

EVBQ26xx

MANUAL

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History

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GLYN

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1. Introduction

1.1. EVBQ26xx Evaluation Board for WAVECOM Wireless CPUs Q26xx Series

The EVBQ26 Evaluation Board from GLYN offers a very cost-effective and easy way to evaluate and develop applications with WAVECOM Q26 Series Wireless CPUs.

The Q26xx platform is the latest series of Wireless CPUS developed by WAVECOM for mobile communication. Based on a powerfull ARM9 microcontroller core, the Q26 series offers processing power for the mobile communication stack firmware and customer specific embedded Open AT application software.

At the moment Q26 series Wireless CPUs are available for Quadband GSM/GPRS (Q2686) and EDGE (Q2687), but more variants are under development for CDMA and UMTS mobile communication technologies.

1.2. Scope of Delivery

- ◆ EVBQ26xx Evaluation Board with appropriate Wavecom Wireless CPU
- ◆
- ◆ EVBQ26xx Manual
- ◆ CD with Wavecom Open AT Software Suite and documentation
- ◆ RS232 cable
- ◆ 2x50pin 2.54mm connector
- ◆ Dualband GSM antenna

Optional:

- ◆ M1306B Power Supply :
Power supply for WAVECOM Fastrack Modem and EVBQUIK

1.3. Quick Start

- 1) Connect the EVBQ26xx's serial port (X3) to a PC's serial port (COM1: etc.) with the RS232 cable
- 2) Start a terminal emulation software (Hyperterm or something similar) on the PC, check communication parameters: correct COM port, 115200 baud, 8bit, no parity, 1 stop, RTS/CTS or Hardware Handshake
- 3) Connect the antenna to the antenna connector on the EVBQ26xx
- 4) Connect a power supply (9-12V DC, 1A) to connector X1A or the specific power supply M1306B Power Supply to X1B on the EVBQ26xx
- 5) The green LED (Power) should be on immediately, the red one (GSM) 1-2 seconds later
- 6) Insert a SIM card into the SIM card socket SIM1 on the EVBQ26xx
- 7) From the terminal software, type **AT** and hit **[RETURN]** until you receive the response **OK**
- 8) Enter **AT+CPIN=** and your PIN number and hit **[RETURN]**
- 9) After some time, the red LED should start blinking, the module is registered to the network and can start communication

1.3.1. Voice Call

For voice calls it is necessary to connect some audio hardware to the EVBQ26xx. Audio pins are available on the 2x50pin connectors U1 and U2. Please consult the Product Technical Specification PTS for additional information

1.3.2. Data Call

- 1) Enter **ATD** and the phone number you want to connect to.
- 2) After establishing contact the module answers **CONNECT XXXX** , with XXXX indicating the baudrate of the data connection.
- 3) To close the data connection, type **+++** to enter command mode (module answers **OK**) and then **ATH** to close the connection

1.3.3. Receiving Calls

- 1) When receiving a call, the module sends unsolicited responses, either **RING** or **+CRING: XXXX** , with XXXX indicating the type of call being received [This can be changed with the **AT+CRICB** command]

NOTE: When receiving calls from the conventional telephone network, the indication of incoming call bearer type (voice or data) may not be correct, depending on network, SIM card and module settings.

Setting **AT+CICB=0** will set the modem for incoming data calls.

For more information, refer to the commands **AT+CICB** and **AT+CSNS** in the AT commands manual.

- 2) Answer the call with **ATA** or reject it with **ATH**
- 3) In the case of data calls, use **+++** and **ATO** to switch between data and command mode
- 4) To close the connection, enter **ATH**

1.3.4. Sending SMS

- 1) Enter **AT+CMGS=** and the phone number you want to send the SMS to, i.e. **AT+CMGS=0123456789**
- 2) The module sends a **>**
- 3) Enter the text of your SMS
- 4) To send the SMS, type [**CTRL-Z**]
- 5) The module response **+CMGS: XX** , with XX being a continuous number, increasing by one for every SMS sent

1.3.5. Receiving SMS

- 1) When receiving a SMS, the module sends an unsolicited response **+CMTI: XX,YY** , with XX indicating the memory type used for storage of the SMS (.,SM being the SIM card memory) and YY indicating the number of the storage position
- 2) To read the SMS, type **AT+CMGR=YY** , with YY indicating the storage position of the SMS
- 3) To list all SMS stored in memory, enter **AT+CMGL="ALL"**
- 4) To delete a SMS enter **AT+CMGD=YY** , with YY indicating the storage position of the SMS to be deleted

1.4. Common Error Messages

When a command fails to execute, an error message is sent. This is either a generic **ERROR** or a more detailed **+CME ERROR: XX** or **+CMS ERROR: XX**. When you receive just the **ERROR** response, please set the module for extended error codes using the **AT+CMEE=1** command and retry the previous command. Some common error messages are listed below.

1.4.1. +CME ERROR:

	Meaning	Action
3	Operation not allowed	
4	Operation not supported	
10	SIM not inserted	insert SIM card, check SIM card reader
11	SIM PIN required	enter SIM PIN
12	SIM PUK required	enter SIM PUK
13	SIM failure	remove and reinsert SIM card, check SIM card with other GSM equipment
17	SIM PIN2 required	enter SIM PIN2
18	SIM PUK2 required	enter SIM PUK2
20	Phonebook memory full	
26	Dial string too long	

1.4.2. +CMS ERROR:

	Meaning	Action
302	Operation not allowed	
303	Operation not supported	
304	Invalid PDU mode parameter	
305	Invalid text mode parameter	
310	SIM not inserted	insert SIM card, check SIM card reader
311	SIM PIN required	enter SIM PIN
313	SIM failure	remove and reinsert SIM card, check SIM card with other GSM equipment
316	SIM PUK required	enter SIM PUK
317	SIM PIN2 required	enter SIM PIN2
318	SIM PUK2 required	enter SIM PUK2
321	Invalid memory index	
322	SIM memory full	
330	SCA address unknown	enter service center address AT+CSCA=XXXX

1.5. Important Links

Wavecom	www.wavecom.com
GSM World (GSM Association)	www.gsmworld.com

2. Hardware

2.1. EVBQ26xx Board Description

The EVBQ26xx evaluation board is based on the original WAVECOM reference design.

All peripherals functions (RS232, USB, LED, Switches, Display) can be easily disconnected from the module by jumpers or solder pads.

Connection to a PC or other control device is established via standard serial RS232 interface on connector X3 or using the USB connector X5.

All pins of the Q26 Series Wireless CPU are available on the 2x50pin 2.54mm connector U1/U2 for easy measurement or connection of peripheral devices.

2.2. Power Supply

2.2.1. Using on-board voltage regulation circuit

Though the EVBQ26xx power supply is based on a design rated from 5.5 to 32V, it has so far only been tested for a supply of 9-12V DC. Connection of the power supply to the board can be made by either one of two connectors X1A or X1B.

Connector X1B allows connection of a specific power supply for WAVECOM modems using a MOLEX Micro-Fit connector.

Any other power supply meeting the requirements can be connected to X1A. Please observe the correct connection of VCC and GND, though a diode D1 is implemented to provide some protection against accidental switching of polarity.

Power Supply 9-12V DC, 1A

X1BA : M1306B Power Supply : power supply for WAVECOM modems

X1B : any other power supply, observe polarity

**DO NOT CONNECT TWO POWER SUPPLIES
AT THE SAME TIME !**

2.2.2. Using a custom power supply

It is also possible to connect your own stabilised 3.6V power supply directly to the module by opening jumper J1 and thus disconnecting the on-board voltage regulation circuit from the module. Capacitor C25 still remains connected to the module. The external power supply can then be connected to pin 3 and 4 (VBATT) and 1 and 2 (GND) of the 50pin connector U1.

This power supply must meet the specifications for the Q26 Series Wireless CPUs such as current peaks of up to 2A and a maximum voltage drop of 300mV during transmission burst. For more information, please check the detailed technical documentation, which also contains examples of power supply circuits.

2.2.3. Power LED (LED5)

The Power(VBATT) indication LED (LED5) is connected directly to the output of the voltage regulation circuit via a 180ohms resistor to indicate „POWER ON“ status. It can be disconnected by jumper JP1B, which also disconnects power to the GSM status LED (LED6).

2.3. GSM status LED (LED6)

The GSM status LED shows the operational status of the module. It can be disconnected from the power supply by jumper JP1B, which also disconnects power to the Power LED (LED5).

GSM LED	Status
OFF	module powered off or resetting
ON	module powered on, not registered to the network
Blinking slowly (once per 2 seconds)	registered to the network
Blinking quickly (1-2 times per second)	communication in progress

2.4. Jumper

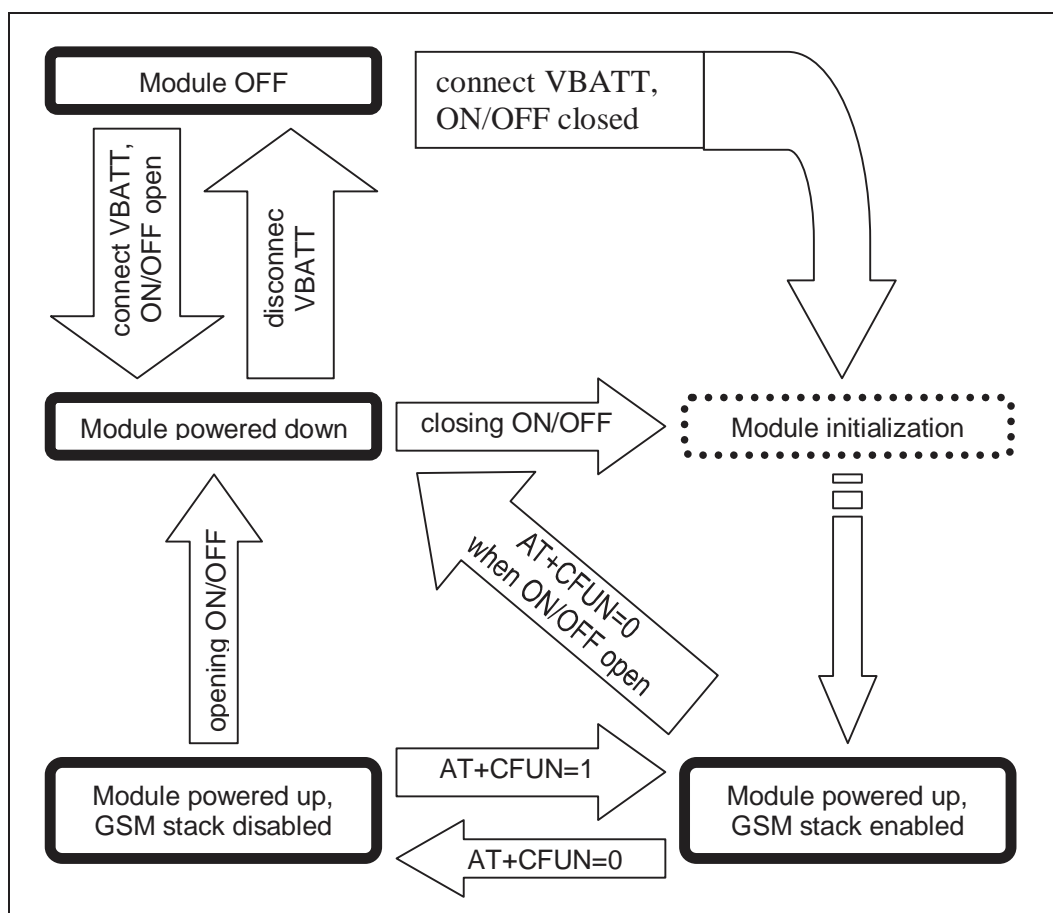
Numerous jumpers allow easy disconnection of peripheral functions from the module to either connect custom peripheral devices instead of the on-board devices or to enable measurement of the power consumption of the Q26 Wireless CPU without peripheral devices.

Jumper	Signal	Comments	Default
JP1	VBATT : 3.6V	connects on-board power supply to Q26xx Wireless CPU	closed
JP1B	3.6V	connects on-board power supply to Power and GSM status LEDs (LED5 + LED6)	closed
JP2	ON/OFF	Module power on/off when AT+CFUN=0	closed
JP3A	RI	connects serial link signals from Q26xx to RS232 level shifter IC4	closed
JP3B	DCD		closed
JP3C	RX		closed
JP3D	CTS		closed
JP3E	DSR		closed
JP3F	DTR		closed
JP3G	TX		closed
JP3H	RTS		closed
JP3Z	Vcc_2V8	Vcc for RS232 level shifter IC4	closed
SJ51	USB-DP	connects USB signals from Q26xx to USB connector X5	closed
SJ52	USB-DM		closed
SJ53	VPAD-USB		closed
JP6	Vcc_LCD	connects Vcc_2V8 to LCD display	closed
JP6B	LCD_BACK	connects on-board power supply to LCD backlight	closed
SJ61	SPI1-CLK	connects SPI bus signals and control signals from Q26xx to LCD display	closed
SJ62	SPI1-IO		closed
SJ63	~SPI1-CS		closed
SJ64	GPIO18		closed
SJ65	GPIO20		closed
SJ66	GPIO1	connects GPIO ports for LCD backlight control to transistors T5..7	closed
SJ67	GPIO2		closed
SJ68	GPIO3		closed
JP7	3.6V	connects on-board power supply to LED1..4	closed
SJ71	GPIO21	connects GPIO signals to LED control transistors T1..4	closed
SJ72	GPIO22		closed
SJ73	GPIO23		closed
SJ74	GPIO24		closed
JP9	Vcc_1V8 or COL0	connects either Vcc_1V8 or COL0 to "keypad"	open
GND	GND	Test pins: GND	closed

2.5. Q26 Series Wireless CPU power control – ON/OFF signal

The ON/OFF signal allows to control power on/off states of the Q26xx Wireless CPU in combination with the **AT+CFUN** command according to the following table:

State	Change	Condition	Next State
Module OFF	connect VBATT	ON/OFF closed	Module powered up, GSM stack enabled
Module OFF	connect VBATT	ON/OFF open	Module powered down
Module powered up, GSM stack enabled	AT+CFUN=0	ON/OFF closed	Module powered up, GSM stack disabled
Module powered up, GSM stack enabled	AT+CFUN=0	ON/OFF open	Module powered down
Module powered up, GSM stack enabled	opening ON/OFF	AT+CFUN=1	no effect
Module powered up, GSM stack disabled	opening ON/OFF	AT+CFUN=0	Module powered down
Module powered down	closing ON/OFF		Module powered up, GSM stack enabled
Module powered down	disconnect VBATT		Module OFF
Module powered up	disconnect VBATT		Module OFF, NOT RECOMMENDED !



2.6. RESET switch

The RESET switch on the EVBQ26xx board resets the Q26xx Wireless CPU. However it is recommended to use Software Reset **AT+CFUN=1** normally.

2.7. BOOT switch

The BOOT switch is used to switch the module to a special downloader mode- When the BOOT switch is pressed during power-on or reset, the Q26xx enters BOOT mode. In this mode, download is done using a special DWLwin software tool. Download is also possible using **AT+WDWL** and XModem protocol.

2.8. USB connector

To use the USB connector on the EVBQ26xx, it is necessary to activate the USB port on the Q26xx Wireless CPU with **AT+WMFM=0,1,3**. After this, connect the board to your PC using a standard USB cable and install the USB driver software contained on the CD in the directory \GLYN_EVBQ26xx\USB\.

2.9. Connector U1/U2

The evaluation board features two sets of 2x25 pads suitable for two 50pin 2.54mm connectors.

Every single pad is connected directly to the corresponding pin of the 100pin .5mm pitch connector of the Q26xx Series Wireless CPU with two exceptions:

Pad 1 and 2 are NOT connected to VBATT but to GND instead.

You can mount the two 50pins connector on either top or bottom side of the evaluation board, depending on your needs.

2.10. Notes regarding on-board voltage regulation circuit

GSM and GPRS transmissions occur in bursts with a duty cycle of 1/8 for GSM and up to 1/4 for GPRS Class 10. The maximum peak current during these transmission bursts is 2A.

The power supply circuit used on the EVBQ26xx Evaluation board is based on a slightly older Power Supply Application Note for Q24xx Series modules.

For your own design it is recommended to check out the application notes from WAVECOM concerning power supply design. These designs cover various ranges of input voltages, from direct connection to Li-Ion batteries to input voltage ranges of 5 to 32V.

3. TROUBLESHOOTING

3.1. General Information

When an AT command results in an **ERROR** message, please set the module for extended error messages by using the **AT+CMEE=1** command and repeat the command that failed. For a detailed description of the error refer to the AT Commands Manual.

In case of a **NO CARRIER** error when trying to establish a connection, an extended error report is available with **AT+CEER**.

For easier diagnostics the following information is required:

3.2. AT Command Settings for problem diagnostics

Enable Extended Error Report (**AT+CMEE=1**)

Enable Wavecom Indicator (**AT+WIND=2047** [exact number may be different depending on firmware version])

On **NO CARRIER** message, use **AT+CEER** for extended error report

3.3. Proper Identification of Modem or Module

Type of Modem or Module (label on product):

Hardware Revision (**AT+WHWV**):

Date of Production (**AT+WODP**):

Software Version (**ATI3** or **AT+CGMR**):

Downloader Version (**AT+WDWL**):

3.4. Precise Problem Description

Enable logging of communication with the module in your terminal software.

What does/doesn't happen? Be as precise as possible.

Can the problem be reproduced? How?

Have you reproduced the problem?

3.5. Environment of the Modem or Module

Network Conditions: **AT+COPS=?** , **AT+COPS** , **AT+CSQ** , **AT+CREG?** , **AT+CCED=1,1**

SIM-Card: **AT+CCID** , **AT+CPIN?**

3.6. Problem Source

If possible, do tests with other SIM-Cards, on other networks and maybe with other GSM/GPRS-Modems/Modules, to narrow down the source of the problem.

Appendix A : Bill of Material

#	Part	Value	Package
1	BOOT		B3F-10XX
2	C11	4n7	C1206
3	C12	100n	C1206
4	C13	100n	C1206
5	C14	100n	C1206
6	C15	47u	153CLV-0605
7	C16	22p	C1206
8	C17	100n	C1206
9	C18	470p	C1206
10	C19	220p	C1206
11	C20	100p	C1206
12	C21	1n	C1206
13	C22	4u7 TT	153CLV-0405
14	C23	100n	C1206
15	C24	1u TT	A/3216-18R
16	C25	470u TT	D/7343-31R
17	C26	470u TT	D/7343-31R
18	C27	1u TT	A/3216-18R
19	C29	100n	C1206
20	C30	100n	C1206
21	C31	100n	C1206
22	C32	100n	C1206
23	C33	100n	C1206
24	C34	100n	C1206
25	C35	100n	C1206
26	C40	100n	C1206
27	C41	470p	C1206
28	C51	100n	C1206
29	C52	100n	C1206
30	C60	1u	C1206
31	C61	1u	C1206
32	C62	1u	C1206
33	C63	1u	C1206
34	C64	1u	C1206
35	C65	1u	C1206
36	C66	1u	C1206
37	C67	1u	C1206
38	C68	1u	C1206
39	C69	1u	C1206
40	D1	STPS340U	DO214AA
41	D2	sm15t33aa	DO214AB
42	D3	BAS40	SOT23
43	GND		JP1

#	Part	Value	Package
44	IC1	Q2686H	Q26XX
45	IC1-conn	AXK500145J	
46	IC2	LTC1735SSOP16	SSOP16
47	IC3	STS4DNF60L	SO08
48	IC4	ADM3307	TSSOP-28
49	IC5	s-1200b33-m5t1g	SOT23-5
50	JP1	rot	JP1
51	JP1B	rot	JP1
52	JP2	blau	JP1
53	JP3A	schwarz	JP1
54	JP3B	schwarz	JP1
55	JP3C	schwarz	JP1
56	JP3D	schwarz	JP1
57	JP3E	schwarz	JP1
58	JP3F	schwarz	JP1
59	JP3G	schwarz	JP1
60	JP3H	schwarz	JP1
61	JP3Z	rot	JP1
62	JP4A	rot	JP1
63	JP4B	rot	JP1
64	JP4C	schwarz	JP1
65	JP6	rot	JP1
66	JP6B	rot	JP1
67	JP7	rot	JP1
68	JP9	schwarz	JP2
69	L1	Tyco 10uH	TYCO3631
70	L2	ZJYS51R5-2PT	ZJYS-4PIN
71	L3	Epcos 1uH	EPCOS-B82462
72	LCD	64128J	64128J
73	LED1	BLUE	CHIPLED_1206
74	LED2	BLUE	CHIPLED_1206
75	LED3	BLUE	CHIPLED_1206
76	LED4	BLUE	CHIPLED_1206
77	LED5	green	CHIPLED_1206
78	LED6	red	CHIPLED_1206
79	R5	180	R1206
80	R6	180	R1206
81	R11	680k	R1206
82	R12	33k	R1206
83	R21	10	R1206
84	R22	10	R1206
85	R23	0.02 1%	R1206
86	R24	120k 1%	R0805
87	R25	33k 1%	R0805
88	R41	100k	R1206
89	R61	1k	R1206
90	R62	1k	R1206
91	R63	1k	R1206

#	Part	Value	Package
92	R71	180	R1206
93	R72	180	R1206
94	R73	180	R1206
95	R74	180	R1206
96	R75	10k	R1206
97	R76	10k	R1206
98	R77	10k	R1206
99	R78	10k	R1206
100	Reset		B3F-10XX
101	S1		B3F-10XX
102	S2		B3F-10XX
103	S3		B3F-10XX
104	S4		B3F-10XX
105	SIM1	FMS006-2001	FMS006-2001
106	SJ1		SJ_2
107	SJ51		SJ
108	SJ52		SJ
109	SJ53		SJ
110	SJ61		SJ
111	SJ62		SJ
112	SJ63		SJ
113	SJ64		SJ
114	SJ65		SJ
115	SJ66		SJ
116	SJ67		SJ
117	SJ68		SJ
118	SJ71		SJ
119	SJ72		SJ
120	SJ73		SJ
121	SJ74		SJ
122	T1	BC847BSMD	SOT23
123	T2	BC847BSMD	SOT23
124	T3	BC847BSMD	SOT23
125	T4	BC847BSMD	SOT23
126	T5	BC847BSMD	SOT23
127	T6	BC847BSMD	SOT23
128	T7	BC847BSMD	SOT23
129	U1		2X25
130	U2		2X25
131	X1A	AB9V	AB9V
132	X1B	43045-0400	43045-0400
133	X3	DRB-09S	F09HP
134	X5	USB-B-001	PN61729

Appendix B : Schematics

