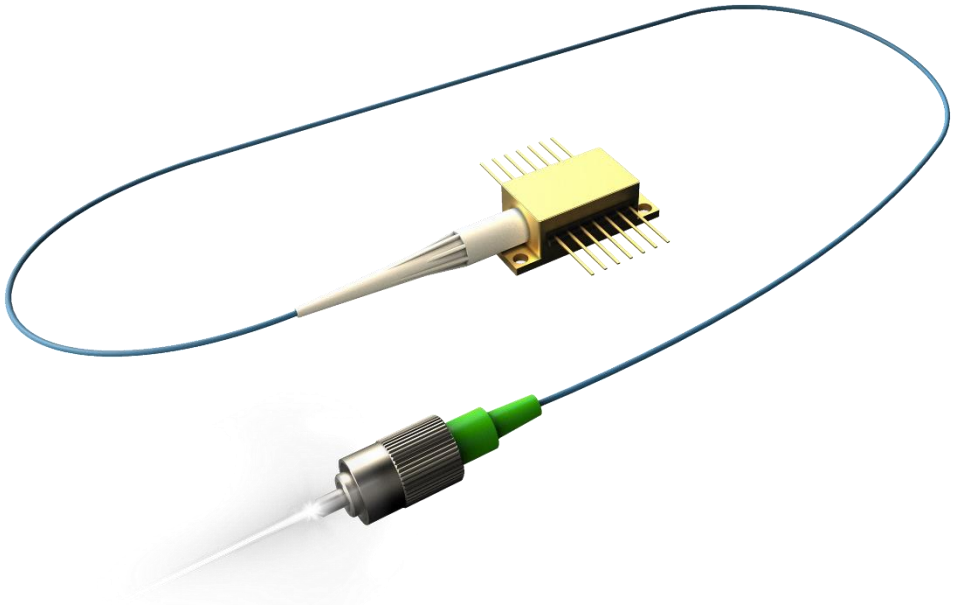
DATASHEET

Distributed Feedback Laser (DFB) Optical Spectral Engine G3: 14-Pin Butterfly Package, CW: 1650.5nm, SM Fiber, FWHM: 3MHz, Fiber Output Power >10mW

Part# ASM001502



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A. PRODUCT DESCRIPTION

The ASM001506 is a Multi-Quantum Well (MQW) distributed feedback (DFB) laser packaged in an industry-standard 14-pin butterfly (BTF) module. Leveraging DAYY Photonics' advanced design and manufacturing technology, the device offers mode-hop-free tunability, high output power, excellent side-mode suppression ratio (SMSR), and precise wavelength accuracy. The module is designed for stable, low-noise operation and is well suited for demanding applications requiring reliable spectral performance and repeatability over time.

B. KEY FEATURES

- DFB with peak wavelength 1650.5nm
- Mode-hop free tunability
- Compact BTF package with integrated Thermal Electric Cooler (TEC), Thermistor, Monitor Diode and Isolator.
- Single mode fiber pigtail
- Light output: FC/APC Connector (Optional: FC/PC or SMA)

C. APPLICATIONS

- Gas Sensing
- Telecom Test Equipment
- Metrology
- Biomedical Imaging Systems
- Optical Sensing
- Research and Development

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D. ABSOLUTE MAXIMUM RATINGS (see note 1)

Parameter	Symbol	Condition	Min.	Max.	Unit
Operating Current	I_{OP}	CW T_{OP} = 25˚C T_{TEC} = 21˚C	-	175	mA
Forward Voltage	V_F	CW T_{OP} = 25˚C T_{TEC} = 21˚C	-	3	V
Reverse Voltage	V_R	CW T_{OP} = 25˚C T_{TEC} = 21˚C	-	2	V
Ambient Package Temperature (see note 2)	T_{BTF}	-	-40	80	˚C
TEC Temperature (see note 3)	T_{TEC}	-	0	50	˚C
Storage Temperature (see note 4)	T_{stg}	No condensation, Unbiased	-40	85	˚C
Storage Humidity (see note 4)	RH_{stg}	-	5	85	%RH
Electro Static Discharge (ESD)	V_{ESD}	Human Body Model	-	500	V
Lead Soldering Temperature	T_{Solder}	-	-	280	˚C
Lead Soldering Time	t_{Solder}	-	-	10	s

Notes:

1. *Please note that exceeding the Absolute Maximum Ratings above may cause device failure. The manufacturer does not bear responsibility for laser power damage that is attributed to electrostatic discharge, excessive current levels, and current spikes (transients).*

   Any attempts to increase the laser drive current above the pre-set limits or recommended specification limits, can damage the device, and nullify the warranty period. It should be emphasized that the current limit set points cannot be exceeded.

2. *For optimum performance of the DFB, the DFB must be operated within the specified temperature ranges. The DFB has an internal thermoelectric cooler (TEC) but it's always required to mount the butterfly package on an appropriate heatsink, capable of dissipating up to 7W.*

3. T_{TEC} *is monitored by internal thermistor with external readout.*

4. *Storage temperature and relative humidity should be chosen so the dew point of the humid air around the package is below the storage temperature of the package, to avoid condensation on the package.*

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E. OPTICAL AND ELECTRICAL SPECIFICATIONS

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Peak Wavelength	CWL	T_{OP} = 25˚C T_{TEC} = 21˚C I_{OP}	1650.0	1650.5	1651	nm
Operating Current	I_{OP}	T_{OP} = 25˚C T_{TEC} = 21˚C I_{OP}	-	100	150	mA
Forward Voltage	V_F	T_{OP} = 25˚C T_{TEC} = 21˚C I_{OP}	-	-	2.5	V
SM Fiber Coupled Power	P	T_{OP} = 25˚C T_{TEC} = 21˚C I_{OP}	10	-	-	mW
Linewidth (FWHM)	B_{FWHM}	T_{OP} = 25˚C T_{TEC} = 21˚C I_{OP}	-	2	3	MHz
Wavelength Repeatability Peak-to-Peak	λr	T_{OP} = 25˚C T_{TEC} = 21˚C I_{OP}	-	0.15	-	pm
Threshold Current	Ith	T_{OP} = 25˚C T_{TEC} = 21˚C I_{OP}	-	10	35	mA
Side Mode Suppression Ratio	SMSR	T_{OP} = 25˚C T_{TEC} = 21˚C I_{OP}	40	50	-	dB
Optical Isolation	PI	T_{OP} = 25˚C T_{TEC} = 21˚C I_{OP}	30	-	-	dB
Temperature Tuning Coefficient	$\Delta\lambda/\Delta T$	T_{OP} = 25˚C T_{TEC} = 21˚C I_{OP}	-	0.09	-	nm/°C
Current Tuning Coefficient	$\Delta\lambda/\Delta I$	T_{OP} = 25˚C T_{TEC} = 21˚C I_{OP}	-	0.01	-	nm/mA
Slope Efficiency	SE	T_{OP} = 25˚C T_{TEC} = 21˚C I_{OP}	0.1	0.2	0.3	mW/mA
Thermistor Resistance TEC	R_{THTEC}	T_{OP} = 25˚C T_{TEC} = 21˚C	9.5	10.0	10.5	kΩ
Monitor Photodiode Current	M_{CURR}	T_{OP} = 25˚C T_{TEC} = 21˚C	0.01	-	2.5	mA
TEC Capacity	TC	I_{OP}	-	-	50	℃
TEC Voltage	V_{TEC}	-	-	-	3.5	V
TEC Current	I_{TEC}	-	-	-	1.5	A

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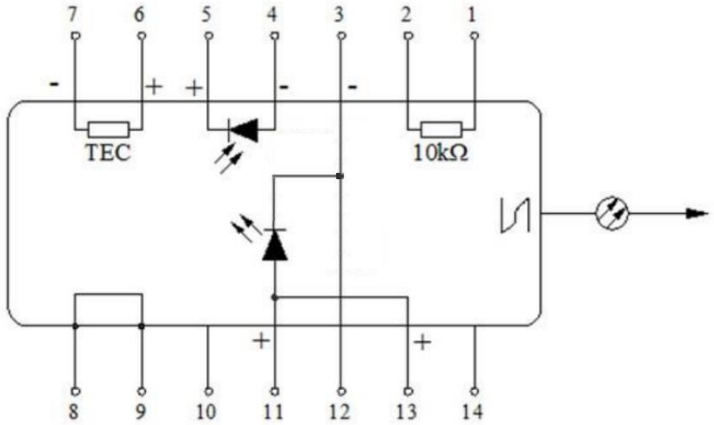
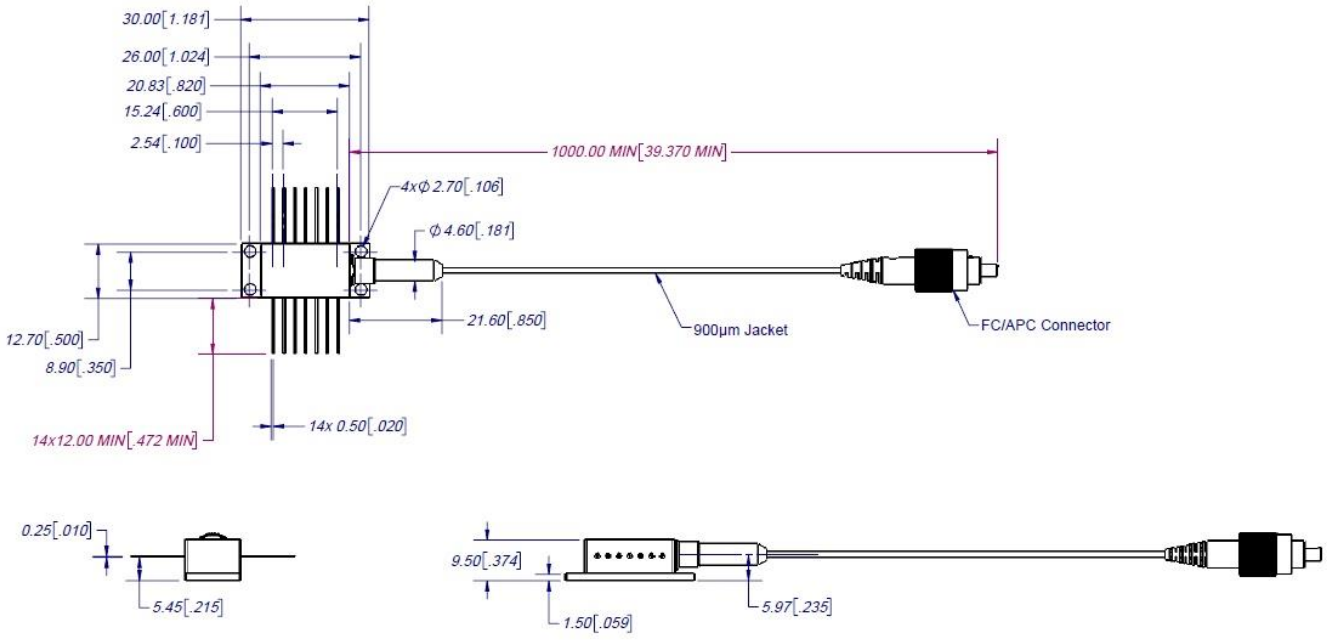
F. PIN OUT



1	Thermistor
2	Thermistor
3	Laser Cathode (–)
4	Monitor PD Anode (-)
5	Monitor PD Cathode (+)
6	Thermoelectric Cooler (+)
7	Thermoelectric Cooler (–)
8	Case Ground
9	Case Ground
10	NC
11	Laser Anode (+)
12	Laser Cathode (–)
13	Laser Anode (+)
14	NC

G. MECHANICAL DIAGRAM



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Part	Description
Package type	14-pin Butterfly
Fiber:	SMF28e
Core Diameter	8.2µm
Cladding Diameter	125µm
Coating Diameter	245µm
Jacket	900µm loose tube
Fiber pigtail length	1m
Fiber bending radius	>40mm
Connector	Standard: FC/APC
Dimensions	See figure

H. MOUNTING RECOMMENDATIONS:

The DFB can be mounted on a flat cooling surface without having to risk forming the pins. Mounting surface should be flat, with no physical obstructions underneath to cause any discontinuity in the surface flatness. If a heatsink is used, the base of the butterfly package will rest on the surface of a heatsink in order to cool the internal TEC.

Maximum torque to avoid damage to the device is 13 lb.in. /1.5 Nm. Minimum torque is 9 lb.in/1.1 nm. Do not use self-tapping screws. This light source should be mounted so that mechanical vibrations cannot cause short circuits between leads. AZIMUTH 7 pin, 0.100" pitch Sockets are recommended. The 14 pins will rest on a pair of spring-loaded sockets and be squeezed between the contacts and a plastic clamp.

I. SAFETY

All statements regarding safety of operation and technical data will only apply when the unit is operated correctly.

This DFB is a Class 1M laser product. It is safe for all conditions of use except when passed through magnifying optics such as microscopes and telescopes. It produces a beam that is divergent. If light is re-focused use protective eye wear.

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