Test Report

Verified code: 687147

Report No.: E20220613205901-4

Customer:	Lumi United Technology Co., Ltd
Address:	Room 801-804, Building 1, Chongwen Park, Nanshan iPark, No.3370, Liuxian Avenue, Fuguang Community, Taoyuan Residential District, Nanshan District, Shenzhen, China
Sample Name:	Smart Pet Feeder C1
Sample Model:	PETC1-M01
Receive Sample Date:	Jun.24,2022
Test Date:	Jun.28,2022 ~ Aug.18,2022
Reference Document:	EN 55014-1:2017+A11:2020 Electromagnetic compatibility - Requirements for house hold appliances, electric tools and similar apparatus - Part 1: Emission EN 55014-2:2015 Electromagnetic compatibility - Requirements for house hold appliances, electric tools and similar apparatus - Part 2: Immunity - Product family standard EN 61000-3-3:2013 Electromagnetic compatibility (EMC) –Part 3-3: Limits–Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤16 A per phase and not subject to conditional connection
Test Result:	Pass

Prepared by: Huang Lifang Reviewed by: Wu Haoting Approved by: Liao Liang

GUANGZHOU GRG METROLOGY & TEST CO., LTD

Issued Date: 2022-08-26

GUANGZHOU GRG METROLOGY & TEST CO., LTD.
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5. Without the agreement of the laboratory, the client is not authorized to use the test results for unapproved propaganda.

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REPORT ISSUED HISTORY

Report Version	Report No.	Description	Compile Date
1.0	E20220613205901-4	Original Issue	2022-08-19

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1. TEST RESULT SUMMARY

Test Item	Test mode	Test Requirement	Test Method	Class / Severity	Test Result
Conduction Emission	Mode 1	EN 55014-1:2017+A11:2020	/	Mains ports: Frequency range: 0.15MHz~30MHz Meet Standards Limits	PASS
Radiated Emission	Mode 1 Mode 2	EN 55014-1:2017+A11:2020	CISPR 16-2-3:2010/AMD 2:2014	Frequency range: 30MHz~1000MHz Meet Standards Limits	PASS
Disturbance Power	Mode 1	EN 55014-1:2017+A11:2020	/	Frequency range: 30MHz~300MHz Meet Standards Limits	PASS
Harmonic Current	/	EN 61000-3-2:2019	/	Meet Standards Class A Limits	Note 1)
Voltage Fluctuation and Flicks	Mode 1	EN 61000-3-3:2013	/	Meet Standards Limits For Pst, Tp = 10 min	PASS
Electrostatic discharge	Mode 1 Mode 2	EN 55014-2:2015	IEC 61000-4-2:2008	Contact Discharge: ±4kV Air Discharge: ±8kV (Direct mode) HCP discharge: ±4kV VCP discharge: ±4kV (Indirect mode) Performance Criterion B	PASS
Continuous RF electromagnetic field disturbances	Mode 1 Mode 2	EN 55014-2:2015	IEC 61000-4-3:2006 +AMD2:2010	Frequency range: 80 to 1000MHz, 3V/m(unmodulated, r.m.s), 1kHz Sine Wave, 80% AM modulated Performance Criterion A	PASS
Electrical fast transient/burst	Mode 1	EN 55014-2:2015	IEC 61000-4-4:2012	Input and output ac power ports: ±1kV 5/50ns Tr/Th, 5kHz Performance Criterion B	PASS

Surge	Mode 1	EN 55014-2:2015	IEC 61000-4-5:2014	Input and output ac power ports: Phase to Phase: ±1kV Phase to neutral: ±2kV Phase to earth: ±2kV Neutral to earth: ±2kV Positive pulse at 90 ° phase, Negative pulse at 270 ° phase Performance Criterion B	PASS
Conducted radio frequency disturbances	Mode 1	EN 55014-2:2015	IEC 61000-4-6:2013	Input and output ac power ports: Frequency range: 0.15 MHz to 230 MHz: 3V 1kHz Sine Wave, 80% AM modulated Performance Criterion A	PASS
Voltage Dip & Voltage Interruptions	Mode 1	EN 55014-2:2015	IEC 61000-4-11:2004	Input and output ac power ports: Voltage dips in 100% Number of cycles: 0.5 Performance Criterion C Voltage dips in 30% Number of cycles: 25 for 50Hz Number of cycles: 30 for 60Hz Performance Criterion C Voltage dips in 60% Number of cycles: 10 for 50Hz Number of cycles: 12for 60Hz Performance Criterion C	PASS

Note [1]:Not applicable, since The EUT with a rated power of less 75 W.

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2. GENERAL DESCRIPTION OF EUT

2.1 APPLICANT

Name:	Lumi United Technology Co., Ltd
Address:	Room 801-804, Building 1, Chongwen Park, Nanshan iPark, No. 3370, Liuxian Avenue, Fuguang Community, Taoyuan Residential District, Nanshan District, Shenzhen, China

2.2 MANUFACTURER

Name:	Lumi United Technology Co., Ltd
Address:	Room 801-804, Building 1, Chongwen Park, Nanshan iPark, No. 3370, Liuxian Avenue, Fuguang Community, Taoyuan Residential District, Nanshan District, Shenzhen, China

2.3 FACTORY

Name:	Huizhou Dudu Pet Products Co.,Ltd
Address:	Building C,Taiming Industrial Park,Jinglong Village,Zhenlong Town,Huiyang District,Huizhou City.

2.4 BASIC DESCRIPTION OF EQUIPMENT UNDER TEST

Equipment:	Smart Pet Feeder C1
Model No.:	PETC1-M01
Adding Models:	/
Trade Name:	Aqara
Power Supply:	Rated Input:5V ⎓ 1A by adapter; 4.5Vdc by battery.
Work Frequency:	2405MHz to 2480MHz
Modulation Type:	O-QPSK
Antenna Type:	Internal antenna
Hardware Version:	35
Software Version:	0.0.0_3733
Sample submitting way:	■Provided by customer □Sampling
Sample No:	E20220613205901-0002
Note:	/

2.5 TEST MODE

Mode No.	Description of the modes
1	The power supply by adapter. After the gateway is connected to the phone through the app, the EUT is associated in the sub-device options, and the feedback information of EUT feeding and the normal playback of the recording function are monitored in the EUT device logs.
2	The power supply by battery. After the gateway is connected to the phone through the app, the EUT is associated in the sub-device options, and the feedback information of EUT feeding and the normal playback of the recording function are monitored in the EUT device logs.

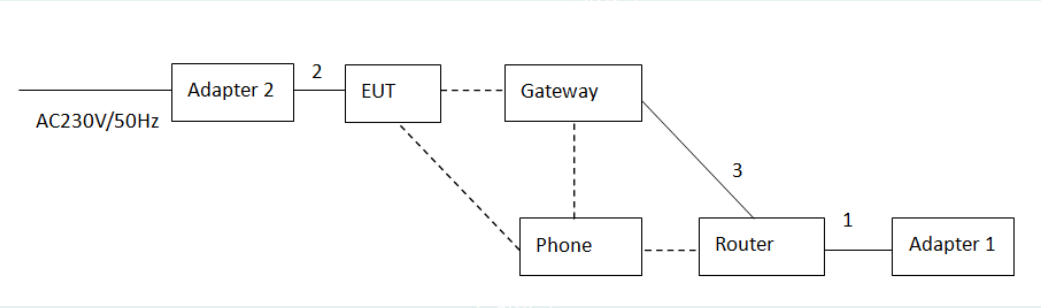
2.6 LOCAL SUPPORTIVE INSTRUMENTS

Name of Equipment	Manufacturer	Model	Serial Number	Note
Router	Fenglian	P2	100007770-30001051	/
Phone	Vivo	Vivo Y85	SZDC-2020-059	/
Gateway	Aqara	ZHWG12LM	2019DP0172	/
Adapter 1	Fenglian	NTGP1201000GB	/	/
Adapter 2	Tianyin	TPA-98B050100CU01	/	/

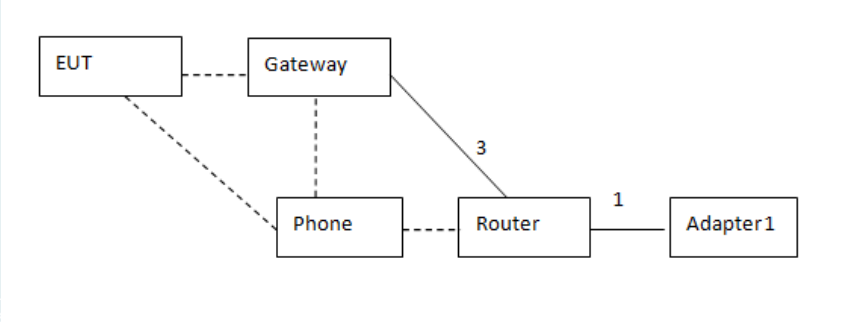
No.	Cable Type	Qty.	Shielded Type	Ferrite Core(Qty.)	Length
1	DC cable	1	No	0	1.5m
2	USB cable	1	No	0	1.48m
3	RJ45 Cable	1	No	0	1.5m

2.7 CONFIGURATION OF SYSTEM UNDER TEST

Mode 1:



Mode 2:



3. LABORATORY

The tests & measurements refer to this report were performed by Shenzhen EMC Laboratory of Guangzhou GRG Metrology & Test Co., Ltd.

Add.: No.1301 Guanguang Road Xinlan Community, Guanlan Street, Longhua District Shenzhen, 518110, People's Republic of China.

P.C.: 518110

Tel : 0755-61180008

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4. ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

USA	A2LA(Certificate#:2861.01)
China	CNAS(L0446)

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

Canada	ISED (Company Number: 24897, CAB identifier:CN0069)
USA	FCC (Registration Number: 759402, Designation Number:CN1198)

Copies of granted accreditation certificates are available for downloading from our web site, http://www.grgtest.com

5. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Uncertainty
Conduction Emission	150kHz～30MHz	3.4 dB[1)]
Radiated Emission（3m）	30MHz～200MHz(H)	4.5 dB[1)]
	200MHz～1000MHz(H)	4.4 dB[1)]
	30MHz～200MHz(V)	4.5 dB[1)]
	200MHz～1000MHz(V)	4.4 dB[1)]
Disturbance Power	30MHz～300MHz	2.3 dB[1)]
Voltage Fluctuation and Flicks	/	[2)]
Electrostatic discharge	/	[2)]
Radio-Frequency Electromagnetic Field	/	[2)]
Electrical fast transient/burst	/	[2)]
Surge	/	[2)]
Conducted radio frequency disturbances	/	[2)]
Voltage Dip & Voltage Interruptions	/	[2)]

Note[1)]: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

[2)]Tests have proved that, EMS test item equipment meet the requirements of the standard with a confidence level of not less than 95%.

6. LIST OF USED TEST EQUIPMENT AT GRGT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Conduction Emission				
Test software	EZ	CCS-3A1-CE	/	/
Test Receiver	R&S	ESCI	100783	2022-09-13
LISN(EUT)	R&S	ENV216	101543	2022-09-14
Radiated Emission (Below 1GHz)				
Test S/W	EZ	CCS-03A1	/	/
Test Receiver	R&S	ESR7	102444	2022-09-21
Preamplifier	EMEC	EM330	I00426	2023-03-05
Bi-log Antenna	Schwarzbeck	VULB9160	VULB9160-3401	2022-10-27
Disturbance Power				
Test software	EZ	CCS-03A1	/	/
Test Receiver	R&S	ESCI	100783	2022-09-13
Absorbing Clamp (include 6dB attenuator)	R&S	MDS-21	100165	2023-04-02
Preamplifier	HP	8447D	2944A08999	2022-09-04
Harmonic Current,Voltage Fluctuation and Flicks				
Test S/W	/	CTS4	/	/
Power Source	SCHAFFNER	NSG1007	54789	2023-03-08
Harmonic & Flicker Tester	SCHAFFNER	CCN1000	72045	2022-09-24
Electrostatic discharge				
Dito ESD Simulator	EM Test	dito	V0809103493	2022-10-30
Radio-Frequency Electromagnetic Field				
Test S/W	Tonscend	JS35-RS	/	/
Signal generator	R&S	SMA100A	100434	2022-09-04
Switch	TOYO	BS5000	/	/
Power Meter	Keysight	N1914A	MY57090009	2022-10-11
Power Probe	Keysight	E9301A	MY57060008	2022-09-04
Log-periodic broadband antenna	Schaffner	CBL6143	5082	2023-01-08
Dual directional Coupler	AR	DC 6180A	0328212	2022-09-22
Power Amplifier	SCHAFFNER	CBA9433	3007	2022-10-29

Electrical fast transient/burst				
Test S/W	/	Win3025 Version 4.00	/	/
Fast Transients/Burst Generator	TESEQ	NSG 3025	26861	2022-09-04
Surge				
Surge simulator	3ctest	CWS 600G	ES0381813	2022-10-29
Lightning surge coupling decoupling network	3ctest	SPN 3618T	ES0941720	2022-11-05
Conducted radio frequency disturbances				
Test S/W	Tonscend	JS35-CS	/	/
Conduction and radiation immunity testing system	TESEQ	NSG4070	25807	2023-04-06
Attenuator	Weinschel corp	40-6-34	QQ986	2022-09-04
Coupled decoupled network	Luthi	CDN801-M2	1897	2022-09-11
Voltage Dip & Voltage Interruptions				
Test S/W	AMETEK	AC Source CIGuiSII-500lix	2.0.0.7-No v.2006	/
Power Source	SCHAFFNER	NSG1007	54789	2023-03-08
current switchgear	TESEQ	NSG2200-1	A17820	2022-09-24
Harmonic & Flicker Tester	SCHAFFNER	CCN1000	72045	2022-09-10

Note: The calibration interval of the above test instruments is 12 months.

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7. EMISSION TEST

7.1 CONDUCTION EMISSION MEASUREMENT

7.1.1 LIMITS

Frequency range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15~0.50	66-56	59-46
0.50~5	56	46
5~30	60	50

NOTE: (1) The lower limit shall apply at the transition frequencies.
(2) The limit decreases in line with the logarithm of the frequency in the range of 150 kHz to 0.5MHz.
(3) All emanations from a class B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

7.1.2 TEST PROCEDURE

a) Let the EUT work in test modes.

b) Receiver connected to the AMN. Testing shall include measurements on all live and neutral lines (or ports).

c) overall range scan by using the test receiver controlled by computer and recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.

d) The mains cable of the unit being assessed shall be connected to one AMN. All other units of the EUT and AE shall be connected to a second (or multiple) AMN(s). It is acceptable to connect these other equipments to an AMN via extension cables that include one or multiple socket outlets. Where additional socket outlets are needed, the extension shall be as short as practical. All AMNs shall be bonded to a RGP.

e) For AMNs mounted below the RGP an extension cable may be used. The AMN specification shall be met at the connection point for the EUT (the end of the extension cable or power strip) with at least 0.8 m spacing between the EUT and the connection point on the extension cable.

f) For table-top equipment

The RGP shall have a minimum size of 2 m by 2 m and shall extend a minimum of 0.5 m beyond the EUT, local AE and associated cabling in all directions.

The measurement shall be performed using a vertical RGP. The rear of the EUT, local AE and associated cabling shall be 0.4 m from the vertical RGP. The portions of signal cables that hang over the rear of the table shall be positioned at a distance of 0.4 m from the vertical RGP and no less than 0.4 m from any horizontal RGP bonded to the vertical RGP. If necessary, maintain the separations using a fixture made of non-conductive material with an appropriate dielectric constant.

The equipment to be tested is placed in the test facility on a non-conductive table 0.8 m(± 0.01 m) high.

Spacing between any two elements on the measurement table shall be ≥0.1 m (±10%).

Equipment, including the power supply, intended for table-top use shall be placed on a nonconductive table of sufficient size to hold the EUT, local AE and associated cabling. Where practical, the rear of the EUT should be flush with the rear of the table.

Where possible, cables that connect between modules or units shall hang over the back of the table. If a cable hangs closer than 0.4 m from the horizontal RGP (or floor), the excess shall be folded at the cable centre into a bundle no longer than 0.4 m, such that the bundle is 0.4 m above the horizontal RGP.

If the mains port input cable is less than 0.8 m long, (including power supplies integrated in the mains plug) an extension cable shall be used such that the external power supply unit is placed on the measurement table. The extension cable shall have similar characteristics to the mains cable (including the number of conductors and the presence of ground connection).

g) For floor-standing equipment

The EUT shall be insulated (by insulation of maximum thickness of 150 mm) from the horizontal reference ground plane.

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7.1.3 TEST SETUP

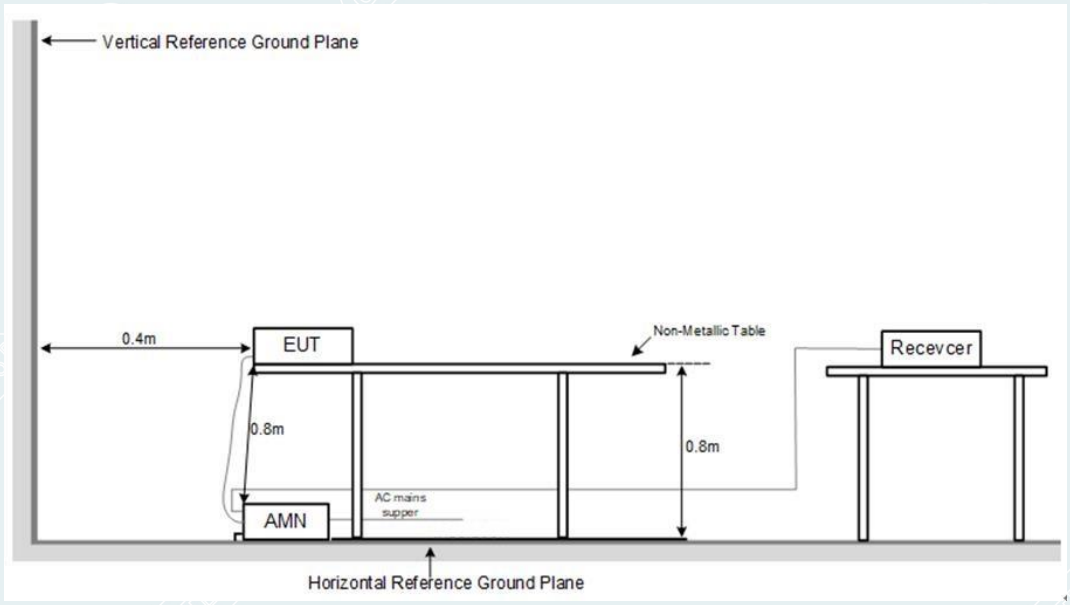

Figure 7.1 – Example measurement arrangement for table-top EUT

7.1.4 DATA SAMPLE

Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
X.XXXX	24.60	10.97	19.90	44.50	30.87	56.00	46.00	-11.50	-15.13	Pass

Factor = Insertion loss of LISN + Cable Loss
Result = Quasi-peak Reading/ Average Reading + Factor
Limit = Limit stated in standard
Margin = Result (dBuV) – Limit (dBuV)

7.1.5 PHOTOGRAPH OF THE TEST ARRANGEMENT

Mode 1

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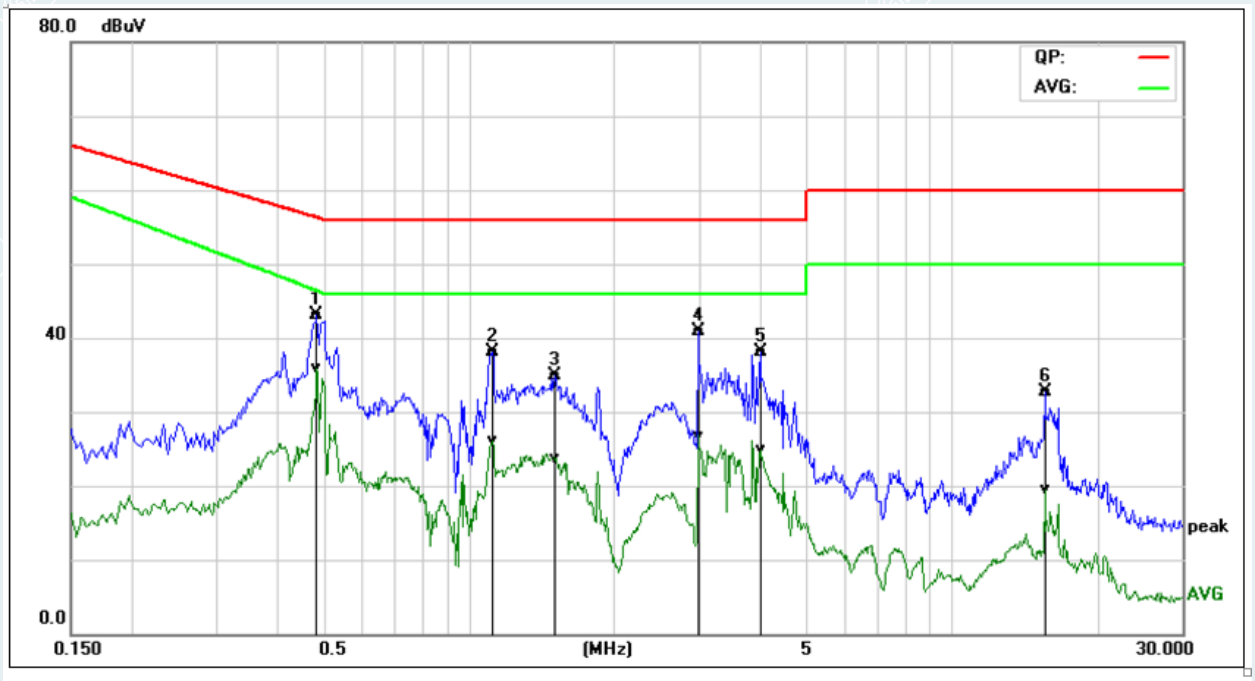
7.1.6 TEST RESULTS

EUT Name	Smart Pet Feeder C1	Model:	PETC1-M01
Environmental Conditions	25.5℃/57%RH/101.0kPa	Test Mode	Mode 1
Power supply	DC 5V supply by adapter (AC 230V/50Hz)	Tested By	Jiang Tao
Test Date	2022-08-16	Sample No.	E20220613205901-0002

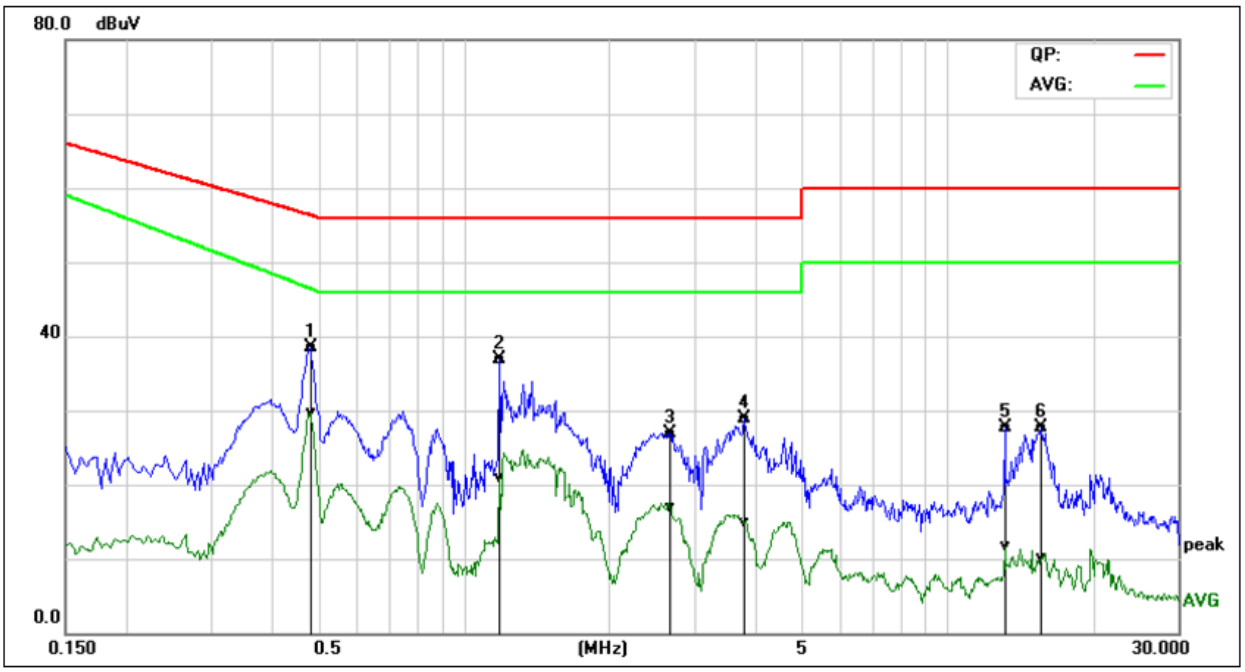
Line: L1



No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1*	0.4860	33.58	26.41	9.57	43.15	35.98	56.24	46.31	-13.09	-10.33	Pass
2	1.1180	28.50	16.57	9.59	38.09	26.16	56.00	46.00	-17.91	-19.84	Pass
3	1.5060	25.34	14.15	9.60	34.94	23.75	56.00	46.00	-21.06	-22.25	Pass
4	2.9900	31.37	17.18	9.62	40.99	26.80	56.00	46.00	-15.01	-19.20	Pass
5	4.0220	28.47	15.18	9.65	38.12	24.83	56.00	46.00	-17.88	-21.17	Pass
6	15.5860	22.88	9.62	9.85	32.73	19.47	60.00	50.00	-27.27	-30.53	Pass

EUT Name	Smart Pet Feeder C1	Model	PETC1-M01
Environmental Conditions	25.5℃/57%RH/101.0kPa	Test Mode	Mode 1
Power supply	DC 5V supply by adapter (AC 230V/50Hz)	Tested By	Jiang Tao
Test Date	2022-08-16	Sample No.	E20220613205901-0002

Line: N



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1*	0.4820	28.74	20.11	9.69	38.43	29.80	56.30	46.40	-17.87	-16.60	Pass
2	1.1900	27.27	11.34	9.62	36.89	20.96	56.00	46.00	-19.11	-25.04	Pass
3	2.6660	17.33	7.29	9.60	26.93	16.89	56.00	46.00	-29.07	-29.11	Pass
4	3.8020	19.32	5.29	9.63	28.95	14.92	56.00	46.00	-27.05	-31.08	Pass
5	13.1460	17.93	1.81	9.85	27.78	11.66	60.00	50.00	-32.22	-38.34	Pass
6	15.6980	17.86	0.16	9.89	27.75	10.05	60.00	50.00	-32.25	-39.95	Pass

7.2 RADIATED EMISSION MEASUREMENT

7.2.1 LIMITS

Below 1GHz

Frequency range (MHz)	Limits (dBμV/m)
	Distance: 3m
	Quasi peak
30 ~ 230	40
230 ~ 1000	47

NOTE:(1) The lower limit shall apply at the transition frequencies.

(2) Emission level (dBuV/m) = 20 log Emission level (uV/m)

7.2.2 TEST PROCEDURE

a) Let the EUT work in test modes.

b) The measuring distance of 3m shall be used for measurements.

c) Emissions were scanned and measured rotating the table was rotated 360 degrees and the height of the test antenna shall vary between 1 m to 4 m above the ground plane, in both the vertical and the horizontal polarization are set to make the measurement, to degrees to determine the position of the highest radiation.

d) The initial step in collecting radiated emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode.

e) Recorded at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.

f) All readings are Peak unless otherwise stated Quasi Peak in column of Note. Peak denotes that the Peak reading compliance with the Quasi Peak limits and then Quasi Peak Mode measurement didn‘t perform.

g) For table-top equipment

The equipment to be tested is placed in the test facility on a non-conductive table 0.8 m(± 0.01 m) high.

Spacing between any two elements on the measurement table shall be ≥0.1 m (±10%).

Equipment, including the power supply, intended for table-top use shall be placed on a nonconductive table of sufficient size to hold the EUT, local AE and associated cabling. Where practical, the rear of the EUT should be flush with the rear of the table.

Where possible, cables that connect between modules or units shall hang over the back of the table. If a cable hangs closer than 0.4 m from the horizontal RGP (or floor), the excess shall be folded at the cable centre into a bundle no longer than 0.4 m, such that the bundle is 0.4 m above the horizontal RGP.

If the mains port input cable is less than 0.8 m long, (including power supplies integrated in the mains plug) an extension cable shall be used such that the external power supply unit is placed on the measurement table. The extension cable shall have similar characteristics to the mains cable (including the number of conductors and the presence of ground connection).

h) For floor-standing equipment

Mains cabling shall drape vertically to (but be insulated from) the horizontal RGP.

The EUT shall be insulated (by insulation of maximum thickness of 150 mm) from the horizontal reference ground plane.

7.2.3 TEST SETUP

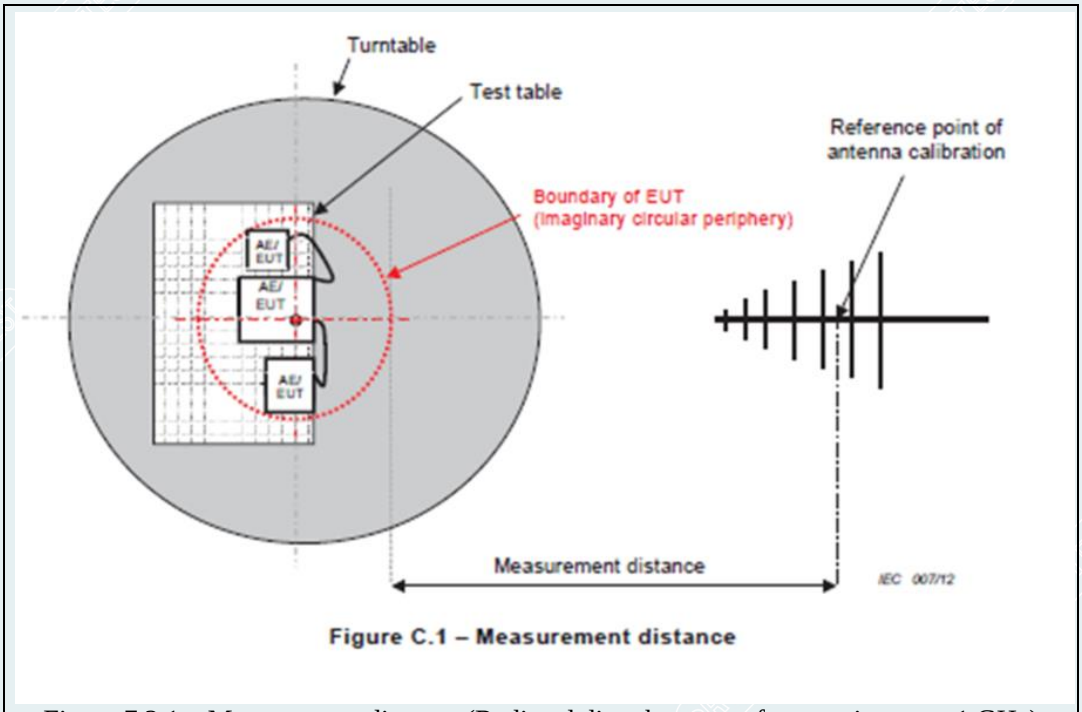


Figure 7.2.1 – Measurement distance (Radiated disturbances at frequencies up to 1 GHz)

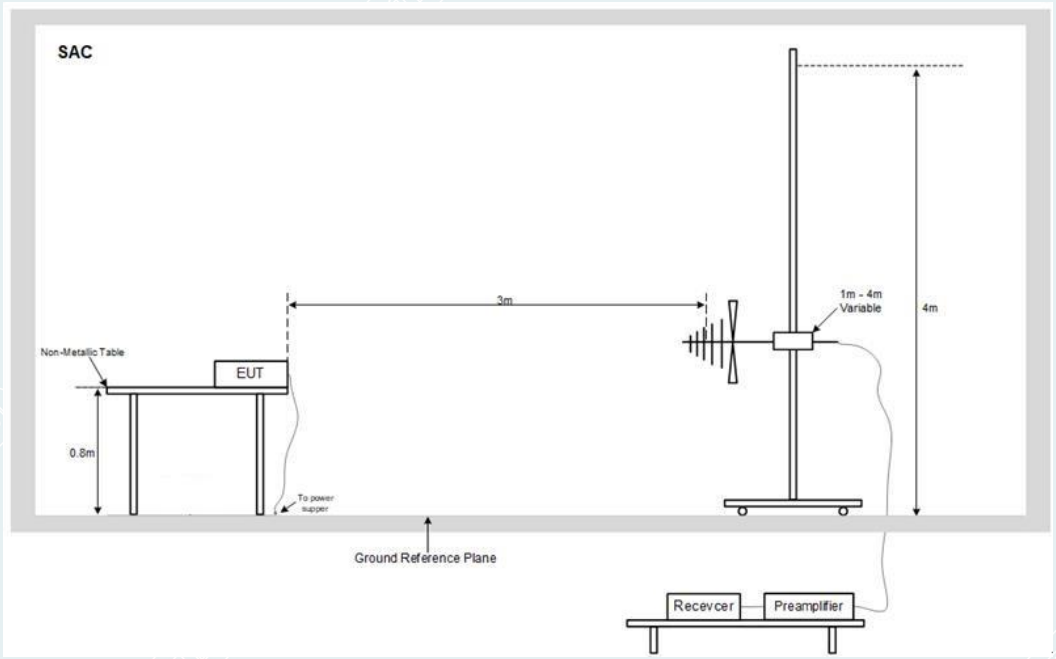


Figure 7.2.2 – Example measurement arrangement for table-top EUT
(Radiated disturbances at frequencies up to 1 GHz)

7.2.4 DATA SAMPLE

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
XXXX	63.53	-27.15	36.38	43.50	-7.12	QP

Frequency (MHz) = Emission frequency in MHz

Reading (dBuV) = Uncorrected Analyzer / Receiver reading

Correct Factor (dB/m) = Antenna factor + Cable loss – Amplifier gain

Result (dBuV/m) = Reading (dBuV) + Corr. Factor (dB/m)

Limit (dBuV/m) = Limit stated in standard

Margin (dB) = Result (dBuV/m) – Limit(dBuV/m)

QP = Quasi-peak Reading

Calculation Formula

Margin (dB) = Result (dBuV/m) – Limits (dBuV/m)

Result (dBuV/m) = Reading (dBuV) + Correction Factor (dB/m)

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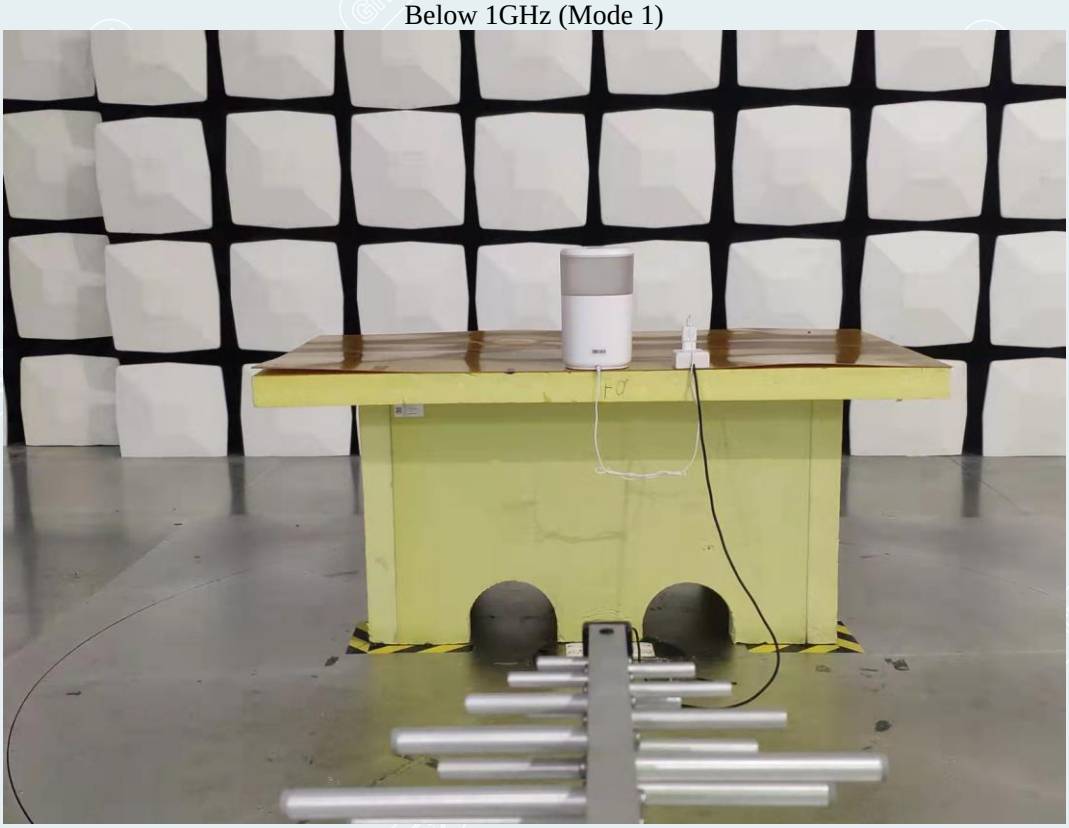
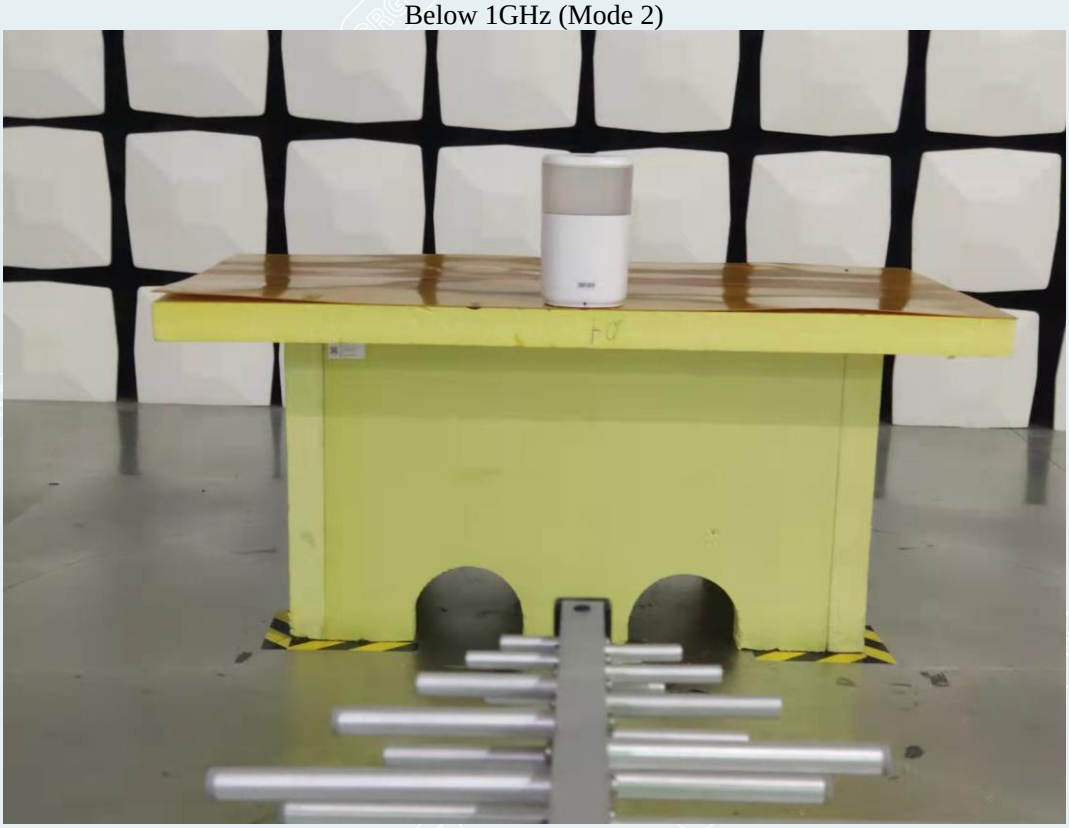
7.2.5 PHOTOGRAPH OF THE TEST ARRANGEMENT

Below 1GHz (Mode 1)



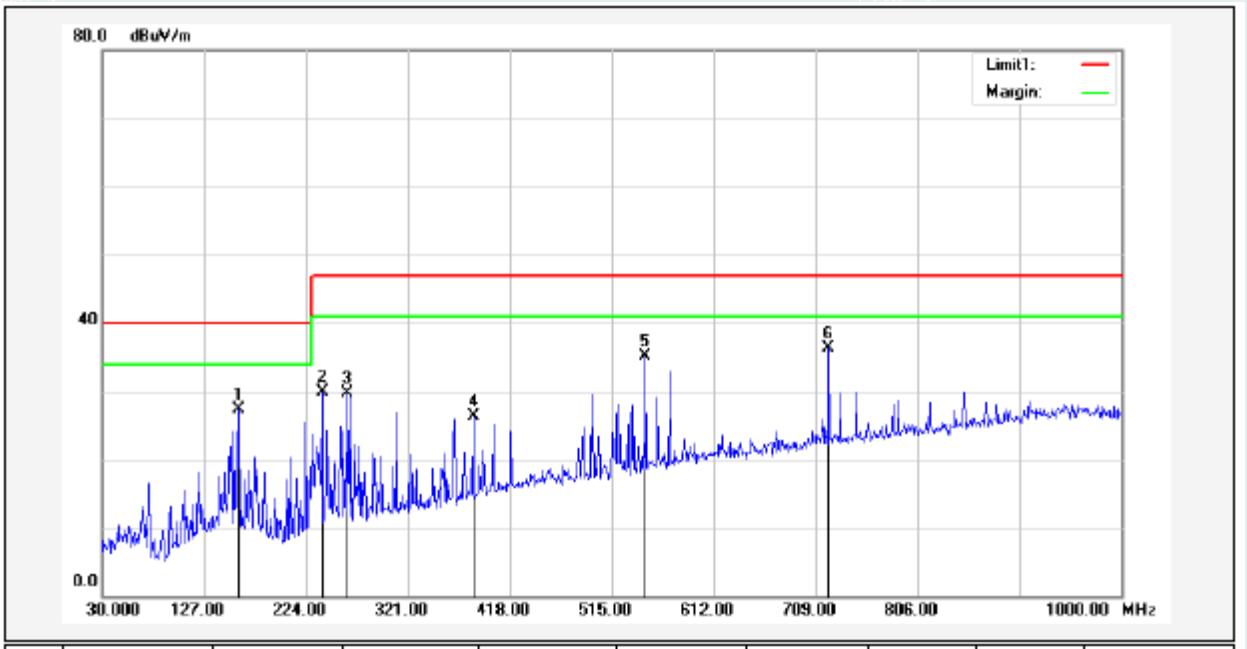
Below 1GHz (Mode 2)



7.2.6 TEST RESULTS

EUT Name	Smart Pet Feeder C1	Model:	PETC1-M01
Environmental Conditions	25.5℃/48%RH/101.0kPa	Test Mode	Mode 1
Power supply	DC 5V supply by adapter (AC 230V/50Hz)	Tested By	Tang Shenghui
Test Date	2022-08-18	Sample No.	E20220613205901-0002

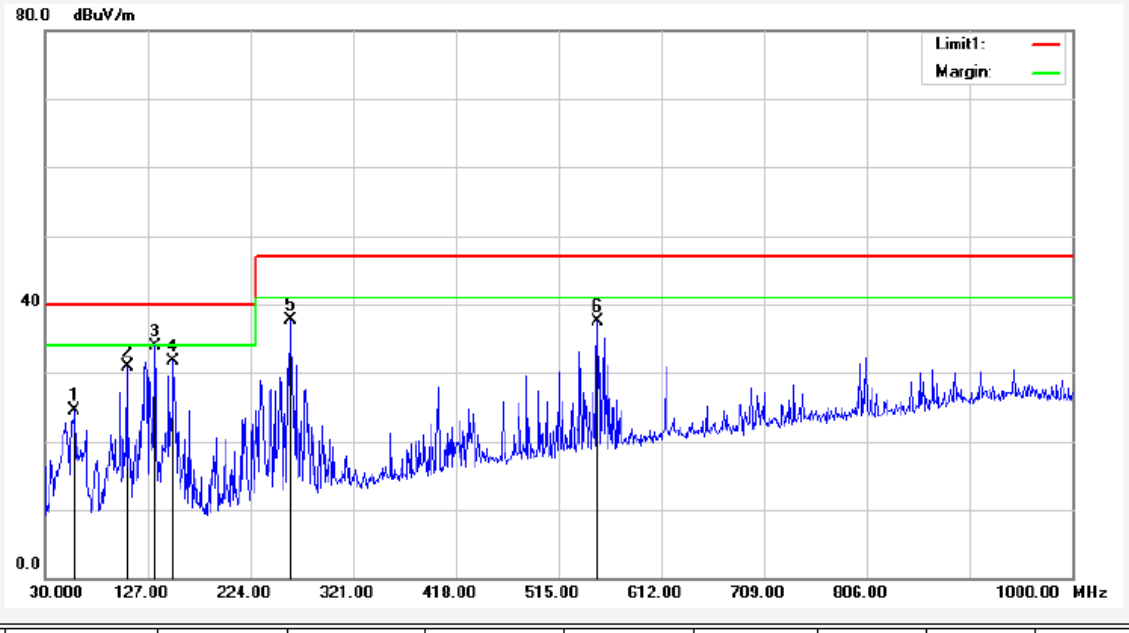
Polarity: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1	159.9800	52.20	-24.99	27.21	40.00	-12.79	239	100	QP
2	239.5200	55.80	-25.86	29.94	47.00	-17.06	331	100	QP
3	263.7700	54.61	-24.86	29.75	47.00	-17.25	151	199	QP
4	383.0800	47.37	-21.13	26.24	47.00	-20.76	287	100	QP
5	547.0100	51.73	-16.70	35.03	47.00	-11.97	0	102	QP
6*	721.6100	49.18	-12.86	36.32	47.00	-10.68	331	100	QP

EUT Name	Smart Pet Feeder C1	Model:	PETC1-M01
Environmental Conditions	25.5℃/48%RH/101.0kPa	Test Mode	Mode 1
Power supply	DC 5V supply by adapter (AC 230V/50Hz)	Tested By	Tang Shenghui
Test Date	2022-08-18	Sample No.	E20220613205901-0002

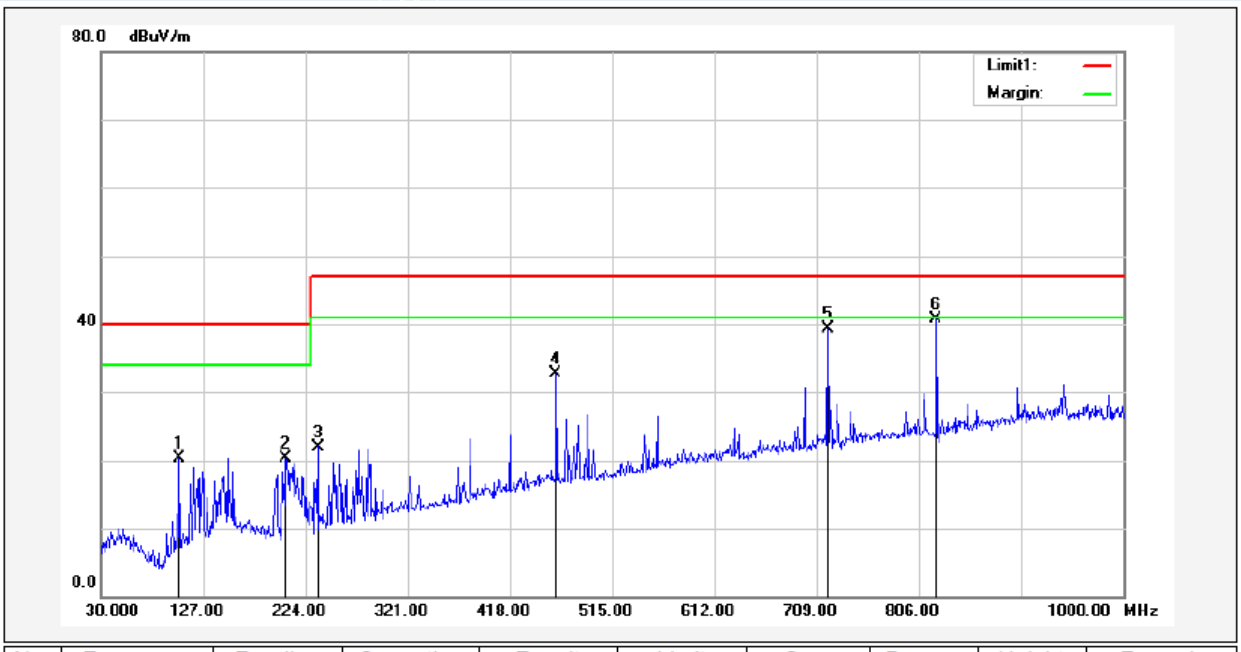
Polarity: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1	58.1300	52.14	-27.55	24.59	40.00	-15.41	312	100	QP
2	107.6000	59.08	-28.23	30.85	40.00	-9.15	305	200	QP
3*	133.7900	59.74	-25.84	33.90	40.00	-6.10	2	100	QP
4	151.2500	56.46	-24.84	31.62	40.00	-8.38	0	124	QP
5	261.8300	62.69	-24.94	37.75	47.00	-9.25	107	300	QP
6	551.8600	54.05	-16.56	37.49	47.00	-9.51	2	100	QP

EUT Name	Smart Pet Feeder C1	Model:	PETC1-M01
Environmental Conditions	25.5℃/48%RH/101.0kPa	Test Mode	Mode 2
Power supply	DC 4.5V supply by battery	Tested By	Tang Shenghui
Test Date	2022-08-18	Sample No.	E20220613205901-0002

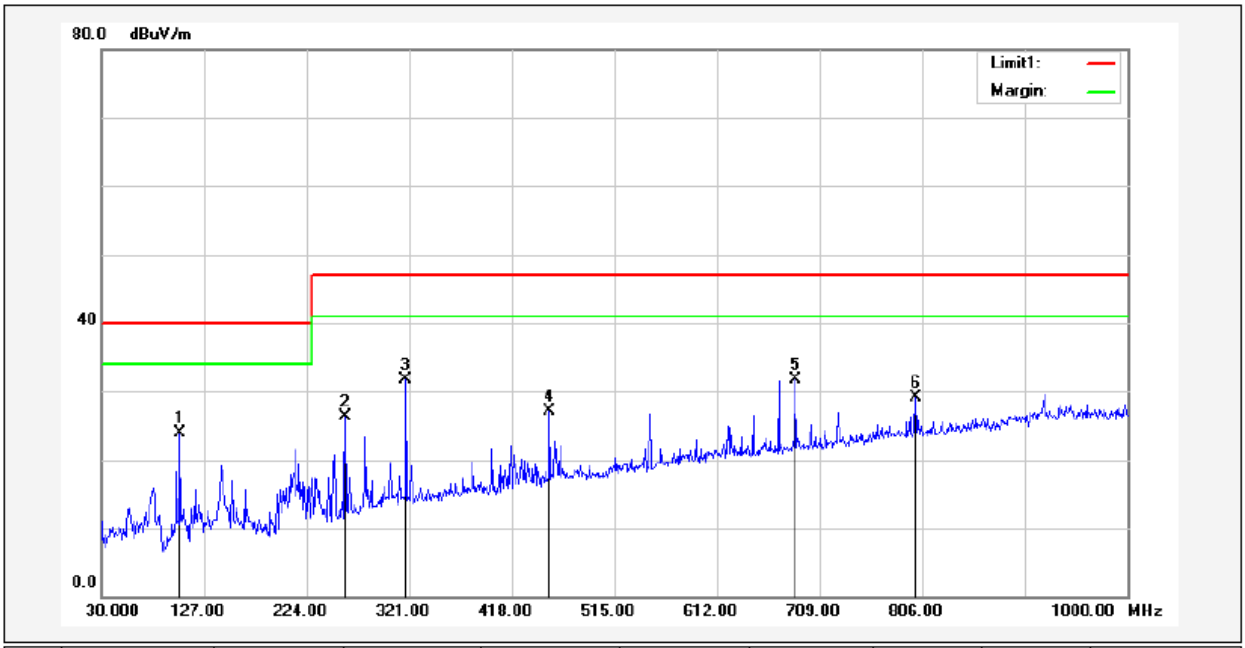
Polarity: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1	104.6900	48.95	-28.62	20.33	40.00	-19.67	98	100	QP
2	205.5700	47.75	-27.48	20.27	40.00	-19.73	275	199	QP
3	235.6400	48.06	-26.06	22.00	47.00	-25.00	136	199	QP
4	461.6500	51.21	-18.55	32.66	47.00	-14.34	233	100	QP
5	719.6700	52.24	-12.91	39.33	47.00	-7.67	193	100	QP
6*	822.4900	52.03	-11.25	40.78	47.00	-6.22	357	100	QP

EUT Name	Smart Pet Feeder C1	Model:	PETC1-M01
Environmental Conditions	25.5℃/48%RH/101.0kPa	Test Mode	Mode 2
Power supply	DC 4.5V supply by battery	Tested By	Tang Shenghui
Test Date	2022-08-18	Sample No.	E20220613205901-0002

Polarity:Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over (dB)	Degree (deg.)	Height (cm)	Remark
1	104.6900	52.52	-28.62	23.90	40.00	-16.10	318	100	QP
2	260.8600	51.26	-24.97	26.29	47.00	-20.71	0	201	QP
3*	318.0900	54.90	-23.12	31.78	47.00	-15.22	137	200	QP
4	453.8900	45.85	-18.68	27.17	47.00	-19.83	360	140	QP
5	685.7200	45.33	-13.59	31.74	47.00	-15.26	0	298	QP
6	800.1800	40.55	-11.52	29.03	47.00	-17.97	360	101	QP

7.3 DISTURBANCE POWER MEASUREMENT

7.3.1 LIMITS

FREQUENCY (MHz)	dB(pw)	
	Quasi-peak	Average
30 ~ 300	45 ~ 55 [1)]	35 ~ 45 [1)]
Note: [1)] Increasing linearly with the frequency.		

7.3.2 TEST PROCEDURE

a) Let the EUT work in test modes.

b) The distance between the clamp test setup(EUT, LUT(lead under test), clamp) and any objects (including persons, walls and ceiling, but floor excluded) shall be at least 0.8 m.

c) The disturbance power shall be measured for each of the leads.

d) For the interconnect line between units of the same EUT, two measurements should be made. First the absorbing clamp current converter should be oriented towards one of the units for measurement, and then towards the other unit for measurement.

e) The EUT shall be placed on a support table. The height of the table shall be 0.8 m(± 0.05 m) for table top EUTs. The support for equipment designed for use primarily on a floor, shall be 0.1m(± 0.01m) high;

f) The EUT shall be positioned on the EUT table in its normal operating position as far as possible. The LUT(lead under test) shall run directly towards the SRP(slide reference point) of the clamp slide. In case a normal position is not defined, the EUT shall be positioned such that its LUT(lead under test) runs directly towards the clamp slide. The distance from EUT unit to the SRP(slide reference point) shall be as short as possible.

g) If the EUT has more than one lead, the leads that are not subject to measurement(including the connected auxiliary apparatus) shall be removed if operationally possible, at the time when another lead is measured. A lead that cannot be removed shall be isolated by means of a common-mode absorbing device (CMAD).

h) The LUT is positioned horizontally straight above the clamp slide, to permit variation of the position of the absorbing clamp along the lead to find the maximum reading. Outside the absorbing clamp, the height of the LUT(lead under test) above the floor shall be as close to 0,8 m as possible.

i) For better attachment of the LUT(lead under test) during the clamp sliding procedure, it is convenient to fix the LUT at the near end and the far end of the clamp slide by using quick release locks.

j) The lead to be measured is placed in a straight line for a distance sufficient to accommodate the absorbing clamp, and to permit the necessary measuring adjustment of position for tuning.

k) The absorbing clamp is positioned for maximum indication at each test frequency: the clamp shall be moved along the lead until the maximum value is found between a position adjacent to the EUT and a distance of about a half-wavelength from it.

7.3.3 TEST SETUP

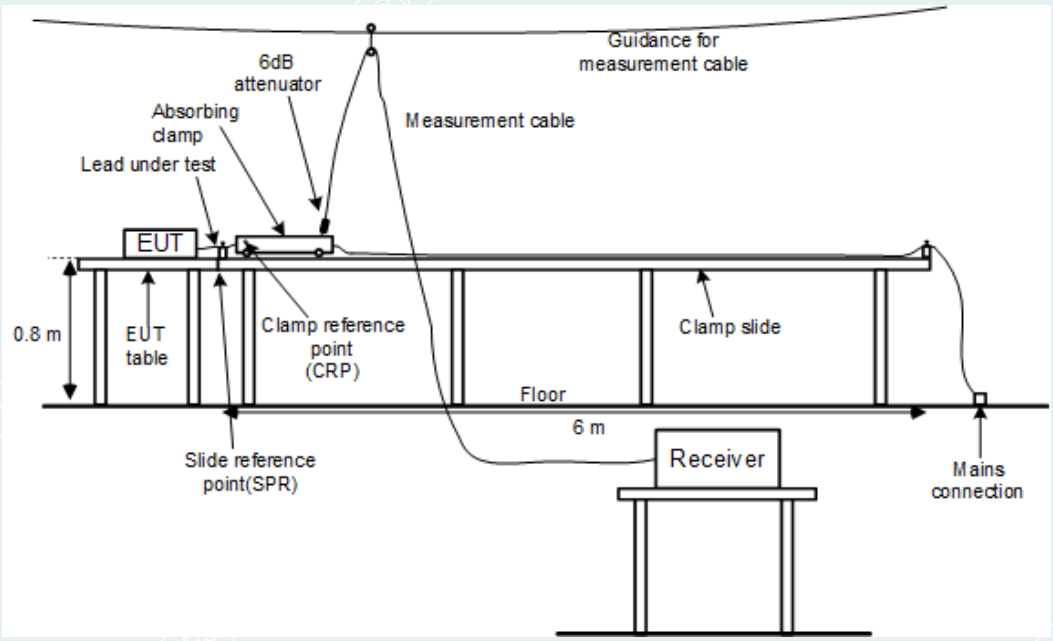


Figure 7.3 – Example measurement arrangement for table-top EUT

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7.3.4 DATA SAMPLE

Frequency (MHz)	Reading (dBpW)	Correct Factor (dB)	Result (dBpW)	Limit (dBpW)	Margin (dB)	Remark
XX.XXXX	35.54	4.56	40.10	55.00	-14.90	QP
XX.XXXX	29.66	4.56	34.22	45.00	-10.78	AVG

Frequency (MHz) = Emission frequency in MHz

Reading (dBpW) = Uncorrected Analyzer / Receiver reading

Correction Factor (dB) = Antenna factor + Cable loss – Amplifier gain

Result (dBpW) = Reading (dBpW) + Corr. Factor (dB)

Limit (dBpW) = Limit stated in standard

Margin (dB) = Result (dBpW) – Limit(dBpW)

QP = Quasi-peak Reading

AVG = Average Reading

Calculation Formula

Margin (dB) = Result (dBpW) – Limits (dBpW)

Result (dBpW) = Reading (dBpW) + Correction Factor (dB)

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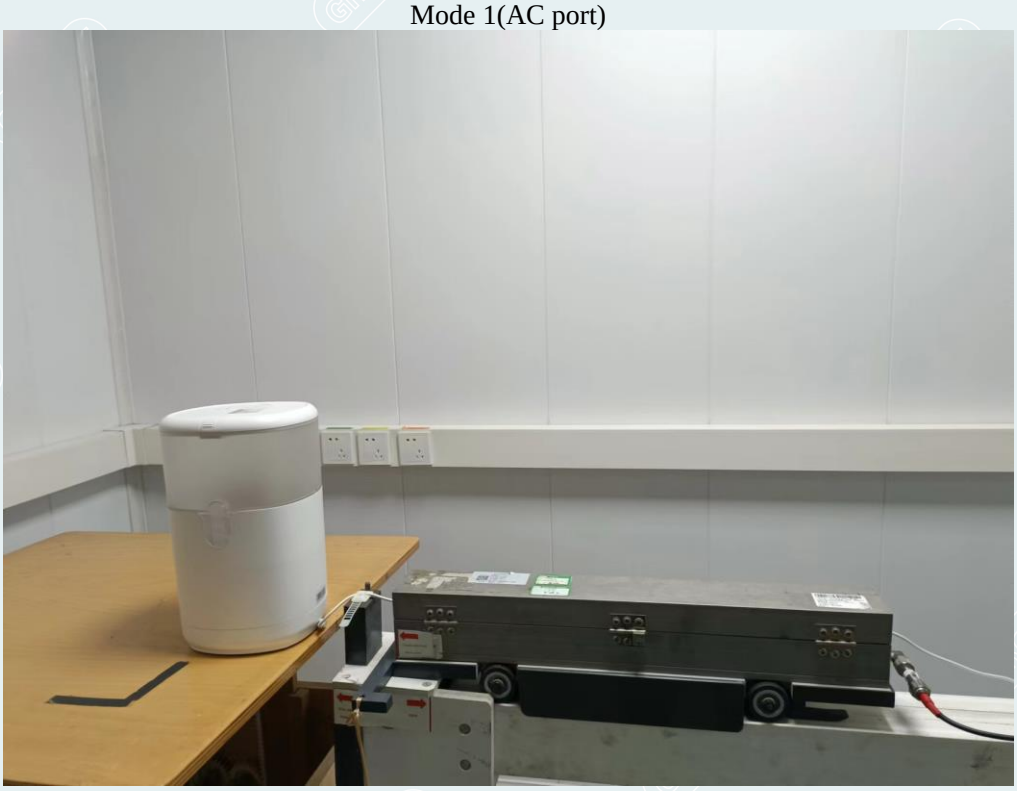
7.3.5 PHOTOGRAPH OF THE TEST ARRANGEMENT

Mode 1(AC port)



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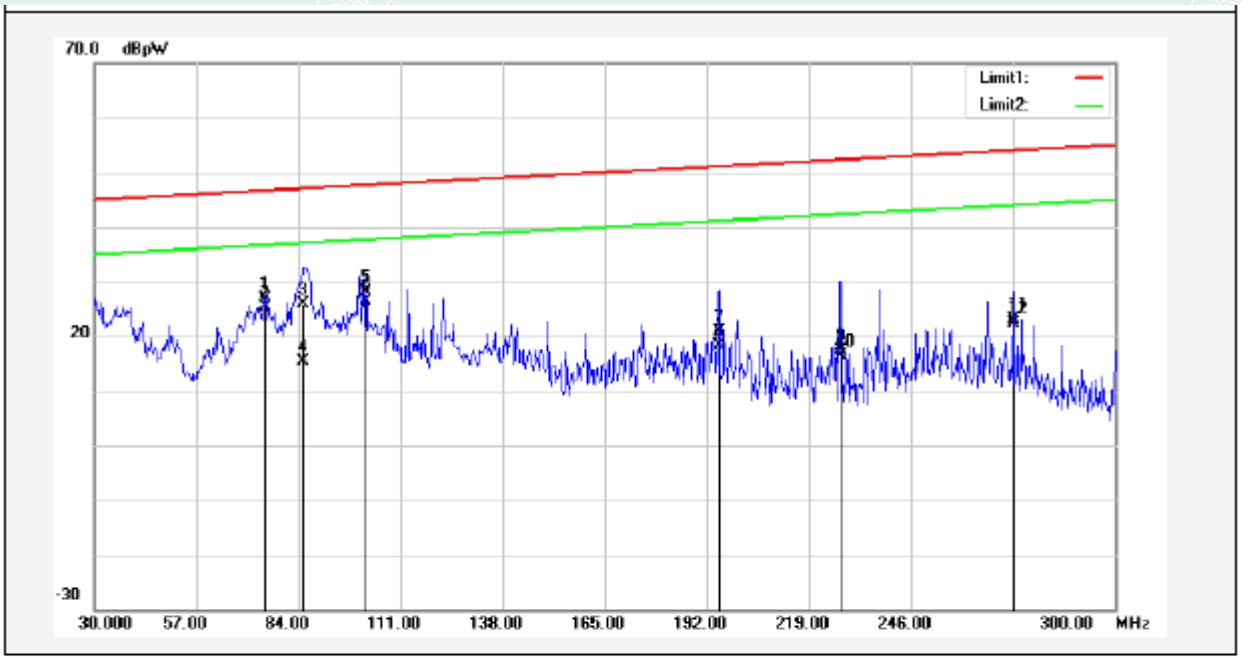
7.3.6 TEST RESULTS

EUT Name	Smart Pet Feeder C1	Model	PETC1-M01
Environmental Conditions	25.6℃/48%RH/101.0kPa	Test Mode	Mode 1
Power supply	DC 5V supply by adapter (AC 230V/50Hz)	Tested By	Jiang Tao
Test Date	2022-08-19	Sample No.	E20220613205901-0002
Test Line	DC cable		



No.	Frequency (MHz)	Reading (dBpW)	Correction factor(dB)	Result (dBpW)	Limit (dBpW)	Margin (dB)	Remark
1	75.0900	30.40	-3.60	26.80	46.67	-19.87	QP
2	75.0900	29.00	-3.60	25.40	36.67	-11.27	AVG
3	85.3500	30.11	-4.11	26.00	47.05	-21.05	QP
4	85.3500	19.51	-4.11	15.40	37.05	-21.65	AVG
5	101.8200	32.69	-4.59	28.10	47.66	-19.56	QP
6	101.8200	31.09	-4.59	26.50	37.66	-11.16	AVG
7	195.2400	26.07	-5.27	20.80	51.12	-30.32	QP
8	195.2400	23.57	-5.27	18.30	41.12	-22.82	AVG
9	227.3700	22.89	-5.49	17.40	52.31	-34.91	QP
10	227.3700	21.99	-5.49	16.50	42.31	-25.81	AVG
11	273.0000	28.19	-4.99	23.20	54.00	-30.80	QP
12	273.0000	27.29	-4.99	22.30	44.00	-21.70	AVG

7.4 Harmonic current

7.4.1 LIMITS

Limits for Class A equipment	
Harmonics Order (n)	Max. permissible harmonics current (A)
Odd harmonics	
3	2.30
5	1.14
7	0.77
9	0.40
11	0.33
13	0.21
15≤n≤39	0.15x15/n
Even harmonics	
2	1.08
4	0.43
6	0.30
8≤n≤40	0.23x8/n

Limits for Class D equipment		
Harmonics Order (n)	Max. permissible harmonics current per watt (mA/W)	Max. permissible harmonics current (A)
Odd Harmonics only		
3	3.4	2.30
5	1.9	1.14
7	1.0	0.77
9	0.5	0.40
11	0.35	0.33
13	0.30	0.21
15≤n≤39	3.85/n	0.15x15/n

Note:

1. *Class A and Class D are classified according to item 7.4.2 f).*
2. *According to section 7 of EN 61000-3-2, the above limits for all equipment except for lighting equipment having an active input power > 75 W and no limits apply for equipment with an active input power up to and including 75 W.*

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7.4.2 TEST PROCEDURE

a) Let the EUT work in test modes.
b) Measurement using the Harmonic & Flicker Tester controlled by computer.
c) Full equipment program cycle (reference method) or a representative 2.5 min
d) For table-top equipment
The equipment to be tested is placed in the test facility on a non-conductive table 0.8 m(±0.01 m) high.
e) For floor-standing equipment
The equipment to be tested is placed in the test facility on insulating support of 0.05 m to 0.15 m thick.
f) The EUT is classified as follows:
Class A: Balanced three-phase equipment, Household appliances excluding equipment as Class D, Tools excluding portable tools, Dimmers for incandescent lamps, audio equipment, equipment not specified in one of the three other classes.
Class B: Portable tools; Arc welding equipment which is not professional equipment.
Class C: Lighting equipment.
Class D: Equipment having a specified power less than or equal to 600 W of the following types: Personal computers and personal computer monitors and television receivers. The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen.

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7.4.3 TEST SETUP

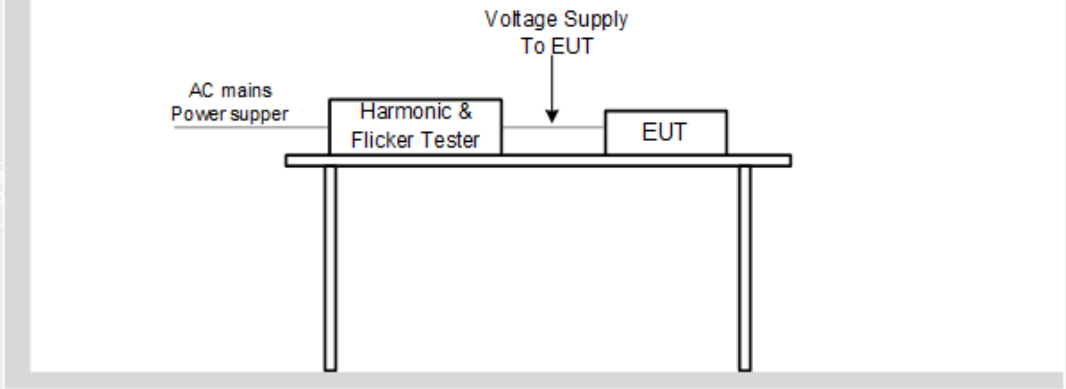

Figure 7.4 – Example measurement arrangement for table-top EUT

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7.4.4 PHOTOGRAPH OF THE TEST ARRANGEMENT

---------- The following blanks ----------

7.4.5 TEST RESULTS

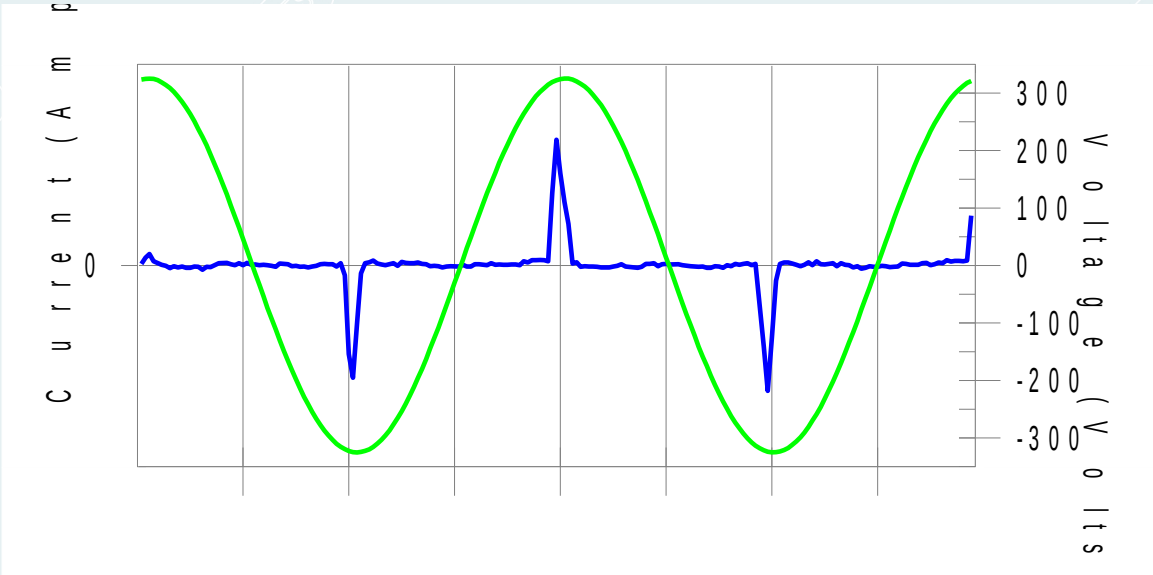
EUT Name	Smart Pet Feeder C1	Model:	PETC1-M01
Environmental Conditions	22.5℃/45%RH/101.0kPa	Test Mode	Mode 1
Power supply	DC 5V supply by adapter (AC 230V/50Hz)	Tested By	Wang Xinyuan
Test Date	2022-08-15	Sample No.	E20220613205901-0002

Harmonics – Class-A

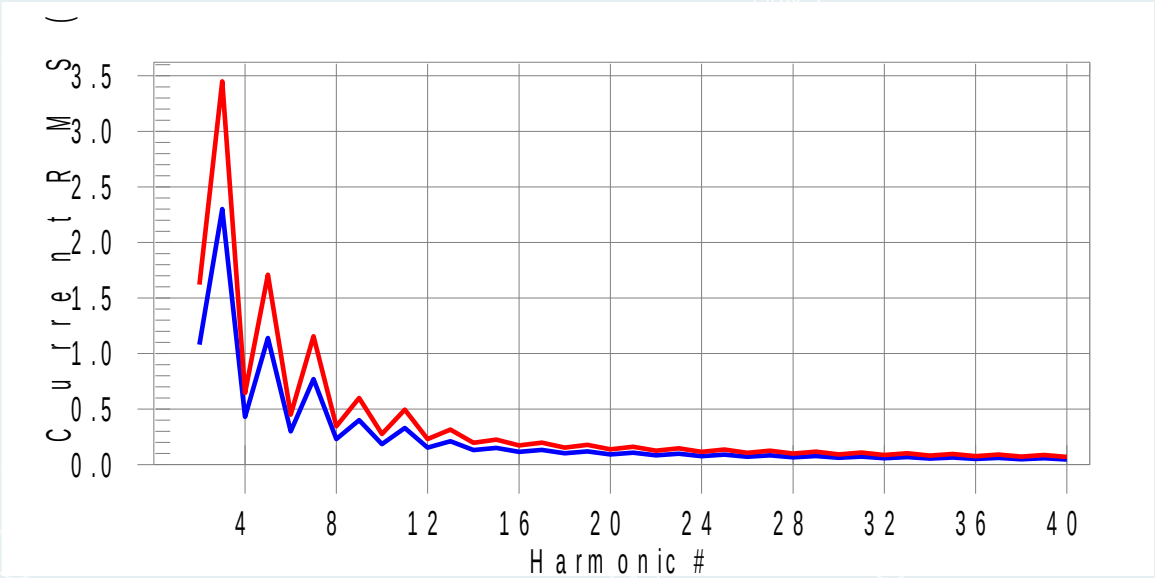
Test category: Class-A (European limits) **Test Margin: 100**
Test date: 2022/8/15 **Start time: 15:54:53** **End time: 15:57:35**
Test duration (min): 2.5 **Data file name: H-000337.cts_data**

Test Result: Pass **Source qualification: Normal**

Current & voltage waveforms



Harmonics and Class A limit line **European Limits**



Test result: Pass Worst harmonics H0-0.0% of 150% limit, H0-0% of 100% limit

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Current Test Result Summary (Run time)

Test category: Class-A (European limits) **Test Margin: 100**
Test date: 2022/8/15 **Start time: 15:54:53** **End time: 15:57:35**
Test duration (min): 2.5 **Data file name: H-000337.cts_data**

Test Result: Pass **Source qualification: Normal**
THC(A): 0.005 **I-THD(%): 211.0** **POHC(A): 0.002** **POHC Limit(A): 0.251**

Highest parameter values during test:

V_RMS (Volts):	**230.05**	**Frequency(Hz):**	**50.00**
I_Peak (Amps):	**0.148**	**I_RMS (Amps):**	**0.013**
I_Fund (Amps):	**0.002**	**Crest Factor:**	**15.799**
Power (Watts):	**0.6**	**Power Factor:**	**0.325**

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.001	1.080	N/A	0.001	1.620	N/A	Pass
3	0.002	2.300	N/A	0.003	3.450	N/A	Pass
4	0.001	0.430	N/A	0.001	0.645	N/A	Pass
5	0.002	1.140	N/A	0.002	1.710	N/A	Pass
6	0.000	0.300	N/A	0.000	0.450	N/A	Pass
7	0.002	0.770	N/A	0.002	1.155	N/A	Pass
8	0.000	0.230	N/A	0.000	0.345	N/A	Pass
9	0.002	0.400	N/A	0.002	0.600	N/A	Pass
10	0.000	0.184	N/A	0.000	0.276	N/A	Pass
11	0.002	0.330	N/A	0.002	0.495	N/A	Pass
12	0.000	0.153	N/A	0.000	0.230	N/A	Pass
13	0.001	0.210	N/A	0.002	0.315	N/A	Pass
14	0.000	0.131	N/A	0.000	0.197	N/A	Pass
15	0.001	0.150	N/A	0.002	0.225	N/A	Pass
16	0.000	0.115	N/A	0.000	0.173	N/A	Pass
17	0.001	0.132	N/A	0.002	0.198	N/A	Pass
18	0.000	0.102	N/A	0.000	0.153	N/A	Pass
19	0.001	0.118	N/A	0.002	0.178	N/A	Pass
20	0.000	0.092	N/A	0.000	0.138	N/A	Pass
21	0.001	0.107	N/A	0.001	0.161	N/A	Pass
22	0.000	0.084	N/A	0.000	0.125	N/A	Pass
23	0.001	0.098	N/A	0.001	0.147	N/A	Pass
24	0.000	0.077	N/A	0.000	0.115	N/A	Pass
25	0.001	0.090	N/A	0.001	0.135	N/A	Pass
26	0.000	0.071	N/A	0.000	0.107	N/A	Pass
27	0.001	0.083	N/A	0.001	0.125	N/A	Pass
28	0.000	0.066	N/A	0.000	0.099	N/A	Pass
29	0.001	0.078	N/A	0.001	0.116	N/A	Pass
30	0.000	0.061	N/A	0.000	0.092	N/A	Pass
31	0.001	0.073	N/A	0.001	0.109	N/A	Pass
32	0.000	0.058	N/A	0.000	0.086	N/A	Pass
33	0.000	0.068	N/A	0.001	0.102	N/A	Pass
34	0.000	0.054	N/A	0.000	0.081	N/A	Pass
35	0.000	0.064	N/A	0.000	0.096	N/A	Pass
36	0.000	0.051	N/A	0.000	0.077	N/A	Pass
37	0.000	0.061	N/A	0.000	0.091	N/A	Pass
38	0.000	0.048	N/A	0.000	0.073	N/A	Pass
39	0.000	0.058	N/A	0.000	0.087	N/A	Pass
40	0.000	0.046	N/A	0.000	0.069	N/A	Pass

Voltage Source Verification Data (Run time)

Test category: Class-A (European limits) **Test Margin: 100**
Test date: 2022/8/15 **Start time: 15:54:53** **End time: 15:57:35**
Test duration (min): 2.5 **Data file name: H-000337.cts_data**

Test Result: Pass **Source qualification: Normal**

Highest parameter values during test:

Voltage (Vrms):	**230.05**	**Frequency(Hz):**	**50.00**
I_Peak (Amps):	**0.148**	**I_RMS (Amps):**	**0.013**
I_Fund (Amps):	**0.002**	**Crest Factor:**	**15.799**
Power (Watts):	**0.6**	**Power Factor:**	**0.325**

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.166	0.460	36.18	OK
3	0.427	2.070	20.62	OK
4	0.073	0.460	15.95	OK
5	0.051	0.920	5.58	OK
6	0.031	0.460	6.69	OK
7	0.023	0.690	3.34	OK
8	0.022	0.460	4.83	OK
9	0.021	0.460	4.50	OK
10	0.023	0.460	4.90	OK
11	0.015	0.230	6.68	OK
12	0.020	0.230	8.82	OK
13	0.013	0.230	5.85	OK
14	0.012	0.230	5.13	OK
15	0.011	0.230	4.71	OK
16	0.013	0.230	5.45	OK
17	0.014	0.230	6.21	OK
18	0.015	0.230	6.39	OK
19	0.009	0.230	3.72	OK
20	0.011	0.230	4.98	OK
21	0.009	0.230	3.88	OK
22	0.007	0.230	2.99	OK
23	0.008	0.230	3.42	OK
24	0.006	0.230	2.68	OK
25	0.009	0.230	3.87	OK
26	0.010	0.230	4.20	OK
27	0.008	0.230	3.32	OK
28	0.008	0.230	3.51	OK
29	0.005	0.230	2.28	OK
30	0.007	0.230	3.15	OK
31	0.004	0.230	1.80	OK
32	0.006	0.230	2.62	OK
33	0.007	0.230	2.97	OK
34	0.003	0.230	1.35	OK
35	0.004	0.230	1.52	OK
36	0.004	0.230	1.68	OK
37	0.004	0.230	1.56	OK
38	0.003	0.230	1.36	OK
39	0.004	0.230	1.56	OK
40	0.005	0.230	2.16	OK

7.5 VOLTAGE FLUCTUATION & FLICKER MEASUREMENT

7.5.1 LIMITS

	Test Item	Limit	Remark
Test Item	P_{st}	1.0	P_{st} means short-term flicker indicator.
	P_{lt}	0.65	P_{lt} means long-term flicker indicator.
	T_{dt} (ms)	500	T_{dt} means maximum time that dt exceeds 3 %.
	d_{max} (%)	4%,6%,7%	d_{max} means maximum relative voltage change.
	dc (%)	3.3%	dc means relative steady-state voltage change

7.5.2 TEST PROCEDURE

a) Let the EUT work in test modes.

b) Measurement using the Harmonic & Flicker Tester controlled by computer.

c) During the flick measurement, the measure time shall include that part of whole operation cycle in which the EUT produce the most unfavorable sequence of voltage changes. The observation period for short-term flicker indicator is 10 minutes.

d) For table-top equipment

The equipment to be tested is placed in the test facility on a non-conductive table 0.8 m(± 0.01 m) high.

e) For floor-standing equipment

The equipment to be tested is placed in the test facility on insulating support of 0.05 m to 0.15 m thick.

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7.5.3 TEST SETUP

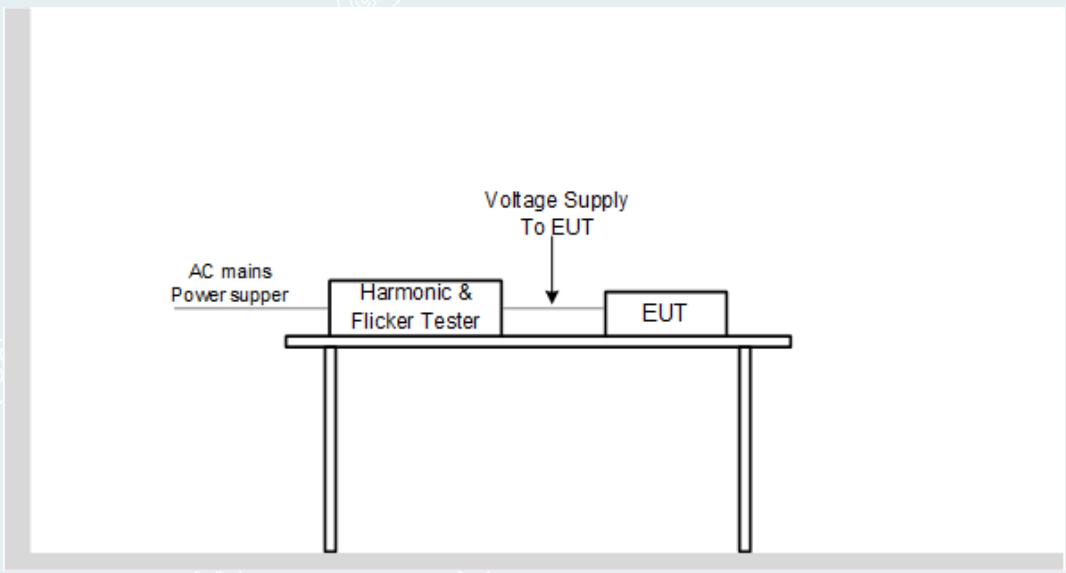

Figure 7.5 – Example measurement arrangement for table-top EUT

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7.5.4 PHOTOGRAPH OF THE TEST ARRANGEMENT

Mode 1

---------- **The following blanks** ----------

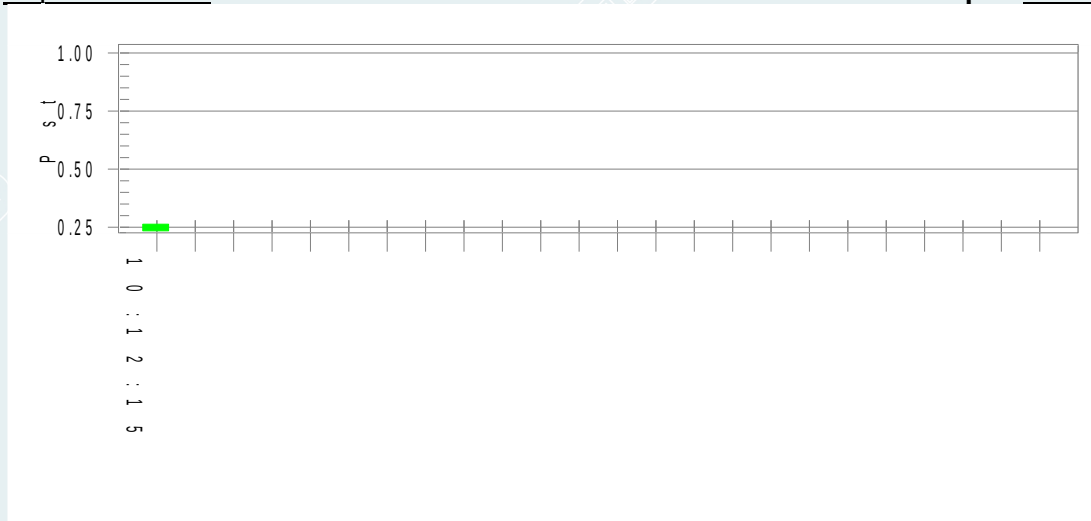
7.5.5 TEST RESULTS

EUT Name	Smart Pet Feeder C1	Model:	PETC1-M01
Environmental Conditions	25.5℃/57%RH/101.0kPa	Test Mode	Mode 1
Power supply	DC 5V supply by adapter (AC 230V/50Hz)	Tested By	Wang Xinyuan
Test Date	2022-08-17	Sample No.	E20220613205901-0002

Test category: All parameters (European limits) **Test Margin: 100**
Test date: 2022/8/17 **Start time: 10:01:54** **End time: 10:12:22**
Test duration (min): 10 **Data file name: F-000350.cts_data**

Test Result: Pass **Status: Test Completed**

Pst_t and limit line **European Limits**



Plt and limit line

Parameter values recorded during the test:
Vrms at the end of test (Volt): 230.04

Highest dt (%):		**Test limit (%):**		
T-max (mS):	**0**	**Test limit (mS):**	**500.0**	**Pass**
Highest dc (%):	**0.00**	**Test limit (%):**	**3.30**	**Pass**
Highest dmax (%):	**0.00**	**Test limit (%):**	**4.00**	**Pass**
Highest Pst (10 min. period):	**0.263**	**Test limit:**	**1.000**	**Pass**
Highest Plt (2 hr. period):	**0.115**	**Test limit:**	**0.650**	**Pass**

8. IMMUNITY TEST

8.1 GENERAL DESCRIPTION

EN 55014-2:2015		
Test Method	**Test Type**	**Minimum Requirement**
IEC 61000-4-2	Electrostatic discharge immunity test	Enclosure port: Contact Discharge : 4 kV (Direct) Air Discharge:, ±8 kV (Direct); HCP discharge: ±4kV(Indirect) VCP discharge: ±4kV(Indirect) Performance Criterion B
IEC 61000-4-3	Continuous RF electromagnetic field disturbances	Radio-Frequency Electromagnetic Field Susceptibility Test – RS: 80 ~1000 MHz, 3V/m, 80% AM(1kHz), Performance Criterion A
IEC 61000-4-4	Electrical fast transient/burst immunity test	AC Input Power: ±1kV 5/50 Tr/Th ns 5kHz Performance Criterion B
IEC 61000-4-5	Surge immunity test	AC Input Port:1.2/50（8/20）Tr/Th us line to line: ±1.0kV 90 °, -270 ° Performance Criterion B
IEC 61000-4-6	Conducted radio frequency disturbances immunity test	AC Input Power: 0.15MHz-230MHz 3V 80%AM(1kHz) Performance Criterion A
IEC 61000-4-11	Voltage Dip & Voltage Interruptions immunity test	AC Input Port: 0%,0.5T Performance Criterion C 70%,25T for 50Hz Performance Criterion C 40%,10 T for 50Hz Performance Criterion C

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8.2 GENERAL PERFORMANCE CRITERIA DESCRIPTION

Criteria A	The apparatus shall continue to operate as intended during the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.
Criteria B	The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. During the test, degradation of performance is allowed, however no change of actual operating state or stored data is allowed to persist after the test. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.
Criteria C	Temporary loss of function is allowed, provided the function is selfrecoverable or can be restored by the operation of the controls, or by any operation specified in the instructions for use.

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8.3 ELECTROSTATIC DISCHARGEIMMUNITY TEST

8.3.1 TEST SPECIFICATION

Test Method	IEC 61000-4-2
Discharge Impedance	330 ohm / 150 pF
Discharge Voltage	Enclosure port: Contact Discharge : 4kV (Direct) Air Discharge: ±8kV (Direct); HCP discharge: ±4kV(Indirect mode); VCP discharge: ±4kV(Indirect mode);
Polarity	Positive & Negative
Number of Discharge	Minimum 10 times at each test point
Discharge Mode	Single Discharge 1 second minimum

8.3.2 TEST PROCEDURE

f) Let the EUT work in test modes.

g) For each test, any degradation of performance shall be recorded.

h) The test shall be performed with single discharges. On each pre-selected point at 10 single discharges (in the most sensitive polarity) shall be applied.

i) For the time interval between successive single discharges an initial value of 1 s is recommended. Longer intervals may be necessary to determine whether a system failure has occurred.

j) In the case of contact discharges, the tip of the discharge electrode shall touch the EUT, before the discharge switch is operated.

k) In the case of painted surfaces covering a conducting substrate, the following procedure shall be adopted:

If the coating is not declared to be an insulating coating by the equipment manufacturer, then the pointed tip of the generator shall penetrate the coating so as to make contact with the conducting substrate. Coating declared as insulating by the manufacturer shall only be submitted to the air discharge. The contact discharge test shall not be applied to such surfaces.

l) At least ten single discharges (in the most sensitive polarity) were applied to the center of one vertical edge of the Vertical Coupling Plane (VCP) in sufficiently different positions that the four faces of the EUT were completely illuminated. The VCP (dimensions 0.5m * 0.5m) was placed vertically to and 0.1 meters from the EUT.

m) Where coupling planes are specified, shall be connected to the GRP via a cable with a 470 kΩ resistor located at each end.

n) For table-top equipment

The test setup shall consist of a non-conductive table, (0.8 ± 0.08) m high, standing on the ground reference plane.

A horizontal coupling plane (HCP), (1.6 ± 0.02) m × (0.8 ± 0.02) m, shall be placed on the table. The EUT and its cables shall be isolated from the coupling plane by an insulating support (0.5 ± 0.05) mm in thickness.

If the EUT is too large to be located 0.1 m minimum from all sides of the HCP, an additional, identical HCP shall be used, placed (0.3 ± 0.02) m from the first HCP. The table has to be enlarged or two tables may be used. The HCPs shall not be bonded together, other than via resistive cables to the GRP.

The ground reference plane (GRP) shall project beyond the EUT or the horizontal coupling plane (when applicable) by at least 0.5 m on all sides, and shall be connected to the protective grounding system.

At ten single discharges (in the most sensitive polarity) were applied at the front edge of each HCP opposite the center point of each unit of the EUT and 0.1 meters from the front of the EUT. The long axis of the discharge electrode was in the plane of the HCP and perpendicular to its front edge during the discharge.

o) For floor-standing equipment

The EUT shall be isolated from the ground reference plane by an insulating support of 0.05 m to 0.15 m thick. The EUT cables shall be isolated from the ground reference plane by an insulating support of (0.5 ± 0.05) mm. This cable isolation shall extend beyond the edge of the EUT isolation.

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8.3.3 TEST SETUP

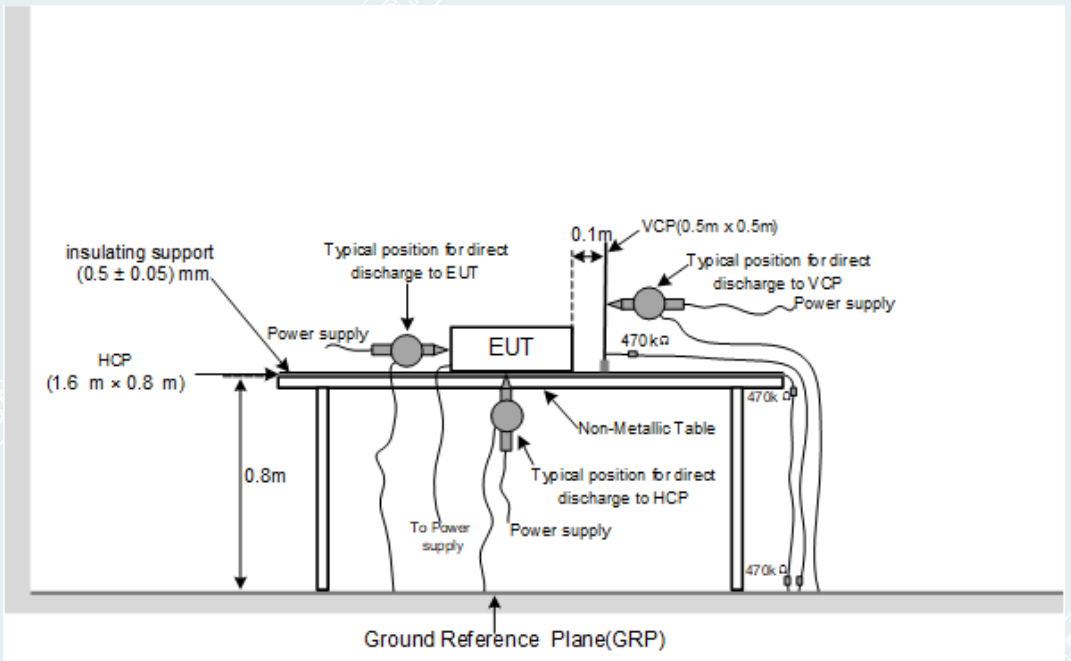

Figure 8.3 – Example measurement arrangement for floor standing EUT

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8.3.4 PHOTOGRAPH OF THE TEST ARRANGEMENT

Mode 1

Mode 2

8.3.5 TEST RESULTS

EUT Name	Smart Pet Feeder C1	Model	PETC1-M01
Environmental Conditions	25.5℃/57%RH/101.0kPa	Test Mode	Mode 1
Power supply	DC 5V supply by adapter (AC 230V/50Hz)	Tested By	Jiang Tao
Test Date	2022-08-16	Sample No.	E20220613205901-0002

Discharge point	Discharge voltage	C-Conduct A-Air	Required Performance	Actual performance	Result
Vertical coupling plane	±4kV	C	Criterion B	Criterion A[1)]	PASS
Horizontal coupling plane	±4kV	C	Criterion B	Criterion A[1)]	PASS
Shell gaps	±8kV	A	Criterion B	Criterion A[1)]	PASS
Charging port	±8kV	A	Criterion B	Criterion A[1)]	PASS
Indicator light	±8kV	A	Criterion B	Criterion A[1)]	PASS
Keypad	±8kV	A	Criterion B	Criterion A[1)]	PASS
NOTE: [1)] Before test, during the test, and after test, the EUT function is normal,Zigbee connection communication is normal, the recording is played properly.					

EUT Name	Smart Pet Feeder C1	Model	PETC1-M01
Environmental Conditions	25.5℃/57%RH/101.0kPa	Test Mode	Mode 2
Power supply	DC 4.5V supply by battery	Tested By	Jiang Tao
Test Date	2022-08-16	Sample No.	E20220613205901-0002

Discharge point	Discharge voltage	C-Conduct A-Air	Required Performance	Actual performance	Result
Vertical coupling plane	±4kV	C	Criterion B	Criterion A[1)]	PASS
Horizontal coupling plane	±4kV	C	Criterion B	Criterion A[1)]	PASS
Shell gaps	±8kV	A	Criterion B	Criterion A[1)]	PASS
Charging port	±8kV	A	Criterion B	Criterion A[1)]	PASS
Indicator light	±8kV	A	Criterion B	Criterion A[1)]	PASS
Keypad	±8kV	A	Criterion B	Criterion A[1)]	PASS
NOTE: [1)] Before test, during the test, and after test, the EUT function is normal,Zigbee connection communication is normal, the recording is played properly.					

8.4 CONTINUOUS RF ELECTROMAGNETIC FIELD DISTURBANCES

8.4.1 TEST SPECIFICATION

Basic Standard	IEC 61000-4-3
Frequency Range	80 MHz ~1000 MHz;
Field Strength	3V/m
Modulation	1kHz Sine Wave, 80%, AM Modulation
Frequency Step	1 % of preceding frequency value
Polarity of Antenna	Horizontal and Vertical
Test Distance:	3 m
Antenna Height:	1.55m

8.4.2 TEST PROCEDURE

a) Let the EUT work in test modes.
b) Testing using the Radio frequency electromagnetic field test system controlled by computer.
c) For each test, any degradation of performance shall be recorded.
d) The testing was performed in a fully anechoic chamber. The transmit antenna was located at a distance of 3 meters from the EUT.
e) The EUT is initially placed with one face coincident with the calibration plane. The EUT face being illuminated shall be contained within the UFA. If possible, a minimum of 1 m of cable is exposed to the electromagnetic field. Excess length of cables interconnecting units of the EUT shall be bundled low-inductively in the approximate center of the cable to form a bundle 30 cm to 40 cm in length.
f) The frequency ranges to be considered are swept with the signal 80% amplitude modulated with a 1 kHz sine-wave. the step size shall be 1 % of the preceding frequency value.
g) The test shall normally be performed with the generating antenna facing each side of the EUT. The polarization of the field generated by each antenna necessitates testing each selected side twice, once with the antenna positioned vertically and again with the antenna positioned horizontally.
h) The dwell time of the amplitude modulated carrier at each frequency shall be 1s.
i) For table-top equipment
The equipment to be tested is placed in the test facility on a non-conductive table 0.8 m high.
j) For floor-standing equipment
Floor-standing equipment should be mounted on a non-conductive support 0.05 m to 0.15 m above the supporting plane.
NOTE: Non-conductive rollers may be used as the 0.05 m to 0.15 m support.

8.4.3 TEST SETUP

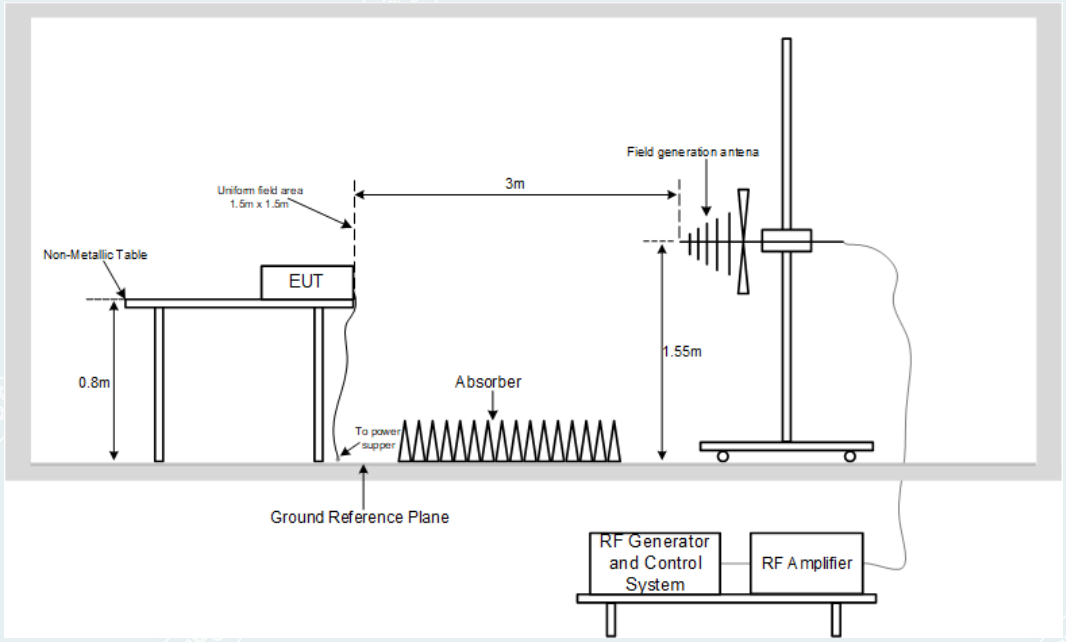

Figure 8.4 – Example measurement arrangement for table-top EUT (Frequencies up to 1 GHz)

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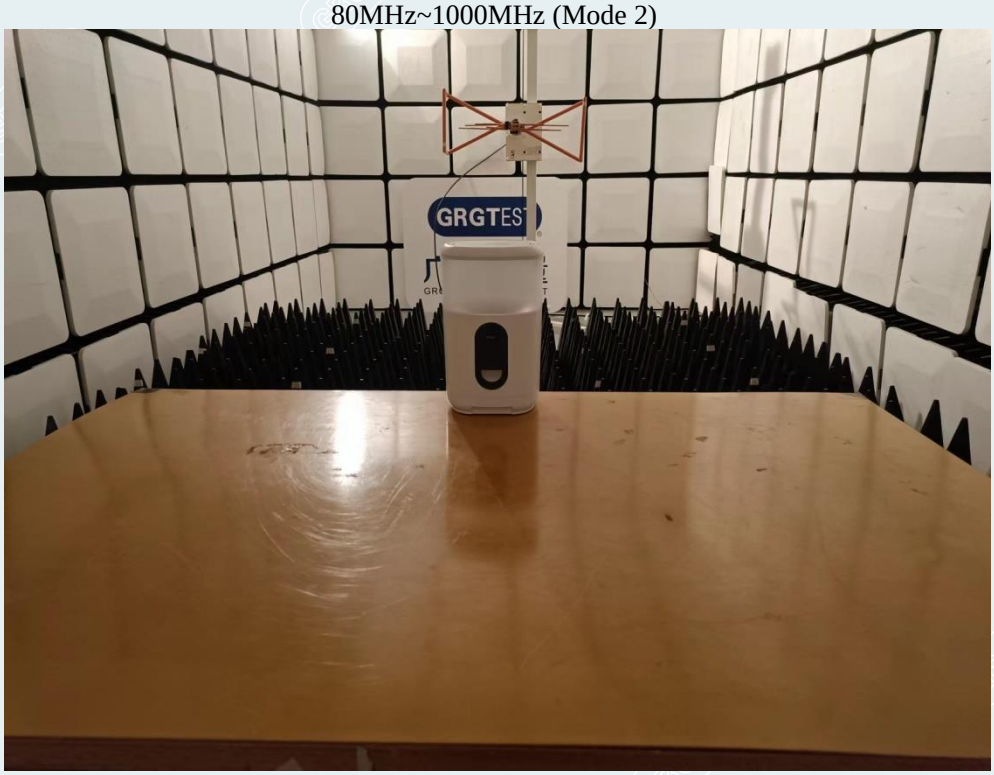
8.4.4 PHOTOGRAPH OF THE TEST ARRANGEMENT

80MHz~1000MHz (Mode 1)

80MHz~1000MHz (Mode 2)



8.4.5 TEST RESULTS

EUT Name	Smart Pet Feeder C1	Model	PETC1-M01
Environmental Conditions	24.5℃/45%RH/101.0kPa	Test Mode	Mode 1
Power supply	DC 5V supply by adapter (AC 230V/50Hz)	Tested By	Wang Xinyuan
Test Date	2022-08-18	Sample No.	E20220613205901-0002

Frequency (MHz)	Field strength (V/m)	EUT orientation	Antenna polarization	Required criterion	Actual performance	Result
80~1000	3	Front	H	Criterion A	Criterion A [1)]	pass
			V	Criterion A	Criterion A [1)]	pass
		Left	H	Criterion A	Criterion A [1)]	pass
			V	Criterion A	Criterion A [1)]	pass
		Right	H	Criterion A	Criterion A [1)]	pass
			V	Criterion A	Criterion A [1)]	pass
		Rear	H	Criterion A	Criterion A [1)]	pass
			V	Criterion A	Criterion A [1)]	pass
NOTE: [1)] Before test, during the test, and after test, the EUT function is normal,Zigbee connection communication is normal, the recording is played properly.						

EUT Name	Smart Pet Feeder C1	Model	PETC1-M01
Environmental Conditions	24.5℃/45%RH/101.0kPa	Test Mode	Mode 2
Power supply	DC 4.5V supply by battery	Tested By	Wang Xinyuan
Test Date	2022-08-18	Sample No.	E20220613205901-0002

Frequency (MHz)	Field strength (V/m)	EUT orientation	Antenna polarization	Required criterion	Actual performance	Result
80~1000	3	Front	H	Criterion A	Criterion A [1)]	pass
			V	Criterion A	Criterion A [1)]	pass
		Left	H	Criterion A	Criterion A [1)]	pass
			V	Criterion A	Criterion A [1)]	pass
		Right	H	Criterion A	Criterion A [1)]	pass
			V	Criterion A	Criterion A [1)]	pass
		Rear	H	Criterion A	Criterion A [1)]	pass
			V	Criterion A	Criterion A [1)]	pass
NOTE: [1)] Before test, during the test, and after test, the EUT function is normal,Zigbee connection communication is normal, the recording is played properly.						

8.5 ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

8.5.1 TEST SPECIFICATION

Test Method	IEC 61000-4-4
Test Voltage	AC Input and output Power: ±1kV
Polarity	Positive and Negative
Impulse Frequency	5 kHz
Impulse Wave-shape	5 ns/50ns for voltage
Burst Duration	15 ms at 5kHz
Burst Period	300 ms
Test Duration	2 min for each polarity

8.5.2 TEST PROCEDURE

a) Let the EUT work in test modes.
b) Testing using the Electrical Fast Transients/Burst Generator controlled by computer.
c) For each test, any degradation of performance shall be recorded.
d) The duration time of each polarity was 1 minute. test voltage both polarities are mandatory.
e) All cables to the EUT shall be placed on the insulation support 0.1 m above the ground reference plane.
f) Either a direct coupling network or a capacitive clamp shall be used for the application of the test voltages. The test voltages shall be coupled to all of the EUT ports in turn including those between two units of equipment involved in the test, unless the length of the interconnecting cable makes it impossible to test.
g) When using the coupling clamp, the minimum distance between the coupling plates and all other conductive surfaces (including the generator), except the ground reference plane beneath the coupling clamp and beneath the EUT, shall be at least 0.5 m.
h) The distance between any coupling devices and the EUT shall be (0.5 - 0/+0.1) m for tabletop equipment testing, and (1.0 ±0.1) m for floor standing equipment.
i) The cable between the EUT and the coupling device, if detachable, shall be as short.
j) If the manufacturer provides a cable exceeding the distance between the coupling device and the point of entry of the EUT, the excess length of this cable shall be bundled and situated at a distance of 0.1m above the ground reference plane. When a capacitive clamp is used as a coupling device, the excess cable length shall be bundled at the AE side.
k) For table-top equipment
Table-top equipment and equipment normally mounted on ceilings or walls as well as built-in equipment shall be tested with the EUT located (0.1 ±0.01) m above the ground reference plane.
Testing of large table-top equipment or multiple systems can be performed on the floor; maintaining the same distances as for the test setup of table-top equipment.
l) For floor-standing equipment

Floor standing EUTs and equipment designed to be mounted in other configurations, shall be placed on a ground reference plane and shall be insulated from it by an insulating support with a thickness of (0.1 ±0.05) m including non-conductive roller/castors.

8.5.3 TEST SETUP

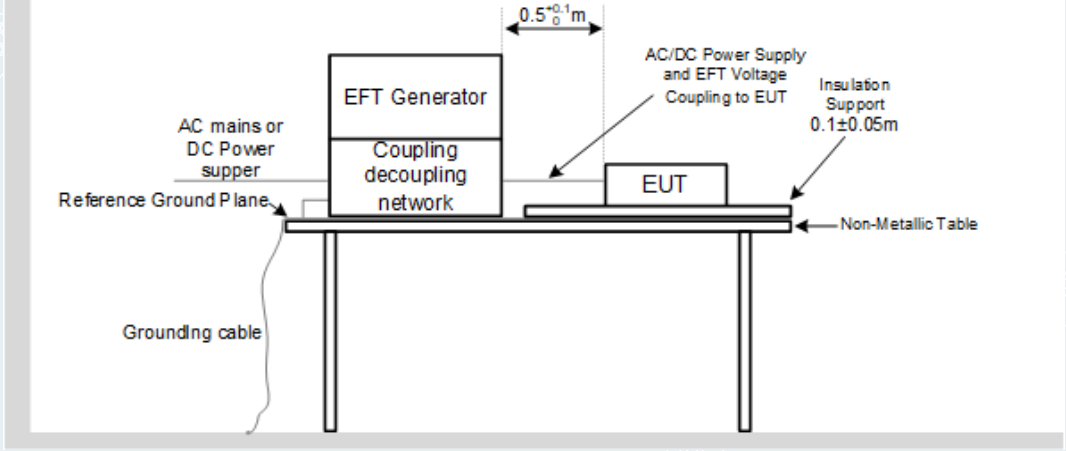


Figure 8.5.1 – Example measurement arrangement for table-top EUT
(Input and output ac power ports/ Input and output dc power ports)

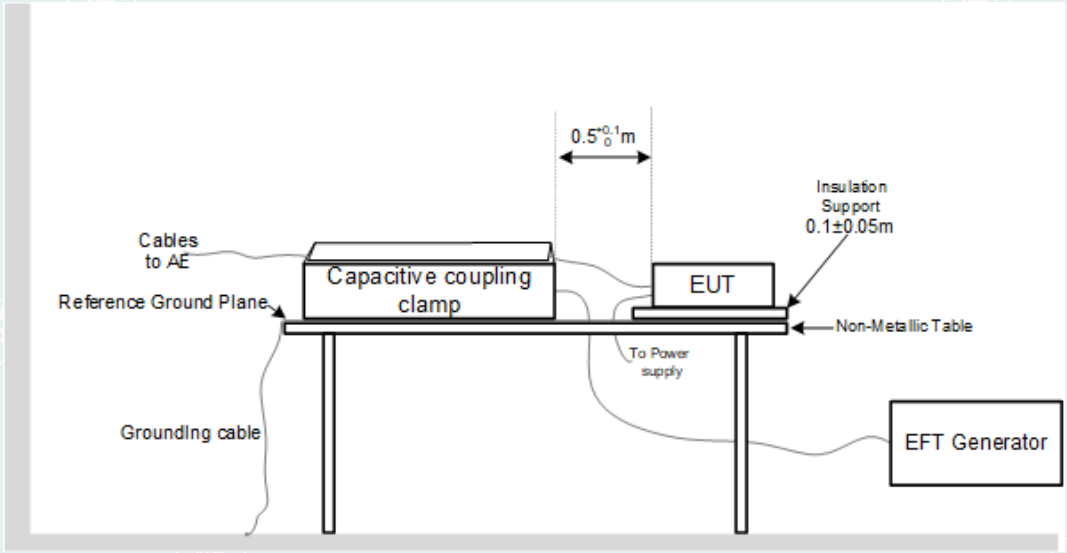


Figure 8.5.2 – Example measurement arrangement for table-top EUT
(Signal lines port and control lines port)

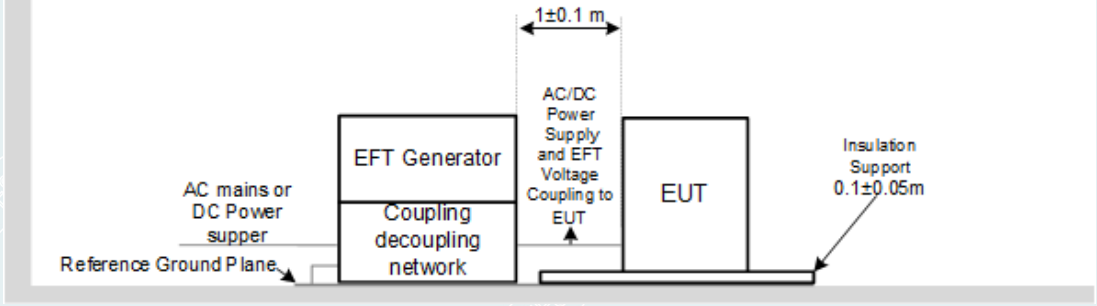


Figure 8.5.3 – Example measurement arrangement for floor standing EUT
(Input and output ac power ports/ Input and output dc power ports)

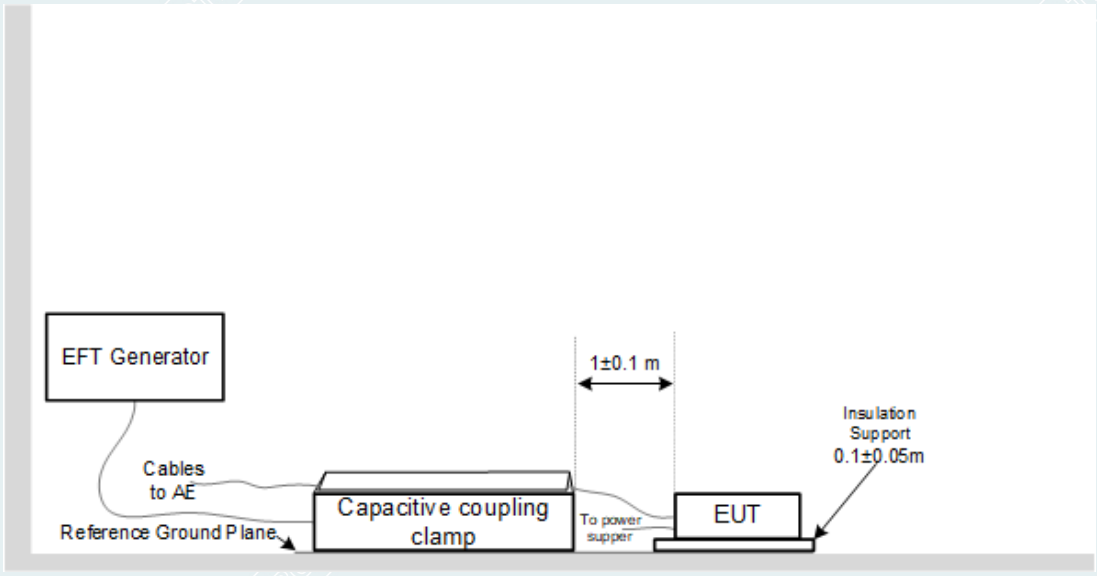


Figure 8.5.4 – Example measurement arrangement for floor standing EUT
(Signal lines port and control lines port)

8.5.4 PHOTOGRAPH OF THE TEST ARRANGEMENT

Mode 1

---------- The following blanks ----------

8.5.5 TEST RESULTS

EUT Name	Smart Pet Feeder C1	Model	PETC1-M01
Environmental Conditions	25.5℃/57%RH/101.0kPa	Test Mode	Mode 1
Power supply	DC 5V supply by adapter (AC 230V/50Hz)	Tested By	Jiang Tao
Test Date	2022-08-16	Sample No.	E20220613205901-0002

Test Point	Polarity	Test Level (kV)	Required Performance	Actual performance	Result
L	+	1	Criterion B	Criterion A 1)	PASS
	-	1	Criterion B	Criterion A 1)	PASS
N	+	1	Criterion B	Criterion A 1)	PASS
	-	1	Criterion B	Criterion A 1)	PASS
L-N	+	1	Criterion B	Criterion A 1)	PASS
	-	1	Criterion B	Criterion A 1)	PASS
NOTE: 1) Before test, during the test, and after test, the EUT function is normal,Zigbee connection communication is normal, the recording is played properly.					

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8.6 SURGE IMMUNITY TEST

8.6.1 TEST SPECIFICATION

Test Method	IEC 61000-4-5
Wave-Shape	Combination Wave AC Input Port: 1.2/50 μs Open Circuit Voltage 8/20 μs Short Circuit Current
Test Voltage	AC Input Port: Line to line: 1kV
Generator Source Impedance	AC Input Port: Line to line 2ohm
Polarity	Positive and Negative
Phase Angle	90 °, -270 °
Pulse Repetition Rate	1 minute
Number of Tests	5 times for each phase angel

8.6.2 TEST PROCEDURE

a) Let the EUT work in test modes.
b) Testing using the combined wave lightning surge simulator.
c) For each test, any degradation of performance shall be recorded.
d) The 1.2/50μs surge shall be applied to the EUT power supply terminals via the capacitive coupling network. Decoupling networks are required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines and to provide sufficient decoupling impedance to the surge wave so that the specified. Wave may be applied on the lines under test.
e) The power cord between the EUT and the coupling network shall not exceed 2 m in length.
f) Test setup for surges applied to unshielded unsymmetrical interconnection lines and unshielded symmetrical interconnection lines:
The interconnection line between the EUT and the coupling network shall not exceed 2 m in length.
g) Number of impulses (for each coupling path):
For d.c. power ports and interconnection lines five positive and five negative surge impulses;
For a.c. power ports five positive and five negative impulses each at specified phase angle;
h) Time between successive impulses: 1 min.
i) If testing done at rates faster than one per minute cause failures and tests done at one per minute do not, the test done at one per minute prevails.
j) For table-top equipment
The equipment to be tested is placed in the test facility on a non-conductive table 0.8 m(±0.01 m) high.
k) For floor-standing equipment
The equipment to be tested is placed in the test facility on insulating support of 0.05 m to 0.15 m thick.

8.6.3 TEST SETUP

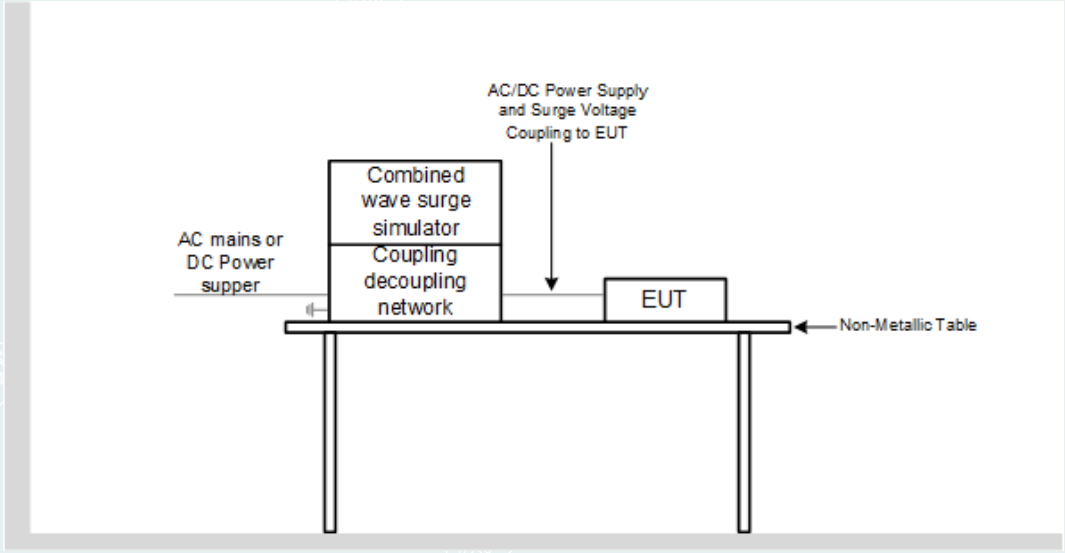

Figure 8.6 – Example measurement arrangement for table-top EUT
(Input and output ac power ports)

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8.6.4 PHOTOGRAPH OF THE TEST ARRANGEMENT

Mode 1

---------- **The following blanks** ----------

8.6.5 TEST RESULTS

EUT Name	Smart Pet Feeder C1	Model	PETC1-M01
Environmental Conditions	25.5℃/57%RH/101.0kPa	Test Mode	Mode 1
Power supply	DC 5V supply by adapter (AC 230V/50Hz)	Tested By	Jiang Tao
Test Date	2022-08-16	Sample No.	E20220613205901-0002

Test port	Polarity	Test Level	Phase	Required Performance	Actual performance	Result
L-N	+	1kV	90 °	Criterion B	Criterion A [1)]	PASS
	-	1kV	270 °	Criterion B	Criterion A [1)]	PASS
NOTE: [1)] Before test, during the test, and after test, the EUT function is normal,Zigbee connection communication is normal, the recording is played properly.						

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8.7 CONDUCTED RADIO FREQUENCY DISTURBANCES IMMUNITY TEST

8.7.1 TEST SPECIFICATION

Test Method	IEC 61000-4-6
Frequency Range	0.15MHz to 230MHz
Field Strength	Input and output ac power ports: 3V(unmodulated, r.m.s)
Modulation	1kHz ,80%AM
Injection Method	AC Input Power:CDN
Frequency Step	1%
Dwell Time	1s

8.7.2 TEST PROCEDURE

a) Let the EUT work in test modes.
b) Testing using the Injected currents test system controlled by computer.
c) For each test, any degradation of performance shall be recorded.
d) The frequency ranges to be considered are swept with the signal 80% amplitude modulated with a 1 kHz sine-wave. The step size shall be 1 % of the preceding frequency value.
e) The dwell time of the amplitude modulated carrier at each frequency shall be 1s.
f) The EUT clearance from any metallic obstacles other than the test equipment shall be at least 0.5 m.
g) Coupling and/or decoupling devices shall be located between 0.1 m and 0.3 m from the EUT. This distance is to be measured horizontally from the projection of the EUT on to the reference ground plane to the coupling and/or decoupling device. The coupling and decoupling devices shall be placed on the reference ground plane, making direct contact. The cables between the coupling and decoupling devices and the EUT shall be as short as possible and shall not be bundled or wrapped. Their height above the reference ground plane shall be at least 30 mm. All cables exiting the EUT shall be supported at a height of at least 30 mm above the reference ground plane.
h) For table-top equipment and for floor-standing equipment
The EUT shall be placed on an insulating support 0.1 m above the reference ground plane.

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8.7.3 TEST SETUP

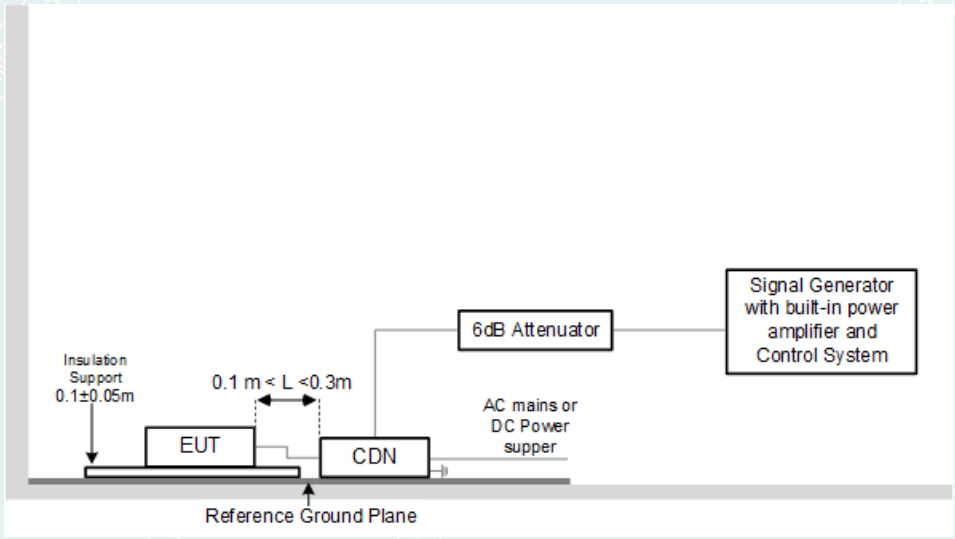
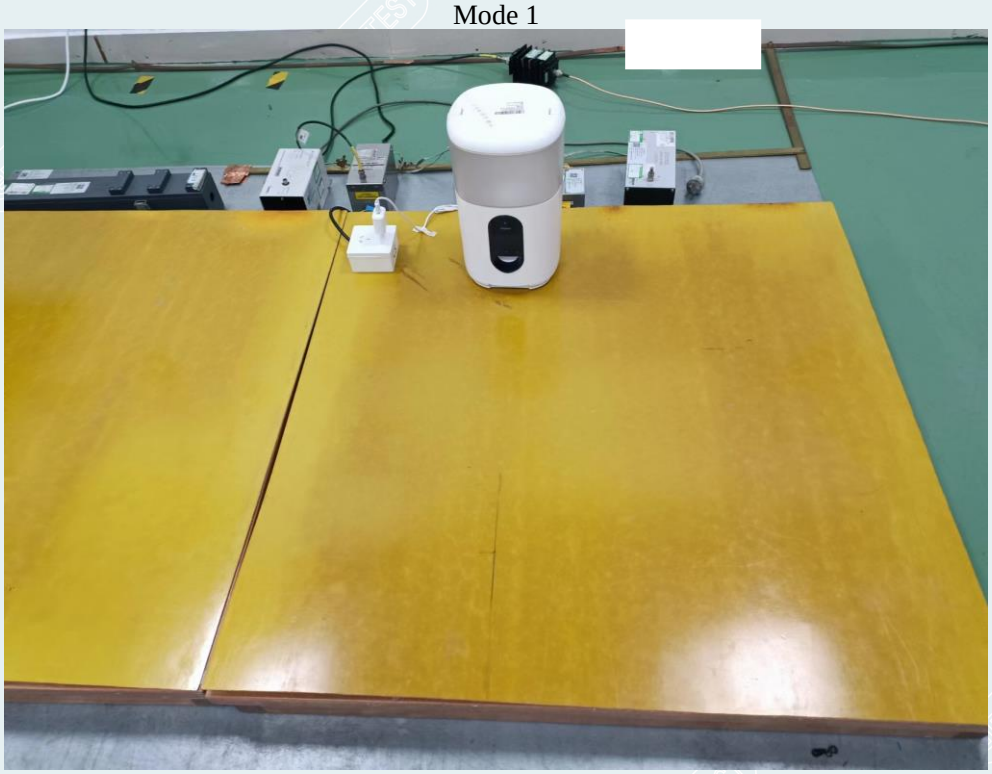


Figure 8.7 – Example measurement arrangement for used CDN
(CDNs for power supply lines)

8.7.4 PHOTOGRAPH OF THE TEST ARRANGEMENT

Mode 1



8.7.5 TEST RESULTS

EUT Name	Smart Pet Feeder C1	Model	PETC1-M01
Environmental Conditions	25.5℃/57%RH/101.0kPa	Test Mode	Mode 1
Power supply	DC 5V supply by adapter (AC 230V/50Hz)	Tested By	Jiang Tao
Test Date	2022-08-16	Sample No.	E20220613205901-0002

Test Ports	Frequency Band(MHz)	Field Strength (Vrms)	Injection Method	Required Performance	Actual performance	Result
Power port	0.15~230	3	CDN	Criterion A	Criterion A[1)]	Pass
NOTE: [1)] Before test, during the test, and after test, the EUT function is normal,Zigbee connection communication is normal, the recording is played properly.						

---------- **The following blanks** ----------

8.8 VOLTAGE DIP & VOLTAGE INTERRUPTIONS IMMUNITY TEST

8.8.1 TEST SPECIFICATION

Test Method	IEC 61000-4-11
Test duration time	Voltage dips in 100%, Number of cycles: 0.5 Voltage dips in 30%, Number of cycles: 25 for 50Hz, Voltage dips in 60%, Number of cycles: 10 for 50Hz
Interval between event	10s for each dips at each test angle
Phase Angle	0 °,180 °
Test cycle	3

8.8.2 TEST PROCEDURE

a) Let the EUT work in test modes.
b) Testing using the Voltage dips test system controlled by computer.
c) For each test, any degradation of performance shall be recorded.
a) The test shall be performed with the EUT connected to the test generator with the shortest power supply cable as specified by the EUT manufacturer. If no cable length is specified, it shall be the shortest possible length suitable to the application of the EUT.
b) For each test, any degradation of performance shall be recorded. The monitoring equipment should be capable of displaying the status of the operational mode of the EUT during and after the tests. After each group of tests, a full functional check shall be performed.
c) For table-top equipment
The equipment to be tested is placed in the test facility on a non-conductive table 0.8 m(± 0.01 m) high.
d) For floor-standing equipment
The equipment to be tested is placed in the test facility on insulating support of 0.05 m to 0.15 m thick.

---------- **The following blanks** ----------

8.8.3 TEST SETUP

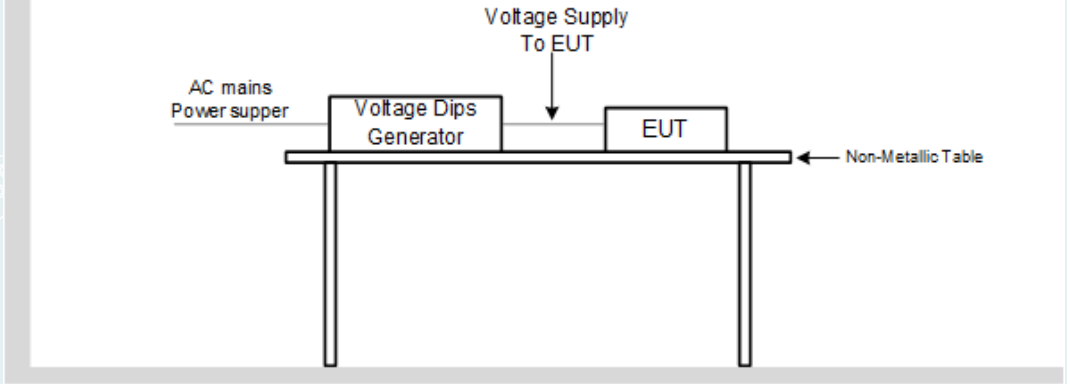


Figure 8.8 – Example measurement arrangement for table-top EUT

8.8.4 PHOTOGRAPH OF THE TEST ARRANGEMENT

Mode 1

---------- The following blanks ----------

8.8.5 TEST RESULTS

EUT Name	Smart Pet Feeder C1	Model	PETC1-M01
Environmental Conditions	25.5℃/57%RH/101.0kPa	Test Mode	Mode 1
Power supply	DC 5V supply by adapter (AC 230V/50Hz)	Tested By	Jiang Tao
Test Date	2022-08-16	Sample No.	E20220613205901-0002

Test level % U_T	Voltage Dips & Interruptions % U_T	Duration (Period)	Angle	Required Performance	Actual performance	Result
0	100	0.5	0 °	B	A[1)]	PASS
			180 °	B	A[1)]	PASS
70	30	25	0 °	C	A[1)]	PASS
			180 °	C	A[1)]	PASS
40	60	10	0 °	C	B[2)]	PASS
			180 °	C	B[2)]	PASS

NOTE: [1)] Before test, during the test, and after test, the EUT function is normal,Zigbee connection communication is normal, the recording is played properly.
[2)]Before the test, the EUT works as normal. During the test, the EUT restarts, the signal is interrupted. And it can restore normally by itself after the test.

---------- The following blanks ----------

APPENDIX A: PHOTOGRAPH OF THE EUT

Please refer to the attached document E20220613205901-1-EUT photo.

---------- End of Report ----------