

OE HYBRID
2.48832 Gbps Transmitter

OD-J8340-0A*1/ 0B*1/ 0D*1/ 0E*1

OC-48 IR/ LR

STM-16 S-16.1/ L-16.1

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1. Product number

Specifications	Product number
SONET OC-48 IR and ITU-T G. 957 STM-16 S-16.1 compliant	OD-J8340-0A*1/ 0D*1
SONET OC-48 LR and ITU-T G. 957 STM-16 L-16.1 compliant	OD-J8340-0B*1/ 0E*1

" * " in the product number depends on the optical connector type. Refer to the table below.

Connector type	Product number	
	OC-48 IR / S-16.1	OC-48 LR / L-16.1
SC	OD-J8340-0A11/ 0D11	OD-J8340-0B11/ 0E11
MUJ	OD-J8340-0A21/ 0D21	OD-J8340-0B21/ 0E21
FC	OD-J8340-0A31/ 0D31	OD-J8340-0B31/ 0E31

2. Specifications

(1) Absolute Maximum Ratings

Parameters	Specifications		Notes
	Min.	Max.	
Power supply voltage (Vcc)	-0.3 V	+4.0 V	
Storage temperature	- 40 deg. C	+ 85 deg. C	Case temperature
RF input pins	0 V	1.2 V	AC coupled, 50 ohms
Input pins (except for RF input pins)	0 V	Vcc	

Stresses beyond these listed parameters may cause permanent damage to the device.

(2) Environmental Conditions

(2) Environmental Conditions			
Items	Specifications	Notes	
Bit rate	2488.32 Mbps		
Data format	Scrambled NRZ	Scrambler is not included.	
Transmission cable	Single mode fiber	SI-10/125	
Operating temperature	0 to 75 deg. C.	0A**/ 0B**	Case temperature
	-40 to 85 deg. C.	0D**/ 0E**	
Power supply voltage	+3.3V ±5%		
Power consumption	0.33 W typical, 0.6 W maximum	@25 deg. C., +3.3V	
Package size	18.5 mm × 66.0 mm × 9.0 mm	Refer to page 8	

(3) Optical Signal Interface Specifications

Items	Specifications				Notes
	OC-48 IR-1 / S-16.1		OC-48 LR-1 / L-16.1		
	Min.	Max.	Min.	Max.	
Optical output power	-5.0 dBm	0 dBm	-2.0 dBm	+3.0 dBm	Average
Extinction ratio	8.2 dB	---	8.2 dB	---	
Spectral characteristics					
	-20dB width	1 nm	---	1 nm	
	Suppression ratio	30dB	---	30dB	---
Operating wavelength range	1260 – 1360 nm		1280 – 1335 nm		
Optical output waveform	Mask speck				Refer to fig. 1
Laser diode class	IEC 825-2 class 1 compliant				

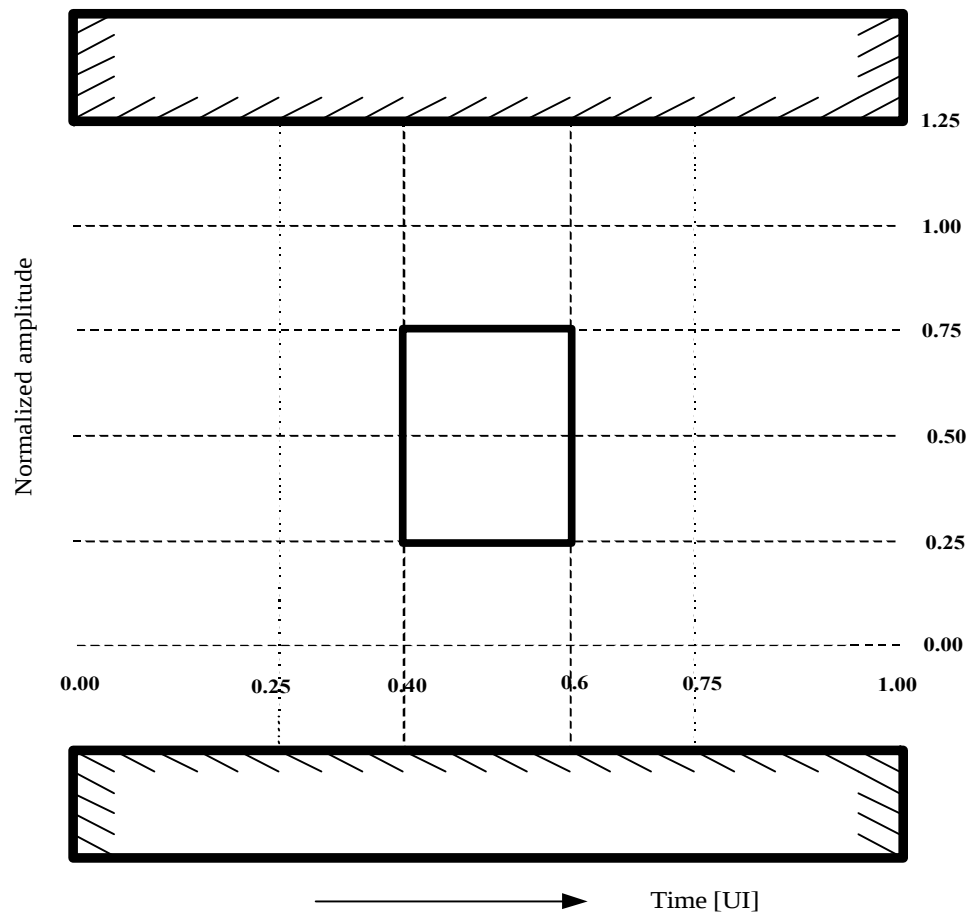
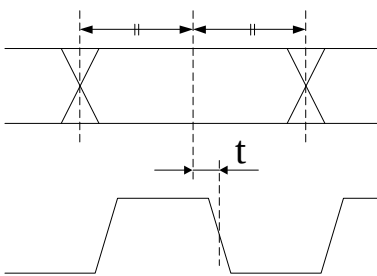


Fig. 1 Optical output signal mask specifications of SONET/ITU standard specified by the waveform after passing through a 4th order Bessel filter which has cut-off frequency of 2.48832 GHz $\pm$ 0.75.

(4) Electrical Interface Specifications

4.1 Data and clock signal

Items	Specifications		Notes
	Min.	Max	
Input signal level	600 mV *	1000 mV	AC coupled 50 Ω
Data and clock signal	DATA OUT  CLK OUT (+) -100 ps < t < 100 ps		

* The interface with CML is referred at 6.2.

4.2 Alarm output (OPT OUT ALM, CURR ALM)

Items	Specifications		Unit	Notes
Output level	V _{IH}	V _{IH} ≥ 2.4 V	V	LV-CMOS
	V _{IL}	V _{IL} ≤ 0.5 V	V	
Status	“L” while alarm detected “H” while alarm not detected		---	
Fan-out	I _{OH}	-0.2	mA	
	I _{OL}	0.2	mA	

4.3 Laser shut down

Items	Specifications		Unit	Notes
Input level	V _{OH}	V _{CC} × 0.7 ≤ V _{IH} ≤ V _{CC}	V	LV-CMOS
	V _{OL}	0 ≤ V _{IL} ≤ V _{CC} × 0.3	V	
Status	L	Optical output disable		
	H	Optical output enable		

4.4 CURR ALM TST

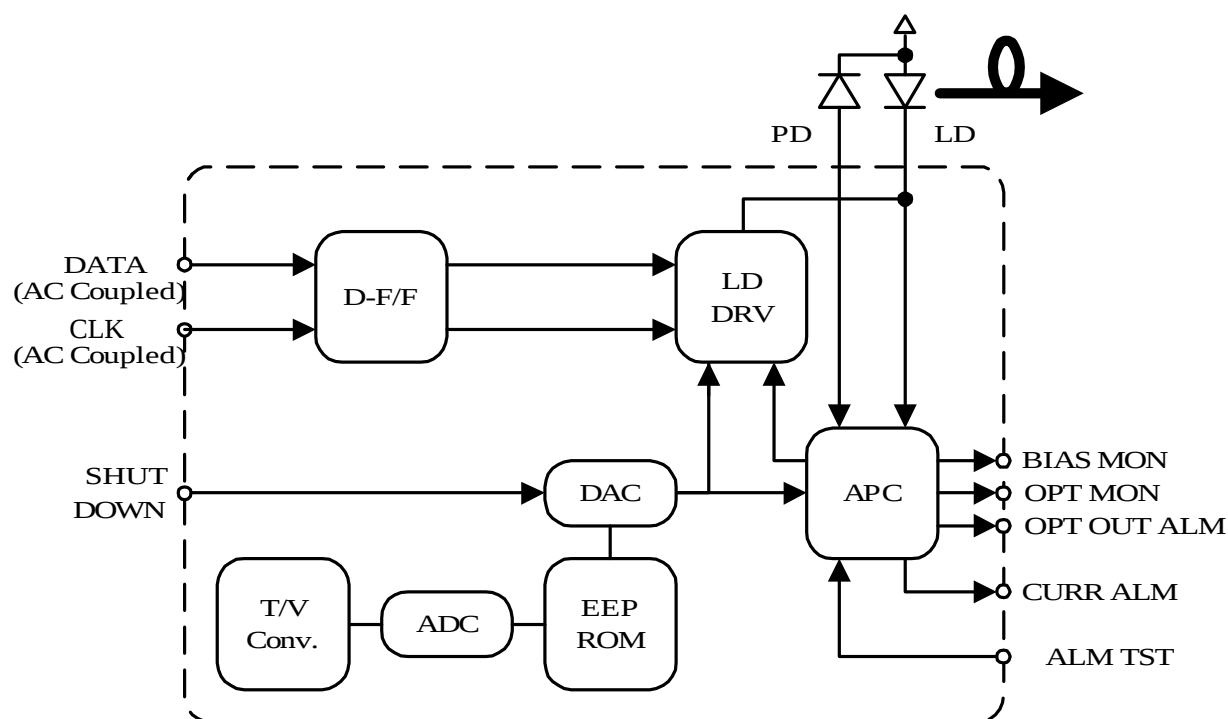
Items	Specifications	Notes
Status	CURR ALM will be asserted when connected to GND.	Leave open during normal operation

4.5 Performance monitor

Items	Specifications	Notes
OPT MON	Voltage output: 1V (max.)	Receive with high impedance (1 M ohms).
BIAS MON	Voltage output: $42 \times I_b$	Laser bias compensation current monitor. Receive with high impedance (1 M ohms). I_b : Laser bias compensation current

3. Functional Block Diagram

(1) Functional Block Diagram



D-F/F: D flip-flop

LD DRV: Laser diode driver

DAC: Digital to analogue converter

T/V Conv.: Temperature to voltage converter

APC: Automatic power control circuit

ADC: Analogue to digital converter

EEPROM: Electronic erasable ROM

PD: PIN photo diode

LD: 1.3 um DFB laser diode

(2) Alarm, monitor and control function

Items	Symbol	Function
Optical output power loss alarm	OPT OUT ALM	Active in loss of power condition. Does not assert until power degraded exceed 3 dB. Active 'L'
Laser degrade alarm	CURR ALM	Laser degradation alarm. Alarm asserts when laser bias compensation current increases by $25 \text{ mA} \pm 5 \text{ mA}$ from the initial value.
Laser shut down	SHUT DOWN *	Shutdown laser output. Active 'L'
Current alarm test	CURR ALM TST	Test CURR ALM function. When connected to GND, CURR ALM is forced to active.
Laser bias current monitor	BIAS MON	Laser bias compensation current (I_b) monitor. The I_b is calculated from output voltage (V_o) of this terminal; $I_b = V_o / 42 \Omega$. Initial value is nearly 0 V.
Optical output power monitor	OPT MON	Voltage output proportional to optical launch power of the transmitter.

* In the event of the loss of signal (data and clock), laser output status is undefined. The SHUT DOWN is required to disable the laser radiation.

4. Reliability

(1) FIT Number

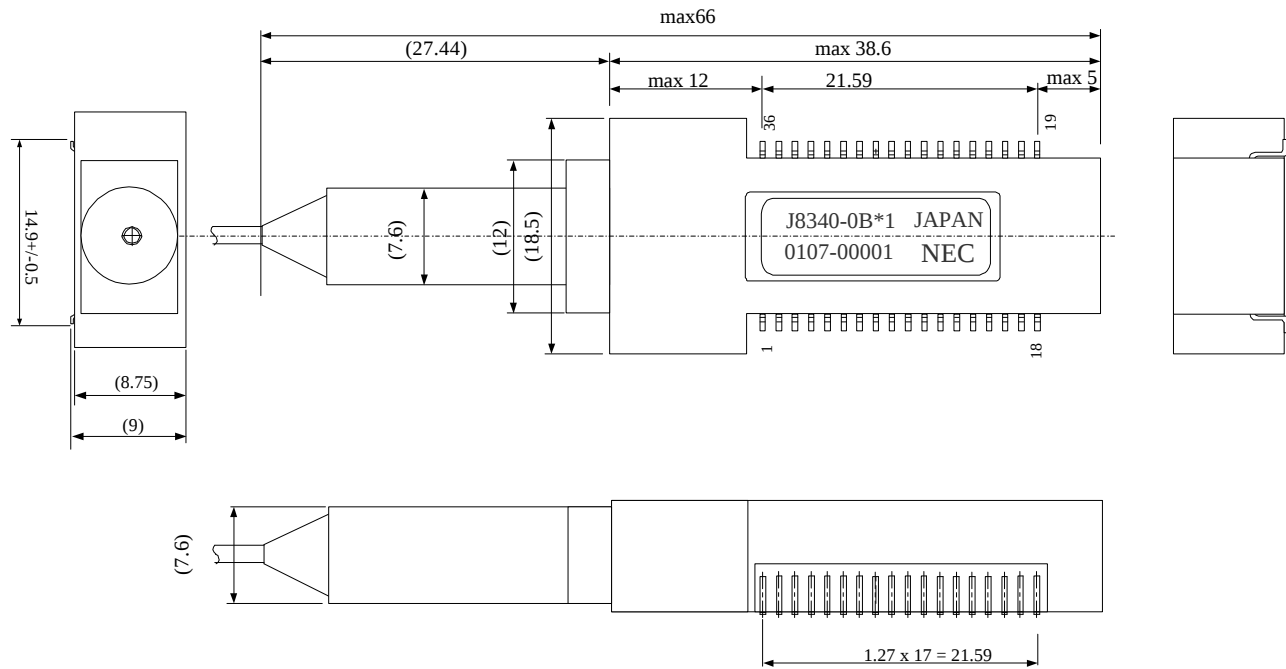
T.B.D

(2) Reliability Test Items and Conditions

T.B.D

5. Package size, Pin Assignment

(1) Outline diagram, Pin layout



(Unit in mm)

(Note) Product name description is given below:

NEC : Maker name

J8340-0A*1 : Product Number

****_***** : Production year/month-serial no.

(2) Pin Assignment

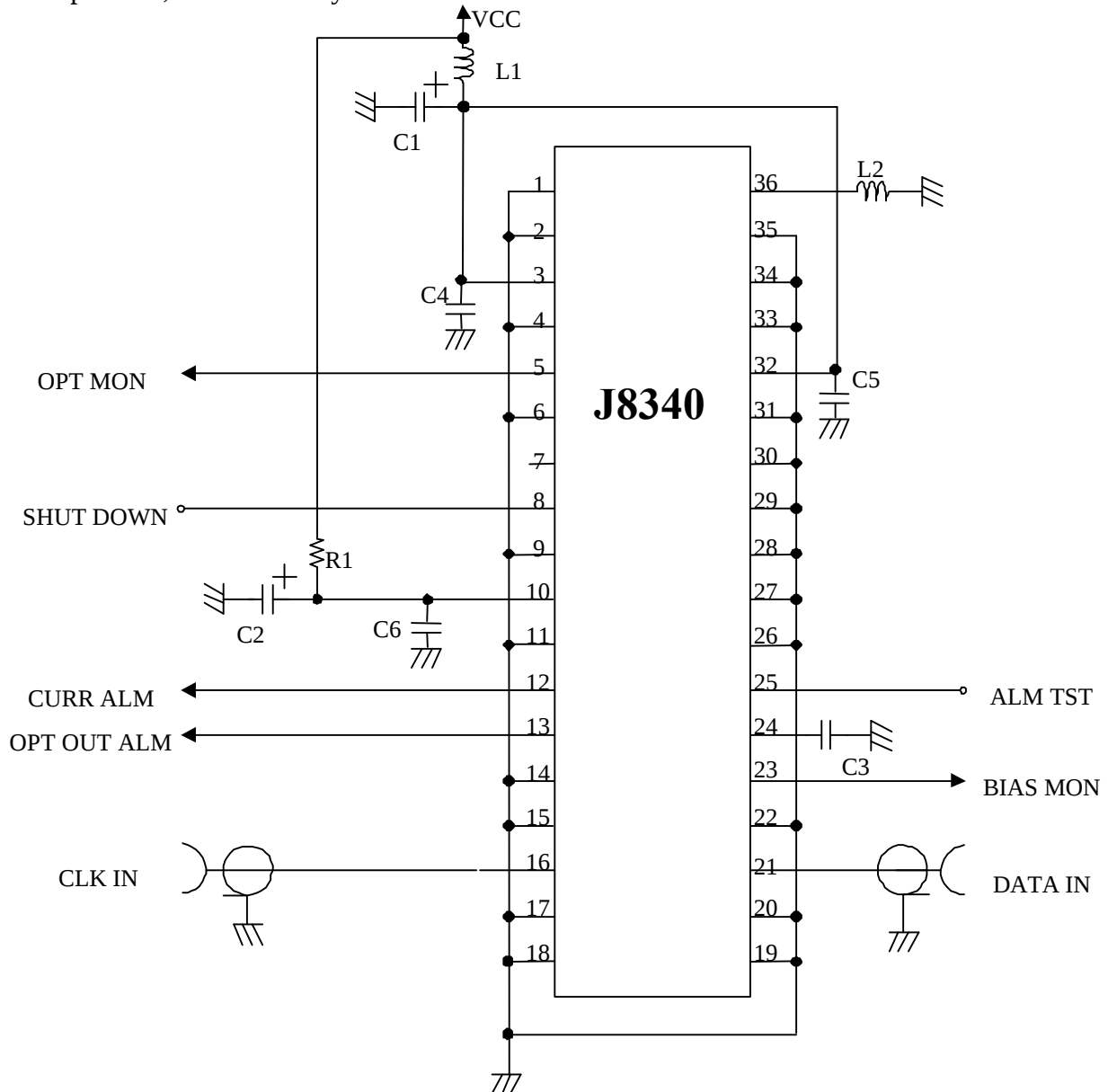
Pin No.	Symbol	I/O	Notes
1	GND	I	Ground
2	GND	I	
3	Vcc	I	+ 3.3 V
4	GND	I	
5	OPT MON	O	Optical output power monitor
6	GND	I	
7	NC	---	(Leave open)
8	SHUT DOWN	I	Laser shutdown. Active 'L'
9	GND	I	
10	Vcc	I	+ 3.3 V
11	GND	I	
12	CURR ALM	O	Laser bias current alarm
13	OPT OUT ALM	O	Laser degrade alarm
14	GND	I	
15	GND	I	
16	CLK IN	I	Clock signal input. AC coupled.
17	GND	I	
18	GND	I	
19	GND	I	
20	GND	I	
21	DATA IN	I	Data signal input. AC coupled
22	GND	I	
23	BIAS MON	O	Laser bias current monitor.
24	EXTC	---	Connect 0.1 uF capacitor to ground.
25	CURR ALM TST	I	Current alarm test.
26	GND	I	
27	GND	I	
28	GND	I	
29	GND	I	
30	GND	I	
31	GND	I	
32	Vcc	I	+ 3.3 V
33	GND	I	
34	GND	I	
35	GND	I	
36	NC	---	(Leave open)

I: input terminal, O: output terminal

6. Recommended peripheral circuit

(1) Peripheral circuit

For this product, it is necessary to use the recommended circuit shown below:



Connect Vcc capacitors as near as possible to the pins.

Make pads for L2, in case of OD-J6887 will be mounted on the PCB for OD-J8340. Pin layout of OD-J6887 and OD-J8340 are same.

<OD-J6887 is for SONET OC-48 SR / ITU-T G. 957 STM-16 I-16 compliant. >

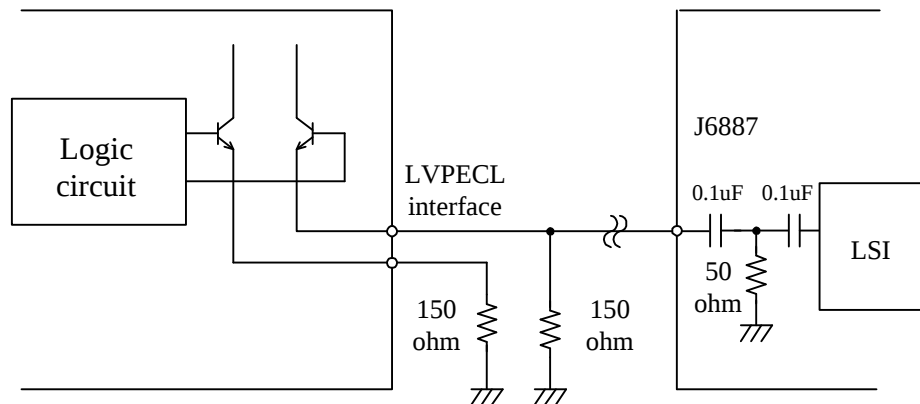
L2: Chip impedance. TOKIN N1608ZA800

Fig. 2 Recommended peripheral circuit for OD-J8340-0A

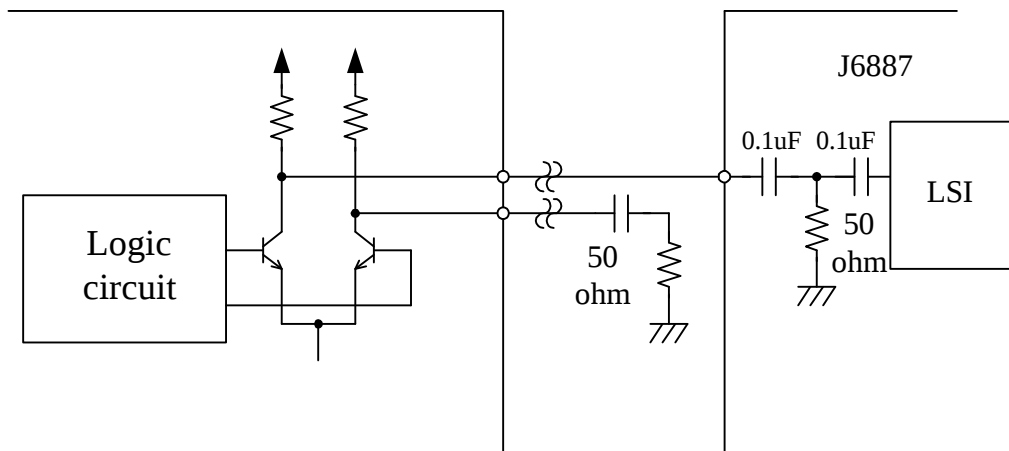
(2) Peripheral circuit part list

Symbol	Description
R1	10 Ω , 1/16 W
C1	10 μ F $\pm$ 20 %, 10V Tantalum capacitor
C2	10 μ F $\pm$ 20 %, 10V Tantalum capacitor
C3	0.1 μ F, + 20 % / - 80 %, 10V Ceramic capacitor
C4	0.1 μ F, + 20 % / - 80 %, 10V Ceramic capacitor
C5	0.1 μ F, + 20 % / - 80 %, 10V Ceramic capacitor
C6	0.1 μ F, + 20 % / - 80 %, 10V Ceramic capacitor
L1	1 μ H, MURATA LQH3C1ROM24
L2	Open

(3) LVPECL interface termination



(4) CML interface termination

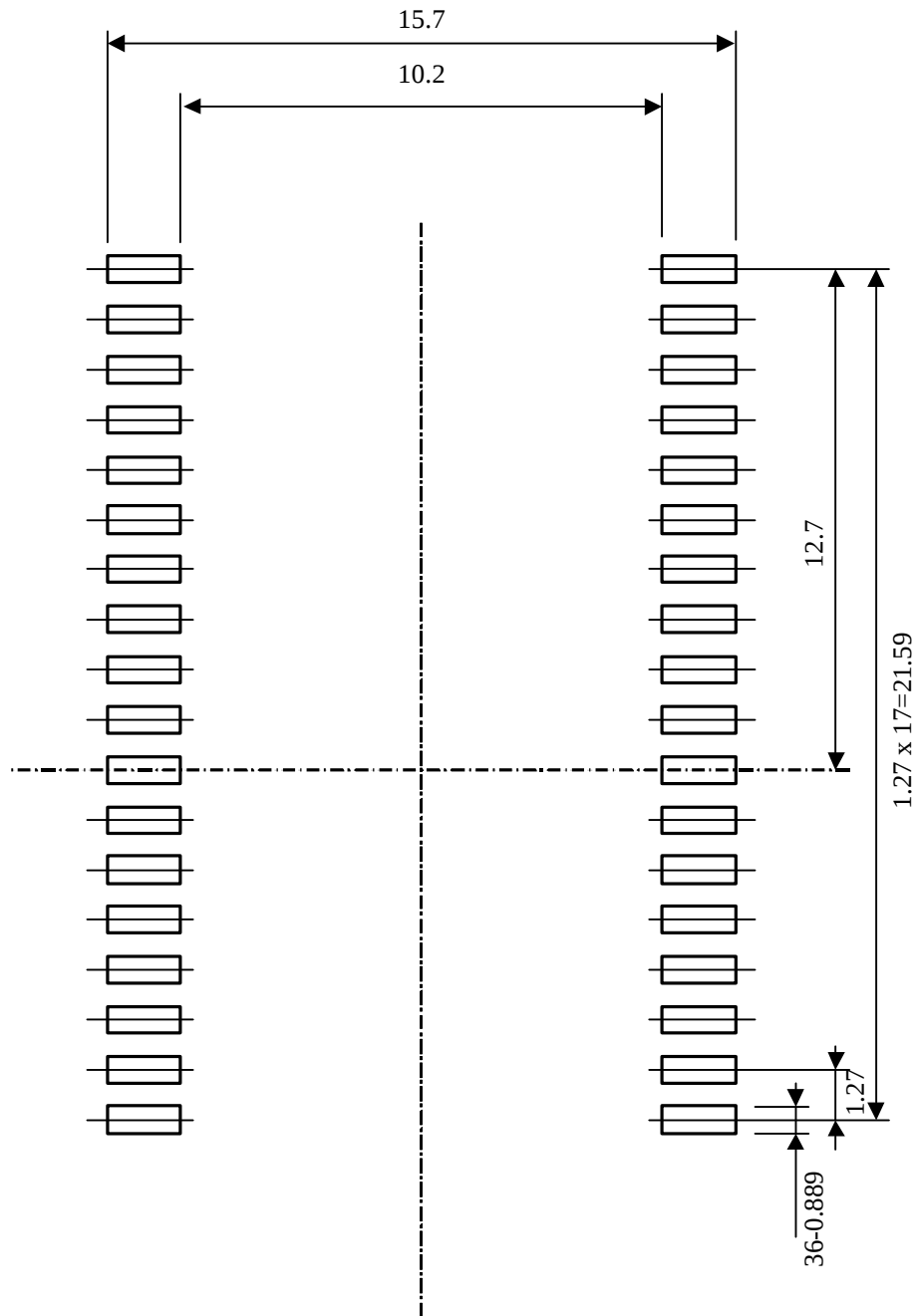


Note;

Use 50 Ω coaxial cable or 50 Ω strip line to interface with the OD-J8340-0A/0B high speed inputs.

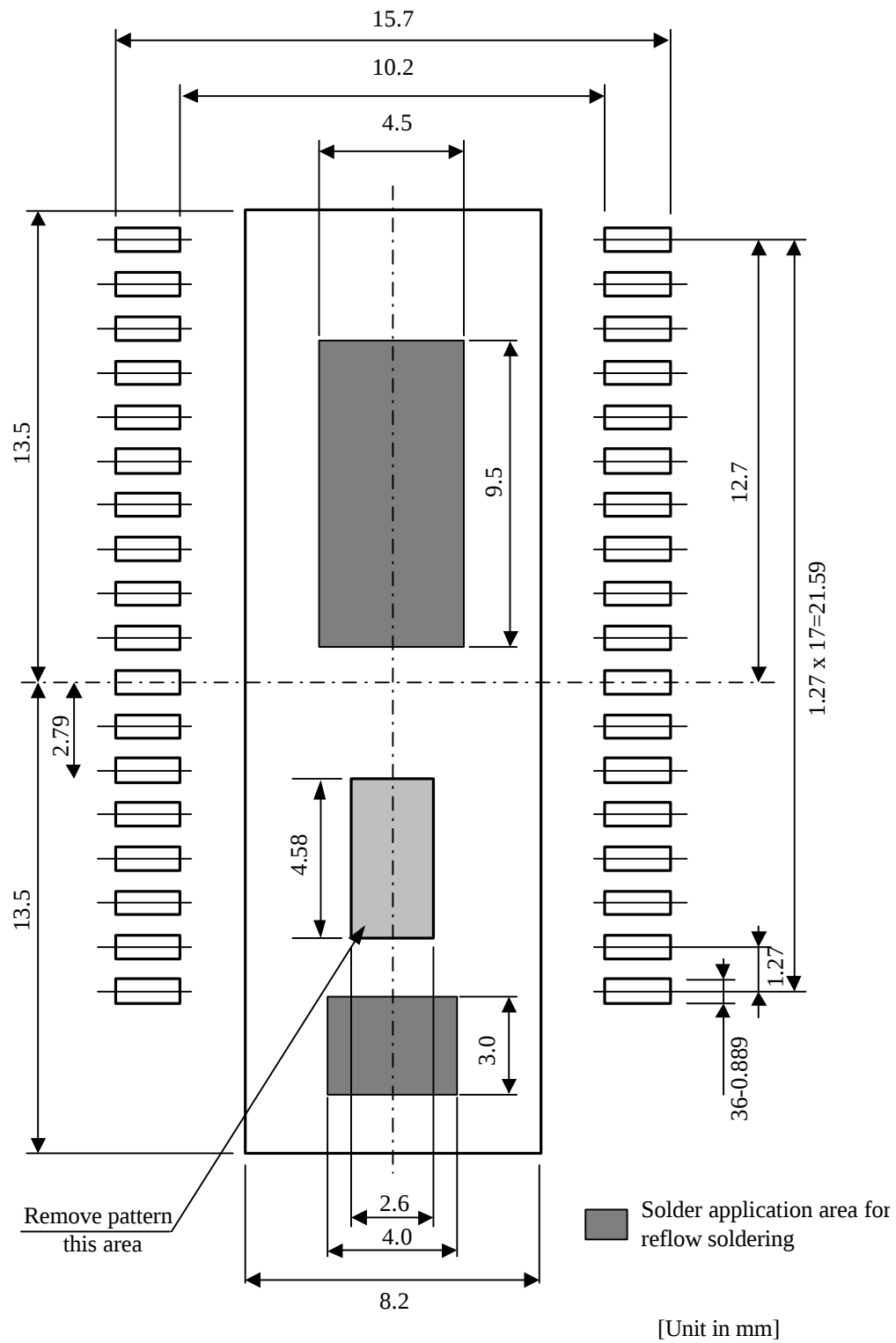
7. Pad layout

(1) Pad layout for OD-J8340



[Unit in mm]

(2) Pad layout for OD-J6887 / OD-J8340 (common pad)



8. Recommended Mounting Conditions

(1) Soldering Conditions

- 1) Soldering iron temperature : Less than 260 deg C
- 2) Soldering Time per pin : Less than 5 second
- 3) Environment for soldering : room temperature

(Caution)

- 1) Please connect soldering iron to the earth ground
- 2) Be careful the pigtail fiber to touch the soldering iron

(2) Solvent Cleaning

Solvent cleaning is prohibited.

(3) Mounting Precautions

Do not reform or deform the product.

(4) De-soldering from the Printed Board

The product performance is not guaranteed in case of de-soldering from a printed circuit board.

9. Application Precautions

(1) Optical Connector Precautions

The optical connector should be kept free from dust, and the optical connector cap should be kept in place as a dust cover when the device is not connected to a cable.

If contamination is present on the optical connector, the use of canned air with a extension tube should remove any loose debris.

(2) Optical Fiber Precautions

Do not stretch or bend pigtail cord more than specified values. Recommended value for stretch is less than 200gf and bending radius should be more than 30 mm.

Do not step on the pigtail cord, Do not put a thing on the pigtail cord.

(3) Other Precautions

Mechanical shocks due to falling could lead permanent damage to optical parts of the product.

The product's performance given in this manual is guaranteed for correct applications only. In case of incorrect usage product performance are not guaranteed.

Sudden heating and sudden cooling by dryer and cooling spray could lead permanent damage to the product. The product may not operate correctly while sudden heating and/or sudden cooling.

This product should be handled as a CMOS product.

Un-terminated optical connector may emit laser radiation. Do not view with optical instruments.

Do not disconnect the optical connector under operating.