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Markus Wejrot	2003-03-17	cBProject-0303-06 (1)	1 (5)

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Bluetooth Comfort Module Block Diagram with Operational Description

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1   Operational Description

1.1 Blockdiagram
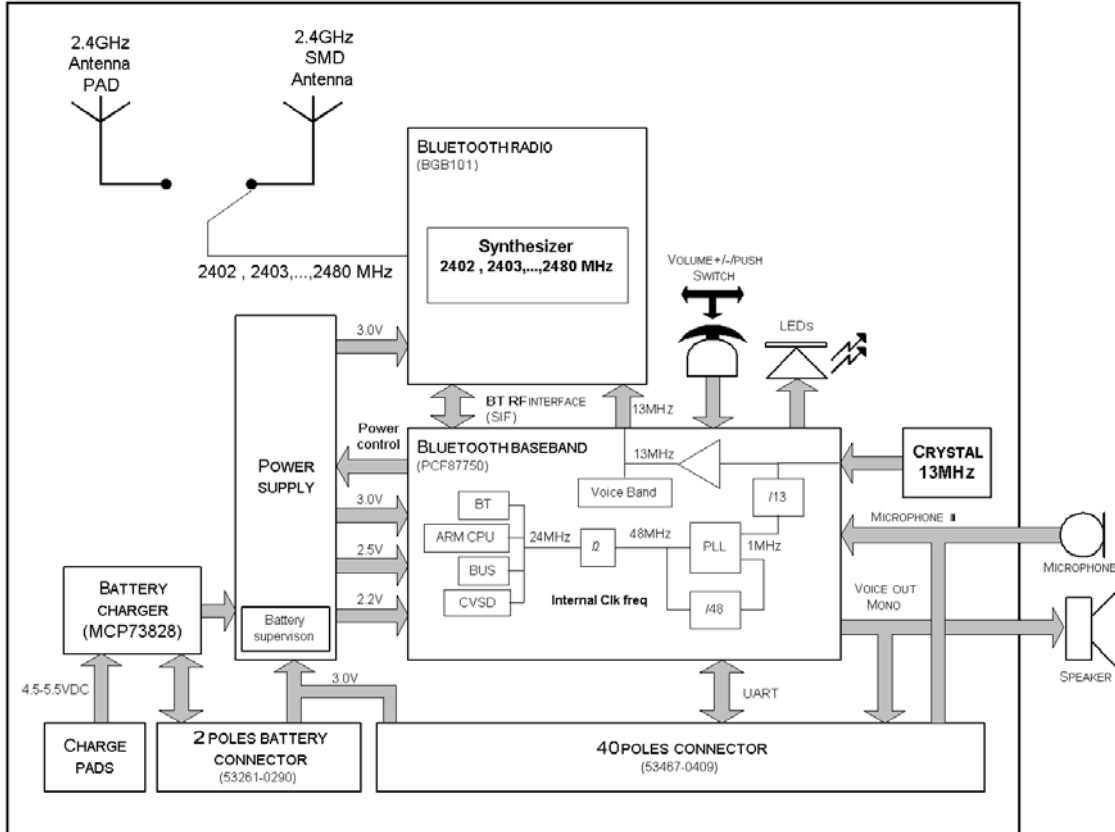
1.2 Operational Description

This solution is a completely new construction optimised for the audio use. Based on a single CPU solution where the Link Manager, Bluetooth Stack, Headset profile and application execute in the base band CPU.

The Unit is controlled with AT commands or switches.

1.2.1 Baseband

The base band chip is a Philips PCF87750E. This chip is complete with a built-in ARM7 CPU with 384 KB Flash and 64 KB RAM memory (enough to execute the full Bluetooth stack, the headset profile and the application). The base band chip also includes an audio codec allowing for direct connection of the analogue sound input and output (headset quality sound). It is possible to control the line output level of codec e.g. to support a volume control.

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PIO pins are available and will be used for control e.g. through buttons or indications through LEDs.

The UART are logic levels and interface circuits will be used for AT commands and production purpose.

The Baseband need an external 13MHz crystal and the internal frequencies are

- 13MHz – Voice Band block.

- 1MHz and 48MHz in PLL only.

- 24MHz – BT Block, ARM CPU, BUS etc.

An external 13MHz is output for the radio module.

1.2.2 Radio

The radio is a Philips BGB101 radio module and is connected directly to baseband chip.

An internal synthesizer is moving the 13MHz to the 79 Bluetooth channels starting at 2402MHz up to 2480MHz with a channel separation of 1MHz.

1.2.3 Antenna

There are 3 antenna alternatives (only one could be used at the same time)

- *SMD antenna* – A surface mounted antenna from gigaAnt called Mica: L x W x H = 20.5 x 3.6 x 3.3mm

- *External antenna pad* – An antenna PAD is designed for antenna placement on a separate PCB.

1.2.4 Audio

The module has one mono input interface (microphone) and one mono output (speaker).

1.2.4.1 Input

The mono input interface is designed for a microphone/line level input. The interface is working in two modes:

- With an electret microphone source. The module has an integrated power source for the microphone.

- Line levels input (0.775Vpp).

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1.2.4.2 Output

The mono output is working is intended for speaker/line level output:

Min load: 32Ω
Max output power pp: 5dBm
Common mode: 1.1VDC

1.2.4.3 Battery charge

An internal battery charger is integrated on the unit (MCP73828).

1.2.5 Power supply

The circuits need a couple of power supplies.

There is a linear voltage regulator for 3.0V main supply and the other voltages needed is linear controlled with the integrated control block of the baseband.

Symbol	Parameter	Mode	Unit	Min	Typ	Max	Unit
VDD_3V0	Main supply voltage			2.8	3.0	3.4	V
	Voltage ripple					10	mV
VDD_2V5	Supply voltage for IO interface of PCF87550				2.5		V
VDD_2V2	Supply voltage for PCF87550 Core				2.2		V
I_{VDD_3V0}	Supply current	Connected in Voice	Baseband Radio		10 10	20 12	mA
		Idle	Baseband Radio		0.6 0.4	1.5 0.5	mA