

Sumitomo Electric Industries, Ltd.
Part No. : SLT544x-xB Series
Document No. : HUW0025001-01C
Date of issue : January 31, 2002



Technical Specification
of
1.5 μ m Tunable Laser Diode Module
for WDM External Modulation
~ 4 Channels , 20mW ~

SLT544x-xB Series

Sumitomo Electric Industries, Ltd.

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 SLT5441 : Anode pins are connected to case ground
SLT5443 : 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, $T_{LD}=10\sim40^{\circ}\text{C}$, BOL)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Threshold current	I_{th}	CW	-	-	30	mA
Operating current	I_{op}	CW, $P_f=20\text{mW}$	-	-	130	mA
Forward voltage	V_f	CW, $I_f=I_{op}$	-	-	2	V
Monitor current	I_m	CW, $I_f=I_{op}$, $V_{rp}=5\text{V}$	50	-	1000	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	-	-	0.2(*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 4 channels of 50GHz spacing by tuning the LD temperature during 10 to 40°C. See ordering information (Section 7)

Note *5 Estimated MTTF : 2.8×10^5 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} =10°C, Tc=70°C, Pf=Pop, BOL	-	-	1.5	A
TEC voltage(BOL)	Vc		-	-	3.5	V
TEC current(EOL)	Ic2	T _{LD} =10°C, Tc=70°C, Pf=Pop, EOL	-	-	Ic x1.1	A
TEC voltage(EOL)	Vc2		-	-	Vc x1.1	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
SLT5441-CB-xxxx	Case Ground	SC/PC
SLT5443-CB-xxxx	Floating	SC/PC
SLT5441-DB-xxxx	Case Ground	FC/PC
SLT5443-DB-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
Q620	F620 to F605	Q465	F465 to F450	Q310	F310 to F295
Q615	F615 to F600	Q460	F460 to F445	Q305	F305 to F290
Q610	F610 to F595	Q455	F455 to F440	Q300	F300 to F285
Q605	F605 to F590	Q450	F450 to F435	Q295	F295 to F280
Q600	F600 to F585	Q445	F445 to F430	Q290	F290 to F275
Q595	F595 to F580	Q440	F440 to F425	Q285	F285 to F270
Q590	F590 to F575	Q435	F435 to F420	Q280	F280 to F265
Q585	F585 to F570	Q430	F430 to F415	Q275	F275 to F260
Q580	F580 to F565	Q425	F425 to F410	Q270	F270 to F255
Q575	F575 to F560	Q420	F420 to F405	Q265	F265 to F250
Q570	F570 to F555	Q415	F415 to F400	Q260	F260 to F245
Q565	F565 to F550	Q410	F410 to F395	Q255	F255 to F240
Q560	F560 to F545	Q405	F405 to F390	Q250	F250 to F235
Q555	F555 to F540	Q400	F400 to F385	Q245	F245 to F230
Q550	F550 to F535	Q395	F395 to F380	Q240	F240 to F225
Q545	F545 to F530	Q390	F390 to F375	Q235	F235 to F220
Q540	F540 to F525	Q385	F385 to F370	Q230	F230 to F215
Q535	F535 to F520	Q380	F380 to F365	Q225	F225 to F210
Q530	F530 to F515	Q375	F375 to F360	Q220	F220 to F205
Q525	F525 to F510	Q370	F370 to F355	Q215	F215 to F200
Q520	F520 to F505	Q365	F365 to F350	Q210	F210 to F195
Q515	F515 to F500	Q360	F360 to F345	Q205	F205 to F190
Q510	F510 to F495	Q355	F355 to F340	Q200	F200 to F185
Q505	F505 to F490	Q350	F350 to F335	Q195	F195 to F180
Q500	F500 to F485	Q345	F345 to F330	Q190	F190 to F175
Q495	F495 to F480	Q340	F340 to F325	Q185	F185 to F170
Q490	F490 to F475	Q335	F335 to F320	Q180	F180 to F165
Q485	F485 to F470	Q330	F330 to F315	Q175	F175 to F160
Q480	F480 to F465	Q325	F325 to F310	Q170	F170 to F155
Q475	F475 to F460	Q320	F320 to F305	Q165	F165 to F150
Q470	F470 to F455	Q315	F315 to F300	Q160	F160 to F145

Table of part number (L-band)

L-band					
Part No.	Tunable channels	Part No.	Tunable channels	Part No.	Tunable channels
Q155	F155 to F140	P980	E980 to E965	P805	E805 to E790
Q150	F150 to F135	P975	E975 to E960	P800	E800 to E785
Q145	F145 to F130	P970	E970 to E955	P795	E795 to E780
Q140	F140 to F125	P965	E965 to E950	P790	E790 to E775
Q135	F135 to F120	P960	E960 to E945	P785	E785 to E770
Q130	F130 to F115	P955	E955 to E940	P780	E780 to E765
Q125	F125 to F110	P950	E950 to E935	P775	E775 to E760
Q120	F120 to F105	P945	E945 to E930	P770	E770 to E755
Q115	F115 to F100	P940	E940 to E925	P765	E765 to E750
Q110	F110 to F095	P935	E935 to E920	P760	E760 to E745
Q105	F105 to F090	P930	E930 to E915	P755	E755 to E740
Q100	F100 to F085	P925	E925 to E910	P750	E750 to E735
Q095	F095 to F080	P920	E920 to E905	P745	E745 to E730
Q090	F090 to F075	P915	E915 to E900	P740	E740 to E725
Q085	F085 to F070	P910	E910 to E895	P735	E735 to E720
Q080	F080 to F065	P905	E905 to E890	P730	E730 to E715
Q075	F075 to F060	P900	E900 to E885	P725	E725 to E710
Q070	F070 to F055	P895	E895 to E880	P720	E720 to E705
Q065	F065 to F050	P890	E890 to E875	P715	E715 to E700
Q060	F060 to F045	P885	E885 to E870	P710	E710 to E695
Q055	F055 to F040	P880	E880 to E865	P705	E705 to E690
Q050	F050 to F035	P875	E875 to E860	P700	E700 to E685
Q045	F045 to F030	P870	E870 to E855	P695	E695 to E680
Q040	F040 to F025	P865	E865 to E850	P690	E690 to E675
Q035	F035 to F020	P860	E860 to E845	P685	E685 to E670
Q030	F030 to F015	P855	E855 to E840	P680	E680 to E665
Q025	F025 to F010	P850	E850 to E835	P675	E675 to E660
Q020	F020 to F005	P845	E845 to E830	P670	E670 to E655
Q015	F015 to F000	P840	E840 to E825	P665	E665 to E650
Q010	F010 to E995	P835	E835 to E820	P660	E660 to E645
Q005	F005 to E990	P830	E830 to E815	P655	E655 to E640
Q000	F000 to E985	P825	E825 to E810	P650	E650 to E635
P995	E995 to E980	P820	E820 to E805	P645	E645 to E630
P990	E990 to E975	P815	E815 to E800	P640	E640 to E625
P985	E985 to E970	P810	E810 to E795	P635	E635 to E620

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

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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
HUW0025001-01A	Mar./5/2001	Preliminary	T. Kounosu	N. Kushida	K. Tanida
HUW0025001-01B	July/9/2001	Initial issue	N. Kushida	T. Kounosu	K. Tanida
HUW0025001-01C	Jan/31/2002	IfL, Precaution and Condition for RIN are revised. Itherm, Vtherm, VESD and Pigtail length are added.	N. Kushida	T. Kounosu	K. Tanida