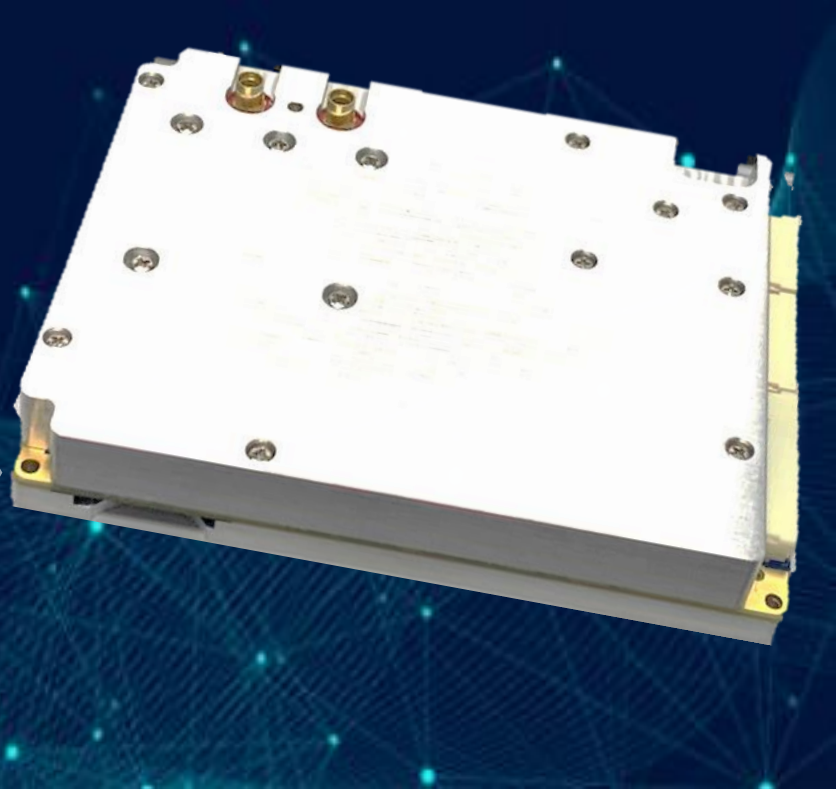
vizmo

FREEDOM FROM WIRES



# DATASHEET

## ES-N2N2-2450

### IEEE 820.11 a/b/g/n

High-Performance, Dual independent Radio operating in ISM 2.4 GHz license-free Band and 4.9 GHz (Public safety), UNII-B1,B2A,B2C and B3 Bands

,

### SWaP-C

**Size, Weight, Power, Cost**
Optimized Radio Module

### Industrial grade

-40 deg C to +85 deg C operation temperature

dun & bradstreet

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**VIZMONET PTE LTD**

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# TECHNICAL SPECIFICATION

| RADIO MODULE – GENERAL INFO | |
|---|---|
| 11 b/g/n Radio chipset<br>11 a/n Radio 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 – 11 b/g/n<br>Operating frequency – 11 a/n | 2300 MHz to 2700 MHz (Operating frequency range)<br>4920 MHz to 5825 MHz (Operating Channels) |
| Data rate-11n HT20/HT40-1S (SISO)<br><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 – 11b/g/n<br>Channel BW – 11 a/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 | Power Over Ethernet |
| 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) 86 mm x (W) 65 mm x (D) 16.3 mm |
| Weight | 115 g |
| **REGULATORY INFORMATION** | |
| Compliance | TBD |
| **PACKAGING INFORMATION** | |
| No of units | TBD |

| ORDERING INFORMATION | |
|---|---|
| ES-N2N2-2450 | Embedded System-in-Module, Dual Independent, MIMO, IEEE 802.11 a/b/g/n, 2.4 GHz, 5 GHz Bands, 29 dBm |
| EVK-ES-N2N2-2450 | EVK, Embedded System-in-Module, Dual Independent, MIMO, IEEE 802.11 a/b/g/n, 2.4 GHz, 5 GHz Bands, 29 dBm |

# RADIO SPECIFICATION

## TX/RX Specification – 2412 MHz to 2462 MHz

TX Power and Sensitivity Tolerance = +/- 2 dBm

| Data Rate | TX Power per chain (dBm) | Current 24V (A) | RX Sensitivity (dBm) |
|---|---|---|---|
| 54 Mbps | 21 | 0.290 | -80 |
| 48 Mbps | 22 | 0.300 | -81 |
| 36 Mbps | 24 | 0.320 | -88 |
| 24 Mbps | 26 | 0.360 | -89 |
| 18 Mbps | 26 | 0.360 | -92 |
| 12Mbps | 26 | 0.360 | -94 |
| 9 Mbps | 26 | 0.360 | -95 |
| 6 Mbps | 26 | 0.360 | -96 |
| 11 Mbps | 26 | 0.360 | -91 |
| 5.5 Mbps | 26 | 0.360 | -96 |
| 2 Mbps | 26 | 0.360 | -98 |
| 1 Mbps | 26 | 0.360 | -99 |
| HT20-MCS7 | 19 | 0.270 | -74 |
| HT20-MCS6 | 20 | 0.280 | -75 |
| HT20-MCS5 | 24 | 0.320 | -76 |
| HT20-MCS4 | 25 | 0.350 | -81 |
| HT20-MCS3 | 25 | 0.350 | -85 |
| HT20-MCS2 | 25 | 0.350 | -89 |
| HT20-MCS1 | 25 | 0.350 | -91 |
| HT20-MCS0 | 25 | 0.350 | -93 |
| HT40-MCS7 | 19 | 0.270 | -71 |
| HT40-MCS6 | 20 | 0.280 | -72 |
| HT40-MCS5 | 24 | 0.320 | -73 |
| HT40-MCS4 | 25 | 0.350 | -78 |
| HT40-MCS3 | 25 | 0.350 | -82 |
| HT40-MCS2 | 25 | 0.350 | -86 |
| HT40-MCS1 | 25 | 0.350 | -88 |
| HT40-MCS0 | 25 | 0.350 | -90 |

## TX/RX Specification – 4920 MHz to 4990 MHz

Sensitivity tested in ART Mode, PSR >=95%, Chain0+Chain1
TX Power Setting = Calibrated Power level in dBm

| Data Rate | TX Power per chain (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

Sensitivity tested in ART Mode, PSR >=95%, Chain0+Chain1
TX Power Setting = Calibrated Power level in dBm

| Data Rate | TX Power per chain (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

Sensitivity tested in ART Mode, PSR >=95%, Chain0+Chain1
TX Power Setting = Calibrated Power level in dBm

| Data Rate | TX Power per chain (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 |

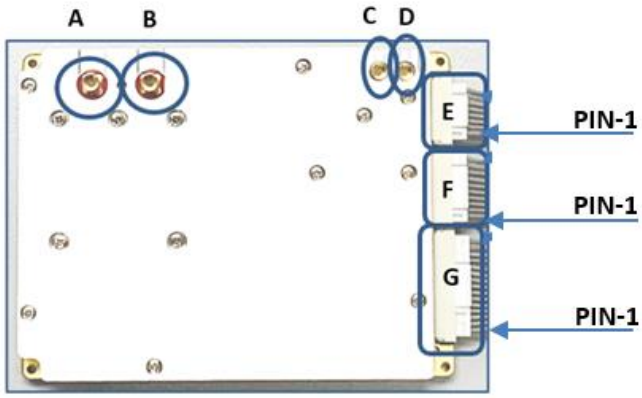
## TX/RX Specification – 5745 MHz to 5825 MHz

Sensitivity tested in ART Mode, PSR >=95%, Chain0+Chain1
TX Power Setting = Calibrated Power level in dBm

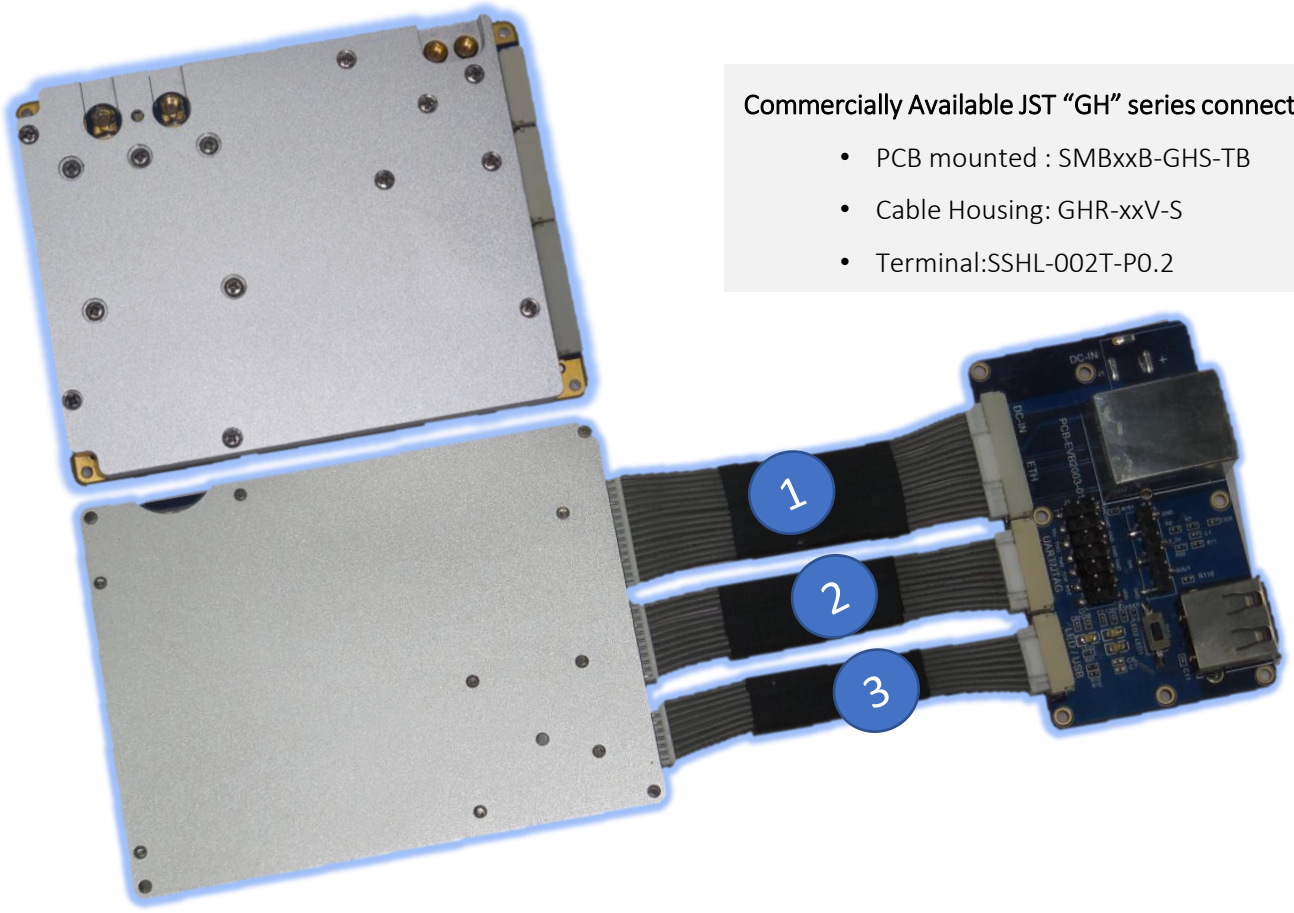
| Data Rate | TX Power per chain (dBm) | Current 24V (A) | RX Sensitivity (dBm) |
|---|---|---|---|
| 54 Mbps | 19 | 0.19 | -74 |
| 48 Mbps | 20 | 0.20 | -76 |
| 36 Mbps | 23 | 0.23 | -77 |
| 24 Mbps | 26 | 0.27 | -78 |
| 18 Mbps | 26 | 0.27 | -84 |
| 12Mbps | 26 | 0.27 | -87 |
| 9 Mbps | 26 | 0.27 | -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 |

# CONNECTOR PIN OUT

| PIN# | PIN DESCRIPTION |
|---|---|
| A | 5 GHz Ant-1 |
| B | 5 GHz Ant-1 |
| C | 2.4 GHz Ant-0 |
| D | 2.4 GHz Ant-0 |
| E-Pin1 | UART_SOUT |
| E-Pin2 | UART_SIN |
| E-Pin3 | 3.3V |
| E-Pin4 | 2.5V |
| E-Pin5 | RST_B |
| E-Pin6 | EJTAG-TCK |
| E-Pin7 | EJTAG-TDI |
| E-Pin8 | EJTAG-TDO |
| E-Pin9 | EJTAG-TMS |
| E-Pin10 | EJTAG-TCK |
| F-Pin1 | 5V |
| F-Pin2 | GND |
| F-Pin3 | LED0 |
| F-Pin4 | LED1 |
| F-Pin5 | LED2 |
| F-Pin6 | SWRST |
| F-Pin7 | USB_DM |
| F-Pin8 | USB_DP |
| G-Pin1 | POE_POWER |
| G-Pin2 | POE_POWER |
| G-Pin3 | POE_POWER |
| G-Pin4 | GND |
| G-Pin5 | GND |
| G-Pin6 | GND |
| G-Pin7 | SHIELD GND |
| G-Pin8 | MDI_3- |
| G-Pin9 | MDI_3+ |
| G-Pin10 | MDI_2- |
| G-Pin11 | MDI_2+ |
| G-Pin12 | MDI_1- |
| G-Pin13 | MDI_1+ |
| G-Pin14 | MDI_0- |
| G-Pin15 | MDI_0+ |



# EVALUATION KIT

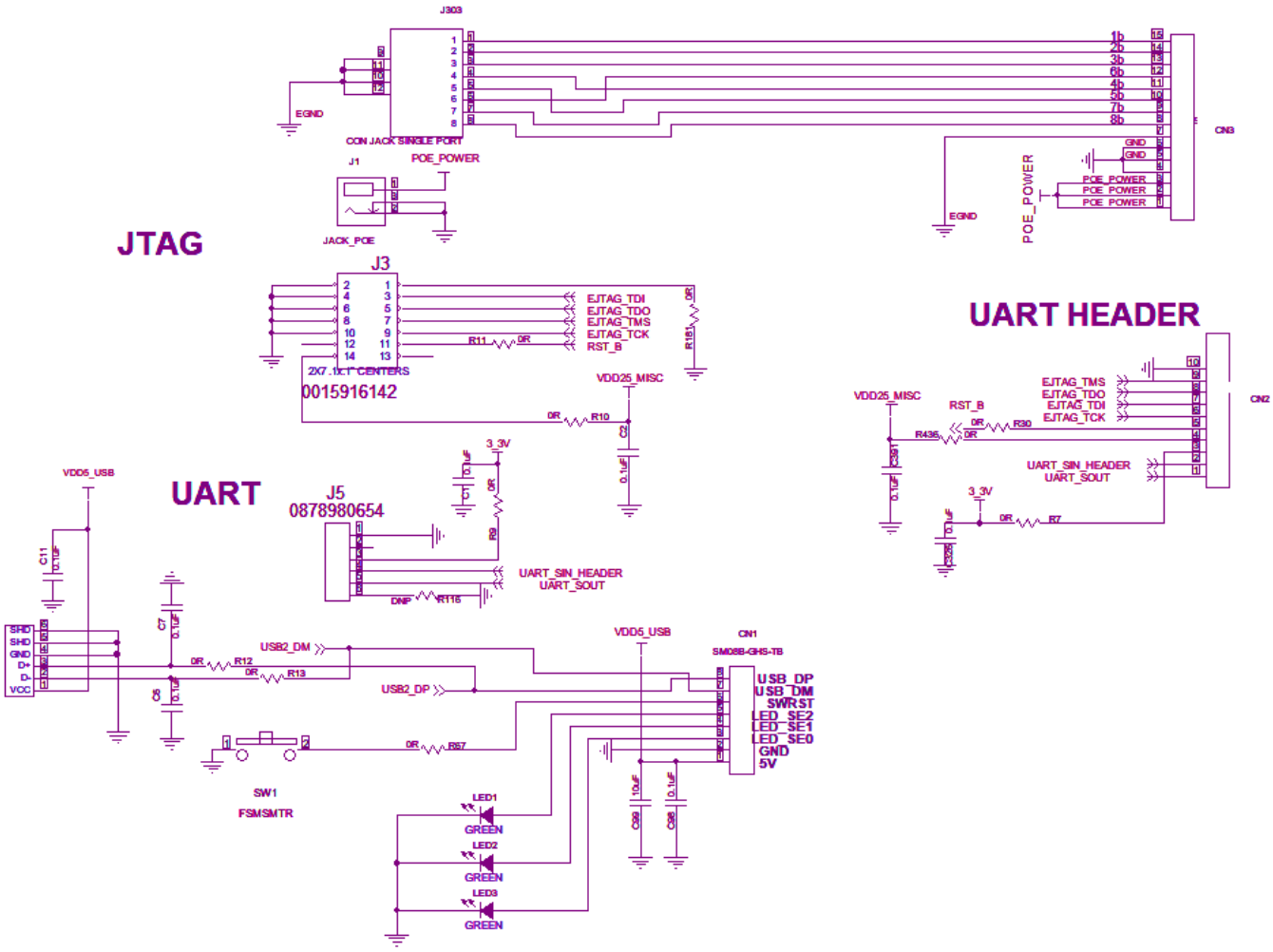



**Commercially Available JST "GH" series connectors**

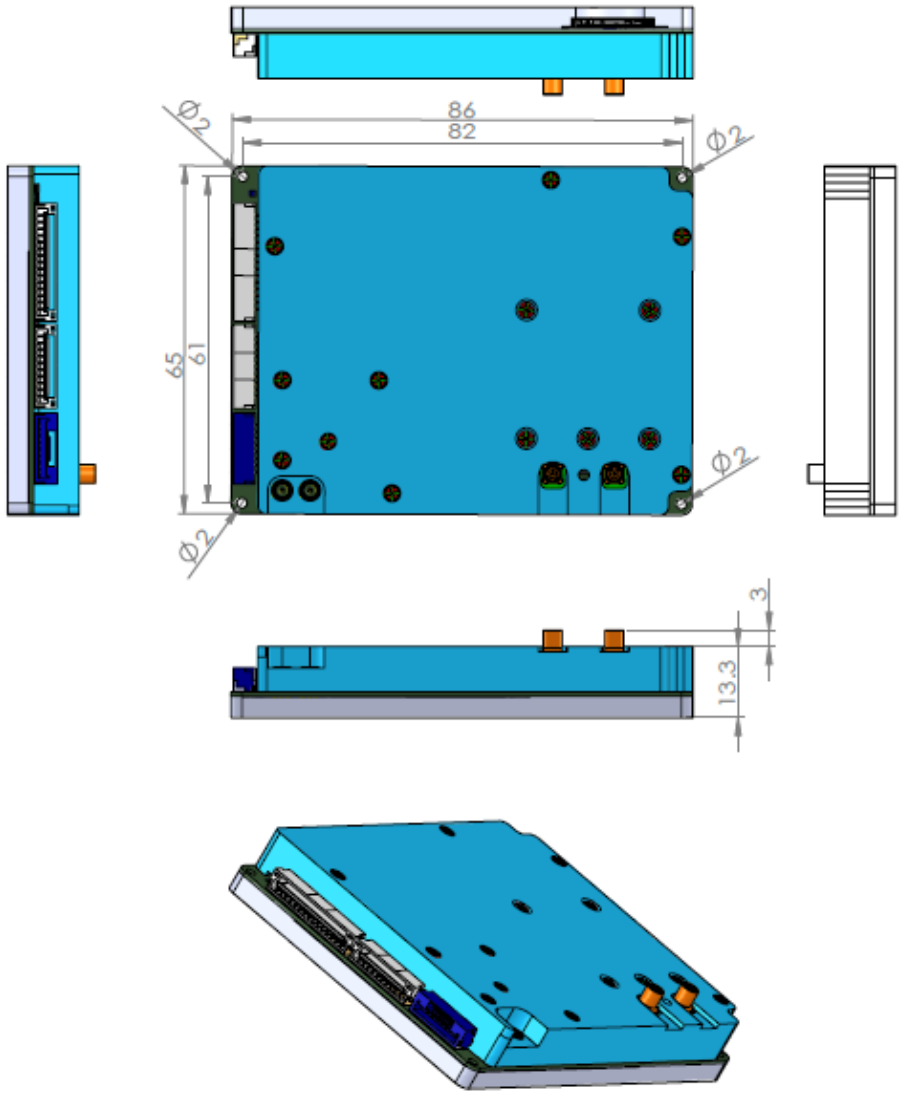
- PCB mounted : SMBxxB-GHS-TB
- Cable Housing: GHR-xxV-S
- Terminal:SSHL-002T-P0.2

| | | |
|---|---|---|
| PCB Mounted : JST SM15B-GHS-TB<br>Cable Housing: JST GHR-15V-S<br>Terminal: SSHL-002T-P0.2 | 1 | Ethernet Data/POE in (Power) |
| PCB Mounted : JST SM10B-GHS-TB<br>Cable Housing: JST GHR-10V-S<br>Terminal: SSHL-002T-P0.2 | 2 | LED, RESET SW, USB Data |
| PCB Mounted : JST SM08B-GHS-TB<br>Cable Housing: JST GHR-08V-S<br>Terminal: SSHL-002T-P0.2 | 3 | UART, EJTAG |

# EVAL BOARD SCHEMATIC



# MECHANICAL DIMENSIONS





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