

EMC

TEST REPORT

Report No.: EME-060096**Model No.:** EF-6217**Issued Date:** Feb. 22, 2006

Applicant: Procare International Co.
11F. -6, 410, Chung Hsiao E. Rd., Sec. 5, Taipei, Taiwan

Test By: Intertek Testing Services Taiwan Ltd.
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Project Engineer



Kevin Chen

Reviewed By



Jerry Liu

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Summary of Tests**USB FM Transmitter -Model: EF-6217
FCC ID: POSEF-6217**

Test	Reference	Results
Bandwidth of fundamental frequency	15.239(a)	Complies
Field strength of fundamental frequency	15.239(b)	Complies
Radiated emission	15.239(c), 15.209	Complies
Power Line Conducted Emission test	15.207	Complies

1. General information

1.1 Identification of the EUT

Applicant:	Procare International Co.
Product:	USB FM Transmitter
Model No.:	EF-6217
FCC ID.:	POSEF-6217
Frequency Range:	88.1MHz to 88.7MHz
Channel Number:	4 channels
Frequency of Each Channel:	88.1 + 0.2k MHz, k=0-3
Type of Modulation:	FM
Power Supply:	1. DC 12V from Car adapter 2. DC 5V from PC USB port
Power Cord:	N/A
Sample Received:	Jan. 23, 2006
Test Date(s):	Jan. 26, 2006

A DoC report has been generated for the client.

1.2 Additional information about the EUT

The EUT is a USB FM Transmitter, and was defined as information technology equipment.

For more detail features, please refer to User's manual as file name "Installation guide.pdf"

1.3 Antenna description

The EUT uses a permanently connected antenna.

Antenna Gain: 0dBi

Antenna Type: PCB Printed

Connector Type: N/A

1.4 Peripherals equipment

Peripherals	Manufacturer	Product No.	Serial No.
Notebook PC	IBM	1860	L3BTAG6
Notebook PC	HP	HSTNN-I04C	CNU5240X14
Speaker	JS	NA	99-I-576489-C
MP 3 Player	N/A	N/A	N/A

2. Test specifications

2.1 Test standard

The EUT was performed according to the procedures in FCC Part 15 Subpart C Section §15.239, §15.207 and ANSI C63.4/2001.

The test of radiated measurements according to FCC Part15 Section 15.33(a) had been conducted and the field strength of this frequency band were all meet limit requirement, thus we evaluate the EUT pass the specified test.

2.2 Operation mode

The EUT was operated in continuously transmitting status during all the tests.

2.3 Test equipment

Equipment	Brand	Frequency range	Model No.	Intertek ID No.	Next Cal. Date
EMI Test Receiver	Rohde & Schwarz	9kHz~2.75GHz	ESCS 30	EC303	04/13/2006
EMI Test Receiver	Rohde & Schwarz	20Hz~26.5GHz	ESMI	EC317	07/14/2006
Spectrum Analyzer	Rohde & Schwarz	9kHz~30GHz	FSP 30	EC353	07/13/2006
Bilog Antenna	SCHWARZBECK	25MHz~1.7GHz	VULB 9160	EC368	05/20/2006
Controller	HDGmbH	N/A	HD 100	EP317-1	N/A
Antenna Tower	HDGmbH	N/A	MA 240	EP317-2	N/A
Turn Table	HDGmbH	N/A	DS 420S	EP317-3	N/A
LISN	Rohde & Schwarz	9KHz~30MHz	ESH3-Z5	EC344	01/14/2007

Note: The above equipments are within the valid calibration period.

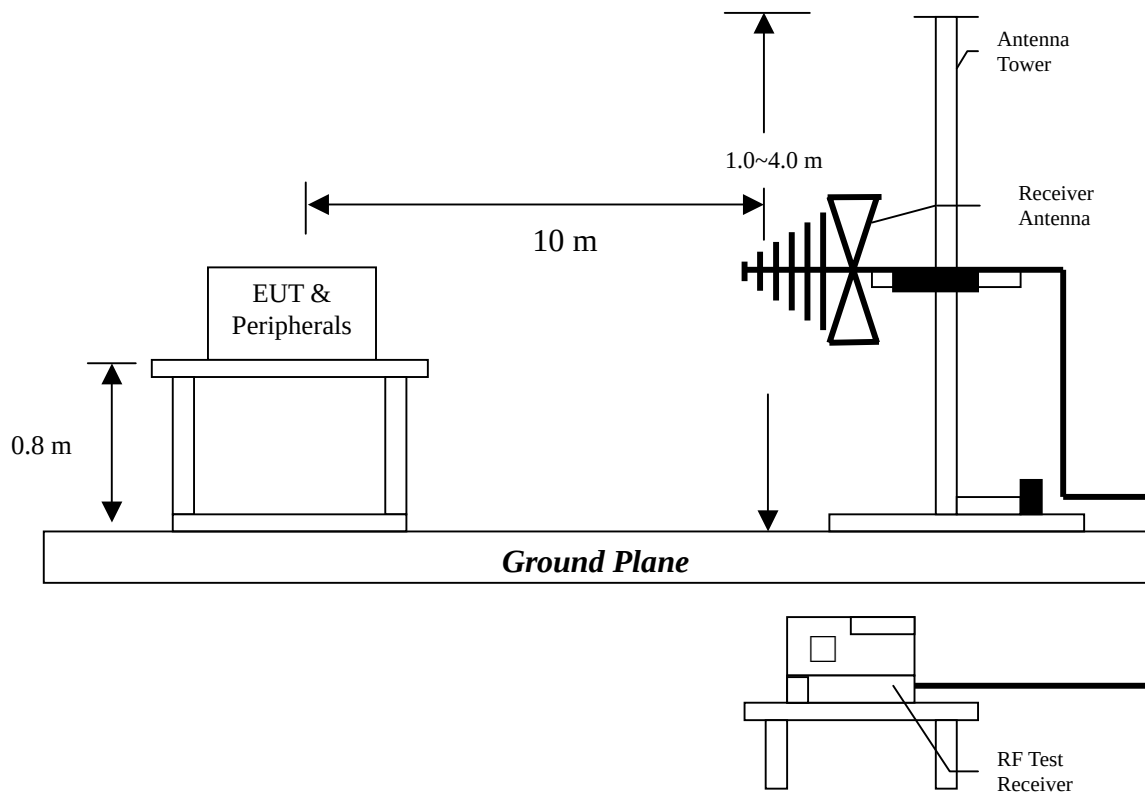
3. Radiated emission test FCC 15.239 (b)/(c)

3.1 Operating environment

Temperature: 23 °C
Relative Humidity: 53 %
Atmospheric Pressure: 1023 hPa

3.2 Test setup & procedure

The Diagram below shows the test setup, which is utilized to make these measurements.



The signal is maximized through rotation and placement in the three orthogonal axes. Radiated emissions were investigated cover the frequency range from 30MHz to 1000MHz using a receiver RBW of 120kHz record QP reading, and the frequency over 1GHz using a spectrum analyzer RBW of 1MHz and 10Hz VBW record Average reading. (15.209 paragraph), the Peak reading (1MHz RBW/VBW) recorded also on the report. The EUT for testing is arranged on a wooden turntable. If some peripherals apply to the EUT, the peripherals will be connected to EUT and the whole system. During the test, all cables were arranged to produce worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meters and down to 1 meter.

The measurement for radiated emission will be done at the distance of three meters unless the signal level is too low to measure at that distance. In the case of the reading under noise floor, a pre-amplifier is used and/or the test is conducted at a closer distance. And then all readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance.

The EUT configuration please refer to the “Spurious set-up photo.pdf”.

3.3 Emission limit

3.3.1 Fundamental and harmonics emission limits

Frequency (MHz)	Field Strength of Fundamental	
	(uV/m@3m)	(dBuV/m@3m)
88-108	250	48

The emission limit above is based on measurement instrumentation employing an average detector. The provisions in Section 15.35 for limiting peak emissions apply.

3.3.2 General radiated emission limits

Frequency MHz	15.209 Limits (dB μ V/m@3m)
30-88	40
88-216	43.5
216-960	46
Above 960	54

Remark:

1. In the above table, the tighter limit applies at the band edges.
2. Distance refers to the distance in meters between the measuring antenna and the closed point of any part of the device or system

Uncertainty was calculated in accordance with NAMAS NIS 81.

Expanded uncertainty (k=2) of radiated emission measurement is ± 4.98 dB.

3.4 Radiated emission test data

3.4.1 Radiated Emission Data

EUT : EF-6217

Test Condition : Tx at channel 3 with USB port

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)	Antenna high (cm)	Turn Table angle (degree)
88.500	AV	V	8.50	32.05	40.55	48.00	-7.46	163	125
41.640	QP	V	12.38	23.49	35.87	40.00	-4.14	123	136
159.980	QP	V	15.83	18.47	34.30	43.50	-9.20	146	186
278.320	QP	V	13.24	19.33	32.57	46.00	-13.44	182	211
398.600	QP	V	16.40	17.21	33.61	46.00	-12.39	154	326
442.500	QP	V	17.64	18.59	36.23	46.00	-9.77	139	79
480.080	QP	V	18.43	13.69	32.12	46.00	-13.89	205	86
598.420	QP	V	20.71	17.12	37.83	46.00	-8.17	169	41
679.900	QP	V	22.33	14.73	37.06	46.00	-8.95	188	233
959.260	QP	V	25.34	10.06	35.40	46.00	-10.61	174	157
88.500	AV	H	9.45	28.75	38.20	48.00	-9.81	169	173
159.980	QP	H	13.60	23.66	37.26	43.50	-6.24	146	98
198.780	QP	H	11.27	19.13	30.40	43.50	-13.11	179	161
398.600	QP	H	16.74	20.55	37.29	46.00	-8.71	132	185
439.340	QP	H	18.12	16.39	34.51	46.00	-11.49	188	237
480.080	QP	H	18.64	16.46	35.10	46.00	-10.90	154	249
559.620	QP	H	19.72	15.83	35.55	46.00	-10.45	166	179
598.420	QP	H	20.84	13.16	34.00	46.00	-12.01	149	78
639.160	QP	H	21.55	16.02	37.57	46.00	-8.44	205	354
679.900	QP	H	22.48	13.88	36.36	46.00	-9.64	198	49
959.260	QP	H	25.54	12.31	37.85	46.00	-8.15	196	211

Remark:

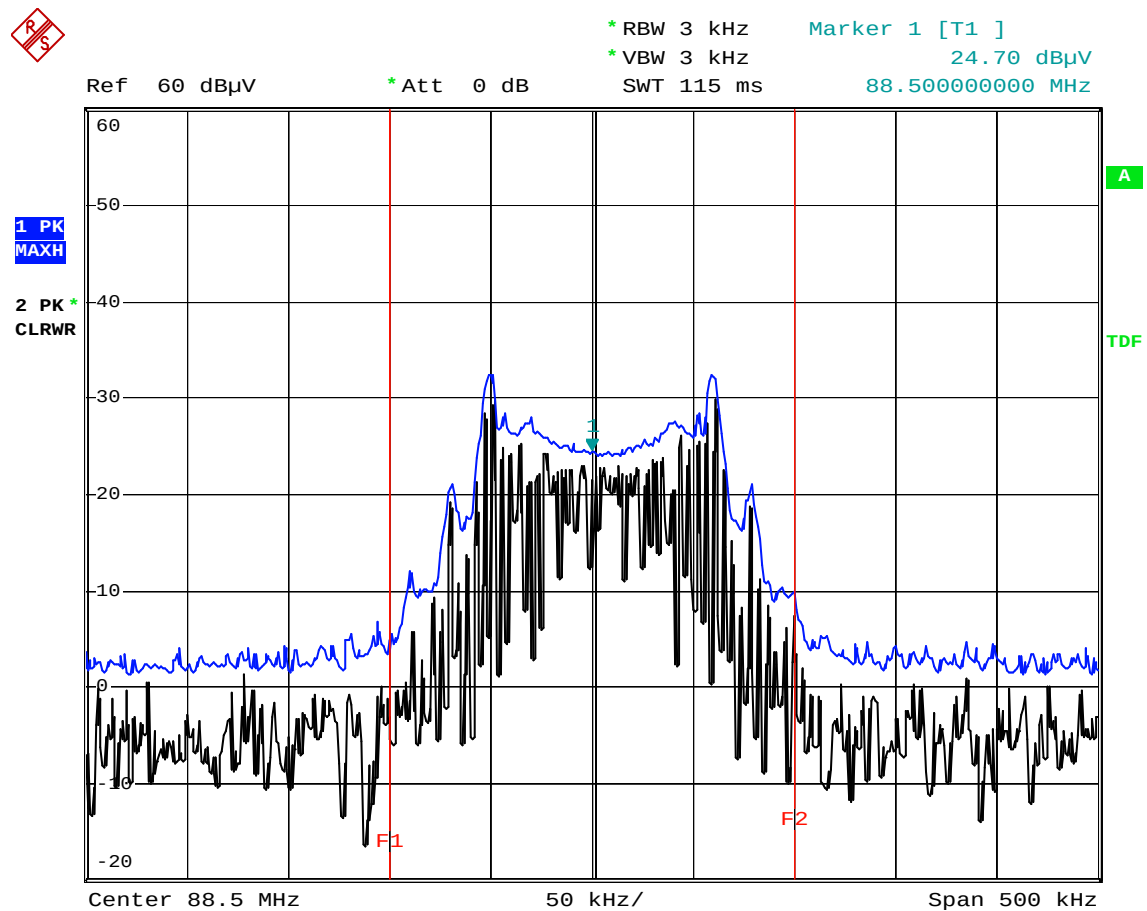
1. Corrected Level = Reading + Correction Factor

2. Correction Factor = Antenna Factor + Cable Loss

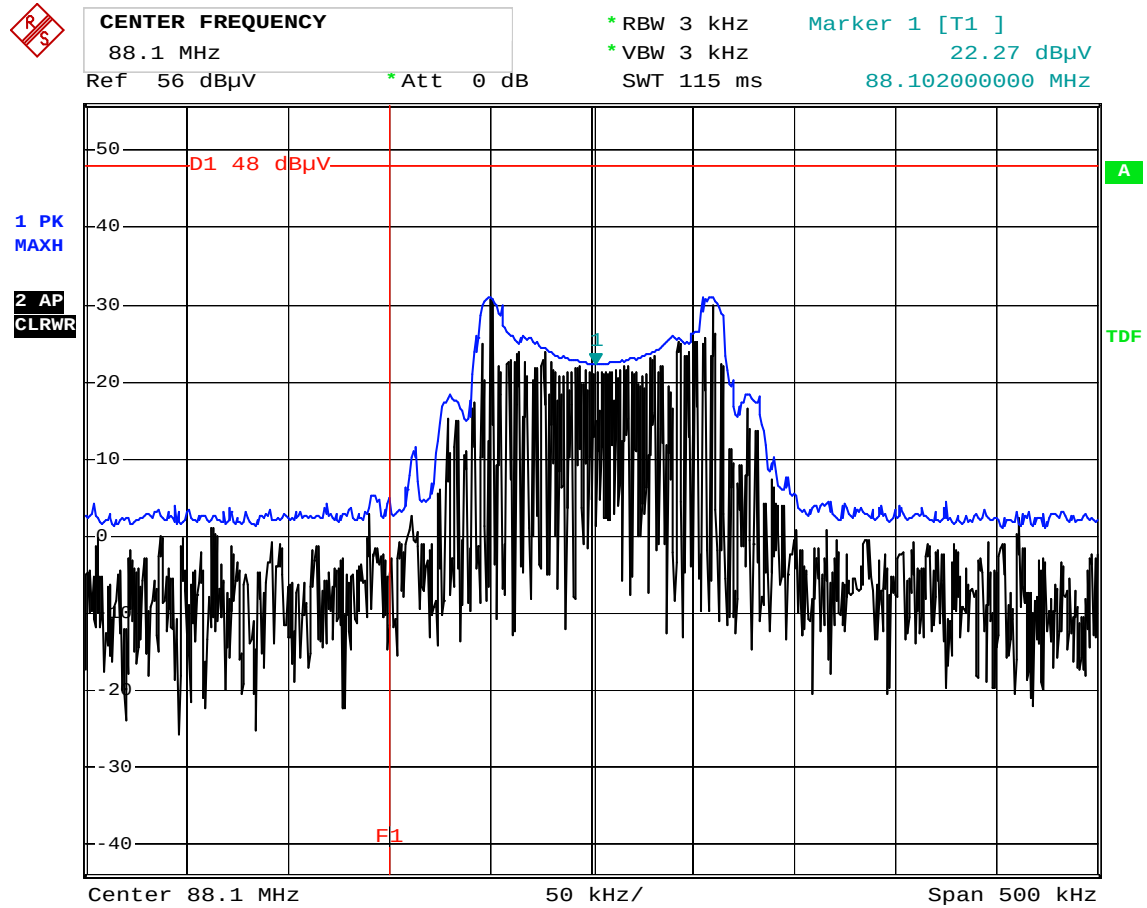
4. Bandwidth of fundamental frequency FCC 15.239(a)

Emissions from the intentional radiator shall be confined within a band 200 kHz wide centered on the operation frequency. The 200 kHz band shall lie wholly within the frequency range of 88-108 MHz.

Please see the plot below.



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Comment: Band-edge tx at 88.1MHz

Comment: F1=88MHz

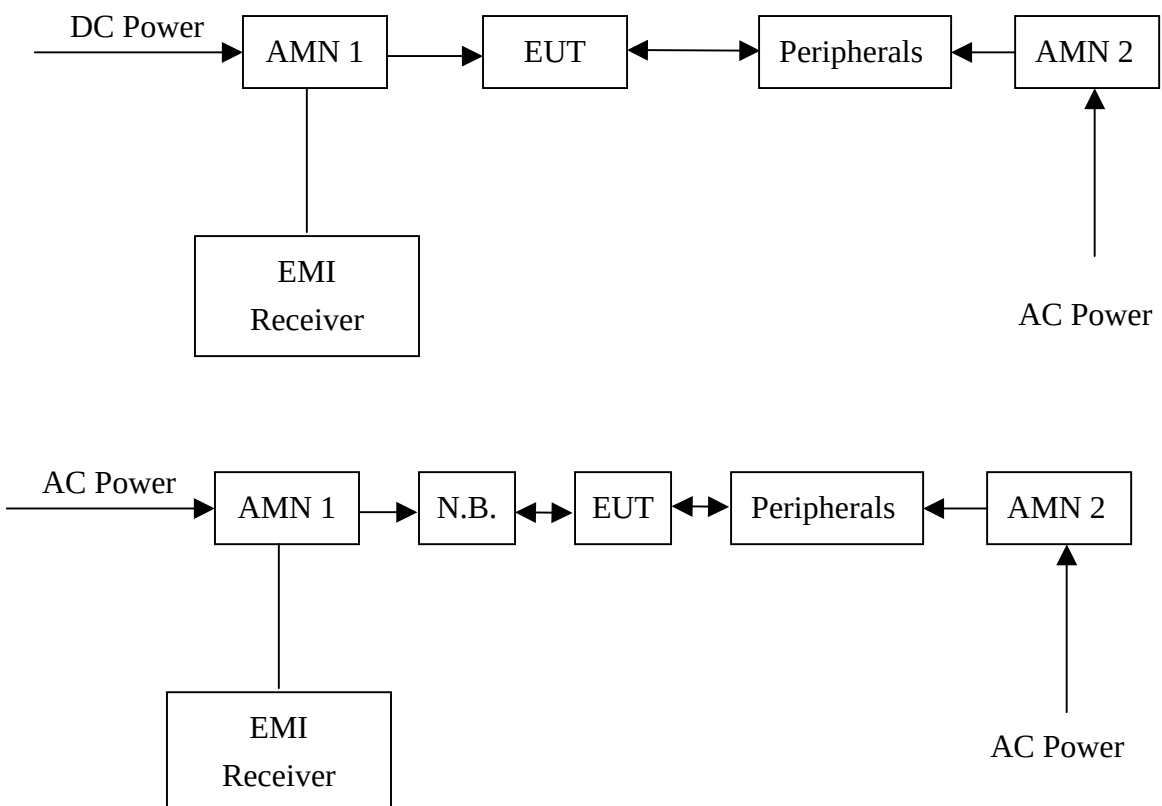
Date: 30.MAR.2006 13:57:47

5. Power Line Conducted Emission test §FCC 15.207

5.1 Operating environment

Temperature:	23	°C
Relative Humidity:	53	%
Atmospheric Pressure	1022	hPa

5.2 Test setup & procedure



The EUT are connected to the main power through a line impedance stabilization network (LISN). This provides a 50 ohm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. Both sides (Line and Neutral) of AC line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4/1992 on conducted measurement. The AC power conducted emissions was investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz. (15.207 paragraph)

The EUT configuration please refer to the “Conducted set-up photo.pdf”.

5.3 Emission limit

Freq. (MHz)	Conducted Limit (dBuV)	
	Q.P.	Ave.
0.15~0.50	66 – 56*	56 – 46*
0.50~5.00	56	46
5.00~30.0	60	50

*Decreases with the logarithm of the frequency.

5.4 Uncertainty of Conducted Emission

Expanded uncertainty (k=2) of conducted emission measurement is ± 2.6 dB.

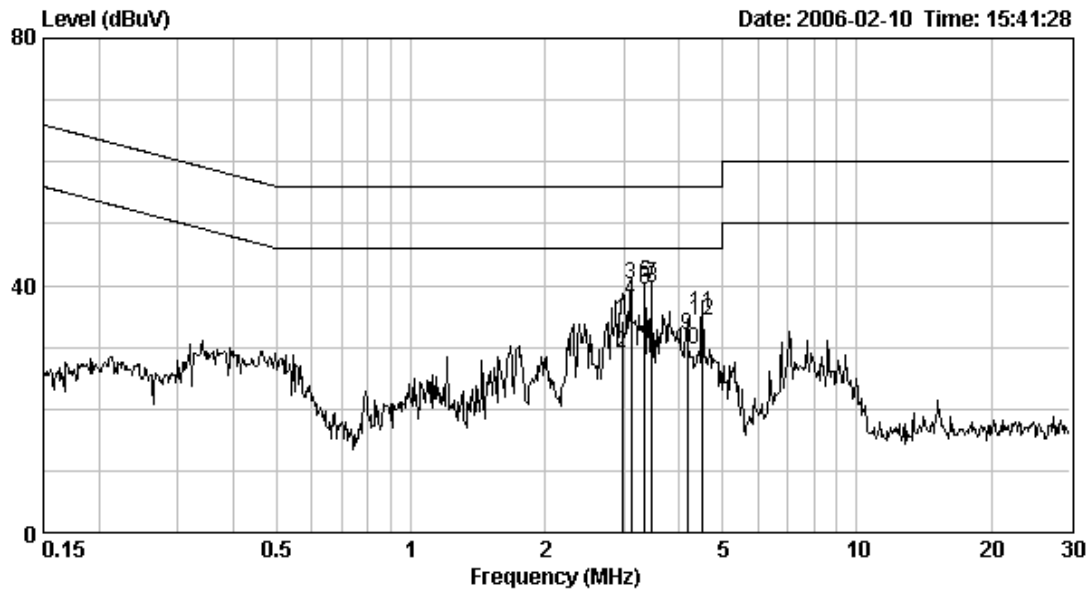
5.5 Power Line Conducted Emission test data

Phase: Line
 Model No.: EF-6217
 Test Condition: Car adapter mode

Frequency (MHz)	Corr. Factor (dB)	Level	Limit	Level	Limit	Margin	
		Qp (dBuV)	Qp (dBuV)	AV (dBuV)	Av (dBuV)	Qp	Av
2.977	0.08	34.21	56.00	29.11	46.00	-21.79	-16.89
3.120	0.08	40.09	56.00	37.50	46.00	-15.91	-8.50
3.351	0.09	40.32	56.00	39.37	46.00	-15.68	-6.63
3.468	0.09	40.19	56.00	39.61	46.00	-15.81	-6.39
4.160	0.11	31.81	56.00	29.69	46.00	-24.19	-16.31
4.507	0.11	35.59	56.00	34.28	46.00	-20.41	-11.72

Remark:

1. Corr. Factor (dB)= LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Level (dBuV) – Limit (dBuV)

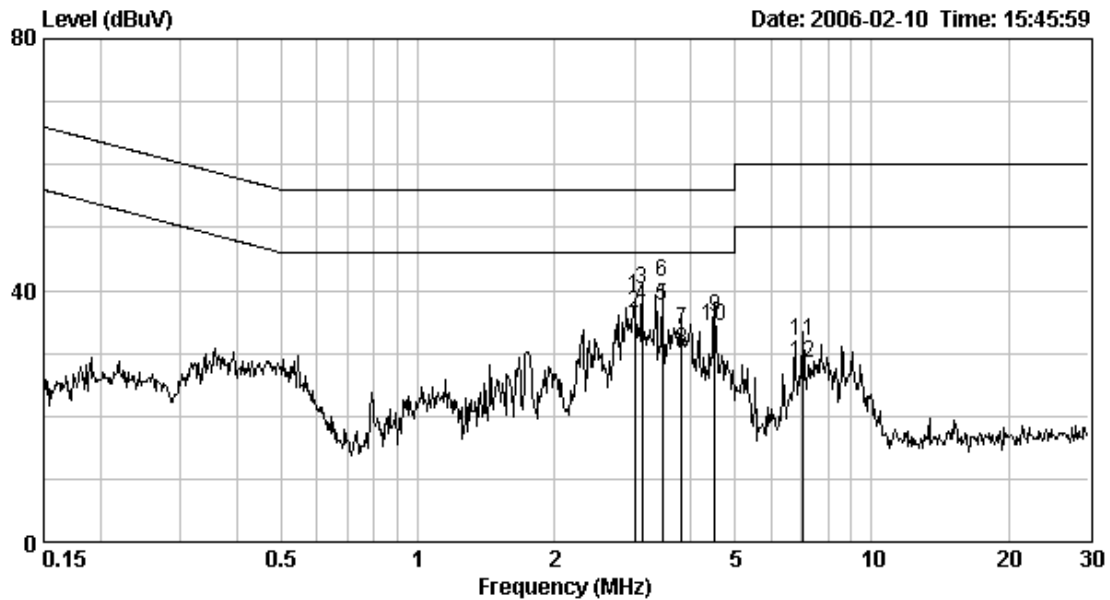


Phase: Neutral
 Model No.: EF-6217
 Test Condition: Car adapter mode

Frequency (MHz)	Corr. Factor (dB)	Level Qp (dBuV)	Limit Qp (dBuV)	Level AV (dBuV)	Limit Av (dBuV)	Margin (dB)	
						Qp	Av
3.005	0.08	38.90	56.00	36.48	46.00	-17.10	-9.52
3.120	0.08	40.17	56.00	37.64	46.00	-15.83	-8.36
3.464	0.08	41.28	56.00	37.65	46.00	-14.72	-8.35
3.814	0.09	33.56	56.00	30.35	46.00	-22.44	-15.65
4.507	0.10	35.62	56.00	34.27	46.00	-20.38	-11.73
7.038	0.14	31.98	60.00	28.42	50.00	-28.02	-21.58

Remark:

1. Corr. Factor (dB)= LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Level (dBuV) – Limit (dBuV)

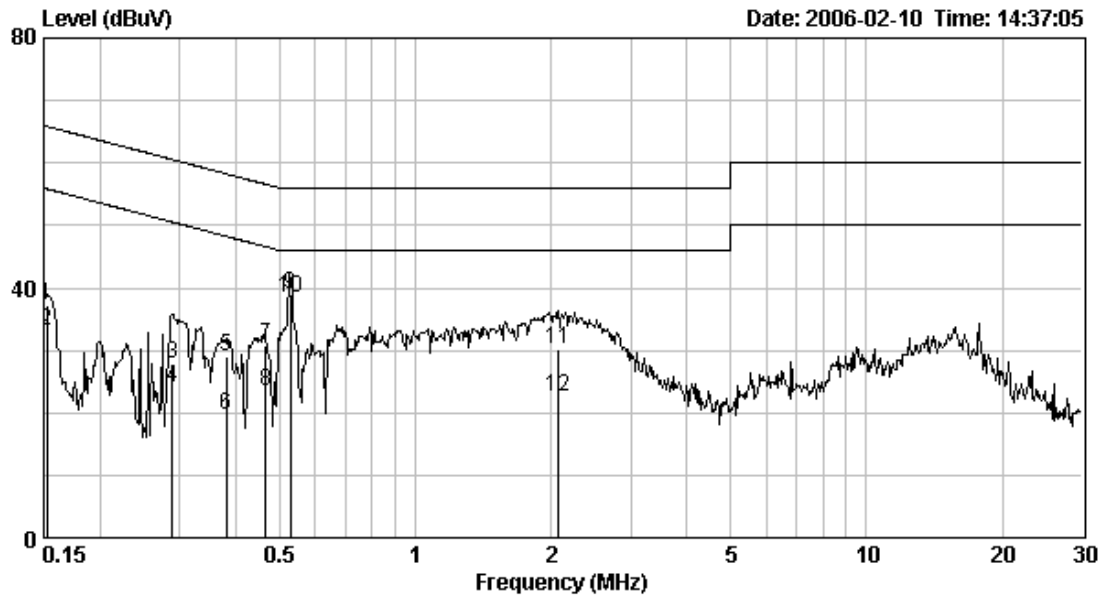


Phase: Line
 Model No.: EF-6217
 Test Condition: USB mode

Frequency (MHz)	Corr. Factor (dB)	Level	Limit	Level	Limit	Margin	
		Qp (dBuV)	Qp (dBuV)	Av (dBuV)	Av (dBuV)	Qp	Av
0.153	0.10	37.19	65.86	33.16	55.86	-28.67	-22.70
0.289	0.10	27.71	60.56	23.89	50.56	-32.85	-26.67
0.381	0.10	28.99	58.26	19.61	48.26	-29.27	-28.65
0.465	0.10	30.87	56.60	23.37	46.60	-25.73	-23.23
0.528	0.10	38.90	56.00	38.36	46.00	-17.10	-7.64
2.080	0.10	30.17	56.00	22.69	46.00	-25.83	-23.31

Remark:

1. Corr. Factor (dB)= LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Level (dBuV) – Limit (dBuV)



Phase: Neutral
 Model No.: EF-6217
 Test Condition: USB mode

Frequency (MHz)	Corr. Factor (dB)	Level	Limit	Level	Limit	Margin	
		Qp (dBuV)	Qp (dBuV)	AV (dBuV)	Av (dBuV)	Qp (dB)	Av (dB)
0.152	0.10	34.43	65.88	28.66	55.88	-31.45	-27.22
0.200	0.10	30.33	63.62	22.80	53.62	-33.29	-30.82
0.335	0.10	32.65	59.32	20.94	49.32	-26.67	-28.38
0.397	0.10	28.84	57.93	21.16	47.93	-29.09	-26.77
0.464	0.10	31.05	56.63	24.06	46.63	-25.58	-22.57
0.528	0.10	37.75	56.00	37.43	46.00	-18.25	-8.57

Remark:

1. Corr. Factor (dB)= LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Level (dBuV) – Limit (dBuV)

