

## Micro HDMI

Pin	Pin Description	Pin	Pin Description
1	Hot Plug Detect	2	Utility
3	TMDS Data2+	4	TMDS Data2 Shield
5	TMDS Data2-	6	TMDS Data1+
7	TMDS Data1 Shield	8	TMDS Data1-
9	TMDS Data0+	10	TMDS Data0 Shield
11	TMDS Data0-	12	TMDS Clock+
13	TMDS Clock Shield	14	TMDS Clock-
15	CEC	16	DDC /CEC Ground
17	SCL	18	SDA
19	+5V Power		

## USB 3.0

Pin	Pin Description	Pin	Pin Description
1	VBUS	2	USB 2.0 D-
3	USB 2.0 D+	4	GND
5	SSRX-	6	SSRX+
7	GND	8	SSTX-
9	SSTX+		

## Micro USB

Pin	Pin Description	Pin	Pin Description
1	VBUS	2	USB 2.0 D-
3	USB 2.0 D+	4	USB ID
5	GND		

## USB 2.0 connector

Pin	Pin Description	Pin	Pin Description
1	5V	2	USB 22_ D_N
3	USB 22_ D_P	4	GND

### Audio connector (10 Pin)

Pin	Pin Description	Pin	Pin Description
1	VDD_5V_IN	2	GND
3	GPIO12_LS	4	GPIO09_LS
5	I <sup>2</sup> C2_SCL_LS	6	I <sup>2</sup> S0_SCLK_LS
7	I <sup>2</sup> C2_SDA_LS	8	I <sup>2</sup> S0_SDOUT_LS
9	I <sup>2</sup> S0_LRCK_LS	10	I <sup>2</sup> S0_SDIN_LS

### Fan

Pin	Pin Description	Pin	Pin Description
1	GND	2	+5V
3	FAN_TACH_CON	4	FAN_PWM

### Ethernet

Pin	Pin Description	Pin	Pin Description
1	TP0+	2	TP0-
3	TP1+	4	TP2+
5	TP2-	6	TP1-
7	TP3+	8	TP3-

### 12V Power

Pin	Pin Description	Pin	Pin Description
1	Power DC		

Input range: +12V

### 5V Power

Pin	Pin Description	Pin	Pin Description
1	Power DC		

Input range: +5V

### POE

Pin	Pin Description	Pin	Pin Description
1	VC1	2	VC2
3	VC3	4	VC4

## 24 Pin

Pin	Pin Description	Pin	Pin Description
1	3.3V	2	3.3V
3	UART0_TX	4	UART0_RX
5	UART1_RX	6	UART1_TX
7	GPIO_0	8	GPIO_1
9	GPIO_2	10	GPIO_3
11	I <sup>2</sup> C_GP1_CLK	12	I <sup>2</sup> C_GP1_DAT
13	RECOVERY	14	RTC_BAT_INPUT
15	RESET	16	PC_LED+
17	POWER_BUTTON	18	PC_LED-
19	GND	20	GND
21	-	22	-
23	CAN0H	24	CAN0L

## URAT0

Pin	Pin Description	Pin	Pin Description
3	UART0_TX	4	UART0_RX

Note: URAT0 is a debug serial port, you can debug via ubuntu system  
you can install 'cutecom':

```
sudo apt-get install cutecom
```

Set port rate as 115200/8N1

## URAT1

Pin	Pin Description	Pin	Pin Description
5	UART1_RX	6	UART1_TX

Note: /dev/ttyTHS0

On default it could debug, you could close debug function to use it as normal pin  
Type the following command:

```
$ systemctl stop nvgetty
```

```
$systemctl disable nvgetty
```

```
$udevadm trigger
```

and restart the whole system

## CAN0

Pin	Pin Description	Pin	Pin Description
23	CAN0H	24	CAN0L

**Note:** Testing can

**#Install testing tool**

```
sudo apt-get install can-utils
```

**#Run CAN server (save as : can\_server.sh)**

```
#!/bin/bash
```

```
can_init(){
echo "nvidia" | sudo -S modprobe can
sudo modprobe can_raw
sudo modprobe mttcan
sudo ip link set can0 type can bitrate 500000
sudo ip link set up can0
}
NN=`ifconfig | grep "can0" >findout && cat findout`
if [ "$NN" = "" ]
then
can_init
fi
#candump can0 && cansend can1 1f334455#1122334455667788
candump can0
```

**Then run:**

```
sudo ./can_server.sh
```

**#Run CAN client (save as: can\_client.sh)**

```
#!/bin/bash
can_init(){
echo "nvidia" | sudo -S ip link set can0 type can bitrate 500000
sudo ip link set up can0
}
NN=`ifconfig | grep "can0" >findout && cat findout`
if [ "$NN" = "" ]
then
can_init
fi
cansend can0 1F334455#1122334455667788
```

**Run :**

```
sudo ./can_client.sh
```

## GPIO

Pin	Pin Description	Pin	Pin Description
7	GPIO_0	8	GPIO_1
9	GPIO_2	10	GPIO_3

Note: GPIO testing:

#check gpio (Pin 7/8/9/10 match GPIO No. 421/393/422/424)

```
cd /sys/class/gpio #load gpio
echo '421'|sudo tee /sys/class/gpio/export
echo '393'|sudo tee /sys/class/gpio/export
echo '422'|sudo tee /sys/class/gpio/export
echo '424'|sudo tee /sys/class/gpio/export
```

#Set gpio output direction

```
cd gpio421
echo 'out'|sudo tee /sys/class/gpio/gpio421/direction
#gpio 3.3v
echo '1'|sudo tee /sys/class/gpio/gpio421/value
#gpio 0v
echo '0'|sudo tee /sys/class/gpio/gpio421/value
#Set gpio input direction under /sys/class/gpio
#Check gpio value, set input as '0'
cat ./gpio393/value
echo 'in'|sudo tee /sys/class/gpio/gpio393/direction
#Set high input, 3.3v will return '1'
cat /sys/class/gpio/gpio393/value
```

## I<sup>2</sup>C

Pin	Pin Description	Pin	Pin Description
11	I <sup>2</sup> C_GP1_CLK	12	I <sup>2</sup> C_GP1_DAT

Note: I<sup>2</sup>C testing:

#Check bus

```
sudo i2cdetect -l
#Check BusID, if values and 'UU address' shown, device detected successfully
```

```
sudo i2cdetect -y BUSID
#Read BusID and write (0x50 is the values and UU address), (0x00; 0x20 is register address), (r means read)
```

```
sudo i2ctransfer -f -y BUSID w2@0x50 0x00 0x20 r16
#Write (0x77 0x77 is the modified value)
```

```
sudo i2ctransfer -f -y BUSID w4@0x50 0x00 0x20 0x77 0x77
```