

Prüfbericht-Nr.: <i>Test report no.:</i>	CN24FMXH 005	Auftrags-Nr.: <i>Order no.:</i>	168515554	Seite 1 von 24 <i>Page 1 of 24</i>	
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	2024-11-26		
Auftraggeber: <i>Client:</i>	Guangdong World Precision Technology Co., Ltd. No. 6 Wanjiang Section, Gangkou Avenue, Wanjiang Subdistrict, Dongguan City, Guangdong Province, 523061, China				
Prüfgegenstand: <i>Test item:</i>	Presto 2				
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	9040034310				
Auftrags-Inhalt: <i>Order content:</i>	Test Report				
Prüfgrundlage: <i>Test specification:</i>	CFR47 FCC Part 2.1093 KDB 680106 D01 Wireless Power Transfer v04				
Wareneingangsdatum: <i>Date of sample receipt:</i>	2024-11-26	Please refer to Photo Document			
Prüfmuster-Nr.: <i>Test sample no.:</i>	A003873212-001~009				
Prüfzeitraum: <i>Testing period:</i>	2024-12-05 - 2024-12-10				
Ort der Prüfung: <i>Place of testing:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.				
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.				
Prüfergebnis*: <i>Test result*:</i>	Pass				
geprüft von: <i>tested by:</i>			genehmigt von: <i>authorized by:</i>		
Datum: <i>Date:</i>	2025-01-23 Signed by: Breeze Jiang		Ausstellungsdatum: <i>Issue date:</i>	2025-01-23 Signed by: Bell Hu	
Stellung / Position:	Sachverständige(r)/Expert		Stellung / Position:	Sachverständige(r)/Expert	
Sonstiges / <i>Other:</i>	FCC ID: 2BD9P-310398M056				
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>			Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>		
* Legende: P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet * Legend: P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested					
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Anmerkungen
Remarks

1	Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben. Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden. <i>The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system. Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.</i>
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3	Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben. Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt. <i>Test clauses with remark of * are subcontracted to qualified subcontractors and described under the respective test clause in the report.</i> <i>Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.</i>
4	Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnissen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. Zu weiteren Informationen bezüglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019. <i>The decision rule for statements of conformity, based on numerical measurement results, in this test report is based on the "Zero Guard Band Rule" and "Simple Acceptance" in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report. For additional information to the resulting risk based of this decision rule please refer to ILAC G8:2019.</i>

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1 General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix A: Photographs of the Test Set-up

2 Test Sites

2.1 Test Facilities

TÜV Rheinland (Shenzhen) Co., Ltd.

Address: No. 362 Huanguan Road Middle, Longhua District, 518110, Shenzhen, P. R. China.

FCC Test Site Number: CN1260

ISED Test Lab CAB identifier:CN0078

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

EMF					
Equip. No.	Description	Manufacturer	Model	Serial No.	Calibrated until (DD.MM.YYYY)
9050046	Electric and Magnetic Field Analyzer	Narda	EHP200A	180ZX20517	21.09.2025

2.3 Traceability

All measurement equipment calibrations are traceable to NIM (National Institute of Metrology) or where calibration is performed in other countries, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements as below table.

Table 2: Measurement Uncertainty

Parameter	Uncertainty
Magnetic Field Emissions (A/m)	1.5dB
Electric Field Emissions (V/m)	1.5dB

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

2.6 Location of Original Data

The original copies of all test data taken during actual testing were attached at Appendix A of this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) Co., Ltd. file for certification follow-up purposes.

2.7 Status of Facility Used for Testing

TÜV Rheinland (Shenzhen) Co., Ltd. test facility located at No. 362 Huanguan Road Middle, Longhua District, 518110, Shenzhen, P. R. China is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

3 General Product Information

3.1 Product Function and Intended Use

The EUT is a Presto 2 which supports wireless charging (WPT) and NFC functions.

The Presto 2 is a fixture designed for charging and recognizing compatible wireless devices.

The fixture consists of 6 wireless Qi chargers, 6 NFC readers that are interconnected and controlled through a USB HUB and USB Relay and powered via an internal power supply.

For details refer to the User Manual, Technical Description and Circuit Diagram.

3.2 Ratings and System Details

Table 3: Technical Specification of EUT

General Information of EUT		Value
Kind of Equipment:		Presto 2
Type Designation:		9040034310
FCC ID:		2BD9P-310398M056
Rated Input		AC 100-240V, 50/60Hz
Rated Output:		Output 1~6: 7.5W (for Phone) Total Output: 45W MAX
Test Voltage:		AC 120V, 60Hz
Technical Specification of WPT		
Output 1 (Coil 1)	Frequency Range:	110.5kHz to 205kHz
	Type of Modulation:	FSK
	Antenna Type:	Coil antenna
	Antenna Number:	1
	Wireless output power:	123.8~146.7KHz: 7.5W
Output 2 (Coil 2)	Frequency Range:	110.5kHz to 205kHz
	Type of Modulation:	FSK
	Antenna Type:	Coil antenna
	Antenna Number:	1
	Wireless output power:	123.8~146.7KHz: 7.5W
Output 3 (Coil 3)	Frequency Range:	110.5kHz to 205kHz
	Type of Modulation:	FSK
	Antenna Type:	Coil antenna
	Antenna Number:	1
	Wireless output power:	123.8~146.7KHz: 7.5W
Output 4 (Coil 4)	Frequency Range:	110.5kHz to 205kHz
	Type of Modulation:	FSK
	Antenna Type:	Coil antenna
	Antenna Number:	1
	Wireless output power:	123.8~146.7KHz: 7.5W
Output 5	Frequency Range:	110.5kHz to 205kHz

(Coil 5)	Type of Modulation:	FSK
	Antenna Type:	Coil antenna
	Antenna Number:	1
	Wireless output power:	123.8~146.7KHz: 7.5W
Output 6 (Coil 6)	Frequency Range:	110.5kHz to 205kHz
	Type of Modulation:	FSK
	Antenna Type:	Coil antenna
	Antenna Number:	1
	Wireless output power:	123.8~146.7KHz: 7.5W

3.3 Operation Modes

Operating Mode	Description of Mode
Single Coil Charging (E/H Field)	
1	On, Maximum Power Charging (7.5W max) Coil 1 @ 123.8~146.7KHz for Phone
2	On, Idle
3	On, Direct Exposure During Device Removal
All 6 Coil Charging (E/H Field)	
4	On, Maximum Power Charging (7.5W max) Coil 1 @ 123.8~146.7KHz for Phone
5	On, Idle
6	On, Direct Exposure During Device Removal
Multilpe Coils Maximum Power Charging (E/H Field): N/A	

3.4 Coil Description

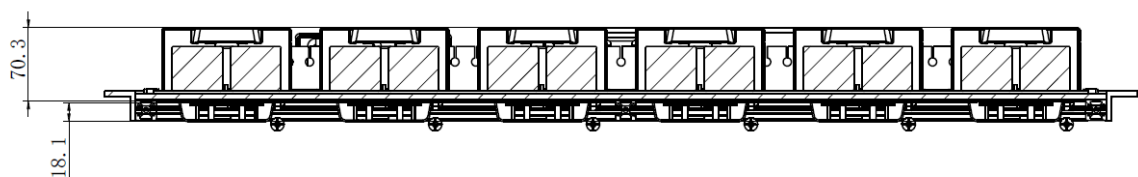
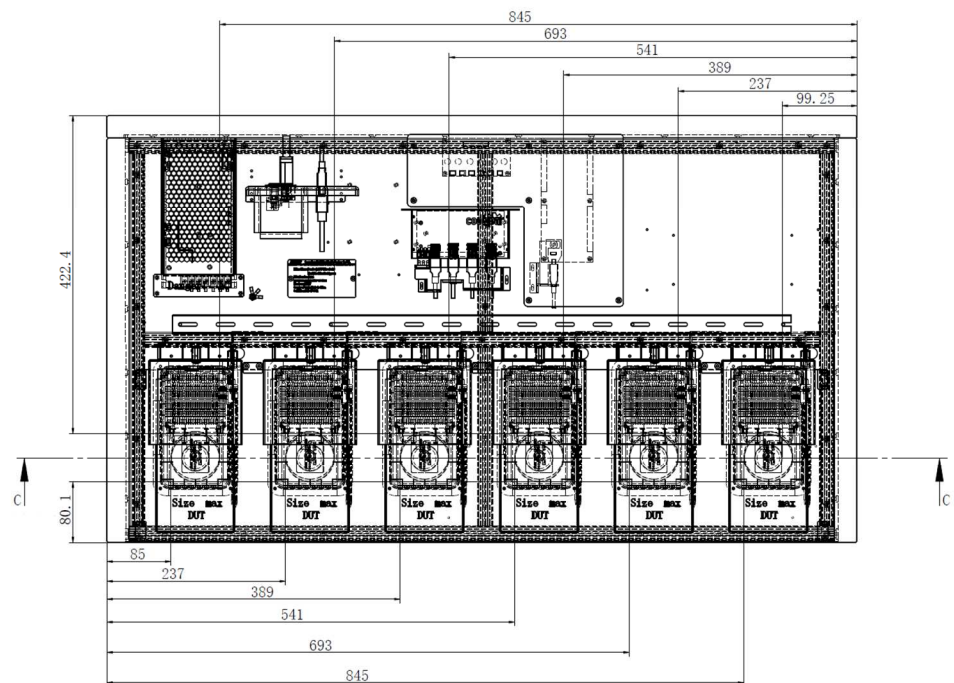
Coil 1~6:

Size (geometry) 50±0.5mm × 35±0.5mm

Number of turns 5

Note: All coil are working at same time.

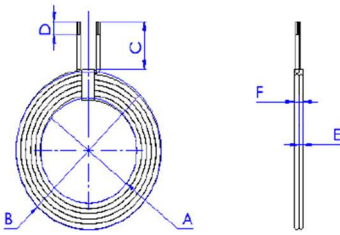
Coil(s) Location within the EUT (unit: mm)



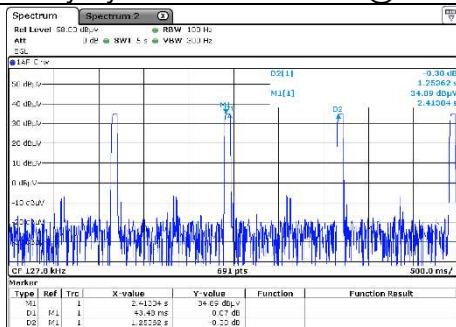
3.5 Coil Specifications

Coil 1~6 – 7.5W

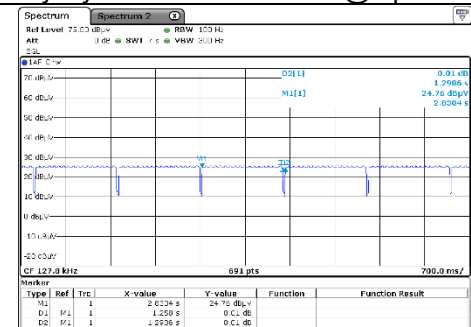
Layer: 1

product size	Φ 50*Φ35*H3.5	Bonding mode	Acetone self-adhesive			
				A	35±0.5	
				B	50±0.5	
				C	19±2	
				D	4 MAX	
				E	1.6±0.05	
				F	3.5±0.1	
				unit: mm		
wire	0.1*90股	way of winding	Single wire folded	remark	The coil is counterclockwise with adhesive backing	
Number of turns	2*5 Ts	L	12.1uH			
Coil size	Φ 50*35	Measurement frequency	123.8-146.7KHz	Test mode	Series test	

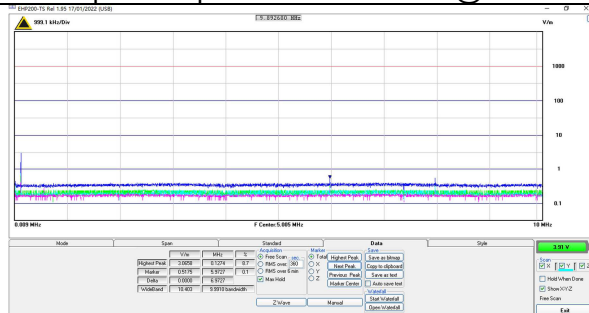
Duty Cycle – 110.5~148KHz @ idle



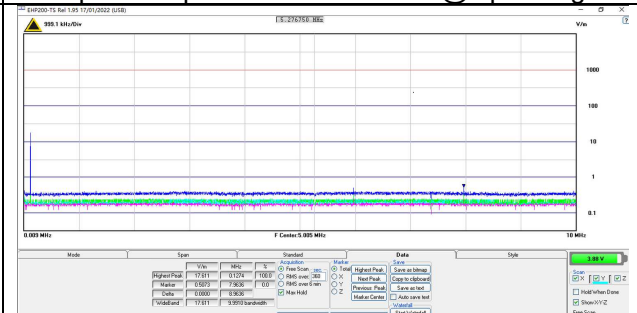
Duty Cycle – 110.5~148KHz @ operating



Spectrum plot – 110.5~148KHz @ idle



Spectrum plot – 110.5~148KHz @ operating



3.6 Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

3.7 Submitted Documents

- Application Form
- Block Diagram
- ID Label and Location Info
- User Manual
- Schematics
- Operation Description

3.8 Special Accessories and Auxiliary Equipment

Description	Manufacturer	Model	Remark
Notebook Computer	N/A	N/A	Provided by Client
Cellphone*6	N/A	N/A	Provided by Client

4 Radio Frequency Exposure Compliance

4.1 Test Procedures According to the Technical Standards

Standard Section	Test Item	Judgment
FCC CFR 47 part1, 1.1310 KDB 680106 D01 Wireless Power Transfer v04	Electric Field Strength (E) (V/m)	PASS
	Magnetic Field Strength (H) (A/m)	PASS

4.2 Limit of Maximum Permissible Exposure

Limits for Occupational / Controlled Exposure				
Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6

1500-100,000			5	6
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Limits for General Population / Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180 / f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1	30

Note 1: f = frequency in MHz ; *Plane-wave equivalent power density.

Note 2: For the applicable limit, see FCC 1.1310, KDB 680106 D01 Wireless Power Transfer v04.

Note 3: Emissions between 100 kHz to 300 kHz should be assessed versus the limits at 300 kHz in Table 1 of Section 1.1310: 614 V/m and 1.63 A/m. A KDB inquiry is required to determine the applicable exposure limits below 100 kHz.

4.3 Test result

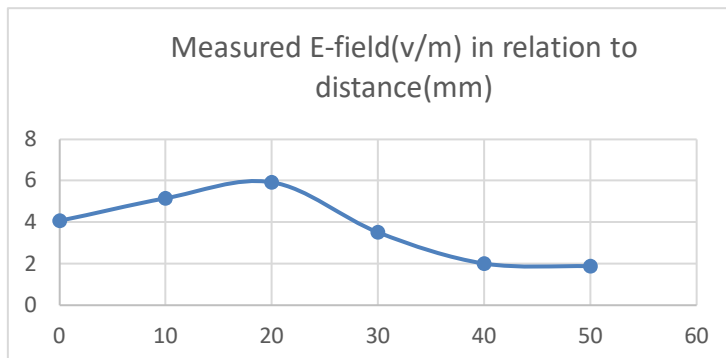
4.3.1 General Description

The Probe parameters as below:

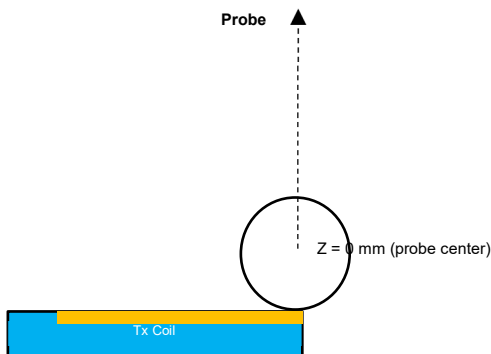
Probe: EHP200A	Probe Center to edge	46mm
	E-field Sensor Dp	52mm
	H-field Sensor Dp	76mm
	1.7Dp E-field	88mm
	1.7Dp H-field	129mm

E-field and H-field Test Procedures:

1. The grid of 10mm by 10mm is used as the size between the EUT and the probe when measurement
2. The probe is used to measure the E-field and H-field from the EUT
3. Measurements are made perpendicular to the XY plane
4. Locate the MFS in the XY plane; take coil 1 for example
5. These initial measurements are made at Z = 70 mm from the surface of the XY plane when 1.7Dp E-field=88mm, and 1.7Dp H-field=129mm of the probe
6. The resulting magnetic H-field strength was plotted against the distance in below figure:



7. The maximum E-field strength (5.95V/m) on this plot occurs at 20 mm from the center of the coil
8. The probe must therefore be placed at 20 mm from the center of the coil to gather electric or magnetic values when measuring along the Z-axis



9. Repeat the step1~8 to confirm the maximum H-field strength
10. Test was performed on operating mode with client device, 10%, 50%, 90% battery status of client device, here the worst-case status data are shown

4.3.2 Test Result for Coil 1, 123.8~146.7KHz for Phone, 7.5W max

Data Collecting Process

Operating, Device removal and standby modes use the same test method, only the power of the test load is changed. The data only reflects the worst mode EUT+Mobile Phone (battery status: <20%).

Test Distance (mm)	E-Field (V/m):		H-Field (A/m):	
	EUT + Mobile Phone (Battery Status: <20%)		EUT + Mobile Phone (Battery Status: <20%)	
70	5.476		0.352	
80	5.234		0.331	
90	4.879		0.302	
100	4.328		0.281	
110	3.961		0.258	
120	3.472		0.221	
130	3.12		0.193	
140	2.978		0.162	
150	2.619		0.141	
160	2.234		0.119	
170	1.983		0.103	
180	1.788		0.082	
190	1.522		0.074	
200	1.328		0.062	

Performing Curve-fitting

Four (4) regression techniques were used to validate their model errors.

Model 1: Quadratic Regression

Model 2: Cubic Regression

Model 3: Quartic Regression

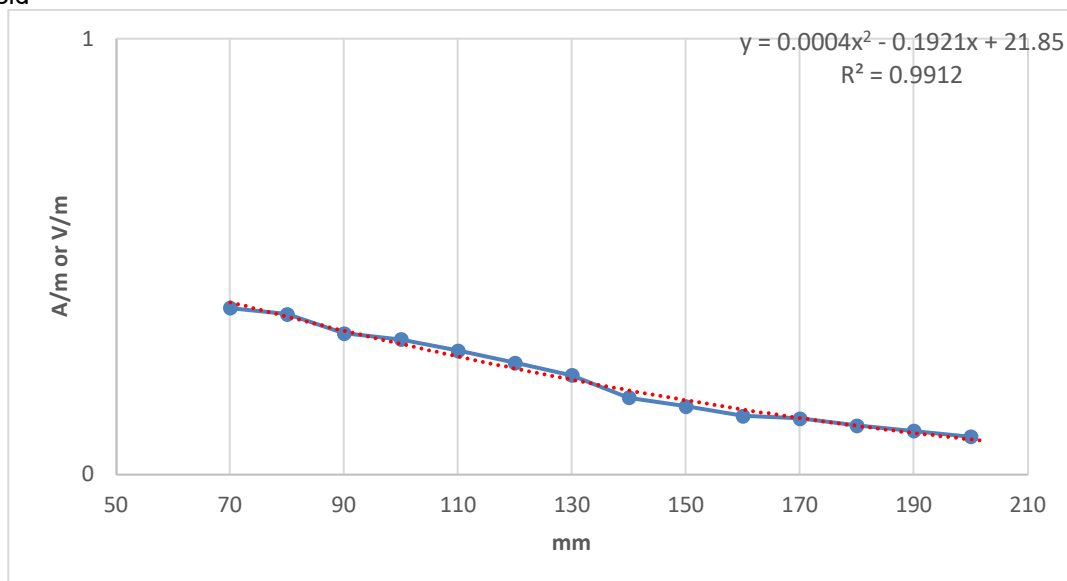
Model 4: 5th Order Regression

The Data Analysis package included in MS Excel was used to perform the regression analyses.

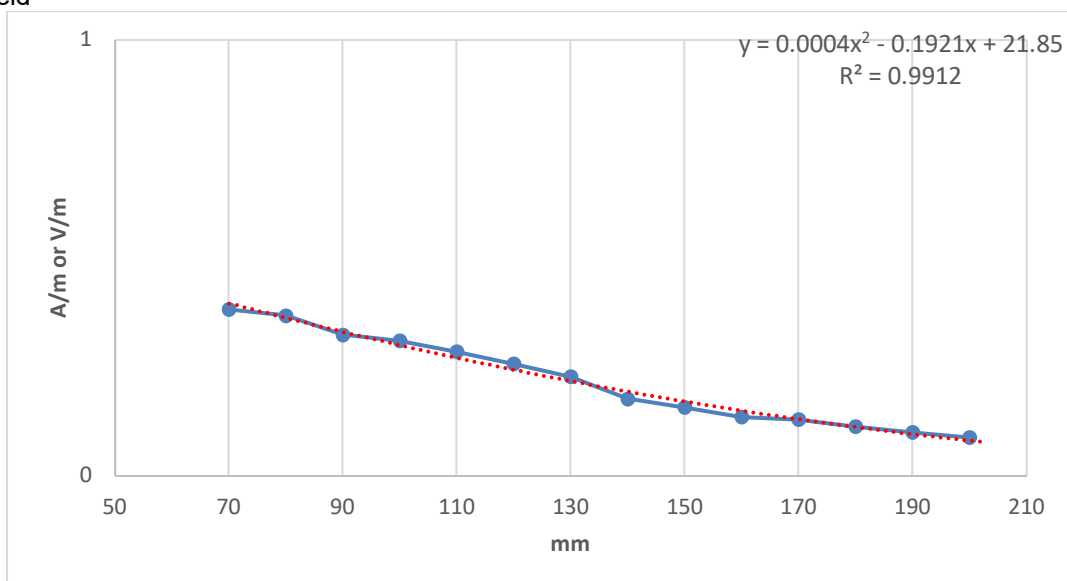
Operating mode (Battery Status: <20%)-Worst case

Model 1: Quadratic Regression

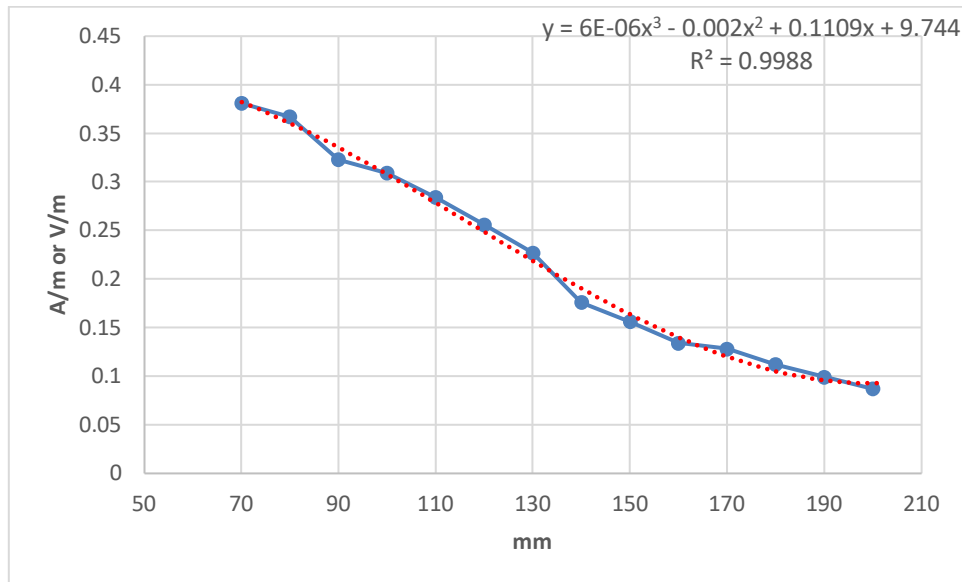
E-Field



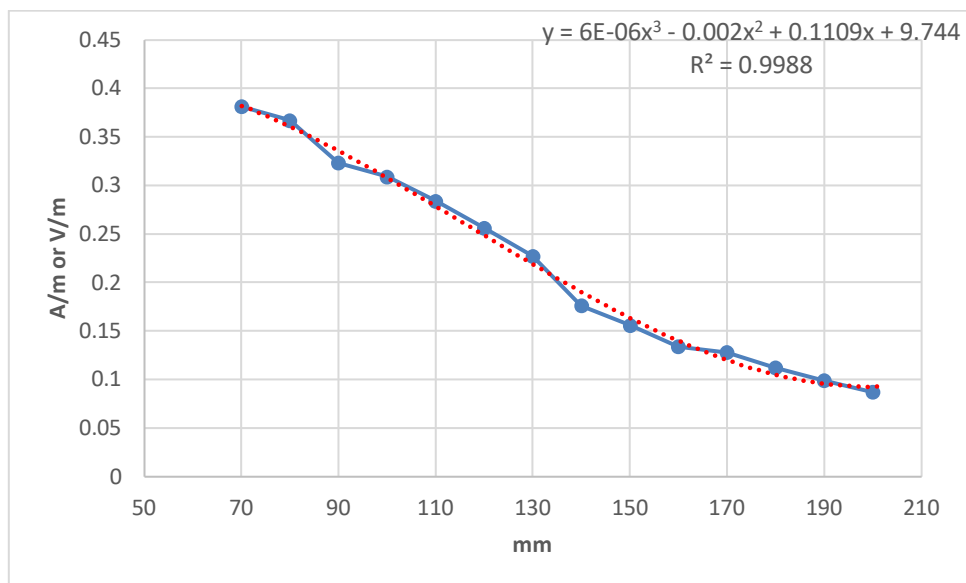
H-Field



Model 2: Cubic Regression
 E-Field

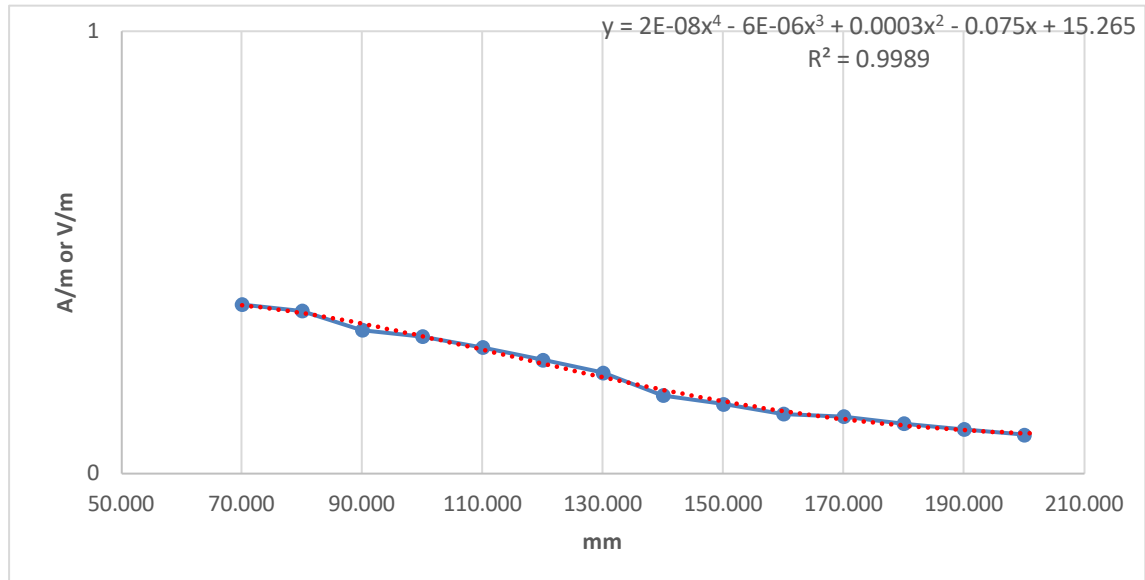


H-Field

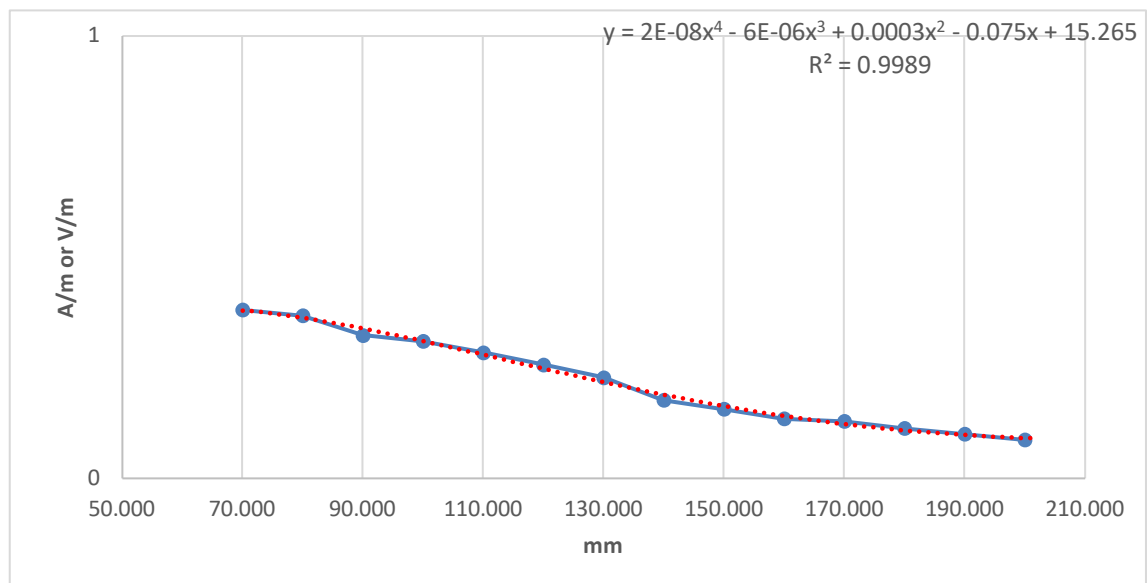


Model 3: Quartic Regression

E-Field



H-Field



Analyzing Results
E-Field

Parameter	Quadratic Regression	Cubic Regression	Quartic Regression
Multiple R	0.998	0.999	0.999
R Square	0.997	0.997	0.998
Adjusted R Square	0.996	0.996	0.997
Standard Error (S)	0.084	0.085	0.079
Number of data points used	14	14	14
Estimated magnetic field strength at touch position (V/m)	9.272	8.405	3.283
Limit (V/m)	614	614	614
Result	Pass		

Note: The regression analysis utilized a confidence level of 95%, which is the minimum value that should be used by applicants, by using curve fitting techniques for modeling and calculation.

H-Field

Parameter	Quadratic Regression	Cubic Regression	Quartic Regression
Multiple R	0.998	0.999	1.000
R Square	0.995	0.999	0.999
Adjusted R Square	0.994	0.999	0.999
Standard Error (S)	0.008	0.004	0.004
Number of data points used	14	14	14
Estimated magnetic field strength at touch position (A/m)	0.621	0.374	0.179
Limit (A/m)	1.63	1.63	1.63
Result	Pass		

Note: The regression analysis utilized a confidence level of 95%, which is the minimum value that should be used by applicants, by using curve fitting techniques for modeling and calculation.

4.3.3 Test Result for Coil 1~6, 123.8~146.7KHz for Phone, 45W max

Data Collecting Process

Operating, Device removal and standby modes use the same test method, only the power of the test load is changed. The data only reflects the worst mode EUT+Mobile Phone (battery status: <20%).

Test Distance (mm)	E-Field (V/m):	H-Field (A/m):
	EUT + Mobile Phone (Battery Status: <20%)	EUT + Mobile Phone (Battery Status: <20%)
70	6.059	0.381
80	5.764	0.367
90	5.128	0.323
100	4.788	0.309
110	4.339	0.284
120	4.107	0.256
130	3.784	0.227
140	3.232	0.176
150	2.887	0.156
160	2.561	0.134
170	2.217	0.128
180	2.018	0.112
190	1.862	0.099
200	1.776	0.087

Performing Curve-fitting

Four (4) regression techniques were used to validate their model errors.

Model 1: Quadratic Regression

Model 2: Cubic Regression

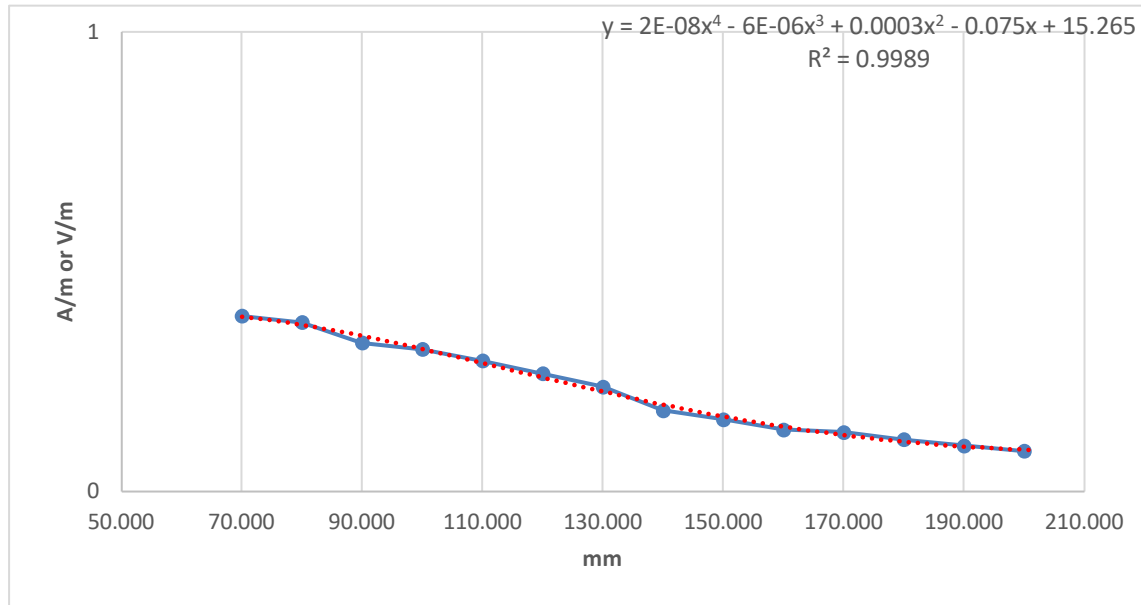
Model 3: Quartic Regression

The Data Analysis package included in MS Excel was used to perform the regression analyses.

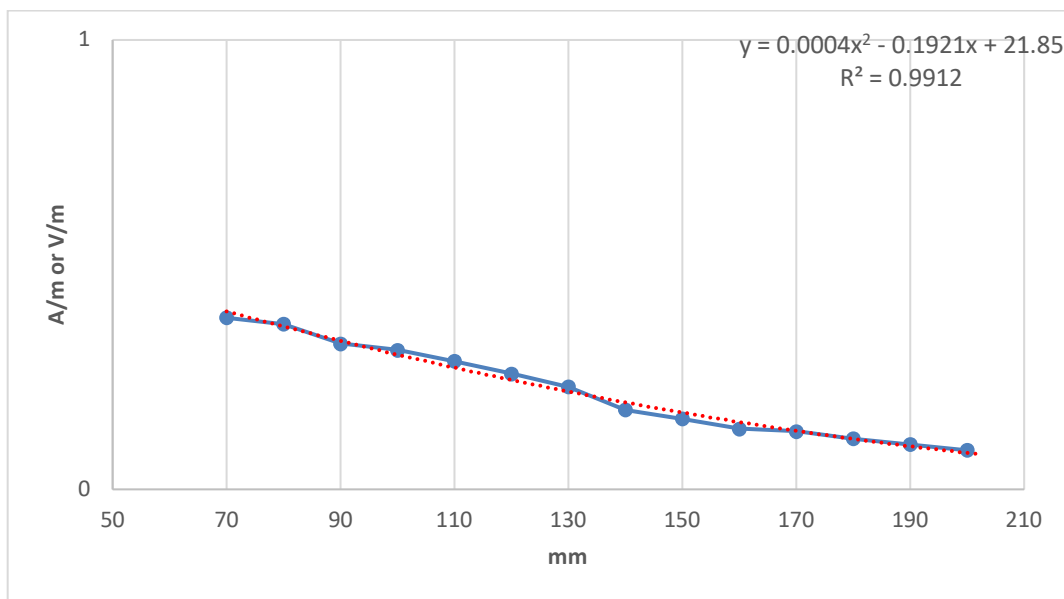
Operating mode (Battery Status: <20%)-Worst case

Model 1: Quadratic Regression

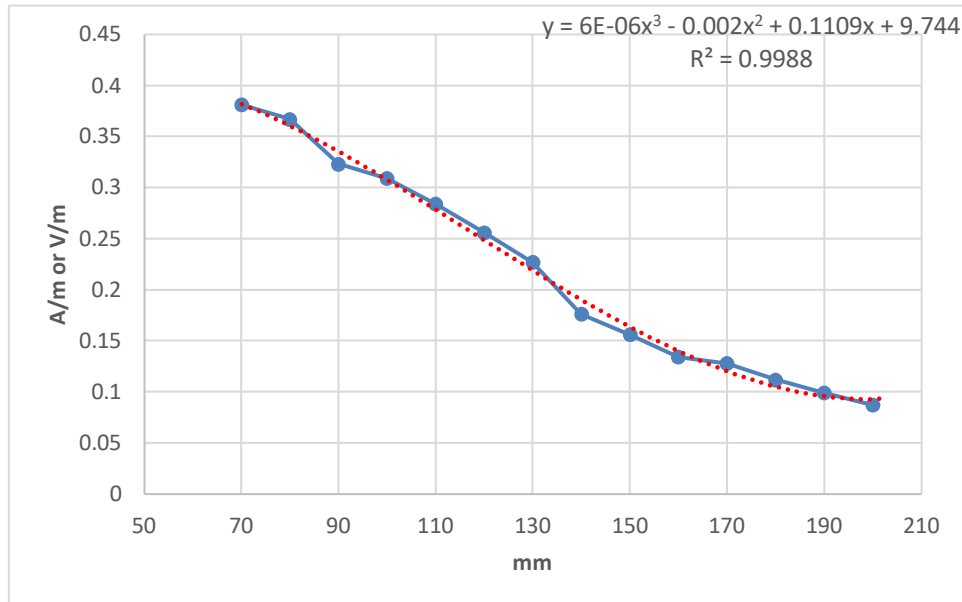
E-Field



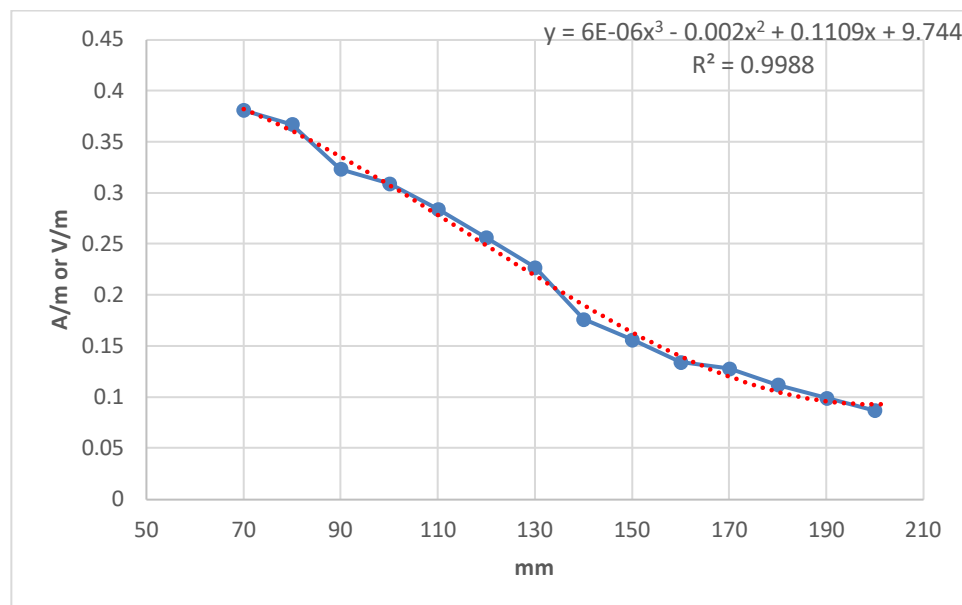
H-Field



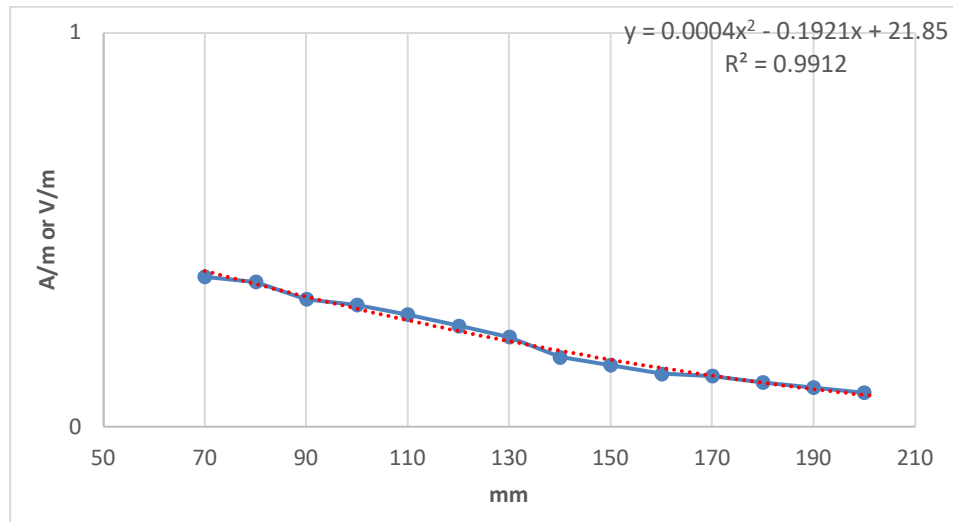
Model 2: Cubic Regression
 E-Field



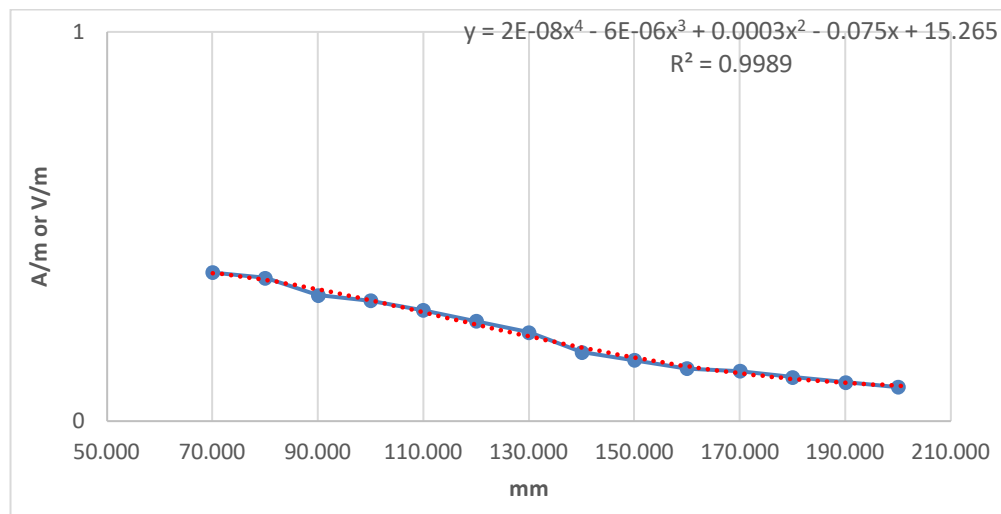
H-Field

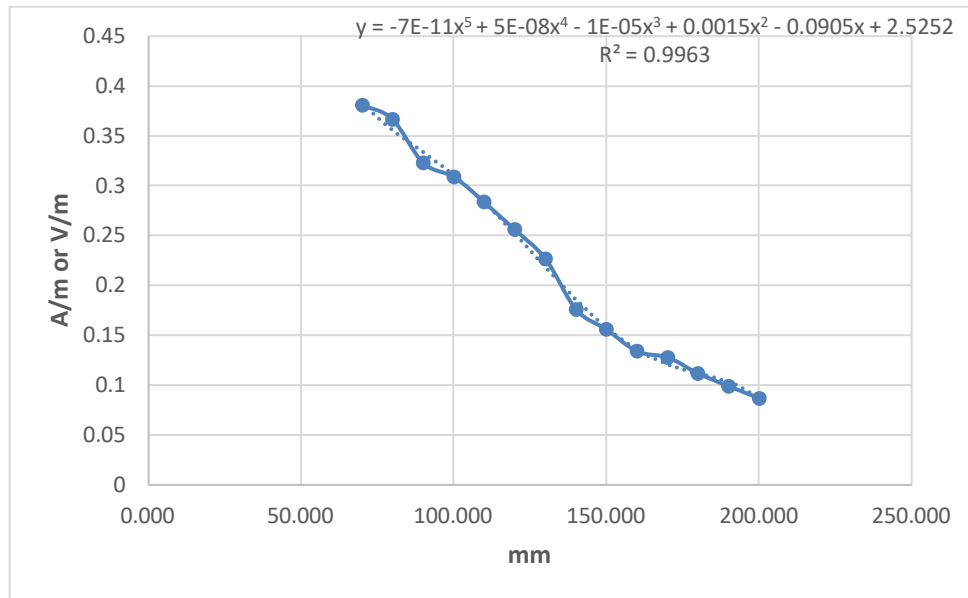


Model 3: Quartic Regression
 E-Field



H-Field



Model 4: 5th Order Regression
E-Field

Analyzing Results
E-Field

Parameter	Quadratic Regression	Cubic Regression	Quartic Regression	5 th Order Regression
Multiple R	0.998	0.999	0.999	0.999
R Square	0.996	0.997	0.998	0.998
Adjusted R Square	0.995	0.996	0.997	0.997
Standard Error (S)	0.106	0.089	0.080	0.085
Number of data points used	14	14	14	14
Estimated magnetic field strength at touch position (V/m)	10.104	7.774	13.768	14.248
Limit (V/m)	614	614	614	614
Result	Pass			

Note: The regression analysis utilized a confidence level of 95%, which is the minimum value that should be used by applicants, by using curve fitting techniques for modeling and calculation.

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H-Field

Parameter	Quadratic Regression	Cubic Regression	Quartic Regression
Multiple R	0.994	0.997	0.997
R Square	0.988	0.994	0.995
Adjusted R Square	0.986	0.992	0.992
Standard Error (S)	0.012	0.009	0.009
Number of data points used	14	14	14
Estimated magnetic field strength at touch position (A/m)	0.675	0.361	0.080
Limit (A/m)	1.63	1.63	1.63
Result	Pass		

Note: The regression analysis utilized a confidence level of 95%, which is the minimum value that should be used by applicants, by using curve fitting techniques for modeling and calculation.

5 Photographs of the Test Set-Up

For photographs of the test set-up, refer to the appendix A.

6 List of Tables

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