TOSHIBA
Leading Innovation

Press Release

RFCMOS ASIC platforms simplify implementation of advanced RF SoCs

Technology and design flow support low-risk integration of RF, analogue and complex digital functionality

***Düsseldorf, Germany,* 24th February, 2010** – Toshiba Electronics Europe's ASIC & Foundry Business Unit has announced a new generation of technologies and services for speeding the development and reducing the cost of System-on-Chip (SoC) RF ICs. The technologies enable ICs with higher reliabilities than traditional System-in-Package (SiP) alternatives while a 'hybrid' ASIC / COT (customer own tooling) flow model significantly reduces development risk.

Toshiba's latest RF-CMOS technologies and services support the integration of RF, analogue and complex digital baseband and processor functions into a single chip. As a result they are ideally suited to fabless chip makers looking to deliver advanced solutions for Near Field Communications (NFC), Wide Area Networks (WANs), digital broadcast, telemetry and many other wireless communications applications.

Available at the 130nm, 90nm, 65nm and 40nm process nodes, Toshiba's RF technology combines mature baseline CMOS processes with a fully featured RF Process Design Kit (PDK). The 130nm, 90nm and 65nm processes are characterized by high f_t ratings of 90GHz, 140GHz and 180GHz respectively. The RF module enables on-chip integration of passive elements such as MIM capacitors; junction and MOSFET varactors (deep N-well, single-end and differential); half-turn differential or symmetrical inductors; and mid-range poly resistors with zero temperature coefficients. Junction capacitors and parasitic devices such as NPN transistors are also available.

To speed the development of RF SoCs, customers can choose to use Toshiba's 'hybrid' ASIC / COT model. In this model the flow is divided into two – one for the digital baseband processor and the other for the analogue and RF elements. For the RF- and analogue elements, the customer implements the GDSII based on the RF-PDK, with Toshiba's involvement to ensure success in manufacturing and testing. The customer applies its expertise to physical design of the value-added elements of the macro cell, and Toshiba actively provides feedback on process-dependent layout considerations. Once the macro cell layout is frozen, all manufacturability and yield-assurance rules will have been followed, and downstream re-spins avoided.

For the digital portion of the chip, an RT-level or gate-level netlist is accepted and the GDSII for the digital portion is implemented by Toshiba, as in a standard ASIC flow. Standard ASIC libraries, SPICE DFM/DFY models and package parasitics are part of the design environment. In addition, proven IP elements, such as, connectivity functions (HDMI, Generic SerDes, PCI-Express, SATA, USB) and A/D, D/A, PLL, SRAM, ROM, I/O, ESD and latch-up structures are available for integration into the digital baseband. Value-added place and route services are performed that take into account DFM/DFY considerations.

Lastly, the analogue- or RF blocks designed by the customer are integrated into the top-level layout. After the SoC layout is complete, the customer signs the project off based on the verification reports provided.

For more information on Toshiba's RFCMOS and ASIC & Foundry services, including the company's full range of IP technologies, please visit: www.toshiba-components.com/ASIC/rfcmos.html.

###

About Toshiba

Toshiba Electronics Europe (TEE) is the European electronic components business of Toshiba Corporation, which is ranked among the world's largest semiconductor vendors. TEE offers one of the industry's broadest IC and discrete product lines including high-end memory, microcontrollers, ASICs, ASSPs and display products for automotive, multimedia, industrial, telecoms and networking applications. The company also has a wide range of power semiconductor solutions. TEE was formed in 1973 in Neuss, Germany, providing design, manufacturing, marketing and sales and now has headquarters in Düsseldorf, Germany, with subsidiaries in France, Italy, Spain, Sweden and the United Kingdom. TEE employs approximately 300 people in Europe. Company president is Mr. Hitoshi Otsuka.

Toshiba Corporation is a world leader and innovator in pioneering high technology, a diversified manufacturer and marketer of advanced electronic and electrical products spanning information & communications systems; digital consumer products; electronic devices and components; power systems, including nuclear energy; industrial and social infrastructure systems; and home appliances. Founded in 1875, Toshiba today operates a global network of more than 740 companies, with 199,000 employees worldwide and annual sales surpassing US$73 billion.

For more company information visit Toshiba's web site at www.toshiba-components.com

Contact details for publication:
Toshiba Electronics Europe, Hansaallee 181, D-40549 Düsseldorf, Germany
Tel: +49 (0) 211 5296 0 Fax: +49 (0) 211 5296 792197
Web: http://www.toshiba-components.com/pressoffice/index.asp
E-mail: customsoc-internet@toshiba-components.com

Contact details for editorial enquiries:
Henning Rausch, Toshiba Electronics Europe
Tel: +49 (211) 5296 117
E-mail: HRausch@tee.toshiba.de

Issued by:
Simon Flatt/Andrew Town, Pinnacle Marketing Communications Ltd, Prosperity House, Dawlish Drive, Pinner, Middlesex, HA5 5LN, UK
Tel: +44 (0) 20 8869 9229/+44 (0) 20 8429 6546 Fax: +44 (0) 20 8868 4373.
Web: www.pinnacle-marketing.com
E-mail: simon@pinnaclemarcom.com or andrew@pinnaclemarcom.com

February 2010 **Ref. 5967/A**