Federal Communications Commission
Washington, D.C. 20554

ORIGINAL

EX PARTE OR LATE FILED

April 26, 2011

Ms. Marlene Dortch
Secretary
Federal Communications Commission
445 12th Street, NW
Washington, D.C. 20554

Re: 700 MHz Interoperability Workshop, RM No. 11592

Dear Ms. Dortch:

On Tuesday, April 26, 2011, the Federal Communication Commission's (FCC) Wireless Telecommunications Bureau (WTB) held a workshop on the interoperability of customer mobile equipment across commercial spectrum blocks in the 700 MHz Band. This event focused on exploring solutions for promoting the development and availability of equipment for the 700 MHz band. In addition, the workshop discussed providers' technology choices for the 700 MHz band, including the planned deployment of Long Term Evolution (LTE) technology by certain providers, and how these technology choices can affect equipment availability, competition, and roaming. The workshop was held from 9:00 a.m. to 12:00 p.m. in the Commission Meeting Room at FCC Headquarters in Washington, DC.

The workshop was broadcast live with open captioning over the Internet from the FCC's web page and is available for review at http://beta.fcc.gov/event/700-mhz-interoperability-workshop. Please enter this link into the official record for the above-referenced proceeding.

Sincerely,

Nicole M. McGinnis
Assistant Chief
Spectrum Competition & Policy Division
Wireless Telecommunications Bureau

700 MHz INTEROPERABILITY WORKSHOP
Presentation

RM-11592

April 26, 2011

Doug Hyslop – Partner,
Wireless Strategy

wireless strategy

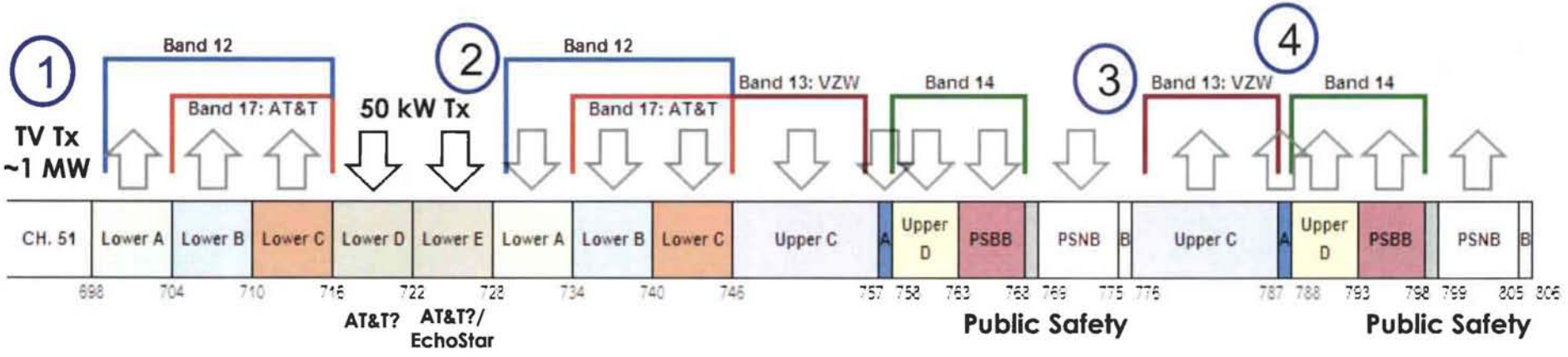
the business of wireless technology

700 MHz Interoperability

April 26, 2011

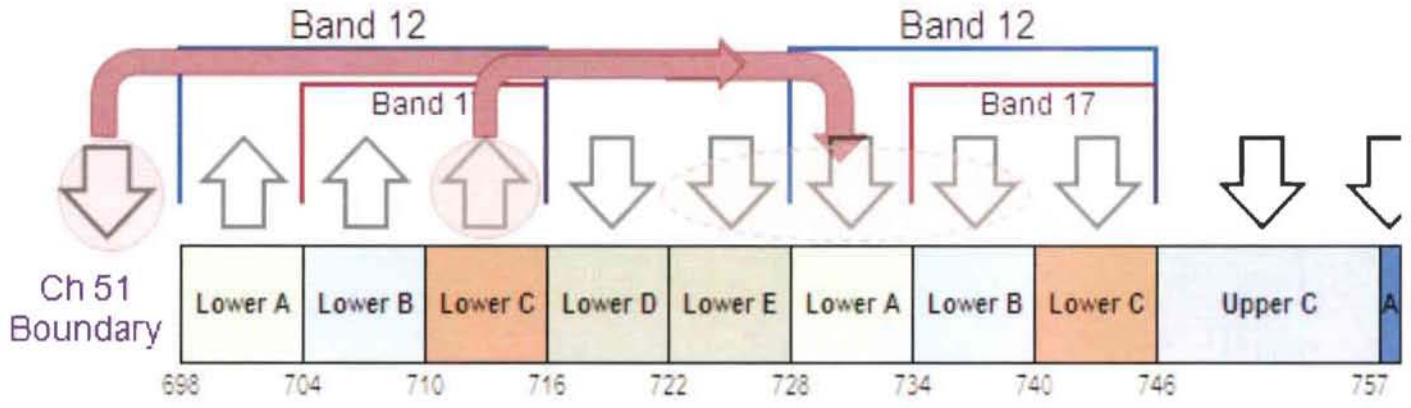
Doug Hyslop
doug@wirelessstrategy.com

US 700 MHz Band Interoperability



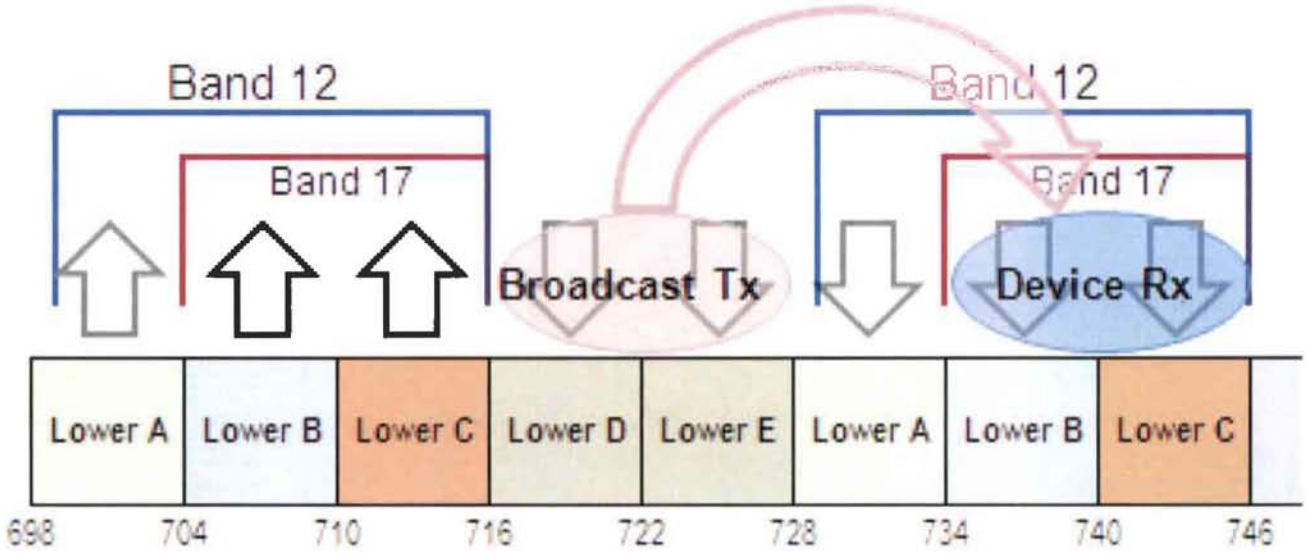
- Lower 700 MHz Band discussion points:
  1. Ch 51 reverse power amplifier intermodulation
  2. Lower D and E broadcast transmissions causing receiver desense
- Upper 700 MHz Band discussion points:
  3. Device transmit emissions into Public Safety Narrowband (PSNB) device receive spectrum
  4. Device transmit creating second harmonic interference to GPS reception
- Equipment specifications and, in some cases, normal network coordination adequately controls any potential interference

Lower 700 Reverse PA Intermodulation



- Reverse PA intermodulation involves a mixing of two transmit signals:
  - A strong Channel 51 signal at the device antenna mixes with a high-power device transmission in the Lower B+C block
  - Intermodulation products may fall within the same device's receive blocks
- Device specifications and deployment scenarios play a role in whether this interference would occur

Lower D and E Broadcast Transmissions



- Band 17 proponents are concerned about device receiver blocking near high-power Lower D and E broadcast transmissions

700 MHz Interoperability Summary

wireless strategy

- Lower 700 MHz Band devices should use Band 12
  - Channel 51 interference potential to Lower B and C is unlikely to occur, and if it does, modest network coordination eliminates the issue
  - Lower D and E block interference is no longer a concern given Qualcomm's abandonment of the MediaFLO business plan
- Upper 700 MHz Band devices should use a single band class encompassing Bands 13 and 14
  - PSNB protection criteria is met through the device emissions mask
  - GPS harmonics issue is well handled through device design and normal filtering

700 MHz INTEROPERABILITY WORKSHOP
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April 26, 2011

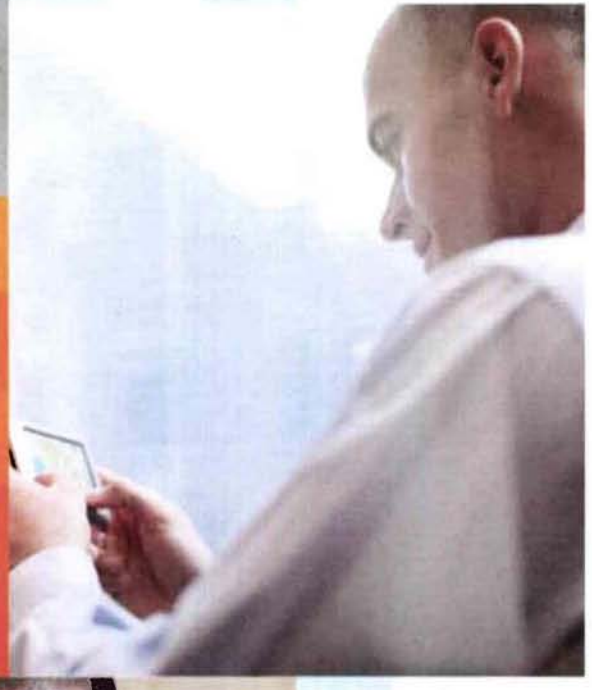
Gene Fong – Senior Staff Engineer,
Qualcomm CDMA Technologies

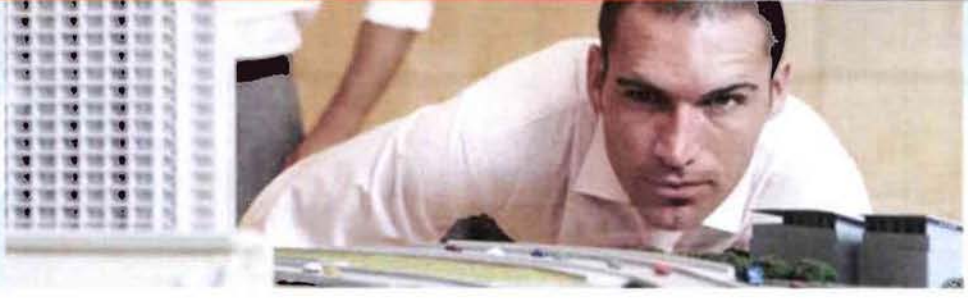
QUALCOMM

FCC 700 MHz Meeting

Gene Fong
gfong@qualcomm.com

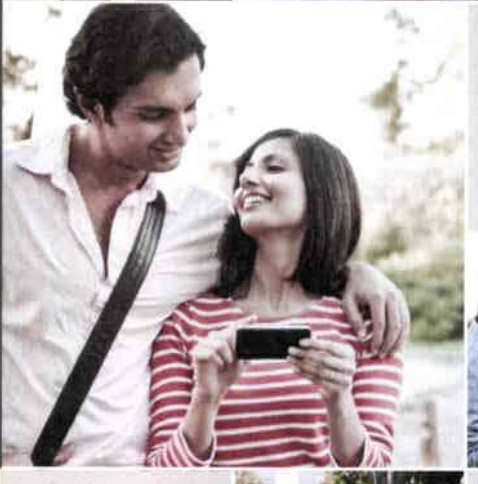
April 26, 2011





Qualcomm Is a World Leader in Next-Generation Mobile Technologies

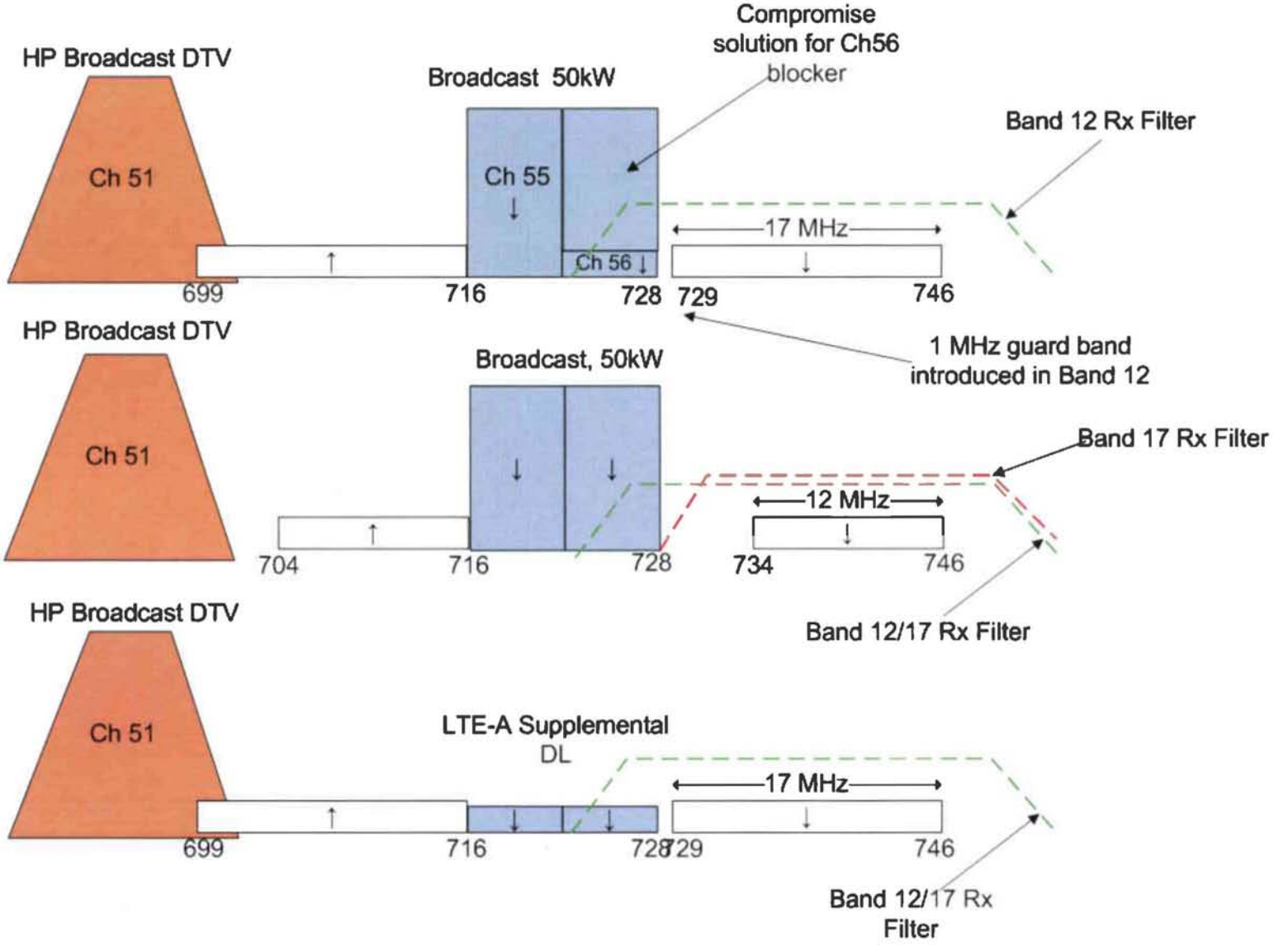
- Celebrating 25 years of driving the evolution of wireless communications
- Making wireless more personal, affordable & accessible to people everywhere
- World's largest fabless semiconductor company, #1 in wireless
- S&P 100 / S&P 500 / Fortune 500



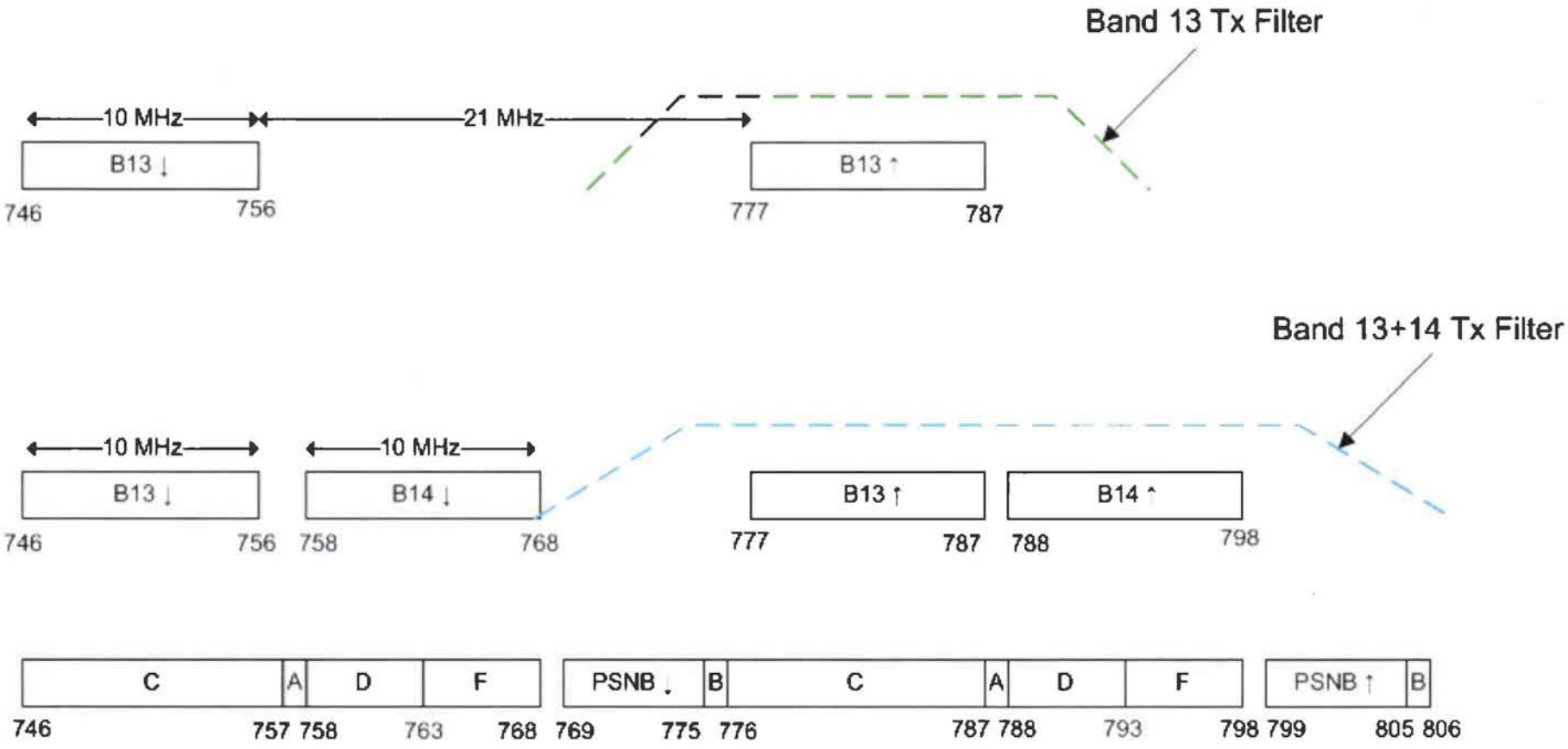
Qualcomm Chipset Solutions

- Qualcomm chips are all multi-mode (e.g., LTE, 3G & 2G) & multi-band (cellular, PCS, AWS, and 700 MHz). Our goal is to provide as much capability and band support as possible within size, cost, and other constraints.
- Qualcomm chips are not currently able to support more than two bands below 1 GHz and three above 1 GHz. Due to this limitation, Qualcomm cannot now support more than one 700 MHz band plus the cellular band. However, Qualcomm continues to work towards extending the capabilities of the chipset.
  - Technical challenges exist in combining multiple 700 MHz bands
  - Lower 700 MHz: Band 12 + Band 17
  - Upper 700 MHz: Band 13 + Band 14

Lower 700 MHz



Upper 700 MHz



QUALCOMM

- Thank you!

700 MHz INTEROPERABILITY WORKSHOP
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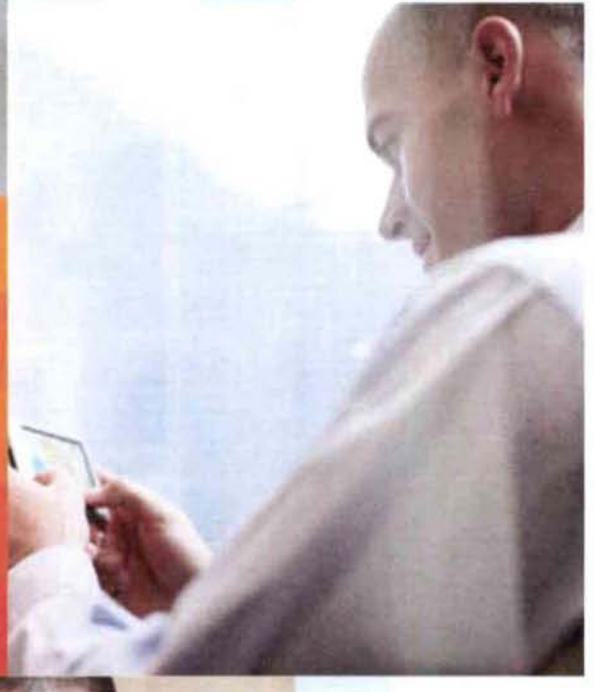
April 26, 2011

Michael Chard – Senior Director,
Business Development, Qualcomm CDMA Technologies

QUALCOMM®



FCC 700 MHz Meeting

Michael Chard

April 26, 2011

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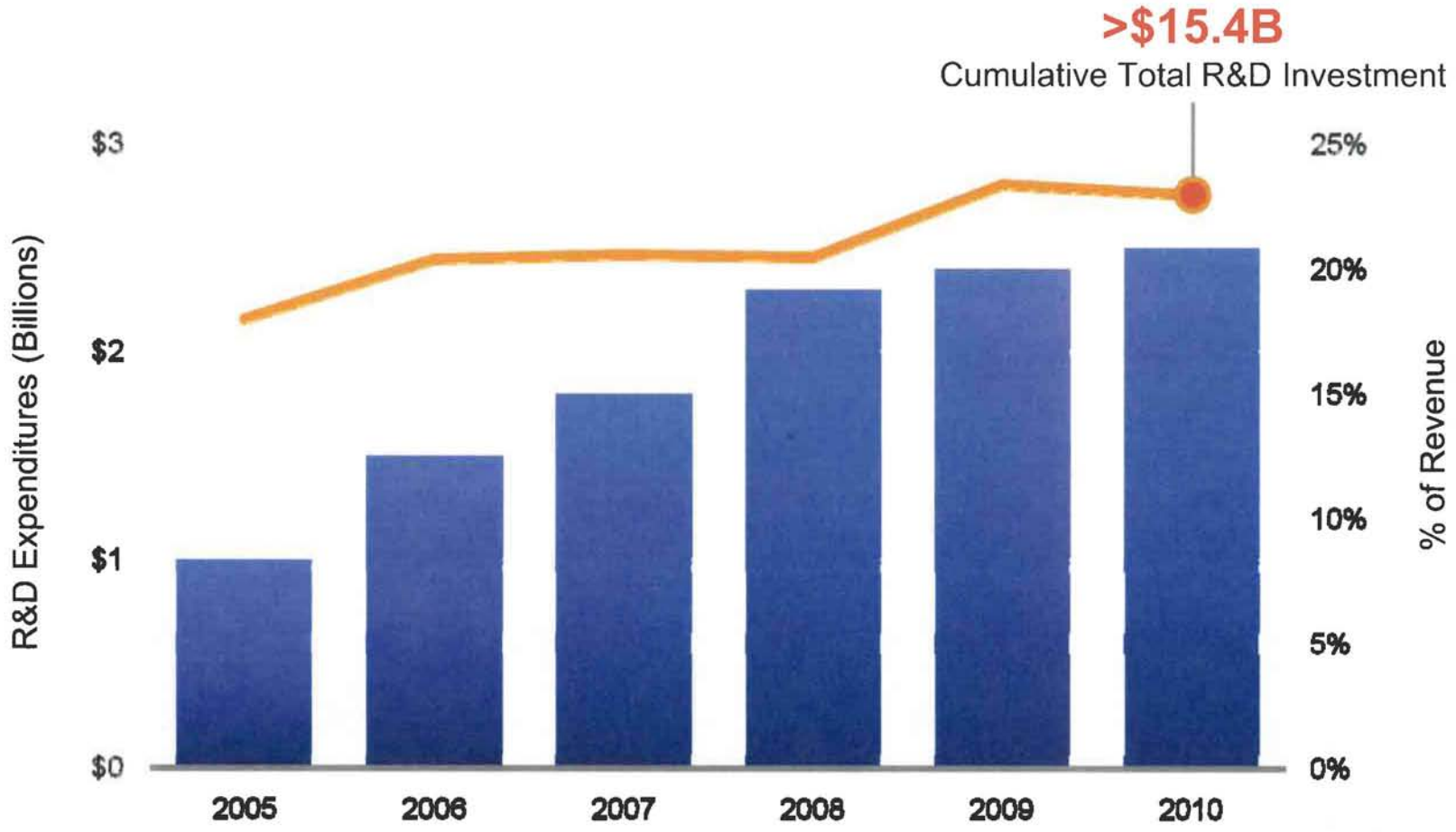
Qualcomm CDMA Technologies

OUR CHIPSETS CONNECT AND POWER LEADING DEVICES
WITH INTEGRATED AND DISCRETE 3G, 4G, LTE AND MULTI-MODE

Continuing Strategic R&D Investments

QUALCOMM GAAP FISCAL YEAR R&D EXPENDITURES



Qualcomm Multi-Mode, Multi-Band Solutions

- Our chips are all multi-mode (e.g., LTE, 3G & 2G) & multi-band (cellular, PCS, AWS, and 700 MHz). We strive to provide support for the most capabilities and bands possible, within cost, size & other constraints, for devices using our chips to ensure that our operator partners can provide the widest possible interoperable coverage to their subscribers.
- We have chips available for each of the 700 MHz paired spectrum blocks owned by US operators (Lower A, B, & C & Upper C) that support LTE/3G/2G technologies & also support cellular, PCS, & AWS frequency bands.

QCT MDM 9x00 Roadmap

	In Production	2011				2012			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4

MDM9600

RF support:

3GPP2 : 450 MHz, 700 MHz, 800MHz(BCO/BC10 &JCDMA), 1800MHz(KPCS), 1900MHz(PCS+Block G), 1700MHz (AWS), 2100MHz (IMT), 2500 MHz, S and L bands

3GPP: 700 MHz, 800 MHz, 850 MHz, 900 MHz, 1700 MHz, 1800 MHz, 1900 MHz, 2100 MHz, 2300MHz, 2600 MHz

Industry's first standards-compliant LTE/3G multi-mode fully-tested solution available now supporting:

-1X Advanced,
-1xEV-DO Rev. A/B,
-GSM/GPRS/EDGE,
-DC-HSPA+ Release 8
-LTE Release 8

Support for 700 MHz Band 12/cellular/PCS/AWS:

Commercial samples of the MDM 9600 using the RTR8600 available September 2011, assuming component availability.

MDM9x00 Modem Capabilities

Technology	Peak Data rate DL/UL	Bandwidth(s) supported	DL MIMO
LTE	FDD: 100/50 Mbps[1] TDD: 68/17 Mbps[2] (Category 3)	1.4, 3, 5, 10, 15, 20 MHz	2x2 SU-MIMO 4x2 SU-MIMO
DO Rev B[4]	14.7/5.4 Mbps	1.25, 2.5, 3.75 MHz[3]	No
DO Rev A	3.1/1.8 Mbps	1.25 MHz	No
DO Rel 0	2.4 Mbps/153.6 Kbps	1.25 MHz	No
1x Advanced	307.2 /307.2 Kbps	1.25 MHz	No
DC-HSPA+ Rel8	42/5.76 Mbps	5, 10 MHz	Rel 8 2x2 MIMO
HSPA+ Rel7	28/11.4 Mbps	5MHz	Rel 7 2x2 MIMO
HSPA Rel 6	14.4/5.76 Mbps	5MHz	No
WCDMA R99	384 Kbps	5MHz	No
GPRS/EDGE	296/236.8 Kbps (MSC 33)	200 KHz	No

[1]Requires >10 MHz BW

[2]TDD peak rates based on 20 MHz with 6:3 DL/UL ratio. Other DL/UL configurations supported

[3]BW's greater than 1.25 MHz applicable for DO Rev B and represent 2x and 3x baseband carrier configurations. Baseband carriers can be located within 10 MHz RF B

[4]c2K upto RevB applicable to MDM9600 only version.

- Thank you!

700 MHz INTEROPERABILITY WORKSHOP

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April 26, 2011

William H. Stone - Executive Director of Network Strategy
Verizon Wireless

FCC Panel

Bill Stone

April, 2011