

AceAxis chooses NXP Semiconductors' DAC1628D

for Remote Radio Head (RRH) base station solution

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1. Introduction

Wireless infrastructure equipment developer AceAxis Ltd (www.aceaxis.co.uk) has chosen NXP Semiconductors' DAC1628D for their latest Remote Radio Head (RRH) base station solution. The DAC1628D Digital-to-Analog Converter (DAC) provides a JEDEC JESD204B-compliant digital interface for reduced cost, reduced space and higher transceiver performance.

AceAxis is a world leader in Remote Radio Head innovation and development. In RRH base stations, the radio transceiver is located in close proximity to the antenna, to largely eliminate the electrical power losses associated with Radio Frequency (RF) cabling in conventional macrocell base station designs. RRH transceivers must be as small in volume and as light in weight as possible. The JESD204B digital interface, which connects the high-speed data converters to the system logic devices in the transceiver subsystem, helps to meet these goals. JESD204B is a SerDes-based digital interface which offers higher bandwidth and embedded synchronization protocols, essentially making the legacy LVDS parallel interface obsolete. The higher bandwidth (up to 12.5 Gbps per differential lane) enables lower pin-count converters and logic devices, saving packaging cost and Printed-Circuit Board (PCB) area and cost. The embedded synchronization protocols eliminate external logic otherwise needed for phase-coherent sampling across multiple signal channels. NXP Semiconductors is an early adopter of JESD204B, first-to-market with compliant ADCs and DACs.

The DAC1628D is a dual-channel, 16-bit, 1.25 Gsps, 85 dBc typical SFDR digital-to-analog converter with four JESD204B lanes running up to 6.25 Gbps. This DAC is fully compliant to the Multi-Carrier GSM spectral mask. The DAC1628D supports 625 Msps input data rate, and includes an embedded complex (I/Q) digital modulator. It also includes Multiple Device Synchronization (MDS) and assured FPGA interoperability, benefits of NXP's value-added CGVxpress implementation of this breakthrough new serial digital interface. More information on the DAC1628D1G25 can be found at: http://www.nxp.com/products/rf/data_converters/high_speed_dac/jesd204b_cgvxpress/DAC1628D1G25HN.html.

AceAxis leads the world in the development and supply of platform-based, software reconfigurable multi-channel digital radios, subsystems and IP to OEMs, for deployment in WiMAX and LTE 4G wireless broadband networks. Multimode, multiband Atlas Remote Radio Heads are already enabling Global 4G wireless LTE and WiMAX broadband services, with state-of-the-art power efficiency performance that helps network operators to minimize CAPEX and OPEX. Features of AceAxis RRH solutions include: Digital Pre-Distortion (DPD); Quadrature Modulation Correction (QMC); Crest Factor Reduction (CFR); Envelope Tracking (ET); power control; TDD or FDD applications; Integrated Adaptive Antenna Systems; CDRS Management and Control; and CPRI, OBSAI or Custom baseband interface. The patented AceAxis RF Power Amplifier (RFPA) linearization process underpins the company's claim that its RRHs are more efficient than competitors. With the launch of the Atlas product family, the AceAxis product portfolio now features:

- Industry leading value
- Greater efficiency
- Optimization for mass production
- Higher thermal operating capabilities

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- Outstanding MTBF

The new Atlas RRH range features three models, the Atlas 2 × 2, the Atlas 4 × 4 and the Atlas 8 × 8. The Atlas 2 × 2 RRH is the world's most cost-effective LTE Remote Radio Head and features a unique coplanar compact cableless interconnect which minimizes RRH volume. The Atlas 4 × 4 and 8 × 8 are more compact and lighter than earlier models. They are the world's first beamforming-enabled, multi-antenna LTE RRHs and provide multi-mode functionality including simultaneous TD-LTE and WiMAX or FD-LTE and W-CDMA for transition networks. The 8 × 8 features a massive 24 Gbps fiber capacity and is particularly suitable for high-density networks. The class-leading cost efficiencies of the Atlas 2 × 2, combined with the beamforming sophistication and multimode flexibility of the Atlas 4 × 4 and 8 × 8, demonstrate that the Atlas range can deliver across all OEM requirements. AceAxis leads the market in terms of product innovation, sophistication and efficiency. Combined with state-of-the-art manufacturing capability, the Atlas product family shows AceAxis is also defining the industry benchmarks for market value, quality, reliability, and continuity of supply across TD-LTE, FD-LTE and WiMAX 4G solutions.



Fig 1. The Atlas 2 × 2 LTE Remote Radio Head

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Fig 2. The Atlas 4 × 4 LTE Remote Radio Head



Fig 3. The Atlas 8 × 8 LTE Remote Radio Head

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2. Abbreviations

Table 1. Abbreviations

Acronym	Description
ADC	Analog-to-Digital Converter
CAPEX	CAPital EXpenditure
CDRS	Charge Data Record System
CPRI	Common Public Radio Interface
DAC	Digital-to-Analog Converter
FDD	Frequency-Division Duplex
FD-LTE	Frequency-Division LTE
FPGA	Field-Programmable Gate Array
GSM	Global System for Mobile communications
IP	Intellectual Property
LTE	Long-Term Evolution
LVDS	Low Voltage Differential Signaling
MIMO	Multiple Input, Multiple Output
OBSAI	Open Base Station Architecture Initiative
OEM	Original Equipment Manufacturer
OPEX	OPERating EXpenditure
RRH	Remote Radio Head
SFDR	Spurious-Free Dynamic Range
TDD	Time-Division Duplex
TD-LTE	Time-Division LTE
WiMAX	Worldwide interoperability for Microwave Access