

# PRODUCT DATA SHEET

## OMP-DP

*MPO/MTP type optical extender  
for DisplayPort Ver. 1.2a/1.4*



## Revision History

Version Number	Revision Date	Page	Description of Changes
1.0	May. 28 <sup>th</sup> . 2020	ALL	Initial Version
1.1	Jan. 14 <sup>th</sup> . 2021	11, 12	Adding cable specification/packaging information
1.2	May. 11 <sup>th</sup> . 2021	10	Mechanical design change
1.3	Jun. 18 <sup>th</sup> . 2021	8,9 15, 16	Adding Optical Characteristics Declaration Documents of CE and UKCA
1.4	Sep. 24 <sup>th</sup> . 2021	4	Adding 70m/4K@120Hz

### PROPRIETARY NOTE

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## 1. General Description

### 1.1 Introduction

**OMP-DP**, is MPO/MTP type optical cable extender for DisplayPort standard.

The OMP-DP consists of transmitting part and receiving part, both of which are connected by a MPO/MTP optical cable. The OMP-DP's transmitter is connected to the DisplayPort source device and the receiver is connected to the DisplayPort sink device.

Video and audio signals can be transmitted up to 200m when a system using DisplayPort 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
- Support OM3 fiber with MPO/MTP connector
- DPCD/HDCP compliant
- Aux and Hot plug channels are transmitted by optical fiber
- Maximum transmission distance : 200m(70m/4K@120Hz)
- External power required in RX(No required in TX)

### 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 VCSEL, 1xPD, 1xVCSEL for sideband	1x4 Array PD, 1xPD, 1xVCSEL for sideband
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(Male)	20 pin DisplayPort(Male)
Recommend optical fiber	MPO/MTP, 8core(or 12 Core), OM3, 50/125 $\mu$ m Multi-mode 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 (5V adapter)	+4.75	+5.0	+5.4	V	External adapter
Supply Current	TX (Source side)		50	60	mA	DC +3.3V
	RX (5V adapter)		110	120	mA	DC +5.0V
Power Dissipation	TX (Source side)		165	200	mW	DC +3.3V
	RX (5V adapter)		550	600	mW	DC +5.0V

### 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 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	

### 4.2 Connector Pin Assignment

#### 4.2.1 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)

#### 4.2.2 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)

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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)

### 4.3 Optical Specification

#### 4.3.1 Electro Characteristics

Parameter	Symbol	Conditions	Ratings			Unit
			Min	Typ	Max	
Threshold current	$I_{th}$			0.8	1.1	mA
Slope efficiency	$\eta$	$I=4mA$	0.34	0.43	0.52	mW/mA
Optical output power	$P_{out}$	$I_{op}=5mA$	1.4	1.8	2.2	mW
Operating voltage	$U_{op}$	$I_{op}=5mA$		1.9	2.1	V
Differential resistance	$R_d$	$I_{op}=5mA$	45	60	75	$\Omega$
Emission wavelength	$\lambda$	$I_{op}=5mA, T=-10^{\circ}C - 85^{\circ}C$	840	850	860	nm
Spectral width, RMS	$\Delta\lambda$	$I_{op}=5mA, T=-10^{\circ}C - 85^{\circ}C$			0.4	nm
Modulation bandwidth	$f_{3dB}$	$I_{op}=5mA$	9			GHz
Rise time	$t_r$	$I_{op}=5mA, ER=5dB, 20\% - 80\%$		30	35	ps
Fall time	$t_f$	$I_{op}=5mA, ER=5dB, 20\% - 80\%$		40	45	ps
Capacitance	$C$	$I_{op}=5mA$		0.2	0.3	pF
Beam divergence	$\Theta$	$I_{op}=5mA, Full\ width\ 1/e^2$		24	30	$^{\circ}$
Relative Intensity Noise	RIN(OMA)	$I_{op} = 5mA, ER=5dB, 7.7GHz\ bandwidth$			-128	dB/Hz
Threshold uniformity	$\Delta I_{th}$	Range across 1x4 and 1x12 array chips			0.15	mA
Slope efficiency uniformity	$\Delta\eta$				0.05	mW/mA

T=25°C unless otherwise noted



4.3.2 Thermal Characteristics

Parameter	Symbol	Ratings			Unit
		Min	Typ	Max	
Wavelength tuning coefficient	$\delta\lambda/\delta T$		0.06		nm/K
Slope efficiency variation 25°C - 85°C	$\Delta\eta_T$	-0.5	-0.3	-0.1	%/K
Thermal impedance	$Z_{th}$		3.0		K/mW

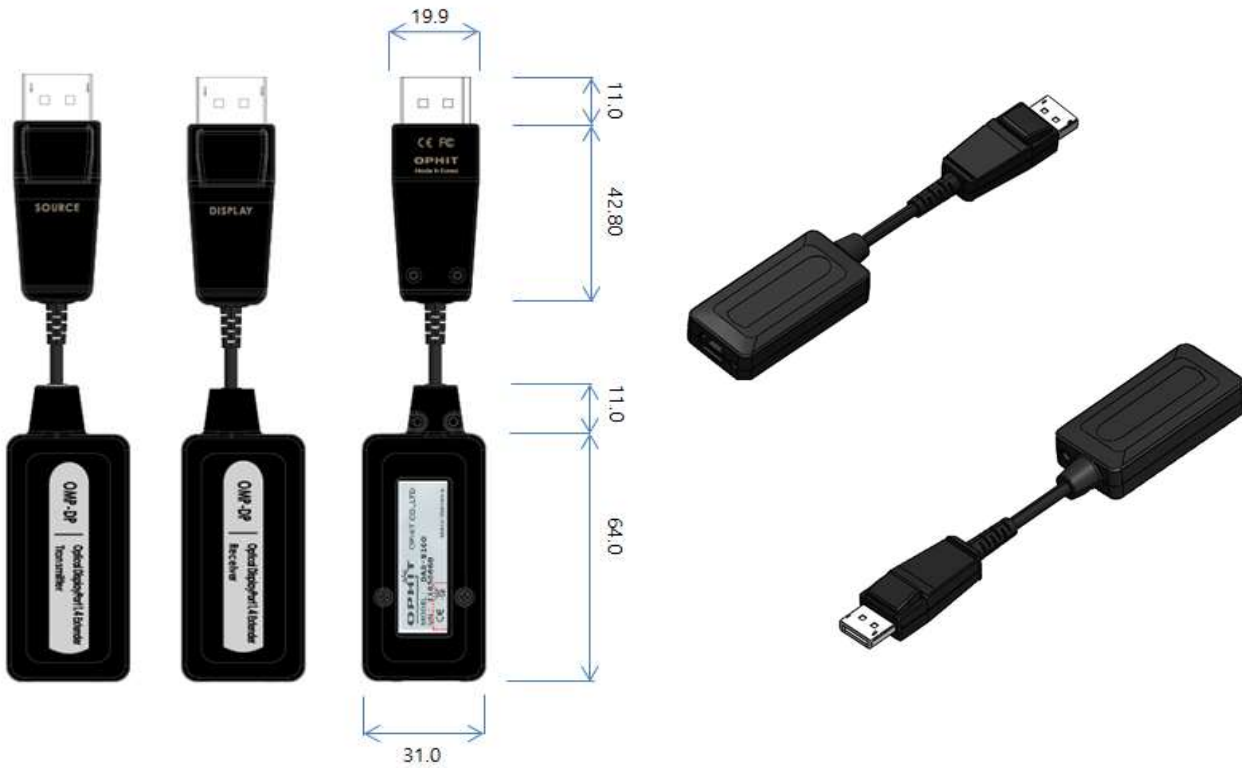
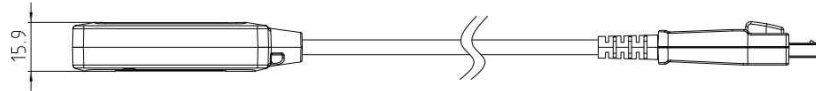
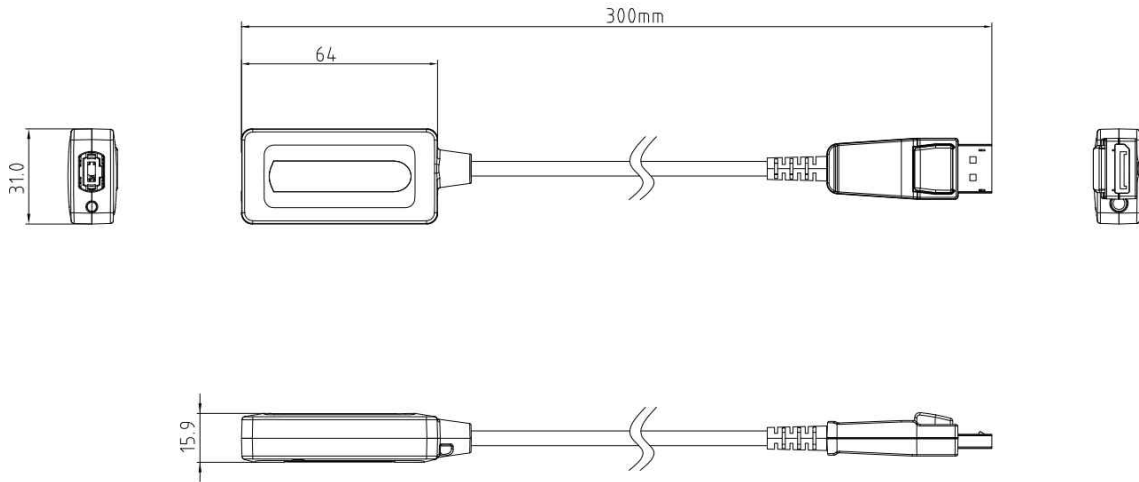
*Transmitter Laser module is Class 3R product(Receiver Laser module is Class 1)*

*Note-Do not view directly laser module of transmitter or the end of the other side of optical cable connected to transmitter without eyewear.*

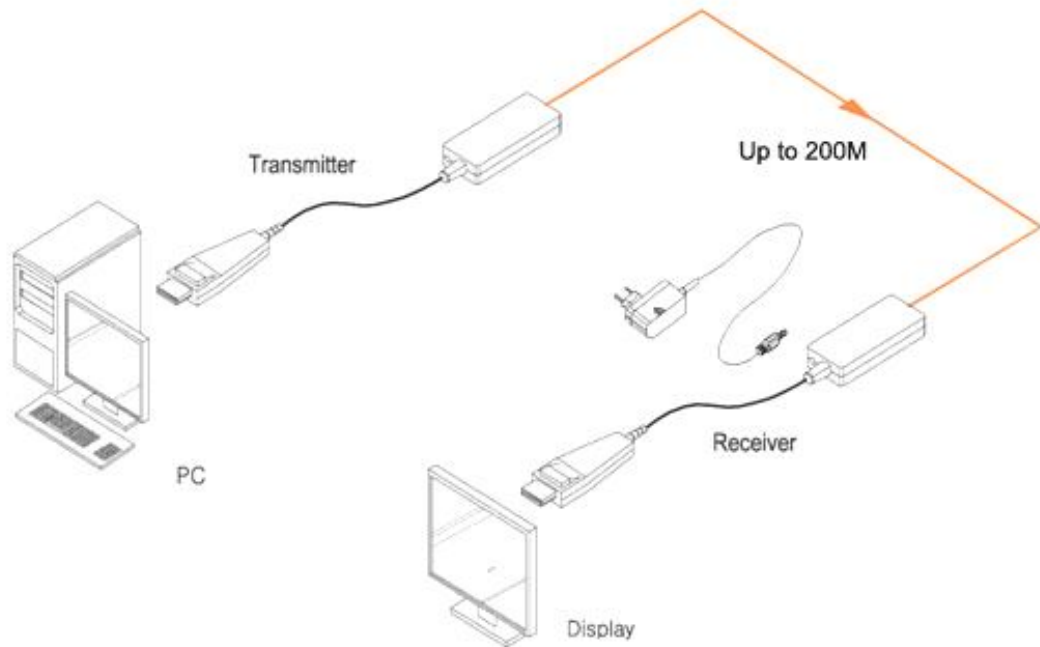


**5. Mechanical Specification**

**5.1 Transmitter and Receiver Case Dimension**



### 5.3 Connection

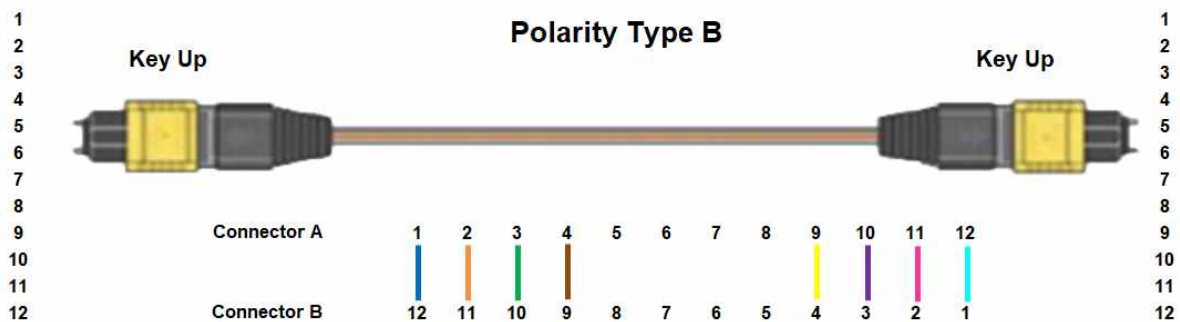


### 5.4 MPO/MTP Cable

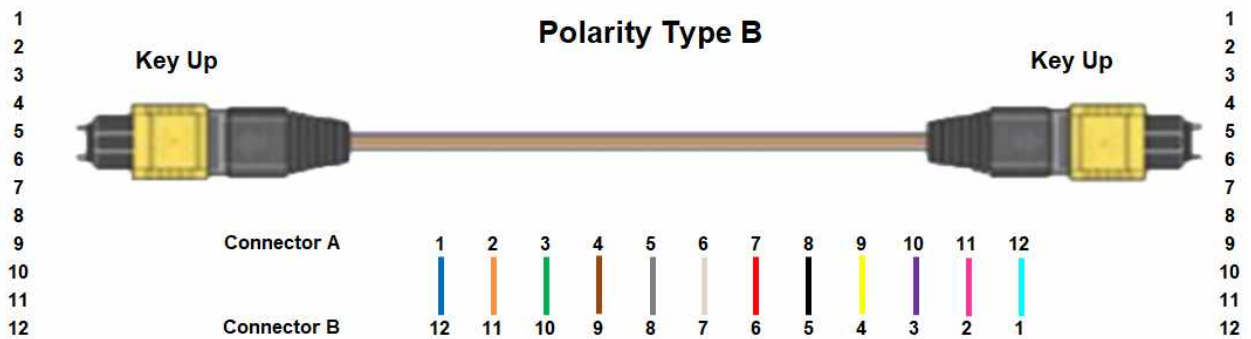
OPHIT recommend to use 8 core (or 12 core) MPO/MTP, OM3, 50/125  $\mu\text{m}$  Multi-mode fiber cable for optimized operation.  
OPHIT recommend to use 1) 8 core cable or 2) 12 core as below picture.

※ Please CHECK the pin connection of before installing!!

#### 1) 8-core pin assignment



2)12-core pin assignment



## 6. Regulatory

### 6.1 EMC & Safety Agency approval

#### 6.1.1 CE-EMC compliance:

This Product is investigated to EN55032:2015, EN55035:2017, EN61000-3-2:2019 and EN61000-3-3:2013

#### 6.1.2 FCC compliance:

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

#### 6.1.3 KC compliance

This Product is investigated to KN61000-4-2, KN61000-4-3, KN61000-4-4, KN61000-4-5, KN61000-4-6 and KN61000-4-11

#### 6.1.4 Laser Safety

This Product is evaluated to IEC60825-1:2014 clause 4 and 5.

## 7. Packing Information

Set(Unpacking, OMP-DP Only)	300.0mm*16.0mm*31.0mm	60.0g
Package(1Set, Inner Box Packing)	350.0mm*177.0mm*62.0mm	415.0g
Package(Multi, 15PCS Packing)	595.0mm*305.0mm*345.0mm	9.0Kg

**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)
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/January.14.2021**

## 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 register substances.



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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) 6104-64398-20

Declare under our sole responsibility that the product

Product : MPO/MTP type optical extender for DisplayPort Ver. 1.2a/1.4

Model : OMP-DP

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 : 2019

EN 61000-3-3 : 2013

RoHS

RoHS Directive 2011/65/EU+2015/863/EU

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

Manufacture Signature

Date of issue : Mar, 2021

Signature : Jong-Kook, Moon

# UKCA Declaration of Conformity

OPHIT CO., LTD

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

UK Authorized Representative : Foreseeson UK

1 Wolsey Road, East Molesey Surrey, KT8 9EL  
(Tel : +44 (0) 208 546 1047 / Fax : +44 (0) 208 391 4953)

Declare under our sole responsibility that the product

Product : MPO/MTP type optical extender for DisplayPort Ver. 1.2a/1.4  
Model : OMP-DP

The objective of the declaration described above is in conformity with the relevant UK  
Statutory instruments(and their amendments):

2016 No. 1091	The Electromagnetic Compatibility Regulations 2016
2016 No. 1101	The Electrical Equipment Safety Regulations 2016
2012 No. 3032	The Restriction of the Use of Certain Hazardous Substances in Electrical And Electronic Equipment Regulations 2012

EMC Part

EN 55032:2015  
EN 55035:2017  
EN 61000-3-2:2019  
EN 61000-3-2:2013

RoHS

RoHS Directive 2011/65/EU+2015/863/EU

*The technical documentation for the product is available from :*

Name : Jason Kwon(e-mail : [Jason.kwon@fsmmed.eu](mailto:Jason.kwon@fsmmed.eu))  
Address : 1 Wolsey Road, East Molesey Surrey, KT8 9EL

Signed for and on behalf of : Jong-Kook, Moon

Place of Issue : Suwon-city, KOREA

Date of issue : March.19.2021

Function : CEO

Signature : 