



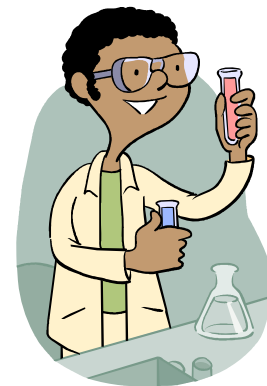
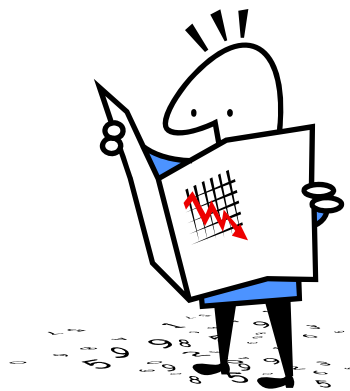
Fiber-Optic Components – Is This Any Way to Earn a Living?

OFC 2008 Business & Management Insights Forum

Peter Bordui, Chairman, Bookham

- Bookham overview
- Technology bubbles
- Fibre-optic components value chain
- Options for a business
- Vertical integration for worse and for better

A Matter of Perspective:



Any statements in this presentation about the future expectations, plans and prospects of Bookham, including statement containing the words “believe”, “plan”, “anticipate”, “expect”, “estimate”, “will”, “ongoing” and similar expressions, constitute forward –looking statements for purposes of the Safe Harbor Provisions of The Private Securities Litigation Reform Act of 1995. There are a number of important factors that could cause actual results or events to differ materially from those indicated by such forward-looking statements, including factors described in Bookham’s most recent Annual Report on Form 10-K and in subsequent Quarterly Reports on Form 10-Q and in the prospectus supplement relating to our proposed offering, which are on file with the Securities and Exchange Commission. These include projections of future revenues, gross margins, and earnings, continued demand for optical components, transfer of test and assembly operations to China, changes in inventory and product mix, no further change in the \$/£ exchange rate and the continued ability of the Company to maintain requisite financial resources. The forward-looking statements represent Bookham’s view as of the date of this presentation. Bookham anticipates that subsequent events and developments may cause Bookham’s views to change. However, Bookham disclaims any intention to update any forward-looking statements as a result of developments occurring after the date of this document. Those forward-looking statements should not be relied upon as representing Bookham’s views as of any date subsequent to the date of this presentation.



Entrepreneurial Start-Up

- Silicon optical circuits

Initial and Follow-On Public Offerings

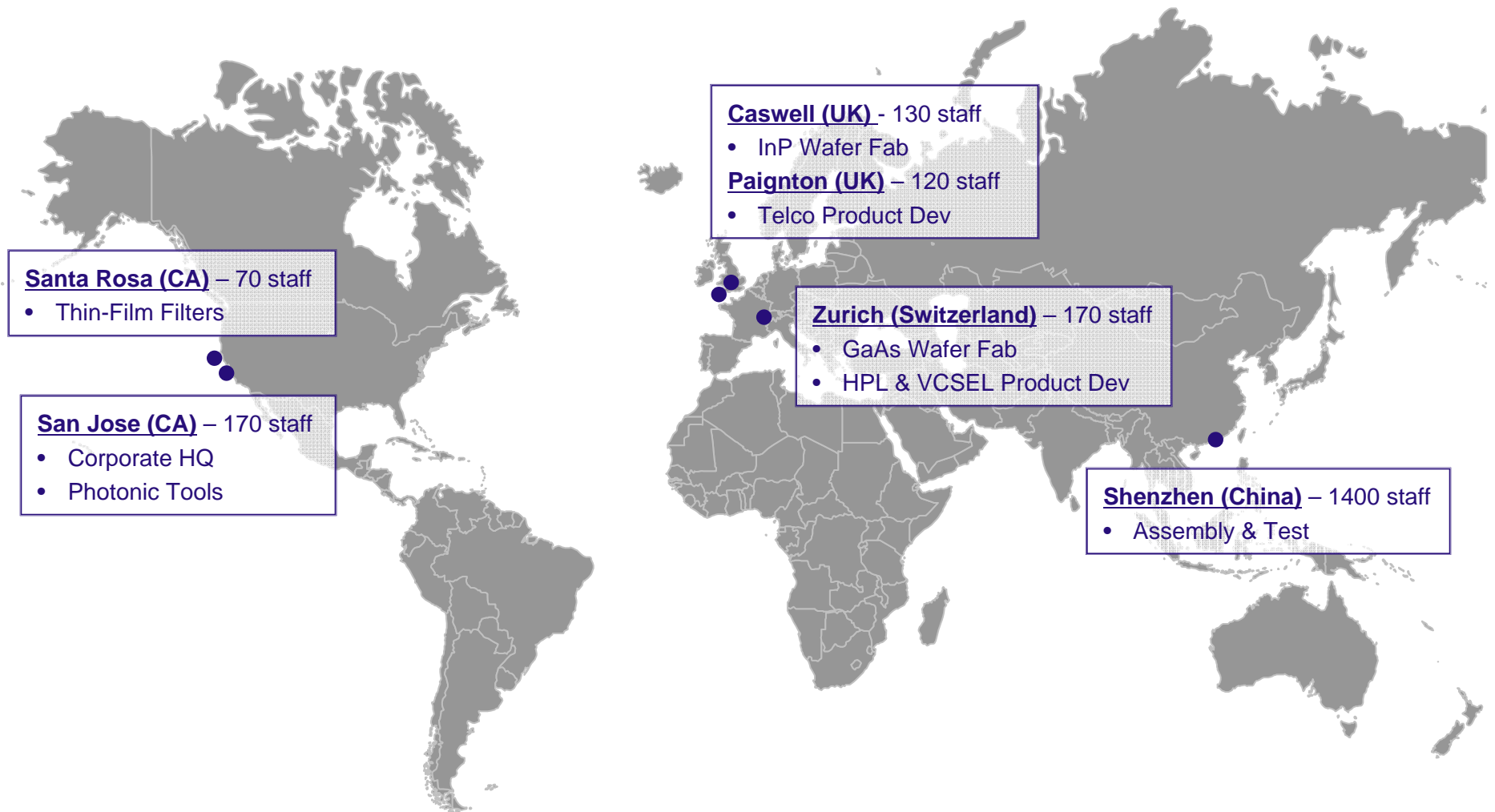
- \$10B market cap in 2000

Post –Bubble Acquisitions:

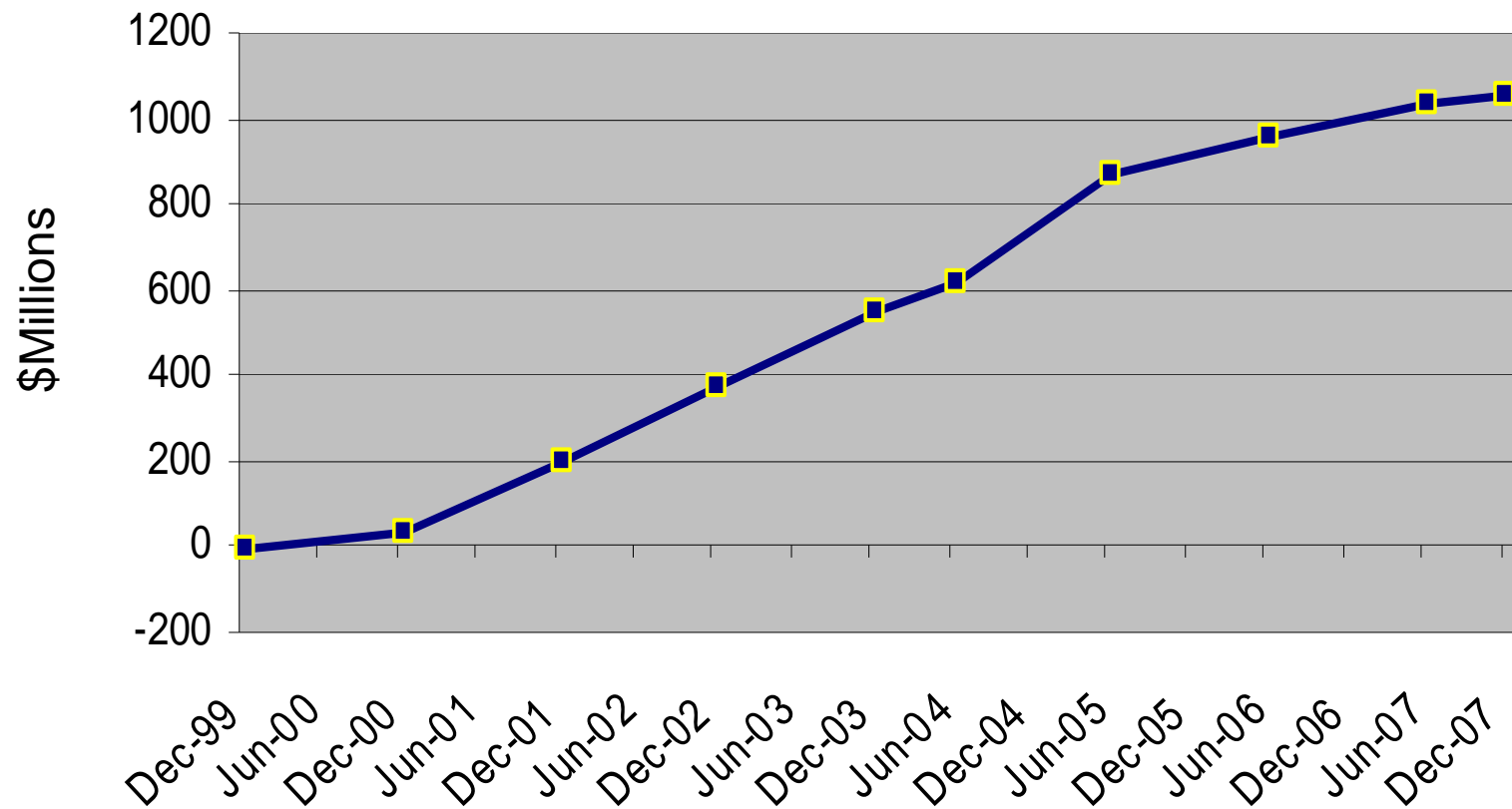


Consolidation & Restructuring

- Headquarters moved, UK to US
- III-V wafer fab moved from Canada to England
- Assembly & test operations moved from England to China
- 5 sites closed
- >1500 jobs transferred



Cumulative Deficit, 2000 through 2007



Technology Bubbles

World-changing invention



Building & investment



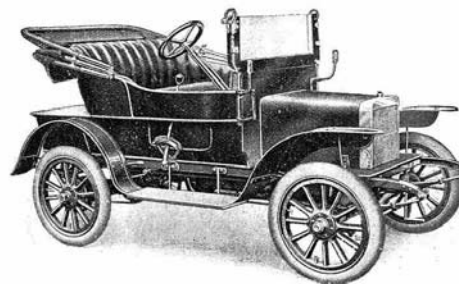
Overbuilding & overinvestment



Crash



POLO AW-5 All-Wave AC Midget Receiver



Historical recoveries on order of decades, not years

- Analogous origins to previous technology bubbles, nothing fundamentally new
- Recovery still playing out:
 - Last 10 years of financial performance not a good guide to future expectations
 - Many companies still working through structural and operational inefficiencies associated with overbuilding
 - Market itself still with an overabundance of suppliers
- Bubble effects will continue to decrease

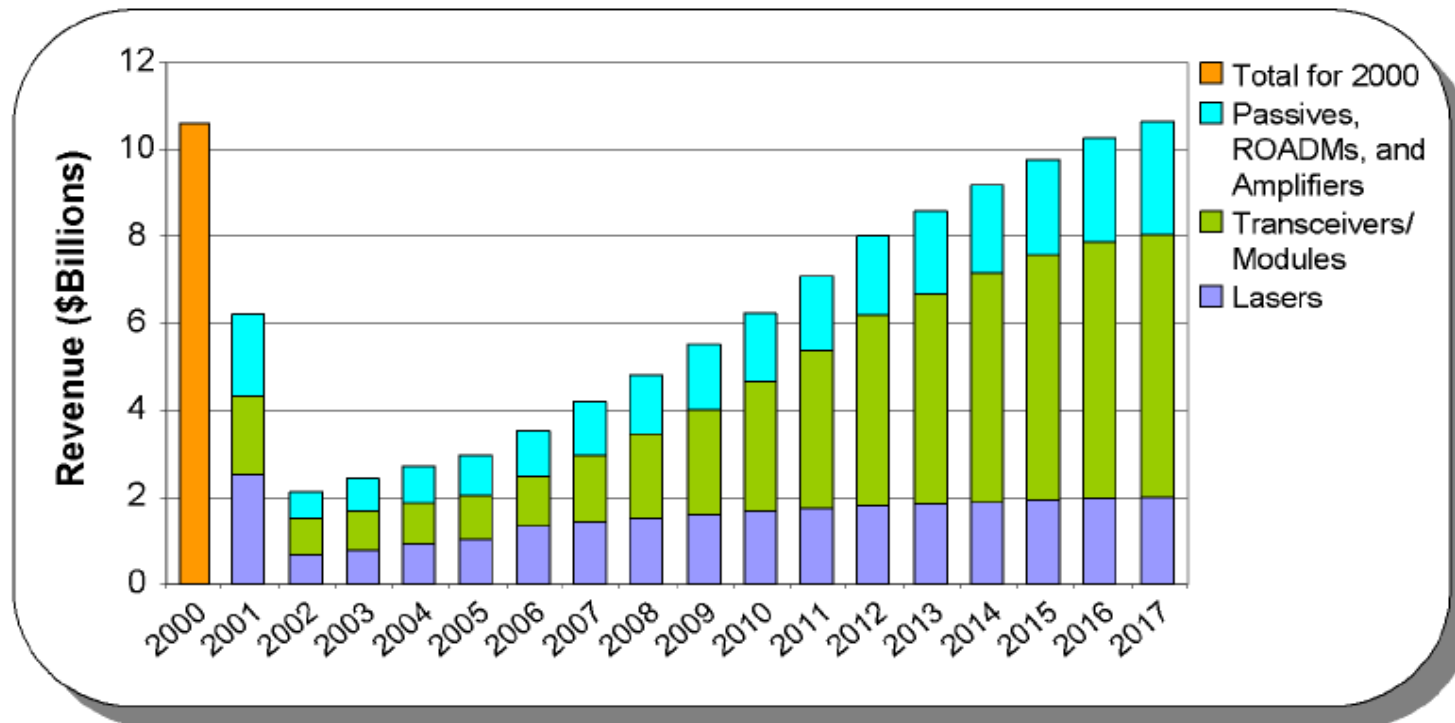


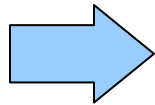
Figure 6.14: Components for Telecom and Datacom: Revenue and Forecast, 2000-2017

Sources: OIDA member companies, KMI, Ovum-RHK, Laser Focus World, LightCounting, iSuppli, TIA, IDC, CIR, Gartner, Dell'Oro, PIDA, OITDA, OIDA estimates

OIDA's Global Optoelectronics Industry Market Report and Forecast 2007

Customer-side pressures:

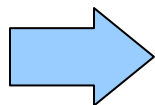
- Carriers coping with view that “Internet should be free”
- Components a large fraction of equipment makers’ costs
- Consolidation among carriers and equipment-makers



Price erosion, lead-time reduction, vendor-base streamlining

Supplier-side resistance:

- Suppliers with large and diversified revenues – Fibre-optics not critical
- Few suppliers for certain in-feeds
- Credit-rating weakness

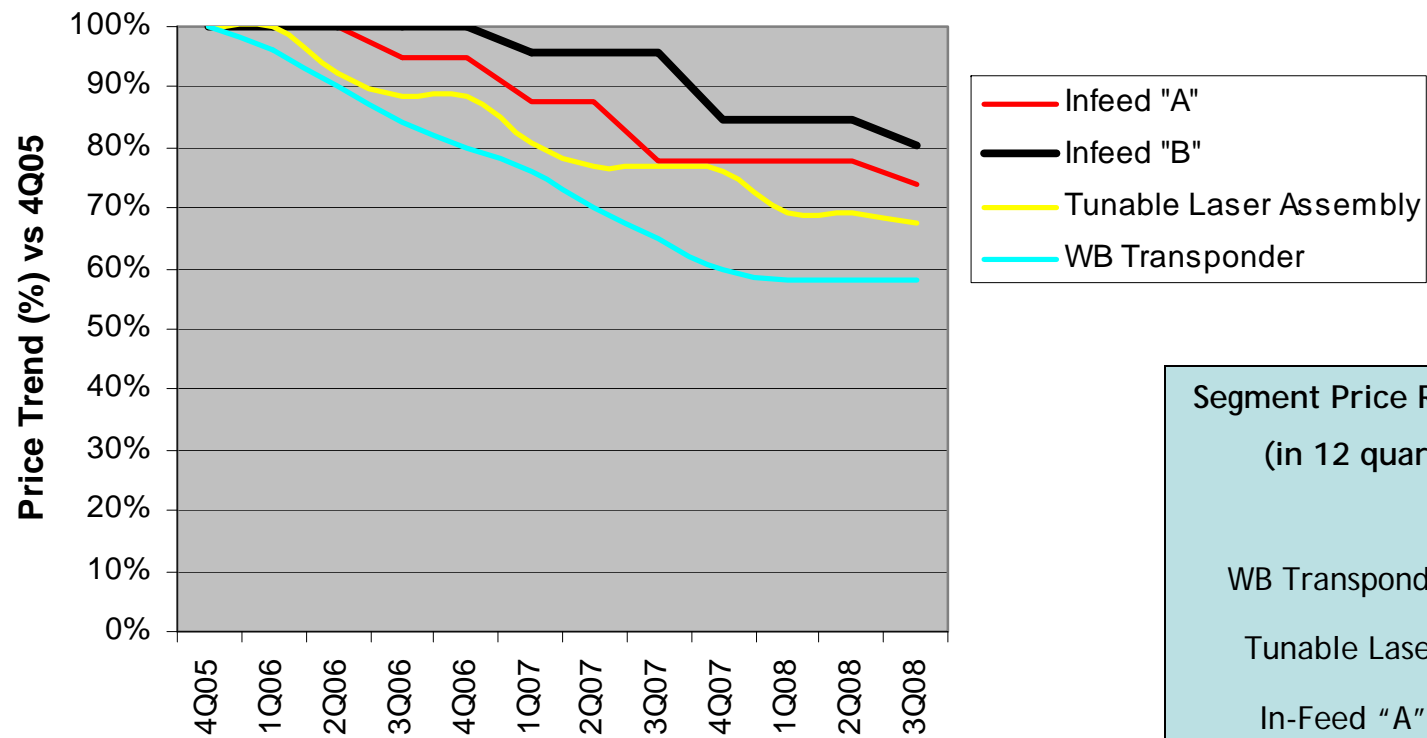


Can't push problems “upstream”

Pricing Pressures



Price Trend in percentage of 4Q05 Baseline



Source of Laser and Transponder data: Dell-Oro

Segment Price Reduction

(in 12 quarters)

WB Transponder: 42%

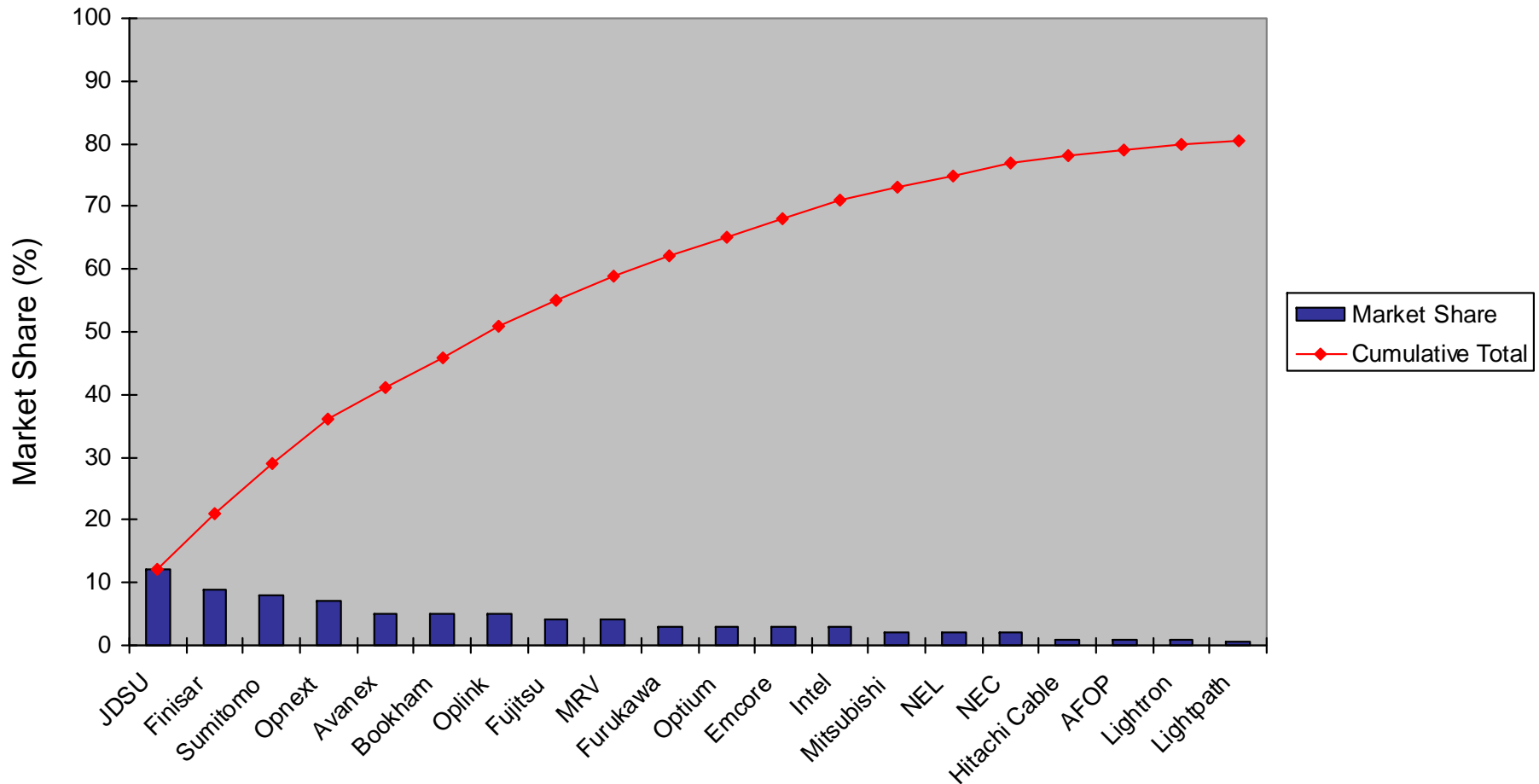
Tunable Laser: 32%

In-Feed "A": 26%

In-Feed "B": 20%

(Over)Abundance of Competition

Fiber-Optic Components Market Share by Supplier



Source: RHK-Ovum, Dec-07

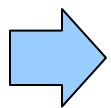
Multiplicity of Business Models

Current Business Models

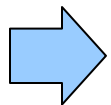
		A	B	C	D	E	F	G	H
Subsystem	Ass'y			✓					✓
	Design			✓			✓	✓	
Module	Ass'y		✓	✓					✓
	Design		✓	✓			✓		
Package	Ass'y	✓	✓	✓		✓			✓
	Design	✓	✓	✓	✓				
Chip	Fab	✓	✓	✓		✓			
	Design	✓	✓	✓	✓				

Current fibre-optic component business models:

- Different cost structures
- Different supplier bases
- Different customer bases
- Different competencies
- Different approaches to value creation and differentiation
- Different risks of substitutes
- Different risks of new entrants



Limited comparability between companies pursuing different models



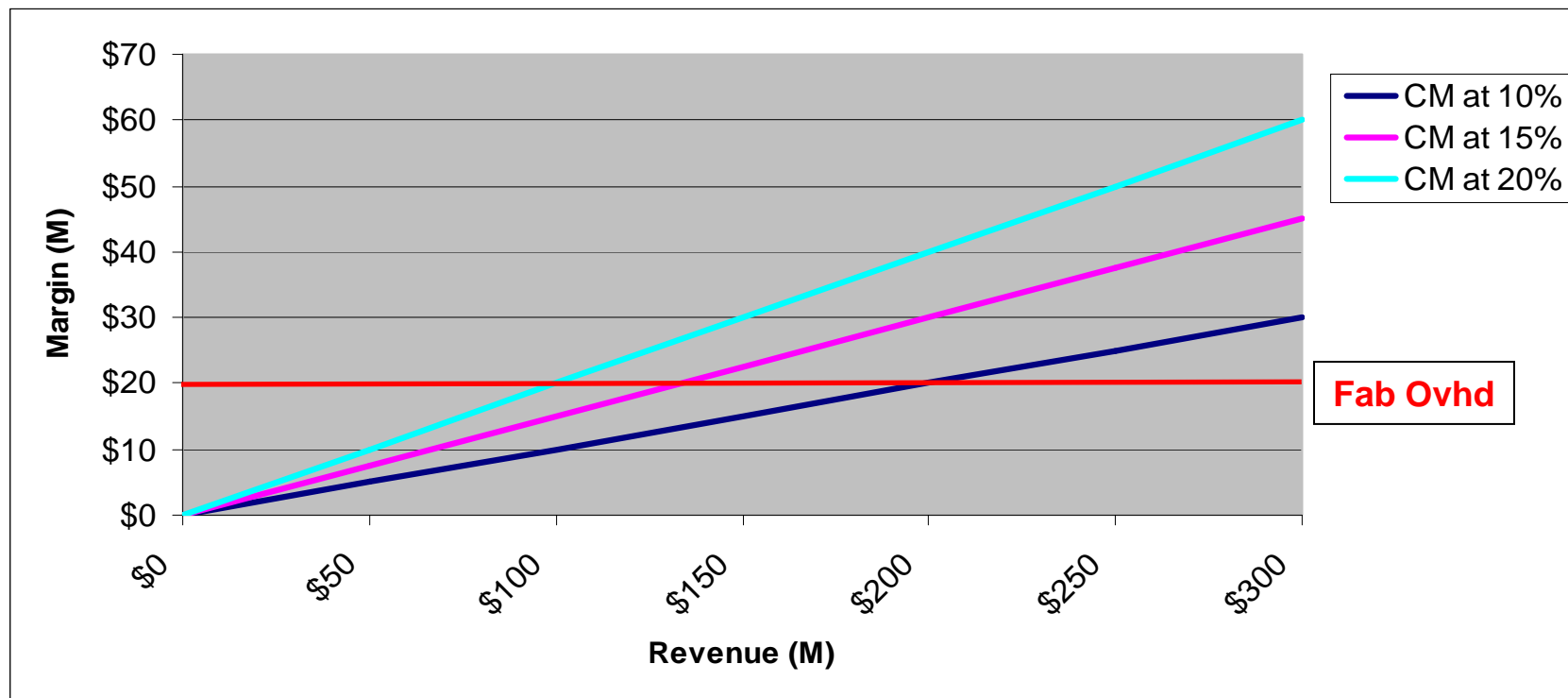
Broad range of relative strengths and weaknesses

Example: Vertical Integration

One big negative, numerous positives:

- Large fixed cost base
- High variable margin

Fixed overhead versus variable margin benefit (10-20%)

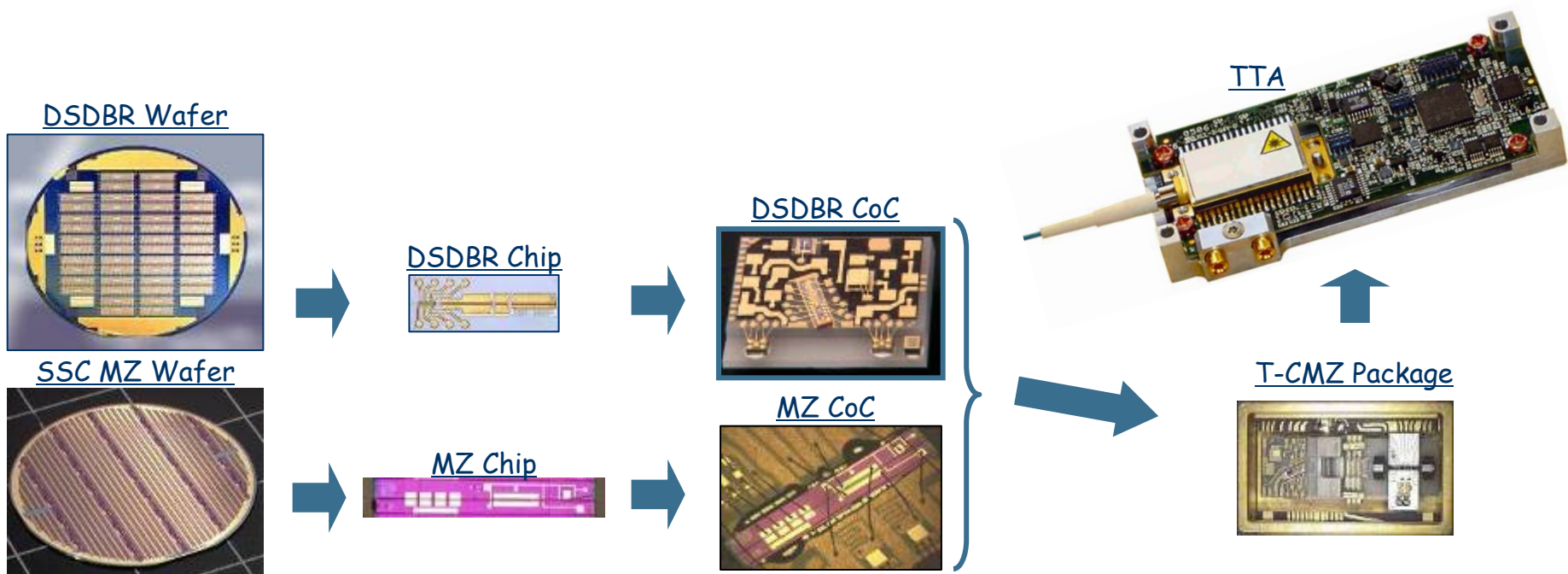


Example: Vertical Integration

One big negative, numerous positives:

- Large fixed cost base
- High variable margin
- Hands-on control over quality, safety, and social-compliance aspects of products
- Resistant to IP abuses and counterfeiting
- Flexible in responding to lead-time challenges
- Access to markets at component, module, and subsystems levels, important in informing R&D efforts and amortizing R&D costs
- Access to innovation at chip level, key to improvements in product performance and cost reduction

Tunable Transmitter Assembly (TTA): Hybrid integration of InP tunable laser and MZ modulator chips



- Tailored grating for “featureless” digital tuning maps
- On-wafer testing for improved process control
- Regular endurance testing (Production wafers with <5GHz stability over 30k hours)
- Ongoing development for
 - Increased power (100 mW ex-facet)
 - Increased (60 nm) tuning range

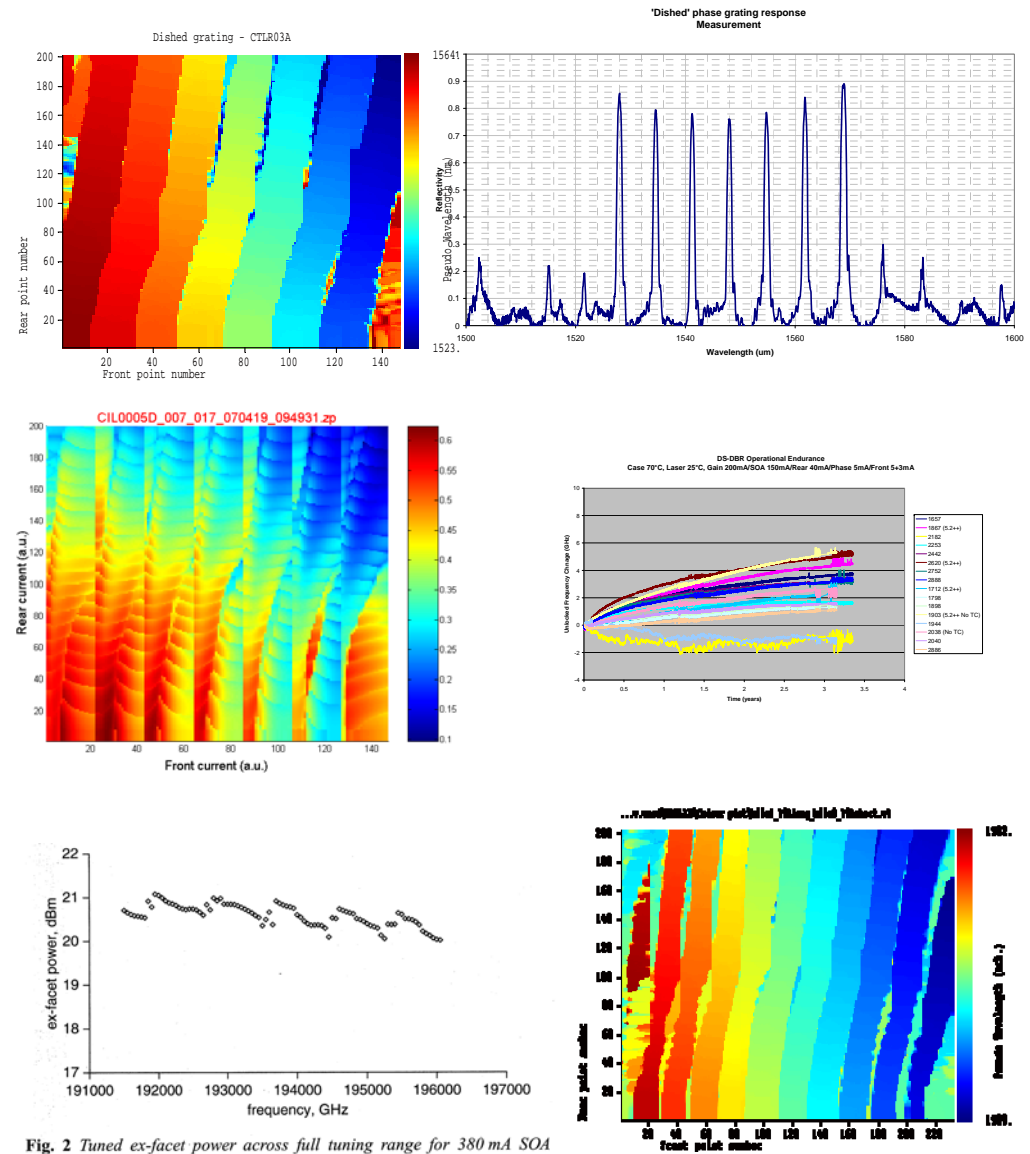
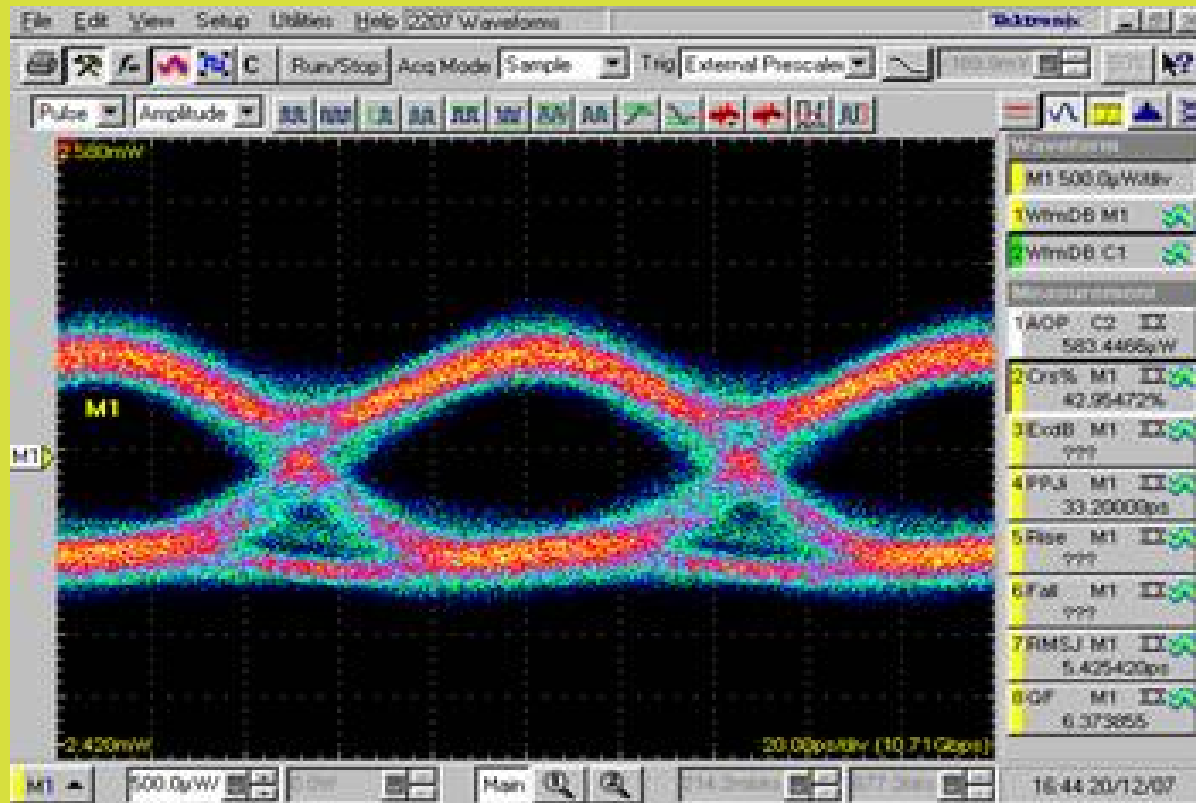


Fig. 2 Tuned ex-facet power across full tuning range for 380 mA SOA current

40G and 100G Transmission:

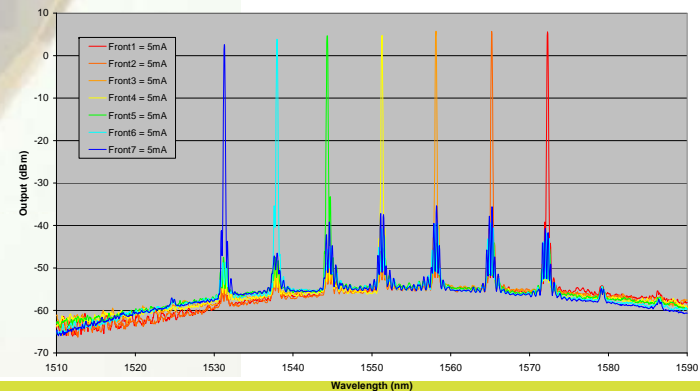
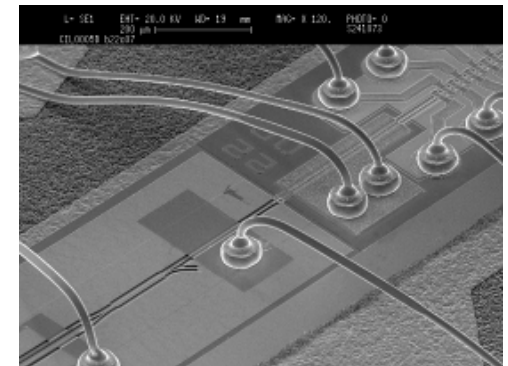
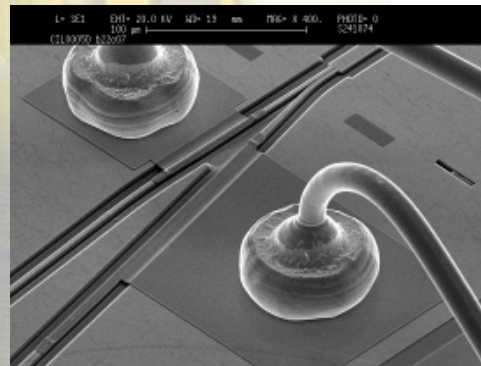
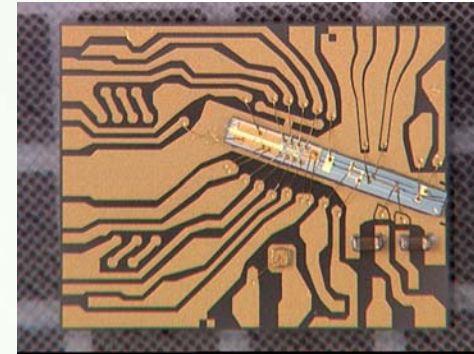


Full-band tunable DQPSK Encoder is compatible with today's 10G footprint

Chip Innovation for Cost Reduction

Integration of DSDBR laser and MZ modulator on same chip

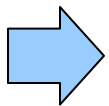
- 3" diameter wafer process, common with discrete DSDBR and MZ devices
- Integral monitor detectors and bias control
- Cost reduction through
 - reduced handling
 - fewer packaging components
 - smaller footprint
- Compatible with parallel modulator integration for higher speed and phase coding



Could a centralized III-V chip foundry adequately support necessary innovation in device performance and cost reduction?

Current reality:

- Leading-edge chip design linked to fabrication process capability
- Fab process capability a major source of competitive differentiation



Foundry-model not able to support critical innovations in product performance and cost

Example: Vertical Integration

One big negative, numerous positives:

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- Access to markets at component, module, and subsystems levels, important in informing R&D efforts and amortizing R&D costs
- Access to innovation at chip level, key to improvements in product performance and cost reduction
- Opportunities to leverage capabilities in new markets

Leveraging into New Markets

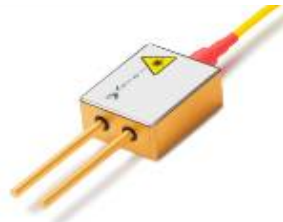
- Technical capabilities

Laser Products for Materials Processing:

SM Cooled Module
Seed Laser



10W 9xx nm MM
Uncooled Module

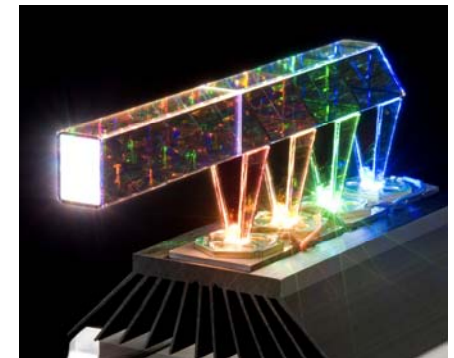


80W 9xx nm Multimode Bar
on Microchannel Cooler



Filter Products for Bio Instrumentation:

LED Multiplexer for
Fluorescence
Illumination



Precision Filters for
PCR Fluorescence and
Cytometry



- Business-process capabilities

Summary Observations

- Bubble recovery still playing out
- Fundamental demand for fiber-optic components, although components suppliers currently at weak point in value chain
- Large number of suppliers, with broad range of business models in play
- Chip innovation drives industry-wide performance and cost improvements; Not easily outsourced
- For integrated suppliers, potential for leveraging into new markets

