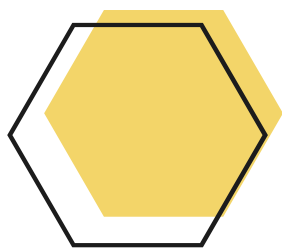


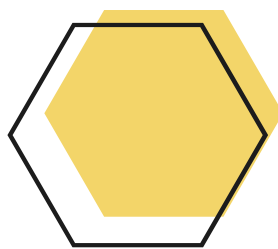
# DATASHEET

## ES-P-N2N2-5050



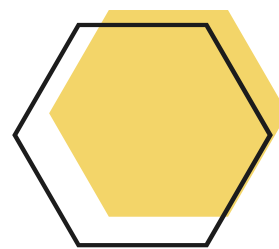
### IEEE 802.11 a/n

High-Performance,  
Dual independent  
Radio



### Tri Band

4.9 GHz to 5.9 GHz  
supporting 4.9 GHz, UNII-  
B1,B2A,B2C and B3 Bands



### Industrial grade

-40 deg C to +85 deg C  
operation temperature

dun & bradstreet



#### VIZMONET PTE LTD

21 Woodlands Close, #03-01, Primz Biz Hub, Singapore 737 854  
+65 6255 0581 | enquiry@vizmonet.com | <https://vizmonet.com>

HW REV# 03.00

# TECHNICAL SPECIFICATION

| RADIO MODULE – GENERAL INFO  |   |
|--|---|
| On-board Radio (11a/n) chipset<br>MiniPCie Radio (11a/n) chipset             | QCA 9550-AT4B (CPU) & AR 8033-AL1B (Ethernet PHY)<br>AR 9592-AR1B   |
| NOR Flash<br>NAND Flash<br>RAM   | SPI Flash, 16MB<br>NAND Flash, 256 MB<br>DDR2, 200 MHz, 256 MB (64Mx16x2)   |
| Operating frequency – on-board Radio<br>Operating frequency – MiniPCie Radio | 4920 MHz to 5825 MHz (Operating Channels)<br>4920 MHz to 5825 MHz (Operating Channels)  |
| Data rate-11n HT20/HT40-1S (SISO)<br>Data rate-11n HT20/HT40-2S (MIMO)       | 6Mbps, 9Mbps, 12Mbps, 24Mbps, 36Mbps, 48Mbps,54Mbps (11a)<br>MCS0, MCS1, MCS2, MCS3, MCS4, MCS5, MCS6, MCS7 (11n)<br>MCS8, MCS9, MCS10, MCS11, MCS12, MCS13, MCS14, MCS15 (11n) |
| Channel BW - On-board Radio (11a/n)<br>Channel BW - MiniPCie Radio (11a/n)   | 5 MHz/10 MHz/20 MHz /40 MHz<br>5 MHz/10 MHz/20 MHz /40 MHz  |
| RoHS Compliance  | Compliant   |
| INTERFACE SPECIFICATIONS   |   |
| Power in   | DC in through 2 pin header  |
| Operating Voltage  | 9V to 30V   |
| RF Antenna connector   | x4 MMCX Female (jack) connectors  |
| ENVIRONMENTAL SPECIFICATIONS   |   |
| Operating Temperature Range  | -40 deg C to +85 deg C  |
| PHYSICAL SPECIFICATIONS  |   |
| Mechanical Dimension   | (L) 111.5 mm x (W) 98.55 mm x (D) x 17.06 mm  |
| Weight   | 130 g   |
| REGULATORY INFORMATION   |   |
| Compliance   | TBD   |
| PACKAGING INFORMATION  |   |
| No of units  | TBD   |

## ORDERING INFORMATION

ES-P-N2N2-5050

OEM PCB Assembly Kit, ES-P-N2N2-5050, HW Rev 03.00  
 SBC, 5 GHz, MIMO, HW Rev 2001.0300  
 MiniPCIe, 5 GHz, MIMO, HW Rev 1805.0600

**RADIO SPECIFICATION****TX/RX Specification – 4920MHz to 4990 MHz (on-board radio)**

Sensitivity tested in ART Mode, PSR >=95%, Chain0+Chain1

TX Power Setting = Calibrated Power level in dBm

Current consumption is measured at the input of the SBC, and it includes idle current drawn by the system

| Data Rate | TX Power (dBm) | Current 24V (A) | RX Sensitivity (dBm) |
|-----------|----------------|-----------------|----------------------|
| 54 Mbps   | 19             | 0.30            | -77                  |
| 48 Mbps   | 22             | 0.34            | -80                  |
| 36 Mbps   | 23             | 0.35            | -83                  |
| 24 Mbps   | 24             | 0.37            | -85                  |
| 18 Mbps   | 24             | 0.37            | -87                  |
| 12Mbps    | 24             | 0.37            | -89                  |
| 9 Mbps    | 24             | 0.37            | -92                  |
| 6 Mbps    | 24             | 0.37            | -94                  |
| HT20-MCS7 | 18             | 0.29            | -71                  |
| HT20-MCS6 | 19             | 0.30            | -74                  |
| HT20-MCS5 | 20             | 0.31            | -75                  |
| HT20-MCS4 | 23             | 0.35            | -79                  |
| HT20-MCS3 | 24             | 0.37            | -82                  |
| HT20-MCS2 | 24             | 0.37            | -86                  |
| HT20-MCS1 | 24             | 0.37            | -88                  |
| HT20-MCS0 | 26             | 0.40            | -92                  |
| HT40-MCS7 | 18             | 0.29            | -68                  |
| HT40-MCS6 | 19             | 0.30            | -71                  |
| HT40-MCS5 | 20             | 0.31            | -72                  |
| HT40-MCS4 | 23             | 0.35            | -75                  |
| HT40-MCS3 | 24             | 0.37            | -76                  |
| HT40-MCS2 | 24             | 0.37            | -83                  |
| HT40-MCS1 | 24             | 0.37            | -85                  |
| HT40-MCS0 | 26             | 0.40            | -89                  |

**TX/RX Specification – 5180 MHz to 5320 MHz (on-board radio)**

Sensitivity tested in ART Mode, PSR >=95%, Chain0+Chain1

TX Power Setting = Calibrated Power level in dBm

Current consumption is measured at the input of the SBC, and it includes idle current drawn by the system

| Data Rate | TX Power (dBm) | Current 24V (A) | RX Sensitivity (dBm) |
|-----------|----------------|-----------------|----------------------|
| 54 Mbps   | 21             | 0.32            | -77                  |
| 48 Mbps   | 22             | 0.34            | -80                  |
| 36 Mbps   | 23             | 0.35            | -83                  |
| 24 Mbps   | 25             | 0.38            | -85                  |
| 18 Mbps   | 25             | 0.38            | -87                  |
| 12Mbps    | 25             | 0.38            | -89                  |
| 9 Mbps    | 25             | 0.38            | -92                  |
| 6 Mbps    | 25             | 0.38            | -94                  |
| HT20-MCS7 | 20             | 0.31            | -71                  |
| HT20-MCS6 | 21             | 0.32            | -74                  |
| HT20-MCS5 | 22             | 0.34            | -75                  |
| HT20-MCS4 | 23             | 0.35            | -79                  |
| HT20-MCS3 | 24             | 0.37            | -82                  |
| HT20-MCS2 | 24             | 0.37            | -86                  |
| HT20-MCS1 | 24             | 0.37            | -88                  |
| HT20-MCS0 | 26             | 0.40            | -92                  |
| HT40-MCS7 | 20             | 0.31            | -68                  |
| HT40-MCS6 | 21             | 0.32            | -71                  |
| HT40-MCS5 | 22             | 0.34            | -72                  |
| HT40-MCS4 | 23             | 0.35            | -75                  |
| HT40-MCS3 | 24             | 0.37            | -76                  |
| HT40-MCS2 | 24             | 0.37            | -83                  |
| HT40-MCS1 | 24             | 0.37            | -85                  |
| HT40-MCS0 | 26             | 0.40            | -89                  |

**TX/RX Specification – 5500 MHz to 5720 MHz (on-board radio)**

Sensitivity tested in ART Mode, PSR >=95%, Chain0+Chain1  
 TX Power Setting = Calibrated Power level in dBm  
 Current consumption is measured at the input of the SBC, and it includes idle current drawn by the system

| Data Rate | TX Power (dBm) | Current 24V (A) | RX Sensitivity (dBm) |
|-----------|----------------|-----------------|----------------------|
| 54 Mbps   | 20             | 0.31            | -77                  |
| 48 Mbps   | 22             | 0.34            | -80                  |
| 36 Mbps   | 23             | 0.35            | -83                  |
| 24 Mbps   | 25             | 0.38            | -85                  |
| 18 Mbps   | 25             | 0.38            | -87                  |
| 12Mbps    | 25             | 0.38            | -89                  |
| 9 Mbps    | 25             | 0.38            | -92                  |
| 6 Mbps    | 25             | 0.38            | -94                  |
| HT20-MCS7 | 19             | 0.30            | -71                  |
| HT20-MCS6 | 20             | 0.31            | -74                  |
| HT20-MCS5 | 21             | 0.32            | -75                  |
| HT20-MCS4 | 22             | 0.34            | -79                  |
| HT20-MCS3 | 24             | 0.37            | -82                  |
| HT20-MCS2 | 24             | 0.37            | -86                  |
| HT20-MCS1 | 24             | 0.37            | -88                  |
| HT20-MCS0 | 26             | 0.40            | -92                  |
| HT40-MCS7 | 19             | 0.30            | -68                  |
| HT40-MCS6 | 20             | 0.31            | -71                  |
| HT40-MCS5 | 21             | 0.32            | -72                  |
| HT40-MCS4 | 22             | 0.34            | -75                  |
| HT40-MCS3 | 24             | 0.37            | -76                  |
| HT40-MCS2 | 24             | 0.37            | -83                  |
| HT40-MCS1 | 24             | 0.37            | -85                  |
| HT40-MCS0 | 26             | 0.40            | -89                  |

**TX/RX Specification – 5745 MHz to 5825 MHz (on-board radio)**

Sensitivity tested in ART Mode, PSR >=95%, Chain0+Chain1  
 TX Power Setting = Calibrated Power level in dBm  
 Current consumption is measured at the input of the SBC, and it includes idle current drawn by the system

| Data Rate | TX Power (dBm) | Current 24V (A) | RX Sensitivity (dBm) |
|-----------|----------------|-----------------|----------------------|
| 54 Mbps   | 21             | 0.32            | -77                  |
| 48 Mbps   | 22             | 0.34            | -80                  |
| 36 Mbps   | 23             | 0.35            | -83                  |
| 24 Mbps   | 25             | 0.38            | -85                  |
| 18 Mbps   | 25             | 0.38            | -87                  |
| 12Mbps    | 25             | 0.38            | -89                  |
| 9 Mbps    | 25             | 0.38            | -92                  |
| 6 Mbps    | 25             | 0.38            | -94                  |
| HT20-MCS7 | 20             | 0.31            | -71                  |
| HT20-MCS6 | 21             | 0.32            | -74                  |
| HT20-MCS5 | 22             | 0.34            | -75                  |
| HT20-MCS4 | 23             | 0.35            | -79                  |
| HT20-MCS3 | 24             | 0.37            | -82                  |
| HT20-MCS2 | 24             | 0.37            | -86                  |
| HT20-MCS1 | 24             | 0.37            | -88                  |
| HT20-MCS0 | 26             | 0.40            | -92                  |
| HT40-MCS7 | 20             | 0.31            | -68                  |
| HT40-MCS6 | 21             | 0.32            | -71                  |
| HT40-MCS5 | 22             | 0.34            | -72                  |
| HT40-MCS4 | 23             | 0.35            | -75                  |
| HT40-MCS3 | 24             | 0.37            | -76                  |
| HT40-MCS2 | 24             | 0.37            | -83                  |
| HT40-MCS1 | 24             | 0.37            | -85                  |
| HT40-MCS0 | 26             | 0.40            | -89                  |

**TX/RX Specification – 4920 MHz to 4990 MHz (miniPCIe)**

Sensitivity tested in ART Mode, PSR >=95%, Chain0+Chain1

TX Power Setting = Calibrated Power level in dBm

Test Condition for Current consumption:

Current consumption is measured at the input of the SBC with the mini-PCIe radio module connected to it. The current consumption figures are then adjusted so that they only include extra current drawn by the mini-PCIe radio module.

| Data Rate | TX Power (dBm) | Current 24V (A) | RX Sensitivity (dBm) |
|-----------|----------------|-----------------|----------------------|
| 54 Mbps   | 19             | 0.19            | -77                  |
| 48 Mbps   | 20             | 0.20            | -80                  |
| 36 Mbps   | 22             | 0.22            | -82                  |
| 24 Mbps   | 23             | 0.23            | -85                  |
| 18 Mbps   | 23             | 0.23            | -87                  |
| 12Mbps    | 23             | 0.23            | -89                  |
| 9 Mbps    | 23             | 0.23            | -92                  |
| 6 Mbps    | 23             | 0.23            | -94                  |
| HT20-MCS7 | 18             | 0.19            | -71                  |
| HT20-MCS6 | 19             | 0.19            | -74                  |
| HT20-MCS5 | 20             | 0.20            | -75                  |
| HT20-MCS4 | 22             | 0.22            | -79                  |
| HT20-MCS3 | 23             | 0.23            | -82                  |
| HT20-MCS2 | 23             | 0.23            | -86                  |
| HT20-MCS1 | 23             | 0.23            | -88                  |
| HT20-MCS0 | 26             | 0.27            | -92                  |
| HT40-MCS7 | 18             | 0.19            | -68                  |
| HT40-MCS6 | 19             | 0.19            | -71                  |
| HT40-MCS5 | 20             | 0.20            | -72                  |
| HT40-MCS4 | 22             | 0.22            | -76                  |
| HT40-MCS3 | 23             | 0.23            | -79                  |
| HT40-MCS2 | 23             | 0.23            | -83                  |
| HT40-MCS1 | 23             | 0.23            | -85                  |
| HT40-MCS0 | 26             | 0.27            | -89                  |

**TX/RX Specification – 5180 MHz to 5320 MHz (miniPCIe)**

Sensitivity tested in ART Mode, PSR >=95%, Chain0+Chain1

TX Power Setting = Calibrated Power level in dBm

Test Condition for Current consumption:

Current consumption is measured at the input of the SBC with the mini-PCIe radio module connected to it.

The current consumption figures are then adjusted so that they only include extra current drawn by the mini-PCIe radio module.

| Data Rate | TX Power (dBm) | Current 24V (A) | RX Sensitivity (dBm) |
|-----------|----------------|-----------------|----------------------|
| 54 Mbps   | 20             | 0.20            | -77                  |
| 48 Mbps   | 21             | 0.21            | -80                  |
| 36 Mbps   | 23             | 0.23            | -82                  |
| 24 Mbps   | 24             | 0.24            | -85                  |
| 18 Mbps   | 24             | 0.24            | -87                  |
| 12Mbps    | 24             | 0.24            | -89                  |
| 9 Mbps    | 24             | 0.24            | -92                  |
| 6 Mbps    | 24             | 0.24            | -94                  |
| HT20-MCS7 | 19             | 0.19            | -71                  |
| HT20-MCS6 | 20             | 0.20            | -74                  |
| HT20-MCS5 | 21             | 0.21            | -75                  |
| HT20-MCS4 | 23             | 0.23            | -79                  |
| HT20-MCS3 | 24             | 0.24            | -82                  |
| HT20-MCS2 | 24             | 0.24            | -86                  |
| HT20-MCS1 | 24             | 0.24            | -88                  |
| HT20-MCS0 | 26             | 0.27            | -92                  |
| HT40-MCS7 | 19             | 0.19            | -68                  |
| HT40-MCS6 | 20             | 0.20            | -71                  |
| HT40-MCS5 | 21             | 0.21            | -72                  |
| HT40-MCS4 | 23             | 0.23            | -76                  |
| HT40-MCS3 | 24             | 0.24            | -79                  |
| HT40-MCS2 | 24             | 0.24            | -83                  |
| HT40-MCS1 | 24             | 0.24            | -85                  |
| HT40-MCS0 | 26             | 0.27            | -89                  |



**TX/RX Specification – 5500 MHz to 5720 MHz (miniPCIe)**

Sensitivity tested in ART Mode, PSR >=95%, Chain0+Chain1  
 TX Power Setting = Calibrated Power level in dBm  
 Test Condition for Current consumption:  
 Current consumption is measured at the input of the SBC with the mini-PCIe radio module connected to it.  
 The current consumption figures are then adjusted so that they only include extra current drawn by the mini-PCIe radio module.

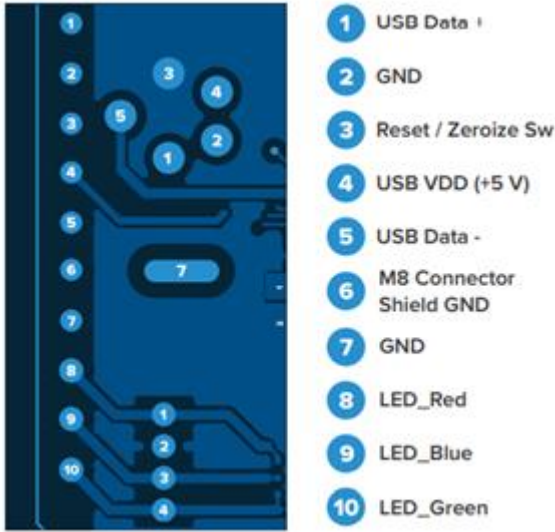
| Data Rate | TX Power (dBm) | Current 24V (A) | RX Sensitivity (dBm) |
|-----------|----------------|-----------------|----------------------|
| 54 Mbps   | 19             | 0.19            | -77                  |
| 48 Mbps   | 20             | 0.20            | -80                  |
| 36 Mbps   | 23             | 0.23            | -82                  |
| 24 Mbps   | 26             | 0.27            | -85                  |
| 18 Mbps   | 26             | 0.27            | -87                  |
| 12Mbps    | 26             | 0.27            | -89                  |
| 9 Mbps    | 26             | 0.27            | -92                  |
| 6 Mbps    | 26             | 0.27            | -94                  |
| HT20-MCS7 | 19             | 0.19            | -71                  |
| HT20-MCS6 | 20             | 0.20            | -74                  |
| HT20-MCS5 | 21             | 0.21            | -75                  |
| HT20-MCS4 | 23             | 0.23            | -79                  |
| HT20-MCS3 | 24             | 0.24            | -82                  |
| HT20-MCS2 | 24             | 0.24            | -86                  |
| HT20-MCS1 | 24             | 0.24            | -88                  |
| HT20-MCS0 | 26             | 0.27            | -92                  |
| HT40-MCS7 | 19             | 0.19            | -68                  |
| HT40-MCS6 | 20             | 0.20            | -71                  |
| HT40-MCS5 | 21             | 0.21            | -72                  |
| HT40-MCS4 | 23             | 0.23            | -76                  |
| HT40-MCS3 | 24             | 0.24            | -79                  |
| HT40-MCS2 | 24             | 0.24            | -83                  |
| HT40-MCS1 | 24             | 0.24            | -85                  |
| HT40-MCS0 | 26             | 0.27            | -89                  |

**TX/RX Specification – 5745 MHz to 5825 MHz (miniPCIe)**

Sensitivity tested in ART Mode, PSR >=95%, Chain0+Chain1  
 TX Power Setting = Calibrated Power level in dBm  
 Test Condition for Current consumption:  
 Current consumption is measured at the input of the SBC with the mini-PCIe radio module connected to it.  
 The current consumption figures are then adjusted so that they only include extra current drawn by the mini-PCIe radio module.

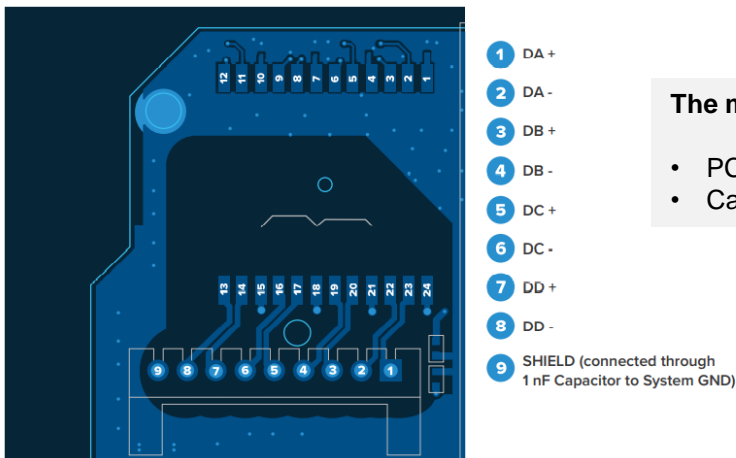
| Data Rate | TX Power (dBm) | Current 24V (A) | RX Sensitivity (dBm) |
|-----------|----------------|-----------------|----------------------|
| 54 Mbps   | 19             | 0.19            | -74                  |
| 48 Mbps   | 20             | 0.20            | -76                  |
| 36 Mbps   | 23             | 0.23            | -77                  |
| 24 Mbps   | 26             | 0.27            | -78                  |
| 18 Mbps   | 26             | 0.27            | -84                  |
| 12Mbps    | 26             | 0.27            | -87                  |
| 9 Mbps    | 26             | 0.27            | -90                  |
| 6 Mbps    | 26             | 0.27            | -91                  |
| HT20-MCS7 | 18             | 0.19            | -69                  |
| HT20-MCS6 | 19             | 0.19            | -70                  |
| HT20-MCS5 | 20             | 0.20            | -71                  |
| HT20-MCS4 | 23             | 0.23            | -75                  |
| HT20-MCS3 | 24             | 0.24            | -77                  |
| HT20-MCS2 | 24             | 0.24            | -80                  |
| HT20-MCS1 | 24             | 0.24            | -82                  |
| HT20-MCS0 | 26             | 0.27            | -83                  |
| HT40-MCS7 | 18             | 0.19            | -66                  |
| HT40-MCS6 | 19             | 0.19            | -67                  |
| HT40-MCS5 | 20             | 0.20            | -68                  |
| HT40-MCS4 | 23             | 0.23            | -72                  |
| HT40-MCS3 | 24             | 0.24            | -74                  |
| HT40-MCS2 | 24             | 0.24            | -77                  |
| HT40-MCS1 | 24             | 0.24            | -79                  |
| HT40-MCS0 | 26             | 0.27            | -80                  |

## PIN OUT DETAILS



The mating connectors for DF3-10P-2DS(01) are

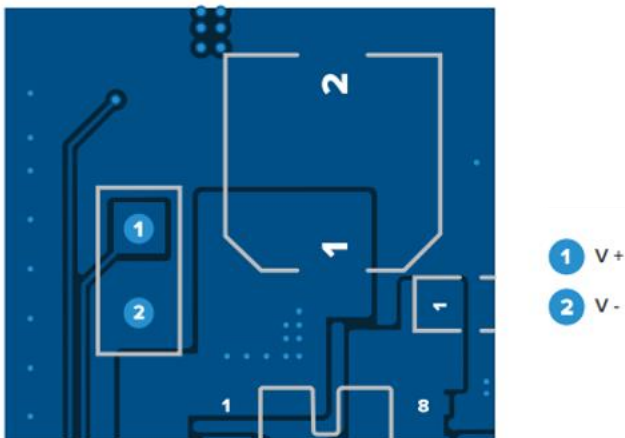
- PCB Mounted: DF3-10S-2DSA(25)
- Cable Housing: DF3-10S-2C



The mating connectors for DF3-9P-2DS(01) are

- PCB Mounted: DF3-9S-2DSA(25)
- Cable Housing: DF3-9S-2C

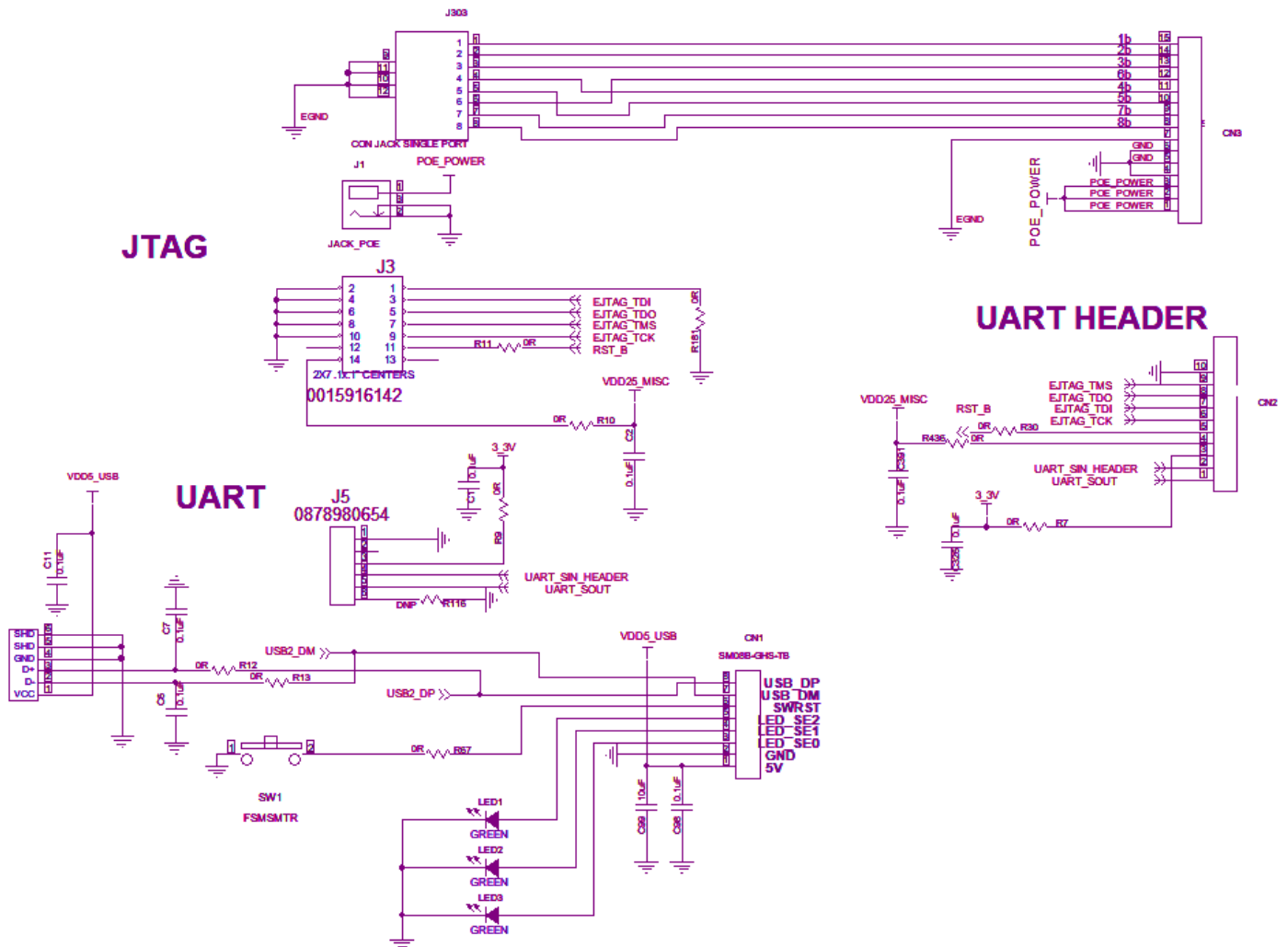
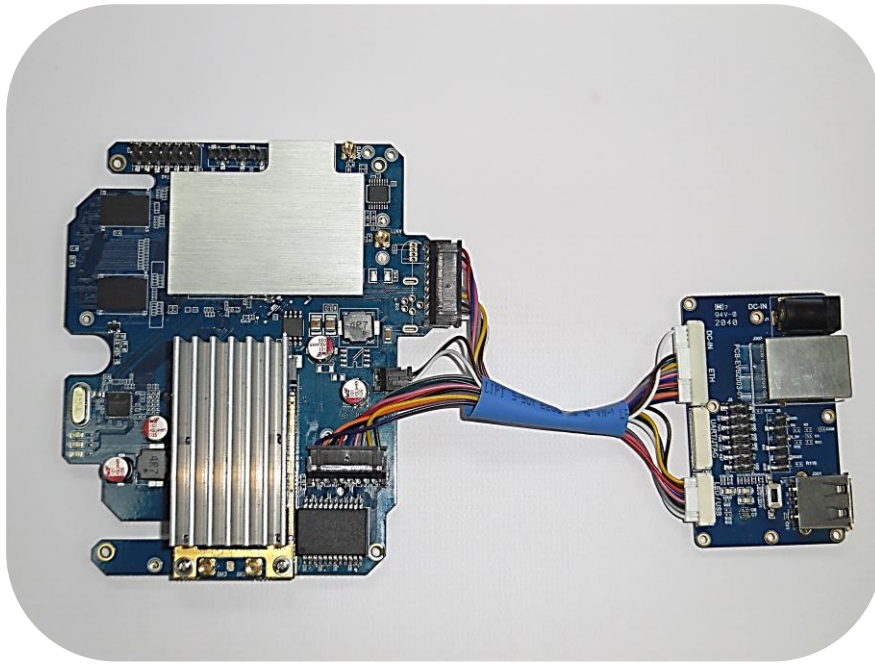
A DC power interface is provided through a 2-pin Hirose DF3-2P-2DS(01) connector with the following pinout:



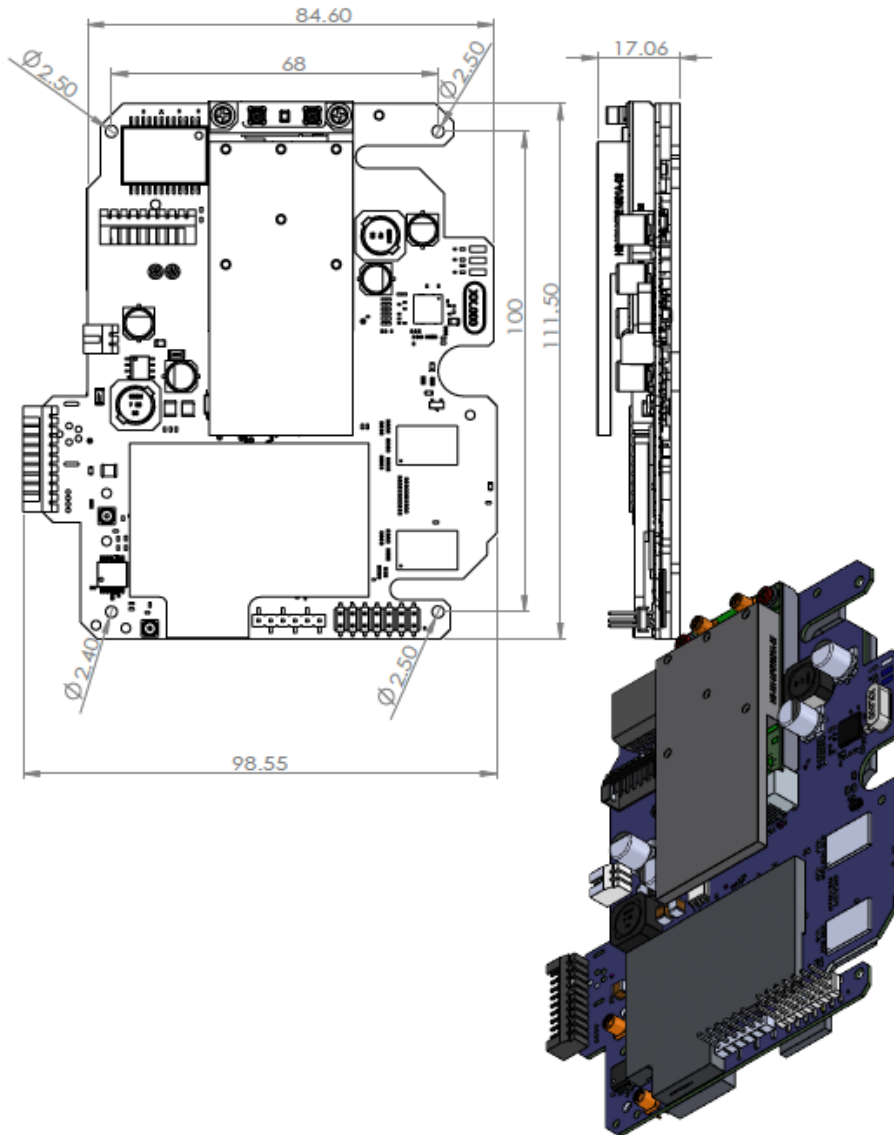
The mating connectors for DF3-2P-2DS(01) are

- PCB Mounted: DF3-2S-2DSA(25)
- Cable Housing: DF3-2S-2C

# EVAL BOARD SCHEMATIC



## MECHANICAL DIMENSIONS



### Trademarks

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HW REV# 03.00

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