

Data Sheet: JN5142-x01-Myy

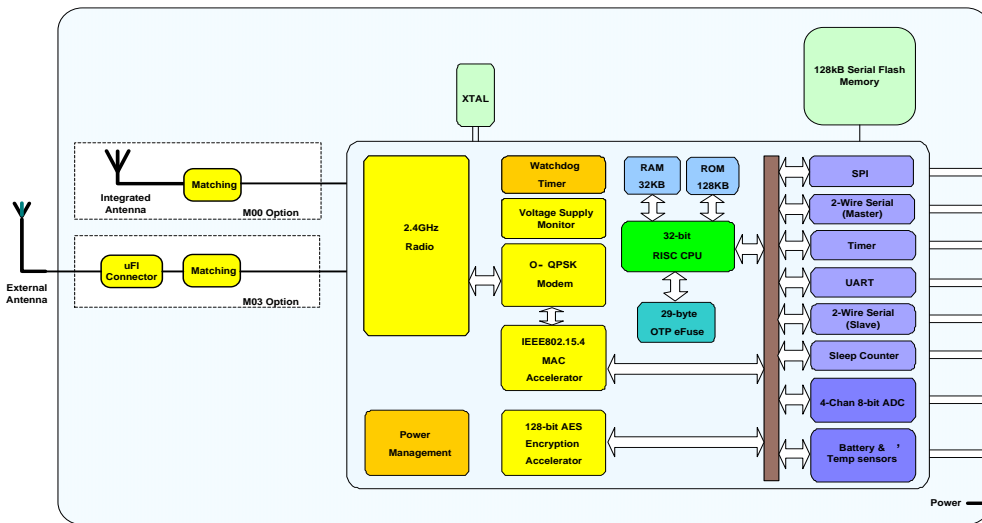
JenNet-IP, RF4CE and IEEE802.15.4 Module

Overview

The JN5142-x01-Myy family is a range of ultra low power, high performance surface mount modules targeted at JenNet-IP and RF4CE networking applications, enabling users to realise products with minimum time to market and at the lowest cost. They remove the need for expensive and lengthy development of custom RF board designs and test suites. The modules use NXP's JN5142 wireless microcontroller to provide a comprehensive solution with large memory, high CPU and radio performance and all RF components included. All that is required to develop and manufacture wireless control or sensing products is to connect a power supply and peripherals such as switches, actuators and sensors, considerably simplifying product development.

Two module variants are available: JN5142-x01-M00 with an integrated antenna and the JN5142-x01-M03 with antenna connector. The modules can implement networking stacks such as JenNet-IP and RF4CE, as well as customer applications.

Module Block Diagram



Benefits

- Single chip optimized for simple applications
- Very low currenting solution for long battery life – over 10 yrs
- Highly featured 32-bit RISC CPU for high performance and low power
- System BOM is low in component count and cost
- FCC part 15.247 rules, IC Canada RSS 210e and ETSI EN 300-328 v 1.7 compliant

Applications

- Robust and secure low power wireless applications using RF4CE
- Remote Control
- Toys and gaming peripherals
- Active RFID tags
- Point-to-point or star networks using IEEE802.15.4
- Energy harvesting, for example self powered light switch

Features: Module

- 2.4GHz IEEE802.15.4, JenNet-IP and RF4CE compatible
- Sleep current (with active sleep timer) 0.73µA
- **JN5142-x01-M00/03**
 - up to 1km range (Ext antenna)
 - M00: integral antenna 18x32mm
 - M03: uFI connector 18x30mm
 - TX power +2.5dBm
 - Receiver sensitivity –95dBm
 - TX current 15mA
 - RX current 17.5mA
 - 2.3-3.6V operation

Features: Microcontroller

- 32-bit RISC CPU, 1-32MHz clock speed
- Low power operation
- Variable instruction width for high coding efficiency
- Multi-stage instruction pipeline
- 128KB ROM and 32KB RAM for bootloaded program code
- Master/Slave I2C interface.
- 3xPWM and Application timer/counter
- UART
- SPI port with 3 selects
- Supply Voltage Monitor with 8 programmable thresholds
- 4-input 8-bit ADC
- Comparator
- Battery and temperature sensors
- Watchdog timer and Power-on-Reset (with brown-out) circuit
- Up to 18 DIO

**Industrial temp (-40°C to +125°C)
 6x6mm 40-lead Punched QFN**

Lead-free and RoHS compliant

Contents

1. Introduction	3
1.1. Variants	3
1.2. Regulatory Approvals	3
2. Specifications	4
3. Product Development	5
3.1. JN5142 Single Chip Wireless Microcontroller	5
4. Pin Configurations	6
4.1. Pin Assignment	7
4.2. Pin Descriptions	8
4.2.1 Power Supplies	8
4.2.2 SPI Memory Connections	8
5. Electrical Characteristics	9
5.1. Maximum Ratings	9
5.2. Operating Conditions	9
Appendix A Additional Information	10
A.1 Outline Drawing	10
A.2 Module PCB Footprint	12
A.3 Manufacturing	13
A.3.1 Reflow Profile	13
A.3.2 Soldering Paste and Cleaning	13
A.4 Ordering Information	14
A.5 Tape and Reel Information:	15
A.5.1 Tape Orientation and dimensions	15
A.5.2 Cover tape details	15
A.5.3 Leader and Trailer	16
A.5.4 Reel Dimensions:	16
A.6 Related Documents	16
A.7 Federal Communication Commission Interference Statement	17
A.7.1 Antennas approved by FCC for use with JN5142 modules	18
A.7.2 FCC End Product Labelling	18
A.8 Industry Canada Statement	18
A.8.1 Industry Canada End Product Labelling	18
A.9 European R & TTE Directive 1999/5/EC Statement	19
A.10 RoHS Compliance	19
A.11 Status Information	19
A.12 Disclaimers	20
Version Control	20

1. Introduction

The JN5142-x01-Myy module family provides designers with a ready-made component that provides a fully integrated solution for applications using the IEEE802.15.4 standard in the 2.4 - 2.5GHz ISM frequency band [1], including RF4CE. A later version of the JN5142 will provide support for JenNet-IP “Smart Device” applications such as lighting.

Applications that transfer data wirelessly tend to be more complex than wired ones. Wireless protocols make stringent demands on frequencies, data formats, timing of data transfers, security and other issues. Application development must consider the requirements of the wireless network in addition to the product functionality and user interfaces. To minimise this complexity, NXP provides a series of software libraries and interfaces that control the transceiver and peripherals of the JN5142. These libraries and interfaces remove the need for the developer to understand wireless protocols and greatly simplifies the programming complexities of power modes, interrupts and hardware functionality.

In view of the above, it is not necessary to provide the register details of the JN5142 in the datasheet.

The device includes a Wireless Transceiver, RISC CPU, on chip memory and an extensive range of peripherals.

The modules integrate all of the RF components required, removing the need to perform expensive RF design and test. Products can be designed by simply connecting sensors and switches to the module IO pins. The modules use an NXP single chip IEEE802.15.4 Wireless Microcontroller, allowing designers to make use of the extensive chip development support material. Hence, this range of modules allows designers to bring wireless applications to market in the minimum time with significantly reduced development effort and cost.

Two variants are available: JN5142-x01-M00 (standard module with integral antenna) and the JN5142-x01-M03 (standard module with uFL connector for use with external antennae). All modules have FCC modular approvals and are compliant with EU regulations. The variants available are described below.

1.1. Variants

Variant	Description	FCCID	Industry Canada ID
JN5142-001-M00	Standard Power, integrated antenna, IEEE802.15.4 stack	TYOJN5142M0	IC: 7438A-CYO5142M0
JN5142-J01-M00	Standard Power, integrated antenna, Jennet IP stack	TYOJN5142M0	IC: 7438A-CYO5142M0
JN5142-001-M03	Standard Power, uFI connector, IEEE802.15.4 stack	TYOJN5142M3	IC: 7438A-CYO5142M3
JN5142-J01-M03	Standard Power, uFI connector, Jennet IP stack	TYOJN5142M3	IC: 7438A-CYO5142M3

1.2. Regulatory Approvals

All module types have been tested against the requirements of European standard EN 300 328 v1.7.1 and a Notified Body statement of opinion for this standard is available on request.

Additionally, all module types have received FCC “Modular Approvals”, in compliance with CFR 47 FCC part 15 regulations and in accordance to FCC Public notice DA00-1407, appendix A.7 contains details on the conditions applying to this modular approval. The modules are approved for use with a range of different antennas; further details of which can be found in section Appendix A.7.1. The modular approvals notice and test reports are available on request.

In addition, all modules have Industry Canada modular approval and RSS210e Issue 7 (June 2007) certification.

2. Specifications

Most specification parameters for the modules are specified in the chip datasheet - JN-DS-JN5142 Wireless Microcontroller Datasheet, [2]. Where there are differences, the parameters are defined here.

VDD=3.0V @ +25°C

Typical DC Characteristics		Notes
	JN5142-x01-M00/03	
Deep sleep current	100nA	
Sleep current	0.73uA	With active sleep timer
Radio transmit current	14.8mA	CPU in doze, radio transmitting
Radio receive current	16.5mA	CPU in doze, radio receiving
Centre frequency accuracy	+/-25ppm	Additional +/-15ppm allowance for temperature and ageing
Typical RF Characteristics		Notes
Receive sensitivity	-95dBm	Nominal for 1% PER, as per 802.15.4 section 6.5.3.3 (Note 1)
Maximum Transmit power	+2.5dBm	Nominal (Note 1)
Maximum input signal	+10dBm	For 1% PER, measured as sensitivity
RSSI range	-95 to -10 dBm	
RF Port impedance – uFl connector	50 ohm	2.4 - 2.5GHz
VSWR (max)	2:1	2.4 - 2.5GHz
Peripherals		Notes
Master SPI port	3 selects	250kHz - 16MHz
Slave SPI port	✓	250kHz - 8MHz
UART	✓	16550 compatible
Two-wire serial I/F (compatible with SMBus & I ² C)	✓	Up to 400kHz
Two programmable Timer/Counters with capture/compare facility, Tick timer	✓	16MHz clock
Two programmable Sleep Timers	✓	32kHz clock
Digital IO lines (multiplexed with UARTs, timers and SPI selects)	18	
Four channel Analogue-to-Digital converter	✓	8-bit, up to 100ks/s
Programmable analogue comparator	✓	Ultra low power mode for sleep
Internal temperature sensor and battery monitor	✓	

The performance of all peripherals is defined in the JN-DS-JN5142 Wireless Microcontroller Datasheet [2]

Note 1: Sensitivity is defined for conducted measurements on connectorised modules. Modules with an integrated antenna have approximately 3 dB less e.i.r.p and reciprocal receive sensitivity.

3. Product Development

NXP supplies all the development tools and networking stacks needed to enable end-product development to occur quickly and efficiently. These are all freely available from www.nxp.com/jennic. A range of evaluation/developer kits is also available, allowing products to be quickly bread boarded. Efficient development of software applications is enabled by the provision of a complete, unlimited, software developer kit. Together with the available libraries for the IEEE802.15.4 MAC and the JenNet-IP and RF4CE network stacks, this package provides everything required to develop application code and to trial it with hardware representative of the final module.

The modules can be user programmed both in development and in production using software supplied by NXP. Access to the on-chip peripherals, MAC and network stack software is provided through specific APIs. This information is available on the NXP/Jennic support website, together with many example applications, user guides, reference manuals and application notes.

3.1. JN5142 Single Chip Wireless Microcontroller

The JN5142-x01-Myy series is constructed around the JN5142-x01 single chip wireless microcontroller, which includes the radio system, a 32-bit RISC CPU, ROM and RAM memory and a range of analogue and digital peripherals.

The chip is described fully in JN-DS-JN5142 Wireless Microcontroller Datasheet [2].

The module also includes a 1Mbit serial flash memory, which holds the application code that is loaded into the JN5142 during the boot sequence and provides static data storage, required by the application.

4. Pin Configurations

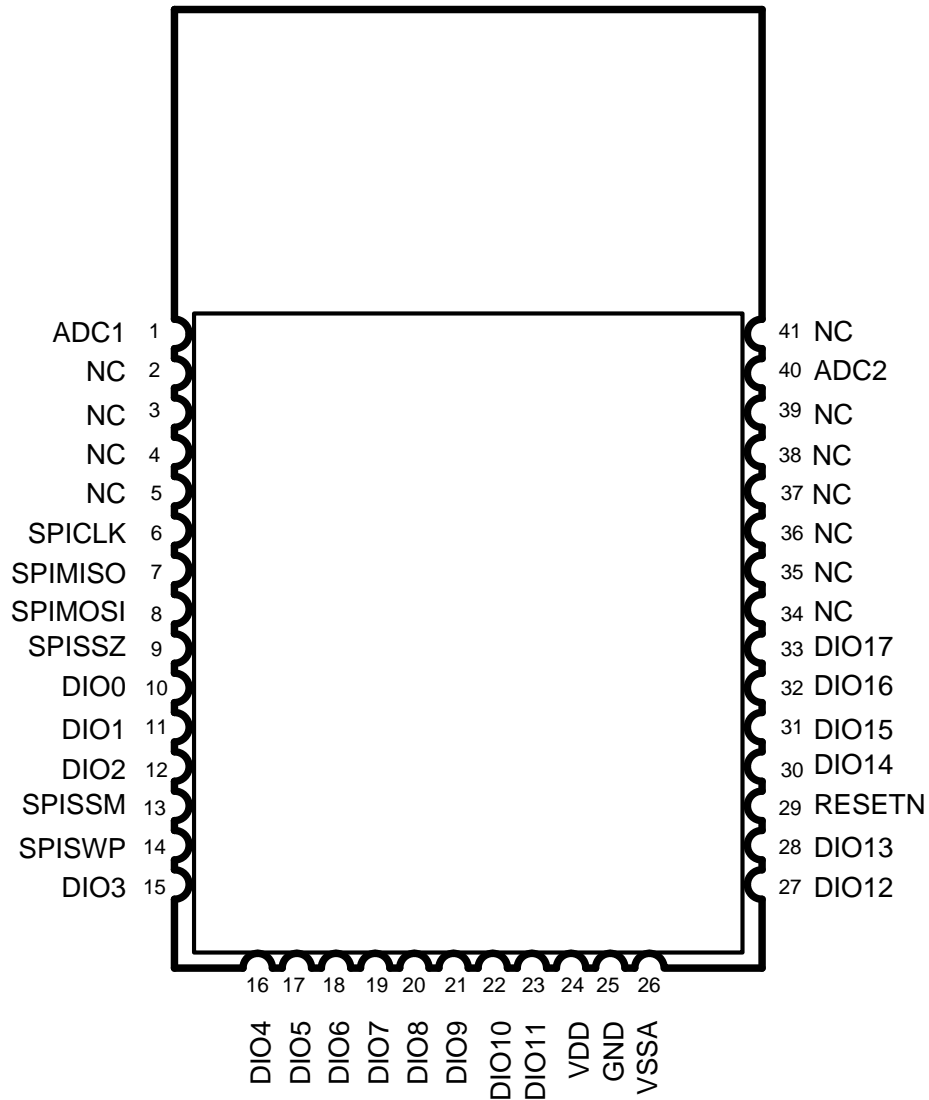


Figure 1: Pin Configuration (top view)

Note that the same basic pin configuration applies for all module designs.

Pin Assignment

Pin No	Pin Functions					Signal Type	Description
	Primary	Alternate Functions					
1	ADC1					3.3V	Analogue to Digital Input
2	NC						
3	NC						
4	NC						
5	NC						
6	SPICLK					CMOS	SPI Clock Output
7	SPIMISO					CMOS	SPI Master In Slave Out Input
8	SPIMOSI					CMOS	SPI Master Out Slave In Output
9	SPISSZ					CMOS	SPI Select From Module – SS0 Output
10	DIO0	SPISEL1	ADC3			CMOS	DIO0 or SPI Slave Select Output 1 or ADC input 3
11	DIO1	SPISEL2	ADC4	PC0		CMOS	DIO1, SPI Slave Select Output 2, ADC input 4 or Pulse Counter0 Input
12	DIO2	TIM0CK_GT	RFRX			CMOS	DIO2, Timer0 Clock/Gate Input or Radio Receive Control Output
13	SPISSM					CMOS	SPI Select to FLASH (Input)
14	SPISWP					CMOS	FLASH Write Protect (Input)
15	DIO3	TIM0CAP	RFTX			CMOS	DIO3, Timer0 Capture Input or Radio Transmit Control Output
16	DIO4	CTS0	JTAG_TCK	TIM0OUT		CMOS	DIO4, UART 0 Clear To Send Input, JTAG CLK or Timer0 PWM Output
17	DIO5	RTS0	JTAG_TMS	PWM1	PC1	CMOS	DIO5, UART 0 Request To Send Output, JTAG Mode Select, PWM1 Output or Pulse Counter 1 Input
18	DIO6	TXD0	JTAG_TDO	PWM2		CMOS	DIO6, UART 0 Transmit Data Output, JTAG Data Output or PWM2 Output
19	DIO7	RXD0	JTAG_TDI	PWM3		CMOS	DIO7, UART 0 Receive Data Input, JTAG Data Input or PWM 3 Output
20	DIO8	TIM0CK_GT	PC1			CMOS	DIO8, Timer0 Clock/Gate Input or Pulse Counter1 Input
21	DIO9	TIM0CAP	32KXTALIN			CMOS	DIO9, Timer0 Capture Input or 32K External Crystal Input
22	DIO10	TIM0OUT	32KXTALOUT			CMOS	DIO10, Timer0 PWM Output or 32K External Crystal Output
23	DIO11	PWM1				CMOS	DIO11 or PWM1 Output
24	VDD					3.3V	Supply Voltage
25	GND					0V	Digital Ground
26	VSSA					0V	Analogue Ground
27	DIO12	PWM2	CTS0	JTAG_TCK	AD0	CMOS	DIO12, PWM2 Output, UART 0 Clear To Send Input, JTAG CLK or Antenna Diversity Odd
28	DIO13	PWM3	RTS0	JTAG_TMS	ADE	CMOS	DIO13, PWM3 Output, UART 0 Request To Send Output, JTAG Mode Select or Antenna Diversity Even
29	RESETN					CMOS	Reset input

30	DIO14	SIF_CLK	TXD0	JTAG_TDO	SPISEL1	CMOS	DIO14, Serial Interface Clock, UART 0 Transmit Data Output, JTAG Data Output or SPI Slave Select Output 1
31	DIO15	SIF_D	RXD0	JTAG_TDI	SPISEL2	CMOS	DIO15, Serial Interface Data, UART 0 Receive Data Input, JTAG Data Input or SPI Slave Select Output 2
32	DIO16	COMP1P	SIF_CLK			CMOS	DIO16, Comparator Positive Input or Serial Interface clock
33	DIO17	COMP1M	SIF_D			CMOS	DIO17, Comparator Negative Input or Serial Interface Data
34	NC						
35	NC						
36	NC						
37	NC						
38	NC						
39	NC						
40	ADC2	VREF				3.3V	Analogue peripheral reference voltage or ADC input 2
41	NC						

4.2. Pin Descriptions

All pins behave as described in the JN-DS-JN5142 Wireless Microcontroller Datasheet [2], with the exception of the following:

4.2.1 Power Supplies

A single power supply pin, VDD is provided. Separate analogue (VSSA) and digital (GND) grounds are provided. These should be connected together at the module pins.

4.2.2 SPI Memory Connections

SPISWP is a write protect pin for the serial flash memory. This should be held low to inhibit writes to the flash device.

SPISSZ is connected to SPI Slave Select 0 on the JN5142.

SPISSM is connected to the Slave Select pin on the memory.

This configuration allows the flash memory device to be programmed using an external SPI programmer if required. For programming in this mode, the JN5142 should be held in reset by taking RESETN low. Two suggested flash 1Mbit memory devices that may be used in the module are, the Micron M25P10A and the Winbond W25X10B.

The memory can also be programmed over the UART by using the flash programmer software provided by NXP. This is available as part of the Software Developer kit and libraries available from www.nxp.com/jennic. To enter this programming mode, SPIMISO (pin 7) should be held low whilst the chip is reset. Once programming has finished, the chip should be reset, when it will execute the new code downloaded.

For normal operation of the module and programming over the UART, SPISSZ should be connected to SPISSM.

5. Electrical Characteristics

In most cases, the Electrical Characteristics are the same for both module and chip. They are described in detail in the chip datasheet. Where there are differences, they are detailed below.

5.1. Maximum Ratings

Exceeding these conditions will result in damage to the device.

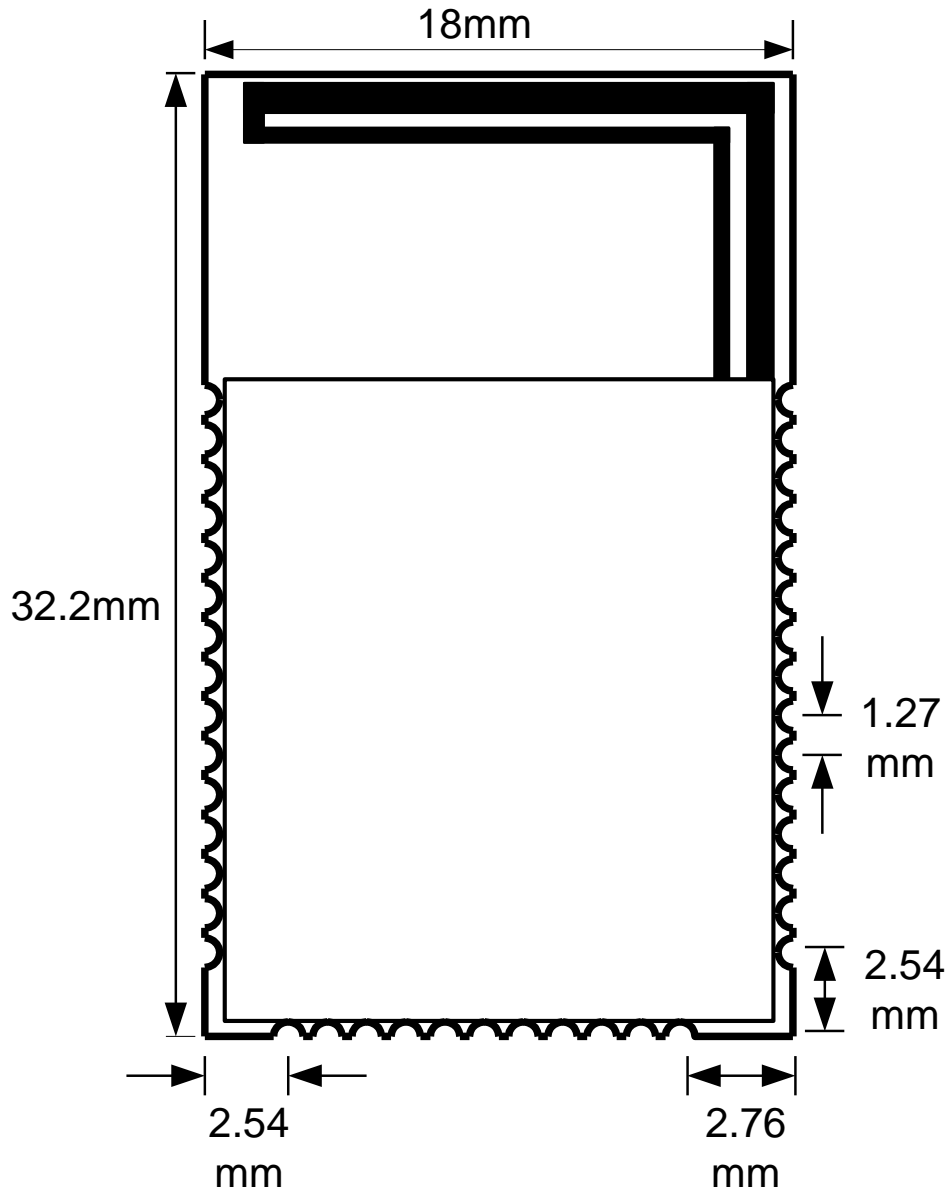
Parameter	Min	Max
Device supply voltage VDD	-0.3V	3.6V
Voltage on analogue pins ADC1-2	-0.3V	VDD + 0.3V
Voltage on 5v tolerant digital pins DIO0-DIO8 & DIO11-17, RESETN	-0.3V	Lower of (VDD + 2V) and 5.5V
Voltage on 3v tolerant digital pins DIO9, DIO10, SPISSM, SPISWP, SPICLK, SPIMOSI, SPIMISO, SPISSZ	-0.3V	VDD + 0.3V
Storage temperature	-40°C	150°C

5.2. Operating Conditions

Supply	Min	Max
VDD	2.3V	3.6V
Ambient temperature range	-40°C	125°C

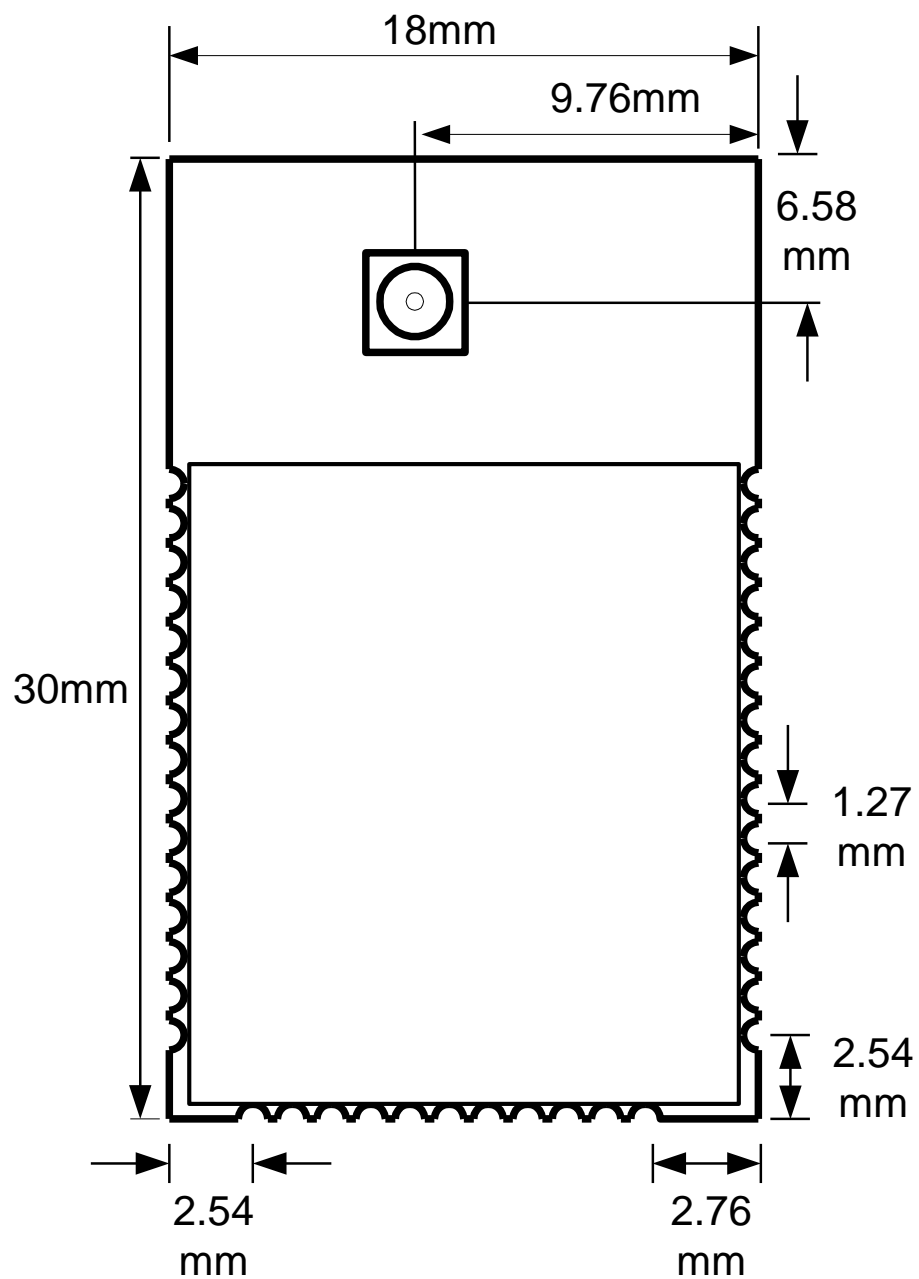
Appendix A Additional Information

A.1 Outline Drawing



Thickness: 3.5mm

Figure 2 JN5142-x01-M00 Outline Drawing

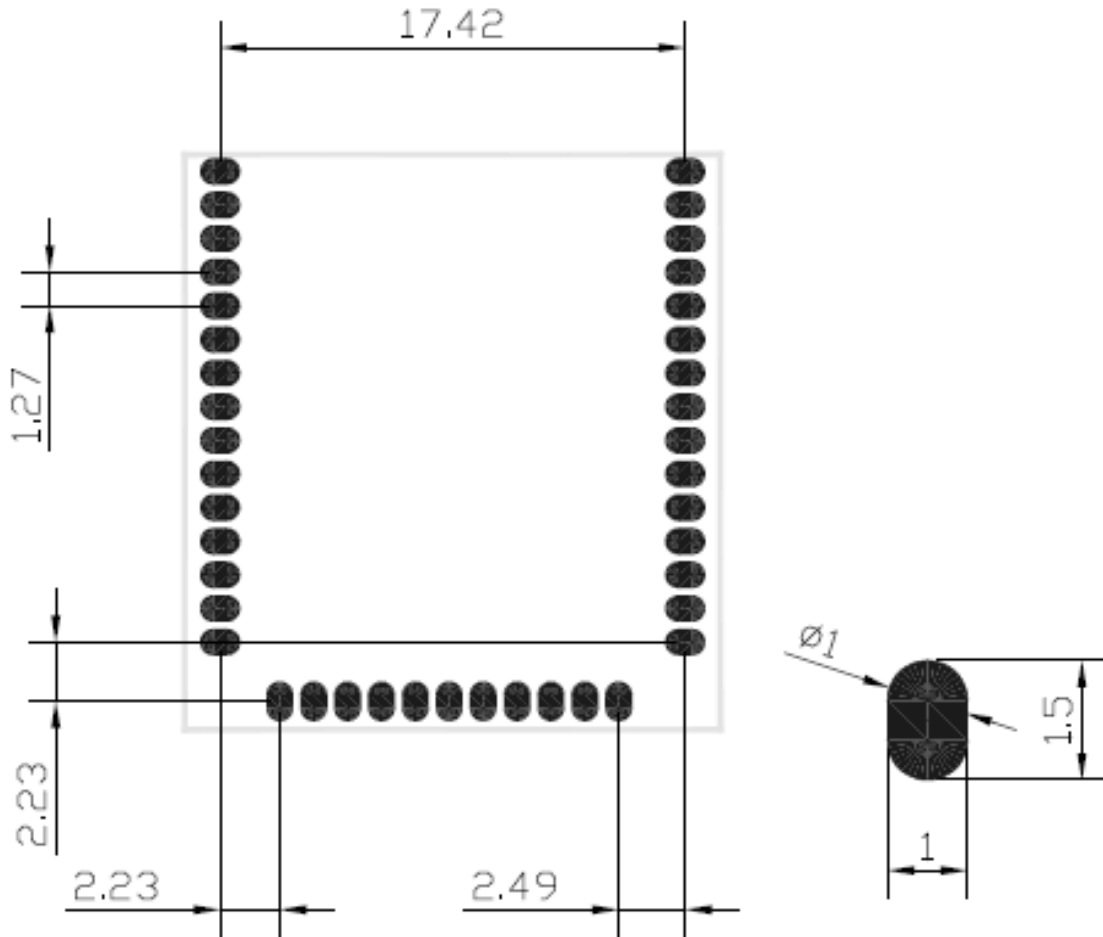


Thickness: 3.5mm

Figure 3 JN5142-x01-M03 Outline Drawing

A.2 Module PCB Footprint

All dimensions are in mm.



Note: All modules have the same footprint.

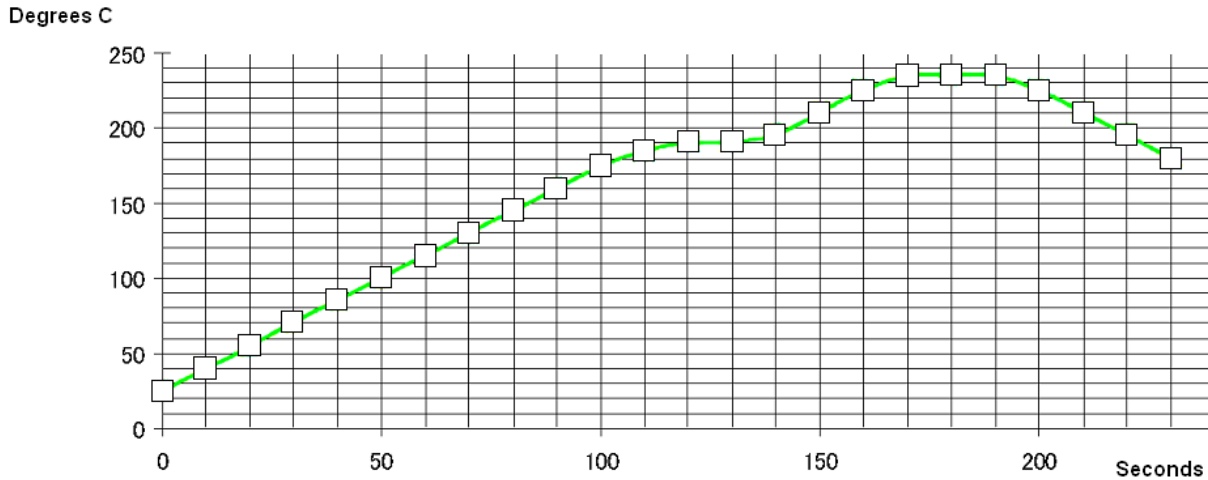
Figure 4 Module PCB footprint

RF note for -M00 modules with integral antenna: No components, ground plane or tracks on any layer of the mother board should be placed within 20mm of the 3 free sides of the antenna. Tracks etc may be placed adjacent to the can, but should not extend past the can towards the antenna end of the module for 20mm from the antenna.

A.3 Manufacturing

A.3.1 Reflow Profile

For reflow soldering, it is recommended to follow the reflow profile in figure 6 as a guide, as well as the paste manufacturers guidelines on peak flow temperature, soak times, time above liquidus and ramp rates.



Temperature	25~160 °C	160~190 °C	> 220° C	230~Pk.	Pk. Temp (235°C)
Target Time (s)	90~130	30~60	20~50	10~15	150~270

Figure 5: Recommended solder reflow profile

A.3.2 Soldering Paste and Cleaning

NXP would not recommend use of a solder paste that requires the module and pcb assembly to be cleaned (rinsed in water) for the following reasons:

Solder flux residues and water can be trapped by the pcb, can or components and result in short circuits.

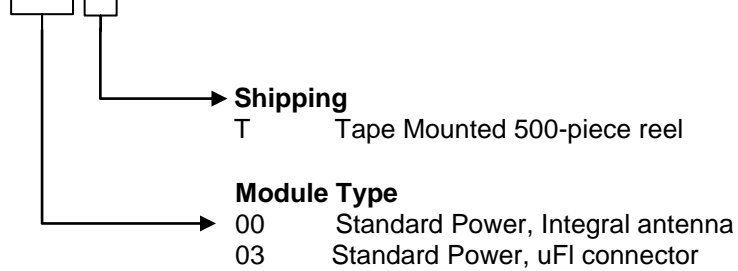
The module label could be damaged or removed.

NXP recommends use of a 'no clean' solder paste for all its module products.

A.4 Ordering Information

Ordering Code Format:

JN5142 - x01 - M / Y1Y2 Y3



Where this Data Sheet is denoted as “Advanced” or “Preliminary”, devices will be either Engineering Samples or Prototypes. Devices of this status have an Rx suffix after the module type to identify qualification status during these product phases - for example, JN5142-X01-M00R1T.

Part Number	Ordering Code	Description
JN5142-x01-M00T	JN5142-x01-M/00T	JN5142 module, variant as detailed above
JN5142-x01-M03T	JN5142-x01-M/03T	

- Label line 1: **IC ID Number**
- Label line 2: **FCC ID Number**
- Label line 3: **Part Number**
- Label line 4: **Barcode Label**
- Label line 5: **YYWWTNNNNN (see below)**

Identifier	Description	Format
YY	Year	06 (example)
WW	Week	45 (example)
T	Module type	
NNNNN	Serial Number	

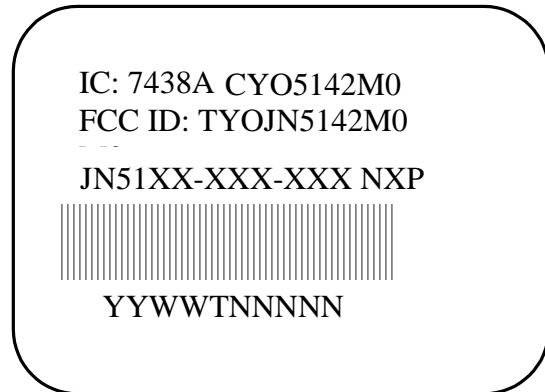
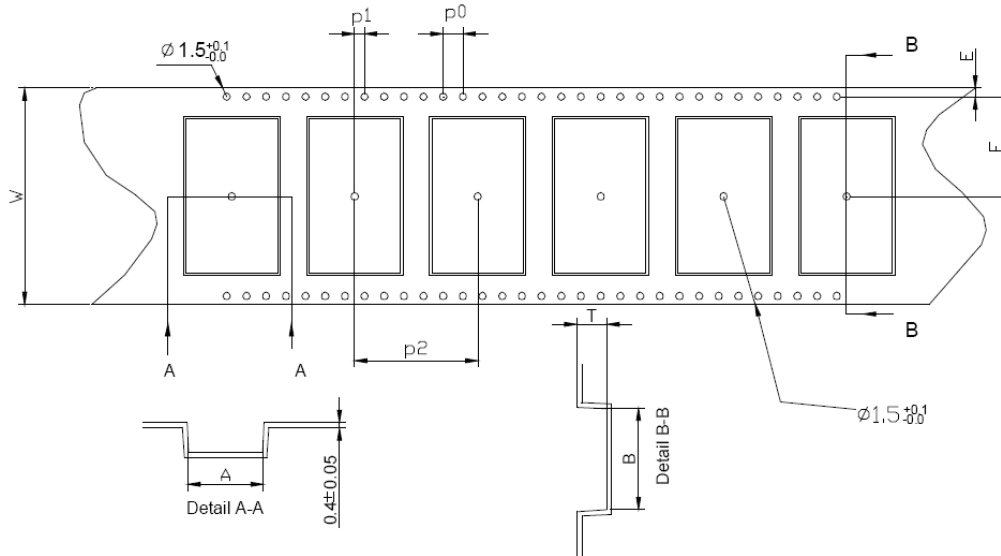


Figure 7: Example module labelling for FCC approved modules

A.5 Tape and Reel Information:

A.5.1 Tape Orientation and dimensions

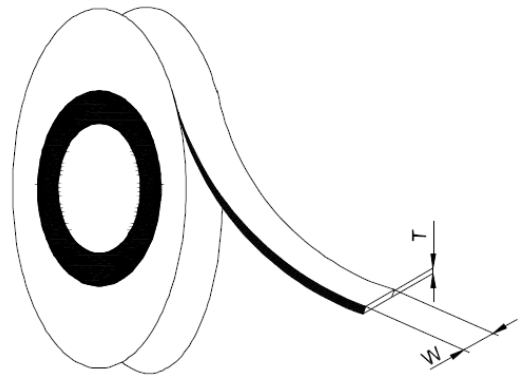
All dimensions are in mm



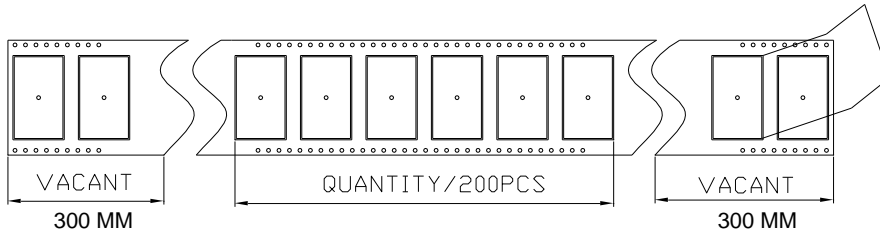
Module type:	A	B	W	F	E	P0	P1	P2	T	Cover Tape width (W)
JN5142-x01-M00	18.4	32.6	44	20.2	1.75	4.0	2.0	24.0	3.4	37.5
JN5142-x01-M03	18.4	30.4	44	20.2	1.75	4.0	2.0	24.0	3.4	37.5
Tolerance	±0.1	±0.1	±0.3	±0.1	+0.1	±0.1	±0.1	±0.1	±0.1	±0.1

A.5.2 Cover tape details

Thickness (T)	0.061mm
Surface resistivity (component side)	10^4 to 10^7 Ohms/sq
Surface resistivity (component side)	Non-conductive
Backing type:	Polyester
Adhesive type:	PSA
Sealing:	Room ambient

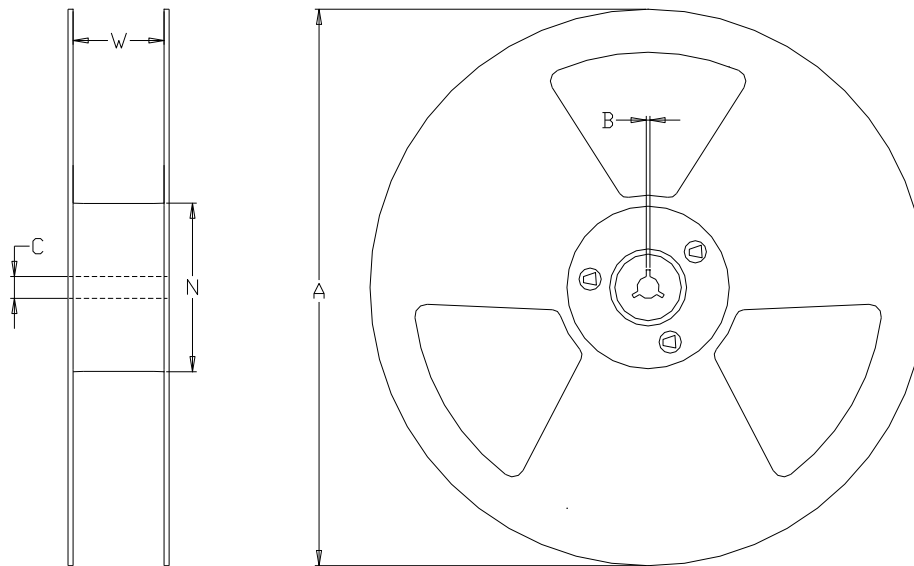


A.5.3 Leader and Trailer



A.5.4 Reel Dimensions:

All dimensions are in mm.



Module type:	A	B	C	N	W (min)
JN5142-x01-M00/03	330 ±1.0	2.2±0.5	13 ±0.2	100 +0.1	44.5 ±0.3

A.6 Related Documents

- [1] IEEE Std 802.15.4-2003 IEEE Standard for Information Technology – Part 15.4 Wireless Medium Access Control (MAC) and Physical Layer (PHY) Specifications for Low-Rate Wireless Personal Area Networks (LR-WPANs)
- [2] JN-DS-JN5142 Wireless Microcontroller Datasheet

A.7 Federal Communication 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 can radiate 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 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.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

WARNING!

FCC Radiation Exposure Statement:

This portable equipment with its antenna complies with FCC's RF radiation exposure limits set forth for an uncontrolled environment. To maintain compliance follow the instructions below;

1. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
2. Avoid direct contact to the antenna, or keep it to a minimum while using this equipment.

This transmitter module is authorized to be used in other devices only by OEM integrators under the following condition:

The transmitter module must not be co-located with any other antenna or transmitter.

As long as the above condition is met, further transmitter testing will not be required. However, the OEM integrator is still responsible for testing their end product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

A.7.1 Antennas approved by FCC for use with JN5142 modules

	Brand	Model Number	Description	Gain (dBi)	Connector type
1	Antenna Factor	ANT-2.4-CW-RCT-RP	Vertical - knuckle antenna	2.2	RP-SMA
2	Antennova	2010B6090-01	Vertical - knuckle antenna	2.2	RP-SMA
3	Hyperlink Technology	HG2402RD-RSF	Vertical - knuckle antenna	2.2	RP-SMA
4	Aveslink Technology, Inc	E-0005-AC	Vertical- flying lead	2	RP-SMA
5	Aveslink Technology, Inc	E-2411-GC	Vertical - swivel	2	RP-SMA
6	Aveslink Technology, Inc	E-2410-CA	Vertical - bulkhead- flying lead	2	uFL
7	Aveslink Technology, Inc	E-2410-GC	Vertical - swivel	2	RP-SMA
8	Aveslink Technology, Inc	E-2820-CA	Vertical - bulkhead- flying lead	2	uFL
9	Aveslink Technology, Inc	E-2820-GC	Vertical - swivel	2	RP-SMA
10	Aveslink Technology, Inc	E-0903-AX	Embedded - nickel silver strip	2	None
11	Aveslink Technology, Inc	E-0904-AX	Embedded - nickel silver strip	2	None
12	Embedded Antenna Design	FBKR35068-RS-KR	Vertical - knuckle antenna	2	RP-SMA
13	Nearson	S131CL-L-PX-2450S	Vertical - knuckle-flying lead	2	uFL
14	Laird Technologies	WRR2400-IP04	Vertical - knuckle-flying lead	1.5	uFL
15	Laird Technologies	WRR2400-RPSMA	Vertical - knuckle-flying lead	1.3	RP-SMA
16	Aveslink Technology, Inc	E-6170-DA	Vertical - right angle	1	uFL
17	Laird Technologies	WCR2400-SMRP	Vertical - knuckle antenna	1	RP-SMA

These antennae or versions with alternative connectors may be used to meet European regulations.

This device has been designed to operate with the antennas listed above, and having a maximum gain of 2.2 dBi. Antennas not included in this list or having a gain greater than 2.2 dBi are strictly prohibited for use with this device. The required antenna impedance is 50 ohms.

A.7.2 FCC End Product Labelling

The final 'end product' should be labelled in a visible area with the following:

"Contains TX FCC ID: TYOJN5142M0 or TYOJN5142M3" to reflect the version of the module being used inside the product.

A.8 Industry Canada Statement

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that permitted for successful communication.

These modules have been designed to operate with antennas having a maximum gain of 2.2 dBi. Antennas having a gain greater than 2.2 dBi are strictly prohibited for use with this device. The required antenna impedance is 50 ohms.

As long as the above condition is met, further transmitter testing will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc).

A.8.1 Industry Canada End Product Labelling

For Industry Canada purposes the following should be used.

"Contains Industry Canada ID IC: 7438A-CYO5142M0 or IC: 7438A-CYO5142M3" to reflect the version of the module being used inside the product.

A.9 European R & TTE Directive 1999/5/EC Statement

All modules listed in this datasheet are compliant with ETSI EN 300 328V1.7.1 (2006/05) and are subject to a Notified Body Opinion.

The modules are approved for use with the antennas listed in the following table.

	Brand	Model Number	Description	Gain (dBi)	Connector type
1	Antenna Factor	ANT-2.4-CW-RCT-RP	Vertical - knuckle antenna	2.2	RP-SMA
2	Antennova	2010B6090-01	Vertical - knuckle antenna	2.2	RP-SMA
3	Hyperlink Technology	HG2402RD-RSF	Vertical - knuckle antenna	2.2	RP-SMA
4	Aveslink Technology, Inc	E-0005-AC	Vertical- flying lead	2	RP-SMA
5	Aveslink Technology, Inc	E-2411-GC	Vertical - swivel	2	RP-SMA
6	Aveslink Technology, Inc	E-2410-CA	Vertical - bulkhead- flying lead	2	uFL
7	Aveslink Technology, Inc	E-2410-GC	Vertical - swivel	2	RP-SMA
8	Aveslink Technology, Inc	E-2820-CA	Vertical - bulkhead- flying lead	2	uFL
9	Aveslink Technology, Inc	E-2820-GC	Vertical - swivel	2	RP-SMA
10	Aveslink Technology, Inc	E-0903-AX	Embedded - nickel silver strip	2	None
11	Aveslink Technology, Inc	E-0904-AX	Embedded - nickel silver strip	2	None
12	Embedded Antenna Design	FBKR35068-RS-KR	Vertical - knuckle antenna	2	RP-SMA
13	Nearson	S131CL-L-PX-2450S	Vertical - knuckle-flying lead	2	uFL
14	Laird Technologies	WRR2400-IP04	Vertical - knuckle-flying lead	1.5	uFL
15	Laird Technologies	WRR2400-RPSMA	Vertical - knuckle-flying lead	1.3	RP-SMA
16	Aveslink Technology, Inc	E-6170-DA	Vertical - right angle	1	uFL
17	Laird Technologies	WCR2400-SMRP	Vertical - knuckle antenna	1	RP-SMA

A.10 RoHS Compliance

JN5142-x01-My devices meet the requirements of Directive 2002/95/EC of the European Parliament and of the Council on the Restriction of Hazardous Substance (RoHS).

The JN5142-x01-M00 and M03 modules meet the requirements of Chinese RoHS requirements SJ/T11363-2006.

Full data can be found at www.nxp.com/jennic.

A.11 Status Information

The status of this Data Sheet is **Preliminary**.

NXP products progress according to the following format:

Advanced

The Data Sheet shows the specification of a product in planning or in development.

The functionality and electrical performance specifications are target values and may be used as a guide to the final specification.

NXP reserves the right to make changes to the product specification at anytime without notice.

Preliminary

The Data Sheet shows the specification of a product that is commercially available, but is not yet fully qualified. The functionality of the product is final. The electrical performance specifications are target values and may be used as a guide to the final specification. Modules are identified with an Rx suffix, for example JN5142-x01-M00R2. NXP reserves the right to make changes to the product specification at anytime without notice.

Production

This is the production Data Sheet for the product.

All functional and electrical performance specifications, where included, including min and max values are derived from detailed product characterization.

This Data Sheet supersedes all previous document versions.

NXP reserves the right to make changes to the product specification at anytime.

A.12 Disclaimers

The contents of this document are subject to change without notice. NXP reserves the right to make changes, without notice, in the products, including circuits and/or software, described or contained therein. Information contained in this document regarding device applications and the like is intended through suggestion only and may be superseded by updates. It is your responsibility to ensure that your application meets with your specifications.

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Version Control

Version	Notes
1.0	1st Issue of Preliminary Datasheet

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