SNR-CFP2-DA-XX

CFP2 Cable Assemblies, 1m/2m/3m RoHS6 Compliant

Features

- Supports 103.125Gb/s and 118.3Gb/s bit rates
- Lower Power Consumption for Single Module < 1.3W
- 30AWG up to 3 meters distance
- 26AWG up to 4 meters distance
- CDR Inside
- Power Supply: +3.3V
- Compatible to CFP2 MSA
- Temperature Range: 0~ 70℃
- RoHS6 Compliant

Applications

- 100G Ethernet
- OTU4

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Regulatory Compliance*Note1

Product Certificate	Certificate Number	Applicable Standard
TUV	R50135086	EN 60950-1:2006+A11+A1+A12
UL	E317337	UL 60950-1
		CSA C22.2 No. 60950-1-07
EMC CE	AE 50285865 0001	EN 55022:2010
		EN 55024:2010
CB	JPTUV-049251	IEC 60950-1
FCC	WTF14F0514437E	47 CFR PART 15 OCT., 2013
ROHS	RHS01G006464	2011/65/EU

Note1:The above certificate number updated to June 2014, because some certificate will be updated every year, such as FCC and ROHS. For the latest certification information, please check with NAG

Absolute Maximum Ratings*Note2

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	Ts	-40	+85	°C
Supply Voltage	Vcc	-0.5	3.6	V
Operating Relative Humidity	RH	5	85	%

Note2: Exceeding any one of these values may destroy the device immediately.

Product Description

Copper Cable assemblies are high-performance, cost effective I/O solutions for 100 GB Ethernet and OTU4 applications. CFP2 copper modules allow hardware manufacturers to achieve high port density, configurability and utilization at a very low cost and to reduce power budget.

Recommended Operating Conditions

Parameter	Symbol		Min.	Typical	Max.	Unit
Operating Case Temperature	T_C	SNR-CFP2-DA-XX	0		+70	°C
Power Supply Voltage	Vcc		3.2	3.3	3.4	V
Power Consumption*Note3	P				1.3	W

Note3: The power consumption value is just depended on single module.

Performance Specifications - Electrical

Parameter	Symbol	Min.	Typ.	Max	Unit	Notes
Transmitter						
Input Amplitude (Differential)	Vin	500		1200	mVpp	AC coupled inputs
Input Impedance (Differential)	Zin	85	100	115	ohms	Rin > 100 kohms @ DC

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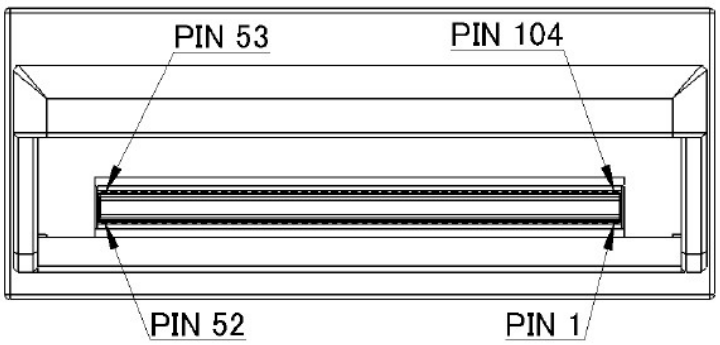
Receiver						
Output Amplitude (Differential)	Vout	360		770	mVpp	AC coupled outputs
Output Impedance (Differential)	Zout	85	100	115	ohms	

1.2V MDIO Interface Specifications

Parameter	Symbol	Min.	Typ.	Max	Unit
Input Voltage	V_{IH}	0.84		1.5	V
	V_{IL}	-0.3		0.36	V
Input Leak current	I_{IN}	-100		100	uA
Output Voltage	V_{OH}	1.0		1.5	V
	V_{OL}	-0.3		0.2	V
Input Capacitance	C_I			10	pF
Input MDC Clock	f_{MDC}	0.1		4	MHz
MDC Clock Period	T_{MDC}	250		10000	ns
MDIO Hold Time	T_{hold}	10			ns
MDIO SetupTime	T_{setup}	10			ns
GLB_ALM	$T_{glb\_alm\_ass}$			150	ms
	$T_{glb\_alm\_dea}$			150	ms

CFP2 Transceiver Electrical Pad Layout



Pin Function Definitions

CFP2	
Bottom	
1	GND
2	(TX_MCK_N)
3	(TX_MCK_P)
4	GND
5	N.C.
6	N.C.
7	3.3V_GND
8	3.3V_GND
9	3.3V

CFP2	
Top	
104	GND
103	N.C.
102	N.C.
101	GND
100	TX3n
99	TX3p
98	GND
97	TX2n
96	TX2p

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10	3.3V	95	GND
11	3.3V	94	N.C.
12	3.3V	93	N.C.
13	3.3V_GND	92	GND
14	3.3V_GND	91	N.C.
15	VND_IO_A	90	N.C.
16	VND_IO_B	89	GND
17	PRG_CNTL1	88	TX1n
18	PRG_CNTL2	87	TX1p
19	PRG_CNTL3	86	GND
20	PRG_ALRM1	85	TX0n
21	PRG_ALRM2	84	TX0p
22	PRG_ALRM3	83	GND
23	GND	82	N.C.
24	TX_DIS	81	N.C.
25	RX_LOS	80	GND
26	MOD_LOPWR	79	(REFCLKn)
27	MOD_ABS	78	(REFCLKp)
28	MOD_RSTn	77	GND
29	GLB_ALRMn	76	N.C.
30	GND	75	N.C.
31	MDC	74	GND
32	MDIO	73	RX3n
33	PRTADR0	72	RX3p
34	PRTADR1	71	GND
35	PRTADR2	70	RX2n
36	VND_IO_C	69	RX2p
37	VND_IO_D	68	GND
38	VND_IO_E	67	N.C.
39	3.3V_GND	66	N.C.
40	3.3V_GND	65	GND
41	3.3V	64	N.C.
42	3.3V	63	N.C.
43	3.3V	62	GND
44	3.3V	61	RX1n
45	3.3V_GND	60	RX1p
46	3.3V_GND	59	GND
47	N.C.	58	RX0n
48	N.C.	57	RX0p
49	GND	56	GND
50	(RX_MCK_N)	55	N.C.
51	(RX_MCK_P)	54	N.C.
52	GND	53	GND

Bottom Row Pin Descriptions

Pin Num.	Name	Function	Notes
1	GND		
2	(TX_MCK_N)	O CML	For optical waveform testing. Not for normal use.
3	(TX_MCK_P)	O CML	For optical waveform testing. Not for normal use.
4	GND		
5	N.C.		
6	N.C.		
7	3.3V_GND		
8	3.3V_GND		
9	3.3V		3.3V Module Supply Voltage
10	3.3V		
11	3.3V		
12	3.3V		
13	3.3V_GND		
14	3.3V_GND		
15	VND_IO_A		Module Vendor I/O A. Do not connect!
16	VND_IO_B		Module Vendor I/O B. Do not connect!
17	PRG_CNTL1		Programmable control 1 set over MDIO, MSA default: TRXIC_RSTn. TX&RX ICs reset. “0”: reset; “1” or NC: enabled = not used.
18	PRG_CNTL2		Programmable Control 2 set over MDIO, MSA Default: Hardware Interlock LSB, "00":≤3W, "01":≤6W, "10":≤9W, "11" or NC: ≤12W = not used
19	PRG_CNTL3		Programmable Control 3 set over MDIO, MSA Default: Hardware Interlock MSB, "00": ≤3W, "01": ≤6W, "10": ≤9W, "11" or NC: ≤12W = not used
20	PRG_ALRM1		Programmable alarm 1 set over MDIO, MSA default: HIPWR_ON. “1”: module power up completed; “0”: module not high powered up.
21	PRG_ALRM2		Programmable alarm 2 set over MDIO, MSA default: MOD_READY. “1”: ready; “0”: not ready.
22	PRG_ALRM3		Programmable alarm 3 set over MDIO, MSA default: MOD_FAULT, fault detected. “1”: fault; “0”: not fault.
23	GND		
24	TX_DIS	I LVCMOS	Transmitter disable for all lanes. “1” or NC: transmitter disabled; “0”: transmitter enabled.
25	RX_LOS	O LVCMOS	Receiver loss of optical signal. “1”: low optical signal; “0”: normal condition.
26	MOD_LOPWR	I LVCMOS	Module Low power mode. “1” or NC: module in low power (safe) mode; “0”: power-on enabled.

27	MOD_ABS	O	GND	Module Absent. “1”or NC: module absent; “0”: module present. Pull up resistor on Host.
28	MOD_RSTn	I	LVCMOS	Module Reset. “0”: resets the module; “1” or NC: module enabled. Pull Down Resistor in module.
29	GLB_ALRMn	O	LVCMOS	Global Alarm. “0”: alarm condition in any MDIO alarm register; “1”: no alarm condition. Open Drain, Pull up resistor on Host
30	GND			
31	MDC	I	1.2V CMOS	Management Data Clock
32	MDIO	I/O	1.2V CMOS	Management Data I/O bi-directional data
33	PRTADR0	I	1.2V CMOS	MDIO Physical Port address bit 0
34	PRTADR1	I	1.2V CMOS	MDIO Physical Port address bit 1
35	PRTADR2	I	1.2V CMOS	MDIO Physical Port address bit 2
36	VND_IO_C	I/O		Module Vendor I/O C. Do not connect!
37	VND_IO_D	I/O		Module Vendor I/O D. Do not connect!
38	VND_IO_E	I/O		Module Vendor I/O E. Do not connect!
39	3.3V_GND			
40	3.3V_GND			
41	3.3V			3.3V Module Supply Voltage
42	3.3V			
43	3.3V			
44	3.3V			
45	3.3V_GND			
46	3.3V_GND			
47	N.C.			No Connect
48	N.C.			No Connect
49	GND			
50	(RX_MCK_N)	O	CML	For optical waveform testing. Not for normal use.
51	(RX_MCK_P)	O	CML	For optical waveform testing. Not for normal use.
52	GND			

Top Row Pin Descriptions

Pin Num.	Name	Function	Notes
53	GND		
54	N.C.		
55	N.C.		
56	GND		
57	RX0p	Lane 0 Rx Output O	CML Output
58	RX0n		
59	GND		
60	RX1p	Lane 1 Rx Output O	CML Output
61	RX1n		
62	GND		

63	N.C.		
64	N.C.		
65	GND		
66	N.C.		
67	N.C.		
68	GND		
69	RX2p	Lane 2 Rx Output O	CML Output
70	RX2n		
71	GND		
72	RX3p	Lane 3 Rx Output O	CML Output
73	RX3n		
74	GND		
75	N.C.		
76	N.C.		
77	GND		
78	(REFCLKn)	Reference Clock I	Reference Clock Input
79	(REFCLKp)		
80	GND		
81	N.C.		
82	N.C.		
83	GND		
84	TX0p	Lane 0 Tx Input I	CML Input
85	TX0n		
86	GND		
87	TX1p	Lane 1 Tx Input I	CML Input
88	TX1n		
89	GND		
90	N.C.		
91	N.C.		
92	GND		
93	N.C.		
94	N.C.		
95	GND		
96	TX2p	Lane 2 Tx Input I	CML Input
97	TX2n		
98	GND		
99	TX3p	Lane 3 Tx Input I	CML Input
100	TX3n		
101	GND		
102	N.C.		
103	N.C.		
104	GND		

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Memory Map

EEPROM Definition					
EEPROM Address		CFP NVR 1		Version V1.0	
Data Addr	Field Size (Byte)	Name Of filed	Description of field	Coded value	Hex
BASE ID FIELDS					
8000h	1	Module Identifier	Module Identifier	CFP2	11
8001h	1	Extended Identifier	Extended Identifier	Power Class 1 Module (≤3W max),Network lane : Host lane = Reserved,Non-WDM,No CLEI code present	30
8002h	1	Connector Type Code	Connector Type Code	Undefined	00
8003h	1	Ethernet Application Code	Ethernet Application Code	100GE-CR4 Copper	12
8004h	1	Fiber Channel Application Code	Fiber Channel Application Code		00
8005h	1	Copper Link Application Code	Copper Link Application Code		00
8006h	1	SONET/SDH Application Code	SONET/SDH Application Code		00
8007h	1	OTN Application Code	OTN Application Code		00
8008h	1	Additional Capable Rates Supported	Additional Capable Rates Supported	111.8 Gbps,103.125 Gbps	18
8009h	1	Number of Lanes Supported	Number of Lanes Supported	Number of Network Lanes:4; Number of Host Lanes:4;	44
800Ah	1	Media Properties	Media Properties	Media Type:Copper;Directionality:Normal;Without optical MUX/DEMUX;1 TX Lane and 1 RX Lane,	C1
800Bh	1	Maximum Network Lane Bit Rate	Maximum Network Lane Bit Rate	28Gbps	8C
800Ch	1	Maximum Host Lane Bit Rate	Maximum Host Lane Bit Rate	28Gbps	8C
800Dh	1	Maximum Single Mode Optical Fiber Length	Maximum Single Mode Optical Fiber Length		00
800Eh	1	Maximum Multi-Mode Optical Fiber Length	Maximum Multi-Mode Optical Fiber Length		00

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800Fh	1	Maximum Copper Cable Length	Maximum Copper Cable Length	x(m)	xx
8010h	1	Transmitter Spectral Characteristics 1	Transmitter Spectral Characteristics 1		00
8011h	1	Transmitter Spectral Characteristics 2	Transmitter Spectral Characteristics 2		00
8012h	2	Minimum Wavelength per Active Fiber	Minimum Wavelength per Active Fiber		00
8013h					00
8014h	2	Maximum Wavelength per Active Fiber	Maximum Wavelength per Active Fiber		00
8015h					00
8016h	2	Maximum per Lane Optical Width	Maximum per Lane Optical Width		00
8017h					00
8018h	1	Device Technology 1	Device Technology 1	Copper	44
8019h	1	Device Technology 2	Device Technology 2	No wavelength control,Un-cooled transmitter device,Transmitter not Tunable,Detector side VOA not implement,Detector Type:Undefined;CDR without EDC	00
801Ah	1	Signal Code	Signal Code	Undefined;Non-PSK	00
801Bh	1	Maximum Total Optical Output Power per Connector	Maximum Total Optical Output Power per Connector		00
801Ch	1	Maximum Optical Input Power per Network Lane	Maximum Optical Input Power per Network Lane		00
801Dh	1	Maximum Power Consumption	Maximum Power Consumption	1600mW	08
801Eh	1	Maximum Power Consumption in Low Power Mode	Maximum Power Consumption in Low Power Mode	1500mW	4B
801Fh	1	Maximum Operating Case Temp Range	Maximum Operating Case Temp Range	70℃	46
8020h	1	Minimum Operating Case Temp Range	Minimum Operating Case Temp Range	0℃	0
8021h	8	Vendor Name	Vendor Name	E	45
8022h				o	6F
8023h				p	70
8024h				t	74
8025h				o	6F
8026h				l	6C

8027h				i	69
8028h				n	6E
8029h				k	6B
802Ah				<space>	20
802Bh				<space>	20
802Ch				<space>	20
802Dh				<space>	20
802Eh				<space>	20
802Fh				<space>	20
8030h				<space>	20
8031h	3	Vendor OUI	Vendor OUI		00
8032h					00
8033h					00
8034h	16	Vendor Part Number	Vendor Part Number	E	45
8035h				O	4F
8036h				L	4C
8037h				C	43
8038h				1	31
8039h				H	48
803Ah				G	47
803Bh				C	43
803Ch				x	xx
803Dh				x	xx
803Eh				x	xx
803Fh				x	xx
8040h				C	43
8041h				2	32
8042h				<space>	20
8043h				<space>	20
8044h	16	Vendor Serial Number	Vendor Serial Number	C	43
8045h-804Dh				x	xx
804Eh-8053h				<space>	20
8054h	8	Date Code	Date Code	Year	xx
8055h				Year	xx
8056h				Year	xx
8057h				Year	xx
8058h				Month	xx
8059h				Month	xx
805Ah				Day	xx
805Bh				Day	xx
805Ch	2	Lot Code	Lot Code	<space>	20

805Dh				<space>	20
805Eh-8067h	10	CLEI Code	CLEI Code	0	30
8068h	1	CFP MSA Hardware Specification Revision Number	CFP MSA Hardware Specification Revision Number	V1.4	0E
8069h	1	CFP MSA Management Interface Specification Revision Number	CFP MSA Management Interface Specification Revision Number	V1.4	0E
806Ah	2	Module Hardware Version Number	Module Hardware Version Number	V1.0	01
806Bh					00
806Ch	2	Module Firmware Version Number	Module Firmware Version Number	V1.0	01
806Dh					00
806Eh	1	Digital Diagnostic Monitoring Type	Digital Diagnostic Monitoring Type		00
806Fh	1	3	Digital Diagnostic Monitoring Capability 1		00
8070h	1	Digital Diagnostic Monitoring Capability 2	Digital Diagnostic Monitoring Capability 2		00
8071h	1	Module Enhanced Options	Module Enhanced Options		00
8072h	1	Maximum High-Power-up Time	Maximum High-Power-up Time	60s	3C
8073h	1	Maximum TX-Turn-on Time	Maximum TX-Turn-on Time	1s	01
8074h	1	Host Lane Signal Spec	Host Lane Signal Spec		FF
8075h	1	Heat Sink Type	Heat Sink Type	Heat Sink Type:Flat top	00
8076h	1	Maximum TX-Turn-off Time	Maximum TX-Turn-off Time	1ms	14
8077h	1	Maximum High-Power-down Time	Maximum High-Power-down Time	20s	01
8078h	1	Module Enhanced Options 2	Module Enhanced Options 2		00
8079h	1	Transmitter Monitor Clock Options	Transmitter Monitor Clock Options		00
807Ah	1	Receiver Monitor Clock Options	Receiver Monitor Clock Options		00
807B-807Eh	4	Reserved	Reserved		00
807Fh	1	CFP NVR 1 Checksum	CFP NVR 1 Checksum	Note4	xx

Note4: The check code shall be the 8 bit unsigned result of the checksum of all of the CFP register LSB contents from addresses 8000h to 807Eh inclusive.

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EEPROM Definition					
EEPROM Address		CFP NVR 1		Version	V1.0
Data Addr	Field Size (Byte)	Name Of filed	Description of field	Coded value	Hex
Alarm & Warning Thresholds					
8080h	2	Temp High Alarm	Temp High Alarm	73℃	49
8081h					00
8082h	2	Temp High Warning	Temp High Warning	70℃	46
8083h					00
8084h	2	Temp Low Warning	Temp Low Warning	-5℃	FB
8085h					00
8086h	2	Temp Low Alarm	Temp Low Alarm	-8℃	F8
8087h					00
8088h	2	VCC High Alarm	VCC High Alarm	3.5V	88
8089h					B8
808Ah	2	VCC High Warning	VCC High Warning	3.4V	84
808Bh					D0
808Ch	2	VCC Low Warning	VCC Low Warning	3.2V	7D
808Dh					00
808Eh	2	VCC Low Alarm	VCC Low Alarm	3.1V	79
808Fh					18
8090h	2	SOA Bias Current High Alarm	SOA Bias Current High Alarm	N/A	00
8091h					00
8092h	2	SOA Bias Current High Warning	SOA Bias Current High Warning	N/A	00
8093h					00
8094h	2	SOA Bias Current Low Warning	SOA Bias Current Low Warning	N/A	00
8095h					00
8096h	2	SOA Bias Current Low Alarm	SOA Bias Current Low Alarm	N/A	00
8097h					00
8098h	2	Auxiliary 1 Monitor High Alarm	Auxiliary 1 Monitor High Alarm	N/A	00
8099h				N/A	00
809Ah	2	Auxiliary 1 Monitor High Warning	Auxiliary 1 Monitor High Warning	N/A	00
809Bh				N/A	00
809Ch	2	Auxiliary 1 Monitor Low Warning	Auxiliary 1 Monitor Low Warning	N/A	00
809Dh				N/A	00
809Eh	2	Auxiliary 1 Monitor Low Alarm	Auxiliary 1 Monitor Low Alarm	N/A	00
809Fh				N/A	00
80A0h	2	Auxiliary 2 Monitor High Alarm	Auxiliary 2 Monitor High Alarm	N/A	00
80A1h				N/A	00
80A2h	2	Auxiliary 2 Monitor High	Auxiliary 2 Monitor High Warning	N/A	00

80A3h		Warning		N/A	00
80A4h	2	Auxiliary 2 Monitor Low Warning	Auxiliary 2 Monitor Low Warning	N/A	00
80A5h				N/A	00
80A6h	2	Auxiliary 2 Monitor Low Alarm	Auxiliary 2 Monitor Low Alarm	N/A	00
80A7h				N/A	00
80A8h	2	Laser Bias Current High Alarm	Laser Bias Current High Alarm	N/A	00
80A9h				N/A	00
80AAh	2	Laser Bias Current High Warning	Laser Bias Current High Warning	N/A	00
80ABh				N/A	00
80ACh	2	Laser Bias Current Low Warning	Laser Bias Current Low Warning	N/A	00
80ADh				N/A	00
80AEh	2	Laser Bias Current Low Alarm	Laser Bias Current Low Alarm	N/A	00
80AFh				N/A	00
80B0h	2	Laser Output Power High Alarm	Laser Output Power High Alarm	N/A	00
80B1h				N/A	00
80B2h	2	Laser Output Power High Warning	Laser Output Power High Warning	N/A	00
80B3h				N/A	00
80B4h	2	Laser Output Power Low Warning	Laser Output Power Low Warning	N/A	00
80B5h				N/A	00
80B6h	2	Laser Output Power Low Alarm	Laser Output Power Low Alarm	N/A	00
80B7h				N/A	00
80B8h	2	Laser Temperature High Alarm	Laser Temperature High Alarm	N/A	00
80B9h				N/A	00
80BBh	2	Laser Temperature High Warning	Laser Temperature High Warning	N/A	00
80BBh				N/A	00
80BCh	2	Laser Temperature Low Warning	Laser Temperature Low Warning	N/A	00
80BDh				N/A	00
80BEh	2	Laser Temperature Low Alarm	Laser Temperature Low Alarm	N/A	00
80BFh				N/A	00
80C0h	2	Receive Optical Power High Alarm	Receive Optical Power High Alarm	N/A	00
80C1h				N/A	00
80C2h	2	Receive Optical Power High Warning	Receive Optical Power High Warning	N/A	00
80C3h				N/A	00
80C4h	2	Receive Optical Power Low Warning	Receive Optical Power Low Warning	N/A	00
80C5h				N/A	00
80C6h	2	Receive Optical Power Low Alarm	Receive Optical Power Low Alarm	N/A	00
80C7h				N/A	00
80C8-80FE	55	Reserved			00
80FF	1	CFP NVR 2 Checksum		Note5	xx

Note5: The check code shall be the 8 bit unsigned result of the checksum of all of the CFP register LSB contents from addresses 8080h to 80FFh inclusive.

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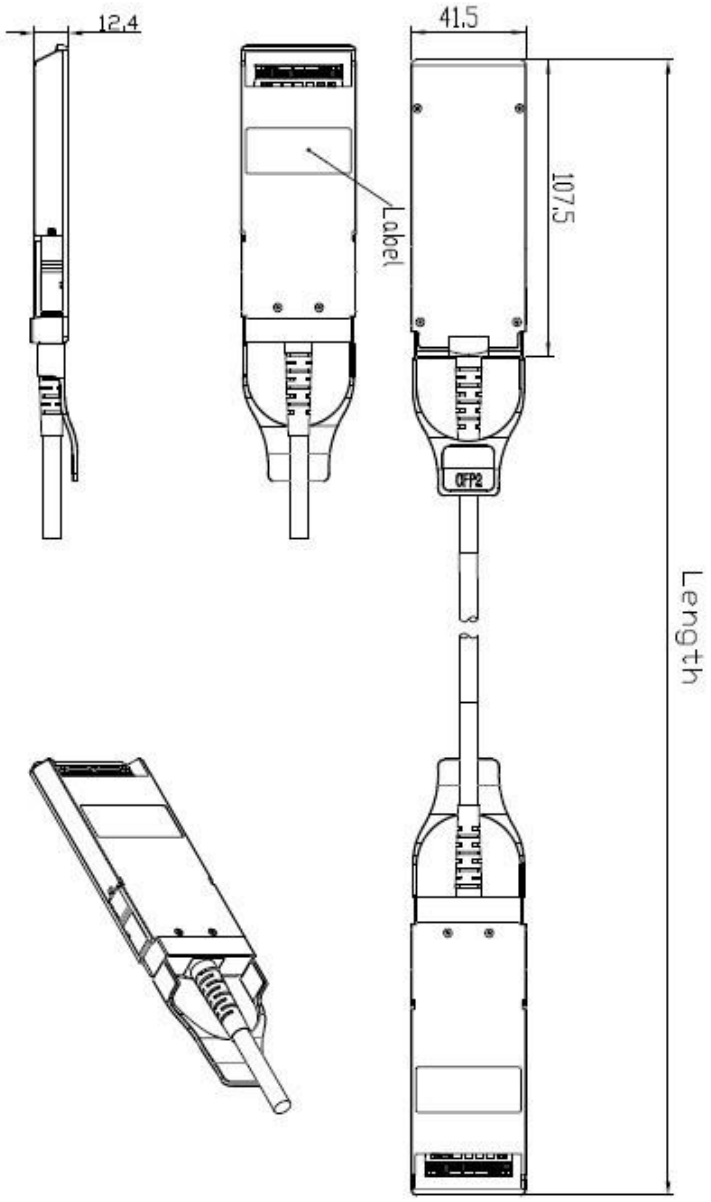
Mechanical Specifications



CFP2