

# PRODUCT DATA SHEET

## DSFP

*Optical DisplayPort Extension System*



## Revision History

Version Number	Revision Date	Page	Description of Changes
1.0	Jul.03, 2012	ALL	Initial Version
1.1	Mar.13, 2014	4	Max Resolution 4K support, HDCP compliant
1.2	Jun.16, 2015	10, 11	ROHS2, Reach DOC Added.
1.3	Oct.23.2019	ALL	Renewal Specification

### PROPRIETARY NOTE

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## 1. General Description

**DSFP**, This unique fiber optical transceiver let your PC, digital HDTV or Projector extend up to 1,000 meter(3300ft) away from host based on DisplayPort standard without signal degradation by 4K(3840x2160) / 30Hz resolution.

- High Speed and long distance transmission by optical system
- Compatible with DisplayPort standard V1.1a
- Main-link video signal / AUX data and Hot Plug Detection signal is transmitted by-  
1 channel multimode optical fiber
- External power supply use
- DPCD(DisplayPort Configuration Data) compliant
- HDCP(High-bandwidth Digital Contents Protection) compliant
- Does not support DP Dual Mode

## 2. General Specification

### 2.1 Specification

Parameter	Symbol	
	Transmitter	Receiver
Optical Converter	850nm, 4Ch Transmit OSA 911nm, 1Ch VCSEL 980nm, 1Ch PIN P/D Diode	850nm, 4Ch Receive OSA 980nm, 1Ch VCSEL 911nm, 1Ch PIN P/D Diode
Input and Output Signal	ANSI8B/10B (DisplayPort 1.1a standard)	
Video Bandwidth	3.5Gbps / Channel	
Module Dimension	33 x 12 x 282 mm (W x H x D)	
Module Weight	--	--
Using electrical Connector	20 pin DisplayPort Plug(input)	20 pin DisplayPort Plug (Output)
Optical Connector	1 SC Connector	1 SC Connector
Recommended Fiber	50/125um Multi-mode glass-fiber	
Maximum Supporting Resolution	4K (3840x2160) / 30Hz	

### 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
Power Supply	-0.3 ~ 5.5 V
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.

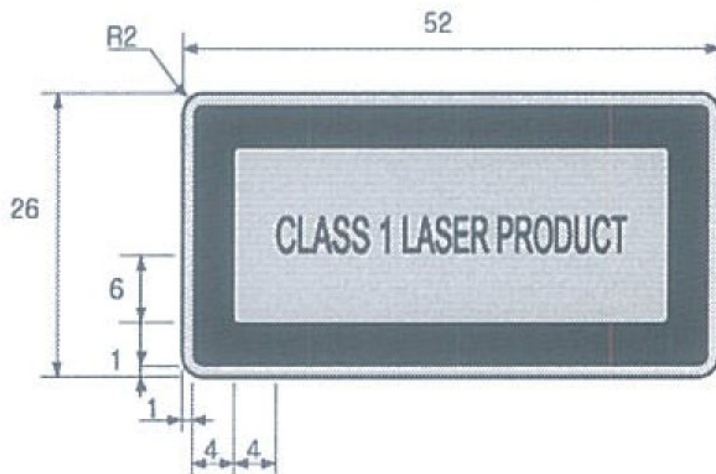
**4. Electrical Specification**

4.1. Transmitter Module

	Parameter	Symbol	Min	Typ	Max	Units	Condition
<b>P O W E R</b>	Supply Voltage (Option External Power)	$V_{CC}$	4.5	5.0	5.5	V	
	Supply Current	$I_{CC}$	-	210	260	mA	
	Power Dissipation	$P_O$	-	1.05	1.30	W	
<b>S I G N A L</b>	Diff. P-to-P Input level 1	$V_{TX-DIFF-PP1}$	0.34	0.4	0.46	V	
	Diff. P-to-P Input level 2	$V_{TX-DIFF-PP2}$	0.51	0.6	0.68	V	
	Diff. P-to-P Input level 3	$V_{TX-DIFF-PP3}$	0.69	0.8	0.92	V	
	Diff. P-to-P Input level 4	$V_{TX-DIFF-PP4}$	1.02	1.2	1.38	V	
	TX DC Common Mode	$V_{TX-DC-CM}$	0		2.0	V	
	TX AC Common Mode	$V_{TX-AC-CM}$			20	mV	

Transmitter module of Model DSFP includes 4 channel VCSEL(Vertical Surface Emitting Laser Diode) with 850, 911, 980nm invisible laser radiation.

Transmitter module of DSFP is Class 1 Laser Product.



*Note-Do not view directly laser module of transmitter or the end of the other side of optical cable connected to transmitter with optical instrument.*

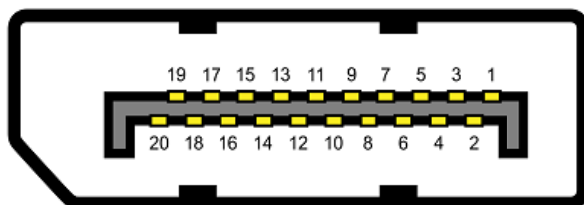
4.2 Receiver Module

	Parameter	Symbol	Min	Typ	Max	Units	Condition
<b>P O W E R</b>	Supply Voltage (External Power)	V <sub>CC</sub>	4.5	5.0	5.5	V	
	Supply Current	I <sub>CC</sub>	-	230	260	mA	
	Power Dissipation	P <sub>O</sub>	-	1.15	1.30	W	
<b>T M D S</b>	Diff. P-to-P Output Voltage	V <sub>RX-DIFF-PP-H</sub>	120			mV	For HBR
	Diff. P-to-P Output Voltage	V <sub>RX-DIFF-PP-R</sub>	40			mV	For HBR
	RX DC Common Mode	V <sub>RX-DC-CM</sub>	0		2.0	V	

4.3 Connector Pin Assignment

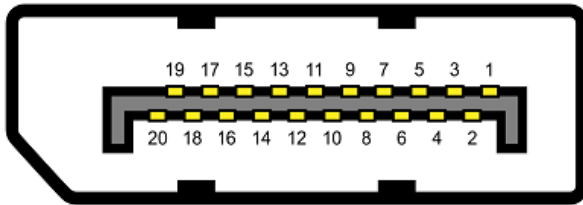
4.3.1 Transmitter

Pin	Signal Assignment	Pin	Signal Assignment
1	ML_Lane0(p)	2	GND
3	ML_Lane0(n)	4	ML_Lane1(p)
5	GND	6	ML_Lane1(n)
7	ML_Lane2(p)	8	GND
9	ML_Lane2(n)	10	ML_Lane3(p)
11	GND	12	ML_Lane3(n)
13	No Connect(CONFIG1)	14	No Connect(CONFIG2)
15	AUX_CH(p)	16	GND
17	AUX_CH(n)	18	Hot Plug Detect
19	Return	20	DP_PWR



4.3.2 Receiver

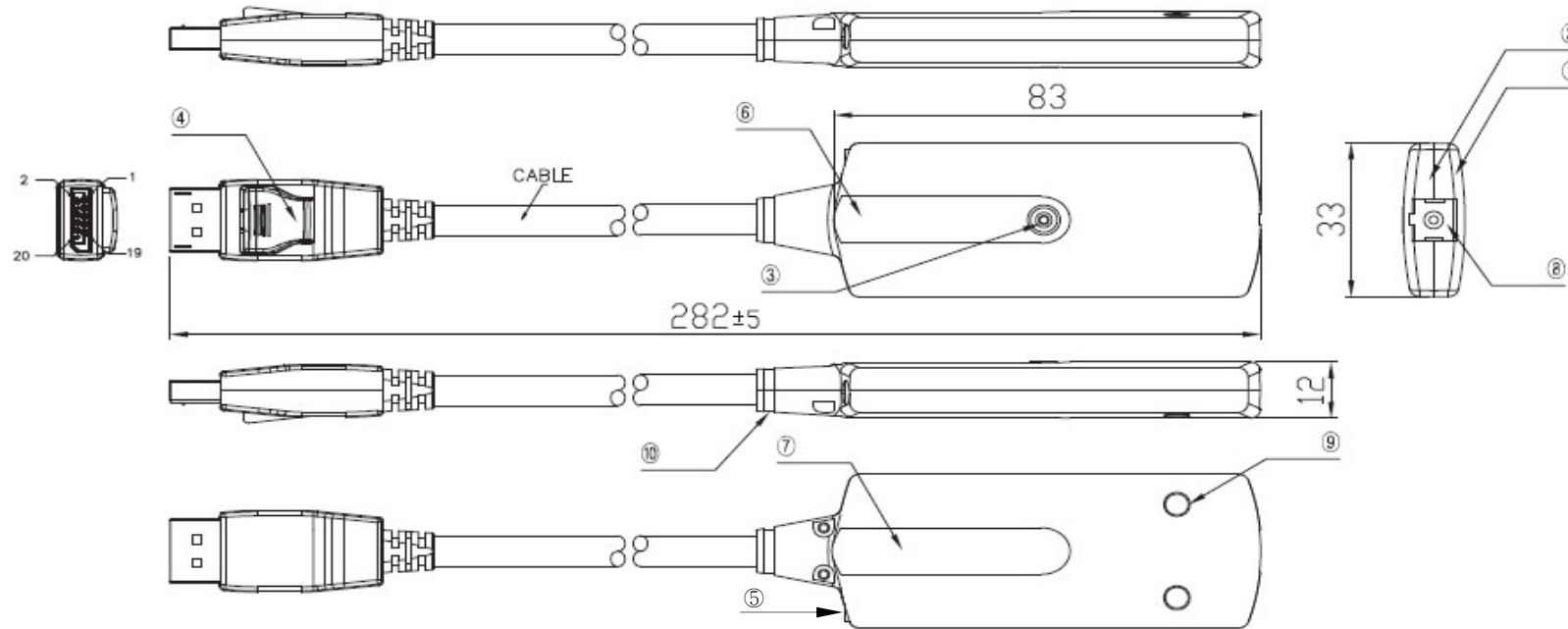
Pin	Signal Assignment	Pin	Signal Assignment
1	ML_Lane3(n)	2	GND
3	ML_Lane3(p)	4	ML_Lane2(n)
5	GND	6	ML_Lane2(p)
7	ML_Lane1(n)	8	GND
9	ML_Lane1(p)	10	ML_Lane0(n)
11	GND	12	ML_Lane0(p)
13	No Connect(CONFIG1)	14	No Connect(CONFIG2)
15	AUX_CH(p)	16	GND
17	AUX_CH(n)	18	Hot Plug Detect
19	Return	20	No Connect(DP_PWR)





## 5. Mechanical Specification

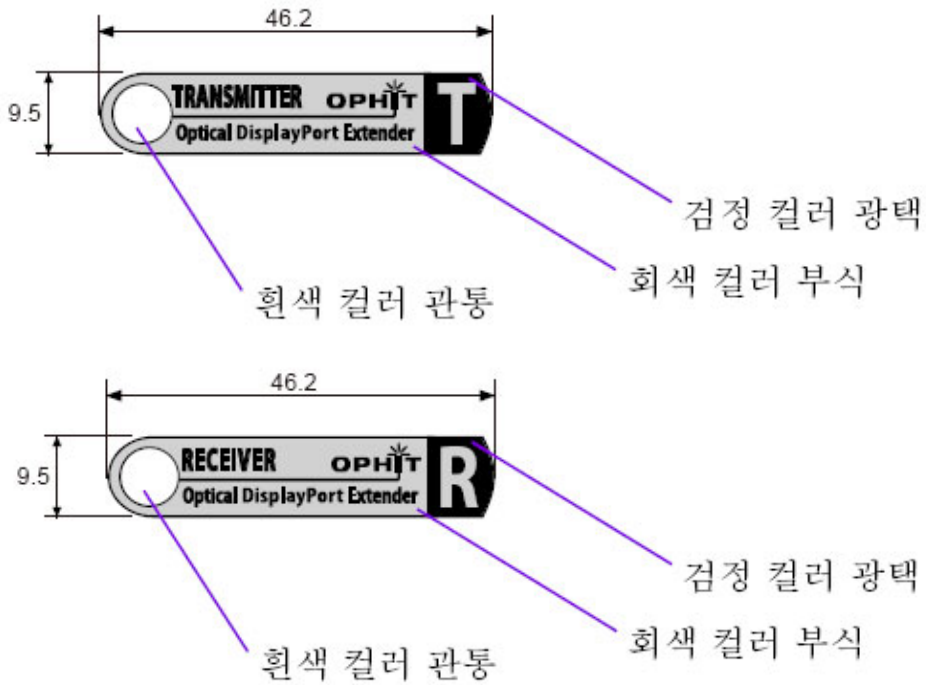
### 5.1 Transmitter and Receiver Case Dimension



NO	PART NAME	NO	PART NAME	NO	PART NAME	NO	PART NAME
1	TOP CASE	4	DISPLAYPORT	7	SERIAL LABEL	10	RING LABEL
2	BOTTOM CASE	5	POWER JACK	8	SC CONNECTOR	-	
3	LED INDICATOR	6	LOGO LABEL	9	RUBBER PAD	-	

**GENERAL SPECIFICATION V1.3**  
**DSFP**

5.2 Design drawing  
5.2.1 Logo Label



NOTE-METAL, Adhesion

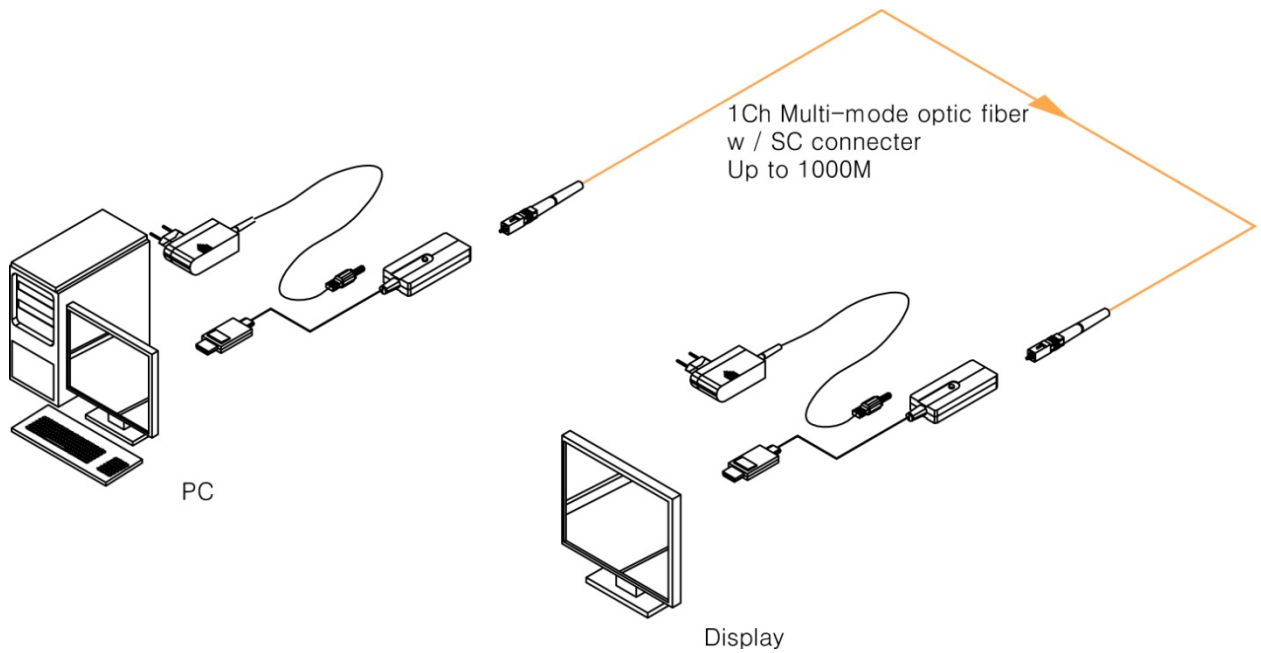
5.2.2 Ring Label  
5.2.2.1 Transmitter



5.2.2.2 Receiver

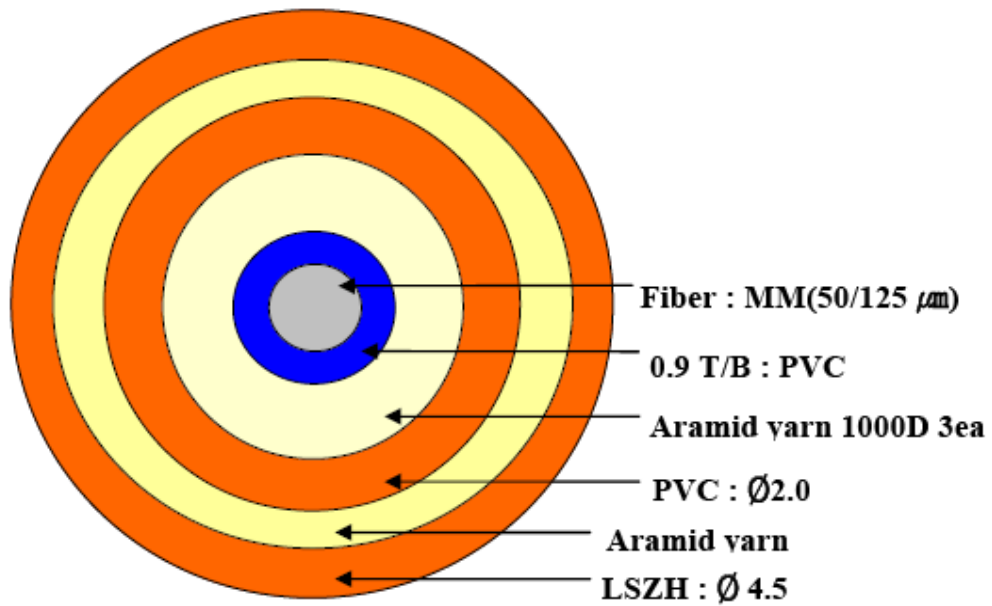
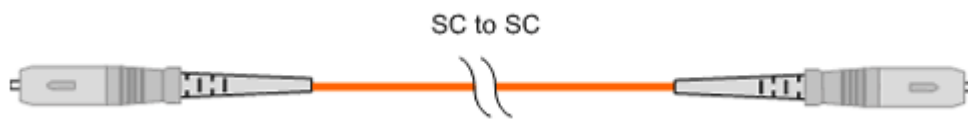


5.3 Connection



5.4 Optical Cable

- Optical Fiber Cable (MMF 50/125)



## 6. Regulatory

### 6.1 EMC & Safety Agency approval

#### 6.1.1 CE-EMC compliance:

This Product is investigated to EN55022:2010/AC 2011, EN55024:2010 and EN61000-3-3:2008

#### 6.1.2 FCC compliance:

This Product is investigated to FCC 47CFR part 2 and part 15

#### 6.1.3 Eye Safety

CLASS 1 LASER PRODUCT-IEC60825-1:2007(2<sup>nd</sup> Edition)

## 7. Packing Information

Set(Unpacking, DSFP Only)	285.0mm*33.0mm*12.0mm	58.0g
Package(1Set, Inner Box Packing)	350.0mm*177.0mm*62.0mm	630.0g
Package(Multi, 15PCS Packing)	595.0mm*305.0mm*345.0mm	11.0Kg

**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-Etylhexyl) 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)
Disobutyl 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.



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Jong-Kook, Moon  
President

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