

Sumitomo Electric Industries, Ltd.
Part No.: SLV4270 Series
Document No.: HUW9823056-01E
Date of issue: April 1, 2000



Technical Specification
of
1.3 μ m MQW-DFB Laser Diode Module
for CATV Return-Path Application

SLV4270 Series

Sumitomo Electric Industries, Ltd.

1. General

SLV4270 Series are 1.3 μ m InGaAsP/InP MQW-DFB laser diode modules designed for fiber optic CATV return path applications. These modules are ideally suitable for high capacity transmission including several video channels.

A laser diode is mounted into a coaxial package integrated with a single mode fiber pigtail, a double stage isolator and an InGaAs monitor PD.

2. Package dimension and pin assignment

(See attached appendix.)

3. Absolute maximum ratings ($T_c = +25^\circ\text{C}$, unless otherwise noted.)

Parameter	Symbol	Ratings	Unit
Storage temperature	Tstg	-40~+90	$^\circ\text{C}$
Operating case temperature	Top	-20~+85	$^\circ\text{C}$
Forward current (LD)	IfL	150	mA
Reverse voltage (LD)	VrL	2	V
Reverse voltage (PD)	VrP	15	V
Reverse current (PD)	IrP	2	mA
Soldering temperature (<10sec.)	Stemp	260	$^\circ\text{C}$

4. Electrical and optical characteristics ($P_f=2.0\text{mW}$, $T_c=+25^\circ\text{C}$, unless otherwise noted.)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Threshold current	I _{th}	CW	-	10	15	mA
		CW, $T_c=-20\sim+85^\circ\text{C}$	-	-	45	
Operating current	I _f	CW	-	25	45	mA
		CW, $T_c=-20\sim+85^\circ\text{C}$	-	-	80	
Operating voltage	V _f	CW, $T_c=-20\sim+85^\circ\text{C}$	-	-	2.0	V
Slope efficiency	Se	CW, Average(I _{th} to I _{th} +20mA)	0.07	-	-	mW/mA
Thermal slope efficiency	TSe	CW, Se(T_c)/Se(25°C) $T_c=-20\sim+85^\circ\text{C}$	0.5	-	1.5	-
Peak wavelength	λ_p	CW	1300	1310	1320	nm
		CW, $T_c=-20\sim+85^\circ\text{C}$	1290	-	1330	
Side-mode suppression ratio	SSR	CW, $T_c=-20\sim+85^\circ\text{C}$	30	-	-	dB
Tracking error	ΔP_f	Im hold(@ $P_f=2.0\text{mW}$ (25°C)) CW, $T_c=-20\sim+85^\circ\text{C}$	-1.0	-	1.0	dB
Passband flatness	-	peak to peak, $f=5\text{-}200\text{MHz}$	-	-	1.0	dB
Second order inter-modulation distortion	IMD2	$T_c=-20\sim+85^\circ\text{C}$, (*1)	-	-40	-	dBc
Third order inter-modulation distortion	IMD3	$T_c=-20\sim+85^\circ\text{C}$, (*1)	-	-55	-	dBc
Spurious-noise with carrier ON	SNon	$T_c=-20\sim+85^\circ\text{C}$, (*2)	-	-60	-	dBc
Spurious noise with carrier OFF	SNo _{ff}	$T_c=-20\sim+85^\circ\text{C}$, (*2)	-	-52	-	dBc
Relative intensity noise	RIN	CW, $T_c=-20\sim+85^\circ\text{C}$, (*3)	-	-150	-	dB/Hz
Monitor current	I _m	CW, V _{rP} =5V, $T_c=-20\sim+85^\circ\text{C}$	50	-	1500	pA
Monitor dark current	I _d	V _{rP} =5V	-	1	10	nA
Monitor capacitance	C	V _{rP} =5V, $f=1\text{ MHz}$	-	-	10	pF

Note: *1. OMI=20%, Optical loss=9dB, 2tone (13MHz, 19MHz)

*2. OMI=20%, Optical loss=9dB, Modulation signal=19MHz, $f=5\text{-}200\text{MHz}$, Res. B.W.=100kHz, Video B.W.=30kHz, Hold time=30sec.

Using high gain optical receiver with responsivity of 90-100A/W

Since spurious noise is strongly dependent on an optical receiver, cross check is strongly recommended.

*3. Zero link loss, ORL $\leq -50\text{dB}$, $f=5\text{-}200\text{MHz}$

5. Fiber pigtail specification

Parameter	Min.	Typ.	Max.	Unit
Type	Single Mode			
Mode field diameter	8.5	9.5	10.5	μm
Cladding diameter	122	125	128	μm
Outer jacket diameter	0.8	0.9	1.0	mm
Bending radius	30	-	-	mm

6. Order information

Part number	Pin assignment	Connector type	Flange type (hole pitch)
SLV4270-PS	Type A	FC/APC	Horizontal (12.7mm)
SLV4270-QP		SC/APC	Vertical (12.0mm)
SLV4270-QS			Horizontal (12.7mm)
SLV4270-XS		None	Horizontal (12.7mm)

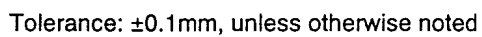
7. Precaution

- (1) Radiation emitted by laser devices can be dangerous to the eyes. Avoid eye or skin exposure to direct or scattered radiation.
- (2) The governmental approval is required to export this product to other countries. To dispose of this product, the appropriate procedure should be taken to prevent illegal exportation.
- (3) The modules should be handled in the same manner as ordinary semiconductor devices to prevent the electro-static damages. For safekeeping and carrying, the modules should be packaged with ESD proof material. To assemble the modules on PCB, the workbench, the soldering iron and the human body should be grounded.
- (4) The stress to the fiber pigtail may cause the damage on the performance. The fiber pigtail may snap off by dropping the module.
- (5) Please pay special attention to the atmosphere condition because the dew on the module may cause some electrical damage.
- (6) Under such a strong vibration environment as in automobile, the performance and reliability are not guaranteed.

Part No.: SLV427□-□□/□□□

Pin No.	Pin function for typeA and typeB
1	LD anode (CASE)
2	LD cathode
3	PD cathode
4	PD anode

– Pin assignment



Sumitomo Electric Industries, Ltd.
Part No.: SLV4270 Series
Document No.: HUW9823056-01E
Date of issue: April 1, 2000

8. For More Information

U.S.A.

Sumitomo Electric Lightwave Corp.
78 Alexander Drive
Research Triangle Park, NC 27709
U.S.A.
Tel. (919)541-8100
Fax. (919)541-8376
www.sumitomoelectric.com
info@sumitomoelectric.com

Europe

Sumitomo Electric Europe Ltd.
Unit 11, Magnolia House
Spring Villa Park, Spring Villa Road
Edgware, Middlesex, HA8 7EB
United Kingdom
Tel. (181)905-6160
Fax. (181)905-6195

Japan

Sumitomo Electric Industries, Ltd.
International Business Division.)
3-12, Moto-Akasaka 1-chome
Minato-ku Tokyo 107
Japan
Tel. (03)3423-5771
Fax. (03)3423-5099
URL: www.sei.co.jp/Electro-optic/index_e.html