Product Tests Report

Product name: BOSCH MIC Series 612 Thermal Cameras

Model numbers and description:

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MIC-612TIALB36N  MIC Series 612 Standard Res. 7.5Hz NTSC Dual Thermal Camera, Black
MIC-612TIALW36N  MIC Series 612 Standard Res. 7.5Hz NTSC Dual Thermal Camera, White
MIC-612TIALB36P  MIC Series 612 Standard Res. 8.3Hz PAL Dual Thermal Camera, Black
MIC-612TIALG36P  MIC Series 612 Standard Res. 8.3Hz PAL Dual Thermal Camera, Grey
MIC-612TIALW36P  MIC Series 612 Standard Res. 8.3Hz PAL Dual Thermal Camera, White
MIC-612TFALB36N  MIC Series 612 Standard Res. 30Hz NTSC Dual Thermal Camera, Black
MIC-612TFALW36N  MIC Series 612 Standard Res. 30Hz NTSC Dual Thermal Camera, White
MIC-612TFALB36P  MIC Series 612 Standard Res. 25Hz PAL Dual Thermal Camera, Black
MIC-612TFALG36P  MIC Series 612 Standard Res. 25Hz PAL Dual Thermal Camera, Grey
MIC-612TFALW36P  MIC Series 612 Standard Res. 25Hz PAL Dual Thermal Camera, White
MIC-612HIALB36N  MIC Series 612 High Res. 7.5Hz NTSC Dual Thermal Camera, Black
MIC-612HIALB36P  MIC Series 612 High Res. 8.3 PAL Dual Thermal Camera, Black
MIC-612HFALB36N  MIC Series 612 High Res. 30Hz NTSC Dual Thermal Camera, Black
MIC-612HFALB36P  MIC Series 612 High Res. 30Hz PAL Dual Thermal Camera, Black
MIC-612TFALD36N  MIC Series 612 Standard Res. 30Hz NTSC Dual Thermal Camera, Sand
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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.

Data subject to change without notice.

ENVIRONMENTAL TEST

BS EN 50130-5:1999 Alarm systems Part 5: Environmental test methods	Specific Test Description	Comments	Passed
Dry heat Operational IEC 60068-2-2:1974 +A1:1993+ A2:1994	Temp. +60°C, duration 96 hours		Yes
Dry heat endurance IEC 60068-2-2:1974 +A1:1993+ A2:1994	Temp. +70°C, duration 16 hours		Yes
Cold Operational IEC 60068-2-1:1990 +A1:1993+ A2:1994	Temp. -40°C, duration 96 h		Yes
Cold Endurance IEC 60068-2-1:1990 +A1:1993+ A2:1994	Temp -50°C, duration 16 h		Yes
Cold Start	At -40°C, 30 minute warm up period		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
Temperature change operational IEC 60068-2-14:1984 +A1:1986	(+) 65 deg C for 48hrs min (-) 45 deg C for 48hrs min Non-operational 5 cycles -40 °C to +70 °C, fast changes, 2h stabilizing, 2 chamber method		Yes
Humidity, Operational Damp heat, steady state operational IEC 60068-2-2:1988	(+)65deg C, 95% RH for 6hrs min (+) 35deg C, 85% RH for 16hrs min 5 cycles.		Yes

BS EN 50130-5:1999 Alarm systems Part 5: Environmental test methods	**Specific Test Description**	**Comments**	**Passed**
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
IEC 60529 Ingress Protection Rating Degrees of protection provided by enclosures (IP Code) [Dust, water ingress (operational)]	Submersion 1 meter for 24 hours	IP68	Yes
NEMA XX	UL50 test: - hose down - protective coating - corrosive resistance - Icing - Gasket => aging test - Gasket test	NEMA 6P *Lens windows exempt from test.*	Yes
External Mechanical Impact (IK Code) IK10 Rating ["Vandalism-proof test"] IEC 62262:2002-02	Energy 20 J, 5 kg steel mass, 50 mm spherical radius, drop height .2m 5 drops per side, impact 5 sides, 25 total impacts *Excludes direct hit on optical or thermal window.*	IK10 Fully functional after all impacts and cycling power	Yes
Vibration sinusoidal operational IEC60068-2 6:1995 Test Fc: 10 m/s² (1.0 g)	Freq. Range 10-150Hz, 10m/s², 3 axes, sweep rate 1 octave/m 1 sweep/axis, (1.0g)		Yes
Shock Operational, IEC60068-2-27, Test Ea: Shock, 30g	15 g, Half sine wave, pulse duration 11mS, 18 shocks, 3 per axis	Vertical = 30g Horizontal = 20g	Yes
Wind speed	240 km/h (150 mph) (sustained) Camera: 517 N (116 lbf) Wall Mount: 130 N (29 lbf) Effective Projected Area (EPA): Camera: 0.192 m² / 2.06 ft² Wall Mount: 0.0483 m² / 0.52 ft²	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 depends on weight of product 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 MIL-HDBK-217.	MTBF ≡186,470 hrs	FIT number of manufacturer	Yes

Environmental test methods	Specific Test Description	Comments	Passed
Design Maturity Test	Life test at 25°C		Yes
HALT (Highly Accelerating Life Test)	overstress test to Fail		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 55022:2010	Information Technology Equipment- Radio disturbance characteristics Limits and Methods of measurement. Class A		Yes
EN 50130-4:2011	Part 4: Electromagnetic compatibility - Product family standard: Immunity requirements for components of fire, intruder and social alarm systems.		Yes
EN 61000-3-2:2006 + A2:2009	Mains harmonics Part 3-2: Limits - Limits for harmonic current emissions (equipment input current up to and including 16 A per phase)		Yes
EN 61000-3-3:2008	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
EN 50121-4:2006	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			**Passed**
CFR 47 FCC part 15 Class A	Conducted + Radiated Emission based on VERIFICATION procedure		Yes

Specific Approval	Description	Comments	Passed
Australian AS/NZS CISPR 22 equal to CISPR 22	Product market with BOSCH supplier code N663		Yes
Lightning protection EN 61000-4-5:1995	Levels ±0.5, 1, 2 and 4kV common mode. ± 0.5, 1 and 2kV differential mode. To ALL input / output - and supply-wiring.		Yes
Safety Europe			
IEC 60950-1:2005 (2nd Edition); Am 1: 2009	Information technology equipment – Safety – Part 1: General requirements		Yes
Safety USA + Canada			
EN 60950-1:2006 / A11:2009 + A1:2010 + A12:2011 UL 60950-1, 2nd edition, 2011-12-19 CAN/CSA-C22.2 No.E60950-1 (CSA C22.2 No. 60950-1-07, 2nd Edition, 2011-12))	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 MIC612 datasheet.		Yes

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

Lancaster, PA; 18 February 2013