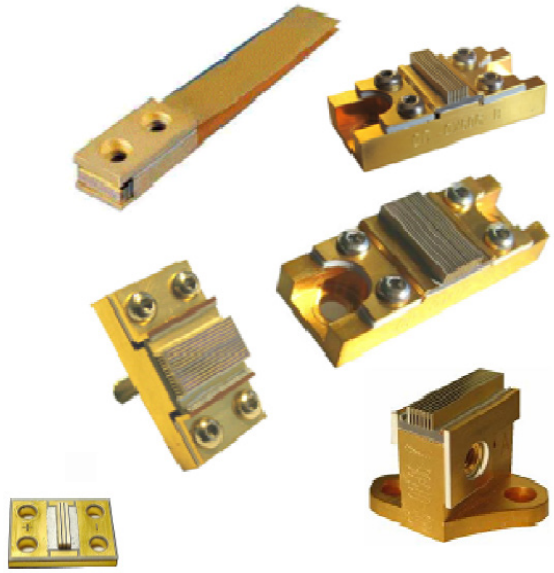
Conduction-cooled QCW Stacked Array

Laser diodes & components
BY LUMIBIRD

QD-Q1yzz-A / QD-Q1yzz-B / QD-Q1yzz-BS / QD-Q1yzz-G / QD-Q1yzz-K

DESCRIPTION

QD-Q1yzz-A, QD-Q1yzz-B, QD-Q1yzz-BS, QD-Q1yzz-G and QD-Q1yzz-K are a variety of conductively cooled laser diode stacked arrays. These stacks can be built from 1 to 19 diode bars of 60 W QCW to 400 W QCW. The laser diode bar arrays benefit from a fully mastered technology, with the appropriate design for improved efficiency and reliable operation. Packaging and heat-sink have been optimized to reduce the overall thermal resistance. Assembly in a compact and rugged package, using AuSn hard solder, allows easy connection to a heat exchanger to get good thermal control. This technology of stacks has been successfully submitted to specific environmental tests requested for space missions (long life-tests, endurance under vacuum, irradiations...) with NASA or ESA. These stacks are ideal for different applications under severe conditions: pumping rods or slabs solid-state lasers, illuminators... for aerospace, industrial, space applications.



MAIN FEATURES

- QCW operation
- 60 W to 400 W QCW per diode bar
- Standard wavelength: from 790 to 980 nm
- Vacuum qualified technology
- Low thermal resistance assembly
- Mechanically robust, shock and vibration resistant

x =	1	2	3	4	5	6		
λ	808	790	830	915	940	980		nm
y =	2	3	4	5	6	7	8	9
P/bar	60	80	100	125	150	200	300	400 W

SPECIFICATIONS

PARAMETERS @ 25°C	QD-Qxyzz-A	QD-Qxyzz-B	QD-Qxyzz-BS	QD-Qxyzz-G	QD-Qxyzz-K	Units
Number of diode bars zz =	**2 to 6**	**1 to 12**	**1 to 19**	**1 to 16**	**1 to 8**	
Pitch between diode bars	**330 to few 1000s**					**µm**
Emitting area	**10 x (zz – 1)* pitch**					**mm²**
QCW optical power per diode bar	**up to 400**					**W**
QCW optical power	**up to 2400**	**up to 4400**	**up to 7000**	**up to 6000**	**up to 1600**	**W**
Operating current @ 100 W / bar	**95 A typical - 115 A max**					**A**
Operating current @ 200 W / bar	**185 A typical - 215 A max**					**A**
Operating current @ 400 W / bar	**370 A typical - 390 A max**					**A**
Operating voltage	**< 2 V /bar**					**V**
Total efficiency	**58% @ 808 nm, 65% @ 940/980 nm**					**%**
Wavelength	**790 to 980**					**nm**
Spectral width (FWHM)	**3**					**nm**
Beam divergence (FWHM)	**9 X 36**					**deg.**

Note :
- Standard polarisation: TM or TE mode @ 808 nm, TE @ 9xx nm
- Variation of wavelength with temperature is approximately 0.26 nm/°C
- Tolerance on wavelength is +/- 3 nm, +/- 1,5 nm on demand
- Double or triple quantum well bars available (ex: 400 W @ 200 A & 4 V)
- Specifications are for nominal lifetime > 1.10^9 pulses (for 200 µs pulse width)

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Many options and configurations are available. Please contact Lumibird to find the best match for your needs and compatibility between options.

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ABSOLUTE MAXIMUM RATINGS

PARAMETERS	QD-Qxyzz-A	QD-Qxyzz-B	QD-Qxyzz-BS	QD-Qxyzz-G	QD-Qxyzz-K	Units
Pulse width	**500**					**µs**
Maximum duty cycle	**3**	**4**				**%**
Reverse voltage	**3**					**V**
Storage temperature	**- 55 to + 85**					**°C**

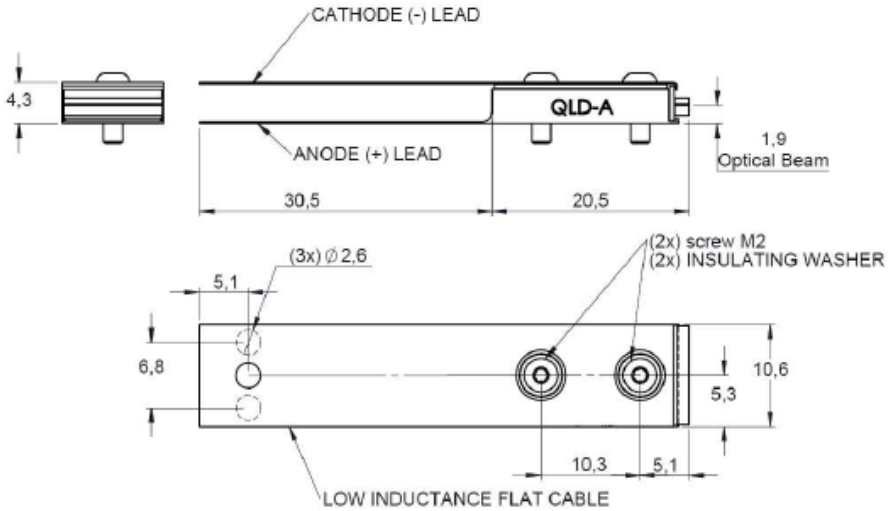
Note : Operation at temperature below dew point requests to use dry N2 environment

PACKAGE SPECIFICATIONS

- dimensions are in mm
- standard tolerances are ± 0.2 mm

QD-Q1yzz-A

This stack “A” type with a very thin design can be proposed with a total number of ‘zz’ diode bars.
‘zz’ = 1 to 6 bars at a pitch of 400 µm,
‘zz’= 1 to 5 bars at a pitch of 500 µm



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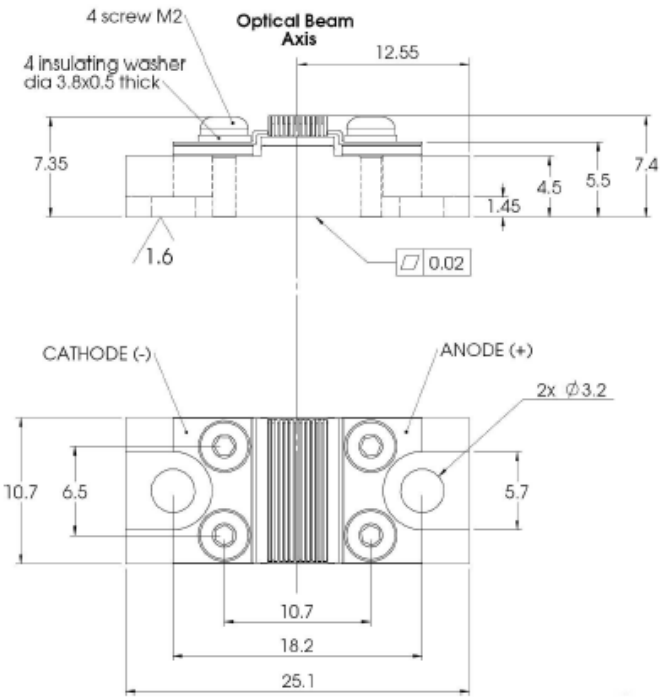
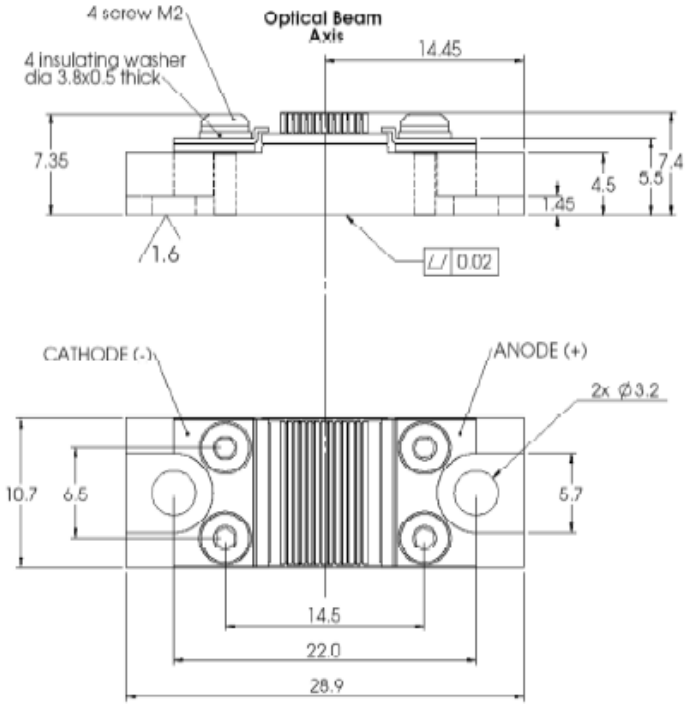
QD-Q1yzz-B

This stack “B” type can be proposed with a variable number (‘zz’) of diode bars:
‘zz’ = 1 to 12 bars at a pitch of 330 µm,
‘zz’ = 1 to 11 bars at a pitch of 400 µm,
‘zz’= 1 to 8 bars at a pitch of 500 µm



QD-Q1yzz-BS

This stack “BS” type can be proposed with a variable number (‘zz’) of diode bars:
‘zz’ = 1 to 19 bars at a pitch of 400 µm,
‘zz’ = 1 to 15 bars at a pitch of 500 µm
‘zz’ = 1 to 6 bars at a pitch of 1000 µm



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LASER RADIATION
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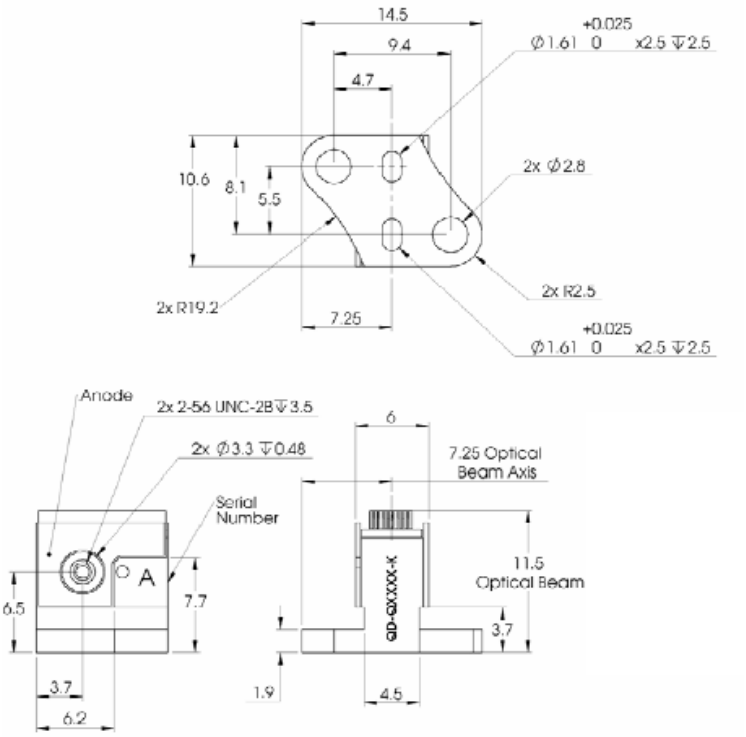
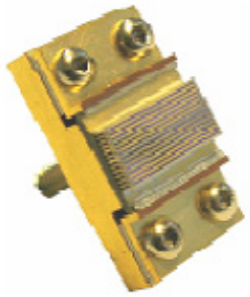
QD-Q1yzz-K

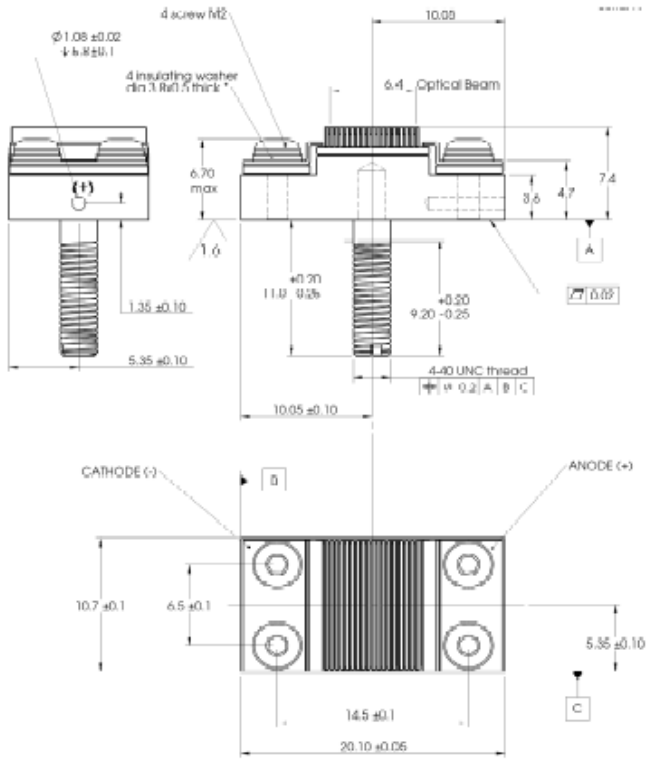
This stack “K” type offers a very small foot-print. It can be proposed with a variable number of ‘zz’ diode bars:
‘zz’ = 1 to 8 bars at a pitch of 400 µm,
‘zz’= 1 to 6 bars at a pitch of 500 µm



QD-Q1yzz-G



This stack “G” type can be proposed with a variable number (‘zz’) of diode bars:
‘zz’ = 1 to 19 bars at a pitch of 400 µm,
‘zz’= 1 to 15 bars at a pitch of 500 µm
‘zz’ = 1 to 6 bars at a pitch of 1000 µm



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