



Applications

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

Features

- Single 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 DOCSIS 3.1 standard
- Backward compatible to DOCSIS 3.0
- Tilt Control for CATV and SAT IF inputs

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

The C-Type, J-Type, F-Type and S-Type Medallion 8100 series is a family of DOCSIS 3.1 compliant, 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 EMCORE. 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 EMCORE 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 J-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 F-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 S-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).

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 | | NTSC80/PAL 60 | NTSC110/PAL 89 | 42 CENELEC | |
| Optical Output Power | Po (dBm) | 10 | 10 | 10 | Min. |
| Noise Bandwidth | BW (MHz) | 4/5 | 4/5 | 5 | |
| SBS Suppression | (dBm) | 11.0 | 11.0 | 11.0 | Min. |
| Carrier to Noise Ratio | CNR (dB) | 52 | 50.5 | 53.5 | Min. |
| Composite Second Order | CSO (dBc) | -62 | -61 | -61 | Max. |
| Composite Triple Beat | CTB (dBc) | -63 | -63 | -63 | Max. |
| All Digital Load QAM/OFDM | MER | 38 | 38 | NA | Min. Digital loading to 1.2GHz |
| All Digital Load QAM/OFDM | BER | 1.0 E-08 | 1.0 E-08 | NA | Min. Pre-FEC |

J-Type

| Property Performance (Note 1-8) | Units | Models | | Comments |
|------------------------------------|-----------|-----------------|-------------------|--|
| | | 8100-J01 | 8100-J02 | |
| Specified Link Length | L (km) | 25 | 25 | |
| Channel Plan | | NTSC 80 / PAL60 | NTSC 110 / PAL 89 | With 54 QPSK carriers from 950 to 3500 MHz |
| Optical Output Power | Po (dBm) | 7.0 | 7.0 | Min. |
| Noise Bandwidth | BW (MHz) | 4 | 4 | |
| SBS Suppression | (dBm) | 15.0 | 15.0 | Min. |
| CATV Carrier to Noise Ratio | CNR (dB) | 51.0 | 49.5 | Min. |
| CATV Composite Second Order | CSO (dBc) | -62 | -61 | 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 | 8100-F03 | |
| Specified Link Length | L (km) | 30 | 30 | 30 | |
| Channel Plan | | NTSC 80-Ch | PAL 60-Ch | NTSC 110-ch | |
| Optical Output Power | Po (dBm) | 7.0 | 7.0 | 7.0 | Min. |
| Noise Bandwidth | BW (MHz) | 4 | 5 | 4 | |
| SBS Suppression | (dBm) | 21.0 | 21.0 | 21.0 | Min. |
| Carrier to Noise Ratio | CNR (dB) | 48.0 | 48.0 | 46.0 | Min. |
| Composite Second Order | CSO (dBc) | -60 | -60 | -60 | Max. |
| Composite Triple Beat | CTB (dBc) | -60 | -60 | -60 | Max. |
| All Digital Load QAM/OFDM | MER | 38 | 38 | NA | Min. Digital loading to 1.2GHz |
| All Digital Load QAM/OFDM | BER | 1.0 E-08 | 1.0 E-08 | NA | Min. Pre-FEC |

Medallion 8100 Series DOCSIS 3.1 L-EML™ 1550 nm Externally-Modulated Transmitter



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 | | NTSC80/PAL 60 | NTSC110/PAL 89 | 42 CENELEC | |
| Optical Output Power | Po (dBm) | 7.0 | 7.0 | 7.0 | Min. |
| Noise Bandwidth | BW (MHz) | 4/5 | 4/5 | 5 | |
| SBS Suppression | (dBm) | 16.0 | 16.0 | 16.0 | Min. |
| Carrier to Noise Ratio | CNR (dB) | 52 | 50 | 52.5 | Min. |
| Composite Second Order | CSO (dBc) | -61 | -60 | -60 | Max.. |
| Composite Triple Beat | CTB (dBc) | -63 | -63 | -63 | Max. |
| All Digital Load QAM/OFDM | MER | 38 | 38 | NA | Min. 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 1.5 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
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 Optional | VFD- (Vacuum Fluorescent Display - Optional) |
| 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 60728-11 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) | 90 to 265 VAC, 50/60 Hz +/- (36 – 72) VDC | |
| Dimensions | 19.0"W x 15.0"D x 1.72"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 | 80 dBuV/ch - 20 dBmV/ch | 80 NTSC channels |
| 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 | |
| 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 |

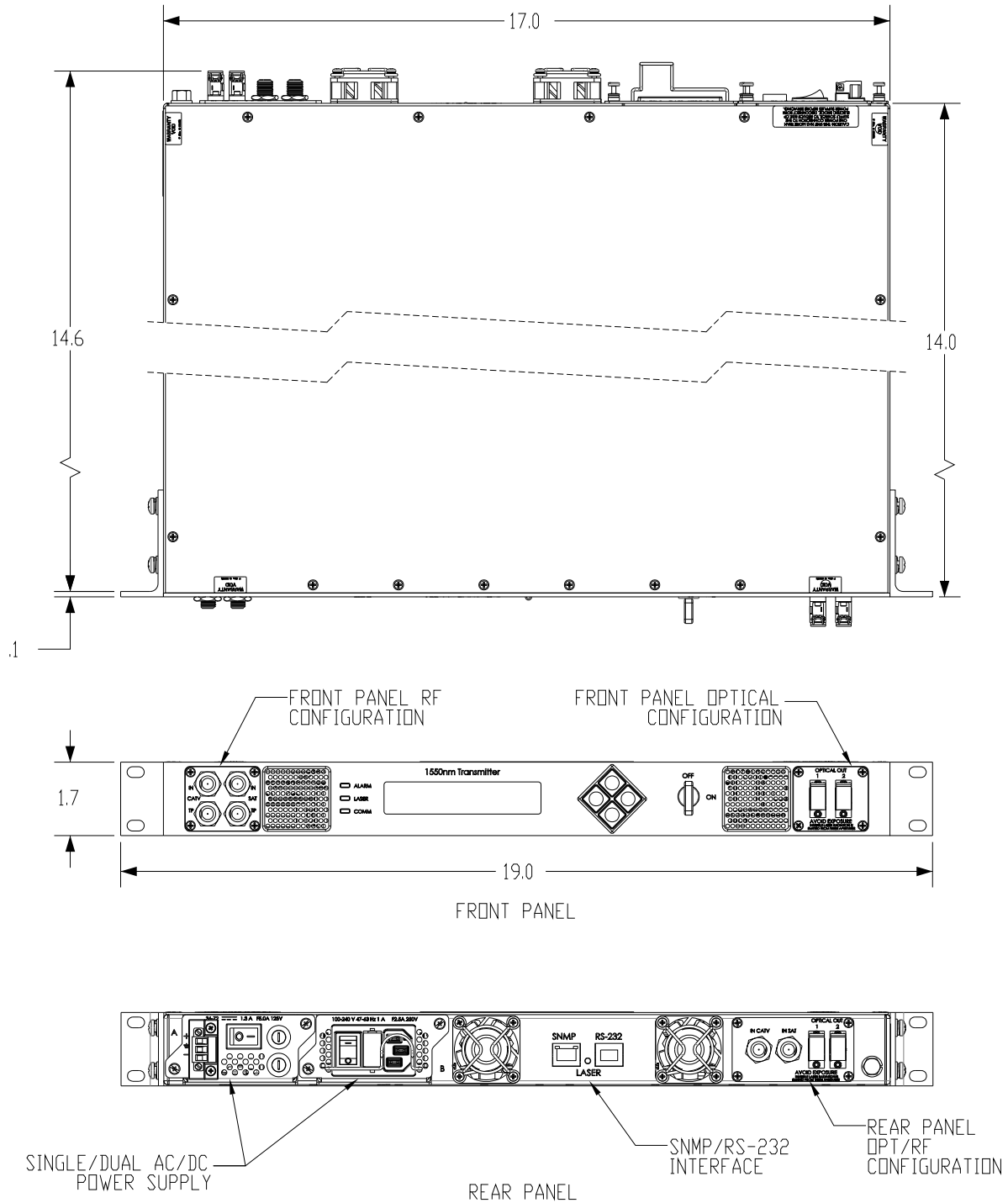
Test/Link Configuration

| Property | EDFA | Link ¹ | Received Power ² |
|----------|--------|-------------------|-----------------------------|
| J-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 | -5.0 dBm at the receiver |

Medallion 8100 Series DOCSIS 3.1 L-EML™ 1550 nm Externally-Modulated Transmitter



Outline Drawing (Dimensions in inches)

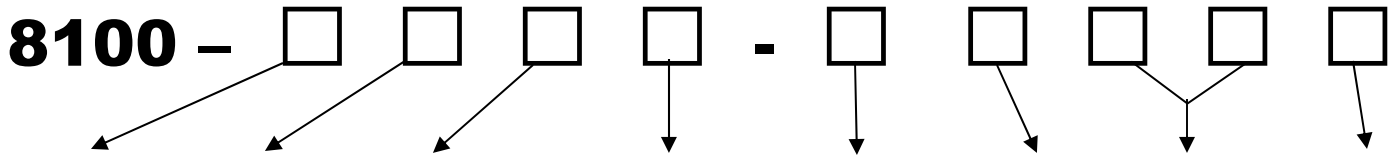


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Medallion 8100 Series DOCSIS 3.1 L-EML™ 1550 nm Externally-Modulated Transmitter



Model Number Information (note 2)



| Logo & Customer Specific | Link type | Pout (dBm min) | Loading Type | Optics | RF | Wavelength (nm) | Power Supply |
|--------------------------|-----------|------------------------------|--------------------------------|----------------------|---------------------------|-----------------------------------|------------------------------|
| 0 – Emcore Logo | S – 65 km | 0 – 7.0 dBm Min. Types S,F,J | 1 – NTSC (80-ch) / PAL (60-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 – NTSC (110-ch)/ PAL (89-ch) | 2 – FC/APC, Rear | 2 – RF IN Front, TP Front | 01 – 1550 +/- 5.0nm | 2 – DC primary, no secondary |
| | F – 30 km | | 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 |
| | J – 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.
 Note 2: Not all configurations are available, contact factory.
 Note 3: Contact Factory for Model type availability.

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 0820466-001.

⚠ 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 IEC 60825-1:2007 EN 60825-1:2007
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

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