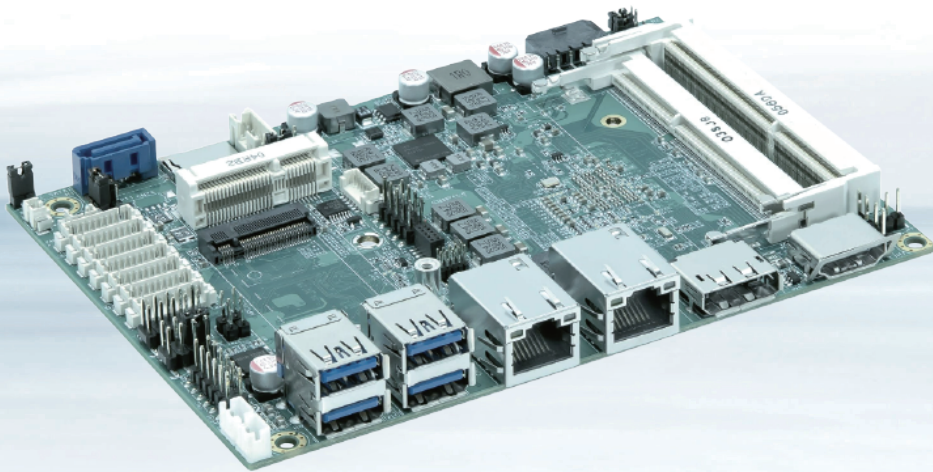


3.5"-SBC-APL

EXTENDED / EXTREME TEMPERATURE SUPPORT



3.5" SINGLE BOARD COMPUTER WITH INTEL® ATOM® E3900 SERIES & PENTIUM® / CELERON® N- / J-SERIES PROCESSORS

- ▶ 1x LVDS, 1x DP, 1x HDMI for display output
- ▶ 2x GbE LAN for Ethernet
- ▶ 4x USB 3.2 Gen 1, up to 3x USB 2.0, 2x RS232/422/485, 4x RS232, 8x DIO for peripherals
- ▶ 1x SATA 3.0, 1x Micro-SD Cage for storage
- ▶ 1x mPCIe, 1x M.2 Key B for expansion

POSSIBILITIES START HERE



3.5"-SBC-APL V2.0

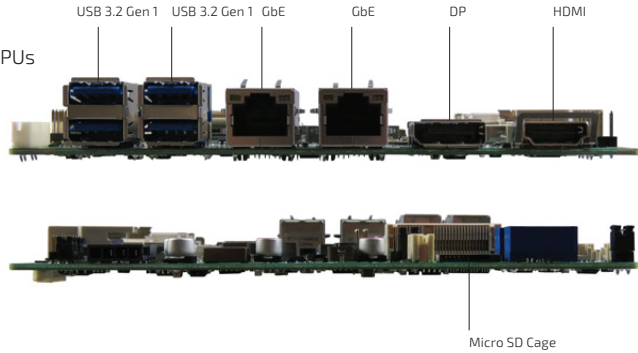
3.5" SINGLE BOARD COMPUTER WITH INTEL® ATOM® E3900 SERIES & PENTIUM® / CELERON® N- / J-SERIES CPU

Kontron 3.5"-SBC-APL V2.0 is a 3.5" single board computer equipped with Intel® Atom® E3900 Series & Pentium® / Celeron® N- / J-Series processors, providing up to 30 % increase in processing / graphics performance and 15 % increase in power efficiency over models powered by previous-generation processors. In addition, 3.5"-SBC-APL V2.0 supports a highly-integrated M.2

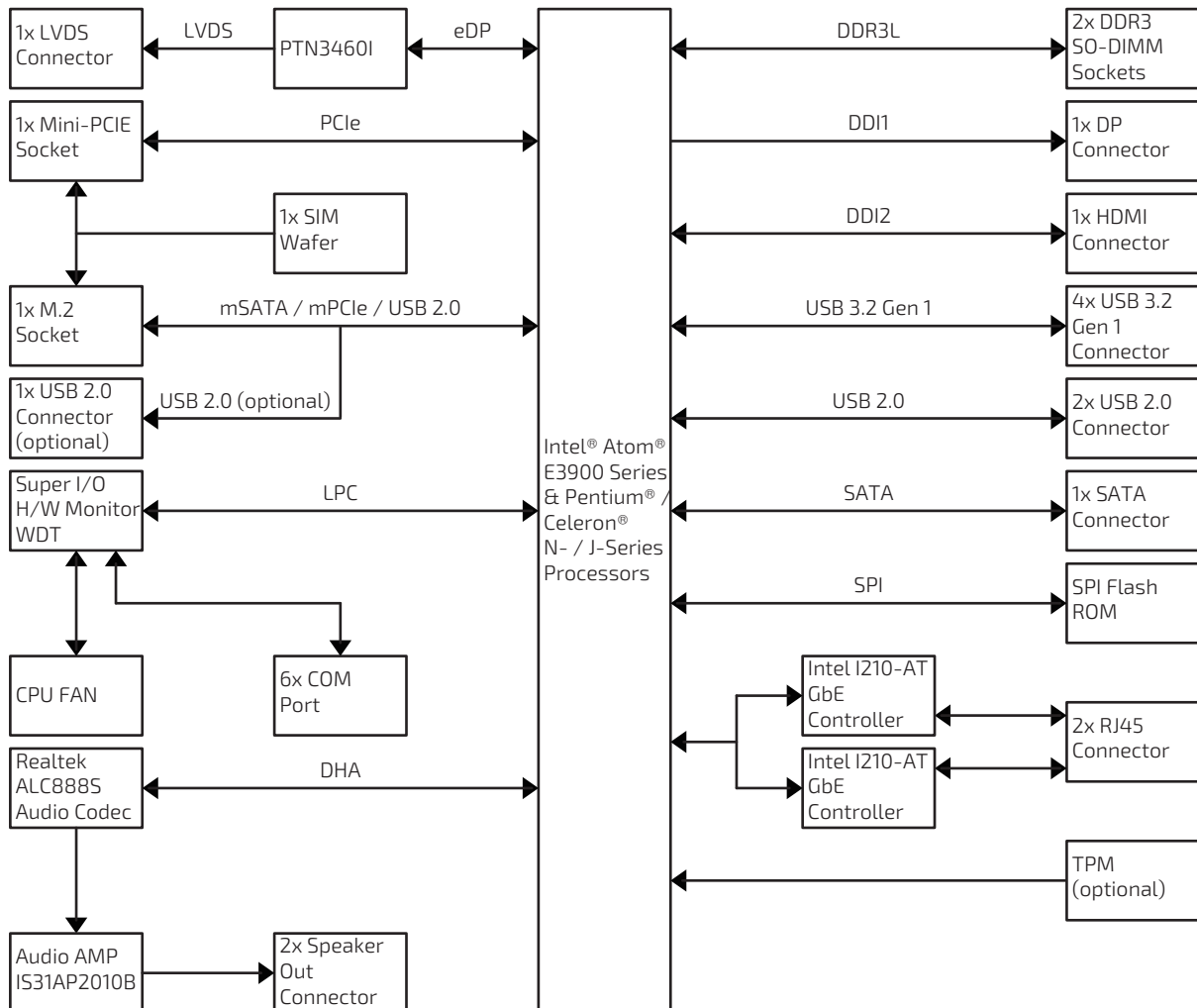
expansion socket and thus allows developers to build more compact or thinner embedded devices. Extended and extreme temperature models are available for integration into the systems used under extreme high, low or radically fluctuating temperatures.

▶ PRODUCT HIGHLIGHTS

- ▶ Intel® Atom® E3900 Series & Pentium® / Celeron® N- / J-Series CPUs
- ▶ 2x DDR3L SO-DIMM memory socket
- ▶ 1x LVDS, 1x DP, 1x HDMI for triple display support
- ▶ 2x GbE LAN for Ethernet
- ▶ 4x USB 3.2 Gen 1, up to 3x USB 2.0 for USB device connection
- ▶ 2x RS232/422/485, 2x RS232 for serial device connection
- ▶ 8x DIO for device / signal control
- ▶ 1x SATA 3.0, 1x Micro-SD Cage for storage
- ▶ 1x mPCIe, 1x M.2 Key B for expansion
- ▶ Extended / extreme temperature model available



▶ BLOCK DIAGRAM



► TECHNICAL INFORMATION

SYSTEM	PROCESSOR	Intel® Atom® x7-E3950 (Quad Core, 2M Cache, 1.60 / 2.00 GHz, FCBGA1296, 12 W TDP) Intel® Atom® x5-E3940 (Quad Core, 2M Cache, 1.60 / 1.80 GHz, FCBGA1296, 9.5 W TDP) Intel® Atom® x5-E3930 (Dual Core, 2M Cache, 1.30 / 1.80 GHz, FCBGA1296, 6.5 W TDP) Intel® Pentium® N4200 (Quad Core, 2M Cache, 1.10 / 2.50 GHz, FCBGA1296, 6 W TDP) Intel® Celeron® J3455 (Quad Core, 2M Cache, 1.50 / 2.30 GHz, FCBGA1296, 10 W TDP) Intel® Celeron® N3350 (Dual Core, 2M Cache, 1.10 / 2.40 GHz, FCBGA1296, 6 W TDP) 2x DDR3L 1867 1.35 V SO-DIMM
	MEMORY	
VIDEO	GRAPHICS	Intel® HD Graphics 505 (for models w/ Atom® x7, Pentium®)
	DISPLAY INTERFACE	Intel® HD Graphics 500 (for models w/ Atom® x5, Celeron®) 1x LVDS (18/24-bit, 1/2-ch, 1920 x 1200 @ 60 Hz) 1x DP 1.2 (4096 x 2160 @ 60 Hz, on rear) 1x HDMI 1.4 (3840 x 2160 @ 30 Hz, on rear)
	MULTIPLE DISPLAY	Triple Display
AUDIO	AUDIO CODEC	Realtek ALC8885
	AUDIO INTERFACE	1x Speaker-out (Stereo, 3 W, by header) 1x Line-in (by header, extreme temperature model excluded) 1x Line-out (by header, extreme temperature model excluded) 1x Mic-in (by header, extreme temperature model excluded)
NETWORK CONNECTION	ETHERNET	2x GbE LAN (RJ45 on rear, Intel® I210-AT)
PERIPHERAL CONNECTION	USB	4x USB 3.2 Gen 1 (Type A on rear) 2x USB 2.0 (by header, default) 3x USB 2.0 (by header, only for 3.5"-SBC-APL-6-E3950 V 2.0)
	SERIAL PORT	2x RS232/422/485 (by wafer, auto flow control function for RS485)
	OTHER I/Os	4x RS232 (by wafer) 8x DIO (by header)
STORAGE & EXPANSION	SATA	1x SATA 3.0
	MICRO SD CAGE	1x Micro SD Cage (on front)
	mPCIe	1x mPCIe (full size)
	M.2	1x M.2 Key B (2242, w/ USB 2.0 / SATA / PCIe x1, default) 1x M.2 Key B (2242, w/ SATA / PCIe x1, only for 3.5"-SBC-APL-6-E3950 V 2.0)
	SIM CARD CAGE	1x SIM Card Cage (by wafer, switchable between mPCIe and M.2)
POWER	INPUT VOLTAGE	DC 12 V
	CONNECTOR	1x4-pin Wafer (Straight & Right Angle dual-footprint)
FIRMWARE	BIOS	AMI uEFI BIOS w/ 128 Mb SPI Flash
	WATCHDOG	Programmable WDT to generate system reset event
	H/W MONITOR	Voltages, Temperatures
	REAL TIME CLOCK	Processor integrated RTC
	SECURITY	TPM 2.0 (optional, Infineon SLB 9665)
SYSTEM CONTROL & MONITORING	FP HEADER	1x Header Reset button, HDD LED & External Speaker 1x Header for Power button, Power LED & SM bus 1x Header for mPCIe activity LED 1x Header for M.2 activity LED
COOLING	FAN	1x Wafer for System Smart Fan
SOFTWARE	OS SUPPORT	Windows 10, Linux
MECHANICAL	DIMENSION (L x W)	ECX (146 mm x 105 mm / 5.75" x 4.13")
ENVIRONMENTAL	OPERATION TEMPERATURE	0 °C ~ 60 °C / 32 °F ~ 140 °F (Standard) -20 °C ~ 70 °C / -4 °F ~ 158 °F (Extended) -40 °C ~ 85 °C / -40 °F ~ 185 °F (Extreme)
	STORAGE TEMPERATURE	-20 °C ~ 80 °C / -4 °F ~ 176 °F (Standard) -40 °C ~ 85 °C / -40 °F ~ 185 °F (Extended) -55 °C ~ 85 °C / -67 °F ~ 185 °F (Extreme)
	HUMIDITY	0 % ~ 95 %
COMPLIANCE	EMC & SAFETY	CE Class B, FCC Class B

▶ ORDERING INFORMATION

ARTICLE	DESCRIPTION
3.5"-SBC-APL-0-E3950 V2.0	Atom® x7-E3950, 2x USB 2.0, 1x M.2 Key B (w/ SATA / PCIe / USB), w/ audio, w/o TPM, Op. temp.: 0 °C ~ 60 °C
3.5"-SBC-APL-1-E3940 V2.0	Atom® x5-E3940, 2x USB 2.0, 1x M.2 Key B (w/ SATA / PCIe / USB), w/ audio, w/o TPM, Op. temp.: 0 °C ~ 60 °C
3.5"-SBC-APL-3-N4200 V2.0	Pentium® N4200, 2x USB 2.0, 1x M.2 Key B (w/ SATA / PCIe / USB), w/ audio, w/o TPM, Op. temp.: 0 °C ~ 60 °C
3.5"-SBC-APL-4-N3350 V2.0	Celeron® N3350, 2x USB 2.0, 1x M.2 Key B (w/ SATA / PCIe / USB), w/ audio, w/o TPM, Op. temp.: 0 °C ~ 60 °C
3.5"-SBC-APL-6-E3950 V2.0	Atom® x7-E3950, 3x USB 2.0, 1x M.2 Key B (w/ SATA / PCIe), w/ audio, w/ TPM, Op. temp.: 0 °C ~ 60 °C
3.5"-SBC-APL-A-E3930 V2.0	Atom® x5-E3930, 2x USB 2.0, 1x M.2 Key B (w/ SATA / PCIe / USB), w/ audio, w/ TPM, Op. temp.: 0 °C ~ 60 °C
3.5"-SBC-APL-K-J3455 V2.0	Celeron® J3455, 2x USB 2.0, 1x M.2 Key B (w/ SATA / PCIe / USB), w/ audio, w/ TPM, Op. temp.: 0 °C ~ 60 °C
3.5"-SBC-APL-0-E3950-ET V2.0	Atom® x7-E3950, 2x USB 2.0, 1x M.2 Key B (w/ SATA / PCIe / USB), w/ audio, w/o TPM, Op. temp.: -20 °C ~ 70 °C
3.5"-SBC-APL-H-E3950-XT V2.0	Atom® x7-E3950, 2x USB 2.0, 1x M.2 Key B (w/ SATA / PCIe / USB), w/o audio, w/ TPM, Op. temp.: -40 °C ~ 85 °C
3.5"-SBC-APL-I-E3940-XT V2.0	Atom® x5-E3940, 2x USB 2.0, 1x M.2 Key B (w/ SATA / PCIe / USB), w/o audio, w/ TPM, Op. temp.: -40 °C ~ 85 °C
3.5"-SBC-APL-J-E3930-XT V2.0	Atom® x5-E3930, 2x USB 2.0, 1x M.2 Key B (w/ SATA / PCIe / USB), w/o audio, w/ TPM, Op. temp.: -40 °C ~ 85 °C

ACCESSORIES

ARTICLE	PART NO.	DESCRIPTION
COM PORT CABLE*	0C5020000005130L	10-pin pitch = 1.25 mm to DB-9 connector, L = 350 mm
DIO CABLE*	0C5020000003360L	MX51021-10P 1x10P 1.25 pitch to D-SUB-9P (Female), L = 200 mm
USB CABLE (2 PORT)*	0C5020000005700L	DP-2.54 2x5P pitch: 2.54 mm to 2x USB Female, L = 250 mm
SATA PPOWER CABLE*	0C5020000004230L	SATA 1x15P pitch: 1.27 mm to PH 2.0 HSG 1x4P 2.0 pitch, L = 460 mm
SATA CABLE*	0C5020000004240L	SATA 1x7P pitch: 1.27 mm with lock, L = 460 mm
AUDIO CABLE*	0C5020000002050L	WL6008H 2x6P 2.54 pitch to EAR phone jack x3 pitch: 3.5 mm, L = 350 mm
DC IN CABLE*	0C5020000004220L	2.5 DC Jack w/ 2 mm nut, 0.5 mm washer to H-300F-XX 1x4P 3.0 pitch, L = 300 mm
MINI SIM CARD HOLDER KIT*	0ZHK12003GSIM003	1x SIM card holder board, 1x SIM card cable, 4x screw
HEATSINK KIT*	0ZHKOECXAPL00001	148 x 105 x 15.8 mm, w/ thermal pad, 4x M3x5 screw, 6 W N-Series CPU support
HEATSINK KIT*	0ZHKOECXAPL00002	148 x 105 x 15.8 mm, w/ thermal pad, 4x M3x5 & 2x M2.5x4 screw, for 12W E-Series CPU
HEATSPREADER KIT*	0ZHKOECXAPL00003	70 x 60 x 6 mm, w/ thermal pads on both sides, 2x M3x5 screw, for 6 W N-Series CPU
HEATSPREADER KIT*	0ZHKECXAPL000002	48.48 x 35.55 x 7.4 mm, thermal pads on 2 sides, 2x M2.5x4 screw, for N/J-Series CPU
HEATSPREADER KIT*	0ZHKECXAPL000003	48.48 x 35.55 x 7.4 mm, thermal pads on two sides, 2x M2.5x4 screw, for E-Series CPU

(*: Optional)

▶ GLOBAL HEADQUARTERS

Kontron Europe GmbH

Gutenbergstraße 2
 85737 Ismaning, Germany
 Tel.: + 49 821 4086-0
 Fax: + 49 821 4086-111
 info@kontron.com
www.kontron.com