TO WHOM IT MAY CONCERN

Bosch Security Systems
Torenallee 49
5617 BA Eindhoven
The Netherlands

Product Test Report BT-SC 2018-E-054

Products

NDI-4502-A	Fixed dome 2MP 3-10mm auto
NDI-4502-AL	Fixed dome 2MP 3-10mm auto
NDI-5503-A	Fixed dome 5MP HDR 3-10mm auto
NDI-5503-AL	Fixed dome 5MP HDR 3-10mm auto

The above mentioned Bosch Security Systems products have been tested in accordance and were found to comply with the tests listed below which were carried out during the development phase of the product.

EMC approvals

EMC EU	**Description**
EN 55032: 2015 / AC: 2016 EN 55024: 2010+ A1: 2015	Information Technology Equipment- Radio disturbance characteristics Limits and Methods of measurement. Class B
EN 50130-4: 2011+ A1: 2014	Alarm systems - Part 4: Electromagnetic compatibility - Product family standard: Immunity requirements for components of fire, intruder and social alarm systems.
EN 50121-4: 2016	Railway applications – Electromagnetic compatibility – Part 4: Emission and immunity of signaling and telecommunications apparatus.
EN 61000-3-2: 2014	Mains harmonics Part 3-2: Limits - Limits for harmonic current emissions
EN 61000-3-3: 2013	Voltage fluctuations Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems.
EMC US	
CFR 47 FCC part 15 Class B	Code of Federal Regulations, Radio Frequency Devices, Unintentional Radiators. Radiated Emission based on verification procedure.
EMC Australia	
AS/NZS CISPR 32 equal to CISPR 32	Product market with BOSCH supplier code N663.
EMC Japan	
VCCI: VCCI-CISPR 32: 2016	EMC certification for Japan.
EMC India	
BIS: IS 13252 (Part 1):2010	EMC certification for India.

Safety approvals

Safety EU	
EN 62368-1:2014 + A11:2017	Audio/video, Information and Communication technology equipment - Part 1: Safety requirements
EN 62471: 2008 (Only for IR version)	Eye Safety
Safety USA + Canada	
UL 62368-1 CAN/CSA-C22.2 No. 62368-1-14	Audio/video, Information and Communication technology equipment - Part 1: Safety requirements

Environmental approvals

Directive or standard	**Description**
RoHS EU, 2011/65/EU EN 50581:2012	Restriction of the use of certain hazardous substances (RoHS)
WEEE EU, 2012/19/EU	Waste Electrical and Electronic Equipment (WEEE)
Packaging EU, 94/62/EC (amended by 2014/12/EC)	Packaging and packaging waste
N2580-1 (Bosch standard)	Central directive Bosch-Norm N 2580-1: "Prohibition and declaration of substances" Bosch-Norm N 2580-1 regulates prohibited substances and those rated declarable in materials, and it is part of the requirements for materials.
N33 6 (Bosch standard)	Design for Environment (DfE): Design and manufacturing rules.

Management system

Directive or standard	**Description**
ISO 9001:2008	Quality management systems – Requirements Scope: Development, Production, Installation and Sales.
ISO 14001:2004 /AC:2009	Environmental management systems – Requirements with guidance for use Scope: Development, Production, Sales and After Sales.

Reliability tests

EN50130-5:2011 Alarm systems Part 5: Environmental test methods	**Class II, fixed equipment, indoor in general**
Dry heat (Operational) (EN 60068-2-2:2007)	Temperature +55°C, Duration 16 hours.
Cold operation (Operational) (EN 60068-2-1:2007)	Temperature -10°C, Duration 16 hours. *Bosch tested more severe at temperature -20°C.*
Damp heat, steady state (Endurance) (EN 60068-2-78:2012)	Temperature +40°C, Relative Humidity 93%, duration 21 days.
Damp heat, cyclic (Operational) (EN 60068-2-30:2005)	Temperature +25°C to +55°C, Relative Humidity 93%, 2 cycles. *Bosch tested more severe for 6 cycles.*
Shock (Operational) (EN 60068-2-27:2009)	Halve sine wave pulse, duration 6ms, 3 pulses per direction, 6 directions. *Bosch tested with acceleration of ± 920 m/s^2.*
Impact (Operational) (EN 60068-2-75:2014)	Impact energy 0.5 Joule , 3 impacts per point (Similar to EN 62262 IK04 rating).
Vibration sinusoidal (Operational) (EN 60068-2-6:2008)	Frequency Range 10~150Hz, 5 m/s², 3 axes, Sweep rate 1 octave/min, 1 sweep/axis. *Bosch tested with acceleration of 10m/s2 and in operational mode.*
Vibration sinusoidal (Endurance) (EN 60068-2-6:2008)	Frequency Range 10~150Hz, 10 m/s², 3 axes, Sweep rate 1 octave/min, 20 sweep/axis.
Dust tightness (Endurance) (EN 60529:1991 A1:2000)	Duration 8h (similar to EN 60529 IP5X). *This product is not a specific enclosure to protect ingress of dust. Optical path is tested to IP5X.*

Additional Reliability tests

Environmental test methods	Specific Test description
MTBF (Mean Time Between Failures) calculation of used components	Based on: Siemens SN29500, or FIT figures manufacturer. Theoretical MTBF is about 800.000 h.
HALT (Highly Accelerating Life Test)	Overstress test to Fail, Operational, Lower Of Limitation = -40°C, High Of Limitation = +80°C, Vibration OL > 50Grms Combined Environment Stress: Temperature -40°C to +80°C, with 4 to 25 Grms for each cycle.
Cold start test	At ambient temperature -20°C.
Transport tests acc. AV18-Q0681 ISTA-2A: 2011	
1. Conditioning	Pre-conditioning: Temp. +25°C, 43%RH, Duration 6 hours. Conditioning: Temp. +38°C, 85%RH, Duration 72 hours. Temp. +60°C, 30%RH, Duration 6 hours.
2. Compression	Top to Bottom, Apply and Hold, Duration 60min. Calculated test load = 972 lbs
3. First vibration test	Frequency 232CPM, Duration 62 min. ; Number of Impact (cycle): 14200 cycles
4. Drop test after 1st vibration test	Height depending of weight of product. Drop height (inch): 32; drop times: 10
5. Second vibration test	Frequency 232CPM, Duration 62 min. ; Number of Impact (cycle): 14200 cycles

Data subject to change without notice.
Eindhoven, September 2019.