

Energy Efficiency in Telecom Equipment

By Linnea Brush, Senior Analyst, Darnell Group

Energy efficiency is a major feature driving power supply sales in all regions of the world. Telecommunications carriers are looking to lower their utility bills, just like data center operators. In Europe, regulatory actions could have an impact on rectifier design, particularly for broadband applications.

The European Commission (EC) has been working since 1997 on power supply efficiency, and more recently on uninterruptible power supplies and data centers. Some of these topics will be addressed in the Digital Power Europe forum in Munich on 13 – 15 November.

In 2006, the EC issued the Code of Conduct (CoC) on Energy Consumption of Broadband Equipment. Tier 1 entered into force in January, 2007, and Tier 2 will start in January, 2008 and be valid for one year. The CoC is a voluntary base initiative with the aim of targeting "reduced energy consumption of broadband communication equipment without hampering the fast technological developments and the service provided."

One of the aims for both network and customer equipment is to require power reduction and adoption of power management

(low power modes L2/L3) for new ADSL2+/VDSL2 systems. The requirements on power reduction push for specific study and development of energy efficient equipment, while the implementation of power management would allow benefits from time periods when data traffic is limited or absent.

Telecom Italia Group is actively involved in this initiative, and in a presentation at Intelec, 2007, they indicated that the power targets are challenging. The 2008 goals will imply "a complete redesign of xDSL chips and systems, and the development of power management mechanisms will require analysis and proposals in conjunction with standardization bodies (ITU-T/ETSI)." In fact, a proposal to start standardization activities on power consumption reduction of DSL equipment has been presented with wide support from operators and accepted (ETSI TM6 and ITU-T SG15).

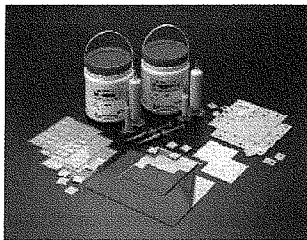
Network equipment covered under the CoC includes DSL ports, combined ports, ISDN terminators at customer premises, WiMAX base stations, PLC and cable service provider equipment and optical network terminals. Tier 1 and Tier 2 refer to the maximum power consumption targets (power measured on the 230Vac input).

Optimizing a base station's power efficiency is a key consideration for companies in the telecommunications industry. Significant efforts are being made to reduce the overall energy consumption of base stations to lessen their impact on the environment. The principal day-to-day running cost in a base station is electrical energy. As rectifiers are replaced, the replacements tend to be more energy efficient than the previous models. The priority for rectifier replacement is usually reliability, but energy efficiency has become a close second.

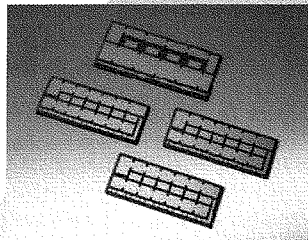
For example, the power amplifier (PA) can consume more than one-half of the required power for a base station, so optimizing its power efficiency improves operational performance and provides environmental and financial benefits. In the latest-generation (2.5G and 3G) base stations, design strategies include methods for achieving high linearity while also minimizing power consumption. By monitoring and controlling the performance of the base station's PA, it is possible to maximize the PA's output power while achieving optimum linearity and efficiency.

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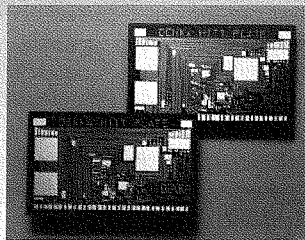
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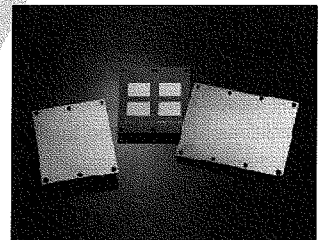
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