

# Tech Exchange - Power Efficiency

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### **1. What do you consider as most critical to deliver the right RF components to enable the coming wideband wireless networks for 4G and beyond?**

We believe the most critical factors as an RF component supplier are to deliver the most compelling performance, lowest power consumption and widest bandwidth capability 4G RF components, while driving the most cost-effective solutions to our customers. In doing so, we help solve some of the most challenging problems faced every day as designers constantly make difficult design trade-offs.

### **2. What are the technical challenges to ensure smooth rollout of 4G wireless services?**

4G wireless equipment is packed with ever-increasing electronics with the deployment of MIMO (Multiple-Input/Multiple-Output), with more transmitter and receiver channels cramped into a small enclosure, which must be convection cooled, not air cooled. So the challenge is packing more through thoughtful integration while driving the power consumption much lower than ever to keep the potentially destructive self-heating to a manageable level without negatively impacting the long-term reliability of the network equipment. And the network trend of migration toward smaller cells compounds the RF interference problem by creating denser networks. So the performance requirements of RF components are actually increasing, not lowered.

### **3. What are you doing to resolve the trade-offs among low power consumption, high performance and wide bandwidth of RF components that are at odds to one another?**

Linear Technology takes on the diametrically opposing trade-off challenges with added rigor by designing RF components that are much lower power consumption, very wide frequency range and high bandwidth, all without sacrificing performance. We leverage our design expertise as well as our advanced Silicon Germanium RF processes to drive device performance to a level that truly differentiates our products from the competition. An example of such accomplishment is our latest generation LTC5567 single mixer and our LTC5569 dual mixer, which with a single part can cover all 700MHz to 2.7GHz cellular bands. They consume less than one-half the supply current of competing solutions, and they support wide bandwidth to over 500MHz. To help with the size constraints, these mixers are designed with minimum external components. So the total solution size is less than one-half that of the competition. We are doing our part to help make 4G realizable.

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Published on Wireless Design & Development (<http://www.wirelessdesignmag.com>)

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July 23, 2012

**Source URL (retrieved on 03/06/2015 - 5:54pm):**

[http://www.wirelessdesignmag.com/blogs/2012/07/tech-exchange-power-efficiency?qt-digital\\_editions=0](http://www.wirelessdesignmag.com/blogs/2012/07/tech-exchange-power-efficiency?qt-digital_editions=0)