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Product Tests Report

Product name: MIC IP fusion 9000i camera family and applicable accessories

Model numbers and descriptions:

MIC-9502-Z30BQS	PTZ thermal QVGA-19mm 2MP 30x9Hz, black
MIC-9502-Z30WQS	PTZ thermal QVGA-19mm 2MP 30x9Hz, white
MIC-9502-Z30GQS	PTZ thermal QVGA-19mm 2MP 30x9Hz, gray
MIC-9502-Z30BVS	PTZ thermal VGA-50mm 2MP 30x 9Hz, black
MIC-9502-Z30WVS	PTZ thermal VGA-50mm 2MP 30x 9Hz, white
MIC-9502-Z30GVS	PTZ thermal VGA-50mm 2MP 30x 9Hz, gray
MIC-9502-Z30BVF	PTZ thermal VGA-50mm 2MP 30x 30Hz, black
MIC-9502-Z30WVF	PTZ thermal VGA-50mm 2MP 30x 30Hz, white
MIC-9502-Z30GVF	PTZ thermal VGA-50mm 2MP 30x 30Hz, gray
MIC-ITS9530BVF	PTZ thermal VGA-50mm 30x 30Hz, black ITS
MIC-ITS9530WVF	PTZ thermal VGA-50mm 30x 30Hz, white ITS
MIC-9K-SNSHLD-W	Sunshield thermal PTZ camera, white
MIC9K-IP67-5PK	Connector kit thermal PTZ IP67 5pieces

The above-mentioned Bosch Security Systems product has been tested in accordance and was found to comply with the tests listed below which were carried out during the development phase of the product. Please note that for some tests, test conditions exceed the range that Bosch recommends for effective continuous operation of the camera.


Data subject to change without notice.

General Safety compliance

Standard	Description
CE Product Safety regulations	General regulations
EN Product Safety regulations	General regulations
UL 60950-1 Ed.2	Underwriters Laboratories standard
UL 62368-1	Underwriters Laboratories standard
IEC 60950-1, Ed.2	General safety requirements
IEC 62368-1	Safety
IEC 60950-22	Safety, outdoor equipment
Directive 2014/35/EU	Low Voltage Directive (LVD)
EN 60950-1	ITE Product Safety
EN 62368-1	Safety
CAN/CSA-C22.2 No.E60950-1B-07	Safety

International Electrotechnical Commission (IEC) compliance

Standard	Specific Test Description	Comments	Passed
IEC 60068-2-1, edition 6 Cold operational	Temp. -45 °C, duration 4 hours		Yes
IEC 60068-2-1, edition 6 Cold Endurance	Temp -45 °C, Duration 4 hours		Yes
IEC 60068-2-2, edition 5 Dry heat Operational	Temp. +74 °C, duration 4 hours		Yes
IEC 60068-2-2, edition 5 Dry heat Storage	Temp. +75 °C, duration 4 hours		Yes

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Standard	Specific Test Description	Comments	Passed
IEC 60068-2-30 Humidity, operational	+70°C @ 95% RH for 8 hours, ramp down to 25 °C @ 96% RH for 9 hours, then ramp back up to +70°C. (1 complete cycle = 24 hours) Repeat for 6 cycles total.		Yes
IEC 60529, edition 2.2 Ingress Protection, IP68 (Part of IEC 60950-1)	Dust tight (No leaks/ingress detected). Water immersion: 24 hours Water depth: 1.8 meters	Camera with Deep Conduit Adaptor mount (DCA) or MIC Wall mount	Yes
IEC 60529, edition 2.2 Ingress Protection, IP67 (Part of IEC 60950-1)	Dust tight (No leaks/ingress detected). Water immersion: 30 minutes Water depth: 1 meter	Camera used with MIC9K-IP67-5PK kit (No Deep Conduit Adaptor mount or MIC Wall mount)	Yes
IEC 60529, edition 2.2 Ingress Protection, IP66 (Part of IEC 60950-1)	Dust tight (No leaks/ingress detected). 1/2" nozzle, 22GPM, 5 minutes. Nozzle 10-12 feet from target.	Camera with Deep Conduit Adaptor mount (DCA) or MIC Wall mount	Yes
IEC 62262, edition 1.0 External Mechanical Impact (IK Code) IK## Rating ["Vandalism-proof test"]	Energy 20J, 5.05 kg steel mass test slug, 50 mm striking radius, drop height 0.4037 m 5 drops per side, impact 5 sides, 25 total impacts Excludes windows.	IK10 Fully functional after all impacts and cycling power	Yes
IEC 60068-2-27, edition 4.0 Shock	Half Sine, 45G, 6ms	Camera mounted on DCA mount	Yes
IEC 60068-2-6, edition 7.0 Sinusoidal Vibration	Freq. Range: 10-150Hz, 1.0G (10m/s ²), 3 axes, Sweep Rate: 1 octave/minute	Camera mounted on DCA mount	Yes

European Norm (EN) compliance


Standard	Specific Test Description	Comments	Passed
Directive 2014/30/EU - EMC			
EN 50121-4 Railway Applications, Electromagnetic Compatibility: Emission and Immunity of the Signaling and Telecommunications Apparatus.	Outside "3 meter" zone.		Yes
EN 50130-5 Alarm systems Part 5: Dust tightness	8 hours at 2kPa vacuum	Same as IP6x	Yes
EN 55032 Radiated and Conducted Emissions	Class A limits		Yes
EN 61000-3-2 Mains Harmonic Current Emissions	Tested limits for harmonic current emissions as defined in standard		Yes
EN 61000-3-3 Mains Voltage fluctuations and flicker	Tested limitation of voltage changes, voltage fluctuations, and flicker as defined in standard		Yes

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Standard	Specific Test Description	Comments	Passed
EN 62368-1 Audio/Video, Information and Communication Technology Equipment - Part 1 safety Requirements	Meets safety requirements as defined in standard		Yes
EN 61000-4-2 ESD Susceptibility (Part of EN 50130-4)	Air discharge = +/- 2Kv, +/- 4Kv and +/- 8Kv ; Direct Contact = +/- 2Kv, +/- 4Kv, +/- 6Kv ; Indirect Contact = +/- 2Kv, +/- 4Kv, +/- 6Kv.		Yes
EN 61000-4-3 Radiated electromagnetic fields (Part of EN 50130-4)	80 MHz to 2700 MHz at Voltage level of 10 V/m. Amplitude Modulation 80%, 1KHz. Pulse Modulation 1Hz (500ms on, 500ms off).		Yes
EN 61000-4-4 Electrical Fast Transient (EFT) Burst (Part of EN 50130-4)	AC mains supply lines: +/- 2Kv, Signal lines: +/- 1Kv, Repetition rate: 100 KHz.		Yes
EN 61000-4-5 Surge (Lightening protection) (Part of EN 50130-4)	AC mains supply lines: Levels ±0.5, 1 and 2kV common mode; ±0.5, 1Kv differential mode. Signal lines: Levels +/- 0.5Kv and 1Kv common mode.		Yes
EN 61000-4-6 Conducted Immunity (Part of EN 50130-4)	150KHz to 100MHz. Voltage level: 10V/m. Amplitude Modulation at 80%, 1KHz. Pulse Modulation at 1Hz, (500ms on, 500ms off).		Yes
EN 61000-4-8 Power Frequency Magnetic Field Immunity (Part of EN 50130-4)	50 Hz and 60 Hz. Test levels: 100A/meter.		Yes
EN 61000-4-11 Voltage Dip and Short Interruption (Part of EN 50130-4)	20% reduction of AC input for 5 seconds, 30% reduction of AC input for 0.5 seconds, 60% reduction of AC input for 0.2 seconds, 100% reduction of AC input for 5 seconds.	Tested using shielded CAT 5E/6 cable, UPS power source, and electrically grounded conduit	Yes
EN 60950-22 Outdoor rating	Part 1: General requirements safety, equipment installed outdoors		Yes
EN 50132-7, scope A DORI (detection/observation/recondition/identification)	Based on: Detection requiring 25 pixels/meter. Observation requiring 62.5 pixels/meter. Recognition requiring 125 pixels/meter. Identification requiring 250 pixels/meter.		Yes
EN 50581 Restriction of Hazardous Substances (RoHS) directive, 2011/65/EU	ROHS complaint	Sunshield and MIC-9K-IP67-5PK accessories included.	Yes

USA standards compliance

Standard	Specific Test Description	Comments	Passed
FCC 47 CFR Part 15, Subpart B	Class A, Conducted + Radiated Emissions		Yes

Canadian standards compliance


Standard	Specific Test Description	Comments	Passed
ICES-003 regulations	Class A, Conducted + Radiated Emissions		Yes

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Russian/EAC standards compliance

Standard	Specific Test Description	Comments	Passed
EurAsian Conformity (EAC)	Conforms to all technical regulations of the Eurasian Customs Union		Yes

Australian standards compliance


Standard	Specific Test Description	Comments	Passed
AS/NZS CISPR 32 (RMC) Radiated & Conducted Emissions	Compliant		Yes

China standards compliance

Standard	Specific Test Description	Comments	Passed
Environmental import requirements	Compliant to China RoHS Disclosure directive according to the provisions of SJ/T 11364		Yes

USA Mil-Std compliance

Standard	Specific Test Description	Comments	Passed
MIL-STD-167-1A Sinusoidal vibration test	Exploratory Test: 1Hz frequency intervals for (15) second dwells 4Hz – 25Hz @ .01-in single amplitude (.02-in DAD) Variable Frequency Test: 1Hz frequency intervals for (5) minute dwells. 4Hz – 15Hz @ .03-in single amplitude (.06-in DAD) 16Hz – 25Hz @ .02-in single amplitude (.04-in DAD) Endurance Test: 2 Hour Duration at frequency determined most damaging 25Hz @ .02-in single amplitude (.04-in DAD)		Yes
Mil-Std-810-G, 501.5 High Temperature	Procedure II, steady-state. +74C, 4hrs		Yes
Mil-Std-810-G, 502.5 Low Temperature (Same as IEC-60068-2-1, Cold Operation)	-45C, 48hrs		Yes
Mil-Std-810-G, 503.5 Temperature Shock	Procedure 1-B, single cycle shock. 3 cycles. Each cycle = Ambient->T1->T2->T1->Ambient T1:-45C, T2:+70C		Yes
Mil-Std-810-G, 505.5 Solar Radiation	Procedure I. 7 cycles. Each cycle is 24hrs. Irradiance: 1120W/m ²		Yes
Mil-Std-810-G, 506.5 Rain	Procedure I, no ingress allowed		Yes
Mil-Std-810-G, 509.5 Salt Fog	24hr wet - 24hr dry - 24hr wet - 24hr dry, 35degC, 5% salt solution		Yes
Mil-Std-810-G, 510.5 Sand and Dust	Test blowing sand with concentration 1.13/m ³ (±0.3). Wind speed 40-65MPH.		Yes

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Standard	Specific Test Description	Comments	Passed
	90min duration per vulnerable face. Chamber temp: +65°C		

Other Environmental compliance

Standard or Test Reference	Specific Test Description	Comments	Passed
Cold start test	Power off, soak for 4 hours minimum @ -45 °C. Apply power to unit. Unit must power up & function normally within 1 hour, but requires operation of autopan for an additional 10 minutes to achieve full pan speeds.		Yes
ASTM B117 Salt Spray	2000 hours at 35 °C, 95%RH, 5% NaCl		Yes
Wind resistance (Wind tunnel test)	160 kph (100 mph) winds. Unit holds position in 8x45deg positions for 60 seconds in each position without structural damage or loss of video or PTZ function. 2 cycles of 120mph winds for 10 minutes followed by 150mph winds for 10 minutes minute period without structural damage or loss of video or PTZ function.	Sunshield included. Tested while mounted on MIC DCA.	Yes
ASTM D 3359 Paint Adhesion	Method B, Cross-hatch		Yes
International Safe Transportation Tests (ISTA), Procedure 2A	ISTA – Vibration 14,200 vibratory shocks – 2 axis ISTA – 36 inches (0.9 m) free fall drop 6 faces of box + 3 edges = 1 corner (10 drops total) compression test	Done separately on Camera, Sunshield accessory, Wiper Brush accessory, and MIC9K-IP67-5PK accessory.	Yes

HD standards compliance

Standard or Test Reference	Specific Test Description	Comments	Passed
SMPTE 274M-2008 1920 x 1080 Image Sample Structure, Digital Representation and Digital Timing Reference Sequences for Multiple Picture Rates	Resolution: 1920x1080 Scan: Progressive Color representation: complies with ITU-R BT.709 Aspect ratio: 16:9 Frame rate: 25/30/50/60	For HD cameras	Yes
SMPTE 296M-2001 Standard 1280 x 720 Progressive Image Sample Structure – Analogue and Digital Representation and Analogue Interface	Resolution: 1280x720 Scan: Progressive Color representation: complies with ITU-R BT.709 Aspect ratio: 16:9 Frame rate: 25/30/50/60	For HD cameras	Yes

Other


Standard or Test Reference	Specific Test Description	Comments	Passed
24VAC Power source	Able to be powered using nominal 24VAC power source.	Per Bosch test procedure	Yes
High Power over Ethernet Power source	Able to be powered using 95W High Power over Ethernet power source when connected	Per Bosch test procedure	Yes

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Standard or Test Reference	Specific Test Description	Comments	Passed
	to network cable (CAT5/6) having <=100m length.		
Redundant Power Sources	Able to be powered using both 24VAC and High PoE providing a redundant power source operating mode.	Per Bosch test procedure	Yes
Audible Noise	Meets <65dB average noise during pan/tilt operations	Per Bosch test procedure	Yes
Video Latency, end-to-end	<200ms	Per Bosch test procedure	Yes
Control Latency, command-received-to-motor-start	<50ms	Per Bosch test procedure	Yes
Pan/tilt preposition repeatability	Within +/- 0.05 degrees		Yes
NEMA TS2, Sections 2.2.7, 2.2.8, & 2.2.2.9 Transients, Temperature, Voltage, and Humidity	TS 2 Section 2.2.7 Transients, Temperature, Voltage, and Humidity Tests (74 °C)		Yes
	TS 2 Section 2.2.8 Vibration – 5-30 Hz, 0.5g, Resonant Frequency Search, 1 hour endurance test		Yes
	TS 2 Section 2.2.9 Shock (Impact) Test Half sine wave 11 msec, 10g		Yes
Open Network Video Interface Forum (ONVIF) Interoperability between network video products	Tested using ONVIF Device Test Tool v17.01 Rev 1140		Yes
NTCIP protocols	Conformant with NTCIP protocols 1205, 2301, 1101:1996, 2202:2001, 2101:2001, 2102:2003	Requires optional eLicense (Not available in all regions)	Yes
Serial protocol compatibility	Accepts Bosch OSRD, Pelco P/D, Forward Vision, Cohu	Requires optional eLicense (MVS-FCOMPRCL)	Yes
Window defrosting (visible and thermal)	Able to melt up to 3.1mm (1/8") ice build-up at -20C, under calm winds <3.2kph (<2mph)		Yes
Wiper life test	Meets >200,000 wipe cycles		Yes
Thermal IC temperature rating	At +65C, with and without airflow		Yes
Window Condensation	Room temperature down to -40C at rate of 5C per hour		Yes
MTBF	79932 hours	Calculated per MIL-HDBK-217FN1, GB, GC, 25C	n/a
Motor output torque	Pan motor = 5.0 N m (3.7 ft lb) Tilt motor = 6.0 N m (4.4 ft lb)	Measured at pan and tilt shafts	n/a
Prohibited and declarable substances in products, components, materials and preparations.	Compliant, based on manufacturer's declarations according to Bosch N 2580-1	Applies to Camera, Sunshield accessory, and MIC9K-IP67-5PK accessory.	n/a

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Standard or Test Reference	Specific Test Description	Comments	Passed
HALT (Highly Accelerated Life Test)	Ambient Operational Test: +25 °C HALT LOL/UOL Voltage Test: 1 - Step mains voltage down from nominal 24VAC by 2 volts every 5 minutes until operational failure and/or destruct failure. (Brown out test) 2 - Step mains voltage up from nominal 24 VAC by 2 volts every 5 minutes until operational failure and/or destruct failure. HALT LOL/UOL Temperature Test: 1 - Step temperature down from -40 °C by 5 °C every 4 hours (minimum) until operational failure and/or destruct failure. 2 - Step temperature up from +40 °C by 5 °C every 4 hours (minimum) until operational failure and/or destruct failure. Ambient Operational Test: +25 °C HALT Vibration Test: 1 - The DUT is initially vibrated at acceleration level of 5g (rms) for minimum period of at least 10 minutes. After 10 minutes exposure, the DUT is tested operationally and results are recorded. The operating vibration level is then increased by 5g (rms) and the process is repeated for the next step in the test. This sequence is repeated until the DUT fails operational testing or the test level reaches 50g (rms).	Sunshield included.	Yes

General Specifications

Camera Specifications	Refer to MIC IP fusion 9000i datasheet.
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The product is produced by a manufacturing organization which is certified on **ISO9001** and **ISO14001** standards.