



Semiconductor Strategies for 4G Mobile Broadband



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MOBILIZING
BROADBAND

Discussion Topics

- The path to undisputed WiMAX Leadership
- What it takes to get to the top in Wireless
- Comparing the Panelists



A HISTORY OF MOBILE WiMAX LEADERSHIP

Jan 2004
Beceem:
The
Revolution
Begins



Dec 2005
\$20M C-Round
Financing Lead
by Samsung
Ventures



Apr 2006
Intel and
DoCoMo
Capital
Invest



Feb 2007
\$60+M D-Round:
NEC Invests;
SANYO Selects
Wave 2 Chipset



Oct 2005
World's First
WiBro Chipset
in Samsung
Demo at APEC

Mar 2006
World's First
Wave 1 Chipset
Deployed in
Korea

Dec 2006
World's First
Wave 2
Chipset
Released

Mar 2007
Motorola
Selects
Wave 2
Chipset

May 2007
WiMAX Speed
Record; 33+Mbps
Live MIMO
Throughput

Dec 2007
First to Demo
Successful
Sprint Network
Compliance

Jan 2008
Beceem's Chips
Power Clearwire's
Mobile WiMAX
Network Demos

2004 – 2007: establishing leadership and credibility





BECEEM



A HISTORY OF MOBILE WiMAX LEADERSHIP

Mar 2008
ZTE Chooses
Beceem's Chipset
for its WiMAX
Products



Apr 2008
BCSM250: World's
First Fully Integrated
65nm Wave 2
Solution

Jun 2008
Beceem Among
First to Receive
WiMAX
Certification



Jun 2008
Acer Laptop with
WiMAX from
Beceem Shown
at Computex



Sep 2008
BCS5200: World's
First Single Chip
WiMAX + VoIP
CPE Solution



Jan 2009
World's First
Dual-Mode 3G
CDMA/4G WiMAX
USB Modem



Feb 2009
Beceem's Chip
Included in
First 4G Service
to Launch in Japan

**Beceem:
The Clear Choice**



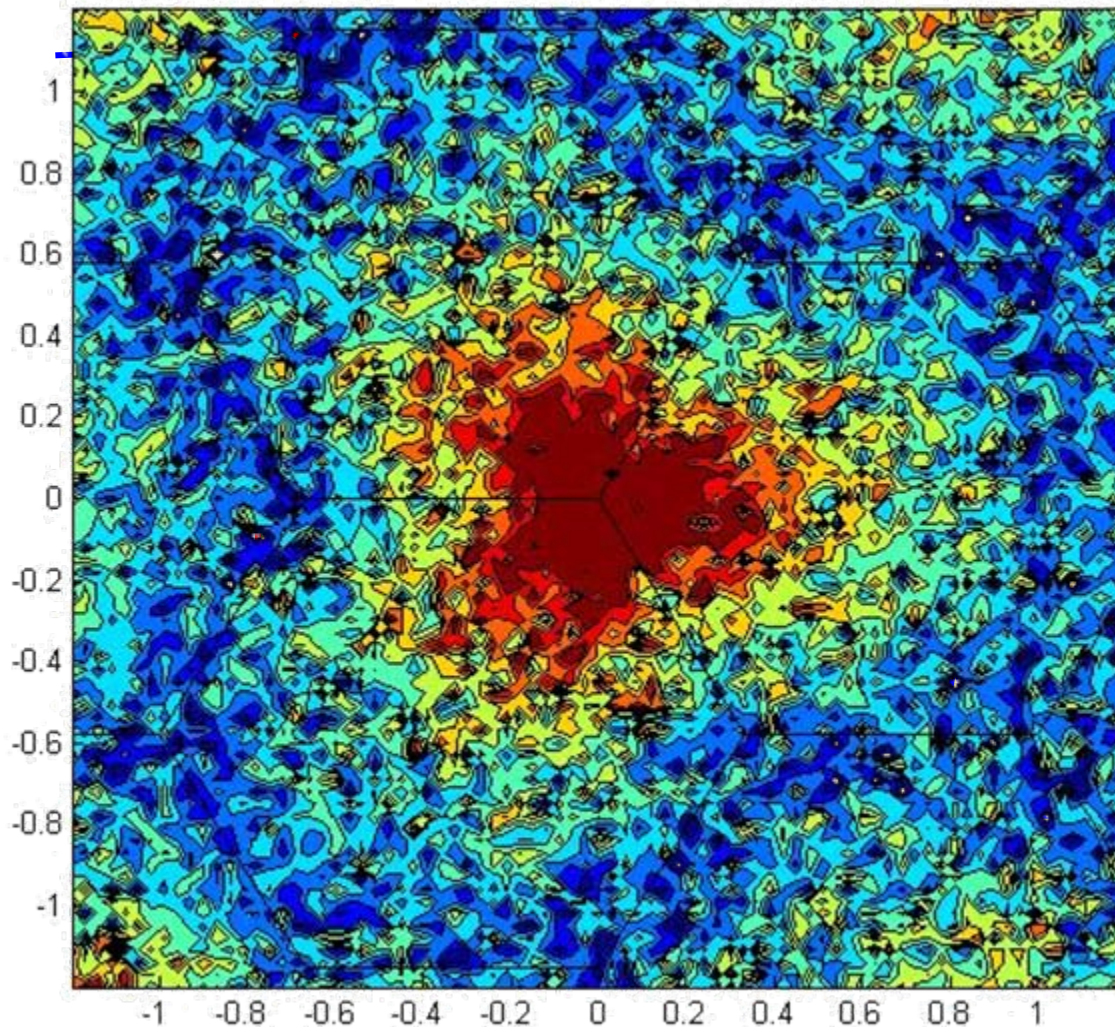
Feb 2009
Clear Chooses Beceem's
High-Performance
WiMAX Chip for 4G
Mobile WiMAX Service

2008 + : enabling & driving the Mobile Broadband market

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Mobile Broadband – the challenge starts with constantly changing signal strength



- Beceem solutions are optimized for high performance and robust operation at low SNR
- Our channel estimation excels in all conditions
 - Propagation loss over distance
 - Delay spread (freq selective fading)
 - Doppler spread (time selective fading)
 - Angle spread (space selective fading)
 - Interference (users in same/other sectors)

Beceem's Algorithms – the Secret Sauce behind our Mobile Performance Leadership

1. Maximum Likelihood Receiver
 - Increases receive sensitivity
2. Improved Channel Estimation
 - Better channel estimation allows for better decoding. BCSM250 receiver can estimate this channel more than 200 times per second to decode the data
3. LLR Truncation
 - Improvements in adaptive algorithms allows the receiver to have higher performance at lower power
4. Interference Cancellation
 - Improves handoff in 'Frequency Reuse 1' scenarios
 - BCSM250 decodes the data stream of both the desired signal and the strongest interferer, then eliminate the strongest interferer

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4G/WiMAX Chip Provider Comparison

	Beceem	GCT	Sequans	Wavesat
Corporate				
Overview	All companies are VC funded fabless semcos, CF negative			
Funding	Raised \$20M in early 09 - fully funded	Raised \$10M late 08 – Challenged	Raised \$28M early 08 - need more \$\$ in 09	Raised \$12M in early 09
Employees	170	~ 100	~ 125	<50
Products				
Mobile WiMAX terminals	BCSM250 PHY/MAC/RF 65nm chip	GDM7215 PHY/MAC/RF 90nm + WiFi	SQN 1210 PHY/MAC/RF 65nm chip	Odyssey 8500 Programmable PHY/MAC
Other products	•None	•CMOS RF •DMB chips •LTE in dev.	•WiMAX BTS •Fixed WiMAX •LTE in dev.	•Fixed WiMAX •X-PHS
SWOT				
Strength	Clear WiMAX performance leader	Diversified product line	Basestation products	Programmable
Weakness	Success based on WiMAX	Resource dilution	Resource dilution	Programmable, no RF

Beceem WiMAX Summary

• Beceem Summary

- Exclusively focused on Mobile WiMAX 16e terminal chips
 - The only company dedicated to making WiMAX Work!
- Unmatched Mobile WiMAX Expertise
 - Best hand-off performance and 3.5GHz mobility pioneer
- Technology & Product Leadership
 - >30 Mbps throughput; 65nm single chip
- Broad ecosystem of capable device partners
 - Modems, CPEs, embedded computing and media devices, handhelds
- Key enabler of the MOBILE Market
 - Handoff performance, multi-mode support and co-existence
- Leading supplier to Clearwire and UQ
 - Will drive >>50% market share in Mobile WiMAX in 2009
- Emerging leader in the FIXED Market
 - Integrated CPE chip raises performance and lowers cost



Thank You



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