SPECTROSCOPIC DFB-LASERS: SPECDILAS®-D

INTRODUCTION

HHI has been involved in the development of semiconductor DFB lasers from its early start in the 80's. Based on this experience, custom design of multi quantum well ridge waveguide laser structures is available for applications in production control, environmental research and surface analysis.

Features:

- Excellent single wavelength optical sources for gas analysis or similar applications
- Laser diode with multi quantum well structure
- Proven reliability (ageing tests available)
- Mounted on compact SOT hermetically sealable headers or fibre-pigtailed modules
  (RoHS compliance!)

General Notes:

- Specifications valid in the wavelength range 1250 – 1700 nm
- Lasers can be tuned exactly to the customer specified wavelength by temperature tuning within the range from +15°C to +35°C
- Specifications for emission wavelengths > 1700 nm available on request

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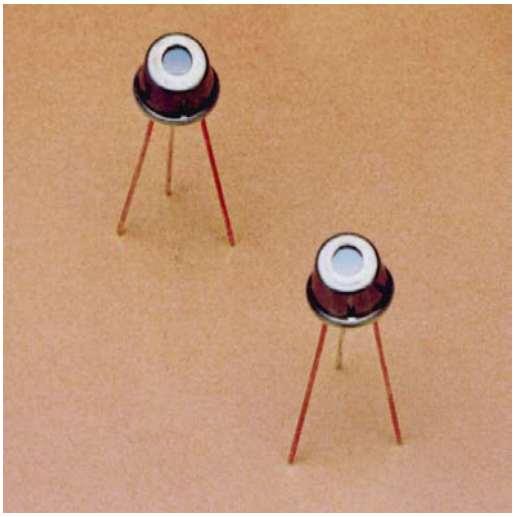
DFB Lasers in SOT5.6 / SOT9 headers

- Compact design
- Hermetically sealed cap with AR coated window
- RoHS compliance

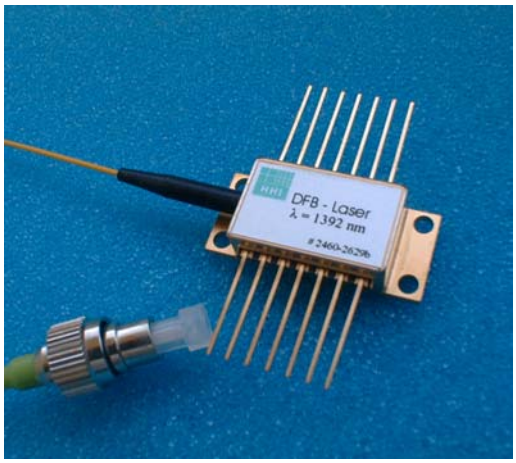


DFB Lasers in TO8 MTE modules

- Compact design
- Integrated TEC cooler
- Hermetically sealed cap with AR coated window
- RoHS compliance

DFB Lasers in BTF modules

- Fibre pigtailed module with standard 9 µm SMF and FC/APC connector
- Integrated TEC cooler
- RoHS compliance



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DFB Lasers in SOT5.6 / SOT9 headers

Specifications

Standard
SPECDILAS-D-XXXX

	min.	typ.	max.	unit	
Temperature	15	25	35	°C	@ λ_0 nm
Bias current		50	100	mA	@ λ_0 nm
Optical output power	1	2		mW	@ λ_0 nm
SMSR	< -40	-30	-25	dB	@ λ_0 nm
Threshold current		25	45	mA	
dλ/dT		100		pm/K	
dλ/dI	6	10	20	pm/mA	
Far-field FWHM		lat. 27/ vert. 55	lat. 30/ vert. 60	mA	

Laser class 3R

>= 6 mW,
SPECDILAS-D-XXXX-PREMIUM

	min.	typ.	max.	unit	
Temperature	15	25	35	°C	@ λ_0 nm
Bias current		100	150	mA	@ λ_0 nm
Optical output power	6	8		mW	@ λ_0 nm
SMSR	< -40	-30	-25	dB	@ λ_0 nm
Threshold current		25	45	mA	
dλ/dT		100		pm/K	
dλ/dI	6	10	20	pm/mA	
Far-field FWHM		lat. 27/ vert. 55	lat. 30/ vert. 60	mA	

Laser class 3R

>= 11 mW,
SPECDILAS-D-XXXX-PREMIUMPLUS

	min.	typ.	max.	unit	
Temperature	15	25	35	°C	@ λ_0 nm
Bias current		150	200	mA	@ λ_0 nm
Optical output power	11	13		mW	@ λ_0 nm
SMSR	< -40	-30	-25	dB	@ λ_0 nm
Threshold current		25	45	mA	
dλ/dT		100		pm/K	
dλ/dI	6	10	20	pm/mA	
Far-field FWHM		lat. 27/ vert. 55	lat. 30/ vert. 60	mA	

Laser class 3R

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DFB Lasers in TO8 MTE modules

Specifications

Standard
SPECDILAS-D-XXXX-MTE

	min.	typ.	max.	unit	
Temperature	15	25	35	°C	@ λ_0 nm
Bias current		50	100	mA	@ λ_0 nm
Optical output power	1	2		mW	@ λ_0 nm
SMSR	< -40	-30	-25	dB	@ λ_0 nm
Threshold current		25	45	mA	
dλ/dT		100		pm/K	
dλ/dI	6	10	20	pm/mA	
Far-field FWHM		lat. 27/ vert. 55	lat. 30/ vert. 60	mA	

Laser class 3R

>= 6 mW,
SPECDILAS-D-XXXX-MTE-PREMIUM

	min.	typ.	max.	unit	
Temperature	15	25	35	°C	@ λ_0 nm
Bias current		100	150	mA	@ λ_0 nm
Optical output power	6	8		mW	@ λ_0 nm
SMSR	< -40	-30	-25	dB	@ λ_0 nm
Threshold current		25	45	mA	
dλ/dT		100		pm/K	
dλ/dI	6	10	20	pm/mA	
Far-field FWHM		lat. 27/ vert. 55	lat. 30/ vert. 60	mA	

Laser class 3R

>= 11 mW,
SPECDILAS-D-XXXX-MTE-PREMIUMPLUS

	min.	typ.	max.	unit	
Temperature	15	25	35	°C	@ λ_0 nm
Bias current		150	200	mA	@ λ_0 nm
Optical output power	11	13		mW	@ λ_0 nm
SMSR	< -40	-30	-25	dB	@ λ_0 nm
Threshold current		25	45	mA	
dλ/dT		100		pm/K	
dλ/dI	6	10	20	pm/mA	
Far-field FWHM		lat. 27/ vert. 55	lat. 30/ vert. 60	mA	

Laser class 3R

Thermistor Type:

10 kOhm at 25°C Alpha: -4.39%, Beta: 3892 (0/50°C)
Max. TEC current: I_{TECmax} = 1.8 A

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DFB Lasers in BTF modules

Specifications

Butterfly
SPECDILAS-D-XXXX-MTE-BTF

	min.	typ.	max.	unit	
Temperature	15	25	35	°C	@ λ_0 nm
Bias current		100	150	mA	@ λ_0 nm
Fibre output power	3	5		mW	@ λ_0 nm
SMSR	< -40	-30	-25	dB	@ λ_0 nm
Threshold current		25	45	mA	
$d\lambda/dT$		100		pm/K	
$d\lambda/dI$	6	10	20	pm/mA	
Monitoring current	0.1			mA	@ 150 mA

Laser class 3R

> 6 mW, Butterfly
SPECDILAS-D-XXXX-MTE-BTF-PREMIUM

	min.	typ.	max.	unit	
Temperature	15	25	35	°C	@ λ_0 nm
Bias current		150	200	mA	@ λ_0 nm
Fibre output power	7	10		mW	@ λ_0 nm
SMSR	< -40	-30	-25	dB	@ λ_0 nm
Threshold current		25	45	mA	
$d\lambda/dT$		100		pm/K	
$d\lambda/dI$	6	10	20	pm/mA	
Monitoring current	0.1			mA	@ 150 mA

Laser class 3R

Thermistor Type:

10 kΩ thermistor (C1, C2, C3: 1.109, 2.386, 0.725)
Max. Peltier current: $I_{Peltier\ max}$ = 1 A

Connector / Fibre:

Standard: 1 m Single Mode Fibre with FC/APC Connector

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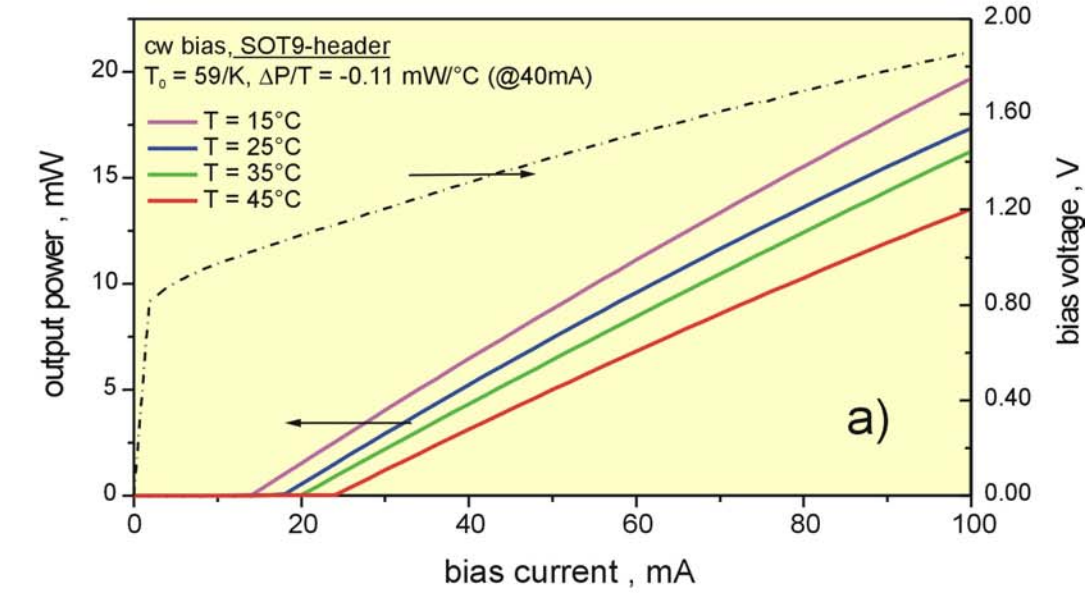
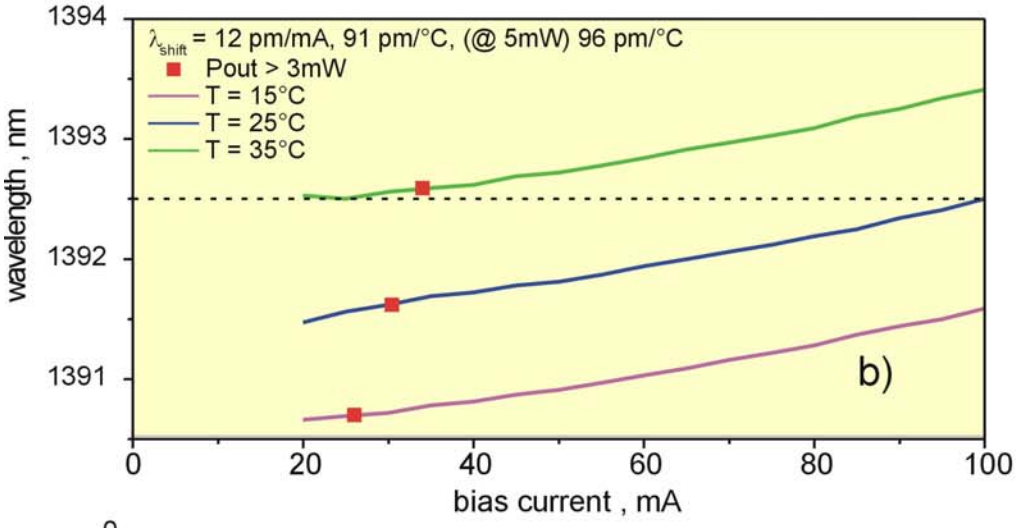
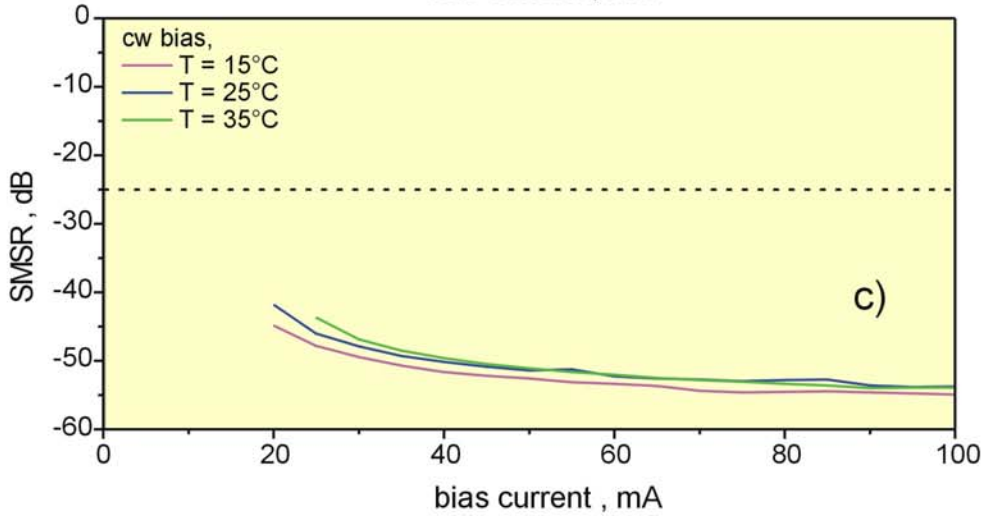
Typical Data (SOT5.6 / SOT9 header / TO8 Module)







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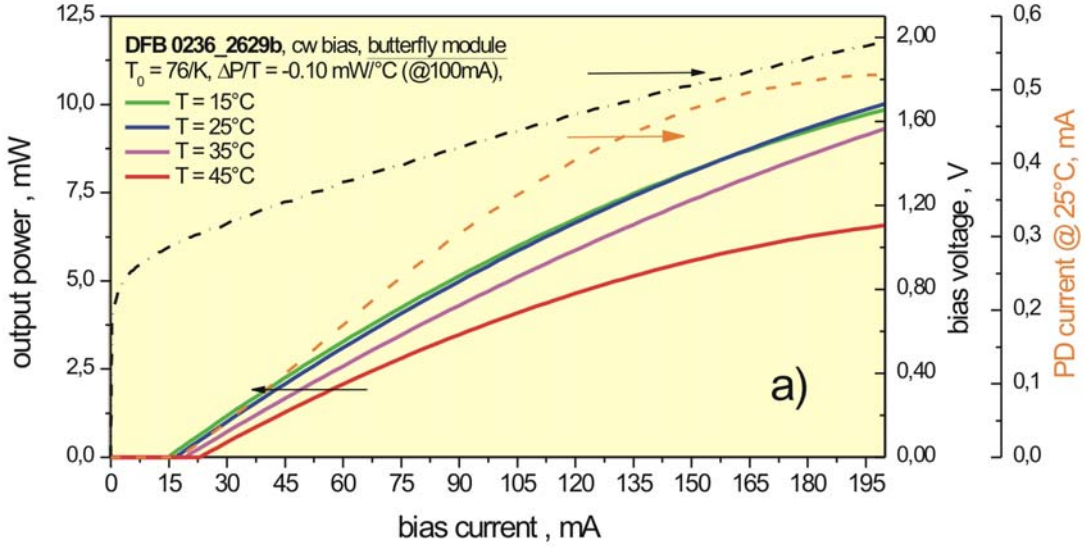
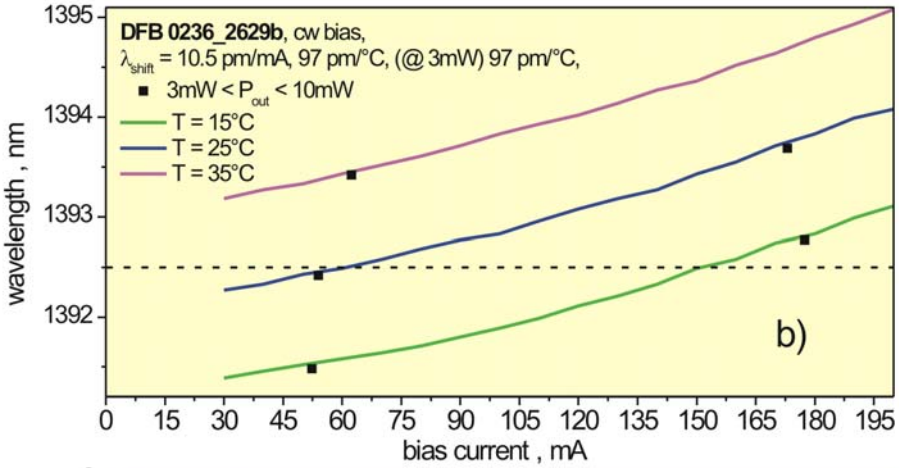
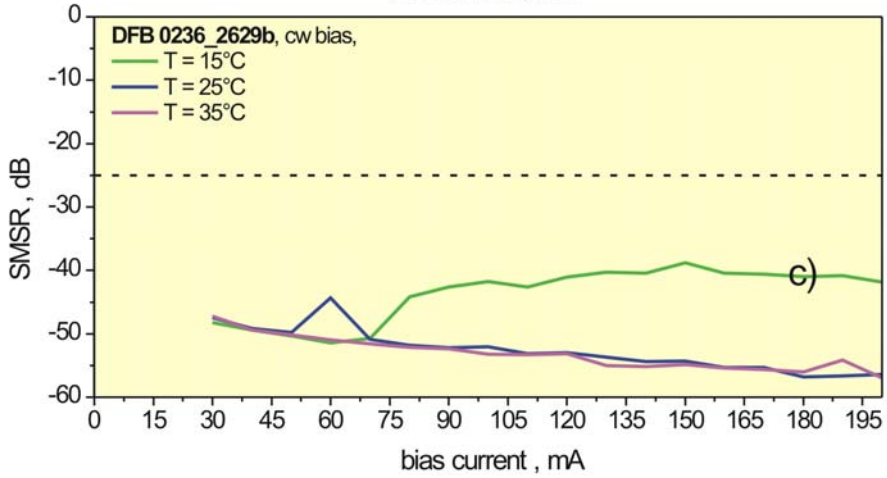
Typical Data BTF Module







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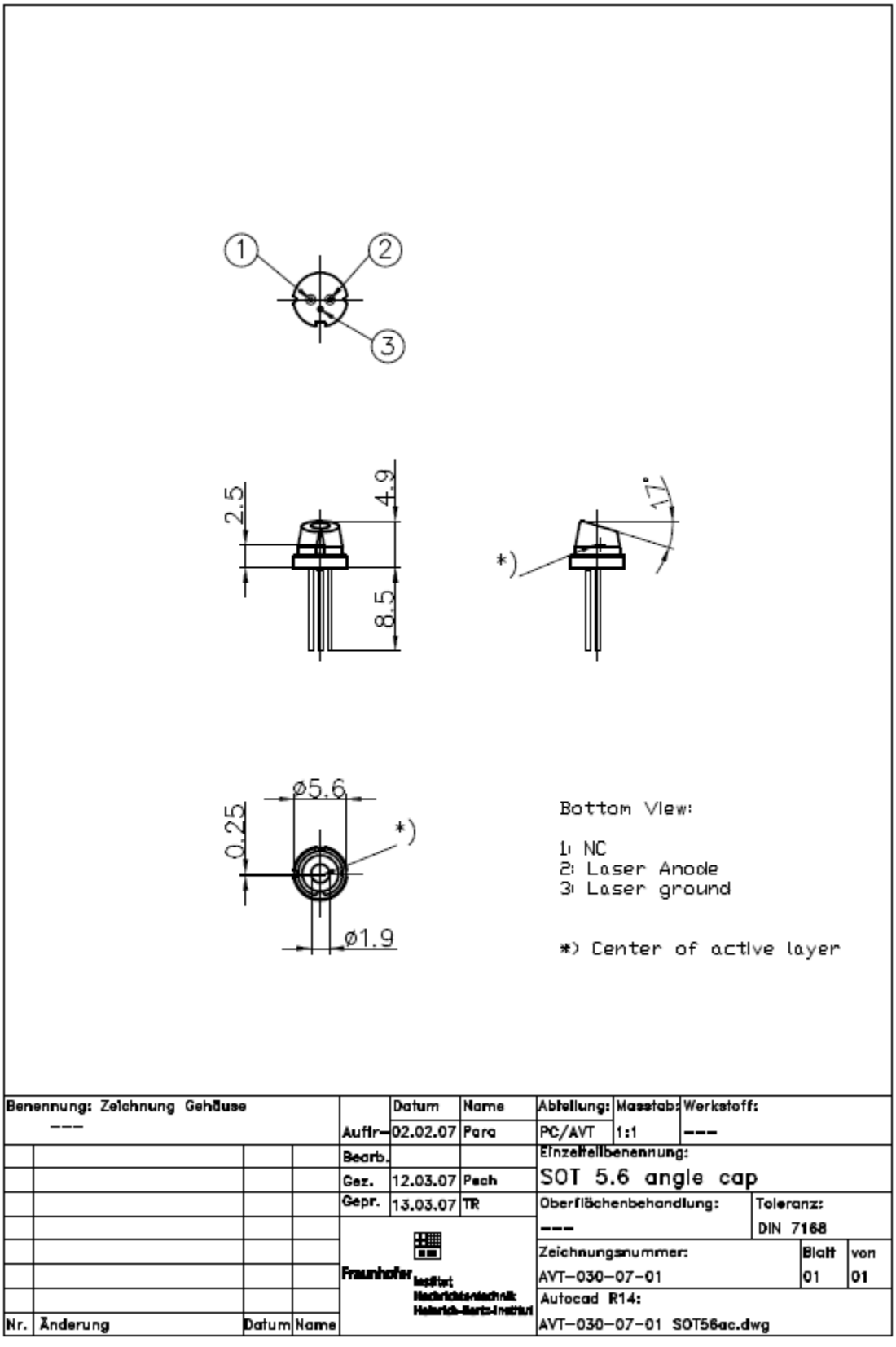
Drawing SOT5.6 header (Standard Version)



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				Gez.	12.03.07	Pech	SOT 5.6 angle cap
				Gepr.	13.03.07	TR	Oberflächenbehandlung: --- / Toleranz: DIN 7168
				Fraunhofer Institut Nachrichtentechnik Heinrich-Hertz-Institut			Zeichnungsnummer: AVT-030-07-01 / Blatt 01 / von 01
Nr.	Änderung	Datum	Name				Autocad R14: AVT-030-07-01 SOT56ac.dwg

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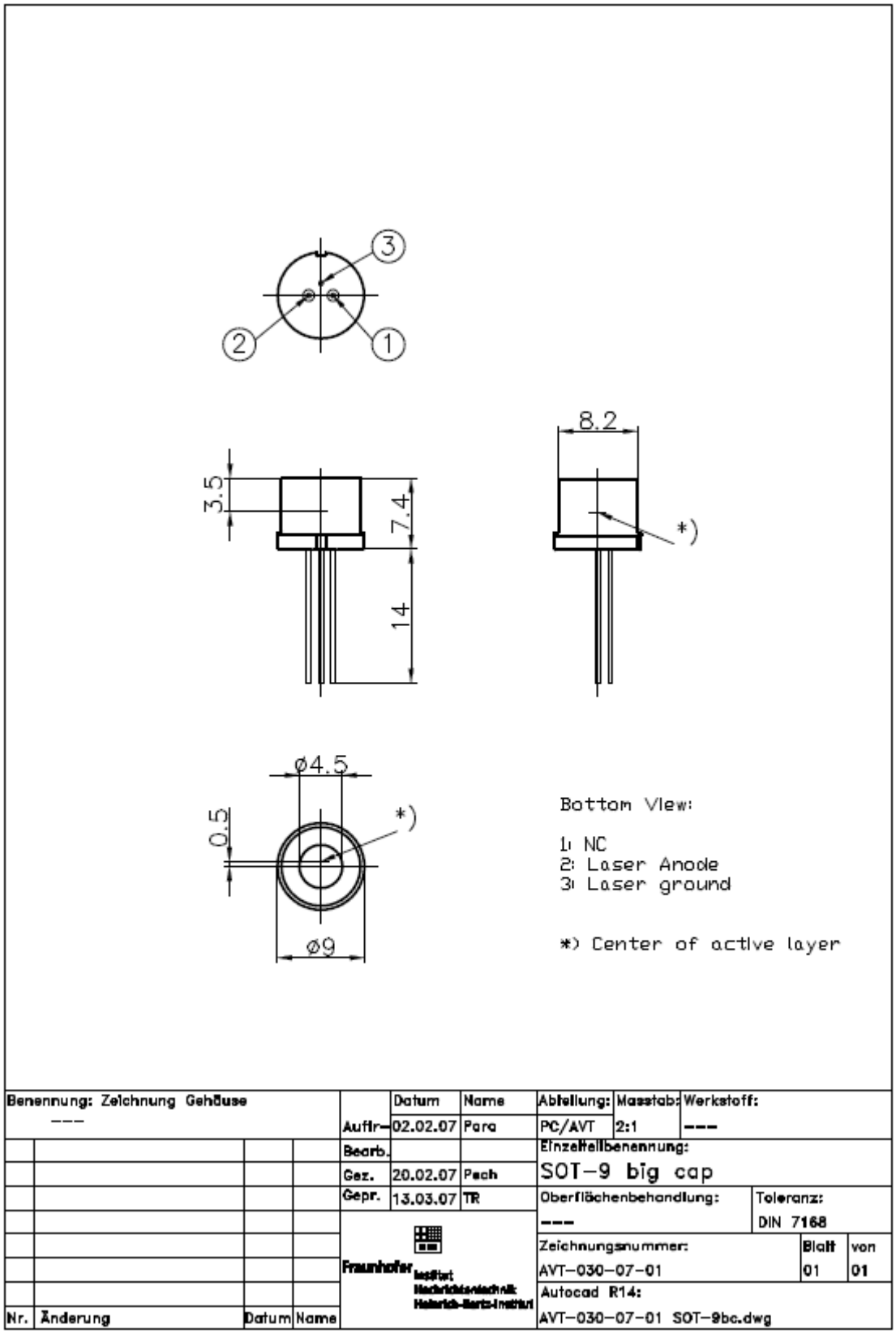
Drawing SOT9 header (big cap) (Special Version)



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				Gez.	20.02.07	Pech	SOT-9 big cap		
				Gepr.	13.03.07	TR	Oberflächenbehandlung:		Toleranz:
							---		DIN 7168
				Fraunhofer Institut Nachrichtentechnik Heinrich-Hertz-Institut			Zeichnungsnummer:	Blatt	von
							AVT-030-07-01	01	01
							Autocad R14:		
Nr.	Änderung	Datum	Name				AVT-030-07-01 SOT-9bc.dwg		

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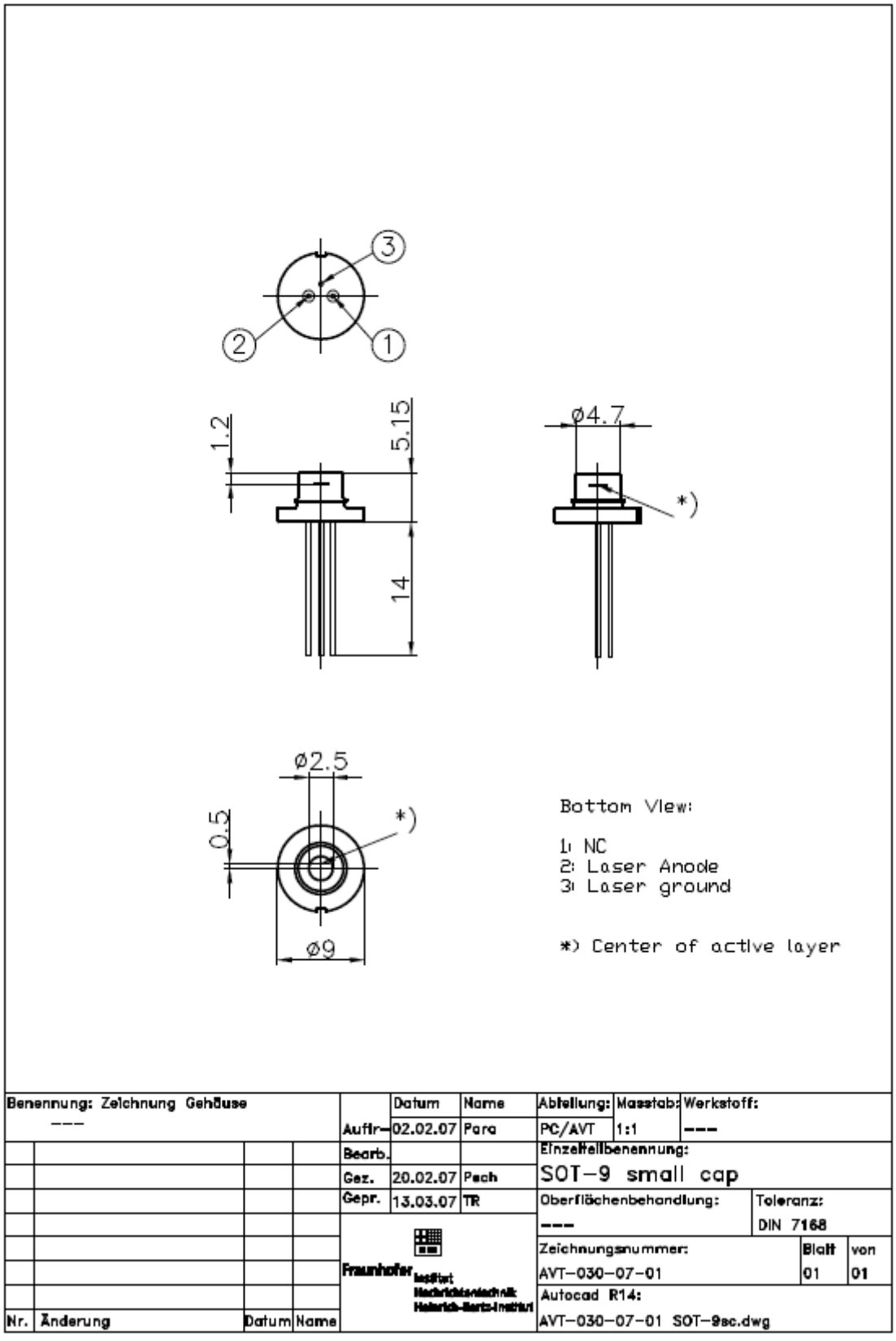
Drawing SOT9 header (small cap) (Special Version)



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				Gepr.	13.03.07	TR	Oberflächenbehandlung:		Toleranz:
							---		DIN 7168
				Fraunhofer Institut Nachrichtentechnik Heinrich-Hertz-Institut			Zeichnungsnummer:	Blatt	von
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Nr.	Änderung	Datum	Name				AVT-030-07-01 SOT-9sc.dwg		

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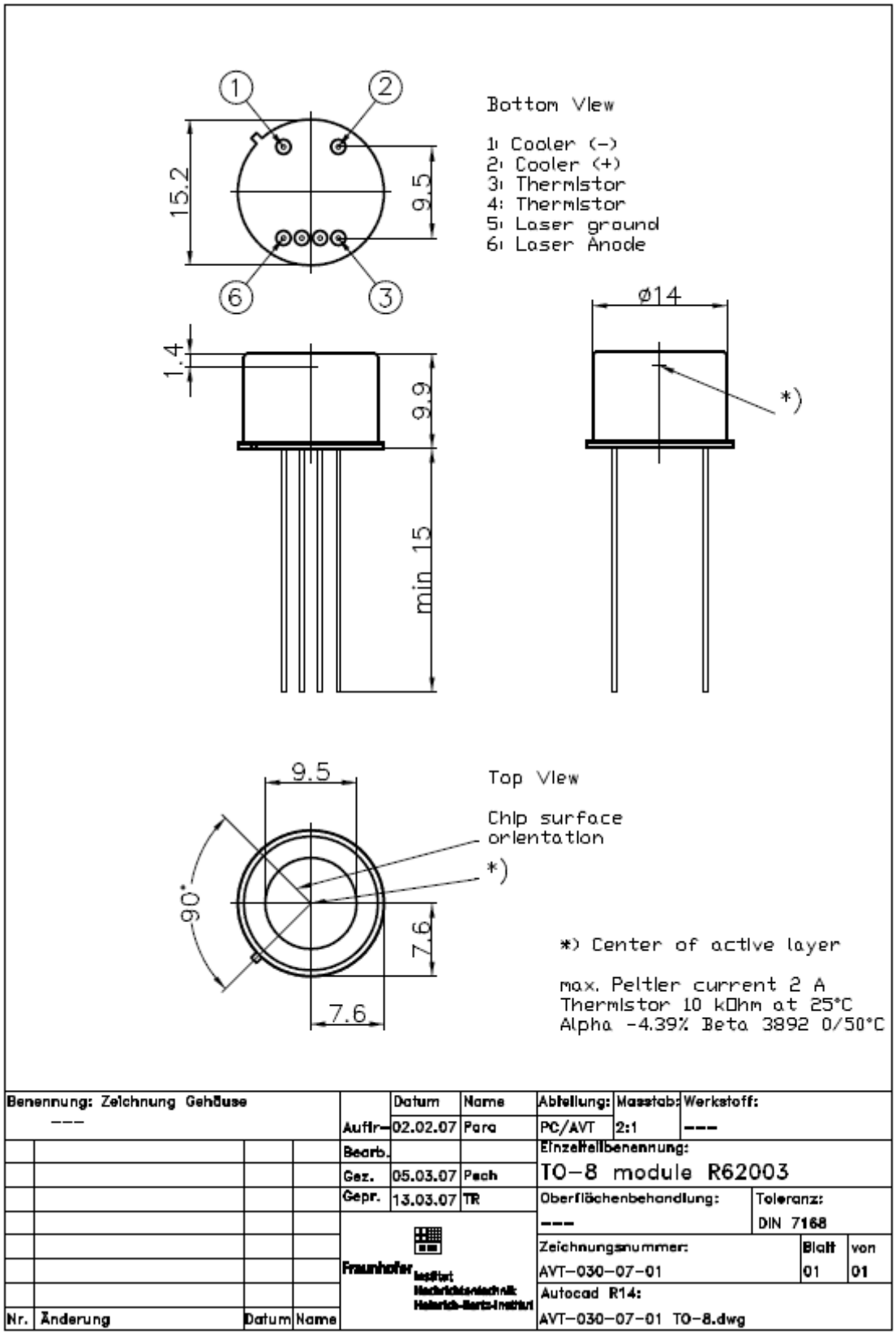
Drawing TO8 module



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							---	DIN 7168	
				Fraunhofer Institut Nachrichtentechnik Heinrich-Hertz-Institut			Zeichnungsnummer:	Blatt	von
							AVT-030-07-01	01	01
							Autocad R14:		
Nr.	Änderung	Datum	Name				AVT-030-07-01 TO-8.dwg		

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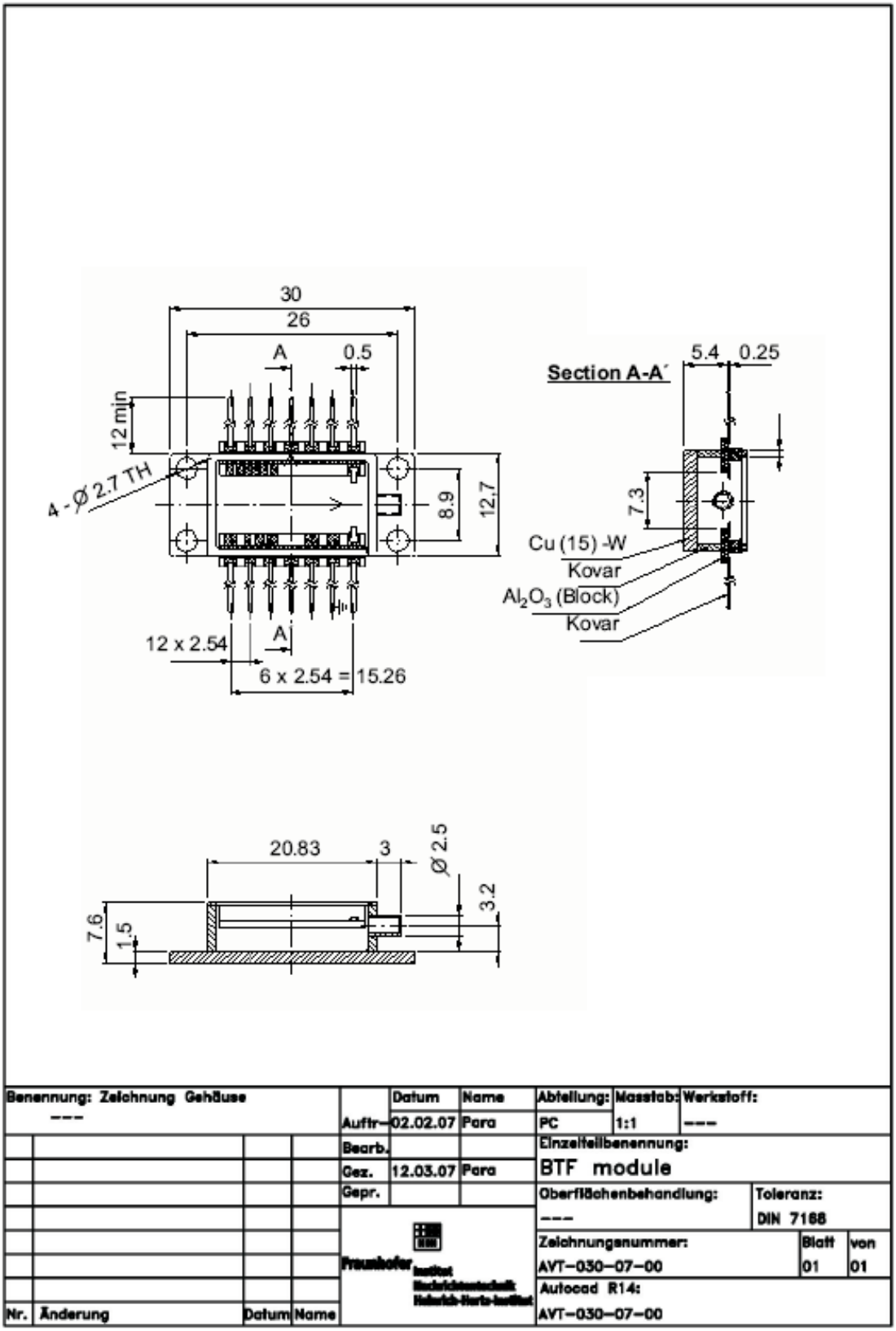
Drawing BTF module



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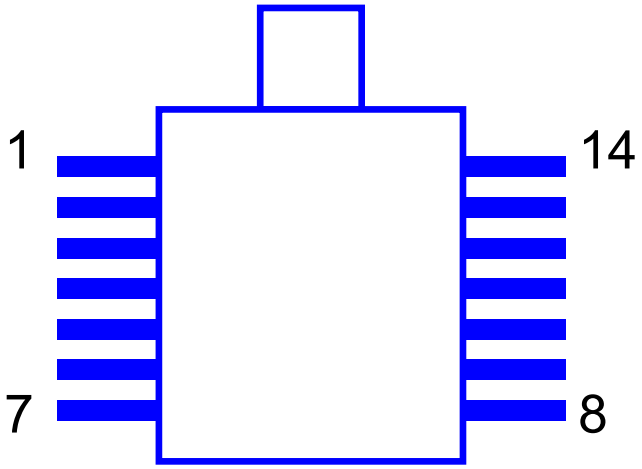
Pin Connection Scheme BTF Module



Temperature control via 10 kΩ thermistor

(C1, C2, C3: 1.109, 2.386, 0.725)

Max. Peltier current: $I_{Peltier\ max}$ = 1 A

1	**TEC +**	**14**	**TEC -**
2	**Thermistor**	**13**	**Case**
3	**PD (A)**	**12**	**NC**
4	**PD (C)**	**11**	**LD (C)**
5	**Thermistor**	**10**	**LD (A)**
6	**NC**	**9**	**NC**
7	**NC**	**8**	**NC**

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1. **SOT headers**

   Example:

   S P E C D I L A S – D – 1 3 9 3 – P R E M I U M

   This means a DFB laser with guaranteed single mode emission > 6 mW at 1393.0 nm in SOT.5.6 angle can. The 1393.0 nm must be matched somewhere in between + 15°C and + 35°C.

   Options:
   - no suffix: > 3 mW guaranteed
   - PREMIUM PLUS: > 10 mW guaranteed
   - additional suffix (ME): indicates mechanical or electrical changes against standard like SOT9 can or special selection criteria.

2. **TO-8 peltier module**

   Example:

   S P E C D I L A S – D – 1 3 9 3 – M T E – P R E M I U M

   Similar to item 1, but a laser in TO-8 package with 1 stage peltier cooler is described (MTE: miniature thermoelectric). Options are analogous to item 1.

3. **BTF module**

   Example:

   S P E C D I L A S – D – 1 3 9 3 – M T E – B T F – P R E M I U M

   Similar to item 1, but a laser coupled to single mode fibre in butterfly package is described. This laser is mounted on 1 stage cooler and a monitor diode is integrated. Options are mainly analogous to item 1, but a PREMIUM PLUS option does not exist as a standard.

Issue: 07/07 / V3 / HW / hhi/ spectroscopic-dfb-lasers.doc

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