



CE EMC TEST REPORT

Report No.: RPA-16JY0025VNTY-65
MODEL NO.: DH-SD59xyzuv-Hab;SD59xyzuv-Hab; DH-SD59220T-PV1-HN
(X=1-9 or blank; y=0-9; z=0-9; u=A-Z or blank; v= N,P
or blank; a= C,N or blank; b=l or blank)

Received: Mar 15, 2016

ISSUED: Mar 26, 2016

Applicant: Zhejiang Dahua Vision Technology Co., Ltd.

Address: No.1199, Bin'an road, Binjiang District, Hangzhou,
P.R.China

Issued By: BUREAU VERITAS ADT (Shanghai) Corporation

Lab Location: 2F, Building C, No.1618, Yishan Rd., 201103, Shanghai, China

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1. TEST PROGRAM

PRODUCT: 5 INCH IR SPEED DOME
MODEL NO.: DH-SD59xyzuv-Hab;SD59xyzuv-Hab; DH-SD59220T-PV1-HN
(X=1-9 or blank; y=0-9; z=0-9; u=A-Z or blank; v= N,P
or blank; a= C,N or blank; b=l or blank)
APPLICANT: Zhejiang Dahua Vision Technology Co., Ltd.
TESTED: Mar 21, 2016
STANDARDS: EN 55032: 2012+AC:2013 (Class B)
EN 61000-6-3: 2007+A1:2011
EN 50130-4: 2011
EN 61000-3-2: 2014
EN 61000-3-3: 2013
EN 55024: 2010
IEC 61000-4-2: 2008
IEC 61000-4-3: 2006+A1: 2007+A2: 2010
IEC 61000-4-4: 2012
IEC 61000-4-5: 2014
IEC 61000-4-6: 2013
IEC 61000-4-8: 2009
IEC 61000-4-11: 2004

We, BUREAU VERITAS ADT (Shanghai) Corporation, declare that the equipment above has been tested in Cerpass Technology Corp., and found compliance with the requirement limits of applicable standards. The test record, data evaluation and Equipment Under Test (EUT) configurations represented herein are true and accurate under the standards herein specified.

PREPARED BY : Sally Wan, **DATE:** Mar 26, 2016
Sally Wan
Report Engineer

TECHNICAL ACCEPTANCE : Joy ZHU, **DATE:** Mar 26, 2016
Joy ZHU
Testing Manager

APPROVED BY : Zhaoqian YU, **DATE:** Mar 26, 2016
Zhaoqian YU
Lab Manager



2. Summary of Test Procedure and Test Results

| EMISSION[EN55032: 2012+AC:2013 / EN 61000-6-3: 2007/A1:2011] | | |
|---|---|-------------|
| Test Item | Normative References | Test Result |
| Conducted Emission | EN55032: 2012+AC:2013 EN 61000-6-3: 2007/A1:2011 | PASS |
| Radiated Emission | EN55032: 2012+AC:2013 EN 61000-6-3: 2007/A1:2011 | PASS |
| Harmonics | EN 61000-3-2: 2014 | PASS |
| Voltage Fluctuations | EN 61000-3-3: 2013 | PASS |

| IMMUNITY (EN 55024 : 2010) | | |
|---|--|-------------|
| Test Item | Test Spec | Test Result |
| Electrostatic Discharge Immunity Test (ESD) | ± 4 kV (contact discharge, HCP/VCP) ± 8 kV (Air discharge) | PASS |
| Radio Frequency electromagnetic field immunity test (RS) | 80-1000 MHz, 3V/m, 80%AM(1KHz) | PASS |
| Electrical Fast Transient/ Burst Immunity Test (EFT) | AC Port: ± 1 kV, Signal Port: ± 0.5 kV | PASS |
| Surge Immunity Test | AC Power Ports: Line to Line: ± 1 kV Line to earth: ± 2 kV Signal and telecommunication port: ± 1 kV | PASS |
| Conduction Disturbances induced by Radio-Frequency Fields | 0.15-80MHz, 3V, 80%AM(1KHz) | PASS |
| Power Frequency Magnetic Field Immunity Test | 50Hz, 1A/m | PASS |
| Voltage Dips and Voltage Interruptions Immunity Test | Voltage dips: >95% Reduction, 0.5 Durations (Cycle) | PASS |
| | 30% Reduction, 25 Durations (Cycle) | PASS |
| | Voltage interruptions: >95% Reduction, 250 Durations (Cycle) | PASS |



| IMMUNITY (EN 50130-4: 2011) | | |
|---|--|-------------|
| Test Item | Test Spec | Test Result |
| Electrostatic Discharge Immunity Test (ESD) | ± 6 kV (contact discharge ,HCP/VCP) ± 8 kV (Air discharge) | PASS |
| Radio Frequency electromagnetic field immunity test (RS) | 80-2700 MHz, 10V/m, 80%AM(1KHz) | PASS |
| Electrical Fast Transient/ Burst Immunity Test (EFT) | AC Port: ± 2.0 kV, Signal Port: ± 1.0 kV | PASS |
| Surge Immunity Test | AC Power Ports: line to line: ± 0.5 , ± 1 kV line to earth: ± 0.5 , ± 1 , ± 2 kV Signal Port: ± 0.5 , ± 1 kV | PASS |
| Conduction Disturbances induced by Radio-Frequency Fields | 0.15-100MHz, 10V, 80%AM(1KHz) | PASS |
| Voltage Dips and Voltage Interruptions Immunity Test | Voltage Interruptions: 100% Reduction, 250 Cycle | PASS |
| | Voltage Dips: 60% Reduction, 10 Cycle 30% Reduction, 25 Cycle 20% Reduction, 250 Cycle | PASS |



History of this test report

☐ ORIGINAL.

■ Additional attachment as following record:

| Report No | Version | Date | Description |
|---------------------|---------|--------------|---|
| SECE1404110 | Rev 01 | May 16, 2014 | Original |
| SECE1404110-A | Rev 02 | Aug 26, 2014 | First edition (Update the Equipment, model name and standard) |
| RPA-16JY0025VNTY-65 | Rev 03 | Mar 26, 2016 | Second edition (update instruction) |
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3. Immunity Testing Performance Criteria Definition

- A. Normal performance within limits specified by the manufacture, requestor or purchaser;
- B. Temporary loss of function or degradation of performance which ceases after the disturbance ceases, and from which the equipment under test recovers its normal performance, without operator intervention;
- C. Temporary loss of function or degradation of performance, the correction of which requires operation intervention;
- D. Loss of function or degradation of performance which is not recoverable, owing to damage to hardware or software, or loss of data.



4. Test Configuration of Equipment under Test

4.1. Manufacturer

Zhejiang Dahua Vision Technology Co., Ltd.

No.1199, Bin'an road, Binjiang District, Hangzhou, P.R. China

4.2. Feature of Equipment under Test

First edition:

| | | |
|----------------------|---|--|
| 5 INCH IR SPEED DOME | Model No.: | DH-SD59xyzuv-Hab;SD59xyzuv-Hab; DH-SD59220T-PV1-HN (X=1-9 or blank; y=0-9; z=0-9; u=A-Z or blank; v= N,P or blank; a= C,N or blank; b=l or blank) |
| Remark | 1) SD59100AN-HCI was selected as the test model and its data have been recorded in this report. 2) Their sales regions are different. | |
| Adapter | Model No.: | HKA-A24300-230 |
| | Input : | 230V~ 50/60Hz 375mA |
| | Output : | 24V ~ 3000mA 72VA |

Original:

| | | |
|---------------------|---|---------------------------------|
| IR HDCVI SPEED DOME | Model No.: | SD59100AN-HCI, DH-SD59100AN-HCI |
| Remark | 1) SD59120I-HC was selected as the test model and its data have been recorded in this report. 2) Their sales regions are different. | |
| Adapter | Model No.: | HKA-A24300-230 |
| | Input : | 230V~ 50/60Hz 375mA |
| | Output : | 24V ~ 3000mA 72VA |



4.3. Test Software and Test Mode

Test Software

- a During testing, the interface cables and equipment positions were varied according to Europe Standard.
- b Turn on the power of all equipment.
- c The complete test system included the DVR, Monitor and EUT for EMI & EMS test.

The pre-test modes

Test Mode 1: Normal Operation

Select the worst case of the pre-test modes as the final test mode

Test Mode 1: Normal Operation

4.4. Description of Support Unit

| No. | Device | Manufacturer | Model No. | Description |
|-----|---------|--------------|-----------|-------------------|
| 1 | Monitor | PTS | PTS-1401C | Non-Shielded,1.8m |
| 2 | DVR | DAHUA | DVR5208 | Non-Shielded,1.5m |

| Item | Cable | Quantity | Description |
|------|-----------|----------|-----------------|
| A | BNC Cable | 1 | Shielded, >3.0m |
| B | BNC Cable | 1 | Shielded, >3.0m |

4.5. Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

| Measurement | Frequency | Uncertainty |
|---------------------|---------------|---------------|
| Conducted emissions | 0.09MHz-30MHz | +/- 1.2462 dB |

| Measurement | Polarity | Frequency | Uncertainty |
|------------------------------------|----------|--------------------|--------------|
| Radiated emissions (below 1GHz) | H | 30MHz ~ 200MHz | +/- 4.0246dB |
| | | 200MHz ~1000MHz | +/- 3.8673dB |
| | V | 30MHz ~ 200MHz | +/- 4.0242dB |
| | | 200MHz ~1000MHz | +/- 3.8688dB |
| Radiated emissions (above 1GHz) | H | 1000MHz ~18000MHz | +/- 3.8856dB |
| | | 18000MHz ~40000MHz | +/- 3.8674dB |
| | V | 1000MHz ~18000MHz | +/- 3.8852dB |
| | | 18000MHz ~40000MHz | +/- 3.8670dB |

| Measurement | Uncertainty |
|-----------------------|-------------|
| ESD—Rise time tr | 9% |
| ESD—Peak current Ip | 2.5% |
| ESD—Current at 30 ns | 1% |
| ESD—Current at 60 ns | 4% |
| RS above 3GHz | ±3.62dB |
| RS under 3GHz | ±3.70dB |
| EFT—Rise time tr | 4% |
| EFT—Peak current Ip | 4% |
| EFT—Current | 4% |
| Surge—Rise time tr | 4% |
| Surge—Peak current Ip | 4% |
| Surge—Current | 4% |
| CS-CND | ±0.80dB |



| | |
|----------|---------------------|
| CS-Clamp | $\pm 1.06\text{dB}$ |
|----------|---------------------|

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

Consistent with industry standard (e.g. CISPR 22: 2008, clause 11, Measurement Uncertainty) determining compliance with the limits shall be based on the results of the compliance measurement. Consequently the measured emissions being less than the maximum allowed emission result in this being a compliant test or passing test.

5. Test of Conducted Emission

5.1. Test Limit

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 kHz and return leads of the EUT according to the methods defined in European Standard EN 55032.

Table A.8 – Requirements for conducted emissions from the AC mains power ports of Class A equipment

| Applicable to | | | | |
|---|---------------------|---------------------------------|---------------------------|-----------------------|
| 1. AC mains power ports (3.1.1) | | | | |
| Table clause | Frequency range MHz | Coupling device (see Table A.7) | Detector type / bandwidth | Class A limits dB(μV) |
| A8.1 | 0,15 – 0,5 | AMN | Quasi Peak / 9 kHz | 79 |
| | 0,5 – 30 | | | 73 |
| A8.2 | 0,15 – 0,5 | AMN | Average / 9 kHz | 66 |
| | 0,5 – 30 | | | 60 |
| NOTE Apply A8.1 and A8.2 across the entire frequency range. | | | | |

Table A.9 – Requirements for conducted emissions from the AC mains power ports of Class B equipment

| Applicable to | | | | |
|---------------------------------|---------------------|---------------------------------|---------------------------|-----------------------|
| 1. AC mains power ports (3.1.1) | | | | |
| Table clause | Frequency range MHz | Coupling device (see Table A.7) | Detector type / bandwidth | Class B limits dB(μV) |
| A9.1 | 0,15 – 0,5 | AMN | Quasi Peak / 9 kHz | 66 – 56 |
| | 0,5 – 5 | | | 56 |
| | 5 – 30 | | | 60 |
| A9.2 | 0,15 – 0,5 | AMN | Average / 9 kHz | 56 – 46 |
| | 0,5 – 5 | | | 46 |
| | 5 – 30 | | | 50 |

NOTE Apply A9.1 and A9.2 across the entire frequency range.

**Table A.10 – Requirements for asymmetric mode conducted emissions
from Class A equipment**

| Applicable to | | | | | |
|---|---------------------|---------------------------------|---------------------------|-------------------------------|-------------------------------|
| 1. wired network ports (3.1.30) 2. optical fibre ports (3.1.24) with metallic shield or tension members 3. antenna ports (3.1.3) | | | | | |
| Table clause | Frequency range MHz | Coupling device (see Table A.7) | Detector type / bandwidth | Class A voltage limits dB(μV) | Class A current limits dB(μA) |
| A10.1 | 0,15 – 0,5 | AAN | Quasi Peak / 9 kHz | 97 – 87 | n/a |
| | 0,5 – 30 | | | 87 | |
| | 0,15 – 0,5 | AAN | Average / 9 kHz | 84 – 74 | |
| | 0,5 – 30 | | | 74 | |
| A10.2 | 0,15 – 0,5 | CVP and current probe | Quasi Peak / 9 kHz | 97 – 87 | 53 – 43 |
| | 0,5 – 30 | | | 87 | 43 |
| | 0,15 – 0,5 | CVP and current probe | Average / 9 kHz | 84 – 74 | 40 – 30 |
| | 0,5 – 30 | | | 74 | 30 |
| A10.3 | 0,15 – 0,5 | Current Probe | Quasi Peak / 9 kHz | n/a | 53 – 43 |
| | 0,5 – 30 | | | | 43 |
| | 0,15 – 0,5 | Current Probe | Average / 9 kHz | | 40 – 30 |
| | 0,5 – 30 | | | | 30 |
| NOTE 1 The choice of coupling device and measurement procedure is defined in Annex C. | | | | | |
| NOTE 2 AC mains power ports shall meet the limits given in Table A.8. | | | | | |
| NOTE 3 The test shall cover the entire frequency range. | | | | | |
| NOTE 4 The application of the voltage and/or current limits is dependent on the measurement procedure used. Refer to Table C.1 for applicability. | | | | | |
| NOTE 5 Testing is required at only one EUT supply voltage and frequency. | | | | | |
| NOTE 6 Applicable to ports listed above and intended to connect to cables longer than 3 m. | | | | | |

**Table A.11 – Requirements for asymmetric mode conducted emissions
from Class B equipment**

| Applicable to | | | | | |
|--|---------------------|---------------------------------|---------------------------|-------------------------------|-------------------------------|
| 1. wired network ports (3.1.30) 2. optical fibre ports (3.1.24) with metallic shield or tension members 3. broadcast receiver tuner ports (3.1.8) 4. antenna ports (3.1.3) | | | | | |
| Table clause | Frequency range MHz | Coupling device (see Table A.7) | Detector type / bandwidth | Class B voltage limits dB(μV) | Class B current limits dB(μA) |
| A11.1 | 0,15 – 0,5 | AAN | Quasi Peak / 9 kHz | 84 – 74 | n/a |
| | 0,5 – 30 | | | 74 | |
| | 0,15 – 0,5 | AAN | Average / 9 kHz | 74 – 64 | |
| | 0,5 – 30 | | | 64 | |
| A11.2 | 0,15 – 0,5 | CVP and current probe | Quasi Peak / 9 kHz | 84 – 74 | 40 – 30 |
| | 0,5 – 30 | | | 74 | 30 |
| | 0,15 – 0,5 | CVP and current probe | Average / 9 kHz | 74 – 64 | 30 – 20 |
| | 0,5 – 30 | | | 64 | 20 |
| A11.3 | 0,15 – 0,5 | Current Probe | Quasi Peak / 9 kHz | n/a | 40 – 30 |
| | 0,5 – 30 | | | | 30 |
| | 0,15 – 0,5 | Current Probe | Average / 9 kHz | | 30 – 20 |
| | 0,5 – 30 | | | | 20 |
| NOTE 1 The choice of coupling device and measurement procedure is defined in Annex C. | | | | | |
| NOTE 2 Screened ports including TV broadcast receiver tuner ports are tested with a common-mode impedance of 150 Ω. This is typically accomplished with the screen terminated by 150 Ω to earth. | | | | | |
| NOTE 3 AC mains power ports shall meet the limits given in Table A.9. | | | | | |
| NOTE 4 The test shall cover the entire frequency range. | | | | | |
| NOTE 5 The application of the voltage and/or current limits is dependent on the measurement procedure used. Refer to Table C.1 for applicability. | | | | | |
| NOTE 6 Testing is required at only one EUT supply voltage and frequency. | | | | | |
| NOTE 7 Applicable to ports listed above and intended to connect to cables longer than 3 m. | | | | | |

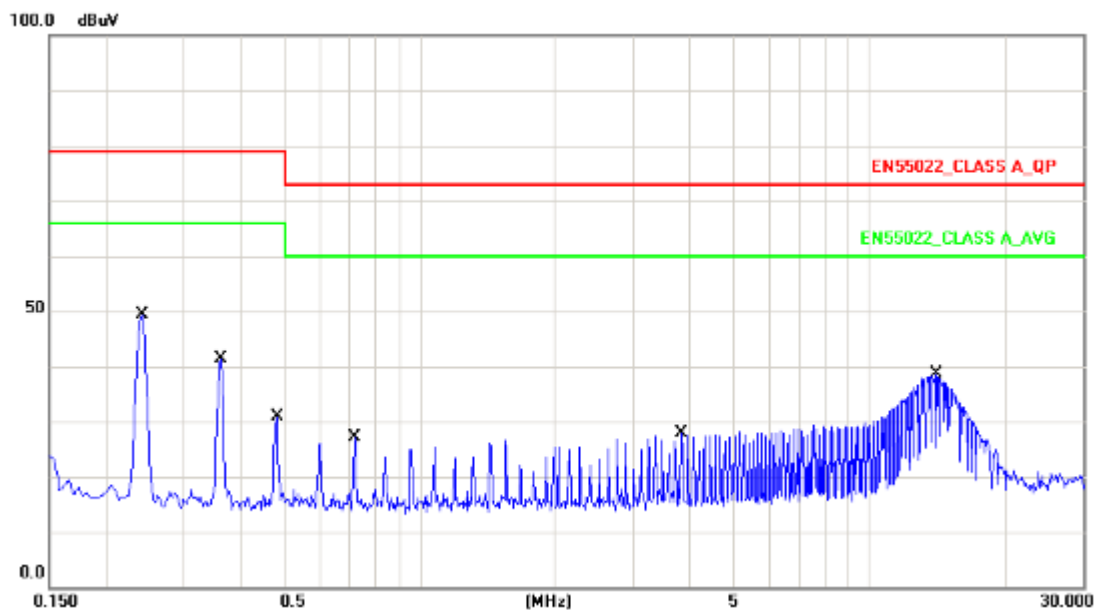


5.4. Measurement equipment

| Instrument/Ancillary | Manufacturer | Model No. | Serial No. | Calibration Date | Valid Date. |
|-----------------------------|--------------|-----------------|------------|------------------|-------------|
| Test Receiver | R&S | ESCI | 100565 | 2016.07.07 | 2017.07.06 |
| AMN | R&S | ESH2-Z5 | 100182 | 2015.09.06 | 2016.09.05 |
| Two-Line V-Network | R&S | ENV216 | 100325 | / | / |
| ISN | FCC | FCC-TLISN-T2-02 | 20379 | 2016.03.26 | 2017.03.25 |
| ISN | FCC | FCC-TLISN-T4-02 | 20380 | 2016.06.24 | 2017.06.24 |
| ISN | FCC | FCC-TLISN-T8-02 | 20381 | 2016.03.26 | 2017.03.25 |
| ISN | TESEQ | ISN ST08 | 30175 | 2016.03.26 | 2017.03.25 |
| Current Probe | R&S | EZ-17 | 100303 | 2016.03.26 | 2017.03.25 |
| Passive Voltage Probe | R&S | ESH2-Z3 | 100026 | 2016.03.26 | 2017.03.25 |
| Pulse Limiter | R&S | ESH3-Z2 | 100529 | 2016.03.26 | 2017.03.25 |
| Temperature/ Humidity Meter | Zhicheng | ZC1-11 | CEP-TH-004 | 2016.03.29 | 2017.03.28 |
| EZ-EMC | Fala | Ver CT3A1 | N/A | N/A | N/A |

5.5. Test Data and Result

| | | | |
|------------------|--------------------------|------------|---------------|
| Test Mode : | Mode 1: Normal Operation | | |
| AC Power : | AC 230V/50Hz | Phase : | LINE |
| Equipment : | 5 INCH IR SPEED DOME | Model No : | SD59100AN-HCI |
| Temperature : | 23°C | Humidity : | 52% |
| Pressure(mbar) : | 1002 | Date : | 2016/03/16 |

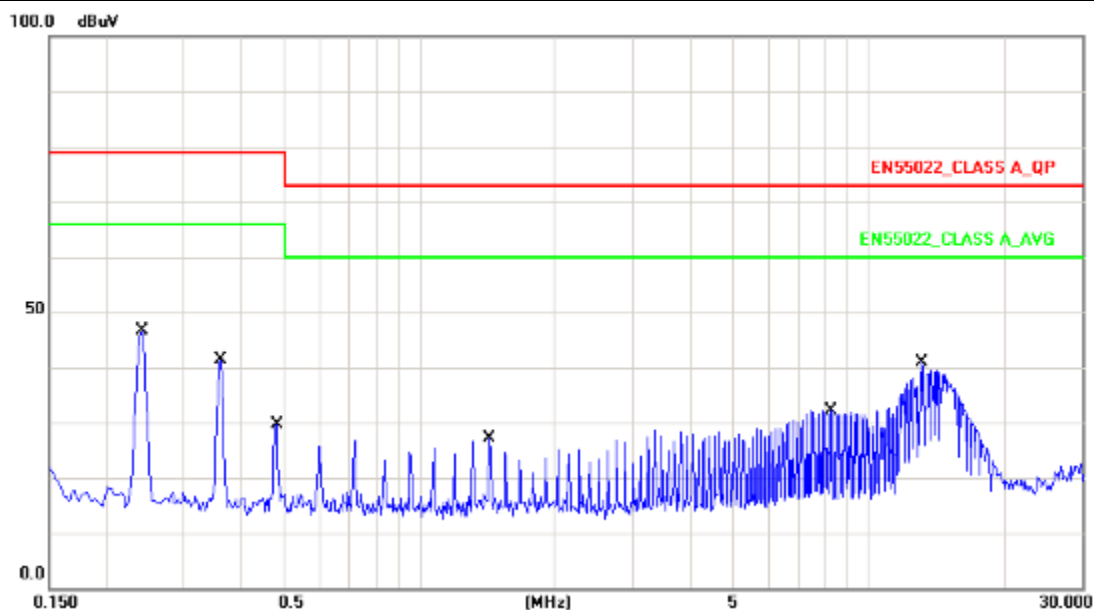


| No. | Frequency (MHz) | Factor (dB) | Reading (dBuV) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector |
|-----|-----------------|-------------|----------------|--------------|--------------|-------------|----------|
| 1 | 0.2420 | 10.12 | 38.06 | 48.18 | 79.00 | -30.82 | QP |
| 2 | 0.2420 | 10.12 | 38.42 | 48.54 | 66.00 | -17.46 | AVG |
| 3 | 0.3620 | 10.15 | 29.14 | 39.29 | 79.00 | -39.71 | QP |
| 4 | 0.3620 | 10.15 | 29.35 | 39.50 | 66.00 | -26.50 | AVG |
| 5 | 0.4820 | 10.16 | 17.29 | 27.45 | 79.00 | -51.55 | QP |
| 6 | 0.4820 | 10.16 | 17.07 | 27.23 | 66.00 | -38.77 | AVG |
| 7 | 0.7180 | 10.15 | 14.47 | 24.62 | 73.00 | -48.38 | QP |
| 8 | 0.7180 | 10.15 | 14.22 | 24.37 | 60.00 | -35.63 | AVG |
| 9 | 3.8380 | 10.20 | 15.32 | 25.52 | 73.00 | -47.48 | QP |
| 10 | 3.8380 | 10.20 | 14.69 | 24.89 | 60.00 | -35.11 | AVG |
| 11 | 14.1540 | 10.48 | 26.65 | 37.13 | 73.00 | -35.87 | QP |
| 12 | 14.1540 | 10.48 | 25.52 | 36.00 | 60.00 | -24.00 | AVG |

Note: Measurement Level = Reading Level + Correct Factor

EN55032 limit=EN55022 limit

| | | | |
|------------------|--------------------------|------------|---------------|
| Test Mode : | Mode 1: Normal Operation | | |
| AC Power : | AC 230V/50Hz | Phase : | NEUTRAL |
| Equipment : | 5 INCH IR SPEED DOME | Model No : | SD59100AN-HCI |
| Temperature : | 23°C | Humidity : | 52% |
| Pressure(mbar) : | 1002 | Date : | 2016/03/16 |

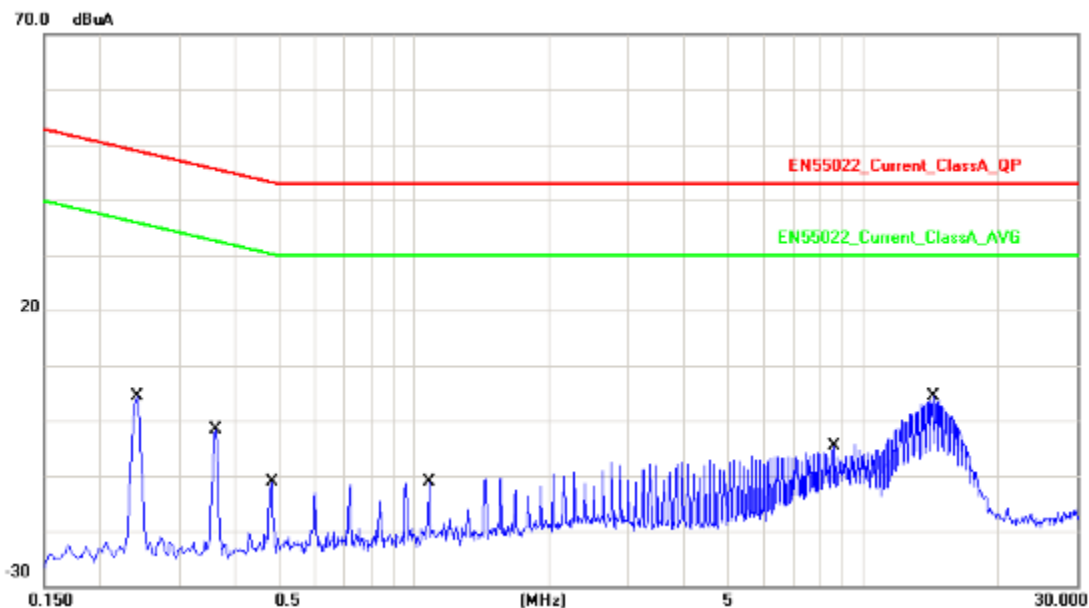


| No. | Frequency (MHz) | Factor (dB) | Reading (dBuV) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector |
|-----|-----------------|-------------|----------------|--------------|--------------|-------------|----------|
| 1 | 0.2420 | 10.12 | 35.69 | 45.81 | 79.00 | -33.19 | QP |
| 2 | 0.2420 | 10.12 | 36.03 | 46.15 | 66.00 | -19.85 | AVG |
| 3 | 0.3620 | 10.15 | 29.56 | 39.71 | 79.00 | -39.29 | QP |
| 4 | 0.3620 | 10.15 | 29.85 | 40.00 | 66.00 | -26.00 | AVG |
| 5 | 0.4820 | 10.16 | 17.28 | 27.44 | 79.00 | -51.56 | QP |
| 6 | 0.4820 | 10.16 | 17.08 | 27.24 | 66.00 | -38.76 | AVG |
| 7 | 1.4380 | 10.16 | 14.68 | 24.84 | 73.00 | -48.16 | QP |
| 8 | 1.4380 | 10.16 | 13.26 | 23.42 | 60.00 | -36.58 | AVG |
| 9 | 8.2739 | 10.26 | 15.52 | 25.78 | 73.00 | -47.22 | QP |
| 10 | 8.2739 | 10.26 | 13.46 | 23.72 | 60.00 | -36.28 | AVG |
| 11 | 13.1900 | 10.42 | 24.16 | 34.58 | 73.00 | -38.42 | QP |
| 12 | 13.1900 | 10.42 | 21.16 | 31.58 | 60.00 | -28.42 | AVG |

Note: Measurement Level = Reading Level + Correct Factor

EN55032 limit=EN55022 limit

| | | | |
|------------------|--------------------------|------------|---------------|
| Test Mode : | Mode 1: Normal Operation | | |
| AC Power : | AC 230V/50Hz | Phase : | BNC |
| Equipment : | 5 INCH IR SPEED DOME | Model No : | SD59100AN-HCI |
| Temperature : | 23°C | Humidity : | 52% |
| Pressure(mbar) : | 1002 | Date : | 2016/03/16 |



| No. | Frequency (MHz) | Factor (dB) | Reading (dBuA) | Level (dBuA) | Limit (dBuA) | Margin (dB) | Detector |
|-----|-----------------|-------------|----------------|--------------|--------------|-------------|----------|
| 1 | 0.2420 | 5.47 | -1.83 | 3.64 | 49.02 | -45.38 | QP |
| 2 | 0.2420 | 5.47 | -1.46 | 4.01 | 36.02 | -32.01 | AVG |
| 3 | 0.3620 | 6.20 | -9.47 | -3.27 | 45.68 | -48.95 | QP |
| 4 | 0.3620 | 6.20 | -9.26 | -3.06 | 32.68 | -35.74 | AVG |
| 5 | 0.4820 | 6.92 | -20.10 | -13.18 | 43.30 | -56.48 | QP |
| 6 | 0.4820 | 6.92 | -20.41 | -13.49 | 30.30 | -43.79 | AVG |
| 7 | 1.0820 | 8.33 | -22.01 | -13.68 | 43.00 | -56.68 | QP |
| 8 | 1.0820 | 8.33 | -22.72 | -14.39 | 30.00 | -44.39 | AVG |
| 9 | 8.6420 | 9.71 | -17.90 | -8.19 | 43.00 | -51.19 | QP |
| 10 | 8.6420 | 9.71 | -20.79 | -11.08 | 30.00 | -41.08 | AVG |
| 11 | 14.4020 | 9.95 | -8.03 | 1.92 | 43.00 | -41.08 | QP |
| 12 | 14.4020 | 9.95 | -9.59 | 0.36 | 30.00 | -29.64 | AVG |

Note: Measurement Level = Reading Level + Correct Factor

EN55032 limit=EN55022 limit

Test engineer: Seben

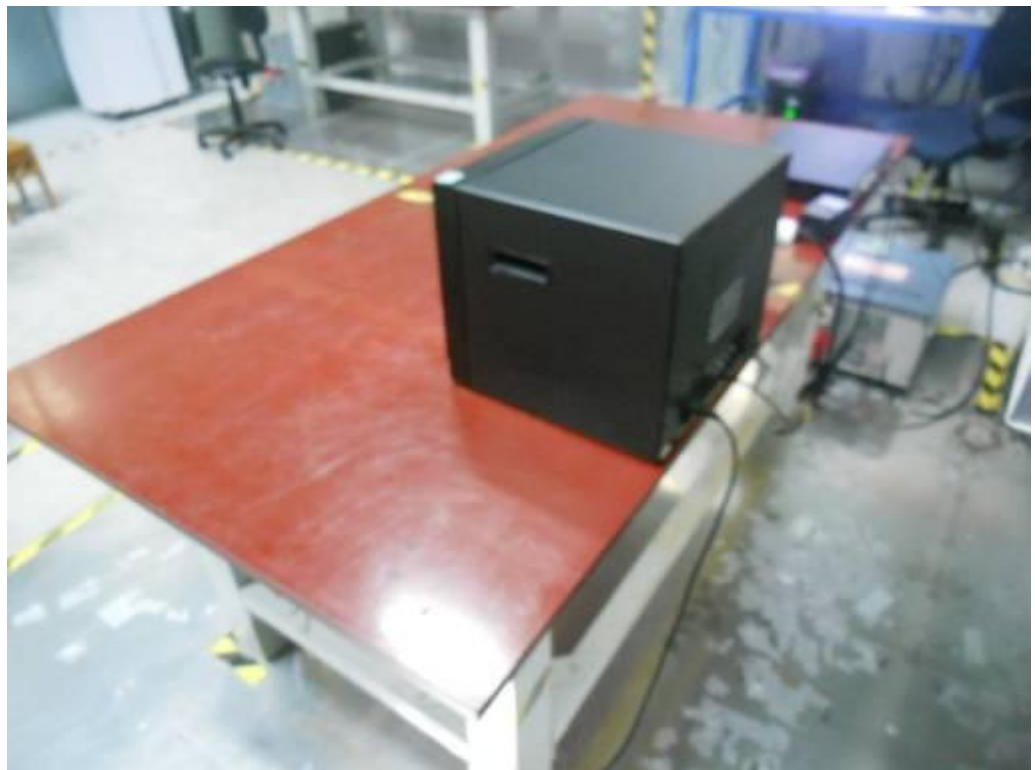
5.6. Test Photographs

Main

Front View



Rear View



Signal

Front View



Rear View



6. Test of Radiated Emission

6.1. Test Limit

The EUT shall meet the limits of below Table when measured at the measuring distance R in accordance with the methods described in European Standard EN 55032. If the reading on the measuring receiver shows fluctuations close to the limit, the reading shall be observed for at least 15 s at each measurement frequency; the highest reading shall be recorded, with the exception of any brief isolated high reading, which shall be ignored.

Table 1 – Required highest frequency for radiated measurement

| Highest internal frequency (F_x) | Highest measured frequency |
|--|---|
| $F_x \leq 108$ MHz | 1 GHz |
| $108 \text{ MHz} < F_x \leq 500$ MHz | 2 GHz |
| $500 \text{ MHz} < F_x \leq 1$ GHz | 5 GHz |
| $F_x > 1$ GHz | $5 \times F_x$ up to a maximum of 6 GHz |
| NOTE 1 For FM and TV broadcast receivers, F_x is determined from the highest frequency generated or used excluding the local oscillator and tuned frequencies. | |
| NOTE 2 F_x is defined in 3.1.19. | |

Where the F_x is unknown, the radiated emission measurements shall be performed up to 6 GHz.

Table A.2 – Requirements for radiated emissions at frequencies up to 1 GHz for Class A equipment

| Table clause | Frequency range MHz | Measurement | | Class A limits dB(μV/m) |
|---|------------------------|---------------|-----------------------------|-----------------------------|
| | | Distance m | Detector type/ bandwidth | OATS/SAC (see Table A.1) |
| A2.1 | 30 – 230 | 10 | Quasi Peak / 120 kHz | 40 |
| | 230 – 1 000 | | | 47 |
| A2.2 | 30 – 230 | 3 | | 50 |
| | 230 – 1 000 | | | 57 |
| NOTE Apply only A2.1 or A2.2 across the entire frequency range. | | | | |

Table A.3 – Requirements for radiated emissions at frequencies above 1 GHz for Class A equipment

| Table clause | Frequency range MHz | Measurement | | Class A limits dB(μV/m) |
|---|------------------------|---------------|-----------------------------|---------------------------|
| | | Distance m | Detector type/ bandwidth | FSOATS (see Table A.1) |
| A3.1 | 1 000 – 3 000 | 3 | Average / 1 MHz | 56 |
| | 3 000 – 6 000 | | | 60 |
| A3.2 | 1 000 – 3 000 | | Peak / 1 MHz | 76 |
| | 3 000 – 6 000 | | | 80 |
| NOTE Apply A3.1 and A3.2 across the frequency range from 1 000 MHz to the highest required frequency of measurement derived from Table 1. | | | | |



Table A.4 – Requirements for radiated emissions at frequencies up to 1 GHz for Class B equipment

| Table clause | Frequency range MHz | Measurement | | Class B limits dB(μV/m) |
|--|------------------------|---------------|-----------------------------|-----------------------------|
| | | Distance m | Detector type/ bandwidth | OATS/SAC (see Table A.1) |
| A4.1 | 30 – 230 | 10 | Quasi Peak / 120 kHz | 30 |
| | 230 – 1 000 | | | 37 |
| A4.2 | 30 – 230 | 3 | | 40 |
| | 230 – 1 000 | | | 47 |
| NOTE Apply only table clause A4.1 or A4.2 across the entire frequency range. | | | | |

Table A.5 – Requirements for radiated emissions at frequencies above 1 GHz for Class B equipment

| Table clause | Frequency range MHz | Measurement | | Class B limits dB(μV/m) |
|---|------------------------|---------------|-----------------------------|---------------------------|
| | | Distance m | Detector type/ bandwidth | FSOATS (see Table A.1) |
| A5.1 | 1 000 – 3 000 | 3 | Average/ 1 MHz | 50 |
| | 3 000 – 6 000 | | | 54 |
| A5.2 | 1 000 – 3 000 | | Peak/ 1 MHz | 70 |
| | 3 000 – 6 000 | | | 74 |
| NOTE 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. | | | | |

Table A.6 – Requirements for radiated emissions from FM receivers

| Table clause | Frequency range MHz | Measurement | | Class B limit dB(μV/m) | |
|--|------------------------|---------------|-----------------------------|-----------------------------|-----------------------------|
| | | Distance m | Detector type/ bandwidth | Fundamental | Harmonics |
| | | | | OATS/SAC (see Table A.1) | OATS/SAC (see Table A.1) |
| A6.1 | 30 – 230 | 10 | Quasi peak/ 120 kHz | 50 | 42 |
| | 230 – 300 | | | | 42 |
| | 300 – 1 000 | | | | 46 |
| A6.2 | 30 – 230 | 3 | | 60 | 52 |
| | 230 – 300 | | | | 52 |
| | 300 – 1 000 | | | | 56 |
| NOTE 1 Apply only A.6.1 or A.6.2 across the entire frequency range. | | | | | |
| NOTE 2 These relaxed limits apply only to emissions at the fundamental and harmonic frequencies of the local oscillator. Signals at all other frequencies shall be compliant with the limits given in Table A.4. | | | | | |

Table A.12 – Requirements for conducted differential voltage emissions from Class B equipment

Applicable to

1. TV broadcast receiver tuner ports (3.1.8) with an accessible connector

2. RF modulator output ports (3.1.27)

3. FM broadcast receiver tuner ports (3.1.8) with an accessible connector

| Table clause | Frequency range MHz | Detector type/ bandwidth | Class B limits dB(μV) 75 Ω | | | Applicability |
|--------------|---------------------|--------------------------|----------------------------|------------------------------|----------------------------|---------------|
| | | | Other | Local Oscillator Fundamental | Local Oscillator Harmonics | |
| A12.1 | 30 – 950 | For frequencies ≤1 GHz | 46 | 46 | 46 | See NOTE 1 |
| | 950 – 2 150 | | 46 | 54 | 54 | |
| A12.2 | 950 – 2 150 | Quasi Peak/ 120 kHz | 46 | 54 | 54 | See NOTE 2 |
| A12.3 | 30 – 300 | | 46 | 54 | 50 | See NOTE 3 |
| | 300 – 1 000 | 52 | | | | |
| A12.4 | 30 – 300 | For frequencies ≥1 GHz | 46 | 66 | 59 | See NOTE 4 |
| | 300 – 1 000 | | | | 52 | |
| A12.5 | 30 – 950 | Peak/ 1 MHz | 46 | 76 | 46 | See NOTE 5 |
| | 950 – 2 150 | | | n/a | 54 | |

NOTE 1 Television receivers (analogue or digital), video recorders and PC TV broadcast receiver tuner cards working in channels between 30 MHz and 1 GHz, and digital audio receivers.

NOTE 2 Tuner units (not the LNB) for satellite signal reception.

NOTE 3 Frequency modulation audio receivers and PC tuner cards.

NOTE 4 Frequency modulation car radios.

NOTE 5 Applicable to EUTs with RF modulator output ports (for example DVD equipment, video recorders, camcorders and decoders etc.) designed to connect to TV broadcast receiver tuner ports.

NOTE 6 Testing is required at only one EUT supply voltage and frequency.

NOTE 7 The term ‘other’ refers to all emissions other than the fundamental and the harmonics of the local oscillator.

NOTE 8 The test shall be performed with the device operating at each reception channel.

NOTE 9 The test shall cover the entire frequency range.

6.2. Test Procedures

- The EUT was placed on a relatable table top 0.8 meter above ground.
- The EUT was set 10 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- The table was rotated 360 degrees to determine the position of the highest radiation.
- The antenna is a half wave dipole and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
- For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
- Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

6.3. Typical test Setup

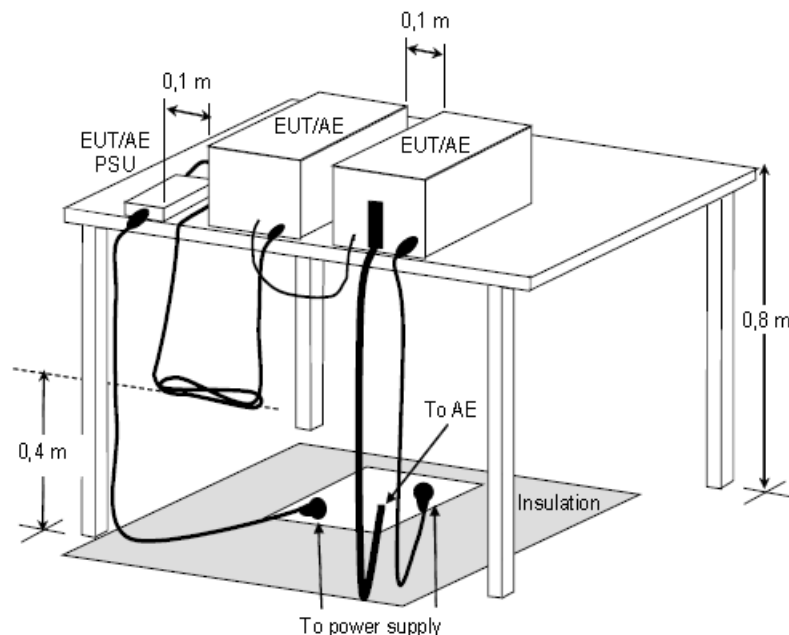


Figure D.8 – Example measurement arrangement for table-top EUT (Radiated emission measurement)

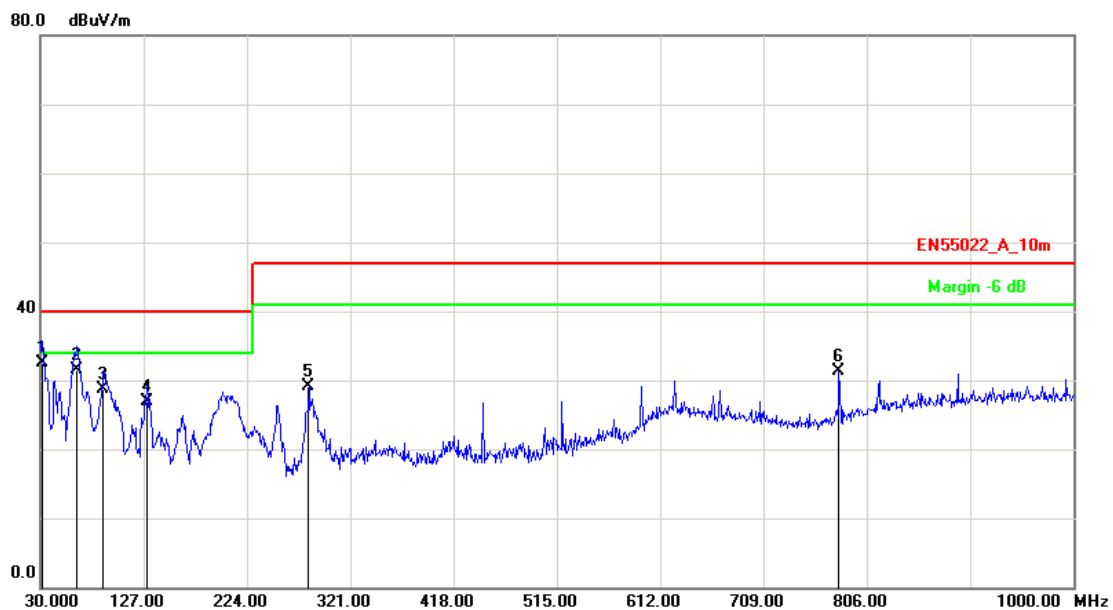


6.4. Measurement equipment

| Instrument/Ancillary | Manufacturer | Model No. | Serial No. | Calibration Date | Valid Date. |
|-----------------------------|---------------|-----------|------------|------------------|-------------|
| EMI Test Receiver | R&S | ESCI7 | 100968 | 2016.03.26 | 2017.03.25 |
| Preamplifier | Agilent | 87405B | My39500554 | 2016.03.26 | 2017.03.25 |
| Preamplifier | Agilent | 8449B | 3008A02342 | 2016.03.26 | 2017.03.25 |
| Bilog Antenna | Sunol Science | JB1 | A072414-1 | 2016.04.16 | 2017.04.15 |
| Broad-Band Horn Antenna | Schwarzbeck | BBHA9120D | 9120D-618 | 2016.04.16 | 2017.04.15 |
| Spectrum Analyzer | R&S | FSP40 | 100324 | 2016.03.26 | 2017.03.25 |
| Temperature/ Humidity Meter | Zhicheng | ZC1-11 | CEP-TH-001 | 2016.03.29 | 2017.03.28 |
| EZ-EMC | Fala | Ver CT3A1 | N/A | N/A | N/A |

6.5. Test Result and Data (30MHz ~ 1000MHz)

| | | | |
|------------------|--------------------------|--------------------|---------------|
| Test Mode : | Mode 1: Normal Operation | | |
| AC Power : | AC 230V/50Hz | Ant. Polarization: | Horizontal |
| Equipment : | 5 INCH IR SPEED DOME | Model No : | SD59100AN-HCI |
| Temp : | 23°C | Humidity : | 52% |
| Pressure(mbar) : | 1002 | Date : | 2016/03/17 |

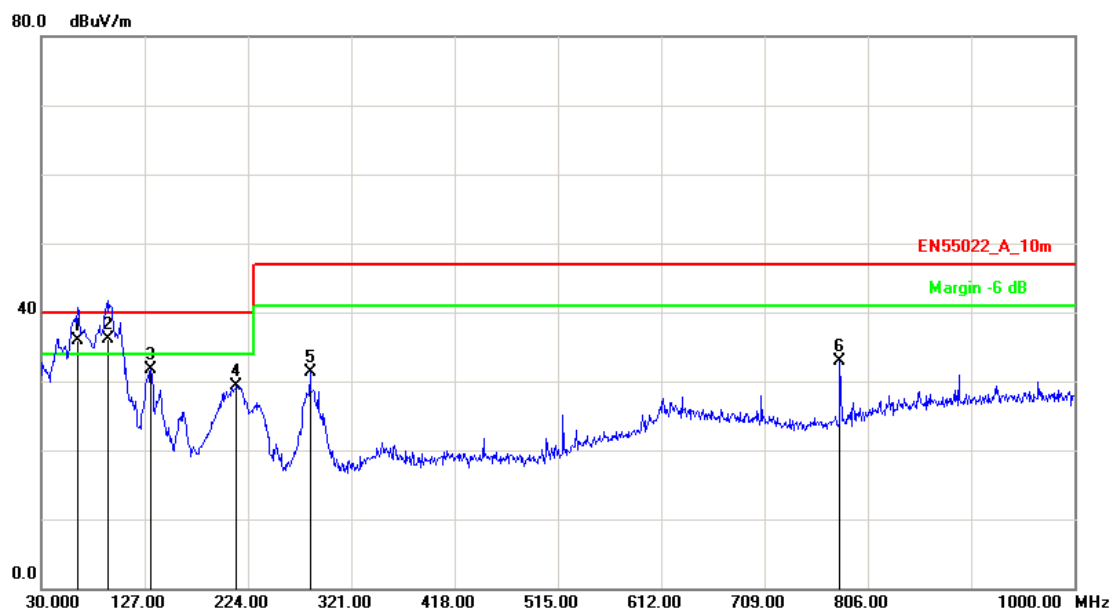


| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Det. | Height (cm) | Azimuth (deg) |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|------|-------------|---------------|
| 1 | 31.9400 | -5.21 | 37.77 | 32.56 | 40.00 | -7.44 | QP | 300 | 32 |
| 2 | 63.9500 | -13.84 | 45.33 | 31.49 | 40.00 | -8.51 | QP | 300 | 0 |
| 3 | 89.1700 | -15.29 | 43.92 | 28.63 | 40.00 | -11.37 | QP | 400 | 244 |
| 4 | 129.9099 | -9.82 | 36.64 | 26.82 | 40.00 | -13.18 | QP | 400 | 311 |
| 5 | 282.1999 | -8.99 | 38.06 | 29.07 | 47.00 | -17.93 | QP | 200 | 113 |
| 6 | 779.8099 | -0.63 | 31.92 | 31.29 | 47.00 | -15.71 | QP | 100 | 338 |

Note: Measurement Level = Reading Level + Correct Factor

EN55032 limit=EN55022 limit

| | | | |
|------------------|--------------------------|--------------------|---------------|
| Test Mode : | Mode 1: Normal Operation | | |
| AC Power : | AC 230V/50Hz | Ant. Polarization: | Vertical |
| Equipment : | 5 INCH IR SPEED DOME | Model No : | SD59100AN-HCI |
| Temp : | 23°C | Humidity : | 52% |
| Pressure(mbar) : | 1002 | Date : | 2016/03/17 |



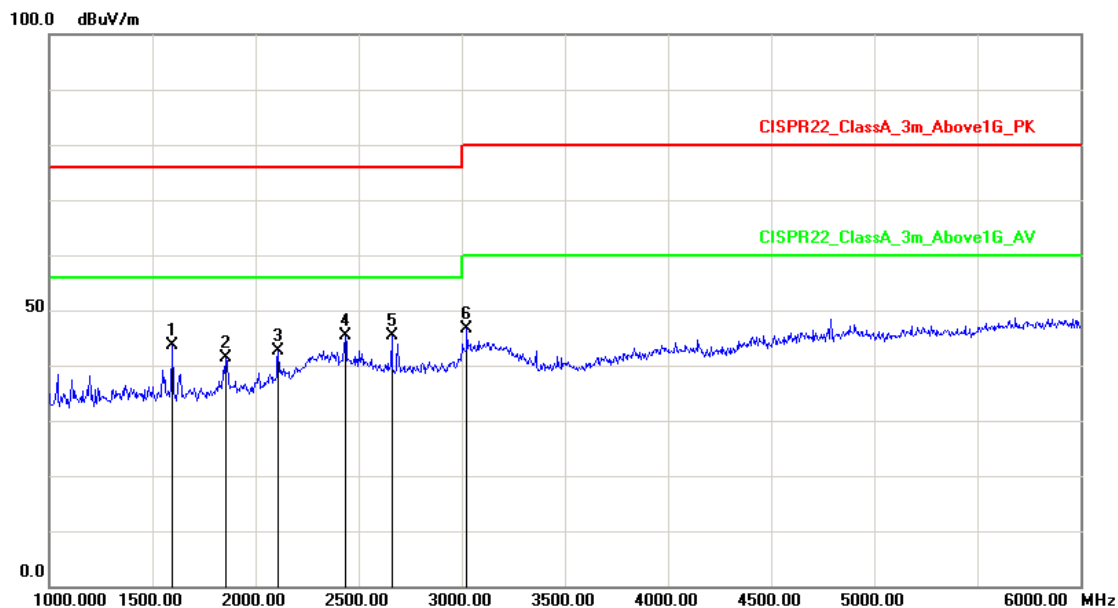
| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Det. | Height (cm) | Azimuth (deg) |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|------|-------------|---------------|
| 1 | 64.4900 | -14.00 | 49.90 | 35.90 | 40.00 | -4.10 | QP | 100 | 263 |
| 2 | 92.0800 | -14.71 | 50.91 | 36.20 | 40.00 | -3.80 | QP | 100 | 120 |
| 3 | 132.8200 | -9.83 | 41.62 | 31.79 | 40.00 | -8.21 | QP | 100 | 223 |
| 4 | 213.3300 | -11.45 | 40.71 | 29.26 | 40.00 | -10.74 | QP | 100 | 342 |
| 5 | 282.2000 | -8.99 | 40.32 | 31.33 | 47.00 | -15.67 | QP | 100 | 313 |
| 6 | 779.8100 | -0.63 | 33.46 | 32.83 | 47.00 | -14.17 | QP | 200 | 166 |

Note: Measurement Level = Reading Level + Correct Factor

EN55032 limit=EN55022 limit

6.6. Test Result and Data (1000MHz ~ 6000MHz)

| | | | |
|------------------|--------------------------|--------------------|---------------|
| Test Mode : | Mode 1: Normal Operation | | |
| AC Power : | AC 230V/50Hz | Ant. Polarization: | Horizontal |
| Equipment : | 5 INCH IR SPEED DOME | Model No : | SD59100AN-HCI |
| Temp : | 23°C | Humidity : | 52% |
| Pressure(mbar) : | 1002 | Date : | 2016/03/17 |



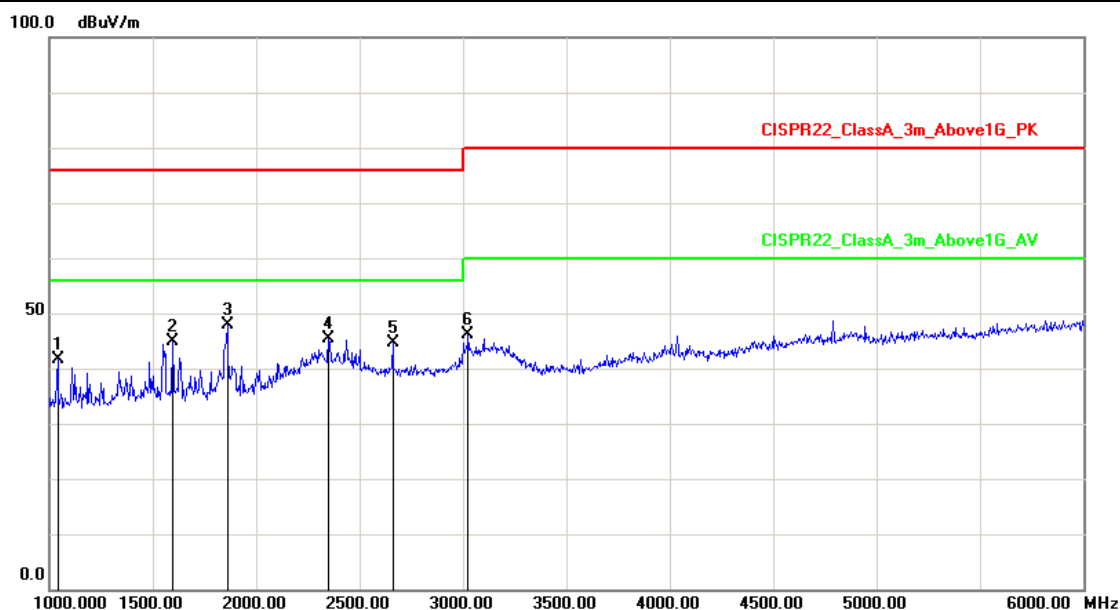
| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Det. | Height (cm) | Azimuth (deg) |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|------|-------------|---------------|
| 1 | 1595.000 | -12.02 | 55.73 | 43.71 | 76.00 | -32.29 | peak | 100 | 248 |
| 2 | 1855.000 | -10.17 | 51.52 | 41.35 | 76.00 | -34.65 | peak | 100 | 226 |
| 3 | 2110.000 | -6.73 | 49.37 | 42.64 | 76.00 | -33.36 | peak | 100 | 24 |
| 4 | 2435.000 | -3.47 | 48.93 | 45.46 | 76.00 | -30.54 | peak | 100 | 359 |
| 5 | 2660.000 | -4.68 | 49.99 | 45.31 | 76.00 | -30.69 | peak | 100 | 210 |
| 6 | 3025.000 | -2.55 | 49.28 | 46.73 | 80.00 | -33.27 | peak | 100 | 78 |

Note: Measurement Level = Reading Level + Correct Factor

EN55032 limit=EN55022 limit



| | | | |
|------------------|--------------------------|--------------------|---------------|
| Test Mode : | Mode 1: Normal Operation | | |
| AC Power : | AC 230V/50Hz | Ant. Polarization: | Vertical |
| Equipment : | 5 INCH IR SPEED DOME | Model No : | SD59100AN-HCI |
| Temp : | 23°C | Humidity : | 52% |
| Pressure(mbar) : | 1002 | Date : | 2016/03/17 |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Det. | Height (cm) | Azimuth (deg) |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|------|-------------|---------------|
| 1 | 1040.000 | -15.34 | 56.86 | 41.52 | 76.00 | -34.48 | peak | 100 | 32 |
| 2 | 1595.000 | -12.02 | 56.91 | 44.89 | 76.00 | -31.11 | peak | 100 | 186 |
| 3 | 1860.000 | -10.13 | 58.03 | 47.90 | 76.00 | -28.10 | peak | 100 | 2 |
| 4 | 2350.000 | -3.09 | 48.43 | 45.34 | 76.00 | -30.66 | peak | 100 | 279 |
| 5 | 2660.000 | -4.68 | 49.21 | 44.53 | 76.00 | -31.47 | peak | 100 | 194 |
| 6 | 3025.000 | -2.55 | 48.78 | 46.23 | 80.00 | -33.77 | peak | 100 | 29 |

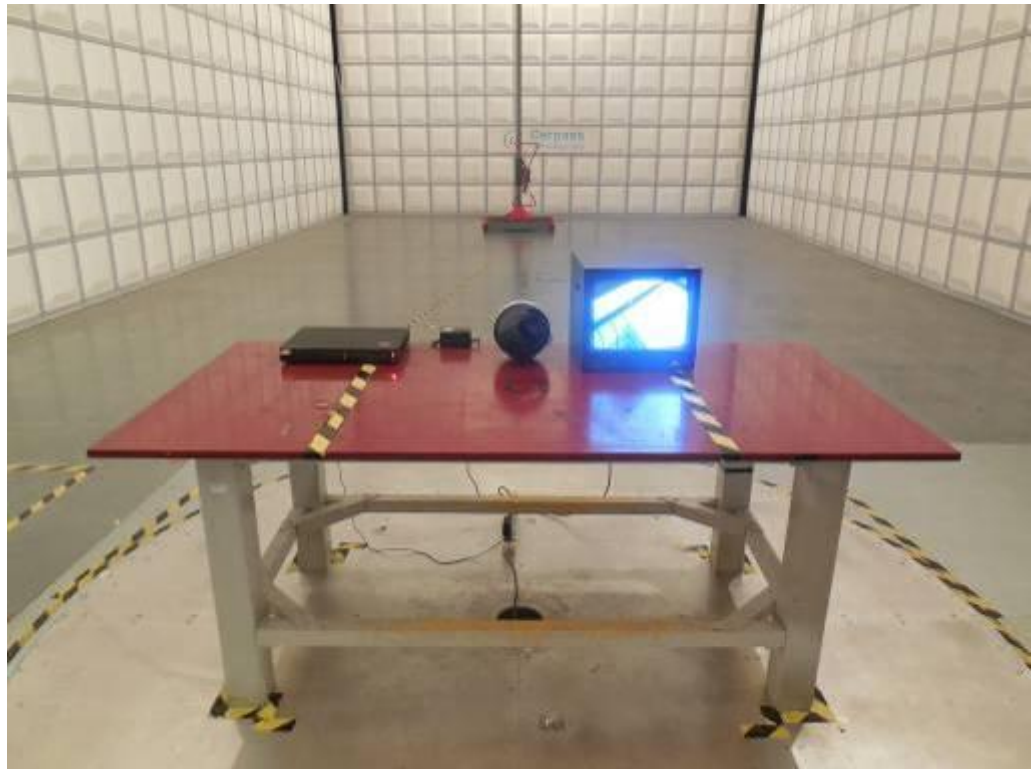
Note: Measurement Level = Reading Level + Correct Factor

EN55032 limit=EN55022 limit

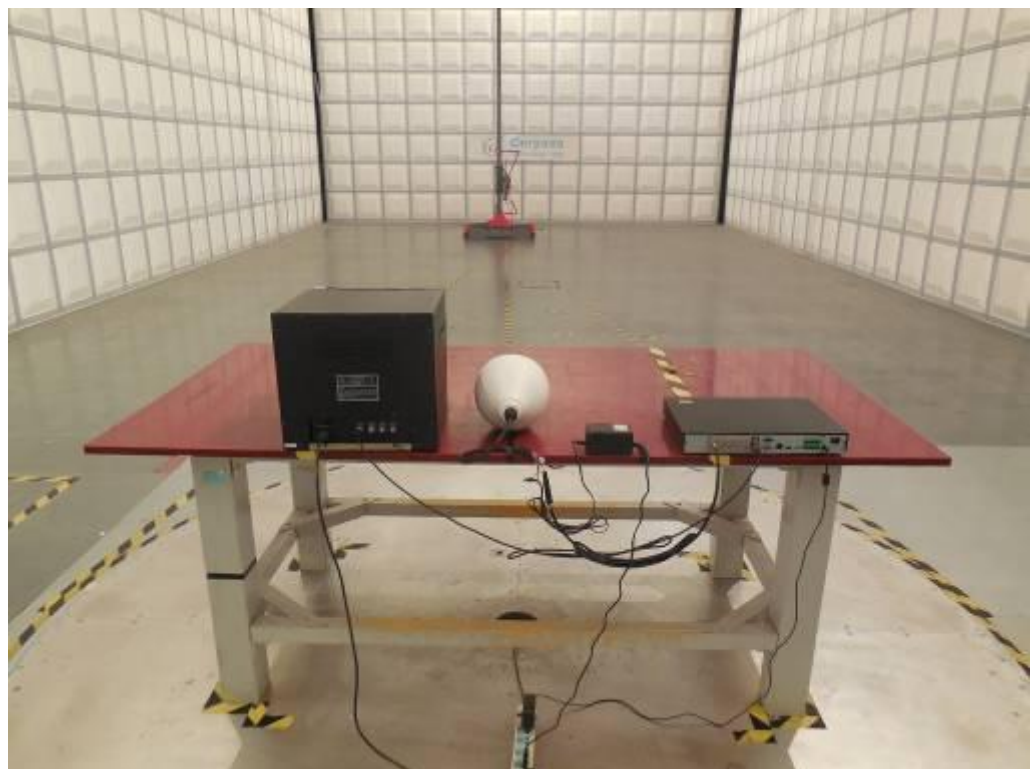
Test engineer: Seben

6.7. Test Photographs (30MHz ~ 1000MHz)

Front View



Rear View

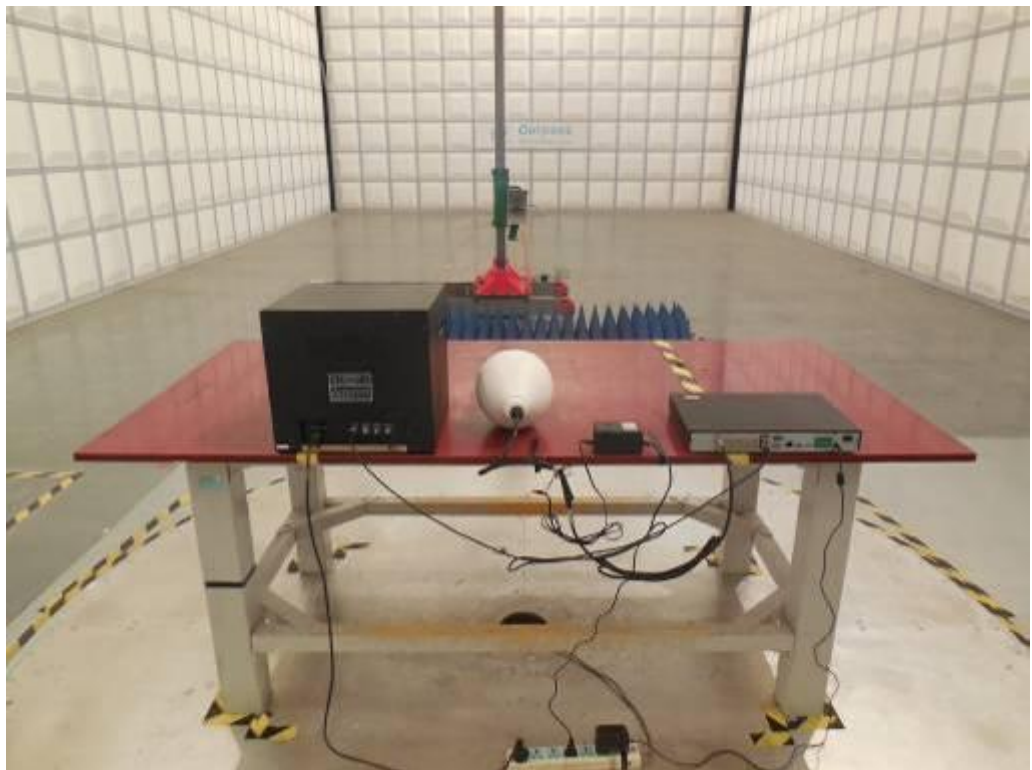


6.8. Test Photographs (1000MHz ~ 6000MHz)

Front View



Rear View



7. Harmonics Test

7.1. Limits of Harmonics Current Measurement

(a) Limits for Class A equipment

| Harmonics Order n | Max. permissible harmonics current A | Harmonics Order n | Max. permissible harmonics current A |
|----------------------|--|----------------------|--|
| Odd harmonics | | Even harmonics | |
| 3 | 2.30 | 2 | 1.08 |
| 5 | 1.14 | 4 | 0.43 |
| 7 | 0.77 | 6 | 0.30 |
| 9 | 0.40 | 8≤n≤40 | 0.23x8/n |
| 11 | 0.33 | | |
| 13 | 0.21 | | |
| 15≤n≤39 | 0.15x15/n | | |

(b) Limits for Class B equipment

For Class B equipment, the harmonics of the input current shall not exceed the values given in Table that is the limit of Class A multiplied by a factor of 1,5.

(c) Limits for Class C equipment

| Harmonics Order n | Maximum permissible harmonic current expressed as a percentage of the input current at the fundamental frequency % |
|---------------------------------|--|
| 2 | 2 |
| 3 | $30 \cdot \lambda^*$ |
| 5 | 10 |
| 7 | 7 |
| 9 | 5 |
| 11<n<39 (odd harmonics only) | 3 |

* λ is the circuit power factor

(d) Limits for Class D equipment

| Harmonics Order n | Maximum permissible harmonic current per watt mA/W | Maximum permissible harmonic current A |
|-------------------------------------|--|--|
| 3 | 3.4 | 2.30 |
| 5 | 1.9 | 1.14 |
| 7 | 1.0 | 0.77 |
| 9 | 0.5 | 0.40 |
| 11 | 0.35 | 0.33 |
| 11 < n < 39 (odd harmonics only) | 3.85/n | See limit of Class A |

NOTE: According to section 7 of EN 61000-3-2, the above limits for all equipment except for lighting equipment having an active input power > 75 W and no limits apply for equipment with an active input power up to and including 75 W.

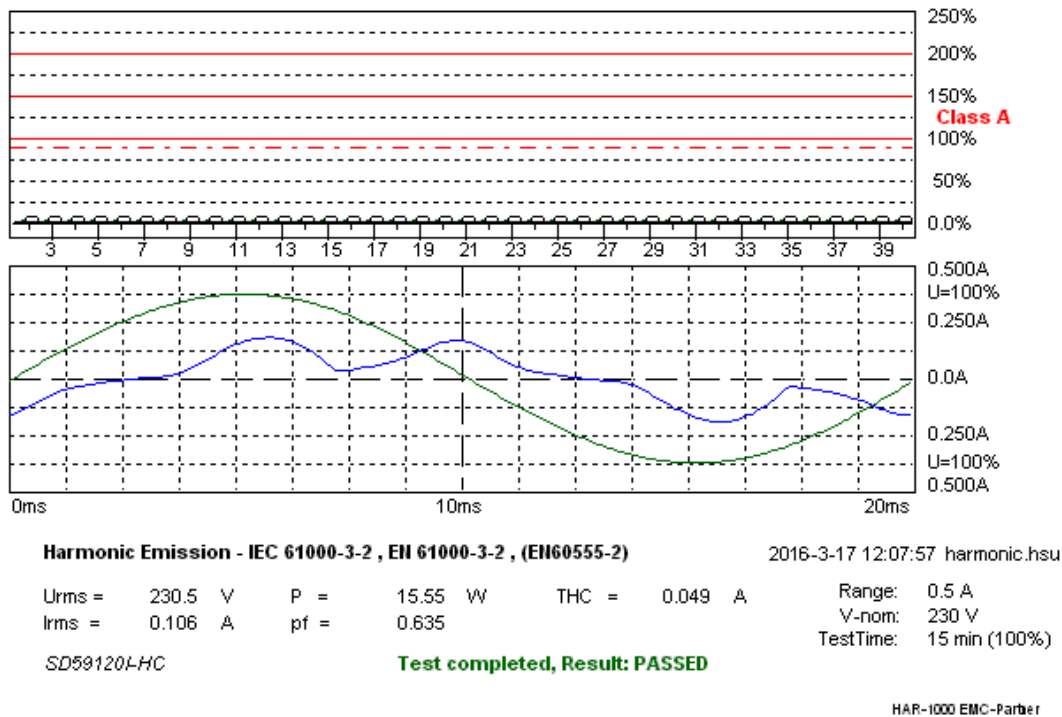


7.2. Measurement equipment

| Instrument/Ancillary | Manufacturer | Model No. | Serial No. | Calibration Date | Valid Date. |
|--------------------------------|-------------------|----------------|------------|------------------|-------------|
| EMC Emission Tester | EMCPARTNER | Harmonics-1000 | 159 | 2016.03.26 | 2017.03.25 |
| Temperature/ Humidity Meter | Zhicheng | ZC1-11 | CEP-TH-004 | 2016.03.29 | 2017.03.28 |
| HARCS | EMC Partner AG | Ver 4.18 | N/A | N/A | N/A |

7.3. Test Result and Data

| | | |
|----------------------|---|----------------------|
| Basic Standard | : | EN 61000-3-2 |
| Final Test Result | : | PASS |
| Test Mode | : | Mode 1 |
| Equipment | : | 5 INCH IR SPEED DOME |
| Model No. | : | SD59100AN-HCI |
| Temperature | : | 20°C |
| Humidity | : | 50 % |
| Atmospheric Pressure | : | 100 kPa |
| Test Date | : | Mar 17, 2016 |



Full Bar : Actual Values

Empty Bar : Maximum Values

Blue : Current , Green : Voltage , Red : Failed

Urms = 230.5V Freq = 50.000 Range: 0.5 A

Irms = 0.106A Ipk = 0.195A cf = 1.834

P = 15.55W S = 24.48VA pf = 0.635

THDi = 45.9 % THDu = 0.90 % Class A

Test - Time : 15min (100 %)

Test completed, Result: PASSED



| Order | Freq. [Hz] | Irms [A] | Irms%L [%] | I _{max} [A] | I _{max} %L [%] | Limit [A] |
|-------|---------------|-------------|---------------|-------------------------|----------------------------|--------------|
| 1 | 50 | 0.0945 | | 0.1107 | | |
| 2 | 100 | 0.0029 | 0.2713 | 0.0031 | 0.2882 | 1.0800 |
| 3 | 150 | 0.0305 | 1.3242 | 0.0405 | 1.7594 | 2.3000 |
| 4 | 200 | 0.0002 | 0.0426 | 0.0004 | 0.0852 | 0.4300 |
| 5 | 250 | 0.0373 | 3.2739 | 0.0402 | 3.5256 | 1.1400 |
| 6 | 300 | 0.0009 | 0.2848 | 0.0009 | 0.2950 | 0.3000 |
| 7 | 350 | 0.0023 | 0.3012 | 0.0037 | 0.4756 | 0.7700 |
| 8 | 400 | 0.0005 | 0.2256 | 0.0006 | 0.2654 | 0.2300 |
| 9 | 450 | 0.0033 | 0.8163 | 0.0034 | 0.8392 | 0.4000 |
| 10 | 500 | 0.0001 | 0.0332 | 0.0001 | 0.0663 | 0.1840 |
| 11 | 550 | 0.0051 | 1.5444 | 0.0054 | 1.6276 | 0.3300 |
| 12 | 600 | 0.0001 | 0.0796 | 0.0002 | 0.1194 | 0.1533 |
| 13 | 650 | 0.0014 | 0.6830 | 0.0016 | 0.7847 | 0.2100 |
| 14 | 700 | 0.0001 | 0.0929 | 0.0002 | 0.1393 | 0.1314 |
| 15 | 750 | 0.0013 | 0.8952 | 0.0018 | 1.2207 | 0.1500 |
| 16 | 800 | 0.0001 | 0.0531 | 0.0001 | 0.1061 | 0.1150 |
| 17 | 850 | 0.0015 | 1.1068 | 0.0015 | 1.1529 | 0.1324 |
| 18 | 900 | 0.0001 | 0.0597 | 0.0001 | 0.0896 | 0.1022 |
| 19 | 950 | 0.0006 | 0.5154 | 0.0010 | 0.8504 | 0.1184 |
| 20 | 1000 | 0.0001 | 0.0663 | 0.0001 | 0.0995 | 0.0920 |
| 21 | 1050 | 0.0008 | 0.7121 | 0.0009 | 0.8545 | 0.1071 |
| 22 | 1100 | 0.0001 | 0.0730 | 0.0001 | 0.1095 | 0.0836 |
| 23 | 1150 | 0.0006 | 0.6551 | 0.0007 | 0.7175 | 0.0978 |
| 24 | 1200 | 0.0001 | 0.0796 | 0.0001 | 0.1194 | 0.0767 |
| 25 | 1250 | 0.0004 | 0.4747 | 0.0007 | 0.7460 | 0.0900 |
| 26 | 1300 | 0.0001 | 0.1294 | 0.0001 | 0.1294 | 0.0708 |
| 27 | 1350 | 0.0005 | 0.5493 | 0.0005 | 0.6226 | 0.0833 |
| 28 | 1400 | 0.0001 | 0.1393 | 0.0001 | 0.1393 | 0.0657 |
| 29 | 1450 | 0.0003 | 0.4327 | 0.0005 | 0.6293 | 0.0776 |
| 30 | 1500 | 0.0001 | 0.1493 | 0.0001 | 0.1493 | 0.0613 |
| 31 | 1550 | 0.0003 | 0.4625 | 0.0004 | 0.5466 | 0.0726 |
| 32 | 1600 | 0.0001 | 0.1592 | 0.0001 | 0.1592 | 0.0575 |
| 33 | 1650 | 0.0003 | 0.4924 | 0.0004 | 0.5371 | 0.0682 |
| 34 | 1700 | 0.0001 | 0.1692 | 0.0001 | 0.1692 | 0.0541 |
| 35 | 1750 | 0.0002 | 0.3798 | 0.0004 | 0.5697 | 0.0643 |
| 36 | 1800 | 0.0001 | 0.1791 | 0.0001 | 0.2388 | 0.0511 |
| 37 | 1850 | 0.0002 | 0.4015 | 0.0003 | 0.5018 | 0.0608 |
| 38 | 1900 | 0.0001 | 0.1261 | 0.0001 | 0.2521 | 0.0484 |
| 39 | 1950 | 0.0002 | 0.4232 | 0.0003 | 0.5290 | 0.0577 |
| 40 | 2000 | 0.0001 | 0.1990 | 0.0001 | 0.2654 | 0.0460 |

EUT is PASSED if:

- all Average values of the Individual Harmonic Currents (I_{avg}) are below 100% of the Individual Limits.
- all Maximum values of the Individual Harmonic Currents (I_{max}) are below 150% of the Individual Limits.

Test engineer: _____

Seben

7.4. Test Photographs





8. Voltage Fluctuations Test

8.1. Test Procedure

The equipment shall be tested under the conditions of **Clause 5**.

The total impedance of the test circuit, excluding the appliance under test, but including the internal impedance of the supply source, shall be equal to the reference impedance. The stability and tolerance of the reference impedance shall be adequate to ensure that the overall accuracy of $\pm 8\%$ is achieved during the whole assessment procedure.

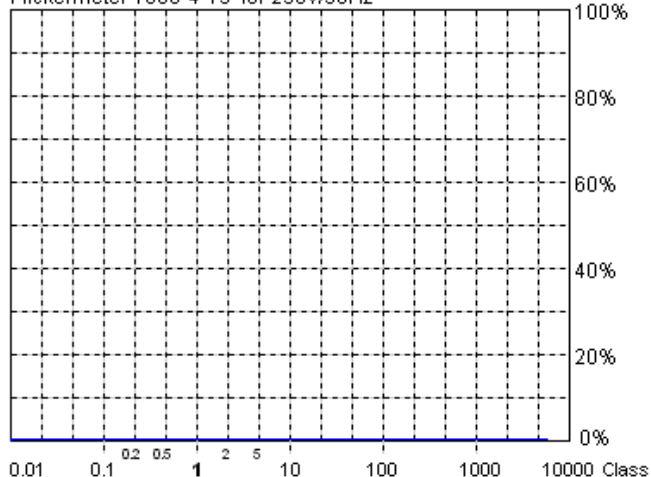
8.2. Measurement equipment

| Instrument/Ancillary | Manufacturer | Model No. | Serial No. | Calibration Date | Valid Date. |
|--------------------------------|-------------------|----------------|------------|------------------|-------------|
| EMC Emission Tester | EMCPARTNER | Harmonics-1000 | 159 | 2016.03.26 | 2017.03.25 |
| Temperature/ Humidity Meter | Zhicheng | ZC1-11 | CEP-TH-004 | 2016.03.29 | 2017.03.28 |
| HARCS | EMC Partner AG | Ver 4.18 | N/A | N/A | N/A |

8.3. Test Result and Data

| | | |
|----------------------|---|----------------------|
| Basic Standard | : | EN 61000-3-3 |
| Final Test Result | : | PASS |
| Test Mode | : | Mode 1 |
| Equipment | : | 5 INCH IR SPEED DOME |
| Model No. | : | SD59100AN-HCI |
| Temperature | : | 20°C |
| Humidity | : | 50 % |
| Atmospheric Pressure | : | 100 kPa |
| Test Date | : | Mar 17, 2016 |

Flickermeter 1000-4-15 for 230V/50Hz



| | |
|---|---------------|
| Actual Flicker (Fli): | 0.00 |
| Short-term Flicker (Pst): | 0.07 |
| Limit (Pst): | 1.00 |
| Long-term Flicker (Plt): | 0.07 |
| Limit (Plt): | 0.65 |
| Maximum Relative Volt. Change (dmax): | 0.00% |
| Limit (dmax): | 4.00% |
| Relative Steady-state Voltage Change (dc): | 0.00% |
| Limit (dc): | 3.30% |
| Maximum Interval exceeding 3.30% (dt): | 0.00ms |
| Limit (dt>Lim): | 500ms |

Flicker Emission - IEC 61000-3-3, EN 61000-3-3, (EN60555-3)

Urms = 230.5 V P = 15.66 W
Irms = 0.106 A pf = 0.638

SD59120L-HC

Test completed, Result: PASSED

2016-3-17 20:37:53 harmonic.hsu

Range: 0.5 A
V-nom: 230 V
TestTime: 10 min (100%)

HAR-1000 EMC-Partner

Full Bar : Actual Values

Empty Bar : Maximum Values

Circles : Average Values

Blue : Current , Green : Voltage , Red : Failed




Urms = 230.5V Freq = 50.000 Range: 0.5 A
Irms = 0.106A Ipk = 0.196A cf = 1.844
P = 15.66W S = 24.54VA pf = 0.638

Test - Time : 1 x 10min = 10min (100 %)

LIN (Line Impedance Network) : No LIN

Limits : Plt : 0.65 Pst : 1.00
dmax : 4.00 % dc : 3.30 %
dtLim: 3.30 % dt>Lim: 500ms

Test completed, Result: PASSED

Test engineer: 

8.4. Test Photographs



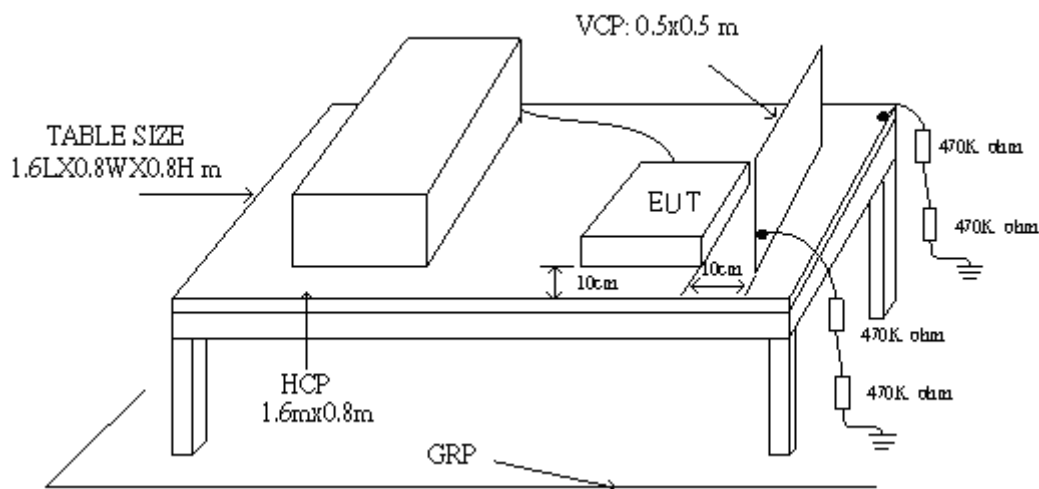


9. Electrostatic Discharge Immunity Test

9.1. Test Procedure

- a. In the case of air discharge testing the climatic conditions shall be within the following ranges:
 - ambient temperature: 15°C to 35°C;
 - relative humidity : 30% to 60%;
 - atmospheric pressure : 86 KPa (860 hPa) to 106 KPa (1060 hPa).
- b. Test programs and software shall be chosen so as to exercise all normal modes of operation of the EUT. The use of special exercising software is encouraged, but permitted only where it can be shown that the EUT is being comprehensively exercised.
- c. The test voltage shall be increased from the minimum to the selected test severity level, in order to determine any threshold of failure. The final severity level should not exceed the product specification value in order to avoid damage to the equipment.
- d. The test shall be performed with both air discharge and contact discharge. On reselected points at least 10 single discharges (in the most sensitive polarity) shall be applied on air discharge. On reselected points at least 25 single discharges (in the most sensitive polarity) shall be applied on contact discharge.
- e. For the time interval between successive single discharges an initial value of one second is recommended. Longer intervals may be necessary to determine whether a system failure has occurred.
- f. In the case of contact discharges, the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.
- g. In the case of painted surface covering a conducting substrate, the following procedure shall be adopted :
 - ✧ If the coating is not declared to be an insulating coating by the equipment manufacturer, then the pointed tip of the generator shall penetrate the coating so as to make contact with the conducting substrate.
 - ✧ Coating declared as insulating by the manufacturer shall only be submitted to the air discharge.
 - ✧ The contact discharge test shall not be applied to such surfaces.
- h. In the case of air discharges, the round discharge tip of the discharge electrode shall be approached as fast as possible (without causing mechanical damage) to touch the EUT . After each discharge, the ESD generator (discharge electrode) shall be removed from the EUT. The generator is then retriggered for a new single discharge. This procedure shall be repeated until the discharges are completed. In the case of an air discharge test, the discharge switch, which is used for contact discharge, shall be closed.

9.2. Test Setup for Tests Performed in Laboratory



The test setup consists of the test generator, EUT and auxiliary instrumentation necessary to perform DIRECT and INDIRECT application of discharges to the EUT as applicable, in the follow manner :

- a. Contact Discharge to the conductive surfaces and to coupling plane;
- b. Air Discharge at insulating surfaces.

The preferred test method is that of type tests performed in laboratories and the only accepted method of demonstrating conformance with this standard. The EUT was arranged as closely as possible to arrangement in final installed conditions.

A ground reference plane was provided on the floor of the test site. It was a metallic sheet (copper or aluminum) of 0.25 mm, minimum thickness; other metallic may be used but they shall have at least 0.65 mm thickness. In the Exclusive Certification Corp., we provided 1 mm thickness stainless steel ground reference plane. The minimum size of the ground reference plane is 2.5 m x 2.5 m, the exact size depending on the dimensions of the EUT. It was connected to the protective grounding system.

The EUT was arranged and connected according to its functional requirements. A distance of 1m minimum was provided between the EUT and the wall of the lab. and any other metallic structure. In cases where this length exceeds the length necessary to apply the discharges to the selected points, the excess length shall, where possible, be placed non-inductively off the ground reference plane and shall not come closer than 0.2m to other conductive parts in the test setup.

Where the EUT is installed on a metal table, the table was connected to the reference plane via a cable with a 470k ohm resistor located at each end, to prevent a build-up of charge. The test setup was consist a wooden table, 0.8m high, standing on the ground reference plane. A HCP, 1.6 m x 0.8 m, was placed on the table. The EUT and cables was isolated from the HCP by an insulating support 0.5 mm thick. The VCP size, 0.5 m x 0.5 m.



9.3. Test Severity Levels

| Contact Discharge | | Air Discharge | |
|-------------------------------|--|---------------|------------------------------------|
| Level | Test Voltage (KV) of Contact discharge | Level | Test Voltage (KV) of Air Discharge |
| 1 | ±2 | 1 | ±2 |
| 2 | ±4 | 2 | ±4 |
| 3 | ±6 | 3 | ±8 |
| 4 | ±8 | 4 | ±15 |
| X | Specified | X | Specified |
| Remark: "X" is an open level. | | | |

9.4. Measurement equipment

| Instrument/Ancillary | Manufacturer | Model No. | Serial No. | Calibration Date | Valid Date. |
|--------------------------------|-----------------|-----------|-------------|------------------|-------------|
| ESD Simulator | EM Test | ditto | V0714102399 | 2016.04.21 | 2017.04.20 |
| Tonometer | shanghaifengyun | DYM3 | 3251 | 2015.12.21 | 2016.12.20 |
| Dehumidifier | ZEDO | ZD-220LB | CEP-TH-01 | N/A | N/A |
| Humidifier | YADU | YZ-DS251C | CEP-TH-02 | N/A | N/A |
| Temperature/ Humidity Meter | feiyang | N/A | 102 | 2016.03.29 | 2017.03.28 |



9.5. Test Result and Data

Basic Standard : IEC 61000-4-2
 Product Standard : EN 50130-4: 2011
 Product Standard : EN 55024 : 2010
 Equipment : 5 INCH IR SPEED DOME
 Model No. : SD59100AN-HCI
 Final Test Result : PASS
 Temperature : 22°C
 Relative Humidity : 50%
 Atmospheric Pressure : 100 kPa
 Test Date : Mar 18, 2016

Test Mode 1: Normal Operation

For EN 55024: 2010

| Test Voltage: AC 230V/50Hz | | | | | | | | | | | | | | | | |
|----------------------------|-------------------|-----|------|-----|------|-----|------|-----|-----------------|-----|------|-----|------|-----|-------|-----|
| | Contact Discharge | | | | | | | | Air Discharge | | | | | | | |
| | 25 times / each | | | | | | | | 10 times / each | | | | | | | |
| Voltage | 2 kV | | 4 kV | | 6 kV | | 8 kV | | 2 kV | | 4 kV | | 8 kV | | 10 kV | |
| Point\Polarity | + | — | + | — | + | — | + | — | + | — | + | — | + | — | + | — |
| HCP | A | A | A | A | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| VCP | A | A | A | A | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1,2,3,4,5,6 | | | | | --- | --- | --- | --- | A | A | A | A | A | A | --- | --- |
| 8,9,11,12,14 | --- | --- | --- | --- | --- | --- | --- | --- | A | A | A | A | A | A | --- | --- |
| 7,10,13,15 | A | A | A | A | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |



For EN 50130-4: 2011

| Test Voltage: AC 230V/50Hz | | | | | | | | | | | | | | | | |
|----------------------------|-------------------|-----|------|-----|------|-----|------|-----|-----------------|-----|------|-----|------|-----|-------|-----|
| | Contact Discharge | | | | | | | | Air Discharge | | | | | | | |
| | 25 times / each | | | | | | | | 10 times / each | | | | | | | |
| Voltage | 2 kV | | 4 kV | | 6 kV | | 8 kV | | 2 kV | | 4 kV | | 8 kV | | 10 kV | |
| Point\Polarity | + | — | + | — | + | — | + | — | + | — | + | — | + | — | + | — |
| HCP | A | A | A | A | A | A | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| VCP | A | A | A | A | A | A | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1,2,3,4,5,6 | | | | | --- | --- | --- | --- | A | A | A | A | A | A | --- | --- |
| 8,9,11,12,14 | --- | --- | --- | --- | --- | --- | --- | --- | A | A | A | A | A | A | --- | --- |
| 7,10,13,15 | A | A | A | A | A | A | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

| Test Voltage: AC 195.5V/50Hz | | | | | | | | | | | | | | | | |
|------------------------------|-------------------|-----|------|-----|------|-----|------|-----|-----------------|-----|------|-----|------|-----|-------|-----|
| | Contact Discharge | | | | | | | | Air Discharge | | | | | | | |
| | 25 times / each | | | | | | | | 10 times / each | | | | | | | |
| Voltage | 2 kV | | 4 kV | | 6 kV | | 8 kV | | 2 kV | | 4 kV | | 8 kV | | 10 kV | |
| Point\Polarity | + | — | + | — | + | — | + | — | + | — | + | — | + | — | + | — |
| HCP | A | A | A | A | A | A | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| VCP | A | A | A | A | A | A | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1,2,3,4,5,6 | | | | | --- | --- | --- | --- | A | A | A | A | A | A | --- | --- |
| 8,9,11,12,14 | --- | --- | --- | --- | --- | --- | --- | --- | A | A | A | A | A | A | --- | --- |
| 7,10,13,15 | A | A | A | A | A | A | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |



| Test Voltage: AC 253V/50Hz | | | | | | | | | | | | | | | | |
|----------------------------|-------------------|-----|------|-----|------|-----|------|-----|-----------------|-----|------|-----|------|-----|-------|-----|
| | Contact Discharge | | | | | | | | Air Discharge | | | | | | | |
| | 25 times / each | | | | | | | | 10 times / each | | | | | | | |
| Voltage | 2 kV | | 4 kV | | 6 kV | | 8 kV | | 2 kV | | 4 kV | | 8 kV | | 10 kV | |
| Point\Polarity | + | — | + | — | + | — | + | — | + | — | + | — | + | — | + | — |
| HCP | A | A | A | A | A | A | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| VCP | A | A | A | A | A | A | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1,2,3,4,5,6 | | | | | --- | --- | --- | --- | A | A | A | A | A | A | --- | --- |
| 8,9,11,12,14 | --- | --- | --- | --- | --- | --- | --- | --- | A | A | A | A | A | A | --- | --- |
| 7,10,13,15 | A | A | A | A | A | A | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

Test engineer: Seben

9.6. Test Photographs







10. Radio Frequency electromagnetic field immunity test

10.1. Test Procedure

- i. The equipment to be tested is placed in the center of the enclosure on a wooden table. The equipment is then connected to power and signal leads according to pertinent installation instructions.
- j. The required field strength is determined by placing the field strength meter(s) on top of or directly alongside the equipment under test and monitoring the field strength meter via a remote field strength indicator outside the enclosure while adjusting the continuous-wave to the applicable antennae.
- k. The test is normally performed with the antenna facing the most sensitive side of the EUT. The polarization of the field generated by the bucolical antenna necessitates testing each position twice, once with the antenna positioned vertically and again with the antenna positioned horizontally. The circular polarization of the field from the log-spiral antenna makes a change of position of the antenna unnecessary.
- l. At each of the above conditions, the frequency range is swept 80-2700 MHz, pausing to adjust the R.F. signal level or to switch oscillators and antenna. The rate of sweep is in the order of 1.5×10^{-3} decades/s. The sensitive frequencies or frequencies of dominant interest may be discretely analyzed.

10.2. Test Severity Levels

| | Condition of Test | Remarks |
|----|----------------------------------|--|
| 1. | Field Strength | 10 V/m |
| 2. | Radiated Signal | AM 80% Modulated with 1kHz Pulse modulation 1Hz (0.5s ON; 0.5s OFF) |
| 3. | Scanning Frequency | 80MHz - 2700MHz |
| 4. | Dwell Time | 3 Seconds |
| 5. | Frequency step size Δf : | 1% |
| 6. | The rate of Swept of Frequency | 1.5×10^{-3} decades/s |



10.3.Measurement equipment

| Instrument/Ancillary | Manufacturer | Model No. | Serial No. | Calibration Date | Valid Date. |
|--------------------------------|-------------------|--------------------------|------------|------------------|-------------|
| Signal Generator | R&S | SML03 | 103287 | 2016.03.26 | 2017.03.25 |
| Power Sensor | R&S | NR P-Z91 | 100383 | 2016.03.26 | 2017.03.25 |
| Power Sensor | R&S | NRP-Z91 | 100384 | 2016.03.26 | 2017.03.25 |
| Power Meter | R&S | NRP | 101206 | 2016.03.26 | 2017.03.25 |
| Power Amplifier | BONN | BLWA0830-16 0/100/40D | 076659 | 2016.03.26 | 2017.03.25 |
| Istropic Electric Field Probe | EST.LINDGRE N | HI-6105 | 137445 | 2015.11.20 | 2016.11.19 |
| EMS Antenna | R&S | HL046E | 100028 | N/A | N/A |
| Temperature/ Humidity Meter | feiyang | N/A | 101 | 2016.03.29 | 2017.03.28 |
| EMC-32 | Rohde&Schwa rz | Ver 6.10.0 | N/A | N/A | N/A |



10.4. Test Result and Data

Basic Standard : IEC 61000-4-3
Product Standard : EN 50130-4: 2011
Product Standard : EN 55024 : 2010
Equipment : 5 INCH IR SPEED DOME
Model No. : SD59100AN-HCI
Final Test Result : PASS
Temperature : 20°C
Relative Humidity : 50%
Atmospheric Pressure : 100 kPa
Test Date : Mar 19, 2016

Test Mode 1: Normal Operation

For EN 55024: 2010

| Modulation : AM 80% , 1KHz sine wave , Dwell time: 3.0 S | | | | |
|--|-----------------------|-------|----------------------|--------|
| Frequency Step Size : 1 % of preceding frequency value | | | | |
| Frequency (MHz) | Antenna Polarization | face | Field strength (V/m) | Result |
| 80~1000 | Horizontal & Vertical | Front | 3 V/m | A |
| 80~1000 | Horizontal & Vertical | Rear | 3 V/m | A |
| 80~1000 | Horizontal & Vertical | Left | 3 V/m | A |
| 80~1000 | Horizontal & Vertical | Right | 3 V/m | A |

For EN 50130-4: 2011

Test Voltage: AC 230V/50Hz

| Modulation : AM 80% , 1KHz sine wave , Dwell time: 3.0S | | | | |
|---|-----------------------|-------|----------------------|--------|
| Frequency Step Size : 1 % of preceding frequency value | | | | |
| Frequency (MHz) | Antenna Polarization | face | Field strength (V/m) | Result |
| 80~2700 | Horizontal & Vertical | Front | 10 V/m | A |
| 80~2700 | Horizontal & Vertical | Rear | 10 V/m | A |
| 80~2700 | Horizontal & Vertical | Left | 10 V/m | A |
| 80~2700 | Horizontal & Vertical | Right | 10 V/m | A |




Test Voltage: AC 195.5V/50Hz

| Modulation : AM 80% , 1KHz sine wave , Dwell time: 3.0 S | | | | |
|--|----------------------|-------|----------------------|--------|
| Frequency Step Size : 1 % of preceding frequency value | | | | |
| Frequency (MHz) | Antenna Polarization | face | Field strength (V/m) | Result |
| 80~2700 | Horizontal &Vertical | Front | 10 V/m | A |
| 80~2700 | Horizontal &Vertical | Rear | 10 V/m | A |
| 80~2700 | Horizontal &Vertical | Left | 10 V/m | A |
| 80~2700 | Horizontal &Vertical | Right | 10 V/m | A |

Test Voltage: AC 253V/50Hz

| Modulation : AM 80% , 1KHz sine wave , Dwell time: 3.0 S | | | | |
|--|----------------------|-------|----------------------|--------|
| Frequency Step Size : 1 % of preceding frequency value | | | | |
| Frequency (MHz) | Antenna Polarization | face | Field strength (V/m) | Result |
| 80~2700 | Horizontal &Vertical | Front | 10 V/m | A |
| 80~2700 | Horizontal &Vertical | Rear | 10 V/m | A |
| 80~2700 | Horizontal &Vertical | Left | 10 V/m | A |
| 80~2700 | Horizontal &Vertical | Right | 10 V/m | A |

Test engineer: 

10.5. Test Photographs





11. Electrical Fast Transient/ Burst Immunity Test

11.1. Test Procedure

- a. In order to minimize the effect of environmental parameters on test results, the climatic conditions when test is carrying out shall comply with the following requirements:
 - ✧ ambient temperature: 15°C to 35°C;
 - ✧ relative humidity : 45% to 75%;
 - ✧ Atmospheric pressure: 86 Kpa (860 hPa) to 106 Kpa (1060 hPa).
- b. In order to minimize the effect of environmental parameters on test results, the electromagnetic environment of the laboratory shall not influence the test results.
- c. The variety and diversity of equipment and systems to be tested make it difficult to establish general criteria for the evaluation of the effects of fast transients/bursts on equipment and systems.
- d. Test on Power Line:
 - ✧ The EFT/B-generator was located on the GRP.. The length from the EFT/B-generator to the EUT is not exceeding 1 m.
 - ✧ The EFT/B-generator provides the ability to apply the test voltage in a non-symmetrical condition to the power supply input terminals of the EUT.
- e. Test on Communication Lines
 - ✧ The coupling clamp is composed of a clamp unit for housing the cable (length more than 3 m), and was placed on the GRP.
 - ✧ The coupling clamp provides the ability of coupling the fast transient/bursts to the cable under test.
- f. The test results may be classified on the basic of the operating conditions and the functional specification of the equipment under test, according to the following performance criteria :
 - ✧ Normal performance within the specification limits.
 - ✧ Temporary degradation or loss of function or performance which is self-recoverable.
 - ✧ Temporary degradation or loss of function or performance which requires operator intervention or system reset.
 - ✧ Degradation or loss of function which is not recoverable due to damage of equipment (components).



11.2. Test Severity Levels

The following test severity levels are recommended for the fast transient/burst test :

| Open circuit output test voltage $\pm 10\%$ | | |
|---|-----------------|--------------------------------------|
| Level | On Power Supply | On I/O signal, data and control line |
| 1 | 0.5 KV | 0.25 KV |
| 2 | 1.0 KV | 0.50 KV |
| 3 | 2.0 KV | 1.00 KV |
| 4 | 4.0 KV | 2.00 KV |
| X | Specified | Specified |

Remark : “ X ” is an open level. The level is subject to negotiation between the user and the manufacturer or is specified by the manufacturer.

11.3. Measurement equipment

| Instrument/Ancillary | Manufacturer | Model No. | Serial No. | Calibration Date | Valid Date. |
|-----------------------------|--------------|---------------|------------|------------------|-------------|
| TRANSIENT | EMCPARTNER | TRA2000IN6 | 901 | 2016.03.26 | 2017.03.25 |
| CDN | EMCPARTNER | CDN2000-06-32 | 121 | 2016.03.26 | 2017.03.25 |
| Coupling clamp | EMCPARTNER | CN-EFT1000 | 547 | 2016.03.26 | 2017.03.25 |
| Temperature/ Humidity Meter | Zhicheng | ZC1-11 | CEP-TH-005 | 2016.03.29 | 2017.03.28 |



11.4. Test Result and Data

Basic Standard : IEC 61000-4-4
 Product Standard : EN 50130-4: 2011
 Product Standard : EN 55024 : 2010
 Equipment : 5 INCH IR SPEED DOME
 Model No. : SD59100AN-HCI
 Final Test Result : PASS
 Temperature : 21 °C
 Relative Humidity : 51%
 Atmospheric Pressure : 100 kPa
 Test Date : Mar 20, 2016

Test Mode 1: Normal Operation
 For EN 55024: 2010

| | | | | | |
|--|-----|--|-----|---------------|-----|
| Pulse : 5/50 ns | | Repetition Rate: <u>5 kHz</u> above 2.0 kV | | | |
| Burst : 15m/300ms | | 5 <u>kHz</u> below and equal 2.0 kV | | | |
| Test time : 1 min/each condition | | | | | |
| Voltage/ Mode/ Polarity/ Result/ Phase | | <u>0.5 kV</u> | | <u>1.0 kV</u> | |
| | | + | — | + | — |
| Power Line | L | --- | --- | A | A |
| | N | --- | --- | A | A |
| | L-N | --- | --- | A | A |
| Signal Line | BNC | A | A | --- | --- |



For EN 50130-4: 2011

Test Voltage: AC 230V/50Hz

| | | | | | |
|--|-----|---|-----|---------------|-----|
| Pulse : 5/50 ns | | Repetition Rate: 5/100 kHz above 2.0 kV | | | |
| Burst : 15m/300ms | | 5/100 kHz below and equal 2.0 kV | | | |
| Test time : 1 min/each condition | | | | | |
| Voltage/ Mode/ Polarity/ Result/ Phase | | <u>1 kV</u> | | <u>2.0 kV</u> | |
| | | + | — | + | — |
| Power Line | L | --- | --- | A | A |
| | N | --- | --- | A | A |
| | L-N | --- | --- | A | A |
| Signal Line | BNC | A | A | --- | --- |

Test Voltage: AC 195.5V/50Hz

| | | | | | |
|--|-----|---|-----|---------------|-----|
| Pulse : 5/50 ns | | Repetition Rate: 5/100 kHz above 2.0 kV | | | |
| Burst : 15m/300ms | | 5/100 kHz below and equal 2.0 kV | | | |
| Test time : 1 min/each condition | | | | | |
| Voltage/ Mode/ Polarity/ Result/ Phase | | <u>1 kV</u> | | <u>2.0 kV</u> | |
| | | + | — | + | — |
| Power Line | L | --- | --- | A | A |
| | N | --- | --- | A | A |
| | L-N | --- | --- | A | A |
| Signal Line | BNC | A | A | --- | --- |



Test Voltage: AC 253V/50Hz

| | | | | | |
|--|-----|---|-----|---------------|-----|
| Pulse : 5/50 ns | | Repetition Rate: 5/100 kHz above 2.0 kV | | | |
| Burst : 15m/300ms | | 5/100 kHz below and equal 2.0 kV | | | |
| Test time : 1 min/each condition | | | | | |
| Voltage/ Mode/ Polarity/ Result/ Phase | | <u>1 kV</u> | | <u>2.0 kV</u> | |
| | | + | — | + | — |
| Power Line | L | --- | --- | A | A |
| | N | --- | --- | A | A |
| | L-N | --- | --- | A | A |
| Signal Line | BNC | A | A | --- | --- |

Test engineer: Seben

11.5. Test Photographs

Main





12. Surge Immunity Test

12.1. Test Procedure

a. Climatic conditions

The climatic conditions shall comply with the following requirements :

- ✧ ambient temperature : 15 °C to 35 °C
- ✧ relative humidity : 10 % to 75 %
- ✧ atmospheric pressure : 86 kPa to 106 kPa (860 hPa to 1060 hPa)

b. Electromagnetic conditions

the electromagnetic environment of the laboratory shall not influence the test results.

c. The test shall be performed according the test plan that shall specify the test set-up with

- ✧ generator and other equipment utilized;
- ✧ test level (voltage/current);
- ✧ generator source impedance;
- ✧ internal or external generator trigger;
- ✧ number of tests : at least five positive and five negative at the selected points;
- ✧ repetition rate : maximum 1/min.
- ✧ inputs and outputs to be tested;
- ✧ representative operating conditions of the EUT;
- ✧ sequence of application of the surge to the circuit;
- ✧ phase angle in the case of AC. power supply;
- ✧ actual installation conditions, for example :

AC : neutral earthed,

DC : (+) or (-) earthed to simulated the actual earthing conditions.

- d. If not otherwise specified the surges have to be applied synchronized to the voltage phase at the zero-crossing and the peak value of the AC. voltage wave (positive and negative).
- e. The surges have to be applied line to line and line(s) and earth. When testing line to earth, the test voltage has to be applied successively between each of the lines and earth, if there is no other specification.
- f. The test procedure shall also consider the non-linear current-voltage characteristics of the equipment under test. Therefore the test voltage has to be increased by steps up to the test level specified in the product standard or test plan.
- g. All lower levels including the selected test level shall be satisfied. For testing the secondary protection, the output voltage of the generator shall be increased up to the worst-case voltage breakdown level (let-through level) of the primary protection.
- h. If the actual operating signal sources are not available, that may be simulated. Under no circumstances may the test level exceed the product specification. The test shall be carried out according to a test plan.
- i. To find all critical points of the duty cycle of the equipment, a sufficient number of positive and negative test pulses shall be applied. For acceptance test previously unstressed equipment shall be used to the protection devices shall be replaced.



12.2. Test Severity Level

| Level | Open-circuit test voltage, $\pm 10\%$, KV |
|---|--|
| 1 | 0.5 |
| 2 | 1.0 |
| 3 | 2.0 |
| 4 | 4.0 |
| X | Specified |
| NOTE: "X" is an open class. This level can be specified in the product specification. | |

12.3. Measurement equipment

| Instrument/Ancillary | Manufacturer | Model No. | Serial No. | Calibration Date | Valid Date. |
|--------------------------------|--------------|---------------|------------|------------------|-------------|
| TRANSIENT | EMCPARTNER | TRA2000IN6 | 901 | 2016.03.26 | 2017.03.25 |
| CDN | EMCPARTNER | CDN-UTP8 | 021 | 2016.03.26 | 2017.03.25 |
| CDN | EMCPARTNER | CDN2000-06-32 | 121 | 2016.03.26 | 2017.03.25 |
| Temperature/ Humidity Meter | Zhicheng | ZC1-11 | CEP-TH-005 | 2016.03.29 | 2017.03.28 |



12.4. Test Result and Data

Basic Standard : IEC 61000-4-5
 Product Standard : EN 50130-4: 2011
 Product Standard : EN 55024 : 2010
 Equipment : 5 INCH IR SPEED DOME
 Model No. : SD59100AN-HCI
 Final Test Result : PASS
 Temperature : 21°C
 Relative Humidity : 51%
 Atmospheric Pressure : 100 kPa
 Test Date : Mar 20, 2016

Test Mode 1: Normal Operation

For EN 55024: 2010

Power Port

| | | | | | | |
|--|-----|---|----|-----|------|------|
| Test Voltage: AC 230V/50Hz | | | | | | |
| Waveform : 1.2/50µs(8/20µs) Repetition rate : 60 sec Time : 20 time/each condition | | | | | | |
| /Phase Voltage / Mode / Polarity / Result | | | 0° | 90° | 180° | 270° |
| <u>0.5/1.0 kV</u> | L-N | + | A | A | A | A |
| | | — | A | A | A | A |

| | | | | |
|--|---------------|---|-------------|---|
| Waveform :10/700µs Repetition rate : 60 sec Time : 5 time/each condition | | | | |
| Voltage | <u>0.5 kV</u> | | <u>1 kV</u> | |
| Mode / Polarity / Result | + | — | + | — |
| BNC | A | A | A | A |



For EN 50130-4: 2011

Power Port

| | | | | | | |
|--|-----|---|----|-----|------|------|
| Test Voltage: AC 230V/50Hz | | | | | | |
| Waveform : 1.2/50µs(8/20µs) Repetition rate : 60 sec Time : 20 time/each condition | | | | | | |
| /Phase Voltage / Mode / Polarity / Result | | | 0° | 90° | 180° | 270° |
| <u>0.5/1.0 kV</u> | L-N | + | A | A | A | A |
| | | — | A | A | A | A |

| | | | | |
|---|---------------|---|-------------|---|
| Waveform : 1.2/50µs(8/20µs) Repetition rate : 60 sec Time : 5 time/each condition | | | | |
| Voltage | <u>0.5 kV</u> | | <u>1 kV</u> | |
| Mode / Polarity / Result | + | — | + | — |
| BNC | A | A | A | A |

| | | | | |
|---|---------------|---|-------------|---|
| Waveform : 10/700µs Repetition rate : 60 sec Time : 5 time/each condition | | | | |
| Voltage | <u>0.5 kV</u> | | <u>1 kV</u> | |
| Mode / Polarity / Result | + | — | + | — |
| BNC | A | A | A | A |

Power Port

| | | | | | | |
|--|-----|---|----|-----|------|------|
| Test Voltage: AC 195.5V/50Hz | | | | | | |
| Waveform : 1.2/50µs(8/20µs) Repetition rate : 60 sec Time : 20 time/each condition | | | | | | |
| /Phase Voltage / Mode / Polarity / Result | | | 0° | 90° | 180° | 270° |
| <u>0.5/1.0 kV</u> | L-N | + | A | A | A | A |
| | | — | A | A | A | A |



| | | | | |
|---|---------------|---|-------------|---|
| Waveform : 1.2/50µs(8/20µs) Repetition rate : 60 sec Time : 5 time/each condition | | | | |
| Voltage | <u>0.5</u> kV | | <u>1</u> kV | |
| Mode / Polarity / Result | + | — | + | — |
| BNC | A | A | A | A |

| | | | | |
|---|---------------|---|-------------|---|
| Waveform : 10/700µs Repetition rate : 60 sec Time : 5 time/each condition | | | | |
| Voltage | <u>0.5</u> kV | | <u>1</u> kV | |
| Mode / Polarity / Result | + | — | + | — |
| BNC | A | A | A | A |

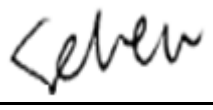
Power Port

| | | | | | | |
|--|-----|---|----|-----|------|------|
| Test Voltage: AC 253V/50Hz | | | | | | |
| Waveform : 1.2/50µs(8/20µs) Repetition rate : 60 sec Time : 20 time/each condition | | | | | | |
| /Phase Voltage / Mode / Polarity / Result | | | 0° | 90° | 180° | 270° |
| <u>0.5/1.0</u> kV | L-N | + | A | A | A | A |
| | | — | A | A | A | A |

| | | | | |
|---|---------------|---|-------------|---|
| Waveform : 1.2/50µs(8/20µs) Repetition rate : 60 sec Time : 5 time/each condition | | | | |
| Voltage | <u>0.5</u> kV | | <u>1</u> kV | |
| Mode / Polarity / Result | + | — | + | — |
| BNC | A | A | A | A |



| | | | | |
|---|---------------|---|-------------|---|
| Waveform : 10/700µs Repetition rate : 60 sec Time : 5 time/each condition | | | | |
| Voltage | <u>0.5</u> kV | | <u>1</u> kV | |
| Mode / Polarity / Result | + | — | + | — |
| BNC | A | A | A | A |

Test engineer: 

12.5. Test Photographs





13. Conduction Disturbances induced by Radio-Frequency Fields

13.1. Test Procedure

- a. The EUT shall be operated within its intended climatic conditions. The temperature and relative humidity should be recorded.
- b. This test method test can be performed without using a sell shielded enclosure. This is because the disturbance levels applied and the geometry of the setups are not likely to radiated a high amount of energy, especially at the lower frequencies. If under certain circumstances the radiated energy is too high, a shielded enclosure has to be used.
- c. The test shall be performed with the test generator connected to each of the coupling and decoupling devices in turn while the other non-excited RF-input ports of the coupling devices are terminated by a 50 ohm load resistor.
- d. The frequency range is swept from 150 KHz to 100 MHz, using the signal levels established during the setting process, and with the disturbance signal 80% amplitude modulated with a 1KHz sign wave, pausing to adjust the RF-signal level or to switch coupling devices as necessary. The rate of sweep shall no exceed 1.5×10^{-3} decades/s. Where the frequency is swept incrementally, the step size shall no exceed 1% of the start and thereafter 1% of the preceding frequency value.
- e. The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised, and able to respond. Sensitive frequencies e.g. clock frequency (ies) and harmonics or frequencies of dominant interest shall be analyzed separately.
- f. An alternative test procedure may be adopted, wherein the frequency range is swept incrementally, with a step size not exceeding 4% of the start ad thereafter 4% of the preceding frequency value. The test level should be at least twice the value of the specified test level.
- g. In cases of dispute, the test procedure using a step size not exceeding 1% of the start and thereafter 1% of preceding frequency value shall take precedence.
- h. Attempts should be made to fully exercise the EUT during testing, and to fully interrogate all exercise modes selected for susceptibility.
- i. The use of special exercising programs is recommended.
- j. Testing shall be performed according to a Test Plan, which shall be included in the test report.
- k. It may be necessary to carry out some investigatory testing in order to establish some aspects of the test plan.



13.2. Test Severity Levels

| Level | Voltage Level (EMF), |
|--|------------------------|
| 1 | 1 V |
| 2 | 3 V |
| 3 | 10 V |
| x | Specified |
| NOTE - x is an open class. This level can be specified in the product specification. | |

13.3. Measurement equipment

| Instrument/Ancillary | Manufacturer | Model No. | Serial No. | Calibration Date | Valid Date. |
|--------------------------------|--------------|-------------|------------|------------------|-------------|
| Conducted immunity test system | FRANKONIA | CIT-10/75 | 102D1294 | 2016.03.26 | 2017.03.25 |
| EM Injection clamp | FCC | F-203I-23MM | 536 | 2016.03.26 | 2017.03.25 |
| CDN | FRANKONIA | CDN-T2 | A3010029 | 2016.03.26 | 2017.03.25 |
| CDN | FRANKONIA | CDN-T4 | A3015017 | 2016.03.26 | 2017.03.25 |
| CDN | FRANKONIA | CDN-T8 | A3022010 | 2016.03.26 | 2017.03.25 |
| CDN | FRANKONIA | CDN-M2 | A3002037 | 2016.03.26 | 2017.03.25 |
| CDN | FRANKONIA | CDN-M2+M3 | A3011102 | 2016.03.26 | 2017.03.25 |
| CDN | FCC | CDN-M5/32 | A3013024 | 2016.03.26 | 2017.03.25 |
| 6 dB Attenuator | FRANKONIA | N/A | N/A | 2016.03.26 | 2017.03.25 |
| Temperature/ Humidity Meter | Zhicheng | ZC1-11 | CEP-TH-005 | 2016.03.29 | 2017.03.28 |
| EN61000-4-6 | Hubert GmbH | Ver 2.21 | N/A | N/A | N/A |



13.4. Test Result and Data

Basic Standard : IEC 61000-4-6
Product Standard : EN 50130-4: 2011
Product Standard : EN 55024 : 2010
Equipment : 5 INCH IR SPEED DOME
Model No. : SD59100AN-HCI
Final Test Result : PASS
Temperature : 21 °C
Relative Humidity : 51%
Atmospheric Pressure : 100 kPa
Test Date : Mar 21, 2016

Test Mode 1: Normal Operation

For EN 55024: 2010

| Frequency : 0.15~80MHz, Modulation : AM 80%,1KHz sine wave, Dwell time: 3.0s Frequency Step Size : 1 % of preceding frequency value | | | |
|--|-----------|------------|--------|
| Frequency | Test mode | Voltage(V) | Result |
| 0.15 ~ 80MHz | Power(M2) | 3 | A |
| 0.15 ~ 80MHz | BNC | 3 | A |

For EN 50130-4: 2011

Test Voltage: AC 230V/50Hz

| Frequency : 0.15~100MHz, Modulation : AM 80%,1KHz sine wave, Dwell time: 3.0s Frequency Step Size : 1 % of preceding frequency value | | | |
|---|-----------|------------|--------|
| Frequency | Test mode | Voltage(V) | Result |
| 0.15 ~ 100MHz | Power(M2) | 10 | A |
| 0.15 ~ 100MHz | BNC | 10 | A |



Test Voltage: AC 195.5V/50Hz

Frequency : 0.15~100MHz, Modulation : AM 80%,1KHz sine wave, Dwell time: 3.0s
Frequency Step Size : 1 % of preceding frequency value

| Frequency | Test mode | Voltage(V) | Result |
|---------------|-----------|------------|--------|
| 0.15 ~ 100MHz | Power(M2) | 10 | A |
| 0.15 ~ 100MHz | BNC | 10 | A |

Test Voltage: AC 253V/50Hz

Frequency : 0.15~100MHz, Modulation : AM 80%,1KHz sine wave, Dwell time: 3.0s
Frequency Step Size : 1 % of preceding frequency value

| Frequency | Test mode | Voltage(V) | Result |
|---------------|-----------|------------|--------|
| 0.15 ~ 100MHz | Power(M2) | 10 | A |
| 0.15 ~ 100MHz | BNC | 10 | A |

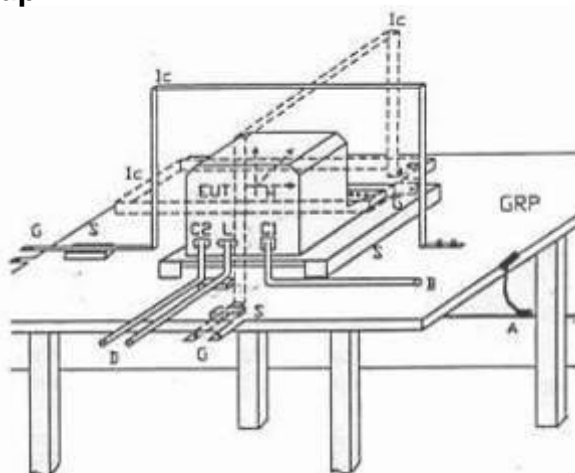
Test engineer: 

13.5. Test Photographs



14. Power Frequency Magnetic Field Immunity Tests

14.1. Test Setup



| | | | | | |
|-----|---|----------------------|----|---|-----------------------------|
| GPR | : | Ground plane | C1 | : | Power supply circuit |
| A | : | Safety earth | C2 | : | Signal circuit |
| S | : | Insulating support | L | : | Communication line |
| EUT | : | Equipment under test | B | : | To power supply source |
| Lc | : | Induction coil | D | : | To signal source, simulator |
| E | : | Earth terminal | G | : | To the test generator |

14.1. Test Severity Levels

| Level | Magnetic field strength A/m |
|--|--------------------------------|
| 1 | 1 |
| 2 | 3 |
| 3 | 10 |
| 4 | 30 |
| 5 | 100 |
| X ¹⁾ | special |
| NOTE 1 "X" is an open level. This level can be given in the product specification. | |

14.2. Measurement equipment

| Instrument/Ancillary | Manufacturer | Model No. | Serial No. | Calibration Date | Valid Date. |
|--------------------------------|--------------|------------|------------|------------------|-------------|
| TRANSIENT | EMCPARTNER | TRA2000IN6 | 901 | 2016.03.26 | 2017.03.25 |
| H-Filed-Loop | EMCPARTNER | MF1000-1 | 144 | 2016.03.26 | 2017.03.25 |
| Temperature/ Humidity Meter | Zhicheng | ZC1-11 | CEP-TH-005 | 2016.03.29 | 2017.03.28 |

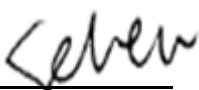


14.3. Test Result and Data

Basic Standard : IEC 61000-4-8
Product Standard : EN 55024 : 2010
Equipment : 5 INCH IR SPEED DOME
Model No. : SD59100AN-HCI
Final Test Result : PASS
Temperature : 21 °C
Relative Humidity : 51%
Atmospheric Pressure : 100 kPa
Test Date : Mar 21, 2016

Test Mode 1: Normal Operation

| Power Frequency Magnetic Field : <u>50/60</u> Hz, <u>1</u> A/m | | |
|--|------------------|---------|
| Coil Orientation | Testing duration | Results |
| X-axis | 1.0 Min | A |
| Y-axis | 1.0 Min | A |
| Z-axis | 1.0 Min | A |

Test engineer: 

14.4. Test Photographs





15. Voltage Dips and Voltage Interruptions Immunity Test Setup

15.1. Test Conditions

1. Source voltage and frequency : 230V / 50Hz, Single phase.
2. Test of interval : 10 sec.
3. Level and duration : Sequence of 3 dips/interrupts.
4. Voltage rise (and fall) time : 1 ~ 5 μ s.
5. Test severity :

| Voltage dips and Interrupt reduction (%) | Test Duration (period) |
|--|---------------------------|
| >95% | 250 |
| 30% | 25 |
| >95% | 0.5 |

| Item | Environmental Phenomena | Units | Test Specification | Performance Criteria |
|-----------------------|----------------------------|-----------------------|-----------------------|-------------------------|
| Input AC Power Ports | | | | |
| Voltage Dips | | % Reduction period | 20 250 | |
| | | % Reduction period | 30 25 | |
| | | % Reduction period | 60 10 | |
| Voltage Interruptions | | % Reduction period | 100 250 | |

15.2. Measurement equipment

| Instrument/Ancillary | Manufacturer | Model No. | Serial No. | Calibration Date | Valid Date. |
|--------------------------------|--------------|------------|------------|---------------------|-------------|
| TRANSIENT | EMCPARTNER | TRA2000IN6 | 901 | 2016.03.26 | 2017.03.25 |
| Temperature/ Humidity Meter | Zhicheng | ZC1-11 | CEP-TH-005 | 2016.03.29 | 2017.03.28 |



15.3. Test Result and Data

Basic Standard : IEC 61000-4-11
 Product Standard : EN 50130-4: 2011
 Product Standard : EN 55024 : 2010
 Equipment : 5 INCH IR SPEED DOME
 Model No. : SD59100AN-HCI
 Final Test Result : PASS
 Temperature : 21 °C
 Relative Humidity : 51%
 Atmospheric Pressure : 100 kPa
 Test Date : Mar 21, 2016

Test Mode 1: Normal Operation

For EN 55024: 2010

| Test Voltage: AC 230V/50Hz | | | | | | | | | | |
|-----------------------------|------------------------|--------------------------|----------------|----|----|-----|-----|-----|-----|-----|
| Interval(s) : 10s Times : 3 | | | | | | | | | | |
| Test mode | Test level reduction % | Durations (period / ms) | Phase / Result | | | | | | | |
| | | | 0 | 45 | 90 | 135 | 180 | 225 | 270 | 315 |
| Voltage interruptions | >95% | 250 | C | C | C | C | C | C | C | C |
| Voltage dips | 30% | 25 | A | A | A | A | A | A | A | A |
| | >95% | 0.5 | A | A | A | A | A | A | A | A |

For EN 50130-4: 2011

| Test Voltage: AC 230V/50Hz Interval(s) : 10s Times : 3 | | | | | | | | | | |
|--|--------------------|--------------------------------|----------------|----|----|-----|-----|-----|-----|-----|
| Test mod | Test level UT % | Durations (period / ms) | Phase / Result | | | | | | | |
| | | | 0 | 45 | 90 | 135 | 180 | 225 | 270 | 315 |
| Voltage interruptions | 100% | 250 | A | A | A | A | A | A | A | A |
| Voltage dips | 20% | 250 | A | A | A | A | A | A | A | A |
| | 30% | 25 | A | A | A | A | A | A | A | A |
| | 60% | 10 | A | A | A | A | A | A | A | A |

100% and 20% is permitted to UPS to meet the requirements of Result A.

| Test Voltage: AC 195.5V/50Hz Interval(s) : 10s Times : 3 | | | | | | | | | | |
|--|--------------------|--------------------------------|----------------|----|----|-----|-----|-----|-----|-----|
| Test mod | Test level UT % | Durations (period / ms) | Phase / Result | | | | | | | |
| | | | 0 | 45 | 90 | 135 | 180 | 225 | 270 | 315 |
| Voltage interruptions | 100% | 250 | A | A | A | A | A | A | A | A |
| Voltage dips | 20% | 250 | A | A | A | A | A | A | A | A |
| | 30% | 25 | A | A | A | A | A | A | A | A |
| | 60% | 10 | A | A | A | A | A | A | A | A |

100% and 20% is permitted to UPS to meet the requirements of Result A.



| Test Voltage: AC 253V/50Hz Interval(s) : 10s Times : 3 | | | | | | | | | | |
|--|--------------------|--------------------------------|----------------|----|----|-----|-----|-----|-----|-----|
| Test mod | Test level UT % | Durations (period / ms) | Phase / Result | | | | | | | |
| | | | 0 | 45 | 90 | 135 | 180 | 225 | 270 | 315 |
| Voltage interruptions | 100% | 250 | A | A | A | A | A | A | A | A |
| Voltage dips | 20% | 250 | A | A | A | A | A | A | A | A |
| | 30% | 25 | A | A | A | A | A | A | A | A |
| | 60% | 10 | A | A | A | A | A | A | A | A |

100% and 20% is permitted to UPS to meet the requirements of Result A.

Test engineer: Seben

15.4. Test Photographs

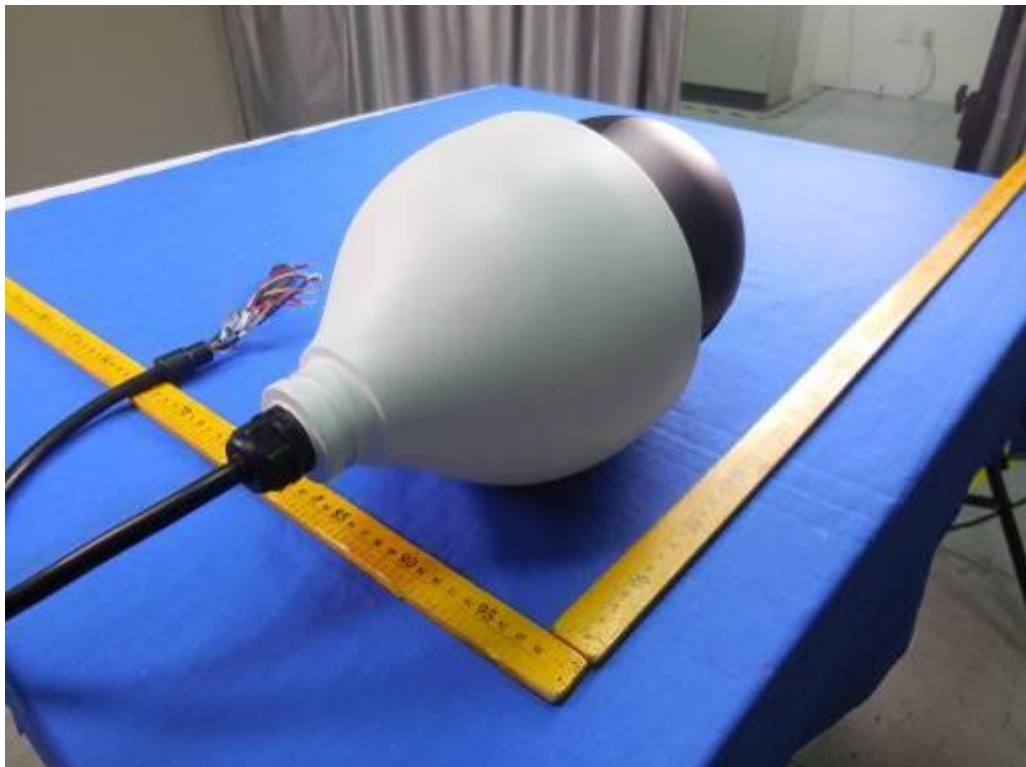


16. EUT Photographs

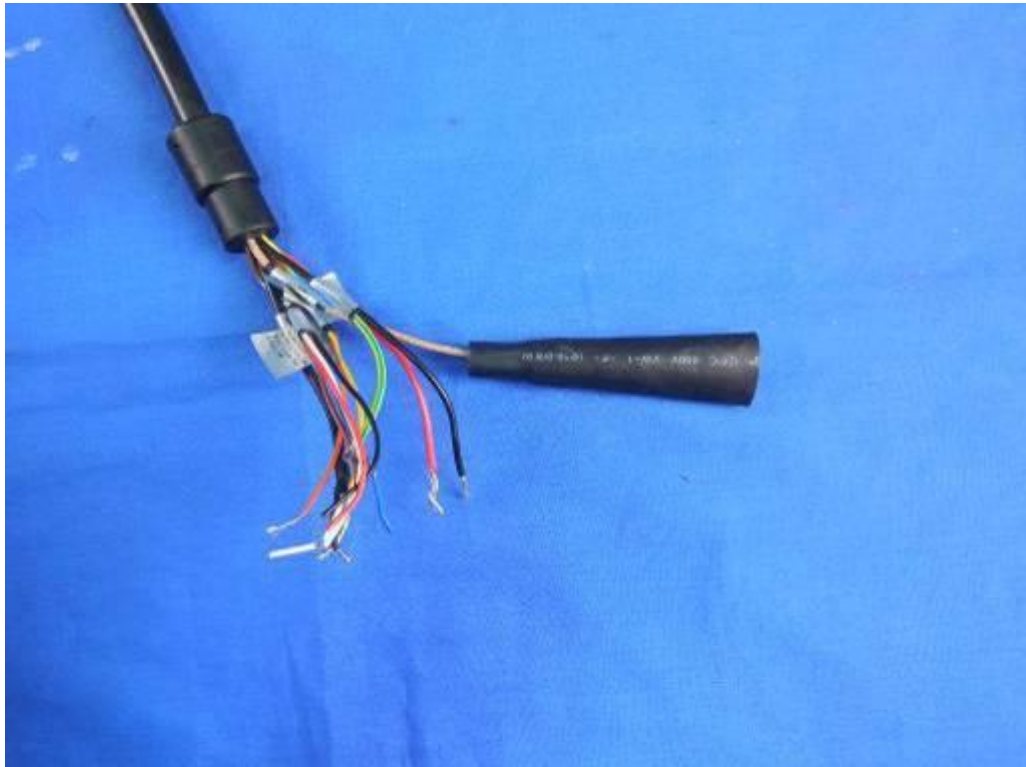
1) EUT Photo



2) EUT Photo



3) EUT Photo



4) EUT Photo(Adapter)



5) EUT Photo(Adapter)



6) EUT Photo(Adapter)

