

# SFP<sup>+</sup>-EDFA

## Pluggable EDFA Series



## FOA

### (SFP<sup>+</sup>-Optical Amplifier)

#### SFP<sup>+</sup> Compatible EDFA

The world first pluggable SFP<sup>+</sup>-EDFA, FOA is a full-functioning EDFA module with control circuitry packaged inside. It is totally compatible with conventional SFP<sup>+</sup> optical transceiver in respect of size and pin-map. Due to the small size and easy installation, the FOA is designed for amplification of optical signals at C-band in fiber optic communications system in 5G network, high speed datacenter, core networks, SDN and CATV networks. The FOA provides very stable output power up to +17 dBm and noise figure of 6 dB in C-band over wide operating temperature range. FOA size (14 x 72 x 13.1 mm) is 15mm longer than conventional SFP<sup>+</sup> size (14 x 57 x 13.1 mm), combined with extremely low power consumption, allows the FOA to be highly suitable for applications of power equalization or pre-emphasis in densely packaged telecom systems, especially for densely integrated high speed transmitter or receiver card.

#### Features

- Conventional SFP<sup>+</sup> compatible size and pin map
- Cost efficiency with pluggable type
- Space efficiency using remaining slot (No extra equipment required)
- EDFA module including micro process control circuit
  - Uncooled 980 nm pump laser module
  - Extremely low heat generation
  - Saturation output power up to +17dBm
  - Selectable output power
  - APC (Automatic Power Control) or AGC(Automatic Gain Control) mode with FLS (Forced Laser Shutdown)
  - ACC(Automatic Current Control) mode for optical sensing
  - Control & monitoring by I2C
  - LVTTTL alarm
  - Single + 3.3 V power supply

#### Applications

- 5G network
- Data center network
- 100G or higher speed channel optical amplifier
- Reach extension for L2/L3 ethernet switch
- Power boosting and pre-emphasis optical amplifier for DWDM metro system
- ROADM system

## Optical Fiber Amplifier

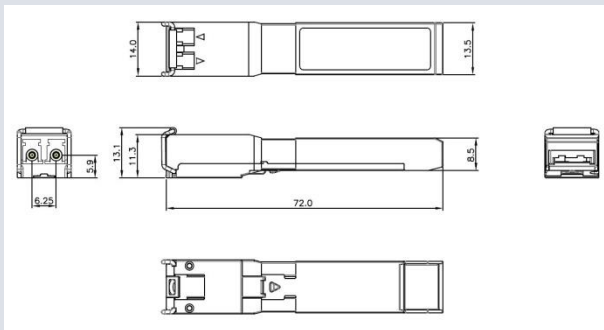
# FOA (SFP+ Optical Amplifier)

### Optical Characteristics

Parameter	Symbol	Booster Specification			Pre-Amp. Specification			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	
Signal wavelength range	$\lambda$	1528.22	-	1568.36	1528.22	-	1568.36	nm
Input power	$P_{IN}$	-20	-	0	-30	-	-10	dBm
Saturation output power	$P_{OUT}$	-	17 <sup>(1)</sup>	-	-	10 <sup>(2)</sup>	-	dBm
Gain	G	-	17 <sup>(1)</sup>	-	-	20 <sup>(2)</sup>	-	dB
Gain flatness	$G_{FLAT}$	-	-	5.5	-	-	5.5	dB
Noise figure	NF	-	6.0	7.0	-	6.5	7.5	dB
Optical isolation	ISO	20	-	-	20	-	-	dB
Return loss	RL	40	-	-	40	-	-	dB
Polarization mode dispersion	PMD	-	-	0.5	-	-	0.5	ps
Polarization dependent gain	PDG	-	-	0.5	-	-	0.5	dB
Control scheme		APC with FLS <sup>(3)</sup>			AGC with FLS <sup>(3)</sup>			

- (1) Input power = 0 dBm, set gain = 17dB, full wavelength range  
 (2) Input power = -10 dBm, set gain = 20dB, full wavelength range  
 (3) FLS : Forced Laser Shutdown

### Mechanical Dimension (WxLxH = 14 X 72 X 13.1 [mm])



### Electric & Environmental Characteristics

Parameter	Specification
Power supply voltage	+3.3 V
Interface	I2C
Alarm	LVTTTL
Operating case temperature	-5 ~ 75 °C
Storage temperature	-40 ~ 85 °C
Storage humidity	5 ~ 85 % R.H
Power consumption*	1.3 W

\* in max. input power and full temperature range

### Control and Monitoring Functions

Parameter	Specification
Control scheme	APC or AGC with FLS
Monitor	IPM / OPM / LD-Bias / Case-Temp
Alarm	LOS / LOP / LD-Bias / Case-Temp

### Ordering Information (Example: OFA-TCF-17AP, TDM C-band SFP+ type 17dBm output power EDFA with APC)

O	F	A - T	C	F	-	17AP	
	F: EDFA	T: TDM	C: C-band	F: SFP+ -EDFA	17AP: 17dBm Pout	AP: Automatic Power Control	
	S: SOA	C: CATV		Q: QSFP-EDFA	14AP: 14dBm Pout	AG: Automatic Gain Control	
		W: DWDM		S: QSFP-SOA	20AG: 20dB AGC		
				X: XFP-EDFA	30AG: 30dB AGC		

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