

Datasheet



# LambdaDriver® - Raman Amplifier Module (EM1600-OAR)



EM1600-OAR

### Overview

The LambdaDriver® EM1600-OAR modules use an advanced Raman technology for optical signal amplification, used in large capacity digital communication and long-haul broadband DWDM networks.

These modules extend the single span reach by at least 50 km in comparison to the conventional EDFA type amplifiers. Raman amplifiers also improve the Optical-Signal-to-Noise-Ratio (OSNR) in amplified long-haul networks because they do not introduce noise whereas typical EDFA amplifiers have a nominal noise figure of about 5.5 dB.

The EM1600-OAR family consists of 4 modules differentiated by maximum gain over G652 fiber (10,15 and 20 dB).

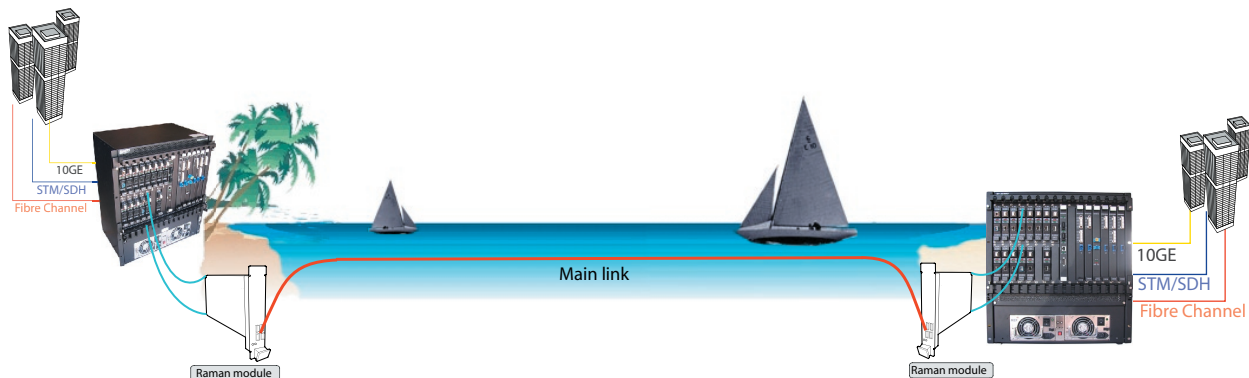
As an example: If we need to transmit 10Gbps signals over a 200 km distance crossing the sea or a desert, without the possibility to place a signal regeneration device in the middle, the only way to reach the other side is by means of the Raman technology.

The EM1600-OAR family provides a flat response for the entire C-band, L-band) and Narrow band as below:

- 23dB Gain for band limited between 1545nm (ch40) and 1550.5nm (ch34)

or

- up to 20db Gain for the entire C-band as per the ordering information.



### Features

- Eye safety and auto shutdown
- Transmission and module condition alarms
- Optical Power Monitoring (OPM)
- Up to 23 dB gain with G652 fiber
- C-band, L-band, Narrow band options

### Applications

- Long-haul transmission networks
- Extending transmission distance
- Upgrading present transmission systems to 10 or 40 Gbit/s

With this module longer distances can be bridged by limiting the number of waves or the wavelength band of operation.

These amplifiers are fully controlled by LambdaDriver® management and provide power monitoring on the amplified optical signal as well as on the condition of the internal pumps.

EM1600-OAR incorporates parallel, independent eye-safety mechanisms that shutdown the amplifier in the following cases:

1. Fiber breakdown, open connectors (including APC), or broken fiber even at long distances from the amplifier.
2. High reflection power which may be caused by bad connection or other problems in the transmission fiber
3. Pump high temperature that may be caused by an internal problem
4. Module high temperature that may be caused by an internal or system problem

This unique and comprehensive safety mechanism of the EM1600-OAR module is extremely important due to the Raman amplifier's high power light and power consumption.

Each EM1600-OAR amplifier module occupies 2 "long" slots so that it can be installed only in LD1600 or LD400L chassis type.

### Environmental

<b>Operating Temperature</b>	- 5 to 45 °C    23 to 104 °F
<b>Storage Temperature</b>	-10 to 70 °C    14 to 158 °F
<b>Relative Humidity</b>	85% maximum, non-condensing
<b>Dimensions (W x H x D)</b>	54.18 mm ( 2.13 in) x 263.4 mm (10.37 in) x 227mm (8.93 in)
<b>Weight</b>	2.6kg (5.73 lb)
<b>Connector</b>	OUT and OUT Monitor - SC/UPC Pump Monitor - SC/APC IN - E2000/APC (high power)

### Technical Specifications

Parameter	Value			Units
	Minimum	Typical	Maximum	
<b>Wavelength Range</b>	1528		1563	nm
<b>Input Detection Range</b>				
EM1600-OAR10	-40		+5	dBm
EM1600-OAR12	-40		+5	
EM1600-OAR15	-45		+5	
EM1600-OAR20	-50		+5	
EM1600-OAR20S	-50		+5	
<b>RAMAN Gain *</b>				
EM1600-OAR10		10		dB
EM1600-OAR12		12		
EM1600-OAR15		15		
EM1600-OAR20		20		
EM1600-OAR20S		23		
<b>Gain Ripple</b>			1	dB
<b>C-band insertion loss</b>			1	dB
<b>Polarization Mode Loss</b>			0,2	dB
<b>Effective Noise Figure</b>	-2		0	dB
<b>Management</b>				
<b>LEDs</b>	Laser Shut down, Temperature alarm, RX, TX			
<b>Monitoring</b>	Input power, Output power, Gain, Temperature			
<b>Alarm</b>	Input power, Output power, Temperature			
<b>Power Consumption:</b>	60W max.			

### Order Info

EM1600-OAR10	10dB gain Raman Amplifier for LD1600 dual slot
EM1600-OAR12	12dB gain Raman Amplifier for LD1600 dual slot
EM1600-OAR15	15dB gain Raman Amplifier for LD1600 dual slot
EM1600-OAR20	20dB gain , Raman Amplifier for LD1600 dual slot
EM1600-OAR20S	23dB gain , Narrow band (1550nm) Raman Amplifier for LD1600 dual slot (1546 - 1551nm)