Nokia 7250 IXR-e3 series Interconnect Routers

Release 26

The Nokia 7250 Interconnect Router (IXR)-e3 series[1] is designed for IP access and aggregation, making it ideal for IP anyhaul, edge computing, fixed-mobile convergence, and enterprise applications for telecommunication providers, AI and cloud providers, and mission-critical enterprise environments.

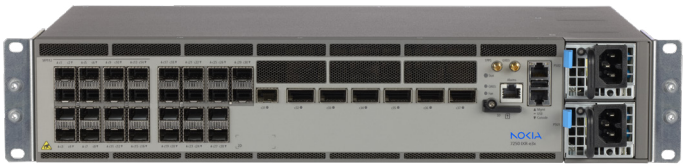
Overview

The Nokia 7250 IXR-e3 series offers three high-density, fixed-connector capacity options —400 Gb/s full duplex (FD), 1.2 Tb/s FD and 2.4 Tb/s FD— in a compact form factor. It delivers low-latency performance, precise timing-and-synchronization, feature-rich IP routing and a temperature-hardened design.

The 7250 IXR-e3 series supports 400G QSFP-DD, 100G SFP112, 50G SFP56 and 25G SFP28 optics with flexible optical breakouts to deliver high-density 400GE, 100GE, 50GE, 25GE and 10GE interfaces, and MACsec linerate encryption on all interfaces. It is also compliant with utility-substation (IEEE 1613 and IEC 61850-3) and railway (EN 50121-4) standards.

The 7250 IXR-e3 series offers flexible interface options through its multi-rate ports, allowing network operators to select the speed that best fits current requirements while preserving scalability for future growth.

The advanced thermal-cooling design of the 7250 IXR-e3 series enables the use of pluggable Digital Coherent Optics (DCO) 100ZR/400ZR+ modules and a pluggable Line System (QSFP-LS) on all ports.



7250 IXR-e3x



7250 IXR-e3



7250 IXR-e3c

1 The 7250 IXR-e3 series is part of the 7250 IXR product family. Additional data sheets, including the 7250 IXR-e and IXR-e2 series data sheet are available for other series in the product family.

Network security

The Nokia 7250 IXR-e3 series plays a crucial role in Nokia's quantum-safe transport networks, delivering low-latency, line-rate traffic encryption with MACsec across all interfaces. It also integrates Trusted Platform Module (TPM) 2.0 technology and supports secure boot and measured boot to enhance system integrity.

Additionally, the 7250 IXR Distributed CPU Protection (DCP) provides an extra layer of defense against DoS attacks targeting network infrastructure.

Hardened and ETR support

All 7250 IXR-e3 series variants are built for enhanced durability and reliability, incorporating PCB Enhanced Plating (PEP) for superior corrosion resistance equivalent to traditional conformal coating. Additionally, all variants support extended temperature range (ETR) operation, making them well-suited for outdoor cabinet deployments. All variants have front-accessible interfaces and power supplies and a shallow system depth. The 7250 IXR-e3c complies with ETSI 300mm standards.

The 7250 IXR-e3 and IXR-e3c variants are electrically and mechanically hardened with a robust electromagnetic compatibility (EMC) design. They comply with the IEEE 1613/1613.1, IEC 61850-3 and EN 50121-4 standards for power substations and railway environments.

Differentiated service support

The 7250 IXR-e3 series is equipped with a large buffer memory for delay-tolerant applications. Very granular per-service and per-forwarding class policing and queuing features support differentiated quality of service (QoS), making it ideal for any-G aggregation and fixed-mobile network convergence.

The 7250 IXR-e3 series complies with the G.8273.2 specification for Class D clocks, delivering highly accurate timing and synchronization to support the stringent requirements of 5G networks. Each variant features an integrated GNSS receiver and meets ITU-T G.8272 PRTC-B standards.

Automation

To simplify and automate network operations, the 7250 IXR-e3 series enables model-driven network management features through the Nokia Service Router Operating System (SR OS) and is managed by the Nokia Network Services Platform (NSP), which offers a rich set of service management features that automate end-to-end service provisioning and operations, administration and maintenance (OAM) to enhance end-user experience and reduce operating costs.

Standards-based software-defined networking (SDN) interfaces enable best-path computation to be offloaded to path computation elements (PCEs) such as the Nokia NSP. 7250 IXR-e3 series operate as path computation clients (PCCs), collecting and reporting per-link and per-service delay, jitter and loss metrics together with interface utilization levels, for efficient path computation.

Technical specifications

Table 1. Nokia 7250 IXR-e3 series specifications

Feature	7250 IXR -e3x	7250 IXR-e3	7250 IXR-e3c
System throughput: Full duplex (FD)	2.4 Tb/s	1.2 Tb/s	400 Gb/s
Connectors	• 6 x 400G QSFP-DD • 16 x 100G SFP112/SFP56/SFP28 • 15 X 50G SFP56/SFP28/SFP+/SFP	• 2 x 400G QSFP-DD • 8 x 100G SFP112/SFP56/SFP28 • 18 X 25G SFP28/SFP+/SFP	• 4 x 100G QSFP28 • 8 X 50G SFP56/SFP28/SFP+/SFP • 16 X 25G SFP28/SFP+/SFP
Optical breakouts	• 4 x 100G, 2x100G, 4 x 25G, 4 x 10G (on QSFP-DD connectors)	• 4 x 100G, 2 x 100G, 4 x 25G, 4 x 10G (on QSFP-DD connectors)	• 4 x 25G, 4 x 10G (on QSFP-DD connectors)
Control interfaces	Console, management, USB, 1 PPS out, SD slot, alarm input/output		
Timing and synchronization	• Includes Stratum 3E oscillator • ITU-T Synchronous Ethernet (SyncE) – ITU-T G.8262.1 (eEEC) • IEEE 1588v2 PTP Clock Types – Boundary – Slave – Grandmaster • IEEE 1588v2 PTP Profiles – ITU-T G.8275.1 – ITU-T G.8275.2 with PTS – ITU-T G.8275.2 with APTS – ITU-T G.8265.1 – IEEE 1588v2 Default – IEC/IEEE 61850-9-3 and C37.238-2017 Power Utility • IEEE 1588v2 PTP Encapsulations – Ethernet – UDP/IPv4 – UDP/IPv6 • PTP Profile Interworking • ITU-T G.8273.2 Class D performance (Contact Nokia for implementation details) • Integrated GNSS receiver – ITU-T G.8272 PRTC-B dual-band GNSS receiver • RFC 5905 Network Time Protocol (NTP) • Pulse-per-second (1PPS) output port		
Indicators	• Management, power supply status LEDs • Per connector link and activity status LEDs • GNSS status LED • System (Stat), fan status LED		
Memory buffer size	4GB	4GB	4GB
Hardware redundancy	Power supplies, cooling fans		
PCB enhanced plating (PEP)	Supported		

Table 1. Nokia 7250 IXR-e3 series specifications (continued)

Feature	7250 IXR -e3x	7250 IXR-e3	7250 IXR-e3c
Dimensions	• Height: 8.6 cm (34 in); 2 RU • Width: 44.45 cm (17.5 in) • Depth: 29.2 cm (11.5 in) • Fits in standard 19-in rack	• Height: 4.3 cm (1.7 in); 1 RU • Width: 44.45 cm (17.5 in) • Depth: 27.7 cm (10.9 in) • Fits in standard 19-in rack	• Height: 4.3 cm (1.7 in); 1 RU • Width: 44.45 cm (17.5 in) • Depth: 21.1 cm (8.3 in) • Fits in standard 19-in rack
Power requirements	• AC input (rated): 100 V to 240 V • DC input (rated): -48 V to -60 V	• AC input (rated): 100 V to 240 V • DC input (rated): -48 V to -60 V	• AC input (rated): 100 V to 240V or HVDC input (rated): 88 V to 300 V • DC input (rated): -48 V to -60 V
Power supply options	Modular AC or DC power supplies		
Cooling	• Internal non-replaceable fans • Front-to-back airflow	• Internal non-replaceable fans • Front-to-back airflow	• Internal non-replaceable fans • Right-to-left airflow
Normal operating temperature range	-40°C to +65°C (-40°F to +149°F) sustained		
Shipping and storage temperature range	-40°C to +70°C (-40°F to +158°F)		
Normal humidity	5% to 95%, non-condensing		

Table2. Nokia 7250 IXR-e3 series maximum density

Ethernet speed	7250 IXR-e3x	7250 IXR-e3	7250 IXR-e3c
1GE	15	18	24
10GE	39	26	40
25GE	55	34	40
50GE	79	8	8
100GE	40	16	4
400GE	6	2	—

Software features

The 7250 IXR-e3 series supports, but is not limited to, the following features.[2]

Services

- Point-to-point Ethernet pseudowires/virtual leased line (VLL)
- Ethernet Virtual Private Network (EVPN) – Virtual Private Wire Service (EVPN-VPWS)
  - Virtual Private LAN Services (EVPN-VPLS): IPv4 and IPv6 support, including Virtual Router Redundancy Protocol (VRRP)
  - Multihoming with single active or active/active modes
  - Virtual eXtensible LAN (VXLAN) tunnel termination in VPLS and Routed-VPLS3
- Multipoint VPLS services based on Targeted Label Distribution Protocol (T-LDP) and Border Gateway Protocol (BGP) Autodiscovery
- Routed-VPLS services with Internet Enhances Services (IES)/IP-VPN IPv4 and IPv6
- Ingress and egress VLAN manipulation for L2 services
- IP VPN Virtual Private Routed Network (VPRN), Inter-Autonomous System (Inter-AS) Option A, B, and C
- IPv6 VPN Provider Edge (6VPE)
- EVPN Interface-less IPv4 and IPv6 prefix routes (EVPN-IFL)
- MPLS (including SR-MPLS) to SRv6 interworking GW, Multi-Instance Services

Network protocols

- Segment Routing MPLS (SR-MPLS)
  - Intermediate System-to-Intermediate System (SR-ISIS) and Open Shortest Path First (SR-OSPF)
  - Traffic engineering (SR-TE) IPv4, IPv6
- Segment Routing IPv6 (SRv6)
  - SRv6 IS-IS shortest path tunnel support in MT=0 and MT=2
- Flexible Algorithms
  - Admin-group include/exclude, IGP/TE/Latency metric
- MPLS label edge router (LER) and label switching router (LSR) functions
  - LDP
  - Resource Reservation Protocol with traffic engineering (RSVP-TE)
- BGP Labeled Unicast (LU) (RFC 3107) route tunnels
- Segment Routing with IPv6 dataplane (SRv6)
  - Classic SID, uSID
  - PSP and USP of SRH, USD
  - FlexAlgo
  - BGP SRv6 Policy
  - Hashing based on flow label
  - IPv4/v6 IP-VRF, GRT
  - EVPN-VPLS/VPWS with MH'ing
  - OAM, ping/traceroute SID/locator, VRF
- IP routing
  - Dual-stack Interior Gateway Protocol (IGP)
  - Multi-topology, multi-instance IS-IS
  - Multi-instance OSPF
  - Multiprotocol BGP (MP-BGP)
  - BGP-LU support in edge, area border router (ABR) and autonomous system boundary router (ASBR) roles
  - Usage-triggered download of BGP label routes to Label - Forwarding Information Base (L-FIB)
  - BGP prefix SID
  - Accumulated IGP (AIGP) metric for BGP
  - BGP monitoring protocol (BMP)
  - BGP route-reflector for EVPN and IP-VPN with VPNv4 and VPNv6 address families (AFs)
  - BGP confederations
  - BGP-FlowSpec
  - IP Fragmentation (IPv4)
  - IGP and BGP shortcuts

2 This section provides an overview of key features supported. Consult Nokia documentation for detailed feature support, interdependencies, exclusions and exceptions.

- Layer 3 Multicast - base routing
  - Internet Group Management Protocol (IGMP)
  - Protocol Independent Multicast – Sparse Mode (PIM-SM), Source Specific Multicast (SSM)
  - Multicast Listener Discovery (MLD)
  - Multicast Source Discovery Protocol (MSDP)
- Layer 3 Multicast – VPRN
  - IGMP/MLD
  - IGMP/MLD on Routed VPLS Interface
- Layer 2 Multicast
  - IGMP/MLD snooping
- IP-GRE tunnel support

SDN

- SR-TE LSPs, RSVP-TE LSPs, SR Policy
  - PCC initialized, PCC controlled – PCC initialized, PCE computed
  - PCC initialized, PCE controlled
- SR-TE LSPs: PCE initialized, PCE controlled
- SR policy: BGP and static
- Topology discovery: BGP-Link State (BGP-LS) IPv4 and IPv6
- Netflow/cflowd
- LSP stats

Load balancing and resiliency

- IEEE 802.3.ax (2008) Link Aggregation Group (LAG) and multi-chassis (MC) LAG
- Weighted LAG hash
- GTP/teid based hashing
- VRRP
- IP and MPLS load balancing by equal-cost multipath (ECMP)
- ECMP for SRv6 tunnels
- Fast reroute (FRR): Segment routing topology independent loop-free alternate (TI-LFA) and remote loop-free alternate (rLFA) in both SR-MPLS and SRv6
  - LDP with loop-free alternate (LFA) and remote loop-free alternate (rLFA) policies
  - RSVP-TE Fast Reroute (FRR)
  - Segment routing with rLFA and topology independent LFA (TI-LFA) , SR-MPLS data plane
  - Segment routing with rLFA and topology independent LFA (TI-LFA) in both SR-MPLS and SRv6
  - BGP Edge and Core Prefix Independent Convergence (BGP PIC)
- Entropy label (RFC 6790)
- Pseudowire and LSP redundancy
- Ethernet Ring Protection Switching ITU-T G.8032v2
- IEEE 802.1d Classic spanning tree (STP)
- IEEE 802.1s Multiple spanning trees (MSTP)
- IEEE 802.1w Rapid reconfiguration of spanning tree (RSTP)
- IEEE 802.1AX (2008) Link Aggregation Group (LAG) and multi-chassis (MC) LAG pseudowire and LSP redundancy
- Control plane high availability (HA)
- LAG adaptive load balancing

Platform

- Ethernet IEEE 802.1Q (VLAN) and 802.1ad (QinQ) with 9K jumbo frames
- Detailed forwarded and discarded counters for service access points (SAPs) and network interfaces in addition to port-based statistics: per Virtual Output Queue (VoQ) packet and byte counters
- VLAN range-based SAPs
- Dynamic Host Configuration Protocol (DHCP server for IPv4 IES, VPNv4)
- DHCP relay, IPv4 and IPV6, IES, IP-VPN, EVPN-VPLS
- Accounting records

QoS and traffic management

- Hierarchical QoS (H-QoS)
  - Hierarchical egress schedulers and shapers per forwarding class, SAP, network interface, port or LAG
  - Port sub-rate
- Intelligent packet classification, including media access control (MAC), IPv4, IPv6 match-criteria-based classification
- Granular rate enforcement with up to 32 policers per SAP/VLAN, including broadcast, unicast, multicast and unknown policers
- Hierarchical policing for aggregate rate enforcement
- Strict priority, weighted fair queuing schedulers
- Congestion management via weighted random early discard (WRED)
- Egress marking or re-marking
- Low latency, low jitter forwarding

System management

- Simple Network Management Protocol (SNMP)
- Model-driven (MD) management interfaces
  - NETCONF
  - MD-CLI
- Comprehensive management with Nokia NSP

Operations, administration and maintenance

- IEEE 802.1ag, ITU-T Y.1731: Ethernet Connectivity Fault Management (CFM) for both fault detection and performance monitoring, including delay, jitter and loss
- Ethernet bandwidth notification (ETH-BN) with egress rate adjustment
- IEEE 802.3ah: Ethernet in the First Mile (EFM)
- ETH-CFM LBM Responder
- ITU-T Y.1564 Service Activation Test (SAT)
- Bidirectional Forwarding Detection (BFD) IPv4, IPv6
- Micro-BFD - per member link
- Hardware based sBFD
- Link Layer Discovery Protocols (LLDP) (IEEE 802.3AB-2005)
- Two-Way Active Measurement Protocol (TWAMP), TWAMP Light/STAMP for base and flex-algo topologies
- A full suite of MPLS OAM tools, including LSP and virtual circuit connectivity verification (VCCV) ping
- Service assurance agent
- Mirroring with slicing support
  - Port
  - VLAN
  - Filter output: MAC, IPv4/IPv6 filters
  - Local/remote
  - Ingress label
- Port and VLAN loopback with MAC-swap

Security

- Remote Authentication Dial-In User Service (RADIUS), Terminal Access Controller Access Control System Plus (TACACS+), and comprehensive control-plane protection capabilities
- Distributed CPU Protection (DCP)
- MAC-, IPv4- and IPv6-based access control lists and criteria-based classifiers
- Secure Shell (SSH)
- MAC security (MACsec) LAN mode
- MAC security (MACsec) WAN mode
- SR OS Secure Boot

Standards compliance[3]

Table 3. Nokia 7250 IXR-e3 series EMC industrial standards compliance

Standard	Title	Variant	
		IXR-e3x	IXR-e3 and IXR-e3c
IEEE 1613-2023	IEEE Standard Environmental and Testing Requirements for Devices with Communications Functions used with Electric Power Apparatus		√ [1]
IEEE Std C37.90	IEEE Standard for relays and relay systems associated with Electric Power Apparatus		√
IEEE Std C37.90.1	Surge Withstand Capability (SWC) Tests		√
IEEE Std C37.90.2	Withstand Capability of Relay Systems to Radiated Electromagnetic Interference from Transceivers		√
IEEE Std C37.90.3	IEEE Standard Electrostatic Discharge Tests for Protective Relays		√
EN 50121-4	Electromagnetic Compatibility – Part 4: Emission and Immunity of the Signalling and Telecommunications Apparatus		√
IEC 62236-4	Electromagnetic Compatibility – Part 4: Emission and Immunity of the Signalling and Telecommunications Apparatus		√
IEC 61000-6-2	Generic standards – Immunity for industrial environments	√	√
IEC 61000-6-4	Generic standards – Emissions standard for industrial environments	√	√
IEC 61000-6-5	Generic standards – immunity for equipment used in power station and substation environment		√
IEC 61850-3	Communication networks and systems for power utility automation - Part 3: General requirements		√
IEC/AS 60870.2.1	Telecontrol equipment and systems. Operating conditions. Power supply and electromagnetic compatibility		√

Notes:

1. Performance Class 2

3 System design intent is according to the listed standards. Certifications vary on different variants. Refer to product documentation for detailed compliance status.

Table 4. Nokia 7250 IXR-e3 series EMC regulatory and customer standards compliance

Standard	Title	Variant	
		IXR-e3x	IXR-e3 and IXR-e3c
IEC 61000-3-2	Limits for harmonic current emissions (equipment input current <16A per phase)	√	√
IEC 61000-3-3	Limits for voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current <16A	√	√
IEC 61000-4-2	Electrostatic discharge immunity test	√	√
IEC 61000-4-3	Radiated electromagnetic field immunity test	√	√
IEC 61000-4-4	Electrical fast transient/burst immunity test	√	√
IEC 61000-4-5	Surge immunity test	√	√
IEC 61000-4-6	Immunity to conducted disturbances	√	√
IEC 61000-4-8	Power frequency magnetic field immunity test	√	√
IEC 61000-4-9	Pulse magnetic field immunity test		√
IEC 61000-4-10	Damped oscillatory magnetic field immunity test		√
IEC 61000-4-11	Voltage dips, short interruptions and voltage variations immunity tests	√	√
IEC 61000-4-12	Ring wave immunity test		√
IEC 61000-4-16	Test for immunity to conducted, common mode disturbances in the frequency range 0 Hz to 150 kHz		√
IEC 61000-4-17	Ripple on d.c. input power port immunity test		√
IEC 61000-4-18	Damped oscillatory wave immunity test		√
IEC 61000-4-29	Voltage dips, short interruptions and voltage variations on d.c. input power port immunity test		√
ITU-T K.20	Resistibility of telecommunication equipment installed in a telecommunications centre to overvoltages and overcurrents	√	√
ETSI EN 300 132-1	Power supply interface at the input to telecommunications equipment; Part 1: Operated by alternate current (ac)	√	√
ETSI EN 300 132-2	Power supply interface at the input to telecommunications and datacom (ICT) equipment; Part 2: Operated by –48 V direct current (dc)	√	√
EN 300 386	Telecommunication network equipment; ElectroMagnetic Compatibility (EMC)	√	√
ES 201 468	Electromagnetic compatibility and Radio spectrum Matters (ERM); Additional ElectroMagnetic Compatibility (EMC) requirements and resistibility requirements for telecommunications equipment for enhanced availability of service in specific applications	√	√
Telcordia GR-1089-CORE	EMC and Electrical Safety - Generic Criteria for Network Telecommunications Equipment	√	√
AS/NZS CISPR 32	Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement	√[1]	√[1]
FCC Part 15, Subpart B	Radio Frequency devices- Unintentional Radiators (Radiated & Conducted Emissions)	√[1]	√[1]
ICES-003	Information Technology Equipment (ITE) — Limits and methods of measurement	√[1]	√[1]

Notes:

1. Class A

Table 4. Nokia 7250 IXR-e3 series EMC regulatory and customer standards compliance (continued)

Standard	Title	Variant	
		IXR-e3x	IXR-e3 and IXR-e3c
EN 55032	Electromagnetic compatibility of multimedia equipment – Emission requirements	√[1]	√[1]
CISPR 32	Electromagnetic compatibility of multimedia equipment – Emission requirements	√[1]	√[1]
VCCI CISPR32	Electromagnetic compatibility of multimedia equipment – Emission requirements	√[1]	√[1]
EN 55035	Electromagnetic compatibility of multimedia equipment - Immunity requirements	√	√
CISPR 55035	Electromagnetic compatibility of multimedia equipment - Immunity requirements	√	√
GS-7 EMC	Electromagnetic Standard Compatibility (BT standard)	√	√
KC Notice Emission (KS C 9832) and Immunity (KS C 9835) (South Korea)	EMS standard: NRRA notice	√	√
BSMI CNS 15936	Information Technology Equipment — Radio Disturbance Characteristics — Limits and Methods of Measurement	√	√
EN 301 489-1	ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/ EU and the essential requirements of article 6 of Directive 2014/30/EU	√	√
EN 301 489-19 (GNSS)	ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 19: Specific conditions for Receive Only Mobile Earth Stations (ROMES) operating in the 1,5 GHz band providing data communications and GNSS receivers operating in the RNSS band (ROGNSS) providing positioning, navigation, and timing data; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU	√	√
ETSI 303 413	Satellite Earth Stations and Systems (SES); Global Navigation Satellite System (GNSS) receivers; Radio equipment operating in the 1 164 MHz to 1 300 MHz and 1 559 MHz to 1 610 MHz frequency bands; Harmonised Standard for access to radio spectrum	√	√

Notes:

1. Class A

Table 5. Nokia 7250 IXR-e3 series environmental standards compliance

Standard	Title	Platform	
		IXR-e3x	IXR-e3 and IXR-e3c
Telcordia GR-63-CORE	NEBS Requirements: Physical Protection	√	√
Telcordia GR295-CORE	Mesh and Isolated Bonding Networks: Definition and Application to Telephone Central Offices	√	√
Telcordia GR-3108-CORE	Network Equipment in the Outside Plant (OSP)	√[1]	√[1]
ATIS-0600015.03	Energy Efficiency for Telecommunications Equipment: Methodology for Measurement and Reporting for Router and Ethernet Switch Products	√	√
ATT-TP-76200	Network Equipment Power, Grounding, Environmental, and Physical Design Requirements	√	√
VZ.TPR.9205	Energy Efficiency Requirements for Telecommunications Equipment	√	√
VZ.TPR.9203 (CO)	NEBS Requirements By Location	√	√
ETSI EN 300 019-2-1	Specification of environmental tests; Storage, Class 1.2	√	√
ETSI EN 300 019-2-2	Specification of environmental tests; Transportation, Class 2.3	√	√
ETSI EN 300 019-2-3	Specification of environmental tests; Stationary use at weatherprotected locations, Class 3.2	√	√
ETSI EN 300 753 Class 3.2	Acoustic noise emitted by telecommunications equipment, Class 3.2	√	√
IEEE 1613:2023	IEEE Standard Environmental and Testing Requirements for Communications Networking Devices Installed in Electric Power Substations		√[2]
IEC 61850-3	Communication networks and systems for power utility automation - Part 3: General requirements		√[3]
IEC 60068-2-1	Environmental testing – Part 2-1: Tests – Test A: Cold	√	√
IEC 60068-2-2	Environmental testing – Part 2-2: Tests – Test B: Dry heat	√	√
IEC 60068-2-30	Environmental testing – Part 2-30: Tests – Test Db: Damp heat, cyclic (12 + 12 h cycle)	√	√
IEC 60255-21-2	Electrical relays – Part 21: Vibration, shock, bump and seismic tests on measuring relays and protection equipment – Section Two: Shock and bump tests		√
AREMA (American Railway Engineering and Maintenance-of-way Association)	Communications & Signals Manual – Section 11.5.1: Recommended Environmental Requirements for Electrical and Electronic Railroad Signal System Equipment		√

Notes:

1. Class 2
2. Forced air system; uses fans
3. Normal environmental conditions as per IEC 61850-3 ed.2

Table 6. Nokia 7250 IXR-e3 series safety standards compliance

Standard	Title	Platform
		All
UL/CSA 62368-1	Audio/video, information and communication technology equipment - Part 1: Safety requirements	√
IEC/EN 62368-1	Audio/video, information and communication technology equipment - Part 1: Safety requirements	√
AS/NZS 62368.1	Information technology equipment - Safety - Part 1: General requirements	√
IEC/EN 60825-1 and 2	Safety of laser products - Part 1: Equipment classification and requirements Part 2: Safety of optical fibre communication systems (OFCS)	√
IEC 60529	Degrees of Protection Provided by Enclosures (IP Code)	√[1]

Notes:

1. IP20

Table 7. Nokia 7250 IXR-e3 series directives, regional approvals and certifications compliance

Standard	Title	Platform
		All
EU Directive 2014/30/EU (EMC)	Electromagnetic Compatibility (EMC)	√
EU Directive 2014/35/EU (LVD)	Low Voltage Directive (LVD)	√
EU Directive 2012/19/EU (WEEE)	Waste Electrical and Electronic Equipment (WEEE)	√
EU Directive 2011/65/EU (Recast) (including Commission Delegated Directive (EU) 2015/863)	Restriction of the use of certain Hazardous Substances in Electrical and Electronic Equipment (Recast)	√
EU Directive 2014/53/EU (RED)	Radio Equipment Directive (RED)	√
CE Mark		√
CRoHS Logo; Ministry of Information Industry order No.39		√
South Korea (KC Mark)		√
Australia (RCM Mark)		√
Japan (VCCI Mark)		√
Taiwan (BSMI Mark)		√
UKCA mark		√
NEBS Level 3		√
TL9000 certified		√
ISO 14001 certified		√
ISO 9001 certified		√



About Nokia

At Nokia, we create technology that helps the world act together.

As a B2B technology innovation leader, we are pioneering networks that sense, think and act by leveraging our work across mobile, fixed and cloud networks. In addition, we create value with intellectual property and long-term research, led by the award-winning Nokia Bell Labs, which is celebrating 100 years of innovation.

With truly open architectures that seamlessly integrate into any ecosystem, our high-performance networks create new opportunities for monetization and scale. Service providers, enterprises and partners worldwide trust Nokia to deliver secure, reliable and sustainable networks today – and work with us to create the digital services and applications of the future.

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