

EOLF-GEUA-25-X Series

ONU for 1000BASE-PX20+-U

Single fiber bi-directional Transceiver

1.25Gbps upstream and 1.25Gbps downstream

RoHS6 Compliant

Features

- ◆ 2x10 SFF Package with SC Receptacle/SC Pigtail
- ◆ Single +3.3 V Power Supply
- ◆ 1.25 Gbps / 1310 nm Burst-Mode Transmitter with FP laser
- ◆ 1.25 Gbps / 1490 nm Continuous-Mode Receiver with 2R Output
- ◆ EOLF-GEUA-25-X Distance up to 20km
- ◆ LVTTTL transmitter burst-mode control
- ◆ LVTTTL receiver signal-detected indication
- ◆ LVTTTL Tx_Dis, SD and TX_SD
- ◆ LVPECL electrical signal interface
- ◆ Operating Case Temperature
Standard: 0°C~+70°C
Industrial: -40°C~+85°C
- ◆ Class 1 FDA and IEC60825-1 laser safety compliant
- ◆ Compliant with IEEE 802.3ah-2004



Applications

- ◆ Gigabit Ethernet PON ONU for P2MP application
- ◆ Broadband GE-PON System
- ◆ IEEE 802.3ah 1000BASE-PX20+-U
- ◆ Burst Mode Application

Ordering information

Part No.	Input	Output	Burst-mode	Interface	Tem.	DDM
EOLF-GEUA-25-D ^{*note1}	DC	AC	LVTTTL High Burst	SC	Standard	YES
EOLF-GEUA-25-DI ^{*note1}	DC	AC	LVTTTL High Burst	SC	Industrial	YES
EOLF-GEUA-25-DP	DC	AC	LVTTTL High Burst	Pigtail ^{*note2}	Standard	YES
EOLF-GEUA-25-DIP	DC	AC	LVTTTL High Burst	Pigtail ^{*note2}	Industrial	YES
EOLF-GEUA-25-DA ^{*note1}	DC	AC	LVTTTL Low Burst	SC	Standard	YES
EOLF-GEUA-25-DIA ^{*note1}	DC	AC	LVTTTL Low Burst	SC	Industrial	YES

EOLF-GEUA-25-DPA	DC	AC	LVTTL Low Burst	Pigtail*note2	Standard	YES
EOLF-GEUA-25-DIPA	DC	AC	LVTTL Low Burst	Pigtail*note2	Industrial	YES
EOLF-GEUA-25-D1*note1	AC	AC	LVTTL High Burst	SC	Standard	YES
EOLF-GEUA-25-DI1*note1	AC	AC	LVTTL High Burst	SC	Industrial	YES
EOLF-GEUA-25-DP1	AC	AC	LVTTL High Burst	Pigtail*note2	Standard	YES
EOLF-GEUA-25-DIP1	AC	AC	LVTTL High Burst	Pigtail*note2	Industrial	YES
EOLF-GEUA-25-D1A*note1	AC	AC	LVTTL Low Burst	SC	Standard	YES
EOLF-GEUA-25-DI1A*note1	AC	AC	LVTTL Low Burst	SC	Industrial	YES
EOLF-GEUA-25-DP1A	AC	AC	LVTTL Low Burst	Pigtail*note2	Standard	YES
EOLF-GEUA-25-DIP1A	AC	AC	LVTTL Low Burst	Pigtail*note2	Industrial	YES

Note1: Standard version

Note2: EOLF-GEUA-X-P series is with pigtail, the fiber length is customized.

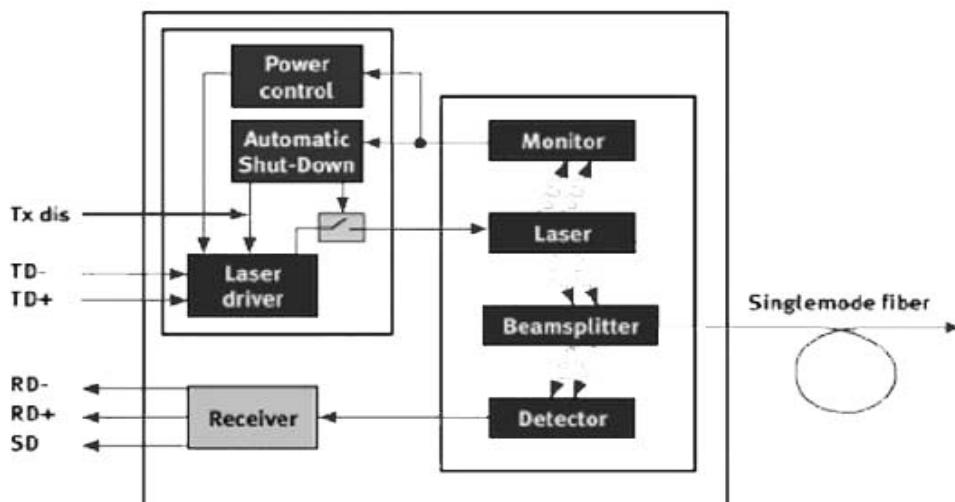
*The product image only for reference purpose.

Regulatory Compliance*Note3

Product Certificate	Certificate Number	Applicable Standard
TUV	R50135086	EN 60950-1:2006+A11+A1+A12+A2
		EN 60825-1:2014
		EN 60825-2:2004+A1+A2
UL	E317337	UL 60950-1
		CSA C22.2 No. 60950-1-07
EMC CE	AE 50285865 0001	EN 55022:2010
		EN 55024:2010
FCC	WTF14F0514417E	47 CFR PART 15 OCT., 2013
FDA	/	CDRH 1040.10
ROHS	/	2011/65/EU

Note3: The above certificate number updated to June 2014, because some certificate will be updated every year, such as FDA and ROHS. For the latest certification information, please check with Eoptolink.

Functional Diagram



The Signal Detect (SD, active high), Normal optical input levels to the receiver result in a logic “1” output, asserted.

The following version is available:

1. AC/AC Transceiver

Standard PECL inputs and outputs, Tx is AC coupling.

2. DC/AC Transceiver

Standard PECL inputs and outputs, Tx is DC coupling.

Product Description

EOLF-GEUA-25-DX Series is a transceiver for the optical network unit (ONU) of GE-PON with 1.25Gbps in downstream and 1.25Gbps in upstream. EOLF-GEUA-25-DX series is high performance module for single fiber communications by using 1310nm burst-mode transmitter and 1490 nm continuous-mode receiver. It also can support TX signal detection and TX power shut down. When TX power supply is disable, so the transmitter will be shut down and receiver still works. After TX power supply is enabling, the transmitter turn on again.

The transmitter section uses a multiple quantum well 1310nm laser and is a class 1 laser compliant according to International Safety Standard IEC-60825-1. The receiver section uses an integrated 1490 nm detector preamplifier (IDP) mounted in an optical header and a limiting post-amplifier IC.

LVPECL interface is used for differential inputs and outputs. A LVTTTL logic interface simplifies interface to external circuitry.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	T _s	-40	+85	°C
Supply Voltage	V _{CC}	-0.5	4.0	V
Operating Relative Humidity	Hopr	5	95	%
Wave Soldering Conditions Temp/Time			260/10	°C/s

*Exceeding any one of these values may destroy the device immediately.

Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit
Operating Case Temperature	T _c	EOLF-GEUA-25-X	0	+70	°C
		EOLF-GEUA-25-IX	-40	+85	°C
Power Supply Voltage	V _{CC}	3.13	3.3	3.47	V
Power Supply Current	I _{CC}		200	250	mA
Date Rate			1.25		Gbps

Performance Specifications - Electrical

Parameter	Symbol	Min.	Typ.	Max	Unit	Notes
Transmitter						
LVPECL	V _{in}	300		1600	mVpp	

Inputs(Differential)							
Input Impedance (Differential)		Zin	85	100	115	ohms	Rin = 100 ohms
TX_Fault	H		2		Vcc+0.3	V	Assert High when Tx fault detected
	L		0		0.8		
TX_Burst	H		2		Vcc+0.3	V	Default LVTTTL High to Enable Burst Transmitter,
	L		0		0.8		
TX_SD	H		2		Vcc+0.3	V	Assert High when Transmitter On
	L		0		0.8		
Receiver							
CML Outputs (Differential)		Vout	600		1000	mVpp	AC coupled outputs
Output Impedance (Differential)		Zout	85	100	115	ohms	
Rx_SD	SD		2		Vcc+0.3	V	
	Normal		0		0.8		

Performance Specifications – Optical

(EOLF-GEUA-25-X, FP & PIN/TIA)

Parameter	Symbol	Min.	Typical	Max.	Unit
9µmCore Diameter SMF			20		km
Data Rate			1.25		Gbps
Transmitter					
Center Wavelength	λ_c	1260		1360	nm
Spectral Width (RMS)	$\Delta\lambda$			3	nm
Average Output Power*(note4)	Pout	0		+4	dBm
Extinction Ratio*(note5)	ER	9			dB
Reflectance	Rt			-10	dB
Rise/Fall Time(20%~80%)*(note9)	tr/tf			260	ps
Total Jitter(PRBS2 ⁷ -1)	T _J			0.35	UI
Output Optical Eye*(note6)	IEEE Std 802.3ah-2004 Compliant				
Optical Burst On Time	t _{on}			30	ns
Optical Burst Off Time	t _{off}			30	ns
Optical Output Power with TX OFF*(note7)	P _{off}			-45	dBm
Receiver					
Center Wavelength	λ_c	1480	1490	1500	nm
Receiver Sensitivity*(note7)	Pmin			-27	dBm
Saturation Optical Power	Pmax	-3			dBm

Receiver Reflectance		CR		-12	dB
Optical Crosstalk				-47	dB
SD De-Assert		SDD	-42		dBm
SD Assert		SDA		-28	dBm
Signal Detect Hysteresis*(note8)			0.5	6	dB
Optical Isolation from external source	1260~1360nm			-38	dB
	1550~1560nm			-35	
	1640~1660nm			-20	

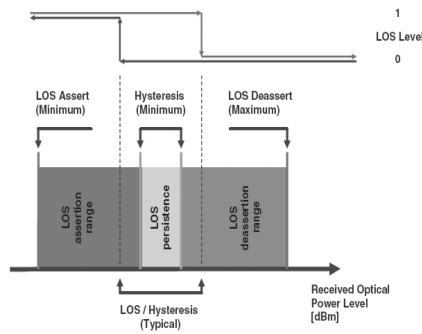
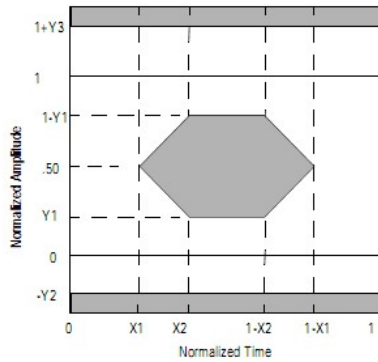
Note4: Output is coupled into a 9/125 um single-mode fiber.

Note5: Filtered, Measured with PRBS2⁷-1 test pattern @1.25Gbps.

Note 7: Measured with a PRBS 2⁷ -1 test pattern @1.25Gbps and ER=9dB, BER is less than 1E-12.

Note6: Eye pattern mask

Note 8: LOS Hysteresis(SD signal coincides with the LOS signal inversion)



Note 9: These are unfiltered 20-80% values

Digital Diagnostic Interface

The memory map in the following describes an extension to the memory map defined in SFF-8472. The enhanced interface uses the two wire serial bus address 1010001X (A2h) to provide diagnostic information about the module's present operating conditions.

2 wire address 1010000X (A0h)

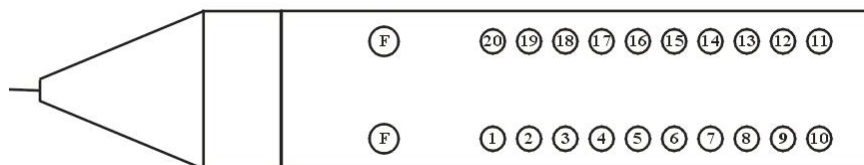
0	Serial ID Defined by SFP MSA (96 bytes)
95	Vendor Specific (32 bytes)
127	Reserved, SFF8079 (128 bytes)
255	

2 wire address 1010001X (A2h)

0	Alarm and Warning Thresholds (56 bytes)
55	Cal Constants (40 bytes)
95	Real Time Diagnostic Interface (24 bytes)
119	Vendor Specific (8 bytes)
127	User Writable EEPROM (120 bytes)
247	
255	Vendor Specific (8 bytes)

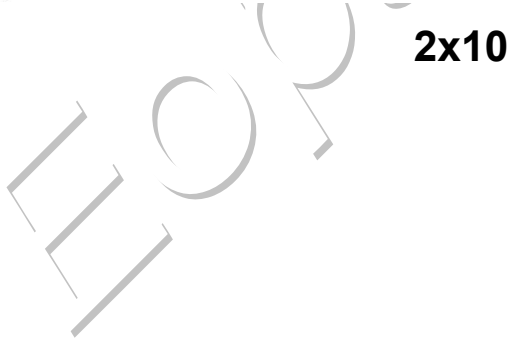
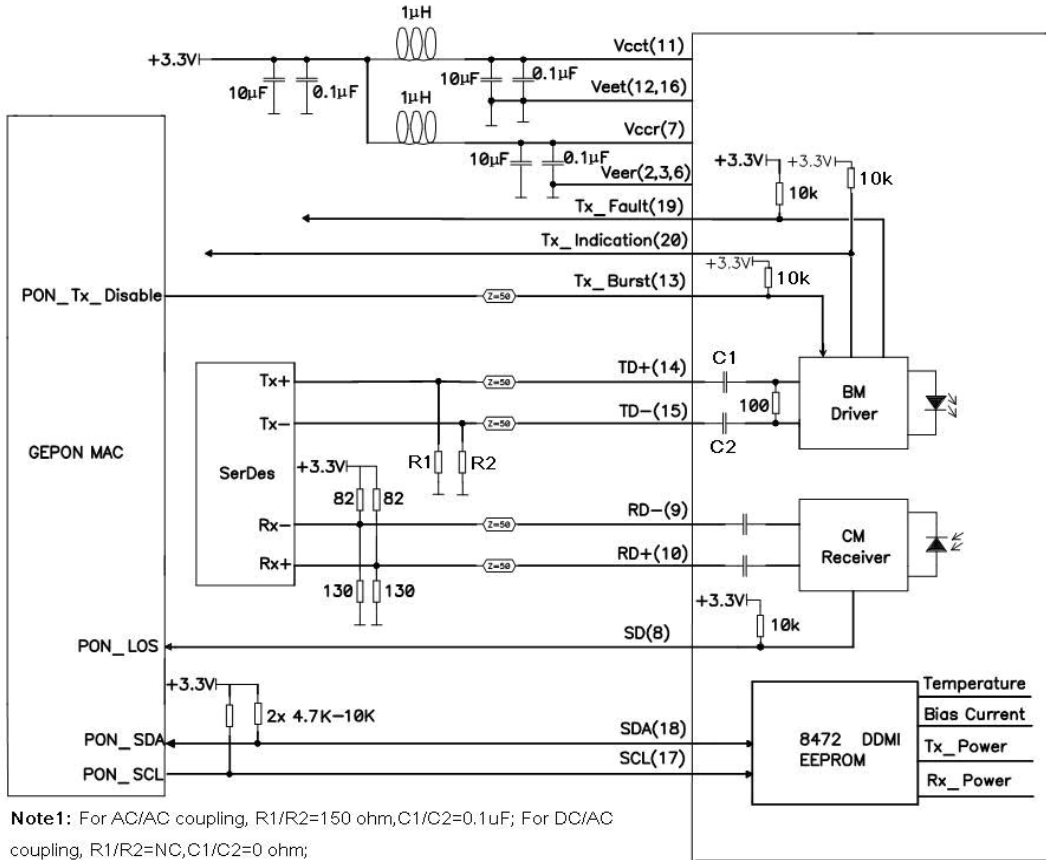
SFF2x10 Pin Function Definitions

Tx/Rx	Pin No.	I/O	Pin Name	Description
Rx	1		NC	No Function Definition
	2		VeeR	Receiver Ground
	3		VeeR	Receiver Ground
	4		NC	No Function Definition
	5		NC	No Function Definition
	6		VeeR	Receiver Ground
	7		VccR	+3.3V Receiver Power Supply
	8	O	SD	Normal Optical Input indicated by logic "High", and No Optical Input indicated by logic "Low".
	9	O	RD(n)	Inverted Receiver Data Output (AC-Coupled internally)
	10	O	RD(p)	Non-Inverted Receiver Data Output (AC-Coupled internally)
Tx	11		VccT	+3.3V Transmitter Power Supply
	12		VeeT	Transmitter Ground
	13	I	TX_Burst	Default: LVTTL "High" to Enable Burst Transmitter, LVTTL "Low" to Disable Burst Transmitter,
	14	I	TD(p)	Non-Inverted Transmitter Data Input (Default: AC-Coupled internally)
	15	I	TD(n)	Inverted Transmitter Data Input (Default: AC-Coupled internally)
	16		VeeT	Transmitter Ground (Mod-Def 0)
	17	I	SCL	I2C Serial Clock (LVTTL) (Mod-Def 1)
	18	I/O	SDA	I2C Serial Data (LVTTL) (Mod-Def 2)
	19	O	TXF	Assert High when TX fail detected.
	20	O	TX_SD	Tx Transmitter State Indication, Assert high when Transmitter ON
			F	Mounting Studs/Connect this pin to Chassis ground

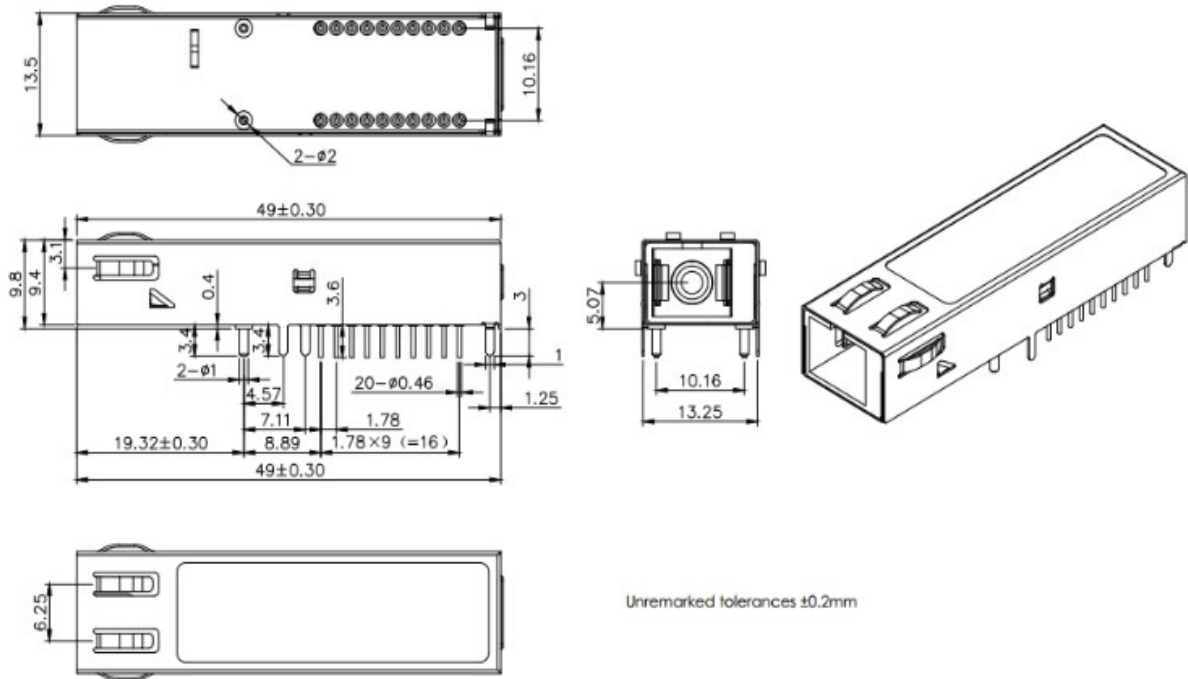


Pin arrangement (Top View)

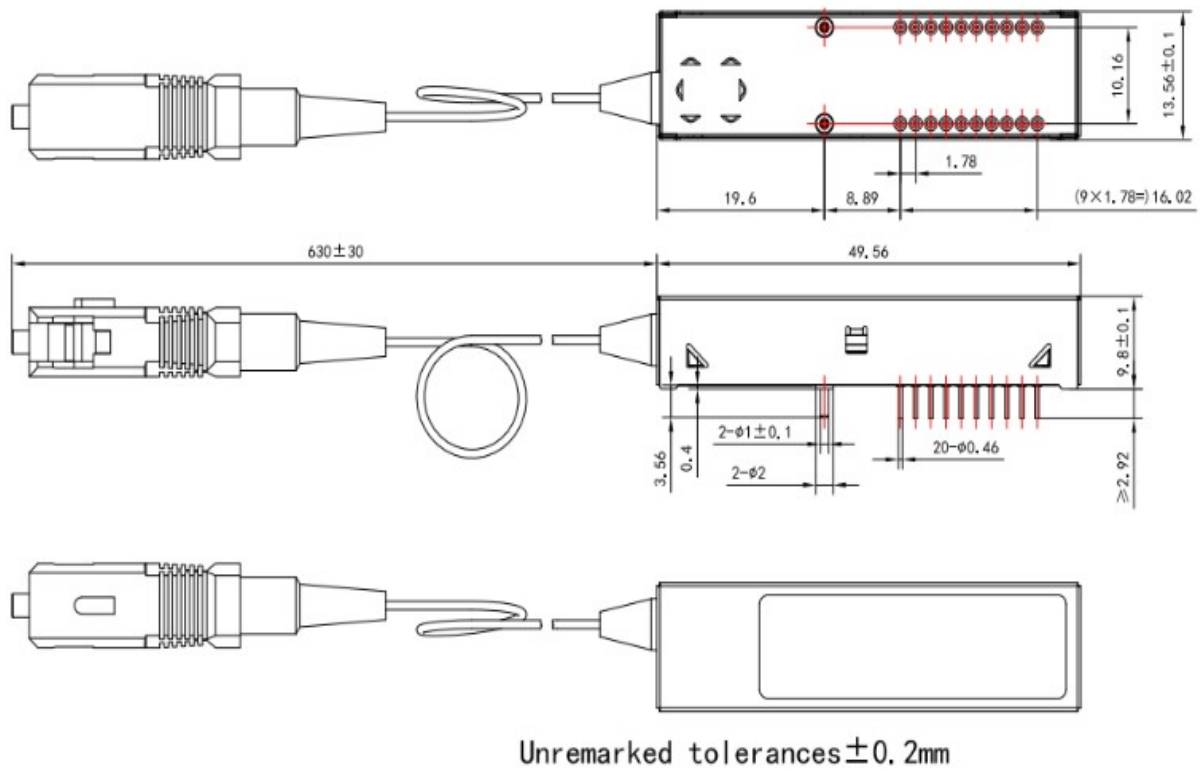
Recommend Circuit Schematic



Mechanical Specifications



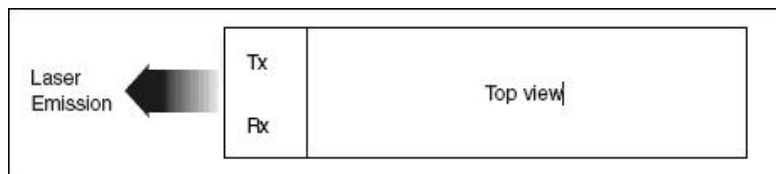
SC Connector



Pigtail with SC Connector

*This 2D drawing only for reference, please check with Eoptolink before ordering.

Laser Emission



Obtaining Document

Please contact Eoptolink Technology Inc., Ltd. listed at the end of the documentation to get the latest documents.

Revision History

Revision	Initiated	Reviewed	Approved	DCN	Release Date
V5.a	Cathy	Phlio		Released.	January 28, 2011
V5.b	Cathy	Phlio		Add the AC/AC coupling in ordering information.	January 30, 2011
V5.c	Cathy			Add the TX power shut down function.	March 3, 2011
V5.d	Kelly	Phlio		Add industrial products. Change mechanical and PIN specification	Aug 1, 2011
V5.e	Phlio			Update Product Picture.	Aug 18, 2011
V5.f	Phlio	Kelly		Update Working Voltage range and Add note 8	Apr. 18, 2012
V5.g	Abby	Kelly		Update Transmitter Reflectance	Nov 14, 2012
V5.h	Angela	Kelly		Update SDD&SDA	Nov 19, 2012
V5.i	Angela			Update the regulatory compliance and SDD&SDA	Dec 3, 2015
V5.j	Elaine	Kelly/Vina/ Dean/ Chao.Wang	Phlio	Update the product picture, the regulatory compliance and the 2D drawing	Jul 25, 2017

Notice:

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