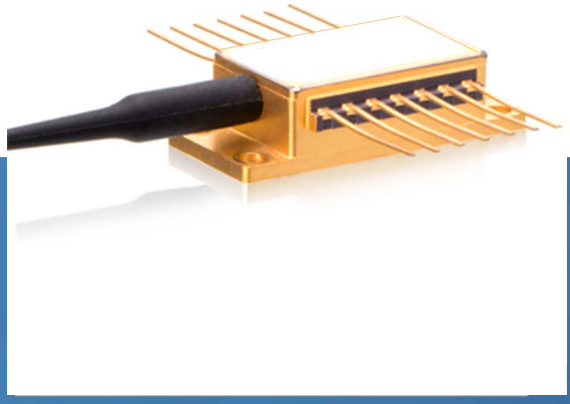

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Alcatel 1935 LMI
High power CW laser
C and L bands
With integrated wavelength monitoring

Advanced Product Definition Sheet

Product in development

Description

The Alcatel 1935 LMI contains an Alcatel SLMQW DFB laser and is designed for use with external modulation. This module is designed to high power DWDM applications with a spacing between the channels down to 50 GHz without using external locker. The module integrates a wavelength monitoring function in order to allow wavelength stabilization over product lifetime. Despite of this new feature, the package and the pinout of the new product stays compatible with the previous series (Alcatel 1905LMI) without the integrated wavelength monitoring function, in order to avoid a complete redesign of existing boards. The choice of an analog output for the control signal will leave the freedom for the user to lock the wavelength either with a digital or an analog circuit.
Also, wavelength tuning over 4 different wavelengths is offered which makes inventory reduction possible, lowering cost.
The module incorporates also a polarization maintaining fiber pigtail, thermoelectric cooler, precision thermistor, and optical isolator for stable operation under all conditions.

Features

- Integrated Fabry-Perot Etalon wavelength monitoring (replaces external lockers)
- Over four 50 GHz ITU-T channels tuneability
- Up to 20mW output power
- 50 GHz channels spacing available
- High reliability InGaAsP Buried Ridge Structure laser chip with outstanding long term wavelength stability
- Optimized for use with $LiNbO_3$ external modulator
- Internal optical isolator
- Internal TEC and power monitoring photodiode
- Polarization Maintaining Fiber PMF pigtail

Applications

- Ultra Long Haul DWDM SONET/SDH transmission system
- DWDM submarine terminal
- Instrumentation

ALCATEL

Electro-Optic Characteristics

Parameter	Symb.	Conditions	Min	Max	Units
Threshold current	I_{TH}			40	mA
Optical output power	P_F	Twave = 15 to 35°C	10 20		mW mW
Laser forward voltage	V_F	@ P_F; CW; pin 11 & 3	-	2.5	V
Laser forward current (BOL)	I_F	@ P_F = 10mW; pin 11 & 3 @ P_F = 20mW; pin 11 & 3		120 190	mA mA
Laser chip temp. range for wavelength tunability	Tλ	(2)	15	35	°C
Spectral width	Δλ	@ 10 mW; CW; FWHM @ 20 mW; CW; FWHM		10 5	MHz MHz
Side mode suppression	SMSR	@ P_F; CW	35		dB
TEC current	I_t	(1), EOL		1.3	A
TEC voltage	V_t	(1), EOL		2.5	V
Thermistor resistance	R_{TH}	@ Ts = 25°C	9.7	10.3	k Ω
Thermistor temperature coefficient	R_T		-3	-5	%/K
Relative Intensity Noise	RIN	100 MHz to 10 GHz @ P_f		-140	dB/Hz
TE/TM fiber Extinction Ratio	ER		20		dB

Note : all limits start of life (except It, Vt), Tsubmount = 25°C, Tcase = 25°C, Pf, V = -5V
(1) Tcase = 70°C (for 10&20mW), Tcase = 65°C (for 30mW), Tsubmount = 20°C, @1.2 P_F
(2) Tchip = Tλ .Tλ is chip temperature required to meet target wavelength

Wavelength monitoring section

Two photodiodes are used to ensure both optical power monitoring and wavelength monitoring. The first one (power monitoring) is referenced as monitoring photodiode (PD_{mon}) whereas the second one (wavelength monitoring) is referenced as filter photodiode (PD_{filt}).

	Symb.	Min	Max	Unit
Power Monitoring Photodiode current	I_{PDmon}	20		µA
Filter Monitoring photodiode current	I_{PDfilt}	20		µA
Photodiodes dark current	I_{dark}		0.1	µA
Center wavelength	λ_c		ITU grid	
Wavelength stability over lifetime	$\Delta\lambda_c$	- 2.5	+2.5	GHZ
Wavelength capture range	CR	45		GHz
Tunable ITU channels	N_{ITU}	1	4	
Wavelength deviation between adjacent ITU channels	ε_λ		0.1	GHz
Filter slope (normalized to maximum PD_{filt} current)	FS	2		nm^{-1}
Electrical responsivity ratio between power monitoring channel and filter monitoring channel	ERT		± 6	dB

Absolute maximum ratings

Exposing the device to stresses above those listed in absolute maximum rating could cause permanent damage. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Environmental

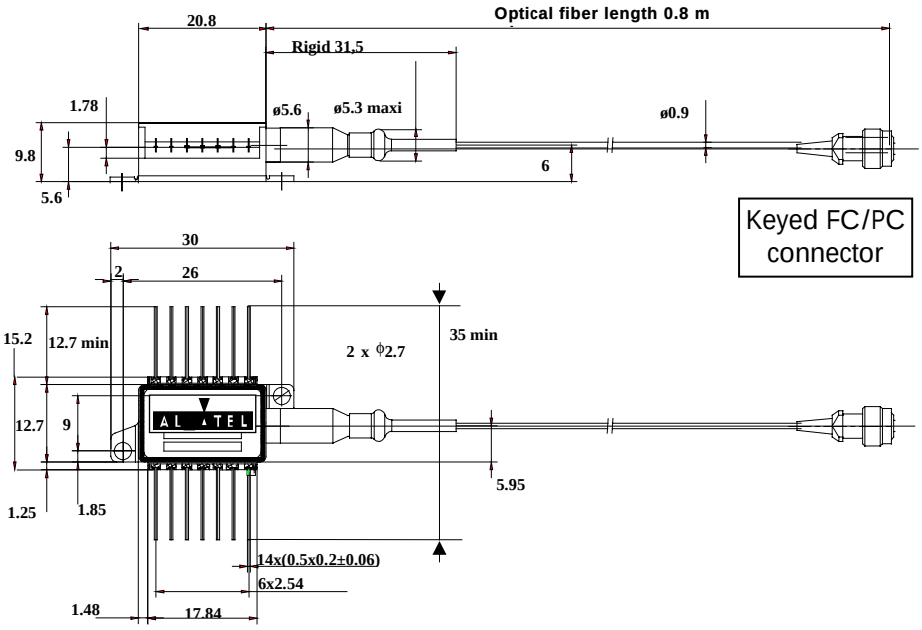
Parameter	Min	Max	Unit
Storage temperature	- 40	85	°C
Operating temperature (for 10mW to 20mW versions)	-10	70	°C
Soldering temperature (10 seconds maximum)		260	°C
Axial force on fiber (10 seconds max.)		5	N
Fiber bend radius	30		mm
ESD (1) applied on PIN detector (Pin 4&5)		100	V
ESD (1) on other Pin		2000	V

(1) Human body model

Electro-optic

Parameter	Min	Max	Unit
Laser forward current		400	mA
Laser reverse voltage		2	V
Photodiode forward current		1	mA
Photodiode reverse voltage		20	V
Thermistor Voltage		9	V
Thermistor Current		250	µA
TEC Voltage		2.8	V
TEC Current		1.4	A
Packing Mounting Torque		0.2	Nm

All dimensions in mm



Pin allocation

Pin	Description
1	Thermistor
2	Thermistor
3	LD DC Bias (-)
4	Power Monitoring PD Anode (-)
5	Common Power Monitoring and λ Monitoring PD Cathode (+)
6	TE Cooler (+)
7	TE Cooler (-)
8	Case Ground
9	Case Ground
10	λ Monitoring PD anode
11	RF common (+)
12	Laser RF input (-)
13	RF common (+)
14	No Connect

Customized versions are available for large quantities.

Performance figures contained in this document must be specifically confirmed in writing by Alcatel Optronics before they become applicable to any particular order or contract. Alcatel Optronics reserves the right to make changes to the products or information contained herein without notice.

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Standards

ITU-T.652 G optical fiber

IEC 68-2 and MIL STD 883 environment

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