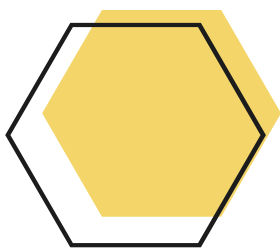


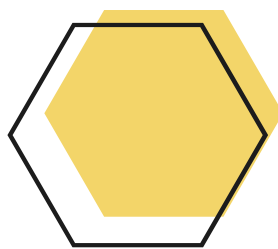
DATASHEET

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



VIZMONET PTE LTD

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+65 6255 0581 | enquiry@vizmonet.com | www.vizmonet.com

HW REV# 02.03

TECHNICAL SPECIFICATION

RADIO MODULE – GENERAL INFO	
11 b/g/n Radio chipset	QCA 9550-AT4B (CPU) & AR 8033-AL1B (Ethernet PHY)
11 a/n Radio chipset	AR 9592-AR1B
NOR Flash	SPI Flash, 16MB
NAND Flash	NAND Flash, 256 MB
RAM	DDR2, 200 MHz, 256 MB (64Mx16x2)
Operating frequency – 11 b/g/n	2300 MHz to 2700 MHz (Operating frequency range)
Operating frequency – 11 a/n	4920 MHz to 5825 MHz (Operating Channels)
Data rate-11n HT20/HT40-1S (SISO)	6Mbps, 9Mbps, 12Mbps, 24Mbps, 36Mbps, 48Mbps,54Mbps (11a)
Data rate-11n HT20/HT40-2S (MIMO)	MCS0, MCS1, MCS2, MCS3, MCS4, MCS5, MCS6, MCS7 (11n) MCS8, MCS9, MCS10, MCS11, MCS12, MCS13, MCS14, MCS15 (11n)
Channel BW – 11b/g/n	5 MHz/10 MHz/20 MHz /40 MHz
Channel BW – 11 a/n	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

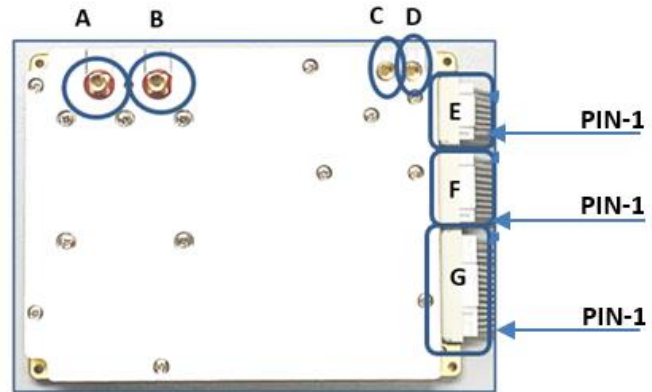
TX/RX Specification – 5745 MHz to 5825 MHz

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

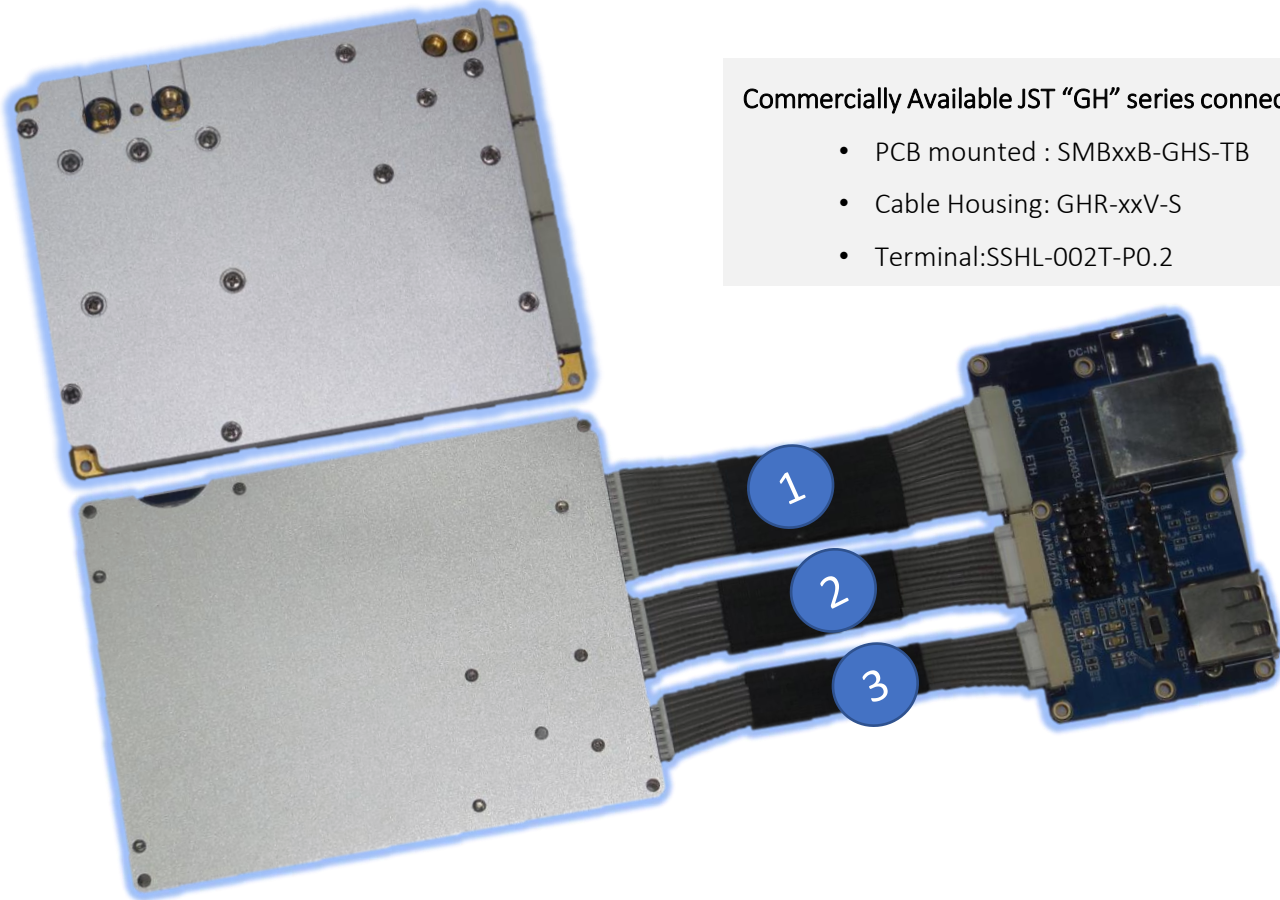
PIN#	PIN DESCRIPTION
A	5 GHz Ant-1
B	5 GHz Ant-1
C	2.4 GHz Ant-0
D	2.4 GHz Ant-0
E-Pin1	UART_SOUT
E-Pin2	UART_SIN
E-Pin3	3.3V
E-Pin4	2.5V
E-Pin5	RST_B
E-Pin6	EJTAG-TCK
E-Pin7	EJTAG-TDI
E-Pin8	EJTAG-TDO
E-Pin9	EJTAG-TMS
E-Pin10	EJTAG-TCK
F-Pin1	5V
F-Pin2	GND
F-Pin3	LED0
F-Pin4	LED1
F-Pin5	LED2
F-Pin6	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

Cable Housing: JST GHR-15V-S

Terminal: SSSL-002T-P0.2

1

Ethernet Data/POE in (Power)

PCB Mounted : JST SM10B-GHS-TB

Cable Housing: JST GHR-10V-S

Terminal: SSSL-002T-P0.2

2

LED, RESET SW, USB Data

PCB Mounted : JST SM08B-GHS-TB

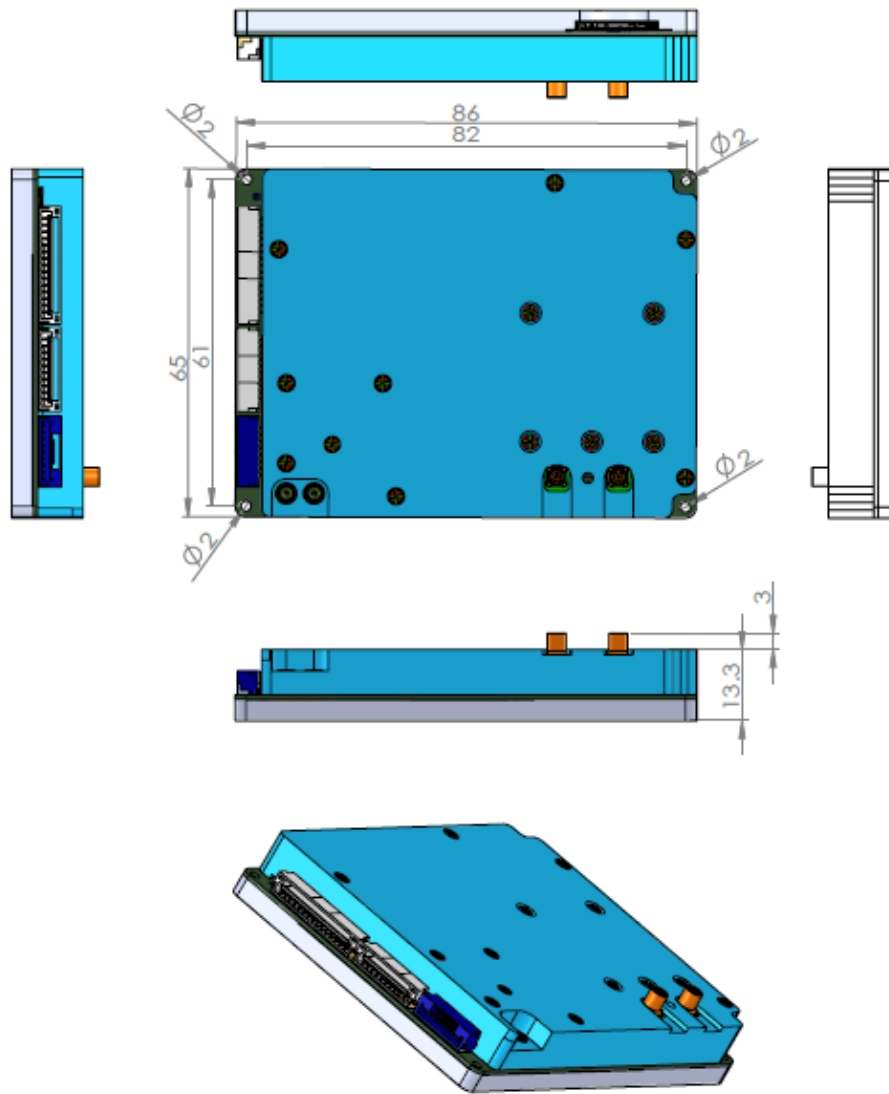
Cable Housing: JST GHR-08V-S

Terminal: SSSL-002T-P0.2

3

UART, EJTAG

MECHANICAL DIMENSIONS



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