SAMEER

Certificate No. T-0464

S-CEM/EMCD/TR/2016-2017/320

EMI/EMC TEST REPORT FOR EDUCATIONAL TOY-PHIRO PRO/UNPLUGGED MANUFACTURED BY M/s. DIGIVISION ELECTRONICS LTD., CHENNAI

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October 2016

EMI/EMC TEST REPORT FOR EDUCATIONAL TOY-PHIRO PRO/UNPLUGGED MANUFACTURED BY M/s. DIGIVISION ELECTRONICS LTD., CHENNAI

Test Request Particulars

1.	Test Request From	:	M/s. Digivision Electronics Ltd., Chennai
2.	Equipment Under Test (EUT)	:	Educational toy- Phiro Pro/ Unplugged
3.	Number of Test Sample(s)	:	One
4.	Type of Tests Requested *(Applicable Standard)*	:	Conducted Emission Test as per FCC part15 B, 2005 and as per customer's request
5.	Manufacturer	:	M/s. Digivision Electronics Ltd., Chennai
6.	Model Number of EUT	:	Phiro Pro
7.	Serial Number of EUT	:	Phiro 00 0001
8.	Test plan concurred by *(Customer Representative)*	:	Mr.A. Harish, Technical Engineer. Digivision Electronics Ltd., Chennai
9.	EUT Arrived On	:	October 27, 2016
10.	Tested On	:	October 27, 2016
11.	Test Venue	:	SAMEER-CEM, Chennai
12.	Status of the EUT on Receipt	:	Functional

Certified that the data reported in this report are valid only for the test sample mentioned above at the time of and under the stated conditions of measurement. Particulars on Manufacturer / Supplier, given in this report, are based on the information given by the customer, along with test request and SAMEER-CEM does not assume any responsibility for the correctness of that information for the above mentioned equipment under test.

Test Plan & Reviewed by:

(J. Thomas Vethamoni)
Scientist - B

Authorized Signatory:

(Dr. Sanjay Baisakhiya)
Scientist - E

Office Seal

SAMEER CENTRE FOR ELECTROMAGNETICS
SAMEER
31 OCT 2016
Ministry of Communications & Information Technology Department of Information Technology, Govt. of India
IIT CAMPUS, TARAMANI, CHENNAI-600 113

EMI/EMC TEST RESULTS AND SUMMARY FOR EDUCATIONAL TOY-PHIRO PRO/UNPLUGGED

EMC EMISSION TEST AND RESULTS

Name of the Test	Basic Standard	AC/DC/ Signal Port/Enclosure	Specification	Test Observations
Conducted Emission	FCC part15 B	5V DC Power port	Quasi Peak 150 kHz -500 kHz : 66- 56* dBµV 500 kHz -5 MHz : 56 dBµV 5 MHz -30 MHz : 60 dBµV Average 150 kHz -500 kHz : 56- 46* dBµV 500 kHz -5 MHz : 46 dBµV 5 MHz -30 MHz : 50 dBµV	Within the limits

*Note: * The Limit decreases linearly with the logarithm of the frequency.*

1. CONDUCTED EMISSION TEST

1.1 Applicable Standard: Test limit level as per FCC part15 B, 2005
Test procedure as per customer's request

1.2 Test Instrumentation:

Description	Make	Model Number	Serial Number	Cal. Date	Cal. Due Date
EMI Receiver	R&S	ESCS-30	100063	10/05/2016	10/05/2017
Artificial Mains Network (LISN - 50µH/50Ω)	Solar Electronics	9247-50-TS-50-N	112514,112515	21/06/2016	21/06/2018
Transient Limiter	Agilent	11947A	3107A03845	31/05/2016	31/05/2018

1.3 Test Frequency Range and Limits:

Frequency (MHz)	Quasi-peak limits (dBµV)	Average limits (dBµV)
0.15 - 0.5	66 - 56*	56 - 46*
0.5 - 5	56	46
5 - 30	60	50

Note: * *The Limit decreases linearly with the logarithm of the frequency.*

1.4 EUT Configuration: Given in Annexure-1.

1.5 Test Procedure:

The RF Conducted Emissions from the EUT sent back to the mains input were coupled using the Line Impedance Stabilization Network and measured using the Electromagnetic Interference (EMI) Receiver. The measurement was done initially in peak and average detection modes and wherever the emission was closer to the limit line, final quasi peak and average detection mode was employed. The measurement was carried out in the frequency range of 150 kHz to 30 MHz.

***Note:* Since this EUT shall not be supplied along with an AC/DC adapter, this was done at DC mode as per customer's request.**

1.6 Test Observation:

The RF Conducted Emissions from the EUT were observed to be within the limit of FCC part15 B in the test frequency range of 150 kHz to 30 MHz.

Table – 1: Positive

Frequency (MHz)	Quasi-Peak (dBµV)	Margin (dB)	Limit (dBµV)	Test Observation
3.386000	13.1	42.9	56.0	Within the Limit
4.658000	14.3	41.7	56.0	Within the Limit

Table – 2: Positive

Frequency (MHz)	Average (dBµV)	Margin (dB)	Limit (dBµV)	Test Observation
0.774000	5.9	40.1	46.0	Within the Limit
3.338000	10.6	35.4	46.0	Within the Limit
4.306000	17.0	29.0	46.0	Within the Limit
4.354000	18.4	27.6	46.0	Within the Limit
4.402000	18.7	27.3	46.0	Within the Limit
4.450000	17.6	28.4	46.0	Within the Limit
4.474000	10.9	35.1	46.0	Within the Limit
4.498000	16.1	29.9	46.0	Within the Limit
4.658000	8.0	38.0	46.0	Within the Limit
7.302000	14.3	35.7	50.0	Within the Limit
17.834000	7.2	42.8	50.0	Within the Limit

Table – 3: Negative

Frequency (MHz)	Quasi-Peak (dBµV)	Margin (dB)	Limit (dBµV)	Test Observation
0.522000	9.7	46.3	56.0	Within the Limit
1.066000	11.3	44.7	56.0	Within the Limit
2.030000	11.9	44.1	56.0	Within the Limit
3.290000	16.3	39.7	56.0	Within the Limit
4.306000	23.1	32.9	56.0	Within the Limit
4.354000	24.7	31.3	56.0	Within the Limit
4.402000	25.3	30.7	56.0	Within the Limit
4.450000	25.2	30.8	56.0	Within the Limit
4.498000	24.9	31.1	56.0	Within the Limit
4.546000	23.5	32.5	56.0	Within the Limit
4.666000	22.6	33.4	56.0	Within the Limit
6.530000	19.6	40.4	60.0	Within the Limit
12.498000	14.6	45.4	60.0	Within the Limit

Table – 4: Negative

Frequency (MHz)	Average (dBµV)	Margin (dB)	Limit (dBµV)	Test Observation
0.194000	14.5	39.4	53.9	Within the Limit
0.726000	7.5	38.5	46.0	Within the Limit
1.114000	7.5	38.5	46.0	Within the Limit
2.078000	7.7	38.3	46.0	Within the Limit
3.338000	14.3	31.7	46.0	Within the Limit
4.258000	18.7	27.3	46.0	Within the Limit
4.306000	21.7	24.3	46.0	Within the Limit
4.354000	23.6	22.4	46.0	Within the Limit
4.402000	24.4	21.6	46.0	Within the Limit
4.450000	23.6	22.4	46.0	Within the Limit
4.478000	19.8	26.2	46.0	Within the Limit
4.498000	21.7	24.3	46.0	Within the Limit
4.546000	19.8	26.2	46.0	Within the Limit
4.594000	18.9	27.1	46.0	Within the Limit
4.666000	20.5	25.5	46.0	Within the Limit
7.302000	16.8	33.2	50.0	Within the Limit
12.138000	10.7	39.3	50.0	Within the Limit
27.522000	8.5	41.5	50.0	Within the Limit

1.7 Enclosed Documents:

Plots -1 & 2 : Conducted Emission from EUT.
Annexure – 2 : Photograph of EUT and Conducted Emission Test Setup.

Test Conducted by:

(Nandhini R.)
Research Scientist

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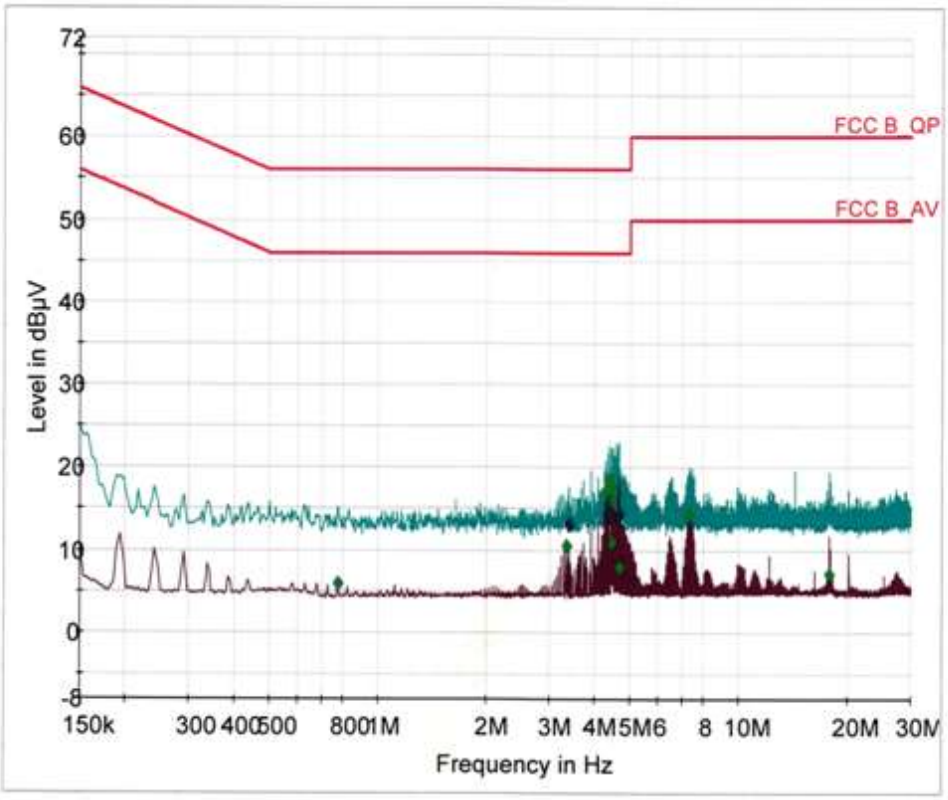
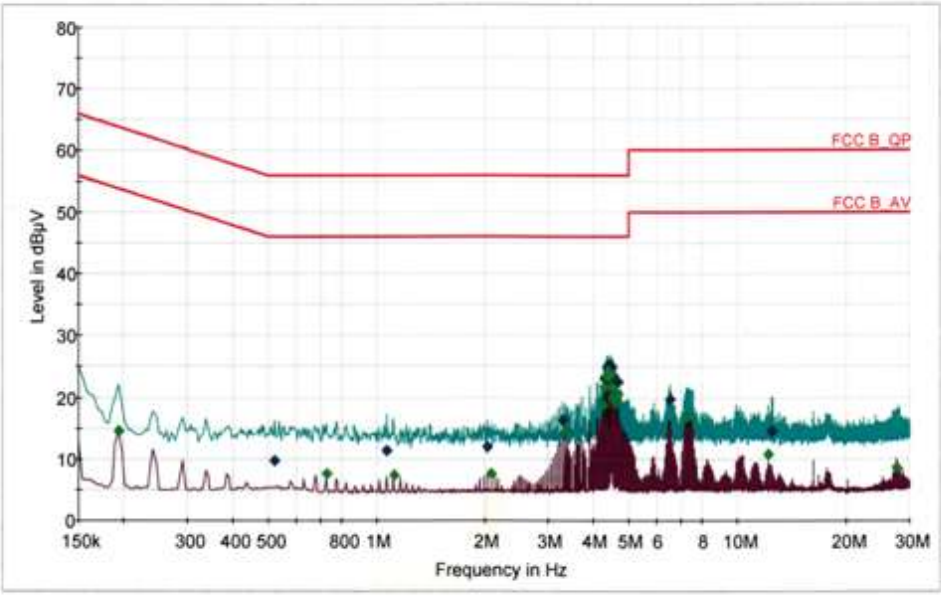
PLOT-1



Conducted Emission - Positive

PLOT-2



Conducted Emission - Negative

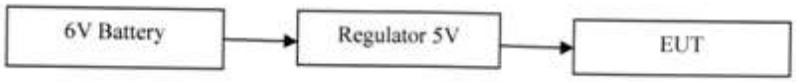
Annexure – 1

(Given by Customer)

EUT Description:
Phiro is an educational toy used to learn programming in a graphical manner.

EUT Configuration:
EUT was powered by 5V battery. 6V battery is step down into 5V and given to the EUT. Conducted Emission test was carried out in charging mode.

Block Diagram of the EUT



Block Diagram of the EUT