

Alcatel 1902 OFA

Booster amplifier with integrated electronics

Erbium-Doped Fiber Amplifier

Description

The Alcatel 1902 OFA products belong to the Alcatel 1900 OFA family of Optical Fiber Amplifier (OFA) modules, designed for the third telecommunication window (1550 nm). Using reliability proven high power 1480 nm lasers and optimized Erbium-Doped Fiber, they provide high gain, high output power and low noise amplification. They incorporate a very high degree of integration and are presented in a compact package with connectorized pigtails. The modules may be mounted directly into a PC board and are, thus, ideal for optimization of system size. The integrated electronics provide an easy user digital interface, exempting the designer from input & output signal controls. The output power is kept constant through an APC (Automatic Power Control) loop, and the chip temperature is stabilized at $+ 25 \pm 10^\circ\text{C}$ with an ATC (Automatic Temperature Control) loop.

Five alarms are generated by the modules: loss of input signal, loss of output signal, output power degradation, laser over down circuitries are set up in the electronic's module : automatic shut down (the output power is switched off if there is no input power or if the temperature is out of range), and external shut down command.



Features

- Bit rate transparency
- High output power
- Wide wavelength range
- Wide operating case temperature
- Built in control electronics with digital interface
- Automatic shut-down with enable
- Built in input & output signal monitoring
- Built in input & output optical isolation
- Single 1480 nm pumped
- High reliability
- Small size

Optical characteristics

Parameter	Conditions	Symbol	Min	Typical	Max	Unit
Wavelength bandwidth		BW	1530		1565	nm
Output power 10 dBm module	Pin > - 6 dBm	Pout	10	12	14	dBm
Output power 13 dBm module	Pin > - 6 dBm	Pout	13	15	17	dBm
Output power 16 dBm module	Pin > - 6 dBm	Pout	16	17	19	dBm
Noise figure	1550 nm - 6 dBm input	NF		7	10	dB
Output power temp. sensitivity	1550 nm - 6 dBm input (ref. = + 25 °C)	$\partial P / \partial T$	- 0.5		+ 0.5	dB
Output power regulation stability	1550 nm, input from -6 to +4 dBm (ref. = + 25 °C)	$\partial P / \partial P_{in}$	- 0.5		+ 0.5	dB
Polarization sensitivity		$\partial P / \partial P_{ol}$	- 0.5		+ 0.5	dB
Input/output return loss		R1	27	40		dB
Time response to shut down	Time between SD command and Pout < -40 dBm	SDT		30	100	ms

(Case temperature = 0 to + 65 °C) otherwise specified

Electrical characteristics

Parameter	Conditions	Symbol	Min	Typical	Max	Unit
Positive power supply voltage		Vcc	4.75		5.25	V
Negative power supply voltage		Vee	- 5.45		- 4.9	V
Positive power supply current	Typ. value at + 25 °C	Icc		0.45	0.9	A
Negative power supply current	Max. value at + 65 °C	Iee		0.25	1	A
Temperature monitoring	Offset (+ 25 °C) = 1.2 ± 0.3 V	Temp	- 6	- 5	- 4	°C/V
Laser drive current monitoring	Offset = 0 V	I _{pump}	0.9	1	1.1	A/V
Alarms Active level	I _{sink} < 3 mA for: LIS, LOS1, LOS2 I _{bias} , TOR	Alarm	0		0.7	V
Alarms Non Active level	I _{scr} > -0.1 mA for: LIS, LOS1, LOS2 I _{bias} , TOR	No alarm	4.25		5.25	V
Shut down (external or automatic)	Command active	ON	3.7		5.25	V
For SD and ASD	Command NON Active	OFF	0		1.35	V

(Case temperature = + 25 °C)

Absolute maximum ratings

Parameter	Symbol	Min	Max	Unit
Operating temperature	Top	0	+ 65	°C
Storage temperature	T _{stq}	-40	+ 70	°C
Soldering temperature (3s)			+ 350	°C
Axial pull force on fiber (10s)	F		5	N
Fiber bend radius from package	r	40		mm
Positive supply voltage	Vcc	0	7	V
Negative supply voltage	Vee	- 7	0	V

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device.





