

# SG4-DFBT, CWDM, & DWDM

**ANALOG RETURN PATH OPTICAL TRANSMITTERS,  
OPTICAL NODE SERIES**



## FEATURES

- Enables bandwidth expansion via upstream node segmentation
- 1310 nm, CWDM and DWDM models accommodate a wide variety of architectures
- Supports migration to fiber deep networks by maximizing fiber usage
- Hot swappable, plug and play modules simplify installation and maintenance



## PRODUCT OVERVIEW

The SG4000 scalable optical node offers a wide variety of analog return path transmitter Distributed Feedback (DFBT) technologies to meet the increasing demand for higher modulation and bonded DOCSIS® environments. SG4-DFBT 1 mW and SG4-DFBT 3 2 mW transmitters are 1310 nm, isolated, un-cooled, Distributed Feedback (DFB) lasers. SG4-DFBT3-CWDM 2 mW transmitters are available in eight Coarse Wave Division Multiplexed (CWDM) wavelengths. CWDM transmitters offer improved link performance and allow multiple wavelengths to be combined on a single fiber utilizing ruggedized optical passives. SG4-ITU-CH transmitters feature cooled, 8 mW lasers based on the International Telecommunications Union (ITU) wavelength grid for maximum link budgets and wavelength aggregation.

All three transmitter types feature SC/APC integrated optical bulkhead connectors, which provide simple, quick connect module installation and easy connector cleaning. To provide additional flexibility, operators can use up to four transmitters in a single SG4000 node for multiple segmentation and redundancy applications.

SG4-\* transmitters contain an integrated RF amplifier and all the active circuitry required to provide RF drive to the laser, optimizing performance while minimizing set-up time. The transmitters utilize a microprocessor controlled circuit to minimize any variation in the optical modulation index (OMI) as the laser slope efficiency changes due to ambient temperature variations. An automatic power control (APC) circuit is also included to minimize the change in optical output power due to module temperature variations and laser aging effects.

SG4-\* transmitters can be hot-swapped in the field, providing true plug and play functionality. Module status indicators help reduce troubleshooting time. The transmitters also include both an optical output power DC voltage test point and an RF input test point. Laser RF drive level adjustments are accomplished with a JXP-style pad attenuator. Operators can monitor parameters via the optional DOCSIS® status monitoring transponder.

## SPECIFICATIONS

	SG4-DFBT	SG4-DFBT3-CWDM	SG4-ITU-CH-*
<b>OPTICAL CHARACTERISTICS</b>			
Laser Type	Distributed Feedback, Isolated, Uncooled	Distributed Feedback, Isolated, Uncooled	Distributed Feedback, Isolated, Cooled
Optical Wavelength	1310 nm	1470 to 1610 nm	CH20 through CH60
Optical Output Power	1.0 mW (0 dBm)	2.0 mW (+3 dBm)	8.0 mW (+6.3 dBm)
Optical Power Test Point Scale Factor	1.0 V/mW	1.0 V/mW	1.0 V/mW
Optical Connector Types	SC/APC	SC/APC	SC/APC
<b>RF CHARACTERISTICS</b>			
Operational Bandwidth	5 – 85 MHz	5 – 85 MHz	5 – 204 MHz
Recommended Total Input Power <sup>1</sup>	+23 dBmV	+23 dBmV	+23 dBmV
Optical Modulation Index (OMI), @ 25 + 5°C	0.20 + 0.020	0.20 + 0.020	0.20 + 0.020
OMI Change Over Temperature	+ 2.0 dB Max.	+ 2.0 dB Max.	+ 2.0 dB Max.
Flatness	1.0 dB P-V Max.	1.0 dB P-V Max.	1.0 dB P-V Max.
RF Input Return Loss	16 dB Min., 5 – 65 MHz	16 dB Min., 5 – 65 MHz	16 dB Min., 5 – 65 MHz
RF Input Impedance	75 Ohms	75 Ohms	75 Ohms
<b>PERFORMANCE</b>			
Noise Power Ratio (NPR) <sup>2</sup>	40 dB over 11 dB dynamic range	40 dB over 13 dB dynamic range	40 dB over 13 dB dynamic range
Single Second Order Distortion (SSO)	-39 dBc	-45 dBc	-45 dBc
Single Third Order Distortion (STO)	-55 dBc	-65 dBc	-65 dBc
Spurious Noise	-52 dBc	-52 dBc	-55 dBc



**SPECIFICATIONS (CONTINUED)**

	SG4-DFBT	SG4-DFBT3-CWDM	SG4-ITU-CH-*
<b>GENERAL</b>			
Dimensions	2.1" W x 6.5" L x 2.4" H (5.3 cm x 16.5 cm x 6 cm)	2.1" W x 6.5" L x 2.4" H (5.3 cm x 16.5 cm x 6 cm)	2.1" W x 6.5" L x 2.4" H (5.3 cm x 16.5 cm x 6 cm)
Weight	0.65 lbs.	0.65 lbs.	0.65 lbs.
Node Operating Temperature Range	-40°C to +60°C (-40°F to +140°F)	-40°C to +60°C (-40°F to +140°F)	-40°C to +60°C (-40°F to +140°F)
Current Draw @ 24 VDC	330 mA Max.	330 mA Max.	415 mA Max.
Current Draw @ 5 VDC	51 mA Max.	51 mA Max.	5 mA Max.
Power Consumption	8 W Max.	8 W Max.	10 W Max.
LED Indicators	Power (Green), Fault (Red)	Power (Green), Fault (Red)	Power (Green), Fault (Red)

**Notes:**

1. All SG4 transmitters operate with a nominal 28 dBmV total power at the node housing inputs.
2. Specified at 25°C, 20km fiber, 9 dB total loss.

**RELATED PRODUCTS**

SG4000 Optical Node	Optical Patch Cords
DOCSIS® Transponder	Optical Passives
Fiber Service Cable	Installation Services

**Note:** Specifications are subject to change without notice.

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