



# TEST REPORT

## No. 2012EEB00456-EMC

for

**Cellon Communications Technology (Shenzhen) Co.,Ltd.**

**GSM QUAD BAND AND UMTS 850/1900**

**Model Name: C3560**

**Market Name: C3560, C3560CA, C3560EN,  
C3560CL, C3560PR, C3560CP**

**FCC ID: T38C3560**

**with**

**Hardware Version: A3560\_MB\_P1B**

**Software Version: A3560\_1.0\_Lab\_Test\_Only**

**Issued Date: 2012-11-13**

**Test Laboratory:**

**FCC 2.948 Listed: No.733176**

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

**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.

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## **1. Test Laboratory**

### **1.1. Testing Location**

Company Name: TMC Beijing, Telecommunication Metrology Center of MIIT  
Address: No 52 Hua Yuanbei Road, Haidian District, Beijing, P.R.China  
Postal Code: 100191  
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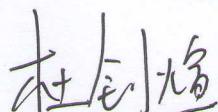
### **1.2. Testing Environment**

Normal Temperature: 15-35°C  
Relative Humidity: 20-75%

### **1.3. Project data**

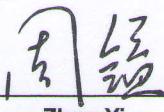
Project Leader: Zhou Yi  
Test Engineer: Du Zhaoxuan  
Testing Start Date: 2012-04-19  
Testing End Date: 2012-04-25

### **1.4. Signature**



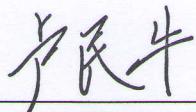
Du Zhaoxuan

(Prepared this test report)



Zhou Yi

(Reviewed this test report)



Lu Minniu

Director of the laboratory

(Approved this test report)

## **2. Client Information**

### **2.1. Applicant Information**

Company Name: Cellon Communications Technology(ShenZhen)Co., Ltd.  
Address /Post: 13/F, Skyworth Building C Gaoxin S. Ave. 1st, High-Tech industrial Park NanShan, ShenZhen  
City: Shenzhen  
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### **2.2. Manufacturer Information**

Company Name: Cellon Communications Technology(ShenZhen)Co., Ltd.  
Address /Post: 13/F, Skyworth Building C Gaoxin S. Ave. 1st, High-Tech industrial Park NanShan, ShenZhen  
Country: China  
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Email: maggie.xu@cellon.com  
Telephone: 0755-86365704  
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### **3. Equipment Under Test (EUT) and Ancillary Equipment (AE)**

#### **3.1. About EUT**

Description	GSM QUAD BAND AND UMTS 850/1900
Model Name	C3560
Marketing Name	C3560, C3560CA, C3560EN, C3560CL, C3560PR, C3560CP
FCC ID	T38C3560
Extreme vol. Limits	3.4VDC to 4.2VDC (nominal: 3.8VDC)

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

Note: The EUT only change the FCC ID. So there are no new tests in this report. This report's result comes from the A3560.

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

EUT ID*	SN or IMEI	HW Version	SW Version
EUT1	357428021081957	A3560_MB_P1B	A3560_1.0_Lab_Test_Only

\*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	Battery	/
AE2	Travel charger	/
AE3	USB cable	/
AE1		
Model	BTR380	
Manufacturer	BAK	
Capacitance	720mAh	
Nominal voltage	3.7V	
AE2		
Model	ASTC20-050065	
Manufacturer	Aquilstar	
Length of cable	120cm	
AE3		
Model	/	
Manufacturer	/	
Length of cable	/	

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

**3.4. EUT set-ups**

EUT set-up No.	Combination of EUT and AE	Remarks
Set.1	EUT1+ AE1 + AE2	Charging mode
Set.2	EUT1+ AE1 + AE3	USB mode

**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	10-1-11
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	Edition 2003
ICES-003	Spectrum Management and Telecommunications Policy Interference-Causing Equipment Standard Digital Apparatus	Issue 4

## **5. LABORATORY ENVIRONMENT**

**Semi-anechoic chamber** (11.20 meters×6.10meters×5.60meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 35 %, Max. = 70 %
Shielding effectiveness	> 100 dB
Electrical insulation	> 2MΩ
Ground system resistance	< 1 Ω
Normalised site attenuation (NSA)	< ± 3.5 dB, 3 m distance, from 30 to 1000 MHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 3000 MHz

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

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 35 %, Max. = 80 %
Shielding effectiveness	> 100 dB
Electrical insulation	> 2MΩ
Ground system resistance	< 1 Ω

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

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 35 %, Max. = 80 %
Shielding effectiveness	> 100 dB
Electrical insulation	> 2MΩ
Ground system resistance	< 1 Ω

**Fully-anechoic chamber** (11.20 meters×6.10 meters×6.60 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 35 %, Max. = 70 %
Shielding effectiveness	> 100 dB
Electrical insulation	> 2MΩ
Ground system resistance	< 1 Ω
Voltage Standing Wave Ratio (VSWR)	≤ 6 dB, from 1 to 6 GHz, 3 m distance

## **6. SUMMARY OF TEST RESULTS**

<b>Abbreviations used in this clause:</b>	
P	Pass
NA	Not applicable
F	Fail

Items	Test Name	Clause in FCC rules	Section in this report	Verdict
1	Radiated Emission	15.109(a)	A.1	P
2	Conducted Emission	15.107(a)	A.2	P

## **7. Test Equipments Utilized**

NO.	Description	TYPE	SERIES NUMBER	MANUFACTURE	CAL DUE DATE
1	Test Receiver	ESCI	100701	R&S	2012.12.29
2	Test Receiver	ESCI	100702	R&S	2012.12.29
3	Test Receiver	FSU 26	200679	R&S	2013.01.17
4	BiLog Antenna	VULB9163	9163 330	Schwarzbeck	2014.02.23
5	LISN	ESH2-Z5	100196	R&S	2012.12.30
6	Universal Radio Communication Tester	CMU200	114544	R&S	2013.01.17
7	Dual-Ridge Waveguide Horn Antenna	3117	00066585	ETS-Lindgren	2013.04
8	PC	M4099t	SA08850737	Lenovo	N/A
9	Monitor	9227-AE1	V1AZ943	Lenovo	N/A
10	Printer	P1008	VNF6C12491	HP	N/A
11	Keyboard	SK-8825	02333613	Lenovo	N/A
12	Mouse	MO28UOL	44P3704	Lenovo	N/A

## **ANNEX A: MEASUREMENT RESULTS**

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

#### **Reference**

FCC: CFR Part 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.

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.

#### **A.1.2 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 Lenovo Thinkcentre M4099t, and the serial number of the PC is SA08850737. 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**

Limit from CFR Part 15.109(a)

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

Limit from ICES-003 Section 5.5

Frequency range (MHz)	Field strength limits* (dB $\mu$ V/m)
30 to 230	40
230 to 1000	47

\*Note: The original limit is defined at 10m test distance. This limit is calculated according to CISPR requirements.

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

Frequency of emission (MHz)	RBW/VBW	Sweep Time(s)
30-1000	120kHz (IF bandwidth)	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". It includes the antenna factor of receive antenna and the path loss.

The measurement results are obtained as described below:

$$\text{Result} = P_{\text{Mea}} + A_{RPL} = P_{\text{Mea}} + G_A + G_{PL}$$

Where

$G_A$ : Antenna factor of receive antenna

$G_{PL}$ : Path Loss

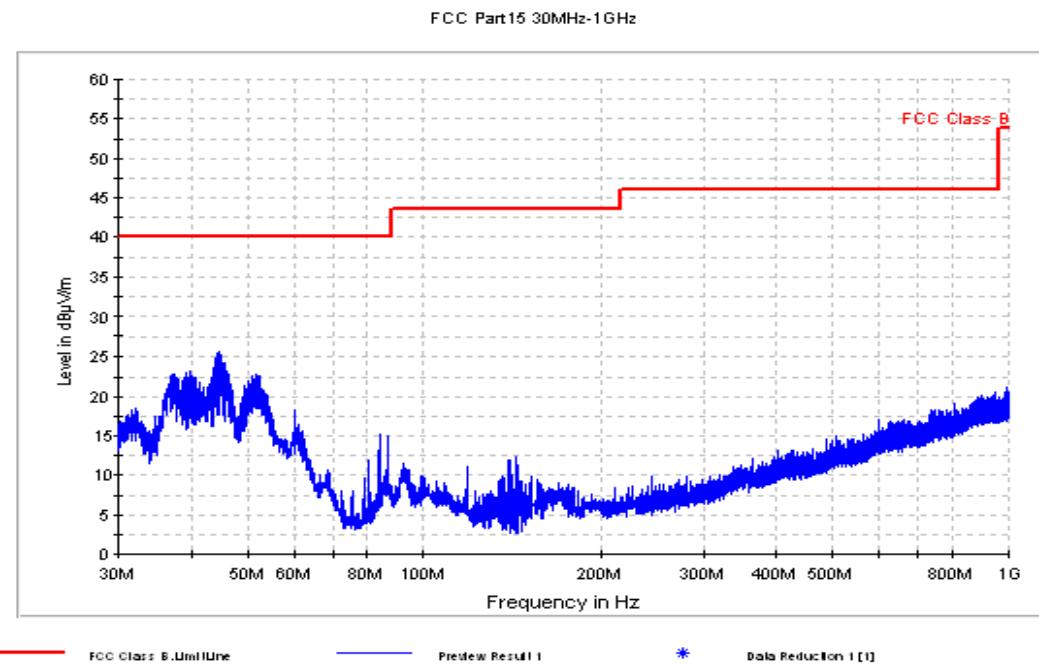
$P_{\text{Mea}}$ : Measurement result on receiver.

### Set.1 Charging mode

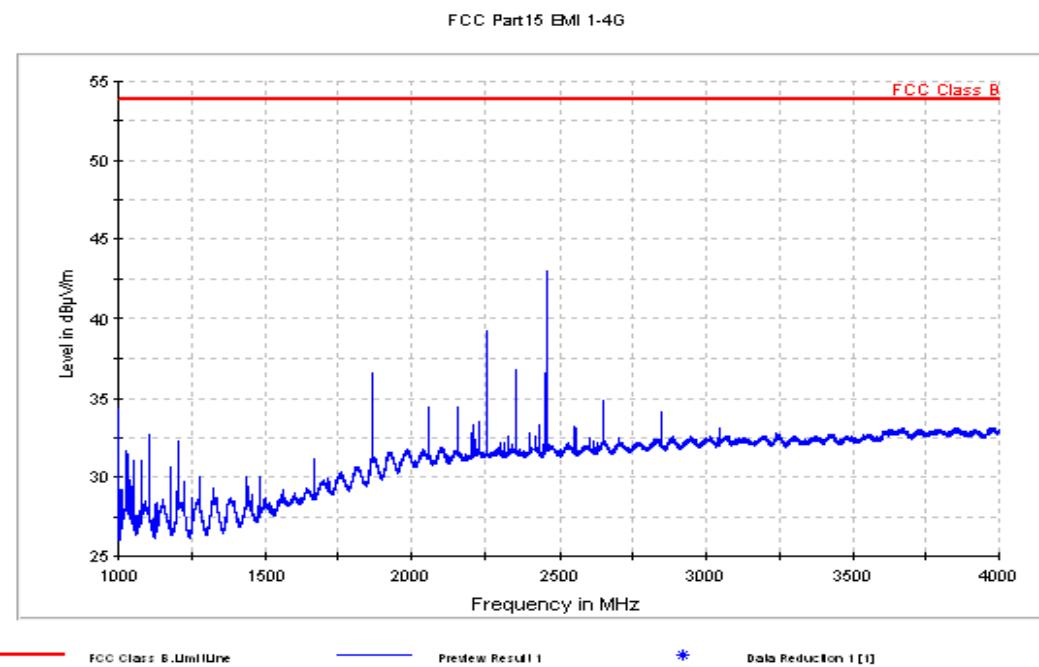
Frequency(MHz)	Result(dBuV/m)	$G_{PL}$ (dB)	$G_A$ (dB/m)	$P_{\text{Mea}}$ (dBuV)	Polarity
1865.6	36.60	-29.70	33.30	33.00	VERTICAL
2159.8	34.32	-29.70	33.30	30.72	VERTICAL
2258.2	39.20	-29.70	33.30	35.60	VERTICAL
2356.0	36.82	-29.50	33.30	33.02	VERTICAL
2454.6	43.00	-29.40	33.30	39.10	VERTICAL
2651.0	34.80	-29.30	33.30	30.80	VERTICAL

### Set.2 USB mode

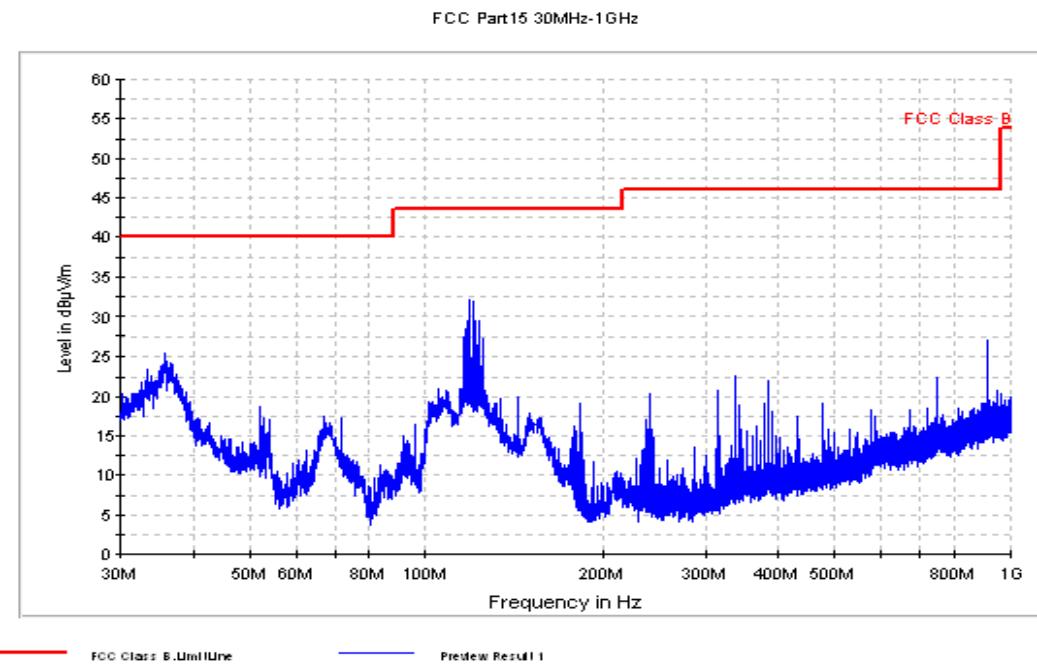
Frequency(MHz)	Result(dBuV/m)	$G_{PL}$ (dB)	$G_A$ (dB/m)	$P_{\text{mea}}$ (dBuV)	Polarity
1500.0	42.13	-32.30	28.70	45.73	VERTICAL
1865.0	36.84	-32.00	28.70	40.14	VERTICAL
2258.2	39.93	-31.10	32.10	38.93	VERTICAL
2356.2	37.81	-31.00	32.20	36.61	VERTICAL
2454.6	43.01	-30.60	32.40	41.21	VERTICAL
3000.0	39.10	-30.10	33.10	36.10	VERTICAL



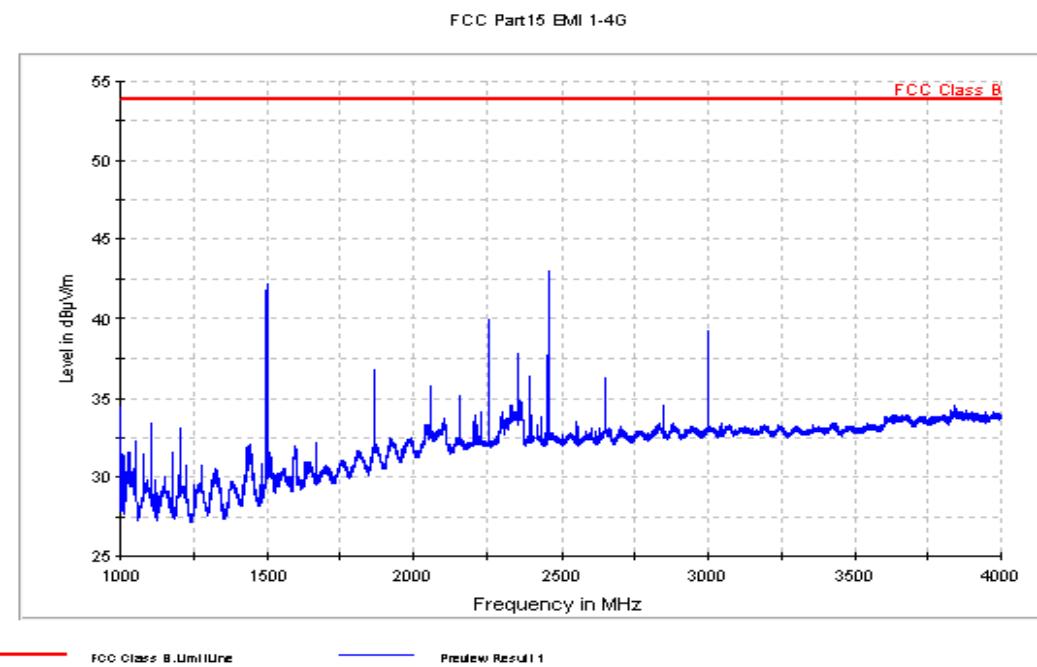
**Figure A.1 Radiated Emission from 30MHz to 1GHz (Set.1, Charging mode)**



**Figure A.2 Radiated Emission from 1GHz to 4GHz (Set.1, Charging mode)**



**Figure A.3 Radiated Emission from 30MHz to 1GHz (Set.2, USB mode)**



**Figure A.4 Radiated Emission from 1GHz to 4GHz (Set.2, USB mode)**

**A.2 Conducted Emission (§15.107(a))****Reference**

FCC: CFR Part 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 Lenovo Thinkcentre M4099t, and the serial number of the PC is SA08850737. 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 (dB $\mu$ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

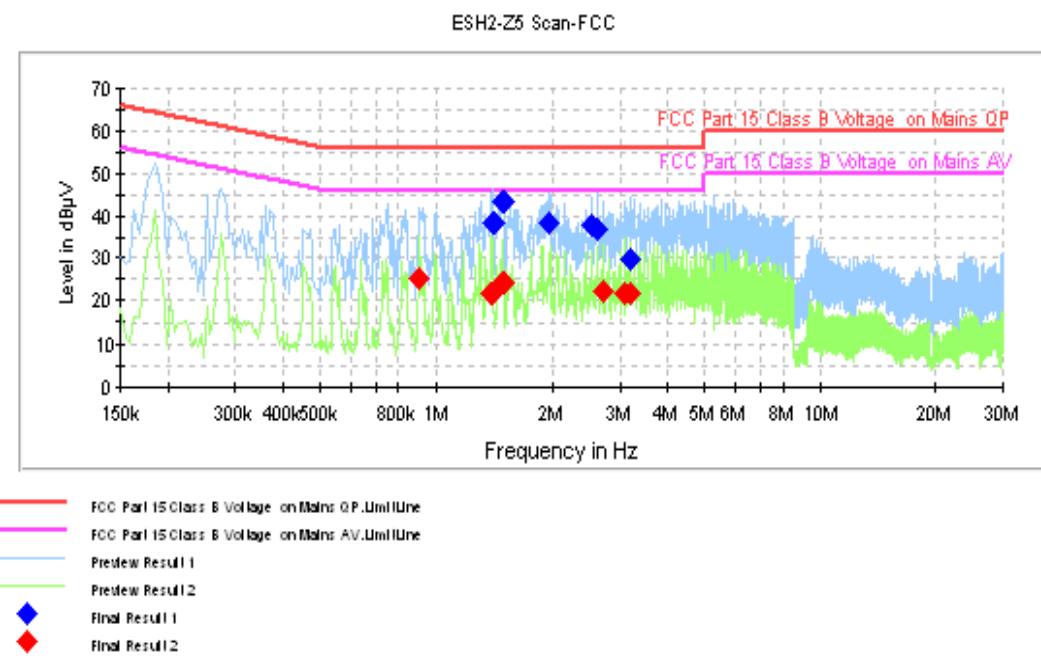
\*Decreases with the logarithm of the frequency

**A.2.4 Test Condition in charging mode**

Voltage (V)	Frequency (Hz)
120	60

RBW	Sweep Time(s)
9kHz	1

### A.2.5 Measurement Results



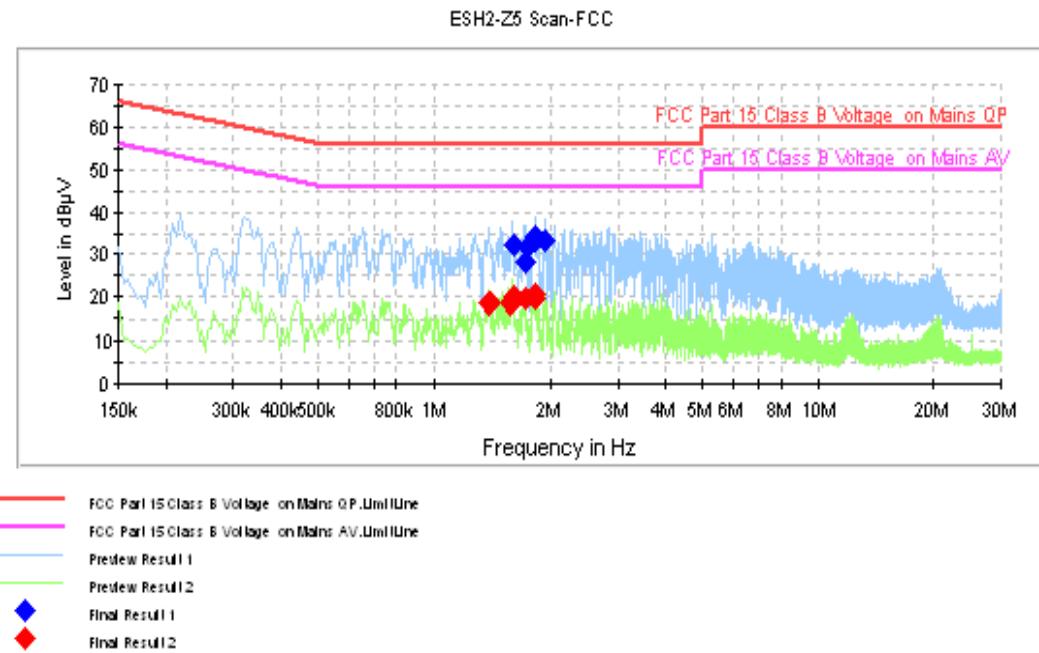
**Figure A.5 Conducted Emission (Set.1, Charging mode)**

#### Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dB μV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB μV)
1.405500	38.4	FLO	L1	10.1	17.6	56.0
1.495500	43.3	FLO	L1	10.1	12.7	56.0
1.959000	38.2	FLO	L1	10.1	17.8	56.0
2.526000	37.6	FLO	L1	10.2	18.4	56.0
2.620500	36.9	FLO	N	10.2	19.1	56.0
3.192000	29.9	FLO	N	10.2	26.1	56.0

#### Final Measurement Detector 2

Frequency (MHz)	Average (dB μV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB μV)
0.906000	25.1	FLO	L1	10.1	21.0	46.0
1.401000	21.9	FLO	N	10.1	24.1	46.0
1.491000	24.1	FLO	N	10.1	21.9	46.0
2.715000	21.9	FLO	L1	10.2	24.1	46.0
3.088500	21.9	FLO	L1	10.2	24.1	46.0
3.183000	21.9	FLO	L1	10.2	24.1	46.0



**Figure A.6 Conducted Emission (Set.2, USB mode)**

**Final Measurement Detector 1**

Frequency (MHz)	QuasiPeak (dB μV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB μV)
1.612500	32.2	FLO	L1	10.1	23.8	56.0
1.720500	28.2	FLO	N	10.1	27.8	56.0
1.729500	31.9	FLO	L1	10.1	24.1	56.0
1.819500	33.1	FLO	L1	10.1	22.9	56.0
1.828500	34.1	FLO	L1	10.1	21.9	56.0
1.941000	33.1	FLO	L1	10.1	22.9	56.0

**Final Measurement Detector 2**

Frequency (MHz)	Average (dB μV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB μV)
1.387500	18.5	FLO	L1	10.1	27.5	46.0
1.572000	18.7	FLO	L1	10.1	27.3	46.0
1.612500	20.2	FLO	L1	10.1	25.8	46.0
1.720500	19.7	FLO	L1	10.1	26.3	46.0
1.819500	19.7	FLO	L1	10.1	26.3	46.0
1.828500	20.6	FLO	L1	10.1	25.4	46.0

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