



Wireless CPU Quik Q26 series

Development Kit Q2686 and Q2687 User Guide

Revision: 004

Date: September 2006

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Development Kit Q2686 and Q2687

User Guide

Reference: **WM_BBD_Q26_UGD_001**

Revision: **004**

Date: **September 11, 2006**



Powered by the Wavecom Operating System and Open AT[®]

Cautions

This Development Kit Q26 series integrates 2 kind of Wireless CPU transmitter. These devices are to be used only for mobile and fixed applications.

They are Q2686 and Q2687 Wireless CPU transmitters, with pin to pin compatibility:

- Q2686 Wireless CPU is a hardware GSM/GPRS class 10 capable.
- Q2687 Wireless CPU is a hardware GSM/GPRS class 10 and EDGE/GPRS class 10 capable.

The antenna(s) used for this transmitter must be installed at a distance of at least 20 cm from all persons and must not be co-located or used in conjunction with any other antenna or transmitter. The antenna(s) used for this transmitter must not exceed a gain of 3 dBi for mobile operation and 7 dBi for fixed operation.

Users and OEM integrators must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance. OEM must also be provided with labeling instructions.

These devices contain EGSM/GPRS and EDGE functions (EDGE functions, only for Q2687 Wireless CPU). This filing is applicable for GSM850 MHz, E-GSM900 MHz, DCS1800 MHz and PCS1900 MHz operations.

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Overview

This document is a description of the Development Kit for Quik Q26 Series Wireless CPU based on a motherboard V3 (Refer to WM0402301-111-30).

This Development Kit is an equipment, which may be used to start software and hardware development based on Q2686 and Q2687 Wireless CPU.

Refer to the documentation on Q2686 and Q2687 Wireless CPU, for further information.

Document History

Revision	Date	List of revisions	
001	June 2005	Creation (Preliminary version)	
002	Sept 2005	Update for the development kit Q26 version2	
003	May 2006	Update for the development kit Q26 version3 <ul style="list-style-type: none"> - Add new for the parallel bus interface (for Wireless CPU Q2687 only) - New GPIO for CHARGER LED - New values around the AUDIO1 filters - Measure of current simplified - New schematics 	
004	Sept 2006	<ul style="list-style-type: none"> - Update the document references - Add new for the auxiliary DAC function - Update the Measures of current 	

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1 References

1.1 Reference Documents

For more details, several reference documents may be consulted. The Wavecom reference documents are provided in the Wavecom document package, contrary to the general reference documents which are not authored by Wavecom.

1.1.1 Wavecom Reference Documents

- [1] MOTHERBOARD Development Kit Schematics and PCB, Release 3.0
Reference: WM0402301-110-30.
- [2] Q2686 Wireless CPU Product Technical Specification
Reference: WM_PRJ_Q2686_PTS_001.
- [3] Q2686 Wireless CPU Customer Design Guideline
Reference: WM_PRJ_Q2686_PTS_003.
- [4] Title AT Commands Interface Guide for revision OS 6.60
Reference: WM_DEV_OAT_UGD_003.
- [5] Wireless CPU Quik Q2687 Product Technical Specification
Reference: WA_ENG_Q2687_PTS_001.
- [6] Wireless CPU Quik Q2687 Customer Design Guideline
Reference: WA_DEV_Q2687_PTS_007.
- [7] Title AT Commands Interface Guide for revision OS 6.61
Reference: WM_DEV_OAT_UGD_014.

1.2 List of Abbreviations

Abbreviations	Definition
ADC	Analog to Digital Converter
AUX	AUXiliary
CLK	CLock
CPU	Central Process Unit
CTS	Clear To Send
DAC	Digital to Analog Converter
DAI	Digital Audio Interface
DC	Direct Current
DCD	Data Carrier Detect
DCE	Data Communication Equipment
DSR	Data Set Ready
DTE	Data Terminal Equipment
DTR	Data Terminal Ready
ESD	ElectroStatic Discharges
GND	GrouND
GPI	General Purpose Input
GPIO	General Purpose Input Output
GPO	General Purpose Output
I/O	Input / Output
MIC	MICrophone
PC	Personal Computer
PCB	Printed Circuit Board.
PCM	Pulse Code Modulation
PWM	Pulse Width Modulation
RF	Radio Frequency
RI	Ring Indicator
RTC	Real Time Clock
RTS	Request To Send
RXD	Receive Data
SCI	Smart Card Interface
SIM	Subscriber Identity Module
SPI	Serial Peripheral Interface
SPK	SPeaKer
TP	Test Point
TXD	Transmit Data
USB	Universal Serial Bus

2 Development Kit Q26 Description

A description of the Q26 Development Kit is described in Figure 1.

For further information on this component design, please refer to the Implementation.pdf file.

Development Kit Q2686 and Q2687
Development Kit Q26 Description

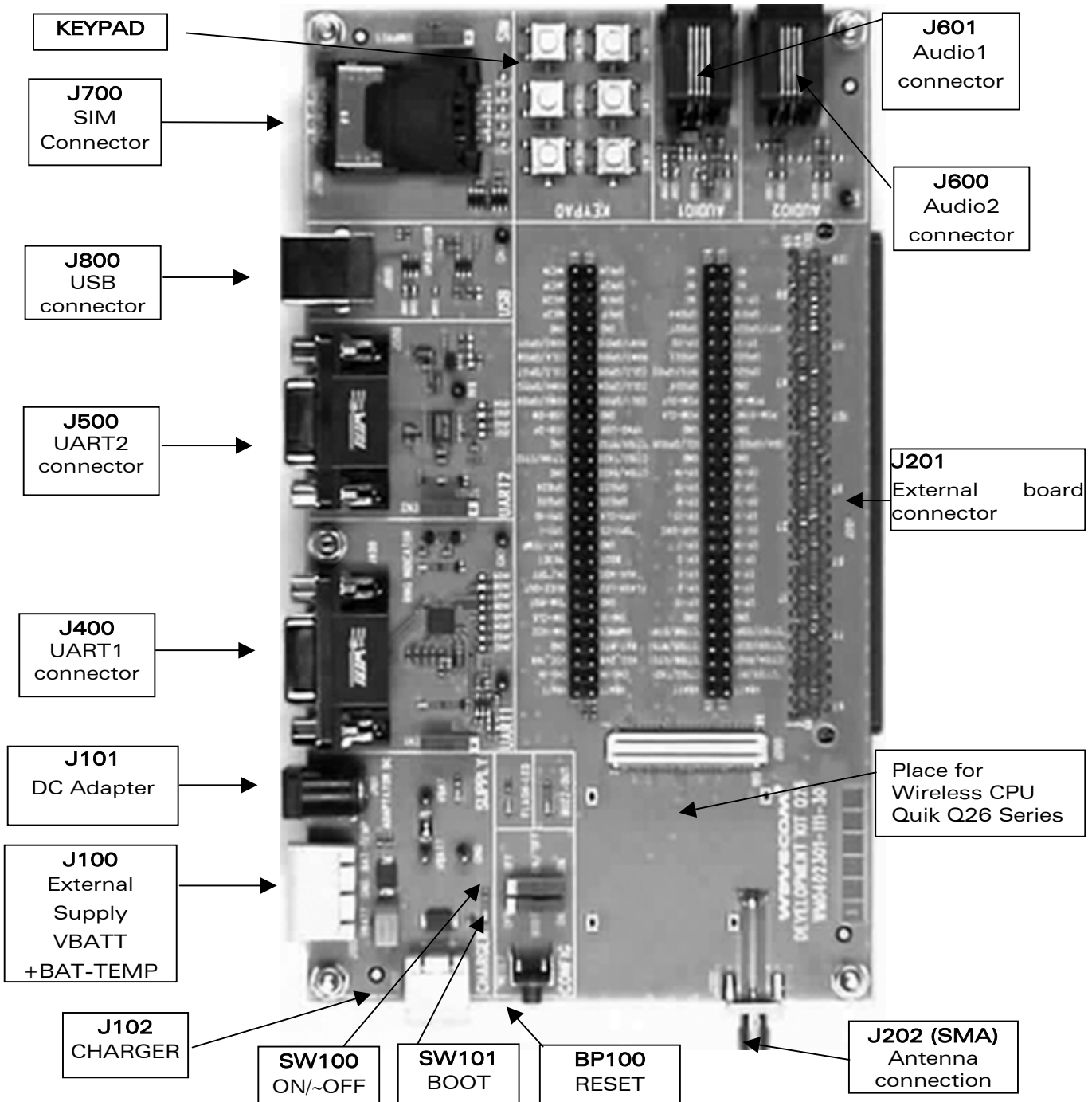


Figure 1: Development Kit Q26 - equipped board

3 General Description

3.1 Development Kit Q26

All functions of the Development Kit Q26 are provided either by the Wireless CPU Q2686 or Q2687.

Interfaces on board:

- External board-to-board connector and TP to access all signals of the Wireless CPU.
 - Parallel bus (only for the Wireless CPU Quik Q2687)
 - Main serial link RS232, UART1(*) with full signals
 - Ring Indicator
 - Auxiliary serial link RS232, UART2* with 4 signals
 - Slave USB*, compliant USB 2.0.
 - SIM* 1.8/3v with management of SIM presence
 - 6-button Keypad
- AUDIO* connectors (AUDIO 1, AUDIO 2)
 - LEDs for several indications
 - RESET Pushbutton
 - Power supply connectors
 - ON/OFF switch
 - BOOT switch
 - Buzzer LED
 - Flash LED
 - Charger LED

(*): A unique feature of the Development Kit Q26 is that each signals peripherals may be electrically removed independently via special solder. (for further details, refer to section 3.2).

3.2 Special Solder

The PCB print is used for the peripherals that are electrically removable.

To connect signals between the Wireless CPU and the dedicated connector on the Development Kit Q26, solder these PCB print.

To connect signals between the Wireless CPU and the external board connector (J201), it is recommended to avoid solder these PCB print (i.e. prototype of daughterboard).



These interfaces are electrically removable via the "special solder":

Development Kit Q2686 and Q2687 General Description

- UART1 (from J402 to J409)
- UART2 (from J501 to J504)
- AUDIO1 (from J602 to J605)
- AUDIO2 (from J606 to J609)
- SIM (from J701 to J705)
- USB (from J801 to J803, signals plus power)
- Power supply of Development Kit (from J103, all components except the Wireless CPU (for further information see section 4).

3.3 RoHS Compliance

The Wireless CPU Quik Q26 Series and the Development Kit Q26 board are compliant with RoHS (Restriction of Hazardous Substances in Electrical and Electronic Equipment) Directive 2002/95/EC, which set limits for the use of certain restricted hazardous substances. This directive states that "from 1st July 2006, new electrical and electronic equipment put on the market does not contain lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) and polybrominated diphenyl ethers (PBDE)".

Wireless CPUs which are compliant with this directive are identified by the RoHS logo on their label.



4 External Board Connector (J201) Description

4.1 Wireless CPU Quik Q2686 and Q2687 Signals

All signals of the Wireless CPU Quik Q2686 and Q2687 are connected to the external board connector (J201) and are available via TP on the center of Development Kit Q26. The pinouts of J201 connector are listed below:

For further information about the Wireless CPU Quik Q2686 signals and multiplexing, refer to document [2].

For further information about the Wireless CPU Quik Q2687 signals and multiplexing, refer to document [5].

4.2 External Board Connector (J201)

Pin #	Name	I/O(*)	I/O type	Description
1	VBATT	I	Supply	Battery Input
2	VBATT	I	Supply	Battery Input
3	CHG-IN	I	Supply	Current source input
4	CHG-IN	I	Supply	Current source input
5	VCC_1V8	O	Supply	1.8V digital supply output
6	VCC_2V8	O	Supply	2.8V digital supply output
7	GND			
8	BAT-RTC	I/O	Supply	RTC back-up supply
9	SIM-VCC	O	Supply	SIM card supply
10	SIMPRES/ GPIO18	I	1V8	SIM card detect
11	SIM-CLK	O	1V8 / 2V9	SIM clock
12	SIM-IO	I/O	1V8 / 2V9	SIM data
13	~SIM-RST	O	1V8 / 2V9	SIM reset
14	GND			
15	BUZZ-OUT	O	Open drain	PWM / Buzzer output
16	FLASH-LED	O	Open Drain	Charging indicator
17	ON/ ~OFF	I	VBATT	Wireless CPU Power ON
18	AUX-ADC	I	Analog	Auxiliary ADC
19	~RESET	I/O	1V8	Wireless CPU Reset
20	BOOT	I	1V8	SW download (with a Wavecom software "DWLwin")
21	BAT-TEMP	I	Analog	ADC input for battery temperature measurement
22	GND			

Development Kit Q2686 and Q2687 External Board Connector (J201) Description

Pin #	Name	I/O(*)	I/O type	Description
23	SPI1-I GPIO30	/ I	2V8	SPI1 Serial input (Multiplexed)
24	~SPI1-CS GPIO31	/ O	2V8	SPI1 Enable (Multiplexed)
25	SPI1-IO GPIO29	/ I/O	2V8	SPI1 Serial input/output (Multiplexed)
26	SPI1-CLK GPIO28	/ O	2V8	SPI1 Serial Clock (Multiplexed)
27	SPI2-CLK GPIO32	/ O	2V8	SPI2 Serial Clock (Multiplexed)
28	SPI2-CS GPIO35	/ O	2V8	SPI2 Enable (Multiplexed)
29	SPI2-I GPIO34	/ I	2V8	SPI2 Serial input (Multiplexed)
30	SPI2-IO GPIO33	/ I/O	2V8	SPI2 Serial input/output (Multiplexed)
31	GND			
32	CT104-RXD2 / GPIO15	O	1V8	Auxiliary RS232 Receive Serial Data (According to PC view and Multiplexed)
33	~CT106-CTS2 / GPIO16	O	1V8	Auxiliary RS232 Clear To Send (According to PC view and Multiplexed)
34	CT103-TXD2 / GPIO14	I	1V8	Auxiliary RS232 Transmit Serial Data (According to PC view and Multiplexed)
35	GND			
36	~CT105-RTS2 / GPIO17	I	1V8	Auxiliary RS232 Request To Send (According to PC view and Multiplexed)
37	USB-DP	I/O	3V3	Differential data interface positive
38	VPAD-USB	I	3V3	USB power supply
39	USB-DM	I/O	3V3	Differential data interface negative
40	GND			
41	ROW0 / GPIO9	I/O	1V8	Row scan (Multiplexed)
42	COL1 / GPIO5	I/O	1V8	Column scan (Multiplexed)
43	ROW4 GPIO13	/ I/O	1V8	Row scan (Multiplexed)

Development Kit Q2686 and Q2687 External Board Connector (J201) Description

Pin #	Name	I/O(*)	I/O type	Description
44	COL0 / GPIO4	I/O	1V8	Column scan (Multiplexed)
45	COL3 / GPIO7	I/O	1V8	Column scan (Multiplexed)
46	COL2 / GPIO6	I/O	1V8	Column scan (Multiplexed)
47	COL4 / GPIO8	I/O	1V8	Column scan (Multiplexed)
48	ROW3 GPIO12	/ I/O	1V8	Row scan (Multiplexed)
49	ROW2 GPIO11	/ I/O	1V8	Row scan (Multiplexed)
50	ROW1 GPIO10	/ I/O	1V8	Row scan (Multiplexed)
51	GND			
52	GND			
53	MIC2P	I	Analog	Microphone 2 positive input
54	SPK1P	O	Analog	Speaker 1 positive output
55	MIC2N	I	Analog	Microphone 2 negative input
56	SPK1N	O	Analog	Speaker 1 negative output
57	MIC1P	I	Analog	Microphone 1 positive input
58	SPK2P	O	Analog	Speaker 2 positive output
59	MIC1N	I	Analog	Microphone 1 negative input
60	SPK2N	O	Analog	Speaker 2 negative output
61	NC			Not connected
62	NC			Not connected
63	NC			Not connected
64	NC			Not connected
65	NC			Not connected
66	VBATT	I	Supply	Battery Input
67	VBATT	I	Supply	Battery Input
68	CT103-TXD1 / GPIO36	I	2V8	Main RS232 Transmit Serial Data (According to PC view and Multiplexed)
69	~CT125-RI1 / GPIO42	O	2V8	Main RS232 Ring indicator (According to PC view and Multiplexed)
70	~CT106-CTS1 / GPIO39	O	2V8	Main RS232 Clear To Send (According to PC view and Multiplexed)
71	CT104-RXD1 / GPIO37	O	2V8	Main RS232 Receive Serial Data (According to PC view and Multiplexed)
72	~CT105-RTS1 / GPIO38	I	2V8	Main RS232 Request To Send (According to PC view and Multiplexed)

Development Kit Q2686 and Q2687 External Board Connector (J201) Description

Pin #	Name	I/O(*)	I/O type	Description
73	~CT109-DCD1 / GPIO43	O	2V8	Main RS232 Data Carrier Detect (According to PC view and Multiplexed)
74	~CT108-2-DTR1 / GPIO41	I	2V8	Main RS232 Data Terminal Ready (According to PC view and Multiplexed)
75	~CT107-DSR1 / GPIO40	O	2V8	Main RS232 Data Set Ready (According to PC view and Multiplexed)
76	GND			
77	GND			
78	EP17			(**)Depend on the Quik Q26 series
79	EP0			(**)Depend on the Quik Q26 series
80	EP2			(**)Depend on the Quik Q26 series
81	EP4			(**)Depend on the Quik Q26 series
82	EP1			(**)Depend on the Quik Q26 series
83	EP6			(**)Depend on the Quik Q26 series
84	EP3			(**)Depend on the Quik Q26 series
85	EP5			(**)Depend on the Quik Q26 series
86	EP7			(**)Depend on the Quik Q26 series
87	EP18			(**)Depend on the Quik Q26 series
88	AUX-DAC	O	2V2	(***)Depend on the software version
89	EP15			(**)Depend on the Quik Q26 series
90	EP13			(**)Depend on the Quik Q26 series
91	EP11			(**)Depend on the Quik Q26 series
92	EP9			(**)Depend on the Quik Q26 series
93	EP12			(**)Depend on the Quik Q26 series
94	EP10			(**)Depend on the Quik Q26 series
95	EP8			(**)Depend on the Quik Q26 series
96	EP14			(**)Depend on the Quik Q26 series
97	EP16			(**)Depend on the Quik Q26 series
98	GND			
99	GND			
100	SCL / GPIO26	I/O	Open drain	Serial Clock / General purpose input-output
101	SDA / GPIO27	I/O	Open drain	Serial Data / General purpose input-output
102	GND			
103	GND			
104	PCM-CLK	O	1V8	Data clock

Development Kit Q2686 and Q2687 External Board Connector (J201) Description

Pin #	Name	I/O(*)	I/O type	Description
105	PCM-SYNC	O	1V8	Frame synchronization 8Khz
106	PCM-OUT	O	1V8	Data output
107	PCM-IN	I	1V8	Data input
108	GPIO24	I/O	2V8	General purpose input / output
109	GND			
110	INT0/ GPIO3	I/O	1V8	Interruption 0 / General purpose input-output
111	GPIO20	I/O	2V8	General purpose input / output
112	GPIO23	I/O	2V8	General purpose input / output
113	GPIO22	I/O	2V8	General purpose input / output
114	EP20	I/O	1V8	(**)Depend on the Wireless CPU Quik Q26 series
115	EP21	I/O	1V8	(**)Depend on the Wireless CPU Quik Q26 series
116	GPIO21	I/O	2V8	General purpose input / output
117	INT1/ GPIO25	I/O	2V8	Interruption 1 / General purpose input-output
118	GPIO44	I/O	2V8	General purpose input / output
119	GPIO19	I/O	2V8	General purpose input / output
120	NC			Not connected
121	EP19	I/O	1V8	(**)Depend on the Quik Q26 series
122	NC			Not connected
123	NC			Not connected
124	NC			Not connected
125	NC			Not connected
126	NC			Not connected
127	NC			Not connected
128	NC			Not connected
129	NC			Not connected
130	NC			Not connected

Table 1: Pin out of the external board connector (J201)

(*): According to Wireless CPU view.

(**): Refer to Table 19 and Figure 1.

(***): Refer to document [7]

5 Power Supply

Two power supply sources are available to start the Development Kit Q26:

- DC external supply (via J100)
- AC/DC adapter (via J101)

These power supplies are protected by a transient voltage suppressor.

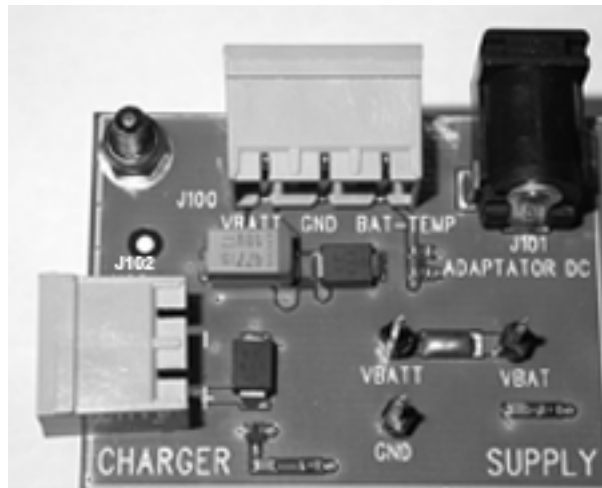


Figure 2: Power supply voltage (J101 and J102)

Each of these power supplies is used for both the Wireless CPU and the peripherals on the Development Kit Q26.

It is possible to disconnect the power supply for the Wireless CPU ("VBATT", measurable via the TP153) and for the peripherals ("VBAT", measurable via the TP157).



Figure 3: Zoom on "J103"

Current measurement is possible between the VBATT and VBAT via J103 (refer to section 20).

5.1 LED Signalization ("VBAT")

"VBAT" indicator is a green LED. It indicates the external power supply presence. In other words, peripherals and Wireless CPU are respectively powered via VBAT and VBATT.

Hence, the Development Kit Q26 is operational.

LED	VBATT	VBAT
Light ON	ON	ON
Light OFF*	Can be ON	OFF

Table 2: LED of "VBAT"

* If the special solder, J103, is not soldered, an external power supply must be used. It is recommended to use both VBATT and VBAT always together.

5.2 External Supply

The J100 connector has three contacts:

- J100:1-2: for the power supply.
- J100:2-3: refer to section 5.3

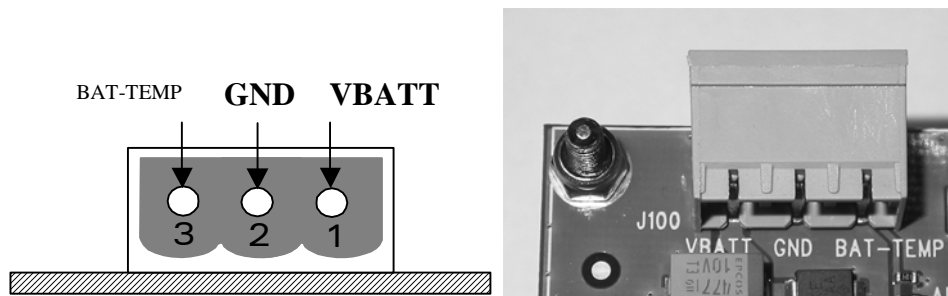


Figure 4: Power supply voltage

	V _{min}	V _{nom}	V _{max}
VBATT ^{1,2}	3.2v	3.6v	(*)

(*) Refer to doc [2] or doc [5]

Table 3: Electrical Characteristics

(1): This value has to be maintained during the burst (with 2.0A Peak in GSM, GPRS, and EDGE mode)

(2): Maximum operating Voltage Stationary Wave Ratio (VSWR) is 2:1.

5.3 BAT-TEMP

This signal acts as an input (ADC) in the Wireless CPU.

J100:2-3 also allows simulation of the temperature level by a sensor inside the battery.

	V _{min}	V _{nom}	V _{max}
BAT-TEMP	0	-	2v

Table 4: Electrical Characteristics

For more information, refer to either document [3] or [6].

5.4 Main Supply Adapter

The J101 connector powers the Development Kit Q26 using the AC power supply cable.



Figure 5: Main supply adapter

The only approved reference is:

Manufacturer	Reference	Characteristics
SINPRO	SPU12C-101	4v DC / 2.5 A.

Table 5: Main supply adapter reference

6 Charger Supply & LED

6.1 Charger Supply

The J102 is used to simulate a charger.

This power supply is protected by a transient voltage suppressor.

When the charger is used, the battery must be connected.

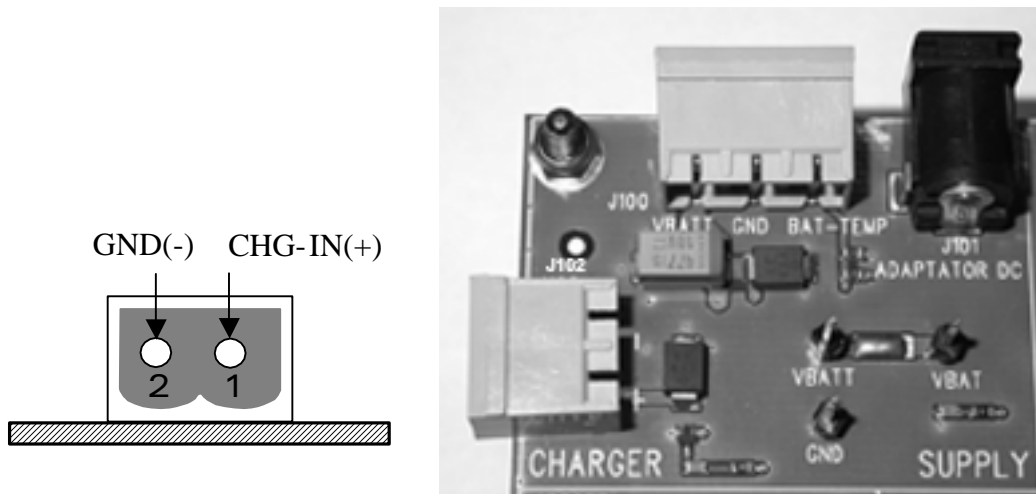


Figure 6: Charger supply

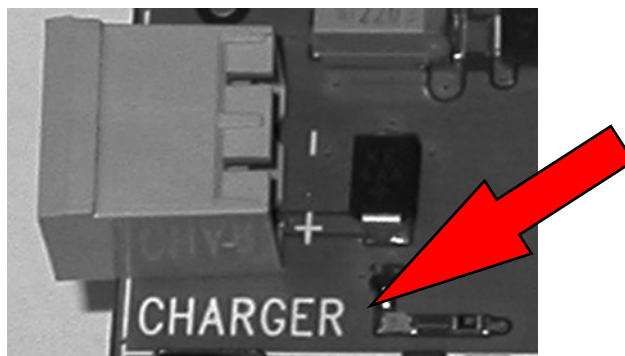
	V_{min}	V_{nom}	V_{max}
CHG-IN Voltage (for $I=I_{max}$)	4.6(*)v		6v

(*) Parameters are set as per battery manufacturer.

Table 6: Power supply voltage

6.2 LED Signalization ("CHARGER")

The "CHARGER" LED location is shown in the following figure:



Development Kit Q2686 and Q2687 Charger Supply & LED

The "CHARGER" indicator is a red LED wired on the GPIO21. Wavecom software allows the customer to manage the charging with the Open AT[®] application. This LED represents the logic level of GPIO21.

7 Flash LED ("FLASH-LED")

The "FLASH-LED " location is shown in the following figure:



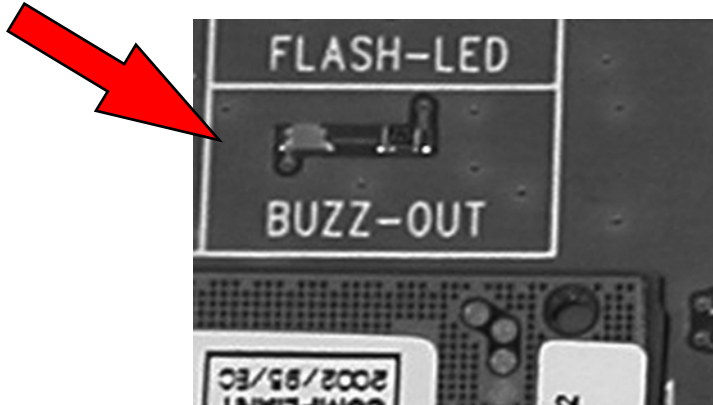
This LED works in two modes:

- Wireless CPU is in OFF state:
"FLASH-LED" blinks in pre-charging mode (via J102 connector).
- Wireless CPU is in ON state:
"FLASH-LED" indicates the network status.

For more information, refer to documents [2] or [5] and [3] or [6].

8 Buzzer LED ("BUZZ-OUT")

The "BUZZ-OUT" LED location is shown in the following figure:



"BUZZ-OUT" indicator is a yellow LED controlled by the signal, with the same name provided by the Wireless CPU. It is driven by a "PWM" signal (open drain).

9 Control Functions

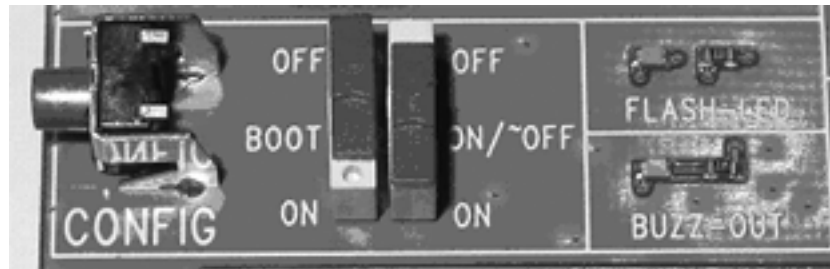


Figure 7: Switches configuration

9.1 ON/~OFF

Once the Development Kit Q26 is connected to the external source (via J100 or J101), the ON/~OFF switch can provide the VBATT to the Wireless CPU when it is "ON".

After 1 second, it can be switched off. (refer to document. [2] or [5] and [3] or [6]).

9.2 ~RESET

The pushbutton ~RESET starts a general reset when it is pushed.

An Operating System reset is preferred to a HW reset.

9.3 BOOT

The BOOT switch is only used to download a new software to the Wireless CPU via UART1, with the specific download software provided by Wavecom.

Under normal conditions, it must be on "OFF" position.

Mode	BOOT	ON/~OFF
Normal	OFF	ON
Back-up download With the specific download software	ON	ON

Table 7: BOOT configuration

10 Keypad Function

Only 6 keypads are connected on the Development Kit Q26, as shown in the figure below.

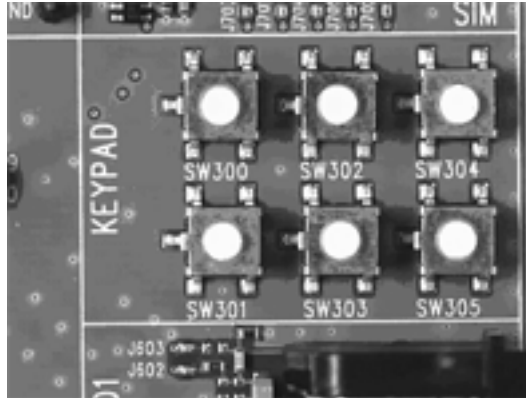


Figure 8: Keypad configuration

The following table shows the matrix of the keyboard:

	COL0	COL1	COL2	COL3	COL4
ROW0	SW300	-	-	-	-
ROW1	-	SW301	-	-	-
ROW2	-	-	SW302	-	-
ROW3	-	-	-	SW303	SW304
ROW4	-	-	-	-	SW305

Table 8: Matrix of the keyboard

Example: If the key SW300 is pressed, an electric detection will be made on ROW0 and COL0.

11 UART1 Function

The UART1 function is the main RS232 serial link of Wireless CPU in 3.0V on the Development Kit Q26.

This function may be electrically detached with special solder (not as soldered from J402 to J409).

For example, UART1 allows undisturbed signals transmission via the external connector (J201).

By default, the UART1 is available on its dedicated connector J400 (J402 to J409 soldered).

11.1 UART1 Connector (J400)

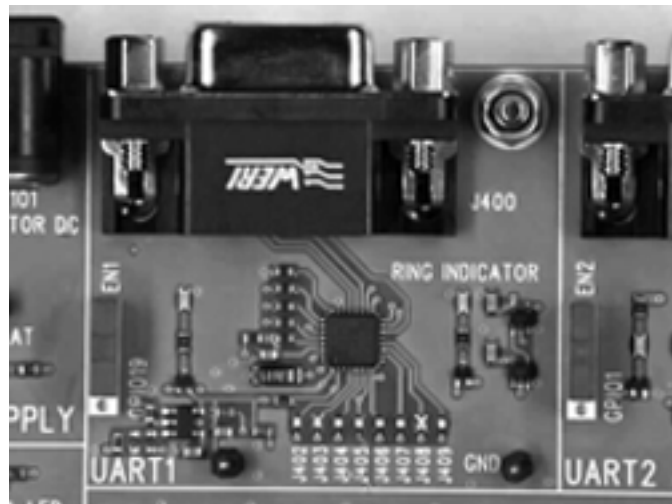
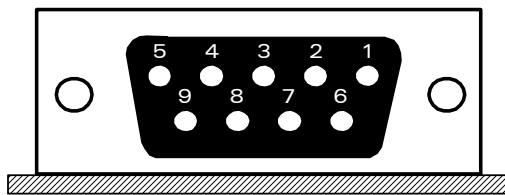


Figure 9: UART1 connector

J400 is a SUB-D 9-pin female connector. The table below describes the signals and relative pins for the connector.

**Development Kit Q2686 and Q2687
UART1 Function**

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

Table 9: Pin out of the UART1 connector

11.2 Configuration of the UART1

The Development Kit Q26 acts as DCE and is connected to a DTE (PC or terminal) with a "straight cable".

This is a full UART.

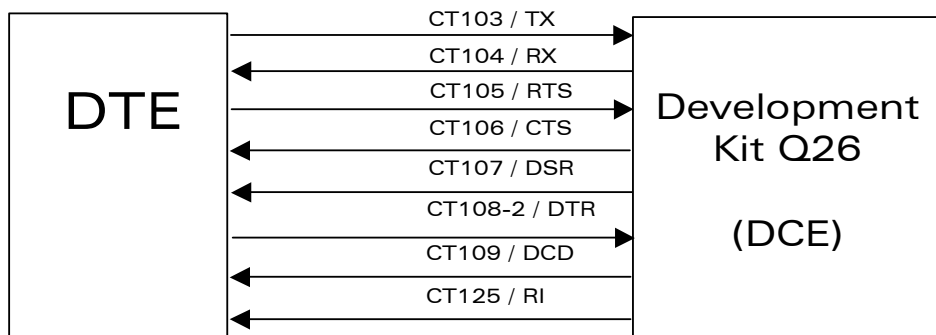


Figure 10: RS232 main serial link

11.3 Enable UART1 ("EN1/GPIO19")

A switch "EN1/GPIO19" may enable the shutdown mode of the RS232 transceiver. By default, the RS232 transceiver is in active mode (switch to "EN1").

Development Kit Q2686 and Q2687 UART1 Function

For other cases, Wavecom software allows customer to enable the shutdown mode by using the GPIO19.

Switch "EN1/GPIO19"		UART1	LED "EN1"
EN1		ON (in hardware)	LIGHTS
GPIO19	0L	ON	LIGHTS
	1L	OFF	EXTINCT

Table 10: Enable UART1 configuration

11.4 LED Signalization

11.4.1 LED "RING INDICATOR"

The "RING INDICATOR" is a yellow LED controlled by the ~CT125-RI1/GPIO42 signal provided by the Wireless CPU.

It is possible to activate a « visual » mode with AT command: AT+WRIM=0, (refer to document [4] or [7]). When there is an incoming call, this signal becomes low and high each 0.5sec.

The "RING INDICATOR" LED indicates with blinking.

11.4.2 LED "EN1"

The "EN1" indicator is a green LED controlled by the EN1 or GPIO19 signals provided by the Wireless CPU.

The LED "EN1" lights when the RS232 transceiver is operational (see the configuration in Table 10).

12 UART2 Function

The UART2 function is an auxiliary RS232 serial link of the Wireless CPU in 1.8V. This function may be electrically detached with special solder (J501 to J504 not soldered).

For example, UART2 allows transmitting undisturbed signals via the external connector (J201).

By default, the UART2 is available on its dedicated connector J500 (J501 to J504 soldered).

12.1 UART2 Connector (J500)

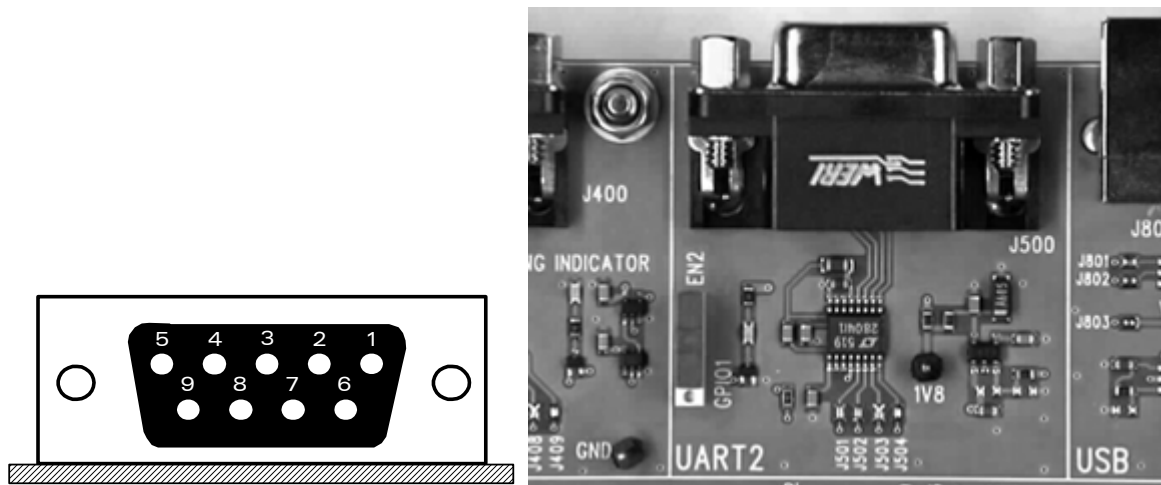


Figure 11: Enable UART2 configuration

The J500 is a SUB-D 9-pin female connector. Table 11 describes the signals and relative pins for the connector.

**Development Kit Q2686 and Q2687
UART2 Function**

Pin Number	Signal Name	I/O	I/O Type	Description
1	Not used(*)	-	-	-
2	CT104 RXD	O	RS232 (V24/V28)	Receive serial data
3	CT103 TXD	I	RS232 (V24/V28)	Transmit serial data
4	Not used(*)	-	-	-
5	GND			Ground
6	Not used(*)	-	-	-
7	CT105 RTS	I	RS232 (V24/V28)	Request To Send
8	CT106CTS	O	RS232 (V24/V28)	Clear To Send
9	Not used(*)	-	-	-

(*)Only 4 signals are used.

Table 11: Pin out of the UART2 connector

12.2 Configuration of the UART2

The Development Kit Q26 acts as a DCE and is connected to a DTE (PC or terminal) with a "straight cable".

There are only 4 signals on the UART2.

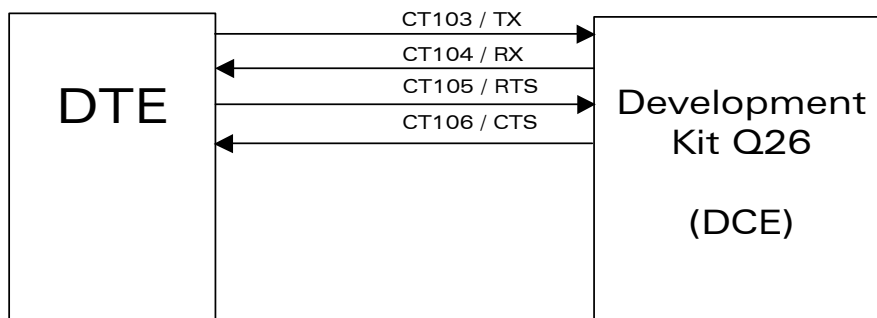


Figure 12: RS232 auxiliary serial link

12.3 Enable UART2 ("EN2/GPIO1")

A switch "EN2/GPIO1" may enable the shutdown mode of the RS232 transceiver.

By default, the RS232 transceiver is in active mode (switch to "EN2").

For other cases, Wavecom software allows customer to enable the shutdown mode by using the GPIO1.

Switch "EN2/GPIO1"		UART2	LED "EN2"
EN2		ON (in hardware)	LIGHTS
GPIO1	1L	ON	LIGHTS
	0L	OFF	EXTINCT

Table 12: Enable UART2 configuration

12.4 LED Signalization ("EN2")

The "EN2" indicator is a green LED controlled either by the EN2 or GPIO1 signals provided by the Wireless CPU.

The LED "EN2" lights when the RS232 transceiver is operational (see the configuration in Table 12).

13 SIM Function

13.1 SIM Connector (J700)

The J700 is a standard either 1V8 or 3V SIM socket.

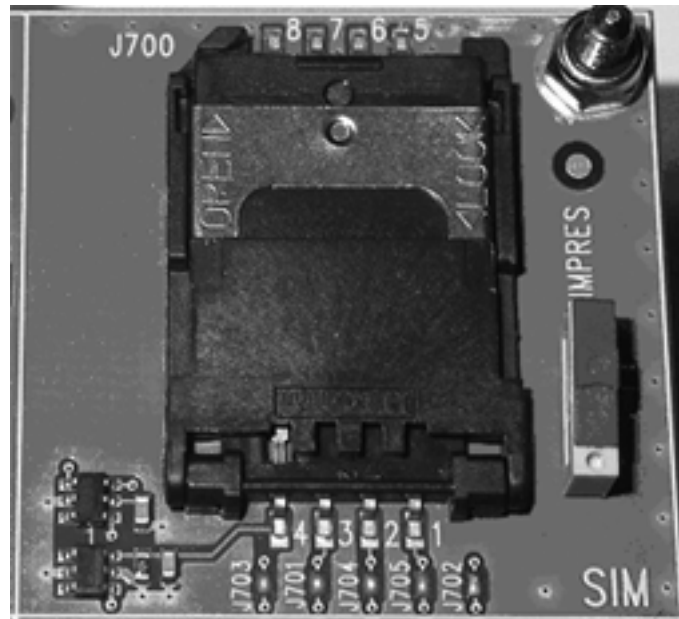


Figure 13: SIM connector

Table 13 describes the the signals and relative pins for the connector.

Pin Number	Signal Name	I/O	I/O Type	Description	Comment
1	SIM-VCC	O	1V8 or 2V9	SIM Power Supply	
2	SIM-RST	O	1V8 or 2V9	SIM Reset	
3	SIM-CLK	O	1V8 or 2V9	SIM Clock	
4	SIMPRES	I	1V8 max(*)	SIM Card Detect	Multiplexed with GPIO18
5	GND			Ground	
6	VPP	Not connected			
7	SIM_DATA	I/O	1V8 or 2V9	SIM Data	
8	CC8		1V8	SIMPRES signal supply	

(*) Either for 1V8 or 3V SIM cards.

Table 13: Pin out of the SIM connector

Development Kit Q2686 and Q2687 SIM Function

The SIM interface controls both the 2.9V and 1.8V SIM cards.

ESD protections are used on the 5 SIM signals

This function may be electrically detached with special solder (J701 to J705 not soldered).

For example, SIM allows transmitting undisturbed signals via the external connector (J201).

By default, the SIM signals are available on its dedicated connector J700 (J701 to J705 soldered).

SIMPRES presents the following options:

- If the SIMPRES signal is used by the application (detection of SIM card presence by the SIM socket), the "SIMPRES" switch must be moved to "SIMPRES" (contact 1-2 used).
- Otherwise, to simulate all the time the SIM card presence (without the SIM socket), the "SIMPRES" switch must be moved to other side (contact 2-3 used).

Switch "SIMPRES"	SIM card presence
SIMPRES	Depend of the real SIM presence
Other side	Simulate a SIM presence

Table 14: SIMPRES configuration

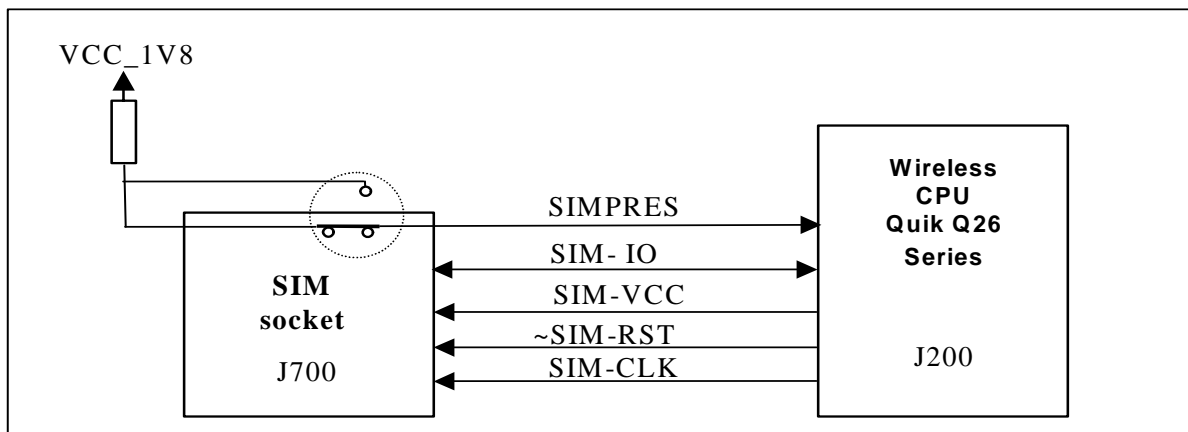


Figure 14: Schematic of switch "SIMPRES"

14 USB Function

ESD protections are used on the 2 USB signals.

This function may be electrically removed with special solder (J801 to J803 not soldered).

For example, USB allows transmitting undisturbed signals via the external connector (J201).

By default, the USB signals are available on its dedicated connector J800 (J801 to J803 soldered).

14.1 USB Connector (J800)

J800 is a USB Series type B receptacle.

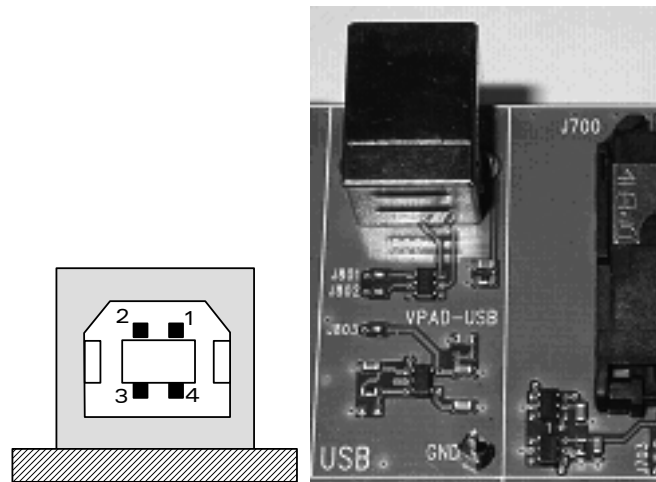


Figure 15: USB connector

Pin Number	Signal Name	I/O	I/O Type	Description
1	VBUS	I	Power supply	+ 5 VDC
2	DM	I/O	Digital	USB negative line
3	DP	I/O	Digital	USB positive line
4	GND		Power supply	Ground
Shell	Shielding			

Table 15: Pin out of the USB connector

14.2 LED Signalization ("VPAD-USB")

The "VPAD-USB" indicator is a green LED controlled by the presence of VBUS (when the plug is in the USB connector).

The power supply for the USB interface in the Wireless CPU is provided by the USB connector.

A USB cable is plugged the LED light and VPAD-USB (the output of a regulator - LDO) at 3.3v.

But a special solder (J803) must be soldered to power the USB interface in the Wireless CPU. Hence, by default J803 is soldered.

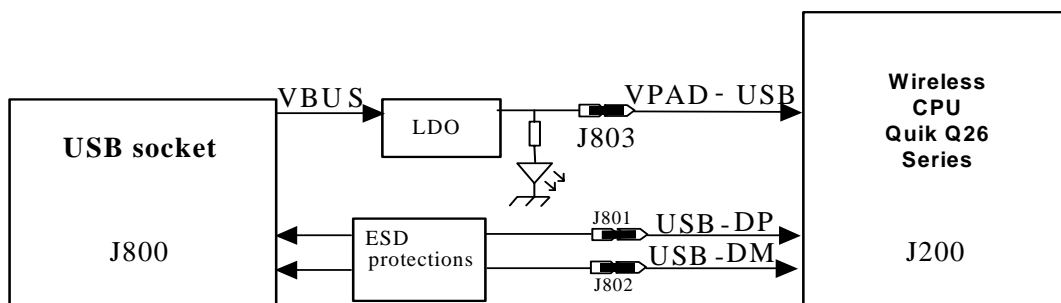


Figure 16: USB electrical diagram

15 AUDIO Functions

There are 2 AUDIO interfaces in the Wireless CPU.

15.1 AUDIO1 Connector (J601)

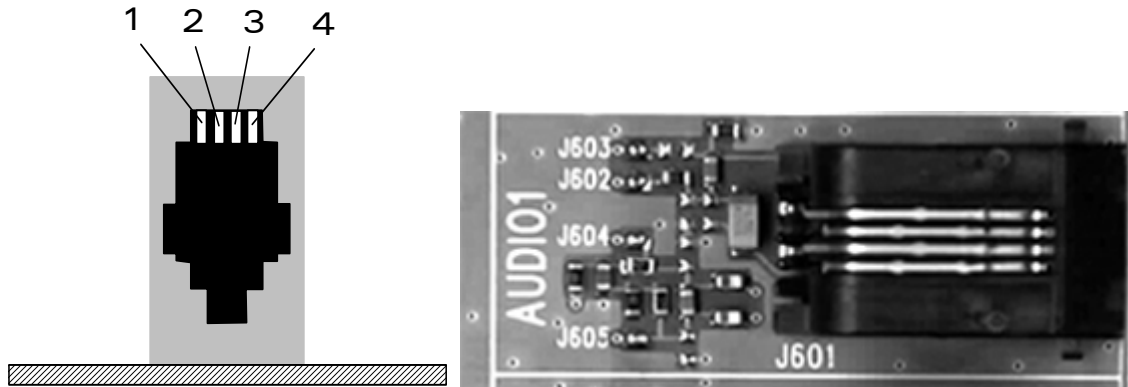


Figure 17: AUDIO1 connector J601 is a RJ9 4-pin connector.

Table 16 describes the signals and relative pins for the connector.

Pin Number	Signal Name	I/O	I/O Type	Description
1	MIC1N	I	Analog	Auxiliary microphone negative input
2	SPK1N	O	Analog	Auxiliary speaker negative output
3	SPK1P	O	Analog	Auxiliary speaker positive output
4	MIC1P	I	Analog	Auxiliary microphone positive input

Table 16: Pin-out of the AUDIO1 connector

15.2 AUDIO2 Connector (J600)

The J600 is a RJ9 4-pin connector.

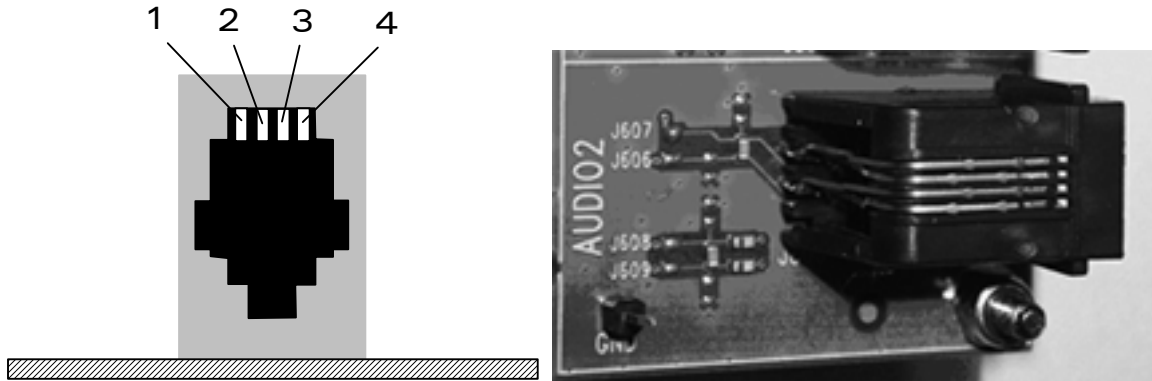


Figure 18: AUDIO2 connector

Table 17 describes the signals and relative pins for the connector.

Pin Number	Signal Name	I/O	I/O Type	Description
1	MIC2N	I	Analog	Main microphone negative input
2	SPK2N	O	Analog	Main speaker negative output
3	SPK2P	O	Analog	Main speaker positive output
4	MIC2P	I	Analog	Main microphone positive input

Table 17: Pin out of the AUDIO2 connector

15.3 AUDIO Functions Description

The AUDIO functions may be electrically removed with special solder (J602 to J609 not soldered).

For example, AUDIO allows transmitting undisturbed signals via the external connector (J201).

By default, AUDIO signals are available on its dedicated connector J601 (for AUDIO1), and J600 (for AUDIO2) (J602 to J609 soldered).

The main audio is named "AUDIO2".

The auxiliary audio is named "AUDIO1".

Development Kit Q2686 and Q2687
AUDIO Functions

Mode	Single-ended	Differential
AUDIO2	NO	YES
AUDIO1	YES	NO

Table 18: AUDIO configuration

16 Parallel Bus Interface (with the Wireless CPU Quik Q2687 only)

With the Wireless CPU Quik Q2687 (not with Wireless CPU Quik Q2686), it is possible to interface applications with a 16-bit parallel bus with few addresses and chip select signals (LCD, NAND FLASH, μ P). All signals are in 1.8V.

These signals are available on the TP (with their names) and the external board connector (J201).

J201 pins	Names on signals	For Wireless CPU Quik Q2686	For Wireless CPU Quik Q2687
J201-78	EP-17	NC	READ(*)
J201-79	EP-0	NC	DATA_0
J201-80	EP-2	NC	DATA_2
J201-81	EP-4	NC	DATA_4
J201-82	EP-1	NC	DATA_1
J201-83	EP-6	NC	DATA_6
J201-84	EP-3	NC	DATA_3
J201-85	EP-5	NC	DATA_5
J201-86	EP-7	NC	DATA_7
J201-87	EP-18	NC	CS3(*)
J201-89	EP-15	NC	DATA_15
J201-90	EP-13	NC	DATA_13
J201-91	EP-11	NC	DATA_11
J201-92	EP-9	NC	DATA_9
J201-93	EP-12	NC	DATA_12
J201-94	EP-10	NC	DATA_10
J201-95	EP-8	NC	DATA_8
J201-96	EP-14	NC	DATA_14
J201-97	EP-16	NC	WRITE(*)
J201-114	EP-20	GPIO1	Configurable signal GPIO1/CS2(*)/A25
J201-115	EP-21	GPIO2	Configurable signal GPIO2/A24
J201-121	EP-19	RESERVED	A1

(*): Signal is active at low level.

Table 19: Signal names according to the Wireless CPU.

Development Kit Q2686 and Q2687 Parallel Bus Interface (with the Wireless CPU Quik Q2687 only)

The possible configurations with signals multiplexed are:

CS3*, A1, GPIO1, GPIO2

CS3*, A1, A24, GPIO1

CS3*, A1, A24, A25

CS3*, CS2*, A1, GPIO2

CS3*, CS2*, A1, A24

(*): Signal is active at low level.

17 DAC Function

The Wireless CPU Quik Q2687 provides one Digital to Analog Converter (DAC): AUX-DAC signal.

This is an 8-bit resolution DAC ranges from 0V to 2.3V. For further information (refer to document.[5]).

The functionality of DAC depends on the embedded software version.

Pin #	Name	I/O(*)	I/O type	Description
88	AUX-DAC	O	2V2	(**)Depends on the software version

Table 20: Pin description of the Digital to Analog Converter

(*): According to Wireless CPU view.

(**): Available with the OS 6.61. (Refer to document [7]).

18 Antenna Function

The antenna is connected to the board via the SMA connector.

The antenna cable is fitted with a FME connector. An SMA/FME adapter is provided, allowing the connection to the board.

18.1 RF Connectors (P200+J202)



Figure 19: RF connectors

Pin Number	Signal Name	I/O	I/O Type	Description
1	ANT		RF 50 Ω	RF signal
2, 3	GND			Ground

Table 21: Pin-out of the RF connector

Warning:

Care must be taken with the IMP connector. It is only made to be used (connected/disconnected) for 20 times. .

19 ESD Functions

External ESD protections are added on the Development Kit Q26 for the following signals:

- SIM interface signals: SIMPRES, SIM-VCC, SIM-IO, SIM-CLK, and SIM-RST ($\pm 15\text{kV}$, air discharge).
- USB interface signals: USB-DP and USB-DM ($\pm 15\text{kV}$, air discharge).

The other interface signals are protected on chip:

- UART1 signals with the ADM3307 transceiver ($\pm 15\text{kV}$, air discharge).
- UART2 signals with the LTC2804 transceiver ($\pm 10\text{kV}$, air discharge).
- AUDIO1 and AUDIO2 ($\pm 15\text{kV}$, air discharge).

Warning:

The user must be protected against the ESD discharges, when he uses the TP signal (on the center of Development Kit Q26).

20 Measures of Current

To measure the current consumed by the Wireless CPU, use the configuration as shown in Figure 20:

Do not solder the "special solder", J103.

On UART1:

- Remove R408.
- Place R406=0 Ω (like R408).

On UART2:

- Remove R502 and R505.
- Place R506=0 Ω (like R502).
- The UART2 link is not used, therefore J501, J502, J503, and J504 must be open (by removing the solder).
- The switch UART2 must be switched to "GPIO1" position.

On BAT-TEMP:

- Remove R100.
- Plug an external power supply like **VCC-EXT** on "VBAT"(+), and (GND) on "GND"(-). This power supply may be set to **4 volts**. Thus, peripherals may be used.

On USB:

The USB link is not used, therefore J801, J802, and J803 must be open (by removing the solder).

With this configuration, the consumption current from VBATT is ONLY that of the Wireless CPU plugged in. For further information refer to document.[3] or [6].

Note:

Before doing any modification, ensure that the Development Kit is disconnected from the power supply during the work. Use pewter and a soldering iron (refer to WS80 from Weller or similar) to solder.

Development Kit Q2686 and Q2687
Measures of Current

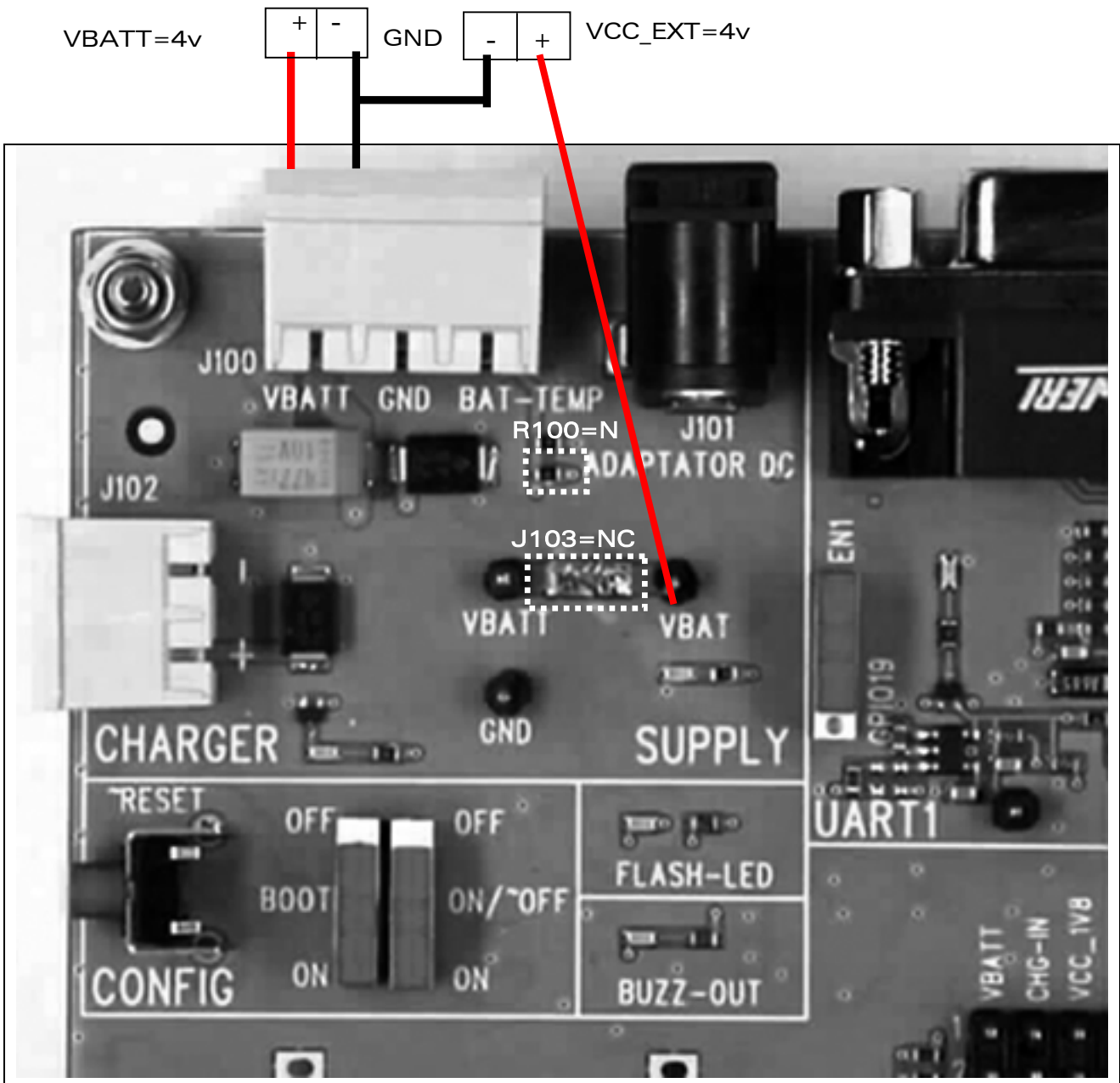


Figure 20: Configuration for the measure of current

21 Starting Procedure

21.1 Unpacking the Development Kit Q2686 or Q2687 components

The Wireless CPU Quik Q26 series box contains:

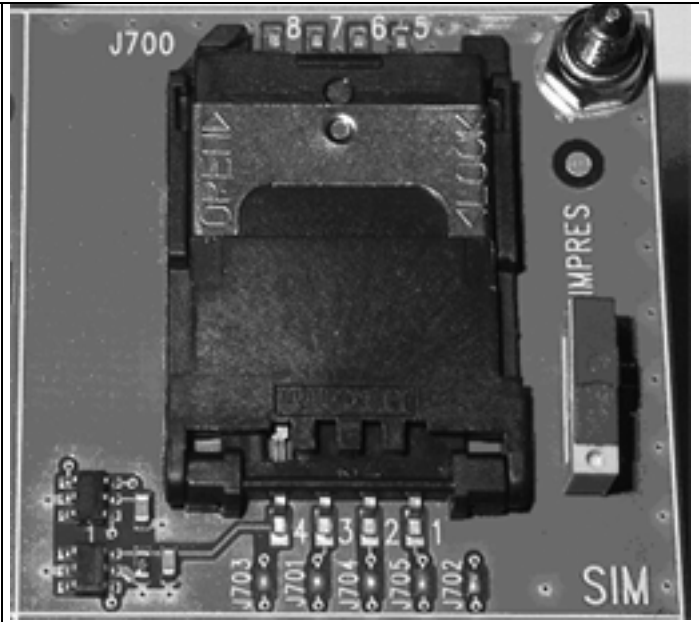
- 1 Development Kit Q26 board.
- 1 Wireless CPU soldered, and 1 free (Wireless CPU Quik Q2686 or Q2687).
- 1 SMA/FME antenna connector.
- 1 Power supply connector (3-pin).
- 1 AC/DC adapter.
- 1 RS232 cable.
- 1 USB cable.
- 1 Handset.
- 1 RJ9 cable (for handset).
- 1 CDROM with all specifications inside.



21.2 Setting the Accessories

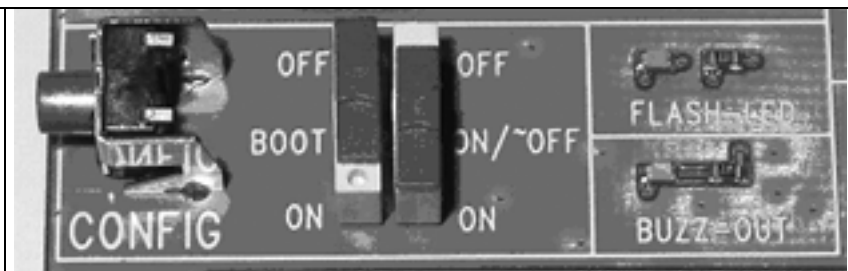
Follow the instructions shown below step by step:

Insert a SIM card into the SIM card holder, J700 (if communications are required).



Make sure that:

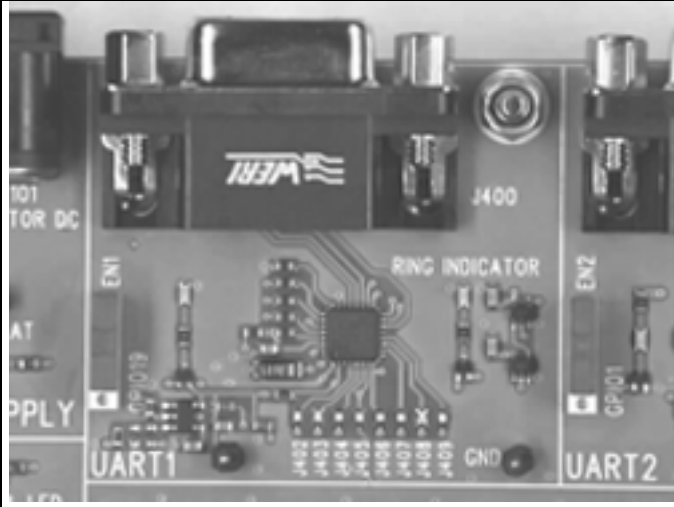
- The "ON/OFF" switch is in the "ON".position
- The "BOOT" switch is in the "OFF".position



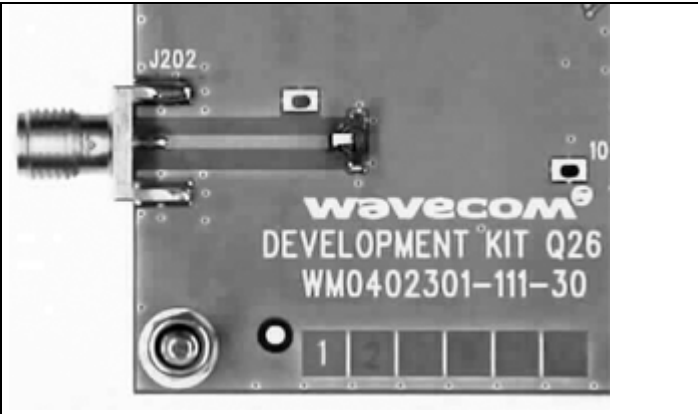
- Also make sure that:
 - The UART1 switch is in the "EN1" position.
 - The UART2 switch is in the "EN2" position.
 - The SIM switch is in the "SIMPRES" position.
 - All special solders are soldered.

Development Kit Q2686 and Q2687 Starting Procedure

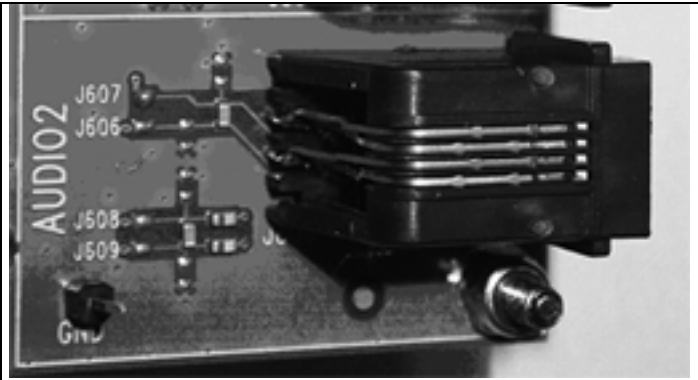
Connect RS232 cable, provided with the Development Kit Q26, between PC port and **J400** of the board. (baud rate, by default to 115.2 kbps,8N1)



Connect the antenna to **SMA** connector (J202), (if communications are required).



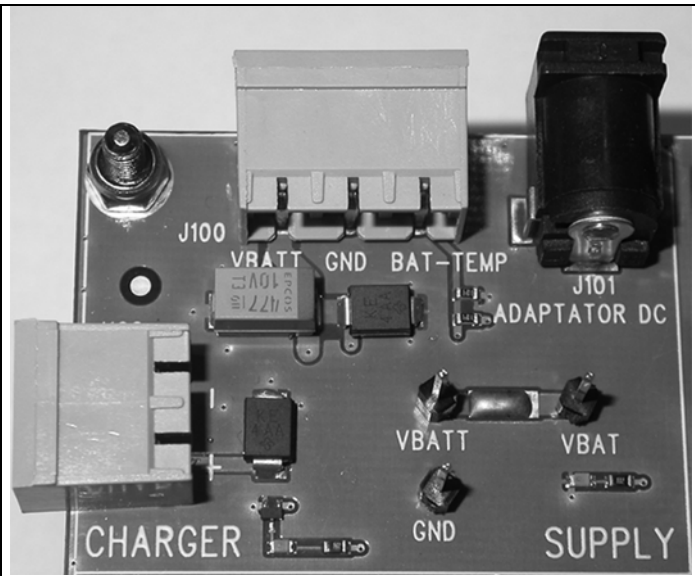
Connect the handset, provided with the Development Kit Q26, to the Main AUDIO connector **J600** (if communications are required).



Development Kit Q2686 and Q2687 Starting Procedure

21.3 Power Supply

Plug the power supply (via the adapter (J101) or external power supply, 4V/2.5A (J100)).



21.4 Communication Test

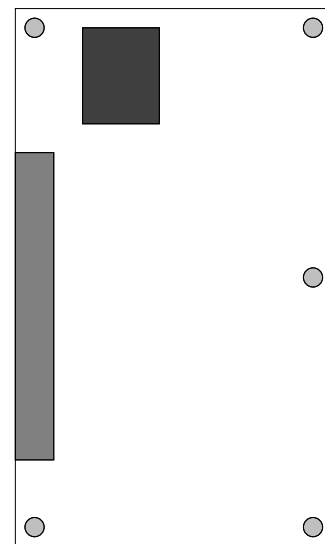
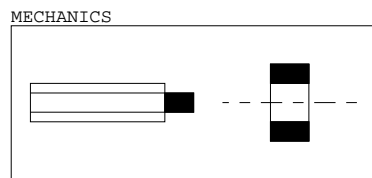
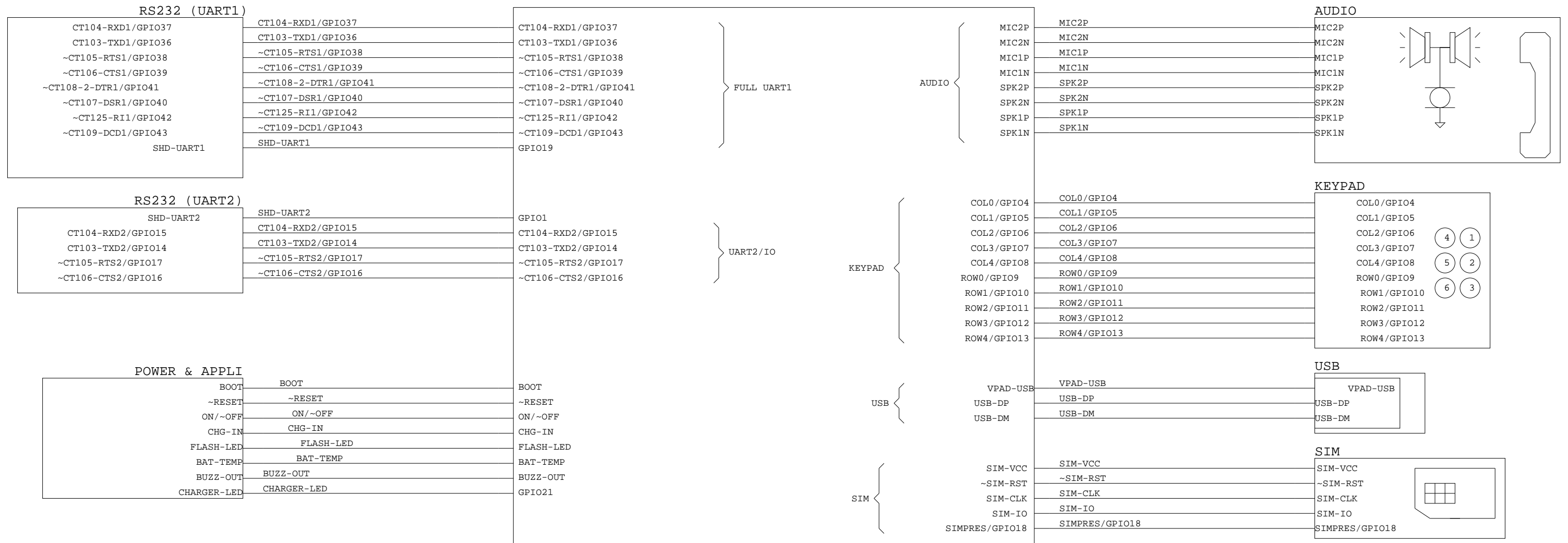
- Using the terminal emulator, send the following command on COM port to communicate with the Wireless CPU Quik Q26 Series: **AT**.
- When the communication is established between the PC and the Wireless CPU, the last one sends the message "OK" as a reply. The message is displayed in the terminal emulator window.

Refer to document [4] to communicate between the PC and the Q2686 Wireless CPU with AT commands.

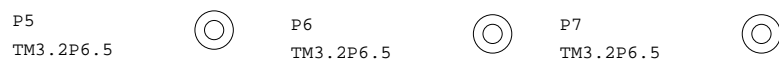
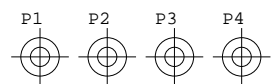
Refer to document [7] to communicate between the PC and the Q2687 Wireless CPU with AT commands.

22 Appendix

CONNECTORS



PCB=V3.0
PCB



PROJECT: DEVELOPMENT KIT Q26

SCHEMATIC: HIERARCHIC

Date: 23/01/05

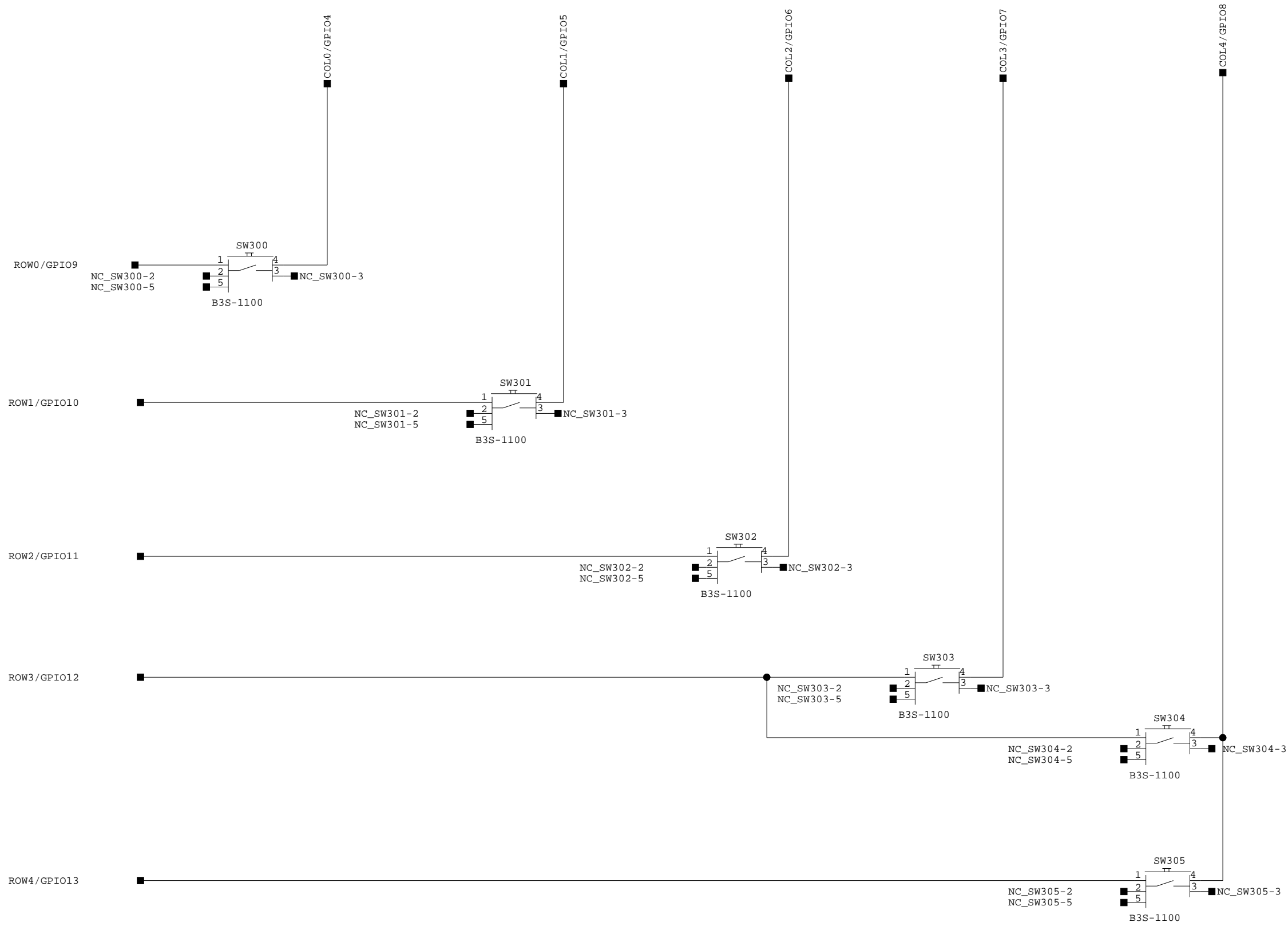
Version: 3.0

Validate by: FDL

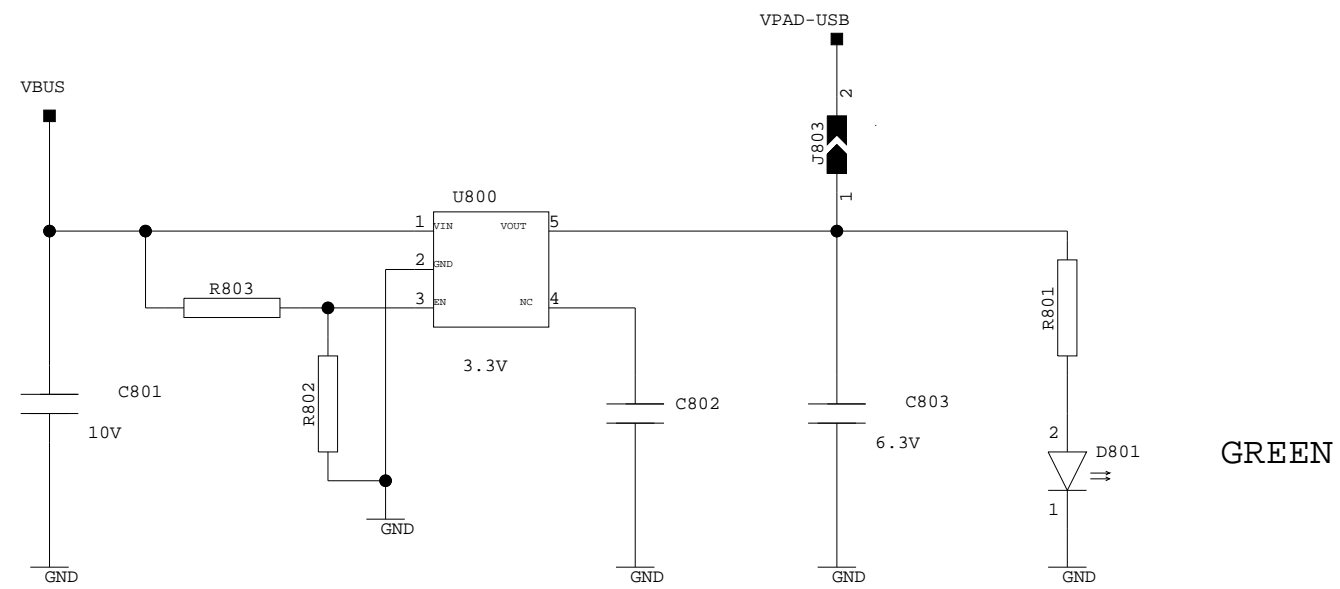
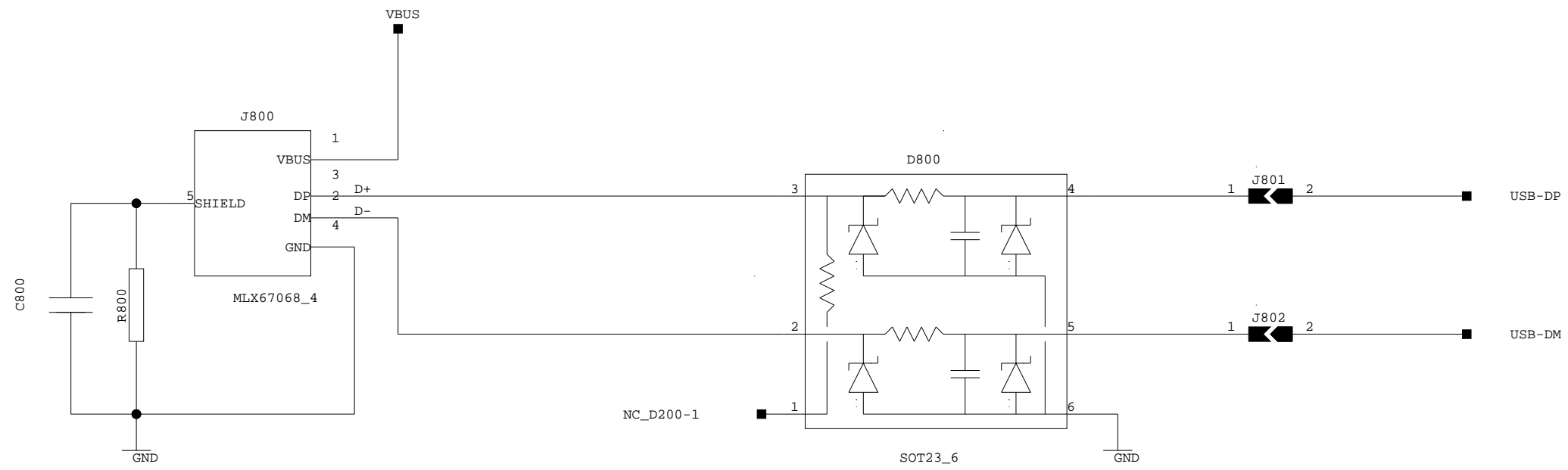
Verify by: FDL

Made-by: GGI

Sheet : 0/8



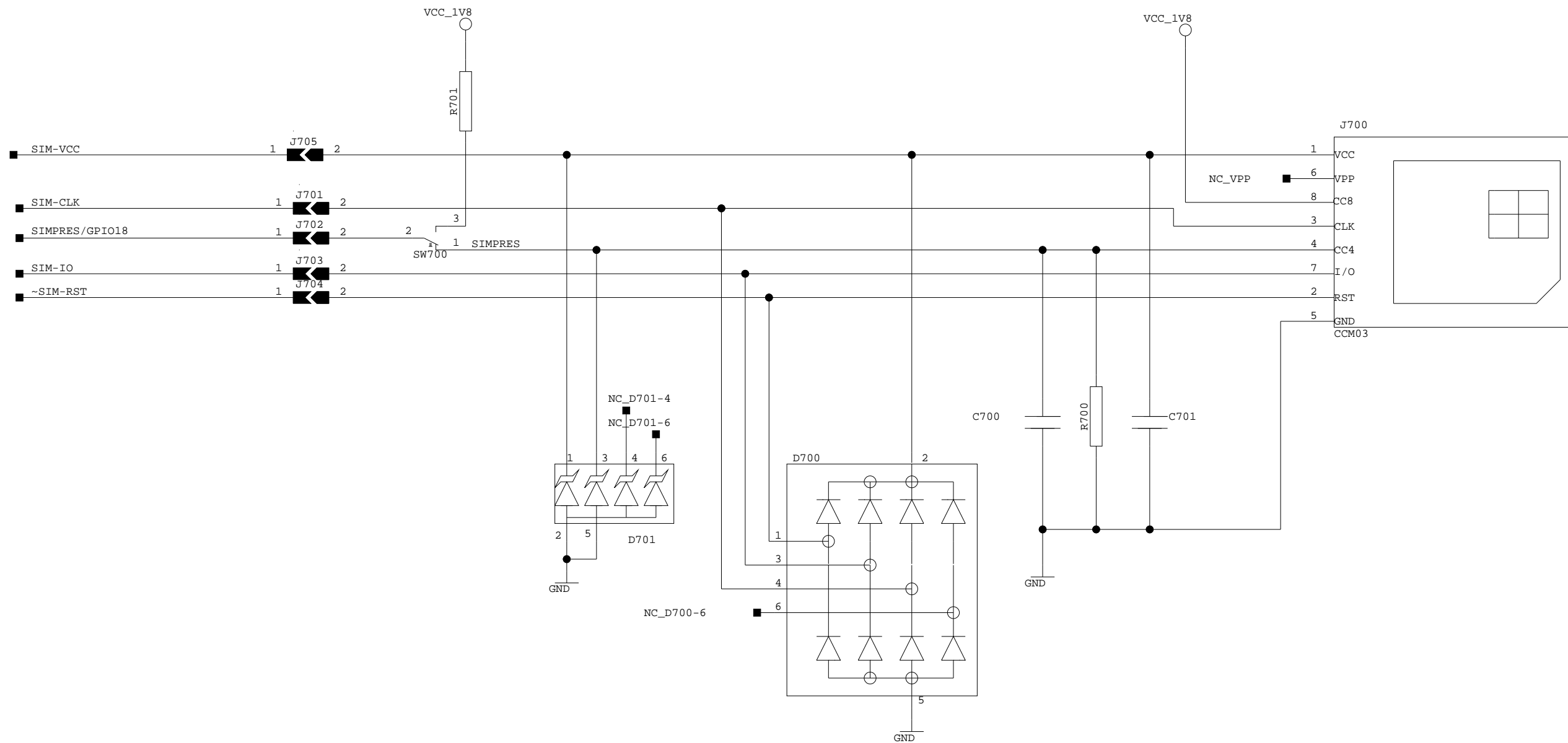
PROJECT: DEVELOPMENT KIT Q26	
SCHEMATIC: KEYPAD	
Date:	23/01/05
Version:	3.0
Validate by:	FDL
Verify by:	FDL
Made-by:	GGI
Sheet :	3/8



GREEN

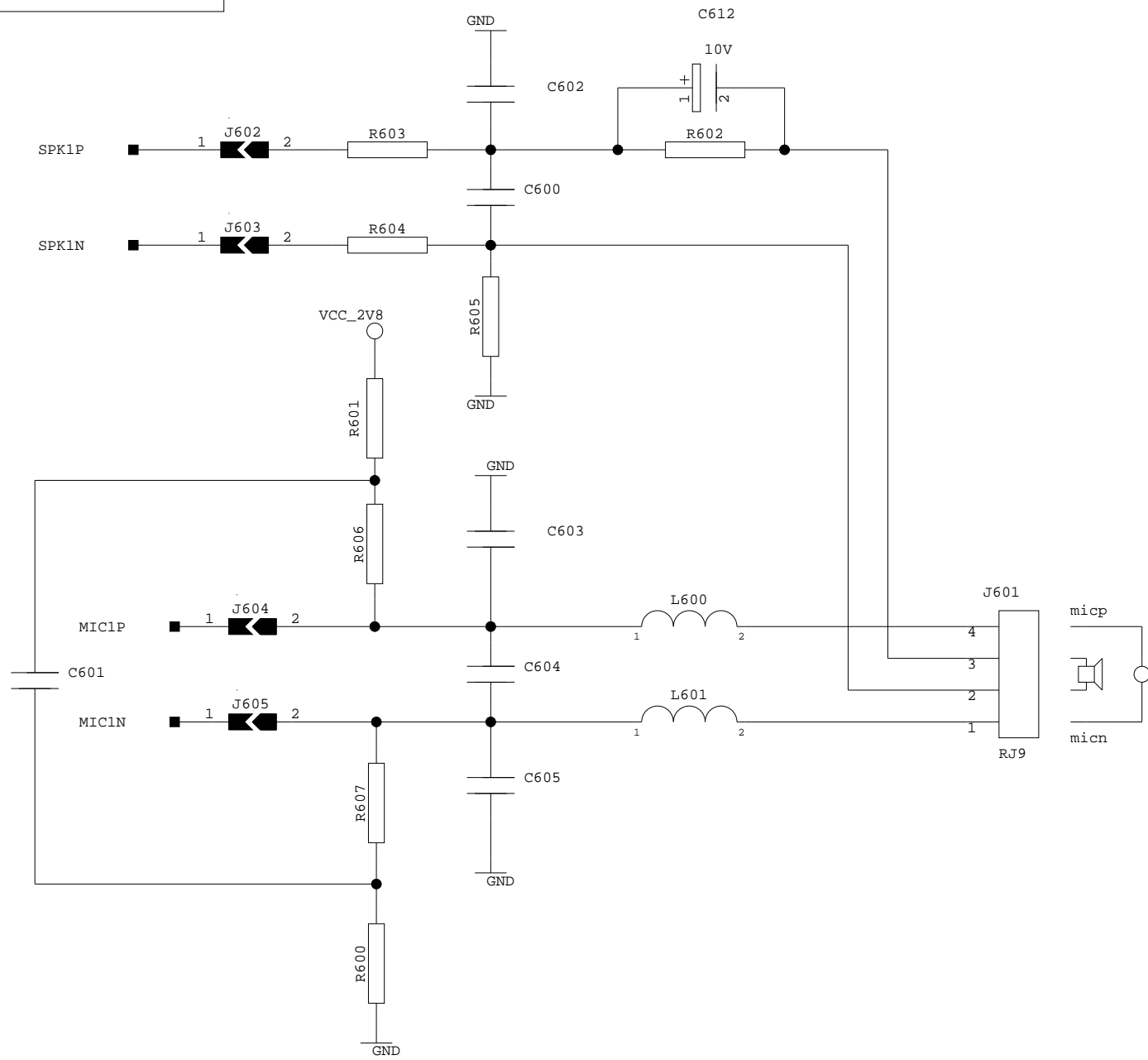


PROJECT: DEVELOPMENT KIT Q26	
SCHEMATIC: USB	
Date:	23/01/05
Version:	3.0
Validate by:	FDL
Verify by:	FDL
Made-by:	GGI
Sheet :	8/8

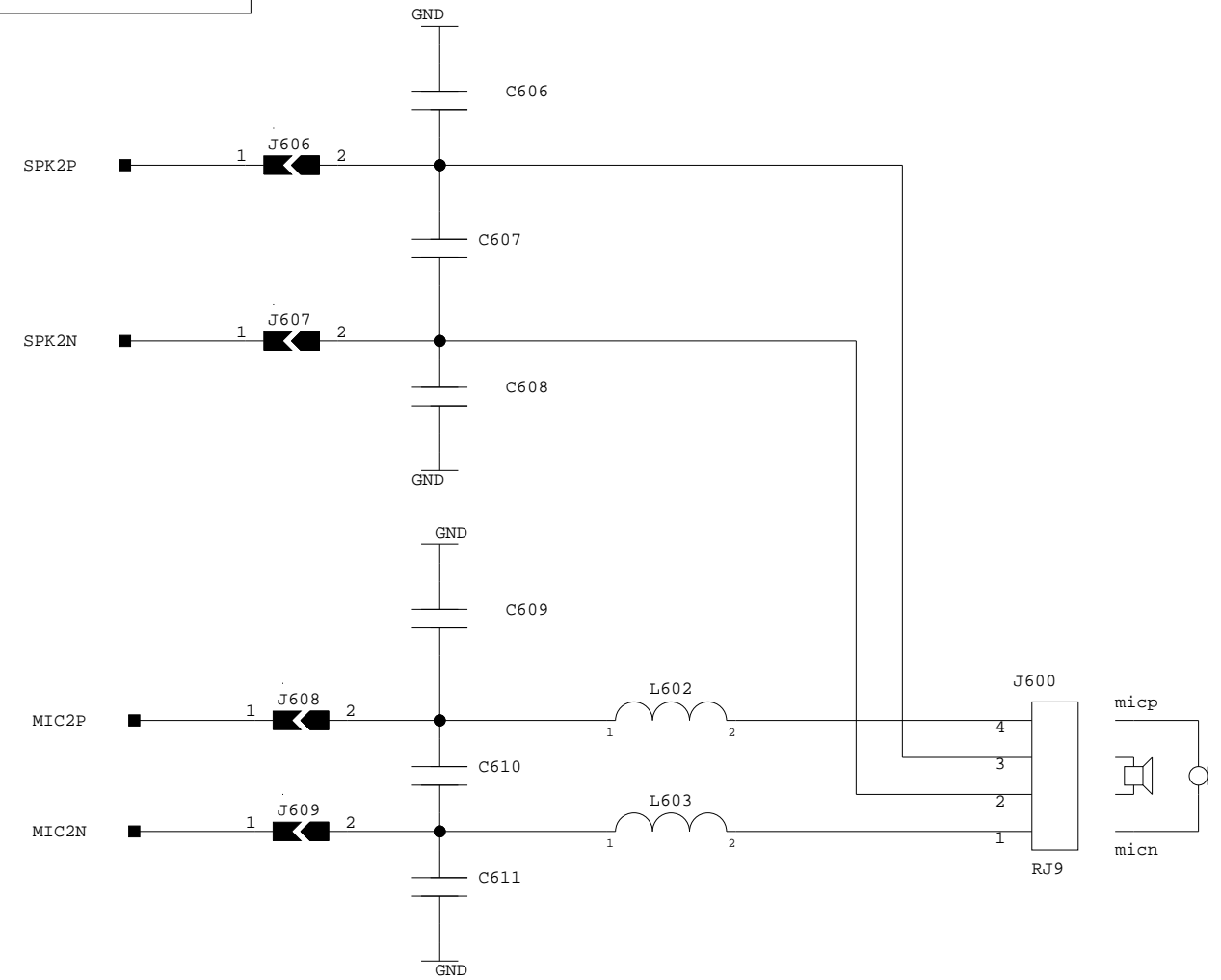


PROJECT: DEVELOPMENT KIT Q26	
SCHEMATIC: SIM	
Date:	23/01/05
Version:	3.0
Validate by:	FDL
Verify by:	FDL
Made-by:	GGI
Sheet :	7/8

SUB AUDIO



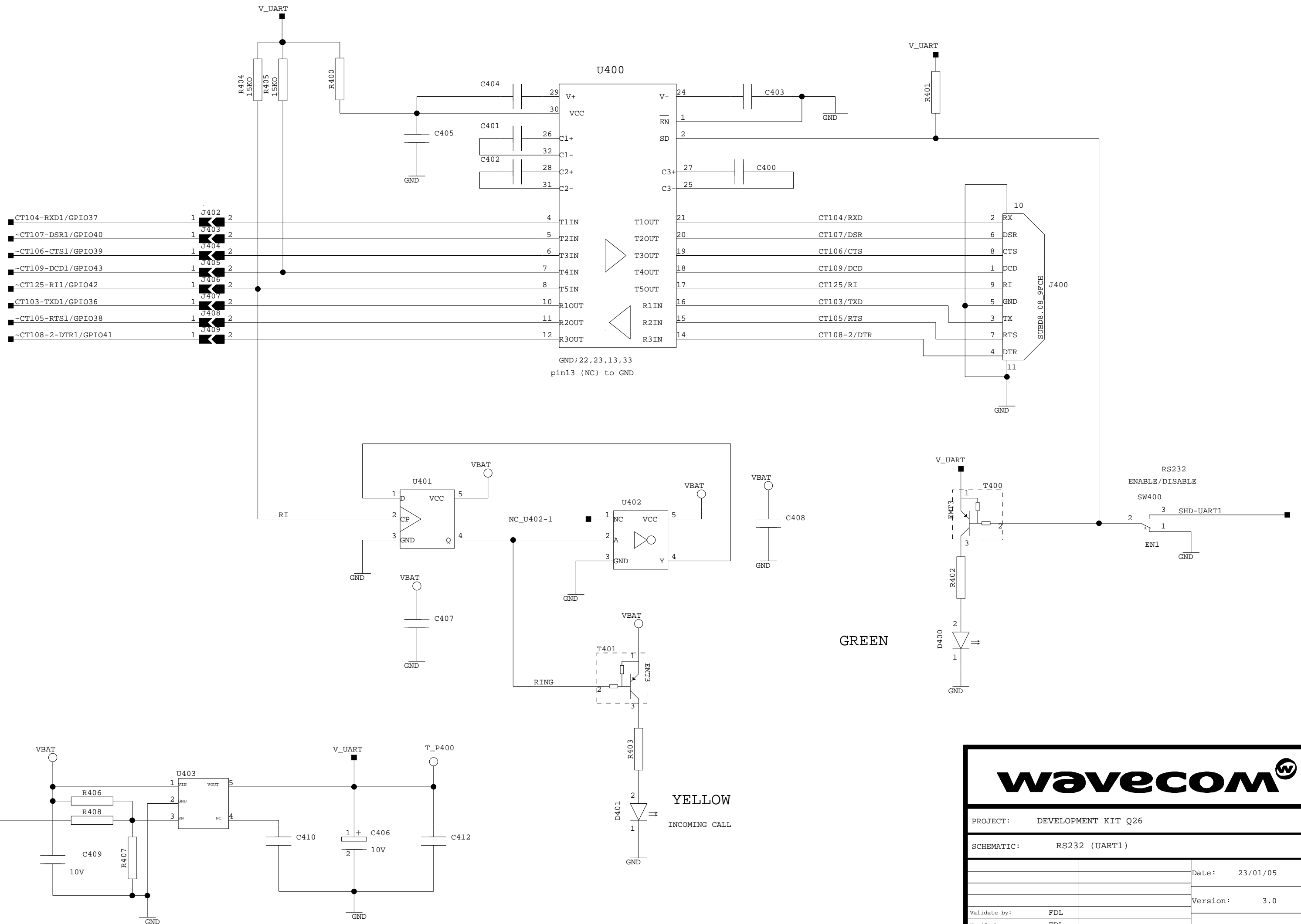
MAIN AUDIO



PROJECT: DEVELOPMENT KIT Q26

SCHEMATIC: AUDIO

		Date:	23/01/05
		Version:	3.0
Validate by:	FDL		
Verify by:	FDL	Sheet :	6/8
Made-by:	GGI		

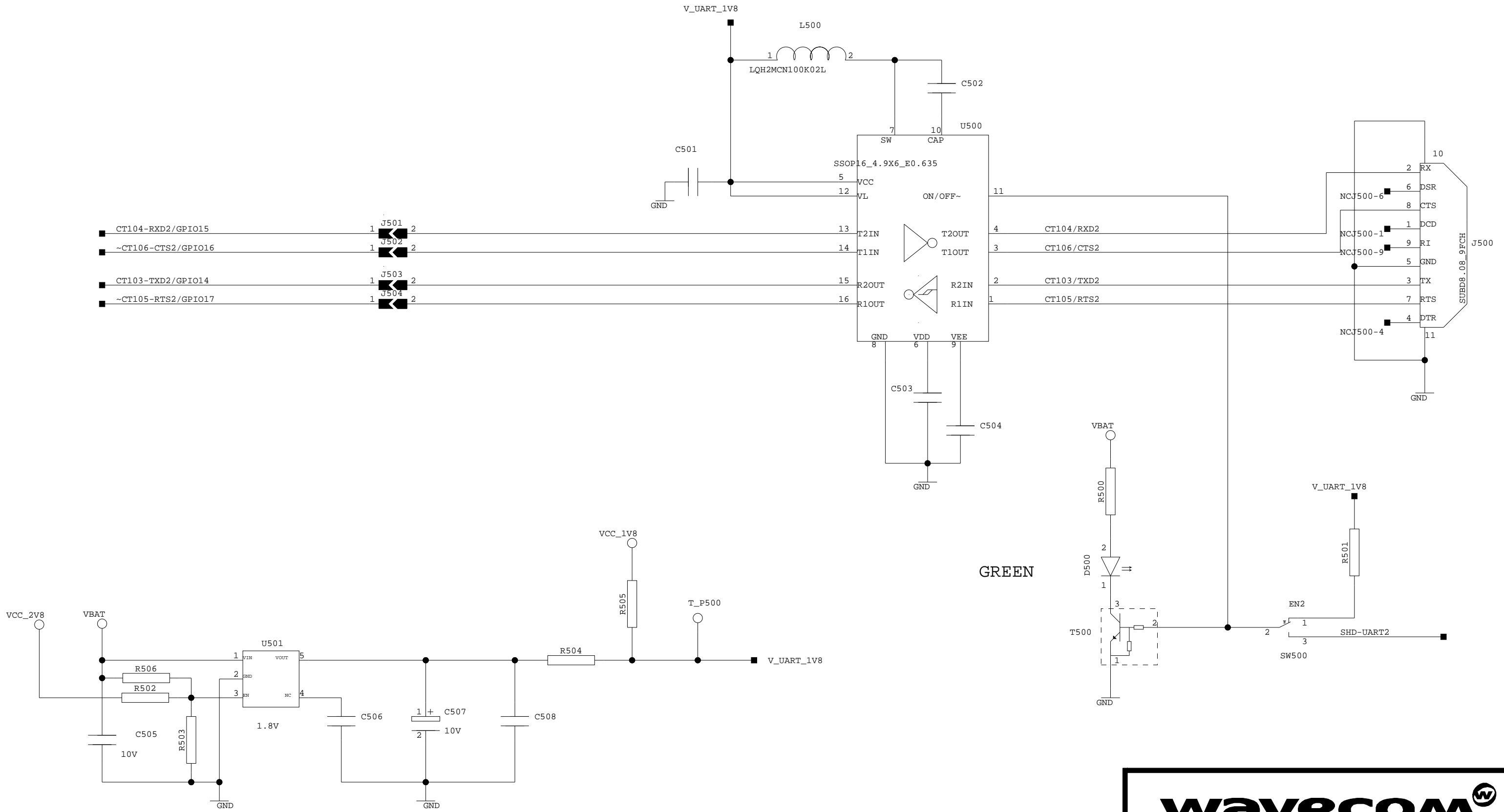


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PROJECT: DEVELOPMENT KIT Q26

SCHEMATIC: RS232 (UART1)

Date:	23/01/05
Version:	3.0
Validate by:	FDL
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Sheet :	4/8



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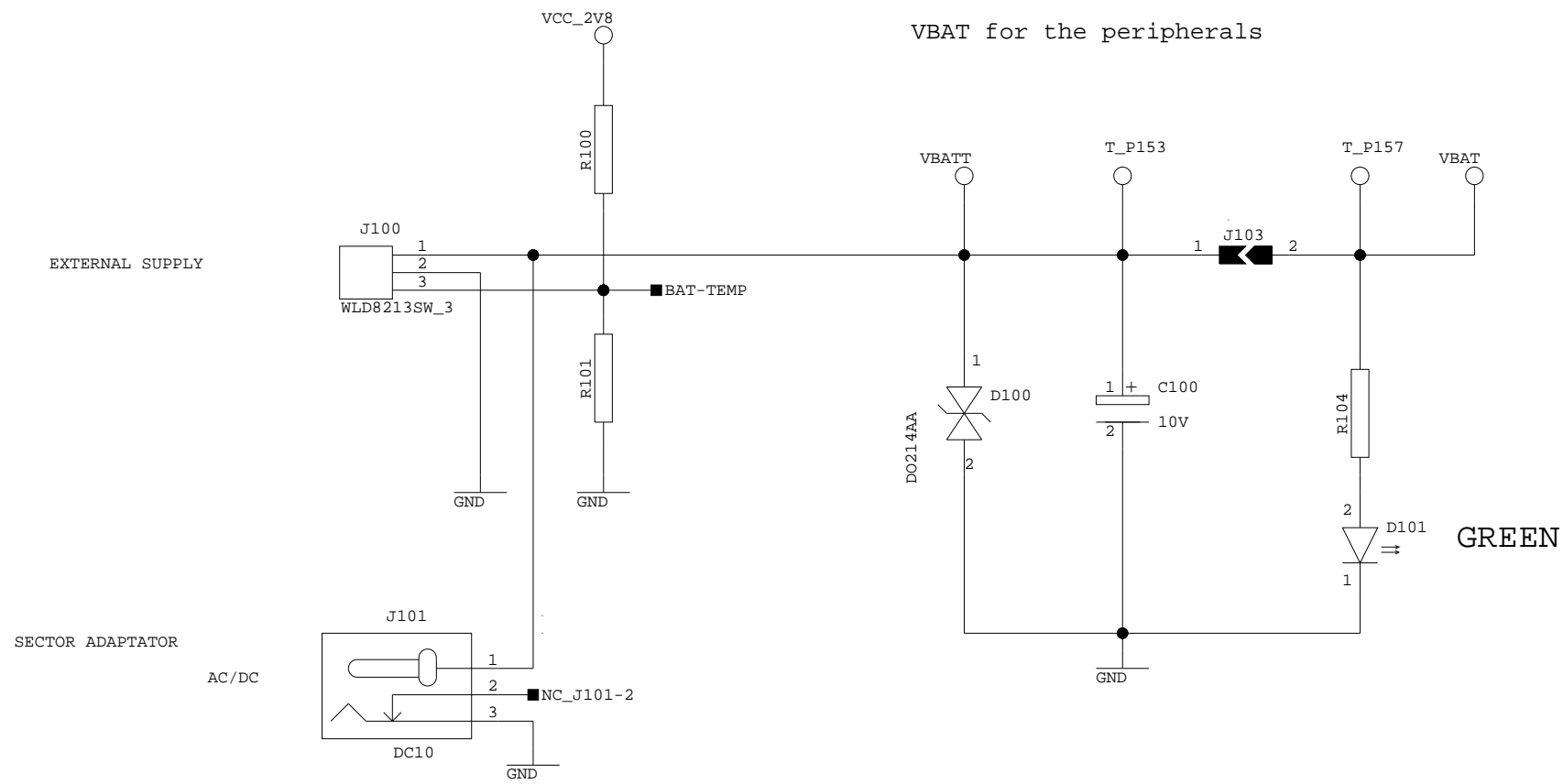
PROJECT: DEVELOPMENT KIT Q26

SCHEMATIC: RS232 (UART2)

	Date: 23/01/05
	Version: 3.0
Validate by: FDL	Sheet : 5/8
Verify by: FDL	
Made-by: GGI	

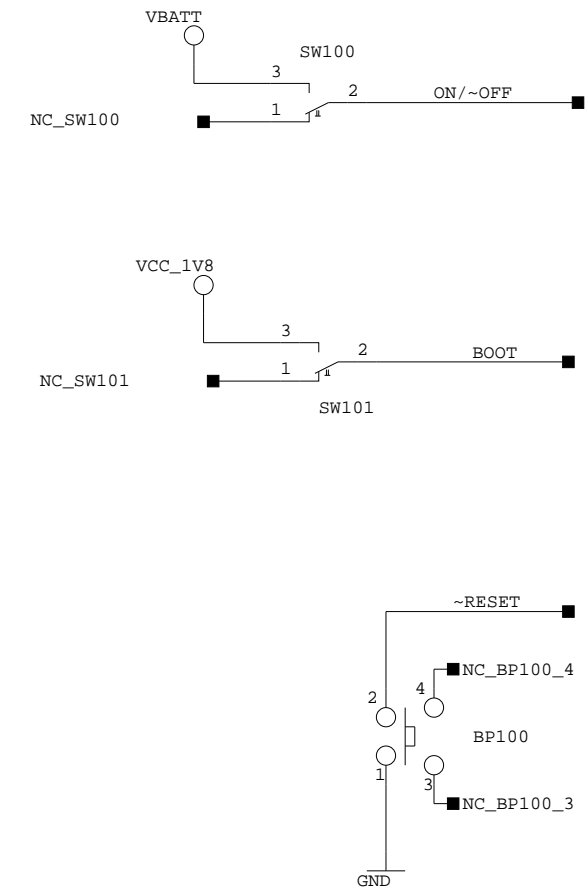
POWER SUPPLY

VBATT for the module
VBAT for the peripherals



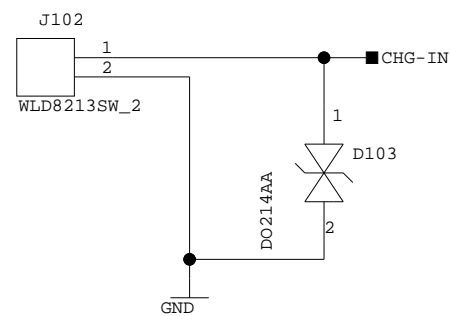
GREEN

CONFIG

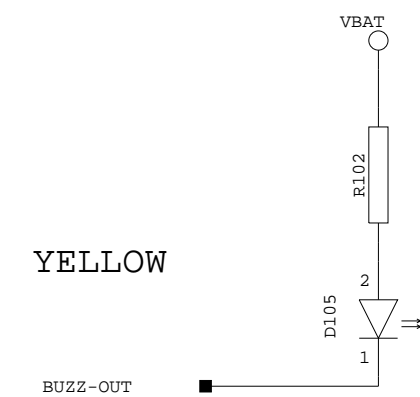


CHARGER

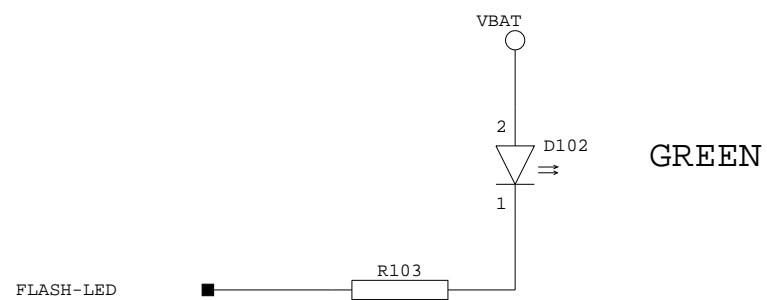
CHARGER INPUT



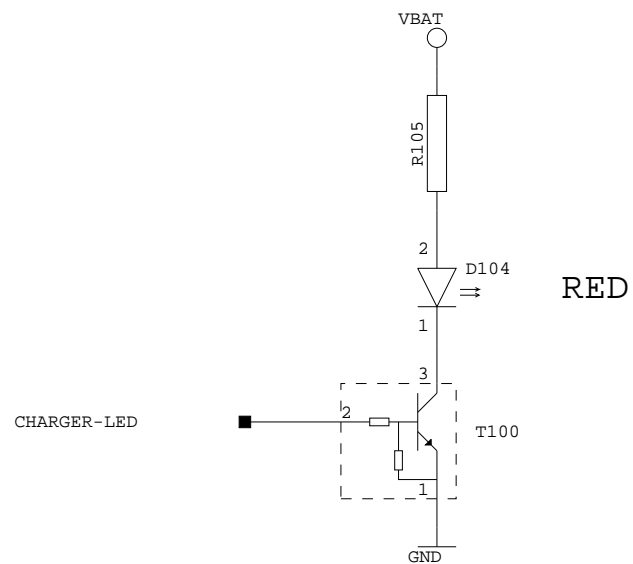
BUZZER



YELLOW



GREEN



RED



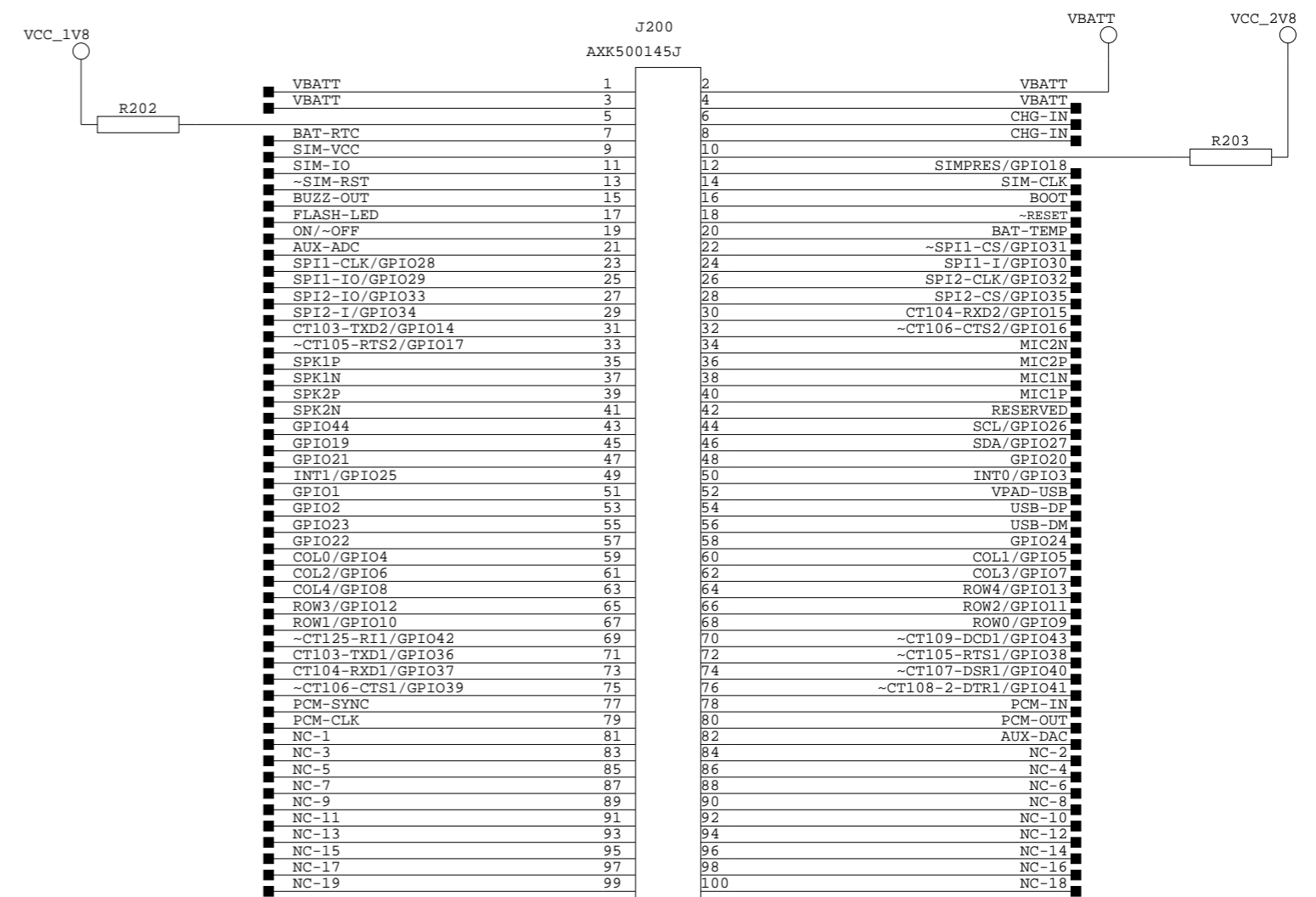
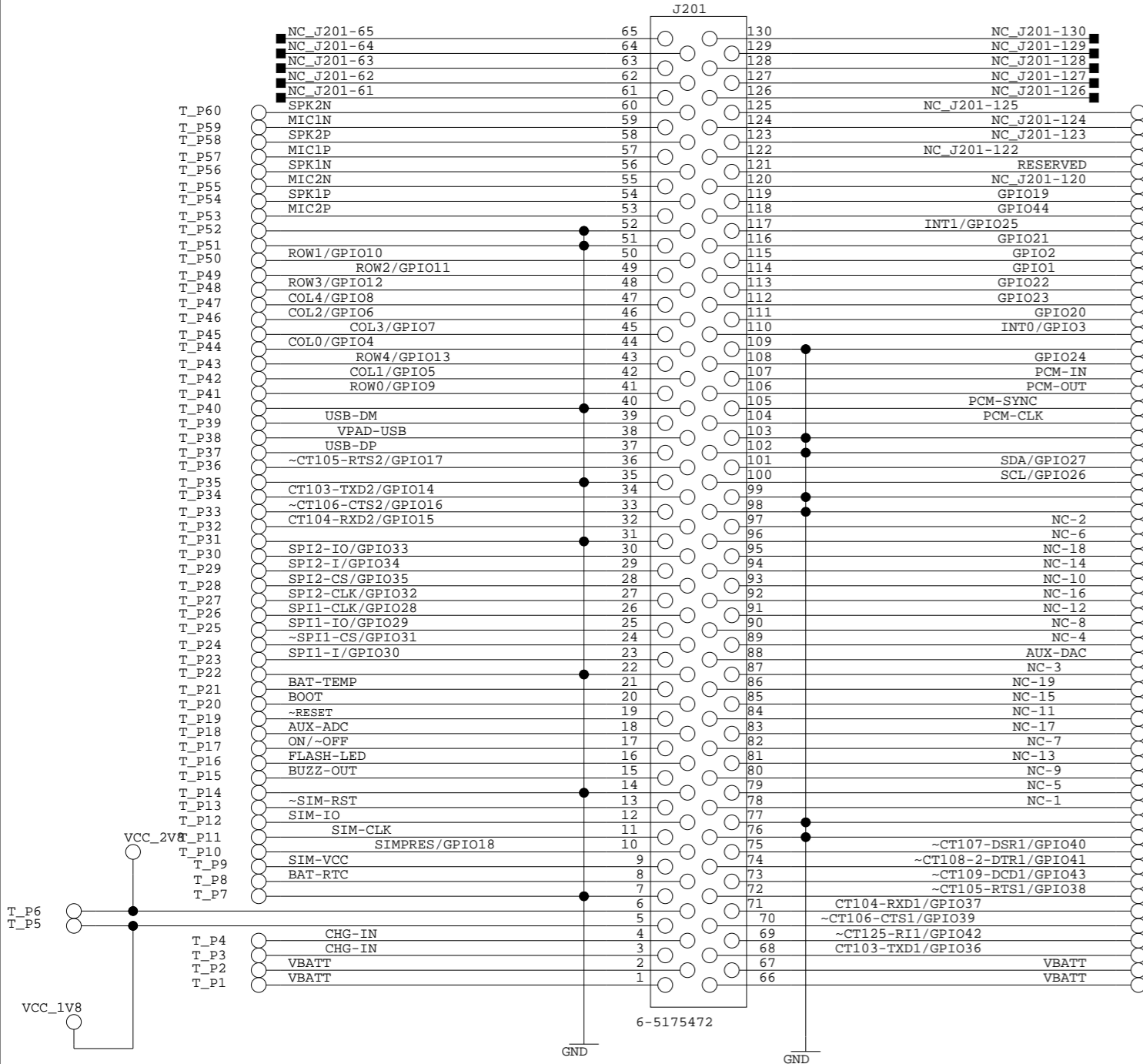
PROJECT: DEVELOPMENT KIT Q26

SCHEMATIC: POWER + CTRL

Date:	23/01/05
Version:	3.0
Validate by:	FDL
Verify by:	FDL
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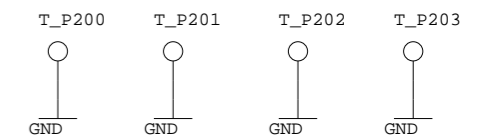
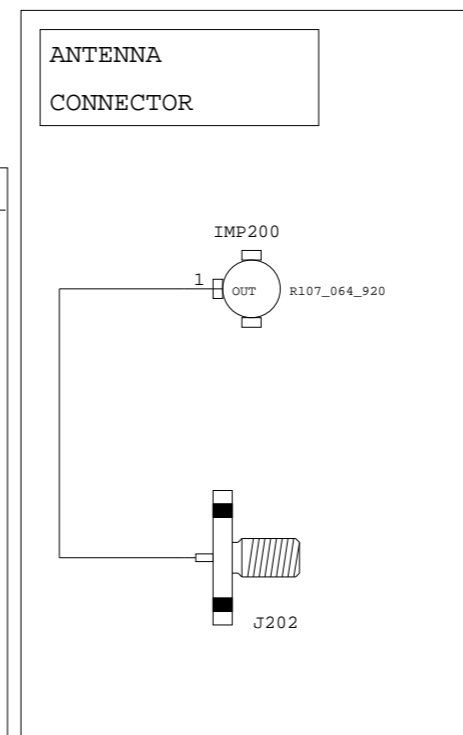
EXTERNAL BOARD CONNECTOR

MODULE CONNECTOR

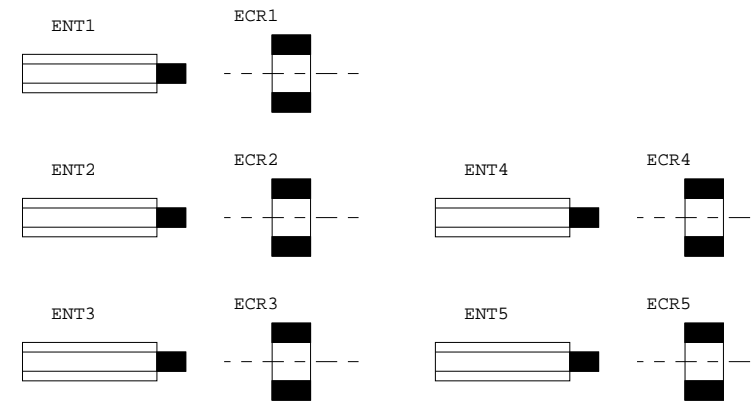


DETAILS OF THE PINS NAMES
ACCORDING TO THE MODULE

J201	J200	Q2686	NAMES ON BOARD	Q2687
J201-78	J200-81	NC-1	EP-17	~OE-R/W
J201-79	J200-85	NC-5	EP-0	D0
J201-80	J200-89	NC-9	EP-2	D2
J201-81	J200-93	NC-13	EP-4	D4
J201-82	J200-87	NC-7	EP-1	D1
J201-83	J200-97	NC-17	EP-6	D6
J201-84	J200-91	NC-11	EP-3	D3
J201-85	J200-95	NC-15	EP-5	D5
J201-86	J200-99	NC-19	EP-7	D7
J201-87	J200-83	NC-3	EP-18	~CS3
J201-89	J200-86	NC-4	EP-15	D15
J201-90	J200-90	NC-8	EP-13	D13
J201-91	J200-94	NC-12	EP-11	D11
J201-92	J200-98	NC-16	EP-9	D9
J201-93	J200-92	NC-10	EP-12	D12
J201-94	J200-96	NC-14	EP-10	D10
J201-95	J200-100	NC-18	EP-8	D8
J201-96	J200-88	NC-6	EP-14	D14
J201-97	J200-84	NC-2	EP-16	~WE-E
J201-114	J200-51	GPIO1	EP-20	~CS2/A25/GPIO1
J201-115	J200-53	GPIO2	EP-21	A24/GPIO2
J201-121	J200-42	RESERVED	EP-19	A1



PROJECT:	DEVELOPMENT KIT Q26
SCHMATIC:	CONNECTORS
Date:	23/01/05
Version:	3.0
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PROJECT: DEVELOPMENT KIT Q26

SCHEMATIC: MECHANICS

Date: 23/01/05

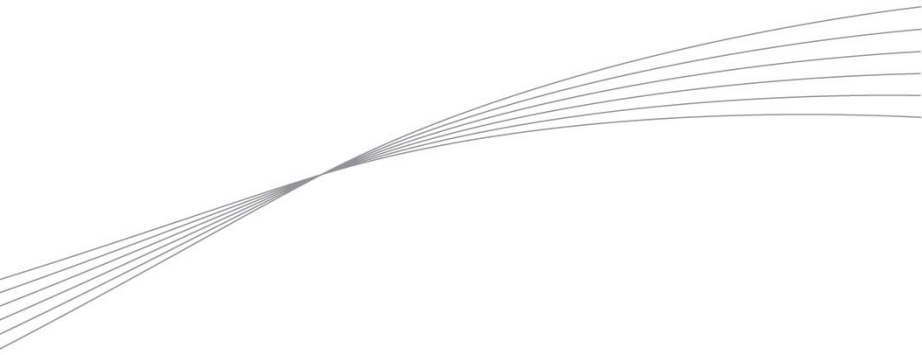
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