Overview

Arista 7020R Gigabit Ethernet Data Center Switch Series

HPE and Arista share a common vision around the need to deliver secure hybrid IT solutions and experiences built on industry-leading software-defined infrastructure—helping customers to operate their workloads with speed and agility to grow their business. This partnership will provide our customers with proven networking solutions that are superior to legacy alternatives and that complement HPE compute, storage, virtualization, and cloud offerings.

The Arista 7020R series offers a purpose-built, high-performance, and power-efficient solution for high-density data center deployments. With 48 ports of 100/1000 Mb and 6 integrated 1/10 GbE SFP+ ports, the switch delivers non-blocking forwarding of 216 Gbps combined with feature-rich L2 and L3 switching. A natural extension to the 7280R series, the 7020R are members of the Arista portfolio of data center switches.

With broad support for QoS, security, automation, and monitoring features, the 7020R provides an ideal solution to the challenges of implementing network policy consistently in both 1G and 10G environments when combined with the Arista fixed-configuration 7280R series 10 and 40 gigabit switches. The 7020R delivers the flexibility to be deployed as the server edge of 1 Gb Ethernet leaf and spine designs or as a high-performance storage network switch. Arista Extensible Operating System (EOS) advanced automation, monitoring, and provisioning features are consistent to all Arista switches, eliminating the complexity associated with managing mixed environments with inconsistent feature sets. The 7020R series deep packet buffers and large forwarding tables allow for a broad set of networking applications.

The 7020TR and 7020TRA both provide 48 100/1000 Mb RJ45 ports and 6 SFP+ ports for both 1 G or 10 G uplink connections with a full range of optics and cables. The Arista 7020TR switches offer low latency and a deep packet buffer of up to 3 GB that is fully shared and allocated dynamically to ports that are congested.

Consuming under 1 W per gigabit, the 7020TR are extremely power efficient with choices of AC and DC power and built-in power redundancy along with redundant fans supporting either forward or reverse airflow in a single system.

Combined with Arista EOS, the 7020R series delivers advanced features for big data, cloud, virtualized, and traditional designs together with enhancements for video streaming, media, and entertainment.

Arista 7020TR: 48 port 100/1000 Mb and 6 port 10GbE Switch

Overview

Product Highlights

Performance
- 7020TR-48: 48 x 100/1000 Mb and 6 SFP+
- 7020TRA-48: 48 x 100/1000Mb and 6 SFP+
- Up to 216 Gbps throughput
- Up to 162 Mpps forwarding
- Wire speed L2 and L3 forwarding

Data center optimized design
- Ultra-deep packet buffer up to 3GB
- Virtual Output Queues per port to eliminate head of line blocking
- 1+1 redundant and hot-swappable power
- N+1 redundant and hot-swappable fans
- Front-to-rear or rear-to-front cooling
- Tool-less rails for simple installation
- 2-post and 4-post mounting
- Over 90% efficient power supplies
- AC or DC power options

Cloud networking ready
- Up to 256 K MAC entries
- Up to 200 K IPv4/IPv6 Routes
- Up to 80 K IPv4/IPv6 Host Routes
- 128-way ECMP
- 64-port MLAG
- 3 GB Buffer
- AlgoMatch

Resilient control plane
- Multi-core x86 CPU
- 8 GB DRAM
- 4 GB Flash

Advanced provisioning and monitoring
- CloudVision
- Zero touch provisioning (ZTP)
- Advanced Event Monitoring
- sFlow® (RFC3176)
- VXLAN for next generation DC*
- LANZ for microburst detection*
- VM Tracer*
- OpenStack®
- Chef, Puppet, Ansible

Arista Extensible Operating System
- Single binary image
- Fine-grained truly modular network OS
- Stateful fault containment (SFC)
- Stateful fault repair (SFR)
- Full access to Linux® shell and tools
- Extensible platform—bash, python, C++, GO, OpenConfig

Arista Extensible Operating System (EOS)
The Arista 7020R series runs the same Arista EOS software as all Arista products, simplifying network administration. Arista EOS is a modular switch operating system with a unique state sharing architecture that cleanly separates switch state from protocol processing and application logic. Built on top of a standard Linux® kernel, all EOS processes run in their own protected memory space and exchange state through an in-memory database. This multi-process state-sharing architecture provides the foundation for in-service-software updates and self-healing resiliency.
With Arista EOS, advanced monitoring and automation capabilities such as zero touch provisioning, LANZ, VM Tracer and Linux®-based tools can be run natively on the switch with the powerful x86 CPU subsystem.

High availability
The Arista 7020R switches were designed for continuous operations with system-wide monitoring of both hardware and software components, simple serviceability, and provisioning to prevent single points of failure. Key high availability features include:

- 1+1 hot-swappable power supplies and four hot-swap fans provide dynamic temperature control combined with N+1 redundancy
- Color-coded PSUs and fans that deliver platinum-level power efficiency
- Live software patching
- Self-healing software with SFR
- Up to 32 ports per link aggregation group (LAG)
- Multi-chassis LAG for active-active L2 multi-pathing

Overview

- 128-way ECMP routing for load balancing and redundancy

Arista 7020TR-48 and 7020TRA-48 1RU Rear View: Front to Rear

Hot swap power supplies

Hot swap fan modules

Scaling data center performance
The Arista 7020R series delivers line rate switching at layer 2 and layer 3 to enable dramatically faster and simpler network designs for data centers that lower the network capital and operational expenses. When used in conjunction with the Arista 7000 series of fixed and modular switches, it allows networks to scale to over 80,000 1G servers in a high-performance and low-latency two-tier network that provides predictable and consistent application performance. The flexibility of the L2 and L3 multi-path design options, combined with support for open standards, provides maximum flexibility, scalability, and network-wide virtualization. Arista EOS advanced features provide control and visibility with single point of management.

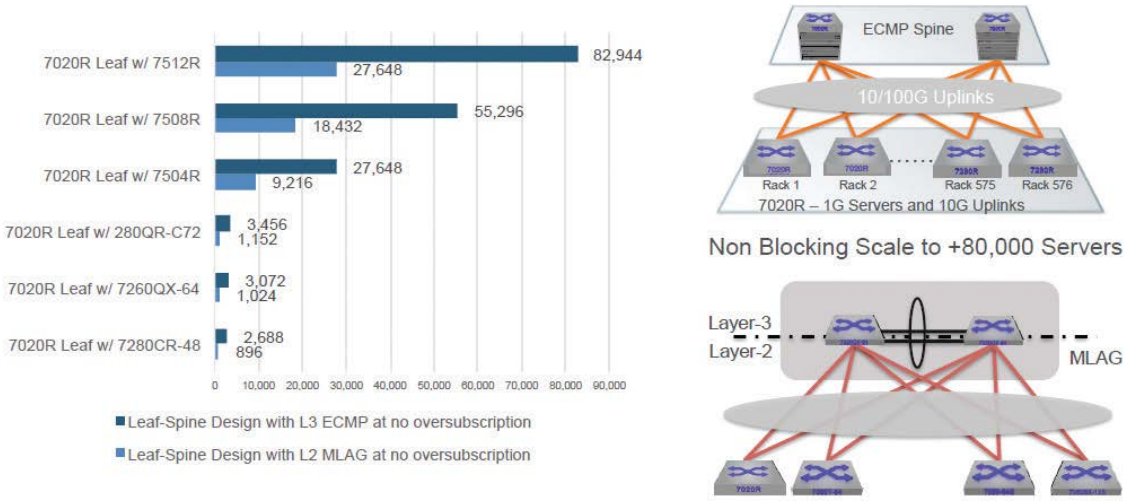
Software-defined cloud networks
Arista software-defined cloud networking (SDCN) combines the principles that have made cloud computing the unstoppable force that it is automation, self-service provisioning, and linear scaling of both performance and economics coupled with the trend in software-defined networking that delivers: network virtualization, custom programmability, simplified architectures, and lower CAPEX. This combination creates a best-in-class software foundation for maximizing the value of the network to both the enterprise and service provider data center.

Maximum flexibility for scale-out network designs
Scale-out network designs enable solutions to start small and evolve over time. A simple two-way design can grow as far as 128-way without significant changes to the architecture. The Arista 7020R series include enhancements that allow for flexible scale-out designs:

- 6 ports of 1/10 G to provide scalable designs and balance traffic evenly across large-scale two-tier leaf-and-spine designs
- Comprehensive L2 and L3 forwarding table resources for more design choice
- VXLAN gateway, bridging and routing with VM Tracer features to enable next-generation data center designs*
- Virtual output queue (VOQ) architecture and eep packet buffering to eliminate head-of-line (HOL) blocking with low latency

Overview

- Wide choice of both 1 G and 10 G transceivers and cables for single port multi-speed flexibility
- Integrated packet capture, sFlow, and multi-port mirroring provide network-wide visibility and monitoring to detect traffic bursts, monitor latency and congestion, and allow capacity planning to improve application performance and availability*



Number of 1GbE Nodes Interconnected Using Arista Leaf-Spine Designs

Advanced Event Management (AEM)
Simplifying the overall operations, AEM provides the tools to customize alerts and actions. AEM is a powerful and flexible set of tools to automate tasks and customize the behavior of EOS and the operation of the overall data center switching infrastructure. AEM allows operators to fully utilize the intelligence within EOS to respond to real-time events, automate routine tasks, and automate actions based on changing network conditions.

CloudVision
CloudVision is a network-wide approach for workload orchestration and workflow automation as a turnkey solution for cloud networking. CloudVision extends the EOS publish-subscribe architectural approach across the network for state, topology, monitoring, and visibility. This enables enterprises to move to cloud-class automation without significant internal development.

Next-generation provisioning and monitoring
Zero touch provisioning (ZTP) combined with other Arista features, such as VM Tracer's adaptive VLAN configuration, allows data center managers to fully automate the bring-up of network elements and virtual servers, and leverage Arista's unique "hands-off" provisioning. Designed to integrate with VMware®, OpenStack, and Microsoft® OMI, Arista's open architecture allows for integration with any virtualization and orchestration system providing visibility to the VM level, enabling portable policies, persistent monitoring, and rapid troubleshooting of cloud networks.

7020R deterministic network performance
The Arista 7020R series uses a deep buffer VOQ architecture that eliminates HOL blocking and virtually eliminates packet drops even in the most congested network scenarios. An advanced traffic scheduler fairly allocates bandwidth between all virtual output queues while accurately following queue disciplines including weighted fair queueing, fixed priority, or hybrid schemes. As a result, the Arista 7020R can handle the most demanding data center requirements with ease, including mixed traffic loads of real-time, multicast, and storage traffic while still delivering low latency.

Virtualization*
Supporting next-generation virtualized data centers requires tight integration with orchestration tools and emerging encapsulation technologies such as VXLAN. The 7020R builds on the valuable tools already provided by the Arista VM Tracer suite to integrate directly into encapsulated environments. Offering a wire-speed gateway between VXLAN and traditional L2/3 environments, the 7020R makes integration of non-VXLAN aware devices including servers, firewalls and load-balancers seamless and provides the ability to leverage VXLAN as a standards-based L2 extension technology for non-MPLS environments.

Overview

EOS software licensed features
Arista EOS delivers a comprehensive feature set along with single-image consistency with all other Arista switches. The default EOS software has a broad layer 2 feature set with extensive monitoring and provisioning, security, QoS, and management features.

AlgoMatch
AlgoMatch is a unique Arista innovation for modern cloud networks, combining both software and hardware to enable more flexible and scalable solutions for access control, policy based forwarding and network telemetry. By combining general purpose memory with advanced software algorithms AlgoMatch delivers higher scale, performance and efficiency with lower power and is more cost effective than traditional solutions. AlgoMatch provides a more efficient packet matching algorithm that in turn enables flow matching for access control, policy and visibility. The net benefits are a high performance policy engine with both increased functionality and scale in a cost and power efficient solution. AlgoMatch is available on the 7020RA Series of products.

*Not currently supported in EOS

Features and Benefits

Layer 2 Features
- 802.1w Rapid Spanning Tree
- 802.1s Multiple Spanning Tree Protocol
- Rapid Per VLAN Spanning Tree (RPVST+)
- 4096 VLANs
- Q-in-Q
- 802.3ad Link Aggregation/LACP
  - 32 ports/channel
  - 54 groups per system
- Multi-Chassis Link Aggregation (MLAG)
  - 64 ports per MLAG
- 802.1Q VLANs/Trunking
- 802.1AB Link Layer Discovery Protocol
- 802.3x Flow Control
- Jumbo Frames (9216 bytes)
- IGMP v1/v2/v3 snooping
- Storm Control

Layer 3 Features
- Static routes
- Routing protocols: OSPF, OSPFv3, BGP, MP-BGP, IS-IS, and RIPv2
- 128-way Equal Cost Multipath Routing (ECMP)
- VRF
- Bi-Directional Forwarding Detection (BFD)
- Route maps
- Policy Based Routing (PBR)*
- VRRP
- Virtual ARP (VARP)
- uRPF*

Multicast
- IGMP v2/v3
- PIM-SM / PIM-SSM
- PIM-BiDir*
- Anycast RP (RFC 4610)
- Multicast Source Discovery Protocol (MSDP)
- Integrated packet capture/analysis with TCPDump
- RFC 3176 sFlow
- Restore and configure from USB

Virtualization Support*
- VXLAN Gateway (draft-mahlingam-dutt-dcops-vxlan-01)
- VXLAN Tunnel Endpoint
- VXLAN Bridging
- VXLAN Routing (VRF, MLAG)*
- VM Tracer VMware Integration*
  - VMware vSphere® support
  - VM Auto Discovery
  - VM Adaptive Segmentation
  - VM Host View

Security Features
- PDP
- Service ACLs
- IPv4/IPv6 ACLs using L2, L3, L4 fields [1]
- MAC ACLs* [1]
- ACL Deny Logging [1]
- ACL Counters [1]
- Control Plane Protection (CPP)
- DHCP Relay/Snooping
- MAC Security [1]
- TACACS+
- RADIUS

Quality of Service (QoS) Features
- Up to 8 queues per port
- 802.1p based classification
- DSCP based classification and remarking
- Explicit Congestion Notification (ECN)*
- QoS interface trust (COS / DSCP)
- Strict priority queueing

Overview

Advanced monitoring and provisioning

- Zero touch provisioning (ZTP)
- Port Mirroring
- Advanced Event Management suite (AEM)
  - CLI Scheduler
  - Event Manager
  - Event Monitor
  - Linux® tools

- Per-Priority Flow Control (PFC)*
- Data Center Bridging Extensions (DCBX)*
- ACL-based DSCP Marking*
- Policing/shaping
- Rate limiting*

NOTE 1: Supported only on 7020TRA

* Not currently supported in EOS

Overview

Network Management

- CloudVision
- Configuration rollback and commit
- 100/1000 Management Port
- RS-232 Serial Console Port
- USB Port
- SNMP v1, v2, v3
- Management over IPv6
- Telnet and SSHv2
- Syslog
- AAA
- Industry Standard CLI
- System logging
- Environment monitoring

Extensibility

- Linux® Tools
  - Bash shell access and scripting
  - RPM support
  - Custom kernel modules
- Software Defined Networking (SDN)
  - eAPI
  - OpenStack Neutron Support
- Programmatic access to system state
  - Python
  - C++
  - eAPI
  - OpenStack Neutron Support
- Programmatic access to system state
  - Python
  - Chef
  - Puppet
  - C++
  - eAPI
  - GO
  - OpenConfig
  - OpenStackNeutron Plug-in support
- Native KVM/QEMU support

Standards Compliance

- 802.1D Bridging and Spanning Tree
- 802.1p QOS/COS
- 802.1Q VLAN Tagging
- 802.1w Rapid Spanning Tree
- 802.1s Multiple Spanning Tree Protocol
- 802.1AB Link Layer Discovery Protocol
- 802.3ad Link Aggregation with LACP
- 802.3x full duplex on 100BASE-TX and 1000BASE-T
- 802.3u 100BASE-TX
- 802.3ab 1000BASE-T
- 802.3z 1000BASE-X
- 802.3ae 10 gigabit Ethernet
- RFC 2460 Internet Protocol, Version 6 (IPv6) Specification
- RFC 4861 Neighbor Discovery for IP Version 6 (IPv6)
- RFC 4862 IPv6 Stateless Address Autoconfiguration
- RFC 4443 Internet Control Message Protocol (ICMPv6) for the Internet Protocol Version 6 (IPv6) Specification

SNMP MIBs

- RFC 3635 EtherLike-MIB
- RFC 3418 SNMPv2-MIB
- RFC 2863 IF-MIB
- RFC 2864 IF-INVERTED-STACK-MIB
- RFC 2096 IP-FORWARD-MIB
- RFC 4363 Q-BRIDGE-MIB
- RFC 4188 BRIDGE-MIB
- RFC 2013 UDP-MIB
- RFC 2012 TCP-MIB
- RFC 2011 IP-MIB
- RFC 2790 HOST-RESOURCES-MIB
- RFC 3636 MAU-MIB
- RMON-MIB
- RMON2-MIB
- HC-RMON-MIB
- LLDP-MIB
- LLDP-EXT-DOT1-MIB
- LLDP-EXT-DOT3-MIB
- ENTITY-MIB
- ENTITY-SENSOR-MIB
- ENTITY-STATE-MIB
- ARISTA-ACL-MIB
- ARISTA-QUEUE-MIB
- RFC 4273 BGP4-MIB
- RFC 4750 OSPF-MIB
- ARISTA-CONFIG-MAN-MIB
- RFC 2787 VRRPv2MIB
- MSDP-MIB
- PIM-MIB
- IGMP-MIB
- IPMROUTE-STD-MIB
- SNMP Authentication Failure trap
- ENTITY-SENSOR-MIB support for DOM (Digital Optical Monitoring)
- User configurable custom OIDs

See EOS release notes for latest supported MIBs

* Not currently supported in EOS

Overview

Table Sizes	
STP Instances	64 (MST) / 510 (RPVST+)
IGMP Groups	up to 64 K
Ingress ACLs	12 K (7020TRA only)
Egress ACLs	12 K (7020TRA only)
ECMP	128-way
MAC Addresses	256 K
IPv4 Host Routes	80 K
IPv4 Multicast (S,G)	24 K
IPv6 Host Routes	80 K
IPv4 Routes - Unicast	200 K
IPv6 Routes - Unicast	200 K

NOTE: Maximum values dependent on shared resources in some cases

Configuration

Ordering Information

Switch	Arista SKU	HPE SKU
Arista 7020R 48T 6SFP+ Front-to-Back AC Switch	DCS-7020TR-48-F	JH994A
Arista 7020R 48T 6SFP+ Back-to-Front AC Switch	DCS-7020TR-48-R	JH995A
Arista 7020RA 48T 6SFP+ Algomatch Front-to-Back AC Switch	DCS-7020TRA-48-F	JQ084A
Arista 7020RA 48T 6SFP+ Algomatch Back-to-Front AC Switch	DCS-7020TRA-48-R	JQ085A

Optional components	Arista SKU	HPE SKU
Arista Enhanced Software 1G Fixed E-LTU	LIC-7048-E	JH603AAE
Arista Virtualization Software 1G Fixed E-LTU	LIC-7048-V	JH604AAE
Arista FlexRoute L3 Lite Software 1G E-LTU	LIC-FIX-FLX-L-1G	JQ053AAE
Arista FlexRoute L3 Software 1G E-LTU	LIC-FIX-FLX-1G	JQ054AAE
Arista 7000 Front-to-Back Fan Module	FAN-7000-F	JH856A
Arista 7000 Back-to-Front Fan Module	FAN-7000-R	JH857A
Arista 7000 1RU Switch Front-to-Back Fan Module	FAN-7001D-F	JQ212A
Arista 7000 1RU Switch Back-to-Front Fan Module	FAN-7001D-R	JQ213A
Arista 500W Front-to-Back AC Power Supply	PWR-500AC-F	JH882A
Arista 500W Back-to-Front AC Power Supply	PWR-500AC-R	JH883A
Arista 500W Front-to-Back DC Power Supply	PWR-500-DC-F	JH597A
Arista 500W Back-to-Front DC Power Supply	PWR-500-DC-R	JH599A
Arista 7000 1RU Switch 1600W Front-to-Back AC Power Supply	PWR-1600AC-F	JQ210A
Arista 7000 1RU Switch 1600W Back-to-Front AC Power Supply	PWR-1600AC-R	JQ211A
Arista 7001 1RU Accessory Kit	KIT-7001	JH866A
Arista 2 Post 1RU Rack Mount Kit	KIT-2POST-1U-NT	JH863A
Arista 4 Post Rack Mount Kit	KIT-4POST-NT	JH864A

Service	Arista SKU	HPE SKU
Arista A-Care 7020TR-48 NBD Software 1 Month Support E-LTU	SVC-7020TR-48-1M-NB	JH961AAE
Arista A-Care 7020TR-48 4H Software 1 Month Support E-LTU	SVC-7020TR-48-1M-4H	JH962AAE
Arista A-Care 7020TR-48 2H Software 1 Month Support E-LTU	SVC-7020TR-48-1M-2H	JH963AAE
Arista A-Care 7020TRA-48 NBD Software 1 Month Support E-LTU	SVC-7020TRA-48-1M-NB	JQ138AAE
Arista A-Care 7020TRA-48 4H Software 1 Month Support E-LTU	SVC-7020TRA-48-1M-4H	JQ139AAE
Arista A-Care 7020TRA-48 2H Software 1 Month Support E-LTU	SVC-7020TRA-48-1M-2H	JQ140AAE

Warranty, service, and support

The Arista 7020R switches come with a one-year limited hardware warranty that covers parts, repair, or replacement with a 10-business-day turnaround after the unit is received.
All technical, hardware, and software support for Arista products is provided directly by Arista and not HPE. Consult the Arista Customer Support page for contact information: arista.com/en/support/customer-support.

Services may be purchased from HPE or Arista to extend your support coverage and software upgrades. Support will be provided by Arista for these services. For details on Arista warranty and support, see: arista.com/assets/data/pdf/Warranty.pdf.

Technical Specifications

Specifications	7020TR-48	7020TRA-48
Ports	48 x100/1000 Mb RJ-45 6 x 1/10GbE SFP+	48 x100/1000 Mb RJ-45 6 x 1/10GbE SFP+
1/10 GbE SFP/SFP+ ports	6	6
100/1000 BASE-T (RJ45) ports	48	48
Throughput	216 Gbps	216 Gbps
Packets/second	162 Mpps	162 Mpps
Latency (RJ45 to uplinks)	From 3.8 microseconds	From 3.8 microseconds
CPU	Quad-Core x86	Quad-Core x86
System memory	8 GB	8 GB
Flash storage memory	4 GB	4 GB
Packet buffer memory	3 GB	3 GB
100/1000 mgmt ports	1	1
RS-232 serial ports	1 (RJ-45)	1 (RJ-45)
USB ports	2	2
Power supplies	2 (1+1 redundant)	2 (1+1 redundant)
Hot-swappable fans	4 (N+1 redundant	4 (N+1 redundant
Reversible airflow	Yes	Yes
Typical power draw*	105 W	105 W
Max power draw	115 W	115 W
Size (WxHxD)	17.3 in. x 1.71 in. x 15.8 in. (43.9 cm x 4.34 cm x 40.1 cm)	17.3 in. x 1.71 in. x 15.8 in. (43.9 cm x 4.34 cm x 40.1 cm)
Weight	17 lb (7.71 kg)	17 lb (7.71 kg)

* Typical power consumption measured at 25C ambient with 50% load on all ports

Supported SFP Optics and Cables

Interface type	SFP+ ports
10GBASE-CR	SFP+ to SFP+: 0.5m-5m
10GBASE-AOC	SFP+ to SFP+: 3m-30m
10GBASE-SRL	100 m (OM3) / 150 m (OM4)
10GBASE-SR	300 m (OM3) / 400 m (OM4)

Technical Specifications

10GBASE-LRL	1 km SMF
10GBASE-LR	10 km SMF
10GBASE-ER	40 km
10GBASE-ZR	80 km
10GBASE-DWDM	80 km
100/1000BASE-T, 1GbE SX/LX	Yes

Power supply specifications

Module	PWR-500AC	PWR-500-DC
Input voltage	100-240AC	40-72V DC
Typical input current	6.3–2.3A	13.1–7.3A, 11A at –48V
Input frequency	50/60 Hz	DC
Input connector	IEC 320-C13	AWG #16-#12
Efficiency (typical)	93% platinum	90%

Environmental Characteristics	
Operating Temperature	0 to 40˚C (32 to 104˚F)
Storage Temperature	-40 to 70˚C (-40 to 158˚F)
Relative Humidity	5 to 95%
Operating Altitude	0 to 10,000 ft, (0-3,000m)

Standards Compliance	
EMC	Emissions: FCC, EN55022, EN61000-3-2, EN61000-3-3 or EN61000-3-11, EN61000-3-12 (as applicable) Immunity: EN55024 Emissions and Immunity: EN300 386
Safety	UL/CSA 60950-1, EN 60950-1, IEC 60950-1 CB Scheme with all country differences
Certifications	North America (NRTL) European Union (EU) BSMI (Taiwan)

Technical Specifications

	C-Tick (Australia) CCC (PRC) MSIP (Korea) EAC (Customs Union) VCCI (Japan)
European Union Directives	2006/95/EC Low Voltage Directive 2004/108/EC EMC Directive 2011/65/EU RoHS Directive 2012/19/EU WEEE Directive

Summary of Changes

Date	Version History	Action	Description of Change
05-Mar-2018	Version 6	Changed	Configuration section updated
08-Jan-2018	Version 5	Added	SKUs added: JQ210A, JQ211A, JQ212A, JQ213A
04-Dec-2017	Version 4	Added	SKUs added: JH603AAE, JH604AAE, JH961AAE, JH962AAE, JH963AAE, JQ053AAE, JQ054AAE, JQ138AAE, JQ139AAE, JQ140AAE, JH523AAE, JH524AAE, JH525AAE, JH526AAE, JH527AAE, JH895AAE
06-Nov-2017	Version 3	Added	Models added: JQ084A, JQ085A SKUs added: JQ138A, JQ139A, JQ140A
		Changed	Changes made on Overview, Features and Benefits, Technical Specifications
03-Jul-2017	Version 2	Added	SKUs added: JQ053A, JQ054A
08-May-2017	Version 1	Created	Document creation.

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