

# **Specification for**

**Model : HSP**

Revised : July 31, 2012  
Original Release Date : Dec 24, 2009

# **OPHIT**

## Revision History

Version Number	Revision Date	Author	Description of Changes
1.0	December 24, 2009	D.H. Kim	Initial Version
2.0	July 28, 2011	K.H. Kim	Supports HDCP (Rev 1.1) Extend distance (300 meter) Ordering Information (Dummy No.) Electrical Specification (Supply Current)
2.1	Feb 07, 2012	J.H. Lee	Document Form modified
2.2	Apr 09, 2012	J.H. Lee	Ordering Information Removed
3.0	July 12, 2012	K.H. Kim	Case Dimension Electrical Specification (Supply Current)
3.1	July 31, 2012	J.H. Lee	Case Dimension Changed

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## 1. General Description

**HSP**, optical HDMI extension module, is designed to let digital flat panel display signal extend over 300 meters away from host based on HDMI standard by optical transmission technology. Its small package and transmit up to four video and one low-speed lane, while simultaneously receiving one low-speed signal, all on one multimode fiber.

- Long distance transmission of digital graphic signal corresponding to T.M.D.S -over 300 meter (1,000ft) by multi-mode one fiber.
- TMDS video signals and EDID data are transmitted by 1 channel multimode optical fiber
- Maximum Support resolution – WUXGA (1920x1200)
- Supports HDCP(Rev 1.1) by DDC channel
- Small size for insertion into internal system
- External power supply for Transmitter is optional. Automatic power switch is included.

## 2. General 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	TMDS Signal HDMI 1.3a standard)	TMDS Signal (HDMI 1.3a standard)
Video Bandwidth	3.5Gbps / Channel	
Module Dimension	33 x 12 x 282 mm (W x H x D)	
Module Weight	--	--
Used electrical Connector	HDMI A Type Plug (input)	HDMI A Type Plug (Output)
Optical Connector	1 SC Connector	1 SC Connector
Recommended Fiber	50/125um Multi-mode glass-fiber	
Maximum Supported Resolution	WUXGA(1920x1200) / 60Hz	

### 3. Absolute Maximum Ratings

Parameter	Symbol	Minimum	Maximum	Units
Power Supply	$V_{CC}$	-0.3	+5.5	V
Operating temperature	$V_{OT}$	0	+50	°C
Storage temperature	$V_{ST}$	-20	+70	°C
Relative Humidity	$H_{RH}$	10	80	RH

**NOTICE**

Stresses greater than those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. These are stress ratings 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 Electrical Specification

#### 4.1.1 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	$I_{CC}$	-	260	300	mA	
	Power Dissipation	$P_O$	-	1.3	1.5	W	
<b>T M D S</b>	Reference voltage for graphic signal	$V_{REF}$	3.1	3.3	3.5	V	
	Single-ended high level input voltage	$V_H$	$V_{REF} - 0.01$		$V_{REF} + 0.01$	V	
	Single-ended low level input voltage	$V_L$	$V_{REF} - 0.6$		$V_{REF} - 0.4$	V	
	Single-ended input swing voltage	$V_{ISWING}$	0.4		0.6	V	
	Single-ended standby input voltage		$V_{REF} - 0.01$		$V_{REF} + 0.01$	V	
	Data Output Load	RLD		50		$\Omega$	

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

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

Transmitter module of HSP is Class 1M Laser Product.

#### 4.1.2 Receiver Module

	Parameter	Symbol	Min	Typ	Max	Units	Condition
<b>P O W E R</b>	Supply Voltage (External Power)	$V_{CC}$	4.5	5.0	5.5	V	
	Supply Current	$I_{CC}$	-	230	250	mA	
	Power Dissipation	$P_O$	-	1.15	1.25	W	
<b>T M D S</b>	Reference voltage for graphic signal	$V_{REF}$	3.1	3.3	3.5	V	
	Single-ended output swing voltage	$V_{OSWING}$	0.4		0.6	V	AC couple
	Data Input Load	RLD		50		$\Omega$	

## 4.2 Connector Pin Assignment

### 4.2.1 Transmitter

Pin	Signal Assignment	Pin	Signal Assignment
1	T.M.D.S. Data2 +	11	T.M.D.S Clock Shield
2	T.M.D.S. Data2 Shield	12	T.M.D.S Clock -
3	T.M.D.S. Data2 -	13	CEC
4	T.M.D.S. Data1 +	14	No Connect
5	T.M.D.S. Data1 Shield	15	SCL
6	T.M.D.S. Data1 -	16	SDA
7	T.M.D.S. Data0 +	17	DDC/CEC Ground
8	T.M.D.S. Data0 Shield	18	+5V POWER
9	T.M.D.S. Data0 -	19	Hot Plug Detect
10	T.M.D.S Clock +		

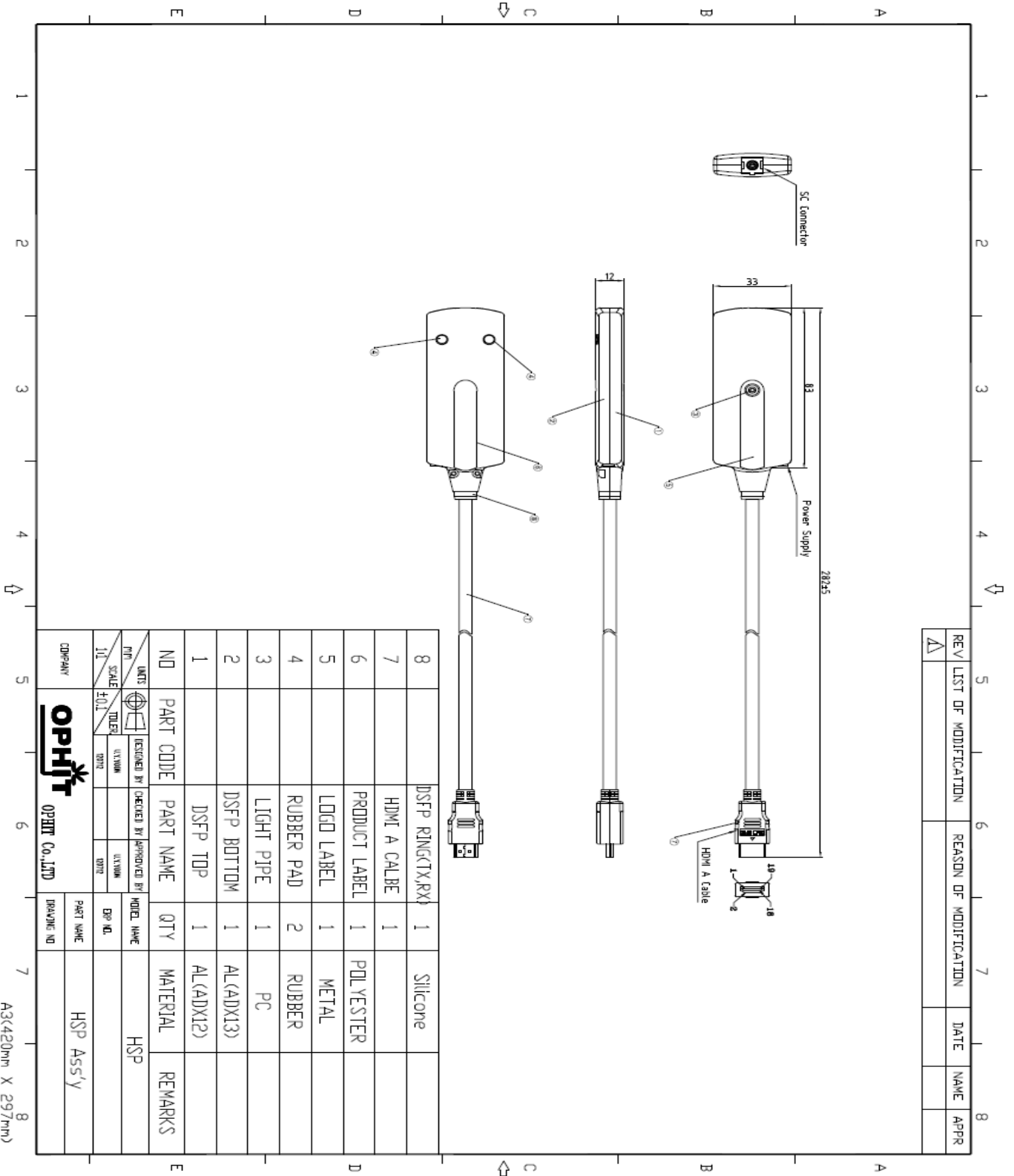
### 4.2.2 Receiver

Pin	Signal Assignment	Pin	Signal Assignment
1	T.M.D.S. Data2 +	11	T.M.D.S Clock Shield
2	T.M.D.S. Data2 Shield	12	T.M.D.S Clock -
3	T.M.D.S. Data2 -	13	CEC
4	T.M.D.S. Data1 +	14	No Connect
5	T.M.D.S. Data1 Shield	15	SCL
6	T.M.D.S. Data1 -	16	SDA
7	T.M.D.S. Data0 +	17	DDC/CEC Ground
8	T.M.D.S. Data0 Shield	18	Out +5V POWER
9	T.M.D.S. Data0 -	19	Hot Plug Detect
10	T.M.D.S Clock +		

### 5 Mechanical Specification

#### 5.1 Case Dimension

##### 5.1.1 Transmitter & Receiver

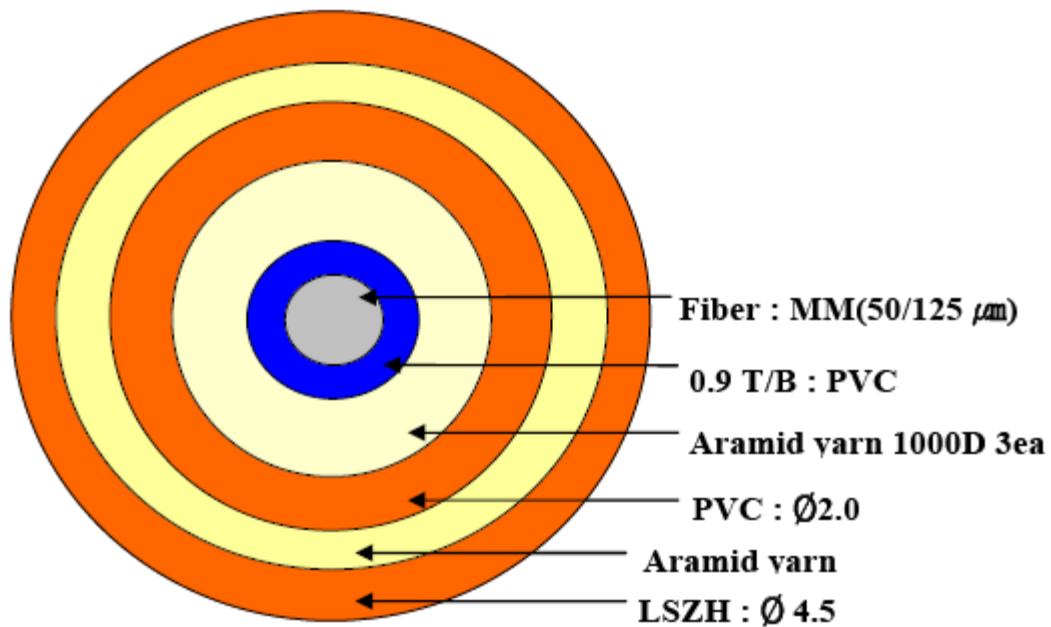
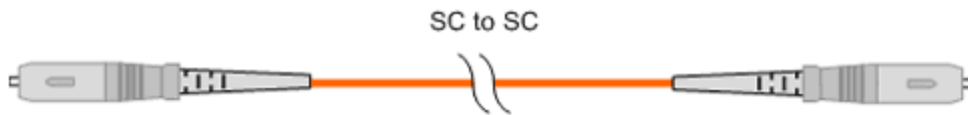


A3(420mm X 297mm)



5.2 Cable Information

- Optical Fiber Cable (MMF 50/125)



## 6. RoHS

### Certificate of Conformance RoHS

Dear Customer,

On January 27, 2003, the European Parliament and the Administrative Council adopted Directive 2002/95/EC (RoHS) that concerns the "Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment".

The parts currently delivered by **OPHIT CO., LTD.** are already free of lead (Pb), mercury (Hg), cadmium (Cd), hexavalent chromium (Cr<sup>6+</sup>), polybrominated biphenyl (PBB) and polybrominated diphenyl (PBDE).

This Certification of Conformance is to certify that the products listed below comply with RoHS Directive mentioned above:

- HSP

If you have any further questions regarding the RoHS compliance of parts delivered by **OPHIT CO., LTD.**, please do not hesitate to contact us at [support@ophit.com](mailto:support@ophit.com).

Best regards,

JONG-KOOK MOON/CEO

OPHIT CO., LTD.