

VA6003 Product Brief

Valens' second-generation, cost-optimized, Ethernet-based automotive connectivity solution supporting the aggregation of multiple interfaces for feature-rich infotainment and telematics systems

Overview

Valens' symmetric VA6003 is a second-generation, cost-optimized automotive chipset that is designed to deliver resilient, multi-gig, long-distance connectivity over a single Unshielded Twisted Pair (UTP) cable for infotainment, telematics, and backbone applications.

The VA6003, Valens' second-generation automotive connectivity chipset, inherits the capabilities and robustness of the production-proven VA6000 chipset and includes an innovative, state-of-the-art DSP technology. It tremendously improves total system cost and lowers power consumption while maintaining EMI resilience in the harshest environments.

The VA6003 integrated circuit aggregates Ethernet, digital audio, and serial control signals over a single UTP, for a total bidirectional bandwidth of 1.5Gbps, with the ability to work over simple 100Base-T1 channels (low cost cables and connectors).

Main Benefits

Aggregative – Tunnels multiple interfaces over the same wire, such as Ethernet, audio and controls.

Lower total system cost – Support for unshielded cables and connectors, allowing for simplified and cost-optimized infrastructure.

Power Consumption - Low power consumption, typically less than 0.65W.

High speed – Supports symmetric multi-gig links of up to 1.5Gbps/1.5Gbps with near-zero latency (less than 40µsec).

Long reach – Can maintain highest-quality connection for up to 15m/50ft and 4 inline connectors.

Resilient – Withstands harsh EMI environment with an advanced PHY-level retransmission mechanism, adaptive modulation, and real-time noise cancellers for error-free links throughout the vehicle lifespan.

AEC-Q100 Qualified – Device temperature grade 2: -40°C to 105°C ambient operating temperature.

Applications



- Head Units
- Rear-Seat Units
- Multimedia Box Units

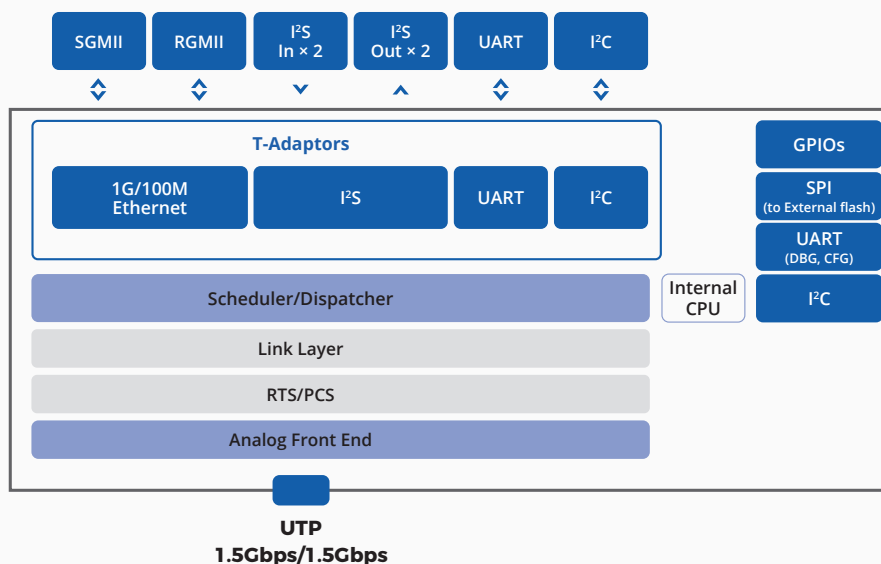


- Smart Antennas
- Telematics Control Units
- Central Gateways

VA6003 Functional Block Diagram



True to size



Key Technical Highlights

VA6003	
Channel	
Bandwidth	1.5Gbps/1.5Gbps
Infrastructure	100Base-T1
Connectors	MQS/NanoMQS, MATEnet, MTD, AMEC
Wires	Single UTP
Link	
Distance	15m/50ft
Inline Connectors	4
Supported Topologies	Point-to-point
Aggregated Interfaces	
1G Ethernet	SGMII/RGMII
Audio	Supports multiple I2S/TDM audio streams: <ul style="list-style-type: none"> • Multiple, independent I2S interfaces (2 input ports and 2 output ports) • Bit clock up to 25Mhz • Up to 32 audio channels per data line • Standard I2S, left justified, right justified, TDM modes
I2C	Master/slave interfaces
UART	Variable speed interface (baud rates of up to 2Mbps)
Package	
Size	10mm x 10mm
Type	Wire-bond BGA
Pin Count	144
Power Supply Rails	1.8V, 0.95V
Automotive Quality	AEC-Q100 grade 2