SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

588 West Jindu Road,Songjiang District,Shanghai,China
Telephone: +86 (0) 21 6191 5666
Fax: +86 (0) 21 6191 5678
ee.shanghai@sgs.com

1 Cover Page

TEST REPORT

Application No.:	SHEM1610002957HS
Applicant:	ZHEJIANG BLUE ARROW WEIGHING TECHNOLOGY CO., LTD.
Product Name:	Crane Scale
Model No.(EUT):	XZ-JJE，OCS-XZ-JJE(P)
Standards:	EN 61000-6-1: 2007 EN 61000-6-3: 2007+A1: 2001
Date of Receipt:	September 28, 2016
Date of Test:	September 28, 2016 to October 25, 2016
Date of Issue:	October 28, 2016
Test Result :	**Pass***

* In the configuration tested, the EUT (Equipment under test) complied with the standards specified above.

The CE mark as shown below can be used, under the responsibility of the manufacturer, after completion of an EC Declaration of Conformity and compliance with all relevant EC Directives.

Parlam Zhan
E&E Section Manager
SGS-CSTC (Shanghai) Co., Ltd.

2 Version

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
00		October 28, 2016		Original

Authorized for issue by:				
Engineer		Zoe Cang **Print Name**		Zoe Cang
Clerk		Tricia Jiang **Print Name**		Tricia Jiang
Reviewer		Keny Xu **Print Name**		Keny.xu

3 Test Summary

ELECTROMAGNETIC INTERFERENCE (EMI)				
Test	**Test Requirement**	**Test Method**	**Class / Severity**	**Result**
Radiated Emission, (30MHz to 1GHz)	EN 61000-6-3: 2007+A1: 2001	Cispr 16-2-3	N/A	PASS
Electromagnetic Susceptibility(EMS)				
Test	**Test Requirement**	**Test Method**	**Class / Severity**	**Result**
ESD	EN 61000-6-1: 2007	EN 61000-4-2:2009	Contact ±4.0 kV Air ±8.0 kV	PASS
Radiated Immunity, (80MHz to 1 GHz)	EN 61000-6-1: 2007	EN 61000-4-3 :2006 +A1: 2008+A2:2010	3.0V/m 80%, 1kHz, AM	PASS
Electrical Fast Transients (EFT) on AC ports	EN 61000-6-1: 2007	EN 61000-4-4:2004 +A1:2010	± 1.0kV	N/A
Surge Immunity on AC	EN 61000-6-1: 2007	EN 61000-4-5:2006	±1.0kV D.M.† ±2.0kV C.M.‡	N/A
Injected Currents(150kHz to 80MHz) on AC ports	EN 61000-6-1: 2007	EN 61000-4-6:2009	3.0Vrms (emf), 80%, 1kHz Amp. Mod.	N/A
Power Frequency Magnetic Field	EN 61000-6-1: 2007	EN 61000-4-8:2010	50 Hz 1.0 A/m	N/A**
Voltage Dips and Interruptions on AC	EN 61000-6-1: 2007	EN 61000-4-11:2004	0 % U_T* for 0.5per 0 % U_T* for 250per 70 % U_T* for 25per	N/A
Remark:				
* U_T is the nominal supply voltage				
† D.M. – Differential Mode				
‡ C.M. – Common Mode				
EUT In this whole report EUT means Equipment Under Test.				
N/A：Not applicable.				
Note1:♀ If the highest frequency of the internal sources of the EUT is less than 108MHz,the measurement shall only be made up to 1GHz. Note2:**Power-frequency magnetic field immunity test is only applicable to equipment containing devices susceptible to magnetic fields, such as CRT monitors, Hall elements, electrodynamic microphones, magnetic field sensors, etc.				

4 Contents

5 General Information

5.1 Client Information

Applicant:	ZHEJIANG BLUE ARROW WEIGHING TECHNOLOGY CO., LTD.
Address of Applicant:	No.31 Xianxin Road Xianlin Hangzhou China.
Manufacturer:	ZHEJIANG BLUE ARROW WEIGHING TECHNOLOGY CO., LTD.
Address of Manufacturer:	No.31 Xianxin Road Xianlin Hangzhou China.
Factory:	ZHEJIANG BLUE ARROW WEIGHING TECHNOLOGY CO., LTD.
Address of Factory:	No.31 Xianxin Road Xianlin Hangzhou China.

5.2 Details of E.U.T.

Product Name:	Crane Scale
Test voltage:	DC 6V

5.3 E.U.T Operation Mode.

Functions/Modes:	Working mode
Running mode:	Keep EUT Working continually.

5.4 E.U.T Operation Environment

Temperature Range:	20-25^{0}C
Humidity Range:	30-60% RH
Atmospheric Pressure Range:	100-102kPa

5.5 Description of Support Units

The EUT has been tested independently.

5.6 Deviation from Standards

All Immunity tests to EN 55014-2 were performed in accordance with EN 61000-4-x and not IEC 61000-4-x. (x=2,3,4,5,6,8,11).

5.7 Abnormalities from Standard Conditions

None.

5.8 Modification/Retest Record

None.

5.9 Monitoring of EUT for All Immunity Test

Audio: None

Visual: None

5.10 Test Location

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. E&E Lab

No.588 West Jindu Road, Songjiang District, Shanghai, China. 201612.

Tel: +86 21 6191 5666

Fax: +86 21 6191 5678

No tests were sub-contracted.

5.11 Test Facility

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing. Date of expiry: 2017-07-14.

- **FCC – Registration No.: 402683**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered and fully described in a report filed with the Federal Communications Commission (FCC). The acceptance letter from the FCC is maintained in our files. Registration No.: 402683, Expiry Date: 2017-09-16.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A. Expiry Date: 2017-06-18.

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-3868 and C-4336 respectively. Date of Expiry: 2017-11-16.

5.12 Measurement Uncertainty

According to CISPR 16-4-2.

Test Item	Frequency Range	Measurement Uncertainty	U_{cispr}
Conducted Emission at mains port using AMN	9kHz-150kHz	3.2dB	3.8dB
Conducted Emission at mains port using AMN	150kHz-30MHz	2.6dB	3.4dB
Conducted Emission at mains port using VP	9kHz-30MHz	3.9dB	2.9dB
Conducted Emission at telecommunication port using AAN	150kHz-30MHz	4.5dB	5.0dB
Radiated Emission	30MHz-1000MHz	4.3dB	6.3dB
Radiated Emission	1GHz-18GHz	4.5dB	5.2dB(1GHz-6GHz)
			5.5dB(6GHz-18GHz)
Disturbance Power	30MHz-300MHz	2.6dB	4.5dB
Remark: AMN – Artificial Mains Network VP – Voltage Probe ANN – Asymmetric Artificial Network			

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

6 Equipment Used during Test

Radiated Emission

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal.Due date
1	EMI test receiver	Rohde & Schwarz	ESU40	100109	2016-06-02	2017-06-01
2	Antenna	SCHWARZBECK	VULB9168	9168-313	2016-06-15	2017-06-14
3	CONTROLLER	INNCO	CO200	474	/	/
4	Antenna	SCHWARZBECK	BBHA9120D	9120D-679	2016-06-15	2017-06-14
5	Antenna	SCHWARZBECK	BBHA9170	9170-373	2016-06-15	2017-06-14
6	Low nosie amplifier	LNA6900	TESEQ	71033	2016-06-15	2017-06-14

Electrostatic Discharge Test

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal.Due date
2	Electrostatic Discharge Simulator	TESEQ	NSG 437	468	2016-08-05	2017-08-03

Radiated Immunity

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal.Due date
1	Ultra broadband antenna	Rohde & Schwarz	HL562	100227	2016-05-15	2017-05-14
2	amplifier	AR	30W1000B	0327284	--	--
3	amplifier	AR	30S1G3	0324978	--	--
4	power meter	Rohde & Schwarz	NRP	101641	2016-05-16	2017-05-15
5	Signal generator	Rohde & Schwarz	SMR40	100555	2016-05-13	2017-05-12

General Equipment

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal.Due date
1	Digital pressure meter	YONGZHI	DYM3-01	101012	2016-01-16	2017-01-14
2	Digital Multimeter	FLUKE	17B	10560713	2016-08-24	2017-08-22
3	Temperature& humidity recorder	ShangHai weather meter work	ZJ 1-2B	0804081 0802150 0805126	2016-07-25	2017-07-23

7 Electromagnetic Interference Test Results

7.1 Radiated Emissions, 30MHz to 1GHz

Test Requirement: EN 61000-6-3

Test Method: EN 61000-6-3

Test Date: October 18, 2016

Frequency Range: 30 MHz to 1 GHz

Measurement Distance: 3m

Class: Class B

Detector: Peak for pre-scan (120 kHz resolution bandwidth)

Limit:

For 3m

Frequency range	Quasi-peak limits(Class B)
MHz	dB (μV/m)
30 to 230	40
230 to 1000	47
At transitional frequencies the lower limit applies.	

7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 24.5 °C Humidity: 55% RH Atmospheric Pressure: 100.4 kPa

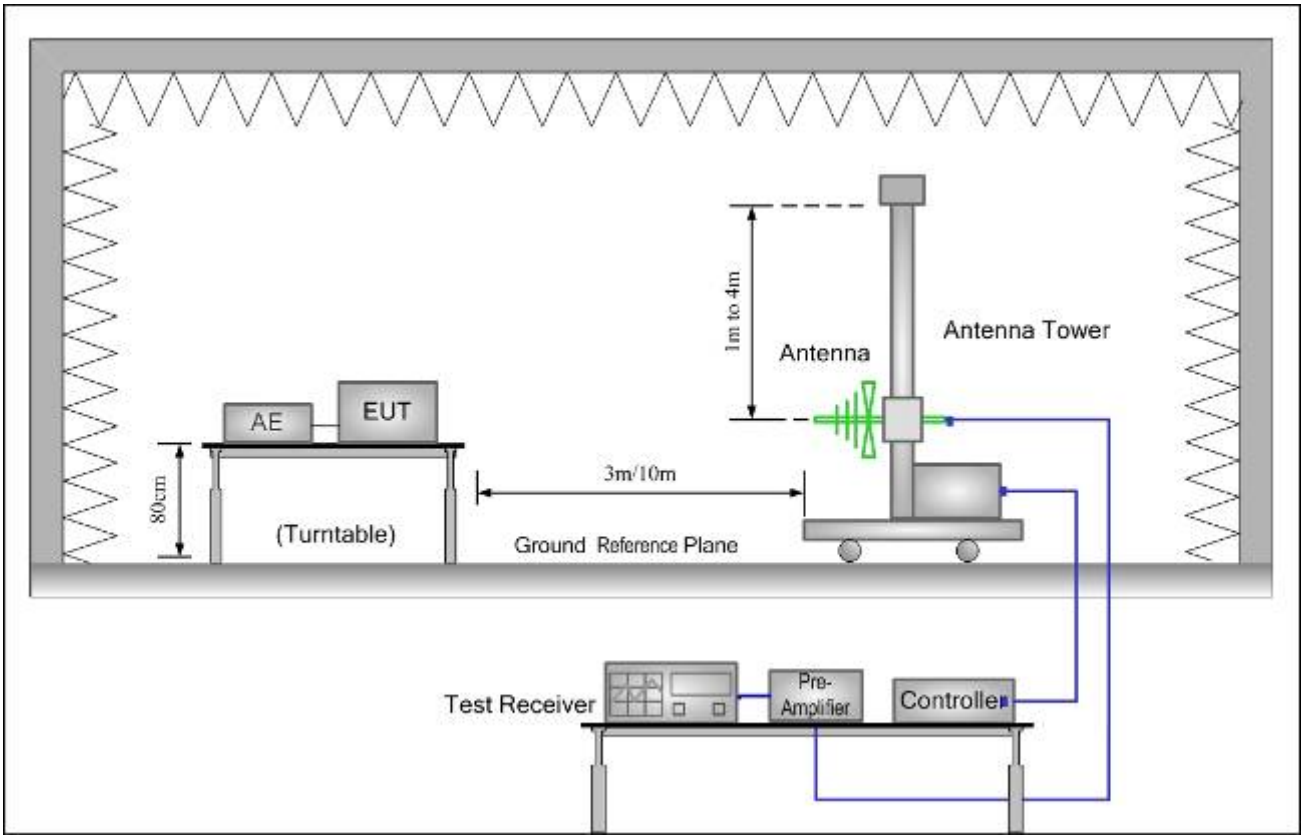
Test mode: Transmission Mode

Pre-scan was performed with peak detected on all ports, Quasi-peak measurements was performed at the frequencies at which maximum peak emission level were detected.

Please see the attached Quasi-peak test results.

For radiated emission: Level = Read Level + Antenna Factor + Cable Loss – Preamp Factor.

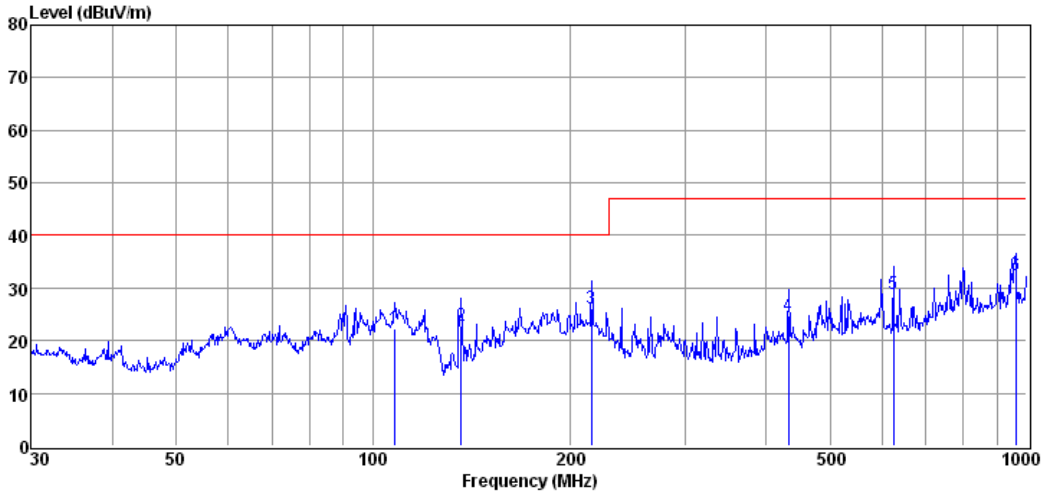
7.1.2 Test Setup and Procedure



1. The radiated emissions test was conducted in a semi-anechoic chamber.
2. The EUT was connected to AC power source through a mains power outlet which was bonded to the ground reference plane; The mains cables shall drape to the ground reference plane.
3. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.
4. Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emission spectrum signature data plots of the EUT.
5. The frequencies of maximum emission were determined in the final radiated emissions measurement, the physical arrangement of the test system and associated cabling was varied in order to determine the effect on the EUT's emissions in amplitude, direction and frequency. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization.

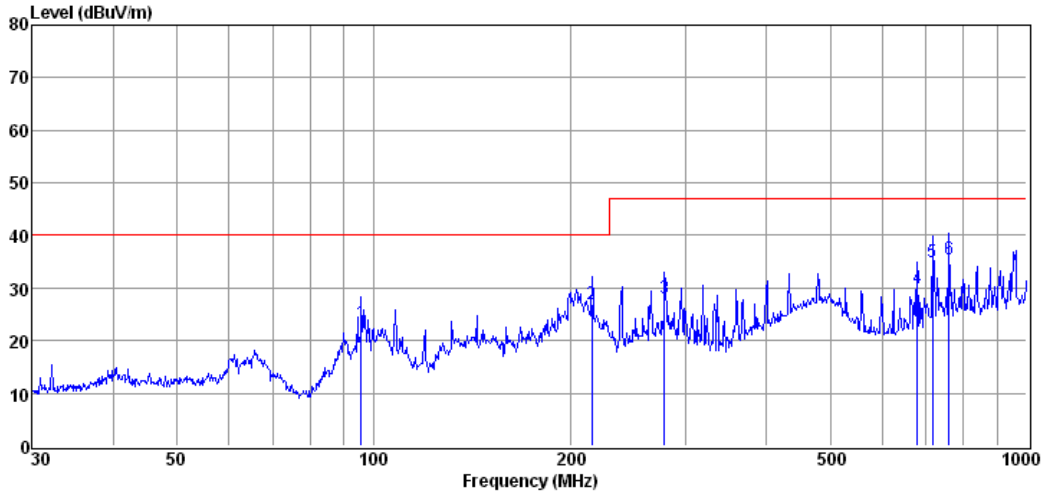
7.1.3 Measurement Data

Horizontal:



Item	Freq.	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Result Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBµV)	(dB/m)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	
1	107.89	35.92	9.91	24.70	1.08	22.21	40.00	-17.79	QP
2	136.46	34.83	11.57	24.70	1.21	22.91	40.00	-17.09	QP
3	216.02	40.09	9.14	24.60	1.58	26.21	40.00	-13.79	QP
4	432.55	30.99	15.64	24.40	2.39	24.62	47.00	-22.38	QP
5	625.08	30.49	19.70	24.20	2.98	28.97	47.00	-18.03	QP
6	962.16	28.45	24.00	23.75	3.82	32.52	47.00	-14.48	QP

Vertical:



Item	Freq.	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Result Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBµV)	(dB/m)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	
1	95.76	38.14	8.90	24.70	1.00	23.34	40.00	-16.66	QP
2	216.02	40.94	9.14	24.60	1.58	27.06	40.00	-12.94	QP
3	279.04	38.76	11.81	24.50	1.86	27.93	47.00	-19.07	QP
4	679.96	30.84	20.16	24.10	3.08	29.98	47.00	-17.02	QP
5	716.68	34.98	20.87	24.10	3.21	34.96	47.00	-12.04	QP
6	760.70	34.37	21.71	24.00	3.36	35.44	47.00	-11.56	QP

8 Electromagnetic Susceptibility Test Results

8.1 Performance Criteria Description in Clause 7 of EN 61000-6-1

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

8.2 ESD

Test Requirement:	EN 61000-6-1	
Test Method:	EN 61000-6-3	
Test Date:	October 18, 2016	
Discharge Impedance:	330 Ω / 150 pF	
Discharge Voltage:	Air Discharge:	8.0 kV
	Contact Discharge:	4.0 kV
	HCP/VCP:	4.0 kV
Polarity:	Positive & Negative	
Number of Discharge:	Minimum 10 times at each test point for Air Discharge; Minimum 50 times at each test point for Contact or VCP & HCP Discharge.	
Discharge Mode:	Single Discharge	
Discharge Period:	1 second minimum	

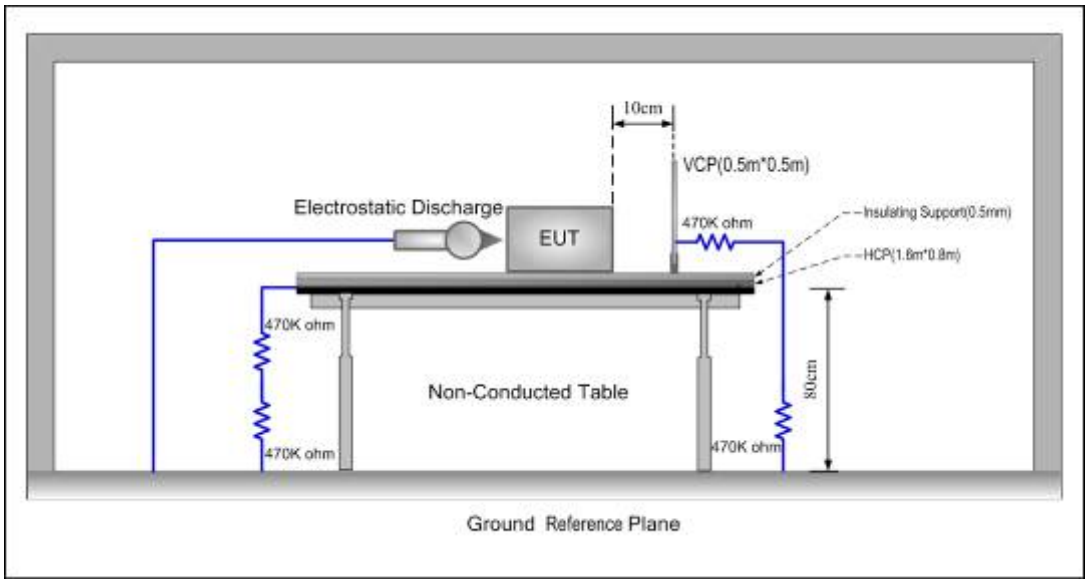
8.2.1 E.U.T. Operation

Operating Environment:

Temperature: 23.8 °C Humidity: 40 % RH Atmospheric Pressure: 101.5 kPa

Test mode: Transmission Mode

8.2.2 Test Setup and Procedure



1. Contact discharge was applied only to conductive surfaces of the EUT. Air discharge was applied only to non-conducted surfaces of the EUT.
2. The EUT was put on a 0.8m high wooden table for table-top equipment or 0.1m high for floor standing equipment standing on the ground reference plane (GRP).
3. A horizontal coupling plane(HCP) 1.6m by 0.8m in size was placed on the table, and the EUT with its cables were isolated from the HCP by an insulating support thick than 0.5mm. The VCP 0.5m by 0.5m in size while HCP were constructed from the same material type and thickness as that of the GRP, and connected to the GRP via a 470kΩ resistor at each end. The distance between EUT and any of the other metallic surface excepted the GRP, HCP and VCP was greater than 0.8m.
4. During the contact discharges, the tip of the discharge electrode was touch the EUT before the discharge switch is operated. During the air discharges, the round discharge tip of the discharge electrode was approached as fast as possible to touch the EUT.
5. After each discharge, the ESD generator was removed from the EUT, the generator is then retriggered for a new single discharge. For ungrounded product, a discharge cable with two resistances were used after each discharge to remove remnant electrostatic voltage. A minimum 50 times discharges at each point of each polarity single discharge were applied to HCP and VCP.

8.2.3 Test Results

Direct Application Test Results

Observations: Test Point:

1. All insulated enclosure & seams.
2. All accessible metal parts of the enclosure.

Direct Application				Test Results	
Discharge Level (kV)	Polarity (+/-)	Test Point	Test Mode	Contact Discharge	Air Discharge
8.0	+/-	1	Encrypt mode	N/A	A
4.0	+/-	2	Encrypt mode	N/A	N/A

Indirect Application Test Results

Observations: Test Point:

1. All sides.

Indirect Application				Test Results	
Discharge Level (kV)	Polarity (+/-)	Test Point	Test Mode	Horizontal Coupling	Vertical Coupling
4.0	+/-	1	Encrypt mode	A	A

Results:

A: During test, no degradation in the performance of the EUT was observed; After test, no degradation in the performance of the EUT was observed.

N/A: Not applicable (floor mounted EUT or not requested by Standard).

8.3 Radiated Immunity

Test Requirement:	EN 61000-6-1
Test Method:	EN 61000-6-1
Test Date:	October 18, 2016
Frequency Range:	80 MHz to 1 GHz
Antenna Polarization:	Horizontal & Vertical
Test level:	3.0 V/m on enclosure
Modulation:	80%, 1 kHz Amplitude Modulation

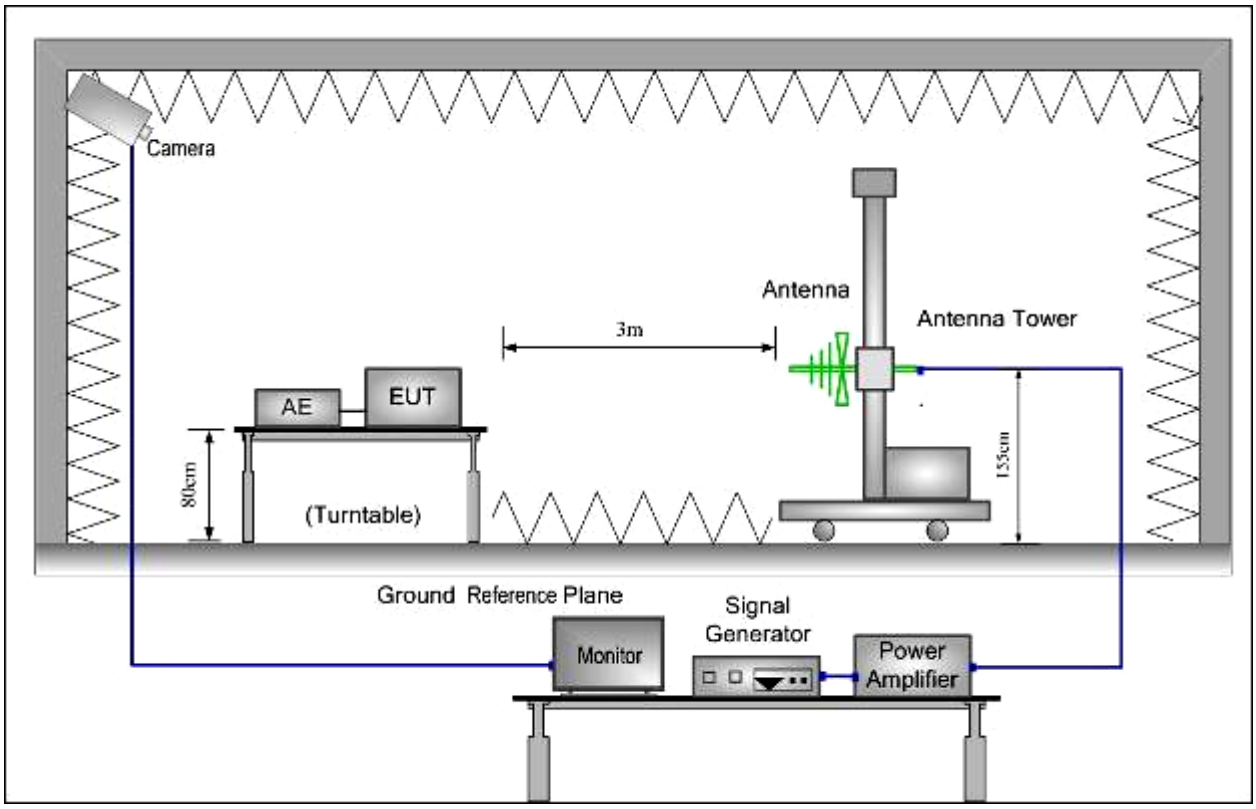
8.3.1 E.U.T. Operation

Operating Environment:

Temperature: 24.5 °C Humidity: 55 %RH Atmospheric Pressure: 100.4 kPa

Test mode: Transmission Mode

8.3.2 Test Setup and Procedure



1. For table-top equipment, the EUT was placed in the chamber on a non-conductive table 0.8m high. For arrangement of floor-standing equipment, the EUT was mounted on a non-conductive support 0.1m above the supporting plane. For human body-mounted equipment, the EUT may be tested in the same manner as table top items.
2. If possible, a minimum of 1 m of cable is exposed to the electromagnetic field. Excess length of cables interconnecting units of the EUT shall be bundled low-inductively in the approximate center of the cable to form a bundle 30 cm to 40 cm in length.
3. The EUT was initially placed with one face coincident with the calibration plane. The EUT face being illuminated was contained within the UFA (Uniform Field Area).
4. The frequency ranges to be considered were swept with the signal modulated and pausing to adjust the RF signal level or to switch oscillators and antennas as necessary. Here the frequency range was swept incrementally, the step size was not exceed 1% of the preceding frequency value.
5. The dwell time of the amplitude modulated carrier at each frequency was not be less than the time necessary for the EUT to be exercised and to respond, and was not less than 0.5 s.
6. The test normally was performed with the generating antenna facing each side of the EUT.
7. The polarization of the field generated by each antenna necessitates testing each selected side twice, once with the antenna positioned vertically and again with the antenna positioned horizontally.
8. The EUT was performed in a configuration to actual installation conditions, a video camera and/or a audio monitor were used to monitor the performance of the EUT.

8.3.3 Test Results

Frequency	Level	Modulation	Test Mode	Antenna Polarization	EUT Face	Result / Observations
80 MHz-1 GHz	3.0 V/m	1 kHz, 80% Amp. Mod, 1 % increment	Transmission Mode	V	Front	A
				H		A
				V	Rear	A
				H		A
				V	Left	A
				H		A
				V	Right	A
				H		A
				V	Top	N/A
				H		N/A
				V	Bottom	N/A
				H		N/A

Remarks:

Front: the front of the EUT faces to transmitting antenna (refer to Radiated Immunity test setup photo)

A: During test, no degradation in the performance of the EUT was observed; After test, no degradation in the performance of the EUT was observed.

N/A: Not applicable.

The EUT does meet the Radiated Immunity requirements of Standard.

9 Photographs

9.1 Radiated Emission & Radiated Immunity Test Setup

9.2 EUT Constructional Details

XZ-JJE

OCS-XZ-JJE(P)

---The end of report---