

# 3.5"-SBC-APL

## EXTENDED / EXTREME TEMPERATURE SUPPORT

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### 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 3.0, up to 3x USB 2.0, 2x RS232/422/485, 4x RS232, 8-bit 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

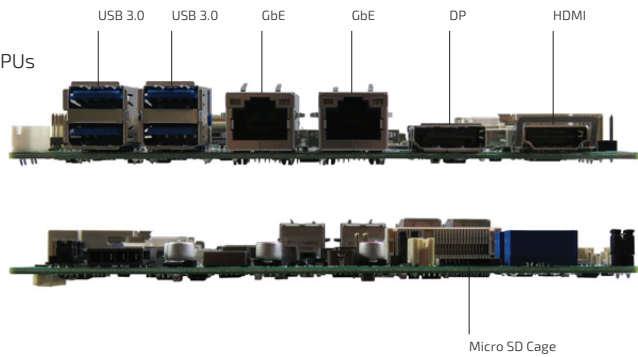
### 3.5" SINGLE BOARD COMPUTER WITH INTEL® ATOM® E3900 SERIES & PENTIUM® / CELERON® N- / J-SERIES CPU

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

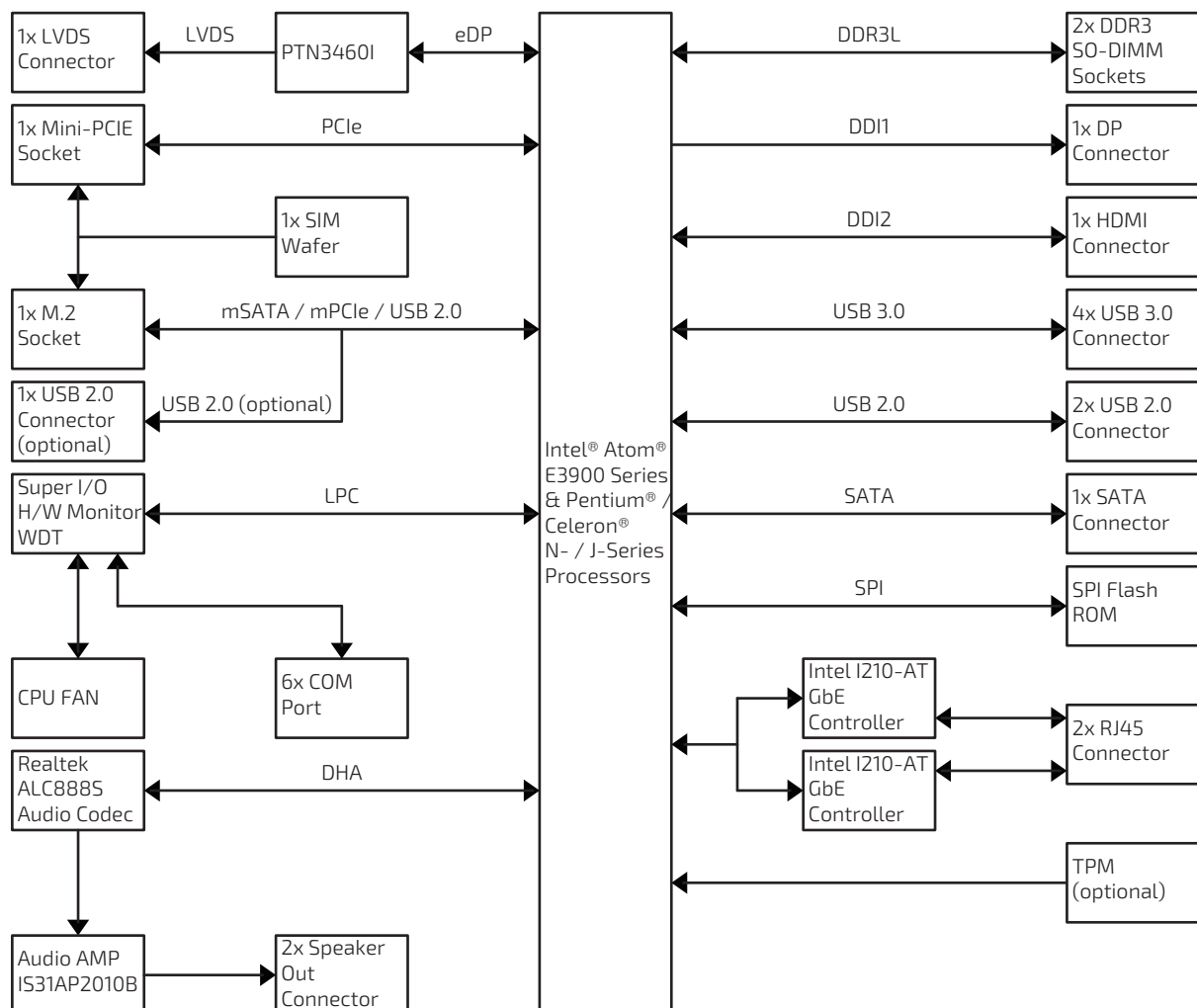
expansion socket and thus allows developers to build more compact or thinner embedded devices. Extended and extreme temperature models are available for integration into the systems used under extreme high, low or radically fluctuating temperatures.

#### ► 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 3.0, up to 3x USB 2.0 for USB device connection
- ▶ 2x RS232/422/485, 2x RS232 for serial device connection
- ▶ 8-bit 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, up to 2.00 GHz, FCBGA1296, 12 W TDP) Intel® Atom® x5-E3940 (Quad Core, 2M Cache, up to 1.80 GHz, FCBGA1296, 9.5 W TDP) Intel® Atom® x5-E3930 (Dual Core, 2M Cache, up to 1.80 GHz, FCBGA1296, 6.5 W TDP) Intel® Pentium® N4200 (Quad Core, 2M Cache, up to 2.50 GHz, FCBGA1296, 6 W TDP) Intel® Celeron® J3455 (Quad Core, 2M Cache, up to 2.30 GHz, FCBGA1296, 10 W TDP) Intel® Celeron® N3350 (Dual Core, 2M Cache, up to 2.40 GHz, FCBGA1296, 6 W TDP) 2x DDR3L 1867 1.35 V SO-DIMM
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 AUDIO INTERFACE	Realtek ALC8885 2x Speaker-out (3 W) 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 3.0 (Type A on rear) 2x USB 2.0 (by header, default) 3x USB 2.0 (by header, optional)
	SERIAL PORT	2x RS232/422/485 (by wafer, auto flow control function for RS485) 4x RS232 (by wafer)
	OTHER I/Os	1x 8-bit DIO (by header)
STORAGE & EXPANSION	SATA MICRO SD CAGE mPCIe M.2	1x SATA 3.0 1x Micro SD Cage (on front) 1x mPCIe (full size) 1x M.2 Key B (Type 2242, w/ USB 2.0 / SATA / PCIe x1, default) 1x M.2 Key B (Type 2242, w/ SATA / PCIe x1, optional in case of 3x USB 2.0) 1x SIM Card Cage (by wafer, switchable between mPCIe and M.2)
	SIM CARD CAGE	
POWER	INPUT VOLTAGE CONNECTOR	DC 12 V 1x4-pin Wafer (Straight & Right Angle dual-footprint)
FIRMWARE	BIOS WATCHDOG H/W MONITOR REAL TIME CLOCK SECURITY	AMI uEFI BIOS w/ 128 Mb SPI Flash Programmable WDT to generate system reset event Voltages, Temperatures Processor integrated RTC 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 %
CERTIFICATION	EMC & SAFETY	CE Class B, FCC Class B

## ► ORDERING INFORMATION

ARTICLE	DESCRIPTION
3.5"-SBC-APL-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-E3950 V2.0 <sup>(w/ TPM 3x USB 2.0)</sup>	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-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-E3930 V2.0 <sup>(w/ TPM)</sup>	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-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-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-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-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-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-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
3.5"-SBC-APL-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

## 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)*	0C5040000000110L	DP-2.54 2x5P pitch: 2.54 mm to 2x USB Female, L = 340 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*	0ZHK0ECXAPL00001	148 x 105 x 15.8 mm, w/ thermal pad, 4x M3x5 screw, 6 W N-Series CPU support
HEATSINK KIT*	0ZHK0ECXAPL00002	148 x 105 x 15.8 mm, w/ thermal pad, 4x M3x5 & 2x M2.5x4 screw, for 12W E-Series CPU
HEATSPREADER KIT*	0ZHK0ECXAPL00003	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

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