



**FCC PART 15C
TEST REPORT
No. I16N00975-BT**

for

OnePlus Technology(Shenzhen) Co., Ltd.

Mobile Phone

Model Name: ONEPLUS A3000

With

Hardware Version: 28

Software Version: oxygen 3.5.1

FCC ID: 2ABZ2-A3000

Issued Date: Nov. 14th, 2016

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 CTTL.

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REPORT HISTORY

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1. Test Laboratory

1.1. Testing Location

Location: CTTL(South Branch)

Address: TCL International E city No. 1001 Zhongshanyuan Road, Nanshan
District, Shenzhen, Guangdong, China 518000

1.2. Testing Environment

Normal Temperature: 15-35°C

Extreme Temperature: -20/+55°C

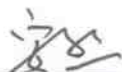
Relative Humidity: 20-75%

1.3. Project data

Testing Start Date: 2016-04-06

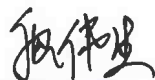
Testing End Date: 2016-11-01

1.4. Signature



An Ran

(Prepared this test report)



Tang Weisheng

(Reviewed this test report)



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(Approved this test report)



2. Client Information

2.1. Applicant Information

Company Name: OnePlus Technology(Shenzhen) Co., Ltd.
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Postal Code: /
Country: China
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2.2. Manufacturer Information

Company Name: OnePlus Technology(Shenzhen) Co., Ltd.
Address: 18/F, Tower C, Tai Ran Building, No.8 Tai Ran Road, Shenzhen, China
City: Shenzhen
Postal Code: /
Country: China
Telephone: 0755 61898696 EXT 7023
Fax: /

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

3.1. About EUT

Description	Mobile Phone
Model Name	ONEPLUS A3000
Market Name	/
Frequency Band	2402MHz~2480MHz
Type of Modulation	GFSK/ π /4 DQPSK/8DPSK
Number of Channels	79
FCC ID	2ABZ2-A3000

*Note: Photographs of EUT are shown in ANNEX A of this test report.

3.2. Internal Identification of EUT

EUT ID*	IMEI	HW Version	SW Version	Receive Date
EUT1	860046030164299	28	oxygen 3.5.1	2016-04-06

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

3.3. Internal Identification of AE

AE ID*	Description	Type	SN
AE1	Power Supply Unit	HK0504	HC1608500001
AE2	Power Supply Unit	DC0504A5	H11619000004
AE3	Power Supply Unit	DC0504B5GB	LCYYWWWSSSSSS

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

4. Reference Documents

4.1. Documents supplied by applicant

EUT feature information is supplied by the applicant or manufacturer, which is the basis of testing.

4.2. Reference Documents for testing

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

Reference	Title	Version
FCC Part15	FCC CFR 47, Part 15, Subpart C: 15.205 Restricted bands of operation; 15.209 Radiated emission limits, general requirements; 15.247 Operation within the bands 902–928MHz, 2400–2483.5 MHz, and 5725–5850 MHz	Nov,2015
ANSI C63.10	American National Standard for Testing Unlicensed Wireless Devices	Jun,2013

5. Test Results

5.1. Summary of Test Results

No	Test cases	Sub-clause of Part15C	Verdict
0.	Antenna Requirement	15.203	P
1.	Radiated Spurious Emission	15.247,15.205,15.209	P
2.	AC Powerline Conducted Emission	15.107,15.207	P

See **ANNEX B** and **ANNEX C** for details.

5.2. Statements

CTTL has evaluated the test cases requested by the applicant/manufacture as listed in section 5.1 of this report, for the EUT specified in section 3, according to the standards or reference documents listed in section 4.2

5.3. Terms used in the result table

Terms used in Verdict column

P	Pass
NA	Not Available
F	Fail

Abbreviations

AC	Alternating Current
AFH	Adaptive Frequency Hopping
BW	Band Width
E.I.R.P.	equivalent isotropical radiated power
ISM	Industrial, Scientific and Medical
R&TTE	Radio and Telecommunications Terminal Equipment
RF	Radio Frequency
Tx	Transmitter

5.4. Laboratory Environment

Semi-anechoic chamber did not exceed following limits along the EMC testing

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 35 %, Max. = 60 %
Shielding effectiveness	0.014MHz - 1MHz, >60dB; 1MHz - 1000MHz, >90dB.
Electrical insulation	> 2 MΩ
Ground system resistance	< 4Ω
Normalised site attenuation (NSA)	< ±4dB, 3m/10m distance, from 30 to 1000 MHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 3000 MHz

Shielded room did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 35 %, Max. = 60 %
Shielding effectiveness	0.014MHz - 1MHz, >60dB; 1MHz - 1000MHz, >90dB.
Electrical insulation	> 2 MΩ
Ground system resistance	< 4 Ω

Fully-anechoic chamber did not exceed following limits along the EMC testing

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 35 %, Max. = 60 %
Shielding effectiveness	0.014MHz - 1MHz, >60dB; 1MHz - 1000MHz, >90dB.
Electrical insulation	> 2 MΩ
Ground system resistance	< 4Ω
Voltage Standing Wave Ratio (VSWR)	≤6dB, from 1 to 18 GHz, 3m distance

6. Test Facilities Utilized

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date	Calibration Period
1	Chamber	FACT5-2.0	4166	ETS-Lindgren	2018-05-13	3 years
2	Test Receiver	ESCI	100701	Rohde & Schwarz	2017-08-09	1 year
3	BiLog Antenna	VULB9163	9163 329	Schwarzbeck	2017-01-20	3 years
4	Horn Antenna	3117	00066577	ETS-Lindgren	2019-03-05	3 years
5	Spectrum Analyser	FSP40	100378	Rohde & Schwarz	2016-12-18	1 year
6	Bluetooth Tester	CBT32	100584	Rohde & Schwarz	2017-01-09	1 year
7	Loop Antenna	HLA6120	35779	TESEQ	2019-05-10	3 years
8	Test Receiver	ESCI	100702	Rohde & Schwarz	2017-06-26	1 year
9	LISN	ESH2-Z5	100196	Rohde & Schwarz	2017-01-12	1 year

Anechoic chamber

Fully anechoic chamber by ETS-Lindgren.

ANNEX A: MEASUREMENT RESULTS FOR RECEIVER

A.0 Antenna requirement

Measurement Limit:

Standard	Requirement
FCC CRF Part 15.203	An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, § 15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

**Conclusion: The Directional gains of antenna used for transmitting is -3.5 dBi.
The RF transmitter uses an integrate antenna without connector.**

A.1 Radiated Emission

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247, 15.205, 15.209	20dB below peak output power

In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

Limit in restricted band:

Frequency of emission (MHz)	Field strength($\mu\text{V/m}$)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Condition

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

Frequency of emission (MHz)	RBW/VBW	Sweep Time(s)
30-1000	120kHz/300kHz	5
1000-4000	1MHz/3MHz	15
4000-18000	1MHz/3MHz	40
18000-26500	1MHz/3MHz	20

Note: According to the performance evaluation, the radiated emission margin of EUT is over 20dB in the band from 9kHz to 30MHz. Therefore, the measurement starts from 30MHz to tenth harmonic.

The measurement results include the horizontal polarization and vertical polarization measurements.

Measurement Results:

Mode	Channel	Frequency Range	Test Results	Conclusion
GFSK	0	1 GHz ~18 GHz	Fig.1	P
	39	9 kHz ~30 MHz	Fig.2	P
		30 MHz ~1 GHz	Fig.3	P
		1 GHz ~18 GHz	Fig.4	P
	78	1 GHz ~18 GHz	Fig.5	P
	Power(CH0)	2.38 GHz ~ 2.45 GHz	Fig.6	P
	Power(CH78)	2.45 GHz ~ 2.5 GHz	Fig.7	P
$\pi/4$ DQPSK	0	1 GHz ~18 GHz	Fig.8	P
	39	9 kHz ~30 MHz	Fig.9	P
		30 MHz ~1 GHz	Fig.10	P
		1 GHz ~18 GHz	Fig.11	P
	78	1 GHz ~18 GHz	Fig.12	P
	Power(CH0)	2.38 GHz ~ 2.45 GHz	Fig.13	P
	Power(CH78)	2.45 GHz ~ 2.5 GHz	Fig.14	P

8DPSK	0	1 GHz ~18 GHz	Fig.15	P
	39	9 kHz ~30 MHz	Fig.16	P
		30 MHz ~1 GHz	Fig.17	P
		1 GHz ~18 GHz	Fig.18	P
	78	1 GHz ~18 GHz	Fig.19	P
	Power(CH0)	2.38 GHz ~ 2.45 GHz	Fig.20	P
	Power(CH78)	2.45 GHz ~ 2.5 GHz	Fig.21	P
/	All channels	18 GHz~ 26.5 GHz	Fig.22	P

GFSK CH0 (1-18GHz)

Frequency (MHz)	MaxPeak-ClearWrite (dBμV/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
14340.500000	56.1	V	11.5	17.9	74.0
14727.000000	56.8	H	11.9	17.2	74.0
15726.500000	58.5	V	12.7	15.5	74.0
16205.500000	58.7	V	13.1	15.3	74.0
16811.000000	59.3	V	13.9	14.7	74.0
17333.000000	58.6	H	14.0	15.4	74.0

Frequency (MHz)	Average-ClearWrite (dBμV/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
14147.500000	43.9	H	11.2	10.1	54.0
15180.000000	44.9	H	12.2	9.1	54.0
15705.000000	46.5	V	12.7	7.5	54.0
16201.500000	47.0	H	13.1	7.0	54.0
16751.000000	47.7	H	13.9	6.3	54.0
17341.000000	47.2	H	14.0	6.8	54.0

GFSK CH39 (1-18GHz)

Frequency (MHz)	MaxPeak-ClearWrite (dBμV/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
14146.500000	55.7	V	11.2	18.3	74.0
14654.500000	56.5	V	11.9	17.5	74.0
15708.500000	58.4	V	12.7	15.6	74.0
16166.500000	58.9	V	13.1	15.1	74.0
16762.000000	59.1	V	13.9	14.9	74.0
17790.500000	58.7	H	13.9	15.3	74.0

Frequency (MHz)	Average-ClearWrite (dBμV/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
14541.000000	43.9	H	11.9	10.1	54.0
15175.500000	44.9	H	12.1	9.1	54.0
15682.500000	46.6	H	12.6	7.4	54.0
16207.000000	46.9	H	13.1	7.1	54.0
16786.000000	47.7	V	13.9	6.3	54.0
17284.500000	47.1	H	13.9	6.9	54.0

GFSK CH78 (1-18GHz)

Frequency (MHz)	MaxPeak-ClearWrite (dBμV/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
14117.500000	56.3	V	11.1	17.7	74.0
15141.500000	57.4	V	12.1	16.6	74.0
15675.000000	59.3	H	12.6	14.7	74.0
16221.500000	58.4	V	13.1	15.6	74.0
16768.000000	59.6	H	13.9	14.4	74.0
17301.500000	58.9	H	13.9	15.1	74.0

Frequency (MHz)	Average-ClearWrite (dBμV/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
14524.000000	44.3	V	11.8	9.7	54.0
15185.500000	45.3	V	12.2	8.7	54.0
15756.000000	46.9	H	12.8	7.1	54.0
16234.000000	46.9	H	13.1	7.1	54.0
16734.000000	47.5	V	13.8	6.5	54.0
17280.500000	47.2	H	13.9	6.8	54.0

$\pi/4$ DQPSK CH0 (1-18GHz)

Frequency (MHz)	MaxPeak-ClearWrite (dBμV/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
14529.000000	55.8	V	11.8	18.2	74.0
15180.500000	56.6	H	12.2	17.4	74.0
15690.500000	59.2	H	12.7	14.8	74.0
16211.500000	59.1	H	13.1	14.9	74.0
16830.500000	58.8	V	13.9	15.2	74.0
17330.000000	59.3	V	14.0	14.7	74.0

Frequency (MHz)	Average-ClearWrite (dBμV/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
14538.500000	43.9	H	11.9	10.1	54.0
15179.500000	44.9	H	12.2	9.1	54.0
15675.000000	46.5	V	12.6	7.5	54.0
16220.000000	47.0	V	13.1	7.0	54.0
16794.500000	47.7	V	13.9	6.3	54.0
17330.500000	47.2	H	14.0	6.8	54.0

$\pi/4$ DQPSK CH39 (1-18GHz)

Frequency (MHz)	MaxPeak-ClearWrite (dBμV/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
14026.000000	56.0	V	10.9	18.0	74.0
15093.500000	57.2	H	12.1	16.8	74.0
15708.500000	58.4	V	12.7	15.6	74.0
16295.000000	58.8	V	13.3	15.2	74.0
16748.500000	58.9	H	13.9	15.1	74.0
17345.500000	59.1	H	14.0	14.9	74.0

Frequency (MHz)	Average-ClearWrite (dBμV/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
14530.000000	44.1	V	11.8	9.9	54.0
15164.500000	45.2	V	12.1	8.8	54.0
15727.000000	46.7	H	12.7	7.3	54.0
16208.000000	46.9	H	13.1	7.1	54.0
16770.500000	47.6	V	13.9	6.4	54.0
17358.000000	47.2	V	14.0	6.8	54.0

$\pi/4$ DQPSK CH78 (1-18GHz)

Frequency (MHz)	MaxPeak-ClearWrite (dB μ V/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
14534.500000	56.0	H	11.9	18.0	74.0
15119.000000	57.0	H	12.1	17.0	74.0
15694.500000	58.5	H	12.7	15.5	74.0
16234.000000	58.7	H	13.1	15.3	74.0
16879.000000	59.0	H	14.0	15.0	74.0
17280.500000	59.2	V	13.9	14.8	74.0

Frequency (MHz)	Average-ClearWrite (dB μ V/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
14552.000000	44.2	H	11.9	9.8	54.0
15170.000000	45.1	H	12.1	8.9	54.0
15672.500000	46.6	V	12.6	7.4	54.0
16205.500000	46.9	H	13.1	7.1	54.0
16833.500000	47.5	H	13.9	6.5	54.0
17355.500000	47.0	H	14.0	7.0	54.0

8DPSK CH0 (1-18GHz)

Frequency (MHz)	MaxPeak-ClearWrite (dB μ V/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
14100.000000	55.6	H	11.1	18.4	74.0
15172.000000	56.7	V	12.1	17.3	74.0
15752.000000	58.0	V	12.8	16.0	74.0
16248.000000	58.2	V	13.2	15.8	74.0
16887.500000	59.2	H	14.0	14.8	74.0
17838.500000	58.3	V	13.8	15.7	74.0

Frequency (MHz)	Average-ClearWrite (dBμV/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
14548.500000	44.2	V	11.9	9.8	54.0
15143.500000	45.1	V	12.1	8.9	54.0
15739.500000	46.4	H	12.8	7.6	54.0
16226.500000	46.7	H	13.1	7.3	54.0
16737.000000	47.1	V	13.8	6.9	54.0
17298.500000	46.9	H	13.9	7.1	54.0

8DPSK CH39 (1-18GHz)

Frequency (MHz)	MaxPeak-ClearWrite (dBμV/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
14268.000000	56.4	H	11.4	17.6	74.0
15160.500000	56.3	H	12.1	17.7	74.0
15678.500000	58.2	V	12.6	15.8	74.0
16328.500000	58.3	V	13.4	15.7	74.0
16730.000000	59.0	H	13.8	15.0	74.0
17484.500000	58.3	H	14.0	15.7	74.0

Frequency (MHz)	Average-ClearWrite (dBμV/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
14514.500000	44.2	H	11.8	9.8	54.0
15143.000000	45.1	H	12.1	8.9	54.0
15674.000000	46.4	V	12.6	7.6	54.0
16231.500000	46.6	H	13.1	7.4	54.0
16771.500000	47.3	V	13.9	6.7	54.0
17301.500000	46.9	H	13.9	7.1	54.0

8DPSK CH78 (1-18GHz)

Frequency (MHz)	MaxPeak-ClearWrite (dBμV/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
14546.000000	55.9	H	11.9	18.1	74.0
14651.000000	56.8	H	11.9	17.2	74.0
15744.000000	58.1	V	12.8	15.9	74.0
16318.000000	58.3	H	13.3	15.7	74.0
16753.000000	59.1	V	13.9	14.9	74.0
17334.500000	59.2	H	14.0	14.8	74.0

Frequency (MHz)	Average-ClearWrite (dBμV/m)	Polarization	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
14157.500000	43.8	H	11.2	10.2	54.0
15183.000000	44.8	H	12.2	9.2	54.0
15684.000000	46.5	V	12.6	7.5	54.0
16214.500000	46.8	V	13.1	7.2	54.0
16790.500000	47.6	V	13.9	6.4	54.0
17300.500000	47.1	H	13.9	6.9	54.0

See ANNEX C for test graphs.

Conclusion: Pass

A.2 AC Power line Conducted Emission

Test Condition:

Voltage (V)	Frequency (Hz)
120	60

Measurement Result and limit:

BT (Quasi-peak Limit)-AE1

Frequency range (MHz)	Quasi-peak Limit (dB μ V)	Result (dB μ V)	Conclusion
		Traffic	
0.15 to 0.5	66 to 56	Fig.23	P
0.5 to 5	56		
5 to 30	60		

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

BT (Average Limit)-AE1

Frequency range (MHz)	Average-peak Limit (dB μ V)	Result (dB μ V)	Conclusion
		Traffic	
0.15 to 0.5	56 to 46	Fig.23	P
0.5 to 5	46		
5 to 30	50		

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

BT (Quasi-peak Limit)-AE1

Frequency range (MHz)	Quasi-peak Limit (dB μ V)	Result (dB μ V)	Conclusion
		Idle	
0.15 to 0.5	66 to 56	Fig.24	P
0.5 to 5	56		
5 to 30	60		

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

BT (Average Limit)-AE1

Frequency range (MHz)	Average-peak Limit (dB μ V)	Result (dB μ V)	Conclusion
		Idle	
0.15 to 0.5	56 to 46	Fig.24	P
0.5 to 5	46		
5 to 30	50		

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

Test Condition:

Voltage (V)	Frequency (Hz)
240	60

Measurement Result and limit:

BT (Quasi-peak Limit)-AE1

Frequency range (MHz)	Quasi-peak Limit (dB μ V)	Result (dB μ V)	Conclusion
		Traffic	
0.15 to 0.5	66 to 56	Fig.25	P
0.5 to 5	56		
5 to 30	60		

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

BT (Average Limit)-AE1

Frequency range (MHz)	Average-peak Limit (dB μ V)	Result (dB μ V)	Conclusion
		Traffic	
0.15 to 0.5	56 to 46	Fig.25	P
0.5 to 5	46		
5 to 30	50		

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

BT (Quasi-peak Limit)-AE1

Frequency range (MHz)	Quasi-peak Limit (dB μ V)	Result (dB μ V)	Conclusion
		Idle	
0.15 to 0.5	66 to 56	Fig.26	P
0.5 to 5	56		
5 to 30	60		

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

BT (Average Limit)-AE1

Frequency range (MHz)	Average-peak Limit (dB μ V)	Result (dB μ V)	Conclusion
		Idle	
0.15 to 0.5	56 to 46	Fig.26	P
0.5 to 5	46		
5 to 30	50		

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

Test Condition:

Voltage (V)	Frequency (Hz)
120	60

Measurement Result and limit:

BT (Quasi-peak Limit)-AE2

Frequency range (MHz)	Quasi-peak Limit (dB μ V)	Result (dB μ V)	Conclusion
		Traffic	
0.15 to 0.5	66 to 56	Fig.27	P
0.5 to 5	56		
5 to 30	60		

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

BT (Average Limit)-AE2

Frequency range (MHz)	Average-peak Limit (dB μ V)	Result (dB μ V)	Conclusion
		Traffic	
0.15 to 0.5	56 to 46	Fig.27	P
0.5 to 5	46		
5 to 30	50		

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

BT (Quasi-peak Limit)-AE2

Frequency range (MHz)	Quasi-peak Limit (dB μ V)	Result (dB μ V)	Conclusion
		Idle	
0.15 to 0.5	66 to 56	Fig.28	P
0.5 to 5	56		
5 to 30	60		

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

BT (Average Limit)-AE2

Frequency range (MHz)	Average-peak Limit (dB μ V)	Result (dB μ V)	Conclusion
		Idle	
0.15 to 0.5	56 to 46	Fig.28	P
0.5 to 5	46		
5 to 30	50		

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

Test Condition:

Voltage (V)	Frequency (Hz)
240	60

Measurement Result and limit:

BT (Quasi-peak Limit)-AE2

Frequency range (MHz)	Quasi-peak Limit (dB μ V)	Result (dB μ V)	Conclusion
		Traffic	
0.15 to 0.5	66 to 56	Fig.29	P
0.5 to 5	56		
5 to 30	60		

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

BT (Average Limit)-AE2

Frequency range (MHz)	Average-peak Limit (dB μ V)	Result (dB μ V)	Conclusion
		Traffic	
0.15 to 0.5	56 to 46	Fig.29	P
0.5 to 5	46		
5 to 30	50		

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

BT (Quasi-peak Limit)-AE2

Frequency range (MHz)	Quasi-peak Limit (dB μ V)	Result (dB μ V)	Conclusion
		Idle	
0.15 to 0.5	66 to 56	Fig.30	P
0.5 to 5	56		
5 to 30	60		

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

BT (Average Limit)-AE2

Frequency range (MHz)	Average-peak Limit (dB μ V)	Result (dB μ V)	Conclusion
		Idle	
0.15 to 0.5	56 to 46	Fig.30	P
0.5 to 5	46		
5 to 30	50		

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

Test Condition:

Voltage (V)	Frequency (Hz)
120	60

Measurement Result and limit:

BT (Quasi-peak Limit)-AE3

Frequency range (MHz)	Quasi-peak Limit (dB μ V)	Result (dB μ V)	Conclusion
		Traffic	
0.15 to 0.5	66 to 56	Fig.31	P
0.5 to 5	56		
5 to 30	60		

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

BT (Average Limit)-AE3

Frequency range (MHz)	Average-peak Limit (dB μ V)	Result (dB μ V)	Conclusion
		Traffic	
0.15 to 0.5	56 to 46	Fig.31	P
0.5 to 5	46		
5 to 30	50		

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

BT (Quasi-peak Limit)-AE3

Frequency range (MHz)	Quasi-peak Limit (dB μ V)	Result (dB μ V)	Conclusion
		Idle	
0.15 to 0.5	66 to 56	Fig.32	P
0.5 to 5	56		
5 to 30	60		

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

BT (Average Limit)-AE3

Frequency range (MHz)	Average-peak Limit (dB μ V)	Result (dB μ V)	Conclusion
		Idle	
0.15 to 0.5	56 to 46	Fig.32	P
0.5 to 5	46		
5 to 30	50		

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

Test Condition:

Voltage (V)	Frequency (Hz)
240	60

Measurement Result and limit:

BT (Quasi-peak Limit)-AE3

Frequency range (MHz)	Quasi-peak Limit (dB μ V)	Result (dB μ V)	Conclusion
		Traffic	
0.15 to 0.5	66 to 56	Fig.33	P
0.5 to 5	56		
5 to 30	60		

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

BT (Average Limit)-AE3

Frequency range (MHz)	Average-peak Limit (dB μ V)	Result (dB μ V)	Conclusion
		Traffic	
0.15 to 0.5	56 to 46	Fig.33	P
0.5 to 5	46		
5 to 30	50		

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

BT (Quasi-peak Limit)-AE3

Frequency range (MHz)	Quasi-peak Limit (dB μ V)	Result (dB μ V)	Conclusion
		Idle	
0.15 to 0.5	66 to 56	Fig.34	P
0.5 to 5	56		
5 to 30	60		

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

BT (Average Limit)-AE3

Frequency range (MHz)	Average-peak Limit (dB μ V)	Result (dB μ V)	Conclusion
		Idle	
0.15 to 0.5	56 to 46	Fig.34	P
0.5 to 5	46		
5 to 30	50		

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

Note: The measurement results include the L1 and N measurements.

See ANNEX C for test graphs.

Conclusion: Pass

ANNEX B: TEST FIGURE LIST

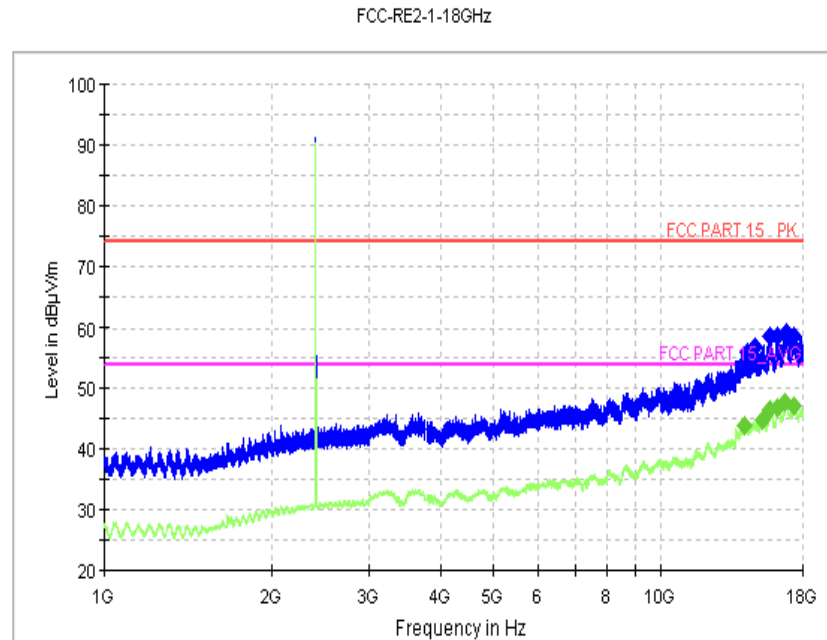


Fig. 1 Radiated Spurious Emission (GFSK, Ch0, 1 GHz ~18 GHz)

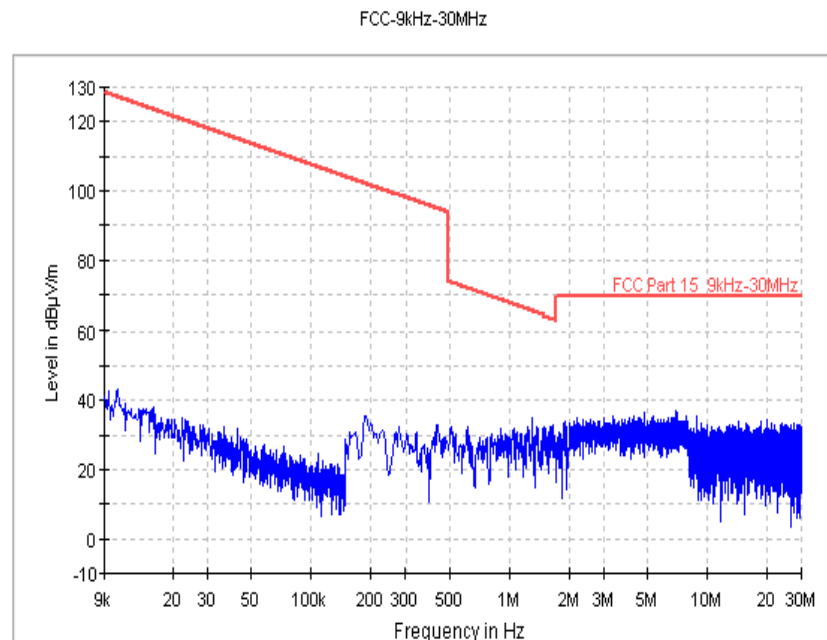


Fig. 2 Radiated Spurious Emission (GFSK, Ch39, 9 kHz ~30 MHz)

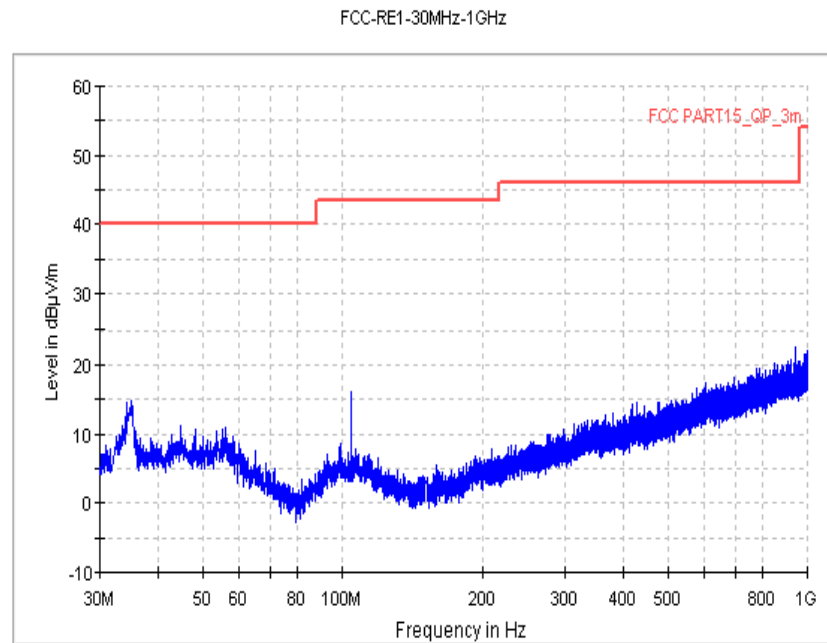


Fig. 3 Radiated Spurious Emission (GFSK, Ch39, 30 MHz ~1 GHz)

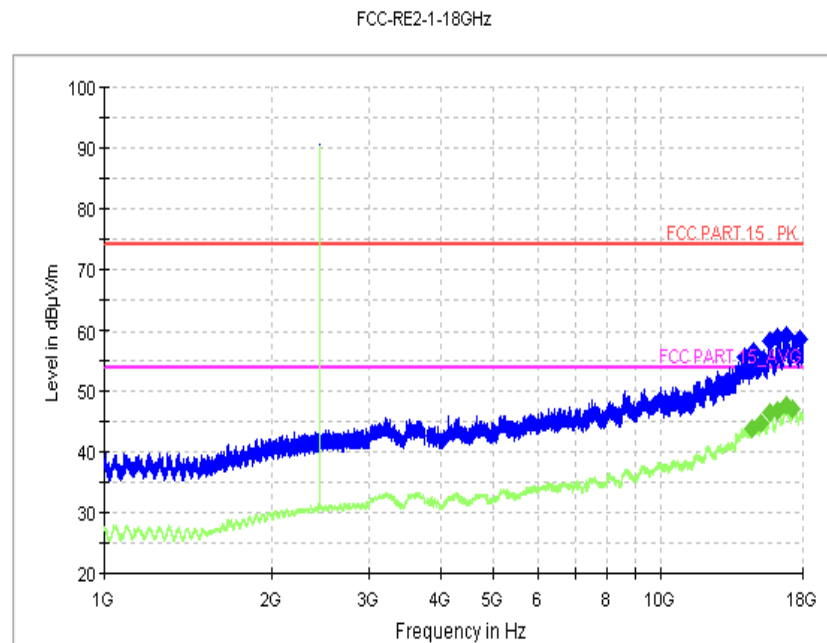


Fig. 4 Radiated Spurious Emission (GFSK, Ch39, 1 GHz ~18 GHz)

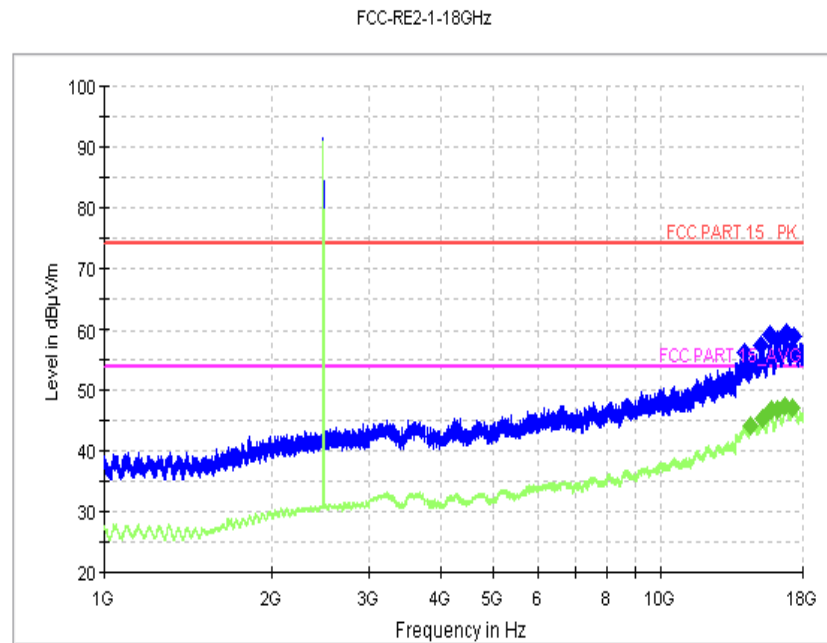


Fig. 5 Radiated Spurious Emission (GFSK, Ch78, 1 GHz ~18 GHz)

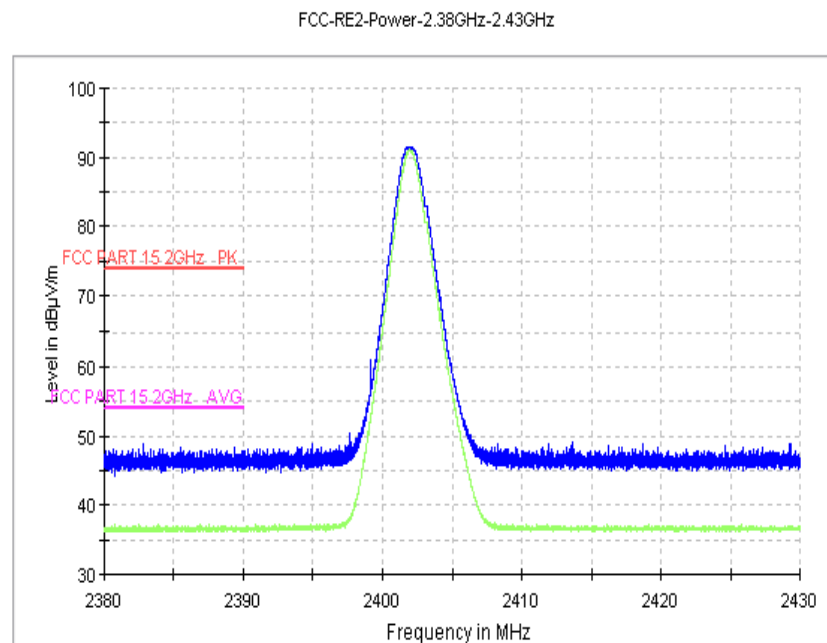


Fig. 6 Radiated Emission Power (GFSK, Ch0, 2380GHz~2450GHz)

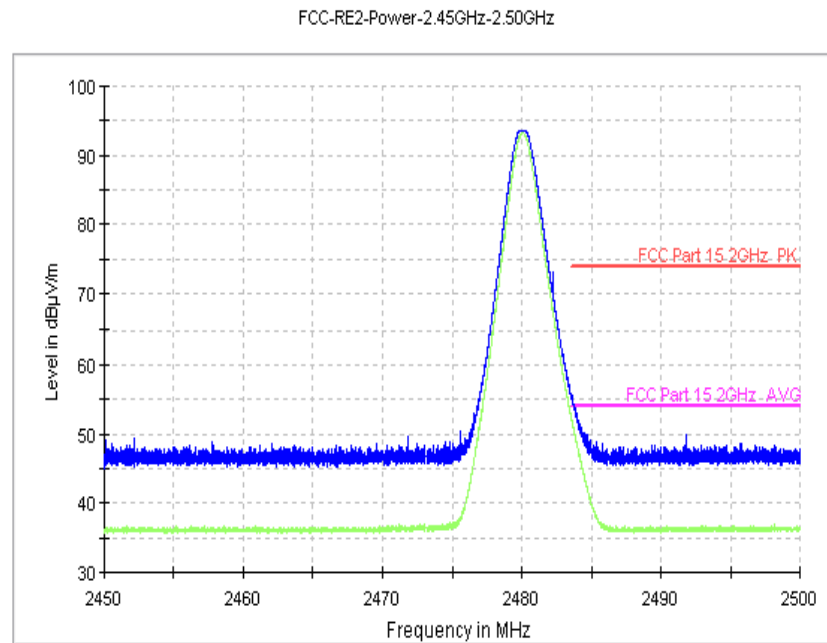


Fig. 7 Radiated Emission Power (GFSK, Ch78, 2450GHz~2500GHz)

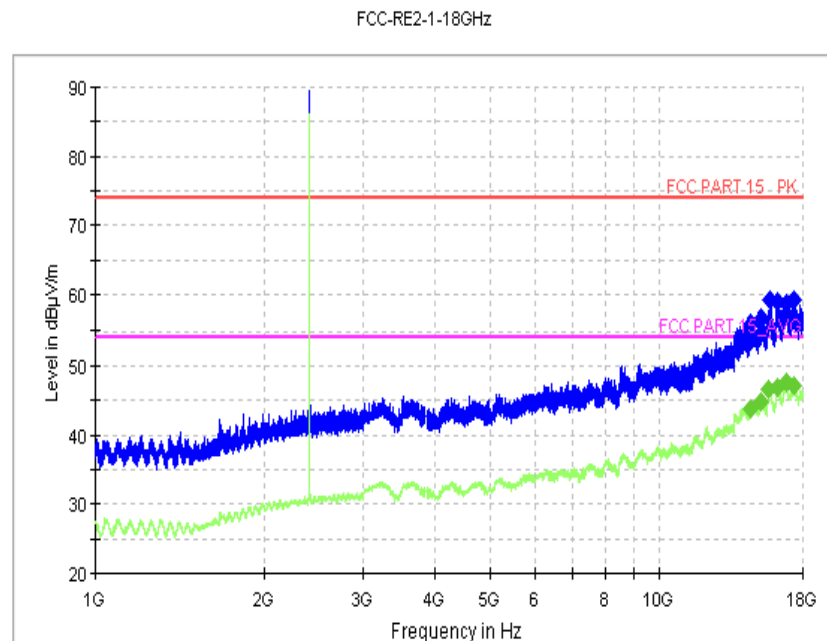


Fig. 8 Radiated Spurious Emission ($\pi/4$ DQPSK, Ch0, 1 GHz ~18 GHz)

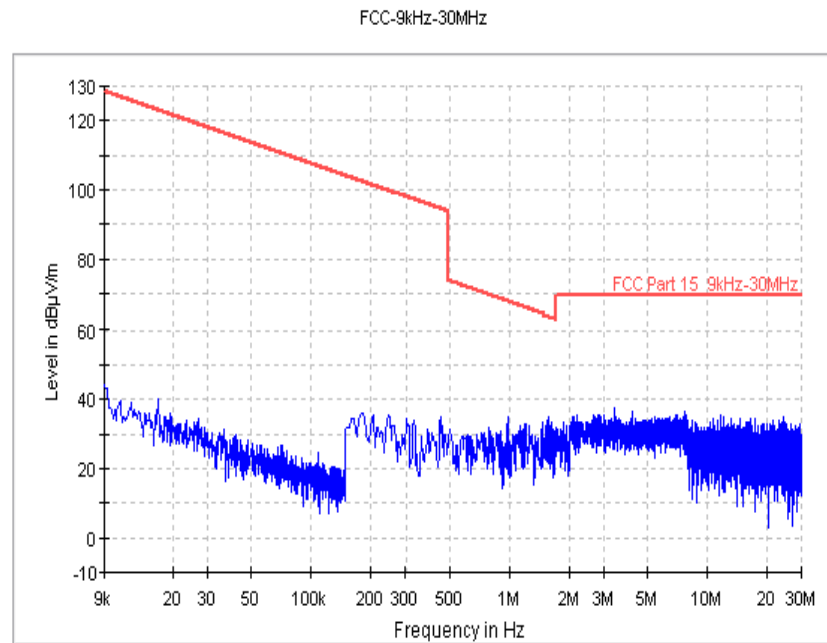


Fig. 9 Radiated Spurious Emission ($\pi/4$ DQPSK, Ch39, 9 kHz ~30 MHz)

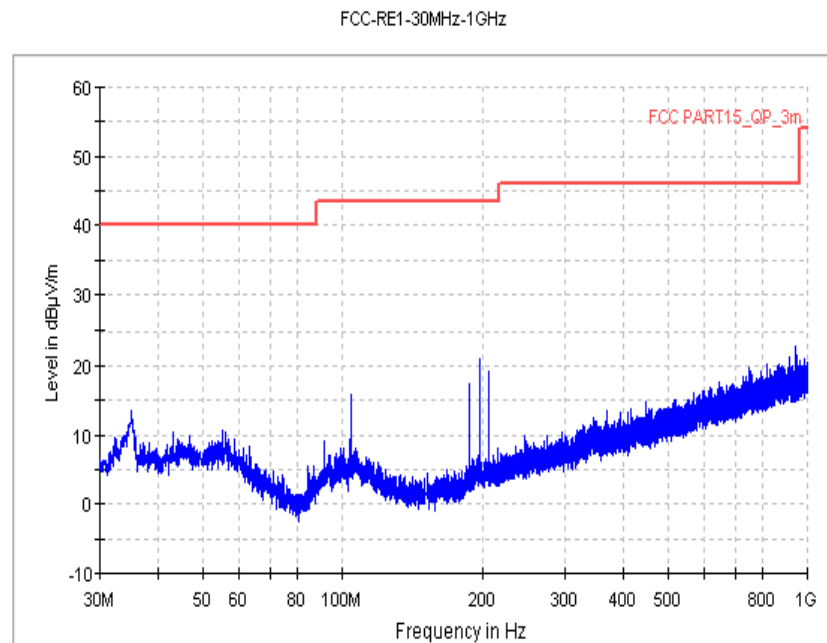


Fig. 10 Radiated Spurious Emission ($\pi/4$ DQPSK, Ch39, 30 MHz ~1 GHz)

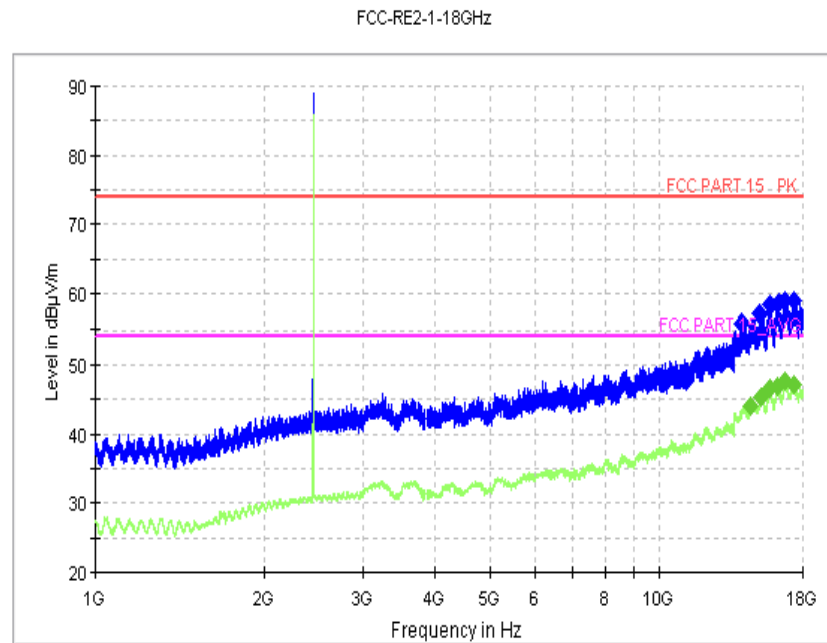


Fig. 11 Radiated Spurious Emission ($\pi/4$ DQPSK, Ch39, 1 GHz ~18 GHz)

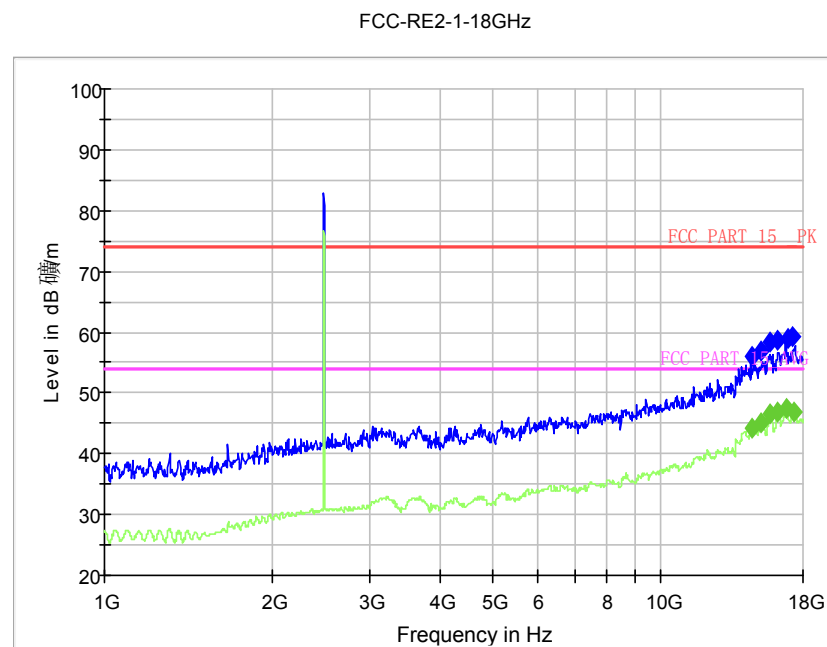


Fig. 12 Radiated Spurious Emission ($\pi/4$ DQPSK, Ch78, 1 GHz ~18 GHz)

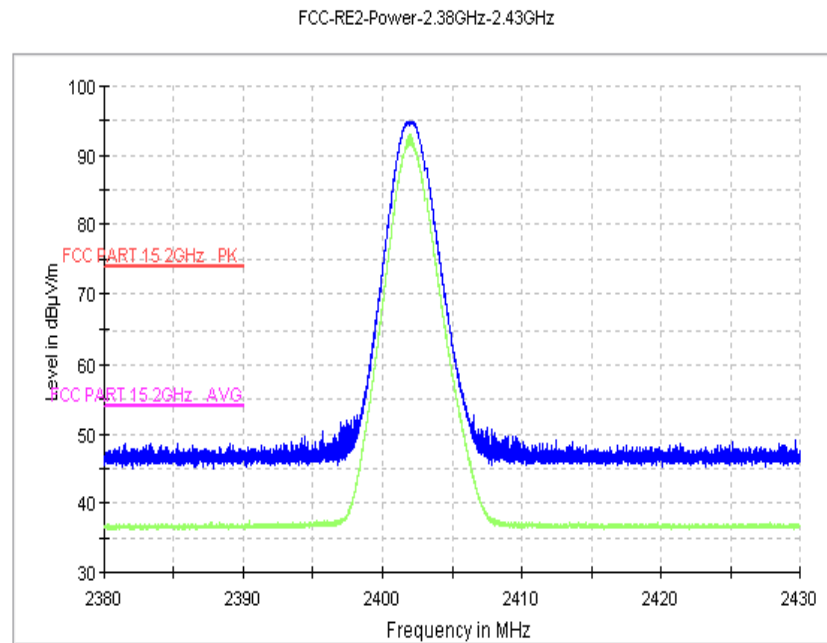


Fig. 13 Radiated Emission Power ($\pi/4$ DQPSK, Ch0, 2380GHz~2450GHz)

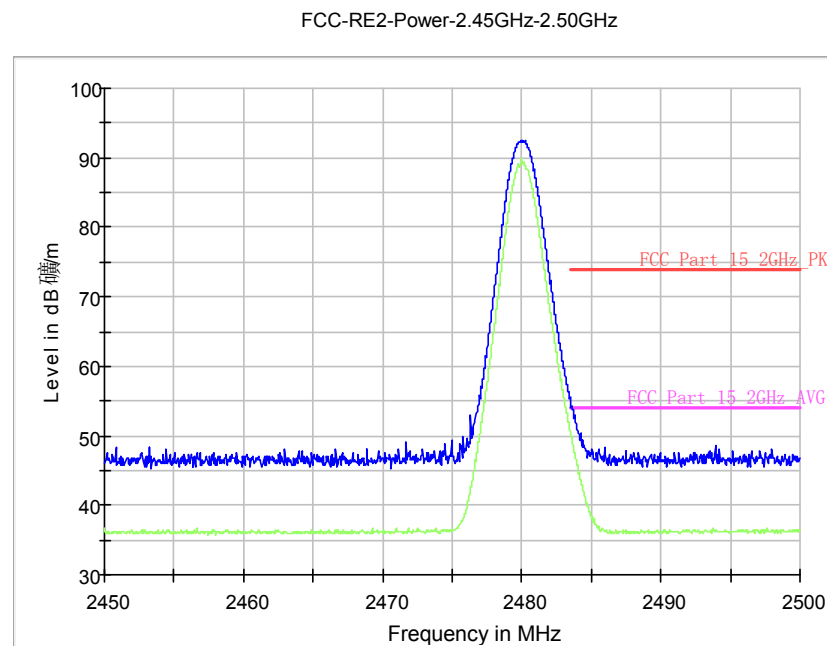


Fig. 14 Radiated Emission Power ($\pi/4$ DQPSK, Ch78, 2450GHz~2500GHz)

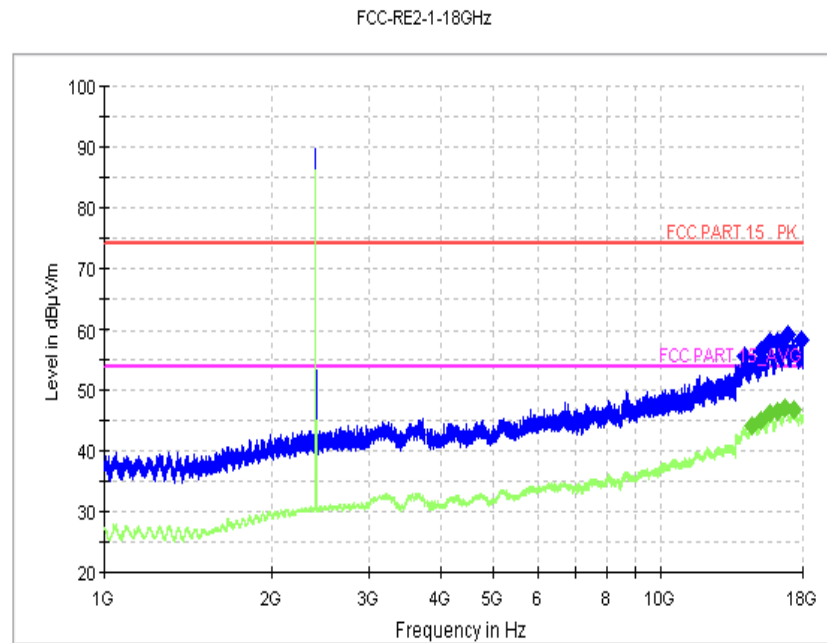


Fig. 15 Radiated Spurious Emission (8DPSK, Ch0, 1 GHz ~18 GHz)

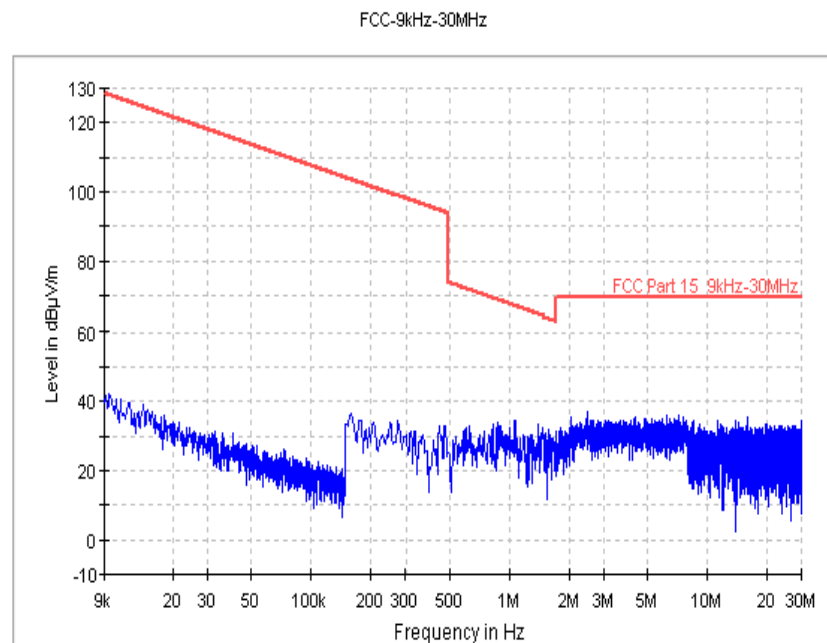


Fig. 16 Radiated Spurious Emission (8DPSK, Ch39, 9 kHz ~30 MHz)

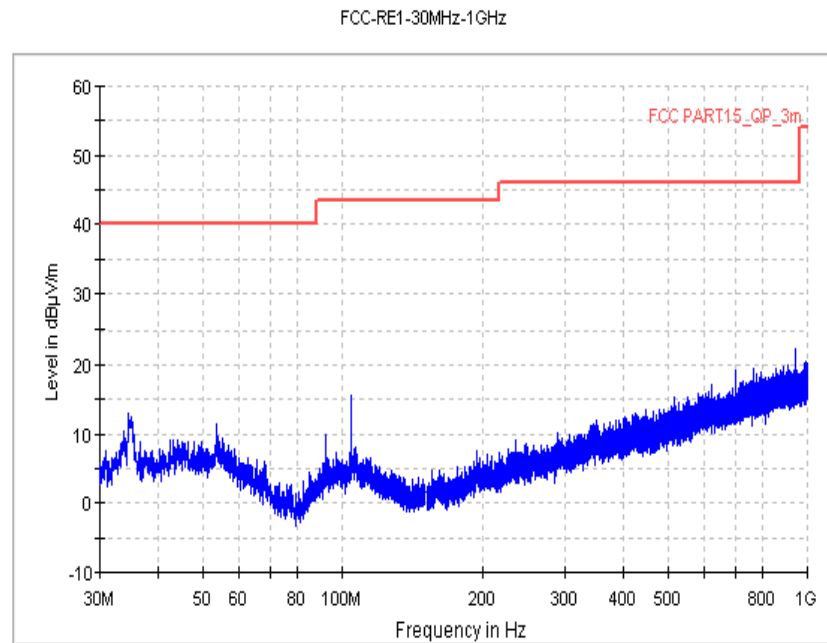


Fig. 17 Radiated Spurious Emission (8DPSK, Ch39, 30 MHz ~1 GHz)

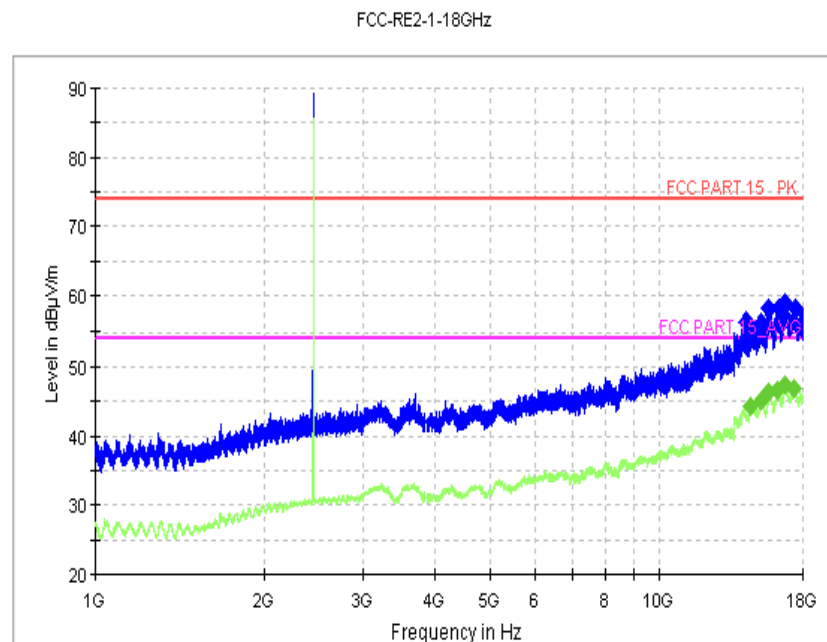


Fig. 18 Radiated Spurious Emission (8DPSK, Ch39, 1 GHz ~18 GHz)

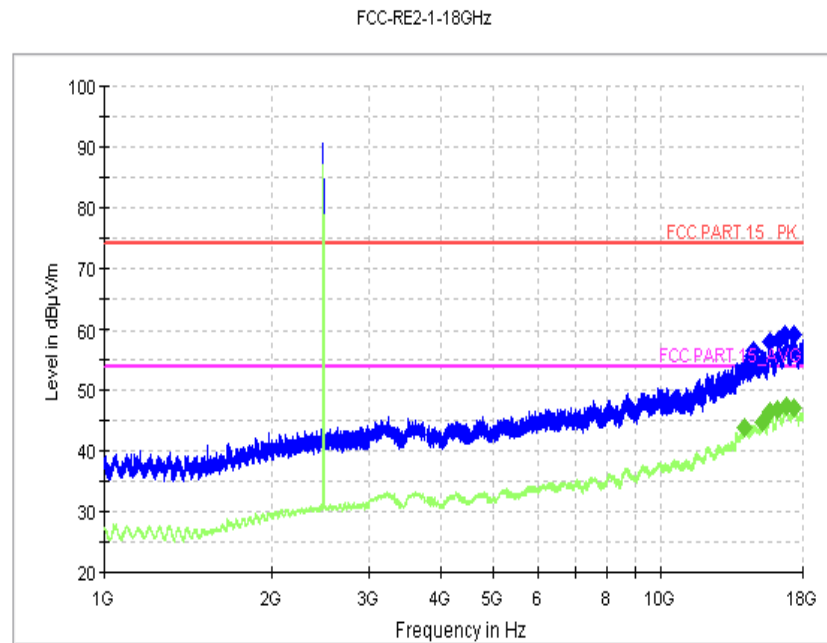


Fig. 19 Radiated Spurious Emission (8DPSK, Ch78, 1 GHz ~18 GHz)

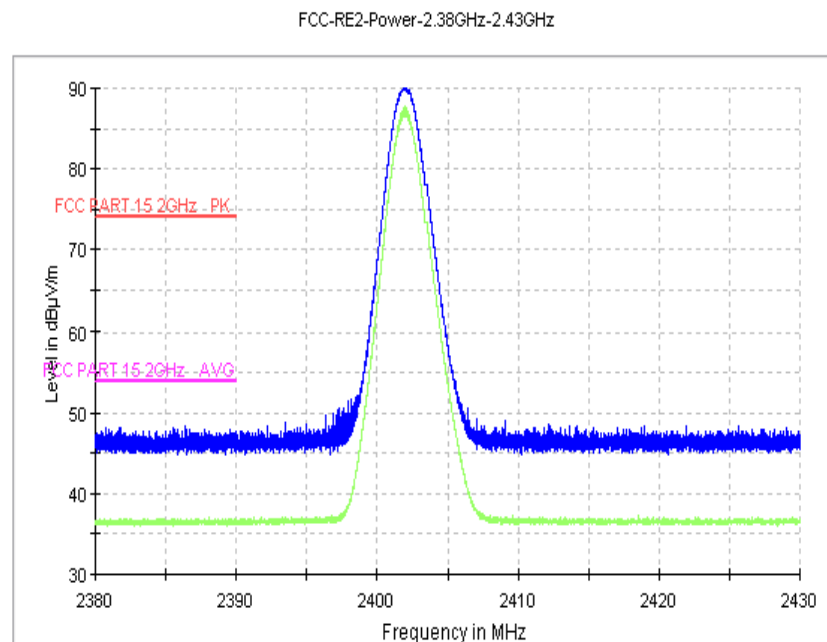


Fig. 20 Radiated Emission Power (8DPSK, Ch0, 2380GHz~2450GHz)

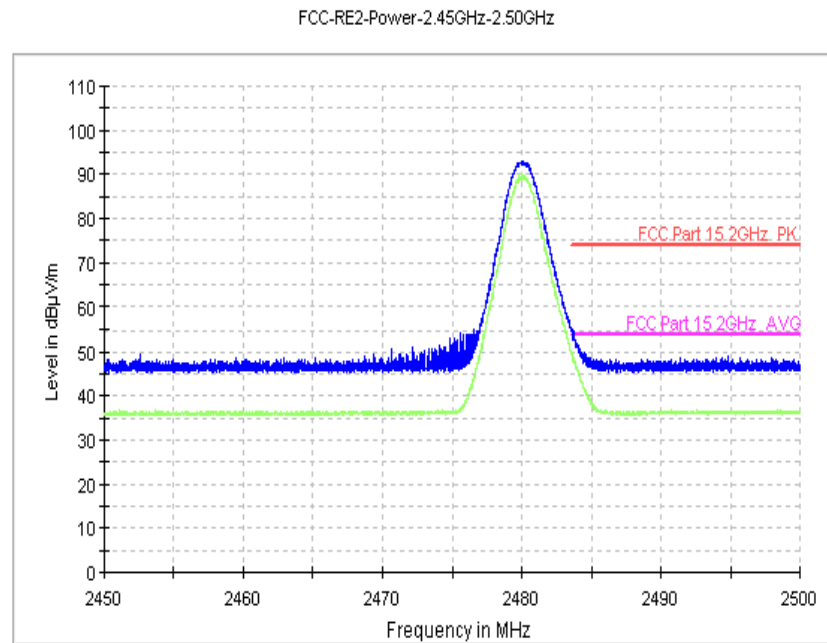


Fig. 21 Radiated Emission Power (8DPSK, Ch78, 2450GHz~2500GHz)

Test Report

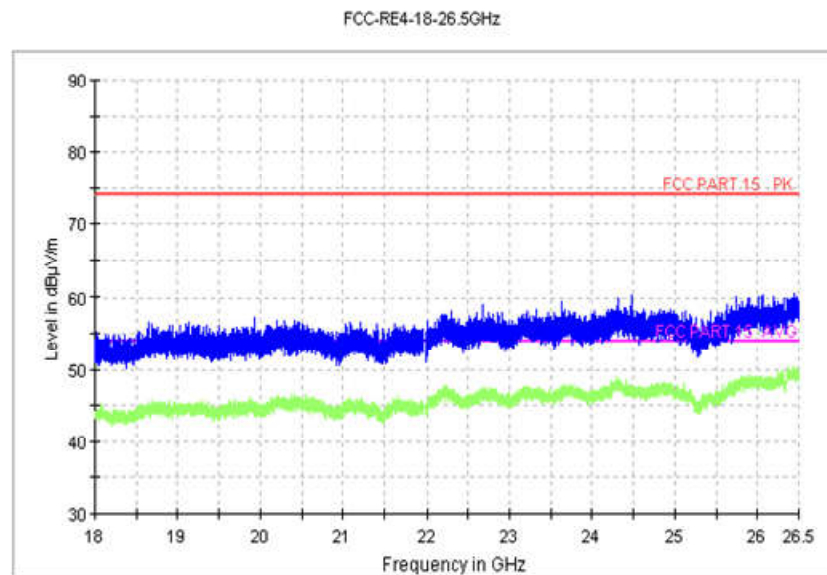


Fig. 22 Radiated Spurious Emission (All channel, 18 GHz ~26.5 GHz)

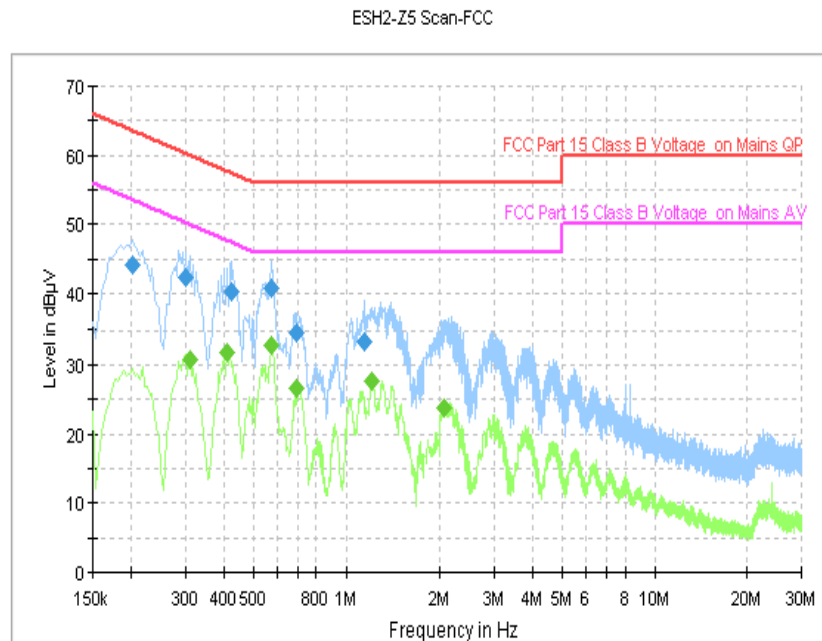


Fig. 23 AC Powerline Conducted Emission (Traffic, AE1)

MEASUREMENT RESULT: " QuasiPeak "

Frequency (MHz)	QuasiPeak (dBuV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.202000	44.3	GND	L1	9.8	19.2	63.5
0.302000	42.3	GND	L1	9.8	17.9	60.2
0.422000	40.2	GND	L1	9.8	17.2	57.4
0.574000	40.8	GND	L1	9.8	15.2	56.0
0.694000	34.7	GND	L1	9.8	21.3	56.0
1.146000	33.3	GND	L1	9.8	22.7	56.0

MEASUREMENT RESULT: " Average "

Frequency (MHz)	Average (dBuV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.310000	30.8	GND	L1	9.8	19.2	50.0
0.410000	31.7	GND	L1	9.8	16.0	47.6
0.570000	32.8	GND	L1	9.8	13.2	46.0
0.694000	26.6	GND	L1	9.8	19.4	46.0
1.214000	27.5	GND	L1	9.8	18.5	46.0
2.058000	23.9	GND	L1	9.8	22.1	46.0

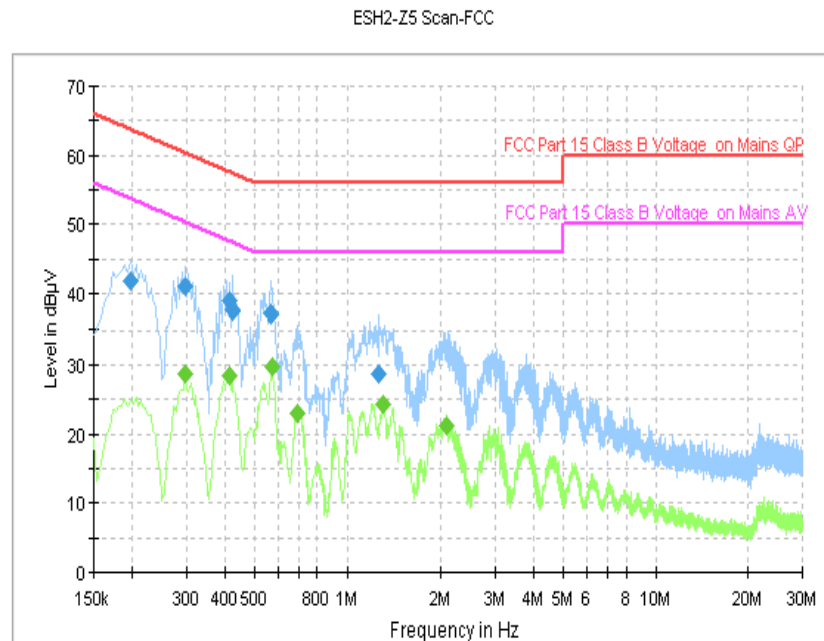


Fig. 24 AC Power line Conducted Emission (Idle, AE1)

MEASUREMENT RESULT: " QuasiPeak "

Frequency (MHz)	QuasiPeak (dBuV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.198000	42.0	GND	L1	9.8	21.7	63.7
0.298000	41.1	GND	L1	9.8	19.2	60.3
0.414000	38.9	GND	N	9.7	18.7	57.6
0.422000	37.8	GND	L1	9.8	19.6	57.4
0.566000	37.1	GND	N	9.7	18.9	56.0
1.270000	28.7	GND	N	9.6	27.3	56.0

MEASUREMENT RESULT: " Average "

Frequency (MHz)	Average (dBuV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.298000	28.6	GND	L1	9.8	21.7	50.3
0.414000	28.3	GND	L1	9.8	19.3	47.6
0.570000	29.8	GND	L1	9.8	16.2	46.0
0.690000	23.1	GND	L1	9.8	22.9	46.0
1.306000	24.2	GND	L1	9.8	21.8	46.0
2.078000	21.2	GND	L1	9.8	24.8	46.0

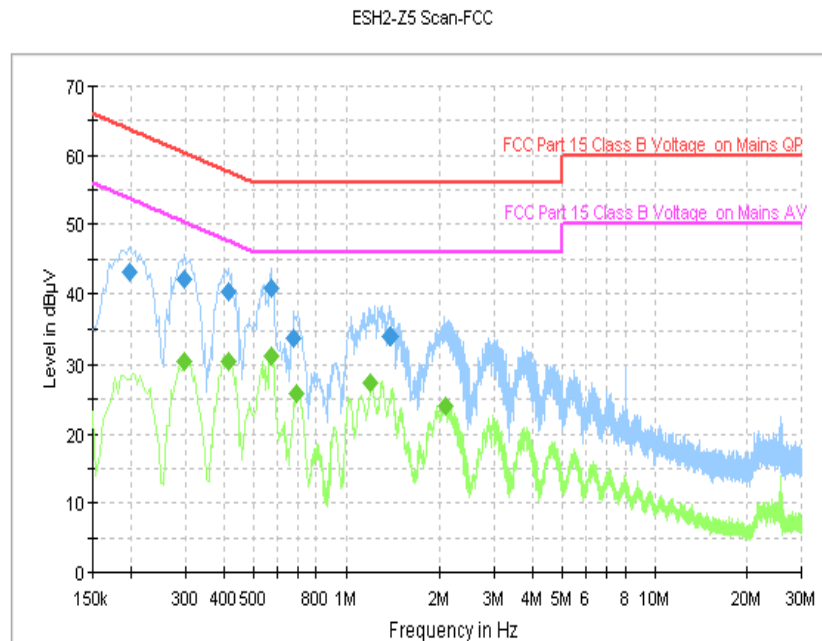


Fig. 25 AC Powerline Conducted Emission (Traffic, AE1)

MEASUREMENT RESULT: " QuasiPeak "

Frequency (MHz)	QuasiPeak (dBuV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.198000	43.2	GND	L1	9.8	20.5	63.7
0.298000	42.2	GND	L1	9.8	18.1	60.3
0.414000	40.4	GND	L1	9.8	17.2	57.6
0.570000	40.9	GND	L1	9.8	15.1	56.0
0.678000	33.9	GND	L1	9.8	22.1	56.0
1.390000	34.0	GND	L1	9.8	22.0	56.0

MEASUREMENT RESULT: " Average "

Frequency (MHz)	Average (dBuV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.298000	30.6	GND	L1	9.8	19.7	50.3
0.414000	30.6	GND	L1	9.8	17.0	47.6
0.574000	31.2	GND	L1	9.8	14.8	46.0
0.690000	25.9	GND	L1	9.8	20.1	46.0
1.206000	27.4	GND	L1	9.8	18.6	46.0
2.078000	24.1	GND	L1	9.8	21.9	46.0

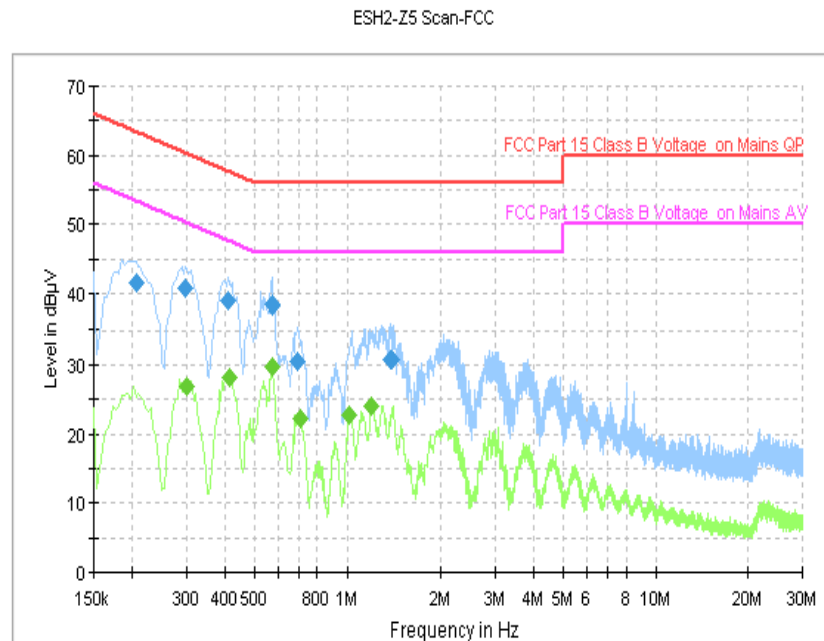


Fig. 26 AC Power line Conducted Emission (Idle, AE1)

MEASUREMENT RESULT: " QuasiPeak "

Frequency (MHz)	QuasiPeak (dBuV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.206000	41.7	GND	N	9.6	21.7	63.4
0.298000	40.8	GND	N	9.6	19.5	60.3
0.410000	38.9	GND	N	9.7	18.8	57.6
0.570000	38.4	GND	L1	9.8	17.6	56.0
0.694000	30.5	GND	N	9.5	25.5	56.0
1.386000	30.8	GND	L1	9.8	25.2	56.0

MEASUREMENT RESULT: " Average "

Frequency (MHz)	Average (dBuV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.302000	26.8	GND	L1	9.8	23.4	50.2
0.414000	28.3	GND	L1	9.8	19.3	47.6
0.570000	29.7	GND	L1	9.8	16.3	46.0
0.706000	22.3	GND	L1	9.8	23.7	46.0
1.022000	22.7	GND	L1	9.8	23.3	46.0
1.206000	24.0	GND	L1	9.8	22.0	46.0

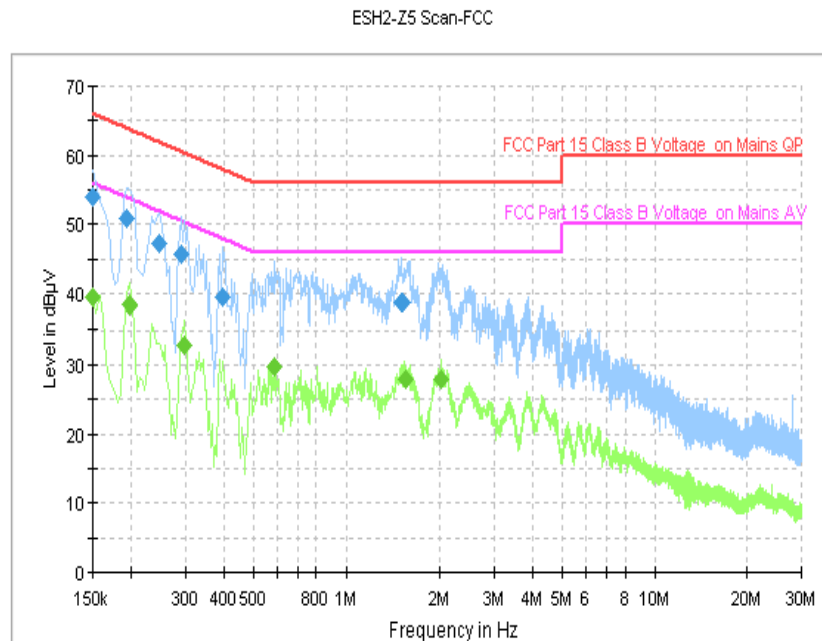


Fig. 27 AC Powerline Conducted Emission (Traffic, AE2)

MEASUREMENT RESULT: " QuasiPeak "

Frequency (MHz)	QuasiPeak (dBuV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	53.9	GND	N	9.6	12.1	66.0
0.194000	50.9	GND	L1	9.8	13.0	63.9
0.246000	47.3	GND	N	9.6	14.6	61.9
0.290000	45.7	GND	L1	9.8	14.9	60.5
0.398000	39.5	GND	L1	9.8	18.4	57.9
1.506000	38.7	GND	L1	9.8	17.3	56.0

MEASUREMENT RESULT: " Average "

Frequency (MHz)	Average (dBuV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	39.4	GND	N	9.6	16.6	56.0
0.198000	38.4	GND	L1	9.8	15.3	53.7
0.298000	32.7	GND	L1	9.8	17.6	50.3
0.582000	29.8	GND	L1	9.8	16.2	46.0
1.554000	27.8	GND	L1	9.8	18.2	46.0
2.026000	27.8	GND	L1	9.8	18.2	46.0

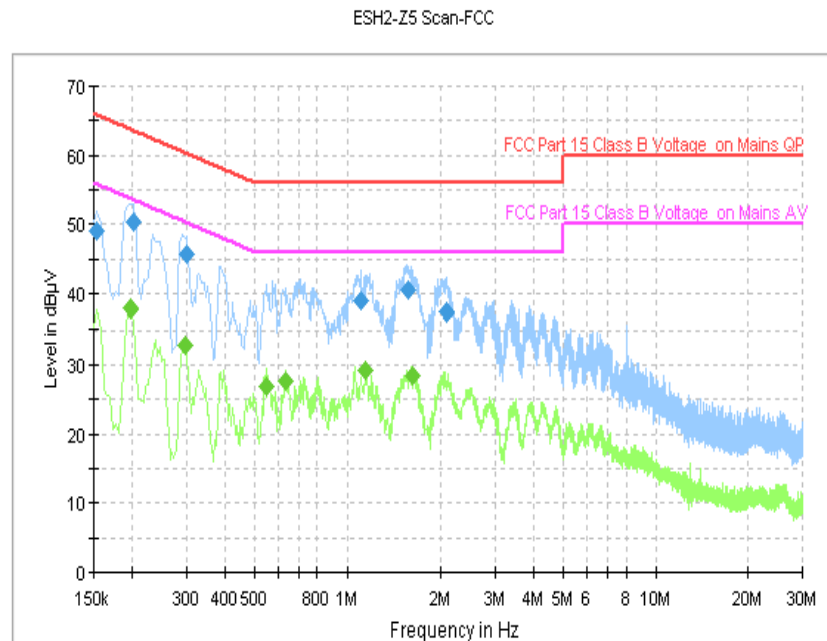


Fig. 28 AC Power line Conducted Emission (Idle, AE2)

MEASUREMENT RESULT: " QuasiPeak "

Frequency (MHz)	QuasiPeak (dBuV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.154000	49.1	GND	N	9.6	16.7	65.8
0.202000	50.3	GND	L1	9.8	13.2	63.5
0.302000	45.7	GND	N	9.6	14.5	60.2
1.110000	38.9	GND	L1	9.8	17.1	56.0
1.566000	40.5	GND	L1	9.8	15.5	56.0
2.082000	37.4	GND	L1	9.8	18.6	56.0

MEASUREMENT RESULT: " Average "

Frequency (MHz)	Average (dBuV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.198000	38.1	GND	L1	9.8	15.6	53.7
0.298000	32.9	GND	L1	9.8	17.4	50.3
0.546000	26.9	GND	L1	9.8	19.1	46.0
0.630000	27.6	GND	L1	9.8	18.4	46.0
1.150000	29.2	GND	L1	9.8	16.8	46.0
1.614000	28.5	GND	L1	9.8	17.5	46.0

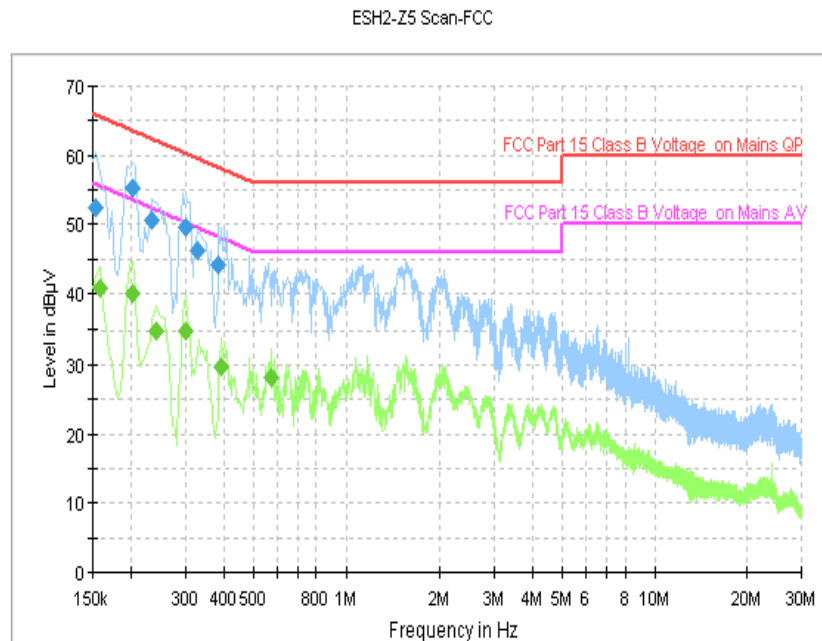


Fig. 29 AC Powerline Conducted Emission (Traffic, AE2)

MEASUREMENT RESULT: " QuasiPeak "

Frequency (MHz)	QuasiPeak (dBuV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.154000	52.5	GND	L1	9.7	13.2	65.8
0.202000	55.2	GND	L1	9.8	8.3	63.5
0.234000	50.7	GND	L1	9.8	11.6	62.3
0.302000	49.7	GND	L1	9.8	10.5	60.2
0.330000	46.1	GND	N	9.6	13.3	59.5
0.386000	44.3	GND	N	9.6	13.9	58.1

MEASUREMENT RESULT: " Average "

Frequency (MHz)	Average (dBuV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.158000	40.8	GND	L1	9.7	14.8	55.6
0.202000	40.0	GND	L1	9.8	13.5	53.5
0.242000	35.0	GND	L1	9.8	17.0	52.0
0.302000	35.0	GND	L1	9.8	15.2	50.2
0.394000	29.8	GND	L1	9.8	18.2	48.0
0.570000	28.1	GND	L1	9.8	17.9	46.0

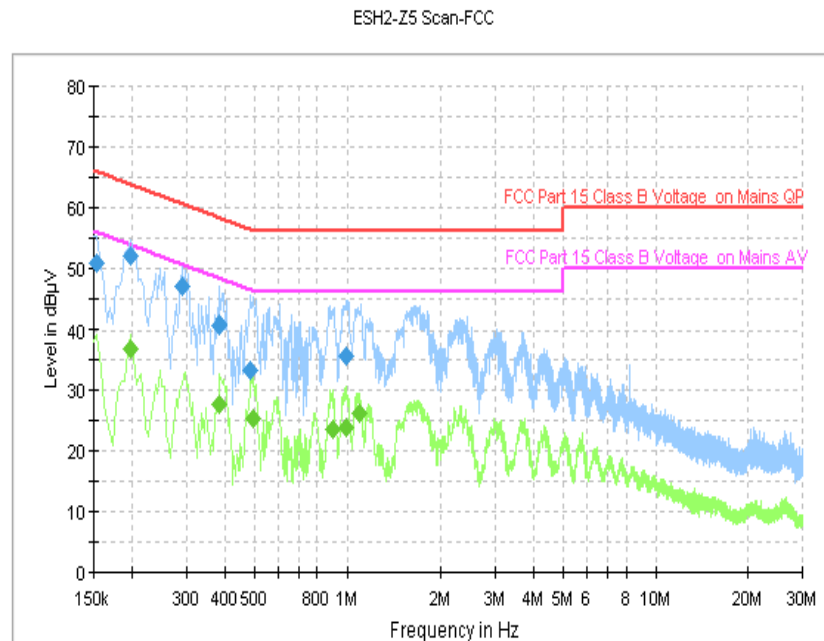


Fig. 30 AC Power line Conducted Emission (Idle, AE2)

MEASUREMENT RESULT: " QuasiPeak "

Frequency (MHz)	QuasiPeak (dBuV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.154000	50.8	GND	N	9.6	15.0	65.8
0.198000	51.9	GND	N	9.6	11.8	63.7
0.290000	47.0	GND	N	9.6	13.5	60.5
0.386000	40.8	GND	L1	9.8	17.4	58.1
0.486000	33.4	GND	L1	9.8	22.8	56.2
0.998000	35.6	GND	L1	9.8	20.4	56.0

MEASUREMENT RESULT: " Average "

Frequency (MHz)	Average (dBuV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.198000	36.8	GND	N	9.6	16.9	53.7
0.386000	27.8	GND	L1	9.8	20.4	48.1
0.498000	25.5	GND	L1	9.8	20.5	46.0
0.898000	23.5	GND	L1	9.8	22.5	46.0
0.998000	23.8	GND	L1	9.8	22.2	46.0
1.098000	26.2	GND	L1	9.8	19.8	46.0

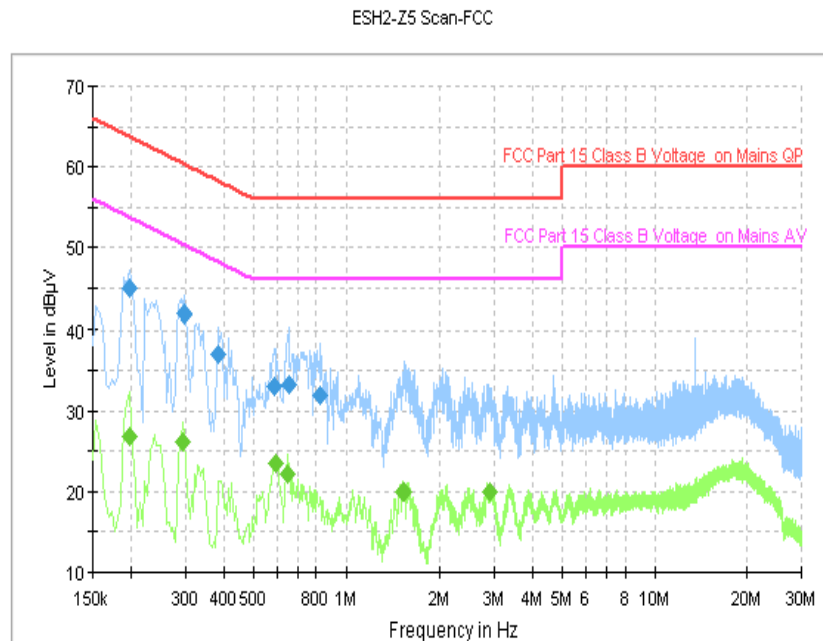


Fig. 31 AC Powerline Conducted Emission (Traffic, AE3)

MEASUREMENT RESULT: " QuasiPeak "

Frequency (MHz)	QuasiPeak (dBuV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.198000	45.0	GND	N	9.6	18.7	63.7
0.298000	41.9	GND	N	9.6	18.4	60.3
0.382000	37.0	GND	N	9.6	21.3	58.2
0.586000	33.0	GND	L1	9.8	23.0	56.0
0.650000	33.3	GND	N	9.6	22.7	56.0
0.826000	31.9	GND	N	9.5	24.1	56.0

MEASUREMENT RESULT: " Average "

Frequency (MHz)	Average (dBuV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.198000	26.8	GND	N	9.6	26.9	53.7
0.294000	26.2	GND	L1	9.8	24.2	50.4
0.590000	23.4	GND	L1	9.8	22.6	46.0
0.646000	22.3	GND	L1	9.8	23.7	46.0
1.526000	19.9	GND	L1	9.8	26.1	46.0
2.906000	19.9	GND	L1	9.8	26.1	46.0

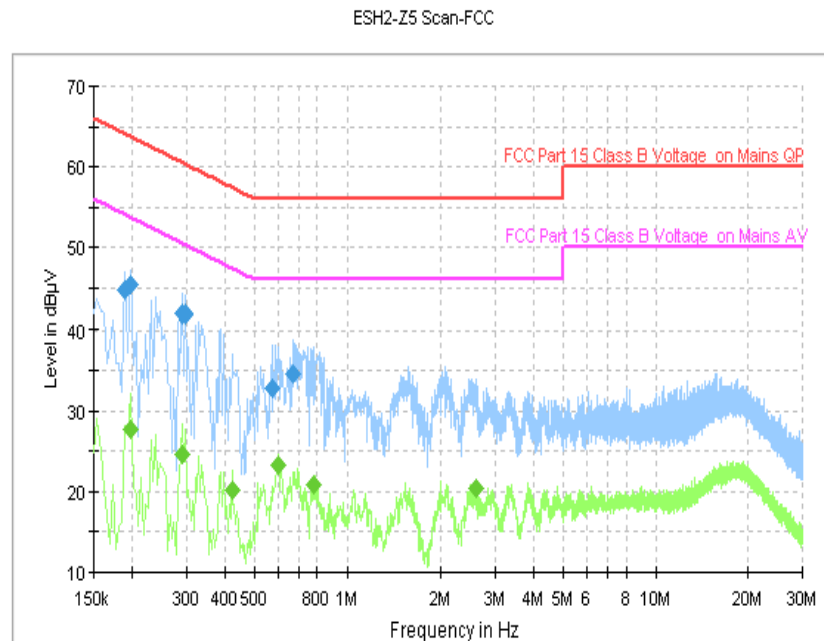


Fig. 32 AC Power line Conducted Emission (Idle, AE3)

MEASUREMENT RESULT: " QuasiPeak "

Frequency (MHz)	QuasiPeak (dBuV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.190000	44.8	GND	N	9.6	19.3	64.0
0.198000	45.4	GND	N	9.6	18.3	63.7
0.290000	42.0	GND	N	9.6	18.6	60.5
0.298000	41.9	GND	N	9.6	18.4	60.3
0.574000	32.8	GND	N	9.7	23.2	56.0
0.666000	34.6	GND	L1	9.8	21.4	56.0

MEASUREMENT RESULT: " Average "

Frequency (MHz)	Average (dBuV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.198000	27.8	GND	N	9.6	25.9	53.7
0.290000	24.6	GND	N	9.6	26.0	50.5
0.422000	20.3	GND	L1	9.8	27.1	47.4
0.598000	23.2	GND	L1	9.8	22.8	46.0
0.782000	20.9	GND	L1	9.8	25.1	46.0
2.590000	20.3	GND	L1	9.8	25.7	46.0

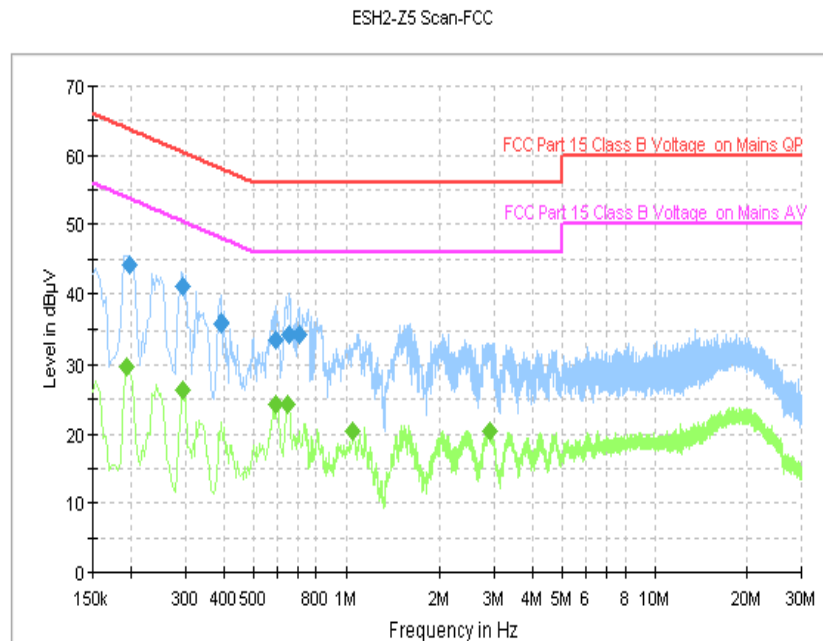


Fig. 33 AC Powerline Conducted Emission (Traffic, AE3)

MEASUREMENT RESULT: " QuasiPeak "

Frequency (MHz)	QuasiPeak (dBuV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.198000	44.2	GND	N	9.6	19.4	63.7
0.294000	41.0	GND	N	9.6	19.5	60.4
0.394000	35.8	GND	N	9.6	22.2	58.0
0.594000	33.5	GND	N	9.6	22.5	56.0
0.654000	34.4	GND	L1	9.8	21.6	56.0
0.702000	34.4	GND	L1	9.8	21.6	56.0

MEASUREMENT RESULT: " Average "

Frequency (MHz)	Average (dBuV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.194000	29.7	GND	L1	9.8	24.2	53.9
0.294000	26.4	GND	L1	9.8	24.0	50.4
0.594000	24.2	GND	L1	9.8	21.8	46.0
0.646000	24.4	GND	L1	9.8	21.6	46.0
1.054000	20.4	GND	L1	9.8	25.6	46.0
2.914000	20.5	GND	L1	9.8	25.5	46.0

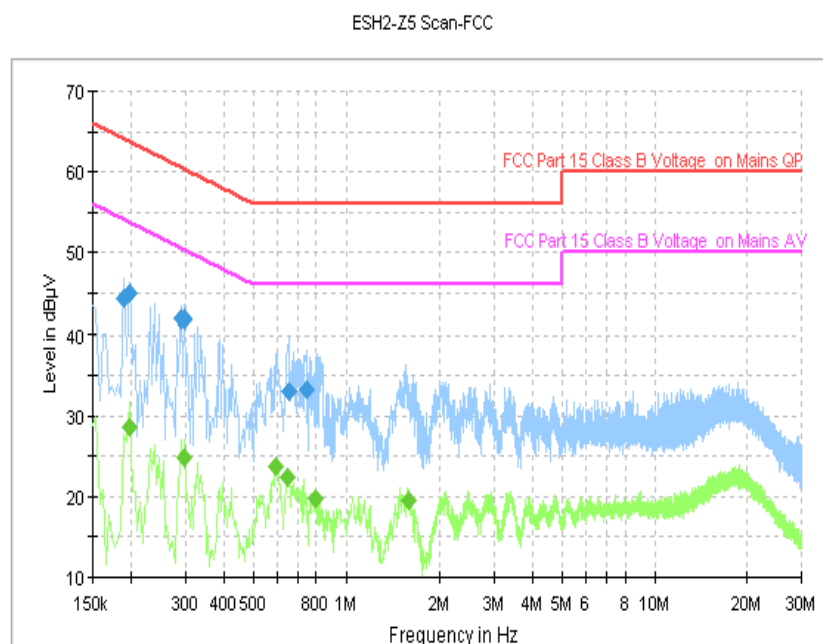


Fig. 34 AC Power line Conducted Emission (Idle, AE3)

MEASUREMENT RESULT: " QuasiPeak "

Frequency (MHz)	QuasiPeak (dBuV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.190000	44.3	GND	N	9.6	19.7	64.0
0.198000	45.0	GND	N	9.6	18.6	63.7
0.290000	41.9	GND	N	9.6	18.6	60.5
0.298000	41.8	GND	N	9.6	18.5	60.3
0.650000	33.0	GND	N	9.6	23.0	56.0
0.742000	33.2	GND	L1	9.8	22.8	56.0

MEASUREMENT RESULT: " Average "

Frequency (MHz)	Average (dBuV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.198000	28.7	GND	L1	9.8	25.0	53.7
0.298000	24.8	GND	L1	9.8	25.5	50.3
0.590000	23.8	GND	L1	9.8	22.2	46.0
0.646000	22.3	GND	L1	9.8	23.7	46.0
0.798000	19.8	GND	L1	9.8	26.2	46.0
1.586000	19.6	GND	L1	9.8	26.4	46.0

ANNEX C: Persons involved in this testing

Test Name	Tester
Radiated Spurious Emission	An Ran, Tang Weisheng
AC Powerline Conducted Emission	An Ran, Tang Weisheng

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