Product Test Report

Product name: BOSCH MIC Series 550 Cameras (Standard and IR)

Model numbers:

MIC-550ALB28N MIC Series 550 28X NTSC Camera, Black
MIC-550ALW28N MIC Series 550 28X NTSC Camera, White
MIC-550ALB36N MIC Series 550 36X NTSC Camera, Black
MIC-550ALW36N MIC Series 550 36X NTSC Camera, White
MIC-550ALB28P MIC Series 550 28X PAL Camera, Black
MIC-550ALG28P MIC Series 550 28X PAL Camera, Grey
MIC-550ALW28P MIC Series 550 28X PAL Camera, White
MIC-550ALB36P MIC Series 550 36X PAL Camera, Black
MIC-550ALG36P MIC Series 550 36X PAL Camera, Grey
MIC-550ALW36P MIC Series 550 36X PAL Camera, White
MIC-550IRB28N MIC Series 550IR 28X NTSC Camera, Black
MIC-550IRW28N MIC Series 550IR 28X NTSC Camera, White
MIC-550IRB36N MIC Series 550IR 36X NTSC Camera, Black
MIC-550IRW36N MIC Series 550IR 36X NTSC Camera, White
MIC-550IRB28P MIC Series 550IR 28X PAL Camera, Black
MIC-550IRG28P MIC Series 550IR 28X PAL Camera, Grey
MIC-550IRW28P MIC Series 550IR 28X PAL Camera, White
MIC-550IRB36P MIC Series 550IR 36X PAL Camera, Black
MIC-550IRG36P MIC Series 550IR 36X PAL Camera, Grey
MIC-550IRW36P MIC Series 550IR 36X PAL Camera, White

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 TEST

EN50130-5:1999 Alarm systems Part 5: Environmental test methods	Specific Test description >>class IV fixed equipment>>	Comments	Passed
Dry heat Operational IEC60068-2- 2:1974 +A1:1993+ A2:1994	Temp. +60°C, duration 96 hours		Yes
Dry heat endurance IEC60068-2-2:1974 +A1:1993+ A2:1994	Temp. +70°C, duration 16 hours		Yes
Cold operational IEC60068-2-1:1990 +A1:1993+ A2:1994	Temp. -40°C, duration 96 h		Yes
Cold start test	At -40°C, 30 minute warm up period		Yes
Cold Endurance IEC60068-2-1:1990 +A1:1993+ A2:1994	Temp -50°C, duration 16 h		Yes
Temperature change IEC60068-2-14:1984 +A1:1986	Non-operational 5 cycles -40°C to +70°C, fast changes, 3h stabilizing, 2 chamber method Special attention to mechanical damage and cracks of the PCB and components.		Yes
Damp heat, cyclic operational IEC60068-2-30:1980+A1:1985	6 hours at +60°C / 95%RH, 16 hours 35°C / 85%RH, 5 cycles total		Yes
IEC60529 IP68 [Water ingress (operational)]	Submersion 1 meter for 24 hours		Yes

EN50130-5:1999 Alarm systems Part 5: Environmental test methods	Specific Test description >>class IV fixed equipment>>	Comments	Passed
External Mechanical Impact (IK Code) IK09 Rating IEC62262:2002-02	Energy 10J, 5kg steel mass, 50mm spherical radius, drop height .2m 5 drops per side, impact 5 sides, 25 total impacts	Fully functional after all impacts and cycling power	Yes
Vibration sinusoidal operational IEC60068-2 6:1995 Test Fc: 20 m/s² (2.0 g)	Freq. Range 10-150Hz, 20m/s², 3 axes, sweep rate 1 octave/m 1 sweep/axis, (2.0g)		Yes
Shock Operational, IEC60068-2-27, Test Ea: Shock, 20g	Half sine wave, pulse duration 18mS, 6 shocks, 3 per axis	Vertical = 20g Horizontal = 20g	Yes
Wind speed	209 km/h (130 mph) (sustained) (Gusts up to 290 km/h (180 mph))	Calculated	Yes
Sound level	<66 dBA		Yes
Transport tests acc. AV18-Q0681 (ISTA, procedure 1A)			
Vibration test	Step vibration g's up to 50 by 5 g's every 10 minutes until operational failure and/or destruct failure.		Yes
Drop test after vibration test 6 drops.	Height of drop is 36 inches.. Weight = 14 k		Yes

ADDITIONAL ENVIRONMENTAL – FUNCTIONAL BOSCH TESTS

Environmental test methods	Specific Test description	Comments	Passed
MTBF calculation of used components Based on: for electronics, Siemens SN29500, or based on FIT number of manufacturer.	MTBF ≡ 76,780 hrs		Yes
Design Maturity Test	Life test at 25°C		Yes
HALT (Highly Accelerating Life Test)	overstress test to Fail	45g, IR arm loose. +100°C video loss -60°C video noisy	Yes
FMEA (Failure Mode and Effect Analysis)			Yes
Hot spots on components, Thermocouples	At room temperature Tamb. 20 ±5 °C (±68 °F)		Yes
Temperature of Hot spots on components, Thermocouples, see cold start test	At T ambient -20 ° (-4 °F)		Yes
Salt spray ASTM B117	200 hrs at 35degC, 95%RH, 5% NaCl		Yes

ADDITIONAL CERTIFICATIONS

Approvals Safety, EMC and Environmental

Specific Approval	Description	Comments	Passed
EMC Europe			
EN-55022:2006+ A1:2007, Class A	Information Technology Equipment- Radio disturbance characteristics Limits and Methods of measurement. Class A		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 61000-3-2:2006	Mains harmonics Part 3-2: Limits - Limits for harmonic current emissions (equipment input current up to and including 16 A per phase)		Yes
EN 61000-3-3:1995, +A1:2001 +A2:2005	Voltage fluctuations Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current <= 16 A per phase and not subject to conditional connection.		Yes
EN50121-4:2006	Railway applications – Electromagnetic compatibility Part 4: Emission and immunity of the signaling and telecommunications apparatus	The product complies with EN 50121-4 for application outside 3m-zone within the railway environment.	Yes
EMC USA			
CFR 47 FCC part 15 Class A	Conducted + Radiated Emission based on VERIFICATION procedure		Yes
Australian AS/NZS CISPR 22 equal to CISPR 22	Product market with BOSCH supplier code N663		Yes
Brown out supply voltage test. Supply voltage down and slowly back to nominal voltage. The DUT must be functioning at normal supply voltage.	Supply voltage 24VAC and 120VAC 230VAC must be linear lowered till 0V and back linear to nominal voltage during 2 min.		Yes
Lightning protection EN61000-4-5:1995	Levels ±0.5, 1, and 2kV common mode. ± 0.5, 1, and 2kV differential mode. To ALL input / output and supply wiring		Yes
Safety Europe			
EN 60950-1, 2nd Edition, 2007-03-27	Information technology equipment – Safety – Part 1: General requirements		Yes

Specific Approval	Description	Comments	Passed
Safety USA + Canada			
UL 60950-1 (2nd edition dated March 27, 2007) CAN/CSA-C22.2 No.E60950-1 (CSA C22.2 No. 60950-1-07, 2nd Edition, 2007-03)	UL listing + cUL listing. First edition dated April 1, 2003. Information technology equipment – Safety – Part 1: General requirements		Yes
Environmental			
Restriction of Hazardous Substances	ROHS complaint		Yes
Prohibited and declarable substances in products, components, materials and preparations.	Manufacturer's declaration database based on N 2580-1.		Yes

Functional and specification test

Functional tests description		Comments	Passed
Camera Performance	Refer to MIC550 Datasheet		Yes

The product is produced by a manufacturing organisation which is certified on **ISO9001** and **ISO14001** standards.

Data subject to change without notice.

Lancaster, PA; 18 February 2013