Two heads really are better than one

A dual core Cortex-A15 forms the heart of the Titanium motherboard. Why stop at two application processor cores? Couple it with two DSPs, two independent video heads, two PCI Express sockets, two quad USB 2.0 hubs, two serial ports, two gigabit Ethernet ports, and two gigabytes of fast DDR3.

In fact, the only thing that there aren't two of is SATA ports - and that's because there are four of those.

Key features at a glance

- Texas Instruments AM5728
  - Dual core ARM Cortex-A15 @ 1500MHz
  - 2 dual core Cortex-M4's @ 212.8MHz
  - DSP computing via two TMS320C66x's @ 750MHz
  - Dual core PowerVR SGX544 graphics accelerator @ 532MHz
- Memories
  - QSPI boot flash and activity LED, socketed with 8MB typical
  - 2GB DDR3 split across two 32 bit controllers for best efficiency
  - 2.5MB of on chip low latency SRAM
  - 64B of OTP unique per each unit, with optional OEM configuration data fields
  - 2kB serial EEPROM for user settings
- Product ready format
  - Compact 6.7" x 8" mini DTX form factor mechanical layout fits in a conventional ATX chassis
  - Powered from standard ATX12V power supply
  - Front panel headers for USB, power/reset push buttons, activity/power LEDs
- Serial I/O
  - 2 full duplex 802.3 gigabit Ethernet ports and link state LEDs
  - 4 ports for Gen2 SATA mass storage peripherals, up to 3Gb/s
  - 2 serial ports with full set of handshaking lines
  - Micro SD card socket and activity LED
  - 2 single lane PCI Express root complexes, up to 5Gb/s
  - Battery backed real time clock
  - Up to 8 USB 2.0 ports, 6 at the rear and 2 on the front panel
- Audio & video
  - 2 independent DVI 1.0 video heads with hardware overlays
  - Stereo audio codec for 24b stereo in/out and mono speaker downmix

Emissions:	EN55022:2010, class A FCC Part 15 Subpart B, class A
Immunity:	EN55024:2010, class A
Safety:	EN60950-1:2006+A2:2013

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

FC CE

Ready to go?

Don't be held back trying to use inconvenient development boards that don't fit your case or your requirements. The printed Quick Start Guide in every box will have you up and running in minutes - you start work on day 1 with a standard form factor, with EMC approval, with a comprehensive technical reference manual including full schematics.

Specifications

Peak DRAM throughput	533MHz × dual edge × 2 controllers × 32b = 8528MB/s
Independent IIC buses	3 (DDC for video heads 1 & 2, plus system IIC peripherals)
UART line driver rate	250kbps into a 3kΩ + 1nF load
Power connection	20 way Molex Mini Fit Jnr 3929-9202 or equivalent
Supply requirements main PCB	8530mA @ 3.3V; 640mA @ 5V; 0mA @ 12V max
peripherals	7260mA @ 3.3V; 4220mA @ 5V; 4200mA @ 12V max
standby	5mA @ 5V max
Real time clock backup supply	800nA @ 3V from a CR2032 lithium coin cell
ATX supply control	Software shutdown or 6s 'press and hold' force off
Operating conditions	0°C to 50°C ambient
	10% to 90% RH (non condensing)
Storage conditions	-40°C to 70°C ambient
	5% to 95% RH (non condensing)

Rear panel layout
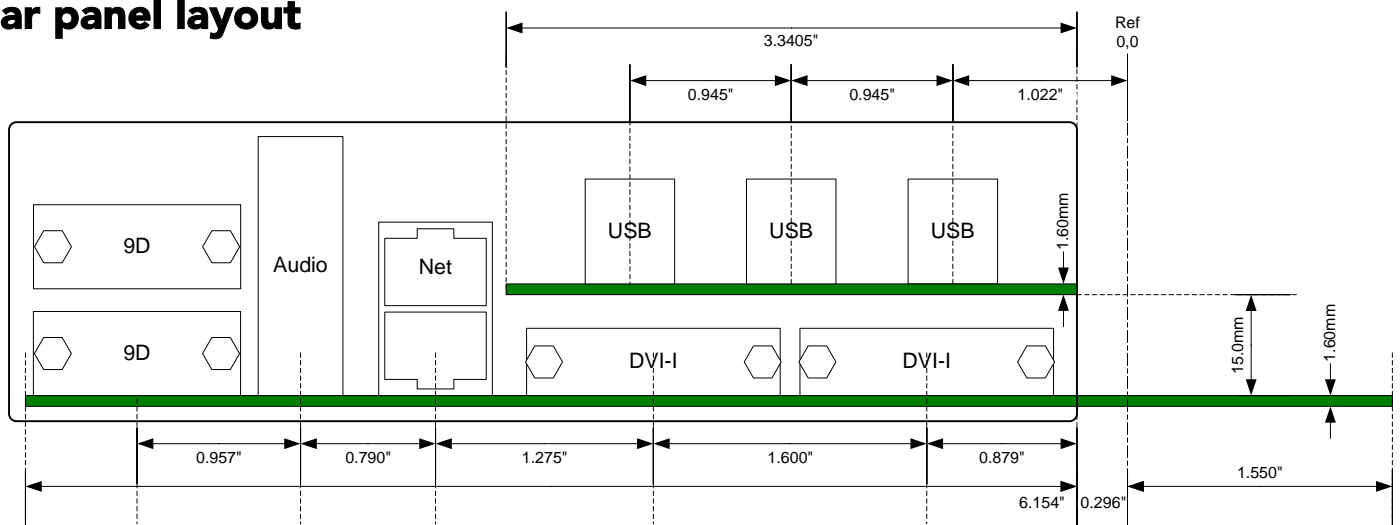
Software support

Operating system support for Linux is based on the TI Linux Kernel with a Debian 10 ("Buster") root file system. The QSPI boot flash is preprogrammed with U-boot 2019.07 to load Linux 4.14 from the SD card (supplied). Source code is hosted on GitHub under user 'elesar-uk'.

Alternatively RISC OS is available preprogrammed into the QSPI boot flash, the source code to which is managed by RISC OS Open Limited.

A 0.1" pitch 14 pin JTAG header allows for in situ debug.

Buy online from
http://shop.elesar.co.uk/

Orderable part numbers

EH-114-2 Titanium motherboard + Linux 4.14
EH-114-3 Titanium motherboard + RISC OS 5.28
ES-516-6 Titanium technical reference manual
ES-114-0 Titanium I/O shield for ATX chassis