D-Link®
Building Networks for People

Highlights

High Availability

Redundancy features, including hot-swappable power supplies, and redundant fan trays maximize the availability of your network

Leaf-Spine, Top-of-Rack (ToR)

10G, 25G, 40G, and 100G port combinations to accommodate the high bandwidth requirements of leaf-spine or ToR architecture deployments

Open Network Switching

ONIE support allows the use of multiple Network Operation Systems (NOS) for optimal flexibility and integration

5000 Series
Data Center Switches

Features

High Availability and Reliability

- Variety of high-speed interface combinations to meet different network requirements
- Two AC/DC hot-swappable power modules for 1+1 redundancy and load sharing
- Modular, N+1 hot-swappable fan design

Data Center and SDN Virtualization

- Wire-speed, ultra-low latency switching
- Variety of 10G, 25G, 40G, and 100G interfaces for high-density availability and uplink options
- Front-to-back and back-to-front airflow
- Supports OpenFlow v1.0/1.3
- Supports Virtual eXtensible LAN (VXLAN) network virtualization
- 802.1Qau, 802.1Qbb, 802.1Qaz Data Center Bridging (DCB) features

Flexibility and Compatibility

- Preloaded with Open Network Install Environment (ONIE) for optimal compatibility with third-party commercial Network Operating Systems (NOSs)
- Open Network Linux (ONL)-ready

Convenient Management

- RJ-45/mini-USB console port
- Dedicated management port
- Industry-standard CLI

The D-Link 5000 Series Data Center Switches are a series of high-performance switches that feature high port density, routing, and ultra-low latency, designed to be deployed as Top-of-Rack (ToR) or leaf-spine switches in data center applications. Combined with ONIE support and increased cost-efficiency, the 5000 Series form a flexible long-term solution for managing and expanding data center infrastructures in a Software-defined Networking (SDN) environment.

Bare Metal and Open Networking Data Center Switches

Open Networking

The 5000 Series switches support open networking, providing IT professionals with innovative third-party operating systems and software options. This lowers costs by separating software from hardware and increases network agility and flexibility. With support for standards-based tools and standards-based applications, open networking simplifies scalability and future-proofs the network.

As bare metal switches, the 5000 Series switches ship pre-loaded with Open Network Install Environment (ONIE). ONIE is an open source install environment that acts as an enhanced boot loader. This small Linux operating system allows administrators to install the network operating system(s) of choice as part of the data center provisioning process in the same manner that servers are provisioned. In addition, the 5000 Series also offers network administrators the option to purchase a license to activate the D-Link OS on the switches.

High Availability and Reliability

The 5000 Series switches feature a modular fan and power supply design for a high availability architecture. The hot-swappable design means that fans and power supplies can be replaced without affecting switch operation. Load sharing enables both power supplies to evenly distribute load to increase reliability and lifetime. Meanwhile, 1+1 redundancy minimizes downtime in case of a single power supply failure.

Flexibility and Versatility

The 5000 Series switches are available in a variety of high-capacity interface combinations, including SFP+, QSFP+, SFP28, and QSFP28 ports to accommodate the scale and requirements of data centers. Open Network Install Environment (ONIE) support means the switches can be easily integrated in existing network ecosystems using a variety of supported third-party Network Operating Systems (NOSs) for optimal compatibility. Furthermore, the ability to pick and choose software based on practical requirements eliminates the restrictions imposed by vendor-locked software environments.

Cost-Efficient with Dedicated Support

Compared to traditional switches, the 5000 Series offer a more cost-efficient solution through a lower initial purchasing cost combined with a reduced long-term Total Cost of Ownership (TCO). The 5000 Series switches feature front-to-back and back-to-front airflow which optimizes air circulation inside the rack and facilitates the building of energy-efficient data centers by separating the hot and cold aisles. The switches also feature built-in smart fans; internal heat sensors monitor and detect temperature changes, and react accordingly by utilizing different fan speeds for different temperatures. At lower temperatures, the fans will run more slowly, reducing the switch's power consumption and noise.

Rich and Comprehensive D-Link OS Software

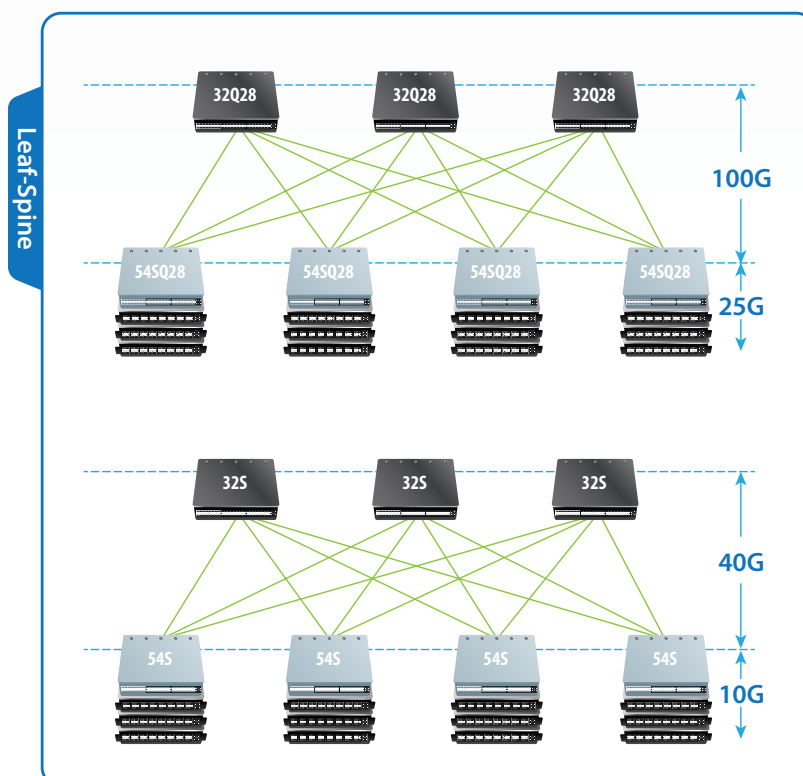### Data Center and Virtualization Features

Data Center Bridging (DCB) is an essential set of enhancements to Ethernet for networking in data center environments. The D-Link OS for the 5000 Series switches supports several core components of Data Center Bridging (DCB) such as IEEE 802.1Qbb, IEEE 802.1Qaz, IEEE 802.1Qau, and VXLAN. IEEE 802.1Qbb (Priority-based Flow Control) provides flow control on specific priority levels to ensure there is no data loss during network congestion. IEEE 802.1Qaz (Enhanced Transmission Selection) manages the allocation of bandwidth amongst different traffic classes. IEEE 802.1Qau (Congestion Notification) provides congestion management for data flows within network domains to avoid congestion. Meanwhile, VXLAN allows network administrators to deploy larger and more flexible VLAN architectures. Using a 24 bit ID, VXLAN greatly increases the number of simultaneous VLANs. Compared to the 4096 limit of traditional VLAN protocols, VXLAN enables the deployment of up to 16 million isolated logical networks across Layer 3 subnets, to accommodate the increasing scale of virtualized cloud environments.

Complete Layer 2/3 Functionality

The 5000 Series switches feature a complete L2 and L3 feature set to meet the demands of data center applications. Layer 2 features include L2 switching, L2 multicast, advanced Quality of Service (QoS), and robust security features. Meanwhile, the 5000 Series offers advanced L3 routing for enterprise integration, including OSPF, BGP, Graceful Restart, Bidirectional Forwarding Detection (BFD), and L3 multicast.
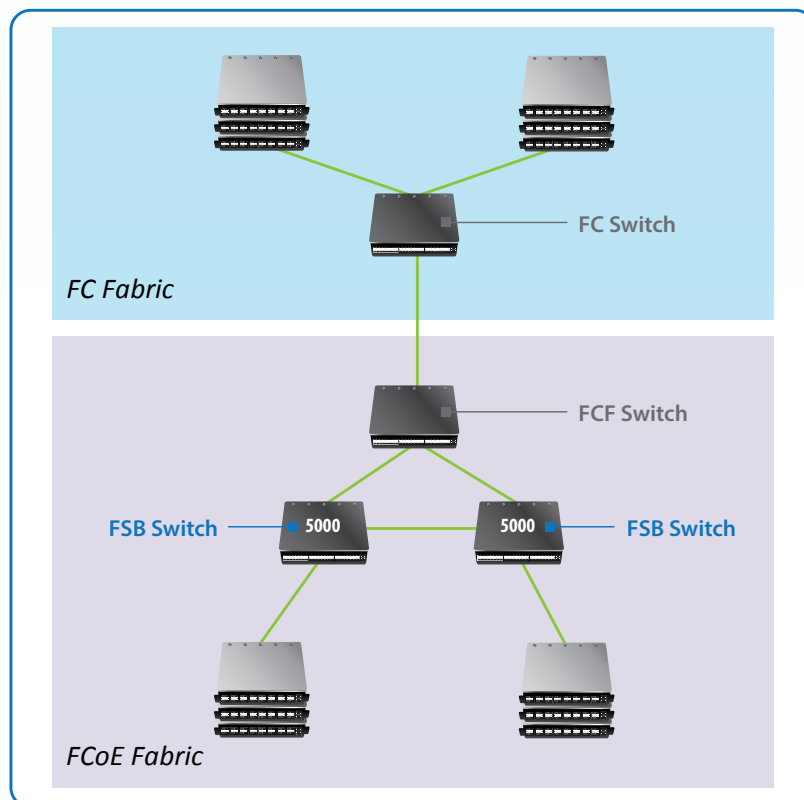
Deployment Scenarios

Leaf-Spine Configuration

Top of Rack (ToR) / End of Row (EoR) Configuration

ToR & EoR

32Q28

100G

54SQ28 54SQ28 54SQ28 54SQ28

25G

32S

40G

54S 54S 54S 54S

10G
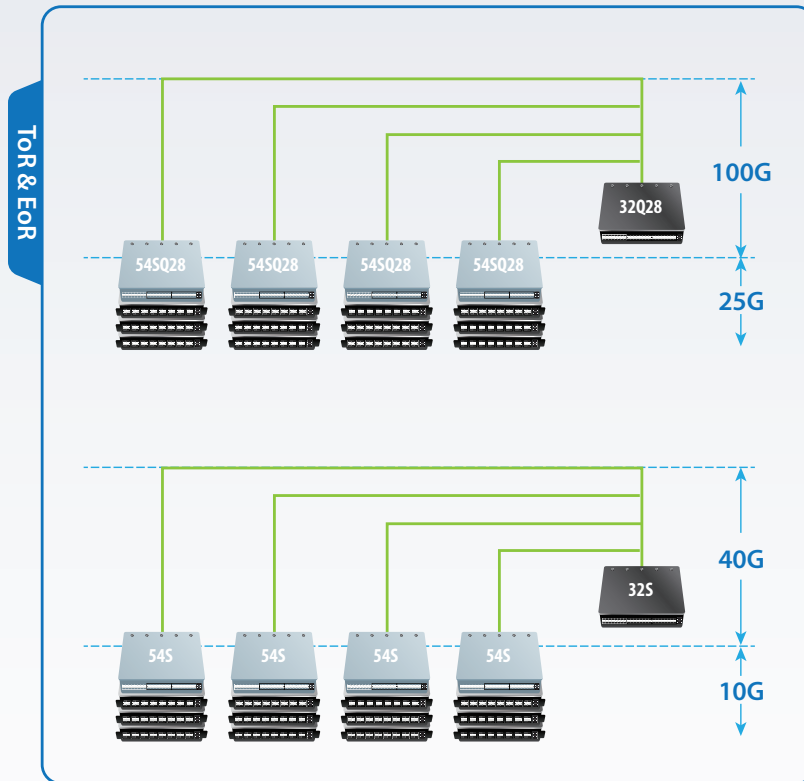
Fibre Channel over Ethernet (FCoE) Configuration

FC Switch

FC Fabric

FCF Switch

FSB Switch — 5000   5000 — FSB Switch

FCoE Fabric

Technical Specifications

General	DXS-5000-54S	DQS-5000-32S	DQS-5000-32Q28	DQS-5000-54SQ28
Interfaces	• 48 x 10G SFP+ ports • 6 x 40G QSFP+ ports • 1 x USB 2.0 port	• 32 x 40G QSFP+ ports • 1 x USB 2.0 port	• 32 x 100G QSFP28 ports • 1 x USB 2.0 port	• 48 x 25G SFP28 ports • 6 x 100G QSFP28 ports • 1 x USB 2.0 port
Console Port	• 1 x mini-USB console port	• 1 x RJ-45 console port	• 1 x RJ-45 console port	• 1 x mini-USB console port
OOB Management Port	• 1 x 10/100/1000BASE-T RJ-45 port			

Performance				
Switching Capacity	• 1.44 Tbps	• 2.56 Tbps	• 6.4 Tbps	• 3.6 Tbps
Max. Forwarding Rate	• 1,071 Mpps (1.071 Bpps)	• 1,428 Mpps (1.428 Bpps)	• 2,980 Mpps (2.980 Bpps)	• 2,380 Mpps (2.380 Bpps)
Packet Buffer Memory	• 12 MB	• 12 MB	• 16 MB	• 16 MB
MAC Address Table	• 288K	• 288K	• 40K	• 40K

Physical				
Power Input	• 1+1 redundant power supply design • Input: 100 to 240 V AC, 50/60 Hz			
Maximum Power Consumption	• 295 W	• 406 W	• 420 W	• 395 W
Heat Dissipation (Max.)	• 1006.58 BTU/hr	• 1385.27 BTU/hr	• 1433.04 BTU/hr	• 1347.74 BTU/hr
Fans	• 4 x fans	• 4 x fans	• 4 x fans	• 4 x fans
Acoustics	• Max: 74 dB • Min: 62 dB	• Max: 69.8 dB • Min: 59.5 dB	• Max: 71.8 dB • Min: 57.2 dB	• Max: 72.3 dB • Min: 58.6 dB
Dimensions (W x D x H)	• 440 x 406 x 44 mm (17.32 x 16 x 1.73 inch)			
Weight	• 9 kg (19.8 lbs)	• 9 kg (19.8 lbs)	• 8.7 kg (19.2 lbs)	• 9 kg (19.8 lbs)
Operating Temperature	• 0 to 45 ºC (32 to 113 ºF)			
Storage Temperature	• -40 to 70 ºC (-40 to 158 ºF)			
Operating Humidity	• 5% to 95% RH, non-condensing			
Storage Humidity	• 5% to 95% RH, non-condensing			
MTBF	• 205,000 hours	• 85,937 hours	• 206,685 hours	• 205,500 hours

Certifications		
Safety	• cULus • CCC • BSMI	• CB • CE
EMI/EMC	• FCC/IC • CCC • CB	• CE • BSMI

Software Features (D-Link OS)

L2 Features	• MAC address table
	  • DXS-5000-54S/DQS-5000-32S: Up to 288K entries
	  • DQS-5000-32Q28/DQS-5000-54SQ28: Up to 40K entries
	• 802.3ad Link Aggregation
	  • Max. 64 groups per device
	  • Max. 32 ports per group
	• Spanning Tree Protocol (STP)
	  • 802.1D STP
	  • 802.1w RSTP
	  • 802.1s MSTP
	  • BPDU Filter/Guard
	  • Loop Guard
	  • TCN Guard
	  • Root Guard
		• Supports 802.3x Flow Control
		• Jumbo frame
		  • DXS-5000-54S/DQS-5000-32S: Up to 9 Kb
		  • DQS-5000-32Q28/DQS-5000-54SQ28: Up to 9 Kb
		• Port mirroring
		  • Supports One-to-One, Many-to-One
		  • Supports mirroring for Tx/Rx/Both
		  • Supports up to 4 mirroring groups
		• Flow mirroring
		  • Supports Rx mirroring
		• VLAN mirroring
		• RSPAN
		• Loopback Detection (LBD)

L2 Multicast Features	• IGMP Snooping
	  • IGMP Snooping v1/v2/v3
	  • IGMP Fast Leave
	  • Supports up to 256 IGMP groups
	  • Per-VLAN IGMP Snooping
	  • IGMP Snooping Querier
		• MLD Snooping
		  • MLD Snooping v1/v2
		  • Supports up to 256 MLD groups
		  • Per-VLAN MLD Snooping
		  • MLD Snooping Querier

L3 Features	• IP interfaces
	  • Supports 128 IP interfaces
	• ARP
	  • Supports 6K ARP entries
	  • Supports 256 static ARP entries
	• IPv6 Neighbor Discovery (ND)
	  • Supports up to 2560 ND entries
	  • Supports up to 32 static ND entries
	• Gratuitous ARP
		• VRRP v2
		• UDP Helper
		• ICMP Router Discovery Protocol (IRDP)
		• Equal-Cost Multi-Path (ECMP)
		• IPv6 Tunneling
		  • 6to4
		  • GRE
		• IPv4/IPv6 Loopback interface

L3 Routing	• Static routing
	  • Max. 64 IPv4 entries
	  • Max. 64 IPv6 entries
	  • Supports Equal-Cost-Multi-Path Route (ECMP)
	• OSPF
	  • OSPF v2/v3
	  • Stub/NSSA Area
	  • OSPF Passive Interface
	  • Text/MD5 authentication
	  • Supports Equal-Cost-Multi-Path Route (ECMP)
	• Supports 12K hardware routing entries shared by IPv4 and IPv6
	• Supports 20K hardware L3 forwarding entries shared by IPv4 and IPv6
		• IPv4/IPv6 Default Route
		• Null Route
		• Route Preference
		• Route Redistribution
		• Graceful Restart (GR) for OSPF
		• Grace Restart (GR) Helper for RIP
		• Bidirectional Forwarding Detection (BFD) for OSPF
		• BGP
		  • BGP4/BGP4+
		  • Max. 256 BGP neighbors
		  • Supports MD5 authentication
		• Policy-based Route (PBR)

L3 Multicast Features	• IGMP v1/v2/v3 • MLD v1/v2 • DVMRP v3 • PIM-SSM	• SSM Mapping for IPv4/IPv6 • PIM-SM IPv4/IPv6 • PIM-DM IPv4/IPv6 • IGMP/MLD proxy

VLAN	• 802.1Q
	• Port-based VLAN
	• Multicast VLAN (ISM VLAN for IPv4/IPv6)
	• Private VLAN
		• Double VLAN (Q-in-Q)
		• VLAN groups
		  • Max. 4K VLAN groups
		  • Max. 1~4093 VLAN IDs

Security	• Broadcast/unicast/multicast control
	• SSH
	  • Supports v1/v1.5/v2.0
	  • Supports IPv4/IPv6 access
	  • Configurable TCP port number
	• Port security
	  • Supports up to 600 MAC addresses per port
	• DoS attack prevention
		• IP Source Guard
		• DHCP Snooping
		• IPv6 Snooping
		• DHCP Server Screening
		• Dynamic ARP Inspection (DAI)
		• IPv6 Route Advertisement (RA) Guard
		• Duplicate Address Detection (DAD)
		• BPDU Attack Protection

Authentication, Authorization, Accounting (AAA)	• 802.1X authentication
	  • Supports port-based access control
	  • Supports host-based access control
	  • Identity-driven policy assignment
	    • Dynamic VLAN assignment
	    • QoS assignment
	    • ACL assignment
	• Guest VLAN
	• RADIUS authentication
		• TACACS+ authentication
		• MAC-based Access Control (MAC)
		  • Supports port/host-based access control
		  • Compatible with RADIUS server authentication
		• Authentication for management access
		• Privilege level for management access
		• Authentication database failover
		• RADIUS/TACACS+ accounting

Quality of Service (QoS)	• Max. of 8 priority queues per port
	• Queue handling
	  • Strict Priority (SP)
	  • Weighted Deficit Round Robin (WDRR)
	• Congestion control
	  • Weighted Random Early Detection (WRED)
	• Bandwidth control
	  • Queue-based bandwidth control; min. granularity of 1% of the port speed
	• Three Color Marker
	  • Two Rate Three Color Marker (trTCM)
	  • Single Rate Three Color Marker (srTCM)
		• Class of Service (CoS)
		  • Switch port
		  • Outer 802.1p priority
		  • ToS/IP preference
		  • DSCP
		• Policy Map
		  • Remark 802.1p priority
		  • Remark ToS/DSCP
		  • Rate limiting

Data Center Features	• Open Network Install Environment (ONIE) • FCoE Initialization Protocol (FIP) Snooping • 802.1Qau Congestion Notification (CN) • 802.1Qbb Priority-based Flow Control (PFC) • 802.1Qaz Enhanced Transmission Selection (ETS)[1]	• Data Center Bridging Exchange (DCBX) • OpenFlow v1.3 • Open API • Supports Puppet/Chef • Virtual eXtensible Local Area Network (VXLAN)

Access Control List (ACL)	• MAC Access List based on:
	  • 802.1p priority mask
	  • VID mask
	  • Source/destination MAC address mask
	  • Ether Type mask
	• IP Access List based on:
	  • Source/destination IP address mask
	  • IP preference/ToS mask
	  • TCP/UDP port number mask
	• IPv6 Access List based on:
	  • Source/destination IP address mask
	  • TCP/UDP port number mask
	• CPU interface filtering
	  • Max. 1023 rule entries
		• Time-based ACL
		• Max. ACL entries:
		  • Max. ingress ACL entries: 16K
		  • Max. egress ACL entries: 16K
		  • Max. number of access control lists: 100
		  • Max. VLAN access maps: 24
		  • Max. ACL rule entries: 1K:

Management	• Industry-standard CLI
	• Telnet server for IPv4/IPv6 access
	• TFTP client for IPv4/IPv6
	• FTP client for IPv4/IPv6
	• Secure FTP (SFTP) client for IPv4/IPv6
	• Multiple images
	• Dual configurations
	• SNMP
	  • Supports SNMP v1/v2c/v3
	  • Supports IPv4/IPv6
	• SNMP traps
	• System log for IPv4/IPv6 Syslog server
	• Command logging
	• SMTP
	• RMON v1
	  • Supports 1/2/3/9 groups
	• DHCP/BOOTP Client support for IPv4/IPv6 DHCP/BOOTP server
	• DHCP Relay
	  • Supports IPv4/IPv6
	  • Option 82
	  • Supports user-defined TLV for Option 82
		• Event log
		• DNS client
		• SNTPv4
		• LLDP/LLDP-MED
		• CDP
		• UDLD
		• sFlow v5
		• DHCP auto-configuration
		• DHCP auto-image
		• Flash file system
		• DNS client for IPv4/IPv6
		• Debug command
		• Password recovery/encryption
		• Supports IPv4/IPv6 Ping/Traceroute

Ordering Information (Bare Metal)

Part Number	Description
DXS-5000-54S/AF	• 48-port 10G SFP+, 6-port 40G QSFP+ interfaces data center switch with 2 front-to-back AC PSUs, 4 front-to-back fan modules
DXS-5000-54S/AB	• 48-port 10G SFP+, 6-port 40G QSFP+ interfaces data center switch with 2 back-to-front AC PSUs, 4 back-to-front fan modules
DXS-5000-54S/UF	• 48-port 10G SFP+, 6-port 40G QSFP+ interfaces data center switch with 2 front-to-back DC PSUs, 4 front-to-back fan modules
DXS-5000-54S/UB	• 48-port 10G SFP+, 6-port 40G QSFP+ interfaces data center switch with 2 back-to-front DC PSUs, 4 back-to-front fan modules
DQS-5000-32S/AF	• 32-port 40G QSFP+ interfaces data center switch with 2 front-to-back AC PSUs, 4 front-to-back fan modules
DQS-5000-32S/AB	• 32-port 40G QSFP+ interfaces data center switch with 2 back-to-front AC PSUs, 4 back-to-front fan modules
DQS-5000-32S/UF	• 32-port 40G QSFP+ interfaces data center switch with 2 front-to-back DC PSUs, 4 front-to-back fan modules
DQS-5000-32S/UB	• 32-port 40G QSFP+ interfaces data center switch with 2 back-to-front DC PSUs, 4 back-to-front fan modules
DQS-5000-32Q28/AF	• 32-port 100G QSFP28 interfaces data center switch with 2 front-to-back AC PSUs, 4 front-to-back fan modules
DQS-5000-32Q28/AB	• 32-port 100G QSFP28 interfaces data center switch with 2 back-to-front AC PSUs, 4 back-to-front fan modules
DQS-5000-32Q28/UF	• 32-port 100G QSFP28 interfaces data center switch with 2 front-to-back DC PSUs, 4 front-to-back fan modules
DQS-5000-32Q28/UB	• 32-port 100G QSFP28 interfaces data center switch with 2 back-to-front DC PSUs, 4 back-to-front fan modules
DQS-5000-54SQ28/AF	• 48-port 25G SFP28, 6-port 100G QSFP28 interfaces data center switch with 2 front-to-back AC PSUs, 4 front-to-back fan modules
DQS-5000-54SQ28/AB	• 48-port 25G SFP28, 6-port 100G QSFP28 interfaces data center switch with 2 back-to-front AC PSUs, 4 back-to-front fan modules
DQS-5000-54SQ28/UF	• 48-port 25G SFP28, 6-port 100G QSFP28 interfaces data center switch with 2 front-to-back DC PSUs, 4 front-to-back fan modules
DQS-5000-54SQ28/UB	• 48-port 25G SFP28, 6-port 100G QSFP28 interfaces data center switch with 2 back-to-front DC PSUs, 4 back-to-front fan modules
DXS-PWR550AC/F	• 550 W AC modular power supply with front-to-back airflow
DXS-PWR550AC/B	• 550 W AC modular power supply with back-to-front airflow
DXS-PWR800DC/F	• 800 W DC modular power supply with front-to-back airflow
DXS-PWR800DC/B	• 800 W DC modular power supply with back-to-front airflow
DXS-FAN5K/F	• 5000 Series fan module with front-to-back airflow
DXS-FAN5K/B	• 5000 Series fan module with back-to-front airflow

Optional D-Link OS Activation Licenses

DXS-5K-54S-DC-LIC	• License to activate the D-Link OS on the DXS-5000-54S
DQS-5K-32S-DC-LIC	• License to activate the D-Link OS on the DQS-5000-32S
DQS-5K-32Q28-DC-LIC	• License to activate the D-Link OS on the DQS-5000-32Q28
DQS-5K-54SQ28-DC-LIC	• License to activate the D-Link OS on the DQS-5000-54SQ28

Optional Management Software

DV-700-N25-LIC	• D-View 7 - 25 node license
DV-700-N50-LIC	• D-View 7 - 50 node license
DV-700-N100-LIC	• D-View 7 - 100 node license
DV-700-N250-LIC	• D-View 7 - 250 node license
DV-700-N500-LIC	• D-View 7 - 500 node license
DV-700-N1000-LIC	• D-View 7 - 1000 node license

DV-700-P5-LIC	• D-View 7 - 5 probe license
DV-700-P10-LIC	• D-View 7 - 10 probe license
DV-700-P25-LIC	• D-View 7 - 25 probe license
DV-700-P50-LIC	• D-View 7 - 50 probe license
DV-700-P100-LIC	• D-View 7 - 100 probe license
Optional 10G SFP+ Transceivers	
DEM-431XT	• 10GBASE-SR, multi-mode, OM1: 33 m/ OM2: 82 m/ OM3: 300 m (without DDM)
DEM-432XT	• 10GBASE-LR, single-mode, 10 km (without DDM)
DEM-433XT	• 10GBASE-LR, single-mode, 40 km (without DDM)
DEM-434XT	• 10GBASE-ZR, single-mode, 80 km (without DDM)
DEM-435XT	• 10GBASE-LRM, multi-mode, 200 m (without DDM)
Optional WDM (Bidi) SFP+ Transceivers	
DEM-436XT-BXD	• 10GBASE-LR, single-mode, 20 km (TX: 1330 nm, RX: 1270 nm) (without DDM)
DEM-436XT-BXU	• 10GBASE-LR, single-mode, 20 km (TX: 1270 nm, RX: 1330 nm) (without DDM)
Optional 40G QSFP+ Transceivers	
DEM-QX01Q-SR4	• 40GBASE-SR4, multi-mode, OM3: 100 m / OM4: 150 m
DEM-QX10Q-SR4	• 40GBASE-LR4, single-mode, 10 km
Optional 10G SFP+ Direct Attach Cables	
DEM-CB100S	• 10G SFP+ to SFP+ 1 m Direct Attach Cable
DEM-CB300S	• 10G SFP+ to SFP+ 3 m Direct Attach Cable
DEM-CB700S	• 10G SFP+ to SFP+ 7 m Direct Attach Cable
DEM-CB100QXS-4XS	• 40G QSFP+ to 4 10G SFP+ 1 m Direct Attach Cable

1 Only supported by DXS-5000-54S and DQS-5000-32S.

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