

TO WHOM IT MAY CONCERN

Bosch Security Systems
Torenallee 49
5617 BA Eindhoven
The Netherlands

Product Test Report

AT18-Q1616

Products

F.01U.316.649	NDE-4502-A	Fixed dome 2MP 3-10mm auto IP66
F.01U.316.650	NDE-4502-AL	Fixed dome 2MP 3-10mm auto IP66
F.01U.322.069	NDE-4502-ALAR	Fixed dome 2MP 3-10mm auto IP66 AR
F.01U.316.662	NDE-5503-A	Fixed dome 5MP HDR 3-10mm auto IP66
F.01U.316.787	NDE-5503-AL	Fixed dome 5MP HDR 3-10mm auto IP66

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: 2012 / AC: 2013 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: 2006 / AC: 2008	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: V-2/2015.04 & V-3/2015.04	EMC certification for Japan.

Safety approvals

Safety EU	
EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013	Information technology equipment - Safety - Part 1: General requirements
EN 60950-22: 2006+ A11: 2008	Information technology equipment - Safety - Part 22: Equipment installed outdoors.
EN 62471: 2008 (Only for IR version)	Eye Safety
Safety USA + Canada	
UL 60950-1 CAN/CSA-C22.2 No. 60950-1-07	Information technology equipment - Safety - Part1: General requirements
CSA/UL 60950-22 CAN/CSA-C22.2 No. 60950-22-07	Information technology equipment - Safety - Part 22: Equipment installed outdoors.

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 IV, fixed equipment, outdoor in general
Dry heat (Operational) (EN 60068-2-2:2007)	Temperature +70°C, Duration 16 hours.
Dry heat (Endurance) (EN 60068-2-2:2007)	Temperature +70°C, Duration 21 days.
Cold operation (Operational) (EN 60068-2-1:2007)	Temperature -25°C, Duration 16 hours. <i>Bosch tested more severe at temperature -40°C.</i>
Damp heat, steady state (Endurance) (EN 60068-2-78:2001)	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. <i>Bosch tested more severe for 6 cycles.</i>
Damp heat, cyclic (Endurance) (EN 60068-2-30:2005)	Temperature +25°C to +55°C, Relative Humidity 93%, 6 cycles.
Water ingress (Operational) (EN 60068-2-30:2005)	Test procedure Ra1.1 or Rb1.2, 10min (Similar EN60529 IPX4). <i>Bosch tested more severe for class IPx6 by mounting on a board.</i>
Salt mist, cyclic (Endurance) (EN 60068-2-52:1996)	Temperature +15°C to +35°C, Relative Humidity 93%, 4 cycles, Duration 28 days.
Shock (Operational) (EN 60068-2-27:2009)	Halve sine wave pulse, duration 6ms, 3 pulses per direction, 6 directions. <i>Bosch tested with acceleration of $\pm 1000 \text{ m/s}^2$.</i>
Impact (Operational) (EN 60068-2-75:1997 Test Ehb)	Impact energy 1.0 Joule , 3 impacts per point (Similar to EN 62262 IK06 rating). <i>Bosch tested more severe for IK10 rating.</i>
Vibration sinusoidal (Operational) (EN 60068-2-6:2008)	Frequency Range 10~150Hz, 5 m/s^2 , 3 axes, Sweep rate 1 octave/min, 1 sweep/axis. <i>Bosch tested with acceleration of 10m/s^2 and in operational mode.</i>
Vibration sinusoidal (Endurance) (EN 60068-2-6:2008)	Frequency Range 10~150Hz, 10 m/s^2 , 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). <i>Bosch tested more severe for IP6X rating.</i>

Additional Reliability tests

Environmental test methods	Specific Test description
MTBF calculation of used components	Based on: Siemens SN 29500, 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 -40°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 1 st 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, August 2017.