200G QSFP DD Electrical Passive Loopback

DC-QDD-LBx

Features

- **Supports 25.78125Gb/s per channel**
- **Operating Case Temperature: 0℃~70**
- **Compliant to QSFP-DD Rev 3.0**
- **SFF-8636 Management Interface**
- **SFF-8679: General Electrical**
- **ROHS-6: Environment Safety**

Applications

- **Ethernet for 2x100GBASE**
- **HPC Interconnects**
- **Proprietary Interconnections**

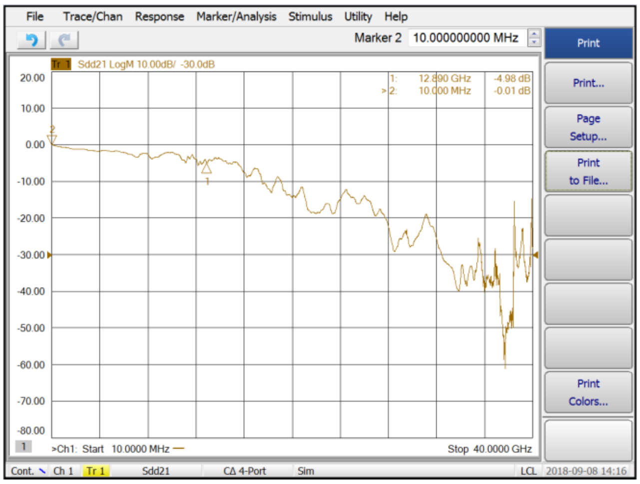
Product Description

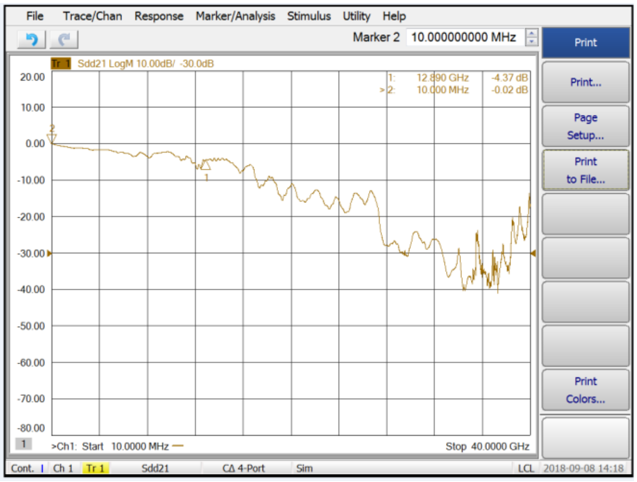
The QSFP-DD Loopback module is an 8-channel parallel passive loopback used for storage, data center QSFP-DD port testing. Monitor power supply and operation temperature; over temperature and power supply warning. It offers 8 independent data transmission channels via its internal module, an aggregate data rate of 200Gbps transmission can be achieved by this product. The cage and connector design provide backwards compatibility to QSFP28 modules, which can be inserted into a QSFP-DD port and connected to 4 of the 8 electrical channels. Data is transmitted from the host into TX of this product and then output from RX of this product back to the host.

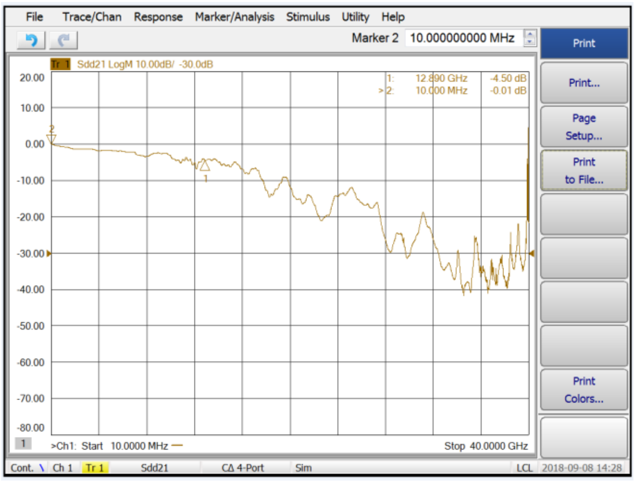
Recommended Operation Condition

Parameter	Symbol	Notes/Conditions	Min	Type	Max	Units
Operating Temperature	TA	Note 1	0		70	°C
+3.3V Supply Voltage	VCC	Main Supply Voltage	3.15	3.3	3.45	V
Data Rate		Guaranteed to work at 28Gbps per lane	10		224	Gbps
Input/ Output Load Resistance	RL		90	100	110	Ω
Power Level 0 1 2 3		0 A 0.45A 1.06 A 1.51 A			0 1.5 3.5 5	W

*Note 1. Ambient temperature with a minimum of 100 linear feet per minute of air flow







Host board Connector Pinout

Figure 1: MSA compliant Connector

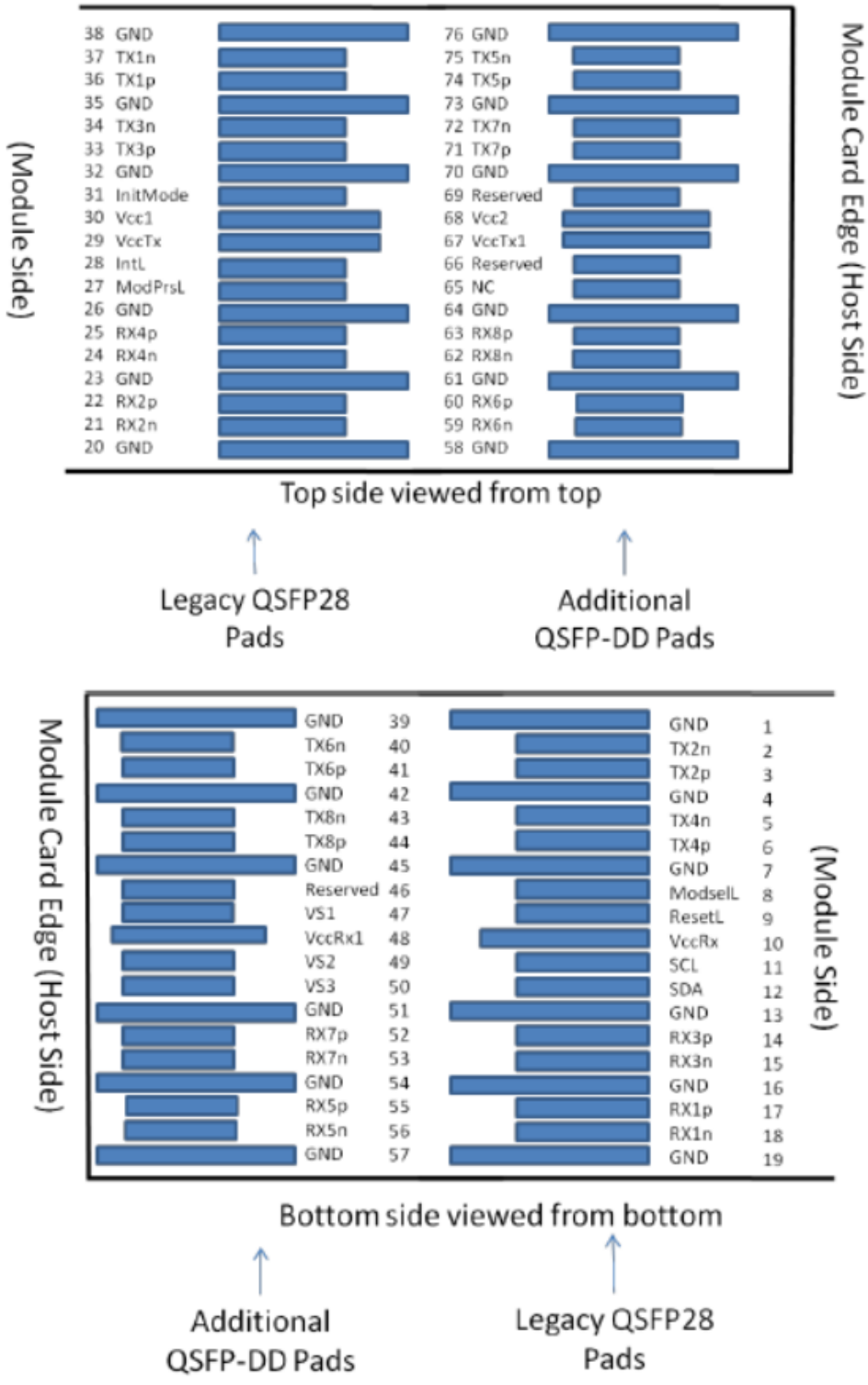


Table 1： Pin Definitions，compliant SFF-8679

PIN	Symbol	Description	Ref.
1	GND	Ground	①

2	TX2n	Transmitter Inverted Data Input	
3	TX2p	Transmitter Non-Inverted Data Input	
4	GND	Ground	①
5	TX4n	Transmitter Inverted Data Input	
6	TX4p	Transmitter Non-Inverted Data Input	
7	GND	Ground	①
8	ModSelL	Module Select	
9	ResetL	Module Reset	
10	Vcc RX	+3.3V Power Supply Receiver	②
11	SCL	2-wire serial interface clock	
12	SDA	2-wire serial interface data	
13	GND	Ground	①
14	RX3p	Receiver Non-Inverted Data Output	
15	RX3n	Receiver Inverted Data Output	
16	GND	Ground	①
17	RX1p	Receiver Non-Inverted Data Output	
18	RX1n	Receiver Inverted Data Output	
19	GND	Ground	①
20	GND	Ground	①
21	RX2n	Receiver Inverted Data Output	
22	RX2p	Receiver Non-Inverted Data Output	
23	GND	Ground	①
24	RX4n	Receiver Inverted Data Output	
25	RX4p	Receiver Non-Inverted Data Output	
26	GND	Ground	①
27	ModPrsL	Module Present	
28	IntL	Interrupt	
29	Vcc TX	+3.3V Power supply transmitter	②
30	Vcc1	+3.3V Power supply	②
31	LPMode	Initialization mode; In legacy QSFP applications, the InitMode pad is called LPMODE	
32	GND	Ground	①
33	TX3p	Transmitter Non-Inverted Data Input	
34	TX3n	Transmitter Inverted Data Input	
35	GND	Ground	①
36	TX1p	Transmitter Non-Inverted Data Input	
37	TX1n	Transmitter Inverted Data Input	
38	GND	Ground	①
39	GND	Ground	①
40	Tx6n	Transmitter Inverted Data Input	
41	Tx6p	Transmitter Non-Inverted Data Input	
42	GND	Ground	①
43	Tx8n	Transmitter Inverted Data Input	

44	Tx8p	Transmitter Non-Inverted Data Input	
45	GND	Ground	①
46	Reserved	For future use	③
47	VS1	Module Vendor Specific 1	③
48	3.3V Power Supply	2A	②
49	VS2	Module Vendor Specific 2	③
50	VS3	Module Vendor Specific 3	③
51	GND	Ground	①
52	Rx7p	Receiver Non-Inverted Data Output	
53	Rx7n	Receiver Inverted Data Output	
54	GND	Ground	①
55	Rx5p	Receiver Non-Inverted Data Output	
56	Rx5n	Receiver Inverted Data Output	
57	GND	Ground	①
58	GND	Ground	①
59	Rx6n	Receiver Inverted Data Output	
60	Rx6p	Receiver Non-Inverted Data Output	
61	GND	Ground	①
62	Rx8n	Receiver Inverted Data Output	
63	Rx8p	Receiver Non-Inverted Data Output	
64	GND	Ground	①
65	NC	No Connect	③
66	Reserved	For future use	③
67	VccTx1	3.3V Power Supply	②
68	Vcc2	3.3V Power Supply	②
69	Reserved	For Future Use	③
70	GND	Ground	①
71	Tx7p	Transmitter Non-Inverted Data Input	
72	Tx7n	Transmitter Inverted Data Input	
73	GND	Ground	①
74	Tx5p	Transmitter Non-Inverted Data Input	
75	Tx5n	Transmitter Inverted Data Input	
76	GND	Ground	①

① QSFP-DD uses common ground (GND) for all signals and supply (power). All are common within the QSFP-DD module and all module voltages are referenced to this potential unless otherwise noted. Connect these directly to the host board signal-common ground plane.

② VccRx, VccRx1, Vcc1, Vcc2, VccTx and VccTx1 shall be applied concurrently. Requirements defined for the host side of the Host Card Edge Connector are listed in Table 4. VccRx, VccRx1, Vcc1, Vcc2, VccTx and VccTx1 may be internally connected within the module in any combination.The connector Vcc ping are each rated for a maximum current of 1000 mA.

③ All Vendor Specific, Reserved and No Connect pins may be terminated with 50ohms to grounds on the host. Pad 65 (No connect) shall be left unconnected within the module. Vendor specific and Reserved pads shall have an impedance to GND that is greater than 10k ohms and less than 100 pF.

④ Plug Sequence specifies the mating sequence of the host connector and module. The sequence is 1A, 2A, 3A, 1B, 2B, 3B. Contact sequence A will make, the break contact with additional QSFP- DD pads. Sequence 1A, 1B will then occur simultaneously, followed by 2A, 2B, followed by 3A,3B.

Memory Map

The memory map is structured as a single address and multiple page approaches, according to the QSFP DD MSA specification as shown in the below. For more detailed description of this memory map or lower pages, please see our Memory Map document with flexible customization settings.

Figure 2. Memory Map (Specific Data Field Descriptions)

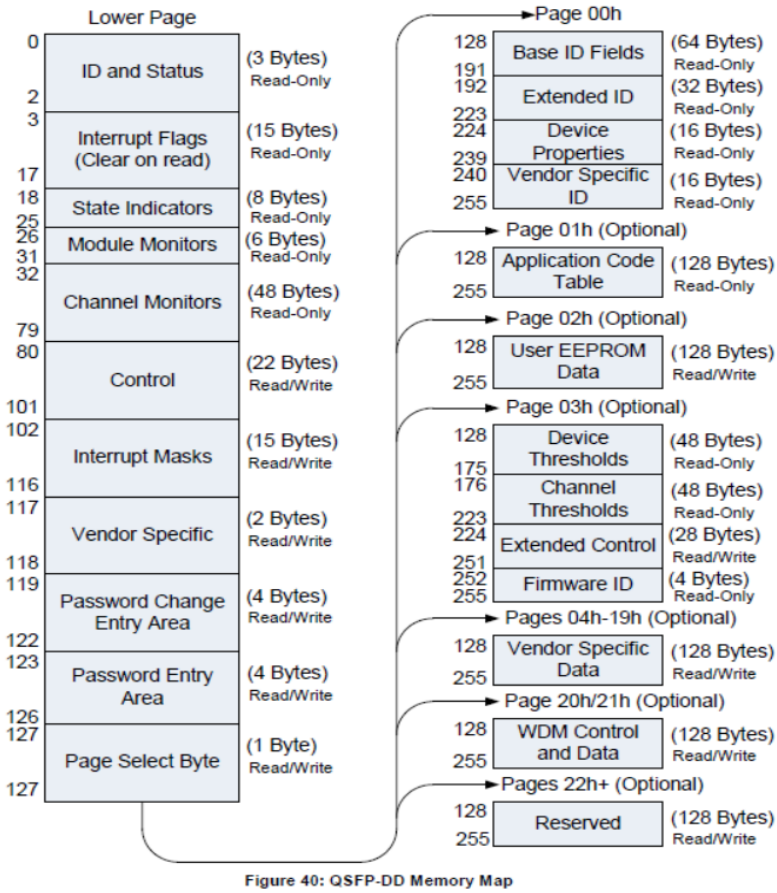


Figure 40: QSFP-DD Memory Map

Table 2 - EEPROM Serial ID Memory Contents (Page00)

Upper Page00

Part Number		DC-QDD-LBx		
Device 0xPage00				
DATA Address	**DATA Address**	**Name of Field**	**Value (HEX)**	**Description**

(DEC)	(HEX)			
128	80	Identifier	0X18	QSFP-DD Double Density 8X Pluggable Transceiver (INF-8628)
129	81	Vendor name	0X31	xxx
130	82		0X30	
131	83		0X47	
132	84		0X74	
133	85		0X65	
134	86		0X6B	
135	87		0X20	
136	88		0X20	
137	89		0X20	
138	8A		0X20	
139	8B		0X20	
140	8C		0X20	
141	8D		0X20	
142	8E		0X20	
143	8F		0X20	
144	90		0X20	
145	91	Vendor OUI	0X00	Unspecified
146	92		0X00	
147	93		0X00	
148	94	Vendor PN	0X43	xxx
149	95		0X41	
150	96		0X42	
151	97		0X2D	
152	98		0X51	
153	99		0X44	
154	9A		0X44	
155	9B		0X2D	
156	9C		0X4C	
157	9D		0X42	
158	9E		0X78	
159	9F		0X20	
160	A0		0X20	
161	A1		0X20	
162	A2		0X20	
163	A3		0X20	
164	A4	Vendor rev	0X30	01
165	A5		0X31	

166	A6	Vendor SN	0X51	Vendor SN
167	A7		0X44	
168	A8		0X44	
169	A9		0X32	
170	AA		0X31	
171	AB		0X30	
172	AC		0X38	
173	AD		0X30	
174	AE		0X39	
175	AF		0X30	
176	B0		0X30	
177	B1		0X30	
178	B2		0X30	
179	B3		0X31	
180	B4		0X20	
181	B5		0X20	
182	B6	Date Code	0X32	Date
183	B7		0X31	
184	B8		0X30	
185	B9		0X38	
186	BA		0X30	
187	BB		0X39	
188	BC		0X20	
189	BD		0X20	
190	BE	CLEI CODE（options）	0X20	Unspecified
191	BF		0XD4	
192	C0		0X00	
193	C1		0X00	
194	C2		0X00	
195	C3		0X00	
196	C4		0X00	
197	C5		0X00	
198	C6		0X00	
199	C7		0X00	
200	C8	MODULE POWER CHARACTERISTICS	0X00	MODULE POWER
201	C9		0X06	MODULE POWER
202	CA	Cable assembly length（Multiplier for value in bits 5-0.）	0X05	Cable assembly length
203	CB	Media connector	0X23	No separable connector
204	CC	Copper Cable attenuation	0X00	Unspecified

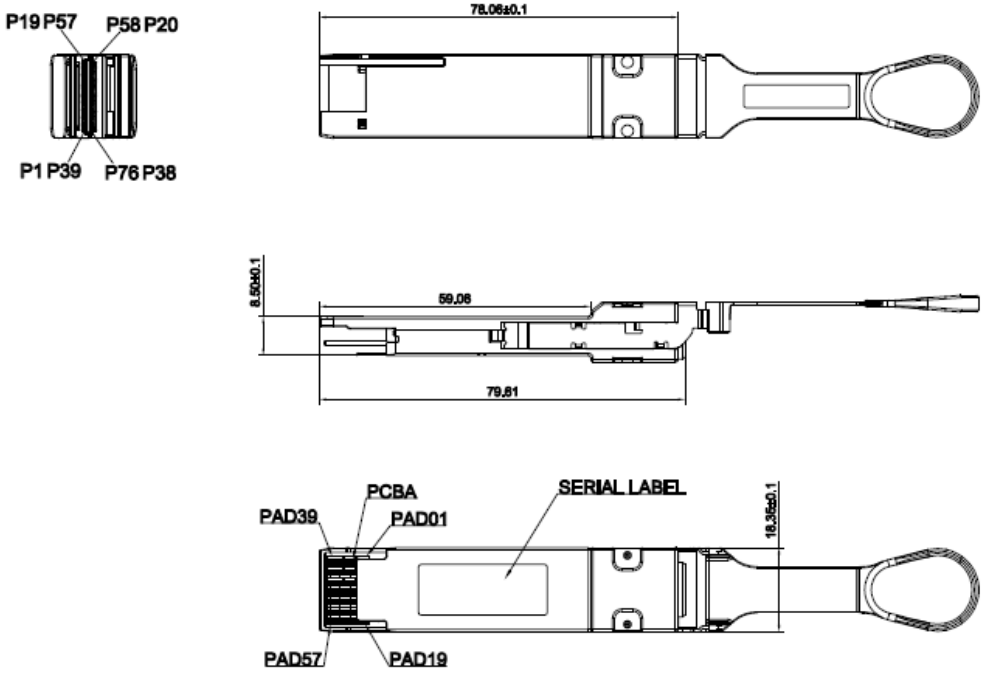
205	CD		0X00	Unspecified
206	CE		0X00	Unspecified
207	CF		0X00	Unspecified
208	D0		0X00	reserved
209	D1		0X00	reserved
210	D2	Cable Assembly Lane Information	0X00	
211	D3		0X02	
212	D4	Media Interface Technology	0X0A	Copper cable Unequalized
213	D5	Reserved	0X00	Reserved
214	D6		0X00	
215	D7		0X00	
216	D8		0X00	
217	D9		0X00	
218	DA		0X00	
219	DB		0X00	
220	DC		0X00	
221	DD	Custom	0X00	
222	DE	Checksum（128-221）		Checksum
223	DF	Custom Info nv	0X00	Custom Info nv
224	E0		0X00	
225	E1		0X00	
226	E2		0X00	
227	E3		0X00	
228	E4		0X00	
229	E5		0X00	
230	E6		0X00	
231	E7		0X00	
232	E8		0X00	
233	E9		0X00	
234	EA		0X00	
235	EB		0X00	
236	EC		0X00	
237	ED		0X00	
238	EE		0X00	
239	EF		0X00	
240	F0		0X00	
241	F1		0X00	
242	F2		0X00	
243	F3		0X00	

244	F4		0X00	
245	F5		0X00	
246	F6		0X00	
247	F7		0X00	
248	F8		0X00	
249	F9		0X00	
250	FA		0X00	
251	FB		0X00	
252	FC		0X00	
253	FD		0X00	
254	FE		0X00	
255	FF		0X00	

The force specification for QSFP-DD is in the list below:

Parameter	Min.	Max.	Unit.	Comments.
QSFP-DD Module Insertion		90	Newton	
QSFP-DD Module Extraction		50	Newton	
QSFP-DD Module Retention	90		Newton	
Insertion and removal cycles	50		Cycle	

Mechanical Specifications



Order Information

Part Number	Internal Attenuation	Power Consumption
DC-QDD-LB0	0dB	0W
DC-QDD-LB3	3.5 dB	0W
DC-QDD-LB5	5 dB	0W
DC-QDD-LB0-5	0dB	5W

Notes: Maximum total power value is specified across the full temperature and voltage range and may vary according to different Options.