

PRODUCT DATA SHEET

FTAD

AOC (Active Optical Cable) for DisplayPort Ver. 1.2a/1.4



Revision History

Version Number	Revision Date	Page	Description of Changes
0.1	Jun.25.2019	ALL	Initial Version
1.0	Oct.29.2019	ALL	Renewal Specification
1.1	Aug.21.2020	9,12~13	Renewal Packing Information & Certificate

PROPRIETARY NOTE

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1. General Description

1.1 Introduction

FTAD is AOC (Active Optical Cable) for DisplayPort standard.

The FTAD consists of a transmitting part and a receiving part, both of which are connected by a hybrid cable (Optical cable + electric cable). The FTAD's transmitter is connected to the Display Port source device, and the receiver is connected to the DisplayPort sink device.

With FTAD, Video/audio signals can be transmitted up to 100m when a system using Display Port standard is used. It is possible to transmit the DisplayPort specification signal of the UHD bandwidth without loss.

1.2 Features

- High speed and long distance transmission by optical system
- Input and Output Signal : DisplayPort 1.2a/1.4 Standard by VESA
- MMF optical fiber + copper hybrid cable structure
- DPCD/HDCP compliant
- AUX and Hot Plug channels are transmitted by copper line
- Gender or signal conversion equipment does not guarantee
- Maximum transmission distance : 100m
- Connector : DisplayPort 20pin (Male)
- No external power supply required

1.3 Applications

- Professional broadcasting and production studios
- Medical center and laboratory
- Presentation application
- Display application

2. Specification

2.1 General Specification

Parameter	Symbol	
	Transmitter	Receiver
Optical Converter	1x4 Array 850nm Multi-mode VCSEL	1x4 Array photo Diode
Input and Output Signal	DisplayPort Signal (Std. V1.2a/1.4)	
Video Bandwidth	Per lane, 5.4Gbps(HBR2)/8.1Gbps(HBR3)	
Using electrical connector	20 pin DisplayPort Plug(Male)	20 pin DisplayPort Plug(Male)
Applied Fiber	50/125 μ m Multi-mode glass-fiber	

2.2 Power Specification

Parameter		Min.	Typ.	Max.	Units	condition
Supply Voltage(DC)	TX (Source side)	+2.25	+3.3	+3.6	V	From source
	RX (Sink side)	+2.25	+3.3	+3.6	V	From source
Supply Current	TX (Source side)	30		47	mA	DC +3.3V
	RX (Sink side)		36	46	mA	DC +3.3V
Power Dissipation	TX (Source side)		0.122	0.139	W	DC +3.3V
	RX (Sink side)		0.264	0.280	W	DC +3.3V

2.3 Electrical Specification

Parameter	Min.	Typ.	Max.	Units	condition
Differential input voltage	200		1400	mV	
Differential input impedance at per lane+/-	80	100	125	Ohm	
Input data transition time	0		0.4	UI	20%, -80%
Output voltage swing	180		380	mVp	Fixed 380mVp
Output impedance at per lane+/-	80	100	125	Ohm	

3. Absolute Maximum Ratings

Parameter	Rating
Storage temperature	-20°C ~ +70°C Non-Condensing
Operating temperature	0°C ~ +50°C Non-Condensing
Transportation temperature	-20°C ~ +70°C Non-Condensing
Relative Humidity	10 ~ 80 %

NOTICE

Stresses greater than those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operations section for extended periods of time may affect reliability.

4. Connector Pin Assignment

4.1 Transmitter (Source side)

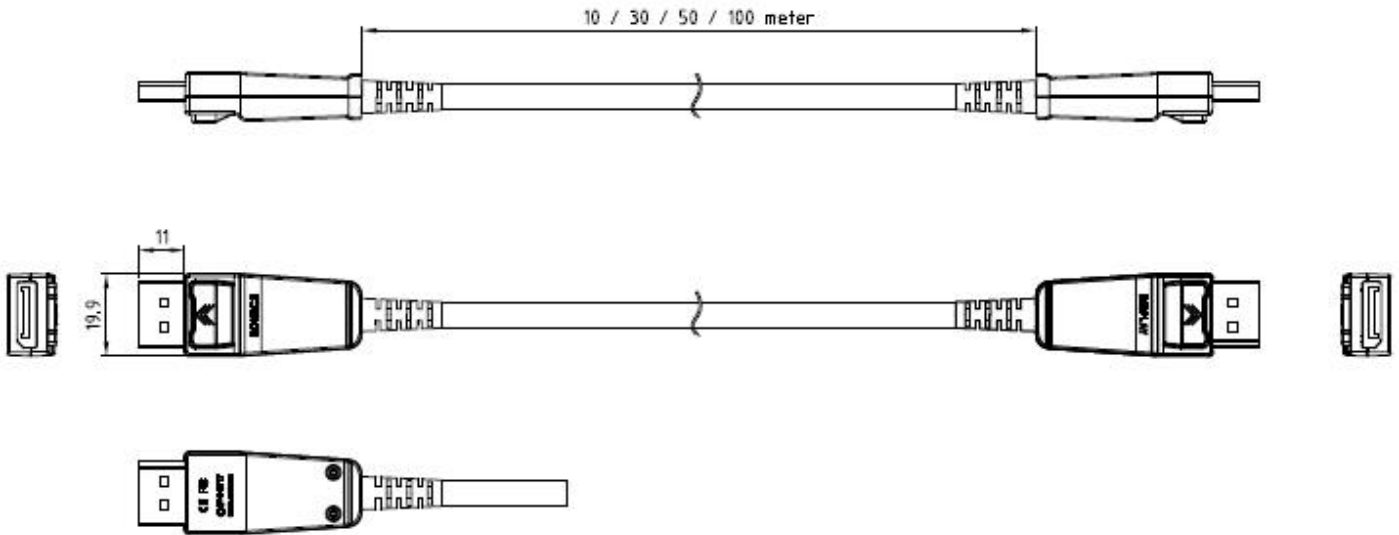
Pin	Signal Assignment	Pin	Signal Assignment
1	Main Link Lane 0 (Positive)	11	Ground
2	Ground	12	Main Link Lane 3 (Negative)
3	Main Link Lane 0 (Negative)	13	Config1 (Ground)
4	Main Link Lane 1 (Positive)	14	Config2 (Ground)
5	Ground	15	AUX Channel (Positive)
6	Main Link Lane 1 (Negative)	16	Ground
7	Main Link Lane 2 (Positive)	17	AUX Channel (Negative)
8	Ground	18	Hot Plug
9	Main Link Lane 2 (Negative)	19	Return
10	Main Link Lane 3 (Positive)	20	DP_PWR (+3.3V input)

4.2 Receiver (Sink side)

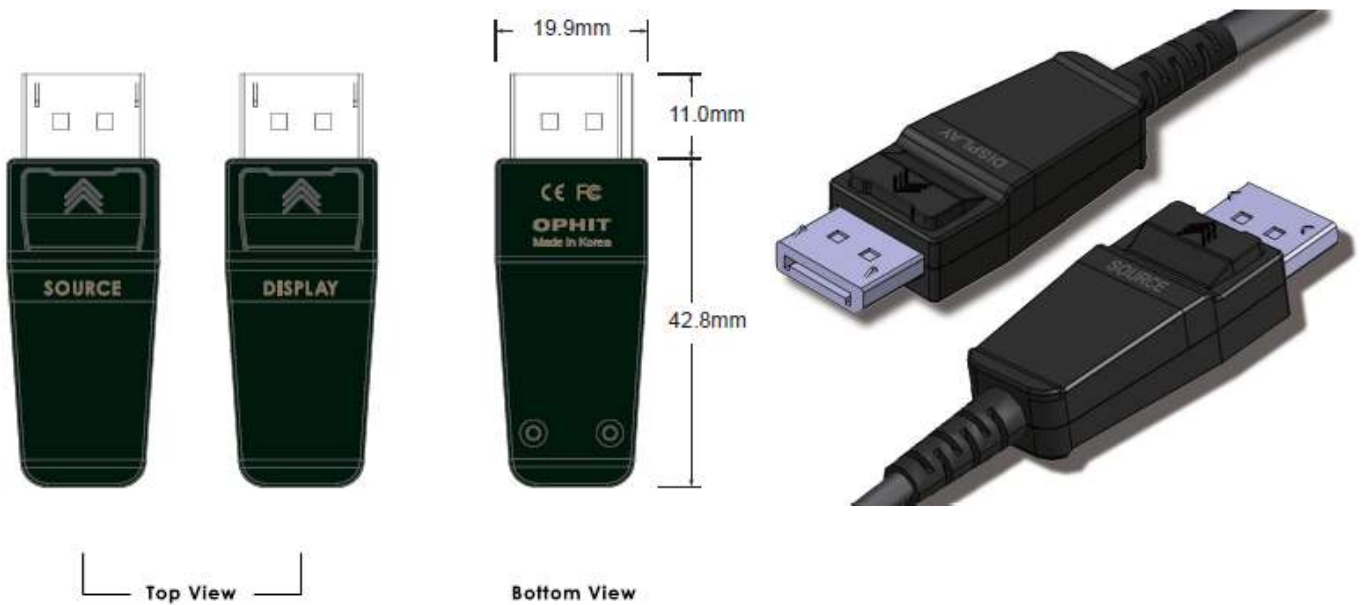
Pin	Signal Assignment	Pin	Signal Assignment
1	Main Link Lane 3 (Negative)	11	Ground
2	Ground	12	Main Link Lane 0 (Positive)
3	Main Link Lane 3 (Positive)	13	Config1 (Ground)
4	Main Link Lane 2 (Negative)	14	Config2 (Ground)
5	Ground	15	AUX Channel (Positive)
6	Main Link Lane 2 (Positive)	16	Ground
7	Main Link Lane 1 (Negative)	17	AUX Channel (Negative)
8	Ground	18	Hot Plug
9	Main Link Lane 1 (Positive)	19	Return
10	Main Link Lane 0 (Negative)	20	DP_PWR (+3.3V input)

5. Mechanical Specification

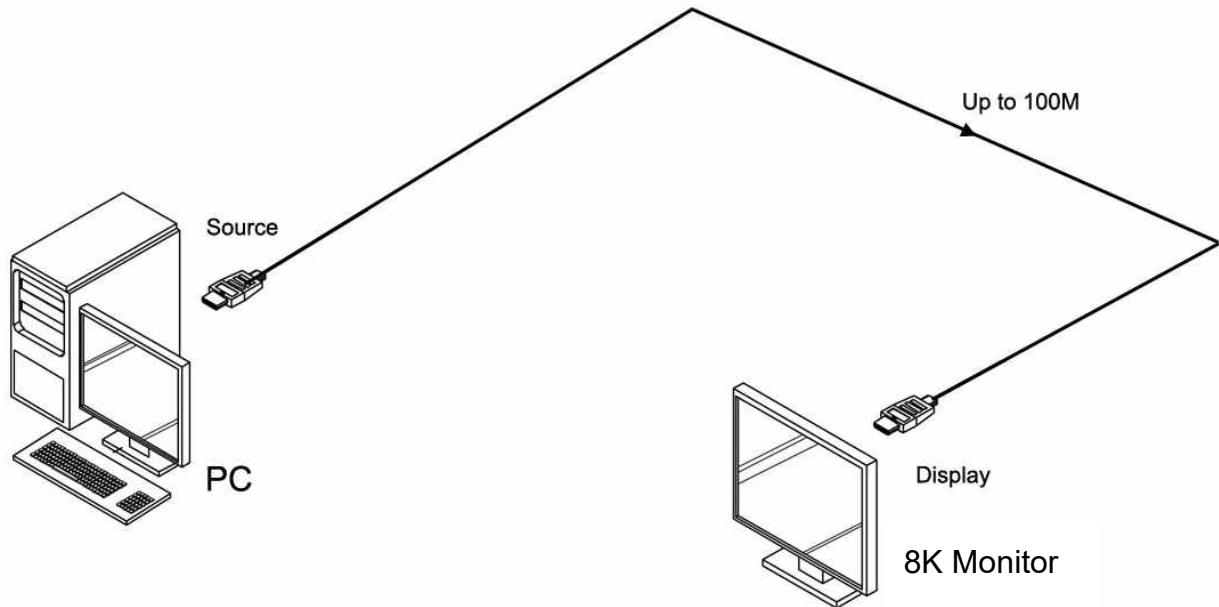
5.1 Cable Dimension



5.2 Design drawing



5.3 Connection



6. Regulatory

6.1 EMC & Safety Agency approval

6.1.1 CE-EMC compliance:

This Product is investigated to EN55032:2015, EN55035:2017, EN61000-3-2:2014 and EN61000-3-3:2013

6.1.2 FCC compliance:

This Product is investigated to FCC 47CFR part 15(ANSI C63.4:2014)

6.1.3 Safety

The basic standard used to investigate products in this category is UL 1651, "Optical Fiber Cable."

7. Packing Information

Length(M)	Net Weight(g)	Giftbox Dimension (W x L x H)mm	Gross Weight(g)	Carton Box Dimension (W x L x H)mm	TOTAL Weight(Kg)
10	290	217 x 203 x 43	420	595 x 305 x 345	8.8
20	565	217 x 203 x 43	690	595 x 305 x 345	13.7
30	820	247 x 233 x 83	1,025	595 x 305 x 345	9.5
40	1,080	247 x 233 x 83	1,280	595 x 305 x 345	11.5
50	1,365	247 x 233 x 83	1,565	595 x 305 x 345	13.8
60	1,745	307 x 293 x 93	1,880	595 x 305 x 345	10.7
70	1,895	307 x 293 x 93	2,185	595 x 305 x 345	12.5
80	2,165	307 x 293 x 93	2,500	595 x 305 x 345	13.8
90	2,440	307 x 293 x 93	2,810	595 x 305 x 345	15.3
100	2,695	307 x 293 x 93	2,895	595 x 305 x 345	15.8

Note : Maximum load Quantity

-10~20M : 18EA

-30~50M : 8EA

-60~100M : 5EA

8. RoHS

OPHIT is fully aware of the requirement under the **Restriction of Hazardous Substances in Electrical and Electronic Equipment Directive EU 2015/863(RoHS3)**, which adds four new restricted substances to the previous Directive 2011/65/EU(RoHS2).

Hereby we guarantee that we do not intentionally use the substances described below and based on third party chemical analysis the thresholds of the substances as indicated are not exceeded for our all products.

Substance	CAS #	RoHS Limity by % (PPM)
Lead (Pb)	7439-92-1	0.1% (1000 PPM)
Mercury (Hg)	7439-97-6	0.1% (1000 PPM)
Hexavalent Chromium (CrVI)	15840-29-9	0.1% (1000 PPM)
Polybrominated Biphenyls (PBB)	-	0.1% (1000 PPM)
Polybrominated Diphenyl Ethers (PBDE)	-	0.1% (1000 PPM)
Cadmium (Cd)	7440-43-9	0.01% (100 PPM)
Bis(2-Ethylhexyl) phthalate(DEHP)	117-81-7	0.1% (1000 PPM)
Benzyl butyl phthalate(BBP)	85-68-7	0.1% (1000 PPM)
Dibutyl Phthalate(DBP)	84-74-2	0.1% (1000 PPM)
Diisobutyl Phthalate(DIBP)	84-69-5	0.1% (1000 PPM)

Banned Substances by RoHS Directive 2011/65/EU+2015/863/EU, EN50581:2012

OPHIT will continue to monitor any new amendments/changes to Directive and subsequently review our all products with regards to compliance. OPHIT will also ensure that any new information is communicated to its customers, suppliers and stakeholders as required.

Signature : Jong-Kook, Moon *Jong-kook, Moon*
Title/Issue date : President/July.22.2019

9. REACH

The European REACH Regulation 1907/2006 on Registration, Evaluation, Authorization, and Restriction of Chemicals(REACH), Annex XV II entered into Force in June 2009, and affects all companies producing, Importing, using, or placing Products on the European market. The aim of the REACH regulation is to ensure a high Level of protection of human health and the environment from chemical substances.

OPHIT Co., Ltd substances management system follow and complies with the current revision of the REACH Regulation on the substances as identified by ECHA(European Chemical Agency).

OPHIT Co., Ltd products are considered articles as defined in REACH Article 3(3). These products/articles under normal and reasonable conditions of use do not have intended release of substances. Therefore the requirement in REACH Article 7(1)(b) for registration of substances contained in these products/articles does not apply.

OPHIT Co., Ltd products/articles, do not contain **Substances of very High Concern** or if there **SVHC** in the product/article, the content is less than the 0.1%(wt/wt) as defined by REACH Article 57, Annex XIV, Directive 67/548/EEC. Therefore the requirement in REACH Article 7(2) to notify ECHA if a product/article contains more than 0.1% wt/wt of an SVHC and tonnage exceeding 1 tone per importer per year is not applicable.

OPHIT's European operations do not manufacture or import chemicals, therefore OPHIT Co., Ltd has no obligation to resister substances.



Jong-Kook, Moon
President

OPHIT Co., Ltd ACCEPTS NO DUTY TO NOTIFY USERS OF THIS OF DECLARATION OF UPDATES OR CHANGES TO THIS DECLARATION.



Declaration of Conformity

OPHIT CO., LTD

3F Suntechnovil, 77Deyoung-daero 1471beon-gil, Yongtong-gu, Suwon-city
Gyeonggi-do, Korea

EU Authorized Representative : Foreseeson GmbH

Industriestasse 38a, 63150 Heusensramm, Germany(Tel +49(0) 6104-64398 0

Declare under our sole responsibility that the product

Model : FTAD-AXXX("XXX" is 10~100)

To which this declaration relates in conformity with the following standards or normative documents;

EMC Part

EN 55032 : 2015

EN 55035 : 2017

EN 61000-3-2 : 2014(IEC61000-3-2 : 2014)

EN 61000-3-3 : 2013(IEC61000-3-3 : 2013)

We, the undersigned, hereby declare that the equipment specified above conforms to the above Directive(s)

Manufacture Signature

Date of issue : June, 2019

Signature : Jong-Kook, Moon

FC Declaration of Conformity

*with The Part2 and Part15
of FCC 47 CFR Requirement*

Model Name : FTAD-AXXX
Product Name DisplayPort Active Optical Cable
Trade Name OPHIT CO.,LTD.
Manufactures Name : OPHIT CO.,LTD.
(Address) 3F Suntechnovil, 77, Deogyong-daero 147beon-
gil,Yeongtong-gu, Suwon-si, Gyeonggi-do, 16681,
KOREA
Responsible party : Foreseason Custom Displays, Inc.,
(Address) 2210E, Winston Road Anaheim,
CA 92806, USA
(Contact Person) Mr. Jay Han / Senior Engineer
(Telephone Number) +1-714 300 0540
Rule Part(s) : FCC Part 15 subpart B
Test Procedure(s) : ANSI C63.4(2014)
Reference Test Report : DREFCC1907-0207 by DT&C Co., Ltd.

This document declare that this device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operating.

Date of issued : June 11, 2019

Signature of authorized person :



President
OPHIT Co., Ltd.