



**SIGN UP for a chance to win a VISA GIFT CARD**



Sign up to receive our daily eNewsletter between now and January 31, 2010 and you could win one of 6 Visa gift cards.\*

\*See contest rules at <http://www.rcrwireless.com/section/rules/>

[Subscribe](#) [My Account](#) Text size: [A](#) [A](#) [A](#)

[follow us on twitter](#)
[facebook fan page](#)
[email updates](#)
[exclusive video](#)
[rss feeds](#)

**RCR Ecosystem Segments**

What is the RCR Ecosystem?

- [BSS | OSS](#)
- [Carriers](#)
- [Chips](#)
- [Customers](#)
- [Devices](#)
- [Content & Mobile Marketing](#)
- [The Channel](#)
- [Enabler Apps](#)
- [Facilitators](#)
- [Infrastructure](#)

**Features**

- [Video](#)
- [Opinion](#)
- [Worst of the Week](#)
- [Analyst Angle](#)
- [Reality Check](#)
- [Reader Forum](#)
- [25 Years of Wireless](#)

[-SIGN UP FOR EMAIL ALERTS](#)

[Article Archive](#)

[Glossary](#)



REGISTER TODAY | [CESWEB.ORG](http://CESWEB.ORG)

**Reality Check: The heat is on**

**INCREASINGLY HIGHER SPEEDS INTRODUCE THERMAL CHALLENGES IN MOBILE DATA DEVICES**

December 8 2009 - 6:00 am ET | Rob Rovetta, VP of Products, Quantance Inc. | [RCR Wireless News](#)

0 tweet



Rob Rovetta, VP of Products, Quantance Inc.

***Editor's Note:** Welcome to our weekly Reality Check column. We've gathered a group of visionaries and veterans in the mobile industry to give their insights into the marketplace.*

Wireless service providers and their manufacturing partners are feeling the heat to deliver a wide range of new devices that will enable consumers to communicate via voice, Internet, e-mail and social networks at increasingly higher data speeds while on the go. But consumers are feeling a bit of their own heat – from the smartphones and data cards themselves, which in some cases tend to overheat in their hands with even basic use.

The excessive heat generated by today's smartphones and data cards is not an insignificant matter. This problem is discussed often on message boards, product forums and in the media. In some extreme cases, it has even resulted in product recalls. Over the last year, reports have surfaced from France about the iPhone overheating, with some devices even reportedly exploding in users' hands. And early in 2009, NTT DoCoMo suspended sales of the new BlackBerry Bold in Japan because of multiple complaints about the device becoming too hot. These well-publicized examples of overheating smartphones are not the only concerns for wireless data users. Complaints about hot data cards also are common fodder on industry and consumer forums, where performance issues are discussed.

**The root causes of overheating**

Very few of today's smartphones and data cards are immune to these thermal problems, unfortunately. For these devices to access high-speed data wirelessly, they must use significantly more transmit power to connect to the cell tower. However, today's mobile devices typically have transmit circuits that use power amplifier designed for voice communications. These PAs are incapable of efficiently producing the maximum signal strength needed to support high-speed data in all conditions. The effort to support high-speed data requires the transmit circuit of the smartphone or data card to operate at higher power and for longer periods than the circuits were designed to easily support. The strain

**RCR Featured Video:**

*Cameron Clayton, VP Mobile, Weather Channel, Part 1*



Site Search  [GO »](#)

[Advanced search](#)

**RCR Wireless**  
INTELLIGENCE ON ALL THINGS WIRELESS

**SIGN UP for a chance to win a VISA GIFT CARD**

Sign up to receive our daily eNewsletter between now and January 31, 2010 and you could win one of 6 Visa gift cards.\*

\*See contest rules at <http://www.rcrwireless.com/section/rules/>

**Free Reports**

- [10 Trends in Wireless Mobility Special Report](#)
- [7 Top Trends on Wireless Providers](#)
- [The challenges of wireless telemetry](#)

**About Us**

- [Editorial Calendar](#)
- [Advertising](#)
- [Contact Us](#)
- [Our Products](#)
- [Reprint Info](#)

**From Our Sponsors**

- [Hot Jobs](#)
- [White Papers](#)
- [Podcasts](#)
- [Business Software](#)
- [Dealers Wanted](#)
- [Equipment for Sale](#)
- [Equipment Wanted](#)
- [Licensing Services](#)

**Resources**

- [Wireless Industry Market Data](#)
- [Glossary](#)
- [Cartoons](#)
- [Stock Watch](#)
- [Online Directory](#)
- [Top 10 Lists](#)
- [Financial Ratings](#)
- [VC Financing](#)
- [Infrastructure Awards](#)
- [Events Calendar](#)
- [Article Archive](#)
- [Email Alert Contest Rules](#)
- [RSS Feed](#)

## Solar Energy Charity

Helping  
Relieve  
Poverty  
Though The  
Provision of  
Solar Energy.  
Join Us!

Public Service Ads  
by Google

on overworked and inefficient components results in heat that can become quite noticeable.

Thermal images of a high-speed USB data card with the plastic case removed, measured at room temperature and operating at peak transmit power shows a PA case temperature of greater than 91 degrees celsius (196 degrees fahrenheit). The PA heats up even more if the plastic case is put back on, and of course the PA temperature will further increase if the data card is used in conditions above room temperature, which is very common. Similar measurement for a smart phone, also with the plastic case removed, measured at room temperature, and operating at peak transmit power show a PA temperature to be greater than 86 degrees celsius (189 degrees fahrenheit). Clearly, the PAs used in today's data cards and smartphones are one of the hottest items in the device and thus a primary cause for consumer complaints about heat. It is also worth noting that the operational specification for these PAs states the maximum case temperature should be limited to 90 degrees celsius, so even under fairly benign conditions, the PA is already being pushed to its thermal limit.

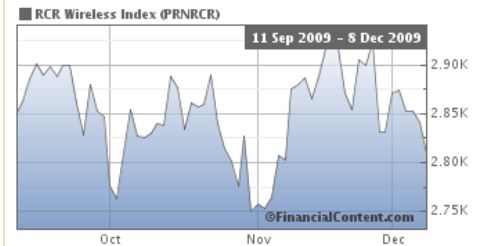
The overheating problem will likely get worse as wireless standards increase signal complexity and push data speeds higher, requiring even more power. Wireless carriers are enhancing their underlying network technology to handle faster data speeds and accommodate demand for mobile data services, which are expected soon to eclipse voice services for mobile devices. The first step toward higher 3G performance was the introduction of the high-speed packet access (HSPA) standard. This standard was quickly followed by evolved HSPA (HSPA+), which increases data capacity and doubles uplink speeds of HSPA. The relative density of information for HSPA+ signals is four times that of HSPA. The increased signal complexity of HSPA+ requires more signal power than HSPA to achieve the publicized benefit, which will put even more strain on the devices' circuitry and cause further risk of overheating.

### The design challenge

Designers of smartphones and data cards are quite familiar with the thermal issues that high-speed data introduces to the devices. To date, they have been altering their system behavior to accommodate the heat issue by reducing power so the PA has less chance of overheating, and kept below the 90°C temperature limit mentioned earlier. This approach requires that the PA not work at peak power for a long period. As a result, wireless devices are designed to operate several dB below peak power. But when designers reduce power by 3 dB, for example, the power is reduced by half. Operating with only half the peak power presents consumers with two serious problems that create angst and frustration: 1) smartphones and data cards are unable to send data as quickly as most users would like, and 2) in areas where wireless coverage is spotty, users may be unable to make a connection. Solving this problem by reducing power is far from optimal because it adversely impacts consumer satisfaction with both their mobile device and their wireless service provider.

Professional Services  
Tower Acquisitions  
Tower Services  
Tower Space  
Training Services

## RCR Wireless Stock Index



### Popular Tags

4G Android Apple AT&T blackberry  
carrier carriers cdma clearwire Content &  
Mobile Marketing Ericsson fcc Google handsets  
HTC infrastructure iphone LTE Microsoft  
Mobile Devices Motorola networks Nokia  
operator operators Opinion Reality Check  
column Retail Samsung smartphone  
smartphones Sprint Nextel T-Mobile  
tower towers Verizon wi-fi wimax Wireless  
Providers Wireless Technology

The other way to significantly minimize thermal issues is to fix the problem at its root. Innovative technologies available now can enable handset and data card designers to do just that. By making the PA more efficient, these new technologies allow them to operate below PA junction temperature thermal limits, while increasing the level of signal power to a point that supports the higher data speeds and performance levels being advertised. Doing so actually enables an *increase* in maximum power without creating a thermal problem for the PA, or the consumer device.

These thermal improvements at the core of the design will become even more important as new standards, such as HSPA+, require more power to deliver the level of high-speed data access that consumers expect from their smartphone or data card. Wireless providers and device manufacturers want to deliver products and services that consumers want: a smartphone that doesn't sear their palms or make it impossible to connect when they really need to. The best solution is simple with the latest technology available today. Now the heat is on the industry to make it happen.

*Rob Rovetta, VP of Products for Quantance Inc., has over 25 years of experience in wireless communications, GPS and digital processing systems in both business and engineering roles. Prior to Quantance, he was senior director of Product Management at Qualcomm's chip division, QCT, responsible for defining strategic opportunities, marketing, licensing and launching assisted-GPS (AGPS) and Qualcomm's gpsOne technology in location-based services worldwide. Rob came to Qualcomm from SnapTrack Inc., the start-up that pioneered AGPS, where he was responsible for licensing AGPS silicon and software to chip manufacturers and handset OEMs. Prior to SnapTrack, Rob held leadership positions for Magellan Corp. and Trimble Navigation, where he led business development and product management for GPS-enabled enterprise and consumer products. Before the GPS and communication industries, Rob worked for ROLM Corp., where he had product management, program management, and system engineering responsibilities for digital processing systems. Rob started his career as a member of the development engineering staff at ESL/TRW, where he designed and produced VHF, UHF and microwave antenna systems for strategic and tactical reconnaissance. Rob earned a B.S. degree in Electrical Engineering from the University of California at Davis.*

[Email Article](#) | [Print Article](#) | [Permalink](#) | [BOOKMARK](#) 

---

#### POST A COMMENT

|                      |  |
|----------------------|--|
| <input type="text"/> | Name (required)                          |
| <input type="text"/> | Email (will not be published) (required) |
| <input type="text"/> |  |

|                      |                           |                           |                                 |                          |                          |                             |                              |                             |                            |                          |
|----------------------|---------------------------|---------------------------|---------------------------------|--------------------------|--------------------------|-----------------------------|------------------------------|-----------------------------|----------------------------|--------------------------|
| <a href="#">Home</a> | <a href="#">Subscribe</a> | <a href="#">RCR Local</a> | <a href="#">Special Edition</a> | <a href="#">Webinars</a> | <a href="#">Hot Jobs</a> | <a href="#">Stock Watch</a> | <a href="#">Free Reports</a> | <a href="#">Marketplace</a> | <a href="#">My Account</a> | <a href="#">About Us</a> |
|----------------------|---------------------------|---------------------------|---------------------------------|--------------------------|--------------------------|-----------------------------|------------------------------|-----------------------------|----------------------------|--------------------------|

[Submit Comment »](#)

[\[Post a comment to this article\]](#) [\[Hide\]](#)

**SPONSORED CONTENT**

**Whitepaper: From ATM to IP/Ethernet: Three Strategies for Cost-Effective Network Convergence**



Learn to mitigate risk within your existing ATM network while efficiently migrating to meet coming demand through a single, converged platform.

[Download the Free Whitepaper](#)

**Webinar: Huawei Technologies USA as your Rural Broadband Solutions Provider**



**HUAWEI**

Charlie Martin, Wireless CTO for Huawei Technologies, USA addresses the opportunities afforded by the recent American

Recovery and Reinvestment Act (ARRA) package that was signed into law in early 2009 which provides more than seven billion dollars of funding for broadband services for rural, underserved, and unserved communities.

[Watch the Recorded Webinar](#)

**Top 5 Tekelec Downloads**



For more than 30 years, Tekelec has consistently anticipated the evolution of the telecom market and developed the technology to deal with changing network complexities, enabling our customers to deliver their own innovative products and services.

- [SMS Network Application Handbook](#)
- [SIP Pocket Guide](#)
- [Monitoring LTE Networks](#)
- [Telecom 2.0: Guidelines for Service Provider Success](#)
- [SIP Signaling Router Application Handbook](#)

**Free Report: 7 Top Trends on Wireless Providers**  
2009 Update on Wireless Carriers Market; Operators Under Pressure



Wireless service providers offer global connectivity to a world on the go. Take an in-depth look at the pressures they are facing.



[Download this free report](#)

**RCR WIRELESS NEWS : INTELLIGENCE ON ALL THINGS WIRELESS**

**RCR GET IN TOUCH**

- Contact Us
- Speak at Local Event
- Submit Movers & Shakers
- Submit Press Release
- Submit Whitepaper
- Submit Video
- Post Jobs
- Search 150K Resumes
- Branding and Advertising
- Lead Gen - Customers
- Lead Gen - Talent

**ARDEN DIGITAL COMMUNITY**

- RCR Wireless News
- RCR Ecosystem
- RCR Local
- RCR Ecosystem Awards
- TelecomCareers.net
- ITJobs.net

**RCR NETWORKING PARTNERS**

- CDMA Development Group
- PCIA
- Telecom Council of Silicon Val.

**RCR ECOSYSTEM MARKET PARTNERS**

- |               |             |
|---------------|-------------|
| Atlanta       | Austin      |
| Barcelona     | Beijing     |
| Berlin        | Boston      |
| Chicago       | Dallas      |
| Denver        | Hong Kong   |
| London        | Los Angeles |
| New Dehli     | New Jersey  |
| New York City | San Diego   |
| San Francisco | Sao Paulo   |
| Seattle       | Tokyo       |

**RCR ECOSYSTEM SPONSORS**

- BCI Communications
  - Crown Castle International
  - Anritsu Corporation
  - Tessco Technologies
  - Global Results Communications
- Become a Partner**

[Article Archive](#) | [Wireless Jobs](#) | [Email Alerts](#) | [Advertise](#) | [Stock Watch](#) | [Glossary](#) | [Contact Us](#) | [Privacy Policy](#) | [RSS](#)