

PRODUCT DATA SHEET

DQSL

DualLink Extension System



Revision History

Version Number	Revision Date	Page	Description of Changes
1.0	Jul.10,2009	ALL	Initial Version
1.1	Apr.09.2012	12	Ordering Information Removed
1.2	Dec.09.2019	ALL	Renewal Specification
1.3	Jan.18 2021		Add to optical characteristics

PROPRIETARY NOTE

****THIS DOCUMENT CONTAINS INFORMATION CONFIDENTIAL AND PROPIETARY TO OPHIT CO.,LTD AND SHALL NOT BE REPRODUCED OR TRANSFERRED TO OTHER DOCUMENTS OR DISCLOSED TO OTHERS OR USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT WAS OBTAINED WITHOUT THE EXPRESSED AND WRITTEN CONSENT OF OPHIT INCORPORATION***

TABLE OF CONTENTS

1. General Description	4
2. General Specification	4
3. Absolute Maximum Ratings	5
4. Electrical Specification	6
4.1 Electrical Specification	
4.1.1 Transmitter module	
4.1.2 Receiver module	
4.2 Optical Characteristics	
4.2.1 Transmitter characteristics	
4.2.2 Receiver characteristics	
4.3 Connector Pin Assignment	
4.3.1 Transmitter	
4.3.2 Receiver	
5. Mechanical Specification	10
5.1 Case Dimension	
5.1.1 Transmitter	
5.1.2 Receiver	
5.2 Cable Information	
5.3 Connection	
6. Regulatory	13
6.1 EMC & Safety Agency approval	
6.1.1 CE-EMC compliance	
7. Packing Information	13
8. RoHS	14
9. REACH	15

1. General Description

DQSL , dual link extension system, lets your Dual digital flat panel display signal extend up to 100 meters (330 feet) away from host by TMDS digital signal transmission.

- High speed and long distance transmission by LC type multimode fibers
(Uses 2 strand multi mode LC fiber optic cable)
- Extends up to 100m
- It can support two mode for DDC
 - Real mode : Uses one CAT-5 cable for DDC
 - Emulation : Pseudo-DDC detection function for EDID information
- Self detecting function for EDID information
- It can support single link and dual link by selectable function switcher

2. General Specification

Parameter	Symbol	
	Transmitter	Receiver
Optical Converter	850nm, 7ch Transmit OSA	850nm, 7ch Receive OSA
Input and Output Signal	TMDS Signal(DVI 1.0 standard)	TMDS Signal(DVI 1.0 standard)
Video Bandwidth	1.65Gbps / Channel	
Module Size	134.9 x 25.0 x 81.7 mm (W x H x D)	
Module Weight	--	--
Used electrical connector	24 PIN DVI-D Plug (Dual)	
Optical Connector	2 LC Connector	2 LC Connector
Recommended Fiber	50/125 μ m Multi-mode glass-fiber	
Link Connector	RJ-45 Jack	
Maximum Supported Resolution	-Single Link : WUXGA(1920x1200)60Hz -Dual Link : WQXGA(2560x1600)60Hz	

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

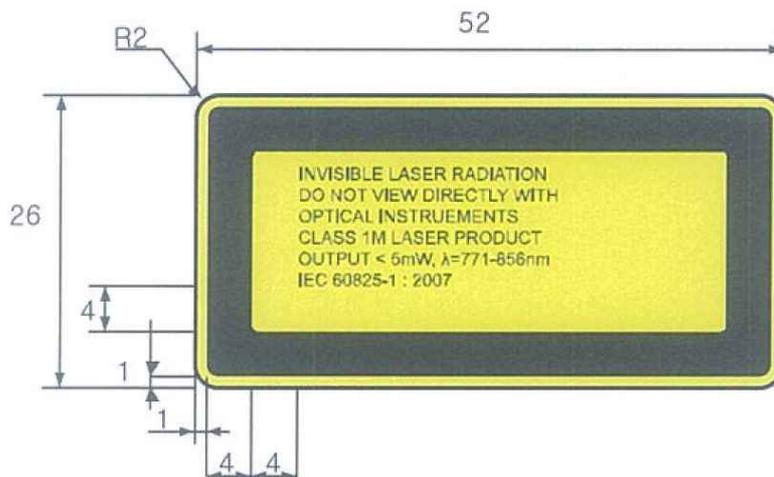
4.1.1 Transmitter Module

	Parameter	Symbol	Min	Typ	Max	Units	Condition
P O W E R	Supply Voltage (Option External Power)	Vcc		+5.0		V	
	Supply Current	Icc		380		mA	Dual
				280			Single
	Power Dissipation	Po		1.9		W	Dual
			1.4		Single		
T M D S	Reference voltage for graphic signal	Vref	+3.1	+3.3	+3.5	V	
	Single-ended high level input voltage	VH	Vref-0.01		Vref+0.01	V	
	Single-ended low level input voltage	VL	Vref-0.6		Vref-0.4	V	
	Single-ended input swing voltage	Vswing	0.4		0.6	V	
	Single-ended standby input voltage		Vref-0.01		Vref+0.01	V	
	Data Output Load	RLD		50		Ohms	

Transmitter module of Model DQSL includes 2 channel VCSEL(Vertical Surface Emitting Laser Diode) with 850 nm 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 DQSL is Class 1M Laser Product.



4.1.2 Receiver Module

	Parameter	Symbol	Min	Typ	Max	Units	Condition
P O W E R	Supply Voltage (External Power)	Vcc		+5.0		V	
	Supply Current	Icc		250		mA	
	Power Dissipation	Po		1.25		W	
T M D S	Reference voltage for graphic signal	Vref	+3.1	+3.3	+3.5	V	
	Single-ended output swing voltage	Voswing	0.4		0.6	V	AC couple
	Data Input Load	RLD		50		Ohms	

4.2 Optical Specification

4.2.1 Transmitter Characteristics

Parameter (per lane)	Symbol	Min	Typ	Max	Units
Optical Power	Pout	-3.0	0.0		dBm
Optical Modulation Amplitude		-6.25			dBm
Center Wavelength – Lane 0			778		nm
Center Wavelength – Lane 2			800		nm
Center Wavelength – Lane 2			825		nm
Center Wavelength – Lane 3			850		nm
Optical Rise/Fall Time			200		Ps

4.2.2 Receiver Characteristics

Parameter (per channel)	Symbol	Min	Typ	Max	Units
Wavelength – Lane 0			778		nm
Wavelength – Lane 1			800		nm
Wavelength – Lane 2			825		nm
Wavelength – Lane 3			850		nm
Data Rate per Channel				1.65	Gb/s
Peak Optical Input Power	Pin		0.0	4.0	dBm
OMA Sensitivity		-14.25	-16.00		dBm

4.3 Connector Pin Assignment

4.3.1 Transmitter

DVI Connector (Dual-mode)

Pin	Signal Assignment	Pin	Signal Assignment	Pin	Signal Assignment
1	T.M.D.S. Data2-	9	T.M.D.S. Data1-	17	T.M.D.S. Data0-
2	T.M.D.S. Data2+	10	T.M.D.S. Data1+	18	T.M.D.S. Data0+
3	T.M.D.S. Data2/4 Shield	11	T.M.D.S. Data1/3 Shield	19	T.M.D.S. Data0/5 Shield
4	T.M.D.S. Data4-	12	T.M.D.S. Data3-	20	T.M.D.S. Data5-
5	T.M.D.S. Data4+	13	T.M.D.S. Data3+	21	T.M.D.S. Data5+
6	DDC Clock (SCL)	14	+5V Power	22	T.M.D.S Clock Shield
7	DDC Data (SDA)	15	Ground (for +5V)	23	T.M.D.S Clock+
8	No Connect	16	Hot Plug Detect	24	T.M.D.S Clock-

DVI Connector (Single-mode)

Pin	Signal Assignment	Pin	Signal Assignment	Pin	Signal Assignment
1	T.M.D.S. Data2-	9	T.M.D.S. Data1-	17	T.M.D.S. Data0-
2	T.M.D.S. Data2+	10	T.M.D.S. Data1+	18	T.M.D.S. Data0+
3	T.M.D.S. Data2 Shield	11	T.M.D.S. Data1 Shield	19	T.M.D.S. Data0 Shield
4	No Connect	12	No Connect	20	No Connect
5	No Connect	13	No Connect	21	No Connect
6	DDC Clock (SCL)	14	+5V Power	22	T.M.D.S Clock Shield
7	DDC Data (SDA)	15	Ground (for +5V)	23	T.M.D.S Clock+
8	No Connect	16	Hot Plug Detect	24	T.M.D.S Clock-

RJ-45 Connector

Pin	Signal Assignment	Pin	Signal Assignment
1	SCL	2	GND
3	SDA	4	GND
5	+5V Power	6	GND
7	+5V Power	8	Hot Plug Detect

4.3.2 Receiver

DVI Connector (Dual-mode)

Pin	Signal Assignment	Pin	Signal Assignment	Pin	Signal Assignment
1	T.M.D.S. Data 2-	9	T.M.D.S. Data 1-	17	T.M.D.S. Data 0-
2	T.M.D.S. Data 2+	10	T.M.D.S. Data 1+	18	T.M.D.S. Data 0+
3	T.M.D.S. Data 2/4 Shield	11	T.M.D.S. Data 1/3 Shield	19	T.M.D.S. Data 0/5 Shield
4	T.M.D.S. Data 4-	12	T.M.D.S. Data 3-	20	T.M.D.S. Data 5-
5	T.M.D.S. Data 4+	13	T.M.D.S. Data 3+	21	T.M.D.S. Data 5+
6	DDC Clock (SCL)	14	Out +5V Power	22	T.M.D.S Clock Shield
7	DDC Data (SDA)	15	Ground (for out +5V)	23	T.M.D.S Clock+
8	No Connect	16	Hot Plug Detect	24	T.M.D.S Clock-

DVI Connector (Single-mode)

Pin	Signal Assignment	Pin	Signal Assignment	Pin	Signal Assignment
1	T.M.D.S. Data2-	9	T.M.D.S. Data1-	17	T.M.D.S. Data0-
2	T.M.D.S. Data2+	10	T.M.D.S. Data1+	18	T.M.D.S. Data0+
3	T.M.D.S. Data2 Shield	11	T.M.D.S. Data1 Shield	19	T.M.D.S. Data0 Shield
4	No Connect	12	No Connect	20	No Connect
5	No Connect	13	No Connect	21	No Connect
6	DDC Clock (SCL)	14	Out +5V Power	22	T.M.D.S Clock Shield
7	DDC Data (SDA)	15	Ground (for +5V)	23	T.M.D.S Clock+
8	No Connect	16	Hot Plug Detect	24	T.M.D.S Clock-

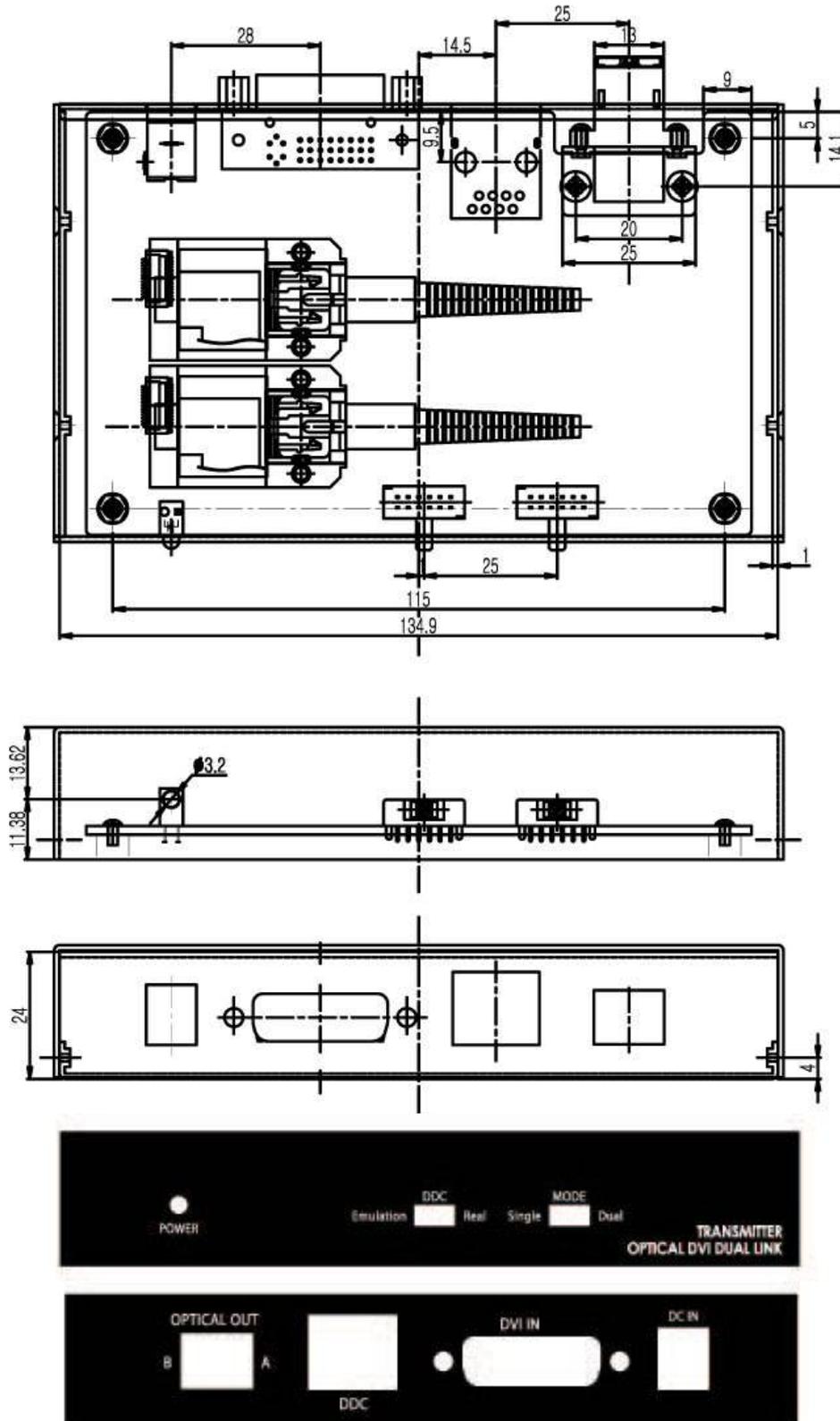
RJ-45 Connector

Pin	Signal Assignment	Pin	Signal Assignment
1	SCL	2	GND
3	SDA	4	GND
5	+5V Power	6	GND
7	+5V Power	8	Hot Plug Detect

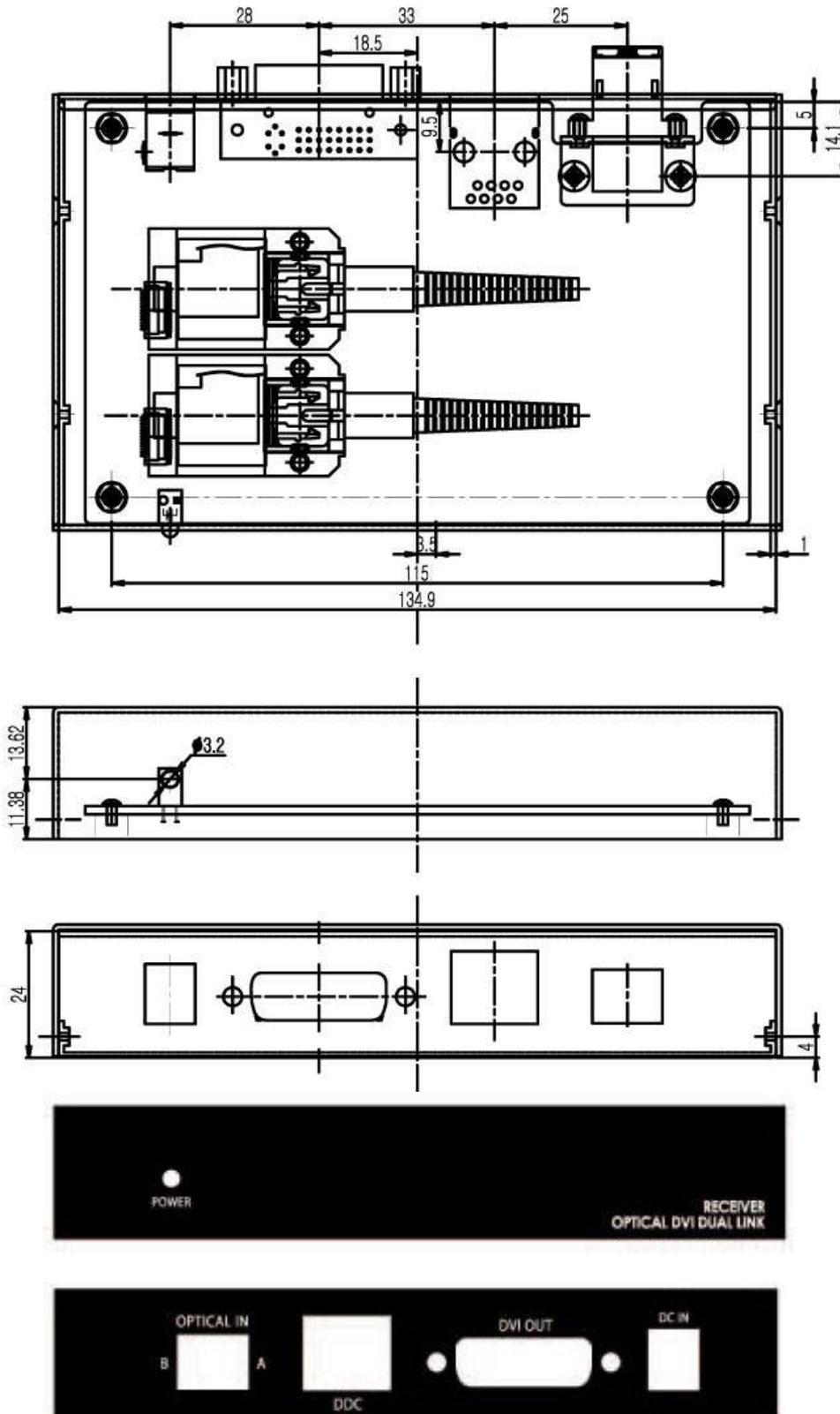
5. Mechanical Specification

5.1 Case Dimension

5.1.1 Transmitter



5.1.2 Receiver

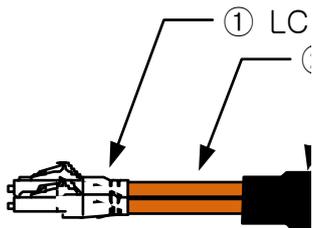


GENERAL SPECIFICATION V1.3

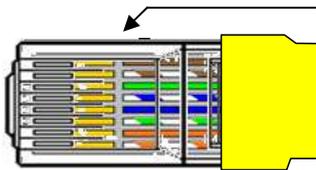
DQSL

5.2 Cable Information

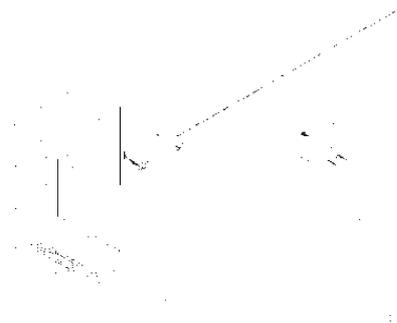
- Optical Fiber Cable



- UTP Cable Cat. 5 (RJ-45 Jack)



5.3 Connection



6. Regulatory

6.1 EMC & Safety Agency approval

6.1.1 CE-EMC compliance:

This Product is investigated to EN55022:2006, EN55024:1998+A1:2001+A2:2003
EN61000-3-2:2006 and EN61000-3-3:1995+A1:2001+A2:2005

7. Packing Information

Unit(Unpacking, DQSL Only)	134.9mm*81.7*24.0mm	355.0g
Package(1Unit, Inner Box Packing)	242.0mm*185.0mm*70.0mm	600.0g
Package(Multi, 15PCS Packing)	595.0mm*305.0mm*345.0mm	12.0Kg

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-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



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 register 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.