

TEST REPORT

Reference No. : WTN18S01102042W
FCC ID : 2AJXR-DM35LE
Applicant : Keystone Sales Group, Inc.
Address : 633 CTC Blvd., Suite 300, Louisville, CO 80027, United States
Manufacturer : Ningbo Dooya Mechanic&Electronic Technology Co.,Ltd
Address : NO.168 shengguang road Luotuo street Zhenhai district Ningbo,
P.R.China
Product : DC Tubular Motor
Model(s) : DM35LE-3/28
Standards : FCC PART15 SUBPART B : 2017
Date of Receipt sample : 2018-01-30
Date of Test : 2018-01-30 to 2018-02-26
Date of Issue : 2018-02-26
Test Result : **Pass**

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

Prepared By:

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Approved by:



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2 Laboratories Introduction

Waltek Services (Shenzhen) Co., Ltd is a professional third-party testing and certification laboratory with multi-year product testing and certification experience, established strictly in accordance with ISO/IEC 17025 requirements, and accredited by ILAC (International Laboratory Accreditation Cooperation) member. A2LA (American Association for Laboratory Accreditation) of USA, Meanwhile, Waltek has got recognition as registration and accreditation laboratory from EMSD (Electrical and Mechanical Services Department), and American Energy star, FCC(The Federal Communications Commission), CEC(California energy efficiency), IC(Industry Canada). It's the strategic partner and data recognition laboratory of international authoritative organizations, such as Intertek(ETL-SEMKO), TÜV Rheinland, TÜV SÜD, etc.



Waltek Services (Shenzhen) Co., Ltd is one of the largest and the most comprehensive third party testing laboratory in China. Our test capability covered four large fields: safety test. ElectroMagnetic Compatibility(EMC), and energy performance, wireless radio. As a professional, comprehensive, justice international test organization, we still keep the scientific and rigorous work attitude to help each client satisfy the international standards and assist their product enter into globe market smoothly.

2.1 Test Facility

A. Accreditations for Conformity Assessment (International)

Accreditation for Laboratory Assessment (International)			
Country/Region	Accreditation Body	Scope	Note
USA	A2LA (Certificate No.: 4243.01)	FCC ID \ DOC \ VOC	1
Canada		IC ID \ VOC	2
Japan		MIC-T \ MIC-R	-
Europe		EMCD \ RED	-
Taiwan		NCC	-
Hong Kong		OFCA	-
Australia		RCM	-
India		International Services	WPC
Thailand	NTC		-
Singapore	IDA		-
Note:			
1. FCC Designation No.: CN1201. Test Firm Registration No.: 523476.			
2. IC Canada Registration No.: 7760A			

B.TCBs and Notify Bodies Recognized Testing Laboratory.

Recognized Testing Laboratory of ...	Notify body number
TUV Rheinland	Optional.
Intertek	
TUV SUD	
SGS	
Phoenix Testlab GmbH	0700
Element Materials Technology Warwick Ltd	0891
Timco Engineering, Inc.	1177
Eurofins Product Service GmbH	0681

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4 Revision History

Test report No.	Date of Receipt sample	Date of Test	Date of Issue	Purpose	Comment	Approved
WTN18S01102042W	2018-01-30	2018-01-30 to 2018-02-26	2018-02-26	original	-	Valid

5 General Information

5.1 General Description of E.U.T

Product	: DC Tubular Motor
Model(s)	: DM35LE-3/28
Model Description	: N/A
The Oscillator	: 13.2256MHz

5.2 Details of E.U.T

Ratings	: Battery: DC 11.1V 28.86Wh
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5.3 Test Mode

Turn on the power, after that, let the EUT work in test mode(Receiving) and measure it.

6 Equipment Used during Test

6.1 Equipments List

Conducted Emissions (Waltek Services (Shenzhen) Co., Ltd.)						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMI Test Receiver	R&S	ESCI	101155	2017-09-12	2018-09-11
2.	LISN	SCHWARZBECK	NSLK 8128	8128-289	2017-09-12	2018-09-11
3.	Limiter	York	MTS-IMP-136	261115-001-0024	2017-09-12	2018-09-11
4.	Cable	Laplace	RF300	-	2017-09-12	2018-09-11
3m Semi-anechoic Chamber for Radiation Emissions (Waltek Services (Shenzhen) Co., Ltd.)						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1	Spectrum Analyzer	R&S	FSP	100091	2017-04-29	2018-04-28
2	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	2017-04-09	2018-04-08
3	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	2017-04-13	2018-04-12
4	Coaxial Cable (above 1GHz)	Top	1GHz-18GHz	EW02014-7	2017-04-13	2018-04-12
3m Semi-anechoic Chamber for Radiation Emissions (Waltek Services (Shenzhen) Co., Ltd.)						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1	Test Receiver	R&S	ESCI	101296	2017-04-13	2018-04-12
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	2017-04-13	2018-04-12
3	Active Loop Antenna	Beijing Dazhi	ZN30900A	-	2017-04-09	2018-04-08
4	Amplifier	ANRITSU	MH648A	M43381	2017-04-13	2018-04-12
5	Cable	HUBER+SUHNER	CBL2	525178	2017-04-13	2018-04-12
6	Coaxial Cable (below 1GHz)	Top	TYPE16(13M)	-	2017-09-12	2018-09-11

6.2 Description of Support Units

Equipment	Manufacturer	Model No.
/	/	/

6.3 Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	$\pm 1 \times 10^{-6}$
RF Power	± 1.0 dB
RF Power Density	± 2.2 dB
Radiated Spurious Emissions test	± 5.03 dB (Bilog antenna 30M~1000MHz)
	± 5.47 dB (Horn antenna 1000M~25000MHz)
Conducted Emissions test	± 3.64 dB (AC mains 150KHz~30MHz)
Confidence interval: 95%. Confidence factor:k=2	

6.4 Subcontracted

Whether parts of tests for the product have been subcontracted to other labs:

☐ Yes ☒ No

If Yes, list the related test items and lab information:

N/A

7 Test Summary

Test Items	Test Requirement	Result
Radiated Emission (30MHz to 1GHz)	FCC PART 15, SUBPART B	Pass
Radiated Emission (Above 1GHz)	FCC PART 15, SUBPART B	Pass
Note: Pass=Compliance; Fail=Not Compliance; N/A=Not Applicable.		

8 Radiation Emission, 30MHz to 1000MHz

Test Requirement..... : FCC PART 15, SUBPART B

Test Method : ANSI C63.4

Test Result : Pass

Frequency Range..... : 30MHz to 1000MHz

Class. : Class B

Limit..... :

Frequency (MHz)	Distance (Meter)	Limit (dB μ V/m)
		Quasi-peak
30 to 88	3	40
88 to 216	3	43.5
216 to 960	3	46
960 to 1000	3	54

8.1 E.U.T. Operation

Operating Environment:

Temperature : 22.5°C

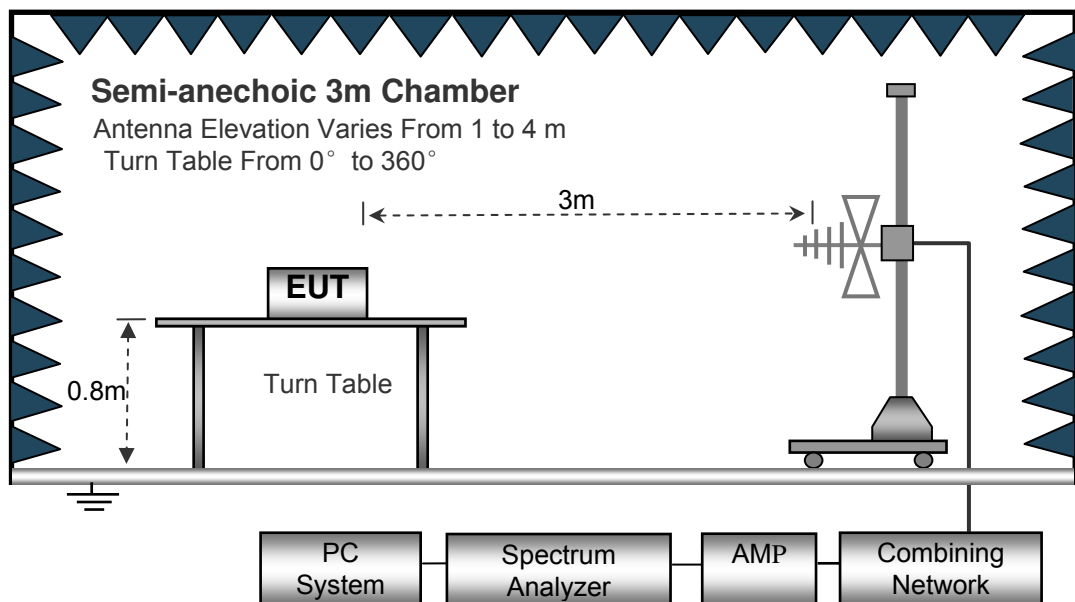
Humidity..... : 52.6%RH

Atmospheric Pressure : 101.8kPa

EUT Operation..... : Refer to section 5.3

8.2 Block Diagram of Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.4.

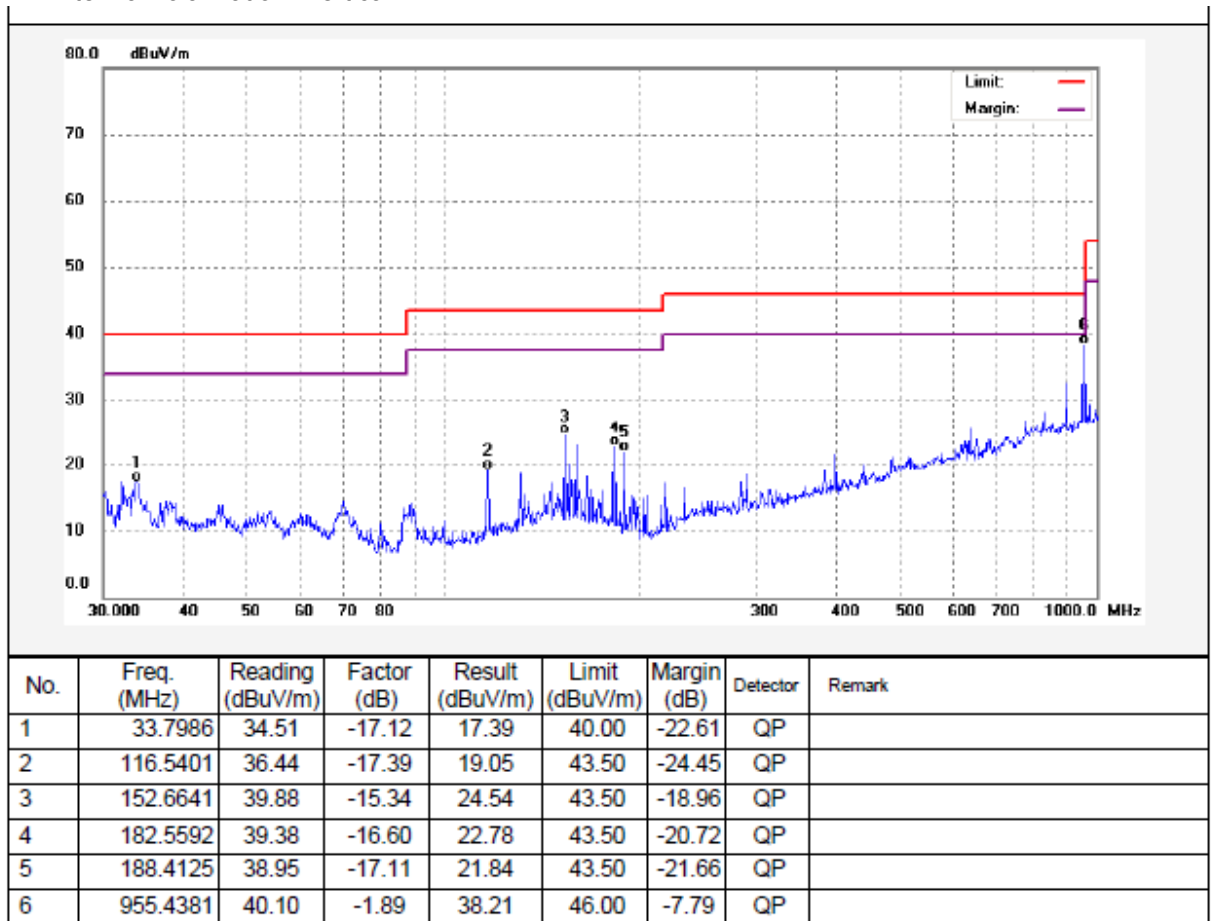


8.3 Measurement Data

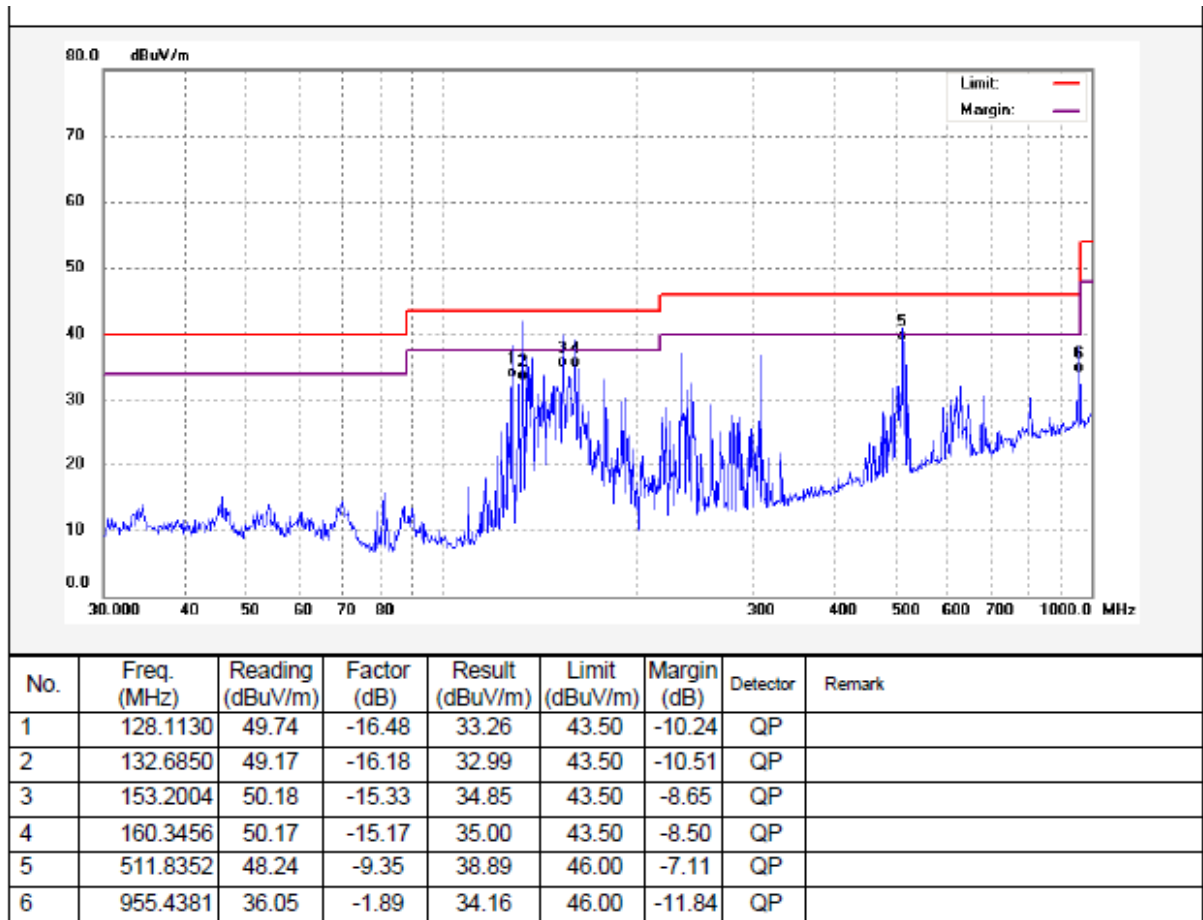
The maximised peak emissions from the EUT was scanned and measured for both the Antenna Vertical Polarization and Antenna Horizontal Polarization. Quasi-peak measurements were performed if peak emissions were within 6dB of the Quasi-peak limit line.

8.4 Radiated Emission Test Data, 30MHz to 1000MHz

Antenna Polarization: Vertical



Antenna Polarization: Horizontal



9 Radiation Emission, Above 1000MHz

Test Requirement : FCC PART 15, SUBPART B
 Test Method : ANSI C63.4
 Test Result : Pass
 Frequency Range : Above 1GHz
 Class. : Class B
 Limit. :

Frequency Range (MHz)	Distance (Meter)	Average Limit dB(uV/m)	Peak Limit (dBuV/m)
Above 1GHz	3	54	74

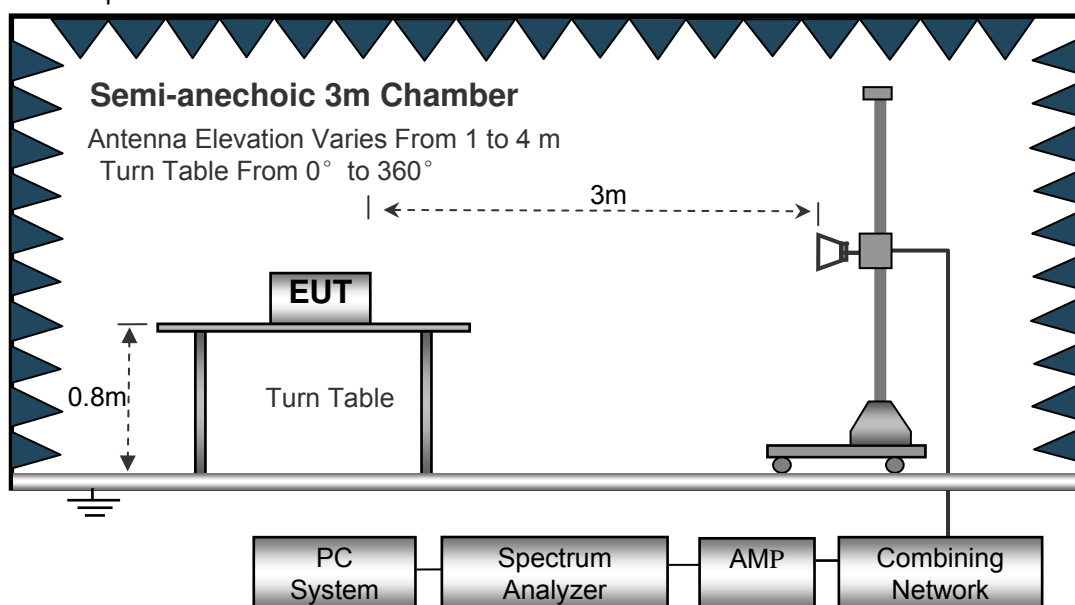
9.1 E.U.T. Operation

Operating Environment:

Temperature : 22.5°C
 Humidity : 52.6%RH
 Atmospheric Pressure : 101.8kPa
 EUT Operation : Refer to section 5.3

9.2 Block Diagram of Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.4.

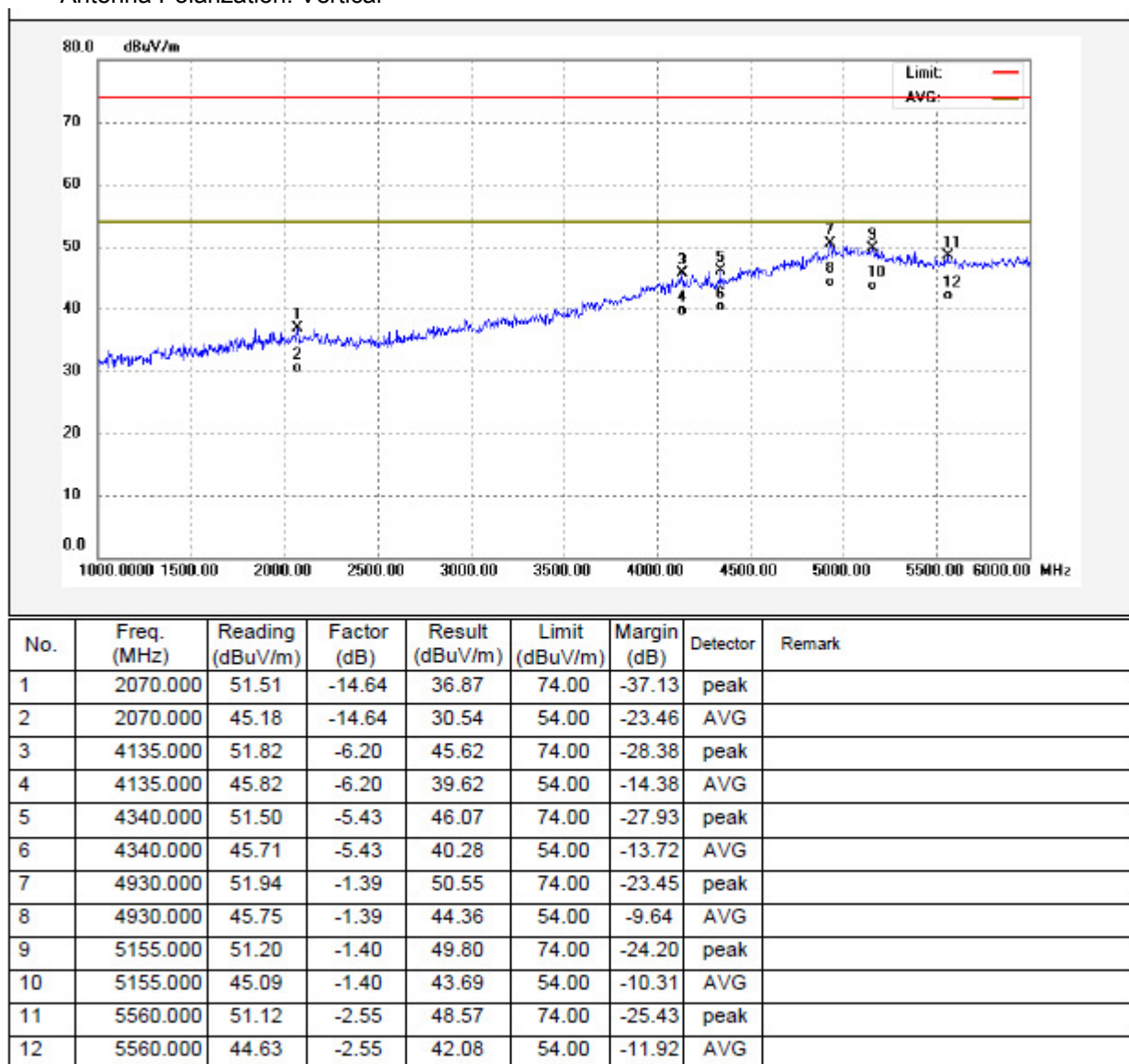


9.3 Measurement Data

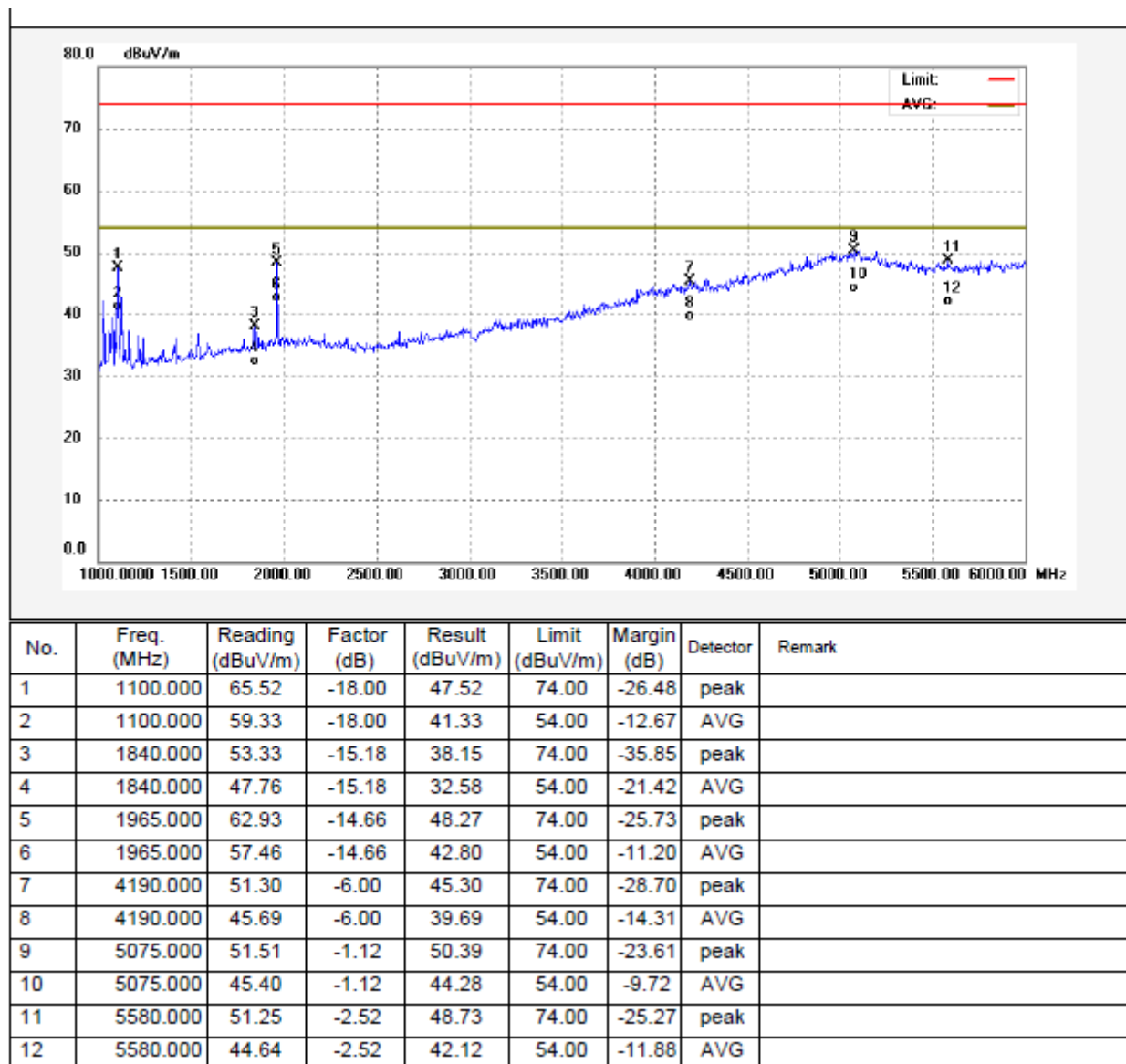
The maximised peak emissions from the EUT was scanned and measured for both the Antenna Vertical Polarization and Antenna Horizontal Polarization. Average measurements were performed if peak emissions were within 6dB of the average limit line

9.4 Radiated Emission test data, Above 1000MHz

Antenna Polarization: Vertical



Antenna Polarization: Horizontal



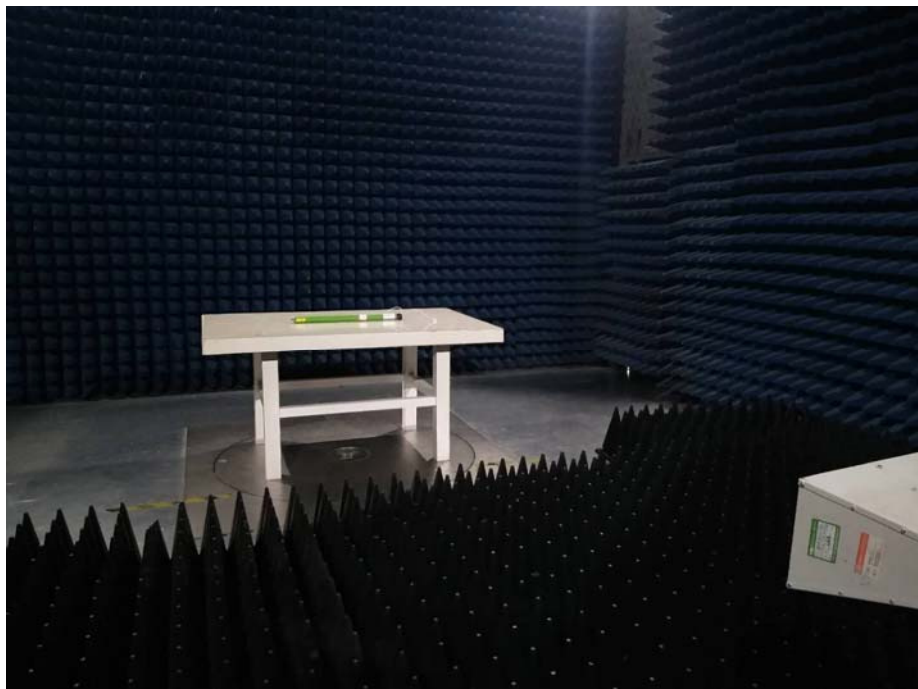
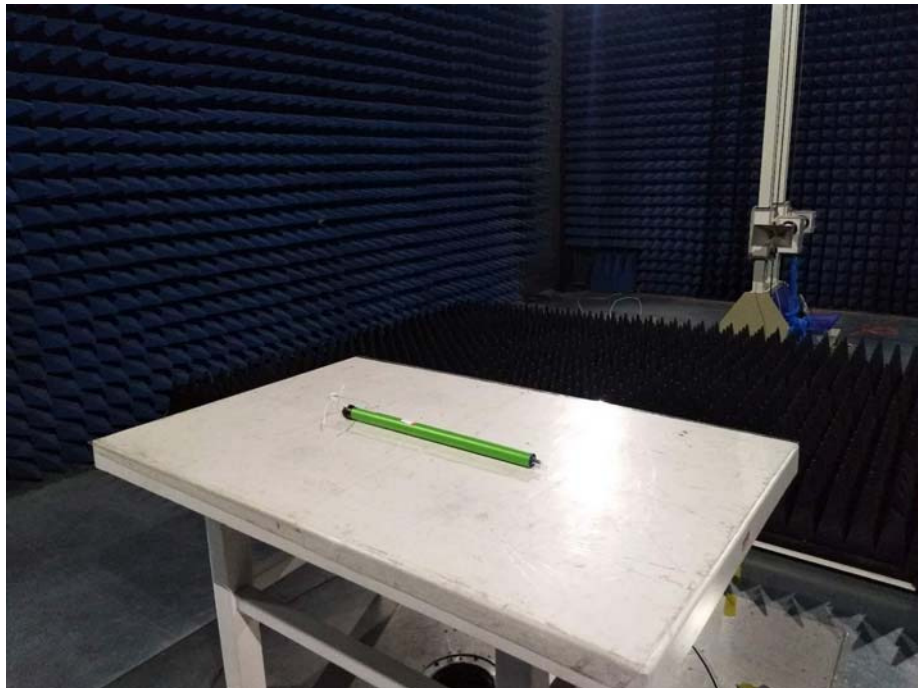
10 Photographs -Test Setup Photos

10.1 Photograph- Radiated Emissions

Test Frequency 30MHz to 1GHz

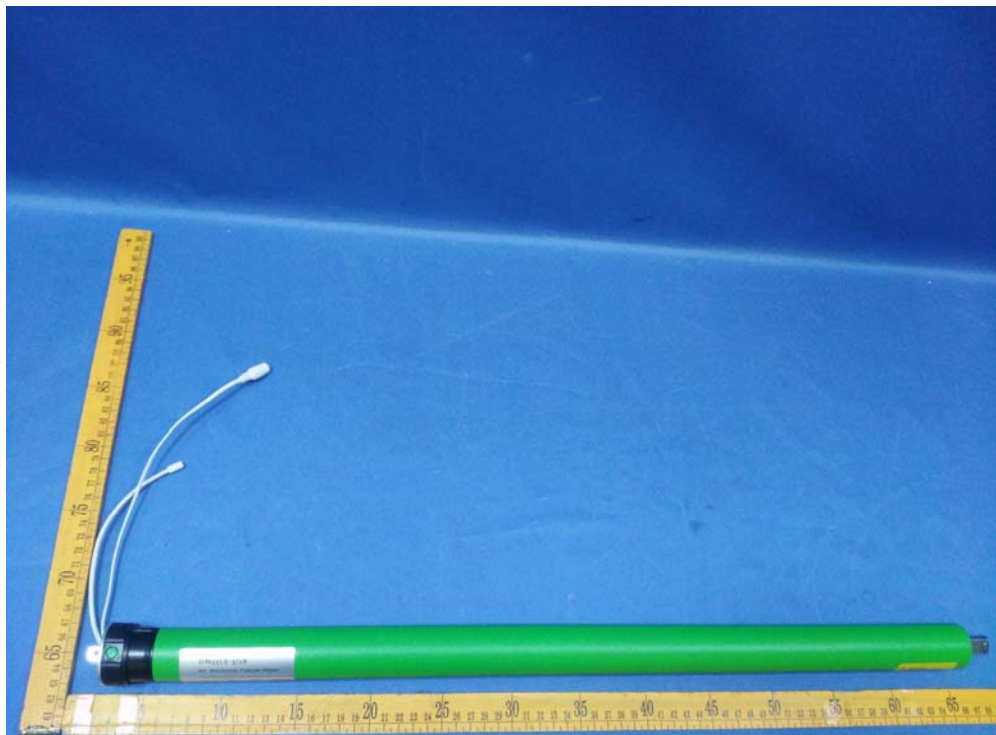
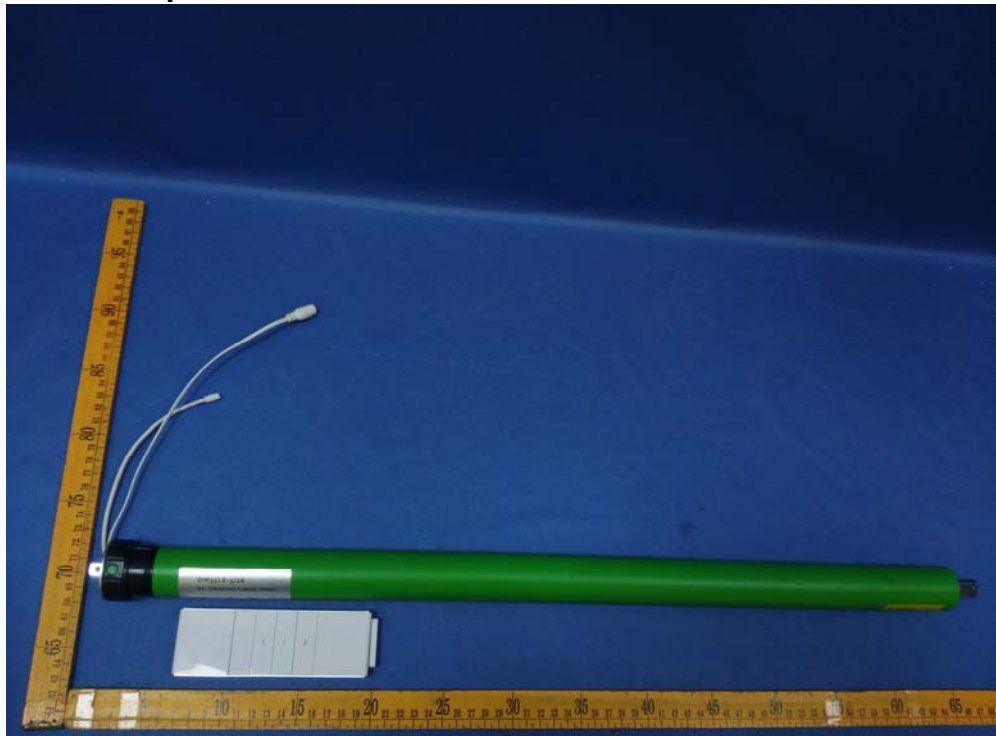


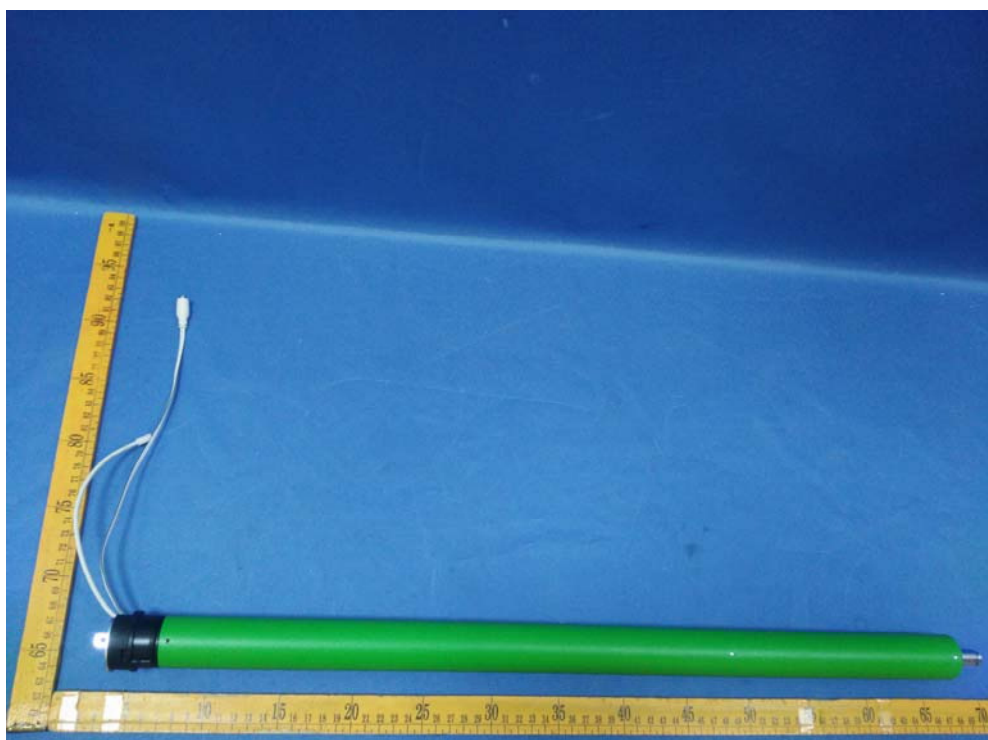
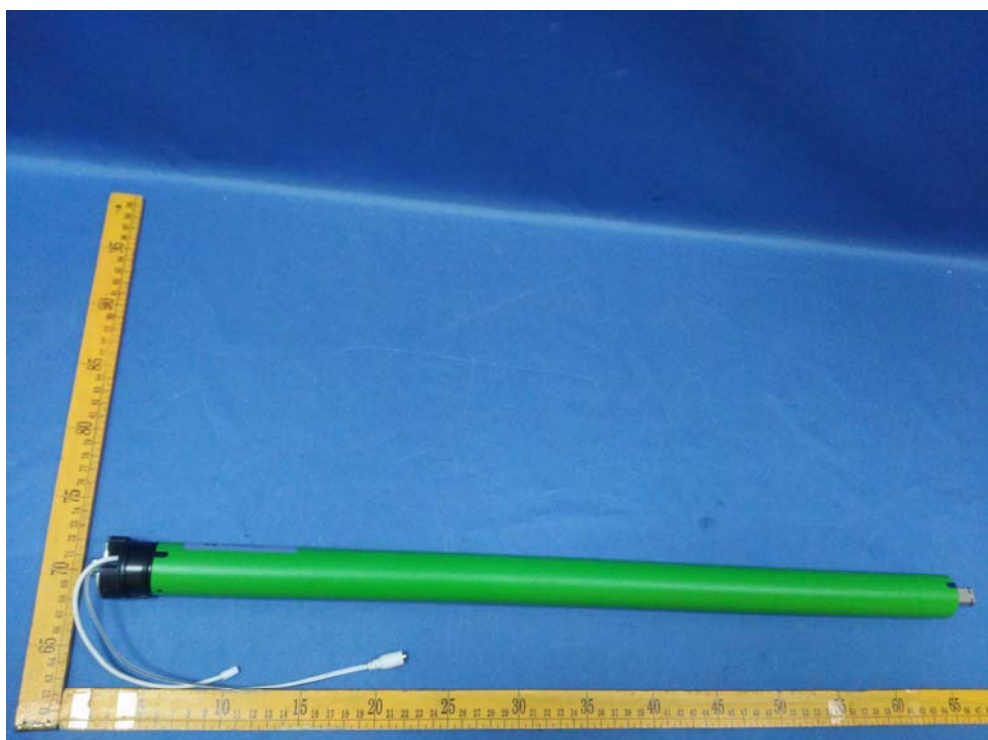
Test Frequency Above 1GHz

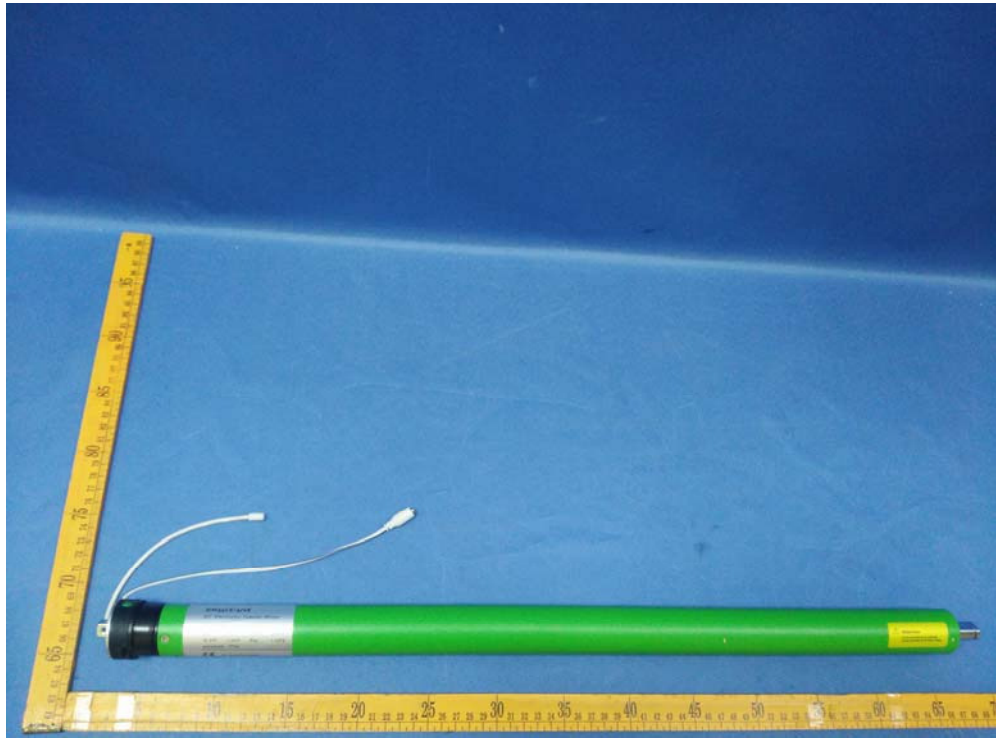


11 Photographs - Constructional Details

11.1 EUT – External photos



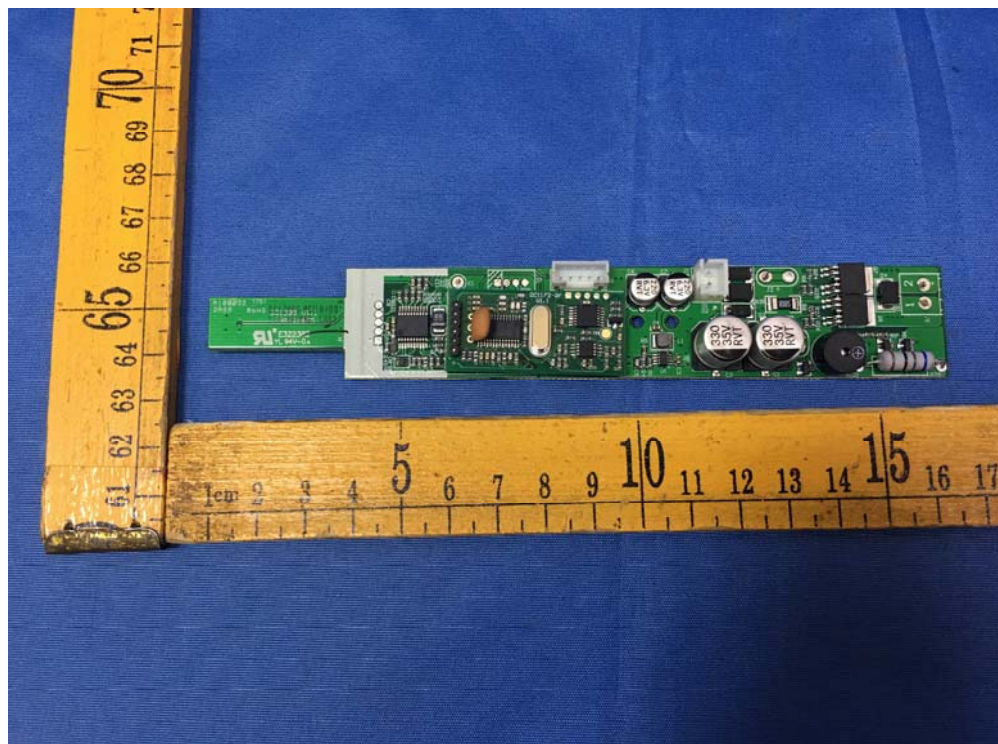


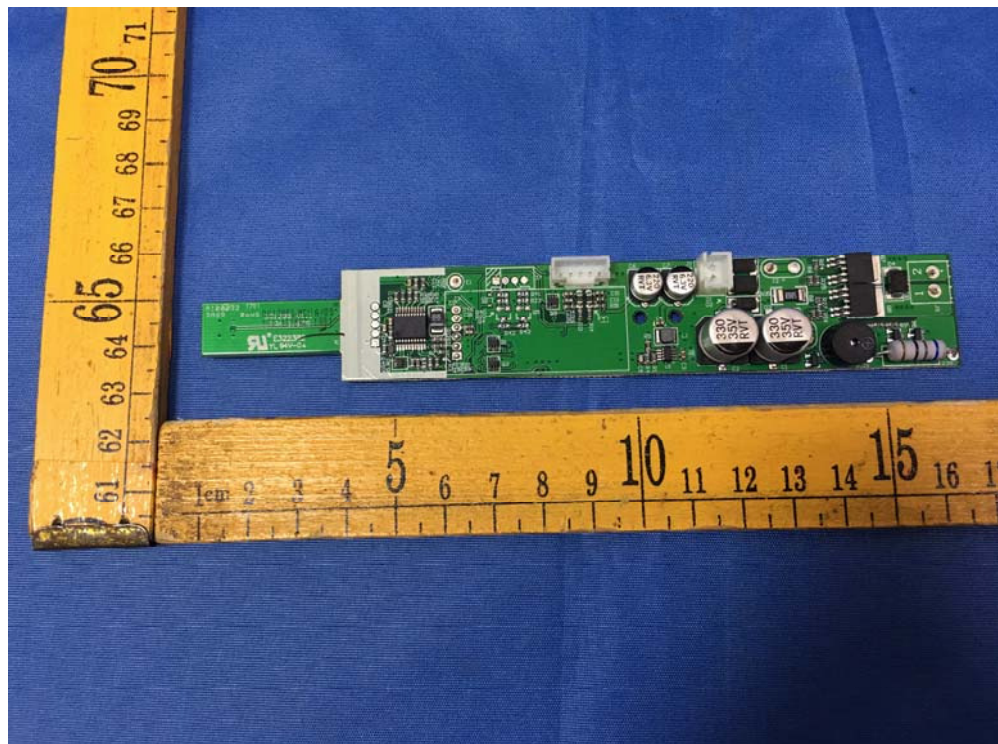
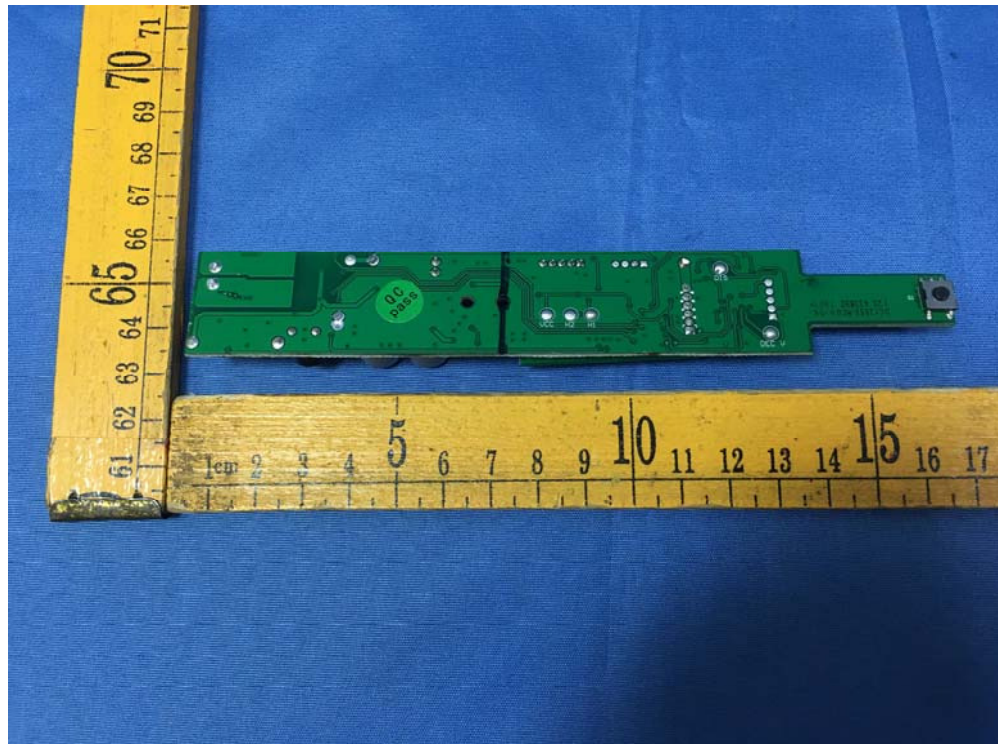


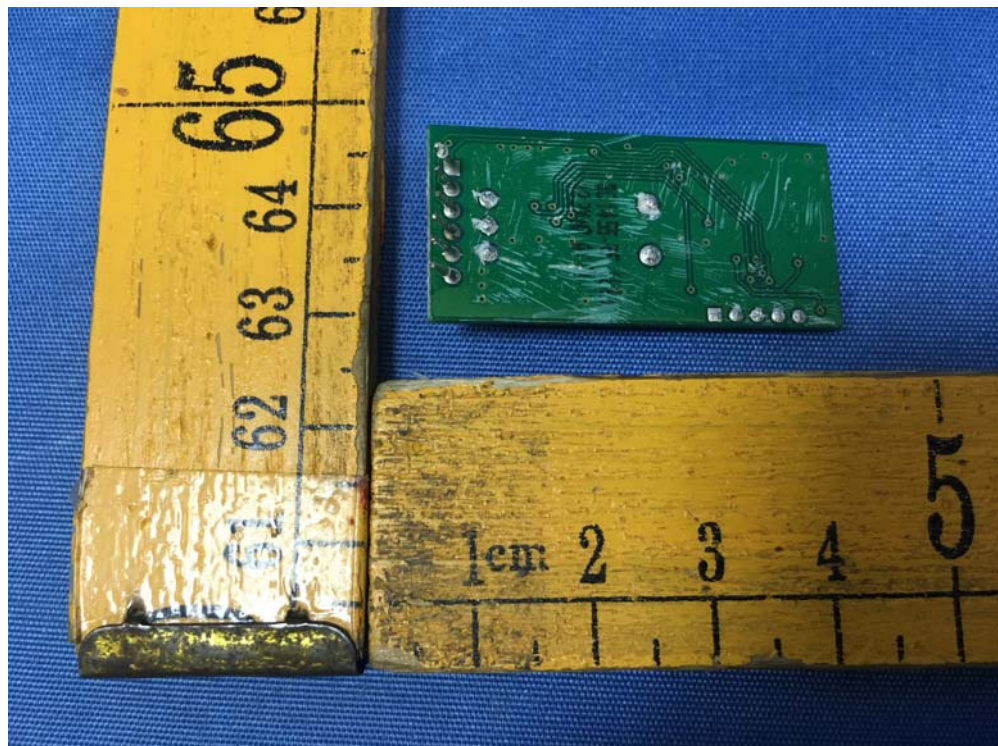
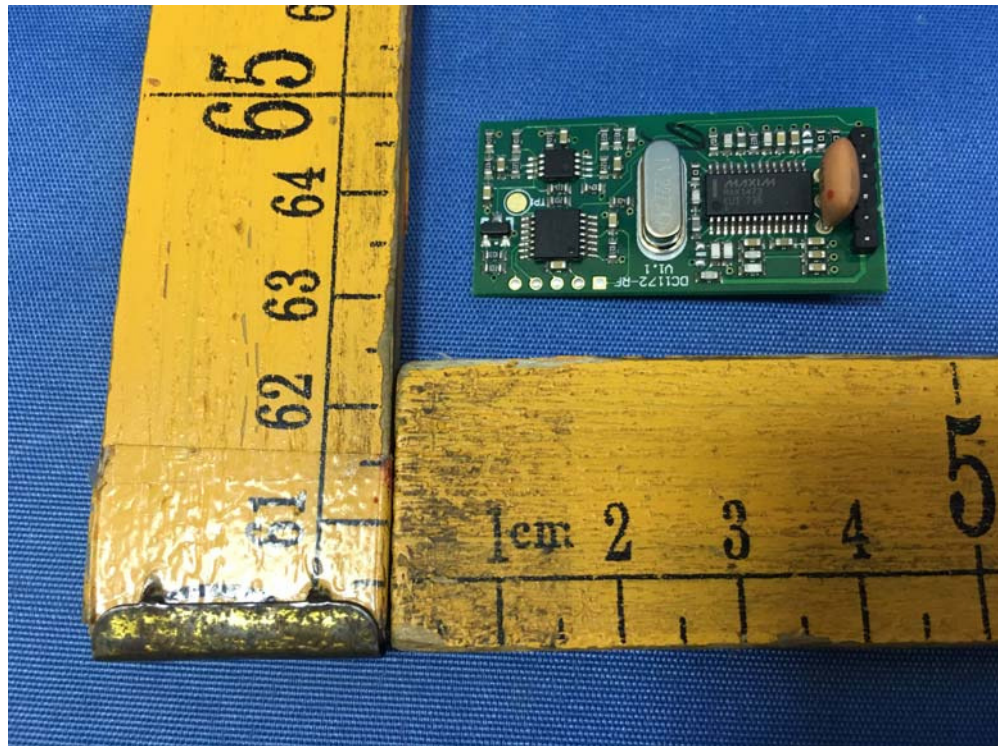




11.2 EUT – Internal photos









=====End of Report=====