MITSUBISHI ELECTRIC CORPLRATION ENGLISH VERSION ONLY

SPECIFICATION	PREPARED BY:	*R.Nakai*	REV							
	CHECKED BY:	*H.Koyanagi*								
	APPROVED BY:	*K.Masuda*								
	DATE:	*Oct.22, '07*								

1.TYPE : ML920LA43S-02
2.APPLICATION : 2.5Gbps Optical Fiber Communication up to 30km distance with CWDM
3.STRUCTURE : InGaAsP/InP DFB LASER DIODE
4.OUTLINE : G880106
5.ABSOLUTE MAXIMUM RATINGS

No.	PARAMETER	SYMBOL	CONDITION	RATINGS	UNIT
1	Optical Output Power	Po	CW	10	mW
2	Laser Forward Current	If	---	150	mA
3	Reverse Voltage (LD)	V_{RL}	---	2	V
4	Reverse Voltage (PD)	V_{RD}	---	20	V
5	Forward Current (PD)	I_{FD}	---	2	mA
6	Case Temperature	Tc	---	-10 to +85	°C
7	Storage Temperature	Tstg	---	-40 to +100	°C

6. OPTICAL AND ELECTRICAL CHARACTERISTICS

(Tc=25+/-3°C otherwise specified)

No.	PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
				MIN.	TYP.	MAX.	
1	Threshold Current	Ith	CW	---	8	12	mA
			CW, Tc=85°C	---	30	40	
2	Operating Current	Iop	CW, Po=5mW	---	25	40	mA
			CW, Po=5mW, Tc=85°C		60	80	
3	Operating Voltage	Vop	CW, Po=5mW	---	1.1	1.5	V
4	Peak Wavelength	λp	CW, Po=5mW	<*3>			nm
5	Slope efficiency	η	CW, Po=5mW	0.20	0.28	---	mW /mA
6	Side Mode Suppression Ratio	SMSR	CW, Po=5mW, Tc=-10 to 85°C	35	40	---	dB
		RF-SMSR	2.48832Gbps, Ib=Ith+15mA Ext.Ratio=10dB	35	40	---	dB
7	Temperature Coefficient of Peak Wavelength	dλp/dT	CW, Po=5mW, Tc=-10 to 85°C	---	0.1	---	nm/°C
8	Fiber Coupling Power	Pf	CW, Po=5mW, SMF(10/125)	1.5	2.0	---	mW
9	Focal Length	Df	CW, Po=5mW, SMF(10/125)	7.0	7.5	8.0	mm
10	Resonance Frequency	fr	2.48832Gbps, Ib=Ith+15mA Ext.Ratio=10dB	---	11	---	GHz
11	Rise time/Fall time	tr/tf	2.48832Gbps, Ib=Ith+15mA Ext.Ratio=10dB，20%-80% <*1>	---	80	120	psec
12	Monitor Current (PD)	Im	CW, Po=5mW V_{RD}=1V,RL=10Ω <*2>	0.1	0.2	1.0	mA
13	Tracking Error	TE	CW, APC(@Im(25°C, 5mW) TE=10 log(Po(Tc)/Po(25°C)) Tc= -10 to +85°C	-1.0	---	1.0	dB
14	Dark Current (PD)	Id	V_{RD}=5V	---	---	0.1	μA
15	Capacitance (PD)	Ct	V_{RD}=5V, f=1MHz	---	10	20	pF

<*1>Except influence of the 18mm lead.
<*2>RL is load resistance of the photo diode.

<*3>Peak Wavelength

Part Number	SYMBOL	TEST CONDITION	LIMITS (nominal -3/+3nm)			UNIT
			MIN.	TYP.	MAX.	
ML920LA43S -02A47	λp	CW, Po=5mW Tc=25°C	1467	1470	1473	nm
ML920LA43S -02A49			1487	1490	1493	
ML920LA43S -02A51			1507	1510	1513	
ML920LA43S -02A53			1527	1530	1533	
ML920LA43S -02A55			1547	1550	1553	
ML920LA43S -02A57			1567	1570	1573	
ML920LA43S -02A59			1587	1590	1593	
ML920LA43S -02A61			1607	1610	1613	

Part Number	SYMBOL	TEST CONDITION	LIMITS (nominal -2/+2nm)			UNIT
			MIN.	TYP.	MAX.	
ML920LA43S -02B47	λp	CW, Po=5mW Tc=25°C	1468	1470	1472	nm
ML920LA43S -02B49			1488	1490	1492	
ML920LA43S -02B51			1508	1510	1512	
ML920LA43S -02B53			1528	1530	1532	
ML920LA43S -02B55			1548	1550	1552	
ML920LA43S -02B57			1568	1570	1572	
ML920LA43S -02B59			1588	1590	1592	
ML920LA43S -02B61			1608	1610	1612	

Part Number	SYMBOL	TEST CONDITION	LIMITS (nominal -3/+1nm)			UNIT
			MIN.	TYP.	MAX.	
ML920LA43S -02C47	λp	CW, Po=5mW Tc=25°C	1467	1470	1471	nm
ML920LA43S -02C49			1487	1490	1491	
ML920LA43S -02C51			1507	1510	1511	
ML920LA43S -02C53			1527	1530	1531	
ML920LA43S -02C55			1547	1550	1551	
ML920LA43S -02C57			1567	1570	1571	
ML920LA43S -02C59			1587	1590	1591	
ML920LA43S -02C61			1607	1610	1611	

Part Number	SYMBOL	TEST CONDITION	LIMITS (nominal -2/+1nm)			UNIT
			MIN.	TYP.	MAX.	
ML920LA43S -02D47	λp	CW, Po=5mW Tc=25°C	1468	1470	1471	nm
ML920LA43S -02D49			1488	1490	1491	
ML920LA43S -02D51			1508	1510	1511	
ML920LA43S -02D53			1528	1530	1531	
ML920LA43S -02D55			1548	1550	1551	
ML920LA43S -02D57			1568	1570	1571	
ML920LA43S -02D59			1588	1590	1591	
ML920LA43S -02D61			1608	1610	1611	

7. TYPE NAME

ML920LA43S - 02 Y ZZ

Bit Rate	Wavelength Spec.	Peak Wavelngth
02: 2.5Gbps / 30km 1.25Gbps	A: -3 / +3 nm	47: 1470nm
03: 2.5Gbps / 80km	B: -2 / +2 nm	49: 1490nm
	C: -3 / +1 nm	51: 1510nm
	D: -2 / +1 nm	53: 1530nm
		55: 1550nm
		57: 1570nm
		59: 1590nm
		61: 1610nm

8. ACCOMPANYING INSPECTION DATA

Ith, Iop, Vop, η, λ p, Im, SMSR (@Po=5mW,Tc=25°C)

9. SAFETY CAUTIONS FOR USE OF OPTOELECTRONICS DEVICES

General:

Although the manufacturer is always striving to improve the reliability of its product, problems and errors may occur with semiconductor products. Therefore, the user's products are required to be designed with full regard to safety. Incorporation of the redundancy, fire prevention, error prevention safeguards is necessary so that any problems or errors with the semiconductor product do not cause any accidents that result in injury, death, fire or environmental damage.
The following requirements must be strictly observed.

Warning!

1. Treatment of the laser light

Semiconductor laser radiates laser light during operation. Laser light is very dangerous when shot directly into human eyes. Don't look at laser light directly, or through optics such as a lens. The laser light should be observed using the ITV camera, IR-viewer, or other appropriate instruments.

2. Handling of the product

The product contains GaAs (gallium arsenide). It is safe for regular use, but harmful to the human body if made into powder or steam. Be sure to avoid dangerous process like smashing, burning, chemical etching. Never put this product in one's mouth or swallow it.

3. Handling of disposal of the product

This product must be disposed of as special industrial waste. It is necessary to separate it from general industrial waste and general garbage.

Caution!

1. High temperature

During operation the product may become hot. Therefore, do not directly touch it during operation. The product will remain hot even after the power is turned off. Wait until it cools before you touch it, otherwise burns may result. Never place any inflammable substances that may cause a fire near the product.

10. HANDLING CAUTIONS FOR OPTOELECTRONICS DEVICES

1. General:

(1) The products described in this specification are designed and manufactured for use in general communication systems or electronic devices, unless their applications or reliability are otherwise specified. Therefore, they are not designed or manufactured for installation in devices or systems that may affect human life or that are used in social infrastructure requiring high reliability.

(2) When the customer is considering to use the products described in this specification in special applications, such as transportation systems (automobiles, trains, vessels), medical equipments, aerospace, nuclear power control, and submarine repeaters or systems, please contact Mitsubishi Electric or an authorized distributor.

2. Shipping Conditions:

(1) During shipment, place the packing boxes in the correct direction, and fix them firmly to keep them immovable. Placing the boxes upside down, tilting, or applying abnormal pressure onto them may cause deformation in the electrode terminals, breaking of resin case, or other problems.

(2) Never throw or drop the packing boxes. Hard impact on the boxes may cause break of the devices.

(3) Take strict precautions to keep the devices dry when shipping under rain or snow.

3. Storage Conditions:

When storing the products, it is recommended to store them following the conditions described below without opening the packing. Not taking enough care in storing may result in defects in electrical characteristics, soldering quality, visual appearance, and so on. The main points are described below (if special storage conditions are given to the product in the specification sheet, they have priority over the following general cautions):

(1) Appropriate temperature and humidity conditions, i.e., temperature range between 5~30°C, and humidity between 40~60 percent RH, should be maintained in storage locations. Controlling the temperature and humidity within this range is particularly important in case of long-term storage for six months or more.

(2) The atmosphere should be particularly free from toxic gases and dust.

(3) Do not apply any load on the product.

(4) Do not cut or bend the leads of the devices which are to be stored. This is to prevent corrosion in the cut or bent part of the lead causing soldering problems in the customer's assembling process.

(5) Sudden change in temperature may cause condensation in the product or packing, therefore, such locations should be avoided for storing. Temperature in storage locations should be stable.

(6) When storing ceramic package products for extended periods of time, the leads may turn reddish due to reaction with sulfur in the atmosphere.

(7) Storage conditions for bare chip and unsealed products shall be stated separately because bare chip and unsealed products require stricter controls than package sealed products.

4. Design Conditions and Environment under Use:

(1) Avoid use in locations where water or organic solvents adhere directly to the product, or where there is any possibility of the generation of corrosive gas, explosive gas, dust, salinity, or other troublesome conditions. Such environments will not only significantly lower the reliability, but also may lead to serious accidents.

(2) Operation in excess of the absolute maximum ratings can cause permanent damage to the device. The customers are requested to design not to exceed those ratings even for a short time.

5. Static Electric Safety Cautions:

The optoelectronic devices are sensitive to static electricity (ESD, electro-static discharge). The product can be broken by ESD. When handling this product, please observe the following countermeasures:

<Countermeasures against Static Electricity and Surge>

To prevent break of devices by static electricity or surge, please adopt the following countermeasures in the assembly line:

(1) Ground all equipments, machinery jigs, and tools in the process line with earth wires installed in them. Take particular care with hot plates, solder irons and other items for which the commercial power supplies are prone to leakage.

(2) Workers should always use earth bands. Use of antistatic clothing, electric conductive shoes, and other safety equipment while at work is highly recommended.

(3) Use conductive materials for this product's container, etc.

(4) It is recommended that grounding mats be placed on the surfaces of assembly line workbench and the surrounding floor in work area, etc.

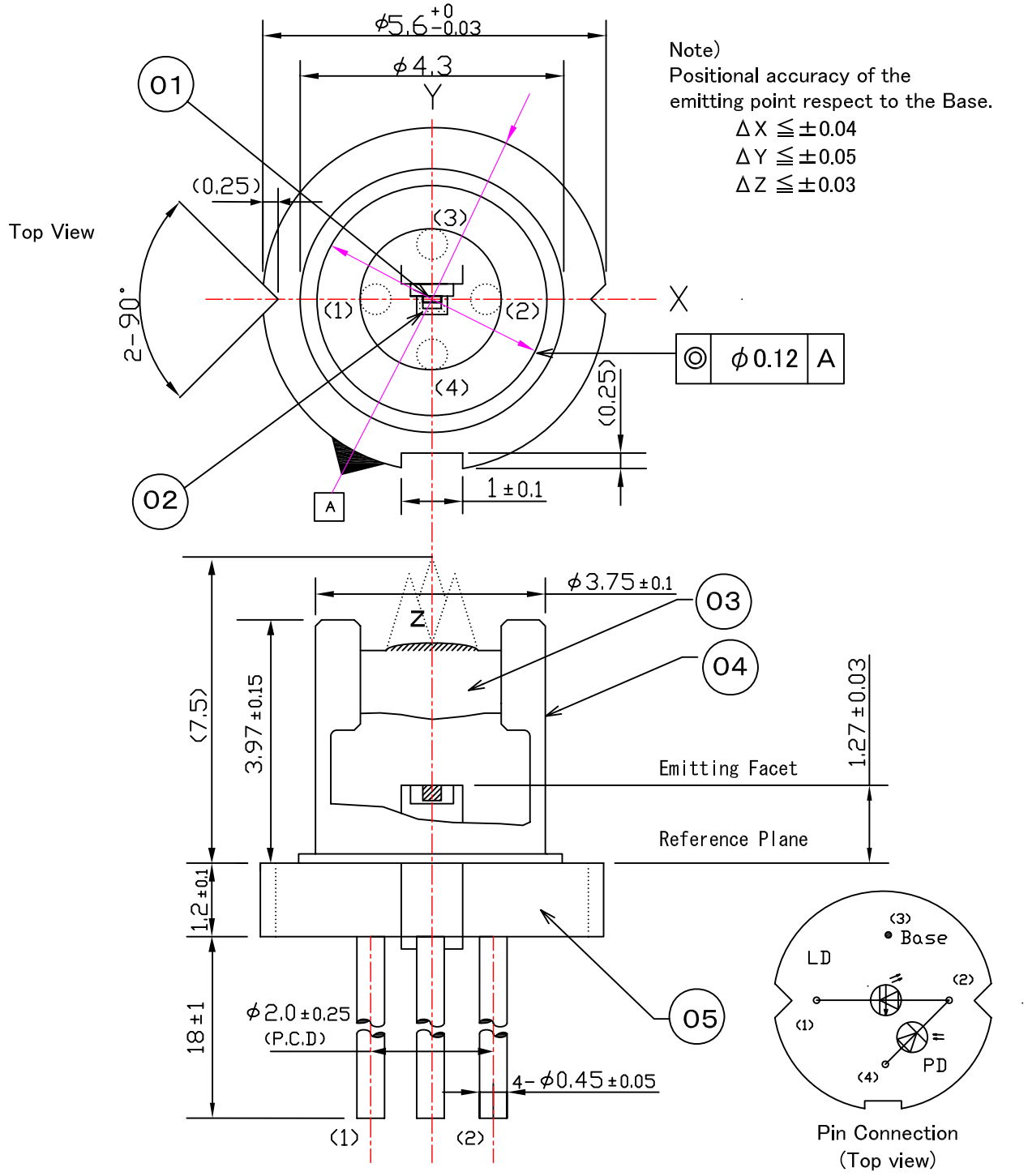
(5) When mounting this product in parts or materials which can be electrically charged (printed wiring boards, plastic products, etc.), pay close attention to the static electricity in those parts. ESD may damage the product.

(6) Humidity in working environment should be controlled to be 40 percent RH or higher.

These countermeasures are most general, and there is a need to carefully confirm the line before starting mass production using this product (in the trial production, etc.). It is extremely important to prevent surge, eliminate it rapidly, and prevent it from spreading.

記 録

Item	Description	Materials	Remarks
01	LD Chip		
02	PD Chip		
03	Aspherical lens	SF6	
04	Cap	SF20T	
05	Base	SPC	



改定 CHANGE

常用
保留
一時
商用

第3角法 3RD ANGLE PROJECTION	MITSUBISHI ELECTRIC CORPORATION				OUTLINE DRAWING OF LASER DIODE (20LA-package,S-connection)	
DIM IN (mm)	作成 DRAWN	照査 CHECKED	設計 DESIGNED	検 認 APPROVED		
尺度 SCALE 10/1 (NTS)	山田	羽田	山田	吉田 '06-8/11	G	8 8 0 1 0 6
作成日付 DATE '06-8/4						

控

出図先