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TEST REPORT

Application No.:	GZEM1706003272IT
Applicant:	WuHan Sunon Electronics Co.,Ltd
Address of Applicant:	Yougang village Qianchuan Street, Huangpi district, WuHan, Hubei Province
Manufacturer:	WuHan Sunon Electronics Co.,Ltd
Address of Manufacturer:	Yougang village Qianchuan Street, Huangpi district, WuHan, Hubei Province
Factory:	WuHan Sunon Electronics Co.,Ltd
Address of Factory:	Yougang village Qianchuan Street, Huangpi district, WuHan, Hubei Province
Equipment Under Test (EUT):	
EUT Name:	quartz watch movement
Model No.:	SL68, SL39, SL32, SL33, PE90, PE21, PE39, PE11, PE32, PE33, PE41, PE42, PE45, PE46, PE48, PE49, PE50, PE60, PE70, PE80, PE81, PE93¤
¤	Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.
Trade Mark:	SUNON
Standards:	EN 61000-6-3:2007 +A1:2011
	EN 61000-6-1:2007
Date of Receipt:	2017-06-07
Date of Test:	2017-06-08 to 2017-06-12
Date of Issue:	2017-06-14
Test Result :	**Pass***

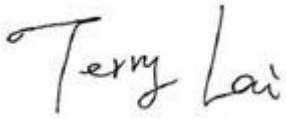
* In the configuration tested, the EUT complied with the standards specified above.

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

Kobe Jian
EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.
If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.
The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
00		2017-06-14		Original

Authorized for issue by:				
Tested By		 **Simon_Cai /Project Engineer**		2017-06-08 to 2017-06-12 **Date**
Checked By		 **Terry_Lai /Reviewer**		2017-06-14 **Date**

2 Test Summary

Emission Part				
Item	**Standard**	**Method**	**Requirement**	**Result**
Radiated Disturbance (30MHz-1GHz)	EN 61000-6-3:2007 +A1:2011	CISPR 16-2-3	N/A	Pass

N/A: Not applicable

Immunity Part				
Item	**Standard**	**Method**	**Requirement**	**Result**
Electrostatic Discharge	EN 61000-6-1:2007	EN 61000-4-2:2009	4kV Contact Discharge 8kV Air Discharge	Pass
Radiated Immunity (80MHz-2.7GHz)	EN 61000-6-1:2007	EN 61000-4-3:2006 +A1:2008+A2:2010	3V/m, 80%, 1kHz Amp. Mod. 3V/m, 80%, 1kHz Amp. Mod. 1V/m, 80%, 1kHz Amp. Mod.	Pass

N/A: Not applicable

¤ Declaration of EUT Family Grouping:

Model No.: SL68, SL39, SL32, SL33, PE90, PE21, PE39, PE11, PE32, PE33, PE41, PE42, PE45, PE46, PE48, PE49, PE50, PE60, PE70, PE80, PE81, PE93

According to the declaration from the applicant, the electrical circuit design, layout, components used and internal wiring were identical for all models, with only difference being the outer decoration, appearance and model name.

Therefore only one model **PE90** was tested in this report.

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4 General Information

4.1 Details of E.U.T.

Power Supply: DC 1.5V size of "LR41" button cell

4.2 Description of Support Units

The EUT has been tested as an independent unit.

4.3 Measurement Uncertainty

EMC

No.	Item	Measurement Uncertainty
1	Conducted Disturbance Voltage at Mains Terminals	3.63dB (9kHz to 150kHz)
		3.22dB (150kHz to 30MHz)
2	Disturbance Power	3.78dB
3	Radiated Disturbance	5.0dB (30MHz-1GHz)
		5.0dB (1GHz-6GHz)
4	Radiated Immunity	2.18dB(80MHz-3GHz)
5	Conducted Immunity	3.5dB(150kHz-230MHz)
6	ESD	6 %
7	EFT (Electrical Fast Transients)	4 %
8	Surge Immunity	6%
9	Voltage Dips and Interruptions	4 %
10	CISPR 20 Immunity	1.5dB
11	Temperature	0.4℃
12	Humidity	1.3%
13	DC power	0.5 %

4.4 Standards Applicable for Testing

Table 1 : Tests Carried Out Under EN 61000-6-3:2007 +A1:2011

Item	Status
Conducted Disturbance at Mains Terminals (150kHz-30MHz)	×
Conducted Disturbance at Telecommunication Port (150kHz-30MHz)	×
Discontinuous Disturbance (150kHz-30MHz)	×
Radiated Disturbance (30MHz-1GHz)	√
Radiated Disturbance (above 1GHz)	×
Harmonic Current Emission	×
Voltage Fluctuations and Flicker	×
Conducted Disturbance at DC Terminals (150kHz-30MHz)	×

Table 2 : Tests Carried Out Under EN 61000-6-1:2007

Item	Status
Electrostatic Discharge	√
Electrical Fast Transients/Burst at Power Port	×
Electrical Fast Transients/Burst at Signal Port	×
Surge at Power Port	×
Conducted Immunity at Power Port (150kHz-80MHz)	×
Conducted Immunity at Signal Port (150kHz-80MHz)	×
Power Frequency Magnetic Field	×
Voltage Dips and Interruptions	×
Radiated Immunity (80MHz-2.7GHz)	√
Electrical Fast Transients/Burst at DC port	×
Surge at DC Port	×
Conducted Immunity at DC Port (150kHz-80MHz)	×

× Indicates that the test is not applicable
√ Indicates that the test is applicable

4.5 Test Location

All tests were performed at:
SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou Branch EMC Laboratory,
198 Kezhu Road, Scientech Park, Guangzhou Economic & Technology Development District,
Guangzhou, China 510663
Tel: +86 20 82155555 Fax: +86 20 82075059
No tests were sub-contracted.

4.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **NVLAP (Lab Code: 200611-0)**

  SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

  The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

- **ACMA**

  SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our NVLAP accreditation.

- **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO**

  Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

- **CNAS (Lab Code: L0167)**

  SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAS-CL01:2006 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of Testing Laboratories.

- **FCC (Registration No.: 282399)**

  SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 282399, May 31, 2002.

- **Industry Canada (Registration No.: 4620B-1)**

  The 3m/10m Alternate Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd., has been registered by Certification and Engineering of Industry Canada for radio equipment testing with Registration No. 4620B-1.

- **VCCI (Registration No.: R-2460, C-2584, G-449 and T-1179)**

  The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co. Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2460, C-2584, G-449 and T-1179 respectively.

- **CBTL (Lab Code: TL129)**

  SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2005, the Basic Rules, IECEE 01 and Rules of procedure IECEE 02, and the relevant IECEE CB-Scheme Operational documents.

4.7 Deviation from Standards

None

4.8 Abnormalities from Standard Conditions

None

4.9 Monitoring of EUT for All Immunity Test

Visual: Pointer rotating of EUT
Audio: N/A

5 Equipment List

Radiated Disturbance (30MHz-1GHz)					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Compact Semi-Anechoic Chamber	ChangZhou ZhongYu	N/A	EMC0525	2016-12-04	2019-12-03
EMI Test Receiver	Rohde & Schwarz	ESIB26	EMC0522	2017-01-20	2018-01-19
EMI Test Receiver	Rohde & Schwarz	ESCI	EMC0056	2017-01-20	2018-01-19
RI High frequency Cable	SGS	20 m	EMC0528	2015-04-19	2018-04-18
Log-Periodic Dipole Antenna	R& S	HL223	EMC0504	2015-08-24	2018-08-23
Trilog Broadband Antenna 30MHz-1GHz	SCHWARZBECK MESS-ELEKTRONIK	VULB 9160	EMC2025	2016-09-08	2019-09-07
Bi-log Type Antenna	Schaffner -Chase	CBL6112B	EMC0524	2016-09-08	2019-09-07
Bilog Type Antenna	Schaffner -Chase	CBL6143	EMC0519	2017-05-04	2020-05-03
Horn Antenna 1GHz-18GHz	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	EMC2026	2016-09-09	2019-09-08
1GHz-26.5GHz Pre-Amplifier	Agilent	8449B	EMC0521	2017-01-20	2018-01-19
Amplifier	HP	8447F	EMC2065	2016-07-04	2017-07-03
PRE AMPLIFIER MH648A	ANRITSU CORP	MH648A	EMC2086	2016-12-02	2017-12-01
Active Loop Antenna	EMCO	6502	EMC0523	2015-02-25	2018-02-26
Broad-Band Horn Antenna (14)15GHz-26.5(40)GHz	SCHWARZBECK MESS-ELEKTRONI	BBHA 9170	EMC2041	2016-05-26	2017-05-25
High Pass Filter (915MHz)	FSY MICROWAVE	HM1465-9SS	EMC2079	2017-01-20	2018-01-19
2.4GHz filter	Micro-Tronics	BRM 50702	EMC2069	2017-01-20	2018-01-19
10m Semi-Anechoic Chamber	ETS	N/A	EMC0530	2015-04-30	2018-04-29

Electrostatic Discharge					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
ESD Simulator	TESEQ AG	NSG 435	EMC2071	2017-01-20	2018-01-19
ESD Ground Plane	SGS	3m x 3m	EMC0804	N/A	N/A
Temperature, & Humidity	Shanghai Meteorological Instrument factory Co., Lt	ZJ1-2B	EMC0078	2016-08-18	2017-08-17

Radiated Immunity (80MHz-2.7GHz)					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Compact 3m Semi-Anechoic Chamber	ChangZhou ZhongYu	N/A	EMC0525	2016-12-04	2019-12-03
Laser probe Interface	Rf Microwave Instrumentation	FI7000	EMC2089	N/A	N/A
Open Swihch and control unit	R&S	OSP130	EMC2090	N/A	N/A
Broadband Amplifier (80MHz~1GHz/250W)	R&S	BBA150	EMC2091	2017-01-20	2018-01-19
Broadband Amplifier (800MHz~3GHz/110W)	R&S	BBA150	EMC2092	2017-01-20	2018-01-19
Signal Generator	R&S	SMB100A	EMC2093	2017-01-20	2018-01-19
Laser probe	Rf Microwave Instrumentation	FL7006	EMC2094	2017-01-24	2018-01-23
NRP-Z91 Power Sensor 6GHz	R&S	NPR-Z91	EMC2095	2017-01-20	2018-01-19
NRP-Z91 Power Sensor 6GHz	R&S	NPR-Z91	EMC2096	2017-01-20	2018-01-19
High-Gain Log-preiodic Antema	R&S	HL046E	EMC2097	2016-02-15	2019-02-14
RI Cable	R&S	7m	EMC2098	2017-05-23	2018-05-22
Oscilloscope	Tektronix	TDS3052C	EMC2055	2017-01-20	2018-01-19
Monitor System	Mitsubish Corp.	M-0552AB	EMC0909	N/A	N/A

General used equipment					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
DMM	Fluke	73	EMC0006	2016-09-01	2017-08-31
DMM	Fluke	73	EMC0007	2016-09-01	2017-08-31

6 Emission Test Results

6.1 Radiated Disturbance (30MHz-1GHz)

Test Requirement:	EN 61000-6-3:2007 +A1:2011
Test Method:	CISPR 16-2-3
Frequency Range:	30MHz to 1GHz
Measurement Distance:	3m
Limit:	
30MHz-230MHz	40 dB(μV/m) quasi-peak
230MHz-1GHz	47 dB(μV/m) quasi-peak
Detector:	Peak for pre-scan (120kHz resolution bandwidth) 30MHz to 1GHz

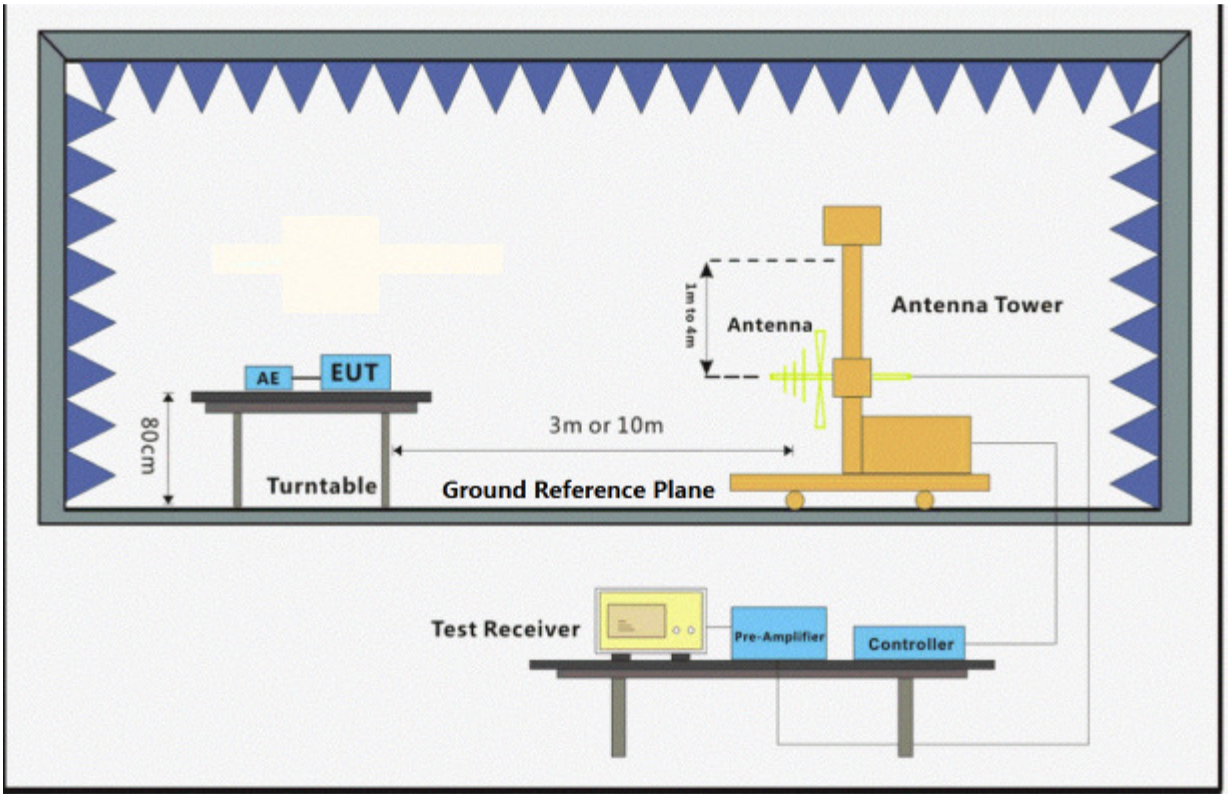
6.1.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 55 % RH Atmospheric Pressure: 1002 mbar

Test mode a:Test the EUT in clock mode.

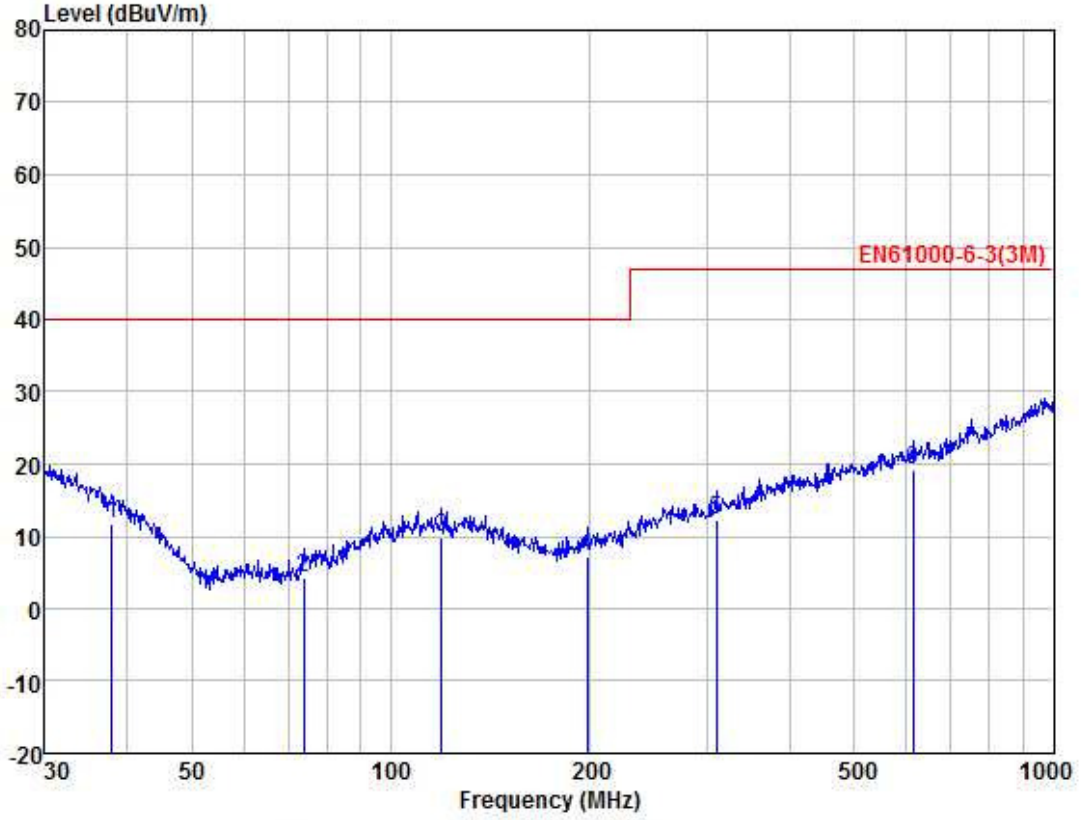
6.1.2 Test Setup Diagram



6.1.3 Measurement Data

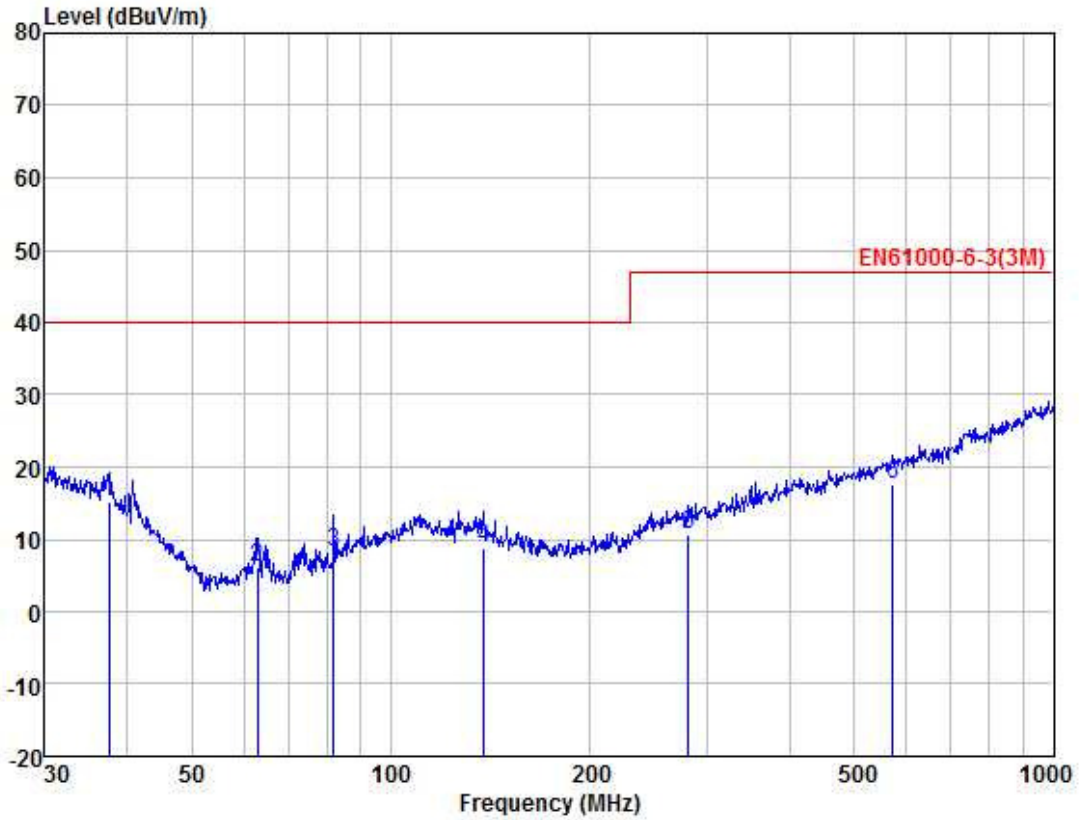
An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities.

Mode:a; Polarization:Horizontal



	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	37.8	25.1	15.7	0.6	29.7	11.7	40.0	-28.3	HORIZONTAL	QP
2	73.9	27.9	5.1	0.8	29.6	4.2	40.0	-35.8	HORIZONTAL	QP
3	119.0	26.4	11.8	1.2	29.6	9.8	40.0	-30.2	HORIZONTAL	QP
4	197.9	26.5	8.8	1.5	29.6	7.2	40.0	-32.8	HORIZONTAL	QP
5	310.0	27.1	13.2	1.8	29.8	12.3	47.0	-34.7	HORIZONTAL	QP
6	614.2	27.9	18.5	2.7	30.0	19.1	47.0	-27.9	HORIZONTAL	QP

Mode:a; Polarization:Vertical



	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	37.5	28.6	15.8	0.6	29.7	15.3	40.0	-24.7	VERTICAL	QP
2	62.9	30.1	4.7	0.8	29.6	6.0	40.0	-34.0	VERTICAL	QP
3	81.8	30.2	6.8	0.9	29.6	8.3	40.0	-31.7	VERTICAL	QP
4	137.9	26.0	11.2	1.3	29.6	8.9	40.0	-31.1	VERTICAL	QP
5	281.0	26.3	12.3	1.8	29.8	10.6	47.0	-36.4	VERTICAL	QP
6	572.6	26.8	18.4	2.4	30.1	17.5	47.0	-29.5	VERTICAL	QP

7 Immunity Test Results

7.1 Performance Criteria Description in EN 61000-6-1:2007

Criterion A The apparatus shall continue to operate as intended during and after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus 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, either of these may be derived from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.

Criterion B The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed. No change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.

Criterion C Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.

7.2 Electrostatic Discharge

Test Requirement:	EN 61000-6-1:2007
Test Method:	EN 61000-4-2:2009
Performance Criterion:	B
Discharge Impedance:	330Ω/150pF
Number of Discharge:	Minimum 10 times at each test point
Discharge Mode:	Single Discharge
Discharge Period:	1 second minimum

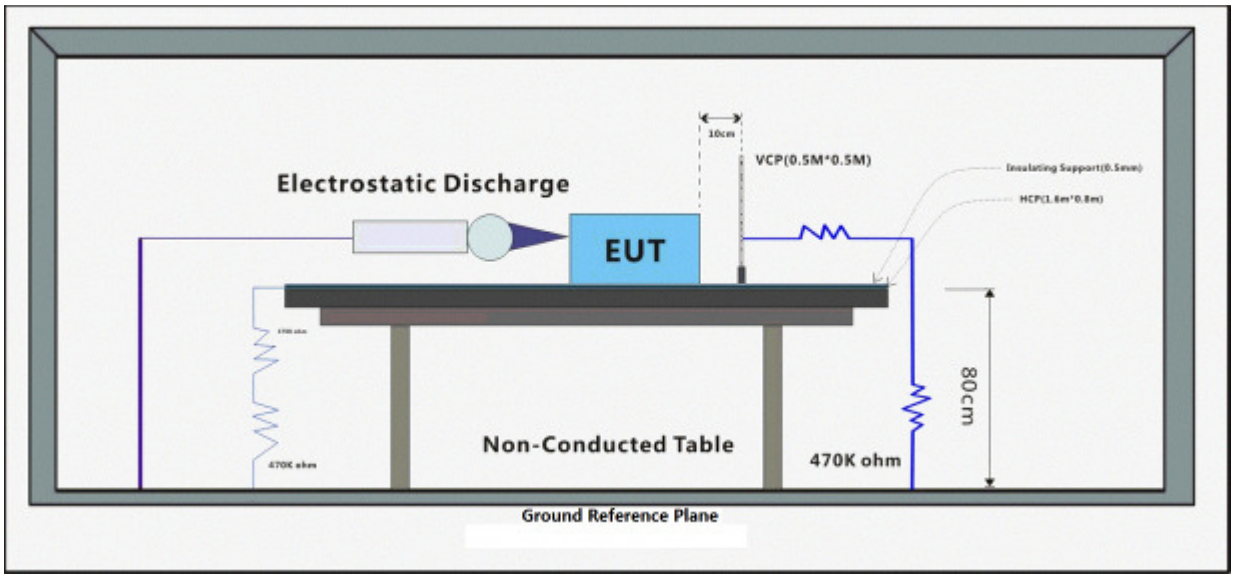
7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 55 % RH Atmospheric Pressure: 1002 mbar

Test Mode: a:Test the EUT in clock mode.

7.2.2 Test Setup Diagram



7.2.3 Test Results:

Observations: Test Point:

1. All insulated enclosure and seams.
2. All accessible metal parts of the enclosure.
3. All side

Discharge type	Level (kV)	Polarity	Test Point	Result / Observations
Air Discharge	2,4,8	+	1	A
Air Discharge	2,4,8	-	1	A
Contact Discharge	4	+	2	A
Contact Discharge	4	-	2	A
Horizontal Coupling	4	+	3	A
Horizontal Coupling	4	-	3	A
Vertical Coupling	4	+	3	A
Vertical Coupling	4	-	3	A

Results:

A: No degradation in the performance of the EUT was observed.

7.3 Radiated Immunity (80MHz-2.7GHz)

Test Requirement: EN 61000-6-1:2007
Test Method: EN 61000-4-3:2006 +A1:2008+A2:2010
Performance Criterion: A
Frequency Range: 80MHz to 1GHz, 1.4GHz to 2GHz, 2GHz to 2.7GHz
Antenna Polarisation: Vertical and Horizontal
Modulation 1kHz,80% Amp. Mod,1% increment

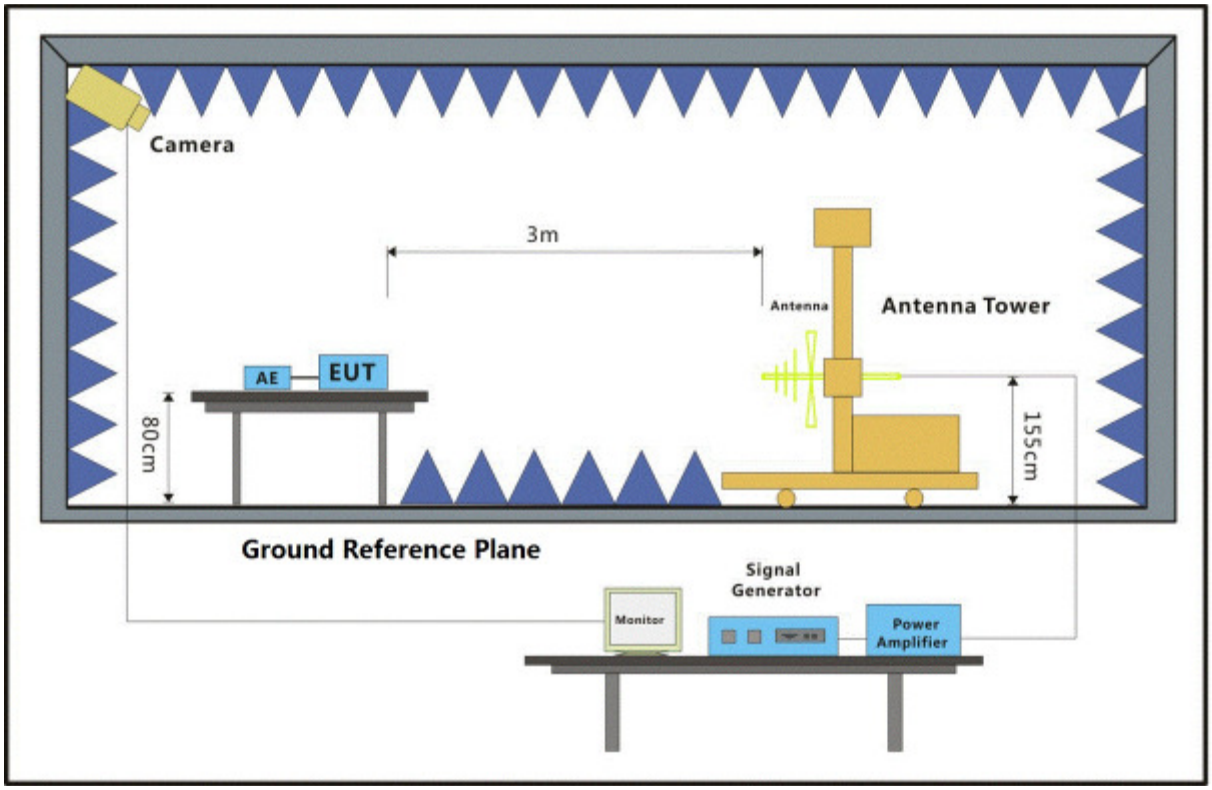
7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 55 % RH Atmospheric Pressure: 1002 mbar

Test Mode: a:Test the EUT in clock mode.

7.3.2 Test Setup Diagram



7.3.3 Test Results:

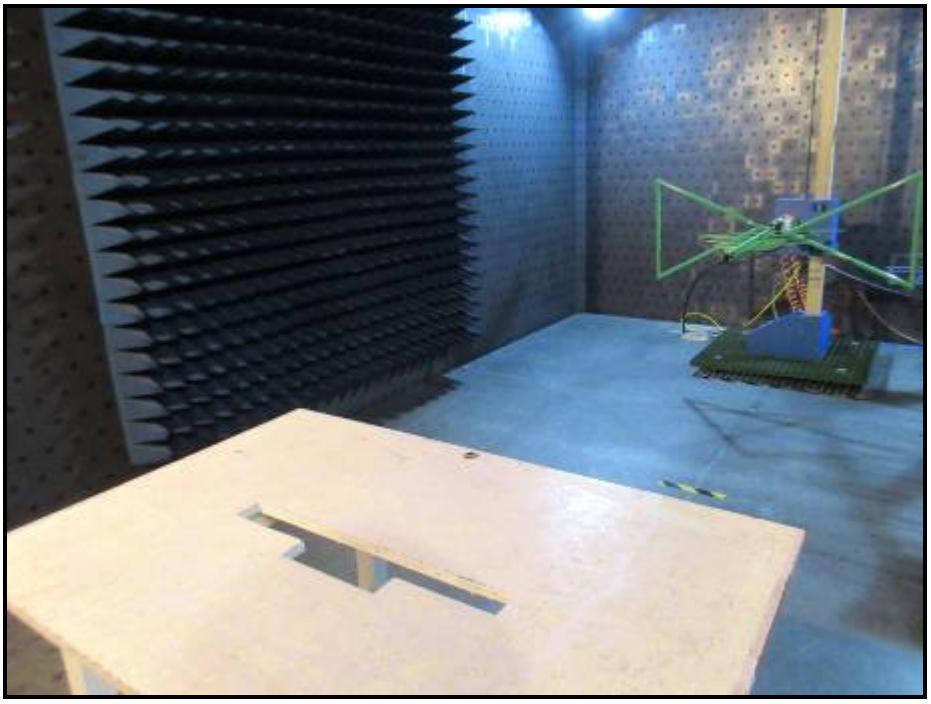
Frequency	Level (V/m)	EUT Face	Dwell time	Result / Observations
80MHz-1GHz	3	Front	2s	A
80MHz-1GHz	3	Back	2s	A
80MHz-1GHz	3	Left	2s	A
80MHz-1GHz	3	Right	2s	A
80MHz-1GHz	3	Top	2s	A
80MHz-1GHz	3	Underside	2s	A
1.4GHz-2GHz	3	Front	2s	A
1.4GHz-2GHz	3	Back	2s	A
1.4GHz-2GHz	3	Left	2s	A
1.4GHz-2GHz	3	Right	2s	A
1.4GHz-2GHz	3	Top	2s	A
1.4GHz-2GHz	3	Underside	2s	A
2GHz-2.7GHz	1	Front	2s	A
2GHz-2.7GHz	1	Back	2s	A
2GHz-2.7GHz	1	Left	2s	A
2GHz-2.7GHz	1	Right	2s	A
2GHz-2.7GHz	1	Top	2s	A
2GHz-2.7GHz	1	Underside	2s	A

Results:

A: No degradation in the performance of the EUT was observed.

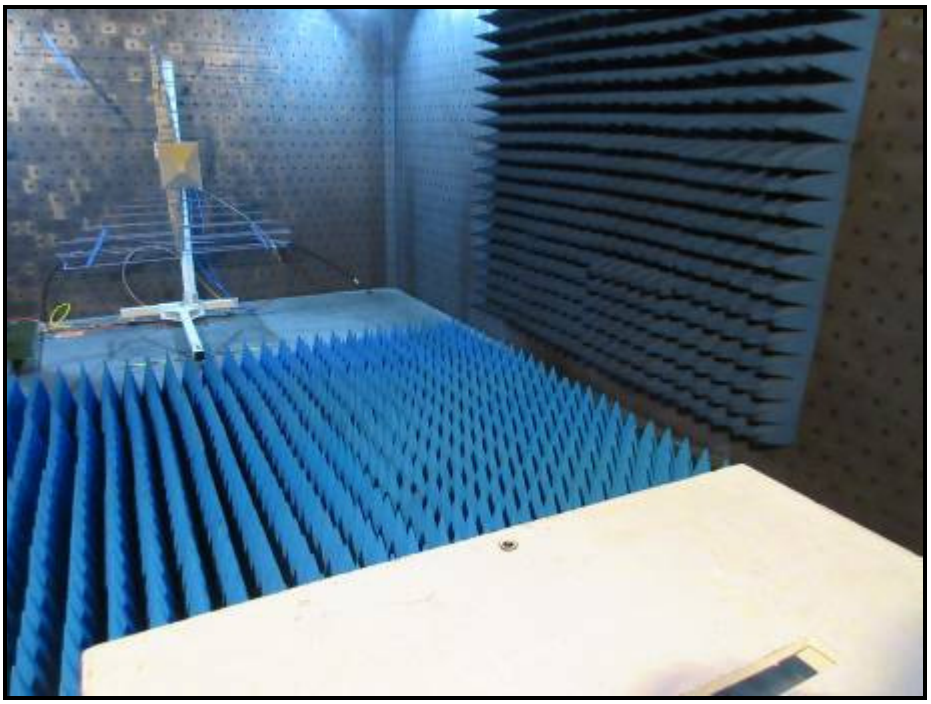
8 Photographs

8.1 Radiated Disturbance (30MHz-1GHz) Test Setup

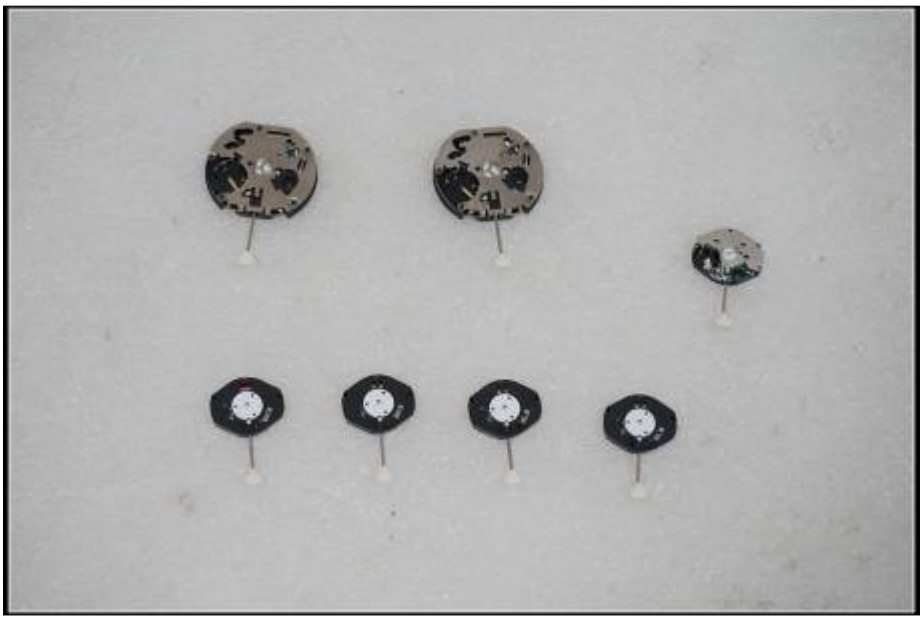


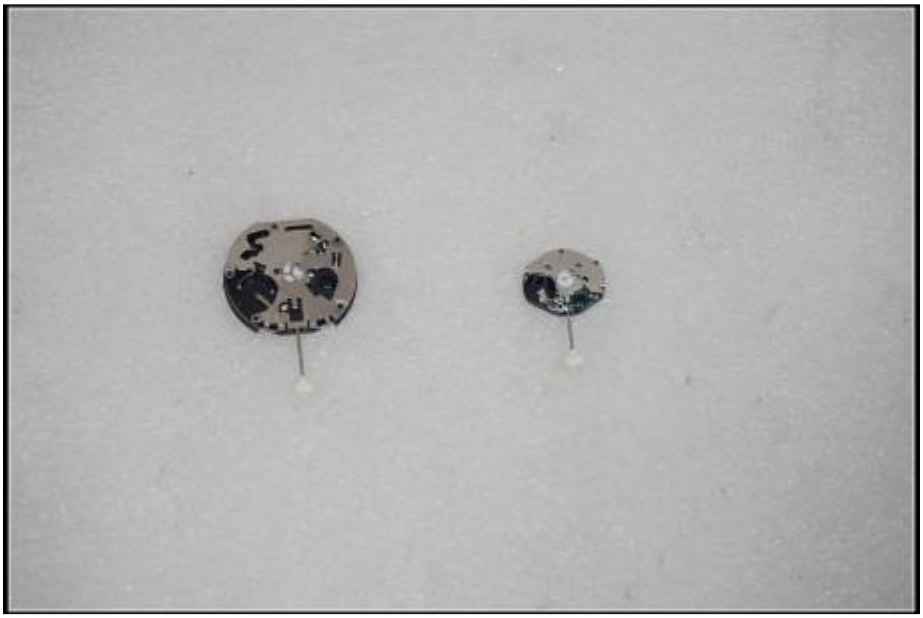
8.2 Electrostatic Discharge Test Setup

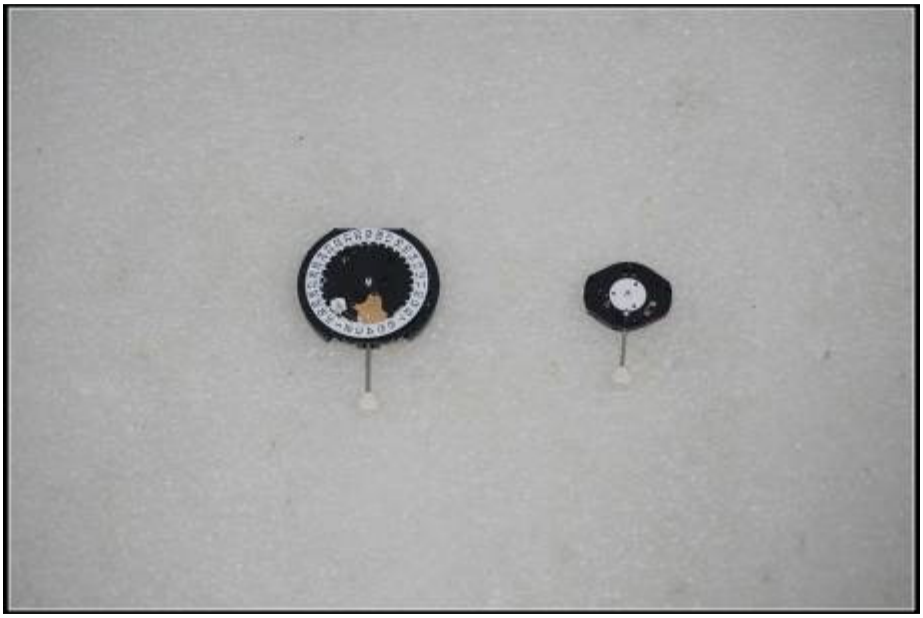
8.3 Radiated Immunity (80MHz-2.7GHz) Test Setup



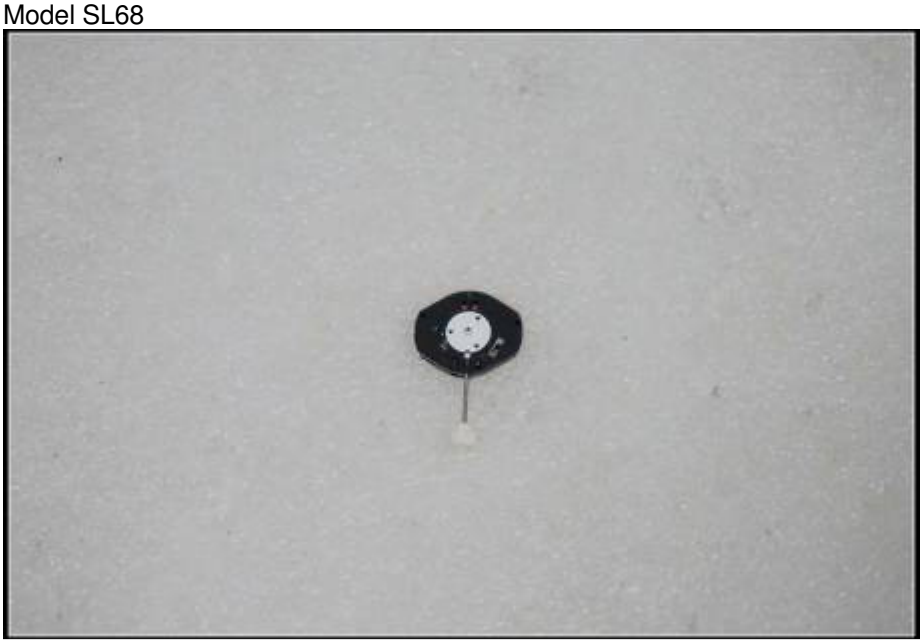
8.4 EUT Constructional Details

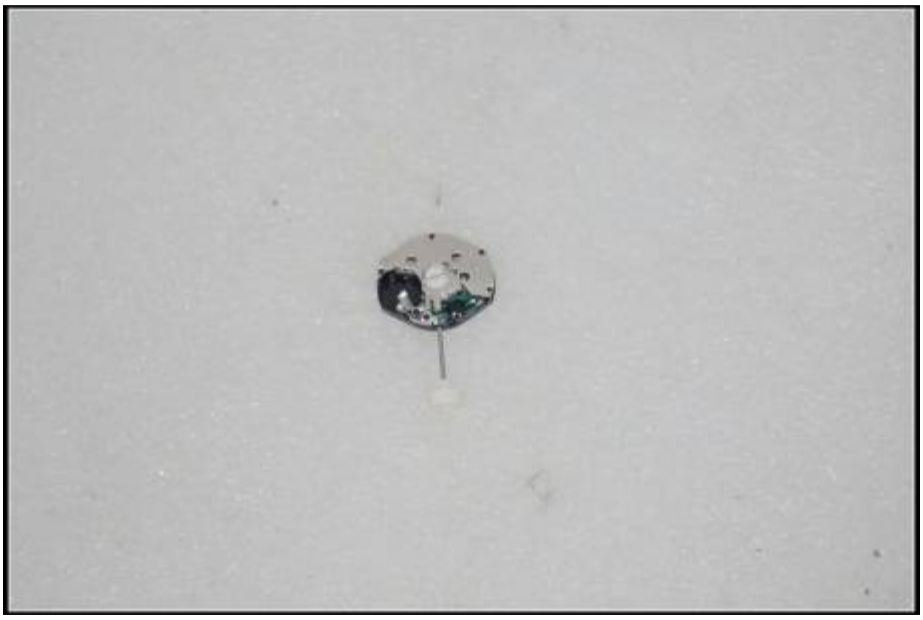






Model SL68





--End of Report--