

Alcatel 1916 LMM

12800 ps/nm WDM 2.5 Gbit/s digital Laser Module with integrated electro-absorption Modulator

Description

This Alcatel 1916 LMM contains an Alcatel DFB laser with monolithically integrated electro-absorption modulator (ILM). This chip provides much lower dispersion penalties than a directly modulated DFB, without the complexity of LiNbO₃ external modulators. The Alcatel 1916 LMM is optimized for ultra long-haul transmission systems using non-dispersion shifted and optical fiber amplifiers.

Features

- Very low dispersion penalty over 750 km of fiber for 2.5 Gbit/s operation

- Wavelength selection according to ITU-T G.692
- Industry-standard 14-pin butterfly package
- High frequency butterfly package with 50 Ω RF impedance
- Low drive voltage (≤ 2 Vpp)
- InGaAsP monolithically integrated DFB laser and modulator chip
- Internal optical isolator

Applications

- STM-16 and OC-48 ultra long-haul transmission systems
- Terminals for submarine transmission systems
- Digital WDM CATV transmission



Optical characteristics

Parameter	Symb.	Conditions	Min	Typical	Max	Units
Threshold current	I_{th}	$CW, V_{bias} = 0$ V	5	17	35	mA
Operating current	I_{op}	$CW, V_{bias} = 0$ V	60		80	mA
Optical output power	P_{AVE}	$I_{op}, V_{mod}, [1]$	0			dBm
Laser forward voltage	V_F	$CW, I_{op}, V_{bias} = 0$ V			2	V
Emission wavelength	λ_m			See table 1		nm
Δ (emitted-target) wavelength	$\Delta\lambda_e$	See [3]	- 0.1		+ 0.1	nm
Laser chip temperature range for tunability	T_λ	See [3]	20		30	°C
Modulator bias voltage	V_{bias}	See [1]	- 1		0	V
Modulator drive voltage	V_{mod}	See [1]			2	V
Dynamic extinction ratio	DER	See [1]	10			dB
Side mode suppression	SMSR	@ I_{op}	35			dB
Cut off frequency	S21	- 3 dB	4			GHz
RF return loss	S11	DC to 3 GHz	10			dB
Dispersion penalty	Δs	See [1], [2], [3]			2	dB
Tracking error	TR	$T_{submount} = 25^\circ\text{C}, T_{case} = 65^\circ\text{C}$ $f = 100\text{mA}, Q = 10\log[P(65^\circ\text{C})/P(25^\circ\text{C})]$	- 0.5		0.5	dB
Rise time / Fall time	T_r/T_f	See [1], [2], 10%, 90%			140	ps
Wavelength drift vs Tcase	$\Delta\lambda/\Delta T_c$			0.2	0.5	pm/°C
Monitor diode current	I_m	$I_{op}, V_M = - 5$ V	0.2	0.5	1.5	mA
Dark current	I_d				0.1	μA
TEC current	I_t	$\Delta T = 45^\circ\text{C}, I_{op} = 100\text{mA}, T_c = 65^\circ\text{C}, V_{bias} = -1\text{V}$			1.3	A
TEC voltage	V_t	$\Delta T = 45^\circ\text{C}, I_{op} = 100\text{mA}, T_c = 65^\circ\text{C}, V_{bias} = -1\text{V}$			2.5	V
Thermistor resistance	R_{TH}		9.5		10.5	KΩ

Notes : All limits start of life $T_{case} = 25^\circ\text{C}$, $T_{submount} = 20^\circ\text{C}$ to 30°C , $V_r = - 5$ V, unless otherwise stated.

[1] BER = 10^{-3} , 2.488 Gbit/s modulation: 2³-1 PRBS; NZR line code; DER ≥ 10dB

[2] 7200 ps/nm dispersion, assuming fiber with an average dispersion of 18 ps/nm/km

[4] $T_{submount} = T_\lambda$. T_λ is chip temperature required to meet target wavelength (see table 1)

[3] 12800 ps/nm dispersion, assuming fiber with an average dispersion of 18 ps/nm/km

Absolute maximum ratings

Parameters	Min	Max	Unit
Operating case temperature	0	65	°C
Storage temperature	-40	85	°C
Laser forward current		150	mA
Laser reverse voltage		2	V
Modulator forward voltage		1	V
Modulator reverse voltage		5	V
Photodiode forward current		1	mA
Photodiode reverse voltage		20	V
TEC Voltage		2.8	V
TEC Current		1.4	A
ESD applied on modulator		500	V
ESD applied on laser [1]		2000	V
Lead soldering time (at 260°C)		10	s
Packing Mounting Screw Torque		0.2	nm

[1] Human body model Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. These are absolute stress ratings only.



