

# I-Type Medallion 6000 1550 nm Externally-Modulated Transmitter

emcore®

DATASHEET | NOVEMBER 2013

CATV



## Applications

- High-Performance Supertrunking Links
- High Power Distribution Networks
- Redundant Ring Architectures
- FTTx Networks
- RFoG Applications
- Optimized for International CATV Systems
- DWDM Node Splitting

## Features

- Single or Dual Optical Outputs
- QAM Loading to 1003 MHz
  - Dual Power Supplies, Redundant & Hot-Swappable
- Front Panel RF Test Point
- Vacuum Fluorescent Status Display
- OMI / RF Gain Adjustment
- AGC Select: CW, Video, Manual (No AGC)
- Industry Leading Field Adjustable SBS Suppression

## The I-Type Medallion 6000 Series

The I-Type Medallion 6000 series is a family of state-of-the-art high-performance 1550 nm externally-modulated CATV fiber optic transmitters optimized for International network applications that employ an 85 MHz forward / reverse path split frequency. Packaged in a convenient 1 RU housing, this line of optical transmitters couples high optical output power, up to 10.0 dBm, with low optical linewidth resulting in unmatched performance. The optical modulator, combined with proprietary pre-distortion circuitry, provides superior CTB and CSO performance with adjustable SBS suppression levels of greater than 19 dBm.

The I-Type transmitter's exceptional performance is enabled by EMCORE's proprietary high power, narrow linewidth CW (Continuous Wave) laser technology. When deployed with one or more EMCORE optical amplifiers, transmissions of 150 km can be achieved. The feature-rich WEB GUI and SNMP interface bring a whole suite of advanced operator monitoring and configuration options to the platform, allowing for secure, simplified and future-ready functionality for the next generation of intelligent networks.

Advanced features such as built-in field adjustable SBS control allow these transmitters to be quickly optimized in the field for any link or application without the need to procure specifically tuned transmitters.

I-Type transmitters are specially designed and optimized to support fiber optic links of up to 150 km for the international marketplace and other markets with similar requirements.

Monitoring and configuration is supported via a convenient front panel display, an RS-232 port, and an Ethernet port with SNMP, Telnet, and Web GUI. The platform is mechanically designed for flexibility and space efficiency including universal rack-mount features, modular front panel design, and optional front and rear port placement. Dual redundant field-replaceable fans and power supplies are standard.

## Optical Characteristics

| Property               | Units     | 6000-01E1              |           | Comments                                  |
|------------------------|-----------|------------------------|-----------|---|
|                        |           | Performance (note 1-9) |           |   |
| Specified Link Length  | L (km)    | 65                     | 65        | Other Fiber Lengths Supported. See Note 8 |
| Channel Plan           |           | NTSC 80-Ch             | PAL 60-Ch | Other Channel Plans Supported. Note 9     |
| Optical Output Power   | Po (dBm)  | 7.0/7.0                | 8.5/8.5   | Min. 10 dBm version avail. See Chart      |
| Noise Bandwidth        | BW (MHz)  | 4                      | 5         |   |
| SBS Suppression        | (dBm)     | 13 to 19               | 13 to 19  | Min.                                      |
| Carrier to Noise Ratio | CNR (dB)  | 52.5                   | 52.5      | Min.                                      |
| Composite Second Order | CSO (dBc) | -65                    | -65       | Max. Port 1                               |
| Composite Triple Beat  | CTB (dBc) | -65                    | -65       | Max. @ +25°C                              |
| Composite Triple Beat  | CTB (dBc) | -64                    | -64       | Max. @ 0°C to 50°C                        |

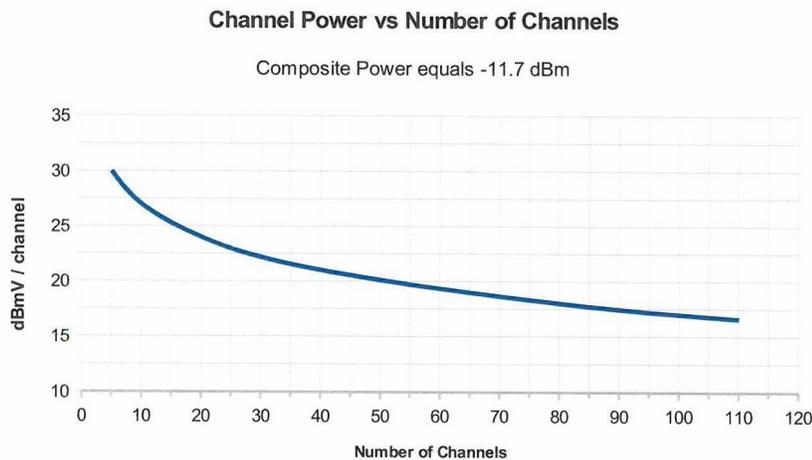
**Notes:**

1. Unless stated otherwise all specifications apply over full temperature range with no digital loading.
2. Unless stated otherwise specifications apply for nominal RF input level as defined below, after a 30 minute stabilization period.
3. Specifications separated by a slash are port1 / port 2.
4. Units are tested per the Test / Link Configuration Table
5. Noise figure for the EDFA = 4.5 ~ 5.5 dB
6. Corning SMF-28 single mode fiber
7. Receiver responsivity is 0.95 mA/mW, Equivalent noise current is 7 pA/(Hz)<sup>1/2</sup>
8. Fiber lengths from 0 to 100 km can be supported. See Figure 2 for CSO performance.
9. The lowest frequency of all channel plans shall be > 119.25 MHz. A 2 dB penalty of CNR may occur for channels from 85 to 112.25 MHz. See the Electrical Specifications Table for correct input power for other channel plans.

## Test/Link Configuration

| Property | EDFA   | Link  | Received Power <sup>2</sup> |
|----------|--------|-------|-----------------------------|
| I-Type   | 16 dBm | 65 Km | 0.0 dBm at the receiver     |

**Figure 1**



# I-Type Medallion 6000 1550 nm Externally-Modulated Transmitter

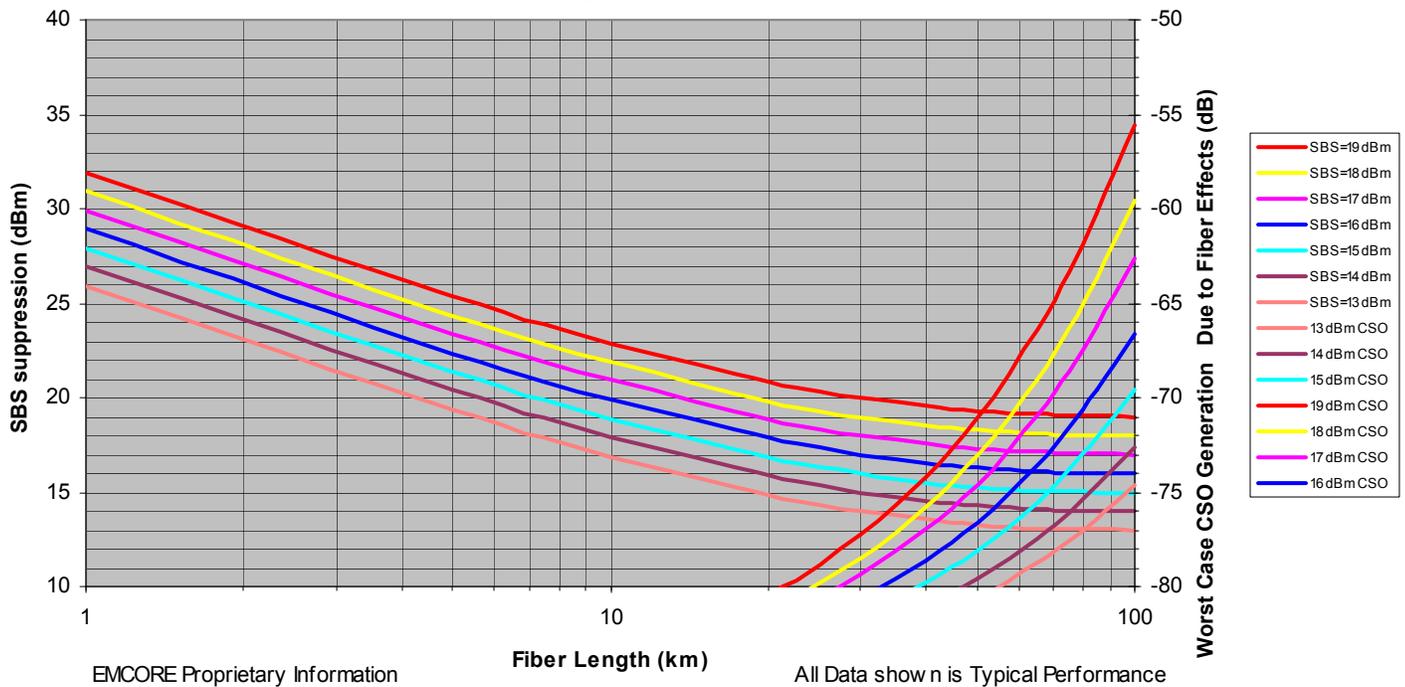


## Electrical Specifications

| Property                            | Requirement  | Comments                                      |
|-------------------------------------|--|---|
| CATV Nominal Input Power            | 18 dBmV/ch (78 dBuV/ch)<br>19 dBmV/ch (79 dBuV/ch) | 80 NTSC channels<br>60 PAL channels           |
| CATV Composite Level                | -11.7 dBm  | 0 dB on FP Display (All Channel Plans)        |
| CATV Input Range                    | +2/-8 dB from nominal input                        | Optimal performance at nominal input          |
| CATV RF Gain / OMI Adjustment Range | +2/-8 dB from nominal setting                      | CATV Performance may vary slightly over range |
| CATV Frequency Range                | 45 MHz – 1003 MHz                                  |   |
| CATV Flatness                       | +/- 0.50 dB<br>+/- 0.75 dB                         | 45 MHz – 550 MHz<br>45 MHz – 1003 MHz         |
| CATV Input impedance                | 75Ω  |   |
| CATV Input Return Loss              | 16 dB min  | 45 MHz – 1003 MHz                             |
| CATV Front Panel RF Tap             | -20 +/- 1 dB down from RF input                    |   |
| CATV Front Panel RF Tap Flatness    | +/- 1 dB   | 45 MHz – 1003 MHz                             |

Figure 2

**Medallion 6000 I-Type SBS Suppression and CSO Generation**  
80 ch NTSC channel load vs Fiber length with varying SBS Settings  
Single EDFA Fiber Link



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## General and Mechanical Specifications

| Property                       | Requirement   | Comments  |
|--------------------------------|---|---|
| Wavelength                     | 1555+/-5 nm   | Various Options + ITU-grid available – see Model Number Information   |
| Channel Plan                   | Various – See Specification Tables  |   |
| Optical Connector              | SC/APC  | Other styles available  |
| Monitoring Interfaces          | 100 Base-T Ethernet (SNMP)<br>Rear Panel RS-232 interface<br>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              | 65 W max  |   |
| Agency Listings                | <b>EMI:</b><br>EN50083-2:2006 (US CATV)<br>EN55022:2006 (US IT)<br>EN61000-3-2 (Harmonics)<br>EN61000-3-3 (Flicker)<br>FCC: Part 15, Subpart B, class “A” Unintentional Radiators<br>ICES-003 (Canada)<br>AN/NZS 3548, Class A (Australia)<br>VCCI, Class A (Japan) | <b>Safety:</b><br>FDA/CDRH Laser Safety Governed by Code of Federal Regulations Title 21, Volume 8, Part 1040<br>IEC 60950-1<br>IEC 60728-11<br>Laser IEC 60825-1<br>CB Certification |
| Transportation Vibration       | GR-2853-CORE  | In Shipping package   |
| Transportation Shock           | GR-2853-CORE  | In Shipping package   |
| Operating Humidity             | 20% to 85%  | Non-condensing  |
| Supply Range<br>(VAC)<br>(VDC) | 90 to 265 VAC, 50/60 Hz<br>+/- (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   |

Information contained herein is deemed reliable and accurate as of the issue date. EMCORE reserves the right to change the design or specification at any time without notice. EMCORE is a registered trademark of EMCORE Corporation in the U.S. and other countries.

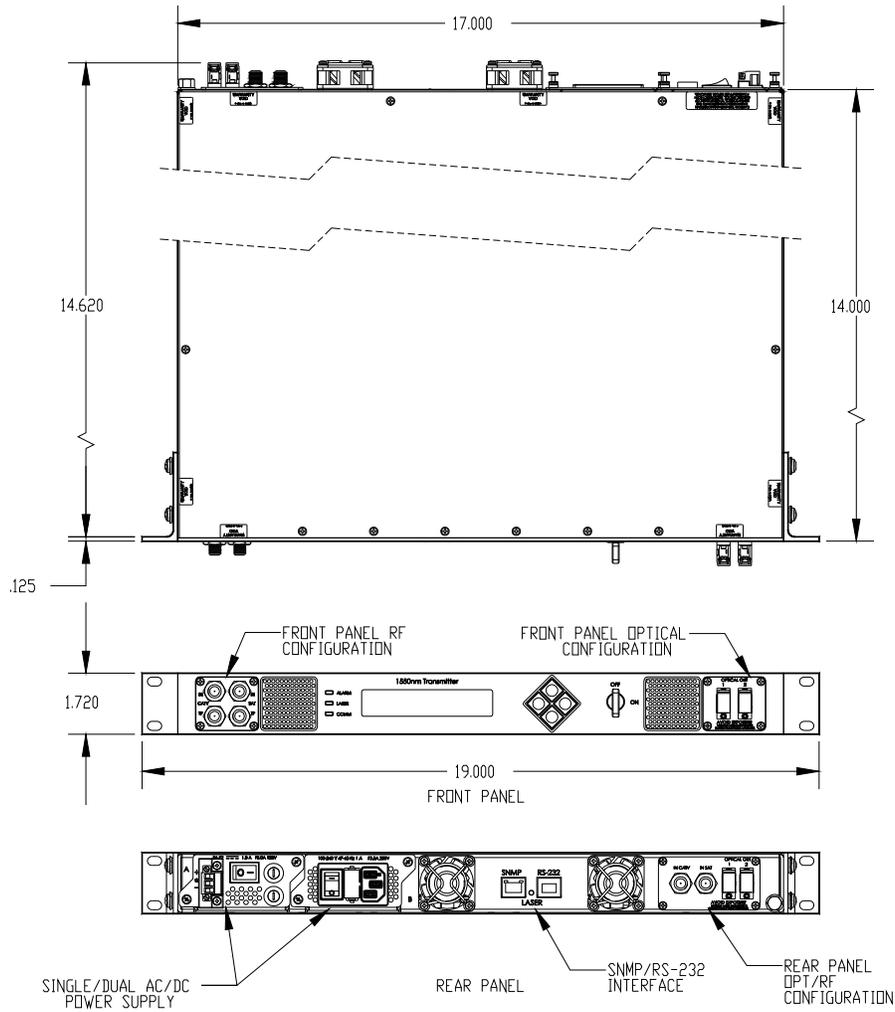
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## Outline Drawing



# I-Type Medallion 6000 1550 nm Externally-Modulated Transmitter



## Model Number Information<sup>Note 3</sup>

6000 - [ ] [ ] [ ] [ ] - [ ] [ ] [ ] [ ] [ ]

| Logo & Customer Specific | Link Type       | Pout (dBm min)<br><small>Note 1</small> | Loading Type          | Optics               | RF                        | Wavelength (nm)                                   | Power Supply                 |
|--------------------------|-----------------|---|-----------------------|----------------------|---------------------------|---|------------------------------|
| 0 – EMCORE Logo          | I – 0 to 100 km | D – 10/10 <small>Note 4</small>         | 1 – All Channel Plans | 1 – SC/APC, Rear     | 1 – RF IN Rear, TP Front  | 00 – 1555+/- 5.0 nm                               | 1 – AC primary, no secondary |
| 1 – no Logo              |                 | A – 7.0/7.0                             |                       | 2 – FC/APC, Rear     | 2 – RF IN Front, TP Front | 01 – 1550+/- 5.0 nm                               | 2 – DC primary, no secondary |
|                          |                 |   |                       | 3 – E2000/APC, Rear  | 3 – RF IN Front, TP Rear  | xx – ITU Channel +/- 0.1 nm <small>Note 2</small> | 3 – AC primary, AC secondary |
|                          |                 |   |                       | 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: Options available for Indicated types only
- Note 2: ITU grid wavelengths can be specified from channel 18 to 40
- Note 3: Not all configurations are available, contact factory
- Note 4: CSO port 2 degraded by 1dB
- Note 5: Contact Factory for Model type availability

### Additional Kits

- G3708-006-001 - Replaceable AC power supply modules
- G3708-005-001 - Replaceable DC power supply modules
- G7914-076-001 - Replaceable Blank power module plate
- G3906-008-001 - 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.

