

Medallion 8100 Series CATV L-EML™ 1550 nm Externally-Modulated Transmitter



Applications

- High Power Distribution Networks
- Redundant Ring Architectures
- FTTx Networks
- RFoG Applications
- SAT-IF Transport
- DWDM Node Splitting

Features

- Single/Dual Optical Output
- QAM or OFDM loading to 1218 MHz
- Dual Power Supplies and Fans, Redundant & Hot Swappable
- Front Panel RF Test Point
- SNMP Control Interface
- Single 10/100BaseT Ethernet
- Supports IPv4
- Vacuum Fluorescent Status Display
- OMI / RF Gain Adjustment
- AGC Select: CW, Video, Manual (No AGC)
- Industry-Leading Field Adjustable SBS Suppression
- Supports Analog + QAM + OFDM signals to 1.2 GHz
- Supports SAT-IF signals from 950 MHz to 3.5 GHz
- Tilt Control for CATV and SAT-IF inputs

The C-Type/L-Type/F-Type/S-Type Medallion 8100 Series

The C-Type, L-Type, F-Type and S-Type Medallion 8100 series is a family of state-of-the-art high-performance 1550 nm externally modulated CATV fiber optic transmitters optimized for varying network applications. The Medallion 8100 series leverages a breakthrough optical device innovation at its core, the Linear Externally Modulated Laser (L-EML™), invented, developed, and manufactured exclusively at Ortel. The L-EML™ device consists of a high-power, low-noise, narrow linewidth laser combined with a proprietary highly-linearized modulator in a monolithic assembly.

Packaged in a convenient 1RU housing, this line of optical transmitters couples high optical output powers, up to 12.0 dBm, with low optical linewidth resulting in unmatched performance. The unique Ortel optical modulator, combined with proprietary predistortion circuitry, provides superior CTB and CSO performance with SBS suppression levels of greater than 21 dBm. Advanced features such as built-in field adjustable SBS control allows these transmitters to be quickly optimized in the field for any link or application without the need to procure specifically tuned transmitters. This affords the system designer a level of flexibility previously unknown in the CATV marketplace.

The L-Type series are designed as a high-performance solution for applications where the simultaneous transport of CATV and SAT-IF FM signals is required. The SAT-IF signals can be applied anywhere in the 950 to 3500 MHz band.

The C-Type and S-Type series transmitters are intended for use in node-splitting architecture designs requiring cost-effective DWDM transmission over medium length fiber distances. They can easily be configured to meet most HFC network solutions requiring link lengths in the range of 0 to 65 kilometers with one EDFA as well as links utilizing multiple EDFA's.

The F-Type series transmitters are intended for use in FTTx and RFoG architecture designs requiring high-quality transmission over varying transmission lengths and EDFA output powers. These transmitters successfully support very high optical launch powers while controlling the detrimental effects of Stimulated Brillouin Scattering (SBS), group velocity dispersion (GVD), and self-phase modulation (SPM).

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Optical / Electrical Characteristics

C-Type

Property Performance (Note 1-7)	Units	Models			Comments
		8100-C11	8100-C12	8100-C13	
Specified Link Length	L (km)	40	40	40	
Channel Plan		NTSC 80-ch	PAL 60-ch	42-ch CENELEC	All units support additional QAM loading to 1.2 GHz
Optical Output Power	Po (dBm)	10	10	10	Min.
Noise Bandwidth	BW (MHz)	4	5	5	
SBS Suppression	(dBm)	11.0	11.0	11.0	Min.
Carrier to Noise Ratio	CNR (dB)	52	52	53.5	Min.
Composite Second Order	CSO (dBc)	-62	-62	-61	Max.
Composite Triple Beat	CTB (dBc)	-63	-63	-63	Max.
All Digital Load QAM/OFDM	MER	38	38	NA	Min. full digital loading to 1.2GHz
All Digital Load QAM/OFDM	BER	1.0 E-08	1.0 E-08	NA	Min. Pre-FEC

L-Type

Property Performance (Note 1-8)	Units	Models		Comments
		8100-L01	8100-L02	
Specified Link Length	L (km)	25	25	
Channel Plan		NTSC 80-ch	PAL 60-ch	With 54 QPSK carriers from 950 to 3500 MHz
Optical Output Power	Po (dBm)	7.0	7.0	Min.
Noise Bandwidth	BW (MHz)	4	5	
SBS Suppression	(dBm)	15.0	15.0	Min.
CATV Carrier to Noise Ratio	CNR (dB)	51.0	51.0	Min.
CATV Composite Second Order	CSO (dBc)	-62	-62	Max.
CATV Composite Triple Beat	CTB (dBc)	-63	-63	Max.
SAT-IF Carrier to Noise Ratio	CNR (dB)	27	27	Min.
SAT-IF Intermodulation Products	(dBc)	-35	-35	Max.
SAT-IF Spurious Products	(dBc)	-38	-38	Max.

F-Type

Property Performance (Note 1-7)	Units	Models		Comments
		8100-F01	8100-F02	
Specified Link Length	L (km)	30	30	
Channel Plan		NTSC 80-Ch	PAL 60-Ch	
Optical Output Power	Po (dBm)	7.0	7.0	Min.
Noise Bandwidth	BW (MHz)	4	5	
SBS Suppression	(dBm)	21.0	21.0	Min.
Carrier to Noise Ratio	CNR (dB)	48.0	48.0	Min.
Composite Second Order	CSO (dBc)	-60	-60	Max.
Composite Triple Beat	CTB (dBc)	-60	-60	Max.
All Digital Load QAM/OFDM	MER	38	38	Min. full digital loading to 1.2GHz
All Digital Load QAM/OFDM	BER	1.0 E-08	1.0 E-08	Min. Pre-FEC

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S-Type

Property	Units	Models			Comments
		8100-S01	8100-S02	8100-S03	
Performance (Note 1-7)					
Specified Link Length	L (km)	65	65	65	
Channel Plan		NTSC 80-ch	PAL 60-ch	42-ch CENELEC	
Optical Output Power	P _o (dBm)	7.0	7.0	7.0	Min.
Noise Bandwidth	BW (MHz)	4	5	5	
SBS Suppression	(dBm)	16.0	16.0	16.0	Min.
Carrier to Noise Ratio	CNR (dB)	52	52	52.5	Min.
Composite Second Order	CSO (dBc)	-61	-61	-60	Max.
Composite Triple Beat	CTB (dBc)	-64	-64	-64	Max.
All Digital Load QAM/OFDM	MER	38	38	NA	Min. full digital loading to 1.2GHz
All Digital Load QAM/OFDM	BER	1.0 E-08	1.0 E-08	NA	Min. Pre-FEC

Notes:

1. Unless stated otherwise all specifications apply with no digital loading.
2. Unless stated otherwise specifications apply for nominal RF input level as defined below, after 30 minute stabilization period.
3. CNR may degrade over full temperature range by 0.5 dB. Distortions may degrade over full temperature range by 1.0 dB.
4. Units are tested per the Test / Link Configuration Table
5. All analog channel plan specifications are valid for frequencies above 112.25 MHz. Lower frequency carriers may exhibit a CNR penalty.
6. Noise figure for the EDFA = 4.5 ~ 5.5 dB. Fiber specification is Corning SMF-28, single mode fiber
7. Receiver responsivity is 0.95 mA/mW, Equivalent noise current is 7 pA/(Hz)^{1/2}
8. With 36 QPSK modulated SAT-IF signals between 950 ... 3500 MHz. 27 MHz IF bandwidth

General and Mechanical Specifications

Property	Requirement	Comments
Wavelength	1555 +/-5 nm, 1550 +/-5 nm	Various Options + ITU-grid available – see Model Number Information
Channel Plan	Various – See Specification Tables	Custom channel plans available
Optical Connector	SC/APC	Other styles available
Monitoring Interfaces	100 Base-T Ethernet (SNMPv3) Rear Panel USB interface VFD Screen Front Panel Controls	VFD- (Vacuum Fluorescent Display)
Operating Temperature	0°C to 50°C	
Storage Temperature	-20°C to 70°C	
Power Consumption	65W max	
Agency Listings	EMI: EN50083-2:2006 (US CATV) EN55022:2006 (US IT) EN61000-3-2 (Harmonics) EN61000-3-3 (Flicker) FCC: Part 15, Subpart B, class "A" Unintentional Radiators	Safety: FDA/CDRH Laser Safety Governed by Code of Federal Regulations Title 21, Volume 8, Part 1040 IEC 60950-1 IEC 62368-1 Laser IEC 60825-1 CB Certification
Transportation Vibration	GR-63-CORE	In Shipping package
Transportation Shock	GR-63-CORE	In Shipping package
Operating Humidity	0% to 95%	Non-condensing
Supply Range (VAC) (VDC)	100 to 240 VAC, 50/60 Hz +/- (36 – 72) VDC	
Dimensions	19.0"W x 15.0"D x 1.7"H	(width includes 19" front panel ears, depth includes, connectors, fans & front panel) – see drawing

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General and Mechanical Specifications (continued)

Property	Requirement	Comments
Nominal CATV RF Input Power Level	83 dBuV/ch - 23 dBmV/ch	80 NTSC – Nom. composite = -6.7 dBm
CATV RF Input Range	78 - 96 dBuV/ch	80 NTSC channels
Composite CATV RF Input Range	-12 to +6 dBm	ALC lock Range
OMI Control Range	+2 to -8 dB	
CATV Frequency Range	45MHz – 1218 MHz	
CATV Flatness	+/- 0.50 dB	45MHz - 550MHz
	+/- 0.75 dB	45MHz – 1218 MHz
CATV Input impedance	75Ω	
CATV Input Return Loss	16dB min	45MHz – 1218 MHz
CATV Programmable Slope Range	-2 to +8 dB	
CATV Front Panel RF Tap	-20 +/- 1 dB down from RF input	
CATV Front Panel RF Tap Flatness	+/- 1 dB	45MHz – 1218 MHz
Nominal SAT-IF RF Input Power Level	86 dBuV/ch - 26 dBmV/ch	Nom. composite = -7.2 dBm
SAT-IF RF Input Range	82 - 98 dBuV/ch	
Composite SAT-IF Input Range	-11 to +5 dBm	ALC lock Range
OMI Control Range	+2 to -8 dB	
SAT-IF Frequency Range	950 MHz to 3500 MHz	
SAT-IF Flatness	+/- 2.0 dB	
SAT-IF Input impedance	75Ω	
SAT-IF Input Return Loss	10dB min	950MHz – 3500 MHz
SAT-IF Programmable Slope Range	0 to +6 dB	
SAT-IF Front Panel RF Tap	66 +/- 2.5 dBuV/Ch at 1% OMI/ch	
SAT-IF Front Panel RF Tap Flatness	+/- 1 dB	950MHz – 3500 MHz

Test/Link Configuration

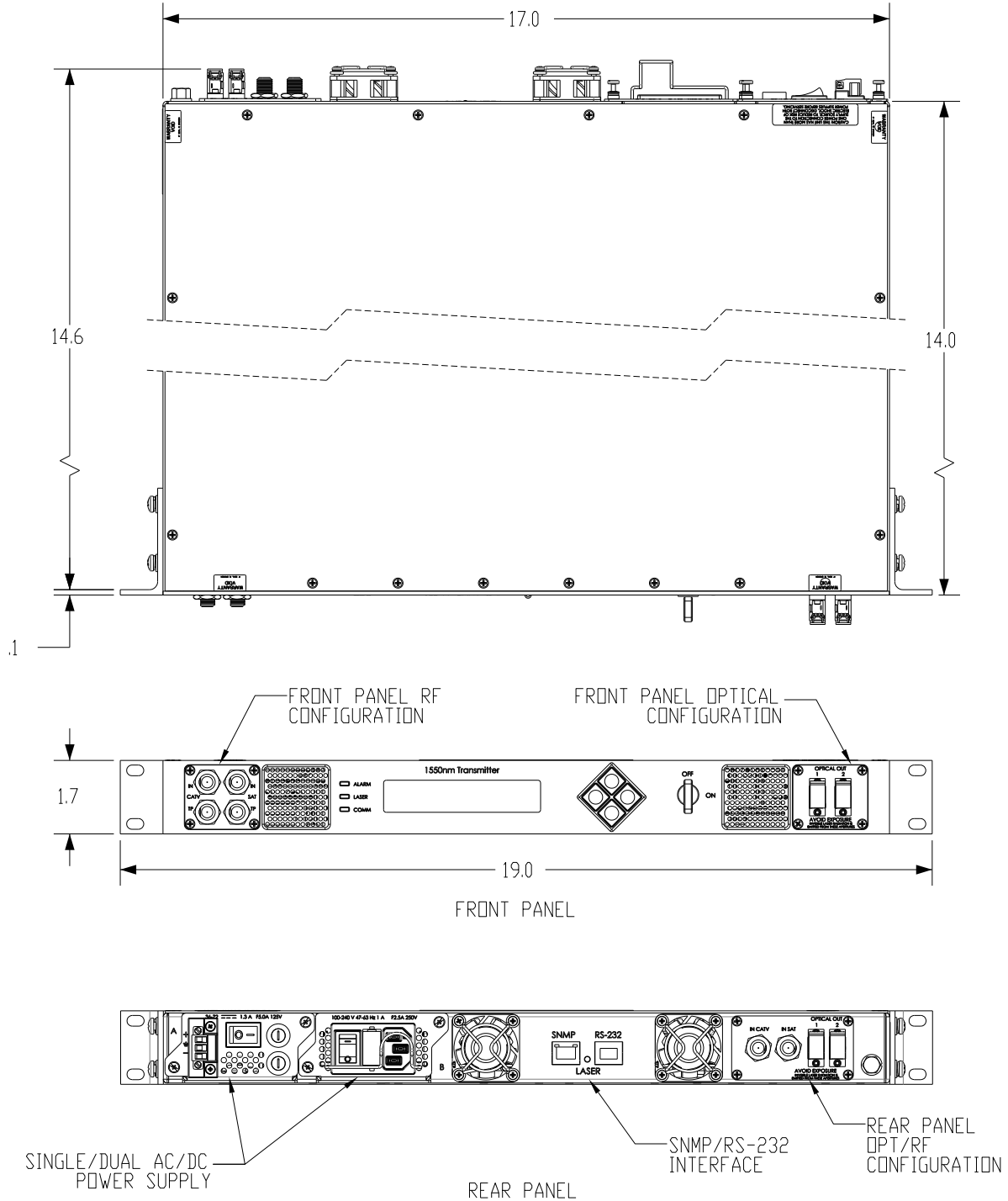
Property	EDFA	Link ¹	Received Power ²
L-Type	15 dBm	25 km	0.0 dBm at the receiver
C-Type	None	40 km	0.0 dBm at the receiver
S-Type	16 dBm	65 km	0.0 dBm at the receiver
F-Type	21 dBm	30 km	-5.5 dBm at the receiver

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Outline Drawing (Dimensions in inches)

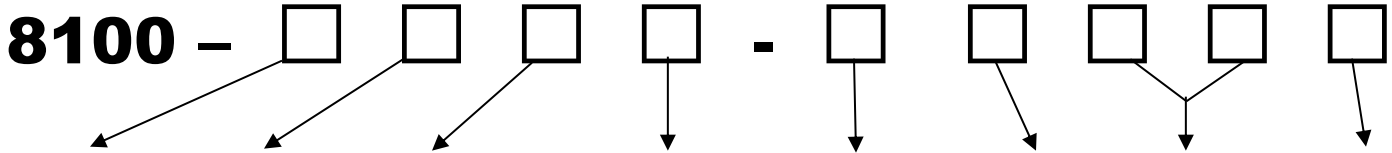


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Model Number Information (note 2)



Logo & Customer Specific	Link type	Pout (dBm min)	Loading Type	Optics	RF	Wavelength (nm)	Power Supply
0 – Ortel Logo	S – 65 km	0 – 7.0 dBm Min. Types S,F,L	1 – NTSC 80-ch	1 – SC/APC, Rear	1 – RF IN Rear, TP Front	00 – 1555+/- 5.0nm	1 – AC primary, no secondary
1 – no Logo	C – 40 km	1 – 10.0 dBm Min. Type C	2 – PAL 60-ch	2 – FC/APC, Rear	2 – RF IN Front, TP Front	01 – 1550+/- 5.0nm	2 – DC primary, no secondary
	F – 30 km	2 – Dual 6.0 dBm Outputs	3 – CENELEC (42-ch)	3 – E2000/APC, Rear	3 – RF IN Front, TP Rear	xx – ITU Channel +/- 0.1nm Note 1	3 – AC primary, AC secondary
	L – 25 km			4 – SC/APC, Front	4 – RF IN Rear, TP Rear		4 – AC primary, DC secondary
				5 – FC/APC, Front			5 – DC primary, DC secondary
				6 – E2000/APC, Front			

Note 1: ITU grid wavelengths can be specified from channel 18 to 62. Contact factory for availability

Note 2: Not all configurations are available, contact factory.

Additional Kits

- G8695-004-001 - Replaceable AC power supply modules
- G8695-006-001 - Replaceable DC power supply modules
- G7914-076-001 - Replaceable Blank power module plate
- G3906-013-001 - Replaceable fans

Laser Safety Information

This product meets the applicable requirements of 21 CFR 1010 & 1040 and is classified as a Class 1M laser product. During use as intended, the laser energy is fully contained within the fiber network such that there is no accessible laser radiation. This product has been issued accession number 1720366-000.

DANGER

INVISIBLE LASER RADIATION
AVOID DIRECT EXPOSURE
TO BEAM

Wavelength: 1550nm
Max. Output: 30mW
Class 1M Laser Product

DANGER

INVISIBLE LASER RADIATION
IS EMITTED FROM THE END
OF FIBER OR CONNECTOR

Avoid direct exposure to beam
Do not view beam directly with
optical instruments

INVISIBLE LASER RADIATION EMITTED FROM END OF FIBER OR CONNECTOR
DO NOT VIEW DIRECTLY WITH OPTICAL INSTRUMENTS

CLASS 1M LASER PRODUCT EC60825-1:2007 EN60825-1:2007
MAX. OUTPUT: 30mW WAVELENGTH: 1550nm

Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant
to Laser Notice No. 50, dated June 24, 2007

G8695-013-001 REV B