

TO WHOM IT MAY CONCERN

Bosch Security Systems  
 Glaslaan 2  
 5600JB Eindhoven  
 The Netherlands  
 AR18-11-D015

## **Product Test report**

Product name: **BOSCH Dinion HD 1080p camera**

Material No / CTN / description:

F.01U.167.409	NBN-832V-1P	DINION HD 1080p
F.01U.167.410	NBN-832V-2P	DINION HD 1080p IVA Ready
F.01U.170.671	NBN-832V-IP	DINION HD 1080p IVA Enabled

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.

### **ENVIRONMENTAL TESTS**

<b>EN 50130-5:1999 Alarm systems Part 5: Environmental test methods</b> 1) till 7) is Introduction	<b>Specific Test description Class II Indoor in general, fixed equipment.</b>	<b>Passed</b>
8) Dry heat Operational IEC 60068-2- 2:1974 +A1:1993+ A2:1994	Temp. +55°C (131°F) for *-1P model, Temp. +50°C (122°F) for *-2P IP models, duration 16 hrs.	Yes
9) Dry heat endurance IEC 60068-2-2:1974 +A1:1993+ A2:1994	No test for Class II products. However tested +85°C (185°F) during 2 days.	Yes
10) Cold operational IEC 60068-2-1:1990 +A1:1993+ A2:1994	Temp. -10°C (14°F) during 16hrs.	Yes
11) Temperature change operational IEC 60068- 2-14:1984 +A1:1986	No test for Class II Fixed products. Tested at more severe executed: Non operational mode 5 cycles -40°C (-40°F) to +75°C (167°F) fast changes.	Yes
12) Damp heat, steady state operational IEC 60068-2-2:1988	No test for Class II products but covered by test 14).	Yes
13) Damp heat, steady state endurance IEC 60068-2-3:1969+A1:1984	Temp. +40°C (104°F), Relative Humidity 93% during 21 days. See test 14).	Yes
14) Damp heat, cyclic operational IEC 60068-2- 30:1980+A1:1985	Temp. 25°C to +55°C (77-131°F), Relative humidity >93%, duration 21 days instead of 2 cycles.	Yes
15) Damp heat, cyclic endurance IEC 60068-2- 30:1980+A1:1985	No test for Class II products but covered by test 14).	Yes

16) Water ingress (operational)	No test for Class II fixed products	N.A.
17) Sulphur Dioxide SO <sub>2</sub> endurance IEC 60068-2-42:1982	Check for resistance of connectors to SO <sub>2</sub> Sulphur Dioxide. Not tested.	N.T.
18) Salt mist, cyclic endurance IEC 60068-2-52:1996	No test for Class II products.	N.A.
19) Shock operational IEC 60068-2-27:1987	Tested with halve sine wave pulse 6 ms, $\pm 850 \text{ m/s}^2$ 3 perpendicular directions, 3 pulses per direction 18 pulses in total.	Yes
20) Impact operational IEC 60068-2-75:1997	Impact energy 0.5 Joule, 3 impacts per point.	Yes
21) Free fall operational IEC 60068-2-32:1975 +A1:1982+ A2:1990	No test for fixed equipment.	N.A.
22) Vibration sinusoidal operational IEC 60068-2-6:1995	Freq. Range 10-150 Hz, 5 m/s <sup>2</sup> , 3 axes, sweep rate 1 octave/m 1 sweep/axis. Tested with severe level of 10m/s <sup>2</sup>	Yes
23) Vibration sinusoidal endurance IEC 60068-2-6:1995	Freq. Range 10-150 Hz, 10 m/s <sup>2</sup> , 3 axes, sweep rate 1 octave/min 20 sweep/axis.	Yes
24) Simulated solar radiation Temperature rise operational	No test for Class II fixed equipment.	N.A.
25) Simulated solar radiation Surface degradation	No test for Class II fixed equipment.	N.A.
26) Dust tightness endurance	This product is not a specific enclosure to protect ingress of dust. Optical path is tested to IP6X. NO ingress of dust.	Yes

#### **ADDITIONAL BOSCH TESTS**

Test specification	Specific Test description	Passed
FMEA (failure Mode and Effect Analysis)	Design and Process analyses based on a Bosch template	Yes
MTBF calculation of used components.	Based on: Siemens SN 29500, or FIT figures manufacturer. Theoretical MTBF = 202835 hrs.	Yes
HALT (Highly Accelerating Life Test)	Overstress test to Fail. Determination of fail limits for: <ul style="list-style-type: none"> <li>• Low ambient temperature</li> <li>• High ambient temperature</li> <li>• Vibration</li> <li>• Combination of Temperature and vibration</li> </ul>	Yes
Thermal cycling / Power cycling tests	Power on/off switching test In combination with Thermal cycling for DC and POE on/off switching (every 1 minute) and temperature changing from -40°C (-40°F) to +85°C (185°F) continuously	Yes
Hot spots on components.	With Infra red scanner at room temperature Tamb. 20 $\pm$ 5 °C ( $\pm$ 68°F).	Yes
Temperature of Hot spots components	With thermocouples at room temperature Tamb. 20 $\pm$ 5°C ( $\pm$ 68°F).	Yes

Bump IEC 60068-2-29:1987 Non operating	Test Eb, 10g, 16ms, 3 perpendicular directions each 1000, in total 6000x	Yes
Decorative surface test UN-D 1235/01	25 rubbings by hand <ul style="list-style-type: none"> <li>Boiling point spirit 100- 140°C (212-284°F)</li> <li>Ethanol 96 % with 5% methanol.</li> </ul>	Yes
Type plate test IEC 60950-1 Par. 1.7.13.	Rubbing by hand with water+ Petroleum spirit during 15s.	Yes
ALT (Accelerated Life Test)	Reliability test in which a moderate number of products are stressed at elevated, but non destructive stress levels for a longer period of time. <ul style="list-style-type: none"> <li>High temperature stress</li> <li>Power + temperature stress</li> <li>Temperature Humidity cycling</li> <li>Low random vibration + Temperature testing</li> <li>Long term High temperature operating</li> </ul>	Yes
<b>Transport tests acc. AV18-Q0681</b>		Passed
1. Vibration test	Freq. 7Hz, 5.3 mm (= 1.05g), 30 min each side, 3 directions.	Yes
2. Drop test after vibration test 10 drops.	Height depending of weight of product.	Yes

### Approvals Safety, EMC and Environmental

<b>EMC Europe standards</b>	Description	Passed
EN 55022:2006, +A1:2007. Class B	Information technology equipment — Radio disturbance characteristics — Limits and methods of measurement CISPR 22:2005 (Modified).	Yes
EN 50130-4:1995, +A1:1998, +A2:2003	Part 4: Electromagnetic compatibility – Product family standard: Immunity requirements for components of fire, intruder and social alarm systems.	Yes
EN 50121-4:2006	Railway EMC Part 4: Emission and immunity of the signaling and telecommunications apparatus	Yes
<b>EMC USA</b>		Passed
CFR 47 FCC part 15:2009-10, Class B	Radiated Emission based on VERIFICATION procedure.	Yes
<b>Australian</b>		Yes
AS/NZS CISPR 22 equal to CISPR 22	Product market with BOSCH supplier code N663.	
<b>Safety Europe</b>		Passed
EN 60950-1: 2006, +A11:2009	Information technology equipment — Safety — Part 1: General requirements.	Yes
<b>Safety USA + Canada</b>		Passed
<b>UL 60950-1, 2<sup>nd</sup> edition, 2007</b>	Information technology equipment - Safety – Part 1:	Yes
<b>CAN/CSA-C22.2 No. 60950-1-07, 2<sup>nd</sup> edition</b>	General requirements. Products marked with cULus logo.	

<b>Environmental</b>		Passed
Restriction of Hazardous Substances	RoHS compliant.	Yes
N 2580-1 Prohibited and declarable substances in product, component, materials and preparations.	Bosch internal environmental standard.	Yes

The products are produced by a manufacturing organization, which is certified on **ISO9001** and **ISO14001** standards.

Data subject to change without notice.

Eindhoven, April 2011.