
NETWORK MEDIA MODULE

Operating Conditions

- 3.3V, 2.5V, 1.8V, 1.2V supply voltage
- Operating frequency up to 400 MHz
- Operating temperature: 0°C to 70°C

Features

- Audio networking system on a small footprint module
- Wi-Fi[®] certified 802.11 a/b/g/n
- Integrated Ethernet + USB 2.0 OTG
- Optional Bluetooth[®] v2.1 + EDR
- Diversity enabled external antenna connectors
- Glueless audio, video, and control ports
- FCC certification is planned for production version
- Ideal for enabling network and USB audio playback for iPod[®] docks, audio systems, AV receivers, active speaker systems, internet radios, network playback adapters

WLAN

- Integrated 802.11 a/b/g/n MAC, Baseband Processor (BBP) and radio frequency (RF) transceiver
- Wi-Fi certified 802.11 a/b/g/n supporting both 2.4 GHz and 5 GHz bands
- On-chip wideband sniffer which enables applications that benefit from efficient interference management algorithms
- 1x1 dual band with Tx and Rx antenna diversity
- Supports Wi-Fi Direct[®]
- Two Ultra Small Miniature RF Connector (U.FL) type external antenna connectors

Bluetooth (Optional)

- Compliant with Bluetooth (BT) v2.1 + EDR specification
- A2DP and AVRCP profiles
- WLAN and Bluetooth co-existence using Packet Traffic Arbitration (PTA) and Adaptive Frequency Hopping (AFH)
- Utilizes same antenna as Wi-Fi system
- Supports Class 2 power output
- Low-power consumption

Memory Interfaces

- 16 MB on-board serial Flash memory
- 64 MB on-board DDR2 SDRAM
- Off-board serial Flash memory via extended connector

Communication Interfaces

- 10/100 Mbps Ethernet support with Ethernet PHY on-board
- USB 2.0 OTG with integrated PHY
- Serial Peripheral Interface (SPI), Inter-Integrated Circuit[™] (I²C[™]), Universal Asynchronous Receiver Transmitter (UART) peripheral ports
- 3.3V tolerance on all digital IOs (GPIO, I²S, SPDIF, SPI, UART, HDMI)

Audio and Graphics Interface

- I²S support with external Digital-to-Analog Converter (DAC)/Power Amplifier (PA)
- Built-in Digital Signal Processor (DSP) with dual core 300 MHz each
- HDMI support with in-built 24-bit HD port and external HDMI transmitter
- Supports analog video (composite, component and S-Video) using external video encoder

Input/Output

- General Purpose Input Outputs (GPIOs) for different Stock Keeping Units (SKUs):
 - CY920-A: 11 GPIOs
 - CY920-B: 13 GPIOs
 - CY920-C: 9 GPIOs

Applications

- JukeBlox[®]: DLNA[™], AirPlay[®] Speaker, network audio DMR/ DMP, Internet radio, mini/micro system
- Audio Video Receivers (AVR)
- Sound Bars
- PC OEM, TV and gaming consoles
- Operating as an access point (Wi-Fi Direct Host)

CY920

NOTES:

Table of Contents

System Overview	5
CY920 Board Layout and Features	15
Application Guidelines	19
Wi-Fi Specification	21
Bluetooth Specifications	23
Packaging Information	25
Electrical Characteristics	29
Regulatory Compliance and Quality	33
Ordering Guide	35
Appendix A: Certification Notices	37
Appendix B: Revision History	39
The Microchip Web Site	41
Customer Change Notification Service	41
Customer Support	41

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CY920

NOTES:

1.0 SYSTEM OVERVIEW

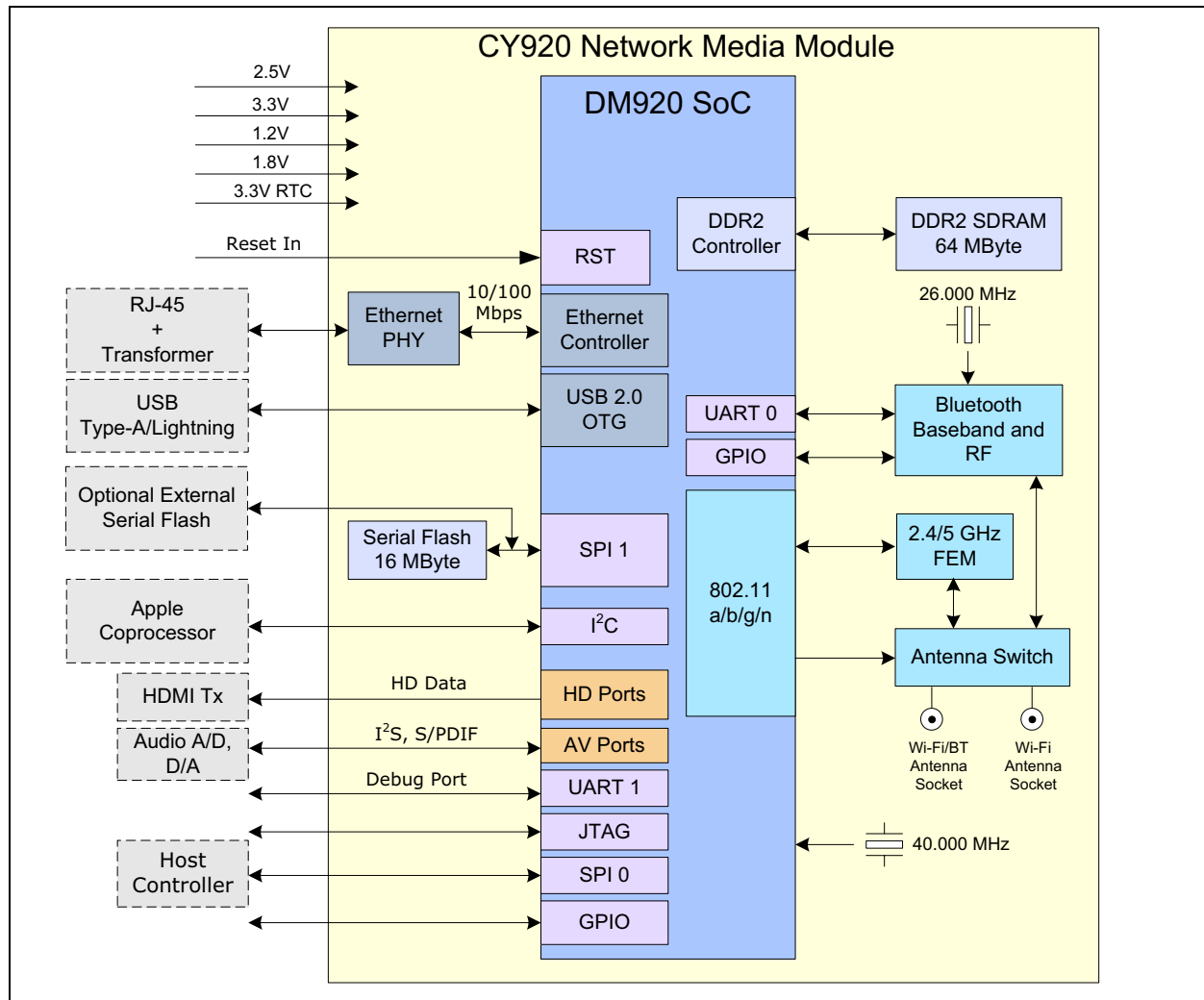
Note: This data sheet summarizes the features of the CY920 network media module. It is not intended to be a comprehensive reference source. To complement the information in this data sheet, refer to the various application notes available on the Microchip web site www.microchip.com.

The CY920 module is a single-board network media module based on Microchip's DM920 network media processor. It enables faster product development with Ethernet, USB, Wi-Fi, and Bluetooth connectivity.

The CY920 module can be connected to standard I/O components in various audio, video, and control formats. The CY920 module and the JukeBlox SDK form a turnkey solution which enables rapid product development by the Original Equipment Manufacturers (OEMs) and Original Design Manufacturers (ODMs). The software packages feature an intuitive Application Programming Interface (API) that enables easy customization result in faster time-to-market.

Figure 1-1 illustrates a typical example of the CY920 module based system block diagram.

FIGURE 1-1: CY920 BASED SYSTEM BLOCK DIAGRAM



1.1 Connectors and Connections

The following sections provide information on different connectors and connections in the CY920 module.

1.1.1 MODULE CONNECTORS

The CY920 module uses two board-to-board connectors, basic and extended, as interfaces to the product main board. Some of the module versions have only the basic connector installed.

The CY920 module uses female connectors and the product main board uses male connectors.

[Table 1-1](#) provides part numbers for the male connectors needed on the product main board that mate to the female connectors on the CY920 module.

TABLE 1-1: MODULE CONNECTORS

Connector Number	Connector Type	Mating Connector Part Numbers	Manufacturer	Alternate Part Number	Alternate Manufacturer
J301 (Basic)	64-pin B2B connector 2 x 32 x 1.27 mm	S1210-64SVB-S01-1R/C	XINYA	1.27*5.7-2*32P	Shen Zhen Hua Xin Sheng Electronic Co Ltd
J300 (Extended)		S1210-64SVB-S01-1R/C		1.27*5.7-2*32P	

Table 1-2 provides the function of the pins in the J301-basic connector.

TABLE 1-2: J301-BASIC CONNECTOR

PIN Number	Signal	GPIO	Function	PIN Number	Signal	GPIO	Function
1	VIN (1.2V)	—	Power supply	2	VIN (2.5V)	—	Power supply
3	VIN (1.2V)	—		4	VIN (2.5V)	—	
5	GND	—		6	GND	—	
7	VIN (1.8V)	—		8	VIN (3.3V)	—	
9	VIN (1.8V)	—		10	VIN (3.3V)	—	
11	GND	—		12	VIN(3.3V RTC)	—	
13	SPF0	GPIO-16	iPod Access Power	14	GND	—	Debug UART
15	NRESET	—	System Reset	16	UART_RXD1	—	
17	SPF1	GPIO-17	Ethernet Reset	18	UART_TXD1	—	SPDIF input
19	MII_TXD3	GPIO-09	IR input	20	AV4DATA1	—	
21	GND	—	Power supply	22	AV4DATA0	—	SPDIF output
23	SPI_DIN	—	SPI	24	GND	—	Power supply
25	SPI_DOUT	—		26	AV2CTRL1	—	MCLK
27	SPI_CLK	—		28	AV2CTRL0	—	LRCK
29	SPI_NCS0	—		30	AV2CLK	—	SCLK
31	GND	—	Power supply	32	AV2DATA1	—	A/D data 0
33	MII_TXD2	GPIO-08	Factory Reset	34	AV2DATA0	—	D/A data 0
35	I2C_SDA	—	I ² C	36	GND	—	Power supply
37	I2C_SCL	—		38	ETH_LED_SPEED	—	Ethernet
39	AV2DATA2	—	D/A Data 1	40	AV2DATA3	—	D/A data 2
41	MII_RXD2	GPIO-10	SPI_REQ	42	ETH_LED_ACT	—	Ethernet
43	AV3CTRL0	GPIO-05	—	44	GND	—	Power supply
45	GND	—	Power supply	46	ETH_TXP	—	Ethernet
47	AV3CLK	GPIO-04	—	48	ETH_TXN	—	
49	HDDATA14	GPIO-14	—	50	ETH_RXP	—	
51	HDDATA15	GPIO-15	—	52	ETH_RXN	—	
53	GND	—	Power supply	54	GND	—	Power supply
55	USB_OTG_DN	—	USB	56	EXT_PA_EN1_5	GPIO-19	Reserved
57	USB_OTG_DP	—		58	MII_RXD3	GPIO-11	—
59	USB_PWR_EN	—		60	AV3CTRL1	GPIO-06	Chip Select for external Flash
61	USB_VBUS	—		62	EXP_PA_EN1_24	GPIO-18	HD_INT
63	USB_ID	—		64	GND	—	Power supply

Note 1: The connector definitions are subject to change in future revisions of this document.

Table 1-3 provides the function of the pins in the J300-extended connector.

TABLE 1-3: J300-EXTENDED CONNECTOR

PIN Number	Signal	GPIO	Function	PIN Number	Signal	GPIO	Function
1	HDDATA12	GPIO-12	HDDATA12	2	AV0DATA0	—	AV0DATA0
3	HDDATA13	GPIO-13	HDDATA13	4	AV0DATA1	—	AV0DATA1
5	HDDATA14	GPIO-14	HDDATA14	6	AV0DATA2	—	AV0DATA2
7	HDDATA15	GPIO-15	HDDATA15	8	AV0DATA3	—	AV0DATA3
9	GND	—	Power supply	10	GND	—	GND
11	HDDATA11	—	HDDATA11	12	AV1DATA0	—	AV1DATA0
13	HDDATA10	—	HDDATA10	14	AV1DATA1	—	AV1DATA1
15	HDDATA9	—	HDDATA9	16	AV1DATA2	—	AV1DATA2
17	HDDATA8	—	HDDATA8	18	AV1DATA3	—	AV1DATA3
19	GND	—	Power supply	20	GND	—	GND
21	HDDATA7	—	HDDATA7	22	AV0CLK	—	AV0CLK
23	HDDATA6	—	HDDATA6	24	AV0CTRL0	—	AV0CTRL0
25	HDDATA5	—	HDDATA5	26	AV0CTRL1	—	AV0CTRL1
27	HDDATA4	—	HDDATA4	28	AV0CTRL2	—	AV0CTRL2
29	GND	—	Power supply	30	GND	—	GND
31	HDDATA0	—	HDDATA0	32	NC	—	NC
33	HDDATA1	—	HDDATA1	34	NC	—	NC
35	HDDATA2	—	HDDATA2	36	NC	—	NC
37	HDDATA3	—	HDDATA3	38	GND	—	GND
39	GND	—	Power supply	40	GND	—	GND
41	TCK	—	JTAG	42	NC	—	NC
43	UART_RXD0	—	Shared with BT	44	SPI_NCS1	—	SPI_NCS1
45	UART_TXD0	—	Shared with BT	46	MII_TX_ER	GPIO-02	MII_TX_ER
47	TDI	—	JTAG	48	MII_TX_CLK	GPIO-03	MII_TX_CLK
49	TDO	—		50	MII_COL	GPIO-01	MII_COL
51	TMS	—		52	MII_CRS	GPIO-00	MII_CRS
53	SPI1CLK	—	Flash interface	54	AV3DATA0	—	AV3DATA0
55	SPI1DIN	—		56	AV3DATA1	—	AV3DATA1
57	GND	—	Power supply	58	GND	—	GND
59	SPI1DOUT	—	Flash interface	60	SPI1HOLDB	—	SPI1HOLDB
61	SPI1CS0	—		62	SPI1WPROT	—	SPI1WPROT
63	GND	—	Power supply	64	NC	—	NC

Note 1: The connector definitions are subject to change in future revisions of this document.

Table 1-4 provides the GPIO assignment on the CY920 module.

TABLE 1-4: CY920 GPIO MAPPING

GPIO Number	DM920 Pin Name	Connected To	Assigned Function
0	MIICRS	BT/extended connector	WLAN_ACTIVE
1	MIICOL	BT/extended connector	BT_PRIORITY
2	MIITXER	BT/extended connector	BT_ACTIVE
3	MIITXCLK	BT/extended connector	BT_LDO_ON
4	AV3CLK	Basic connector	Available
5	AV3CTRL0	Basic connector	Available
6	AV3CTRL1	Basic connector	Chip select for expansion Flash
7	AV0CTRL2	Extended connector	Available
8	MIITXD2	Basic connector	Factory Reset
9	MIITXD3	Basic connector	IR input
10	MIIRXD2	Basic connector	SPI_REQ for Host controller
11	MIIRXD3	Basic connector	Available
12	HDDATA12	Extended connector	Available
13	HDDATA13	Extended connector	Available
14	HDDATA14	Extended connector	Available
15	HDDATA15	Extended connector	Available
16	SPF0	Basic connector	HD_INT
17	SPF1	Basic connector	Ethernet Reset
18	EXT_PA_EN1_5	Basic connector	FEM BSEL
19	EXT_PA_EN1_24	Basic connector	Available

Note 1: The GPIO assignments are subject to change in future revisions of this document.

1.1.2 ANTENNA CONNECTOR

In the CY920 module two external antenna sockets are used to enable diversity operation. During the diversity operation, the firmware selects one antenna at a time through the on-board Tx/Rx diversity RF switch.

The surface-mounted antenna socket used in the CY920 module is Ultra Small Surface Mount Coaxial (U.FL) type.

Note: Do not use the CY920 module that has two external antenna sockets with only one external antenna connected. This will degrade the Wi-Fi or BT performance.

1.2 Pin Description

Table 1-5 through Table 1-15 provide an overview of the important control and interface signals. It also covers pinouts and signal names.

TABLE 1-5: POWER

Signal	Type	Description
3.3V	P	Power input +3.3V
1.2V	P	Power input +1.2V
1.8V	P	Power input +1.8V
2.5V	P	Power input +2.5V
3.3V RTC	P	Power input +3.3V for Real-Time Clock (RTC). Power can be provided by battery or external Supercap.
GND	P	Ground (GND) connection for power supply, signal returns and shielding

Legend: O = Output I/O = Input /Output I = Input P = Power

TABLE 1-6: SERIAL PERIPHERAL INTERFACE (SPI)

Signal	Type	Description
SPI_DOUT	O	SPI data from DM920 to Host controller
SPI_DIN	I	SPI data from Host controller to DM920
SPI_CLK	I	SPI clock from Host controller to DM920 (maximum recommended frequency is 2 MHz and typical frequency is 1 MHz, see Note 1)
SPI_NCS0	I	SPI Chip Select from Host controller to DM920
MII_RXD2	O	- This GPIO signal is used as SPI_REQ (SPI request signal) from DM920 to Host controller for eDMP applications. - Logic 1 indicates there is an SPI message waiting to be read. The Host controller should start the SPI clock and read any changed registers. - Logic 0 indicates that all changed register messages have been read and the message buffer is empty.

Legend: O = Output I/O = Input /Output I = Input P = Power

Note 1: For SPI timing diagram for eDMP applications, refer to "MCHP-JB - Device_Control_Protocol_Registers_v_6_5" or later version. For detailed setup and hold timing details, refer to the "DM920 Data Sheet" (DS60001278).

TABLE 1-7: SPI FLASH INTERFACE

Signal	Type	Description
SPI1CS0	O	Chip Select input for on-board Flash
AV3CTRL1 (GPIO6)	O	Chip Select for external Flash. For more information on how to connect and access external Flash, refer to the Chapter 18. External Flash Interface chapter in the "JukeBlox® Technology 4.X SDK User's Guide" (DS70005181).
SPI1CLK	O	Clock signal to drive serial Flash
SPI1DIN	I	Data line from Flash output to DM920 input
SPI1DOUT	O	Data line from DM920 output to Flash input
SPI1HOLDB	O	Serial Flash control input
SPI1WPROT	O	Write protect input to serial Flash

Legend: O = Output I/O = Input /Output I = Input P = Power

TABLE 1-8: UNIVERSAL ASYNCHRONOUS RECEIVER TRANSMITTER (UART)

Signal	Type	Description
UART_RXD1	I	UART1 input to the DM920, used for shell access. Microchip recommends providing a connection to an external RS-232 transceiver and a DB9 connector to connect to a PC COM port. This connection can be used for the product development debugging, module programming control on the product manufacturing line, and module control during certification procedures.
UART_TXD1	O	UART1 output from the DM920, used for shell access. Microchip recommends providing a connection to an external RS-232 transceiver and a DB9 connector to connect to a PC COM port. This connection can be used for the product development debugging, module programming control on the product manufacturing line, and module control during certification procedures.
UART_RXD0	I	UART0 input, used for Bluetooth (BT) in BT SKU. It can be used as an additional UART in non-BT SKU.
UART_TXD0	O	UART0 output, used for Bluetooth in case of BT SKU. It can be used as an additional UART in non-BT SKU.

Legend: O = Output I/O = Input /Output I = Input P = Power

TABLE 1-9: AUDIO

Signal	Type	Description
AV2DATA0 AV2DATA2 AV2DATA3	O	I ² S or left justified audio data output. It is typically connected to an external D/A converter input or an external DSP for further audio processing. AV2DATA0 is used for the main left and right channel audio output data. AV2DATA2 and AV2DATA3 may be used for surround sound rear channels and sub-woofer. See Note 1 .
AV2DATA1	I	I ² S or left justified audio data input. It can be driven from an optional external A/D converter used to interface to iPod analog output or other analog audio sources, or aux in jack. If not used, leave it open.
AV2CTRL0	O	LRCK, audio data word clock at the audio sample rate (Fs) (currently, maximum supported frequency is 192 kHz).
AV2CTRL1	O	MCLK, audio master clock at 256 Fs. It can be used to clock an external D/A converter or an external DSP. The Fs multiplier may vary at sample rates more than 48 kHz.
AV2CLK	O	SCLK, audio data bit clock at 64 Fs. It allows up to 32 audio data bits per sample word.
AV4DATA0	O	SPDIF format output. It can support sample rate up to 192 kHz. Consequently, the maximum instantaneous frequency on this pin is 24.576 MHz.
AV4DATA1	I	SPDIF input. Currently it is not used, do not connect.
AV3DATA0 AV3DATA1	I/O	Used for I ² S or left justified audio data, depend on firmware and use case. The AV3 port control and clock signals are defined as GPIOs, see Table 1-15 . If required, succeeding use cases may use AV3 control and clock signals as audio clocks.

Legend: O = Output I/O = Input /Output I = Input P = Power

Note 1: For the audio port timing diagrams, setup and hold timing details, refer to the “DM920 Data Sheet” (DS60001278).

TABLE 1-10: CONTROL

Signal	Type	Description
MII_TXD2	I	Factory Reset, GPIO-08. An active-high input with internal pull-down. Pull to GND with a 10 k Ω resistor, unless return to factory settings from a hardware control is needed. Generally, return to factory settings is controlled from the Host controller through SPI register. This pin is monitored only during the boot up process.
MII_TXD3	I	Infrared sensor input, GPIO-09. A Schmitt Trigger input which can handle inputs with slow slopes. It is used for aDMP firmware builds for infrared remote control sensor output connection to DM920. For applications with a Host controller, pull this pin to +3.3V through a 10 k Ω resistor.
I2C_SDA, I2C_SCL	I/O	No internal pull-ups, use maximum 4.7 k Ω pull-up resistor on each pin to +3.3V. The maximum frequency is 400 kHz.
NRESET	I	Low-active input to reset the module. This signal must be driven by an external Reset generator or by a GPIO output from a Host controller. See Section 3.0 “Application Guidelines” for the timing requirements of NRESET signal. The CY920 module includes internal 10K pull-up resistor to +3.3V.

Legend: O = Output I/O = Input /Output I = Input P = Power

TABLE 1-11: ETHERNET

Signal	Type	Description
ETH_RXN, ETH_RXP, ETH_TXN, ETH_TXP	M	Ethernet signals between the PHY on the module and the external magnetics (transformer). The maximum bit rate is 100 Mbps.
ETH_LED_SPEED, ETH_LED_ACT	O	3.3V push-pull outputs from PHY (max. ± 12 mA) to drive the Ethernet LEDs 100 Mbps speed mode and activity are indicated by the outputs being low - Connect ETH_LED_SPEED to LED through 330Ω resistor to +3.3V - Connect ETH_LED_ACT to LED through 330Ω resistor to 0V
SPF1	O	Ethernet PHY Reset signal, GPIO-17. Do not connect if module Ethernet is used. If Ethernet is not available on the module, it can be used as a GPIO.

Legend: O = Output I/O = Input /Output I = Input P = Power

TABLE 1-12: USB

Signal	Type	Description
USB_OTG_DN, USB_OTG_DP	M	USB data signals. It is usually connected to the type A connector, USB switch, iPod dock connector, or Lightning connector. Maximum bit rate is high-speed USB at 480 Mbps.
USB_VBUS	M	Analog input for monitoring the USB type A connector power. Connect to the +5V power which is driving the USB type A connector power pins. If this pin drops below 4.6V, then the DM920 module will drive the USB_PWR_EN signal low to control an external power MOSFET to disconnect +5V power from the USB type A connector.
USB_PWR_EN	O	Logic output to control an external MOSFET, that is in series with the USB type A connector power.
USB_ID	I	Determines whether the USB port is USB Host or USB device. Pull low for the Host and pull high for the device.

Legend: O = Output I/O = Input /Output I = Input P = Power

TABLE 1-13: JTAG

Signal	Type	Description
TMS,TCK,TDI, TDO	I/O	JTAG ports for the DM920 SoC. Do not connect these pins.

Legend: O = Output I/O = Input /Output I = Input P = Power

TABLE 1-14: VIDEO

Signal	Type	Description
AV0CLK	O	HD Clock
AV0CTRL0	O	HD HSYNC
AV0CTRL1	O	HD VSYNC
AV0CTRL2	O	HD data enable, GPIO-07. This GPIO is available if HD interface is not used.
HDDATA [15:0]	O	Lower 16 bits of HD video data
AV0DATA [3:0]	O	HDDATA [19:16]
AV1DATA [3:0]	O	HDDATA [23:20]

Legend: O = Output I/O = Input /Output I = Input P = Power

TABLE 1-15: GPIO (MISCELLANEOUS)

Signal	Type	Description
MII_CRS, MII_COL, MII_TX_ER,MII_TXCLK	I/O	GPIO-00, 01, 02, 03. It is used for Bluetooth control signals. For a non-BT module, these signals can be used for other functions.
AV3CLK	I/O	GPIO-04, see Note 1
AV3CTRL0	I/O	GPIO-05, see Note 1
MII_RXD3	I/O	GPIO-11, see Note 1
HDDATA12	I/O	GPIO-12, see Note 2
HDDATA13	I/O	GPIO-13, see Note 2
HDDATA14	I/O	GPIO-14, see Note 2
HDDATA15	I/O	GPIO-15, see Note 2
SPF0	I/O	GPIO-16, HD_INT (for systems with HDMI transmitter)
EXT_PA_EN1_5	I/O	GPIO-18, FEM BSEL
EXT_PA_EN1_24	I/O	GPIO-19, see Note 1

Legend: O = Output I/O = Input /Output I = Input P = Power

Note 1: These GPIOs are available.

2: These GPIOs are available if HD interface is not used.

Microchip has a set of example schematics that shows how the external circuitry is typically connected to the module. Please contact Microchip sales team for any related documents or for any assistance.

NOTES:

2.0 CY920 BOARD LAYOUT AND FEATURES

Note: This data sheet summarizes the features of the CY920 network media module. It is not intended to be a comprehensive reference source. To complement the information in this data sheet, refer to the various application notes available on the Microchip web site www.microchip.com.

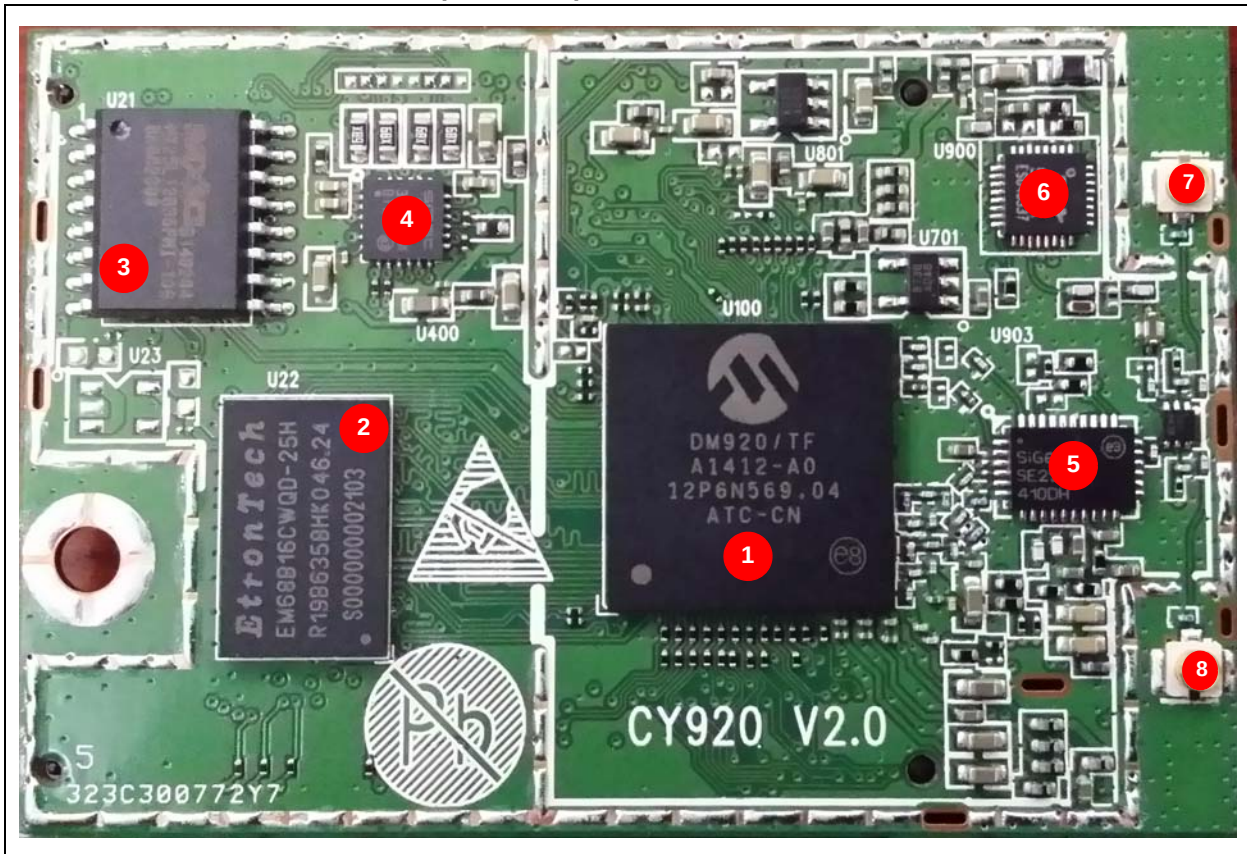
This section describes the CY920 board and its key components. All production modules include two RF shields: the top shield and the bottom shield. Figure 2-1 illustrates the top view of the CY920 board. The figure does not show the RF shields because the shields are temporarily removed to indicate the components.

2.1 Top View of CY920 Board

The top view of the CY920 board features the following key components:

1. DM920 SoC
2. DDR2 SDRAM
3. SPI Flash
4. Ethernet PHY
5. Wi-Fi Front-end
6. Bluetooth SoC
7. Wi-Fi/BT Antenna Socket
8. Wi-Fi Antenna Socket

FIGURE 2-1: CY920 BOARD (TOP VIEW)



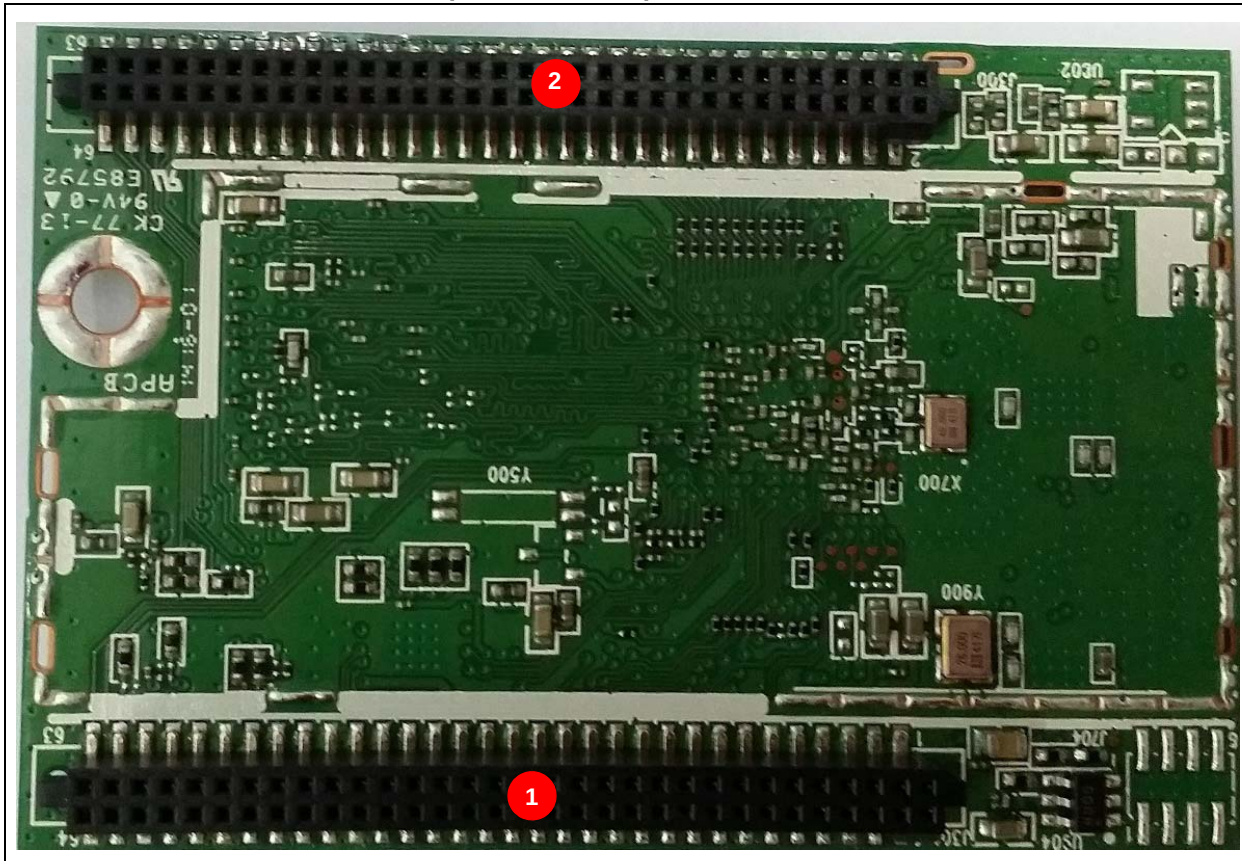
CY920

2.2 Bottom View of CY920 Board

Figure 2-2 illustrates the bottom view of the CY920 board with the following key components:

1. Basic Connector
2. Extended Connector (optional)

FIGURE 2-2: CY920 BOARD (BOTTOM VIEW)



2.3 Production Board with RF Shield (Top View)

Figure 2-3 illustrates the top view of the CY920 board with RF shield.

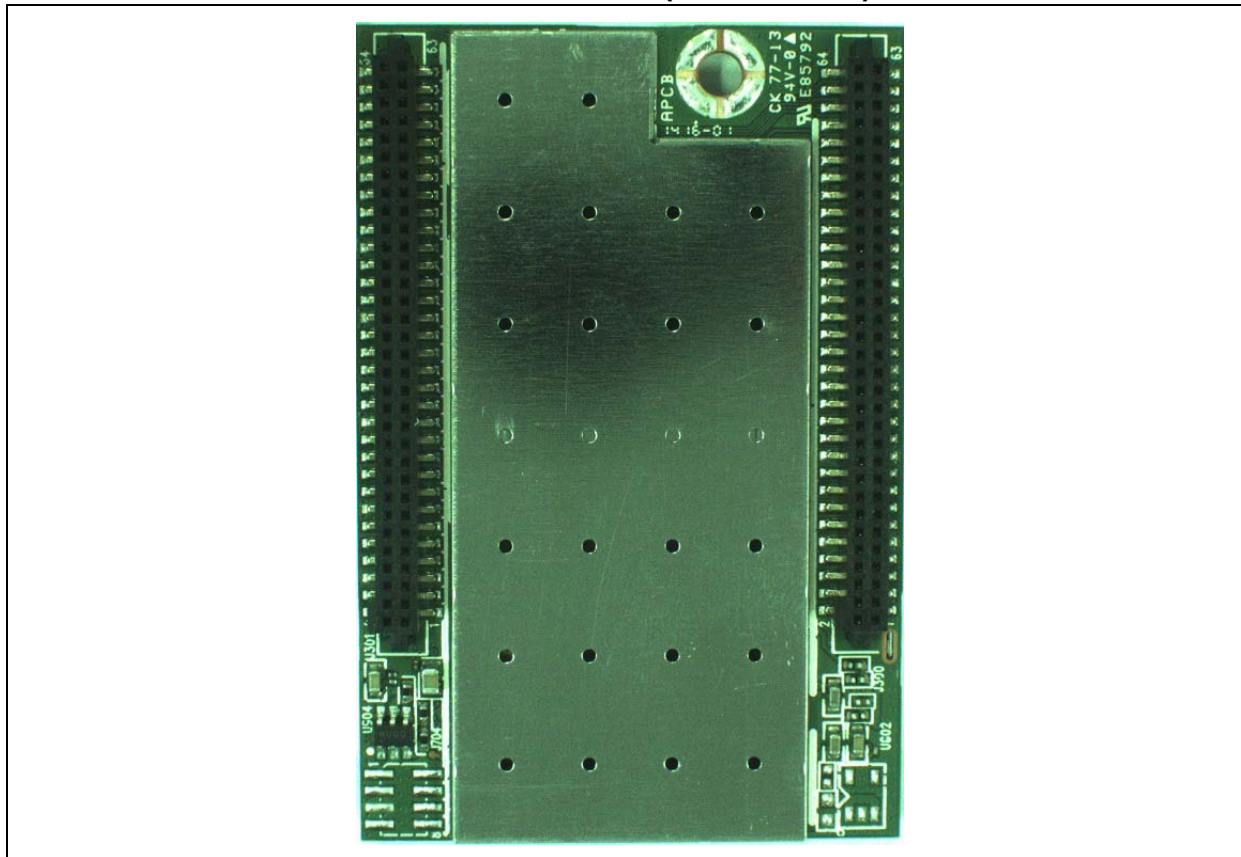
FIGURE 2-3: CY920 BOARD WITH RF SHIELD (TOP VIEW)



2.4 Production Board with RF Shield (Bottom View)

Figure 2-4 illustrates the bottom view of the CY920 board with RF shield.

FIGURE 2-4: CY920 BOARD WITH RF SHIELD (BOTTOM VIEW)



3.0 APPLICATION GUIDELINES

Note: This data sheet summarizes the features of the CY920 network media module. It is not intended to be a comprehensive reference source. To complement the information in this data sheet, refer to the various application notes available on the Microchip web site www.microchip.com.

This section describes the power-up sequence and the RF guidelines recommended by Microchip.

3.1 Power Sequencing and Reset Timing

The power sequencing during power on should start with the highest voltage rail. The power sequencing should progress from the higher voltage rail to the lower voltage rail, i.e. power-up 3.3V, 2.5V, 1.8V, and then 1.2V with a delay of 2 ms between each power rail. During power-down, the power sequencing should be in the reverse direction, i.e., remove 1.2V, 1.8V, 2.5V, and then 3.3V. The power-up sequence is mandatory and the power-down sequence is preferred, but optional. Figure 3-1 illustrates the power-up timing.

FIGURE 3-1: POWER-UP SEQUENCE



3.2 RF Considerations

The overall performance of the system, RF, and Wi-Fi/BT is significantly affected by the product design, environment and application. It is the responsibility of the product designer to ensure system level shielding (if required) and to verify the performance of the given product features and applications.

The Wi-Fi/BT performance will be affected by the RF environment surrounding the CY920 module. Consider the following precautions for optimal Wi-Fi/BT performance:

- The CY920 module is positioned in a noise-free RF environment, i.e. away from high frequency clock signals and any other sources of RF energy.
- The antenna is not shielded by any metal objects, such as loudspeakers or any other metal parts.
- The power supplies are clean and noise-free.

Note: The CY920 module includes RF shielding on the top and bottom of the board as a standard feature.

NOTES:

4.0 Wi-Fi SPECIFICATION

Table 4-1 describes the Wi-Fi specifications of the CY920 module.

TABLE 4-1: Wi-Fi® SPECIFICATIONS (1, 2, 4, 5, 6)

Feature	Description
WLAN Standards	IEEE 802.11a
	IEEE 802.11b
	IEEE 802.11g
	IEEE 802.11n
Frequency Band/Channels	2.412 - 2.472 GHz (2.4 GHz ISM Band, 13 Channels) Channel 1 - Channel 13 5.180 - 5.240 GHz (U-NII lower band) 5.260 - 5.320 GHz (U-NII middle band), see Note 3 5.500 - 5.700 GHz (U-NII middle band extended), see Note 3 5.745 - 5.825 GHz (U-NII upper band/ISM band) North America FCC, Japan Telec, Europe ETSI
Modulation	802.11a mode (OFDM: IEEE 802.11a)
	802.11b mode (DS-SS: IEEE 802.11b)
	802.11g mode (OFDM: IEEE 802.11g)
	802.11n mode (OFDM: IEEE 802.11n)
Transmission Speed	802.11a mode 54 Mbps, 48 Mbps, 36 Mbps, 24 Mbps, 18 Mbps, 12 Mbps, 9 Mbps, 6 Mbps
	802.11b mode 11 Mbps, 5.5 Mbps, 2 Mbps, 1 Mbps
	802.11g mode 54 Mbps, 48 Mbps, 36 Mbps, 24 Mbps, 18 Mbps, 12 Mbps, 9 Mbps, 6 Mbps
	802.11n mode MCS0 to MCS7(20 MHz and 40 MHz supported)
	Normal and short GI supported (PHY data rates up to 150 Mbps for 40 MHz mode + short GI)

- Note 1:** With respect to Tx power, different (higher/lower) RF output power settings may be used for specific regions, antennas and/or enclosures, in which case recertification may be required.
- 2:** 802.11n Greenfield is not supported. (Greenfield forces 802.11n operation even in the presence of 802.11b/g AP)
- 3:** Dynamic Frequency Selection (DFS) is supported by the hardware. Firmware support for DFS may not be in initial firmware releases, but will follow in a later firmware release.
- 4:** 802.11n 20 MHz and 40 MHz bandwidth is supported.
- 5:** The availability of some specific channels and/or operational frequency bands are country dependent and are firmware programmed at the Host product factory to match the intended destination. The firmware setting is not accessible to the end user of the Host product.
- 6:** Specifications are based on nominal test settings during module production at room temperature.

TABLE 4-1: Wi-Fi® SPECIFICATIONS (1, 2, 4, 5, 6) (CONTINUED)

Feature	Description
Tx Power	802.11a mode +12.5 dBm +/-3 dB (U-NII lower and U-NII upper/ISM band)
	802.11n HT20 mode +11.5 dBm +/-3 dB (U-NII lower and U-NII upper/ISM band)
	802.11n HT40 mode +10 dBm +/-3 dB (U-NII lower and U-NII upper/ISM band)
	802.11b mode +16.5 dBm +/- 3 dB
	802.11g mode +13 dBm +/-3 dB
	802.11n (HT20/40) mode +12 dBm +/-3 dB (2.4GHz ISM)
Power-on Ramp	Adhering to IEEE specification
RF Carrier Suppression	Adhering to IEEE specification
Tx EVM	802.11a mode -25 dB at 54 Mbps
	802.11b mode -10 dB at 11 Mbps
	802.11g mode -25 dB at 54 Mbps
	802.11n mode -27 dB at MCS7
Rx Sensitivity	802.11a mode -65 dB at 54 Mbps
	802.11b mode -76 dB at 11 Mbps
	802.11g mode -65 dB at 54 Mbps
	802.11n mode -64 dB at MCS7/20 MHz; -61 dB at MCS7/40 MHz
Throughput rate (measured for each module)	See factory test specification

- Note 1:** With respect to Tx power, different (higher/lower) RF output power settings may be used for specific regions, antennas and/or enclosures, in which case recertification may be required.
- 2:** 802.11n Greenfield is not supported. (Greenfield forces 802.11n operation even in the presence of 802.11b/g AP)
- 3:** Dynamic Frequency Selection (DFS) is supported by the hardware. Firmware support for DFS may not be in initial firmware releases, but will follow in a later firmware release.
- 4:** 802.11n 20 MHz and 40 MHz bandwidth is supported.
- 5:** The availability of some specific channels and/or operational frequency bands are country dependent and are firmware programmed at the Host product factory to match the intended destination. The firmware setting is not accessible to the end user of the Host product.
- 6:** Specifications are based on nominal test settings during module production at room temperature.

5.0 BLUETOOTH SPECIFICATIONS

The Bluetooth (BT) subsystem included in the CY920 module shares the antenna connections with the Wi-Fi subsystem. Dedicated control signals between the DM920 module and the BT controller perform Packet Traffic Arbitration (PTA) to optimise co-existence between the Wi-Fi and BT subsystems. A high-speed UART interface is used to send data from the BT controller to the DM920 SoC for further processing.

5.1 Features

The following are the Bluetooth features:

- Compliant with Bluetooth v2.1 + EDR specification
- SBC and AAC codec
- A2DP and AVRCP profiles
- WLAN and Bluetooth co-existence using PTA and AFH
- Utilises single antenna, shared with Wi-Fi
- Operating band: 2.4 GHz ISM band
- Output power Class 2 (+4 dBm)
- Low power consumption

5.2 Bluetooth Radio Characteristics

Table 5-1 provides Rx and Tx characteristics of the Bluetooth radio.

TABLE 5-1: RADIO CHARACTERISTICS

Parameter	Min.	Typical	Max.	Bluetooth Spec	Units
Sensitivity at 0.1% BER	—	—	—	≤ -70	dBm
RF transmit power	-6	—	4	≤ 4	dBm
Initial carrier frequency tolerance	—	25	75	75	kHz
20 dB bandwidth for modulated carrier	—	—	1000	≤ 1000	kHz
Modulation characteristics (f1_ave)	140	165	175	> 140	kHz
Modulation characteristics (f2_max)	115	145	—	≥ 115	kHz
Note 1: Specifications are based on nominal test settings during module production at room temperature.					

NOTES:

6.0 PACKAGING INFORMATION

Figure 6-1 and Figure 6-2 illustrate the top and bottom dimensions of the CY920 board.

FIGURE 6-1: CY920 BOARD DIMENSIONS (TOP VIEW)

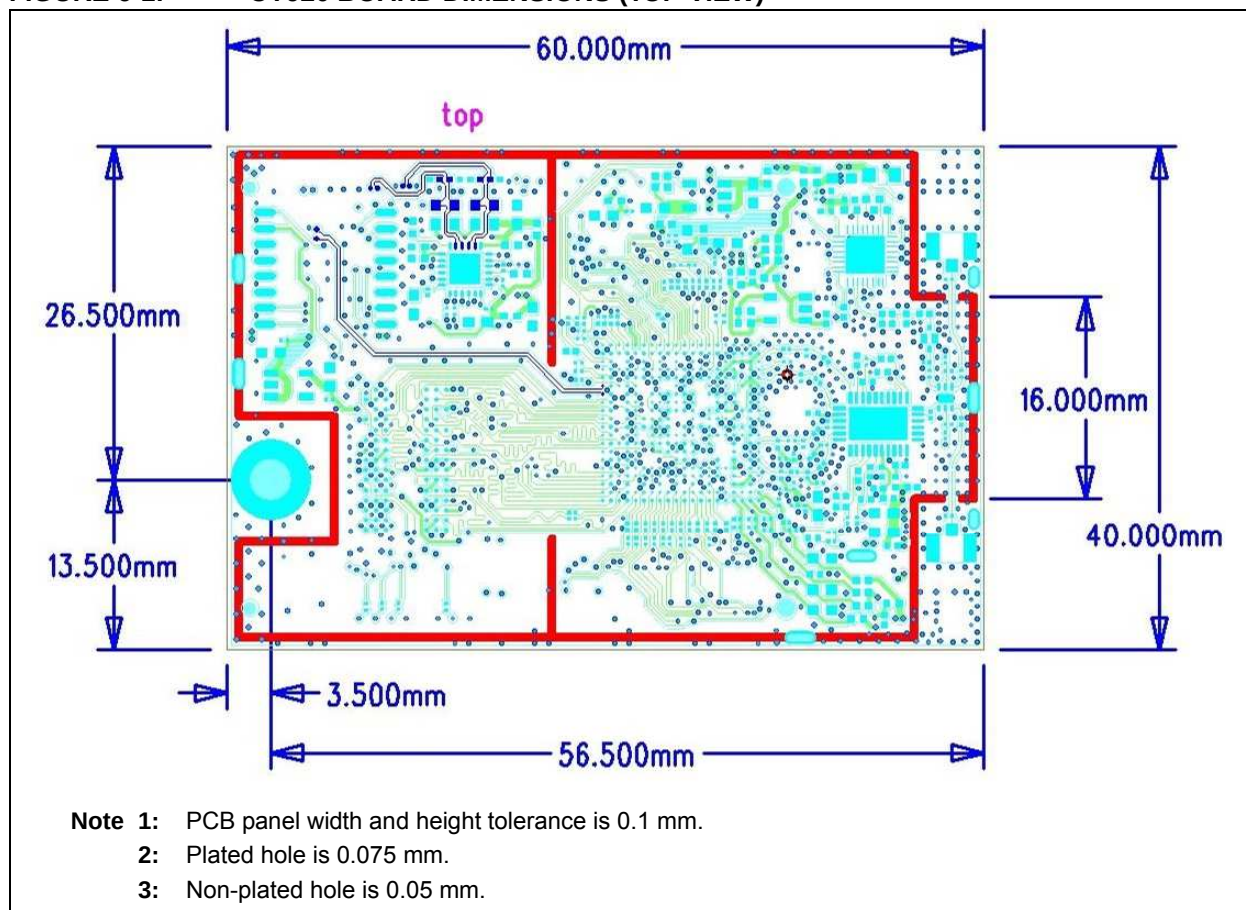
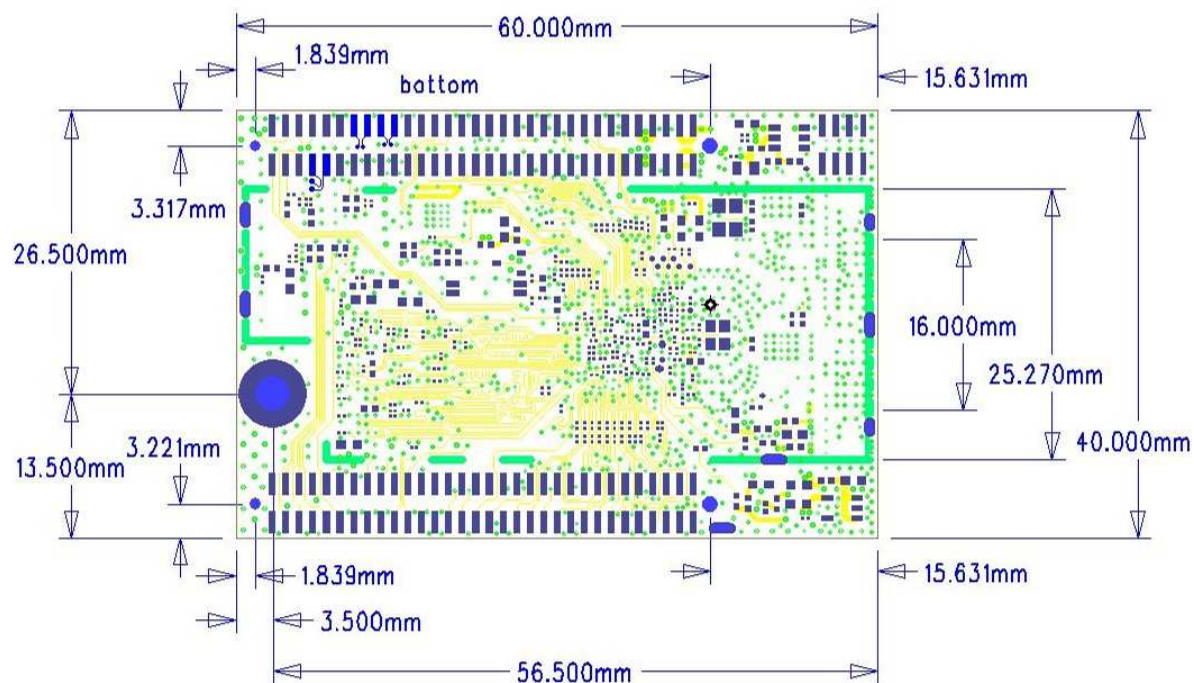


FIGURE 6-2: CY920 BOARD DIMENSIONS (BOTTOM VIEW)

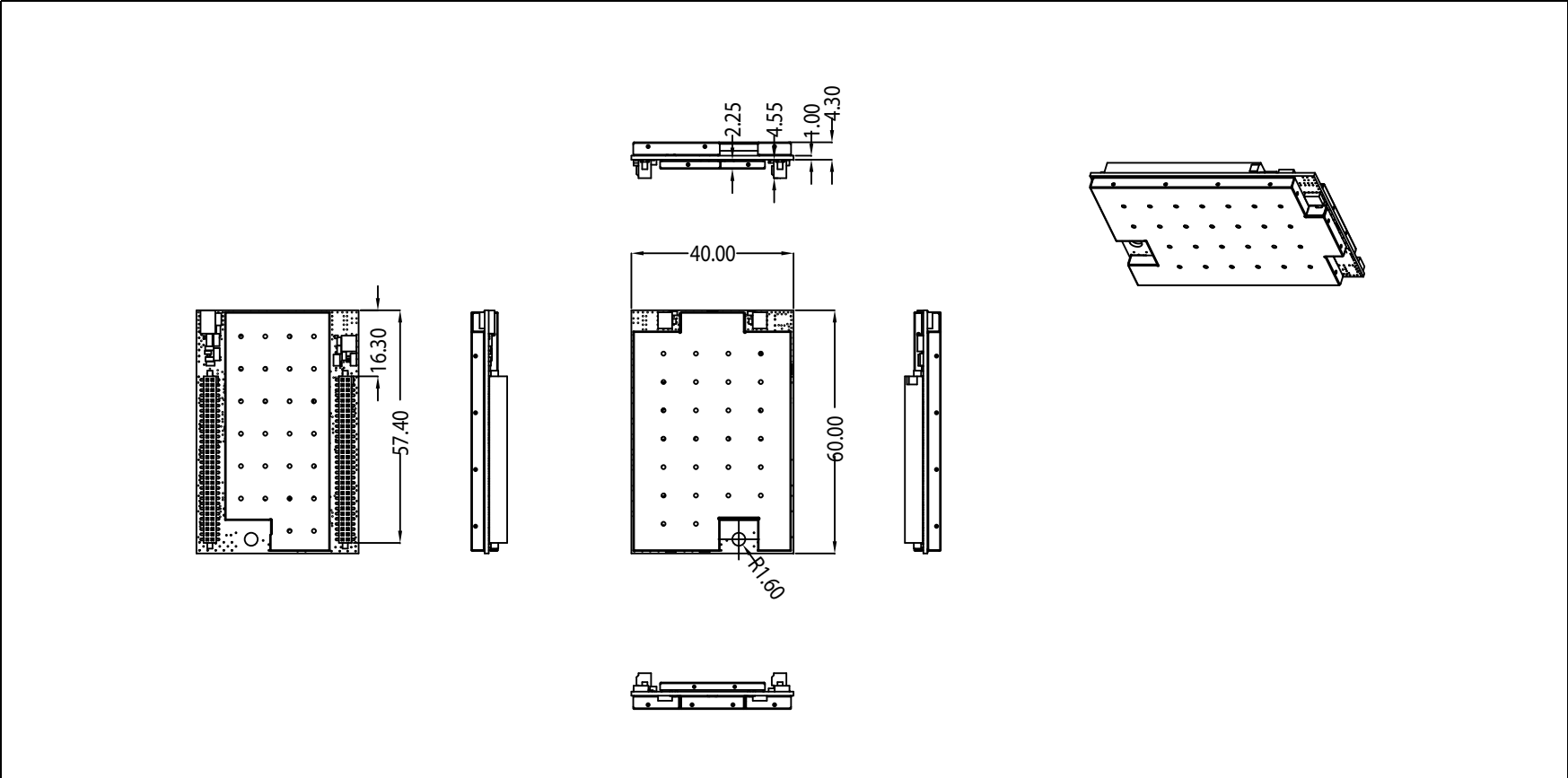


- Note 1:** PCB panel width and height tolerance is 0.1 mm.
Note 2: Plated hole is 0.075 mm.
Note 3: Non-plated hole is 0.05 mm.

6.1 3D View of the CY920 Board

Figure 6-3 illustrates the 3D view of the CY920 board.

FIGURE 6-3: CY920 Board (3D View)



6.2 Module Weight

Table 6-1 provides the weight for the various SKUs of the CY920 module.

TABLE 6-1: MODULE WEIGHT

Configuration Code	Weight (g)
CY920-A	17.5g
CY920-B	18.5g
CY920-C	18.7g

7.0 ELECTRICAL CHARACTERISTICS

This section provides an overview of the electrical characteristics of the CY920 module. Additional information will be provided in future revisions of this document as it becomes available.

Absolute maximum ratings for the CY920 network media module are listed in the following table.

Absolute Maximum Ratings

Parameter	Component	Min.	Max.	Unit
3.3V Supply Voltage	Main	-0.5	4.6	V
1.2V Supply Voltage		-0.5	1.8	V
1.8V Supply Voltage		-0.5	2.1	V
2.5V Supply Voltage		-0.5	3.0	V

† **NOTICE:** Stresses above those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. This is a stress rating only and functional operation of the device at those or any other conditions above those indicated in the operation listings of this specification, is not implied. Exposure to maximum rating conditions for extended periods may affect device reliability.

Table 7-1 provides the basic electric specifications of the CY920 module.

TABLE 7-1: BASIC SPECIFICATIONS

Parameter	Symbol	Min.	Typ	Max.	Unit
Power supply input voltage	VIN	3.165	3.3	3.465	V
		1.14	1.2	1.26	V
		1.71	1.8	1.89	V
		2.375	2.5	2.625	V
Logic input high voltage	VIH	2	—	3.6	V
Logic input low voltage	VIL	-0.3	—	0.8	V
Logic input threshold voltage	VT	1.39	1.51	1.65	V
Schmitt-trigger input low to high threshold voltage	VT+	1.63	1.76	1.9	V
Schmitt-trigger input high to low threshold voltage	VT-	1.18	1.3	1.44	V
Logic output high voltage	VOH	2.4	—	—	V
Logic output low voltage	VOL	—	—	0.4	V
Logic low-level output current (VOL=0.4V)	IOL	10.0	15.2	20.2	mA
Logic high-level output current (VOH=2.4V)	IOH	13.9	28.0	48.2	mA

Table 7-2 provides the current consumption details in various measurement conditions.

The current consumption per voltage rail and power consumption details will be provided in the future revision of this document.

TABLE 7-2: POWER CONSUMPTION⁽¹⁾

Measurement Condition	Current Consumption per Voltage Rail (mA)				Power Consumption (mW)
	1.2V	1.8V	2.5V	3.3V	
Maximum expected current consumption per rail across operating modes (continuous Tx/Rx mode with all function active), see Note 2 .	—	—	—	—	—
Wi-Fi streaming (Ethernet, USB and Bluetooth power-down)	—	—	—	—	—
Wi-Fi streaming (USB active, Ethernet and Bluetooth power-down)	—	—	—	—	—
Wi-Fi streaming (USB and Bluetooth active)	—	—	—	—	—
Ethernet streaming (Wi-Fi, USB and Bluetooth power-down)	—	—	—	—	—
Ethernet streaming (USB active, Wi-Fi and Bluetooth power-down)	—	—	—	—	—
Bluetooth streaming (Ethernet, Wi-Fi and USB power down)	—	—	—	—	—
Bluetooth streaming (USB active, Ethernet and Wi-Fi power-down)	—	—	—	—	—
Bluetooth streaming (Ethernet active, Wi-Fi and USB power down)	—	—	—	—	—
PSM wake up on Wi-Fi (PSM JB Green) (DTIM=1), see Note 2	—	—	—	—	—
PSM wake up on Wi-Fi (PSM JB Green) (DTIM=1), see Note 2	—	—	—	—	—
PSM wake up on Ethernet and wake on Wi-Fi (PSM JB Green)	—	—	—	—	—
Hibernate mode: Wake on Host or GPIO (Wi-Fi, Ethernet, Bluetooth and USB in power-down), see Note 2	—	—	—	—	—
Hibernate mode: Wake on Host or GPIO (Wi-Fi, Ethernet, Bluetooth and USB in power-down), see Note 2	—	—	—	—	—
CY920 module held in Reset	—	—	—	—	—

Note 1: All current consumptions are estimates, and will be revised after initial modules are characterised.

- 2:** The worst case maximum is when all functions are active and when the Wi-Fi is transmitting in continuous Tx/Rx mode. This mode is used only during the Wi-Fi RF certification test. A separate software will be required to perform this test. Power supplies should be designed with some additional derating on top of the maximum value, typically +30%.

[Table 7-3](#) lists the CY920 module operating conditions.

TABLE 7-3: OPERATING CONDITIONS

Parameter	Min.	Max.	Unit
Operating Temperature	0	+70	°C
Operating Humidity	10	90 (non-condensing)	%RH
Storage Temperature	-10	+75	°C
Storage Humidity	10	95 (non-condensing)	%RH
Storage Temperature Cycle Test (24 hrs)	-10	+75	°C

Note 1: For more information on various SKUs of the CY920 module, refer to [Table 9-1](#).

NOTES:

8.0 REGULATORY COMPLIANCE AND QUALITY

Note: This data sheet summarizes the features of the CY920 network media module. It is not intended to be a comprehensive reference source. To complement the information in this data sheet, refer to the various application notes available on the Microchip web site www.microchip.com.

This section addresses the various regulatory standards that are compliant with the CY920 module.

Microchip does not certify all module variants for all the countries. [Table 8-1](#) provides the module versions for which certain certifications have already been done.

The information about certified modules and Bluetooth qualifications will be provided in the future revisions of this document.

TABLE 8-1: REGULATORY COMPLIANCE

Description	Country	Compliance	Certified Modules
Electromagnetic Compatibility (Prescan)	USA	FCC CFR47 Part15B	—
	Europe	EN 301 489-1 EN 301 489-17	
	Canada	IC RSS-GEN	
Radio Regulations	USA	FCC CFR47 Part 15C, para 15.247 FCC CFR47 Part 15E, para 15.407	—
	Europe	EN 300 328 EN 301 893	
	Canada	IC RSS-210	
	Japan	ARIB STD-T66 ARIB STD-T71	
Bluetooth Qualifications	—	—	—

Contact Microchip's sales office for the latest information on certified modules for a particular county, and arranging for an additional certification for your chosen module, if needed. Any additional certification will need to be paid for by the customer.

The product manufacturer is responsible for the end product certification. Microchip can help manufacturers to prepare for the Wi-Fi Alliance test for the Wi-Fi certification by providing an example test plan and the required commands to enable special test modes. Please contact Microchip's sales office for any assistance on Wi-Fi Alliance Logo certification.

For documents related to Wi-Fi certification and recommended interfacing and power supply schematics, refer to the Microchip web site at www.microchip.com.

8.1 Antenna Considerations

Table 8.2 provides the list of antennas along with the manufacturer and part number details.

TABLE 8-2: ANTENNA LIST

SI No.	Manufacturer	Part Number	Antenna Type	Peak Gain
1	WALSIN	PI_RFDPA870920IMLB301_V01	Dipole Antenna	1.84 dBi for 2.4 GHz
2	WALSIN	PI_RFDPA870920IMLB301_V01	Dipole Antenna	3.26 dBi for 5 GHz
3	WALSIN	PI_RFDPA870930IMLB301_V01	Dipole Antenna	1.10 dBi for 2.4 GHz
4	WALSIN	PI_RFDPA870930IMLB301_V01	Dipole Antenna	2.77 dBi for 5 GHz
5	WALSIN	RFDPA870930IMAB301	Dipole Antenna	1.2 dBi for 2.4 GHz
6	WALSIN	RFDPA870945IMAB301	Dipole Antenna	1.16 dBi for 2.4 GHz
7	WALSIN	RFDPA870900SBAB801* + RFCBA100630SA6B301	Dipole Antenna	0.7 dBi for 2.4 GHz
8	WALSIN	RFDPA870900SBAB801* + RFCBA100645SA6B301	Dipole Antenna	0.1 dBi for 2.4 GHz

Note 1: * The antenna connector is reverse SMA type.

Table 8.3 provides the antennas to be used for the various SKUs as per Table 8.2.

TABLE 8-3: ANTENNAS FOR VARIOUS SKUs

Configuration Code	Antenna List (SI No.)
CY920-A	1, 2, 3, 4, 5, 6, 7, 8
CY920-B	—
CY920-C	1, 2, 3, 4, 5, 6, 7, 8
Note 1: The antenna list for CY920-B SKU will be provided in the future revisions of this document.	

8.3 Restriction of Use of Hazardous Substances (RoHS) Compliance

CY920 module uses only RoHS compliant components.

8.2 CY920 Usage Guidelines under Modular Approval

The CY module has received Limited Module Approval (LMA) from FCC and IC. This is because the CY module does not have complete built-in Power regulator circuit. Microchip recommends that customers follow the supply voltage requirements provided in this data sheet, and follow the Power supply design provided in the “CY Module Power Supply V1.0” document. It is the product manufacturer responsibility to ensure that the power supply recommendations are followed, and the RF behavior adheres the FCC or TCB certification requirements when the module is installed in the final Host product. The product manufacturer should work with their test house for confirming the RF behavior with FCC or TCB.

9.0 ORDERING GUIDE

Note: This data sheet summarizes the features of the CY920 network media module. It is not intended to be a comprehensive reference source. To complement the information in this data sheet, refer to the various application notes available on the Microchip web site www.microchip.com.

Table 9-1 describes the various SKUs of CY920 network media module.

TABLE 9-1: ORDERING GUIDE⁽¹⁾

Part number	Microchip IC	Status	Two External Diversity Antennas	Ethernet (10/100 Mbps)	USB	Extended Connector	64 MB DDR2	16 MB Serial Flash	Bluetooth	Top Module Shield	Bottom Module Shield
CY920-A	DM920	Launch	✓	—	✓	—	✓	✓	✓	✓	✓
CY920-B	DM920	Launch	✓	✓	✓	✓	✓	✓	—	✓	✓
CY920-C	DM920	Launch	✓	✓	✓	✓	✓	✓	✓	✓	✓

Note 1: The Apple Authentication Coprocessor is not available on the CY920 module. The Apple Authentication Coprocessor should be provided on the product motherboard, connected to the SDA, SCL signals from the CY920 module.

Note: Do not use a module which has two external antenna connectors with only one external antenna connected. Leaving one antenna socket open will degrade Wi-Fi performance. Microchip recommends using two external antennas for best performance.

NOTES:

APPENDIX A: CERTIFICATION NOTICES

The CY920 module is not tested for Federal Communications Commission (FCC). The following statements are not valid until the production version modules are tested. It is planned to certify the production version of the CY920 module as soon as possible after production versions are made.

Federal Communications Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and radiates radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/ TV technician for help.

Caution: Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

Applicable to UNII device only: The device is restricted to indoor use when operating in the 5.15 GHz to 5.25 GHz frequency band. FCC requires this product to be used indoors for frequency range 5.15 GHz to 5.25 GHz to reduce the potential for harmful interference to co-channel mobile satellite systems.

Labeling Requirements

This device complies with Part 15 of the FCC Rules. The operation is subject to the following two conditions: the device may not cause harmful interference, and the device must accept any interference received, including interferences that may cause undesired operations.

RF Exposure Warning

This equipment must be installed and operated in accordance with provided instructions. The antennas used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. End users and installers must be provide with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

Information for the OEMs or Integrators

The following statement must be included in all versions of this document supplied to OEMs or integrators, but should not be distributed to the end user.

"This device is intended for OEM or integrators only. Please see the full Grant of Equipment document for other restrictions. This device must be operated and used with a locally approved Access ".

Information to be Supplied to the End User by the OEM or Integrator

The following regulatory and safety notices must be published in all documentation supplied to the end user of the product or system, incorporating an adapter in compliance with local regulations.

"The host system must be labelled with: Contains FCC ID:ZQO-CY920'X' and IC: 2581A-CY920'X', FCC ID displayed on the label.

The letter shown in Ordering Guide Part Number column should be substituted for 'X'. For example, for the CY920-C module, the label text should be "Contains FCC ID:ZQO-CY920C"and "IC: 2581A-CY920C. The label text should be updated according to the table shown in [Section 9.0 "Ordering Guide"](#) of this document.

Japan

This device operation in the 5.15 GHz to 5.35 GHz frequency range is restricted to indoor use. Final product shall be labelled "For Indoor use only."

Canada, Industry Canada (IC) Notices

This Class B digital apparatus complies with Canadian ICES-003 and RSS-210.

Operation is subject to the following two conditions: the device may not cause interference, and the device must accept any interference, including interference that may cause undesired operation of the device.

This radio transmitter "IC: 2581A-CY920'X" has been approved by Industry Canada to operate with the antenna types listed in [Table 8.2](#) with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

RF Exposure Information

The radiated output power of the wireless device is below the Industry Canada (IC) radio frequency exposure limits. The Wireless Device should be used in such a manner that the potential for human contact during normal operation is minimized.

This device has been evaluated and shown compliant with the IC radio frequency exposure limits under mobile exposure conditions. (antennas are greater than 20cm from a person's body).

This device has been certified for use in Canada. Status of the listing in the Industry Canada's Radio Equipment List (REL) can be found at the following locations:

<http://www.ic.gc.ca/app/sitt/reltel/srch/nwRdSrch.do?lang=eng>

Additional Canadian information on RF exposure can be found at the following location:

<http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf08792.html>

Caution: Applicable to LE-LAN device only: This device is restricted to indoor use when operating in the 5.15 GHz to 5.25 GHz frequency band. Industry Canada requires this product to be used indoors for frequency range 5.15 to 5.25 GHz to reduce the potential for harmful interference to co-channel Mobile Satellite systems.

Canada, avis d'Industry Canada (IC)

Cet appareil numérique de classe B est conforme aux normes canadiennes ICES-003 et RSS-210.

Son fonctionnement est soumis aux deux conditions suivantes: (1) cet appareil ne doit pas causer d'interférence et (2) cet appareil doit accepter toute interférence, notamment les interférences qui peuvent affecter son fonctionnement.

Cet émetteur radio "IC: 2581A-CY920'X" a été approuvé par Industrie Canada pour fonctionner avec les types d'antennes énumérés dans le tableau 7-2 avec le gain maximal admissible et impédance d'antenne requise pour chaque type d'antenne indiqué. Types d'antennes n'est pas inclus dans cette liste, ayant un gain supérieur au gain maximal indiqué pour ce type, sont strictement interdits pour une utilisation avec cet appareil.

Informations concernant l'exposition aux fréquences radio (RF)

La puissance de sortie émise par l'appareil de sans fil Dell est inférieure à la limite d'exposition aux fréquences radio d'Industry Canada (IC). Utilisez l'appareil de sans fil Dell de façon à minimiser les contacts humains lors du fonctionnement normal.

Ce périphérique a également été évalué et démontré conforme aux limites d'exposition aux RF d'IC dans des conditions d'exposition à des appareils mobiles (les antennes se situent à moins de 20 cm du corps d'une personne).

Ce périphérique est homologué pour l'utilisation au Canada. Pour consulter l'entrée correspondant à l'appareil dans la liste d'équipement radio (REL - Radio Equipment List) d'Industry Canada rendez-vous sur:

<http://www.ic.gc.ca/app/sitt/reltel/srch/nwRdSrch.do?lang=eng>

Pour des informations supplémentaires concernant l'exposition aux RF au Canada rendez-vous sur: <http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf08792.html>

Caution: Prudence (ce n'est applicable qu'aux dispositif LE-LAN): Ce dispositif est limité à une utilisation en intérieur à cause de son fonctionnement dans la gamme 5.15 GHz à 5.25 GHz. Industrie Canada exige que ce produit est utilisé à l'intérieur pour la gamme de fréquence de 5,15 à 5,25 GHz pour réduire les risques d'interférence nuisible à la co-canal systèmes mobiles par satellite.

APPENDIX B: REVISION HISTORY

Revision A (January 2014)

This is the initial release of the CY920 Network Media Module data sheet.

Revision B (March 2014)

- Replaced [Figure 6-1](#) and [Figure 6-2](#) in [Section 6.0 “Packaging Information”](#)
- Added [Figure 2-3](#) and [Figure 2-4](#)

Revision C (June 2014)

This revision includes the following updates:

- Figures:
 - Updated [Figure 2-1](#), [Figure 2-2](#), [Figure 2-3](#), and [Figure 2-4](#)
 - Added [Figure 3-1](#)
 - Replaced [Figure 6-1](#) and [Figure 6-2](#)
- Notes:
 - Updated Note 4 in [Table 4-1](#)
 - Added Note 6 in [Table 4-1](#)
 - Removed Note 3 in [Table 7-2](#)
- Sections:
 - Updated the components in [Section 2.1 “Top View of CY920 Board”](#)
 - Updated [Section 3.1 “Power Sequencing and Reset Timing”](#)
 - Updated [Section 8.2 “CY920 Usage Guidelines under Modular Approval”](#)
- Tables:
 - Updated [Table 1-1](#), [Table 4-1](#), and [Table 7-2](#)
 - Replaced [Table 5-1](#) and [Table 8-2](#)
 - Removed Table 5-2
 - Added [Table 6-1](#) and [Table 8-3](#)
 - Removed the CY920-E SKU in [Table 9-1](#)
- Minor changes related to formatting have been incorporated in the entire document

NOTES:

THE MICROCHIP WEB SITE

Microchip provides online support via our WWW site at www.microchip.com. This web site is used as a means to make files and information easily available to customers. Accessible by using your favorite Internet browser, the web site contains the following information:

- **Product Support** – Data sheets and errata, application notes and sample programs, design resources, user's guides and hardware support documents, latest software releases and archived software
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To register, access the Microchip web site at www.microchip.com. Under "Support", click on "Customer Change Notification" and follow the registration instructions.

CUSTOMER SUPPORT

Users of Microchip products can receive assistance through several channels:

- Distributor or Representative
- Local Sales Office
- Field Application Engineer (FAE)
- Technical Support

Customers should contact their distributor, representative or Field Application Engineer (FAE) for support. Local sales offices are also available to help customers. A listing of sales offices and locations is included in the back of this document.

Technical support is available through the web site at: <http://microchip.com/support>

NOTES:

Worldwide Sales and Service

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Corporate Office
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Chandler, AZ 85224-6199
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