

BLM-S-series Broadband Light Source Modules

Technical Product Specification



November 2008
Revision: 001

Contents

1. Product description	3
2. How to interpret model numbers	4
3. Mechanical specifications.....	4
4. Back panel connectors	4
5. Electrical power specifications.	4
6. Main optical parameters of standard models	4
6.1. BLM-S-680-G-I-5 – HIGH POWER VISIBLE	4
6.2. BLM-S-795-G-I-15 – HIGH POWER.....	4
6.3. BLM-S-820-B-I-10 – ULTRA BROADBAND	4
6.4. BLM-S-830-G-I-20 – HIGH POWER.....	4
6.5. BLM-S-840-G-I-30 – ULTRA HIGH POWER.....	4
6.6. BLM-S-840-B-I-20 – BROADBAND	4
6.7. BLM-S-850-G-I-20 – HIGH POWER.....	4
6.8. BLM-S-1050-B-I-20 – HIGH POWER	4
7. Parameters common to all models.....	4
8. Output emission modulation and output power stability examples	4
9. Remote control of a BLM unit via the Remote Control Port (RCP)	4
10. Acceptance tests.	4

1. Product description

BLM-S-series Broadband Light Source Modules are stable and reliable light sources based on Superlum's most high-power and broadband SLD modules. A "PILOT"-series current and temperature controller is used to drive an SLD module. A polarization insensitive optical isolator (OI) protects an SLD module from being damaged by optical feedback.

The unit must be powered from highly reliable +9V/2A DC regulated power supply with very low ripple and noise. The SLD module may be switched on and off by "ON/OFF" pushbutton on the front panel after electrical power is connected to the unit and turned on. It is also possible to switch the SLD on and off and read its status via the Remote Control Port (RCP) on the back panel. The ON/OFF pushbutton may also be blocked from RCP. There are three LEDs on the front panel for visual indication of the light source status (Light Output On/Off, Error and Service Required).

The SLD emission of all standard BLM-S-series light source modules can be modulated (on/off) with a rate of up to 50 KHz (50% duty) from an external source connected to the modulation input (SMA) on the back panel.

The specified output power for a particular light source is measured at the end of the FC/APC-FC/APC cable shipped with the light source.

Applications

- Optical Fiber Sensing
- Optical Coherence Tomography
- Optical Metrology
- Testing of Optical Components
- Biomedical Imaging
- Low Coherence Interferometry

Features

- Very high output power – up to 30 mW in selected models
- Very broad spectrum – up to 70 nm in selected models
- Single mode fiber output
- Built-in optical isolator
- Compact, tabletop size
- Simple installation in a 19" rack (a 19" rack mount kit is required)

2. How to interpret model numbers

The model number of a BLM-S-series light source is composed of the prefix (BLM-S) and four codes listed in Table 2.1.:

$$\text{BLM-S-(X)XXX-X-X-(X)X}$$

↑	↑	↑	↑
1	2	3	4

Table 2.1. Model Number Codes.

1	Center Wavelength	
		The center wavelength in nm with ± 10 nm tolerance
2	Spectrum Shape	
	G	the light source has a bell-shaped spectrum
	B	the light source spectrum is not bell-shaped
3	Built-in Optical Isolator	
	I	the light source has built-in optical isolator
4	Output Power	
		The output power in mW

For example, model number BLM-S-830-G-I-20 represents a light source with built-in optical isolator that has an output power of 20 mW and bell-shaped spectrum located around 830 nm with ± 10 nm tolerance.

3. Mechanical specifications

The metal case of a BLM light source is a Schroff P/N 30809-676 (www.schroff.co.uk). No active cooling is required if the ambient temperature is maintained within the specified operating temperature range. Output connector is FC/APC. Figure 3.1. shows the mounting dimensions for BLM-S-series light source modules.

Overall dimensions: 246 × 129 × 65 mm (9.69 × 5.06 × 2.55 inches).

Weight: 1.4 kg.

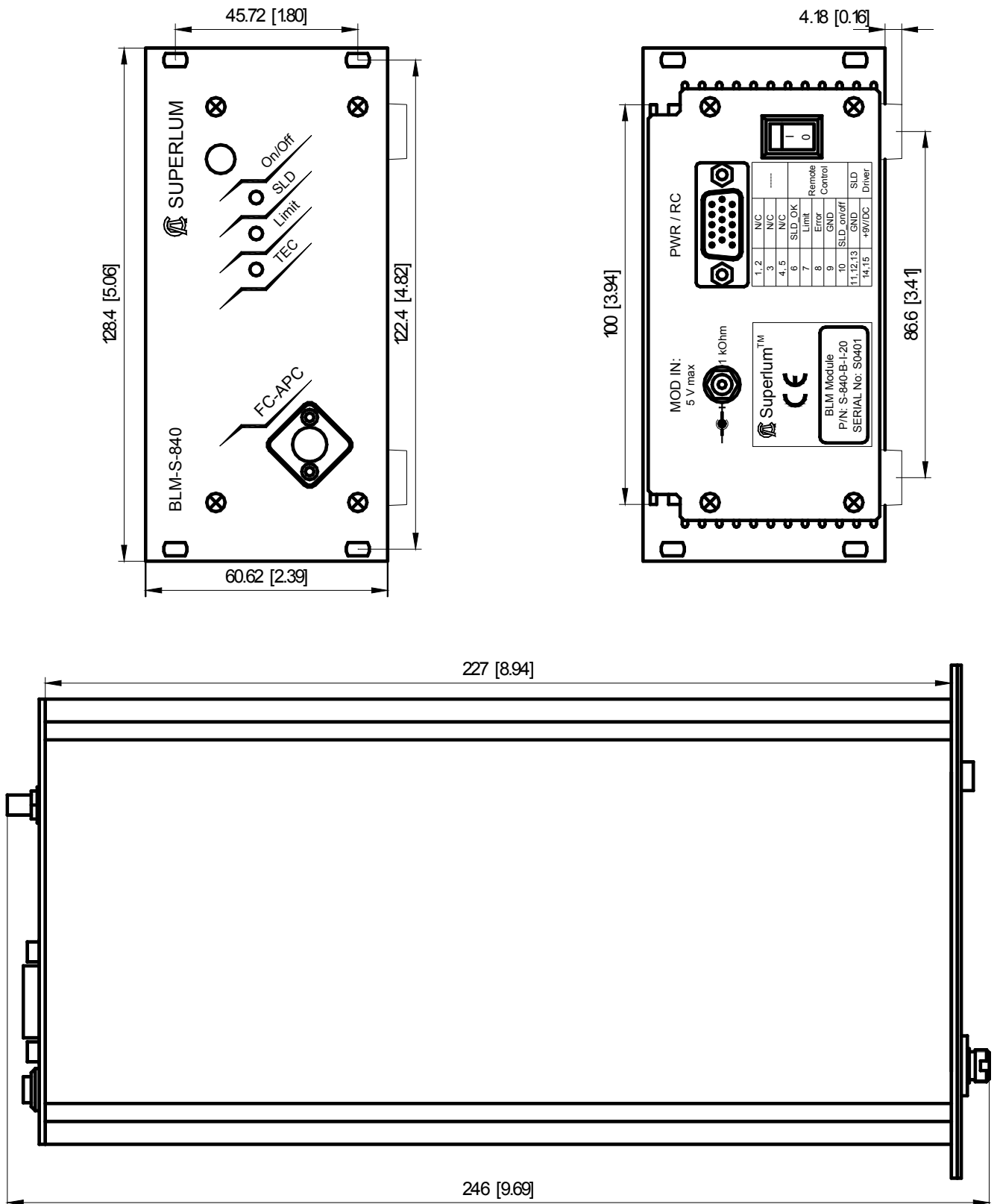


Figure 3.1. Mounting dimensions for BLM-S-series light source modules. Unbracketed dimensions are in millimeters. Dimensions in brackets are in inches.

4. Back panel connectors

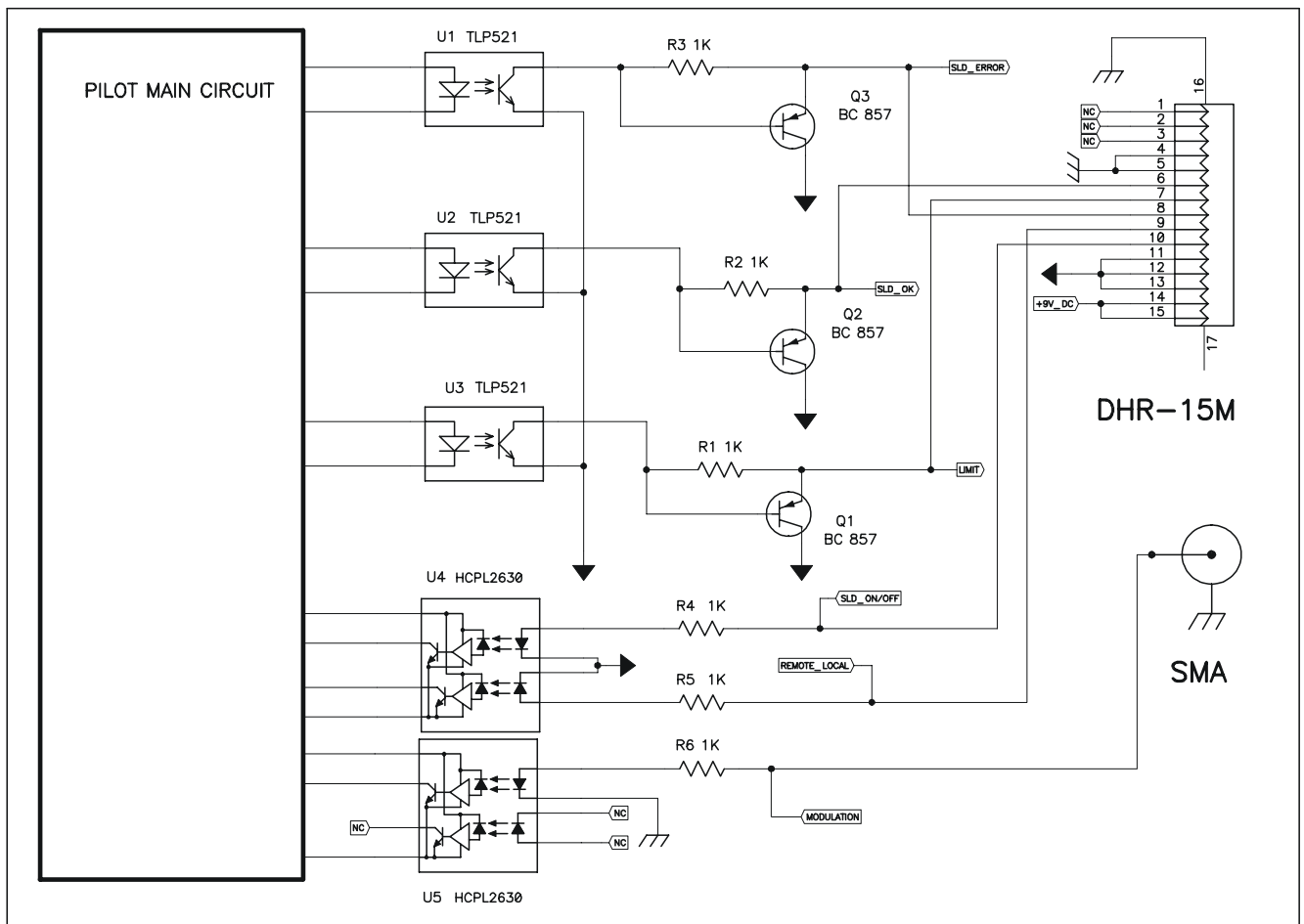
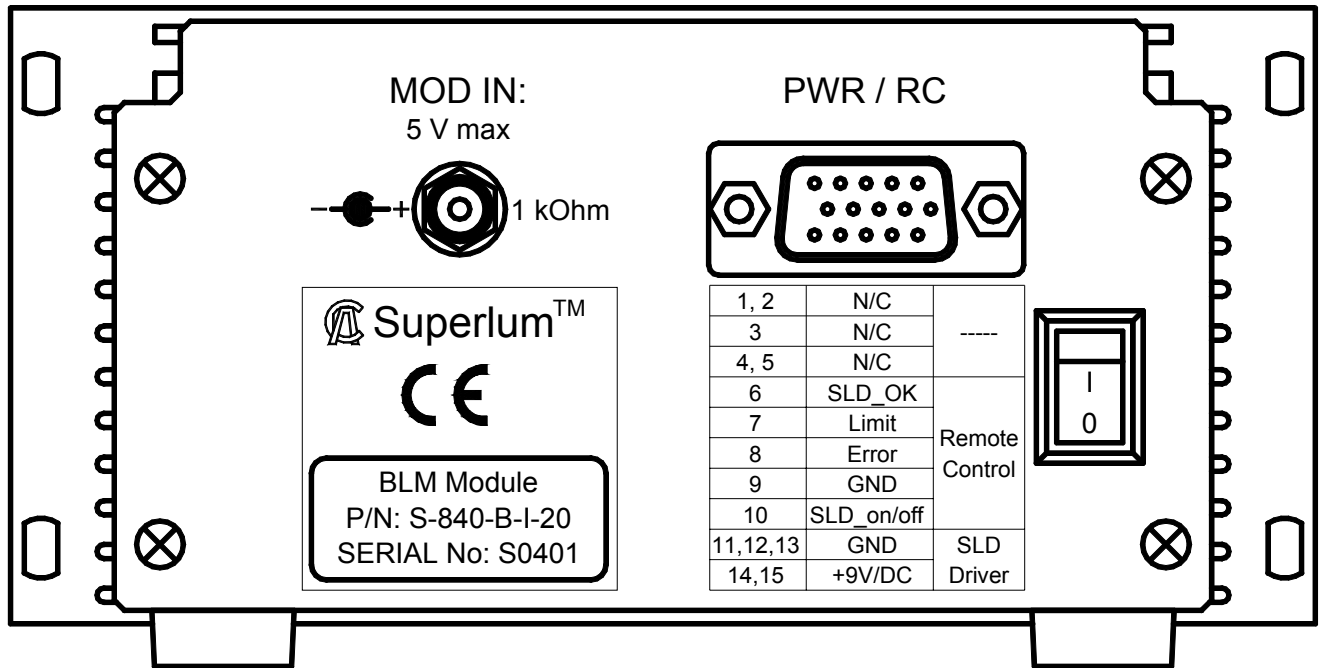


Figure 4.1. Back panel connectors and the related electric circuit for BLM-S-840-B-I-20.

Table 4.1. DHR-15M connector.

Pin	Output Name	Input Name	Description
1,2,3			Not Connected
4,5		Case GND	Ground – case
6	SLD_OK		9 V – SLD OFF 0 V – SLD ON
7	LIMIT		9 V – OK 0 V – Service Required*
8	ERROR		9 V – NO ERROR 0 V – System ERROR. No light.
9		R(EMOTE)/L(OCAL)	Allows disabling the "SLD ON/OFF" pushbutton on the front panel. 9 V must be applied for operation in "Local" mode. See descriptions below.
10		SLD ON/OFF	Allows switching the SLD on and off. Duration of 50 ms minimum. Note: soft start delay is 1.5 s.
11,12,13		GND (SLD Driver)	Ground (for the SLD driver). All pins should be connected to the external power supply ground
14,15		+9V, 2A (SLD Driver)	+9V DC, 2A (for the SLD driver). All pins should be connected to the positive terminal of an external power supply
Modulation input and voltage: SMA connector; maximum 5 V, load resistance 1 kOhm			

*The unit may still be operational, but a wear compensation mechanism has reached its limit of operation and the unit's output power and spectrum may differ considerably from those specified.

5. Electrical power specifications.

+9V DC ($\pm 10\%$), 2A, ripple and noise of 20 mV maximum. Please double check that ripple and noise are low if you are planning to use a switching-mode power supply.

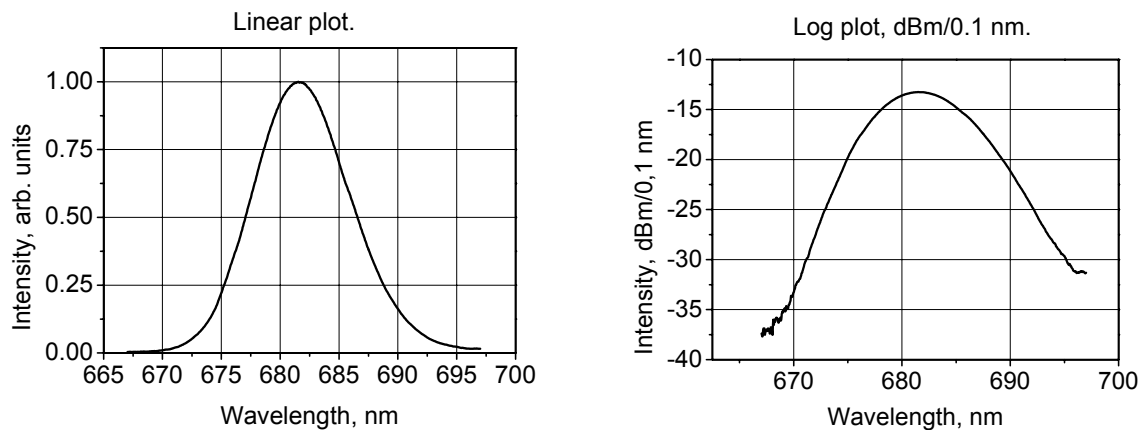
6. Main optical parameters of standard models

Below, main optical parameters of standard models of BLM-S-Series light source modules are presented.

6.1. BLM-S-680-G-I-5 – HIGH POWER VISIBLE

Table 6.1.

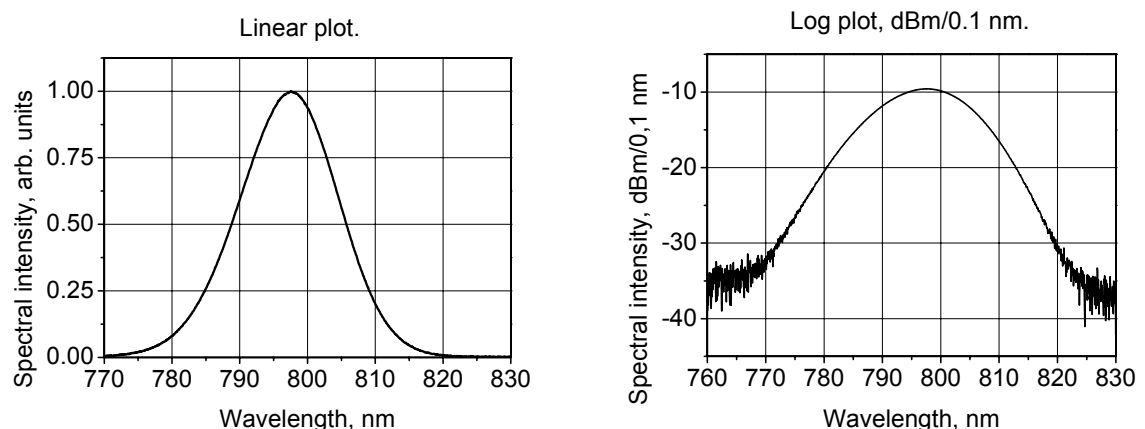
Parameter	Unit	Min	Typ	Max	Notes
Output power, Psm	mW	4	5	-	
Center wavelength, λ	nm	670	680	690	
Optical isolation at λ	dB	-25	-30	-	
Spectrum width	nm	6.5	7.5	-	
Spectral ripple (modulation depth)	%	-	2	5	Low ripple selection on request
Secondary coherence subpeak	dB	-	-20	-	10 log; small subpeak on request


Figure 6.1. Typical spectrum examples - BLM-S-680-G-I-5.

6.2. BLM-S-795-G-I-15 – HIGH POWER

Table 6.2.

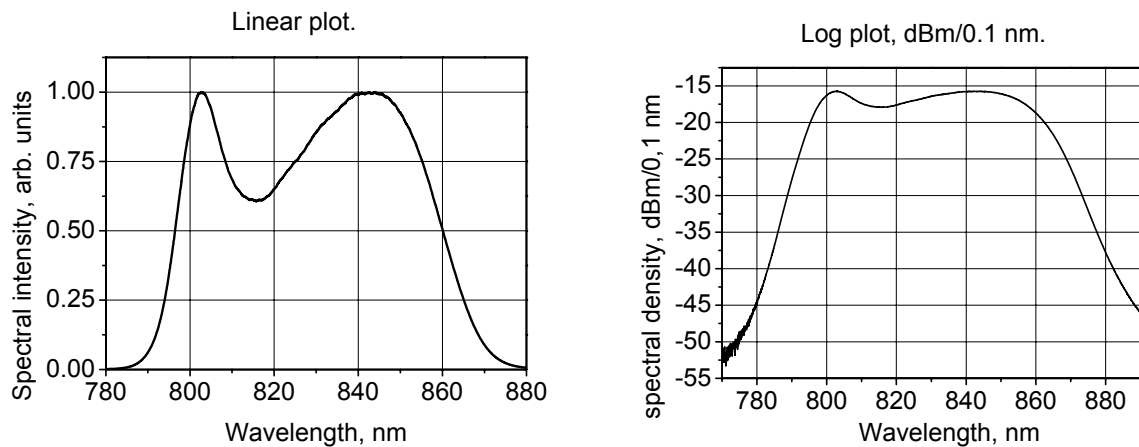
Parameter	Unit	Min	Typ	Max	Notes
Output power, Psm	mW	15	-	-	
Center wavelength, λ	nm	785	795	805	
Optical isolation at λ	dB	-25	-30	-	
Spectrum width	nm	13	16	-	
Spectral ripple (modulation depth)	%	-	1	5	Low ripple selection on request
Secondary coherence subpeak	dB	-	-20	-	10 log; small subpeak on request


Figure 6.2. Typical spectrum examples - BLM-S-795-G-I-15.

6.3. BLM-S-820-B-I-10 – ULTRA BROADBAND

Table 6.3.

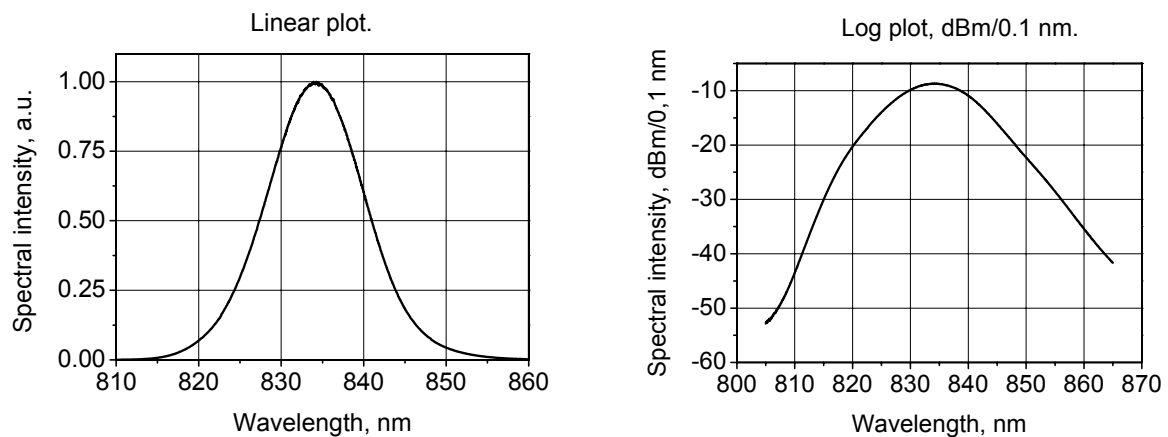
Parameter	Unit	Min	Typ	Max	Notes
Output power, Psm	mW	10	15	-	Higher power on request
Center wavelength, λ	nm	810	820	830	
Optical isolation at λ	dB	-25	-30	-	Maximum -10dB feedback
Spectrum width	nm	60	64	-	70 nm upon request
Spectral ripple (modulation depth)	%	-	1	5	Low ripple selection on request
Secondary coherence subpeak	dB	-	-20	-	10 log; small subpeak on request


Figure 6.3. Typical spectrum examples - BLM-S-820-B-I-10.

6.4. BLM-S-830-G-I-20 – HIGH POWER

Table 6.4.

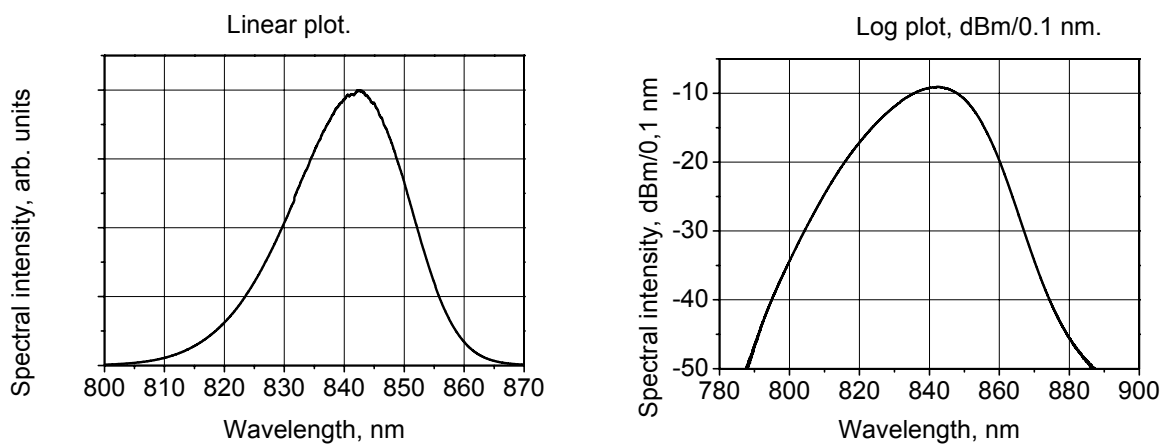
Parameter	Unit	Min	Typ	Max	Notes
Output power, Psm	mW	20	-	-	
Center wavelength, λ	nm	820	830	840	
Optical isolation at λ	dB	-25	-30	-	
Spectrum width	nm	11	14	-	
Spectral ripple (modulation depth)	%	-	2	5	Low ripple selection on request
Secondary coherence subpeak	dB	-	-20	-	10 log; small subpeak on request


Figure 6.4. Typical spectrum examples - BLM-S-830-G-I-20.

6.5. BLM-S-840-G-I-30 – ULTRA HIGH POWER

Table 6.5.

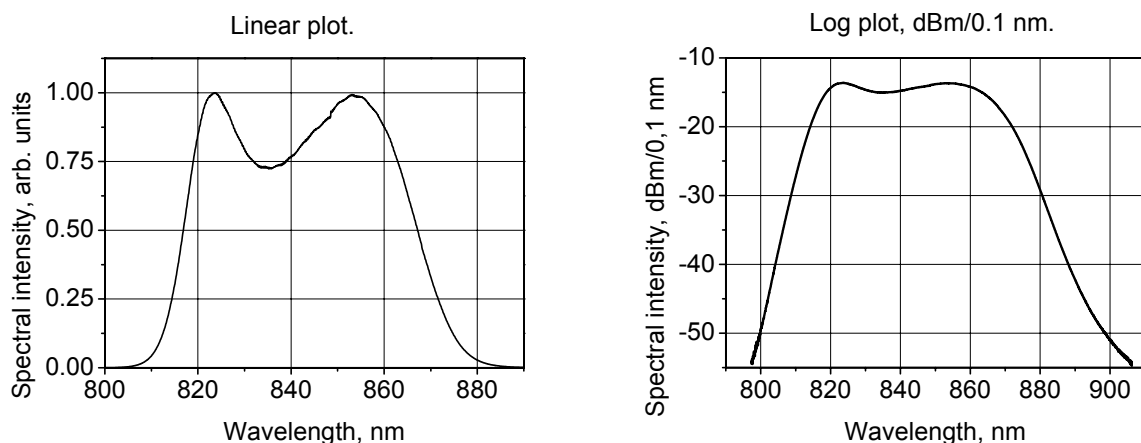
Parameter	Unit	Min	Typ	Max	Notes
Output power, P _{sm}	mW	30	-	-	Higher power on request
Center wavelength, λ	nm	830	840	850	
Optical isolation at λ	dB	-25	-30	-	Maximum -10 dB feedback
Spectrum width	nm	18	23	-	
Spectral ripple (modulation depth)	%	-	3	5	Low ripple selection on request
Secondary coherence subpeak	dB	-	-20	-	10 log; small subpeak on request


Figure 6.5. Typical spectrum examples - BLM-S-840-G-I-30.

6.6. BLM-S-840-B-I-20 – BROADBAND

Table 6.6.

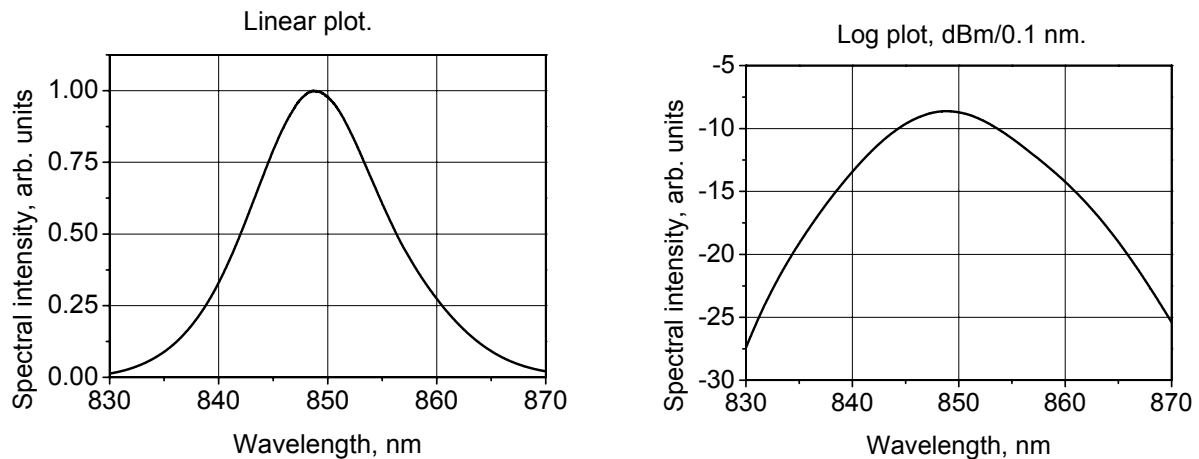
Parameter	Unit	Min	Typ	Max	Notes
Output power, P _{sm}	mW	15	20	-	
Center wavelength, λ	nm	830	840	850	
Optical isolation at λ	dB	-25	-30	-	
Spectrum width	nm	45	50	-	
Spectral ripple (modulation depth)	%	-	1	5	Low ripple selection on request
Secondary coherence subpeak	dB	-	-20	-	10 log; small subpeak on request


Figure 6.6. Typical spectrum examples - BLM-S-840-B-I-20.

6.7. BLM-S-850-G-I-20 – HIGH POWER

Table 6.7.

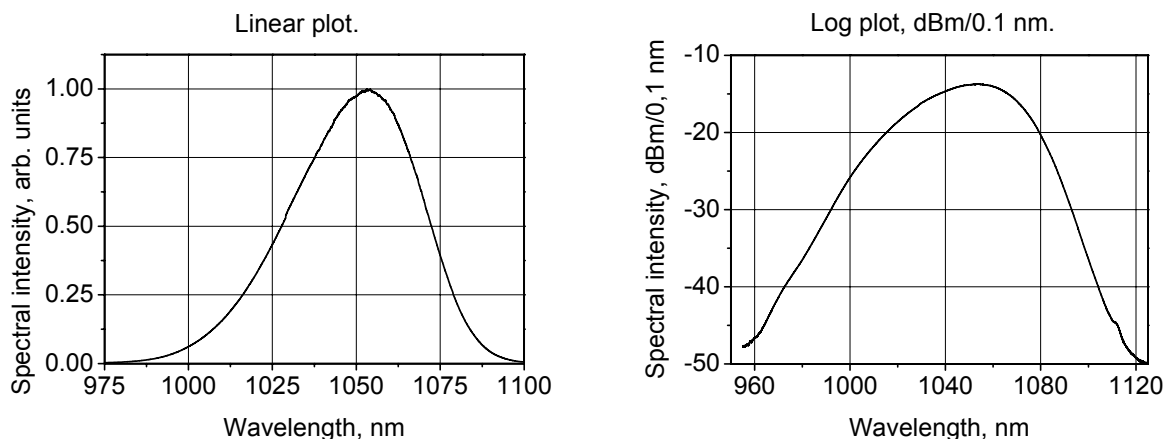
Parameter	Unit	Min	Typ	Max	Notes
Output power, P _{sm}	mW	20	-	-	
Center wavelength, λ	Nm	840	850	860	
Optical isolation at λ	dB	-25	-30	-	
Spectrum width	Nm	11	13	-	
Spectral ripple (modulation depth)	%	-	1	5	Low ripple selection on request
Secondary coherence subpeak	dB	-	-20	-	10 log; small subpeak on request


Figure 6.7. Typical spectrum examples - BLM-S-850-G-I-20.

6.8. BLM-S-1050-B-I-20 – HIGH POWER

Table 6.8.

Parameter	Unit	Min	Typ	Max	Notes
Output power, P _{sm}	mW	20	-	-	
Center wavelength, λ	nm	1040	1050	1060	
Optical isolation at λ	dB	-25	-30	-	
Spectrum width	nm	40	45	-	
Spectral ripple (modulation depth)	%	-	3	5	
Secondary coherence subpeak	dB	-	-20	-	10 log; small subpeak on request


Figure 6.8. Typical spectrum examples - BLM-S-1050-G-I-20.

7. Parameters common to all models

Table 7.1.

Stability after 1 h warm-up, 22 ± 1 °C ambient, 8 h	±0.2% maximum
SLD on/off time via remote	1.5 s
SLD on/off via TTL modulation input	Up to 50 kHz (50 % duty)
Operating temperature range*	0...+40 °C
Storage temperature range	-40...+85 °C

* may be extended upon request.

8. Output emission modulation and output power stability examples

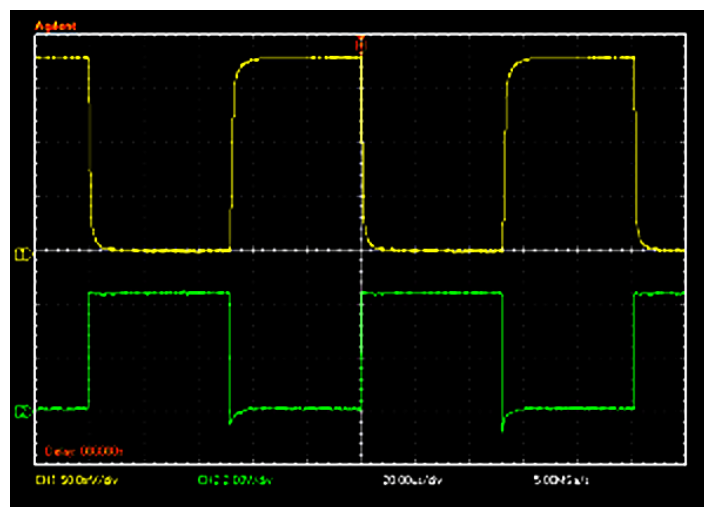


Figure 8.1. Power modulation by TTL. Yellow (upper) trace – optical output (zero to specified power). Green (lower) trace – modulation input. Rise/fall time - maximum speed (50% duty) – 50 KHz.

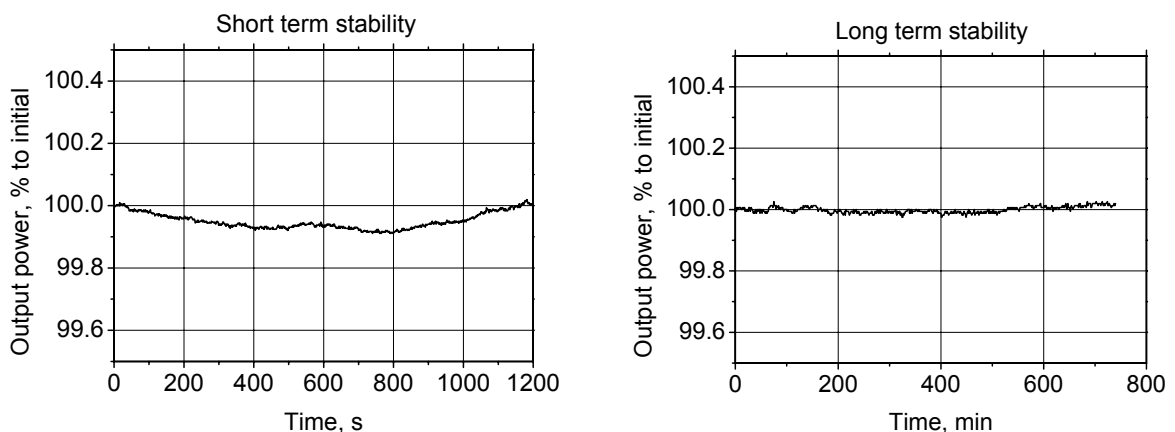


Figure 8.2. Output power stability.

9. Remote control of a BLM unit via the Remote Control Port (RCP)

RCP connector pin-out for BLM-S modules is shown in Fig 4.1. and in Table 4.1. RCP outputs and inputs are listed in Table 4.1.

RCP provides remote switching the SLD ON and OFF and reading the SLD status. The maximum current through output transistors is 20 mA. The maximum collector-emitter voltage is 30 volts. As can be seen from Fig. 4.1., each input is connected through a 1 kOhm resistor (R4-R6) to the anode of the corresponding LED which is a part of a high-speed optocoupler circuit (U4-U5). States of Q1-Q3 transistors correspond to the status of front panel LEDs as shown in the table below.

Table 9.1. RCP output transistors states.

RCP output transistors state	BLM-S front panel LEDs status
Q1 open	'LIMIT' LED is yellow – Service Required
Q2 open	'SLD' LED is green – OK, SLD emits light
Q3 open	'SLD' LED is red – SLD not ready/failure

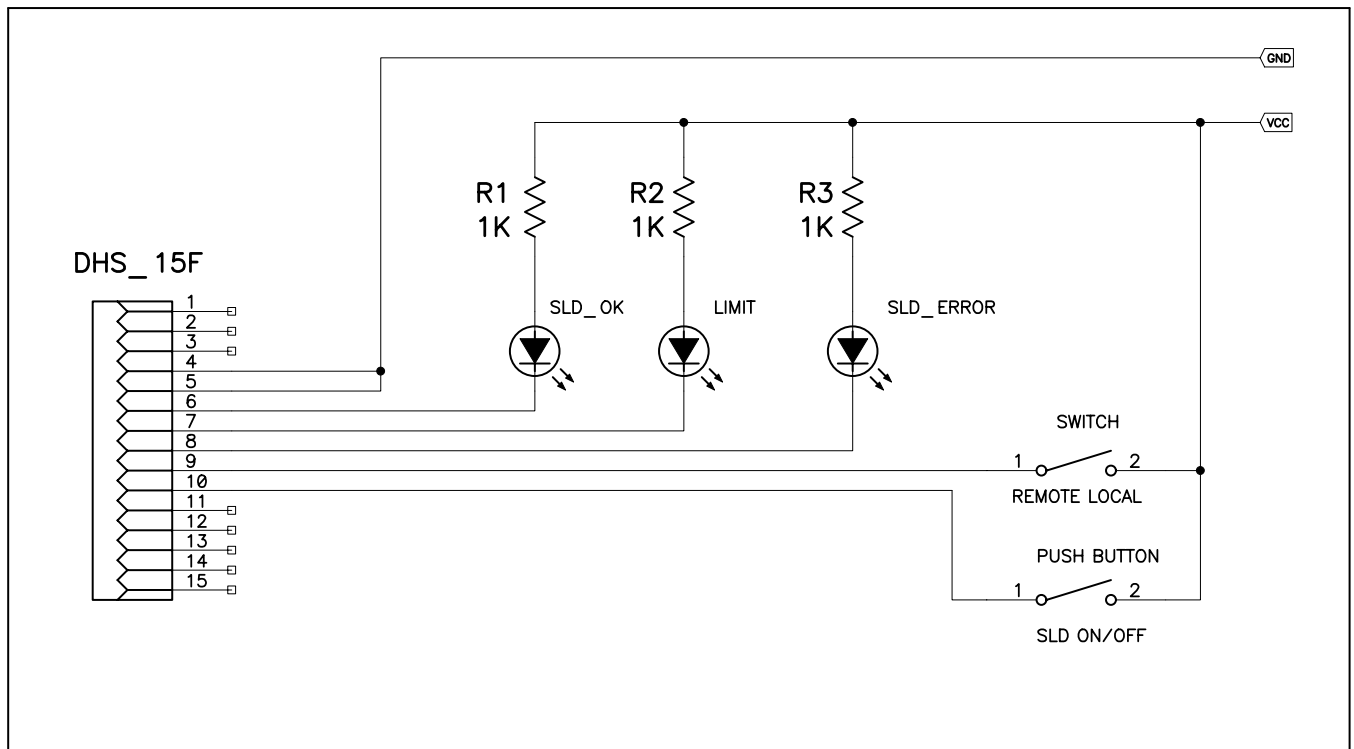


Figure 9.1. Recommended connections example # 1. This circuit emulates the BLM's front panel controls and LEDs.

Note: R1 – R3 are shown assuming VCC 5-10 V DC.

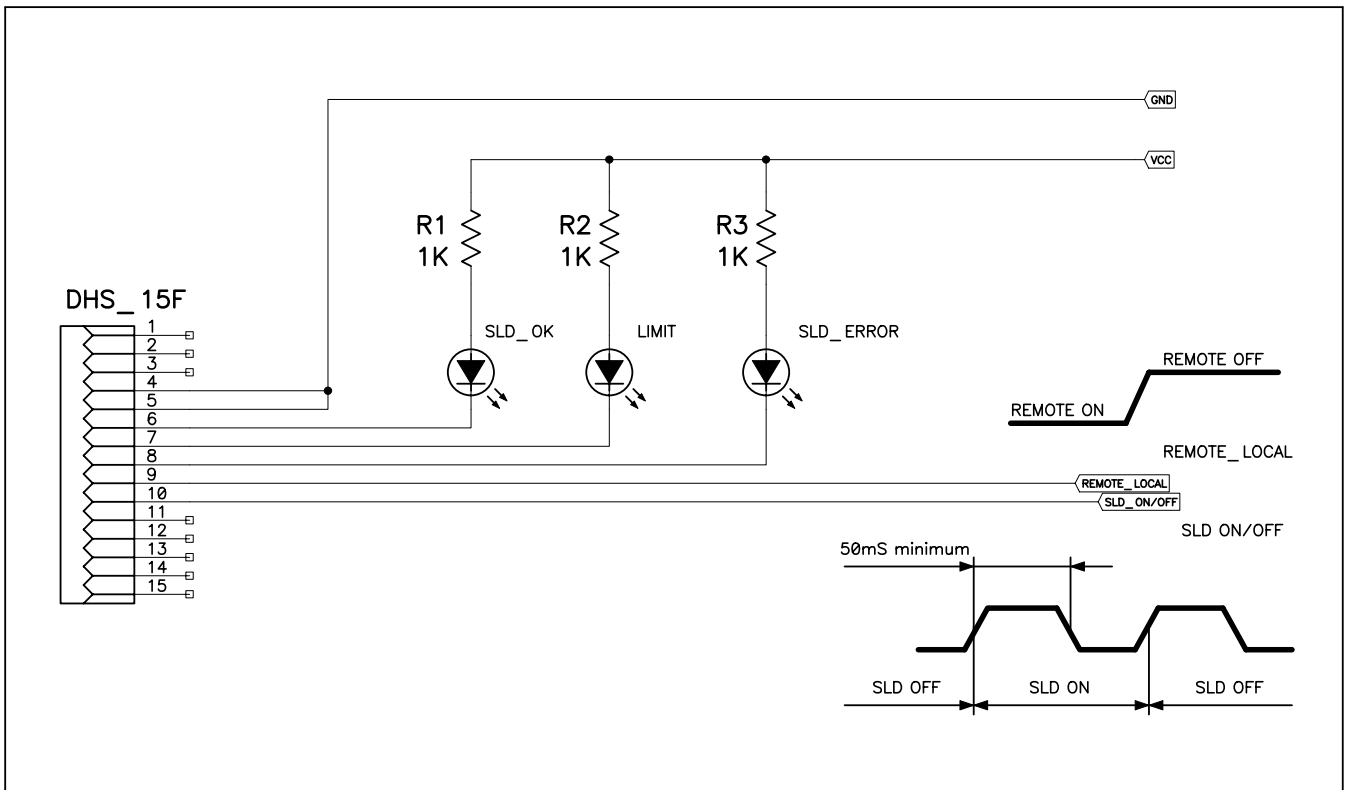


Figure 9.2. Recommended connections example # 2. This circuit provides SLD ON/OFF function via an external logic – level signal between common ground pin and SLD “ON/OFF” input.
 Note: R1 – R3 are shown assuming VCC 5-10 V DC.

10. Acceptance tests.

Each device is delivered with an Acceptance Test Report (ATR). The device Serial Number and the date of tests are clearly indicated there.