



# Dell EMC PowerSwitch S5200-ON Series Switches

High-performance, open networking 25GbE top-of-rack and 100GbE spine/leaf switches

The PowerSwitch S5200-ON 25/100GbE fixed switches comprise Dell EMC's latest disaggregated hardware and software data center networking solutions, providing state-of-the-art, high-density 25/100GbE ports and a broad range of functionality to meet the growing demands of today's data center environment. These innovative, next-generation open networking switches offer optimum flexibility and cost-effectiveness for web 2.0, enterprise, mid-market and cloud service provider with demanding compute and storage traffic environments.

The S5200-ON is a complete family of switches: 12-port, 24-port, and 48-port 25GbE/100GbE ToR switches, 96-port 25GbE/100GbE Middle of Row (MoR)/End of Row (EoR) switch, and a 32-port 100GbE Multi-Rate Spine/Leaf switch. From the compact half-rack width S5212F-ON providing an ideal form factor for hyper-converged deployments, to the high density S5296F-ON for Middle of Row deployments, the S5200-ON series offers performance and flexibility for a variety of network designs.

In addition to 100GbE Spine/Leaf deployments, the S5232F-ON can also be used in high density deployments using breakout cables to achieve up to 128 10GbE or 128 25GbE ports.

Using industry-leading hardware and a choice of Dell EMC's OS10 or select 3rd party network operating systems and tools, the S5200-ON switches incorporate multiple architectural features that optimize data center network flexibility, efficiency and availability, including IO panel to PSU or PSU to IO panel airflow for hot/cold aisle environments, redundant, hot-swappable power supplies and fans and deliver non-blocking performance for workloads sensitive to packet loss.

Priority-based flow control (PFC), data center bridge exchange (DCBX) and enhanced transmission selection

(ETS) make the S5200-ON family ideally suited for DCB environments.

Dell EMC PowerSwitch S5200-ON switches support the open source Open Network Install Environment (ONIE) for zero touch installation of Dell EMC's OS10 networking operating system, as well as alternative network operating systems.

## Key applications

- Organizations looking to enter the software-defined data center era with a choice of networking technologies designed to maximize flexibility
- High-density 10/25GbE ToR server aggregation in high-performance data center environments at the desired fabric speed with the S5248F-ON or S5296F-ON
- Low-density 10/25GbE server and storage aggregation with the S5212F-ON and S5224F-ON
- Small-scale Fabric implementation via the S5232F-ON switch in leaf and spine along with S5248F-ON 1/10/25GbE ToR switches enabling cost-effective aggregation of 10/25/40/50/100 uplinks
- Multi-functional 10/25/40/50/100GbE switching in High Performance Computing Clusters or other business-sensitive deployments requiring the highest bandwidth.
- iSCSI deployments, including DCB converged lossless transactions
- Single-pass VXLAN routing (future software release)

## Key features

- 1 or 2RU high-density ToR switches with up to 48 or 96 ports of 25GbE or 32 ports of 100GbE
- Multi-rate 100GbE ports support 10/25/40/50/100GbE
- Scalable L2 and L3 Ethernet switching with QoS and a full complement of standards-based IPv4 and IPv6 features, including OSPF and BGP routing support
- Line-rate performance via non-blocking switch fabrics: 3.2Tbps (6.4Tbps full-duplex) on S5296F-ON and S5232F-ON, 2.0Tbps (4.0Tbps full-duplex) on S5248F-ON, and 1.08Tbps (2.16Tbps full-duplex) on S5224F-ON and S5212F-ON
- L2 multipath support via Virtual Link Trunking (VLT) and Routed VLT support
- VXLAN gateway functionality support for bridging and routing the non-virtualized and the virtualized overlay networks with line rate performance (hardware only)
- Support for OS10 Enterprise Edition
- Converged network support for DCB, with priority flow control (802.1Qbb), ETS (802.1Qaz), DCBx and iSCSI TLV support
- Routable RoCE to enable convergence of compute and storage on Leaf/Spine Fabric
- IO panel to PSU airflow or PSU to IO panel airflow Redundant, hot-swappable power supplies and fans on most models
- Supports the open source Open Network Install Environment (ONIE) for zero touch installation of alternate network operating systems
- L2 VXLAN (Static VXLAN with VLT, BGP EVPN)
- Tool-less enterprise ReadyRails™ mounting kits for most models reducing time and resources for switch

rack installation (S5212F-ON will utilize a tandem tray for mounting)

- Power-efficient operation and Dell Fresh Air 2.0 compliant up to 45°C helps reduce cooling costs in temperature constrained deployments

## Key features with Dell EMC Networking OS10

- Consistent DevOps framework across compute, storage and networking elements
- Standard networking features, interfaces and scripting functions for legacy network operations integration
- Standards-based switching hardware abstraction via Switch Abstraction Interface (SAI)
- Pervasive, unrestricted developer environment via Control Plane Services (CPS)
- OS10 Enterprise Edition software enables Dell EMC layer 2 and 3 switching and routing protocols with integrated IP services, quality of service, manageability and automation features
- Leverage common open source tools and best practices (data models, commit rollbacks\*)
- Increase VM Mobility region by stretching L2 VLAN within or across two DCs with unique VLT capabilities
- Scalable L2 and L3 Ethernet Switching with QoS, ACL and a full complement of standards based IPv4 and IPv6 features including OSPF, BGP and PBR
- Enhanced mirroring capabilities including local mirroring, Remote Port Mirroring (RPM), and Encapsulated Remote Port Mirroring (ERPM)
- Converged network support for Data Center Bridging, with priority flow control (802.1Qbb), ETS (802.1Qaz), DCBx and iSCSI TLV

Features	S5212F-ON	S5224F-ON	S5248F-ON	S5296F-ON	S5232F-ON
Ports	12xSFP28 3xQSFP28	24xSFP28 4xQSFP28	48xSFP28 2xQSFP28-DD 4xQSFP28	96xSFP28 8xQSFP28	32xQSFP28 2xSFP+
Max 10GbE density	24	40	80	128	128
Max 25GbE density	24	40	80	128	128
Max 40GbE density	3	4	8	8	32
Max 50GbE density	6	8	16	16	64
Max 100GbE density	3	4	8	8	32
Switching capacity	1.08Tbps (2.16Tbps full-duplex)	1.08Tbps (2.16Tbps full-duplex)	2.0Tbps (4.0Tbps full-duplex)	3.2Tbps (6.4Tbps full-duplex)	3.2Tbps (6.4Tbps full-duplex)
Throughput	892Mpps	1488Mpps	1.5Bpps	2.4Bpps	2.4Bpps

\*Roadmap

Features	S5212F-ON	S5224F-ON	S5248F-ON	S5296F-ON	S5232F-ON
Latency (nano sec)	906	881	847	850	877
1588v2 PTP timing (hardware)		●	●	●	●
CPU Memory	8GB	16GB	16GB	16GB	16GB
SSD	16GB	32GB	64GB	64GB	64GB
Packet Buffer	32MB	32MB	32MB	32MB	32MB
Maximum power	304W	455W	647W	893W	635W
Typical power	140W	200W	310W	457W	360W
Maximum current	2.8A@110VAC / 1.4A@220VAC	4.2A@110VAC / 2.1A@220VAC	5.8A@110VAC / 2.9A@220VAC	8.2A@110VAC / 4.1A@220VAC	5.8A@110VAC / 2.9A@220VAC
Fan modules	Fixed	4	4	4	4
Form Factor	1RU (half-width)	1RU	1RU	2RU	1RU
Dimensions	17.1"Wx18.1"D x1.7"H 43.4Wx46.0D x4.4H (cm)	17.1"Wx18.1"D x1.7"H 43.4Wx46.0D x4.4H (cm)	17.1"Wx18.1"D x1.7"H 43.4Wx46.0D x4.4H (cm)	17.4"Wx20.1"D x3.4"H 44.2Wx51.1D x8.7H (cm)	17.1"Wx18.1"D x1.7"H 43.4Wx46.0D x4.4H (cm)
Weight	4.5kg (10.05lbs)	9.7kg (21.4lbs)	9.7kg (21.4lbs)	15.1kg (33.2lbs)	9.8kg (21.6lbs)
Max thermal output	1037 BTU/h	1552 BTU/h	2208 BTU/h	3047 BTU/h	2167 BTU/h

Product	Description
S5200-ON	<p>S5212F, 12x 25GbE SFP28 + 3x 100GbE QSFP28, 2x AC PSU, I/O Panel to PSU Airflow, OS10 Enterprise Edition</p> <p>S5212F, 12x 25GbE SFP28 + 3x 100GbE QSFP28, 2x AC PSU, PSU to I/O Panel Airflow, OS10 Enterprise Edition</p> <p>S5212F, 12x 25GbE SFP28 + 3x 100GbE QSFP28, 2x DC PSU, I/O Panel to PSU Airflow, OS10 Enterprise Edition</p> <p>S5212F, 12x 25GbE SFP28 + 3x 100GbE QSFP28, 2x DC PSU, PSU to I/O Panel Airflow, OS10 Enterprise Edition</p> <p>S5212F, 12x 25GbE SFP28 + 3x 100GbE QSFP28, 2x AC PSU, I/O Panel to PSU Airflow, NO-OS</p> <p>S5212F, 12x 25GbE SFP28 + 3x 100GbE QSFP28, 2x AC PSU, PSU to I/O Panel Airflow, NO-OS</p> <p>S5212F, 12x 25GbE SFP28 + 3x 100GbE QSFP28, 2x AC PSU, I/O Panel to PSU Airflow, OS10 Enterprise Edition, TAA</p> <p>S5212F, 12x 25GbE SFP28 + 3x 100GbE QSFP28, 2x AC PSU, PSU to I/O Panel Airflow, OS10 Enterprise Edition, TAA</p> <p>S5224F, 24x 25GbE SFP28 + 4x 100GbE QSFP28, 2x AC PSU, Fan modules, I/O Panel to PSU Airflow, OS10 Enterprise Edition</p> <p>S5224F, 24x 25GbE SFP28 + 4x 100GbE QSFP28, 2x AC PSU, Fan modules, PSU to I/O Panel Airflow, OS10 Enterprise Edition</p> <p>S5224F, 24x 25GbE SFP28 + 4x 100GbE QSFP28, 2x AC PSU, Fan modules, I/O Panel to PSU Airflow, NO-OS</p> <p>S5224F, 24x 25GbE SFP28 + 4x 100GbE QSFP28, 2x AC PSU, Fan modules, PSU to I/O Panel Airflow, NO-OS</p> <p>S5224F, 24x 25GbE SFP28 + 4x 100GbE QSFP28, 2x AC PSU, Fan modules, I/O Panel to PSU Airflow, OS10 Enterprise Edition, TAA</p> <p>S5224F, 24x 25GbE SFP28 + 4x 100GbE QSFP28, 2x AC PSU, Fan modules, PSU to I/O Panel Airflow, OS10 Enterprise Edition, TAA</p>

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Redundant power supplies	AC Power Supply, IO Panel to PSU Airflow AC Power Supply, PSU to IO Panel Airflow DC Power Supply, IO Panel to PSU Airflow (available as custom kit) DC Power Supply, PSU to IO Panel Airflow (available as custom kit)
Fans	Fan module, IO Panel to PSU Airflow Fan module, PSU to IO Panel Airflow
Optics	Transceiver, 2x100GbE, 2xSR4, QSFP28-DD Transceiver, 2x100GbE, 2xPSM4-IR, QSFP28-DD Transceiver, 2x100GbE, 2xCWDM4, QSFP28-DD Transceiver, 100GbE, SR4 QSFP28 Transceiver, 100GbE, PSM4 (500m) QSFP28 Transceiver, 100GbE, CWDM4 (2Km) QSFP28 Transceiver, 100GbE, LR4 QSFP28 Transceiver, 40GbE, SR4 optic QSFP+ Transceiver, 40GbE, BIDI optic QSFP+ (Duplex) Transceiver, 40GbE, SM4 optic QSFP+ (Duplex) Transceiver, 40GbE, LM4 optic QSFP+ (Duplex) Transceiver, 40GbE, PSM4 10Km, QSFP+ Transceiver, 40GbE, LR4 optic QSFP+ Transceiver, 40GbE, ER4 optics QSFP+ Transceiver, 25GbE, SR, NOF SFP28 Transceiver, 25GbE, LR, SFP28 Transceiver, 10GbE, SR SFP+, short reach Transceiver, 10GbE, LR SFP+, long reach Transceiver, 10GbE, ER SFP+, extended reach Transceiver, 10GbE, ZR SFP+ extra extended reach 10G, Transceiver, 10GBASE-T use with QSA in QSFP+ port, 30m reach on CAT6a/7 Transceiver, 1GbE, SX SFP Transceiver, 1GbE, LX SFP Transceiver, 1GbE, ZX SFP Transceiver, 1GbE, 10km, BiDi SFP Transceiver, 1GbE, 40km, BiDi SFP Transceiver, 1GbE, 80km, BiDi SFP Transceiver, 1GbE, 1000BASE-T, Gen2, SFP

Product	Description
Cables	100GbE, 4x25GbE, QSFP28 to 4xSFP28, passive DAC 100GbE, QSFP28 to QSFP28, active optical 100GbE, QSFP28 to QSFP28, passive DAC 100GbE, 2x50GbE, 2xQSFP to 2xQSFP28, passive DAC, breakout 40GbE, QSFP+ to QSFP+, active optical 40GbE, QSFP+ to QSFP+, passive DAC 40GbE, MTP to 4xLC optical breakout 40GbE, 4x10GbE, QSFP+ to 4xSFP+, passive DAC
Cable management	Z9100 Cable Breakout Kit, MTP to LC (1RU 64-port LC over MMF) Z9100 Cable Breakout Kit, MTP to LC (1RU 64-port LC over SMF)

## Technical specifications

### Physical

1 RJ45 console/management port with RS232 signaling  
S5212F-ON: 12x25GbE SFP28 + 3x 100GbE QSFP28  
S5224F-ON: 24x25GbE SFP28 + 4x 100GbE QSFP28  
S5248F-ON: 48x25GbE SFP28 + 4x 100GbE QSFP28 + 2x 2x100GbE QSFP28-DD  
S5296F-ON: 96x25GbE SFP28 + 8x 100GbE QSFP28  
S5232F-ON: 32x100GbE QSFP28 ports + 2xSFP+ 10GbE

### Environmental

Power supply: 100–240 VAC 50/60 Hz  
Max Operating specifications:  
AC Max. Operating specifications:  
Operating temperature: 32° to 113°F (0° to 45°C)  
Operating humidity: 5 to 90% (RH), non-condensing  
Max. Non-operating specifications:  
Storage temperature: –40° to 158°F (–40° to 70°C)  
Storage humidity: 5 to 90% (RH), non-condensing  
Fresh air Compliant to 45°C

### Redundancy

Hot swappable redundant power  
Hot swappable redundant fans (fixed power supply and fans on S5212F-ON)

### Performance

Packet buffer memory: 32MB  
CPU memory: 16GB  
MAC addresses: 160K  
ARP table: 128K  
IPv4 routes: 128K  
IPv6 routes: 64K  
Multicast hosts: 32K  
Link aggregation: 16 links per group, 128 groups  
Layer 2 VLANs: 4K  
MSTP: 64 instances  
LAG load balancing: Based on layer 2, IPv4 or IPv6 headers

### IEEE Compliance

802.1AB LLDP  
TIA-1057 LLDP-MED  
802.3ad Link Aggregation  
802.1D Bridging, STP  
802.1p L2 Prioritization  
802.1Q VLAN Tagging  
802.1Qbb PFC

### 802.1Qaz

802.1X  
802.3ac

### 802.3x

Layer2  
802.1D

### 802.1p

802.1Q

### 802.1s

802.1w

### 802.1t

VLT (Virtual Link Trunking)  
VRRP Active/Active  
RSTP & RPVST+  
Port Mirroring on VLT ports  
DCB, iSCSI, FSB on VLT  
RPM/ERPM over VLT  
VLT Minloss upgrade

### RFC Compliance

768 UDP  
793 TCP  
854 Telnet  
959 FTP  
1321 MD5  
1350 TFTP  
2474 Differentiated Services  
2698 Two Rate Three Color Marker  
3164 Syslog  
4254 SSHv2

### General IPv4 Protocols

791 IPv4  
792 ICMP  
826 ARP  
1027 Proxy ARP  
1035 DNS (client)  
1042 Ethernet Transmission  
1191 Path MTU Discovery  
1305 NTPv4  
1519 CIDR  
1812 Routers, Static Routes  
1858 IP Fragment Filtering  
2131 DHCPv4 (server and relay)  
5798 VRRPv3  
3021 31-bit Prefixes  
1812 Requirements for IPv4 Routers  
1918 Address Allocation for Private Internets  
2474 Diffserv Field in IPv4 and Ipv6 Headers  
2597 Assured Forwarding PHB Group  
3195 Reliable Delivery for Syslog  
3246 Expedited Forwarding PHB Group  
VRF (BGPv4/v6)

### General IPv6 Protocols

1981 Path MTU for IPv6  
2372 IPv6 Addressing  
2460 IPv6 Protocol Specification  
2461 Neighbor Discovery  
2462 Stateless Address AutoConfig  
2711 IPv6 Router alert  
2463 ICMPv6  
2464 Ethernet Transmission  
2675 IPv6 Jumbograms  
3484 Default Address Selection  
3493 Basic Socket Interface  
4291 Addressing Architecture  
3542 Advanced Sockets API  
3587 Global Unicast Address Format  
4291 IPv6 Addressing  
2464 Transmission of IPv6 Packets over Ethernet Networks  
2711 IPv6 Router Alert Option  
4007 IPv6 Scoped Address Architecture  
4213 Transition Mechanisms for IPv6 Hosts and Routers  
3315 DHCPv6 Server & Relay  
IPv6 Static Routes  
  
**OSPF**  
1745 OSPF/BGP interaction  
1765 OSPF Database overflow  
2154 OSPF with DigitalSignatures  
2328 OSPFv2  
5340 OSPF for IPv6 (OSPFv3)  
2370 Opaque LSA  
3101 OSPF NSSA  
4552 OSPFv3 Authentication

### Multicast

4541 IGMPv1/v2/v3 and MLDv1/v2 Snooping

### Security

2865 RADIUS  
3162 Radius and IPv6  
3579 Radius support for EAP  
3580 802.1X with RADIUS  
3826 AES Cipher in SNMP  
1492 TACACS (Authentication, Accounting) Control Plane, VTY & SNMP ACLs  
IP Access Control Lists

### BGP

1997 Communities  
2385 MD5  
2439 Route Flap Damping  
2796 Route Reflection  
2918 Route Refresh

3065 Confederations  
4271 BGP-4  
2545 BGP-4 Multiprotocol Extensions for IPv6 Inter-Domain Routing  
2858 Multiprotocol Extensions  
4360 Extended Communities  
4893 4-byte ASN  
5396 4-byte ASN Representation  
5492 Capabilities Advertisement  
draft-ietf-idr-add-paths-04.txt ADD PATH

#### Linux Distribution

Debian Linux version 9  
Linux Kernel 4.9

#### Network Management and Monitoring

SNMPv1/2c  
IPv4/IPv6 Management support (Telnet, FTP, TACACS, RADIUS, SSH, NTP)  
Syslog  
Port Mirroring  
RPM/ERPM  
3176 SFlow  
Support Assist (Phone Home)  
RestConf APIs (Layer 2 features)  
XML Schema  
CLI Commit (Scratchpad)  
Uplink Failure Detection  
Object Tracking  
Bidirectional Forwarding Detection (BFD)  
Automation  
Control Plane Services APIs  
Linux Utilities and Scripting Tools  
CLI Automation (Multiline Alias)  
Zero Touch Deployment (ZTD)  
Ansible, Puppet, Chef, SaltStack  
8040 RESTCONF APIs (L3)

#### Quality of Service

Prefix List  
Route-Map  
Rate Shaping (Egress)  
Rate Policing (Ingress)  
Scheduling Algorithms

Round Robin  
Weighted Round Robin  
Deficit Round Robin  
Strict Priority  
Weighted Random Early Detect

#### Data center bridging

802.1Qbb Priority-Based Flow Control  
802.1Qaz Enhanced Transmission Selection (ETS)  
Explicit Congestion Notification  
Data Center Bridging eXchange (DCBx)  
DCBx Application TLV (iSCSI, FCoE)  
RoCEv2  
Software Defined Networking  
OpenFlow 1.3 (Native)

#### MIBS

IP MIB  
IP Forward MIB  
Host Resources MIB  
IF MIB  
LLDP EXT1/3 MIB  
Entity MIB  
LAG MIB  
Dell-Vendor MIB  
TCP MIB  
UDP MIB  
SNMPv2 MIB  
ETHERLIKE-MIB  
SFLOW-MIB  
PFC-MIB

#### Regulatory compliance

##### Safety

UL/CSA 60950-1, Second Edition  
EN 60950-1, Second Edition  
IEC 60950-1, Second Edition Including All National Deviations and Group Differences  
EN 60825-1 Safety of Laser Products Part 1: Equipment Classification Requirements and User's Guide  
EN 60825-2 Safety of Laser Products Part 2:

Safety of Optical Fibre Communication Systems  
FDA Regulation 21 CFR 1040.10 and 1040.11

#### Emissions

Australia/New Zealand: AS/NZS CISPR 22: 2006, Class A  
Canada: ICES-003, Issue-4, Class A  
Europe: EN 55022: 2006+A1:2007 (CISPR 22: 2006), Class A  
Japan: VCCI V3/2009 Class A  
USA: FCC CFR 47 Part 15, Subpart B:2011, Class A

#### Immunity

EN 300 386 V1.4.1:2008 EMC for Network Equipment  
EN 55024: 1998 + A1: 2001 + A2: 2003  
EN 61000-3-2: Harmonic Current Emissions  
EN 61000-3-3: Voltage Fluctuations and Flicker  
EN 61000-4-2: ESD  
EN 61000-4-3: Radiated Immunity  
EN 61000-4-4: EFT  
EN 61000-4-5: Surge  
EN 61000-4-6: Low Frequency Conducted Immunity

#### RoHS

All S Series components are EU RoHS compliant.

#### Certifications

Available with US Trade Agreements Act (TAA) compliance  
USGv6 Host and Router Certified on Dell Networking OS 9.5 and greater  
IPv6 Ready for both Host and Router  
UCR DoD APL (core and distribution)  
ALSAN switch

#### Warranty

1 year return to depot

## IT Lifecycle Services for Networking

### Experts, insights and ease

Our highly trained experts, with innovative tools and proven processes, help you transform your IT investments into strategic advantages.



#### Plan & Design

Let us analyze your multivendor environment and deliver a comprehensive report and action plan to build upon the existing network and improve performance.



#### Deploy & Integrate

Get new wired or wireless network technology installed and configured with ProDeploy. Reduce costs, save time, and get up and running fast.



#### Educate

Ensure your staff builds the right skills for long-term success. Get certified on Dell EMC Networking technology and learn how to increase performance and optimize infrastructure.



#### Manage & Support

Gain access to technical experts and quickly resolve multivendor networking challenges with ProSupport. Spend less time resolving network issues and more time innovating.



#### Optimize

Maximize performance for dynamic IT environments with Dell EMC Optimize. Benefit from in-depth predictive analysis, remote monitoring and a dedicated systems analyst for your network.



#### Retire

We can help you resell or retire excess hardware while meeting local regulatory guidelines and acting in an environmentally responsible way.

Learn more at [DellEMC.com/Services](https://DellEMC.com/Services)

Learn more at [DellEMC.com/Networking](https://DellEMC.com/Networking)