

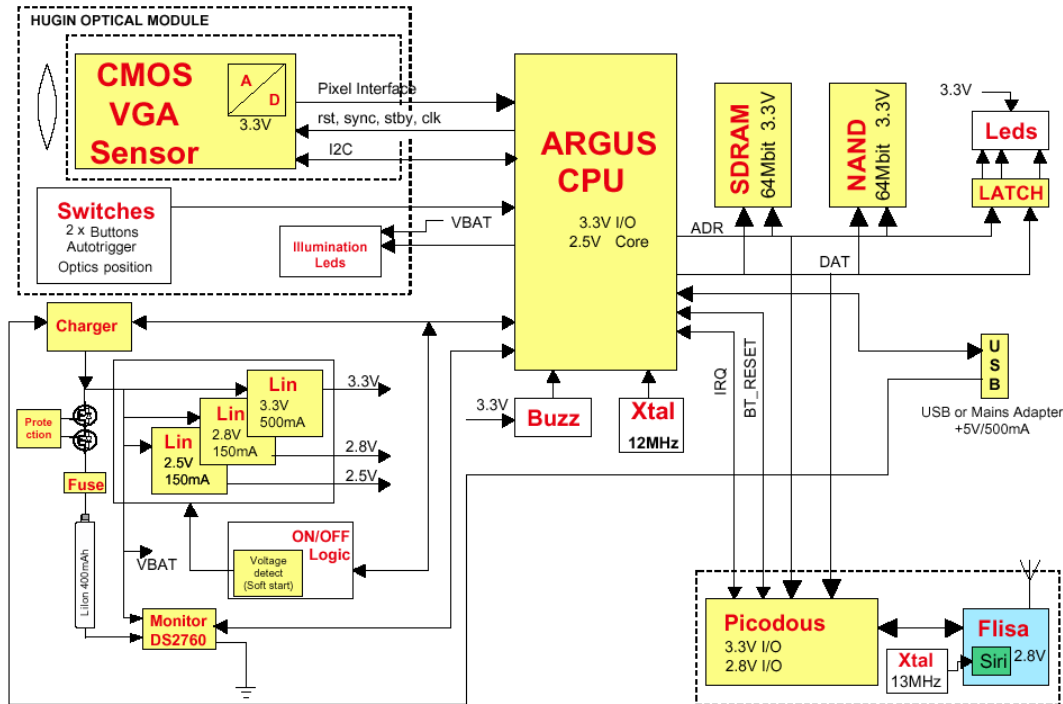
Uppgjord - <i>Prepared</i> Kåre Lindkvist	Telefon - <i>Telephone</i> +46 (0) 46 5401 123	Nr - <i>No.</i> CTech-02:0165		
Godkänd - <i>Approved</i>		Datum - <i>Date</i> 2002-05-15	Rev A	Fil - <i>File</i> Operational_Desc

Operational description BzMate

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1.1 Electrical block schematics



1.2 Product operation description

The device is a combined text-reader and digital camera.

It is based on a 72MHz ARM CPU, connected to 64Mbit SDRAM (72MHz, 3.3V) and 64Mbit NAND flash memory (3.3V).

Images are grabbed with the optical module (3.3V, Main clock 2MHz, resolution 640x480 pixels). These images are converted to text or JPEG-images based on which application is currently running.

The images or text is sent to a PC via Bluetooth (HID and basic imaging profiles) or USB (HID profile).

The user interface is based on 3 switches and a buzzer.

	Photo mode	Read mode
Switch 1	Grab image size 640x480	Scan text
Switch 2	Grab image size 320x240	Carriage return
Switch 3	On/Off/Function selector	On/Off/Function selector

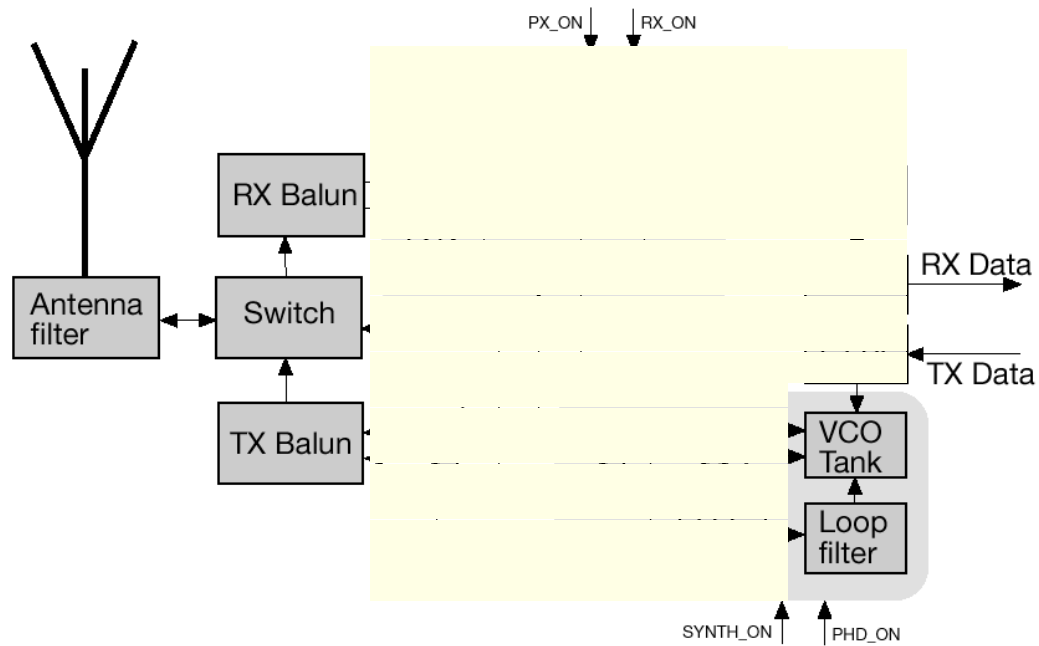
The device is powered by a LiIon battery (3.7V / 410mAh), with 3 linear regulators (3.15V/~150mA, 2.8V/~50mA, 2.5V/~100mA).

The LiIon battery is supervised by a protection IC to prevent failure conditions.

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1.3 Operation details of RF Module “Flisa”

1.3.1 Block diagram

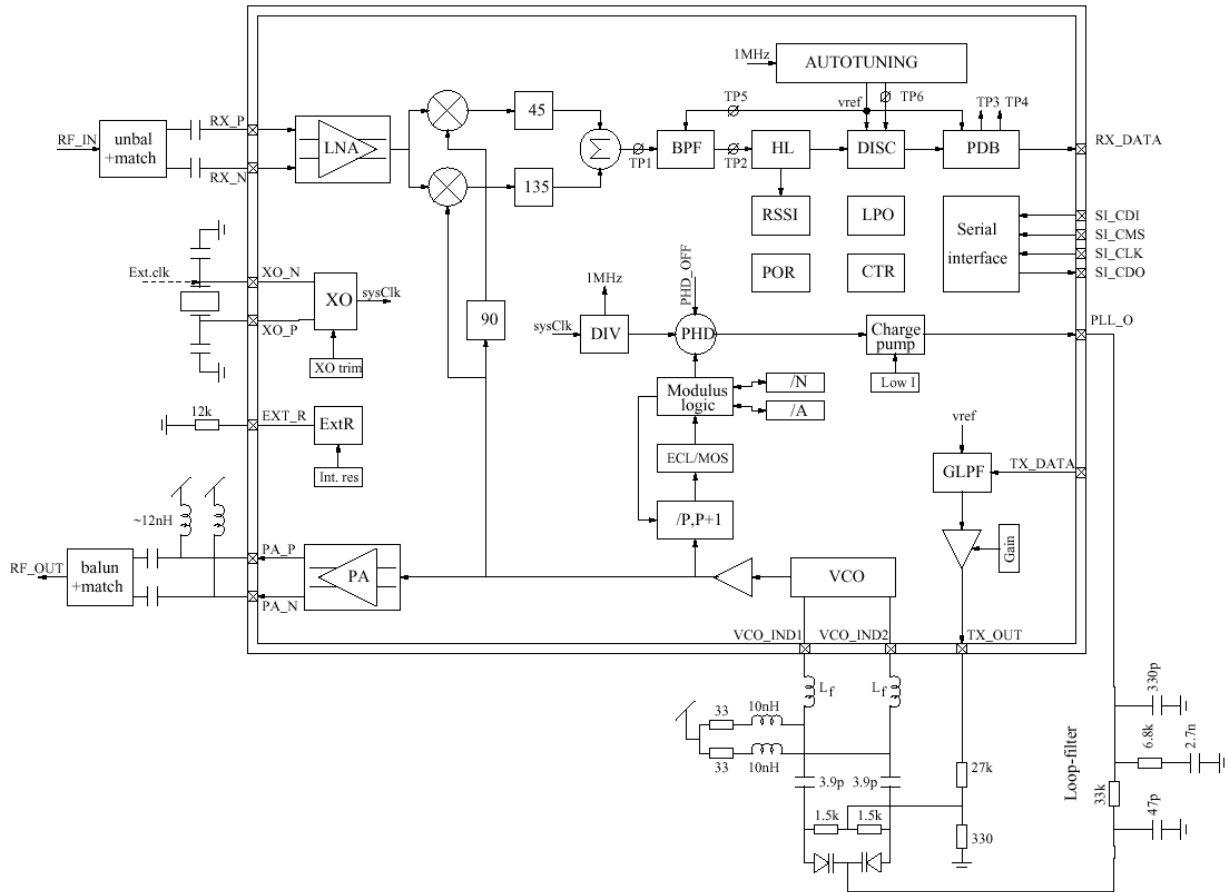


Items marked in yellow is integrated in the radio ASIC.

All blocks except the antenna is integrated in the RF module.

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1.3.2 Block diagram of radio ASIC

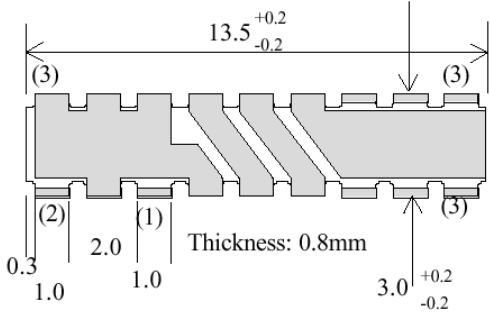
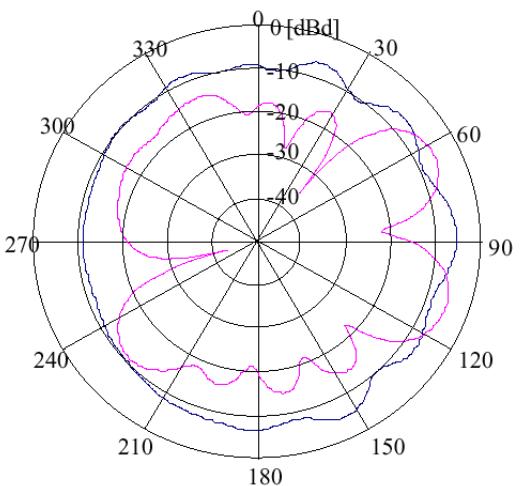
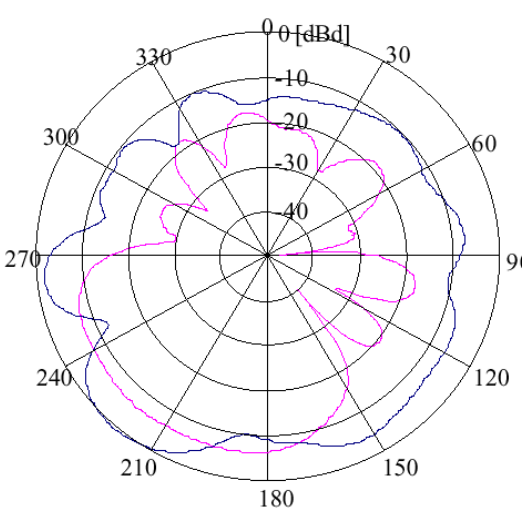


The RF asic uses a heterodyne receiver architecture with an intermediate frequency of 3.0 MHz with the intermediate frequency filters integrated on chip. The receiver consist of an low noise amplifier (LNA) followed by an image rejection mixer. The intermediate frequency signal processing blocks consist of a bandpass filter (BPF), a hardlimiter (HL), a frequency discriminator (DET) and a lowpass filter with offset compensation (PDB).

The RF asic also contains a synthesizer consisting of a phase detector (PHD), charge pump, loop and regulator filters (external), a prescaler (PSC), modulus logic and a voltage controlled oscillator (VCO). The transmitter utilizes direct modulation on the single VCO, the bit-stream data is shaped with the gaussian shaping filter (GLPF) before the RF carrier is modulated. The transmitter further contains a VCO buffer and a power amplifier (PA).

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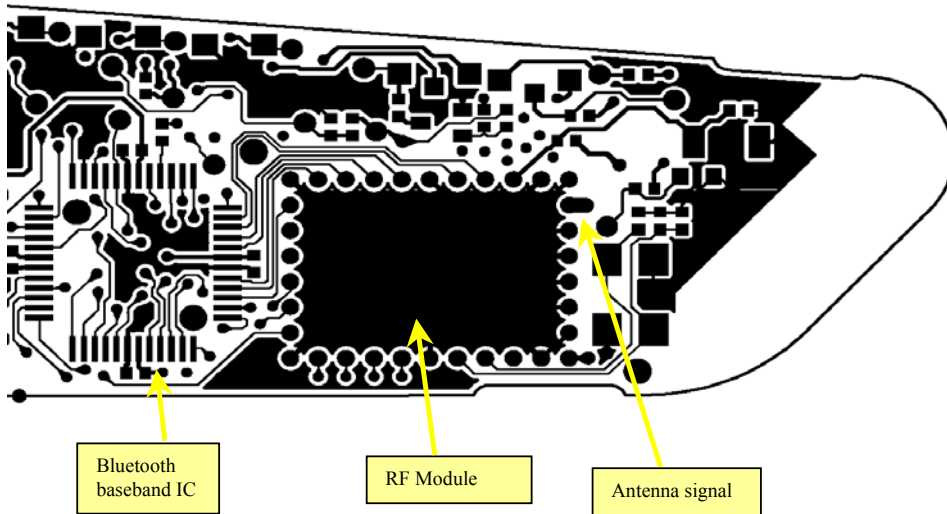
1.4 Details of antenna system

Parameter	Value
Input and output impedance of antenna pin on RF module	50 Ohm
Antenna peak gain measured in device	-3.2 dBd
Antenna type	Mitsubishi AHD1403-244ST06
Antenna mechanical spec	 Thickness: 0.8mm (1) in/out terminal (2) GND (3) Fixing Electrode (should be connected to the floating pad)
Antenna radiation pattern XY plane on evaluation PCB	
Antenna radiation pattern YZ plane on evaluation PCB	

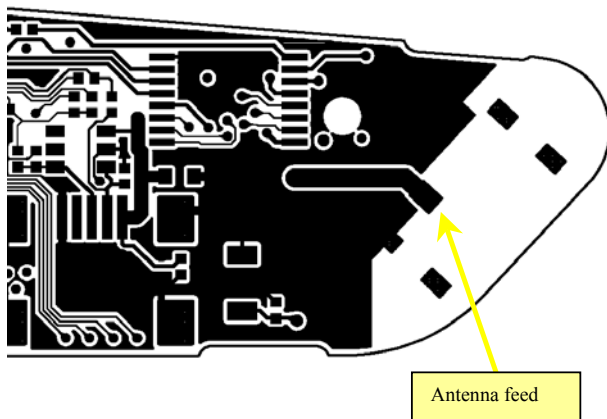
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1.5 PCB Layout / Grounding

Top layer



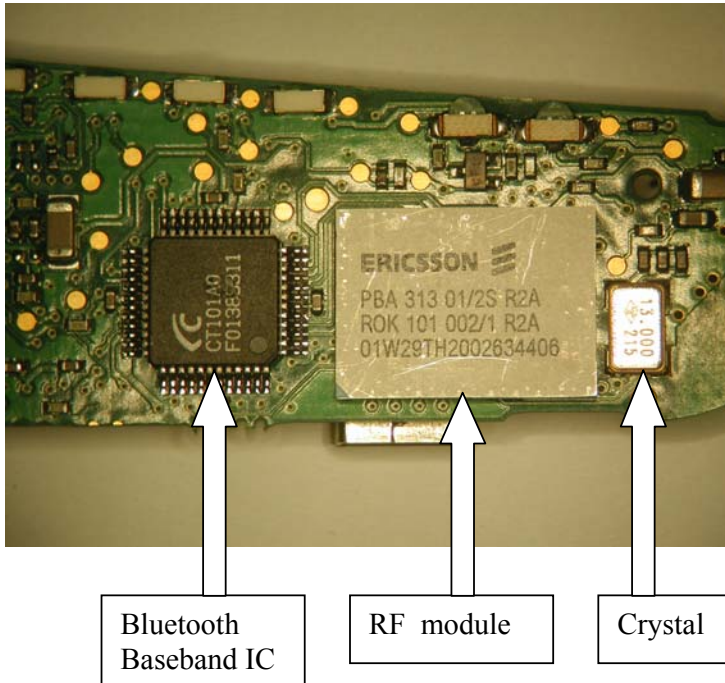
Bottom layer



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1.5.1 Photos of PCB, RF parts

Top side



Bottom side

