

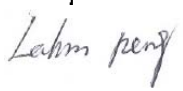
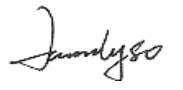
EMC

Measurement and Test Report

For

GlobTek, Inc.

186 Veterans Dr. Northvale, NJ 07647 USA

Test Standards:	<u>ICES-003 Issue 4 (2004-02)</u>
Product Description:	<u>5 Bay Lithium-Ion Battery Charger</u>
Tested Model:	<u>GT-93023-12012</u>
Report No.:	<u>STR13078208C</u>
Tested Date:	<u>2013-07-15 to 2013-07-23</u>
Issued Date:	<u>2013-07-24</u>
Tested By:	<u>Daniel Liu / Engineer</u> 
Reviewed By:	<u>Lahm Peng / EMC Manager</u> 
Approved & Authorized By:	<u>Jandy so / PSQ Manager</u> 
Prepared By:	

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Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by SEM.Test Compliance Service Co., Ltd

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: GlobTek, Inc.
Address of applicant: 186 Veterans Dr. Northvale, NJ 07647 USA
Manufacturer: 1. GlobTek, Inc.
2. GlobTek (Suzhou) Co., Ltd
Address of manufacturer: 1. 186 Veterans Dr. Northvale, NJ 07647 USA
2. Building 4, No. 76, Jin Ling East Rd., Suzhou Industrial Park, Suzhou, JiangSu 215021, China

General Description of EUT

Product Name:	5 Bay Lithium-Ion Battery Charger
Trade Name:	GlobTek
Model No.:	GT-93023-12012
Adding Model(s):	MBC-001

Note: The test data is gathered from a production sample, provided by the manufacturer. The appearance of others models listed in the report is different from main-test model GT-93023-12012, but the circuit and the electronic construction do not change, declared by the manufacturer.

Technical Characteristics of EUT

Rated Voltage:	Input: AC 100-240V Output: DC 24V
Rated Current:	Input: 2.0A Output: 6.25A
Rated Power:	150W
Power Adaptor Model:	GT-43004P15024-T3
Highest Internal Frequency:	Below 108MHz
Classification of ITE:	Class A

1.2 Test Standards

The following report is prepared on behalf of the GlobTek, Inc. in accordance with I.C. Technical Requirements of ICES-003 issue 4 February 2004.

The objective is to determine compliance with I.C. Technical Requirements of ICES-003 I issue 4 February 2004.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission/immunity, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with CAN/CSA-CEI/IEC CISPR 22: 02, Limits and Methods of Measurement of Radio Disturbance Characteristics of Information Technology Equipment.

1.4 Test Facility

- **FCC – Registration No.: 994117**

SEM.Test Compliance Services Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files and the Registration is 994117.

- **Industry Canada (IC) Registration No.: 7673A**

The 3m Semi-anechoic chamber of SEM.Test Compliance Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 7673A.

- **CNAS Registration No.: L4062**

Shenzhen SEM.Test Electronics Service Co., Ltd. is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L4062. All measurement facilities used to collect the measurement data are located at 3/F, Jinbao Commerce Building, Xin'an Fanshen Road, Bao'an District, Shenzhen, P.R.C (518101)

1.5 EUT Setup and Operation Mode

The equipment under test (EUT) was configured to measure its highest possible emission/immunity level. The test modes were adapted according to the operation manual for use, more detailed description as follows:

Test Mode List:

Test Mode	Description	Remark
TM1	Charging	Full Load, Half Load, Empty Load

EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
Power Cable	2.0	Unshielded	Without Core

Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
/	/	/	/

Special Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
/	/	/	/

2. SUMMARY OF TEST RESULTS

Standards	Description of Test Item	Result
ICES-003	Conducted Disturbance	Compliant
	Radiated Disturbance	Compliant

N/A: not applicable

SEM. Test Compliance

3. Conducted Disturbance

3.1 Measurement Uncertainty

Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement is ± 2.88 dB.

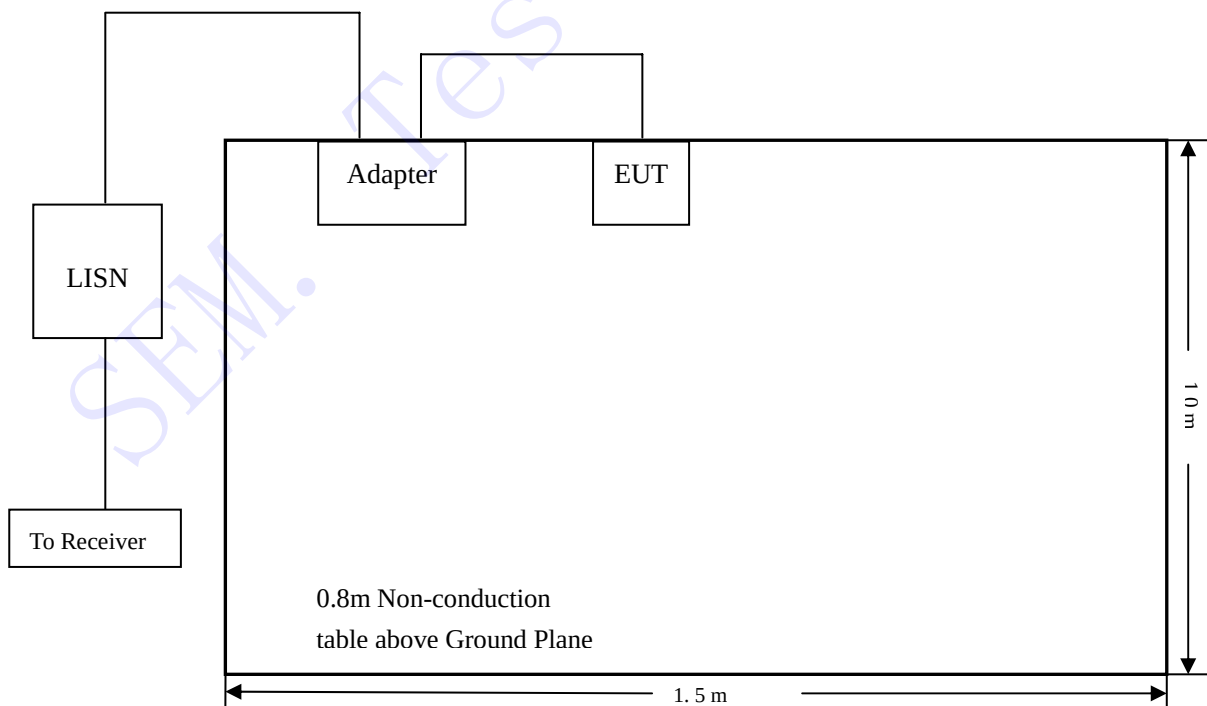
3.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial No.	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2013-05-07	2014-05-06
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2013-05-07	2014-05-06
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2013-05-07	2014-05-06
Current Probe	FCC	F-33-4	091684	2013-05-07	2014-05-06

3.3 Test Procedure

Test is conducting under the description of CISPR 22 Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement.

3.4 Basic Test Setup Block Diagram



3.5 Environmental Conditions

Temperature:	22 ° C
Relative Humidity:	55 %
ATM Pressure:	1015 mbar

3.6 Summary of Test Results/Plots

According to the data in section 3.7, the EUT complied with the CISPR 22 Conducted margin for a Class A device, with the *worst* margin reading of:

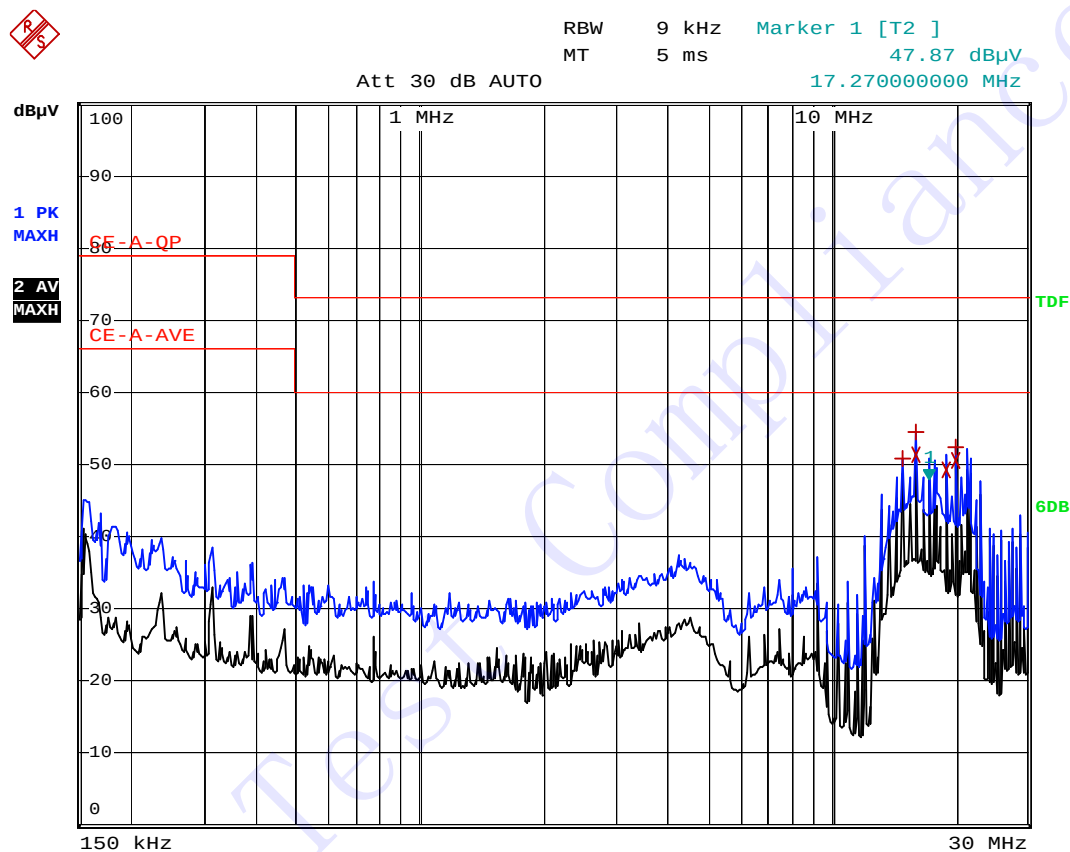
-8.57 dB at 16.118 MHz in the **Line** mode, **Average** detector, **TM1(Full Load)** Model, **0.15-30MHz**

3.7 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data

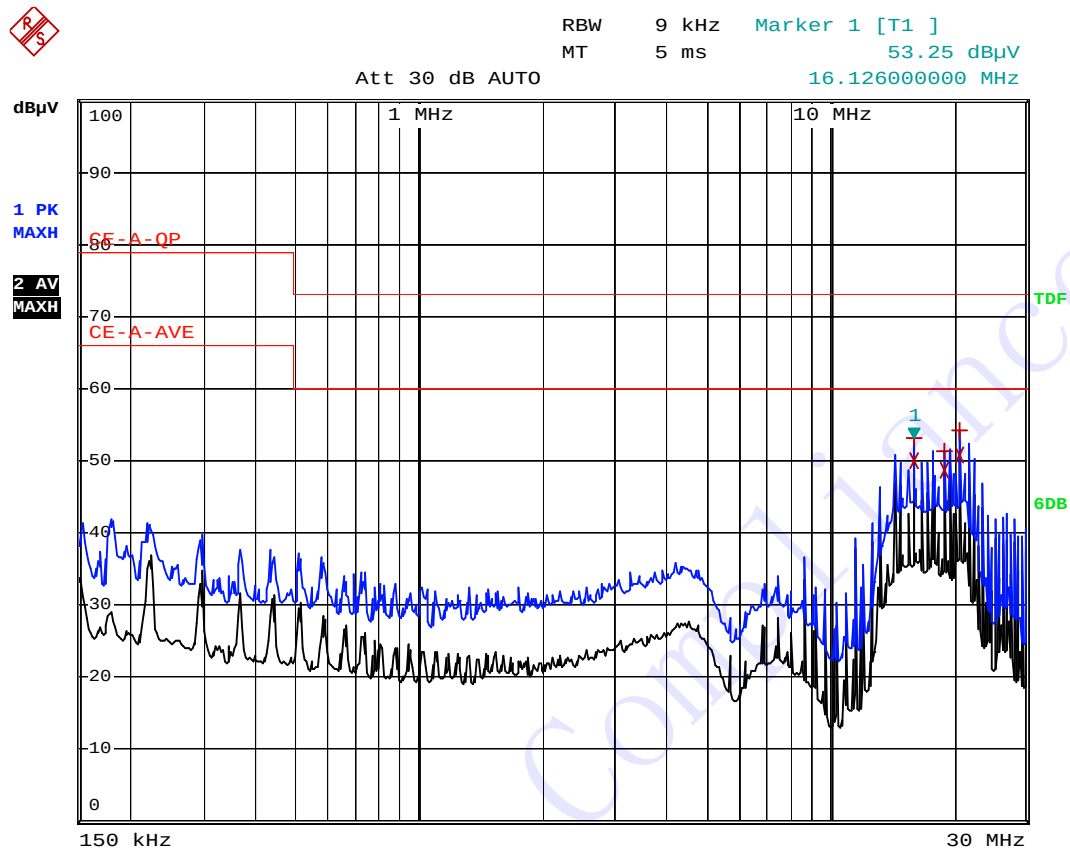
EUT: 5 Bay Lithium-Ion Battery Charger
Tested Model: GT-93023-12012
Operating Condition: TM1(Full Load)
Comment: AC 120V/60Hz; Adapter DC 24V

Test Specification: Line



EDIT PEAK LIST (Prescan Results)			
Trace1:	CE-A-QP		
Trace2:	CE-A-AVE		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1 Max Peak	14.966 MHz	50.86	-22.13
1 Max Peak	16.118 MHz	54.49	-18.51
2 Average	16.118 MHz	51.42	-8.57
2 Average	18.998 MHz	49.19	-10.80
2 Average	20.15 MHz	50.50	-9.49
1 Max Peak	20.15 MHz	52.40	-20.59

Test Specification: Neutral



EDIT PEAK LIST (Prescan Results)			
Trace1:	CE-A-QP		
Trace2:	CE-A-AVE		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV	DELTA LIMIT dB
2 Average	16.126 MHz	49.86	-10.13
1 Max Peak	16.126 MHz	53.24	-19.75
2 Average	19.006 MHz	48.79	-11.20
1 Max Peak	19.01 MHz	51.35	-21.64
1 Max Peak	20.738 MHz	54.21	-18.78
2 Average	20.738 MHz	50.71	-9.28

Plot of Conducted Emissions Test Data

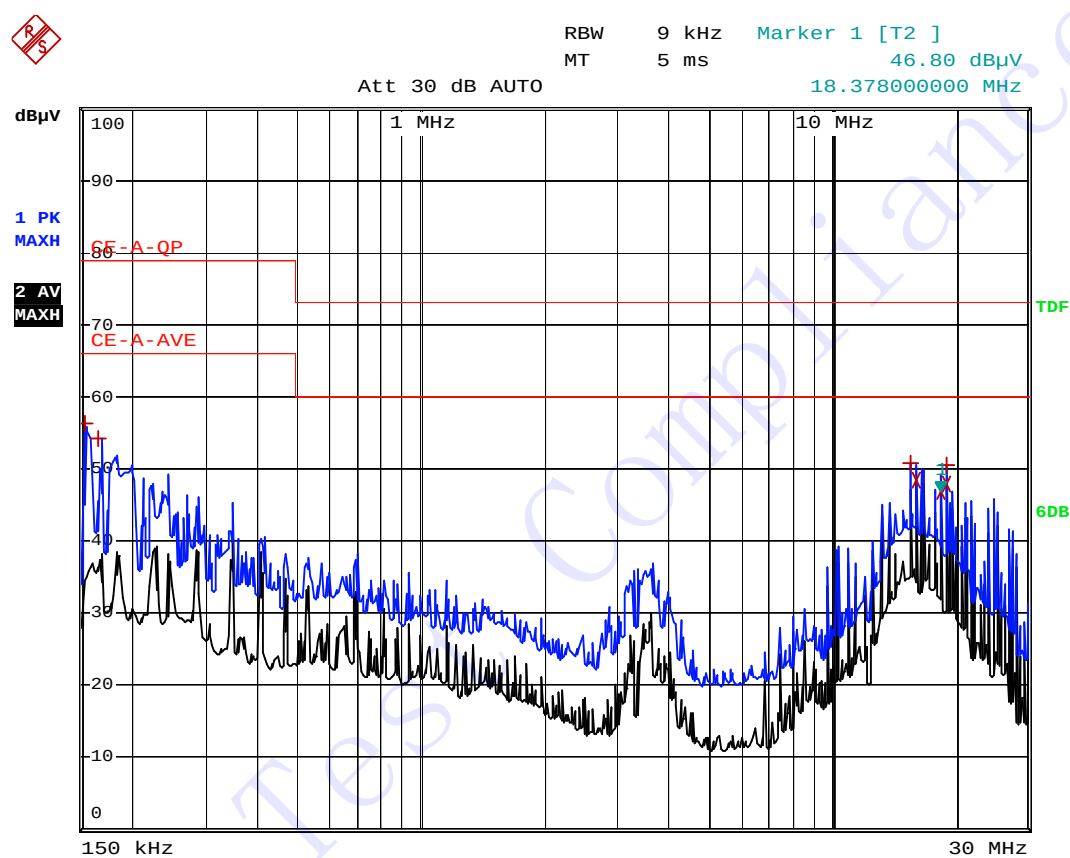
EUT:5 Bay Lithium-Ion Battery Charger

Tested Model:GT-93023-12012

Operating Condition:TM1(Half Load)

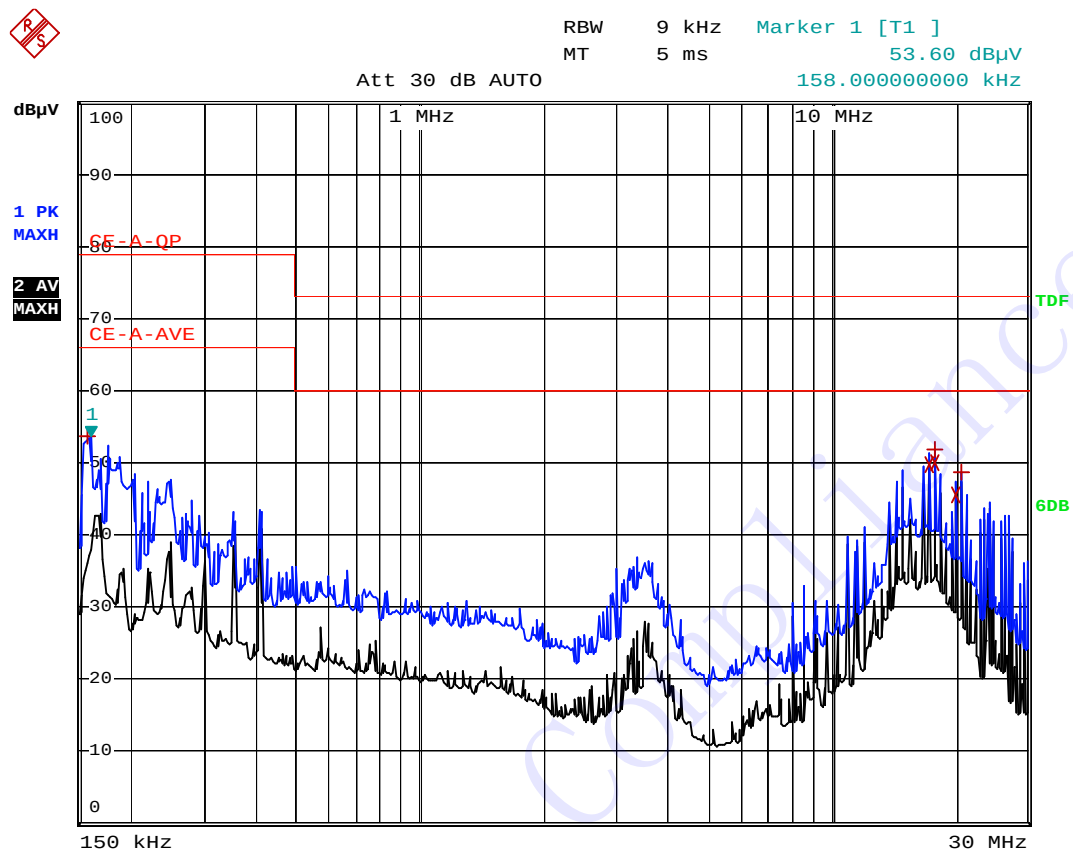
Comment:AC 120V/60Hz; Adapter DC 24V

Test Specification: Line



EDIT PEAK LIST (Prescan Results)			
Trace1:	CE-A-QP		
Trace2:	CE-A-AVE		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1 Max Peak	154 kHz	56.22	-22.77
1 Max Peak	166 kHz	54.29	-24.70
1 Max Peak	15.506 MHz	50.65	-22.34
2 Average	16.082 MHz	48.31	-11.68
2 Average	18.378 MHz	46.80	-13.20
1 Max Peak	18.954 MHz	50.41	-22.58
2 Average	18.958 MHz	47.98	-12.01

Test Specification: Neutral

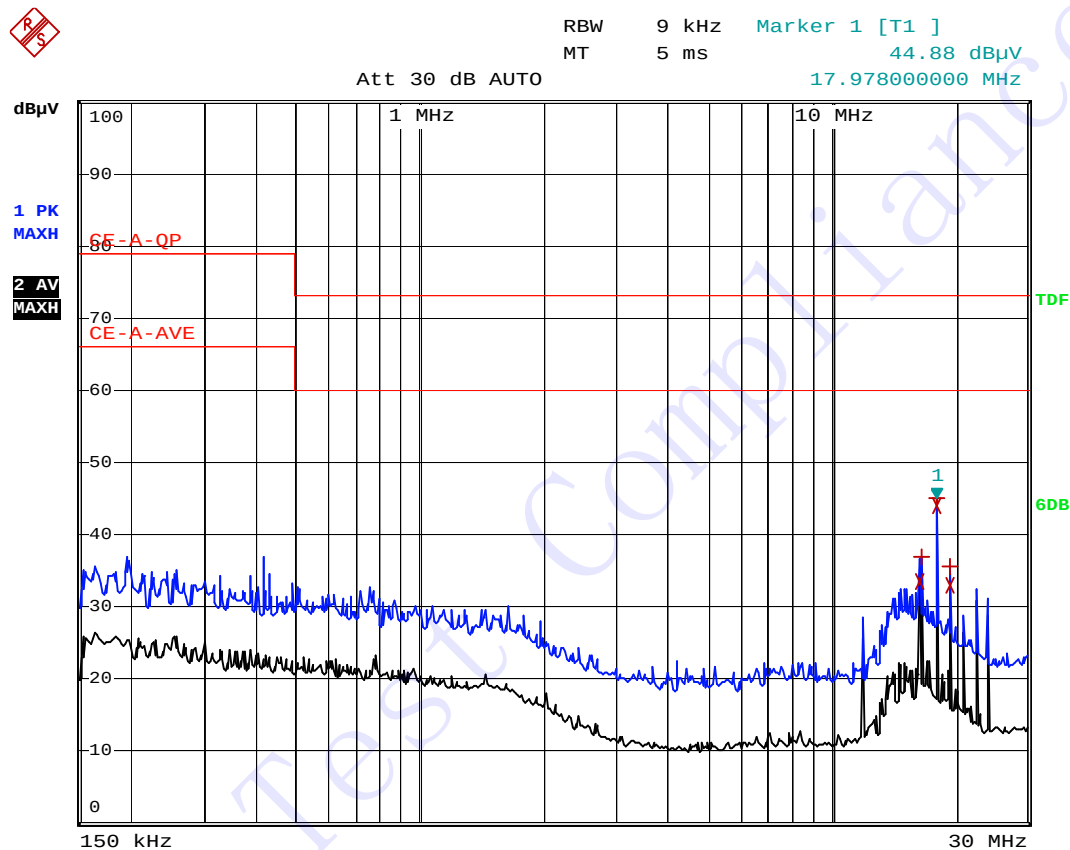


EDIT PEAK LIST (Prescan Results)			
Trace1:	CE-A-QP		
Trace2:	CE-A-AVE		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV	DELTA LIMIT dB
1 Max Peak	158 kHz	53.59	-25.40
2 Average	17.246 MHz	49.70	-10.29
1 Max Peak	17.822 MHz	51.86	-21.13
2 Average	17.822 MHz	50.00	-9.99
2 Average	20.122 MHz	45.65	-14.34
1 Max Peak	20.698 MHz	48.76	-24.24

Plot of Conducted Emissions Test Data

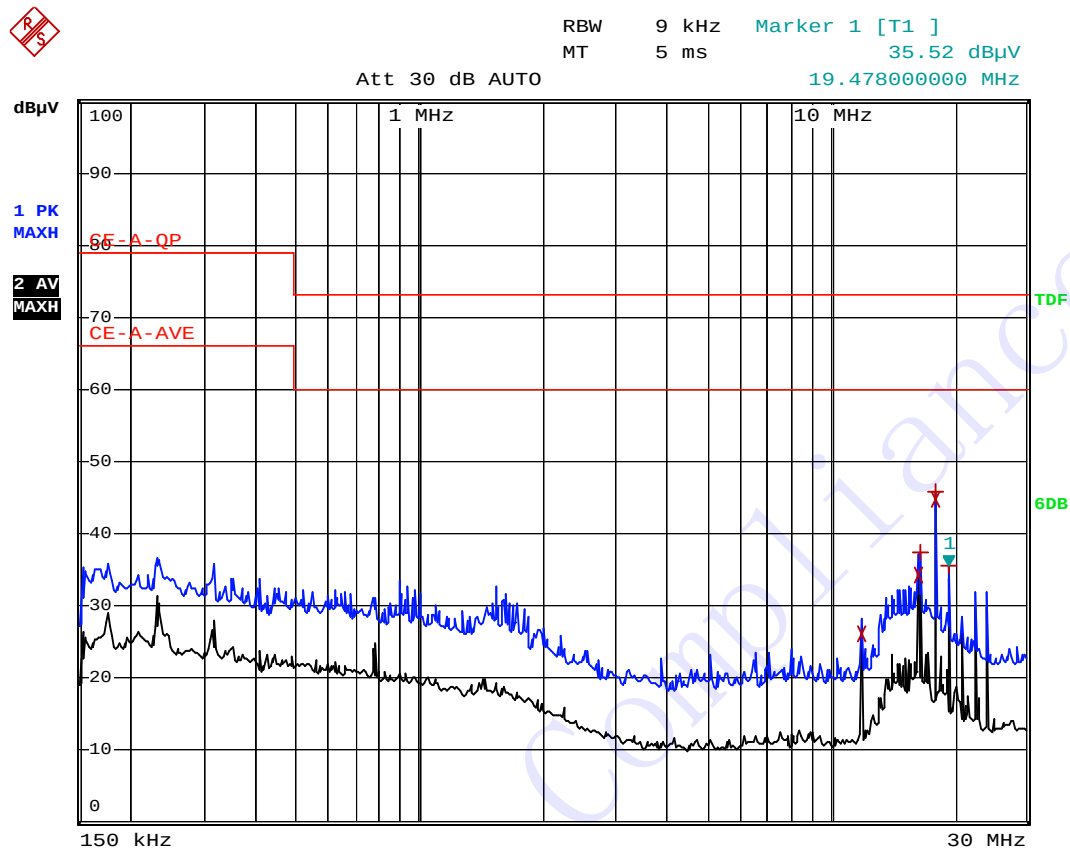
EUT: 5 Bay Lithium-Ion Battery Charger
Tested Model: GT-93023-12012
Operating Condition: TM1(Empty Load)
Comment: AC 120V/60Hz; Adapter DC 24V

Test Specification: Line



EDIT PEAK LIST (Prescan Results)				
Trace1:	CE-A-QP			
Trace2:	CE-A-AVE			
Trace3:	---			
	TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
2	Average	16.478 MHz	33.48	-26.51
1	Max Peak	16.482 MHz	36.91	-36.09
1	Max Peak	17.978 MHz	44.88	-28.11
2	Average	17.978 MHz	44.00	-15.99
2	Average	19.478 MHz	32.92	-27.07
1	Max Peak	19.478 MHz	35.44	-37.56

Test Specification: Neutral



EDIT PEAK LIST (Prescan Results)			
Trace1:	CE-A-QP		
Trace2:	CE-A-AVE		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV	DELTA LIMIT dB
2 Average	11.986 MHz	26.08	-33.91
2 Average	16.478 MHz	34.32	-25.67
1 Max Peak	16.482 MHz	37.35	-35.64
1 Max Peak	17.978 MHz	45.73	-27.26
2 Average	17.978 MHz	44.87	-15.12
1 Max Peak	19.478 MHz	35.51	-37.48

4. Radiated Disturbance

4.1 Measurement Uncertainty

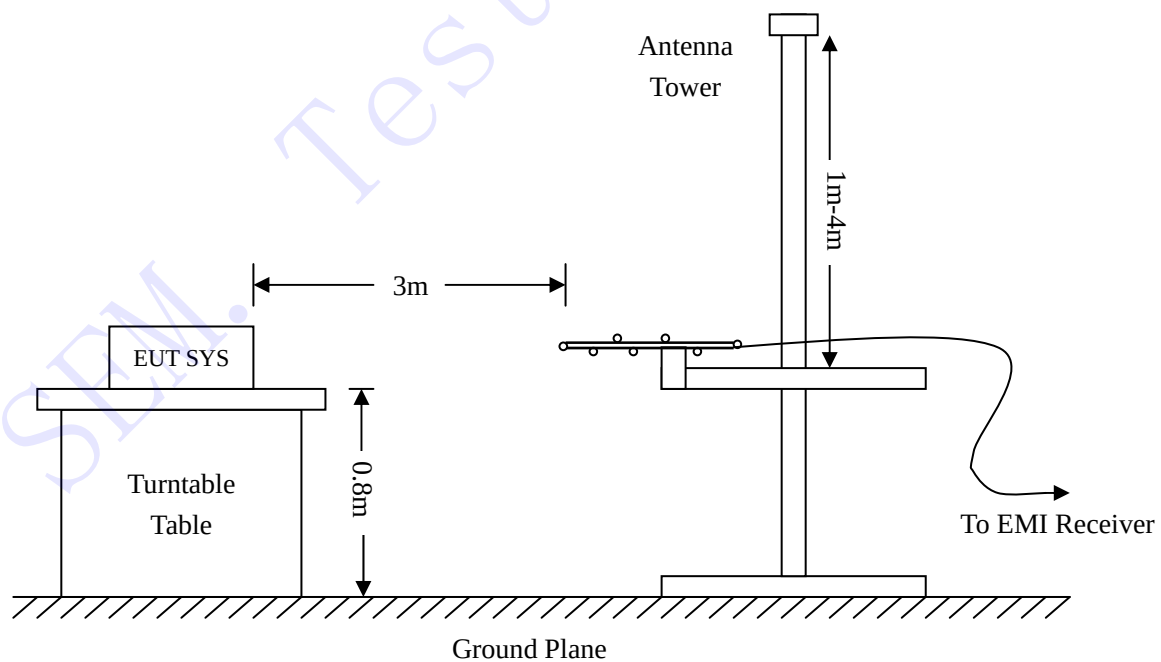
Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any radiation emissions measurement is ± 5.10 dB.

4.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2013-05-07	2014-05-06
EMI Test Receiver	R&S	ESVB	825471/005	2013-05-07	2014-05-06
Pre-amplifier	Agilent	8447F	3113A06717	2013-05-07	2014-05-06
Pre-amplifier	Compliance Direction	PAP-0118	24002	2013-05-07	2014-05-06
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2013-04-20	2014-04-19
Horn Antenna	ETS	3117	00086197	2013-04-20	2014-04-19

4.3 Test Procedure

Test is conducting under the description of CISPR 22 Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement.



4.4 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dB μ V means the emission is 6dB μ V below the maximum limit for Class A device. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{CISPR 22 Class A Limit}$$

4.5 Environmental Conditions

Temperature:	23° C
Relative Humidity:	53%
ATM Pressure:	1011 mbar

4.6 Summary of Test Results/Plots

According to the data in section 4.6, the EUT complied with the CISPR 22 Class A standards, and had the worst margin is:

-1.92 dB at 193.7728 MHz in the, **Horizontal** polarization, **TM1(Half Load)** Model, **30 MHz to 1 GHz**,
3Meters

Plot of Radiated Emissions Test Data

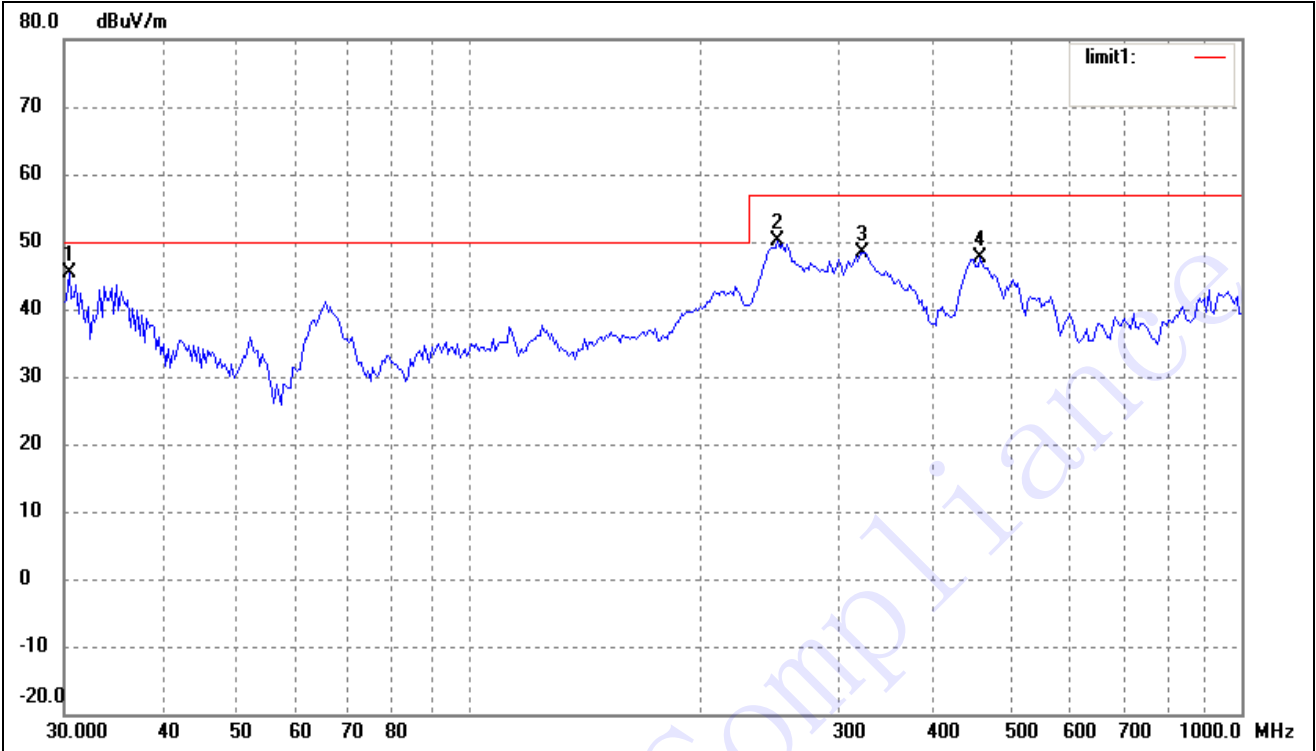
EUT: 5 Bay Lithium-Ion Battery Charger
Tested Model: GT-93023-12012
Operating Condition: TM1(Full Load)
Comment: AC 120V/60Hz; Adapter DC 24V

Test Specification: Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	193.7728	41.60	4.37	45.97	50.00	-4.03	360	100	peak
2	215.2678	42.09	5.62	47.71	50.00	-2.29	360	100	peak
3	254.7284	47.03	7.48	54.51	57.00	-2.49	360	100	peak
4	321.0608	44.15	10.46	54.61	57.00	-2.39	360	100	peak

Test Specification: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	30.4238	37.34	8.11	45.45	50.00	-4.55	360	100	peak
2	251.1804	42.71	7.34	50.05	57.00	-6.95	360	100	peak
3	323.3204	38.02	10.41	48.43	57.00	-8.57	360	100	peak
4	459.1144	35.81	11.77	47.58	57.00	-9.42	360	100	peak

Plot of Radiated Emissions Test Data

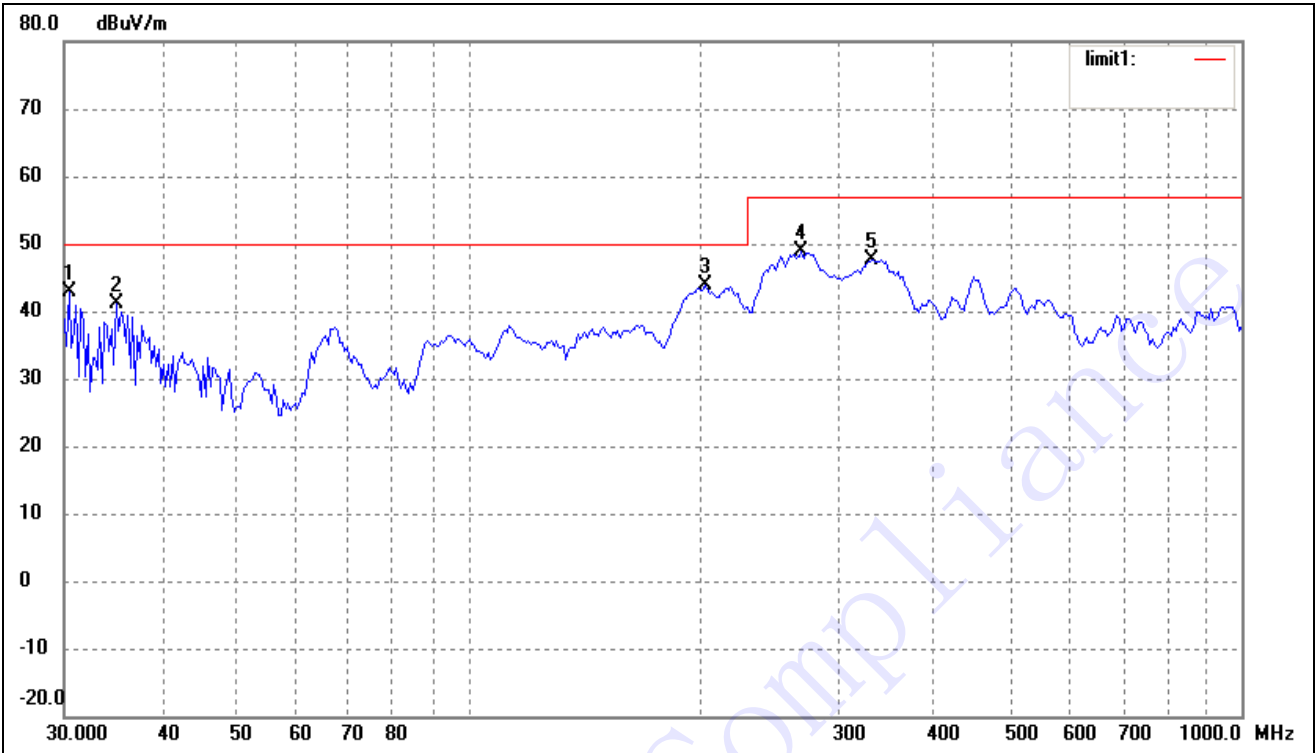
EUT: 5 Bay Lithium-Ion Battery Charger
Tested Model: GT-93023-12012
Operating Condition: TM1(Half Load)
Comment: AC 120V/60Hz; Adapter DC 24V

Test Specification: Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	193.7728	43.71	4.37	48.08	50.00	-1.92	360	100	peak
2	215.2678	41.50	5.62	47.12	50.00	-2.88	254	100	QP
3	227.6906	40.60	6.33	46.93	50.00	-3.07	331	100	QP
4	275.1570	44.96	8.88	53.84	57.00	-3.16	360	100	peak
5	323.3204	42.13	10.41	52.54	57.00	-4.46	360	100	peak

Test Specification: Vertical

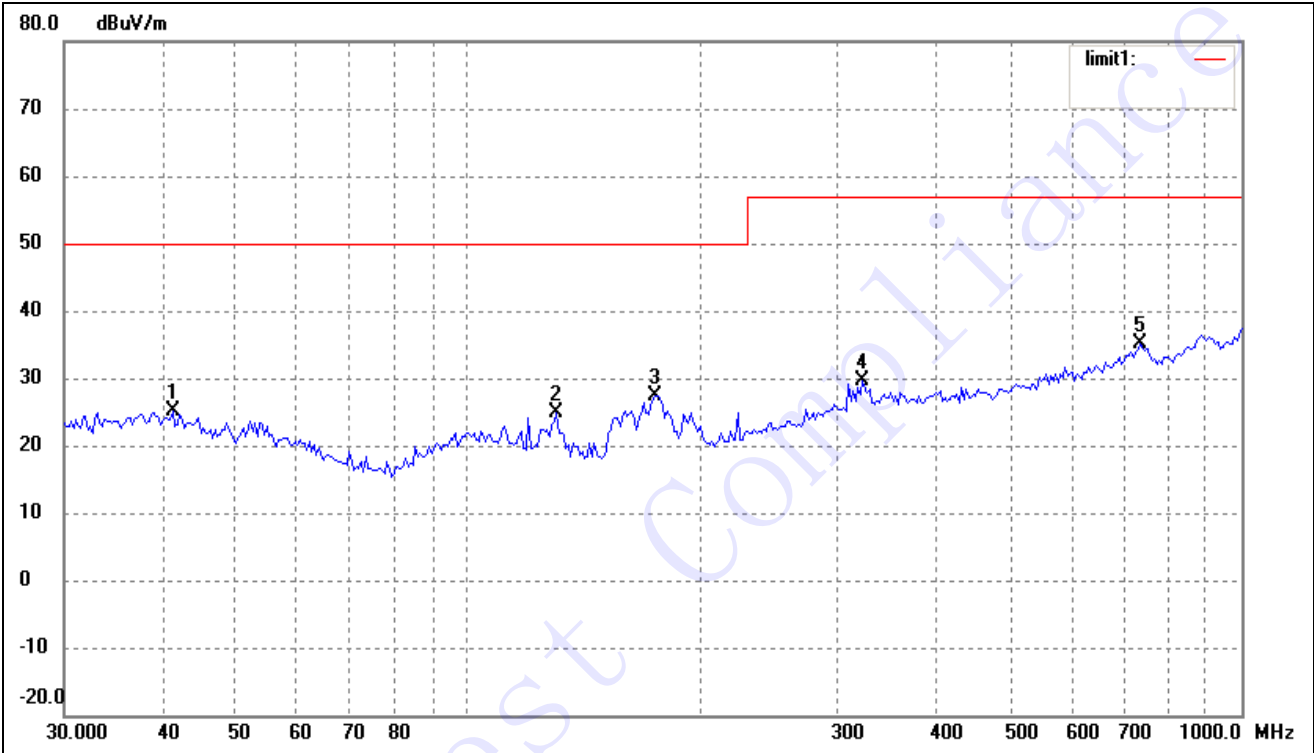


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	30.4238	34.66	8.11	42.77	50.00	-7.23	360	100	peak
2	35.0048	32.37	8.88	41.25	50.00	-8.75	360	100	peak
3	202.1005	39.03	4.78	43.81	50.00	-6.19	360	100	peak
4	269.4284	40.39	8.43	48.82	57.00	-8.18	360	100	peak
5	332.5187	37.51	10.24	47.75	57.00	-9.25	360	100	peak

Plot of Radiated Emissions Test Data

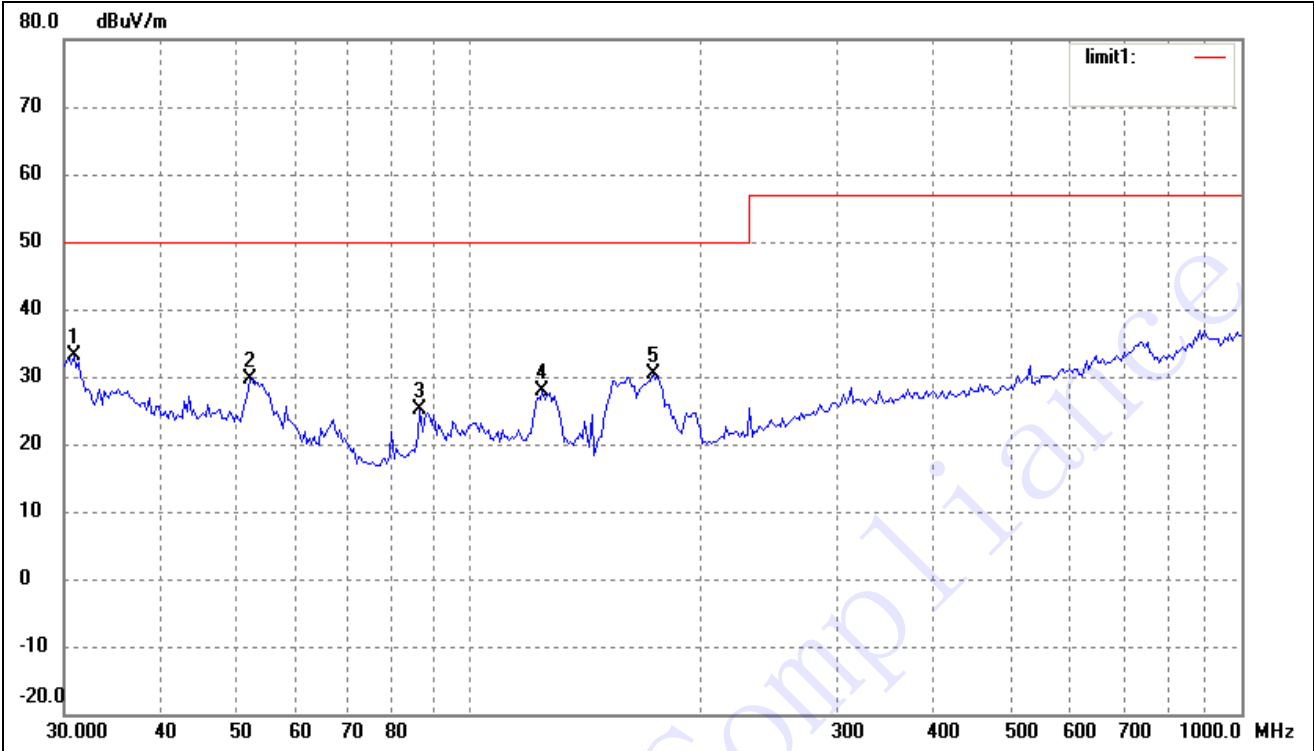
EUT: 5 Bay Lithium-Ion Battery Charger
Tested Model: GT-93023-12012
Operating Condition: TM1(Empty Load)
Comment: AC 120V/60Hz; Adapter DC 24V

Test Specification: Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	41.4215	15.89	9.24	25.13	50.00	-24.87	360	100	peak
2	129.9226	20.69	4.13	24.82	50.00	-25.18	360	100	peak
3	174.4241	23.61	3.72	27.33	50.00	-22.67	360	100	peak
4	323.3204	19.13	10.41	29.54	57.00	-27.46	360	100	peak
5	739.6605	17.00	18.07	35.07	57.00	-21.93	360	100	peak

Test Specification: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	30.8535	25.06	8.19	33.25	50.00	-16.75	360	100	peak
2	52.2079	23.21	6.42	29.63	50.00	-20.37	360	100	peak
3	86.5029	21.73	3.47	25.20	50.00	-24.80	360	100	peak
4	124.5690	23.38	4.53	27.91	50.00	-22.09	360	100	peak
5	173.2051	26.67	3.72	30.39	50.00	-19.61	360	100	peak

EXHIBIT 1- PRODUCT LABELING

Proposed CE Label Format

Canada	Model: GT-93023-12012
ICES-003	
This Class [A] digital apparatus complies with Canadian ICES-003. Cet appareil numérique de la classe [A] est conforme à la norme NMB-003 Du Canada.	

Specifications: Text is Black in color and is justified. Labels are printed in indelible ink on permanent adhesive backing or silk-screened onto the EUT or shall be affixed at a conspicuous location on the EUT.

Proposed Label Location on EUT



EXHIBIT 2 - EUT PHOTOGRAPHS

EUT View 1



EUT View 2



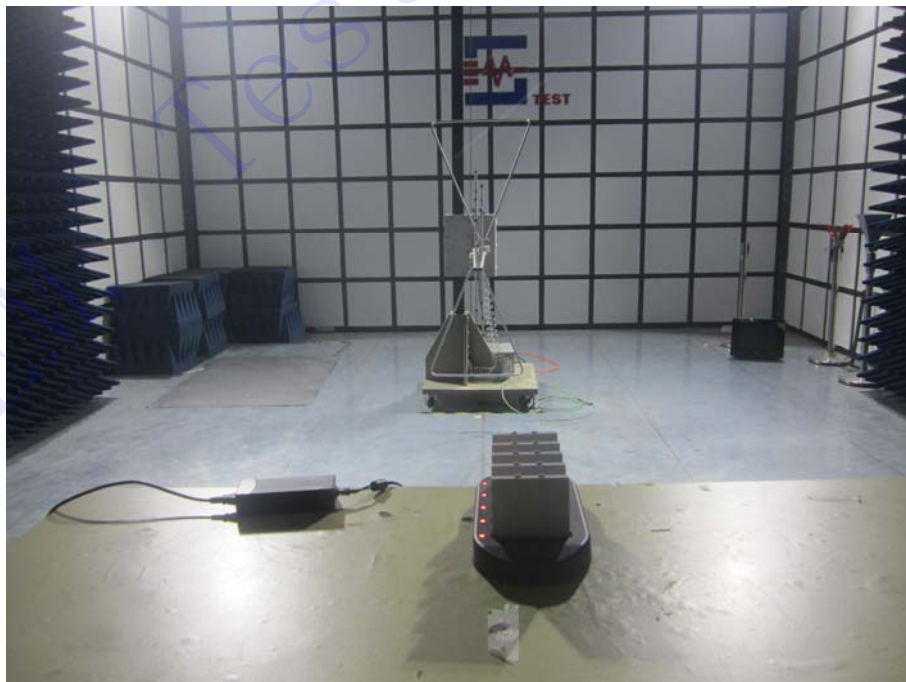
EUT View 3**EUT View 4**

EXHIBIT 3 - TEST SETUP PHOTOGRAPHS

Conduction Emission Test View



Radiation Emission Test View



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