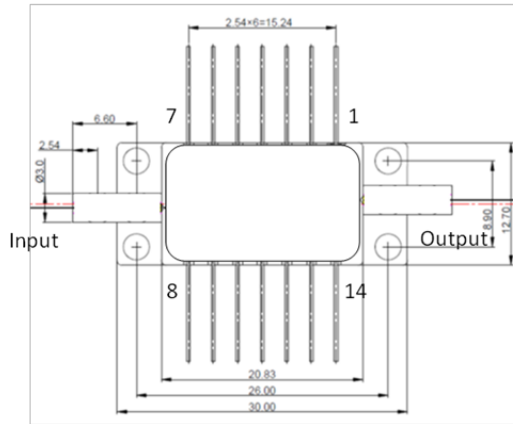


## Preliminary Product Brief

### DL-SOA55014A-HDP-45



DenseLight DL-SOA55014A-HDP-45 product is a polarization-maintaining semiconductor optical amplifier (SOA) packaged in a standard 14pin BTF module. It is designed to have high gain and high output power when operated at stabilized temperature of 45°C. The SOA module has an optical gain of at least 14dB.

#### FEATURES

- Broad ASE bandwidth of  $\geq 45\text{nm}$
- Low ASE ripple of  $\leq 0.3\text{dB}$
- High output power of  $\geq 17\text{dBm}$
- Designed for booster application in Auto-LiDAR and optical networks

| Pin | Configuration | Pin | Configuration |
|-----|---------------|-----|---------------|
| 1   | TEC (+)       | 8   | NC            |
| 2   | Thermistor    | 9   | NC            |
| 3   | NC            | 10  | SOA Anode     |
| 4   | NC            | 11  | SOA Cathode   |
| 5   | Thermistor    | 12  | NC            |
| 6   | NC            | 13  | Case          |
| 7   | NC            | 14  | TEC (-)       |

#### OPTICAL, ELECTRICAL AND THERMAL CHARACTERISTICS ( $T_{\text{SOA}}^* = 45^\circ\text{C}$ )

| Parameter                     | Symbol           | Condition           | Min    | Typ  | Max  | Unit       |
|-------------------------------|------------------|---------------------|--------|------|------|------------|
| Operating current             | $I_{\text{op}}$  | -                   | -      | 100  | 500  | mA         |
| Forward voltage               | $V_f$            | 500mA               | -      | -    | 1.7  | V          |
| ASE center wavelength         | $\lambda_c$      | 100mA               | 1540   | 1550 | 1560 | nm         |
| ASE bandwidth                 | $\Delta\lambda$  | 100mA               | 45     | -    | -    | nm         |
| ASE ripple                    | $R_{\text{ASE}}$ | 100mA               | -      | -    | 0.3  | dB         |
| ASE output power              | $P_{\text{ASE}}$ | 100mA               | 0.3    | -    | -    | mW         |
| Polarization extinction ratio | PER              | 100mA               | 20     | -    | -    | dB         |
| Small signal gain             | G                | 100mA, Pin = -12dBm | 14     | -    | -    | dB         |
| Noise figure                  | NF               | 100mA, Pin = -12dBm | -      | -    | 8    | dB         |
| Output power                  | $P_{\text{out}}$ | 500mA, Pin=+13dBm   | 17.5** | -    | -    | dBm        |
| Thermistor resistance         | G                | 25°C                | 9.9    | 10   | 10.1 | k $\Omega$ |
| Thermistor B-value            | $B_{25/50}$      | -                   | -      | 3930 | -    | K          |
| Thermoelectric cooler voltage | $V_{\text{TEC}}$ | 500mA               | -      | -    | 1.6  | V          |
| Thermoelectric cooler current | $I_{\text{TEC}}$ | 500mA               | -      | -    | 0.6  | A          |

Note:

- \*  $T_{SOA}$  refers to SOA chip temperature as sensed by built-in thermistor and read out from pins 2 and 5
- \*\* Based on fiber coupling loss of 2.5dB

### ABSOLUTE MAXIMUM RATINGS

Operation beyond the absolute maximum ratings can cause degradation in device performance leading to permanent damage to the device.

| Parameter                      | Symbol     | Condition | Min | Max | Unit |
|--------------------------------|------------|-----------|-----|-----|------|
| Reverse voltage                | $V_R$      | -         | -   | 2   | V    |
| Forward current                | $I_F$      | -         | -   | 600 | mA   |
| Case operating temperature     | $T_{op}$   | -         | 0   | 70  | °C   |
| Thermoelectric cooler voltage  | $V_{TEC}$  | -         | -   | 4.8 | V    |
| Thermoelectric cooler current  | $I_{TEC}$  | -         | -   | 2.5 | A    |
| Storage temperature            | $T_{stg}$  | Unbiased  | -40 | 85  | °C   |
| Storage humidity               | -          | -         | 5   | 85  | %RH  |
| Electro static discharge (ESD) | $V_{ESD}$  | HBM       | -   | 500 | V    |
| Lead soldering temperature     | $S_{temp}$ | -         | -   | 260 | °C   |
| Lead soldering time            | $S_{time}$ | -         | -   | 10  | s    |

### PHYSICAL CHARACTERISTICS

| Parameter            | Description             |
|----------------------|-------------------------|
| Package Type         | 14pin BTF               |
| Fiber                | Input: PMF, Output: PMF |
| MFD                  | 9um                     |
| Cladding Diameter    | 125um                   |
| Coating Diameter     | 245um                   |
| Jacket               | 900um loose tube        |
| Fiber Pigtail Length | 1m                      |
| Fiber Bending Radius | >40mm                   |
| Connector            | FC/APC                  |
| Dimensions           | See figure below        |