Anhui Aerospace & PMA Health Technology Co., Ltd.

CE-EMC TEST REPORT

Prepared For:	Anhui Aerospace & PMA Health Technology Co., Ltd. No.16 Building International E-commerce Industrial Estate, No.1201 HuGuang East Rd, Shushan District, Hefei city, Anhui, China
Product Name:	PMA Graphene Multi-purpose Silk Cylindrical Pillow
Trade Name:	PMA
Model:	PMA - H 10
Prepared By:	Shenzhen United Testing Technology Co., Ltd. 2F, Annex Bldg, Jiahuangyuan Tech Park, #365 Baotian 1 Rd, Tiegang Community, Xixiang Str, Bao'an District, Shenzhen, China
Test Date:	Nov., 05, 2018
Test Date:	Nov., 05, 2018 – Nov., 13, 2018
Date of Report:	Nov., 13, 2018
Report No.:	UNIA2018110561ER-01

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TEST REPORT DECLARATION

Applicant	:	Anhui Aerospace & PMA Health Technology Co., Ltd.
Address	:	No.16 Building International E-commerce Industrial Estate, No.1201 HuGuang East Rd, Shushan District, Hefei city, Anhui, China
Manufacturer	:	Anhui Aerospace & PMA Health Technology Co., Ltd.
Address	:	No.16 Building International E-commerce Industrial Estate, No.1201 HuGuang East Rd, Shushan District, Hefei city, Anhui, China
EUT Description	:	PMA Graphene Multi-purpose Silk Cylindrical Pillow
Model Number	:	PMA - H 10

Test Standards:

EN55014-1:2017
EN55014-2:2015
EN61000-4-2:2009
EN61000-4-3:2006+A2:2010

The EUT described above is tested by United Testing Technology (Hong Kong) Limited EMC Laboratory to determine the maximum emissions from the EUT and ensure the EUT to be compliance with the immunity requirements of the EUT. United Testing Technology (Hong Kong) Limited EMC Laboratory is assumed full responsibility for the accuracy of the test results. Also, this report shows that the EUT technically complies with the 2014/30/EU directive and its amendment requirements.
The test report is valid for above tested sample only and shall not be reproduced in part without written approval of the laboratory.

Prepared by: Kahn Yang/Editor

Reviewer: Sherwin Qian/Supervisor

Approved & Authorized Signer: Liuze/Manager

TEST SUMMARY

Test procedures according to the technical standards:

EMC Emission				
Standard	Test Item	Limit	Judgment	Remark
EN55014-1: 2017	Conducted Emission	Class B	N/A	
	Radiated Emission	Class B	PASS	
	Disturbance Power	Class B	N/A	
EN61000-3-2: 2014	Harmonic Current Emission	Class A or D NOTE (2)	N/A	
EN61000-3-3: 2013	Voltage Fluctuations & Flicker	------	N/A	
EMC Immunity				
Section EN55014-2: 2015	Test Item	Performance Criteria	Judgment	Remark
EN61000-4-2: 2009	Electrostatic Discharge	B	PASS	
EN61000-4-3: 2006+A2: 2010	RF electromagnetic field	A	PASS	
EN61000-4-4: 2012	Fast transients	B	N/A	
EN61000-4-5: 2014	Surges	B	N/A	
EN61000-4-6: 2014+AC: 2015	Injected Current	A	N/A	
EN61000-4-11: 2004	Volt. Interruptions Volt. Dips	C / C / C **NOTE (3)**	N/A	

NOTE:

(1)' N/A' denotes test is not applicable in this Test Report, because EUT is powered by dry battery.

(2) Voltage dip: 0% reduction – Performance Criteria **C**

Voltage dip: 30% reduction – Performance Criteria **C**

Voltage dip: 60% reduction – Performance Criteria **C**

(3) For client's request and manual description, the test will not be executed.

TEST FACILITY

Shenzhen United Testing Technology Co., Ltd.
Add.: 2F, Annex Bldg, Jiahuangyuan Tech Park, #365 Baotian 1 Rd, Tiegang Community, Xixiang Str, Bao'an District, Shenzhen, China

MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

Test	Parameters	Expanded Uncertainty (U_{Lab})	Expanded Uncertainty (U_{Cispr})
Conducted Emission	Level Accuracy: 9kHz~150kHz 150kHz to 30MHz	±3.42 dB ±3.42 dB	±4.0 dB ±3.6 dB
Radiated Emission	Level Accuracy: 9kHz to 30 MHz	±4.60 dB	N/A
Radiated Emission	Level Accuracy: 30MHz to 1000 MHz	±4.40 dB	±5.2 dB
Radiated Emission	Level Accuracy: Above 1000MHz	±4.20 dB	N/A
Mains Harmonic	Voltage	±3.11%	N/A
Voltage Fluctuations & Flicker	Voltage	±3.25%	N/A

1. GENERAL INFORMATION

1.1. GENERAL DESCRIPTION OF EUT

Equipment	PMA Graphene Multi-purpose Silk Cylindrical Pillow
Model Name	PMA - H 10
Serial No	/
Model Difference	Only model number.
Class of EUT	☐ Class A ☒ Class B
Product Description	The EUT is a PMA Graphene Multi-purpose Silk Cylindrical Pillow. Operating frequency: N/A Connecting I/O port: N/A

1.2. DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

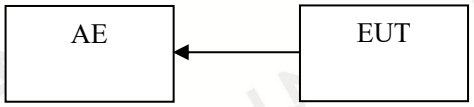
Pretest Mode	Description
Mode 1	Running

For Radiated Test	
Final Test Mode	Description
Mode 1	Running

For EMS Test	
Final Test Mode	Description
Mode 1	Running

1.3. DESCRIPTION OF TEST SETUP

Mode 1:



1.4. DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	PMA Graphene Multi-purpose Silk Cylindrical Pillow	N/A	PMA - H 10	/	EUT

Item	Shielded Type	Ferrite Core	Length	Note

Note:

(1) The support equipment was authorized by Declaration of Confirmation.
(2) For detachable type I/O cable should be specified the length in cm in『Length』column.
(3) 'YES' means 'shielded' 'with core'; 'NO' means 'unshielded' 'without core'.

1.5. MEASUREMENT INSTRUMENTS LIST

Conducted Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	AMN	SCHWARZBECK	NNLK8121	8121370	2019.9.9
2	AMN	ETS	3810/2	00020199	2019.9.9
3	EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	101210	2019.9.9
4	AAN	TESEQ	T8-Cat6	38888	2019.9.9

Radiated Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Horn Antenna	Sunol	DRH-118	A101415	2019.9.29
2	Broadband Hybrid Antenna	Sunol	JB1 Antenna	A090215	2019.9.29
3	Amplifier	HP	8449B	3008A00160	2019.9.9
4	Amplifier	HP	8447D	2944A07999	2019.9.9
5	EMI TEST RECEIVER	ROHDE&SCHWARZ	ESR3	101891	2019.9.9
6	MXA Signal Analyzer	Keysight	N9020A	MY51110104	2019.9.9
7	Biconical antenna	Schwarzbeck	VHA 9103	91032360	2019.9.8
8	Biconical antenna	Schwarzbeck	VHA 9103	91032361	2019.9.8
9	Broadband Hybrid Antenna	Schwarzbeck	VULB9163	VULB9163#958	2019.9.8
10	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1680	2019.1.12
11	Active Receive Loop Antenna	Schwarzbeck	FMZB 1919B	00023	2019.11.02
12	Loop Antenna	Beijing daze Technology	ZN30401	13015	2019.9.9
13	EM CAMLP	SCHWARZBECK	MDS21	03350	2019.9.12
14	Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170651	2019.03.14
15	Microwave Broadband Preamplifier	Schwarzbeck	BBV 9721	100472	2019.10.24

Harmonic / Flicker Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Power Analyzer	California Instrumnets	PACS-1	X71719	2019.9.28
2	AC Power Source	California Instrumnets	5001ix	HK53570	2019.9.9

Electrostatic Discharge Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	ESD Simulator	EM TEST	ESD30C/P30	1202-17	2019.9.9

Surge Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Surge Generator	Shanghai Lioncel	LSG-506S	LSG506S0160601	2019.9.7
2	CDN	Shanghai Lioncel	CDN-532S	CDN532S0160601	2019.9.7

Electrical Fast Transient/Burst Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	EFT/B Generator	Shanghai Lioncel	EFT-404S	EFT404S0160601	2019.9.7

Power-frequency magnetic fields Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Magnetic Field Test System	Shanghai Lioncel	PMF801C-T	PMF801C-T	2019.9.9

Voltage dips and interruptions Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	AC Power Source	California Instrumnets	5001ix	HK53570	2019.9.9

2. EMC EMISSION TEST

2.1. RADIATED EMISSION MEASUREMENT

LIMITS OF RADIATED EMISSION MEASUREMENT (Below 1000MHz)

FREQUENCY (MHz)	At 10m	At 3m
	dBuV/m	dBuV/m
30 – 230	30	40
230 – 1000	37	47

Notes:

(1) The limit for radiated test was performed according to as following: CISPR 14.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

TEST PROCEDURE

a. The measuring distance of at 10 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.

b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.

c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

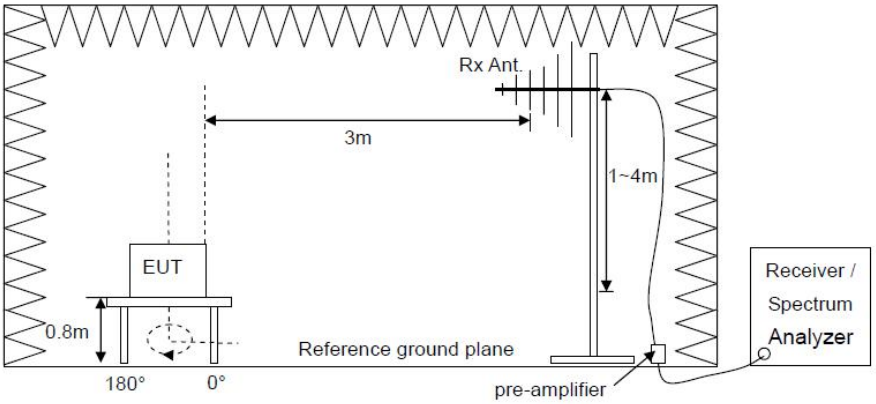
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured, above 1G Average detector mode will be instead.

e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP(AV) Limits and then no additional QP Mode measurement performed.

f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

TEST SETUP

Radiated Emission Test Set-Up Frequency Below 1 GHz.

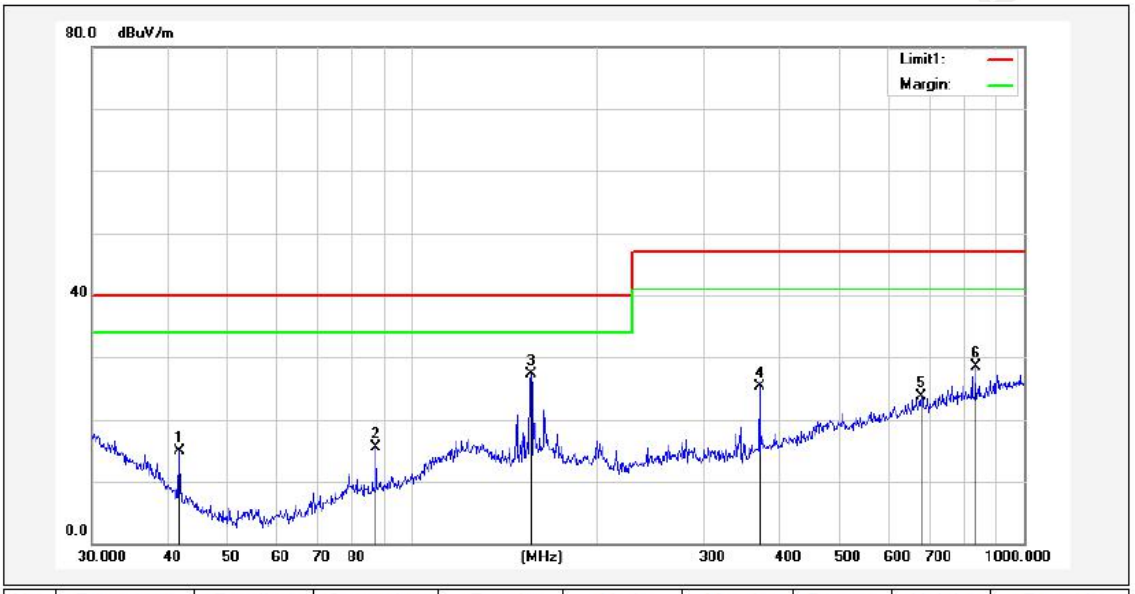


EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

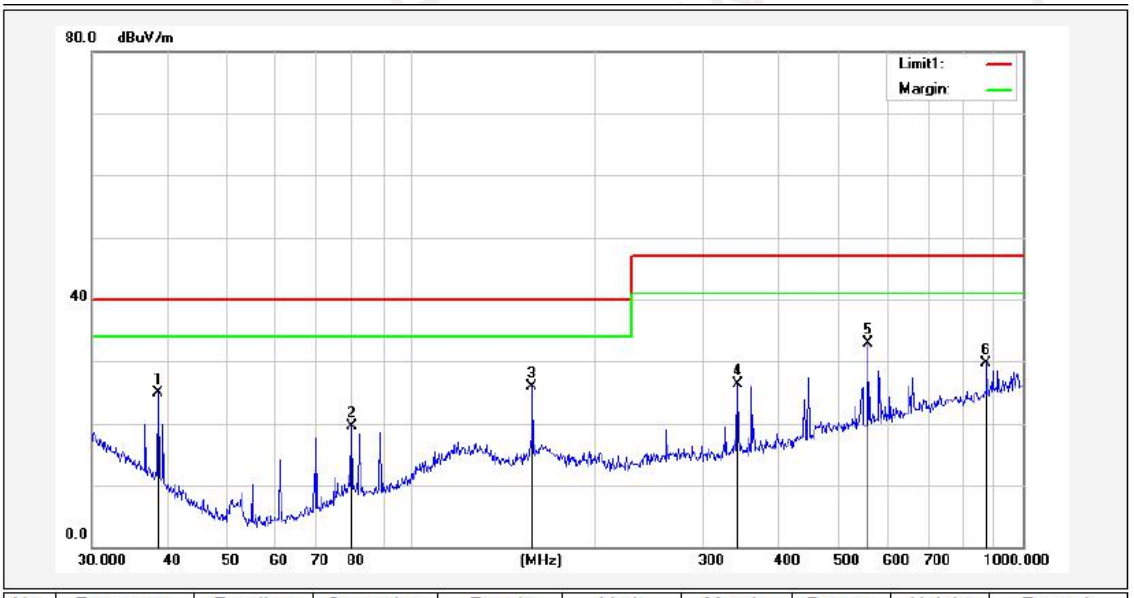
TEST RESULTS (30MHz-1000MHz)

EUT:	PMA Graphene Multi-purpose Silk Cylindrical Pillow	Model Name:	PMA - H 10
Temperature:	24 ℃	Relative Humidity:	54%
Pressure:	1010 hPa	Test Date:	2018-11-05
Test Mode:	Running	Polarization:	Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Remark
1	41.7130	32.41	-17.48	14.93	40.00	-25.07			peak
2	87.4177	34.16	-18.72	15.44	40.00	-24.56			peak
3*	156.4578	39.98	-12.65	27.33	40.00	-12.67			peak
4	369.4047	36.63	-11.33	25.30	47.00	-21.70			peak
5	679.9600	28.99	-5.31	23.68	47.00	-23.32			peak
6	833.3171	31.94	-3.45	28.49	47.00	-18.51			peak

EUT：	PMA Graphene Multi-purpose Silk Cylindrical Pillow	Model Name：	PMA - H 10
Temperature：	24 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Date：	2018-11-05
Test Mode：	Running	Polarization：	Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Remark
1	38.4809	41.81	-17.00	24.81	40.00	-15.19			peak
2	79.8003	37.97	-18.50	19.47	40.00	-20.53			peak
3*	157.5589	38.45	-12.46	25.99	40.00	-14.01			peak
4	341.9787	38.45	-12.24	26.21	47.00	-20.79			peak
5	558.7302	40.47	-7.61	32.86	47.00	-14.14			peak
6	872.1832	32.34	-2.58	29.76	47.00	-17.24			peak

Note: Result=Reading+Factor Over Limit=Result-Limit

3. EMC IMMUNITY TEST

STANDARD COMPLIANCE/ SERVRITY LEVEL/ CRITERIA

Tests Standard No.	TEST SPECIFICATION	Test Mode Test Ports	Perform. Criteria
1. ESD IEC/EN 61000-4-2	8KV air discharge 4KV contact discharge	Direct Mode	B
	4KV HCP discharge 4KV VCP discharge	Indirect Mode	B
2. RS IEC/EN 61000-4-3	80 MHz to 1000 MHz, 1000Hz, 80%, AM modulated	Enclosure	A

GENERAL PERFORMANCE CRITERIA

According to **EN 55014-2** standard, the general performance criteria as following:

Criterion A	The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. 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 by what the user may reasonably expect from the equipment if used as intended.
Criterion B	After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test.
Criterion C	Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

GENERAL PERFORMANCE CRITERIA TEST SETUP

The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

3.1. ESD TESTING

TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-2
Discharge Impedance:	330 ohm / 150 pF
Required Performance	B
Discharge Voltage:	Air Discharge：2kV/4kV/8kV (Direct) Contact Discharge：2kV/4kV (Direct/Indirect)
Polarity:	Positive & Negative
Number of Discharge:	Air Discharge: min. 20 times at each test point Contact Discharge: min. 20 at each test point
Discharge Mode:	Single Discharge
Discharge Period:	1 second minimum

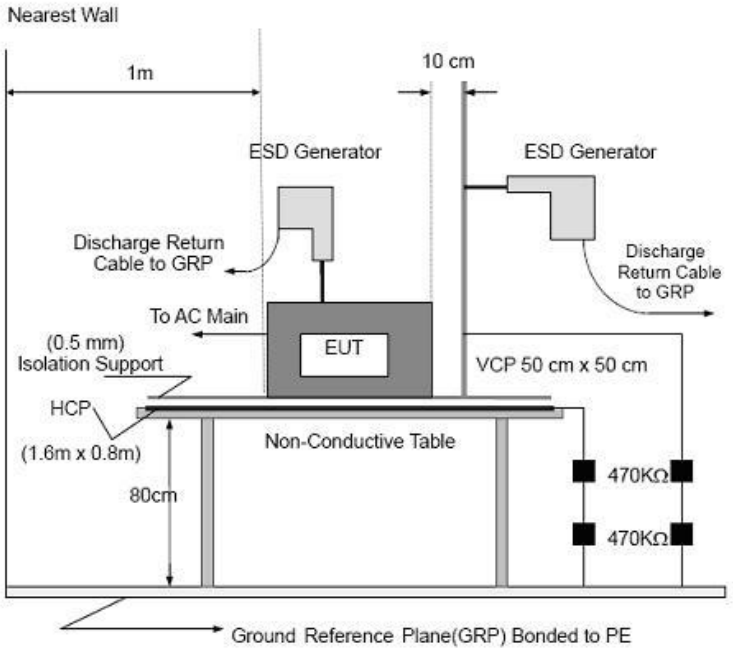
TEST PROCEDURE

The test generator necessary to perform direct and indirect application of discharges to the EUT in the following manner:

a. Contact discharge was applied to conductive surfaces and coupling planes of the EUT.
During the test, it was performed with single discharges. For the single discharge time between successive single discharges was at least 1 second. The EUT shall be exposed to at least 200 discharges, 100 each at negative and positive polarity, at a minimum of four test points. One of the test points shall be subjected to at least 50 indirect discharges to the center of the front edge of the horizontal coupling plane. The remaining three test points shall each receive at least 50 direct contact discharges.
If no direct contact test points are available, then at least 200 indirect discharges shall be applied in the indirect mode. Test shall be performed at a maximum repetition rate of one discharge per second.
Vertical Coupling Plane (VCP):
The coupling plane, of dimensions 0.5m x 0.5m, is placed parallel to, and positioned at a distance 0.1m from, the EUT, with the Discharge Electrode touching the coupling plane.
The four faces of the EUT will be performed with electrostatic discharge.
Horizontal Coupling Plane (HCP):
The coupling plane is placed under to the EUT. The generator shall be positioned vertically at a distance of 0.1m from the EUT, with the Discharge Electrode touching the coupling plane.
The four faces of the EUT will be performed with electrostatic discharge.

b. Air discharges at insulation surfaces of the EUT.
It was at least ten single discharges with positive and negative at the same selected point.

TEST SETUP



Note:

TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table 0.8 meters high standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum at least 0.25mm thick, and 2.5 meters square connected to the protective grounding system. A Horizontal Coupling Plane (1.6m x 0.8m) was placed on the table and attached to the GRP by means of a cable with 940k total impedance. The equipment under test, was installed in a representative system as described in section 7 of IEC /EN 61000-4-2, and its cables were placed on the HCP and isolated by an insulating support of 0.5mm thickness. A distance of1-meter minimum was provided between the EUT and the walls of the laboratory and any other metallic structure.

FLOOR-STANDING EQUIPMENT

The equipment under test was installed in a representative system as described in section 7 of IEC/EN 61000-4-2, and its cables were isolated from the Ground Reference Plane by an insulating support of0.1-meter thickness. The GRP consisted of a sheet of aluminum that is at least 0.25mm thick, and 2.5meters square connected to the protective grounding system and extended at least 0.5 meters from the EUT on all sides.

TEST RESULTS

EUT：	PMA Graphene Multi-purpose Silk Cylindrical Pillow	Model Name：	PMA - H 10
Temperature：	24 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Date：	2018-11-05
Test Mode：	Running		

Mode	Air Discharge								Contact Discharge								Criterion	Result
Test level (kV)	4		8		10		15		2		4		6		8			
Test Location	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-		
HCP									A	A	A	A						**PASS**
VCP									A	A	A	A						**PASS**
Slots	A	A	A	A														**PASS**
Surface	A	A	A	A														**PASS**
																	B	**PASS**

Note:

1) +/- denotes the Positive/Negative polarity of the output voltage.
2) Test condition:
   Direct / Indirect (HCP/VCP) discharges: Minimum 50 times (Positive/Negative) at each point. Air discharges: Minimum 10 times (Positive/Negative) at each point.
3) Test location(s) in which discharge (Air and contact discharge) to be applied illustrated by photos shown in next page(s)
4) The Indirect (HCP/VCP) discharges description of test point as following:
   1. left side 2.right side 3.front side 4.rear side.
5) N/A - denotes test is not applicable in this test report.

3.2. RS TESTING

TEST SPECIFICATION

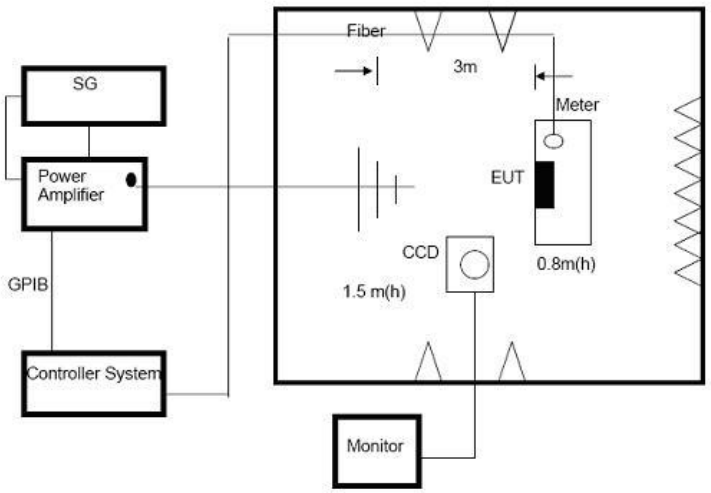
Basic Standard:	IEC/EN 61000-4-3
Required Performance	A
Frequency Range:	80 MHz - 1000 MHz
Field Strength:	3 V/m
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of fundamental
Polarity of Antenna:	Horizontal and Vertical
Test Distance:	3 m
Antenna Height:	1.5 m
Dwell Time:	at least 3 seconds

TEST PROCEDURE

The EUT and support equipment, which are placed on a table that is 0.8 meter above ground and the testing was performed in a fully-anechoic chamber.
The testing distance from antenna to the EUT was 3 meters.
The other condition as following manner:

a. The frequency range is swept from 80 MHz to 1000 MHz, & 1400MHz - 2700MHz with the signal 80%amplitude modulated with a 1kHz sine wave. The rate of sweep did not exceed 1.5x 10-3 decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
b. Sweep Frequency 900 MHz, with the Duty Cycle: 1/8 and Modulation: Pulse 217 Hz(if applicable)
c. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
d. The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

TEST SETUP



Note:

TABLE-TOP EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-3 was placed on a non-conductive table 0.8 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

FLOOR-STANDING EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-3 was placed on a non-conductive wood support 0.1 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

TEST RESULTS

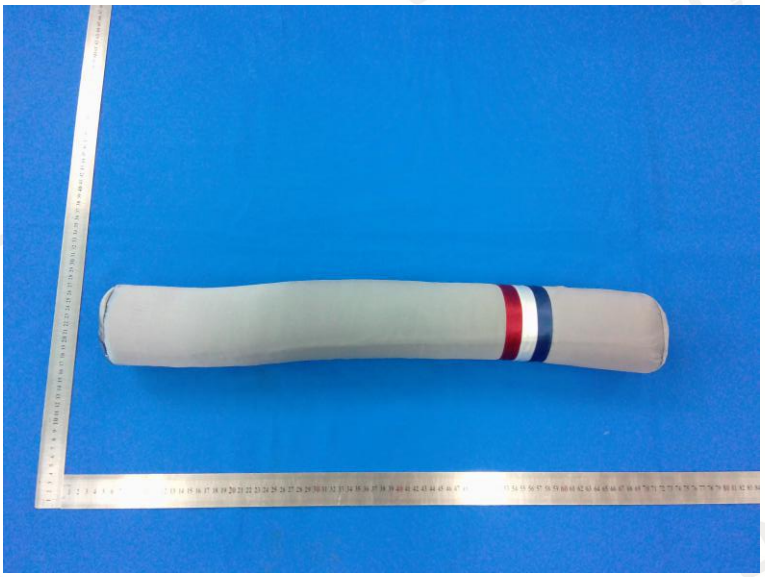
EUT：	PMA Graphene Multi-purpose Silk Cylindrical Pillow	Model Name：	PMA - H 10
Temperature：	24 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Date：	2018-11-05
Test Mode：	Running		

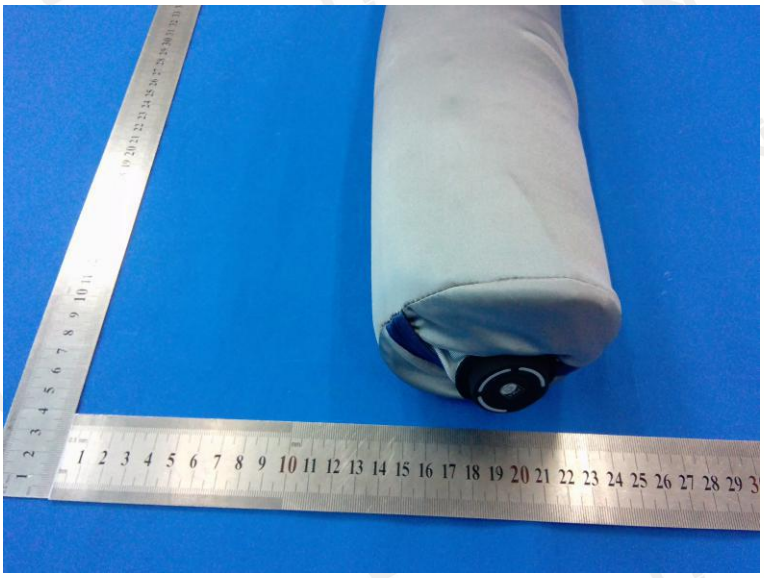
Frequency Range (MHz)	RF Field Position	R.F. Field Strength	Azimuth	Perform. Criteria	Results	Judgment
80MHz - 1000MHz	H / V	3 V/m (rms) AM Modulated 1000Hz, 80%	Front	**A**	**A**	**PASS**
			Rear			
			Left			
			Right			

Note:

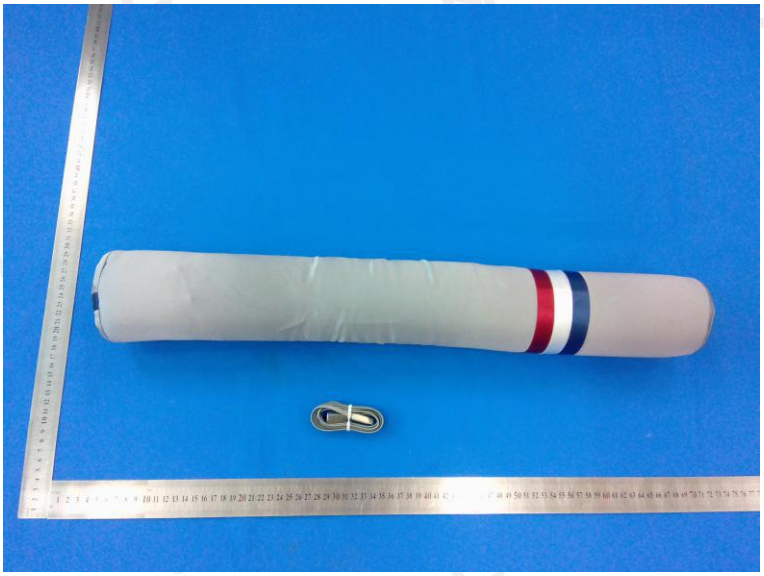
1) N/A - denotes test is not applicable in this test report.
2) Criteria A: There was no change operated with initial operating during the test.
3) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
4) Criteria C: The system shut down during the test.

APPENDIX I






FMA



End of the Report