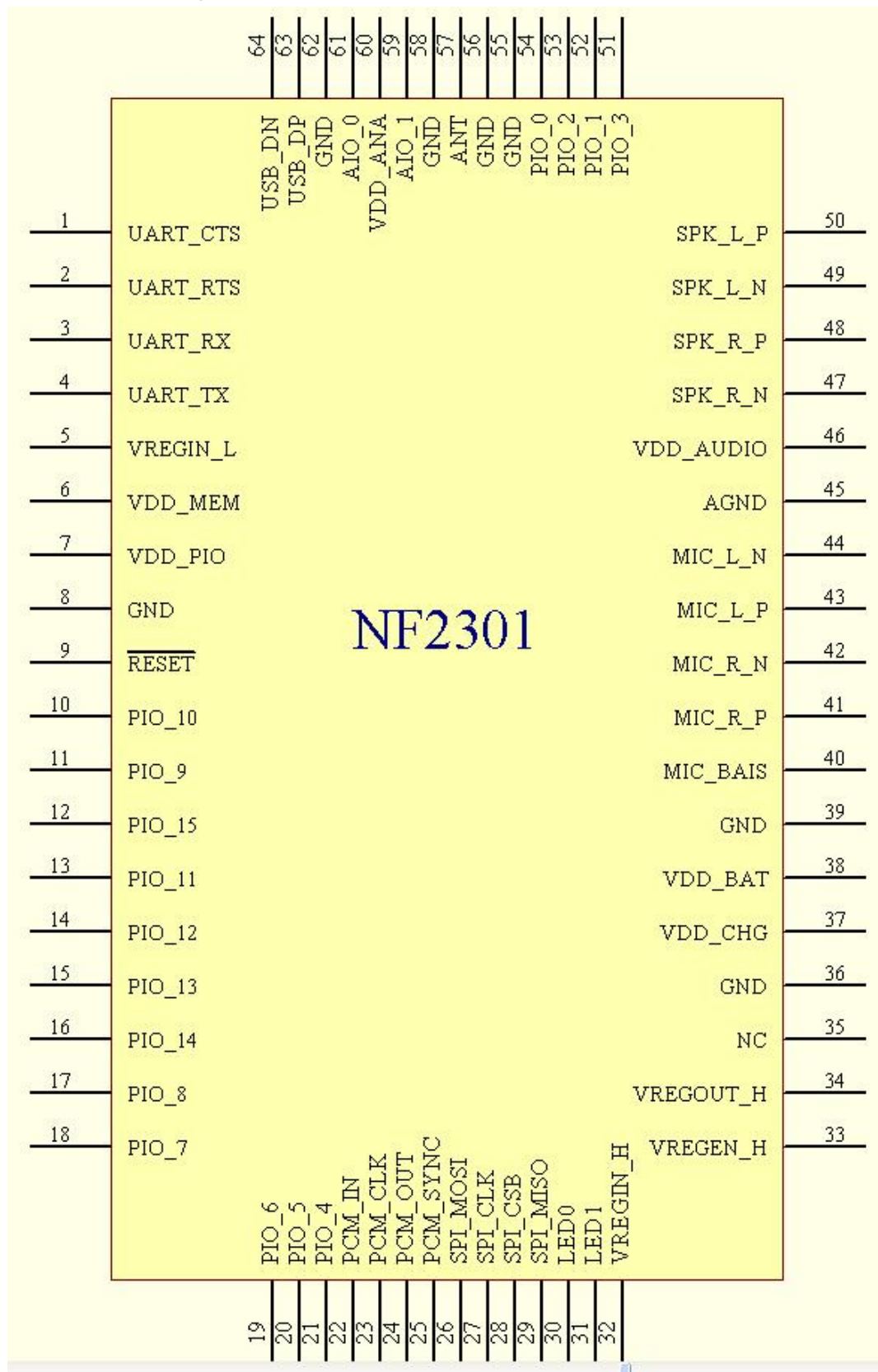# Bluetooth Module

NF2301
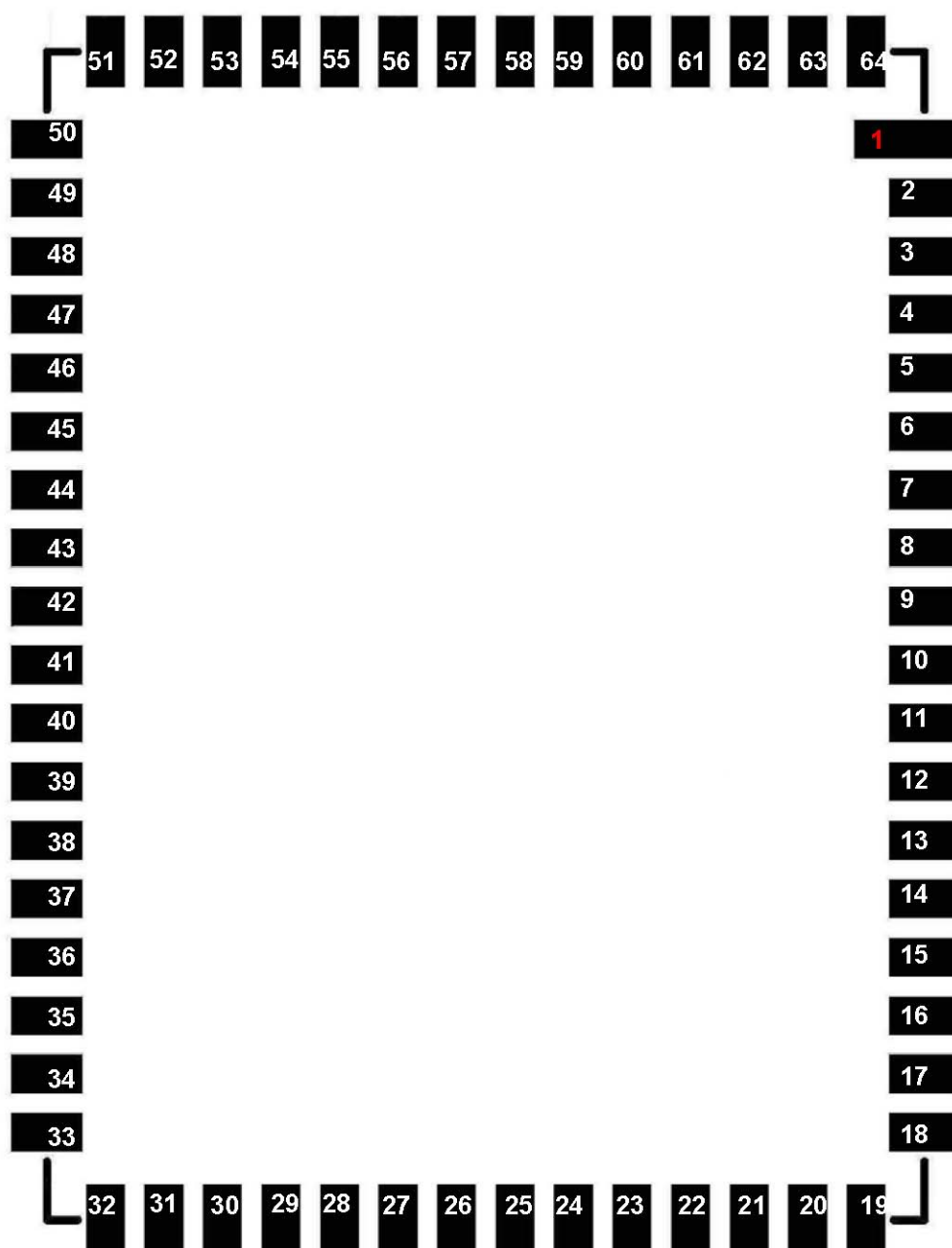# User Manual

Product Description

The NF2301 is a highly integrated Bluetooth 2.1+EDR stereo module, designed for high data rate, short-range wireless communication in the 2.4 GHz ISM band. With Bluetooth stack and profile, the NF2301 provides a low power and ultra-low cost Bluetooth 2.1+EDR solution for wireless voice/audio applications.

Features & Specification

_ Main Chip: CSR BlueCore5
_ Bluetooth 2.1+EDR compliant,
_ Build in Bluetooth Stack, Profiles and DSP Audio/Speech solution
_ Typical +2dBm Class 2 output power
_ Receiver Sensitivity: GFSK typical -90dBm
_ DSP Co-Processor 16-bit Internal Stereo CODEC - 95dB SNR for DAC
_ Supports up to 16 Mbits on module Flash Memory
_ USB and UART with Dual Port Bypass Mode up to 4Mbits/s
_ Enhanced Audibility, DSP post proccesion
_ Support for 802.11 Co-existence
_ Audio DAC: 92dB SNR
_ Microphone Input: -66dB THD
_ Build in Max. 100mAH Li-ion battery charger
_ HSP, HFP, A2DP, AVRCP profile support
_ Low-Power 1.5V Operation, 1.8V to 3.6V I/O
_ Integrated 1.5V and 1.8V Linear Regulators
_ ROM version: 32Kb EEPROM
_ 64 pins for SMT module
_ External PCB Antenna
_ Frequency Range : 2402-2480MHz
_ Max. Output Power : 3.19dBm
_ Number of Channel : 79

Device Pinout Diagram

NF2301

Pin	Left side		Pin	Right side
1	UART_CTS		50	SPK_L_P
2	UART_RTS		49	SPK_L_N
3	UART_RX		48	SPK_R_P
4	UART_TX		47	SPK_R_N
5	VREGIN_L		46	VDD_AUDIO
6	VDD_MEM		45	AGND
7	VDD_PIO		44	MIC_L_N
8	GND		43	MIC_L_P
9	RESET		42	MIC_R_N
10	PIO_10		41	MIC_R_P
11	PIO_9		40	MIC_BAIS
12	PIO_15		39	GND
13	PIO_11		38	VDD_BAT
14	PIO_12		37	VDD_CHG
15	PIO_13		36	GND
16	PIO_14		35	NC
17	PIO_8		34	VREGOUT_H
18	PIO_7		33	VREGEN_H

Top pins (64–51): USB_DN, USB_DP, GND, AIO_0, VDD_ANA, AIO_1, GND, ANT, GND, GND, PIO_0, PIO_2, PIO_1, PIO_3

Bottom pins (19–32): PIO_6, PIO_5, PIO_4, PCM_IN, PCM_CLK, PCM_OUT, PCM_SYNC, SPI_MOSI, SPI_CLK, SPI_CSB, SPI_MISO, LED0, LED1, VREGIN_H

| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 |

50		1
49		2
48		3
47		4
46		5
45		6
44		7
43		8
42		9
41		10
40		11
39		12
38		13
37		14
36		15
35		16
34		17
33		18

| 32 | 31 | 30 | 29 | 28 | 27 | 26 | 25 | 24 | 23 | 22 | 21 | 20 | 19 |

Pin Definition

Pin #	Pin Name	Pad Type	Description
1	UART_CTS	CMOS input with weak internal pull-down	UART clear to send active low
2	UART_RTS	Bi-directional CMOS output, tri-state, with weak internal pull-up	UART request to send active low
3	UART_RX	CMOS input with weak internal pull-down	UART data input
4	UART_TX	Bi-directional CMOS output, tri-state, with weak internal pull-up	UART data output
5	VDD_MEM	VDD Regulator input	Input to internal low-voltage linear regulator for non-audio core circuitry (1.8V~2.7V)
6	VREGIN_L		Positive supply for Flash pads (2.7V~3.6V)
7	VDD_PIO	VDD	Positive supply for PIO,AUX DAC and SPI/PCM ports (3.1V~3.6V)(1)
8	GND	Ground	Digital Ground
9	RESET#	CMOS input with weak internal pull-up	Reset if low. Input debounced so must be low for >5ms to cause a reset
10	PIO[10]	Bi-directional with programmable strength internal pull-up/down	Programmable input/output line
11	PIO[9]	Bi-directional with programmable strength internal pull-up/down	Programmable input/output line
12	PIO[15]	Bi-directional with programmable strength internal pull-up/down	Programmable input/output line
13	PIO[11]	Bi-directional with programmable strength internal pull-up/down	Programmable input/output line
14	PIO[12]	Bi-directional with programmable strength internal pull-up/down	Programmable input/output line
15	PIO[13]	Bi-directional with programmable strength internal pull-up/down	Programmable input/output line
16	PIO[14]	Bi-directional with programmable strength internal pull-up/down	Programmable input/output line
17	PIO[8]	Bi-directional with programmable strength internal pull-up/down	Programmable input/output line
18	PIO[7]	Bi-directional with programmable strength internal pull-up/down	Programmable input/output line
19	PIO[6]	Bi-directional with programmable strength internal pull-up/down	Programmable input/output line

20	PIO[5]	Bi-directional with programmable strength internal pull-up/down	Programmable input/output line
21	PIO[4]	Bi-directional with programmable strength internal pull-up/down	Programmable input/output line
22	PCM_IN	CMOS input, with weak internal pull-down	Synchronous data input
23	PCM_CLK	Bi-directional with weak internal pull-down	Synchronous data clock
24	PCM_OUT	CMOS output, tri-state, with weak internal pull-down	Synchronous data output
25	PCM_SYNC	Bi-directional with weak internal pull-down	Synchronous data sync
26	SPI_MOSI	CMOS input, with weak internal pull-down	SPI data input
27	SPI_CLK	Input with weak internal pull-down	SPI clock
28	SPI_CSB	Input with weak internal pull-up	Chip select for Serial Peripheral Interface (SPI),active low
29	SPI_MISO	CMOS output, tri-state, with weak internal pull-down	SPI data output
30	LED[0]	Open drain output	LED driver
31	LED[1]	Open drain output	LED driver
32	VREGIN_H	Regulator input	Input to internal high-voltage linear regulator (2.5V~4.9V)
33	VREGEN_H	Analogue	Take high to enable high-voltage linear regulator and switch-mode regulator
34	VREGOUT_H	Supply	High-voltage linear regulator output (1.8V out)
35	N.C.	N.C.	Leave unconnected
36	GND	Ground	Digital Ground
37	VDD_CHG	Charger input	Lithium ion/polymer battery charger input (4.5V~6.5V)
38	VDD_BAT	Battery terminal +ve	Lithium ion/polymer battery positive terminal. Battery charger output and input to switch-mode regulator (4.2V out)
39	GND	Ground	Digital Ground
40	MIC_BIAS	Analogue	Microphone bias
41	MIC_R_P	Analogue	Microphone input positive, right
42	MIC_R_N	Analogue	Microphone input negative, right
43	MIC_L_P	Analogue	Microphone input positive, left
44	MIC_L_N	Analogue	Microphone input negative, left
45	AGND	Ground	Analogue Ground

46	VDD_AUDIO	VDD/Low-voltage regulator output	Positive supply output for audio circuitry and 1.5V regulated output (from internal low-voltage regulator)
47	SPK_R_N	Analogue	Speaker output negative, right
48	SPK_R_P	Analogue	Speaker output positive, right
49	SPK_L_N	Analogue	Speaker output negative, left
50	SPK_L_P	Analogue	Speaker output positive, left
51	PIO[3]	Bi-directional with programmable strength internal pull-up/down	Programmable input/output line
52	PIO[1]	Bi-directional with programmable strength internal pull-up/down	Programmable input/output line (external TXEN)
53	PIO[2]	Bi-directional with programmable strength internal pull-up/down	Programmable input/output line
54	PIO[0]	Bi-directional with programmable strength internal pull-up/down	Programmable input/output line (external RXEN)
55	GND	Ground	Digital Ground
56	GND	Ground	Digital Ground
57	ANT	RF	RF In/Out
58	GND	Ground	Digital Ground
59	AIO[1]	Bi-directional	Analogue programmable input/ output line
60	VDD_ANA	VDD/Low-voltage regulator output	Positive supply output for analogue circuitry and 1.5V regulated output (from internal low-voltage regulator)
61	AIO[0]	Bi-directional	Analogue programmable input/ output line
62	GND	Ground	Digital Ground
63	USB_DP	Bi-directional	USB data plus with selectable internal 1.5kΩ pull-up resistor
64	USB_DN	Bi-directional	USB data minus

(1)When UART port is not used, VDD_ PIO may be supported 1.7~3.6 voltage.

FCC 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 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.

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. This device complies with Part 15 of the FCC Rules. Operation is subjectto 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.

Radiation Exposure Statement:

This equipment complies with FCC/IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

IC Statement: (English & Francian)

IC Regulations:This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:

(1) this device may not cause interference, and

(2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présentappareilestconformeaux CNR d'IndustrieCanada applicablesaux appareilsradio exempts de licence. L'exploitationestautoriséeaux deuxconditions suivantes:

(1) l'appareilne doitpas produirede brouillage, et

(2) l'utilisateurde l'appareildoitaccepter tout brouillageradioélectriquesubi, mêmesile brouillageestsusceptible d'encompromettrele fonctionnement.

The device meets the exemption from the routine evaluation limits in section 2.5 of RSS 102 and compliance with RSS-102 RF exposure, users can obtain Canadian information on RF exposure and compliance.

Le dispositif rencontre l'exemption des limites courantes d'évaluation dans la section 2.5 de RSS 102 et la conformité à l'exposition de RSS-102 rf, utilisateurs peut obtenir l'information canadienne sur l'exposition et la conformité de rf.

IMPORTANT NOTE:

IC Radiation Exposure Statement

This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

l'appareil et son antenne ne doivent pas être co-localisées ou opérant en conjonction avec une autre antenne ou transmetteur.

NCC警語：

經型式認證合格之低功率射頻電機，非經許可，公司、商號使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。

前項合法通信，指依電信法規定作業之無線電通信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

本模組於取得認證後將依規定於模組本體標示審驗合格標籤，並要求平台廠商於平台上標示『本產品內含射頻模組 (((CCAx11LPxxxxTx 』