

# Fortinet Transceivers

Transceiver Modules for Fortinet Products

## Highlights

Copper and optical options

Supports

- SFP
- SFP+
- SFP28
- SFP56
- QSFP+
- DAC
- CFP2
- QSFP28
- QSFP56
- QSFP-DD

Performance from 1 Gbps to 400 Gbps

Tested for compatibility with Fortinet appliances

## Take the Guesswork Out of Selecting Transceivers

Common connectivity problems in enterprise and data center networks are often traced back to low-quality and incompatible transceiver modules, rather than a fault in the network appliances themselves. Fortinet's transceivers have been purpose-built and tested to work with Fortinet equipment, ensuring that your network is as stable and robust as possible, and taking the guesswork out of selecting compatible transceivers.

## Wide Range for Maximum Flexibility

Supporting various form factors, media types, and throughput, Fortinet transceivers provide connectivity options to meet many different network architectures and deployment scenarios. Whether your network demands high-speed 400 GE inside the data center, or long-range 1 GE to connect data centers in different cities, Fortinet has a transceiver to meet your needs.



Available in



Appliance

## Key Features and Benefits

### Various Interface Options

Fortinet transceivers support various interfaces including: SFP, SFP+, DAC, and newer high-speed standards including SFP28, SFP56, QSFP+, CFP2, QSFP28, QSFP56, and QSFP-DD.

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### Tested for Compatibility

You can rest assured that your Fortinet transceivers have been tested for compatibility on Fortinet products, taking the guesswork out of selecting transceivers for your environment.

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### Maximize Network Uptime

Eliminate connectivity problems to maximize network uptime by using quality transceivers, designed to work with Fortinet products.

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### Cost Effective

Transceiver modules can be expensive, especially those with sensitive high-speed optics. Fortinet delivers high-quality transceivers, while keeping cost to a minimum.



## Quick Reference Matrix

Maximum Transmission Distance	SFP (100MBPS)	SFP (GE)	SFP (2.5 GE)	SFP+ (10 GE)	SFP28 (25 GE)	SFP56 (50 GE)
10 Meter				SP-CABLE-ADASFP+		
30 Meter				FN-TRAN-SFP+GC		
80 Meter				FN-TRAN-SFP+GC-T80		
100 Meter		FN-TRAN-GC			FN-TRAN-SFP28-SR	FN-TRAN-SFP56-SR
150 Meter						
220 Meter		FN-TRAN-SX (62.5/125 μm) FR-TRAN-SX (62.5/125 μm)		FN-TRAN-SFP+LRM on MMF		
300 Meter			FN-TRAN-SFP2-SX	FN-TRAN-SFP+SR FN-TRAN-SFP+LRM on SMF		
500 Meter		FN-TRAN-SX (50/125 μm) FR-TRAN-SX (50/125 μm)				
550 Meter				FN-TRAN-SFP+SR (on OM4 MMF)		
2 Kilometer	FS-TRAN-FX					
10 Kilometer		FN-TRAN-LX FN-TRAN-SFP-1BD10 FN-TRAN-SFP-1BU10		FN-TRAN-SFP+LR	FG-TRAN-SFP28-LR	
20 Kilometer			FN-TRAN-SFP2-LX			
30 Kilometer				FN-TRAN-SFP+BD27 FN-TRAN-SFP+BD33		
40 Kilometer		FN-TRAN-SFP-1BD40 FN-TRAN-SFP-1BU40		FN-TRAN-SFP+ER		
80 Kilometer				FN-TRAN-SFP+ZR		
90 Kilometer		FR-TRAN-ZX				

Maximum Transmission Distance	QSFP+ (40 GE)	CFP2 (100 GE)	QSFP28 (100 GE)	QSFP56 (200 GE)	QSFPDD (400 GE)
10 Meter					
30 Meter					
100 Meter	FN-TRAN-QSFP+SR and FG-TRAN-QSFP+SR-BIDI (on OM3 MMF)	FG-TRAN-CFP2-SR10	FN-TRAN-QSFP28-SR FN-TRAN-QSFP28-BIDI FN-TRAN-QSFP28-BIDI-I	FN-TRAN-QSFP56-SR4	FN-TRAN-QSFPDD-SR8
150 Meter	FN-TRAN-QSFP+SR and FG-TRAN-QSFP+SR-BIDI (on OM4 MMF)		FN-TRAN-QSFP28-BIDI (on OM5 MMF)		
220 Meter					
300 Meter					
400 Meter					
500 Meter			FN-TRAN-QSFP28-DR		FN-TRAN-QSFPDD-DR4
2 Kilometer			FN-TRAN-QSFP28-CWDM4	FN-TRAN-QSFP56-FR4	FN-TRAN-QSFPDD-DR4+ FN-TRAN-QSFPDD-FR4
10 Kilometer	FN-TRAN-QSFP+LR	FG-TRAN-CFP2-LR4	FN-TRAN-QSFP28-LR		FN-TRAN-QSFPDD-LR4
20 Kilometer			FN-TRAN-QSFP28-ER		
30 Kilometer					
40 Kilometer	FN-TRAN-QSFP+ER				
80 Kilometer					
90 Kilometer					



## Specifications

TRANSCEIVER MODULES						
HARDWARE	FS-TRAN-FX	FN-TRAN-GC	FN-TRAN-SX	FR-TRAN-SX	FN-TRAN-LX	FR-TRAN-ZX
Protocol Standard	100Base-FX	1000Base-T	1000Base-SX	1000Base-SX	1000Base-LX	1000Base-LX
IEEE Standard	802.3u	802.3ab	802.3z	802.3z	802.3z	802.3z
Module Type	SFP	SFP	SFP	SFP	SFP	SFP
Data Link Rate for Ethernet	100Mbps	1.25 Gbps	1.25 Gbps	1.25 Gbps	1.25 Gbps	1.25 Gbps
Transmission Range	2km	100m	220m / 500m	500m	10km	90km
Media	MM	Copper interface	MM	MM	SM	SM
Wavelength (nm)	1310		850	850	1310	1550
Connector Type	Duplex LC	RJ-45	Duplex LC	Duplex LC	Duplex LC	Duplex LC
Power Dissipation	<1.1W	1.05W	< 800mW	< 500mW	< 830mW	< 700mW
Operating Temperature	-40°C to 85°C	-40°C to 85°C	-20°C to 85°C	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C
Hot Plug	Yes	Yes	Yes	Yes	Yes	Yes
Serial ID PROM	Yes	Yes	Yes	Yes	Yes	Yes
Digital Monitoring	Yes	No	Yes	Yes	Yes	Yes
Auto Negotiation	Yes	Yes	Yes	Yes	Yes	Yes
Link Status	Yes	Yes	Yes	Yes	Yes	Yes

TRANSCEIVER MODULES						
HARDWARE	FN-TRAN-SFP-1BD10*	FN-TRAN-SFP-1BU10**	FN-TRAN-SFP-1BD40***	FN-TRAN-SFP-1BU40****	FN-TRAN-SFP2-SX	FN-TRAN-SFP2-LX
Protocol Standard	1000BASE-BX10	1000BASE-BX10	1000BASE-BX10	1000BASE-BX10	2500BASE-X	2500BASE-X
IEEE Standard	802.3ah	802.3ah	802.3ah	802.3ah	802.3z	802.3z
Module Type	SFP	SFP	SFP	SFP	SFP	SFP
Data Link Rate for Ethernet	1.25Gbps	1.25Gbps	1.25Gbps	1.25Gbps	2.5Gbps	2.5Gbps
Transmission Range	10km	10km	40km	40km	300m	20km
Media	SM	SM	SM	SM	MM	SM
Wavelength (nm)	TX: 1490 RX: 1310	TX: 1310 RX: 1490	TX: 1490 RX: 1310	TX: 1310 RX: 1490	850	1310
Connector Type	Simplex LC	Simplex LC	Simplex LC	Simplex LC	Duplex LC	Duplex LC
Power Dissipation	< 1W	< 1W	< 1W	< 1W	< 1W	< 1W
Operating Temperature	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C
Hot Plug	Yes	Yes	Yes	Yes	Yes	Yes
Serial ID PROM	Yes	Yes	Yes	Yes	Yes	Yes
Digital Monitoring	Yes	Yes	Yes	Yes	Yes	Yes
Auto Negotiation	Yes	Yes	Yes	Yes	Yes	Yes
Link Status	Yes	Yes	Yes	Yes	Yes	Yes

\* connects to FN-TRAN-1BU10, ordered separately

\*\* connects to FN-TRAN-1BD10, ordered separately

\*\*\* connects to FN-TRAN-1BU40, ordered separately

\*\*\*\* connects to FN-TRAN-1BD40, ordered separately



## Specifications

TRANSCEIVER MODULES					
HARDWARE	FN-TRAN-SFP+GC	FN-TRAN-SFP+GC-T80	FN-TRAN-SFP+SR	FN-TRAN-SFP+LR	FN-TRAN-SFP+LRM
Protocol Standard	10GBASE-T	10GBase-T	10GBase-SR	10GBase-LR	10GBase-LRM
IEEE Standard	802.3an	802.3an	802.3ae	802.3ae	802.3aq
Module Type	SFP+	SFP+	SFP+	SFP+	SFP+
Data Link Rate for Ethernet	10 Gbps	10Gbps	10 Gbps	10 Gbps	11.3Gbps
Transmission Range	30m (Cat6A or better)	80m (Cat6a or better)	300m	10km	220m MMF 300 SMF
Media	Copper interface	Copper Interface	MM	SM	MM/SM
Wavelength (nm)	—	—	850	1310	1310
Connector Type	RJ-45	RJ-45	Duplex LC	Duplex LC	Duplex LC
Power Dissipation	2.5W	1.88W	600mW	850mW	< 1W
Operating Temperature	-5°C to 85°C	-5°C to 85°C	0°C to 70°C	0°C to 85°C	0°C to 70°C
Hot Plug	Yes	Yes	Yes	Yes	Yes
Serial ID PROM	Yes	Yes	Yes	Yes	Yes
Digital Monitoring	No	No	Yes	Yes	Yes
Auto Negotiation	Yes	Yes	Yes	Yes	Yes
Link Status	Yes	Yes	Yes	Yes	Yes

TRANSCEIVER MODULES				
HARDWARE	FN-TRAN-SFP+ER	FN-TRAN-SFP+ZR	FN-TRAN-SFP+BD27*	FN-TRAN-SFP+BD33**
Protocol Standard	10GBASE-ER	10G-Base-ZR	10G-Base-LR/LW	10G-Base-LR/LW
IEEE Standard	802.3ae	802.3ae	802.3ae	802.3ae
Module Type	SFP+	SFP+	SFP+	SFP+
Data Link Rate for Ethernet	11.3 Gbps	11.3 Gbps	11.3Gbps	11.3Gbps
Transmission Range	40km	80km	30km	30km
Media	SM	SM	SM	SM
Wavelength (nm)	1550	1550	TX: 1271 RX: 1331	TX: 1331 RX: 1271
Connector Type	Duplex LC	Duplex LC	Single LC	Single LC
Power Dissipation	1.5W	< 1.5W	<1W	<1W
Operating Temperature	-5°C to 70°C	-5°C to 70°C	-5°C to 85°C	-5°C to 85°C
Hot Plug	Yes	Yes	Yes	Yes
Serial ID PROM	Yes	Yes	Yes	Yes
Digital Monitoring	Yes	Yes	Yes	Yes
Auto Negotiation	Yes	Yes	Yes	Yes
Link Status	Yes	Yes	Yes	Yes

\* Connects to FN-TRAN-SFP+BD33, ordered separately.

\*\* Connects to FN-TRAN-SFP+BD27, ordered separately.



## Specifications

TRANSCIVER MODULES		
HARDWARE	FN-TRAN-SFP28-SR	FG-TRAN-SFP28-LR
Protocol Standard	25GBase-SR, 10GBase-SR	25GBase-LR
IEEE Standard	802.3by, 802.3ae	802.3cc
Module Type	SFP28	SFP28
Data Link Rate for Ethernet	25.78 / 10.3 Gbps	25.78 Gbps
Transmission Range	100m	10km
Media	MM	SM
Wavelength (nm)	850	1310
Connector Type	Duplex LC	Duplex LC
Power Dissipation	1.2W	1.5W
Operating Temperature	0°C to 70°C	0°C to 70°C
Hot Plug	Yes	Yes
Serial ID PROM	Yes	Yes
Digital Monitoring	Yes	Yes
Auto Negotiation	No	No
Link Status	Yes	Yes

TRANSCIVER MODULES				
HARDWARE	FN-TRAN-QSFP+SR	FN-TRAN-QSFP+LR	FN-TRAN-QSFP+ER	FG-TRAN-QSFP+SR BIDi
Protocol Standard	40GBase-SR4	40GBase-LR4	40G-Base-ER4	40GBase-SR-BiDi
IEEE Standard	802.3ba	802.3ba	802.3bm	802.3ba
Module Type	QSFP+	QSFP+	QSFP+	QSFP+
Data Link Rate for Ethernet	1.06 Gbps–41.2 Gbps	41.2 Gbps	41.3 Gbps	41.2 Gbps
Transmission Range	100m (OM3)–150m (OM4)	10km	40km	100m (OM3)–150m (OM4)
Media	MM	SM	SM	MM
Wavelength (nm)	750–980	1264.5 - 1277.5 1284.5 - 1297.5 1304.5 - 1317.5 1324.5 - 1337.5	1264.5 – 1277.5 1284.5 – 1297.5 1304.5 – 1317.5 1324.5 – 1337.5	850–900
Connector Type	Single 1×12 MPO	Duplex LC	Duplex LC	Duplex LC
Power Dissipation	< 1.5W	< 3.5W	< 3.5W	< 3.5W
Operating Temperature	0°C to 70°C	0°C to 70°C	0°C to 70°C	0°C to 70°C
Hot Plug	Yes	Yes	Yes	Yes
Serial ID PROM	Yes	Yes	Yes	Yes
Digital Monitoring	Yes	Yes	Yes	Yes
Auto Negotiation	Yes	Yes	Yes	Yes
Link Status	Yes	Yes	Yes	Yes



## Specifications

TRANSCEIVER MODULES				
HARDWARE	FG-TRAN-CFP2-SR10	FG-TRAN-CFP2-LR4	FN-TRAN-QSFP28-SR	FN-TRAN-QSFP28-LR
Protocol Standard	100GBase-SR10	100GBase-LR4	100GBase-SR4	100GBase-LR4
IEEE Standard	802.3ba	802.3ba	802.3bm	802.3ba
Module Type	CFP2	CFP2	QSFP28	QSFP28
Data Link Rate for Ethernet	103.12 Gbps	103.1 Gbps	103.1 Gbps	103.1 Gbps
Transmission Range	100m (OM3)–150m (OM4)	10km	100m (OM4)	10km (SMF)
Media	MM	SM	MM	SM
Wavelength (nm)	850	1310	850	1310
Connector Type	24 fiber MPO	Duplex LC	MPO12	Duplex LC
Power Dissipation		< 8W	< 3.5W	< 3.5W
Operating Temperature	0°C to 70°C	0°C to 70°C	0°C to 70°C	0°C to 70°C
Hot Plug	Yes	Yes	Yes	Yes
Serial ID PROM	Yes	Yes	Yes	Yes
Digital Monitoring	Yes	Yes	Yes	Yes
Auto Negotiation	Yes	Yes	Yes	Yes
Link Status	Yes	Yes	Yes	Yes

TRANSCEIVER MODULES					
HARDWARE	FN-TRAN-QSFP28-ER	FN-TRAN-QSFP28-DR	FN-TRAN-QSFP28-CWDM4	FN-TRAN-QSFP28-BIDI	FN-TRAN-QSFP28-BIDI-I
Protocol Standard	100G-Base-LR4	100G-Base-DR	100GBase-CWDM4	100GBase-SR-BiDi	100G-Base-SR1.2
IEEE Standard	802.3ba/bm	802.3bm/cd/cu	802.3bm	802.3bm	802.3bm
Module Type	QSFP28	QSFP28	QSFP28	QSFP28	QSFP28
Data Link Rate for Ethernet	103.1 Gbps	103.1 Gbps	103.1 Gbps	103.1Gbps	106.25Gbps
Transmission Range	20km	500m	2km	100m	100m
Media	SM	SM	SM	MM	MM
Wavelength (nm)	1294.53 – 1296.59 1299.02 – 1301.09 1303.54 – 1305.63 1308.09 – 1310.19	1304.5 – 1317.5	1264.5 – 1277.5 1284.5 – 1297.5 1304.5 – 1317.5 1324.5 – 1337.5	850 900	850 900
Connector Type	Duplex LC	Duplex LC	Duplex LC	Duplex LC	Duplex LC
Power Dissipation	< 3.5W	< 4.5W	< 3.5W	<3.5W	<4W
Operating Temperature	0°C to 70°C	0°C to 70°C	0°C to 70°C	10°C to 70°C	0°C to 70°C
Hot Plug	Yes	Yes	Yes	Yes	Yes
Serial ID PROM	Yes	Yes	Yes	Yes	Yes
Digital Monitoring	Yes	Yes	Yes	Yes	Yes
Auto Negotiation	Yes	Yes	Yes	Yes	Yes
Link Status	Yes	Yes	Yes	Yes	Yes

## Specifications

TRANSCEIVER MODULES			
HARDWARE	FN-TRAN-SFP56-SR	FN-TRAN-QSFP56-SR4	FN-TRAN-QSFP56-FR4
Protocol Standard	50G-Base-SR	200G-Base-SR4	200G-Base-FR4
IEEE Standard	802.3cd	802.3cd	802.3bs
Module Type	SFP56	QSFP56	QSFP56
Data Link Rate for Ethernet	53.125Gbps	212.5Gbps	212.5Gbps
Transmission Range	100m	100m	2km
Media	MM	MM	SM
Wavelength (nm)	850	850	1264.5 – 1277.5 1284.5 – 1297.5 1304.5 – 1317.5 1324.5 – 1337.5
Connector Type	Duplex LC	MPO-12	Duplex LC
Power Dissipation	<1.5W	<4.5W	<6W
Operating Temperature	0°C to 70°C	0°C to 70°C	0°C to 70°C
Hot Plug	Yes	Yes	Yes
Serial ID PROM	Yes	Yes	Yes
Digital Monitoring	Yes	Yes	Yes
Auto Negotiation	Yes	Yes	Yes
Link Status	Yes	Yes	Yes

TRANSCEIVER MODULES					
HARDWARE	FN-TRAN-QSFPDD-SR8	FN-TRAN-QSFPDD-LR4	FN-TRAN-QSFPDD-FR4	FN-TRAN-QSFPDD-DR4	FN-TRAN-QSFPDD-DR4+
Protocol Standard	400G-Base-SR8	400G-Base-LR4	400G-Base-FR4	400G-Base-DR4	400G-Base-DR4
IEEE Standard	802.3bs	802.3bs	802.3cu	802.3bs	802.3bs
Module Type	QSFP-DD	QSFP-DD	QSFP-DD	QSFP-DD	QSFP-DD
Data Link Rate for Ethernet	425Gbps	425Gbps	425Gbps	425Gbps	425Gbps
Transmission Range	100m	10km	2km	500m	2km
Media	MM	SM	SM	SM	SM
Wavelength (nm)	850	1271 1291 1311 1331	1271 1291 1311 1331	1310	1311
Connector Type	MPO-16 APC	Duplex LC	Duplex LC	MPO-12	MPO-12
Power Dissipation	<9W	<10.5W	<12W	<12W	<14W
Operating Temperature	0°C to 70°C	0°C to 70°C	0°C to 70°C	0°C to 70°C	0°C to 70°C
Hot Plug	Yes	Yes	Yes	Yes	Yes
Serial ID PROM	Yes	Yes	Yes	Yes	Yes
Digital Monitoring	Yes	Yes	Yes	Yes	Yes
Auto Negotiation	Yes	Yes	Yes	Yes	Yes
Link Status	Yes	Yes	Yes	Yes	Yes





## Specifications

DIRECT ATTACH CABLES				
HARDWARE	SP-CABLE-FS-SFP+1	SP-CABLE-FS-SFP+3	SP-CABLE-FS-SFP+5	SP-CABLE-ADASFP+
Protocol Standard	10GBase-CR	10GBase-CR	10GBase-CR	10GBase-CR
Data Link Rate for Ethernet	up to 10 Gbps	up to 10 Gbps	up to 10 Gbps	1 Gbps to 10 Gbps
Module Type	SFP+	SFP+	SFP+	SFP+
Power Dissipation	< 0.5W	< 0.5W	< 0.5W	< 0.5W
Operating Temperature	0°C to 70°C	0°C to 70°C	0°C to 70°C	0°C to 70°C
Hot Plug	Yes	Yes	Yes	Yes
Cable Length	1m	3m	5m	10m
Cable Type	Twinax Copper Passive	Twinax Copper Passive	Twinax Copper Passive	Twinax Copper Active
Transceiver	Included	Included	Included	Included
Compliance	RoHS	RoHS	RoHS	RoHS
Bend Radius	25mm (30AWG)	25mm (30AWG)	25mm (30AWG)	25mm (30AWG)
Cable Diameter	4.5mm	4.5mm	4.5mm	4.5mm
Digital Monitoring	N/A	N/A	N/A	Yes

DIRECT ATTACH CABLES				
HARDWARE	FN-CABLE-SFP+1	FN-CABLE-SFP+3	FN-CABLE-SFP+5	
Protocol Standard	10GBase-CR	10GBase-CR	10GBase-CR	
Data Link Rate for Ethernet	10Gbps	10Gbps	10Gbps	
Module Type	SFP+	SFP+	SFP+	
Power Dissipation	<0.1W	<0.1W	<0.1W	
Operating Temperature	0°C to 70°C	0°C to 70°C	0°C to 70°C	
Hot Plug	Yes	Yes	Yes	
Cable Length	1m	3m	5m	
Cable Type	Twinax Copper Passive	Twinax Copper Passive	Twinax Copper Passive	
Transceiver	Included	Included	Included	
Compliance	RoHS	RoHS	RoHS	
Bend Radius	22mm (30AWG)	22mm (30AWG)	33mm (24AWG)	
Cable Diameter	4.5mm	4.5mm	5.6mm	
Digital Monitoring	Yes	Yes	Yes	

DIRECT ATTACH CABLES				
HARDWARE	FN-CABLE-SFP28-1	FN-CABLE-SFP28-3	FN-CABLE-SFP28-5	
Protocol Standard	25GBase-CR	25GBase-CR	25GBase-CR	
Data Link Rate for Ethernet	25Gbps	25Gbps	25Gbps	
Module Type	SFP28	SFP28	SFP28	
Power Dissipation	<0.1W	<0.1W	<0.1W	
Operating Temperature	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C	
Hot Plug	Yes	Yes	Yes	
Cable Length	1m	3m	5m	
Cable Type	Twinax Copper Passive	Twinax Copper Passive	Twinax Copper Passive	
Transceiver	Included	Included	Included	
Compliance	RoHS	RoHS	RoHS	
Bend Radius	35mm (30AWG)	35mm (30AWG)	35mm (30AWG)	
Cable Diameter	4.83mm	4.83mm	4.83mm	
Digital Monitoring	Yes	Yes	Yes	



## Specifications

DIRECT ATTACH CABLES			
HARDWARE	SP-CABLE-FS-QSFP+1	SP-CABLE-FS-QSFP+3	SP-CABLE-FS-QSFP+5
Protocol Standard	40GBase-CR4	40GBase-CR4	40GBase-CR4
Data Link Rate for Ethernet	40 Gbps	40 Gbps	40 Gbps
Module Type	QSFP+	QSFP+	QSFP+
Power Dissipation	< 0.5W	< 0.5W	< 0.5W
Operating Temperature	0°C to 70°C	0°C to 70°C	0°C to 70°C
Hot Plug	Yes	Yes	Yes
Cable Length	1m	3m	5m
Cable Type	Twinax Copper Passive	Twinax Copper Passive	Twinax Copper Passive
Transceiver	Included	Included	Included
Compliance	RoHS	RoHS	RoHS
Bend Radius	25mm (30AWG)	25mm (30AWG)	25mm (30AWG)
Cable Diameter	6.4mm	6.4mm	6.4mm
Digital Monitoring	N/A	N/A	N/A

DIRECT ATTACH CABLES			
HARDWARE	FN-CABLE-QSFP+1	FN-CABLE-QSFP+3	FN-CABLE-QSFP+5
Protocol Standard	40GBase-CR4	40GBase-CR4	40GBase-CR4
Data Link Rate for Ethernet	40Gbps	40Gbps	40Gbps
Module Type	QSFP+	QSFP+	QSFP+
Power Dissipation	<0.1W	<0.1W	<0.1W
Operating Temperature	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C
Hot Plug	Yes	Yes	Yes
Cable Length	1m	3m	5m
Cable Type	Twinax Copper Passive	Twinax Copper Passive	Twinax Copper Passive
Transceiver	Included	Included	Included
Compliance	RoHS	RoHS	RoHS
Bend Radius	37mm (30AWG)	37mm (30AWG)	43mm (26 AWG)
Cable Diameter	7.11mm	7.11mm	8.38mm
Digital Monitoring	Yes	Yes	Yes

DIRECT ATTACH CABLES (DAC)				
HARDWARE	FN-CABLE-SFP56-DAC-L1	FN-CABLE-SFP56-DAC-LB5	FN-CABLE-QSFP56-DAC-L1	FN-CABLE-QSFP56-DAC-LB5
Protocol Standard	50GBase-CR	50GBase-CR	200G-BASE-CR4	200G-BASE-CR4
Data Link Rate for Ethernet	50Gbps	50Gbps	200Gbps	200Gbps
Module Type	SFP56	SFP56	QSFP56	QSFP56
Power Dissipation	< 0.1W	< 0.1W	< 0.1W	< 0.1W
Operating Temperature	0°C to 70°C	0°C to 70°C	0°C to 70°C	0°C to 70°C
Hot Plug	Yes	Yes	Yes	Yes
Cable Length	1m	2.5m	1m	2.5m
Cable Type	Twinax Copper Passive	Twinax Copper Passive	Twinax Copper Passive	Twinax Copper Passive
Transceiver	Included	Included	Included	Included
Compliance	RoHS	RoHS	RoHS	RoHS
Bend Radius	22.5mm (30AWG)	27.5mm (28AWG)	35.0mm (30AWG)	42.5mm (28AWG)
Cable Diameter	4.5mm	5.5mm	7.0mm	8.5mm
Digital Monitoring	No	No	No	No



## Specifications

DIRECT ATTACH CABLES (DAC)				
HARDWARE	FN-CABLE-QSFP28-1	FN-CABLE-QSFP28-2	FN-CABLE-QSFP28-3	FN-CABLE-QSFP28-5
Protocol Standard	100GBase-CR4	100GBase-CR4	100GBase-CR4	100GBase-CR4
Data Link Rate for Ethernet	100 Gbps	100 Gbps	100 Gbps	100 Gbps
Module Type	QSFP28	QSFP28	QSFP28	QSFP28
Power Dissipation	< 0.1W	< 0.1W	< 0.1W	< 0.1W
Operating Temperature	0°C to 70°C	0°C to 70°C	0°C to 70°C	0°C to 70°C
Hot Plug	Yes	Yes	Yes	Yes
Cable Length	1m	2m	3m	5m
Cable Type	Twinax Copper Passive	Twinax Copper Passive	Twinax Copper Passive	Twinax Copper Passive
Transceiver	Included	Included	Included	Included
Compliance	RoHS	RoHS	RoHS	RoHS
Bend Radius	25mm (30AWG)	25mm (30AWG)	25mm (30AWG)	25mm (30AWG)
Cable Diameter	6.4mm	6.4mm	6.4mm	6.4mm
Digital Monitoring	N/A	N/A	N/A	N/A

DIRECT ATTACH CABLES (DAC)		
HARDWARE	FN-CABLE-QSFPDD-DAC-01	FN-CABLE-QSFPDD-DAC-B5
Protocol Standard	400GBase-CR8	400GBase-CR8
IEEE Standard	IEEE802.3bs	IEEE802.3bs
Data Link Rate for Ethernet	425Gbps	425Gbps
Module Type	QSFP-DD	QSFP-DD
Power Dissipation	<0.1W	<0.1W
Operating Temperature	0°C to 70°C	0°C to 70°C
Hot Plug	Yes	Yes
Cable Length	1m	2.5m
Cable Type	Twinax Copper Passive	Twinax Copper Passive
Transceiver	Included	Included
Compliance	RoHS	RoHS
Bend Radius	31.5mm (30AWG)	40.6mm (26AWG)
Cable Diameter	9.0mm	11.6mm
Digital Monitoring	No	No

BREAKOUT DIRECT ATTACH CABLES (DAC)			
HARDWARE	FN-CABLE-QSFP28-4SFP28-1	FN-CABLE-QSFP28-4SFP28-3	FN-CABLE-QSFP28-4SFP28-5
Protocol Standard	25GBase-CR	25GBase-CR	25GBase-CR
IEEE Standard			
Data Link Rate for Ethernet	1x 100Gbps 4x 25Gbps	1x 100Gbps 4x 25Gbps	1x 100Gbps 4x 25Gbps
Module Type	1x QSFP28 4x SFP28	1x QSFP28 4x SFP28	1x QSFP28 4x SFP28
Power Dissipation	<0.1W	<0.1W	<0.1W
Operating Temperature	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C
Hot Plug	Yes	Yes	Yes
Cable Length	1m	3m	5m
Cable Type	Twinax Copper Passive	Twinax Copper Passive	Twinax Copper Passive
Transceiver	Included	Included	Included
Compliance	RoHS	RoHS	RoHS
Bend Radius	30mm (30AWG)	30mm (30AWG)	30mm (30AWG)
Cable Diameter	4.83mm	4.83mm	4.83mm
Digital Monitoring	Yes	Yes	Yes



## Specifications

BREAKOUT CABLES				
HARDWARE	FG-TRAN-QSFP-4xSFP	FG-TRAN-QSFP-4SFP-5	FG-CABLE-SR10-SFP+	FG-CABLE-SR10-SFP+5
Connector A	1× 40 GE QSFP+	1× 40 GE QSFP+	1× 100 GE SR10 CFP2	1× 100 GE SR10 CFP2
Connector A Type	MPO	MPO	MPO	MPO
Connector B	4× 10 GE SFP+	4× 10 GE SFP+	10× 10 GE SFP+	10× 10 GE SFP+
Connector B Type	LC duplex	LC duplex	LC duplex	LC duplex
Cable Length	1m	5m	1m	5m
Cable Type	OM3 MMF	OM3 MMF	OM3 MMF	OM3 MMF
Transceiver	Not included	Not included	Not included	Not included

Fortinet Breakout Cables — Qualified on Fortinet Products (on applicable interfaces)



## Ordering Information

Product	SKU	Description
<b>Transceivers</b>		
1 GE SFP Transceiver module, 10km, BiDi	FN-TRAN-SFP-1BD10	1 GE SFP transceiver module, 10km range single BiDi for systems with SFP slots (connects to FN-TRAN-1BU10, ordered separately).
1 GE SFP Transceiver module, 10km, BiDi	FN-TRAN-SFP-1BU10	1 GE SFP transceiver module, 10km range single BiDi for systems with SFP slots (connects to FN-TRAN-1BD10, ordered separately).
1 GE SFP Transceiver module, 40km, BiDi	FN-TRAN-SFP-1BD40	1 GE SFP transceiver module, 40km range single BiDi for systems with SFP slots (connects to FN-TRAN-1BU40, ordered separately).
1 GE SFP Transceiver module, 40km, BiDi	FN-TRAN-SFP-1BU40	1 GE SFP transceiver module, 40km range single BiDi for systems with SFP slots (connects to FN-TRAN-1BD40, ordered separately).
1 GE SFP LX Transceiver module, long range	FN-TRAN-LX	1 GE SFP LX transceiver module, 10km range, -40°C to 85°C, over SMF, for systems with SFP and SFP/SFP+ slots.
1 GE SFP RJ45 Transceiver module	FN-TRAN-GC	1 GE SFP RJ45 transceiver module for systems with SFP and SFP/SFP+ slots.
1 GE SFP SX Transceiver module, short range	FN-TRAN-SX	1 GE SFP SX transceiver module for systems with SFP and SFP/SFP+ slots.
1 GE SFP SX Transceiver module, MMF, -40°-85°C operation	FR-TRAN-SX	1 GE SFP SX transceiver module, -40°-85°C, over MMF, for systems with SFP and SFP/SFP+ slots.
1 GE SFP Transceiver module, 90 km range, -40°-85°C operation	FR-TRAN-ZX	1 GE SFP transceiver module, -40°-85°C operation, 90km range for systems with SFP slots.
2.5 GE SFP Transceiver module, 20km range	FN-TRAN-SFP2-LX	2.5GE SFP transceiver module, 20km range, for systems with SFP and SFP/SFP+ slots.
2.5 GE SFP Transceiver module, short range	FN-TRAN-SFP2-SX	2.5GE SFP transceiver module, short range, for systems with SFP and SFP/SFP+ slots.
10 GE SFP+ Transceiver module, short range	FN-TRAN-SFP+SR	10 GE SFP+ transceiver module, short range for systems with SFP+ and SFP/SFP+ slots.
10 GE SFP+ Transceiver module, long range	FN-TRAN-SFP+LR	10 GE SFP+ transceiver module, 10km range for systems with SFP+ and SFP/SFP+ slots.
10 GE SFP Transceiver module, long range MMF	FN-TRAN-SFP+LRM	10 GE SFP+ transceiver module, long range OM1 MMF, for systems with SFP+ and SFP/SFP+ slots.
10 GE SFP+ Transceiver module, short range, BiDi	FN-TRAN-SFP+BD27	10GE SFP+ transceiver module, 30KM long range single BiDi for systems with SFP+ and SFP/SFP+ slots (connects to FN-TRAN-SFP+BD33, ordered separately).
10 GE SFP+ Transceiver module, short range, BiDi	FN-TRAN-SFP+BD33	10GE SFP+ transceiver module, 30KM long range single BiDi for systems with SFP+ and SFP/SFP+ slots (connects to FN-TRAN-SFP+BD27, ordered separately).
10 GE SFP+ Transceiver module, extended range	FN-TRAN-SFP+ER	10 GE SFP+ transceiver module, 40km range for systems with SFP+ slots.
10 GE SFP+ Transceiver module, extended range	FN-TRAN-SFP+ZR	10 GE SFP+ transceiver module, 80km range, for systems with SFP+ slots.
10 GE copper SFP+ RJ45 Transceiver module, 30m range	FN-TRAN-SFP+GC	10 GE copper SFP+ RJ45 Fortinet transceiver module (30m range) for systems with SFP+ slots.
10 GE copper SFP+ RJ45 Transceiver module, 80m range	FN-TRAN-SFP+GC-T80	10 GE copper SFP+ RJ45 transceiver module (80m range) for systems with SFP+ slots.
25 GE SFP28 Transceiver module, long range	FG-TRAN-SFP28-LR	25 GE SFP28 transceiver module, 10km range for systems with SFP28 slots.
25 GE/10 GE dual rate SFP28 Transceiver module, short range	FN-TRAN-SFP28-SR	25 GE/10 GE dual rate SFP28 transceiver module, short range for systems with SFP28/SFP+ slots.
40 GE QSFP+ Transceiver module, short range	FN-TRAN-QSFP+SR	40 GE QSFP+ transceiver module, short range for systems with QSFP+ slots.
40 GE QSFP+ Transceiver module, extended range	FN-TRAN-QSFP+ER	40 GE QSFP+ transceiver module, 40km range for systems with QSFP+ slots.
40 GE QSFP+ Transceiver module, short range, BiDi	FG-TRAN-QSFP+SR-BIDI	40 GE QSFP+ transceiver module, short range BiDi for systems with QSFP+ slots.
40 GE QSFP+ Transceiver module, long range	FN-TRAN-QSFP+LR	40 GE QSFP+ transceiver module, 10km range for systems with QSFP+ slots.
50 GE SFP56 Transceiver module, short range	FN-TRAN-SFP56-SR	50 GE SFP56 transceiver module, short range for systems with SFP56 slots.
100 Mb SFP Transceiver module, 2km range over MMF	FN-TRAN-FX	100Mb SFP transceiver module, 2km range over MMF, -40°C to 85°C, for systems with SFP slots and capable of 10/100Mb mode selection.
100 GE CFP2 Transceiver module, long range	FG-TRAN-CFP2-LR4	100 GE CFP2 transceiver module, 10km range, over single mode fiber, for systems with CFP2 slots.
100 GE CFP2 Transceiver module, short range	FG-TRAN-CFP2-SR10	100 GE CFP2 transceiver module, 10 channel parallel fiber, short range for systems with CFP2 slots.
100 GE QSFP28 Transceiver module, short range	FN-TRAN-QSFP28-SR	100 GE QSFP28 transceiver module, 4 channel parallel fiber, short range for systems with QSFP28 slots.
100 GE QSFP28 Transceiver module, long range	FN-TRAN-QSFP28-LR	100 GE QSFP28 transceiver module, 10km range for systems with QSFP28 slots.



## Ordering Information

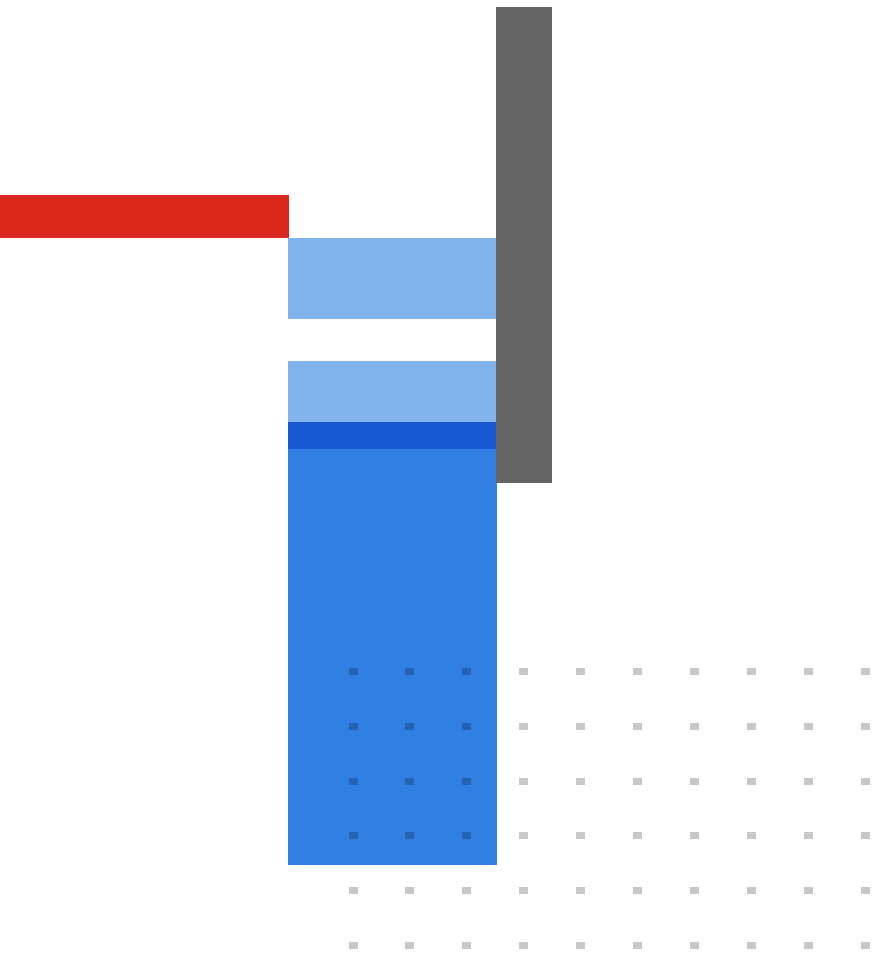
Product	SKU	Description
100 GE QSFP28 Transceiver module, extended range	FN-TRAN-QSFP28-ER	100 GE QSFP28 transceiver module, 20km range, for systems with QSFP28 slots.
100 GE QSFP28 Transceiver module, short range	FN-TRAN-QSFP28-DR	100GE QSFP28 transceiver module, single channel single-mode fiber, 100GBase-DR for systems with QSFP28 slots.
100 GE QSFP28 Transceiver module, CWDM	FN-TRAN-QSFP28-CWDM4	100GE QSFP28 transceiver module, CWDM, LC connectors, 2km range, for systems with QSFP28 slots.
100 GE QSFP28 Transceiver module, short range, BiDi	FN-TRAN-QSFP28-BIDI	100 GE / 40 GE QSFP28 BIDI transceiver module, short range, for systems with QSFP28 slots.
100 GE QSFP28 Transceiver module, short range, BiDi	FN-TRAN-QSFP28-BIDI-I	100 GE QSFP28 transceiver module, short range BiDi for systems with QSFP28 slots.
200 GE QSFP56 Transceiver module, short range	FN-TRAN-QSFP56-SR4	200 GE QSFP56 transceiver module, short range, for systems with QSFP56 slots.
400 GE QSFPDD Transceiver module, short range	FN-TRAN-QSFPDD-SR8	400 GE QSFPDD transceiver module, 8 channel parallel fiber, short range, for systems with QSFP-DD slots.
400 GE QSFPDD Transceiver module, short range	FN-TRAN-QSFPDD-DR4	400 GE QSFPDD transceiver module, 4 channel parallel fiber, short range, for systems with QSFP-DD slots.
400 GE QSFPDD Transceiver module, long range	FN-TRAN-QSFPDD-LR4	400 GE QSFPDD transceiver module, 10km range, SMF, for systems with QSFP-DD slots.
400 GE QSFPDD Transceiver module, mid range	FN-TRAN-QSFPDD-FR4	400 GE QSFPDD transceiver module, 2km range, SMF, for systems with QSFP-DD slots.
400 GE QSFPDD Transceiver module, mid range	FN-TRAN-QSFPDD-DR4+	400 GE QSFPDD transceiver module, 4-channel parallel fiber, 2km range, for systems with QSFPDD slots.
<b>Cables</b>		
10 GE SFP+ active direct attach cable, 10m/32.8 ft	SP-CABLE-ADASFP+	10 GE SFP+ active direct attach cable, 10m / 32.8ft for systems with SFP+ and SFP/SFP+ slots.
10 GE SFP+ passive direct attach cable 1m	SP-CABLE-FS-SFP+1	10 GE SFP+ passive direct attach cable, 1m for systems with SFP+ and SFP/SFP+ slots.
10 GE SFP+ passive direct attach cable 3m	SP-CABLE-FS-SFP+3	10 GE SFP+ passive direct attach cable, 3m for systems with SFP+ and SFP/SFP+ slots.
10 GE SFP+ passive direct attach cable 5m	SP-CABLE-FS-SFP+5	10 GE SFP+ passive direct attach cable, 5m for systems with SFP+ and SFP/SFP+ slots.
10 GE SFP+ passive direct attach cable 1m	FN-CABLE-SFP+1	10 GE SFP+ passive direct attach cable, 1m for systems with SFP+ and SFP/SFP+ slots.
10 GE SFP+ passive direct attach cable 3m	FN-CABLE-SFP+3	10 GE SFP+ passive direct attach cable, 3m for systems with SFP+ and SFP/SFP+ slots.
10 GE SFP+ passive direct attach cable 5m	FN-CABLE-SFP+5	10 GE SFP+ passive direct attach cable, 5m for systems with SFP+ and SFP/SFP+ slots.
25 GE passive direct attach cable 1m	FN-CABLE-SFP28-1	25 GE SFP28 passive direct attach cable 1m for systems with SFP28 slots.
25 GE passive direct attach cable 3m	FN-CABLE-SFP28-3	25 GE SFP28 passive direct attach cable 3m for systems with SFP28 slots.
25 GE passive direct attach cable 5m	FN-CABLE-SFP28-5	25 GE SFP28 passive direct attach cable 5m for systems with SFP28 slots.
40 GE QSFP+ passive direct attach cable 1m	SP-CABLE-FS-QSFP+1	40 GE QSFP+ passive direct attach cable, 1m for systems with QSFP+ slots.
40 GE QSFP+ passive direct attach cable 3m	SP-CABLE-FS-QSFP+3	40 GE QSFP+ passive direct attach cable, 3m for systems with QSFP+ slots.
40 GE QSFP+ passive direct attach cable 5m	SP-CABLE-FS-QSFP+5	40 GE QSFP+ passive direct attach cable, 5m for systems with QSFP+ slots.
40 GE QSFP+ passive direct attach cable 1m	FN-CABLE-QSFP+1	40 GE QSFP+ passive direct attach cable, 1m for systems with QSFP+ slots.
40 GE QSFP+ passive direct attach cable 3m	FN-CABLE-QSFP+3	40 GE QSFP+ passive direct attach cable, 3m for systems with QSFP+ slots.
40 GE QSFP+ passive direct attach cable 5m	FN-CABLE-QSFP+5	40 GE QSFP+ passive direct attach cable, 5m for systems with QSFP+ slots.
40G/100G QSFP+ to 4x SFP+/SFP28 optical breakout 1m	FG-TRAN-QSFP-4XSFP	40G/100G QSFP+/QSFP28 to SFP+/SFP28 Parallel Breakout MPO to 4xLC connectors, 1m reach, transceivers not included.
40G/100G QSFP+ to 4x SFP+/SFP28 optical breakout 5m	FG-TRAN-QSFP-4SFP-5	40G/100G QSFP+/QSFP28 to SFP+/SFP28 Parallel Breakout MPO to 4xLC connectors, 5m reach, transceivers not included.
50 GE SFP56 passive direct attach cable, 1m	FN-CABLE-SFP56-DAC-L1	50 GE SFP56 passive direct attach cable, 1m, for systems with SFP56 slots.
50 GE SFP56 passive direct attach cable, 2.5m	FN-CABLE-SFP56-DAC-LB5	50 GE SFP56 passive direct attach cable, 2.5m, for systems with SFP56 slots.
100 GE SR10 to 10x 10 GE fan out cable, 1m	FG-CABLE-SR10-SFP+	100 GE CFP2/QSFP28 parallel breakout MPO to 10x LC connectors, 1m reach, transceiver module not included.
100 GE SR10 to 10x 10 GE fan out cable, 5m	FG-CABLE-SR10-SFP+5	100 GE CFP2/QSFP28 parallel breakout MPO to 10x LC connectors, 5m reach, transceiver module not included.
100 GE passive direct attach cable 1m	FN-CABLE-QSFP28-1	100 GE QSFP28 passive direct attach cable 1m for systems with QSFP28 slots.



## Ordering Information

Product	SKU	Description
100 GE passive direct attach cable 2m	FN-CABLE-QSFP28-2	100 GE QSFP28 passive direct attach cable 2m for systems with QSFP28 slots.
100 GE passive direct attach cable 3m	FN-CABLE-QSFP28-3	100 GE QSFP28 passive direct attach cable 3m for systems with QSFP28 slots.
100 GE passive direct attach cable 5m	FN-CABLE-QSFP28-5	100 GE QSFP28 passive direct attach cable 5m for systems with QSFP28 slots.
100 GE QSFP28 to 4× 25 GE SFP28 direct attach cable breakout, 1m	FN-CABLE-QSFP28-4SFP28-1	100 GE QSFP28 breakout to 4× 25 GE SFP28 passive direct attach cable, 1m.
100 GE QSFP28 to 4× 25 GE SFP28 direct attach cable breakout, 3m	FN-CABLE-QSFP28-4SFP28-3	100 GE QSFP28 breakout to 4× 25 GE SFP28 passive direct attach cable, 3m.
100 GE QSFP28 to 4× 25 GE SFP28 direct attach cable breakout, 5m	FN-CABLE-QSFP28-4SFP28-5	100 GE QSFP28 breakout to 4× 25 GE SFP28 passive direct attach cable, 5m.
200 GE QSFP56 passive direct attach cable, 1m	FN-CABLE-QSFP56-DAC-L1	200 GE QSFP56 passive direct attach cable, 1m, for systems with QSFP56 slots.
200 GE QSFP56 passive direct attach cable, 2.5m	FN-CABLE-QSFP56-DAC-LB5	200 GE QSFP56 passive direct attach cable, 2.5m, for systems with QSFP56 slots.
400 GE passive direct attach cable 1m	FN-CABLE-QSFPDD-DAC-01	400 GE QSFPDD passive direct attach cable, 1m, for systems with QSFP-DD slots.
400 GE passive direct attach cable 2.5m	FN-CABLE-QSFPDD-DAC-B5	400 GE QSFPDD passive direct attach cable, 2.5m, for systems with QSFP-DD slots.





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