Minimalistic COMe Type6 carrier

1 Description

CarrierCOMeT6-1 is a minimalistic COM Express carrier board with cost-optimized design, intended for first hands-on experience of our customers with COM Express modules. Main purpose is to provide only basic interfaces to allow COMe module boot-up, configuration and potential evaluation.

2 Features

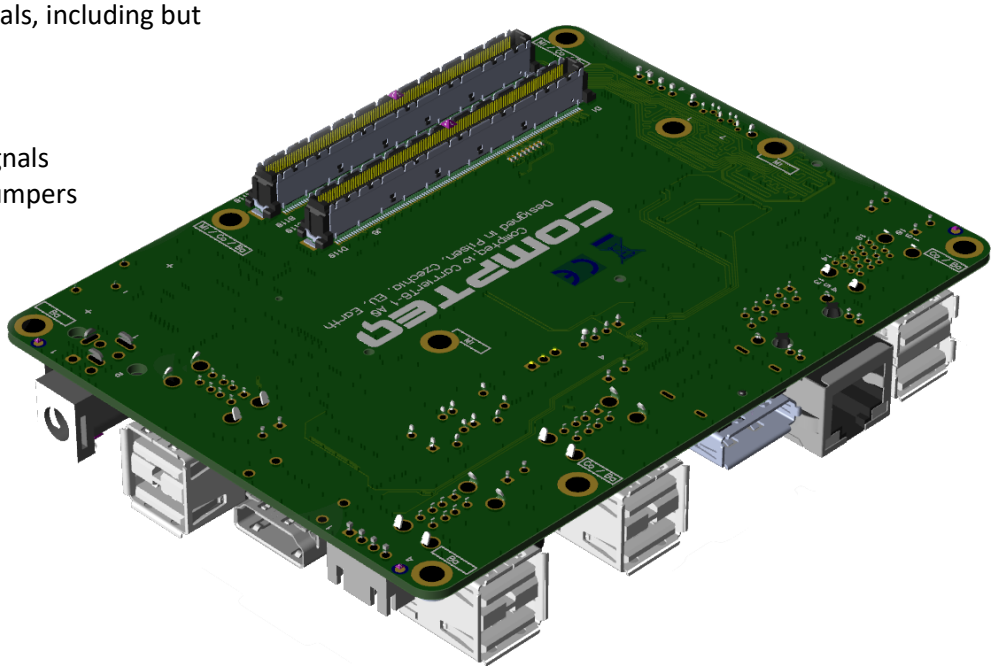
- Mechanical support for all Type6 COMe modules sizes (interface availability and power limitations apply), i.e. Mini, Compact and Basic
- Power input DC 8.5-20V (module and feature dependent, e.g. SATA power requires 12V)
- One native DDI video output
- One passively level-shifted HDMI output (resolution and signal quality limitations apply)
- Two USB 3.0 Type A ports (with ESD/EMI protection option)
- Up to 6 USB 2.0 Type A ports (with ESD/EMI protection option)
- One Gigabit Ethernet port with integrated magnetics (MAGJACK)
- RTC battery connector (PicoBlade 2pin header)
- 40-pin 2.54mm header with majority of COMe management signals, including but not limited to:
  - LPC, eSPI
  - I2C, SMBus
  - Power management signals
  - BIOS_DIS# signals for jumpers
- 10-pin 2.54mm GPIO header
  - 4x IN, 4x OUT, or 8x IO
  - 3.3V power supply for rail reference
- 10-pin 2.54mm UART header
  - 2x TTL-level 2pin UART
  - 3.3V and 5V supply for RS232 transceiver
- *(Optional) One SATA port (with 4-pin power)*
- *(Optional) One M.2 M-Key slot for SATA/NVMe SSD*
- *(Optional) Slot for CR2032 RTC battery*
- *(Optional) BIOS emulator header – 8pin 1.27mm header*
- *(Optional) FAN connector for 4-pin FAN or unregulated 2/3-pin FAN*

3 Module support (to be tested)

Any Kontron COMe Type6 module with CPU up to 50W (with 90W PSU) and without hard requirement for 5V standby voltage.

Examples:

- COMe-cEL6
- COMe-cWL6
- COMe-cTL6
- COMe-bTL6



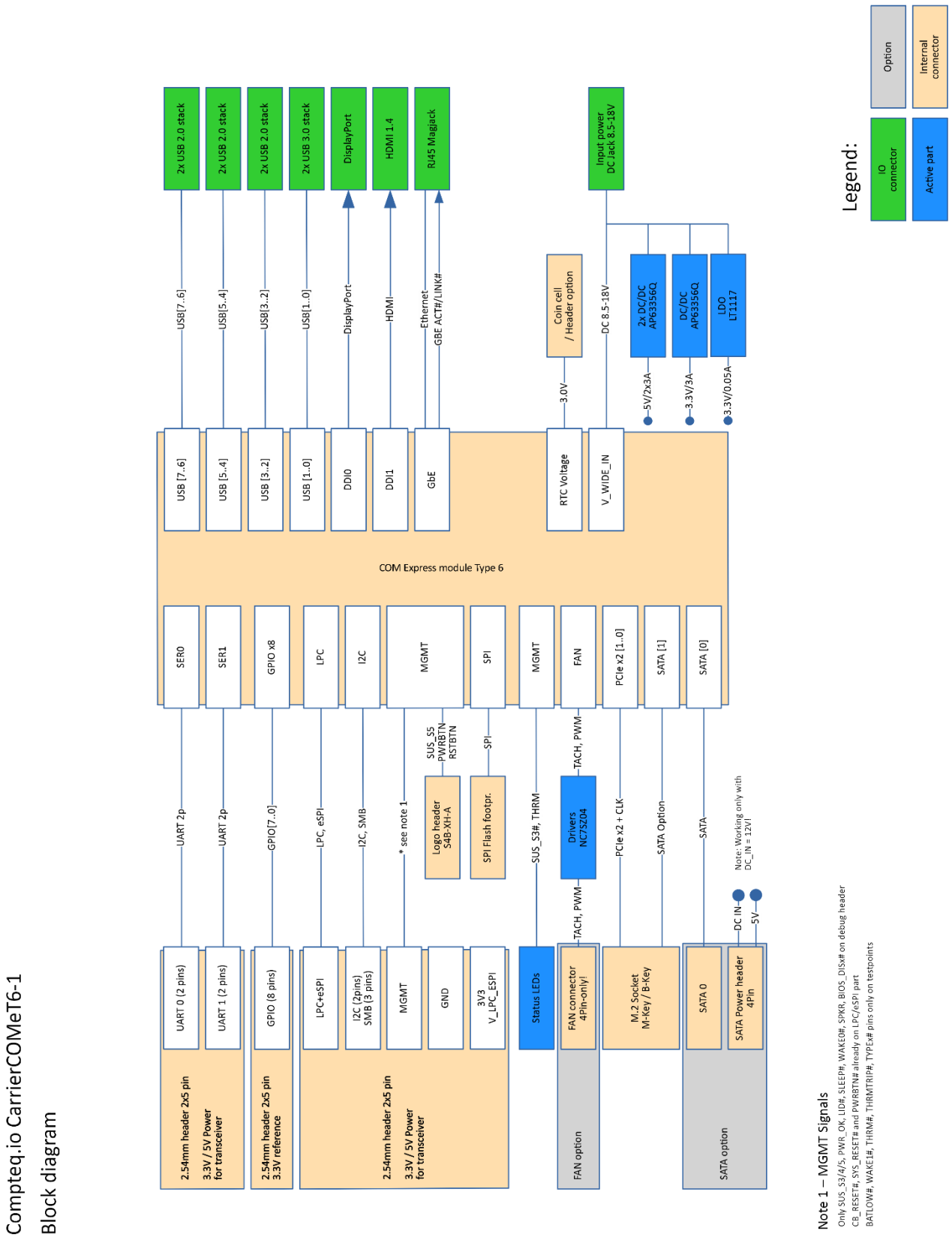
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4 Revision history

Revision	Document changes
1.0	Initial revision

5 Block Diagram



Picture 1 - Block diagram

6 Specifications

6.1 Absolute maximum ratings *

PARAMETER	DESCRIPTION	MIN	MAX	UNIT
V_{IN}	Input voltage applied to J16 / J17	8.5	20	V
V_{RTC}	Input voltage applied to J15 / J22	2.0	3.3	V
$I_{IN_MAX_ATX}$	Maximum input current with ATX 4pin jack (Limits maximum COMe module current and added rail current)		11	A
$I_{IN_MAX_JACK}$	Maximum input current with DC Jack input (Limits maximum COMe module current and added rail current)		5	A
I_{MAX_USB2}	Maximum current drawn from USB 2.0 port		0.5	A
I_{MAX_USB3}	Maximum current drawn from USB 3.0 port		0.9	A
$I_{MAX_SATA_5V}$	Maximum current drawn from SATA 5.0V power port		0.5	A
$I_{MAX_SATA_WIDE}$	Maximum current drawn from SATA DC-IN power port		0.5	A
I_{MAX_FAN}	Maximum current drawn from FAN connector		0.2	A
I_{MAX_HDMI}	Maximum current drawn from 5V pin of HDMI		55	mA
I_{MAX_DP}	Maximum current drawn from 3.3V pin of DisplayPort		0.2	A
I_{MAX_SSD}	Maximum current drawn from M.2 socket		2.5	A
$I_{MAX_USER_5V0}$	Maximum simultaneous current drawn from all runtime 5.0V pins of expansion connectors (LPC/eSPI, GPIO, UART)		200	mA
$I_{MAX_USER_3V3}$	Maximum simultaneous current drawn from all runtime 3.3V pins of expansion connectors (LPC/eSPI, GPIO, UART)		200	mA
$I_{MAX_USER_3V3_SBY}$	Maximum simultaneous current drawn from all standby 3.3V pins of expansion connectors (LPC/eSPI, GPIO, UART)		50	mA
$T_{_OPER}$	Operating temperature range (ambient, under the condition that no component on board shall exceed specified value)	-20	85	°C
$T_{_OPER_NOCON}$	Operating temperature range with exception of connectors (USB3.0, DisplayPort, HDMI, Front panel, SATA power) which lose their mechanical properties at low temperature (mainly brittleness)	-40	85	°C

* Maximum current ratings indicate current capability of selected input/output port, or value required by interface specification. The specified value can only be achieved if the input power supply is able to provide sufficient current to the device power input port.

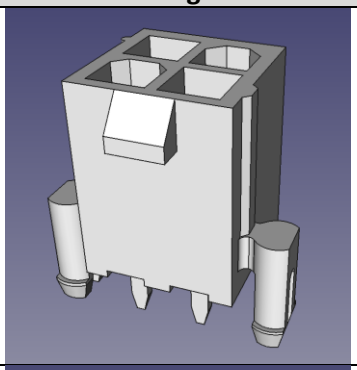
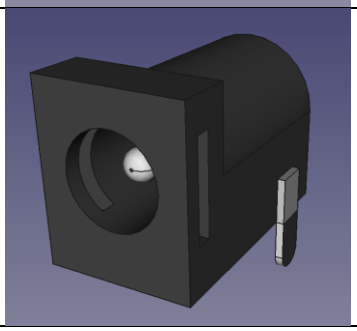
6.2 Typical values

PARAMETER	DESCRIPTION	MIN	TYP	MAX	UNIT
V_{5V0}	5.0V rail (USB, HDMI)	4.97	5.0	5.03	V
V_{3V3}	3.3V rail (DP, User headers)	3.23	3.3	3.37	V

7 Detailed description

7.1 Power input

Input voltage shall only be applied to either ATX 4pin connector (J17) or DC power jack (J16), depending on the carrier BOM option. For standalone application, the ATX connector is more versatile, allowing simple laboratory measurements and adapters creation. For boxed and validation applications, an isolated PSU with DC power jack provides a solution closer to the end-application.

Input port	Connector part number	Possible mating	Image
ATX (J17)	Molex 44472-0451	Molex 3901-2040	
DC Jack (J16)	Kycon KLDHCX-0202-A-LT (5.5/2.0mm)	Kycon KLDX-PA-0202-A-LT	
	Kycon KLDHCX-0202-B-LT (5.5/2.5mm)	Kycon KLDX-PA-0202-B-LT	

For detailed information on pinout and connector positions, please see user manual.

7.2 COMe module

CarrierCOMeT6-1 supports (at least partially) all COMe Type6 modules in Compact (95x95mm) and Basic (125x95mm) form factors under following circumstances:

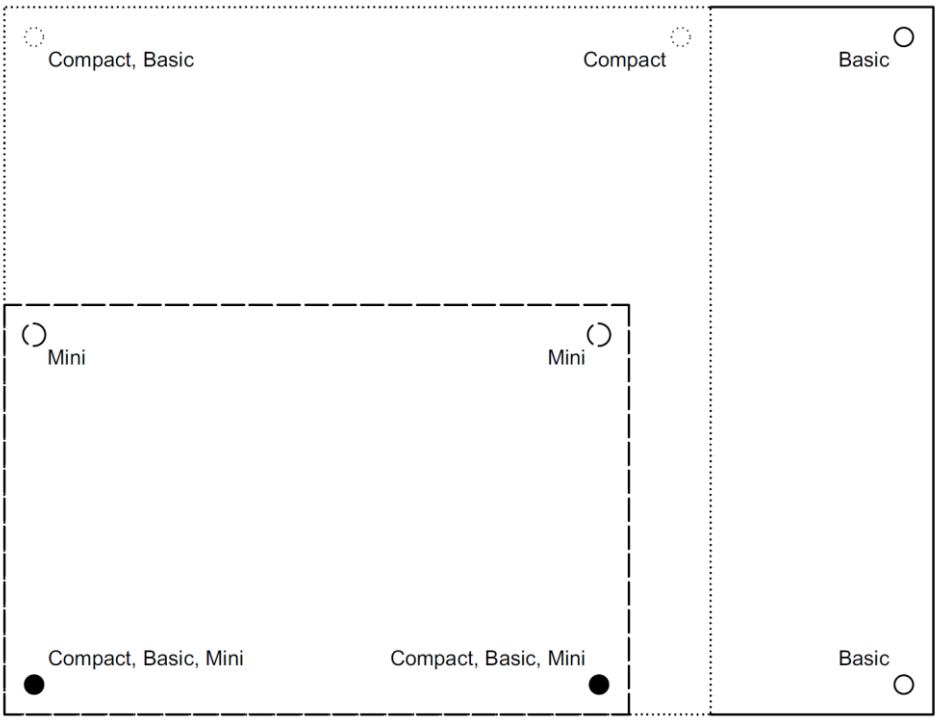
1. COMe module power requirements must not exceed input power supply and input power connector ratings, decreased by the carrier power consumption (self-consumption, USB power, etc.)
2. The COMe module must be able to operate without 5V_SBY rail ("single supply mode")
3. The COMe module must mechanically conform to COMe specification (standoffs location, height restriction map on bottom side, etc)

Additionally, COMe Type10 modules are supported under one of the following circumstances:

1. CarrierCOMeT6-1 is BOM-configured to support Type10 module (TYPE10 option):
    a. C/D rows of COMe connector removed
    b. USB3.0 is routed to Type10 pinout location
    c. DisplayPort is routed from DDI0 (only on Type10) instead of DDI1 (only on Type6)

2. Under the condition that DDI0 and USB3.0 interfaces are not needed, CarrierCOMeT6-1 can be used in conjunction with:
    a. Type10 interposer board (e.g. Kontron 38019-0000-00-1) which raises the COMe module by roughly 9mm using only A/B rows of pins, and skips the requirement for C/D rows removal
    b. Increased height standoffs (17mm instead of 8mm)

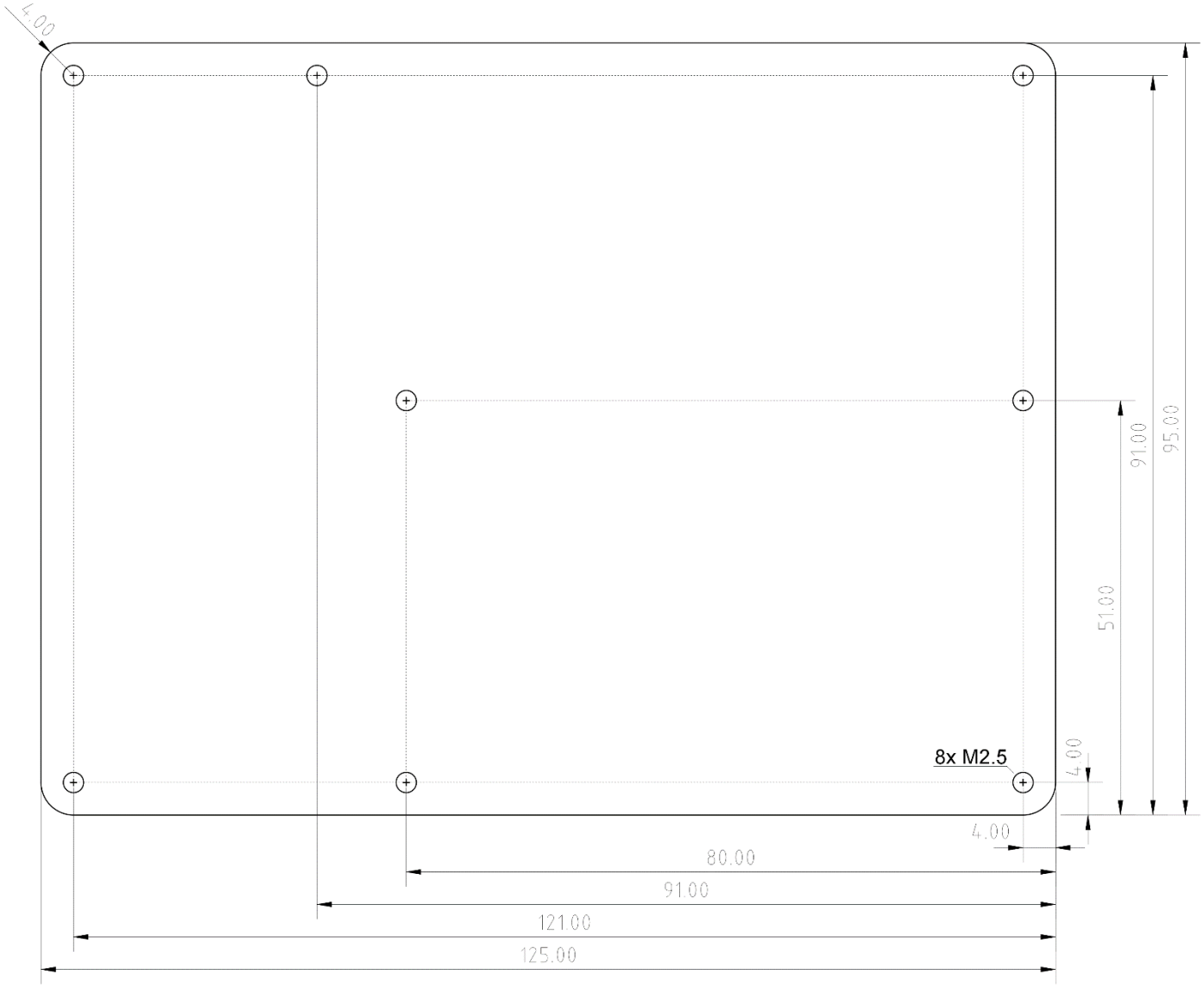
Standoffs used for mounting the COMe module to carrier board can be moved between positions by simply unscrewing the standoff from opposite side PEM and screwing to new positions either by hand or proper size wrench. Following image shows required standoff positions (4x for MINI, 4x for COMPACT, 5x for BASIC):



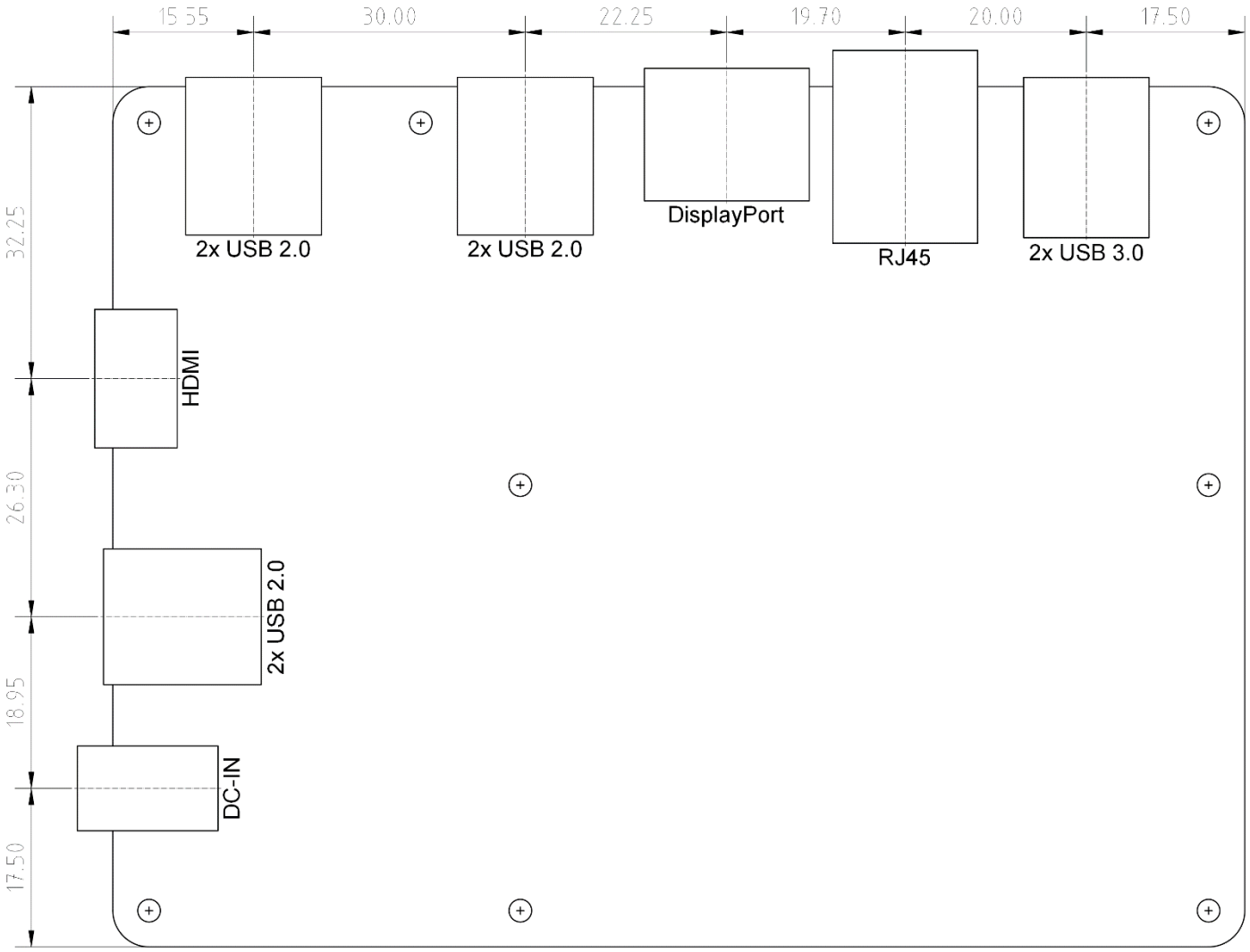
Picture 2 - COMe standoff positions

8 Mechanical information

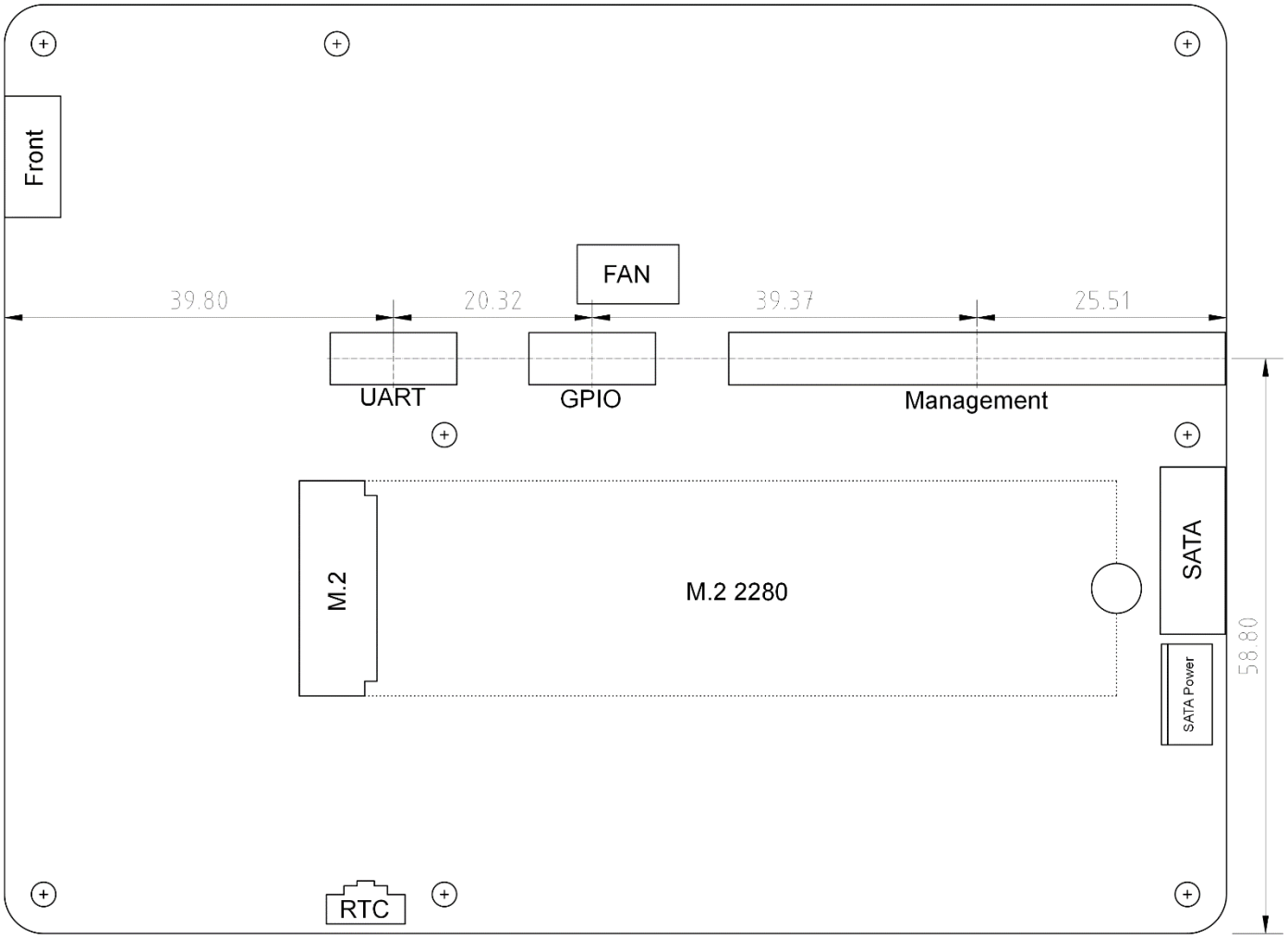
8.1 Overall dimensions, COMe mounting holes



8.2 IO Connector positions



8.3 Internal Connector positions



9 Device options

Specific optioning (differing from standard variant) can be ordered, but minimum order quantities apply.

Option name	Standard variant	Description
COME-T6	X	2-Port COMe connector, Type6 pinout for DDI1 and USB3.0
COME-T10		1-Port COMe connector, Type10 pinout for DDI0 and USB3.0
DC-ATX	X	Power input via ATX 4pin connector
DC-JACK-5520		Power input via DC Jack 5.5mm/2.0mm like Kycon KLDHCX-0202-A-LT
DC-JACK-5525		Power input via DC Jack 5.5mm/2.5mm like Kycon KLDHCX-0202-B-LT
RTC-CON	X	RTC Battery via connector like Molex 53398-0271
RTC-SLOT		RTC Battery via CR2032 battery holder
BIOS-HEADER		2x4 Pin 1.27mm header for BIOS SPI header
SATA	X	SATA Signal and power connectors (COMe SATA0)
HDMI	X	HDMI 1.4 Connector (COMe DDI2)
DP	X	DP 1.2 Conneco
ETHERNET	X	RJ45 connector
M.2	X	M.2 Slot for SSD (PCIe)

Please contact Compteq.io representative for BOM customizations, specific optioning, or customer-specific board modifications.