



DPM2

Optical DisplayPort Extension system

Customer :

Specification for

Model : DPM2

Revised : February 4, 2015
Original Release Date : July 1, 2014

OPHIT

Revision History

Version Number	Revision Date	Author	Description of Changes
0.1	July 1, 2014	H.S YANG	Initial Version
0.2	November 24, 2014	H.S YANG	Electrical Specification modified
1.0	February 4, 2015	H.S YANG	Initial Version (Production Version)

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1. General Description

DPM2, This fiber optic cable system let your DisplayPort compliant display device extend up to 40 meters (131.2 fit) away from host based on DisplayPort standard without signal degradation by 4K UHD (3840 x 2160 @ 60Hz) resolution.

- High speed and long distance transmission by optical system
- compatible with DisplayPortV1.2a standard by VESA
- The use of standard DisplayPort source-sink connector
- MMF optical fiber + copper hybrid cable structure
- HBR2(High Bit Rate) Cable Assembly (up to 5.4Gbps Data Rate)
- AUX and Hot Plug channels are transmitted by copper line
- DPCD/HDCP compliant
- Power operation LED installed
- Gender or signal conversion equipment does not guarantee
- Internal source power supply need for proper operation
- Dual mode is not support.

2. General Specification

Parameter	Symbol	
	Transmitter	Receiver
Optical Converter	4 ch 850nm Multi-mode VCSEL	4 ch GaAs PIN photo Diode
Input and Output Signal	DisplayPort Signal (Std. V1.2a)	
Video Bandwidth	4 lanes, 21.6 Gbps(HBR2)	
Module Size	114 x 25 x 21mm (WxDxH)	114 x 25 x 21mm (WxDxH)
Using electrical connector	20 pin DisplayPort Plug(Male)	20 pin DisplayPort Plug(male)
Applied Fiber	50/125 μ m Multi-mode glass-fiber	

3. Absolute Maximum Ratings

Parameter	Rating
Storage temperature	-20°C ~ +70°C
Operating temperature	0°C ~ +50°C
Power Supply(DC)	-0.3 ~ +3.3V
Relative Humidity	10 ~ 80 %
Lead solder temperature	260°C, 10 seconds

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 Electrical Specification

4.1.1 Transmitter (Source) Module

Parameter		Symbol	Min	Typ	Max	Units	Condition
P O W E R	Supply Voltage(DC)	Vcc	+2.9	+3.3	+3.6	V	
	Supply Current	Icc		0.18		A	4K 60Hz(MST)
	Power Dissipation	Po		0.92		W	
S I G N A L	Diff. P-to-P Input level 1	VTX-DIFF-PP1	0.34	0.4	0.46	V	
	Diff. P-to-P Input level 2	VTX-DIFF-PP2	0.51	0.6	0.68	V	
	Diff. P-to-P Input level 3	VTX-DIFF-PP3	0.69	0.8	0.92	V	
	Diff. P-to-P Input level 4	VTX-DIFF-PP4	1.02	1.2	1.38	V	
	TX DC Common Mode	VTX-DC-CM	0		2.0	V	
	TX AC Common Mode HBR2	VTX-AC-CM			30	mV rms	

Transmitter module of Model DPM2 includes 4 channel VCSEL(Vertial Surface Emitting Laser Diode) with 850 nm invisible laser radiation.

Transmitter module of DPM2 is Class 1 Laser Product.

4.1.2 Receiver(Sink) Module

Parameter		Symbol	Min	Typ	Max	Units	Condition
P O W E R	Supply Voltage	Vcc	+2.9	+3.3	+3.6	V	
	Supply Current	Icc		0.21		A	4K 60 Hz(MST)
	Power Dissipation	Po		1.05		W	
S i g	Diff. P-to-P Output Voltage	T _{RX-DIFFp-p_HBR2}	70			mV	For HBR2
	Diff. P-to-P Output Voltage	V _{RX-DIFFr-p}	40			mV	For RBR

n	RX DC Common Mode	$V_{RX-DC-CM}$	0		2.0	V	
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4.2 Connector Pin Assignment

Transmitter (Source, Male)

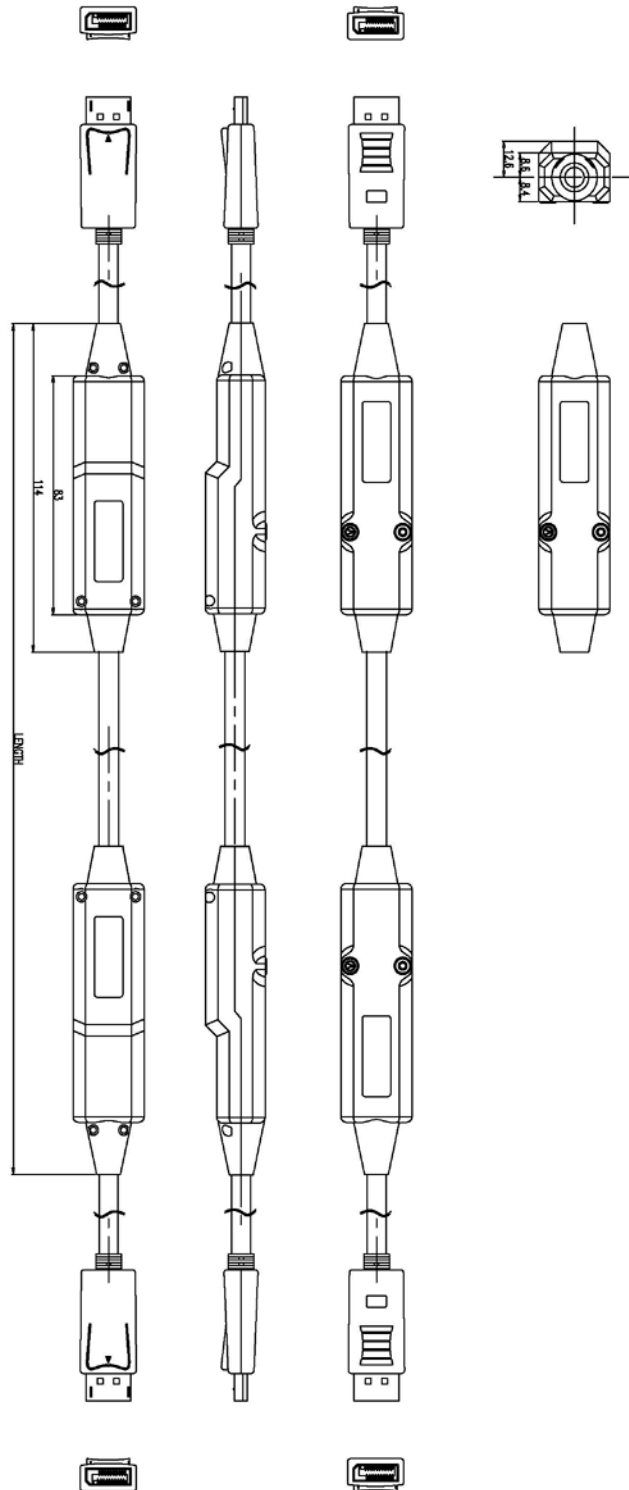
Pin	Signal Assignment	Pin	Signal Assignment
1	Main Link Lane 0 (Positive)	11	Ground
2	Ground	12	Main Link Lane 3 (Negative)
3	Main Link Lane 0 (Negative)	13	Config1 (Ground)
4	Main Link Lane 1 (Positive)	14	Config2 (Ground)
5	Ground	15	AUX Channel (Positive)
6	Main Link Lane 1 (Negative)	16	Ground
7	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)

Receiver (Sink, Female)

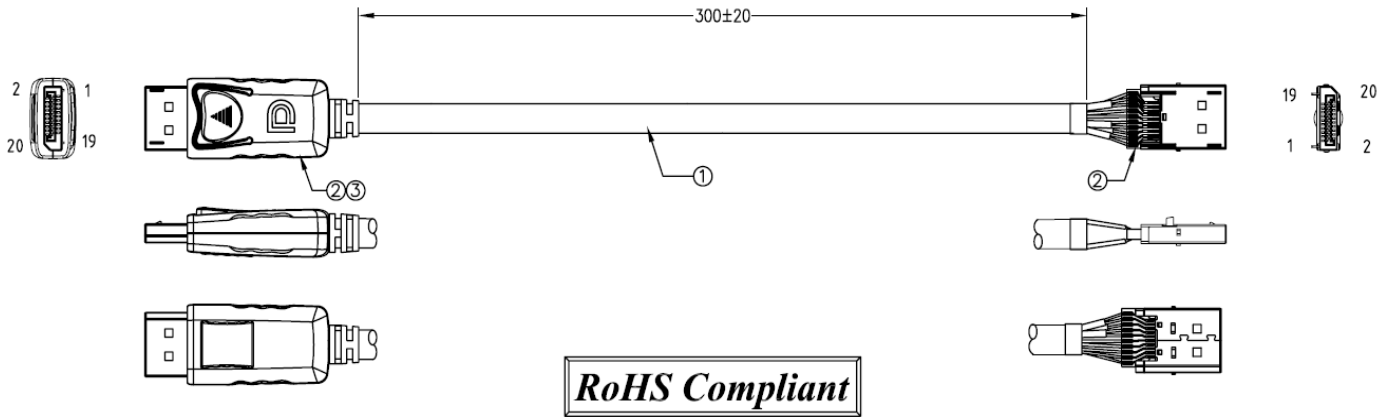
Pin	Signal Assignment	Pin	Signal Assignment
1	Main Link Lane 0 (Positive)	11	Ground
2	Ground	12	Main Link Lane 3 (Negative)
3	Main Link Lane 0 (Negative)	13	Config1 (Ground)
4	Main Link Lane 1 (Positive)	14	Config2 (Ground)
5	Ground	15	AUX Channel (Positive)
6	Main Link Lane 1 (Negative)	16	Ground
7	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	Not Connect(DP_PWR)

5. Mechanical Specification

5.1 Case Dimension

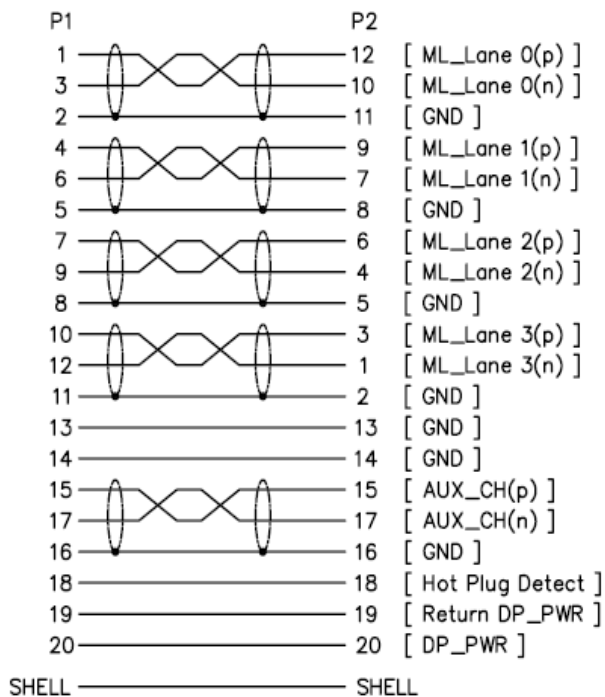


5.2.1 Copper Cable Information



3	INNERMOLD	PE LOW DENSITY
2	CONNECTOR	DISPLAYPORT PLUG CONTACT: 15u" SHELL: G/F W/LATCH W/COVER BLACK
1	CABLE	Display Port CABLE UL20276 30AWG OD: 6.0 BLACK
NO.	PART NAME	SPEC DESCRIPTION

PIN ASSIGNMENT:



Electrical character:

- a. 100% open & short testing.
- b. Withstanding voltage: DC 300V 0.01Sec.
- c. Insulation resistance: 10M Ohm(Min.).
- d. Conductive resistance: 3 Ohm(Max.).

5.2.2 Optical Cable Information

The construction of 4 optical fibers and 6 copper wires cable shall be in accordance with Figure 1 and Table 1.

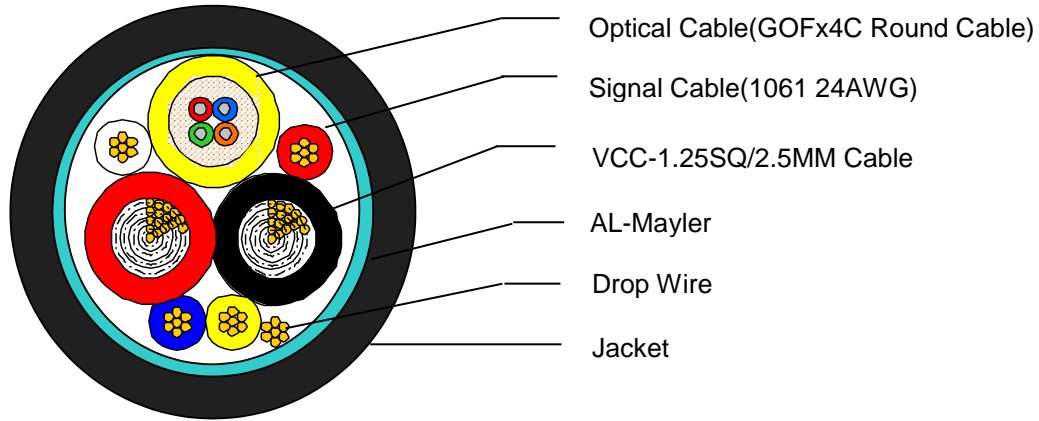


Figure 1. Cable structure of DPM2

Table 1. Specification of electrical wire for DPM2 cable

The Dimension of DPM2 Cable		
Items	Unit	Specification
DVI Cable Make-up	-	Layer Stranding
Drain Wires (Size/Stranded)	mm(AWG)	-0.203/7 (24)
AL-Mylar Screen Shield	-	A helically
Cable Outer Diameter	mm	7.40±0.20
Jacket Color	-	FR-PVC(Orange, Blue, Black)
Cable Marking	-	If need

The construction of 4 optical fibers and 4 copper wires cable shall be in accordance with Figure 2 and Table 2 and 3.

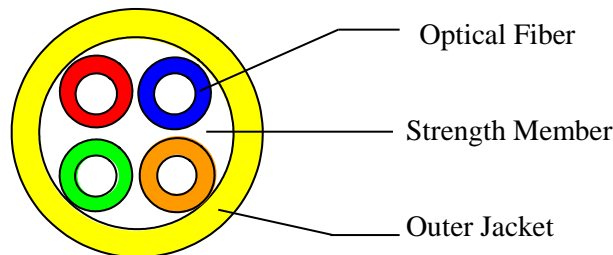


Figure 2. Cable structure of GOFx4C Round Cable

Table 2. Fiber Cable Construction

Item		Description
Optical Fiber	Number	4
	Structure	Figure 1
Strength Member		Aramid Yarn
Outer Jacket	Material	FR-PVC(Yellow)
	Approx.Thickness	1.6mm
Nominal Outside Diameter		φ4.0±0.4mm
Approximate Net Weight		10kg/km
Cable Identification		OPTICAL CABLE

Table 3. Fiber Cable Characteristics

Item	spec.	unit	Condition
Storage Temperature	-40 ~ 70	°C	Spooled
Operational Test	-20 ~ 70	°C	-
Max. Tensile Load	245	N	By careless handling(short term)
Min. Radius Bend	75	mm	By careless handling(short term)
	125		After installing(long term)
Crush Resistance	490	N/50mm	By careless handling(short term)



Declaration of RoHS Compliance

DIRECTIVE 2002/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL OF 27. January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment

Product Name : DPM2

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 products.

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

Substance	RoHS Limity by Weight	RoHS Limity by % (PPM)
Lead (Pb)	1000mg/kg	0.1% (1000 PPM)
Mercury (Hg)	1000mg/kg	0.1% (1000 PPM)
Hexavalent Chromium (CR VI)	1000mg/kg	0.1% (1000 PPM)
Polybrominated Biphenyls (PBB)	1000mg/kg	0.1% (1000 PPM)
Polybrominated Diphenyl Ethers (PBDE)	1000mg/kg	0.1% (1000 PPM)
Cadmium (Cd)	100mg/kg	0.01% (100 PPM)

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