Draft ETSI EN 301 489-1 V2.2.0
Final draft ETSI EN 301 489-3 V2.1.1

EMISSION/IMMUNITY/HARMONICS/FLICKER
COMPLIANCE

Test Report

FOR

RFID Reader module

Model No.: CL7206A5

Trade Mark: Hopeland

Report No.: ES180728001W01

Issue Date: October 18, 2018

Prepared for

SHENZHEN HOPELAND TECHNOLOGIES CO., LTD.

17/F, Block A, Clou Bldg, Baoshen Road, Hitech Industrial Park North,
Nanshan District,518007, Shenzhen, China

Prepared by

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1 TEST RESULT CERTIFICATION

Applicant	:	SHENZHEN HOPELAND TECHNOLOGIES CO., LTD. 17/F, Block A, Clou Bldg, Baoshen Road, Hitech Industrial Park North, Nanshan District,518007, Shenzhen, China
Manufacture	:	SHENZHEN HOPELAND TECHNOLOGIES CO., LTD. 17/F, Block A, Clou Bldg, Baoshen Road, Hitech Industrial Park North, Nanshan District,518007, Shenzhen, China
EUT	:	RFID Reader module
Model	:	CL7206A5
Trademark	:	Hopeland

Measurement Procedure Used:

APPLICABLE STANDARDS	
STANDARD	**TEST RESULT**
Draft ETSI EN 301 489-1 V2.2.0: 2017	PASS
Final draft ETSI EN 301 489-3 V2.1.1: 2017	PASS

The device described above is tested by EMTEK (Shenzhen) 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 measurement results are contained in this test report and EMTEK (Shenzhen) Co., Ltd. is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the ETSI EN 301 489-1 V2.2.0: 2017 and ETSI EN 301 489-3 V2.1.1: 2017 requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of EMTEK (Shenzhen) Co., Ltd.

Date of Test : July 29, 2018 to October 18, 2018

Prepared by : Sevin Li/Editor

Reviewer : Joe Xia/Supervisor

Approve & Authorized Signer : Lisa Wang/Manager

Modified History

Rev.	Summary	Date of Rev.	Report No.
V1.0	Original Report	/	ES180728001W01

2 EUT DESCRIPTION

Equipment Style	Fixed Interrogators
Product Name	RFID Reader module
Model Number	CL7206A5
Power Supply	DC 24V from adapter
Adapter	Model: FSP060-DAAN2 Input: 100-240V~, 1.5A, 50-60Hz Output: DC 24V, 2.5 Max
Operating Frequency	865.7MHz – 867.5MHz
Modulation	ASK
Transmit Power Max	26.24dBm
Number of Channels:	4
Antenna Type :	Panel Antenna
Max Antenna Gain:	9 dBi
Temperature Range	-20°C ~ +70°C

Note: *for more details, please refer to the User's manual of the EUT.*

3 SUMMARY OF TEST RESULT

Applicable Standard: ETSI EN 301 489-1 V2.2.0: 2017			
Standard	**Description of Test Item**	**Result**	**Remarks**
EN 55032:2015	Conducted Emissions From The AC Mains Power Ports Emission Test 150 kHz – 30 MHz	PASS	
	Asymmetric Mode Conducted Emissions Emission Test 150 kHz – 30 MHz	PASS	
	Radiated Emissions 30 MHz – 1000 MHz @ 3 m 1000 MHz – 6000 MHz @ 3 m	PASS	
EN 61000-3-2:2014	Harmonic current emission test	N/A	
EN 61000-3-3:2013	Voltage fluctuations & flicker tests	PASS	
EN 61000-4-2:2009	Electrostatic Discharge ± 2, 4 kV Contact Discharge ± 2, 4, 8 kV Air Discharge Standard Criterion B	PASS	
EN 61000-4-3:2006 +A1:2008+A2:2010	Radio frequency electromagnetic field Frequency Range: 80 MHz to 6000 MHz and Electromagnetic field: 3 V/m (unmodulated, r.m.s) Amplitude modulated: 80 % AM (1 kHz) Standard Criterion A	PASS	
EN 61000-4-4:2012	Fast transients, common mode AC ports 5/50 ns, ± 1 kV, 5 kHz DC ports 5/50 ns, ± 0.5 kV I/O ports 5/50 ns, ± 0.5 kV, 5 kHz Standard Criterion B	PASS	
EN 61000-4-5:2006	Surge (Power port 1.2/50 µs, Signal port 10/700 µs / 1.2/50 µs) AC ports: line to line: ± 0.5 kV, 1 kV line to earth: ± 0.5 kV, 1 kV, 2 kV indoor signal ports and telecommunication ports: ± 0.5 kV outdoor signal ports and telecommunication ports for symmetrically operated: ± 1 kV non-symmetrically operated: ± 0.5 kV, 1 kV Standard Criterion B	PASS	
EN 61000-4-6:2009	Radio frequency, common mode Frequency Range：150 kHz to 80 MHz Electromagnetic field：3 V (unmodulated, r.m.s) Amplitude modulated：80 % AM (1 kHz) Standard Criterion A	PASS	
EN 61000-4-11:2004	Voltage dips and interruptions voltage dip 0% 10 ms (0.5 cycles) – Standard Criterion B voltage dip 0% 20 ms (1.0 cycles) – Standard Criterion B voltage dip 70% (at 50 Hz) 500 ms (25 cycles) – Standard Criterion C voltage interruption 0% (at 50 Hz) 5000 ms (250 cycles) – Standard Criterion C	PASS	
Note: N/A			

4 TEST METHODOLOGY

4.1 GENERAL DESCRIPTION OF APPLIED STANDARDS

According to its specifications, the EUT must comply with the requirements of the following standards:
ETSI EN 301 489-1: ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU and the essential requirements of article 6 of Directive 2014/30/EU
ETSI EN 301 489-3: ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 246 GHz; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU

4.2 MEASUREMENT EQUIPMENT USED

For Conducted Emission Measurement for AC(site 1)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Test Receiver	R & S	ESCI	26115-010-0027	May 19, 2018	1 Year
2	L.I.S.N.	R & S	ENV216	101161	May 19, 2018	1 Year
3	50Ω Coaxial Switch	Anritsu	MP59B	6100175589	May 20, 2018	1 Year
4	Voltage Probe	R & S	ESH2-Z3	100122	May 20, 2018	
5	ESG VERCTOR SIGNAL GENERATOR	Agilent	E4438C	MY45094099	May 19, 2018	1 Year

For 3m Radiated Emission Measurement (30M-1GHz) (3m chamber 3#)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	EMI Test Receiver	R & S	ESCI	101414	May 19, 2018	1 Year
2	Pre-Amplifier	LUNAR-EM	LNA30M3G-25	J10100000071	May 19, 2018	1 Year
3	Bilog Antenna	Schwarzbeck	VULB9163	660	May 20, 2018	1 Year
4	Cable	H+B	NmSm-05-C15052	/	May 20, 2018	1 Year
5	Cable	H+B	NmSm-2-C15201	/	May 20, 2018	1 Year
6	Cable	H+B	NmNm-7-C15702	/	May 20, 2018	1 Year
7	ESG VERCTOR SIGNAL GENERATOR	Agilent	E4438C	MY45094099	May 19, 2018	1 Year

For 3m Radiated Emission Measurement(1-18GHz)(3m chamber 3#)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	EMI Test Receiver	R & S	FSV40	132.1-3008K39-100967-AP	May 19, 2018	1 Year
2	Pre-Amplifier	Lunar EM	LNA1G18-48	J10111310100 01	May 19, 2018	1 Year
3	Horn Antenna	Schwarzbeck	BBHA 9120	1178	May 20, 2018	1 Year
4	Cable	H+B	SAC-40G-1	414	May 20, 2018	1 Year
5	Cable	H+B	SUCOFLEX104	MY14871/4	May 20, 2018	1 Year
6	Wideband Radio Communication Tester	R&S	CMW500	1201.0002K50-140822zk	May 20, 2018	1Year
7	Cable	H+B	BLU18A-NmSm-6500	D8501	May 20, 2018	1 Year
8	ESG VERCTOR SIGNAL	Agilent	E4438C	MY45094099	May 19, 2018	1 Year

	GENERATOR					

For Harmonic Current / Flicker Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	45KVA AC Power source	Teseq	NSG 1007-45/45KVA	1305A02873	May 19, 2018	1 Year
2	Signal conditioning Unit	Teseq	CCN 1000-3	1305A02873	May 19, 2018	1 Year
3	Three phase impedance network	Teseq/Germany	INA2197/37A	1305A02873	May 19, 2018	1 Year
4	Three phase impedance network	Teseq/Germany	INA 2196/75A	1305A02874	May 19, 2018	1 Year
5	Profline 2100 AC Switching Unit	Teseq/Germany	NSG2200-3	A22714	May 19, 2018	1 Year
6	ESG VERCTOR SIGNAL GENERATOR	Agilent	E4438C	MY45094099	May 19, 2018	1 Year

For Electrostatic Discharge Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	ESD Tester	TESEQ AG	NSG 438A	130	May 20, 2018	1 Year
2	Impulse Module	TESEQ AG	IN NSG 438A A 4380-150pF/330Ohm	403-550/1712	May 20, 2018	1 Year
3	Impulse Module	TESEQ AG	INA 4553-330pF/330Ohm	403-588/1912	May 20, 2018	1 Year
4	Impulse Module	TESEQ AG	INA 4381-150pF/2kOhm	403-564/1812	May 20, 2018	1 Year
5	Impulse Module	TESEQ AG	INA 4382-330pF/2kOhm	403-565/1912	May 20, 2018	1 Year
6	ESG VERCTOR SIGNAL GENERATOR	Agilent	E4438C	MY45094099	May 19, 2018	1 Year

For Radio-frequency, Electromagnetic Field Immunity

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Signal Generator	Agilent	N5181A	MY50145187	May 19, 2018	1 Year
2	Ear simulartor	Bruel Kjaer	BK-4182	SB3442/05	May 19, 2018	1 Year
3	Audio Analyzer	Rohde&Schwarz	UPL	SB3439	May 19, 2018	1 Year
4	Audio Analyzer	Rohde &Schwarz	UPL	102216	May 19, 2018	1 Year
5	Field probe	ETS	HI-6005	89587	May 19, 2018	1 Year
6	RF Power Meter. Dual Channel	BOONTON	4232A	10539	May 20, 2018	1 Year
7	50ohm Diode Power Sensor	BOONTON	51011EMC	34236/34238	May 20, 2018	1 Year
8	Field Strength Meter	DARE	RSS1006A	10I00037SO22	May 20, 2018	1 Year
9	50ohm Diode Power Sensor	BOONTON	51011EMC	36164	May 20, 2018	1 Year
10	Power Amplifier	MILMEGA	80RF1000-175	1059345	May 19, 2018	1 Year
11	Power Amplifier	MILMEGA	AS0102-55	1018770	May 19, 2018	1 Year
12	Power Amplifier	MILMEGA	AS1860-50	1059346	May 19, 2018	1 Year
13	Log.-Per. Antenna	Schwarzbeck	VULP 9118E	811	May 20, 2018	1 Year
14	Broad-Band Horn Antenna	Schwarzbeck	STLP 9149	9149-227	May 20, 2018	1 Year
15	Multi-function interface system	DARE	CTR1009B	12I00250SNO 72	N/A	N/A

16	Automatic switch group	DARE	RSW1004A	N/A	N/A	N/A
17	ESG VERCTOR SIGNAL GENERATOR	Agilent	E4438C	MY45094099	May 19, 2018	1 Year

For Electrical Fast Transient / Burst Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Burst Tester	HAEFELY	PEFT4010	080981-16	May 20, 2018	1Year
2	Coupling Clamp	HAEFELY	IP-4A	147147	May 20, 2018	1Year
3	Three phase CDN	Teseq	CDN 163	202	May 20, 2018	1 Year
4	ESG VERCTOR SIGNAL GENERATOR	Agilent	E4438C	MY45094099	May 19, 2018	1 Year

For Surge Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Surge Controller	HAEFELY	Psurge 8000	174031	May 20, 2018	1Year
2	Impulse Module	HAEFELY	PIM 100	174124	May 20, 2018	1Year
3	Coupling Decoupling Filter	HAEFELY	PCD 130	172181	May 20, 2018	1Year
4	Coupling Module	HAEFELY	PCD122	174354	May 20, 2018	1Year
5	Surge Impulse Module	HAEFELY	PIM 120	174435	May 20, 2018	1Year
6	Coupling Module	HAEFELY	PCD 126A	174387	May 20, 2018	1Year
7	Impulse Module	HAEFELY	PIM 110	174391	May 20, 2018	1Year
8	ESG VERCTOR SIGNAL GENERATOR	Agilent	E4438C	MY45094099	May 19, 2018	1 Year

For Immunity Test of Conducted Disturbance Induced by RF Field

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Signal Generator	Agilent	N5181A	MY50145187	May 19, 2018	1 Year
2	Ear simulartor	Bruel Kjaer	BK-4182	SB3442/05	May 19, 2018	1 Year
3	Audio Analyzer	Rohde&Schwarz	UPL	SB3439	May 19, 2018	1 Year
4	Field probe	ETS	HI-6005	89587	May 19, 2018	1 Year
5	Simulator	EMTEST	CWS500C	0900-12	May 20, 2018	1 Year
6	CDN	EMTEST	CDN-M2	5100100100	May 20, 2018	1 Year
7	CDN	EMTEST	CDN-M3	0900-11	May 20, 2018	1 Year
8	Injection Clamp	EMTEST	F-2031-23MM	368	May 20, 2018	1 Year
9	Attenuator	EMTEST	ATT6	0010222A	May 20, 2018	1 Year
10	ESG VERCTOR SIGNAL GENERATOR	Agilent	E4438C	MY45094099	May 19, 2018	1 Year

For Voltage Dips and Interruptions Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	45KVA AC Power source	Teseq	NSG 1007-45/45KVA	1305A02873	May 19, 2018	1 Year
2	Signal conditioning Unit	Teseq	CCN 1000-3	1305A02873	May 19, 2018	1 Year
3	Three phase impedance network	Teseq/Germany	INA2197/37A	1305A02873	May 19, 2018	1 Year
4	Three phase	Teseq/Germany	INA 2196/75A	1305A02874	May 19, 2018	1 Year

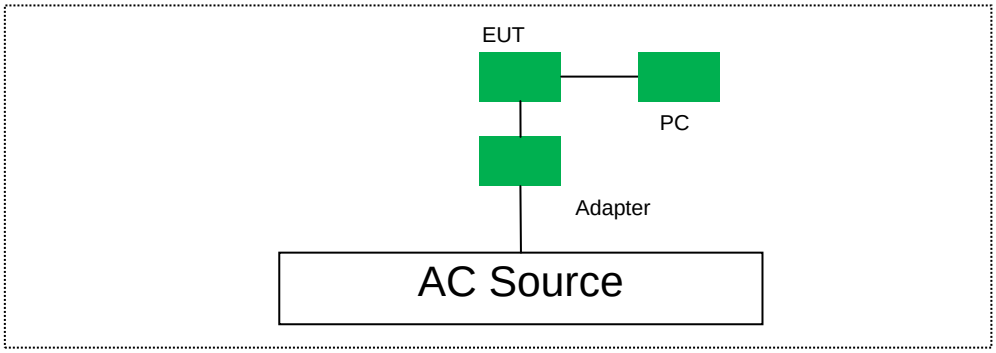
	impedance network					
5	Profline 2100 AC Switching Unit	Teseq/Germany	NSG2200-3	A22714	May 19, 2018	1 Year
6	ESG VERCTOR SIGNAL GENERATOR	Agilent	E4438C	MY45094099	May 19, 2018	1 Year

4.3 DESCRIPTION OF TEST MODES

Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Mode	Description
1	RFID Mode
2	Ping Mode
Test soft is 'DEMOV2.0.10' that is provided by the manufacturer	

4.4 BLOCK DIAGRAM CONFIGURATION OF TEST SYSTEM



4.5 SUPPORT EQUIPMENT

Item	Equipment	Mfr/Brand	Model/Type No.	Note
1	Notebook	HP	Compaq 6515b	/
				/

Notes:
1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

5 FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

Bldg 69, Majialong Industry Zone District, Nanshan District, Shenzhen, China
The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and CISPR Publication 22.

5.2 LABORATORY ACCREDITATIONS AND LISTINGS

Site Description		
EMC Lab.	:	Accredited by CNAS, 2016.10.24 The certificate is valid until 2022.10.28 The Laboratory has been assessed and proved to be in compliance with CNAS-CL01: 2006(identical to ISO/IEC17025: 2005) The Certificate Registration Number is L2291
	:	Accredited by TUV Rheinland Shenzhen, 2016.05.19 The Laboratory has been assessed according to the requirements ISO/IEC 17025.
	:	Accredited by FCC, August 06, 2018 The certificate is valid until August 07, 2020 Designation Number: CN1204 Test Firm Registration Number: 882943
	:	Accredited by Industry Canada, November 24, 2015 The Certificate Registration Number is 4480A

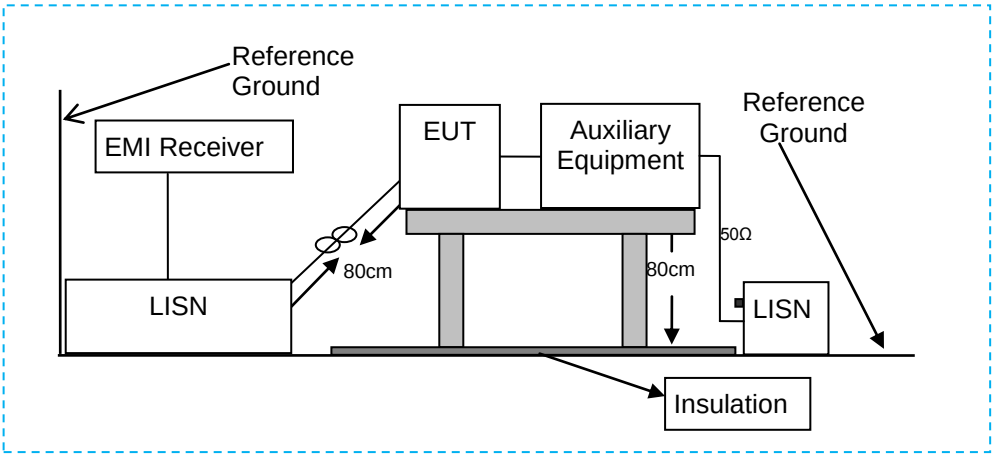
6 TEST SYSTEM UNCERTAINTY

Maximum measurement uncertainty of the test system

Test Item	Measurement Uncertainty
Conducted Emissions	2.96dB(9k~150kHz Conduction 1#) 2.74dB(150k-30MHz Conduction 1#)
Radiated Emission(3m Chamber)	3.78dB (30M~1GHz Polarize: H) 4.27dB (30M~1GHz Polarize: V) 3.7dB (1~18GHz Polarize: H) 3.6dB (1~18GHz Polarize: V)
Voltage fluctuations & flicker tests	0.07%
Harmonic current emission test	1.8%
Electrostatic Discharge	6 %
Radio frequency, common mode	1.45(Using CDN Test) 2.37(Using EM Clamp Test)
Radio frequency electromagnetic field	2.10dB(80MHz-1000MHz) 1.76dB(1000MHz-6000MHz)
Uncertainty for test site temperature and humidity	0.6℃ 4%

7 CONDUCTED EMISSIONS FROM THE AC MAINS POWER PORTS

7.1 BLOCK DIAGRAM OF TEST SETUP



7.2 MEASURING STANDARD

ETSI EN 301 489-1 Clause 8.4
EN 55032: 2015 Clause A.3

7.3 CONDUCTED EMISSION LIMITS (CLASS B)

Power Line Conducted Emission Limits

Applicable to 1. AC mains power ports				
Table clause	Frequency range MHz	Coupling device	Detector type / bandwidth	Class B limits dB(μV)
A10.1	0,15 to 0,5	AMN	Quasi Peak / 9 kHz	66 to 56
	0,5 to 5			56
	5 to 30			60
A10.2	0,15 to 0,5	AMN	Average / 9 kHz	56 to 46
	0,5 to 5			46
	5 to 30			50
Apply A10.1 and A10.2 across the entire frequency range.				

7.4 EUT CONFIGURATION ON MEASUREMENT

The following equipments are installed on Conducted Emission Measurement to meet EN 55032 requirements and operating in a manner which tends to maximize its emission characteristics in a normal application.

7.5 OPERATING CONDITION OF EUT

Operating Condition of EUT are listed in section 4.4.

7.6 TEST PROCEDURE

The EUT is put on the plane 0.8m high above the ground by insulating support and connected to the AC mains through Line Impedance Stability Network (L.I.S.N). This provided a 50ohm coupling impedance for the tested equipments. Both sides of AC line are investigated to find out the maximum conducted emission according to the EN55032 regulations during conducted emission measurement.
The bandwidth of the Receiver (ESCI) is set at 9kHz in 150kHz~30MHz and 200Hz in

9kHz~150kHz.
The frequency range from 150kHz to 30MHz is investigated.
The results were obtained from the following equation

Result dB(uV):

Measurement Level dB(uV)= LISN factor(dB) +Cable Loss(dB) +Reading LeveldB(uV)
Note: LISN factor(dB) and Cable Loss(dB) are included Reading dB(uV) in test software.

Over(dB)= Emission Level dB(uV)- Limit dB(uV)

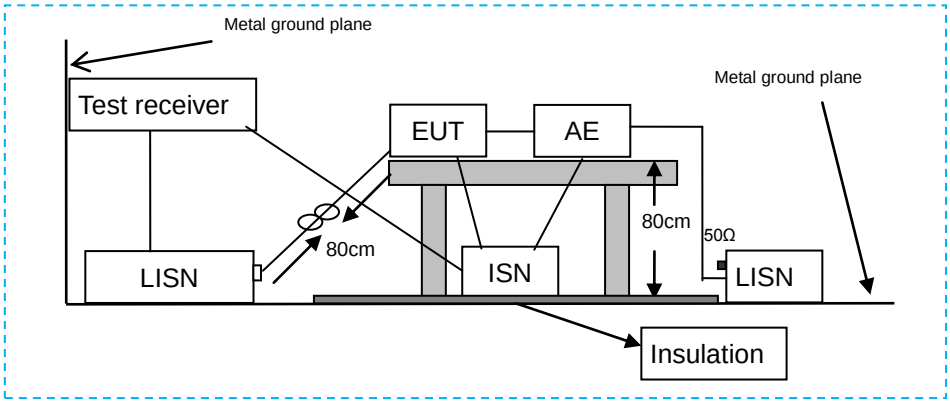
7.7 MEASURING RESULTS

PASS.

All of the Configurations were tested, the data of the worst case are recorded in the appendix A.

8 ASYMMETRIC MODE CONDUCTED EMISSIONS

8.1 BLOCK DIAGRAM OF TEST SETUP



8.2 MEASURING STANDARD

ETSI EN 301 489-1 Clause 8.7
EN 55032: 2015 Clause A.3

8.3 CONDUCTED EMISSION LIMITS

Applicable to
1. Wired Network Ports
2. Optical Fibre Ports With Metallic Shield or Tension Members
3. Broadcast Receiver Tuner Ports
4. Antenna Ports

Table clause	Frequency range MHz	Coupling device (see Table A.8)	Detector type / bandwidth	Class B voltage limits dB(μV)	Class B current limits dB(μA)
A12.1	0,15 to 0,5	AAN	Quasi Peak / 9 kHz	84 to 74	n/a
	0,5 to 30			74	
	0,15 to 0,5	AAN	Average / 9 kHz	74 to 64	
	0,5 to 30			64	
A12.2	0,15 to 0,5	CVP and current probe	Quasi Peak / 9 kHz	84 to 74	40 to 30
	0,5 to 30			74	30
	0,15 to 0,5	CVP and current probe	Average / 9 kHz	74 to 64	30 to 20
	0,5 to 30			64	20
A12.3	0,15 to 0,5	Current Probe	Quasi Peak / 9 kHz	n/a	40 to 30
	0,5 to 30				30
	0,15 to 0,5	Current Probe	Average / 9 kHz		30 to 20
	0,5 to 30				20

The choice of coupling device and measurement procedure is defined in Annex C.
Screened ports including TV broadcast receiver tuner ports are measured with a common-mode impedance of 150 Ω. This is typically accomplished with the screen terminated by 150 Ω to earth.
AC mains ports that also have the function of a wired network port shall meet the limits given in Table A.10.
The measurement shall cover the entire frequency range.
The application of the voltage and/or current limits is dependent on the measurement procedure used. Refer to Table C.1 for applicability.
Measurement is required at only one EUT supply voltage and frequency.
Applicable to ports listed above and intended to connect to cables longer than 3 m.

8.4 EUT CONFIGURATION ON MEASUREMENT

The following equipments are installed on Conducted Emission Measurement to meet EN 55032 requirements and operating in a manner which tends to maximize its emission characteristics in a normal application.

8.5 OPERATING CONDITION OF EUT

Operating Condition of EUT are listed in section 4.4.

8.6 TEST PROCEDURE

The EUT is put on the plane 0.8m high above the ground by insulating support and connected to the AC mains through Line Impedance Stability Network (L.I.S.N) or connected to the telecommunication port through an impedance stabilization network (ISN). L.I.S.N provided a 50ohm coupling impedance for the tested equipments AC mains port, I.S.N provided a common mode (asymmetric mode) impedance of 150 Ω to the telecommunication port under test. Both sides of AC line and telecommunication line are investigated to find out the maximum conducted emission according to the EN 55032 regulations during conducted emission measurement.
The bandwidth of the Receiver (R&S ESCS30) is set at 9kHz in 150kHz~30MHz and 200Hz in 9kHz~150kHz.

The frequency range from 150kHz to 30MHz is investigated.

Result dB(uV):

Measurement Level dB(uV)= ISN factor(dB) +Cable Loss(dB) +Reading Level dB(uV)
Note: ISN factor(dB) and Cable Loss(dB) are included Reading dB(uV) in test software.

Over(dB)= Emission Level dB(uV)- Limit dB(uV)

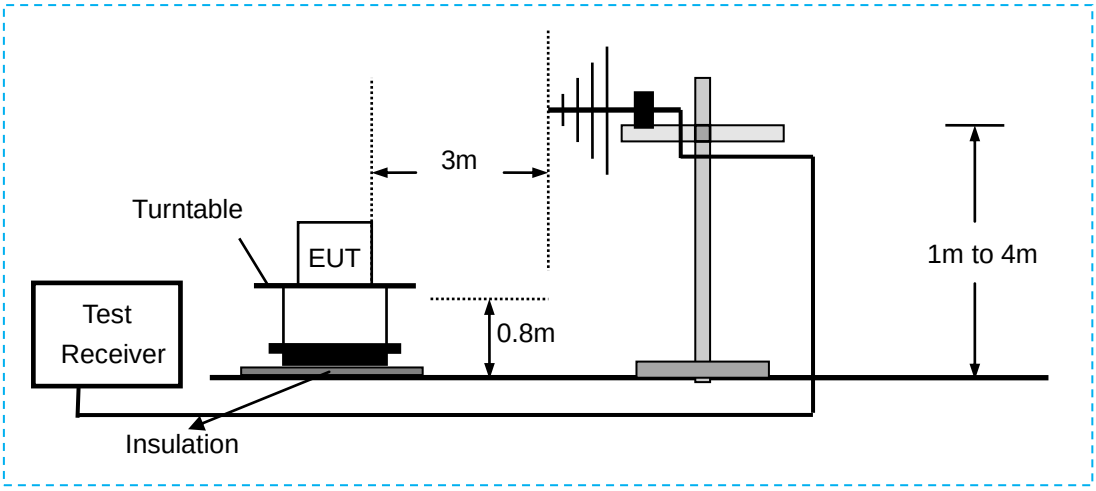
8.7 MEASURING RESULTS

PASS.
The data of the worst case are recorded in the appendix A.

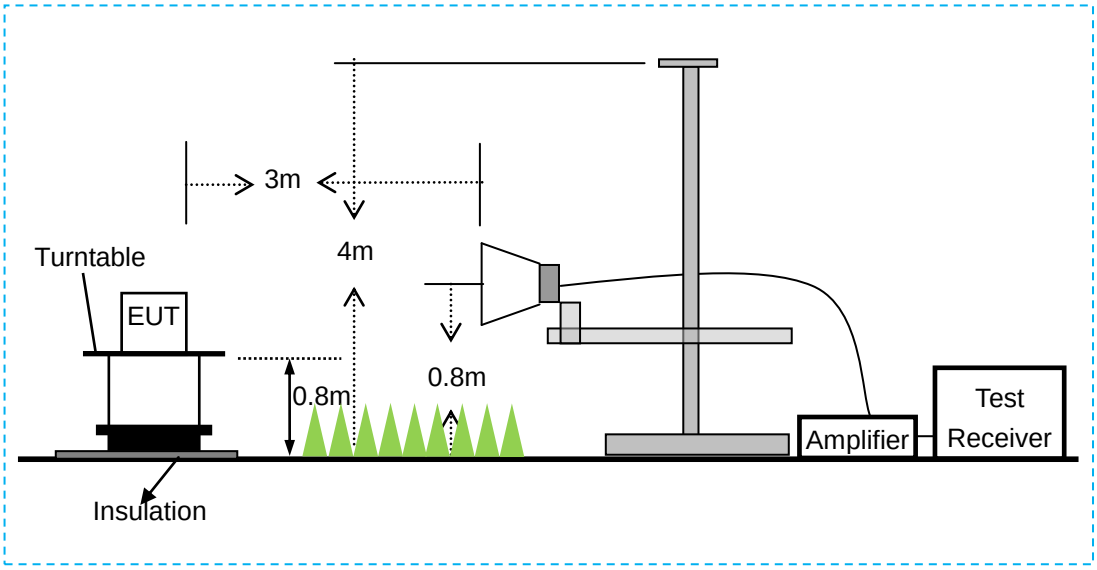
9 RADIATED EMISSIONS

9.1 BLOCK DIAGRAM OF TEST SETUP

Below 1GHz



Above 1GHz



9.2 MEASURING STANDARD

ETSI EN 301 489-1 Clause 8.2
EN 55032: 2015 Clause A.2

9.3 RADIATED EMISSION LIMITS (CLASS B)

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

Table clause	Frequency range MHz	Measurement			Class B limits dB(mV/m)
		Facility (see Table A.1)	Distance m	Detector type /bandwidth	
A4.1	30 to 230	OATS/SAC	10	Quasi Peak / 120 kHz	30
	230 to 1 000				37
A4.2	30 to 230	OATS/SAC	3		40
	230 to 1 000				47
A4.3	30 to 230	FAR	10	Quasi Peak / 120 kHz	32 to 25
	230 to 1 000				32
A4.4	30 to 230	FAR	3		42 to 35
	230 to 1 000				42
Apply only table clause A4.1 or A4.2 or A4.3 or A4.4 across the entire frequency range. These requirements are not applicable to the local oscillator and harmonics frequencies of equipment covered by Table A.6.					

Table clause	Frequency range MHz	Measurement			Class B limits dB(mV/m)
		Facility (see Table A.1)	Distance m	Detector type/ bandwidth	
A5.1	1 000 to 3 000	FSOATS	3	Average/ 1 MHz	50
	3 000 to 6 000				54
A5.2	1 000 to 3 000			Peak/ 1 MHz	70
	3 000 to 6 000				74
Apply A5.1 and A5.2 across the frequency range from 1 000 MHz to the highest required frequency of measurement derived from Table 1.					

9.4 EUT CONFIGURATION ON MEASUREMENT

The EN 55032 regulations test method must be used to find the maximum emission during radiated emission measurement.

9.5 OPERATING CONDITION OF EUT

Operating Condition of EUT is listed in section 4.4.

9.6 TEST PROCEDURE

The EUT is placed on a turntable which is 0.8 meter high above the ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 and 10 meters away from the receiving antenna that is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Bilog antenna (calibrated by Dipole Antenna) and horn antenna are used as a receiving antenna. Both horizontal and vertical polarization of the antenna is set on test.

ResultdB(uV/m):

Measurement Level dB(uV/m)= Antenna factor(dB) –Amp Factor +Cable Loss(dB) +Reading Level dB(uV)

Note: Antenna factor(dB) and Cable Loss(dB) are included Correct factor(dB) in test software.

Margin QP(db)=Reading Level dB(uV/m)- Limit dB(uV/m) for 30~1GHz
Over(dB)= Emission Level dB(uV/m)- Limit dB(uV/m) for above 1GHz

The bandwidth of the Receiver is set at 120 kHz (For 30MHz to 1000MHz).
The resolution bandwidth of the receiver RS ESU26 was set at 1MHz ((For above 1GHz.).
The frequency range for 1GHz to 6GHz was checked with peak and average detector, measurement distance is 3m in 3m Anechoic chamber.

The frequency range for 30MHz to 1GHz was checked with Quasi-peak detector, measurement distance is 3m in 3m semi-chamber.

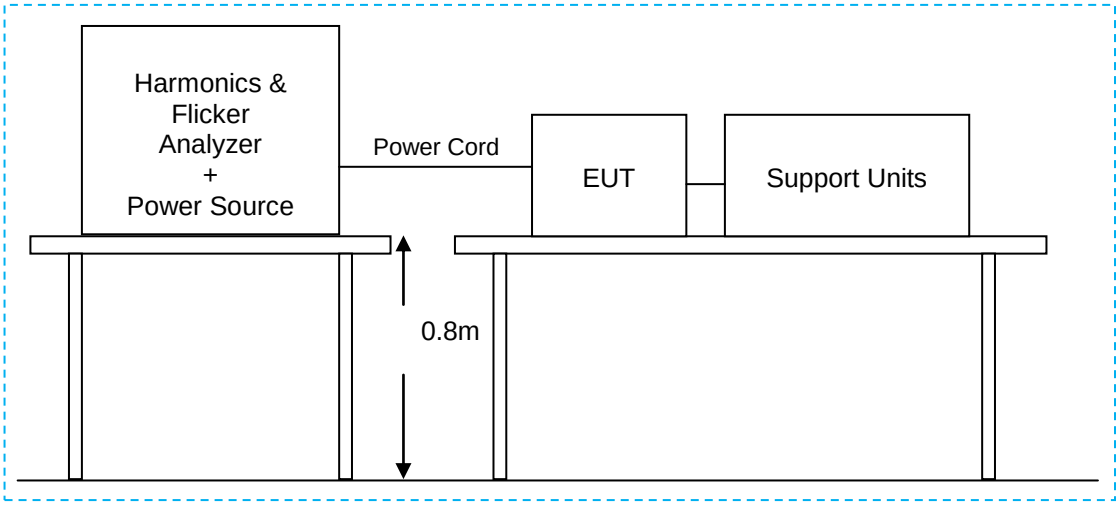
9.7 MEASURING RESULTS

PASS.

All of the Configurations were tested, the data of the worst case are recorded in the appendix A.

10 HARMONIC CURRENT EMISSION TEST

10.1 BLOCK DIAGRAM OF TEST SETUP



10.2 MEASURING STANDARD

ETSI EN 301 489-1 Clause 8.5
EN 61000-3-2

10.3 OPERATION CONDITION OF EUT

Operating Condition of EUT are listed in section 4.4.

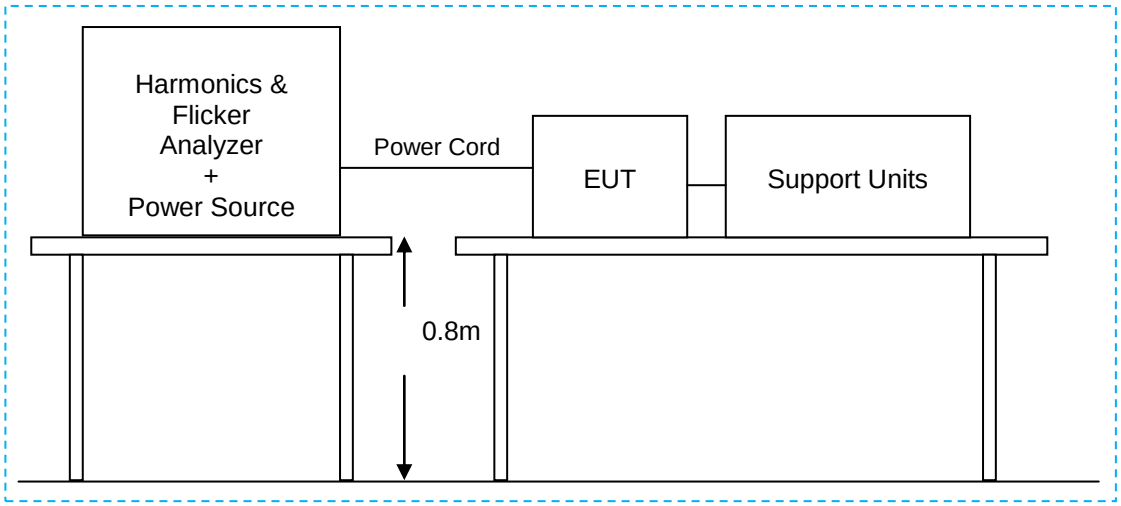
10.4 MEASURING RESULTS

N/A

Note: According to clause 7 of EN 61000-3-2, equipment with a rated power of 75W or less, no limits apply.

11 VOLTAGE FLUCTUATION AND FLICKER TESTS

11.1 BLOCK DIAGRAM OF TEST SETUP



11.2 MEASURING STANDARD

ETSI EN 301 489-1 Clause 8.6
EN 61000-3-3

11.3 OPERATION CONDITION OF EUT

Operating Condition of EUT are listed in section 4.4.

11.4 MEASURING RESULTS

PASS.

All of the Configurations were tested, the data of the worst case are recorded in the appendix A.

12 PERFORMANCE CRITERIA

12.1 GENERAL PERFORMANCE CRITERIA

The performance criteria are:
• performance criteria A for immunity tests with phenomena of a continuous nature;
• performance criteria B for immunity tests with phenomena of a transient nature;
• performance criteria C for immunity tests with power interruptions exceeding a certain time.

The equipment shall meet the minimum performance criteria as specified in the following clauses.

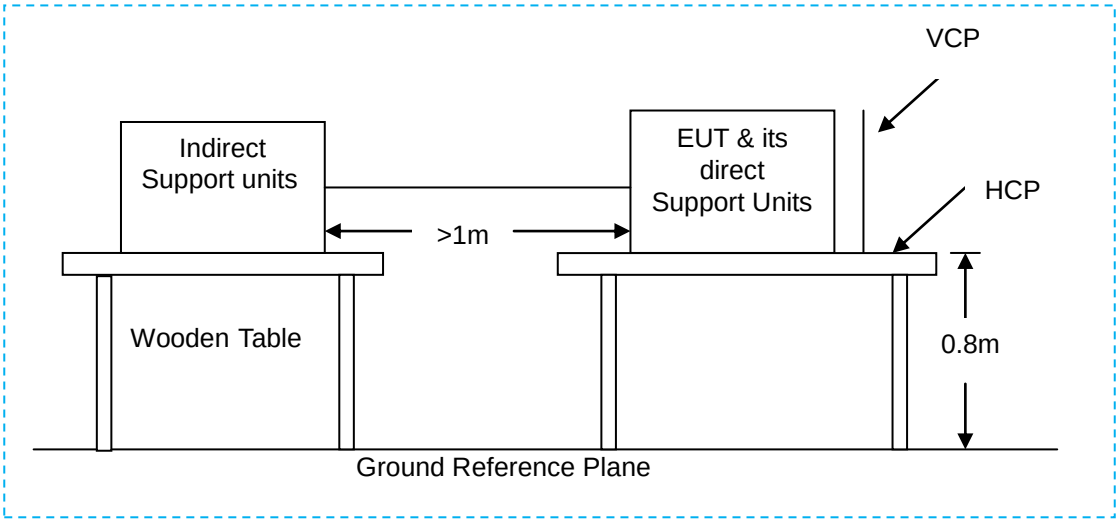
12.2 PERFORMANCE TABLE

ETSI 301 489-3 Performance criteria;

Criteria	During test	After test
A	Operate as intended No loss of function No unintentional responses	Operate as intended No loss of function No degradation of performance No loss of stored data or user programmable functions
B	May show loss of function No unintentional responses	Operate as intended Lost function(s) shall be self-recoverable No degradation of performance No loss of stored data or user programmable functions
Where "operate as intended" or "no loss of function" is specified, the EUT shall demonstrate correct functioning as described in clause 5. Where the EUT has more than one mode of operation (see clause 4.5.2), an unplanned transition from one mode to another is considered as an unintentional response. The EUT shall be tested in sufficient modes to confirm there are no such unintentional responses.		

13 ELECTROSTATIC DISCHARGE

13.1 BLOCK DIAGRAM OF TEST SETUP



13.2 TEST STANDARD

According to ETSI EN 301 489-1 Clause 9.3 and EN 61000-4-2

13.3 SEVERITY LEVELS AND PERFORMANCE CRITERION

13.3.1 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

13.3.2 PERFORMANCE CRITERION

☐ CT	☒ TT	☐ CR	☒ TR

13.4 OPERATING CONDITION OF EUT

Operating Condition of EUT are listed in section 4.4.

13.5 TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.3.2 and EN 61000-4-2 for the measurement methods.

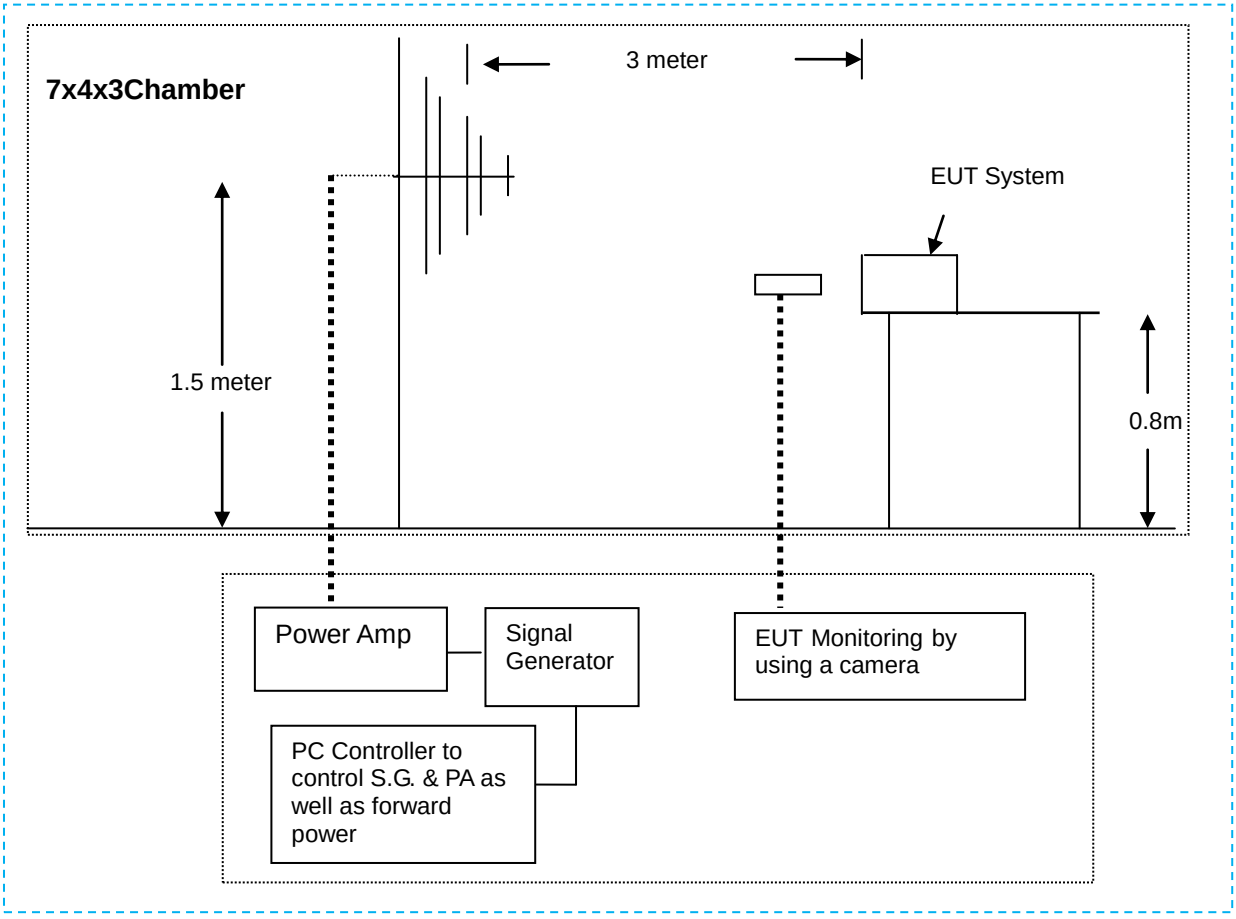
13.6TEST RESULTS

PASS.

All of the Configurations were tested, the data of the worst case are recorded in the appendix A.

14 RADIO FREQUENCY ELECTROMAGNETIC FIELD

14.1BLOCK DIAGRAM OF TEST SETUP



14.2TEST STANDARD

According to ETSI EN 301 489-1 Clause 9.2 and EN 61000-4-3

14.3SEVERITY LEVELS AND PERFORMANCE CRITERION

14.3.1 SEVERITY LEVELS

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

14.3.2 PERFORMANCE CRITERION

☒ CT	☐ TT	☒ CR	☐ TR

14.4 OPERATING CONDITION OF EUT

Operating Condition of EUT are listed in section 4.4.

14.5 TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.2.2 and EN 61000-4-3 for the measurement methods.

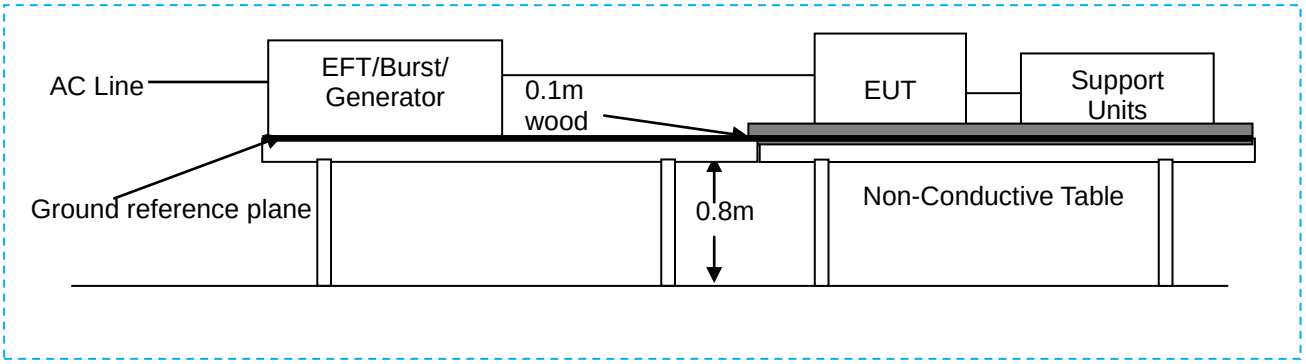
14.6 TEST RESULTS

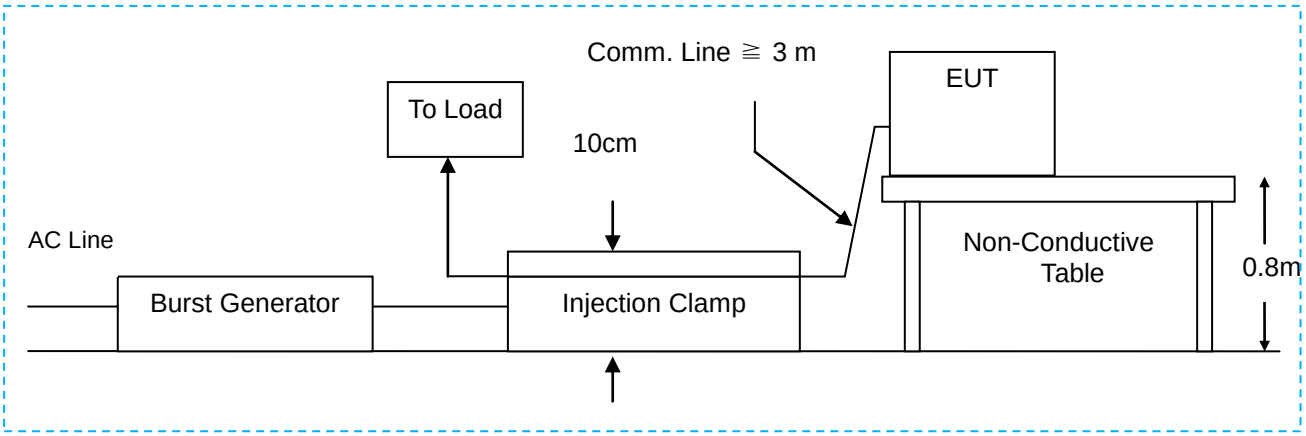
PASS.

All of the Configurations were tested,
the data of the worst case are recorded in the appendix A.

15 FAST TRANSIENTS, COMMON MODE

15.1 BLOCK DIAGRAM OF TEST SETUP





15.2 TEST STANDARD

According to ETSI EN 301 489-1 Clause 9.4 and EN 61000-4-4

15.3 SEVERITY LEVELS AND PERFORMANCE CRITERION

15.3.1 SEVERITY LEVEL

Open Circuit Output Test Voltage ±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

15.3.2 Performance criterion

☐ CT	☒ TT	☐ CR	☒ TR

15.4 OPERATING CONDITION OF EUT

Operating Condition of EUT are listed in section 4.4.

15.5 TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.4.2 and EN 61000-4-4 for the measurement methods.

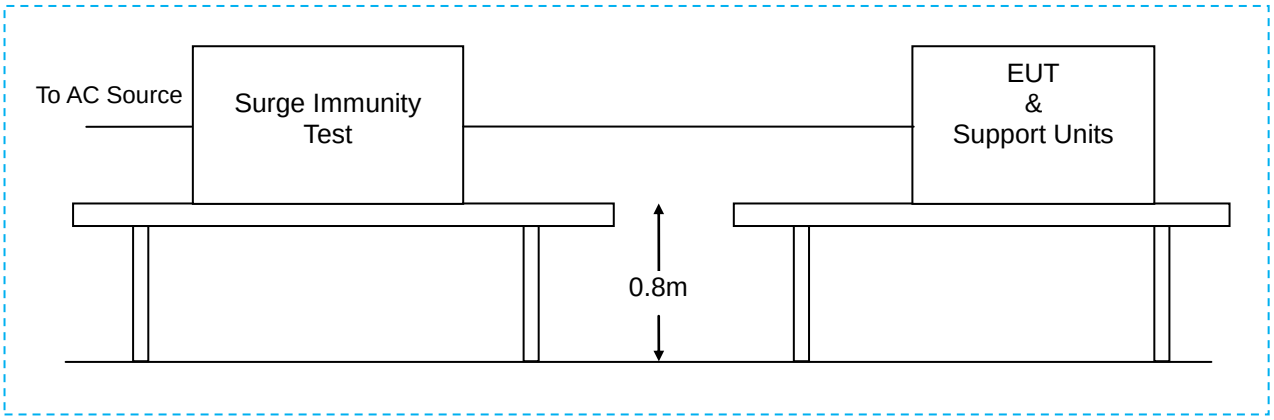
15.6 TEST RESULTS

PASS.

All of the Configurations were tested,
the data of the worst case are recorded in the appendix A.

16 SURGE

16.1 BLOCK DIAGRAM OF TEST SETUP



16.2 TEST STANDARD

According to ETSI EN 301 489-1 Clause 9.8 and EN 61000-4-5

16.3 SEVERITY LEVELS AND PERFORMANCE CRITERION

16.3.1 SEVERITY LEVEL

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

16.3.2 PERFORMANCE CRITERION

☐ CT	☒ TT	☐ CR	☒ TR

16.4 OPERATING CONDITION OF EUT

Operating Condition of EUT are listed in section 4.4.

16.5 TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.8.2 and EN 61000-4-5 for the measurement methods.

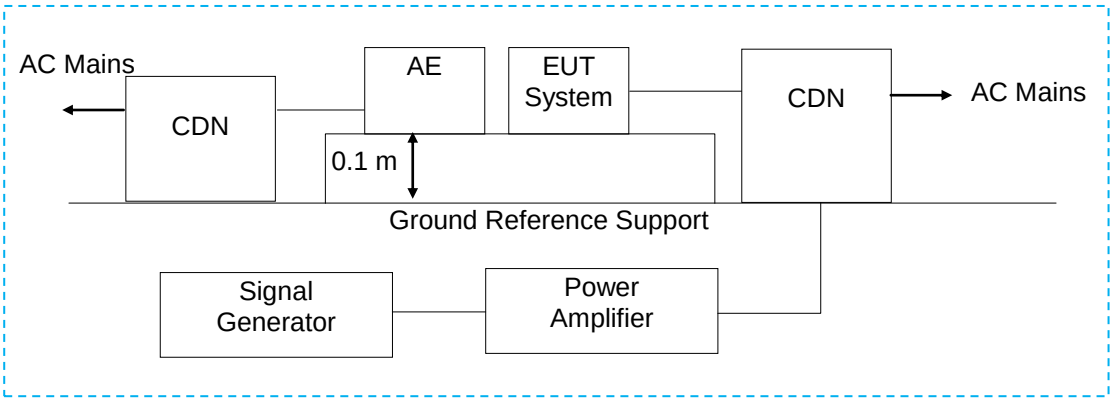
16.6 TEST RESULTS

PASS.

All of the Configurations were tested,
the data of the worst case are recorded in the appendix A.

17 RADIO FREQUENCY, COMMON MODE

17.1 BLOCK DIAGRAM OF TEST SETUP



17.2 TEST STANDARD

According to ETSI EN 301 489-1 Clause 9.5 and EN 61000-4-6

17.3 SEVERITY LEVELS AND PERFORMANCE CRITERION

17.3.1 Severity level

Level	Field Strength V
1	1
2	3
3	10
X	Special

17.3.2 Performance criterion

☒ CT	☐ TT	☒ CR	☐ TR

17.4 OPERATING CONDITION OF EUT

Operating Condition of EUT are listed in section 4.4.

17.5 TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.5.2 and EN 61000-4-6 for the measurement methods.

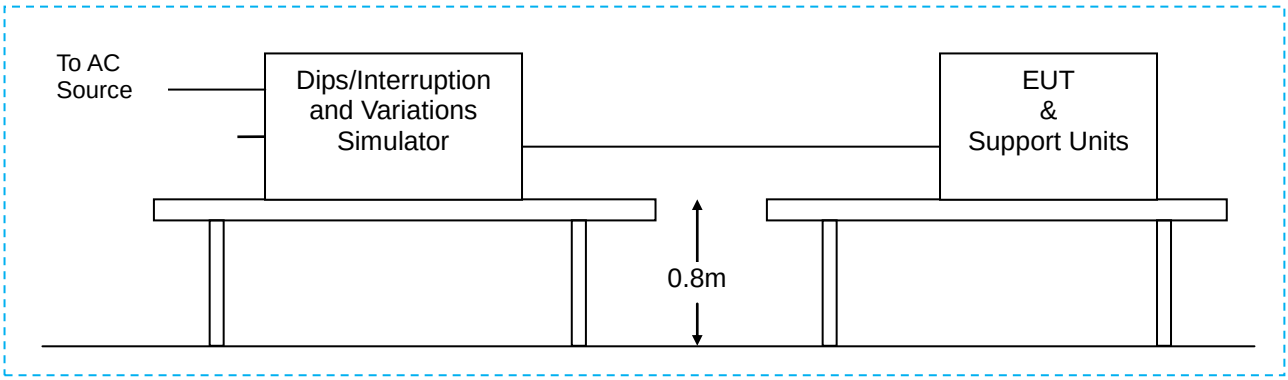
17.6 TEST RESULTS

PASS.

All of the Configurations were tested,
the data of the worst case are recorded in the appendix A.

18 VOLTAGE DIPS AND INTERRUPTIONS

18.1 BLOCK DIAGRAM OF TEST SETUP



18.2 TEST STANDARD

According to ETSI EN 301 489-1 Clause 9.7 and EN 61000-4-11

18.3 SEVERITY LEVELS AND PERFORMANCE CRITERION

18.3.1 SEVERITY LEVEL

Test Level %UT	Voltage dip and short interruptions %UT	Duration (in period)	Performance criterion
0	100	0.5	B
0	100	1	B
70	30	25	C
0	100	250	C

18.3.2 Performance criterion

☐ CT	☒ TT	☐ CR	☒ TR

18.4 OPERATING CONDITION OF EUT

Operating Condition of EUT are listed in section 4.4.

18.5 TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.7.2 and EN 61000-4-11 for the measurement methods.

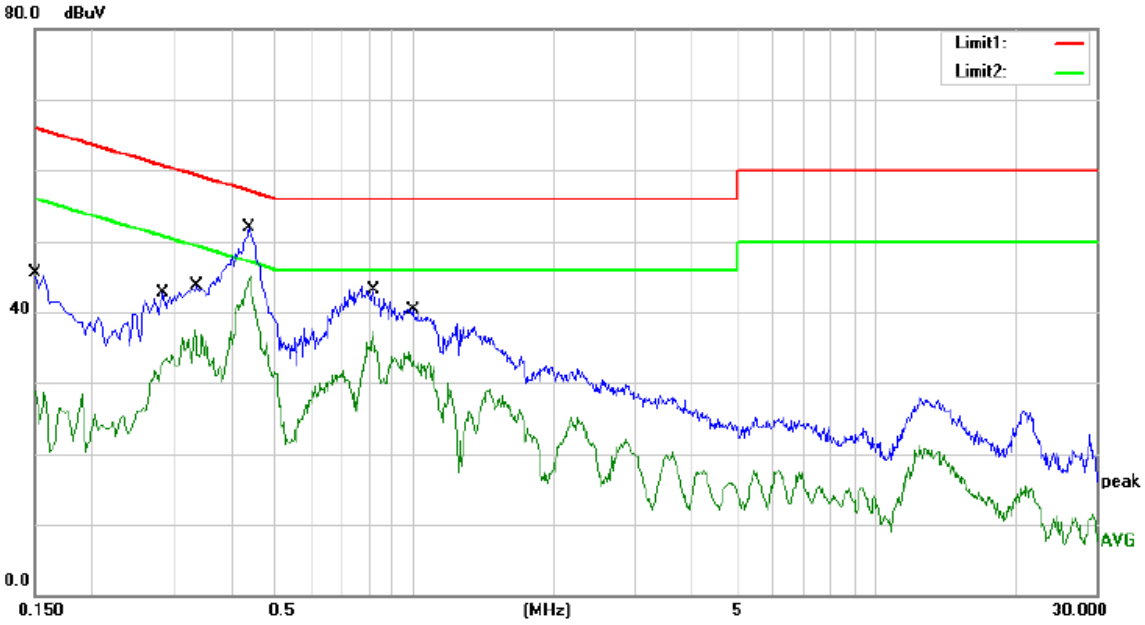
18.6 TEST RESULTS

PASS.

All of the Configurations were tested,
the data of the worst case are recorded in the appendix A.

19 APPENDIX A TEST DATA

19.1DATA FOR CONDUCTED EMISSIONS FROM THE AC MAINS POWER PORTS



Site Conduction #2 Phase: L1 Temperature: 24.9

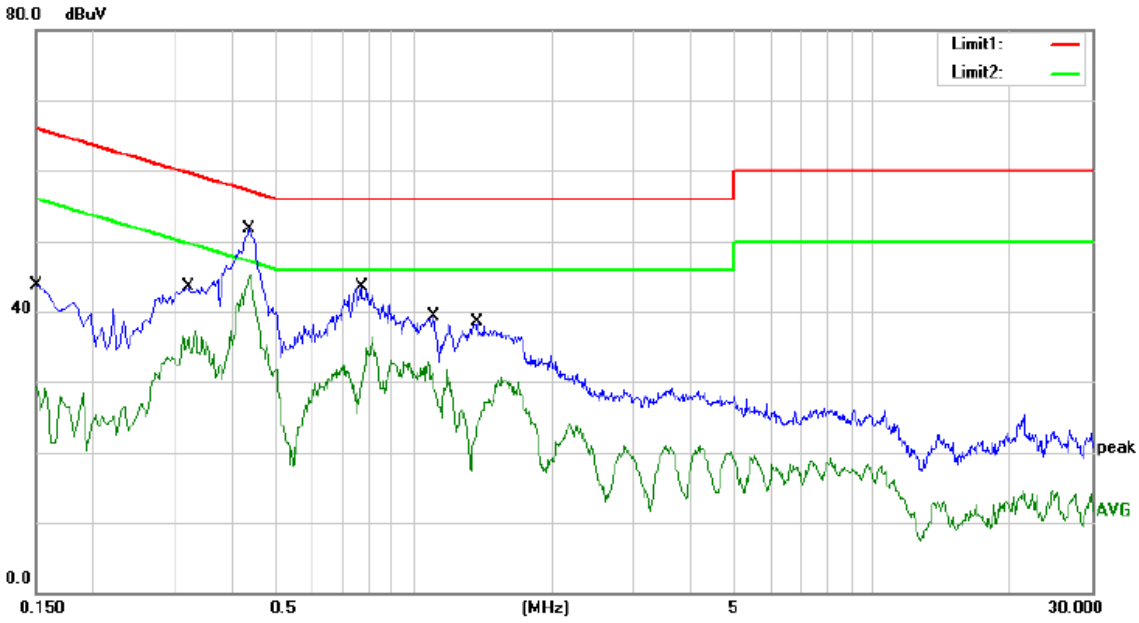
Limit: (CE)EN55032 Class B_QP Power: AC 230V/50Hz Humidity: 54 %

Mode: RFID Mode

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	35.51	9.89	45.40	66.00	-20.60	QP	
2		0.1500	20.06	9.89	29.95	56.00	-26.05	AVG	
3		0.2860	32.87	9.91	42.78	60.64	-17.86	QP	
4		0.2860	26.37	9.91	36.28	50.64	-14.36	AVG	
5		0.3380	33.84	9.91	43.75	59.25	-15.50	QP	
6		0.3380	27.58	9.91	37.49	49.25	-11.76	AVG	
7		0.4380	41.89	9.92	51.81	57.10	-5.29	QP	
8	*	0.4380	35.09	9.92	45.01	47.10	-2.09	AVG	
9		0.8140	33.24	9.92	43.16	56.00	-12.84	QP	
10		0.8140	27.46	9.92	37.38	46.00	-8.62	AVG	
11		0.9900	30.36	9.93	40.29	56.00	-15.71	QP	
12		0.9900	24.30	9.93	34.23	46.00	-11.77	AVG	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: Jason



Site Conduction #2 Phase: N Temperature: 24.9

Limit: (CE)EN55032 Class B_QP Power: AC 230V/50Hz Humidity: 54 %

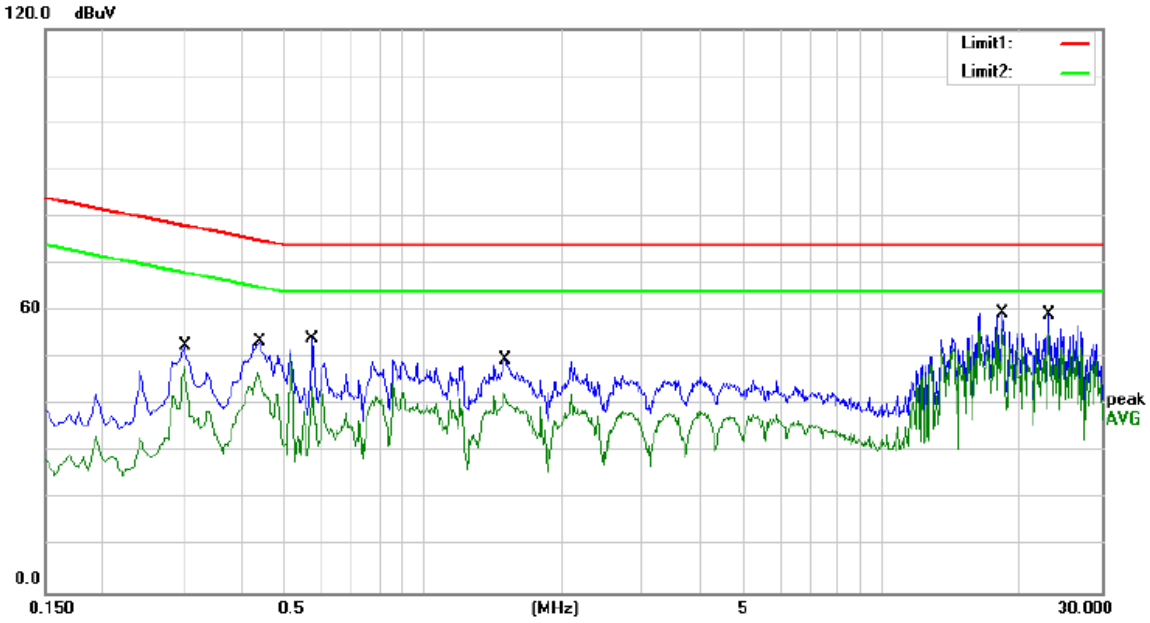
Mode: RFID Mode

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	33.90	9.89	43.79	66.00	-22.21	QP	
2		0.1500	20.19	9.89	30.08	56.00	-25.92	AVG	
3		0.3220	33.59	9.91	43.50	59.66	-16.16	QP	
4		0.3220	27.45	9.91	37.36	49.66	-12.30	AVG	
5		0.4380	41.87	9.92	51.79	57.10	-5.31	QP	
6	*	0.4380	35.42	9.92	45.34	47.10	-1.76	AVG	
7		0.7700	33.63	9.92	43.55	56.00	-12.45	QP	
8		0.7700	26.42	9.92	36.34	46.00	-9.66	AVG	
9		1.1100	29.31	9.93	39.24	56.00	-16.76	QP	
10		1.1100	22.90	9.93	32.83	46.00	-13.17	AVG	
11		1.3780	28.50	9.93	38.43	56.00	-17.57	QP	
12		1.3780	20.73	9.93	30.66	46.00	-15.34	AVG	

':Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: Jason

19.2ASYMMETRIC MODE CONDUCTED EMISSIONS



Site Conduction #2 Phase: Temperature: 24.9

Limit: (CE)EN55032 class B TELECOM_QP Power: AC 230V/50Hz Humidity: 54 %

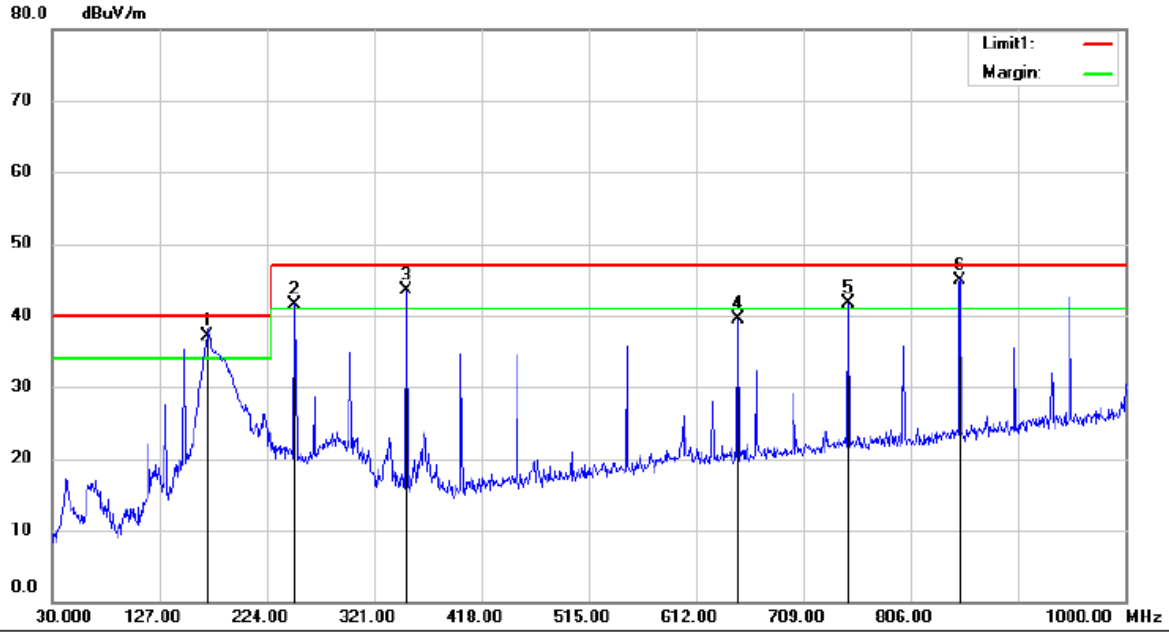
Mode: Ping

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.3020	32.99	19.76	52.75	78.19	-25.44	QP	
2		0.3020	28.47	19.76	48.23	68.19	-19.96	AVG	
3		0.4420	33.89	19.69	53.58	75.02	-21.44	QP	
4		0.4420	27.25	19.69	46.94	65.02	-18.08	AVG	
5		0.5740	34.51	19.65	54.16	74.00	-19.84	QP	
6		0.5740	24.42	19.65	44.07	64.00	-19.93	AVG	
7		1.5020	30.05	19.54	49.59	74.00	-24.41	QP	
8		1.5020	23.09	19.54	42.63	64.00	-21.37	AVG	
9		18.2460	39.99	19.70	59.69	74.00	-14.31	QP	
10	*	18.2460	36.88	19.70	56.58	64.00	-7.42	AVG	
11		23.1300	39.25	19.93	59.18	74.00	-14.82	QP	
12		23.1300	35.29	19.93	55.22	64.00	-8.78	AVG	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: Jason

19.3DATA FOR RADIATED EMISSIONS



Site 3m Chamber #3 Polarization: *Horizontal* Temperature: 23 C

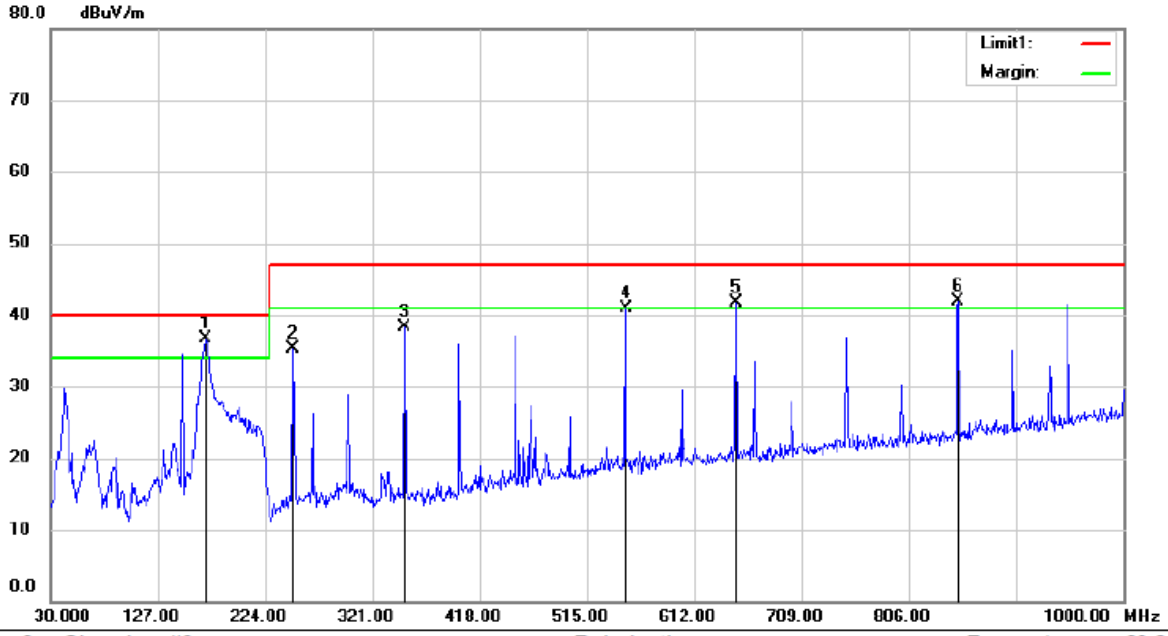
Limit: (RE)EN55032 Class B Power: AC 230V/50Hz Humidity: 51 %

Mode:RFID Mode

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	!	170.6500	55.67	-18.57	37.10	40.00	-2.90	QP			
2	!	249.7050	55.96	-14.36	41.60	47.00	-5.40	QP			
3	!	350.1000	54.95	-11.43	43.52	47.00	-3.48	QP			
4		650.3150	45.26	-5.67	39.59	47.00	-7.41	QP			
5	!	750.2250	45.76	-3.99	41.77	47.00	-5.23	QP			
6	*	850.6200	47.69	-2.79	44.90	47.00	-2.10	QP			

*:Maximum data x:Over limit !:over margin Operator: KK



Site 3m Chamber #3 Polarization: *Vertical* Temperature: 23 C

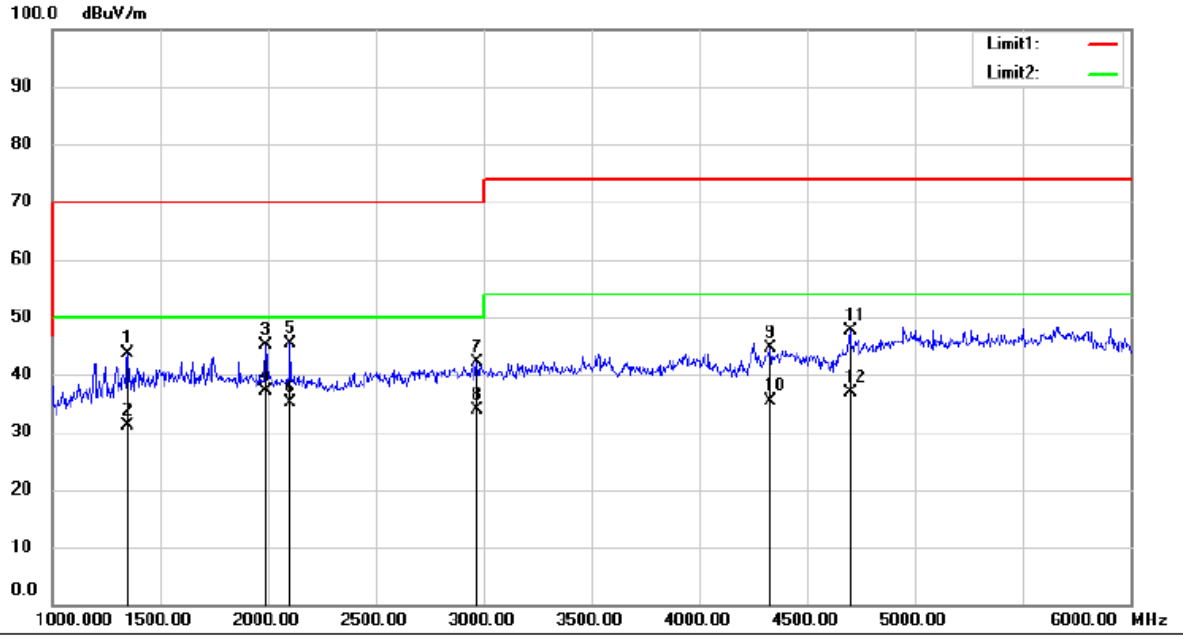
Limit: (RE)EN55032 Class B Power: AC 230V/50Hz Humidity: 51 %

Mode:RFID Mode

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	171.1350	55.31	-18.55	36.76	40.00	-3.24	QP			
2		249.7050	49.73	-14.36	35.37	47.00	-11.63	QP			
3		350.1000	49.82	-11.43	38.39	47.00	-8.61	QP			
4		549.9200	48.71	-7.82	40.89	47.00	-6.11	QP			
5	!	650.3150	47.28	-5.67	41.61	47.00	-5.39	QP			
6	!	850.6200	44.62	-2.79	41.83	47.00	-5.17	QP			

*:Maximum data x:Over limit !:over margin Operator: KK



Site 3m Chamber #3 Polarization: *Vertical* Temperature: 23 C

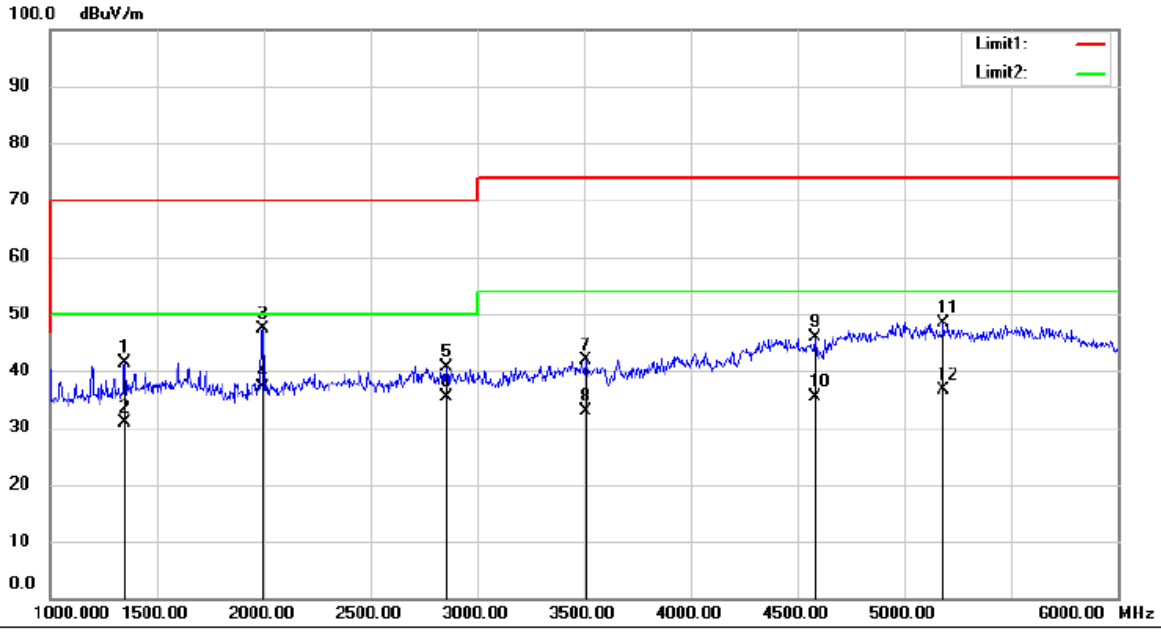
Limit: (RE)EN55032 Class B Power: AC 230V/50Hz Humidity: 51 %

Mode:RFID Mode

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		1350.000	56.93	-13.20	43.73	70.00	-26.27	peak			
2		1350.000	44.40	-13.20	31.20	50.00	-18.80	AVG			
3		1990.000	57.06	-11.90	45.16	70.00	-24.84	peak			
4	*	1990.000	49.00	-11.90	37.10	50.00	-12.90	AVG			
5		2105.000	56.91	-11.60	45.31	70.00	-24.69	peak			
6		2105.000	46.70	-11.60	35.10	50.00	-14.90	AVG			
7		2970.000	51.46	-9.41	42.05	70.00	-27.95	peak			
8		2970.000	43.31	-9.41	33.90	50.00	-16.10	AVG			
9		4330.000	50.15	-5.42	44.73	74.00	-29.27	peak			
10		4330.000	40.72	-5.42	35.30	54.00	-18.70	AVG			
11		4700.000	52.04	-4.48	47.56	74.00	-26.44	peak			
12		4700.000	41.38	-4.48	36.90	54.00	-17.10	AVG			

*:Maximum data x:Over limit !:over margin Operator: KK



Site 3m Chamber #3 Polarization: *Horizontal* Temperature: 23 C

Limit: (RE)EN55032 Class B Power: AC 230V/50Hz Humidity: 51 %

Mode:RFID Mode

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		1350.000	54.70	-13.20	41.50	70.00	-28.50	peak			
2		1350.000	44.10	-13.20	30.90	50.00	-19.10	AVG			
3		1995.000	59.27	-11.90	47.37	70.00	-22.63	peak			
4	*	1995.000	49.10	-11.90	37.20	50.00	-12.80	AVG			
5		2855.000	50.30	-9.68	40.62	70.00	-29.38	peak			
6		2855.000	45.08	-9.68	35.40	50.00	-14.60	AVG			
7		3510.000	49.85	-8.03	41.82	74.00	-32.18	peak			
8		3510.000	40.83	-8.03	32.80	54.00	-21.20	AVG			
9		4580.000	50.54	-4.71	45.83	74.00	-28.17	peak			
10		4580.000	40.11	-4.71	35.40	54.00	-18.60	AVG			
11		5185.000	52.33	-3.95	48.38	74.00	-25.62	peak			
12		5185.000	40.65	-3.95	36.70	54.00	-17.30	AVG			

*:Maximum data x:Over limit !:over margin Operator: KK

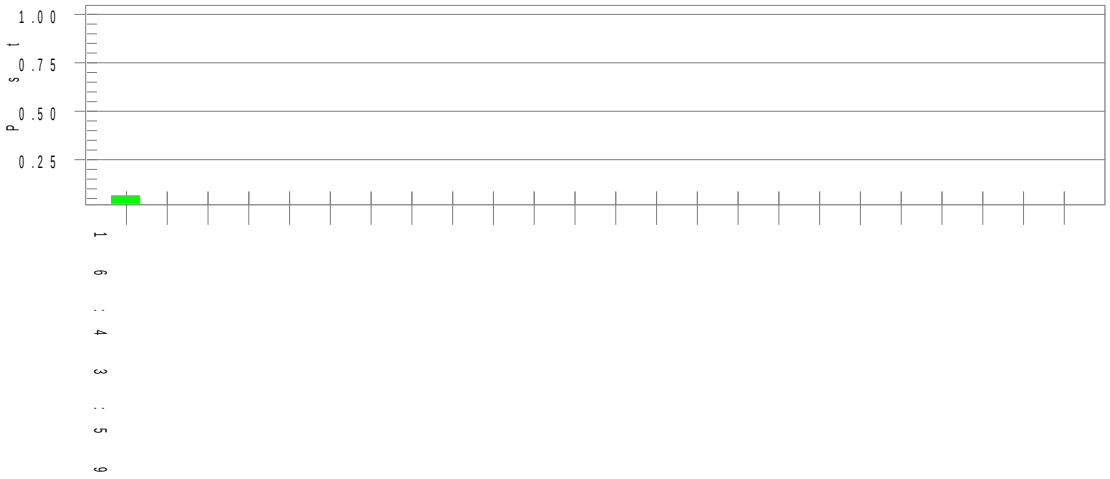
19.4DATA FOR VOLTAGE FLUCTUATIONS & FLICKER TESTS

Flicker Test Summary per EN/IEC61000-3-3 (Run time)

EUT: ntegrated reader（CL7206A5） **Tested by: xmz**
Test category: All parameters (European limits) **Test Margin: 100**
Test date: 2018/08/04 **Start time: 16:33:29** **End time: 16:44:00**
Test duration (min): 10 **Data file name: WIN2105_F-000233.cts_data**
Comment: on

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

Pst_i and limit line **European Limits**



Parameter values recorded during the test:

Vrms at the end of test (Volt):	**229.34**			
Highest dt (%):	**0.00**	**Test limit (%):**	**N/A**	**N/A**
T-max (mS):	**0.0**	**Test limit (mS):**	**500.0**	**Pass**
Highest dc (%):	**0.00**	**Test limit (%):**	**3.30**	**Pass**
Highest dmax (%):	**0.04**	**Test limit (%):**	**4.00**	**Pass**
Highest Pst (10 min. period):	**0.064**	**Test limit:**	**1.000**	**Pass**

19.5DATA FOR ELECTROSTATIC DISCHARGE

Electrostatic Discharge Test Results

Applicant	SHENZHEN HOPELAND TECHNOLOGIES CO., LTD.		
EUT	RFID Reader module	Test Date	2018-08-04
M/N	CL7206A5	Temperature	27.2℃
Power Supply	AC 230V/50Hz	Humidity	42%
Air discharge	±2.0, ± 4.0 kV, ± 8.0kV	Test engineer	XMZ
Contact discharge	± 2.0, ± 4.0kV	Criterion	TT&TR
Test Mode	RFID Mode		

Location	**Kind** A-Air Discharge C-Contact Discharge	**Result**
Slot	A	CT&CR
Metal	C	CT&CR
HCP of front, rear, left, right	C	CT&CR
VCP of front, rear, left, right	C	CT&CR

19.6DATA FOR RADIO FREQUENCY ELECTROMAGNETIC FIELD

Radio-Frequency, Electromagnetic Field Test Results Test Results

Applicant	SHENZHEN HOPELAND TECHNOLOGIES CO., LTD.		
EUT	RFID Reader module	Test Date	2018-08-04
M/N	CL7206A5	Temperature	26.4℃
Field Strength	3 V/m	Humidity	47%
Power Supply	AC 230V/50Hz	Criterion	CT&CR
Test engineer	XMZ	Frequency Range	80MHz to 6000MHz
Modulation	☐ None	☐Pulse	☒ AM 1kHz 80%
Steps	1%		
Test Mode	RFID Mode		

	Freq. Range (MHz)	Field	Modulation	Polarity	Position (°)	Selection for the final test
1	80-1000	3V/m	Yes	H / V	Front	☒
	1000-6000	3V/m	Yes	H / V	Front	☒
2	80-1000	3V/m	Yes	H / V	Right	☒
	1000-6000	3V/m	Yes	H / V	Right	☒
3	80-1000	3V/m	Yes	H / V	Back	☒
	1000-6000	3V/m	Yes	H / V	Back	☒
4	80-1000	3V/m	Yes	H / V	Left	☒
	1000-6000	3V/m	Yes	H / V	Left	☒

PERFORMANCE CRITERIA	
Criteria requested	☒ CT ☒ CR
Criteria meet	☒ CT ☒ CR

19.7DATA FOR FAST TRANSIENTS, COMMON MODE

Fast Transients, Common Mode Test Results

Applicant	SHENZHEN HOPELAND TECHNOLOGIES CO., LTD.		
EUT	RFID Reader module	Test Date	2018-08-04
M/N	CL7206A5	Temperature	25.7℃
Input Voltage	AC 230V/50Hz	Humidity	50%
Test Engineer	XMZ	Criterion	TT&TR
Line : ☒ AC Mains ☐ DC Line		Line : ☒ Signal ☐ I/O Cable	
Coupling : ☒ Direct		Coupling : ☐ Capacitive	
Test Time : 120s			
OperationMode	RFID Mode, Ping Mode		

Line	Test Voltage	Result(+)	Result(-)
L	0.5/1kV	CT&CR	CT&CR
N	0.5/1kV	CT&CR	CT&CR
PE	0.5/1kV	N/A	N/A
L、N	0.5/1kV	CT&CR	CT&CR
L、PE	0.5/1kV	N/A	N/A
N、PE	0.5/1kV	N/A	N/A
L、N、PE	0.5/1kV	N/A	N/A
Signal Line	0.5kV	N/A	CT&CR

Note:

19.8DATA FOR SURGE

Surge Test Results

Applicant	SHENZHEN HOPELAND TECHNOLOGIES CO., LTD.		
EUT	RFID Reader module	Test Date	2018-08-04
M/N	CL7206A5	Temperature	25.7℃
Power Supply	AC 230V/50Hz	Humidity	50%
Test engineer	XMZ	Criterion	TT&TR
Test Mode	RFID Mode, Ping Mode		

Location	Polarity	Phase Angle	Number of Pulse	Pulse Voltage (kV)	Result
L-N	+	0°	5	0.5/1.0	CT&CR
	+	90°	5	0.5/1.0	CT&CR
	+	180°	5	0.5/1.0	CT&CR
	+	270°	5	0.5/1.0	CT&CR
	-	0°	5	0.5/1.0	CT&CR
	-	90°	5	0.5/1.0	CT&CR
	-	180°	5	0.5/1.0	CT&CR
	-	270°	5	0.5/1.0	CT&CR
L-PE	+	0°	5	1.0/2.0	N/A
	+	90°	5	1.0/2.0	N/A
	+	180°	5	1.0/2.0	N/A
	+	270°	5	1.0/2.0	N/A
	-	0°	5	1.0/2.0	N/A
	-	90°	5	1.0/2.0	N/A
	-	180°	5	1.0/2.0	N/A
	-	270°	5	1.0/2.0	N/A
N-PE	+	0°	5	1.0/2.0	N/A
	+	90°	5	1.0/2.0	N/A
	+	180°	5	1.0/2.0	N/A
	+	270°	5	1.0/2.0	N/A
	-	0°	5	1.0/2.0	N/A
	-	90°	5	1.0/2.0	N/A
	-	180°	5	1.0/2.0	N/A
	-	270°	5	1.0/2.0	N/A
Signal Line			5	1.0	CT&CR
			5	1.0	CT&CR

19.9DATA FOR RADIO FREQUENCY, COMMON MODE

Radio frequency, common mode Test Results

Applicant	SHENZHEN HOPELAND TECHNOLOGIES CO., LTD.		
EUT	RFID Reader module	Test Date	2018-08-04
M/N	CL7206A5	Temperature	25.7℃
Power Supply	AC 230V/50Hz	Humidity	50%
Test Engineer	XMZ	Criterion	CT&CR
Test Mode	RFID Mode, Ping Mode		

Frequency Range (MHz)	Injected Position	Strength (Unmodulated)	Criterion	Result
0.15 ~ 80	☒AC Mains	3V	CT&CR	CT&CR
0.15 ~ 80	☒Signal line	3V	CT&CR	CT&CR

Remark **:** Modulation Signal**:**1kHz 80% AM

19.10 DATA FOR VOLTAGE DIPS AND INTERRUPTIONS

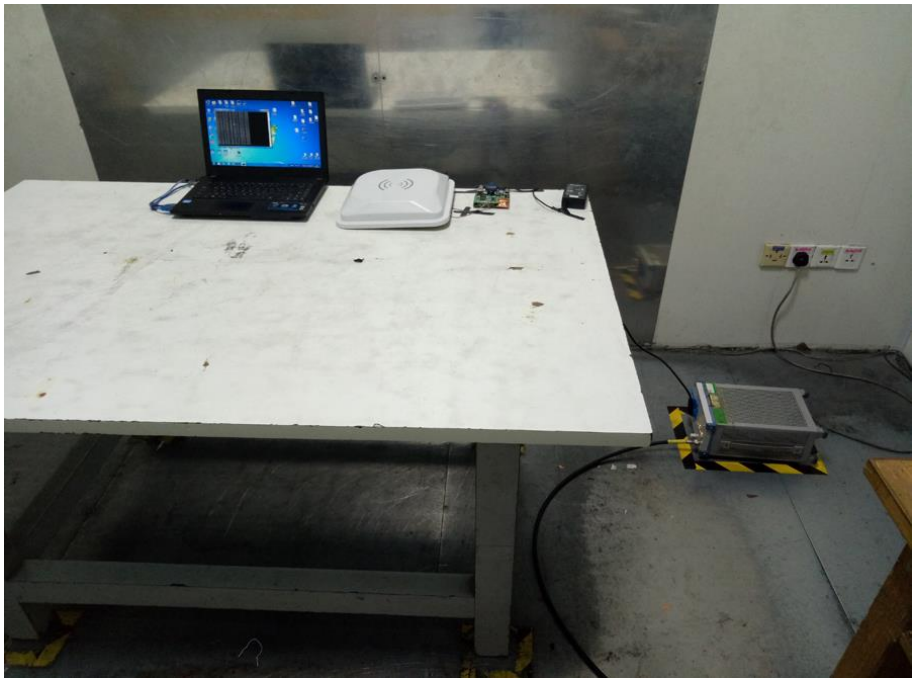
Voltage Dips and Interruptions Test Results

Applicant	SHENZHEN HOPELAND TECHNOLOGIES CO., LTD.		
EUT	RFID Reader module	Test Date	2018-08-04
M/N	CL7206A5	Temperature	25.7℃
Power Supply	AC 230V/50Hz	Humidity	50%
Test Engineer	XMZ	Criterion	TT&TR
Test Mode	RFID Mode		

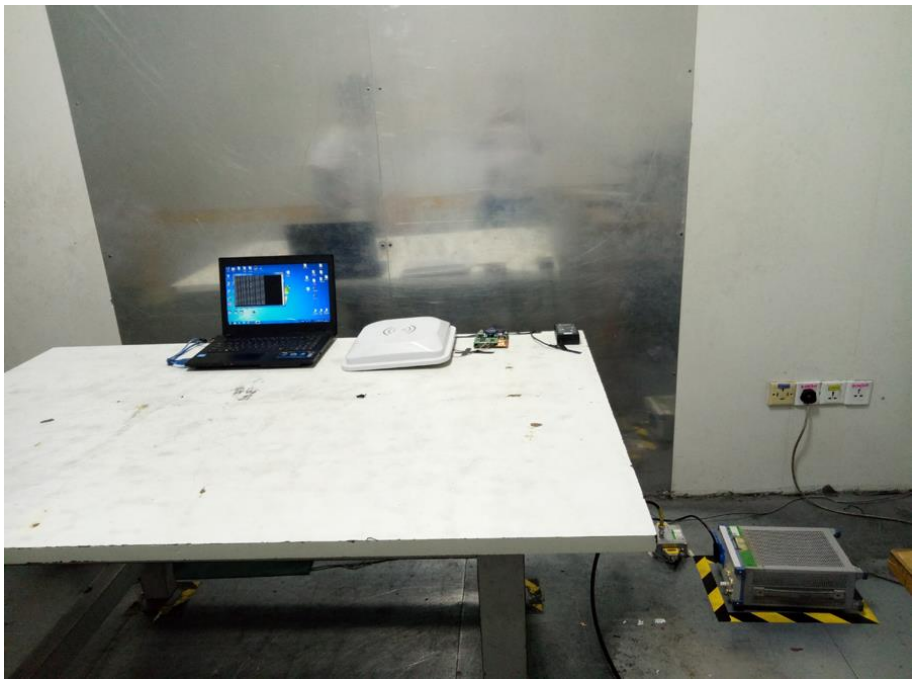
Test Level % U_T	Voltage Dips & Short Interruptions % U_T	Duration (in periods)	Phase Angle	Criterion TT&TR	Result
0	100	0.5P	0°-360°	TT&TR	CT&CR
0	100	1P	0°-360°	TT&TR	CT&CR
70	30	25P	0°-360°	TT&TR	CT&CR
0	100	250P	0°-360°	TT&TR	TT&TR

20 APPENDIX B PHOTOGRAPHS OF TEST SETUP

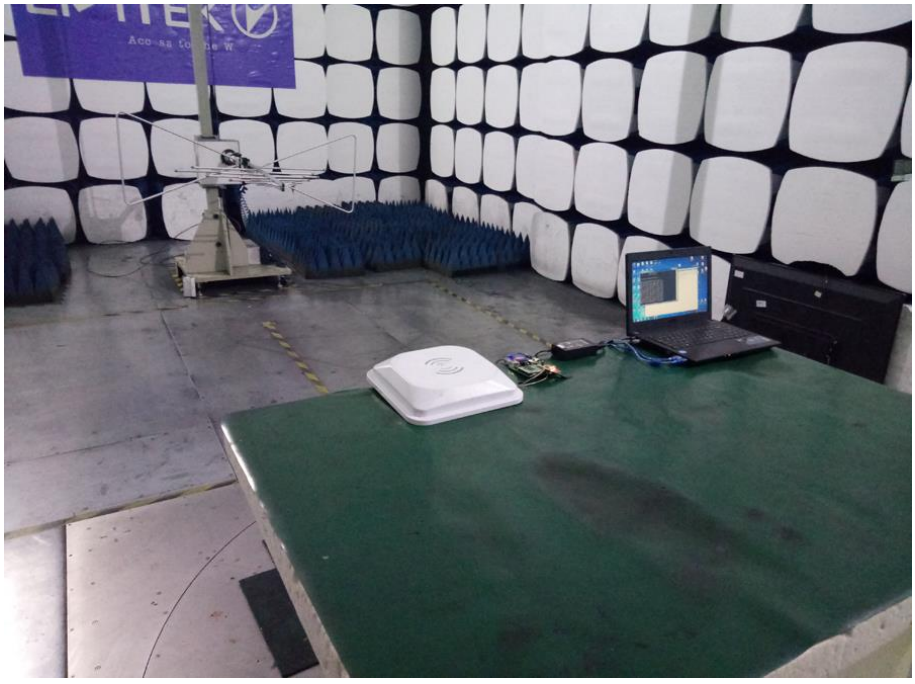
20.1PHOTO FOR CONDUCTED EMISSIONS FROM THE AC MAINS POWER PORTS

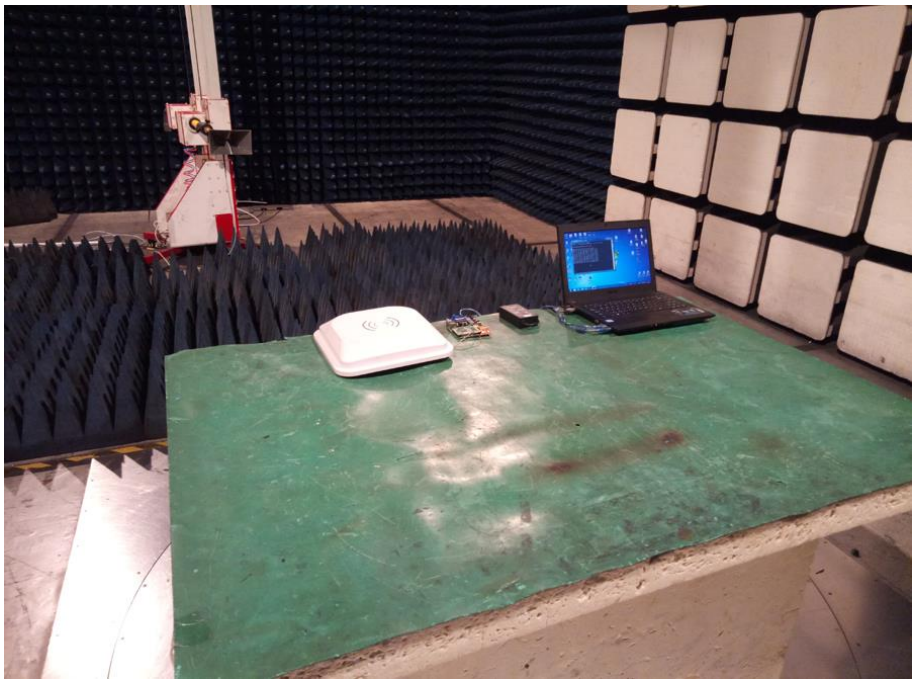


20.2ASYMMETRIC MODE CONDUCTED EMISSIONS



20.3PHOTO FOR RADIATED EMISSIONS

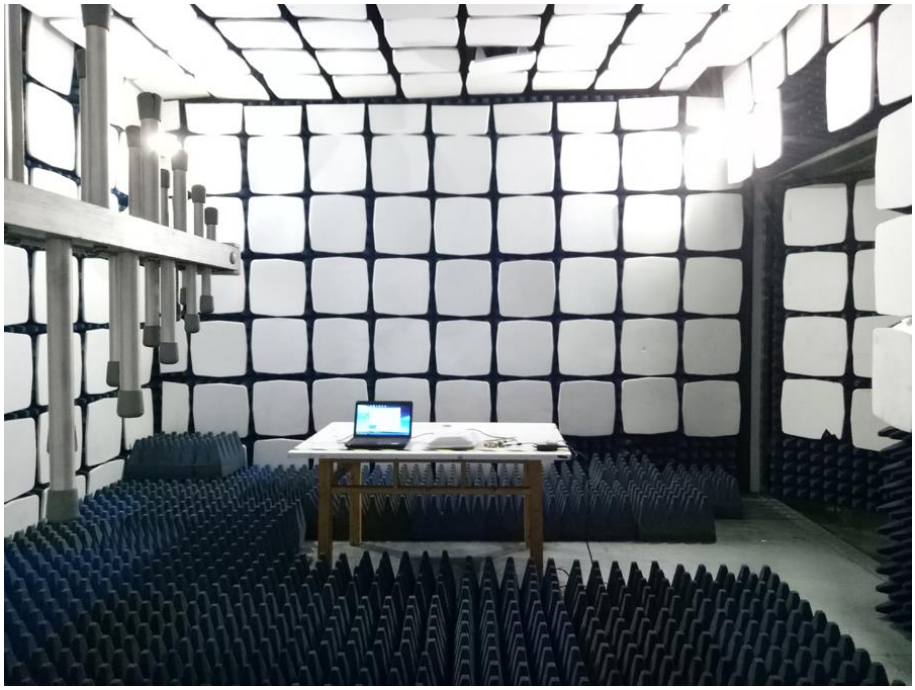




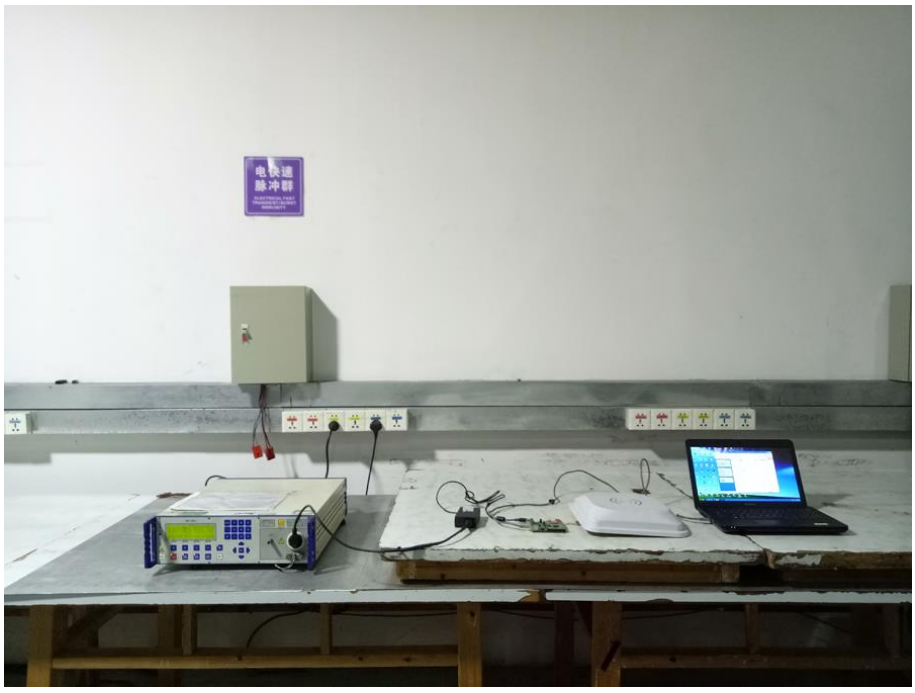
20.4PHOTO FOR VOLTAGE FLUCTUATIONS & FLICKER TESTS

20.5PHOTO FOR ELECTROSTATIC DISCHARGE

20.6PHOTO FOR RADIO FREQUENCY ELECTROMAGNETIC FIELD

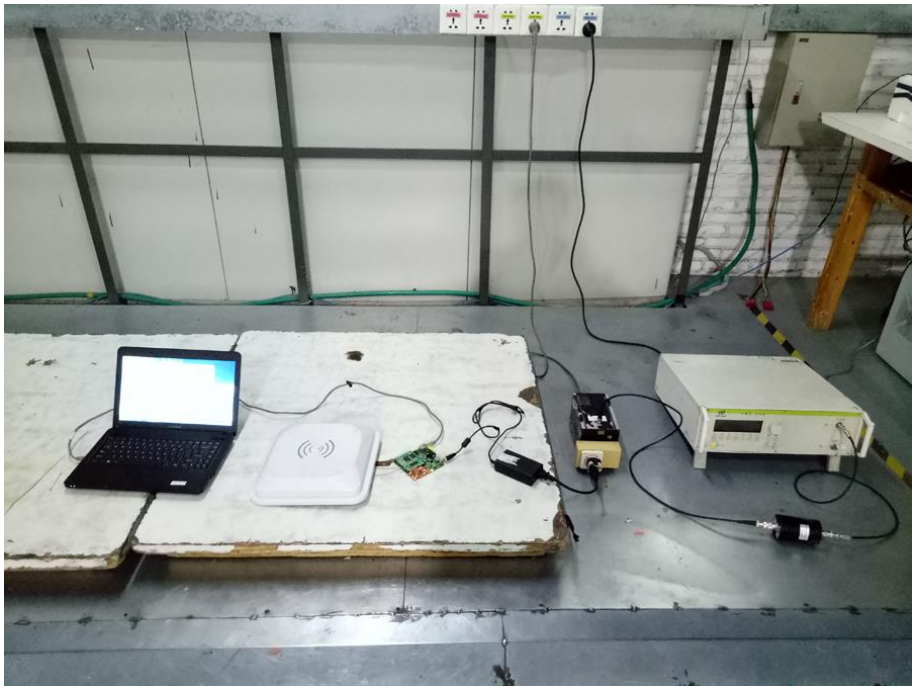


20.7PHOTO FOR FAST TRANSIENTS, COMMON MODE



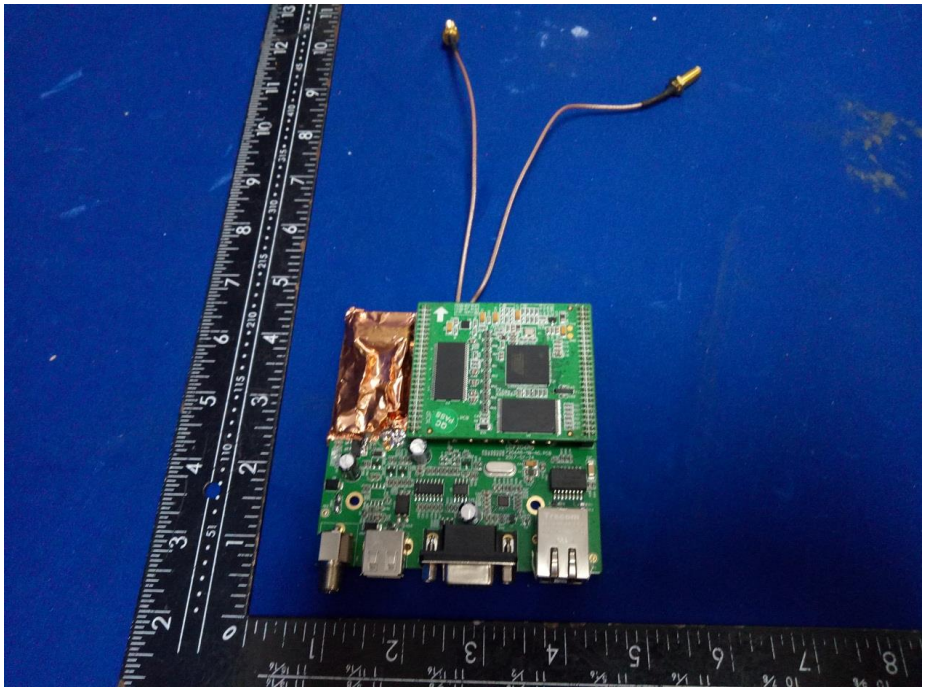
20.8PHOTO FOR SURGE

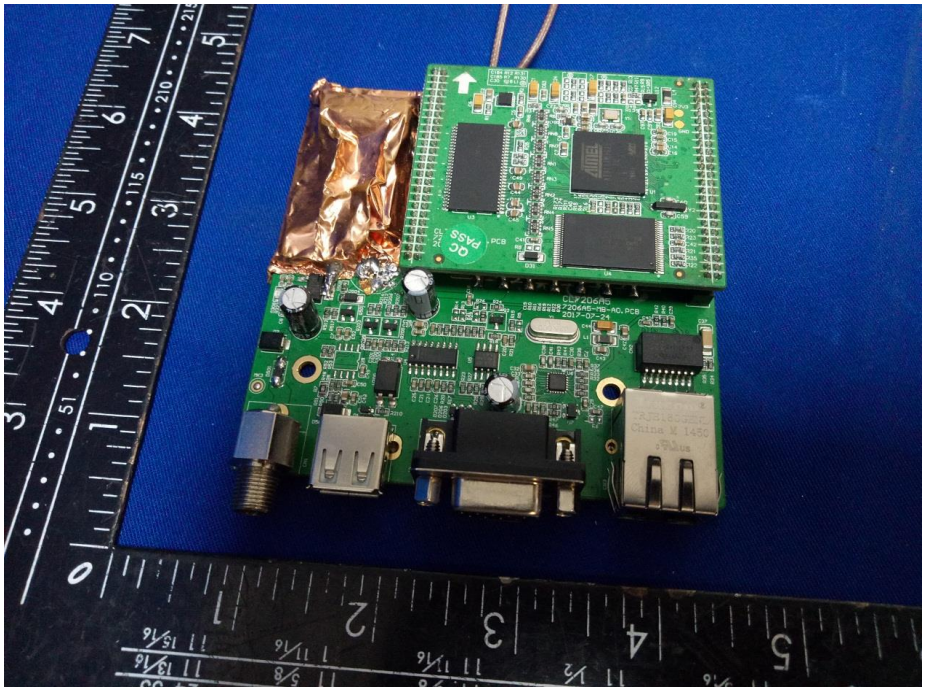
20.9PHOTO FOR RADIO FREQUENCY, COMMON MODE

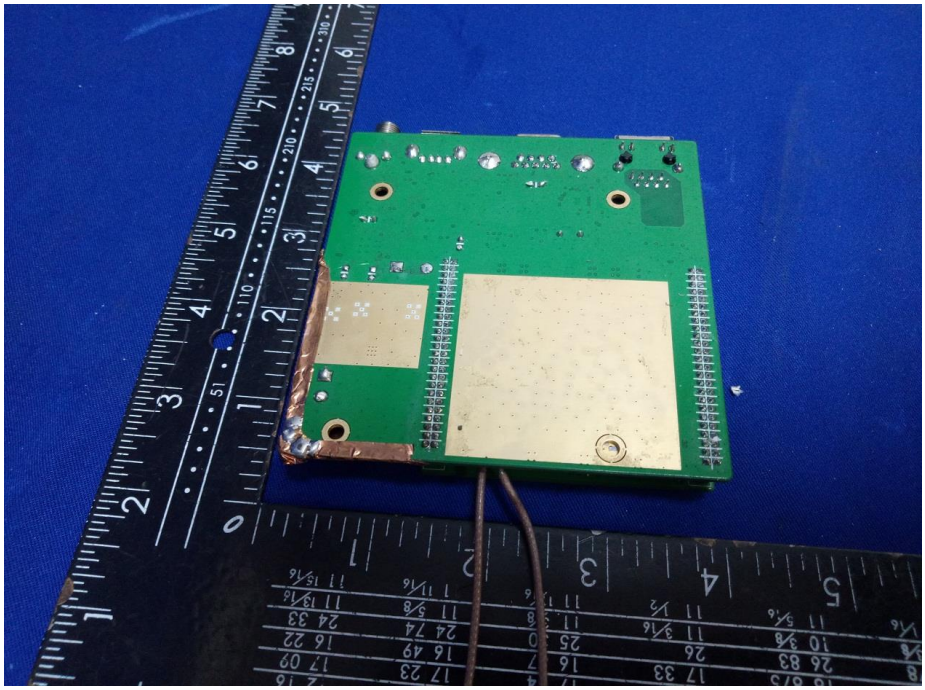


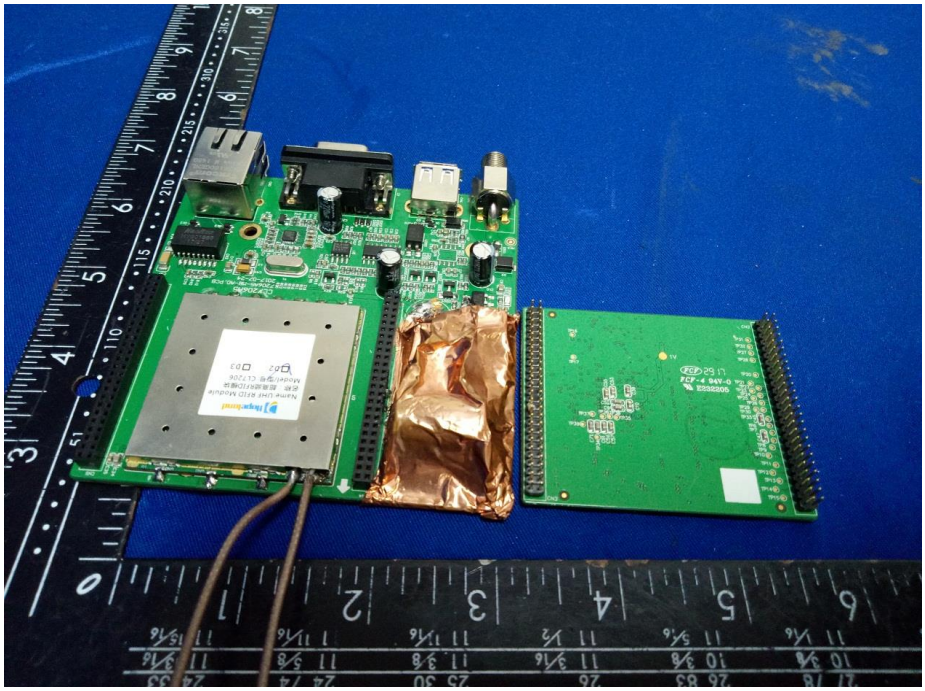
20.10 PHOTO FOR VOLTAGE DIPS AND INTERRUPTIONS

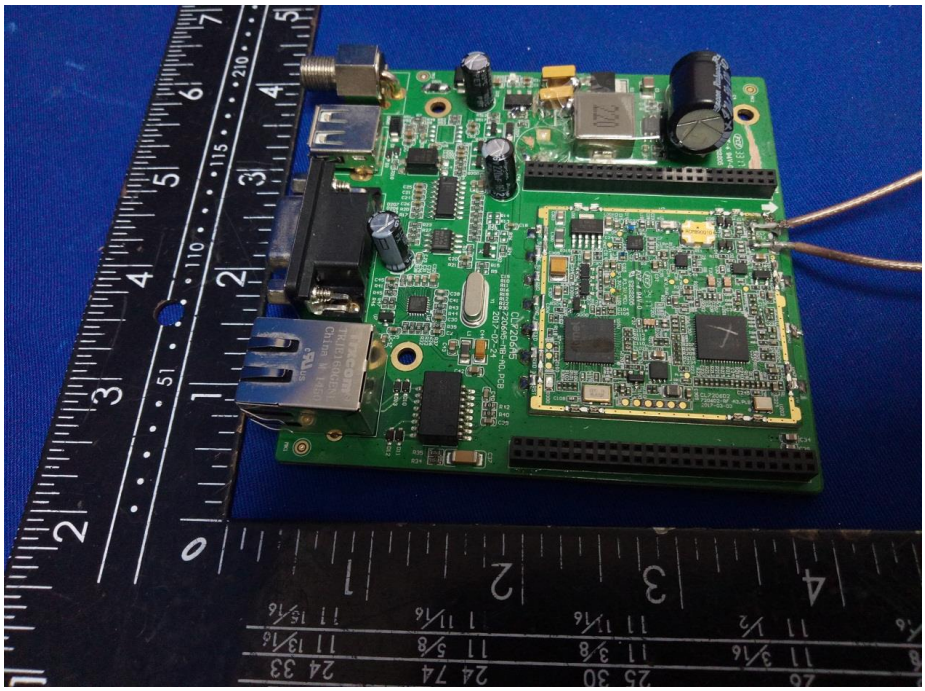
21 APPENDIX C PHOTOGRAPHS OF EUT

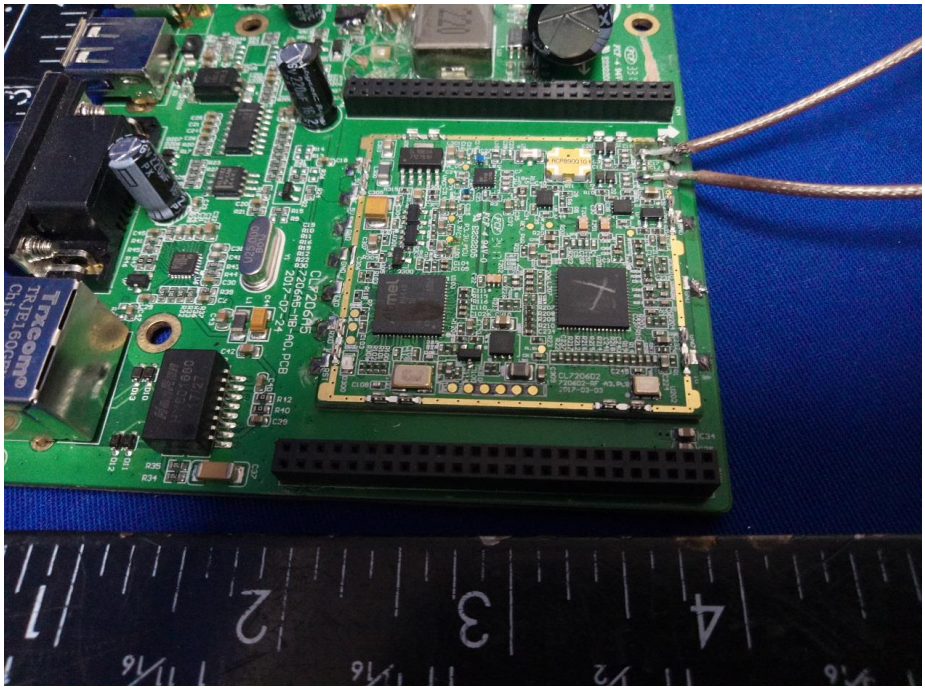












END OF REPORT