



## EX-DY800X 1310/1550 High Speed Laser Module

### Description

The EX-DY800X DFB laser module is an InP based MQW diode. The module features high bandwidth to 9GHz, good linearity, low RIN, stable high output power, and is suitable for RoF (RF over Fiber) links. The EX-DY800X contains a thermo-electric controller, a monitor diode, an optical isolator, an RF impedance matching circuit, plus a bias T.

### Key features

- 10-20mW output power
- High linearity/Low Noise figure
- High modulation bandwidth to 9 GHz
- High reliability
- RoHS compliance
- FC/APC connector
- 50  $\Omega$  impedance matching



### Applications

- Analog RoF (RF over Fiber) links

### Absolute Maximum Rating:

| Parameter                  | Sym.      | Condition  | Min | Max | Unit               |
|----------------------------|-----------|------------|-----|-----|--------------------|
| Operating Case Temperature | $T_c$     | $I=I_{op}$ | -20 | 75  | $^{\circ}\text{C}$ |
| Storage Temperature        | $T_{stg}$ | -          | -40 | 85  | $^{\circ}\text{C}$ |
| Laser Forward Current      | CW        | -          | -   | 120 | mA                 |
| Laser Reverse Bias         | $V_r$     | -          | -   | 2   | V                  |
| Photodiode Reverse Bias    | $V_{rpd}$ | -          | -   | 10  | V                  |
| RF Input Power             | $P_{in}$  | -          | -   | 20  | dBm                |
| TEC Current                | $I_{TEC}$ | -          | -   | 2.0 | A                  |
| TEC Voltage                | $V_{TEC}$ | -          | -   | 4.0 | V                  |
| Bending Radius             |           | SMF28      | 10  | -   | mm                 |
| Lead Soldering Temperature |           | -          | -   | 260 | $^{\circ}\text{C}$ |
| Lead Soldering Time        |           | -          | -   | 10  | s                  |



ExOptronics, Inc

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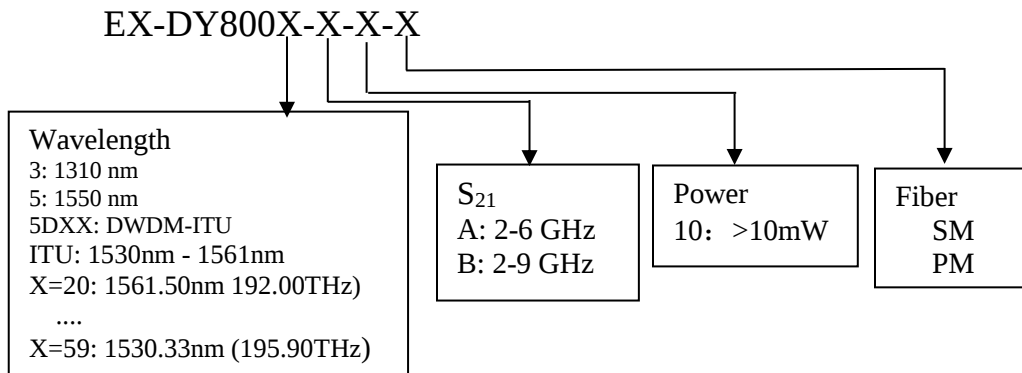
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## Electro-Optical Characteristics (Tested under $T_c=25^\circ\text{C}$ )

| Parameter                     | Symbol      | Test Conditions                            | Min          | Typ          | Max          | Unit             |
|-------------------------------|-------------|--------------------------------------------|--------------|--------------|--------------|------------------|
| Threshold Current             | $I_{th}$    | $T_c=25^\circ\text{C}$                     | -            | 10           | 20           | mA               |
| Output Power                  | $P_o$       | $I=I_{op}$                                 | -            | 10           |              | mW               |
| Laser Drive Current           | $I_{op}$    | CW                                         |              | 70           | 100          | mA               |
| Power Tracking Error          | TE          |                                            | -1.5         |              | 1.5          | dB               |
| Center Wavelength             | $\lambda_c$ | $I=I_{op}$<br>See Options                  | 1290<br>1530 | 1310<br>1550 | 1330<br>1561 | nm               |
| Side-Mode Suppression Ratio   | SMSR        | $I_{th}+20\text{mA}$                       | 35           | 40           | -            | dB               |
| Monitor Current response      | $I_m/P_o$   | -                                          | 8            |              | 160          | $\mu\text{A/mW}$ |
| Frequency Response Flatness   | $S_{21}$    | A: 2 to 6.0 GHz                            | -            | -            | 4.5          | dBp-p            |
|                               |             | B: 3 to 9.0 GHz                            | -            | -            | 4.5          |                  |
| Electrical Back Reflection    | $S_{11}$    | 0.13 to 4.0 GHz                            | -            | -            | -10          | dB               |
|                               |             | 4.0 to 9.0 GHz                             | -            | -            | -4.5         |                  |
| Relative intensity noise      | RIN         | 1 to 9.0 GHz                               |              | -150         | -140         | dB/Hz            |
| Modulation Input Matching     | $Z_{in}$    |                                            | 50           |              |              | $\Omega$         |
| LD Operating Temperature      | $T_\lambda$ | $I=I_{op}$                                 | 15           | -            | 35           | $^\circ\text{C}$ |
| Thermistor Resistance         | $R_{TH}$    | $T_c=25^\circ\text{C}$                     | 9.5          | 10           | 10.5         | k $\Omega$       |
| Thermistor Beta Coefficient   | $\beta$     | $0^\circ\text{C} < T_c < 50^\circ\text{C}$ |              | 3892         |              | $^\circ\text{K}$ |
| Optical Isolation             | ISO         | -                                          | 30           | 40           |              | dB               |
| Polarization Extinction Ratio | PER         | PMF Option                                 | 17           |              | -            | dB               |

1. Chip's  $f_{3dB}$  is guaranteed to be faster than >10 GHz.
2.  $S_{21}$  and  $S_{11}$  are measured on testing fixture without pin shortening & soldering, higher  $S_{11}$  RF reflection than actual is within 4.5 to 9 GHz and  $S_{21}$  drops at the beginning of 0.13-5 GHz.
3.  $S_{21}$  can be improved by 2-4 dB with shortening & soldering pins to PCB board.
4. dBp-p: Amplitude peak to peak difference

## Ordering Options





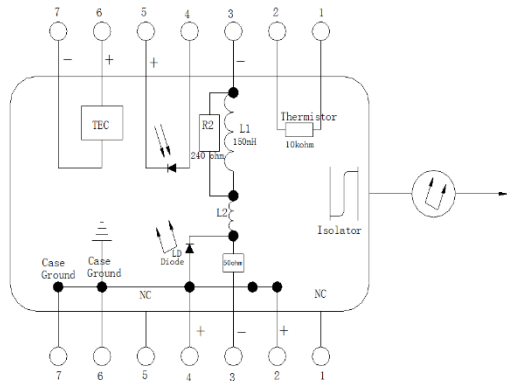
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## Electric Schematics



| PIN Assignments |                  |     |                              |
|-----------------|------------------|-----|------------------------------|
| PIN             | Function         | PIN | Fuction                      |
| 1               | Thermistor       | 8   | Case Ground                  |
| 2               | Thermistor       | 9   | Case Ground                  |
| 3               | DC laser Bias(-) | 10  | NC                           |
| 4               | MPD Anode        | 11  | Laser Common(+), Case Ground |
| 5               | MPD Cathode      | 12  | Laser Modulation(-)          |
| 6               | TEC(+)           | 13  | Laser Common(+), Case Ground |
| 7               | TEC(-)           | 14  | NC                           |

## Outline Drawing (unit: mm)

