



## Development Kit User Guide

# Wireless CPU<sup>®</sup> Q24 Series Development Kit

Reference: **WM\_PGM\_Q24NG\_PTS\_005**

Revision: **003**

Date: **July 21, 2008**

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# Wireless CPU<sup>®</sup> Q24 Series

## Development Kit Description

Reference: WM\_PGM\_Q24NG\_PTS\_005  
Revision: 003  
Date: July 21, 2008



Supports Open AT<sup>®</sup> embedded ANSI C applications







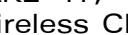

## Document History

Revision	Date	List of revisions	
001	June 2006	Creation (Preliminary version)	
002	April 2007	Modification of document format & wording	
003	July 2008	Update all the document with the new WM02171-011-10 Development Kit Motherboard	

## Cautions

This platform contains a modular transmitter. This device is used for wireless applications. Note that all electronics parts and elements are ESD sensitive.

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## Web Site Support

General information about Wavecom and its range of products	<a href="http://www.wavecom.com">www.wavecom.com</a>
Specific support is available for the Q24 Classic, Plus, Extended and Auto Wireless CPU <sup>®</sup>	<a href="http://www.wavecom.com/Q24Classic">www.wavecom.com/Q24Classic,</a>
	<a href="http://www.wavecom.com/Q24Plus">www.wavecom.com/Q24Plus,</a>
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Developer support for software and hardware	<a href="http://www.wavecom.com/forum">www.wavecom.com/forum</a>

## Overview

This document describes of the Wireless CPU<sup>®</sup> Q24 Series Development Kit based on the new motherboard (Ref. WM02171-011-10).

This Development Kit is equipment, which can be used to start Open AT<sup>®</sup> software and hardware development based on Wireless CPU<sup>®</sup> Q24 Series.

This Development Kit can be used with the following Wireless CPU<sup>®</sup> units.

- **Q24 Classic:** EGSM 900/1800/850/1900 MHz version with 32 Mb of Flash memory and 16 Mb of PSRAM (32/16), T° range [-20°C / +55°C].
- **Q24 Plus:** EGSM/GPRS 900/1800/850/1900 MHz version with 32 Mb of Flash memory and 16 Mb of PSRAM (32/16) T° range [-20°C / +55°C].
- **Q24 Extended:** EGSM/GPRS 900/1800/850/1900 MHz version with 32 Mb of Flash memory and 4 Mb of SRAM (32/4) T° range [-40°C / +85°C].
- **Q24 Automotive:** EGSM/GPRS 900/1800/850/1900 MHz version with 32 Mb of Flash memory and 4 Mb of SRAM (32/4) T° range [-40°C / +85°C].



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## 1 References

For more details, several reference documents can be consulted.

- [1] Motherboard Development Kit Schematics and PCB, Release 1.0  
(Ref. WM02171-011-10)
- [2] Wireless CPU® Q24 Series Product Technical Specification  
(Ref. WM\_PRJ\_Q24NG\_PTS\_001)
- [3] Wireless CPU® Q24 Series Customer Design Guidelines  
(Ref. WM\_PRJ\_Q24NG\_PTS\_002)
- [4] Wireless CPU® Q24 Series Customer Process Guidelines  
(Ref. WM\_PRJ\_Q24NG\_PTS\_003)

Wavecom recommends that the developer should check the web site for the latest documentation.

### 1.1 Abbreviations

Abbreviation	Definition
AC	Alternating Current
ADC	Analog to Digital Converter
A/D	Analog to Digital conversion
AF	Audio-Frequency
AT	ATtention (prefix for modem commands)
AUX	AUXiliary
CAN	Controller Area Network
CB	Cell Broadcast
CEP	Circular Error Probable
CLK	CLock
CMOS	Complementary Metal Oxide Semiconductor
CS	Coding Scheme
CTS	Clear To Send
DAC	Digital to Analogue Converter
dB	Decibel
DC	Direct Current
DCD	Data Carrier Detect
DCE	Data Communication Equipment
DCS	Digital Cellular System

<b>Abbreviation</b>	<b>Definition</b>
<b>DR</b>	<b>D</b> ynamic <b>R</b> ange
<b>DSR</b>	<b>D</b> ata <b>S</b> et <b>R</b> eady
<b>DTE</b>	<b>D</b> ata <b>T</b> erminal <b>E</b> quipment
<b>DTR</b>	<b>D</b> ata <b>T</b> erminal <b>R</b> eady
<b>EFR</b>	<b>E</b> nhanced <b>F</b> ull <b>R</b> ate
<b>EGSM</b>	<b>E</b> xtended <b>G</b> SM
<b>EMC</b>	<b>E</b> lectro <b>M</b> agnetic <b>C</b> ompatib <b>I</b> lity
<b>EMI</b>	<b>E</b> lectro <b>M</b> agnetic <b>I</b> nterference
<b>EMS</b>	<b>E</b> nhanced <b>M</b> essage <b>S</b> ervice
<b>EN</b>	<b>E</b> Nable
<b>ESD</b>	<b>E</b> lectro <b>S</b> tatic <b>D</b> ischarges
<b>FIFO</b>	<b>F</b> irst <b>I</b> n <b>F</b> irst <b>O</b> ut
<b>FR</b>	<b>F</b> ull <b>R</b> ate
<b>FTA</b>	<b>F</b> ull <b>T</b> ype <b>A</b> pproval
<b>GND</b>	<b>G</b> rou <b>N</b> D
<b>GPI</b>	<b>G</b> eneral <b>P</b> urpose <b>I</b> nput
<b>GPC</b>	<b>G</b> eneral <b>P</b> urpose <b>C</b> onnecto <b>R</b>
<b>GPIO</b>	<b>G</b> eneral <b>P</b> urpose <b>I</b> nput <b>O</b> utput
<b>GPO</b>	<b>G</b> eneral <b>P</b> urpose <b>O</b> utput
<b>GPRS</b>	<b>G</b> eneral <b>P</b> acket <b>R</b> adio <b>S</b> ervice
<b>GPS</b>	<b>G</b> lobal <b>P</b> ositioning <b>S</b> ystem
<b>GSM</b>	<b>G</b> lobal <b>S</b> ystem for <b>M</b> obile communications
<b>HR</b>	<b>H</b> alf <b>R</b> ate
<b>I/O</b>	<b>I</b> nput / <b>O</b> utput
<b>LED</b>	<b>L</b> ight <b>E</b> mitting <b>D</b> iode
<b>LNA</b>	<b>L</b> ow <b>N</b> oise <b>A</b> mplifier
<b>MAX</b>	<b>M</b> A <b>X</b> imum
<b>MIC</b>	<b>M</b> I <b>C</b> rophone
<b>MIN</b>	<b>M</b> I <b>N</b> imum
<b>MMS</b>	<b>M</b> ultimedia <b>M</b> essage <b>S</b> ervice
<b>MO</b>	<b>M</b> obile <b>O</b> riginated
<b>MT</b>	<b>M</b> obile <b>T</b> erminated
<b>na</b>	<b>N</b> ot <b>A</b> pplicable
<b>NF</b>	<b>N</b> oise <b>F</b> actor
<b>NMEA</b>	<b>N</b> ational <b>M</b> arine <b>E</b> lectronics <b>A</b> ssociation
<b>NOM</b>	<b>N</b> O <b>M</b> inal

<b>Abbreviation</b>	<b>Definition</b>
NTC	Négative Temperature Coefficient
PA	Power Amplifier
Pa	Pascal (for speaker sound pressure measurements)
PBCCH	Packet Broadcast Control CHannel
PC	Personal Computer
PCB	Printed Circuit Board
PDA	Personal Digital Assistant
PFM	Power Frequency Modulation
PSM	Phase Shift Modulation
PWM	Pulse Width Modulation
RAM	Random Access Memory
RF	Radio Frequency
RFI	Radio Frequency Interference
RHCP	Right Hand Circular Polarization
RI	Ring Indicator
RST	ReSeT
RTC	Real Time Clock
RTCM	Radio Technical Commission for Maritime services
RTS	Request To Send
RX	Receive
SCL	Serial CLock
SDA	Serial DAta
SIM	Subscriber Identification Wireless CPU®
SMS	Short Message Service
SPI	Serial Peripheral Interface
SPL	Sound Pressure Level
SPK	SPeaKer
SRAM	Static RAM
TBC	To Be Confirmed
TDMA	Time Division Multiple Access
TP	Test Point
TVS	Transient Voltage Suppressor
TX	Transmit
TYP	TYPical
UART	Universal Asynchronous Receiver-Transmitter
USB	Universal Serial Bus

<b>Abbreviation</b>	<b>Definition</b>
<b>USSD</b>	<b>U</b> nstructured <b>S</b> upplementary <b>S</b> ervices <b>D</b> ata
<b>VSWR</b>	<b>V</b> oltage <b>S</b> tanding <b>W</b> ave <b>R</b> atio

## 2 Equipment Description

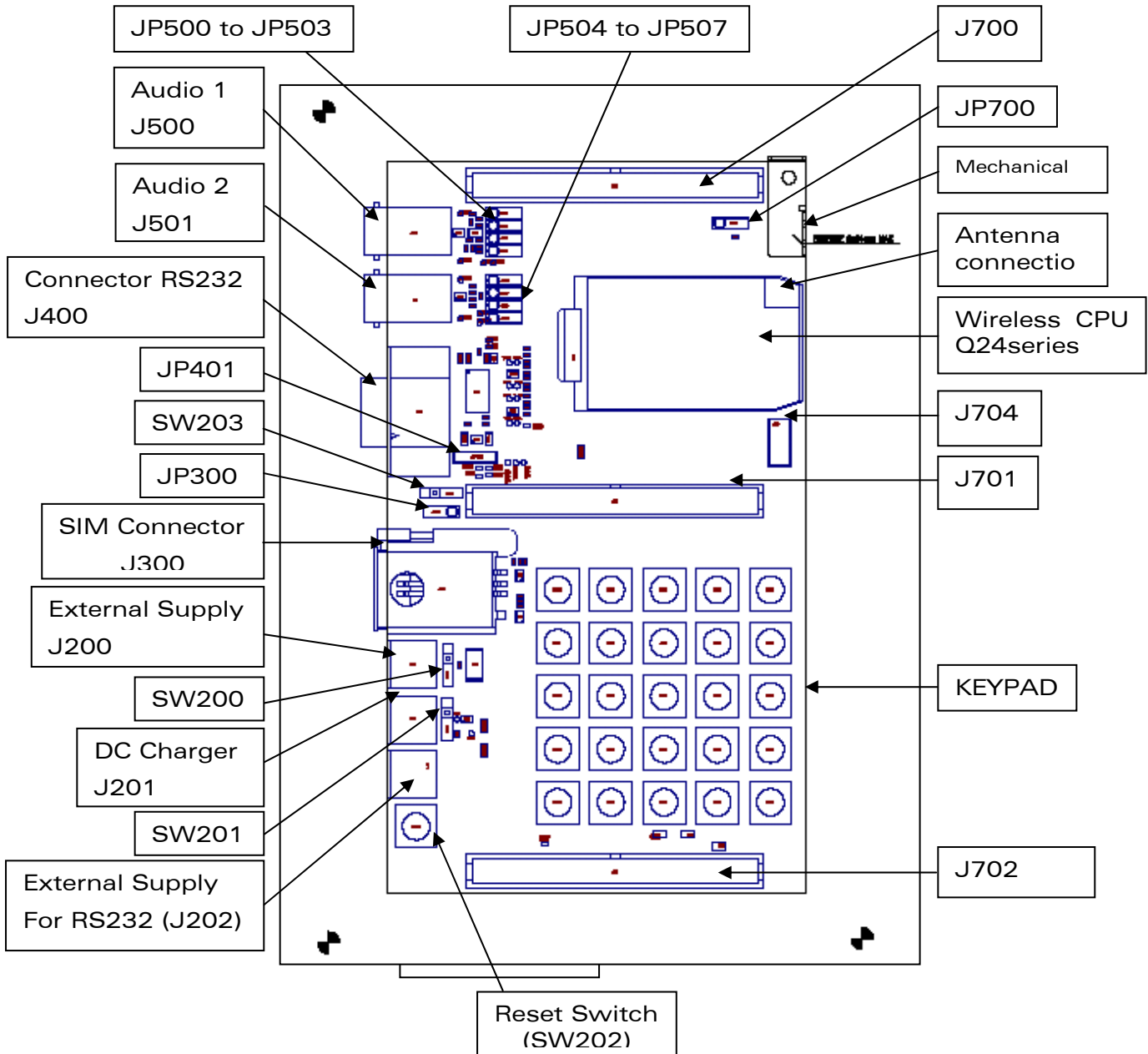


Figure 1: Wireless CPU® Q24 Series and Development Kit

### 3 Connector Description

The connector description shown below defines the signal names of the Wireless CPU® Q24 Series.

#### 3.1 Electrical Information for Digital I/O

All digital I/O comply with a 3 volt CMOS.

##### Operating conditions

Parameter	I/O type	Min	Max	Condition
V <sub>IL</sub>	CMOS	-0.5 V	0.8 V	
V <sub>IH</sub>	CMOS	2.1 V	3.0 V	
V <sub>OL</sub>	1X		0.2 V	I <sub>OL</sub> = -1 mA
	2X		0.2 V	I <sub>OL</sub> = -2 mA
	3X		0.2 V	I <sub>OL</sub> = -3 mA
V <sub>OH</sub>	1X	2.6 V		I <sub>OH</sub> = 1 mA
	2X	2.6 V		I <sub>OH</sub> = 2 mA
	3X	2.6 V		I <sub>OH</sub> = 3 mA

#### 3.2 J700 Connector

J700 is a HE10 50-pin male connector.

Pin number	Signal name	I/O	I/O type	Description	Comment
1, 2, 3	+VBATT	O		Battery voltage	High current.
4	+VDD	O			
5, 6, 7, 8	GND			Ground	.
9	BUZ	O	Open Collector	Buzzer output	80 mA peak max
10	BAT_TEMP	I	Analog	ADC input for battery temperature measurement	Tied to GND if not used
11	GND			Ground	
12	AUXV0	I	Analog	Auxiliary ADC input 0	Tied to GND if not used

## Wireless CPU® Q24 Series

### Connector Description

Pin number	Signal name	I/O	I/O type	Description	Comment
13,14	GND			Ground	
15	SPK1P	O	Analog	Speaker 1 positive output	
16	SPK1N	O	Analog	Speaker 1 negative output	
17	SPK2N	O	Analog	Speaker 2 negative output	
18	SPK2P	O	Analog	Speaker 2 positive output	
19	MIC1P	I	Analog	Microphone 1 positive input	
20	MIC1N	I	Analog	Microphone 1 negative input	
21	MIC2N	I	Analog	Microphone 2 negative input	
22	MIC2P	I	Analog	Microphone 2 positive input	
23, 24, 25	GND			Ground	
26	VCC_RTC	I/O		RTC back-up supply	Iout = 2 mA max
27, 28	GND			Ground	
29	CT108_2/DTR1	I	CMOS	UART1 serial interface Data Terminal Ready	Pull-up to VCC with 100 kΩ when not used
30	CT107/DSR1	O	1X	UART1 serial interface Data Set Ready	
31	CT105/RTS1	I	CMOS	UART1 serial interface Request To Send	Pull-up to VCC with 100 kΩ when not used
32	CT103/TXD1	I	CMOS	UART1 serial interface Transmit	Pull-up to VCC with 100 kΩ when not used
33	CT104/RXD1	O	1X	UART1 serial interface Receive	
34	CT106/CTS1	O	1X	UART1 serial interface Clear To Send	



## Wireless CPU® Q24 Series

### Connector Description

Pin number	Signal name	I/O	I/O type	Description	Comment
35,36	GND			Ground	
37	~INTR	I	CMOS	External interrupt	Active low. 100 kΩ Pull-up inside
38	GPI or CT103/TXD2	I	CMOS	General Purpose Input or UART2 serial interface transmit	100 kΩ Pull-down inside
39	GPIO3 or CT109/DCD1	I/O	CMOS/2X	General Purpose I/O or UART1 serial interface Data Carrier Detect	
40	BOOT	I	CMOS	BOOT	Pull-down through 1 kΩ for Flash downloading
41	GPIO2 or CT125 / RI1	I/O	CMOS/2X	General Purpose I/O or UART1 serial interface Ring Indicator	
42	GPIO5 or CT105/RTS2	I/O	CMOS/2X	General Purpose I/O or UART2 serial interface Request To Send	
43	GPIO4	I/O	CMOS/2X	General Purpose I/O	
44	GPO1	O	2X	General Purpose O	
45	GPO2 or CT104/RXD2	O	2X	General Purpose O or UART2 serial interface Receive	
46	GPIO1	I/O	CMOS/2X	General Purpose I/O	FLASH_LED in AT software

## Wireless CPU® Q24 Series

### Connector Description

Pin number	Signal name	I/O	I/O type	Description	Comment
47	GPIO0 or CT106/CTS2	I/O	CMOS/2X	General Purpose I/O or UART2 serial interface Clear To Send	
48	GPO0 or SPI_AUX	O	3X	General Purpose Output	Also referenced as SPI_AUX in SPI Interface or 3V/5V in SIM interface
49	SIM_PRES	I	CMOS	SIM Card Detect	Tied to VCC if not used
50	GND			Ground	

### 3.3 J701 Connector

J701 is a HE10 50-pin male connector.

Pin number	Signal name	I/O	I/O type	Description	Comment
1	ON/~OFF	I	CMOS	Power ON/OFF control	
2	GND			Ground	
3, 4	VCC	O		2.8 V digital supply output	10 mA max.
5, 6	GND			Ground	
7	NC_WR			Do not use (left floating)	
8, 9, 10	GND			Ground	
11	NC_D7			Do not use (left floating)	
12	NC_D6			Do not use (left floating)	
13	NC_D5			Do not use (left floating)	
14	NC_D4			Do not use (left floating)	
15	NC_D3			Do not use (left floating)	
16	NC_D2			Do not use (left floating)	
17	NC_D1			Do not use (left floating)	
18	NC_D0			Do not use (left floating)	
19, 20	GND			Ground	
21	NC_RD			Do not use (left floating)	
22	NC_A2			Do not use (left floating)	
23, 24	GND			Ground	
25, 26	CHG_IN	I	Supply	Supply for battery charging	High current (0.8 A max)
27, 28	GND			Ground	
29	~RST	I/O	SCHMITT	Reset	Active low

## Wireless CPU® Q24 Series

### Connector Description

Pin number	Signal name	I/O	I/O type	Description	Comment
30, 31, 32	GND			Ground	
33	COL2	I/O	CMOS/1X	Keyboard Column	
34	COL1	I/O	CMOS/1X	Keyboard Column	
35	COL0	I/O	CMOS/1X	Keyboard Column	
36	COL4	I/O	CMOS/1X	Keyboard Column	
37	COL3	I/O	CMOS/1X	Keyboard Column	
38	ROW0	I/O	CMOS/1X	Keyboard Row	
39	ROW1	I/O	CMOS/1X	Keyboard Row	
40	ROW3	I/O	CMOS/1X	Keyboard Row	
41	ROW4	I/O	CMOS/1X	Keyboard Row	
42	ROW2	I/O	CMOS/1X	Keyboard Row	
43, 44	GND			Ground	
45	SDA/SPI_IO	I/O	CMOS/1X	GPSI Data or SPI Data	
46	SCL/SPI_CLK	O	1X	GPSI clock or SPI clock	
47	SPI_EN or GPO3	O	1X	SPI Enable or General Purpose O	
48	SHD_MAX	I		Shut down of RS232 transceiver	Active low
49, 50	GND			Ground	

### 3.4 J702 Connector

J702 is a HE10 50-pin male connector.

Pin number	Signal name	I/O	I/O type	Description
1 to 50	GND			Ground

### 3.5 J300 Connector (SIM)

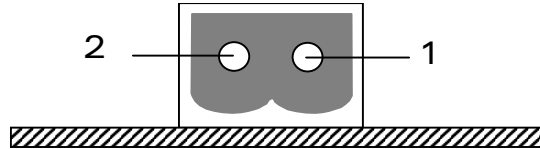
J300 is a standard 3V SIM socket. The table below defines the signal description of this connector.

Pin number	Signal name	I/O	I/O type	Description
1	SIM_VCC	I	2.8 V digital supply	SIM card Power Supply
2	SIM_RST	I	CMOS	SIM card Reset
3	SIM_CLK	I	CMOS	SIM card Clock
4	SIM_PRES	O	2.8 V digital supply (VCC)	SIM Card presence
5	GND			Ground
6	VPP	I	Not connected	
7	SIM_DATA	I/O	CMOS	SIM card Data
8	CC8	I	2.8 V digital supply (VCC)	SIM_PRES power supply

### 3.6 J704 Connector

JP704 is a connector for JTAG debugging (reserved).

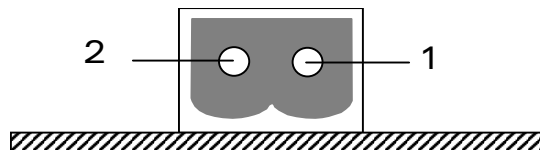
### 3.7 J200 Connector (Main Supply)



J200 is the external supply connector. It is a 2-pin male connector. The table below defines its signals.

Pin number	Signal name	I/O	I/O type	Description
1	VBATT	I		Main Power
2	GND	I		Ground

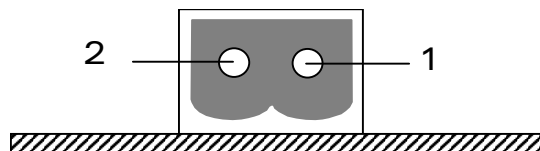
### 3.8 J201 Connector (Battery Charger)



J201 is used to simulate a charger. It is a 2-pin male connector. The table below defines its signals.

Pin number	Signal name	I/O	I/O type	Description
1	CHG_IN	I		External Charger
2	GND	I		Ground

### 3.9 J202 Connector (Auxiliary Supply)

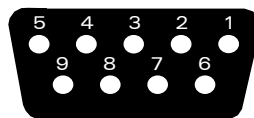


J202 is used to simulate a charger. It is a 2-pin male connector. The table below defines its signals.

**Wireless CPU® Q24 Series**  
Connector Description

Pin number	Signal name	I/O	I/O type	Description
1	ALIM_EXT	I		External Power
2	GND	I		Ground

**3.10 J400 Connector (RS232)**



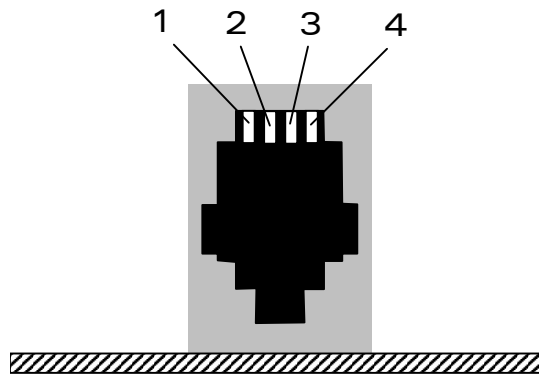
- J400 is a SUB-D 9-pin female connector. The table below defines the signal description of this connector (serial link UART1).

Pin number	Signal name	I/O	I/O type	Description
1	CT109 DCD	O	RS232 (V24/V28)	Data Carrier Detect
2	CT104 RXD	O	RS232 (V24/V28)	Receive serial data
3	CT103 TXD	I	RS232 (V24/V28)	Transmit serial data
4	CT108-2 DTR	I	RS232 (V24/V28)	Data Terminal Ready
5	GND			Ground
6	CT107 DSR	O	RS232 (V24/V28)	Data Set Ready
7	CT105 RTS	I	RS232 (V24/V28)	Request To Send
8	CT106 CTS	O	RS232 (V24/V28)	Clear To Send
9	CT125 RI	O	RS232 (V24/V28)	Ring Indicator

**Note:** The Wireless CPU® Q24 Series Development Kit is a DCE. It can be connected with a DTE (PC or terminal) and a “straight cable”.



### 3.11 J500 Connector (Audio 1)

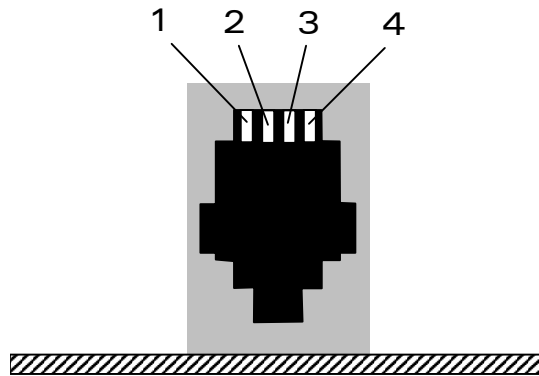


J500 is a RJ9 4-pin connector.

The table below defines the signal description of this connector.

Pin number	Signal name	I/O	I/O type	Description
1	MIC1N	I	Analog	Microphone 1 negative input
2	SPK1P	O	Analog	Speaker 1 positive output
3	SPK1N	O	Analog	Speaker 1 negative output
4	MIC1P	I	Analog	Microphone 1 positive input

### 3.12 J501 Connector (Audio 2)



J501 is a RJ9 4-pin connector.

The table below defines the signal description of this connector.

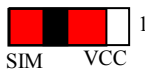
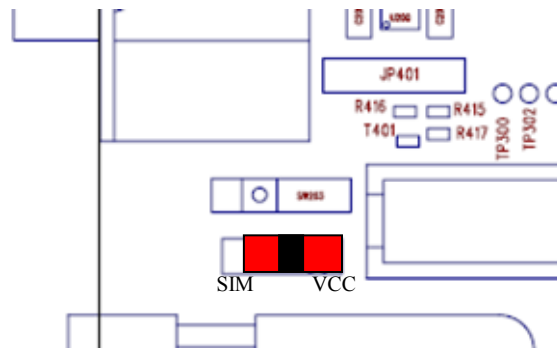
Pin number	Signal name	I/O	I/O type	Description
1	MIC2N	I	Analog	Microphone 2 negative input
2	SPK2P	O	Analog	Speaker 2 positive output
3	SPK2N	O	Analog	Speaker 2 negative output
4	MIC2P	I	Analog	Microphone 2 positive input

## 4 Jumpers & Switches Description

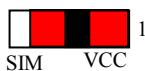
The jumpers & switches description below uses the signal names of the Wireless CPU® Q24 Series.

### 4.1 JP300 Jumper (SIM\_PRES: SIM Function)

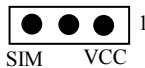
The JP300 jumper is used whether or not the SIM\_PRES (SIM presence) is used by the Application.



SIM\_PRES used: If the SIM\_PRES signal is used on the SIM, then the jumper **JP300** must be connected as shown on the left picture (between pins 2 and 3).



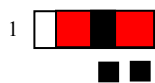
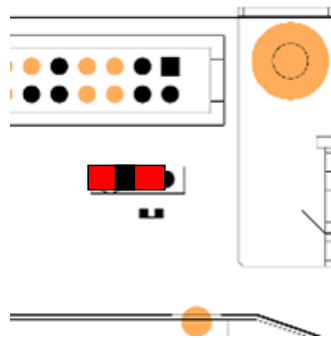
SIM\_PRES not used: the SIM\_PRES signal is not used, the jumper **JP300** can be left open or connected between pins 1 and 2.



## Wireless CPU® Q24 Series Jumpers & Switches Description

### 4.2 JP700 Jumper (Supply)

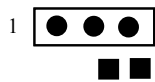
JP700 jumper is used to control the power supply of the Wireless CPU® Q24 series.



Wireless CPU® powered: if the Jumper is on pins 2 & 3, the Wireless CPU® is powered by the power signal present on connector J200.



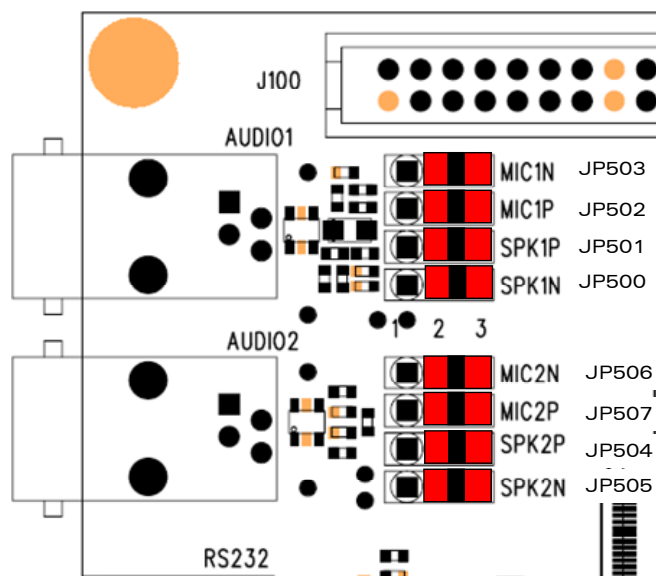
Wireless CPU® not-powered: if the Jumper is on pins 1 & 2 or not used: the Wireless CPU® is not powered.



**Wireless CPU® Q24 Series**  
Jumpers & Switches Description

**4.3 JP500, JP503, JP504 & JP507 Jumpers (Audio1 & Audio2)**

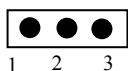
The jumpers JP500 to JP503 are used to enable the Audio1 interface signals.  
The jumpers JP504 to JP507 are used to enable the Audio2 interface signals.



Audio Line connected: when the jumper is on pins 2 & 3, the corresponding audio line is connected.

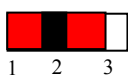
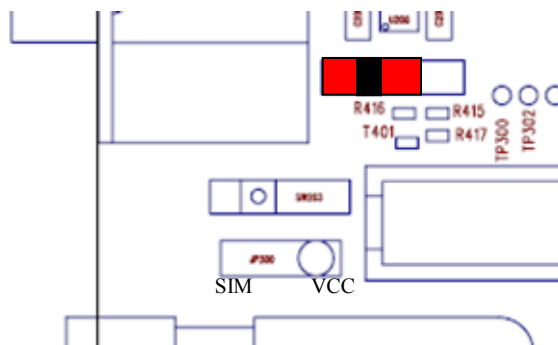


Audio Line not connected: when the jumper is on pins 1 & 2 or not present, the corresponding audio line is disconnected.

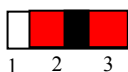
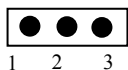


## Wireless CPU® Q24 Series Jumpers & Switches Description

### 4.4 JP401 Jumper (Serial Port Shutdown)



RS232 transceiver active: when the jumper is on pins 1 & 2 or not connected, the RS232 transceiver of the motherboard is enabled & the serial port is able to transfer data.

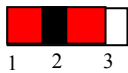
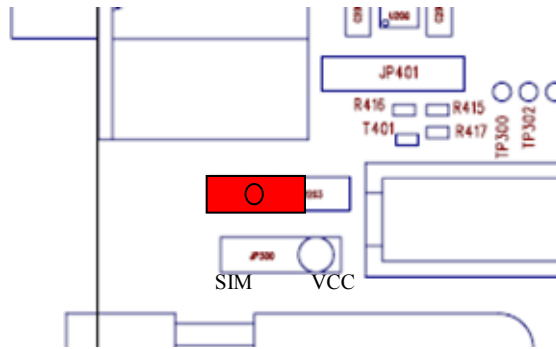


Shutdown of RS232 transceiver: when the jumper is on pins 2 & 3, the RS232 transceiver of the motherboard is shutdown & the serial port unable to transfer data.

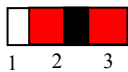
**Wireless CPU® Q24 Series**  
Jumpers & Switches Description

**4.5 SW203 Switch (Supply)**

The Wireless CPU® Q24 Series Development Kit can have a separate or common power source for the motherboard and the Wireless CPU®. The selection is done by the SW203 switch.

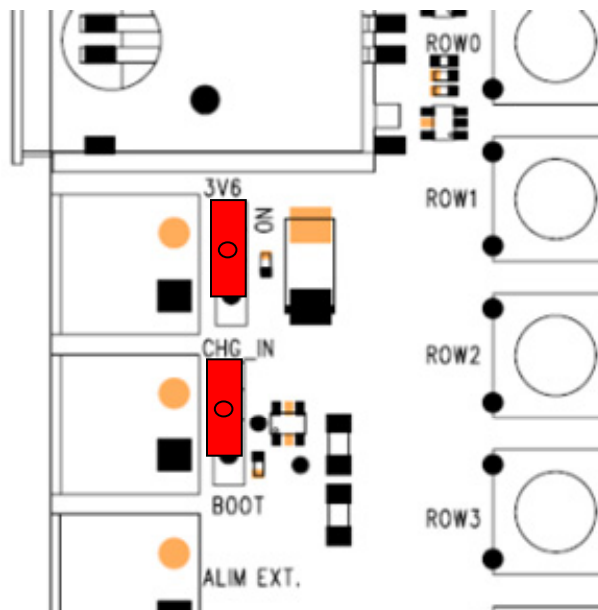


Motherboard powered by J200: when the jumper is on pins 1 & 2, the motherboard & the Wireless CPU® are both powered via the J200 connector.



Motherboard powered by J202: when the jumper is on pins 2 & 3, the motherboard is powered via the J202 connector & the Wireless CPU® via the J200 connector.

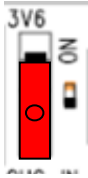
**4.6 SW200 Switch (ON/OFF) & SW201 Switch (BOOT)**



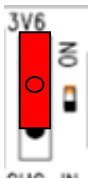


## Wireless CPU® Q24 Series Jumpers & Switches Description

### SW200 Switch (ON/OFF)



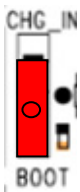
OFF position: when the switch is on this position the Wireless CPU® is in OFF mode.



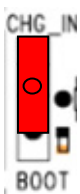
ON position: when the switch is on this position at start-up the Wireless CPU® is in ON Mode & starts.

See ON/OFF section 5.5 for more details.

### SW201 Switch (BOOT)



Boot or Normal Mode Position: when the switch is on this position at start-up the Wireless CPU® starts in normal mode.

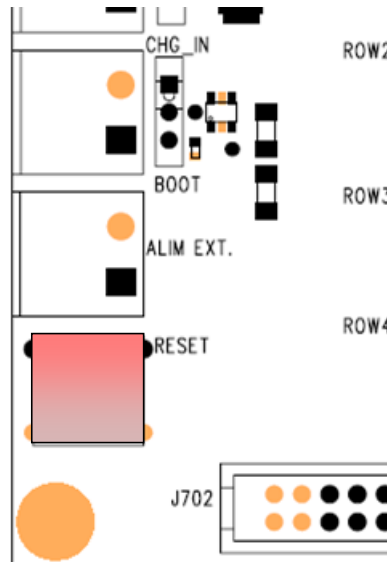


Download position: when the switch is on this position at start-up the Wireless CPU® starts in download mode.

See ON/OFF section 5.5 for more details.

## Wireless CPU® Q24 Series Jumpers & Switches Description

### 4.7 Reset Button (SW202)



Press the RESET button (SW202) to reset the Wireless CPU® Q24 Series resets.

## 5 Main Function Description

### 5.1 Main Supply

**J200** is the Power Supply connector of the Wireless CPU® Q24 Series. The voltage applied to this connector is described below.

	Minimum	Typical	Maximum
VBATT+	3.3 V		4.5 V

**Attention:** JP700 jumper must be correctly positioned to power the Wireless CPU® (see section 4.2).

### 5.2 Charger Function

**J201** is used to simulate a charger. The voltage applied to this connector is described below.

	Minimum	Typical	Maximum
CHG_IN	4.6 V		5.0 V

**Note:** CHG\_IN current = 800 mA max.

### 5.3 External Supply

**J202** is the Power Supply connector of serial link RS232 / UART (U400). The voltage applied to this connector is described below.

	Minimum	Typical	Maximum
ALIM_EXT	3.3 V		4.5 V

## 5.4 RS232 Function

### 5.4.1 Introduction

The Wireless CPU® Q24 Series Development Kit is a DCE and can be connected with a DTE (PC or terminal) with a “straight cable”.

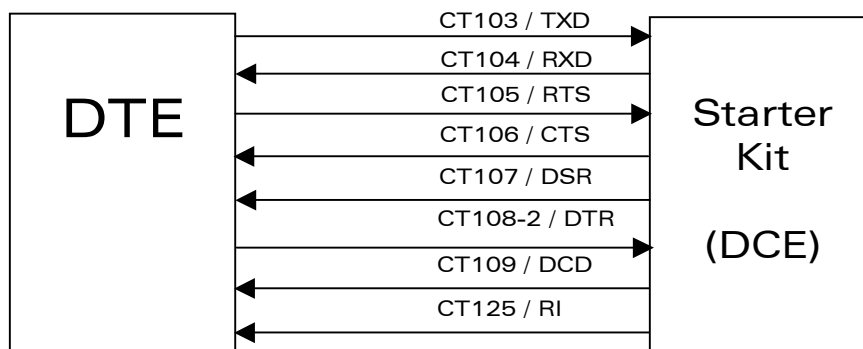


Figure 2: RS232 serial link

The Development Kit board is equipped with a RS232 transceiver device (U400).

### 5.4.2 Power Supply of the RS232 Transceiver

The RS232 transceiver can be supplied in 2 different modes:

- by the main power connector (J200).
- by the auxiliary supply connector (J202). In this case the Wireless CPU® continues to be supplied by the J200 connector.

The selection between these 2 modes is done using switch SW203 (see section 4.5 for details).

In addition to these 2 standard supply modes, it is possible to supply the RS232 transceiver by a Wireless CPU® supply output (VCC) with a few component changes on the board.

## Wireless CPU® Q24 Series Main Function Description

### 5.4.2.1 RS232 Transceiver Supplied via the Main Supply (J200)

The standard configuration is as follows:

- **Connect** an external power source on main supply connector J200.
- Put the SW203 switch on correct position (see section 4.5).

**Note:** In this configuration R202 (0  $\Omega$  resistor) must be disconnected & R201 (0  $\Omega$  resistor) connected. This is the commercial configuration of the board. See schematics [1] for details.

This configuration can be used for the normal use of the Development Kit while power consumption measurements are not needed.

### 5.4.2.2 RS232 Transceiver Supplied via the Auxiliary Supply (J202)

The standard configuration via the auxiliary supply is as follows:

- **Connect** an external power source on main supply connector J200.
- **Connect** an external power source on Auxiliary supply connector J202.
- Put the SW203 switch on correct position (see section 4.5).

**Note:** In this configuration R202 (0  $\Omega$  resistor) must be disconnected & R201 (0  $\Omega$  resistor) connected. This is the commercial configuration of the board. See schematics [1] for details.

This configuration can be used for power consumption measurements of the Wireless CPU®.

### 5.4.2.3 RS232 Transceiver Supplied by Wireless CPU® Q24 Series

This configuration is not a standard one as some components on the board have to be changed but it simulate a current configuration on customer's applications were the RS232 transceiver is supplied directly by the Wireless CPU®. This saves the use of a regulator (U200). See schematics [1] for details.

If you want to supply the RS232 transceiver by this way, you must:

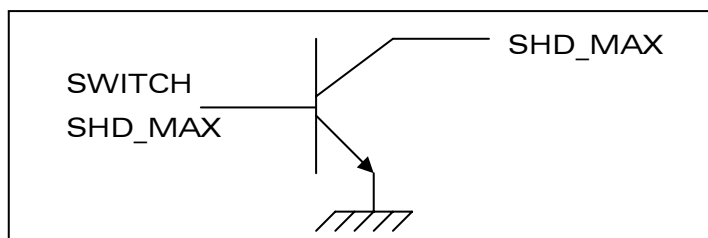
- **Connect** this component R202 (0  $\Omega$  0402 resistor).
- **Disconnect** this component: R201(0  $\Omega$  0402 resistor).
- **Connect VBATT+** on the connector J200 (Position of switch SW203 is indifferent).

**5.4.3 Shut Down of the Serial Port RS232 Transceiver**

The RS232 transceiver can be shut down by two methods:

- Using the JP401 jumper (see section 4.4 for more details)
- NMOS or NPN transistor, which drives the SHD\_MAX signal (pin 48 of J701) as shown in the diagram below.

**Shut down by a transistor:**



- If SWITCH SHD\_MAX = 1, SHD\_MAX (J701 pin 48) = 0 (shut down activated),
- If SWITCH SHD\_MAX = 0, SHD\_MAX (J701 pin 48) = 1.

### 5.5 ON/~OFF and BOOT Function

Mode	BOOT (SW201)	ON/~OFF (SW200)
Normal	BOOT	ON
Download	DOWNLOAD	ON

Before starting the process which leads to the starting of the Wireless CPU® in normal or download mode, the **ON/~OFF** switch (SW200) must be in "OFF" position and the Wireless CPU® must be stopped.

#### Normal mode (or external Boot Mode):

- put the **BOOT** switch (SW201) in position "BOOT" (See section 4.6 for more details.)
- put the **ON/~OFF** switch (SW200) in position "ON" (See section 4.6 for more details.)
- the Wireless CPU® starts in Normal Mode.

Pressing the reset button will led to the restating of Wireless CPU® in the same mode.

#### Download mode (or Internal Boot mode):

- put the **BOOT** switch (SW201) in position "DOWNLOAD" (See section 4.6 for more details.)
- put the **ON/~OFF** switch (SW200) in position "ON" (See section 4.6 for more details.)
- the Wireless CPU® starts in Download Mode.

Pressing the reset button will led to the restating of Wireless CPU® in the same mode.

To stop the Wireless CPU® put the ON/~OFF switch (SW200) in position "OFF" and press the reset button.

For more details on the different start modes of the Wireless CPU® Q24 series see [2]).

## Wireless CPU® Q24 Series Main Function Description

### 5.6 Reset Function

Press the RESET button (SW202) to reset the Wireless CPU® Q24 Series resets.

### 5.7 Keypad Function

The following table defines the keyboard matrix:

	COL0	COL1	COL2	COL3	COL4
ROW0	SW601	SW605	SW610	SW615	SW620
ROW1	SW601	SW606	SW611	SW616	SW621
ROW2	SW602	SW607	SW612	SW617	SW622
ROW3	SW603	SW608	SW613	SW618	SW623
ROW4	SW604	SW609	SW614	SW619	SW624

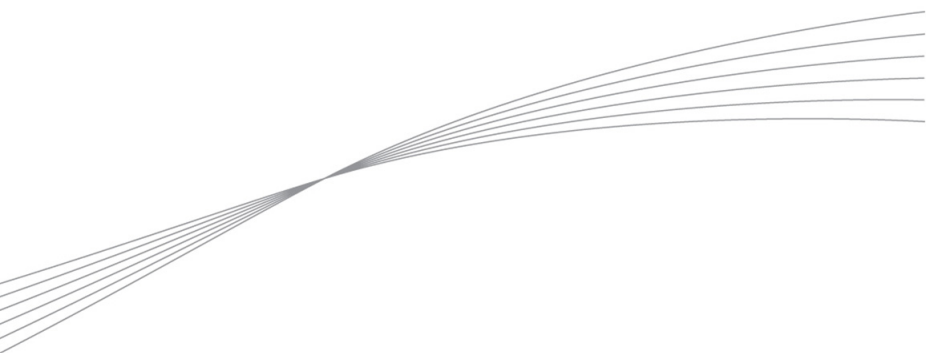
Example: If you press the key SW612, an electric detection is made on ROW2 and COL2.

### 5.8 Antenna Function

A coaxial cable with a SMA connector is provided on the board.

The unused extremity of the cable must be soldered on the Wireless CPU® Q24 Series plugged on the board (refer to the Wireless CPU® documentation [2] to [4] for instructions).





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