

Sumitomo Electric Industries, Ltd.
Part No. : SLT548x-xA Series
Document No. : HUW0025006-01C
Date of issue : January 31, 2002



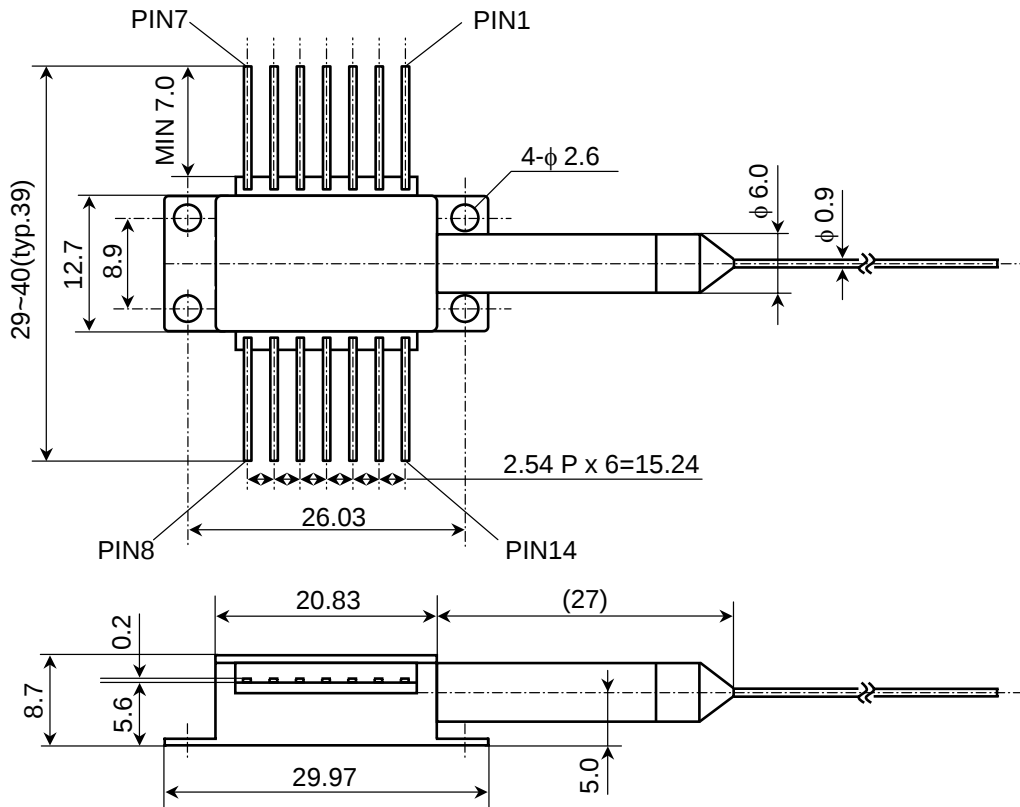
Technical Specification
of
1.5 μ m Tunable Laser Diode Module
for WDM External Modulation
~ 8 Channels , 10mW ~

SLT548x-xA Series

Sumitomo Electric Industries, Ltd.

SLT548x-xA series are 1.5 μ m InGaAsP/InP MQW DFB laser diode modules designed for a CW optical source of WDM (Wavelength Division Multiplexing) application used with an external modulator. SLT548x-xA can be tuned to 8 adjacent channels of 50GHz spacing by controlling the LD chip temperature. A LD chip mounted on a 14 pin butterfly package integrated with an optical isolator, an InGaAs monitor PD, a thermo-electric cooler, and a single mode polarization maintaining (PM) fiber pigtail.

(unit : mm, tolerance : +/-0.15mm unless otherwise noted)



Pin Assignment

Pin No.	Function	Pin No.	Function
1	Thermistor	14	NC
2	Thermistor	13	LD Anode (*1)
3	LD Cathode (DC)	12	LD Cathode (RF)
4	Monitor PD Anode	11	LD Anode (*1)
5	Monitor PD Cathode	10	NC
6	TEC Anode	9	Case Ground
7	TEC Cathode	8	Case Ground

Note *1 SLT5481 : Anode pins are connected to case ground
SLT5483 : Anode pins are floated against case ground

3. Absolute maximum ratings

Parameter	Symbol	Min.	Max.	Unit.
Storage temperature	Tstg	-40	85	°C
Operating case temperature	Tc	-20	70	°C
LD forward current	IfL	-	200	mA
LD reverse voltage	VrL	-	2	V
PD reverse current	IrP	-	2	mA
PD reverse voltage	VrP	-	15	V
Thermistor current	Itherm	—	0.5	mA
Thermistor voltage	Vtherm	—	5	V
TEC current	Ic	-	2	A
Electro static Discharge (ESD) (*2)	VESD	—	500	V
Package mounting screw torque(*3)	Npt	-	0.2	Nm
Lead soldering temperature	Stemp	-	260	°C
Lead soldering time	Stime	-	10	sec

Note *2 A human-body model (HBM, C=100pF, R=1.5kΩ) is employed.

Note *3 Without buffer materials under the package

4. Electrical and optical characteristics

(Unless otherwise noted, $T_{LD}=5\sim 45^{\circ}\text{C}$, BOL)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Threshold current	I_{th}	CW	-	-	30	mA
Operating current	I_{op}	CW, $P_f=10\text{mW}$	-	-	70	mA
Forward voltage	V_f	CW, $I_f=I_{op}$	-	-	2	V
Monitor current	I_m	CW, $I_f=I_{op}$, $V_{rp}=5\text{V}$	25	-	500	μA
Side mode suppression ratio	SMSR	CW, $I_f=I_{op}$	35	-	-	dB
Relative intensity noise	RIN	CW, $I_f=I_{op}$, DC~2.5GHz	-	-	-140	dB/Hz
Monitor dark current	I_d	$V_{rp}=5\text{V}$	-	1	10	nA
Monitor capacitance	C	$V_{rp}=5\text{V}$, $f=1\text{MHz}$	-	-	12	pF
Peak wavelength	λ_p	CW, $I_f=I_{op}$	-	(*4)	-	nm
Peak wavelength drift	$D\lambda$	CW, $P_f=P_{op}$, 20 years	-	-	0.1(*5)	nm
Line width	$\Delta\lambda$	CW, $I_f=I_{op}$	-	-	10	MHz
Polarization extinction ratio	PER	CW, $I_f=I_{op}$, launched into slow axis	20	-	-	dB

Note *4 Peak wavelength can be set to adjacent 8 channels of 50GHz spacing by tuning the LD temperature during 5 to 45°C. See ordering information (Section 7)

Note *5 Estimated MTTF : 4.75×10^5 hours

5. Thermal characteristics

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit.
Thermistor resistance	Rth	T _{LD} =25°C	9.5	10	10.5	kΩ
Thermistor B const.	B	25°C /75°C	3800	3900	4000	K
TEC current(BOL)	Ic	T _{LD} =5°C, Tc=70°C, Pf=Pop, BOL	-	-	1.2	A
TEC voltage(BOL)	Vc		-	-	2.4	V
TEC current(EOL)	Ic2		-	-	Icx1.1	A
TEC voltage(EOL)	Vc2		-	-	Vcx1.1	V
Peak wavelength drift with case temperature	Dλp/DTc	CW, If=Iop, Tc=-20 to 70°C	-1	-	1	pm/°C

6. Fiber specification

Parameter	Min.	Typ.	Max.	Unit.
Fiber type	Single mode PM fiber			-
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
Pigtail length	1.5	2.0	2.5	m
Bending radius	40	-	1	mm
Optical connector	(*6)			-

Note *6 See ordering information (Section 7)

7. Ordering information

Ordering number	Anode pins	Optical connector
SLT5481-CA-xxxx	Case Ground	SC/PC
SLT5483-CA-xxxx	Floating	SC/PC
SLT5481-DA-xxxx	Case Ground	FC/PC
SLT5483-DA-xxxx	Floating	FC/PC

xxxx : Part No. (shown in the following tables)

Table of part number (C-band)

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C-band					
Part No.	Tunable channels	Part No.	Tunable channels	Part No.	Tunable channels
K620	F620 to F585	K465	F465 to F430	K310	F310 to F275
K615	F615 to F580	K460	F460 to F425	K305	F305 to F270
K610	F610 to F575	K455	F455 to F420	K300	F300 to F265
K605	F605 to F570	K450	F450 to F415	K295	F295 to F260
K600	F600 to F565	K445	F445 to F410	K290	F290 to F255
K595	F595 to F560	K440	F440 to F405	K285	F285 to F250
K590	F590 to F555	K435	F435 to F400	K280	F280 to F245
K585	F585 to F550	K430	F430 to F395	K275	F275 to F240
K580	F580 to F545	K425	F425 to F390	K270	F270 to F235
K575	F575 to F540	K420	F420 to F385	K265	F265 to F230
K570	F570 to F535	K415	F415 to F380	K260	F260 to F225
K565	F565 to F530	K410	F410 to F375	K255	F255 to F220
K560	F560 to F525	K405	F405 to F370	K250	F250 to F215
K555	F555 to F520	K400	F400 to F365	K245	F245 to F210
K550	F550 to F515	K395	F395 to F360	K240	F240 to F205
K545	F545 to F510	K390	F390 to F355	K235	F235 to F200
K540	F540 to F505	K385	F385 to F350	K230	F230 to F195
K535	F535 to F500	K380	F380 to F345	K225	F225 to F190
K530	F530 to F495	K375	F375 to F340	K220	F220 to F185
K525	F525 to F490	K370	F370 to F335	K215	F215 to F180
K520	F520 to F485	K365	F365 to F330	K210	F210 to F175
K515	F515 to F480	K360	F360 to F325	K205	F205 to F170
K510	F510 to F475	K355	F355 to F320	K200	F200 to F165
K505	F505 to F470	K350	F350 to F315	K195	F195 to F160
K500	F500 to F465	K345	F345 to F310	K190	F190 to F155
K495	F495 to F460	K340	F340 to F305	K185	F185 to F150
K490	F490 to F455	K335	F335 to F300	K180	F180 to F145
K485	F485 to F450	K330	F330 to F295	K175	F175 to F140
K480	F480 to F445	K325	F325 to F290	K170	F170 to F135
K475	F475 to F440	K320	F320 to F285	K165	F165 to F130
K470	F470 to F435	K315	F315 to F280	K160	F160 to F125

Table of part number (L-band)

L-band					
Part No.	Tunable channels	Part No.	Tunable channels	Part No.	Tunable channels
K155	F155 to F120	J985	E985 to E950	J815	E815 to E780
K150	F150 to F115	J980	E980 to E945	J810	E810 to E775
K145	F145 to F110	J975	E975 to E940	J805	E805 to E770
K140	F140 to F105	J970	E970 to E935	J800	E800 to E765
K135	F135 to F100	J965	E965 to E930	J795	E795 to E760
K130	F130 to F095	J960	E960 to E925	J790	E790 to E755
K125	F125 to F090	J955	E955 to E920	J785	E785 to E750
K120	F120 to F085	J950	E950 to E915	J780	E780 to E745
K115	F115 to F080	J945	E945 to E910	J775	E775 to E740
K110	F110 to F075	J940	E940 to E905	J770	E770 to E735
K105	F105 to F070	J935	E935 to E900	J765	E765 to E730
K100	F100 to F065	J930	E930 to E895	J760	E760 to E725
K095	F095 to F060	J925	E925 to E890	J755	E755 to E720
K090	F090 to F055	J920	E920 to E885	J750	E750 to E715
K085	F085 to F050	J915	E915 to E880	J745	E745 to E710
K080	F080 to F045	J910	E910 to E875	J740	E740 to E705
K075	F075 to F040	J905	E905 to E870	J735	E735 to E700
K070	F070 to F035	J900	E900 to E865	J730	E730 to E695
K065	F065 to F030	J895	E895 to E860	J725	E725 to E690
K060	F060 to F025	J890	E890 to E855	J720	E720 to E685
K055	F055 to F020	J885	E885 to E850	J715	E715 to E680
K050	F050 to F015	J880	E880 to E845	J710	E710 to E675
K045	F045 to F010	J875	E875 to E840	J705	E705 to E670
K040	F040 to F005	J870	E870 to E835	J700	E700 to E665
K035	F035 to F000	J865	E865 to E830	J695	E695 to E660
K030	F030 to E995	J860	E860 to E825	J690	E690 to E655
K025	F025 to E990	J855	E855 to E820	J685	E685 to E650
K020	F020 to E985	J850	E850 to E815	J680	E680 to E645
K015	F015 to E980	J845	E845 to E810	J675	E675 to E640
K010	F010 to E975	J840	E840 to E805	J670	E670 to E635
K005	F005 to E970	J835	E835 to E800	J665	E665 to E630
K000	F000 to E965	J830	E830 to E795	J660	E660 to E625
J995	E995 to E960	J825	E825 to E790	J655	E655 to E620
J990	E990 to E955	J820	E820 to E785		

Table of channel number and frequency (C-band)

Channel No.	Frequency (THz)	Wavelength (nm)	Channel No.	Frequency (THz)	Wavelength (nm)	Channel No.	Frequency (THz)	Wavelength (nm)
F620	196.20	1527.99	F465	194.65	1540.16	F310	193.10	1552.52
F615	196.15	1528.38	F460	194.60	1540.56	F305	193.05	1552.93
F610	196.10	1528.77	F455	194.55	1540.95	F300	193.00	1553.33
F605	196.05	1529.16	F450	194.50	1541.35	F295	192.95	1553.73
F600	196.00	1529.55	F445	194.45	1541.75	F290	192.90	1554.13
F595	195.95	1529.94	F440	194.40	1542.14	F285	192.85	1554.54
F590	195.90	1530.33	F435	194.35	1542.54	F280	192.80	1554.94
F585	195.85	1530.72	F430	194.30	1542.94	F275	192.75	1555.34
F580	195.80	1531.12	F425	194.25	1543.33	F270	192.70	1555.75
F575	195.75	1531.51	F420	194.20	1543.73	F265	192.65	1556.15
F570	195.70	1531.90	F415	194.15	1544.13	F260	192.60	1556.55
F565	195.65	1532.29	F410	194.10	1544.53	F255	192.55	1556.96
F560	195.60	1532.68	F405	194.05	1544.92	F250	192.50	1557.36
F555	195.55	1533.07	F400	194.00	1545.32	F245	192.45	1557.77
F550	195.50	1533.47	F395	193.95	1545.72	F240	192.40	1558.17
F545	195.45	1533.86	F390	193.90	1546.12	F235	192.35	1558.58
F540	195.40	1534.25	F385	193.85	1546.52	F230	192.30	1558.98
F535	195.35	1534.64	F380	193.80	1546.92	F225	192.25	1559.39
F530	195.30	1535.04	F375	193.75	1547.32	F220	192.20	1559.79
F525	195.25	1535.43	F370	193.70	1547.72	F215	192.15	1560.20
F520	195.20	1535.82	F365	193.65	1548.11	F210	192.10	1560.61
F515	195.15	1536.22	F360	193.60	1548.51	F205	192.05	1561.01
F510	195.10	1536.61	F355	193.55	1548.91	F200	192.00	1561.42
F505	195.05	1537.00	F350	193.50	1549.32	F195	191.95	1561.83
F500	195.00	1537.40	F345	193.45	1549.72	F190	191.90	1562.23
F495	194.95	1537.79	F340	193.40	1550.12	F185	191.85	1562.64
F490	194.90	1538.19	F335	193.35	1550.52	F180	191.80	1563.05
F485	194.85	1538.58	F330	193.30	1550.92	F175	191.75	1563.45
F480	194.80	1538.98	F325	193.25	1551.32	F170	191.70	1563.86
F475	194.75	1539.37	F320	193.20	1551.72	F165	191.65	1564.27
F470	194.70	1539.77	F315	193.15	1552.12	F160	191.60	1564.68

Table of channel number and frequency (L-band)

Channel No.	Frequency (THz)	Wavelength (nm)	Channel No.	Frequency (THz)	Wavelength (nm)	Channel No.	Frequency (THz)	Wavelength (nm)
F155	191.55	1565.09	E975	189.75	1579.93	E795	187.95	1595.06
F150	191.50	1565.50	E970	189.70	1580.35	E790	187.90	1595.49
F145	191.45	1565.90	E965	189.65	1580.77	E785	187.85	1595.91
F140	191.40	1566.31	E960	189.60	1581.18	E780	187.80	1596.34
F135	191.35	1566.72	E955	189.55	1581.60	E775	187.75	1596.76
F130	191.30	1567.13	E950	189.50	1582.02	E770	187.70	1597.19
F125	191.25	1567.54	E945	189.45	1582.44	E765	187.65	1597.62
F120	191.20	1567.95	E940	189.40	1582.85	E760	187.60	1598.04
F115	191.15	1568.36	E935	189.35	1583.27	E755	187.55	1598.47
F110	191.10	1568.77	E930	189.30	1583.69	E750	187.50	1598.89
F105	191.05	1569.18	E925	189.25	1584.11	E745	187.45	1599.32
F100	191.00	1569.59	E920	189.20	1584.53	E740	187.40	1599.75
F095	190.95	1570.01	E915	189.15	1584.95	E735	187.35	1600.17
F090	190.90	1570.42	E910	189.10	1585.36	E730	187.30	1600.60
F085	190.85	1570.83	E905	189.05	1585.78	E725	187.25	1601.03
F080	190.80	1571.24	E900	189.00	1586.20	E720	187.20	1601.46
F075	190.75	1571.65	E895	188.95	1586.62	E715	187.15	1601.88
F070	190.70	1572.06	E890	188.90	1587.04	E710	187.10	1602.31
F065	190.65	1572.48	E885	188.85	1587.46	E705	187.05	1602.74
F060	190.60	1572.89	E880	188.80	1587.88	E700	187.00	1603.17
F055	190.55	1573.30	E875	188.75	1588.30	E695	186.95	1603.60
F050	190.50	1573.71	E870	188.70	1588.73	E690	186.90	1604.03
F045	190.45	1574.13	E865	188.65	1589.15	E685	186.85	1604.46
F040	190.40	1574.54	E860	188.60	1589.57	E680	186.80	1604.88
F035	190.35	1574.95	E855	188.55	1589.99	E675	186.75	1605.31
F030	190.30	1575.37	E850	188.50	1590.41	E670	186.70	1605.74
F025	190.25	1575.78	E845	188.45	1590.83	E665	186.65	1606.17
F020	190.20	1576.20	E840	188.40	1591.26	E660	186.60	1606.60
F015	190.15	1576.61	E835	188.35	1591.68	E655	186.55	1607.04
F010	190.10	1577.03	E830	188.30	1592.10	E650	186.50	1607.47
F005	190.05	1577.44	E825	188.25	1592.52	E645	186.45	1607.90
F000	190.00	1577.86	E820	188.20	1592.95	E640	186.40	1608.33
E995	189.95	1578.27	E815	188.15	1593.37	E635	186.35	1608.76
E990	189.90	1578.69	E810	188.10	1593.79	E630	186.30	1609.19
E985	189.85	1579.10	E805	188.05	1594.22	E625	186.25	1609.62
E980	189.80	1579.52	E800	188.00	1594.64	E620	186.20	1610.06

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8. Precaution

Class 3B in the radiation safety standard applies to all versions of this product. Mishandling may result in hazardous laser radiation exposure.

Refer to the document IRO-D01002 in terms of the usage of this product and safety precautions.

Revision record

Document No.	Date	Description	Incorporated by	Checked by	Approved by
HUW0025006-01A	Mar./5/2001	Preliminary	T. Kounosu	N. Kushida	K. Tanida
HUW0025006-01B	July/26/2001	Initial issue	N. Kushida	T. Kounosu	K. Tanida
HUW0025006-01C	Jan/31/2002	IfL, Precaution and Condition for RIN are revised. I _{therm} , V _{therm} , VESD and Pigtail length are added.	N. Kushida	T. Kounosu	K. Tanida