

# Test Report

Applicant: Shenzhen Maxonic Automation Control Co., Ltd.Senex Branch

Product Name: Pressure Transmitters

Brand Name: SENEX

Model No.: DG series

Date of Receipt : Dec.20, 2019

Date of Test: Dec.23-24, 2019

Date of Report: Dec.25, 2019

Prepared by: Shenzhen Most Technology Service Co., Ltd.

**The safety testing has been performed on the submitted samples and found in compliance with the council EMC directive 2014/30/EU.**

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## TEST REPORT DECLARATION

Report Number	MTEN19122137	
Applicant	Shenzhen Maxonic Automation Control Co., Ltd.Senex Branch	
	First Floor 102, No. 600 No. 2, Guangshan Second Road, Tianhe District, Guangzhou	
Manufacturer	Shenzhen Maxonic Automation Control Co., Ltd.Senex Branch	
	First Floor 102, No. 600 No. 2, Guangshan Second Road, Tianhe District, Guangzhou	
Product	Product Name	Pressure Transmitters
	Model No.	DG series
	Power Supply	9-36VDC
Test Result	The EUT was found compliant with the requirement(s) of the standards.	
Standard	EN 61326-1:2013 (CISPR11:2015, IEC 61000-4-2:2008,IEC 61000-4-3:2006+A1:2007+A2:2010, IEC 61000-4-4:2012, IEC 61000-4-5:2014+A1:2017, IEC 61000-4-6:2014)	
<p><b>*Note</b></p> <p>The above device has been tested by Shenzhen Most Technology Service Co., Ltd. To determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The test record, data evaluation &amp; Equipment Under Test (EUT) configurations represented are contained in this test report and Shenzhen Most Technology Service Co., Ltd. Is assumed full responsibility for the accuracy and completeness of test. Also, this report shows that the EUT is technically compliant with the requirement of the above standards.</p> <p>This report applies to above tested sample only. This report shall not be reproduced except in full, without written approval of Shenzhen Most Technology Service Co., Ltd., this document may be altered or revised by Shenzhen Most Technology Service Co., Ltd., personal only, and shall be noted in the revision of the document.</p>		
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Reviewed by	<i>Sunny</i>	
	Sunny Deng(Engineer)	
Approved by	<i>Yvette Zhou</i>	
	Yvette Zhou(Manager)	

# 1. GENERAL INFORMATION

## 1.1. Description of Device (EUT)

Description	:	Pressure Transmitters
Model Number	:	DG series
Remark	:	Used DG2 does all tests

## 1.2. Operational Mode(s) of EUT

Order Number	:	Test Mode(s)
1	:	Running
	:	
	:	
	:	

## 1.3. Test Voltage(s) of EUT

Order Number	:	Test Voltage(s)
1	:	DC 24V by DC Source
	:	
	:	
	:	

## **2. DESCRIPTION OF TEST STANDARD**

The intention of this publication is to establish uniform requirements for the radio disturbance level of the equipment contained in the scope, to fix limits of disturbance, to describe methods of measurement and to standardize operating conditions and interpretation of results.

The following referenced standard are indispensable for the application of this report.

Referenced Description below:

EN 61326-1:2013

Electromagnetic Equipment for measurement, control and laboratory use – EMC requirements-Part 1: General requirement.

### 3. LABORATORY INFORMATION

#### 3.1. Laboratory Name

Shenzhen Most Technology Service Co., Ltd.

#### 3.2. Location

No.5, 2<sup>nd</sup> Langshan Road, North District, Hi-tech Industrial Park, Nanshan, Shenzhen, Guangdong, China

#### 3.3. Test facility

- |                     |   |   |
|---------------------|---|---|
| 3m Anechoic Chamber | : | Nov. 28, 2012 File on Federal Communication Commission<br>Registration Number:490827  |
| Shielding Room      | : | Nov. 28, 2012 File on Federal Communication Commission<br>Registration Number:490827  |
| EMC Lab.            | : | Accredited by TUV Rheinland Shenzhen<br>Audit Report: UA 50149851<br>Mar. 12, 2009<br><br>Accredited by Industry Canada<br>Registration Number: 7103A-1<br>Oct. 22, 2012<br><br>Accredited by TIMCO<br>Registration Number: Q1460<br>March 28, 2010 |

#### 3.4. Measurement Uncertainty

No.	Item	Uncertainty
1.	Uncertainty for Conducted Disturbance Test	1.25dB
2.	Uncertainty for Radiated Disturbance Test	3.15dB

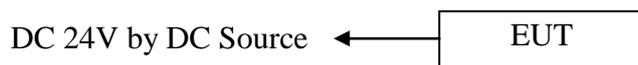
#### 4. SUMMARY OF TEST RESULTS

<b>EMISSION</b>			
<b>Test Item</b>	<b>Standard</b>	<b>Limits</b>	<b>Results</b>
Conducted disturbance at mains terminals	CISPR11:2015	Class A	N/A
Radiated disturbance	CISPR11:2015	Class A	PASS
Harmonic current emissions	EN IEC 61000-3-2:2019	Class A	N/A
Voltage fluctuations & flicker	EN 61000-3-3:2013	---	N/A
<b>IMMUNITY (EN 61326-1:2013)</b>			
<b>Test Item</b>	<b>Basic Standard</b>	<b>Performance Criteria</b>	<b>Results</b>
Electrostatic discharge (ESD)	IEC 61000-4-2:2008	B	PASS
Radio-frequency, Continuous radiated disturbance	IEC 61000-4-3: 2006+A1:2007+A2:2010	A	PASS
Electrical fast transient (EFT)	IEC 61000-4-4:2012	B	PASS
Surge (Input d.c. power ports)	IEC 61000-4-5:2014+A1:2017	B	PASS
Surge (Telecommunication ports)		B	N/A
Radio-frequency, Continuous conducted disturbance	IEC 61000-4-6:2014	A	PASS
Power frequency magnetic field	IEC 61000-4-8:2010	A	PASS
Voltage dips, 100% reduction	IEC 61000-4-11:2004+A1:2017	B	N/A
Voltage dips, 30% reduction		C	N/A
Voltage interruptions		C	N/A
N/A is an abbreviation for Not Applicable.			

## 5. BLOCK DIAGRAM OF TEST SETUP

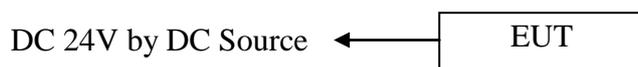
The equipments are installed test to meet CISPR11 requirement and operating in a manner which tends to maximize its emission characteristics in a normal application. EUT was tested in normal configuration (Please See following Block diagrams)

### 5.1. Block Diagram of connection between EUT and simulation-EMI



(EUT: Pressure Transmitters)

### 5.2. Block Diagram of connection between EUT and simulation-EMS



(EUT: Pressure Transmitters)

## 6. TEST INSTRUMENT USED

### 6.1. For Conducted Disturbance at Mains Terminals Emission Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCI	100492	Mar. 09, 19	1 Year
2.	L.I.S.N.	Rohde & Schwarz	ENV216	100093	Mar. 09, 19	1 Year
3.	Coaxial Switch	Anritsu Corp	MP59B	6200283933	Mar. 09, 19	1 Year
4.	Terminator	Hubersuhner	50Ω	No.1	Mar. 09, 19	1 Year
5.	RF Cable	SchwarzBeck	N/A	No.1	Mar. 09, 19	1 Year

### 6.2. For Radiation Test (In Anechoic Chamber)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESPI	101202	Mar. 09, 19	1 Year
2.	Bilog Antenna	Sunol	JB3	A121206	Mar. 09, 19	1 Year
3.	Cable	Resenberger	N/A	NO.1	Mar. 09, 19	1 Year
4.	Cable	SchwarzBeck	N/A	NO.2	Mar. 09, 19	1 Year
5.	Cable	SchwarzBeck	N/A	NO.3	Mar. 09, 19	1 Year
6.	DC Power Filter	DuoJi	DL2×30B	N/A	N/A	N/A
7.	Single Phase Power Line Filter	DuoJi	FNF 202B30	N/A	N/A	N/A
8.	3 Phase Power Line Filter	DuoJi	FNF 402B30	N/A	N/A	N/A

### 6.3. For Harmonic / Flicker Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	AC Power Source	Kikusui	AC40MA	LM003232	Mar. 09, 19	1 Year
2.	Test Analyzer	Kikusui	KHA1000	LM003720	Mar. 09, 19	1 Year
3.	Line Impedance Network	Kikusui	LIN40MA-PCR-L	LM002352	Mar. 09, 19	1 Year

### 6.4. For Electrostatic Discharge Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ESD Tester	Kikusui	KES4021	LM003537	Mar. 09, 19	1 Year

### 6.5. For RF Strength Susceptibility Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Signal Generator	IFR	2032	203002/100	Mar. 09, 19	1 Year
2.	Amplifier	A&R	150W1000	301584	NCR	NCR
3.	Dual Directional Coupler	A&R	DC6080	301508	Mar. 09, 19	1 Year
4.	Power Sensor	Anritsu	MA2491A	32263	Mar. 09, 19	1 Year
5.	Power Meter	R&S	NRVS	100444	Mar. 09, 19	1 Year
6.	Field Monitor	A&R	FM5004	300329	Mar. 09, 19	1 Year
7.	Field Probe	A&R	FP5000	300221	Mar. 09, 19	1 Year
8.	Log-periodic Antenna	A&R	AT1080	16512	Mar. 09, 19	1 Year
9.	RF Cable	MIYAZAKI	N/A	No.1/No.2	Mar. 09, 19	1 Year

### 6.6. For Electrical Fast Transient/Burst Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMCPRO System	EM Test	UCS-500-M4	V0648102026	Mar. 09, 19	1 Year

### 6.7. For Surge Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMCPRO System	EM Test	UCS-500-M4	V0648102026	Mar. 09, 19	1 Year

### 6.8. For Injected Currents Susceptibility Test

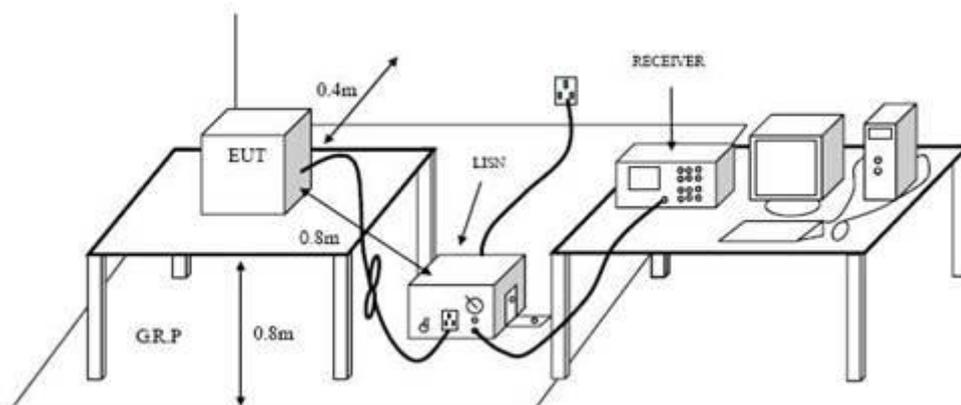
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Signal Generator	IFR	2032	203002/100	Mar. 09, 19	1 Year
2.	Amplifier	A&R	150W1000	301584	NCR	NCR
3.	CDN	FCC	FCC-801-M2-25	47	Mar. 09, 19	1 Year
4.	CDN	FCC	FCC-801-M3-25	107	Mar. 09, 19	1 Year
5.	EM Injection Clamp	FCC	F-203I-23mm	403	Mar. 09, 19	1 Year
6.	RF Cable	MIYAZAKI	N/A	No.1/No.2	Mar. 09, 19	1 Year

### 6.9. For Voltage Dips and Interruptions Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMCPRO System	EM Test	UCS-500-M4	V0648102026	Mar. 09, 19	1 Year

## 7. CONDUCTED DISTURBANCE AT MAINS TERMINALS TEST

### 7.1. Configuration of Test System



### 7.2. Test Standard

CISPR11:2015

### 7.3. Power Line Conducted Disturbance at Mains Terminals Limit

Frequency range MHz	Rated input power of ≤ 20 kVA		Rated input power of > 20 kVA <sup>a</sup>	
	Quasi-peak dB(μV)	Average dB(μV)	Quasi-peak dB(μV)	Average dB(μV)
0,15 – 0,50	79	66	100	90
0,50 – 5	73	60	86	76
5 – 30	73	60	90	80
			decreasing linearly with logarithm of frequency to	
			73	60

At the transition frequency, the more stringent limit shall apply.

NOTE 1 Limits only apply to low voltage a.c. mains input ports.

NOTE 2 For class A equipment intended to be connected solely to isolated neutral or high impedance earthed (IT) industrial power distribution networks (see IEC 60364-1), the limits defined for group 2 equipment with a rated input power > 75 kVA in Table 6 can be applied.

<sup>a</sup> These limits apply to equipment with a rated input power > 20 kVA and intended to be powered by a dedicated power transformer or generator, and which is not connected to Low Voltage (LV) overhead power lines. For equipment not intended to be powered by a user specific power transformer, the limits for ≤20 kVA apply. The manufacturer and/or supplier shall provide information on installation measures that can be used to reduce emissions from the installed equipment. In particular, it shall be indicated that this equipment is intended to be powered by a dedicated power transformer or generator and not by LV overhead power lines.

- Notes: 1. \* Decreasing linearly with logarithm of frequency.  
2. The lower limit shall apply at the transition frequencies.

### 7.4. Test Procedure

The EUT was placed on a non-metallic table, 80cm above the ground plane. The EUT Power connected to the power mains through a line impedance stabilization network (L.I.S.N. 1#). This provided a 50-ohm coupling impedance for the EUT (Please refer to the block diagram

of the test setup and photographs). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N.#2). Both sides of power line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to CISPR 11 Class A on conducted Disturbance test.

The bandwidth of test receiver is set at 9kHz.

The frequency range from 150kHz to 30MHz is checked. The test result are reported on Section 7.5.

## 7.5. Conducted Disturbance at Mains Terminals Test Results

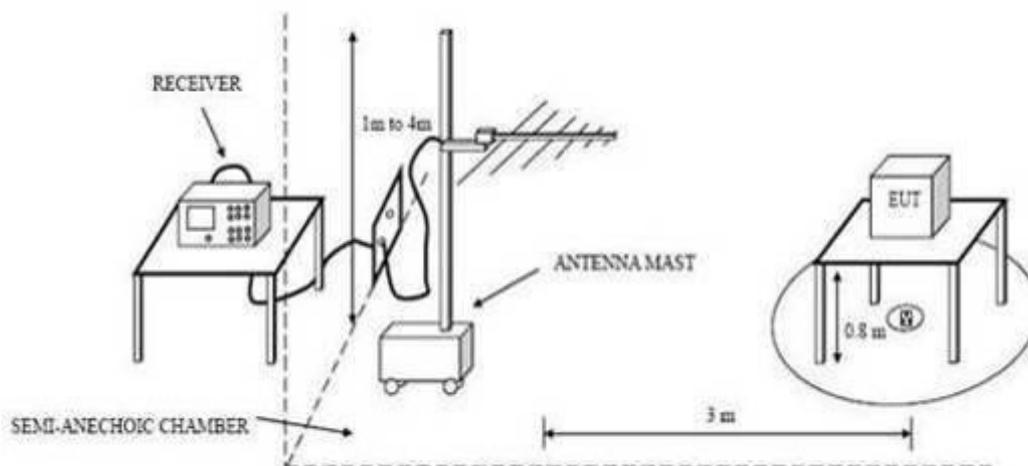
7.5.1. Test Results: **N/A**

7.5.2. If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

7.5.3. Emission Level= Correct Factor + Reading Level.

## 8. RADIATED DISTURBANCE TEST

### 8.1. Configuration of Test System



### 8.2. Test Standard

CISPR11:2015

### 8.3. Radiated Disturbance Limit

All emanations from computing devices or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

Frequency range MHz	10 m measuring distance		3 m measuring distance <sup>b</sup>	
	rated input power of		rated input power of	
	≤ 20 kVA	> 20 kVA <sup>a</sup>	≤ 20 kVA	> 20 kVA <sup>a</sup>
	Quasi-peak dB(μV/m)	Quasi-peak dB(μV/m)	Quasi-peak dB(μV/m)	Quasi-peak dB(μV/m)
30 – 230	40	50	50	60
230 – 1 000	47	50	57	60

On a test site, class A equipment can be measured at a nominal distance of 3 m, 10 m or 30 m. A measuring distance less than 10 m is allowed only for equipment which complies with the definition given in 3.10. In case of measurements at a separation distance of 30 m, an inverse proportionality factor of 20 dB per decade shall be used to normalize the measured data to the specified distance for determining compliance.

At the transition frequency, the more stringent limit shall apply.

<sup>a</sup> These limits apply to equipment with a rated input power of > 20 kVA and intended to be used at locations where there is a distance greater than 30 m between the equipment and third party sensitive radio communications. The manufacturer shall indicate in the technical documentation that this equipment is intended to be used at locations where the separation distance to third party sensitive radio services is > 30 m. If these conditions are not met, then the limits for ≤ 20 kVA apply.

<sup>b</sup> The limits specified for the 3 m separation distance apply only to small equipment meeting the size criterion defined in 3.10.

Note: 1. The lower limit shall apply at the transition frequencies.

2. Distance refers to the distance in meters between the test antenna and the closed point of any part of the EUT.

## 8.4. Test Procedure

The EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber. An antenna was located 3m from the EUT on an adjustable mast. A pre-scan was first performed in order to find prominent radiated emissions. For final emissions measurements at each frequency of interest, the EUT were rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to CISPR11 Class A on Radiated Disturbance test.

The bandwidth setting on the test receiver is 120 kHz.

The frequency range from 30MHz to 1000MHz is checked. The test result are reported on Section 8.5.

## 8.5. Radiated Disturbance Test Results

8.5.1. Test Results: **PASS**

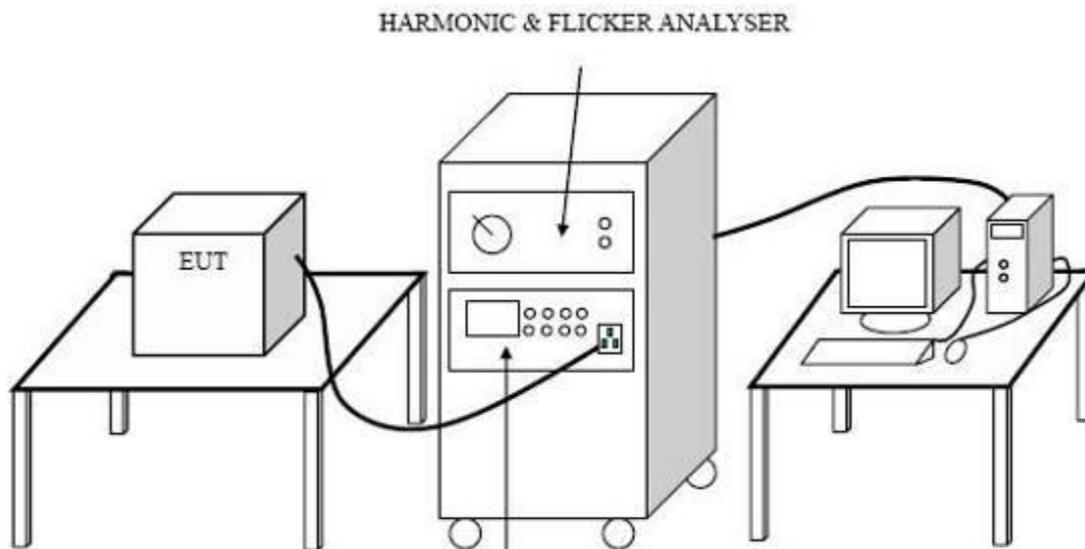
8.5.2. Emission Level= Correct Factor + Reading Level.

8.5.3. All reading are Quasi-Peak values.

8.5.4. The test data and the scanning waveform are attached within Appendix I.

## 9. HARMONIC CURRENT TEST

### 9.1. Configuration of Test System



### 9.2. Test Standard

EN 61000-3-2:2006+A1:2009+A2:2009; Class A

### 9.3. Test Limits

For Class A equipment, the harmonics of the input current shall not exceed the values given in below:

Harmonic order n	Maximum permissible Harmonic current A
Odd harmonics	
3	2.30
5	1.14
7	0.77
9	0.40
11	0.33
13	0.21
$15 \leq n \leq 39$	$0.15 \frac{15}{n}$
Even harmonics	
2	1.08
4	0.43
6	0.30
$8 \leq n \leq 40$	$0.23 \frac{8}{n}$

### 9.4. Test Results

No limits apply for equipment with an active input power less than or equal to 75W

## 10. VOLTAGE FLUCTUATIONS & FLICKER TEST

### 10.1. Configuration of Test System

Same as Section 9.1.

### 10.2. Test Standard

EN 61000-3-3:2013

### 10.3. Test Limits

The limits shall be applicable to voltage fluctuations and flicker at the supply terminals of the equipment under test, the following limits apply:

the value of  $P_{st}$  shall not be greater than 1.0;

the value of  $P_{lt}$  shall not be greater than 0.65;

the value of  $d(t)$  during a voltage change shall not exceed 3.3% for more than 500ms;

the relative steady-state voltage change,  $dc$ , shall not exceed 3.3%;

the maximum relative voltage change  $d_{max}$ , shall not exceed

a) 4% without additional conditions;

b) 6% for equipment which is:

Switched manually, or

Switched automatically more frequently than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds), or manual restart, after a power supply interruption.

c) 7% for equipment which is

Attended whilst in use (for example: hair dryers, vacuum cleaners, kitchen equipment such as mixers, garden equipment such as lawn mowers, portable tools such as electric drills), or

switched on automatically, or is intended to be switched on manually, no more than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds) or manual restart, after a power supply interruption.

### 10.4. Test Results

10.4.1. Test Results: N/A

## 11. IMMUNITY PERFORMANCE CRITERIA

The test results shall be classified in terms of the loss of function or degradation of performance of the equipment under test, relative to a performance level by its manufacturer or the requestor of the test, or the agreed between the manufacturer and the purchaser of the product.

Definition related to the performance level:

Based on the used product standard

Based on the declaration of the manufacturer, requestor or purchaser

Criterion A:

During testing, normal performance within the specification limits.

Criterion B:

During testing, temporary degradation, or loss of function or performance which is self-recovering

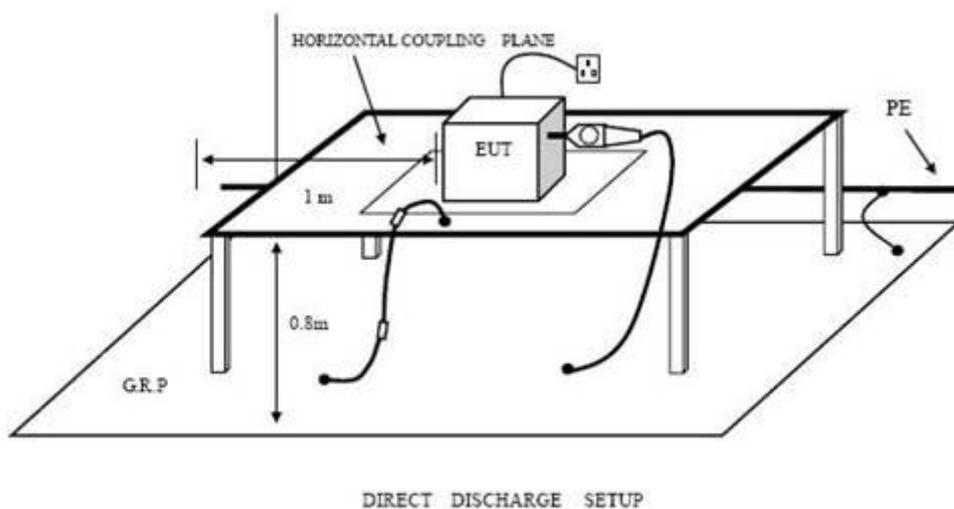
Criterion C:

During testing, temporary degradation, or loss of function or performance which requires operator intervention of system reset occurs.

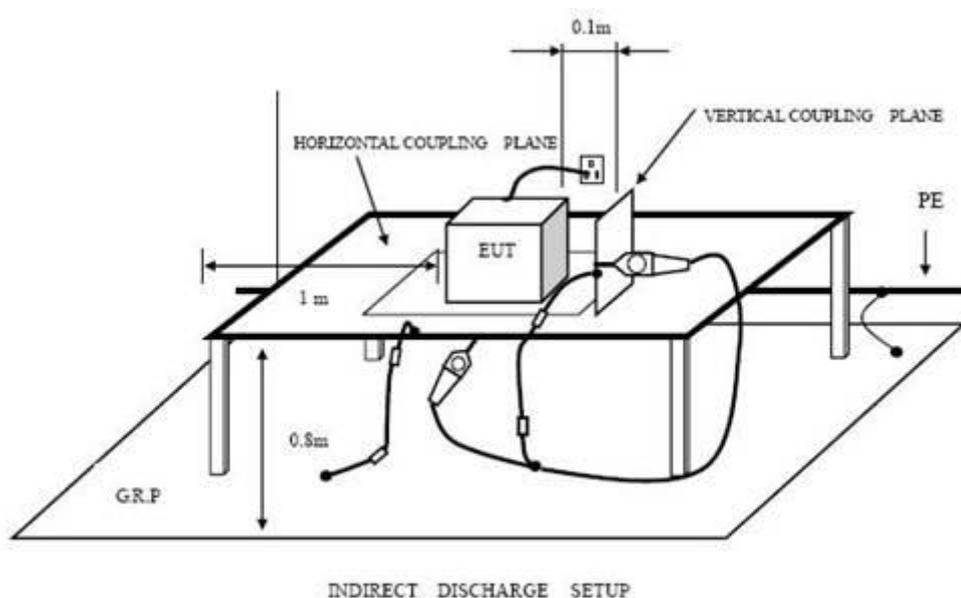
## 12. ELECTROSTATIC DISCHARGE IMMUNITY TEST

### 12.1. Configuration of Test System

#### 12.1.1. Configuration of ESD Test System(Direct Discharge)



#### 12.1.2. Configuration of ESD Test System(Indirect Discharge)



### 12.2. Test Standard

EN 61326-1:2013 (IEC 61000-4-2:2008)  
 (Severity Level 3 for Air Discharge at 8KV,  
 Severity Level 2 for Contact Discharge at 4KV)

## 12.3. Severity Levels and Performance Criterion

### 12.3.1. Severity level

Level	Test Voltage Contact Discharge (KV)	Test Voltage Air Discharge (KV)
1.	2	2
2.	4	4
3.	6	8
4.	8	15
X	Special	Special

### 12.3.2. Performance criterion : **B**

## 12.4. Test Procedure

### 12.4.1. Air Discharge:

The test was applied on non-conductive surfaces of EUT. The round discharge tip of the discharge electrode was approached as fast as possible to touch the EUT. After each discharge, the discharge electrode was removed from the EUT. The generator was re-triggered for a new single discharge and repeated 20 times for each pre-selected test point. This procedure was repeated until all the air discharge completed.

### 12.4.2. Contact Discharge:

All the procedure was same as Section 12.4.1. except that the generator was re-triggered for a new single discharge and repeated 50 times for each pre-selected test point. The tip of the discharge electrode was touch the EUT before the discharge switch was operated.

## 12.5. Test Results

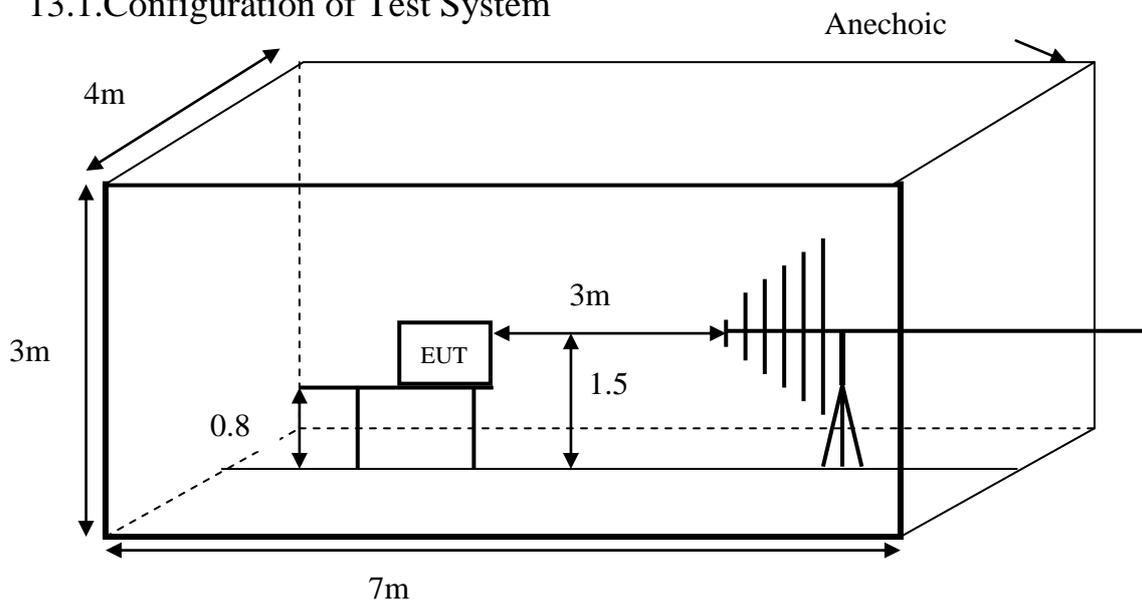
### 12.5.1. Test Results: **PASS**

### 12.5.2. Test data on the following pages.



# 13. RF FIELD STRENGTH SUSCEPTIBILITY TEST

## 13.1. Configuration of Test System



## 13.2. Test Standard

EN 61326-1:2013 (IEC 61000-4-3:2006+A1:2007+A2:2010)  
 (Severity Level: 3 at 10V / m(80-1000MHz), Severity Level:2 at 3V / m(1.4GHz-2GHz),  
 Severity Level: 1 at 1V / m(2GHz-2.7GHz))

## 13.3. Severity Levels and Performance Criterion

### 13.3.1. Severity level

Level	Test Field Strength V/m
1.	1
2.	3
3.	10
X	Special

### 13.3.2. Performance criterion : A

### 13.4. Test Procedure

Testing was performed in a Fully anechoic chamber as recommended by IEC 61000-4-3. The EUT was placed on an 80 cm high non-conductive table located in the area of field uniformity. The radiating antenna was placed 3m in front of the EUT and Support system, and dwell time of the radiated interference was controlled by an automated, computer-controlled system. The signal source was stepped through the applicable frequency range at a rate no faster than 1% of the fundamental. The signal was amplitude modulated 80% over the frequency range 80 MHz to 1GHz at a level of 10 V/m, 1.4GHz to 2.0GHz at a level of 3 V/m, 2.0GHz to 2.7GHz at a level of 1V/m. Field presence was monitored during testing via a field probe placed in close proximity to the EUT. Throughout testing, the EUT was closely monitored for signs of susceptibility. The test was performed with the antennae oriented in both a horizontal and vertical polarization.

All the scanning conditions are as follows :

Condition of Test	Remarks
1. Test Fielded Strength	10V/m (Severity Level 3) 3 V/m (Severity Level 2) 1 V/m (Severity Level 1)
2. Radiated Signal	80% amplitude modulated with a 1kHz sine wave
3. Scanning Frequency	80 - 1000 MHz, 1.4-2.0GHz, 1.4GHz – 2.7GHz
4. Sweeping time of radiated	0.0015 decade/s
5. Dwell Time	1.5 Sec.

### 13.5. Test Results

13.5.1. Test Results: **PASS**

13.5.2. Test data on the following pages.

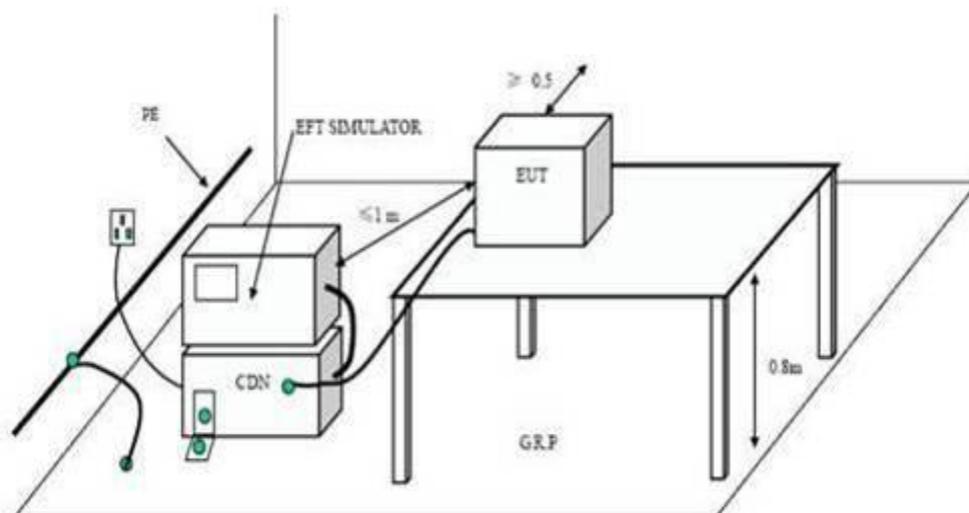






## 14.ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

### 14.1.Configuration of Test System



### 14.2.Test Standard

EN 61326-1:2013 (IEC 61000-4-4:2012)  
(Severity Level 3 at 2KV)

### 14.3.Severity Levels and Performance Criterion

#### 14.3.1.Severity level

Open Circuit Output Test Voltage $\pm 10\%$		
Level	On Power Supply Lines	On I/O (Input/Output) Signal data and control lines
1.	0.5 KV	0.25 KV
2.	1 KV	0.5 KV
3.	2 KV	1 KV
4.	4 KV	2 KV
X	Special	Special

#### 14.3.2.Performance criterion : **B**

## 14.4. Test Procedure

The EUT and its simulators were placed on a the ground reference plane and were insulated from it by an wood support  $0.1\text{m} \pm 0.01\text{m}$  thick. The ground reference plane was  $1\text{m} \times 1\text{m}$  metallic sheet with  $0.65\text{mm}$  minimum thickness. This reference ground plane was project beyond the EUT by at least  $0.1\text{m}$  on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane was more than  $0.5\text{m}$ . All cables to the EUT was placed on the wood support, cables not subject to EFT/B was routed as far as possible from the cable under test to minimize the coupling between the cables.

14.4.1. For input and AC power ports:

14.4.2. The EUT was connected to the power mains by using a coupling device which couples the EFT interference signal to AC power lines. Both positive transients and negative transients of test voltage was applied during compliance test and the duration of the test can't less than 2mins.

14.4.3. For signal lines and control lines ports:

14.4.4. It's unnecessary to test.

14.4.5. For DC input and DC output power ports:

14.4.6. It's unnecessary to test.

## 14.5. Test Results

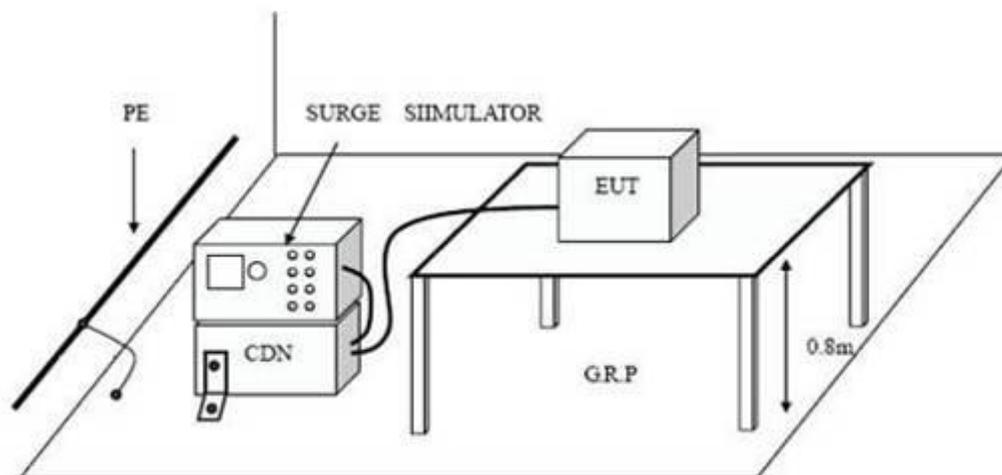
14.5.1. Test Results: **PASS**

14.5.2. Test data on the following pages.



# 15.SURGE TEST

## 15.1.Configuration of Test System



## 15.2.Test Standard

EN 61326-1:2013 (IEC 61000-4-5:2014+A1:2017)  
 (Severity Level : Line to Line was Level 1 at 0.5KV  
 Line to PE was Level 2 at 1KV )

## 15.3.Severity Levels and Performance Criterion

### 15.3.1.Severity level

Severity Level	Open-Circuit Test Voltage KV
1	0.5
2	1.0
3	2.0
4	4.0
*	Special

### 15.3.2.Performance criterion : **B**

## 15.4. Test Procedure

15.4.1. Set up the EUT and test generator as shown on Section 15.1.

15.4.2. For line to line coupling mode, provide a 0.5KV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points, and for active line / neutral line to ground are same except test level is 1KV.

15.4.3. At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are applied during test.

15.4.4. Different phase angles are done individually.

15.4.5. Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

## 15.5. Test Results

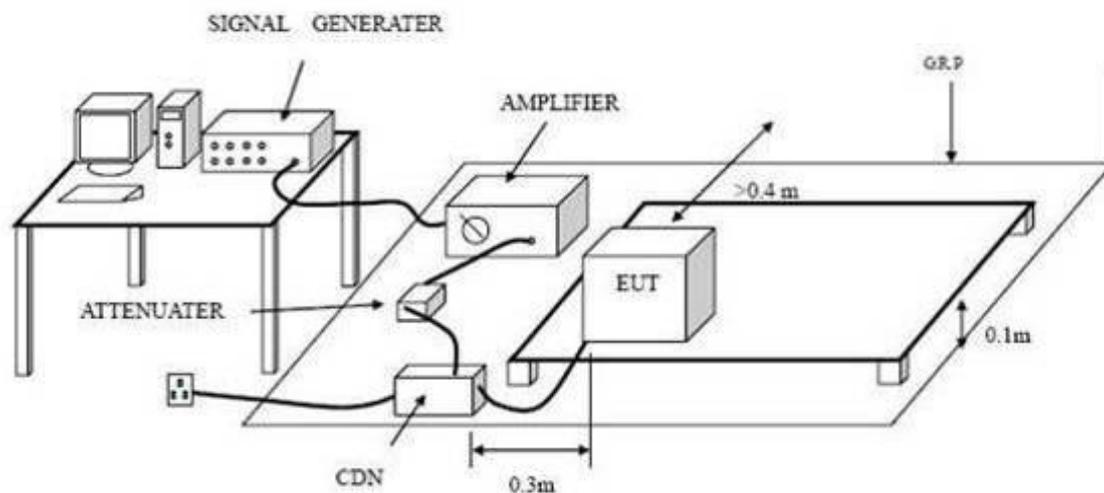
15.5.1. Test Results: **PASS**

15.5.2. Test data on the following pages.



## 16. INJECTED CURRENTS SUSCEPTIBILITY TEST

### 16.1. Configuration of Test System



### 16.2. Test Standard

EN 61326-1:2013 (IEC 61000-4-6:2013)  
 (Severity Level 2 at 3V (r.m.s.) and frequency is from 0.15MHz to 80MHz)

### 16.3. Severity Levels and Performance Criterion

#### 16.3.1. Severity level

Level	Voltage Level (e.m.f.) V
1.	1
2.	3
3.	10
X	Special

#### 16.3.2. Performance criterion: **A**

## 16.4. Test Procedure

- 16.4.1. Set up the EUT, CDN and test generators as shown on Section 16.1.
- 16.4.2. Let the EUT work in test mode and test it.
- 16.4.3. The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
- 16.4.4. The disturbance signal descriptions below is injected to EUT through CDN.
- 16.4.5. The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- 16.4.6. The frequency range is swept from 0.150MHz to 80MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1KHz sine wave.
- 16.4.7. The rate of sweep shall not exceed  $1.5 \cdot 10^{-3}$  decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.
- 16.4.8. Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

## 16.5. Test Results

- 16.5.1. Test Results: **PASS**
- 16.5.2. Test data on the following pages.

# Injected Currents Susceptibility Test Results

Shenzhen Most Technology Service Co., Ltd.

<i>Test Voltage</i> :	1	<i>Test Date</i> :	Dec.24, 2019
<i>Test Mode</i> :	1	<i>Criterion</i> :	A
<i>Temperature:</i>	24 °C	<i>Humidity:</i>	56 %

### Test Results Description

Frequency Range (MHz)	Injected Position	Voltage Level (e.m.f.)	Criterion	Result
0.15 ~ 80	AC Mains	3V(rms), Unmodulated	A	PASS

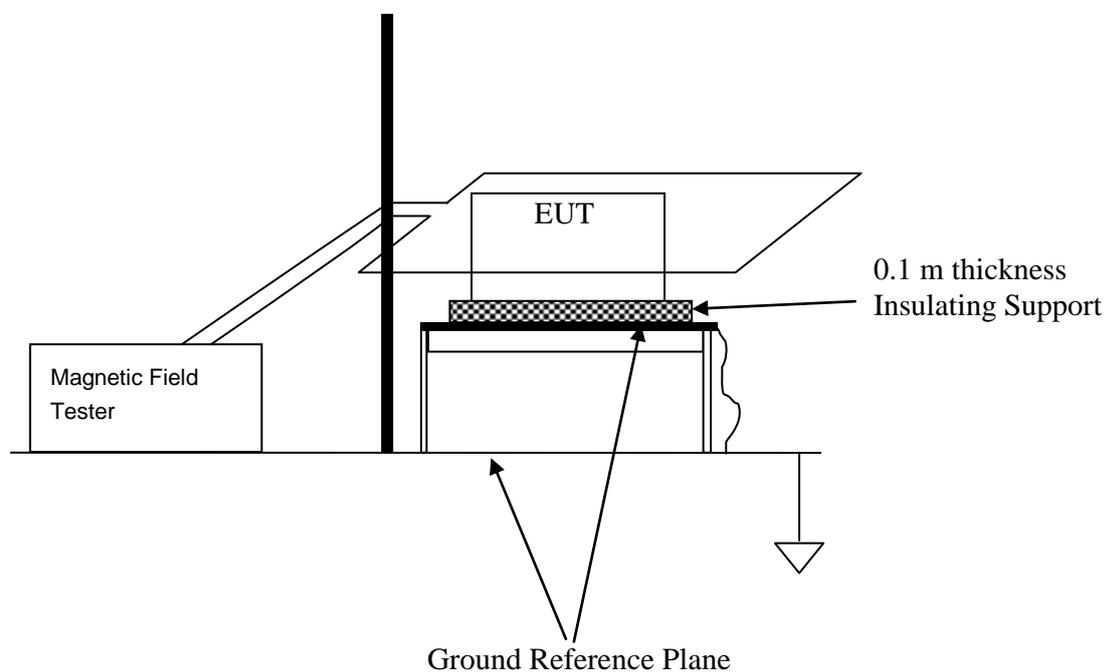
*Remark : No function loss*

Reviewer : \_\_\_\_\_



## 17.MAGNETIC FIELD IMMUNITY TEST

### 17.1.Configuration of Test System



### 17.2.Test Standard

EN 61326-1:2013 (IEC 61000-4-8:2009)  
(Severity Level 4 at 30A/m)

### 17.3.Severity Levels and Performance Criterion

#### 17.3.1.Severity level

Level	Magnetic Field Strength A/m
1.	1
2.	3
3.	10
4.	30
5.	100
X.	Special

#### 17.3.2.Performance criterion : **A**

#### 17.4. Test Procedure

The EUT was subjected to the test magnetic field by using the induction coil of standard dimensions (1m\*1m) and shown in Section 11.1. The induction coil was then rotated by 90° in order to expose the EUT to the test field with different orientations.

#### 17.5. Test Results

17.5.1. Test Results: **PASS**

17.5.2. Test data on the following pages.

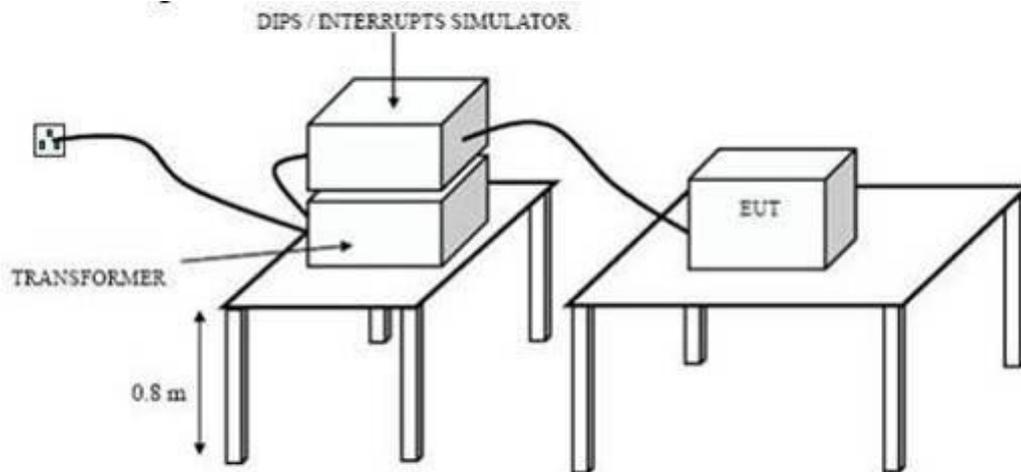
# Magnetic Field Immunity Test Results

Most Technology Service Co., Limited

<i>Test Voltage</i> :	1	<i>Test Date:</i>	Dec.24, 2019	
<i>Test Mode</i> :	1	<i>Criterion</i> :	A	
<i>Temperature:</i>	24 °C	<i>Humidity:</i>	56%	
<i>Test Results Description</i>				
<i>Test Level</i>	<i>Testing Duration</i>	<i>Coil Orientation</i>	<i>Criterion</i>	<i>Result</i>
30A/m (50Hz/60Hz)	5 mins	X	A	PASS
30A/m (50Hz/60Hz)	5 mins	Y	A	PASS
30A/m (50Hz/60Hz)	5 mins	Z	A	PASS
<i>Remark: No function loss</i>				

# 18. VOLTAGE DIPS AND INTERRUPTIONS TEST

## 18.1. Configuration of Test System



## 18.2. Test Standard

EN 61326-1:2013 (IEC 61000-4-11:2004+A1:2017)

## 18.3. Severity Levels and Performance Criterion

### 18.3.1. Severity level

Test Level $\%U_T$	Voltage dip and short interruptions $\%U_T$	Performance Criterion	Duration (in period)
0	100	C	250 at 50 Hz
			300 at 60 Hz
0	100	B	0.5 at 50Hz
			1 at 50Hz
70	30	C	25 at 50Hz
			30 at 60Hz

### 18.3.2. Performance criterion : **B & C**

## 18.4. Test Procedure

18.4.1. The EUT and test generator were setup as shown on Section 18.1.

18.4.2. The interruptions is introduced at selected phase angles with specified duration.

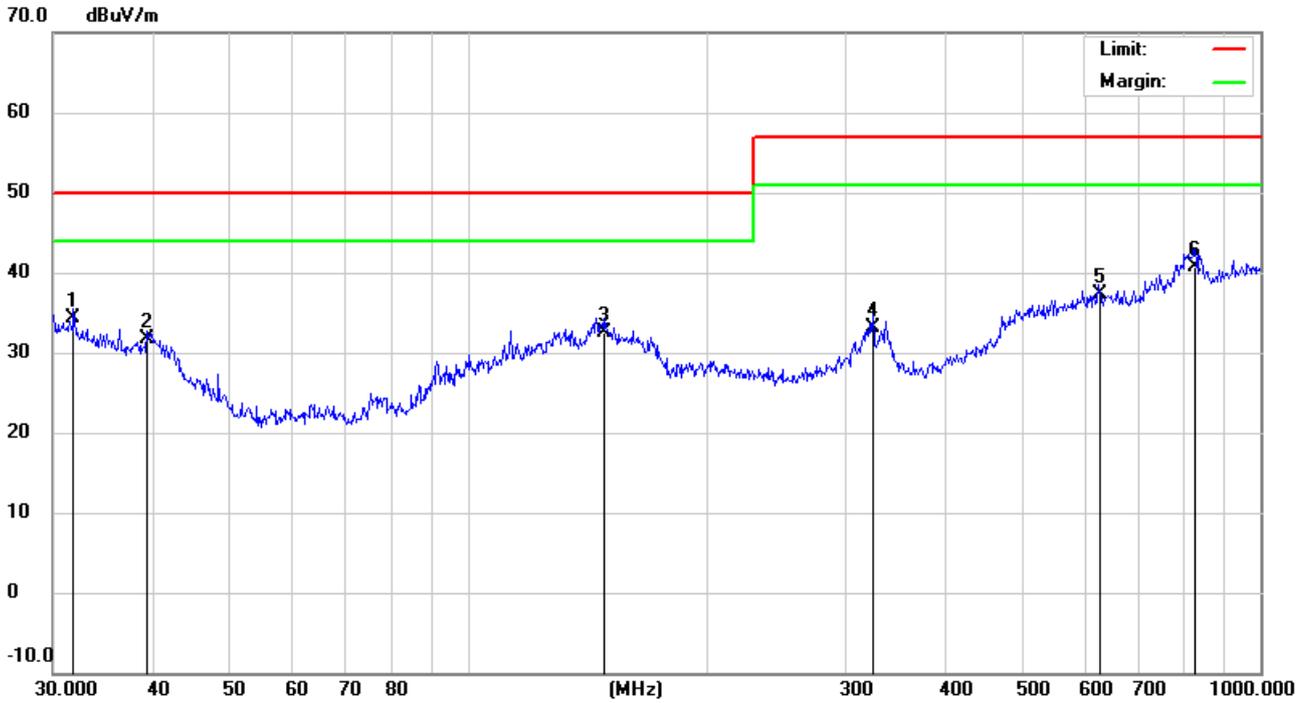
18.4.3. Record any degradation of performance.

## 18.5. Test Results

18.5.1. Test Results: N/A

# **APPENDIX I**

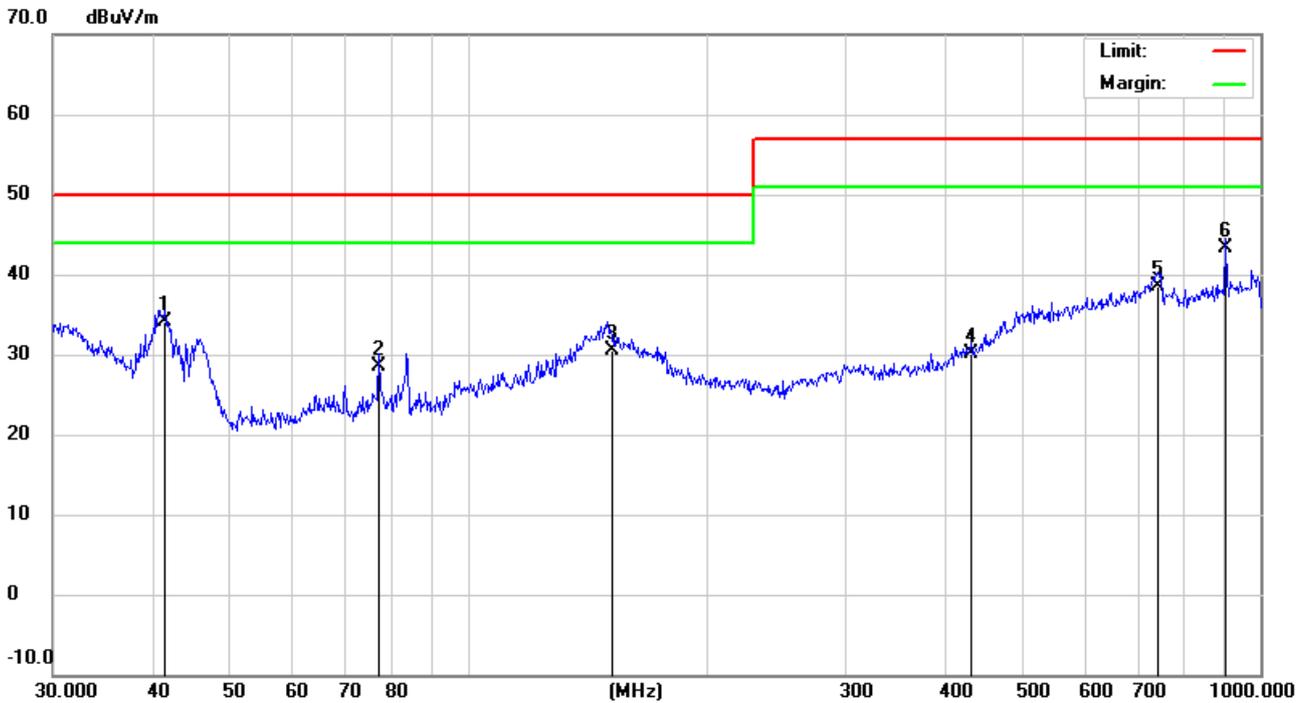
EUT:	Pressure Transmitters	M/N:	DG2
Mode:	Running	Polarization:	Horizontal
Tested by:	Leo	Power:	DC 24V by DC Source
Temperature: / Humidity	23.0°C/64.0%	Test date:	2019-12-24



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1	*	31.8427	14.60	19.65	34.25	50.00	-15.75	QP		
2		39.4371	17.40	14.22	31.62	50.00	-18.38	QP		
3		148.9624	15.01	17.56	32.57	50.00	-17.43	QP		
4		324.4560	17.10	15.96	33.06	57.00	-23.94	QP		
5		625.0780	13.20	24.13	37.33	57.00	-19.67	QP		
6		827.4934	12.50	28.20	40.70	57.00	-16.30	QP		

\*:Maximum data    x:Over limit    !:over margin

EUT:	Pressure Transmitters	M/N:	DG2
Mode:	Running	Polarization:	Vertical
Tested by:	Peter	Power:	DC 24V by DC Source
Temperature: / Humidity	25°C/51%	Test date:	2019-12-24



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		41.5670	21.40	12.77	34.17	50.00	-15.83			QP
2		77.3210	18.60	9.89	28.49	50.00	-21.51			QP
3		152.1297	12.80	17.61	30.41	50.00	-19.59			QP
4		432.5456	11.00	19.12	30.12	57.00	-26.88			QP
5		742.2587	12.30	26.28	38.58	57.00	-18.42			QP
6	*	903.3093	14.20	29.03	43.23	57.00	-13.77			QP

\*:Maximum data    x:Over limit    !:over margin

**APPENDIX II**  
(Photos of the EUT)

## Radiated Test Setup Photograph



**APPENDIX III**  
(Photos of the EUT)

**Figure 1**  
General Appearance of the EUT



**Figure 2**  
General Appearance of the EUT

