

# The Tinker's Toolbox - the First 3G CMOS RF Power Amplifier

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Hosted by ECN's Editorial Director, Alix Paultre, the Tinker's Toolbox is ECN's web-based interview show where we talk about the latest technology, components, and design issues for the electronic design engineering community.



In this episode of the Tinker's Toolbox we talk to Jim Nohrden of [Black Sand](#) [1] about their 3G CMOS RF power amplifier (PA) products. The devices promise to significantly improve the reliability and data throughput of mobile products, and are designed as a drop-in replacement for existing 3G GaAs RF PAs.

[Right-click to download the podcast](#) [2]

[Here is another link to the podcast](#) [2].

[Here is a link to the product family presentation.](#) [3]

### **Here is the press release:**

Black Sand Technologies, Inc, a fabless semiconductor company specializing in advanced power amplifier technology for wireless applications, has launched two new 3G CMOS RF power amplifier (PA) product lines that significantly improve the reliability and data throughput of mobile phones, tablets and datacards.

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The BST34 series of power amplifiers has been designed as a drop-in replacement for existing 3G GaAs RF PAs and, as such, are fully function and pin-compatible. Switching from GaAs to CMOS enables mobile device manufacturers to benefit from an improved supply chain, higher reliability, and lower cost.

The BST35 series, with its TruePower high-performance power detector, improves total radiated power (TRP) performance by up to 2dB; reducing the incidence of dropped calls and increasing the data rates in real-world operating environments. The BST3501 is the industry's first chip to bring this functionality to the RF front end. The device's performance figures match or exceed those of GaAs power amplifier ICs for output power, linearity, efficiency and noise.

The first products in each series are available immediately. The launch follows Black Sand's previous news announcing demonstration of the world's first 3G CMOS PA. John Diehl, CEO of Black Sand said: "Our technology has gained a strong positive reaction from both our initial customers and mobile operators. In particular, the BST35 products help smartphone and datacard companies both meet their industrial design goals and achieve good TRP performance in the real world - ensuring fewer dropped calls and faster data speeds with no additional eBOM components or cost."

Jim Nohrden, VP marketing at Black Sand said: "Mobile device manufacturers are looking for an alternative to GaAs PA technology, which has a known history of supply shortages and higher cost-structure. The BST34 and BST35 products give our customers the rapid access to PA technology they need for ultra-high volume manufacturing.

"We have a strategic supply base larger than all existing GaAs PA vendors combined and this will prove critical as the market continues to adopt 3G mobile devices, which have three to four times as many PAs as 2G phones. Our products will offer our customers better performance and a more reliable source of supply in 2011."

### **Technical specifications:**

The BST34 and BST35 series are packaged in a 3x3mm 10pin form factor. The BST34 series products include an integrated directional coupler with daisy-chain support, integrated overvoltage and over-temperature protection circuitry. The

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BST35 products include Black Sand's TrueDelivered™ power detection technology and are robust to 100:1 VSWR, 10 times that of GaAs power amplifiers.

The BST34 product line includes: BST3401 for "2100" Band-1 (1920-1980 MHz), BST3402 for PCS Band-2 (1850-1910 MHz) and BST3404 for AWS Band-4 (1710-1755 MHz), Japanese Band-9 (1749.9 - 1784.9 MHz) and Latin American Band-10 (1710-1770 MHz).

The BST35 product line includes: BST3501 for "2100" Band-1 (1920-1980 MHz), BST3502 for PCS Band-2 (1850-1910 MHz) and BST3504 for AWS Band-2 (1710-1755 MHz), Japanese Band-9 (1749.9 - 1784.9 MHz) and Latin American Band-10 (1710-1770 MHz). These 3 products are packaged in a 3x3mm 10pin package.

The BST3401 and BST3501 chips and evaluation boards are sampling now. The BST3402, BST3502, BST3404 and BST3504 will sample in Q2 2011.

### About Black Sand Technologies:

Founded in 2005, Black Sand Technologies, Inc. is a fabless semiconductor company dedicated to building solutions for the wireless industry by combining sensitive analog and powerful digital circuits in silicon. Black Sand's unique combination of patented mixed-signal technology and industry experience will lead the way to new levels of cost and performance in wireless products of the future. Black Sand is based in Austin, Texas, and is funded by Austin Ventures and Northbridge Venture Partners. For more information, please visit [www.blacksand.com](http://www.blacksand.com) [4].

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### Links:

[1] <http://www.blacksand.com/>

[2] <http://www.ecnmag.com/sites/ecnmag.com/files/legacyfiles/ECN/Multimedia/Audio/2011/02/black-sand.mp3>

[3] [http://www.ecnmag.com/sites/ecnmag.com/files/legacyfiles/ECN/Multimedia/Audio/2011/02/BST35xx\\_34xx\\_presentation\\_\(AEDN\)Embargo\\_until\\_20th\\_January.pdf](http://www.ecnmag.com/sites/ecnmag.com/files/legacyfiles/ECN/Multimedia/Audio/2011/02/BST35xx_34xx_presentation_(AEDN)Embargo_until_20th_January.pdf)

[4] <http://www.blacksand.com>