

Specific Wavelength Laser Source Module Spec

The WLS-XXXXX2110-01 DFB laser modules are designed for forward-path CATV applications, especially digital transmission using Quadrature Amplitude Modulation (QAM). The modules are designed to incorporate high output power while maintaining high linearity. The devices feature standard pin assignments (compatible with OC-48).

These devices offer excellent performance in directly-modulation QAM transmission, offering considerable cost savings over externally-modulated solutions. The combination of high performance and very reasonable price make these modules the most cost-effective CATV transmitter solutions in the industry.

Applications:

- point-to-point applications
- Digital CATV transmission
- Sensing
- Testing system

Features:

- Meets GR 468 reliability specifications

Product PN	Description
WLS-XXXXX2110-01	WSLS with DFB LD chip, wavelength XXXX.XX±0.20nm, power ≥8mW, 14-pin butterfly package built-in optical isolator and thermoelectric cooler 1.0±0.1m polarization-maintaining optical fiber pigtail with 900um loose tube, No connector.

1. Performance Specifications

1.1 Absolute Maximum Ratings

Parameter	Symbol	Condition	Min.	Max.	Unit
Operating Case Temperature	T _c	I=I _{op}	-20	65	°C
Storage Temperature	T _{stg}	--	-40	85	°C
Laser Forward Current	I _f	--	--	120	mA
Laser Reverse Bias	V _r	--	--	2	V
Photodiode Reverse Bias	V _{rpd}	--	--	10	V
TEC Current	I _{tec}	-20 °C < T _c < +65 °C, Top=25 °C I _f =100 mA		1.5	A

1.2 Electrical and Optical Characteristics

Parameters are over operating temperature range unless otherwise noted.

Parameters	Symbol	Test Conditions	Min	Typ	Max	Unit
Center Wavelength*	λ _c	P _L = P _o , CW, T _{set} = 20C - 35C	1270	--	1610	nm
Optical Output Power	P _o	CW, T _L = T _{set}	8	--	--	mW
Optical Isolation	I _s	T=25 °C	30	--	--	dB
Side-mode Suppression Ratio	SMSR	P _L = P _o ,	30	--	--	dB
Linewidth	FWHM	P _L = P _o , CW	--	6	10	MHz
Chirp	Δλ/Δf	P _L = P _o , 500 MHz	40	--	120	MHz/mA
Threshold Current	I _{th}	T _L =25 °C	--	15	20	mA
Operating Current	I _{op}	P _L = P _o ,	--	--	120	mA
Forward Voltage	V _F	P _L = P _o ,		1.2	1.9	V
Monitor Current	I _{mon}	V _{rpd} =5 V	9	--	150	μ A/mW

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Monitor Dark Current	I_D	$V_{rpd}=5\text{ V}$	--	--	200	nA
Operating Case Temperature	T		-20	--	65	°C
Tracking Error	γ	$I_{mon}=\text{const}, \gamma=10 \log (P_o/10 \text{ mW})$ [dB]	-0.5	--	0.5	dB
Thermistor Resistance	R_t	$T=25\text{ }^\circ\text{C}$	9.5	--	10.5	K Ω
Thermistor B Constant	B	$T=25\text{ }^\circ\text{C}$	--	3900	--	K
TEC Current	I_C	$\Delta T=40\text{ }^\circ\text{C}$	--	--	1.5	A
TEC Voltage	V_C	$\Delta T=40\text{ }^\circ\text{C}$	--	--	2.0	V

*See available wavelengths from Ordering Options. CWDM wavelength set by laser sub-mount temperature.

1.3 RF Characteristics

Parameter	Symbol	Test Conditions	Min.	Typical	Max.	Unit
Input impedance	Z_{IN}	nominal		25		Ω
Frequency Range	F	--	45	-	3000	MHz
Frequency Response	$ S_{21} $	$I_f=I_{op}$ 45 MHz-870 MHz $T=25\text{ }^\circ\text{C}$	--	± 0.5	--	dB
		$I_f=I_{op}$ 45 MHz-3000 MHz $T=25\text{ }^\circ\text{C}$	--	± 1.0	--	
RF return loss	S_{11}	50 – 870 MHz, $P=P_F$, @ 50 Ω ,	6	7		dB
Relative Intensity Noise	RIN	CW, $P_L=P_o$, Note 1	--	--	-155	dB/Hz
2 nd Order Intermodulation	IMD2	Note 2, 42 MHz, @ f_2-f_1	--	--	-44	dBc
3 rd Order Intermodulation	IMD3	Note 2, 511.25 MHz, @ $2f_1-f_2$	--	--	-53	dBc

Note 1: Test condition: $P_L=P_o$, $f=500\text{ MHz}$, Optical reflection <-40 dB, 0 km fiber.

Note 2: Test condition: $P_o \geq 5\text{ mW}$, 2 unmodulated carriers ($f_1=553.25$, $f_2=595.25$), 35% OMI/ carrier, 50 km zero dispersion single mode fiber, optical reflection <-40 dB.

2. Pin Information & Electrical Schematics:

1	Thermistor
2	Thermistor
3	DC Laser Bias (-)
4	MPD Anode (-)
5	MPD Cathode (+)
6	Thermoelectric Cooler (+)
7	Thermoelectric Cooler (-)
8	Case Ground
9	Case Ground
10	Case Ground
11	Laser Common (+), Case Ground
12	Laser Modulation (-)
13	Laser Common (+), Case Ground
14	Case Ground

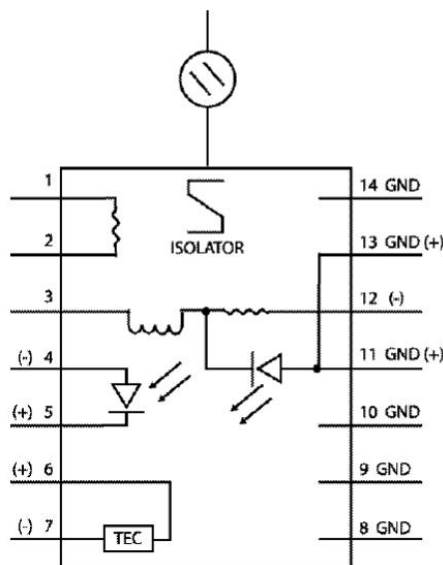
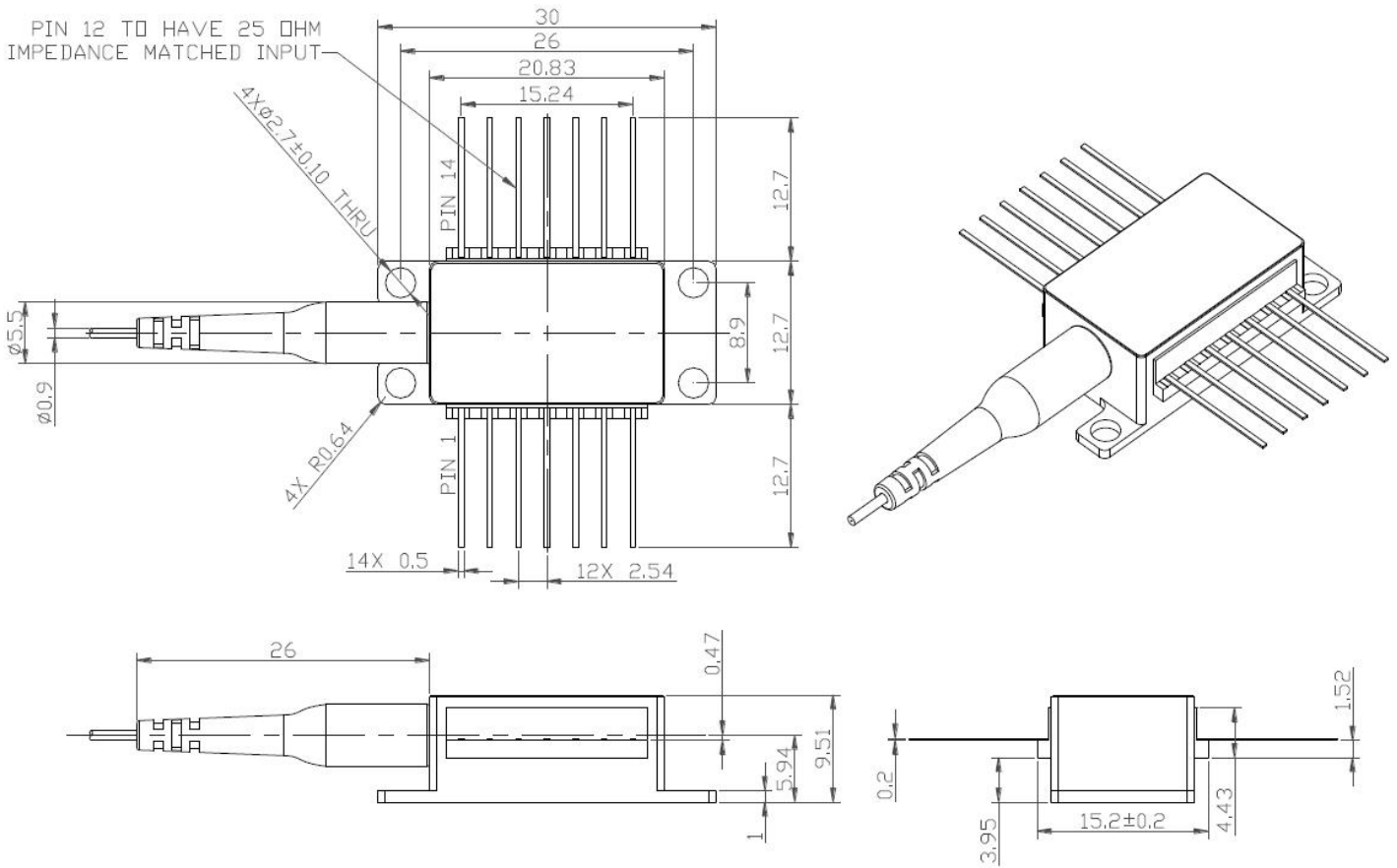


Figure 1. Laser Schematic

3. Outline Diagram:

Dimensions are in millimeters



4. Test Report:

Test report will be attached with each product. The following characteristic test data should be included :

-Optical Output Power, Center Wavelength, P-I curve, Pin Assignments.

5. Packaging:

Black vacuumize anti-static plastic package.

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ORDERING INFORMATION:

Ordering Option*	Power (mW)	Wavelength (nm)	Ordering Option*	Power (mW)	Wavelength (nm)
WLS-270102110-01	10	1270	WLS-270082110-01	8	1270
WLS-290102110-01	10	1290	WLS-290082110-01	8	1290
WLS-310102110-01	10	1310	WLS-310082110-01	8	1310
WLS-330102110-01	10	1330	WLS-330082110-01	8	1330
WLS-350102110-01	10	1350	WLS-350082110-01	8	1350
WLS-370102110-01	10	1370	WLS-370082110-01	8	1370
WLS-390102110-01	10	1390	WLS-390082110-01	8	1390
WLS-410102110-01	10	1410	WLS-410082110-01	8	1410
WLS-430102110-01	10	1430	WLS-430082110-01	8	1430
WLS-450102110-01	10	1450	WLS-450082110-01	8	1450
WLS-470102110-01	10	1470	WLS-470082110-01	8	1470
WLS-490102110-01	10	1490	WLS-490082110-01	8	1490
WLS-510102110-01	10	1510	WLS-510082110-01	8	1510
WLS-530102110-01	10	1530	WLS-530082110-01	8	1530
WLS-550102110-01	10	1550	WLS-550082110-01	8	1550
WLS-570102110-01	10	1570	WLS-570082110-01	8	1570
WLS-590102110-01	10	1590	WLS-590082110-01	8	1590
WLS-610102110-01	10	1610	WLS-610082110-01	8	1610

* Please consult factory for wavelength availability before ordering

* Optical connector: LC/SC/ST/FC/APC ; Etc