AmITX-SL-G

Mini-ITX Embedded Board with 6th/7th Gen Intel® Core™ i7/i5/i3 Desktop Processor

Features

- 6th/7th Gen Intel® Core™ i7/i5/i3, Intel® Pentium® and Celeron® Desktop Processor with Intel® Q170/H110 Chipset
- Up to 32GB dual channel DDR4 at 2133/2400MHz
- PCIe x16, PCIe x1 and Mini PCIe expansion
- 3 DisplayPort outputs on rear IO (Q170)
- Supports Smart Embedded Management Agent (SEMA®) functions

Specifications

Processor & System

CPU

Desktop 6th Generation Intel® Core™ i7/i5/i3 and Pentium®/Celeron® Processor, LGA1151 socket

Intel® Core™ i7-6700 Processor, 4C, 3.4/4.0 GHz, 8M, 65W
Intel® Core™ i7-6700TE Processor, 4C, 2.4/3.4 GHz, 8M, 35W
Intel® Core™ i5-6500 Processor, 4C , 3.2/3.6 GHz 6M, 65W
Intel® Core™ i5-6500TE Processor, 4C, 2.3/3.3 GHz, 6M, 35W
Intel® Core™ i3-6100 Processor, 2C, 3.7 GHz, 3M, 51W
Intel® Core™ i3-6100TE Processor, 2C, 2.7 GHz, 4M, 35W
Intel® Pentium® G4400 Processor, 2C, 3.3 GHz, 3M, 54W
Intel® Pentium® G4400TE Processor, 2C, 2.4 GHz, 3M, 35W
Intel® Celeron® G3900 Processor, 2C, 2.8 GHz, 2M, 51W
Intel® Celeron® G3900TE Processor, 2C, 2.3 GHz, 2M, 35W

Desktop 7th Generation Intel® Core™ i7/i5/i3 and Pentium®/Celeron® Processor, LGA1151 socket

Intel® Core™ i7-7700 Processor, 4C, 3.6/4.2 GHz, 8M, 65W
Intel® Core™ i7-7700T Processor, 4C, 2.9/3.8 GHz, 8M, 35W
Intel® Core™ i5-7500 Processor, 4C, 3.4/3.8 GHz, 6M, 65W
Intel® Core™ i5-7500T Processor, 4C, 2.7/3.3 GHz, 6M, 35W
Intel® Core™ i3-7101E Processor, 2C, 3.9 GHz, 3M, 54W
Intel® Core™ i3-7101TE Processor, 2C, 3.4GHz, 3M, 35W

Supports: Intel® VT, Intel® TXT, Intel® SSE4.2, Intel® HT Technology, Intel® 64 Architecture, Execute Disable Bit, Intel® Turbo Boost Technology 2.0, Intel® AVX2, Intel® AES-NI, PCLMULQDQ Instruction, Intel® Secure Key and Intel® TSX-NI

Chipset

Intel® Q170/H110 Chipset

BIOS

AMI EFI in 16MB SPI BIOS with Intel® AMT 11.0 support (Q170 only)
SPI header for external BIOS, optional onboard SPI BIOS socket

Debug Interface

40-pin multipurpose flat cable connector for use in combination with DB-40 debug module providing BIOS
POST code LEDs, BMC access, SPI BIOS flashing, power testpoints, debug LEDs

Memory

Dual channel non-ECC 2133/2400 MHz DDR4 memory up to 32GB in dual vertical SODIM sockets

SEMA® Support

Supports: voltage/current monitoring, power sequence debug support, AT/ATX mode control, logistics and forensic information, flat panel control, general purpose I2C, failsafe BIOS (dual BIOS), watchdog timer and triple Smart Fan control

I/O Interfaces

Expansion Slots

1 PCIe x16 Gen3
1 PCIe x1 Gen2
1x Mini-PCIe card (half size): support ing PCIex1(Gen 2)/USB 2.0 (top side)
1x Mini-PCIe card (full size): support ing PCIex1(Gen 2) or mSATA/USB 2.0 (bottom side)

Serial ATA

3x SATA 6 Gbps ports (Jumper select NA/3.3V/5V for SATA1 and SATA2 to deliver power by SATA pin7; Default is NA)
2x SATA power connector

USB

4x USB 3.0 and 4x USB 2.0 on rear I/O
2x USB 3.0 onboard header (H110: USB 2.0)
1x USB 3.0 on vertical connector with keep out area for dongle (H110: USB 2.0)

KB/MS

1x PS/2 internal header

Serial Ports

3x RS-232 headers, 1x RS-232/422/485 headers
(Support NA (Default)/5V/12V by jumper selection)

Digital IO

10 GPIO via onboard feature connector

Audio

Audio Codec

Realtek® ALC886

Interfaces

7.1 channel audio via 5 jacks and S/PDIF output on rear I/O
7.1 channel audio signals and S/PDIF output on internal header

Note: "Build option" indicates an alternative BOM configuration to support additional or alternative functions that are not available on the standard product.
Be aware that part numbers for SKUs with "build options" will need to be created and may cause production lead times.

Specifications

- ## Display

  ### Graphics Core
  Intel® 9th generation LP graphics core architecture with up to 18 execution units supporting DirectX 11/12, OGL4.3/4.4, and up to three independent, simultaneous displays

  ### DisplayPort
  3x DisplayPort v1.2 with resolution up to 4096 x 2160 @ 24Hz
  (3x DisplayPort(Q170) , 2x DisplayPort (H110)

  ### LVDS
  LVDS (optional): Single/dual channel 24-bit LVDS up to 1920x1080 @ 60 Hz (from eDP-to-LVDS converter)

  ### eDP (build option)
  eDP (optional): Supports 3840x2160 resolution @ 60Hz, 24bpp (not available concurrently with LVDS)

- ## Ethernet
  Intel® i219-LM (PHY) Ethernet controller (H110: i219-V)
  • Supports Intel® AMT 11.0 (Q170 only)
  • Supports Intel® vPro™ (Q170 only)
  Intel® i211AT (MAC/PHY) Ethernet controller
  10/100/1000 GbE connection

- ## TPM
  Atmel AT97SC3204 (optional)

- ## Power
  Standard Input: ATX: 12V ±5% / 5Vsb ±5%
  AT: 12V ±5%
  Peripheral Output: Onboard headers for fan and SATA power
  ATX Power Connector (14-pin)

- ## Mechanical and Environmental
  Dimension (mm): 170 mm x 170 mm (L x W)

  ### Operating Temperature
  Standard: 0˚C to +60˚C
  Storage Temperature: -20˚C to +80˚C
  Certification: CE, FCC Class B

  ### Relative Humidity
  40° C @ 95% RH Non-condensing

- ## Operating Systems
  ### Standard Support
  6th Gen CPU: Windows 10/8.1/7, Linux
  7th Gen CPU: Windows 10, Linux

  ### Extended Support (BSP)
  6th Gen CPU: WES7, Linux, VxWorks (TBD)
  7th Gen CPU: Linux, VxWorks (TBD)

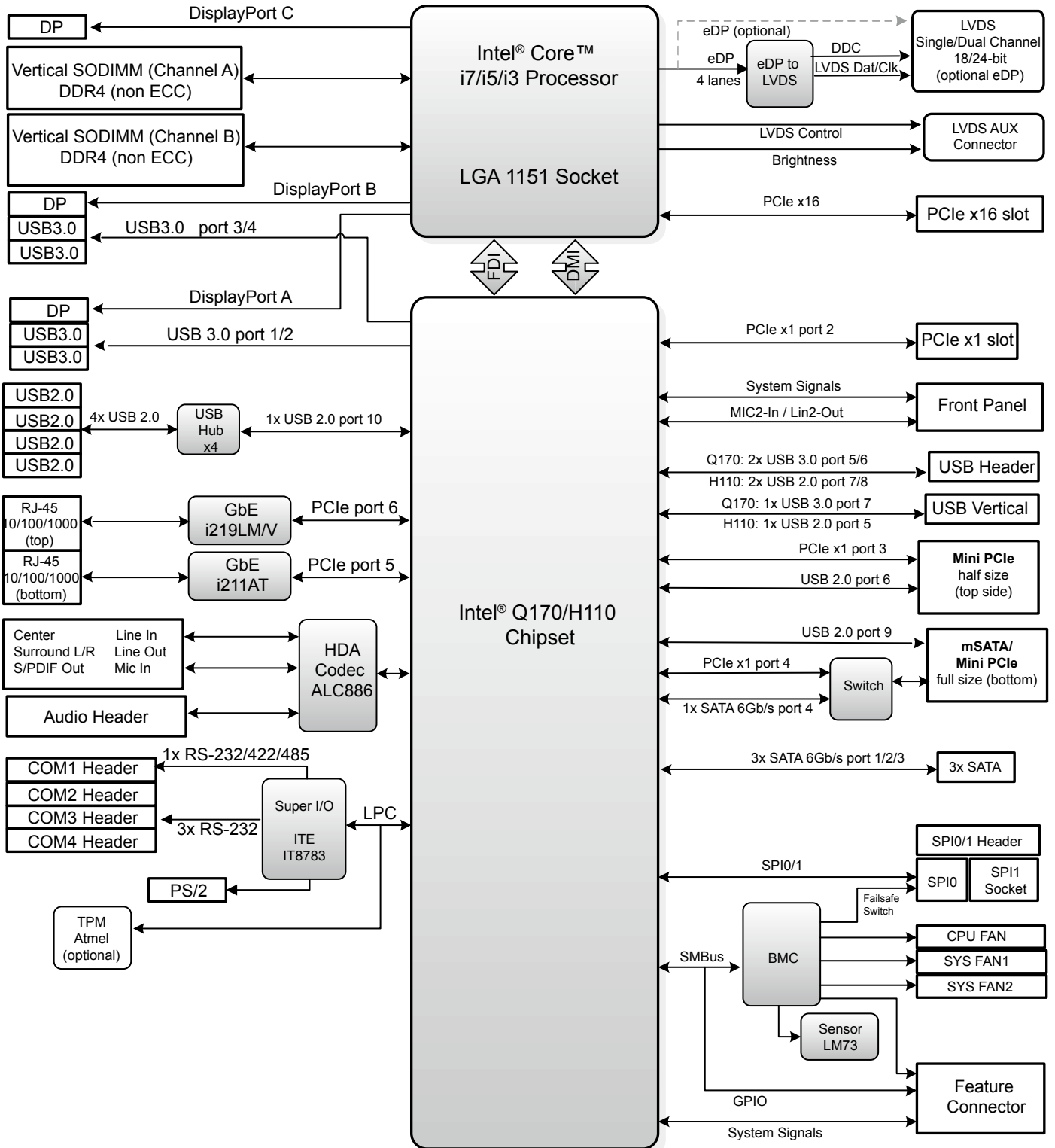- ## Intelligent Middleware
  ### SEMA®
  Local management, control of embedded computer systems
  Extended EAPI for monitoring, controlling and analytics applications
  Multiple OS support and across platforms (x86, ARM)

Functional Diagram

DisplayPort C

DP

Vertical SODIMM (Channel A)
DDR4 (non ECC)

Vertical SODIMM (Channel B)
DDR4 (non ECC)

DisplayPort B

DP
USB3.0
USB3.0

USB3.0   port 3/4

DisplayPort A

DP
USB3.0
USB3.0

USB 3.0 port 1/2

USB2.0
USB2.0
USB2.0
USB2.0

4x USB 2.0

USB Hub x4

1x USB 2.0 port 10

RJ-45
10/100/1000
(top)

RJ-45
10/100/1000
(bottom)

GbE
i219LM/V

PCIe port 6

GbE
i211AT

PCIe port 5

Center   Line In
Surround L/R   Line Out
S/PDIF Out   Mic In

HDA
Codec
ALC886

Audio Header

COM1 Header
COM2 Header
COM3 Header
COM4 Header

1x RS-232/422/485

3x RS-232

Super I/O
ITE
IT8783

LPC

PS/2

TPM
Atmel
(optional)

Intel® Core™
i7/i5/i3 Processor

LGA 1151 Socket

FDI   DMI

Intel® Q170/H110
Chipset

eDP (optional)
eDP
4 lanes

eDP to
LVDS

DDC
LVDS Dat/Clk

LVDS
Single/Dual Channel
18/24-bit
(optional eDP)

LVDS Control

LVDS AUX
Connector

Brightness

PCIe x16

PCIe x16 slot

PCIe x1 port 2

PCIe x1 slot

System Signals

MIC2-In / Lin2-Out

Front Panel

Q170: 2x USB 3.0 port 5/6
H110: 2x USB 2.0 port 7/8

USB Header

Q170: 1x USB 3.0 port 7
H110: 1x USB 2.0 port 5

USB Vertical

PCIe x1 port 3

USB 2.0 port 6

Mini PCIe
half size
(top side)

USB 2.0 port 9

PCIe x1 port 4

Switch

mSATA/
Mini PCIe
full size (bottom)

1x SATA 6Gb/s port 4

3x SATA 6Gb/s port 1/2/3

3x SATA

SPI0/1 Header

SPI0/1

SPI0   SPI1
Socket

Failsafe
Switch

BMC

SMBus

CPU FAN
SYS FAN1
SYS FAN2

Sensor
LM73

GPIO

Feature
Connector

System Signals

Ordering Information

- **AmITX-SL-G-Q170**
  Mini-ITX Embedded Board with 6th/7th generation Intel® Core™ i7/i5/i3 Desktop Processor with Q170 Chipset

- **AmITX-SL-G-H110**
  Mini-ITX Embedded Board with 6th/7th generation Intel® Core™ i7/i5/i3 Desktop Processor with H110 Chipset

Packing List

- **30-20872-0000**
  ATX/AT Power Cable

- **30-20875-0000**
  SATA Dual Power Cable

- **30-10057-0600**
  SATA Cable

- **34-25314-1000**
  Rear I/O Shield

Optional Accessories

- **30-20876-0000**
  COM Port Cable, 1 Port, 25cm

- **30-20873-0000**
  PS/2 KB/MS Cable, 40cm

- **30-20963-0000**
  USB 3.0 Cable, 2 ports, 20cm (for AmITX-SL-G-Q170)

- **30-20874-1000**
  USB 2.0 Cable, 2 ports, 20cm (for AmITX-SL-G-H110)

- **32-20513-0000**
  LGA1150 CPU Cooler, H=30.0mm, 45W

- **32-20512-0000**
  LGA1150 CPU Cooler, H=46.05mm, 45W

- **32-20113-3000**
  LGA1150 CPU Cooler, H=50.2mm, 95W

- **32-20495-0000**
  LGA1150 CPU Cooler, H=61.4mm, 95W