

# PowerLog™ AM-20; AM-40

## 20/40 GHz Intensity Modulators for Analog Applications

### Features:

- Titanium In-Diffused Waveguides
- X-cut LiNbO<sub>3</sub>
- Low Drive Voltage Compatible with Commercially Available Drivers
- Low Optical Insertion Loss
- 1300 nm Wavelength Range on Request
- Operating up to 60 GHz
- Smooth Frequency Response up to > 60 GHz
- Integrated Photodiode
- Integrated Polarizer

### Applications:

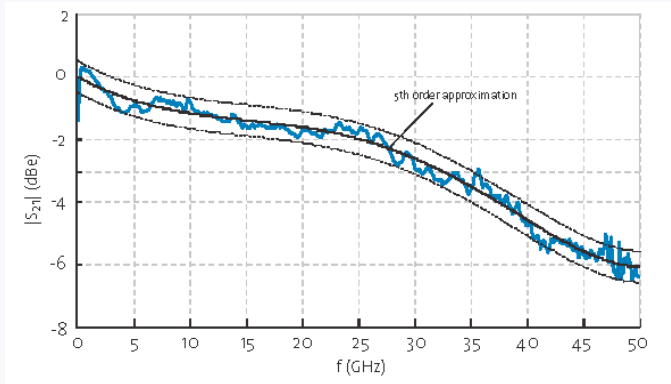
- Antenna Remoting
- High Frequency Fiber Optic Links
- Analog Microwave over Fiber (RoF)
- Delay Lines Telemetry Systems
- Instrumentation (Optical Network Analyzers)



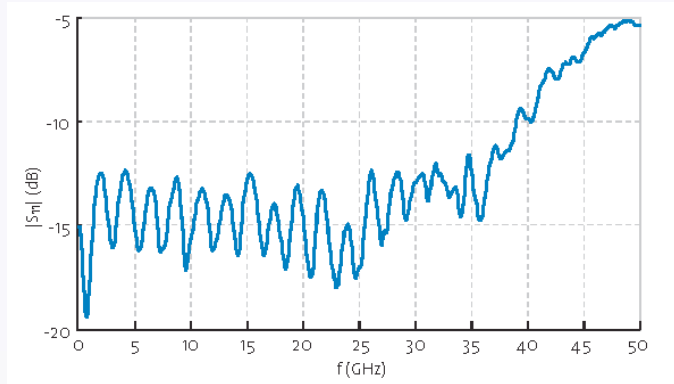
These high performance integrated optical modulators have been specifically designed to target the market of civil and military transmission. Oclaro broadband analog intensity modulators combine high linearity with low driving voltage and small footprint, covering all the frequency range from 20 to beyond 40 GHz (AM20: 20 – 30 GHz; AM40: > 30 GHz). A customized 1300 nm version is available on request. The increasing demand to shift the transmission frequency in microwave fiber optic links towards higher frequency finds in Oclaro analog modulators the most advanced and suitable answer. The experience and know-how of Oclaro engineers is available to customize our products to the customer's specific requirements.

Performance Characteristics

Electro Optical Response (40 GHz Example)



Electrical Return Loss (40 GHz Example)



Absolute Maximum Ratings

Parameters	Conditions	Min	Max	Unit
Maximum Input Power (Electrical)	RF Port		25	dBm
Maximum Input Power (Optical)			100	mW
Maximum Operating Temperature Variation Rate	CW		1	°C/min
Storage Temperature Range		-40	+85	°C
Operating Temperature Range		0	+70	°C

## Specifications

Parameters		Units
<b>Optical</b>		
Operating Wavelength Range	1280 – 1340 (detailed specifications to be agreed)	1525 – 1615
Insertion Loss	< 6	< 4.5
Optical Return Loss (without connectors)	≥ 45	≥ 45
Extinction Ratio	> 20	> 20
<b>Electrical</b>		
S <sub>21</sub> Electro Optic Bandwidth (-3 dBe)	> 20/> 30	> 20/> 30
S <sub>11</sub> Electrical Return Loss	< -10	< -10
RF V Voltage (@ 1 kHz)	4.5	5
Bias V Voltage (@ 1 kHz)	5.0	5.5
2nd Harmonic Suppression	45	45
Photodiode Responsivity	10 <sup>-3</sup>	10 <sup>-3</sup>
Linearity	± 10%	± 10%

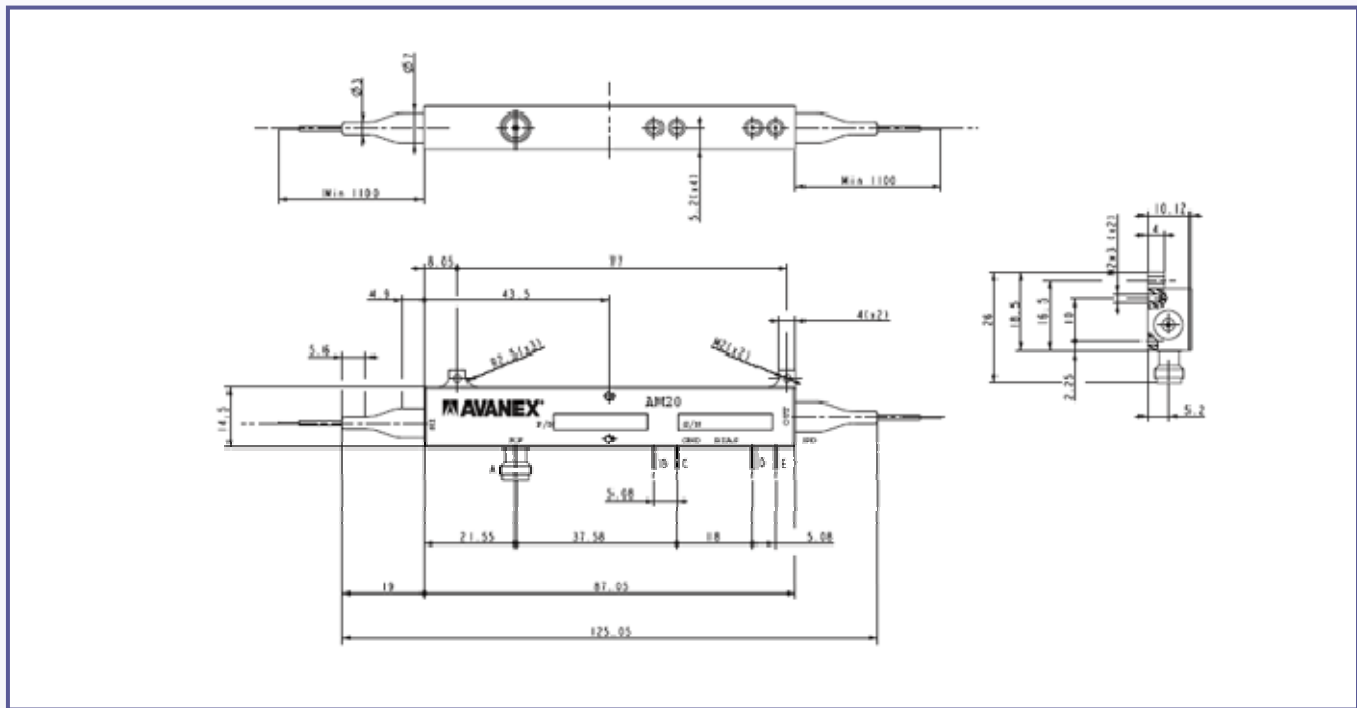
## Pin-Out and Fiber Specifications

RF Connector	V-Connector 1 for 20 GHz and 40 GHz (GPPO available)
Bias Connector	LEAD Pins
Input Fiber	Corning/Fujikura SM 15 PUV/UV250 (Panda Fiber)
Output Fiber	Corning/Fujikura SM 15 PUV/UV250 (Panda Fiber)
	Other fibers available on request

Note 1. V-Connector is a registered trademark of Anritsu Corporation.

### Package Footprint

AM20 (AM40 is equivalent)



Dimensions are in mm.

Pin #	Description
A	RF INPUT
B	GROUND
C	BIAS
D	PHOTODIODE CATHODE
E	PHOTODIODE ANODE

## Ordering Information

Part Number
AMbb-0-bbP-PP-yyzz-00

bb	Bandwidth	20 = 20 GHz
		40 = 40 GHz
yy, zz	Input and Output Optical Connectors	NC = No Connectors
		FP=FC/SPC; FA=FC/APC; SP=SC/APC etc.

Other connectors are available upon request.

## Contact Information

### Worldwide Headquarters

2584 Junction Avenue  
San Jose  
CA 95134  
USA

Tel: +1 408 919 1500  
Fax: +1 408 919 1501

[www.oclaro.com](http://www.oclaro.com)  
[sales@oclaro.com](mailto:sales@oclaro.com)

## Important Notice

Performance figures, data and any illustrative material provided in this data sheet are typical and must be specifically confirmed in writing by Oclaro before they become applicable to any particular order or contract. In accordance with the Oclaro policy of continuous improvement specifications may change without notice. The publication of information in this data sheet does not imply freedom from patent or other protective rights of Oclaro or others. Further details are available from any Oclaro sales representative.

D2801 PowerLog AM-20, AM-40 Version 1.1 September 2009

©Oclaro 2009. Oclaro the Oclaro, Inc. logo, and all other Oclaro, Inc product names and slogans are trademarks or registered trademarks of Oclaro, Inc. in the U.S.A. or other countries. Products described in this datasheet may be covered by one or more patents in the U.S.A. and abroad. Information in this datasheet is subject to change without notice.