

Alcatel 1916 SDH SDH / SONET integrated modules Receiver STM-16 / OC-48 with Pre-amplifier EDFA

New Product

Description

These integrated modules are intended for use in single channel transmission with pre-amplifier EDFA in combination with an optical filter. The receiver contains an in-house III-V APD (Avalanche Photodiode) detector with preamplifier in a front-end module, a main amplifier ASIC, a clock and data recovery function with accurate decision circuit. The modules are housed in a space-saving 30-pin package, providing the same electrical access for overall applications. The Alcatel 1916 SDH family is a range of transmitter and receiver modules, providing convenient and flexible optical interfaces for SDH / SONET systems operating at 2.488 Gbit/s & 2.666 Gbit/s and exceeds the applicable ITU-T G.957, ITU-T G.783, ITU-T G.692 and Bellcore GR-253 standards.

Features

- Bit rate 2.488 Gbit/s & 2.666 Gbit/s (FEC)
- Sensitivity with preamplifier - 41 dBm
- Operating at 1.5 μ m wavelength
- Full performance in operating case temperature from 0 to + 70 °C
- Low power consumption
- Small size less than 100 cm²

- Data Reshaping
- Clock recovery & Data Retiming
- Convenient digital alarms to minimize external circuitry
- Analog information for flexible integration
- Common pin-out for all modules
- Alcatel Reliability and Qualification Program for built in quality

Applications

Used in transmission systems from medium to high-speed for intermediate-reach to long-reach applications, the Alcatel 1900 SDH family operates at SONET OC-3, OC-12 and OC-48 rates as well as at ITU-T SDH rates of STM-1, STM-4 and STM-16. Covering all types of SDH / SONET optical interfaces (tributaries and aggregates) the Alcatel 1900 SDH modules are suitable for line systems, Add Drop Multiplexers and digital cross-connects as well as ATM switches.

As part of the Alcatel 1900 SDH family, the Alcatel 1916 SDH module is suited for all types of STM-16 (Short-Haul, Long-Haul, Very-Long-Haul and Ultra-Long-Haul) and OC-48 (Intermediate-Reach, Long-Reach and Ultra-Long-Reach) optical interfaces. These modules ensure ease of use and offer new flexibility to system designers.



Optical characteristics

Parameter	Condition	Symbol	Min	Typical	Max	Unit
Bit rate	Note 1			2.448 or 2.666		Gbit/s
Center wavelength		λ_c	1545		1562	nm
Receiver sensitivity of EDFA		R_{EDFA}		- 41	- 38	dBm
Receiver sensitivity of Receiver		R_{RX}	-20		- 14	dBm
Return loss at module		R_{ROSS}	27			dB

Note 1: transmitter with ER min > 12.5 dB with chirp compatible with the dispersion and fiber, preamplifier EDFA with noise factor > 4.5 dB and optical filter with 3 dB bandwidth < 0.5 nm.

All parameters are specified End-of-Life within the overall relevant operating temperature range.

The typical values are referenced to + 25 °C, nominal power supply, beginning of life.

Electrical characteristics

Parameter	Condition	Symbol	Min	Typical	Max	Unit
Positive supply voltage		V_{CC}	+ 4.75	5	+ 5.25	V
Positive supply current		I_{CC}		+ 380	+ 510	mA
Negative supply voltage		V_{EE}	- 5.45	- 5.2	- 4.94	V
Negative supply current		I_{EE}	- 400	- 340		mA
Power consumption		P_c			4.9	W
ECL output data & clock voltage	Note 2	DV	0.5	0.7	0.9	V _{pp}
Logic high level output	$I_{src} = -150 \mu A$	V_{OH}	3.5	4.7		V
Logic low level output	$I_{sink} < 4 \text{ mA}$	V_{OL}		0.2	0.44	V
Alarm activation level	Note 3	A_{AC}			10^{-3}	
Alarm deactivation level	Note 3	A_{DE}			10^{-4}	
Alarm activation time		T_{AC}			95	μs
Alarm deactivation time		T_{DE}			50	ms

Note 2 : internally AC coupled and externally loaded by 50 Ω .

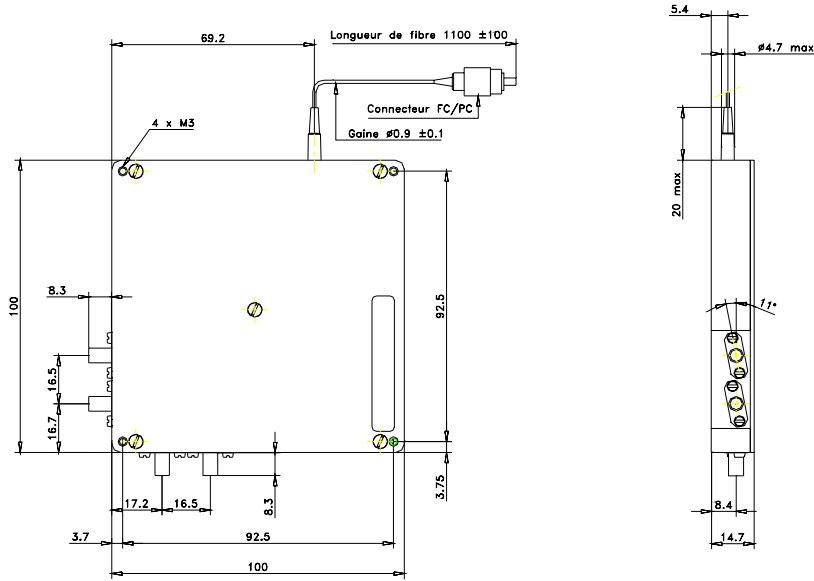
Note 3 : input power sensitivity is considered at connector interface and related to BER with S/N > 25 dB / 0.1 nm.

All parameters are specified End-of-Life within the overall relevant operating temperature range. The typical values are referenced to + 25 °C, nominal power supply, beginning of life.

Absolute maximum ratings

Parameter	Symbol	Min	Max	Unit
Maximum optical input power		- 5		dBm
Positive supply voltage	V_{CC}	0	+ 6	V
Negative supply voltage	V_{EE}	- 6	0	V
Output current		- 50	0	mApp
Alarm output voltage		0	V_{CC}	V
Alarm output current		- 0.5	+ 20	mA
Storage temperature	TSTG	- 25	+ 70	°C
Storage 72h max		- 40	+ 70	
Operating temperature	TOP	0	+ 70	°C

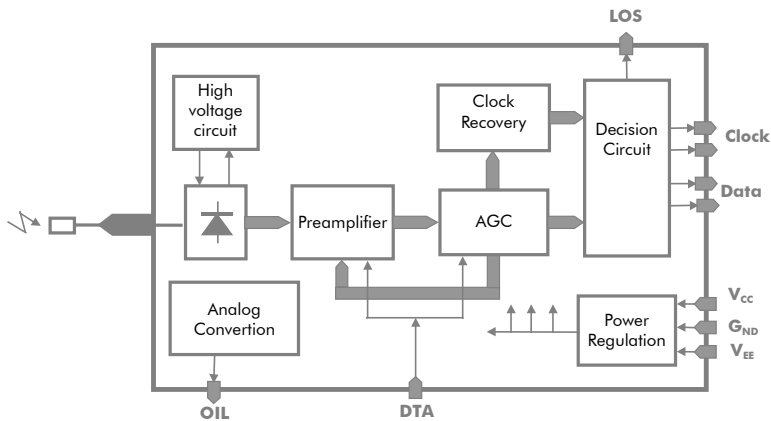
Outline drawing



Pin out

N°	Symb	Description	N°	Symb	Description
1	GND	Ground (0V)	2	GND	Ground (0V)
3	VCC	Positive Power Supply	4	VCC	Positive Power Supply
5	VCC	Positive Power Supply	6	VCC	Positive Power Supply
7	GND	Ground (0V)	8	GND	Ground (0V)
9	VEE	Negative Power Supply	10	VEE	Negative Power Supply
11	VEE	Negative Power Supply	12	VEE	Negative Power Supply
13	GND	Ground (0V)	14	GND	Ground (0V)
15	NUC	No User Connection	16	NUC	No User Connection
17	NUC	No User Connection	18	LOS	Loss of Optical Signal
19	NUC	No User Connection	20	NUC	No User Connection
21	DTA	Decision Threshold Adjustment	22	OIL	Optical Input Level
23	NUC	No User Connection	24	NUC	No User Connection
25	GND	Ground (0V)	26	GND	Ground (0V)
27	GND	Ground (0V)	28	GND	Ground (0V)
29	GND	Ground (0V)	30	GND	Ground (0V)

System block diagram



Pin description

DATA Serial retimed data output true. AC coupled with 50 Ω external load capability. A high electrical level corresponds to a high optical level.

DATA Serial retimed data output false. AC coupled with 50 Ω external load capability. A high electrical level corresponds to a low optical level.

CLOCK Serial recovered clock output true. AC coupled with 50 Ω external load capability. The falling edge is in the middle of the data pattern.

CLOCK Serial recovered clock output false. AC coupled with 50 Ω external load capability. The rising edge is in the middle of the data pattern.

DTA Decision Threshold Adjustment: input analog voltage that allows optimization of the sensitivity around the factory setting. When DTA is opened the factory setting is the default value.

LOS Loss of Optical Signal : set when the incoming optical power level cross the alarm threshold. An hysteresis is provided. Open collector with internal pull-up. The active level corresponds to a 0 V voltage output level.

OIL Optical Input Level : analog information, proportional to the optical input signal.

NUC No User Connection : this lead must be left open.

Ordering information

Alcatel 1916 SDH

Bit Rate (Mbit/s)	Part Number
2.448	3CN 00217 CA
2.666	3CN 00217 FA

Options

3CN xxxxx xA → FC/PC
xB → SC/PC

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Customized versions are available for large quantities.

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Standards

Compliant with ITU-T G.957 & G.783 & G.691

Optical fiber according to ITU-T G.652

Environment according to IEC 68-2 and MIL STD 883

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