

## PRODUCT DATASHEET

**1653.7nm, Cooled TO-Can, Collimated Output**

**DL-DFB65404T-C-S**

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## A. PRODUCT DESCRIPTION

The DL-DFB65404T-C-S is an InGaAsP based and cooled distributed feedback laser in a TO-60 package, with a collimated output, optimized for methane sensing applications. Denselight's advanced technology enables mode-hop free tunability, high power, excellent SMSR, and high accuracy of the lasing wavelength.

## B. FEATURES

- Optical output power min. 3.5mW
- Lasing wavelength of 1653.7nm with accuracy of  $\pm 1$ nm
- Typical SMSR of 40dB

## C. APPLICATIONS

- Test & Measurement (OTDR)
- Methane Sensing
- Biomedical Sensing

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## D. ABSOLUTE MAXIMUM RATINGS

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

Parameter	Symbol	Test Conditions	Min	Max	Unit
Reverse voltage	$V_R$	–	–	2	V
Forward Current	$I_F$	–	–	120	mA
Forward Voltage	$V_F$	–	–	2	V
Chip Temperature	$T_{chip}$	–	0	70	°C
Storage temperature	$T_{stg}$	Unbiased	-40	85	°C
Electro static discharge (ESD)	$V_{ESD}$	Human body model	–	500	V
Lead Soldering Temperature	$S_{Temp}$	–	–	220	°C
Lead Soldering Time	$S_{Time}$	–	–	10	s
TEC Current	$I_{TEC}$	–	–	1.1	A
TEC Voltage	$V_{TEC}$	–	–	1.25	V

## E. ELECTRICAL AND OPTICAL CHARACTERISTICS

The performance is evaluated at  $T_{chip}$  of 25°C and CW, unless stated otherwise

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Peak wavelength	$\lambda_p$	$I_{op} = 45mA$	1652.7	1653.7	1654.7	nm
Optical output power	$P_O$	$I_{op} = 45mA$	3.5	8	13	mW
Threshold current	$I_{th}$	–	–	12	–	mA
Operating current	$I_{op}$	–	–	45	–	mA
Operating Voltage	$V_{op}$	$I_{op} = 45mA$	–	1.2	1.6	V
Side mode suppression ratio	SMSR	$I_{op} = 45mA$	–	40	–	dB
Wavelength Temperature Tuning Coefficient	$\Delta\lambda/\Delta T$	–	0.07	0.1	0.14	nm/°C
Wavelength Current Tuning Coefficient	$\Delta\lambda/\Delta I$	–	0.008	0.01	0.03	nm/mA
Spot Size	SS	Optical path = 80mm	–	3	5	mm
Optical Linewidth	$\Delta f$	$I_{op} = 45mA$	–	–	2	MHz
Thermistor Resistance	$R_{th}$	25°C	9.5	10	10.5	kΩ
B constant of $R_{th}$	B	–	–	3930	–	K
Case Temperature	$T_{case}$	$I_{op} = 45mA$	-30	–	60	°C

**Note:**  $T_{chip}$  is monitored by internal thermistor with external pin out

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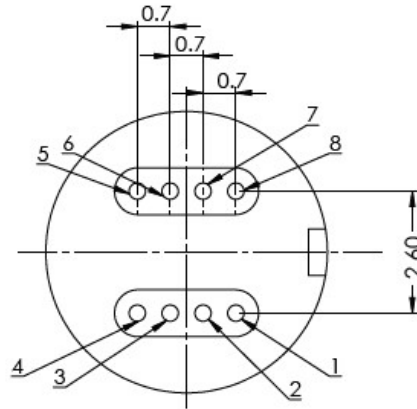
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## F. PACKAGE

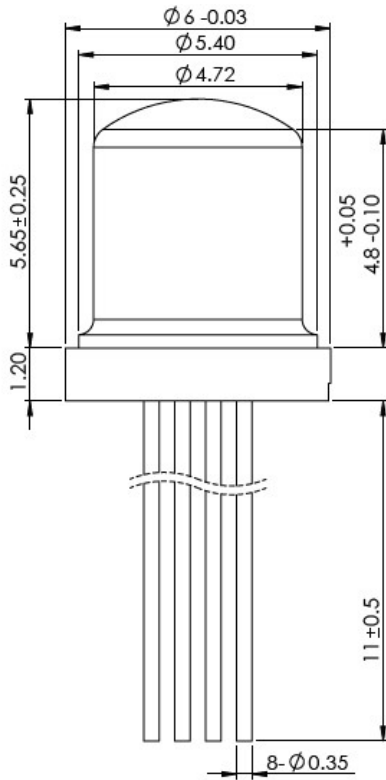
### Pin out

Pin Assignment	
1	TEC-
2	Thermistor+
3	LD+
4	NC
5	NC
6	LD-
7	Thermistor-
8	TEC+

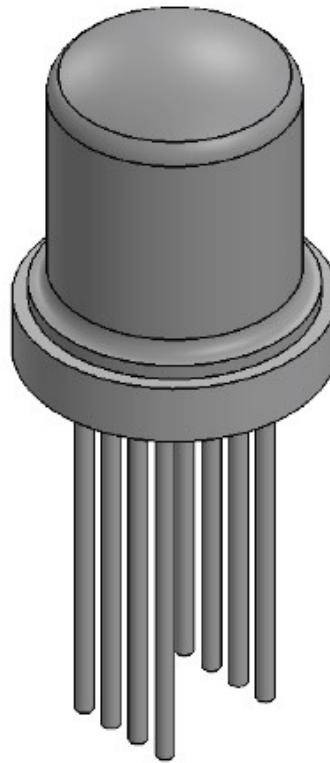
### Bottom View



### Side View



### Perspective View

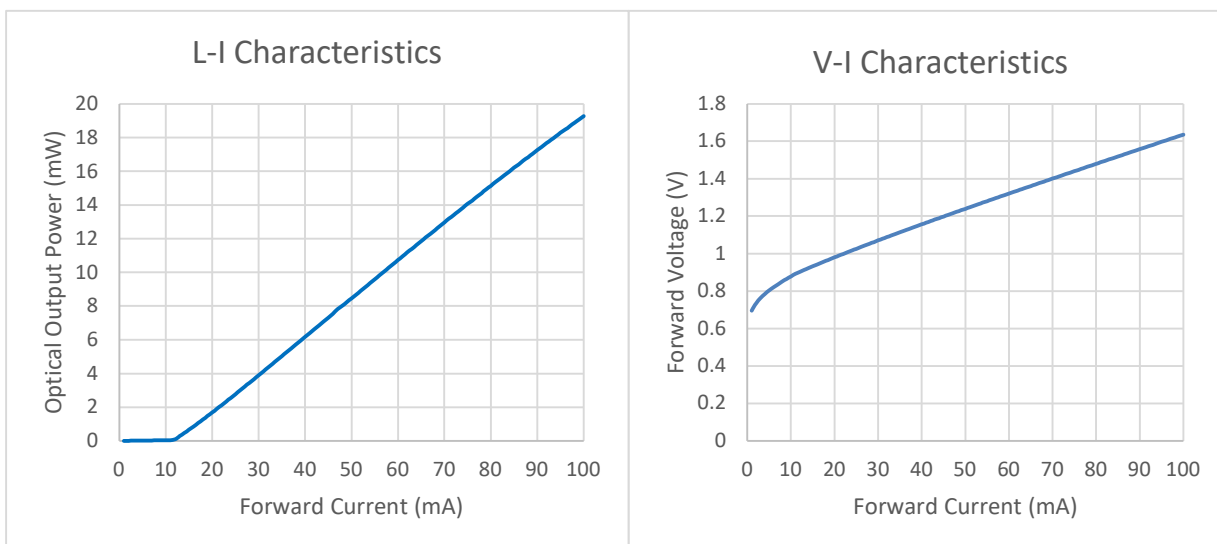


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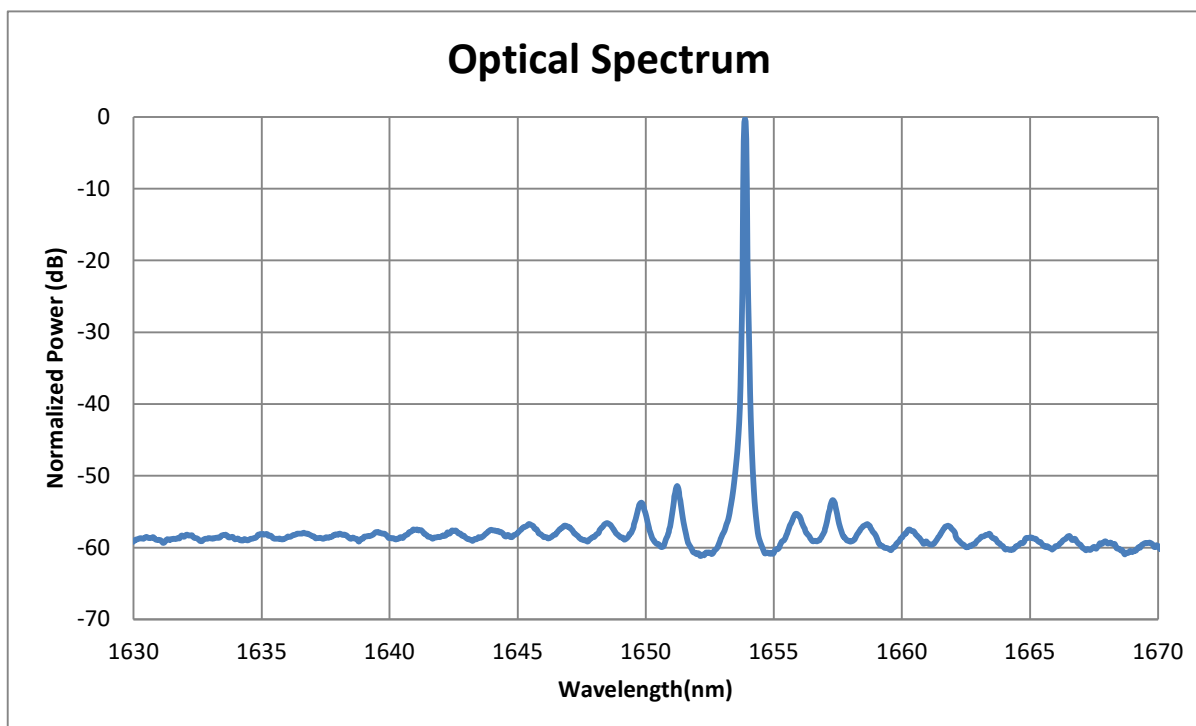
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## G. TYPICAL PERFORMANCE CHARACTERISTICS

The L-I and V-I characteristics are evaluated at  $T_{\text{chip}}=25^{\circ}\text{C}$  and CW



The Optical Spectrum is evaluated at  $T_{\text{chip}}=25^{\circ}\text{C}$ ,  $I_{\text{op}}=45\text{mA}$  and CW



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## **H. PRODUCT NAMING**

### **DL-DFB65404T-C-S**

DL: Denselight

DFB: Distributed Feedback Laser

654: Typical Peak Wavelength 1653.7nm

04: Minimum Power 3.5mW

T: TO-CAN

C: Collimated

S: Pin Configuration type S

## **I. DISCLAIMER FOR CUSTOMER SPECIFIC APPLICATIONS**

Denselight product is not intended for use other than stated on the application note or as defined in the product specification. The performance of the product should always be tested in the actual application conditions. As our products are used in conditions beyond our control, we cannot assume any liability for damage caused through their use. Users of DenseLight products are solely responsible to thoroughly test and qualify their system and / or application for their intended application and have determined such at their sole discretion. DenseLight cannot assume any liability for the use of our products in conjunctions with other. Customer assumes the sole risk and liability of the product performance other than specified by the product specific data sheet or application notes without DenseLight's specific written consent.

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