

DDPQQxxxE000 – QSFP-DD Passive Direct Attach Cable

50cm to 3m / 400× Gigabit Ethernet

For your product safety, please read the following information carefully before any manipulation of the cable:



ESD

This cable is specified as ESD threshold 1kV for SFI pins and 2kV for all others electrical input pins, tested per MIL-STD-883G, Method 3015.4 / JESD22-A114-A (HBM). However, normal ESD precautions are still required during the handling of this module.

1. Overview

DDPQQxxxE000 is a high performance Passive Direct Attach Cable (DAC) for 400 Gigabit Ethernet data links. Several cable lengths between 50cm and 3m are available.

This cable terminals are compliant with the QSFP-DD Multisource Agreement (MSA) and hot pluggable. Always contact Skylane Optics® commercial agents for compatibility with different equipment platforms.

2. Features

- QSFP-DD Multi-Source Agreement compliant
- Hot pluggable QSFP-DD footprint
- Supports 425Gbps Data Rate
- 8× 26.5625GBd PAM4 Serial Electrical Interface (400GAUI-8)
- Supports Link Lengths up to 3m
- Operating Temperature Range: 20°C to 60°C
- Power dissipation <1.5 W (each terminal)
- 30/28/26 AWG Cable

3. Applications

- 400 Gigabit Ethernet
- Infiniband EDR



Figure 1. QSFP-DD Passive Direct Attach Cable (non-binding illustration)

4. Technical Parameters

4.1. Recommended Operating Conditions

Parameter	Min	Typ	Max	Unit	Notes
Storage temperature	-40		85	°C	
Operating Case Temperature	0		70	°C	
Relative Humidity	5		85	%	Non condensing
Power Supply Voltage	3.135	3.3	3.465	V	
Power Supply Current			450	mA	Each terminal
Power Dissipation			1.5	W	Each terminal

4.2. General Specifications

Parameter	Min	Typ	Max	Unit	Notes
Aggregated Data Rate		425		Gbps	
Pre-FEC Bit Error Ratio			2.4×10^{-4}		
Post-FEC Bit Error Ratio			10^{-12}		

4.3. High-speed Transmit Electrical Interface

Parameter	Min	Typ	Max	Unit	Notes
Differential Input Voltage			900	mV _{pp}	
DC Common Mode Input Voltage	-350		2850	mV	
Differential Input Impedance		100		Ω	
Differential Termination Mismatch			10	%	
Differential Input Return Loss and Differential to Common Mode Input Return Loss	Per IEEE 802.3bm-2015			dB	1

1. Equations 83E-5 and 83E-6

4.4. High-speed Receive Electrical Interface

Parameter	Min	Typ	Max	Unit	Notes
Differential Output Voltage			850	mV _{pp}	
DC Common Mode Output Voltage	-350		2850	mV	
Differential Input Impedance		100		Ω	
Differential Termination Mismatch			10	%	
Differential Output Return Loss and Common to Differential Mode Return Loss	Per IEEE 802.3bm-2015			dB	2

2. Equations 83E-2 and 83E-3

5. Transceiver Electrical Pad Layout

Top side				Bottom side						
38	GND		76	GND		GND	39		GND	1
37	TX1n		75	TX5n		TX6n	40		TX2n	2
36	TX1p		74	TX5p		TX6p	41		TX2p	3
35	GND		73	GND		GND	42		GND	4
34	TX3n		72	TX7n		TX8n	43		TX4n	5
33	TX3p		71	TX7p		TX8p	44		TX4p	6
32	GND		70	GND		GND	45		GND	7
31	LPMODE		69	Reserved		Reserved	46		ModSelL	8
30	Vcc1		68	Vcc2		VS1	47		ResetL	9
29	VccTx		67	VccTx1		VccRx1	48		VccRx	10
28	IntL		66	Reserved		VS2	49		SCL	11
27	ModPrsL		65	NC		VS3	50		SDA	12
26	GND		64	GND		GND	51		GND	13
25	RX4p		63	RX8p		RX7p	52		RX3p	14
24	RX4n		62	RX8n		RX7n	53		RX3n	15
23	GND		61	GND		GND	54		GND	16
22	RX2p		60	RX6p		RX5p	55		RX1p	17
21	RX2n		59	RX6n		RX5n	56		RX1n	18
20	GND		58	GND		GND	57		GND	19

Legacy QSFP28 pads Additional QSFP-DD pads Additional QSFP-DD pads Legacy QSFP28 pads

Figure 2. QSFP-DD Electrical Pad Layout

6. Module Electrical Pin Definition

QSFP-DD Hardware Specification

Pin Number	Name	Function	Pin Number	Name	Function
1	GND	Ground	39	GND	Ground
2	TX2n	Transmitter Inverted Data Input	40	TX6n	Transmitter Inverted Data Input
3	TX2p	Transmitter Non-Inverted Data Input	41	TX6p	Transmitter Non-Inverted Data Input
4	GND	Ground	42	GND	Ground
5	TX4n	Transmitter Inverted Data Input	43	TX8n	Transmitter Inverted Data Input
6	TX4p	Transmitter Non-Inverted Data Input	44	TX8p	Transmitter Non-Inverted Data Input
7	GND	Ground	45	GND	Ground
8	ModSelL	Module Select	46	Reserved	For future use
9	ResetL	Module Reset	47	VS1	Module Vendor Specific 1
10	VccRx	+3.3V Power Supply Receiver	48	VccRx1	3.3V Power Supply
11	SCL	2-wire serial interface clock	49	VS2	Module Vendor Specific 2
12	SDA	2-wire serial interface data	50	VS3	Module Vendor Specific 3
13	GND	Ground	51	GND	Ground
14	RX3p	Receiver Non-Inverted Data Output	52	RX7p	Receiver Non-Inverted Data Output
15	RX3n	Receiver Inverted Data Output	53	RX7n	Receiver Inverted Data Output
16	GND	Ground	54	GND	Ground
17	RX1p	Receiver Non-Inverted Data Output	55	RX5p	Receiver Non-Inverted Data Output
18	RX1n	Receiver Inverted Data Output	56	RX5n	Receiver Inverted Data Output
19	GND	Ground	57	GND	Ground
20	GND	Ground	58	GND	Ground
21	RX2n	Receiver Inverted Data Output	59	RX6n	Receiver Inverted Data Output
22	RX2p	Receiver Non-Inverted Data Output	60	RX6p	Receiver Non-Inverted Data Output
23	GND	Ground	61	GND	Ground
24	RX4n	Receiver Inverted Data Output	62	RX8n	Receiver Inverted Data Output
25	RX4p	Receiver Non-Inverted Data Output	63	RX8p	Receiver Non-Inverted Data Output
26	GND	Ground	64	GND	Ground
27	ModPrsL	Module Present	65	NC	No Connect
28	IntL	Interrupt	66	Reserved	For future use
29	VccTx	+3.3V Power supply transmitter	67	VccTx1	3.3V Power Supply
30	Vcc1	+3.3V Power supply	68	Vcc2	3.3V Power Supply
31	InitMode	Initialization Mode	69	Reserved	For future use
32	GND	Ground	70	GND	Ground
33	TX3p	Transmitter Non-Inverted Data Input	71	TX7p	Transmitter Non-Inverted Data Input
34	TX3n	Transmitter Inverted Data Input	72	TX7n	Transmitter Inverted Data Input
35	GND	Ground	73	GND	Ground
36	TX1p	Transmitter Non-Inverted Data Input	74	TX5p	Transmitter Non-Inverted Data Input
37	TX1n	Transmitter Inverted Data Input	75	TX5n	Transmitter Inverted Data Input
38	GND	Ground	76	GND	Ground

7. EEPROM

QSFP-DD CMIS Rev 4.0

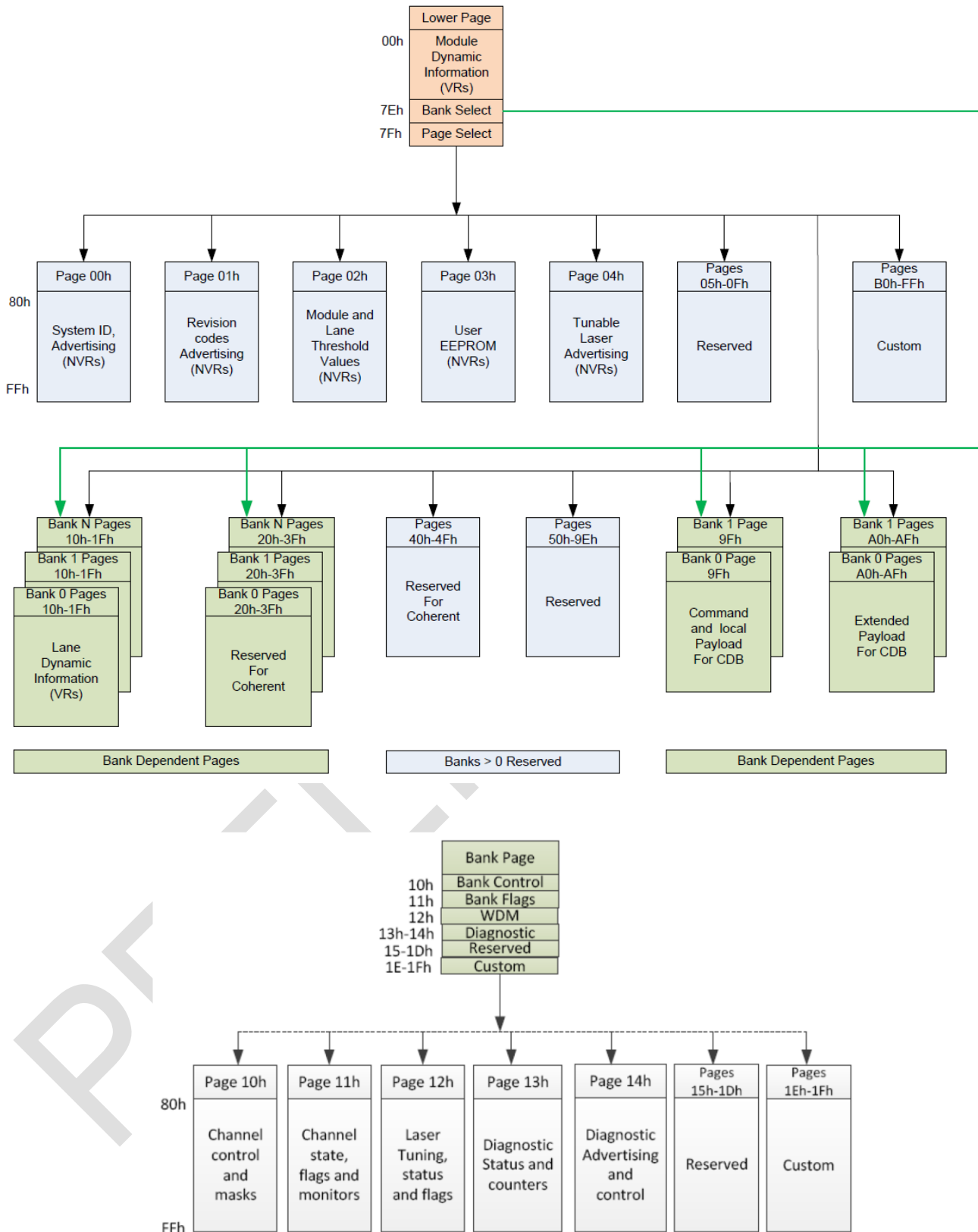


Figure 3. EEPROM of a QSFP-DD

8. Ordering Information

Part Number	Description
DDPQQC50E000	QSFP-DD to QSFP-DD DAC, 400 Gigabit Ethernet, 50cm , 30AWG, 20 to 60°C
DDPQQM01E000	QSFP-DD to QSFP-DD DAC, 400 Gigabit Ethernet, 1m , 30AWG, 20 to 60°C
DDPQQM02E000	QSFP-DD to QSFP-DD DAC, 400 Gigabit Ethernet, 2m , 28AWG, 20 to 60°C
DDPQQM03E000	QSFP-DD to QSFP-DD DAC, 400 Gigabit Ethernet, 3m , 26AWG, 20 to 60°C

9. Document Revision Information

Revision	Description
A	Initial release

Skylane Optics® supplies a broad range of optical transceivers. Our engineers work closely with our customers to find the best solutions for every application. We are committed to provide high quality products and services to our customers.

For questions on this product please contact:
support@skylaneoptics.com

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