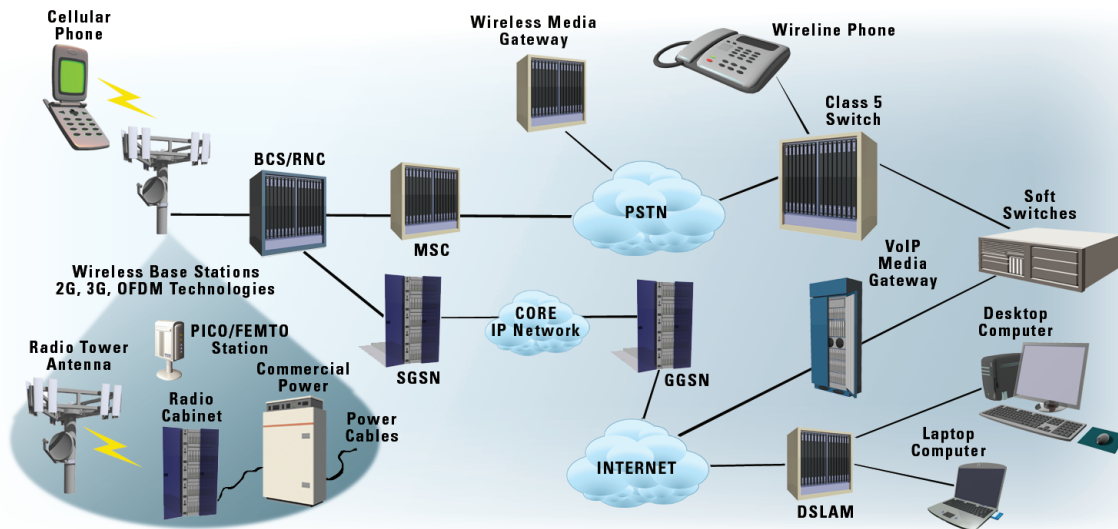*Product Bulletin – Communications Infrastructure*

DSP System Solutions:
Wireless and Carrier Infrastructure
Enabling Convergence

TI's broad portfolio of DSP solutions provides high performance, flexibility and reliability for wireless and wired network infrastructure equipment.

Today's rapid changes in communications demand adaptability. Higher-bandwidth transmissions, the increased use of packet-based switching, the convergence of wired and wireless networks, and new delivery services for voice, data and video: these and other factors continually are changing the communications environment. In order to adapt to these changes, equipment manufacturers and service providers are forced to look for solutions that offer flexibility as well as performance, reliability and ease of use.

Texas Instruments (TI) supplies a comprehensive range of system-on-a-chip (SOC) technology that enables adaptation in the evolving communications industry. TI's broad portfolio of infrastructure products delivers high performance and flexibility needed for networks today and in the future. TI's design and manufacturing leadership spans both high-performance DSP and analog technologies, so we can bring you the complete signal chain to build leading-edge network concentration equipment. With integrated circuits tailored to meet the requirements of both wireless and wireline infrastructure equipment, TI's in-depth technology helps you to design for the convergence of voice, data and video communications.

Programmable DSPs allow for design versatility, helping to speed your development while leaving room for software upgrades. All of TI's high-performance DSP-based processors for wireless infrastructure equipment are code-compatible, saving time and resources to develop new network products. TI's product testing assures you of quality and reliability. You also get the development support you need to get ahead and stay there throughout the development cycle. For performance, flexibility and support throughout the signal chain, you can rely on TI.

Wireless Infrastructure Solutions

TI technology has been enabling digital wireless handsets and base stations from the very beginning, and it continues to do so today. Nine of the top 10 manufacturers of 3G base stations use our DSP-based communications processors in their products, demonstrating TI's recognized leadership as a provider of advanced solutions for wireless communications.

The TMS320TCI6482 DSP provides a power-efficient platform for multi-standard, soft digital baseband solutions, bringing the highest system performance with the lowest power consumption on a single chip to wireless base stations. Using the latest TMS320C64+™ DSP core, the 1 GHz TCI6482 offers advanced features that reduce code size, increase cycle efficiency and speed throughput. New instruction sets that enhance performance include a software pipelined loop, wireless-specific data handling and multiply operations, and Rake, RACH, Search and Spread Assist (RSA) accelerator functions that enable the device to address the challenging requirements of CDMA more successfully than any previously available DSP.

The TCI6482 also features 2M of on-chip memory, Double Data Rate (DDR2) external memory interface, an improved hardware Viterbi and Turbo coprocessors (VCP2 and TCP2) for voice and data encoding/decoding, and a wide range of high-speed peripherals, including Gigabit Ethernet, UTOPIA, Peripheral Control Interface and Host Port Interconnect (PCI/HPI), and the industry's first DSP-integrated Serial RapidIO™ interface. Additionally, the processor's low 3 Watts power consumption allows the base station to operate without cooling fans.

The TCI6482's high channel density and low power reduces system and operating costs per channel and permits the carriers to offer more types of affordable services to their customers. Optimized software tool kits are available to support various types of equipment, including WiMAX and pico base stations.

The TCI6482 supports standards that include:
- TD-SCDMA
- UMTS (3GPP)
- CDMA2000
- GSM-EDGE
- WiMAX

TCI6482 applications include:
- Macro and micro base stations
- Pico, femto and other small form factor base stations
- Chip rate and symbol rate processing
- HSPDA
- MAC-HS
- OFDM
- TCP/IP

The TMS320TCI100Q DSP enables a high degree of flexibility in 3G and 2.5G wireless base stations while reducing materials costs and speeding time to market. The TCI100Q provides the heightened bandwidth needed to deliver wider network coverage areas, clearer signals and cutting-edge services. Outstanding performance enables manufacturers to implement compute-intensive algorithms that maximize the full frequency band for WCDMA's spread spectrum transmission and scalable channels. High performance also permits the implementation of various algorithms that improve bandwidth utilization, as well as supporting increased channel density for greater revenue over the same bandwidth. VCP and TCP accelerators, generous on-chip memory, efficient direct memory access (DMA), and high-speed peripherals all serve to enhance system performance, enabling cost efficiency and value-added services in the competitive wireless marketplace. Applications for the TCI100Q include:
- Symbol-rate processing for 2G, 2.5G, 3G
- Assist in chip-rate processing
- Layer 2 processing in RNC

In addition to these products, TI also offers high-performance TMS320C641x DSPs. With their VLIW architecture delivering up to eight 32-bit operations per cycle, C641x DSPs offer top

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Next Genera[...] Convergent[...]
- C64x+™ base[...]
- Advanced int[...] for communic[...] and packet ba[...]
- Complimente[...] set of teleco[...] codecs

TCI6482
- 1 GHz C64+ DSP core, 90nm CMOS
- Low power consumption (<3 W)
- 28 new instructions sets
- Four Serial RapidIO™ interfaces for up to 12.5 Gbps
- 3GPP/3GPP2-compliant Viterbi, Turbo coprocessors
- 10/100/1000 Ethernet, UTOPIA, PCI, HPI
- RSA for CDMA complex correlation functions

Commun[...] Infras[...]

TCI100Q
- 850 MHz C64x™ DSP core, 90nm CMOS
- Low power design
- Viterbi, Turbo coprocessors
- UTOPIA, PCI, HPI
- Two 10 Gbps external memory interfaces

Wireless

TNETV3010
- Six 300 MHz C55x™ DSP cores
- 1 W (typ) core power consumption at 1.2 V >1500K on-chip RAM
- Global DMA
- 512 multichannel buffered serial port (McBSP)
- UTOPIA, PCI/HPI

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High-Performance Analog
- ADCs, DACs, DUCs, DDCs
- RF
- High-speed amplifiers
- Clocking devices
- Power management

● Convergence   ● Wireline

performance for multi-channel voice-over-packet (VoP), data transcoding, and other operations performed by high-end infrastructure equipment.

High-Performance Analog and Standard Logic Solutions

TI's high-performance analog and standard logic solutions are optimized for wireless infrastructure applications and are designed for flexibility and high levels of integration. These solutions include RF (TRF3761), ADCs and DACs (ADS5546/45 and DAC 5687/86), DUC/DDC (GC1115/5016), clocks

(CDCM7005) and power management (T2 power modules). For radio designs, the wide range of available products provides several options for a complete signal chain, allowing manufacturers to effectively optimize performance and cost with key system decisions such as the number of carriers or sectors.

Carrier Infrastructure Solutions

Packet-based switching is changing the public voice network landscape today, and TI's carrier infrastructure solutions for High-Density Voice (HDV) applications are helping to bring about this change. TI's HDV Carrier Infrastructure solutions combine industry-leading DSP hardware and field-proven Telogy Software™ at a system-level to provide an optimized solution for a wide variety of fixed, mobile and cable applications. TI's carrier infrastructure solutions give you the most channels per square inch utilizing the lowest power consumption in the industry. In addition, TI's field harden Telogy Software offers telecom equipment manufactures the most reliable and flexible solution with comprehensive next generation features that lower the total cost of ownership.

The TNETV3010 DSP solution is based on six 300 MHz TMS320C55x™ DSP cores with shared resources. Designed for high density voice access communications, the TNETV3010 optimizes solution density with power consumption, board space and cost optimized for specific application requirements. Applications of the TNETV3010 include Media Gateways designed for Class 4 and Class 5 replacements, as well as gateways used to interface carrier broadband access networks to the PSTN. The TNETV3010 is also used in

mobile networks to provide gateway functions.

The TNETV3010 processors are fully supported by Telogy VoIP Software and Telinnovation™ echo cancellation software. Telogy Software offers toll-quality VoIP support through a full implementation of carrier-class features, including echo cancellation, wireless capabilities, carrier-class diagnostics, fax relay, low system latency, enhanced system flexibilities and many others. Telinnovation software, the industry's first DSP-based echo cancellation and the leader in performance and channel density, remains the most trusted, market-proven echo cancellation software today, with an estimated 15 million ports in service.

TI's next generation platform for carrier infrastructure systems will debut in 2006. Leveraging TI's market leading high-performance C64x+ DSP family, this platform will enable telecom and wireless equipment manufacturers to develop an effective evolutionary path to providing systems capable of delivering multi-media and 3G services. TI's advanced silicon design and manufacturing expertise combined with our complete, robust application software, drives a jump ahead in solution density – a measure of channel density per unit of area and power consumed. Moreover, leveraging the highest performance DSP engine in the market, TI's next generation platform is well positioned to handle the future requirements in this dynamic market – from next generation "wide band" voice compression codecs to the emerging need to accommodate video compression, transcoding and translating.

Rely on TI

In developing these platforms TI has kept out eye on helping equipment manufacturers minimize total cost of ownership across the lifetime of their product. Our years of experience in telecommunications have taught us how to design quality into our products; then we rigorously test them in a lab that sets the industry benchmark for compliance testing. To help you develop your products more efficiently, we provide a range of reference designs, in-depth documentation and on-line support. TI's worldwide design support means that we can help you get to market quickly with your product, and our manufacturing strength assures you of supply, no matter what your region.

To learn more about how TI products can help with your next network infrastructure design, please contact your local TI sales representative, or visit www.ti.com/widsp

TI Worldwide Technical Support

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