	---	59.66	29.68	1000.0	9.000	L1	ON	9.7
0.321638	---	19.29	49.66	30.37	1000.0	9.000	L1	ON	9.7
0.366412	28.07	---	58.58	30.51	1000.0	9.000	L1	ON	9.7
0.366412	---	16.78	48.58	31.80	1000.0	9.000	L1	ON	9.7
0.485812	37.30	---	56.24	18.94	1000.0	9.000	L1	ON	9.7
0.485812	---	26.75	46.24	19.49	1000.0	9.000	L1	ON	9.7
0.519394	27.62	---	56.00	28.38	1000.0	9.000	L1	ON	9.7
0.519394	---	17.64	46.00	28.36	1000.0	9.000	L1	ON	9.7
0.687300	20.91	---	56.00	35.09	1000.0	9.000	L1	ON	9.7
0.687300	---	13.13	46.00	32.87	1000.0	9.000	L1	ON	9.7

Note:

1. Emission level(quasi-peak or Average peak)=Raw value by receiver + Corr(Insertion loss+ cable loss)
2. The raw value is used to calculate by software which is not shown in the sheet.
3. Margin=limit value – emission level.
4. L1 and N line is all have been tested , the result of them is synthesized in the above data diagram.

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