



# TEST REPORT

No. 2011TAR277

for

**ZTE Corporation**

**WCDMA/GSM (GPRS) Dual-Mode Digital Mobile Phone**

**Model Name: ZTE E821S**

**FCC ID : Q78-E821S**

with

**Hardware Version: w5dA**

**Software Version: ZTE\_VV\_E821S\_V1.0**

**Issued Date: 2011-07-06**

**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 TMC Beijing.

**Test Laboratory:**

***DAR accreditation (DIN EN ISO/IEC 17025): No. DGA-PL-114/01-02***

***FCC 2.948 Listed: No.733176***

***IC O.A.T.S listed: No.6629A-1***

TMC Beijing, Telecommunication Metrology Center of Ministry of Industry and Information Technology

No. 52, Huayuan Bei Road, Haidian District, Beijing, P. R. China 100191

Tel:+86(0)10-62304633 , Fax:+86(0)10-62304633 Email:welcome@emcite.com. www.emcite.com

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## **1. Test Laboratory**

### **1.1. Testing Location**

Company Name: TMC Beijing, Telecommunication Metrology Center of MIIT  
Address: No 52, Huayuan beilu, Haidian District, Beijing, P. R. China  
Postal Code: 100191  
Telephone: 00861062304633  
Fax: 00861062304633

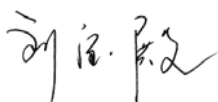
### **1.2. Testing Environment**

Normal Temperature: 15-35℃  
Relative Humidity: 20-75%

### **1.3. Project data**

Testing Start Date: May 27, 2011  
Testing End Date: Jun 10, 2011


### **1.4. Signature**



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**Liu Baodian**

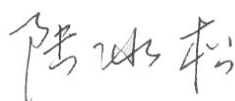
**(Prepared this test report)**



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**Sun Xiangqian**

**(Reviewed this test report)**



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**Lu Bingsong**

**Deputy Director of the laboratory**  
**(Approved this test report)**

## **2. Client Information**

### **2.1. Applicant Information**

Company Name: ZTE Corporation  
Address /Post: #68 Zijin Hua Road, Nanjing, Jiangsu Province, P. R. China  
City: Nan Jing  
Postal Code: 210012  
Country: China  
Telephone: +86-25-52878232  
Fax: +86-25-68897541

### **2.2. Manufacturer Information**

Company Name: ZTE Corporation  
Address /Post: #68 Zijin Hua Road, Nanjing, Jiangsu Province, P. R. China  
City: Nan Jing  
Postal Code: 210012  
Country: China  
Telephone: +86-25-52878232  
Fax: +86-25-68897541

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

#### 3.1. About EUT

Description	WCDMA/GSM (GPRS) Dual-Mode Digital Mobile Phone
Model Name	ZTE E821S
FCC ID	Q78-E821S
Extreme vol. Limits	3.5VDC to 4.2VDC (nominal: 3.7VDC)

Note: Components list, please refer to documents of the manufacturer; it is also included in the original test record of Telecommunication Metrology Center of MII of People's Republic of China.

#### 3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
EUT1	868884000000768	w5dA	ZTE_VV_E821S_V1.0

\*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	SN
AE1	Travel Adapter	/
AE2	Battery	/
AE3	USB Cable	/

##### AE1

Model	STC-A22O50I700USBA-Z
Manufacturer	RUIDE
Length of DC line	/

##### AE2

Model	Li3709T42P3h483757-H
Manufacturer	ZTE
Capacitance	900mAh
Nominal Voltage	3.7V

##### AE3

Model	/
Manufacturer	ZTE
Length of DC line	120cm

\*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.

<b>Reference</b>	<b>Title</b>	<b>Version</b>
FCC Part 15, Subpart B	Radio frequency devices	July 10, 2008 Edition
ANSI C63.4	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2003

## 5. LABORATORY ENVIRONMENT

**Semi-anechoic chamber** (23 meters×17meters×10meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω
Normalised site attenuation (NSA)	< ±3.2 dB, 10 m distance, from 30 to 1000 MHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 2000 MHz

**Control room** did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. =30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω

**Conducted chamber** did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω

**Fully-anechoic chamber** (6.8 meters×3.08 meters×3.53 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω
Uniformity of field strength	Between 0 and 6 dB, from 80 to 2000 MHz

## 6. SUMMARY OF TEST RESULTS

Abbreviations used in this clause:	
P	Pass
NA	Not applicable
F	Fail

Clause	List	Clause in FCC rules	Verdict
1	Radiated Emission	15.109(a)	P
2	Conducted Emission	15.107(a)	P



## 7. Test Equipments Utilized

NO.	Description	TYPE	SERIES NUMBER	MANUFACTURE	CAL DUE DATE
1	Test Receiver	ESCI	100344	R&S	2012-03-12
2	Test Receiver	ESCI	100766	R&S	2011-12-06
3	Test Receiver	ESI40	831564/002	R&S	2012-02-12
4	BiLog Antenna	VUL9163	9163-302	Schwarzbeck	2012-02-10
5	Signal Generator	SMB100A	102063	R&S	2012-03-05
6	LISN	ESH2-Z5	829991/012	R&S	2012-04-20
7	Universal Radio Communication Tester	CMU200	100680	R&S	2011-09-05
8	Dual-Ridge Waveguide Horn Antenna	3115	6914	EMCO	2012-01-18
9	PC	OPTIPLEX 755	3908243625	DELL	N/A
10	Monitor	E178FPc	CN-OWR979-64 180-7AJ-D2MS	DELL	N/A
11	Printer	DeskJet D2368	TH72E12G7Q	HP	N/A
12	Keyboard	L100	CN0RH6596589 07ATOI40	DELL	N/A
13	Mouse	VR-301	6927225500198	XINGYU	N/A

## **ANNEX A: MEASUREMENT RESULTS**

### **A.1 Radiated Emission (§15.109(a))**

#### **A.1.1 Method of measurement**

The field strength of radiated emissions from the unintentional radiator (USB mode of MS and charging mode of MS) at a distance of 3 meters is tested. Tested in accordance with the procedures of ANSI C63.4 - 2003, section 8.3.

#### **A.1.2 EUT Operating Mode:**

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. The MS is operating in the USB mode and charging mode. During the test MS is connected to a PC via a USB cable in the case of USB mode and is connected to a charger in the case of charging mode. The model of the PC is DELL OPTIPLEX 755, and the serial number of the PC is 3908243625. The software is used to let the PC keep on copying data to MS, reading and erasing the data after copy action was finished.

#### **A.1.3 Measurement Limit**

Frequency of emission (MHz)	Field strength (microvolts/meter)
30-88	100
88-216	150
216-960	200
Above 960	500

#### **A.1.4 Test Condition**

Frequency of emission (MHz)	RBW/VBW	Sweep Time(s)
30-1000	100KHz/300KHz	5
1000-4000	1MHz/1MHz	15

### A.1.5 Measurement Results

A "reference path loss" is established and the  $A_{Rpl}$  is the attenuation of "reference path loss", and including the gain of receive antenna and the path loss.

The measurement results are obtained as described below:

$$\text{Result} = P_{\text{Mea}} + F_A + G_{\text{PL}}$$

Where

$F_A$ : Receive Antenna Factor

$G_{\text{PL}}$ : Cable Loss

$P_{\text{Mea}}$ : The measurement result on receiver.

### Charging Mode

Frequency(MHz)	Result(dBuV/m)	$G_{\text{PL}}$ (dB)	$F_A$ (dB/m)	$P_{\text{Mea}}$ (dBuV)	Polarity
3927.856	50.58	-19.8	33.4	36.98	HORIZONTAL
3695.391	50.4	-19.5	33.4	36.5	VERTICAL
3965.932	50.4	-19.6	33.4	36.6	HORIZONTAL
3282.565	50.12	-19.7	31.2	38.62	HORIZONTAL
3408.818	50.06	-19.6	31.2	38.46	VERTICAL
3490.982	50.03	-19.7	31.2	38.53	HORIZONTAL

### USB Mode

Frequency(MHz)	Result(dBuV/m)	$G_{\text{PL}}$ (dB)	$F_A$ (dB/m)	$P_{\text{mea}}$ (dBuV)	Polarity
3657.315	50.38	-19.7	33.4	36.68	HORIZONTAL
3591.182	50.32	-19.6	33.4	36.52	HORIZONTAL
3709.419	50.22	-19.4	33.4	36.22	VERTICAL
2246.493	50.13	-19.6	27.5	42.23	HORIZONTAL
3753.507	50.09	-19.7	33.4	36.39	VERTICAL
3515.03	50.06	-19.6	33.4	36.26	VERTICAL

### Charging Mode

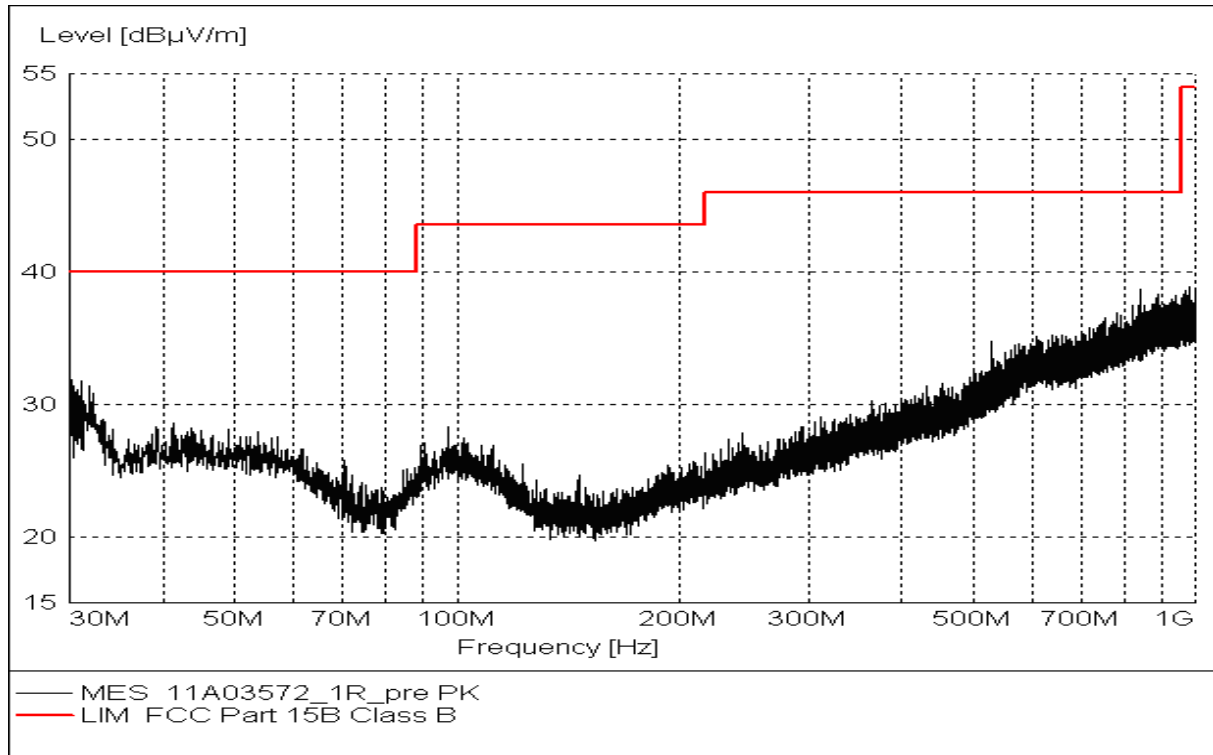


Figure A.1 Radiated Emission from 30MHz to 1GHz

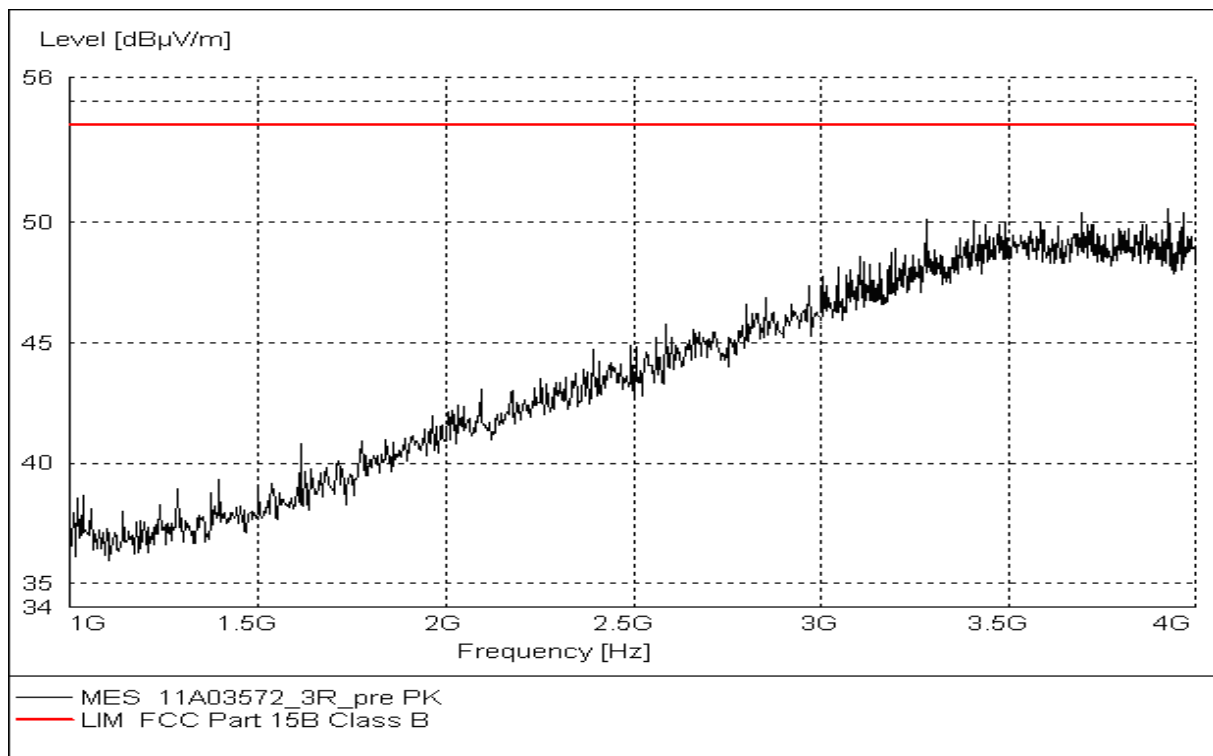


Figure A.2 Radiated Emission from 1GHz to 4GHz

## USB Mode

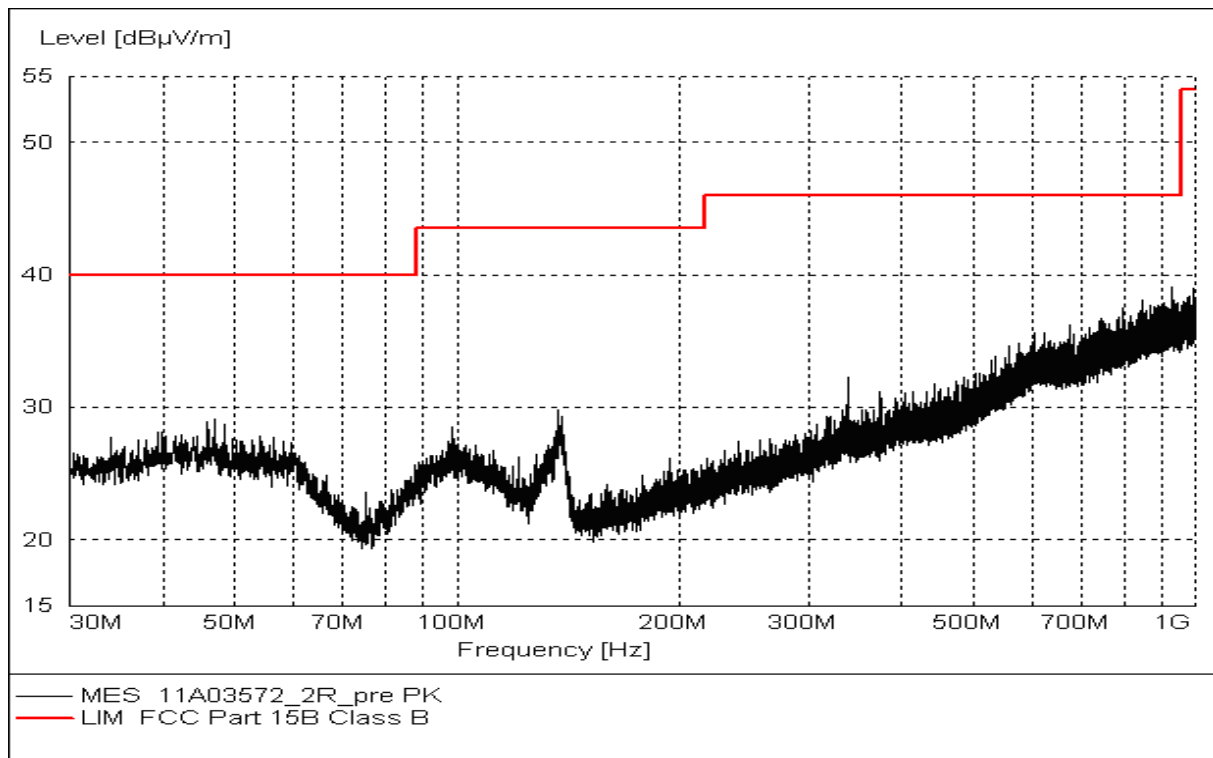


Figure A.3 Radiated Emission from 30MHz to 1GHz

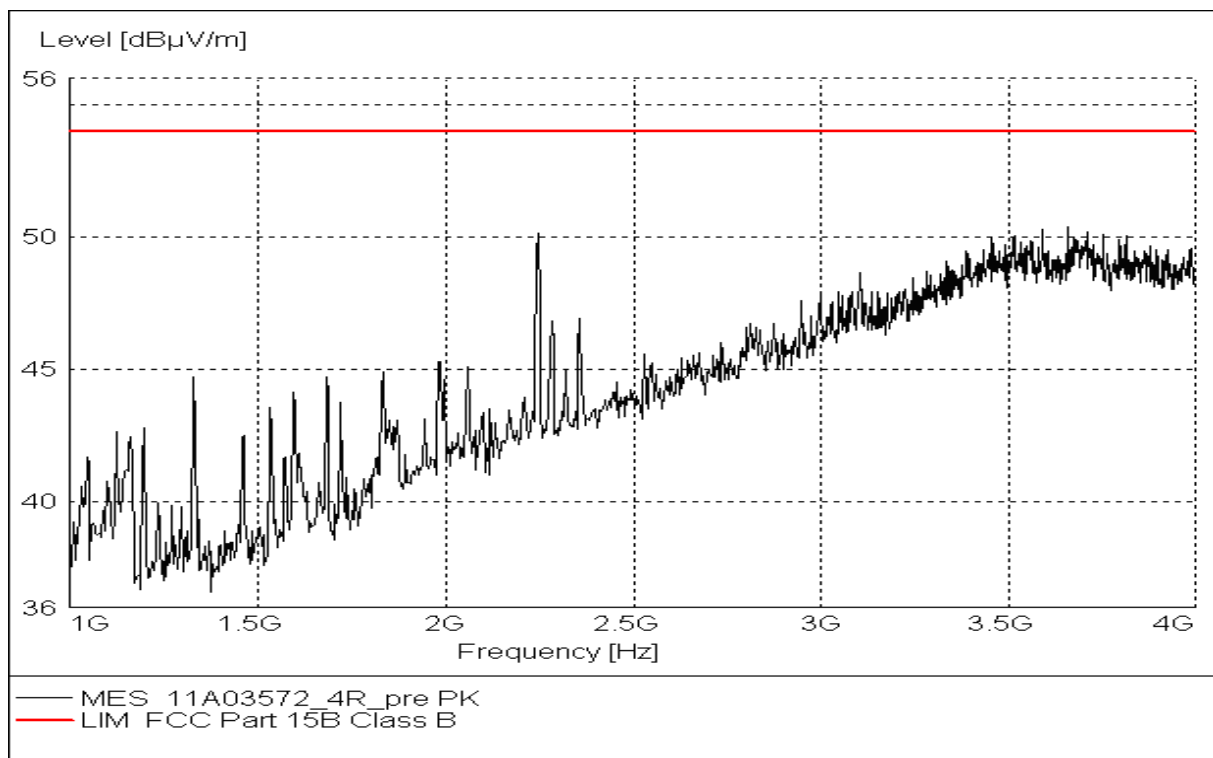


Figure A.4 Radiated Emission from 1GHz to 4GHz

## A.2 Conducted Emission (§15.107(a))

### A.2.1 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 within the band 150 kHz to 30 MHz shall not exceed the limits. Tested in accordance with the procedures of ANSI C63.4 - 2003, section 7.2.

### A.2.2 EUT Operating Mode:

The MS is operating in the USB mode and charging mode. During the test MS is connected to a PC via a USB cable in the case of USB mode and is connected to a charger in the case of charging mode. The model of the PC is DELL OPTIPLEX 755, and the serial number of the PC is 3908243625. The software is used to let the PC keep on copying data to MS, reading and erasing the data after copy action was finished.

### A.2.3 Measurement Limit

Frequency of emission (MHz)	Conducted limit (dBμV)	
	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		

### A.2.4 Test Condition in charging mode

Voltage (V)	Frequency (Hz)
120	60

RBW	Sweep Time(s)
9kHz	1

## A.2.4 Measurement Results

### Charging Mode

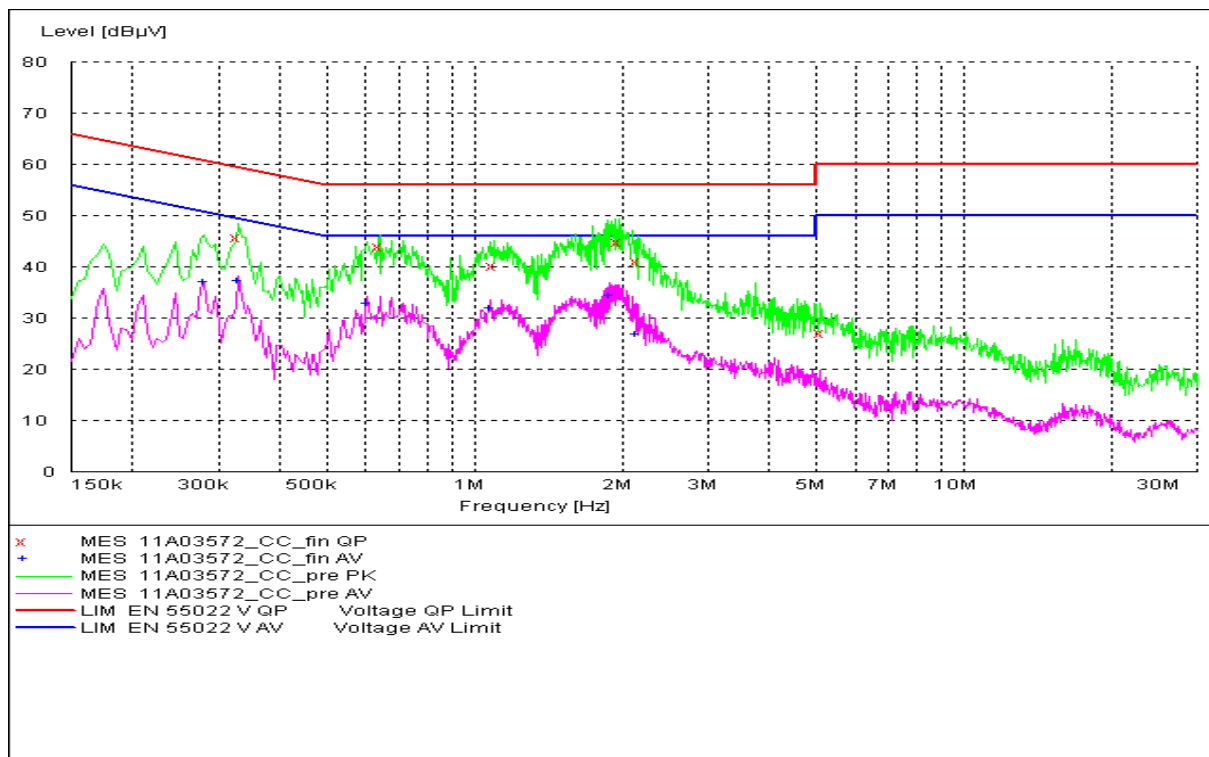


Figure A.5 Conducted Emission

#### MEASUREMENT RESULT: "11A03572\_CC\_fin QP"

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBμV	dB	dBμV	dB	/	/
0.330000	45.80	10.1	60	13.6	L1	GND
0.645000	43.90	10.1	56	12.1	L1	GND
1.095000	40.10	10.1	56	15.9	L1	GND
1.970000	44.90	10.1	56	11.1	L1	GND
2.166142	41.10	10.1	56	14.9	L1	GND
5.133525	27.00	10.2	60	33.0	L1	GND

#### MEASUREMENT RESULT: "11A03572\_CC\_fin AV"

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBμV	dB	dBμV	dB	/	/
0.280000	37.10	10.1	51	13.7	L1	GND
0.330000	37.20	10.1	50	12.2	L1	GND
0.605000	32.90	10.1	46	13.1	L1	GND
1.075000	32.00	10.1	46	14.0	L1	GND
1.890000	34.40	10.1	46	11.6	L1	GND
2.144642	26.80	10.1	46	19.2	N	GND

## USB Mode

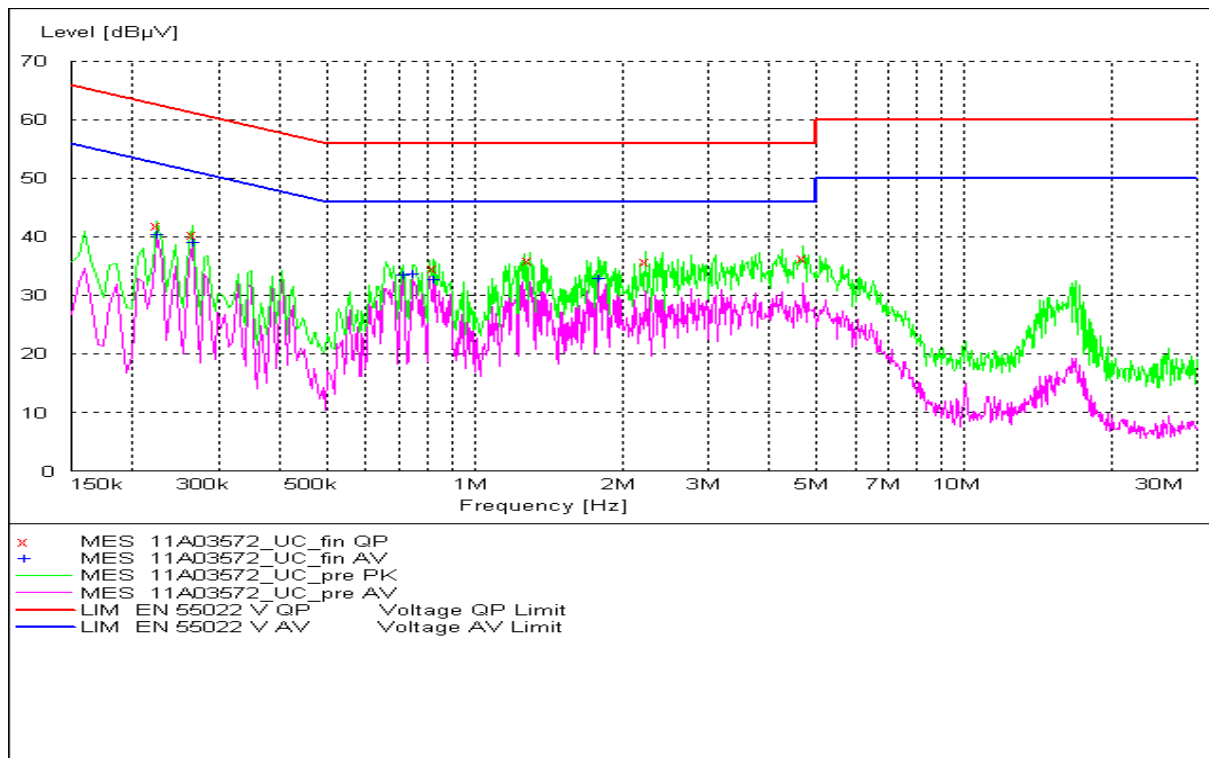


Figure A.6 Conducted Emission

### MEASUREMENT RESULT: "11A03572\_UC\_fin QP"

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBμV	dB	dBμV	dB	/	/
0.225000	41.90	10.1	63	20.7	N	GND
0.265000	40.50	10.1	61	20.8	N	GND
0.825000	34.60	10.1	56	21.4	L1	GND
1.295000	36.00	10.1	56	20.0	N	GND
2.243104	35.90	10.1	56	20.1	L1	GND
4.692741	36.30	10.2	56	19.7	N	GND

### MEASUREMENT RESULT: "11A03572\_UC\_fin AV"

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBμV	dB	dBμV	dB	/	/
0.225000	40.50	10.1	53	12.2	N	GND
0.265000	39.00	10.1	51	12.3	N	GND
0.715000	33.60	10.1	46	12.4	N	GND
0.750000	33.70	10.1	46	12.3	N	GND
0.825000	32.70	10.1	46	13.3	N	GND
1.795000	32.90	10.1	46	13.1	N	GND

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