



TEST REPORT

Applicant Name & Address : Eaglerise Electronics (Foshan) Co., Ltd.
 No. 4, East Huanzhen Road, Beijiao, Shunde, Foshan, Guangdong, 528000,
 China

Manufacturing Site : Same as applicant

Sample Description

Product : Electronic controlgear for LED (Electronic LED driver)

Model No. : EIP016C****LS

Remark:
 The 1st to 4th "*" indicate the output current of LED driver; can be replaced by
 "0350" to "1400" and increasing in multiplies of 50. "0350" means 350 mA;
 "1400" means 1400 mA.

Electrical Rating : Input: 220-240 VAC; 50/60 Hz; 0,15 A; Class II; IP 20; SELV;
 ta 50 °C; tc 80 °C; Independent type; 110 °C thermal protection;
 Inherently short-circuit proof; Output: Constant current type for output; MM
 mark;
 Suitable for direct mounting on normally flammable surfaces;
 Other parameters refer to appendix for model list in test report.

Date Received : 21 June 2012

Date Test Conducted : 09 July 2012 – 11 July 2012

Test standards : EN 62493: 2010

Test Result : Pass


Conclusion : The submitted samples complied with the above light EMF standard.

Remark : When determine the test result, measurement uncertainty has been considered.
 *****End of Page*****

Prepared and Checked By:

Approved By:

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14 Aug., 2012 Date

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1

TEST RESULTS SUMMARY

Test Item	Standard	Result
Disturbance Voltage on Mains Terminals (20kHz-30MHz)	EN 62493: 2010 Reference: EN 55015: 2006+A1:2007+A2:2009	Pass
Radiated Electromagnetic Disturbance (100kHz-30MHz)	EN 62493: 2010 Reference: EN 55015: 2006+A1:2007+A2:2009	Pass
Radiated Electromagnetic Disturbance (30-300MHz)	EN 62493: 2010 Reference: EN 55015: 2006+A1:2007+A2:2009	Pass
Induced Current Density (20kHz-10MHz)	EN 62493: 2010	Pass

Remark: 1. The symbol "N/A" in above table means Not Applicable.

2. When determining the test results, measurement uncertainty of tests has been considered.

2**EMF Results Conclusion**
(with Justification)

We tested the Electronic controlgear for LED (Electronic LED driver), Model:EIP016C1400LS, EIP016C0600LS, EIP016C0350LS, to determine if they were in compliance with the relevant EN standards as marked on the Test Results Summary. We found that the units met the requirement of EN 62493 standard when tested as received. The worst case's test data was presented in this test report.

All models had the same mechanical structure, output load, PCB layout; the only deference is the parameters for the components used in secondary circuit. Model: EIP016C1400LS, EIP016C0600LS, EIP016C0350LS were selected to do the full tests based on above statement.

The production units are required to conform to the initial sample as received when the units are placed on the market.

3

LABORATORY MEASUREMENTS**Configuration Information**

Equipment Under Test (EUT):	Electronic controlgear for LED (Electronic LED driver)
Model:	EIP016C1400LS, EIP016C0600LS, EIP016C0350LS
Serial No.	Not Labeled
Support Equipment:	N/A
Rated Voltage:	220-240V, 50/60Hz
Condition of Environment:	Temperature : 15~25°C Relative Humidity: 35~60% Atmosphere Pressure 86~106kPa

Notes:

The EMI measurements had been made in the operating mode produced the largest emission in the frequency band being investigated consistent with normal applications.

An attempt had been made to maximize the emission by varying the configuration of the EUT.

4 EMI TEST

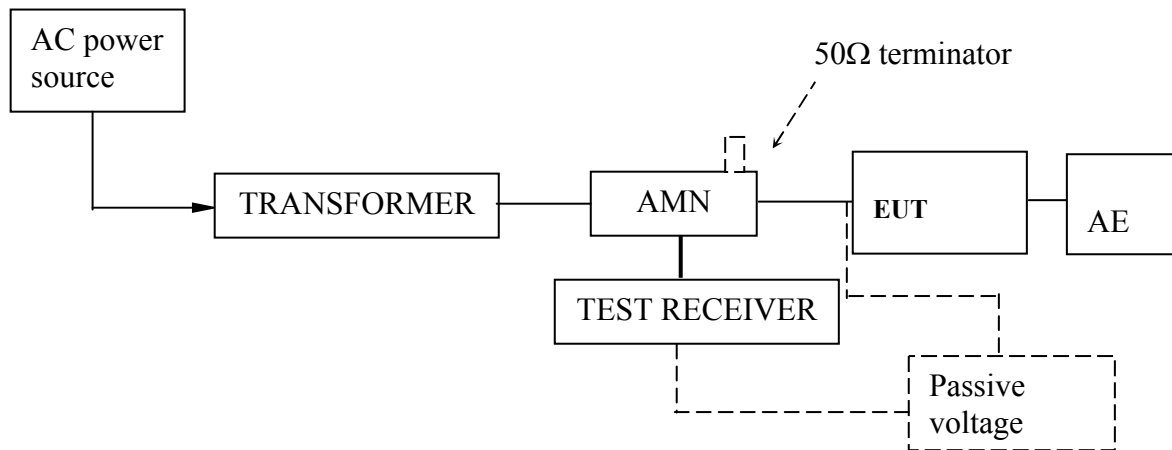
4.1 Disturbance Voltage on Mains Terminals (20 kHz-30 MHz)

Test Result: Pass

4.1.1 Used Test Equipment

Equipment No.	Equipment	Model	Manufacturer
EM080-05	EMI receiver	ESCI	R&S
EM006-05	LISN	ENV216	R&S
EM004-04	EMC shield Room	8m×3m×3m	Zhongyu

4.1.2 Block Diagram of Test Setup



4.1.3 Test Setup and Procedure

The EUT was set to achieve the maximum emission level. The mains terminal disturbance voltage was measured with the EUT in a shielded room. The EUT was connected to AC power source through an Artificial Mains Network which provide a 50Ω linear impedance. Artificial hand is used if appropriate (for handheld apparatus). The load/control terminal disturbance voltage was measured with passive voltage probe if appropriate.

The EUT was placed on a 0.4m high non-metallic table above a metallic plane, and 0.4m from wall of shielded room which is considered as Ground Reference Plane (GRP) (For floor standing EUT, was placed on a 0.1m high non-metallic supported on GRP) The EUT keeps a distance of at least 0.8m from any other of the metallic surface. The Artificial Mains Network is situated at a distance of 0.8m from the EUT.

During the test, mains lead of EUT excess 0.8m was folded back and forth parallel to the lead so as to form a horizontal bundle with a length between 0.3m and 0.4m.

The bandwidth of test receiver was set at 200Hz in the frequency range from 20kHz to 150kHz, and 9kHz in the frequency range from 150kHz to 30MHz.

4.1.4 Test Data

At main terminal: Pass

Model: EIP016C1400LS

Tested Wire: Live

Operation Mode: on mode

Frequency [MHz]	Quasi-Peak		Average	
	Disturbance level [dB(μV)]	Permitted limit [dB(μV)]	Disturbance level [dB(μV)]	Permitted limit [dB(μV)]
0.020	<60	110.0	--	--
0.050	<50	90.0	--	--
0.100	<50	83.7	--	--
0.160	<40	65.5	<30	55.5
0.240	<40	62.1	<30	52.1
0.550	<40	56.0	<30	46.0
1.000	<40	56.0	<30	46.0
1.400	<40	56.0	<30	46.0
2.000	<40	56.0	<30	46.0
3.500	<40	56.0	<30	46.0
6.000	<40	60.0	<30	50.0
10.000	<40	60.0	<30	50.0
22.000	<40	60.0	<30	50.0
30.000	<40	60.0	<30	50.0

Tested Wire: Neutral

Operation Mode: on mode

Frequency [MHz]	Quasi-Peak		Average	
	Disturbance level [dB(μV)]	Permitted limit [dB(μV)]	Disturbance level [dB(μV)]	Permitted limit [dB(μV)]
0.020	<60	110.0	--	--
0.050	<50	90.0	--	--
0.100	<50	83.7	--	--
0.160	<40	65.5	<30	55.5
0.240	<40	62.1	<30	52.1
0.550	<40	56.0	<30	46.0
1.000	<40	56.0	<30	46.0
1.400	<40	56.0	<30	46.0
2.000	<40	56.0	<30	46.0
3.500	<40	56.0	<30	46.0
6.000	<40	60.0	<30	50.0
10.000	<40	60.0	<30	50.0
22.000	<40	60.0	<30	50.0
30.000	<40	60.0	<30	50.0



Model: EIP016C0600LS

Tested Wire: Live

Operation Mode: on mode

EDIT PEAK LIST (Final Measurement Results)				
TRACE		FREQUENCY	LEVEL dB μ V	DELTA LIMIT dB
Trace1:	CE1511QP			
Trace2:	CE1511AV			
Trace3:	---			
2	Average	150 kHz	42.71 L1	-13.28
1	Quasi Peak	154 kHz	50.75 L1	-15.02
1	Quasi Peak	198 kHz	44.51 L1	-19.18
1	Quasi Peak	514 kHz	36.29 L1	-19.70
1	Quasi Peak	522 kHz	36.33 L1	-19.66
2	Average	16.03 MHz	25.16 L1	-24.83
1	Quasi Peak	19.738 MHz	42.82 L1	-17.17

Tested Wire: Neutral

Operation Mode: on mode

EDIT PEAK LIST (Final Measurement Results)				
TRACE		FREQUENCY	LEVEL dB μ V	DELTA LIMIT dB
Trace1:	CE1511QP			
Trace2:	CE1511AV			
Trace3:	---			
2	Average	150 kHz	38.44 L1	-17.55
1	Quasi Peak	510 kHz	35.28 L1	-20.71
1	Quasi Peak	526 kHz	35.63 L1	-20.36
1	Quasi Peak	2.346 MHz	39.14 L1	-16.85
2	Average	16.01 MHz	35.65 L1	-14.34
1	Quasi Peak	19.682 MHz	42.51 L1	-17.48



Model: EIP016C0350LS

Tested Wire: Live

Operation Mode: on mode

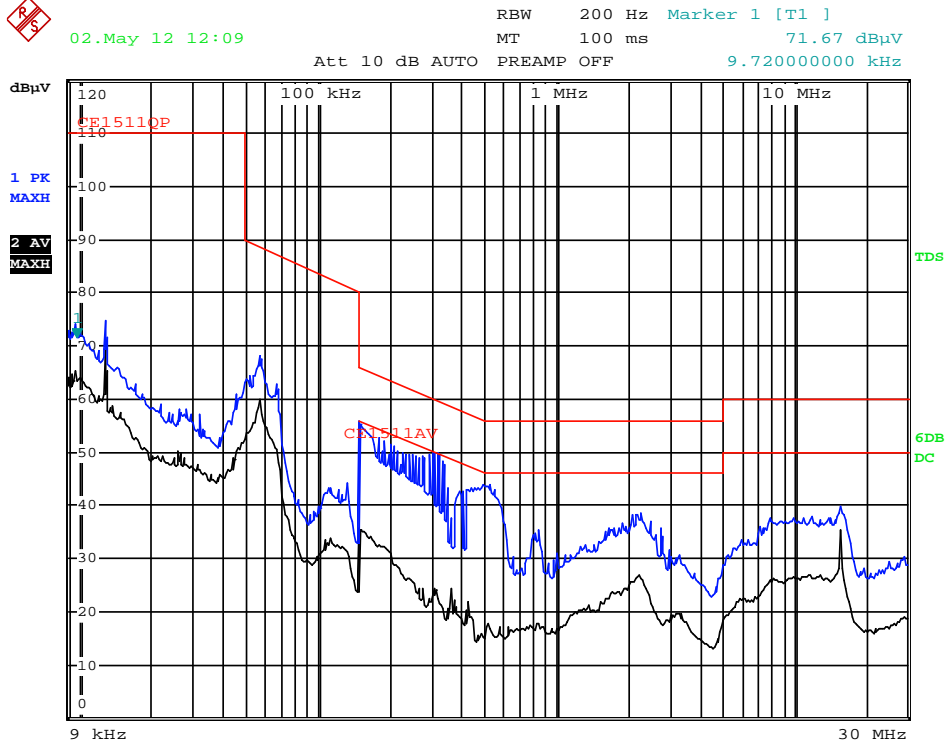
EDIT PEAK LIST (Final Measurement Results)				
Trace1:	CE1511QP			
Trace2:	CE1511AV			
Trace3:	---			
TRACE	FREQUENCY	LEVEL dBμV		DELTA LIMIT dB
1 Quasi Peak	154 kHz	50.02	L1	-15.75
2 Average	170 kHz	40.44	L1	-14.51
1 Quasi Peak	302 kHz	42.34	L1	-17.84
1 Quasi Peak	326 kHz	41.70	L1	-17.85
1 Quasi Peak	530 kHz	37.98	L1	-18.01
1 Quasi Peak	930 kHz	40.88	L1	-15.11
1 Quasi Peak	2.178 MHz	44.43	L1	-11.56
2 Average	2.178 MHz	36.93	L1	-9.06
2 Average	2.39 MHz	36.39	L1	-9.60
1 Quasi Peak	2.462 MHz	42.58	L1	-13.41
1 Quasi Peak	16.13 MHz	46.59	L1	-13.40
2 Average	16.13 MHz	43.17	L1	-6.82
1 Quasi Peak	24.746 MHz	42.57	L1	-17.42

Tested Wire: Neutral

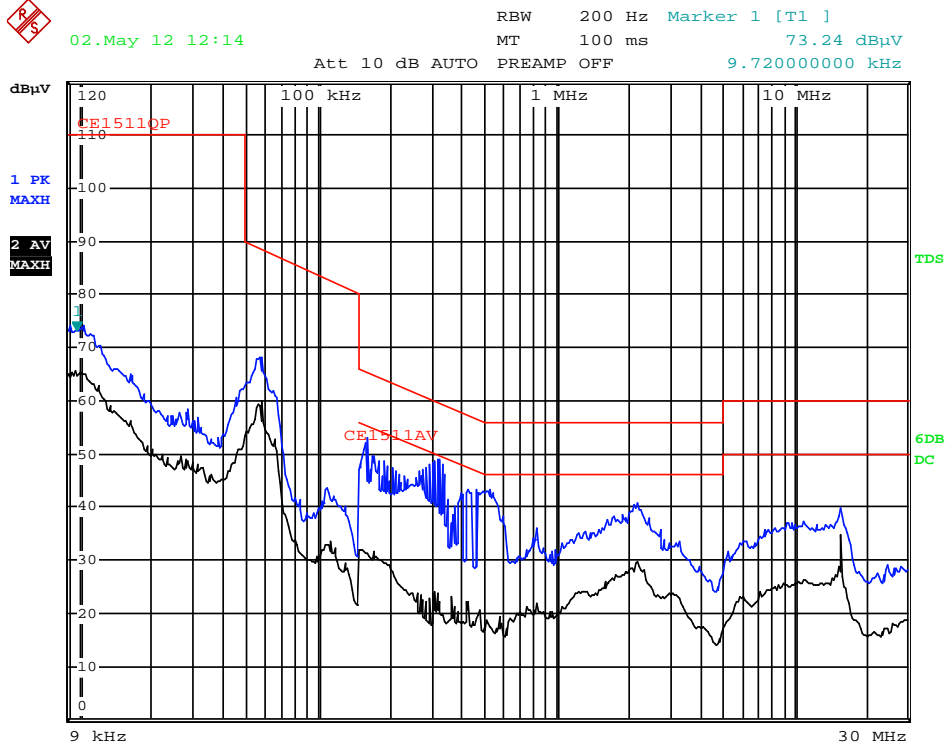
Operation Mode: on mode

EDIT PEAK LIST (Final Measurement Results)				
Trace1:	CE1511QP			
Trace2:	CE1511AV			
Trace3:	---			
TRACE	FREQUENCY	LEVEL dBμV		DELTA LIMIT dB
1 Quasi Peak	166 kHz	45.70	L1	-19.45
2 Average	166 kHz	36.66	L1	-18.49
1 Quasi Peak	306 kHz	40.39	L1	-19.68
1 Quasi Peak	410 kHz	41.40	L1	-16.23
1 Quasi Peak	522 kHz	37.73	L1	-18.26
1 Quasi Peak	930 kHz	38.46	L1	-17.53
2 Average	2.114 MHz	34.10	L1	-11.89
1 Quasi Peak	2.174 MHz	41.94	L1	-14.05
2 Average	2.382 MHz	34.12	L1	-11.87
1 Quasi Peak	2.562 MHz	39.02	L1	-16.97
1 Quasi Peak	10.762 MHz	40.02	L1	-19.97
1 Quasi Peak	16.146 MHz	37.76	L1	-22.23
2 Average	16.146 MHz	26.68	L1	-23.31
1 Quasi Peak	24.586 MHz	41.44	L1	-18.55
2 Average	25.11 MHz	35.71	L1	-14.29

4.1.5 Emission Curve
At mains terminal:
Model: EIP016C1400LS
Tested Wire: Live

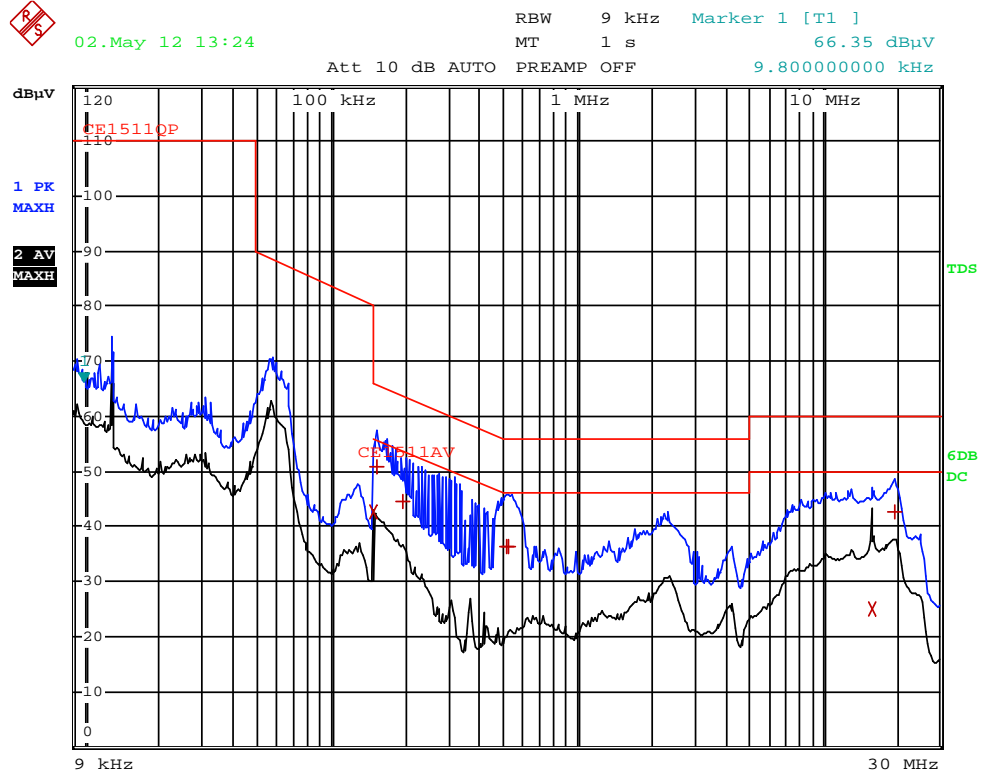


Tested Wire: Neutral

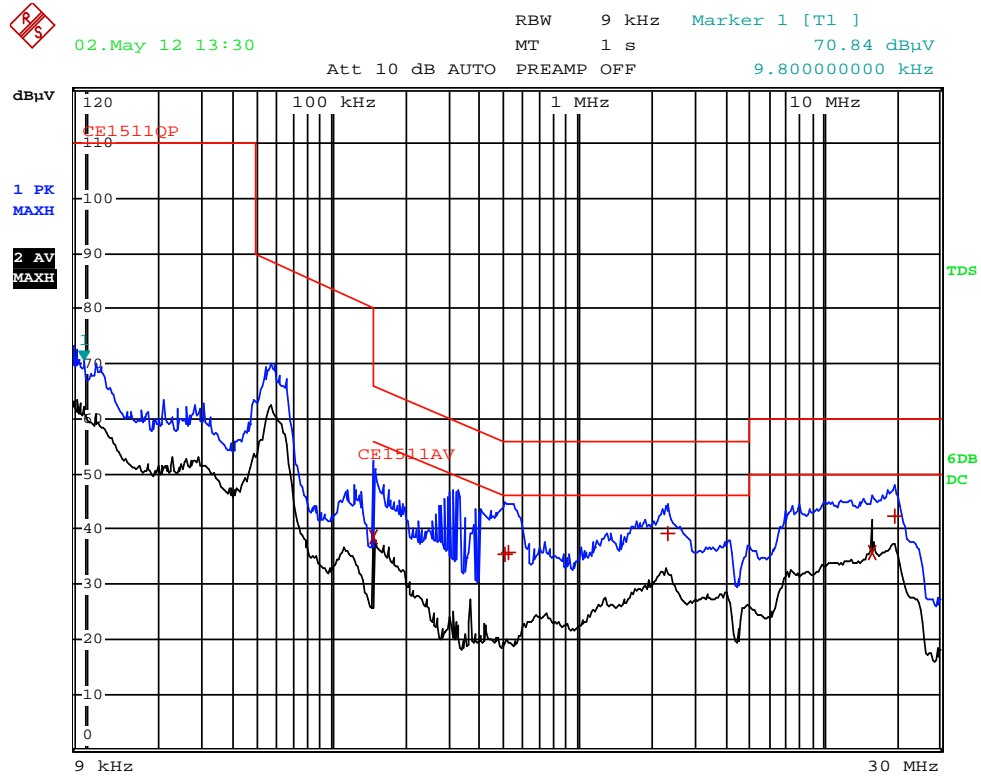


Model: EIP016C0600LS

Tested Wire: Live

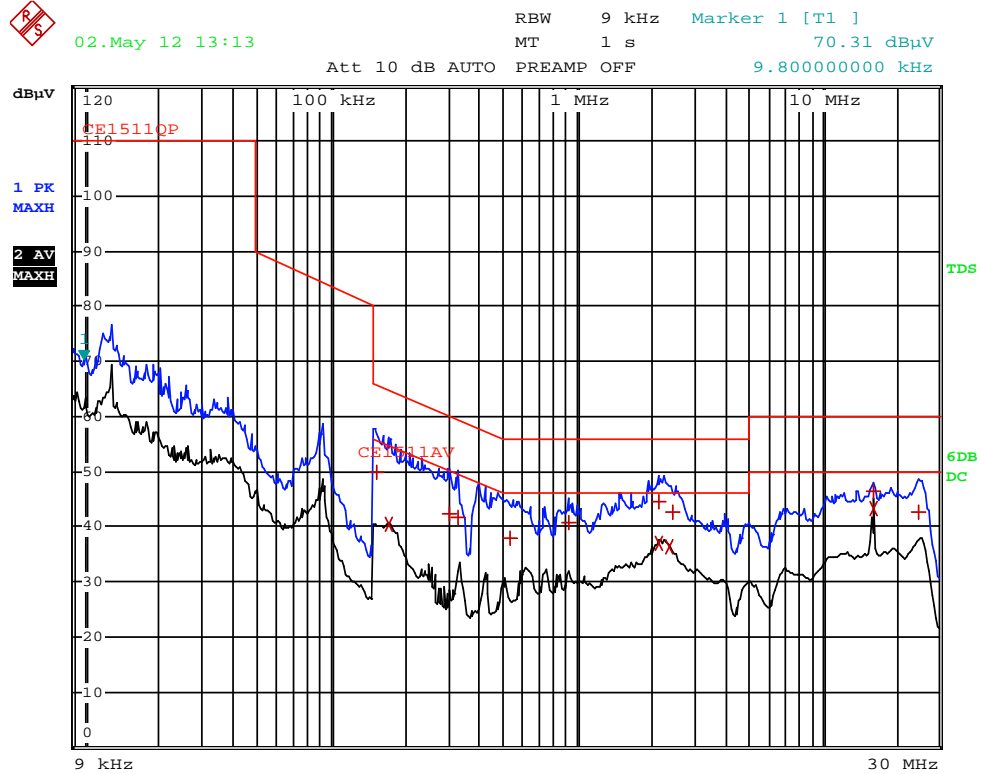


Tested Wire: Neutral

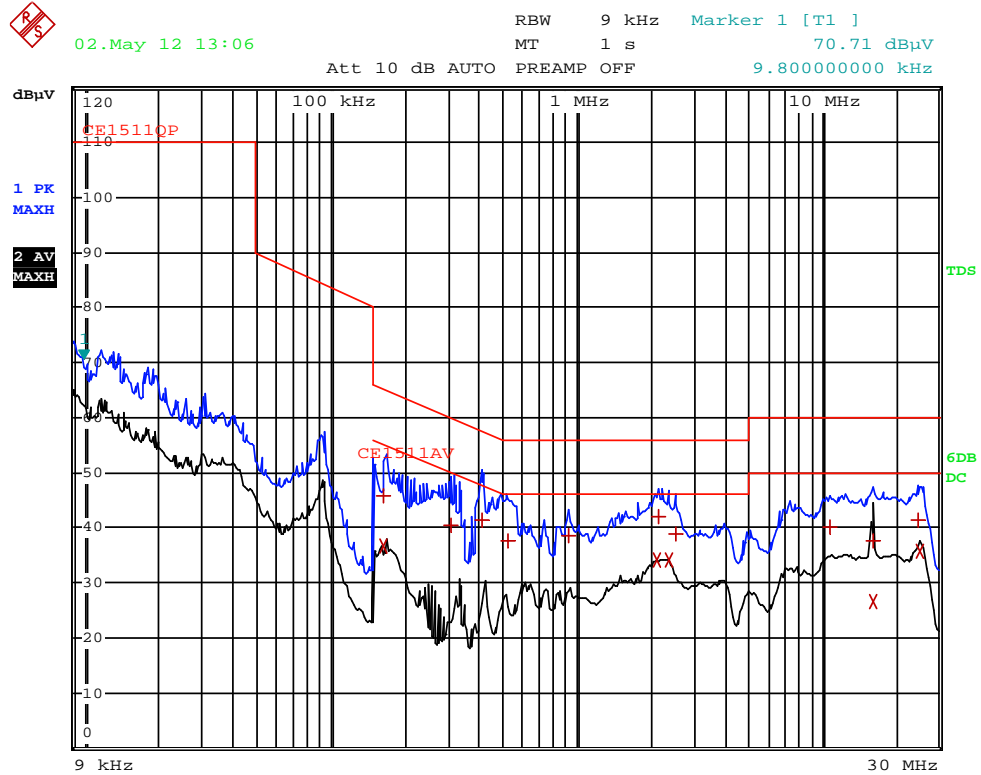


Model: EIP016C0350LS

Tested Wire: Live



Tested Wire: Neutral



4.1.6 Measurement Uncertainty

The measurement uncertainty describes the overall uncertainty of the given measured value during the operation of the EUT.

Measurement uncertainty is calculated in accordance with CISPR 16-4-2: 2003.

Measurement uncertainty of mains terminal disturbance voltage in CISPR band A: 1.6 dB.

Measurement uncertainty of mains terminal disturbance voltage in CISPR band B: 2.3 dB.

The measurement uncertainty is given with a confidence of 95%, $k=2$.

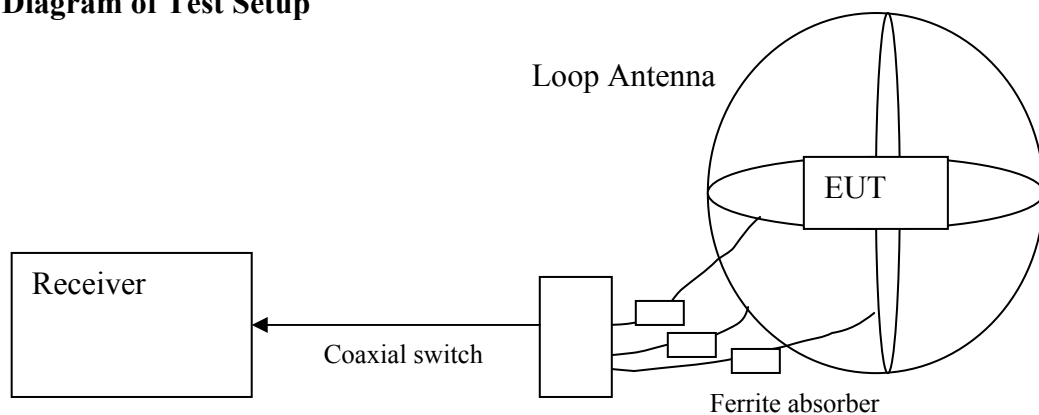
4.2 Radiated Electromagnetic Disturbance (100 kHz -30 MHz)

Test Result: Pass

4.2.1 Used Test Equipment

Equipment No.	Equipment	Model	Manufacturer
EM080-04	EMI receiver	ESCS30	R&S
EM061-04	Triple Loop Antenna	HXYZ9170	SCHWARZBECK
EM004-03	EMC shield Room	8m×4m×3m	Zhongyu

4.2.2 Block Diagram of Test Setup



4.2.3 Test Setup and Procedure

The EUT is placed in the centre of the loop antenna system(LAS). The current induced by the magnetic field from the EUT into each of the three large loop antennas of the LAS is measured by connecting the current probe of the large loop antenna to a measuring receiver. During the measurements the EUT remains in a fixed position.

The currents in the three large loop antenna, origination from the three mutually orthogonal magnetic field components, are measured in sequence. Each current level measured shall comply with the emission limit, expressed in dB μ A, as specified in table of EN 55015.

The distance between the outer perimeter of the LAS and nearby objects, such as floor and walls, shall be at least 0.5m.

To avoid unwanted capacitive coupling between the EUT and the LAS, the maximum dimensions of the EUT shall allow a distance of at least 0.2m between the EUT and the standardized 2m large loop antenna of the LAS.

The position of the mains lead shall be optimized for maximum current induction. In general, this position will not be critical when the EUT complies with the conducted emission limit.

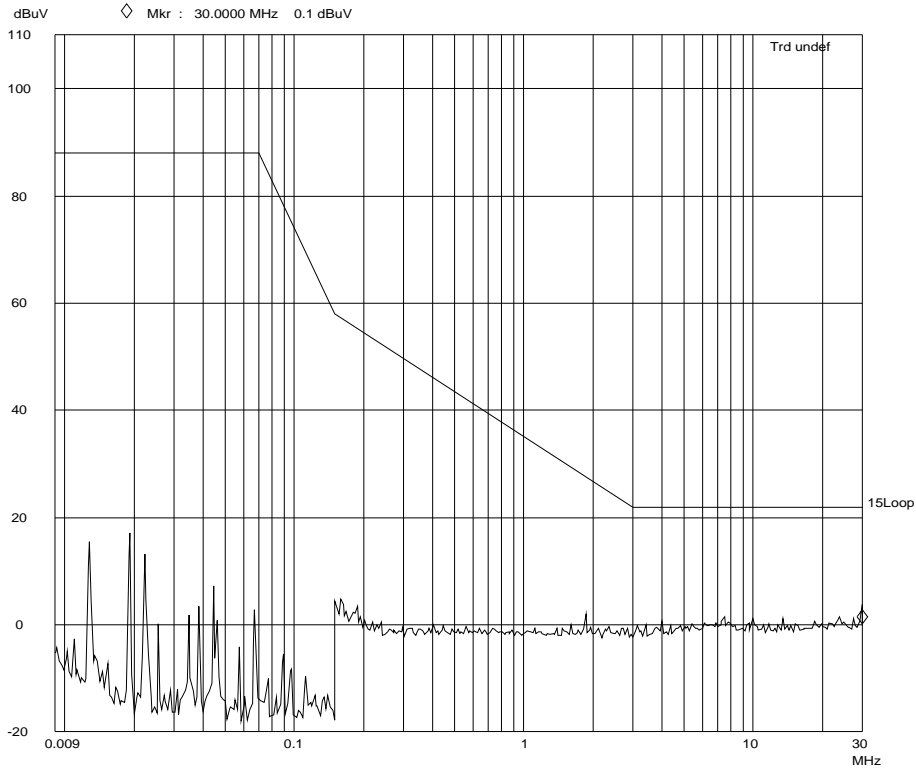
4.2.4 Test Data

Models: EIP016C1400LS, EIP016C0600LS, EIP016C0350LS

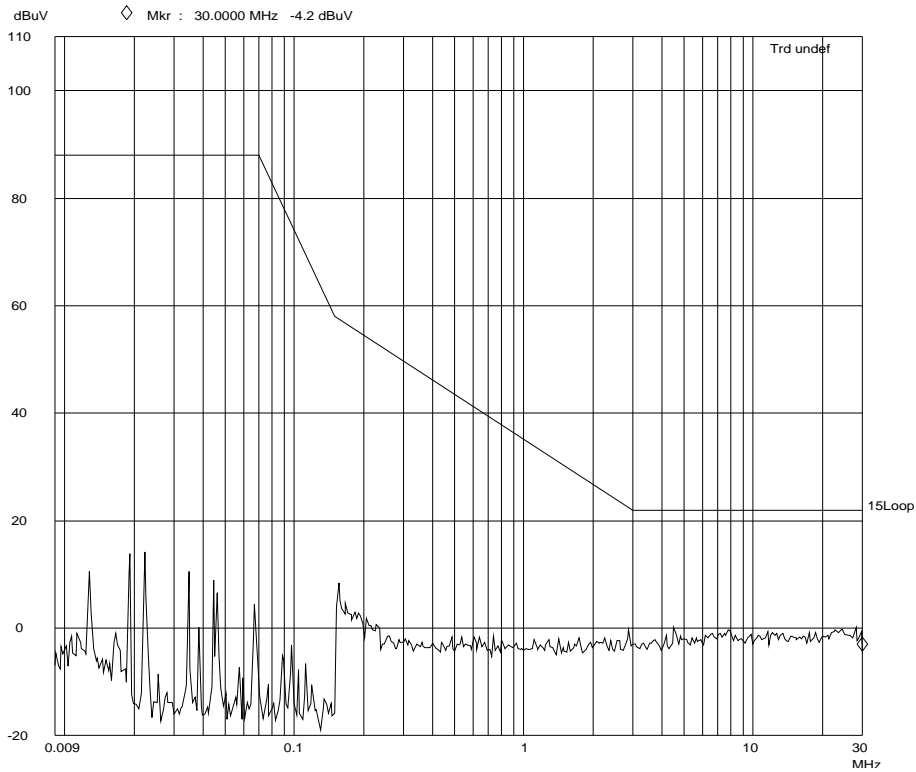
Frequency [MHz]	X axis [dB(μA)]	Y axis [dB(μA)]	Z axis [dB(μA)]	Limit [dB(μA)]
0.100	<64	<64	<64	74.0
0.160	<47	<47	<47	57.2
0.240	<40	<40	<40	52.4
0.550	<30	<30	<30	42.5
1.000	<25	<25	<25	35.4
1.400	<20	<20	<20	31.4
2.000	<17	<17	<17	27.1
3.500	<12	<12	<12	22.0
6.000	<12	<12	<12	22.0
10.000	<12	<12	<12	22.0
22.000	<12	<12	<12	22.0
30.000	<12	<12	<12	22.0

4.2.5 Test Curve EIP016C1400LS

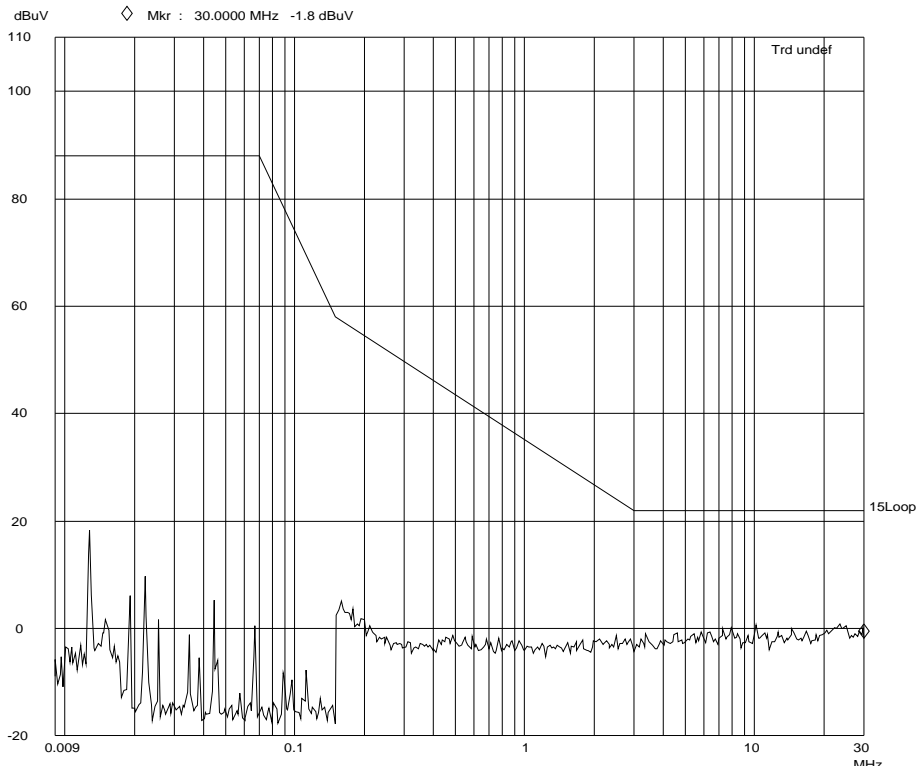
X axis



Y axis

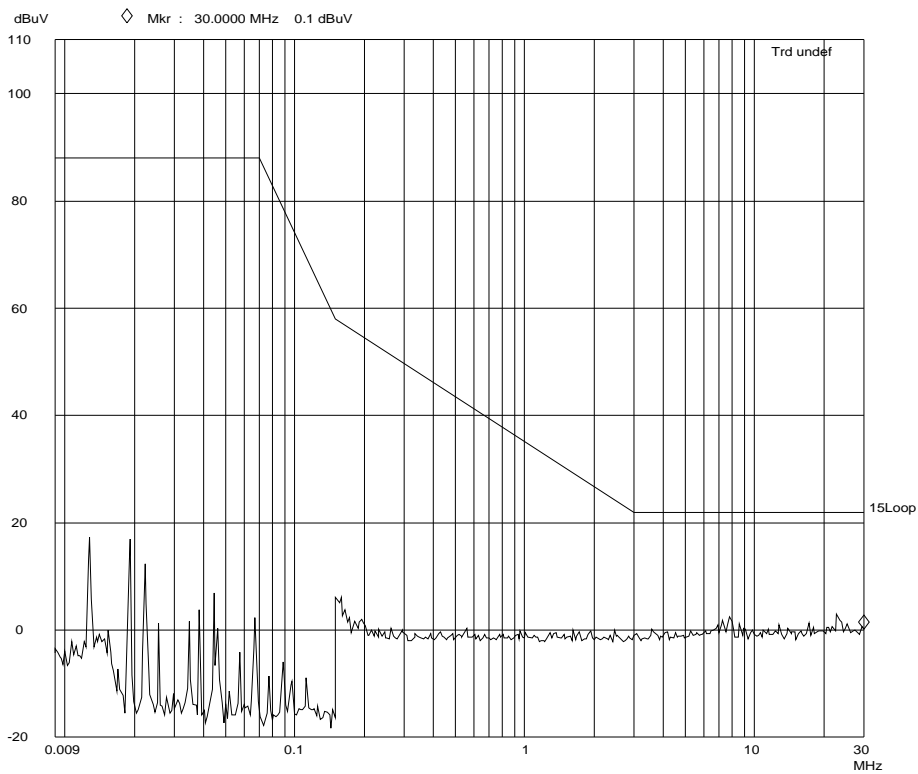


Z axis

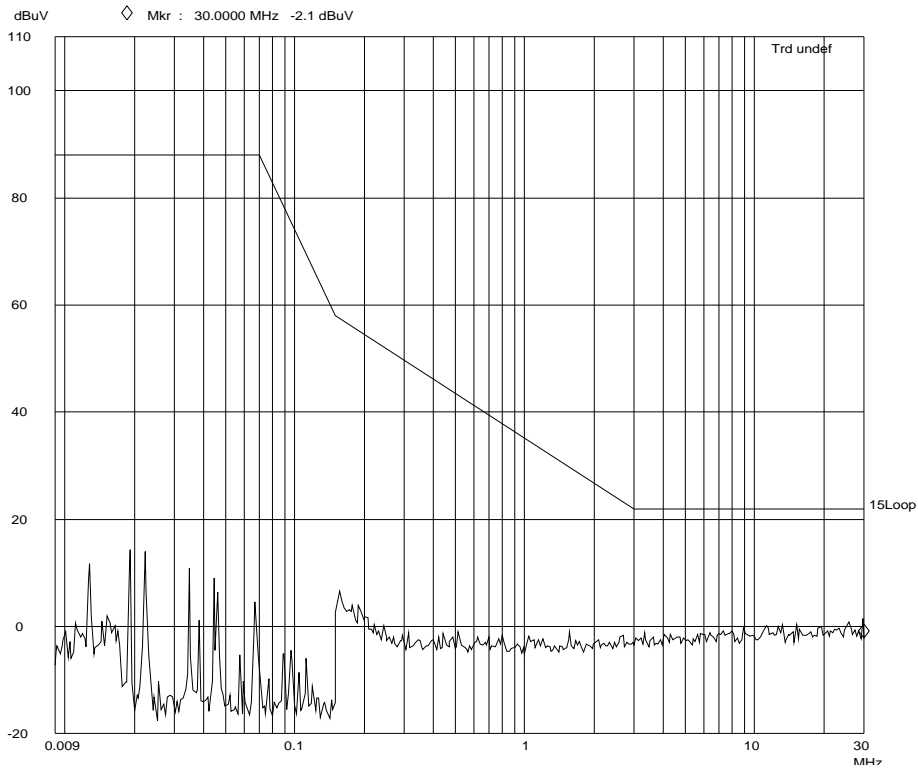


EIP016C0600LS

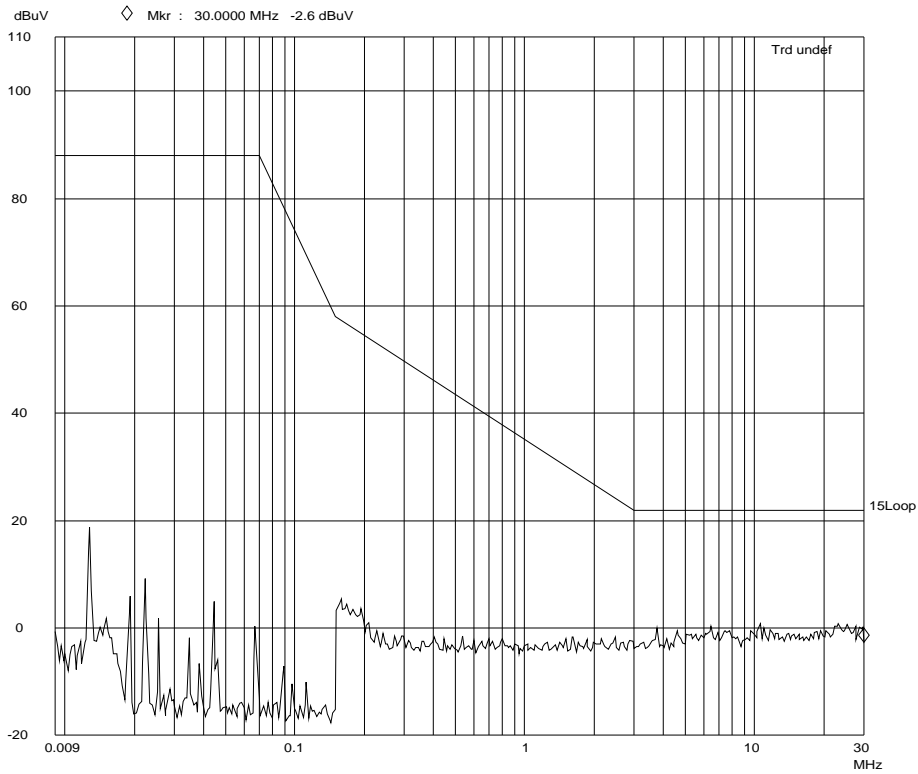
X axis



Y axis

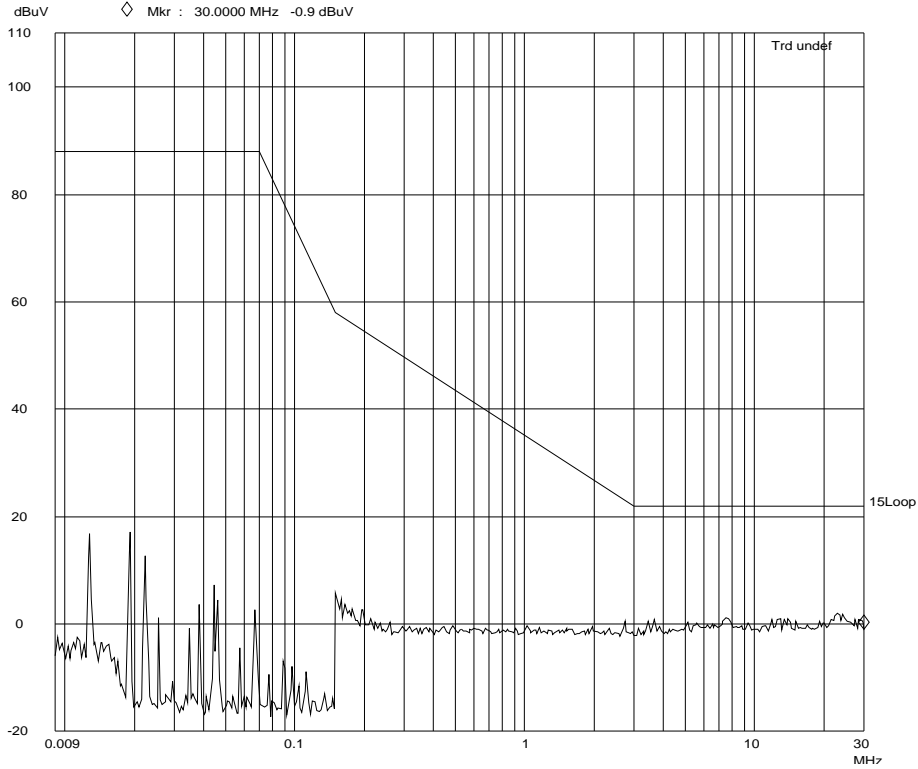


Z axis

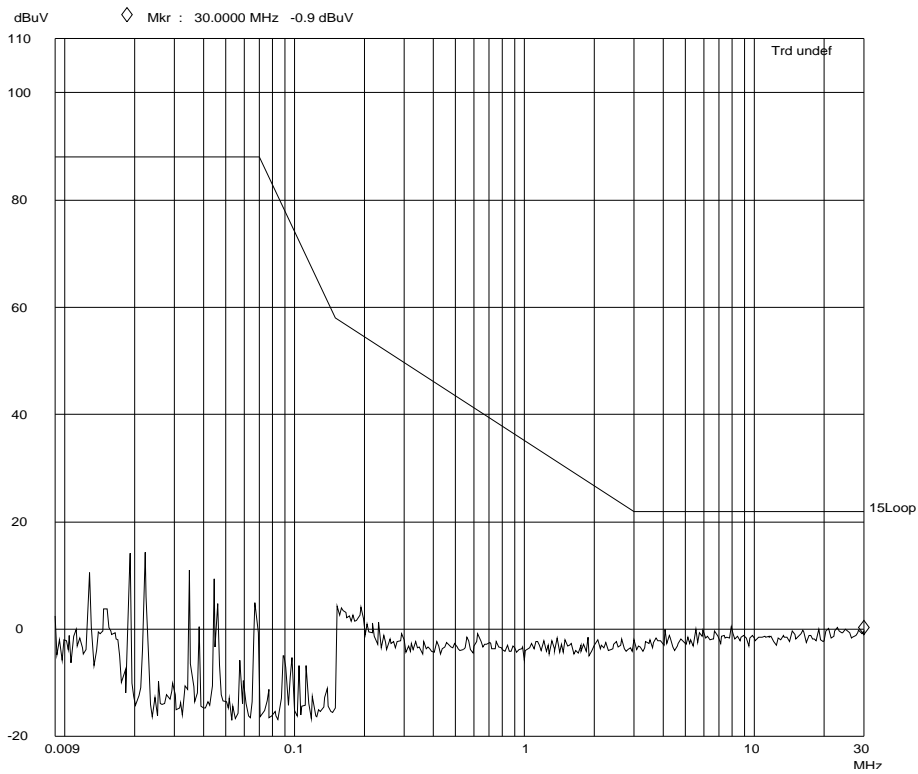


EIP016C0350LS

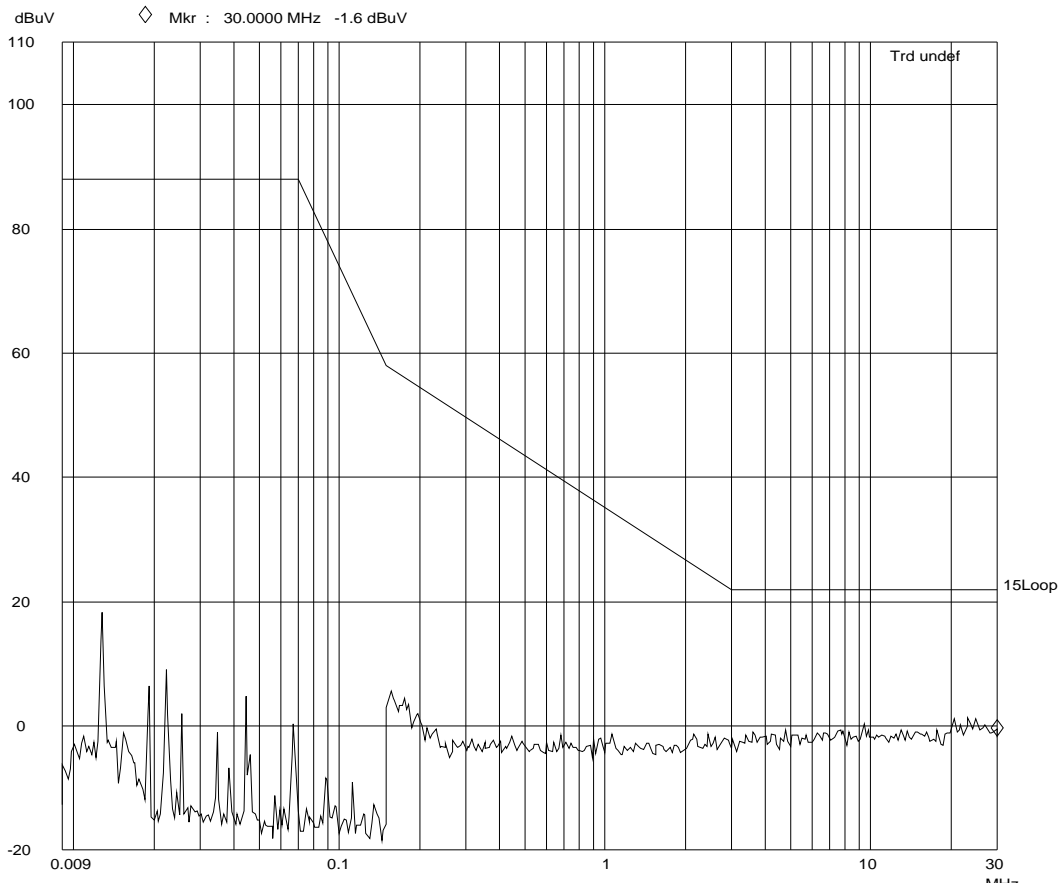
X axis



Y axis



Z axis



4.2.6 Measurement Uncertainty

The measurement uncertainty for induction current is under consideration according to CISPR 16-4-2:2003.

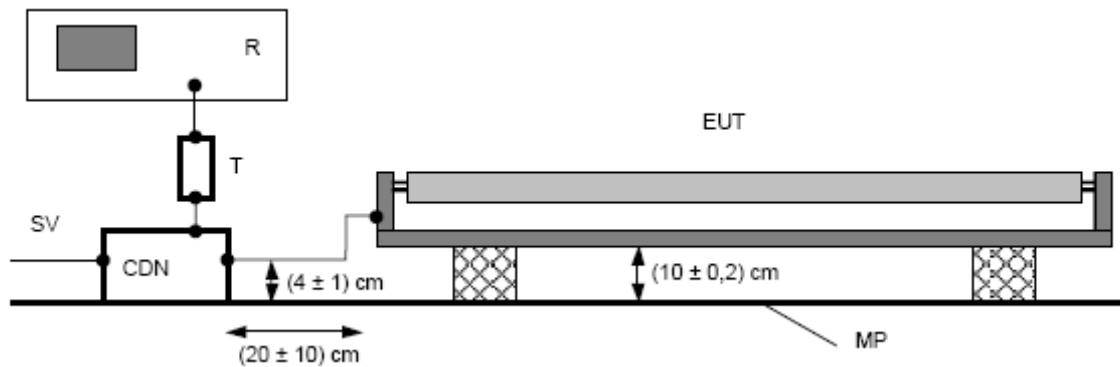
4.3 Radiated Electromagnetic Disturbance (30-300MHz, CDN method)

Test Result: Pass

4.3.1 Used Test Equipment

Equip. No.	Equipment	Model	Manufacturer
EM004-04	EMC shield Room	8m×3m×3m	Zhongyu
EM080-05	EMI receiver	ESCI	R&S
EM003-02	Coupling & Decoupling Network	CDN M2 16	TESEQ
EM003-01-05	Attenuator	6dB	drhubert

4.3.2 Block Diagram of Test Setup



4.3.3 Test Setup and Procedure

The EUT shall be placed on a non-conducting table with a height of (10 ± 0.2) cm.

The EUT is connected to CDN with a length of (20 ± 10) cm and the distance of the cable to the metal plate should be (4 ± 1) cm.

The RF output of the CDN is connected to EMI receiver via a 6 dB, 50Ω attenuator.

The distance from any conductive parts shall be more than 40 cm.

Prior to a measurement, the lamps shall be operated until stabilization has been reached. 5min for incandescent lamps, 15min for fluorescent lamp, 30min for other discharge lamp.

The EUT should be powered on before the coaxial cable is connected to receiver every time. And the coaxial cable should be removed from receiver before stopping EUT.

4.3.4 Test Data

EIP016C1400LS

EDIT PEAK LIST (Final Measurement Results)				
Trace1:	15CDN			
Trace2:	---			
Trace3:	---			
TRACE	FREQUENCY	LEVEL dBμV		DELTA LIMIT dB
1 Quasi Peak	58.88 MHz	53.12	L1	-5.27
1 Quasi Peak	85.44 MHz	48.73	L1	-6.57
1 Quasi Peak	61.64 MHz	50.97	L1	-7.04
1 Quasi Peak	82.12 MHz	46.29	L1	-9.33
1 Quasi Peak	53.24 MHz	49.23	L1	-10.00
1 Quasi Peak	96.24 MHz	44.05	L1	-10.26

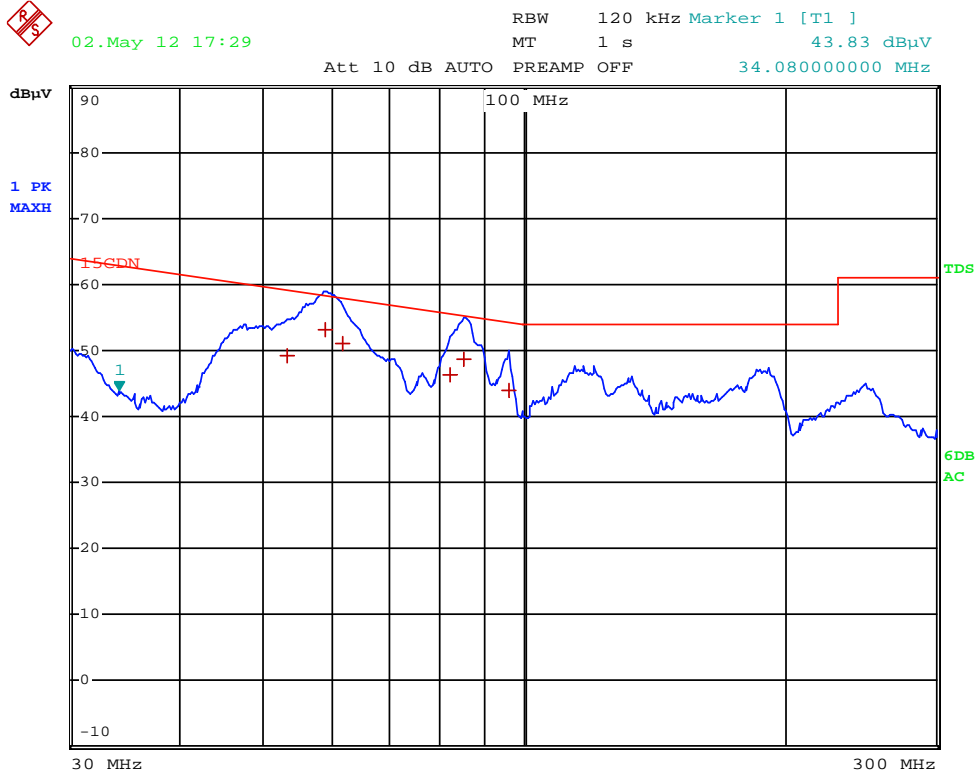
EIP016C0600LS

EDIT PEAK LIST (Final Measurement Results)				
Trace1:	15CDN			
Trace2:	---			
Trace3:	---			
TRACE	FREQUENCY	LEVEL dBμV		DELTA LIMIT dB
1 Quasi Peak	61.56 MHz	48.16	L1	-9.86
1 Quasi Peak	74 MHz	46.09	L1	-10.40
1 Quasi Peak	61.96 MHz	47.19	L1	-10.78
1 Quasi Peak	145.44 MHz	41.95	L1	-12.04
1 Quasi Peak	95.16 MHz	41.68	L1	-12.72
1 Quasi Peak	147.68 MHz	41.23	L1	-12.76
1 Quasi Peak	94.8 MHz	41.58	L1	-12.85
1 Quasi Peak	115 MHz	40.08	L1	-13.91
1 Quasi Peak	169 MHz	39.80	L1	-14.20
1 Quasi Peak	42.84 MHz	45.65	L1	-15.38
1 Quasi Peak	226.68 MHz	37.81	L1	-16.18
1 Quasi Peak	221.2 MHz	37.78	L1	-16.21

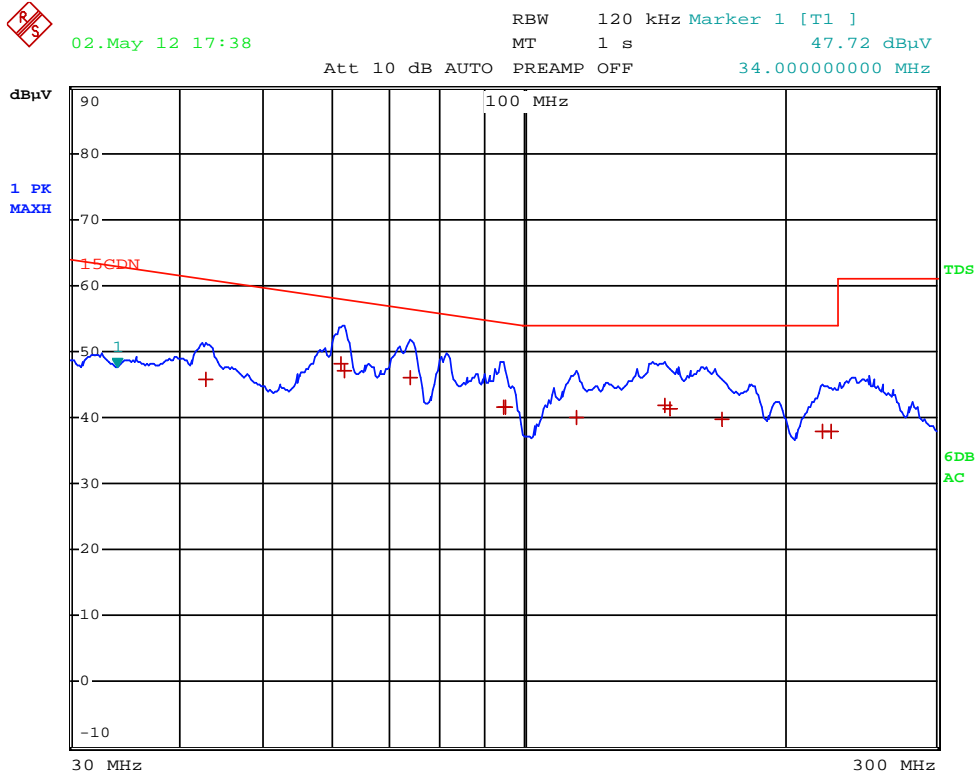
EIP016C0350LS

EDIT PEAK LIST (Final Measurement Results)				
Trace1:	15CDN			
Trace2:	---			
Trace3:	---			
TRACE	FREQUENCY	LEVEL dBμV		DELTA LIMIT dB
1 Quasi Peak	163.16 MHz	45.33	L1	-8.66
1 Quasi Peak	92.16 MHz	43.49	L1	-11.18
1 Quasi Peak	145.96 MHz	42.62	L1	-11.37
1 Quasi Peak	95.04 MHz	42.88	L1	-11.53
1 Quasi Peak	171.36 MHz	41.96	L1	-12.03
1 Quasi Peak	229.76 MHz	41.81	L1	-12.18
1 Quasi Peak	73.52 MHz	43.91	L1	-12.64
1 Quasi Peak	224.4 MHz	39.98	L1	-14.01
1 Quasi Peak	43.68 MHz	46.47	L1	-14.40
1 Quasi Peak	69.76 MHz	42.47	L1	-14.51

4.3.5 Test Curve EIP016C1600LS



EIP016C0600LS

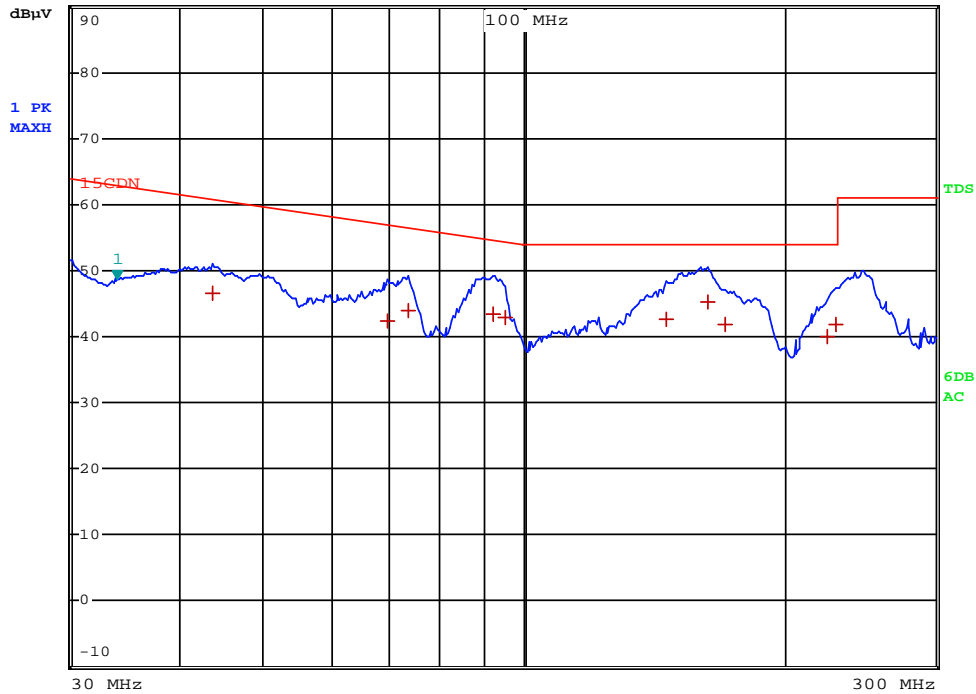


EIP016C0350LS



02.May 12 17:46

RBW 120 kHz Marker 1 [T1]
 MT 1 s 48.66 dBµV
 Att 10 dB AUTO PREAMP OFF 34.00000000 MHz



4.3.6 Measurement uncertainty

The measurement uncertainty for harmonic test is under consideration according to CISPR 16-4-2:2003.

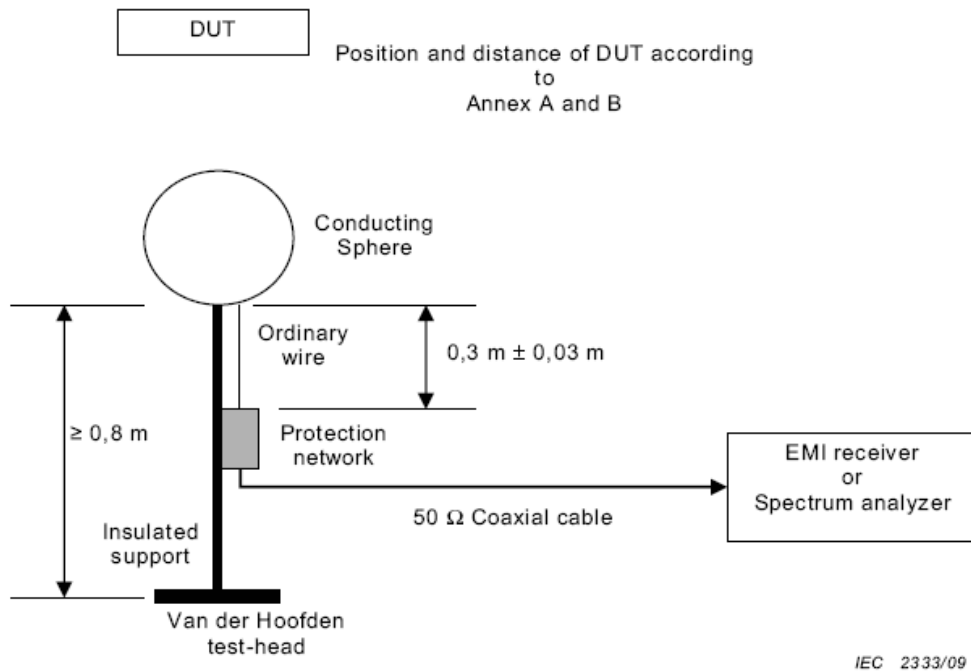
4.4 Induced Current Density (20 kHz-10 MHz)

Test Result: Pass

4.4.1 Used Test Equipment

Equip. No.	Equipment	Model	Manufacturer
EM080-05	EMI receiver	ESCI	R&S
EM007-02	Van der Hoofden test-head	VDHH 9502	SCHWARZBECK
EM004-04	EMC shield Room	8m×3m×3m	Zhongyu

4.4.2 Block Diagram of Test Setup



DUT = device under test.

4.4.3 Test Setup and Procedure

The height of the insulated support is minimum 0,8 m. The conducting sphere is connected to the protection network via an ordinary wire of length $30 \text{ cm} \pm 3 \text{ cm}$. The protection network is then connected to the EMI receiver, or spectrum analyser, by a 50Ω coaxial cable having a maximum cable loss of 0,2 dB and a d.c. resistance of $\leq 10 \Omega$.

Lighting equipment is evaluated in accordance with the measurement distance given in Table A.1 of Annex A unless otherwise specified by the manufacturer. The external surface of the test-head is taken as the reference point when determining the measurement distance.

Tolerances of the measurement distances are $\pm 5 \%$.

If the lighting equipment is provided with an earthing terminal, the lighting equipment shall be connected by means of an earth conductor contained in the power cable to the lighting equipment.

During the tests no conductive plane or object or human being should be closer to the lighting equipment than 0,8 m.

Prior to measurement, the lamp(s) shall be operated until stabilisation has been reached.

Unless otherwise stated by the manufacturer, the following stabilisation times shall be observed: 15 min. for fluorescent lamps; 30 min. for other discharge lamps. All measurements have to be done with 100 h aged lamps.

4.4.4 Test Data

The factors are:

EIP016C1400LS: 0.048

EIP016C0600LS: 0.068

EIP016C0350LS: 0.058

4.4.5 Test Curve

EIP016C1400LS:



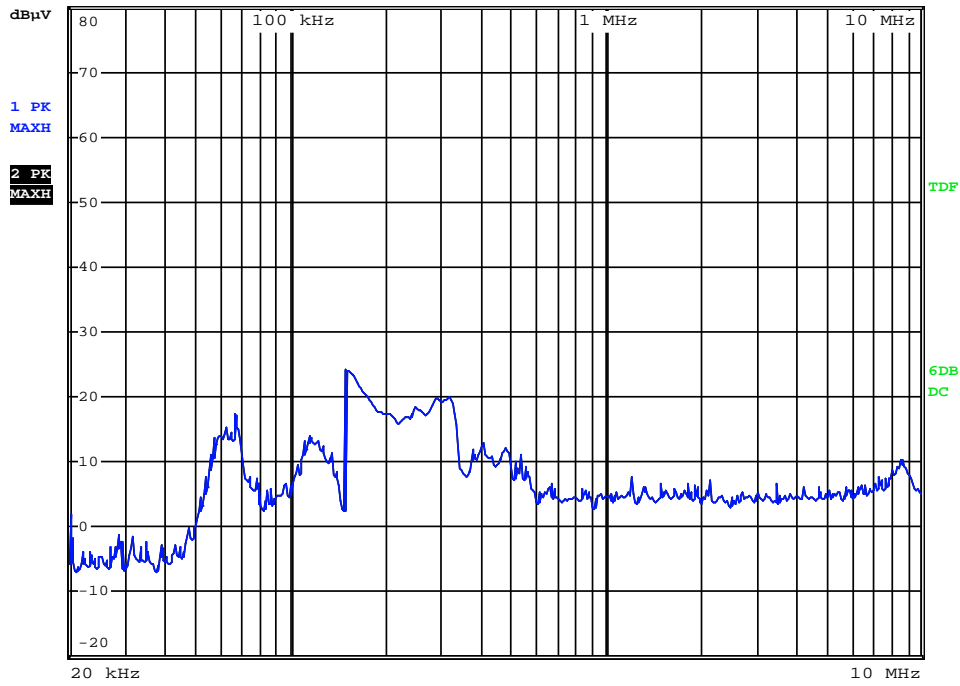
02.May 12 18:19

RBW 200 Hz

MT 100 ms

Att 10 dB

PREAMP OFF



EIP016C0600LS:



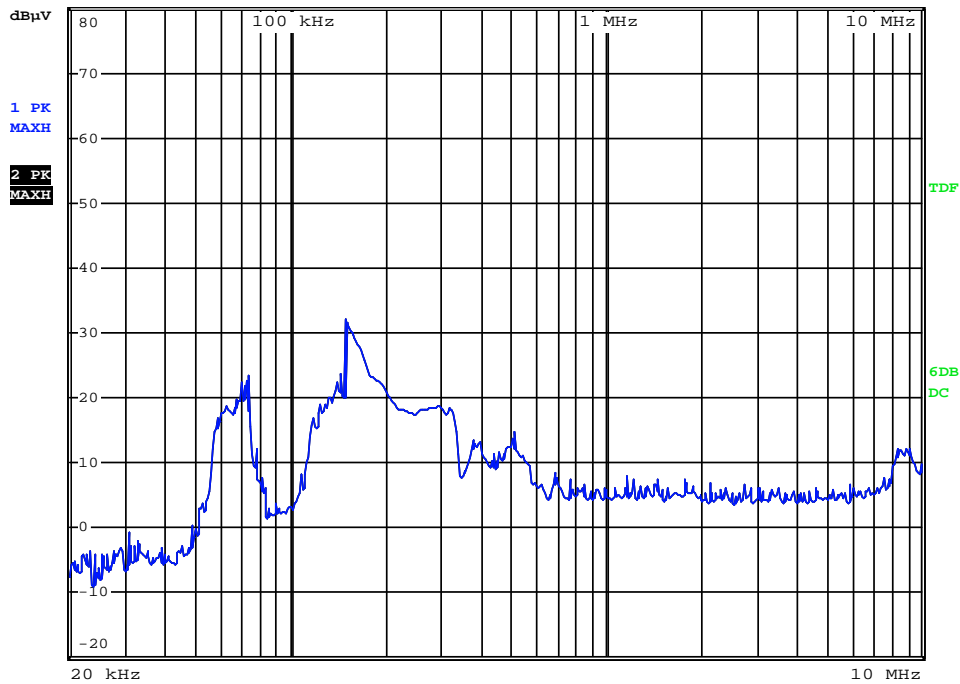
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RBW 200 Hz

MT 100 ms

Att 10 dB

PREAMP OFF



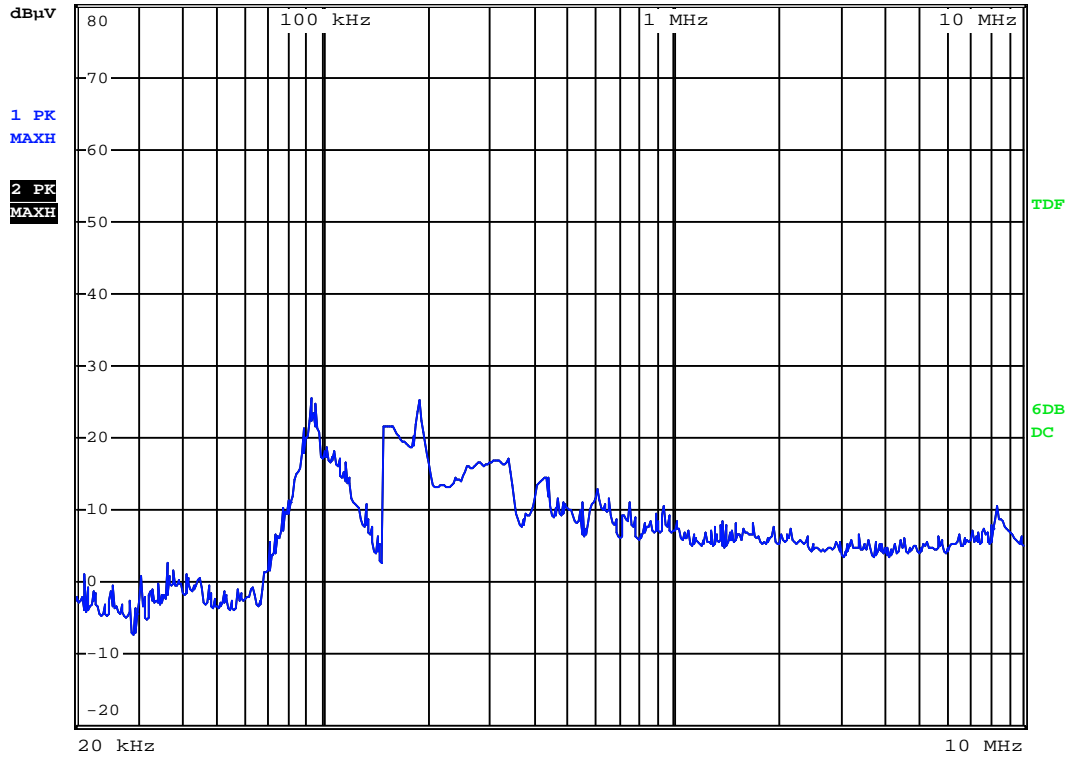
EIP016C0350LS:



02.May 12 18:02

Att 10 dB

RBW 200 Hz
MT 100 ms
PREAMP OFF

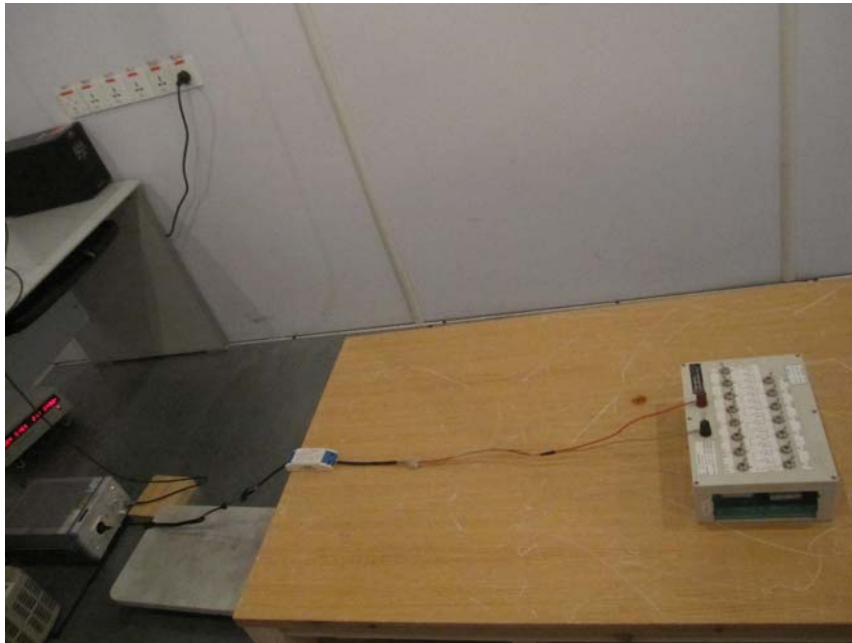


4.4.6 Measurement uncertainty

The measurement uncertainty for Induced Current Density test is according to CISPR 16-4-2:2003.

5 Appendix I - Photos of test setup

Conducted Emission



Radiated Electromagnetic Filed Disturbance



Radiated Emission (CDN method)

